Bridge Inspection Report

047B00133L
Inspector: Allen Cantrell
Entered by: ACANTRELL
05/23/2019
FC

IDENTIFICATION

Structure Num (8):	047B00133L
NBI Number:	047B00133L
Structure Name:	_
Location (9):	SBL I 65 @ BULT-HARDN CL
Carries (7):	INTERSTATE 65 NC
Type of Service (42A):	1 Highway
Feature Crossed (6):	ROLLING FORK RIVER
Type of Service (42B):	5 Waterway
Placecode (4):	Not Applicable
County (3):	Hardin (047)
State (1):	21 Kentucky
Admin Area:	Inventory
District:	District 4
Latitude (16):	37° 48' 48"
Longitude (17):	85° 44' 21"
Owner (22):	State Highway Agency
Maint. Resp. (21):	State Highway Agency
Year Built (27):	1985
Year Recon (106):	0
Border State (98A):	Unknown (P)
Border Number (99):	
% Responsibility (98B):	-1

Fair **Heath Index:** 92.59

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

Inspection Type	Freq (92)	Last Insp (93)	Next Insp
Routine	24	5/23/2019	5/23/2021
Element	24	5/23/2019	5/23/2021
Fracture Critical (A)	24	5/23/2019	5/23/2021
Underwater (B)		1/1/1901	1/1/1901
Special Insp (C)		7/17/2017	1/1/1901

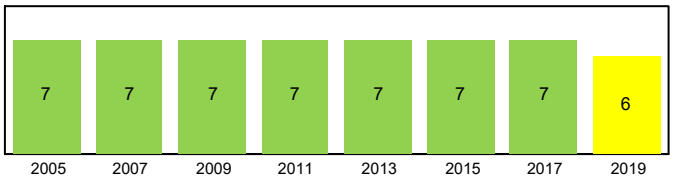
LOAD RATING AND POSTING

Posting Status(41):	A Open, no restriction
Posting (70):	5 At/Above Legal Loads
Signs Posted Cardinal:	No
Signs Posted Non-Cardinal:	No
Recmd Date:	
Posted Date:	

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

DECK GEOMETRY

Deck Geometry (68):	6 Equal Min Criteria
Deck Area:	33,394.00 ft²
Deck Type (107):	1 Concrete-Cast-in-Place
Wearing Surface (108A):	3 Latex Concrete/Similar
Membrane (108B):	0 None
Deck Protection (108C):	1 Epoxy Coated Reinforci
Approach Roadway width (32):	61.02 ft.
Width Curb to Curb (51):	56.10 ft.
O. to O. Width (52):	58.70 ft.
Curb / Sidewalk Width L (50A):	0.00 ft.
Curb / Sidewalk Width R (50B):	0.00 ft.
Median (33):	0 No median

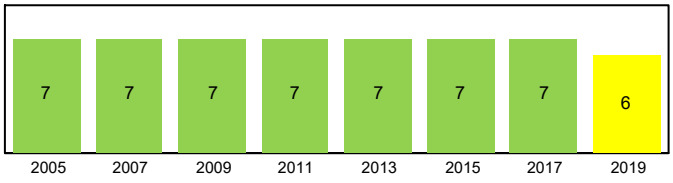


DECK CONDITION

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):	5
# of Approach Spans (46):	0
Main Material (43 A):	4 Steel Continuous
Main Design (43 B):	03 Girder-Floorbeam
Max Span Length (48):	124.00 ft.
Structure Length (49):	568.90 ft.
NBIS Length (37):	Long Enough
Temp Structure (103):	Not Applicable (P)
Skew (34):	0°
Structure Flared (35):	0 No flare
Parallel Structure (101):	Left of || bridge
Approach Alignment (72):	7 Above Min Criteria

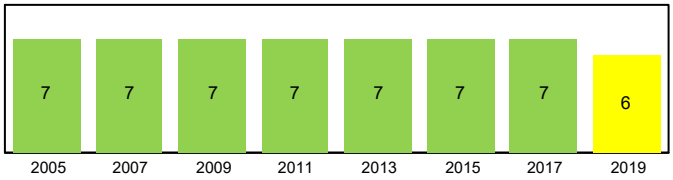


SUPERSTRUCTURE CONDITION

Superstructure Rating (59):	6 Satisfactory
Structure Evaluation (67):	5 Above Min Tolerable

SUBSTRUCTURE GEOMETRY

Navigation Control (38):	Permit Not Required
Nav Vert Clearance (39):	
Nav Horiz Clearance (40):	
Pier Protection (111):	Not Applicable (P)
Lift Bridge Vertical Clearance (116):	
Scour Rating (113):	8 Stable Above Footing
Waterway Adequacy (71):	8 Equal Desirable



SUBSTRUCTURE CONDITION

Substructure Rating (60):	6 Satisfactory
Channel Rating (61):	7 Minor Damage

KYTC FIELDS

Overlay:	Yes	**Scour Observed:**	Minor Scour
Overlay Type:	Latex	**Scour Risk :**	Low Risk
Overylay Thickness:	1.30 in.	**Scour Analysis/Assessment :**	Completed by Ogden
Overlay Year:		**Scour POA :**	Not Required
Cross Section:	Yes	**Scour POA Date :**	
Cross Section Date:	05/16/2017	**Next Cross Section Due Date :**	05/23/2027

ROUTE ON STRUCTURE: I-65 NC

ROADWAY LOCATION

Pos Prefix (5A):	Route On Structure
Kind of Hwy (5B):	1 Interstate Hwy
Route Num (5D):	00065
LRS Route (13A/B):	IO0065_000/00
Milepost (11):	103.28 mi
Suffix (5E):	0 N/A (NBI)
Lanes On (28A):	3
Detour Length (19):	1.24 mi

ROADWAY CLASSIFICATION

Funct Class (26):	01 Rural Interstate
Level Service (5C):	1 Mainline
NHS (104):	1 On the NHS
Defense Hwy (100):	1 On Interstate STRAHNET
Toll Facility (20):	3 On free road
ADT (29):	32,175 Cars/Day
Pct Trucks (109):	25.00%
ADT Year (30):	2019

CLEARANCES

Vertical (10):	99.99 ft.
Min Vert Over (53):	99.99 ft.
Vert Ref (54A):	N Feature not hwy or RR
Undrclearnce (54B):	0.00 ft.
Horizontal (47):	55.77 ft.
Min Lat Left (56):	0.00 ft.
Min Lat Right (55B):	0.00 ft.
Horiz Ref (55A):	N Feature not hwy or RR
Underclearance (69):	N Not applicable (NBI)

STRUCTURE NOTES

- I-65 runs south to north according to the route log, Elizabethtown to the south and Lebanon Junctior to the north. The order of inventory is from south (End Bent 1) to north (End Bent 6).
- Upstream is to the right (east) of the structure, and downstream is to the left (west) of the structure.
- Girders are numbered from left (Girder 1) to right (Girder 5).

INSPECTION NOTES

AECOM completed the NBI, Element, and Fracture Critical Inspection on 5/23/19. The inspection took place between 5/20/19 and 5/23/19. The inspection limits were from End Bent 1 to End Bent 6. For additional detailed findings, conclusions, and recommendations, reference Form TC71-118 and the corresponding cover letter submitted by AECOM to KYTC and attached to this report.

-The Deck (Item 58) rating was lowered from 7 to 6 due to the deterioration of the underside of the deck (Element 12). The Superstructure (Item 59) rating was lowered from 7 to 6 due to the deterioration noted on the girders and floor beams at Joints 1 and 2 (Elements 107 and 152) and pack rust noted on the steel pin and hangers at Joints 1 and 2 (Element 161). The Substructure (Item 60) rating was lowered from 7 to 67 due to the spall and cracks with rust staining in End Bents 1 and 6 (Element 215).

The approach pavement along the south approach has approximately 25 SF of failing asphalt patches throughout all lanes.

In addition to work items, AECOM recommends monitoring the following during future routine and fracture critical inspections:
- Visual inspection of Pin and hanger assemblies and continued use of regular ultrasonic testing of pins.
- Corrosion section loss and pack rust in the stringer, girders, and floorbeams.
- Rotation of bearings at End Bent 1.
- Tack weld crack at top flange of Floorbeam 7.

SCOUR NOTES

LOAD RATING NOTES

8/31/2015 Controlling member is the "new" interior floorbeam for SU7, and the "new" stringer for 16'8"-7@17.75'-16'8" for the rest of the trucks with 1.25" latex overlay and no provision for FWS. Critical point is 1.5 (midspan) for SU7, at 5.0 and 6.0 (beginning and end of middle 17.75ft span) for Type 3; and at 2.0 and 9.0 (at pier) for the rest of the trucks. Rating SU4: 36.7 tons (RF 1.36) SU5: 42.3 tons (RF 1.37) SU6: 44.6 tons (RF 1.28) SU7: 48.3 tons (RF 1.25). DGA
8/31/2015 Post at 20, 27, 34, 40 tons for Types 1-4 due to the load rating of the superstructure. DGA
07/07/17 Memo to remove posting due to revision of KRS 189.2301. Existing load posting signs may be removed. ALI.

COMPLIANCE NOTES

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
12	**Re Concrete Deck**	**3**	**05/23/2019**	**33,410.00**	**sq.ft**	**26,694.00**	**6,682.00**	**34.00**	**0.00**

The underside of the deck is in satisfactory condition.
CS2: The deck underside has minor transverse cracking with occasional intersecting longitudinal cracking on approximately 20% of all spans with areas of light efflorescence (6,682 SF).
- Loose formwork from the joint rehabilitation is still in place which is obscuring inspection of the deck around the joints.
- The haunches above all girders and Stringers 1 and 2 have cracking and spalling occasionally exposing the girder top flange.

CS3: There is an area of delamination and spall adjacent to Joint 1 measuring 5' long by 2' wide by 3" deep on the downstream overhang (10 SF).
- Spall and patch adjacent to Joint 2 on downstream overhang (12 SF) and between Girder 3 and Girder 4 (5 SF).
- There is an area of full depth concrete repair with exposed reinforcing steel measuring 2' long by 2' wide located between Girders 2 and 3 and Floor Beams 26 and 27 (4 SF).
- There is a spall measuring 1.5' by 1.5' by 6" deep adjacent to End Bent 6 on the downstream fascia (3 SF).

510	Wearing Surfaces	3	05/23/2019	31,922.00	sq.ft	31,554.00	320.00	48.00	0.00

CS1: There is minor wear in the tining along the wheel paths in all lanes.
- There is insignificant transverse cracking isolated throughout the wearing surface.

CS2: The wearing surface has minor cracking at the joints and minor potholes throughout approximately 1% of the wearing surface (320 SF).

CS3: There is a 6' by 8' area of minor spalling due to fire damage in the right shoulder of Span 3 just north of Pier 3 (48 SF).

3210	*Del/Spall/Patch/Pot(Wear Surf)*	*3*	*05/23/2019*	*48.00*	*sq.ft*	*0.00*	*0.00*	*48.00*	*0.00*

See parent element.

1080	Delamination/Spall/Patched Area	3	05/23/2019	34.00	sq.ft	0.00	0.00	34.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
107	**Steel Opn Girder/Beam**	**3**	**05/23/2019**	**2,860.00**	**ft**	**2,462.00**	**349.00**	**49.00**	**0.00**

2.2° rotation of Girder 4 rocker to north between FB23 & FB24. Other rockers generally are not rotated.

CS2: Isolated areas of surface corrosion typically on the top and bottom flanges on all girders in all spans:
- Span 1: 8 LF
- Span 2: 155 LF
- Span 3: 18 LF
- Span 4: 64 LF
- Span 5: 104 LF
- There is a poor quality weld at the top of the web on Girder 3 at FB22 (1 LF).
- Rocker bearings on Girders 3 and 4 have insignificant section loss at Joints 1 and 2.
- The transverse stiffeners are occasionally deformed up to 1" out of plane for approximately 6" long.
- There is occasional minor fretting rust at the top of approximately 50% of the transverse stiffeners without welds to the top flange of Girders 3 and 4 at the connection to the floor beams.
- There is a minor distortion to the bottom flange of Girder 2 near FB11.

CS3: Reactivating pack rust typically on the bottom flange and on the lower web cover plates up to 1/4" thick at the splices of Girders 3 and 4:
- Girder 3: Spans 3 and 4 - 11 LF
- Girder 4: Spans 1, 3, and 4 - 16 LF
- 1/8" deep pitting in the web of Girder 3 at Joint 1 (1 LF).
- The transverse stiffener plates within 5' of the end of Girders 3 and 4 are deformed up to 1/4" due to up to 5/8" thick pack rust above the bearings at End Bents 1 and 6 as well as below the rocker bearings at Joints 1 and 2 (8 LF).
- Wind locks on Girders 3 and 4 typically have significant pack rust up to 1/2" thick and loss of section. Loss of section could not be measured due to access.
- 1/4" section loss to bottom flange of Girder 3 at Joint 1 adjacent to the windlock (1 LF).
- Reactivating pack rust on Girder 4 transverse stiffener with initial section loss between FB12 & FB13 (1 LF).
- 3/16" section loss to transverse stiffener under seated rocker on inboard face of G4 at Joint 1.
- 1/2" thick pack rust around windlock at Joint 1 on Girder 4, transverse stiffener is deformed with 3/16" section loss to bottom of web and bottom flange (3 LF).
- 3/16" thick pack rust with up to 1/32" section loss on transverse stiffener of G4 between FB15 & FB16 (2 LF).
- 1/16" section loss on bottom of G4 web between FB24 & FB25 (1 LF).
- Pack rust up to 1/2" thick typically between rocker stiffener plates on Girder 4 (1 LF).
- 9/16" thick pack rust on the lower web angle cover plate at Girder 4 splice between FB33 & FB34 (4 LF).

515	Steel Protective Coating	3	05/23/2019	45,498.00	sq.ft	40,742.00	4,267.00	91.00	398.00

CS2: The protective steel coating on the downstream face of Girder 1 has loss of pigment due to sun bleaching (4267 SF).

CS3: There are isolated areas of paint flaking exposing the primer throughout the girders, concentrated in Span 5 (91 SF).

CS4: The protective steel coating has failed at isolated locations throughout the girders where corrosion was noted (398 SF).

1000	Corrosion	3	05/23/2019	49.00	ft	0.00	0.00	49.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
113	**Steel Stringer**	**3**	**05/23/2019**	**2,288.00**	**ft**	**2,190.00**	**96.00**	**2.00**	**0.00**

CS2: Isolated areas of surface corrosion typically on the top flange and occasionally on the bottom flange and located near the deck joints of all stringers in Spans 1, 2, 4, and 5 (96 LF).
- Audible rattling of Stringer 1 under live load adjacent to FB24.

CS3: Corrosion with initial section loss on top flange of Stringer 4 between FB20 & FB21 and FB21 & FB22 (2 LF).

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	05/23/2019	11,856.00	sq.ft	11,737.00	0.00	119.00	0.00

CS3: Paint flaking exposing the primer coat on approximately 1% of stringers (119 SF).

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
1000	Corrosion	3	05/23/2019	2.00	ft	0.00	0.00	2.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
152	**Steel Floor Beam**	**3**	**05/23/2019**	**1,494.00**	**ft**	**1,388.00**	**58.00**	**48.00**	**0.00**

CS2: Typically, at the connection to ("original") Girders 3 and 4 there are 3 to 5 rivets missing and threaded bolts in place of previous rivets to facilitate the retrofit.
- Cracked tack weld on north face of FB7 between G3 & G4 near G4 (1 LF).
- Surface corrosion on top and/or bottom flanges on the following floor beams:
- FB7: Between G3 & G4 (2 LF)
- FB11: Between G3 & G4 (2 LF)
- FB13: Between G1 & G2 (6 LF)
- FB14: Between G3 & G4 (20 LF)
- FB23: Between G3 & G4 (25 LF)
- FB28: Between G4 & G5 (1 LF)
- FB32: Between G4 & G5 (1 LF)
- Heavier than normal vibrations from live load were observed in FB13 between G3 & G4.

CS3: Laminating corrosion on top and bottom flange along 60% of FB13 between G1 & G2 and FB14 between G3 & G4 (11 LF).
- An area of 1/8" deep pitting on FB13 measuring 8" tall by 3" wide on the east side of the connection to Girder 3.
- 9/16" section remaining (7/8" nominal) on north face of top flange of FB14 measuring 5' long by 4" wide under S4 (5 LF).
- 1/16" section loss along length of FB23 web up to 8" tall and full web height at G4 (15 LF).
- Pack rust along the full length of the box above FB23 between G3 & G4.
- Up to 1/8" section loss on the bottom flange and web of FB23 (2 LF).
- 30% loss of section on the bottom flange and 5" high on the web of FB24 due to painted over prior corrosion between G3 & G4 (15 LF).

515	Steel Protective Coating	3	05/23/2019	11,952.00	sq.ft	11,780.00	125.00	47.00	0.00

CS2: The protective steel coating is substantially effective (125 SF).

CS3: There are isolated areas of minor paint flaking exposing the primer coat throughout the floor beams (7 SF).
- FB32 and FB33 have approximately 20 SF of paint flaking on the bottom flange exposing the primer coat (40 SF).

1000	Corrosion	3	05/23/2019	48.00	ft	0.00	0.00	48.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
161	**Stl Pin Pin/Han both**	**3**	**05/23/2019**	**6.00**	**each**	**1.00**	**3.00**	**2.00**	**0.00**

- Span 2, Girder 1, Joint 1 top, inside - Minor fretting rust staining between nut and hanger indicating some ongoing movement.
- Span 2, Girder 1, Joint 1 bottom, inside - Outside hanger rubbing against web of girder 1.
- Span 2, Girder 1, Joint 1 top, outside - Good condition.
- Span 2, Girder 1, Joint 1 bottom, outside - Initial corrosion on girder web due to outside hanger rubbing against web. Initial pack rust between nut and hanger.
- Span 2, Girder 2, Joint 1 top, inside - Good condition.
- Span 2, Girder 2, Joint 1 bottom, inside - Freckled rust on nut and pin. 7/16" thick pack rust between Girder 2 web and hanger.
- Span 2, Girder 2, Joint 1 top, outside - Initial pack rust between nut and hanger.
- Span 2, Girder 2, Joint 1 bottom, outside - Minor rust staining between nut and hanger. 3/8" gap between outside hanger and girder web.
- Span 2, Girder 5, Joint 1 top, inside - Spilled concrete on top of nut.
- Span 2, Girder 5, Joint 1 bottom, inside - 1/8" clockwise rotation of pin relative to nut (5/16/2017).
- Span 2, Girder 5, Joint 1 top, outside - Good condition.
- Span 2, Girder 5, Joint 1 bottom, outside - Previously noted concrete in contact with hanger was removed.
- Span 4, Girder 1, Joint 2 top, inside - Slight movement indicated in connection (5/11/2015). Less than 1/8" counter-clockwise rotation of nut relative to hanger (5/16/2017). 5/8" counter-clockwise rotation of nut relative to hanger (5/23/2019).
- Span 4, Girder 1, Joint 2 bottom, inside - Minor rust staining between nut and hanger. Steel intrusion on inside hanger, 14" from bottom of hanger.
- Span 4, Girder 1, Joint 2 top, outside - Minor rust staining between nut and hanger.
- Span 4, Girder 1, Joint 2 bottom, outside - Minor rust staining between nut and hanger.
- Span 4, Girder 2, Joint 2 top, inside - Slight movement indicated in connection (5/11/2015). 1/4" clockwise rotation of nut relative to hanger. Minor rust staining between nut and hanger (5/16/2017).
- Span 4, Girder 2, Joint 2 bottom, inside - Freckled rust on nut and pin.
- Span 4, Girder 2, Joint 2 top, outside - Minor rust staining between nut and hanger. Minor rust splatter from joint above on connection components. 1/16" rotation of nut relative to hanger and freckled rust on nut and pin (5/23/2019).
- Span 4, Girder 2, Joint 2 bottom, outside - Minor rust splatter from joint above on connection components.
- Span 4, Girder 5, Joint 2 top, inside - Spilled concrete on top of nut.
- Span 4, Girder 5, Joint 2 bottom, inside - Good condition.
- Span 4, Girder 5, Joint 2 top, outside - Slight movement indicated in connection (5/11/2015). 3/4" rotation of nut relative to hanger (5/23/2019).
- Span 4, Girder 5, Joint 2 bottom, outside - Spilled concrete on top of lower flange of girder contacting hanger. Chipped paint on hanger around nut.
- Faded reference marks on Pin and Hangers were remarked to detect movement as needed, however if grinding was performed during ultrasonic testing, reference marks were removed and not reapplied so that the steel protective coating could cure.
- All locking pins in place.

515	Steel Protective Coating	3	05/23/2019	84.00	sq.ft	14.00	42.00	28.00	0.00

CS2: The steel protective coating is substantially effective (42 SF).

CS3: The steel protective coating has limited effectiveness (28 SF).

1000	Corrosion	3	05/23/2019	2.00	each	0.00	0.00	2.00	0.00

See parent element.

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	05/23/2019	12.00	each	0.00	12.00	0.00	0.00

CS2: There is typically 3' of vertical cracking up to 1/32" wide with light efflorescence at the top of the columns under Girders 2 and 3 (12 EA).
- Minor spall under the bearing at Pier 2, Girder 3.
- 11' long vertical moderate width crack on south face of Pier 4 Column 2 approximately 3' above the ground line.
- 1 SF spall with exposed reinforcing steel on north face of Pier 5 Column 2.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
210	Re Conc Pier Wall	3	05/23/2019	144.00	ft	142.00	2.00	0.00	0.00

- There is light biological growth on all pier faces.

CS2: There is a 10' vertical crack in the Pier 2 webwall between Girders 3 and 4 (1 LF).
- There is a 12' vertical crack in the Pier 5 webwall between Girders 3 and 4 (1 LF).

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	05/23/2019	118.00	ft	104.00	9.00	5.00	0.00

CS2: There are 9 moderate width vertical cracks some with light efflorescence in the backwall of End Bent 1 (9 LF).
- There is debris on the bridge seats on End Bents 1 and 6.

CS3: There is an area of delamination with rust staining measuring 1' long on the bridge seat near Girder 3 on End Bent 1 (1 LF).
- There is an area of delamination measuring 1' long and a 3' long crack with rust staining in the bridge seat between Girders 3 and 4 on End Bent 1 (3 LF).
- There is a 6' long spall with exposed reinforcing steel under Girder 2 on the top of End Bent 6 (1 LF).

1080	Delamination/Spall/Patched Area	3	05/23/2019	5.00	ft	0.00	0.00	5.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
302	Compressn Joint Seal	3	05/23/2019	224.00	ft	122.00	65.00	0.00	37.00

- Joints were replaced in 2014.
CS2: Joint armoring has freckled rust on underside.
- The compression joints are partially filled with hard packed debris at Joint 1 (18 LF), Joint 2 (20 LF), End Bent 6 (24 LF).
- The compression joint is adhered more than 50% of the height in the middle lane of Joint 2, but is beginning to de-bond (3 LF).
- Transverse moderate width cracking in End Bent 6 header spaced approximately 2'.

CS4: There is joint adhesion failure at the following locations:
- End Bent 1: Middle and right lanes (18 LF)
- Joint 1: Middle lane (3 LF)
- End Bent 6: Left and middle lanes (16 LF)

2320	Seal Adhesion	3	05/23/2019	37.00	ft	0.00	0.00	0.00	37.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
311	**Moveable Bearing**	**3**	**05/23/2019**	**15.00**	**each**	**3.00**	**4.00**	**8.00**	**0.00**

- Readings taken at 79 degrees F.
- Moveable bearings expanded at End Bent 1: Girder 1 - 15.8°, Girder 2 - 11.8°, Girder 3 - 1.9°, Girder 4 - 5.2°, Girder 5 - 10.5°.
- Moveable bearings at Pier 4 were between 1° contraction and 3° expansion.
- Moveable bearings at End Bent 6 were expanded between 0.5° and 5.5°.

CS2: The bearing at End Bent 1, Girder 3 has shifted to the south approximately 2 3/4".
- Surface corrosion on moveable bearings at End Bent 1, Girders 4, 5 (2 EA).
- Freckled corrosion on rocker and masonry plate at Pier 4, Girder 1 (1 EA).
- Surface corrosion on moveable bearing at End Bent 6, Girder 4 (1 EA).

CS3: Pack rust between the rocker and masonry plate and laminating corrosion at End Bent 1, Girder 1, 2, and 3 (3 EA).
- Initial pack rust between the rocker and masonry plate at Pier 4, Girder 3 (1 EA).
- Pack rust between the rocker and masonry plate and laminating corrosion at End Bent 6, Girder 1, 2, 3, and 5 (4 EA).

515	Steel Protective Coating	3	05/23/2019	60.00	sq.ft	20.00	8.00	0.00	32.00

CS2: The steel protective coating is substantially effective (8 SF).

CS4: The steel protective coating has failed (32 SF).

1000	Corrosion	3	05/23/2019	8.00	each	0.00	0.00	8.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
313	**Fixed Bearing**	**3**	**05/23/2019**	**15.00**	**each**	**7.00**	**8.00**	**0.00**	**0.00**

CS2: There are isolated areas of minor spotted surface corrosion on masonry plates, bearings, and sole plates.
- 1 of 4 anchor rods at the fixed bearing at Pier 3, Girder 2 is not seated properly, resulting in the nut not being in contact with the base plate.

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	05/23/2019	60.00	sq.ft	52.00	8.00	0.00	0.00

CS2: The steel protective coating is substantially effective (8 SF).

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**	**05/23/2019**	**1,144.00**	**ft**	**849.00**	**295.00**	**0.00**	**0.00**

CS1: Barrier walls have minor impact damage and minor deterioration.

CS2: There is occasional vertical cracking in the barrier walls spaced approximately 4', more prevalent in Spans 3 through 5 (289 LF).
- There in a wide horizontal crack in the upstream barrier wall at End Bent 1 (3 LF).
- There is map cracking adjacent to Joints 1 & 2 on the downstream barrier wall (2 LF).
- There is 1 SF of map cracking in a sound patch on the downstream barrier wall (1 LF).

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**	**05/23/2019**	**1.00**	**(EA)**	**0.00**	**1.00**	**0.00**	**0.00**

This element represents the diaphragms between Girders 1 & 2 and 3 & 4 in line with each floor beam as well as the lateral bracing.

CS2: The diaphragms have isolated areas of surface corrosion on the top and bottom flanges.
- There are isolated areas of minor to moderate corrosion on the lateral bracing connection plates to the girder/floor beam connection.
- The lateral bracing is occasionally deformed up to 1" out of plane for approximately 6" long.
- There are isolated areas of minor surface corrosion throughout the lateral bracing.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
851	Transitions	3	05/23/2019	1.00	(EA)	0.00	0.00	0.00	1.00

CS4: 1 3/4" vertical transition due to isolated potholes in the wheel paths of the right (downstream) lane at End Bent 6.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
852	Drains	3	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: 1 of 32 drains blocked.
- Bridge end drainage on the downstream side of the north approach is clogged.
- The drains on the upstream side of the structure do not extend below the bottom flange of the inside girder, however no deterioration of the Girder 5 was noted near the drains.

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	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: Minor embankment erosion in Span 4 from drainage through joint between northbound and southbound piers and from deck drains.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
859	Vegetation	3	05/23/2019	1.00	(EA)	0.00	0.00	1.00	0.00

CS3: Moderate vegetation restricting access of inspection equipment (UBIU boom).

Work Candidates Report

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-024F-070819-BF2B21BAC3	Bearings-Clean Assemblies/Paint	2019/05/23		2019	Under Review	Medium	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "acantrell" on 7/8/2019
Clean, paint, and grease moveable bearings at End Bents 1 and 6.

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-B8C4-071917-AEA70477A3	Superstructure-Repair Steel	2017/05/16		2017	Under Review	Medium		Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Repair windlock assemblies under Girders 3 and 4.

- Consider modifying windlock assemblies of Girders 3 and 4 to remove bottom cover plate similar to Girders 1, 2, and 5 to reduce likelihood of pack rust development. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-B8C4-070517-B2B6E78FFE	Paint-Structural	2017/05/16		2017	Under Review	Medium		Inspector Recommended

Notes : Generated by user "acantrell" on 7/5/2017. Clean and paint structural steel within 10 ft of Joints 1 and 2.

- I concur with this recommendation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-B8C4-071917-9B4EAB5B7F	Deck-Repair (Potholes)	2017/05/16		2017	Under Review	Medium		Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Patch potholes in wearing surface.

- Patch potholes in latex overlay and replace asphalt pavement along both approaches. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-B8C4-071917-614E883ABE	Joints-Clean	2017/05/16		2017	Under Review	Medium	KYTC Maintenance	Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Clean joints and drains to facilitate adequate drainage.

- I concur with this recommendation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	4FE7062-B8C4-070517-9BD1925375	Joints-Repair	2017/05/16		2017	Under Review	High		Inspector Recommended

Notes : Generated by user "acantrell" on 7/5/2017. Replace compression seal joints at End Bents 1 & 6 and Joints 1 & 2.

- Consider joint elimination or rehabilitation to reduce water infiltration at the joints. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133L	A-KYTC-15677EEE-0000004E	Substruct-Cln Abutment/Pier Seat	2011/05/18		2011	Under Review	High	KYTC Maintenance	Inspector Recommended

Notes : Generated by TLAWLER on 05/19/2011. Clean abutment seats.

- I concur with this recommendation. ADC 05/2019

047B00133L	A-KYTC-15677EEE-0000004A	Misc-Remove Vegetation	2011/05/18	2011	Under Review	High	KYTC Maintenance	Inspector Recommended

Notes : Generated by TLAWLER on 05/19/2011. Vegetation needs to be removed.

- I concur with this recommendation. ADC 05/2019

Bridge Inspection Report

047B00133R
Inspector: Allen Cantrell
Entered by: ACANTRELL
05/23/2019
FC

IDENTIFICATION

Structure Num (8):	047B00133R
NBI Number:	047B00133R
Structure Name:	_
Location (9):	NBL I-65 @ BULLT-HARDIN
Carries (7):	I-65
Type of Service (42A):	1 Highway
Feature Crossed (6):	ROLLING FORK RIVER
Type of Service (42B):	5 Waterway
Placecode (4):	Not Applicable
County (3):	Hardin (047)
State (1):	21 Kentucky
Admin Area:	Inventory
District:	District 4
Latitude (16):	37° 48' 48"
Longitude (17):	85° 44' 20"
Owner (22):	State Highway Agency
Maint. Resp. (21):	State Highway Agency
Year Built (27):	1985
Year Recon (106):	0
Border State (98A):	Unknown (P)
Border Number (99):	
% Responsibility (98B):	

Fair **Heath Index:** 92.97

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

Inspection Type	Freq (92)	Last Insp (93)	Next Insp
Routine	24	5/23/2019	5/23/2021
Element	24	5/23/2019	5/23/2021
Fracture Critical (A)	24	5/23/2019	5/23/2021
Underwater (B)		1/1/1901	1/1/1901
Special Insp (C)		7/17/2017	1/1/1901

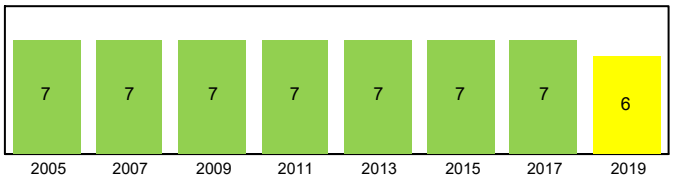
LOAD RATING AND POSTING

Posting Status(41):	A Open, no restriction
Posting (70):	5 At/Above Legal Loads
Signs Posted Cardinal:	No
Signs Posted Non-Cardinal:	No
Recmd Date:	
Posted Date:	

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

DECK GEOMETRY

Deck Geometry (68):	6 Equal Min Criteria
Deck Area:	33,622.00 ft²
Deck Type (107):	1 Concrete-Cast-in-Place
Wearing Surface (108A):	3 Latex Concrete/Similar
Membrane (108B):	0 None
Deck Protection (108C):	1 Epoxy Coated Reinforci
Approach Roadway width (32):	61.02 ft.
Width Curb to Curb (51):	56.10 ft.
O. to O. Width (52):	59.10 ft.
Curb / Sidewalk Width L (50A):	0.00 ft.
Curb / Sidewalk Width R (50B):	0.00 ft.
Median (33):	0 No median

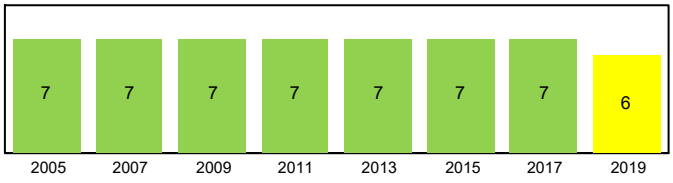


DECK CONDITION

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):	5
# of Approach Spans (46):	0
Main Material (43 A):	4 Steel Continuous
Main Design (43 B):	03 Girder-Floorbeam
Max Span Length (48):	124.00 ft.
Structure Length (49):	568.90 ft.
NBIS Length (37):	Long Enough
Temp Structure (103):	Not Applicable (P)
Skew (34):	0°
Structure Flared (35):	0 No flare
Parallel Structure (101):	Left of || bridge
Approach Alignment (72):	7 Above Min Criteria

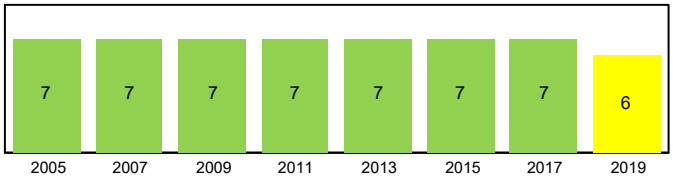


SUPERSTRUCTURE CONDITION

Superstructure Rating (59):	6 Satisfactory
Structure Evaluation (67):	5 Above Min Tolerable

SUBSTRUCTURE GEOMETRY

Navigation Control (38):	Permit Not Required
Nav Vert Clearance (39):	
Nav Horiz Clearance (40):	
Pier Protection (111):	Not Applicable (P)
Lift Bridge Vertical Clearance (116):	
Scour Rating (113):	8 Stable Above Footing
Waterway Adequacy (71):	8 Equal Desirable



SUBSTRUCTURE CONDITION

Substructure Rating (60):	6 Satisfactory
Channel Rating (61):	6 Bank Slumping

KYTC FIELDS

Overlay:	Yes	**Scour Observed:**	No Scour
Overlay Type:	Latex	**Scour Risk :**	Low Risk
Overylay Thickness:	1.30 in.	**Scour Analysis/Assessment :**	Completed by Ogden
Overlay Year:		**Scour POA :**	Not Required
Cross Section:	Yes	**Scour POA Date :**	
Cross Section Date:	05/16/2017	**Next Cross Section Due Date :**	05/23/2027

ROUTE ON STRUCTURE: I-65

ROADWAY LOCATION

Pos Prefix (5A):	Route On Structure
Kind of Hwy (5B):	1 Interstate Hwy
Route Num (5D):	00065
LRS Route (13A/B):	IO0065_000/00
Milepost (11):	103.28 mi
Suffix (5E):	0 N/A (NBI)
Lanes On (28A):	3
Detour Length (19):	0.62 mi

ROADWAY CLASSIFICATION

Funct Class (26):	01 Rural Interstate
Level Service (5C):	1 Mainline
NHS (104):	1 On the NHS
Defense Hwy (100):	1 On Interstate STRAHNET
Toll Facility (20):	3 On free road
ADT (29):	32,175 Cars/Day
Pct Trucks (109):	25.00%
ADT Year (30):	2019

CLEARANCES

Vertical (10):	99.99 ft.
Min Vert Over (53):	99.99 ft.
Vert Ref (54A):	N Feature not hwy or RR
Undrclearnce (54B):	0.00 ft.
Horizontal (47):	55.77 ft.
Min Lat Left (56):	0.00 ft.
Min Lat Right (55B):	0.00 ft.
Horiz Ref (55A):	N Feature not hwy or RR
Underclearance (69):	N Not applicable (NBI)

STRUCTURE NOTES

- I-65 runs south to north according to the route log, Elizabethtown to the south and Lebanon Junctior to the north. The order of inventory is from south (End Bent 1) to north (End Bent 6).
- Upstream is to the right (east) of the structure, and downstream is to the left (west) of the structure.
- Girders are numbered from left (Girder 1) to right (Girder 5).

8/31/2015 Controlling member is the "new" interior floorbeam for SU7, and the "new" stringer for 16'8"-7@17.75'-16'8" for the rest of the trucks with 1.25" latex overlay and no provision for FWS. Critical point is 1.5 (midspan) for SU7, at 5.0 and 6.0 (beginning and end of middle 17.75ft span) for Type 3; and at 2.0 and 9.0 (at pier) for the rest of the trucks. Rating SU4: 36.7 tons (RF 1.36) SU5: 42.3 tons (RF 1.37) SU6: 44.6 tons (RF 1.28) SU7: 48.3 tons (RF 1.25). DGA
8/31/2015 Post at 20, 27, 34, 40 tons for Types 1-4 due to the load rating of the superstructure. DGA
12/9/15 Missing joint seal 3 repaired.dbk

INSPECTION NOTES

AECOM completed the NBI, Element, and Fracture Critical Inspection on 5/23/19. The inspection took place between 5/20/19 and 5/23/19. The inspection limits were from End Bent 1 to End Bent 6. For additional detailed findings, conclusions, and recommendations, reference Form TC71-118 and the corresponding cover letter submitted by AECOM to KYTC and attached to this report.

-The Deck (Item 58) rating was lowered from 7 to 6 due to the deterioration of the underside of the deck (Element 12). The Superstructure (Item 59) rating was lowered from 7 to 6 due to the deterioration noted on the girders and floor beams at Joints 1 and 2 (Elements 107 and 152) and pack rust noted on the steel pin and hangers at Joints 1 and 2 (Element 161). The Substructure (Item 60) rating was lowered from 7 to 6 due to the spalls with exposed reinforcing steel noted on Pier 5 (Element 205).

In addition to work items, AECOM recommends monitoring the following during future routine and fracture critical inspections:
- Visual inspection of Pin and hanger assemblies and continued use of regular ultrasonic testing of pins.
- Corrosion section loss and pack rust in the stringer, girders, and floor beams.
- Monitor Girder 1 web misalignment at Joint 2.
- Tack weld cracks at Span 4, Girder 2, bottom flange cover plate and FB22 between Girders 2 and 3.

SCOUR NOTES

LOAD RATING NOTES

07/07/17 Memo to remove posting due to revision of KRS 189.2301. Existing load posting signs may be removed. ALI.

COMPLIANCE NOTES

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
12	**Re Concrete Deck**	**3**	**05/23/2019**	**33,597.00**	**sq.ft**	**27,234.00**	**6,322.00**	**41.00**	**0.00**

CS2: The deck underside has minor transverse cracking (spaced 5' to 7') with occasional intersecting longitudinal cracking throughout all spans with areas of light efflorescence (6322 SF).
- The haunches above Girders 2 & 5 and Stringers 3 & 4 have cracking and spalling occasionally exposing the top flanges.

CS3: Spall and area of unsound patching in upstream overhang at Joint 1 (7 SF).
- Transverse cracking with moderate efflorescence and rust staining between G4 & G5 and FB17 & FB18 (5 SF).
- Spall and area of unsound patching in upstream (15 SF) and downstream overhang (5 SF) at Joint 2.
- Bottom edge of End Bent 6 Joint is spalled between S1 and S2 (9 SF).

510	Wearing Surfaces	3	05/23/2019	31,922.00	sq.ft	31,921.00	1.00	0.00	0.00

There is heavy debris along the upstream gutter line throughout all spans.

CS2: There is one minor spall (1 SF).

1080	Delamination/Spall/Patched Area	3	05/23/2019	36.00	sq.ft	0.00	0.00	36.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
107	**Steel Opn Girder/Beam**	**3**	**05/23/2019**	**2,860.00**	**ft**	**2,602.00**	**183.00**	**75.00**	**0.00**

2.2° rotation of Girder 2 rocker at Joint 1 to south between FB13 & FB14. Other rockers are rotated similarly.

CS2: There is corrosion on the top flange of all girders within 2 feet of End Bents 1 and 6 (20 LF).
- The transverse stiffeners have occasional areas of deformations up to 4" wide by 6" long likely due to construction.
- There are isolated areas of minor to moderate corrosion on the lateral bracing connection plates to the girder/floor beam connection.
- There is occasional minor fretting rust at the top of approximately 50% of the transverse stiffeners without welds to the top flange of Girders 2 and 3 at the connection to the floor beams.
- There is typically surface corrosion on the top flange of girders where haunch has spalled and isolated areas of surface corrosion on the bottom flange in all spans:
- Span 1: 25 LF
- Span 2: 6 LF
- Span 3: 1 LF
- Span 4: 111 LF
- Span 5: 17 LF
- Span 1, Girder 5 has mis-drilled holes in multiple stiffeners.
- Span 1, Girder 3 over Pier 2 rivet missing from vertical stiffener near top flange (1 LF).
- 1/8" deflection of the bottom flange of Girder 3 on north side of FB14 (1 LF).
- Span 4, Girder 2 just south of Floor Beam 25 has a cracked tack weld on the bottom flange cover plate (1 LF).

CS3: - Span 2, Girder 2, Joint 1 inside transverse stiffener has heavy corrosion with up to 75% loss of section at the welded connection to the bottom flange (1 LF).
- Span 2, Girder 2 and 3, Joint 1 has minor to moderate paint deterioration and rusting with minor to moderate section loss up to 10% and pack rust, rivets have minor to moderate deterioration at joint location.
- Reactivating pack rust typically on the bottom flange and on the lower web cover plates up to 1/4" thick at the splices of Girders 2 and 3:
- Girder 2: Spans 2, 3, & 4 - 5 LF
- Girder 3: Spans 2 & 3 - 6 LF
- 1/16" section loss on transverse stiffener (3/8" nominal) on G2 at FB12 (1 LF).
- Laminating corrosion on bottom and top flanges of G5 between FB12 & FB14 (34 LF).
- Laminating corrosion and pack rust up to 1/2" thick with up to 1/16" section loss on bottom flange, web, and stiffener plates on G2 (8 LF) and G3 (9 LF) between FB13 & FB14.
- The transverse stiffener plates within 5' of the end of Girders 2 and 3 are deformed up to 1/4" due to pack rust up to 1/2" thick above the bearings at End Bents 1 and 2 (4 LF) as well as below the rocker bearings at Joints 1 and 2.
- Wind locks on Girders 2 and 3 typically have significant pack rust up to 1/2" thick and loss of section. Loss of section could not be measured due to access.
- 3/16" section loss on bottom of web of G2 between FB16 & FB17 (1 LF).
- Laminating corrosion on top flange of G5 between FB22 & FB23 (2 LF).
- Painted over 1/8" section loss on G3 on south side of Joint 2 (3 LF).
- Section loss on G3 between FB24 & FB25 (1 LF).

515	Steel Protective Coating	3	05/23/2019	45,498.00	sq.ft	40,593.00	4,252.00	415.00	238.00

CS2: The protective steel coating on the upstream face of Girder 5 has loss of pigment due to sun bleaching (4252 SF).

CS3: There are isolated areas of paint flaking exposing the primer throughout the girders (400 SF).
- There is approximately 15 SF of paint flaking exposing the primer coat on the outside of Girder 5 between Floor Beams 21 and 22 (15 SF).

CS4: The protective steel coating has failed at isolated locations throughout the girders where corrosion was noted (238 SF).

1000	Corrosion	3	05/23/2019	75.00	ft	0.00	0.00	75.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
113	**Steel Stringer**	**3**	**05/23/2019**	**2,288.00**	**ft**	**2,257.00**	**31.00**	**0.00**	**0.00**

CS2: Minor rust on the top flanges of all stringers adjacent to End Bent 1 (10 LF).
- Surface corrosion on top flange of Stringers 3 and 4 between FB14 & FB15 (15 LF).
- Surface corrosion on Stringers 3 and 4 between FB22 & FB23 (6 LF).

515	Steel Protective Coating	3	05/23/2019	11,856.00	sq.ft	11,737.00	0.00	119.00	0.00

CS3: Paint flaking exposing the primer coat on approximately 1% of stringers (119 SF).

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
152	**Steel Floor Beam**	**3**	**05/23/2019**	**1,494.00**	**ft**	**1,393.00**	**69.00**	**32.00**	**0.00**

CS2: - Typically, at the connection to ("original") Girders 2 and 3 there are 3 to 5 rivets missing and threaded bolts in place of previous rivets to facilitate the retrofit.
- Missing rivet at top of FB3 connection to west face of G3 (1 LF).
- Fretting rust typical at connection to girder transverse stiffener.
- Missing rivet at top of FB4 connection to west face of G3 (1 LF).
- Minor surface corrosion and painted over minor section loss on the top and bottom flanges of FB13 (28 LF).
- Drilled holes in the top flange of FB14.
- Surface corrosion on the top and bottom flanges of FB14 between G4 & G5 (5 LF).
- Cracked tack weld on top flange of north face of FB22 between G2 & G3 near G3 (1 LF).
- Surface corrosion on the bottom flange of FB23 (21 LF).
- Surface corrosion on top flange of FB24 between G2 & G3 (10 LF).
- Surface corrosion on bottom flange of FB29 (2 LF).

CS3: Painted over section loss at each end of FB13 between G2 & G3 (2 LF).
- Moderate corrosion with up to 25% section loss on the top flange and 10% section loss on the bottom flange and 1/16" deep pitting on bottom of web of FB14 between Girders 2 and 3 concentrated on the west and east ends (25 LF).
- 1/4" thick pack rust and laminating corrosion throughout the top flange of FB14 between Girders 2 and 3.
- Moderate corrosion with 1/4" section loss measuring 5" wide by 8" long outside the connection plate to Girder 3 on FB14.
- Moderate corrosion on the top and bottom flanges at the east end of Floor Beam 24 between Girders 4 and 5 (5 LF).

515	Steel Protective Coating	3	05/23/2019	11,952.00	sq.ft	11,806.00	0.00	146.00	0.00

CS3: There are isolated areas of minor paint flaking exposing the primer coat throughout the floor beams (146 SF).

1000	Corrosion	3	05/23/2019	32.00	ft	0.00	0.00	32.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
161	**Stl Pin Pin/Han both**	**3**	**05/23/2019**	**6.00**	**each**	**0.00**	**1.00**	**5.00**	**0.00**

- Span 2, Girder 1, Joint 1 top, inside - Minor rust staining between nut and hanger and pin and nut.
- Span 2, Girder 1, Joint 1 bottom, inside - Moderate rust staining between nut and hanger.
- Span 2, Girder 1, Joint 1 top, outside - 1/8" clockwise rotation of nut relative to hanger. Light rust staining between nut and hanger (5/16/2017).
- Span 2, Girder 1, Joint 1 bottom, outside - Freckled rust on nut and locking pin.
- Span 2, Girder 4, Joint 1 top, inside - Freckled rust on nut and minor rust staining between nut and hanger.
- Span 2, Girder 4, Joint 1 bottom, inside - Moderate pack rust between hanger and girder web. Freckled rust on nut and pin and minor rust staining between nut and hanger.
- Span 2, Girder 4, Joint 1 top, outside - Freckled rust on nut and pin and light pack rust between nut and hanger.
- Span 2, Girder 4, Joint 1 bottom, outside - Light pack rust between nut and hanger.
- Span 2, Girder 5, Joint 1 top, inside - 1/8" counter-clockwise rotation of nut relative to hanger (5/16/2017).
- Span 2, Girder 5, Joint 1 bottom, inside - Light pack rust between nut and hanger.
- Span 2, Girder 5, Joint 1 top, outside - Minor rust staining between nut and hanger.
- Span 2, Girder 5, Joint 1 bottom, outside - Light pack rust between nut and hanger.
- Span 4, Girder 1, Joint 2 has possible minor pin wear (5/12/2015). Pin wear could not be confirmed with UT inspection (5/16/2017).
- Span 4, Girder 1, Joint 2 top, inside - Good condition.
- Span 4, Girder 1, Joint 2 bottom, inside - Webs of girders misaligned, 1/8" gap between inside hanger and web at bottom, 5/8" gap at top. Gaps consistent with misalignment between outside hanger and web. Audible rattling of hangers while under load (not confirmed in 05/2019). Minor rust staining between nut and hanger. 1/4" thick pack rust between hanger and web and initial pitting on nut.
- Span 4, Girder 1, Joint 2 top, outside - Fretting rust between nut and hanger.
- Span 4, Girder 1, Joint 2 bottom, outside - Freckled rust on nut.
- Span 4, Girder 4, Joint 2 top, inside - Minor rust staining between nut and hanger.
- Span 4, Girder 4, Joint 2 bottom, inside - Minor pitting on nut.
- Span 4, Girder 4, Joint 2 top, outside - Minor rust staining between nut and hanger.
- Span 4, Girder 4, Joint 2 bottom, outside - Initial pack rust between nut and hanger.
- Span 4, Girder 5, Joint 2 top, inside - 1/16" counter-clockwise rotation of nut relative to hanger (5/16/2017).
- Span 4, Girder 5, Joint 2 bottom, inside - 1/4" thick pack rust between hanger and girder web, nut and hanger, and pin and nut.
- Span 4, Girder 5, Joint 2 top, outside - Chipped paint and minor surface rust on top of nut.
- Span 4, Girder 5, Joint 2 bottom, outside - Minor rust staining between nut and hanger.

- All locking pins in place.

515	Steel Protective Coating	3	05/23/2019	84.00	sq.ft	14.00	42.00	28.00	0.00

CS2: The steel protective coating is substantially effective (42 SF).

CS3: The steel protective coating has limited effectiveness (28 SF).

1000	Corrosion	3	05/23/2019	5.00	each	0.00	0.00	5.00	0.00

See parent element.

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**	**05/23/2019**	**12.00**	**each**	**0.00**	**10.00**	**2.00**	**0.00**

CS2: There is typically 3' of vertical cracking up to 1/32" wide with light efflorescence at the top of the columns under Girders 3 and 4 at all piers (10 EA).

CS3: Pier 5, Column 1 - 6 SF of spalls with exposed reinforcing steel on north face of Column 1 (1 EA).
- Pier 5, Column 2 - 8 SF of spalls with exposed reinforcing steel on north face of Column 2 (1 EA).

1080	Delamination/Spall/Patched Area	3	05/23/2019	2.00	each	0.00	0.00	2.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
210	**Re Conc Pier Wall**	**3**	**05/23/2019**	**144.00**	**ft**	**143.00**	**1.00**	**0.00**	**0.00**

CS2: 1 SF spall on south face of Pier 2 web wall between Girders 2 and 3, approximately 10' above ground (1 LF).

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**	**05/23/2019**	**118.00**	**ft**	**116.00**	**2.00**	**0.00**	**0.00**

CS1: Insignificant vertical cracking throughout End Bents 1 and 6.

CS2: One full height vertical crack with light efflorescence at End Bent 1.
- Light to moderate debris on the bridge seats on End Bents 1 and 6.
- One vertical crack with efflorescence in the backwall of End Bent 6 between Girders 2 and 3.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
302	**Compressn Joint Seal**	**3**	**05/23/2019**	**224.00**	**ft**	**92.00**	**80.00**	**12.00**	**40.00**

- Joints were replaced in 2014.

CS2: The joint is partially filled with hard-packed debris but still allowing free movement at the following locations:
- End Bent 1: 30 LF
- Joint 1: 20 LF
- Joint 2: 20 LF
- End Bent 6: 10 LF

CS3: Adhered less than 50% of joint height adjacent to CS4 at the following locations:
- End Bent 1: 4 LF
- Joint 1: 4 LF
- End Bent 6: 4 LF

CS4: 100% loss of adhesion at the following locations:
- End Bent 1: Middle lane - 4 LF
- Joint 1: Middle and right lanes - 24 LF
- End Bent 6: Middle and right lanes - 12 LF

2320	Seal Adhesion	3	05/23/2019	52.00	ft	0.00	0.00	12.00	40.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
311	**Moveable Bearing**	**3**	**05/23/2019**	**15.00**	**each**	**5.00**	**5.00**	**5.00**	**0.00**

- Readings taken at 79° F.
- Moveable bearings at End Bent 1 (in expansion): Girder 1 - 15.2°, Girder 2 - 6.4°, Girder 3 - 7.8°, Girder 4 - 9.9°, Girder 5 - 6.4°.
- Moveable bearings at Pier 4 and End Bent 6 were expanded between 0° and 5.1°.

CS2: Surface corrosion on rocker and masonry plate at End Bent 1 under Girders 1, 2, and 4 (3 EA).
- Surface corrosion on rocker and masonry plate at End Bent 6 under Girders 2 and 3 (2 EA).

CS3: Pack rust between the rocker and masonry plate at End Bent 1 under Girders 3 and 5 (2 EA).
- Laminating corrosion on masonry plate and rocker at End Bent 6 under Girders 1, 4, and 5 (3 EA).

515	Steel Protective Coating	3	05/23/2019	60.00	sq.ft	52.00	0.00	0.00	8.00

CS4: The steel protective coating has failed at areas of noted corrosion (8 SF).

1000	Corrosion	3	05/23/2019	5.00	each	0.00	0.00	5.00	0.00

See parent element.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
313	**Fixed Bearing**	**3**	**05/23/2019**	**15.00**	**each**	**8.00**	**7.00**	**0.00**	**0.00**

CS1: The anchor rods for the fixed bearings occasionally are not plumb.

CS2: Spotted surface corrosion on the fixed bearings at the following locations:
- Pier 2: G2, 3, and 5 (3 EA)
- Pier 3: G2 and 5 (2 EA)
- Pier 5: G3 and 5 (2 EA)

515	Steel Protective Coating	3	05/23/2019	60.00	sq.ft	60.00	0.00	0.00	0.00

No significant deficiencies noted.

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**	**05/23/2019**	**1,144.00**	**ft**	**0.00**	**1,140.00**	**4.00**	**0.00**

CS2: Minor impact scrapes on downstream barrier wall in Span 2 (15 LF).
- Occasional moderate width vertical cracks throughout both barrier walls spaced 3' to 6' (382 LF). The cracks have light efflorescence on the outboard face of the upstream barrier wall.
- 2 SF area of delamination on the west face of the upstream barrier wall approximately 3' south of Joint 2 (2 LF).
- Minor scaling throughout both barrier walls (741 LF).

CS3: 42" long by 8" wide by 7" tall spall with exposed reinforcing steel on the exterior face of the upstream barrier wall near the midspan of Span 4 (4 LF).

1080	Delamination/Spall/Patched Area	3	05/23/2019	4.00	ft	0.00	0.00	4.00	0.00

See parent element.

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	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: Missing bolts on the lateral bracing connection to G3 at Joint 2.
- There are occasional areas of deformations up to 4" wide by 6" long in the lateral bracing.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
852	Drains	3	05/23/2019	1.00	(EA)	0.00	0.00	1.00	0.00

- Laminating corrosion on the bottom of the downspouts and connection hardware is typical.
- Bridge end drain at the north approach is completely blocked.
- The drains on the inside of the structure do not extend below the bottom flange of the inside girder, however no deterioration of the Girder 5 was noted near the drains.

CS3: All drains along upstream fascia are blocked (21 of 32 drains blocked).

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	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: Water is bypassing bridge end drainage at southeast corner, resulting in a 6' wide by 3' deep erosion hole in the embankment.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
859	Vegetation	3	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: Minor vegetation growth in Span 5 slightly restricting access of inspection equipment (UBIU boom).

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
860	Erosion Ctrl/Prt	3	05/23/2019	1.00	(EA)	0.00	1.00	0.00	0.00

CS2: Minor deterioration of the rip rap at the upstream end of Pier 3 and Pier 4.

Work Candidates Report

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-CD51-070819-EF3CE9E7F2	Bearings-Clean Assemblies/Paint	2019/05/23		2019	Under Review	Medium	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "acantrell" on 7/8/2019
Clean, paint, and grease moveable bearings at End Bents 1 and 6.

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-071917-650D2C18E3	Drain-Cln/Clr Dck Drain/Dwnspout	2017/05/16		2017	Under Review	High	KYTC Maintenance	Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Clean joints and drains to facilitate adequate deck drainage.

- I concur with this recommendation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-071917-359DF0AC21	Drainage-Repair Washouts/Erosion	2017/05/16		2017	Under Review	Medium	KYTC Maintenance	Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Repair erosion hole at southeast corner of structure and mitigate cause of erosion.

- I concur with this recommendation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-071917-B4B07D4414	Misc-Remove Vegetation	2017/05/16		2017	Under Review	High	KYTC Maintenance	Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Remove actively growing vegetation on the piers.

10. Remove vegetation under bridge that interferes with UBIU boom operation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-071917-0D1165E1C1	Deck-Repair (Potholes)	2017/05/16		2017	Under Review	Low	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Patch potholes in wearing surface.

- I concur with this recommendation. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-071917-ACB77079DB	Superstructure-Repair Steel	2017/05/16		2017	Under Review	Medium		Inspector Recommended

Notes : Generated by user "acantrell" on 7/19/2017. Repair windlock assemblies under Girders 2 and 3.

2. Consider modifying windlock assemblies to remove bottom cover plate on Girders 2 and 3 to reduce likelihood of pack rust development. ADC 05/2019

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
047B00133R	4FE7062-886A-070517-25DEBE532C	Joints-Replace	2017/05/16		2017	Under Review	High		Inspector Recommended

Notes : Generated by user "acantrell" on 7/5/2017. Replace strip seal joints at End Bents 1 & 6 and Joints 1 & 2.

Consider joint elimination or rehabilitation to reduce water infiltration at the joints. ADC 05/2019

047B00133R	4FE7062-886A-070517-D05AB9C19B	Paint-Structural	2017/05/16	2017	Under Review	Medium		Inspector Recommended

Notes : Generated by user "acantrell" on 7/5/2017. Clean and paint structural steel within 10 ft of Joints 1 and 2.

- I concur with this recommendation. ADC 05/2019

047B00133R	A-KYTC-15677EEE-00000021	Substruct-Cln Abutment/Pier Seat	2011/05/18	2011	Under Review	High	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by TLAWLER on 05/19/2011. Abutment seats need to be cleaned.

- I concur with this recommendation. ADC 05/2019