071C00023N

KYTC Bridge Inspection Report

Summary:

Inspection Date: 6/27/12
Inspector: RSEMAR (193)
Primary Type: Substandard (12 Months)

Types of Inspections Performed:

National Bridge Inventory:	Y
Element:	Y
Fracture Critical:	Y
Underwater:	N
Other Special:	N

Inspector Signature:

District Review Date:

District Reviewer: ()

IDENTIFICATION

Bridge ID (8):	071C00023N MAP BRIDGE	**District Number:**	3
Route Carried (7):	LOGAN MILL RD	**County (3):**	71 Logan
Mile Point:	0.806	**Feature Intersected (6):**	RED RIVER
Location (9):	1.0 MI N OF JCT W/KY 96	**Road Name:**	LOGAN MILL RD
Structure Description:	94.16 Foot - Single Span Steel Truss - Thru		

NBI CONDITION

Deck (58):	4
Superstructure (59):	5
Substructure (60):	5
Culverts (62):	N
Channel/Protection (61):	8

SCHEDULE TAB

Schedule:	Required (Y/N)	Last Date		Frequency	Next Date
NBI (90):		6/27/12	**(91):**	12 mos	6/27/13
Fracture Critical (92A):	Y	**(93A):** 6/9/11	**(92A):**	12 mos	6/27/13
Underwater (92B):	N	**(93B):** 1/1/01	**(92B):**	mos	1/1/01
Other Special (92C):	N	**(93C):** 6/9/11	**(92C):**	mos	1/1/01
Elemental:	NA			12 mos	6/27/13

Load Rating and Posting

Truck Type	Typ I	Typ II	Typ III	Typ IV	Gross
Recomm. Posting:	10	10	10	10	10
Field Posting:	-1	-1	-1	-1	10

Posting Status (41): P Posted for load

Signs Posted: Cardinal: Y Non-Cardinal: Y

WATERWAY

Scour Critical (113):	8
Observed 113 Rating:	8
Waterway Adeq. (71):	5

DECK/WEARING SURFACE

Deck Type (107):	6 Corrugated Steel							
Wearing Surface/Protective System (108):	**Type:**	6	**Membrane:**	0	**Protection:**	0		
Traffic Safety Features (36):	**Bridge Rail:**	0	**Transition:**	0	**Appr. Rail:**	0	**Rail Ends:**	0
Overlay:	N							
Overlay Type:	None							
Overlay Thickness:	0							

Vertical Clearances

Minimum Vertical Overclearance (53):	14.09
Minimum Vertical Underclearance (54):	0
Maximum Vertical Clearance (10):	14.09
Minimum Vertical Clearance:	

Sufficiency Ratings

SR: 25.3 **SD/FO:** 1 Structurally Deficient

Element Condition State Data

Elm/Env	Description	Units	Total Qty.	Qty. CS1	Qty. CS2	Qty. CS3	Qty. CS4	Qty. CS5
113/3	Paint Stl Stringer	LF	470	0.01	0	465.5	1.99	2.5
121/3	P/Stl Thru Truss/Bot	LF	188	0	0	174	14	0

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Elm/Env	Description	Units	Total Qty.	Qty. CS1	Qty. CS2	Qty. CS3	Qty. CS4	Qty. CS5
126/3	P/Stl Thru Truss/Top	LF	188	0	0	188	0	0
152/3	Paint Stl Floor Beam	LF	94.5	0	0	84.5	8	2
161/3	Paint Stl Pin/Hanger	EA	24	0	0	0	21	3
217/3	Other Mtl Abutment	LF	119.5	45	0	74.5	0	0
30/3	Corrug/Orthotpc Deck	SF	1,096.59	0	0	1,096.59	0	0
304/3	Open Expansion Joint	LF	24	0	24	0	0	0
311/3	Moveable Bearing	EA	2	1	1	0	0	0
313/3	Fixed Bearing	EA	2	2	0	0	0	0
333/3	Other Bridge Railing	LF	188	0	188	0	0	0
357/3	Pack Rust Smart Flag	EA	1	0	0	1	0	0
363/3	Section Loss SmFlag	EA	1	0	0	1	0	0
601/3	MisAlign/ot of plane	EA	1	1	0	0	0	0
604/3	2nd Elem Dist	EA	1	1	0	0	0	0

Element Condition State Data

Str Unit	Elm/Env	Description	Description
1	113/3	Paint Stl Stringer	The stringers show surface rusting only, mostly on the top flanges. The rusting is caused by deck leakage. The top flange of stringer #2 (over abutment #2) has 100% section loss for about 2.5' of its length. STRINGER #1 HAS ABOUT 40% SECTION LOSS IN THE LOWER FLANGE AND 15% IN TOP FLANGE @ FB #5.

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Str Unit	Elm/Env	Description	Description
1	121/3	P/Stl Thru Truss/Bot	The middle tension hanger at L1, west truss, was separated from the hanger plate. A good weld has secured the hanger back to the top of the hanger plate. There is a 6" laminar tear on the inside lower chord at L2 (east truss). (See photos attached to 1992 Report.) The crack begins on the lower chord "eye," and extends outward on a horizontal plane for 6". The crack is inactive. The lower chords in panels #2 and #3(west truss) are bent out of plane. Both members of the lower chord in panels #1, #2 and #3 (west truss) are completely out of tension, and have been loaded into compression. The exterior lower chords in panels #2 and #3 (west truss) are completely out of tension. Both chords in panel #2 (east truss) are out of tension. The exterior chord in panel #5, east truss, is out of tension. The "hair pin" block on the lower chord in L6 (east truss) has two loose nuts (the upper two of four). The chord is loose in this panel. There is active section loss, distortion, and pack-rust on the vertical compression posts between the channel web and the build-up plates at all lower chord pin connections. On the west truss at L-1 through L-4, there is approximately 1/2" to 1" of pack rust. The interior lower chord pin-nut is corroded with section loss at the following locations: 1.) L1, west truss 2.) L2, east truss 30%, west truss 50%, of the thickness along one side of the nut. 3.) L3, both trusses 30% ON US 10% ON DS 4.) L4, east truss 5.) L5, both trusses 10% US The bottom two rivets have sheared at the connection of build-up plate to interior compression post web @ L3, west truss and L2, east truss.
1	126/3	P/Stl Thru Truss/Top	There is a slight separation (3/4") of the temper around the upper chord pin on diagonals U4-L3 (west truss, interior) and U2-L3 (both trusses, both diagonals). There is active section loss in the web of each interior end post channel (north end) at the portal brace detail(20%) All three tension hangers at U5-L5, east truss are completely un-tensioned & the middle and interior tension hangers at U5-L5, west truss are completely un-tensioned on this 6.2011 inspection. Some moderate section loss noted on the lower tensioning block nut at U1, east truss.
1	152/3	Paint Stl Floor Beam	Floor beams #2, #3 and #4 have out-of-plane bending at each end of the web, between the flanges. The top flange of floor beam #2 is losing section under the stringer #5, but most in stringer (15%) @ fb #4 The bottom flange of floor beam #2, west truss side, at the u-bolt connection, has 1/4"deep section loss across the width of the lower flange. The bottom flange of F.B. #1, @ U1-L1, both trusses, have section loss at the bottom of the U-Bolt hanger plate detail. 60% @ west truss and 70% @ east truss @ ends of flange. Floor beam #4 has section loss on the top flange between stringers #3 and #4. Floor beam #5 has section loss on the lower flange at the U-Bolt detail, L5 (approx. 90% @ east truss and 70% @ west truss) (See photos attached to 2010 Report.) The section loss is caused by active pack-rust between the U-Bolt hanger plate and the floor beam lower flanges. The hanger plate @ L5, east truss is was completely un-tensioned and easily moved by hand on the 2011 inspection. On this inspection the plate could not be moved. RTS 6-27-2012

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Element Condition State Data

Str Unit	Elm/Env	Description	Description
1	161/3	Paint Stl Pin/Hanger	The pin @ L0, west truss, was found to have about 15% loss of section on this 6.2011 inspection. The lower chord pin for the tension hanger at L1, both trusses, has rotated out of alignment about ¾" – 1.0". The misalignment has completely loosened the interior and middle tension hangers, U1, L1 on the east truss location, and the interior hanger on the west truss. The pins @ L2 & L4, east truss have approx. 30% & 45% loss of section, respectively, near the interior pin nut (See photo dated 8/2/05). Pin @ L2 was found to have a 1" long X 1/2" deep 'hole' on the interior side of the pin with 1/4" loss of section. (see 2012 photos). The pin @ L3, west truss also has section loss near the interior pin nut (10%)
1	217/3	Other Mtl Abutment	45 FEET OF THE QUANTITY LISTED FOR THIS ELEMENT ARE R/C WINGWALLS THAT WERE ADDED TO THE STONE MASONRY ABUTMENT#1. Several stones in the top tier of abutment #1 at SW corner have large gaps and minor misalignment due to failed grout and fill drainage. (See photos dated 8/2/05) There is normal wear and weathering with slight misalignment and settling among all the stones of each masonry abutment. There is no mortar in the joints. One stone at the top of the northeast wingwall has rotated out of alignment about 15 degrees.
1	30/3	Corrug/ Orthotpc Deck	The asphalt wearing surface is in fair condition with some cracking & pot-holing in the surface. The S.I.P. forms under the deck show rusting with section loss at the top flanges of the stringers and the fillet holes - except in the northern most 10.0' of forms which are in good condition.
1	304/3	Open Expansion Joint	The expansion dams appear to be functioning and are in fair condition.
1	311/3	Moveable Bearing	The bearing devices mainly show light scaling-type rusting with some section loss below the pins, in the channel of the end posts. Device #1 (over abutment #1) is partially covered with concrete. A 30% section loss has developed on the lower leg of the inside channel of the end post; and a 15% loss on the lower exterior leg, L0, west truss.
1	313/3	Fixed Bearing	The bearing devices show light scaling-type rusting with some pitting rust and minor loss of section developing on the interior channel (below the pin) on bearing device #2, abutment #2. A 10 % section loss has developed on the interior channel of end post #2, east truss, below the pin. Both anchor bolt nuts have rusted away on B.D. #1 (over abutment #2). The exterior nut has rusted away on B.D. #2 (over abutment #2)
1	333/3	Other Bridge Railing	The rail system is bent throughout the bridge and has minor corrosion of the steel, on each truss.
1	357/3	Pack Rust Smart Flag	SEE SUPERSTRUCTURE ELEMENTS FOR FURTHER DETAILS, MAINLY IN REGARD TO BUILDUP PLATES ON INTERIOR FACE OF VERTICAL POSTS.
1	363/3	Section Loss SmFlag	ANALYSIS WAS COMPLETED BY ERIN VAN ZEE ON 7.2009 TO LOWER POSTING TO 10 TONS BASED ON STRINGER ANALYSIS. FURTHER ANALYSIS WAS REQUESTED TO ANN IRISH ON THIS INSPECTION DATE DUE TO ADDITIONAL SECTION LOSS NOTED IN FLOOR BEAM #5, AT THE HANGER PLATE CONNECTION OF THE LOWER CHORD. SEE SUPERSTRUCTURE ELEMENTS FOR FURTHER DETAILS. Severe section loss of 95%-100% is on the lower leg of the angles that comprise the lower portal bracing strut. The section loss is at the portal brace to end post detail, each point, both trusses.
1	601/3	MisAlign/ot of plane	SEE SUPER/SUB ELEMENT NOTES FOR DETAILS. U5-L4 Ext. tension cntr has been bent above rail.

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Str Unit	Elm/Env	Description	Description
1	604/3	2nd Elem Dist	The broken lateral in panel #4 was removed for safety on this inspection date. RTS 6-27-2012 There is a missing floor lateral in panel #3. All of the lower lateral bracing in each panel under the deck are un-tensioned. Watch the welded connections in the upper lateral bracing of Panel #2 at U2 & U3. The counters and diagonals are un-tensioned at the following locations: 1.) Diagonal U1-L2 (east truss, interior) 2.) Diagonal U2-L3 (east truss, exterior) 3.) Counter U3-L4 (east truss)

BRIDGE.Notes

As a matter of record, the flood of 1998 inundated the deck/floor system

As of July 23, 2009, this bridge structure shall be posted with gross posting of 10 tons; on 8.20.09, the 10 ton posting was verified to be in place and compliance has been met.

Work Candidates

Inspector Candidates:

Candidate ID:	Status	Priority	Assigned	Action	Elem	Date Recommended
A-KYTC-177EB033-00000021	Approved	High	Unassigned	60	0	6/27/12