

Oklahoma Dept. of Transportation - Bridge Inspection Report

NBI No.: 16159	Structure No.: 3704 0543EX	Local ID: 024	Suff. Rating: 53.30	SD
Bridge Description: 30ft., 44ft., 2-57ft., 42ft., 35ft. I-BM. SPANS WITH 2-1.5ft. SAFETY CURBS SKEW. VARIES		INSPECTION		
IDENTIFICATION				
1. State: Oklahoma 2. Division: Division 4 3. County: KINGFISHER 4. City: Unknown Admin Area: Unknown 5a. On/Under: Route On Structure 5b. Kind of Hwy: U.S. Hwy 5c. Lvl of Srvc: Mainline 5d. Route No.: 00081 5e. Dir. Suffix: N/A (NBI)		7. Facility Carried U.S. 81 6. Feat. UP R.R. UNDER 9. 5.3 MI N JCT SH 33 11. Mile Post: 5.470 mi 13. LRS / Sub Rte: 3700004HX / 00 16. Latitude: 35° 55' 52.94" 17. Longitude: 097° 54' 58.00" 98. Border Unknown (P) % Responsible: 0.00 99. Border Brdg #: Unknown		
STRUCTURE TYPE AND MATERIALS		CLASSIFICATION		
43a/b. Main Span: Steel / Stringer/Girder 44a/b. Appr. Span: Unknown / Unknown (P) 45. # of Main Spans: 6 46. # of Appr. Spans: 0 107. Deck Type: Concrete-Cast-in-Place 108a. Wearing Surface: Bituminous 108b. Membrane: Unknown 108c. Deck protection: Unknown		12. Base Hwy Net.: On Base Network 20. Toll Facility: On free road 21. Custodian: State 22. Owner: State 26. Function Class: 02 Rural Other Princ 37. Historical Sig.: Not eligible for NRHP 100. Def. Hwy: On STRAHNET 101. Parallel Str.: Right of bridge 102. Traffic Dir.: 1-way traffic 103. Temp. Str.: Not Applicable (P) 104. Hwy System: On the NHS 105. Fed Land Hwy: N/A (NBI) 110. Defense Hwy: On STRAHNET 112. NBIS Length: Long Enough		
AGE AND SERVICE		CONDITION		
19. Detour Length: 0.1 mi 27. Year Built: 1964 28a/b. Lanes on/und: 2 / 0 29. ADT: 2,500 30. Year of ADT: 2022 42a/b. Type of Svc on/und: Highway / Railroad		58. Deck: 5 Fair 62. Culvert: N/A (NBI) 59. Sup.: 4 Poor 61. Chan./Chan. Prot.: N/A (NBI) 60. Sub: 5 Fair Flowline Notes: N/A		
GEOMETRIC DATA		LOAD RATING AND POSTING		
10. Vert. Clearance: 99.99 ft 32. Appr Rwy Width: 38.00 ft 33. Median: No median 34. Skew: 60.00° 35. Struct. Flared: No flare 47. Horizontal Clr: 30.00 ft 48. Length Max Span: 57.09 ft 49. Struct. Length: 265.09 ft		31. Design Load MS 18 (HS 20) 41. Post. Status: A Open, no restriction 70. Posting: 5 At/Above Legal Loads 63. Op / 65. Inv. Rating Meth.: 1 LF Load Factor / 1 LF Load Factor 64. Operating Rating (tons): 66. Inventory Rating (tons):		
50a. Curb/Sdwk Width L: 1.50 ft 50b. Curb/Sdwk Width R: 1.50 ft 51. Width Curb to Curb: 30.00 ft 52. Width Out to Out: 33.00 ft Deck Area: 8,751.06 sq. ft 53. Min. Vert. Cl. Ovr Brg: 99.99 ft 54a. Min. Vt. Undclr. Ref: R Railroad beneath 54b. Min. Vert. Undclr.: 23.25 ft 55a. Min. Lat. Undclr. Ref: R Railroad beneath 55. Min. Lat. Underclr. R: 18.58 ft 56. Min. Lat. Underclr. L: 0.00 ft		H HS 3-3 EV3 SHV 38.00 52.00 85.00 43.00 48.00 23.00 31.00 51.00 26.00		
OKLAHOMA ITEMS		APPRAISAL		
200c. Temperature: 7 200d. Weather: Clear 201. Struc. Stl. ASTM Desig.: A36 / 20 202. Waterprf. Membrane: -1 Date Installed: 01/01/1901 203. Type Exp. Device: Pourable 204. Type of Railing: Metal Railing (other) 205. Material Quantity: 1,050.00 208a. Type of Abutment: Skeleton b. Type of Found.: Concrete Piling 209. Type of Pier/Found.: 2 / No Spread Footing 210. Foundation Elev.: 211. Wear. Surf. Prot. Sys: None Date Installed: 11/08/2011 211c. Silane Reapplied 211d. Date: 213. Utilities Attached:		36a. Brdg Rail: 0 Substandard 36b. Transition: 0 Substandard 36c. Appr. Rail: 0 Substandard 36d. Appr. Rail Ends: 0 Substandard 67. Str Evaluation: 4 Minimum Tolerab 68. Deck Geom.: 4 Tolerable 69. Vert./Horiz. Undclr: 7 Above Minimum 71. Waterway Adeq: N Not applicable 72. Appr. Alignment: 8 Equal Desirable Crit 113. Scour Critical: N Not Over Waterway		
214a. Posted Weight Limit: NR b. Posted Speed Limit: N c. Narrow/1way Brdg Sign: No d. Vertical Clr. Sign: No Adv. Warning Sign: No e. Navigation Lights?: No Working/Not Working: No 215. Overpass: U.S. HIGHWAY 218. Functionally Obsolete: - 220. Bridge Redecked: - 221. Substr. Cond. (U/W): 222. Fill Over RCB: 223. Appr. Slab/Rwy Cond.: 3 225. Paint Type/Ovrct: Inorganic Zinc 3Coat Sys N/A 226. Date Painted: 2004 227. Paint Color: Gray 233. Deck Forming: Conventional Forming 238. School Bus Rte.: Current & Desired route 240. Appr. Rwy Type.: Asphalt/Bituminous 243. Grdr Spacing/No.: / 5		94. Bridge Cost: \$818,346 95. Roadway Cost: \$1,350,271 96. Total Cost: \$2,291,369 97. Yr. of Cost Est.: 2015 75. Type of Work: 31 Repl-Load Capacity 76. Lngth of Improvement: 336.7 ft 114. Future ADT: 4,000 115. Yr. of Future ADT: 2042		
		NAVIGATION DATA		
		38. Nav. Control: NA-no waterway 39. Vert. Clearance: 0.0 ft 40. Horiz. Clearance: 0.0 ft 111. Pier Protect.: Not Applicable (P) 116. Lift Bridge Vert. Clr.: 0.0 ft		
		244. Span Lengths: 30 44 57 57 42 35 245. Girder Depth: 2.75 246a. Type of Overlay: AC Overlay b. Overlay Thickness: 4.00 c. Overlay Date: 03/24/2008 d. Only Depth Changed >1": - 247. Protective Systems: 248. # Field Splices w/ Corrosion: 249. Scour Crit. POA Exists?: - 250. Headwall: 258. Plans w/Found. in ODOT File: - 259. Scour Eval. in ODOT File: - 263. Interchange at Intersection: No 264. Interstate Milepoint: -1.00		

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Inspection Date: 1/15/24		Shaun Fillmore		
Invoice No.: 1131453		Inspected With: -1		

BRIDGE NOTES:

The bridge is a 6-span structure numbered south-to-north:
 Span 1 - 30-foot-long steel multi beam.
 Span 2 - 44-foot-long multi beam.
 Spans 3 and 4 - 57-foot-long steel multi beam.
 Span 5 - 42-foot-long steel multi beam.
 Span 6 - 35-foot-long steel multi beam.

Bridge 16167 SB controls vertical clearance.
 The bridge crosses the Union Pacific Railroad at railroad milepost 373.72 with crossing ID: 595413M.

Other/Special Inspection Items include:

- Monitor cracked connection angles between the beams and pier beam at pier 3 (railroad flagger required):
 - Beam 1 - Northwest connection angle = 1 1/2-inch-long crack (no change).
 - Beam 2 - Southeast connection angle = 10 1/4-inch-long and 2-inch-long cracks, 11 3/4-inch total length (no change).
 - Beam 3 - Southeast connection angle = 14-inch-long crack (no change).
 - Beam 4 - Southeast connection angle = 13 3/4-inch-long crack (1/2" growth)
 - Beam 5 - South connection angles repair welds and seat added (no change).
- Monitor misalignment and global sweep of beam 1, span 2 = 1 5/16 inches to the east with stringline between bearings (could not get accurate stringline measurement due to wind; however, visually shows no change).

INSPECTION NOTES: 1/15/24

PX' – Highly Recommended Action.
 • Install seats under beams with connection angle cracks at south face of pier beam at beams 2 through 4.

- PX
- Upgrade bridge railing and approach railing including transitions and terminations.
 - Clean and paint bridge railing.
 - Replace two damaged railing posts near pier 1.
 - Reform deck where railing post anchorages are compromised by spalls.
 - Investigate condition of concrete deck (cores) where asphalt patches exist.
 - Replace fixed and expansion joints.
 - Backfill and armor eroded area behind NE wingwall.
 - Remove and patch deteriorated and delaminated concrete in piers and abutments and seal bearing seats with CIM 1000.
 - Remove trees and vegetation growing through slope wall and seal joints.
 - Remove extruded lead plugs at canister bearings.
 - Install shim plates where beams are lifted from canister bearing at beam 2, span 1 at pier 1, beam 3, span 2 at pier 2 and beam 4, span 6 at pier 5.
 - Repave approaches to provide a smooth riding surface onto and off of bridge .

- FX
- Monitor deck adjacent to joints for further deterioration.
 - Monitor alignment of beam 1, span 2 (1 5/16 inches to east) and distress in beam web at midspan diaphragm.
 - Monitor pack rust induced cracks in diaphragm connection angle welds.
 - Monitor painted over 1/4-inch deep section loss in bottom flange of pier beam under beam 2 at pier 3.

ELEMENT CONDITION STATE DATA

Elem. / Env	Description	Unit	Total Qty	% 1	Qty. 1	% 2	Qty. 2	% 3	Qty. 3	% 4	Qty. 4
12 / 4	Re Concrete Deck	sq.ft	7,953.00	0%	0.00	0%	0.00	100%	7,953.00	0%	0.00
PX - (Asphalt overlay on deck) Size and number of asphalt patches has significantly increased since 2014 inspection suggesting deterioration of the top surface of the concrete deck. Concrete and asphalt patches exist along the joints and bridge centerline with discolored concrete in the soffit at these locations. Shallow spalls with exposed reinforcing steel in face of both curbs at isolated locations. Deck overshoots N abutment backwall 1 3/8in.											
510 / 4	Wearing Surfaces	sq.ft	7,953.00	66%	5,253.00	31%	2,500.00	3%	200.00	0%	0.00
PX - Asphalt patches along roadway centerline, edge of pavement and along joints. Minor rutting in the wheel lines. Asphalt is weathered.											
107 / 4	Steel Opn Girder/Beam	ft	1,025.00	75%	769.00	25%	256.00	0%	0.00	0%	0.00
FX - Beam 1, span 2 bottom flange is bent east 1 5/16in at 8ft from pier 1 due to vehicular collision from vehicle launched off southbound bridge . Horizontal paint cracks in beam 1, span 2 web at midspan diaphragm. Shop-welded partial-length cover plates in positive moment regions.											
515 / 4	Steel Protective Coating	sq.ft	14,000.00	0%	0.00	100%	14,000.00	0%	0.00	0%	0.00
IZEU applied in 4/2004. Surface corrosion and pack rust at joints.											
205 / 4	Re Conc Column	each	8.00	0%	0.00	63%	5.00	38%	3.00	0%	0.00
PX - Cracks with adjacent delaminations and rust stains along vertical and hoop reinforcing steel; most severe in column 1 of piers 2 and 4;											
215 / 4	Re Conc Abutment	ft	150.00	25%	37.00	57%	85.00	19%	28.00	0%	0.00

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PX - Erosion 4ft deep behind NE wingwall exposing 31in of wingwall foundation/abutment breastwall vertically (no significant change since 2014). PX - Isolated shallow spalls, delaminations and 1/16-inch wide cracks in abutments breastwall; North abutment has spalls two spalls up to 2 feet long and 2 inches deep with exposed corroded reinforcing. PX - Trees and vegetation growing through slope wall. South slope wall bulging 5in with 1in wide crack near abutment. Bearing pedestals have cracking; Beam 4 pedestal at N abutment has 1 ft diameter spall that does not affect bearing. Retaining wall between bridges rotated away embankment 3 1/2in at S abutment and 1 1/4in at N abutment.													
234 / 4	Re Conc Pier Cap	ft	131.00	0%	0.00	62%	81.00	38%	50.00	0%	0.00		
PX - Horizontal cracks and delaminations along top and bottom reinforcing steel of caps between beams 1 and 4, most severe at piers 2 and 4; Cracks occur in most bearing pedestals.													
301 / 4	Pourable Joint Seal	ft	60.00	0%	0.00	0%	0.00	0%	0.00	100%	60.00		
Exists at piers 2 and 4 PX - Pier 2 joint has adhesion failure and areas of missing seal in E lane. PX - Pier 4 joint has seal missing in west half and isolated area in east lane. Elastomeric concrete header spalled exposing remnants of original finger joint.													
311 / 4	Moveable Bearing	each	40.00	0%	0.00	20%	8.00	80%	32.00	0%	0.00		
Canister bearings at piers 1, 2, 4 and 5. PX - Beam 2, span 1 at pier 1 and beam 4, span 6 at pier 5 are lifted off canister bearings up to 1/16in.; Lead plugs around anchor studs are extruded inhibiting movement. Pack rust between bearing components is common. Canisters exhibit 1/8in section loss from corrosion and wear at contact points with sole and masonry plates.													
313 / 4	Fixed Bearing	each	12.00	0%	0.00	83%	10.00	17%	2.00	0%	0.00		
Fixed bearings at abutments. Pack rust under few fixed bearings. Bearing pads are typically distorted and extruding. Cracked beveled washers at beam 4, span 6 at N abutment.													
321 / 4	Re Conc Approach Slab	sq.ft	2.00	0%	0.00	100%	2.00	0%	0.00	0%	0.00		
PX - South approach roadway and edge of approach slab settled causing ramp onto bridge. Both approach slabs have patches along longitudinal construction joint in asphalt at roadway centerline.													
330 / 4	Metal Bridge Railing	ft	532.00	0%	0.00	90%	479.00	10%	53.00	0%	0.00		
PX - Railing does not meet current standards for NHI roadway. PX - Spalls in soffit exposing/debonding bridge rail post anchorage. PX - 2 rail post severely damaged in west rail near pier 1; Isolated areas of section loss due to corrosion; Loose bolts in east railing near pier 3.													
919 / 4	St.(Rail) Prot. Coat	sq.ft	2,400.00	0%	0.00	0%	0.00	0%	0.00	100%	2,400.00		
PX - The paint is failing and the railing is corroding.													
859 / 4	Soffit	each	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00		
PX - Spalls exposing/debonding embedded bridge railing posts connections to the deck exist in the soffit near the joints . FX - Discolored concrete and cracks with efflorescence and corrosion stains at joints . Spalls with exposed reinforcing steel along joints.													
863 / 4	Steel Pier Beam	ft	49.00	0%	0.00	100%	49.00	0%	0.00	0%	0.00		
FX - Painted over loss up to 1/4 inch deep in bottom flange; Surface corrosion with minor section loss along top flange. Debris on bottom flange.													
865 / 4	St.Open Gird End(5Ft)	ft	300.00	0%	0.00	67%	200.00	32%	97.00	1%	3.00		
PX' (Highly Recommended Action) - Vertical cracks in connection angles to pier beam not observed in previous inspections <ul style="list-style-type: none">FX - Beam 1 northwest connection angle (1 1/2in crack)PX' - Beam 2 southeast connection angle (10 1/4in and 2in cracks, 11 3/4in total length)PX' - Beam 3 southeast connection angle (14in crack - 3/8in growth for 2023)PX' - Beam 4 southwest connection angle (13 1/4in crack - 1/4in growth for 2023)Repaired - Beam 5 southwest connection angle (5 3/4in crack welded over)Repaired - Beam 5 southeast connection angle (6 1/4in crack welded over) Cracks in end diaphragm welds at piers 1, 2, 4 and 5. Minor loss and reactivation of corrosion in top flange at piers.													
870 / 4	Concrete Wingwall	each	4.00	100%	4.00	0%	0.00	0%	0.00	0%	0.00		
PX - Erosion up to 4 feet deep exists behind the NE wingwall exposing the wingwall foundation/breastwall 31 inches (abutment supported by concrete piles).													
909 / 4	Pourable Fix Jt.Seal	ft	297.00	0%	0.00	0%	0.00	0%	0.00	100%	297.00		
Fixed joints at abutments (skewed 60 degrees) and piers 1, 3 and 5. Deck control joints at midspan of spans 3 and 4. PX - S abutment has evidence of leakage with spalls/asphalt patches along joint. PX - Pier 1 joint header replaced with concrete, spalled and patched with asphalt at roadway centerline. PX - Pier 3 over pier beam is leaking with parallel cracks in asphalt along joint. PX - Pier 5 has multiple asphalt patches and a concrete patch along joint. PX - N abutment has multiple asphalt patches, areas of seal debonded and evidence of leakage. Deck control joints have full depth concrete patch over pier 3 and asphalt patches adjacent to the joints.													
956 / 4	St. Cracking/Fatigue	each	1.00	0%	0.00	0%	0.00	0%	0.00	100%	1.00		

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PX' (Highly Recommended Action) - Vertical cracks in connection angles to pier beam not observed in previous inspections													
<ul style="list-style-type: none">FX - Beam 1 northwest connection angle (1 1/2in crack)PX' - Beam 2 southeast connection angle (10 1/4in and 2in cracks, 11 3/4in total length)PX' - Beam 3 southeast connection angle (14in crack - 3/8in growth for 2023)PX' - Beam 4 southwest connection angle (13 1/4in crack - 1/4in growth for 2023)Repaired - Beam 5 southwest connection angle (5 3/4in crack welded over)Repaired - Beam 5 southeast connection angle (6 1/4in crack welded over)													
Cracks in end diaphragm welds at piers 1, 2, 4 and 5.													
957 / 4	Pack Rust Smart Flag	each	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00		
Pack rust between beam top flange and deck at joints. Pack rust up to 1in between bearing components.													
Cracks in end diaphragm welds at piers 1, 2, 4 and 5 due to pack rust.													
962 / 4	Super.Traffic Impact	each	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00		
FX - Beam 1, span 2 bent 1 5/16in due to vehicular collision from southbound bridge.													
963 / 4	Steel Section Loss SF	each	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00		
FX - Painted over section loss on pier beam top and bottom flange up to 1/4 inch deep.													
968 / 4	Erosion SF	each	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00		
PX - Erosion up to 4 feet deep exists behind the NE wingwall (abutments and wingwalls supported by concrete piles).													
974 / 4	Straight Gird.Diaphr	each	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00		
Diaphragms exhibit corrosion of the top flange and pack rust up to 1/2 inch thick between the diaphragm top flange and deck causing minor distortion in the top flange.													

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Photograph 1 - Looking north at bridge end view.

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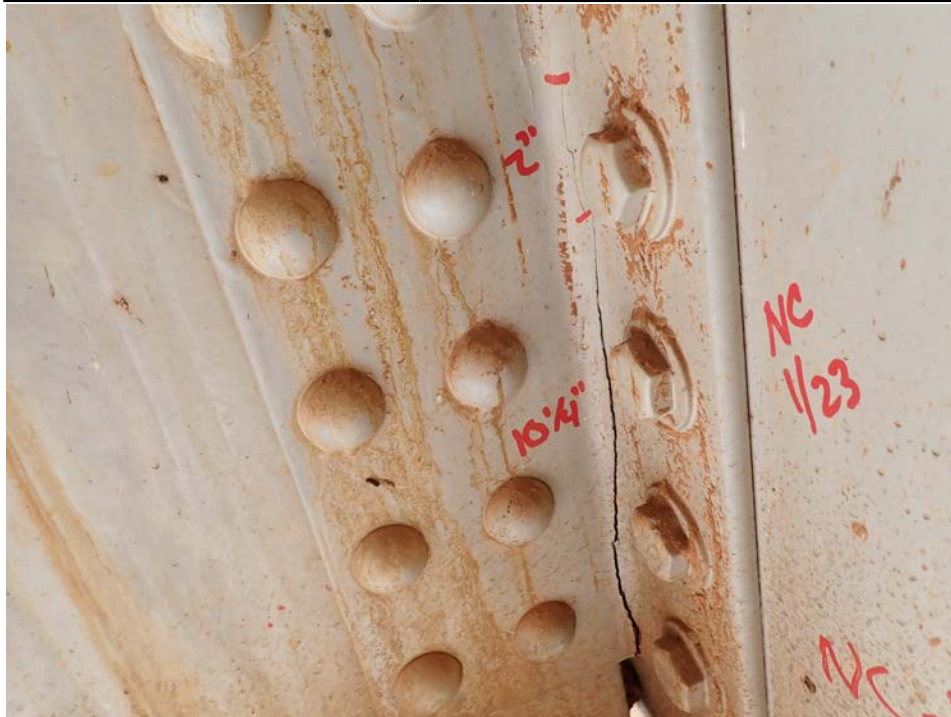
Photograph 2 - Looking southwest at the bridge elevation

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Photograph 3 - Looking southeast at the beam 1, span 4 west connection angle to the north face of the pier beam at pier 3. Note: 1 1/2-inch-long vertical crack (no change).

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Photograph 4 - Looking northwest at the beam 2, span 3 east connection angle to the pier beam at pier 3. Note: 11 3/4-inch-long overall vertical crack (no change).

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Photograph 5 - Looking northwest at the beam 3, span 3 east connection angle to the south face of the pier beam at pier 3. Note: 14-inch-long overall vertical crack (no change).

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Photograph 6 - Looking northwest at the beam 4, span 3 east connection angle to the south face of the pier beam at pier 3. Note: 13 3/4-inch-long vertical crack (1/2-inch growth)..

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Photograph 7 - Looking north along the beam 5, span 3 bottom flange at the connection to the pier beam at pier 3. Note: seat has been installed beneath the beam.