Oklahoma Dept. of Transportation - Bridge Inspection Report

NBI No.:	Structure No.:	Local ID:	Suff. Rating:	
04085	0902 0000 X	-1	21.10	SD

IDENTIFICATION

Bridge Description:
38-100ft. PONY TRUSS & 2-36ft. I-BM. SPANS(BRIDGEPORT BR.)

1. State: Oklahoma
2. Division: Division 4
3. County: CANADIAN
4. City: Unknown
Admin Area: L/T Truss
5a. On/Under: Route On Structure
5b. Kind of Hwy: U.S. Hwy
5c. Lvl of Srvc: Mainline
5d. Route No.: 00281
5e. Dir. Sufx: N/A (NBI)

7. Facility Carried : U.S. 281
6. Feat. Intersect: S. CANADIAN RIVER
9. Location: CADDO CANADIAN CL
11. Mile Post: NA
13. LRS Inv. / Sub Rte: 0902 0000 / 01
16. Latitude: 35° 32' 25.00"
17. Longitude: 098° 19' 22.00"
98. Border Brdg: Unknown (P)
% Responsible: 0.00
99. Border Brdg #: Unknown

INSPECTION

Type	Insp. Req.	Insp. Done	Freq.	Insp. Date	Next Insp.
NBI:		1	12 months	10/14/2018	10/14/2019
FC:	Y	1	12 months	10/14/2018	10/14/2019
UW:	N	0		NA	NA
OS:	Y	0	12 months	4/11/2018	4/14/2019

CLASSIFICATION

12.Base Hwy Net.: On Base Network
20. Toll Facility: On free road
21. Custodian: State
22. Owner: State
26. Function Class: 06 Rural Minor Arteri
37. Historical Sig.: Br eligible for NRHP
100. Def. Hwy: Not a STRAHNET hwy

101. Parallel Str.: No || bridge exists
102. Traffic Dir.: 2-way traffic
103. Temp. Str.: Not Applicable (P)
104. Hwy System: Not on NHS
105. Fed Land Hwy: N/A (NBI)
110. Defense Hwy: Not a STRAHNET hwy
112. NBIS Length: Long Enough

STRUCTURE TYPE AND MATERIALS

43a/b. Main Span: Steel / Truss-Thru
44a/b. Appr. Span: Steel / Stringer/Girder
45. # of Main Spans: 38
46. # of Appr. Spans: 2
107. Deck Type: Concrete-Cast-in-Place
108a. Wearing Surface: Bituminous
108b. Membrane: Unknown
108c. Deck protection: Unknown

CONDITION

58.Deck: 5 Fair
62.Culvert: N/A (NBI)
59.Sup.: 4 Poor
61.Chan./Chan. Prot.: 5 Bank Prot Eroded
60.Sub: 5 Fair

Flowline Notes

OCT-2018: Flow too high to measure. Channel now in span 11.
OCT-2017: 29.7' TOC at L4, west truss, span 10

AGE AND SERVICE

19. Detour Length: 11.8 mi
27. Year Built: 1933
28a/b. Lanes on/und: 2 / 0
29. ADT: 1,100
30. Year of ADT: 2016
106. Year Reconst.:
109. Truck ADT: 16%
42a/b. Type of Svc on/und: Highway / Waterway

LOAD RATING AND POSTING

31. Design Load: M 13.5 (H 15)
41. Post. Status: P Posted for load
70. Posting: 2 20.0-29.9%below
Date Rated: 03/25/2014
63.Op / 65.Inv. Rating Meth.: 1 LF Load Factor / 1 LF Load Factor

	H	HS	3-3	EV3	SHV
64. Operating Rating (tons):	15.00	15.10	65.40	36.30	0.00
66. Inventory Rating (tons):	14.00	14.10	37.70	21.80	

GEOMETRIC DATA

10. Vert. Clearance: 99.99 ft
32. Appr Rwy Width: 30.00 ft
33. Median: No median
34. Skew: 0.00°
35. Struct. Flared: No flare
47Horizontal Clr: 24.00 ft
48. Length Max Span: 100.07 ft
49. Struct. Length: 3,937.01 ft

50a. Curb/Sdwlk Width L: 1.00 ft
50b. Curb/Sdwlk Width R: 1.00 ft
51. Width Curb to Curb: 24.00 ft
52. Width Out to Out: 26.00 ft
Deck Area: 102,364.79 sq. ft
53. Min.Vert.Cl.Ovr Brg: 99.99 ft
54a.Min.Vt.Undclr.Ref.: N Feature not hwy c
54b. Min. Vert. Undclr.: 0.00 ft
55a. Min.Lat.Undclr.Ref: N Feature not hwy
55. Min.Lat.Underclr. R: 99.90 ft
56. Min.Lat.Underclr. L: 99.90 ft

APPRAISAL

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: Not applicable (NB
71. Waterway Adeq: 5 Above Tolerable
72. Appr. Alignment: 6 Equal Min Criteria
113. Scour Critical: 7 Countermeasures

PROPOSED IMPROVEMENTS

94. Bridge Cost: $6,781,689
95. Roadway Cost: $4,500,000
96. Total Cost: $11,920,275
97. Yr.of Cost Est.: 2015

75. Type of Work: 31 Repl-Load Capacity
76. Lngth of Improvement: 3,937.0 ft
114. Future ADT: 1,760
115. Yr.of Future ADT: 2036

NAVIGATION DATA

38. Nav. Control: Permit Not Required
39. Vert. Clearance: 0.0 ft
40. Horiz. Clearance: 0.0 ft
111. Pier Protect.: 1 Not Required
116. Lift Bridge Vert. Clr.: 0.0 ft

OKLAHOMA ITEMS

200c. Temperature: 50
200d. Weather: Rain/Snow
201. Struc.Stl. ASTM Desig.: -1 / -1
202. Waterprf.Membrane: -1
Date Installed: 01/01/1901
203. Type Exp. Device: Sliding Plate
Open Joint-No Device _
204. Type of Railing: Metal Railing (other)
205. Material Quantity: 10.00
208a. Type of Abutment: Pedestal
b. Type of Found.: Bears on Natural Found.
209. Type of Pier/Found.: 2 / Yes
No Piling/Drilled Shaft
210. Foundation Elev.: -1.00 -1.00 -1.00 -1.00 -1.00
211. Wear.Surf.Prot.Sys: None
Date Installed: 01/01/1901
213. Utilities Attached: Communication

214a. Posted Weight Limit: 090909
b. Posted Speed Limit:
c. Narrow/1way Brdg Sign:
d. Vertical Clr. Sign: No
Adv. Warning Sign: No
e. Navigation Lights?: No
Working/Not Working: No
215. Overpass: U.S. HIGHWAY
221. Substr.Cond.(U/W):
222. Fill Over RCB:
223. Appr.Slab/Rwy Cond.: 3
225. Paint Type/Ovrct: Red Lead 3 Coat System
N/A
226. Date Painted: 1933
227. Paint Color: Silver
233. Deck Forming: Conventional Forming
238. School Bus Rte.: Current & Desired route
240. Appr. Rwy Type.: Concrete
243. Grdr Spacing/No.: /

244. Span Lengths:
245. Girder Depth: 48.00
246a. Type of Ovelay: AC Overlay
b. Overlay Thickness: 3.00
c. Overlay Date: 12/04/2003
d. Ovly Depth Changed >1": _
247. Protective Systems: _ _ _ _ _ _
248. # Field Splices w/ Corrosion:
249. Scour Crit. POA Exists?: _
250. Headwall:
254. Thru Truss Type:
257a. OkiePROS Truck Routing: Yes
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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04085	0902 0000 X	-1	21.10	SD

Inspection Date: 10/14/18 Brendan Prendeville

Invoice No.: 845637 Inspected With: -1

Brendan J. Prendeville

Digitally signed by Brendan J. Prendeville
DN: cn=Brendan J. Prendeville, o=B&N, ou=Burgess & Niple, Inc., email=brendan.prendeville@burgessniple.com, c=US
Date: 2018.12.04 13:12:46 -05'00'

BRIDGE NOTES:

(38) 100-foot long riveted pony trusses with (2) 36-foot long steel beam approach spans. The bridge had a 15-ton load restriction at the time of the inspection. The posting was lowered to 9 tons after cracks were discovered in the east U4 inboard gusset plates of spans 32 and 37 during the inspection. It was also discovered that the latest load rating report, dated March 25, 2014, used 8 rivets per gusset plate for the U1L0 and U4L3 panel points where only 6 exist.
OS Inspection Items: See Appendix tables in 2018-10-14 FC report for list of the following: Inspect cracks in stringer web copes, stringer connection angles, floor beams web copes, lower chord gusset plates above bearings for growth, stringer connections at end floor beams for additional loss or broken rivets; pier beams and supplemental pier beams at piers 1 and 39 for distress; misalignment of W U1U2 sp 37; floor beam section loss; gusset plate cracks at east U4 spans 32 and 37; scour from stream in spans 10 and 11; areas of collision damage on deck to steel trusses; east bearing at pier 3 for any undermining.

INSPECTION NOTES: 10/14/18

PX – Strengthen the stringer webs as recommended in Appendix D (spans 15, 16, 21, 24, 31, 36, and 38); Reinforce/replace the damaged concrete bridge railing in spans 1 and 40; Seal cracks in the asphalt in both the bridge and approach wearing surfaces; Remove loose elastomeric concrete and patch the joint headers as necessary to provide a smooth riding surface across the bridge; Reseal the poured seal expansion joints; Install elastomeric pads or steel shims at missing locations on the supplemental pier beams over piers 1 and 39; Compare lengths of cracks in stringer and floor beam webs with Appendix A values. Drill stringer crack tips noted in Appendix A that grow significantly; Repair cracks in stringer connection angles noted in Appendix B by adding seat brackets below the stringer; Repair section loss in stringer and floor beam webs where corrosion holes and/or heavy section loss exists with welded plates and/or angles; Remove broken rivets for the stringer connections at the locations noted in Appendix C and replace with bolts; Replace sheared rivets in the vertical connection, upper chord, and end post with bolts at west U1 in spans 31 and 37; Remove pack rust and apply caulking and paint along the edges of the gusset plates at L0 and L5; Clean and paint the stringer ends and floor beams adjacent to the joints above the piers and the lower chord panel points including the splice locations; Add rip rap around piers near the current channel to protect against scour; Repave the south approach near the bridge to provide a smooth transition; Install full depth pressure relief joints in both approaches to mitigate ongoing effects of pavement pressure.
FX – Monitor: Cracks in the inboard gusset plates at east U4, spans 32 and 37, and at west U1 span 37 for growth; Channel for further movement; Beam connections to the original pier beams at piers 1 and 39 for further cracking; Notches and cuts in inboard flange and gusset plate at west U1L2, span 31 for cracks or signs of distress; Collision damage to W U1L2 span 6, W U1L0 in spans 7 and 37, and E U1L0 in spans 14 and 39 for distress; Pack rust and section loss in truss web members and end posts at railing connections; Spalls and corroding reinforcing steel in soffit for further deterioration; Lower chord gusset plates over the bearings for the development of horizontal cracks; Cracks at floor beam copes for growth and further deterioration; Horizontal cracks in the web of the end floor beams at span 6 in floor beam 0, span 11 in floor beam 5, and span 20 in floor beam 0; Fatigue prone stitch welds of angle strengthening at floor beam 0, span 2 for cracking; Corrosion holes through the floor bracing system gusset plates for the development of cracks; 1/4-inch bow in W U1U2 due to collision damage for further distress and development of cracks; Bowed gusset plates near bearings for distress; Lower chord section loss at floor system bracing connections, splices, and adjacent to stay/batten plates; Bullet strike damage to east truss span 4 members/gusset plates for crack development; Cracking/spall of the east column capital, pier 3 for conditions which would undermine the bearing; Expansion bearing pins for signs of additional wear or distress.

ELEMENT CONDITION STATE DATA

Elem. / Env	Description	Unit	Total Qty	% 1	Qty. 1	% 2	Qty. 2	% 3	Qty. 3	% 4	Qty. 4
12 / 1	Re Concrete Deck	sq.ft	94,488.00	0%	0.00	0%	0.00	100%	94,488.00	0%	0.00
	Many portions of the curbs exhibit spalls and/or cracking with corroding reinforcing steel especially over the ends of the intermediate floor beams. Some spalls have been patched in isolated areas throughout the deck. Deck appears to be growing from center of each span causing cracking of floor beam webs at connection angles and distress/cracking of stringer connection angles at end floor beams.										
510 / 1	Wearing Surfaces	sq.ft	94,488.00	80%	75,488.00	10%	9,500.00	10%	9,500.00	0%	0.00
	PX – The asphalt wearing surface has unsealed longitudinal and transverse cracks throughout the spans. Raveling and patching exists along outside wheel lines at isolated locations.										
107 / 1	Steel Opn Girder/Beam	ft	259.00	67%	174.00	33%	85.00	0%	0.00	0%	0.00
	Surface corrosion along top flange of exterior beams.										
113 / 1	Steel Stringer	ft	9,501.00	0%	0.00	65%	6,175.60	35%	3,325.40	0%	0.00
	Section loss of the top flange is typical in the exterior stringers. Pack rust is lifting the deck from the exterior stringers.										
120 / 1	Steel Truss	ft	7,600.00	0%	0.00	65%	4,940.00	35%	2,660.00	0%	0.00
	PX – Impact damage at E U3U4 span 9 and W U1U2 span 31 has sheared rivets for the bottom lacing bars. FX– W U1 span 37 has a 5/16-inch long crack in the bottom edge of the inboard gusset plate; Impact damage exists to the truss web members at multiple locations; West U1U2 in span 37 is bowed globally to the east 1/4in.; Impact damage exists on the inboard flanges of the upper chord. Pack rust is common at the end post connection to the inboard gusset plate at the lower chord connection; Horizontal cracks were observed in the inboard truss gusset plate between the bearing pin and the end floor beam. All eight locations noted during the previous Fracture Critical inspection have been strengthened with the addition of a welded steel angle on the inboard face. Vehicular collision damage exists at numerous locations of the truss end posts. See FC Report.										
515 / 1	Steel Protective Coating	sq.ft	406,533.00	0%	0.00	0%	0.00	100%	406,533.00	0%	0.00

PX – Corrosion and significant section loss are occurring at many locations on the lower chord, floor beams, and stringers due to deck drainage passing through joints. Widespread section loss and corrosion holes exist in the exterior stringers and end floor beams.

152 / 1	Steel Floor Beam	ft	6,155.00	0%	0.00	62%	3,816.10	38%	2,338.90	0%	0.00

PX – Section loss with corrosion holes is common in the end floor beams and floor beams at the east truss connection (57 locations - See Appendix F).
FX – Horizontal cracks in the end floor beams between the top flange and connection angle range between 5/8 inch to 9 3/16 inches (71 locations - See Appendix G)

162 / 1	Stl Gus Plate	each	1,672.00	0%	0.00	45%	758.00	55%	914.00	0%	0.00

PX- Horizontal cracks in the inboard truss gusset plates above the bearings range in length between 6 3/4 inches to 17 5/8 inches long (10 locations - See Appendix H); Noted cracks have been strengthened; Numerous locations where paint cracks exists at this location suggesting eminent development of cracks.
FX- Cracks in edge of E U4 in spans 32 and 37 due to pack rust (NEW 2018) and W U1 span 37 due to collision damage; LC inboard gusset plates typically bowed at L0 and L5 due to pack rust; West U1 span 31 has tears (1 7/8 inch and 1 inch) in edge of inboard gusset plate Bullet strike damage to E M2.5 span 4.

205 / 1	Re Conc Column	each	78.00	0%	0.00	99%	77.00	1%	1.00	0%	0.00

FX – A 7/8-inch maximum wide crack exists in the capital of the east column of pier 3 which is emanating from the span 2 bearing anchor bolt.

215 / 1	Re Conc Abutment	ft	49.20	50%	24.60	50%	24.60	0%	0.00	0%	0.00

No significant deficiencies were noted in the abutments except for moderate debris on the bearing seats of both abutments and map cracking exposing a few reinforcing bars at the ends of the south abutment.

301 / 1	Pourable Joint Seal	ft	495.00	0%	0.00	0%	0.00	50%	247.50	50%	247.50

PX – Spalling of the headers was observed along the joints at piers 1, 13, 27, 33, 35 and 39; The poured joint seals typically are deteriorated and show evidence of leaking. Many of the poured seals were never installed at many of the repaired header locations leaving only the form board to fill the joint.

310 / 1	Elastomeric Bearing	each	7.00	50%	5.00	0%	0.00	50%	2.00	0%	0.00

PX – Elastomeric bearing pads missing under beams at supplemental pier beams (beams 1-4 at pier 1, beams 1-3 at pier 39). The pads appear to be walking at pier 39 under beams 4 and 5.
Unreinforced elastomeric bearing pads exists under the supplemental pier beams.

311 / 1	Moveable Bearing	each	86.00	0%	0.00	71%	61.00	29%	25.00	0%	0.00

FX – Wear causing grooving in the expansion bearing pins and enlarging of the pin hole in the connecting gusset plates are common throughout the spans. The wear is a result of bearing rotation under live loads. This condition is most severe at L0 span 38 over pier 37 which has 3/16-inch total wear to the pin and gusset plate.
Heavy pack rust with minor associated pitting is wide spread on and between the bearing components. Bronze sliding plate between the sole and masonry plates has slid out and broken at several bearings. Anchor bolts have corroded away at many of the sliding bearings.

313 / 1	Fixed Bearing	each	84.00	0%	0.00	100%	84.00	0%	0.00	0%	0.00

Surface corrosion exists at the fixed bearings.

330 / 1	Metal Bridge Railing	ft	7,600.00	0%	0.00	95%	7,220.00	5%	380.00	0%	0.00

FX- Pack rust is typical between the metal bridge railing, truss end posts, and web members. Small cracks were observed in the railing where the flange and web have been coped.

859 / 1	Soffit	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

FX- Spalls exposing corroded rebar are common in the underside of the deck at the expansion joints due to leakage thru joints.
The underside of the deck exhibits transverse cracks with light efflorescence. Spalls and deteriorated concrete exist in exterior stringer bays at isolated locations.

865 / 1	St.Open Gird End(5Ft	(LF)	100.00	100%	0.00	0%	80.00	0%	20.00	0%	0.00

FX - Connection angles to pier beam 39 are deformed due to longitudinal force from approach pavement.
Elastomeric bearing pads missing at supplemental pier beams (beams 1-4 at pier 1, beams 1-3 at pier 39).

877 / 1	St. Stringer End(5Ft)	(LF)	9,501.00	0%	0.00	50%	4,750.50	50%	4,750.50	0%	0.00

PX - Significant loss including corrosion holes through exterior stringer webs at end floor beams (59 locations - See Appendix D); Cracks in the web at the top flange cope range from 1/8 inch to 2 1/2 inches long (98 locations - See Appendix A); Cracks in the stringer connection angles at the end floor beams range from 1 1/4 inches to 7 inches long (61 locations - See Appendix B); Broken rivets at the stringer connections to the end floor beams (121 rivets at 92 locations - See Appendix C).

909 / 1	Pourable Fix Jt.Seal	(LF)	495.40	0%	0.00	0%	0.00	50%	247.70	50%	247.70

Fixed joints are paved over with transverse crack in asphalt above joint. Space between floor beams under joint at pier 20 has been filled with asphalt.

916 / 1	St.Bearing Assembly	(LF)	4.00	100%	4.00	0%	0.00	0%	0.00	0%	0.00

Surface corrosion with no significant deficiencies.
Note: Bearing assemblies do not exist between beams and supplemental pier beams

956 / 1	St. Cracking/Fatigue	(SF)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

PX- Cracks in the stringer web at the top flange cope range from 1/8 inch to 2 1/2 inches long (98 locations - See Appendix A); Cracks in the stringer connection angles at the end floor beams range from 1 1/4 inches to 7 inches long (61 locations - See Appendix B).
FX- Cracks in edge of E U4 in spans 32 and 37 due to pack rust (NEW 2018) and W U1 span 37 due to collision damage; Horizontal cracks in the end floor beams between the top flange and connection angle range between 5/8 inch to 9 3/16 inches (71 locations - See Appendix G).

957 / 1	Pack Rust Smart Flag	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

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PX – Pack rust is common at the end post connection to the inboard gusset plate at the lower chord connection causing bowing of the gusset plates.
FX – Cracks in edge of E U4 in spans 32 and 37 due to pack rust (NEW 2018); Pack rust is forming at many of the bridge railing to inboard end post channel connections.
Pack rust occurs between the lower chord components and at the gusset plates at M2.5.

961 / 1	Scour SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

PX - Local scour exists around the columns at piers 5 through 9 and pier 23. The top of the column foundation is exposed up to 4 1/2 feet at these locations. Local scour was also observed at the columns in the flood plain north of the river.

962 / 1	Super.Traffic Impact	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

Collision damage has bent or damaged the above deck truss members with no significant loss in capacity at
PX - E U3U4 span 9, W U1U2 U1L1 and the U1 gusset plate span 31,
FX- W U1L2 span 6, W U1U2 and U1L2 span 37.

963 / 1	Steel Section Loss SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

PX - Significant loss including corrosion holes through exterior stringer webs at end floor beams (59 locations - See Appendix D); Section loss with corrosion holes is common in the end floor beams and floor beams at the east truss connection (57 locations - See Appendix F).
FX- Corrosion of the lower chord has caused section loss on inboard top flange.

965 / 1	Debris SF	(EA)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00

Drift consisting of large trees exists on the west flood plain under and around spans 5 through 10.

969 / 1	OutOfPlane Dist./Load	(EA)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00

FX – Pier beams 1 and 39 have severe sweep and have been sistered.

973 / 1	Horizontal Force SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00

PX- Significant approach pavement pressure occurs at both abutments pushing inward from both ends as evidenced by the movement of the deck, and sheared rivets and cracks in stringer to floor beam connections.

975 / 1	Supplemental Support	(EA)	76.00	100%	76.00	0%	0.00	0%	0.00	0%	0.00

Shim plate between floor beam 5, span 26 and the stiff leg is rotating out from under the floor beam bottom flange.