

# Oklahoma Dept. of Transportation - Bridge Inspection Report

<b>NBI No.:</b> 17611	<b>Structure No.:</b> 5159 0300 X	<b>Local ID:</b> -1	<b>Suff. Rating:</b> 66.70	<b>ND</b>																														
<b>Bridge Description:</b>		<b>INSPECTION</b>																																
<b>IDENTIFICATION</b>																																		
4(100ft.CONT.)(207ft.-334ft. -207ft.CONT.)3(100ft.CONT.)4(100ft.CONT.)75ft. PLATE GIRDER S		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Insp. Req.</th> <th>Insp. Done</th> <th>Freq.</th> <th>Insp. Date</th> <th>Next Insp.</th> </tr> </thead> <tbody> <tr> <td>NBI:</td> <td></td> <td>1</td> <td>24 months</td> <td>7/21/2021</td> <td>07/21/2023</td> </tr> <tr> <td>FC:</td> <td>Y</td> <td>1</td> <td>24 months</td> <td>7/21/2021</td> <td>7/21/2023</td> </tr> <tr> <td>UW:</td> <td>Y</td> <td>0</td> <td>60 months</td> <td>10/8/2017</td> <td>10/8/2022</td> </tr> <tr> <td>OS:</td> <td>Y</td> <td>0</td> <td>24 months</td> <td>8/14/2020</td> <td>7/21/2022</td> </tr> </tbody> </table>			Type	Insp. Req.	Insp. Done	Freq.	Insp. Date	Next Insp.	NBI:		1	24 months	7/21/2021	07/21/2023	FC:	Y	1	24 months	7/21/2021	7/21/2023	UW:	Y	0	60 months	10/8/2017	10/8/2022	OS:	Y	0	24 months	8/14/2020	7/21/2022
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OS:	Y	0	24 months	8/14/2020	7/21/2022																													
1. State: Oklahoma 2. Division: Division 1 3. County: MUSKOGEE 4. City: Unknown Admin Area: Unknown 5a. On/Under: Route On Structure 5b. Kind of Hwy: State Hwy 5c. Lvl of Svc: Mainline 5d. Route No.: 00100 5e. Dir. Sufx: N/A (NBI)		7. Facility Carried : S.H. 100 6. Feat. Intersect: ARKANSAS RIVER 9. Location: SEQUOYAH C/L 11. Mile Post: 4.827 mi 13. LRS Inv. / Sub Rte: -1 / -1 16. Latitude: 35° 31' 14.59" 17. Longitude: 095° 07' 24.89" 98. Border Brdg: Unknown (P) % Responsible: 0.00 99. Border Brdg #: Unknown																																
<b>STRUCTURE TYPE AND MATERIALS</b>		<b>CLASSIFICATION</b>																																
43a/b. Main Span: Steel Cont. / Girder-Floorbeam 44a/b. Appr. Span: Steel / Stringer/Girder 45. # of Main Spans: 3 46. # of Appr. Spans: 11 107. Deck Type: Concrete-Cast-in-Place 108a. Wearing Surface: Epoxy Overlay 108b. Membrane: None 108c. Deck protection: Unknown		12. Base Hwy Net.: Not on Base Network 20. Toll Facility: On free road 21. Custodian: State 22. Owner: State 26. Function Class: 07 Rural Mjr Collecto 37. Historical Sig.: Not 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: IRR-Indian Res Rd 110. Defense Hwy: Not a STRAHNET hwy 112. NBIS Length: Long Enough																																
		<b>CONDITION</b>																																
		58. Deck: 6 Satisfactory 62. Culvert: N/A (NBI) <b>Flowline Notes</b> There has been general scour ranging from 5-ft to 15-ft, west of Pier 7 since construction. The top of the footing at Pier 5 and Pier 6 is exposed;																																
		<b>LOAD RATING AND POSTING</b>																																
		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): <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>H</td><td>HS</td><td>3-3</td><td>EV3</td><td>SHV</td></tr> <tr><td>33.29</td><td>54.45</td><td>75.84</td><td>0.00</td><td>0.00</td></tr> </table> 66. Inventory Rating (tons): <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>19.95</td><td>32.63</td><td>45.53</td><td>-1.00</td></tr> </table> Date Rated: 11/24/2003			H	HS	3-3	EV3	SHV	33.29	54.45	75.84	0.00	0.00	19.95	32.63	45.53	-1.00																
H	HS	3-3	EV3	SHV																														
33.29	54.45	75.84	0.00	0.00																														
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<b>AGE AND SERVICE</b>		<b>APPRAISAL</b>																																
19. Detour Length: 9.9 mi 27. Year Built: 1969 28a/b. Lanes on/und: 2 / 0 29. ADT: 3,300 30. Year of ADT: 2019 42a/b. Type of Svc on/und: Highway / Waterway		106. Year Reconst.: 109. Truck ADT: 15% 36a. Brdg Rail: 0 Substandard 36b. Transition: 1 Meets Standards 36c. Appr. Rail: 1 Meets Standards 36d. Appr. Rail Ends: 1 Meets Standard 67. Str Evaluation: 5 Above Min Tolerz 68. Deck Geom.: 4 Tolerable 69. Vert./Horiz. Undclr: Not applicable (NB) 71. Waterway Adeq: 8 Equal Desirable 72. Appr. Alignment: 6 Equal Min Criteria 113. Scour Critical: 8 Stable Above Footin																																
<b>GEOMETRIC DATA</b>		<b>PROPOSED IMPROVEMENTS</b>																																
10. Vert. Clearance: 99.99 ft 32. Appr Rwy Width: 44.00 ft 33. Median: No median 34. Skew: 0.00° 35. Struct. Flared: No flare 47 Horizontal Clr: 28.00 ft 48. Length Max Span: 333.99 ft 49. Struct. Length: 1,928.15 ft		50a. Curb/Sdwk Width L: 1.50 ft 50b. Curb/Sdwk Width R: 4.00 ft 51. Width Curb to Curb: 28.00 ft 52. Width Out to Out: 35.30 ft Deck Area: 68,060.89 sq. ft 53. Min. Vert. Cl. Ovr Brg: 99.99 ft 54a. Min. Vert. 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: 0.00 ft 56. Min. Lat. Underclr. L: 0.00 ft 94. Bridge Cost: \$11,530,195 95. Roadway Cost: \$4,500,000 96. Total Cost: \$16,937,565 97. Yr. of Cost Est.: 2015 75. Type of Work: 31 Repl-Load Capacity 76. Lngth of Improvement: 1,928.1 ft 114. Future ADT: 5,280 115. Yr. of Future ADT: 2039																																
		<b>NAVIGATION DATA</b>																																
		38. Nav. Control: Permit Required 39. Vert. Clearance: 52.0 ft 40. Horiz. Clearance: 300.0 ft 111. Pier Protect.: 2 In-Place, Function 116. Lift Bridge Vert. Clr.: 0.0 ft																																
<b>OKLAHOMA ITEMS</b>																																		
200c. Temperature: 90 200d. Weather: Clear 201. Struc. Stl. ASTM Desig.: A-36 / -1 202. Waterprf. Membrane: -1 Date Installed: 01/01/1901 203. Type Exp. Device: Finger 204. Type of Railing: PTR-1 (square hand rail) 205. Material Quantity: -3.00 208a. Type of Abutment: Skeleton b. Type of Found.: Steel Piling 209. Type of Pier/Found.: 2 / No No Piling/Drilled Shaft 210. Foundation Elev.: <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>4,402.00</td><td>4,352.00</td></tr> <tr><td>-1.00</td><td>4,400.00</td></tr> <tr><td></td><td>-1.00</td></tr> </table> 211. Wear. Surf. Prot. Sys: None Date Installed: 01/01/1901 211c. Silane Reapplied 211d. Date : 213. Utilities Attached: Communication <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>Natural Gas</td><td>Power</td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>		4,402.00	4,352.00	-1.00	4,400.00		-1.00	Natural Gas	Power					214a. Posted Weight Limit: NR b. Posted Speed Limit: c. Narrow/1way Brdg Sign: NA d. Vertical Clr. Sign: NA Adv. Warning Sign: NA e. Navigation Lights?: Yes Working/Not Working: Yes 215. Overpass: STATE HIGHWAY 218. Functionally Obsolete : - 220. Bridge Redecked : - 221. Substr. Cond. (U/W): 222. Fill Over RCB: 0 223. Appr. Slab/Rwy Cond.: 2 225. Paint Type/Ovrct: Organic Zinc(OZ-E-U) Gr N/A 226. Date Painted: 2010 227. Paint Color: Gray 233. Deck Forming: 238. School Bus Rte.: Current & Desired route 240. Appr. Rwy Type.: Concrete 243. Grdr Spacing/No.: /																				
4,402.00	4,352.00																																	
-1.00	4,400.00																																	
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Natural Gas	Power																																	
		244. Span Lengths: 245. Girder Depth: 246a. Type of Overlay: Chipseal b. Overlay Thickness: 0.10 c. Overlay Date: 05/01/2014 d. Ovlv Depth Changed >1": N 247. Protective Systems: 248. # Field Splices w/ Corrosion: 3 249. 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:																																

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ND

Inspection Date: 7/21/21

Brendan Prendeville

Invoice No.: 987584

Inspected With:

## **BRIDGE NOTES:**

15 span structure consisting of: Spans 1-4 100-foot long continuous steel multi girders spans; Spans 5-7 three span continuous steel twin girders (207 feet, 334 feet, 207 feet); Spans 8-10 three 100-foot long continuous steel multi girders spans; Spans 11-14 four 100-foot long continuous steel multi girders spans; Span 15 100-foot long simple steel multi girder span.

OS Inspection Items Include:

Girder web cracks which have not been arrested and cracks with drilled hole retrofits.

Crack on exterior face of beam 1 in span 15, near pier 14.

Floor beam 0 lower connection to girder 2, span 6.

Cracked welds between lower lateral bracing gusset plates and bottom angles.

Kinks and bends in floor beams adjacent to the piers

Recently replaced floor beams and the welded connections to the girders and the stringers.

Welds at recently reattached floor beam 0 lower chord connection to girder in span 7.

Loose stringer bolts at floor beam 3, 5, 6, 11, and 12 in span 6.

Abutment movement and erosion.

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**INSPECTION NOTES:** 7/21/21

**PX-**

Replace rail post anchor bolts along the north barrier at the end of the east approach slab.  
 Unclog the deck scupper in span 10.  
 Reseal the fixed poured joint seal at both abutments.  
 Arrest girder web cracks via drilled holes that have not previously been arrested. See girder section for locations.  
 Repair cracked area at previous navigation light in girder 2 of span 6.  
 Replace or tighten bolts in the girders in spans 5;6;7.  
 Arrest crack on the exterior face of girder 1 in span 15: near pier 14.  
 Tighten loose stringer bolts at stringer to floor beam connections. See stringer section for locations.  
 Reattach floor beam 0 lower connection to girder 2 in span 6. Consider bolting the previously welded connection.  
 Repair cracked web connection plate weld for floor beam 6 in span 5 at girder 1.  
 Tighten and replace bolts at floor beam to girder connections. See floor beam section for locations.  
 Repair cracks for the lower lateral bracing in span 5; floor beam 7; girder 2 and span 6; floor beam 12; girder 2.  
 Replace severed lower lateral bracing hanger rods and missing connection brackets.  
 Tighten and replace anchor bolts at fixed bearings. See bearing section for locations.

**FX-**

Monitor spalls in the sidewalk of span 5; near pier 4.  
 Monitor the epoxy overlay for further deterioration.  
 Monitor the deck soffit along the girders, floor beams and stringers for further deterioration.  
 Monitor the vertical offset of the finger joints for changes in height at piers 4 and 7.  
 Monitor locations of drilled hole retrofits and paint cracks for signs of crack propagation or initiation.  
 Monitor bow in the web of girder 1; span 7 at the field splice between floor beams 3 and 4.  
 Monitor surface corrosion and pack rust along the top flange of the girders and between the girder top flanges and the deck.  
 Monitor painted over pitting at girder webs adjacent to the top of lower lateral bracing gusset plates for reactivation. Remove debris.  
 Monitor pack rust between girder web horizontal splice plates for deformation of the girders and bottom flange splices.  
 Monitor cracked welds at cross frame connection to girders due to pack rust.  
 Monitor cracks at the connection angles for floor beam 3; span 5 at stringer 3 and floor beam 0; span 7 at stringer 3.  
 Monitor cracks in welds at recently reattached floor beam 0 lower chord connection to girder in span 7.  
 Monitor welded connections at recently replaced floor beams due to marginal weld quality.  
 Monitor kinks and bends in floor beam members and gusset plates for further distortion or signs of cracking in the welded details. See floor beam section for locations.  
 Monitor small gouges in member L2U3 of floor beam 2 in span 6 for cracking.  
 Monitor lower lateral bracing connections for pack rust initiation.  
 Monitor east and west abutment slope for further erosion and undermining of abutment breastwalls.  
 Monitor abutment movement toward channels.  
 Monitor pack rust that has initiated at the fixed bearings.

Channel Notes: Channel has a slight bend but is aligned with the piers. Spur dikes on the east bank, approximately 450-ft, 1400-ft, and 2700-ft upstream. Both embankments appear stable. Channel bottom material at the piers consists of sand, gravel, and rock.

UW Inspection General Notes: Light scaling, up to 1/8-in penetration on the upstream column and 1/16-in penetration on the downstream columns and webwalls, extending from 3-ft above the waterline to the channel bottom. Piers 5 and 6 also have light scaling, up to 1/8-in penetration, extending from 3-ft above the waterline to the channel bottom. There is light algae growth on the submerged surfaces.

Per the 2017 Underwater Inspection report; There has been general scour ranging from 5-ft to 15-ft, west of Pier 7 since construction. The top of the footing at Pier 5 and Pier 6 is exposed; however, the footings are keyed into hard shale, according to the design plans.

**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	53,984.00	0%	0.00	100%	53,984.00	0%	0.00	0%	0.00
PX – Minor to moderate debris accumulation exists along the curbs. The deck scupper in span 10 near pier 10 is clogged. Several additional scuppers are partially clogged with vegetation. Isolated shallow spalls exist in the deck. Longitudinal cracks exist along the deck surface, mostly in the wheel lines. Transverse cracks spaced at 1 to 3 feet exist on the surface randomly along the full length of the bridge. Cracks are widest and most prominent in the twin girder spans. Deck patches exist from a prior rehabilitation. The deck patches are functioning as intended.  Note: The deck is being coded CS2 (Soffit CS3) due to areas of the deck being visible due to the deterioration of the wearing surface.											
510 / 1	Wearing Surfaces	sq.ft	53,984.00	60%	32,391.00	35%	18,894.00	5%	2,699.00	0%	0.00
FX – The 2014 epoxy grit overlay is failing in patches throughout the deck, mostly along the wheel lines.											
107 / 1	Steel Opn Girder/Beam	ft	4,780.00	82%	3,900.00	10%	478.00	8%	402.00	0%	0.00

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Fracture Critical twin girder spans exist in spans 5 through 7 and have the following comments:  
 Cracks were observed at the ends of the horizontal web splice at the following locations:  
 PX – Span 5; G 1 at the field splice near FB 5 – This crack is 5/8 inch long and has no arrestor hole.  
 FX – Span 5; G 2 at the field splice near FB 5 – A 3/8-inch long likely paint crack.  
 FX – Span 6; G 1 at the field splice near FB 3 – A 3/4-inch long crack has been arrested with two drilled hole retrofits.  
 FX – Span 6; G 2 near FB 11 – 3/16 inch long vertical crack in the lower web plate.  
 FX – Span 7; G 1 at the field splice near FB 4 – Paint cracks exists in the girder web at the toe of the longitudinal stiffener.  
 FX – Span 7; G 2 at the field splice near FB 4 – Two vertical cracks arrested with drilled hole retrofits.  
 PX – Span 6; G 2 exterior, at midspan, the welded detail for the previous navigation light conduit is missing a section and the remaining circumference is cracked.  
 PX – Missing or loose bolts were observed:  
 G 2 in span 5; near FB 5.  
 G 2 in span 6; exterior face near FB 3.  
 G 1 in span 6; top flange.  
 G 1 at pier 6; horizontal web splice  
 G 1 in span 7; horizontal web splice near FB 3.  
 FX – A global bow up to 1/2 inch exists in the web of G 1; span 7 between FB 3 and 4 at the field splice.  
 FX – Surface corrosion along the top flange and 1/8-inch thick pack rust between the girder top flanges and the deck is common.  
 FX – Painted over pitting was observed in the web of the girders adjacent to the top of lower lateral bracing gusset plates.  
 FX – Pack rust up to 1/2 inch thick has developed between the horizontal web splice of the girders causing distortion at several locations.  
 FX – Pack rust up to 5/16 inch thick exists at isolated locations at the bottom flange splice plates.  
 Heavy laminating corrosion was noted at the girder horizontal web splices at the bearing stiffeners over piers 5 and 6. G 2 over pier 6 also has up to 50% section loss to 4 of 6 bolts.  
 Cracks were previously observed at the longitudinal stiffener butt welds on the exterior faces of the twin girders at the following locations:  
 Span 5; G 1 between FB 4 and 5. A paint crack has formed along the girder web.  
 Span 6; G 1 near FB 6  
 Span 6; G 1 near FB 7  
 Span 6; G 1 near FB 9  
 Span 6; G 2 near FB 9  
 Span 7; G 2 between FB 7 and 8  
 The cracks have been retrofitted by drilling a 4-inch diameter hole adjacent to the girder web to prevent propagation into the girder web.  
 Pack rust and section loss up to 3/16 inch deep exists in the girder top flanges at several of the deck joints.  
 One missing bolt was noted at the FB 2 connection to G 1; span 7.

Multi girder spans exist in spans 1 through 4 and 8 through 15 and have the following comments:  
 PX – A 1 3/4-inch long crack was observed in the vertical fillet weld to the exterior face of the web of G 1; span 15; at pier 14 at the bottom flange. A 19-inch long paint crack extends from this crack in the vertical fillet weld.  
 FX – Isolated CF top struts exhibit cracked welds between the CF and gusset plate due to pack rust. The following locations exhibited cracks:  
 CF at pier 1; connection to G 3 – 5 3/8-inch long crack in the bottom weld.  
 CF at pier 3; connection to G 4 – 1/4-inch long crack in the top weld.  
 CF at pier 4; span 4 connection to girder 1 – 1/4-inch long crack in the top weld and a broken weld at the bottom weld connection for the top strut.  
 CF at pier 12; connection to G 2 – crack full length of the gusset plate.  
 FX – Pack rust up to 1 1/4 inches thick is typical between the girder CF members and vertical web stiffeners. Minor to moderate pitting and distortion to the gusset plate is also present at these locations.  
 Girder cross frames between G 1; 2 and 3 at pier 9 and pier 10 exhibits a 3-inch bow, most likely due to the bearing rehabilitation project.

<b>515 / 1</b>	Steel Protective Coating	sq.ft	140,000.00	0%	0.00	100%	140,000.00	0%	0.00	0%	0.00
The bridge was repainted in 2010. Areas of previous corrosion and pack rust are reactivating in many locations especially at gusset plates near the expansion joints. Pack rust is active in many girder horizontal web splices. Previous PX of laminating corrosion and pack rust at lower lateral bracing gusset plates were repaired prior to the 2014 OS although corrosion is reactivating in isolated locations.											
<b>113 / 1</b>	Steel Stringer	ft	1,914.00	97%	1,850.00	3%	50.00	1%	14.00	0%	0.00

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PX – Loose stringer connection bolts were observed between the connection angle and the floor beam web at the following locations:

- Span 5, stringer 2 at floor beam 4 – 1 loose bolt
- Span 5, stringer 3 at floor beam 4 – 1 loose bolt
- Span 5, stringer 3 at floor beam 8 – 1 loose bolt
- Span 6, stringer 1 at floor beam 3 – 4 loose bolts
- Span 6, stringer 2 at floor beam 3 – 1 loose bolt
- Span 6, stringer 3 at floor beam 4 – 1 loose bolt
- Span 6, stringer 1 at floor beam 5 – 2 loose bolts
- Span 6, stringer 1 at floor beam 6 – 2 loose bolts
- Span 6, stringer 2 at floor beam 6 – 1 loose bolt
- Span 6, stringer 3 at floor beam 6 – 3 loose bolts
- Span 6, stringer 3 at floor beam 8 – 3 loose bolts
- Span 6, stringer 1 at floor beam 11 – 5 loose bolts
- Span 6, stringer 1 at floor beam 12 – 1 loose bolt

The bolts appear to have not been properly tightened during construction with the majority of locations being the result of improper fit or alignment.

FX – Span 5; stringer 3 at floor beam 3 has a crack 3 inches long in the weld on the bottom side of the connection angle.

FX – Span 7; stringer 3 at floor beam 0 has a crack 1 inch long in the weld on the bottom side of the connection angle.

FX - A portion of stringer 3; at floor beam 0; span 7 has been removed and replaced with a welded steel section due to previous corrosion holes.

Multiple stringers have mis-drilled holes in the bottom flange at the floor beam connections.

<b>152 / 1</b>	Steel Floor Beam	ft	891.00	57%	508.00	22%	200.00	21%	183.00	0%	0.00
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The FBs in spans 5 through 7 act as trusses.

PX – FB 0; span 6 at G 2 is cracked for the full width of horizontal weld along bottom of truss FB gusset plate. The vertical weld is cracked full height. The gusset plate has been reinforced with a welded strut which is bowed 3/16-inch.

PX – Span 5; west face of FB 6 at G 1; weld for the web connection plate has a crack 4 1/2 inches.

PX – Loose and misaligned bolts exist in the FB to G connections:

FB 0 upper chord to G 1 span 5 – 1 bolt not fully seated.

FB 1 lower chord to G 1 span 6 – 11 loose bolts.

FB 4 lower chord to G 1 span 6 – 2 blind holes at top of the gusset plate with adjacent pack rust up to 11/16-inch.

FB 5 lower chord to G 2 span 6 – 2 blind holes.

FB 12 lower chord to G 1 span 6 – 1 unseated bolt due to misaligned holes.

FB 13 lower chord to G 1 span 6 – 4 loose bolts and one bolt without a nut. Pack rust up to 1/4-inch.

FB 2, lower chord to G 1 span 7 – 1 missing bolt.

FB 9 to G 1 span 7 – 2 missing bolts.

FX – Following FBs have been replaced: FB 3 span 5; FB 0 span 6; and FB 0 span 7. Many of welds in these locations are of poor quality.

FX – Previous repair to FB 0 at G 2 span 7 was reattached via welded plate. Weld quality is marginal. 1 1/8-inch and 1/2-inch inch long cracks were observed.

FX – Several kinks and bends were noted in floor beam members and gusset plates. Locations:

FB 5; span 5 at G 2; L4 gusset plate – bow.

FB 2; span 5 at G 2; L4 gusset plate – bow.

FB 7; span 5; adjacent to G 2 – 3/8-inch kink in the U3 gusset plate under stringer 3 and approximately 1/8-inch bow in the L4 gusset plate.

FB 4; span 6 center gusset plate kinked.

FB 13; span 6 at L0L1 – exhibits 2 minor kinks.

FB 1; span 7 at stringer 3 – bottom flange of the upper chord is twisted to the east. The upper gusset plate under stringer 3 is kinked 1/2 inch on the vertical edges and 1/2 inch on the bottom horizontal edge. Vertical stiffeners are out of alignment. The center gusset plate is kinked 1/4 inch to the west.

FB 2; 5 and 8 in span 7 at stringer 3 – a 1/4-inch kink in the bottom horizontal face of the gusset plate and rotated up to 1/2 inch to the west.

Poor weld quality exist between the north vertical stiffener under stringer 3 and FB 2 bottom flange.

FX – U3L2 of FB 2 in span 6 has several shallow gouges up to 3/8 inch deep in the bottom flange. No cracks were noted.

FB 4; span 6 exhibits two mis-drilled holes in the bottom flange under stringer 3.

Oversized holes exist randomly throughout the FBs.

FB 6 top flange in span 6 exhibits a 14-inch by 1-inch corrosion hole with adjacent knife edging.

Several floor beams exhibit surface corrosion along top flange with evidence of deck pumping due to splash marks on underside of the deck.

The FBs have corrosion on flanges and up to 1/8 inch pitting on bottom face of the top flange.

PX - LLB diagonal at G 2; east of FB 7; span 5 has a 4 1/4-inch long crack in the weld between the bottom angle and LLB gusset plate.

PX – LLB diagonal at G 2; east face of FB 12; span 6 has a 5 3/4-inch long crack in the weld between the bottom angle and LLB gusset plate.

PX – LLB hanger rods are severed in several locations. Other locations LLB connection brackets to the stringers are missing. Oscillation of the LLB can cause fatigue cracks in the gusset plate weld to the web of the girders.

FX – Previous recommended repairs for LLB welded angles were performed prior to the 2014 OS inspection.

Span 6; LLB has up to 1 inch of pack rust between the gusset plate and the floor beam causing the bracing to rotate.

A 5-inch by 2-inch corrosion hole exists through LLB gusset plate at the edge of the FB 6 stiffener to G 1; span 7.

Many hanger rod connections were replaced. In many locations the bolted assembly is not tight.

The hanger rod connection clamp has slid along the stringer bottom flange at several locations in spans 5 and 6.



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331 / 1	Re Conc Bridge Railing	ft	3,856.00	100%	3,856.00	0%	0.00	0%	0.00	0%	0.00	
<p>The steel bridge railing has recently been painted and the concrete bridge railing has recently been skim coated. Isolated areas of the concrete rail exhibit minor cracking.</p> <p>Minor debris exists along the toe of both the north and south barriers.</p> <p>The curbs exhibit active vertical cracks and small spalls with exposed reinforcing due to insufficient cover.</p> <p>Tapered concrete curbs have been installed at both approaches to address blunt impact potential.</p>												
859 / 1	Soffit	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00	
<p>FX – Isolated spalls typically 4 to 6 square feet and up to 3/4 inch deep with exposed reinforcing steel exist on the soffit. These spalls are not currently problematic.</p> <p>FX – Shallow spalls are common along the top flanges of girders, floor beams, and stringers. Isolated locations have larger spalls up to 1-foot-wide with exposed corroding reinforcing steel. This spalling is most likely due to pack rust between the superstructure and the deck. Isolated areas of the deck have lifted from the top flange of the girders or floor beams due to pack rust.</p> <p>Multiple 1/4-inch-wide cracks exist along the stringer deck haunch at locations in span 6 where stringers are not continuous over floor beam members.</p> <p>The deck soffit exhibits random transverse cracking with efflorescence throughout. The cracking is heaviest within 3 floor beams/diaphragms of the piers and is typically spaced at 5 feet. The cracks are due to flexure in the negative moment region over the piers. Shrinkage and hairline map cracking is common throughout.</p> <p>Bird nesting along soffit adjacent to girder top flanges is typical; this is heaviest in the main spans.</p> <p>Many scuppers in the main spans are filled with foam padding. It appears this foam was temporarily installed during the recent deck overlay installation and was not removed at all locations.</p>												
865 / 1	St.Open Gird End(5Ft)	(LF)	180.00	78%	140.00	22%	40.00	0%	0.00	0%	0.00	
<p>Active corrosion was noted at the girder horizontal web splices at the bearing stiffeners over piers 5 and 6.</p> <p>Pack rust and section loss up to 3/16-inch deep exists in the girder top flanges at several of the deck joints.</p>												
870 / 1	Concrete Wingwall	(EA)	4.00	100%	4.00	0%	0.00	0%	0.00	0%	0.00	
<p>No significant deficiencies.</p>												
872 / 1	St.Gird Und Const.Jt	(LF)	1,236.00	74%	920.00	8%	100.00	18%	216.00	0%	0.00	
<p>Pack rust and laminating corrosion has reactivated beneath joints.</p>												
877 / 1	St. Stringer End(5Ft)	(LF)	30.00	100%	30.00	0%	0.00	0%	0.00	0%	0.00	
<p>A portion of stringer 3, at floor beam 0, span 7 has been removed and replaced with a welded steel section due to previous corrosion holes.</p>												
879 / 1	St.Strng.Un Const.Jt	(LF)	300.00	100%	300.00	0%	0.00	0%	0.00	0%	0.00	
<p>Isolated areas of surface corrosion.</p>												
906 / 1	Sealed Exp.Jt.(SEJ-3	(LF)	105.00	0%	0.00	100%	105.00	0%	0.00	0%	0.00	
<p>The anchor bolts on the underside of the pier 10 joint armor have sheared off.</p> <p>The sealed expansion joints at the west abutment, and over piers 10 and 14 are newly installed and have moderate debris impactation. Sealed expansion joints are all nearly closed.</p>												
907 / 1	St.Finger Jt. (SED-2	(LF)	70.00	0%	0.00	50%	35.00	50%	35.00	0%	0.00	
<p>FX – The pier 4 finger joint exhibits moderate debris impactation along with a slight vertical offset of 1/8 to 3/8 inch higher from the west assembly to the east assembly. Five feet of the pier 4 finger joint has been replaced with a welded steel plate.</p> <p>FX - The pier 7 finger joint exhibits moderate debris impactation along with a slight vertical offset of 1/8-inch.</p>												
909 / 1	Pourable Fix Jt.Seal	(LF)	1,890.00	8%	150.00	55%	1,040.00	37%	700.00	0%	0.00	
<p>PX – The poured fixed joint seals at the abutments exhibits minor to moderate debris impactation, debonded seals, and a few shallow spalls and patches to the headers.</p> <p>Poured seal deck control joints are typically spaced at 18 feet in the approach spans and at 50 to 75 feet in the main spans. Joint seals exhibit areas of failure and the joint headers exhibit cracking and/or spalling up to 2 feet long and 2 inches wide, some with exposed reinforcement.</p>												
916 / 1	St.Bearing Assembly	(LF)	12.00	100%	12.00	0%	0.00	0%	0.00	0%	0.00	
<p>Previous rocker bearings for span 4 at pier 4, span 8 at pier 7; and span 11 at pier 10 have been replaced with elastomeric bearings</p>												
956 / 1	St. Cracking/Fatigue	(SF)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00	

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Fracture Critical twin girder spans exist in spans 5 through 7 and have the following comments:  
Cracks were observed at the ends of the horizontal web splice at the following locations:  
PX – Span 5; G 1 at the field splice near FB 5 – This crack is 5/8 inch long and has no arrestor hole.  
FX – Span 5; G 2 at the field splice near FB 5 – A 3/8-inch long likely paint crack.  
FX – Span 6; G 1 at the field splice near FB 3 – A 3/4-inch long crack has been arrested with two drilled hole retrofits.  
FX – Span 6; G 2 near FB 11 – 3/16 inch long vertical crack in the lower web plate.  
FX – Span 7; G 1 at the field splice near FB 4 – Paint cracks exists in the girder web at the toe of the longitudinal stiffener.  
FX – Span 7; G 2 at the field splice near FB 4 – Two vertical cracks arrested with drilled hole retrofits.  
PX – Span 6; G 2 exterior, at midspan, the welded detail for the previous navigation light conduit is missing a section and the remaining circumference is cracked.

Cracks were previously observed at the longitudinal stiffener butt welds on the exterior faces of the twin girders at the following locations:  
Span 5; G 1 between FB 4 and 5. A paint crack has formed along the girder web.  
Span 6; G 1 near FB 6  
Span 6; G 1 near FB 7  
Span 6; G 1 near FB 9  
Span 6; G 2 near FB 9  
Span 7; G 2 between FB 7 and 8  
The cracks have been retrofitted by drilling a 4-inch diameter hole adjacent to the girder web to prevent propagation into the girder web.

Multi girder spans exist in spans 1 through 4 and 8 through 15 and have the following comments:  
PX – A 1 3/4-inch long crack was observed in the vertical fillet weld to the exterior face of the web of G 1; span 15; at pier 14 at the bottom flange. A 19-inch long paint crack extends from this crack in the vertical fillet weld.  
FX – Isolated CF top struts exhibit cracked welds between the CF and gusset plate due to pack rust. The following locations exhibited cracks:  
CF at pier 1; connection to G 3 – 5 3/8-inch long crack in the bottom weld.  
CF at pier 3; connection to G 4 – 1/4-inch long crack in the top weld.  
CF at pier 4; span 4 connection to girder 1 – 1/4-inch long crack in the top weld and a broken weld at the bottom weld connection for the top strut.  
CF at pier 12; connection to G 2 – crack full length of the gusset plate.

FX – Span 5; stringer 3 at floor beam 3 has a crack 3 inches long in the weld on the bottom side of the connection angle.  
FX – Span 7; stringer 3 at floor beam 0 has a crack 1 inch long in the weld on the bottom side of the connection angle.

The FBs in spans 5 through 7 act as trusses.  
PX – FB 0; span 6 at G 2 is cracked for the full width of horizontal weld along bottom of truss FB gusset plate. The vertical weld is cracked full height. The gusset plate has been reinforced with a welded strut which is bowed 3/16-inch.  
PX – Span 5; west face of FB 6 at G 1; weld for the web connection plate has a crack 4 1/2 inches.

PX - LLB diagonal at G 2; east of FB 7; span 5 has a 4 1/4-inch long crack in the weld between the bottom angle and LLB gusset plate.  
PX – LLB diagonal at G 2; east face of FB 12; span 6 has a 5 3/4-inch long crack in the weld between the bottom angle and LLB gusset plate.

<b>957 / 1</b>	Pack Rust Smart Flag	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
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FX – Pack rust up to 5/16 inch thick exists at isolated locations at the bottom flange splice plates.  
Heavy laminating corrosion was noted at the girder horizontal web splices at the bearing stiffeners over piers 5 and 6. G 2 over pier 6 also has up to 50% section loss to 4 of 6 bolts.  
Pack rust and section loss up to 3/16 inch deep exists in the girder top flanges at several of the deck joints.

Multi girder spans exist in spans 1 through 4 and 8 through 15 and have the following comments:  
FX – Pack rust up to 1 1/4 inches thick is typical between the girder CF members and vertical web stiffeners. Minor to moderate pitting and distortion to the gusset plate is also present at these locations.

Span 6; LLB has up to 1 inch of pack rust between the gusset plate and the floor beam causing the bracing to rotate.

<b>958 / 1</b>	Concrete Cracking SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
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Longitudinal cracks exist along the deck surface; mostly in the wheel lines.  
Transverse cracks exist on the surface randomly along the full length of the bridge. Cracks are widest and most prominent in the twin girder spans.  
Multiple 1/4-inch wide cracks exist along the stringer deck haunch at locations in span 6 where stringers are not continuous over floor beam members.  
The deck soffit exhibits random transverse cracking with efflorescence throughout. The cracking is heaviest within 3 floor beams/diaphragms of the piers and is typically spaced at 5 feet.  
Shrinkage and hairline map cracking is common throughout.

<b>960 / 1</b>	Settlement SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
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FX – Both abutments appear to be moving towards the channel. Abutments are supported on vertical piles which are susceptible to movement from soil pressure acting behind the abutments. The west abutment the transverse measurement between the abutment backwall and the girder flanges are 1-inch at the top flange (previously 5 3/4 inches) and 3 1/4 inches at the bottom flange (previously 8 1/8 inches). The east abutment backwall is rotated 1 7/8 inches over a 4-foot vertical distance. This movement most likely is responsible for the excessive bearing rotations observed at piers 4, 7, and 10.

<b>963 / 1</b>	Steel Section Loss SF	(EA)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00
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FX – Painted over pitting was observed in the web of the girders adjacent to the top of lower lateral bracing gusset plates.  
 FB 6 top flange in span 6 exhibits a 14-inch by 1-inch corrosion hole with adjacent knife edging.  
 A 5-inch by 2-inch corrosion hole exists through LLB gusset plate at the edge of the FB 6 stiffener to G 1; span 7.

<b>969 / 1</b>	OutOfPlane Dist./Load	(EA)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00
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FX – A global bow up to 1/2 inch exists in the web of G 1; span 7 between FB 3 and 4 at the field splice.

FX – Several kinks and bends were noted in floor beam members and gusset plates. Locations:  
 FB 5; span 5 at G 2; L4 gusset plate – bow.  
 FB 2; span 5 at G 2; L4 gusset plate – bow.  
 FB 7; span 5; adjacent to G 2 – 3/8-inch kink in the U3 gusset plate under stringer 3 and approximately 1/8-inch bow in the L4 gusset plate.  
 FB 4; span 6 center gusset plate kinked.  
 FB 13; span 6 at L0L1 – exhibits 2 minor kinks.  
 FB 1; span 7 at stringer 3 – bottom flange of the upper chord is twisted to the east. The upper gusset plate under stringer 3 is kinked 1/2 inch on the vertical edges and 1/2 inch on the bottom horizontal edge. Vertical stiffeners are out of alignment. The center gusset plate is kinked 1/4 inch to the west.  
 FB 2; 5 and 8 in span 7 at stringer 3 – a 1/4-inch kink in the bottom horizontal face of the gusset plate and rotated up to 1/2 inch to the west.  
 Poor weld quality exist between the north vertical stiffener under stringer 3 and FB 2 bottom flange.  
 Span 6; LLB has up to 1 inch of pack rust between the gusset plate and the floor beam causing the bracing to rotate.