

Other Special Bridge Inspection Report

NBI Bridge No.: 04085

Route U.S. 281 over S. CANADIAN RIVER
Canadian County



Prepared for:

Oklahoma Department of Transportation

Field Division 04

Inspection Date:

4/11/2018



Report Prepared By:

BURGESS & NIPLE, INC.

5085 Reed Rd.
Columbus, Ohio 43220
614-459-2050

BURGESS & NIPLE
Engineers ■ Surveyors ■ Planners

Oklahoma Dept. of Transportation - Bridge Inspection Report

NBI No.: 040850000000000		Structure No.: 0902 0000 X		Local ID: -1		Suff. Rating: 21.10	
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IDENTIFICATION				INSPECTION																																	
Bridge Description: 38-100' PONY TRUSS & 2-36' I-BM. SPANS(BRIDGEPORT BR.)				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Type</th> <th>Insp. Req.</th> <th>Insp. Done</th> <th>Freq.</th> <th>Insp. Date</th> <th>Next Insp.</th> </tr> <tr> <td>NBI:</td> <td></td> <td>0</td> <td>12 months</td> <td>10/5/2017</td> <td>10/5/2018</td> </tr> <tr> <td>FC:</td> <td>Y</td> <td>0</td> <td>12 months</td> <td>10/5/2017</td> <td>10/5/2018</td> </tr> <tr> <td>UW:</td> <td>N</td> <td>0</td> <td></td> <td>NA</td> <td>NA</td> </tr> <tr> <td>OS:</td> <td>Y</td> <td>1</td> <td>12 months</td> <td>4/11/2018</td> <td>4/11/2019</td> </tr> </table>				Type	Insp. Req.	Insp. Done	Freq.	Insp. Date	Next Insp.	NBI:		0	12 months	10/5/2017	10/5/2018	FC:	Y	0	12 months	10/5/2017	10/5/2018	UW:	N	0		NA	NA	OS:	Y	1	12 months	4/11/2018	4/11/2019
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1. State: 40 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: 2 U.S. Hwy 5c. Lvl of Srvc: 1 Mainline 5d. Route No.: 00281 5e. Dir. Sufx: 0 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																																	
STRUCTURE TYPE AND MATERIALS				CLASSIFICATION																																	
43a/b. Main Span: 3 Steel / 10 Truss-Thru 44a/b. Appr. Span: 3 Steel / Stringer/Girder 45. # of Main Spans: 38 46. # of Appr. Spans: 2 107. Deck Type: 1 Concrete-Cast-in-Place 108a. Wearing Surface: 6 Bituminous 108b. Membrane: 8 Unknown 108c. Deck protection: 8 Unknown				12. Base Hwy Net.: On Base Network 20. Toll Facility: 3 On free road 21. Custodian: State 22. Owner: State 26. Function Class: 06 Rural Minor Arter 37. Historical Sig.: 2 Br eligible for NRHP 100. Def. Hwy: 0 Not a STRAHNET hwy 101. Parallel Str.: No bridge exists 102. Traffic Dir.: 2 2-way traffic 103. Temp. Str.: Not Applicable (P) 104. Hwy System: 0 Not on NHS 105. Fed Land Hwy: 0 N/A (NBI) 110. Defense Hwy: 0 Not a STRAHNE 112. NBIS Length: Long Enough																																	
AGE AND SERVICE				CONDITION																																	
19. Detour Length: 11.8 mi 27. Year Built: 1933 28a/b. Lanes on/un: 2 / 0 29. ADT: 1,100 30. Year of ADT: 2016 42a/b. Type of Svc on/un: 1 Highway / 5 Waterway				58. Deck: 5 Fair 62. Culvert: N N/A (NBI) Flowline Notes OCT-2017: 29.7' TOC at L4, west truss, span 10 OCT-2016: 27.3' TOC at L3, west truss, span 6 59. Sup.: 4 Poor 71. Chan./Chan. Prot.: 5 Bank Prot Eroded 60. Sub: 5 Fair																																	
GEOMETRIC DATA				LOAD RATING AND POSTI																																	
10. Vert. Clearance: 99.99 ft 32. Appr Rwy Width: 30.00 ft 33. Median: 0 No median 34. Skew: 0.00° 35. Struct. Flared: 0 No flare 47. Horizontal Clr: 24.00 ft 48. Length Max Span: 100.07 ft 49. Struct. Length: 3,937.01 ft				31. Design Load: 2 M 13.5 (H 15) 41. Post. Status: P Posted for load 63. Op / 65. Inv. Rating Meth.: 1 LF Load Factor / 1 LF Load Factor 64. Operating Rating (tons) (H/HS/3-3): <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>16.50</td></tr> <tr><td>15.00</td></tr> </table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>16.56</td></tr> <tr><td>15.06</td></tr> </table> <table border="1" style="display: inline-table;"> <tr><td>16.53</td></tr> <tr><td>37.70</td></tr> </table> 66. Inventory Rating (tons) (H/HS/3-3): 70. Posting: 2 20.0-29.9% below				16.50	15.00	16.56	15.06	16.53	37.70																								
16.50																																					
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37.70																																					
OKLAHOMA ITEMS				APPRAISAL																																	
200c. Temperature: 75 200d. Weather: Clear 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 Foundation: Bears on Natural Found. 209. Type of Pier/Found.: 2 / Yes No Piling/Drilled Shaft 210. Foundation Elev.: <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>-1.00</td></tr> <tr><td>-1.00</td></tr> </table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>-1.00</td></tr> <tr><td>-1.00</td></tr> </table> 211. Wear.Surf.Prot.Sys: None Date Installed: 01/01/1901 213. Utilities Attached:				-1.00	-1.00	-1.00	-1.00	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.: N Not applicab 71. Waterway Adeq.: 5 Above Tolerable 72. Appr. Alignment: 6 Equal Min Criteri 113. Scour Critical: 7 Countermeasures PROPOSED IMPROVEMEN 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 Capacit 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. Vertical Clearance: 0.0 ft 40. Horizontal Clearance: 0.0 ft 111. Pier Protect.: 1 Not Required 116. Lift Bridge Vert. Clr.: 0.0 ft																													
-1.00																																					
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214a. Posted Weight Limit: 151515 b. Posted Speed Limit: c. Narrow/1way Bridge 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 Syst N/A 226. Date Painted: 1933 227. Paint Color: Silver 233. Deck Forming: 238. School Bus Rte.: Current & Desired rou 240. Appr. Rwy Type.: Concrete 243. Grdr Spacing/No.: /				244. Span Lengths: 245. Girder Depth: 48.00 246a. Type of Overlay: AC Overlay b. Overlay Thickness: 3.00 c. Overlay Date: 12/04/2003 d. Ovlly Depth Changed >1": - 247. Protective Systems <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table> 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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040850000000000	0902 0000 X	-1	21.10

Inspection Date: 4/11/18 Reported By: Brendan Prendeville

Invoice No.: Inspected With: -1

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NBI No.:
04085000000000

Structure No.:
0902 0000 X

Local ID:
-1

Suff. Rating:
21.10

ELEMENT CONDITION STATE DATA

Elem. / En	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.											
107 / 1	Steel Opn Girder/Beam	ft	259.00	67%	174.00	33%	85.00	0%	0.00	0%	0.00
FX – The connection angles for the beams to pier beam 39 are deformed due to the apparent approach pavement growth and pier beam sweep. The beams are still supported by the original pier beams at piers 1 and 39; however, the added pier beam will support the beams should the connection angles fail.											
113 / 1	Steel Stringer	ft	9,501.00	0%	0.00	65%	6,175.60	35%	3,325.40	0%	0.00
PX – Cracks were observed in the web of numerous stringers at the top flange cope and stringer connection angles. Numerous broken rivets were observed at the connection angles. Section loss exists through the exterior stringers at the end floor beams at numerous locations.											
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 west U1U2 [^] span 31 and west U1L1 span 37. FX– Span 37 [^] west U1 gusset plate – 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.											
152 / 1	Steel Floor Beam	ft	6,155.00	0%	0.00	62%	3,816.10	38%	2,338.90	0%	0.00
PX – Active section loss with corrosion holes is common on the floor beams under the expansion joints; FX – Cracks were observed in the web of the end floor beams and intermediate floor beams in many locations.											
162 / 1	Stl Gus Plate	each	1,672.00	0%	0.00	45%	760.00	55%	912.00	0%	0.00
PX- Numerous horizontal cracks were observed in the inboard truss gusset plates above the bearings [^] see report for locations and crack lengths; FX-LC inboard gusset plates typically bowed at L0 and L5 due to pack rust.											
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 7 [^] 9 [^] 15 [^] 25 [^] 27 [^] and 31; The poured joint seals typically are deteriorated and show evidence of leaking. Many of the poured seals were never installed at many of the hrepaired header locations [^] leaving only the form board to fill the joint.											
310 / 1	Elastomeric Bearing	each	4.00	50%	2.00	0%	0.00	50%	2.00	0%	0.00
PX – Elastomeric pads are missing at the supplemental pier beams under beams 1 through 4 at pier 1 and at beams 2 and 3 at pier 39 with heavy pack rust forming at beam 5 [^] pier 1. The pads appear to be walking at pier 39 under beams 4 and 5.											
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 widespread on and between the bearing components.											
313 / 1	Fixed Bearing	each	84.00	0%	0.00	100%	84.00	0%	0.00	0%	0.00
Surface corrosion exists the 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.											
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. The deck growing in each span causing rotation/sweep in floor beams..											
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.											
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.											
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- Cracks were observed in the web of numerous stringers at the top flange cope [^] see FC report for locations; Cracks in the stringer connection angles were observed at numerous locations at the end floor beams [^] see FC report for locations; Severe section loss with corrosion holes exists through exterior stringer webs.											
909 / 1	Pourable Fix Jt.Seal	(LF)	495.40	0%	0.00	0%	0.00	50%	247.70	50%	247.70
The poured seal joints typically are deteriorated and show evidence of leaking..											
956 / 1	St. Cracking/Fatigue	(SF)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
PX- Numerous cracks exist in the stringer copes [^] stringer connection angles [^] end floor beams [^] and interior floor beams. See FC report.											
957 / 1	Pack Rust Smart Flag	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
PX – Pack rust is common at the end post connection to the inboard gusset plate at the lower chord connection; FX – Pack rust is forming at many of the bridge railing to inboard end post channel connections.											

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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
PX-Collision damage to end posts^ upper chord^ verticals and diagonals at numerous locations.											
963 / 1	Steel Section Loss SF	(EA)	1.00	0%	0.00	0%	0.00	100%	1.00	0%	0.00
PX- Corrosion holes through stringer webs^ floor beam webs at numerous locations; 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
Accumulations of drift exists under spans 5 through 10. Heaviest accumulations at piers 7 and 10.											
969 / 1	OutOfPlane Dist./Load	(EA)	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00
PX – 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^ sheared rivets on stringers and anchor bolts missing for bearings.											

BRIDGE NOTES:

(38) 100-foot long riveted pony trusses with (2) 36-foot long steel beam approach spans.

OS Inspection Items: See tables in 2017-10-05 FC report appendix 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; 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.

Posted 15 tons due to extensive deterioration to bridge.

INSPECTION NOTES: 4/11/18

PX – Strengthen stringer webs in several spans; Reinforce/replace the damaged concrete bridge railing in spans 1 and 40; Seal cracks in wearing surface and approach pavement; Remove debris from along the curbs; Remove loose concrete and patch the joint headers; Reseal the expansion joints; Install elastomeric pads or steel shims at missing locations on the supplemental pier beams over piers 1 and 39; Monitor cracks in stringer and floor beam webs. Drill crack tips that grow significantly; Repair cracks in stringer connection angles; Repair section loss in stringer and floor beam webs where corrosion holes and/or heavy section loss exists; Replace sheared rivets in the vertical connection, upper chord, and end post with bolts near west U1 in spans 31 and 37; Remove pack rust and apply caulking and paint along vertical edges of end gusset plates to arrest/mitigate ongoing edge bowing; Clean and paint steel below deck within 5 feet of the joints; Add rip rap around the piers in spans 10 and 11 in the main channel to arrest/mitigate the ongoing scour; Install full depth pressure relief joints on both approaches to mitigate ongoing effects of pavement pressure.

FX – Monitor: 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; Pack rust and section loss in truss members; Spalls and corroding reinforcing steel in soffit; Lower chord gusset plates over bearings for development of horizontal cracks; Cracks at FB copes and stringer connections; Fatigue prone strich welds of angle strengthening at FB 0, span 2; Corrosion holes in floor bracing system; Plug welds in diagonals of spans 1 and 2 near railing connections; Bowed members near locations of collision damage; Bowed gusset plates near bearings; Bullet strike damage to east truss, span 4; Cracking/spalling at east column capital, pier 3 for condition which would undermine bearing; Expansion bearing pins for signs of additional wear or distress.

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Photograph 1 - Looking north at the bridge end view.

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Photograph 2 - Looking southwest at the bridge elevation.

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Photograph 3 - Looking south at the 15-ton load posting sign in the north approach.

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Photograph 4 - Looking north at the 15-ton load posting sign in the south approach.

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Photograph 5 - Looking northwest at the damaged east bridge rail in span 1. Note: bottom rail damaged and hanging from reinforcing steel to post connection.

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Photograph 6 - Looking south at asphalt in NB lane in span 11 Note: 6-inch diameter pothole that extends through entire asphalt layer. Similar potholes up to 2 square feet with large unsealed transverse and longitudinal cracks exist throughout bridge.

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Photograph 7 - Looking east along the joint over pier 13. Note: heavy spalls and cracking has removed large sections of elastomeric joint header exposing bare concrete deck underneath. Joint material has failed and is absent for almost entire joint length.

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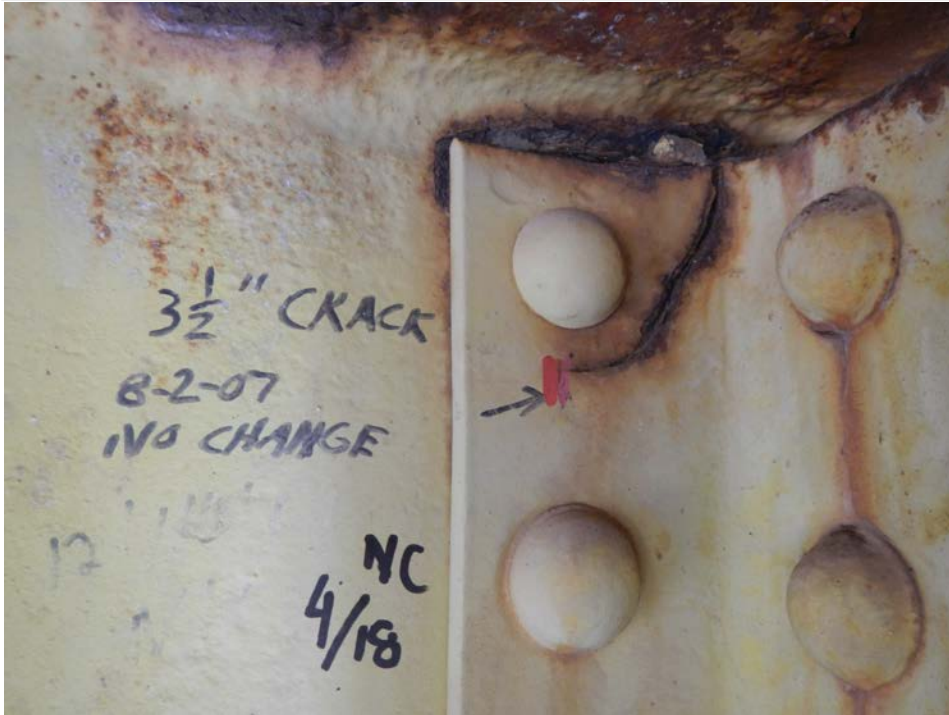
Photograph 8 - Looking east at stringer 5 connection to floor beam 0, span 21. Note: no change to previously noted 7/8-inch long crack.

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Photograph 9 - Looking east at the west face of stringer 1, south of floor beam 1, in span 27. Note: 1-inch long crack in stringer cope grew 1/4 inch and is now 1 1/4 inches long.

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Photograph 10 - Looking northeast at the connection angle at the west face of stringer 5, south of floor beam 5, span 34. Note: 3 1/2-inch long crack has not grown since last inspection.

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Photograph 11 - Looking southeast at east face stringer 5 at floor beam 33, span 33. Note: east face of stringer exhibits severe section loss to connection angles and rivets. Top flange also exhibits corrosion holes near end of stringer.

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Photograph 12 - Looking east at stringer 5 connection to floor beam 0, span 36. Note: no change to previously noted corrosion in top cope of web with 1 3/4-inch long vertical crack.

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Photograph 13 - Looking northwest at stringer 4, connection to floor beam 5, span 25. Note: no change to previously noted missing rivet head on east connection angle.

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Photograph 14 - Looking southwest along floor beam 0 bottom flange of span 2. Note: angle stitch welded to north face of the floor beam.

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Photograph 15 - Looking south at floor beam 0, span 11. Note: 29 1/2-inch long (1/2-inch growth) crack with slight offset and a 6-inch by 1 1/2-inch corrosion hole below stringer 3.

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Photograph 16 - Looking south at floor beam 0, span 6. Note: 7 1/4-inch long crack along the base of the web below stringer 3 (new).

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 17 - Looking northeast along the supplemental pier beam at pier 1. Note: elastomeric bearing pads missing below beam 2. Similar at beams 1, 3, and 4.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 18 - Looking east at pier 1 pier beams. Note: pier beam has been sistered due to excessive sweep to original pier beam for span 1.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 19 - Looking southwest at the west U1 inboard gusset plate in span 37. Note. 5/16-inch crack in gusset plate and slight bowing in gusset plate due to collision damage. 2 sheared rivets at L1U1 connection

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 20 - Looking southwest at east L0, span 2. Note: no change to previously noted 17 5/8-inch long crack in gusset plate.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 21 - Looking southeast along the inboard face of east U1L0, span 39. Note: top flange is bent downward approximately 2 inches out of plane from previous collision damage.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 22 - Looking northeast at east capital of pier 3. Note: spalling and cracking at bearings. No undermining present.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 23 - Looking northeast at pier 10 west column. Note: debris accumulated around the west column of pier 10 in the main channel. Local scour has exposed the top of the shafts. Similar debris at pier 9.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/11/2018



Photograph 24 - Looking southeast at pier 5. Note: drift and local scour around west column. Local scour is 30 inches below top of cassion.

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2018 OS Comment
2	0	North	5	1 1/2 vertical, 1 horizontal	
2	2	South	1	3/8	
2	4	South	1	1/8	
2	5	South	1	1/2	
3	0	North	1	1 1/4	
3	0	North	5	1/2	
3	5	South	1	3/8	
4	0	North	1	5/8	
4	2	South	5	1/4	Overcut
4	5	South	5	1 1/4	Crack arrested by drilled hole, 2007
5	0	North	5	1/2	
6	2	North	1	1/8	
6	3	North	1	1/4	
6	3	North	1	1/8	
7	0	North	5	2 1/4	
7	5	South	5	3/4	Adjacent 50% section loss to the web 3 inches high
8	4	North	5	1 1/4, 7/8 (exterior), 1 1/4, 1 1/4 (interior)	
8	5	South	1	1 3/8	
9	1	North	1	1/4	
9	3	North	1	3/8	
9	3	South	1	3/8	
9	4	North	1	3/8	
10	0	North	1	5/8	
10	1	South	2	3/4	
10	2	North	1	5/8	
10	5	South	5	1	
11	0	North	5	9/16	
11	0	North	1	3/4	
12	5	South	1	1 1/2, 1 1/2	
13	5	South	5	5/8	
14	5	South	1	1 1/4	
15	0	North	1	3/8	
16	1	South	5	1 5/8	Grown 1/4-inch to 1 5/8-inch
16	4	North	5	3/8	
17	0	North	5	1 3/8	
18	0	North	1	7/8	

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2018 OS Comment
18	2	South	1	3/8	
18	2	North	1	1/4	
19	0	North	5	1/2	
19	5	South	1	3/4	
19	5	South	5	1 1/4	
20	0	North	1	5/8	
20	1	North	5	1/8	
20	2	North	1	3/8	
20	2	South	1	3/4	
20	4	North	5	1/8	
20	4	North	1	3/16	
21	0	North	5	7/8	photo 8
21	3	North	1	1/8	
21	4	South	1	1/8	
23	0	North	5	1/4	
23	1	South	5	3/16	
25	0	North	5	3/4	
25	2	South	1	1/4	
26	3	North	1	3/16	
26	5	South	1	2 1/2	
27	1	North	1	1/2 & 1 1 1/16	1-inch crack grew to 1 1/16-inch, no change to 1/2-inch crack.
27	1	South	1	1 1/4	Grew 1/4-inch and is now 1 1/4-inch (photo 9)
27	1	South	5	1/4	
27	2	South	1	3/16	
28	1	North	1	3/16	
28	2	North	1	5/8	
28	2	South	1	1/4	
28	3	North	5	3/8	
28	5	South	1	5/8	
29	4	South	5	1 1/2	Now 1 1/2 inches.
30	1	South	5	1/2	
30	4	North	5	1/2	
31	1	North	1	1/4	
31	2	North	1	1/4	
32	2	South	1	1/4	
32	0	North	5	5/8	
32	4	North	1	1/8	
32	5	South	1	1/4	
33	2	South	1	1/8	

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2018 OS Comment
33	3	South	1	1/4	
33	5	South	1	2	
34	1	South	1	1/4	
34	2	South	1	5/16	
34	5	South	1	1/2	Only one 1/2-inch crack (NC) in stringer cope, east face of stringer. Remove additional crack
35	0	North	1	1/2	
35	4	South	1	1/8	
36	0	North	1	1/2	
36	1	North	1	3/8	
36	2	South	1	3/4	
36	4	North	1	1/8	
36	5	South	1	2 1/4	
37	3	North	1	1/4	
37	0	North	5	1/2	
38	2	North	1	3/4	
38	2	South	1	5/8	
38	5	South	1	1/2	
39	1	North	1	1/8	
39	1	South	1	1/2	
39	3	South	1	3/8	

Appendix B: Stringer Connection Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Stringer Face	Length (in.)	2018 OS Comment
2	0	North	2	West	3 1/4	
3	5	South	4	West	2 1/2	
4	0	North	2	West	2 3/4	
5	5	South	3	East	3 1/4	
8	0	North	3	West	3 1/2	
9	5	South	3	East	2 1/4	2 1/4 inches (7/8-inch growth)
9	5	South	3	West	3 5/8	
10	0	North	3	West	3	
12	0	North	2	East	3	
13	5	South	4	West	4	
15	5	South	4	West	3 7/8	
17	5	South	4	East	4 1/2	
18	0	North	3	East	2 3/4	
18	0	North	4	East	2 3/4	
22	0	North	1	East	3 3/4	
22	0	North	3	East	3 7/8	
22	0	North	4	East	2 3/4	
23	5	South	4	West	3 1/2	
24	0	North	2	West	2 3/4	
24	0	North	3	East	4	
24	0	North	3	West	4	
24	0	North	4	East	3 1/4	
25	5	South	2	West	3 1/4	
25	5	South	3	West	4 3/4	
25	5	South	3	East	1 1/4	
25	5	South	4	West	3 5/8	
25	5	South	5	West	5 1/2	
26	0	North	2	East	2 7/8	
26	0	North	2	West	3 1/4	
26	0	North	3	East	5 3/8	
26	0	North	3	West	2 5/8	
26	0	North	4	East	3 1/2	
27	5	South	3	East	2 1/2	
27	5	South	3	West	3 3/4	
27	5	South	4	West	4 1/4	
28	0	North	2	East	4 1/4	
28	0	North	3	East	3 7/8	
29	5	South	3	West	4	
29	5	South	4	East	1 1/2	
29	5	South	4	West	2 1/8	
30	0	North	2	East	5 5/8	
30	0	North	3	East	4 5/8	

Appendix B: Stringer Connection Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Stringer Face	Length (in.)	2018 OS Comment
30	0	North	4	East	3 3/4	
31	5	South	4	East	3 3/4	
31	5	South	4	West	6 1/8	
33	5	South	3	West	4	
33	5	South	4	West	7	
34	0	North	2	East	3 1/2	
34	0	North	2	West	2	
34	0	North	3	West	2 1/4	
34	5	South	5	West	3 1/2	photo 10
35	5	South	2	West	1 1/4	
35	5	South	3	West	4 1/4	
35	5	South	4	West	4	
36	0	North	2	West	3	
36	0	North	3	West	2	
36	0	North	4	East	4 1/8	
38	0	North	2	West	2 1/8	
38	0	North	3	West	2 1/2	
39	5	South	4	West	4 5/8	

Appendix C: Missing Stringer Rivets

Span	Floor Beam	Floor Beam Face	Stringer	Number	Previous comments, and 2018 OS Comments
2	0	North	2	1	All shanks still in shear plane unless noted otherwise.
2	0	North	3	2	
4	0	North	2	1	Shanks not in shear plane.
4	1	South	2	1	
4	3	South	3	1	
5	1	North	2	1	
5	1	North	3	1	
5	2	North	2	1	
5	4	South	4	1	
5	5	South	4	1	
6	0	North	2	2	East shank not in shear plane
6	0	North	3	1	Shank not in shear plane.
6	1	North	2	1	
6	2	North	2	2	
7	1	North	2	1	
7	2	North	2	2	
7	2	North	3	1	
7	5	South	3	2	Shanks not in shear plane.
7	5	South	4	2	Shanks not in shear plane.
8	0	North	2	2	Shanks not in shear plane.
8	0	North	3	1	Rivet shank is welded to connection angle, weld has broken away from rivet. Rivet shank no longer in shear plane.
8	1	North	2	1	
9	1	North	2	2	1 missing rivet each connection angle. 2 total
9	4	South	4	1	
9	5	South	4	2	
10	0	North	2	2	
10	0	North	3	1	Shank not in shear plane.
10	1	North	2	2	
10	1	North	3	2	
10	4	South	4	1	
11	1	North	2	1	
11	4	South	4	2	
11	5	South	3	2	Shanks not in shear plane.
11	5	South	4	2	
12	0	North	2	1	
12	0	North	3	2	Shanks not in shear plane.
12	0	North	4	1	
13	2	North	2	2	
14	0	North	2	2	Shanks not in shear plane.
14	1	North	2	1	New missing rivet (2017)
15	5	South	3	2	West shank not in shear plane.
15	5	South	4	1	Shank not in shear plane.
16	0	North	2	2	Shanks not in shear plane.
16	0	North	3	1	
17	5	South	4	1	
18	0	North	2	2	Shanks not in shear plane.
18	0	North	3	1	Shank not in shear plane.
18	4	South	3	1	
20	0	North	1	1	
20	0	North	2	1	
22	0	North	2	2	Shanks not in shear plane.
22	0	North	3	1	Shank not in shear plane.
23	2	North	2	1	
23	4	South	4	1	
24	0	North	2	2	East shank not in shear plane.
24	4	South	4	2	
25	2	North	2	1	New missing rivet (2017)

Appendix C: Missing Stringer Rivets

25	5	South	4	1	Shank not in shear plane (photo 13).
26	0	North	2	1	
28	1	North	2	1	
29	1	North	2	2	
29	2	North	2	1	
30	0	North	3	1	
31	2	North	2	1	New missing rivet (2017)
31	5	South	3	2	
32	0	North	2	2	East rivet shank not in shear plane.
32	0	North	3	1	East rivet shank not in shear plane.
33	1	North	2	1	
33	5	South	3	1	Shank not in shear plane
34	0	North	3	1	Shank not in shear plane
34	1	North	2	1	
34	1	North	3	1	
35	2	North	2	2	
35	4	South	4	1	
35	5	South	3	1	Shank not in shear plane.
35	5	South	4	1	Shank not in shear plane.
36	0	North	2	1	Shank not in shear plane.
36	0	North	3	1	Shank not in shear plane.
36	1	North	2	2	
36	1	North	3	2	
36	4	South	3	1	
36	4	North	3	1	
37	1	North	2	1	
37	2	North	2	1	Shank not in shear plane.
37	5	South	3	2	
37	5	South	4	1	
38	0	North	2	2	East shank not in shear plane.
38	0	North	3	1	East shank not in shear plane.
38	1	North	2	1	
39	5	South	3	1	
39	5	South	4	1	

Appendix D: Stringer Loss

Span	Floor Beam	Floor Beam Face	Stringer	Description
2	0	North	1	3/4" diameter with 1/4" crack and 3" high knife edge loss below hole
4	0	North	5	1 1/4-in diameter with with 1/2-in horizontal crack and 5/8-in horizontal crack with 3-in H, 3/16-in remaining below hole
5	5	South	5	1-inch diameter with horizontal crack, 1/2-inch long, and vertical crack, 3/8-inch long
6	0	North	1	1 1/2 " diameter with 1 1/8" vertical crack & 2-in H knife edge loss below hole
6	0	South	5	1 3/8" diameter, 1/2" vertical crack & 3-in H knife edge loss below hole
7	5	South	1	1/2-in diameter, 1/4" crack
9	1	South	5	2 3/8-inch x 1-inch corrosion hole
9	5	South	1	2 7/8"H x 1 1/4"W with 1" vertical crack & 2-in H x 50% web loss below hole
9	5	South	5	1-inch W x 1 1/4-inch H with 1/8-inch crack.
10	0	North	5	1/2-inch diameter hole with 3-inch H x 3/16-inch, 4-inch H x 1/8-inch, and 3-inch H x 1/16-inch pitting extending below the hole, and two cracks above hole, 3/4-inch & 1/2-inch. One crack below hole, 1/2-inch
10	5	South	5	4-inch W x 1 1/8-inch H with 1/2-inch knife edging adjacent in lower web.
11	5	South	1	25% web loss at cope, 3-in H
11	5	South	5	5/8" diameter with 7/8" long crack & knife edge loss below hole, 3-in H
12	0	North	1	1" diameter with 5/16" vertical crack (grew 1/16", 2017).
12	0	North	5	1-1/8-inch H x 5/8-inch W with 3/4-inch vertical crack
12	1	North	5	1-inch H x 3/4-inch W
13	5	South	1	1/4" crack extends below through hole, 1 5/8"H x 1/2"W, & 2-in H knife edge loss below hole
14	0	North	5	1/2-inch diameter hole with 1 3/4-inch vertical crack (1/2-inch growth). 10% average loss full web height.
14	5	South	1	5/16-in diameter & 3-in H knife edge loss below hole
15	1	South	5	1-inch high x 3/4-inch wide corrosion hole has grown.
15	5	South	5	1 1/4" diameter at cope & 2"H x 5"W below connection angle & 3/8" crack below top hole. RECOMMEND STRENGTHENING.
16	0	North	5	No change. RECOMMEND STRENGTHENING.
17	4	North	5	2 1/2-inch x 1-inch with 9/16-inch long crack
17	5	South	1	Two holes: 1 1/2"W x 1/2"H and 1/2"H hole with 3/16" crack
17	5	South	5	2 1/4"H x 1" with 5/8" long crack (grew 1/8", 2017)
18	0	North	5	2 1/4-inch diameter hole with 3/16-inch pitting for 7-inch H
18	5	South	1	2 1/2" long by 5/8" wide. No longer cracked and web below has 25% loss (2017).
19	5	South	1	5/8-in hole with 3/4-in crack
19	5	South	5	7 1/2"W x 4"H in lower web and 3/8" crack from top of hole & 2"H knife edge loss above hole, approx 50% total web loss
20	0	North	5	1 1/4-inch diameter
21	5	South	1	1 1/4-inch W x 1/4-inch H with 1/4-inch vertical crack
21	5	South	5	2 1/2-inch H x 1 1/2-inch W with 4 1/2-inch long crack. RECOMMEND STRENGTHENING
22	0	North	1	2 1/4-in W x 1/2-in H
23	5	South	5	2 3/4"H x 5/8"W
24	0	North	1	1 1/4-inch H x 3/4-inch W with 3/16-inch max loss over 6-inch below hole
24	0	North	5	10 1/2-inch W x 2-inch H with 1/16-1/8-inch remaining full height at edge of connection angle; 1-inch and 3/4-inch diameter corrosion holes in web adjacent to connection angle with multiple holes emanating from lower holes, 1/4-inch max L. RECOMMEND STRENGTHENING
24	5	South	5	1" diameter hole in bottom flange, approx 10-in from end
25	2	North	5	Heavy corrosion on south stringer end, no holes. Typical Heavy corrosion on splice plates. Length of hole has grown 1-inch.
25	5	South	1	2-inch H x 5/8-inch W with 5/8-inch crack

Appendix D: Stringer Loss

25	5	South	5	1/8-inch section loss, full height
26	0	North	1	1/2" diameter with 3/8" crack & 3"H knife edge loss below hole
26	0	North	5	2-inch H x 5/8-inch W
27	5	South	1	3 3/4"H X 1"W with 1/4" vertical crack
29	4	South	5	1/2-inch growth of crack to previously noted 1-inch crack below 5/8-inch diameter corrosion hole.
29	5	South	5	1 1/2-inch H X 1-inch W with two cracks, 1-inch crack extends cope to hole & 1-inch crack below hole. Two new through holes, 1/2-inch and 5/8-inch diameter in lower web
30	0	North	5	1 1/2" x 1 1/2" & 1" vertical crack
31	5	South	5	1 1/2" H x 1" W & 1 1/4" H x 1" W, total web section loss = approx 75%, with new 5" vertical crack. RECOMMEND STRENGTHENING
33	5	South	5	Severe section loss to east connection angle, top 2 rivet heads have near 100% head loss (west connection angle is good) (photo 11)
34	3	South	5	2 3/4-inch H x 1/2-inch W with 1/2-inch crack at bottom of hole
34	4	South	5	1-inch high by 1 1/4-inch wide corrosion hole with 3/4-inch vertical crack at bottom of hole (crack grew 2018). Additional two corrosion holes in lower web, 2-inch wide x 1-inch high and 3/4-inch diameter.
35	5	South	5	6 1/4-in W x 1 3/4-in H
36	0	North	5	2 1/2" H x 1 1/2" W with 1 3/4" vertical crack. Also, 1/4" pitting for 3" H and 1/8" pitting for remaining height. Approx 50% section loss to this location. Heavy rivet head loss on stringer connection rivets on outside face due to laminating corrosion. Additional corrosion holes in lower web, 8" W x 1 1/4"H max. RECOMMEND STRENGTHENING (photo 12).
38	0	North	5	1" diameter hole in stringer cope.
38	5	South	5	1 1/2-inch H x 4 1/2-inch W below connection angle and 1/2-inch cope crack
39	0	North	5	1 1/4-inch H x 1/2-inch W below connection angle
39	1	South	5	1/2-inch H x 1/4-inch wide corrosion hole within 1/2-inch long crack extending below corrosion hole. Also 1/8-inch deep section loss over the full height of the beam.
39	5	South	1	1-inch diameter hole below connection angle with 1/2-inch crack at cope.

Appendix E: Floor Beam Sweep

Span	Floor Beam	Sweep (in.)	Sweep Direction	Stiff Leg Installed	Description
1	pier 1			Yes	Sister pier beam added due to severe sweep (photo 18)
2	0	-	-	Yes	
2	5	-	-	Yes	
3	0	1/2	North	Yes	1/16-inch wide gap on south edge. Can be moved by hand.
3	5	1/4	South	Yes	
4	0	1/4	North	Yes	
4	5	1/4	South	Yes	
5	0	3/4	North	Yes	
5	5	-	-	Yes	
6	0	-	-	Yes	
6	5	1/2	South	Yes	
7	0	1/2	North	Yes	
7	5	-	-	Yes	
8	0	1/4	North	Yes	
8	5	1/2	South	Yes	
9	0	3/8	North	Yes	
9	5	-	-	Yes	
10	0	-	-	Yes	
10	5	1/2	South	Yes	
11	0	5/8	North	Yes	
11	5	-	-	Yes	
12	0	1/4	North	Yes	
12	5	5/8	South	Yes	
13	0	1/2	North	Yes	
13	5	3/16	South	Yes	
14	0	5/8	North	Yes	
14	5	1/2	South	Yes	
15	0	5/8	North	Yes	
15	5	3/16	South	Yes	
16	0	3/16	North	Yes	
16	5	3/4	South	Yes	
17	0	1/2	North	Yes	
17	5	1/4	South	Yes	
18	0	5/16	North	Yes	
18	5	3/4	South	Yes	
19	0	5/8	North	Yes	
19	5	-	-	Yes	
20	0	-	-	Yes	
20	5	7/8	South	Yes	
21	0	5/8	North	Yes	

Appendix E: Floor Beam Sweep

Span	Floor Beam	Sweep (in.)	Sweep Direction	Stiff Leg Installed	Description
21	5	-	-	Yes	
22	0	1/4	North	Yes	
22	5	3/8	South	Yes	
23	0	1/2	North	Yes	
23	5	-	-	Yes	
24	0	1/4	North	Yes	
24	5	3/4	South	Yes	
25	0	3/8	North	Yes	
25	5	7/16	North	Yes	
26	0	3/8	North	Yes	
26	5	1/2	South	Yes	
27	0	3/4	North	Yes	
27	5	5/8	South	Yes	
28	0	1/2	North	Yes	
28	5	3/4	South	Yes	
29	0	3/4	North	Yes	
29	5	-	-	Yes	
30	0	-	-	Yes	
30	5	7/8	South	Yes	
31	0	1/2	North	Yes	
31	5	-	-	Yes	
32	0	-	-	Yes	
32	5	3/4	South	Yes	
33	0	3/8	North	Yes	
33	5	-	-	Yes	
34	0	-	-	Yes	
34	5	3/4	South	Yes	
35	0	1/2	North	Yes	
35	5	-	-	Yes	
36	0	-	-	Yes	
36	5	5/8	South	Yes	
37	0	1/2	North	Yes	
37	5	-	-	Yes	
38	0	-	-	Yes	
38	5	3/8	South	Yes	
39	0	3/8	North	Yes	
39	5	-	-	Yes	
40	pier 39				Sister pier beam added due to severe sweep

Appendix F: Floor Beam Loss

Span	Floor Beam	Location	Description
2	0	Between stringer 2 and 5	4-inch x 8-inch x 3/8-inch angle added to bottom of web and bottom flange with stitch welds.
3	5	Between stringers 3 and 4	1 1/2-inch diameter
4	0	Between stringer 4 and 5	14-inch long x 1-inch high
5	5	Between stringers 3 and 4	2-inch high x 1-inch wide
5	5	Between stringers 1 and 2	3/4-inch diameter and 1-inch H x 2-inch wide
6	0	Between stringers 3 and 4	1-inch H x 16 1/2-inch wide
6	0	Between stringers 1 and 2	6-inch wide x 1-1/4-inch H
7	2	At E Truss	3/4-inch X 3/4-inch corrosion hole with 1/2-inch horizontal crack
7	3	At east truss cope	5/8-inch X 5/8-inch with 5/16-inch vertical crack
8	3	At E Truss	3/4-inch vertical by 1/2-inch horizontal corrosion hole
9	0	Under stringer 3	3/4-inch and 3/8-inch corrosion holes just in lower web above stiff leg.
9	1	West Truss	3/4-inch corrosion hole with adjacent knife edging in cope.
9	1	At east truss	2 3/4-inch diameter corrosion hole with a 1 1/8-inch long crack that has self-arresting into the corrosion hole.
10	1	At east truss cope	5/8-inch vertical X 3/16-inch horizontal.
11	5	Between stringers 4 and 5	5 through holes, 4-inch high x 1-1/2-inch and four 3/8-inch diameter.
11	5	Near stringer 3	29 1/2-inch long (1/2-inch growth) crack with slight offset and a 6-inch x 1 1/2-inch corrosion hole (photo 15)
12	0	Near stringer 4	Multiple corrosion holes over a 48 1/2-inch long x 1 5/8-inch high area.
12	3	At E Truss	1 3/8-inch high x 1-inch wide.
13	5	Near stringer 2	1 3/8-inch wide x 1-inch high corrosion hole
15	3	At E Truss	9/16-inch diameter with 1/4-inch corrosion crack
15	4	At E Truss	1/2-inch wide x 1/4-inch high corrosion hole in floor beam cope. Corrosion crack starting to form
15	5	Between stringers 1 and 2	Multiple holes over 21-inch length, max size 6-inch wide x 2-inch high
16	4	East truss	3-1/2-inch high x 4-1/4-inch wide
18	2	At E Truss	1-inch high by 5/8-inch wide and 1/4-inch diameter corrosion holes with 1-inch horizontal crack extending between holes.
19	3	At east truss	Section loss up to knife edging in cope. Crack forming. NEW
19	5	Between stringers 3 and 4	6 1/4-inch long horizontal crack along the base of the web with heavy corrosion and through holes (NEW)
20	0	between stringers 1&2	2 holes, 3/4-inch diameter and 1 1/4-inch wide x 3/4-inch high.
20	0	Between stringer 3 & 4	14 1/2-inch long horizontal crack with multiple corrosion holes up to 1-inch high

Appendix F: Floor Beam Loss

Span	Floor Beam	Location	Description
20	3	At east truss connection	1 1/8-inch wide x 9/16-inch high through hole with adjacent knife edging.
22	5	Near stringer 4	1 1/2-inch wide x 3/4-inch high in lowideer wideeb
22	5	Near W truss connection	1-inch wide x 3-inch high corrosion hole
23	0	At E truss	2 3/4-inch high x 5/8-inch wide in lower web.
24	0	Between stringer 1 & west truss	3/4-inch diameter in lower web
24	2	At east truss connection	3/4-inch high x 3/4-inch wide hole at cope with 1/4-inch diagonal crack.
25	2	At E Truss	3 1/2-inch high x 2-inch wide corrosion hole in floor beam cope, with adjacent knife ending.
26	3	At E Truss	1/2-inch corrosion hole in floor beam cope
26	5	Between stringer 1-2	1 3/4-inch wide x 1-inch high
27	1	At W Truss	2-inch high x 2 1/2-inch wide.
27	1	At E Truss	3/4-inch diameter corrosion hole near cope and a 3/16-inch crack at cope on north face.
27	2	At east truss connection	1 1/4-inch high x 1 1/4-inch wide corrosion hole with 1/2-inch vertical crack below hole. (Crack grew 3/16-inch)
27	5	Between stringer 1 & 2	1 1/2-inch corrosion hole.
28	0	Between stringers 4-5	Through hole, 1 1/4-inch wide x 5/8-inch high.
28	2	At E Truss	3/4-inch diameter & 1-inch wide x 3/4-inch high holes. 1/8-inch crack emanating from hole at cope.
28	3	At E truss	4 1/2-inch high x 1-inch wide corrosion hole
29	5	Between stringers 2-3	2 1/4-inch wide x 3/4-inch high
30	1	At west truss	1/2-inch X 1/2-inch with knife edging for 3 1/4-inch vertically
30	2	At E Truss	1-inch high x 1/4-inch wide corrosion hole with 13/16-inch vertical crack.
33	2	At east truss connection	2-inch high x 5/16-inch wide hole at cope.
33	3	At east truss connection	3/4-inch diameter corrosion hole
33	5	Between stringers 4-5	Through hole, 5 1/4-inch wide x 1 1/8-inch high.
34	3	At east truss connection	Heavy web section loss over top 15-inch with 2 1/2-inch high x 1/2-inch wide and 1/2-inch diameter holes. Approx 33% total web loss. Crack has now become corrosion hole. RECOMMEND STRENGTHENING.
37	5	Between stringers 4 and 5	3/4-inch high X 2-inch wide, multiple holes (3/4-inch high x 12-inch wide)
37	5	At stringer 3, over stiff leg	Corrosion hole measuring 3/8-inch high x 1-inch wide with 3/8-inch crack to east side and 1 1/4-inch long crack to west side above stiff leg. (Additional crack added, original crack grew 5/8-inch)
38	0	At east truss connection	1 1/4-inch high x 3/4-inch wide

Appendix F: Floor Beam Loss

Span	Floor Beam	Location	Description
38	0	Between stringers 4 and 5	4 corrosion holes between: 1-inch high x 5-inch wide, 1-inch high x 1-inch wide, 1-inch high x 1 1/2-inch wide, 1 1/2-inch diameter
39	1	At east truss connection	3/4-inch high x 1/2-inch wide through hole at cope with 3/16" horizontal crack at corrosion hole
39	3	At east truss connection	1/2-inch x 3/8-inch

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	2018 OS Comment
2	East	0	2 1/4	
2	West	0	1	
2	West	5	1 3/8	
3	East	5	3 1/8	
3	West	5	1 1/2	
4	East	0	5	
4	West	0	3	
5	West	3	5/16	
5	East	5	3 1/8	
5	West	5	1	
6	East	0	8	
6	West	0	1 1/2	
6	NA	0	7 1/4	Through web over stiff leg repair, below stringer 3 (photo 16)
7	West	0	1	
7	East	2	1/2	
7	East	3	5/16	Crack grew 1/16-inch
7	East	5	3 1/8	
7	West	5	1 5/8	
8	East	0	6 1/4	
8	West	0	4 1/4	
8	East	3	3/16	
9	East	1	1 1/8	
9	East	5	3 1/4	
9	West	5	2 1/2	
10	East	0	6 5/8	
10	West	0	3	
11	East	5	2 5/8	
11	West	5	2 1/2	
12	East	0	1 7/8	
12	West	0	1 7/8	
13	East	5	2 1/2	
13	West	5	1 1/4	
14	East	0	5 7/16	
14	West	0	3	
14	East	1	7/16	
15	East	3	1/4	
15	West	4	5/16	
15	East	5	4 7/8	
16	East	0	3 7/8	
16	West	0	3 5/8	
16	East	1	3/8	

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	2018 OS Comment
16	West	1	1/2	
16	West	3	1	
17	West	1	1/8	
17	East	4	3/8	
17	West	4	1/2	
17	East	5	3 1/8	
17	West	5	3 1/8	
18	East	0	5 1/8	
18	West	0	3 3/8	
18	West	1	5/16	
19	East	5	1 3/8	
19	West	5	2 1/8	
20	East	0	6 3/8	
20	West	0	1 3/4	
20	East	2	3/16	
21	West	4	3/4	
21	East	5	1 1/4	
21	West	5	1 3/4	
22	East	0	3 3/4	
22	West	0	5 3/4	
22	West	1	1/2	
23	East	3	1/2	
23	West	4	3/8	
23	East	5	4	
23	West	5	1 3/4	
24	East	0	4 1/8	
24	West	0	4 3/4	
24	East	1	3/4	
25	East	5	6 3/4	
26	East	0	4 1/4	
26	West	0	3 1/2	
27	East	5	1 1/4	
29	East	4	3/8	
29	East	5	5	
29	West	5	5/8	
30	East	0	1 5/8	
30	West	0	5/8	
30	West	1	9/16	Crack grew 1/16-inch
31	East	5	4 1/4	
31	West	5	1	
32	East	0	2	

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	2018 OS Comment
32	West	0	5/8	
33	East	3	3/8-inch crack with 3/8-inch diameter corrosion hole.	1/8-inch growth
33	West	4	5/16	
33	East	5	3 1/4	
34	East	0	2 1/8	
34	East	1	1/2	1/8-inch growth
35	East	3	1/4	
35	East	5	2 13/16	
35	West	5	3 1/8	
36	East	0	2 3/8	
36	West	0	1 3/8	
36	East	1	1/4	
36	East	4	5/8	
36	West	1	3/8	
36	West	4	1/8	
37	West	4	3/8	
37	East	5	1 5/8	
37	West	5	1 3/4	
38	East	0	9 3/16	
38	West	0	3 1/2	
38	West	1	1/2	
38	East	2	5/8-inch crack with through hole 9/16"H x 3/8"W.	Crack is 5/8-inch
38	West	3	7/16	
38	West	4	1/8	
39	East	4	1/4	
39	West	4	1/4	
39	East	5	3	
39	West	5	1 1/2	

Appendix H: Gusset Plate Cracks

Span	Truss	Panel Point	Length of Crack (in.)	Strengthened (Y/N)	2018 OS Comment
2	East	L0	17 5/8	Yes	photo 20
7	East	L0	Paint Crack	No	
8	East	L0	9 1/4	Yes	
13	East	L5	Paint crack	No	
14	West	L0	4 3/4	Yes	
17	East	L5	9 3/4	Yes	
19	West	L5	9 1/2	Yes	
20	East	L0	7 1/2	Yes	
20	East	L5	Paint Crack	No	
22	East	L0	Paint Crack	No	
23	East	L0	Paint Crack	No	
23	West	L0	Paint Crack	No	
24	East	L0	8 1/2	Yes	
27	East	L5	Paint Crack	No	
27	West	L5	Paint Crack	No	
28	East	L0	Paint Crack	No	
29	East	L5	11 1/2	Yes	
30	East	L0	6 3/4	Yes	
33	East	L5	14	Yes	
38	East	L0	Paint Crack	No	