

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:

4/14/2017



Report Prepared By:

BURGESS & NIPLE, INC.

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BURGESS & NIPLE
Engineers ■ Surveyors ■ Planners

OKLAHOMA DEPARTMENT OF TRANSPORTATION -

Bridge Inspection Report

Suff. Rating: 21.1
SD

Health Index :
53.8

NBI No.: 04085

Structure No.: 0902 0000 X

Local ID: -1

IDENTIFICATION
Description:
38-100' PONY TRUSS & 2-36' 1-BM. SPANS(BRIDGEPORT BR.)
1. State: Oklahoma 2. SHD District: Division 4
3. County Code: CANADIAN 4. Place Code: Unknown
Admin. Area: LT Snooper Truss
5. Inventory Route (Route On Structure) : 1 - 2 - 1 - 00281 - 0
6. Feature Intersected: S. CANADIAN RIVER
7. Facility Carried: U.S. 281 U.S. 281
9. Location: CADDO CANADIAN CL 11. Mile Post: 0.000 mi
13. LRS Inv. Route./ Subroute.: 0902 0000 01
16. Latitude: 35 32 25.00 17. Longitude: 098 19 22.00
98. Border Br. Code: Unknown (P) % Resp.: 0 99. Border Br. #: Unknown

STRUCTURE TYPE AND MATERIALS
43. Main Span Material and Design Type
Steel Truss-Thru
44. Approach Span Material and Design Type
Steel Stringer/Girder
45. No. of Spans Main Unit: 38 46. No. of Approach Spans: 2
107. Deck Type: 1 Concrete-Cast-in-Place
108A. Wearing Surface: 6 Bituminous
108B. Membrane: 8 Unknown
108C. Deck Protection: 8 Unknown

AGE AND SERVICE
27. Year Built: 1933 106. Year Reconstructed: Unknown
28A. Lanes on: 2 28B. Lanes Under: 0 19. Detour Length: 11.8 mi
29. ADT: 1100 30. Year of ADT: 2015 109. Truck ADT %: 16
42A. Type of Service on: 1 Highway
42B. Type of Service under: 5 Waterway

GEOMETRIC DATA
10. Inv. Rte. Min. Vert. Clr.: 328.1 ft
32. Approach Roadway Width (W/ Shoulders): 30.0 ft
Deck Area: 102,364.8 sq. ft 33. Median: 0 No median
34. Skew: 0 35. Structure Flared: 0 No flare
47. Inv. Rte. Total Horiz. Clr.: 24.0 ft
48. Length Maximum Span: 100.1 ft 49. Structure Length: 3,937.0 ft
50A. Curb/Sdwk Width L: 1.0 ft 50B. Curb/Sidewalk Width R: 1.0 ft
51. Width Curb to Curb: 24.0 ft 52. Width Out to Out: 26.0 ft
53. Minimum Vertical Clearance Over Bridge: 328.1 ft
54A/54B. Min. Vert. Underclearance : N Feature not hwy or RR 0.0 ft
Meas. N/E S/W
-1 -1 -1 -1 -1 -1
Post. DO NOT U DO NOT U DO NOT U DO NOT U B&N -1
55A/55B. Minimum Lateral Underclearance R: N Feature not hwy or RR 327.8 ft
56. Minimum Lateral Underclearance L: 327.8 ft

INSPECTION
Type Insp Req. Insp Done Freq: Insp. Date: Next Insp.:
NBI: N 12 10/15/2016 10/15/2017
FC Freq.: Y N 12 10/15/2016 10/15/2017
UW Freq.: N N NA NA
OS Freq.: Y Y 12 4/14/2017 4/15/2018

CLASSIFICATION
12. Base Hwy Network : On Base Network 20. Toll Facility: 3 On free road
21. Custodian: 01State Highway Agency 22. Owner: 01State Highway Agency
26. Functional Class: 06 Rural Minor Arteri 37. Historical Sig.: 2 Br eligible for NRHP
100. Defense Highway: 0 Not a STRAHNET h 101. Parallel Structure: No || bridge exists
102. Dir. of Traffic: 2 2-way traffic 103. Temp. Structure: Not Applicable (P)
104. Highway System: 0 Not on NHS 105. Fed. Land Hwy 0 N/A (NBI)
110. National Truck Network: 0 Not part of na 112. NBIS Length: Long Enough

CONDITION
58. Deck: 5 Fair 59. Super.: 4 Poor 60. Sub.: 5 Fair
62. Culvert: N N/A (NBI) 61. Channel/Channel Protection: 5 Bank Prot Eroded
Flowline Notes:

OCT-2016: 27.3 TOC at L3, west truss, span 6
[2016] FL to top of curb = 27.3' measured at E L5, span 6
[2015] FL to TOC = 27.7' measured @ L5, east truss.

LOAD RATING AND POSTING
31. Design Load: 2 M 13.5 (H 15) 41. Posting status: P Posted for load
63. Op. Rating Method: 1 LF Load Factor-Ton Alt. Op. Rating Meth.: 1 LF Load Factor-To
64. Operating Rating (H / HS / 3-3) : 16.5 16.5 16.5
66. Inventory Rating (H / HS / 3-3) : 15.0 15.1 37.7
65. Inv. Rating Method: 1 LF Load Factor-Ton Alt. Inv. Rating Meth.: 1 LF Load Factor-To
70. Posting: 2 20.0-29.9% below Date Rated : 3/25/2014

PROPOSED IMPROVEMENTS
94. Bridge Cost: \$6,781,689 75. Type of Work: 31 Repl-Load Capacit
95. Roadway Cost: \$4,500,000 76. Lgth. of Improvement: 3,937.0 ft
96. Total Cost: \$11,920,275 114. Future ADT: 1760
97. Year of Cost Est.: 2015 115. Year of Future ADT: 2035

NAVIGATION DATA
38. Navigation Control: Permit Not Required
39. Vertical Clearance: 0.0 ft 40. Horizontal Clearance: 0.0 ft
111. Pier Protection: 1 Not Required 116. Lift Bridge Vert. Clear.: 0.0 ft

APPRAISAL
36A. Bridge Rail: 0 Substandard 36C. Approach Rail: 0 Substandard
36B. Transition: 0 Substandard 36D. Approach Rail Ends: 0 Substandard
67. Str. Evaluation: 4 Minimum Tolerable 68. Deck Geometry: 4 Tolerable
69. Underclearance, Vertical and Horizontal: N Not applicable (NBI)
71. Waterway Adequacy: 5 Above Tolerable
72. Approach Alignment: 6 Equal Min Criteria
113. Scour Critical: 7 Countermeasures

200c. Temperature: 65
200d. Weather: RAINING/SNOWING
201. Structural Steel ASTM Desig.: -1 -1
202. Waterproof Membrane : -1
Date Installed : 1/1/1901
203. Type Exp. Dev. : Pourable
204. Type of Handrail: Metal Railing (other)
205. Material and Quantity : 10.0
208. Type of Abutment : Pedestal
Type of Foundation : Natural Foundation Matl.
209. Type of Pier / Found.: 2 Piers Yes
No Piling or Drilled Shaft
210. Foundation Elev. -1.0 -1.0
-1.0 -1.0 -1.0
211. Wear. Surf. Prot. System : None
Date Installed : 1/1/1901
213. Utilities Attached : -1
-1 -1 -1
-1 -1 -1

214a. Posted Weight Limit: 151515
b. Posted Speed Limit : -1
c. Narrow/One Lane Bridge sign : -1
d. Vertical Clearance Sign: NO
Advanced Warning Sign : NO
e. Navigation Lights : NO
Working/Not Working : NO
215. Overpass : C - US Highway
221. Substructure Cond. (U/W) : -
222. Fill over RCB: -1
223. Appr. Slab/Rdwy Cond.: Satisfactory
225. Paint Type : Red Lead Ready
Overcoat : Not Applicable
226. Date Painted: 3301
227. Paint Coloring: Silver
233. Deck Forming: -
238. School Bus Rte: Current and Desired Route
240. Appr. Roadway Type: Concrete

243. Girder Spacing/Number : -1.0 / -1
244. Span Lengths :
-1 -1 -1
-1 -1 -1
-1 -1
245. Girder Depth : 48.000
246. Type of Overlay : AC Overlay
246. Overlay Thickness : 3.0
246. Overlay Date : 12/4/2003
246. Overlay Depth Changed > 1"? -
247. Protective Systems : 1: -
2: - 3: -
4: - 5: -
248. No. of Field Splices w/ Corrosion : -1
249. Scour Crit. POA exists?: -
250. Culvert Headwall Dist.: -1.0
256. Chan. Profile Up/Down Stream?: -
257a. OkiePROS Auto. Truck Routing - Yes
258. Plans w/ found. are in file at ODOT:
259. Scour Eval. is in file at ODOT:
263. Interchange at Intersection: No Interchange
264. Interstate Milepoint: -1.00

OKLAHOMA DEPARTMENT OF TRANSPORTATION -**Bridge Inspection Report**NBI No.: **04085**

Structure No.: 0902 0000 X

Local ID: -1

Suff. Rating: 21.1
SDHealth Index :
53.8

Inspection Date: 4/14/2017 Reported By: DPOORMAN

Invoice No.: -1 Inspected With: -1

Agency :

Structure / Inspection Notes

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

OS Inspection Items: See tables in 2017-04-14 OS 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 WU1U2 sp 37; Stringer 5 section loss at end floor beams; Scour due to movement of stream from span 10 to span 6.

Posted 15 tons, 2/2017

PX – Str 5 at FB 0, span 24 should be strengthened; 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 pier 9 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: the beam connections to the original pier beams at piers 1 and 39 for further cracking; notches and cuts in inboard flange; notches and cuts in inboard flange and gusset plate at west U1L2, span 31; packrust and section loss in truss members; spalls and corroding rebar in soffit; lower chord gusset plates over bearings for development of horizontal cracks; cracks at FB copes and stringer connections; fatigue prone stitch welds of angle strengthening at FB 0, span 2; corrosion holes in floor bracing system; bowed members near locations of collision damage; bowed gusset plates near bearings; bullet strike damage to east truss, span 4; cracking/spall at east column capital, pier 3 for condition which would undermine bearing; expansion bearing pins for signs of additional wear or distress.

Additional
Elements

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/14/2017



Photograph 1 - Endview looking south.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 2 - Elevation looking northwest.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 3 - Looking south at 15-ton load posting sign in the north approach.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 4 - Looking north at 15-ton load posting sign in the south approach.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/14/2017



Photograph 5 - Looking east at the east bridge rail in span 1. Note: Lower portion of concrete bridge rail has failed.

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Photograph 6 - Looking north at the deck surface in span 37. Note: Wearing surface exhibits large unsealed transverse and longitudinal cracks with isolated potholes up to 2 square feet.

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Photograph 7 - Looking west along the expansion joint at pier 7. Note: Elastomeric concrete joint header is spalled in both lanes at the joint.

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Photograph 8 - Looking east at stringer 1 connection to the north face of floor beam 1, span 27. Note: Previously noted 3/4-inch crack grew to 1-inch. A 1/2-inch crack has also developed in this location.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 9 - Looking southwest at stringer 1 at floor beam 0, span 11. Note: 3/4-inch long crack in web at cope.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 10 - Looking northeast at stringer 5 connection to floor beam 5, span 34. Note: 4 1/2-inch long crack exists in the west connection angle.

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Photograph 11 - Looking northeast at stringer 4 connection angle at floor beam 5, span 25. Note: Previously noted crack grew from 3 1/2 inches to 3 5/8 inches.

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Photograph 12 - Looking northwest at stringer 5 at floor beam 5, span 21. Note: 2 1/2-inch vertical corrosion hole with 4 1/2-inch vertical crack.

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Photograph 13 - Looking northwest at stringer 5 at floor beam 5, span 33. Note: Severe section loss exists in the east stringer connection angle.

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04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/14/2017



Photograph 14 - Looking east at stringer 5 at floor beam 0, span 38. Note: An 8 1/4-inch long by 3/4-inch high corrosion hole exists in the stringer web above the bottom flange.

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Photograph 15 - Looking southwest at stringer 5 at floor beam 0, span 23. Note: Corrosion holes and section loss along edge of connection angle.

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Photograph 16 - Looking west at stringer 2 at floor beam 5, span 39. Note: New missing rivet in the east face of the stringer connection angle. Shank is not in shear plane.

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Photograph 17 - Looking north at floor beam 3 connection to the east truss, span 34. Note: Heavy web section loss over top 15 inches with a 1 1/8-inch by 1/2-inch and 1/2-inch diameter corrosion hole, and 3/4-inch long crack emanating from top hole.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 18 - Looking southeast at floor beam 0, span 2. Note: 4-inch by 8-inch by 3/8-inch bent plate stitch welded to bottom flange and east face of web between stringers 2 through 5.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 19 - Looking northwest at floor beam 5 under stringer 3, span 11. Note: 28 1/2-inch long horizontal crack in floor beam web.

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Photograph 20 - Looking north at floor beam 1 connection to the east truss, span 14. Note: 7/16-inch crack in floor beam cope.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
04085	0902 0000 X	Canadian	U.S. 281	S. CANADIAN RIVER	4/14/2017



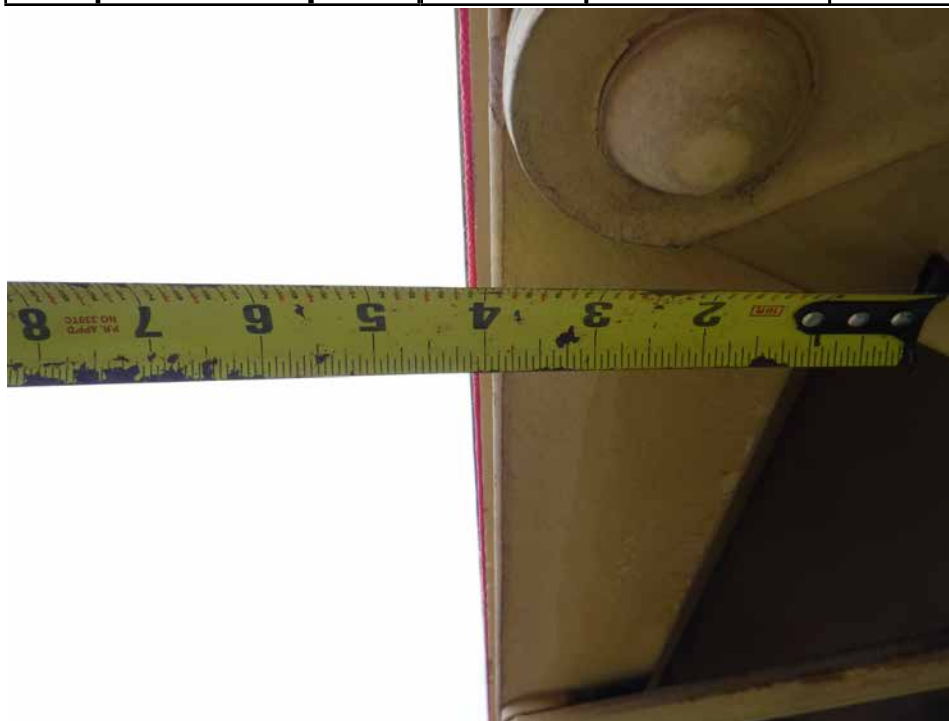
Photograph 21 - Looking east at pier beam 39 in span 40. Note: Pier beam exhibits significant sweep and has been sistered.

NBI #	Structure #	County	Fac. Carried	Fac. Intersected	Insp. Date
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Photograph 22 - Looking east at beam 3 at sister pier beam at pier 39. Note: Elastomeric pad is missing from beams 3 and 4.

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Photograph 23 - Looking south at west U1U2, span 37. Note: U1U2 exhibits a 1/4-inch bow the east. .

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Photograph 24 - Looking northwest at the inboard gusset plate at east L0, span 2. Note: A 17 1/2-inch long horizontal crack exists through upper half of gusset plate. Crack is offset 1/2-inch at the south end of the gusset plate.

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Photograph 25 - Looking northeast at east column bearing seat, pier 3. Note: 3/4-inch wide crack intersecting the inboard anchor bolt for span 3 east truss expansion bearing; Bearing is at limit of expansion and lifted 1/2 inch along south edge.

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Photograph 26 - Looking northeast at pier 6. Note: Channel scour has exposed the top of the column foundations.

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2017 OS Comment	Report Photo
2	0	North	5	1 1/2		
2	2	South	1	3/8		
2	4	South	1	1/8		
2	5	South	1	3/8		
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		
4	5	South	5	1 1/2		
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	1	3/4		
7	5	South	5	3/4		
8	4	North	5	1 1/4, 7/8		
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	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	Crack grew from 9/16" to 3/4"	9
12	0	North	1	1/4	New Crack (2017 OS)	
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 1/8		
16	4	North	5	3/8		
16	5	South	5	3/4, 1/4		
17	0	North	5	1 3/8		
17	3	North	1	1/16		
18	0	North	1	1/2		
18	2	South	1	3/8		
18	5	South	1	1	1/8" crack, with 3/4" x 1/4" corrosion hole	

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2017 OS Comment	Report Photo
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		
20	5	South	1	1/8		
21	0	North	5	7/8		
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	Previously noted 3/4" crack grew to 1"	8
27	1	South	1	1		
27	1	South	5	1/4		
27	2	South	1	3/16		
27	4	North	5	1/2		
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		
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	3	South	1	1/4		
32	4	North	1	1/8		
32	5	South	1	1/4		
33	2	South	1	1/8		
33	5	South	1	1 1/2		
34	1	South	1	1/4		
34	2	South	1	5/16		
34	5	South	1	1/2		
35	0	North	1	1/2		

Appendix A: Stringer Cope Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Length (in.)	2017 OS Comment	Report Photo
35	4	South	1	1/8		
36	0	North	1	3/8		
36	1	North	1	3/8		
36	2	South	1	3/4		
36	4	North	1	1/4		
36	5	South	1	2 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.)	2017 OS Comment	Report Photo
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	1 3/8	Crack grew from 1 1/4" to 1 3/8"	
9	5	South	3	West	3 1/2		
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 1/2		
25	5	South	3	East	1 1/4		
25	5	South	4	West	3 5/8	Crack grew from 3 1/2" to 3 5/8"	11
25	5	South	5	West	6		
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 3/8		
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		

Appendix B: Stringer Connection Cracks

Span	Floor Beam	Floor Beam Face	Stringer	Stringer Face	Length (in.)	2017 OS Comment	Report Photo
29	5	South	3	West	4		
29	5	South	4	East	1 1/2		
30	0	North	2	East	5 5/8		
30	0	North	3	East	4 1/2		
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	4 1/2		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	2017 OS Comment	Report Photo
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	1 shank in shear plate, 1 not in shear plane.	
6	0	North	3	1		
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	Not in plane	
7	5	South	4	2	Not in 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		
9	4	South	4	1		
9	5	South	4	2		
10	0	North	2	2		
10	0	North	3	1	Shanks 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. (2016)	
12	0	North	4	1		
13	2	North	2	2		
14	0	North	2	2	Shanks not in shear plane.	
15	5	South	3	2		
15	5	South	4	1		
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.	

Appendix C: Missing Stringer Rivets

Span	Floor Beam	Floor Beam Face	Stringer	Number	2017 OS Comment	Report Photo
18	0	North	3	1	Shanks 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	Shanks not in shear plane.	
23	2	North	2	1		
23	4	South	4	1		
24	0	North	2	2	East rivet shank no longer in shear plane.	
24	4	South	4	2		
25	5	South	4	1	Shank not in shear plane.	
26	0	North	2	1		
28	1	North	2	1		
29	1	North	2	2		
29	2	North	2	1	Shank still present in shear plane. (New 2016)	
30	0	North	3	1		
31	5	South	3	2		
32	0	North	2	2	East rivet shank no longer in shear plane.	
32	0	North	3	1	East rivet shank no longer in shear plane.	
33	1	North	2	1		
33	5	South	3	1		
34	0	North	3	1		
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	Shank still present in shear plane. (New 2016)	
37	1	North	2	1		
37	2	North	2	1		
37	5	South	3	2		
37	5	South	4	1		
38	0	North	2	2	East rivet shank no longer in shear plane.	
38	0	North	3	1	East rivet shank no longer in shear plane.	
38	0	South	4	1		
38	1	North	2	1		
39	5	North	2	1	New (2017 OS) Shank no longer in shear plate.	16
39	5	South	3	1		
39	5	South	4	1		

Appendix D: Stringer Loss

Span	Floor Beam	Floor Beam Face	Stringer	Description	2017 OS Comments	Report Photo
2	0	North	1	3/4" diameter with 1/4" crack		
4	0	North	5	1 1/4" diameter with 3/4" crack		
4	0	North	5	3" H x 3/16" remaining along top of web. New (2016)		
5	5	South	5	1" diameter with horizontal crack, 1/2"L, and vertical crack, 3/8"L		
6	0	North	1	1 1/2 " diameter with 1 1/8" vertical crack (grew 1/4")		
6	0	South	5	1 3/8" diameter, 1/2" vertical crack		
9	1	South	5	2 3/8" x 1"		
9	5	South	1	2 7/8"H x 1 1/4"W with 1" vertical crack.	Crack grew from 3/4" to 1".	
9	5	South	5	1"W x 1 1/4"H with 1/8" crack.		
10	0	North	5	1/2" diameter hole with 3"H x 3/16", 4"H x 1/8", and 3"H x 1/16" pitting extending below the hole, and two cracks above hole, 3/4" & 1/2". One crack below hole, 1/2"		
10	5	South	5	DEP1-026, 4"W x 1 1/8"H with 1/2" knife edging adjacent in lower web. New (2016)		
11	5	South	5	5/8" diameter with 7/8" long crack		
12	0	North	1	1" diameter with 1/4" vertical crack.		
12	0	North	5	1-1/8"H x 5/8"W with 3/4" vertical crack		
12	1	North	5	1"H x 3/4"W		
13	5	South	1	1/4" crack extends below through hole, 1 5/8"H x 1/2"W		
14	0	North	5	1/2" diameter hole with 1 1/4" vertical crack. New (2016)		
15	5	South	5	1" diameter at cope & 2"H x 5"W below connection angle		
16	0	North	5	Web top at connection angle: 4 1/4"H x 1 1/2" hole with two cracks (5/8" & 1/4"). Web bottom just above bottom flange 5"W x 1"H Approx 33% web area remains.		
17	4	North	5	2 1/2" x 1" with 9/16" long crack		
17	5	South	1	Two holes: 1 1/2"W x 1/2"H and 1/2"H hole with 5/8" crack		
17	5	South	5	2 1/4"H x 1" with 1/2" long crack		
18	0	North	5	2 1/4" diameter hole with 3/16" pitting for 7"H	Hole grew from 2 1/4"Hx 1"W to 2 1/4" diameter	
19	5	South	1	1/2" hole with 3/4" crack		
19	5	South	5	7 1/2"W x 4"H in lower web and 3/8" crack from top of hole		
20	0	North	5	1 1/4" diameter		
21	5	South	1	1 1/4"W x 1/4"H with 1/4" vertical crack		
21	5	South	5	2 1/2"H x 1 1/2"W with 4 1/2" long crack. RECOMMEND STRENGTHENING.	Crack grew from 3 7/8" long to 4 1/2" long.	12
22	0	North	1	2"W x 1/2"H		
23	5	South	5	2 3/4"H x 1/2"W		
24	0	North	1	1 1/4"H x 3/4" W with 3/16" max pitting over 6" below hole		
24	0	North	5	10 1/2"W x 2"H with 1/16-1/8" remaining full height at edge of connection angle; 1" and 3/4" diameter corrosion holes in web adjacent to connection angle with multiple holes emanating from lower holes, 1/4" max L. RECOMMEND STRENGTHENING		15
24	5	South	5	1" diameter		
25	2	North	5	1/2" diameter. Adjacent knife edging to hole.		
25	5	South	1	2"H x 5/8"W with 5/8" crack		
25	5	South	5	1/8" section loss, full height.		
26	0	North	1	1/2" diameter with 3/8" crack	Crack grew from 3/16" to 3/8"	
26	0	North	5	2"H x 5/8"W		
27	5	South	1	3 1/4"H x 1"W with 1/4" vertical crack		
29	4	South	5	5/8" dia corrosion hole in stringer cope with 1" vertical crack below hole		
29	5	South	5	1 1/2"H x 1"W with two cracks, 1" crack extends cope to hole & 1" crack below hole. Two new through holes, 1/2" and 5/8" diameter in lower web (2016)		
30	0	North	5	1 1/2" x 1 1/2"		
31	5	South	5	1 1/2" H x 1" W & 1 1/4" H x 1" W, total web section loss = approx 40%		
33	5	South	5	Severe section loss to east connection angle (west connection angle good)		13
34	3	South	5	2 3/4"H x 1/2"W with 1/2" crack at bottom of hole		
34	4	South	5	1" vertical by 1 1/4" horizontal corrosion hole with 3/8" vertical crack at bottom of hole. Also, 2 holes in lower web, 2"W x 1"H and 3/4" diameter.		
35	5	South	5	6" W x 1 3/4" H		

Appendix D: Stringer Loss

36	0	North	5	2 1/2" H x 1 1/4" 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.		
38	0	North	5	3/4"H x 8 1/4"W hole at cope with 1/8" average (3/16" max) section loss full height on outboard face. RECOMMEND STRENGTHENING	Corrosion holes have grown from 3/4"H x 2"W to 8 1/4" W x 3/4 H in web above bottom flange.	14
38	5	South	5	1 1/2"H X 4 1/2"W below connection angle and 1/2" cope crack		
39	0	North	5	1 1/4"H X 1/2"W below connection angle		
39	1	South	5	1/2"H x 1/4"W hole within 1 1/16" crack at cope, also 1/8" average full height section loss.		
39	5	South	1	1" diameter below connection angle with 1/2" crack at cope		

Appendix E: Floor Beam Sweep

Span	Floor Beam	Sweep (in.)	Sweep Direction	Stiff Leg Installed	Description	2017 OS Comment	Report Photo
1	pier 1			Yes	Sister pier beam added due to severe sweep		
2	0	-	-	Yes			
2	5	-	-	Yes			
3	0	1/2	North	Yes			
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			

Appendix E: Floor Beam Sweep

Span	Floor Beam	Sweep (in.)	Sweep Direction	Stiff Leg Installed	Description	2017 OS Comment	Report Photo
19	5	-	-	Yes			
20	0	-	-	Yes			
20	5	7/8	South	Yes			
21	0	5/8	North	Yes			
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			

Appendix E: Floor Beam Sweep

Span	Floor Beam	Sweep (in.)	Sweep Direction	Stiff Leg Installed	Description	2017 OS Comment	Report Photo
40	pier 39				Sister pier beam added due to severe sweep		

Appendix F: Floor Beam Loss

Span	Floor Beam	Location	Description	2017 OS Comment	Report Photo
2	0	Between stringer 2 and 5	4" x 8" x 3/8" angle added to bottom of web and bottom flange with stitch welds.	New (2017 OS)	18
3	5	Between stringers 3 and 4	1 1/2" diameter		
4	0	Between stringer 4 and 5	14" L x 1" H		
5	5	Between stringers 3 and 4	2" H x 1" W		
5	5	Between stringers 1 and 2	3/4" diameter and 1" H x 2" W		
6	0	Between stringers 3 and 4	1" H x 14" W		
6	0	Between stringers 1 and 2	6" W x 1-1/4" H		
7	2	At E Truss	3/4" X 3/4" corrosion hole with 1/2" horizontal crack		
7	3	At east truss cope	5/8" X 5/8"		
8	3	At E Truss	3/4" vertical by 1/2" horizontal corrosion hole		
9	0	Under stringer 3	3/4 in corrosion hole just above bottom flange above stiff leg.		
9	1	West Truss	3/4-inch corrosion hole with adjacent knife edging in cope.		
9	1	At east truss	1 1/2" diameter.		
10	1	At east truss cope	5/8" vertical X 3/16" horizontal.		
11	5	Between stringers 4 and 5	5 through holes, 4"Hx1-1/2" and four 3/8" diameter.		
11	5	Near stringer 3	Crack 28 1/2" long with slight offset. W 6 x 1 1/2 corrosion hole.	Previously noted several corrosion holes. Now 28 1/2 " long crack with slight offset and 6"W x 1 1/2"H corrosion hole.	19
12	0	Near stringer 4	1.5" W x 1" H, 3.5" W x 3/4" H, 2.5" W x 1" H, 3/4in diameter, 1 1/2in x 1in. 1/2" section remaining.	Bottom flange orianally 7/8" now 1/2" section remains.	
12	3	At E Truss	1 3/8" H x 1" W.		
13	5	Near stringer 2	1 1/4"W x 1"H corrosion hole		
15	3	At E Truss	9/16" diameter with 1/4" corrosion crack		
15	4	At E Truss	1/2"W x 1/4"H corrosion hole in floor beam cope. Corrosion crack starting to form		
15	5	Between stringers 1 and 2	Multiple holes over 21" length, max size 6"W x 2"H		
16	4	East truss	3-1/2"H x 4-1/4"W		
18	2	At E Truss	1"H x 5/8"W & 1/4" diameter corrosion holes with 1" crack extending between holes.		
20	0	between stringers 1&2	2 holes, 3/4" diameter and 1 1/4"W x 3/4"H.		
20	0	Between stringer 3 & 4	14 1/2 in long crack. 4 in x 1/2 in corrosion hole.		
20	3	At east truss connection	1 1/8"W x 9/16"H through hole with adjacent knife edging.		
22	5	Near stringer 4	1 1/2" W x 3/4" H in lower web		
22	5	At stringer 5	1 in x 3 in corrosion hole		
23	0	At E truss	2 3/4"" H x 5/8" W in lower web.		
24	0	Between stringer 1 & west truss	3/4" diameter in lower web		
24	2	At east truss connection	3/4"H x 3/4"W hole at cope with 1/4" diagonal crack.		
25	2	At E Truss	3 1/2" H x 2" W corrosion hole in floor beam cope, with adjacent knife ending.		
26	3	At E Truss	1/2" corrosion hole in floor beam cope		
26	5	Between stringer 1-2	1 3/4"W x 1"H		
27	1	At W Truss	2" H x 2 1/2" W.		
27	1	At E Truss	3/4" diameter corrosion hole and a 3/16" crack at cope. Cope crack 3/16"		
27	2	At east truss connection	1 1/4"H x 1 1/4"W hole with 5/16" vertical crack below hole.		
27	5	Between stringer 1 & 2	1 1/2" corrosion hole.		
28	0	Between stringers 4-5	Through hole, 1 1/4"W x 5/8"H.		
28	2	At E Truss	3/4" diameter & 1"W x 1/4"H holes. 1/8" crack emanating from hole at cope.		17
28	3	At E truss	4" H x 3/4" W		
29	5	Between stringers 2-3	2 1/4" W x 3/4" H		
30	1	At west truss	1/2" X 1/2" with knife edging for 2 1/2" vertical.		
30	2	At E Truss	1"H x 1/4"W corrosion hole with 5/8" vertical crack.		
33	2	At east truss connection	1 1/2"H x 5/16"W hole at cope.		
33	5	Between stringers 4-5	Through hole, 5 1/4"W x 1 1/8"H.		

Appendix F: Floor Beam Loss

Span	Floor Beam	Location	Description	2017 OS Comment	Report Photo
34	3	At east truss connection	Heavy web section loss over top 15" with 1 1/8"H x 1/2"W and 1/2" diameter holes. Also, 3/4" crack emanating from top hole. Approx 33% total web loss. RECOMMEND STRENGTHENING.		
37	5	Between stringers 4 and 5	3/4" H X 2" W, multiple holes (3/4"H x 12"W)		
37	5	At stringer 3, over stiff leg	Corrosion hole measuring 3/8"H x 1"W with 5/8" long crack above stiff leg.		
38	0	At east truss connection	1 1/4" H x 3/4" W		
38	0	Between stringers 4 and 5	3 corrosion holes between: 1" H x 5" W, 1" H x 1" W, 1" H x 1 1/2" W		
39	1	At east truss connection	3/4"H x 1/2"W through hole at cope.		
39	3	At east truss connection	1/2" x 3/8"		

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	Additional Coomment from 2017 OS Inspection	Report Photo
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		
5	West	5	1		
6	East	0	8		
6	West	0	1 3/8		
7	West	0	1		
7	East	2	1/2		
7	East	3	1/4		
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	5	3 1/4		
9	West	5	2 1/2		
10	East	0	6 5/8		
10	West	0	3		
11	East	5	3		
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		20
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		
16	West	1	1/2		
16	West	3	7/8		
17	West	1	1/8		
17	East	4	3/8		
17	West	4	1/2		
17	East	5	3 1/8		

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	Additional Coomment from 2017 OS Inspection	Report Photo
17	West	5	3 1/8		
18	West	1	5/16		
18	East	0	5 1/8		
18	West	0	3 3/8		
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	East	5	1 1/4		
21	West	4	3/4		
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 1/16		
24	West	0	4 5/8		
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	1/2		
31	East	5	4 1/4		
31	West	5	1		
32	East	0	2		
32	West	0	5/8		
33	East	3	1/8" crack with 3/8" diameter		
33	West	4	5/16		
33	East	5	3 1/4		
34	East	0	2 1/8		
34	East	1	1/4		
35	East	3	1/4		
35	East	5	2 13/16		
35	West	5	3 1/8		

Appendix G: Floor Beam Cracks

Span	Truss	Floor Beam	Length (inch)	Additional Coomment from 2017 OS Inspection	Report Photo
36	East	0	2 3/8		
36	West	0	1 3/8		
36	East	1	1/8		
36	East	4	1/4		
36	West	1	3/8		
36	West	4	1/4		
37	West	4	1/8		
37	East	5	2		
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	7/16" crack with through hole 9/16"H x 3/8"W.		
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)	2017 OS Comment	Report Photo
2	East	L0	17 1/2	Yes		24
7	East	L0	Paint Crack	No		
8	East	L0	9 1/4	Yes	Crack grew from 9" to 9 1/4".	25
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		