

Fracture Critical Bridge Inspection Report

NBI Bridge No.: 17051

Route I-40 over ARKANSAS RIVER
Sequoyah County



Prepared for:

Oklahoma Department of Transportation

Field District 1

Inspection Date:

7/17/2023



Report Prepared By:

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Mr. Wes Kellogg, P.E.
Field Service Engineer
Oklahoma Department of
Transportation
200 Northeast 21st Street
Oklahoma City, OK 73102-3204

Re: Fracture Critical Bridge Inspection Report
Structure No.: 6822 0000 X
NBI No.: 17051
I-40 over Arkansas River
Sequoyah County
State Field District 1

August 9, 2023

Dear Mr. Kellogg:

Burgess & Niple (B&N) performed a fracture critical and routine inspection of the above referenced bridge on July 16 and 17, 2023. The bridge is a thirteen-span structure (**photos 1 and 2**) with spans numbered west to east and consisting of:

- Spans 1-3: Simple prestressed concrete girder approach spans (131.4 feet, 130 feet, 130 feet)
- Spans 4-6: Continuous variable-depth steel girder main spans (201 feet, 330 feet, 201 feet)
- Spans 7-10: Continuous steel girder approach spans (125 feet, 125 feet, 125 feet, 126 feet)
- Spans 11-13: Continuous steel girder approach spans (126 feet, 125 feet, 126.3 feet)

The limits of the inspection were from the west abutment to the east abutment. Inspection team members included Dale Poorman, PE (Team Leader), Shaun Fillmore, PE, Drew Urban, EI, and Jerrett Shafer, EI.

As per the latest load rating report date October 1, 2006, the bridge does not require a load posting.

This report includes appendices containing:

- Significant Findings
- Truss/FC Bridge Rating Form
- Condition photographs
- Oklahoma DOT Bridge Inspection Form/BrM element report

The current and previous NBI ratings for the bridge are:

| NBI Item | Current Rating (2023) | Previous Rating (2021) |
|------------------------------|---|---|
| NBI Item 58 (Deck) | 6 = Satisfactory | 6 = Satisfactory |
| NBI Item 59 (Superstructure) | 6 = Satisfactory | 6 = Satisfactory |
| NBI Item 60 (Substructure) | 6 = Satisfactory | 6 = Satisfactory |
| NBI Item 61 (Channel) | 6 = Bank Slumping | 6 = Bank Slumping |
| NBI Item 113 (Scour) | (8 = Calculated Scour Above Foundation) | (8 = Calculated Scour Above Foundation) |
| Sufficiency Rating | 82.9 | 82.9 |

The bridge is neither structurally deficient nor functionally obsolete.

RECOMMENDED ACTIONS, in order of decreasing priority, are as follows:

Priority Code **CX** – *Bridge condition is bad enough that there is a possibility of failure of a major structural component if repairs are not completed within the next few days.*

- No CX repair items are required at this time.

Priority Code **PX** – *Bridge condition is such that immediate repair is not necessary but should be completed within the next several weeks or months.*

- Replace the missing north railing posts in span 8 and near pier 12.
- Splice gaps in the metal rail of the north railing in spans 5 and 9, and the south railing in spans 1, 6 and 7.
- Patch spalls in driving surface.
- Repair cracks in the bearing boxes at the modular joint supports at pier 3. Also, install shim plates or additional support below the bearing blocks to prevent future cracking.
- Replace the modular joints at pier 3, 6 and 10.
- Replace pourable joint seals at the west abutments and fixed joints and deck control joints.
- Replace the strip seal expansion joint at the east abutment.
- Replace missing or loose bolts at stringer connections.
- Arrest the ends of cracks at:
 - Floor beam 4, span 4 under stringer 1.
 - Floor beam 4, span 4 under stringer 3.
 - Stringer diaphragm over floor beam 5, span 6, between stringers 3 and 4.
- Repair the cracks in the lateral bracing gusset plates:
 - Span 8, girder 3 at floor beam 4 – 8 1/2-inch-long crack in gusset plate.
 - Span 10, girder 2 at floor beam 2 – 18-inch-long crack in gusset plate weld.
 - Span 11, girder 2 at floor beam 1 – 8-inch-long and 6-inch-long cracks in gusset plate weld.
- Reattach the lateral bracing vibration dampeners at:
 - Span 4, between girders 1 and 2, between floor beams 5 and.
 - Span 4, between girders 1 and 2 and between floor beams 8 and pier.
 - Span 4, between girders 3 and 4 and between floor beam 7 and pier.
 - Span 6, between girders 1 and 2 and between floor beams 2 and 3.

- Span 6, between girders 3 and 4 and between floor beam 0 and 1 – fractured spring not functioning as intended.
- Span 6, between girders 3 and 4 and between floor beam 6 and pier 6.
- Patch the corrosion hole through the lateral bracing gusset plate at girder 4, span 6 at pier 6
- Install crushed aggregate slope protection on the east approach embankment.
- Remove debris from east abutment seat.
- Patching the spall in pier 6, column 2 at the top of the web wall.
- Repair the broken seismic cables at piers 6 and 10.
- Reset the elastomeric bearings for girder 1 for span 4 at pier 3.
- Remove paint from the stainless-steel sliding surfaces of the elastomeric bearings at pier.

Priority Code **FX** – *Bridge condition is such that repair should not be necessary any time soon, monitor during future inspections.*

- Monitor the terminations of the horizontal web splices for crack propagation or initiation in spans 4 through 6.
- Monitor lateral bracing gusset plate connections to the web of the girders at:
 - Span 10, girder 1 at floor beam 4
 - Span 11, girder 1 at floor beam 1
 - Span 11, girder 2 at floor beam 3
 - Span 12, girder 2 at floor beam 1
 - Span 12, girder 2 at floor beam 2
- Monitor the ends of the prestressed concrete beams for deterioration associated with the exposed strands.

It is recommended that this structure be inspected on a 24-month Routine/Fracture Critical inspection frequency and a 24-month Other/Special inspection frequency.

Observed fatigue prone details include:

- Category E – Termination of welded cover plates on stringers
- Category E – Termination of horizontal splice for the variable depth steel girders.

Other/Special inspection items include:

- Modular joints support boxes and support beams at piers 3, 6 and 10.
- Cracks in floor beam 4, span 4:
 - Stringer 1 (1 5/8 and 1 1/2 inches).
 - Stringer 3 (2 3/8 inches)
- Cracks in the lateral bracing gusset plates:
 - Span 8, girder 3 at floor beam 4 (8 1/2-inch-long crack in gusset plate).
 - Span 10, girder 2 at floor beam 2 – (18-inch-long crack in gusset plate weld).
 - Span 11, girder 2 at floor beam 1 – (8-inch-long and 6-inch-long cracks in gusset plate weld).
- Horizontal web splice terminations in spans 4 near floor beam 5, span 5 near floor beams 3 and 11, and span 6 near floor beam 3. Cracks or cored hole noted at:

- Span 4, girder 2, near floor beam 5 (1-inch-long crack arrested by cored hole, 1 1/2-inch-long crack arrested by cored hole).
- Span 4, girder 4, near floor beam 5 (7/16-inch-long crack arrested by a cored hole).
- Span 5, girder 1, near floor beam 11 (3/4-inch-long crack stopping short of the cored hole, 1 1/4-inch-long crack arrested by two cored holes).
- Span 5, girder 2, near floor beam 11 (2-inch-long crack arrested by a cored hole).
- Span 5, girder 3, near floor beam 11 (7/8-inch-long crack stopping short of the cored hole).
- Span 5, girder 4, near floor beam 3 (1 1/8-inch-long crack arrested by a cored hole, 1-inch-long crack arrested by a cored hole).
- Span 5, girder 4, near floor beam 11 (1-inch-long crack arrested by a cored hole).
- Span 6, girder 1, near floor beam 3 (both cracks arrested by a cored hole).
- Span 6, girder 2, near floor beam 3 (1-inch-long crack arrested by a cored hole).
- Span 6, girder 3, near floor beam 3 (Paint crack originally noted).
- Span 6, girder 4, near floor beam 3 (1 1/4-inch-long crack arrested by a cored hole).

We thank you for the opportunity to provide our engineering services. Please contact me if you have any questions or comments.

Sincerely,

BURGESS & NIPLE, INC.



Dale Poorman, PE
Team Leader

Attachments



8-9-2023

SIGNIFICANT FINDINGS are as follows (red text is new or significantly changed condition for 2023):

NBI Item 36 – Traffic Safety (5 = Fair condition)

- **PX** – The metal rail for the north bridge railing is missing two adjacent posts in span 8 and three adjacent posts near pier 12 (**photos 3 and 4**). Spalls with exposed reinforcing steel exist in the concrete railing at the post locations where damaged near pier 12.
- **PX** – The following railing locations exhibit gaps in the metal rail:
 - North railing over floor beam 1, span 5.
 - North railing over floor beam 4, span 9 (**photo 5**).
 - South railing floor beam 1 in span 5 has gap connected with a bar (**photo 6**).
 - South railing over pier 6 (**photo 7**).
 - South railing over pier 7.
- Concrete bridge railing and median typically exhibits vertical cracks spaced at 3 to 5 feet and spalls in the curb exposing the reinforcing steel due to inadequate cover depth (**photo 8**). The cracks are spaced at 3 to 5 feet with leaching and minor rust staining. The worst spalling exists to the south curb in span 6 with a 20-foot-long by up to 6-inch-deep spall.
- The following locations exhibit minor impact damage with heavy cracking and/or spalling with exposed reinforcement:
 - North railing in spans 3, 4, and 9.
 - Median railing north face of the over piers 4, 10, and 12 (**photo 9**).
- Minor debris accumulation exists along the median railing.
- Northeast approach railing exhibits minor impact damage to steel approach rail. Minor impact damage was noted at other locations.
- All of the traffic safety items meet current standards for a National Highway System roadway.

NBI Item 58 – Deck (6 = Satisfactory condition)

Driving Surface – (6 = Satisfactory condition) *The following conditions are considered to be minor deterioration.*

- **PX** – The original portion of the deck (span 4 (east 70 feet) and spans 5 through 12) has control joints at every second or third floor beam. The pourable joint sealant has typically failed, allowing water to drain onto the floor system. Small spalls are typical along control joints. Deck patches are common along these joints, and many patched areas exhibit recent spalling and heavy cracking (**photo 10**). Multiple areas previously mentioned as being deteriorated have been patched. Locations of unrepaired spalling or deteriorated patches are as follows:

| Span | Location | Lane | Description |
|------|--------------|-----------|---|
| 4 | Pier 4 | Westbound | 8-inch-wide by 6-inch-long patch in south lane. 4-foot-wide by 12-foot-long patch in north lane. |
| 4 | Floor beam 2 | Westbound | Severe scaling of joint header repair. |
| 4 | Floor beam 7 | Westbound | Deteriorating patch in north lane. |
| 6 | Pier 6 | Westbound | Failing patches near pier 6. |
| 10 | Floor beam 2 | Eastbound | 3-foot-wide by 6-inch-long delamination. |

| Span | Location | Lane | Description |
|------|----------|-----------|---|
| 13 | Pier 12 | Eastbound | 3-foot-wide by 1-foot-long spall/delamination in north lane |

- The deck is offset 1 inch relative to the approach concrete railing mounted to the wingwalls at the east abutment (**photo 11**).
- The newer portion of the deck (spans 1 through 3 and approximately 127.5 feet of span 4) exhibit isolated locations of moderate transverse cracking up to 0.020-inch-wide and spaced at 3 to 5 feet, high-density longitudinal cracking up to 0.020-inch-wide and spaced less than 1-foot, and hairline map cracking. The westbound lanes in span 3 exhibit diagonal cracking up to 0.030-inch-wide (**photo 12 and 13**). Some of the wider cracks have been sealed. Transverse cracking in the deck is typical over the piers.
- The original portion of the deck (spans 5 through 12 along with approximately 72.5 feet of span 4) typically exhibits transverse cracking up to 0.050-inch-wide and spaced at 5 to 10 feet (**photo 14**). Many of the cracks are full depth and are reflected in the soffit.
- All of the raised pavement markers between lanes in both directions have broken loose from the deck.
- The north edge of the deck at the west abutment is in contact with the backwall, causing the edge of the deck to spall.

Soffit – (6 = Satisfactory condition)

- The original portion of the deck exhibits full depth and full width transverse cracking up to 0.030-inch-wide spaced at 2 to 6 feet with minor efflorescence (**photo 15**). Cracking is most prominent over the piers.
- Shallow spalls exist sporadically adjacent to girder top flanges throughout the main spans.
- Isolated areas of the soffit overhangs exhibit spalling with exposed reinforcement adjacent to the joints.
- The soffit below the median in span 4 over pier 3 exhibits a 2-square-foot spall with exposed and corroded reinforcing steel (**photo 16**).
- Soffit between girders 2 and 3 exhibits rust staining and small pop-outs due to shallow cover of reinforcing steel chairs.
- The deck is lifting above the stringers due to pack rust forming on the floor beams and stringer ends at several locations (**photo 17**). Evidence of deck pumping under truck loads was also observed at a few locations (**photo 18**). The pack rust is promoted by leaking deck control joints.
- Stay-in-place forms used where joints have been replaced typically exhibit areas of surface and laminating corrosion near the interface with the original deck.

Joints – (4 = Poor condition)

- **PX** – Modular joints exist above piers 3, 6, and 10. The pier 3 joint was replaced with the west approach spans after the 2002 partial collapse. The piers 6 and 10 modular joints were installed as part of the 1983 deck and substructure rehabilitation and replaced finger joints with elastomeric trough. The modular joints consist of the following components:
Transverse Separation Beams – exist between the elastomeric compression seals

Support Bars – longitudinal bars that span the joint and support the Transverse Separation Beam.

Support Boxes – steel boxes embedded in the deck on opposite sides of the joint to provide a bearing area for the Support Bar.

Equidistant Control Bars/Springs – bars and springs designed to keep the support bars in place.

- The following deficiencies were observed in the pier 3 joint:

| Joint | Support Joint Assembly | Description |
|-------|------------------------|--|
| 3 | 2 | Western support box is unsupported between the prestressed concrete beams (photo 19) . |
| 3 | 3 | Both bottom plates of support boxes have fractured below the support bars. A portion of the bottom plate and bearing block are missing under the west end of support bar 1 leaving the bar unsupported (photo 20) . Bearing block for support bar 2 is dislodged. East end of support bar 2 is partially unsupported. |
| 3 | 4 | Both bottom plates of support boxes have fractured below the support bars (photo 21) . |
| 3 | 5 | The bearing block for support bar 1 is missing at the east support box (photo 22) . |
| 3 | 6 | The bearing block for support bar 1 is missing at the east support box (photo 23) . |
| 3 | 7 | The west bottom plate of the support box has fractured below the support bar 1 (photo 24) . |
| 3 | 8 | The west support box is only supported by the end 6 3/4 inches over its 22 1/4-inch total length. A 7-inch diameter spall exists to the thin layer of concrete below the beam. |
| 3 | 14 | A 0.010-inch-wide crack exists in 3-inch-thick unreinforced concrete pour below the support beam. The weld for the stainless steel plate on the bottom of the support beam is cracked full width (photo 25) . |
| 3 | 15 | The west bottom plate of the support box has fractured below support bar 1. Composite reinforcing extending up from beam 10 is exposed with no concrete under support box (photo 26) . |

| Joint | Support Joint Assembly | Description |
|-------|------------------------|---|
| 3 | 16 | The west bottom plate of the support box and the 3-inch-thick unreinforced concrete pour below the support box have fallen away and are no longer supporting support bar 1 (photo 27). East support box has a crack in the bottom plate between the middle vertical plate and the bearing for support bar 1. Sliding surface for the bearing block of support bar 1 is dislodged. |
| 3 | 17 | The 3-inch thick unreinforced concrete pour below the support box is not continuous with the concrete beam top flange. |

The several of the western support boxes at pier 3 are unsupported with only a thin layer of concrete beneath the box, which does not provide adequate support. The plans (17051(2002-07-26)BP) notes that the joint manufacturer was to provide details for supports of the bearing support box on the prestressed concrete beam side of the joint. The details for these supports were not included in the bridge plans and no support for the boxes exist between the prestressed beams. The eastern boxes have a seat angle attached to the end floor beam. The entire bridge repairs after the partial collapse were completed in just 2 months. The modular joint at pier 3 was also observed to be closed and the neoprene joint seals are cracked and split (photo 28).

- The joints above piers 6 and 10 have support assemblies with cantilevered equidistant control bars (used to ensure equal compression of the neoprene compression seals). These equidistant control bars and the support bar welds are cracked, broken, or dislodged at the following locations:

| Joint | Support Joint Assembly | Description |
|-------|------------------------|---|
| 6 | 1 | One equidistant bar broken and dislodged. |
| 6 | 2 | Transverse separation beam is fractured, and the repair plate welded to the top of the beam has also fractured (photos 29 and 30). The longitudinal support bar has broken free from the transverse separation beam and is displaced. Both equidistant bars are broken and missing. The transverse separation beam has dropped 1 inch (photo 31). |
| 6 | 3 | Longitudinal support bar has broken free from the transverse separation beam (photo 32). One equidistant bar is missing. |
| 6 | 4 | Equidistant bars are missing. |
| 6 | 10 | One equidistant bar broken and wedged in place. |

| Joint | Support Joint Assembly | Description |
|-------|------------------------|---|
| 6 | 11 | One equidistant bar is dislodged, and one equidistant bar is missing. |
| 6 | 12 | Both equidistant bars are missing. |
| 6 | 13 | The longitudinal support bar has broken free from the transverse separation beam and is displaced (photo 33). One equidistant bar dislodged, and one equidistant bar missing. |
| 6 | 14 | Both equidistant bars are dislodged. |
| 10 | 1 | Shim plates exist between both support boxes and the supporting angles. |
| 10 | 3 | The longitudinal support bar has broken free from the transverse separation beam and is displaced (photo 34). |
| 10 | 4 | The longitudinal support bar has broken free from the transverse separation beam and is displaced (photo 35). South equidistant bar broken and is wedged in place. |
| 10 | 5 | Support beam detached from the transverse support beam and has slid east (photo 36). |
| 10 | 12 | Equidistant bars are no longer attached and one is wedged in place. |
| 10 | 13 | Equidistant bars are missing |

Modular joints historically have been very susceptible to fatigue cracking due to the number of cycles (one per wheel load), the intensity of the impact load and the fatigue prone weld details.

- **PX** – The modular joint seals over piers 3, 6, and 10 are bulging and torn along the full length of the joints **(photo 37)**. This deterioration allows water to drain through the joint accelerating the deterioration of the steel superstructure and the pier caps below. During this inspection, these conditions were noted at several other locations as well.
- **PX** – The pourable expansion joint seal at the west abutment is missing the joint seal for 10 feet in the westbound lanes and throughout the southern lane of the eastbound lanes **(photo 38)**.
- **PX** – The strip seal expansion joint at the east abutment was installed as part of the 1983 deck and substructure rehabilitation project and is closed at 91°F **(photo 39)**. The joint was designed to have a 2 1/2-inch opening at 60°F. The joint in the westbound lanes is impacted with soil and gravel in the inside shoulders and partially covered in a light amount of asphalt. The joint header in the westbound lanes exhibits a 24-inch-wide by 9-inch-long by 2-inch-deep spall in the northern lane. The seal in the eastbound lanes is missing causing the joint to leak and allowing drainage to pass onto the bearing seat at the east abutment. The joint armor in the eastbound lanes exhibits a 1/2-inch vertical offset with the bridge side joint armor lower than the approach joint armor.

- **PX – Shallow spalls exist in the deck along the span 4 side of the modular expansion joint at pier 3 (photo 40).** These appear to correspond with the location of support boxes 3 through 6. Support boxes 3, 5 and 6 have missing bearing blocks for the support bar; however, it could not be determined if this has caused the spalling.
- The transverse separation beam is for the modular joint at pier 6 is sagging at the north curb.
- Several of the deck control joints exhibit minor spalling adjacent to the joints and missing joint seals.
- The median joint sliding plate is missing at pier 6 (photo 41).

NBI Item 59 – Superstructure (6 = Satisfactory condition)

| Fracture Critical Member Rating Summary | |
|---|----------------------------|
| Steel Girders | 6 = Satisfactory condition |
| Floor Beams | 6 = Satisfactory condition |

[FCM] Steel Girders – (6 = Satisfactory condition) *Conditions noted below are considered minor deterioration.*

The end 129 feet of span 4 was replaced in 2002 due to damage sustained from the loss of spans 1 through 3. This portion of the structure was replaced in-kind with the deck being composite for the girders and stringers. The remaining steel superstructure appears to be non-composite; however, this was not confirmed.

Span 4 – Floor beams numbered 0 through 7, deck control joints at floor beams 3 and 6, and horizontal splice termination at floor beam 5.

Span 5 – Floor beams numbered 0 through 13, deck control joints at floor beams 0, 3, 6, 8 and 11, and horizontal splice termination at floor beams 3 and 11.

Span 6 – Floor beams numbered 0 through 8, deck control joints at floor beams 2 and 5, and horizontal splice termination at floor beam 3.

- **FX – Horizontal web splice plates welded to the girder web creates a category E fatigue prone detail at the termination.** These splice plates occur near the neutral axis of the girders. Vertical cracks exist at the termination of the horizontal web splice at the following locations:

| Span | Girder /Face | Near Floor Beam | Description |
|------|--------------|-----------------|--|
| 4 | 2 South | 5 | Upper web: 1-inch-long crack arrested by cored hole. Lower web: 1 1/2-inch-long crack arrested by cored hole. (photo 42) |
| 4 | 4 South | 5 | Lower web: 7/16-inch-long crack arrested by a cored hole. (photo 43) |
| 5 | 1 North | 11 | Upper web: 3/4-inch-long crack stopping short of the cored hole. Lower web: 1 1/4-inch-long crack arrested by two cored holes. (photo 44) |

| Span | Girder /Face | Near Floor Beam | Description |
|------|--------------|-----------------|--|
| 5 | 2 South | 11 | Upper web: 2-inch-long crack arrested by a cored hole. (photo 45) |
| 5 | 3 North | 11 | Upper web: 7/8-inch-long crack stopping short of the cored hole. (photo 46) |
| 5 | 4 South | 3 | Upper web: 1 1/8-inch-long crack arrested by a cored hole. Lower web: 1-inch-long crack arrested by a cored hole. (photo 47) |
| 5 | 4 South | 11 | Lower web: 1-inch-long crack arrested by a cored hole. (photo 48) |
| 6 | 1 North | 3 | Upper web: crack arrested by a cored hole. Lower web: crack arrested by a cored hole. (photo 49) |
| 6 | 2 South | 3 | Upper web: 1-inch-long crack arrested by a cored hole. (photo 50) |
| 6 | 3 North | 3 | Upper web: Paint crack originally noted. Paint removed by wire brush, no crack found under paint. (photo 51) |
| 6 | 4 South | 3 | Lower web: 1 1/4-inch-long crack arrested by a cored hole. (photo 52) |

No visible signs of crack growth or propagation beyond the cored holes were observed.

- FX** – The lateral bracing gusset plates are welded to the web of the girders with the use of 1/4-inch-thick backer bars due to the proximity of the bracing gusset plate to the girder bottom flange. Many of these welds appear to have undercut the girder web base metal. Holes have been cored in the girder webs at the ends of the lateral bracing gusset plates at the following locations:

| Span | Girder | Near Floor Beam | Description |
|------|--------|-----------------|--|
| 10 | 1 | 4 | 1 1/2-inch diameter cored hole with no visible crack. |
| 11 | 1 | 1 | 2-inch diameter cored hole with no visible crack. |
| 11 | 2 | 3 | 1 1/2-inch diameter cored hole with no visible crack. |
| 12 | 2 | 1 | 1 1/2-inch diameter cored hole with no visible crack (photo 53) . |
| 12 | 2 | 2 | 1 1/2-inch diameter cored hole with no visible crack. |

Weld material has also spilled behind the backer bars along the girder webs. This condition does not appear to be of major concern currently.

- Lateral bracing gusset plates at floor beams 3, 4, 5 in spans 4 and 6, and floor beams 3 and 11 in span 5 have been flame-cut and reattached to the girder webs with bolted bent plates. The lateral bracing modifications occurred during the 1983 rehabilitation project. A reason for these modifications could not be determined from the plans. Arc gouges up to 1/4 inch deep exist in the web of the girders along the original lateral bracing weld lines **(photo 54)**.
- Pack rust exists at isolated locations in the main girder spans:
 - Between the horizontal splice in the web of the girders.
 - Between vertical connection stiffeners and floor beam truss lower chord gusset plates

- Between at the girder bottom flange field splices (**photo 55**). Pack rust up to 1/4 inch thick exists at the termination of the girder bottom flange resulting in minor section loss to the splice plates.

Pack rust is active in many locations and is the result of leaking deck and expansion joints.

- Laminating corrosion exists between the girder bottom flange and the lateral bracing gusset plates at piers 5 and 6 resulting in section loss (**photo 56**).
- The weld between the lateral bracing gusset plate and connection stiffener on girder 4, span 6 at floor beams 5 has a 3-inch long crack (**photo 57**).
- Paint cracks noted between the vertical or connection stiffener and the girder flange or lateral bracing gusset plates were observed at the following locations:

| Span | Girder /Face | Near Floor Beam | Description |
|------|--------------|-----------------|---|
| 6 | 3 | 4 | Paint crack between the vertical stiffener and bottom flange. No weld exists between the vertical stiffener and bottom flange. (photo 58) |
| 6 | 4 | 7 | 8 1/2-inch-long paint crack between the vertical stiffener and the lateral bracing gusset plate. |
| 8 | 3 | 2 | 1 3/4-inch long paint crack around the end of the vertical stiffener to top flange weld, 1/4-inch growth since the 2021 inspection. (photo 59) |
| 8 | 4 | 2 | 3 1/2-inch-long paint crack at the vertical stiffener to top flange weld. (photo 60) |

Paint tends to puddle around the base of the vertical stiffener. The thick paint shrinks and results in the observed paint cracks.

- Girder 1, span 4 near floor beam 5 exhibit grinder marks at the girder web.
- A welded nut or open hole exists at the inboard web splice plate in span 5 at girder 1 near floor beam 9, and girder 3 near floor beams 3, 5, and 9 (**photo 61**). These likely were used to aid in positioning the splice plates.
- Loose bolts in the web splice plates were observed at girder 3, span 7 near floor beam 4 and girder 4, span 11 near floor beam 4.
- Tri-axial welds exist at the intersections between vertical or connection stiffeners and the girder flanges. No cracked welds are noted.

Prestressed Concrete Beams – (6 = Satisfactory condition) *The following conditions are considered minor deterioration.*

Spans 1 through 3 were replaced with prestressed concrete, 72-inch deep bulb tee beams. A total of 12 beams were used per span and the spans are simply supported.

- **FX** – End faces of the following beams exhibit spalls with exposed strands:

| Span | Beam | Pier | Description |
|------|------|------|---|
| 1 | 1 | 1 | Crack extending 30 inches up the web and spall in bottom flange exposing 9 strands. |
| 2 | 12 | 2 | Spall in bottom flange exposing 23 strands. |

| Span | Beam | Pier | Description |
|------|------|------|--|
| 3 | 1 | 2 | Crack extending 31 inches down the web and spall exposing 3 strands. |
| 3 | 12 | 2 | 12-inch by 4-inch spall/delamination in web exposing 3 strands, delaminated area over bottom flange strands. |
| 3 | 1 | 3 | Spall in bottom flange exposing 4 strands. |
| 3 | 12 | 3 | Spall in bottom flange exposing 26 strands and smaller spall in web exposing 4 strands (photo 62). |

- Some of the girder ends exhibit hairline cracking with rust and efflorescence staining from the deck. This condition has not changed from the previous inspection.
- Beam 6, span 3 at pier 3 bottom flange has the ends of the mild steel anchors for the sole plate exposed (photo 63).

Stringers – (6 = Satisfactory condition) *The stringers rest on the top flanges of the floor beams and following conditions are considered minor deterioration.*

The stringers between floor beams 0 and 5, span 4 were replaced due to damage sustained from the loss of spans 1 through 3. This portion of the structure was replaced in-kind with the deck being composite for the girders and stringers. The remaining steel superstructure appears to be non-composite; however, this was not confirmed. The stringers frame into the face of every third floor beam and are continuous over the top of the remaining floor beams.

- **PX** – Bolts and/or nuts are missing or loose in the stringer to floor beam connections at the following locations:
 - Span 6, west side of floor beam 1, stringer 1 exhibits two missing bolts.
 - Span 6, east side of floor beam 1, north face of stringer 3 exhibits a missing nut.
 - Span 7, floor beam 2, stringer 4 exhibits four not fully seated bolts.
 - Span 8, west face of floor beam 0, stringer 3 exhibits one missing bolt.
 - Span 10, floor beam 0, stringer 3 exhibits four missing bolts (photo 64).
 - span 12, between floor beams 3 and 4, stringer 3 has a loose bolt on the bottom flange splice.
- **PX** – The stringer diaphragm between stringers 3 and 4, span 6 over floor beam 5 exhibits an 8 1/2-inch-long crack. No growth was noted during this inspection (photo 65).
- The deck is lifting off the stringers at several locations (photo 17). This separation can eventually cause an uneven riding surface increasing impact on the superstructure and further accelerating deck deterioration.
- Stringer 2 diaphragm connection on the north face at floor beam 1, span 8 exhibits 5 of 7 connection bolts not fully seated.
- Stringer 3 connection to floor beam 1 in span 6 has one broken bolt. Stringer 3 connection to the floor beam at pier 9 is missing all 4 anchor bolts. Stringer 4 connection to floor beam 2 in span 8 has all four bolts not fully seated.
- Stringers in span 7 near pier 6 and span 13 near the east abutment have a partial length welded cover plate beneath the bottom flange creating a category E fatigue prone detail.

[FCM] Floor Beams – (6 = Satisfactory condition) *The following conditions are considered minor deterioration.*

- **PX** – Cracks are present at the top of the weld termination of the floor beam vertical stiffener at the following locations:
 - Span 4, floor beam 4, stringer 1 has two cracks. A 1 5/8-inch-long horizontal crack extends above the stiffener with the majority of the crack length on the north side. A 1 1/2-inch-long horizontal crack extends across the top edge of the weld with the majority of the crack length on the south side (**photo 66**).
 - Span 4, floor beam 4, at stringer 3 has a horizontal crack extending 3/4 inch north of the stiffener and 1 1/8 inches south of the stiffener (approximately 2 3/8 inches total length) (**photo 67**).

The cracks only occur on the east face of the floor beam and appear to be due to flexure of the web by the stringer.

- Noted misalignment of the floor beams is as follows:
 - **Member Alignment** – A 1/4-inch global sweep to the east exists in floor beam 3, span 6 between girders 1 and 2. A 1/2-inch-long by 3/16-inch-deep gouge also exists in the bottom flange approximately 2 feet from girder 2. The sweep appears to be from construction and has not changed from prior inspections. It is assumed that the bracing provides additional support to the floor beam.
 - Floor beam 2, span 6 between girders 3 and 4 lower strut exhibits an 11/16-inch local kink to the west of over a 10-inch length (**photo 68**).
 - Floor beam 0, span 9 at girder 4 exhibits slight bow in lower gusset plate.

Minor construction related damage exists to the bottom strut for the floor beam connections in isolated locations.

- Painted over pack rust exists at the floor beam connections due to deck drainage leaking through the deck control and expansion joints:
 - Floor beam 6, span 4 at girder 4 – 1/2-inch-thick painted over pack rust between the floor beam web and the connection plate (**photo 69**).
 - Floor beam 8, span 6 at girder 4 – 1/2-inch-thick painted over pack rust between the floor beam web and the connection plate.
 - Floor beam 8, span 6 between girders 3 and 4 – 1-inch-thick (previously 1/2-inch-thick) pack rust between the floor beam truss lower strut and the lower center gusset plate with 1/16-inch-deep section loss to the gusset plate (**photo 70**).
 - Floor beam 0, span 7 – 1-inch-thick pack rust between floor beam lower strut and center gusset plate.
 - Floor beams in spans 10 and 11 over pier 10 – 1-inch-thick pack rust between floor beam lower strut and center middle gusset plate.

Pack rust is also developing between the diaphragm top flange and the deck soffit at random locations.

- Loose bolts or oversized bolt holes in the floor beam to girder connections were noted at the following locations:
 - Floor beam 8, span 5 at girder 3 – one loose bolt.
 - Floor beam 3, span 7 at girder 2 – one missing and one loose bolt.
 - Floor beam 4, span 9 at girder 2 – one loose bolt.

- Floor beam 3, span 11 at girder 2 – top 6 bolts have oversized holes **(photo 71)**.
- Floor beam 2, span 12 at girder 2 – top 9 bolts have oversized holes.
- Fretting corrosion is present at the isolated upper floor beam connections to the girders. The movement may be due to a loose connection.

Floor Bracing System– (5 = Fair condition)

- **PX** – Fatigue cracks are present in the welds for the lateral bracing gusset plates at several locations. Lack of fusion and weld undercuts were observed at the gusset plate welds at several locations. The locations are as follows:

| Span | Girder | Floor beam | Comment |
|------|--------|------------|---|
| 4 | 2 | 7 | Poor weld adhesion for 7 inches observed at the gusset plate weld. |
| 5 | 2 | 0 | 2-inch-long area of lack of fusion on south face at end of lateral bracing gusset plate. |
| 5 | 2 | 4 | Poor weld adhesion for 7 inches observed along the gusset plate weld on the south face of the girder web at the west end of the plate. |
| 5 | 2 | 8 | Undercut in weld 2 inches long by 1 inch wide by 1/8 inch deep. |
| 6 | 4 | 2 | Undercut in weld adjacent to the end of the lateral bracing gusset plate weld. |
| 6 | 4 | 7 | 8 1/2-inch-long paint crack due to undercut weld. |
| 8 | 3 | 4 | 8 1/2-inch-long crack tangent to the corner of the lateral bracing member weld. 3 1/2-inch-long crack along the floor beam bottom flange. (photo 72) . |
| 9 | 3 | 4 | 3 3/8-inch-long undercut weld between lateral bracing gusset plate to girder web. |
| 9 | 4 | 1 | 2 1/2-inch-long undercut weld at the lateral bracing gusset plate connection to girder 4. |
| 10 | 2 | 2 | 18-inch-long crack gusset plate weld (photo 73) . |
| 11 | 1 | 2 | 6-inch-long undercut weld between lateral bracing gusset plate to girder web east side (photo 74) . 8-inch-long undercut weld on the west side (photo 75) . |
| 11 | 2 | 1 | 8-inch-long crack along weld on south face of girder on east end of plate. Previously noted as 8 1/2 inches long; however, no change present. |
| 11 | 2 | 1 | 6-inch-long the crack along weld on south face of girder on west end of plate. |
| 11 | 3 | 2 | Undercut weld between lateral bracing gusset plate to girder web (photo 76) . |
| 11 | 3 | 4 | Undercut weld along the lateral bracing connection plate weld to the girder web at the west end. |
| 12 | 1 | 4 | Undercut weld along the lateral bracing connection plate on the west side of the floor beam. |

- **PX** – The lateral bracing vibration dampeners were installed during the 1983 and exhibit fractures or deterioration at the following locations:
 - Span 4, between girders 1 and 2, between floor beams 5 and 6 – spring hanger connection to bracing fractured.

- Span 4, between girders 1 and 2 and between floor beams 8 and pier 4 – spring hanger connection to bracing fractured.
- Span 4, between girders 3 and 4 and between floor beam 7 and pier 4 – spring hanger connection to bracing fractured (**photo 77**).
- Span 6, between girders 1 and 2 and between floor beams 2 and 3 – Guide bar wearing into the spring hanger housing.
- Span 6, between girders 3 and 4 and between floor beam 0 and 1 – fractured spring not functioning as intended.
- **Span 6, between girders 3 and 4 and between floor beam 6 and pier 6 – internal spring not connected to cable attached to stringers.**
- **PX** – A corrosion hole measuring 8 1/2 inches by 2 3/4 inches exists through the lateral bracing gusset plate at girder 4, span 6 at pier 6 (**photo 78**).
- Bolts and/or nuts are missing or loose in the diaphragm to girder connections at the following locations:
 - Span 8, between stringer 2 and girder 2, diaphragm connection has one loose bolt and one missing bolt.
 - Span 8, at girder 1 at floor beam 1, diaphragm connection has two loose bolts.
- The north cable clamps for the dampeners between floor beams 3 and 5 between girders 3 and 4 in span 6 were installed with saddle over free end (**photo 79**).
- Small distortions in the lateral bracing angles are common most likely due to erection damage.

Paint/Coating System – (6 = Satisfactory condition)

- The paint system is sound. Corrosion is reactivating under joints resulting in isolated areas of pack rust and laminating corrosion.

Load Deflection – (6 = Satisfactory condition)

- Vibrations under heavy truck loads exist in the steel girder spans.

NBI Item 60 – Substructure (6 = Satisfactory condition)

Abutments – (6 = Satisfactory condition) *The following conditions are considered minor deterioration.*

Both abutments are supported by steel piles with the front row battered. The west abutment was replaced in 2002 as a result of damage sustained to the original abutment from the collapse of spans 1 through 3.

- **PX** – The east abutment breastwall exhibits undermining with up to 20 inches of penetration beneath the flowable fill repair installed prior to the 2013 fracture inspection to encase the exposed steel piles (**photo 80**). No exposure of the piles was observed. The embankment soil under span 13 is silt with no vegetation near the abutment. Erosion appears to be the result of deck drainage passing through the strip seal expansion joint at the abutment.

- **PX** – Debris and ponding drainage exists on the east abutment seat (**photo 81**). The debris is up to 9 inches deep under the median between girders 2 and 3.
- Deck drainage is leaking through the poured seal joint at the east abutment (**photo 82**).
- Erosion exists under the remnants of the original west abutment under span 1 near the replaced abutment (**photo 83**). This erosion does not affect the replaced abutment.
- Both abutments exhibit random hairline cracking with the east abutment cracks up to 0.020 inch wide.

Piers – (6 = Satisfactory condition) *Conditions noted below are considered minor deterioration.*

Piers 1 through 3 were replaced in 2002 as a result of damage sustained to the original abutment from the collapse of spans 1 through 3. The replacement piers are founded on new drilled shafts, independent from the original pier spread footings. Both the drilled shafts and spread footings are keyed into hard shale.

- **PX** – Pier 6, column 2 exhibits a 5-square-foot spall with exposed and corroding reinforcing steel at the top of the web wall and a vertical crack extending the full height of the column (**photo 84**). This spall appears to be the result of a lateral force acting on the pier. Documentation of when the spall occurred could not be found but is speculated to be associated with the collapse of spans 1 through 3. The spall appears to have only affected the cover concrete and does not significantly affect the load carrying capacity of the column.
- **PX** – Seismic restraints, consisting of cables attached between the bottom flange of the girders and the pier cap, exist at piers 6 and 10.
 - Pier 6 – cables for all four girders are broken (**photo 85**).
 - Pier 10 – both cables for beams 1 and 3 are broken and one of two cables for girder 2 is broken (**photo 86**).

The seismic restraint cables were installed during the 1983 rehabilitation project.

- Insignificant cracking and spalls were observed in the pier columns and caps:
 - Pier 1 – The cap on the west and east faces at the south end exhibits a 1/16-inch-wide by 20-foot-long crack 2-feet from the top.
 - Pier 4 – The wall exhibits several vertical and diagonal cracks between the cap and shelf, and in the lower portion below the shelf and extending below water (**photo 87**). These cracks were sealed as part of the 1983 rehabilitation project.
 - Pier 5 – The wall exhibits a few vertical cracks. The cracks appear to be sealed similar to those in pier 3; however, the 1983 rehabilitation plans do not include pier 5 as having these repairs. The pier cap exhibits vertical cracking between beams 2 and 3.
 - Pier 6 – The cap exhibits rust staining throughout and a spall to the bottom east edge of the south cantilever.
 - Pier 10 - The cap exhibits a wide crack and delamination to the bottom west edge between girders 3 and 4.

Bearings – (5 = Fair condition)

- **PX** – The elastomeric bearings for the steel girders in span 4 at pier 3 have the following conditions:
 - Girder 1 – The elastomeric bearing has sheared longitudinally 2 inches in contraction between the sole plate and the bearing seat, causing the bearing to split near the sole plate at the northeast corner and debond from the sole plate at the southeast corner (**photo 88**). The bearing has rotated about the vertical axis with the southeast corner of the sole plate extending past the bearing assembly 3 1/2 inches and the northeast corner 1 5/8 inches (no change from 2019 inspection when first documented). The PTFE pad between the sole plate and bearing assembly is distorted and the stainless steel sliding surface welded to the bearing assembly has been painted. The bearing assembly is near its limit of expansion and is in contact with the bearing seat (**photo 89**).
 - Girder 2 – The elastomeric bearing is bulging along the east edge of the sole plate (**photo 90**). The bearing was vulcanized to the sole plate and appears to either be debonded or not installed completely under the sole plate. The bottom east edge is lifting from the pier seat.
 - Girder 3 – The bearing assembly is not aligned parallel with the girder causing binding of the anchor bolts in the slots during expansion and contraction (**photo 91**). The bearing is offset 5/16 inch over a 16 5/8-inch length. The bearing assembly also bears on the pier seat as evidenced by fretting corrosion.
 - The stainless-steel sliding surface for the girder bearings have been painted (**photo 90**). This condition has compromised the low friction sliding surface of the bearings, causing longitudinal movements to be accommodated by deformation of the elastomeric bearings instead of sliding.
 - The bearings are at or near full expansion at 91°F while the adjacent span 3 bearings at pier 3 are nearly centered.
- The rocker bearings at piers 4, 6, 10 and at the east abutment have pack rust between the rockers and the masonry plates (**photo 92**). The lead bearing pads below the masonry plates are extruding out from under the masonry plates, suggesting the bearings are being loaded longitudinally. Several rocker bearing bolts are broken or missing, especially at pier 6 and the east abutment.
- East abutment bearings typically exhibit surface corrosion on the rocker and the masonry plate with up to 1/16-inch-deep active corrosion and painted over pitting. Anchor bolts are typically bent and/or broken due to expansion. Girders 1 and 2 bearings have shifted 1-inch north, while girder 3 bearing has shifted 1-inch south. Girder 4 bearing is rotated 11 degrees east and has been reset 4 inches west in the past (**photo 93**).
- The rocker bearings for span 6 at pier 6 are rocked 14° maximum in expansion at 85°F (**photo 94**). The rocker bearings at pier 10 are rotated between 5 and 9 degrees in expansion.
- The bearing for girder 3 at pier 4 is rotated out of alignment relative to the bearings for the other girders. This rotation appears to be due to construction as no correlating signs of distress were noted. The misalignment will tend to transfer higher longitudinal forces to the pier.

NBI Item 61 – Channel and Channel Protection (6 = Bank Slumping condition)**Flowline Stability – (6 = Satisfactory condition)**

- No significant deficiencies were noted for channel scour during this inspection.

Channel Bank Damage – (6 = Satisfactory condition)

- No significant deficiencies were noted to the channel banks. Previously noted erosion hole at the south end of the east abutment has been repaired.

Debris – (7 = Good condition)

- No issues with debris were noted at the time of the inspection.

Vegetation – (7 = Good condition)

- The banks were moderately vegetated at the time of the inspection with no vegetation issues noted.

NBI Item 72 – Approach (6 = Satisfactory condition)**Approach Roadway Condition – (6 = Satisfactory condition)**

- The west and east approaches were recently paved with asphalt prior to the 2023 inspection with the asphalt extending across the east approach slab for both the eastbound and westbound lanes.
- Minor longitudinal and map cracking exists throughout the west approach slab up to 1/16 inch wide and minor edge spalls exist along the approach slab adjacent to the joint.

Approach Roadway Settlement – (6 = Satisfactory condition)

- No significant settlement was observed in the roadways.

NBI Item 113 – Scour Rating (8 = Calculated Scour Above Foundation)

- No change in the scour rating is recommended at this time. See most recent UW report for specifics.

Truss/FC Bridge Rating Form

| | |
|-----------|-------------|
| NBI | 17051 |
| Structure | 6822 0000 X |
| County | Sequoyah |
| Division | 1 |

| | |
|---------------------|----------------|
| Facility Carried | I-40 |
| Feature Intersected | Arkansas River |

| | | |
|------------|------|------|
| NBI Item # | 2023 | 2021 |
|------------|------|------|

| | | |
|---------------------|-------|-------|
| 36 - Traffic Safety | 5, PX | 5, PX |
|---------------------|-------|-------|

| | | |
|--------------------|-------|-------|
| 58 - Deck | 6, PX | 6, PX |
| a. Driving Surface | 6, PX | 6, PX |
| b. Soffit | 6 | 6, FX |
| c. Joints | 4, PX | 5, PX |

| | | |
|--------------------------------|-------|-------|
| 59 - Superstructure* | 6, PX | 6, PX |
| a. Beams (Steel, P/S Concrete) | 6, FX | 6, FX |
| b. Stringers** | 6, PX | 6, PX |
| c. Floor Beams | 6, PX | 6, FX |
| d. Pier Beams | N/A | N/A |
| e. Floor Bracing System | 5, PX | 5, PX |
| f. Truss Upper Chord*** | N/A | N/A |
| g. Truss Lower Chord*** | N/A | N/A |
| h. Truss Web Members | N/A | N/A |
| i. Truss End Posts | N/A | N/A |
| j. Truss Bracing | N/A | N/A |
| k. Paint/Coating | 6 | 6 |
| l. Load Deflection | 6 | 5 |

| | | |
|-----------------------|-------|-------|
| 60 - Substructure**** | 6, PX | 6, PX |
| a. Abutments | 6, PX | 6, FX |
| b. Piers | 6, PX | 6, PX |
| c. Bearings | 5, PX | 5, PX |

| | | |
|-----------------------------------|---|---|
| 61 - Channel & Channel Protection | 6 | 6 |
| a. Flowline Stability | 6 | 6 |
| b. Channel Bank Damage | 6 | 6 |
| c. Debris | 7 | 7 |
| d. Vegetation | 7 | 7 |

| | | |
|--------------------------------|---|-------|
| Approach Roadway | 6 | 5, FX |
| a. Approach Roadway Condition | 6 | 5, FX |
| b. Approach Roadway Settlement | 6 | 6 |

| | | |
|-------------|---|---|
| 113 - Scour | 8 | 8 |
|-------------|---|---|

| | | |
|----------------|-----|-----|
| Flowline/Notes | N/A | N/A |
|----------------|-----|-----|

| Rating | Description (For 36, 58, 59, 60, 72) |
|-----------|---|
| N/A | NOT APPLICABLE |
| 9 | EXCELLENT CONDITION |
| 8 | VERY GOOD CONDITION - no problems noted. |
| 7 | GOOD CONDITION - some minor problems. |
| 6 | SATISFACTORY CONDITION - structural elements show some minor deterioration |
| 5 (FX,PX) | FAIR CONDITION - all primary structural elements are sound but may have minor section loss, cracking, spalling or scour. |
| 4 (PX) | POOR CONDITION - advanced section loss, deterioration, spalling or scour. |
| 3 (PX,CX) | SERIOUS CONDITION - loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present. |
| 2 (CX) | CRITICAL CONDITION - advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken. |
| 1 (CX) | IMMINENT FAILURE CONDITION - major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service. |
| 0 | FAILED CONDITION - out of service - beyond corrective action. |

* - Members with fatigue cracks in compression zones (top flange stringer copes, clip angles, etc.) are to be coded as a 5 unless the crack turns toward a tension zone, then code 3.

* - Members with fatigue cracks in tension zones (cover plate ends, etc.) are to be coded as a 3.

** - Includes connection angles.

*** - Includes gusset plates. Missing rivets in connections are coded as a 3.

**** - Elements with superficial cracking are coded as 6, spalls with exposed rebar 5, spalls with exposed rebar with section loss 4.

| Rating | Description (For 61) |
|--------|--|
| N/A | NOT APPLICABLE |
| 9 | There are no noticeable or noteworthy deficiencies which affect the condition of the channel. |
| 8 | Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in a stable condition. |
| 7 | Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift. |
| 6 | Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor stream bed movement evident. Debris is restricting the channel slightly. |
| 5 | Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel. |
| 4 | Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the channel. |
| 3 | Bank protection has failed. River control devices have been destroyed. Stream bed aggradation, degradation or lateral movement has changed the channel to now threaten the bridge and/or approach roadway. |
| 2 | The channel has changed to the extent the bridge is near a state of collapse. |
| 1 | Bridge closed because of channel failure. Corrective action may putback in light service. |
| 0 | Bridge closed because of channel failure. Replacement necessary. |

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
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Photograph 1 - Looking west at the bridge end view.

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Photograph 2 - Looking southwest at the bridge elevation.

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Photograph 3 - Looking northwest at the north bridge railing, span 8. Note: steel rail bent and two posts detached. Spalls in the concrete has not exposed reinforcing steel.

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Photograph 4 - Looking southeast at the north bridge railing near mid span of span 13. Note: three spalls in the concrete railing where rail posts used to exist.

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Photograph 5 - Looking northeast at the median bridge railing near mid span of span 1. Note: vertical cracks along the length of the bridge rail.

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Photograph 6 - Looking south at the median railing near pier 12 . Note: spalling due to impact damage.

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Photograph 7 - Looking north at the north bridge railing over floor beam 4, span 9. Note: splice for rail is missing.

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Photograph 8 - Looking southeast at the south bridge railing in over pier 6, span 7 near. Note: spalled curb and aluminum rail not spliced.

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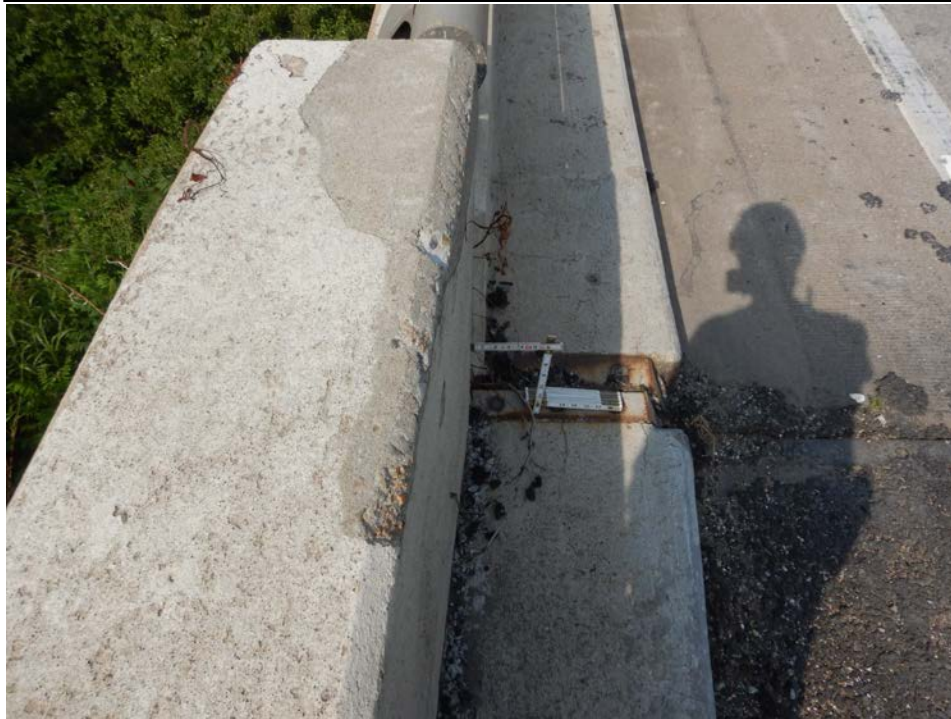
Photograph 9 - Looking south at the south bridge railing near floor beam 1, span 5. Note: rail is connected by a bar.

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|-------|-------------|----------|--------------|------------------|------------|
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Photograph 10 - Looking south at the deck in the westbound lanes over floor beam 1, span 8. Note: patches with adjacent spalls forming along the deck control joint.

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Photograph 11 - Looking west along the south bridge railing at the east abutment. Note: bridge deck is offset 1 inch north relative to the approach railing.

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|-------|-------------|----------|--------------|------------------|------------|
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Photograph 12 - Looking southeast at the deck in the westbound lanes near mid span of span 1. Note: longitudinal cracks (typical in new section of approach beams).

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|--------------|--------------------|---------------|---------------------|-------------------------|-------------------|
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Photograph 13 - Looking south at the deck in the westbound lanes over pier 2. Note: diagonal and longitudinal cracks.

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|--------------|--------------------|---------------|---------------------|-------------------------|-------------------|
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Photograph 14 - Looking northeast at the deck near floor beam 6, span 4. Note: transverse cracks in original portion of deck near the new deck section.

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Photograph 15 - Looking northeast at the deck soffit between girders 3 and 4 near 1/3 span in span 6. Note: transverse cracking with efflorescence spaced at 3 to 6 feet.

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Photograph 16 - Looking east at the underside of the deck under the median at pier 3. Note: spalling with exposed reinforcing steel.

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Photograph 17 - Looking north at stringer 3 near floor beam 11, span 5. Note: deck lifting above stringer (common at deck control joint locations).

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Photograph 18 - Looking northeast at stringer 4 over floor beam 4, span 7. Note: evidence of deck pumping.

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Photograph 19 - Looking northwest at the underside of the pier 3 modular joint at support box 2. Note: bottom plate of the support box is unsupported along the end of span 3. Equidistant spring between support bars is missing (typical).

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Photograph 20 - Looking west at the underside of the pier 3 modular joint at support box 3. Note: bottom plate of support box has fractured and west end of support bar 1 is unsupported. Bearing block for support bar 2 is dislodged. Stainless steel sliding surface is painted.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
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Photograph 21 - Looking southeast at the underside of the pier 3 modular joint at support box 4. Note: the bottom plate of support box has fractured and support bar 2 is unsupported.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
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Photograph 22 - Looking east at the underside of the pier 3 modular joint at support box 5. Note: bearing block for support bar 1 is missing at the east support box. Stainless steel sliding surface is painted (typ.).

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Photograph 23 - Looking southeast at the underside of the pier 3 modular joint at support box 6. Note: bearing block for support bar 1 is missing at the east support box.. Stainless steel sliding surface is painted.

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Photograph 24 - Looking west at the underside of the pier 3 modular joint at support box 7. Note: bottom plate of bearing support box is fractured adjacent to vertical plate.

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Photograph 25 - Looking northeast at the underside of the pier 3 modular joint at support box 14. Note: stainless steel plate welded to support bar 1 at the east bearing box has fractured near the west weld.

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Photograph 26 - Looking southwest at the underside of the pier 3 modular joint at support box 15. Note: bottom plate of the west support box is fractured beneath the bearing block for support bar 1. Composite reinforcing extending up from beam 10 is exposed with no concrete under support box.

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Photograph 27 - Looking northwest at the underside of the pier 3 modular joint at support box 16. Note: bottom plate of the west support box has fractured away and the west end of support bar 1 is unsupported.

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Photograph 28 - Looking south at the north end of the modular joint at pier 3. Note: elastomeric seals are split.

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Photograph 29 - Looking south at the underside of the pier 6 modular joint at support box 2. Note: transverse separation beam fractured. Support bar has broken away from the transverse separation beam.

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Photograph 30 - Looking west at the modular expansion joint in the south eastbound lane at pier 6. Note: repair of the transverse separation beam has failed and beam has dropped 1 inch.

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Photograph 31 - Looking northwest along the modular expansion joint in the south eastbound lanes at pier 6. Note: repair of the transverse separation beam has failed and beam has dropped 1 inch.

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Photograph 32 - Looking south at the underside of the pier 6 modular joint at support box 3. Note: support bar has broken away from the transverse separation beam.

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Photograph 33 - Looking north at the underside of the pier 6 modular joint at support box 13. Note: support bar has broken away from the transverse separation beam. One equidistant bar is missing and the other is loose.

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Photograph 34 - Looking south at the underside of the pier 10 modular joint at support box 3. Note: support beam is no longer attached to the transverse support beam and has slid east.

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Photograph 35 - Looking up at the underside of the pier 10 modular joint at support box 4. Note: support beam is no longer attached to the transverse support beam and has slid east. South equidistant bar has broken and is wedged in place.

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Photograph 36 - Looking north at the underside of the pier 10 modular joint at support box 5. Note: support beam is no longer attached to the transverse support beam and has slid east.

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Photograph 37 - Looking north at the underside of the pier 6 modular joint between support boxes 9 and 10. Note: equidistant bar broken away at support box 10. Joint seal deteriorated and light visible through joint.

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Photograph 38 - Looking north along the poured seal fixed joint at the west abutment. Note: seal is missing in south eastbound lane.

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Photograph 39 - Looking south along the strip seal expansion joint in the westbound roadway at the east abutment. Note: joint is closed.

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Photograph 40 - Looking north along the modular expansion joint in the eastbound lanes at pier 3. Note: spalls in the deck likely correspond with support boxes.

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Photograph 41 - Looking south at the median at pier 6. Note: sliding plate for joint is missing.

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Photograph 42 - Looking north at the termination of the horizontal splice for girder 2, span 4 near floor beam 5. Note: cracks in upper and lower web of girder at horizontal splice termination have been arrested by drilled holes.

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Photograph 43 - Looking north at the termination of the horizontal splice for girder 4, span 4 near floor beam 5. Note: 7/16-inch-long vertical crack in lower web between paint mark and drilled hole. Edge of fill plate for splice plate is cut by drilled holes.

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Photograph 44 - Looking south at the termination of the horizontal splice for girder 1, span 5 near floor beam 11. Note: 3/4-inch-long and 1 1/4-inch-long cracks in upper and lower web of girder at horizontal splice termination have been arrested by drilled holes.

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Photograph 45 - Looking north at the termination of the horizontal splice for girder 2, span 5 near floor beam 11. Note: 2-inch-long crack in upper web of girder at horizontal splice termination has been arrested by drilled hole.

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Photograph 46 - Looking southeast at the termination of the horizontal splice for girder 3, span 5 near floor beam 11. Note: 7/8-inch-long crack in upper web of girder at horizontal splice termination with drilled hole near crack termination.

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Photograph 47 - Looking north at the termination of the horizontal splice for girder 4, span 5 near floor beam 3. Note: 1 1/8-inch-long crack in upper web and 1-inch-long crack in lower web at horizontal splice termination has been arrested with drilled holes.

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Photograph 48 - Looking north at the termination of the horizontal splice for girder 4, span 5 near floor beam 11. Note: 1-inch-long crack in lower web at horizontal splice termination has been arrested with a drilled hole.

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Photograph 49 - Looking south at the termination of the horizontal splice for girder 1, span 6 near floor beam 3. Note: cracks in upper and lower web at splice termination are arrested in drilled holes.

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Photograph 50 - Looking north at the termination of the horizontal splice for girder 2, span 6 near floor beam 3. Note: 1-inch-long crack in upper web at horizontal splice termination has been arrested with drilled holes.

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Photograph 51 - Looking south at the termination of the horizontal splice for girder 3, span 6 near floor beam 3. Note: paint crack in upper web at horizontal splice.

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Photograph 52 - Looking north at the horizontal splice plate at girder 4 west of floor beam 3 at span 6. Note: lower web contains a 1 1/4-inch-long crack arrested with a drilled hole.

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Photograph 53 - Looking northwest at girder 2, span 12 near floor beam 1. Note: arrest hole through girder web at termination of lateral bracing weld.

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Photograph 54 - Looking southwest at lower lateral bracing gusset plate at girder 1 at floor beam 3 in span 6. Note: gouges exist in the web of the girder.

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Photograph 55 - Looking northwest at the bottom flange bolted field splice for girder 4, span 5 at floor beam 9. Note: pack rust with minor section loss to the splice plates.

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Photograph 56 - Looking north below the lateral bracing gusset plate connection to girder 4 at pier 6. Note: laminating corrosion and section loss exists in the girder web.

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Photograph 57 - Looking west at the connection stiffener for girder 3, span 6 at floor beam 3. Note: 3-inch-long crack in the weld to the lateral bracing gusset plate.

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Photograph 58 - Looking east at the connection stiffener for girder 3, span 6 at floor beam 4. Note: paint crack at the interface with the girder bottom flange.

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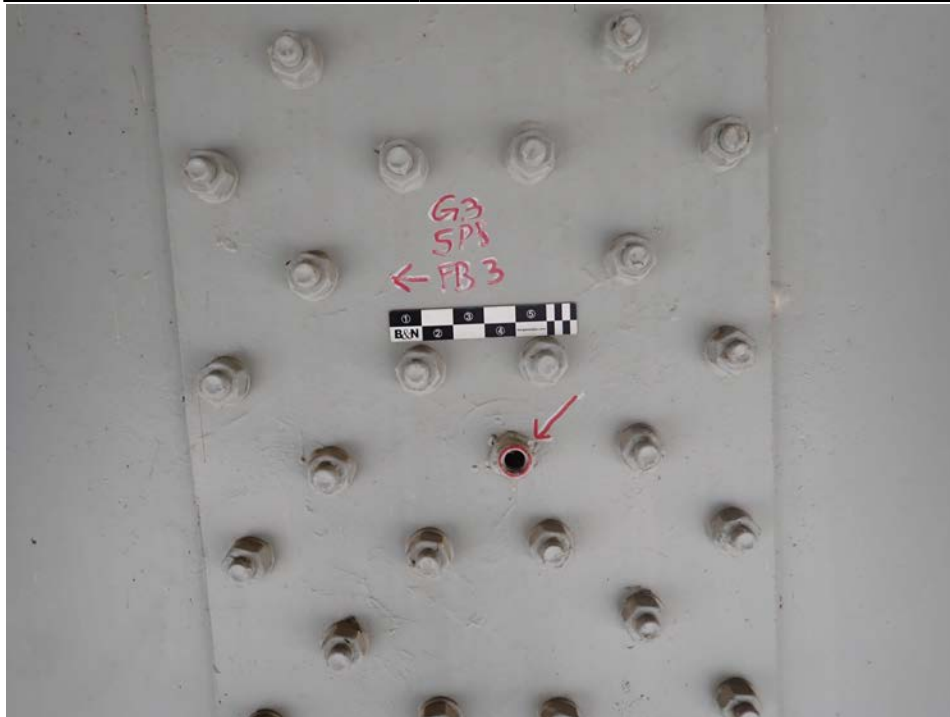
Photograph 59 - Looking south at the vertical stiffener for girder 3, span 8 at floor beam 2. Note: 1 3/4-inch-long paint crack in the weld to the top flange.

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Photograph 60 - Looking east at the connection stiffener at girder 4, span 8 at floor beam 2. Note: 3 1/2-inch-long paint crack at the weld to the lateral bracing gusset plate.

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Photograph 61 - Looking south at the web splice at girder 3, span 5 near floor beam 3. Note: nut welded to splice plate.

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Photograph 62 - Looking southwest at prestressed beam 12, span 3 at pier 3. Note: strands exposed in the end of the beam (26 in bottom flange and 4 in web), corrosion stains and cracks with discolored concrete in web.

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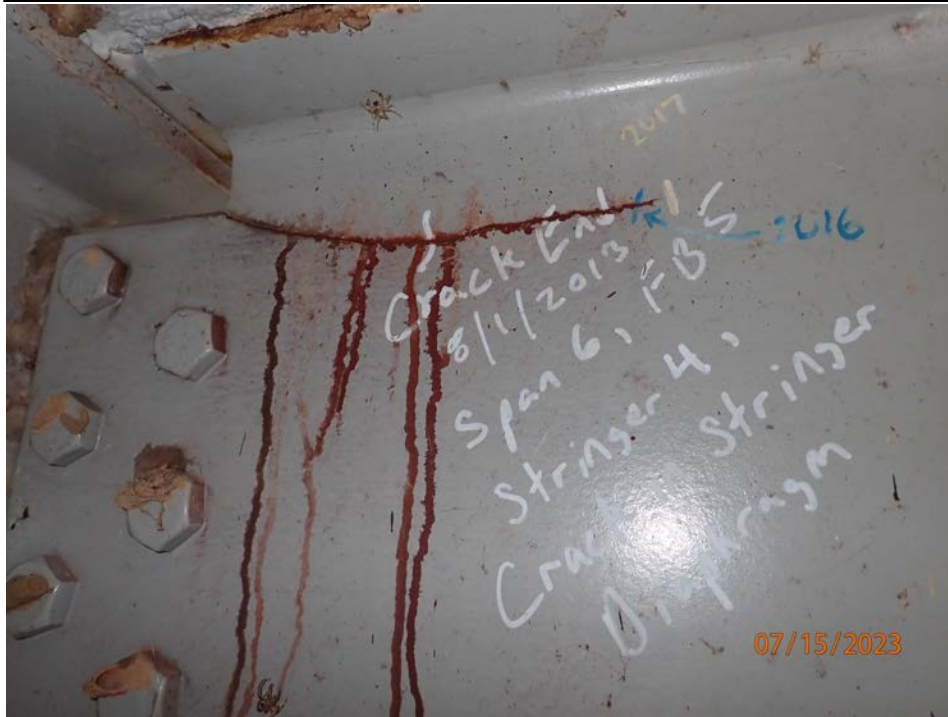
Photograph 63 - Looking south at the bottom flange of prestressed concrete beam 6, span 3 at pier 3. Note: ends of mild steel anchors for sole plate are exposed.

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Photograph 64 - Looking northeast at stringer 3, span 10 over the floor beam 0. Note: all 4 anchor bolts are missing.

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Photograph 65 - Looking east at the stringer diaphragm connection to stringer 4 at floor beam 5, span 6. Note: 8 1/2-inch-long horizontal crack in web.

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Photograph 66 - Looking west at floor beam 4 at stringer 1 in span 4. Note: 1 5/8-inch-long horizontal crack exists approximately 1/4 inch above the weld termination of the stiffener and extending north and south of the stiffener. 1 1/2-inch-long horizontal crack exists at the toe of the weld termination of the stiffener connection south.

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Photograph 67 - Looking west at floor beam 4 at stringer 2 in span 4 . Note: horizontal crack extends 3/4 inch north and 1 1/8 inches south of the stiffener.

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Photograph 68 - Looking north at the center girder bottom gusset plate for floor beam 2, span 6 between girders 3 and 4. Note: vertical leg of T-section is kinked west 11/16 inch over 10 inches.

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Photograph 69 - Looking east at floor beam 6, span 4 connection to girder 4. Note: 1/2-inch-thick painted over pack rust between floor beam and connection plate.

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Photograph 70 - Looking northeast at floor beam 0, span 7 between girders 3 and 4. Note: 1-inch thick pack rust between lower strut and lower center gusset plate.

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Photograph 71 - Looking east at floor beam 3, span 11 connection to girder 2. Note: top 6 bolt holes are oversized.

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Photograph 72 - Looking southwest at the lateral bracing gusset plate connection to girder 3, span 8 at floor beam 4. Note: 8 1/2-inch-long crack running tangent to the corner of the bracing and one 3 1/2-inch-long crack along the floor beam bottom flange.

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Photograph 73 - Looking north at girder 2, span 10 at floor beam 2. Note: 18-inch long crack in weld connecting gusset plate to the web.

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Photograph 74 - Looking north at girder 2, span 11 at floor beam 1. Note: 6-inch-long cracked weld in gusset plate weld.

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Photograph 75 - Looking north at girder 2, span 11 at floor beam 1. Note: cracked weld on gusset plate, 6 inches long, no change from previous inspection.

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Photograph 76 - Looking south at lower lateral gusset plate weld at girder 3, span 11 at floor beam 2. Note: undercut weld.

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Photograph 77 - Looking northeast at the dampening canister between floor beam 7 and pier in span 4, 4. Note: canister lower anchor has broken and is no longer effective.

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Photograph 78 - Looking north at lateral bracing gusset plate at girder 4, span 6 at pier 6. Note: 8 1/2-inch by 2 3/4-inch corrosion hole through the gusset plate.

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Photograph 79 - Looking north between girders 3-4 between floor beams 4 and 5 in span 6, . Note: north cable clamps for the dampeners installed backwards with saddle over live end of cable.

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Photograph 80 - Looking southeast at the east embankment under the eastbound lanes. Note: erosion gullies from deck drainage leaking through the expansion joint is undermining the repair to encase the exposed piles.

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Photograph 81 - Looking south along the east abutment seat from girder 4. Note: ponding and debris exist on the bearing seat.

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Photograph 82 - Looking southwest at the west abutment. Note: few horizontal and vertical cracks exist in the breastwall and back wall. Evidence of water leakage exists on the breastwall.

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Photograph 83 - Looking north along the remnants of the original west abutment. Note: erosion exposing the underside of the breastwall.

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Photograph 84 - Looking east at pier 6 north column. Note: 5 square feet of spalling with exposed corroded reinforcement at the base of the column and a full height vertical crack of the column.

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Photograph 85 - Looking north along pier 6 from girder 1. Note: seismic restraint cables are broken.

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Photograph 86 - Looking south along pier 10 from girder 1. Note: both seismic restraint cables are broken at girders 1 and 3, and one is broken at girder 2.

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Photograph 87 - Looking southeast at pier 4. Note: sealed vertical and diagonal cracks in pier wall.

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Photograph 88 - Looking northwest at the elastomeric expansion bearing for girder 1, span 4 at pier 3. Note: bearing split at northeast corner and debonded from sole plate at southeast corner. PTFE pad distorted and stainless steel surface painted.

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|-------|-------------|----------|--------------|------------------|------------|
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Photograph 89 - Looking north at the elastomeric expansion bearing for girder 1, span 4 at pier 3. Note: bearing assembly is near full expansion. Bearing assembly is in contact with the bearing seat with evidence of recent expansion observed.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
| 17051 | 6822 0000 X | Sequoyah | I-40 | ARKANSAS RIVER | 7/17/2023 |



Photograph 90 - Looking southwest at the elastomeric expansion bearing for girder 2, span 4 at pier 3. Note: elastomeric bearing is bulging over the edge of the sole plate. Bearing is sheared in expansion 3/4 inch and the bottom east edge has lifted from the pier seat.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
| 17051 | 6822 0000 X | Sequoyah | I-40 | ARKANSAS RIVER | 7/17/2023 |



Photograph 91 - Looking down at the south edge of the girder 3, span 4 at the pier 3 bearing. Note: bearing assembly is not parallel with the girder (offset 5/16 inch over a 16 5/8-inch length).

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
| 17051 | 6822 0000 X | Sequoyah | I-40 | ARKANSAS RIVER | 7/17/2023 |



Photograph 92 - Looking south at the girder 3 expansion bearings at pier 10. Note: bearings are rocked slightly in expansion at 90F. Pack rust exists between the rocker and masonry plate.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
| 17051 | 6822 0000 X | Sequoyah | I-40 | ARKANSAS RIVER | 7/17/2023 |



Photograph 93 - Looking south at the girder 4 expansion bearing at the east abutment. Note: bearing rotated 11 degrees east. Bearing has been reset 4 inches west in the past. Bottom flange is 1 1/2 inches from the backwall. All bearings at east abutment are similar.

| NBI # | Structure # | County | Fac. Carried | Fac. Intersected | Insp. Date |
|-------|-------------|----------|--------------|------------------|------------|
| 17051 | 6822 0000 X | Sequoyah | I-40 | ARKANSAS RIVER | 7/17/2023 |



Photograph 94 - Looking south at the girder 1 expansion bearings at pier 6. Note: span 6 rocker rotated 14 degrees in expansion with anchor bolts missing. Span 7 rockers rotated 7 degrees in contraction at 85F. Brags are 8 inches tall to center of pin.

Oklahoma Dept. of Transportation - Bridge Inspection Report

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|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|
| NBI No.: 17051 | Structure No.: 6822 0000 X | Local ID: -1 | Suff. Rating: 82.90 | ND |
|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|

Bridge Description: **IDENTIFICATION**
 3-125ft. P/S CONCRETE GIRDERS, 3-CONT. PLATE GIRDER SPANS
 (200ft.-330ft.-200), 4-125ft., 3-125ft. CONT. PLATE GIRDER SPANS

| | |
|----------------------------------|-----------------------------------|
| 1. State: Oklahoma | 7. Facility Carried: I-40 |
| 2. Division: Division 1 | 6. Feat.: ARKANSAS RIVER |
| 3. County: SEQUOYAH | 9. SEQUOYAH-MUSKOGEE CC |
| 4. City: Unknown | 11. Mile Post: NA |
| Admin Area: Unknown | 13. LRS / Sub Rte: 6800022HX / 00 |
| 5a. On/Under: Route On Structure | 16. Latitude: 35° 29' 16.49" |
| 5b. Kind of Hwy: Interstate Hwy | 17. Longitude: 095° 05' 38.05" |
| 5c. Lvl of Srvc: Mainline | 98. Border: Unknown (P) |
| 5d. Route No.: 00040 | % Responsible: 0.00 |
| 5e. Dir. Sufx: N/A (NBI) | 99. Border Brdg #: Unknown |

INSPECTION

| Type | Insp. Req. | Insp. Done | Freq. | Insp. Date | Next Insp. |
|------|------------|------------|-----------|------------|------------|
| NBI: | | 1 | 24 months | 7/17/2023 | 07/17/2025 |
| FC: | Y | 1 | 24 months | 7/17/2023 | 7/17/2025 |
| UW: | Y | 0 | 60 months | 7/19/2020 | 7/19/2025 |
| OS: | Y | 0 | 24 months | 7/14/2022 | 7/17/2024 |

STRUCTURE TYPE AND MATERIALS

43a/b. Main Span: Steel Cont. / Girder-Floorbeam
 44a/b. Appr. Span: P/S Conc. / Stringer/Girder

45. # of Main Spans: 10
 46. # of Appr. Spans: 3
 107. Deck Type: Concrete-Cast-in-Place
 108a. Wearing Surface: Low Slump Concrete
 108b. Membrane: Unknown
 108c. Deck protection: Unknown

CLASSIFICATION

| | |
|--|---|
| 12. Base Hwy Net.: On Base Network | 101. Parallel Str.: No bridge exists |
| 20. Toll Facility: On free road | 102. Traffic Dir.: 2-way traffic |
| 21. Custodian: State | 103. Temp. Str.: Not Applicable (P) |
| 22. Owner: State | 104. Hwy System: On the NHS |
| 26. Function Class: 01 Rural Interstate | 105. Fed Land Hwy: IRR-Indian Res Rd |
| 37. Historical Sig.: Not eligible for NRHP | 110. Defense Hwy: On Interstate STRAHNE |
| 100. Def. Hwy: On Interstate STRAHNE | 112. NBIS Length: Long Enough |

AGE AND SERVICE

| | |
|------------------------------------|--------------------------|
| 19. Detour Length: 5.0 mi | 106. Year Reconst.: 1983 |
| 27. Year Built: 1967 | 109. Truck ADT: 36% |
| 28a/b. Lanes on/und: 4 / 0 | |
| 29. ADT: 15,900 | |
| 30. Year of ADT: 2020 | |
| 42a/b. Type of Svc on/und: Highway | / Waterway |

CONDITION

58. Deck: 6 Satisfactory | 59. Sup.: 6 Satisfactory | 60. Sub: 6 Satisfactory
 62. Culvert: N/A (NBI) | 61. Chan./Chan. Prot.: 6 Bank Slumping

Flowline Notes:
 The Pier 5 footing is exposed up to 4"H x 5'L along the west face.
 2020 Underwater Channel Notes: The channel in the vicinity of the bridge

GEOMETRIC DATA

| | |
|----------------------------------|--|
| 10. Vert. Clearance: 99.99 ft | 50a. Curb/Sdwk Width L: 3.00 ft |
| 32. Appr Rwy Width: 69.91 ft | 50b. Curb/Sdwk Width R: 3.00 ft |
| 33. Median: Closed Med w/o Barri | 51. Width Curb to Curb: 60.00 ft |
| 34. Skew: 0.00° | 52. Width Out to Out: 68.50 ft |
| 35. Struct. Flared: No flare | Deck Area: 136,247.76 sq. ft |
| 47. Horizontal Clr: 30.00 ft | 53. Min. Vert. Cl. Ovr Brg: 99.99 ft |
| 48. Length Max Span: 330.00 ft | 54a. Min. Vt. Undclr. Ref: N Feature not hwy c |
| 49. Struct. Length: 2,003.16 ft | 54b. Min. Vert. Undclr.: 0.00 ft |
| | 55a. Min. Lat. Undclr. Ref: N Feature not hwy |
| | 55. Min. Lat. Undercl. R: 99.90 ft |
| | 56. Min. Lat. Undercl. L: 99.90 ft |

LOAD RATING AND POSTING

31. Design Load: MS 18 (HS 20) | Date Rated: 10/01/2006
 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

| | H | HS | 3-3 | EV3 | SHV |
|------------------------------|-------|-------|-------|------|------|
| 64. Operating Rating (tons): | 30.40 | 54.70 | 92.80 | 0.00 | 0.00 |
| 66. Inventory Rating (tons): | 18.20 | 32.80 | 55.70 | | |

OKLAHOMA ITEMS

| | |
|--|--|
| 200c. Temperature: 91 | 214a. Posted Weight Limit: NR |
| 200d. Weather: Clear | b. Posted Speed Limit: 70 |
| 201. Struc. Stl. ASTM Desig.: A-36 / -1 | c. Narrow/1way Brdg Sign: NA |
| 202. Waterprf. Membrane: -1 | d. Vertical Clr. Sign: NA |
| Date Installed: 01/01/1901 | Adv. Warning Sign: NA |
| 203. Type Exp. Device: Modular | e. Navigation Lights?: Yes |
| Elastomeric Strip Seal: Sealed Expansion Joint | Working/Not Working: No |
| 204. Type of Railing: PTR-1 (round hand rail) | 215. Overpass: INTERSTATE |
| 205. Material Quantity: -3.00 | 218. Functionally Obsolete: - |
| 208a. Type of Abutment: Skeleton | 220. Bridge Redecked: - |
| b. Type of Found.: Steel Piling | 221. Substr. Cond. (U/W): Satisfactory Condition |
| 209. Type of Pier/Found.: 2 / Yes | 222. Fill Over RCB: - |
| Spread Footing | 223. Appr. Slab/Rwy Cond.: 6 |
| 210. Foundation Elev.: 4,300.00 4,240.00 | 225. Paint Type/Ovrct: Inorganic Zinc 3Coat Sys |
| -1.00 4,290.00 -1.00 | N/A |
| 211. Wear. Surf. Prot. Sys: Silane | 226. Date Painted: 2010 |
| Date Installed: 01/01/1901 | 227. Paint Color: Gray |
| 211c. Silane Reapplied | 233. Deck Forming: - |
| 211d. Date: - | 238. School Bus Rte.: Current & Desired route |
| 213. Utilities Attached: Communication | 240. Appr. Rwy Type.: Asphalt/Bituminous |
| | 243. Grdr Spacing/No.: / |

APPRAISAL

| | |
|--|--|
| 36a. Brdg Rail: 1 Meets Standards | 68. Deck Geom.: 4 Tolerable |
| 36b. Transition: 1 Meets Standards | 69. Vert./Horiz. Undclr: Not applicable (NB) |
| 36c. Appr. Rail: 1 Meets Standards | 71. Waterway Adeq: 8 Equal Desirable |
| 36d. Appr. Rail Ends: 1 Meets Standard | 72. Appr. Alignment: 7 Above Min Criteria |
| 67. Str Evaluation: 6 Equal Min Criteria | 113. Scour Critical: 8 Stable Above Footin |

PROPOSED IMPROVEMENT

| | |
|-------------------------------|---|
| 94. Bridge Cost: \$20,219,922 | 75. Type of Work: 31 Repl-Load Capacity |
| 95. Roadway Cost: \$4,500,000 | 76. Lngth of Improvement: 1,989.0 ft |
| 96. Total Cost: \$26,119,163 | 114. Future ADT: 25,440 |
| 97. Yr. of Cost Est.: 2015 | 115. Yr. of Future ADT: 2040 |

NAVIGATION DATA

| | |
|-----------------------------------|--|
| 38. Nav. Control: Permit Required | 111. Pier Protect.: 2 In-Place, Function |
| 39. Vert. Clearance: 52.0 ft | 116. Lift Bridge Vert. Clr.: 0.0 ft |
| 40. Horiz. Clearance: 300.0 ft | |

| | | | |
|--------------------------------------|-----|-----|-----|
| 244. Span Lengths: | 131 | 130 | 130 |
| | 201 | 330 | 201 |
| | | 201 | 125 |
| | | | 125 |
| 245. Girder Depth: | | | |
| 246a. Type of Overlay: NA | | | |
| b. Overlay Thickness: 0.00 | | | |
| c. Overlay Date: 01/01/1901 | | | |
| d. Ovlly Depth Changed >1": - | | | |
| 247. Protective Systems: | | | |
| 248. # Field Splices w/ Corrosion: | | | |
| 249. Scour Crit. POA Exists?: - | | | |
| 250. Headwall: | | | |
| 258. Plans w/Found. in ODOT File: - | | | |
| 259. Scour Eval. in ODOT File: - | | | |
| 263. Interchange at Intersection: No | | | |
| 264. Interstate Milepoint: 290.66 | | | |

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|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|
| NBI No.: 17051 | Structure No.: 6822 0000 X | Local ID: -1 | Suff. Rating: 82.90 | ND |
|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|

Inspection Date: 7/17/23 Dale Poorman

Invoice No.: 1055453 Inspected With:



BRIDGE NOTES:

Spans 1-3: Simple prestressed concrete girder approach spans (131.4 feet, 130 feet, 130 feet)
 Spans 4-6: Continuous variable-depth steel girder main spans (201 feet, 330 feet, 201 feet)
 Spans 7-10: Continuous steel girder approach spans (125 feet, 125 feet, 125 feet, 126 feet)
 Spans 11-13: Continuous steel girder approach spans (126 feet, 125 feet, 126.3 feet)
 w/ 18 inch safety curbs & 4ft median

Other/Special inspection items include:

- Modular joints support boxes and support beams at piers 3, 6 and 10.
- Cracks in floor beam 4, span 4:
 - o Stringer 1 (1 5/8 and 1 1/2 inches).
 - o Stringer 3 (2 3/8 inches)
- Cracks in lateral bracing gusset plates:
 - o Span 8, girder 3 at floor beam 4 (8 1/2-inch-long crack in gusset plate).
 - o Span 10, girder 2 at floor beam 2 – (18-inch-long crack in gusset plate weld).
 - o Span 11, girder 2 at floor beam 1 – (8-inch-long and 6-inch-long cracks in gusset plate weld).
- Horizontal web splice terminations in spans 4 near floor beam 5, span 5 near floor beams 3 and 11, and span 6 near floor beam 3. Cracks or cored hole noted at:
 - o Span 4, girder 2, near floor beam 5 (1-inch-long crack arrested by cored hole, 1 1/2-inch-long crack arrested by cored hole).
 - o Span 4, girder 4, near floor beam 5 (7/16-inch-long crack arrested by a cored hole).
 - o Span 5, girder 1, near floor beam 11 (3/4-inch-long crack stopping short of cored hole, 1 1/4-inch-long crack arrested by two cored holes).
 - o Span 5, girder 2, near floor beam 11 (2-inch-long crack arrested by a cored hole).
 - o Span 5, girder 3, near floor beam 11 (7/8-inch-long crack stopping short of cored hole).
 - o Span 5, girder 4, near floor beam 3 (1 1/8-inch-long crack arrested by a cored hole, 1-inch-long crack arrested by a cored hole).
 - o Span 5, girder 4, near floor beam 11 (1-inch-long crack arrested by a cored hole).
 - o Span 6, girder 1, near floor beam 3 (both cracks arrested by a cored hole).
 - o Span 6, girder 2, near floor beam 3 (1-inch-long crack arrested by a cored hole).
 - o Span 6, girder 3, near floor beam 3 (Paint crack originally noted).
 - o Span 6, girder 4, near floor beam 3 (1 1/4-inch-long crack arrested by a cored hole).

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|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|
| NBI No.: 17051 | Structure No.: 6822 0000 X | Local ID: -1 | Suff. Rating: 82.90 | ND |
|--------------------------|--------------------------------------|------------------------|-------------------------------|-----------|

INSPECTION NOTES: 7/17/23

PX – Recommendations:

- Replace missing north railing posts in span 8 and near pier 12.
- Splice gaps in metal rail of north railing in spans 5 and 9, and south railing in spans 1, 6 and 7.
- Patch spalls in driving surface.
- Repair cracks in bearing boxes at modular joint supports at pier 3. Also, install shim plates or additional support below bearing blocks to prevent future cracking.
- Replace modular joints at pier 3, 6 and 10.
- Replace pourable joint seals at west abutments and fixed joints and deck control joints.
- Replace strip seal expansion joint at east abutment.
- Replace missing or loose bolts at stringer connections.
- Arrest ends of cracks at:
 - o Floor beam 4, span 4 under stringer 1.
 - o Floor beam 4, span 4 under stringer 3.
 - o Stringer diaphragm over floor beam 5, span 6, between stringers 3 and 4.
- Repair cracks in lateral bracing gusset plates:
 - o Span 8, girder 3 at floor beam 4 – 8 1/2-inch-long crack in gusset plate.
 - o Span 10, girder 2 at floor beam 2 – 18-inch-long crack in gusset plate weld.
 - o Span 11, girder 2 at floor beam 1 – 8-inch-long and 6-inch-long cracks in gusset plate weld.
- Reattach lateral bracing vibration dampeners at:
 - o Span 4, between girders 1 and 2, between floor beams 5 and.
 - o Span 4, between girders 1 and 2 and between floor beams 8 and pier.
 - o Span 4, between girders 3 and 4 and between floor beam 7 and pier.
 - o Span 6, between girders 1 and 2 and between floor beams 2 and 3.
 - o Span 6, between girders 3 and 4 and between floor beam 0 and 1 – fractured spring not functioning as intended.
 - o Span 6, between girders 3 and 4 and between floor beam 6 and pier 6.
- Patch corrosion hole through lateral bracing gusset plate at girder 4, span 6 at pier 6
- Install crushed aggregate slope protection on east approach embankment.
- Remove debris from east abutment seat.
- Patching spall in pier 6, column 2 at top of web wall.
- Repair broken seismic cables at piers 6 and 10.
- Reset elastomeric bearings for girder 1 for span 4 at pier 3.
- Remove paint from stainless-steel sliding surfaces of elastomeric bearings at pier.

FX – Monitor:

- Terminations of horizontal web splices for crack propagation or initiation in spans 4 through 6.
- Lateral bracing gusset plate connections to web of girders at:
 - o Span 10, girder 1 at floor beam 4
 - o Span 11, girder 1 at floor beam 1
 - o Span 11, girder 2 at floor beam 3
 - o Span 12, girder 2 at floor beam 1
 - o Span 12, girder 2 at floor beam 2
- Ends of prestressed concrete beams for deterioration associated with exposed strands.

ELEMENT CONDITION STATE DATA

| Elem. / Env | Description | Unit | Total Qty | % 1 | Qty. 1 | % 2 | Qty. 2 | % 3 | Qty. 3 | % 4 | Qty. 4 |
|--|--------------------------|-------|------------|------|-----------|------|------------|-----|--------|-----|--------|
| 12 / 4 | Re Concrete Deck | sq.ft | 119,340.00 | 70% | 83,518.00 | 30% | 35,802.00 | 0% | 20.00 | 0% | 0.00 |
| PX – Small spalls and patches are typical along control joints. Deck offset 1in relative to east approach railing. Deck in new portion (spans 1 through 3 and 70ft in span 4) has transverse cracks of 0.020in spaced at 3ft to 5ft, span 3 has 0.030in diagonal cracking. Deck in original portion has transverse cracks of 0.050in spaced at 5ft to 10ft. Raised pavement markers is missing. | | | | | | | | | | | |
| 107 / 4 | Steel Opn Girder/Beam | ft | 5,540.00 | 91% | 5,036.00 | 9% | 500.00 | 0% | 4.00 | 0% | 0.00 |
| FX – Cracks at horizontal web splice terminations in spans 4 near floor beam 5, and span 6 near floor beam 3 (Item 872 has splice terminations for span 5 near floor beams 3 and 11). Cracks or cored hole noted at: <ul style="list-style-type: none"> • Span 4, girder 2, near floor beam 5 (1-inch-long crack arrested by cored hole, 1 1/2-inch-long crack arrested by cored hole). • Span 4, girder 4, near floor beam 5 (7/16-inch-long crack arrested by a cored hole). • Span 6, girder 1, near floor beam 3 (both cracks arrested by a cored hole). • Span 6, girder 2, near floor beam 3 (1-inch-long crack arrested by a cored hole). • Span 6, girder 3, near floor beam 3 (Paint crack originally noted). • Span 6, girder 4, near floor beam 3 (1 1/4-inch-long crack arrested by a cored hole). FX – Lateral bracing gusset plates welded to girders web using backing bars. Cored holes through web with no visible crack at: <ul style="list-style-type: none"> • Span 10 (girder 1, FB 4). • Span 11 (girder 1, FB 1 and girder 2, FB 3). • Span 12 (girder 2, FB 1 and girder 2, FB 2). Lateral bracing gusset plates at FBs 3, 4, 5 in spans 4 and 6, and FBs 3 and 11 in span 5 have been flame-cut and reattached to the girder webs. Pack rust exists at isolated locations in the main girders between horizontal splices, FB connections, bolted bottom splice plates. Paint cracks at stiffener to girder bottom flange at span 6 (girder 3 at FB4 and girder 4 at FB7) and span 8 (girder 3 at FB 2 and girder 4 at FB 2). Welded nut or open hole on inboard web splice plate at span 5 (girder 1 near FB 9, and girder 3 near FBs 3, 5, and 9). Loose bolts in web splice plate at span 7 (girder 3 near FB 4) and span 11 (girder 4 near FB 4). | | | | | | | | | | | |
| 515 / 4 | Steel Protective Coating | sq.ft | 330,000.00 | 0% | 0.00 | 100% | 330,000.00 | 0% | 0.00 | 0% | 0.00 |
| Paint is sound with corrosion reactivating under joints. | | | | | | | | | | | |
| 109 / 4 | Pre Opn Conc Girder/Beam | ft | 4,140.00 | 100% | 4,140.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 |

Oklahoma Dept. of Transportation - Bridge Inspection Report

| NBI No.: | Structure No.: | Local ID: | Suff. Rating: | ND | | | | | | | |
|--|----------------------|-----------|---------------|-----|----------|-----|----------|-----|--------|------|--------|
| 17051 | 6822 0000 X | -1 | 82.90 | | | | | | | | |
| No significant deficiencies were observed to the prestressed concrete girders in spans 1-3. | | | | | | | | | | | |
| 113 / 4 | Steel Stringer | ft | 5,540.00 | 98% | 5,437.00 | 2% | 100.00 | 0% | 3.00 | 0% | 0.00 |
| PX – Bolts and/or nuts are missing in the stringer to floor beam connections at the following locations: <ul style="list-style-type: none"> • Span 6, west side of floor beam 1, stringer 1 exhibits two missing bolts. • Span 6, east side of floor beam 1, north face of stringer 3 exhibits a missing nut. • Span 7, floor beam 2, stringer 4 exhibits four not fully seated bolts. • Span 8, west face of floor beam 0, stringer 3 exhibits one missing bolt. • Span 10, floor beam 0, stringer 3 exhibits four missing bolts. PX – Stringer diaphragm between stringers 3 and 4, span 6 over FB 5 has an 8 1/2in crack. Deck is lifting off stringers at several locations. Stringer 2 diaphragm connection to FB 1, span 8 has 5 of 7 connection bolts not fully seated. Stringer 3 connection to FB 1, span 6 has 1 broken bolt. Stringer 3 connection to FB at pier 9 is missing all 4 anchor bolts. Stringer 4 connection to FB 2, span 8 has all 4 bolts not fully seated. Stringers in span 7 near pier 6 and span 13 near the east abutment have a partial length welded cover plates. | | | | | | | | | | | |
| 152 / 4 | Steel Floor Beam | ft | 3,536.00 | 0% | 0.00 | 95% | 3,346.00 | 5% | 190.00 | 0% | 0.00 |
| PX – Span 4 FB 4 has cracks in web at top of vertical stiffener below stringer 1 (1 5/8in and 1 1/2in) and below stringer 3 (2 3/8in) Member Alignment – Span 6 FB 4 has 1/4in sweep between girders 1 and 2. Span 6 FB 2 between G3 and G4 has 11/16in local kink in lower strut. Span 9 FB 0 at G4 has slight bow in lower gusset plate. Painted over pack rust between FB components below deck control and expansion joints. Loose bolts or oversized bolt holes at FB to girder connections at span 5 FB 8 G3, span 7 FB 3 G2, span 9 FB4 G2, span 11 FB 3 at G2 and Span 12 FB 2 at G2. | | | | | | | | | | | |
| 205 / 4 | Re Conc Column | each | 23.00 | 87% | 20.00 | 9% | 2.00 | 4% | 1.00 | 0% | 0.00 |
| PX – Pier 6, column 2 exhibits a 5-square-foot spall with exposed and corroding reinforcing steel at the top of the web wall and a vertical crack extending the full height of the column. | | | | | | | | | | | |
| 210 / 4 | Re Conc Pier Wall | ft | 94.00 | 68% | 64.00 | 32% | 30.00 | 0% | 0.00 | 0% | 0.00 |
| Minor hairline cracking exists in the concrete pier walls. Pier 4 exhibits some water staining and vertical cracks to the stem wall. | | | | | | | | | | | |
| 215 / 4 | Re Conc Abutment | ft | 152.00 | 97% | 147.00 | 3% | 4.00 | 1% | 1.00 | 0% | 0.00 |
| PX – E abutment breastwall has undermining with 20in of penetration beneath flowable fill (2013 repair) and no exposure of piles. Erosion is from leaking joint. PX – Debris and ponding on E abutment seat (9in deep under median). Erosion exists under remnants of the original W abutment with no affect to the replaced abutment . Both abutments exhibit random hairline cracking with E abutment cracks up to 0.020in wide. | | | | | | | | | | | |
| 234 / 4 | Re Conc Pier Cap | ft | 837.00 | 33% | 280.00 | 66% | 550.00 | 1% | 7.00 | 0% | 0.00 |
| PX – Seismic restraints, consisting of cable anchorages attached between the girder bottom flanges and the pier caps, exist at piers 6 and 10. The cable anchorages for girders 1 through 4 at piers 6 and 10 are broken and are no longer functioning. Pier 6 cap exhibits rust staining throughout and a spall to the bottom east edge of the south cantilever. Pier 1 cap on the west and east faces at the south end exhibits 1/16-inch-wide x 20-foot-long crack 2-feet from the top. Pier 10 cap exhibits a wide crack and delamination to the bottom west edge between girders 3 and 4. | | | | | | | | | | | |
| 300 / 4 | Strip Seal Exp Joint | ft | 69.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 | 100% | 69.00 |
| Joint at east abutment. PX – The pourable expansion joint seal at the west abutment is missing the joint seal for 10 feet in the westbound lanes and throughout the southern lane of the eastbound lanes. Seal is missing in EB lane. | | | | | | | | | | | |
| 303 / 4 | Assem Jnt With Seal | ft | 207.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 | 100% | 207.00 |
| PX – Modular joints have fractured or missing components, joint seals bulging/torn, joints closed: Joint 3 Box 2 – W box unsupported. Box 3 – Both box bottom plates fractured and missing under W end of support bar 1. Bearing blocks dislodged. Support bar 2 partially unsupported. Box 4 – Both box bottom plates fractured. Boxes 5 and 6 – E bearing block for support bar 1 missing. Box 7 – W box bottom plate fractured under support bar 1. Box 8 – W box supported by 6 3/4in over 22 1/4in length. Box 15 – W box bottom plate fractured under support bar 1. Composite reinforcing above beam 10 exposed and box unsupported. Box 16 – W box bottom plate fractured away, support bar 1 unsupported. E box bottom plate fractured. Box 17 – W box not fully supported. Joint 6 – equidistant bars broken/dislodged/missing, transverse separation beam sagging. Box 2 – Transverse separation beam and repair plate fractured, sagging 1in. Longitudinal support bar broken free from transverse beam, dislodged. Box 3 – Longitudinal support bar broken free from transverse beam, dislodged. Joint 10 – equidistant bars broken/dislodged/missing. Box 3 – Longitudinal support bar broken free from transverse beam, dislodged. | | | | | | | | | | | |
| 310 / 4 | Elastomeric Bearing | each | 76.00 | 97% | 74.00 | 0% | 0.00 | 3% | 2.00 | 0% | 0.00 |
| PX – Span 4 bearings at pier 3, sliding surface painted: G 1 – Sheared 2in east, bearing split at N end of E face, debonded from sole plate at S end of E face, rotated with S end 3 1/2in E and N end 1 5/8in E, PTFE pad distorted, near limits of expansion at 91F. G 2 – Bulging along E edge, bottom edge lifting from pier seat. G 3 – Bearing assembly not parallel with girder (offset 5/16in over 16 5/8in length). | | | | | | | | | | | |
| 311 / 4 | Moveable Bearing | each | 24.00 | 0% | 0.00 | 63% | 15.00 | 38% | 9.00 | 0% | 0.00 |

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| NBI No.: | Structure No.: | Local ID: | Suff. Rating: | ND | | | | | | | |
|---|------------------------|-----------|---------------|------|----------|------|----------|-----|-------|------|----------|
| 17051 | 6822 0000 X | -1 | 82.90 | | | | | | | | |
| Bearings at piers 4, 6, 10 and E abutment have pack rust between rocker and masonry plate. Several bearing bolts broken/missing, pier 6 and E abutment worst. E abutment bearings have corrosion with 1/16in painted over pitting, anchor bolts bent/broken from over expansion. E abutment G1 and G2 bearings shifted 1in N, G3 and G4 bearings shifted 1in S. Span 6, pier 6 bearings rocked up to 14 degree in expansion at 91F, bearings at pier 10 rocked up to 9 degrees expansion. Pier 4 G3 rocked more than other girders. | | | | | | | | | | | |
| 313 / 4 | Fixed Bearing | each | 24.00 | 0% | 0.00 | 100% | 24.00 | 0% | 0.00 | 0% | 0.00 |
| No significant deficiencies. | | | | | | | | | | | |
| 321 / 4 | Re Conc Approach Slab | sq.ft | 4.00 | 0% | 0.00 | 75% | 3.00 | 25% | 1.00 | 0% | 0.00 |
| E approach slab recently overlaid with asphalt. 1/16in longitudinal and map cracks in W approach slab. | | | | | | | | | | | |
| 330 / 4 | Metal Bridge Railing | ft | 3,978.00 | 100% | 3,973.00 | 0% | 0.00 | 0% | 5.00 | 0% | 0.00 |
| PX – Rail for N bridge railing missing adjacent posts in span 8 and near pier 12, spalls with exposed reinforcing at post location at pier 12. PX – Gaps in rail at N railing in spans 5 and 9, S railing in spans 5, 6 and 7. | | | | | | | | | | | |
| 919 / 4 | St.(Rail) Prot. Coat | sq.ft | 7,500.00 | 0% | 0.00 | 100% | 7,500.00 | 0% | 0.00 | 0% | 0.00 |
| aluminum railing. | | | | | | | | | | | |
| 331 / 4 | Re Conc Bridge Railing | ft | 5,967.00 | 0% | 0.00 | 100% | 5,939.00 | 0% | 28.00 | 0% | 0.00 |
| Concrete bridge railing and curb typically exhibits 0.020-inch to 0.030-inch-wide cracking spaced at 3 to 5 feet with leaching and minor rust staining and isolated locations of spalling with exposed reinforcing steel. The worst spalling exists to the south curb in span 6 with a 20-foot-long x up to 6-inch-deep spall. The following locations exhibit minor impact damage with heavy cracking and/or spalling with exposed reinforcement: -North railing in spans 3 and 4. -North face of the median railing over piers 10 and 12. | | | | | | | | | | | |
| 819 / 4 | PS Conc.Gird.End(5Ft) | ft | 360.00 | 99% | 356.00 | 1% | 4.00 | 0% | 0.00 | 0% | 0.00 |
| FX – End of beams spalling with exposed strands: <ul style="list-style-type: none"> • Span 1, B1 at pier 1 - crack extending 30in up web and spall in bottom flange exposing 9 strands. • Span 2, B12 at pier 2 - spall in bottom flange exposing 23 strands. • Span 3, B1 at pier 2 – crack extending 31 inches down the web and spall exposing 3 strands. • Span 3, B12 at pier 2 – 12in x 4in spall exposing 3 strands. • Span 3, B1 at pier 3 - spall in bottom flange exposing 4 strands. • Span 3, B12 at pier 3 - spall in bottom flange exposing 26 strands and in web exposing 4 strands. Span 3, B6 at pier 3 bottom flange has the ends of the mild steel anchors for sole plate exposed. | | | | | | | | | | | |
| 859 / 4 | Soffit | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| Original spans exhibits full depth x full width transverse cracking up to 0.030-inch-wide spaced at 2 to 6 feet with minor efflorescence. Cracking is heavier over piers. Shallow spalls exist sporadically adjacent to girder top flanges throughout the main spans. Isolated areas of the soffit overhangs exhibit spalling with exposed reinforcement adjacent to the joints . Soffit between girders 2 and 3 exhibits rust staining and small pop-outs due to shallow cover of reinforcing steel chairs. Soffit below median in span 4 over pier 3 exhibits a 2SF spall with exposed and corroded reinforcing steel. | | | | | | | | | | | |
| 865 / 4 | St.Open Gird End(5Ft) | ft | 120.00 | 50% | 60.00 | 50% | 60.00 | 0% | 0.00 | 0% | 0.00 |
| Pack rust up to 1/2in between connection stiffeners and FB lower strut gusset plates. | | | | | | | | | | | |
| 870 / 4 | Concrete Wingwall | each | 4.00 | 100% | 4.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 |
| No significant deficiencies. | | | | | | | | | | | |
| 872 / 4 | St.Gird Und Const.Jt | ft | 760.00 | 74% | 560.00 | 26% | 200.00 | 0% | 0.00 | 0% | 0.00 |
| FX – Cracks at horizontal web splice terminations in spans 4 near floor beam 5, and span 6 near floor beam 3 (Item 107 has splice terminations for spans 4 and 6). Cracks or cored hole noted at: <ul style="list-style-type: none"> • Span 5, girder 1, near floor beam 11 (3/4-inch-long crack stopping short of the cored hole, 1 1/4-inch-long crack arrested by two cored holes). • Span 5, girder 2, near floor beam 11 (2-inch-long crack arrested by a cored hole). • Span 5, girder 3, near floor beam 11 (7/8-inch-long crack stopping short of the cored hole). • Span 5, girder 4, near floor beam 3 (1 1/8-inch-long crack arrested by a cored hole, 1-inch-long crack arrested by a cored hole). • Span 5, girder 4, near floor beam 11 (1-inch-long crack arrested by a cored hole). | | | | | | | | | | | |
| 877 / 4 | St. Stringer End(5Ft) | ft | 120.00 | 50% | 60.00 | 33% | 40.00 | 17% | 20.00 | 0% | 0.00 |
| Deck is lifting off the stringers at several locations. This separation can eventually cause an uneven riding surface increasing impact on the superstructure and further accelerating deck deterioration. The stringers are generally in good condition with negligible surface corrosion in isolated locations. | | | | | | | | | | | |
| 879 / 4 | St.Strng.Un Const.Jt | ft | 760.00 | 100% | 760.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 |
| Deck is lifting off the stringers at several locations. This separation can eventually cause an uneven riding surface increasing impact on the superstructure and further accelerating deck deterioration. The stringers are generally in good condition with negligible surface corrosion in isolated locations. | | | | | | | | | | | |
| 890 / 4 | Steel SIP Form | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| Stay-in-place forms typically exhibit areas of surface and laminating corrosion near the interface with the original deck surface. | | | | | | | | | | | |
| 906 / 4 | Sealed Exp.Jt.(SEJ-3) | ft | 69.00 | 100% | 69.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 |
| Joint at pier 1. No significant deficiencies. | | | | | | | | | | | |
| 909 / 4 | Pourable Fix Jt.Seal | ft | 1,311.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 | 100% | 1,311.00 |

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|--|-----------------------|-----------|---------------|------|-------|------|------|------|------|----|------|
| 17051 | 6822 0000 X | -1 | 82.90 | ND | | | | | | | |
| <p>Fixed poured seal joints at west abutment, pier 2, and deck control joints. PX – The compression joint seal at the east abutment has pushed through the full length and the joint is closed . The seal in the westbound lanes is impacted with soil and gravel in the inside shoulders and partially covered in a light amount of worn asphalt. The joint header in the westbound lanes exhibits a 24-inch-wide x 9-inch-long x 2-inch-deep spall in the northern lane. The seal in the eastbound lanes is missing causing the joint to leak and allowing drainage to pass onto the bearing seat at the east abutment. The joint armor in the eastbound lanes exhibits a 1/2-inch vertical offset with the bridge side joint armor lower than the approach joint armor . Several of the deck control joints exhibit minor spalling adjacent to the joints and missing joint seals.</p> | | | | | | | | | | | |
| 916 / 4 | St.Bearing Assembly | each | 76.00 | 97% | 74.00 | 0% | 0.00 | 3% | 2.00 | 0% | 0.00 |
| Bearings showed some surface corrosion and some pack rust between assemblies. | | | | | | | | | | | |
| 956 / 4 | St. Cracking/Fatigue | each | 1.00 | 0% | 0.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 |
| <p>FX – Cracks at horizontal web splice terminations in spans 4 near floor beam 5, span 5 near floor beams 3 and 11, and span 6 near floor beam 3. Cracks or cored hole noted at:</p> <ul style="list-style-type: none"> • Span 4, girder 2, near floor beam 5 (1-inch-long crack arrested by cored hole, 1 1/2-inch-long crack arrested by cored hole). • Span 4, girder 4, near floor beam 5 (7/16-inch-long crack arrested by a cored hole). • Span 5, girder 1, near floor beam 11 (3/4-inch-long crack stopping short of the cored hole, 1 1/4-inch-long crack arrested by two cored holes). • Span 5, girder 2, near floor beam 11 (2-inch-long crack arrested by a cored hole). • Span 5, girder 3, near floor beam 11 (7/8-inch-long crack stopping short of the cored hole). • Span 5, girder 4, near floor beam 3 (1 1/8-inch-long crack arrested by a cored hole, 1-inch-long crack arrested by a cored hole). • Span 5, girder 4, near floor beam 11 (1-inch-long crack arrested by a cored hole). • Span 6, girder 1, near floor beam 3 (both cracks arrested by a cored hole). • Span 6, girder 2, near floor beam 3 (1-inch-long crack arrested by a cored hole). • Span 6, girder 3, near floor beam 3 (Paint crack originally noted). • Span 6, girder 4, near floor beam 3 (1 1/4-inch-long crack arrested by a cored hole). | | | | | | | | | | | |
| 957 / 4 | Pack Rust Smart Flag | each | 1.00 | 0% | 0.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 |
| <p>Pack rust up to 1/2-in thick exists between some girder vertical web stiffeners and floor beam truss lower chord gusset plates and between horizontal splice flanges. Minor pack rust up to 1/4-in thick is developing at girder bottom flange splice plates where girder ends butt up against each other. Pack rust is active in many locations and worse at expansion joints. At floor beam 6 in span 4 between girders 3 and 4; 1/2-thick painted over pack rust exists between the floor beam web and the connection plate at girder 4. Similar condition at floor beam 8 at girder 4 over pier 6; in span 6. Similar conditions occur sporadically but with less severity. Floor beam 8 between girders 3 and 4 over pier 6; span 6; the floor beam truss lower chord exhibits pack rust up to 1/2 inch between the center gusset plate and the lower chord angle with 1/16-inch deep section loss to the gusset plate. Similar condition in span 7 over pier 6. FX – Pack rust is typically developing between the diaphragm top flange and the deck soffits ; up to 1/16-inch at random locations.</p> | | | | | | | | | | | |
| 958 / 4 | Concrete Cracking SF | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| Deck in new portion (spans 1 through 3 and 70ft in span 4) has transverse cracks of 0.020in spaced at 3ft to 5ft, span 3 has 0.030in diagonal cracking. Deck in original portion has transverse cracks of 0.050in spaced at 5ft to 10ft. | | | | | | | | | | | |
| 963 / 4 | Steel Section Loss SF | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| Areas of painted over pitting are present throughout the bridge primary members. Minor section loss is active at areas of pack rust, generally at deck joints. | | | | | | | | | | | |
| 968 / 4 | Erosion SF | each | 1.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 | 0% | 0.00 |
| <p>PX – E abutment breastwall has undermining with 20in of penetration beneath flowable fill (2013 repair) and no exposure of piles. Erosion is from leaking joint. Erosion exists under remnants of the original W abutment with no affect to the replaced abutment .</p> | | | | | | | | | | | |
| 969 / 4 | OutOfPlane Dist./Load | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| Member Alignment – Span 6 FB 4 has 1/4in sweep between girders 1 and 2. | | | | | | | | | | | |
| 974 / 4 | Straight Gird.Diaphr | each | 1.00 | 0% | 0.00 | 100% | 1.00 | 0% | 0.00 | 0% | 0.00 |
| <p>PX – Stringer diaphragm between stringers 3 and 4, span 6 over FB 5 has an 8 1/2in crack. Pack rust exists between diaphragm top flange and deck soffit .</p> | | | | | | | | | | | |