Appendix H

2023 Routine Bridge Inspection Report

North Main Street
High Level Bridge

SUM-M008-00908
SFN: 7730306

October 19, 2023

Prepared by: Luke A. Langdon, EI
Checked by: Michael Kronander, PE

Prepared For: Summit County Engineer
538 East South Street
Akron, OH 44311

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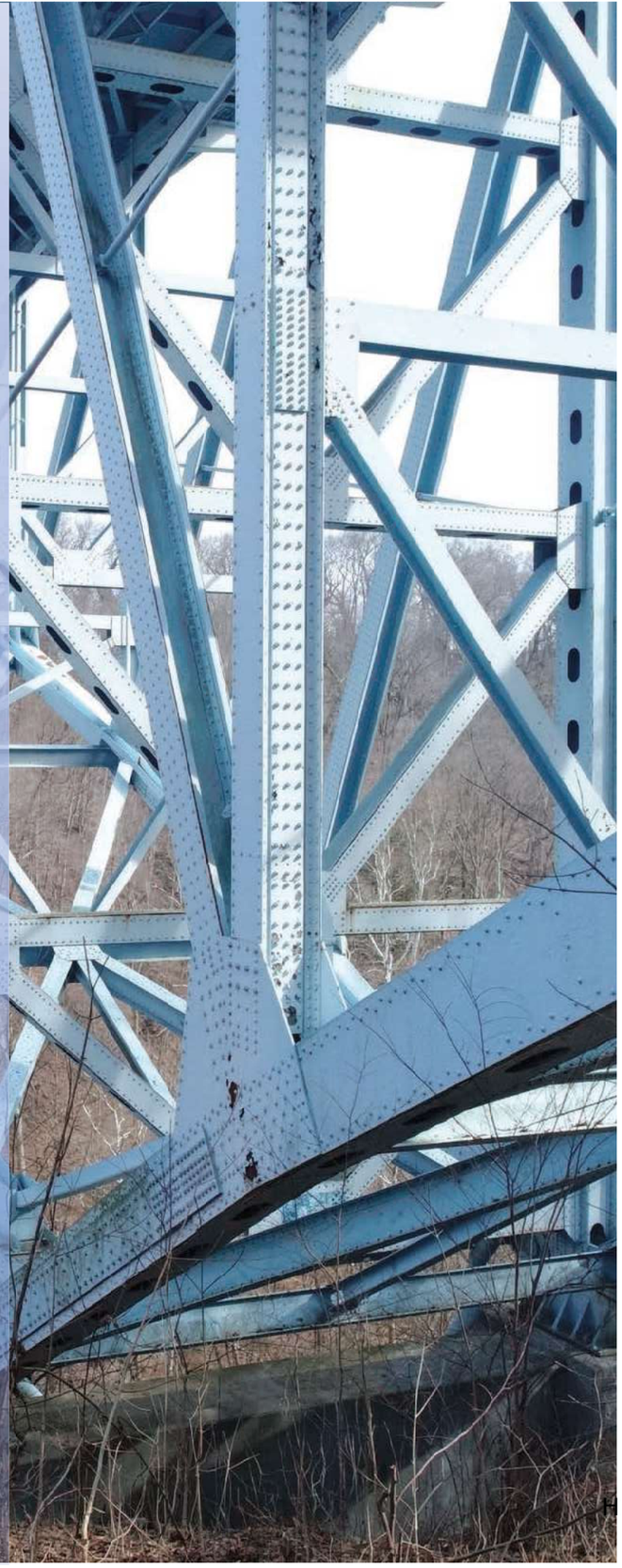

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100 West Erie Street | Painesville, OH 44077 | 440.354.9700

Mr. Neal Miesle P.E.
Bridge Project Manager
Summit County Engineers Office
538 East South Street
Akron, OH 44311

Re: Routine Bridge Inspection Report
Structure File No.: 7730306
SUM-008-0908
North Main Street High Level Bridge over Cuyahoga River

October 19, 2023

Dear Mr. Miesle:

Burgess & Niple (B&N) performed a routine of the above referenced bridge on September 5, 2023. The 900-foot long bridge is a continuous Pratt deck truss supported by reinforced concrete wall-type abutments and cap/column, reinforced concrete piers. The bridge carries four lanes of traffic with a sidewalk along each side. The bridge includes three spans **(photos 1 and 2)** with spans and truss panel points numbered south (rear) to north (forward) and bridge components (stringers, columns, etc.) numbered from left to right or west to east for the trusses while looking forward (north).

The limits of the inspection were from the rear abutment to the forward abutment. Inspection team members included Mike Kronander (Team Leader), PE, Luke Langdon, EI, and Jacob Molnar, EI.

No complex access techniques were used during this year's routine inspection. Access was achieved by walking from the ground to inspect the deck and abutments, and by utilizing an adjustable ladder to reach the catwalk below the deck and piers on the embankments. Keys to the locks for each gate was provided by Summit County Engineer's Office.

The narrative portion of this report includes:

- Significant Findings
- Condition Photographs

Appendices are included after the conclusion of the report and are:

- **Appendix A** - Joint/Truss Clearance Measurements/Charts
- **Appendix B** - 2023 AssetWise Routine Report
- **Appendix C** - Fracture Critical Plan

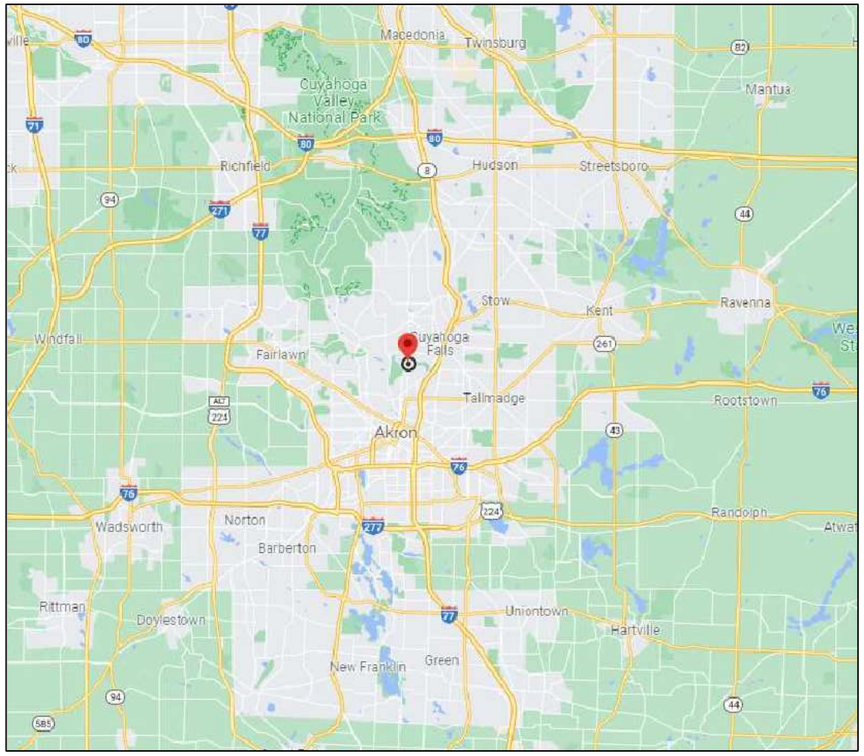
10/19/2023

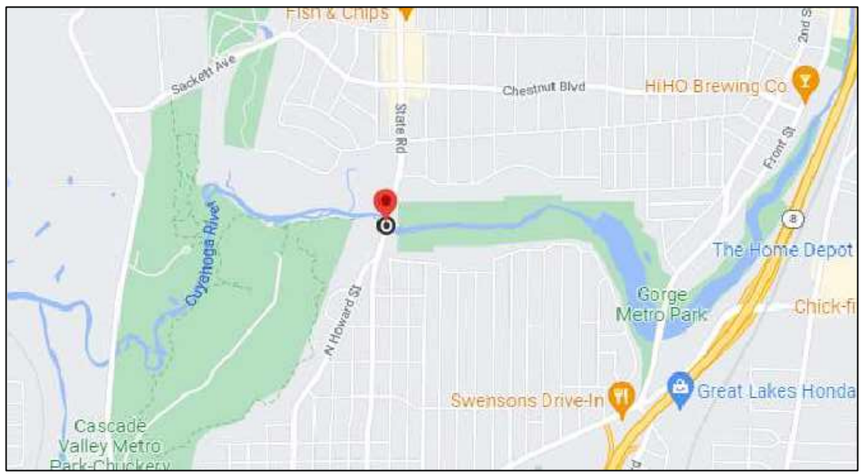
The current and previous NBI ratings for the bridge are:

NBI Item	Current Rating (2023)	Previous Rating (2022)
58 - Deck Summary	5 = Fair	5 = Fair
58.01 – Wearing Surface	5 = Fair	5 = Fair
58.02 - Joints	6 = Satisfactory	6 = Satisfactory
59 - Superstructure	5 = Fair	5 = Fair
59.01 – Paint & PCS	6 = Satisfactory	6 = Satisfactory
60 - Substructure	7 = Good	7 = Good
61 - Channel	9 = Excellent	9 = Excellent
61.01 - Scour	7 = Good	7 = Good
67.01 - General Appraisal	5 = Fair	5 = Fair

10/19/2023

LOCATION MAP:





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

Short-term (Performed by Summit County Maintenance Forces)

- Continue to repair the east pedestrian fence. **(Page 6)**
- Continue to repair the security fences at both abutments and on the south side of pier 2. **(Page 6)**
- Trim or remove the trees encroaching on the bridge at the northwest corner of the roadway and growing near the piers. **(Pages 6 and 15)**
- Seal the joints between the deck and sidewalk to prevent further deterioration. **(Page 7)**
- Continue to patch areas of spalling or delaminated concrete in the approach slabs and bridge deck. **(Pages 7 and 16)**
- Clean/remove debris from the strip seal expansion joints **(Page 8)** and from inside the bearings at piers 1 and 2 to promote proper drainage through the drilled holes. **(Page 14)**
- Remove inactive bird nest at the east end of the catwalk at panel point 17. **(Page 6)**

Long-term (Performed by Contract)

- Replace the security fences at both abutments and on the south side of pier 2. **(Page 6)**
- Trim or remove the trees along east side of forward abutment slope. **(Page 6)**
- Replace the east pedestrian fence. **(Page 6)**
- Abrasively clean and spot paint areas of active corrosion and pack rust to steel superstructure members, especially under the joints and at the tie-down anchorages. **(Pages 8 thru 14)**
- Replace the two missing rivets with high strength bolts for the west U21 outboard gusset plate. **(Page 12)**
- Perform UT (Ultrasonic) Testing on the 6 pins at each abutment (12 total) by 2025 to keep testing on a 10 year cycle (last testing was performed in 2015). **(Page 14)**
- Repair and stabilize the embankment near the forward abutment with additional rip rap. **(Page 16)**

Items to Monitor during Future Inspections

- Continue to monitor catwalk access for ropes/ladders and for areas of damaged security fencing at each abutment. **(Page 6)**
- Section loss to post-tensioning rods for west U12L13 and U18L17. **(Page 10)**
- Tie-down eyebar anchorages at each abutment for further section loss or distress. **(Page 14)**
- Section loss and corrosion to the pins at panel points 13 and 17. **(Page 14)**
- Abutments and southwest/northeast wingwalls for further rotation and obtain measurements on an annual inspection cycle between the wingwall and backwall joints. **(Pages 15 and 16)**
- Spalling along the expansion joint armor at both abutments. **(Page 16)**

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.

Michael Kronander

Michael J. Kronander, PE
Team Leader

SIGNIFICANT FINDINGS are as follows:

NBI Item 36 – Traffic Safety/General

Bridge Railing – The bridge railing is comprised of a galvanized steel thrie-beam between the sidewalk and roadway on both sides of the roadway. An 8-foot-tall chain link pedestrian fence runs along the full length of the deck fascia along the exterior of both sidewalks.

- The bridge railing exhibits light surface corrosion along the full length of both railings **(photo 3)**. No change from previous inspection.
- Very minor, isolated collision damage exists along the bridge railing and is heaviest on the east railing of span 2. No change from previous inspection.
- The east pedestrian fence posts exhibit heavy corrosion with multiple locations of 100% section loss **(photo 4)**. At some locations where heavy corrosion exists in the pedestrian fencing, steel plates were recently fastened to the horizontal pipes by county maintenance to stiffen the loose components. Most of the repairs were functioning at the time of inspection **(photo 5)**. Loose areas of the chain-link fence should be checked for during future inspections for safety.

Approach Railing – The approach railing is comprised of thrie-beam which transitions into w-beams at the end of the approach slabs. Steel posts support the approach railing.

- New W-beam guardrail and steel (previously timber) posts have been installed at both the rear and forward approaches. No significant deficiencies exist in the approach railing **(photos 6 and 7)**.

Miscellaneous Items

- The security fence is broken or damaged at the following locations: east and west side of the rear abutment **(photos 8 and 9)**; east side of the forward abutment **(photo 10)**, and the south end of pier 2. The damaged fence allows trespassers to access various locations of the bridge including the catwalk using ropes and makeshift ladders to reach the catwalk.
- Overgrown trees and vegetation exist at the northwest corner of the bridge over the forward abutment **(photo 11)**. The vegetation continues to grow and further encroach upon the sidewalk and closer to the roadway every inspection. Additionally, overgrown trees exist along the east side of the forward abutment slope.
- The heads of the set screws which secure the casting lids for anchor pit access are stripped; however, the lids are still able to be removed to access the pits. No change from the previous inspection.
- A bird's nest exists at the east end of the catwalk at panel point 17 **(photo 12)**. The nest is currently unoccupied and should be removed.

NBI Item 58 – Deck (5 = Fair condition)

Deck/Wearing Surface – Spans 1 and 3 have an 8-inch-deep concrete deck integral with the stringers, installed in 1994 with monolithic wearing surface. Span 2 has a filled grid deck with a 1/4-inch-thick epoxy wearing surface. Both deck systems have had the wearing surface repaired by contract in 2018. County maintenance forces have continued to make repairs to the deck and south approach slab. Repairs were performed in September/October of 2022 by Summit County forces.

- The concrete curbs in spans 1 and 3 have minor spalls along the curb edges, especially along the expansion joint armor **(photo 13)**. Cracking in the curbs is isolated and is spaced approximately 5 feet apart with the heaviest cracking in span 1 near pier 1. No change from the previous inspection.
- The longitudinal joint along the curb line in span 2 between the deck and sidewalk leaks and is corroding the grid deck along the joint **(photo 14)**. This problem persists throughout Span 2 along both sidewalk joints. No change from previous inspection.
- The exterior sidewalk fascia plate in span 2 exhibits active corrosion with no significant section loss noted. No change from previous inspection.
- An isolated 6-inch-diameter x 1/4-inch-deep spall exists in the northbound lane of span 3. Additionally, a 2 square-foot x 1-inch deep spall exists in the southbound lane closest to the centerline of the bridge **(photo 15)**.
- The epoxy overlay in span 2 was repaired in 2018 but is now failing. Sections of the epoxy overlay are deteriorated and there are locations where the overlay has delaminated and is able to be removed by hand **(photo 16)**. No change from the previous inspection.
- Approximately 10% of the wearing surface (including patches) in spans 1 and 3 is delaminated. The highest density of delaminations, cracking, and cracked patches exists along the northbound lane of span 1 **(photos 17 and 18)**. Approximately 75% of the 2018 patches are cracked. Isolated locations of shallow spalls typically less than 1 square foot and up to 1 inch deep exist in the northbound lane.

Soffit

- The soffit exhibits isolated hairline longitudinal and transverse cracks, many with light efflorescence, in spans 1 and 3. The cracks are most prevalent in span 1, near midspan **(photo 19)**. No change from the previous inspection.
- Cracking with delaminations exist in isolated locations over the east truss. Due to the deficiencies in the top of the deck, this problem continues to appear more frequently each inspection.
- In span 2 (where grid deck exists), areas of corrosion exist along the longitudinal sidewalk joints due to leaking between the deck and joint. Isolated areas of surface corrosion also exist away from the sidewalk joint **(photo 20)**. No change from the previous inspection.

Joints – Three expansion joints exist on the bridge: strip seal joints exist at the abutments, and a finger joint at floorbeam 13 in span 2 (expansion end of suspended span). Three fixed joints exist on the bridge: compression seal joints at floorbeam 7 (over pier 1) and floorbeam 23 (over pier 2), and a strip seal joint at floorbeam 17 in span 2 (fixed end of suspended span).

- All the joints appear to be functioning as intended and the expansion joints are free to move. The expansion joints have experienced a gradual closing over time, likely due to movement of the abutments towards the channel (see **Appendix A - Joint/Truss Clearance Measurements**). Although these measurements have not been corrected for temperature, the overall data shows that the joints have been steadily closing since first recorded in 1994. The joint openings still appear adequate for the normal range of temperature experienced by the bridge.
- Minor to moderate debris and standing water was noted on the strip seal joints at the time of inspection **(photo 21)**. Prior to 2018, the joints had previous issues with leakage evident by the corrosion and failing paint on the steel superstructure below each joint. The joints were repaired, and neoprene flashing sheets to direct water into the pans were installed under each joint at floorbeams 13 and 17 in 2018 to mitigate past drainage issues **(photo 22)**. The sheets exhibit minor areas of misalignment; however, no leakage was noted at the time of the 2023 inspection. No significant changes from the previous inspection.
- Shallow spalls typically exist in the driving surface of the concrete deck adjacent to the joint armor. No change from the previous inspection.
- Surface corrosion with some section loss is typical at the ends of the joints adjacent to each curb **(photo 23)**.

Note: Joint measurement procedures followed the instructions outlined in the "Maintenance and Inspection Manual" from January 1995, included in **Appendix A.*

NBI Item 59 – Superstructure (5 = Fair condition)

Stringers – The deck and sidewalks are supported by 11 stringers in spans 1 and 3, and 13 stringers in span 2 which are continuous and bear on top of the floorbeams.

- Isolated areas of peeling paint with exposed primer exist throughout **(photo 24)**. No change from previous inspection.
- Up to 1/2-inch-thick pack rust exists between stringer 11 and floorbeam 17 bearing plate **(photo 25)**. The exterior stringers under joints exhibit heavier than typical surface corrosion and section loss due to past leakage issues at the joints. The noted issues have existed in the past and have not significantly changed since the joint leakage has been resolved.
- Two loose bolts exist at the south connection angle of stringer 8 to floorbeam 28 connection **(photo 26)**. This condition exists at random locations throughout the superstructure for stringer to floorbeam connections. However, no bolts appeared to have loosened further since the 1994 rehabilitation/painting project was performed.

[FCM] Floorbeams – There are 30 floorbeams in total spaced at 30 feet center-to-center. Due to their spacing (greater than 14 feet), the floorbeams are considered fracture critical and received an in-depth, arm's length inspection.

- The floorbeams exhibit areas of painted over pitting up to 3/16 inch deep typically in the webs and flanges with isolated areas of section loss up to 3/8 inch deep in the top flange **(photo 27).** Floorbeams with the most significant section loss have been strengthened by post-tensioning rods. No change from the previous inspection.
- The original stringer connection angles are still attached to the web at most floorbeams. No change from the previous inspection.
- The floorbeams under the joints exhibit surface and laminating corrosion **(photo 28)**. The impact caused by the joints leaking has lessened over the years and current conditions where paint flakes and rust exist developed in the past where water, contaminants, deicing chemicals, and other contaminants would pass through the joints. The conditions have not significantly degraded the past few inspections.
- Cracks exist in tack welds connecting lateral bracing connection plates to the floorbeam bottom (tension zone) flange at the roadway centerline. The cracks have not extended into floorbeam base metal **(photo 29)**. The cracks should continue to be checked during in-depth inspections to make sure any noted cracks or new cracks do not propagate into the floorbeam base metal.
- Tack welds exist at isolated locations of the floorbeams typically between the web and accessory attachments. Tack welds in tension zones of fracture critical members should be monitored during in-depth inspections. No change from the previous inspection.
- Vertical bearing stiffeners overtop the upper chord exhibit painted over pack rust up to 1 inch thick bowing the stiffener angle legs outward. Additionally, painted over pack rust up to 3/4 inch thick exists between the bottom flange and fill plate at sway bracing connections.
- Post-tensioning rods have been added to the bottom flange of the floorbeams in span 2. The rods were installed during the 1994 major rehabilitation project to add tensile capacity, contributing roughly 10% capacity per member. Isolated areas of surface corrosion exist on the rods. No change from the previous inspection.
- Conditions specific to the floorbeams are as follows:
  - Floorbeam 7 exhibits a tack weld on the bottom of abandoned accessory brackets and painted over section loss adjacent to the bracket. No crack in the tack weld was noted. No change from the previous inspection.
  - Floorbeam 8 exhibits a small cut in the west end of the south web **(photo 30)**. No change from the previous inspection.
  - Floorbeam 13 below the finger joint exhibits surface corrosion with 1/8-inch-deep section loss in the top flange **(photo 22)**. No change from the previous inspection.
  - Floorbeam 14 has multiple deep gouges in the east end of the south web and bottom flange **(photo 31)**. No change from the previous inspection.
  - Floorbeam 15 has a fin (steel fabrication defect) in the west end of the top flange. No change from the previous inspection.

- Floorbeam 15 has a fin (steel fabrication defect) in the west end of the top flange. No change from the previous inspection.
- Floorbeam 17 exhibits heavy surface corrosion and rust staining in the north face, of the west cantilever from past leakage through deck joint **(photo 28)**. No change from the previous inspection.
- Floorbeams 19 and 20 have small saw cuts in the top (tension) flange over the west truss. No cracks were noted. No change from the previous inspection.
- Floorbeam 22 has a 4 3/4-inch-long fin in the top flange and a 2-inch-long fin in the web. No change from the previous inspection.
- Floorbeam 23 exhibits up to 3/16-inch-deep painted over section loss throughout the bottom of the web and bottom flange. No change from the previous inspection.

Any tack welds noted are considered fatigue prone details in tension regions of the floorbeam and should be monitored during in-depth inspections for cracks. The floorbeams with previous section loss have been strengthened by the post-tensioning rods installed in 1994.

Truss Verticals – The truss verticals are compression members and are not considered fracture critical.

- The truss verticals exhibit pack rust between built-up members and connection plates at isolated locations. The thickness and amount of distress caused by the pack rust have not significantly changed from past inspections. Adjacent areas around existing pack rust should be monitored during in-depth inspections for distress.

[FCM] Truss Diagonals – The truss diagonals are riveted built-up members. Due to uplift forces of the truss at the abutments, the diagonals can be subjected to both tension and compression loads.

- The post-tensioning rods for west U12L13 and U18L17 exhibit section loss reducing the diameter up to 30% at the lower panel point anchor **(photo 32)**. The joints at floorbeams 13 and 17 have leaked deck drainage in the past and the plastic bushing insert between the rod and anchor retains moisture. This condition has not significantly changed the past few inspections and the corrosion does not currently appear active.
- East U2L1 outboard connection exhibits up to 1 1/4-inch-thick pack rust causing distortion of the fill plate up to 1 1/4 inches. The diagonal member should be monitored for significant section loss where pack rust has developed. No change from the previous inspection.
- Minor to heavy pack rust up to 1 inch thick exists between built-up members throughout truss diagonals. This is a typical condition and has not changed.
- West U23L24 has up to 75% section loss to rivet heads. The corrosion does not appear to be active, and the rivet head loss has not impacted the overall connection or capacity of the member. No change from the previous inspection.
- West U24L25 at L25 has a 1-inch-long crack in the tack weld between the top outboard angle and diagonal web. The crack exists at the end of the diagonal where the member

has already been developed into the gusset plates and still only resides in the weld itself. The existing crack is not significant to the bridge and has not changed from the previous inspection.

- Surface corrosion and peeling paint are typical on truss diagonals with no significant section loss noted. The corrosion typically is not active. No change from the previous inspection.

[FCM] Truss Upper Chord – See the fracture critical plan for segments of the upper chord which are fracture critical.

- Painted over pitting exists along the exterior faces of the web plates and top of the upper chord throughout the bridge typically ranging from 1/16 to 1/8 inch deep **(photo 33)**. A few locations were noted to have up to 3/16-inch-deep section loss with active pitting. No changes from the previous inspection that would significantly affect the overall capacity of the bridge.
- Post-tensioning rod retrofits exist along upper chord members between:
  - Panel points 6 to 11 in spans 1 and 2 **(photo 34)**
  - Panel points 19 to 24 in spans 2 and 3

  The rods provide additional tensile capacity and were installed during the 1994 major rehabilitation project. Surface corrosion exists on several of the rods. Section loss in the rod was observed in the free end past the attachment brackets which does not affect the strength of the retrofit. No change from the previous inspection.
- A large corrosion hole exists in the bottom flange plate of U12U13 where the member is open at the west U13 pin. The member is a zero-force member, and the corrosion hole is not significant to the bridge. No change from the previous inspection.
- Typical pack rust exists between the bottom plate of the upper chord and bottom of the web distorting the bottom flange plate intermittently **(photo 33)**.

[FCM] Truss Lower Chord – See the fracture critical plan for segments of the lower chord which are fracture critical.

- West L15 interior web plates exhibit distortion up to 2 inches inward with adjacent heavy surface corrosion and failed paint due to pack rust. This condition exists at a few other isolated locations inside lower chord members. The cause of the pack rust could not be determined at the time of inspection; however, the distortion exists at sway bracing connection locations and possibly is from lateral forces at the connection. This specific condition was not previously identified, so it is difficult to determine if the area has deteriorated rapidly or slowly. The areas should be checked again for active corrosion, section loss, pack rust and distortion during in-depth inspections.
- West lower chord exhibits painted over pitting and section loss up to 1/8 inch deep in the top of the lower chord between L14 and L16. Pack rust and active corrosion also exists along the top edges of web plates at the panel points. This condition exists at multiple panel points due to past debris accumulations which retains moisture. Most of the panel points were mostly free of debris during this inspection.

- Painted over pitting is typical on the top of the top plate of the lower chord up to 3/16 inch deep. Isolated painted over section loss between 1/16 to 1/8 inch deep is typical in the exterior web plates throughout the bridge. The section loss has been observed in prior inspections and has not significantly increased affecting the overall capacity of the bridge.
- Heavy amounts of vegetation exist along east L22L23 near pier 2. Vegetation can hold water and moisture accelerating corrosion on the surrounding steel.
- East L9L10 and L11L12 exhibit isolated locations of surface corrosion and failing paint along the top of the members. The corrosion does not appear to be active. No change from the previous inspection.
- Heavy corrosion and some section loss exists mostly in the bottom flange plates of the lower chord members at the south end of span 1 and north end of span 3 near the abutments **(photo 35)**.

[FCM] Gusset Plates

- West L0 inboard gusset plate exhibits a 1-foot-long x 3-inch-wide x 3/16-inch-deep area of painted over section loss along the upper chord inside the panel point. Painted over section loss is common on the interiors and exteriors of gusset plates with the maximum amount of loss noted up to 1/4 inch deep **(photo 36)**. The section loss has been observed in prior inspections and has not significantly increased affecting the overall capacity of the bridge.
- East L1 inboard lower lateral bracing to gusset plate connection exhibits up to 3/4-inch-thick pack rust between the gusset plate and angle. The lower lateral bracing is a secondary member, and this condition does not affect the overall capacity of the bridge. No change from the previous inspection.
- The gusset plates at east U13 and U17 exhibit bows between 1/4 inch and 5/16 inch. This condition does not have a significant impact on the capacity of the bridge as the plates are bowed along the free edges and are on the same side as the zero force upper chord members at the pins. No change from the previous inspection.
- East U13, inside face of the outboard gusset plate exhibits a cracked tack weld between the plate and the pin bearing assembly. The crack has not propagated into the base metal and has not grown or changed from the past inspection. Cracked tack welds exist at multiple locations but no cracks were observed to be propagating into the base metal. Most likely the cracks are not new and have existed during the past few inspections. Continue to monitor cracked tack welds or any tack weld in tension regions of the gusset plate.
- A previously noted crack exists in north side of the east L14 outboard gusset plate interior. The crack was magnetic particle tested yielding a negative result. The area where the crack was thought to be is only paint cracking and overlapping section loss to the gusset plate. The condition has not degraded or changed from the past inspection.
- West U21 outboard gusset plate exhibits two missing rivets. The issue is not currently significant; however, should be addressed during the next major rehabilitation project.

- East U29 outboard gusset plate was noted to be previously bowed and has been retrofitted with a bolted angle to mitigate the issue. Other isolated bows exist in gusset plates typically less than 3/16 inch. If bows of other gusset plates increase significantly, consider installing similar repairs to resolve the issue.
- Pack rust up to 3/4 inch thick with adjacent section loss in the gusset plates exists between the plate and angle members of diagonals inside the panel point prying the corners of the diagonal angles. The section loss and pack rust is no longer active and has been observed in prior inspections. No significant changes in overall capacity were observed.

Bracing Members – Bracing members include sway bracing, upper lateral bracing, and lower lateral bracing. The upper lateral bracing includes a center connection to the bottom flange of floorbeams every other panel point. All bracing members are considered secondary members and did not receive an in-depth, arm's length inspection.

- Cracks exist in tack welds connecting lateral bracing connection plates to the floorbeam bottom (tension zone) flange at the roadway centerline. The cracks have not extended into the floorbeam base metal **(photo 29)**. Cracks in tack welds or tack welds connecting bracing members to tension members of the bridge should be closely monitored during in-depth inspections.
- Painted over pack rust up to 3/4 inch thick exists between the bottom flange and fill plate at sway bracing connections. The pack rust does not appear to be active and has not changed from the past inspection.
- Sway bracing members typically exhibit painted over section loss at isolated locations. Debris sits in horizontal members collecting debris which retains moisture and accelerates section loss to the steel. Currently, no debris was observed inside of these members during the 2023 inspection.
- East L1 inboard lower lateral bracing to gusset plate connection exhibits up to 3/4-inch-thick pack rust between the gusset plate and angle. The pack rust is no longer active and has not changed from the last inspection.
- Corrosion holes exist in the lower horizontal strut of the sway bracing at panel point 17. Additionally, corrosion holes exist adjacent to the bottom perforation of the horizontal sway bracing strut over pier 1 near the connection to the east truss. The areas of section loss occur below joints in the deck where past debris and water would get trapped on top or inside of the members causing section loss and corrosion of the steel. No change from the previous inspection.
- Corrosion holes exist in the end of the upper lateral bracing member on the north side of floorbeam 26, span 3. The corrosion is no longer active. No change from the previous inspection.

Bearings

- The bearings appear to be functioning as designed.
- Painted over section loss up to 3/16 inch deep exists in the exterior face of the vertical pin plates for the hold-down bearings at the rear abutment **(photo 37)**. Similar less severe section loss exists at the forward abutment. No change from the previous inspection as the section loss and corrosion is no longer active.
- Surface corrosion exists around the perimeters of the masonry plates typically with 1-inch deep wear into the bearing seat **(photo 38)**.
- The fixed bearings at the piers exhibit active surface corrosion inside the assembly due to the bearings not able to fully drain from inside the assembly. Drain holes have been installed (2 on each side) at the base of the assembly; however, these most likely get clogged by debris inhibiting proper drainage through the drilled holes. Corrosion also exists along the masonry plate and at the interface with the lower chord pin plates **(photo 39)**.

Pins and Eyebars

- The tie down anchorages at each abutment exhibit active surface and laminating corrosion with less than 1/16-inch-deep section loss **(photo 40)**. The corrosion appears to be very gradual causing negligible increases in section loss each inspection; however, no significant changes exist from the previous inspection. Ultrasonic testing should be performed on the 6 pins at each abutment every 10 years. The last testing was performed in 2015.
- The anchorage eyebars and pits exhibit moisture which can accelerate the oxidation process of the eyebars **(photo 41)**. No change from the previous inspection.
- The pins at each pier are in full bearing and do not carry any shear loads. The pins should be checked visually every in-depth inspection.
- Painted over section loss exists in both inboard and outboard pin plates up to 5/16 inch deep inside of west U13 **(photo 42)**. The interiors of panel points around the pins at panel points 13 and 17 typically exhibit surface corrosion and ineffective paint. No significant changes exist from the previous inspection. The truss chord pins at these locations are guides and align the members carrying no design loads. The truss chord pins should be checked visually every in-depth inspection.

Paint/Coating System

- The paint system is substantially effective at areas away from the joints with chalking throughout the structure. No significant changes exist in the overall paint system for the superstructure.
- Floorbeams, stringer ends, and truss members under the joints exhibit some areas of corrosion, failing paint, and pack rust between components. Active corrosion with ineffective paint exists at isolated locations throughout.

NBI Item 60 – Substructure (7 = Good condition)

Abutments

- Both abutments show a gradual movement towards the channel as noted in the Joint/Truss Clearance Measurements table and graph. This condition is common for tall abutments where active soil pressure behind the abutment moves the abutment by either sliding or rotation over time. No significant changes were observed in the overall rotation or alignment of the abutments.
- Very isolated delaminations and cracking exist along both abutments. A 4-foot-long x 1-foot-tall delamination exists in the west end of the forward abutment. A 2-foot x 1-foot delamination exists in the rear abutment **(photo 43)**. No significant changes from the previous inspection.
- The abutments are covered in graffiti from trespassers **(photo 44)**. No change from the previous inspection.
- Spalling up to 1 square foot x 2 inches deep with adjacent shallow delaminations exist in both abutments. No significant changes in size or dimensions of the spalls from the previous inspection.

Piers

- Minor cracks with efflorescence exist along the piers at isolated locations. No change from the previous inspection.
- A 2-foot x 2-foot delamination exists along the south face of column 2 at pier 1, approximately 7 feet above ground level **(photo 45)**. Additionally, efflorescence cracking and spalling exists in the bottom northwest corner of the pier cap above column 1. No changes from the previous inspection.
- Minor spalls exist along the bearing seat at the west truss bearing at pier 1 where debris and water collects. No change from the previous inspection.
- A 2-foot long x 1-foot wide x 1-inch deep edge spall with adjacent efflorescence exists in the north face of the pier 1 cap near column 1 **(photo 46)**.
- A tree and vines are growing into the east face of the cap and column 2 at pier 2, south face of column 1 at pier 2 and north face of cap and column 1 at pier 1 **(photo 47)**.

Backwalls

- The abutment backwalls exhibit no significant deficiencies; however, are covered in graffiti similar to the abutment breastwalls **(photo 44)**. No change from the previous inspection.

Wingwalls

- Abutment rotation from the wingwalls exists at the southwest and northeast corners of the bridge. Measurements to acquire a baseline for each rotation were taken at the bases and tops of each wall. The separation between the wingwalls and abutment backwalls were:
  - The southwest wingwall - 1/2 inch measured at the base and 1 3/4 inches (previously 1 1/2 inches in 2022) measured at the top **(photo 48)**.

- The northeast wingwall - 0 inches measured at the base and 1 1/4 inches measured at the top of the wall (previously 1 1/2 inches in 2022) **(photo 49)**.

Both abutments show a gradual movement towards the channel as noted in the Joint/Truss Clearance Measurements table and graph. This condition is common for tall abutments where active soil pressure behind the abutment moves the abutment by either sliding or rotation over time. The measurements should be taken each year to monitor any changes.

NBI Item 61 – Channel and Channel Protection (9 = No Deficiencies condition)

Channel

- The channel banks are stable and well vegetated **(photos 50 and 51)**. No change from the previous inspection.

Channel Protection

- Slope failures and washout areas exist at the southeast and northeast corners of the bridge **(photo 52)**. Additionally, the slope is washed out under panel points 26 and 27 near the forward abutment. Stone rip rap has been placed around the affected area; however, the stones no longer exist where the slope has washed out. No significant changes have occurred to the channel protection from the past few inspections as the drainage down the slopes continues to travel down towards the channel.
- Minor erosion exists on the north slope down to pier 2 where water from the top of the slope and bridge drains down to the channel. No significant increases in erosion were observed.

Scour

- No significant deficiencies noted related to scour as most of the bridge components exist far outside the normal flow limits of the channel.

NBI Item 72 – Approach (6 = Satisfactory condition)

Approaches

- The rear approach slab exhibits multiple patches in the northbound lane from recent wearing surface repairs performed in 2018 by contract and more recently by county maintenance in 2022 **(photo 53)**. The patches appeared sound at the time of inspection. The north approach slab exhibits no significant deficiencies.
- Both approaches exhibit shallow spalling along the expansion joint armor. No change from the previous inspection. If spalling continues creating a rougher transition on and off of the bridge, consider performing patch work to improve rideability.
- The forward approach asphalt pavement exhibits one transverse crack, approximately 40 feet from the approach slab **(photo 54)**. The crack has been previously sealed with mastic. No change from the previous inspection.

- Edge spalling exists along the rear asphalt approach roadway creating a rough transition between the approach slab and asphalt roadway **(photo 55)**.

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Photographs

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Photo 1 – End view looking north.

Photo 2 – Elevation looking northeast.

Photo 3 – Looking west at the west sidewalk and railings. Note: typical minor corrosion throughout thrie-beam railing.

Photo 4 – Looking east at east pedestrian fence in span 3. Note: typical through holes in ends of horizontal pipes for fence.

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Photo 5 – Looking east at east pedestrian fence base connection in span 3. Note: steel longitudinal retainer plate repair due to previous heavy corrosion.

Photo 6 – Looking southwest at newly installed approach guardrail along east side of the rear approach.

Photo 7 – Looking northwest at newly installed approach guardrail along west side of the forward approach.

Photo 8 – Looking southeast at the hole in the fence adjacent to the gate, west side of the rear abutment.

Photo 9 – Looking east at hole in the fence at the east side of the rear abutment.

Photo 10 – Looking west at hole in the fence at the west end of the forward abutment.

Photo 11 – Looking south along the west side of the north end of the bridge. Note: overgrown trees onto sidewalk, no change.

Photo 12 – Looking east at inactive bird's nest at east end of catwalk at panel point 17, span 2.

Photo 13 – Looking west at west end of rear abutment expansion joint at curb. Note: typical spall in curb at end of joint.

Photo 14 – Looking north under west sidewalk at steel SIP forms, span 2. Note: heavy corrosion and failing paint throughout.

Photo 15 – Looking west at southbound lanes of bridge wearing surface near centerline, span 3. Note: 2 square-foot x 1-inch deep spall.

Photo 16 – Looking southwest at northbound lanes in span 2. Note: no change to epoxy overlay and patches in bridge wearing surface.

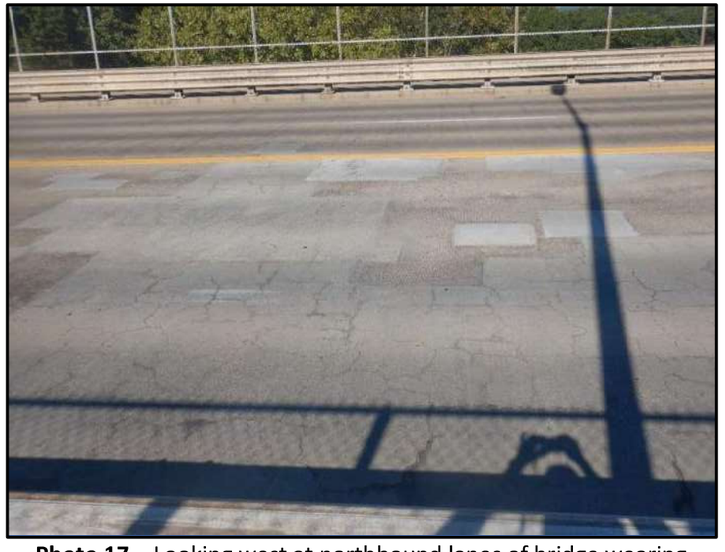

Photo 17 – Looking west at northbound lanes of bridge wearing surface in span 1. Note: cracking in patches throughout.

Photo 18 – Looking southwest at close-up of patching in bridge wearing surface in northbound lanes, span 1. Note: cracks in patches.

Photo 19 – Looking north at general underside of span 1. Note: cracking with light efflorescence in deck.

Photo 20 – Looking north at general underside grid deck in span 2. Note: isolated areas of surface corrosion in SIP forms.

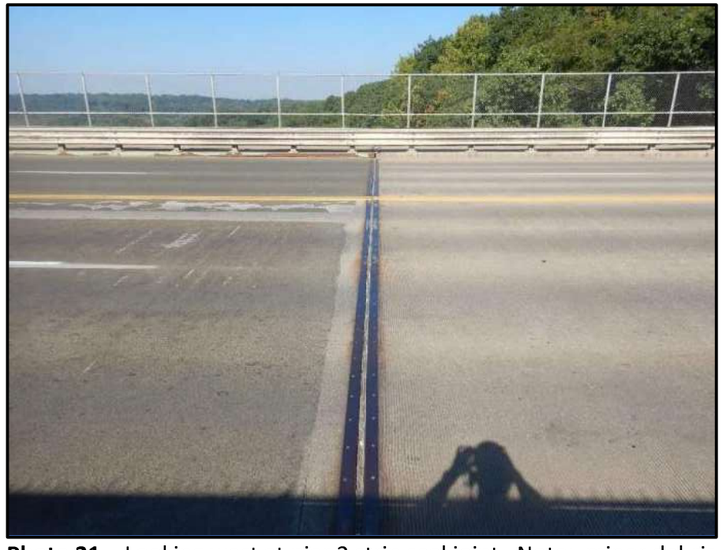

Photo 21 – Looking west at pier 2 strip seal joint. Note: minor debris in joint.

Photo 22 – Looking north at underside of top flange of floorbeam 13 below finger joint. Note: corrosion to floorbeam from previous leakage. Neoprene flashing sheet in place to direct water.

Photo 23 – Looking west at east end of rear abutment strip seal joint. Note: typical corrosion and minor section loss to joint armor.

Photo 24 – Looking west at east face of stringer 5 between floorbeams 5 and 6, span 1. Note: 2 square feet of peeling paint exposing primer.

Photo 25 – Looking southeast at stringer 11 connection to north face of floorbeam 17, span 2. Note: heavy corrosion and pack rust under stringer bearing.

Photo 26 – Looking northeast at stringer 8 connection angle to south face of floorbeam 28, span 3. Note: two loose bolts.

Photo 27 – Looking east along top of bottom flange of floorbeam 23, south face, span 3. Note: painted over section loss typically 3/16 inch deep.

Photo 28 – Looking southeast at west end of floorbeam 17, north face, span 2. Note: heavy corrosion and rust staining.

Photo 29 – Looking northwest floorbeam 18 bottom flange connection to lower lateral bracing connection plate, span 2. Note: cracked tack welds.

Photo 30 – Looking north at south face of floorbeam 8 under stringer 5, span 2. Note: minor cut in floorbeam web below stiffener. No change.

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Photo 31 – Looking northeast at south face of floorbeam 14 web under stringers 7 and 8, span 2. Note: multiple gouges in web most likely from construction.

Photo 32 – Looking west at west U12L13 inboard PT rod, span 2. Note: rod exhibits up to 30% section loss, no change.

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Photo 33 – Looking east at east U3U4 at U3, west face, span 1. Note: typical painted over section loss to web of upper chord. Pack rust up to 1 inch thick between bottom plate and bottom of web.

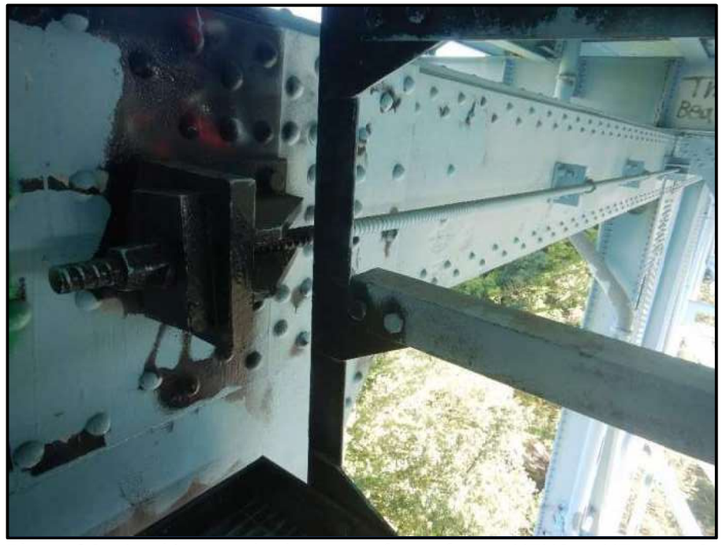

Photo 34 – Looking north along east face of west U7U8 at U7, span 2. Note: typical PT rod repair for upper chord.

Photo 35 – Looking south at west L0L1 at the rear abutment, span 1. Note: heavy corrosion and peeling paint along bottom flange plate interior.

Photo 36 – Looking west at east L0 outboard gusset plate at rear abutment. Note: graffiti and isolated areas of painted over section loss.

Photo 37 – Looking west at east truss bearing at rear abutment, east face. Note: 3/16-inch deep painted over section loss to exterior of outboard pin plate, no change.

Photo 38 – Looking east at west truss bearing at forward abutment. Note: surface corrosion around edges of masonry plate with 1-inch deep wear into bearing seat.

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Photo 39 – Looking east at west face of east truss bearing at pier 1. Note: surface corrosion around masonry plate.

Photo 40 – Looking north at west truss eye bar tie down anchorage at forward abutment. Note: 1/16-inch deep pitting and laminating corrosion on eye bars.

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Photo 41 – Looking north at west truss anchor pit for tie down anchorage at forward abutment. Note: moisture inside of pit.

Photo 42 – Looking east at interior of pin at west U13, span 2. Note: painted over section loss and active corrosion in pin plate.

Photo 43 – Looking north at west end of forward abutment along top of breastwall. Note: 4-foot long x 1-foot tall delamination.

Photo 44 – Looking north at forward abutment, overall. Note: abutment and backwall are covered in graffiti.

Photo 45 – Looking north at south face of column 2, pier 1 approximately 7 feet above the ground. Note: 2-foot x 2-foot delamination.

Photo 46 – Looking south at north face of pier 1 cap at column 1. Note: 2-foot long x 1-foot wide x 1-inch deep spall with adjacent efflorescence.

Photo 47 – Looking at pier 2 at heavy vegetation growth around cap and columns.

Photo 48 – Looking north at top of southwest wingwall Note: 1 3/4 inches rotation away from abutment.

Photo 49 – Looking north at northeast wingwall at forward abutment.
Note: wingwall rotation east away from abutment.

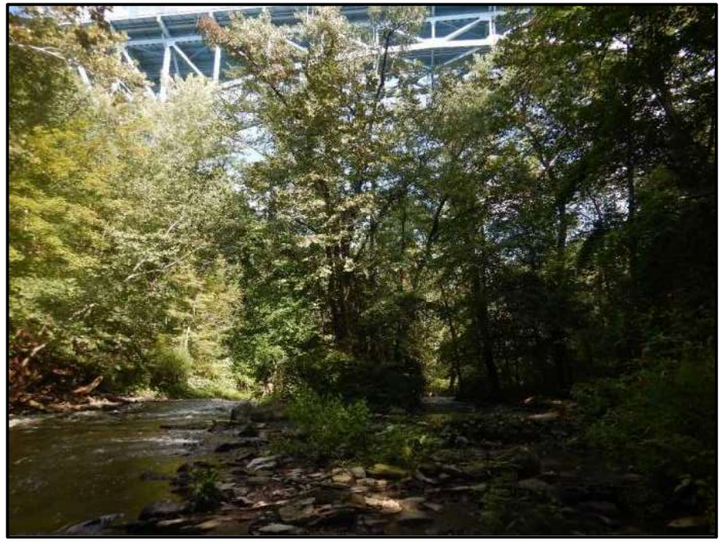

Photo 50 – Looking east at upstream channel with bridge above.

Photo 51 – Looking southwest at downstream channel with bridge above.

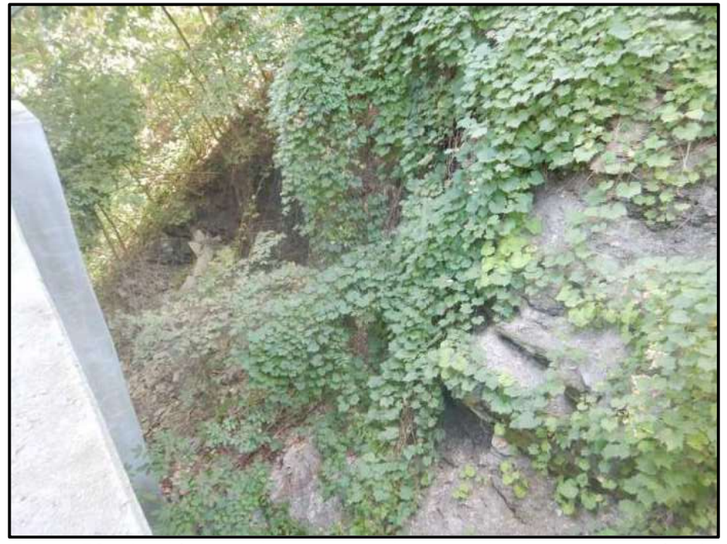

Photo 52 – Looking southeast at southeast embankment near pier 1.
Note: shale banks are steep and eroding.

Photo 53 – Looking northwest at rear approach slab. Note: sound patches throughout northbound lanes.

Photo 54 – Looking southeast at interior of outboard east L14 gusset plate. Note: previously noted crack confirmed to be combination of paint cracking and section loss to gusset plate.

Photo 55 – Looking east along approach slab to asphalt roadway transition at rear approach. Note: edge spalling along asphalt.

Appendix A

Joint/Truss Clearance Measurements

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Joint/Truss Clearance Measurements

Date	Steel Temp (°F)	Rear (South) Abutment				Span 2	
		Truss to Backwall		Deck Joint at Curb		Finger Joint at Curb	
		West	East	West	East	West	East
5/24/1994	62	16	16	7.75	8.06	26.63	23.88
5/27/1994	42	16.25	16.25	8.13	8.44	27.19	24.5
6/28/1994	65	15.75	15.75	7.5	7.75	26.5	23.63
7/5/1994	77	15.5	15.5	7.25	7.5	25.75	23.25
7/20/1994	80	15.5	15.06	7.31	7.75	26.63	22.88
7/29/1994	68	15.75	15.75	7.5	7.75	26	23.5
8/1/1994	68	15.81	15.81	7.75	8	26.5	23.75
8/18/1994	60	15.5	15.75	7.5	7.75	26.5	23.56
9/11/1994	49	16.06	16.13	7.81	8.13	26.81	24.13
9/13/1994	62	15.88	15.88	7.63	8	26.5	23.94
9/15/1994	74	15.63	15.38	7.38	7.75	26	23.38
10/11/1994	42	16.5	16.5	8	8.31	26.81	24.25
1/27/1995	30	16.75	16.75	8.5	8.94	27.88	25.5
10/20/1995	53	16	16	7.88	8.19	26.88	24.31
10/5/1998	51	16	16	7.88	8	26.88	24.13
9/17/2004	61	15.81	15.81	7.56	7.88	26.56	23.88
3/10/2015	44	16.5	16.5	8	8.31	26.56	24.13
3/20/2017	38	16.38	16.31	7.94	8.12	27.75	23.88
3/26/2018	45	16.31	16.31	7.75	8.06	26.5	24
9/25/2018	71	15.75	15.75	7.2	7.5	25.9	23.2
9/18/2019	73	15.63	15.69	7.38	7.5	25.88	23.13
8/31/2020	70	15.69	15.63	7.19	7.56	26.06	23.38
9/23/2021	55	14.13*	14*	7.25*	7.75*	24.44*	24.25*
9/6/2022	67	16.00	15.88	7.25	7.5	25.88	23.25
9/5/2023	75	15.75	15.50	7.00	7.5	25.38	23.13

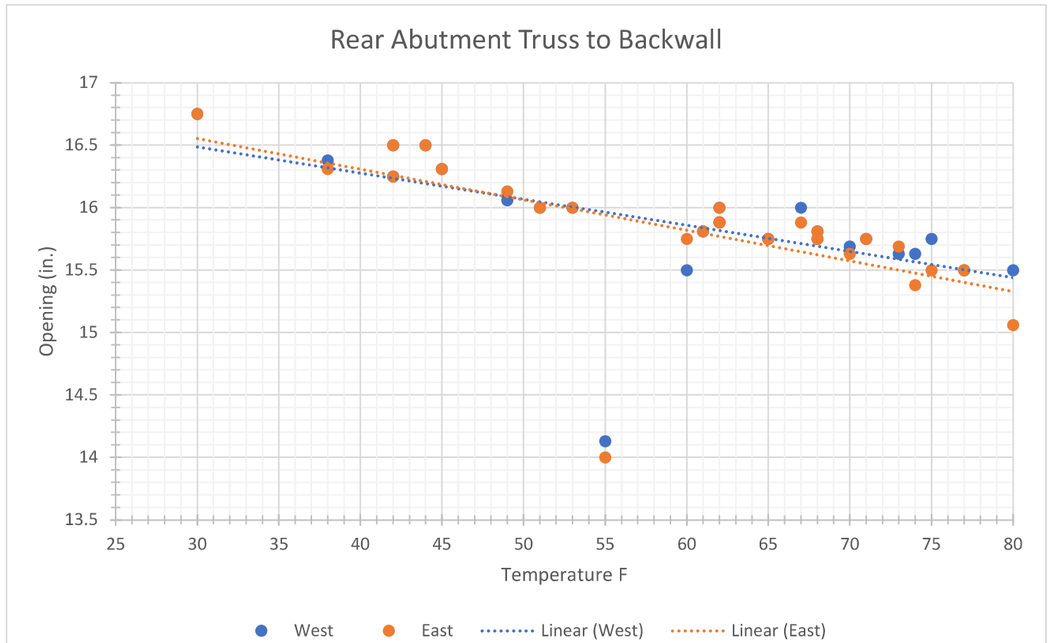
Note: It was unable to be determined exactly how the joint measurements were previously recorded for the 2021 measurements. For the purposes of the 2021 report the finger joints were measured from the edge of the joint armor assembly to the opposite edge of the finger joint (these joint measurements are typically recorded by measuring the opening between the fingers). The strip seal measurements were recorded from the edge of the joint armor to the opposite edge of the joint opening (typically measured the actual opening). After the field work was completed in 2021, we obtained a copy of the 1995 Maintenance and Inspection Manual that describes the measurement locations. The 2022 and 2023 inspection measurements followed the procedure outlined in the manual and the procedures from the manual are included in* ***Appendix A.*

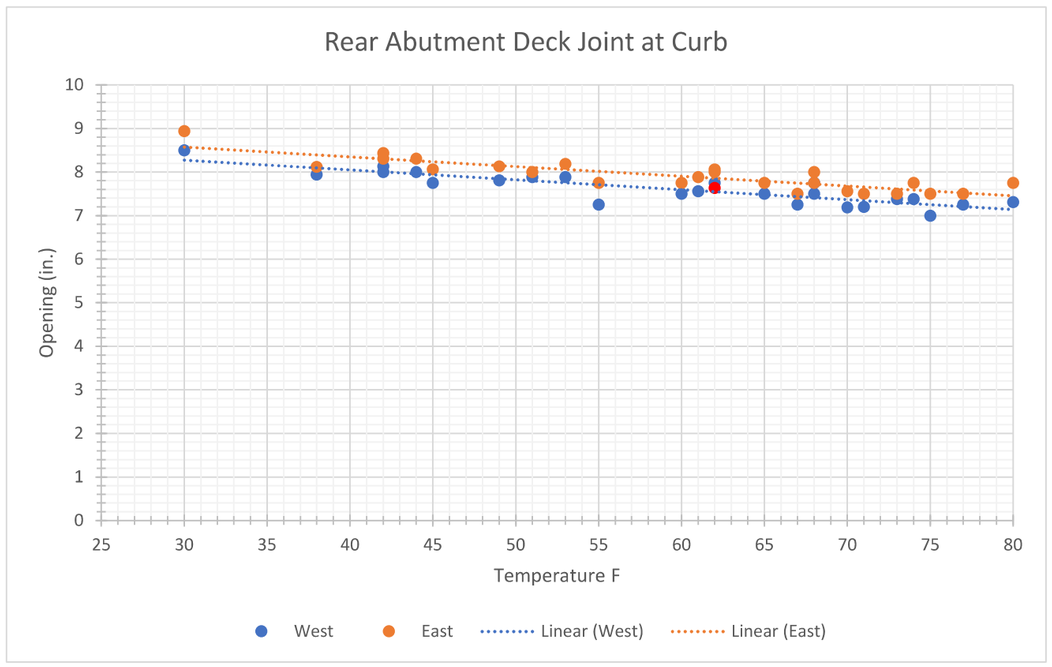
Joint/Truss Clearance Measurements

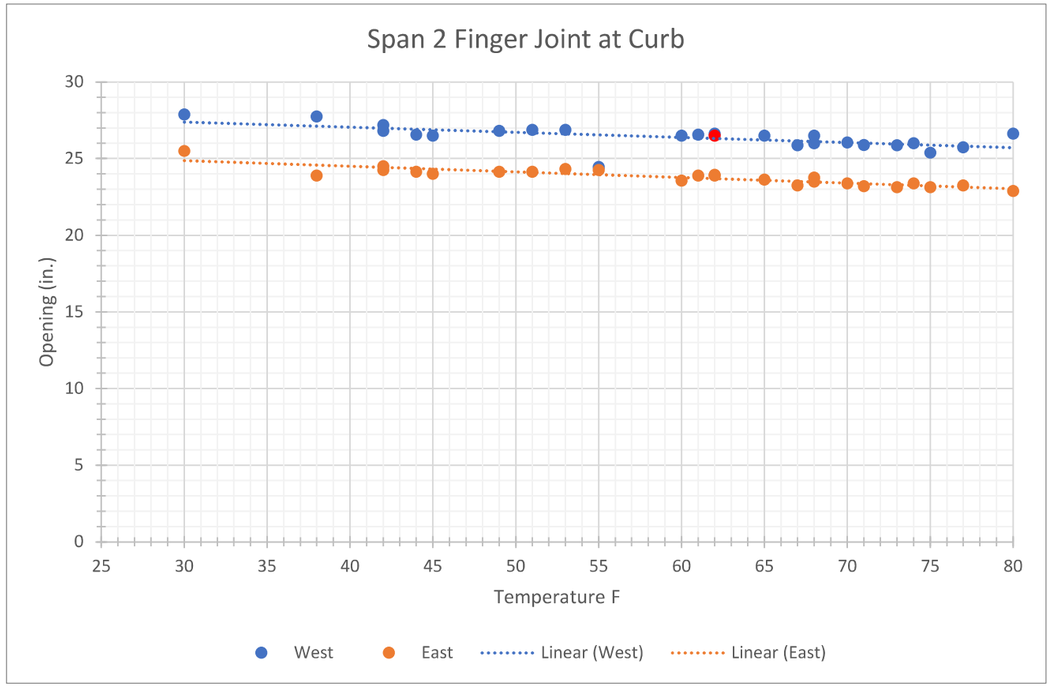
Date	Steel Temp (°F)	Forward (North) Abutment			
		Truss to Backwall		Deck Joint at Curb	
		West	East	West	East
5/24/1994	57	14.25	14.25	8.13	8.38
5/27/1994	41	14.44	14.44	8.4	8.69
6/28/1994	66	14	14	8	8.25
7/5/1994	78	13.75	13.75	7.75	8
7/20/1994	80	13.63	13.75	7.75	8
7/29/1994	68	14	14	7.75	8.25
8/1/1994	68	14	14	8	8.31
8/18/1994	58	14	13.94	7.94	8.19
9/11/1994	54	14.19	14.19	8.13	8.44
9/13/1994	63	14	14	7.94	8.25
9/15/1994	74	13.94	13.5	7.75	8
10/11/1994	48	14.13	14.31	8.25	8.63
1/27/1995	32	14.88	14.88	8.88	9.25
10/20/1995	54	14.06	14.13	8.19	8.5
10/5/1998	51	14.19	14.13	8.13	8.38
9/17/2004	61	13.94	14	7.94	8.19
3/10/2015	42	14.56	14.63	8.31	8.56
3/20/2017	38	14.38	14.38	8.19	8.19
3/26/2018	45	14	14	8	8.38
9/25/2018	71	13.6	13.6	7.6	7.9
9/18/2019	73	13.81	13.75	7.5	7.63
8/31/2020	75	13.81	13.75	7.5	7.75
9/23/2021	55	13.25*	12.75*	7.75*	7.5*
9/6/2022	67	15.00	14.25	7.63	7.75
9/5/2023	75	14.75	14.25	7.5	7.13

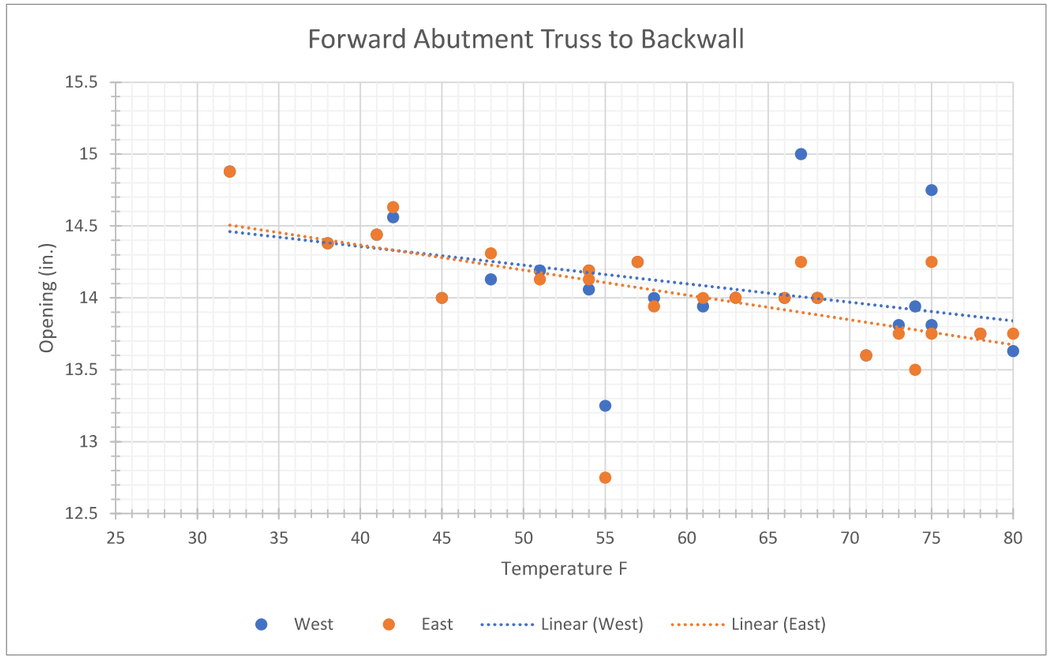
Note: It was unable to be determined exactly how the joint measurements were previously recorded for the 2021 measurements. For the purposes of the 2021 report the finger joints were measured from the edge of the joint armor assembly to the opposite edge of the finger joint (these joint measurements are typically recorded by measuring the opening between the fingers). The strip seal measurements were recorded from the edge of the joint armor to the opposite edge of the joint opening (typically measured the actual opening). After the field work was completed in 2021, we obtained a copy of the 1995 Maintenance and Inspection Manual that describes the measurement locations. The 2022 and 2023 inspection measurements followed the procedure outlined in the manual and the procedures from the manual are included in* ***Appendix A.*

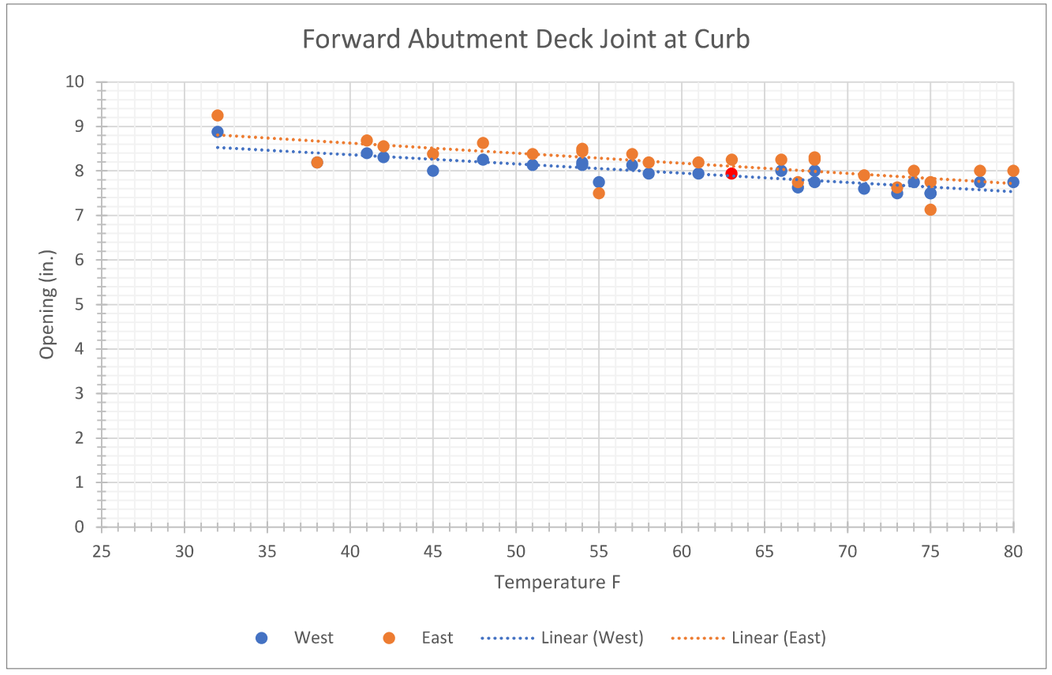
Joint/Truss Clearance Measurements










Forward Abutment Deck Joint at Curb
Opening (in.)
10
9
8
7
6
5
4
3
2
1
0
25
30
35
40
45
50
55
60
65
70
75
80
Temperature F
West
East
Linear (West)
Linear (East)

Appendix B

2023 AssetWise Routine Report

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Inspector: Kronander,Mike
Inspection Date: 09/05/2023
Structure Number: 7730306
Facility Carried: N MAIN STREET

Ohio Bridge Inspection Summary Report

SUM-M0008-00908 _(7730306)

2: District: District 04 — 01000 - AKRON (SUM county)
5A: Inventory Route: 1 M0008

21: Major Maint A/B: 02 - County Highway Agency /
225 Routine Main A/B: 02 - County Highway Agency /
221 Inspection A/B: 02 - County Highway Agency /
220: Inv. Location: AKR

7: Facility On: N MAIN STREET
6: Feature Ints: CUYAHOGA RIVER
9: Location: 900 FT N OF HOWARD ST
Lat, Lon: 41.1219128407897 ,-81.5096291190491

Condition

58: Deck	**5 - Fair Condition**
58.01 Wearing Surface	5 - Fair (10-15%, 2% asphalt patch)
58.02 Joint	6- Satisfactory (isolated leaking)
59: Superstructure	**5 - Fair Condition**
59.01 Paint & PCS	6 - Satisfactory (5-10% corr.)
60: Substructure	**7 - Good Condition**
61: Channel	**9**
61.01 Scour	**7 - Good**
62: Culverts	**N - Not Applicable**
67.01 GA	**5**

Appraisal

Sufficiency Rating	57.4 SD/FO 0 - ND
36: Rail, Tr, Gd, Term Std	1 1 1 1
72: Approach Alignment	8 - Equal to present desirable criteria
113: Scour Critical	9 - Foundations above flood waters
71: Waterway Adequacy	9 - Bridge Above Flood Water Elevations

Geometric

48: Max Span Length (ft)	480.0
49: Structure Length (ft)	909.0
52: Deck Width, Out-To-Out (ft)	67.6
424: Deck Area (sf)	61448.4
32: Appr Roadway Width (ft)	56.0
51: Road Width, Curb-Curb (ft)	52.0
50A: Curb/SW Width: Left (ft)	6
50A: Curb/SW Width: Right (ft)	6
34: Skew (deg)	0
33: Bridge Median	0 - No median
54B: Min Vert Underclearance (ft)	0
336A: Min Vert Clrnce IR Cardinal (ft)	99
336B: Min V Clr IR Non-Cardinal (ft)	0
578: Culvert Length (ft)	0

Load Posting

41: Op/Post/Closed	A - Open
70: Posting	5 - Equal to or above legal loads
70.01: Date	
70.02: Sign Type	
734: Percent Legal (%)	105
704: Analysis Date	10/16/2018
63: Analysis Method	6 - Load Factor (LF) rating reported by rating factor (RF) method using MS18 loading.

Structure Type

43: Bridge Type	3 - Steel 09 - Truss - Deck N- Not Applicable
45: Spans Main / Approach	3 / 0
107: Deck Type	1 - Concrete Cast-in-Place
408: Composite Deck	N - Non-composite Construction
414A Joint Type 1	8 - Elastomeric Strip Seal
414B: Joint Type 2	1 - Metal Finger
108A: Wearing Surface	5 - Epoxy Overlay N- Not Applicable
422: WS Date	01/01/1994
423: WS Thick (in)	.25
482: Protective Coating	5 - Paint System OZEU
483: PCS Date	12/12/1993
453: Bearing Type 1	2 - Rockers & Bolsters
455: Bearing Type 2	3 - Sliding (Bronze)
528: Foundn: Abut Fwd	4 - Spread Footing (on soil)
533: Foundn: Abut Rear	4 - Spread Footing (on Soil)
536: Foundn: Pier 1	4 - Spread Footing (on soil)
539: Foundn: Pier 2	N - None (Such as most Culverts)

Age and Service

27: Year Built/ 106 Rehab	1949 / 1993
42A: Service On	5 - Highway-pedestrian
42B: Service Under	5 - Waterway
28A: Lanes on	04
28B: Lanes Under	00
19: Bypass Length	2
29: ADT	14545
109: % Trucks (%)	7

Inspections

		Months	
90: Routine Insp.		12	09/05/2023
92A: FCM Insp.	Y	24	09/10/2022
92B: Dive Insp.	N	0	
92C: Special Insp.	N	0	
92D: UBIT Insp.	N	0	09/04/2020
92E: Drone Insp.	N	0	

Inspector: Kronander,Mike

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Inspector: Kronander,Mike
Inspection Date: 09/05/2023
Structure Number: 7730306
Facility Carried: N MAIN STREET

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12-Reinforced Concrete Deck	3 - Mod.	60122	sq. ft.	56447	2975	700	0
	In Spans 1 & 3, The underside of the slab exhibits hairline longitudinal and transverse cracks, many with light efflorescence. The cracks are most prevalent in Span 1, near midspan. Additionally in Span 1, delaminations that are reflective of the failing patches in the deck wearing surface that exist overtop the east truss at isolated locations. In Span 2, there are locations of corrosion concentrated along the longitudinal sidewalk joints as well in isolated areas corresponding to the worst of the wearing surface failing patches. There are vertical cracks in the edge of the slab in Spans 1 & 3. In Span 2, the joint along the curb line between the deck and sidewalk continues to leak and is corroding the forms along the joint. The exterior sidewalk fascia plate is corroding. The concrete curbs have minor spalls along the edges, especially along the expansion joint armor. There are also transverse cracks throughout the sidewalks in Spans 1 & 3, some of which are exhibiting past efflorescence in the floor of the slab. These cracks were sealed during the rehab project in 2018.						
510-Wearing Surfaces		46956	sq. ft.	29819	15935	1202	0
	Approximately 10% of the concrete wearing surface (including patches with cracking) in Spans 1 and 3 is delaminated. The delaminations have the highest incidence in the northbound lanes in Span 1. Over 1500 square feet of the recent patches are cracked. Similar to the delaminations, the greatest concentration of cracked patches is in the northbound lanes of Span 1. Summit County maintenance crews came out during the 2022 inspection to perform some repairs on the patched areas. 2023: Spall measuring 2 SF x 1in deep in SB lane close to CL, Span 3. The wearing course epoxy overlay in Span 2 was repaired in 2018, but is now failing. Sections of the epoxy overlay are flaking off and in locations the overlay has delaminated enough that it is possible to lift it off of the underlying concrete by hand.						
113-Steel Stringer	3 - Mod.	10959	ft.	9913	996	50	0
	Isolated areas of peeling paint with exposed primer. The exterior roadway stringers have minor painted over pitting and localized corrosion beneath the leaking longitudinal sidewalk joints typically. Isolated locations exhibit loose bolts that are not flush.						
120-Steel Truss	3 - Mod.	1800	ft.	920	850	30	0
	The upper chord, lower chord and gusset plates are in satisfactory condition. There are previous distortions of the individual built-up members due to pack rust. In very few locations there are indications that some of the corrosion could be re-activating. Additionally, there is member pitting that was the result of previous corrosion that has since been arrested. Both of these conditions are considered rehabilitated and are not counted as deficiencies in the element condition state ratings. Isolated post-tensioning rods exhibit corrosion with section loss - the worst case being 30% loss to west truss, U12L13. The uphill side of the lower chord gusset plates catch debris. There is localized corrosion of the chords and gussets directly beneath the transverse structure joints.						
515-Steel Protective Coating		60000	sq. ft.	36000	15000	9000	0
	Widespread minor deficiencies. Approximately 5% of the paint has failed. An additional 10% of the paint is chalking. These failures are generally located on the verticals and diagonals near the piers as well as on the truss members beneath the structure joints. The seams between sections of built-up compression members have active pack rust. Near the abutments there is damage to the paint system caused by rocks thrown at the structure.						
152-Steel Floor Beam	3 - Mod.	2096	ft.	1420	338	338	0
	The floorbeams exhibit areas of painted over pitting up to 3/16-inch deep typically along the web, flanges, and web stiffeners. Top flange section loss was noted up to 3/8 inch deep. The floorbeams under the joint exhibit surface and laminating corrosion. Fins and slivers in the steel floorbeams exist throughout at isolated locations. Lateral bracing gusset plates are tack and fillet welded to the bottom flange of the floorbeam in the tension zone. A few of the tack welds are cracked.						

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Inspector: Kronander,Mike
Inspection Date: 09/05/2023
Structure Number: 7730306
Facility Carried: N MAIN STREET

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
162-Steel Gusset Plate	3 - Mod.	248	each	248	0	0	0
	Various gusset plates exhibit bowing up to 5/16 inch along the unstiffened free edges. Pack rust exists between the truss chords and the gusset plates at isolated locations, worse under joints. Painted over section loss in gusset plates up to 3/16 inch deep has been painted over and arrested. Previous bowing at east U29 outboard gusset plate has been repaired with a retrofit bolted angle.						
205-Reinforced Concrete Column	3 - Mod.	4	each	3	1	0	0
	Minor cracking along columns. A 2-foot x 4-foot delamination exists in the south face of Column 2, Pier 1. A tree is growing into Column 2 at Pier 2. 2023: Trees and vines growing into south face of Column 1 at Pier 2, and north face of cap and Column 1 at Pier 1.						
215-Reinforced Concrete Abutment	3 - Mod.	135	ft.	103	30	2	0
	Very minor delaminations noted on rear and forward abutments. There is a lot of graffiti on the abutments and superstructure. No evidence of leaking joint at forward abutment as noted in previous inspections. Rear abutment stained from leaking joint; however, not actively leaking during 2019, 2021 or 2022 inspection. Isolated small spalls exist in abutments. The wingwalls exhibit vertical cracks and efflorescence emanating from stepped corners in wingwall tops. Small spall at SE pilaster and NW. Fence pulled back at Right Rear & Right Forward wingwalls. The abutments appear to be rotating towards the channel. The joint between the abutment and the SE wingwall measures 1/2-inch at the base and 1 3/4 inches (2023, previously 1 1/2 inches) at the top. The northeast wingwall has a gap of 1 1/4 inches (2023, previously 1 1/2 inches) measured at the top of the joint between the wingwall and abutment backwall.						
234-Reinforced Concrete Pier Cap	3 - Mod.	80	ft.	41	35	4	0
	Spalls exist in the bearing seat measuring 1 SF x 1 1/2 inches deep around West truss bearing at Pier 1. 1/2-inch deep wear around East truss bearing at Pier 1. Isolated cracks with efflorescence also exist in the caps. 2023: North face of Pier 1 cap near Column 1 exhibits 2-foot long x 1-foot wide x 1-inch deep spall with adjacent efflorescence.						
300-Strip Seal Expansion Joint	3 - Mod.	135	ft.	90	45	0	0
	Minor scraping damage to the expansion joint armor. The strip seal glands exhibit minor to moderate debris. 2023: Surface corrosion and some section loss to ends of joint armor adjacent to curbs at both abutments.						
306-Other Joint	3 - Mod.	135	ft.	132	3	0	0
	Steel Finger Joints. Neoprene flashing sheets under joint in Span 2 have minor separation at seams.						
311-Movable Bearing	3 - Mod.	4	each	0	2	2	0
	Surface corrosion to bearings. Moveable bearings at abutments over eyebar tie down anchorages. Isolated areas of painted over section loss exist in the plates around the pins.						
313-Fixed Bearing	3 - Mod.	4	each	0	4	0	0
	The fixed bearings at the piers exhibit active corrosion inside the assembly due to water not being able to fully drain from the assembly.						

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	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
321-Reinforced Concrete Approach Slab	3 - Mod.	2600	sq. ft.	2535	65	0	0
	Previous spalls in the approach slabs have been patched since the 2021 inspection. Most recently, 10 square feet of patching was performed in the rear approach slab. The asphalt pavement at the south end of the south approach is cracking with some minor spalls developing. These minor spalls are most prevalent at the interface between the asphalt approach pavement and the concrete approach slab in the northbound lanes. The asphalt pavement north of the north approach has one transverse crack, approximately 40 ft north of the end of the approach slab that has been sealed with mastic. 2023: All approach guardrail, end treatments and bridge terminal assemblies have been replaced. There is minor erosion to the approach slopes around the ends of the wingwalls.						
330-Metal Bridge Railing	3 - Mod.	1806	ft.	1696	60	50	0
	2023: New guardrail installed at all four corners of bridge. The galvanizing on the pedestrian fence on the east side of the structure has mostly failed. Isolated areas of heavy corrosion with four fence couplings with 100% section loss. The fencing has received repair plates by county maintenance to stiffen loose areas of the chain-link. East bridge rail exhibits minor impact damage in Span 3.						
815-Drainage	3 - Mod.	1	each	1	0	0	0
	The scuppers are open and clear of debris. A 5 ft section of the neoprene trough under the finger joint in Span 2 has been replaced as part of the 2018 repair project with neoprene flashing sheets. This repair is functioning in an acceptable manner, although there is some minor separation of the seams between the old and new sections of the neoprene. The scupper in the SB lanes in Span 3 near the forward end of the structure was free of debris at the time of the 2022 inspection.						
830-Abutment Backwall	3 - Mod.	135	ft.	115	20	0	0
	Heavy graffiti. Isolated cracking in backwall.						
840-Approach Slab: Termination or Joint	3 - Mod.	270	ft.	110	65	95	0
	Both approaches have spalling along the expansion joint armor. There are spalls in the asphalt pavement at the ends of the approach slabs. The spalls are most prevalent in the northbound lanes .						

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SUM-M0008-00908 _(7730306)

ODOT District: District 04
Major Maint: 02 - County Highway Agency
Routine Maint: 02 - County Highway Agency
FIPS Code: 01000 - AKRON (SUM county)
Facility Carried: N MAIN STREET
Feature Inters: CUYAHOGA RIVER
Location: AKR
Traffic On: 5 - Highway-pedestrian
Traffic Under: 5 - Waterway
900 FT N OF HOWARD ST
Date Built: 07/01/1949
Rehab Date: 12/31/1993
Insp. Resp A: 02 - County Highway Agency
Insp Resp B:
Inspector Kronander,Mike
Inspection Date 09/05/2023
Reviewer Kronander,Mike

Inspector Comments - Deck and Approach

Deck

Floor/Slab (SF)

Hairline longitudinal and transverse cracks visible on top of Span 1 and 3 concrete deck, especially around midspan of Span 1. Underside exhibits minor transverse cracks with efflorescence, more dense in Span 1 with isolated delaminations overtop the east truss upper chord, reflective of patched areas in top of deck. Salt staining on underside of deck corresponds to previous deterioration/recent patching on top side of deck in Span 1, northbound lanes. Laminating corrosion exists along the forms between the deck and the sidewalks in Span 2.

Edge of Floor/Slab (LF)

Vertical full depth cracks in Spans 1 and 3, but no spalls or delaminations. Active corrosion and minor section loss to curb plates and sidewalk edge plates in Span 2.

Bridge Wearing Surface (SF)

The surface of the concrete deck in Spans 1 & 3 is in fair condition with increased areas of delamination and minor spalling. Approximately 10% of the concrete wearing surface (including patches) in Spans 1 and 3 is delaminated. The delaminations have the highest incidence in the northbound lanes in Span 1. Over 1500 square feet of the recent patches are cracked. Similar to the delaminations, the greatest concentration of cracked patches is in the northbound lanes of Span 1. Isolated areas of shallow spalling (up to 1 inch deep) exist throughout the deck with no exposed reinforcing steel, mostly in the northbound lanes. County maintenance performed recent patch work on the deck wearing surface repairs several unsound areas. 2023: 2 SF x 1in. deep spall in SB lane closest to CL in wearing surface.

The wearing course epoxy overlay in Span 2 was repaired in 2018, but is now failing. Sections of the epoxy overlay are flaking off and in locations the overlay has delaminated enough that it is possible to lift it off of the underlying concrete by hand.

Curbs/Sidewalk (LF)

Surface rust exists on the face of the steel curb in Span 2. Leakage through Span 2 curb onto steelwork below (Joint sealed 2018 / caulk has failed in 2019, leaking again). Sidewalks in Spans 1 and 3 have consistent full-width cracks on top spaced at approximately 6 feet (Cracks sealed in 2018) and efflorescence cracks on bottom. Span 2 sidewalks have hairline longitudinal cracks throughout. Minor spalls on curbs at piers. Cracks and some minor spalling of curb at railing supports (predominantly at west sidewalk PP19-20 and east sidewalk PP9-13) Cracks in SW sealed (2018).

Bridge Railing (LF)

Very minor collision damage noted at multiple locations on both rails. East side fence mesh galvanizing has mostly failed. East fence - broken rail/post connections - 27 post brackets heavy corrosion, 4 post couplings rusted through. County maintenance have repaired several areas fastening a plate over loose areas of the chain-link to stiffen it.

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Deck Drainage (EA)

All scuppers and downspouts are open and functioning.

Expansion Joint (LF)

All joints are functioning as intended for thermal movement. The Rear Abutment joint seal was not actively leaking above the West Truss at the time of inspection, as it has in previous years. The Pier 2 deflection joint was also not observed to be leaking at the time the 2022 inspection as it has in the past.. The Forward Abutment joint seal has leaked in the past near the first stringer from the east onto the abutment. (No leaks observed in 2021, 2022, or 2023). 2023: Surface corrosion and some section loss to joint armor at curbs for both abutment joints.

Approach

Approach Wearing Surface (EA)

Mild cracking, longitudinal and transverse (rear approach). Approach pavement - edge spalling along the end of of both approach slabs. Multiple patches exist in the rear approach slab, northbound lanes from ongoing patch work. North end: Full width transverse crack, 40' north of approach slab sealed with mastic.

Approach Slab (SF)

Forward approach slab in very good condition. Rear approach slab spalls have been patched.

Approach Embankment (EA)

Minor settlement around wingwalls. Erosion around wingwall ends.

Approach Guardrail (EA)

2023: Guardrail and posts replaced at all four corners of bridge.

Inspector Comments - General Appraisal

Superstructure

Superstructure Alignment (EA)

Members were checked by sighting with no problems noted.

Stringers (LF)

Diaphragms present in approach spans, rated with the stringers. Isolated areas of peeling paint with exposed primer. Heaviest surface corrosion and minor section loss exists under sidewalk joints onto first exterior roadway stringer on both sides of bridge.

Floorbeams (LF)

Painted over pitting to top flanges, primarily over trusses. Worst section loss noted in top flange of floorbeams up to 3/8 inch deep. Painted over pitting up to 3/16-inch deep exists along the bottom of several floorbeam webs/web stiffeners and painted over pitting up to 3/16-inch (1/8 to 1/16-inch average) exists along the flanges. A 3-inch x 2-inch corrosion hole exists through a web stiffener on the north face

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of Floorbeam 23 at Pier 2. Minor cracks found in tack welds connecting upper lateral bracing connection plates to floorbeam bottom (tension) flange at centerline have not extended into floorbeam base metal. Floorbeams 19 and 20 have small cuts in the top (tension) flange over the west truss. No cracks were noted. Floorbeam 13 under previously missing neoprene flashing sheet below finger joint (repaired 2018) shows surface rust and beginning stages of section loss and pitting. Floorbeams under joints exhibit areas of surface corrosion from past leakage. Minor cut in the south side of FB 8 near the center of the web between Stringers 5 & 6. Fins and slivers exist at isolated locations throughout the floorbeams.

Truss Verticals (EA)

Pack rust along built-up seams. Section loss and through holes exist in bottom fill plate at East U13L13 at U13.

Truss Diagonals (EA)

Pack rust along built up seams; especially bad near piers. PT rods under joints at PP's 13 and 17 exhibit up to 30% section loss. Pack rust between fill plates and flanges occurs at isolated diagonals.

Truss Upper Chord (EA)

Pack rust up to 1-inch thick along built up seams, especially along bottom plate and tops at gussets. Isolated painted over section loss that has been arrested throughout.

Truss Lower Chord (EA)

Pack rust along built up seams, especially along bottom plate. Deep crevices between gusset plates and top splice plates of chord are trapping debris. Some of these areas have begun to rust. Interior of lower chords trap water just above pin connection at the piers. A few locations exhibit distortion and rusting inside the members at lateral bracing connections in Span 2. Isolated painted over section loss that has been arrested throughout.

Truss Gusset Plate (EA)

Painted over corrosion along most seams with lower chords and a few diagonals (10% - 20%, up to 25%). Minimal section loss to upper chord gussets. A few areas have started to rust again. The exterior gusset plate at U29 of the east truss has a 1/4" bow, which is the largest measured on the bridge. The plate has been repaired with a bolted retrofit angle. Gusset plates at the pins at U13 and U17 are bowed up to 1/4" along free unstiffened edges at the zero force upper chord members. All other bows measured were 3/16" or less. Several gussets rehabilitated in 2018 had unsupported edges stiffened and rivets replaced with high-strength bolts. Pack rust exists between the truss chords and the gusset plates at several locations.

Lateral Bracing (EA)

Lower lateral bracing has scalloped seams from previous pack rust in built up members. Rust starting to reactivate in some of these places. Minor cracks found in tack welds connecting upper lateral bracing connection plates to floorbeam bottom flange at centerline have not extended into base metal and connections are still secure. Painted over pitting is common throughout with isolated areas of painted over through holes.

Sway Bracing (EA)

Some thin bottom plates and deteriorated rivet heads from previous corrosion. Heavy previous arrested section loss and through holes exist under joints.

Bearing Devices (EA)

Pier bearings and abutment bearings are in good condition with surface corrosion and few isolated areas of painted over arrested section loss. The fixed bearings at the piers exhibit active corrosion inside the assembly due to water not being able to fully drain from the assembly. 2023: Wear up to 1-inch deep exists in bearing seat at both abutments.

Protective Coating System (LF)

Widespread minor deficiencies, but is generally functioning as designed. Throughout the bridge, approximately 5% of the paint has failed. Approximately another 10% of the paint is chalking. These failures are generally located on the verticals and diagonals near the piers as well as on the truss members beneath the structure joints. The seams between sections of built up compression members have active pack rust. Near the abutments there is damage to the paint system caused by rocks thrown at the structure.

Pins/Hangers/Hinges (EA)

Pins at panel points 13 and 17 were lubricated. Pins in the anchorage pits are corroded with negligible section loss. Eight pins at the abutments were visually checked during this inspection with no issues noted. The middle pins at the rear abutment east truss and forward abutment west truss both indicated wear grooves at the edge of the tie down linkage.

Fatigue (LF)

Tack welds on many members with a few noted to have cracked. Base metal undamaged. No significant deficiencies in the fillet welds around the pin plates at panel points 13 and 17, or between the bottom flange of floorbeams and lateral bracing connections.

Utilities (LF)

Street lights are in good condition.

Substructure

Abutment Walls (LF)

Very minor delaminations noted on rear and forward abutments. Isolated small spalls from previous delaminated concrete breaking off . There is a lot of graffiti on the abutments and superstructure. Both abutment walls appear to be rotating towards the channel from the measurements taken at the joints between the southwest wingwall and rear abutment backwall, and northeast wingwall and forward abutment. See Wingwalls for measurements.

Pier Columns/Bents (EA)

Minor cracks with efflorescence. Pier 1, Column 2 - South face, 6' above ground line - 2' x 4' delamination. Tree growing into Column 2 at Pier 2. 2023: Trees and vine growth in south face of Column 1 at Pier 2, and north face of cap and Column 1 at Pier 1.

Pier Caps (EA)

Spalls in bearing seat measuring 1 SF x 1 1/2 inches around West truss bearing at Pier 1. 1/2-inch deep wear around East truss bearing at Pier 1. Isolated cracking with efflorescence exists in caps. 2023: 2-foot long x 1-foot wide x 1-inch deep edge spall with adjacent efflorescence in Pier 1 cap, north face near Column 1.

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Backwalls (LF)

Minor cracks noted. Covered in graffiti.

Wingwalls (EA)

Vertical cracks with minor dampness and efflorescence emanating from stepped corners in wingwall tops. Small spall at SE pilaster and NW. Fence pulled back at Right Rear & Right Forward wingwalls. The abutment appears to be rotating away from southwest wingwall. The joint between the abutment and the wingwall measures 1/2-inch at the base and 1 3/4 inches (1/4-inch increase in 2023) at the top. At the joint between the northeast wingwall and forward abutment, similar conditions with a 1 1/4-inch gap (1/4 -inch decrease in 2023) measured at the top of the joint and no gap at the base exist.

Substructure Scour (EA)

Not affecting bridge, but river looks like it has eroded the south bank beneath the drainage outlet pipe from Pier 1. No damage to pipe supports yet.

Slope Protection (EA)

Forward slope under Span 3 has experienced a 10' deep by 22' wide slope failure/mudslide down past Pier 2. Previous dump rock placed there has washed away and little remains. Water is flowing through new valley out of embankment, possibly from natural spring. Minor Increase in 2021 to 2022.

Culvert

Inspector Comments - Waterway

Waterway Adequacy

Channel

Channel Protection (LF)

Not affecting structure, but channel is flowing adjacent to drainage pipe and supports down the hill in Span 2. River has eroded the south bank beneath the drainage outlet pipe from Pier 1.

Scour Critical

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Bridge Inspection Report

Pictures

PHOTO 1 Condition

Description End view looking north.

PHOTO 1

Description Downstream channel, looking west.

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Bridge Inspection Report

Pictures

PHOTO 2

Description Upstream channel, looking east.

PHOTO 2 Condition

Description End view looking south.

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Bridge Inspection Report

Pictures

PHOTO 3 Condition

Description Elevation of west fascia looking northeast.

PHOTO 4 Condition

Description General underside of Span 1, looking north.

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Bridge Inspection Report

Pictures

PHOTO 5 Condition

Description General underside of Span 2, looking north.

PHOTO 6 Condition

Description Overgrown trees onto sidewalk at northwest corner, looking south.

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Bridge Inspection Report

Pictures

PHOTO 7 Condition

Description Hole in chain link fence by gate at southwest corner, looking southeast.

PHOTO 8 Condition

Description Hole in chain link fence at southeast corner, looking southeast.

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Bridge Inspection Report

Pictures

PHOTO 9 Condition

Description Hole in chain link fence at northeast corner, looking west.

PHOTO 10 Condition

Description Stripped hex head screws for hatches to eyebar linkages at abutments looking west.

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Bridge Inspection Report

Pictures

PHOTO 11 Condition

Description Bird's nest at east end of catwalk at Floorbeam 17, looking east.

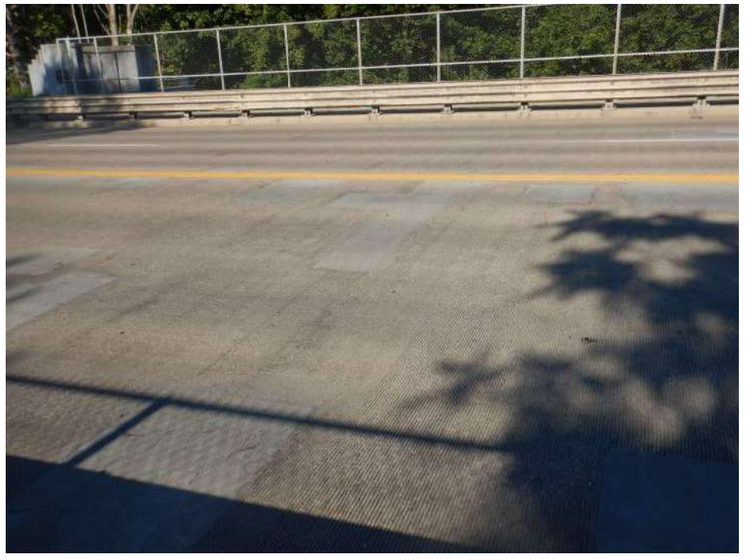

PHOTO 12 Condition

Description Concrete patches in NB lanes, Span 1 shown, looking southwest. Note: Some patches exhibit cracking.

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Bridge Inspection Report

Pictures

PHOTO 13 Condition

Description Cracking in concrete patch in NB lanes of Span 1, looking southwest.

PHOTO 14 Condition

Description Overall of deck wearing surface in Span 2, looking southwest. Note: Epoxy overlay and patches.

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Bridge Inspection Report

Pictures

PHOTO 15 Condition

Description 2-square-foot x 1-inch deep spall in SB lanes near centerline, Span 3, looking west.

PHOTO 16 Condition

Description Typical bridge railing with minor corrosion throughout, west railing shown, looking west.

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Bridge Inspection Report

Pictures

PHOTO 17 Condition

Description Typical steel plate repair to east pedestrian fencing, looking east.

PHOTO 18 Condition

Description Repair to corroded horizontal piping for east pedestrian fence, typical, looking east.

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Bridge Inspection Report

Pictures

PHOTO 19 Condition

Description Surface corrosion typical throughout longitudinal steel plate along curb, looking west.

PHOTO 20 Condition

Description Spalling in curb at at end of Rear Abutment joint, looking west.

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Bridge Inspection Report

Pictures

PHOTO 21 Condition

Description Isolated transverse cracks with minor efflorescence in Span 1 deck soffit, looking south.

PHOTO 22 Condition

Description Corroded SIP forms under west sidewalk in Span 2, looking north.

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Bridge Inspection Report

Pictures

PHOTO 23 Condition

Description Surface corrosion and minor section loss to joint armor from debris, Rear Abutment joint at east end, looking west.

PHOTO 24 Condition

Description Finger joint at Floorbeam 13, looking west.

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Bridge Inspection Report

Pictures

PHOTO 25 Condition

Description Strip seal at Forward Abutment, looking west.

PHOTO 26 Condition

Description 2-square-feet of peeling paint on Stringer 5 between Floorbeams 5 and 6, Span 1, looking west.

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Bridge Inspection Report

Pictures

PHOTO 27 Condition

Description Heavy corrosion and pack rust under Stringer 11 bearing over Floorbeam 11, Span 2, looking southeast.

PHOTO 28 Condition

Description Two loose bolts on Stringer 8 connection to Floorbeam 28, Span 3, looking northeast.

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Bridge Inspection Report

Pictures

PHOTO 29 Condition

Description Painted over pitting and section loss in bottom of web, typical, Floorbeam 0 shown, looking south.

PHOTO 30 Condition

Description Abandoned stringer attachment angles, typical, Floorbeam 1 shown, looking northeast.

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Bridge Inspection Report

Pictures

PHOTO 31 Condition

Description Typical upper lateral bracing gusset plate connection to floorbeam tack welds, looking northwest.

PHOTO 32 Condition

Description Cracked bottom flange to upper lateral bracing gusset plate connection tack weld at Floorbeam 18, looking northwest.

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Bridge Inspection Report

Pictures

PHOTO 33 Condition

Description Pack rust between bottom flange plate and fill plate up to 1-inch thick causing distortion, looking east at East U3U4 at U3.

PHOTO 34 Condition

Description PT rod exhibits moderate corrosion with up to 30% section loss, looking west at West U12L13.

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Bridge Inspection Report

Pictures

PHOTO 35 Condition

Description Typical inside of lower chord with peeling paint and surface corrosion, heaviest along bottom flange, looking north.

PHOTO 36 Condition

Description Isolated areas of painted over pitting and section loss, looking west at OB gusset plate at East L0.

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Bridge Inspection Report

Pictures

PHOTO 37 Condition

Description Exterior pin and lomas nut connection on OB gusset plate, looking west at East U13. Note: No deficiencies in fillet weld. Pin heavily greased.

PHOTO 38 Condition

Description Eyebar tie-down anchorage with 1/16-inch deep pitting and laminating corrosion at Forward Abutment, looking north.

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Pictures

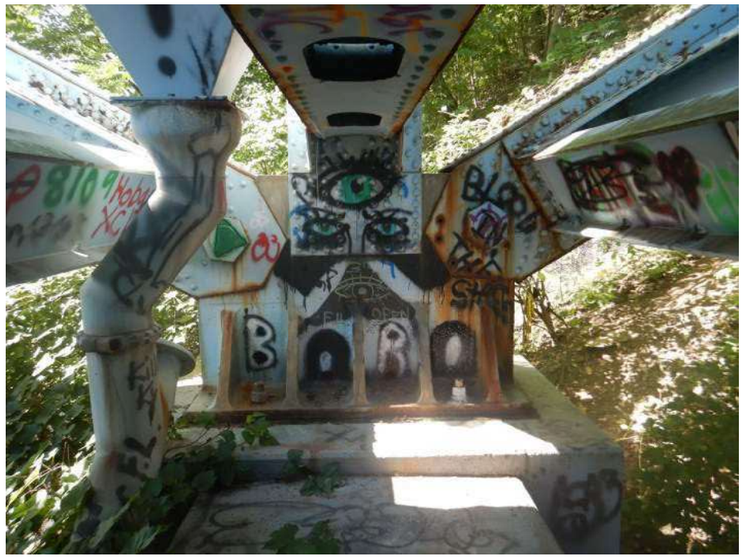

PHOTO 39 Condition

Description Fixed bearing, typical, looking west at west truss bearing at Pier 2.

PHOTO 40 Condition

Description Typical surface corrosion around masonry plate and 1-inch deep wear into bearing seat, looking east at west truss bearing Forward Abutment.

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Bridge Inspection Report

Pictures

PHOTO 41 Condition

Description Overall of Forward Abutment, looking north. Note: Backwall and breastwall covered with graffiti.

PHOTO 42 Condition

Description 4-foot long x 1-foot tall delamination along top of breastwall, looking north at west end of Forward Abutment.

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Bridge Inspection Report

Pictures

PHOTO 43 Condition

Description 2-foot long x 1-foot wide x 1-inch deep spall with adjacent efflorescence in north face of west end of Pier cap 1, looking south.

PHOTO 44 Condition

Description Southwest wingwall rotating away from Rear Abutment, looking south.

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Bridge Inspection Report

Pictures

PHOTO 45 Condition

Description Southwest wingwall has rotated away from Rear Abutment, 1 3/4 inches measured at top, looking north.

PHOTO 46 Condition

Description South embankment is steep from erosion around Pier 1, looking southeast.

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Bridge Inspection Report

Pictures

PHOTO 47 Condition

Description Spalling along edge of asphalt roadway at Rear Approach slab with failing patches, looking east.

PHOTO 48 Condition

Description Sound patches in NB lanes at Rear Approach, looking northwest.

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Bridge Inspection Report

Pictures

PHOTO 49 Condition

Description New approach guardrail, typical at all four corners of bridge, looking northwest at northwest approach.

Appendix C

Fracture Critical Plan

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SUM-M008-00908: FRACTURE CRITICAL PLAN

Prepared by Burgess and Niple, Inc.

October 2023

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County: Summit

Bridge No.: SUM-M0008-00908

Structural File Number: 7730306

Access: All members safely accessed via adapted climbing techniques and from the ground.

Fatigue Life Study: Year of Study ___N/A__ Remaining Fatigue Life __N/A__

Load Path Redundant: No, the structure includes fracture critical members; inspect FCM's every 24 months.

Structurally Redundant: No, the structure is comprised of simple and cantilever spans.

Internally Redundant: The truss members are internally redundant and the floorbeams and stringers are not internally redundant. The truss members are built up members and the floorbeams and stringers are rolled members.

Location: The SUM-M0008-00908 bridge carries North Main Street over the Cuyahoga River between the Cities of Akron and Cuyahoga Falls.

Structure Description: This cantilevered Pratt deck truss structure consists of two 210-foot anchor spans and one 480-foot-long main span. The two truss lines are spaced 40'-0" center-to-center.

Elevation looking northeast at the North Main Street Bridge.

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Inspection Access:

Access to all fracture critical members is best performed through walking around the structure and through adapted climbing techniques from the access catwalk.

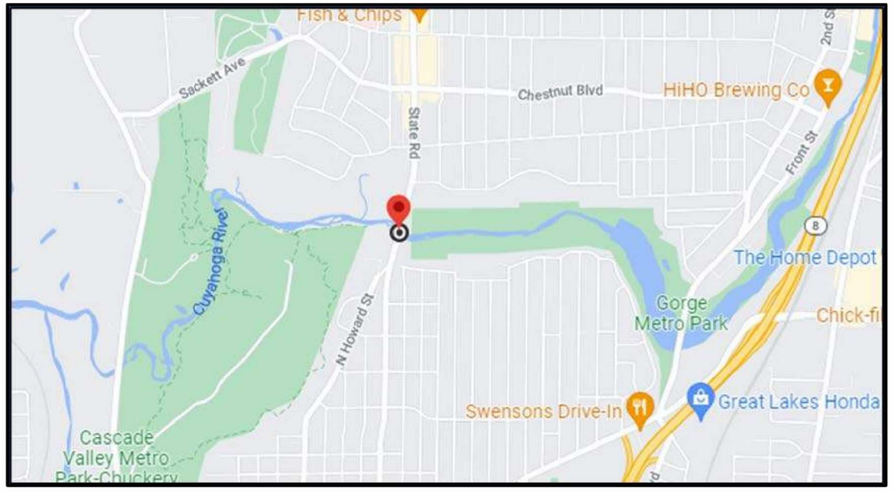
All the floor system and truss members can be accessed via the catwalk and climbing. The diagonals can be inspected by rope access and the floorbeams can be traversed utilizing webbing to tie around the floorbeams or a combination of beam clamps and rollers.

The anchorage links can be inspected by opening hinged hatches using an English Allen wrench set and climbing down an 11-foot ladder.

Maintenance of Traffic: No MOT was utilized during the 2022 Fracture Critical Inspection.

Equipment: A UT gage, scissor calipers, pit gage and magnetic particle kit were utilized to check crack propagation and section loss measurements.

Experience: The team leader should be a certified team leader in the State of Ohio and should have taken the *NHI 130078-Fracture Critical Inspection Techniques for Steel Bridges.*



SUM-M0008-00908: North Main Street Bridge location.

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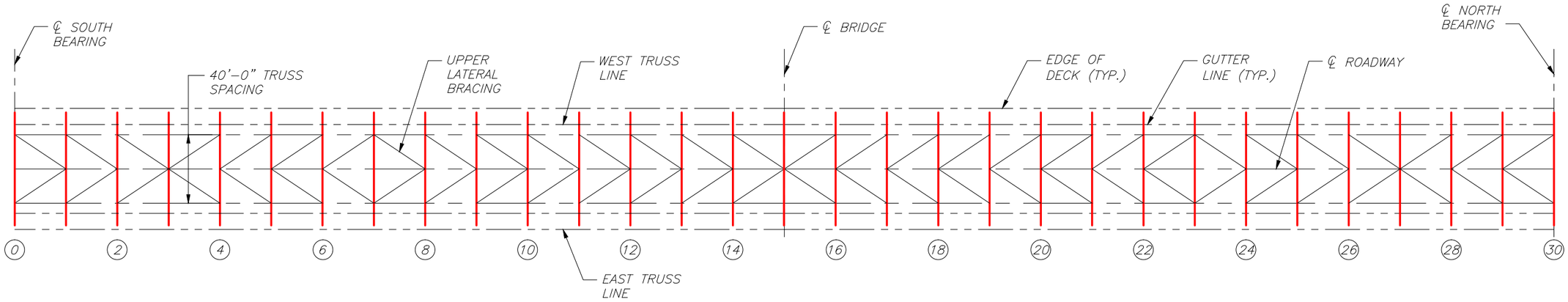
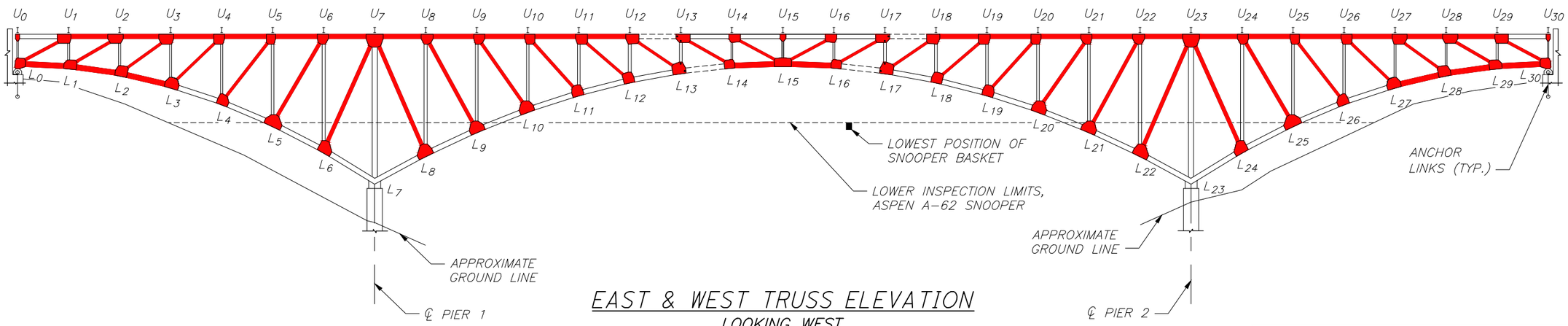


PLAN

NOTE: FRACTURE CRITICAL MEMBERS SHOWN IN RED.



EAST & WEST TRUSS ELEVATION

LOOKING WEST

LEGEND

FRACTURE CRITICAL MEMBER

ZERO LOAD MEMBER

(X) FLOOR BEAM NUMBER

FIGURE 2

DRAWING PREPARED BY: Pennoni

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NORTH MAIN STREET OVER CUYAHOGA RIVER

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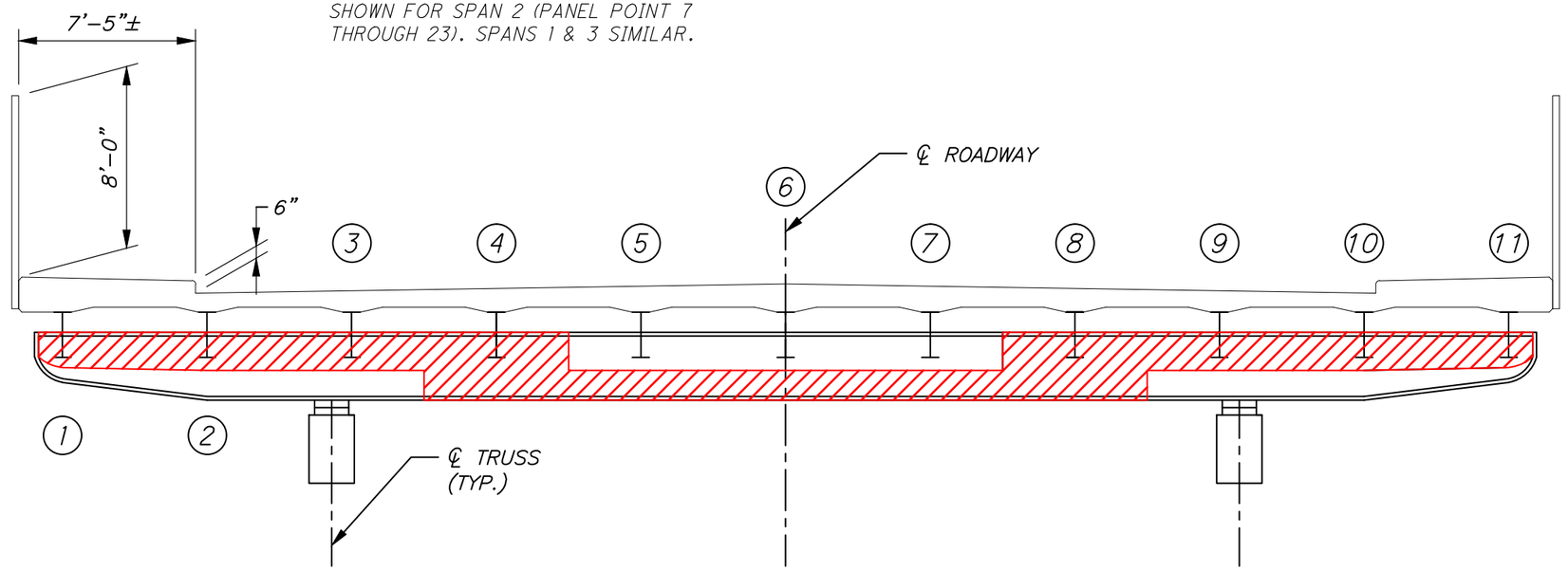
NOTE: SIDEWALK AND FENCE CONSTRUCTION SHOWN FOR SPAN 2 (PANEL POINT 7 THROUGH 23). SPANS 1 & 3 SIMILAR.



TYPICAL FLOOR BEAM ELEVATION

(LOOKING NORTH)

LEGEND

TENSION & REVERSAL REGIONS

(X) STRINGER NUMBER

FIGURE 3

DRAWING PREPARED BY: Pennoni

AKR-008-0909
NORTH MAIN STREET OVER CUYAHOGA RIVER

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Fatigue Prone Details			
Category	**Distribution**	**Description**	**Photo**
*	Widespread	Tack welds connecting floor beam bearing plate to either top of upper chord or top upper chord splice plate.	Photo 1
E	Isolated	Fillet welds along perimeter of hinge pin plate connected to U13 & U17 gusset plates.	Photo 2
*	Widespread	Tack welds connecting angles to vertical plates on exterior of upper & lower chord box members, near the ends of the member.	Photo 3
*	Widespread	Tack welds between angles and plates at ends of all diagonal members	Photo 4
*	Widespread	Tack weld at bottom of old stringer connection angles on floorbeam webs. These welds are fatigue prone in the main bay only. Typically in non-tension zones.	Photo 5
E	Widespread	Fillet weld along bottom flange of floorbeam at lateral bracing center connection plates.	Photo 6
*	Widespread	Tack welds across bottom of bottom flange of floor beam at lateral bracing connection plates.	Photo 7
*	Isolated	Tack welds connecting dwyidag housing to bottom flange of floorbeam 9.	Photo 8
C	Isolated	Close-up of saw cut from 1992 rehabilitation project, floorbeam 19, both faces and south face of floorbeam 20.	Photo 9
*	Isolated	West L15L16 at L16, angles along web are tack welded to internal diaphragm of lower chord box member.	Photo 10

*There is no specific fatigue category for tack welds, however per *section 7.2.1* of The *Manual for Bridge Evaluation, Third Edition,* "Tack welds may be evaluated based upon the requirements of Category C…".

Note: Slivers, fins and other steel defects or damage from construction/rehabilitation stated in the 2023 narrative inspection report were removed from the table above which were included in the 2017 Fracture Critical Plan developed by Pennoni. These defects can be considered fatigue prone details in tension regions; however, the detail category is of least significance compared to other details listed above.

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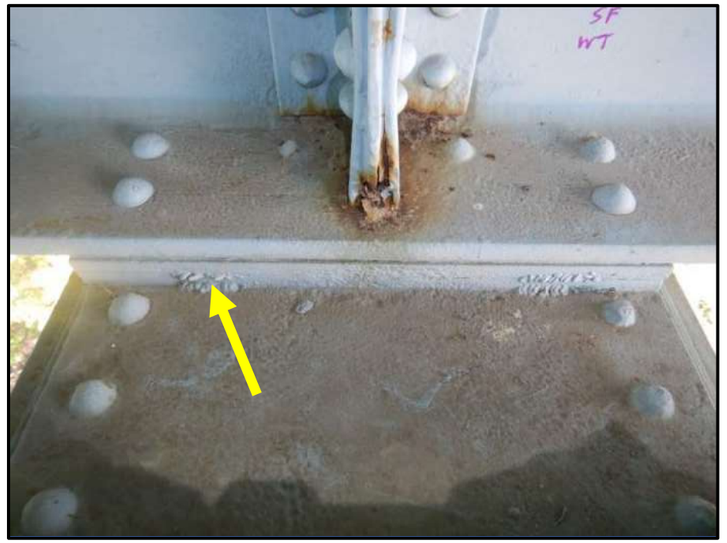

Photo 1 – Tack welds connecting floorbeam bearing plate to top of upper chord.

Photo 2 – Fillet welds along perimeter of hinge pin plate connected to U13 & U17 gusset plates.

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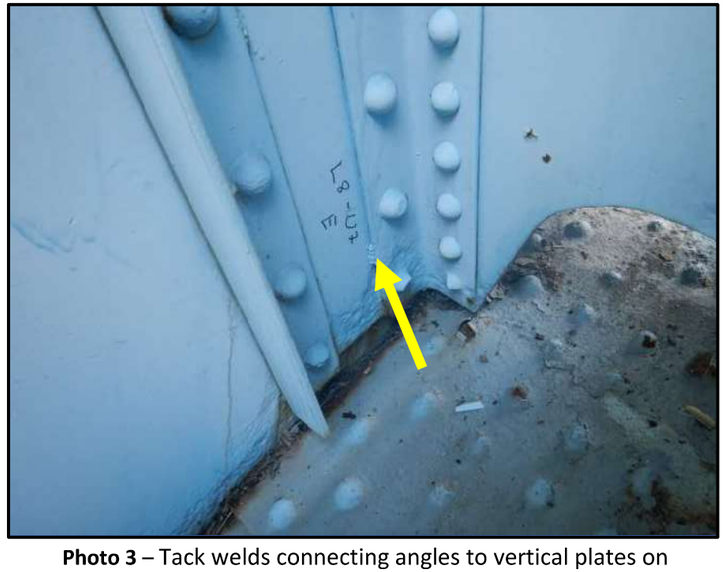

Photo 3 – Tack welds connecting angles to vertical plates on exterior of upper & lower chord box members, near the ends of the member.

Photo 4 – Tack welds between angles and plates at ends of all diagonal members

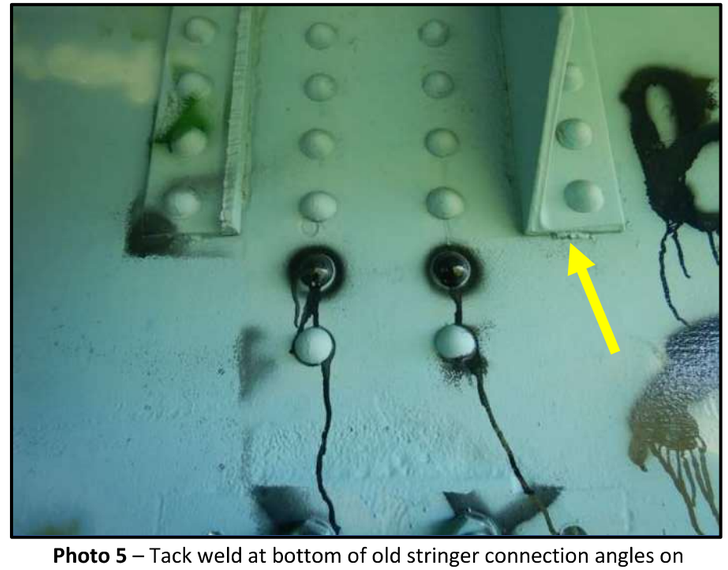

Photo 5 – Tack weld at bottom of old stringer connection angles on floorbeam webs. These welds are fatigue prone in the main bay only. Typically in non-tension zones.

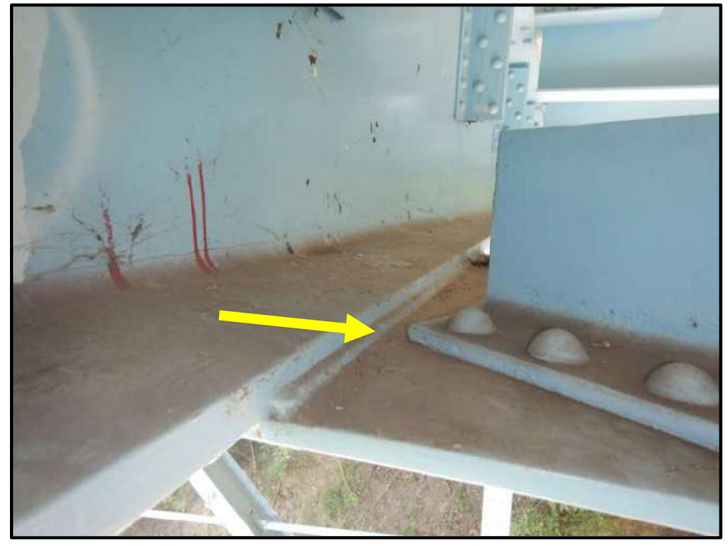

Photo 6 – Fillet weld along bottom flange of floorbeam at lateral bracing center connection plate

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Photo 7 – Tack welds across bottom of bottom flange of floorbeam at lateral bracing connection plates.

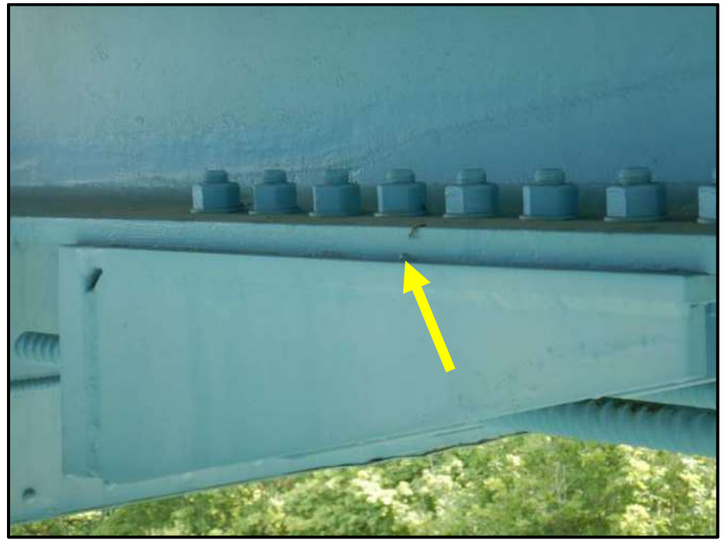

Photo 8 – Tack welds connecting dwyidag housing to bottom flange of floorbeam 9.

Photo 9 – Close-up of saw cut from 1991 rehabilitation project, south face of floorbeam 19 shown.

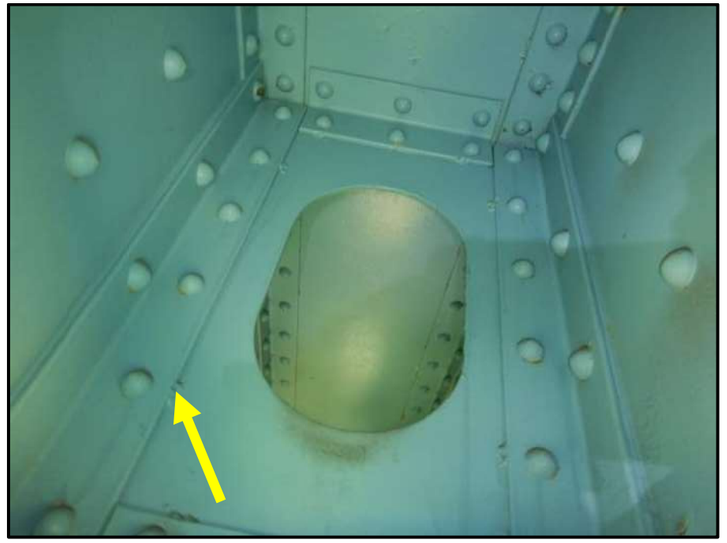

Photo 10 – West L15L16 at L16, angles along web are tack welded to internal diaphragm of lower chord box member.

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