

**PHYSICAL CONDITION REPORT  
FOR THE 2023 ROUTINE ELEMENT LEVEL INSPECTION**

**I-480 OVER THE ROCKY RIVER VALLEY**

**BR#: CUY-480-0647**

**SFN: 1812831**

**Cuyahoga County, OH**

**PREPARED FOR:**

**OHIO DEPARTMENT OF TRANSPORTATION**

**District 12**

**PID#: 115405**



**Inspected: September 23-24 and October 2, 2023**

**Report: December 28, 2023**

**2023 ROUTINE ELEMENT LEVEL INSPECTION  
PHYSICAL CONDITION REPORT**

**of the**

**I-480 OVER THE ROCKY RIVER VALLEY  
BRIDGE NO. CUY-480-0647  
SFN: 1812831**

**Cuyahoga County, Ohio**


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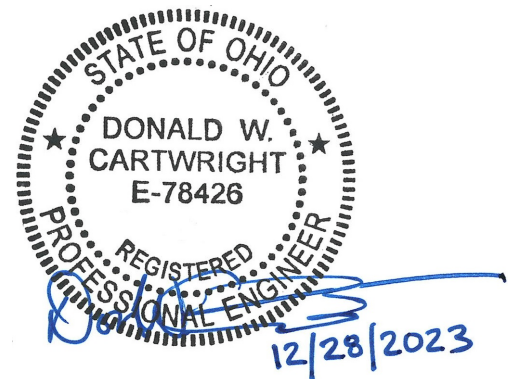
  
Ohio PE#: 78426

**Inspected on:**

September 23-24 and October 2, 2023

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**Prepared for:**

**OHIO DEPARTMENT OF TRANSPORTATION  
DISTRICT 12**

**TRANSYSTEMS CORPORATION  
PID No. 115405**

Report Submitted December 28, 2023

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## EXECUTIVE SUMMARY

The I-480 Bridge over Rocky River (CUY-480-0647), located between the cities of Fairview Park and Cleveland, is one of the major river crossings over the Rocky River Valley. The bridge consists of twin nine-span plate girder structures carrying four lanes of I-480 traffic in each direction (See Photo 1). Originally constructed in 1970, the eastbound and westbound structures are 1,571' long and 1,535' long, respectively, and each consist of a nine-span superstructure divided into three continuous units by seated hinges in Spans 4 and 6. The structure is owned and maintained by the Ohio Department of Transportation (ODOT).

Srinteg Corporation, as a subconsultant to TranSystems Corporation, was contracted by the ODOT to perform the 2023 routine element level inspection of the CUY-480-0647 Bridge (SFN 1812831). While not typically required by scope for a routine inspection, hands-on inspection was performed on the fracture critical members and fatigue prone details on the structure. These members include the main girders and all floorbeams. Inspection findings were recorded on bridge specific field inspection forms and field sketches were created to document specific conditions. **Items highlighted in red text within this report denote new conditions that were not noted during previous inspections or defects that have notably changed since the previous inspection.**



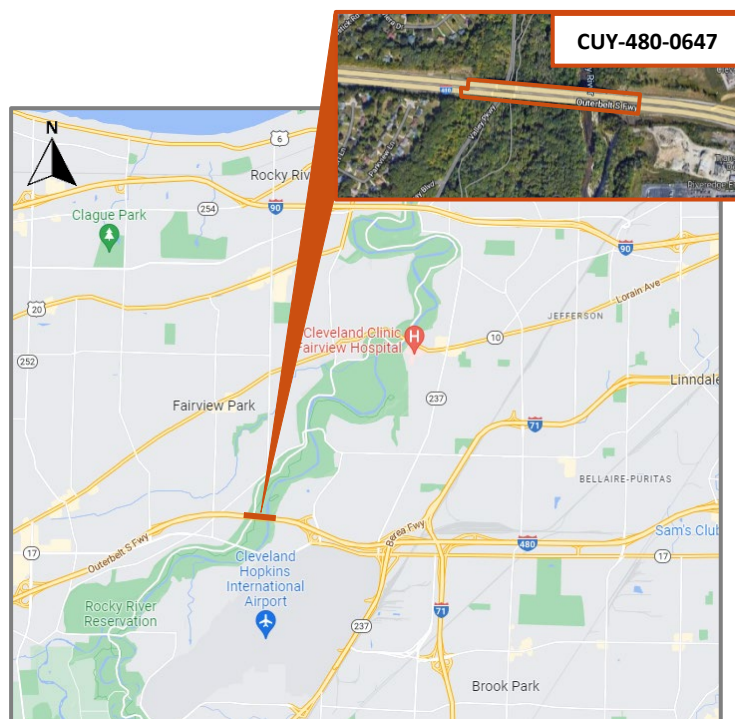
Photo 1 – Superstructure underside of the CUY-480-0647 Bridge, looking west from Forward Abutment.

Based upon the results of the 2023 inspection, the CUY-480-0647 Bridge is in **SATISFACTORY CONDITION [6-NBIS]** overall due to cracks and spalls in the reinforced concrete deck; failed patches and widespread deterioration of the wearing surface; widespread cracks, delaminations, and spalls in the reinforced concrete bridge railings; isolated areas of cleaned and painted section loss on the steel floorbeams and previous cracks in the steel girders; and moderate delaminations and spalls in the reinforced concrete substructure. As such, the operational status of the bridge remains **OPEN WITH NO RESTRICTIONS [A-NBIS]**.

Detailed inspection findings are included within this narrative Physical Condition Report. Rehabilitation and maintenance recommendations are included within this report to extend the usable life and safe function of the structure. Based upon these inspection findings, no High Priority Repairs are required at this time.

## BRIDGE DESCRIPTION

The CUY-480-0647 Bridge consists of twin nine-span plate girder structures carrying eight lanes of I-480 traffic over the Rocky River Valley between the cities of Fairview Park and Cleveland in Cuyahoga County, Ohio. Originally constructed in 1970, the existing eastbound structure is approximately 1,571' long, and the existing westbound structure is approximately 1,535' long (See Figures 1 and 4). Each structure consists of a nine-span superstructure divided into three continuous units by seated hinges present in Spans 4 and 6. Span 1 for the eastbound and westbound structures are 139'-8" long and 103'-8" long, respectively, while the remaining spans are the same across both bridges: Spans 2 and 3 are each 177'-4" long, Spans 4, 5, and 6 are each 199'-6" long, Span 7 is 177'-4" long, Span 8 is 155'-2" long, and Span 9 is 82'-8" long.



LOCATION MAP

The 8 3/4" thick reinforced concrete deck for each structure is 72'-0" out-to-out with a roadway width of approximately 69'-0". Each structure carries four lanes of traffic with wide shoulders along each reinforced concrete railing. The deck for each structure is supported by six steel stringers: the interior stringers consist of rolled 21WF55 or 21WF62 sections, stringers along the median (Stringers 6 and 7) consist of rolled 12WF45 sections, and exterior stringers (Stringers 1 and 12) consist of small welded haunched I-sections. The steel floorbeams, which are generally spaced at 22'-2" on-center but have intervals as short as 11'-6" at the ends, consist of built-up I-sections of varying height comprised of both rolled wide flange beams and built-up plate sections with transverse stiffeners. The main girders, spaced at 25'-6" on-center, are comprised of haunched, welded plate girders that vary from 12'-0" to 15'-0" in height. The plate girders for each structure are supported by reinforced concrete pier caps on two columns and cellular reinforced concrete abutments. The substructure units are each founded on spread footings in shale.

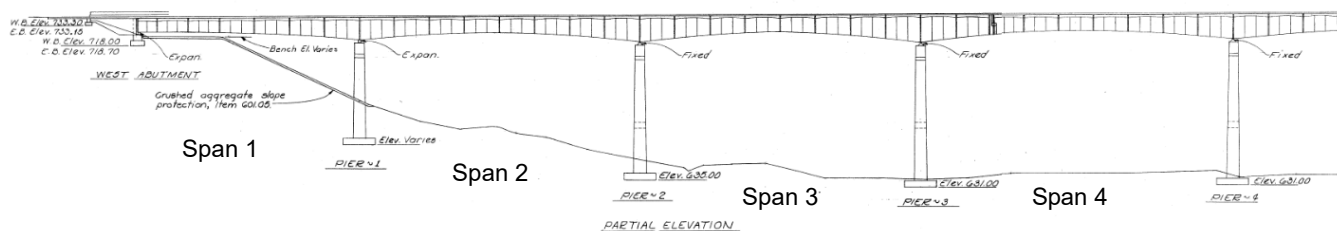


Figure 1 – Partial south elevation of CUY-480-0647 (west half).

The westbound bridge was closed in 2000 due to a crack being found on the support side of the seated hinge in Span 4 at Girder D (See Figure 2). Shortly thereafter, the bridge was repaired by jacking each seated hinge and installing carrier beam retrofits at all twelve hinge locations to provide redundancy (See Figure 3).

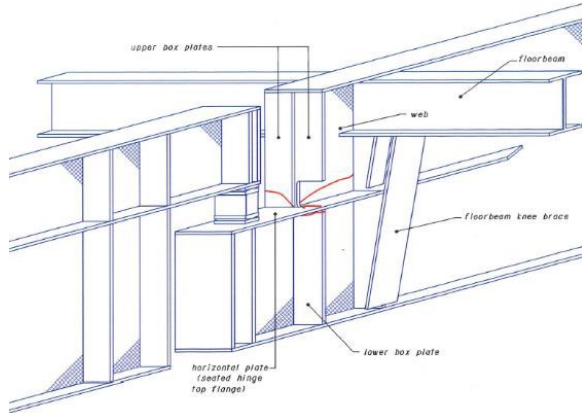


Figure 2 – Schematic diagram showing location of cracks found during the 2000 inspection (cracks shown in red).

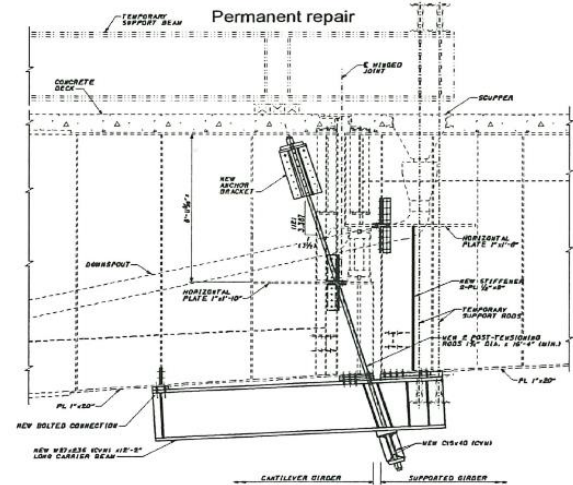


Figure 3 – Plan details showing carrier beam retrofits installed during 2001 emergency repair.

In addition to the 2001 emergency repairs, the structure has undergone several minor modifications and rehabilitations since its original construction, as summarized below:

- **1990 Minor Rehabilitation:** Retrofits to lower lateral bracing connections at the webs; sealing of concrete; drainage system improvements; safety cable and handrail installation for aid in inspections; and IZEU protective coating system.
- **2001 Emergency Repairs:** Installation of carrier beams below all twelve seated hinges to address cracks that were found during the 2000 inspection.
- **2002 Overlay:** Latex modified concrete overlay installed over bridge.
- **2015 Overlay:** Microsilica overlay installed over the middle two lanes on each structure.
- **2020-2021 Painting and Slope Repairs:** Cleaning and painting of the steel superstructure with an OZEU protecting coating system; installation of new slope protection on the east and west slopes.

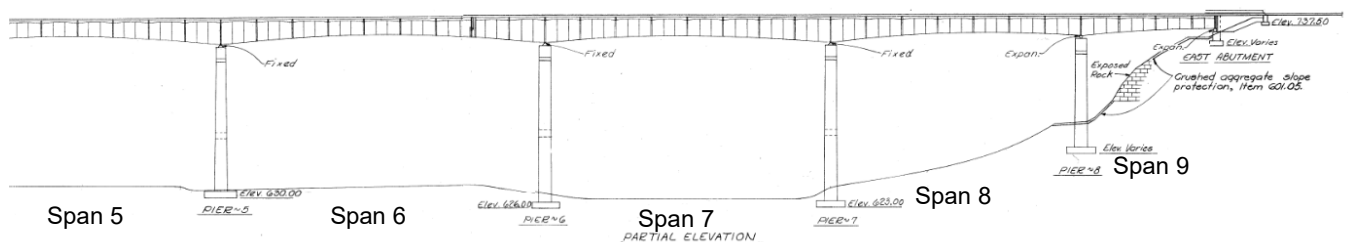


Figure 4 – Partial south elevation of CUY-480-0647 (east half).

All structure nomenclature is per the existing bridge plans and in concurrence with appendices used within recent prior inspection reports (See Appendix B). The westbound bridge is denoted as the Left (or “L”) structure, and the eastbound bridge is denoted as the Right (or “R”) structure. The substructure units are numbered from west to east, starting with the Rear Abutment, continuing with Piers 1 through 8, and ending with the Forward Abutment. Similarly, the spans (1 through 9) and floorbeams (1 through 72) are numbered from west to east. Note that on the westbound structure, Floorbeams 2 and 3 are not present; the floorbeams at the west end of the bridge start at Floorbeam 1 (at the Rear Abutment) and skip to Floorbeam 4 (in line with Floorbeam 4 on the eastbound bridge) due to the differing lengths of Span 1. The girders and stringers are numbered continuously across both structures from south to north as shown on the original bridge plans; as such, Girders A through C and Stringers 1 through 6 are located on the eastbound bridge, while Girders D through F and Stringers 7 through 12 are located on the westbound bridge. All steel superstructure members are comprised of ASTM A36 structural steel.

### INSPECTION PROCEDURE

Personnel from Srinteg Corporation performed a routine element level inspection of the structure on September 23-24 and October 2, 2023. Access to the structure was gained by walking the top of deck within lane closures, from a 62' under-bridge inspection unit (snooper), and using protected climbing and rope access techniques utilizing the installed safety cables along the girders (See Photo 2). Traffic control consisted of alternating single lane and shoulder closures along I-480 EB and EB. Traffic control and the under-bridge inspection unit were provided by Sofis Company, Inc.



Photo 2 – Typical protected climbing and rope access techniques utilizing the safety cables along the girders, looking southwest at Girder C in Span 8.

Inspection findings were recorded on bridge specific field inspection forms and field sketches were created to document specific conditions. Inspection equipment utilized during the inspection included: chipping hammers, calipers, scrapers, wire brushes, measuring tapes, flashlights, markers, and pit gauges. Color digital photographs were taken of the fatigue prone details, areas of deterioration, condition changes, retrofits and repairs, and any immediate maintenance needs, as necessary.

Items highlighted in red text within this report denote new conditions that were not noted during previous inspections or defects that have notably changed since the previous inspection.



## INSPECTION TEAM

The inspection was led by qualified bridge inspection team leaders as set forth by the Federal Highway Administration (FHWA) and the National Bridge Inspection Standards (NBIS). In addition, these team leaders have completed the Occupational Safety and Health Administration (OSHA) 10-hour Construction Safety and Health course and all training required by the FHWA through the National Highway Institute (NHI) which includes Safety Inspection of In-Service Bridges (Course No. 130055) and Fracture Critical Inspection Techniques for Steel Bridges (Course No. 130078).

The inspection team members were as follows:

- Donald Cartwright, PE, SPRAT III (Team Leader)
- Douglas Dickson, PE, SPRAT III
- Anthony Koloze, PE, SPRAT II
- Nicholas Fisco, PE, SPRAT II
- Victoria Feudo, PE, SPRAT I
- Michael Mallak

## CONDITION RATING

National Bridge Inspection Standards (NBIS) are federal regulations that set the national standard for the proper safety inspection and evaluation of all highway bridges. The NBIS applies to all structures defined as highway bridges located on all public roads. State and federal guidelines for evaluating the condition of bridges were developed to promote uniformity in the inspections performed by different teams and at different times. Condition ratings are used to describe the existing, in-place bridge as compared to the as-built condition. The following table was used as a guide in evaluating the condition of the various members of the bridge.

SUMMARY ITEMS (NBIS)	CONDITION	DEFECTS
9	Excellent	Excellent condition.
8	Very Good	No problems noted.
7	Good	Some minor problems.
6	Satisfactory	Structural elements show some minor deterioration.
5	Fair	All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
4	Poor	Advanced section loss, deterioration, spalling or scour.
3	Serious	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	Critical	Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	"Imminent" Failure	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put it back in light service.
0	Failed	Out of service - beyond corrective action.

The inspection of this bridge was performed in accordance with the following documents:

1. *Manual of Bridge Inspection*, Ohio Department of Transportation (ODOT), 2014 (rev 2021).
2. *The Manual for Bridge Evaluation*, AASHTO, 3rd Edition, 2018 (rev 2020).
3. *Manual for Bridge Element Inspection*, AASHTO, 2nd Edition, 2019.
4. *Bridge Inspector's Reference Manual*, U.S. Department of Transportation, 2022 (rev 2023).
5. *Inspection of Fracture Critical Bridge Members*, U.S. Department of Transportation, 1986.
6. *National Bridge Inspection Standards*, U.S. Department of Transportation, 2022.
7. *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*, Federal Highway Administration, 1995 with Latest Revisions.
8. *Ohio Manual of Uniform Traffic Control Devices (OMUTCD)*, ODOT, 2005 (rev 2011).

### INSPECTION SUMMARY

The CUY-480-0647 Bridge is in SATISFACTORY CONDITION [6-NBIS] overall. The individual item condition ratings are summarized as follows in **Table 1**:

Item	Rating	Westbound
Item 58 - Deck	5	Continued deteriorated of the reinforced concrete deck, including cracks and spalls in the deck underside; failed patches and widespread deterioration of the wearing surface; vertical misalignments and deterioration of joint headers and armor at expansion joints; widespread cracks, delaminations, and spalls in the bridge railings
Item 59 - Superstructure	6	Isolated areas of cleaned and painted section loss on the steel floorbeams and previous cracks in the steel girders
Item 60 - Substructure	6	Moderate delaminations and spalls in the reinforced concrete
Item 61 - Channel	7	Good alignment, minor scour along columns in flood plain
Approach	7	Isolated potholes, guardrail damage, and deterioration of median barrier

Table 1 – Bridge condition summary ratings.

### ITEM 58 – DECK SUMMARY

The deck is in FAIR CONDITION [5-NBIS] overall due to continued deterioration of the reinforced concrete deck. The underside of the deck has hairline transverse cracks and map cracking and numerous minor to moderate delaminations and spalls, many of which have grown in size since the previous inspection. The deck underside and edges have more significant spalls noted along the hinge expansion joints. The wearing surface over the bridge has widespread transverse cracks and numerous potholes, some of which have failing patches and/or have grown in size since the previous inspection, which has accelerated deterioration of the deck below. The expansion joints have vertical misalignments and isolated broken welds, and the abutment joints have widespread deterioration of the joint headers and armor. The reinforced concrete bridge railings and median barriers have widespread spalls with exposed, corroded, missing, and debonded reinforcement; vertical and horizontal cracks, and areas of map cracking. Deck scuppers are typically partially filled with dirt and debris, and drainage downspouts generally exhibit minor to moderate surface corrosion and signs of leakage.

## ELEMENT 12 – REINFORCED CONCRETE DECK

The reinforced concrete deck is covered by a latex modified concrete overlay over its width and an additional microsilica overlay over the middle two lanes in each direction. The underside of deck has hairline transverse cracks (typically up to 0.020" wide) and areas of hairline map cracking spaced at approximately 12" (See Photo 3). Numerous cracks exhibit light or isolated moderate efflorescence. There is one 0.016" wide transverse crack with light rust staining in the westbound structure deck underside between Stringers 10 and 11 between Floorbeams 46 and 47.



Photo 3 – Typical crack transverse crack, up to 0.020" wide, in the Span 4 underside of deck between Floorbeams 24 and 25 of the eastbound structure, looking north.

On the westbound structure, there are several locations of moisture staining and greater than typical efflorescence in the underside of deck; these areas are typically approximately 5' diameter and are located below patched areas in the wearing surface (See Photo 4). There is one 30' long by 6' wide area of hairline map cracking with moisture staining and light efflorescence between Floorbeams 44 and 45 along the south side of Girder E.

The deck overhangs typically have hairline transverse cracks with light efflorescence and leakage (See Photo 5).



Photo 4 – Several areas of moisture staining and efflorescence in the deck underside between Girders E and F between Floorbeams 43 and 44, looking west. Note these are defects are typically located between failing patches in the wearing surface.



Photo 5 – Typical hairline transverse cracks with light efflorescence and leakage in the deck overhangs, looking west at the south overhang of the westbound structure between Floorbeams 23 and 24.

The deck underside has isolated minor to moderate delaminations and spalls. The westbound structure deck underside has a 36" long by 42" wide by up to 5" deep spall with fully exposed and corroded transverse and longitudinal bottom mat reinforcement along the south side of Stringer 11 at Floorbeam 42 (See Photo 6). There is up to 90% section loss to one transverse bar at this location, with the remaining exposed bars having approximately 50% section loss. The deck forms near the joints have moderate to advanced corrosion in isolated locations with portions failed and moderate spalls with exposed reinforcement near the joints.

The deck underside of the eastbound structure along the west side of the Span 6 expansion joint has a 7' wide by up to 15" long by full depth (9") spall with two layers of debonded and corroded reinforcement (approximately 20%) at the end of the deck along the joint armor (See Photo 7). Along this joint, the adjacent stay-in-place corrugated deck forms have advanced surface corrosion or have failed over the deck width, and the exposed concrete deck in these areas has widespread shallow spalls with exposed reinforcement. The deck underside of the westbound structure along the east side of the Span 4 expansion joint has an 18" long by 8" wide by full depth (9") spall with exposed and corroded reinforcement along the joint with an adjacent area of 5' long by 18" wide by 2" deep spalling with exposed and corroded reinforcement where the deck forms have failed (See Photo 8).



Photo 6 – 36" long by 42" wide by up to 5" deep spall with debonded and corroded reinforcement (up to 90%) along the south side of Stringer 11 at Floorbeam 42 on the westbound structure, looking northeast.



Photo 7 – 7' wide by up to 15" long by full depth spall with two layers of fully exposed and corroded reinforcement at the end of the eastbound structure deck along the Span 6 expansion joint armor, looking east. Note up to 20% section loss to the exposed reinforcement.



Photo 8 – 18" long by 8" wide by full depth spall with exposed and corroded reinforcement in the westbound structure deck underside along the Span 4 expansion joint, looking west.

The exterior deck edges and undersides at the hinge joints typically have large spalls with multiple layers of exposed and corroded reinforcement, worst along the south edges of the eastbound structure; these spalls also typically extend into the railings. At the Span 4 hinge joint, the deck/railing on the west side has a 20" long by 9" high by 4" deep spall along the south face and a 24" wide by 21" high by 6" deep on the east face, while the east side has a 24" long by 9" high by 3 1/2" deep spall on the south face and a 24" wide by 24" high by 6" deep spall on the west face (See Photo 9). At the Span 6 hinge joint, the deck/railing on the west side has a 14" long by 9" high by 3" deep spall/delamination along the south face and a 24" wide by 16" high by 4" deep on the east face, while the east side has a 30" long by 20" high by 5" deep spall/delamination on the south face and a 24" wide by 24" high by 9" deep spall on the west face.

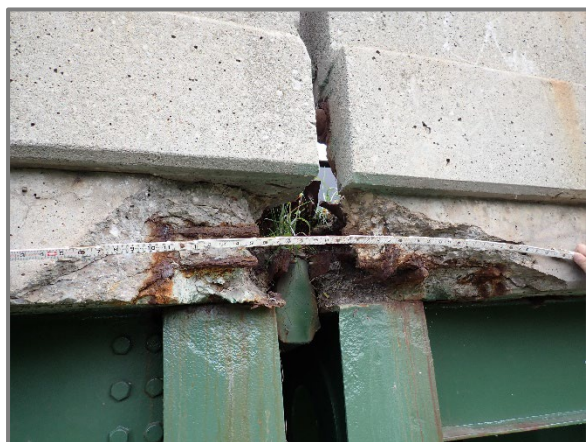


Photo 9 – Large spalls with multiple layers of exposed and corroded reinforcement in the south deck edge of the eastbound structure at the Span 4 expansion joint, looking north.



Photo 10 – Typical failing patches in the right lane of the westbound structure wearing surface in Span 5, looking east. Note additional broken up wearing surface material around the perimeter of the patches.

## ELEMENT 510 – WEARING SURFACE

The wearing surface has been lowered to fair condition based on continued deterioration since the previous inspection. The bridge wearing surface consists of a latex modified concrete overlay over its full width (installed in 2002) and an additional microsilica overlay over the middle two lanes in each direction (installed in 2015), as well as a non-epoxy sealing treatment that was performed in 2017. Overall, the wearing surface has widespread minor cracks and potholes, typically worst in the shoulders and outside lanes where the deck did not receive the additional microsilica overlay in 2015. In these areas, up to 1/16" wide transverse cracks at 3' to 5' spacing are typical.

Numerous potholes, up to 3" deep, are present in the wearing surface. The majority of these potholes have been patched with microsilica concrete and/or asphalt; however, many of the patches are failing with additional spalled or broken up concrete and asphalt around their perimeter (See Photo 10). The majority of the potholes and failing patches have grown in size since the previous inspection. Potholes and failing patches are most frequent in the westbound right lane and shoulder, particularly in Spans 4 through 6 where potholes are typically up to 6' diameter by 3" deep. The potholes and failed patches in the deck surface have caused accelerated deterioration of the concrete deck below with numerous areas of more concentrated cracking, moisture, and efflorescence in the underside of deck at these locations. See ELEMENT 12 – REINFORCED CONCRETE DECK for additional information. Numerous shallow potholes, roughly 6" diameter by 1" deep, are present in isolated locations throughout the deck wearing surface.



Photo 11 – Typical potholes along the drainage scuppers, looking northeast at a drainage scupper in the westbound right shoulder in Span 4.



Photo 12 – Large pothole in the right shoulder of the Span 8 wearing surface on the westbound structure at the base of the bridge railing, looking northeast.

Potholes are typically present around the perimeter of the drainage scuppers for an approximately 20" width by 1 1/2" depth (See Photo 11). Potholes are also common in the shoulders along the bases of the concrete bridge railings, worst on the westbound right shoulder (See Photo 12). In Span 5, the right shoulder of the westbound bridge has a 7'-3" long by 9' wide delaminated area with moderate abrasion, possibly due to fire damage (See Photo 13). Moderate scaling in the exterior lanes and shoulders have worn away the transverse tines in the wearing surface; the transverse tines in the middle lanes are generally in good condition.



Photo 13 – Delaminated area with moderate abrasion, up to 7'-3" long by 9' wide, in westbound right shoulder, looking north.

Lane reflectors are typically missing their reflective elements with isolated locations which have spalled out or have been patched.

### ELEMENT 305 – ASSEMBLY JOINT WITHOUT SEAL

The expansion joints at the abutments and hinge joints consist of sliding plate assemblies with no joint seals.

At the eastbound Rear Abutment, the joint armor on the west (approach) side of the joint in both middle lanes is approximately 1" lower than the east side of the joint due to vertical misalignments transversely between armor sections. While the previously noted bouncing of the joint in the 2<sup>nd</sup> lane (from left) under live load truck traffic was not observed during inspection, there is abrasion dust and spalling of the adjacent joint header (See Photo 14).



Photo 14 – 1/2" vertical misalignment at the Rear Abutment joint for the eastbound structure, looking north. Note the adjacent spalling to the joint header in the 2<sup>nd</sup> lane (from left).

At the westbound Rear Abutment, the joint armor on the west (approach) side of the joint in the left two lanes is discontinuous and depressed approximately 1" over the full width of the lane (See **Photo 15**). The joint armor on the west side of the joint is approximately 1/4" lower at the right lane line.



Photo 15 – Joint armor discontinuous and depressed approximately 1/2" at the westbound Rear Abutment joint in the 2<sup>nd</sup> lane (from left), looking south.



Photo 16 – Up to 1" vertical misalignment at the eastbound Forward Abutment joint in the right two lanes, looking north. Note the asphalt on the east side of the joint has been replaced since the previous inspection.

At the eastbound Forward Abutment, the joint armor on the east (approach) side of the joint is settled up to 7/8" and 1" in the third and fourth lanes (from left), respectively. The joint armor appears to be flush in the left two lanes. **The asphalt on the east side of the joint header has been replaced since the previous inspection and now partially covers the joint armor on the east side (See Photo 16).** Additionally, the joint armor in the left shoulder is undermined due to a spall in the abutment backwall below. See **ELEMENT 830 – BACKWALL** for additional information.

At the westbound Forward Abutment, there is a 1/2" vertical misalignment in the middle two lanes and a 1/4" vertical misalignment in the right lane and moderate plow damage to the joint armor. **The east approach has been repaved since the previous inspection and asphalt now covers the majority of the east joint armor. The previously noted broken weld between the east joint armor sections in the right lane and the multiple breaks and transverse misalignments up to 1/2" in the east joint armor are assumed to remain underneath (See Photo 17).** A break in the east joint armor is still visible in the right shoulder.



Photo 17 – Westbound Forward Abutment joint with moderate plow damage to the west joint armor and break in the east armor in the right shoulder, looking south. Note east approach has been repaved since the previous inspection and asphalt now covers majority of east joint armor.

Vertical misalignments up to 1/4" were also noted at the hinge joints in Spans 4 and 6 with isolated minor associated plow damage. See **Table 2** for measurements at each hinge joint locations.

Westbound / Eastbound	Location	Vertical Misalignment	Higher Side
Eastbound	Span 4 Hinge	3/16"	Rear
Westbound	Span 4 Hinge	1/4"	Rear
Eastbound	Span 6 Hinge	1/4"	Forward
Westbound	Span 6 Hinge	1/8"	Forward

Table 2 – Vertical misalignments at expansion joints over seated hinges (changes since the previous inspection shown in red).

The abutment joints are generally partially filled with loose dirt and granular debris over their length, worst in the shoulders.

Joint opening measurements were taken at each roadway joint and are presented in **Table 3** below. The measurements were taken from inside the lane closures in the right lanes near the shoulder.

Location	Eastbound		Westbound	
	Temperature	Joint Opening	Temperature	Joint Opening
Rear Abutment	73 °F	2 1/4"	56 °F	1 7/8"
Span 4 Hinge Joint	74 °F	1 1/2"	60 °F	1 1/4"
Span 6 Hinge Joint	74 °F	1 1/4"	65 °F	1 7/8"
Forward Abutment	74 °F	5/8"	69 °F	2 1/8"

Table 3 – Roadway expansion joint opening measurements (changes since the previous inspection shown in red).

### ELEMENT 331 – REINFORCED CONCRETE BRIDGE RAILING

The reinforced concrete bridge railings have widespread spalls with exposed, corroded, missing, and debonded reinforcement; vertical and horizontal cracks, and areas of map cracking (**See Photo 18**). The top edges of the exterior bridge railings are typically spalled over their full width by up to 6" deep with up to fully exposed reinforcement; these spalls commonly extend down onto the vertical faces up to 18" by 2" deep. In locations where spalls are not yet present, horizontal delamination cracks are typical on the interior faces of the exterior railings approximately 3" from the top; this condition is present for nearly the full length of the bridge railings.



Photo 18 – Typical spalls, up to full width, with exposed, corroded, missing, and debonded reinforcement along the top edges of the exterior bridge railings, looking southwest at the south railing in Span 1 of the eastbound structure. Note the debonded top longitudinal bars hanging down.



Photo 19 – 24" long by 24" high by full depth spall in the south bridge railing on the east side of the Span 6 joint on the eastbound structure, looking south. Note that spalls of this nature are typically present at the hinge joints.



The south bridge railing on the eastbound structure has large spalls with fully exposed and corroded reinforcement adjacent to the deck edge spalls along the expansion joints in Spans 4 and 6 (See **Photo 19**). The upward turned ends of the joint armor is missing at each of these locations. See **ELEMENT 12 – REINFORCED CONCRETE DECK** for additional information.

The median barrier on the westbound structure has spalls which are generally up to 24" high by 5' long by 3" deep with exposed reinforcement in the previously repaired top portions; the eastbound structure has similar spalls typically 15" high by 8" wide by 3" deep. A 50' long section of the median railing on the eastbound structure has moderate spalls and delaminations exposing longitudinal and transverse reinforcement near Pier 4 (See **Photo 20**). The longitudinal neoprene seal covering the opening between the median barriers is missing for over half of the bridge length and is hanging down in Span 8.



Photo 20 – Widespread spalling of the median barrier on the eastbound structure near Pier 4, looking north.

#### ELEMENT 815 – DRAINAGE

Drainage scuppers on the bridge deck are partially filled up to 85% (30% to 50% typical) with dirt, gravel, and debris with isolated vegetation growth; however, the downspouts at deck level are clear (See **Photo 21**). Dirt, gravel, and debris along the bases of the bridge railings limit flow for drainage slightly and contribute to further debris accumulation in the scuppers. Previous inspection reports noted that the deck is still clearing drainage adequately with only minor ponding noted; however, no evidence of water ponding was observed during this inspection. Multiple median scupper grates exhibit missing or broken metal bars, including the north and median scupper grates near Pier 4 of the westbound structure and the south scupper grate near the expansion joint in Span 6 of the eastbound structure (See **Photo 22**).



Photo 21 – Partially clogged drainage scupper (approximately 85% clogged), looking southwest at the west end of the bridge on the eastbound structure. Note downspout is clear.

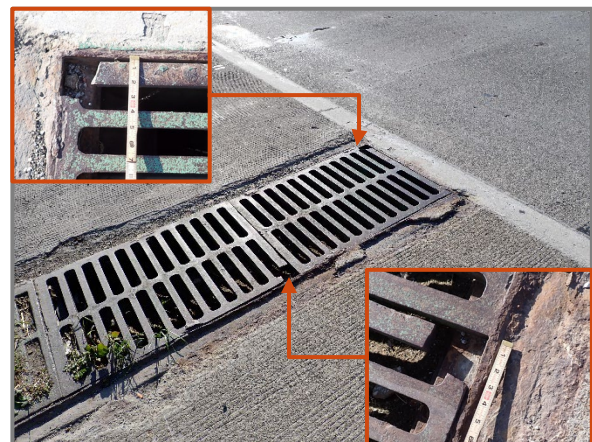


Photo 22 – Scupper grate near Pier 4 of the westbound structure with broken grate bars at the corners, looking southeast.

The drainage downspouts below the bridge exhibit minor to moderate surface corrosion throughout with isolated areas of minor section loss and signs of leakage on the downspout pipes and isolated corrosion holes in the supports (See Photo 23). The 2020 inspection report noted a corrosion hole in the north downspout of the westbound structure near the hinge joint in Span 6; however, while evidence of leaking in this area remains, no corrosion holes have been observed during subsequent inspections following painting of the structure (See Photo 24). There is a 12" long hole in the drain trough below the Span 4 expansion joint of the westbound structure, causing minor dirt and granular debris to collect on the Girder E hinge seat below.

The downspout at Pier 7 for the eastbound bridge is fully clogged approximately 12' from the top, as detected using a drop line inside the pipe as no rain events occurred during the inspection. Additionally, the bottom of this downspout is fully clogged at the elbow, approximately 4' from outlet (See Photo 25). This downspout was noted to be clogged with water overflowing during rain events during the 2021 inspection. The downspout at Pier 4 for the eastbound bridge was full of water at the time of inspection (See Photo 26).

Large diameter rip rap has previously been placed along the west bank of the river around Pier 6 to address undermined and washed out concrete paved gutters. This rip rap remains in good condition and appears to function as intended.



Photo 23 – Downspout on Pier 3 of westbound structure with moderate surface corrosion to downspout pipe and corrosion holes in downspout supports due to leakage from joint, looking north.

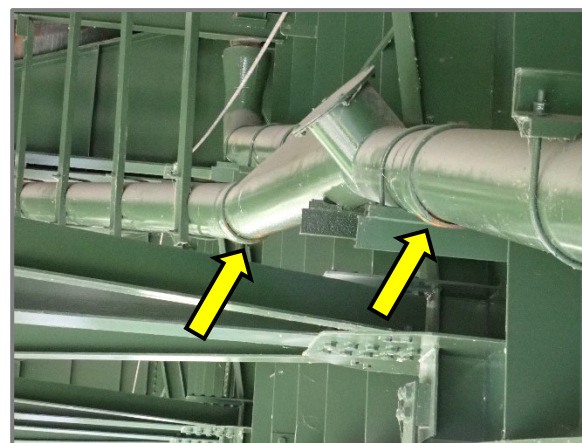


Photo 24 – Evidence of leakage in the north downspout near the hinge joint in Span 6 of the westbound structure, looking west. Note that corrosion holes were observed during the 2020 inspection but have not been noted since.

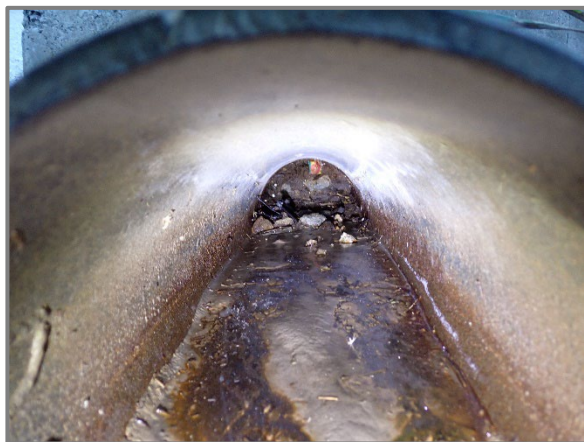


Photo 25 – Downspout at Pier 7 for the eastbound bridge fully clogged at bottom elbow approximately 4' from the outlet, looking east.



Photo 26 – Downspout at Pier 4 for the eastbound bridge full of water at the time of inspection, looking south.

## ITEM 59 – SUPERSTRUCTURE SUMMARY

The superstructure is in SATISFACTORY CONDITION [6-NBIS] overall due to isolated areas of minor surface corrosion and cleaned and painted section loss below the expansion joints, primarily to floorbeams below the hinges in Spans 4 and 6. No significant fatigue distress was observed in the superstructure members, and previously implemented retrofits appear to be functioning as intended.

### ELEMENT 107 – STEEL OPEN GIRDER/BEAM

The main girders have been recently cleaned and painted and exhibit only isolated areas of minor section loss. The carrier beam retrofits installed below the hinge seats at the Span 4 and 6 expansion joints are functioning as intended with no defects noted. See **ELEMENT 820 – STEEL SEATED-HINGE ASSEMBLY** for additional information. No cracks or other fatigue-related distress were observed on the main girders.



Photo 27 – Typical dogbone retrofit overcut in the girder web, looking north at Girder B at Floorbeam 6.

Dogbone retrofits consisting of drilled arrest holes with sawcuts between the holes have previously been installed in tension zones within the girder webs adjacent to floorbeam bottom flanges or lateral bracing connections. Numerous dogbone retrofits exhibit an overcut or areas that were not fully sawcut during the initial installation (See Photo 27). Most of the overcuts are no longer visible due to the new paint system that was recently installed on the structure. Isolated arrest holes for the dogbone retrofits are misshapen (oblong). Refer to **Appendix D** for additional information on the dogbone retrofits. *Note that previously documented locations of overcuts were assumed to remain in areas that could not be confirmed due to the new paint system.*



Photo 28 – Cleaned and painted pitting 1/8" deep on the bottom of the north face of the Girder F web along the bolted splice between Floorbeams 54 and 55, looking south.

Girder F in Span 7 has a 36" long by 4" high area of cleaned and painted pitting up to 1/4" deep (1/8" deep typical) on the bottom of the north face of the web along the bolted splice between Floorbeams 54 and 55 (See Photo 28). The main girder flanges, webs, and hinge seat elements below the expansion joints have isolated areas of minor cleaned and painted pitting, typically up to 1/16" deep. There are isolated small areas of failed paint with minor surface corrosion along the edges of the girder flanges.

Isolated transverse stiffeners on the main girders have small impact deformations, likely due to construction. The first transverse stiffener west of Floorbeam 11 on the south face of Girder D has a 3" long painted over tear along its edge, likely from construction.

Knee brace connection retrofits have been previously installed along the bottom portions of the knee braces at the girder bottom flanges below each floorbeam. Multiple knee brace connection retrofit bolts in the girder bottom flanges are missing at isolated locations on the structure (See Photo 29).

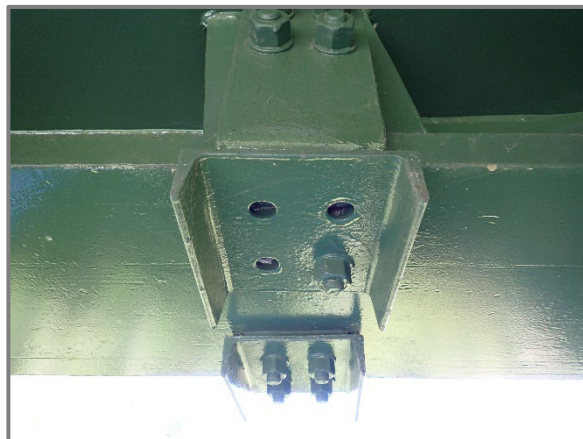


Photo 29 – 3 of 4 bottom flange bolts missing in the Girder F knee brace connection retrofit at Floorbeam 15, looking north.

The girder alignment is in good condition overall. No instances of girder misalignment or sagging were noted during this inspection.

### ELEMENT 113 – STEEL STRINGER

The steel stringers are in good condition overall with only isolated areas of minor surface corrosion noted on the stringer ends along the edges of their flanges adjacent to expansion joints.

### ELEMENT 152 – STEEL FLOORBEAM

The steel floorbeams have minor to moderate cleaned and painted section loss below the expansion joints in Span 4 (Floorbeams 26 and 27) and Span 6 (Floorbeams 50 and 51), worst between the floorbeam cantilevers below the median. Floorbeam top flanges have several areas of minor surface corrosion where stay-in-place forms have failed along the joints.

There are 3" long by 1" high corrosion holes in the tops of the Floorbeam 26 and 27 webs at the ends of the north cantilevers of the eastbound structure below the median (See Photo 30); similar corrosion holes up to 1" diameter are present at the ends of other floorbeam cantilevers below the expansion joints. The floorbeam webs and flanges typically have up to 1/8" deep cleaned and painted pitting on the faces directly below the expansion joints (See Photo 31). The Floorbeam 26 south cantilever on the westbound structure has one area of cleaned and painted section loss with down to 1/8" remaining thickness (3/4" original thickness) on the east edge of the bottom flange which tapers to 1/8" deep pitting at the web.



Photo 30 – 3" long by 1" high corrosion hole at the top of the Floorbeam 26 north cantilever on the eastbound structure at its end, looking northwest. Note that Floorbeam 27 is similar.

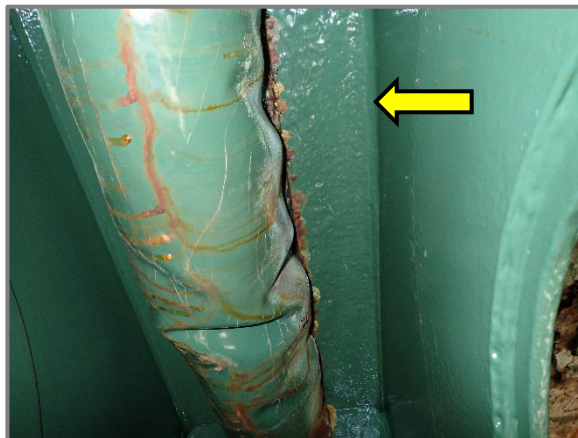


Photo 31 – Floorbeam 26 south cantilever on the westbound structure with cleaned and painted pitting 1/8" deep for the full width of the east top flange, looking south.

Floorbeam 26 of the eastbound structure has one transverse stiffener exhibiting a 3" diameter area of 100% section loss at the base in the north cantilever, and Floorbeam 26 of the westbound structure has **two stiffeners with areas of 100% section loss up to 2" high at the base in the south cantilever (See Photo 32)**. Several other transverse stiffeners below the expansion joints exhibit up to 1/8" deep cleaned and painted section loss.



Photo 32– South cantilever of Floorbeam 26 on the westbound structure with 100% section loss at the base of a transverse stiffener near the base, looking north.

The floorbeams away from the expansion joints are typically in good condition overall with no significant defects noted.

**At the Floorbeam 70 south cantilever connection to Girder D in Span 9, the welds between the handrail bar and the west floorbeam connection angle are broken on the south face and underside (See Photo 33).**

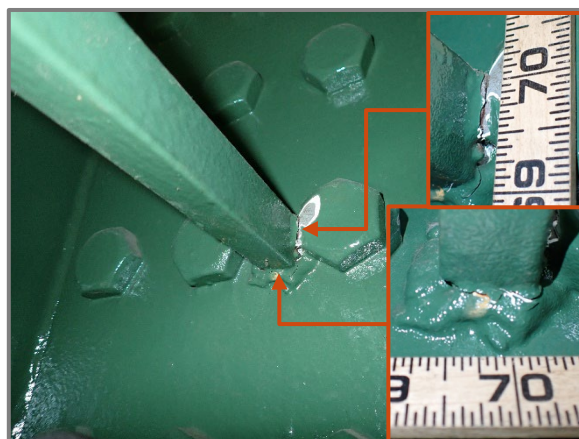


Photo 33– Broken welds on south face and underside on weld between handrail bar and west connection angle for south cantilever of Floorbeam 70 to Girder D on the westbound structure, looking east.

#### ELEMENT 311 – MOVABLE BEARING

The rocker bearings at the Forward Abutment had slight differential movement at the time of inspection (78 °F), with the exterior girders (Girders A and F) expanded 5.5° and 6.5°, respectively, Girder E expanded 6.0°, and the other interior girders expanded between 1.0° and 2.5°. At the Rear Abutment, all rocker bearings were approximately neutral or slightly expanded at the time of inspection (65 °F). Rocker bearing expansion measurements at the abutments are presented in **Table 4**.

A 36" long by 12" high by 3" deep spall in the west face of the Girder F seat pedestal at the Forward Abutment has undermined the masonry plate up to 3/4" deep over its full width (See Photo 34).



Photo 34 – Spall in the west face of the Girder F seat pedestal at the Forward Abutment undermining the bearing masonry plate up to 3/4" deep, looking north.

Girder	Rocker Bearing Position	
	Rear Abut. (65 °F)	Forward Abut. (78 °F)
A	1.0° Exp.	5.5° Exp.
B	1.5° Exp.	1.0° Exp.
C	1.0° Exp.	2.5° Exp.
D	0.5° Exp.	2.5° Exp.
E	Neutral	6.0° Exp.
F	1.0° Exp.	6.5° Exp.

Table 4 – Rocker bearing measurements at the abutments  
("Exp." = expansion, "Con." = contraction) (values changed more than 1° since the previous inspection shown in red).

### ELEMENT 313 – FIXED BEARING

The fixed bearing for Girder F at Pier 7 has up to 1/4" deep cleaned and painted pitting on the bearing assembly and masonry plate; minor active corrosion with pack rust up to 1/8" thick is also present between the masonry plate and the lead leveling sheet at this location (See Photo 35). Fixed bearings at other locations have isolated cleaned and painted minor pitting. The southeast anchor bolt nut at the Girder A bearing at Pier 5 is backed off 5/8".



Photo 35 – Up to 1/4" deep cleaned and painted pitting on the bearing assembly and masonry plate for Girder F at Pier 7, looking south.



Photo 36 – New stamp denoting the recently applied OZEU protective coating system, looking southwest at Girder F at the Rear Abutment.

### ELEMENT 515 – STEEL PROTECTIVE COATING

A new protective coating system was applied to the steel superstructure members prior to the 2021 inspection (See Photo 36). The protective coating system is in very good condition overall with isolated areas of missing paint with minor surface corrosion along the edges of the girder flanges and locations of paint failure with minor surface corrosion at floorbeams and stringer ends adjacent to the hinge expansion joints.

### ELEMENT 820 – STEEL SEATED-HINGE ASSEMBLY

As noted in the BRIDGE DESCRIPTION, the westbound bridge was closed in 2000 due to a crack being found at the seated hinge in Span 4 at Girder D. As a result, the bridge was closed until carrier beam retrofits could be installed at all twelve hinge locations across both structures. The carrier beam retrofits installed below the hinge seats are functioning as intended with no defects noted (See Photo 37). The girders and hinge seat elements below the expansion joints have isolated areas of minor cleaned and painted pitting, typically up to 1/16" deep.



Photo 37 – Typical carrier beam retrofit installed below the seated hinge joints, looking north at Girder C at the Span 6 expansion joint.

### DIAPHRAGMS /CROSSFRAMES (No Associated Element)

Crossframes are present between interior stringers between the main girders. Minor cleaned and painted pitting was noted on the end crossframes at the abutments and adjacent to the hinge expansion joints. No other significant defects were noted in the crossframes.

### LATERAL BRACING (No Associated Element)

Lateral bracing is present in the exterior bays between Girders A and B and between Girders E and F. Isolated lateral bracing members exhibit minor dents and deformations from erection damage. There is a 1 1/2" outward impact deformation over an 8" long by 6" high area of the stem of the lateral bracing member on the west side of Floorbeam 14 near Girder B. Isolated lateral bracing erection bolts are loose or missing.

### SWAY BRACING (No Associated Element)

Lower sway bracing struts are present between the girders of each structure at each floorbeam, and intermediate sway bracing vertical members are present below the crossframes in exterior bays. **The sway strut between Girders D and E at Floorbeam 28 in Span 4 is bent upward 3/4" over a 10" length.**

### ITEM 60 – SUBSTRUCTURE SUMMARY

The substructure is in SATISFACTORY CONDITION [6-NBIS] overall due to minor to moderate spalls and delaminations with exposed and corroded reinforcement in the pier columns, caps, and backwalls (See Photo 38). Corner spalls and delaminations are present in the abutment girder seat pedestals, and the abutment backwalls have widespread delaminated areas, **up to full height of the backwall, and an isolated spall at the Forward Abutment that undermines the joint armor behind Girder C (See Photo 39).** The wingwalls have cracks, spalls, and patches, including multiple cracks up to 1/8" wide with efflorescence and rust staining in the interior wingwall at the Rear Abutment.



Photo 38 – Numerous delaminations and spalls with exposed reinforcement throughout the north column at Pier 3 of the eastbound structure, looking southwest.



Photo 39 – Spall at the top of the Forward Abutment backwall behind Girder C undermining the joint armor above, looking northeast.

## ELEMENT 205 – REINFORCED CONCRETE COLUMN

The reinforced concrete pier columns exhibit widespread minor to moderate delaminations and spalls, some with exposed and corroded reinforcement (See Photo 40). Corner spalls and delaminations are present up to 30' high, typically worst near the bases of the columns (See Photo 41). Deterioration is also common on the columns along leaking drainage downspouts. Isolated pier columns have hairline vertical cracks with light efflorescence.

At Pier 6, the columns for the westbound structure have moderate to heavy scaling near their base, and the columns for the eastbound structure have minor scaling of the bottom 18" (See Photo 41). Previously placed large diameter rip rap remains in place around the bases of these columns. Up to 2' deep localized scour pockets are present around the bases of the Pier columns 5 for both structures (See Photo 41).



Photo 40 – Numerous spalls with exposed reinforcement and delaminations on the south column at Pier 1 of the eastbound structure, looking north.



Photo 41 – Corner spalls with exposed reinforcing on south column of Pier 6 of the westbound structure, looking northeast. Note minor scaling to bottom 18" of column.

## ELEMENT 215 – REINFORCED CONCRETE ABUTMENT

Visible portions of the abutments consist of the girder seat pedestals at each end of the structure. The girder seat pedestals at the Forward Abutment have minor to moderate spalls and delaminations, some with exposed reinforcement. A 36" long by 12" high by 3" deep spall in the west face of the Girder F seat Pedestal at the Forward Abutment has undermined the masonry plate up to 3/4" deep over its full width (See Photo 33). Corner delaminations are also present on the seat pedestals for Girders A, B, D, and E; however, these delaminations do not undermine the girder masonry plates. A 20" high by 30" wide by 1" deep top corner spall/delamination is present on the west face of the Girder A seat pedestal and a 26" high by 26" wide on the west face by 20" wide on the north face by 5" deep top corner spall/delamination is present on the west face of the Girder E seat pedestal with no undermining to the masonry plates noted at either location. No significant defects were noted in the girder seat pedestals at the Rear Abutment.



### ELEMENT 234 – REINFORCED CONCRETE PIER CAP

The reinforced concrete pier caps have minor to moderate spalls and delaminations, some with exposed reinforcement. The west face of the Pier 2 cap for the westbound structure has a 72" high by 42" wide by 2" deep spall with exposed and corroded reinforcement on the west face over the west column behind the drainage downspout; there is a 24" diameter by 1" deep spall with exposed and corroded reinforcement adjacent to this location on the west face and an 18" high by 9" wide by 2" deep spall on the east face. The west face of the Pier 2 cap for the eastbound structure has numerous spalls with reinforcement (up to 21" wide by 15" high by 2" deep) and delaminations (up to 3' diameter) over the west column behind the drainage downspout. The west face of the Pier 7 cap for the westbound structure has a 72" high by 60" wide by 2" deep spalled and delaminated area over the west column behind the downspout (See Photo 42).



Photo 42 – 72" high by 60" wide area with that is delaminated and spalled up to 2" deep with exposed and corroded reinforcement behind the downspout on the west face of the Pier 7 cap for the westbound structure, looking east.

There are moderate top corner spalls in the center pedestals of Pier 3 on the eastbound structure and Pier 4 on the westbound structure; no undermining was noted to either girder bearing. The pier caps have minor to moderate top corner spalls in isolated locations.

### ELEMENT 830 – ABUTMENT BACKWALL

The abutment backwalls have widespread large delaminations, primarily behind the girder ends, that have developed into spalls in multiple locations. At the Forward Abutment behind Girder C, the top of the backwall has a 12" high by 10" deep by 8.5' wide spall with exposed reinforcement that has undermined the joint armor support up to 10" (See Photo 43). This undermined portion of the joint armor is located beneath the left shoulder. There are V-shaped delaminations, up 7' wide by full height, in the Forward Abutment backwall behind Girders A, B, D, E, and F. The Rear Abutment backwall has widespread delaminations, up to 8' wide by 6' high that have grown in size since the previous inspection, behind the girder ends, and smaller delaminations in isolated locations between the girders. The Rear Abutment backwall has an 8' wide by 4' high delamination with a 27" wide by 21" high by 2" deep spall along the south edge of the delamination behind Girder F. The



Photo 43 – 12" high by 10" deep by 8.5' wide spall with exposed reinforcement in the top of the Forward Abutment backwall behind Girder C that is undermining the joint armor support up to 10", looking southeast. Note this area is under the left shoulder of the eastbound bridge.

Forward Abutment backwall for the eastbound structure has a 12" diameter by 3" deep spall near the top adjacent to the median.

The south end of the Rear Abutment backwall for the westbound structure is undermined 5" high by **up to 15" deep over an approximately 7.5' length** from the Girder D pedestal to the interior wingwall. The south end of the Forward Abutment backwall for the eastbound structure is undermined up to 4" high by 30" deep over a 40" length **and the north end is undermined up to 5" high by 13" deep over a 7' length (See Photo 44).**



Photo 44 – Forward Abutment backwall for the eastbound structure undermined up to 5" high by 13" deep over a 7' length at the north end, looking east.

### WINGWALLS (No Associated Element)

The wingwalls have isolated minor cracks, patches, and spalls. The wingwalls typically exhibit full height vertical cracks up to 1/16" wide along the backwall connections. The south wingwall at the Forward Abutment has a full height by **24" wide** patch which is cracking and beginning to fail along the backwall connection (See Photo 45). The north wingwall at the Forward Abutment has a **15" diameter** by 1" deep spall with exposed reinforcement along the full height crack at the backwall connection. The south wingwall at the Forward Abutment is undermined 4" high by up to full depth over a 30" length at the backwall interface.

The interior wingwall at the Rear Abutment has one 1/8" wide vertical/diagonal crack with moderate efflorescence **and rust staining** near the bottom approximately 10' from the backwall of the westbound structure (See Photo 46). This wingwall has two additional 1/16" wide vertical cracks with moderate efflorescence and light rust staining near the bottom and one hairline horizontal crack near the backwall connection for the westbound structure.



Photo 45 – 12" wide patch beginning to fail in the south wingwall at the along the Forward Abutment connection, looking north.



Photo 46 – 1/8" wide vertical/diagonal crack with moderate efflorescence and rust staining in the interior wingwall at the Rear Abutment, looking northwest.

## SLOPE PROTECTION (No Associated Element)

Installation of new slope protection was completed prior to the 2022 inspection, at which time the previously noted erosion channels along the west and east sides of the structure were filled with large stone rip rap, and the faces of the slope protection on both sides were covered with aggregate stone. The slope protection on the west side extends from the Rear Abutment to where Valley Parkway crosses below the bridge in Span 3, and from the Forward Abutment to the river edge on the east side (See Photos 47 and 48).



Photo 47 – View of slope protection on west slope from the Rear Abutment, looking east.



Photo 48 – View of slope protection on east slope from the Forward Abutment, looking west.

The prior erosion channel at the east side of the structure runs north to south. The erosion channel is even on the north end and transitions to a 30' high near-vertical slope at the south end (See Photo 49). This slope profile remains, but the new slope protection is in place and performing adequately.

### ITEM 61 – CHANNEL SUMMARY

The channel, which flows in a straight alignment below Span 7, is in GOOD CONDITION [7-NBIS] overall. Up to 2' deep localized scour pockets are present around the bases of the Pier columns 5 for both structures. Previously placed large diameter rip rap remains in place around the bases of the columns at Pier 6 for both structures. No significant scour was noted at any of the remaining piers within the flood plain.



Photo 49 – Erosion channel in front of the Forward Abutment, looking south. Note that new slope protection should mitigate further erosion.

The waterway adequacy of the structure is very good, as the bridge superstructure is located approximately 100' above the river.

## APPROACH SUMMARY

The approaches are in **good condition** overall due to isolated potholes in the east approach asphalt pavement and numerous defects related to the approach guardrails and concrete railings. Approach embankment from behind the Forward Abutment backwalls is spilling out through the median joint. **Resurfacing of the forward approach has been completed since the previous inspection (See Photo 50).**



Photo 50 – Forward approach roadway resurfaced since the previous inspection, looking east.

## ELEMENT 321 – REINFORCED CONCRETE APPROACH SLAB

The reinforced concrete approach slabs are covered with asphalt at both ends of the bridge. **The previously noted edge spalls in the approach slab along the length of the Forward Abutment joint and the spall in the westbound joint header in the shoulder are now covered by the new asphalt; however, the spalls are still assumed to be present. The asphalt covering the forward approach slabs in is very good condition, with no deficiencies noted.** The asphalt pavement covering the rear approach slabs is in good condition with minor wear noted in the eastbound pavement only.

## APPROACH ROADWAY SURFACE (no associated element)

**The asphalt roadway pavement on the forward approach has been resurfaced since the previous inspection and is in very good condition with no significant deficiencies noted (See Photo 50). The rear approach roadways are in good condition. There is a 7' wide by 8" long by 3" deep pothole in the 2<sup>nd</sup> lane from the left in the rear eastbound approach roadway.**



Photo 51 – Embankment fill spilling out from behind the Forward Abutment backwall through the median joint, looking north. Note this embankment fill is located below the reinforced concrete “abutment span” behind this backwall.

## EMBANKMENT (No Associated Element)

Short reinforced concrete beam spans (abutment spans) are present between the backwalls and approach slabs at each abutment. At the Forward Abutment, embankment fill behind the backwall is spilling out from the median joint, **resulting in a minor loss of embankment fill with an active runoff erosion channel (See Photo 51).** Runoff erosion at the southeast bridge corner has resulted in minor undermining at the backwall interface with the southeast wingwall. The corner embankments along the wingwalls are generally well vegetated.

## APPROACH GUARDRAIL (No Associated Element)

The approach guardrail is in fair condition overall with minor to moderate impact damage to the metal flexbeam, isolated split or damaged posts and blockouts, and deterioration of the approach concrete median barriers and exterior railings.



Photo 52 – Damaged timber posts and plastic blockouts on Posts 3 through 6 from the bridge end in the southeast corner approach guardfence, looking east.

The southeast corner approach guardrail has moderate damage and impact scrapes. There is heavy damage to the timber posts and blockouts on Posts 3 through 6 and Post 10 from the bridge end, and the blockouts are typically rotated (See Photo 52). Isolated timber guardrail posts have minor to moderate decay and splits. The southwest corner approach guardrail has isolated minor impact damage and scrapes. Post 10 from the bridge end has a broken plastic blockout, and the third post from the end terminal is broken. The northeast corner approach guardrail has minor impact damage (scrapes), and the guardrail posts in the northeast and northwest corner approach guardrails have isolated minor splits. **The northwest transition has very minor impact damage to the W-beam.**

The approach concrete median barriers have widespread moderate spalls with exposed and corroded reinforcement. At the rear approach, the median barrier has widespread spalls with exposed and corroded reinforcement, approximately 24" high by 2" deep, in the vertical faces. At the forward approach, the median barrier has isolated moderate spalls 8' long by up to full height by 3" deep with exposed reinforcement. Median barriers typically have moderate vertical and horizontal **delamination** cracks throughout. The north exterior concrete approach railings typically have deep spalls with exposed reinforcement along the joints.

## SIGN/UTILITY ITEMS SUMMARY

### SIGNS

The signs on the bridge are in good condition overall with no significant deficiencies noted.

### SIGN SUPPORTS

"Corporation Limit" signs are mounted on each side of the bridge in Span 4. The bolts for the brackets attaching these signs to the exterior bridge railings are broken; however, the signs remain attached to the floorbeams at their bases (See Photo 53).



Photo 53 – Broken bolt connecting the "Corporation Limit" to the north rail of the westbound structure in Span 4, looking west. Note sign support still connected to floorbeam top flange.

## UTILITIES

Light post GR1-2-6 at Pier 7 on the eastbound structure has moderate impact damage with the west face indented 32" high by 12" wide by 1 1/2" deep and the post leaning to the east. Additionally, the bottom 1 1/2" of the post is crimped over the east half and the base plate on the west side is bent up 1/2" (See Photo 54).

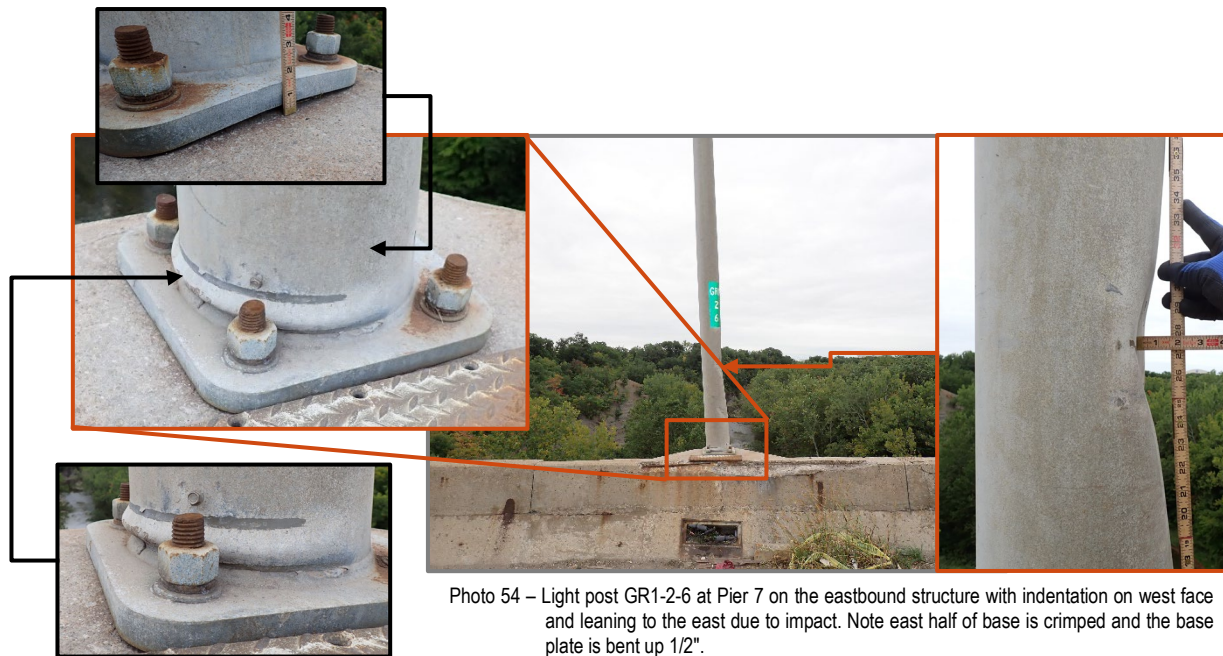


Photo 54 – Light post GR1-2-6 at Pier 7 on the eastbound structure with indentation on west face and leaning to the east due to impact. Note east half of base is crimped and the base plate is bent up 1/2".

Access hatches for the electrical panels below light poles are typically missing with exposed wiring, dirt and granular debris, and vegetation growth inside (See Photo 55). Most of the light post bases are missing bolt caps.

The majority of the grounding cables are broken at the pier caps (See Photo 56). Previous inspection reports noted that these grounding cables were likely broken during the recent repainting of the superstructure.



Photo 55 – Typical missing electrical panel access hatch below the light poles, looking north at north railing in Span 6. Note exposed wiring, dirt, granular debris, and vegetation growth inside the panel.



Photo 56 – Typical broken grounding cable at the pier caps, looking west at Pier 7 adjacent to Girder F.

## ITEM 41 – OPERATIONAL STATUS

The bridge remains OPEN WITH NO RESTRICTIONS [A-NBIS].

## CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the 2023 inspection, the CUY-480-0647 Bridge is in SATISFACTORY CONDITION [6-NBIS] overall due to cracks and spalls in the reinforced concrete deck; failed patches and widespread deterioration of the wearing surface; widespread cracks, delaminations, and spalls in the reinforced concrete bridge railings; isolated areas of cleaned and painted section loss on the steel floorbeams and previous cracks in the steel girders; and moderate delaminations and spalls in the reinforced concrete substructure. Previously installed retrofits on the steel superstructure are in good condition and appear to be performing as intended. Recent work completed on the structure includes cleaning and repainting of the steel superstructure, slope protection installation at the west and east slopes, and resurfacing of the rear approach roadways.

Srinteg has provided rehabilitation and maintenance recommendations below in order to extend the usable life of the structure. We present our recommendations in the following three priority categories:

- High Priority Repairs:  
(Within 6 Month Period) Work which should be performed as soon as possible to address deficiencies which affect the load carrying capacity of the structure or public safety.
- Medium Priority Repairs:  
(Within 1 to 2 Year Period) Recommendations for deficiencies which currently do not significantly affect the load carrying capacity of the structure or public safety but will require corrective action if deterioration continues.
- Low Priority Repairs:  
(As Scheduled) Recommendations for deficiencies that are minor in nature and won't affect the capacity of the structure or public safety or rehabilitation level repairs that are not immediately time sensitive. Recommendations for minor preventative repairs or routine maintenance may also be listed.

<b>High Priority Repairs:</b>	None.
<b>Medium Priority Repairs:</b>	<p>Replace or patch the bridge wearing surface to prevent further deterioration to the concrete deck.</p> <p>Patch spalls with exposed reinforcement in the underside of deck and deck edges.</p> <p>Repair or replace the deteriorated abutment joints and adjacent headers.</p> <p>Clean all gutters, drainage scuppers, and downspouts to restore proper function of the drainage system.</p> <p>Repair or replace broken scupper grate bars.</p> <p>Repair or replace the deteriorated concrete bridge railings and median barriers.</p> <p>Clean and patch spalls and delaminations in the substructure units.</p> <p>Patch spall in Forward Abutment backwall behind Girder C that is undermining the joint armor.</p> <p>Replace damaged light pole GR1-2-6 at Pier 7 on the eastbound structure.</p>
<b>Low Priority Repairs:</b>	<p>Replace missing access hatches for electrical panels below the light poles.</p> <p>Backfill loss of embankment and undermining of the abutment backwalls and wingwalls and provide countermeasures to prevent further loss of fill.</p>



# APPENDIX A

## Bridge Inspection Field Report

Inspector: Cartwright,Donald

Inspection Date: 10/02/2023

Structure Number: 1812831

Facility Carried: IR 480

### Ohio Bridge Inspection Summary Report

**CUY-00480-0647 (1812831)**

2: District 26446 - FAIRVIEW PARK (CUY county)  
ict  
12

5A: Inventory Route 1 00480

21: Major Maint A/B 01 - State Highway Agency /  
225 Routine Main A/B 01 - State Highway Agency /  
221 Inspection A/B 01 - State Highway Agency /  
220: Inv. Location DISTRICT 12

7: Facility On IR 480  
6: Feature Ints ROCKY RIVER  
9: Location 2.07 MI. W. OF JCT. I-71  
Lat, Lon 41.424461018037384 ,-81.8577877386747

Condition	Structure Type
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**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** **6 - Satisfactory Condition**  
59.01 Paint & PCS 8 - Very Good (up to 1% corr.)  
**60: Substructure** **6 - Satisfactory Condition**  
**61: Channel** **7**  
**61.01 Scour** **7 - Good**  
**62: Culverts** **N - Not Applicable**  
**67.01 GA** **6**

43: Bridge Type 3 - Steel  
03 - Girder and Floorbeam System  
N- Not Applicable  
45: Spans Main / Approach 9 / 0  
107: Deck Type 1 - Concrete Cast-in-Place  
408: Composite Deck N - Non-composite Construction  
414A Joint Type 1 2 - Sliding Metal Plate Angle  
414B: Joint Type 2 N - None  
108A: Wearing Surface 3 - Latex Concrete or similar additive  
N- Not Applicable

Appraisal
-----------

Sufficiency Rating 61.8 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 8 - Stable for scour conditions  
71: Waterway Adequacy 8 - Bridge Above Approaches

422: WS Date 09/30/2005  
423: WS Thick (in) 1.2  
482: Protective Coating 5 - Paint System OZEU  
483: PCS Date 01/01/1991  
453: Bearing Type 1 2 - Rockers & Bolsters  
455: Bearing Type 2 N - None  
528: Foundn: Abut Fwd 6 - Rock (including Spread Footing on Rock)  
533: Foundn: Abut Rear 6 - Rock (Including Spread Footing on Rock)  
536: Foundn: Pier 1 6 - Rock (including Spread Footing on Rock)  
539: Foundn: Pier 2 0 - Other

Geometric
-----------

48: Max Span Length (ft) 200.0  
49: Structure Length (ft) 1571.0  
52: Deck Width, Out-To-Out (ft) 144.0  
424: Deck Area (sf) 226224  
32: Appr Roadway Width (ft) 103.0  
51: Road Width, Curb-Curb (ft) 142.0  
50A: Curb/SW Width: Left (ft) 0  
50A: Curb/SW Width: Right (ft) 0  
34: Skew (deg) 0  
33: Bridge Median 0 - No median  
54B: Min Vert Underclearance (ft) 99  
336A: Min Vert Clrnce IR Cardinal (ft) 99  
336B: Min V Clr IR Non-Cardinal (ft) 0  
578: Culvert Length (ft) 0

Age and Service
-----------------

27: Year Built/ 106 Rehab 1970 / 0000  
42A: Service On 1 - Highway  
42B: Service Under 6 - Highway - waterway  
28A: Lanes on 08  
28B: Lanes Under 02  
19: Bypass Length 1  
29: ADT 109150  
109: % Trucks (%) 5

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 (%) 130  
704: Analysis Date 06/12/2019  
63: Analysis Method 6 - Load Factor (LF) rating reported by rating factor (RF) method using MS18 loading.

Inspections
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90: Routine Insp. 12 10/02/2023  
92A: FCM Insp. Y 24 09/09/2022  
92B: Dive Insp. N 0  
92C: Special Insp. N 0  
92D: UBIT Insp. Y 12 09/24/2023  
92E: Drone Insp. N 0

Inspector Cartwright,Donald

Inspector: Cartwright, Donald  
 Inspection Date: 10/02/2023

Structure Number: 1812831  
 Facility Carried: IR 480

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
<b>12-Reinforced Concrete Deck</b>	3 - Mod.	216432	sq. ft.	195549	19546	1337	0
<p>CS2 - Hairline transverse cracks and map cracking, some with light efflorescence. Isolated minor delaminations.            CS3 - Cracks with moderate efflorescence, moisture staining, or light rust staining. Spalls with exposed and corroded reinforcement. Large spalls with debonded reinforcement in underside of deck and at deck edges along expansion joints.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>							
<b>510-Wearing Surfaces</b>		206663	sq. ft.	181507	20669	4487	0
<p>CS1 - Generally in middle two lanes in each direction where the 2015 MSMC concrete overlay was placed.            CS2 - In the outside lanes in each direction and in the shoulders where the 2002 LMC concrete overlay was placed.            CS3 - Areas with potholes and/or failing asphalt patches. Generally located in the shoulders, near the expansion joints, along scuppers, and at the interface between the new and old overlays. Worst on westbound bridge in Spans 4 through 6.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>							
<b>107-Steel Open Girder/Beam</b>	3 - Mod.	8944	ft.	8781	145	18	0
<p>CS2 - Isolated locations with minor surface corrosion near girder ends at abutments and below hinge seat expansion joints. (Dogbone retrofit overcuts not included as defects in Element Level Condition States; see 2023 Physical Condition report for additional information).            CS3 - Isolated locations of cleaned and painted minor pitting.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>							
<b>515-Steel Protective Coating</b>		317516	sq. ft.	316936	0	580	0
<b>113-Steel Stringer</b>	3 - Mod.	17880	ft.	17736	144	0	0
<p>CS2 - Isolated locations with minor surface corrosion near stringer ends at abutments and below hinge seat expansion joints.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>							
<b>515-Steel Protective Coating</b>		101921	sq. ft.	101777	0	144	0
<b>152-Steel Floor Beam</b>	3 - Mod.	9918	ft.	9503	3	412	0
<p>CS2 - 3 LF active corrosion in Floorbeam 50 on westbound structure            CS3 - Minor to moderate cleaned and painted section loss in floorbeams below hinge seat expansion joints with areas of reactivating surface corrosion. Up to 3" by 1" high corrosion holes in tops of webs at cantilever ends below median. Cleaned and painted pitting (down to 1/8" remaining) in eastbound Floorbeam 26 north cantilever bottom flange below median.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>							
<b>515-Steel Protective Coating</b>		111086	sq. ft.	110262	0	824	0
<b>205-Reinforced Concrete Column</b>	3 - Mod.	32	each	8	8	16	0

Inspector: Cartwright,Donald  
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Structure Number: 1812831  
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	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	<p>CS2 - Minor to moderate delaminations, typically along the corners. 1 CS2 Abrasion/Wear due to scaling at the base of westbound Pier 6. 3 CS2 Scour due to localized scour pockets up to 2' deep at base of Pier 5 columns. Crack with efflorescence in Pier 2 eastbound.</p> <p>CS3 - Minor to moderate spalls with exposed and corroded reinforcement. Corner spalls/delaminations up to 30' high, worst near the bases. Deterioration is common along leaking drainage downspouts.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>215-Reinforced Concrete Abutment</b>	3 - Mod.	92	ft.	56	24	12	0
	<p>CS2 - Corner delaminations on girder seat pedestals for Girders A, B, D, and E at the Forward Abutment.</p> <p>CS3 - Minor to moderate spalls and delaminations, some with exposed reinforcement, at the girder seat pedestals at the Forward Abutment. Spall in the west face of the Girder F seat pedestal undermining the Girder F masonry plate up to 3/4" deep over its full width.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>234-Reinforced Concrete Pier Cap</b>	3 - Mod.	960	ft.	921	9	30	0
	<p>CS2 - Delaminations and minor top corner spalls on pier caps.</p> <p>CS3 - Minor to moderate delaminations and spalls with exposed reinforcement, worst behind downspouts. Larger spalls with exposed reinforcement noted on westbound Pier 2 cap, eastbound Pier 2 cap, and westbound Pier 4 cap. Moderate top corner spall in center pedestals of eastbound Pier 3 cap and westbound Pier 4 cap.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>305-Assembly Joint without Seal</b>	3 - Mod.	552	ft.	166	279	107	0
	<p>CS2 - Expansion joints with rusted joint armor and minor deterioration to adjacent headers. Isolated plow damage on joint armor.</p> <p>CS3 - Expansion joints have vertical misalignments and isolated broken welds, and abutment joints have widespread deterioration of the joint headers and armor with several areas depressed up to 1".</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>311-Movable Bearing</b>	3 - Mod.	24	each	21	3	0	0
	<p>CS2 - Slight differential movement between bearings at Forward Abutment (exterior girders and Girder E expanded more relative to interior girders).</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>313-Fixed Bearing</b>	3 - Mod.	36	each	35	0	1	0
	<p>CS3 - Up to 1/4" deep cleaned and painted pitting on bearing assembly and masonry plate for Girder F at Pier 7.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>321-Reinforced Concrete Approach Slab</b>	3 - Mod.	4842	sq. ft.	4404	64	374	0

Inspector: Cartwright,Donald  
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	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	<p>Rear approach slabs were paved over prior to 2022 inspection. Forward approach slabs were paved over prior to the 2023 inspection. Previously noted spalls and delaminations assumed to remain below.</p> <p>CS2 - Isolated CS2 cracks in eastbound Forward Abutment approach slab.</p> <p>CS3 - Edge spalls along Forward Abutment joints, typically moderate cracking throughout approach slab, and potholes in asphalt over approach slab.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>331-Reinforced Concrete Bridge Railing</b>	3 - Mod.	6210	ft.	0	3901	2309	0
	<p>CS2 - Widespread vertical and horizontal cracks, areas of map cracking, and horizontal delamination cracks along the interior faces of railings near the top.</p> <p>CS3 - Widespread spalls with exposed, corroded, missing, or debonded reinforcement. Top edges of railings typically spalled over their full width by up to 6" deep with fully exposed reinforcement, commonly extending down vertical faces of railings. Large spalls at bases adjacent to expansion joints.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>815-Drainage</b>	3 - Mod.	24	each	0	22	2	0
	<p>CS2 - Drain scuppers partially filled (up to 85%) with dirt, gravel, debris, and isolated vegetation growth. Deck conveys flow but is slightly limited.</p> <p>CS3 - Fully clogged downspout on Pier 7 for the eastbound bridge. Downspout filled with water at Pier 4 for the eastbound bridge.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>820-Steel Seated-Hinge Assembly</b>	3 - Mod.	12	each	10	2	0	0
	<p>The hinges are in good condition. No significant deficiencies noted on the hinge components. As noted under the Bridge Description, the seated hinge in Span 4 at Girder 3 had previously cracked and the bridge was closed until the seated hinge could get retrofitted. The repair appears to be in good condition with no changes since installed; this location is rated CS2. The other 11 hinges were also retrofitted with carrier beams installed below the structure to add redundancy.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						
<b>830-Abutment Backwall</b>	3 - Mod.	288	ft.	133	84	63	8
	<p>CS2 - Widespread minor to moderate delaminations in abutment backwalls behind girder ends and isolated areas between girders.</p> <p>CS3 - Up to 7' wide by full height V-shaped delaminations in Forward Abutment backwall behind girders. Up to 7' wide by 6' high delaminations in Rear Abutment backwall behind girders, and one 8' wide by 4' high delamination/spall behind Girder F. Large spall at the top of the Forward Abutment backwall for the eastbound structure near the median (below left shoulder) undermining approach joint channel.</p> <p>CS4 - Large spall on top of Forward Abutment backwall below left shoulder of the eastbound roadway.</p> <p>For additional information regarding condition states and defects broken down by span, refer to the 2023 Routine Element Level Inspection report, attached in AssetWise.</p>						

**Inspector:** Cartwright,Donald

**Structure Number:** 1812831

**Inspection Date:** 10/02/2023

**Facility Carried:** IR 480

## CUY-00480-0647\_(1812831)

ODOT District: District 12

Date Built: 07/01/1970

Major Maint: 01 - State Highway Agency

Facility Carried: IR 480

Traffic On: 1 - Highway

Rehab Date:

Routine Maint: 01 - State Highway Agency

Feature Inters: ROCKY RIVER

Traffic Under: 6 - Highway - waterway

Insp. Resp A: 01 - State Highway Agency

FIPS Code: 26446 - FAIRVIEW PARK (CUY county)

Location: DISTRICT 12

2.07 MI. W. OF JCT. I-71

Insp  
Resp B:

Inspector

Cartwright,Donald

Inspection Date 10/02/2023

Reviewer Not Approved

## Inspector Comments - Deck and Approach

### Deck

**2023: The deck is in Fair Condition overall based on continued deterioration of the reinforced concrete deck.** The underside of deck has hairline transverse cracks, map cracking, and numerous minor to moderate delaminations and spalls with deterioration more significant noted along the hinge expansion joints. The wearing surface has widespread transverse cracks, numerous potholes, and failing patchwork. Expansion joints have vertical misalignment, isolated broken welds, and widespread deterioration of the joint headers and armor at the abutments.

Additional comments for each element are included in the Element Inspection Tab.

### Reinforced Concrete Deck

The underside of deck has hairline transverse cracks (typically up to 0.020" wide) and areas of hairline map cracking, some with light efflorescence. On the westbound structure, there are several locations of moisture staining and greater than typically efflorescence, typically below patched areas in the wearing surface. Deck overhangs typically have hairline transverse cracks with light efflorescence **and leakage**. The deck underside has minor to moderate delaminations and spalls, worst in the westbound structure along the south side of Stringer 11 at Floorbeam 42 and along the hinge joints in Spans 4 and 6. The exterior deck edges and undersides at the hinge joints have large spalls with multiple layers of exposed and corroded reinforcement.

### Wearing Surface

**The wearing surface has been lowered to fair condition based on continued deterioration since the previous inspection.** The wearing surface has widespread minor cracks and potholes, typically worst in the shoulders and outside lanes. Numerous potholes, typically up to 3" deep, are present in the wearing surface with several failing microsilica or asphalt patches. **The majority of potholes and failing patches have grown in size since the previous inspection. Potholes and failing patches are most frequent in the westbound right lane and shoulder, particularly in Spans 4 through 6.** Potholes are typical around the perimeter of drainage scuppers and in the shoulders along the bases of railings. **In Span 5, the right shoulder of the westbound bridge has a 7'-3" long by 9' wide delaminated area with moderate abrasion, possibly due to fire damage.**

### Assembly Joint Without Seal

At the eastbound Rear Abutment, joint armor on the west (approach) side is approximately 1" lower than the east side due to vertical misalignments transversely between armor sections. At the westbound Rear Abutment, the joint armor on the west (approach) side of the joint in the left two lanes is discontinuous and depressed approximately 1". At the eastbound Forward Abutment, the joint armor on the east (approach) side of the joint is settled up to 7/8" and 1" in the 3rd and 4th lanes, respectively. **The joint armor in the left shoulder is undermined due to a spall in the abutment backwall below.** At the westbound Forward Abutment, there is a 1/2" vertical misalignment in the middle two lanes and a 1/4" misalignment in the right lane with moderate plow damage to the joint armor. **The forward approach has been repaved since the previous inspection, obscuring views of previously noted defects in the joint armor and header which are assumed to remain below.**

### Reinforced Concrete Bridge Railing

The reinforced concrete bridge railings have widespread spalls with exposed, corroded, missing, and debonded reinforcement; vertical and horizontal cracks, and areas of map cracking. The top edges of the exterior bridge railings are typically spalled over their full width with up to fully exposed reinforcement. The south bridge railing on the eastbound structure has large spalls with fully exposed and corroded reinforcement adjacent to the deck edge spalls along the expansion joints. The median barrier has widespread moderate spalls and delaminations.

### Drainage

**Drainage scuppers are partially filled up to 85% (30% to 50% typical) with dirt, gravel, debris, and isolated vegetation**

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growth; however, the downspouts at deck level are clear. Dirt, gravel, and debris along the bases of the railings limit flow for drainage slightly. Multiple scupper grates exhibit missing or broken metal bars. The drainage downspouts below the bridge exhibit minor to moderate surface corrosion throughout with isolated areas of minor section loss, signs of leakage, and isolated corrosion holes on supports. The downspout at Pier 7 of the eastbound bridge is fully clogged at the elbow near the outlet at ground level, and the downspout at Pier 4 for the eastbound bridge was full of water at the time of inspection.

### Signs

The signs on the bridge are in good condition with no significant deficiencies noted.

### Sign Supports

"Corporation Limit" signs are mounted on each side of the bridge in Span 4. The bolts for the brackets attaching these signs to the exterior bridge railings are broken; however, the signs remain attached to the floorbeams at their bases.

### Utilities

Light post GR-1-2-6 at Pier 7 on the eastbound structure has moderate impact damage with the west face indented 32" high by 12" wide by 1 1/2" deep and the post leaning to the east. Additionally, the bottom 1 1/2" of the post is crimped over the east half and the base plate on the west side is bent up 1/2". Access hatches for the electrical panels below light poles are typically missing with exposed wiring, dirt and granular debris, and vegetation growth inside. Most grounding cables are broken at the pier caps.

## Approach

2023: The approaches are in Good Condition overall due to isolated potholes in the east approach asphalt pavement and numerous defects related to the approach guardrails and concrete railings. Approach embankment from behind the Forward Abutment backwalls is spilling through the median joint. Resurfacing of the forward approach has been completed since the previous inspection.

### Reinforced Concrete Approach Slab

The reinforced concrete approach slabs are covered with asphalt at both ends of the bridge. The previously noted edge spalls in the approach slab along the length of the Forward Abutment joint and the spall in the westbound joint header in the shoulder are now covered with new asphalt; however, the spalls are still assumed to be present. The asphalt covering the forward approach slab is in very good condition, while the asphalt covering the rear approach slab is in good condition with minor wear noted in the eastbound pavement.

Additional comments for this element are included in the Element Inspection Tab.

### Approach Roadway Surface

The asphalt approach pavement on the forward approach has been resurfaced since the previous inspection and is in very good condition. The rear approach roadways are in good condition. There is a 7' wide by 8" long by 3" deep pothole in the 2nd lane from left in the rear eastbound approach roadway.

### Embankment

At the Forward Abutment, embankment fill behind the backwall is spilling out from the median joint, resulting in a minor loss of embankment fill with an active runoff erosion channel. Runoff erosion at the southeast bridge corner has resulted in minor undermining at the backwall interface with the southeast wingwall.

### Approach Guardrail

The approach guardrail is in fair condition with minor to moderate impact damage to the metal flexbeam, isolated split or damaged posts and blockouts, and deterioration of the approach concrete median barriers and exterior railings. The southeast corner approach guardrail has moderate impact damage and scrapes. The southwest and northeast corner approach guardrail has isolated minor impact damage and scrapes. The northwest transition has very minor impact damage to the W-beam. The approach concrete median barriers have widespread moderate spalls with exposed and corroded reinforcement.

Inspector: Cartwright,Donald

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Facility Carried: IR 480

## **Inspector Comments - General Appraisal**

### **Superstructure**

2023: The superstructure is in Satisfactory Condition due to isolated areas of minor surface corrosion and cleaned and painted section loss below the expansion joints, primarily to floorbeams below the hinges in Spans 4 and 6. No significant fatigue distress was observed in the superstructure members, and previously implemented retrofits appear to functioning as intended.

Additional comments for each element are included in the Element Inspection Tab.

#### **Steel Open Girder/Beam**

The main girders have been recently cleaned and painted and exhibit only isolated areas of minor section loss. Carrier beam retrofits installed below the hinge seats at the Span 4 and Span 6 expansion joints are functioning as intended. Dogbone retrofits consisting of drilled arrest holes with sawcuts between the holes have been previously installed within tension zones of the girders webs adjacent to floorbeam bottom flanges or lateral bracing connections; numerous dogbone retrofits exhibit an overcut or areas that were not fully sawcut during initial installation, with many of these locations no longer visible due to the recently installed paint system. **Girder F in Span 7 has a 36" long by 4" high area of cleaned and painted pitting up to 1/4" deep (1/8" deep typical) on the bottom of the north face of the web along the bolted splice between Floorbeams 54 and 55.** The main girder flanges, webs, and hinge seat elements below the expansion joints have isolated areas of cleaned and painted pitting, typically up to 1" deep. Isolated transverse stiffeners have small impact deformations, likely from construction.

#### **Steel Stringer**

The steel stringers are in good condition with only isolated areas of minor surface corrosion noted on the stringer ends along the edges of their flanges adjacent to expansion joints.

#### **Steel Floorbeam**

The steel floorbeams have minor to moderate cleaned and painted section loss below the expansion joints in Span 4 (Floorbeams 26 and 27) and Span 6 (Floorbeams 50 and 51), worst between the floorbeam cantilevers below the median. There are up to 3" long by 1" high corrosion holes in the tops of webs at the ends of the floorbeam cantilevers below the median. Floorbeams webs and flanges typically have up to 1/8" deep cleaned and painted pitting directly below the expansion joints, and the Floorbeam 26 south cantilever on the westbound structure has one area of cleaned and painted section loss down to 1/8" remaining thickness (3/4" original thickness) on the east edge of the bottom flange. Isolated transverse stiffeners exhibit areas of 100% section loss, including Floorbeam 26 on the eastbound structure **and Floorbeam 26 on the westbound structure. At the Floorbeam 70 south cantilever connection to Girder D in Span 9, the welds between the handrail bar and the west floorbeam connection angle are broken on the south face and underside.**

#### **Movable Bearing**

The rocker bearings at the Forward Abutment has slight differential movement at the time of inspection (78 °F), **with the exterior girders (Girders A and F) expanded 5.5° and 6.5°, respectively, and Girder E expanded 6.0°.** All rocker bearings at the Rear Abutment were slightly neutral at the time of inspection(65 °F). A 36" long by 12" high by 3" deep spall in the west face of the Girder F seat pedestal at the Forward Abutment has undermined the masonry plate up to 3/4" deep.

#### **Fixed Bearing**

The fixed bearing for Girder F at Pier 7 has up to 1/4" deep cleaned and painted pitting on the bearing assembly and masonry plate; minor active corrosion with pack rust up to 1/8" thick is also present between the masonry plate and lead leveling sheet. Fixed bearings at other locations have isolated cleaned and painted minor pitting.

#### **Steel Protective Coating**

A new steel protective coating system was applied to the steel superstructure prior to the 2021 inspection. The protective coating system is in very good condition overall with isolated areas of missing paint with minor surface corrosion.

#### **Steel Seated Hinge Assembly**

The carrier beam retrofits installed below the hinge seats are functioning as intended with no defects noted. The girders and



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**Facility Carried:** IR 480

hinge seat elements below the expansion joints have isolated areas of minor cleaned and painted pitting, typically up to 1/16" deep.

### **Diaphragms/Crossframes**

Minor cleaned and painted pitting was noted on the end crossframes at the abutments and adjacent to the hinge expansion joints.

### **Lateral Bracing**

Isolated lateral bracing members exhibit minor dents and deformations from erection damage. There is a 1 1/2" outward impact deformation over an 8" long by 6" high area of the stem of the lateral bracing member on the west side of Floorbeam 14 near Girder B. Isolated lateral bracing erection bolts are loose or missing.

### **Sway Bracing**

The sway strut between Girders D and E at Floorbeam 28 in Span 4 is bent upward 3/4" over a 10" length.

## **Substructure**

2023: The substructure is in Satisfactory Condition due to minor to moderate spalls and delaminations with exposed and corroded reinforcement in the pier columns, caps, and backwalls. Corner spalls and delaminations are present in the abutment girder seat pedestals. Abutment backwalls have widespread delaminated areas and isolated spalls, and the Forward Abutment backwall has a top edge spall undermining the approach joint armor near Girder C. Wingwalls have cracks, patches, and spalls.

Additional comments for each element are included in the Element Inspection Tab.

### **Reinforced Concrete Column**

The pier columns exhibit widespread minor to moderate delaminations and spalls, some with exposed and corroded reinforcement. Deterioration is also common on the columns along leaking drainage downspouts. Isolated pier columns have hairline vertical cracks with light efflorescence. The Pier 6 columns on the westbound structure have moderate to heavy scaling near their base,. Up to 2' deep localized scour pockets are present around the bases of the Pier 5 columns for both structures.

### **Reinforced Concrete Abutment**

The girder seat pedestals at the Forward Abutment have minor to moderate spalls and delaminations, some with exposed reinforcement. A 36" long by 12" high by 3" deep spall in the west face of the Girder F seat pedestal at the Forward Abutment has undermined the masonry plate up to 3/4" deep. Corner delaminations are also present at the seat pedestals for Girders A, B, D, and E. A 20" high by 30" wide by 1" deep top corner spall/delamination is present on the west face of the Girder A seat pedestal and a 26" high by 26" wide on the west face by 20" wide on the north face by 5" deep top corner spall/delamination is present on the west face of the Girder E seat pedestal with no undermining to the masonry plates noted at either location. No significant defects were noted in the girder seat pedestals at the Rear Abutment.

### **Reinforced Concrete Pier Cap**

The pier caps have minor to moderate spalls and delaminations, some with exposed reinforcement. Several caps, including Pier 2 westbound, Pier 2 eastbound, Pier 7 westbound, have moderate spalls with exposed reinforcement behind the drainage downspouts. There are moderate top corner spalls in the center pedestals of Pier 3 on the eastbound structure and Pier 4 on the westbound structure. The pier caps have minor to moderate top corner spalls in isolated locations.

### **Abutment Backwall**

The abutment backwalls have widespread large delaminations, primarily behind the girder ends, that have developed into spalls in multiple locations. At the Forward Abutment behind Girder C, the top of the backwall has a 12" high by 10" deep by 8.5' wide spall with exposed reinforcement that has undermined the joint armor support up to 10". This undermined portion of the joint armor is located beneath the left shoulder of the eastbound roadway. There are V-shaped delaminations,

**Inspector:** Cartwright,Donald

**Structure Number:** 1812831

**Inspection Date:** 10/02/2023

**Facility Carried:** IR 480

up to 7' wide by full height, in the Forward Abutment backwall behind Girders A, B, D, E, and F. The Rear Abutment backwall has widespread delaminations, **up to 8' wide by 6' high that have grown in size since the previous inspection**, behind the girder ends. The south end of the Rear Abutment backwall for the westbound structure is undermined 5" high by **up to 15" deep over an approximately 7.5' length** from the Girder D pedestal to the interior wingwall. The south end of the Forward Abutment backwall for the eastbound structure is undermined up to 4" high by 30" deep over a 40" length **and the north end is undermined up to 5" high by 13" deep over a 7' length**.

### **Wingwalls**

The wingwalls have isolated minor cracks, patches, and spalls. The wingwalls typically exhibit full height vertical cracks up to 1/16" wide along the abutment connections. The interior wingwall at the Rear Abutment has one 1/8" wide vertical/diagonal crack with moderate efflorescence **and rust staining** near the bottom approximately 10' from the backwall of the westbound structure. This wingwall has two additional 1/16" wide vertical cracks with moderate efflorescence and light rust staining near the bottom and one hairline horizontal crack near the backwall connection for the westbound structure.

### **Slope Protection**

**Installation of new slope protection was completed prior to the 2022 inspection, at which time the previously noted erosion channels along the west and east sides of the structure were filled with large stone rip rap, and the faces of the slope protection on both sides were covered with aggregate stone.** The prior erosion channel at the east side of the bridge runs north to south; the erosion channel is even on the north end and transition to a 30' high near-vertical slope at the south end.

### **Culvert**

## **Inspector Comments - Waterway**

### **Waterway Adequacy**

2023: The waterway adequacy of the structure is very good, as the bridge superstructure is located approximately 100' above the river.

### **Channel**

2023: The channel, which flows in a straight alignment below Span 7, is in Good Condition overall. Up to 2' deep isolated scour pockets are present around the bases of the Pier 5 columns for both structures. Previously placed large diameter rip rap remains in place around the bases of the columns at Pier 6 for both structures. No significant scour was noted at any of the remaining piers within the flood plain.

### **Scour Critical**

Inspector: Donald Cartwright

Structure Number: 1812831

Inspection Date: 10/02/2023

Facility Carried: IR 480

### Bridge Inspection Report

## Pictures

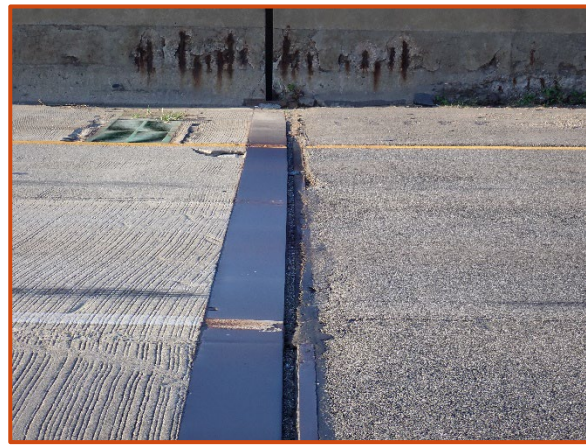


PHOTO 1 Elevation

Description South bridge elevation, looking northwest.

# **APPENDIX B**

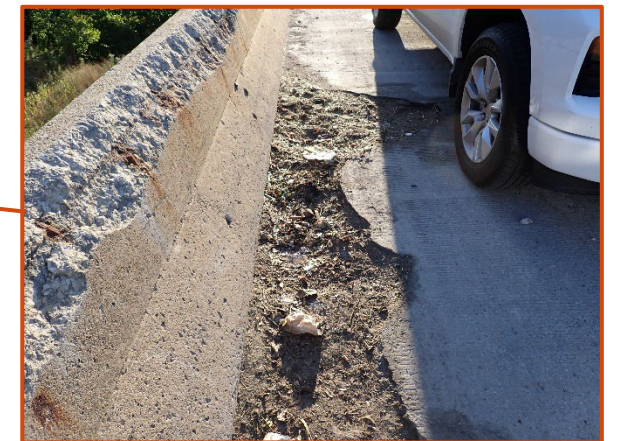
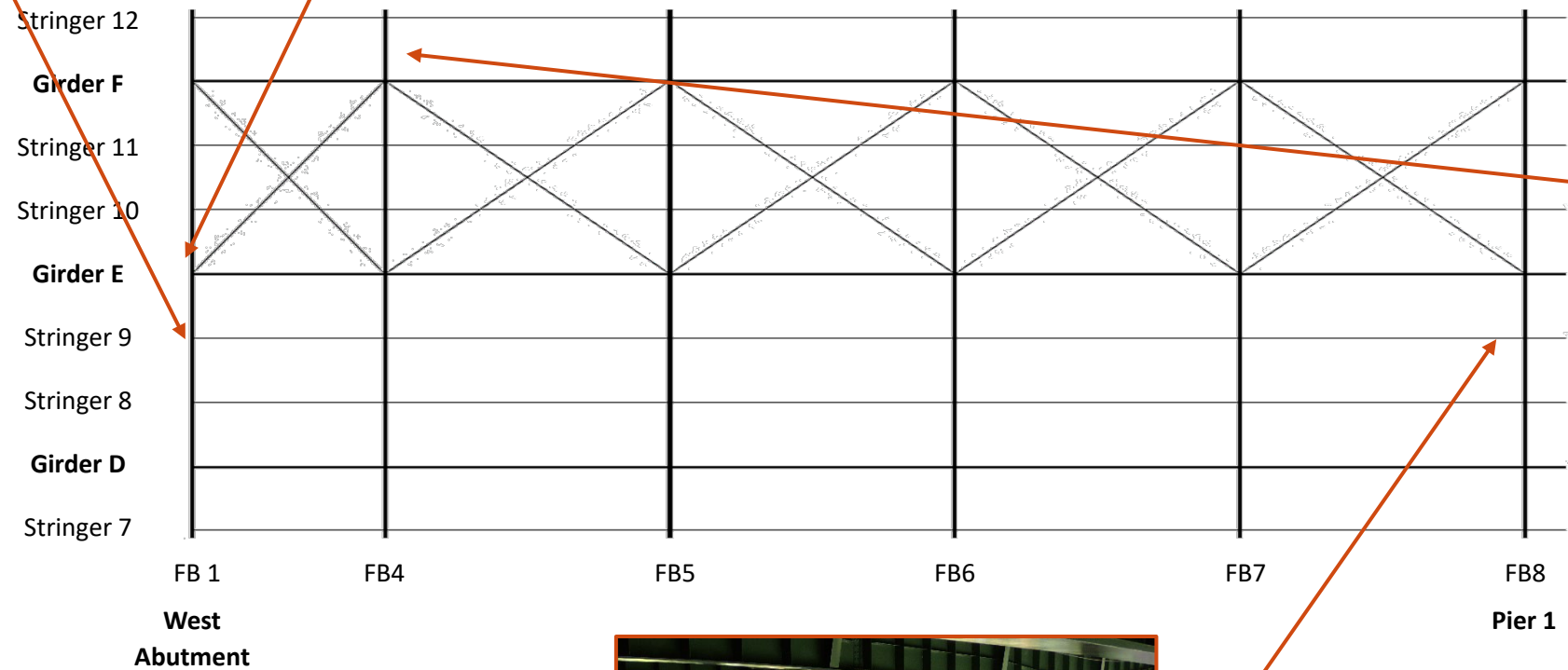
## **Framing Plan with Deficiencies**



Joint armor discontinuous and depressed approximately 1/2" at the westbound Rear Abutment joint in the 2<sup>nd</sup> lane (from left), looking south.



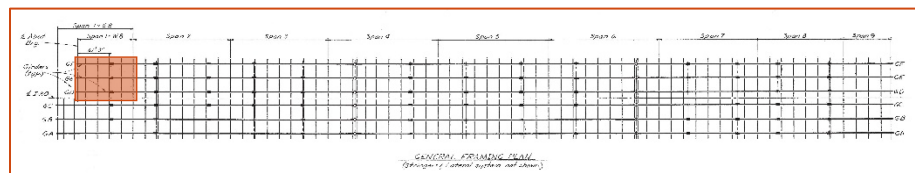
6' high by 4' wide by up to 3" deep delamination/spall in the Rear Abutment backwall behind Girder E, looking southwest.



Up to 12' long by 50" wide by 2" deep pothole in the right shoulder of the Span 1 wearing surface for the westbound structure, looking east.



General view of Pier 1 for the westbound structure, looking east.

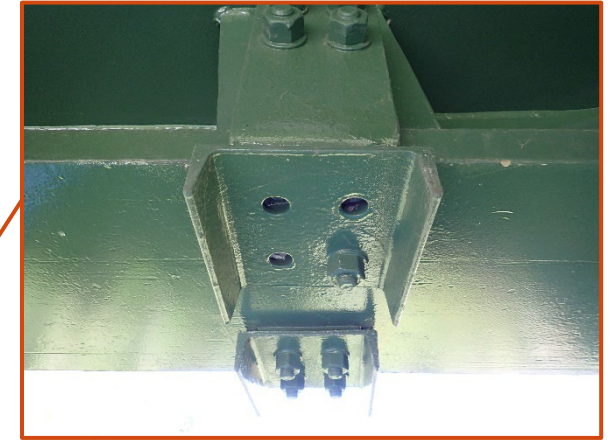


**Key Plan**

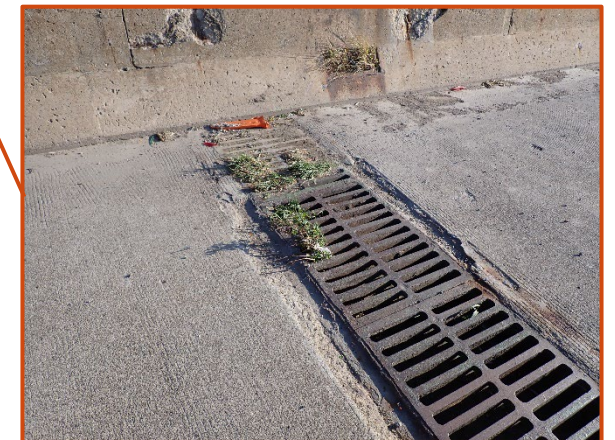
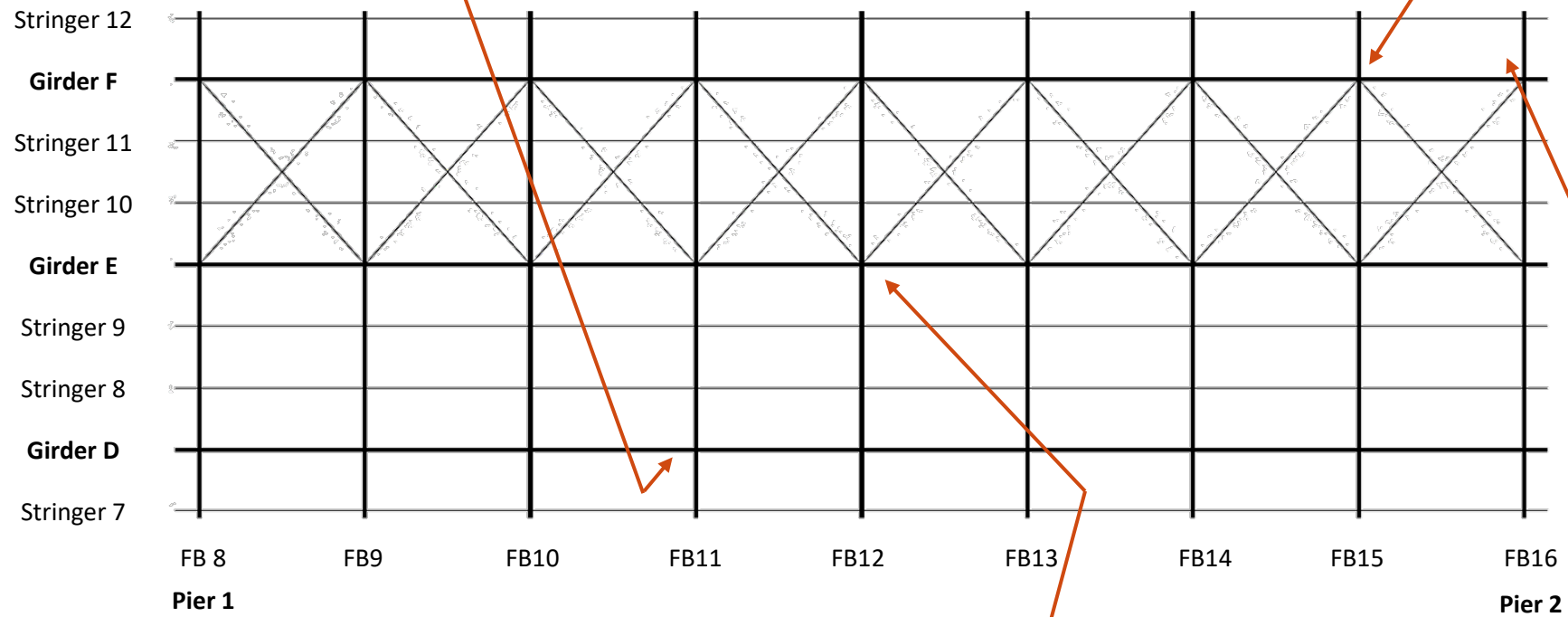
**Span 1 Framing Plan - Westbound**



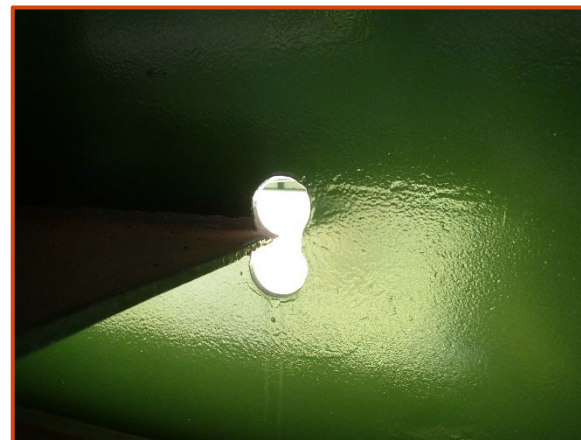
3" long tear in first transverse stiffener west of Floorbeam 11 on the south face of Girder D, looking north.



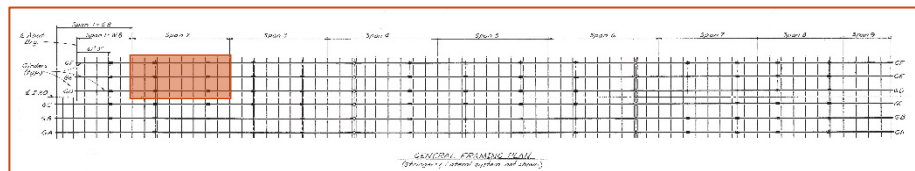
3 of 4 bottom flange bolts missing in the Girder F knee brace connection retrofit at Floorbeam 15, looking north.



Scupper with typical clogging up to 50% and potholes in the surrounding wearing surface, looking north.



Dogbone undercut and overlapping drilled arrest holes in the web of Girder E on the west side of Floorbeam 12, looking north.



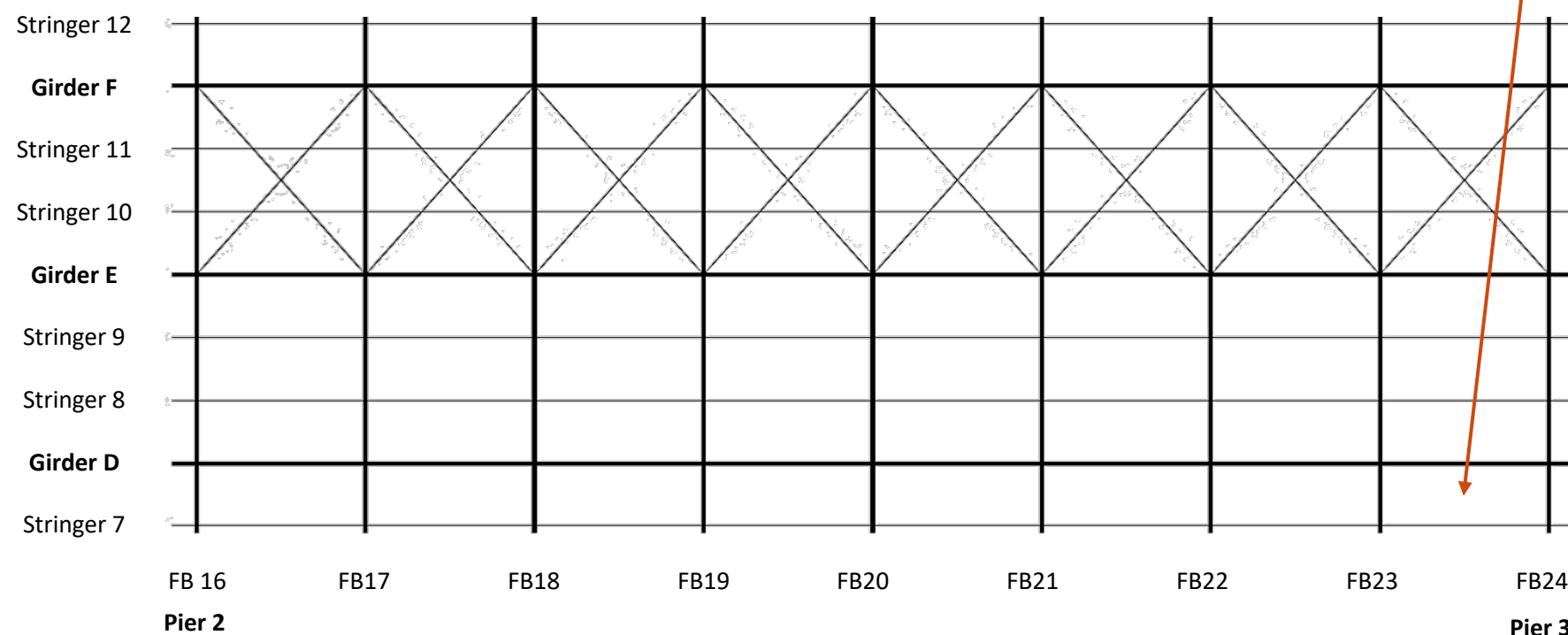
**Key Plan**

**Span 2 Framing Plan - Westbound**

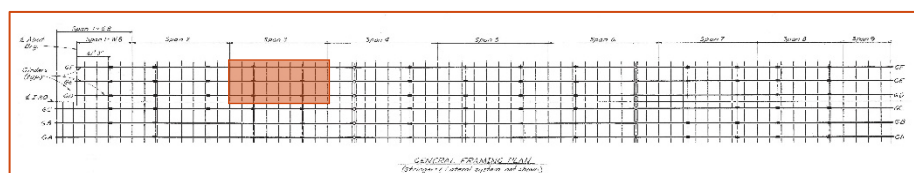
**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
**Page B2 of B18**



Typical hairline transverse cracks with light efflorescence and leakage in the deck overhangs, looking west at the south overhang of the westbound structure between Floorbeams 23 and 24.



Downspout on Pier 3 of westbound structure with moderate surface corrosion to downspout pipe and corrosion holes in downspout supports due to leakage from joint, looking north.



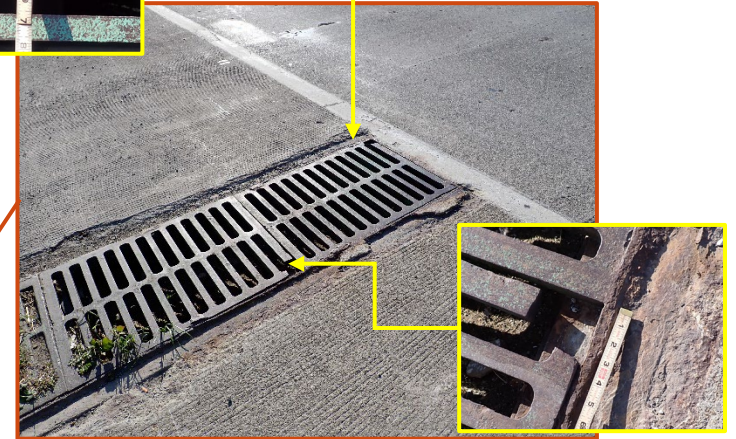
**Key Plan**



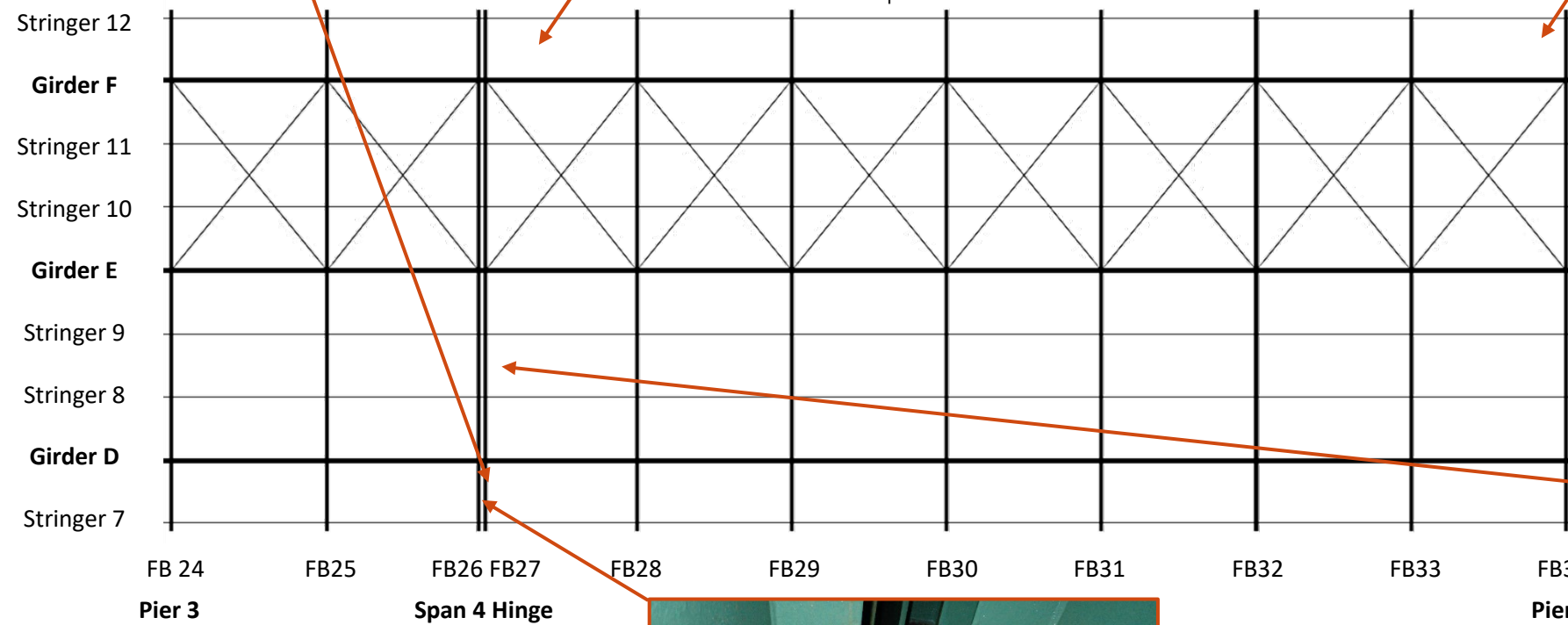
Floorbeam 26 south cantilever on the westbound structure with cleaned and painted pitting 1/8" deep for the full width of the east top flange, looking south.



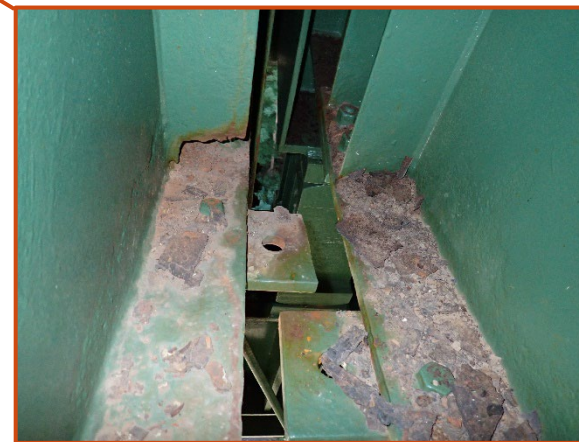
Typical potholes along the drainage scuppers, looking northeast at a drainage scupper in the westbound right shoulder in Span 4.



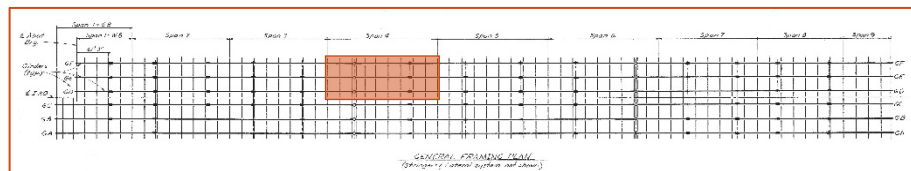
Scupper grate near Pier 4 of the westbound structure with broken grate bars at the corners, looking southeast.



18" long by 8" wide by full depth spall with exposed and corroded reinforcement in the westbound structure deck underside along the Span 4 expansion joint, looking west.



South cantilever of Floorbeam 26 on the westbound structure with 100% section loss at the base of a transverse stiffener near the base, looking north.



**Key Plan**

**Span 4 Framing Plan - Westbound**

**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
**Page B4 of B18**





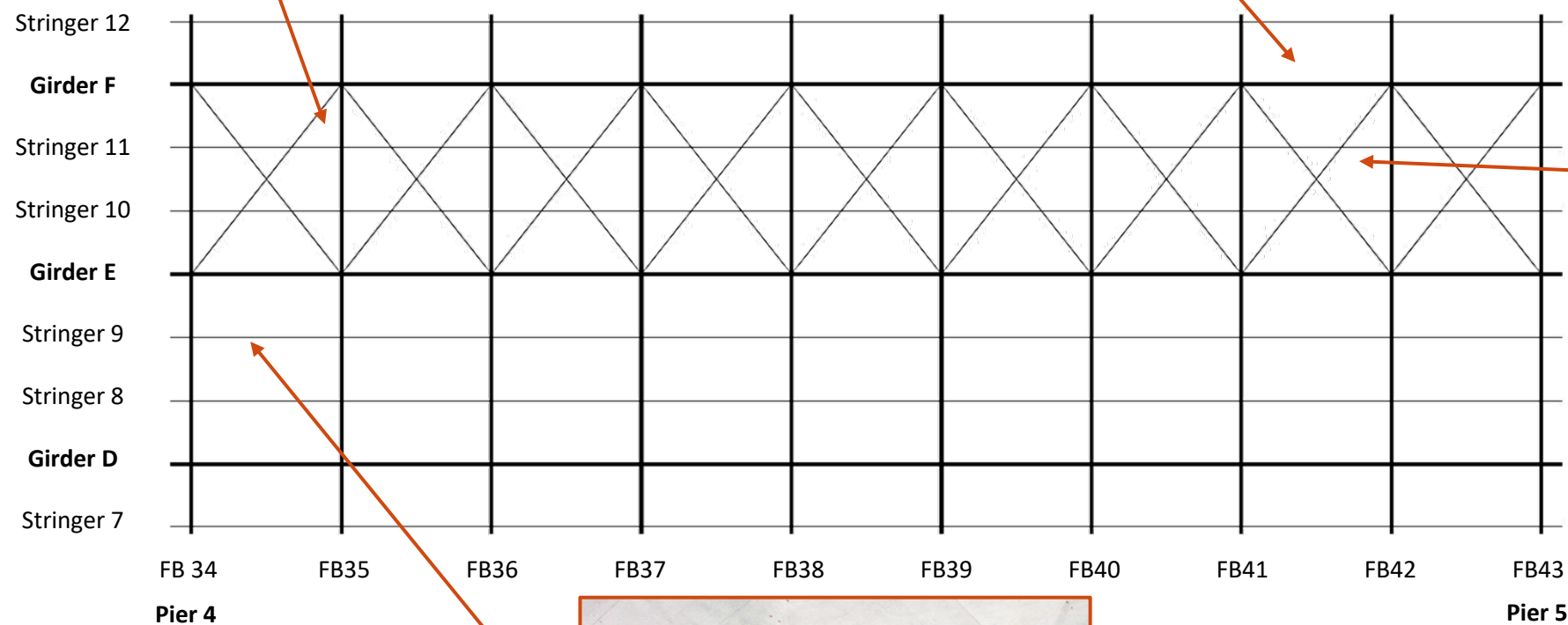
Typical failing patches in the right lane of the westbound structure wearing surface in Span 5, looking east. Note additional broken up wearing surface material around the perimeter of the patches.



Delaminated area with moderate abrasion, up to 7'-3" long by 9' wide, in westbound right shoulder, looking north.



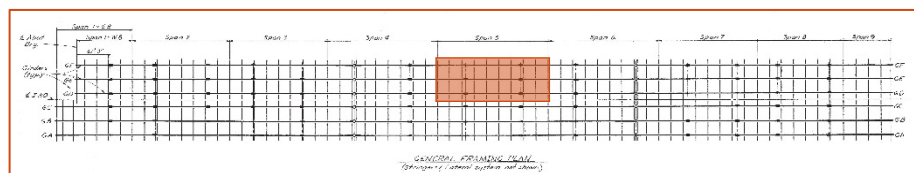
36" long by 42" wide by up to 5" deep spall with debonded and corroded reinforcement (up to 90%) along the south side of Stringer 11 at Floorbeam 42 on the westbound structure, looking northeast.



36" long by 42" wide by up to 5" deep spall with debonded and corroded reinforcement (up to 90%) along the south side of Stringer 11 at Floorbeam 42 on the westbound structure, looking northeast.



Minor abrasion rust along the top flange of Stringer 9 at Floorbeam 34, looking northwest.



**Key Plan**

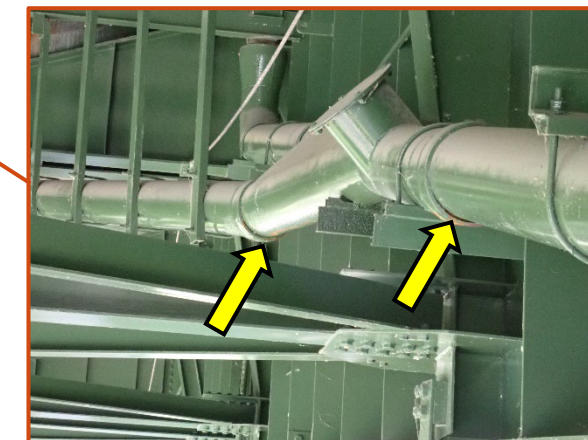
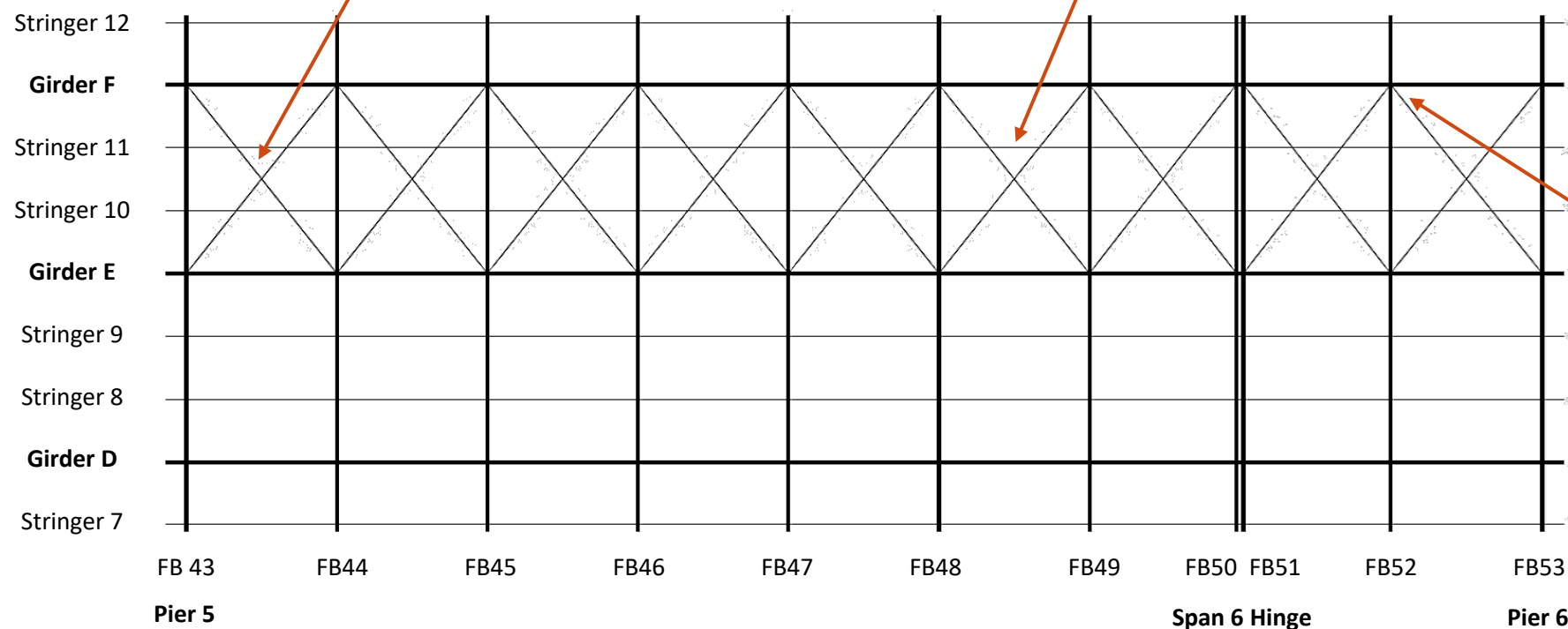
**Span 5 Framing Plan - Westbound**



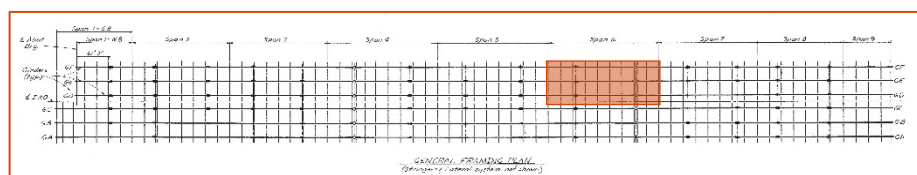
Several areas of moisture staining and efflorescence in the deck underside between Girders E and F between Floorbeams 43 and 44, looking west.



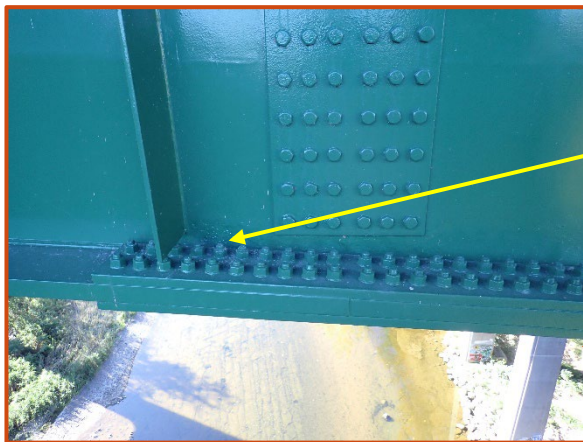
Efflorescence and moisture staining in the underside of deck between Girders E and F between Floorbeams 48 and 49, looking south.



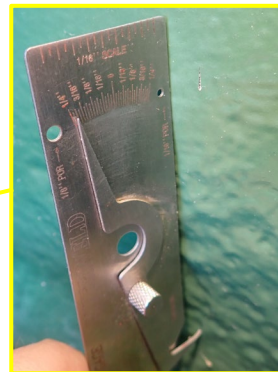
Evidence of leakage in the north downspout near the hinge joint in Span 6 of the westbound structure, looking west. Note that corrosion holes were observed during the 2020 inspection but have not been noted since.



**Key Plan**



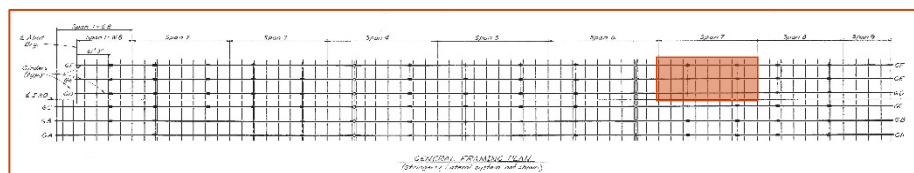
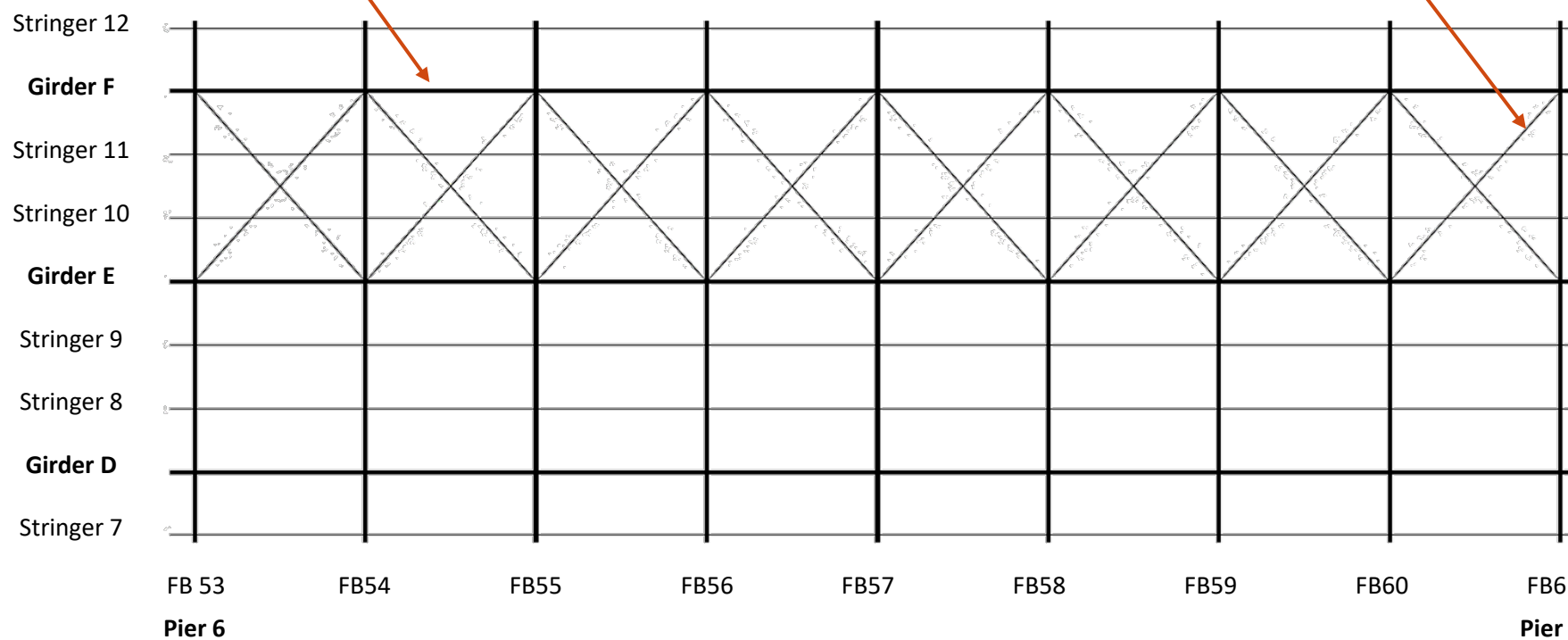
Cleaned and painted pitting 1/8" deep on the bottom of the north face of the Girder F web along the bolted splice between Floorbeams 54 and 55, looking south.



Spalls with exposed reinforcement in the west face of the Pier 7 cap on the westbound structure, looking east.



Top corner spall with exposed reinforcement in the east face of the Pier 7 cap on the westbound structure, looking west.



**Key Plan**

**Span 7 Framing Plan - Westbound**

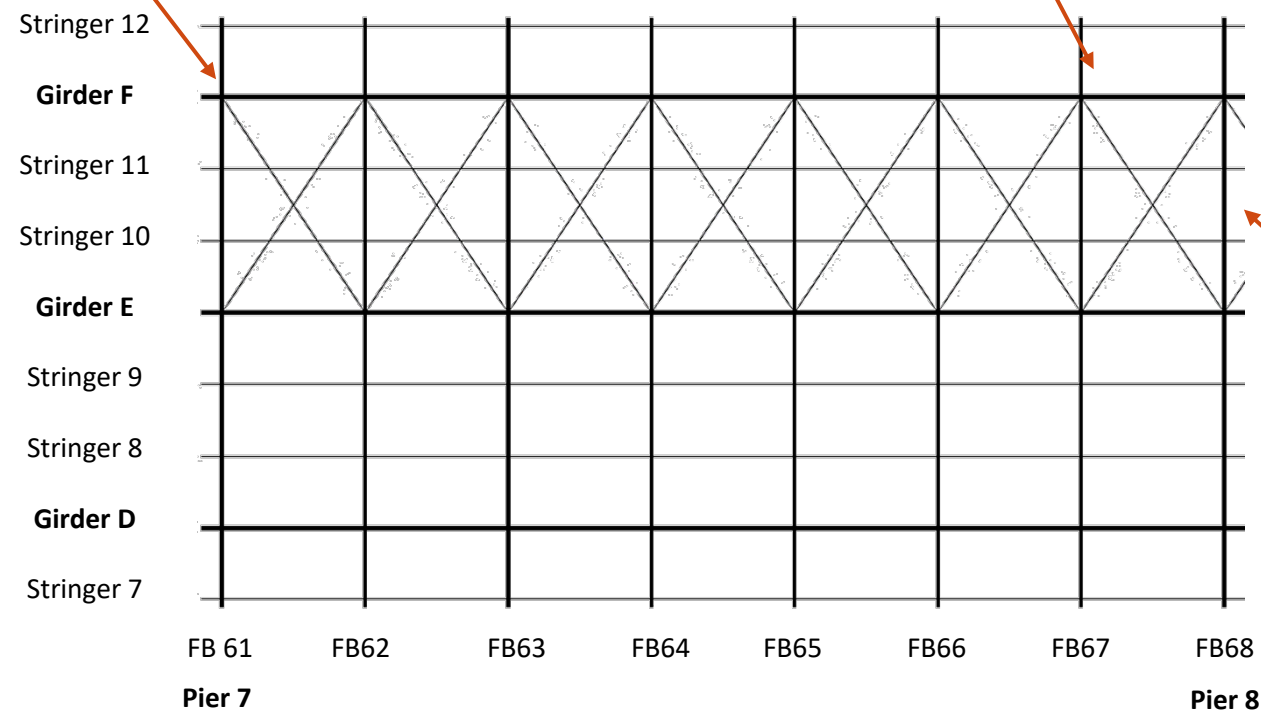
**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
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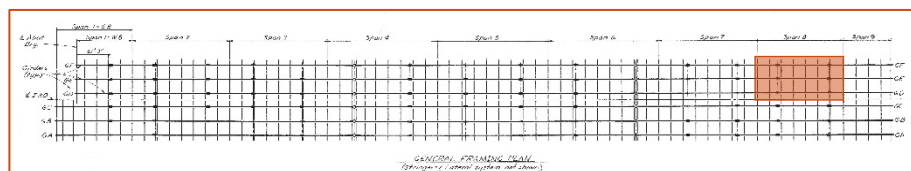
Up to 1/4" deep cleaned and painted pitting on the bearing assembly and masonry plate for Girder F at Pier 7, looking south.



Large pothole in the right shoulder of the Span 8 wearing surface on the westbound structure at the base of the bridge railing, looking northeast.



Typical 0.012" to 0.014" wide map cracking at 6" to 12" spacing in the underside of deck, looking north.



**Key Plan**

**Span 8 Framing Plan - Westbound**

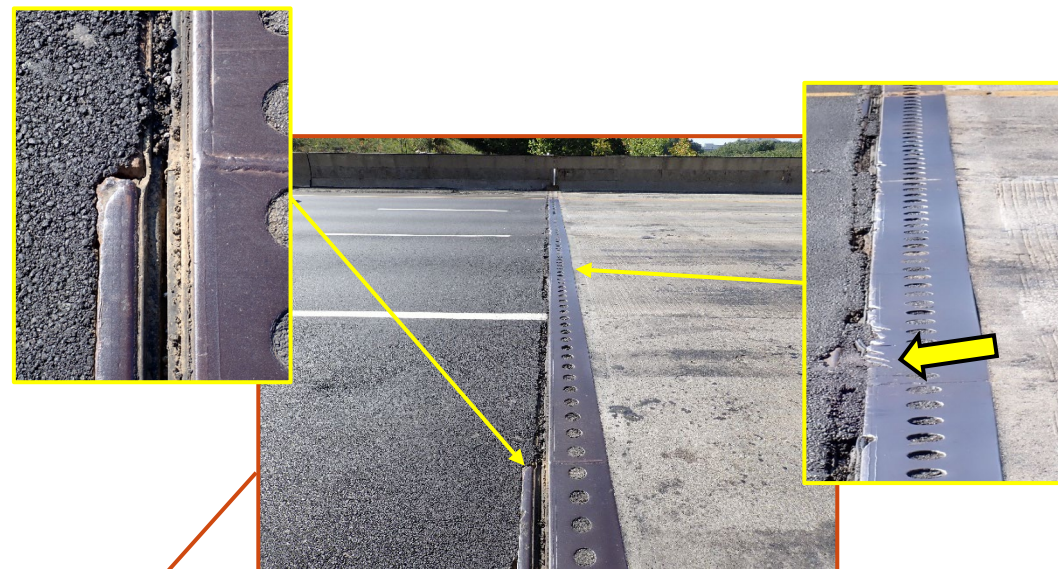
**CUY-480-0647 over Rocky River  
Appendix B: Framing Plan with Deficiencies  
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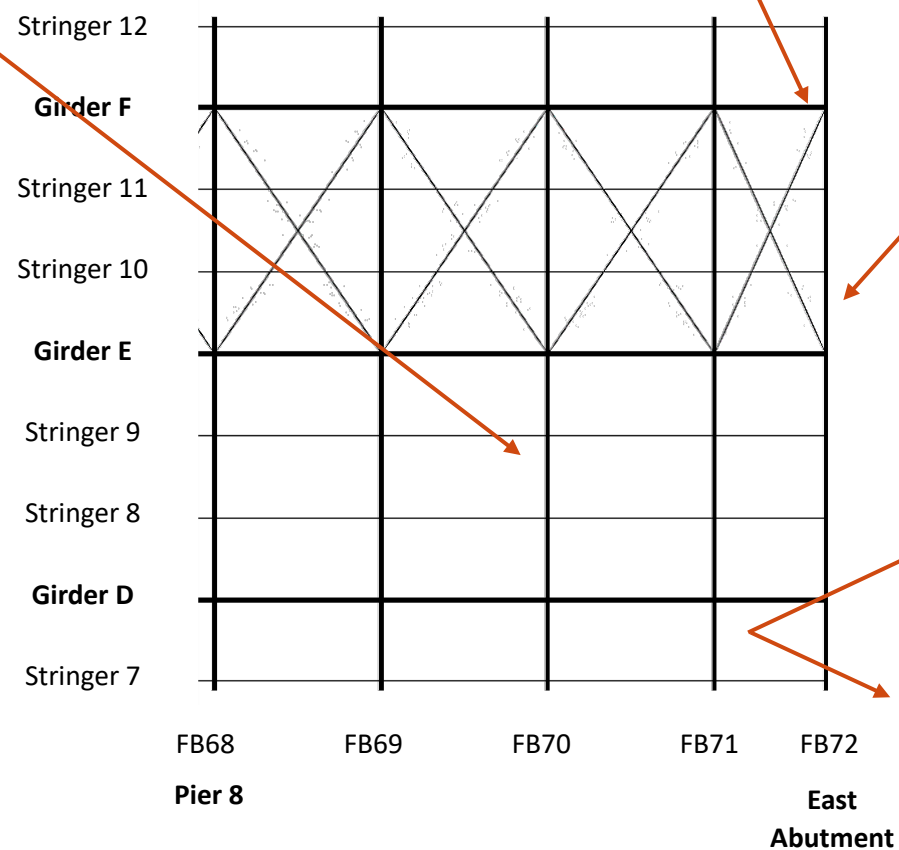
Erosion channel in front of the Forward Abutment, looking south. Note that new slope protection should mitigate further erosion.



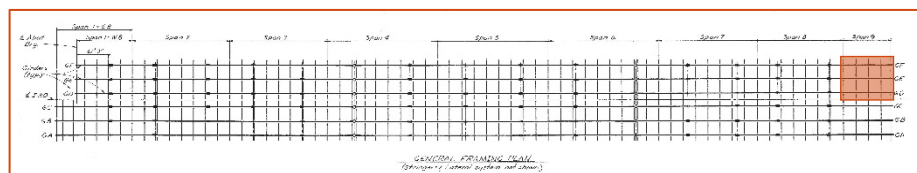
Spall in the west face of the Girder F seat pedestal at the Forward Abutment undermining the bearing masonry plate up to 3/4" deep, looking north.



Westbound Forward Abutment joint with moderate plow damage to the west joint armor and break in the east armor in the right shoulder, looking south. Note east approach has been repaved since the previous inspection and asphalt now covers majority of east joint armor.



Embankment fill spilling out from behind the Forward Abutment backwall through the median joint, looking north. Note the 8' tall by 15' wide by 30' deep void that has resulted below the approach slabs with an active runoff erosion channel.



**Key Plan**

**Span 9 Framing Plan - Westbound**

**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
**Page B9 of B18**



Cleaned and painted pitting up to 1/16" deep on the top of the Girder C bottom flange between Floorbeams 1 and 2, looking northwest.



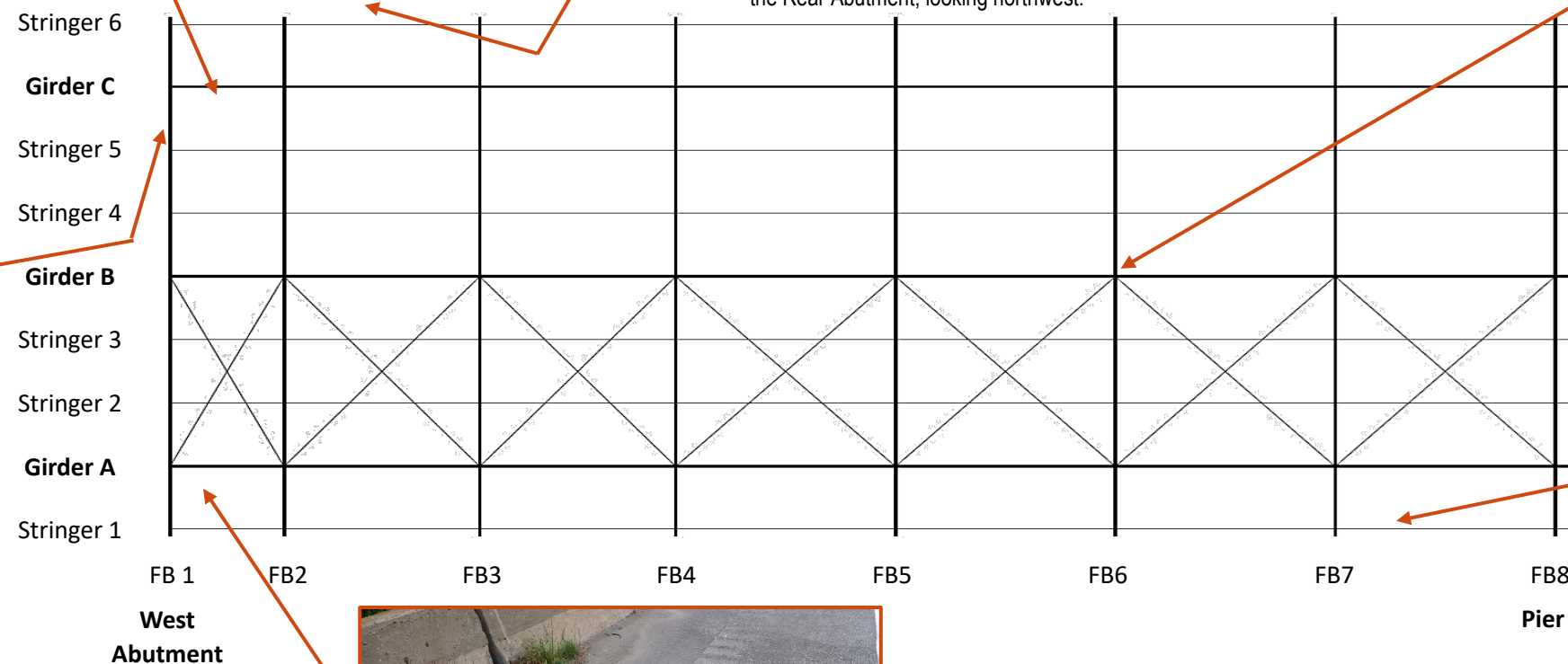
1/8" wide vertical/diagonal crack with moderate efflorescence and rust staining in the interior wingwall at the Rear Abutment, looking northwest.



Typical dogbone retrofit overcut in the girder web, looking north at Girder B at Floorbeam 6.



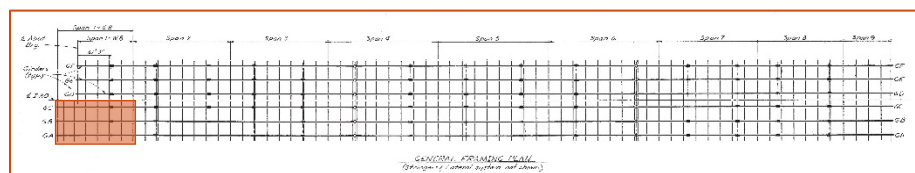
1/2" vertical misalignment at the Rear Abutment joint for the eastbound structure, looking north. Note the adjacent spalling to the joint header in the 2nd lane (from left).



Typical spalls, up to full width, with exposed, corroded, missing, and debonded reinforcement along the top edges of the exterior bridge railings, looking southwest at the south railing in Span 1 of the eastbound structure. Note the debonded top longitudinal bars hanging down.



Partially clogged drainage scupper (approximately 85% clogged), looking southwest at the west end of the bridge on the eastbound structure. Note downspout is clear.



Key Plan

CUY-480-0647 over Rocky River  
Appendix B: Framing Plan with Deficiencies  
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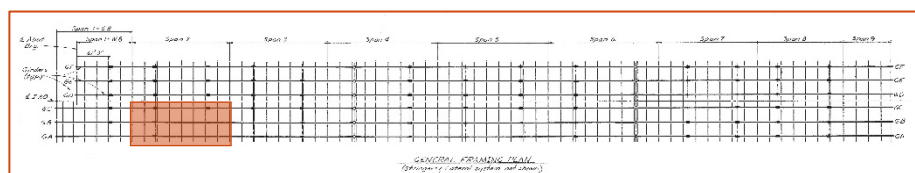
Typical bird nest on top of the girder bottom flange at the retrofit plate, looking southeast.



10' high northwest corner delamination on the north face of the south column on Pier 2 of the eastbound structure, looking south.

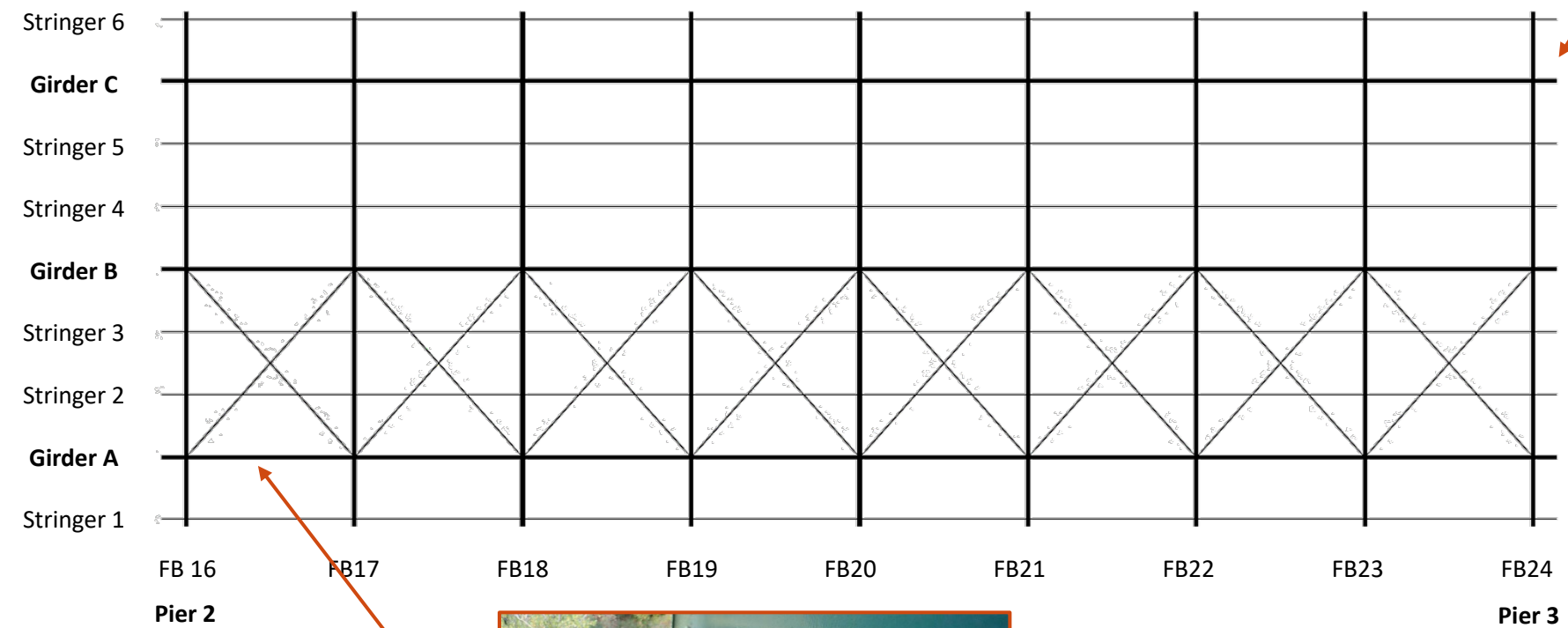


Southwest corner spall with exposed and corroded reinforcement near the base of the south column on Pier 2 of the eastbound structure, looking east.



**Key Plan**

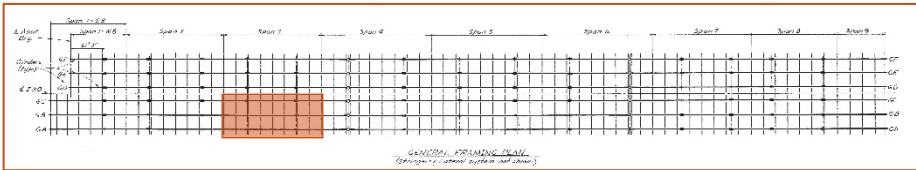
**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
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Numerous delaminations and spalls with exposed reinforcement throughout the north column at Pier 3 of the eastbound structure, looking southwest.



Less than 1/16" deep cleaned and painted pitting on the top face of the Girder A bottom flange on the exterior face between Floorbeams 16 and 18, looking west.



**Key Plan**

**Span 3 Framing Plan - Eastbound**





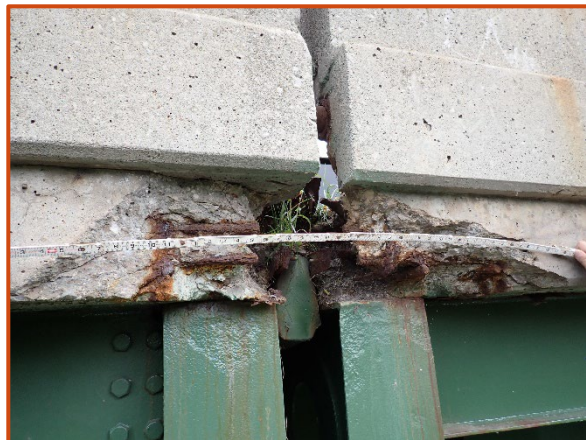
Deck edge and railing spalls with exposed and corroded reinforcement along the Span 4 expansion joint at the south edge of the eastbound structure, looking south.



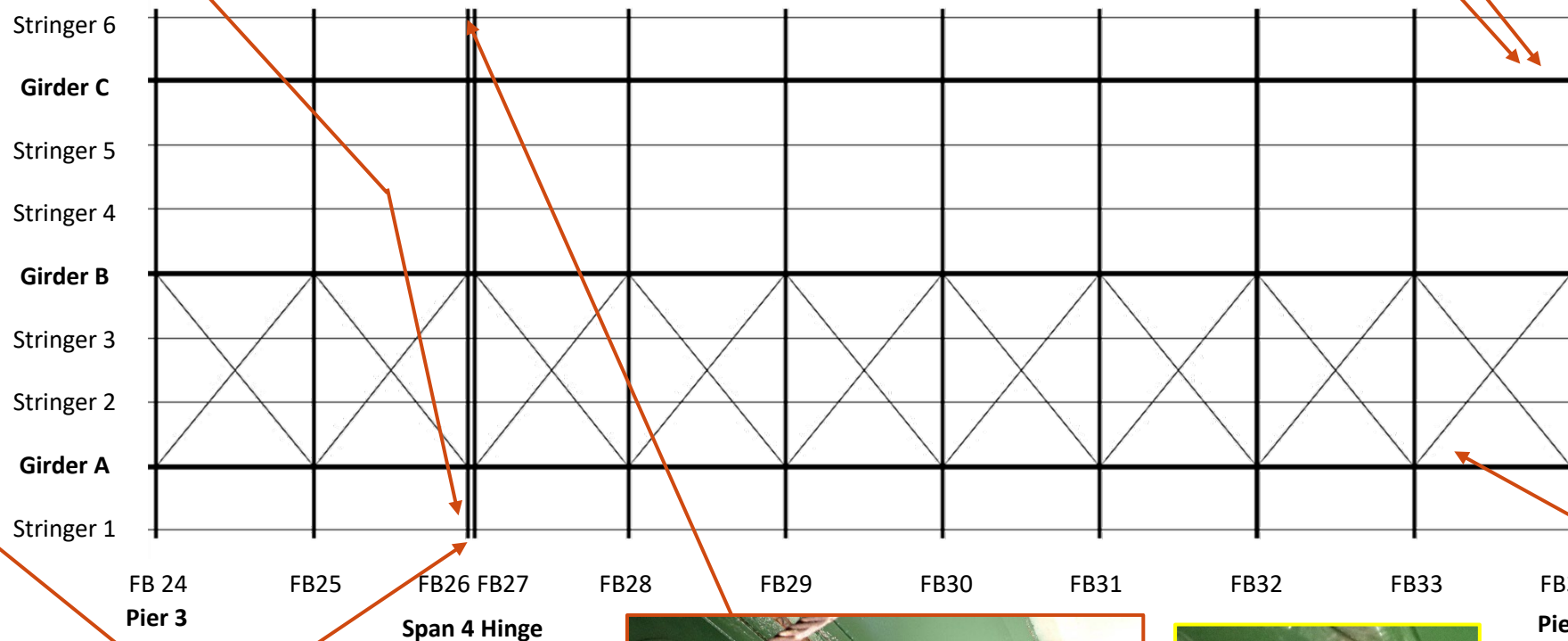
Laminate rust and corrosion on the downspout on the west face of the north column on Pier 4 of the eastbound structure, looking east. Note adjacent corner spall with exposed and corroded reinforcement.



Downspout at Pier 4 for the eastbound bridge full of water at the time of inspection, looking south.



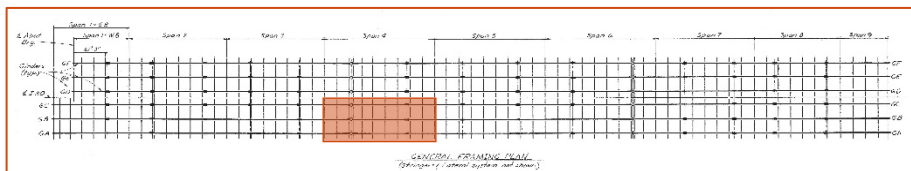
Large spalls with multiple layers of exposed and corroded reinforcement in the south deck edge of the eastbound structure at the Span 4 expansion joint, looking north.



Up to 3 1/2" deep partially patched spall/pothole in the right lane of the Span 4 wearing surface on the eastbound structure, looking northwest.



3" long by 1" high corrosion hole at the top of the Floorbeam 26 north cantilever on the eastbound structure at its end, looking northwest.

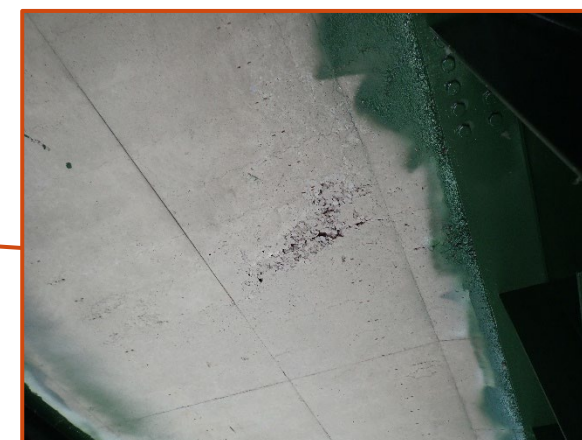
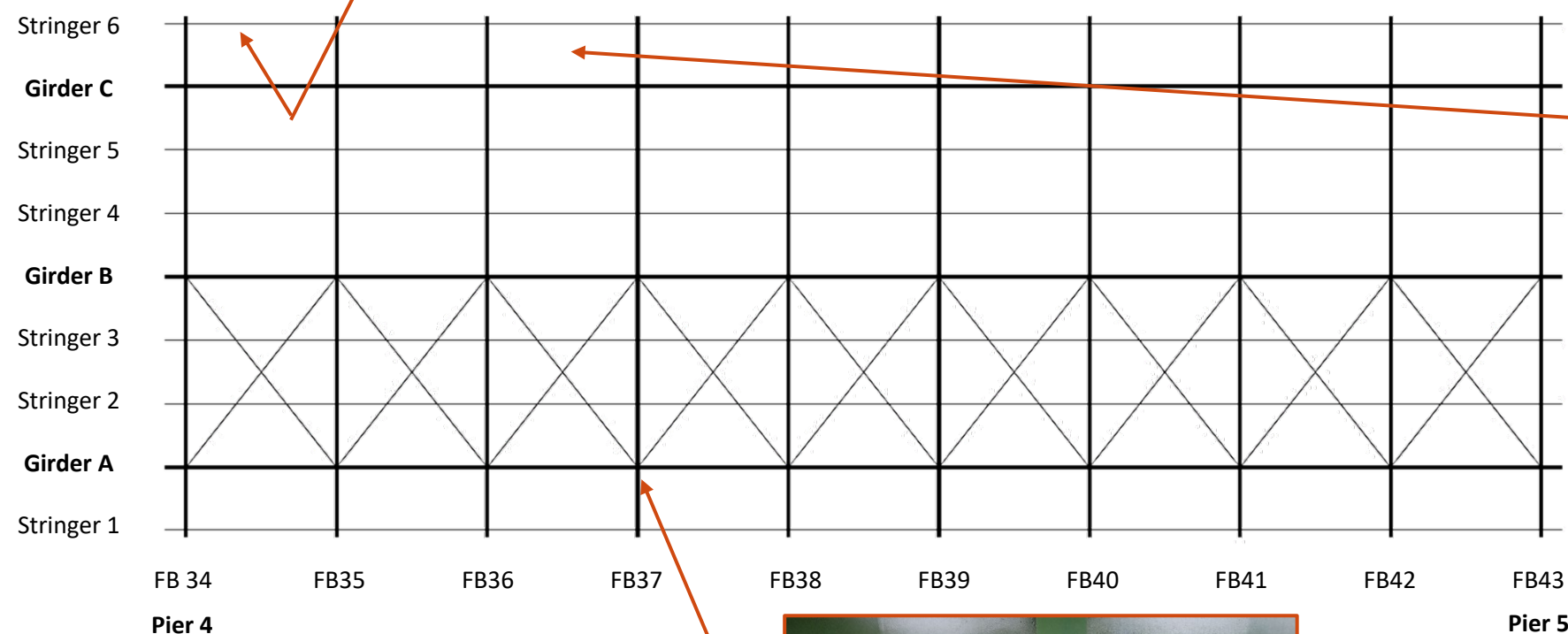


**Key Plan**

**Span 4 Framing Plan - Eastbound**



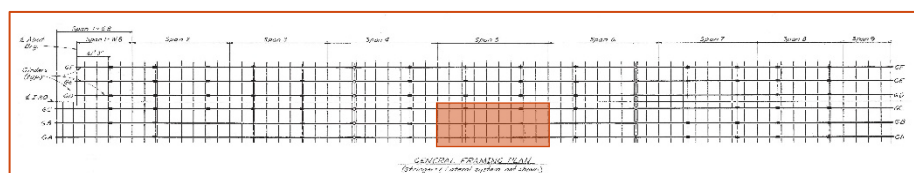
Widespread spalling of the median barrier on the eastbound structure near Pier 4, looking north.



Minor honeycombing with exposed reinforcement in the north deck overhang between Floorbeams 36 and 37, looking northeast.



General view of dogbone retrofits in Girder A at Floorbeam 37, looking north.



**Key Plan**

**Span 5 Framing Plan - Eastbound**

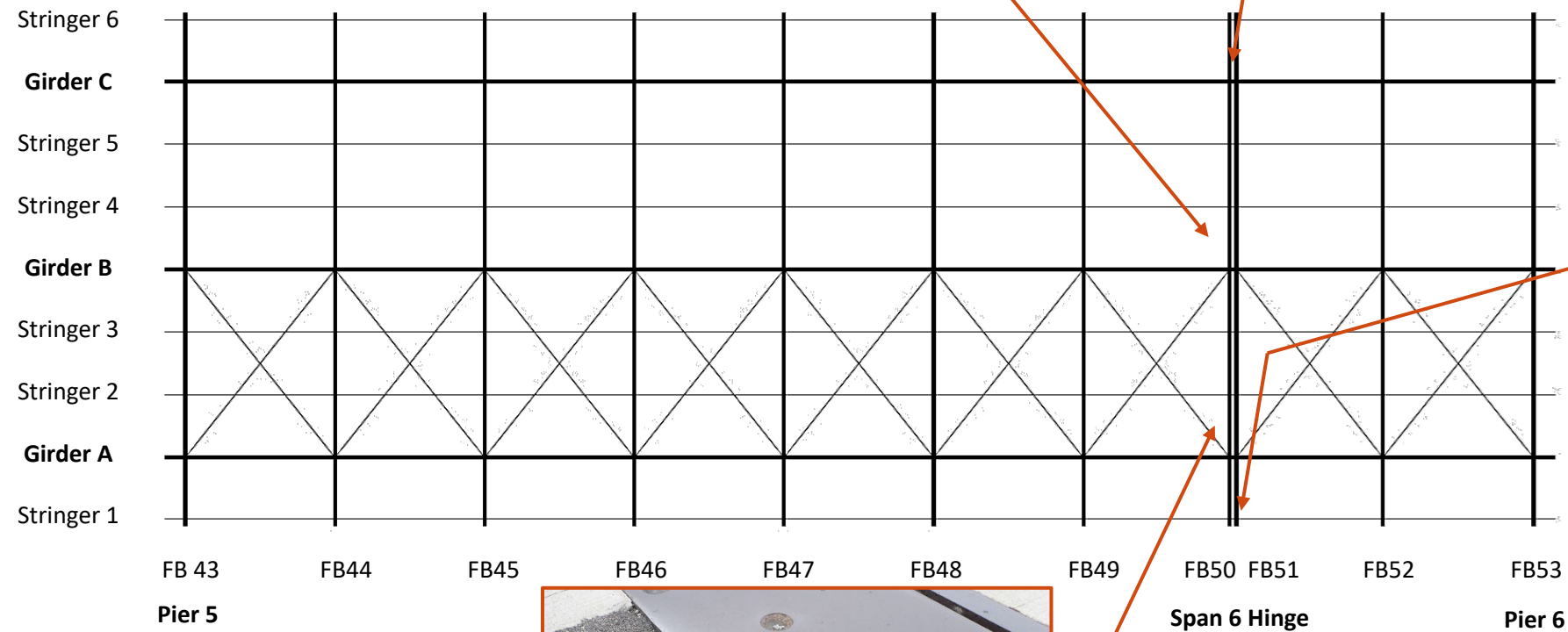
**CUY-480-0647 over Rocky River**  
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7" wide by up to 15" long by full depth spall with two layers of fully exposed and corroded reinforcement at the end of the eastbound structure deck along the Span 6 expansion joint armor, looking east. Note up to 20% section loss to the exposed reinforcement.



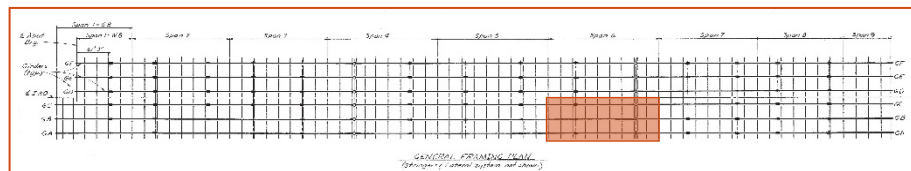
Typical carrier beam retrofit installed below the seated hinge joints, looking north at Girder C at the Span 6 expansion joint.



24" long by 24" high by full depth spall in the south bridge railing on the east side of the Span 6 joint on the eastbound structure, looking south. Note that spalls of this nature are typically present at the hinge joints.



Patching and potholes along west side of Span 6 hinge joint with a 2' wide by 3" long full depth pothole in the right lane of the eastbound structure, looking northeast.



**Key Plan**

**Span 6 Framing Plan - Eastbound**

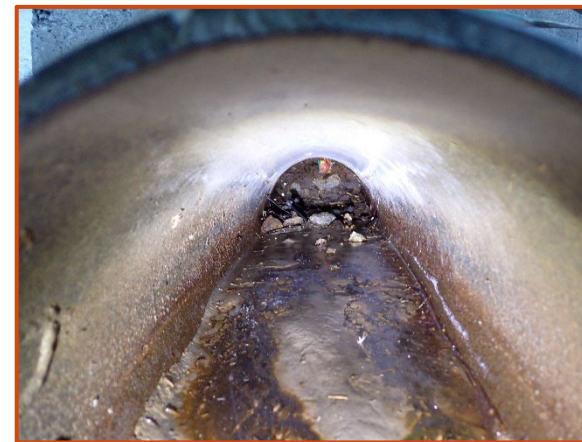
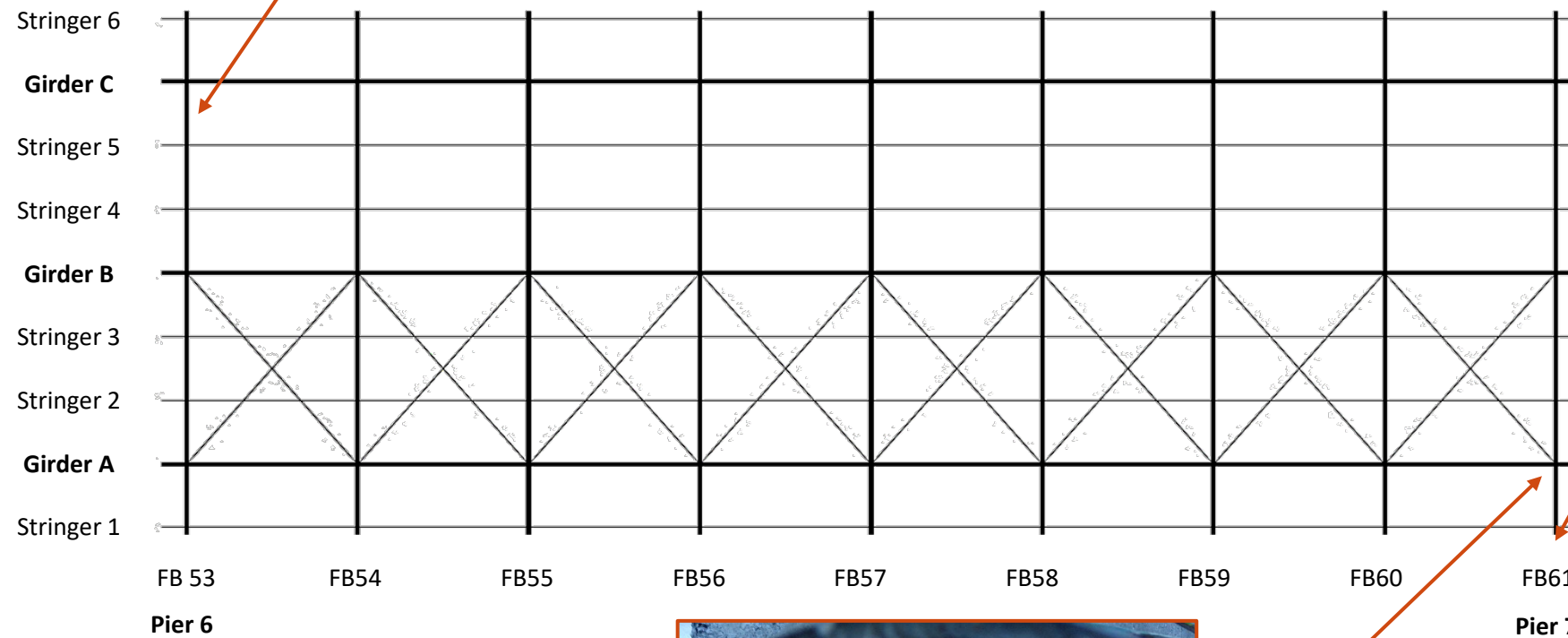
**CUY-480-0647 over Rocky River**  
**Appendix B: Framing Plan with Deficiencies**  
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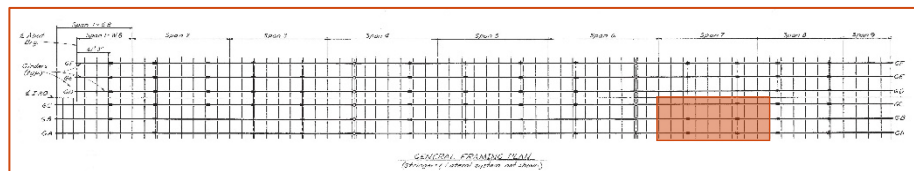
Minor scaling to the bottom 18" of the north column of Pier 6 of the eastbound structure, looking south.



Light post GR1-2-6 at Pier 7 on the eastbound structure with indentation on west face and leaning to the east due to impact. Note east half of base is crimped and the base plate is bent up 1/2".



Downspout at Pier 7 for the eastbound bridge fully clogged at bottom elbow approximately 4' from the outlet, looking east.



**Key Plan**

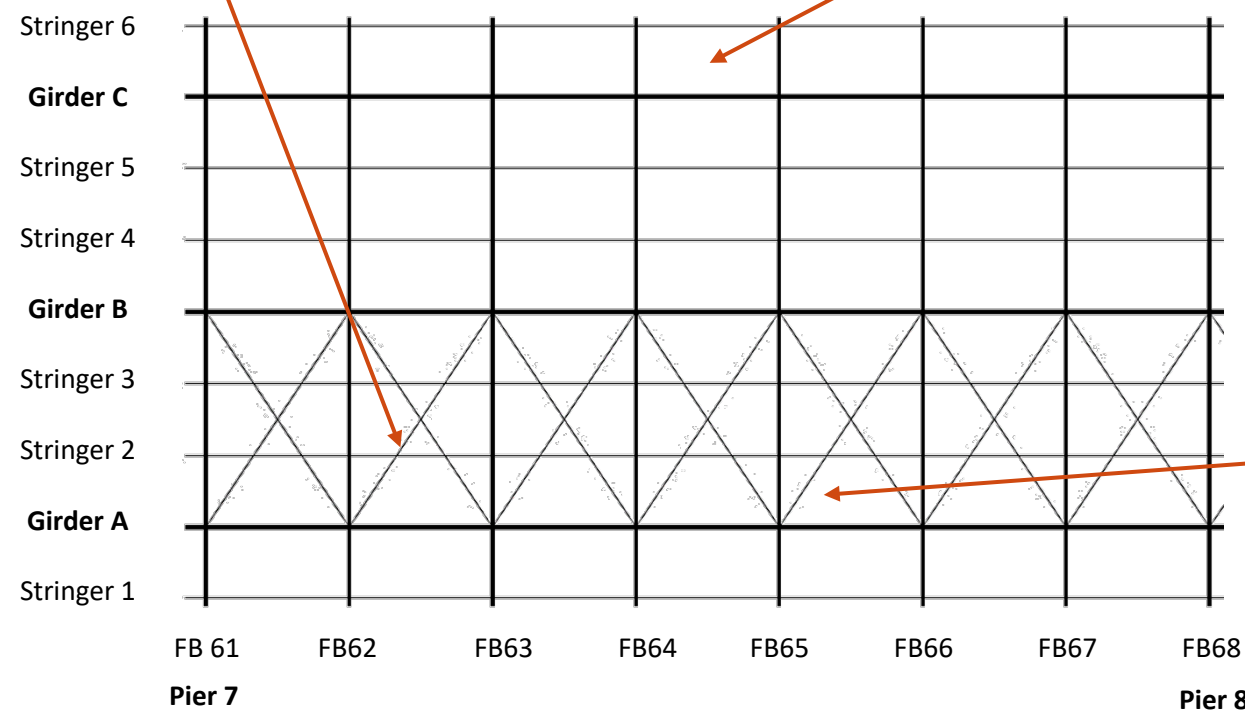
**Span 7 Framing Plan - Eastbound**



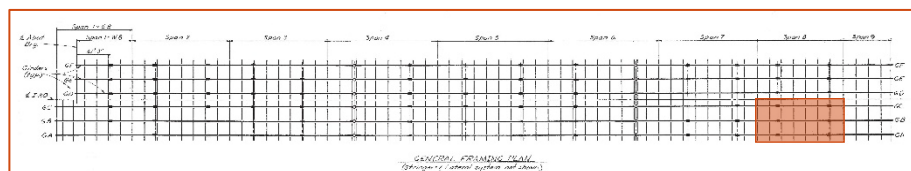
5' long by 6' wide patch in the right lane of the wearing surface in Span 8 of the eastbound structure, looking north.



Delaminations in the north deck overhang of the eastbound structure between Floorbeams 64 and 65, looking west.



3' long by 1.5' by 3" deep pothole/spall (partially filled with asphalt) in the right lane of the wearing surface in Span 8 of the eastbound structure, looking north.



**Key Plan**





12" high by 10" deep by 8.5' wide spall with exposed reinforcement in the top of the Forward Abutment backwall behind Girder C that is undermining the joint armor support up to 10", looking southeast.



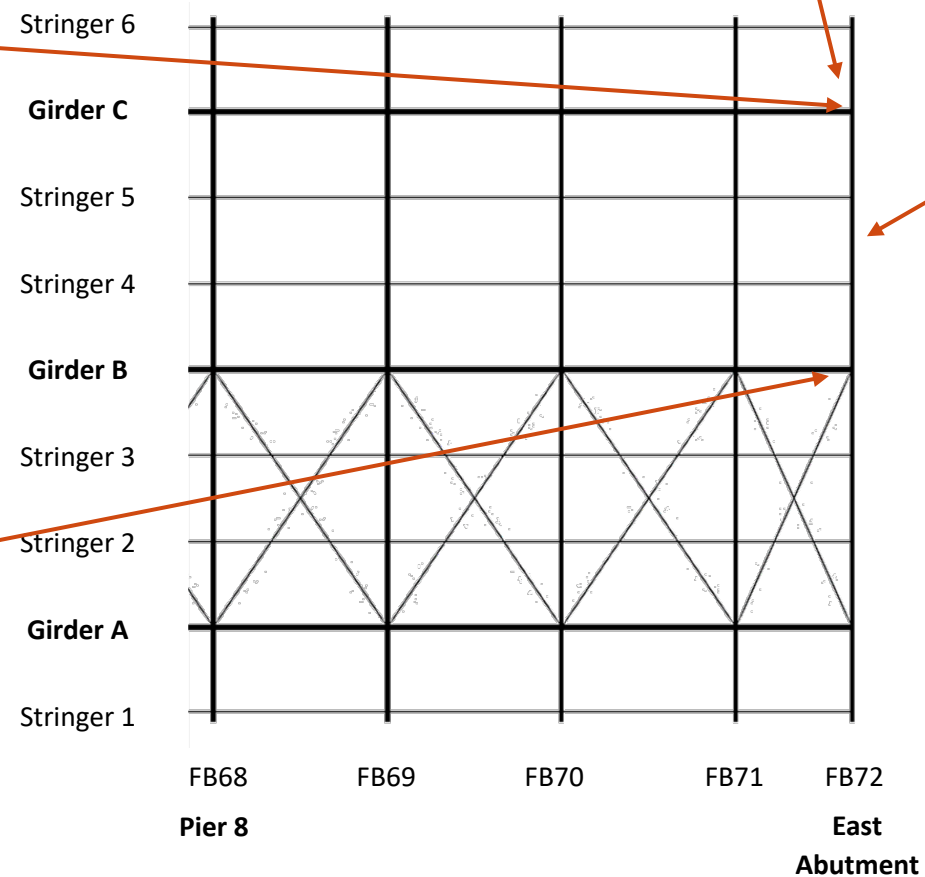
Up to 1" vertical misalignment at the eastbound Forward Abutment joint in the right two lanes, looking north. Note the asphalt on the east side of the joint has been replaced since the previous inspection.



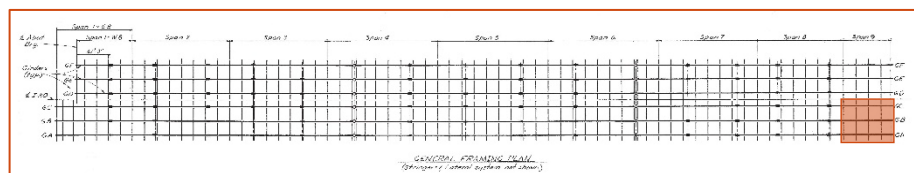
Forward Abutment backwall for the eastbound structure undermined up to 5" high by 13" deep over a 7' length at the north end, looking east.



General view of Girder B bearing at the Forward Abutment, looking northeast. Note spalled concrete from backwall behind girder end.



12" wide patch beginning to fail in the south wingwall at the along the Forward Abutment connection, looking north.



**Key Plan**

**Span 9 Framing Plan - Eastbound**

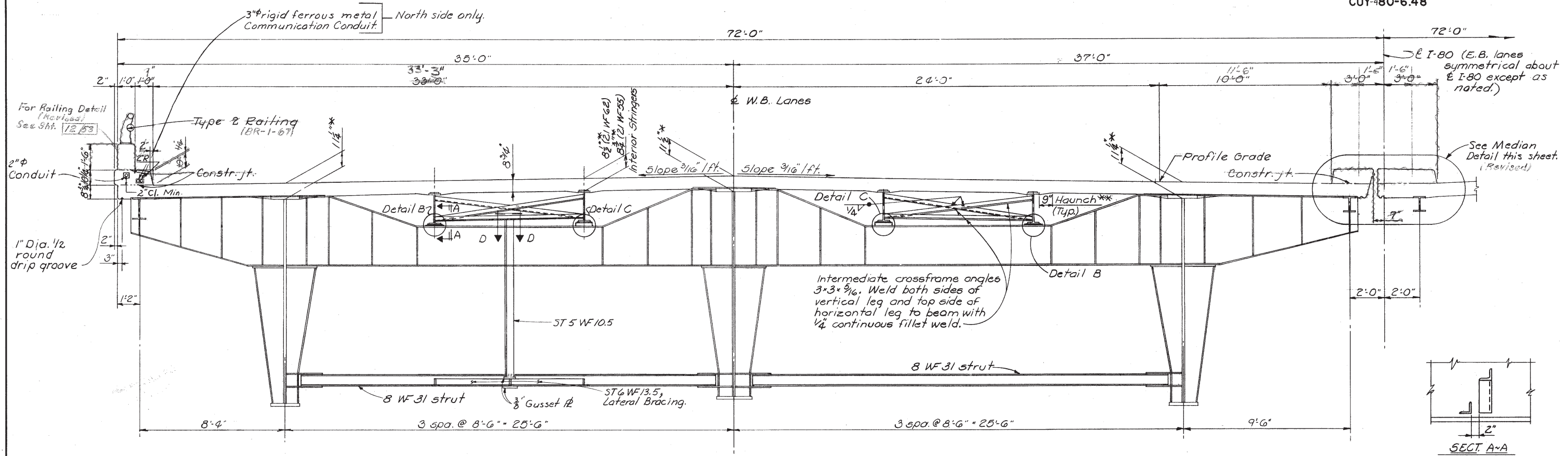
# APPENDIX C

## Existing Bridge Plans

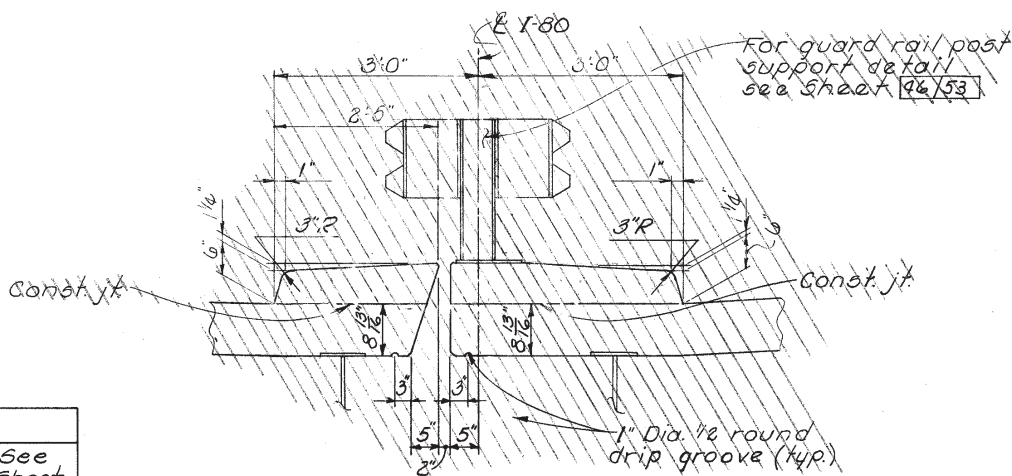
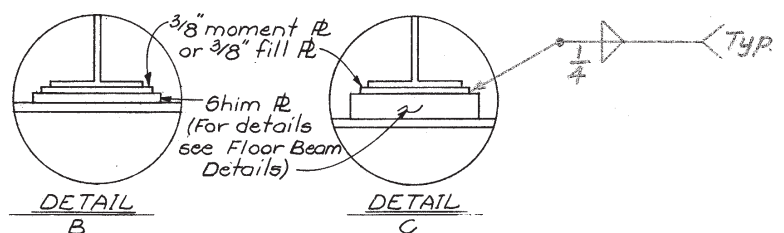




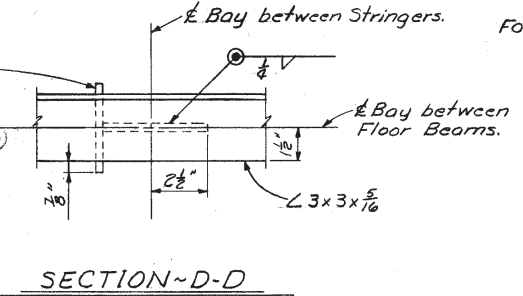
MICROFILMED  
JUN 1 8 1984



TRANSVERSE SECTION (Near Mid-Span)



MEDIAN DETAIL



SECTION ~D-D

NOTES

- \* This is the nominal dimension. The quantity of deck concrete to be paid for shall be based upon this dimension, even though deviation from it may be necessary because the top flange of the girder or beam may not have the exact camber or conformation required to place it parallel to the finished grade. Deduction shall be made for volume of encased steel plates as per Sec. 511.19 of the Construction and Material Specifications.
- Field Welded Attachments: No attachments shall be made by welding to the top flanges of the beams or girders within a distance of 0.10 of the span length on either side of the interior supports. Welding for attachments to the top flanges at other parts of the spans shall be kept at least 2" from edge of flange.
- \*\* A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" wide.
- Concrete parapet shall be included with item 317 for payment.
- Slab thickness includes 1" monolithic wearing surface.
- For superstructure reinforcing see sheet 43/53

INDEX OF DETAILS			
For Details of	See Sheet No	For Details of	See Sheet No
Transverse Section	29/53	Floor Beam Details	39/53
Framing Plan	30/53	Knee Brace Details	35/53
Girder Details	32/53	Stringer Framing Plan and Details	40/53
Girder Details, Intermediate Stiffeners	33/53	Bearing Details	41/53
Girder Details, Longitudinal Stiffeners and Splices	34/53	Bearing, Roller, and Alignment Plate Details	42/53
Girder Details, Expansion Hinge and End Dam	36/53	Superstructure Reinforcing Details	43/53
Girder Details, Abutment End Dam and Lateral Bracing	37/53	Camber Diagram and Screed Elevations	38/53
		Superstructure Drainage Details	44/53

ALDEN E. STILSON & ASSOCIATES, LIMITED  
CONSULTING ENGINEERS  
COLUMBUS, OHIO 29/53

**SUPERSTRUCTURE DETAILS**

BRIDGE No. CUY-480-0648  
OUTERBELT SOUTH over ROCKY RIVER  
CUYAHOGA COUNTY STA. 441+96.50 E.B.  
STA. 457+67.50

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
GEA	E.K.		RWE	J.E.V.	2/23/60

Rev. 1-11-72

Rev. 10-22-70



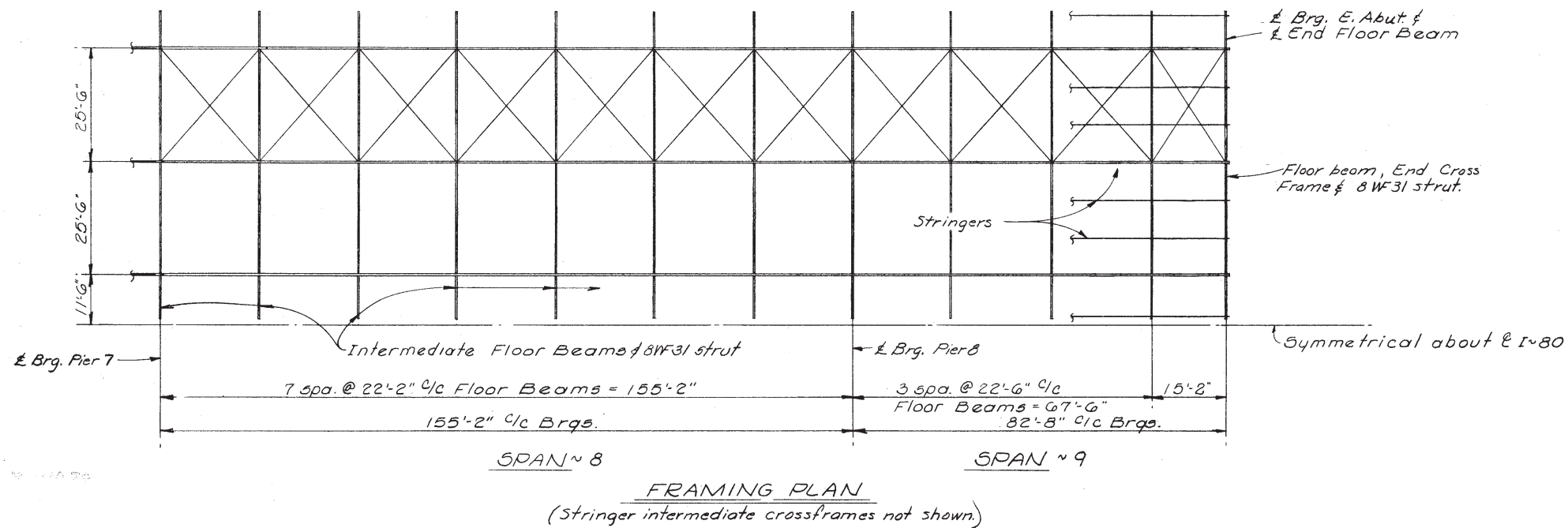
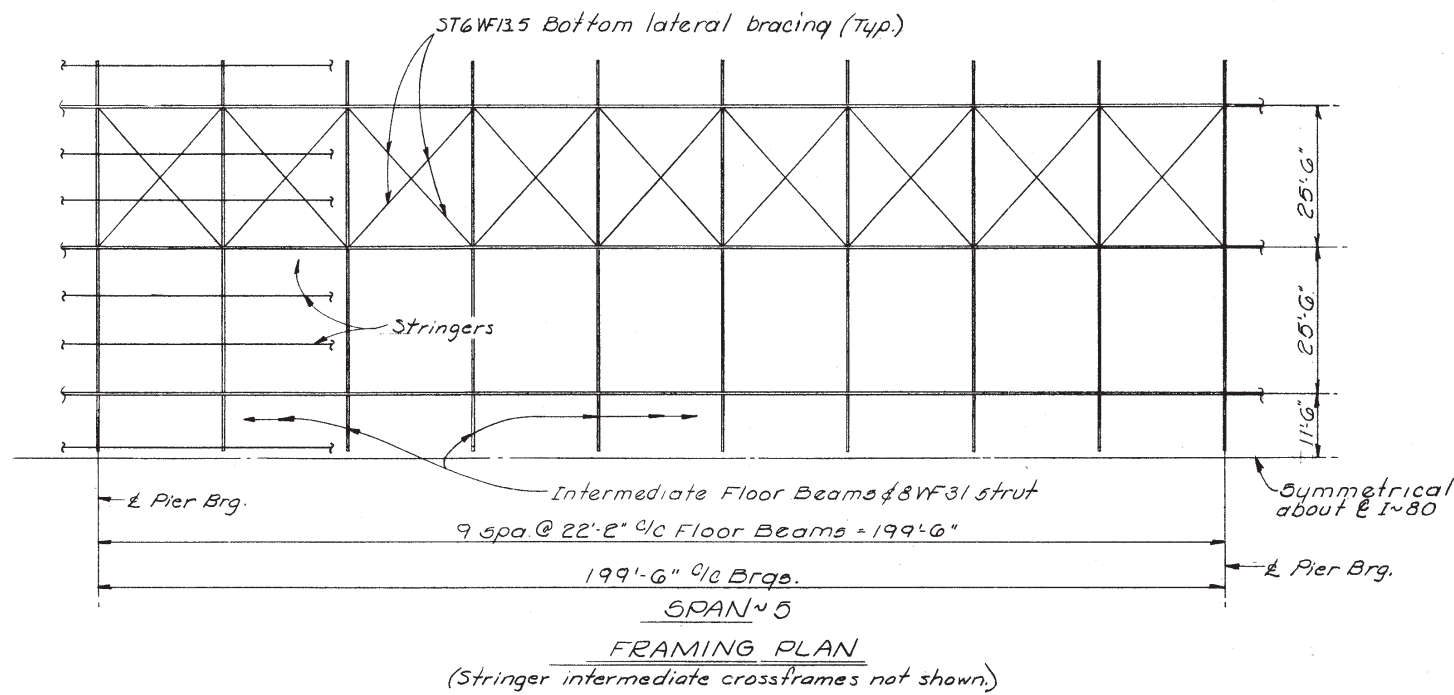
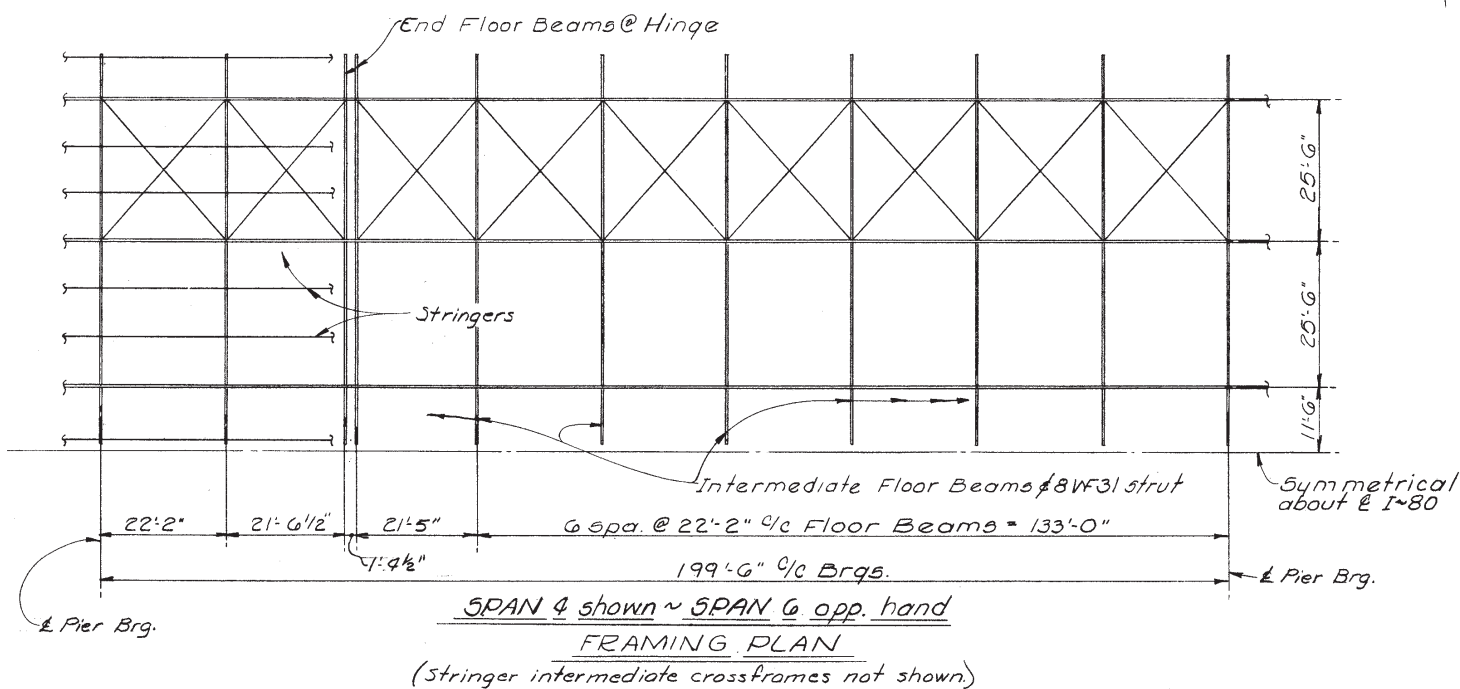
MICROFILMED  
JUN 18 1984

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

90  
120

CUYAHOGA COUNTY  
CUY 480-6.48

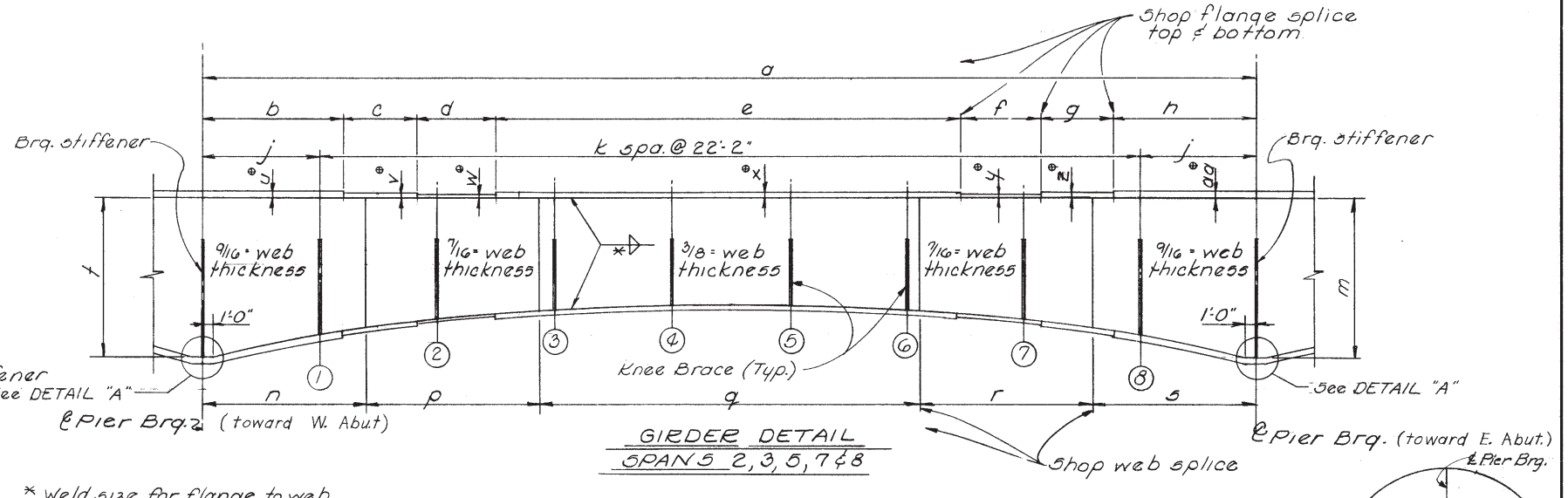
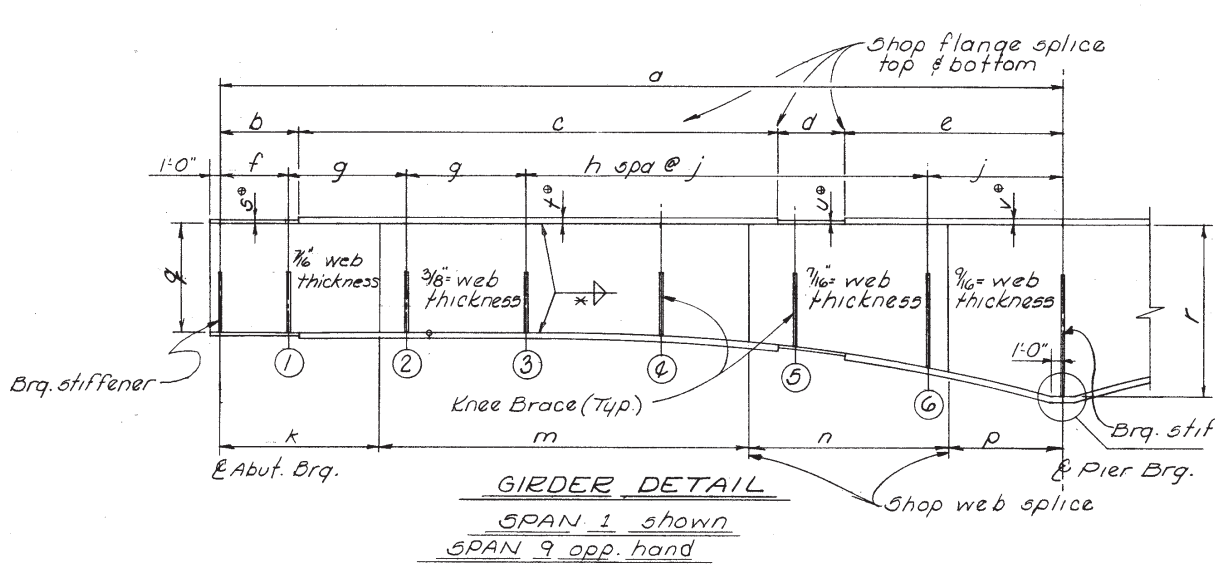
N



NOTE  
For Bearing Units, see sheets 4142/53

ALDEN E. STILSON & ASSOCIATES, LIMITED CONSULTING ENGINEERS COLUMBUS, OHIO						31/53
<b>FRAMING PLAN</b>						
BRIDGE No. CUY480-0648 OUTERBELT SOUTH over ROCKY RIVER CUYAHOGA COUNTY						
STA. 441+96.50 E.B. STA. 457+67.50						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GEA	JEK		RUE	J.E.V.	2/23/68	

Rev. 10-22-70



~ GIRDER DETAIL DIMENSIONS ~

SPAN	a	b	c	d	e	f	g	h	j	k	m	n	p	q	r
1-E.B.	139-8	13-0	79-8	14-0	33-0	11-6	19-9	3	22-2	33-0	49-8	33-0	24-0	9-0	14-0
1-W.B.	103-8	56-8	-	-	47-0	15-0	-	3	22-2	25-6	35-9	25-5	17-0	9-0	14-0
9	82-8	47-8	-	-	35-0	15-2	-	2	22-6	20-8	26-0	24-0	12-0	8-0	12-0

~ GIRDER FLANGE P's ~

SPAN	GIRDERS-GA, GC, GD & GF				GIRDERS-GB & GE				~ WEB DEPTH @ KNEE BRACE ~					
	s	t	u	v	s	t	u	v	1	2	3	4	5	6
1-E.B.	1 1/2 x 20	1 1/2 x 20	1 1/2 x 20	2 x 20	1 1/2 x 24	2 1/2 x 24	1 1/2 x 24	2 1/2 x 24	9-0	9-0	9-0 1/2	9-5 1/2	10-4 1/2	11-10 1/2
1-W.B.	1 x 20	-	-	1 1/2 x 20	1 1/2 x 24	-	-	1 1/2 x 24	9-0	-	-	9-0 1/2	9-7 1/2	11-2 1/2
9	1 1/2 x 20	-	-	1 1/2 x 20	1 1/2 x 24	-	-	1 1/2 x 24	8-0	-	-	-	8-1 1/2	9-4 1/2

\* Weld size for flange to web

Flange thickness	size of fillet weld
7/8	5/16
1	3/16
1 1/4	5/16
1 3/8	5/16
1 1/2	5/16
1 5/8	3/8
1 3/4	3/8
1 7/8	3/8
2	3/8
2 1/8	3/8
2 1/4	3/8
2 3/8	1/2
2 1/2	1/2

~ GIRDER DETAIL DIMENSIONS ~

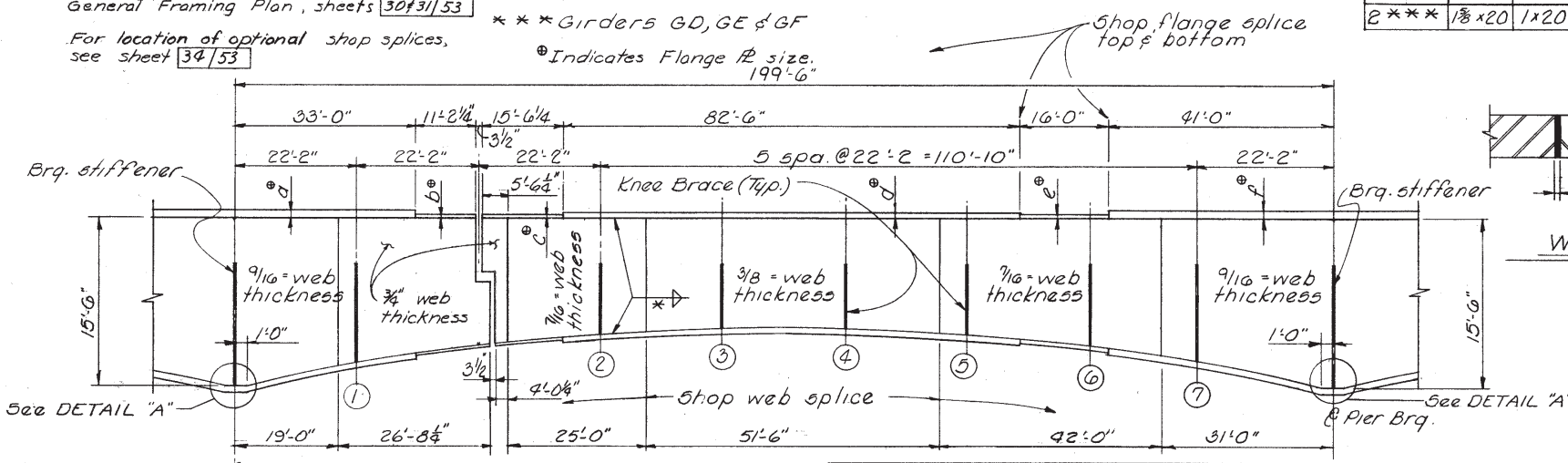
SPAN	a	b	c	d	e	f	g	h	j	k	m	n	p	q	r	s	t	
2**	177-4	29-0	19-0	-	81-4	-	14-0	34-0	22-2	6	15-6	32-0	36-0	41-4	43-0	25-0	14-0	
3	177-4	31-0	17-0	-	-	-	-	129-4	22-2	6	15-6	38-8	30-0	40-8	37-0	31-0	15-6	
5	199-6	29-0	12-0	15-0	87-6	15-0	12-0	29-0	22-2	7	15-6	31-0	44-0	49-6	44-0	31-0	15-6	
7	177-4	132-4	-	-	-	-	-	14-0	31-0	22-2	6	15-6	31-0	37-0	40-8	30-0	38-8	15-6
8	155-2	48-0	-	-	71-2	-	-	23-0	13-0	22-2	5	12-0	25-0	28-0	49-2	29-0	24-0	15-6
2***	177-4	25-0	18-0	-	84-4	-	-	15-0	35-0	22-2	6	15-6	32-0	36-0	41-4	43-0	25-0	14-0

~ GIRDER FLANGE P's ~

SPAN	GIRDERS-GA, GC, GD & GF				GIRDERS-GB & GE				~ WEB DEPTH @ KNEE BRACE ~														
	U	V	W	X	Y	Z	aa	U	V	W	X	Y	Z	aa	1	2	3	4	5	6	7	8	
2**	2 x 20	1 x 20	-	1 1/2 x 20	-	1 1/2 x 20	1 1/2 x 20	2 1/2 x 24	1 1/2 x 24	-	2 x 24	-	1 1/2 x 24	2 x 24	11-9 1/2	10-3 1/2	9-7 3/4	-	9-6	9-8 1/2	10-7 1/2	12-6 1/2	
3	1 1/2 x 20	1 x 20	-	-	-	-	-	2 3/8 x 20	2 x 24	1 1/2 x 24	-	-	-	2 1/2 x 24	12-9 1/2	11-0	10-2 1/2	-	10-0	10-2 1/2	11-0	12-9 1/2	
5	2 1/2 x 20	1 3/4 x 20	1 1/2 x 20	1 3/4 x 20	1 1/2 x 20	1 3/4 x 20	2 1/2 x 20	2 1/2 x 24	2 1/2 x 24	1 1/2 x 24	2 1/2 x 24	1 1/2 x 24	2 1/2 x 24	2 1/2 x 24	10-0 1/2	10-4 1/2	10-4 1/2	10-0 1/2	10-0 1/2	10-4 1/2	11-3 1/2	13-0 1/2	
7	2 3/8 x 20	-	-	-	-	1 x 20	1 5/8 x 20	2 1/2 x 24	-	-	-	-	-	1 1/2 x 24	13-4 1/2	12-9 1/2	11-0	10-2 1/2	-	10-0	10-2 1/2	11-0	12-9 1/2
8	1 1/2 x 20	-	-	1 3/8 x 20	-	1 x 20	1 3/8 x 20	1 1/2 x 24	-	-	-	-	1 1/2 x 24	1 x 24	13-8 x 24	11-0 3/4	9-9 3/8	9-0 3/8	-	-	9-0 3/8	9-4 1/2	10-4 1/2
2***	1 1/2 x 20	1 x 20	-	2 x 20	-	1 3/4 x 20	1 1/2 x 20	1 1/2 x 24	1 x 24	-	2 1/2 x 24	-	1 1/2 x 24	2 x 24	11-9 1/2	10-3 1/2	9-7 3/4	-	9-6	9-8 1/2	10-7 1/2	12-6 1/2	

NOTES  
For Knee Brace & Brq. stiffener details see sheet 35/53  
For field splice locations see General Framing Plan, sheets 30/31/53  
For location of optional shop splices, see sheet 34/53

For Girder designations, see General Framing Plan, sheet 30/53  
\*\* Girders GA, GB & GC  
\*\*\* Girders GD, GE & GF  
@ Indicates Flange P size, 199-6"



GIRDERS-GA, GC, GD & GF (Flange)

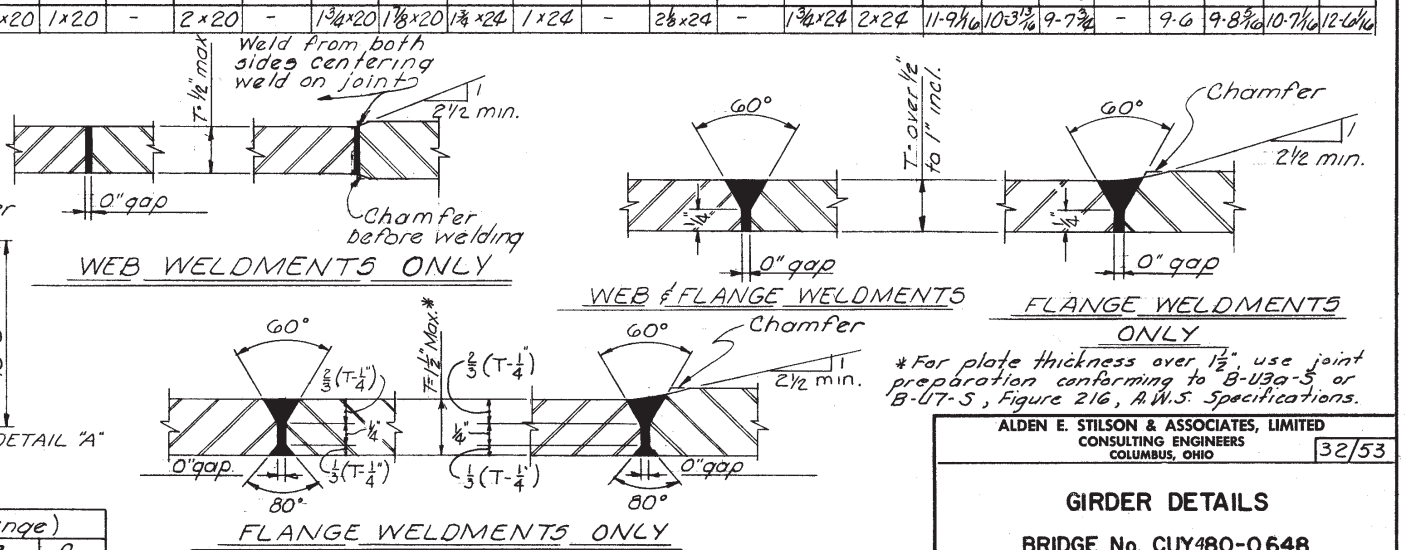
a	b	c	d	e	f
2 3/8 x 20	1 x 20	1 1/2 x 20	1 x 20	2 1/2 x 20	2 1/2 x 24

GIRDERS-GB & GE (Flange)

a	b	c	d	e	f
1 x 24	1 x 24	2 1/2 x 24	1 3/4 x 24	2 1/2 x 24	-

~ WEB DEPTH @ KNEE BRACE ~

1	2	3	4	5	6	7
13-0 1/2	10-4 1/2	10-0 1/4	10-0 1/4	10-4 1/2	11-3 1/2	13-0 1/2



All of the above full penetration welds shall be back-gauged and welded after welding far side.  
Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.  
Rev. 10-22-70

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COLUMBUS, OHIO 32/53

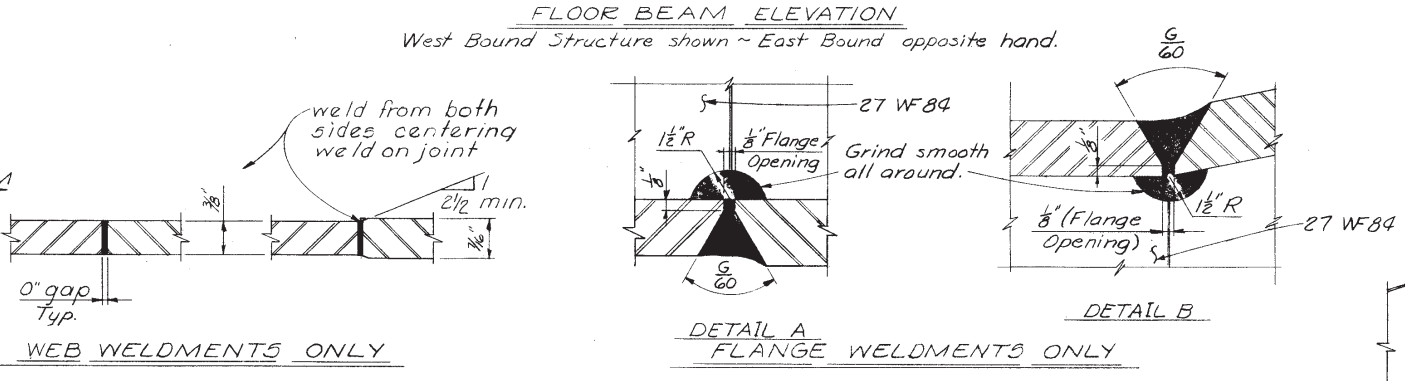
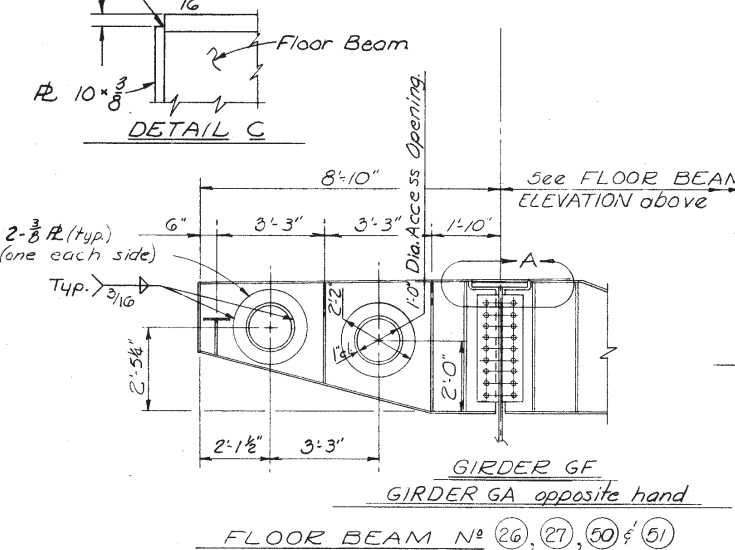
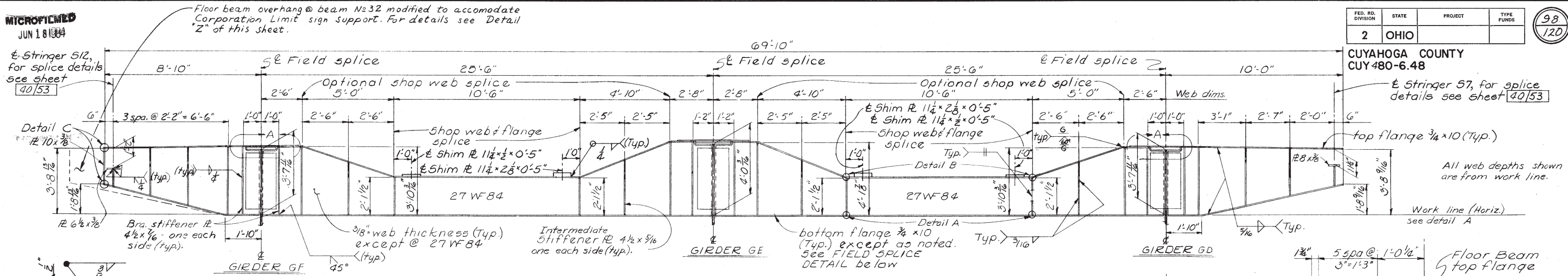
**GIRDER DETAILS**  
BRIDGE No. CUY480-0648  
OUTERBELT SOUTH over ROCKY RIVER  
CUYAHOGA COUNTY STA. 441+96.50 E.B.  
STA. 457+67.50

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GEA	DEK		RWC	J.E.V.	2/23/68	

MICROFILMED  
JUN 18 1984

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

98  
120



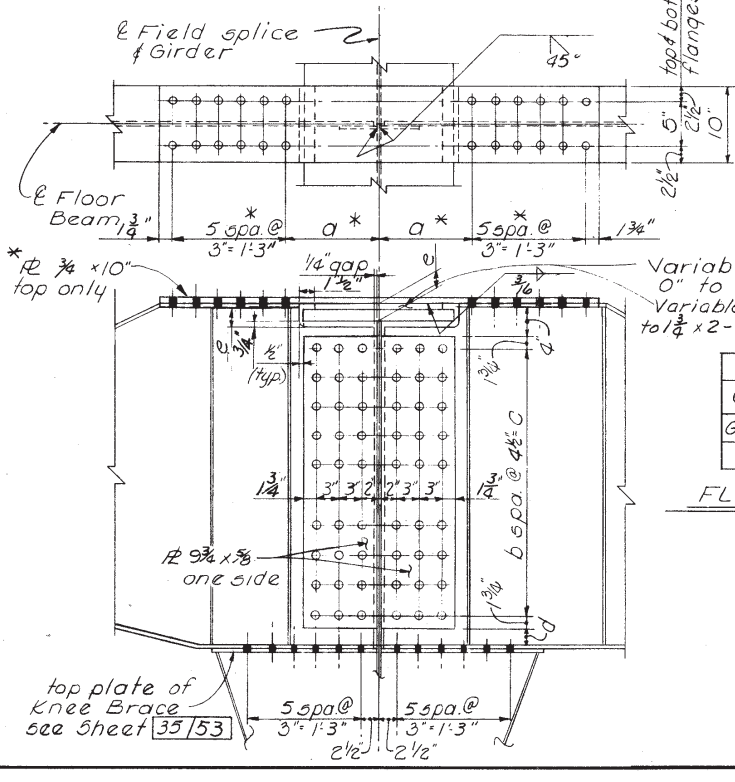
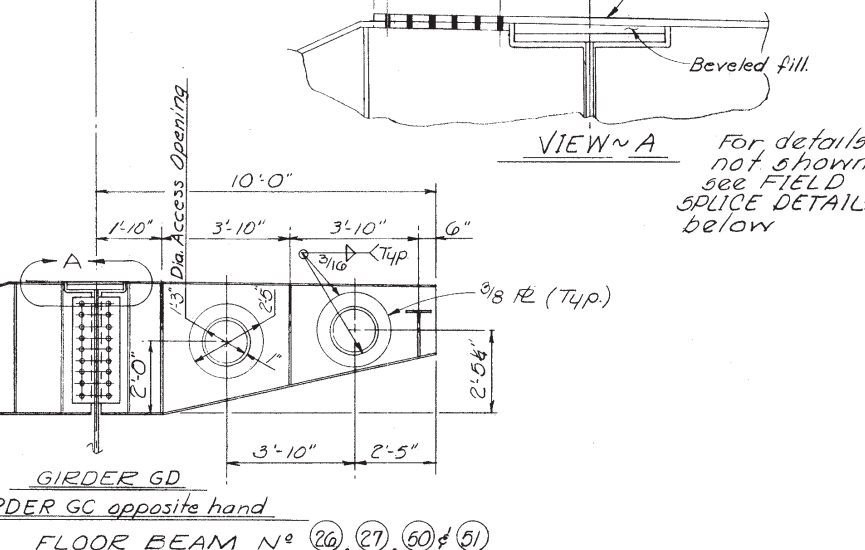
**JOINT PREPARATION for SUBMERGED ARC WELDMENTS**

All full penetration welds (joint preparations shown) shall be back-gouged and welded after welding far side.

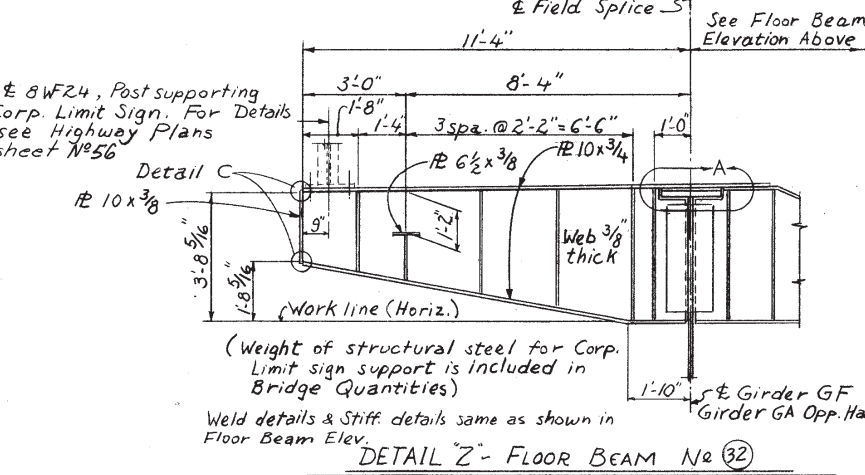
**NOTES**

\* Top splice  $\phi 3\frac{1}{4} \times 10$  not required on Girders GA, GC, GD & GF see VIEW ~ A

All bolts shown shall be 1"  $\phi$  high strength.



FIELD SPLICE					
GIRDER	a	b	c	d	e
GA, GC, GD & GF	-	8	3-0	2 $\frac{3}{16}$	2 $\frac{3}{4}$
GB & GE	1-2 $\frac{1}{4}$	9	3-4 $\frac{1}{2}$	1 $\frac{1}{16}$	2 $\frac{1}{2}$



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CONSULTING ENGINEERS  
COLUMBUS, OHIO 39/53

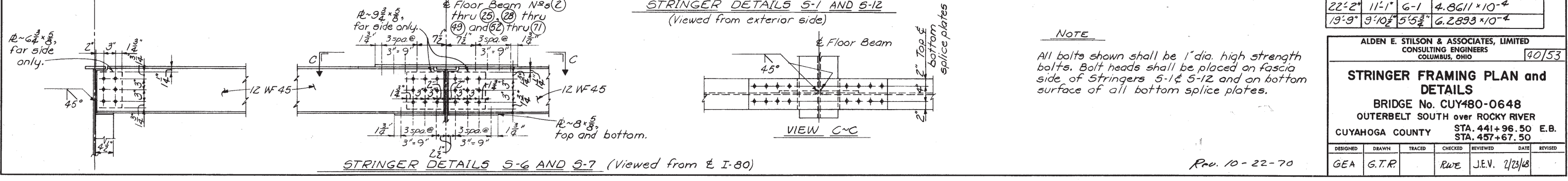
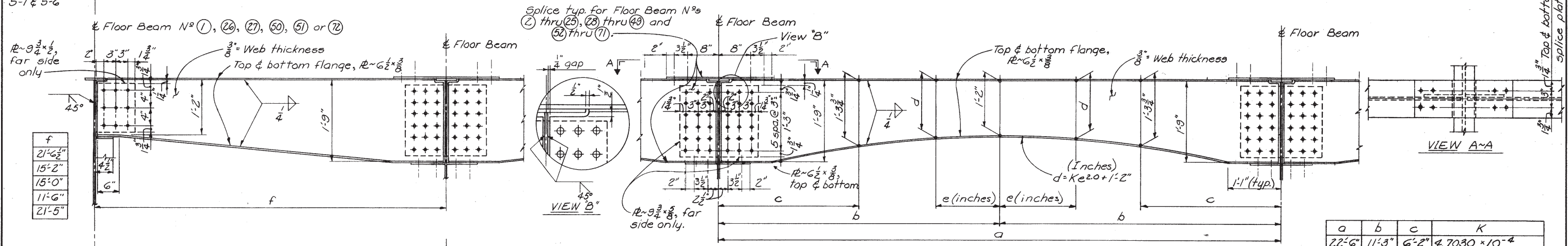
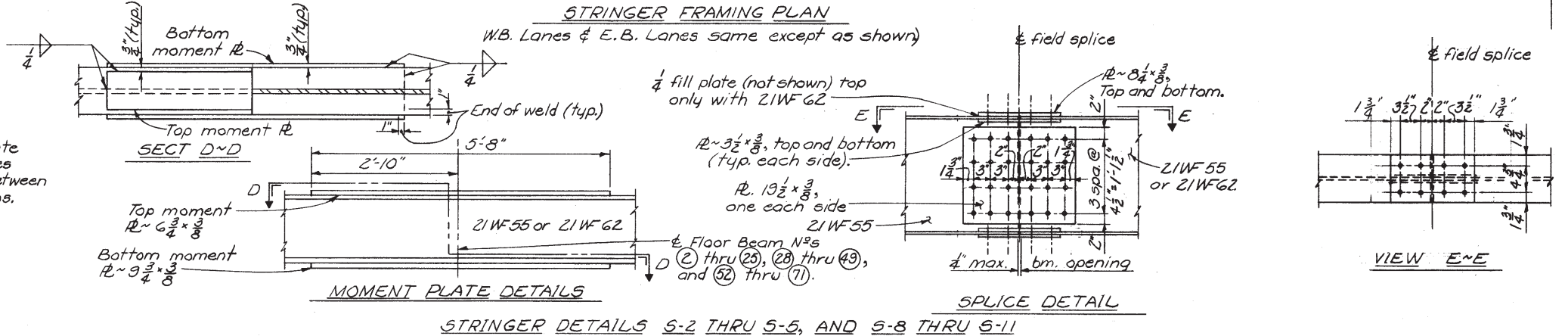
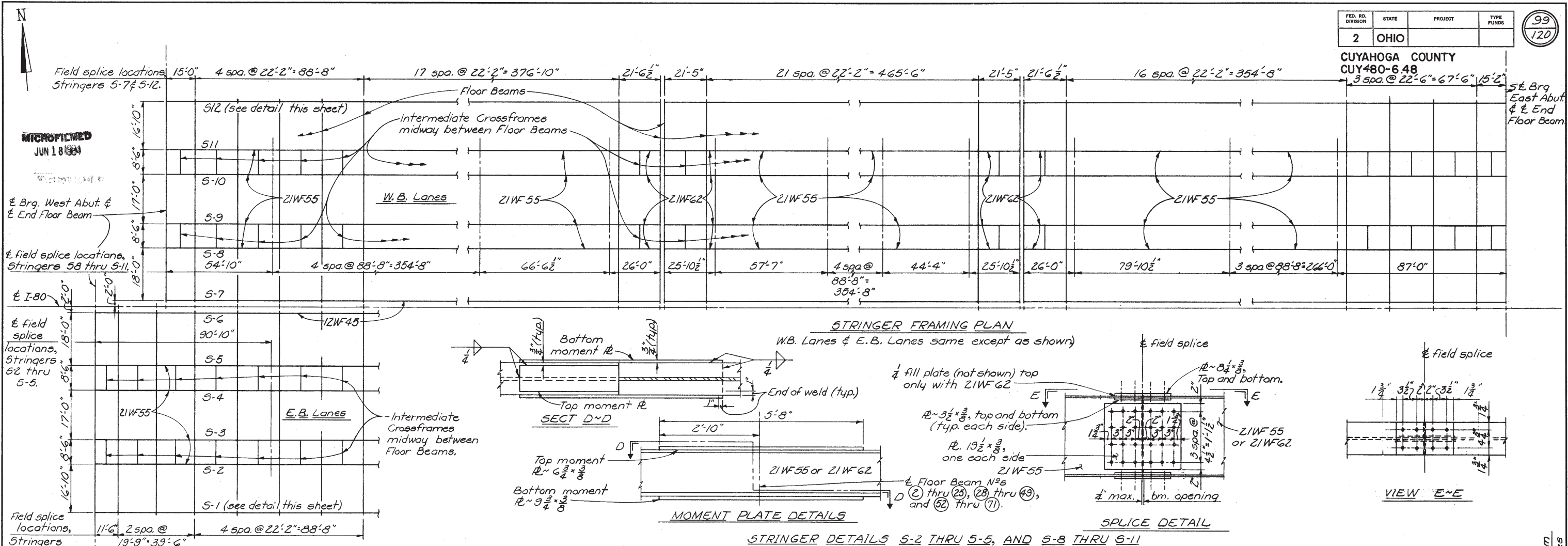
**FLOOR BEAM DETAILS**

BRIDGE No. CUY480-0648  
OUTERBELT SOUTH over ROCKY RIVER  
CUYAHOGA COUNTY STA. 441+96.50 E.B.  
STA. 457+67.50

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GEA	EK		RWE	J.E.V.	2/23/68	

Rev. 10-22-70

CUYAHOGA COUNTY  
 CUY480-6.48  
 3 spa. @ 22'-6" = 67'-6" 15'-2" 5' E. Brg. East Abut. & End Floor Beam



a	b	c	K
22'-6"	11'-3"	6'-2"	4.7030 x 10 <sup>-4</sup>
22'-2"	11'-1"	6'-1"	4.8611 x 10 <sup>-4</sup>
19'-9"	9'-10 1/2"	5'-5 3/4"	6.2893 x 10 <sup>-4</sup>

**NOTE**  
 All bolts shown shall be 1" dia. high strength bolts. Bolt heads shall be placed on fascia side of Stringers S-1 & S-12 and on bottom surface of all bottom splice plates.

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 COLUMBUS, OHIO 40/53

**STRINGER FRAMING PLAN and DETAILS**  
 BRIDGE No. CUY480-0648  
 OUTERBELT SOUTH over ROCKY RIVER  
 CUYAHOGA COUNTY STA. 441+96.50 E.B.  
 STA. 457+67.50

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GEA	G.T.R.		RWE	J.E.V.	2/23/68	

Rev. 10-22-70

# APPENDIX D

## Dogbone Retrofit Tables

Appendix D: Dogbone Retrofit Defect Locations							
Bridge	Span	Girder	Face	Floorbeam	Side of FB	Location*	Additional Notes
Right	1E	B	South	2	West	Bottom	
	1E	A	North	3	East	Bottom	
	1E	B	South	4	West	Top	
	1E	B	South	5	West	Bottom	Additional (3rd) drilled arrest hole adjacent to top hole
	1E	C	South	5	West	Bottom	
	1E	C	South	5	West	Top	
	1E	B	South	6	West	Top	
	1E	C	-	7	East	FB	No sawcut between holes
	1E	C	-	7	West	FB	No sawcut between holes
	2E	A	North	13	West	Top	
	<b>2E</b>	<b>B</b>	<b>North</b>	<b>13</b>	<b>West</b>	<b>Top</b>	
	2E	C	South	14	East	Top	
	2E	B	South	15	West	FB	
	4E	A	North	25	West	Bottom	
	4E	A	North	29	East	Bottom	
	4E	B	South	29	East	Top	
	4E	B	North	30	East	Bottom	
	5E	C	-	35	West	FB	Incomplete sawcut between holes
	5E	C	South	38	East	Top	
	5E	C	North	40	West	Top	
	6E	B	South	46	West	Top	
	6E	C	South	48	West	Bottom	
	6E	C	South	53	East	FB	
	6E	C	South	53	West	FB	
	7E	B	South	56	East	Top	
	7E	C	South	56	East	Bottom	
	7E	C	South	59	East	Bottom	
	7E	C	South	59	West	Bottom	
	8E	B	South	66	East	Bottom	
	8E	B	South	66	East	Top	

**Denotes newly documented or changed condition since the previous inspection**

**\* Location Definitions:**

<b>FB</b>	Dogbone retrofit located adjacent to the floorbeam bottom flange
<b>Bottom</b>	<u>Bottom</u> set of dogbone retrofits located adjacent to the lateral bracing connection plate
<b>Top</b>	<u>Top</u> set of dogbone retrofits located adjacent to the lateral bracing connection plate



Appendix D: Dogbone Retrofit Defect Locations							
Bridge	Span	Girder	Face	Floorbeam	Side of FB	Location*	Additional Notes
Left	1W	F	North	4	East	FB	
	1W	F	North	5	West	Top	
	1W	F	South	8	West	FB	
	2W	E	North	12	West	Bottom	Overlapping holes
	2W	E	North	13	East	Bottom	
	3W	F	North	17	West	FB	
	3W	F	South	19	West	Top	
	3W	F	South	19	West	Bottom	
	3W	F	South	21	East	Bottom	
	3W	F	South	23	West	FB	
	4W	F	South	31	East	Bottom	
	4W	F	North	33	West	FB	
	5W	D	North	37	East	Bottom	
	7W	D	North	55	West	Top	
	7W	E	North	55	West	FB	
	7W	F	South	56	East	Bottom	
	7W	D	North	60	West	FB	
	7W	F	South	60	West	FB	
	8W	D	Both	66	West	Bottom	
	8W	F	South	66	West	Bottom	
	8W	D	North	67	East	FB	
9W	F	South	70	West	Bottom		
9W	F	North	71	West	Bottom		

Denotes newly documented or changed condition since the previous inspection

\* Location Definitions:

<b>FB</b>	Dogbone retrofit located adjacent to the floorbeam bottom flange
<b>Bottom</b>	Bottom set of dogbone retrofits located adjacent to the lateral bracing connection plate
<b>Top</b>	Top set of dogbone retrofits located adjacent to the lateral bracing connection plate

# APPENDIX E

## Element Level Inspection Data

Deck Summary			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>216432</b>	<b>195549</b>	<b>19546</b>	<b>1337</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	90	338	0
	1090	Exposed Rebar		0	0	85	0
	1120	Efflorescence/Rust Staining		0	3130	734	0
	1130	Cracking (RC and Other)		0	16326	180	0
<b>510</b>		<b>Wearing Surface (SF)</b>	<b>206663</b>	<b>181507</b>	<b>20669</b>	<b>4487</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	4487	0
	3220	Crack (Wearing Surface)		0	20669	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>552</b>	<b>166</b>	<b>279</b>	<b>107</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	279	107	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>6210</b>	<b>0</b>	<b>3901</b>	<b>2309</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1953	2309	0
	1130	Cracking (RC and Other)		0	1948	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>24</b>	<b>0</b>	<b>22</b>	<b>2</b>	<b>0</b>

Westbound Deck Unit 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>36660</b>	<b>34372</b>	<b>2253</b>	<b>35</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	20	35	0
	1090	Exposed Rebar		0	0	0	0
	1120	Efflorescence/Rust Staining		0	400	0	0
	1130	Cracking (RC and Other)		0	1833	0	0
<b>510</b>		<b>Wearing Surface (SF)</b>	<b>35005</b>	<b>30803</b>	<b>3501</b>	<b>701</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	701	0
	3220	Crack (Wearing Surface)		0	3501	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>69</b>	<b>0</b>	<b>47</b>	<b>22</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	47	22	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>1068</b>	<b>0</b>	<b>343</b>	<b>725</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	172	725	0
	1130	Cracking (RC and Other)		0	171	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

Westbound Deck Unit 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>36708</b>	<b>30583</b>	<b>5101</b>	<b>1024</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	60	0
	1090	Exposed Rebar		0	0	50	0
	1120	Efflorescence/Rust Staining		0	1430	734	0
	1130	Cracking (RC and Other)		0	3671	180	0
<b>510</b>		<b>Wearing Surface (SF)</b>	<b>35051</b>	<b>30493</b>	<b>3506</b>	<b>1052</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	1052	0
	3220	Crack (Wearing Surface)		0	3506	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>69</b>	<b>59</b>	<b>10</b>	<b>0</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	10	0	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>1019</b>	<b>0</b>	<b>768</b>	<b>251</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	384	251	0
	1130	Cracking (RC and Other)		0	384	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

Westbound Deck Unit 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>33552</b>	<b>31381</b>	<b>2113</b>	<b>58</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	30	58	0
	1120	Efflorescence/Rust Staining		0	250	0	0
	1130	Cracking (RC and Other)		0	1833	0	0
<b>510</b>		<b>Wearing Surface (SF)</b>	<b>32038</b>	<b>28193</b>	<b>3204</b>	<b>641</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	641	0
	3220	Crack (Wearing Surface)		0	3204	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>138</b>	<b>0</b>	<b>108</b>	<b>30</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	108	30	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>982</b>	<b>0</b>	<b>581</b>	<b>401</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	291	401	0
	1130	Cracking (RC and Other)		0	290	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

Eastbound Deck Unit 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>39252</b>	<b>36829</b>	<b>2383</b>	<b>40</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	20	40	0
	1120	Efflorescence/Rust Staining		0	400	0	0
	1130	Cracking (RC and Other)		0	1963	0	0
	<b>510</b>	<b>Wearing Surface (SF)</b>	<b>37480</b>	<b>32982</b>	<b>3748</b>	<b>750</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	750	0
	3220	Crack (Wearing Surface)		0	3748	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>69</b>	<b>48</b>	<b>0</b>	<b>21</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	0	21	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>1140</b>	<b>0</b>	<b>779</b>	<b>361</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	390	361	0
	1130	Cracking (RC and Other)		0	389	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>

Eastbound Deck Unit 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>36708</b>	<b>32397</b>	<b>4171</b>	<b>140</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	105	0
	1090	Exposed Rebar		0	0	35	0
	1120	Efflorescence/Rust Staining		0	500	0	0
	1130	Cracking (RC and Other)		0	3671	0	0
	<b>510</b>	<b>Wearing Surface (SF)</b>	<b>35051</b>	<b>30843</b>	<b>3506</b>	<b>702</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	702	0
	3220	Crack (Wearing Surface)		0	3506	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>69</b>	<b>59</b>	<b>10</b>	<b>0</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	10	0	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>1019</b>	<b>0</b>	<b>619</b>	<b>400</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	310	400	0
	1130	Cracking (RC and Other)		0	309	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>

Eastbound Deck Unit 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>12</b>		<b>Reinforced Concrete Deck (SF)</b>	<b>33552</b>	<b>29987</b>	<b>3525</b>	<b>40</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	20	40	0
	1120	Efflorescence/Rust Staining		0	150	0	0
	1130	Cracking (RC and Other)		0	3355	0	0
	<b>510</b>	<b>Wearing Surface (SF)</b>	<b>32038</b>	<b>28193</b>	<b>3204</b>	<b>641</b>	<b>0</b>
	3210	Delam/Spall/Patch/Pothole		0	0	641	0
	3220	Crack (Wearing Surface)		0	3204	0	0
<b>305</b>		<b>Assembly Joint without Seal (LF)</b>	<b>138</b>	<b>0</b>	<b>104</b>	<b>34</b>	<b>0</b>
	2360	Adjacent Deck or Header		0	104	34	0
<b>331</b>		<b>Reinforced Concrete Bridge Railing (LF)</b>	<b>982</b>	<b>0</b>	<b>811</b>	<b>171</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	406	171	0
	1130	Cracking (RC and Other)		0	405	0	0
<b>815</b>		<b>Drainage (EA)</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>

Superstructure Summary			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	8944	8781	145	18	0
	1000	Corrosion		0	145	18	0
	515	<b>Steel Protective Coating (SF)</b>	317516	316936	0	580	0
	3440	Effectiveness		0	0	580	0
113		<b>Steel Stringer (LF)</b>	17880	17736	144	0	0
	1000	Corrosion		0	144	0	0
	515	<b>Steel Protective Coating (SF)</b>	101921	101777	0	144	0
	3440	Effectiveness		0	0	144	0
152		<b>Steel Floorbeam (LF)</b>	9918	9503	3	412	0
	1000	Corrosion		0	3	412	0
	515	<b>Steel Protective Coating (SF)</b>	111086	110262	0	824	0
	3440	Effectiveness		0	0	824	0
311		<b>Movable Bearing (EA)</b>	24	21	3	0	0
	2220	Alignment		0	3	0	0
313		<b>Fixed Bearing (EA)</b>	36	35	0	1	0
	1000	Corrosion		0	0	1	0
820		<b>Steel Seated-Hinge Assembly (EA)</b>	12	10	2	0	0

Westbound Superstructure Span 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	311	299	12	0	0
	1000	Corrosion		0	12	0	0
	515	<b>Steel Protective Coating (SF)</b>	11041	10993	0	48	0
	3440	Effectiveness		0	0	48	0
113		<b>Steel Stringer (LF)</b>	622	610	12	0	0
	1000	Corrosion		0	12	0	0
	515	<b>Steel Protective Coating (SF)</b>	3546	3534	0	12	0
	3440	Effectiveness		0	0	12	0
152		<b>Steel Floor Beam (LF)</b>	349	349	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	3909	3909	0	0	0
311		<b>Movable Bearing (EA)</b>	3	3	0	0	0

Westbound Superstructure Span 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	532	532	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	18886	18886	0	0	0
113		<b>Steel Stringer (LF)</b>	1064	1064	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	6065	6065	0	0	0
152		<b>Steel Floor Beam (LF)</b>	559	559	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	6261	6261	0	0	0
311		<b>Movable Bearing (EA)</b>	3	3	0	0	0

Westbound Superstructure Span 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	532	532	0	0	0
	515	Steel Protective Coating (SF)	18886	18886	0	0	0
113		Steel Stringer (LF)	1064	1064	0	0	0
	515	Steel Protective Coating (SF)	6065	6065	0	0	0
152		Steel Floor Beam (LF)	559	559	0	0	0
	515	Steel Protective Coating (SF)	6261	6261	0	0	0
313		Fixed Bearing (EA)	3	3	0	0	0

Westbound Superstructure Span 4			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	599	574	25	0	0
	1000	Corrosion		0	25	0	0
	515	Steel Protective Coating (SF)	21265	21165	0	100	0
	3440	Effectiveness		0	0	100	0
113		Steel Stringer (LF)	1197	1173	24	0	0
	1000	Corrosion		0	24	0	0
	515	Steel Protective Coating (SF)	6823	6799	0	24	0
	3440	Effectiveness		0	0	24	0
152		Steel Floor Beam (LF)	698	572	0	126	0
	1000	Corrosion		0	0	126	0
	515	Steel Protective Coating (SF)	7818	7566	0	252	0
	3440	Effectiveness		0	0	252	0
313		Fixed Bearing (EA)	3	3	0	0	0
820		Steel Seated-Hinge Assembly (EA)	3	2	1	0	0

Westbound Superstructure Span 5			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	599	599	0	0	0
	515	Steel Protective Coating (SF)	21265	21265	0	0	0
113		Steel Stringer (LF)	1197	1197	0	0	0
	515	Steel Protective Coating (SF)	6823	6823	0	0	0
152		Steel Floor Beam (LF)	629	629	0	0	0
	515	Steel Protective Coating (SF)	7045	7045	0	0	0
313		Fixed Bearing (EA)	3	3	0	0	0

Westbound Superstructure Span 6			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	<b>599</b>	<b>573</b>	<b>24</b>	<b>2</b>	<b>0</b>
	1000	Corrosion		0	24	2	0
	515	<b>Steel Protective Coating (SF)</b>	<b>21265</b>	<b>21169</b>	<b>0</b>	<b>96</b>	<b>0</b>
	3440	Effectiveness		0	0	96	0
113		<b>Steel Stringer (LF)</b>	<b>1197</b>	<b>1173</b>	<b>24</b>	<b>0</b>	<b>0</b>
	1000	Corrosion		0	24	0	0
	515	<b>Steel Protective Coating (SF)</b>	<b>6823</b>	<b>6799</b>	<b>0</b>	<b>24</b>	<b>0</b>
	3440	Effectiveness		0	0	24	0
152		<b>Steel Floor Beam (LF)</b>	<b>698</b>	<b>664</b>	<b>3</b>	<b>31</b>	<b>0</b>
	1000	Corrosion		0	3	31	0
	515	<b>Steel Protective Coating (SF)</b>	<b>7818</b>	<b>7750</b>	<b>0</b>	<b>68</b>	<b>0</b>
	3440	Effectiveness		0	0	68	0
313		<b>Fixed Bearing (EA)</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
820		<b>Steel Seated-Hinge Assembly (EA)</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>

Westbound Superstructure Span 7			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	<b>532</b>	<b>529</b>	<b>0</b>	<b>3</b>	<b>0</b>
	1000	Corrosion		0	0	3	0
	515	<b>Steel Protective Coating (SF)</b>	<b>18886</b>	<b>18886</b>	<b>0</b>	<b>0</b>	<b>0</b>
113		<b>Steel Stringer (LF)</b>	<b>1064</b>	<b>1064</b>	<b>0</b>	<b>0</b>	<b>0</b>
	515	<b>Steel Protective Coating (SF)</b>	<b>6065</b>	<b>6065</b>	<b>0</b>	<b>0</b>	<b>0</b>
152		<b>Steel Floor Beam (LF)</b>	<b>559</b>	<b>559</b>	<b>0</b>	<b>0</b>	<b>0</b>
	515	<b>Steel Protective Coating (SF)</b>	<b>6261</b>	<b>6261</b>	<b>0</b>	<b>0</b>	<b>0</b>
313		<b>Fixed Bearing (EA)</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>
	1000	Corrosion		3	0	0	1

Westbound Superstructure Span 8			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	<b>466</b>	<b>466</b>	<b>0</b>	<b>0</b>	<b>0</b>
	515	<b>Steel Protective Coating (SF)</b>	<b>16543</b>	<b>16543</b>	<b>0</b>	<b>0</b>	<b>0</b>
113		<b>Steel Stringer (LF)</b>	<b>931</b>	<b>931</b>	<b>0</b>	<b>0</b>	<b>0</b>
	515	<b>Steel Protective Coating (SF)</b>	<b>5307</b>	<b>5307</b>	<b>0</b>	<b>0</b>	<b>0</b>
152		<b>Steel Floor Beam (LF)</b>	<b>489</b>	<b>489</b>	<b>0</b>	<b>0</b>	<b>0</b>
	515	<b>Steel Protective Coating (SF)</b>	<b>5477</b>	<b>5477</b>	<b>0</b>	<b>0</b>	<b>0</b>
313		<b>Fixed Bearing (EA)</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>



Westbound Superstructure Span 9			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>107</b>		<b>Steel Open Girder/Beam (LF)</b>	<b>248</b>	<b>236</b>	<b>12</b>	<b>0</b>	<b>0</b>
	1000	Corrosion		0	12	0	0
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>8804</b>	<b>8756</b>	<b>0</b>	<b>48</b>	<b>0</b>
	3440	Effectiveness		0	0	48	0
<b>113</b>		<b>Steel Stringer (LF)</b>	<b>496</b>	<b>484</b>	<b>12</b>	<b>0</b>	<b>0</b>
	1000	Corrosion		0	12	0	0
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>2828</b>	<b>2816</b>	<b>0</b>	<b>12</b>	<b>0</b>
	3440	Effectiveness		0	0	12	0
<b>152</b>		<b>Steel Floor Beam (LF)</b>	<b>349</b>	<b>349</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>3909</b>	<b>3909</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>311</b>		<b>Movable Bearing (EA)</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>

Eastbound Superstructure Span 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	419	399	12	8	0
	1000	Corrosion		0	12	8	0
	515	Steel Protective Coating (SF)	14875	14827	0	48	0
	3440	Effectiveness		0	0	48	0
113		Steel Stringer (LF)	838	826	12	0	0
	1000	Corrosion		0	12	0	0
	515	Steel Protective Coating (SF)	4777	4765	0	12	0
	3440	Effectiveness		0	0	12	0
152		Steel Floor Beam (LF)	489	486	0	3	0
	1000	Corrosion		0	0	3	0
	515	Steel Protective Coating (SF)	5477	5477	0	0	0
311		Movable Bearing (EA)	3	3	0	0	0

Eastbound Superstructure Span 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	532	532	0	0	0
	515	Steel Protective Coating (SF)	18886	18886	0	0	0
113		Steel Stringer (LF)	1064	1064	0	0	0
	515	Steel Protective Coating (SF)	6065	6065	0	0	0
152		Steel Floor Beam (LF)	559	559	0	0	0
	515	Steel Protective Coating (SF)	6261	6261	0	0	0
311		Movable Bearing (EA)	3	3	0	0	0

Eastbound Superstructure Span 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	532	532	0	0	0
	515	Steel Protective Coating (SF)	18886	18886	0	0	0
113		Steel Stringer (LF)	1064	1064	0	0	0
	515	Steel Protective Coating (SF)	6065	6065	0	0	0
152		Steel Floor Beam (LF)	559	559	0	0	0
	515	Steel Protective Coating (SF)	6261	6261	0	0	0
313		Fixed Bearing (EA)	3	3	0	0	0

Eastbound Superstructure Span 4			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	599	570	24	5	0
	1000	Corrosion		0	24	5	0
	515	<b>Steel Protective Coating (SF)</b>	21265	21169	0	96	0
	3440	Effectiveness		0	0	96	0
113		<b>Steel Stringer (LF)</b>	1197	1173	24	0	0
	1000	Corrosion		0	24	0	0
	515	<b>Steel Protective Coating (SF)</b>	6823	6799	0	24	0
	3440	Effectiveness		0	0	24	0
152		<b>Steel Floor Beam (LF)</b>	698	572	0	126	0
	1000	Corrosion		0	0	126	0
	515	<b>Steel Protective Coating (SF)</b>	7818	7566	0	252	0
	3440	Effectiveness		0	0	252	0
313		<b>Fixed Bearing (EA)</b>	3	3	0	0	0
820		<b>Steel Seated-Hinge Assembly (EA)</b>	3	3	0	0	

Eastbound Superstructure Span 5			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	599	599	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	21265	21265	0	0	0
113		<b>Steel Stringer (LF)</b>	1197	1197	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	6823	6823	0	0	0
152		<b>Steel Floorbeam (LF)</b>	629	629	0	0	0
	515	<b>Steel Protective Coating (SF)</b>	7045	7045	0	0	0
313		<b>Fixed Bearing (EA)</b>	3	3	0	0	0

Eastbound Superstructure Span 6			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		<b>Steel Open Girder/Beam (LF)</b>	599	575	24	0	0
	1000	Corrosion		0	24	0	0
	515	<b>Steel Protective Coating (SF)</b>	21265	21169	0	96	0
	3440	Effectiveness		0	0	96	0
113		<b>Steel Stringer (LF)</b>	1197	1173	24	0	0
	1000	Corrosion		0	24	0	0
	515	<b>Steel Protective Coating (SF)</b>	6823	6799	0	24	0
	3440	Effectiveness		0	0	24	0
152		<b>Steel Floorbeam (LF)</b>	698	572	0	126	0
	1000	Corrosion		0	0	126	0
	515	<b>Steel Protective Coating (SF)</b>	7818	7566	0	252	0
	3440	Effectiveness		0	0	252	0
313		<b>Fixed Bearing (EA)</b>	3	3	0	0	0
820		<b>Steel Seated-Hinge Assembly (EA)</b>	3	2	1	0	0
	1000	Corrosion		0	1	0	0

Eastbound Superstructure Span 7			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	532	532	0	0	0
515		Steel Protective Coating (SF)	18886	18886	0	0	0
113		Steel Stringer (LF)	1064	1064	0	0	0
	515	Steel Protective Coating (SF)	6065	6065	0	0	0
152		Steel Floorbeam (LF)	559	559	0	0	0
	515	Steel Protective Coating (SF)	6261	6261	0	0	0
313		Fixed Bearing (EA)	3	3	0	0	0

Eastbound Superstructure Span 8			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
107		Steel Open Girder/Beam (LF)	466	466	0	0	0
	515	Steel Protective Coating (SF)	16543	16543	0	0	0
113		Steel Stringer (LF)	931	931	0	0	0
	515	Steel Protective Coating (SF)	5307	5307	0	0	0
152		Steel Floorbeam (LF)	489	489	0	0	0
	515	Steel Protective Coating (SF)	5477	5477	0	0	0
313		Fixed Bearing (EA)	3	3	0	0	0

Eastbound Superstructure Span 9			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>107</b>		<b>Steel Open Girder/Beam (LF)</b>	<b>248</b>	<b>236</b>	<b>12</b>	<b>0</b>	<b>0</b>
	1000	Corrosion		0	12	0	0
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>8804</b>	<b>8756</b>	<b>0</b>	<b>48</b>	<b>0</b>
	3440	Effectiveness		0	0	48	0
<b>113</b>		<b>Steel Stringer (LF)</b>	<b>496</b>	<b>484</b>	<b>12</b>	<b>0</b>	<b>0</b>
	1000	Corrosion		0	12	0	0
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>2828</b>	<b>2816</b>	<b>0</b>	<b>12</b>	<b>0</b>
	3440	Effectiveness		0	0	12	0
<b>152</b>		<b>Steel Floorbeam (LF)</b>	<b>349</b>	<b>349</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>515</b>	<b>Steel Protective Coating (SF)</b>	<b>3909</b>	<b>3909</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>311</b>		<b>Movable Bearing (EA)</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>
	2220	Alignment		0	3	0	0

Substructure Summary			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>32</b>	<b>8</b>	<b>8</b>	<b>16</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	3	16	0
	<b>1120</b>	<b>Efflorescence/Rust Staining</b>		0	<b>1</b>	0	0
	1190	Abrasion/Wear		0	<b>1</b>	0	0
	6000	Scour		0	<b>3</b>	0	0
<b>215</b>		<b>Reinforced Concrete Abutment (LF)</b>	<b>92</b>	<b>56</b>	<b>24</b>	<b>12</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	24	12	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>960</b>	<b>921</b>	<b>9</b>	<b>30</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	9	30	0
<b>830</b>		<b>Abutment Backwall (LF)</b>	<b>288</b>	<b>133</b>	<b>84</b>	<b>63</b>	<b>8</b>

Westbound Rear Abutment			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>215</b>		<b>Reinforced Concrete Abutment (LF)</b>	<b>22</b>	<b>18</b>	<b>4</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	4	0	0
<b>830</b>		<b>Abutment Backwall (LF)</b>	<b>72</b>	<b>40</b>	<b>26</b>	<b>6</b>	<b>0</b>

Westbound Pier 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	0	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>0</b>

Westbound Pier 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	1	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>55</b>	<b>0</b>	<b>5</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	5	0

Westbound Pier 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	<b>1</b>	0	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>56</b>	<b>1</b>	<b>3</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	3	0

Westbound Pier 4			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>58</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0

Westbound Pier 5			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
205		Reinforced Concrete Column (EA)	2	1	1	0	0
	6000	Scour		0	1	0	0
234		Reinforced Concrete Pier Cap (LF)	60	59	1	0	0
	1080	Delamination/Spall/Patched Area		0	1	0	0

Westbound Pier 6			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
215		Reinforced Concrete Column (EA)	2	0	0	2	0
	1080	Delamination/Spall/Patched Area		0	0	2	0
234		Reinforced Concrete Pier Cap (LF)	60	58	2	0	0
	1080	Delamination/Spall/Patched Area		0	2	0	0

Westbound Pier 7			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
205		Reinforced Concrete Column (EA)	2	0	0	2	0
	1080	Delamination/Spall/Patched Area		0	0	2	0
234		Reinforced Concrete Pier Cap (LF)	60	52	0	8	0
	1080	Delamination/Spall/Patched Area		0	1	8	0

Westbound Pier 8			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
205		Reinforced Concrete Column (EA)	2	2	0	0	0
234		Reinforced Concrete Pier Cap (LF)	60	60	0	0	0

Westbound Forward Abutment			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
215		Reinforced Concrete Abutment (LF)	24	8	10	6	0
	1080	Delamination/Spall/Patched Area		0	10	6	0
830		Abutment Backwall (LF)	72	35	14	23	0

Eastbound Rear Abutment			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>215</b>		<b>Reinforced Concrete Abutment (LF)</b>	<b>22</b>	<b>21</b>	<b>1</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	0	0
<b>830</b>		<b>Abutment Backwall (LF)</b>	<b>72</b>	<b>37</b>	<b>30</b>	<b>5</b>	<b>0</b>

Eastbound Pier 1			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	1	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	0	0

Eastbound Pier 2			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>51</b>	<b>3</b>	<b>6</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	3	6	0

Eastbound Pier 3			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	1	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>57</b>	<b>1</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	2	0

Eastbound Pier 4			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	1	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>0</b>



Eastbound Pier 5			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
	6000	Scour		0	2	0	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>58</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0

Eastbound Pier 6			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	1	0
	1190	Abrasion/Wear		0	1	0	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>59</b>	<b>1</b>	<b>0</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	1	0	0

Eastbound Pier 7			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>58</b>	<b>0</b>	<b>2</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	2	0

Eastbound Pier 8			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>205</b>		<b>Reinforced Concrete Column (EA)</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	1	0
	1120	Efflorescence/Rust Staining		0	1	0	0
<b>234</b>		<b>Reinforced Concrete Pier Cap (LF)</b>	<b>60</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>0</b>

Eastbound Forward Abutment			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>215</b>		<b>Reinforced Concrete Abutment (LF)</b>	<b>24</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	9	6	0
<b>830</b>		<b>Abutment Backwall (LF)</b>	<b>72</b>	<b>21</b>	<b>14</b>	<b>29</b>	<b>8</b>

Approach Summary			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>321</b>		<b>Reinforced Concrete Approach Slab (SF)</b>	<b>4842</b>	<b>4404</b>	<b>64</b>	<b>374</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	170	0
	1130	Cracking (RC and Other)		0	64	204	0

Westbound Rear (West) Approach			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>321</b>		<b>Reinforced Concrete Approach Slab (SF)</b>	<b>1200</b>	<b>1200</b>	<b>0</b>	<b>0</b>	<b>0</b>

Westbound Forward (East) Approach			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>321</b>		<b>Reinforced Concrete Approach Slab (SF)</b>	<b>1242</b>	<b>1018</b>	<b>0</b>	<b>224</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	20	0
	1130	Cracking (RC and Other)		0	0	204	0

Eastbound Rear (West) Approach			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>321</b>		<b>Reinforced Concrete Approach Slab (SF)</b>	<b>1200</b>	<b>1200</b>	<b>0</b>	<b>0</b>	<b>0</b>

Eastbound Forward (East) Approach			Condition State				
NBI	Defect	Description	QTY.	1	2	3	4
<b>321</b>		<b>Reinforced Concrete Approach Slab (SF)</b>	<b>1200</b>	<b>986</b>	<b>64</b>	<b>150</b>	<b>0</b>
	1080	Delamination/Spall/Patched Area		0	0	150	0
	1130	Cracking (RC and Other)		0	64	0	0

## **APPENDIX F**

### **Fracture Critical Plan and Fatigue Prone Details**



## **Fracture Critical Member (FCM) Inspection Procedure**

*Reference: ODOT Manual of Bridge Inspection, Chapter 4*

<b>Inspection Responsibility:</b>	ODOT District 12
<b>County-Route-SLM:</b>	CUY-480-0647
<b>Structural File Number:</b>	1812831
<b>Inspection Frequency:</b>	24 Months
<b>Fatigue Life Study:</b>	Year of Study: <u>Not Calculated</u> Remaining Fatigue Life: <u>Not Calculated</u>
<b>Load Path Redundant:</b>	Main Spans: <u>No, Each structure is a three-girder system at 25'-6" spacing, and floorbeam spacing exceeds 14'.</u> Approach Spans: <u>None.</u>
<b>Structurally Redundant:</b>	<u>No, Girders are continuous spans.</u>
<b>Internally Redundant:</b>	<u>No, Tension members consist of welded built-up plate girders and built-up/rolled I-section members.</u>
<b>System Redundant:</b>	<u>No rigorous analysis performed (i.e. finite element, 3-D modeling)</u>



Figure 1 – CUY-480-0647 south elevation, looking northwest.

**Location:** The CUY-480-0647 Bridge (see Figure 1) spans the Rocky River Valley north of Cleveland Hopkins International Airport (see Figure 2). The bridge carries traffic on Interstate 480 between the cities of Fairview Park and Cleveland, Ohio.

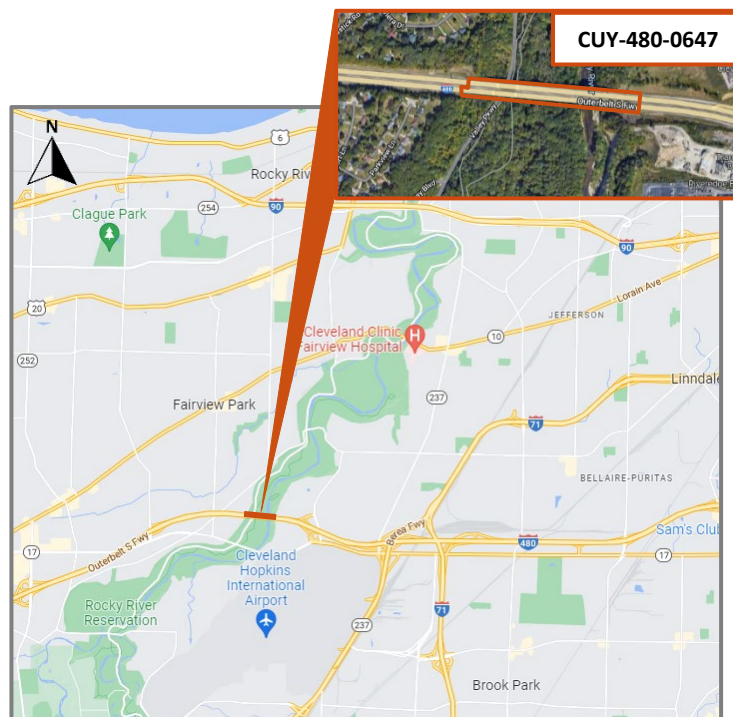


Figure 2 – CUY-480-0647 location map.

**Structure Description:** Each structure consists of a nine-span superstructure divided into three continuous units by seated hinges present in Spans 4 and 6. Originally constructed in 1970, the existing eastbound structure is approximately 1,571' long, and the existing westbound structure is approximately 1,535' long. Each structure carries four lanes of traffic with wide shoulders along each railing with approximate roadway widths of 69'-0". Span 1 for the eastbound and westbound structures are 139'-8" long and 103'-8" long, respectively, while the remaining spans are the same across both bridges: Spans 2 and 3 are each 177'-4" long, Spans 4, 5, and 6 are each 199'-6" long, Span 7 is 177'-4" long, Span 8 is 155'-2" long, and Span 9 is 82'-8" long.

The deck for each structure is supported by six steel stringers: the interior stringers consist of rolled 21WF55 or 21WF62 sections, stringers along the median (Stringers 6 and 7) consist of rolled 12WF45 sections, and exterior stringers (Stringers 1 and 12) consist of small welded haunched I-sections. The steel floorbeams, which have spacing that varies from 11'-6" to 22'-2" on-center, consist of built-up I-sections of varying height comprised of both rolled wide flange beams and built-up plate sections with transverse stiffeners. The main girders, spaced at 25'-6" on-center, are comprised of haunched, welded plate girders that vary from 12'-0" to 15'-0" in height.

The westbound bridge was closed in 2000 due to a crack being found on the support side of the seated hinge in Span 4 at Girder D. Shortly thereafter, the bridge was repaired by jacking each seated hinge and installing carrier beam retrofits at all twelve hinge locations to provide redundancy. The structure has undergone several additional minor modifications and rehabilitations since its original construction.

The fracture critical members on this structure include all main girders (Girders A through F) and all floorbeams (Floorbeams 1 through 72).



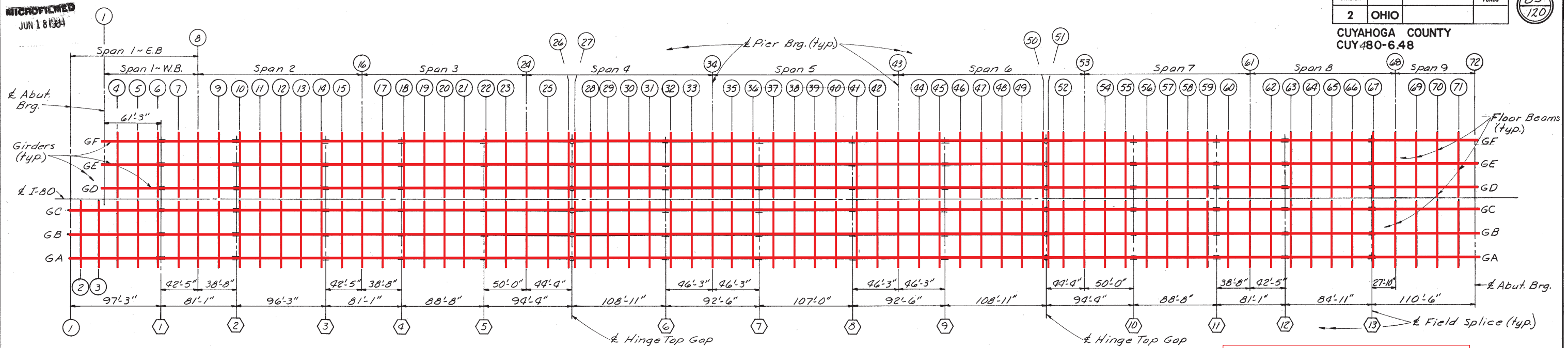
Figure 3 – CUY-480-0647 superstructure underside, looking west in Span 7.

MICROFILMED  
JUN 18 1984

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

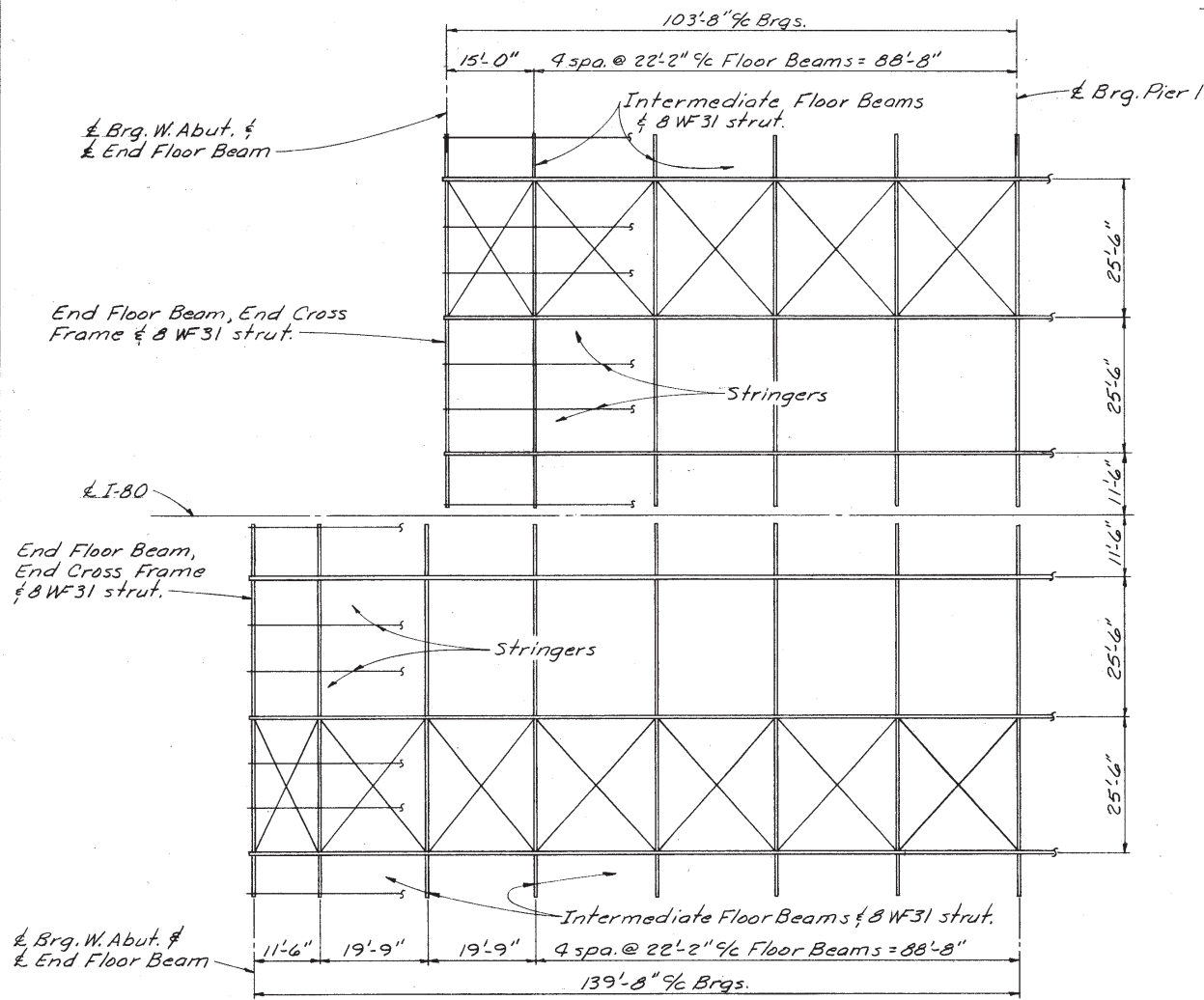
89  
120

CUYAHOGA COUNTY  
CUY480-6.48

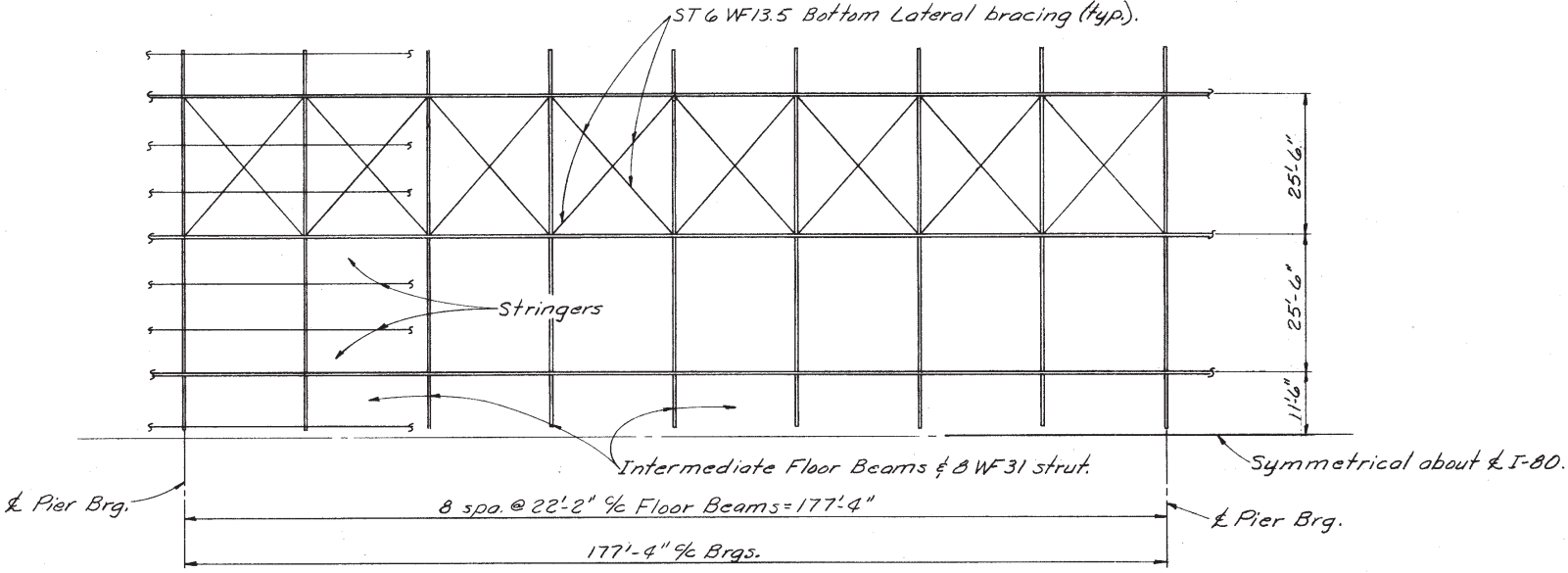


GENERAL FRAMING PLAN  
(Stringers & Lateral system not shown.)

Girders and floor beams are fracture critical members



SPAN 1 FRAMING PLAN  
(Stringer intermediate crossframes not shown.)



SPANS 2,3 & 7 FRAMING PLAN  
(Stringer intermediate crossframes not shown.)

BEARING UNITS	
Location (& Bearing)	Unit
W. Abutment ~ All Girders	R-925
Pier 1 ~ " "	R-1125
Piers 2 & 7 ~ " "	B-1125
Piers 3 thru 6 ~ " "	B-1250
Pier 8 ~ " "	R-850
E. Abutment ~ " "	R-300

For details of Bearing Units, see sheets 40 & 41/53

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CONSULTING ENGINEERS  
COLUMBUS, OHIO 30/53

FRAMING PLAN  
BRIDGE No. CUY480-0648  
OUTERBELT SOUTH over ROCKY RIVER  
CUYAHOGA COUNTY STA. 441+96.50 E.B.  
STA. 457+67.50

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GEA	JER	DW	RWE	J.E.V.	2/23/68	

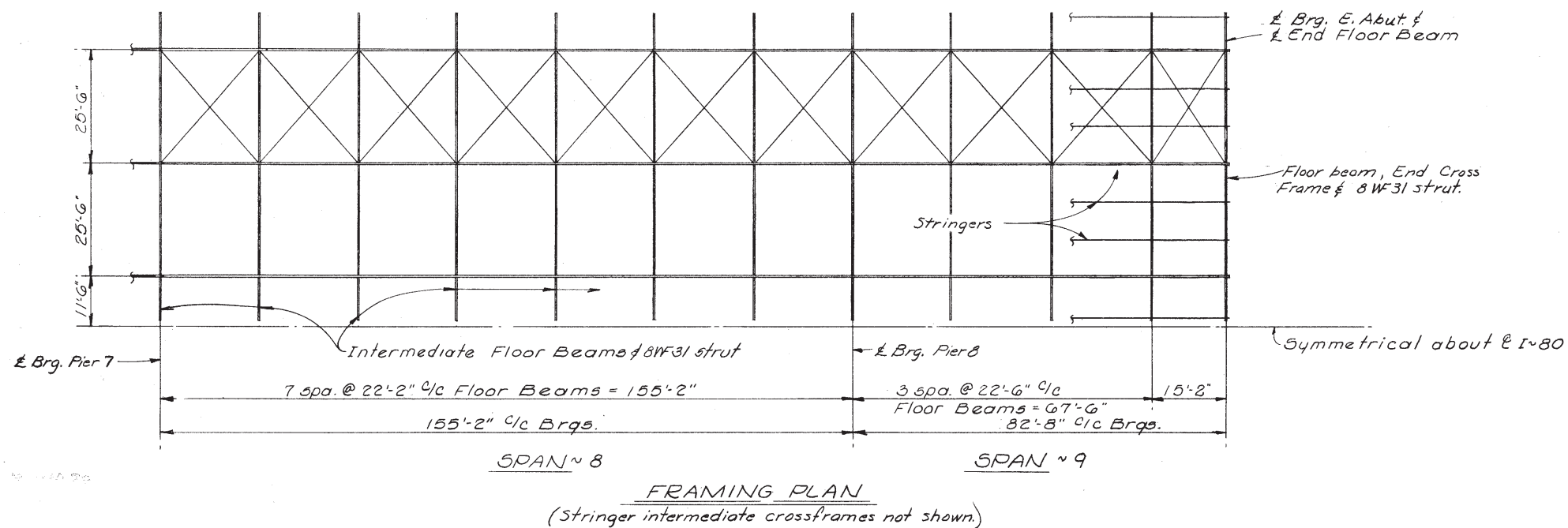
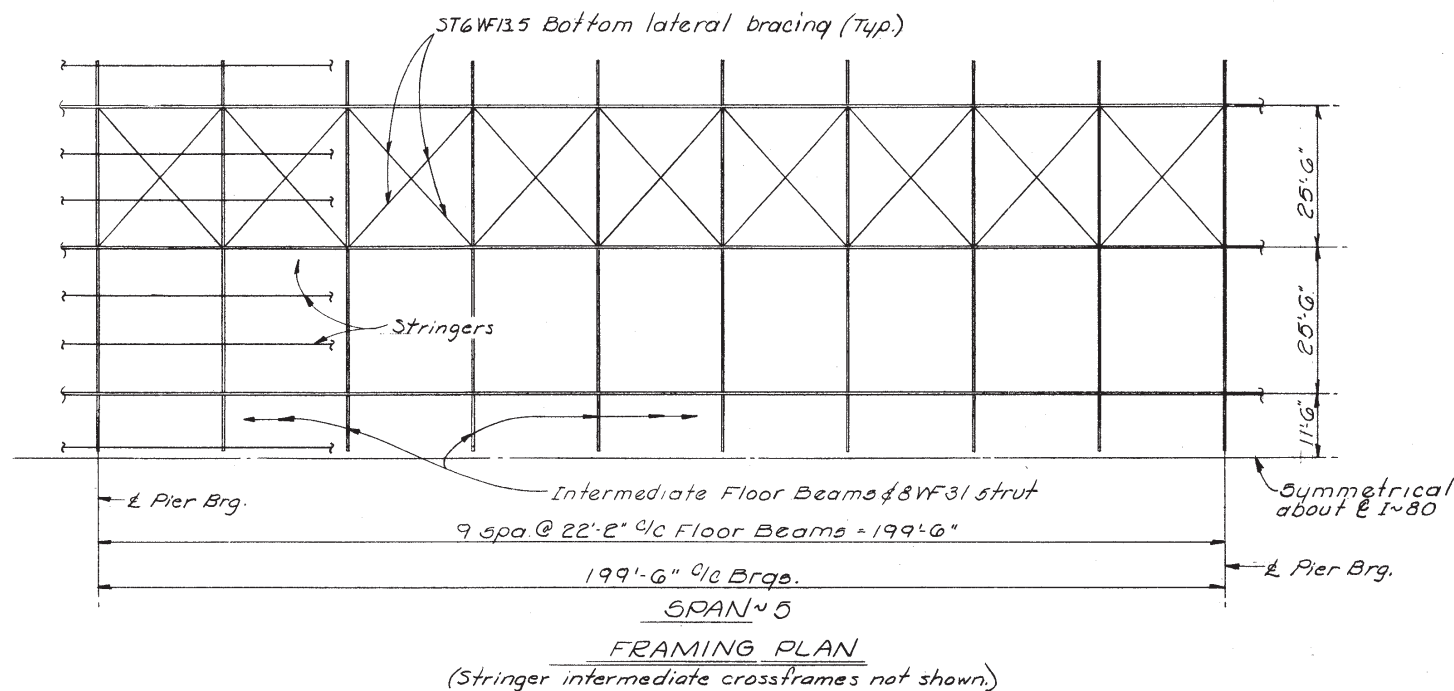
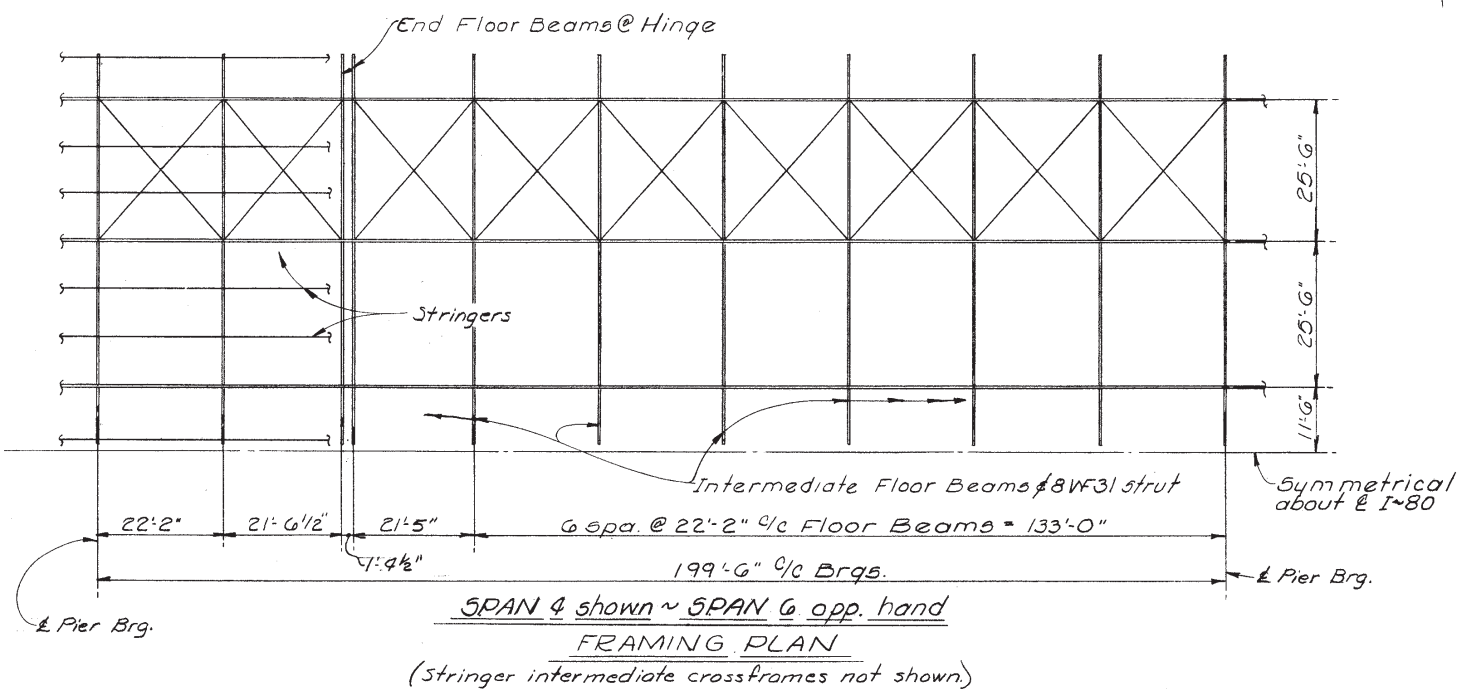
Rev. 10-22-70

MICROFILMED  
JUN 18 1984

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

90  
120

CUYAHOGA COUNTY  
CUY 480-6.48



NOTE  
For Bearing Units, see sheets 4142/53

ALDEN E. STILSON & ASSOCIATES, LIMITED CONSULTING ENGINEERS COLUMBUS, OHIO						31/53
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## Inspection Risk Factors

**Inspection Procedure and Inspector Access Risk Factors:** A combination of aerial lift equipment, rope access techniques, protected climbing techniques, ladders, and/or rigging are required to gain hands-on access to all the fracture critical members and their tension regions. In the 2022 inspection, all fracture critical members were accessed with a 62' under-bridge inspection unit (snooper) and using protected climbing and rope access techniques utilizing the installed safety cables along the girders.

- Inspection Methods
  - Main girders: Inspect the bottom flange and bottom half of the web in positive moment regions, the top flange and top half of the web in negative moment regions, and the full height of the web in primary shear regions. Inspect each member for its full length, particularly for distress at fatigue prone details and at prior retrofit locations.
  - Floorbeams: Inspect the bottom flange and bottom half of the web in positive moment regions, the top flange and top half of the web in negative moment regions, and the full height of the web in primary shear regions, especially at the copes for cracks and for distress at fatigue prone details.
- Access
  - Under-bridge inspection unit: Used to gain hands-on access to the main girders and floorbeams which are within reach from the outside lane and shoulder of each structure
  - Protected climbing and rope access: Used to gain hands-on access to the interior faces of girders below the median and floorbeam cantilevers not within reach of the snooper. Girders are accessed from the bridge ends using installed safety cables.
- Maintenance of Traffic
  - Single right lane and shoulder closures in each direction of I-480 are required during snooper work.
- Inspector Risks
  - Work at heights
  - Traffic on the bridge
  - Working over water
  - Cold/hot extreme temperatures
  - Biological/wildlife hazards

<b>Inspection Risk Factors</b>			
<b>Risk Factor</b>	<b>Location</b>	<b>Description</b>	<b>Photo</b>
Fracture Critical Structure	Superstructure	Main girder or floorbeam failure would cause partial or complete collapse of the structure.	-
Fatigue Prone Detail – Category E	Girder web	Base metal at the end termination of longitudinal stiffener to web welds with no transition radius (Category E)	1
Fatigue Prone Detail – Category E	Girder web	Base metal at lateral bracing connection plate to web welds (Category E)	2
Fatigue Prone Detail – Category E	Girder web	Base metal at abandoned channel bracket to web welds (Category E)	3
Fatigue Prone Detail – Category E'	Girders at hinge seats	Base metal at the termination of longitudinal seat plates welds to floorbeam webs (thickness > 0.8") (Category E')	4
Fatigue Prone Detail – Category E	Floorbeam webs	Base metal at all-around access hole reinforcing plate welds to webs of floorbeam cantilevers (Category E)	5
Fatigue Prone Detail – Category E	Stringer bottom flanges	Base metal at the termination of partial length welded cover plates with welds across the ends (flange thickness ≤ 0.8") (Category E)	6
Previous Cracking and Repairs	Girder webs along lateral bracing connections and floorbeam flange	Overcuts, misshapen arrest holes, or areas that were not fully sawcut during installation.	7
Previous Cracking and Repairs	Girders at hinge seats in Spans 4 and 6s	Installed carrier beam retrofits at all 12 hinge locations in response to previous cracking noted in Girder D in Span 4.	8
High ADTT	All primary truss members and floorbeams	Average daily traffic is 120,850 vehicles with average truck traffic of 7,240.	-

Category Reference: AASHTO LRFD Bridge Design Specs Table 6.6.1.2.3-1



Photo 1 – Base metal at the end termination of longitudinal stiffener to girder web welds with no transition radius (Category E). Girder E at Floorbeam 18 shown, looking northeast.



Photo 2 – Base metal at lateral bracing connection plate to girder web welds (Category E). Girder F at Floorbeam 37 shown, looking south.



Photo 3 – Base metal at abandoned channel bracket to girder web welds (Category E). Girder C between Floorbeams 52 and 53 shown, looking northwest.

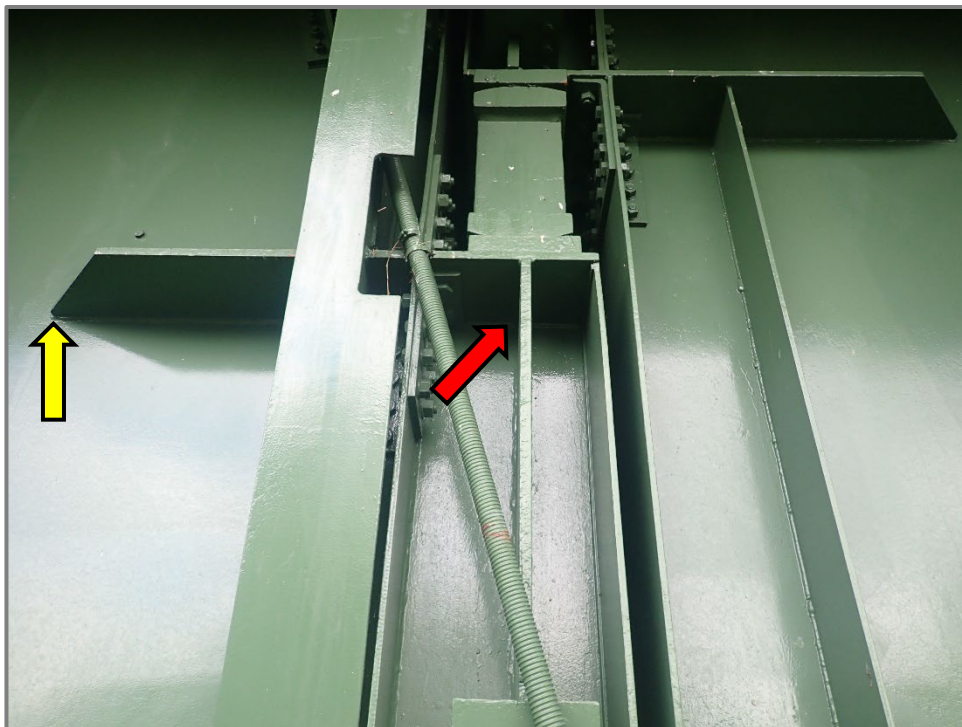


Photo 4 – Base metal at the termination of longitudinal seat plates welds to floorbeam webs (thickness > 0.8") (Category E'). Girder A at the Span 4 hinge shown, looking north. Note triaxial constraint below hinge.



Photo 5 – Base metal at all-around access hole reinforcing plate welds to webs of floorbeam cantilevers (Category E). Floorbeam 26 north cantilever at Girder C shown, looking east.

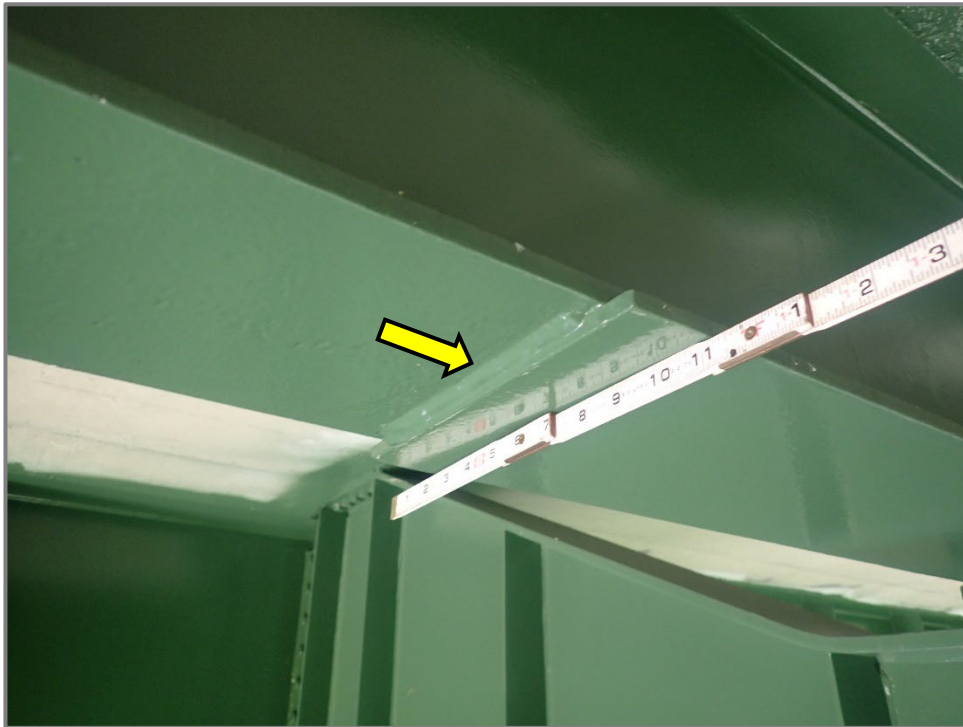


Photo 6 – Base metal at the termination of partial length welded cover plates with welds across the ends (flange thickness  $\leq 0.8$ " ) (Category E). Stringer 3 on the west side of Floorbeam 20 shown, looking northeast.

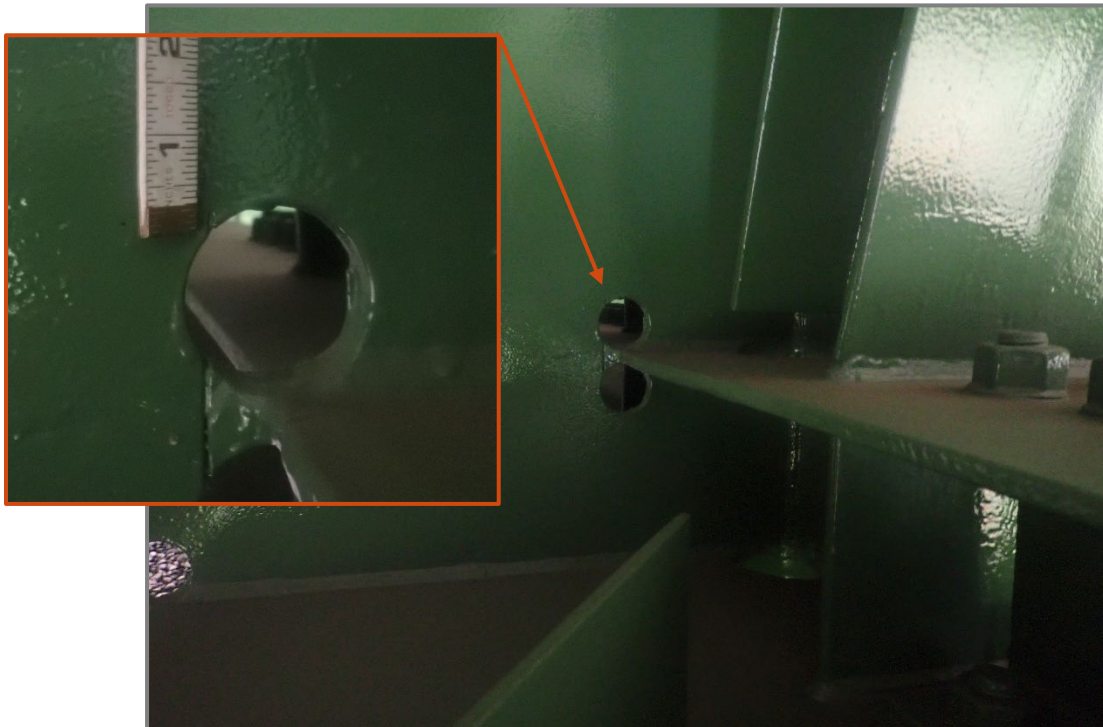


Photo 7 – Typical dogbone retrofit overcut in the girder web, looking north at Girder B at Floorbeam 4. Note that some overcut locations are not visible due to the new paint system.



Photo 8 – Typical carrier beam retrofit installed below the seated hinge joints, looking north at Girder A at the Span 4 expansion joint.