PHYSICAL CONDITION REPORT
FOR THE 2022 ROUTINE ELEMENT LEVEL INSPECTION

BROOKPARK ROAD BRIDGE
BRIDGE NO. CUY-17-0283
SFN: 1802046

OHIO DEPARTMENT OF TRANSPORTATION DISTRICT 12
PID #115405

Inspected: August 22-26 and September 7, 2022

Report: December 2022

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2022 ROUTINE ELEMENT LEVEL PHYSICAL CONDITION REPORT

of the

BROOKPARK ROAD BRIDGE OVER THE ROCKY RIVER
BRIDGE NO. CUY-17-0283
SFN: 1802046

CUYAHOGA COUNTY, OHIO

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Inspected on:

August 22-26 and September 7, 2022

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Prepared for:

OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 12

PID No. 115405

Report Submitted December 2022

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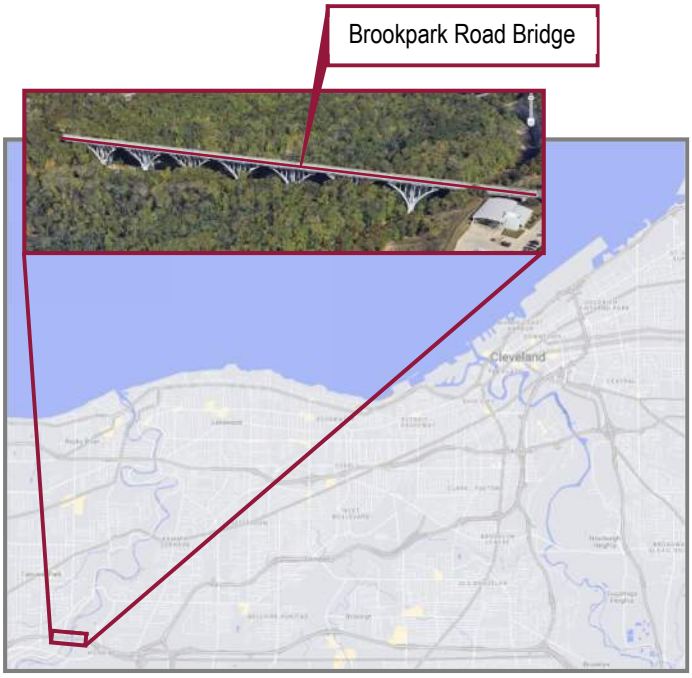
BRIDGE DESCRIPTION



Location Map

The CUY-17-0283 Bridge (Brookpark Road Bridge over the Rocky River) carries four lanes of S.R. 17 traffic over the Rocky River, the Cleveland Metroparks Rocky River Reservation, the Valley Parkway Trail, and Valley Parkway in Cuyahoga County, Ohio.

The bridge was built in 1933 and is composed of seventeen spans with an overall length of 1,918'-7" including the approach slabs **(see Figure 1)**. The superstructure is composed of six reinforced concrete beam spans at the rear approach, eight open spandrel reinforced concrete arch spans, and three reinforced concrete beam spans at the forward approach which all have a reinforced concrete deck with a latex modified wearing surface, 5' wide sidewalks, and metal railings. There are slabs that span the cellular abutments, and they are included in the element quantities but do not alter the total span count of seventeen **(see Figure 2)**. The approach spans are composed of ten lines of reinforced concrete beams, and the arch spans consist of two reinforced concrete arch lines that include the main arches, spandrel columns, and reinforced concrete jack arches. The superstructure is supported by two reinforced concrete cellular abutments, reinforced concrete pier caps and columns in the approach spans, two reinforced concrete pylons at the ends of the arch spans, and reinforced concrete columns between each of the arch spans **(see Figure 3)**.

All structure component nomenclature follows previous inspection reports for consistency and in accordance with current ODOT standards. Therefore, in this report, “left” is north, “right” is south, “rear” is west, and “forward” is east. Substructure units and spans are labeled from west to east beginning with the Rear Abutment. Pylons are referred to as West or East. The two reinforced concrete abutment slabs are labeled as the Rear Abutment Slab and the Forward Abutment Slab. The reinforced concrete beam spans are numbered from west to east starting with Span 1 through Span 6 at the rear approach and Span 15 through Span 17 at the forward approach. The open spandrel reinforced concrete arch spans are labeled from west to east beginning with Span A and ending with Span H. The arch span spandrel columns and floorbeams are labeled from west to east starting with Floorbeam 0 in each span, and floorbeams at the pylons and piers are labeled west or east with respect to the substructure unit near which they are situated.

The bridge underwent several minor rehabilitations in 1955, 1966, and 2017. In 1955, portions of the rear abutment, sidewalks, curbs, and roadway joints were rehabilitated, and the expansion joints were replaced in 1966. There was a major rehabilitation in 1989 in order to widen the structure from a 39' roadway to a 52' roadway. During the course of the widening, a new wearing surface was applied, the drainage system was replaced, new elastomeric compression seals were installed, bronze sliding plate expansion bearings were rehabilitated by replacing asbestos sheets with Teflon sheets, and areas of deteriorated concrete were patched with pneumatically-placed mortar. The most recent rehabilitation took place in 2017 and included a

wearing surface replacement, new elastomeric compression seals, rehabilitation and painting of the railings, new fences between the arch pier columns, and the installation of netting below Spans B and C.

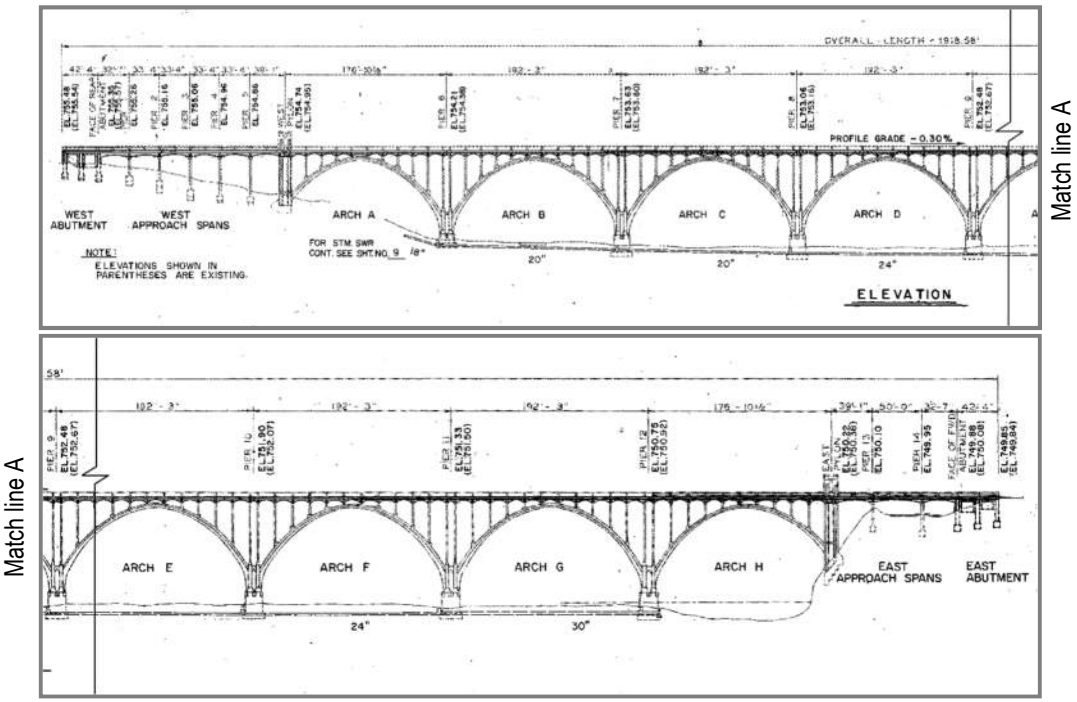


Figure 1 – CUY-17-0283 South Elevation (taken from the major rehabilitation plans).

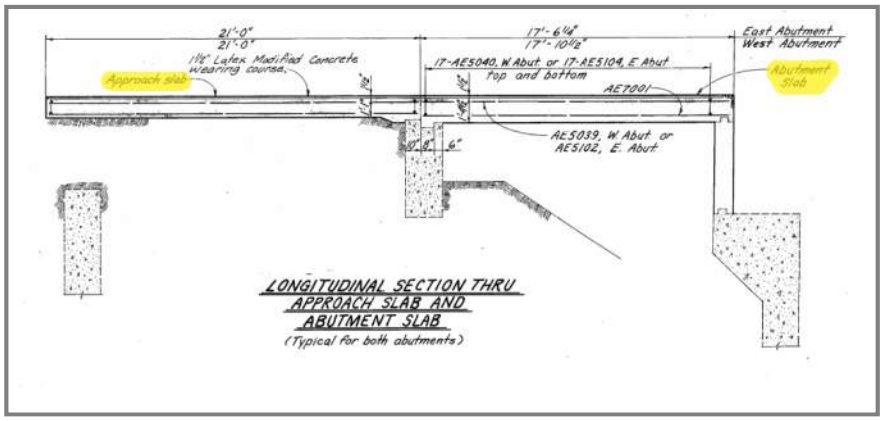


Figure 2 – Longitudinal section through the approach and abutment slabs at the abutments (taken from the major rehabilitation plans).

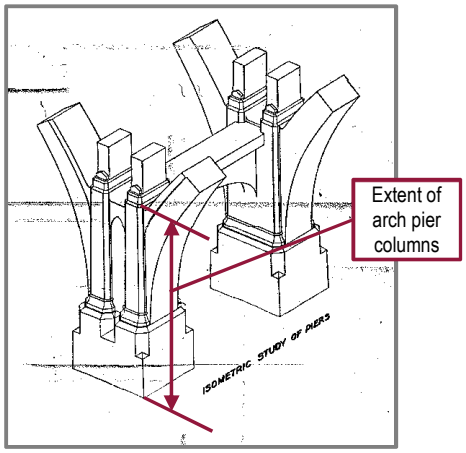


Figure 3 – Typical arch pier (taken from the original design plans).

INSPECTION SCOPE AND PROCEDURE

Personnel from TranSystems Corporation performed a routine element level inspection of the bridge during the days of August 22 through 26 and September 7, 2022. Access to the structure was gained through use of an Aspen Aerials A-62 under bridge inspection unit (snooper). The substructure units of the bridge from the Rear Abutment to the Rocky River were also accessed from the ground.

The 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 but was not limited to: chipping hammers, wire brushes, measuring tapes, 6 foot carpenter rules, and flashlights. Color digital photographs were taken of areas of deterioration, condition changes, typical details, and any immediate maintenance needs, if necessary.

Traffic control was necessary to perform a routine element level inspection and consisted of single right lane alternating closures in both the westbound and eastbound directions.

INSPECTION TEAM

The TranSystems inspection team members are as follows:

- Carolyn Guion, PE
- Steven Hammerschmidt, PE
- Victoria Feudo, PE
- Jacob Adamrovich, EIT

CONDITION RATING GUIDELINES

State and federal guidelines for evaluating the condition of bridges have been 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.
2. *Manual for Bridge Element Inspection, 2nd Edition,* AASHTO, 2019
3. *Manual for Condition Evaluation of Bridges, 2nd Edition,* AASHTO, 2011 (rev 2016).
4. *Bridge Inspector's Reference Manual,* U. S. Department of Transportation, 2002 (rev 2012).
5. *National Bridge Inspection Standards,* U.S. Department of Transportation, 2004.
6. *Manual for Bridge Evaluation,* AASHTO, 2018 (3rd edition).
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, 2012

EXECUTIVE SUMMARY

The Brookpark Road Bridge is in POOR CONDITION [4-NBIS] overall. Significant findings include:

- Undermining of the left rear corner of both East Pylon columns due to erosion of the shale slope
- Unknown condition of the cellular abutment slabs due to their being fully enclosed
- Extensive spalls with exposed reinforcement, delaminations, longitudinal cracks with rust staining and efflorescence in the deck underside
- Several nearly full length spalls with exposed and some broken reinforcement in the floorbeams
- Large spalls and delaminated areas in the underside of the main arch ribs
- Spalls with exposed reinforcement and delaminations near midspan of the approach span beams
- Pylon and arch pier columns with scattered spalls with exposed reinforcement and widespread hairline map cracking
- Half of the scuppers 100% clogged and 100% section loss in nearly half of the downspouts

The overall item ratings can be summarized as follows in **Table 1**:

ITEM	RATING	TYPICAL NOTES
DECK	4	Spalls with exposed and corroded reinforcement throughout, unknown abutment slab condition
SUPERSTRUCTURE	**4**	**Delaminations and spalls with exposed reinforcement in the main arch ribs, spalls with exposed and broken reinforcement in the floorbeams (particularly near the joints), cracks and spalls in the approach span concrete beams**
SUBSTRUCTURE	**4**	**Undermining of the East Pylon columns, spalls with exposed reinforcement throughout the columns, pier caps, and abutments**

Table 1 - Bridge Condition Summary Ratings. Ratings which influence the **General Appraisal** are **bold**.

INSPECTION FINDINGS

ITEM 58 – DECK SUMMARY

The deck is in POOR CONDITION [4-NBIS] overall due to spalls with exposed reinforcement, rust staining and efflorescence at longitudinal cracks, and delaminations throughout the underside **(see Photo 1)**. There is widespread hairline cracking throughout the wearing surface, a spall near midspan of the Span C wearing surface, loss of adhesion at the compression joint seals, and fully clogged scuppers. The cellular abutment slabs are not observable, and their current condition is unknown. The compression joints typically have minor bulges and depressions with moderate debris throughout, and the railings typically have sealed spalls in the concrete portion below the metal posts. Several drainage downspouts have 100% section loss at the bends.

Photo 1 – Typical spalls with exposed and corroded reinforcement, delaminations, and rust staining in the deck underside (looking up and south between Floorbeams H3 and H4).

ELEMENT 12 – REINFORCED CONCRETE DECK

The reinforced concrete deck is in poor condition overall with the underside exhibiting widespread spalls with exposed reinforcement, delaminations, and typically hairline width cracks with rust staining and efflorescence. Approximately 35% of the total deck underside is considered to be in fair condition, and 25% is in poor condition. The profile grade of the bridge is -0.30% from west to east according to the major rehabilitation plans **(see Figure 1 and Appendix D)**, and the forward end of the bridge has the highest concentration of deck deficiencies with 65% of Span H **(see Photo 1)** and 30% of Spans G and 15 to 17 in poor condition **(see Photo 2)**. The Span H spalls are up to 30' wide by 15' long by 3" deep, particularly between Floorbeams H1 and H2. The remaining 35% of Span H is in fair condition with some good areas interspersed. In the remaining spans of the rear portion of the bridge, poor condition state deficiencies typically compose 15% to 25% of the deck underside with several failing areas at patches from the major rehabilitation.

Photo 2 – Typical deck condition at the forward end of the bridge (looking east between Beams 2 to 4 at the left forward end of Span 17). Note the longitudinal construction joint between the original structure and the portion added during the major rehabilitation (typical on both sides of all spans).

There is a 2' long by 2' wide spall with three layers of exposed and moderately corroded reinforcement at the right side of the deck underside at the West Pylon **(see Photo 3)**. There is safety netting installed between the jack arches in Spans B and C to prevent debris from falling on Valley Parkway and Valley Parkway Trail, and some debris is present below the floorbeams at Piers 7 and 8 with the area below the deck typically clear. The underside of the deck at the compression joints has heavy rust staining throughout due to the corroding joint armor above **(see Photo 4)**. There are spalls with exposed reinforcement, delaminations, and heavy rust staining in the deck underside below the East Pylon joint **(see Photo 5)**. The deck underside below the scuppers has longitudinal cracks up to 1/8" wide and several delaminated areas 5' long by 2' wide **(see Photo 6)**.

Photo 3 – Spall with three layers of exposed reinforcement at the right side of the deck underside (looking northwest at the West Pylon).

Photo 4 – Typical heavy rust staining in the deck underside below the compression joints (looking south at the Pier 6 joint underside). Note the netting in Span B and extensive floorbeam spalls.

Photo 5 – Deck underside at the East Pylon with a large spall with exposed reinforcement between Beams 2 and 3 in Span 15 (looking northeast).

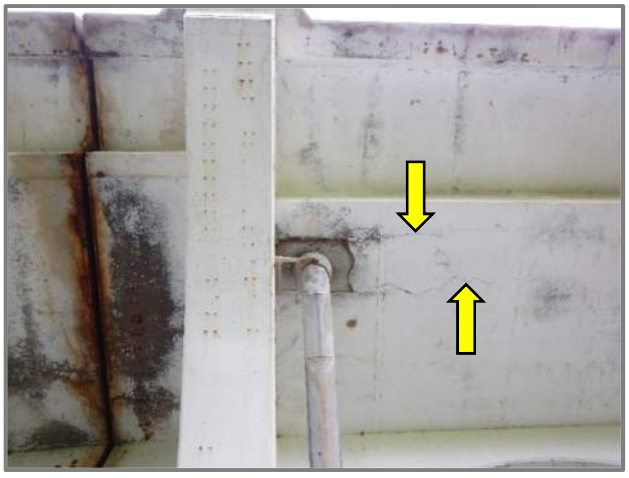


Photo 6 – Wide longitudinal cracks in the deck underside below scuppers (looking up and south in Span F near Pier 11).

ELEMENT 38 – REINFORCED CONCRETE SLAB

The reinforced concrete slabs that span the cellular abutments at each end of the bridge are not visible. The current condition is unknown. Since the wearing surface of the slabs was replaced in 2017, the condition of the wearing surface may not be exactly reflective of the slab condition. There are transverse cracks and small spalled areas in the 6" length of the Rear Abutment slab at the approach slab compression seal and areas of minor wear elsewhere **(see Photo 7)**.

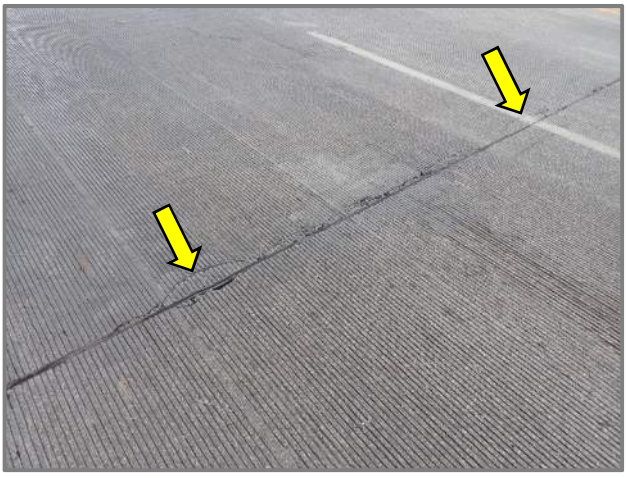


Photo 7 – Transverse cracks at the rear edge of the Rear Abutment slab wearing surface (looking southeast in the westbound lanes).

ELEMENT 510 – WEARING SURFACE

The wearing surface is in satisfactory condition overall with transverse hairline and longitudinal cracks and areas of hairline map cracking. A spall 4" in diameter by 2" deep is present near midspan of the Span C eastbound lanes **(see Photo 8)**, and there is a 24" long by 12" wide by 1 1/2" deep depression in the right edge of the wearing surface near the same location. There is a location of minor rust staining at a longitudinal crack in the wearing surface near midspan of Span E **(see Photo 9)**. Shallow spalling is present at the centerline of the forward end of Span C surrounding what appears to be a patched deck core location. Minor wear and scaling is present in the wheel line near the curbs throughout the westbound lanes and in the

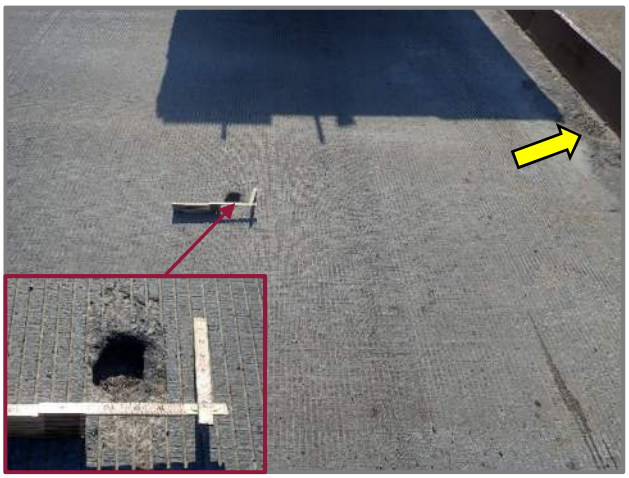


Photo 8 – A spall in the wearing surface located near midspan of Span C (looking east in the eastbound lanes). Note the depression in the wearing surface near the curb.

eastbound lanes of the rear approach spans. Water ponding was noted throughout the left side of the wearing surface at the time of the inspection **(see Photo 10)**.

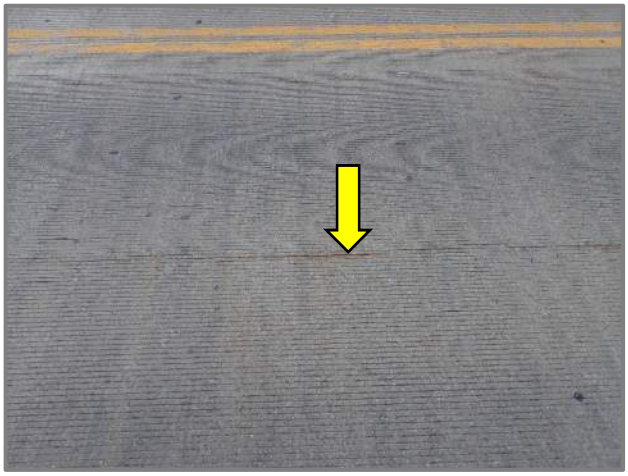


Photo 9 – A location of minor rust staining at a longitudinal crack in the wearing surface (looking south at the westbound lanes near midspan of Span E).

Photo 10 – Water ponding throughout the left edge of the wearing surface (looking west in the westbound lanes from Pier 7).

Photo 11 – Delamination at the rear end of the Span A left sidewalk (looking north). Note the typical rust staining on the curb plates at the impact scrapes and areas of failed protective coating.

Photo 12 – Typical sealed spall in the exterior face of the concrete portion of the railings (looking southwest at the left railing near Pier 13).

SIDEWALK (no associated element)

The sidewalks are in satisfactory condition with transverse and isolated hairline longitudinal cracks up to 0.02" wide throughout the underside and top face. The right sidewalk is heaved 2" at the interface between the rear approach slab and Rear Abutment slab span. There is a delamination 6' long by 1' wide in the left rear sidewalk of Span A **(see Photo 11)** and a delamination 45" long by 4" wide in the left rear portion of the Span B sidewalk. An area of the sidewalk is cracked and spalling up to 9" wide by 4' long at the curb plate interface at the left rear end of Span A. There are diagonal and transverse cracks up to 1/16" wide in the Forward Abutment slab left sidewalk at a patch near the compression joint. The rear end of the right sidewalk in Span G has a poorly patched core location. The steel curb plates have areas of surface corrosion and rust staining at locations of impact scrapes and failed protective coating.

ELEMENT 330 – METAL BRIDGE RAILING

The metal bridge railing is in satisfactory condition with areas of painted over minor section loss in the metal posts and sealed spalls in the concrete portion of the railing **(see Photo 12)**. Painted over

pitting up to 1/8" deep is present in the interior face of some metal posts above the railings **(see Photo 13)**. There is minor corrosion and rust staining along the bottom of the metal post base plates. Sealed top corner spalls 18" long by 6" high by 2" deep are present in the exterior face of the concrete portion of the railings at the railing post base plates.

Photo 13 – Painted over pitting in a metal post above the railing (looking north at the left forward end of Span E). Note the minor corrosion at the base plate.

At the request of District 12, the left and right edge beam comments are included with this railing element. The underside of the beams have longitudinal cracks up to 1/16" wide with moderate rust staining and efflorescence **(see Photo 14)**, and the remaining length of the beams have hairline transverse cracks, water staining, scattered delaminations, and isolated spalls up to 2" deep.

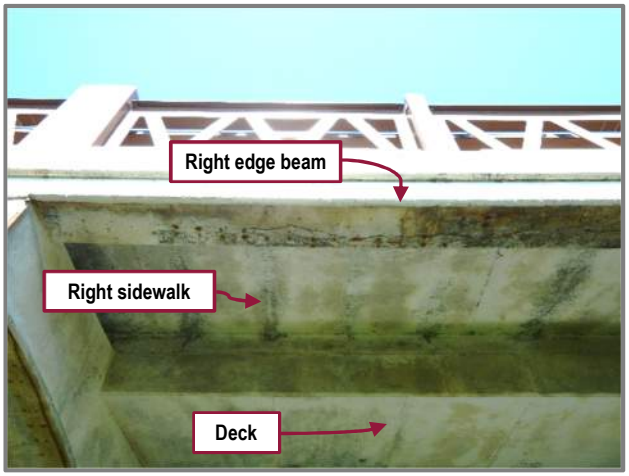


Photo 14 – Right edge beam with typical longitudinal cracks, rust staining, and water staining (looking up and north between Floorbeams 6 and 7 in Span A). Note the transverse hairline cracks in the sidewalk underside.

ELEMENT 815 – DRAINAGE

The drainage system is in poor condition due to ponding on the roadway **(see Photo 10)**, significant debris in 75% of the scuppers with half of them fully clogged, and nearly half of the downspouts having locations of 100% section loss. Many of scuppers at the left curb are partially clogged with clear downspouts, and the scuppers at the right curb are typically 100% clogged **(see Photo 15)**. There are scuppers at both sides of the forward approach slab, and the left side scupper is 100% clogged with the downspout not visible.

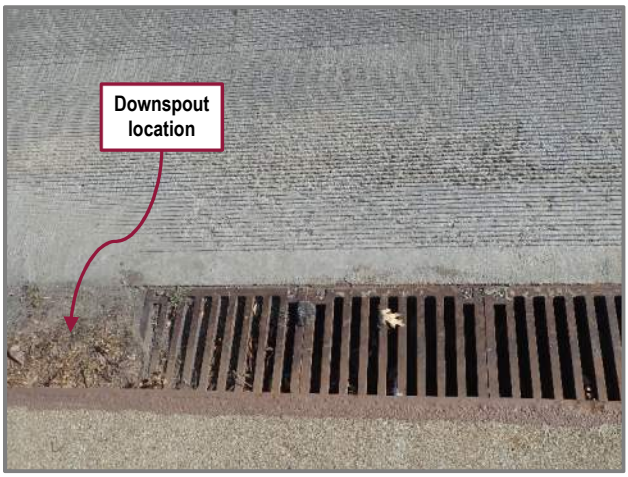


Photo 15 – Scupper at the right forward end of Span A which is 100% clogged above the downspout (looking north). Note the minor wear in the wearing surface.

Photo 16 - 100% section loss in the downspout on the west side of Pier 6 (looking northwest).

There are several downspouts with 100% section loss at the bends near the deck underside. They are typically located at the right side of the arch span piers **(see Photo 16)**, but several of the left side downspouts also have 100% section loss. The bottom of the downspouts have moderate surface corrosion at the interface with the ground. The concrete encasing the bottom of the downspouts at the West Pylon is exposed up to 18" high **(see SLOPE PROTECTION)**.

Photo 17 – Typical compression joint seal with moderate to heavy debris in the joint and laminate corrosion on the armor (looking south at the East Pylon joint). Note the heavy debris near the left curb.

ELEMENT 302 – COMPRESSION JOINT SEAL

The elastomeric compression joint seals are in satisfactory condition due to areas of adhesion failure, gouges and corrosion on the joint armor **(see Photo 17)**, and hairline longitudinal cracks in the joint headers. The seal adhesion is beginning to fail with several depressed and bulging areas up to 1/4" high throughout the joints **(see Photo 18)**. There is minor to moderate surface corrosion on the joint armor and moderate to heavy debris accumulation within the joints, especially near the curbs. The vertical surfaces of the joint armor have laminate corrosion up to 1/4" thick above and below the elastomeric seals with locations of 1/4" deep section loss (1/2" nominal thickness). The Forward Abutment joint is beginning to bulge in some areas and has a 4" long tear in the westbound lanes. There are isolated minor spalls in the joint headers. The previous West Pylon elastomeric seal is frayed and was discarded on top of the pier cap struts **(see ELEMENT 234 – REINFORCED CONCRETE PIER CAP)**.

The longitudinal joint openings were measured at the north edge line at an ambient temperature of 75°F **(see Table 2)**.

Location	2021 (67°F)	2022 (75°F)*
Rear Abutment	1 3/4"	1 13/16"
West Pylon	2 1/2"	2 1/2"
Pier 6	2 3/8"	2 1/2"
Pier 7	2 3/8"	2 1/2"
Pier 8	2 1/4"	2 1/4"
Pier 9	2 1/8"	2 3/8"
Pier 10	2 1/2"	2 3/4"
Pier 11	2 3/8"	2 1/2"
Pier 12	2 5/8"	2 1/2"
East Pylon	2 3/8"	2 5/8"
Forward Abutment	1 3/8"	1 9/16"

Table 2 - Compression Joint Longitudinal Measurements

*Measurement taken at the north edge line

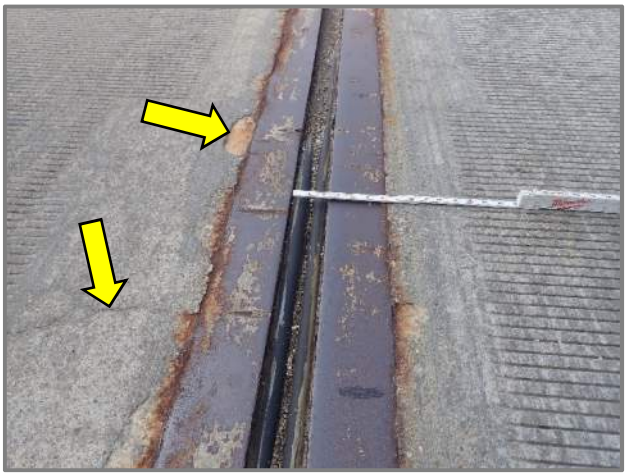


Photo 18 – Typical loss of adhesion of the compression joint seals with bulges and depressions (looking south at the Pier 7 joint in the westbound lanes). Note the minor spalls and longitudinal hairline crack in the joint header.

ITEM 59 – SUPERSTRUCTURE SUMMARY

The superstructure is in POOR CONDITION [4-NBIS] overall due to delaminations and spalls with exposed and corroded reinforcement throughout the main arch ribs, arch spandrel columns, floorbeams, and approach span beams.

ELEMENT 110 – REINFORCED CONCRETE OPEN GIRDER/BEAM

The beams are in poor condition overall with the majority having delaminations or spalls with exposed and corroding reinforcement. This element does not include the left and right edge beams below the railings **(see ELEMENT 330 – METAL BRIDGE RAILING)**. Spalls in the underside of the approach span beams are typically 3' long by full width by 3" deep near midspan. Several spalls and delaminations with wide cracks in the forward approach spans are up to 6' long in Span 16 and 20' long in Span 17 **(see Photo 19)**, with heavy laminate corrosion on the exposed reinforcement. The original beams, Beams 3 through 8, in the rear approach spans and at the rear end of Span 16 have full perimeter hairline cracks near the piers, and there are very isolated locations of moderate efflorescence at the cracks. The full perimeter cracks are 1/32" to 1/16" wide at the forward end of Beams 4 through 7 in Spans 4 and 5 **(see Photo 20)**. There are areas of minor rust staining in the Beam 10 underside at reinforcement chairs. Several beams in the approach spans are patched with pneumatically placed mortar.

Beam 9 at the Rear Abutment has a 1' high by 6" long spall in the underside which exposes the forward side of the bearing foam, and the Rear Abutment face below this location is spalled and flush with the bearing foam. The underside of Beams 3 and 4 in Span 2 are delaminated near midspan over a 4' length with 1/4" wide cracks at the bottom of the beam faces. The end 1' of the beams at the West Pylon are typically spalled 3" deep and delaminated up to 2' high below the joint **(see Photo 21)**. The beam ends at the East Pylon

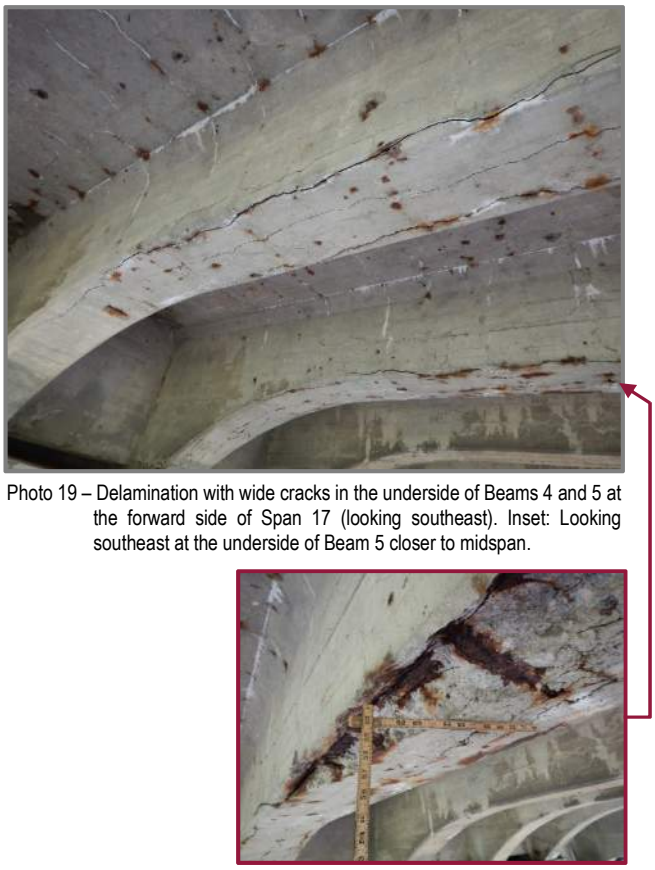


Photo 19 – Delamination with wide cracks in the underside of Beams 4 and 5 at the forward side of Span 17 (looking southeast). Inset: Looking southeast at the underside of Beam 5 closer to midspan.

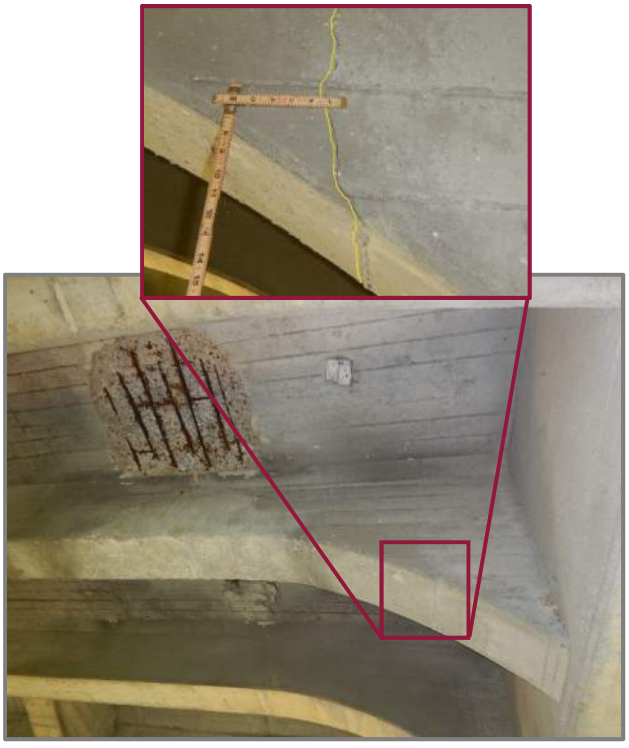


Photo 20 – 1/16" wide crack around the full perimeter of Beam 4 in Span 4 (looking north at the forward end near Pier 5). Crack outlined in yellow.

Photo 21 – Spall and delamination in the end of Beam 4 at the West Pylon (looking northeast in Span 6).

Photo 22 - Typical main arch rib underside exhibiting spalls with exposed reinforcement and delaminations (looking east at the Span E right arch). Inset: Looking south.

Spalls in the arch spandrel columns are most prevalent at the interior face below the joints with the worst locations being Piers 6 through 9 and 12. The upper 10' of the spandrel columns are typically spalled up to 5" deep **(see Photo 24)** with the remaining height exhibiting delaminations and wide cracks with rust staining. The remainder of the arch spandrel columns have scattered spalls and delaminations with the most notable being the are similar with more advanced deterioration including hairline cracks with heavy efflorescence and rust staining **(see Photo 5)**.

ELEMENT 144 – REINFORCED CONCRETE ARCH

This element includes the main arch ribs, spandrel columns, and jack arches. The reinforced concrete arches are in poor condition due to spalls with exposed reinforcement and widespread delaminations in the underside of the main arch ribs **(see Photo 22)**, large deep spalls with exposed reinforcement in the arch spandrel columns, and hairline vertical cracking throughout the jack arches. A delamination in the left face of the Span B left arch was safely removed during the inspection due to its proximity to Valley Parkway and is now a 3' diameter by 3" deep spall **(see Photo 23)**. The spalls in the underside of the main arch ribs are typically located near midspan and are up to 4" deep by 15' long by 2' wide. Delaminations in the main arch rib underside range from 10' long to 50' long (Span E right arch from Column 7 to Pier 10) and are typically concentrated near the third points and ends of the arch. There are top corner spalls with exposed reinforcement in the main arch ribs, and several patches at the top corner are delaminated. A top corner spall in the Span C right arch is 6' long by 20" high by 7" deep below Column 6. The remainder of the main arch ribs exhibit areas of hairline map cracking and sealant failure.

Photo 23 – Spall with exposed reinforcement where a delamination in the Span B left arch was safely removed during the inspection (looking south above the east shoulder of Valley Parkway and below Column 8).

Span D left arch Spandrel Column 2 with an 8' high by 3' wide by up to 3" deep spall/delamination **(see Photo 25)**. The decorative reliefs at the top of the spandrel columns are cracked, delaminated, and/or spalled below the longitudinal construction joints.

Photo 24 – Typical spalls with exposed reinforcement in the arch spandrel columns below the joints (looking south at right columns near Pier 9).

Photo 25 – Spall/delamination 8' high in the rear face of the Span D left arch Spandrel Column 2 (looking east).

The jack arches were replaced during the 1989 major rehabilitation and typically exhibit hairline vertical cracks throughout and some spalls with exposed reinforcement below the joints.

Numerous areas of graffiti were noted throughout the rear half of Span A, especially at the top of the arches. The ground clearance from the top of the Span A arches is approximately 50' according to the original 1933 plans, and the rear end of the Span A arches is easily accessible.

ELEMENT 155 – REINFORCED CONCRETE FLOORBEAM

The reinforced concrete floorbeams are in fair condition overall with the majority having full height vertical hairline cracks but the floorbeams under joints having large spalls with heavily corroded or broken reinforcement. Exposed reinforcement in the floorbeams below the joints typically exhibits 1/16" deep section loss in the main bars and 50% section loss in the stirrups. Several of the floorbeams with large spalls have stirrups which are broken or have 100% section loss:

- Floorbeam A3 – 3 broken stirrups at a 10' long by up to full height by 3" deep spall **(see Photo 26)**
- Floorbeam A4 – 3 broken stirrups at a 5' long by 18" high by 3" deep spall
- Floorbeam Pier 10E – 5 broken stirrups in a 20' long by up to 18" high spall

Photo 26 – Spalls with 3 broken stirrups in Floorbeams A3 and A4 (looking west). Inset: Looking northwest at Floorbeam A3 where a 10' long delamination was removed.

- Floorbeam Pier 11W – 1 broken stirrup in a 12' long by 3" deep spall
- Floorbeam G8 – 6 stirrups with 100% section loss at a 7' long by up to full height spall
- Floorbeam Pier 12W – 9 stirrups with 100% section loss in a 20' long by up to full height spall **(see Photo 27)**
- Floorbeam Pier 12E – 2 broken stirrups at a 20' long by up to full height spall/delamination

Delaminatons in the underside of Floorbeams A3 and A4 were removed during the inspection to expose three broken stirrups, and delaminations in Floorbeams A1 and A2 are up to 15' long but could not be removed with chipping hammers. The netting below the Span B and C floorbeams has caught several spalls at Piers 7 and 8 with the largest being 3' long by 6" wide by 3" high below Floorbeam Pier 8W. Full height vertical cracks in the floorbeams are usually located at the quarter points between the jack arches but are spaced as closely as 2' **(see Photo 28)**; the cracks range from hairline to 1/16" wide in isolated locations. Typically delaminations but some spalls with exposed reinforcement are present below and adjacent to the longitudinal construction joints at the interior side of the jack arches. Minor honeycombing with exposed reinforcement due to lack of cover is present in some locations.

Photo 27 – Floorbeam Pier 12W spall with broken stirrups and spalling up to full height (looking southwest in Span H).

Photo 28 – Full height vertical hairline cracks in Floorbeam H5 (looking west). Cracks outlined in yellow.

ELEMENT 311 – MOVABLE BEARING

The movable bearings are in good condition overall with no significant deficiencies noted at the time of the inspection.

ITEM 60 – SUBSTRUCTURE SUMMARY

The substructure is in POOR CONDITION [4-NBIS] due to undermining of the East Pylon columns at the shale slope with erosion and large spalls with exposed reinforcement, delaminations, and cracks with rust staining in the pier caps, pier columns, and abutments.

Photo 29 – Spalls with exposed reinforcement throughout the Pier 8 right column exterior face (looking north). Note the nearly fully faded falling concrete warning sign.

ELEMENT 205 – REINFORCED CONCRETE COLUMN

The reinforced concrete columns are in poor condition overall with nearly 50% of the columns having spalls with exposed and corroding reinforcement. The faces of the columns typically exhibit areas of hairline map cracking with isolated rust staining. The most extensive spalls and hairline cracks with rust staining are present at the left and right faces of the pylon columns and Piers 7 and 8 below the joints **(see Photo 29)**. There is moderate to heavy vegetation growth over the full height of the columns from Pier 5 to Pier 12 **(see Photo 30)**.

The arch span columns extend from the ground to the bottom of the end two arch spandrel columns **(see Figure 3)** and typically have scattered delaminations and spalls with exposed reinforcement up to 3" deep **(see Photo 34)**. The exceptions are Piers 7 and 8 which have more extensive spalling and cracks with rust staining throughout the column faces. The transverse struts between the arch span columns are not included in the element quantities but typically have top corner spalls, delaminations, and hairline cracks with rust staining.

The pylon columns have several spalls with exposed reinforcement and hairline horizontal cracks with minor to moderate rust staining, particularly in the exterior faces below the joint **(see Photo 30)**. The interior faces of the pylon columns exhibit moderate rust staining from corroding reinforcement below the joints which emanates from the openings below the pier caps. At the top of the West Pylon left column, the upper slab has been cut open in an 8' long by 4' wide area, and the exposed reinforcement is deteriorating with scaling in the surrounding concrete.

Photo 30 – West Pylon left column exterior face with spalls with exposed reinforcement and vegetation growth (looking south at the left face). Top left inset: Looking south. Top right inset: Looking east at the top of the column on the left side of Beam 1.

The rear face of the East Pylon columns are exposed over the full height, and the left rear corners of both columns are undermined approximately 1'-6" deep by 1'-6" wide (less than 1% of the overall footing area) **(see Photo 31)**. The East Pylon downspouts outlet directly onto the shale at the interior face of the columns, and the angle of the slope facilitates erosion at all four faces of the columns. **See Figure 4** for details of the East Pylon left column footer which is founded directly on the shale and to see the erosion of the slope since the original slope protection was in place.

Photo 31 – Drastic elevation change between Pier 15 and the East Pylon with advanced erosion of the shale surrounding the East Pylon columns (looking east from Pier 12). Inset: Looking northeast at the left column undermined left rear corner and nearby downspout.

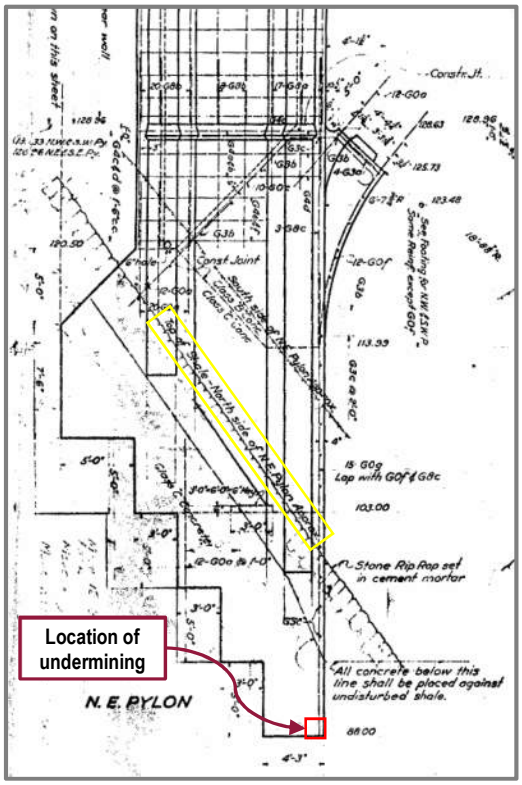


Figure 4 - East Pylon left column footing detail (taken from the original design drawings).

The rear approach columns typically have patches with hairline map cracking in the exterior face, and there are isolated delaminations and corner spalls at the exterior face of the decorative reliefs. The Pier 4 left column has several spalls up to 2" deep near ground level. The forward approach columns have hairline map cracking and isolated spalls up to 12" in diameter with exposed reinforcement.

ELEMENT 215 – REINFORCED CONCRETE ABUTMENT

The abutments are in fair condition overall. This element includes all walls of the cellular abutments; each abutment has four longitudinal and three transverse walls. The only visible walls are the three exterior walls: two longitudinal and one transverse. The original reinforced concrete abutment reliefs are typically spalled or delaminated. The Rear Abutment has a 6' long by 2' high spall with exposed and corroded reinforcement in the forward face of the right relief, and the left relief is delaminated at the top 2' **(see Photo 32)**. The Forward Abutment wall has several spalls with exposed reinforcement besides the spalls in the reliefs including a 10' high by 18" wide spall at the left end and a 2' high by up to 3' long spall/delamination below Beam 4. The abutment walls have several vertical hairline cracks with minor to moderate rust staining.

Photo 32 – East elevation of the Rear Abutment (looking west). Inset: Looking southwest at the spall with exposed reinforcement in the right relief.

The top face of the Forward Abutment right wall is typically spalled up to 2" wide by 3" deep throughout the interface with the sidewalk, and there is a 16" wide by 32" long by up to 20" deep spall near the compression joint **(see Photo 33)**. The top of the Forward Abutment left wall is similar with a spall up to 15" deep at the compression joint.

Photo 33 – Spall up to 20" deep at the rear end of the Forward Abutment right wall (looking east). Note the spalls throughout the top of the wall.

ELEMENT 234 – REINFORCED CONCRETE PIER CAP

The pier caps are in satisfactory condition overall due to several spalls with exposed reinforcement and hairline cracks with rust staining at the pylons and typically only vertical cracks in the approach span pier caps.

The pylons each have west and east pier caps which include the length of the cantilevers and the central portions between the columns. The West Pylon pier caps have delaminations up to 2' high with surrounding spalling in the exterior face, spalls with exposed reinforcement in the underside, and several horizontal hairline cracks with minor to moderate rust staining **(see Photo 34)**. The previous West Pylon compression joint seal is

Photo 34 – East elevation of the West Pylon pier caps (looking up and west below the centerline of the bridge). Note the spall and rust staining in the West Pylon right column and the previous compression joint seal discarded on top of the pier cap struts.

frayed and discarded on top of the pier cap struts. The East Pylon has several spalls, one sealed, in the west pier cap rear face and hairline map cracking at a patch up to 4' wide. The East Pylon east pier cap has a 3' long by 2' high by up to 5" deep spall at the top corner below Beam 5 with several exposed stirrups with advanced section loss and an exposed longitudinal bar.

The forward approach caps have full height vertical hairline cracks which are reflective in both faces of the pier caps. Several locations of minor to moderate efflorescence at the vertical cracks are present with moderate efflorescence in both faces of the Pier 14 cap between Beams 5 and 6 **(see Photo 35)**. The Pier 13 cap has several shallow spalls with exposed reinforcement due to lack of cover. The rear approach caps have isolated patches composed of pneumatically placed mortar.

Photo 35 – West elevation of the Pier 14 cap with moderate efflorescence at full height vertical hairline cracks between Beams 5 and 6 (looking east). Note the spalls and rust staining in the Forward Abutment.

SLOPE PROTECTION (no associated element)

The slope protection near the abutments is in satisfactory condition overall with no special protection measures having been installed. Minor erosion up to 6" deep was noted at the right end of the Rear Abutment. There are minor erosion channels from the left rear end of the Rear Abutment to the slope between the West Pylon and Pier 6, and the concrete embedment at the bottom of the West Pylon downspouts is exposed over an 18" height **(see Photo 36)**.

Photo 36 – Typical minor erosion channels at the rear approach spans with up to 18" deep erosion at the West Pylon right downspout (looking east from Span 6). Inset: Looking southwest.

ITEM 61 – CHANNEL SUMMARY

The channel is in fair condition due to the curve in the channel alignment at the bridge and the poor channel protection at the forward bank near the East Pylon and the rear bank upstream from Pier 12 **(see Photo 37)**.

Photo 37 – Looking towards the bridge from upstream (looking north towards Span H). Note the curve in the channel alignment at the bridge and the downed tree.

ITEM 61.01 – SCOUR

The scour is in GOOD CONDITION [7-NBIS] overall due to no visible signs of scour at Pier 12 or the East Pylon.

CHANNEL ALIGNMENT (no associated element)

The channel alignment is in fair condition due to the curved path of the channel below Span H **(see Photo 37)**. The channel flowed approximately 5' from the forward face of the Pier 12 right column where there is rip rap **(see Photo 38)**.

CHANNEL PROTECTION (no associated element)

The channel protection is in poor condition overall due to the forward bank being composed of a very steep shale that has erosion **(see Photo 31)** and the rip rap in satisfactory condition at Pier 12. The embankment elevation from Pier 15 to the Rocky River drops drastically starting just to the rear of Pier 15. There is a downed tree at the rear bank slightly upstream from Pier 12.

Photo 38 – Looking toward Pier 12 from downstream (looking south). Note the rip rap in the channel near the right column and the proximity of the rear bank.

HYDRAULIC OPENING (no associated element)

The hydraulic opening is in good condition with a vertical clearance over 100', which is greater than several other structures on the river. No obstructions were noted during the inspection.

APPROACH SUMMARY

The approaches are in satisfactory condition overall with minor cracking in the approach slabs, map cracking in the approach wearing surface, and moderate decay in the timber blockouts.

Photo 39 – Rear approach slab with a failed patch/pothole at the rear edge (looking west). Note the cracking along the rear edge of the slab.

ELEMENT 321 – REINFORCED CONCRETE APPROACH SLAB

The approach slabs are in good condition overall due to minor to moderate transverse cracking at the rear and forward edges and a failed patch/pothole. The failed patch is 1' long by 2' wide by up to 3 1/2" deep and is located at the rear edge of the rear approach slab in the westbound lanes **(see Photo 39)**. The left rear approach slab sidewalk is spalled 2' wide by up to 7" long by 1 1/2" deep along the rear edge.

APPROACH WEARING SURFACE (no associated element)

The approach wearing surfaces are typically in fair condition with transverse map cracking up to 1/8" wide near the end of the approach slabs. The forward approach wearing surface has a 1/4" wide transverse crack over the full width of the roadway approximately 25' from the end of the approach slab. The left rear approach sidewalk has settled 1" at the bridge. The right forward approach curb has several spalls, and there are asphalt patches along the right edge of the eastbound lanes at the right forward approach **(see Photo 40)**. The drainage grate at the left forward approach curb inlet is cracked through at the far end and missing a bar at the rear end.

Photo 40 – Typical forward approach (looking north). Note the asphalt patches in the approach wearing surface and spalls in the right curb. Inset: Looking southwest at the cracked left forward curb inlet grate.

EMBANKMENT (no associated element)

The bridge approach embankment is in good condition overall with only erosion up to 6" deep noted at the right end of the Rear Abutment wall.

GUARDRAIL (no associated element)

The guardrail is typically in satisfactory condition with moderate decay throughout the timber blockouts.

SIGN/UTILITY ITEMS SUMMARY

The signs and utilities on the bridge are in fair condition overall due to several faded warning signs below the bridge and a missing light post.

Photo 41 – Missing light post with corrosion on the anchor bolts and nuts and taped electrical wires (looking north at the right forward end of Pier 10 in Span E).

SIGNS AND SUPPORTS
(no associated element)

The signs are in satisfactory condition overall. The following signs are on or near the structure:

- Curve ahead sign (Pier 12 right side light post)
- Bridge delineators (right rear and left forward approaches)
- NASA Parkway ahead sign (right rear approach)
- Warning Falling Concrete Above signs (scattered throughout the column faces and fences of Piers 6 through 12)

Both falling concrete warning signs on the left and right faces of Pier 7 and at the right face of Pier 8 are almost completely faded **(see Photo 29)**. Some of the falling concrete warning signs at Piers 6 through 12 are partially covered by graffiti.

Photo 42 – Light post anchor bolts and nuts with minor corrosion and negative thread count (looking northwest at the right forward end of Span C).

UTILITIES (no associated element)

The utilities are in fair condition due to a missing light post and minor to moderate corrosion at the base of light pole covers and the underside of their anchor bolts and nuts. The light pole at the right forward end of Span E is missing where the electrical wires are taped off, and the anchor bolts and nuts exhibit heavy surface corrosion **(see Photo 41).** There is up to 100% section loss at the rear bottom corners of the light pole base at the right forward end of Span C. The light pole luminaire hinged cover at the left forward end of Span D is secured in place with tape. The anchor bolt nuts at the underside of the right forward end of Span C have typical minor corrosion, and two of four bolts have negative thread count up to 3/8" deep **(see Photo 42)**.

ITEM 41 – OPERATIONAL STATUS

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

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the 2022 routine element level inspection, the Brookpark Road (SFN 1802046) CUY-17-0283 Bridge is in POOR CONDITION [4-NBIS] overall. The approach span beams have large spalls with exposed reinforcement, delaminations, and vertical cracks with isolated efflorescence, particularly in Span 17. The main arch ribs typically have spalls with exposed reinforcement in the underside near midspan with delaminations and areas of hairline map cracking elsewhere. The arch columns below the joints are spalled with exposed and corroded reinforcement, and scattered spalls and delaminations are present throughout the arch columns. There are typically full height vertical hairline cracks in the floorbeams, and the floorbeams near the joints exhibit the most extensive deterioration with locations of broken stirrups. The reinforced concrete deck has widespread spalls with exposed reinforcement, delaminations, and longitudinal cracks with moderate rust staining and locations of efflorescence. The slabs spanning the cellular abutments are not visible; therefore, the condition is unknown. The wearing surface is in satisfactory condition with only one spall noted at the time of the inspection, and the compression joints have moderate to heavy debris throughout along with some depressions and bulges. The metal railings were painted in 2017, and the concrete portion of the railings exhibits sealed spalls at the railing post base plates and longitudinal cracks with rust staining and water staining in the edge beams below. The reinforced concrete substructure units have spalls with exposed reinforcement and hairline cracks with minor to moderate rust staining throughout. The left rear corner of the East Pylon columns are undermined at the continuously eroding shale slope. The rear bank of the channel has erosion near the Pier 12 right column where there is rip rap in place, and the forward bank lacks protection near the bridge. Several of the falling concrete warning signs at the base of the arch pier columns are partially or fully illegible due to faded lettering and graffiti.

The four categories of recommendations for the Brookpark Road Bridge are as follows:

- Priority Work: (Within 1 Year Period) — Work which should be performed as soon as possible to address deficiencies which affect the capacity of the structure or public safety.
- Rehabilitation/Evaluation: (Within 5 Year Period) — Recommendations for large-scale deficiencies which are extensive in nature and require engineering analysis.
- Maintenance: (As Scheduled) — Recommendations that are minor in nature and can be easily repaired.
- Monitoring: (As Recommended) — Regular field observation of defects which are not currently in need of repair, but will require corrective action if deterioration continues.

Priority Work:

Superstructure

1. Install protection at the rear end of Span A to prevent trespassers having easy access to the arches.

2. Clean and patch and/or fiber wrap areas of deteriorating concrete over the multipurpose and bridle trails.

Substructure

3. Evaluate the erosion of the forward bank and slope from Pier 15 to the Rocky River which is undermining both columns of the East Pylon. Relocate the drainage downspouts at the East Pylon to prevent further erosion.

4. Determine where an access opening can be installed in each cellular abutment in order to inspect the abutment slabs.

Signs

5. Replace illegible falling concrete warning signs at Piers 6 through 12.

Rehabilitation/Evaluation:

Superstructure

6. Patch and seal spalls with exposed reinforcement and delaminations throughout the main arch ribs, arch spandrel columns, floorbeams, and approach span beams. Consider adding fiber wrapping to locations if warranted.

Deck

7. Patch or perform full depth repairs at areas of spalling in the deck underside.

8. Remove and replace missing or heavily corroded downspouts and drainage assemblies.

9. Repair, patch, and seal the cracked, delaminated, and spalled areas in the edge beams below the railings.

Substructure

10. Repair, patch, and seal the pier caps, pier columns, and abutments with spalls with exposed reinforcement.

11. Stabilize the forward channel shale bank around the East Pylon.

Maintenance:

Approach

12. Patch the failed asphalt patch/pothole at the left rear approach.
13. Remove and replace the spalled curb at the right forward approach.
14. Replace the broken drainage grate at the left forward approach curb inlet.
15. Replace the deteriorated timber blockouts in the approach guardrails.

Deck

16. Clean the drainage system of debris.
17. Remove the concrete caught in the net below Spans B and C.
18. Patch the wearing surface spall near midspan of Span C.

Channel

19. Remove the tree in the channel upstream from Pier 12.

Utilities

20. Replace the missing light post at the right forward end of Span E.
21. Fix the luminaire that is secured closed with tape at the left forward end of Span D.

Monitoring:

Superstructure

22. Monitor the netting below Spans B and C.
23. Monitor the forward slope that has erosion and the undermining of the East Pylon columns.
24. Continue to inspect the structure on a 12 month cycle.

Appendix A
Framing Plan with Deficiencies

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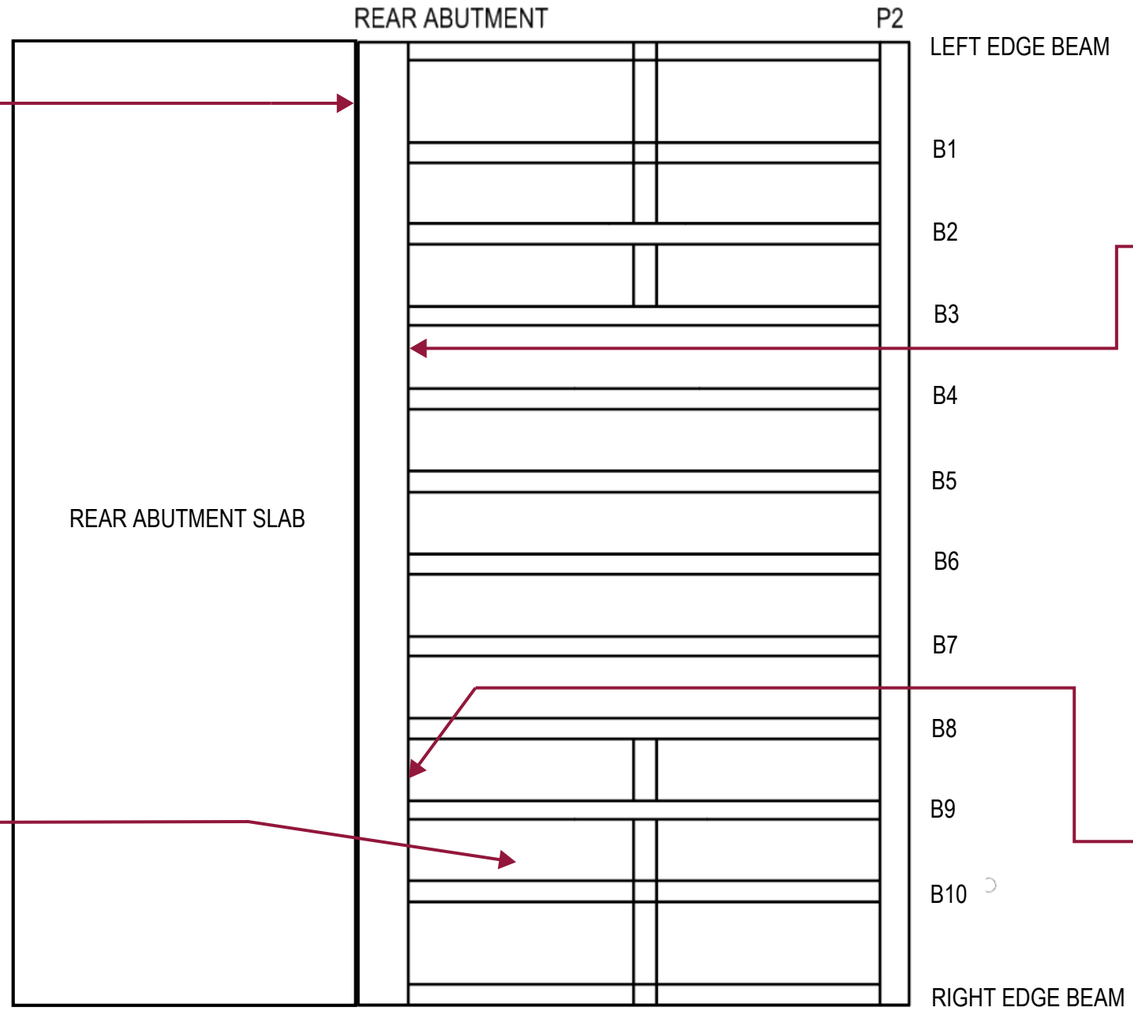
Settlement of the left rear approach sidewalk at the bridge (looking east).



Delamination in the forward face of the Rear Abutment left relief (looking northwest).

Minor scaling in the right side of the wearing surface (looking east).

Spalls at the end of Beam 9 and in the top corner of the Rear Abutment beam seat (looking southwest).

TranSystems

Span 1

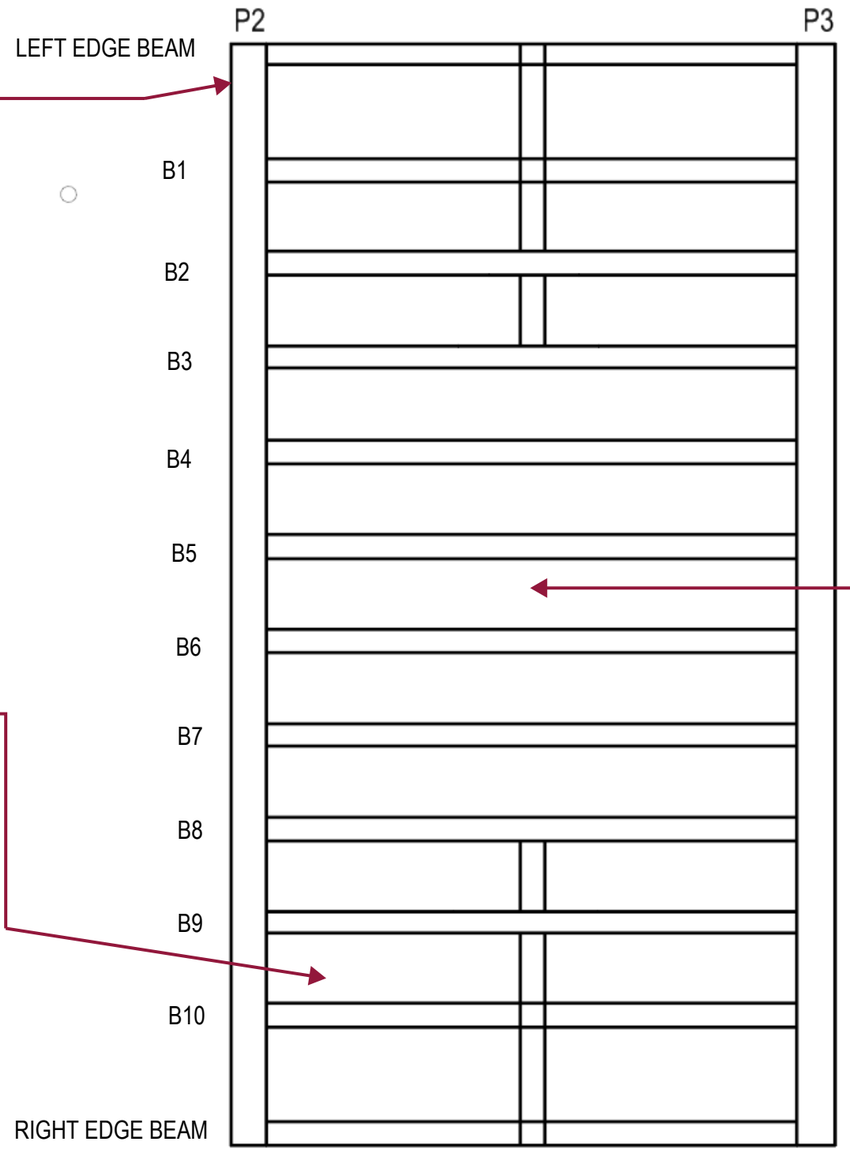
Patch in the Pier 1 cap (looking east).

View of the wearing surface from the rear approach (looking east).

Longitudinal cracks up to 1/4" wide at delaminations in the underside of Beams 3 and 4 (looking east).
Note the spalls with exposed reinforcement in the underside of the deck.

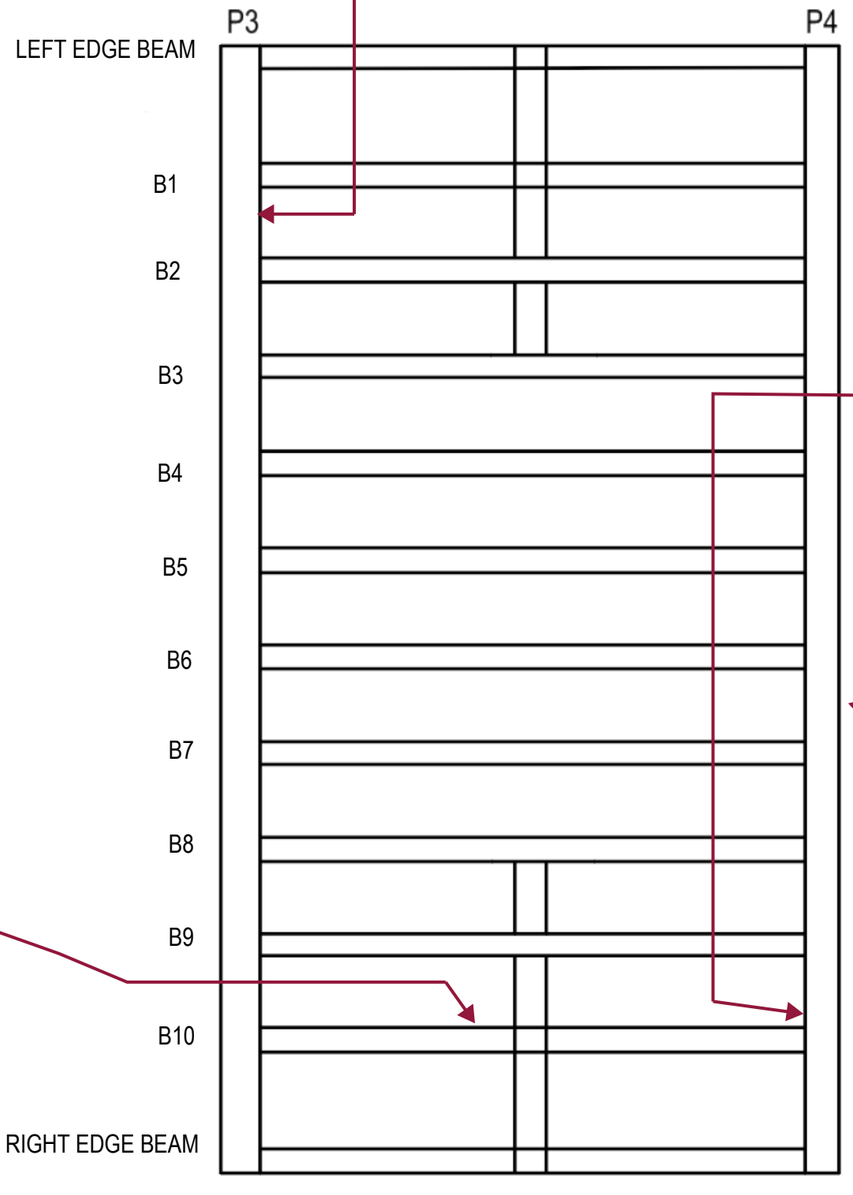
Typical hairline map cracking and minor popouts at patches in the columns (looking southeast).

Typical railing and wearing surface (looking southeast from the rear approach).



Deck underside overall view (looking west).

Typical hairline map cracking at patches in the approach columns (looking west).



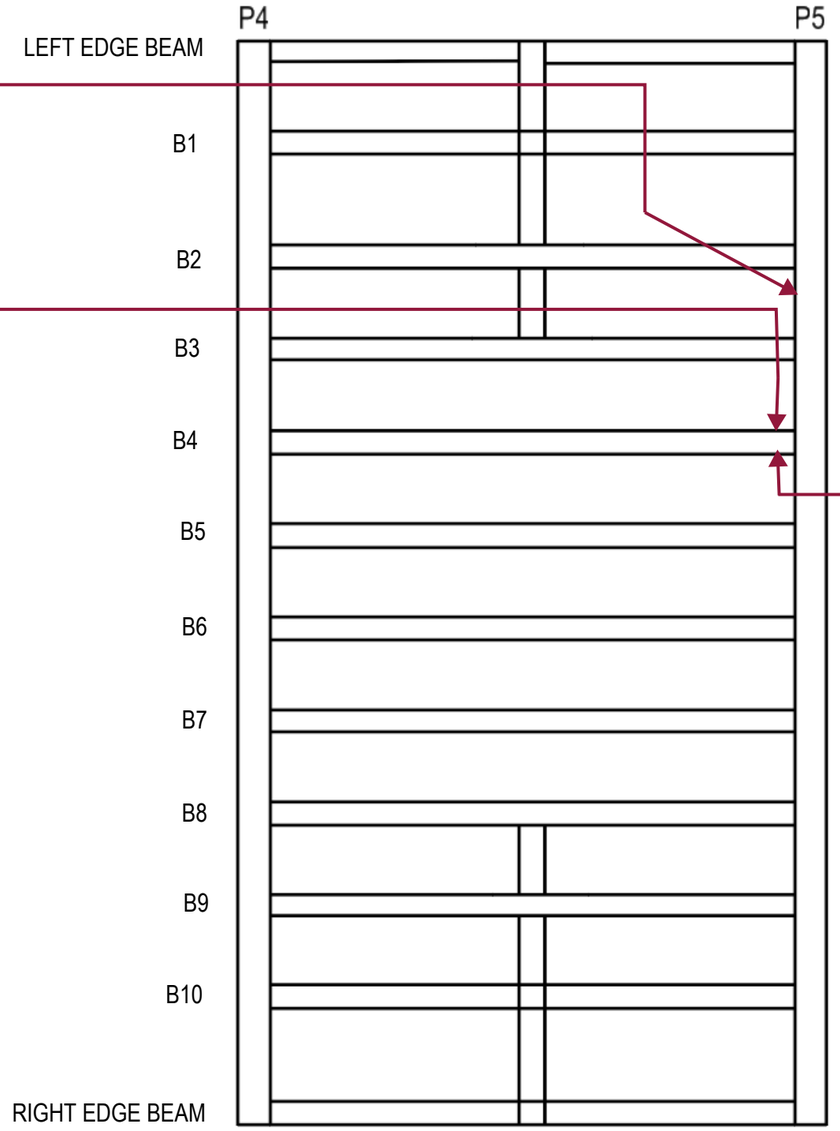
Hairline map cracking at a patch in the Pier 4 right column (looking east).

Delamination in the underside of Beam 10 near midspan (looking southeast).

Typical minor erosion channels in the area below the bridge (looking west).

Hairline map cracking at a patch in the approach pier column (looking east).

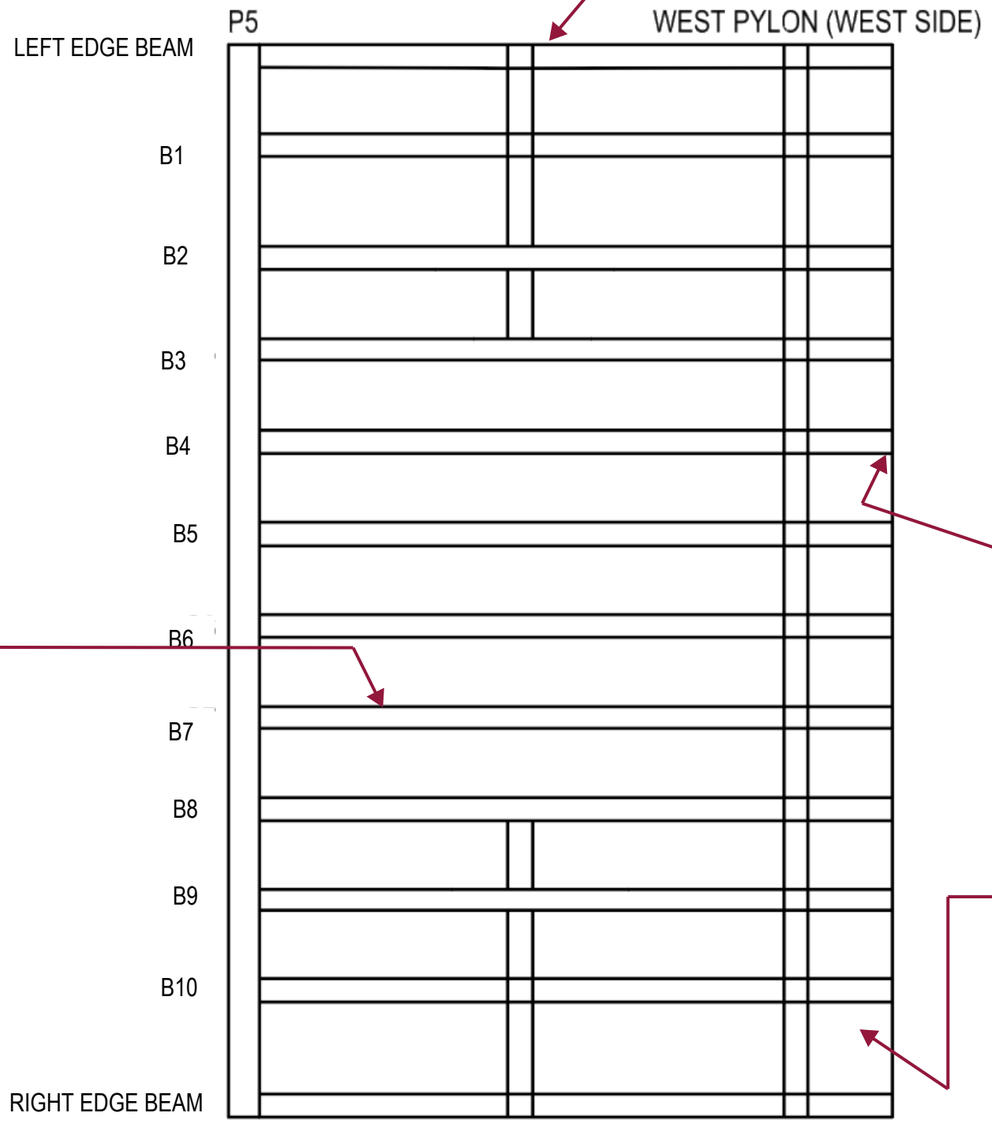
Full height vertical crack up to 1/16" wide at the east end of the Beam 4 north face (looking south).



Full height vertical crack up to 1/16" wide at the east end of the Beam 4 south face (looking north).

Typical longitudinal hairline cracks with rust staining and isolated spalls up to 2" deep at the north face of the Left Edge Beam near midspan (looking southwest).

Patch to the deck underside and all faces of Beam 7 near midspan (looking southeast).



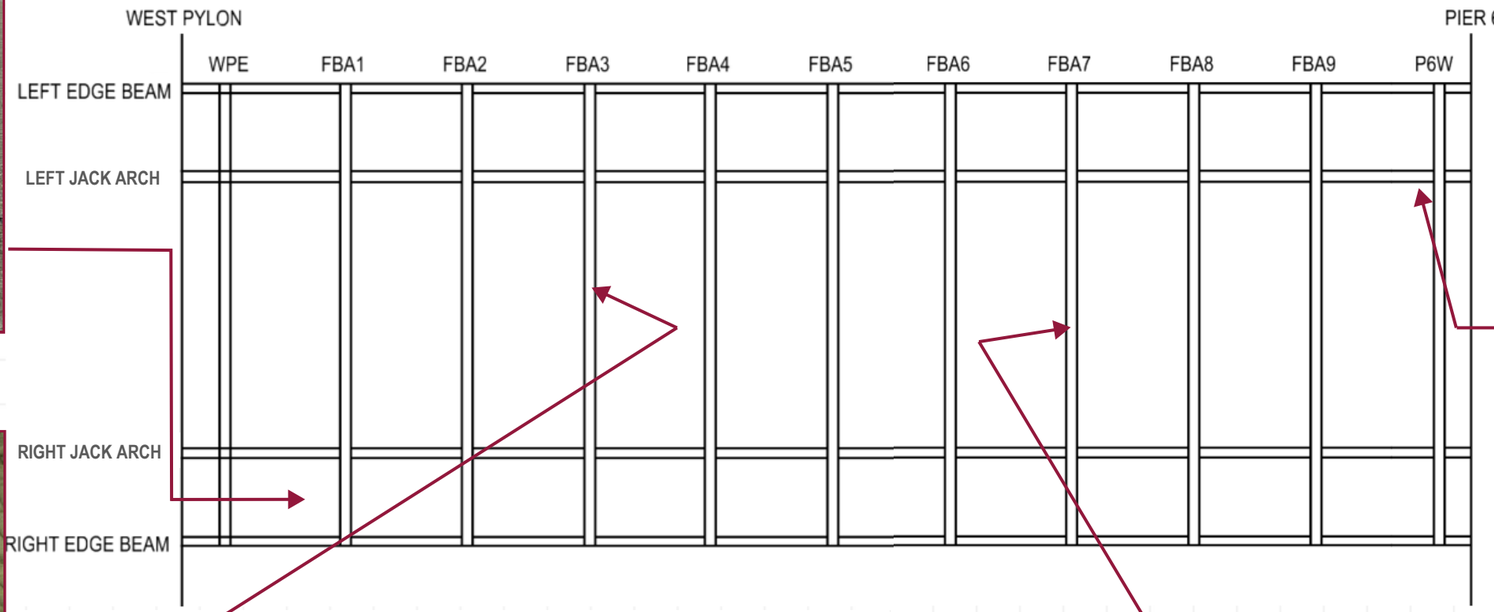
Up to 2' high by 2' long by 3" deep spall/ delamination on the south face of Beam 4 at the east end at the West Pylon (looking northeast).

Spall with three layers of exposed reinforcement and moderate rust staining in the underside of the deck at the top of the south face of the West Pylon (looking north).

Scupper 75% blocked by debris (looking east near the right curb).

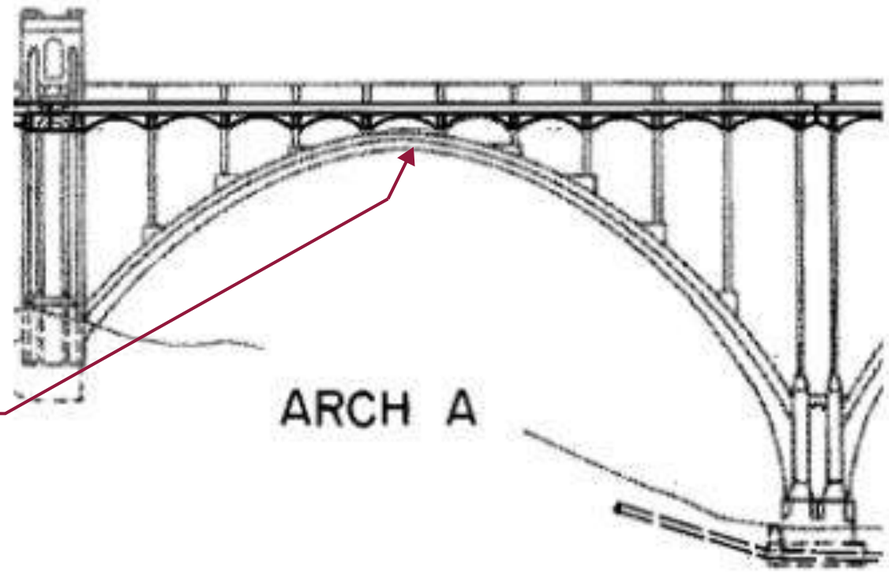
10" long by 4" high by 3" deep spall with exposed and broken reinforcement on the east and bottom face of Floorbeam A3 near midpoint between the Left and Right Jack Arch (looking west).

20' long by 4' wide spall/ delamination on the bottom face of the North Arch between Spandrel Columns 4 & 5 (looking east).



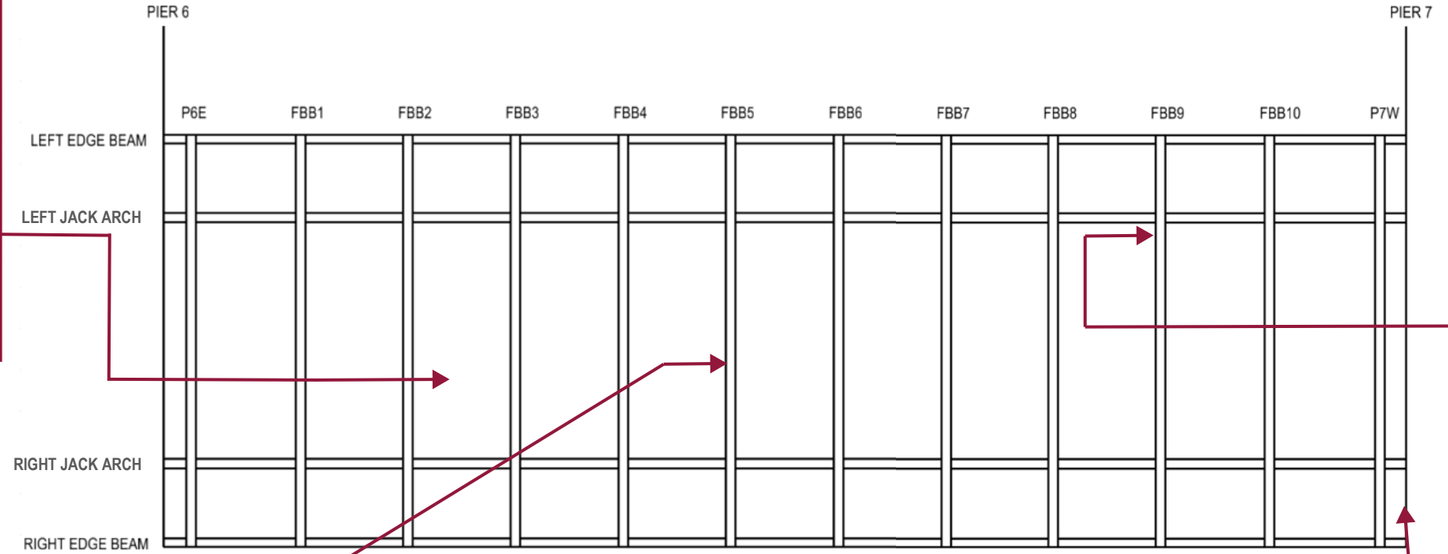
North downspout with 100% section loss throughout the south half at Spandrel Column 6W on the North Arch (looking north).

Gouges in the west face near the bottom of Floorbeam A7 near midpoint between the Left and Right Jack Arch (looking east).



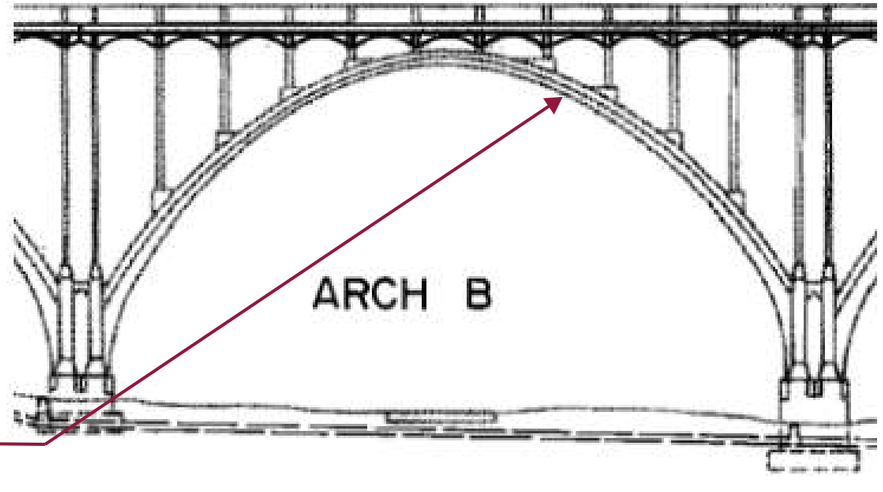
Span A

Longitudinal crack up to 1/16" wide in the eastbound lanes (looking east).



Spall with exposed and bent reinforcement in the north half of the west face of Floorbeam B9 between the Left and Right Jack Arch (looking east).

Spall with exposed reinforcement that has been sealed in the north half of the west face of Floorbeam B5 between the Left and Right Jack Arch (looking east).

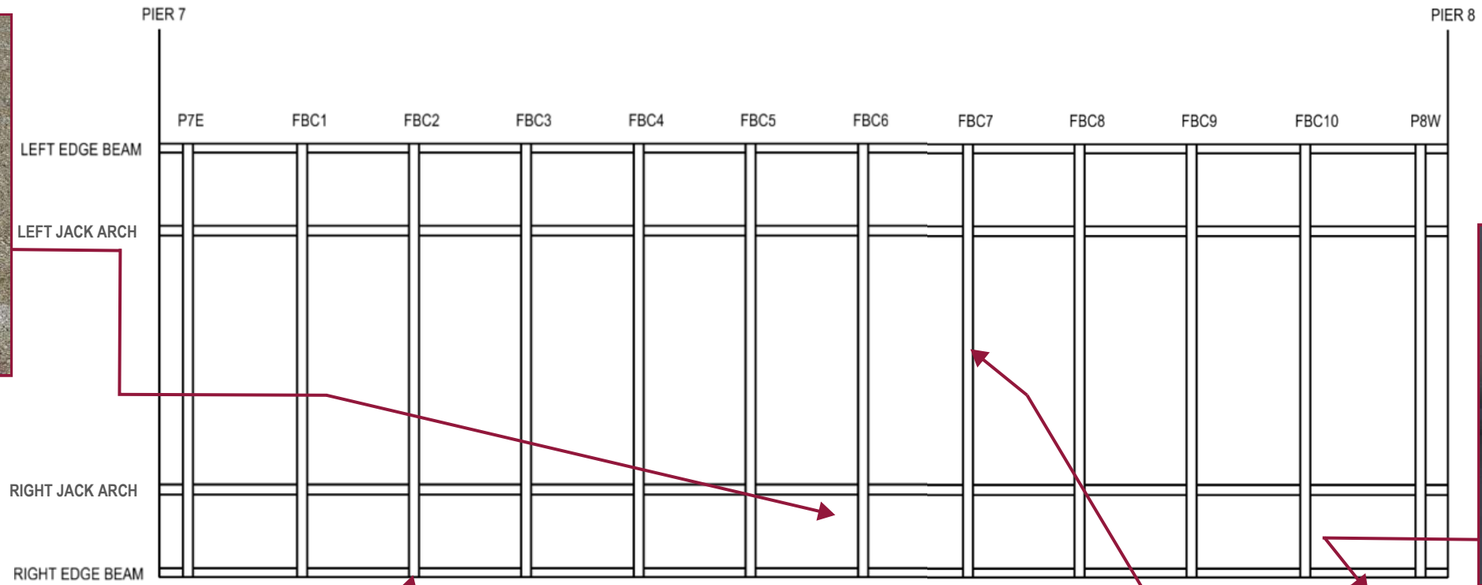


Spalls with exposed reinforcement in the underside of both the North and South Arch between Spandrel Columns 7 & 8 (looking west).

Up to 1/2" thick laminate corrosion throughout the interior face of the joint armor at Pier 7 at the Right Arch (looking north).

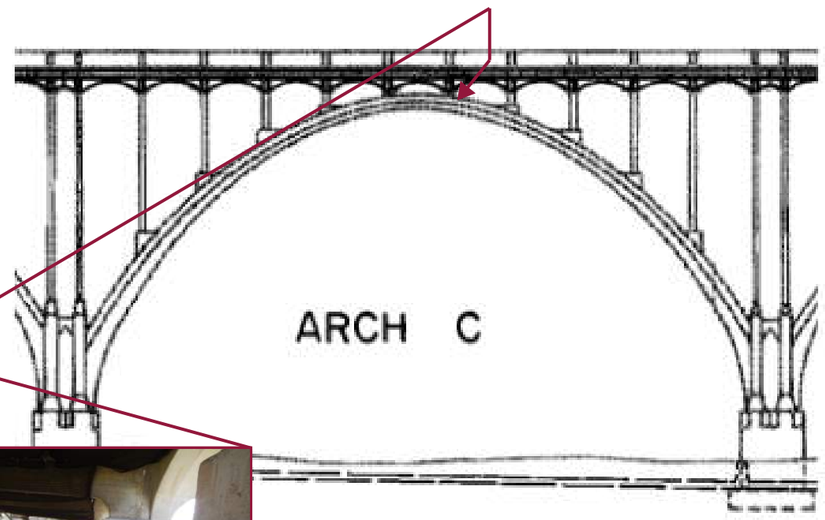
Span B

Depression up to 1 1/2" deep by 12" wide by 24" long near the right curb (looking east).



100% section loss at the bottom west corners of the light pole cover (looking east).

Spall with exposed reinforcement on the south face of Floorbeam C2 (looking northeast).



Top edge spall with exposed reinforcement on the north face of the South Arch below Column 6 (looking south).

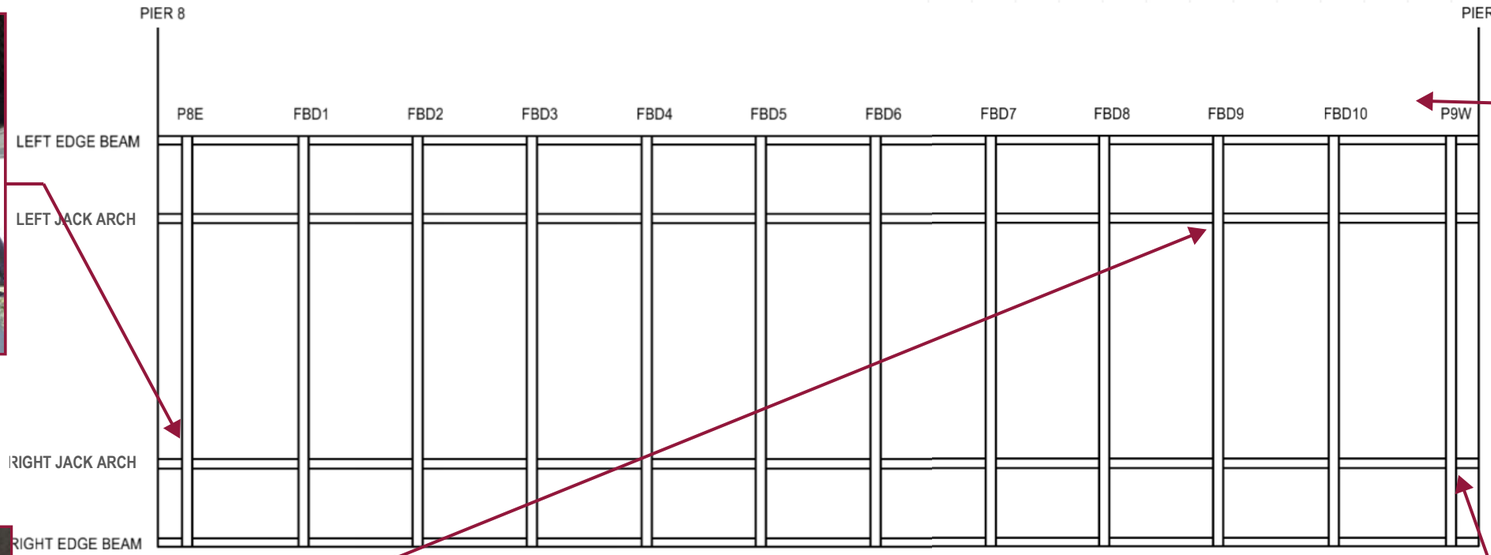
Partially sealed spalls with exposed reinforcement on the east face of Floorbeam C7 and in the underside of the deck at Floorbeam C7 (looking northwest).

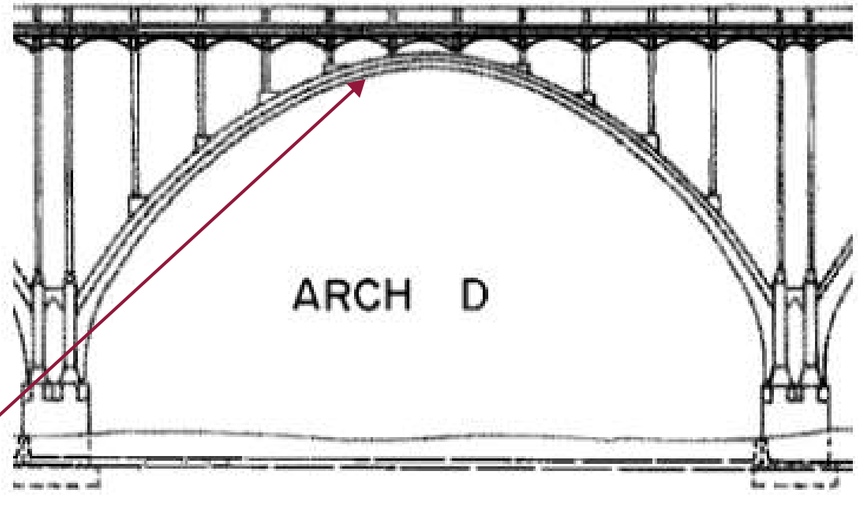
Span C

Typical spalls with exposed and deteriorated reinforcement and cracks throughout Spandrel Columns near the Right Jack Arch on the South Truss (looking south).

Longitudinal and transverse cracks with minor efflorescence and rust staining throughout the underside of the deck near the Left Jack Arch and west side of Floorbeam D9 (looking east).

5' long by 2' wide by 4" deep spall on the bottom face of the North Arch between Spandrel Columns 4 & 5 (looking west).





Light cover secured in closed position with tape (looking northwest). Note that the cover is hinged and is not in danger of falling.

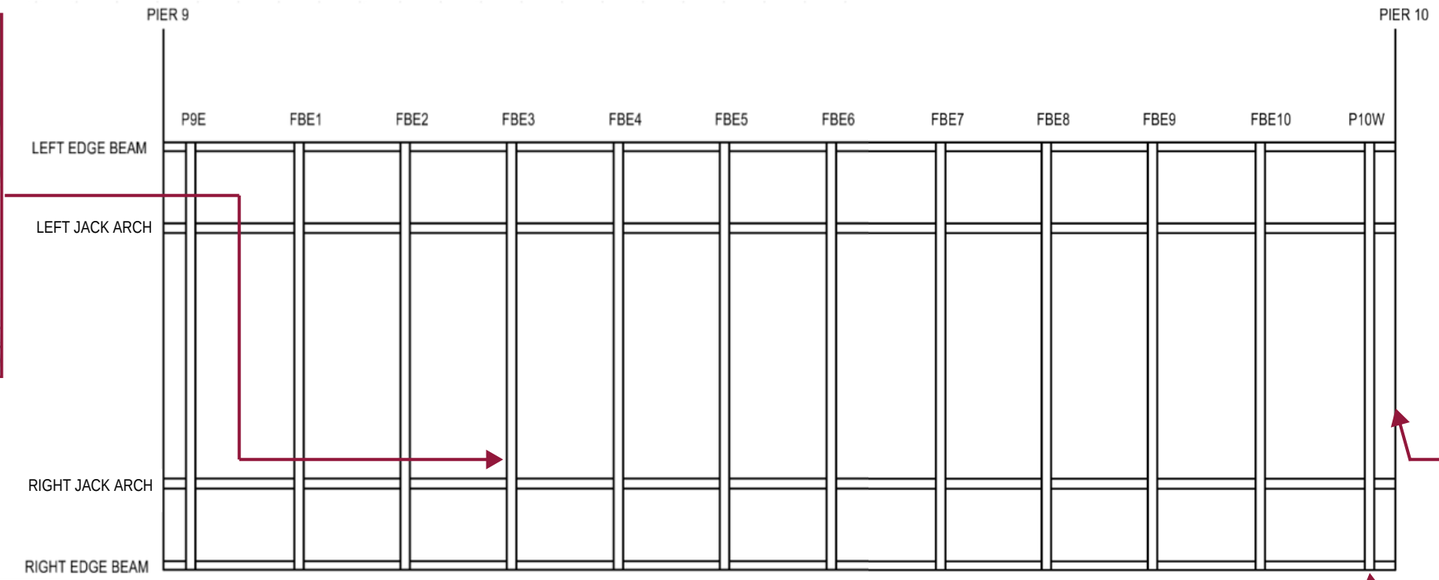
Vegetation growth on the west face of the south column of Pier 9 (looking southeast).

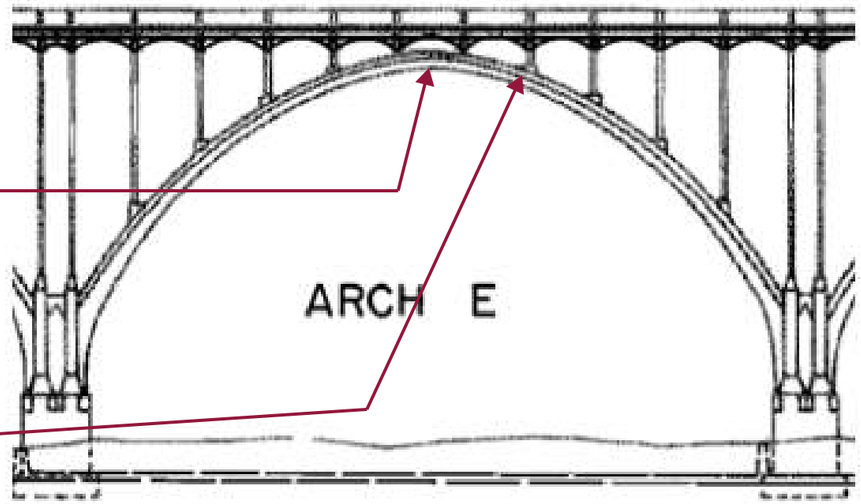
Span D

2' high by 1' wide delamination on the west face of Floorbeam E3 near the south end at the Right Jack Arch (looking east).

18" wide by 3' long by 3-1/2" deep spall to the underside of the South Arch between Spandrel Columns 5 & 6 (looking south).

2' wide by 1' high by 2" deep spall on the south face of the North Arch below Spandrel Column 7 (looking north).





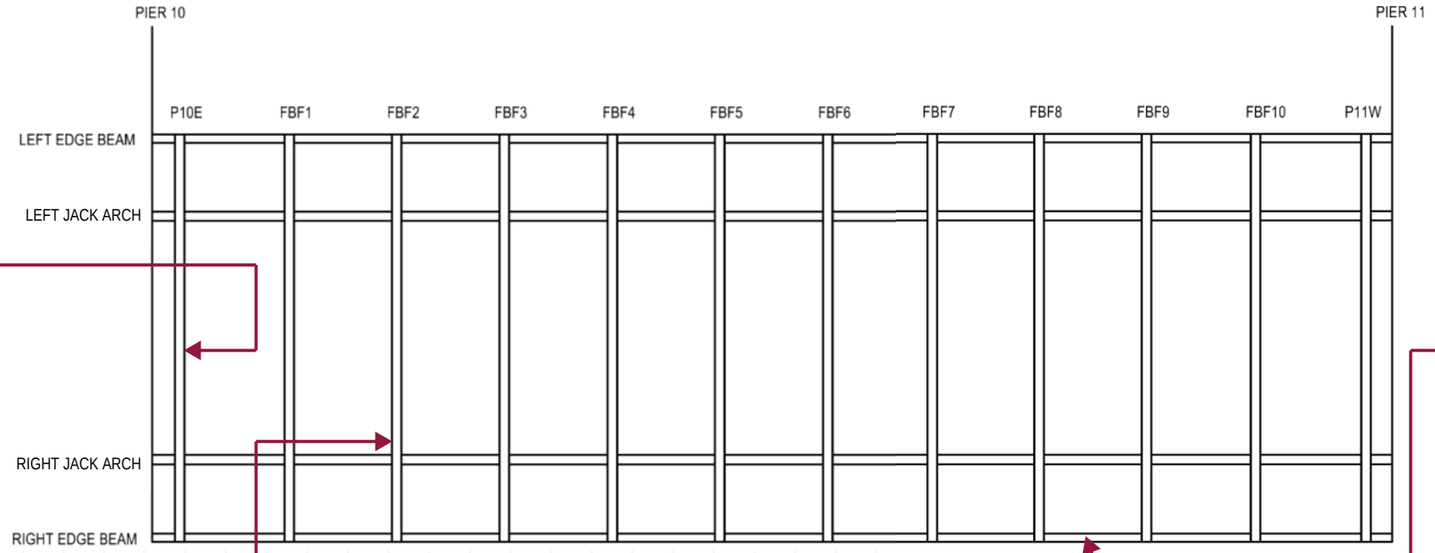
Vertical displacement of the compression seal material up to 1/4" over an 18" length (looking north).

Missing light standard and wires taped off at the south railing and edge of deck at Pier 10 (looking north).

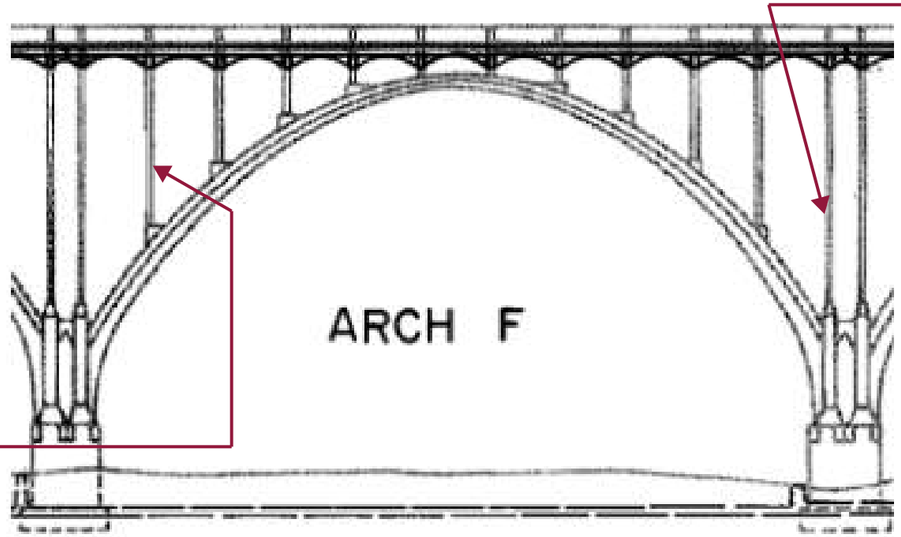
20' long by 18" high by full width spall with exposed reinforcement including 5 broken stirrups on the underside of Pier 10 (looking southwest).

Shallow spall with exposed reinforcement due to lack of cover on the west face of Floorbeam F2 near the Right Jack Arch on the South Arch (looking east).

Shallow spall with exposed reinforcement on the west face of Spandrel Column 1 on the North Arch (looking east).



Longitudinal hairline cracks along the underside of the Right Edge Beam between Floorbeams F8 & F9 (looking north).



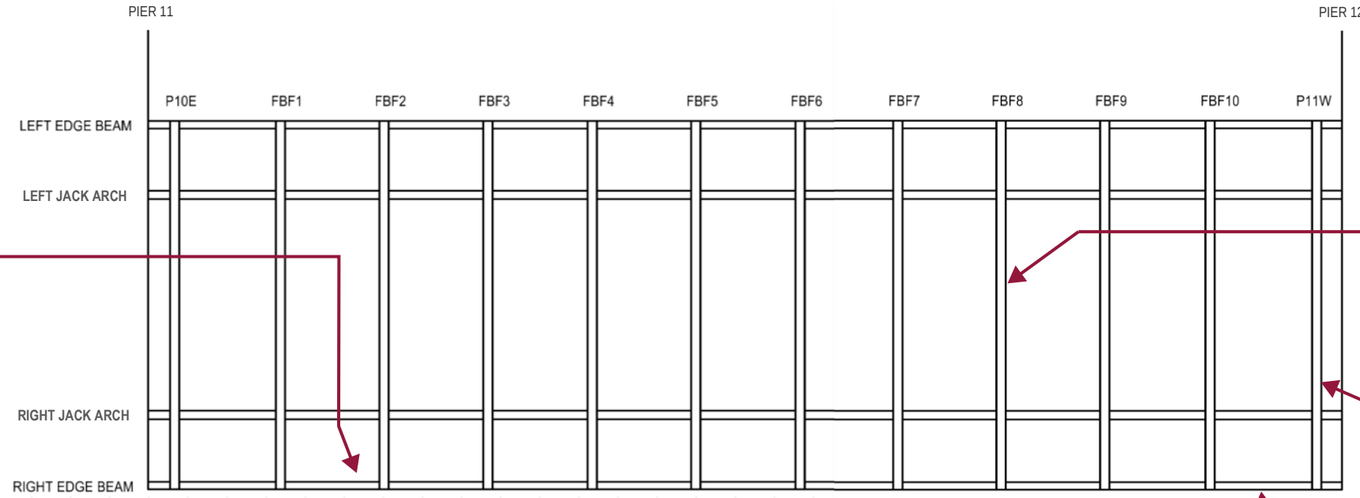
Full width by 6' high edge spall with exposed reinforcement on the south face of the North Spandrel Column at Pier 11 (looking northeast).

Span F

Typical longitudinal and transverse hairline cracks in the sidewalks (looking southeast).

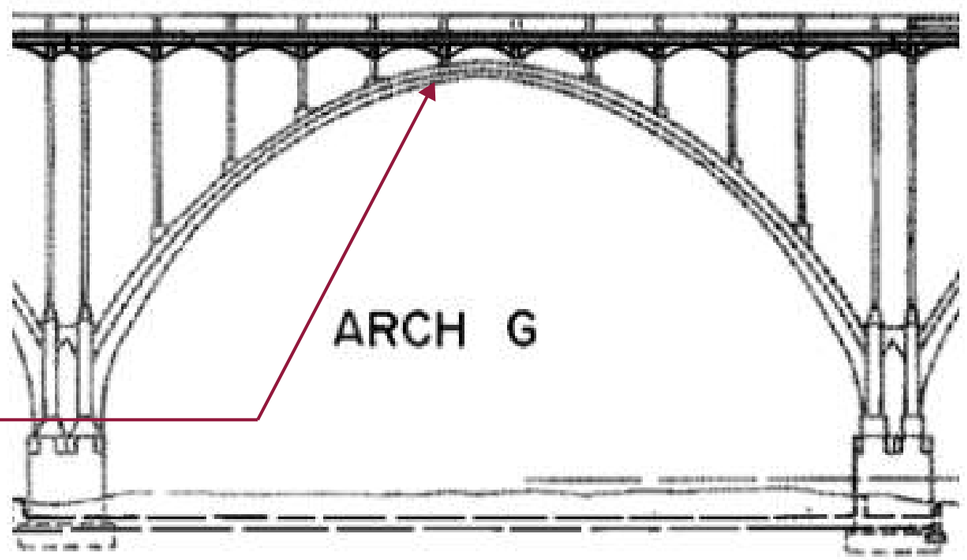
Typical longitudinal and transverse hairline cracks in the sidewalks (looking southeast).

12' long by 2' wide by 2-1/2" deep spall/ delamination on the underside of the North Arch between Spandrel Columns 4 & 5 (looking northwest).



7' long by 18" high spall with exposed reinforcement and 3 broken stirrups on the east face of Floorbeam G8 at the midpoint between the Left and Right Jack Arches (looking west).

Spall with exposed reinforcement and nine stirrups with 100% section loss on the east face Pier 12 near the Right Jack Arch on the South Arch (looking west).

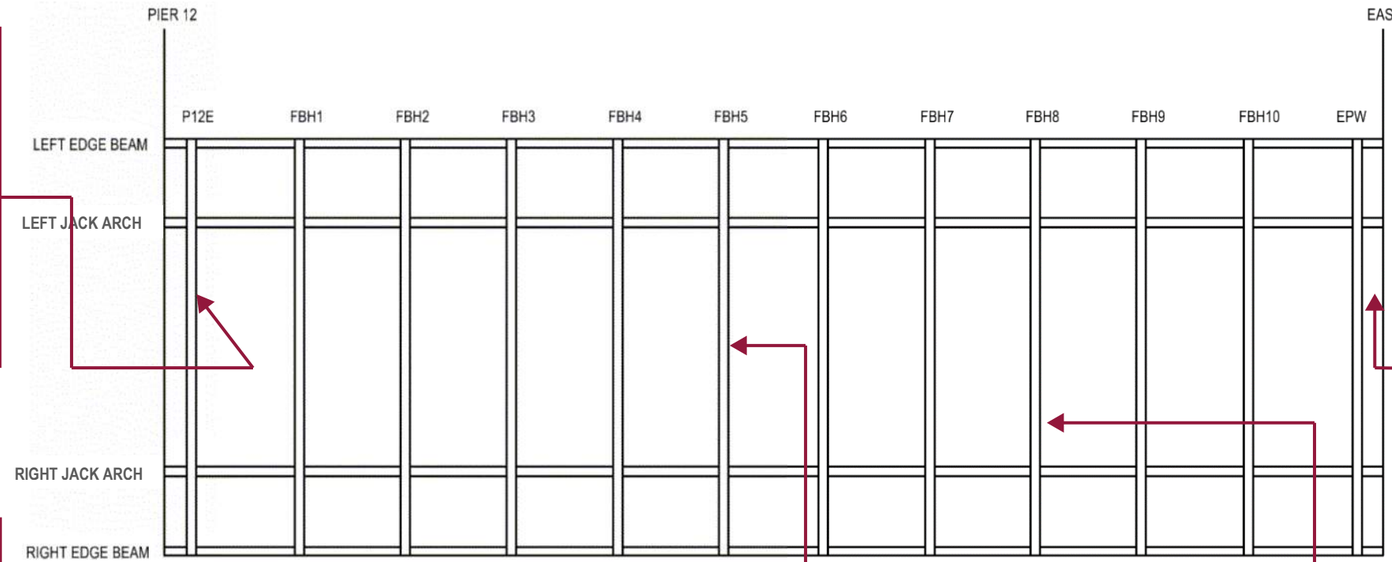


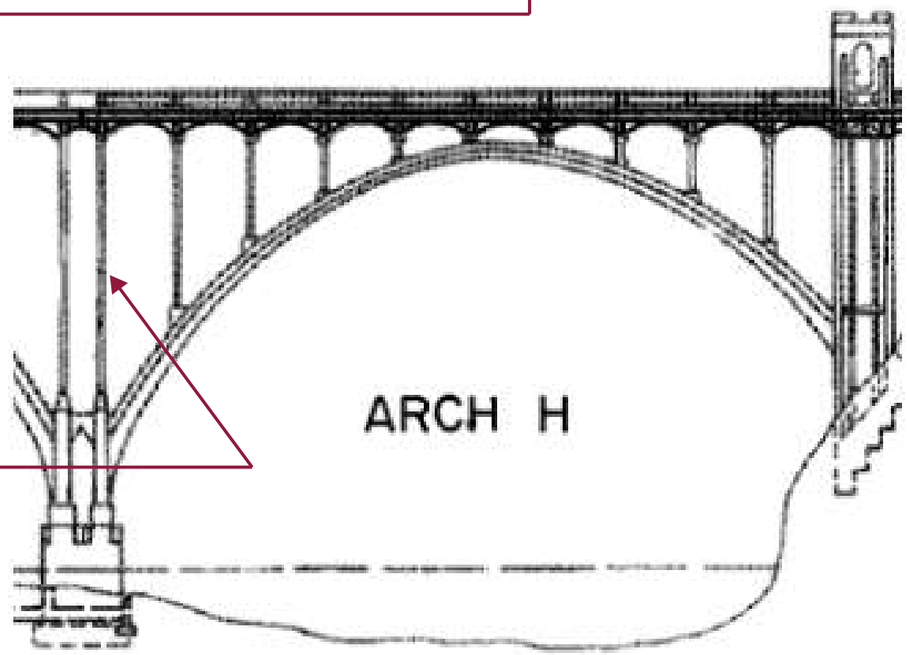
Span G

Full width spall with exposed and deteriorated reinforcement on the underside of Pier 12 near the Left Jack Arch (looking north).

Full height vertical hairline cracks in the web on the east face of Floorbeam H5 near the midpoint (looking west).

Spalls with exposed reinforcement on both columns at Pier 12 on the North Arch (looking northwest).

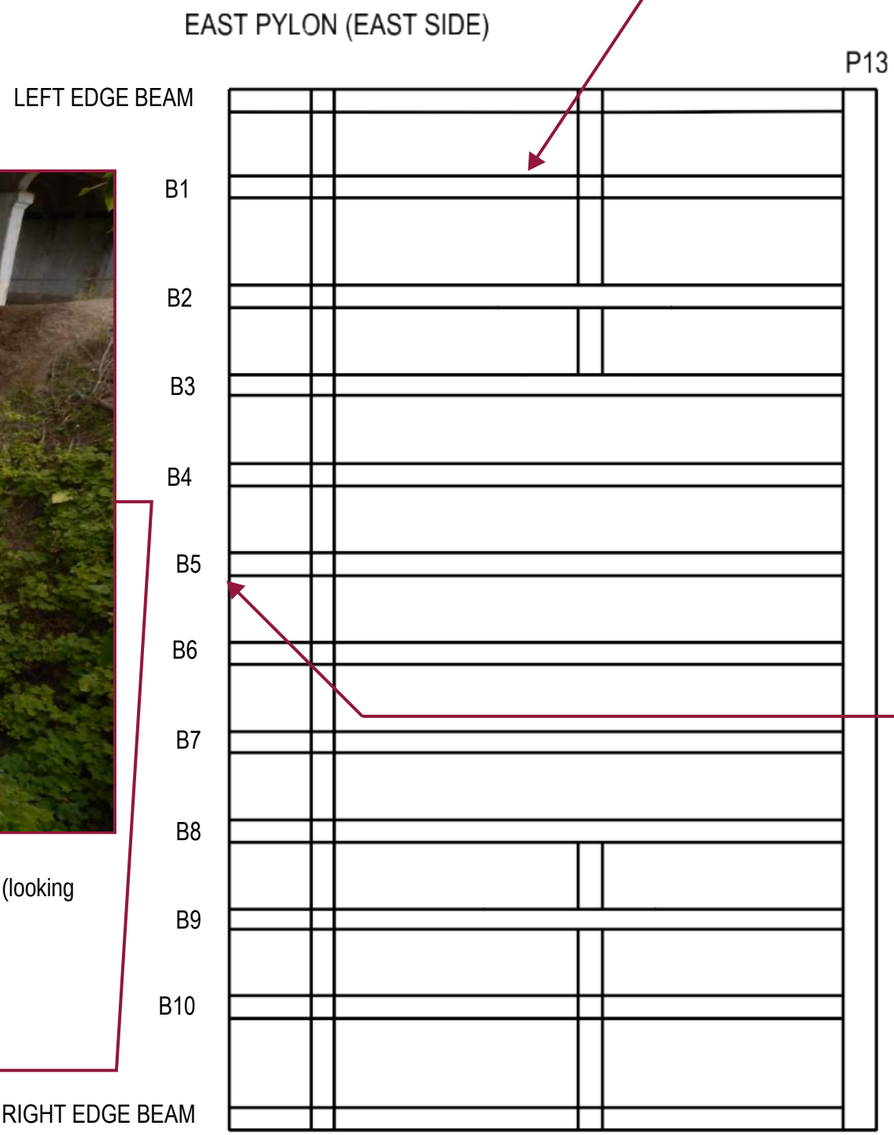




Spalls with exposed reinforcement and hairline cracking with minor efflorescence on the east end of Beams 2 through 4 at the interior of the East Pylon (looking northeast).

Full height vertical hairline cracks with minor spalls in the web on the east face of Floorbeam H8 near the midpoint (looking west). Note the large spalls with exposed reinforcement on the underside of the deck.

Hairline cracks with map cracking in the south face of the East Pylon right column (looking northeast).

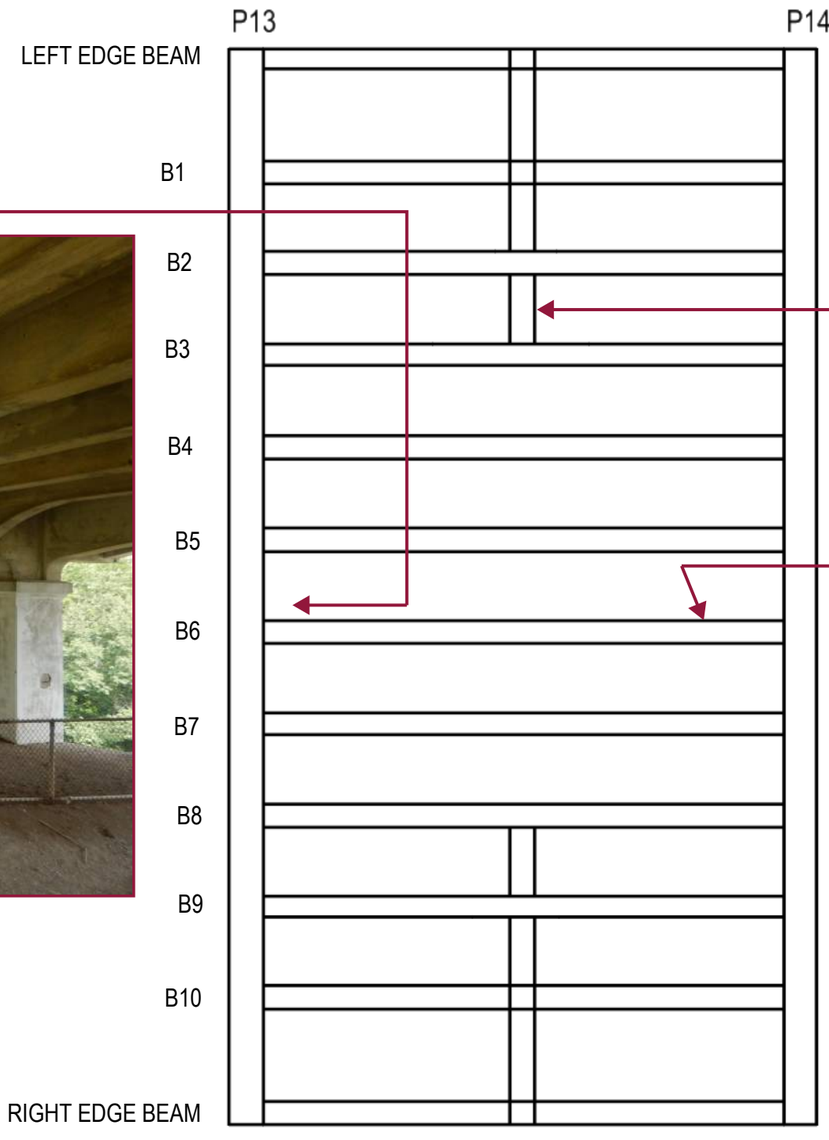


Rapid elevation change of shale slope between Pier 15 and the East Pylon (looking southwest).

East Pylon east elevation and a spall with exposed reinforcement in the east pier cap below Beam 5 (looking west).

Span 15

Pier 13 east elevation (looking west).

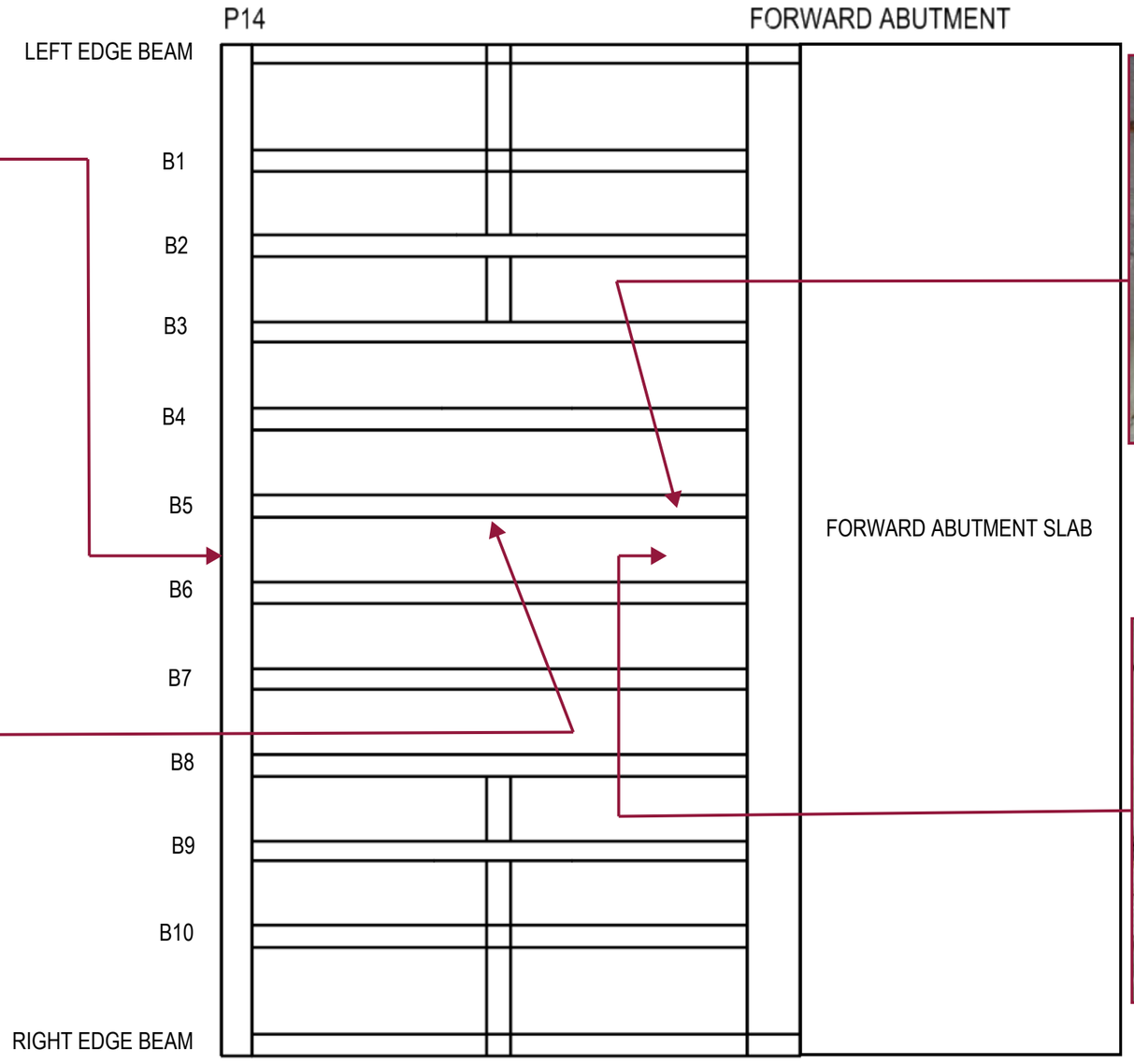


Typical approach span diaphragm (looking west).

18" long by 12" wide spall with exposed reinforcement on the north face bottom edge of Beam 6 near Pier 14 (looking southeast).

Vertical hairline crack with moderate efflorescence on the west face of the diaphragm between Beams 5 & 6 at Pier 14 (looking east).

Full width delamination with an isolated spall on the underside of Beam 5 near midspan (looking north).



Full width spall with exposed reinforcement on the underside of Beam 5 near the Forward Abutment (looking east).

Hairline longitudinal and transverse cracks with minor efflorescence and rust staining throughout the underside of the deck between Beams 5 & 6 near the Forward Abutment (looking east).

Appendix B
Element Level Data

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Approach Slab Summary	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
321 - Reinforced Concrete Approach Slab (SF)	2282	2193	74	15	0

Rear Approach	Condition State				
	QTY.	1	2	3	4
321 - Reinforced Concrete Approach Slab (SF)	1141	1082	49	10	0

Forward Approach	Condition State				
	QTY.	1	2	3	4
321 - Reinforced Concrete Approach Slab (SF)	1141	1111	25	5	0

Deck Summary	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	99653	40629	34299	24725	0
510 - Wearing Surface (SF)	95370	91285	4082	3	0
38 - Reinforced Concrete Slab (SF) *unobservable	1924	1863	55	6	0
510 - Wearing Surface (SF)	1842	1781	55	6	0
302 - Compression Joint Seal (LF)	715	184	153	378	0
330 - Metal Bridge Railing (LF)	3748	3417	331	0	0
815 - Drainage (EA)	20	5	2	3	10

Deck - Rear Abutment Slab	Condition State				
	QTY.	1	2	3	4
38 - Reinforced Concrete Slab (SF) *unobservable	972	911	55	6	0
510 - Wearing Surface (SF)	930	869	55	6	0
330 - Metal Bridge Railing (LF)	36	36	0	0	0

Deck - Span 1	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1771	1150	266	355	0
510 - Wearing Surface (SF)	1695	1628	67	0	0
302 - Compression Joint Seal (LF) [Rear Abut.]	65	27	11	27	0
330 - Metal Bridge Railing (LF)	66	60	6	0	0

Deck - Span 2	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1812	724	544	544	0
510 - Wearing Surface (SF)	1734	1685	49	0	0
330 - Metal Bridge Railing (LF)	67	61	6	0	0

Deck - Span 3	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1812	905	544	363	0
510 - Wearing Surface (SF)	1734	1635	99	0	0
330 - Metal Bridge Railing (LF)	67	61	6	0	0

Deck - Span 4	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1812	814	635	363	0
510 - Wearing Surface (SF)	1734	1625	109	0	0
330 - Metal Bridge Railing (LF)	67	61	6	0	0

Deck - Span 5	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1812	815	544	453	0
510 - Wearing Surface (SF)	1734	1660	74	0	0
330 - Metal Bridge Railing (LF)	67	61	6	0	0

Deck - Span 6	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	2124	1167	744	213	0
510 - Wearing Surface (SF)	2033	1967	66	0	0
330 - Metal Bridge Railing (LF)	79	72	7	0	0

	2022 Ratings				
Deck - Span A	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	9611	3603	4085	1923	0
510 - Wearing Surface (SF)	9198	8455	743	0	0
302 - Compression Joint Seal (LF) [West Pylon]	65	10	2	53	0
330 - Metal Bridge Railing (LF)	354	322	32	0	0
815 - Drainage (EA)	4	0	1	2	1

Deck - Span B	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	3916	4440	2090	0
510 - Wearing Surface (SF)	9997	9147	850	0	0
302 - Compression Joint Seal (LF) [Pier 6]	65	30	0	35	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	0	0	0	2

Deck - Span C	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	6005	2612	1829	0
510 - Wearing Surface (SF)	9997	9494	500	3	0
302 - Compression Joint Seal (LF) [Pier 7]	65	12	0	53	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	0	0	0	2

Deck - Span D	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	5484	3395	1567	0
510 - Wearing Surface (SF)	9997	9747	250	0	0
302 - Compression Joint Seal (LF) [Pier 8]	65	9	4	52	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	1	0	1	0

Deck - Span E	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	5222	3657	1567	0
510 - Wearing Surface (SF)	9997	9807	190	0	0
302 - Compression Joint Seal (LF) [Pier 9]	65	3	17	45	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	0	1	0	1

Deck - Span F	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	4699	3657	2090	0
510 - Wearing Surface (SF)	9997	9877	120	0	0
302 - Compression Joint Seal (LF) [Pier 10]	65	14	0	51	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	2	0	0	0

Deck - Span G	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	10446	4178	3134	3134	0
510 - Wearing Surface (SF)	9997	9891	106	0	0
302 - Compression Joint Seal (LF) [Pier 11]	65	18	31	16	0
330 - Metal Bridge Railing (LF)	385	350	35	0	0
815 - Drainage (EA)	2	1	0	0	1

Deck - Span H	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	9611	960	2403	6248	0
510 - Wearing Surface (SF)	9198	8580	618	0	0
302 - Compression Joint Seal (LF) [Pier 12]	65	23	18	24	0
330 - Metal Bridge Railing (LF)	354	322	32	0	0
815 - Drainage (EA)	2	0	0	0	2

Deck - Span 15	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	2124	317	1169	638	0
510 - Wearing Surface (SF)	2033	1938	95	0	0
302 - Compression Joint Seal (LF) [East Pylon]	65	8	37	20	0
330 - Metal Bridge Railing (LF)	79	72	7	0	0

Deck - Span 16	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	2717	406	1495	816	0
510 - Wearing Surface (SF)	2600	2574	26	0	0
330 - Metal Bridge Railing (LF)	100	91	9	0	0

Deck - Span 17	Condition State				
	QTY.	1	2	3	4
12 - Reinforced Concrete Deck (SF)	1771	264	975	532	0
510 - Wearing Surface (SF)	1695	1575	120	0	0
330 - Metal Bridge Railing (LF)	66	60	6	0	0

Deck - Forward Abutment Slab	Condition State				
	QTY.	1	2	3	4
38 - Reinforced Concrete Slab (SF) *unobservable	952	952	0	0	0
510 - Wearing Surface (SF)	912	912	0	0	0
302 - Compression Joint Seal (LF) [Fwd Abut.]	65	30	33	2	0
330 - Metal Bridge Railing (LF)	36	36	0	0	0
815 - Drainage (EA)	2	1	0	0	1

Superstructure Summary	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
38 - Reinforced Concrete Slab (SF) *see Deck	1924	1863	55	6	0
110 - Reinforced Concrete Open Girder/Beam (LF)	3270	2036	777	457	0
144 - Reinforced Concrete Arch (LF) [Jack Arches, Spandrel Columns, Main Arches]	3018	2375	410	233	0
155 - Reinforced Concrete Floorbeam (LF)	6070	5312	252	506	0
311 - Movable Bearing (EA)	40	40	0	0	0

Span 1	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	326	300	12	14	0
311 - Movable Bearing (EA) [Rear Abut.]	10	10	0	0	0

Span 2	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	334	306	20	8	0

Span 3	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	334	309	17	8	0

Span 4	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	334	302	16	16	0

Span 5	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	334	304	13	17	0

Span 6	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	391	359	14	18	0
311 - Movable Bearing (EA) [West Pylon]	10	10	0	0	0

Span A	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	354	221	113	20	0
155 - Reinforced Concrete Floorbeam (LF)	710	667	27	16	0

Span B	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	305	40	40	0
155 - Reinforced Concrete Floorbeam (LF)	775	682	25	68	0

Span C	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	310	30	45	0
155 - Reinforced Concrete Floorbeam (LF)	775	658	24	93	0

Span D	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	280	40	65	0
155 - Reinforced Concrete Floorbeam (LF)	775	659	30	86	0

Span E	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	262	100	23	0
155 - Reinforced Concrete Floorbeam (LF)	775	670	29	76	0

Span F	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	308	61	16	0
155 - Reinforced Concrete Floorbeam (LF)	775	657	60	58	0

Span G	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	385	355	16	14	0
155 - Reinforced Concrete Floorbeam (LF)	775	687	31	57	0

Span H	Condition State				
	QTY.	1	2	3	4
144 - Reinforced Concrete Arch (LF)	354	334	10	10	0
155 - Reinforced Concrete Floorbeam (LF)	710	632	26	52	0

Span 15	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	391	244	98	49	0
311 - Movable Bearing (EA) [East Pylon]	10	10	0	0	0

Span 16	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	500	200	200	100	0

Span 17	Condition State				
	QTY.	1	2	3	4
110 - Reinforced Concrete Open Girder/Beam (LF)	326	97	98	131	0
311 - Movable Bearing (EA) [Fwd Abut.]	10	10	0	0	0

Substructure Summary	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	34	4	15	15	0
215 - Reinforced Concrete Abutment (LF)	732	641	26	65	0
234 - Reinforced Concrete Pier Cap (LF)	609	561	28	20	0

Rear Abutment	Condition State				
	QTY.	1	2	3	4
215 - Reinforced Concrete Abutment (LF)	366	350	6	10	0

Pier 1	Condition State				
	Qty.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	1	1	0	0
234 - Reinforced Concrete Pier Cap (LF)	65	65	0	0	0

Pier 2	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	2	0	0
234 - Reinforced Concrete Pier Cap (LF)	65	0	0	0	0
Pier 3	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	2	0	0
234 - Reinforced Concrete Pier Cap (LF)	65	65	0	0	0

Pier 4	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	1	1	0
234 - Reinforced Concrete Pier Cap (LF)	65	65	0	0	0

Pier 5	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	2	0	0
234 - Reinforced Concrete Pier Cap (LF)	65	0	0	0	0

West Pylon	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	0	2	0
234 - Reinforced Concrete Pier Cap (LF)	77	58	10	9	0

Pier 6	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	0	2	0

Pier 7	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	0	2	0

Pier 8	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	0	2	0

Pier 9	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	1	1	0

Pier 10	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	0	2	0

Pier 11	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	2	0	0

Pier 12	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	1	1	0

East Pylon	2022 Ratings				
	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	2	0	2	0	0
234 - Reinforced Concrete Pier Cap (LF)	77	67	6	4	0

Pier 13	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	3	1	1	1	0
234 - Reinforced Concrete Pier Cap (LF)	65	53	10	2	0

Pier 14	Condition State				
	QTY.	1	2	3	4
205 - Reinforced Concrete Column (EA)	3	2	0	1	0
234 - Reinforced Concrete Pier Cap (LF)	65	58	2	5	0

Forward Abutment	Condition State				
	QTY.	1	2	3	4
215 - Reinforced Concrete Abutment (LF)	366	291	20	55	0

Appendix C
AssetWise Report

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Inspector:	Feudo,Victoria	**Structure Number:**	1802046
Inspection Date:	09/07/2022	**Facility Carried:**	SR 17

Bridge Inspection Report

Ohio Bridge Inspection Summary Report

CUY-00017-0283 (1802046)

2: District	District 12 26446 - FAIRVIEW PARK (CUY county)	5A: Inventory Route	1 00017
21: Major Maint A/B	01 - State Highway Agency /	7: Facility On	SR 17
225 Routine Main A/B	04 - City or Municipal Highway Agency /	6: Feature Ints	ROCKY RIVER
221 Inspection A/B	01 - State Highway Agency /	9: Location	APPROX 900FT E W220 ST
220: Inv. Location	DISTRICT 12	Lat, Lon	41.420475 ,-81.861814

Condition

58: Deck	**4 - Poor Condition**
58.01 Wearing Surface	6 - Satisfactory (1-10% distress)
58.02 Joint	6- Satisfactory (isolated leaking)
59: Superstructure	**4 - Poor Condition**
59.01 Paint & PCS	N - Not Applicable
60: Substructure	**4 - Poor Condition**
61: Channel	**4**
61.01 Scour	**7 - Good**
62: Culverts	**N - Not Applicable**
67.01 GA	**4**

Appraisal

Sufficiency Rating	38.8	SD/FO	1 - SD	
36: Rail, Tr, Gd, Term Std	1	0	0	0
72: Approach Alignment	6 - Equal to present minimum criteria			
113: Scour Critical	9 - Foundations above flood waters			
71: Waterway Adequacy	8 - Bridge Above Approaches			

Geometric

48: Max Span Length (ft)	192.0
49: Structure Length (ft)	1919.0
52: Deck Width, Out-To-Out (ft)	64.5
424: Deck Area (sf)	123775.5
32: Appr Roadway Width (ft)	52.0
51: Road Width, Curb-Curb (ft)	52.0
50A: Curb/SW Width: Left (ft)	5
50A: Curb/SW Width: Right (ft)	5
34: Skew (deg)	0
33: Bridge Median	0 - No median
54B: Min Vert Underclearance (ft)	0
336A: Min Vert Clrnce IR Cardinal (ft)	99
336B: Min V Clr IR Non-Cardinal (ft)	0
578: Culvert Length (ft)	0

Load Posting

41: Op/Post/Closed	A - Open
70: Posting	5 - Equal to or above legal loads
70.01: Date	
70.02: Sign Type	
734: Percent Legal (%)	140
704: Analysis Date	07/01/2013
63: Analysis Method	6 - Load Factor (LF) rating reported by

Structure Type

43: Bridge Type	1 - Concrete 11 - Arch - Deck N- Not Applicable
45: Spans Main / Approach	8 / 9
107: Deck Type	1 - Concrete Cast-in-Place
408: Composite Deck	N - Non-composite Construction
414A Joint Type 1	8 - Elastomeric Strip Seal
414B: Joint Type 2	N - None
108A: Wearing Surface	3 - Latex Concrete or similar additive N- Not Applicable
422: WS Date	10/31/1989
423: WS Thick (in)	1.2
482: Protective Coating	B - Epoxy - Urethane sealers
483: PCS Date	01/01/1987
453: Bearing Type 1	3 - Sliding (Bronze)
455: Bearing Type 2	N - None
528: Foundn: Abut Fwd	4 - Spread Footing (on soil)
533: Foundn: Abut Rear	4 - Spread Footing (on Soil)
536: Foundn: Pier 1	4 - Spread Footing (on soil)
539: Foundn: Pier 2	0 - Other

Age and Service

27: Year Built/ 106 Rehab	1933 / 1989
42A: Service On	5 - Highway-pedestrian
42B: Service Under	5 - Waterway
28A: Lanes on	04
28B: Lanes Under	02
19: Bypass Length	3
29: ADT	14415
109: % Trucks (%)	6

Inspections

		Months	
90: Routine Insp.		12	09/07/2022
92A: FCM Insp.	N	0	
92B: Dive Insp.	N	0	
92C: Special Insp.	N	0	
92D: UBIT Insp.	Y	12	08/26/2022
92E: Drone Insp.	N	0	

Inspector Feudo,Victoria

rating factor (RF) method using MS18 loading.

Inspector:	Feudo,Victoria	**Structure Number:**	1802046
Inspection Date:	09/07/2022	**Facility Carried:**	SR 17

Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12-Reinforced Concrete Deck	3 - Mod.	99653	sq. ft.	40629	34299	24725	0
	2022: This element includes the width of the roadway and the extensions below the sidewalks - 54'-4" total width. CS2 - Delaminations in the underside CS3 - Spalls with exposed reinforcement, longitudinal cracks with rust staining and efflorescence For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
510-Wearing Surfaces		95370	sq. ft.	91285	4082	3	0
	2022: CS2 - Transverse hairline and longitudinal hairline cracks, minor depressions/spalls CS3 - Spall near midspan of Span C For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
38-Reinforced Concrete Slab	3 - Mod.	1924	sq. ft.	1863	55	6	0
	2022: This element includes the slabs at the enclosed cellular abutments. The true condition is unknown due to lack of access; therefore, the condition states must be based on the wearing surface above (replaced in 2017 vs. slabs constructed in 1989). CS2 - Transverse cracking at the rear edge of the Rear Abutment slab wearing surface CS3 - Spalling in the rear edge of the Rear Abutment slab wearing surface For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
510-Wearing Surfaces		1842	sq. ft.	1781	55	6	0
	2022: This element includes the slabs at the enclosed cellular abutments. The true condition is unknown due to lack of access; therefore, the condition states must be based on the wearing surface above (replaced in 2017 vs. slabs constructed in 1989). CS2 - Transverse cracking at the rear edge of the Rear Abutment slab wearing surface CS3 - Spalling in the rear edge of the Rear Abutment slab wearing surface For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						

Inspector:	Feudo,Victoria	**Structure Number:**	1802046
Inspection Date:	09/07/2022	**Facility Carried:**	SR 17

Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
110-Reinforced Concrete Open Girder/Beam	3 - Mod.	3270	ft.	2036	777	457	0
	2022: This element includes the approach span beams but not the left and right edge beams. See Element 330 for the edge beam deficiency comments. CS2 - Vertical hairline cracks near the piers. Delaminations CS3 - Spalls with exposed reinforcement, cracks 1/16" wide or more with rust staining and efflorescence For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
144-Reinforced Concrete Arch	3 - Mod.	3018	ft.	2375	410	233	0
	2022: This element includes the main arch ribs, spandrel columns (including those below the joints), and jack arches. CS2 - Delaminations. Hairline cracking CS3 - Spalls with exposed and corroded reinforcement For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
155-Reinforced Concrete Floor Beam	3 - Mod.	6295	ft.	5537	252	506	0
	2022: This element includes the arch span floorbeams. CS2 - Hairline cracks, shallow popout spalls at the construction joints, delaminations CS3 - Spalls with exposed reinforcement. Heavily corroded or broken reinforcement particularly below the joints For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
205-Reinforced Concrete Column	3 - Mod.	34	each	4	15	15	0
	2022: The arch pier columns extend from the ground to the bottom of the main arch end columns below the joints. CS2 - Hairline cracks. Delaminations CS3 - Spalls with exposed reinforcement. Undermining at the left rear corner of the East Pylon columns due to the eroding shale slope For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
215-Reinforced Concrete Abutment	3 - Mod.	732	ft.	641	26	65	0
	2022: This element includes all walls of both cellular abutments: four longitudinal and three transverse at each. Only the exterior faces of three walls are visible. CS2 - Delaminations. Hairline vertical cracks CS3 - Spalls with exposed reinforcement. Hairline vertical cracks with rust staining For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						

Inspector:	Feudo,Victoria	**Structure Number:**	1802046
Inspection Date:	09/07/2022	**Facility Carried:**	SR 17

Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
234-Reinforced Concrete Pier Cap	3 - Mod.	609	ft.	561	28	20	0
	2022: The pylons have west and east pier caps connected with struts. CS2 - Delaminations. Minor map cracking at spalls CS3 - Spalls with exposed reinforcement. Sealed spalls. Cracks with rust staining For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
302-Compression Joint Seal	3 - Mod.	715	ft.	184	153	378	0
	2022: CS2 - Minor to moderate debris impaction. Minor surface corrosion and minor gouges in the armor. Longitudinal hairline cracks in the joint headers. CS3 - Heavy debris impaction. Depressions and bulges in the elastomeric seal. Moderate corrosion in the joint armor For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
311-Movable Bearing	3 - Mod.	40	each	40	0	0	0
	For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
321-Reinforced Concrete Approach Slab	3 - Mod.	2282	sq. ft.	2193	74	15	0
	2022: CS2 - Hairline cracks. Deteriorating asphalt patches at the edges CS3 - Failed patch/pothole at the left rear approach. Spalling at the edges For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
330-Metal Bridge Railing	3 - Mod.	3748	ft.	3417	331	0	0
	2022: This element includes the concrete portion of the railings at the metal post bases. See the inspector comments for information about the edge beams below the railings. CS2 - Sealed spalls in the concrete portion exterior face typical at the metal post base plates. For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						
815-Drainage	3 - Mod.	20	each	5	2	3	10
	2022: This element includes the scuppers at both sides of the forward approach slab. CS2 - Scuppers clogged up to 50% with clear downspouts CS3 - Scuppers clogged 50% - 75% with clear downspouts CS4 - Scuppers clogged 100% at downspouts. Downspouts with 100% section loss at the bends For additional information regarding condition states and a table of condition states broken down by span, refer to the 2022 Routine Element Level Inspection Report, attached in AssetWise.						

Inspector:	Feudo,Victoria	**Structure Number:**	1802046
Inspection Date:	09/07/2022	**Facility Carried:**	SR 17

Bridge Inspection Report

CUY-00017-0283 _(1802046)

ODOT District:	District 12					Date Built:	07/01/1933
Major Maint:	01 - State Highway Agency	Facility Carried:	SR 17	Traffic On:	5 - Highway-pedestrian	Rehab Date:	10/31/1989
Routine Maint:	04 - City or Municipal Highway Agency	Feature Inters:	ROCKY RIVER	Traffic Under:	5 - Waterway	Insp. Resp A:	01 - State Highway Agency
FIPS Code:	26446 - FAIRVIEW PARK (CUY county)	Location:	DISTRICT 12	APPROX 900FT E W220 ST		Insp Resp B:	
Inspector	Feudo,Victoria	Inspection Date	09/07/2022	Reviewer	Not Approved		

Inspector Comments - Deck and Approach

Deck

2022: The deck is in poor condition overall due to spalls with exposed reinforcement throughout the underside, a spall and widespread hairline cracking in the wearing surface, loss of adhesion at the compression joint seals, and half of the scuppers being 100% clogged. The cellular abutment slabs are not observable, and their true condition is unknown. The compression joints typically have minor bulges and depressions with moderate debris throughout, and the railings typically have sealed spalls in the concrete portion below the metal posts. Several drainage downspouts have 100% section loss at the bends.

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

Reinforced Concrete Deck

This element includes the width of the roadway - 52' - and the 1'-2" wide extensions under the sidewalks.

The reinforced concrete deck is in poor condition overall with the underside exhibiting widespread spalls with exposed reinforcement, delaminations, and typically hairline width cracks with rust staining and efflorescence. Approximately 35% of the total deck underside is considered to be in fair condition, and 25% is in poor condition. The profile grade of the bridge is -0.30% from west to east according to the major rehabilitation plans, and the forward end of the bridge has the highest concentration of deck deficiencies with 65% of Span H and 30% of Spans G and 15 to 17 in poor condition. The Span H spalls are up to 30' wide by 15' long by 3" deep, particularly between Floorbeams H1 and H2. The remaining 35% of Span H is in fair condition with some good areas interspersed. In the remaining spans of the rear portion of the bridge, poor condition state deficiencies typically compose 15% to 25% of the deck underside with several failing areas at patches from the major rehabilitation. There is a 2' long by 2' wide spall with three layers of exposed and moderately corroded reinforcement at the right side of the deck underside at the West Pylon. There is safety netting installed between the jack arches in Spans B and C to prevent debris from falling on Valley Parkway and Valley Parkway Trail which is typically clear below the deck but has floorbeam spall debris at Piers 7 and 8. The underside of the deck at the compression joints has heavy rust staining throughout due to the corroding joint armor above. There are spalls with exposed reinforcement, delaminations, and heavy rust staining in the deck underside below the East Pylon joint. The deck underside below the scuppers has longitudinal cracks up to 1/8" wide and several delaminated areas 5' long by 2' wide.

Reinforced Concrete Slab

The reinforced concrete slabs that span the cellular abutments at each end of the bridge are not visible. The current condition is unknown. Since the wearing surface of the slabs was replaced

in 2017, the condition of the wearing surface may not be exactly reflective of the slab condition. There are transverse cracks and small spalled areas in the 6" length of the Rear Abutment slab at the approach slab compression seal and areas of minor wear elsewhere.

Sidewalks

The sidewalks are in satisfactory condition with transverse and isolated longitudinal cracks up to 0.02" wide throughout the underside and top face.

Wearing Surface

This element includes the wearing surface of Element 38 – Reinforced Concrete Slab present at the cellular abutments. The wearing surface is in satisfactory condition overall with transverse hairline and longitudinal cracks and areas of hairline map cracking. A spall 4" in diameter by 2" deep is present near midspan of the Span C eastbound lanes. There is a location of minor rust staining at a longitudinal crack in the wearing surface near midspan of Span E. Water ponding was noted throughout the left side of the wearing surface at the time of the inspection.

Metal Bridge Railing

This element includes the length of the railings between the approach slabs. Comments about the left and right edge beams are included here. The metal bridge railing is in satisfactory condition with areas of painted over minor section loss in the metal posts and sealed spalls in the concrete portion of the railing. Painted over pitting up to 1/8" deep is present in the interior face of some metal posts above the railings. There is minor corrosion and rust staining along the bottom of the metal post base plates. Sealed top corner spalls 18" long by 6" high by 2" deep are present in the exterior face of the concrete portion of the railings at the railing post base plates.

The underside of the beams have longitudinal cracks up to 1/16" wide with moderate rust staining and efflorescence, and the remaining length of the beams have hairline transverse cracks, water staining, scattered delaminations, and isolated spalls up to 2" deep.

Drainage

The drainage system is in poor condition due to ponding in the roadway, significant debris in 75% of the scuppers with half of them fully clogged, and nearly half of the downspouts having locations of 100% section loss. Many of scuppers at the left curb are partially clogged with clear downspouts, and the scuppers at the right curb are typically 100% clogged. There are several downspouts with 100% section loss at the bends near the deck underside. They are typically located at the right side of the arch span piers, but several of the left side downspouts also have 100% section loss. The bottom of the downspouts typically have moderate surface corrosion at the interface with the ground. The concrete encasing the bottom of the downspouts at the West Pylon is exposed up to 18" high

Compression Joint Seal

The elastomeric compression joint seals are in satisfactory condition due to areas of adhesion failure, gouges and corrosion on the joint armor, and hairline longitudinal cracks in the joint headers. The seal adhesion is beginning to fail with several depressed and bulging areas up to 1/4" high throughout the joints. There is typically minor to moderate surface corrosion on the joint armor and moderate to heavy debris accumulation within the joints, especially near the curbs. The vertical surfaces of the joint armor have laminate corrosion up to 1/4" thick above

and below the elastomeric seals with locations of 1/4" deep section loss (1/2" nominal thickness).

Approach

2022: The approaches are in satisfactory condition overall with typically only minor cracking in the approach slabs, map cracking in the approach wearing surface, and moderate decay in the timber blockouts.

Approach Wearing Surface

The approach wearing surfaces are in fair condition with transverse map cracking up to 1/8" wide near the end of the approach slabs. The forward approach wearing surface has a 1/4" wide transverse crack over the full width of the roadway approximately 25' from the end of the approach slab. The left rear approach sidewalk has settled 1" at the bridge. The right forward approach curb has several spalls, and there are asphalt patches along the right edge of the eastbound lanes at the right forward approach. The drainage grate at the left forward approach curb inlet is cracked through at the far end and missing a bar at the rear end.

Approach Slab

The approach slabs are in good condition overall due to minor to moderate transverse cracking at the rear and forward edges and a failed patch/pothole. The failed patch is 1' long by 2' wide by up to 3 1/2" deep and is located at the rear edge of the rear approach slab in the westbound lanes.

Approach Guardrail

The guardrail is in satisfactory condition with moderate decay throughout the timber blockouts.

Signs and Supports

The signs are in satisfactory condition. The following signs are on or near the structure:

-Curve ahead sign (Pier 12 right side light post)

-Bridge delineators (right rear and left forward approaches)

-NASA Parkway ahead sign (right rear approach)

-Warning Falling Concrete Above signs (scattered throughout the column faces and fences of Piers 6 through 12)

Both falling concrete warning signs on the left and right faces of Pier 7 and at the right face of Pier 8 are almost completely faded. Some of the falling concrete warning signs at Piers 6 through 12 are partially covered by graffiti.

Utilities

The utilities are in fair condition due to a missing light post and minor to moderate corrosion at the base of light pole covers and the underside of their anchor bolts and nuts. The light pole at the right forward end of Span E is missing where the electrical wires are taped off, and the anchor bolts and nuts exhibit heavy surface corrosion. There is up to 100% section loss at the

rear bottom corners of the light pole base at the right forward end of Span C. The light pole luminaire hinged cover at the left forward end of Span D is secured in place with tape. The anchor bolt nuts at the underside of the right forward end of Span C have typical minor corrosion, and two of four bolts have negative thread count up to 3/8" deep.

Inspector Comments - General Appraisal

Superstructure

2022: The superstructure is in poor condition overall due to delaminations and spalls with exposed and corroded reinforcement throughout the main arch ribs, arch spandrel columns, floorbeams, and approach span beams.

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

Superstructure Alignment

The reinforced concrete arches and beams are in good alignment overall.

Reinforced Concrete Slab

*see Deck

Reinforced Concrete Open Girder/Beam

The beams are in poor condition overall with the majority having delaminations or spalls with exposed and corroding reinforcement. This element does not include the left and right edge beams below the railings (see Element 330 – Metal Bridge Railing). Spalls in the underside of the approach span beams are typically 3' long by full width by 3" deep near midspan. Several spalls and delaminations with wide cracks in the forward approach spans are up to 6' long in Span 16 and 20' long in Span 17, with heavy laminate corrosion in the exposed reinforcement. The original beams, Beams 3 through 8, in the rear approach spans and at the rear end of Span 16 have full perimeter hairline cracks near the piers, and there are very isolated locations of moderate efflorescence at the cracks.

Reinforced Concrete Arch

The arch quantity includes the main arch ribs, spandrel columns, and jack arches. The reinforced concrete arches are in poor condition due to spalls with exposed reinforcement and widespread delaminations in the underside of the main arch ribs, large deep spalls with exposed reinforcement in the arch spandrel columns, and hairline vertical cracking throughout the jack arches. A delamination in the left face of the Span B left arch was safely removed during the inspection due to its proximity to Valley Parkway and is now a 3' diameter by 3" deep spall. The spalls in the underside of the main arch ribs are typically located near midspan and are up to 4" deep by 15' long by 2' wide. Delaminations in the main arch rib underside range from 10' long to 50' long (Span E right arch from Spandrel Column 7 to Pier 10) and are typically concentrated near the third points and ends of the arch. Spalls in the arch spandrel columns are most prevalent at the interior face below the joints with the worst locations being Piers 6 through 9 and 12. The jack arches were replaced during the 1989 major rehabilitation and typically exhibit hairline vertical cracks throughout and some spalls with exposed

reinforcement below the joints.

Numerous areas of graffiti were noted throughout the rear half of Span A, especially at the top of the arches. The ground clearance from the top of the Span A arches is approximately 50' according to the original 1933 plans, and the rear end of the Span A arches is easily accessible.

Reinforced Concrete Floorbeam

The reinforced concrete floorbeams are in fair condition overall due to the majority having full height vertical hairline cracks but floorbeams under the joints having large spalls with heavily corroded or broken reinforcement. Exposed reinforcement in the floorbeams below the joints typically exhibits 1/16" deep section loss in the main bars and 50% section loss in the stirrups. Several of the floorbeams with large spalls have stirrups which are broken or exhibit 100% section loss:

-Floorbeam A3 – 3 broken stirrups at a 10' long by up to full height by 3" deep spall

-Floorbeam A4 – 3 broken stirrups at a 5' long by 18" high by 3" deep spall

-Floorbeam Pier 10E – 5 broken stirrups in a 20' long by up to 18" high spall

-Floorbeam Pier 11W – 1 broken stirrup in a 12' long by 3" deep spall

-Floorbeam G8 – 6 stirrups with 100% section loss at a 7' long by up to full height spall

-Floorbeam Pier 12W – 9 stirrups with 100% section loss in a 20' long by up to full height spall

-Floorbeam Pier 12E - 2 broken stirrups at a 20' long by up to full height spall/delamination

Delaminatons in the underside of Floorbeams A3 and A4 were removed during the inspection to expose three broken stirrups, and delaminations in Floorbeams A1 and A2 are up to 15' long but could not be removed with chipping hammers. The netting below the Span B and C floorbeams has caught several spalls at Piers 7 and 8 with the largest being 3' long by 6" wide by 3" high below Floorbeam Pier 8W. Full height vertical cracks in the floorbeams are usually located at the quarter points between the jack arches but are spaced as closely as 2'.

Movable Bearing

The movable bearings are in good condition overall with no significant deficiencies noted at the time of the inspection.

Substructure

2022: The substructure is in poor condition due to undermining of the East Pylon columns at the shale slope with erosion and large spalls with exposed reinforcement, delaminations, and cracks with rust staining in the pier caps, pier columns, and abutments.

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

Reinforced Concrete Column

This element includes the reinforced concrete arch pier columns, and while comments regarding the arch pier struts at Piers 6 through 12 are included, they do not influence the condition ratings. The arch pier columns extend from the ground to the bottom of the arch end columns. The reinforced concrete columns are in poor condition overall with nearly 50% of the columns having spalls with exposed and corroding reinforcement. The faces of the columns typically exhibit areas of hairline map cracking with isolated rust staining. The most extensive spalls and hairline cracks with rust staining are present at the left and right faces of the pylon columns and Pier 7 and 8 columns below the joints. The pylon columns have several spalls with exposed reinforcement and hairline horizontal cracks with minor to moderate rust staining, particularly in the left and right faces below the joint. The rear face of the East Pylon columns are exposed over the full height, and the left rear corners of both columns are undermined approximately 1'-6" deep by 1'-6" wide (less than 1% of the total footing area).

Reinforced Concrete Abutment

This element includes all walls of the cellular abutments; each abutment has four longitudinal and three transverse walls.

The original reinforced concrete abutment reliefs are typically spalled or delaminated. The Rear Abutment has a 6' long by 2' high spall with exposed and corroded reinforcement in the forward face of the right relief, and the left relief is delaminated at the top 2'. The Forward Abutment wall has several spalls with exposed reinforcement besides the spalls in the reliefs including a 10' high by 18" wide spall at the left end and a 2' high by up to 3' long spall/delamination below Beam 4. The abutment walls have several vertical hairline cracks with minor to moderate rust staining. The top face of the Forward Abutment right wall is typically spalled up to 2" wide by 3" deep throughout the interface with the sidewalk, and there is a 16" wide by 32" long by up to 20" deep spall near the compression joint. The top of the Forward Abutment left wall is similar with a spall up to 15" deep at the compression joint.

Reinforced Concrete Pier Cap

This element includes the reinforced concrete pier caps at the pylons and Piers 1-5, 13, and 14. The pylons have west and east pier caps which include the length of the cantilevers and the central portions between the columns. The pier caps are in satisfactory condition overall due to several spalls with exposed reinforcement and hairline cracks with rust staining at the pylons and typically only vertical cracks in the approach span pier caps.

Substructure Scour/Embankment/Slope Protection

The slope protection is in satisfactory condition overall with only 6" deep erosion noted at the right end of the rear abutment. No special protection measures have been installed near the abutments. There are minor erosion channels from the left end of the Rear Abutment to the slope between the West Pylon and Pier 6, and the concrete encasing the bottom of the West Pylon downspouts is exposed up to 18" high.

Culvert

Inspector Comments - Waterway

Waterway Adequacy

Channel

2022: The channel is in fair condition due to the curve in the channel alignment at the bridge and the poor channel protection at the forward bank near the East Pylon and the rear bank upstream from Pier 12

Scour

The scour is in good condition with no signs of scour at Pier 12 or the East Pylon.

Channel Alignment

The channel alignment is in fair condition due to the curved path of the channel below Span H. The channel flowed approximately 5' from the forward face of the Pier 12 right column where there is rip rap.

Channel Protection

The channel protection is in poor condition due to the forward shale bank with erosion, rip rap in satisfactory condition at Pier 12, and the presence of a downed tree at the rear bank slightly upstream from Pier 12. The embankment elevation from Pier 15 to the Rocky River drops drastically starting just to the rear of Pier 15, and both columns of the East Pylon are undermined up to 1'-6" deep by 1'-6"wide at the left rear corner due to erosion of the shale which they are founded on.

Hydraulic Opening

The hydraulic opening is in good condition with a vertical clearance over 100', which is greater than several other structures on the river. No obstructions were noted during the inspection.

Scour Critical

Pictures

PHOTO 1

Description South elevation (looking northwest).

Appendix D

Select Plan Sheets from the Rehabilitation Plans

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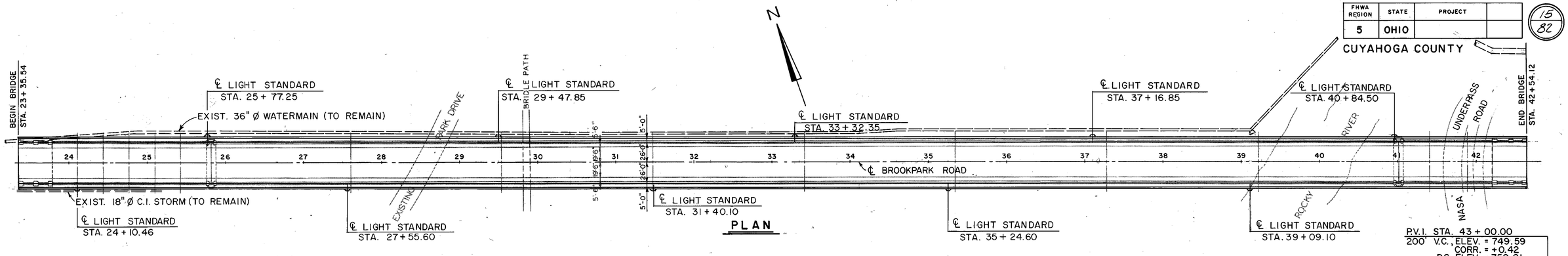
FHWA REGION	STATE	PROJECT	
5	OHIO		

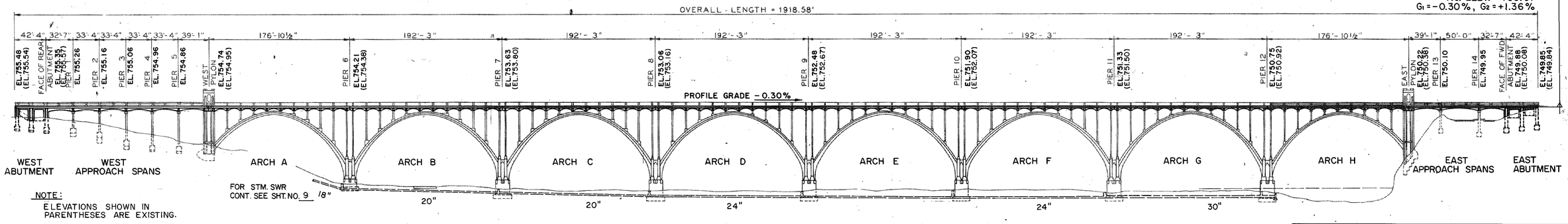
15
82

CUYAHOGA COUNTY



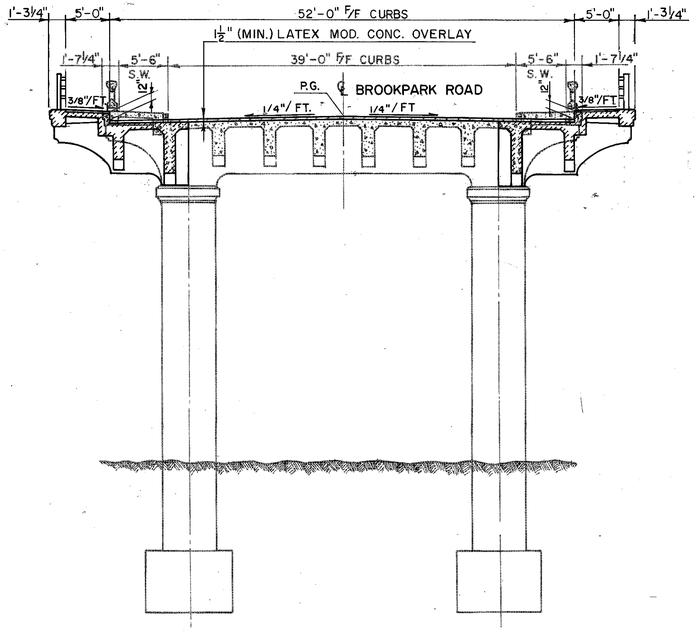
PLAN

P.V.I. STA. 43+00.00
200' V.C., ELEV. = 749.59
CORR. = +0.42
P.G. ELEV. = 750.01
$G_1 = -0.30\%$, $G_2 = +1.36\%$

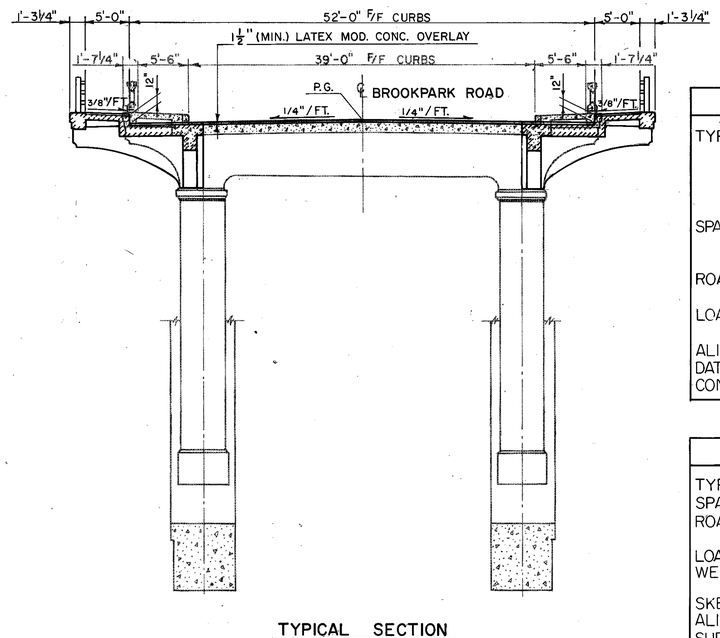


NOTE:
ELEVATIONS SHOWN IN PARENTHESES ARE EXISTING.

ELEVATION



TYPICAL SECTION
APPROACH SPANS - WEST SHOWN
EAST SIMILAR



TYPICAL SECTION
ARCH SPAN

EXISTING STRUCTURE

TYPE: Open spandrel reinforced concrete arches with continuous reinforced concrete beam approach spans. Reinforced concrete deck and substructure both arch and approach spans.
SPANS: West Approach: 32'-7", 4 @ 33'-4", 39'-1"
Arch Spans: 176'-10½", 6 @ 192'-3", 176'-10½"
East Approach: 39'-1", 50'-0", 32'-7"
ROADWAY: 39'-0" f/f curbs, 5'-6" sidewalks, reinforced concrete railings
LOADING: H-20 (Specification current October 1932)
ALIGNMENT: Tangent and 6° curve left
DATE BUILT: C 1932
CONDITION:

PROPOSED STRUCTURE

TYPE: Same as existing, with widened deck
SPANS: Same as existing
ROADWAY: 52'-0" f/f curbs, 5'-0" sidewalks, tubular steel railings (as per plan)
LOADING: HS 20-44
WEARING SURFACE: 1½" (min.) Latex Modified Concrete
SKEW: None
ALIGNMENT: Tangent and 6° curve left
SUPERELEVATION: None
APPROACH SLABS: As-1-81 (Modified as per plan)

STRUCTURE SHEET INDEX

ALDEN E. STILSON & ASSOCIATES, LIMITED
CONSULTING ENGINEERS
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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

GENERAL PLAN AND ELEVATION
TYPICAL SECTIONS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

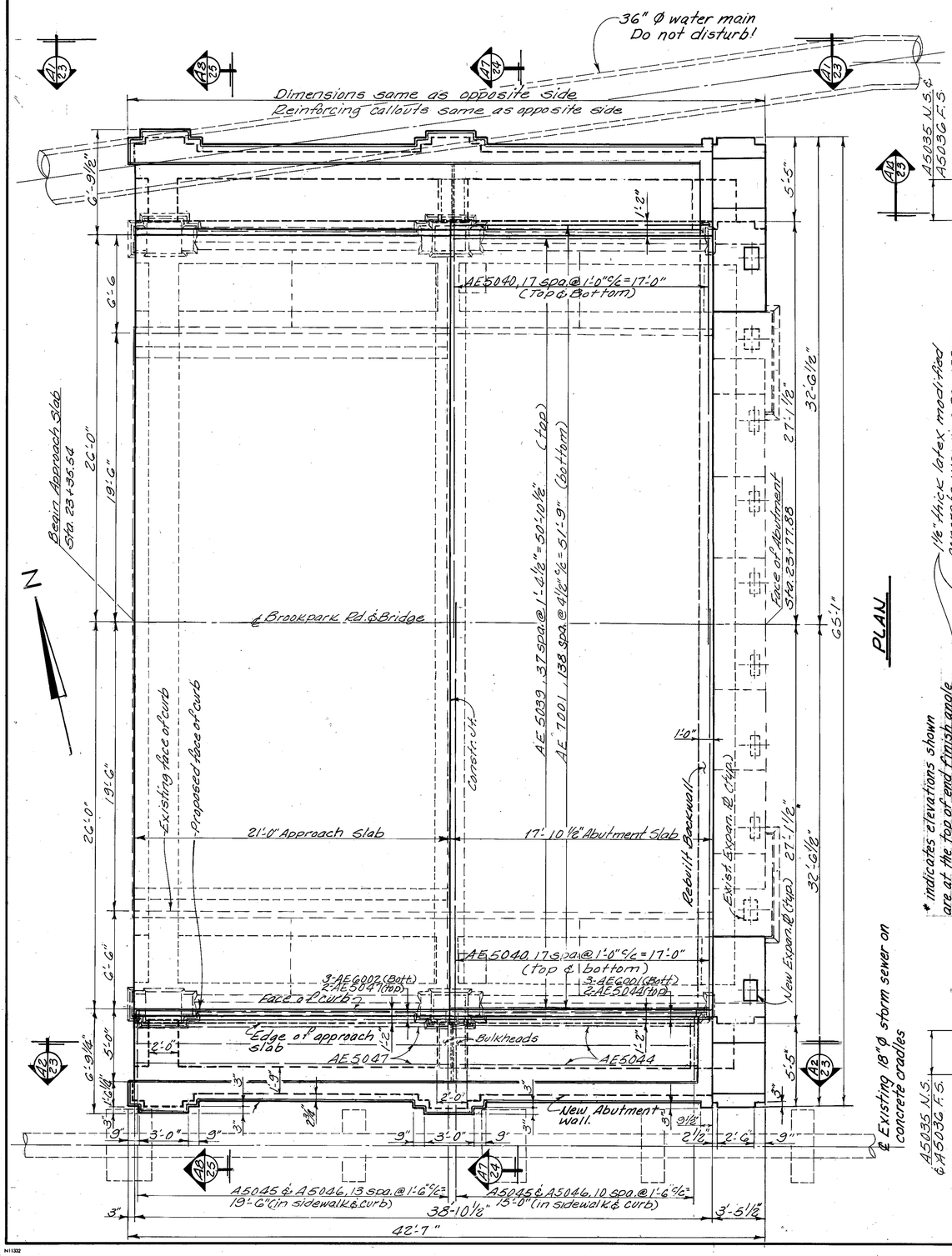
NO. B-191

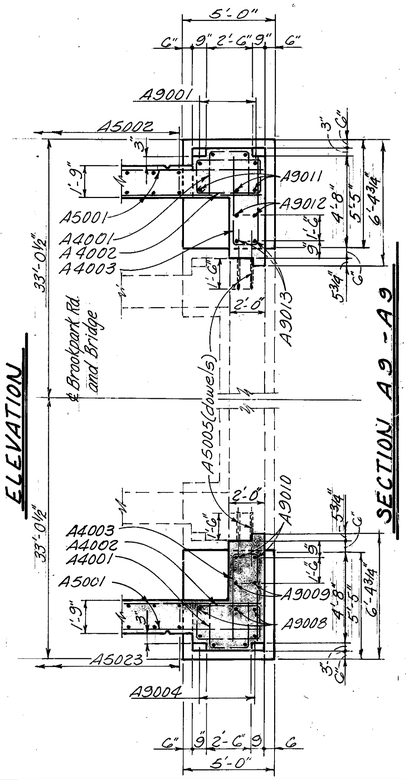
DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
WM	R.T.	G.W.M.	

FHWA REGION	STATE	PROJECT	
5	OHIO		

22
82

CUYAHOGA COUNTY





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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST ABUTMENT WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
WM	R.T.	GWM	

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FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

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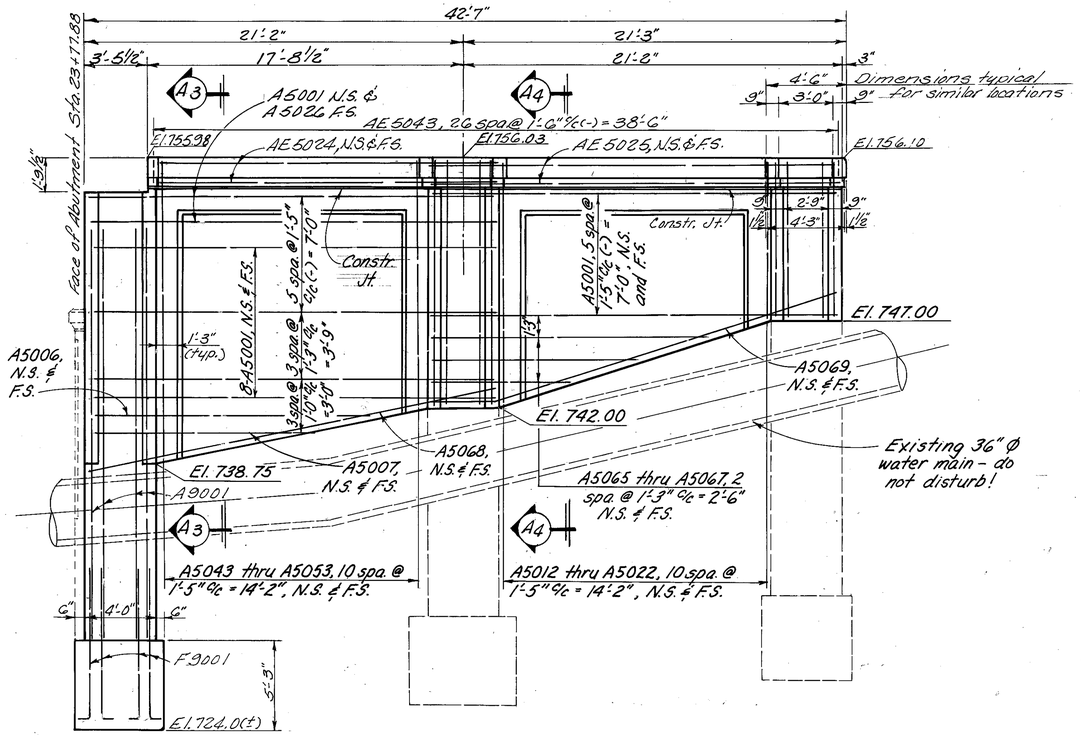
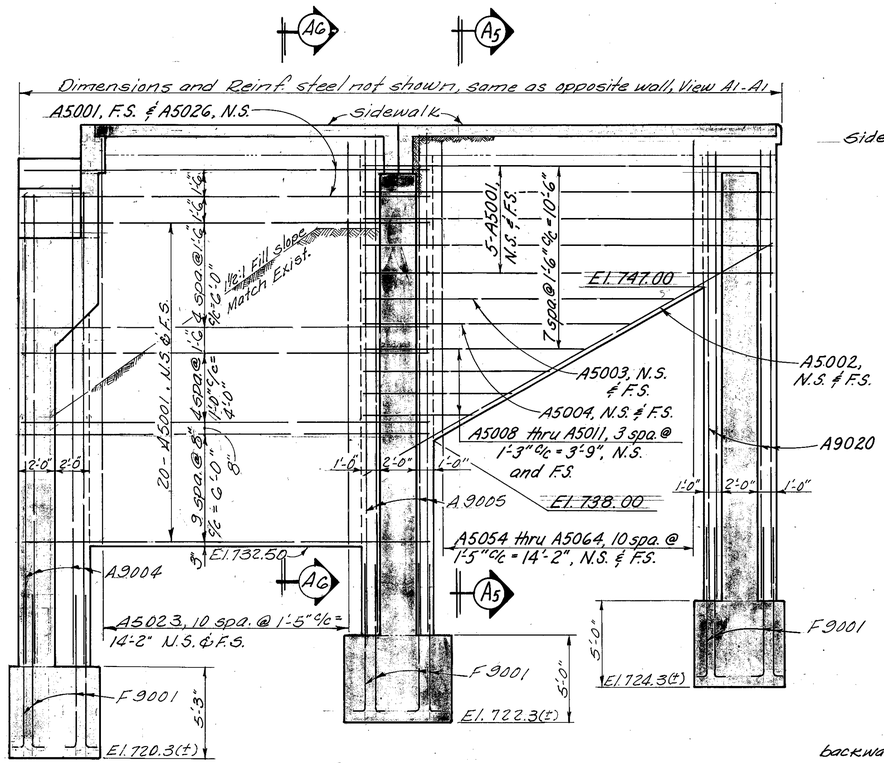
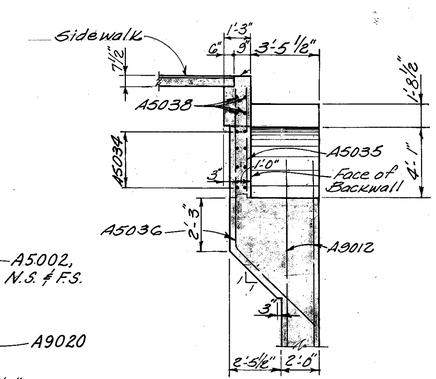
82



VIEW A1-A1



SECTION A2-A2



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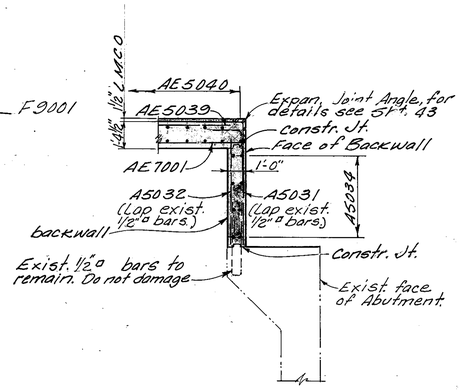

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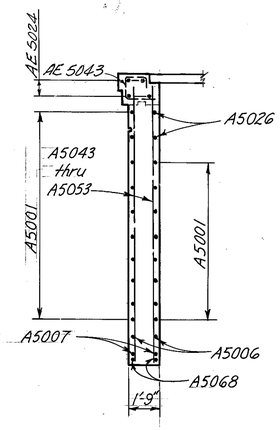
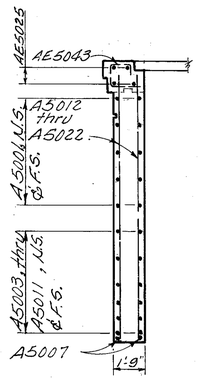
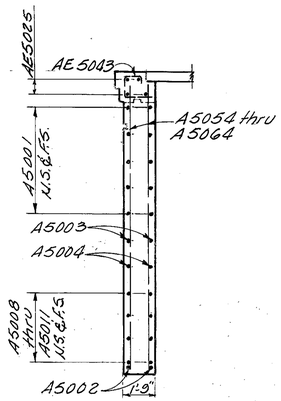


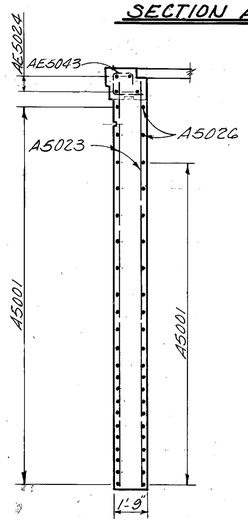
SECTION A3-A3



SECTION A4-A4



SECTION A5-A5



SECTION A6-A6

Note:
For location of Sections A1-A1 & A2-A2 see Sheet 22

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST ABUTMENT WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
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FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

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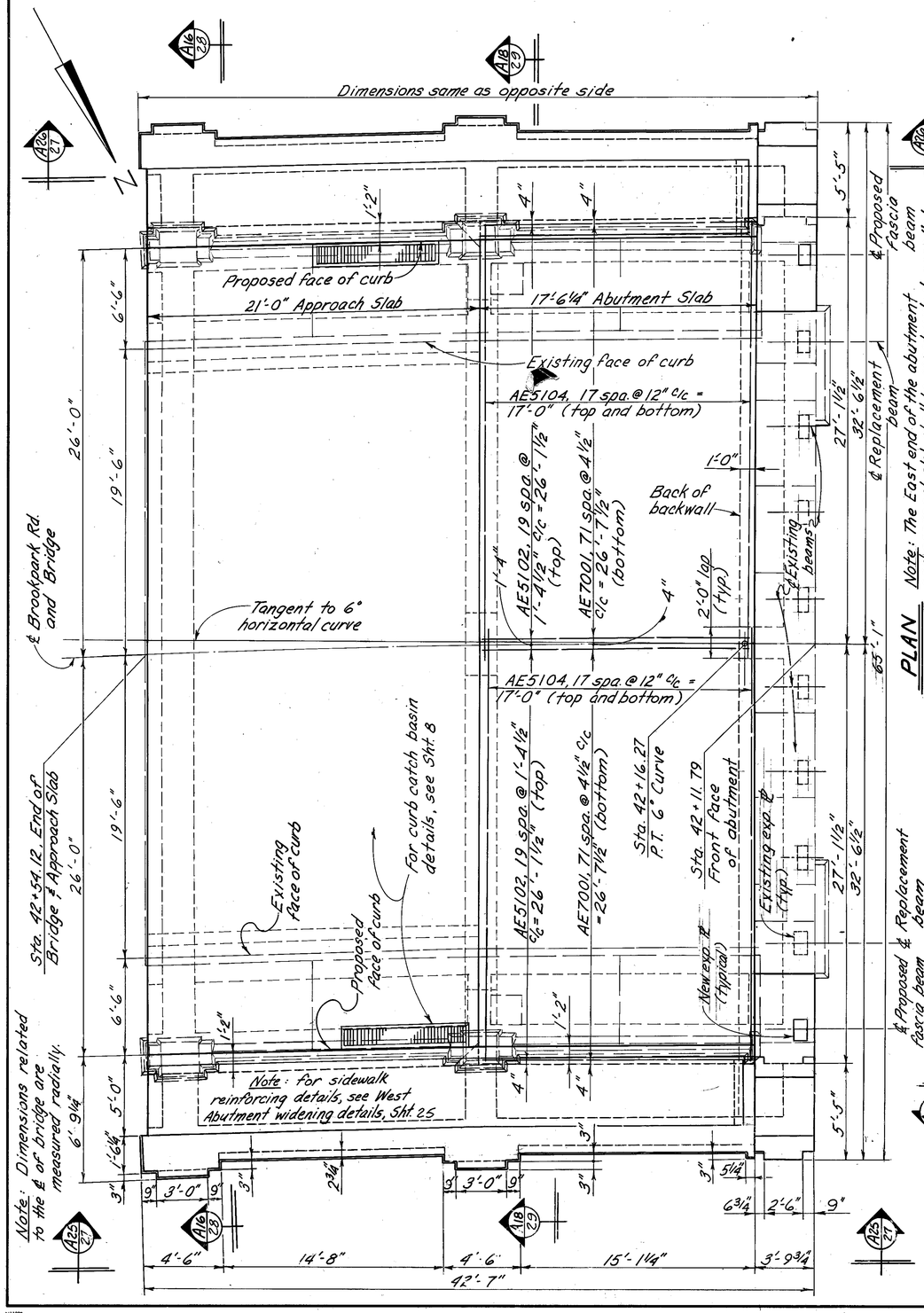
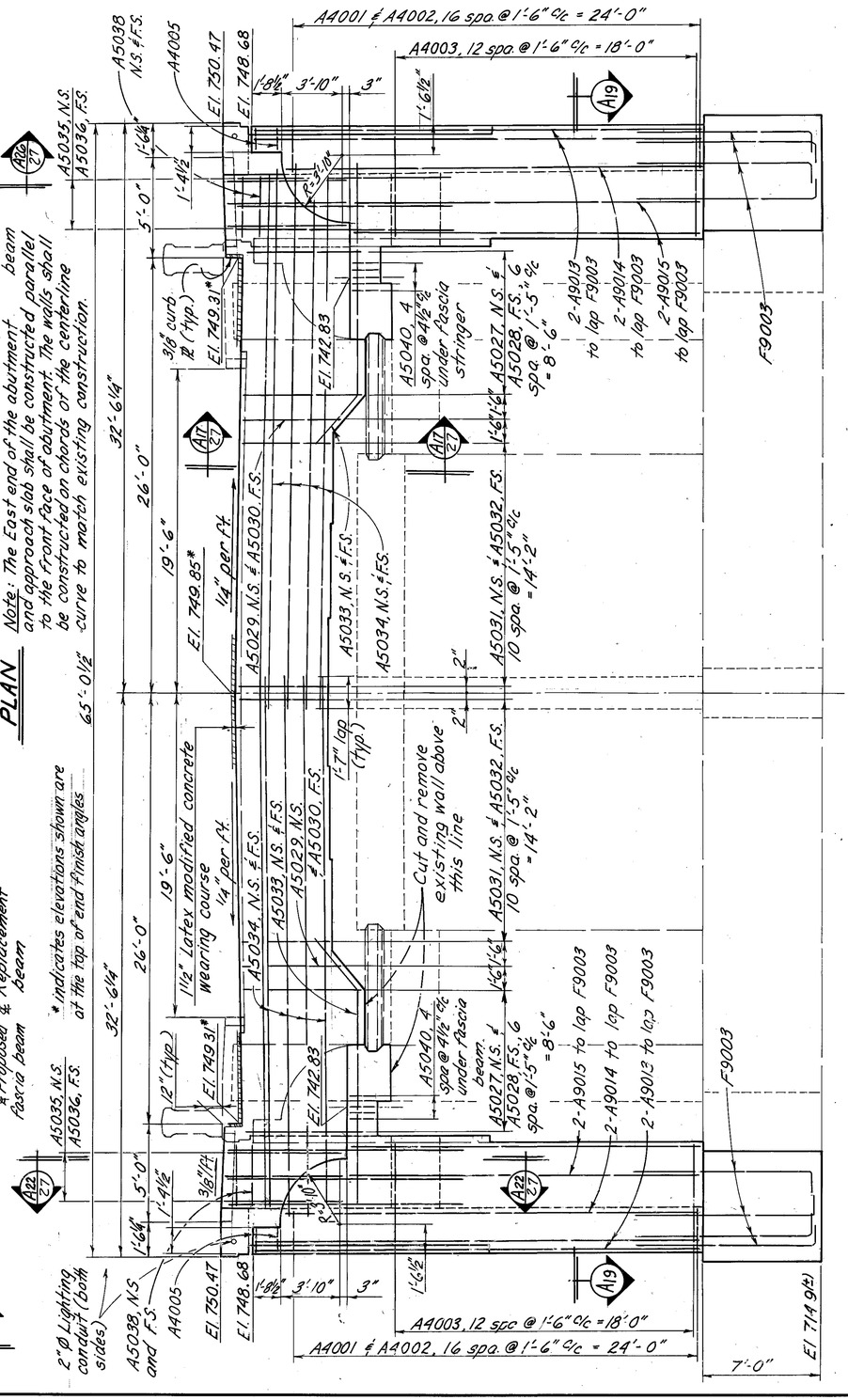
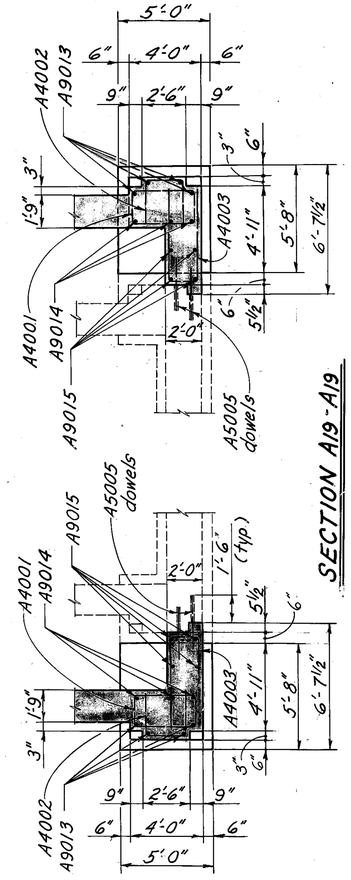


PLAN

Note: The East end of the abutment and approach slab shall be constructed parallel to the front face of abutment. The walls shall be constructed on chords of the centerline curve to match existing construction.



ELEVATION



SECTION A19-A19

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BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
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EAST ABUTMENT WIDENING DETAILS

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NO. B-191

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FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

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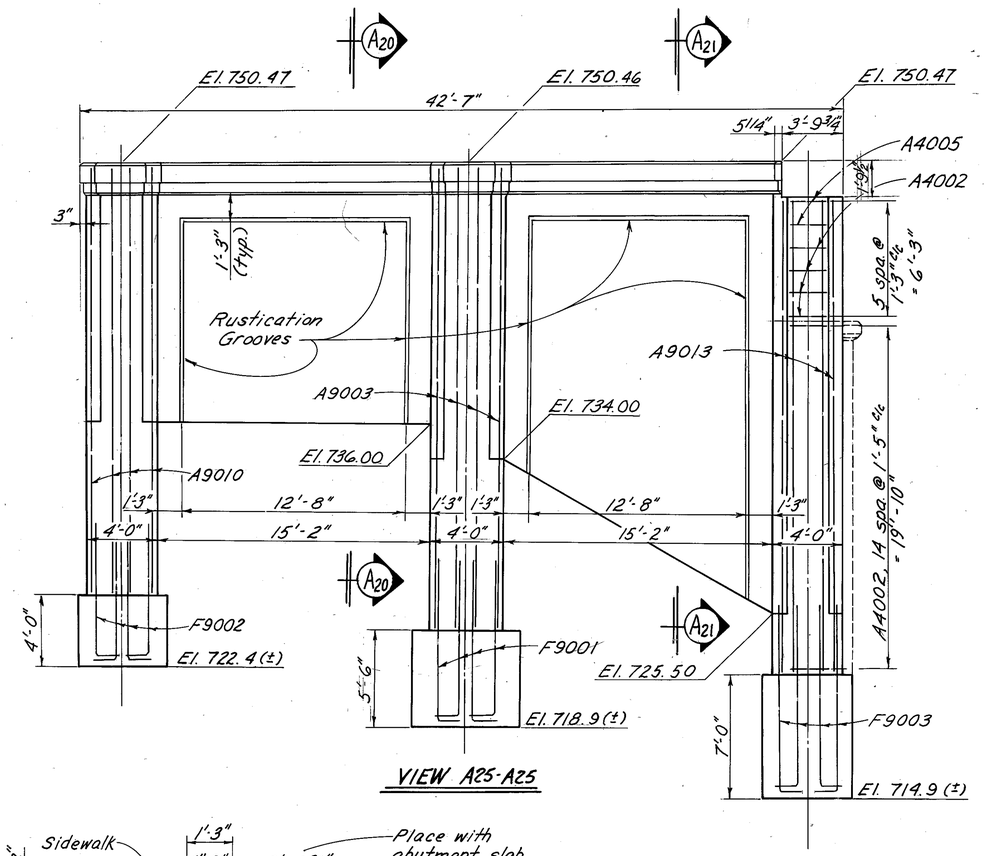
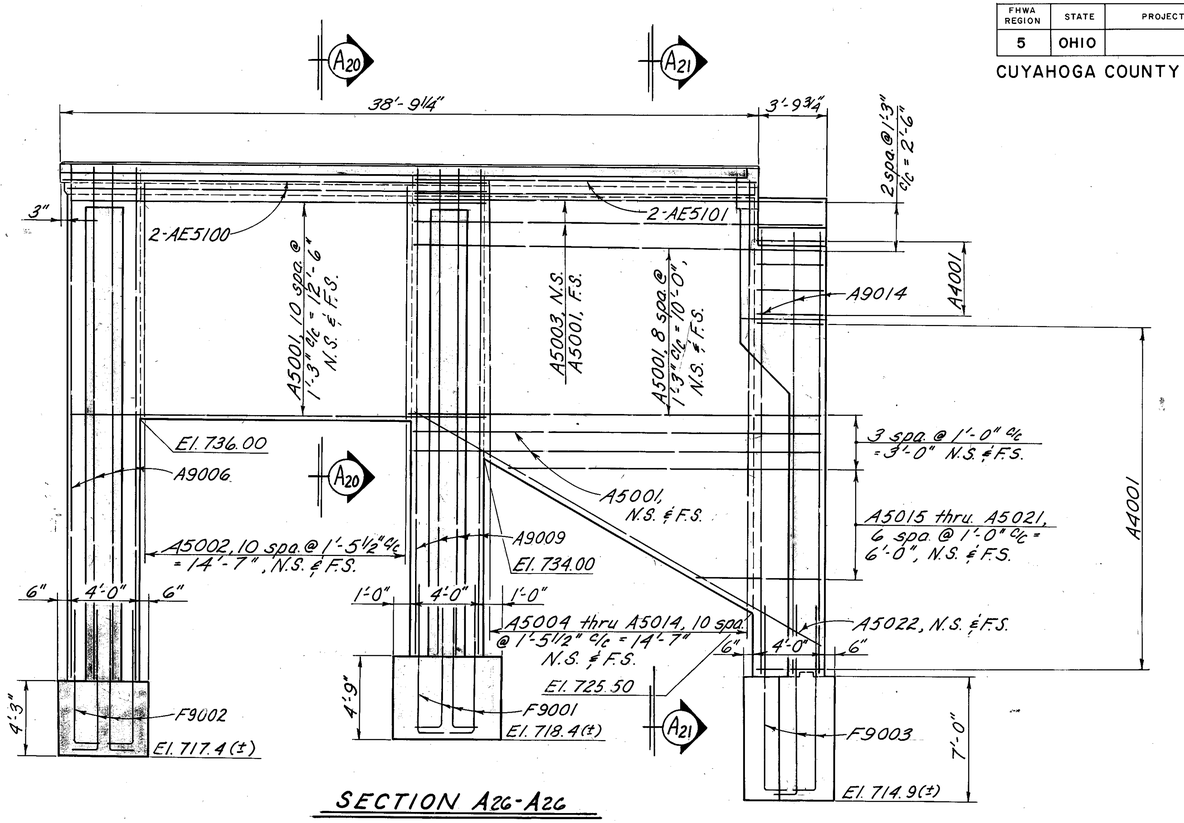
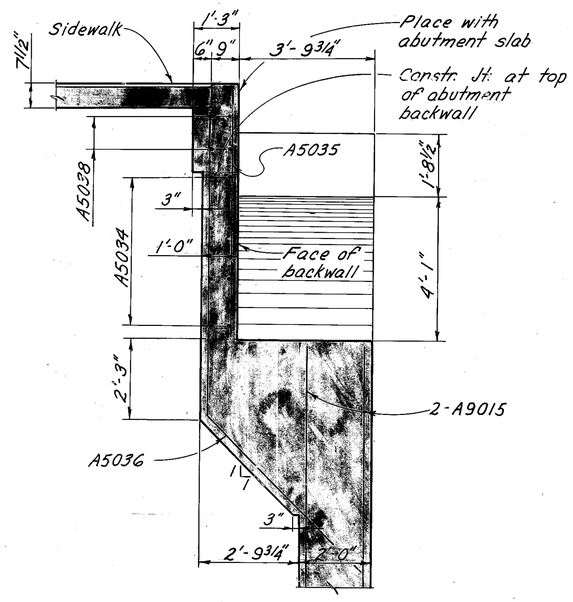


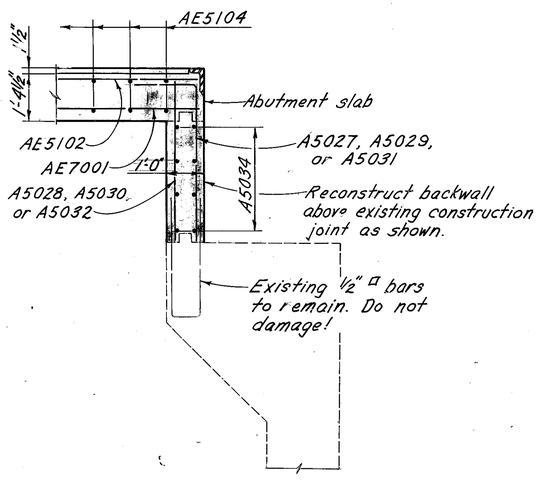
VIEW A25-A25



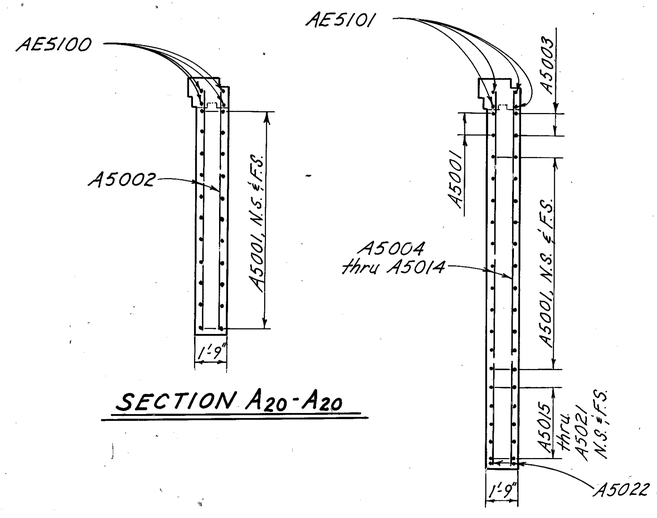
SECTION A26-A26



SECTION A22-A22



SECTION A17-A17



SECTION A20-A20

SECTION A21-A21

Note:
For location of Sections A17-A17, A25-A25 & A26-A26 See Sheet 26.

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BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

EAST ABUTMENT WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-82

NO. B-191

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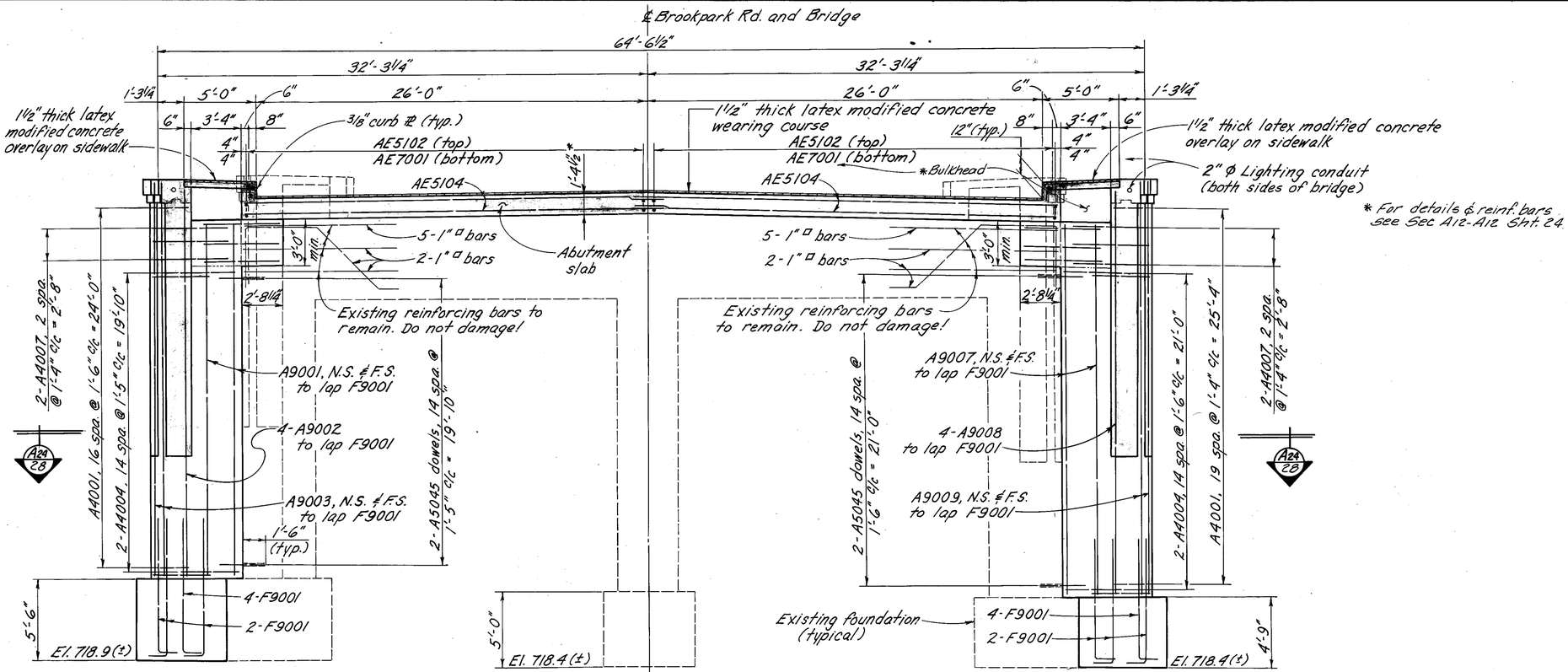
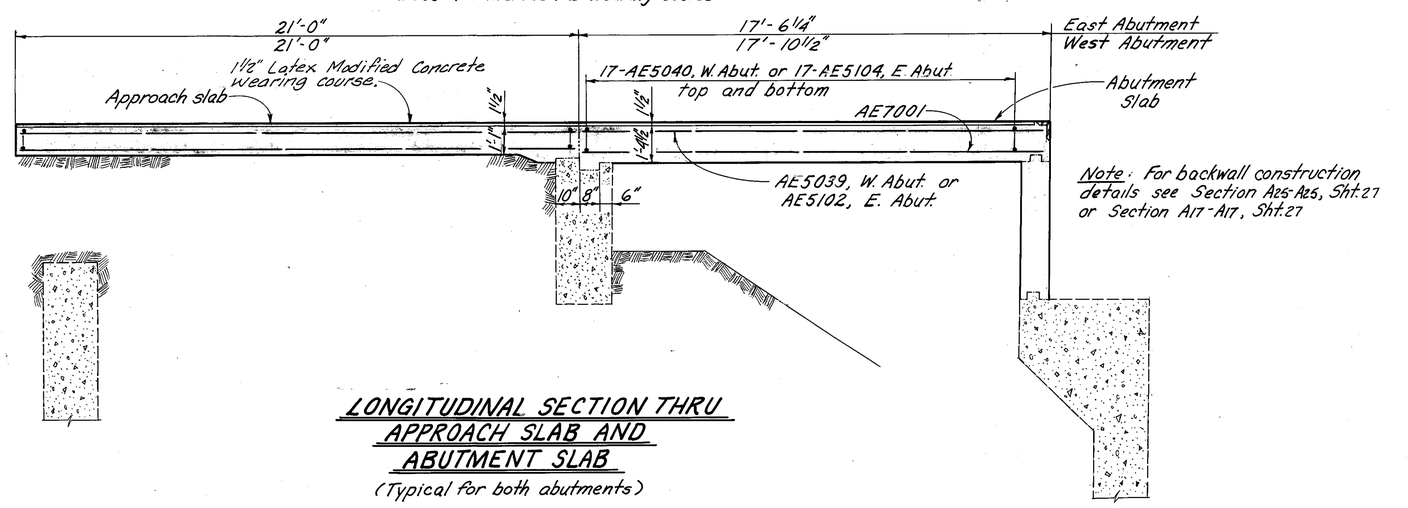


SECTION A18-A18

*Does not include 1½" wearing course



Note: For backwall construction details see Section A26-A26, Sht. 27 or Section A17-A17, Sht. 27

LONGITUDINAL SECTION THRU APPROACH SLAB AND ABUTMENT SLAB

(Typical for both abutments)

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CITIES OF CLEVELAND & FAIRVIEW PARK

EAST ABUTMENT WIDENING DETAILS

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FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

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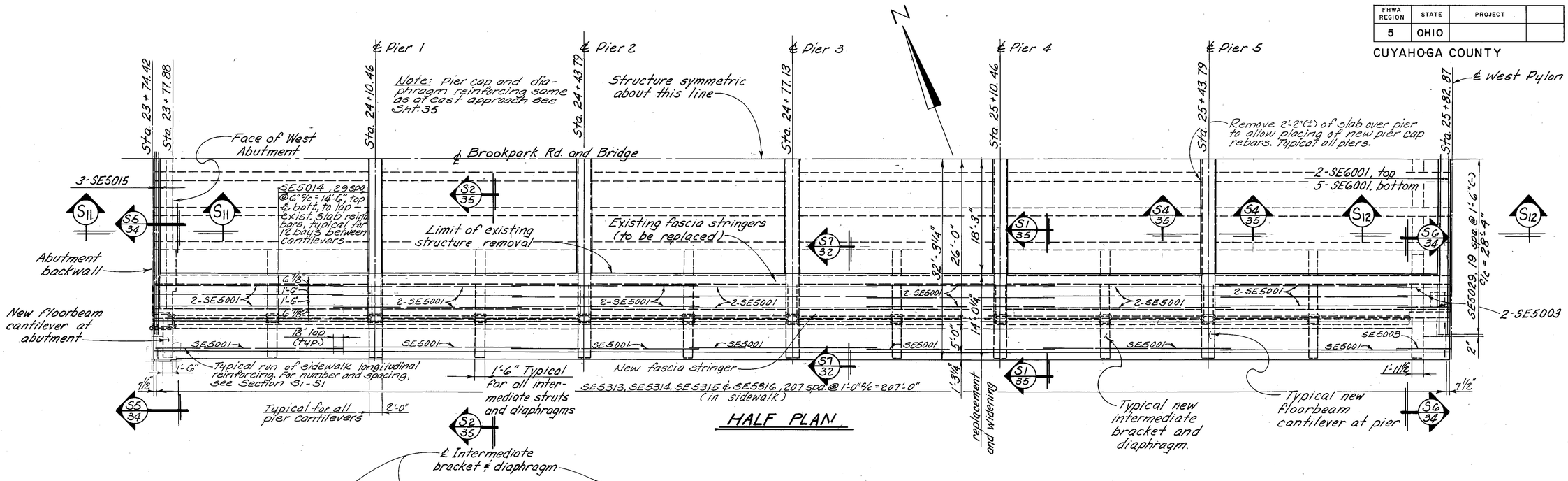

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BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST APPROACH SPANS WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 9-31-86

NO. B-191

DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
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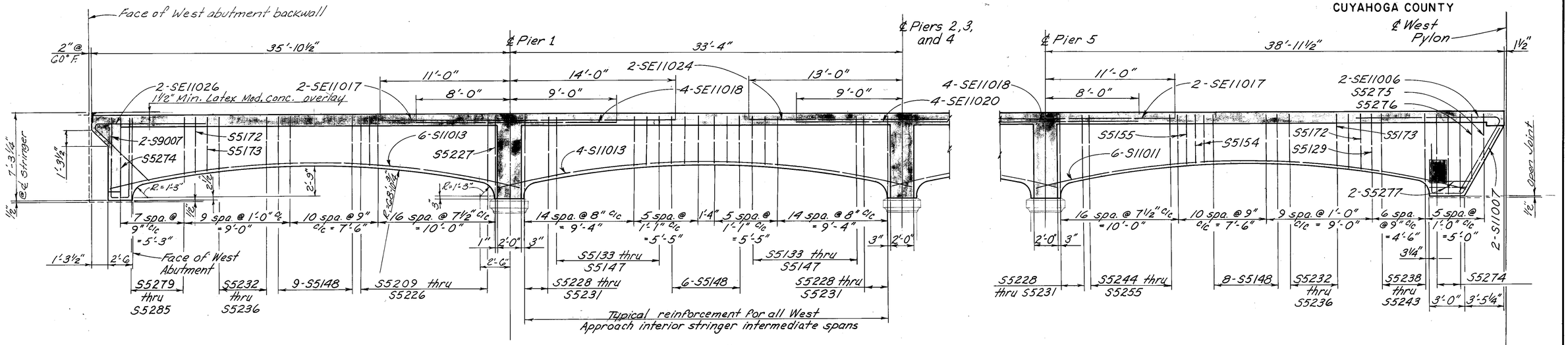
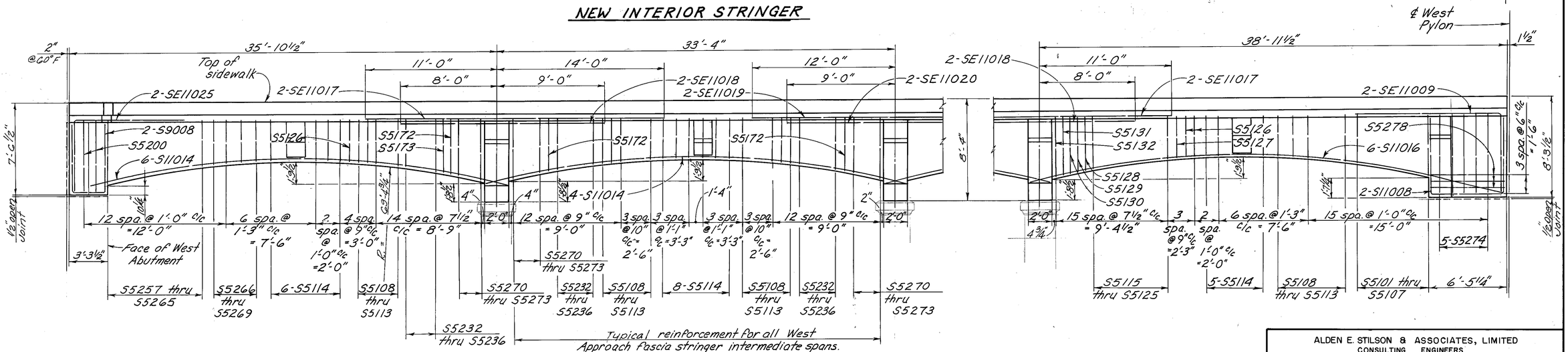
CUYAHOGA COUNTY



NEW INTERIOR STRINGER



NEW FASCIA STRINGER

WEST APPROACH STRINGER DETAILS

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WEST APPROACH SPANS WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-'86

NO. B-191

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FHWA REGION	STATE	PROJECT	
5	OHIO		

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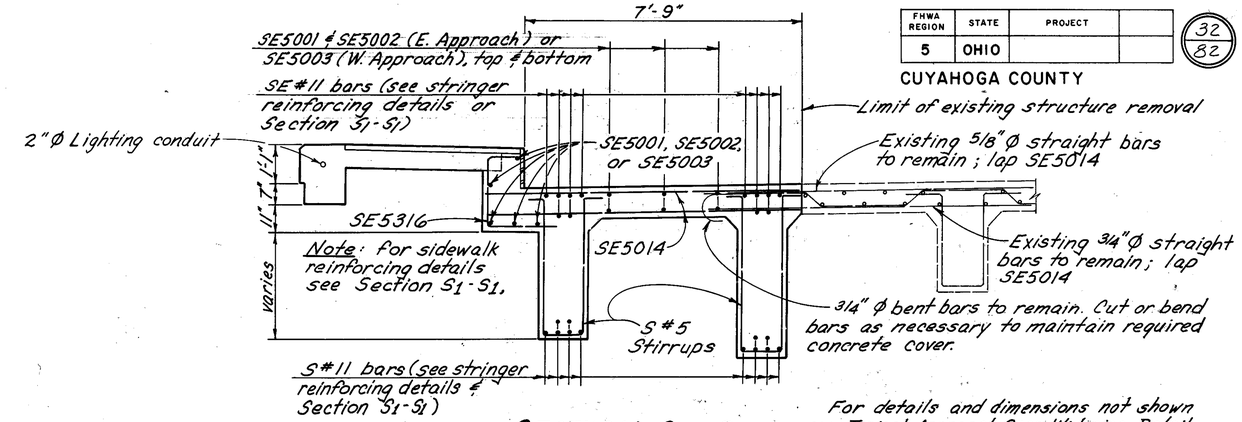
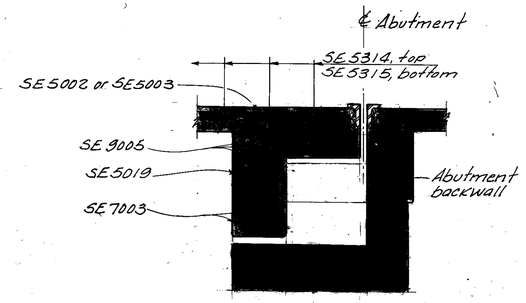
CUYAHOGA COUNTY

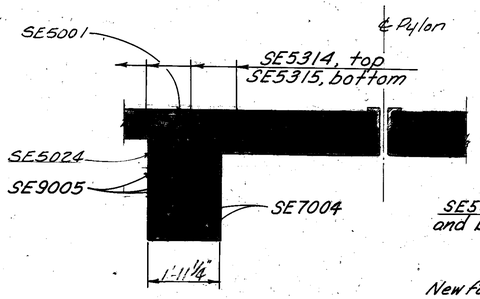


SECTION S7 - S7

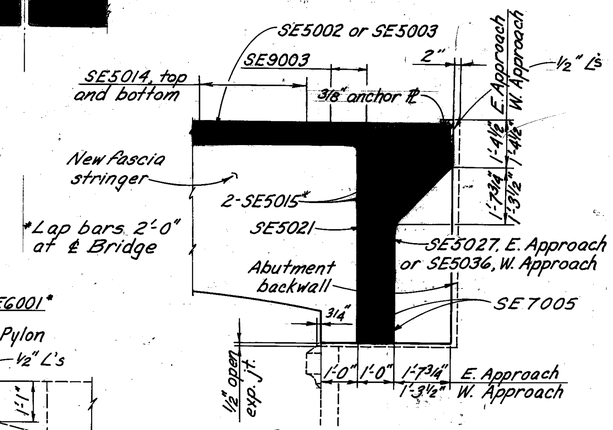
For details and dimensions not shown see Typical Approach Span Widening Detail, Sht. 35.
For East Approach span stringer reinforcing details, see Sht. 34.
For West Approach span stringer reinforcing details, see Sht. 31.



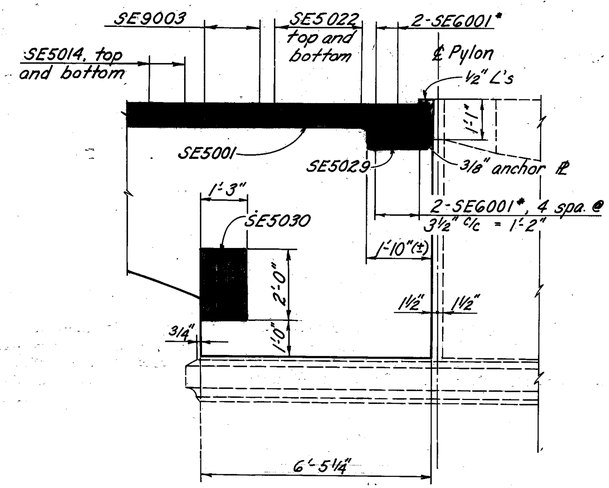
SECTION S25 - S25



SECTION S10 - S10



SECTION S8 - S8



SECTION S9 - S9

Note:
For location of Section S7-S7 see Sheet 30.
For location of Section S8-S8, S9-S9, S10-S10 & S25-S25, see Sheet 34.

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CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

WEST APPROACH SPANS WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

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FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

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℄ East Pylon
Sta. 40+90.12

Note: for East Pylon expansion joint details see Section S12-S12, Sht. 30

℄ Pier 13
Sta. 41+29.21

Structure symmetric about this line

℄ Pier 14
Sta. 41+79.21

Sta. 42+11.79

Sta. 42+15.60

℄ Brookpark Rd. and Bridge

Mechanical connectors (typ.) (See note, this Sheet)

2'-0" lap

2-SE6001, top
5-SE6001, bottom

SE5029, 19 spa. @ 1'-6" ℄'s (-) = 28'-4"

Existing interior stringers (to remain)

SE9002, top
SE9007, bottom

SE9001, top
SE9006, bottom

Remove 2'-2"(±) width of existing slab above existing pier cap to allow placing of new pier cap bars. Typical both piers.

SE50015

Abutment backwall

Existing Fascia stringers (to be replaced)

18'-7" to face of stringer

1'-4½"

18" lap (Typical)

Limit of existing structure removal

32'-3¼"

26'-0"

18'-3"

SE5028, centered over bracket. Typical all brackets and piers - 6 locations.

Existing face of curb

SE5014, 29 spa. @ 6" ℄'s, top & bottom to lap existing slab rebars. Typical 7 bays between cantilevers.

SE9003, lap existing 1" □ bars, typical all intermediate brackets.

2-SE5001

2-SE5002

Proposed face of curb

Typical run of longitudinal sidewalk & curb reinforcing. For number and spacing, see Section S1-S1.

SE5001

New Fascia stringer

5'-0" Sidewalk

14'-0¼" Replacement and widening

SE5002

1'-6"

1'-1¼"

1'-6" Typical for all intermediate struts and diaphragms

SE5313, SE5314, SE5315, and SE5316, 125 spa. @ 1'-0" ℄'s (±) = 124'-10" (±) (in sidewalk)

1'-3¼"

2'-0" Typical for all pier cantilevers

6" 3" 9" 3'-0" 1'-3¼" 3'-10¾" 2"

3'-9¾"

2" open jt.

HALF PLAN

39'-1" | 50'-0" | 36'-4¾"

6'-6¾" | 15'-10¼" | 16'-8" | 16'-8" | 16'-8" | 16'-8" | 16'-8" | 15'-11"

top of sidewalk

bottom of slab

1½" 2" 2'-9" 6" 1'-8½" 3" 2'-0" 3" 2" 6" 2'-9" 2" 1'-9¾" 3" 2'-0" 3" 6" 2" 2'-9" 2½" ½" 6"

R = 70'-11¾" R = 71'-5¾" R = 170'-9" R = 171'-3" R = 68'-10¾" R = 69'-4¾"

Radius = 1'-3" (Typical all interior stringers)

3" Typical all interior stringers

Bottom of first interior stringer

Bottom of fascia stringer

Face of existing pylon shaft

Span 7 | Span 8 | Span 9

ELEVATION

℄ East Pylon

℄ Pier 13

℄ Pier 14

Note:

Mechanical connectors shall be an approved, Epoxy Coated, threaded type as manufactured by Erico Products Inc. Solon, Ohio; Fox-Hewlett Industries Inc. Berkeley, Calif. or approved equal. Cost of connectors shall be included in Unit Price Bid for Item 824 Epoxy Coated Reinforcing Steel, Grade 60.

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EAST APPROACH SPANS WIDENING DETAILS

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NO. B-191

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FHWA REGION	STATE	PROJECT /	
5	OHIO		

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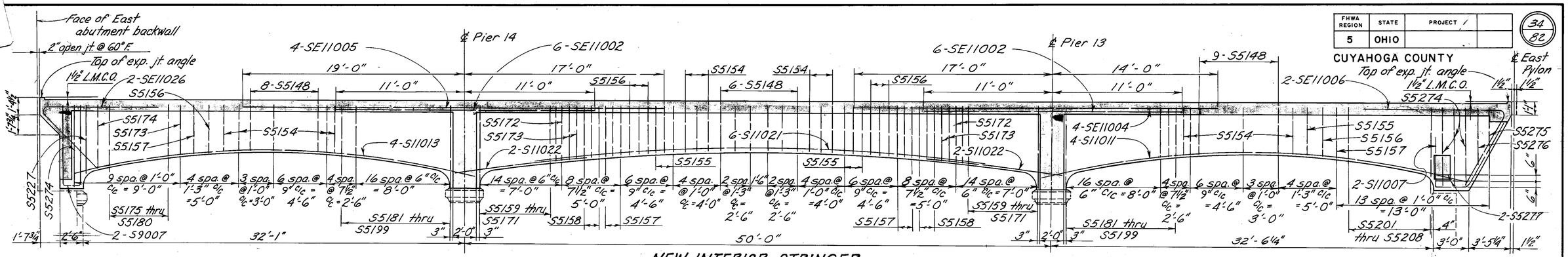
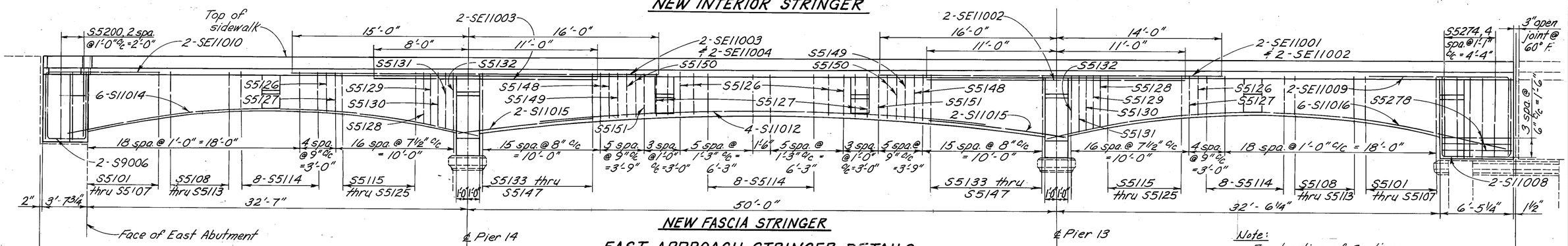
CUYAHOGA COUNTY



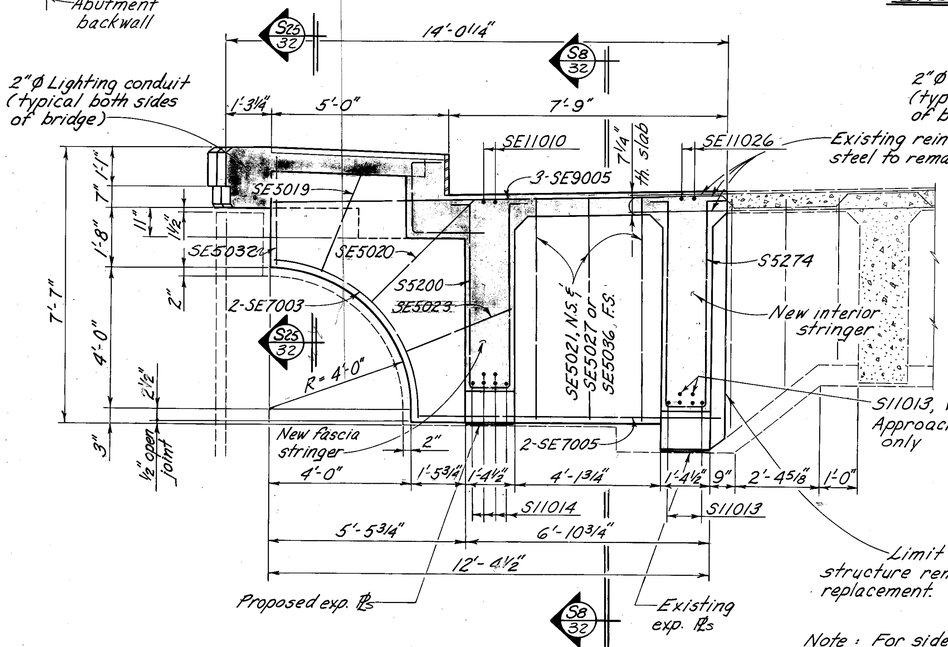
NEW INTERIOR STRINGER



NEW FASCIA STRINGER

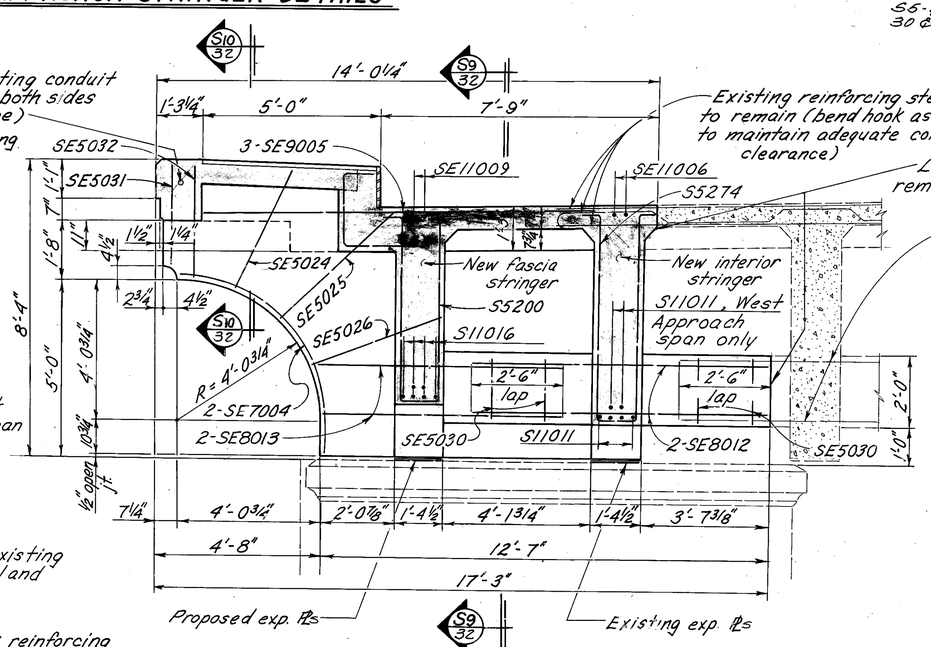
Note: For location of Sections S6-S6 & S6-S6, see Sheets 30 & 33.

EAST APPROACH STRINGER DETAILS



SECTION S5-S5

Note: For sidewalk reinforcing details, see Section S1-S1, Sht. 35



SECTION S6-S6

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EAST APPROACH SPANS WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

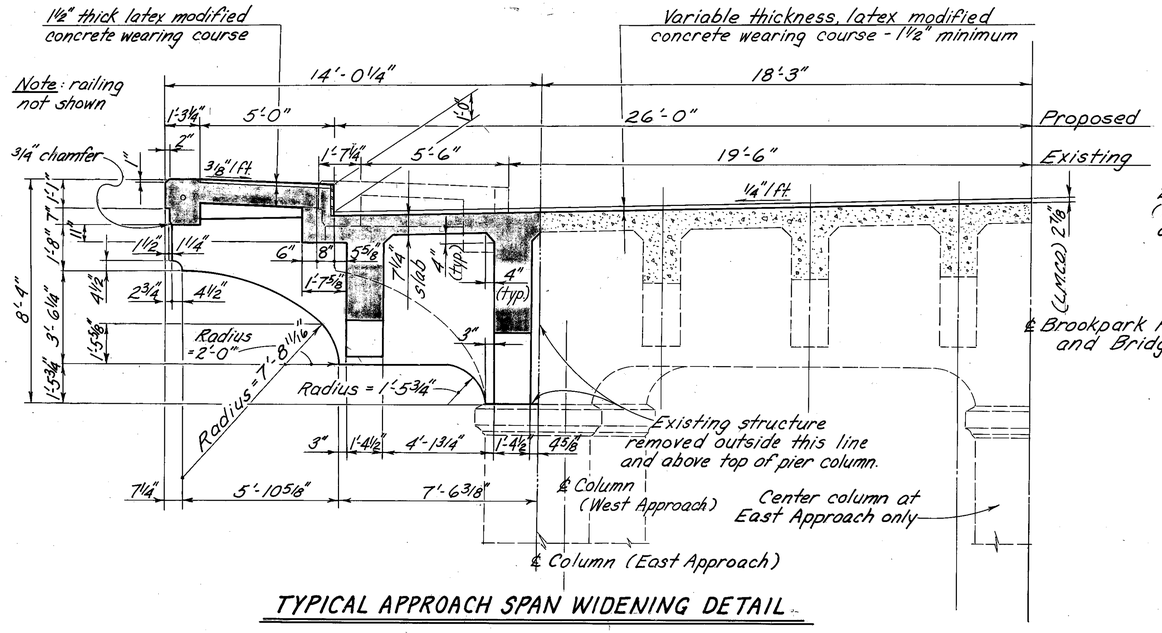
DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
B.T.G.	B.T.G.	G.W.M.	

N11332

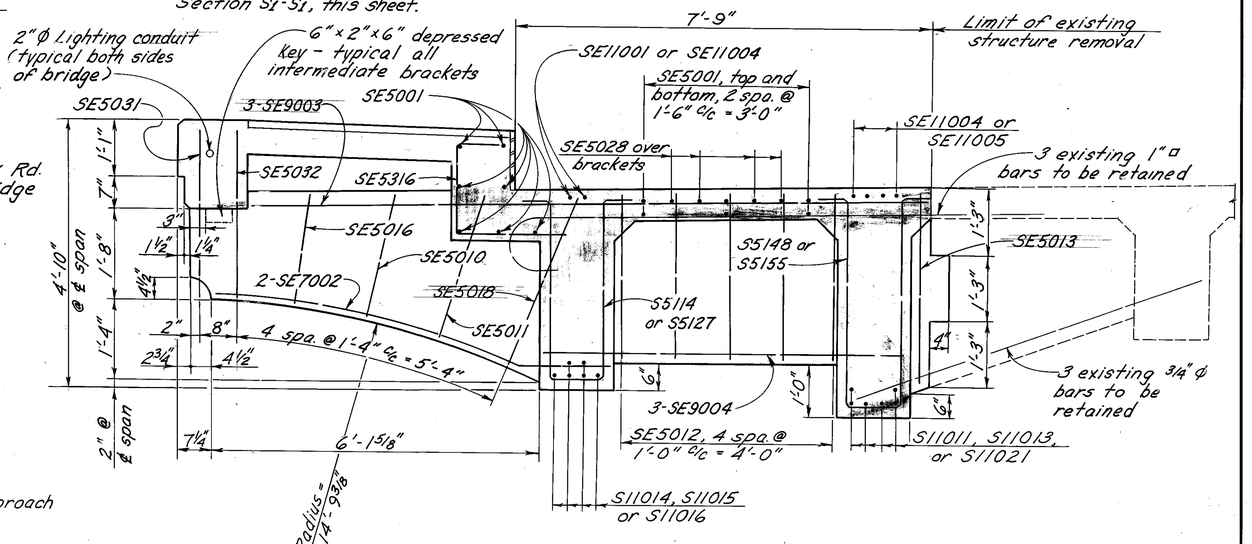
FHWA REGION	STATE	PROJECT	
5	OHIO		

35
82

CUYAHOGA COUNTY

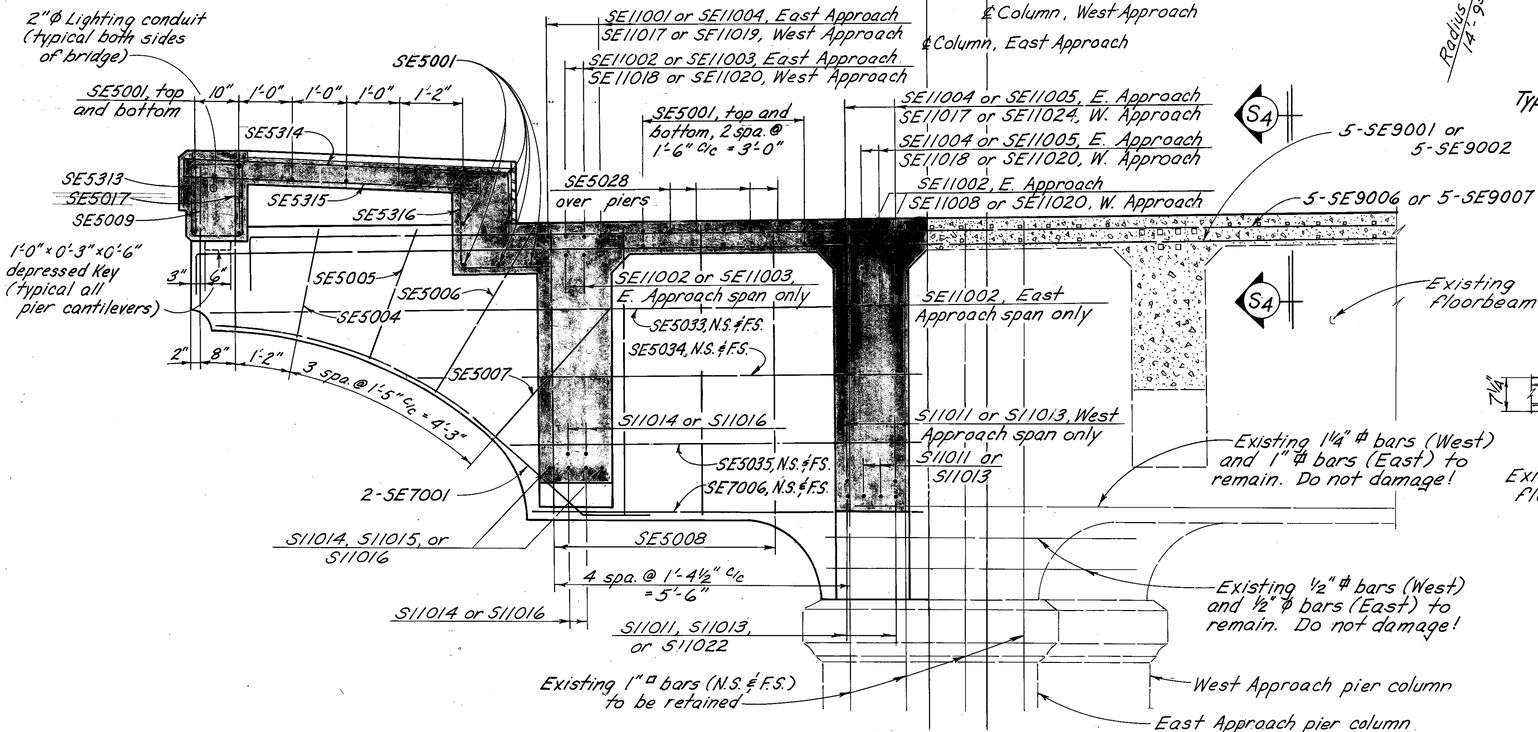


TYPICAL APPROACH SPAN WIDENING DETAIL



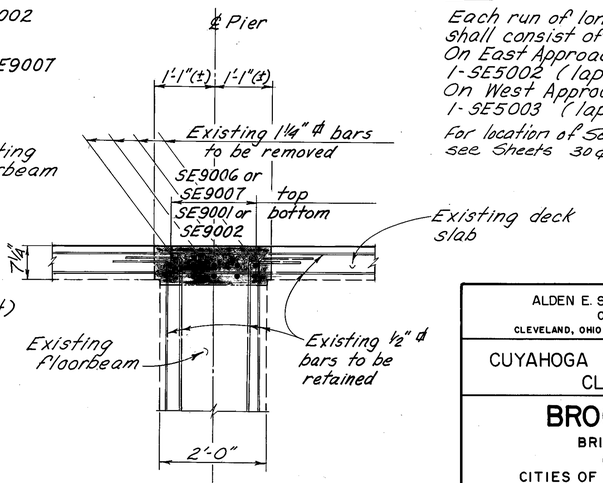
SECTION S2-S2

Typical Intermediate Bracket Detail



SECTION S1-S1

Typical Pier Cantilever Detail



SECTION S4-S4

Typical at all Approach Piers

Note:

Each run of longitudinal deck reinforcing shall consist of the following:
On East Approach: 4-SE5001 and 1-SE5002 (lap 1'-6")
On West Approach: 7-SE5001 and 1-SE5003 (lap 1'-6")

For location of Sections S1-S1, S2-S2 & S4-S4 see Sheets 30 & 33.

ALDEN E. STILSON & ASSOCIATES, LIMITED
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CLEVELAND, OHIO COLUMBUS, OHIO WHEELING, W. VA.

CUYAHOGA COUNTY ENGINEER
CLEVELAND OHIO

BROOKPARK ROAD

BRIDGE NO. CUY-17-0283
OVER ROCKY RIVER
CITIES OF CLEVELAND & FAIRVIEW PARK

APPROACH SPAN DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE ~~3-31-84~~

NO. B-191

DESIGN	DRAWN	CHECKED	REVISED TO AS BUILT
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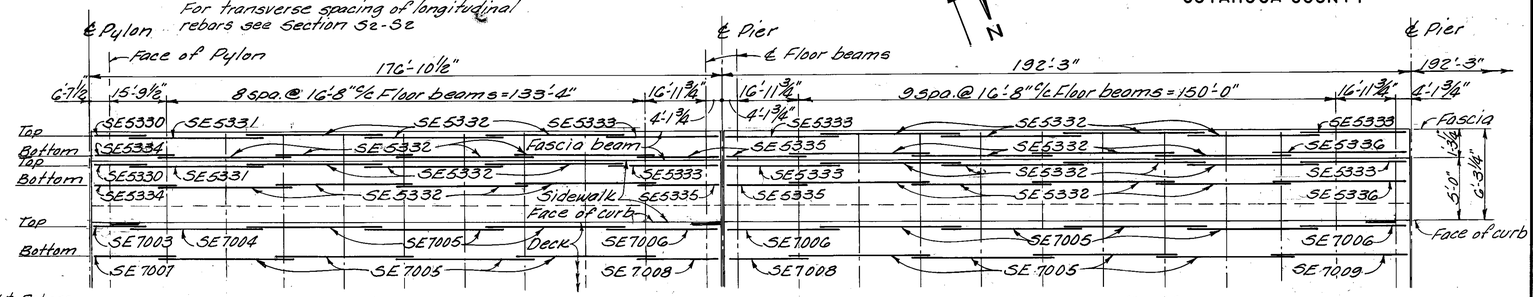
FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY

38
82

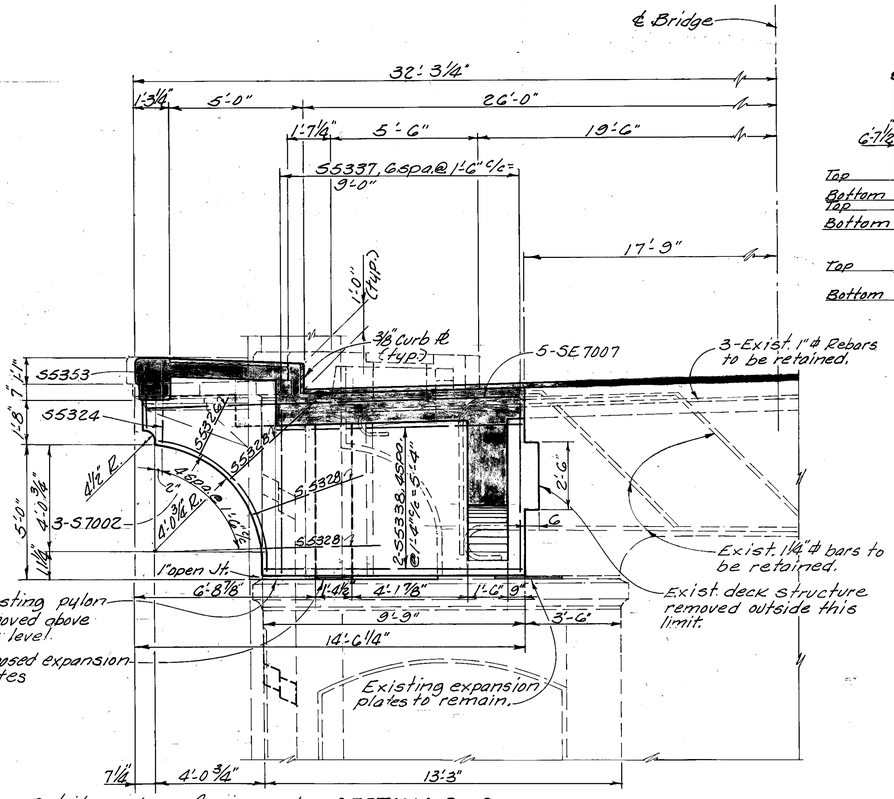
Note: lap #5 bars 1'-7" min.
lap #6 bars 1'-11" min.
lap #7 bars 2'-2" min.
lap #8 bars 2'-6" min..
For transverse spacing of longitudinal rebars see Section S2-S2



PART PLAN ARCH DECK REINFORCING

SPANS A & H — SPANS B thru G

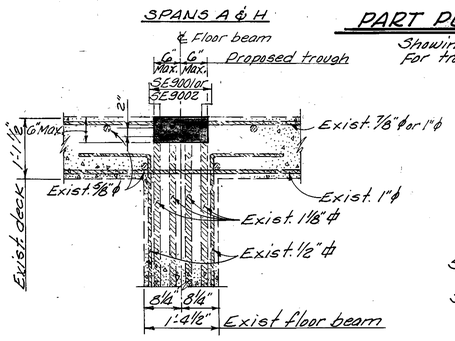
Showing layout of longitudinal deck and sidewalk reinf.
For transverse reinf. see Part Plan Shts. 36 & 37



SECTION S17-S17

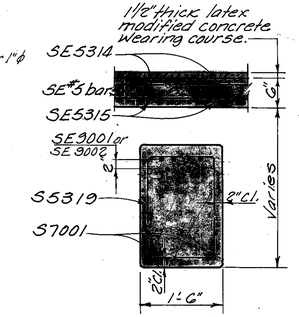
Typical widening details at pylons.

Note: Details and reinforcing not shown same as Sec. S20-S20

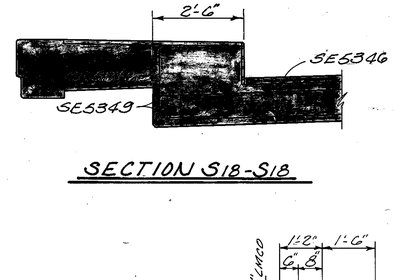


SECTION S21-S21

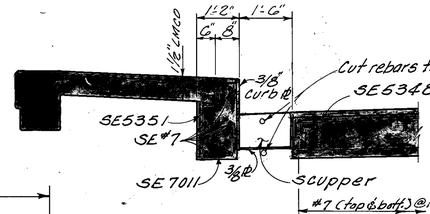
Showing trough cut in existing deck to accept SE9001 or SE9002 reinforcing bars in cantilevered bracket. Exercise care in concrete removal so as not to damage concrete and rebars which are to remain.



SECTION S22-S22



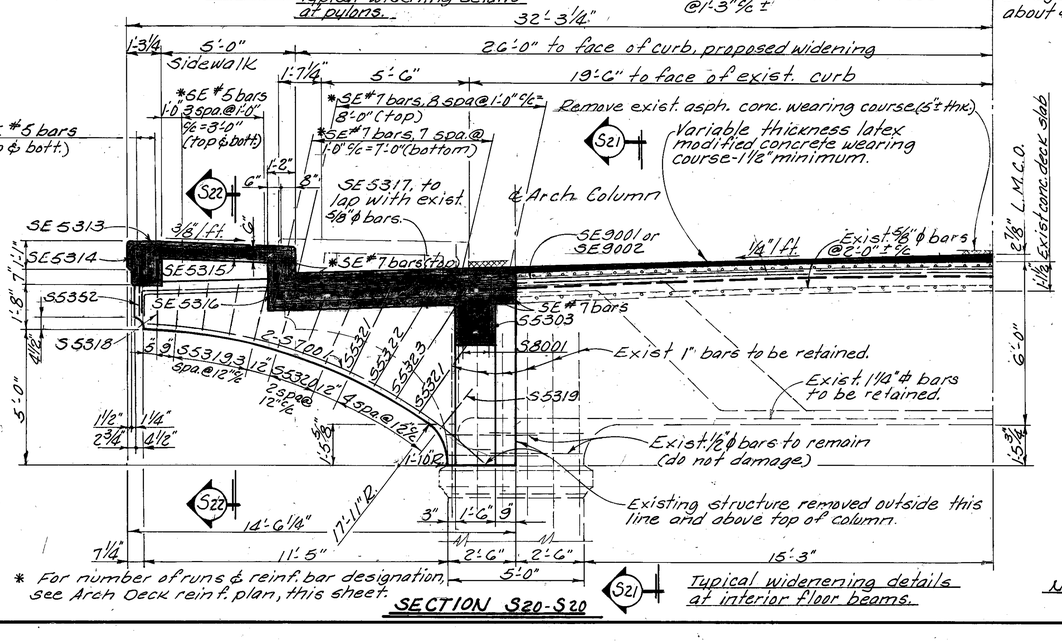
SECTION S18-S18



SECTION S13-S13

Note: For location of Sections S3-S3, S13-S13, S17-S17 & S18-S18, see Sheet 36.
For location of Section S20-S20, see Sheet 37.

Note: SE 5313, SE5314, SE5315 & SE 5316 shall be spaced @ 1'-3" c/c ±

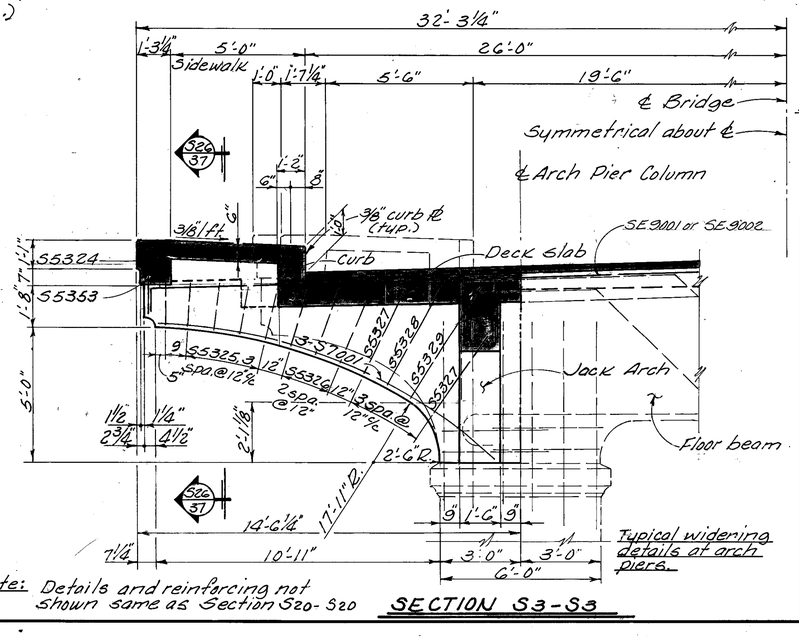


* For number of runs & reinf. bar designation see Arch Deck reinf. plan, this sheet.

SECTION S20-S20

Typical widenening details at interior floor beams.

Note: Details and reinforcing not shown same as Section S20-S20



Typical widening details at arch piers.

SECTION S3-S3

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CLEVELAND OHIO

BROOKPARK ROAD

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CITIES OF CLEVELAND & FAIRVIEW PARK

ARCH SPAN WIDENING DETAILS

COUNTY BRIDGE NO. 39 REPORT NO. 7068 DATE 3-31-86

NO. B-191

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W.M.	R.T.	G.W.M.	

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FHWA REGION	STATE	PROJECT	
5	OHIO		

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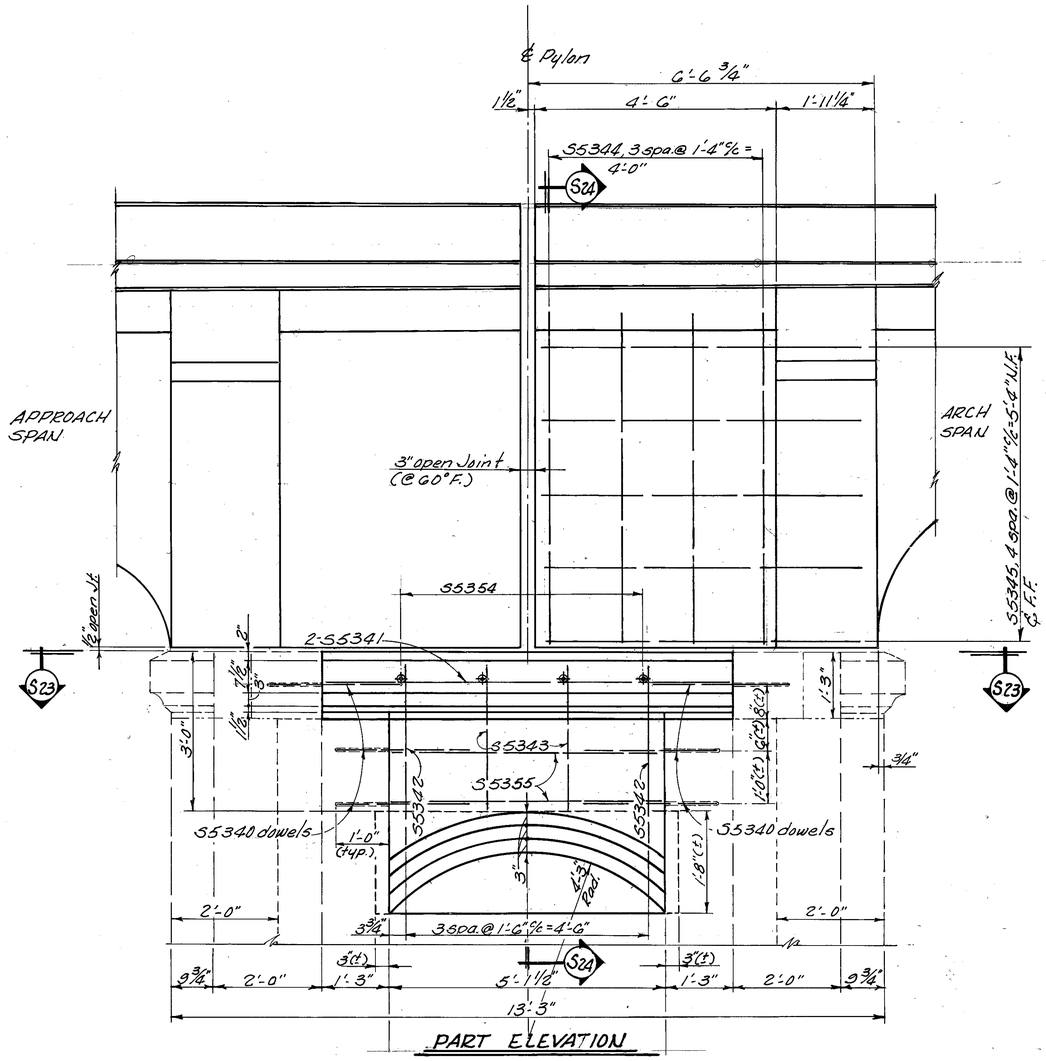
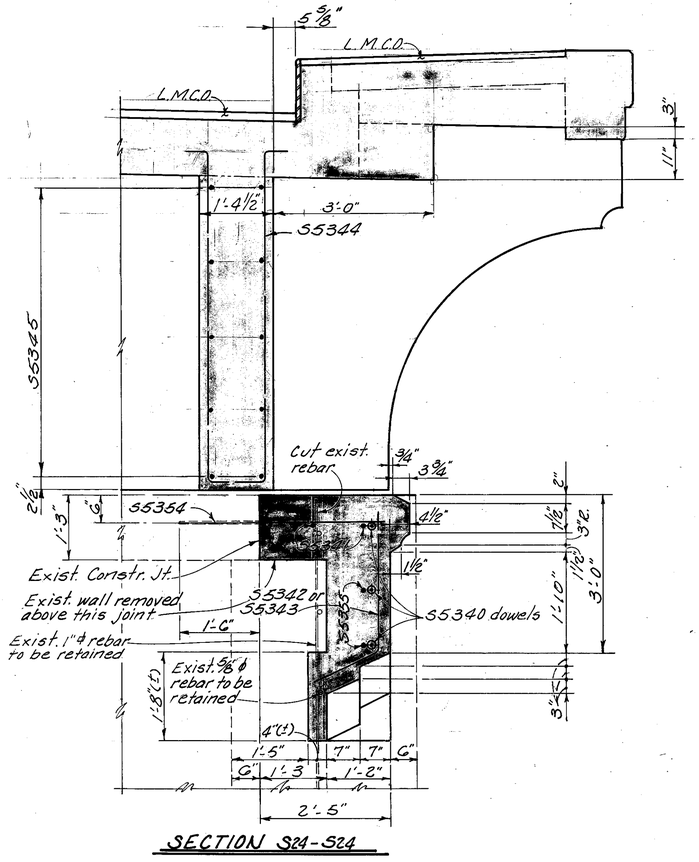
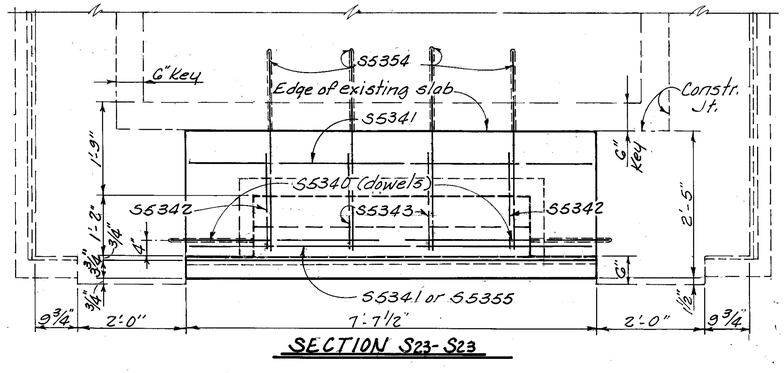


PART ELEVATION



SECTION S24-S24



SECTION S23-S23

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PYLON DETAILS

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