



# BRENT SPENCE APPROACH BRIDGE

## South Bound/Upper Deck

HAM-71-0000L

SFN: 3105946

PID 109780

VAR-DISTRICT 8

## 2025 In-Depth/NSTM Inspection Report



Inspection Date: September 22-26, 2025

Report Date: December 1, 2025



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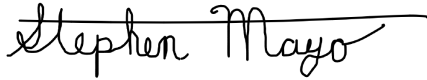
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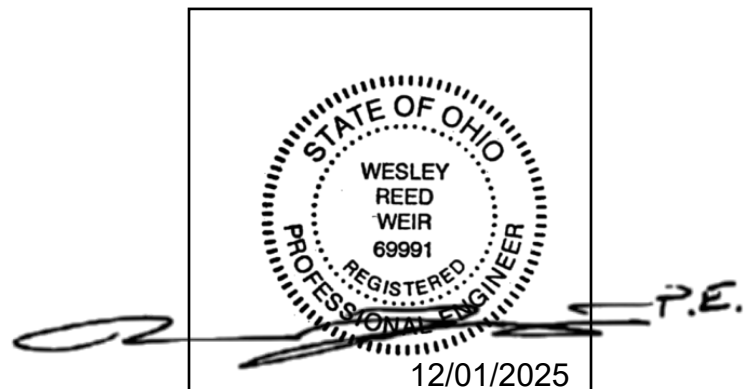
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## 1.0 Executive Summary

### 1.1 Inspection Summary

The HAM-71-0000L Bridge is in SATISFACTORY CONDITION [6-NBIS] overall, with no significant structural changes observed from the previous 2024 routine report and 2023 NSTM report. Based on our inspection, the bridge is safe to operate in its current condition at its current capacity with no restrictions.

#### 1.1.1 Deck

The deck is in SATISFACTORY CONDITION [6-NBIS] overall. The deck condition is controlled by the underside, which exhibits multiple transverse hairline cracks with efflorescence, as well as an isolated area of spalling, with exposed rebar. Both concrete bridge railings (parapets) exhibit moderate cracking, with some exhibiting efflorescence, spalls, and areas of delamination. The deck drains and the drainpipes are clogged with debris, causing ponding on the deck. The deck joints have debris accumulation throughout.

| Deck Elements (Item 58) |                                    |                                 |
|-------------------------|------------------------------------|---------------------------------|
| Element #               | Element Name                       | NBIS CONDITON                   |
| 12                      | Reinforced Concrete Deck           | SATISFACTORY CONDITION [6-NBIS] |
| 510                     | Wearing Surface                    | SATISFACTORY CONDITION [6-NBIS] |
| 300                     | Strip Seal Expansion Joints        | FAIR CONDITION [5-NBIS]         |
| 331                     | Reinforced Concrete Bridge Railing | SATISFACTORY CONDITION [6-NBIS] |
| 815                     | Drainage                           | POOR CONDITION [4-NBIS]         |

#### 1.1.2 Superstructure

The superstructure is in FAIR CONDITION [5-NBIS] overall. Isolated areas of moderate laminar corrosion with up to 1/8" deep section loss to the top of the bottom flanges, mostly found at the fascia girders and beams. The girders in Spans 15A – 28B exhibit coating failure and active corrosion throughout. Corrosion is most advanced on the fascia girders. The Non-Redundant Steel Tension Member (NSTM) steel pier caps are in fair condition and exhibit isolated coating failures, some minor impact damage, and pack rust at the web and flange connections. The bearings typically exhibit minor surface corrosion and peeling paint, and some of the rockers have pack rust between the rockers and masonry plates.

## Superstructure Elements (Item 59)

| Element # | Element Name                | NBIS CONDITON                   |
|-----------|-----------------------------|---------------------------------|
| 107       | Steel Beams/Girders         | SATISFACTORY CONDITION [6-NBIS] |
| 231       | Steel Pier Caps             | FAIR CONDITION [5-NBIS]         |
| 310       | Elastomeric Bearing         | SATISFACTORY CONDITION [6-NBIS] |
| 311       | Movable Bearing             | SATISFACTORY CONDITION [6-NBIS] |
| 313       | Fixed Bearing               | SATISFACTORY CONDITION [6-NBIS] |
| 314       | Pot Bearing                 | SATISFACTORY CONDITION [6-NBIS] |
| 515       | Steel Protective Coating    | FAIR CONDITION [5-NBIS]         |
| 820       | Steel Seated-Hinge Assembly | FAIR CONDITION [5-NBIS]         |
| -         | Diaphragms and Cross Frames | GOOD CONDITION [7-NBIS]         |

### 1.1.3 Substructure

The substructure is in SATISFACTORY CONDITION [6-NBIS] overall. The concrete piers typically exhibit minor hairline vertical and horizontal cracking, with isolated areas of spalling and rebar. Hairline flexural cracks were observed at the Fort Washington Way (FWW) rehabilitation pier cap overhangs.

## Substructure Elements (Item 60)

| Element # | Element Name                  | NBIS CONDITON                   |
|-----------|-------------------------------|---------------------------------|
| 205       | Reinforced Concrete Column    | SATISFACTORY CONDITION [6-NBIS] |
| 210       | Reinforced Concrete Pier Wall | GOOD CONDITION [7-NBIS]         |
| 234       | Reinforced Concrete Pier Cap  | SATISFACTORY CONDITION [6-NBIS] |

### 1.1.4 Other

## Other Items

| Element # | Element Name       | NBIS CONDITON                       |
|-----------|--------------------|-------------------------------------|
| -         | Signs and Supports | SATISFACTORY CONDITION [6-NBIS]     |
| -         | Utilities          | GOOD CONDITION [7-NBIS]             |
| Item 41   | Operational Status | OPEN WITH NO RESTRICTIONS [A-NBIS]. |

## 1.2 Recommendations

The recommended structural, civil, and safety repairs are classified into the following six categories:

Critical Work: (Within 30 Day Period) - Work which should be performed as soon as possible to address deficiencies that affect the capacity of the structure or public safety.

- No Critical Work noted at time of inspection.

Priority Work: (Within 6 Month Period) - Work which should be performed to address deficiencies with primary structural, electrical, or mechanical components that do not affect the capacity of the structure or public safety. Repairs that take precedence over other scheduled work.

- Remove debris/ clean clogged deck drains, scuppers, and clogged drainpipes.
- Repair broken/ missing/ disconnected/ drainpipes and bulging boots throughout.

Routine Work: (Within 24 Month Period) - Recommendations that are minor in nature and can be easily repaired. This work can be undertaken as part of a scheduled maintenance program, a scheduled project, or routine facility maintenance.

- Replace access hatch gaskets on all pier caps.
- Replace utility box that has 100% section loss.

Rehabilitation/Evaluation: (Within 5 Year Period) - Recommendations for large-scale deficiencies that are extensive in nature and require engineering analysis.

- Repair spalls and seal cracks in the wearing surface.
- Repair spalls, delaminations, and seal cracks in concrete railings throughout structure.
- Spot paint areas of corrosion in pier box cap interiors.
- Clean and apply protective coating on Spans 15A to 28B.
- Repair isolated spalls and delaminations on concrete substructure units throughout the structure.

Monitoring: (Varies) - Regular field observation of deficiencies which are not currently in need of repair but will require corrective action if deterioration continues.

- Continue to monitor the lateral movement of the girder ends in Span 24B.
- Continue to monitor the fatigue-prone details of the Non-Redundant Steel Tension Member members, especially cracked tack welds.
- Monitor erosion around Pier 18A.

Inspection/Assessment: (Varies) - Evaluation work that should be completed by qualified personnel.

- Continue performing annual inspections per FHWA and ODOT standard practices.

## 2.0 Bridge Description

HAM-71-0000L (SFN: 3105946), also known as the northern approach to the upper deck of the Brent Spence Bridge, carries four southbound lanes of vehicular traffic from I-75, I-71, and the Third Street ramp. The bridge is approximately 2,683' long, 38 spans, and consists of an elevated straight section and an elevated curve section.





## 2.1 Structural Description

The bridge deck consists of 10 reinforced concrete deck units separated by expansion joints. The deck width and the number of travel lanes vary as the different ramps converge towards the Brent Spence Main Span.

The bridge superstructure has 38 spans and typically consists of rolled or welded steel girders or steel beams with cross-frame diaphragms welded or bolted to the transverse stiffeners at varied spacings throughout. Fifteen (15) NSTM steel box caps and one NSTM plate cap make up part of the bridge's superstructure. Various types of bearings are used to support the superstructure, including elastomeric, pot, rocker, and fixed bearings.

The bridge substructure consists of various types of reinforced concrete piers, including cap-and-column, hammerhead, and a wall-type pier/abutment. The bridge plans show that the substructure units were constructed on top of concrete pile foundations.

## 2.2 Bridge Stationing

The nomenclature/stationing for the bridge follows the original 1960 design plans and the 1999 Fort Washington Way (FWW) rehabilitation plans. The original bridge consists of substructure and superstructure from the River Pier to Pier 28B. The Fort Washington Way (FWW) rehabilitation consists of substructure and superstructure from Piers 28B to the Wall Pier.

For components of the bridge deck across all spans, locations are based on the original bridge's alignment, which is south to north.

Girders, box cap diaphragms, bearings, and cross frames are arranged west to east, with the furthest west component being A and the furthest east being G typically.

Pier columns will be identified by their cardinal directions and the name of the pier they are associated with. When a pier has three columns, any defects reported specifically for the middle column are called out as "middle column". The other columns will be referred to based on their cardinal direction relative to the middle column.

## Bridge Substructure Stationing

| Substructure Unit                  |                     | Notes                                                                          |
|------------------------------------|---------------------|--------------------------------------------------------------------------------|
| Original Bridge                    | River Pier          | NSTM Box Cap Location & Closest Pier to the Ohio River and Brent Spence Bridge |
|                                    | Pier 1A – Pier 13A  | 13 NSTM Box Cap Locations                                                      |
|                                    | Pier 14A – Pier 18A | Concrete Substructure                                                          |
|                                    | Pier 19A            | Concrete Substructure & Location I-75 merges on to I-71                        |
|                                    | Pier 20B – Pier 28B | Concrete Substructure                                                          |
| Fort Washington Way Rehabilitation | Pier 28B            | Concrete Substructure                                                          |
|                                    | Pier 29B            | NSTM Plate Cap Location                                                        |
|                                    | Pier 8 – Pier 5     | Concrete Substructure                                                          |
|                                    | Pier 4              | Concrete Substructure & Location Third Street Ramp Merges onto I-71            |
|                                    | Pier 3              | Concrete Substructure                                                          |
|                                    | Pier 2              | NSTM Box Cap Location                                                          |
|                                    | Pier 1              | Concrete Substructure                                                          |
|                                    | Wall Pier           | Concrete Substructure & Location I-71 Southbound enters onto Bridge            |

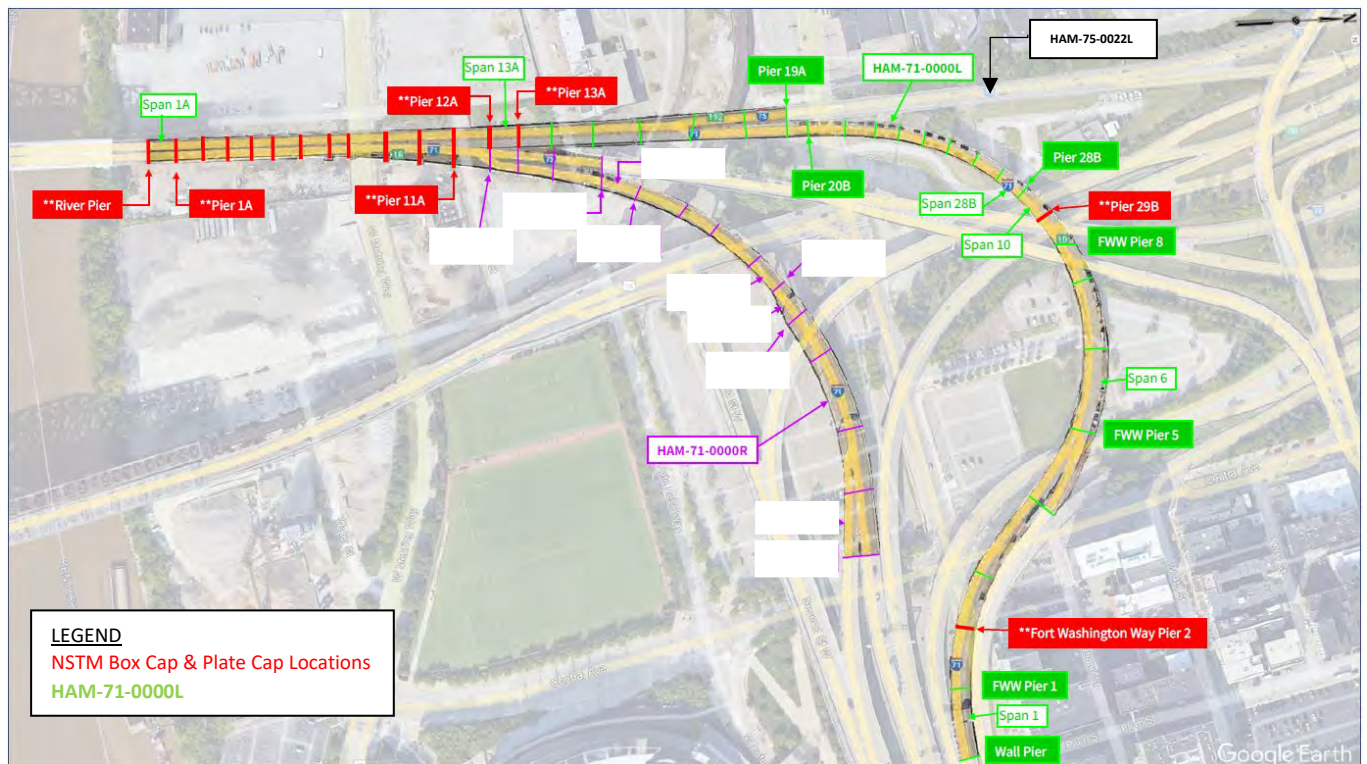


Figure 1 - Bridge nomenclature and orientation map of HAM-71-0000L.

## 2.3 Bridge Details by Span and Pier

### 2.3.1 Original Bridge

The original bridge superstructure consists of seven steel girders. The River Pier to Pier 13A of the original structure is framed into Non-Redundant Steel Tension Member (NSTM) steel box caps and is continuous through the interior of the box caps. The girder top flanges are spliced across the top of the pier caps with bolts/rivets. The girder bottom flanges are supported on butt plates, which are bolted or riveted to the pier cap webs, and the seat angles are bolted/riveted to the pier cap webs. There are interior stiffener plates that transfer the load from the butt plates through the box caps. The girder webs are connected to the box cap webs using bolted/riveted connection angles.

These box caps consist of built-up steel plates constructed using steel rivets. The box caps are supported using two bearings on square reinforced concrete pier columns. The east ends of the box caps at Piers 8A and 9A are exposed beyond the deck. The box caps at Piers 10A to 12A are cantilevered at the west ends and partially exposed beyond the upper deck and straddle the lower deck. Pier 13A is cantilevered at both ends.

Piers 14A to 28B are reinforced concrete cap-and-column piers that support the individual steel girders using various types of bearings.

### 2.3.2 Fort Washington Way (FWW) Rehabilitation

The FWW superstructure consists of welded steel plate girders and rolled beams. Spans 1 to 4 (east to west) are made up of five rolled steel beams that run continuously through the NSTM steel box cap at Pier 2. End plates are welded to the beams and bolted to the steel pier cap. Welded stiffener plates within the steel pier cap transfer forces across the pier cap at the beam locations. Pier 2's Box Cap is supported by two bearings on a concrete hammerhead pier.

Span 5 consists of 10 rolled steel beams, including adjacent beams that carry the extension of the Third Street Ramp. As the ramp transitions, the number of beams is reduced to seven for the substructure units in Spans 6 and 7. Spans 8 and 9 consist of six rolled steel beams, and Span 10 consists of five rolled steel beams.

Pier 29B is a built-up plate cap on two bearings with cantilevered ends. The bearings are supported by a reinforced concrete pier.

Pier 1 (FWW) and Piers 3-8 (FWW) are reinforced concrete cap-and-column piers. These substructure units support the individual steel girders using various types of bearings.

## 2.4 Bridge History

The structure was built in 1961 and 1962 by Peneker Construction and opened to traffic in 1963. In 1988, the parapets were replaced, and a super-plasticized dense concrete overlay was placed on the deck.

During the 1999 rehabilitation, the last twelve spans after Pier 28B were removed for the reconfiguration of Fort Washington Way (FWW). Three new structural units were constructed, totaling 10 spans, to connect the new alignments of I-71 and Third Street. The wearing surface on the non-composite portion of the bridge was removed in 2009 and replaced with a micro-silica concrete overlay. This rehabilitation also included minor deck repairs, and the piers below the deck expansion joints were sealed. In 2016 and 2017, six expansion joints were replaced, and fiber-reinforced polymer (FRP) wrap was applied to five Piers.

## 2.5 Maintenance History

- 1988 Rehabilitation
  - Parapets refaced.
  - Super-plasticized dense concrete overlay placed on deck.
- 1999 Rehabilitation
  - Reconfiguration of Fort Washington Way.
- 2004 Rehabilitation
  - Repair expansion joints.
  - Replaced cross frames.
  - Cleaned and replaced portions of bridge drainage.
  - Installed drainage cleanouts.
  - Sealing of concrete piers.
  - Zone painted structural steel.
- 2009 Rehabilitation
  - Placed micro-silica concrete overlay to non-composite portions of deck.
  - Minor deck repairs.
  - Sealed piers below deck expansion joints.
  - Cleaned out bridge drainage.
- 2013 Type B Emergency Improvement
  - Applied flexible concrete patching material to portions of existing concrete deck.
- 2016/2017 Rehabilitation
  - Replaced expansion joints at Piers 4, 8, 12A, 15A, 19A, and 23B.
  - Installed FRP wrap to Piers 12A, 15A, 19A, 23B, and 28B.
  - Zone painted structural steel ends at expansion joints and the steel pier caps.
- 2021 Paint Contract
  - Spans 1A-14A were sand-blasted, primed, and painted.

## 3.0 Inspection Summary

### 3.1 Scope

In December of 2024, WSP was engaged, as a subconsultant to AECOM, to perform the 2025 in-depth element level NBIS/ NSTM inspection of HAM-71-0000L as a part of a two-structure inspection alongside HAM-71-0000R for ODOT.

WSP performed the inspection in accordance with FHWA National Bridge Inspection Standards (NBIS), ODOT Bridge Manual, and the Consultant Bridge Inspection Scope of Services. The inspection findings were recorded on bridge-specific field inspection forms, created to document specific conditions.

The inspection took place on September 22, 2025, through September 26, 2025, and utilized both daytime and nighttime inspection hours. Both the exterior and interior portions of the 14 Nonredundant Steel Tension Member (NSTM) box caps and 1 Nonredundant Steel Tension Member (NSTM) plate cap were accessed as part of this inspection.

### 3.2 Inspection Team

The structural inspection team members were as follows:

Wesley Weir, PE, NBIS, & NSTM – WSP Project Manager/ SPRAT

Stephen Mayo, NBIS – WSP NBIS Team Lead/ SPRAT

Blake Fink, PE, NBIS, & NSTM – WSP NSTM Team Lead

Alex Thellman, PE – WSP Assistant Team Lead

Jim Henry – WSP Inspector

Chris Stonehocker, PE, NBIS, & NSTM – WSP Inspector

Kyle Compton-Troesch, PE, NBIS, & NSTM – AECOM Team Lead

Prateek Nepal, EIT & NBIS – AECOM Inspector

Matt Kish, EIT – AECOM Inspector

### 3.3 Inspection Methodology and Limitations

An in-depth inspection was conducted on the majority of the bridge, with the steel box caps and plate caps receiving a hands-on NSTM inspection. The inspection findings of the various bridge elements were recorded on bridge-specific field inspection forms. Field sketches were prepared to detail specific conditions. Color digital photographs were taken to document areas of deterioration and typical details of the structure. In order to achieve the hands-on access required for this type of inspection, ladders and a 140' boom lift were used. The steel box pier caps required an impact driver, breaker bar, 15/16" socket, scraper, and silicone sealant in order to access the interiors. The inspector entering the caps utilized a multi-gas air meter, flashlight, and dust mask to enter and perform the NSTM inspection of the interior safely.

Inspection equipment utilized during the inspection included: safety harnesses and lanyards, drones, calipers, chipping hammers, wire brushes, carpenter rulers, straight edges, dye penetrant, levels, flashlights, and multi-gas air monitors. The superstructure and elevated substructure associated with Spans 1A to 17A were inspected utilizing the boom lift.

Traffic Control was necessary to perform a hands-on inspection of the exterior of the Non-Redundant Steel Tension Member pier caps. Access to the exterior of the box caps and superstructure of HAM-71-0000L (the upper deck) was provided by night lane closures of the lower deck (HAM-71-0000R). On the first night, the west (right) two lanes of I-75 NB were closed to inspect the superstructure and box caps from Girders A-D in Spans 1A to 13A. On the first night the east (left) two lanes of I-75 NB were closed to inspect the superstructure and box caps from Girders E-G in Spans 1A to 13A.

A third daytime turning lane closure was used to allow for the inspection of FWW Pier 2. An existing lane closure for the inspection of HAM-75-0022R was utilized to inspect the plate cap, bearings, and concrete of Pier 29B. Traffic control was provided by AECOM through Intech Contracting LLC, and all signs/devices were placed in accordance with the latest Ohio Manual on Uniform Traffic Control Devices.

The remaining structure was inspected from the ground with the use of an extension ladder and a DSLR camera equipped with a 75-300mm zoom lens. Locations of photos and specific conditions are noted and identified by the location on the structure and cardinal directions associated with each photograph.

### 3.4 NBIS Condition Rating

State and federal guidelines for evaluating bridge condition have been developed to promote uniformity in inspections conducted 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 for evaluating the condition of the various bridge members.

| NBIS Code | Condition               | Description                                       |
|-----------|-------------------------|---------------------------------------------------|
| N         | <b>NOT APPLICABLE</b>   |                                                   |
| 9         | <b>EXCELLENT</b>        | New Construction                                  |
| 8         | <b>VERY GOOD</b>        | No problems noted                                 |
| 7         | <b>GOOD</b>             | Some minor problems                               |
| 6         | <b>SATISFACTORY</b>     | Minor deterioration in structural elements        |
| 5         | <b>FAIR</b>             | Sound structural elements with minor section loss |
| 4         | <b>POOR</b>             | Advanced section loss                             |
| 3         | <b>SERIOUS</b>          | Affected structural elements from section loss    |
| 2         | <b>CRITICAL</b>         | Advanced deterioration of structural elements     |
| 1         | <b>IMMINENT FAILURE</b> | Obvious movement affecting structure stability    |
| 0         | <b>FAILED</b>           | 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, 2025).
2. Manual for Bridge Element Inspection, 2nd Edition, AASHTO, (2019; Interim Revisions 2022, 2024, 2025).
3. Manual for Condition Evaluation of Bridges, 3rd Edition, AASHTO, (2018; Interim Revisions 2019, 2020, 2022, 2024).
4. Bridge Inspector's Reference Manual, U. S. Department of Transportation, 2022 (rev 2023).
5. NSTM Guide for Fracture Critical Bridge Inspections, FHWA, (2022)
6. Inspection of Fracture Critical Bridge Members, FHWA (1986; current guidance integrated into NBIS Final Rule 2022 and SNBI specifications).
7. Manual for Bridge Evaluation, AASHTO, 2018 (3rd edition 2018; Interim Revisions 2019, 2020, 2022, and 2024).
8. Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, Federal Highway Administration, (1995; Errata 2012, 2018; SNBI guidance now supplements coding requirements).
9. Ohio Manual of Uniform Traffic Control Devices (OMUTCD, ODOT, 2012 (11<sup>th</sup> Edition MUTCD 2023).

## 4.0 Inspection Findings

### 4.1 Deck [Item 58]

The deck is in SATISFACTORY CONDITION [6-NBIS] overall. The deck condition is controlled by the underside, which exhibits multiple transverse hairline cracks, isolated areas of efflorescence, and spalling throughout with isolated areas of exposed rebar. Both concrete bridge railings have moderate cracking, with efflorescence, spalls, and areas of delamination. The deck drains and the drainpipes are clogged with debris, causing ponding on the deck. The deck joints are filled with debris.

#### 4.1.1 Reinforced Concrete Deck [Element 12]

The reinforced concrete deck is in SATISFACTORY CONDITION [6-NBIS] overall (Photo 1 & Photo 2), due to isolated spalling on the deck underside with exposed rebar and transverse cracking throughout girder bays (Photo 3).

Steel and wood panel shielding are installed between the girders in Spans 1A to 13A (Photo 4). The panels were lifted to gain access for visual inspection of the deck underside at various locations. The underside of the deck within the limits of the grating and wood panels exhibits hairline transverse and map cracking with efflorescence (Photo 5), and one isolated 3' wide by 12" long by 3" deep spall with exposed rebar in Span 8A between Girders A and B near Pier 8A. Hairline to moderate-width cracks with efflorescence, typically spaced between 12" to 6' apart, are present throughout the deck underside in Spans 14A to 28B.

Access to Span 18A was limited due to the railroad tracks below. This span typically exhibits a dark layer of soot throughout framing members and underside of the deck. Cracking with efflorescence is typical throughout the underside of the deck for the full width of the bays between the girders in the Fort Washington Way spans and under Girder F in Span 8. Individual cracks are typically spaced 2' to 4' apart within each bay (Photo 6). There are areas of patches, delamination, and spalls with exposed reinforcement in isolated locations throughout. If necessary, concrete debris was safely removed from the structure.

| Deck Defects |                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location     | Defect                                                                                                                                                 |
| Span 4A      | 2' diameter spall with exposed rebar in Bay 5 above the grating.                                                                                       |
| Span 8A      | 3 potholes in middle two travel lanes, patched with asphalt fill (Photo 7).                                                                            |
| Span 19A     | 18" long by 2' wide by 2" deep spall with two exposed transverse reinforcing steel between Girders G and H near Pier 19A.                              |
|              | 12" spall with exposed rebar over the Pier 19A.                                                                                                        |
| Span 20A     | 12" diameter by 1" deep spall with one exposed between Girders A and B at midspan.                                                                     |
|              | 9" diameter by 1" deep spall between Girders D and E just past midspan.                                                                                |
| Span 21B     | 18" long by full deck width by 2" deep spall rebar with 1/16" section loss from Girder A through Girder E at midspan cross frames.                     |
| Span 23B     | 2' long by 12" wide by 1" deep spall with exposed rebar with 1/16" section loss between Girders D and E just past the first cross frame from Pier 22B. |
| Span 26B     | Four spalls up to 3' long by 3' wide by 3" deep with rebar exposed between Girders D and E at the second cross frame from Pier 25B (Photo 8).          |
| Span 27B     | 4' long by 3' wide by 3" deep spall with rebar exposed between Girders D and E at the first cross frame from Pier 26B.                                 |

Haunch spalls are typical along the edge of the top flange of Girders A through E in Spans 20B through 28B. There are typical full-depth, 4' by 4' concrete patches where the expansion joints were replaced at Piers 4A, 8A, 15A, and 19A. There are two spalls, 24" wide by 12" long by 3" deep, and 24" wide by 24" long by 3" deep along the north side of the patch at the Pier 19A east overhang in Span 20A.

The deck overhangs typically exhibit hairline map cracking and isolated spalls with exposed reinforcement (Photo 9).

| Deck Overhang Defects |                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------|
| Location              | Defect                                                                                                                  |
| Span 1A               | Two 8" diameter by 1" deep spalls with exposed reinforcement in the east overhang near the River Pier.                  |
|                       | 21" long by 12" wide by 1" deep edge spall with exposed rebar on the east face of the east overhang near midspan.       |
| Span 5A               | 5" diameter by 1" deep spall with exposed rebar in the east face of the deck at midspan.                                |
| Span 6A               | Two spalls up to 2" long by 4" wide by 2" deep in the underside of the west overhang with exposed rebar.                |
| Span 8A               | 2' long by 12" wide by 1" deep spall with exposed rebar in the west overhang.                                           |
|                       | 5' long by 20" wide by 5" deep spall with exposed rebar in the east overhang, both near midspan (Photo 10).             |
| Span 20B              | 5' long by 3' wide by 4" deep spall with rebar exposed in the east overhang 15' from Pier 19A.                          |
|                       | 4' long by 2' wide spall with exposed rebar on the East overhang near Pier 19A.                                         |
| Span 21B              | Large spall with efflorescence between the structure and 0022L on the West overhang.                                    |
| Span 23B              | 18" long by 12" wide by 12" high by 5" deep corner spall with exposed rebar in the west overhang at the Pier 23B joint. |
| Span 25B              | 12" long by 12" wide by 4" deep spall with exposed rebar on the west overhang near Pier 24B.                            |
|                       | Areas of moderate cracking and heavy efflorescence typically throughout the east bottom edge of the deck.               |
| Span 28B              | Areas of moderate cracking and heavy efflorescence typically throughout the east bottom edge of the deck.               |



*Photo 1 - Typical top of deck at Span 1A, looking northeast.*

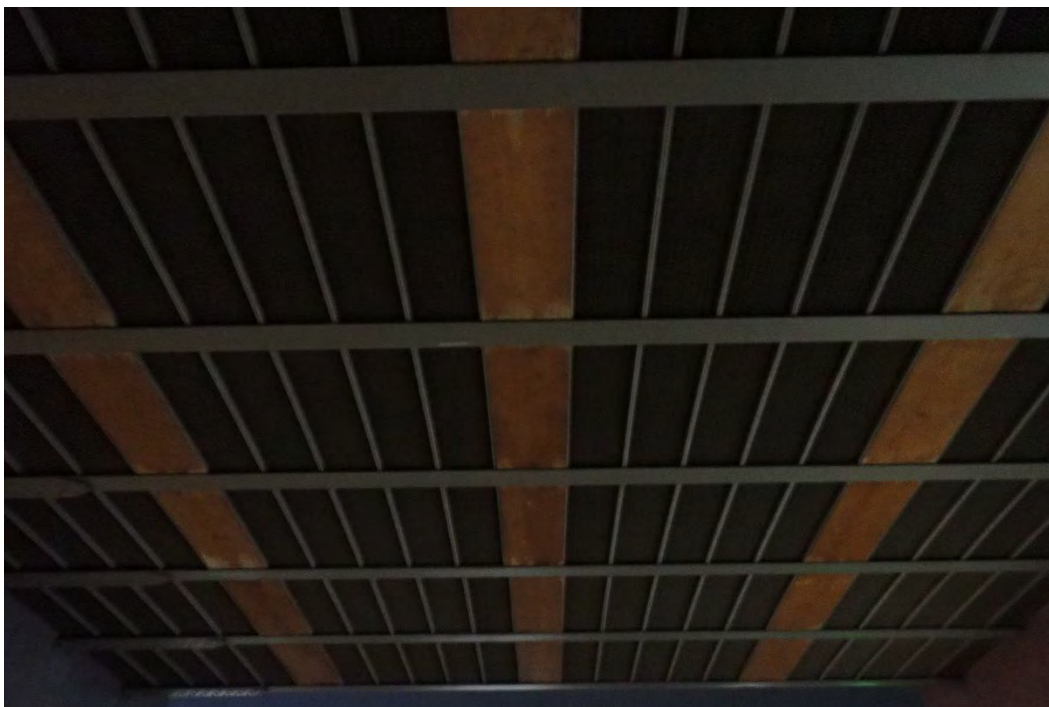


*Photo 2 - Typical deck underside at Span 15A, looking south.*





*Photo 3 – Typical transverse cracking with efflorescence throughout girder bay sat Span 11A Bay 4, looking west*



*Photo 4 - Typical Deck underside with debris grating at Span 1A looking south.*



*Photo 5 - Hairline transverse and map cracking with efflorescence at the underside of Deck in Span 8A.*



*Photo 6 - Typical transverse cracking with efflorescence on deck underside at Span 29B, looking northeast.*





*Photo 7 - Pothole in top of deck with temporary asphalt fill/patch at Span 8A, looking east. Note: previous deck repair.*



*Photo 8 - Typical spalling with exposed rebar on the underside of deck at Span 26B, looking south.*



Photo 9 - Typical deck overhang at Span 3, looking north. Note: minor transverse cracking along with efflorescence.



Photo 10 - 5' long by 20" wide by 5" deep spall with exposed rebar in the east overhang, both near midspan of Span 8A.



#### 4.1.2 Wearing Surface [Element 510]

The wearing surface is in SATISFACTORY CONDITION [6-NBIS] overall with minor spalls and hairline to moderate longitudinal, diagonal, and transverse cracks throughout (Photo 11). The wearing surface was visually inspected from a 135-foot manlift and driven as slowly as safety permitted. Small shallow pop-out spalls less than 6" in diameter are typical throughout spans (Photo 12). There are typical full-width transverse hairline cracks spaced 24" to 4' apart throughout the FWW spans. The high-friction treatment of the wearing surface in these spans is worn in the travel lanes, but is still present. There are multiple isolated concrete and asphalt patches throughout Spans 5A, 6A, 8A, 14A, and 25B (Photo 13 & Photo 14). Based on the 2020 ODOT Concrete Wearing Surface Delamination Report (Appendix B), there are several areas of delamination throughout the deck.



*Photo 11 - Typical top of deck at Span 1A, looking east.*



*Photo 12 - Typical high-friction deck top at Span 5A, looking east. Note: Minor concrete popouts/ spalls in far west travel lane.*



*Photo 13 - Typical concrete deck repair at Span 5A, looking northeast.*





*Photo 14 - Typical asphalt patching of pothole in deck at Span 8A, looking east.*



#### 4.1.3 Strip Seal Expansion Joint [Element 300]

The expansion joints are in FAIR CONDITION [5-NBIS] overall with minor to heavy debris accumulation, deterioration, and isolated areas of leakage (Photo 15). There are strip seal expansion joints located at Piers 4A, 8A, 12A, 15A, 19A, 23B, 28B, 7 (FWW), 4 (FWW), and the Wall Pier (Photo 16). The joints typically exhibit minor debris accumulation throughout the entire length, and minor tears are present at Piers 15A, 23B, 28B, and 7 (FWW). Signs of water leakage were noted at several joint locations.



*Photo 15 - Typical debris accumulation in expansion joint at Pier 4A, looking east.*



*Photo 16 - Typical strip seal joint at Pier 4A, looking east.*

#### 4.1.4 Reinforced Concrete Bridge Railing [Element 331]

The reinforced concrete bridge railings are in SATISFACTORY CONDITION [6-NBIS] overall, with isolated spalls with exposed reinforcement, isolated minor delamination, and hairline to wide transverse and longitudinal cracking with efflorescence and rust staining. The exterior face of the railings typically exhibits full height by hairline vertical cracking with efflorescence spaced 12" to 24" apart (Photo 17). The interior faces typically exhibit wide longitudinal cracks located below the top edge (Photo 18) and isolated locations full height vertical cracking spaced 12" apart throughout (Photo 19).

There are isolated minor spalls throughout the railings in the original bridge spans that have been repaired (Photo 20 & Photo 21). The west railing of the River Pier joint has a previously noted 12" long by 6" high by 2" deep spall with exposed reinforcement (Photo 22). The area is surrounded by delaminated concrete and wide longitudinal and vertical cracks with water and rust staining. The previously noted 18" long by 6" high by 2" deep spall on the top east edge of the east railing at a sign connection in Span 3A has been repaired, along with several other sections of railing throughout the structure. The sign was moved to a different location in Span 2A. Isolated concrete patches are present throughout both railings, typically at the top edge. The patches are sound and in good condition overall.



*Photo 17 - Typical concrete bridge railing with vertical hairline cracking and efflorescence at Span 3, looking northeast.*





*Photo 18 - Typical longitudinal cracking along top of concrete bridge railing.*



*Photo 19 - Wide vertical cracks in concrete railing on west railing or Span 5.*





*Photo 20 - Typical concrete patch on railing top at Span 3A, looking northeast.*



*Photo 21 - Typical concrete bridge railing repair at a joint location at Pier 7A, looking east.*



*Photo 22 - Spall with exposed reinforcement, surrounded by delaminated concrete, at the River Pier, looking east.*

#### 4.1.5 Drainage [Element 815]

The bridge deck drainage is in POOR CONDITION [4-NBIS], due to multiple drainpipes being completely or partially clogged at the deck level scupper locations (Photo 23) and at the ground level (Photo 24), causing water ponding on the deck. Scuppers that are 100% clogged are located in Spans 3A, 6A, 8A, 9A, 10A, 17A, 18A, 19A, and at the Wall Pier in Span 1 (FWW). The drain grate in the left lane of Span 2A is missing (Photo 25). The drainage grate over the scupper near the east railing at Pier 19A has multiple broken bars.

There are disconnected and misaligned drain boots at Piers 4A, 6A, 8A, 18A, 19A, and 22B (Photo 26). There are numerous locations where there is a large gap between the deck drainpipe and the drainpipe attached to the pier columns. The exposed drainage bells are typically fully clogged with debris (Photo 27 & Photo 28). The drainpipe T-joint is disconnected on the north face of Column 1 at Pier 12A, and the pipe is cracked, but this condition has not changed from the 2024 inspection. The most downspouts are partially or completely disconnected at the ground termination of Column 2 at Pier 4A. The missing pipe has caused erosion of the asphalt material below Pier 18A. Various locations throughout are also disconnected from the underground drainage termination, but do not show signs of erosion. Several drainpipes are cracked with corrosion holes through the pipe wall throughout the structure (Photo 29).



*Photo 23 - Debris impacted deck drain with vegetation growth at pier 6A, looking east.*





*Photo 24 - Drain pipe impacted with debris and disconnected at base at Pier 6A, looking west.*



*Photo 25 - Missing deck drain grate with debris accumulation at Span 2A, looking northeast.*





*Photo 26 - Typical disconnected drainpipe at pier column base at Pier 19A, looking south.*



*Photo 27 - Typical clogged drainpipe at Pier 8A, looking east.*



*Photo 28 - Clogged and overflowing drainpipe at Pier 2A, looking south.*



*Photo 29 - Corroded drainpipe, with holes and disconnections at joints at River Pier west column, looking west.*



## 4.2 Superstructure [Item 59]

The superstructure is in FAIR CONDITION [5-NBIS] overall, due to the pack rust between the bottom of the web plates and the internal bottom flange angles and active corrosion throughout the web plates, angles, and bottom flange plates inside the NSTM box caps. The steel beams and girders exhibit localized areas of moderate laminar corrosion with minor section loss to the top of the bottom flanges, mainly found at the fascia girders. The girders in Spans 15A to 28B exhibit paint failure and active corrosion throughout, with the most advanced failure on the fascia girders. The rocker bearings typically exhibit minor surface corrosion and paint peeling, and some rockers have pack rust between the rocker and masonry plate.

### 4.2.1 Steel Beams/Girders [Element 107]

The steel beams and girders are in SATISFACTORY CONDITION [6-NBIS] overall, with areas of laminate corrosion and up to 1/8" deep section loss.

There is metal grating and wood shielding between interior bays of Spans 1A to 11A and portions of Spans 12A to 14A; therefore, only the bottom flanges were inspected with hands-on techniques (Photo 30). The shielding could not be removed, so the remaining portions of the girders were inspected visually through the grating. The girders in Spans 1A to 14A are in good condition overall. There is up to 1/8" painted over pitting typical for fascia girders in Spans 1A to 14A, most notable at box cap seats (Photo 31 & Photo 32). Typically, there is up to 3/4" thick painted over pack rust between the girder bottom flange and seat angles at the steel box pier caps in these spans; in some cases, the angles are bent up to 2" (Photo 33). The bottom flange of Girder G in Span 1A is bent upward 1/2" over 18" length (Photo 34). There are two, 1" diameter, corrosion holes in the web of Girder F between the bearing stiffeners at the hinge assembly at Pier 4A. There is a bent stiffener at the bottom flange of Girder E in Span 13A (Photo 35).

The girders in the remaining original spans typically exhibit minor surface corrosion and freckled rust throughout due to the failure of the protective coating system (Photo 36). The bottom flanges, lower webs, and transverse stiffeners of the fascia girders in Spans 16A to 22B exhibit isolated areas of laminate corrosion with section loss up to 3/16" deep. The bottom flange of Girders E and F are bent 3/4" at midspan Span 17A (Photo 38). The bottom flange of Girder H in Span 18A exhibits a 7" wide by 3/16" deep area of section loss 22' from Pier 17A. The top flange, stiffeners, and web of Girder A in Span 23B have areas of laminate corrosion with section loss up to 1/8" deep. There is laminate corrosion with section loss up to 1/8" on the bottom flange of Girder A of Span 20A adjacent to the timber shielding installed between HAM-75-0022L and HAM-71-0000L. There is a bent stiffener on the east side of Girder E near Pier 21B in Span 22B.

The end of the beams have been painted (approximately 10') near expansion joints at Piers 15A, 19B, and 23B and are in good condition. Painted over pitting, up to 1/4" deep, is present on the bottom flange of the Span 16A girders at Pier 15A and the Span 19B girders at Pier 19B, there was no significant change. There is a 3/4" diameter inactive corrosion on exterior stiffeners of Girder G in Span 16A near Pier 15A. There is a 3" long x 1" wide inactive corrosion hole in the web behind the bearing stiffener of Girder D, Span 19B at Pier 19B.

There are fatigue-prone welds from previous attachments on the bottom flanges of the girders in Span 15A, 12' from Piers 14A and 15A, and Drain pipe is currently welded to several girders in Spans 1A to 13A (Photo 37).

The girders in Spans 1 to 10 (FWW) are in good condition, with no significant defects noted (Photo 39, Photo 40, & Photo 41).





*Photo 30 - Typical girder layout with debris screens between River Pier and Pier 13A, Span 1A looking east.*



*Photo 31 - Typical Painted over minor section loss from previous corrosion on bottom flange at Pier 7A, looking east.*



Photo 32 - 1/8" pitting on bottom flange of girder at Pier 6A, looking south. Note: Corrosion has been painted over.



Photo 33 - 1" of pack rust between girder and bottom flange angle at River Pier Girder A, looking southwest.

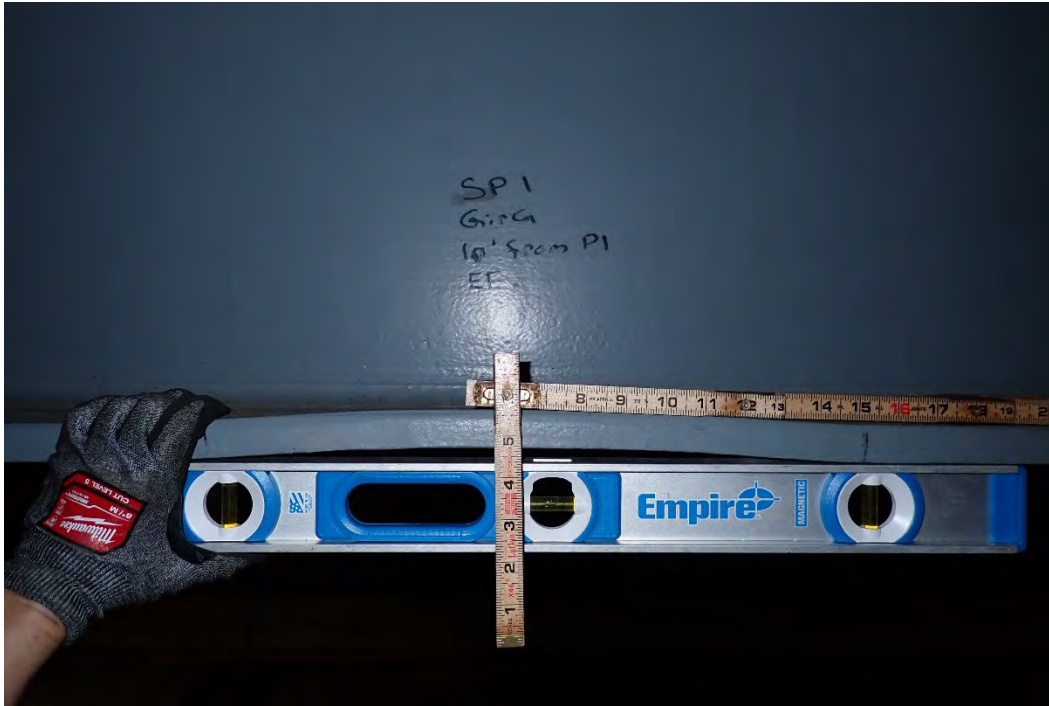


Photo 34 – Deflection in Girder G in Span 1.



Photo 35 - Typical warped/ bent stiffeners at bottom flange of Girder E Span 13A, looking east.





*Photo 36 - Typical surface corrosion and pack rust in webs and bottom flange of girders at Span 18A east facia girder looking north.*



*Photo 37 - Drain pipe hangers welded to the bottom flange of Girder E at Pier 12A, looking southeast.*



*Photo 38 - Bent bottom flange of Girder E of Span 17A, looking west.*



*Photo 39 - Typical girder layout and condition at FWW Span 4, looking southeast.*





*Photo 40 - Typical girder bolted connection at FWW Span 3, looking north.*



*Photo 41 - Typical girder depth transition at FWW Span 4, looking north.*



#### 4.2.2 Steel Pier Cap [Element 231]

Fifteen steel box caps and one plate cap are in FAIR CONDITION [NBIS-5] overall (Photo 42 & Photo 43), typically 1" thick pack rust between the bottom of the web plates and the interior bottom flange angles, and up to 1/8" deep active pitting throughout the web plates, angles, and bottom flange plates on the box caps between the River Pier and Pier 13A.

| STEEL PIER CAP CONDITION SUMMARY |          |                        |
|----------------------------------|----------|------------------------|
| PIER CAP                         | NBIS     | CONDITON               |
| River                            | NBIS - 5 | FAIR Condition         |
| 1A                               | NBIS - 5 | FAIR Condition         |
| 2A                               | NBIS - 5 | FAIR Condition         |
| 3A                               | NBIS - 5 | FAIR Condition         |
| 4A                               | NBIS - 5 | FAIR Condition         |
| 5A                               | NBIS - 5 | FAIR Condition         |
| 6A                               | NBIS - 6 | SATISFACTORY Condition |
| 7A                               | NBIS - 6 | SATISFACTORY Condition |
| 8A                               | NBIS - 6 | SATISFACTORY Condition |
| 9A                               | NBIS - 6 | SATISFACTORY Condition |
| 10A                              | NBIS - 5 | FAIR Condition         |
| 11A                              | NBIS - 7 | GOOD Condition         |
| 12A                              | NBIS - 6 | SATISFACTORY Condition |
| 13A                              | NBIS - 6 | SATISFACTORY Condition |
| 29B                              | NBIS - 7 | GOOD Condition         |
| 2 (FWW)                          | NBIS - 7 | GOOD Condition         |



Photo 42 - Typical box cap elevation view at Pier 8A, looking northeast.



Photo 43 - Typical box cap interior view at Pier 6A, looking east.

#### 4.2.2.1 River Pier Cap

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of the River Pier Cap is in SATISFACTORY CONDITION [6-NBIS].

There is typically 1" thick pack rust between the bottom of the web plates and the internal bottom flange angles (Photo 44). Active rust staining is present between the south web plate and the south bottom flange connection angle, as well as throughout the underside of the bottom flange.

The protective coating on the exterior is in good condition overall. There is a minor scrape on the underside of the bottom flange between Girders B and C. The scrape removed the protective coating from nearby rivet heads and a small portion of the bottom flange; however, only minor surface corrosion was noted (Photo 45).

##### **Pier Cap Interior**

The interior of the cap is in FAIR CONDITION [5-NBIS]. The interior of the cap was last inspected during the 2023 NSTM inspection.

The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust. The bottom flange plate and angles exhibit moderate inactive surface pitting up to 1/8" deep throughout. There is up to 1/8" deep active pitting throughout the web plates, angles, and bottom flange plates at either end of the cap. Moderate active pack rust is present between the south web plate and the bottom flange angle throughout.

There is one missing rivet in the bottom angle to south web plate connection on the west side of Girder A. The south top flange angle of Girder A is missing five bolts/rivets, and the open holes are filled with concrete. There are two mis-drilled holes adjacent to the five missing bolts/rivets. One bolt is not fully seated at the south top flange angle of Girder E (Photo 46).

There are tack welds typically between the transverse stiffener angles and the web plates, but no signs of distress were noted.

The protective coating system on the interior of the cap is in satisfactory condition with some minor areas of freckled rust throughout (Photo 47).



## RIVER PIER CAP FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                                                                                                                                                    |
|-------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *C'               | Pier Cap Web Plate        | Typical tack welds to interior transverse stiffeners.                                                                                                                                                                                          |
| C                 | Pier Cap Web Plate        | Fillet welds at the ladder rungs on the north web interior near the east end.                                                                                                                                                                  |
| *C'               | Pier Cap Web Plate        | One cracked tack weld between the east edge of the Girder E seat angle and the north web exterior, and one weld between the east edge of the Girder G seat angle and the north web exterior. The crack does not propagate into the base metal. |
| D                 | Pier Cap Webs and Flanges | Riveted connections                                                                                                                                                                                                                            |
| *D                | Pier Cap Webs and Flanges | 3" tack weld on the north web exterior near the west bearing.                                                                                                                                                                                  |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



Photo 44 - Typical pack rust between box cap web and internal bottom flange angles at River Pier Girder C, looking east.



*Photo 45 - Impact scrapes to bottom flange and rivets removed protective coating on River Pier, looking east.*



*Photo 46 - Not fully seated bolt at the south top flange angle of Girder E, looking east.*



*Photo 47 - Minor areas of freckled rust around top hatch at east end of box cap at River Pier, looking east.*



#### 4.2.2.2 Pier Cap 1A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 1A is in SATISFACTORY CONDITION [6-NBIS]. Multiple scrapes and gouges are present along the underside of the bottom flange plate (Photo 48). There is an 8' wide by 3" long gouge with peeling paint and one sheared riveted head in the underside of the bottom flange below Girder C, and a 4" wide by 1" long gouge with six damaged rivet heads in the underside of the bottom flange below Girder B (Photo 49).

There is pack rust between the web plates and the bottom flange plates/angles that have been previously caulked and painted. Isolated pack rust up to 1/4" thick is present between the north web plate and the seat angle of Girder A. There is a minor area of 1/8" painted over pitting in the north web plate above Girder A.

The drainpipe support bracket is welded to the north web plate at both ends.

The protective coating on the exterior of the pier cap is in good condition.

##### **Pier Cap Interior**

The interior of the pier cap is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust.

There is up to 1/8" deep active pitting throughout the web plates, angles, and bottom flange plates at either end of the cap. Isolated areas exhibit active corrosion up to 1/8" in the web plates at either end near the fill plate and top flange angles. Painted over pitting is typical throughout the bottom surface.

There are tack welds between the transverse stiffener angles and the webs, but no signs of distress were noted (Photo 50).

The protective coating system on the interior of the pier cap is in satisfactory condition, with some areas of minor freckled rust throughout.

## PIER CAP 1A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                                                                          |
|-------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *C'               | Pier Cap Web Plate        | Typical tack welds to interior transverse stiffeners.                                                                                                                |
| C                 | Pier Cap Web Plate        | Fillet welds at the ladder rungs on the north web interior near the east end.                                                                                        |
| *C'               | Pier Cap Web Plate        | One cracked tack weld between the east edge of the Girder E seat angle and the north web, and one weld between the east edge of the Girder G seat and the north web. |
| D                 | Pier Cap Webs and Flanges | Riveted connections                                                                                                                                                  |
| D                 | Pier Cap Webs and Flanges | 3" fillet welds for two drainpipe support brackets on the north web near the cap ends.                                                                               |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 48 - Typical surface corrosion and impact damage on bottom flange of box cap at Pier 1A, looking northeast.*



Photo 49 – Impact damage and corrosion with minor section loss, with missing rivet from bottom flange over center lanes on Pier 1A, looking northeast.



Photo 50 - Typical tack weld between box cap web and interior stiffeners at Pier 1A, looking west.



#### 4.2.2.3 Pier Cap 2A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 2A is in GOOD CONDITION [7-NBIS]. Minor impact damage and gouges are present on the underside of the bottom flange plate and rivets by Girder F, and in the center two lanes (Photo 51). There is typical 3/8" thick pack rust between the web plates and the bottom flange angles/plate. The pack rust has been caulked and painted with no signs of deterioration or reactivation of corrosion.

There is minor pack rust up to 1/8" thick between the seat angle of Girder A and both the north and south web plates.

The drainpipe support bracket is welded to the north web plate at both ends.

The protective coating on the exterior of the pier cap is in good condition.

##### **Pier Cap Interior**

The pier cap interior is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust (Photo 52).

There is up to 1/8" deep active pitting throughout the web plates, angles, and bottom flange plates at either end of the cap. Isolated areas exhibit active corrosion up to 1/8" in the web plates at either end near the fill plate and top flange angles. Painted over pitting is typical throughout the bottom surface. There is active corrosion with section loss, approximately 1/4" section of steel remaining at the base of the stiffening diaphragm of Girder G.

There are typical tack welds between the transverse stiffener angles and the webs, but no signs of distress were noted.

The protective coating on the interior is in satisfactory condition, with some areas of minor freckled rust throughout.

## PIER CAP 2A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                   |
|-------------------|---------------------------|-------------------------------------------------------------------------------|
| C'                | Pier Cap Web Plate        | Typical tack welds to interior transverse stiffeners.                         |
| C                 | Pier Cap Web Plate        | Fillet welds at the ladder rungs on the north web interior near the east end. |
| D                 | Pier Cap Webs and Flanges | Riveted connections                                                           |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 51 - Minor impact damage and scrapes along bottom flange of box cap at Pier 2A, looking northeast.*



*Photo 52 - Typical dry box cap interior with light surface corrosion at Pier 2A, looking east.*



#### 4.2.2.4 Pier Cap 3A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 3A is in GOOD CONDITION [7-NBIS].

There is 1" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angles. This area was previously filled with putty and painted. The putty appears to be functioning as intended. There is pack rust, up to 1/8" thick, between the south top flange connection angle and top flange plate at the west end of the cap.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of Pier Cap 3A is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust (Photo 53).

There is active corrosion along the edges of the bottom flange angles and the bottom flange plate. The web plates, flange angles, and bottom flange plate at each end of the cap exhibit minor, active surface corrosion and up to 3/8" deep painted over pitting throughout. Isolated areas of painted-over pitting are beginning to reactivate with freckled rust. The access hatch at the west end of the cap has small gaps around the sides and active corrosion along the bottom.

There are typical tack welds between the transverse stiffener angles and the webs, but no signs of distress were noted (Photo 54).

The protective coating system on the interior of the pier cap is in fair condition. There is peeling and failing paint on the top of the bottom flange angles, predominantly at the west end (Photo 55).

## PIER CAP 3A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                   |
|-------------------|---------------------------|-------------------------------------------------------------------------------|
| *C'               | Pier Cap Web Plate        | Typical tack welds to interior transverse stiffeners east of Girder B.        |
| C                 | Pier Cap Web Plate        | Fillet welds at the ladder rungs on the north web interior near the east end. |
| *C'               | Pier Cap Web Plate        | 2"-3" long tack welds to transverse stiffeners west of Girder B.              |
| D                 | Pier Cap Webs and Flanges | Riveted connections                                                           |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 53 - Typical interior corrosion with pitting of bottom flange in box cap at Pier 3A, looking east.*



Photo 54 - Typical tack welds in box cap interior at Pier 3A.



Photo 55 – Painted-over pitting and active corrosion at the east end on Pier 3A, looking north.



#### 4.2.2.5 Pier Cap 4A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 4A is in GOOD CONDITION [7-NBIS]. There is 1" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angles (Photo 56). The pack rust has been previously caulked and painted. The caulking is functioning as intended with no signs of deterioration.

There is 1/2" thick pack rust between the north web and the Girder A seat angle. There is 1/8" deep painted over pitting on the south web at Girder A seat angle (Photo 57).

Two drainpipe support brackets are attached to the north web with bolts.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of the pier cap is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust.

The web plates, angles, and bottom plate at each end of the cap exhibit some minor active surface corrosion and pitting, typically at the intersections. There is also typical minor corrosion between the top flange angles, web plates, and filler plates at either end of the cap. An isolated 9" wide by 1" high by 1/16" deep area of pitting was present at the west end of the cap between the north top flange angle and the north web plate (Photo 58).

There are typical tack welds between the transverse stiffener angles and the web plates. Tack welds are also present between the bottom flange plate and angles. No signs of distress were noted at these locations.

The access hatch at the west end of the cap has small gaps along the sides, allowing a small amount of moisture to enter the west end. The gaps were caulked when the hatch cap was reassembled after the inspection.

The protective coating on the interior is in satisfactory condition, with minor freckled rust in some areas, particularly on the bottom flange plate and angles. A similar condition exists along the top flange angles and throughout the web plates.

## PIER CAP 4A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                                | DESCRIPTION                                                                                                                           |
|-------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| B                 | Pier Cap Web Plate                      | Two bolted brackets on the north web plate for the downspout supports                                                                 |
| C                 | Pier Cap Web Plate                      | Fillet welds at the ladder rungs on the north web interior near the east end.                                                         |
| *C'               | Pier Cap Web Plate                      | Typical 2"-3" long tack welds to transverse stiffeners (16 total).                                                                    |
| D                 | Pier Cap Webs and Flanges               | Riveted connections                                                                                                                   |
| *D                | Pier Cap Bottom Flange Plate and Angles | Typical 2"-3" long tack welds to south bottom flange angle and bottom flange plate on each side of every girder diaphragm (14 total). |
| *D                | Pier Cap Bottom Flange Plate and Angles | Typical 2"-3" long tack welds to north bottom flange angle and bottom flange plate on each side of every girder diaphragm (14 total). |
| *D                | Pier Cap Bottom Flange Plate            | 2" transverse tack weld between the bottom flange plate and the connection angle on the west side of Girder G diaphragm.              |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 56 - 1" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angles at Pier 4A.*



Photo 57 - Up to 1/8" section loss of box cap south web at Girder A seat at Pier 4A, looking north.



Photo 58 - Typical minor corrosion between the top flange angles, web plates, and filler plates at Pier 4A, looking north.



#### 4.2.2.6 Pier Cap 5A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 5A is in GOOD CONDITION [7-NBIS]. There is up to 5/8" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angles throughout the entire width of the pier cap (Photo 59). The pack rust has been previously filled with putty and painted. The putty is functioning as intended, with signs of reactivation noted.

One broken tack weld is present between the bottom flange and horizontal leg of the seat angle on the east side of Girder A on the north web plate. There is a 3/8" thick pack rust on the west side between the north web plate and the vertical leg of the Girder A seat angle. A similar broken tack weld is present along the bottom flange and seat angle of the east face of Girder C at the north web plate.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of Pier Cap 5A is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry at the time of inspection; however, granular rusting debris indicates possible moisture intrusion at each end of the cap. The entire bottom surface was covered by up to 1/2" of granular debris and dust. There is active corrosion with up to 3/8" deep section loss throughout the top and bottom flange plate, flange angles, and web plates at each end of the pier cap (Photo 60). Some isolated areas of minor surface pitting have been painted over on the bottom flange plate and angles throughout.

There are typical tack welds between the transverse stiffener angles and the web plates. No signs of distress were noted near the tack weld locations; however, there are cracked tack welds between the top flange connection angles and web plates at the following locations:

- Stiffener 1, 2, 5, 6, 7, & 8 between the top flange angle and the north web plate (Photo 61).
- Stiffener 7 between the top flange angle and the south web plate.

The cracks do not propagate into the base metal.

There are multiple cracked tack welds between the bottom flange of the girders and the transverse diaphragm connection angle at Girder B, D, & E, and the bottom flange and diaphragm connection angle at the south web plate. The cracks do not propagate into the base metal.

The protective coating on the interior is in satisfactory condition (Photo 62), except for failures at either end of the pier cap, which are causing minor active corrosion.

## PIER CAP 5A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                                | DESCRIPTION                                                                                                                           |
|-------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| *C'               | Pier Cap Web Plate                      | Typical tack welds between the webs and every transverse stiffener angle (16 total).                                                  |
| C                 | Pier Cap Web Plate                      | Fillet welds at the ladder rungs on the north web interior near the east end.                                                         |
| *C'               | Pier Cap Web Plate                      | Typical tack welds to north web plate and every transverse stiffener angle (8 total).                                                 |
| *C'               | Pier Cap Bottom Flange Plate and Angles | Typical tack welds to south web plate and each side of every transverse stiffener angle (16 total).                                   |
| *D                | Pier Cap Flange Angle                   | Typical 2"-4" long tack welds to north bottom flange angle and bottom flange plate on each side of every girder diaphragm (7 total).  |
| *D                | Pier Cap Flange Angle                   | Typical 2"-4" long tack welds to south bottom flange angle and bottom flange plate on each side of every girder diaphragm (14 total). |
| *D                | Pier Cap Web Plate                      | Two 2" transverse tack welds along the south edge of the bottom flange plates below Girder F.                                         |
| D                 | Pier Cap Webs and Flanges               | Riveted connections.                                                                                                                  |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.

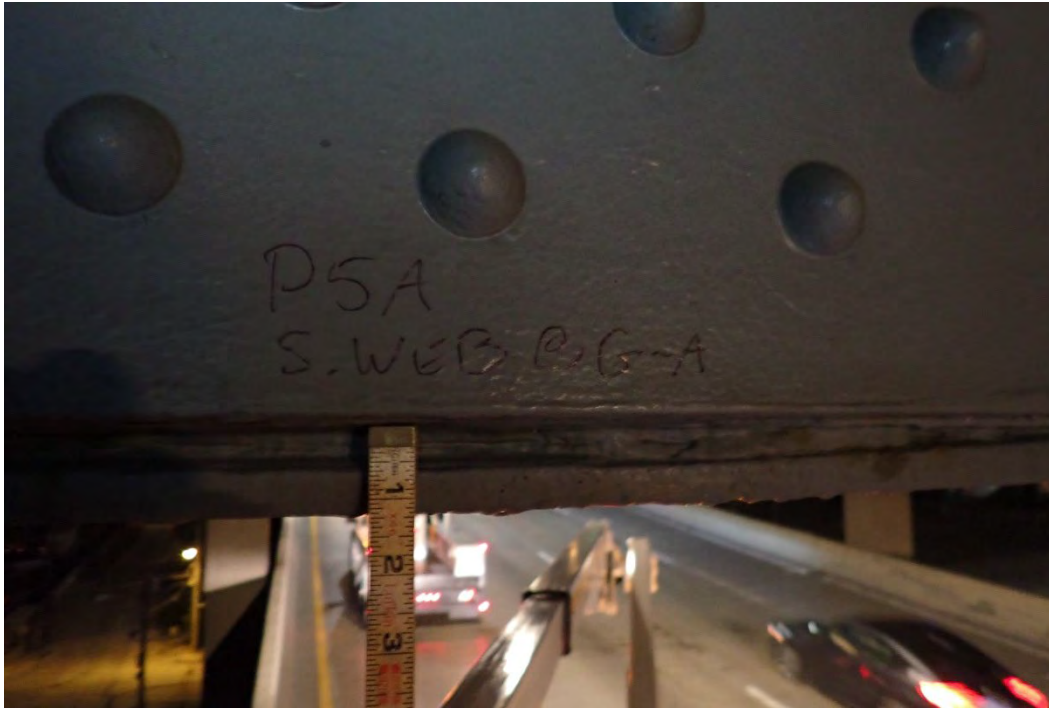


Photo 59 - 5/8" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angle at Girder A of Pier 5A.



Photo 60 - Typical top hatch access to box cap interior, with missing bolt at Pier 5A, looking north.



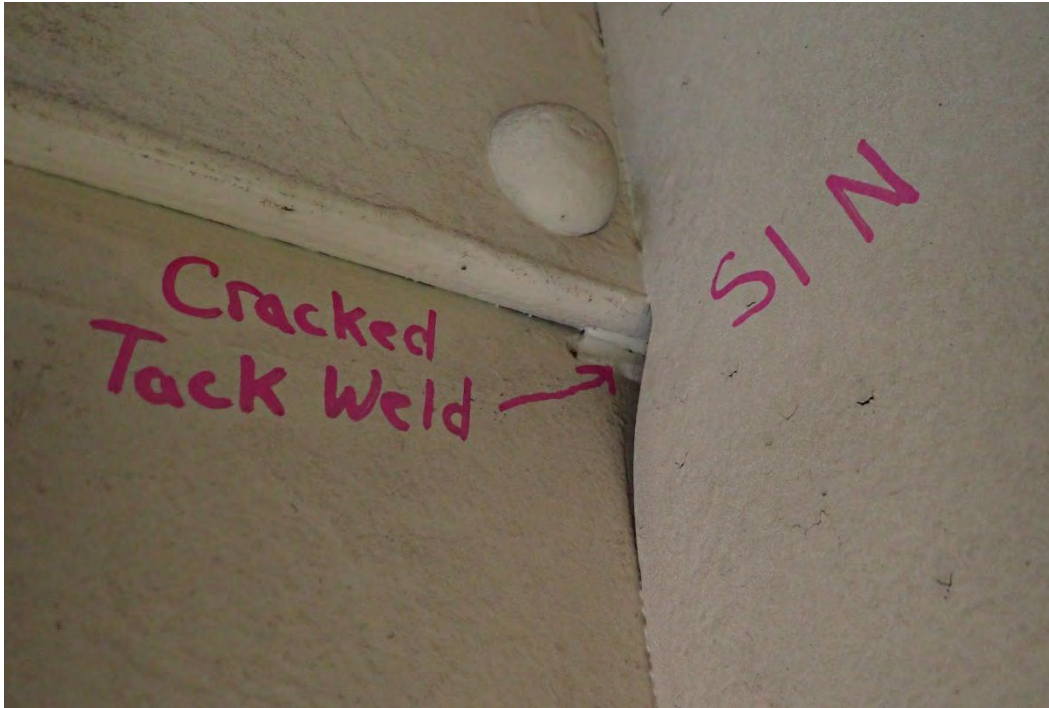


Photo 61 - Typical cracked tack welds between the top flange connection angles and web plates at Stiffener 1 of Pier 5A.



Photo 62 - Interior box cap coating in good condition at East end of Pier 5A.

#### 4.2.2.7 Pier Cap 6A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY CONDITION [6-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 6A is in SATISFACTORY CONDITION [6-NBIS]. There is up to 1/2" thick pack rust between the south bottom flange angle and the south web plate that has been previously caulked and painted. Active pack rust up to 3/8" thick is present between the seat angle and bottom flange of Girder A on the north side of Pier Cap 6A. The underside of Girder A's bottom flange exhibits up to 1/8" deep painted over pitting at the interface of the seat angle.

There are three tack welds between the north edge of the bottom flange plate and the north bottom flange angle below Girders C and E (Photo 63). No signs of distress were noted near the tack weld locations.

Two drainpipe support brackets are attached to the north web with bolts (Photo 64).

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of the pier cap is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust.

The web plates, angles, and bottom plate at each end of the cap exhibit some minor active surface corrosion and pitting, typically at the interfaces between members. There is also typical minor corrosion between the top flange angles, web plates, and filler plates at either end of the cap.

There are four cracked tack welds at the following locations:

- At the northeast side of Diaphragm A and the connection angle on the underside of the bottom flange stiffener plate.
- At the second intermediate stiffener on the south web near mid height.
- At Stiffener 8 at the east end of the cap at the top flange angle interface to the south web (Photo 65).
- At the southeast end of the cap and the top flange angle under the access hatch.

These cracks do not propagate into the base metal.

The access hatch at the west end of the pier cap has small gaps along the sides, allowing a small amount of moisture to enter the west end.

These gaps were caulked upon reassembly of the hatch cap after the inspection was performed.

The protective coating system on the interior of the pier cap is in satisfactory condition, with some areas of freckled rust on the surface of the bottom flange plates and bottom flange angles (Photo 66). Freckled rust was also noted along the top flange angle and web plate interface.

## PIER CAP 6A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                                | DESCRIPTION                                                                                                                             |
|-------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| B                 | Pier Cap Web Plate                      | Two bolted brackets on the north web plate for the downspout supports at each end.                                                      |
| *C'               | Pier Cap Web Plate                      | Typical tack welds between the webs and every transverse stiffener angle (14 total).                                                    |
| *C'               | Pier Cap Bottom Flange Plate and Angles | Three tack welds between the north edge of the bottom flange and the flange angle below Girder C and E (6 total).                       |
| *C'               | Pier Cap Transverse Stiffeners          | Typical tack welds between the north web and each side of all transverse stiffeners (16 total).                                         |
| *C'               | Pier Cap Transverse Stiffeners          | Typical tack welds between the south web and each side of the transverse stiffeners between Girder C and east bearings (10 total).      |
| C                 | Pier Cap Web Plate                      | Fillet welds at the ladder rungs on the north web near the east end                                                                     |
| *D                | Pier Cap Bottom Flange                  | Typical 2"-4" tack welds between the bottom plate and the south flange angle at every Girder diaphragm.                                 |
| *D                | Pier Cap Web Plate                      | Typical 2"-3" tack welds between both web plates and bottom angles at every transverse stiffener angle (16 total).                      |
| *D                | Pier Cap Web Plate                      | Two 3" tack welds between the south web plate and connection angles on each side of Girder C and G stiffeners (8 total).                |
| *D                | Pier Cap Web Plate                      | Typical 2"-3" tack welds between the south web and each side of every transverse stiffener between Girder C and west bearing (6 total). |
| *D                | Pier Cap Web Plate                      | 3" Tack weld on the south web and girder diaphragm connection angles between Girder D and E (2 total).                                  |
| D                 | Pier Cap Webs and Flanges               | Riveted connections.                                                                                                                    |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.





*Photo 63 – Typical tack welds between the north edge of the bottom flange plate and the north bottom flange angle.*



*Photo 64 – Typical drainpipe support brackets attached to the north web with bolts.*

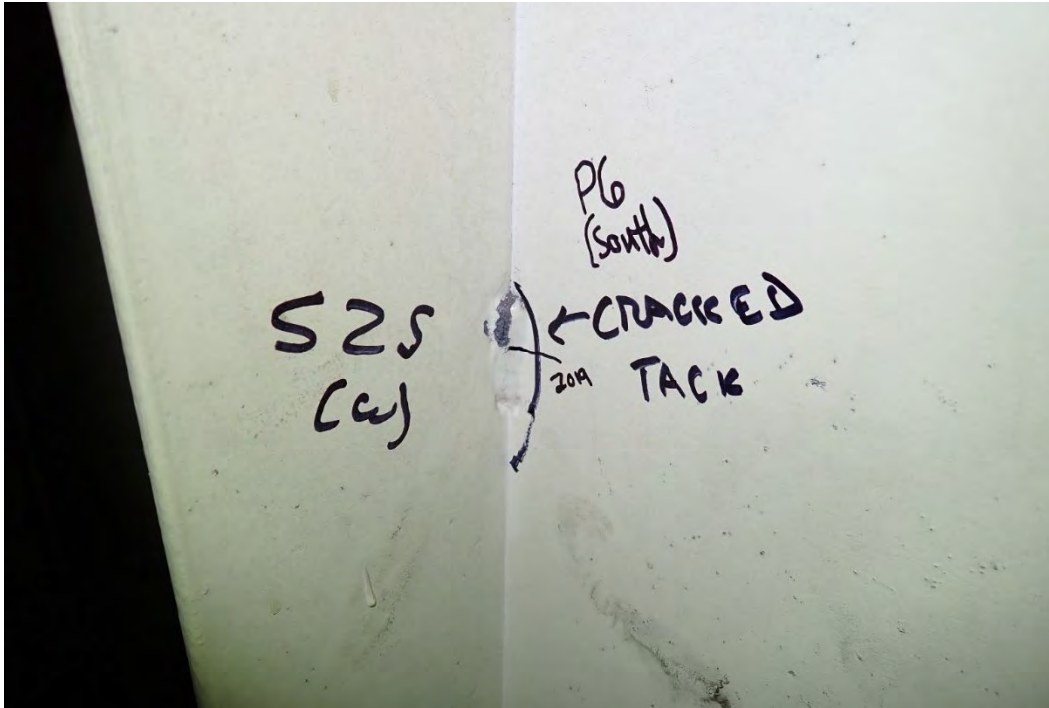


Photo 65 - Typical cracked tack weld in box cap interior at Pier 6A, looking southeast.



Photo 66 - Typical freckled rust on the surface of the bottom flange plates and bottom flange angles in box cap of Pier 6A.

#### 4.2.2.8 Pier Cap 7A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY CONDITION [6-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 7A is in GOOD CONDITION [7-NBIS]. There is up to 1/2" thick pack rust between the south web plate and the bottom flange angle that has been caulked and painted along the entire width of the pier cap (Photo 67). There is up to 1/8" thick pack rust between the bottom flange of Girder B and the seat angle at the north web plate.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of the pier cap is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust.

The web plates, angles, and bottom plate at each end of the cap exhibit some minor active surface corrosion and pitting, typically at the interfaces between members. There is also typical minor corrosion between the top flange angles, web plates, and filler plates at either end of the cap. Minor surface corrosion is present throughout the entire cap along the bottom flange angles and bottom flange plate, as well as along the stiffener connection angles.

There are cracked tack welds between the north web plate and stiffening diaphragms of Girders A and E. The cracks do not propagate into the base metal (Photo 68).

A distinct intermittent popping sound was noted at the east end of the pier cap every two to three minutes in previous reports. The inspector observed a rattling noise as vehicles passed over the box cap. The source of the sound could not be determined, and no loose fasteners, rivets, or steel components were found. The sound should continue to be monitored during future inspections.

The protective coating system on the interior of the pier cap is in good condition. There are some minor areas of freckled rust throughout the bottom flange plate and bottom flange angles.

| PIER CAP 7A FATIGUE PRONE DETAILS |                           |                                                                                                                                                                                                           |
|-----------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FATIGUE CATEGORY*                 | LOCATION                  | DESCRIPTION                                                                                                                                                                                               |
| *C'                               | Pier Cap Web Plate        | Tack weld between the north web plate and connection angle on the east side of Girder F.                                                                                                                  |
| C                                 | Pier Cap Web Plate        | Fillet welds at ladder rungs on the north web plate near the east end.                                                                                                                                    |
| *C'                               | Pier Cap Bottom Flange    | Typical 2"-3" tack welds between bottom angles and bottom plate at every girder diaphragm (14 total).                                                                                                     |
| *C'                               | Pier Cap Web Plate        | Four 2"-3" tack welds between the south web plate and the connection angles on each side of every girder diaphragm (56 total).                                                                            |
| *C'                               | Pier Cap Web Plate        | Typical 2"-3" tack welds between the south web and the bottom flange at every transverse stiffener (8 total).                                                                                             |
| *C'                               | Pier Cap Bottom Flange    | Typical 2"-3" tack weld between the north web plate and the bottom angle on the east side of both fascia girders and at every transverse stiffener angle between the west bearing and Girder F (8 total). |
| *D                                | Pier Cap Web Plate        | Typical 2"-4" tack welds between the bottom plate and the south flange angle at every girder diaphragm (7 total).                                                                                         |
| D                                 | Pier Cap Webs and Flanges | Riveted connections                                                                                                                                                                                       |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.





Photo 67 - 1/2" of pack rust between box cap web and bottom flange at Pier 7A. Note: Pack rust has been painted over.



Photo 68 - Typical cracked weld between interior connection bottom angle and the diaphragm plate at Pier 7A, looking northeast.

#### 4.2.2.9 Pier Cap 8A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY CONDITION [6-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 8A is in GOOD CONDITION [7-NBIS]. There is up to 1 1/2" thick pack rust between the south web plate and the bottom flange angle that has been filled with steel putty and painted along the entire width of the pier cap (Photo 69). Isolated sections of the steel putty were removed during the 2021 painting contract. Still, the remaining putty is in satisfactory condition and functions as intended, with only isolated areas of rust staining throughout. There is up to 3/8" thick pack rust present between the seat angles and the south web plate at girder connection locations (Photo 69).

Two bolted drainpipe support brackets are attached to the north web plate near the east end bearing.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of Pier Cap 8A is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust. There is minor active surface corrosion throughout the bottom flange plate, web plates, and flange angles at each end of the pier cap. There are isolated areas of rust staining between the north web plate and the north top flange angle.

There are cracked tack welds between the diaphragm angles and the top flange at Girders A, B, C, and G. There are also cracked tack welds on the diaphragm angles below the horizontal stiffener plates at Girders A, E, F, and G. Neither of these types of cracks propagates into the base metal (Photo 70).

The protective coating system on the interior of the pier cap is in satisfactory condition. The bottom 12" of the cap has been repainted recently, but isolated areas of freckled corrosion are present throughout the remainder of the cap.

## PIER CAP 8A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                                       |
|-------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| B                 | Pier Cap Web Plate        | Two bolted drainpipe support brackets on the north web near the east end.                                                         |
| *C'               | Pier Cap Flange Plate     | Tack welds between the bottom plate and east connection angle of the girder diaphragms (7 total).                                 |
| *C'               | Pier Cap Web Plate        | Tack welds between the south web plate and each side of transverse stiffener angles (16 total).                                   |
| *C'               | Pier Cap Web Plate        | Tack welds on the south web plate and bottom angle at every transverse stiffener (6 total).                                       |
| C                 | Pier Cap Web Plate        | Fillet welds at ladder rungs on north web near east end.                                                                          |
| *C'               | Pier Cap Bottom Flange    | One 3" tack weld between the bottom flange and the north edge of the connection angle on the east side of the Girder B diaphragm. |
| D                 | Pier Cap Webs and Flanges | Riveted connections.                                                                                                              |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



Photo 69 - Pack rust between box cap web and bottom flange at Pier 8A. Note: Pack rust has been painted over.



Photo 70 - Cracked welds between the top flange and the top clip angle of the interior diaphragm of Pier 8A, looking west.



#### 4.2.2.10 Pier Cap 9A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY CONDITION [6-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 9A is in SATISFACTORY CONDITION [6-NBIS]. There is up to 1 1/8" thick pack rust between the south web plate and the bottom flange angle that has been caulked and painted along the entire width of the pier cap (Photo 71). The pack rust has been previously filled with putty and painted. The putty appears to be in good condition and is functioning as intended. There is up to 3/4" thick pack rust present between the top flange cover plates east of Girder G, and intermittent pack rust between the bottom flange cover plates throughout (Photo 72).

There is a 6" wide by 3" high area of 100% section loss at the bottom of the west end vertical access plate (Photo 73).

There are exterior tack welds along the north edge of the bottom flange plate between Girder C and the east end of the cap.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of Pier Cap 9A is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap exhibited moisture throughout the west end due to the previously mentioned area of 100% section loss. The entire bottom surface was covered by up to 1/2" of granular debris and dust that is rusting from moisture (Photo 74). There is minor pitting throughout the surface of the bottom flange plate from Girder F to the east bearing. There is laminate corrosion up to 1/8" thick throughout the connection angles at the east end of the cap.

There is a blank hole in the east top flange of the Girder F diaphragm.

There are cracked tack welds at the following locations:

- Between the south web plate and the east edge of the west bearing diaphragm fill plate.
- Between the north web plate and top flange angle at the first stiffener west of Girder G.
- Two between the north and south web plates and flange angles at the first stiffener east of Girder G (Photo 75).
- At the top of the Girder G diaphragm.

These cracks do not propagate into the base metal.

The protective coating system on the interior of the pier cap is in satisfactory condition, with isolated areas of minor freckled rust throughout the cap.

## PIER CAP 9A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                                                                             |
|-------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C                 | Pier Cap Web Plate        | Fillet welds at ladder rungs on south web near east end.                                                                                                                |
| *C'               | Pier Cap Flange Plate     | 2"-3" tack welds between the north web and each edge of the west bearing diaphragm fill plate (10 total).                                                               |
| *C'               | Pier Cap Web Plate        | 2"-3" tack welds between the south web and the east edge of the west bearing diaphragm fill plate (2 total).                                                            |
| *C'               | Pier Cap Web Plate        | 2"-3" tack welds between the south web and the west edge of the west bearing diaphragm fill plate (3 total).                                                            |
| *C'               | Pier Cap Web Plate        | 2"-3" tack welds at east end bearing fill plate (3 at south web, 4 at north web).                                                                                       |
| *C'               | Pier Cap Web Plate        | Typical 2"-4" tack welds between the south web and the bottom angle on each side of every transverse stiffener angle between Stringer F and the east bearing (8 total). |
| *C'               | Pier Cap Web Plate        | Typical 2"-4" tack welds between the north web and the bottom and top angles on each side of the transverse stiffener angles adjacent to Girder G (4 total).            |
| *C'               | Pier Cap Bottom Flange    | 3" tack welds along the angles and web plates at nine locations between Girder C and the east end of the outer flange plate (26 total).                                 |
| D                 | Pier Cap Webs and Flanges | Riveted connections.                                                                                                                                                    |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



Photo 71 - 1/8" pack rust at the west end of Pier 9A's box cap, looking east.



Photo 72 - 3/4" pack rust on top flange cover plates at Girder G of box cap of Pier 9A, looking south.



Photo 73 - 100% section loss of a bolted and welded keeper plate approximately 6.5" x 3" at the west end of Pier 9A's box cap, looking east.



Photo 74 - Bottom surface of box cap covered by up to 1/2" of granular debris and dust that is rusting from moisture.



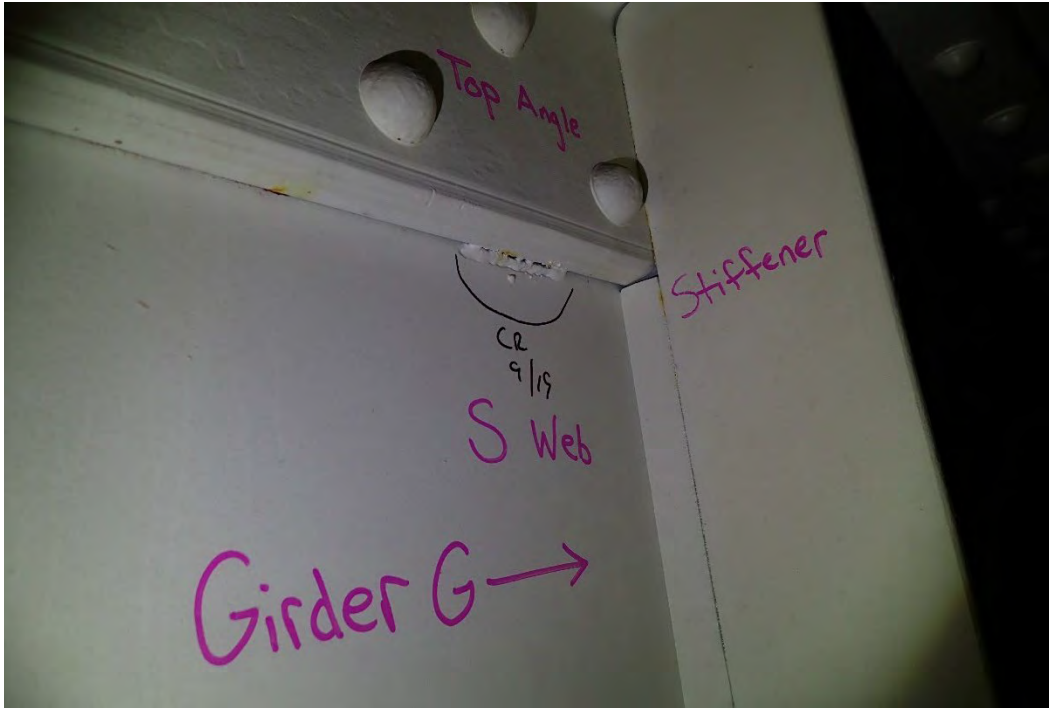


Photo 75 – Cracked tack weld at the south web and top flange angle at the first stiffener east of Girder G.

#### 4.2.2.11 Pier Cap 10A

The Non-Redundant Steel Tension Member steel box pier cap is in FAIR CONDITION [5-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 10A is in GOOD CONDITION [7-NBIS]. There is typically up to 1/2" thick pack rust between the south bottom flange angle and the bottom flange plate along the entire width of the pier cap. This area has been previously caulked and painted. There is a 9" high by 2" wide scrape with minor surface corrosion on the north face of the north web plate near the east end of the cap.

There are two tack welds between the web plates and the outer edges of each flange angle splice plate. Tack welds are also present at each web plate, and both ends of all flange angle splice plates. There are cracked tack welds between the south web and the west end of the bottom splice plate, and the north web and the west end of the top flange angle splice plate. The cracks do not propagate into the base metal.

There are four tack welds between the south web and both edges of the web splice plate. Three tack welds are noted between the north web and both edges of the web splice plate. The center tack weld between the north web and the west edge, and the upper tack weld between the north web and the east edge are cracked. These cracks do not propagate into the base metal.

Pack rust up to 1/2" thick is present between the south web plate and the top flange angle at the west end of the cap (Photo 76).

There are eight drainpipe support brackets that are attached with bolts on the north web plate between Girder B and Girder F (Photo 77).

The protective coating system on the exterior of the pier cap is in very good condition.

##### **Pier Cap Interior**

The interior of Pier Cap 10A is in FAIR CONDITION [5-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust. The web plates, flange angles, and bottom flange plate at each end of the cap exhibit minor surface corrosion and pitting throughout (Photo 78). There are signs of previous moisture intrusion, evidenced by rust staining and minor corrosion along the bottom of the splice plates near the bottom flange angles. There is moderate painted over pitting throughout the bottom flange angle, vertical legs, and web plates.

There are tack welds near the girder diaphragm fill plates, web plates, various transverse stiffeners, and web splice plates.

The protective coating system on the interior of the pier cap is in fair condition. The paint is peeling, and there are isolated areas of rust staining throughout. The bottom flange plate and diaphragm connection angles exhibit heavy active corrosion.

## PIER CAP 10A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                        |
|-------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------|
| B                 | Pier Cap Web Plate        | Bolted drainpipe support brackets.                                                                                 |
| C                 | Pier Cap Web Plate        | Fillet welds at the ladder rungs on the north web near the east end.                                               |
| *C'               | Pier Cap Web Plate        | Typical tack welds between the webs and each transverse stiffener (36 total).                                      |
| *C'               | Pier Cap Flange Angles    | Typical tack welds between the flange angles and each end of interior splice plates (36 total).                    |
| *C'               | Pier Cap Web Plate        | Typical tack welds between the web plates, angles, and the exterior splice plates (20 total).                      |
| *C'               | Pier Cap Web Plate        | Typical 2"-3" tack welds between the web plates and each side of the west bearing diaphragm fill plate (12 total). |
| D                 | Pier Cap Webs and Flanges | Riveted connections.                                                                                               |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



Photo 76 - 1/4" of pack rust on box cap cover plates of Pier 10A, looking south.



*Photo 77 - Typical pipe connection bracket on the north face of Pier 10A, looking east.*



*Photo 78 - Section loss with 1/4" of steel thickness remaining on internal diaphragm bottom angle and rivets of Girder G in box cap of Pier 10A, looking east.*



#### 4.2.2.12 Pier Cap 11A

The Non-Redundant Steel Tension Member steel box pier cap is in GOOD CONDITION [7-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 11A is in GOOD CONDITION [7-NBIS]. There is up to 1/2" thick pack rust between the web plates and the bottom flange angles that has been filled with steel putty and painted along the entire width of the pier cap (Photo 79). The putty is in good condition and functions as intended.

There is 1/4" thick pack rust between the top flange cover plates east of Girder G. Similar pack rust was noted between the north web plate and the seat angles of Girders A and F.

The protective coating system on the exterior of the pier cap is in good condition (Photo 80).

##### **Pier Cap Interior**

The interior of Pier Cap 11A is in GOOD CONDITION [7-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of rusted granular debris and dust.

There are cracked tack welds between the south web plate and both sides of the interior splice plate. The cracks do not propagate into the base metal. There is a 1" diameter area of up to 3/16" deep pitting on south web at splice plate (Photo 81).

The protective coating system on the interior of the pier cap is in good condition with isolated areas of minor surface corrosion. The top and bottom 12" of all diaphragms, stiffeners, web, and flange angles have been recently repainted.

## PIER CAP 11A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                            |
|-------------------|---------------------------|--------------------------------------------------------------------------------------------------------|
| C                 | Pier Cap Web Plate        | Fillet welds at ladder rungs on north web near east end.                                               |
| *C'               | Pier Cap Splice Plate     | Tack welds at the interior webs and splice plates on each side.                                        |
| *C'               | Pier Cap Splice Plate     | Tack welds at the exterior webs and splice plates on each side.                                        |
| *C'               | Pier Cap Flange Angles    | 2"-3" tack welds on both web plates at the interior splice plates (6 total).                           |
| *C'               | Pier Cap Web Plate        | 2"-3" tack welds on bottom of moment plate to vertical angles at each girder, 4 per girder (28 total). |
| D                 | Pier Cap Webs and Flanges | Riveted connections.                                                                                   |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 79 - Bottom flange angles that has been filled with steel putty and painted along the entire width of the pier cap.*



*Photo 80 - Protective coating system on the exterior of the pier cap is in good condition at Pier 11A, looking north.*



*Photo 81 - 1" diameter area of up to 3/16" deep pitting on south web at splice plate.*

#### 4.2.2.13 Pier Cap 12A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY CONDITION [6-NBIS] overall.

##### **Pier Cap Exterior**

The exterior of Pier Cap 12A is in GOOD CONDITION [7-NBIS]. There is up to 3/8" thick pack rust between both web plates and bottom flange angles that has been previously caulked and painted (Photo 82). The caulk is in good condition and is functioning as intended.

There is minor pitting on both web plates above the seat angle of Girder A. Up to 3/4" thick pack rust is typical between the bottom flange moment plates and seat angles of Girders A and G at the north web plate. A similar condition exists at the south web plate and Girder C.

There are tack welds between the north web plate and each side of both stiffener plates at the west bearing. Three tack welds on the east stiffener plate are cracked but do not propagate into the base metal.

There are drainpipe support brackets that are attached with bolts on the north web plate, and hangers are welded onto the moment plates of Girders B and F.

There are gouges in the north web plate between Girders A and B that appear to be from a previously welded drainpipe support bracket.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### **Pier Cap Interior**

The interior of Pier Cap 12A is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection (Photo 83). The entire bottom surface was covered by up to 1/2" of granular debris and dust. There is a mis-drilled hole in the south top flange angle between Girders F and G.

The bottom flange plate at each end of the cap exhibits minor corrosion with pitting. There is also isolated nonactive surface pitting on the north web plate above the Girder A bottom flange stiffener.

There are tack welds at the top angle and the girder diaphragms. There are two broken tack welds at the north and south corners of the bottom moment plate connection angle on the west side of Girder B. There is one broken tack weld at the northwest corner of the top moment plate connection angle at Girder B.

The protective coating system on the interior of the pier cap is in satisfactory condition with isolated areas of rust staining and paint peeling.



## PIER CAP 12A FATIGUE PRONE DETAILS

| FATIGUE CATEGORY* | LOCATION                  | DESCRIPTION                                                                                                          |
|-------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------|
| B                 | Pier Cap Web Plate        | Four bolted drainpipe support brackets on the north web plate.                                                       |
| *C'               | Pier Cap Web Plate        | Typical tack welds between the north web plate and each side of both stiffener plates at the west bearing (8 total). |
| *C'               | Pier Cap Web Plate        | Typical tack welds between the top angles and girder diaphragms (14 total).                                          |
| D                 | Pier Cap Webs and Flanges | Riveted connections.                                                                                                 |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



*Photo 82 - 3/8" thick pack rust between both web plates and bottom flange angles that has been previously caulked and painted.*



*Photo 83 - Interior of the cap was dry with no signs of moisture intrusion at the time of the inspection.*

#### 4.2.2.14 Pier Cap 13A

The Non-Redundant Steel Tension Member steel box pier cap is in SATISFACTORY [6-NBIS] overall.

##### Pier Cap Exterior

The exterior of Pier Cap 13A is in GOOD CONDITION [7-NBIS]. There is up to 1" thick pack rust between the web plates and the bottom flange angles that has been filled with steel putty and painted along the entire width of the pier cap (Photo 84). The putty is in good condition and functions as intended.

There is minor pitting on both web plates adjacent to the Girder A seat angles.

The protective coating system on the exterior of the pier cap is in excellent condition.

##### Pier Cap Interior

The interior of Pier Cap 13A is in SATISFACTORY CONDITION [6-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust. There is isolated rust staining running down the interior face of the web plates from the top flange angles. There is a missing fastener in the north top flange angle above Girder C (Photo 85).

The bottom flange plate has minor surface corrosion with isolated pitting at both ends of the cap. There is also painted over pitting on the north web plate near the Girder A diaphragm.

The protective coating system on the interior of the pier cap is in good condition with isolated areas of freckled corrosion throughout. The bottom 12" of all diaphragms, stiffeners, webs, and flanges have been recently repainted.

| PIER CAP 13A FATIGUE PRONE DETAILS |                           |                                                                                                |
|------------------------------------|---------------------------|------------------------------------------------------------------------------------------------|
| FATIGUE CATEGORY*                  | LOCATION                  | DESCRIPTION                                                                                    |
| *C'                                | Pier Cap Web Plate        | Tack welds between the diaphragm plate and each side of every diaphragm fill plate (14 total). |
| *C'                                | Pier Cap Flange Angles    | Tack welds between the top and bottom angles and girder diaphragms (14 total).                 |
| D                                  | Pier Cap Webs and Flanges | Riveted connections.                                                                           |

\*According to the most recent version of the AASHTO LRFD Bridge Design Specifications, tack welds do not have a defined fatigue category but are considered problematic details. Therefore, each type of tack weld was assigned an equivalent Fatigue Category based on size, orientation, and location.



Photo 84 - Painted over pack rust up to 1" at the south web of Pier 13A's box cap, looking west.



Photo 85 - Top flange angle at Girder C in box cap has a blank hole at Pier 13A, looking west.



#### 4.2.2.15 Pier Cap 29B

The Non-Redundant Steel Tension Member welded steel plate pier cap is in GOOD CONDITION [7-NBIS] overall (Photo 86). The protective coating system on the pier cap is in satisfactory condition. There is minor active corrosion on the bottom flange at the bearing locations and along the welds of the bearing plates (Photo 87). There is also minor active corrosion on the bottom flange splice plate bolts (Photo 88).



*Photo 86 - West elevation of pier cap at Pier 29B.*



*Photo 87 - Surface corrosion of the bottom flange at stiffener plate weld on north end of pier cap, at Pier 29B*



*Photo 88 - Typical surface corrosion at pier cap bolted splice connection on Pier 29B.*

#### 4.2.2.16 Pier Cap 2 (FWW)

The Non-Redundant Steel Tension Member steel box pier cap is in GOOD CONDITION [7-NBIS] overall (Photo 89).

##### **Pier Cap Exterior**

The exterior of Pier Cap 2 (FWW) is in VERY GOOD CONDITION [8-NBIS]. No deficiencies were noted (Photo 90 & Photo 91).

The protective coating system is in good condition overall, with minor surface dulling and staining throughout.

##### **Pier Cap Interior**

The interior of Pier Cap 2 (FWW) is in GOOD CONDITION [7-NBIS]. The interior of the cap was dry with no signs of moisture intrusion at the time of the inspection. The entire bottom surface was covered by up to 1/2" of granular debris and dust. There are isolated areas of very minor surface corrosion throughout (Photo 92).

There is a 1 1/2" gap at each end of the pier cap between the flange plates and the fascia girder web plates. As a result, birds have access to the hatch; however, there were no nests present at the time of inspection. There were small amounts of bird debris at both ends of the cap, but this does not appear to have changed significantly from the last inspection.

The protective coating system on the interior of the pier cap is in good condition. There is very minor surface corrosion on the interior diaphragms and bottom flange.



*Photo 89 - East elevation of box cap at FWW Pier 2, looking west.*



*Photo 90 - Top side of top flange of box cap at FWW Pier 2, looking north.*





*Photo 91 - Typical girder connection to FWW Pier 2 on west face, looking southwest.*



*Photo 92 - Minor surface corrosion in box cap interior, at FWW Pier 2, looking north.*

### 4.2.3 Elastomeric Bearing [Element 310]

The elastomeric bearings are in SATISFACTORY CONDITION [6-NBIS] overall (Photo 93). Elastomeric bearings are present at Piers 15A, 16A, 19A, 23B, and 28B. The bearings typically have some minor areas of surface corrosion and isolated paint failure. The elastomeric bearing pads beneath Girder A and E in Span 23B and Girder A in Span 24B at Pier 23B exhibit minor expansion and rust staining between the layers. The remaining bearings showed very few signs of expansion and were in a neutral position.

Isolated bearing pads exhibit minor distortion, however, they do not appear to be sliding on the pier cap. Painted-over pitting is typical throughout the bearing risers in Span 24B at Pier 23B. A painted-over 1" diameter hole was observed in the web of the bearing riser of Girder E at Pier 23B.

Previous inspection reports noted that the ends of the Span 24B girders at Pier 23B were observed swaying laterally under live load, causing the bearings to rock side-to-side. This movement was not observed, and no evidence of the bearings walking out was observed at the time of the inspection.



*Photo 93 - Typical Elastomeric bearings on Pier 15A, looking south.*

#### 4.2.4 Movable Bearing [Element 311]

The movable bearings are in SATISFACTORY CONDITION [6-NBIS] overall. The original girder rocker bearings typically exhibit minor paint failure and freckled surface corrosion throughout. Bearing A at Pier 14A, Bearing A at Pier 27B, and Bearing E at Piers 22B and 28B exhibited pack rust between the rocker and masonry plate. Minor rust staining on the bottoms of the bearing plates was typical throughout.

The east bearing of Pier Cap 11A has a retrofit to the bearing plate (Photo 94) and the south keeper lug of the rocker plate is misaligned and sitting on top of the masonry plate (Photo 95). There are loose anchor nuts at the west bearing of Pier Cap 8A, the east bearing of Pier Cap 12A, and the east bearing of Pier Cap 13A (Photo 96).



*Photo 94 - Retrofit to east bearing sole plate of Pier 11A, looking east.*





Photo 95 – The upper portion of the bearing has shifted creating a gap between the upper bearing and sole plate of the east bearing of Pier 11A, looking east.



Photo 96 - Bearing nut is backed off at Pier 13A, looking southwest.



#### 4.2.5 Fixed Bearing [Element 313]

The fixed bearings are in SATISFACTORY CONDITION [6-NBIS] overall and typically exhibit paint failure and moderate surface corrosion throughout (Photo 97). There are two loose anchors on bearing B at Pier 12A. Bearing A at Pier 12A has ½" deformation in the stiffener. Bearings B and A at Pier 13A have loose anchor nuts.



*Photo 97 - Typical fixed bearing at Pier 17A, looking east.*

#### 4.2.6 Pot Bearing [Element 314]

The pot bearings of the FWW spans are in SATISFACTORY CONDITION [6-NBIS] overall (Photo 98). The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout—isolated locations of the elastomeric bulging or extruding from the bearing pot. The Teflon pad at Bearing 7 on Pier 6 is extruded from the pot bearing.



*Photo 98 - Typical pot bearing at FWW Pier 7, looking southwest.*

#### 4.2.7 Steel Protective Coating [Element 515]

The steel protective coating system is painted and is in FAIR CONDITION [5-NBIS] overall, due to areas of the original Spans 15A-28B exhibiting paint failure on girders with chalking, dulling, flaking, and peeling (Photo 99).

Spans 1A-14A were painted in 2020-2021; the paint in these spans is in excellent condition (Photo 100). The pier caps were also painted at the same time. Some of the steel pier caps have isolated minor rust staining along the bottom of the web. In 2017, steel members within approximately 10' of the expansion joints at Piers 15A, 19A, and 23B were cleaned and painted, and the paint in these locations is in good condition (Photo 101).

In the areas of the original Spans 15A-28B have not been recently painted (Photo 102), paint failure is typical on girders with chalking, dulling, flaking, and peeling throughout. Surface corrosion is active at locations where the paint has failed. The fascia girders exhibit the most severe paint condition, with complete paint failure to the bottom flanges and bottom portions of the web, with areas of moderate to severe surface and laminate corrosion with section loss.

The paint on the FWW spans is typically in good condition with small areas of isolated surface rust (Photo 103).



*Photo 99 - Span 27B exhibits typical paint failure on girders with chalking, dulling, flaking, and peeling, looking south.*





*Photo 100 - Typical girder protective coating in good condition overall, from River Pier to Pier 15A. Photo of Pier 7A, looking east.*



*Photo 101 - Superstructure paint condition near deck joint at Pier 19A, looking north.*





*Photo 102 - Typical protective coating failure, with minor surface corrosion, and chalking from Pier 15A to Pier 28B. Photo of Span 27B, looking north.*



*Photo 103 Typical protective coating condition of superstructure from Pier 28B to Wall Pier. Photo of FWW Span 3, looking east.*

#### 4.2.8 Steel Seated- Hinge Assembly [Element 820]

The steel seated-hinge assemblies in Spans 4A, 8A and 12A are in FAIR CONDITION [5-NBIS] (Photo 104). The 2021 inspection noted that the bronze shim plate of the Girder C hinge in Span 4A was shifted 2" to the south. Still, no indication of significant additional displacement was observed during the 2025 inspection. There are isolated areas of painted-over section loss on several of the bearing plates.



*Photo 104 - Typical girder seat assembly detail at Pier 7A, looking east.*

#### 4.2.9 Diaphragms and Cross Frames [No Element]

The diaphragms and cross frames are in GOOD CONDITION [7-NBIS] with only minor surface corrosion typical for Span 10 (FWW) through Span 1 (FWW) (Photo 105 & Photo 106) and significant coating failure with minor surface corrosion throughout the original Span 15A through Span 28B (Photo 107). Span 1A through 14A are in good condition with little surface corrosion present (Photo 108).



*Photo 105 - Typical cross-frame diaphragm of FWW spans, at FWW Pier 3, looking west.*





*Photo 106 - Typical solid diaphragms at Span 1, looking east.*



*Photo 107 - Typical cross frame layout in Span 21B, looking north.*





*Photo 108 - Typical cross-frame diaphragm for spans between the River Pier and Pier 15A.*

#### 4.2.10 Alignment [No Element]

Alignment is in GOOD CONDITION [7-NBIS], with no irregularities in vertical or horizontal alignment noted during visual inspection.

#### 4.2.11 Fatigue [No Element]

The superstructure fatigue-prone details are in GOOD CONDITION [7-NBIS]. See Element 231 – Steel Pier Cap for fatigue-related deficiencies corresponding to each Non-Redundant Steel Tension Member.

## 5.0 Substructure [Item 60]

The substructure is in SATISFACTORY CONDITION [6-NBIS] overall. The reinforced concrete substructure exhibits isolated areas of spalling with exposed reinforcing and areas with hairline vertical and horizontal cracking. The original bridge substructure consists of twenty-nine reinforced concrete cap-and-column piers. The Fort Washington Way Rehabilitation portion consists of eight reinforced concrete cap-and-column piers, one hammerhead pier, and one wall-type pier. The concrete piers in the original spans typically exhibit minor hairline vertical and horizontal cracking, with isolated areas of spalling and exposed reinforcing. Concrete patches and Fiber Reinforced Polymer (FRP) wrapping were present on Piers 5A, 7A, 15A, 19A, 23B, and 28B. Several hairline flexural cracks were observed on the Fort Washington Way concrete pier cap overhangs.

### 5.1.1 Reinforced Concrete Column [Element 205]

The reinforced concrete pier columns are in SATISFACTORY CONDITION [6-NBIS] (Photo 109 & Photo 110). Typically, there are isolated minor delaminations and spalls with exposed reinforcement and hairline cracking. Isolated portions of Piers 5A, 7A, 12A, 15A, 19A, 23B, and 28B were repaired with concrete patches and FRP wrapping (Photo 111 & Photo 112). Patches are typically sound, and the FRP wrapping is in good condition with only isolated areas of peeling/failing protective coating, most notably at Pier 12A on the East face. Shallow spalls with exposed reinforcement due to lack of cover are typical at various pier columns at or near deck level (Photo 113). Up to 2' of erosion at the east column base of Pier 18A was observed, due to a disconnected drain pipe (Photo 114).

The locations of the more notable defects are as follows:

| Reinforced Concrete Column Defects |                                                                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Location                           | Defect                                                                                                                         |
| Pier 1A Column 1                   | Spalling and delamination on west column (Photo 115).                                                                          |
| Pier 2A Column 1                   | Map cracking at the bearing.                                                                                                   |
| Pier 5A Column 1                   | Efflorescence with scrape marks on the east face.                                                                              |
| Pier 9A Column 1                   | Spall with exposed reinforcing on the northeast corner under the bearing.                                                      |
| Pier 11A Column 2                  | 12" high by 12" wide by 3" deep corner spall with one exposed rebar at the top northeast corner (Photo 116).                   |
| Pier 12A Column 1                  | Minor cracking at the bearing seat on the east face.                                                                           |
| Pier 13A, Column 2                 | 4' high by 12" wide by 3" deep corner spall with exposed reinforcement (Photo 117).                                            |
| Pier 16A, Columns 1 & 2            | 12" diameter by 1" deep corner spalls at each existing corner protection bracket (Photo 118).                                  |
| Pier 17A, Column 1                 | Spalls with exposed reinforcement up to 18" wide by 12" high by 1" deep (total about ten feet below the pier cap).             |
| Pier 23B, Column 2                 | 6' high by 3' wide by 1" deep spall with exposed reinforcement and minor section loss near the base of the column (Photo 119). |
|                                    | Vertical cracking on the east and north face with rust staining.                                                               |
| Pier 29B, Column 2                 | 6" wide by 7" long by 1" deep spall at the masonry plate for the east bearing.                                                 |



*Photo 109 - Elevation of Pier 2A, looking south.*



*Photo 110 - Elevation of Pier 12A, looking south.*





*Photo 111 - Elevation of Pier 15A, looking south. Note: Pier columns wrapped in FRP, and deck drainpipes fastened to pier columns.*



*Photo 112 - Typical FRP application on Pier 12A, looking north.*





*Photo 113 - Minor spalling around rebar on Pier 5A east column, looking south.*



*Photo 114 - Up to 24" of erosion at the east column base of Pier 18A, looking south. Note: Erosion starts at the discharge of the pier drain pipe.*



*Photo 115 - Minor spalling and delamination on west column of Pier 1A, looking west.*



*Photo 116 - 12" x 12" x 3" corner spall with exposed rebar at Pier 11A, looking southwest.*





*Photo 117 - Large corner spall with rebar on the east column of Pier 13A, looking south.*



*Photo 118 - Non-typical column corner armor at Pier 16A, looking northeast. Note: Armor is also present on Pier 17A.*



*Photo 119 - Large spall with rebar on east column of Pier 23B, looking northwest.*



### 5.1.2 Reinforced Concrete Pier Wall [Element 210]

The reinforced concrete pier wall is in GOOD CONDITION [7-NBIS] with no significant deficiencies noted (Photo 120). Most of the Wall Pier is inaccessible due to a chain link fence and installed utilities.



*Photo 120 - FWW Wall Pier, looking East.*

### 5.1.3 Reinforced Concrete Pier Cap [Element 234]

The reinforced concrete pier caps are in SATISFACTORY CONDITION [6-NBIS] (Photo 121). Typically, hairline cracking and minor corner spalls with exposed reinforcing steel were observed at isolated locations.

The concrete pier caps are located at Piers 1-8 (FWW), Piers 14A-20A (original), and Piers 21B-28B (original). The concrete pier caps at Piers 1-8 (FWW) were constructed during the Fort Washington Way rehabilitation and are in good condition overall. There is a 24" wide by 24" high by 4" deep corner spall with exposed reinforcement noted in the north overhang of Pier 2 (FWW) (Photo 122). Isolated areas between the pier columns and overhangs exhibit hairline vertical cracking with minor efflorescence throughout the FWW pier caps. There are moderate-width flexural cracks with rust staining on the south and bottom faces of Pier Cap 4 between the pier columns.

Several of the original piers were partially wrapped in FRP. The FRP wrapping is typically in good condition with only isolated areas of failing/peeling protective coating at Pier 23B (Photo 123). Typical map cracking was noted on the vertical faces of the original pier caps. Horizontal hairline cracks near the top of each original pier cap are typical.

The locations of the more notable defects are as follows:

| Reinforced Concrete Pier Cap Defects |                                                                                                                                                                                            |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location                             | Defect                                                                                                                                                                                     |
| Pier Cap 19A                         | Transverse cracks with rust staining along the bottom south edge of the west overhang (Photo 124).                                                                                         |
| Pier Cap 15A                         | 12" diameter by 1" deep spall with rust staining was noted on the east face.                                                                                                               |
| Pier Cap 18A                         | 10" high by 4" wide by 1" deep spall on the southeast corner.                                                                                                                              |
| Pier Cap 27B                         | Two 24" long by 12" wide by up to 3" deep spalls with exposed reinforcement adjacent to either side of the Girder E bearing (no loss of bearing area noted at the time of the inspection). |



*Photo 121 - Typical pier cap at Pier 27B, looking north.*



*Photo 122 - 24" wide by 24" high by 4" deep corner spall with exposed reinforcement at Pier 2 (FWW).*





*Photo 123 - Failing/peeling protective coating at Pier 23B, looking south.*



*Photo 124 - Transverse cracks with rust staining along the bottom south edge of the west overhang of Pier 19A, looking north*

## 6.0 Sign/Utility Items [No Item]

The signs and utilities are in SATISFACTORY CONDITION [6-NBIS]. The utilities include conduit attached to the bottom of the diaphragms in Bays 1 and 2, Spans 1-10 (FWW), and along the exterior of Girder A in Span 27. There are also lights supported from the girders in Spans 1A through 12A. Two overhead signs are mounted to the structure, one in Span 1 (FWW) and another in Span 16A. Multiple utility junction boxes are mounted to the bottom flange of the girders at pier locations throughout the structure.

### 6.1.1 Signs and Supports [No Element]

The structure-mounted sign supports are in SATISFACTORY CONDITION [6-NBIS]. There is one overhead sign mounted to the structure in Span 1 (FWW) and one in Span 16A. There is minor surface corrosion throughout the anchor bolts and cantilever support at each sign support.

### 6.1.2 Utilities [No Element]

The utilities on the structure are in SATISFACTORY CONDITION [6-NBIS] overall, however there is a utility junction box with areas of 100% section loss throughout the bottom and side plates at Pier 13A (Photo 125). The section loss has exposed the internal electrical wiring, and the box is impeding access to the west pier cap hatch. The junction box at the west end of Pier 26B has active corrosion and missing connections. There are multiple nonfunctioning roadway lights throughout Spans 1A-12A, and one lens is shattered in both Spans 9A and 11A. Some of the light pole handhole covers are missing.



Photo 125 - Utility box with bottom 100% corroded on Pier 13A, looking east.

## 7.0 Operational Status [Item 41]

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

## 8.0 Conclusions & Recommendations

Based on the 2025 In-Depth Inspection, the HAM-71-0000L bridge is in SATISFACTORY (6 condition overall based on the NBIS rating guidelines. The overall rating is based on the condition of both the superstructure and the substructure.

The recommended structural, civil, and safety repairs are classified into the following six categories:

Critical Work: (Within 30 Day Period) - Work which should be performed as soon as possible to address deficiencies that affect the capacity of the structure or public safety.

- No Critical Work noted at time of inspection.

Priority Work: (Within 6 Month Period) - Work which should be performed to address deficiencies with primary structural, electrical, or mechanical components that do not affect the capacity of the structure or public safety. Repairs that take precedence over other scheduled work.

- Remove debris/ clean clogged deck drains, scuppers, and clogged drainpipes.
- Repair broken/ missing/ disconnected/ drainpipes and bulging boots throughout.

Routine Work: (Within 24 Month Period) - Recommendations that are minor in nature and can be easily repaired. This work can be undertaken as part of a scheduled maintenance program, a scheduled project, or routine facility maintenance.

- Replace access hatch gaskets on all pier caps.
- Replace utility box that has 100% section loss.

Rehabilitation/Evaluation: (Within 5 Year Period) - Recommendations for large-scale deficiencies that are extensive in nature and require engineering analysis.

- Repair spalls and seal cracks in the wearing surface.
- Repair spalls, delaminations, and seal cracks in concrete railings throughout structure.
- Spot paint areas of corrosion in pier box cap interiors.
- Clean and apply protective coating on Spans 15A to 28B.
- Repair isolated spalls and delaminations on concrete substructure units throughout the structure.

Monitoring: (Varies) - Regular field observation of deficiencies which are not currently in need of repair but will require corrective action if deterioration continues.

- Continue to monitor the lateral movement of the girder ends in Span 24B.
- Continue to monitor the fatigue-prone details of the Non-Redundant Steel Tension Member members, especially cracked tack welds.
- Monitor erosion around Pier 18A.

Inspection/Assessment: (Varies) - Evaluation work that should be completed by qualified personnel.

- Continue performing annual inspections per FHWA and ODOT standard practices.





# APPENDIX

# A

## ASSETWISE BRIDGE INSPECTION REPORT

Inspector: Banaszak,Ken

Inspection Date: 09/26/2025

Structure Number: 3105946

Facility Carried: SB IR 71

**Ohio Bridge Inspection Summary Report****HAM-00071-0000L\_(3105946)**

B.L.04: District District 0815000 - CINCINNATI (HAM county)  
 B.CL.02: Major Maint 01 - State Highway Agency /  
 225 Routine Main A/B 01 - State Highway Agency /  
 221 Inspection A/B 01 - State Highway Agency /

5A: Inventory Route 1 00071  
 7: Facility On SB IR 71  
 6: Feature Ints USR 42  
 9: Location OH-KY LINE  
 Lat, Lon 39.093039 ,-84.522619

**Condition**

**B.C.01: Deck** 6  
 58.01: Wearing Surface 6  
**B.C.08: Joint** 5  
**B.C.02: Superstructure** 5  
 59.01: Paint & PCS 5  
**B.C.03: Substructure** 6  
**B.C.09: Channel** N  
**B.C.11: Scour** N  
**B.C.10: Channel Prot.** N  
**B.C.05: Bridge Railing** 6  
  
**B.C.06: Transitions** 6  
**B.C.07: Bearings** 6  
  
**B.C.04: Culverts** N  
**Ohio GA** 5

**Structure Type**

43: Bridge Type 4 - Steel continuous  
 02 - Stringer/Multi-beam or Girder  
 N- Not Applicable  
 45: Spans Main / Approach 40 / 0  
 107: Deck Type 1 - Concrete Cast-in-Place  
 408: Composite Deck U - Unknown  
 414A Joint Type 1 2 - Sliding Metal Plate Angle  
 414B: Joint Type 2 N - None  
 108A: Wearing Surface 2 - Integral Concrete (separate non-modified layer of concrete added to structural deck)  
 3 - MicroSilica  
 422: WS Date 07/01/2007  
 423: WS Thick (in) 2.8  
 482: Protective Coating 3 - Paint System A  
 483: PCS Date 01/01/1978  
 453: Bearing Type 1 2 - Rockers & Bolsters  
 455: Bearing Type 2 C - Elastomeric (laminated)  
 528: Foundn: Abut Fwd 1 - Steel H Piles (Other size)  
 533: Foundn: Abut Rear N - None (such as most Culverts)  
 536: Foundn: Pier 1 2 - Cast-in-Place Reinforced Concrete Piles (Other diameter)  
 539: Foundn: Pier 2 N - None (Such as most Culverts)

**Appraisal**

B.AP.03: Scour Vul. Not over Waterway

**Geometric**

48: Max Span Length (ft) 127.0  
 49: Structure Length (ft) 2683.0  
 52: Deck Width, Out-To-Out (ft) 40.1  
 424: Deck Area (sf) 107588.3  
 32: Appr Roadway Width (ft) 36.0  
 51: Road Width, Curb-Curb (ft) 38.1  
 50A: Curb/SW Width: Left (ft) 0  
 50A: Curb/SW Width: Right (ft) 0  
 34: Skew (deg) 12  
 33: Bridge Median 0 - No median  
 54B: Min Vert Underclearance (ft) 15.08  
 336A: Min Vert Clrnce IR Cardinal (ft) 99  
 336B: Min V Clr IR Non-Cardinal (ft) 0  
 578: Culvert Length (ft) 0

**Age and Service**

27: Year Built/ 106 Rehab 1963 / 0000  
 42A: Service On 1 - Highway  
 42B: Service Under 4 - Highway - railroad  
 28A: Lanes on 03  
 28B: Lanes Under 08  
 19: Bypass Length 0  
 29: ADT 67393  
 109: % Trucks (%) 15

**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 (%) 150  
 704: Analysis Date 02/07/2000  
 63: Analysis Method 6 - Load Factor (LF) rating reported by rating factor (RF) method using MS18 loading.

**Inspections**

*Months*  
 B.IE.03 Routine Insp. 12  
 B.IE.03: NSTM Insp. Y 24 09/26/2025  
 B.IE.03: UW Insp. 0  
 B.IE.03: Special Insp.  
 UBIT Insp. N 0 04/09/2014  
 Drone Insp. N 0  
 Inspector Banaszak,Ken

**Structure Number:** 3105946  
**Facility Carried:** SB IR 71

[illegible]



**Inspector:** Banaszak, Ken  
**Inspection Date:** 09/26/2025

**Structure Number:** 3105946  
**Facility Carried:** SB IR 71

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Environment | Total Quantity | Units   | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|---------|-------------------|-------------------|-------------------|-------------------|
| 510-Wearing Surfaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | 156158         | sq. ft. | 13210             | 142168            | 780               | 0                 |
| CS2:<br>-There are locations of hairline to moderate transverse, diagonal, and longitudinal cracks.<br>-There are isolated concrete patches that are starting to break up and deteriorate in Spans 6A and 8A. Asphalt patches were present at 8A in 2025 inspection; these are in satisfactory condition.<br>-The bridge deck was sounded by ODOT in December 2020, multiple delaminated areas were found throughout the wearing surface.<br>-There are typical gouges, scrapes, and popouts throughout 10% of the deck.<br>CS3:<br>-Minor pop-out spalls were present throughout the surface of the wearing surface.<br>-There are multiple small (6" diameter) spalls in the west lane of Span 14A and Span 25B.<br>-There are asphalt patches in Spans 6A and 8A; these are in satisfactory condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |                |         |                   |                   |                   |                   |
| 107-Steel Open Girder/Beam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3 - Mod.    | 21338          | ft.     | 13435             | 7569              | 334               | 0                 |
| CS2:<br>-There is a 3/4" bend at the midspan on the bottom flanges of Girders E and F at Span 17.<br>-There is a minor deformation (approximately 1" out of plane over 6") to the bottom flange of Girder G in Span 1A.<br>-The original girders typically exhibit minor surface corrosion and freckled rust where the paint system has failed, particularly on the fascia girders.<br>-There is a bent stiffener on the east side of Girder E near Pier 21B in Span 22B.<br>-There are isolated areas of spot rust on the fascia girders in the FWW spans.<br>-Typical isolated 2" deformations on the lower angles of the stringers.<br>CS3:<br>-Painted-over pack rust up to 3/8" thick is typical on the girder support angles at the steel pier caps.<br>-In Span 4A, there is painted-over pitting up to 1/8" deep on the bottom flange of Girder G at the hinge assembly and at Girder A near Pier 4A, and two 1" diameter holes in the web of Girder F at the hinge assembly.<br>-Painted-over pitting up to 1/4" deep is present on the bottom flange of the Span 16A girders at Pier 15A and the Span 19B girders at Pier 19B.<br>-Girder G has typical inactive section loss on the lower 3/4" of all its exterior stiffeners.<br>-Area of 3/16" deep section loss bottom flange of Girder H in Span 18A<br>-There is a 3" x 1" inactive corrosion hole in the web behind the bearing of Girder D, Span 19B at Pier 19B.<br>-The bottom flanges, lower webs, and transverse stiffeners of the fascia girders in Spans 16A-22B exhibit isolated areas of laminating corrosion with section loss up to 3/16" deep.<br>-The top flange, stiffeners, and web of Girder A in Span 23B exhibits areas of laminating corrosion with section loss up to 1/8" deep.<br>-There is laminating corrosion with section loss up to 1/8" on the bottom flange of Girder A of Span 20A adjacent to the timber falsework installed between HAM-75-0022L and HAM-71-0000L. |             |                |         |                   |                   |                   |                   |
| 515-Steel Protective Coating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             | 225402         | sq. ft. | 157681            | 22561             | 33858             | 11302             |
| CS2:<br>-Chalking, dulling, and flaking are typical throughout (Spans 15A-28B).<br>-There are small areas of spot rust throughout the FWW spans.<br>CS3:<br>-Paint peeling is typical throughout the structure.<br>CS4:<br>-The paint has failed throughout much of Spans 15A-28B.<br>-Surface corrosion is active at all locations where the paint has failed, and rust staining is evident on the protective system remaining.<br>-The fascia girders exhibit the most severe paint condition with complete paint failure to the bottom flanges and bottom portions of the web with areas of moderate to severe surface and laminating corrosion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                |         |                   |                   |                   |                   |
| 205-Reinforced Concrete Column                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3 - Mod.    | 80             | each    | 38                | 33                | 9                 | 0                 |

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| Environment                       | Total Quantity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Units | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------|-------------------|-------------------|-------------------|
|                                   | CS2:<br>-Pier 2A, Column 1 has map cracking at the bearing on the north face.<br>-Pier 5A, Column 1 has efflorescence with scorch marks.<br>-Pier 12A, Columns 1 and 2 have minor cracking and peeling FRP on the east faces.<br>-Pier 12A, Column 1 has a moderate width vertical crack at the top near the bearing.<br>-Exposed rebar due to lack of cover is common throughout.<br>-Moderate width cracking and minor spalling is typical throughout.<br>-Isolated delaminations on columns.<br>CS3:<br>-Pier 1A Column 1 has minor delamination and spall near base.<br>-Pier 9A, Column 1 has a corner spall with exposed reinforcing on the west end of the northeast corner under bearing.<br>-Pier 11A Column 2 – There is a 16" high by 9" wide by 8" deep corner spall with one exposed reinforcing bar at the top northeast corner.<br>-Pier 13A, Columns 1 & 2, South Face – There is a 48" high by 12" wide by 3" deep corner spall with exposed reinforcement.<br>-Pier 16A, Columns 1 & 2, North and South Faces – There are 12" diameter by 1" deep corner spalls at each existing corner protection bracket<br>-Pier 17A, Column 1, South Face – Four spalls with exposed reinforcement up to 18" wide by 12" high by 1" deep (total) about ten feet below the pier cap.<br>-Pier 23B, Column 2, South Face - 72" high by 36" wide by 1" deep spall with exposed reinforcement and minor section loss near the base of the column<br>-Pier 23B, Column 2 has mid length vertical cracking on the top east face and rust staining on the north face.<br>-Pier 24B, on the northwest corner there is a 36" high by 12" wide by 2" deep corner spall with exposed reinforcement at the base of the column<br>-Pier 29B, Column 2, Top Face - 6" wide by 7" long by 1" deep spall at the masonry plate for the east bearing of Pier Cap 29B |       |                   |                   |                   |                   |
| 210-Reinforced Concrete Pier Wall | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 73    | ft.               | 73                | 0                 | 0                 |
| 231-Steel Pier Cap                | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 910   | ft.               | 109               | 108               | 693               |
|                                   | CS2:<br>-The steel single-web pier cap at Pier 29B is in good condition, with minor active surface corrosion on the bottom flange at the bearings and on the bottom flange splice bolts.<br>-Isolated broken tack welds on the interiors of the original steel box pier caps.<br>-Pier 9A has 3/4" pack rust at the top flange plate in the overhang portion.<br>CS3:<br>For the original steel box pier caps<br>-Pack rust up to 1.5" thick is typical between the web plates and flange connection angles and between the bottom flange plates and connection angles.<br>-Pack rust up to 1/2" thick is typical between the web plates and the girder seat angles.<br>-There are also isolated areas of pack rust up to 1/8" thick under the top flange plates.<br>-There is minor to moderate pack rust at the ends of most caps between the internal angles and flange plates where they are not protected from the elements.<br>-Many areas of pack rust were caulked in 2017; the majority of the caulk appears to be functioning as intended.<br>-There are areas of painted-over pitting on the web plates, bottom flange plates, and bottom flange angles up to 1/8" deep.<br>-Pier Cap 2A has impact damage on the center 2 lanes with localized damage and scrapes to the edges and bottom of the bottom flange.<br>-Pier Cap 9A and 10A have inactive corrosion holes in the seal plates at the west ends.<br>-Pier Cap 12A has an isolated area of reactivating pack rust between the north web plate and the west end plate connection angle.                                                                                                                                                                                                                                                                                              |       |                   |                   |                   |                   |

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| 515-Steel Protective Coating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             | 27612          | sq. ft. | 13883             | 11140             | 2589              | 0                 |
| CS2:<br>-Some of the steel pier caps have isolated minor rust staining along the bottom of the web.<br>CS3:<br>-The protective coating on the interior of the pier caps have some areas of minor freckled rust throughout and intermittent areas of active corrosion and paint failure concentrated to the east and west ends of the pier caps (2021 Inspection).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                |         |                   |                   |                   |                   |
| 234-Reinforced Concrete Pier Cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3 - Mod.    | 1226           | ft.     | 1039              | 179               | 8                 | 0                 |
| CS2:<br>-There is typically map cracking on the concrete pier caps between pier columns on the original piers.<br>-On the north and south face of many of the original concrete pier caps, there is a horizontal hairline crack approximately 12" from the top.<br>-There are minor to moderate width cracks with efflorescence on several of the overhangs of the FWW pier caps.<br>-There are also minor to moderate width vertical cracks between pier columns and in the concrete bearing pedestals.<br>-There is rust staining on the east overhang and the FRP is beginning to flake and peel on the south face at Pier 23B.<br>-There are 2 minor corner spalls on the east face of Pier 28B.<br>CS3:<br>-There is a 12" diameter x 1" deep spall with rust staining on the east face of Pier Cap 15A.<br>-There is a 10" high by 4" wide by 1" deep spall on the southeast corner of the Pier Cap 18A east overhang.<br>-There are two 2'L x 1'W spalls up to 3" deep with exposed rebar at the top of Pier Cap 27B on each side of Bearing E; these spalls are beginning to encroach on the bearing, with no loss of bearing area at this time.<br>-There are cracks with rust stains on Pier Cap 19A.<br>-There is a 2' wide by 2' high by 4" deep corner spall with exposed reinforcement noted in the north overhang of Pier 2 (FWW).<br>-There are moderate width flexural cracks with rust staining on the south and bottom faces of Pier Cap 4 (FWW) between the pier columns. |             |                |         |                   |                   |                   |                   |
| 300-Strip Seal Joint                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3 - Mod.    | 704            | ft.     | 100               | 540               | 26                | 38                |
| CS2:<br>-Isolated areas of loosely packed debris in all expansion joints on the deck.<br>CS3:<br>- Joint at the wall pier has heavy debris.<br>-Minor tears are present at Piers 15A, 23B, 28B, and 7 (FWW).<br>CS4:<br>-The strip seals at the Wall Pier and Pier 4 (FWW) have areas of tearing that has led to leaking through the joint.<br>-The seals are beginning to tear in the joints at Piers 15A, 23B, 28B, and 7 (FWW).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                |         |                   |                   |                   |                   |
| 310-Elastomeric Bearing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3 - Mod.    | 36             | each    | 25                | 7                 | 4                 | 0                 |
| CS2:<br>-There are some minor areas of surface corrosion and isolated paint failure on the steel bearing plates.<br>-There is minor bulging in the fascia bearings of both Spans 23B and 24B at Pier 23B. All Span 24B bearings at Pier 23B were observed rocking side-to-side. No indications of the bearing walking out were observed.<br>-The edge distance to caps on all bearings at Pier 23B is 1"-2" in Span 23.<br>CS3:<br>-There is a 1" diameter corrosion hole in the bearing riser of Girder E, Span 24B.<br>-There is painted-over pitting present on several bearing risers.<br>-At Bearing A of Span 24B, Pier 23B is bulging with rust staining between layers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |             |                |         |                   |                   |                   |                   |
| 515-Steel Protective Coating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             | 36             | sq. ft. | 26                | 6                 | 4                 | 0                 |
| CS2:<br>-There is isolated minor surface corrosion on some steel bearings.<br>CS3:<br>-There are some minor to moderate areas of surface corrosion and isolated paint failure on the steel bearing plates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                |         |                   |                   |                   |                   |
| 311-Movable Bearing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3 - Mod.    | 76             | each    | 30                | 42                | 4                 | 0                 |

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|                                        | Environment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Total Quantity | Units   | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|-------------------|-------------------|-------------------|-------------------|
|                                        | CS2:<br>-The original girder rocker bearings typically exhibit minor peeling paint and surface corrosion throughout.<br>-The anchor rod of Bearing C at Pier 28B is bent 1" to the south.<br>-The bearing at Girder A was contracted 7° to the south and Girder B bearing was contracted 3° to the south at Pier 14A at 81°F; the other bearings at this pier had minimal rotation.<br>-The bearings for the steel pier caps were all painted in 2021, but there is minor rust staining on the bottoms of several of the bearing plates.<br>-There are backed off anchor nuts at the west bearing of Pier Cap 8A, the east bearing of Pier Cap 12A, and the east bearing of Pier Cap 13A.<br>CS3:<br>-Pack rust between the rocker and masonry plate was noted at Bearing A at Pier 14B, Bearing A at Piers 24B and 27B, and Bearing E at Piers 22B and 28B.<br>-The east bearing of Pier Cap 11A is misaligned, with the south keeper lug of the rocker plate sitting on top of the masonry plate. |                |         |                   |                   |                   |                   |
| 515-Steel Protective Coating           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 76             | sq. ft. | 31                | 35                | 10                | 0                 |
|                                        | CS2:<br>-Minor isolated corrosion.<br>CS3:<br>-The original girder rocker bearings typically exhibit minor to moderate paint failure and surface corrosion throughout.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |         |                   |                   |                   |                   |
| 313-Fixed Bearing                      | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 27             | each    | 4                 | 20                | 3                 | 0                 |
|                                        | CS2:<br>-The original steel fixed bearings typically exhibit paint failure and moderate surface corrosion throughout.<br>-Pier 12A has a 1/2" deformation in the stiffener at Bearing A and 2 loose bolts at Bearing B.<br>-Pier 13A has 1 loose bolt at Bearings A and B.<br>CS3:<br>-Pack rust is typical on the bearings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |         |                   |                   |                   |                   |
| 515-Steel Protective Coating           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 27             | sq. ft. | 7                 | 12                | 8                 | 0                 |
|                                        | CS2:<br>-Isolated minor surface corrosion.<br>CS3:<br>-The original steel fixed bearings typically exhibit paint failure and moderate surface corrosion throughout.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |         |                   |                   |                   |                   |
| 314-Pot Bearing                        | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 67             | each    | 2                 | 56                | 9                 | 0                 |
|                                        | CS2:<br>-The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout.<br>-There are a few instances of the elastomer bulging or walking out of the bearing pot.<br>-The anchor rods of the bearings at Pier 5 and Pier 7 are bent.<br>CS3:<br>-The Pier 4 bearings exhibit laminating corrosion with negligible section loss on the bearing plates, shim plates, and pots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |         |                   |                   |                   |                   |
| 515-Steel Protective Coating           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 67             | sq. ft. | 12                | 40                | 15                | 0                 |
|                                        | CS3:<br>-The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |         |                   |                   |                   |                   |
| 331-Reinforced Concrete Bridge Railing | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6496           | ft.     | 2985              | 3304              | 207               | 0                 |



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|                                 | Environment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Total Quantity | Units | Condition State 1 | Condition State 2 | Condition State 3 | Condition State 4 |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|-------------------|-------------------|-------------------|-------------------|
|                                 | CS2:<br>-There is minor to moderate to wide transverse and map cracks throughout both bridge railings, spaced 1 ft-3 ft apart with some exhibiting efflorescence, rust staining, and/or moisture staining.<br>-There is minor impact damage to the west railing of Span 21B.<br>-There are concrete patches in the railings throughout; these patches are in good condition.<br>-There is vertical cracking at 6' on center.<br>CS3:<br>-There is a 12" x 6" x 2" spall with exposed reinforcement in the north railing at the Wall Pier.<br>-A 12" long by 6" high by 2" deep spall with exposed reinforcement is present in the top corner of the west railing at the River Pier joint. The spall is surrounded by delaminated concrete and wide longitudinal and vertical cracks with water and rust staining.<br>-The spall is surrounded by delaminated concrete and wide longitudinal and vertical cracks with water and rust staining.<br>-There is a 2' long full width spall with exposed rebar in the top of the east railing near Pier 23B and the top 6" of the railing is delaminated for approximately 20' adjacent to the spall. |                |       |                   |                   |                   |                   |
| 815-Drainage                    | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 37             | each  | 12                | 11                | 13                | 1                 |
|                                 | CS2:<br>-There are numerous locations where there is a large gap between the deck drainpipe and the downspout attached to the pier columns.<br>CS3:<br>-The drainpipe sections are disconnected at Piers 4A, 6A, and 8A near the Pier cap.<br>-Scuppers that are 100% clogged are located in Spans 3A, 9A, 10A, 17A, 18A, 19A, and at the Wall Pier in Span 1 (FWW)<br>-The downspouts at Piers 6A and 8A are clogged with debris.<br>-There are disconnected or misaligned drainpipe boots at Piers 18A, 19A, and 22B.<br>- The downspout is completely disconnected at the ground termination of Column 2 at Pier 4A. The missing pipe has caused significant erosion of the asphalt material below Column 2 on the north side of the pier.<br>-The drainage grate in the east gutter at Pier 19A has broken bars.<br>-The downspout T-joint is disconnected on the north face of Column 1 at Pier 12A and the pipe is breaking, but this condition does not appear to have changed from the 2022 inspection.<br>CS4:<br>-The drainage grate to the left lane in Span 2A is missing.                                                          |                |       |                   |                   |                   |                   |
| 820-Steel Seated-Hinge Assembly | 3 - Mod.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 21             | each  | 10                | 8                 | 3                 | 0                 |
|                                 | CS2:<br>-Minor isolated painted-over pitting areas.<br>CS3:<br>-The 2021 inspection noted that the bronze shim plate of the Girder C hinge in Span 4A was walked out 2" to the south; no indication of significant additional displacement was observed at 2025 inspection.<br>-There is isolated painted-over pitting on several of the bearing plates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |       |                   |                   |                   |                   |

**Inspector:** Banaszak, Ken

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**Inspection Date:** 09/26/2025

**Facility Carried:** SB IR 71

ODOT District: District 08

**HAM-00071-0000L\_(3105946)**

Date Built: 07/01/1963

Major Maint: 01 - State Highway Agency

Facility Carried: SB IR 71

Traffic On: 1 - Highway

Rehab Date:

Routine Maint: 01 - State Highway Agency

Feature Inters: USR 42

Traffic Under: 4 - Highway - railroad

Insp. Resp A: 01 - State Highway Agency

FIPS Code: 15000 - CINCINNATI (HAM county)

Location: DISTRICT 08

OH-KY LINE

Insp  
Resp B:

Inspector

Banaszak, Ken

Inspection Date 09/26/2025

Reviewer Not Approved

## **Inspector Comments - Deck and Approach**

### **Deck, Wearing Surface, Joints, Railing**

#### **Reinforced Concrete Deck**

As part of the 2021 paint contract, steel grates and new wood shielding were installed between the girders in Spans 1A through 13A. Panels can be lifted and visually inspected. The panels were removed as part of the 2025 NSTM inspection.

Span 18A exhibits a dark layer of soot due to the railroad tracks below the span.

#### **Bridge Wearing Surface**

Bridge wearing surface was visually inspected.

#### **Bridge Railing**

Bridge railings were visually inspected.

#### **Expansion Joint**

The expansion joints were inspected visually from the boom lift. Strip seal expansion joints are located at Piers 4A, 8A, 12A, 15A, 19A, 23B, 28B, 7 (FWW), 4 (FWW), and the Wall pier. Joints at Piers 4A, 8A, 15A, and 19A were replaced in 2017.

#### **Drainage**

In 2017 as part of the rehabilitation project, drains at various locations were replaced and scuppers were cleaned.

### **Approach**

#### **Signs**

There are two overhead signs mounted to the bridge, one in Span 16A and another in Span 1 (FWW). The signs on the structure are in Good Condition with minor corrosion on the support bolts of the overhead exit signs and moderate active corrosion on the cantilever support underneath the sign support. Complete inspection of the overhead sign structures was outside the scope of this inspection.

#### **Utilities**

The utilities on the structure are in Good condition and consist of electrical conduits in Span 27B and Span 10 (FWW) in Bay 1. There is a utility junction box with areas of 100% section loss throughout the bottom and side plates at Pier 13A.; this box also impedes easy access to the adjacent pier cap hatch. The utility box at Pier 26B has active corrosion and missing connections. There are various roadway lights supported from the girders that are nonfunctioning in Spans 1A through 12A and one lens is broken in both Spans 9A and 11A. The handhole covers on various light poles are missing. The grounding cable between the girders at Pier 3, FWW is broken on the right exterior side.

Inspector: Banaszak, Ken

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Facility Carried: SB IR 71

## **Inspector Comments - General Appraisal**

### **Superstructure, Bearings**

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

The girders in Spans 1A-14A were painted as part of the 2021 paint contract. The end 10' of the girders at the expansion joints at Piers 15A, 19B, and 23B were cleaned and painted during the 2017 rehabilitation. There are fatigue-prone welds from previous attachments on the bottom flanges of the girders in Span 15A, 12' from Piers 14A and 15A.

#### **Elastomeric Bearings**

There are elastomeric bearings at Piers 15A, 16A, 19A, 23B, and 28B.

#### **Steel Protective System**

Spans 1A-14A were painted in 2020-2021. The pier caps were also painted as part of the 2020-2021 paint contract. As part of the 2017 Rehabilitation, all steel members within approximately 10' of the expansion joints at Piers 15A, 19A, and 23B were cleaned and painted.

#### **Diaphragm and Crossframes**

The steel crossframes are in Good condition, with minor surface corrosion present on the crossframes.

#### **Alignment**

Alignment is in Good condition without any problems in the vertical or horizontal alignment noted through visual inspection.

#### **Fatigue**

The superstructure fatigue elements are in Good condition with no deficiencies noted.

### **Substructure**

#### **Reinforced Concrete Column**

As part of the 2017 rehabilitation, concrete patches and FRP wrapping were applied to Piers 5A, 7A, 15A, 19A, 23B, and 28B.

#### **Reinforced Concrete Pier Wall**

Access to the Pier Wall was restricted due to a utility fence and utilities impeding a proper inspection, but no significant deficiencies were observed.

#### **Reinforced Concrete Pier Cap**

As part of the 2017 rehabilitation, concrete patches and FRP wrapping were applied to portions of Piers 15A, 19A, 23B, and 28B.

#### **Steel Pier Cap**

The interiors of the steel pier caps were inspected during the 2023 NSTM element level inspection.

**Inspector:** Banaszak, Ken

**Structure Number:** 3105946

**Inspection Date:** 09/26/2025

**Facility Carried:** SB IR 71

Detailed descriptions of each pier cap can be found in the 2025 In-depth and NSTM inspection report. The steel pier caps at the River Pier and Piers 1A-13A were painted in 2021. Many areas of pack rust were caulked in 2017; the majority of the caulk appears to be functioning as intended.

**Culvert**

N/A

**Inspector Comments - Waterway**

**Channel Protection**

N/A

**Channel**

N/A

**Scour**

N/A





# APPENDIX

# B

ODOT CONCRETE WEARING SURFACE  
DELAMINATION IDENTIFICATION

WEARING SURFACE DELAMINATIONS, IDENTIFIED BY ODOT DECEMBER 2020



A MATCHLINE A



White painted rectangles denotes delaminated areas

Pier 8A

B MATCHLINE B

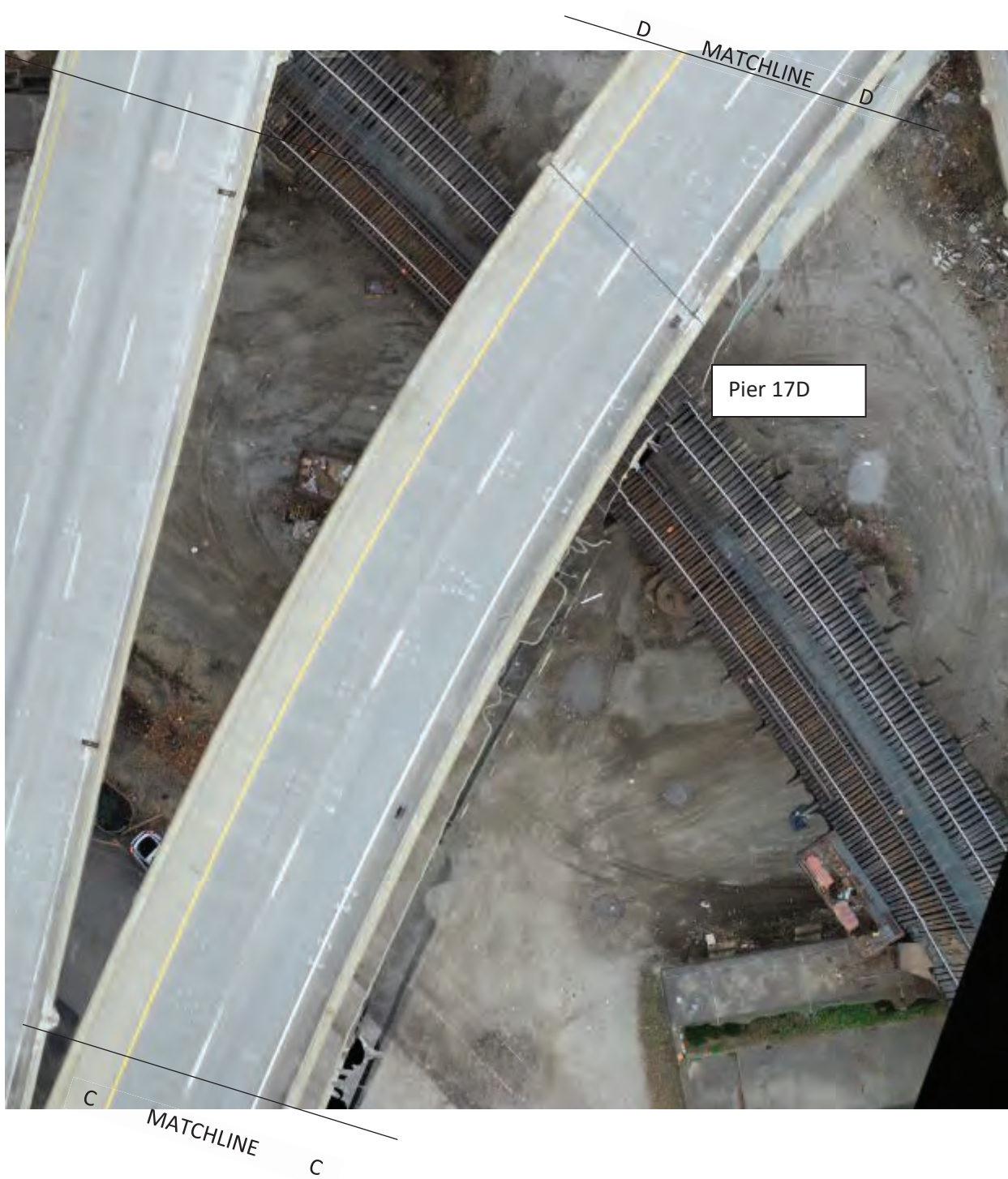


Pier 12C

A MATCHLINE A



B MATCHLINE B





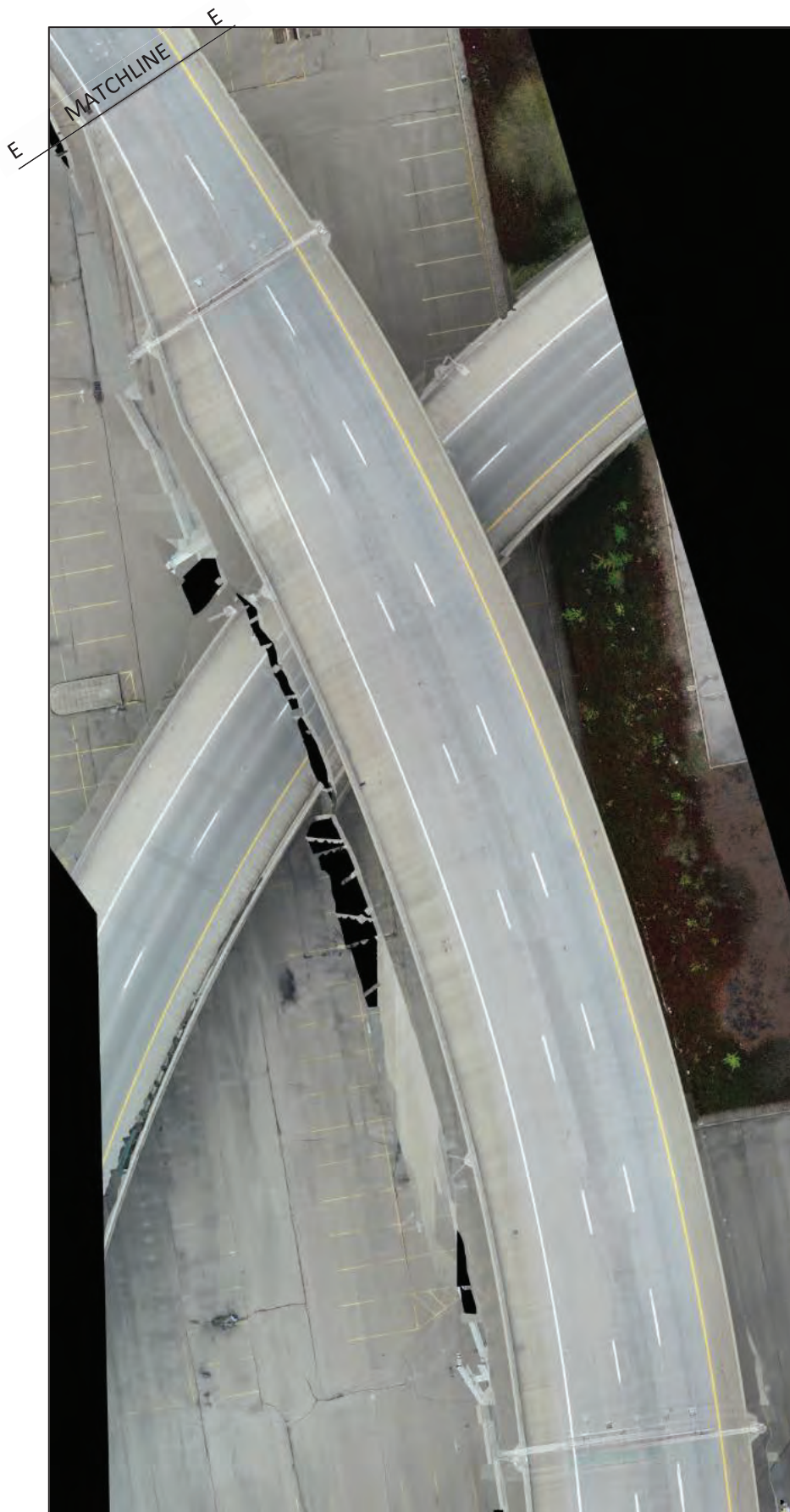


E  
MATCHLINE  
E

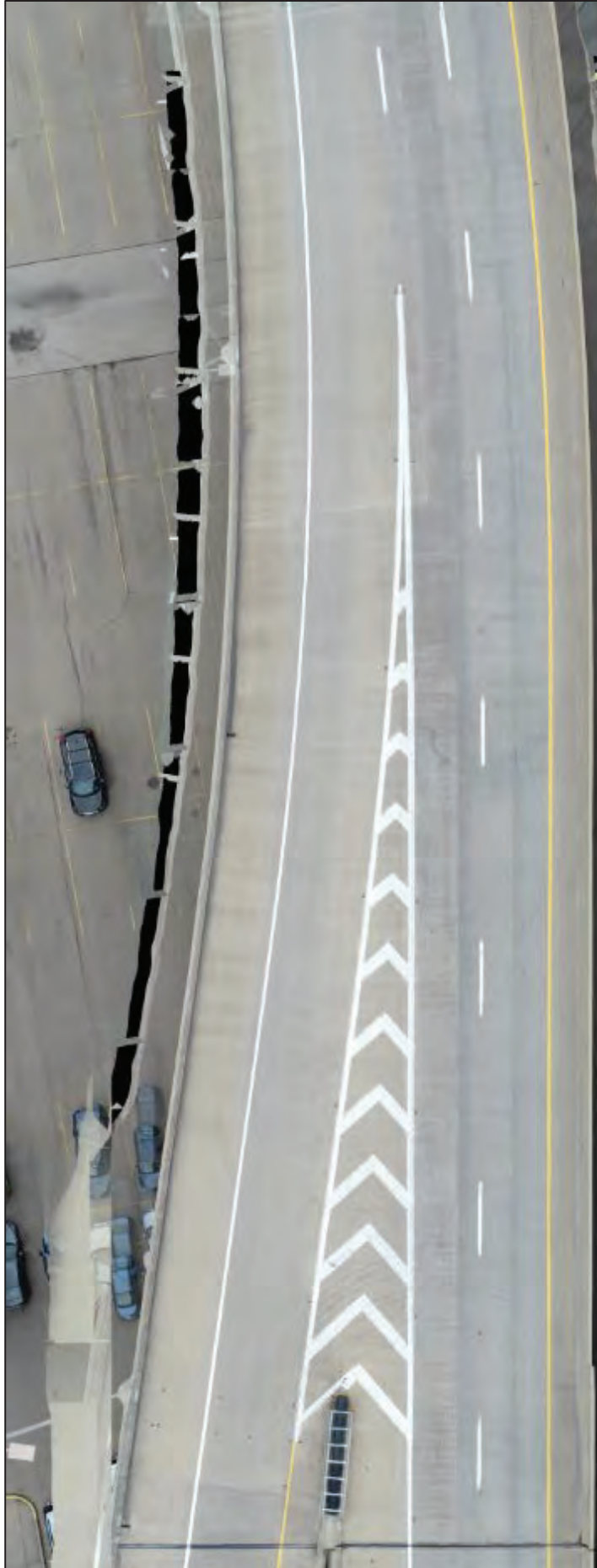
Pier 20D



D  
MATCHLINE  
D



F MATCHLINE F



Pier 5

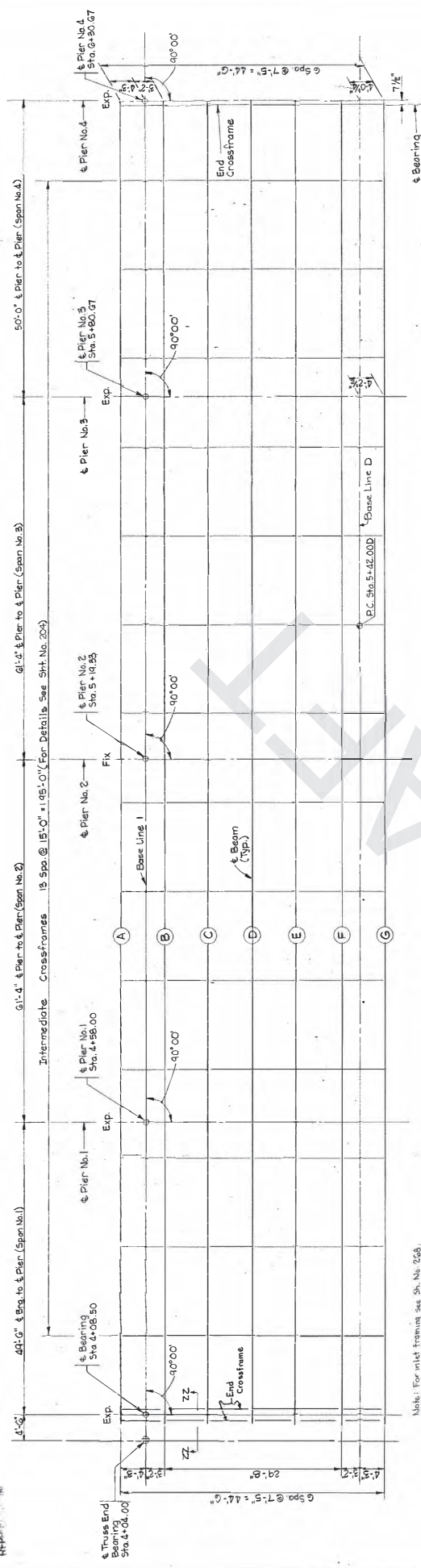


# APPENDIX

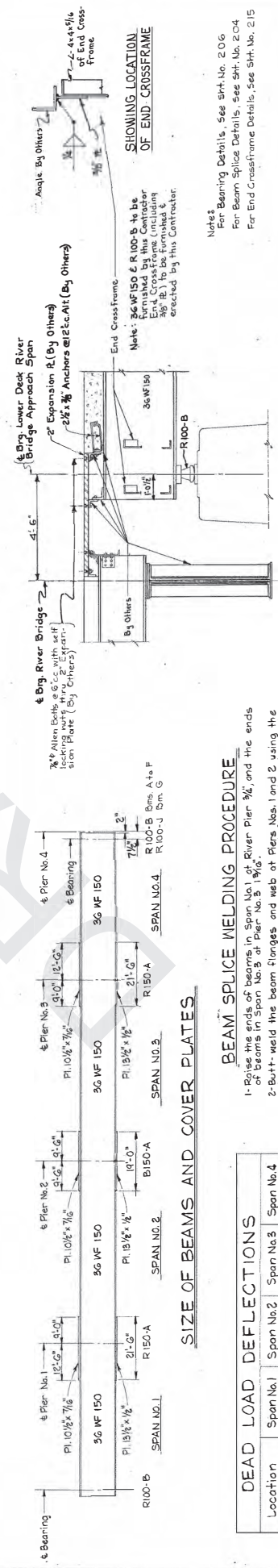
# C

SELECTED PLAN SHEETS





FRAMING PLAN - LOWER DECK UNIT 1



SIZE OF BEAMS AND COVER PLATES

BEAM SPLICING WELDING PROCEDURE

- 1-Raise the ends of beams in Span No. 1 of River Pier 1/2, and the ends of beams in Span No. 3 at Pier No. 3 1/2.
- 2-Remove the beam flanges and web of spans Nos. 1 and 2 using the torch; weld the beam flanges and web of spans Nos. 1 and 2 using the torch; repeat using one pass at each location until welds are completed.
- 3-Weld the bottom and top moment plates of spans Nos. 1 and 2.
- 4-Lower beams to their final position.
- 5-Raise the ends of beams in Span No. 4 at Pier No. 4 1/2.
- 6-Repeat Step 2 at Pier No. 3.
- 7-Weld the bottom and top moment plates of Pier No. 3.
- 8-Lower beams to their final position.

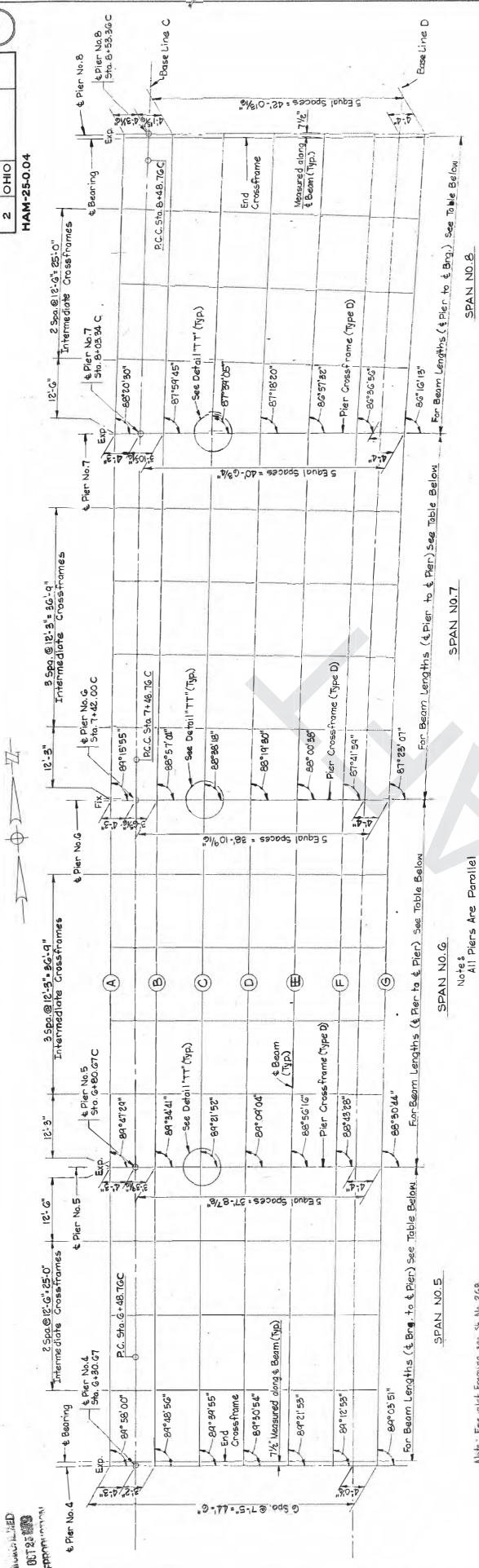
DEAD LOAD DEFLECTIONS

| Location                              | Span No. 1 | Span No. 2 | Span No. 3 | Span No. 4 |
|---------------------------------------|------------|------------|------------|------------|
| Deflection Due To Weight Of Steel     | 0          | 1/8"       | 1/8"       | 0          |
| Deflection Due To Remaining Dead Load | 3/16"      | 3/16"      | 3/16"      | 3/16"      |

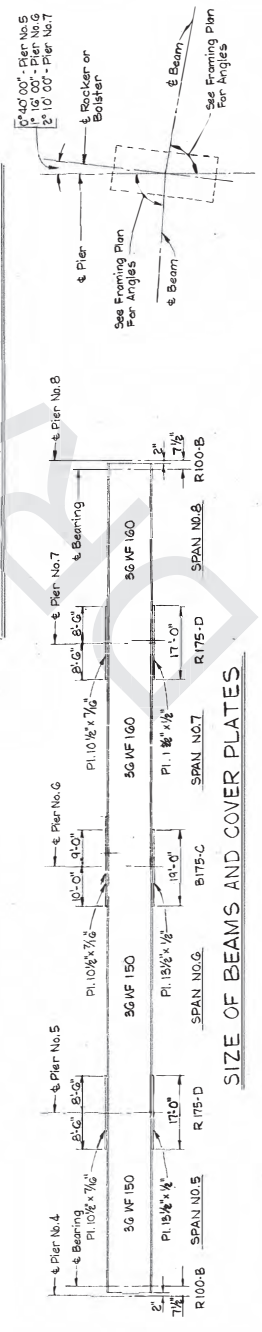
Notes:  
 Where no camber is required, the beams shall be so cambered that when the curved beams will be placed with no camber required for beams in Unit 1 (Lower Deck).

SECTION ZZ-ZZ

Notes:  
 For Bearing Details, See Sht. No. 206  
 For Beam Splice Details, See Sht. No. 204  
 For End Crossframe Details, See Sht. No. 215



## FRAMING PLAN - LOWER DECK UNIT 2



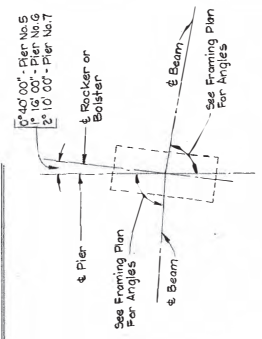
# SIZE OF BEAMS AND COVER PLATES

| TABLE OF BEAM LENGTHS |   | Span No.5   | Span No.6    | Span No.7   | Span No.8   |
|-----------------------|---|-------------|--------------|-------------|-------------|
| Beam                  | A | 4'0"-4 1/8" | 0'1"-5 9/16" | 0'0"-1 1/8" | 4'0"-4 3/8" |
|                       | B | do          | 0'1"-4"      | 0'1"-4 5/8" | 4'0"-4 7/8" |
|                       | C | do          | do           | 0'1"-4 3/8" | 4'0"-5"     |
|                       | D | do          | 0'1"-4 1/2"  | 0'1"-4 5/8" | 4'0"-5 1/8" |
|                       | E | 4'0"-4 3/8" | do           | 0'1"-4 7/8" | 4'0"-5 1/2" |
|                       | F | do          | 0'1"-4 1/8"  | 0'1"-4 3/8" | 4'0"-5 5/8" |
|                       | G | do          | 0'1"-4 1/2"  | 0'1"-4 3/8" | 4'0"-5 5/8" |

| DEAD LOAD DEFLECTIONS                 |           |           |           |           |
|---------------------------------------|-----------|-----------|-----------|-----------|
| Location                              | Span No.5 | Span No.6 | Span No.7 | Span No.8 |
| Deflection Due To Weight Of Slab      | 0         | 1/8"      | 1/8"      | 0         |
| Deflection Due To Remaining Dead Load | 1/8"      | 1/8"      | 1/8"      | 1/8"      |

**Notes:**  
Where no camber is required, the beams shall be so fabricated that any curved beams will be placed with convex flange up.  
No camber required for beams in Unit 2 (Lower Deck).

DETAIL TT



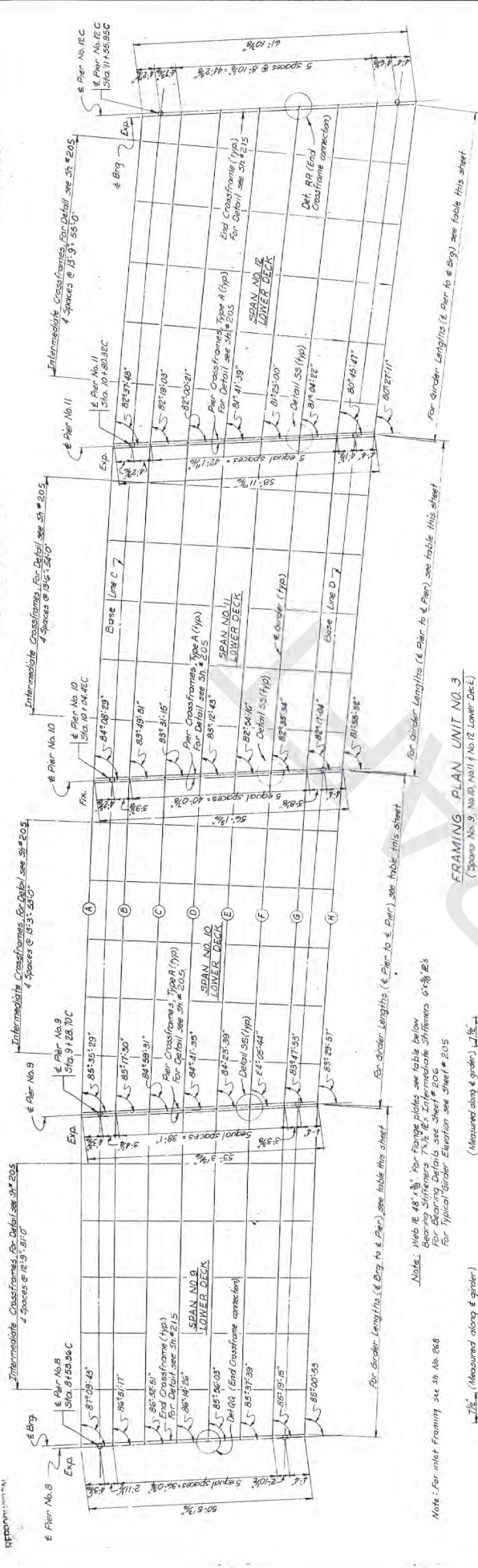
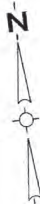
## BEAM SPLICE WELDING PROCEDURE

- 1-Raise the ends of beams in Span No.5 of Pier No.4  $1\frac{1}{2}$ " and the ends of beams in Span No.7 of Pier No.7  $1\frac{1}{2}$ ".
- 2-Butt-weld the beam flanges and web of Piers Nos. 5 and 6 using the following sequence: make two passes on each flange, then two on the web; repeat, using one pass at each location, until welds are completed.
- 3-Weld the bottom and top moment plates at Piers Nos. 5 and 6.
- 4-Weld all pier crossframes of Piers Nos. 5 and 6.
- 5-Lower beams to their final positions.
- 6-Raise the ends of beams in Span No.8 of Pier No.8  $1\frac{1}{2}$ ".
- 7-Repeat Step 2 of Pier No.7.
- 8-Weld the bottom and top moment plates at Pier No.7.
- 9-Weld all pier crossframes of Pier No.7.
- 10-Lower beams to their final positions.

Note: For Bearing Details, See Sht. No. 206  
For Beam Splice Details, See Sht. No. 204.  
For End Crossframe Details, See Sht. No. 215  
For Intermediate Crossframe Details and  
Pier Crossframe (Type D) Details, See  
Sht. No. 204

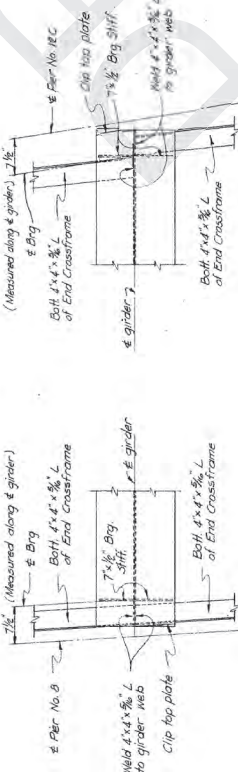


Note: Piers No. 8, No. 9, No. 10, No. 11 & No. 12 are parallel to each other.



### FRAMING PLAN UNIT NO. 3

(SPANS NO. 9, NO. 10, NO. 11 & NO. 12 LOWER DECK)



Note: Web & 18" x 1/2" for flange plates see table below.  
 Bearing stiffeners 7/16" x 1/2" intermediate stiffeners 6" x 1/2"  
 For bearing details see sheet # 206  
 For typical girder elevation see sheet # 205

Note: Web & 18" x 1/2" for flange plates see table below.  
 Bearing stiffeners 7/16" x 1/2" intermediate stiffeners 6" x 1/2"  
 For bearing details see sheet # 206  
 For typical girder elevation see sheet # 205

TABLE OF FLANGE PLATES AND WELD SIZE

| Girder      | A      | B      | C      | D      | E      | F       | G       | H       |
|-------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Span No. 9  | 74'-8" | 74'-8" | 74'-9" | 74'-9" | 74'-9" | 74'-10" | 74'-10" | 74'-10" |
| Span No. 10 | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-10" | 75'-10" | 75'-10" |
| Span No. 11 | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-10" | 75'-10" | 75'-10" |
| Span No. 12 | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-0" | 75'-10" | 75'-10" | 75'-10" |



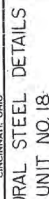












Notes: Convexity includes variations due to vertical curvature, super-elevation and horizontal curvature.  
Girder web plates shall be cut to a parabolic crown



| TABLE "W"                                |                         |
|------------------------------------------|-------------------------|
| Dimensions to raise girders for welding. |                         |
| Girders                                  | At Pier 17D At Pier 20D |
| A & B                                    | 1 3/4" 1 3/4"           |
| C thru E                                 | 1 3/4" 1 1/2"           |

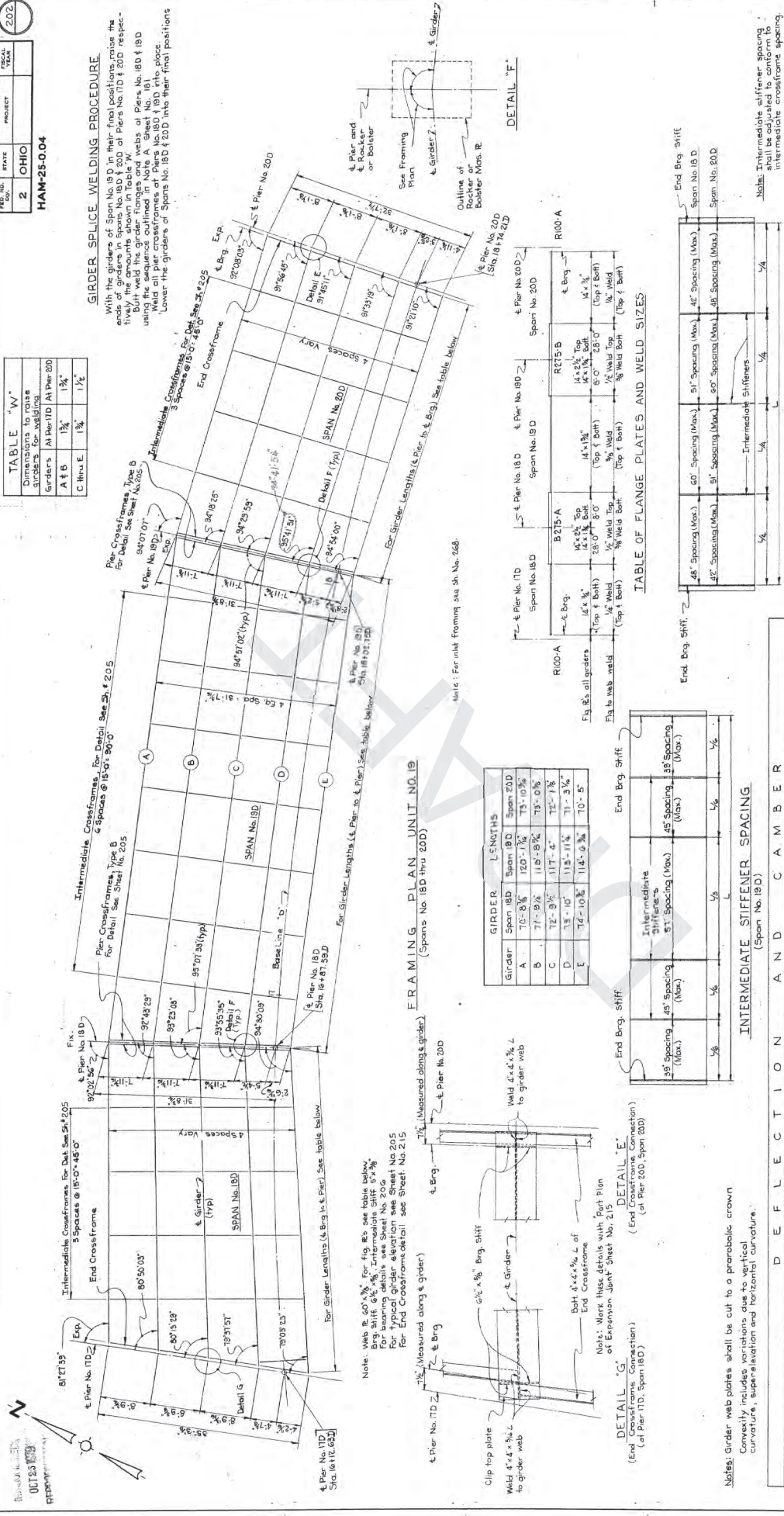
## GIRDER SPLICE WELDING PROCEDURE

With the girders of Span No. 18 D in their final positions, raise the ends of girders in Span No. 18 D to 200 ft. Piers No. 17 D respectively the amounts shown in Table W.

Butt weld the girder flanges and webs of Piers No. 18 D using the sequence outlined in Note A, Sheet No. 18.

Weld all pier crossframes of Piers No. 18 D to 19 D into place.

Lower the girders of Spans No. 18 D to 20 D into their final positions.



INTERMEDIATE STIFFENER SPACING

(Spanne No. 100 of 100)

curvature, super-elevation and horizontal curvature.

INTERMEDIATE STIFFENER SPACING  
(Spec. No. 19 D)

[illegible]

| Location |               |                |                |                |                 |
|----------|---------------|----------------|----------------|----------------|-----------------|
|          | $\frac{7}{8}$ | $\frac{5}{8}$  | $\frac{1}{2}$  | $\frac{1}{4}$  | $\frac{1}{8}$   |
|          | $\frac{3}{4}$ | $\frac{1}{2}$  | $\frac{1}{4}$  | $\frac{1}{8}$  | $\frac{1}{16}$  |
|          | $\frac{1}{2}$ | $\frac{1}{4}$  | $\frac{1}{8}$  | $\frac{1}{16}$ | $\frac{1}{32}$  |
|          | $\frac{1}{4}$ | $\frac{1}{8}$  | $\frac{1}{16}$ | $\frac{1}{32}$ | $\frac{1}{64}$  |
|          | $\frac{1}{8}$ | $\frac{1}{16}$ | $\frac{1}{32}$ | $\frac{1}{64}$ | $\frac{1}{128}$ |

[illegible]

| weight of steel | 0 | $-\frac{1}{16}$ | $-\frac{1}{8}$ | 0 | $-\frac{1}{8}$ | $-\frac{1}{16}$ | 0 | $-\frac{1}{16}$ |
|-----------------|---|-----------------|----------------|---|----------------|-----------------|---|-----------------|
| weight of steel | 0 | $-\frac{1}{16}$ | $-\frac{1}{8}$ | 0 | $-\frac{1}{8}$ | $-\frac{1}{16}$ | 0 | $-\frac{1}{16}$ |

| Deflection due to | $\delta$ | $\delta^2$ | $\delta^3$ | $\delta^4$ | $\delta^5$ |
|-------------------|----------|------------|------------|------------|------------|
|                   |          |            |            |            |            |

|                     | 0 | $\frac{1}{16}$ | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1 |
|---------------------|---|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---|
| remaining Dead Load | 0 | $\frac{1}{16}$ | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1 |

| Convexity (See | $\frac{1}{2}''$ | $\frac{1}{4}''$ | $\frac{1}{8}''$ | $\frac{1}{16}''$ | $\frac{1}{32}''$ | $\frac{1}{64}''$ | $\frac{1}{128}''$ | $\frac{1}{256}''$ | $\frac{1}{512}''$ | $\frac{1}{1024}''$ | $\frac{1}{2048}''$ | $\frac{1}{4096}''$ | $\frac{1}{8192}''$ | $\frac{1}{16384}''$ | $\frac{1}{32768}''$ | $\frac{1}{65536}''$ | $\frac{1}{131072}''$ | $\frac{1}{262144}''$ | $\frac{1}{524288}''$ | $\frac{1}{1048576}''$ | $\frac{1}{2097152}''$ | $\frac{1}{4194304}''$ | $\frac{1}{8388608}''$ | $\frac{1}{16777216}''$ | $\frac{1}{33554432}''$ | $\frac{1}{67108864}''$ | $\frac{1}{134217728}''$ | $\frac{1}{268435456}''$ | $\frac{1}{536870912}''$ | $\frac{1}{1073741824}''$ | $\frac{1}{2147483648}''$ | $\frac{1}{4294967296}''$ | $\frac{1}{8589934592}''$ | $\frac{1}{17179869184}''$ | $\frac{1}{34359738368}''$ | $\frac{1}{68719476736}''$ | $\frac{1}{137438953472}''$ | $\frac{1}{274877906944}''$ | $\frac{1}{549755813888}''$ | $\frac{1}{1099511627776}''$ | $\frac{1}{2199023255552}''$ | $\frac{1}{4398046511104}''$ | $\frac{1}{8796093022208}''$ | $\frac{1}{17592186044416}''$ | $\frac{1}{35184372088832}''$ | $\frac{1}{70368744177664}''$ | $\frac{1}{140737488355328}''$ | $\frac{1}{281474976710656}''$ | $\frac{1}{562949953421312}''$ | $\frac{1}{1125899906842624}''$ | $\frac{1}{2251799813685248}''$ | $\frac{1}{4503599627370496}''$ | $\frac{1}{9007199254740992}''$ | $\frac{1}{18014398509481984}''$ | $\frac{1}{36028797018963968}''$ | $\frac{1}{72057594037927936}''$ | $\frac{1}{144115188075855872}''$ | $\frac{1}{288230376151711744}''$ | $\frac{1}{576460752303423488}''$ | $\frac{1}{1152921504606846976}''$ | $\frac{1}{2305843009213693952}''$ | $\frac{1}{4611686018427387904}''$ | $\frac{1}{9223372036854775808}''$ | $\frac{1}{18446744073709551616}''$ | $\frac{1}{36893488147419103232}''$ | $\frac{1}{73786976294838206464}''$ | $\frac{1}{147573952589676412928}''$ | $\frac{1}{295147905179352825856}''$ | $\frac{1}{590295810358705651712}''$ | $\frac{1}{1180591620717411303424}''$ | $\frac{1}{2361183241434822606848}''$ | $\frac{1}{4722366482869645213696}''$ | $\frac{1}{9444732965739290427392}''$ | $\frac{1}{18889465931478580854784}''$ | $\frac{1}{37778931862957161709568}''$ | $\frac{1}{75557863725914323419136}''$ | $\frac{1}{151115727451828646838272}''$ | $\frac{1}{302231454903657293676544}''$ | $\frac{1}{604462909807314587353088}''$ | $\frac{1}{1208925819614629174706176}''$ | $\frac{1}{2417851639229258349412352}''$ | $\frac{1}{4835703278458516698824704}''$ | $\frac{1}{9671406556917033397649408}''$ | $\frac{1}{19342813113834066795298816}''$ | $\frac{1}{38685626227668133590597632}''$ | $\frac{1}{77371252455336267181195264}''$ | $\frac{1}{154742504910672534362390528}''$ | $\frac{1}{309485009821345068724781056}''$ | $\frac{1}{618970019642690137449562112}''$ | $\frac{1}{1237940039285380274899124224}''$ | $\frac{1}{2475880078570760549798248448}''$ | $\frac{1}{4951760157141521099596496896}''$ | $\frac{1}{9903520314283042199192993792}''$ | $\frac{1}{19807040628566084398385987584}''$ | $\frac{1}{39614081257132168796771975168}''$ | $\frac{1}{79228162514264337593543950336}''$ | $\frac{1}{158456325028528675187087900672}''$ | $\frac{1}{316912650057057350374175801344}''$ | $\frac{1}{633825300114114700748351602688}''$ | $\frac{1}{1267650600228229401496703205376}''$ | $\frac{1}{2535301200456458802993406410752}''$ | $\frac{1}{5070602400912917605986812821504}''$ | $\frac{1}{10141204801825835211973625643008}''$ | $\frac{1}{20282409603651670423947251286016}''$ | $\frac{1}{40564819207303340847894502572032}''$ | $\frac{1}{81129638414606681695789005144064}''$ | $\frac{1}{162259276829213363391578010288128}''$ | $\frac{1}{324518553658426726783156020576256}''$ | $\frac{1}{649037107316853453566312041152512}''$ | $\frac{1}{1298074214633706907132624082305024}''$ | $\frac{1}{2596148429267413814265248164610048}''$ | $\frac{1}{5192296858534827628530496329220096}''$ | $\frac{1}{10384593717069655257060992658440192}''$ | $\frac{1}{20769187434139310514121985316880384}''$ | $\frac{1}{41538374868278621028243970633760768}''$ | $\frac{1}{83076749736557242056487941267521536}''$ | $\frac{1}{166153499473114484112975882535043072}''$ | $\frac{1}{332306998946228968225951765070086144}''$ | $\frac{1}{6646$ |
|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-----------------|
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[illegible]

|                   |                  |                 |                 |                 |                 |                  |                 |                  |                 |                  |   |
|-------------------|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|---|
| Sum of deflection | $1\frac{1}{2}$ " | $\frac{5}{8}$ " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | $\frac{1}{4}$ " | $\frac{3}{16}$ " | $\frac{1}{2}$ " | $-\frac{1}{8}$ " | $\frac{3}{8}$ " | $7\frac{1}{2}$ " | 0 |
|-------------------|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|---|

[illegible]

| Required Comber | $\frac{1}{4}$ | 0 | 0 |
|-----------------|---------------|---|---|
|                 |               |   | 0 |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

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|      |         |          |          |       |
|------|---------|----------|----------|-------|
| DRWN | CHECKED | REVIEWED | DATED    | CHETS |
| LHC  | MKM     |          | 07-07-98 | MK    |



BENCH MARK 4300  
 E. 426.08061, N. 123772.053, ELEV. 161.508.  
 LOCATED ON THE PLAZA LEVEL AT CINERGY FIELD  
 LOCATED ON THE PLAZA LEVEL AT CINERGY FIELD  
 EAST OF THE WEST PARAPET WALL AND SOUTH  
 OF THE NORTH PARAPET WALL.

BENCH MARK 4301  
 E. 426.12618, N. 123772.053, ELEV. 161.536.  
 LOCATED ON THE PLAZA LEVEL AT CINERGY FIELD  
 IN THE NORTHEAST CORNER, A BRASS DISC 0.81m  
 SOUTH OF THE NORTH PARAPET WALL AND 3.1m  
 WEST OF THE EAST PARAPET WALL.

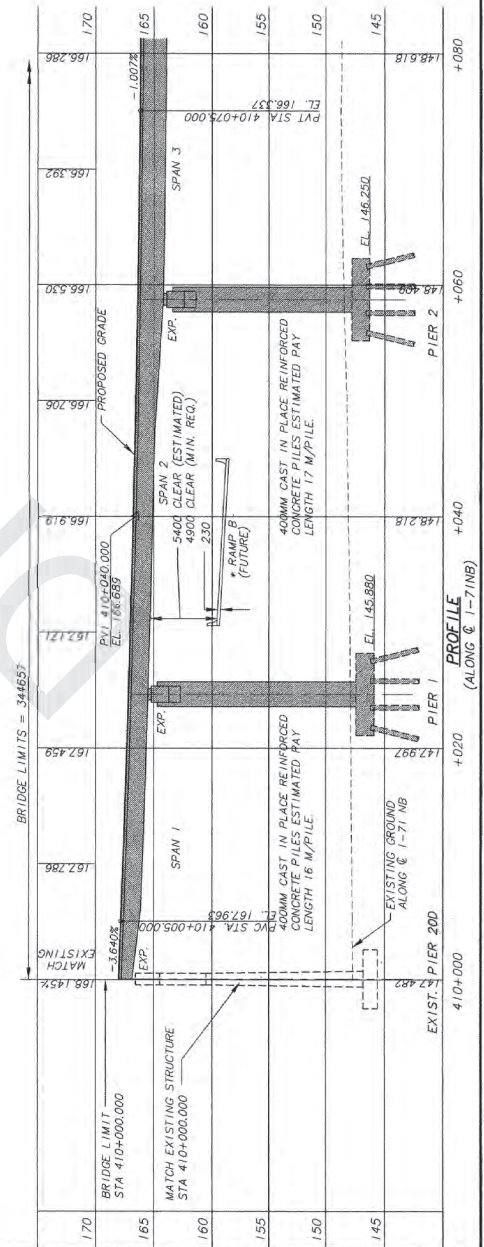
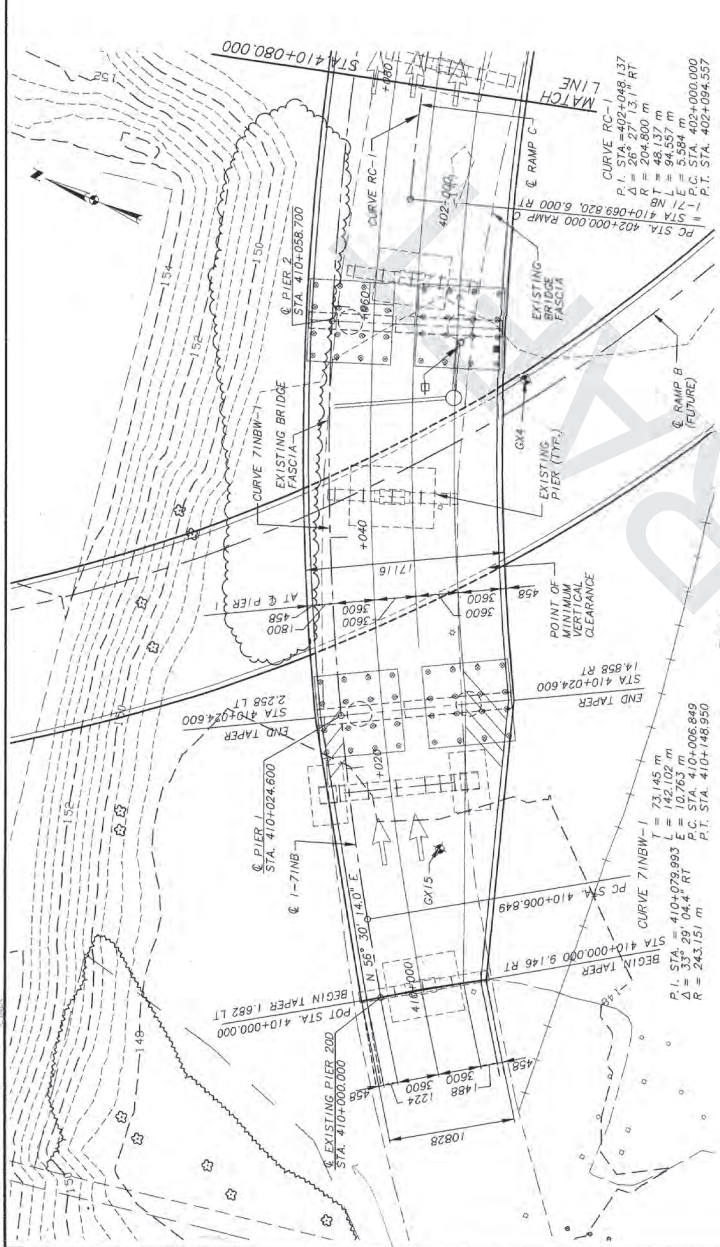
CURRENT ADT=25420  
 2020 ADT=19100  
 CURET (2020)=1874  
 ADT (2020)=2248  
 ADT (2020)=2557  
 TRUCKS: 2248

LEGEND  
 \* BORING LOCATION  
 \* DOWNSPOUT  
 \* SCUPPER

NOTES:

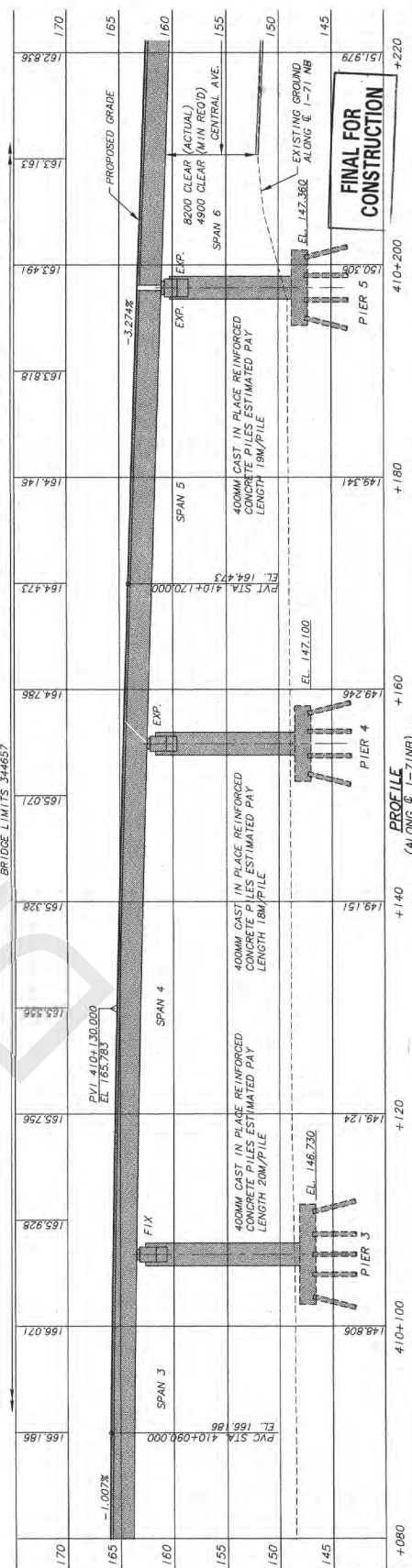
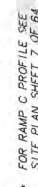
1. FOR SUPERELEVATIONS, SEE ROADWAY PLANS.
  2. PILE DESIGN LOADS (SAFE BEARING CAPACITY):  
 SEE SHEETS 23 THRU 26 OF 64.
  3. FOR UTILITY INFORMATION, SEE ROADWAY PLANS.
  4. SITE PLAN INFORMATION SHOWN FOR BRIDGE 3 IS BASED  
 UPON PRELIMINARY ROADWAY ALIGNMENT & PROFILE  
 DESIGN INFORMATION FOR FUTURE RAMP B & C.  
 THIS INFORMATION FOR RAMP B & C SHALL BE CONFIRMED FOR  
 CONFLICTS WITH BRIDGE 3 BY THE CONTRACTOR PRIOR TO  
 COMMENCEMENT OF WORK.
  5. TOPOGRAPHIC AND UTILITY INFORMATION SHOWN ON THE  
 PLANS IS BASED UPON EXISTING CONDITIONS AT THE TIME  
 OF PLAN PREPARATION. CONTRACTOR SHALL FIELD VERIFY  
 PRIOR TO COMMENCEMENT OF WORK.
  6. SEE BRIDGE 8 & 33 SHEETS FOR ADDITIONAL INFORMATION.
  7. SEE SHEET 51 OF 64 FOR SCUPPER STATION LOCATIONS.
  8. EXISTING PIERS ARE LOCATED APPROXIMATELY  
 HORIZONTALLY AND VERTICALLY. CONTRACTOR SHALL FIELD VERIFY  
 PRIOR TO COMMENCEMENT OF WORK.
  9. FOR DRAINAGE STRUCTURE DETAILS, REFERENCE  
 DRAINAGE PLANS.
  10. ALL PIERS ON THIS SHEET ARE PERPENDICULAR OR RADIAL  
 TO  $\pm 1-71$  NB.
  11. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS EXCEPT  
 AS NOTED OTHERWISE. ALL ELEVATIONS, OFFSETS, AND  
 STATIONING ARE IN METERS.
  12. ESTIMATED PILE LENGTH OF PILES IS BASED ON VERTICAL  
 STATIONING. PILES TO CUT OFF ELEVATION. NO  
 PRE-BORING IS CONSIDERED.
- \* SUPER ELEVATION OF RAMP B (FUTURE) WAS  
 ASSUMED TO BE 5% FOR CLEARANCE CALCULATION

FINAL FOR  
 CONSTRUCTION



\* PIER CAP ELEV'S  
 FOR EXISTING PIER 200





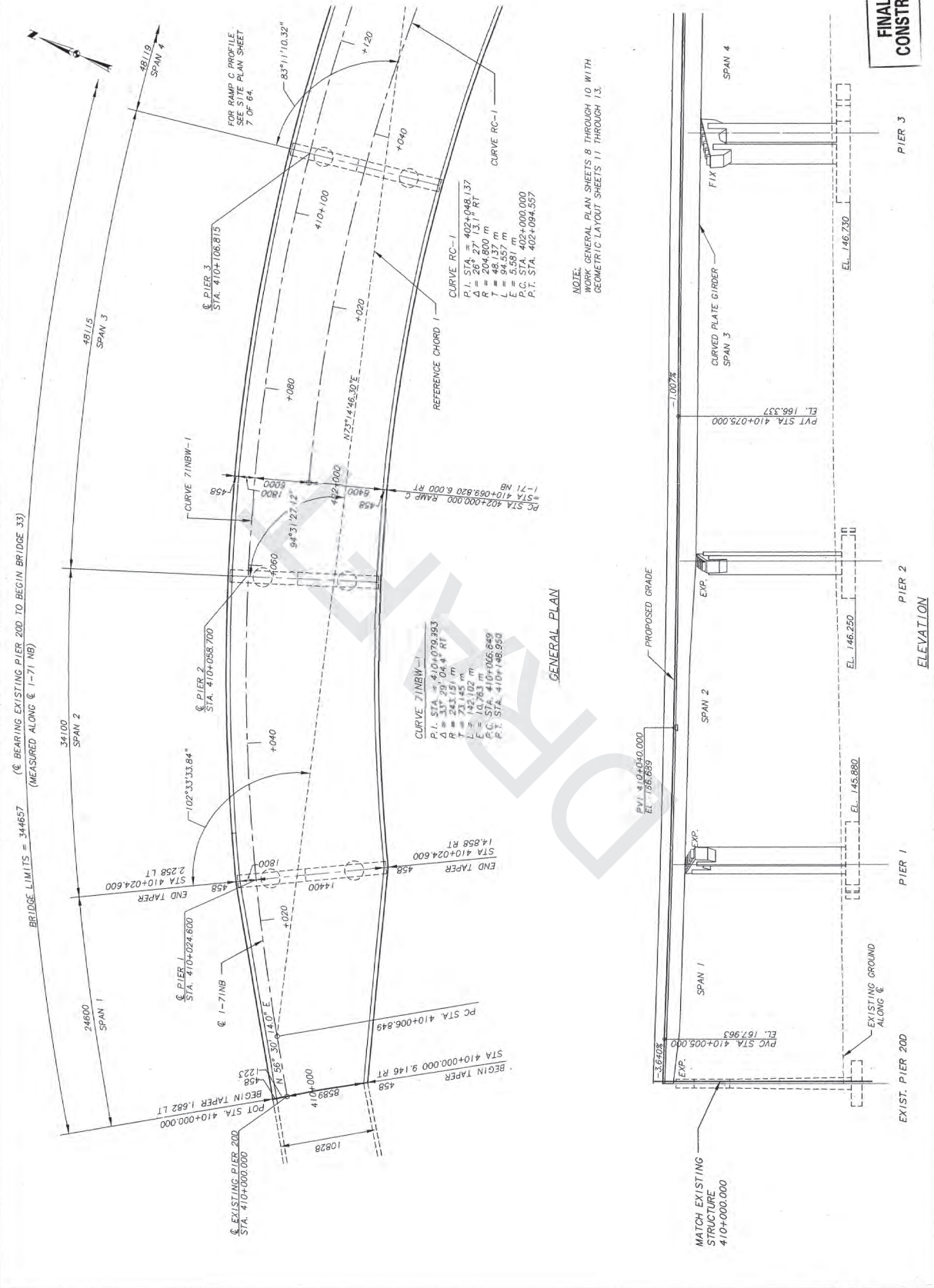


[illegible]

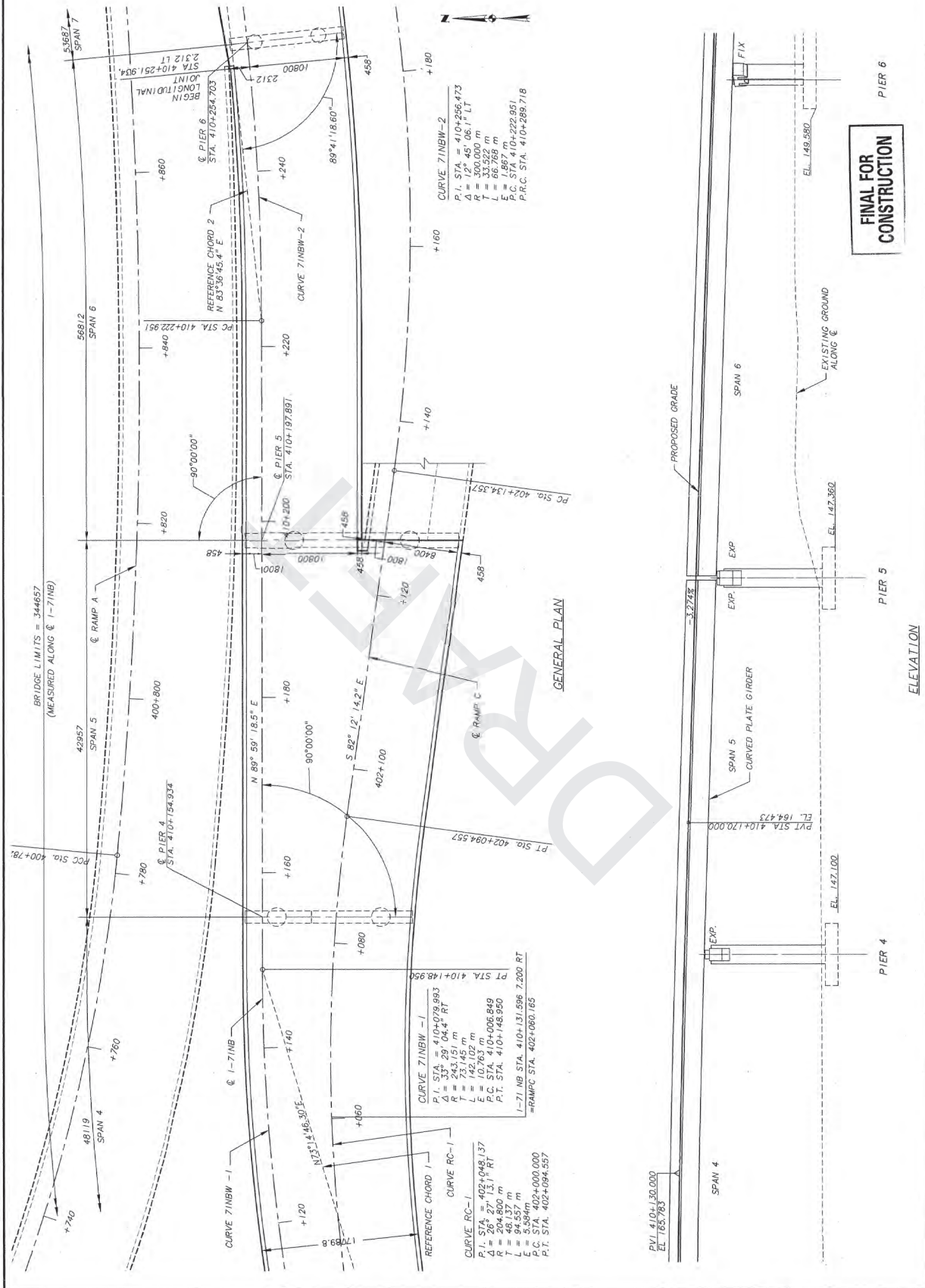
68351753 7/16/98



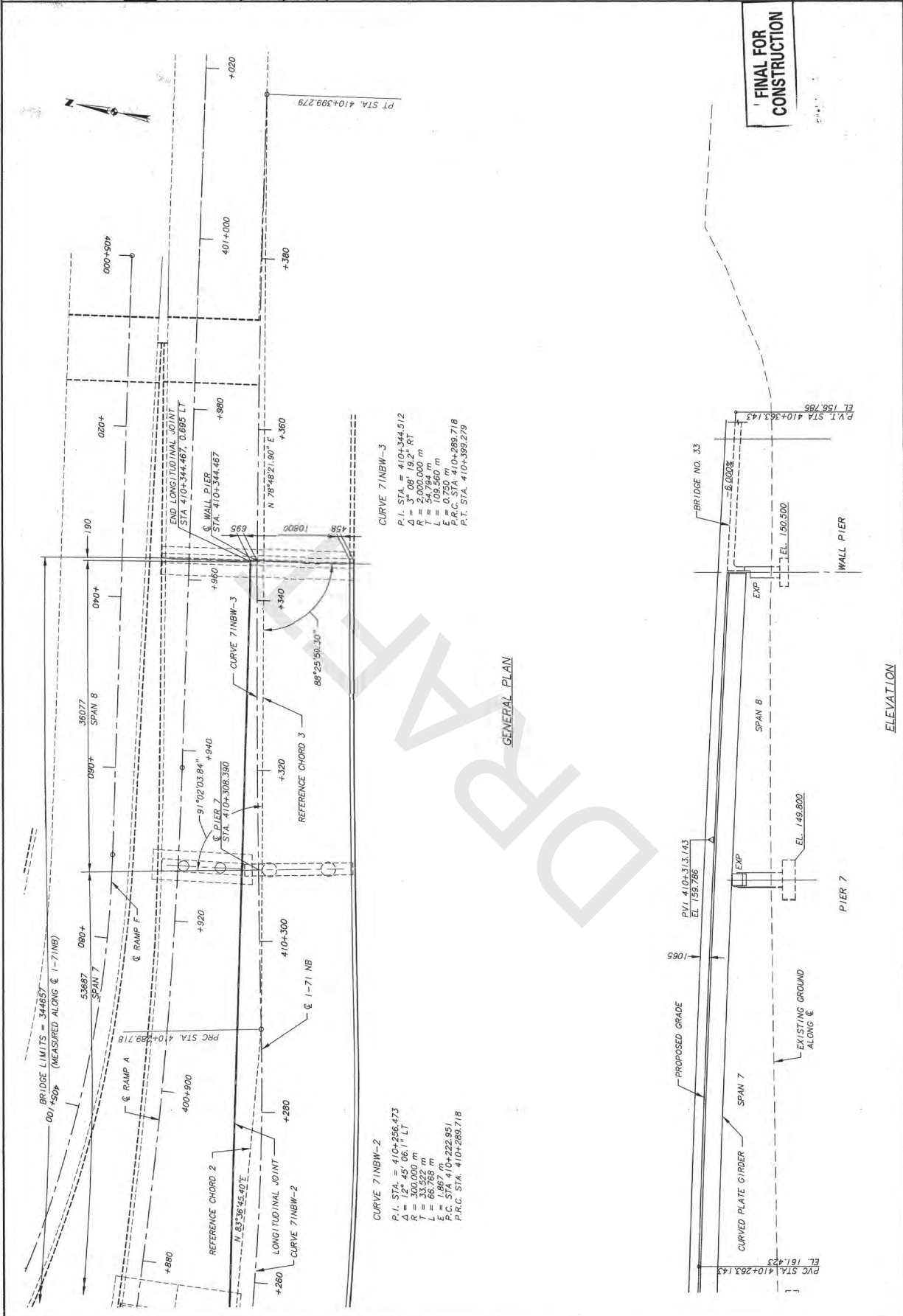
3. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS EXCEPT AS NOTED OTHERWISE. ALL ELEVATIONS, OFFSETS AND STATIONS ARE IN METERS.

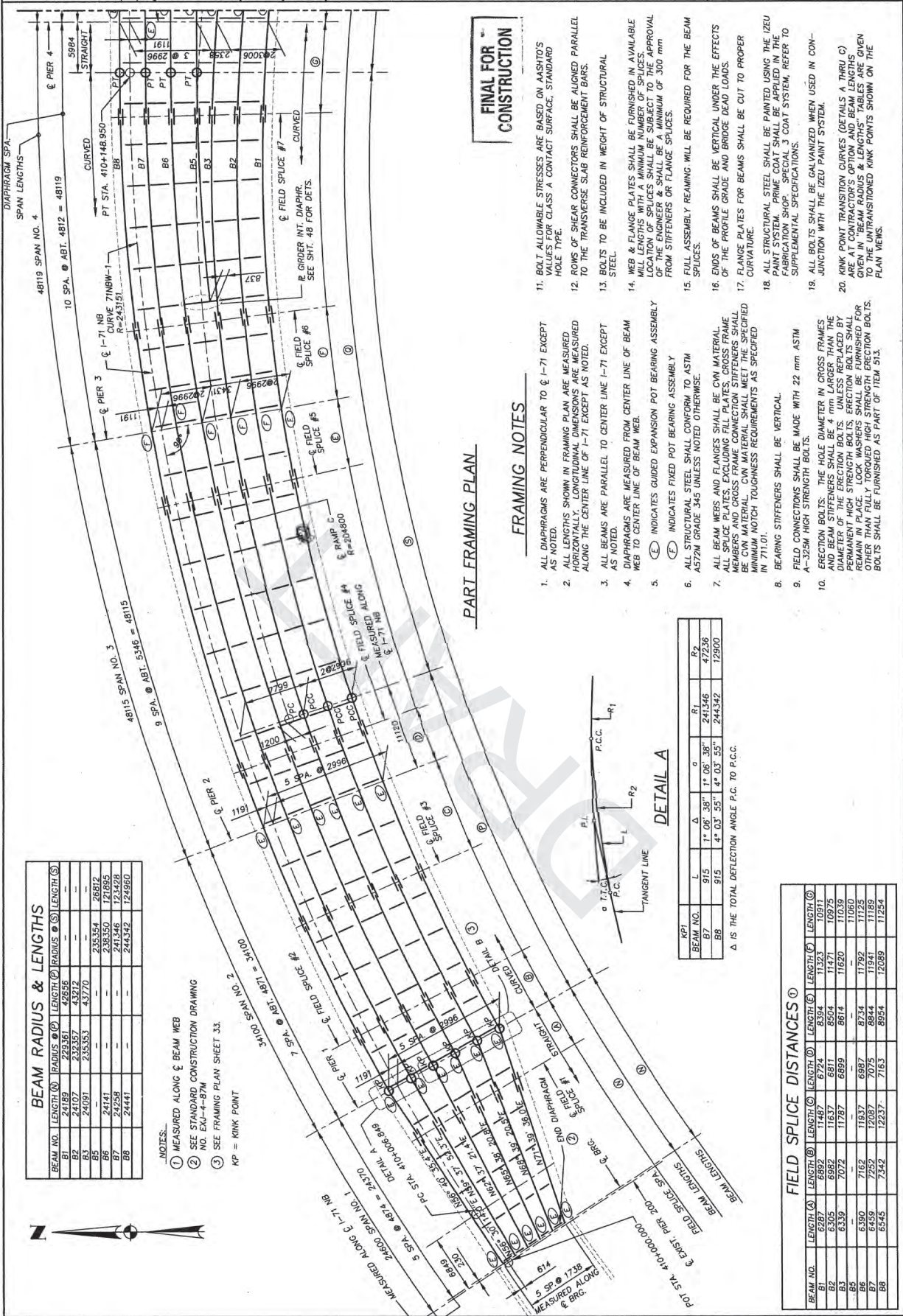












**BEAM RADIUS & LENGTHS**

| BEAM NO. | LENGTH (1) | RADIUS (2) | LENGTH (3) | RADIUS (4) |
|----------|------------|------------|------------|------------|
| B1       | 24189      | 229361     | 42856      | —          |
| B2       | 24107      | 233357     | 43512      | —          |
| B3       | 24091      | 235353     | 43770      | —          |
| B4       | 24141      | 235354     | 28612      | —          |
| B5       | 24258      | 238350     | 121895     | —          |
| B6       | 24258      | 241346     | 123428     | —          |
| B7       | 24441      | 244342     | 124560     | —          |

- NOTES:
- MEASURED ALONG & BEAM WEB
  - SEE STANDARD CONSTRUCTION DRAWING NO. ENG-4-BPM
  - SEE FRAMING PLAN SHEET 33.
- KP = KINK POINT

**FINAL FOR CONSTRUCTION**

**PART FRAMING PLAN**

**FRAMING NOTES**

- ALL DIAPHRAGMS ARE PERPENDICULAR TO & 1-71 EXCEPT AS NOTED.
- ALL LENGTHS SHOWN IN FRAMING PLAN ARE MEASURED HORIZONTALLY. LONGITUDINAL DIMENSIONS ARE MEASURED ALONG THE CENTER LINE OF 1-71 EXCEPT AS NOTED.
- ALL BEAMS ARE PARALLEL TO CENTER LINE 1-71 EXCEPT AS NOTED.
- DIAPHRAGMS ARE MEASURED FROM CENTER LINE OF BEAM WEB TO CENTER LINE OF BEAM WEB.
- (E) INDICATES GUIDED EXPANSION POT BEARING ASSEMBLY
- (E) INDICATES FIXED POT BEARING ASSEMBLY
- ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A572M GRADE 345 UNLESS NOTED OTHERWISE.
- ALL BEAM WEBS AND FLANGES SHALL BE CWN MATERIAL. ALL SPICE PLATES, EXCLUDING FILL PLATES, CROSS FRAME PLATES, AND END PLATES SHALL BE CWN MATERIAL. ALL MATERIAL SHALL MEET THE SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01.
- BEARING STIFFENERS SHALL BE VERTICAL.
- FIELD CONNECTIONS SHALL BE MADE WITH 22 mm ASTM A-325M HIGH STRENGTH BOLTS.
- ERECTOR BOLTS: THE HOLE DIAMETER IN CROSS FRAMES AND BEAM STIFFENERS SHALL BE 4 mm LARGER THAN THE DIAMETER OF THE BOLTS. THE BOLTS SHALL BE PERMANENT HIGH STRENGTH BOLTS. ERECTOR BOLTS SHALL REMAIN IN PLACE. LOCK WASHERS SHALL BE FURNISHED FOR OTHER THAN FULLY TORQUED HIGH STRENGTH ERECTOR BOLTS. BOLTS SHALL BE FURNISHED AS PART OF ITEM 513.
- BOLT ALLOWABLE STRESSES ARE BASED ON AASHTO'S VALUES FOR CLASS A CONTACT SURFACE, STANDARD HOLE TYPE.
- ROWS OF SHEAR CONNECTORS SHALL BE ALIGNED PARALLEL TO THE TRANSVERSE SLAB REINFORCEMENT BARS.
- BOLTS TO BE INCLUDED IN HEIGHT OF STRUCTURAL STEEL.
- WEB & FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE LENGTHS. THE LOCATION OF SPICES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER & SHALL BE A MINIMUM OF 300 mm FROM STIFFENERS OR FLANGE SPICES.
- FULL ASSEMBLY REAMING WILL BE REQUIRED FOR THE BEAM SPICES.
- ENDS OF BEAMS SHALL BE VERTICAL UNDER THE EFFECTS OF THE PROFILE GRADE AND BRIDGE DEAD LOADS.
- FLANGE PLATES FOR BEAMS SHALL BE CUT TO PROPER CURVATURE.
- ALL STRUCTURAL STEEL SHALL BE PAINTED USING THE IZEU PAINT SYSTEM. PRIME COAT SHALL BE APPLIED IN THE FABRICATION SHOP. SPECIAL 3 COAT SYSTEM, REFER TO SUPPLEMENTAL SPECIFICATIONS.
- ALL BOLTS SHALL BE GALVANIZED WHEN USED IN CONJUNCTION WITH THE IZEU PAINT SYSTEM.
- KINK POINT TRANSITION CURVES (DETAILS A, TABU C) ARE A CONTRA CURVE ACTION. KINK POINTS ARE GIVEN IN "BEAM RADIUS & LENGTHS" TABLES ARE GIVEN TO THE UNTRANSITIONED KINK POINTS SHOWN ON THE PLAN VIEWS.



**DETAIL A**

| KPI | BEAM NO. | L          | Δ          | Δ      | R1    | R2 |
|-----|----------|------------|------------|--------|-------|----|
| B7  | 915      | 1° 06' 38" | 1° 06' 38" | 241346 | 47236 | —  |
| B8  | 915      | 4° 03' 55" | 4° 03' 55" | 244342 | 12500 | —  |

Δ IS THE TOTAL DEFLECTION ANGLE P.C. TO P.C.T.

**FIELD SPICE DISTANCES (1)**

| BEAM NO. | LENGTH (1) | LENGTH (2) | LENGTH (3) | LENGTH (4) |
|----------|------------|------------|------------|------------|
| B1       | 6287       | 6892       | 11487      | 8394       |
| B2       | 6305       | 6992       | 11637      | 8504       |
| B3       | 6339       | 7072       | 11787      | 8614       |
| B4       | 6390       | 7162       | 11937      | 8724       |
| B5       | 6459       | 7252       | 12087      | 8844       |
| B6       | 6545       | 7342       | 12237      | 8954       |





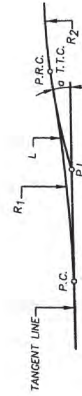
## PART FRAMING PLAN

| BEAM NO. | LENGTH (M) | LENGTH (F) |
|----------|------------|------------|
| B1       | 8648       | 19287      |
| B2       | 8647       | 19170      |
| B3       | 8645       | 18933      |
| B4       | —          | 18756      |
| B5       | 8600       | 18579      |
| B6       | 8600       | —          |
| B7       | 8600       | —          |

| BEAM NO. | RADIUS $\phi$ | LENGTH $l$ | LENGTH $l_0$ | LENGTH $l_1$ | LENGTH $l_2$ |
|----------|---------------|------------|--------------|--------------|--------------|
| B1       | 197009        | 90960      | —            | 32462        | —            |
| B2       | 200005        | 92444      | —            | 32051        | —            |
| B3       | 203001        | 93727      | —            | 31640        | —            |
| B4       | —             | —          | —            | 26871        | —            |
| B5       | —             | —          | —            | 49581        | —            |
| B6       | —             | —          | —            | 49581        | —            |
| B7       | —             | —          | —            | 49581        | —            |
| B8       | —             | —          | —            | 49581        | —            |
| B9       | —             | —          | —            | —            | 10240        |

| WELD CHART                               |  | MIN. SIZE OF<br>FILLET WELD |
|------------------------------------------|--|-----------------------------|
| MAT. THICKNESS OF<br>THICKER PART JOINED |  |                             |
| TO 19 mm THICK INCLUSIVE                 |  | 6 mm                        |
| OVER 19 mm THICK TO 38 mm INCL.          |  | 8 mm                        |
| OVER 38 mm THICK TO 57 mm INCL.          |  | 10 mm                       |
| OVER 57 mm THICK TO 152 mm INCL.         |  | 13 mm                       |

NOTES:  
 ① MEASURED ALONG C BEAM WEB  
 ② SEE STANDARD CONSTRUCTION DRAWING NO. EXJ-4-87M  
 KP = KINK POINT



| BEAM NO. | L   | $\Delta$    | $\sigma$    | R <sub>1</sub> | R <sub>2</sub> |
|----------|-----|-------------|-------------|----------------|----------------|
| B1       | 915 | 10° 54' 57" | 10° 54' 57" | 4803           | 229361         |
| B2       | 915 | 7° 54' 45"  | 7° 54' 45"  | 6626           | 232357         |
| B3       | 915 | 4° 53' 46"  | 4° 53' 46"  | 10706          | 235353         |
| B6       | 915 | 1° 59' 46"  | 1° 59' 46"  | 23973          | 239350         |

$\Delta$  IS THE TOTAL DEFLECTION ANGLE P.C. TO P.R.C.

**FINAL FOR  
CONSTRUCTION**

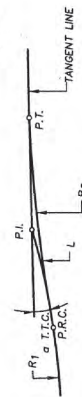
DETAIL B





## PART FRAMING PLAN

**FINAL FOR  
CONSTRUCTION**

DETAIL C

| BEAM NO. | L   | $\Delta$   | $\alpha$   | R <sub>1</sub> | R <sub>2</sub> |
|----------|-----|------------|------------|----------------|----------------|
| B5       | 915 | 4° 04' 12" | 4° 04' 12" | 298809         | 13021          |

$\Delta$  IS THE TOTAL DEFLECTION ANGLE P.R.C. TO P.T.

NOTES:

- ① MEASURED ALONG C BEAM WEB
- ② SEE STANDARD CONSTRUCTION DRAWING NO. EXJ-4-87M

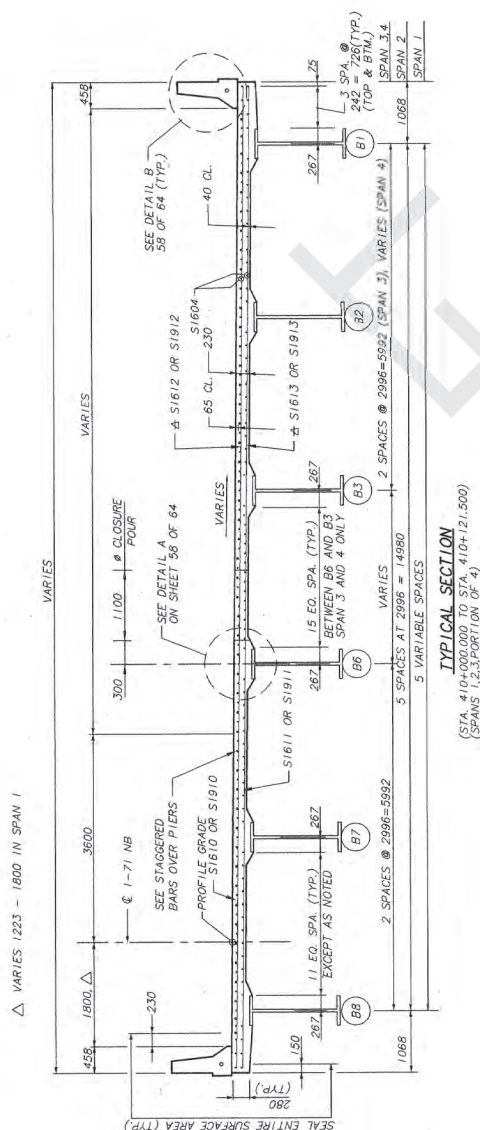
KP = KINK POINT

| BEAM NO. | LENGTH (6) | LENGTH (1) | LENGTH (10) |
|----------|------------|------------|-------------|
| B1       | 14882      | 14129      | 7024        |
| B2       | 14755      | 14149      | 7034        |
| B3       | 14619      | 14169      | 7044        |
| B4       | 14482      | 14190      | 7054        |
| B5       | 14344      | 14220      | 7067        |

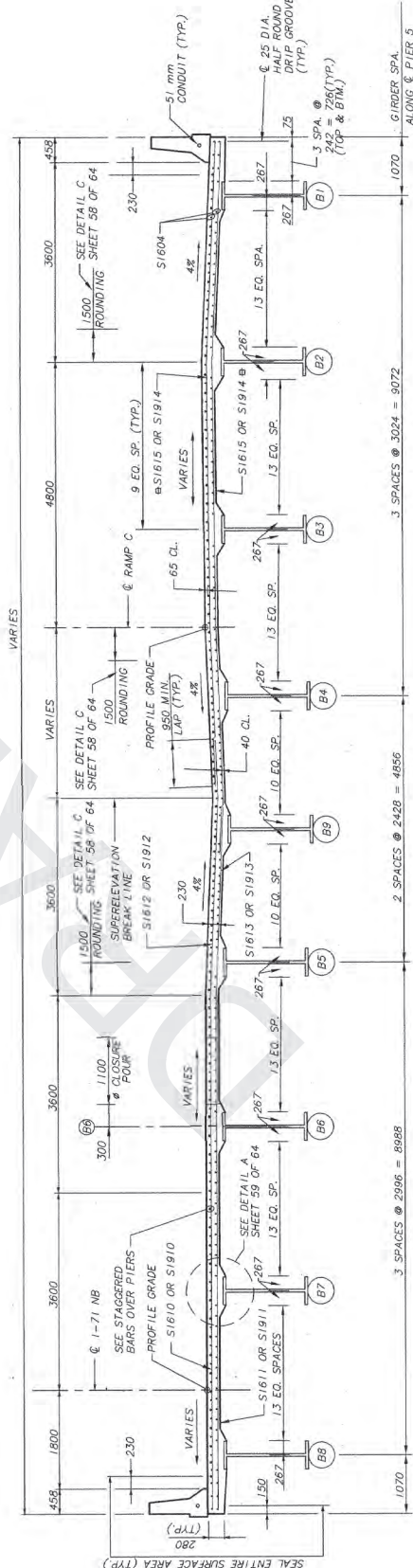
### BEAM RADIUS & LENGTHS

| BEAM NO. | RADIUS $\bullet$ (1) | LENGTH (1) | RADIUS $\bullet$ (2) | LENGTH (2) | RADIUS $\bullet$ (3) | LENGTH (3) | RADIUS $\bullet$ (4) | LENGTH (4) |
|----------|----------------------|------------|----------------------|------------|----------------------|------------|----------------------|------------|
| 81       | 310191               | 69035      | 1989809              | 53965      | -                    | -          | -                    | -          |
| 82       | 307345               | 68402      | 1992655              | 54120      | -                    | -          | -                    | -          |
| 83       | 304500               | 67770      | 1995500              | 54274      | -                    | -          | -                    | -          |
| 84       | 301654               | 67136      | 1998346              | 54428      | -                    | -          | -                    | -          |
| 85       | -                    | -          | -                    | -          | 298809               | 31626      | -                    | 89395      |

| SUPERSTRUCTURE<br>(SPANS 1,2,3,4,5) |       | RE INFORMING STEEL L / ST |      |
|-------------------------------------|-------|---------------------------|------|
| MARK                                | TOTAL | LENGTH                    | TYPE |
| S1604                               | 30,30 | 12000                     | STR  |
| S1606                               | 868   | 21,30                     | I    |
| S1610                               | 666   | 7310                      | STR  |
| S1611                               | 666   | 7310                      | STR  |
| S1612                               | 666   | 12000                     | STR  |
| S1613                               | 666   | 12000                     | STR  |
| S1614                               | 203   | 8200                      | STR  |
| S1615                               | 288   | 3800                      | STR  |
| S1901                               | 868   | 765                       | 3    |
| S1902                               | 868   | 865                       | 3    |
| S1903                               | 661   | 7310                      | STR  |
| S1911                               | 661   | 7310                      | STR  |
| S1912                               | 661   | 12000                     | STR  |
| S1913                               | 661   | 12000                     | STR  |
| S1914                               | 286   | 3800                      | STR  |



TYPICAL SECTION  
(STA. 410+000.000 TO STA. 410+121.500)  
(SPANS 1,2,3, PORTION OF 4)



TYPICAL SECTION  
(STA. 410+121.5 TO STA. 410+197.891)  
(PORTION SPAN 4, 5)

A- CUT S1612, S1613, S1912, S1913 TO FIT.  
 Ø SEE SECTION B-B  
 SHEET 52 OF 64  
 ⊕ CUT S1615 OR S1914 TO  
 FIT. MINIMUM LAPS ARE ALLOWED PER  
 BAR LINE. LAP TOP BARS MIDWAY  
 BETWEEN GIRDERS AND BTM. BARS  
 OVER GIRDERS.

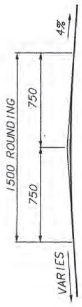
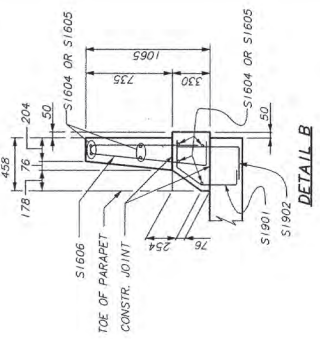
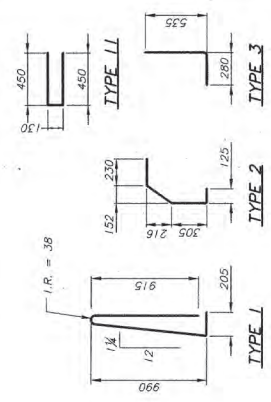
**NOTES:**

1. TRANSVERSE BARS TO BE PLACED RADIAL TO 1-71 NB ALIGNMENT.
2. FOR SUPERELEVATION RATES, REFERENCE SUPERELEVATION PLANS.

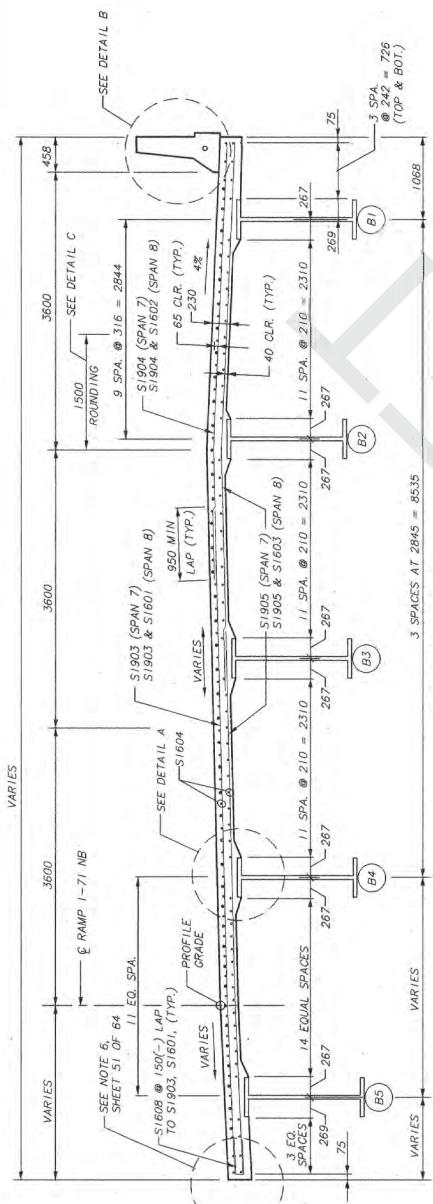
**FINAL FOR CONSTRUCTION**



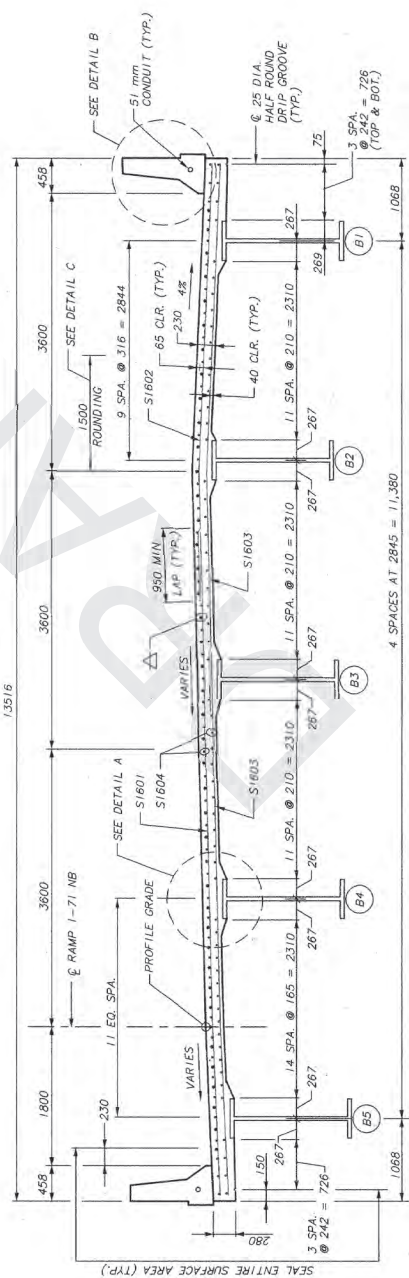
| SUPERSTRUCTURE<br>(SPANS 6.7.8) |           |        |      |  |
|---------------------------------|-----------|--------|------|--|
| REINFORCING STEEL LIST          |           |        |      |  |
| MARK                            | TOTAL NO. | LENGTH | TYPE |  |
| S1601                           | 507       | 87900  | STR. |  |
| S1602                           | 507       | 59600  | STR. |  |
| S1603                           | 1014      | 73000  | STR. |  |
| S1604                           | 1608      | 12000  | STR. |  |
| S1605                           | 112       | 11400  | STR. |  |
| S1606                           | 444       | 21300  | I    |  |
| S1607                           | 84        | 12000  | STR. |  |
| S1608                           | 615       | 10300  | I    |  |
| S1901                           | 444       | 7850   | 3    |  |
| S1902                           | 444       | 8950   | 3    |  |
| S1903                           | 487       | 94000  | STR. |  |
| S1904                           | 487       | 57000  | STR. |  |
| S1905                           | 974       | 76000  | STR. |  |



DETAIL C

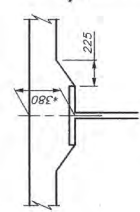


TYPICAL SECTION  
(SPAN 6 STA. 410+252.220 TO STA. 410+  
(SPAN 7 AND SPAN 8)



TYPICAL SECTION  
(SPAN 6 STA. 410+197.891 TO STA. 410+)

- NOTES:**
1. TRANSVERSE BARS TO BE PLACED RADIAL TO 1-71 NB ALIGNMENT.
  2. FOR SUPERELEVATION RATES, REFERENCE SUPERELEVATION PLANS.



DETAIL A

DECK SLAB DEPTH: THE DISTANCE SHOWN FROM TOP OF DECK SLAB TO TOP OF STEEL GIRDER WEB IS THE DESIGN DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.