

ODOT District 8
2023 Fracture Critical and In-Depth
Element Level Inspection Report

December 3, 2023

Bridge No. HAM-71-0000L
SFN: 3105946



Prepared for:



ODOT District 8
505 SR 741
Lebanon, Ohio 45036

PID No. 105475

Prepared by:

TRANSYSTEMS

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Project Number P402220026

**2023 FRACTURE CRITICAL AND IN-DEPTH ELEMENT LEVEL
PHYSICAL CONDITION REPORT**

of

BRIDGE NO. HAM-71-0000L

SFN: 3105946

CINCINNATI, OHIO

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**OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 8**

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BRIDGE DESCRIPTION

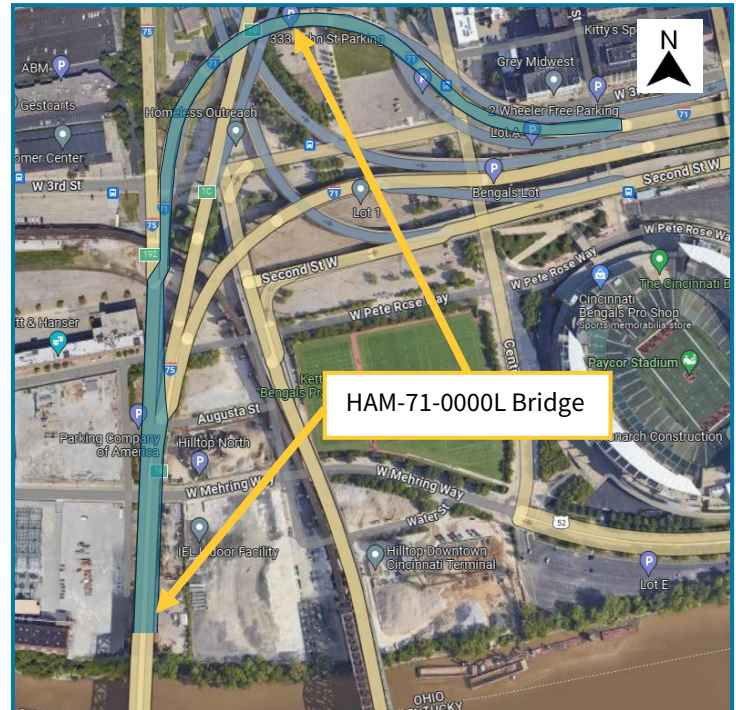
HAM-71-0000L (SFN: 3105946) carries four southbound lanes of vehicular traffic from Interstate Route 75, Interstate Route 71 (Fort Washington Way), and Third Street to the upper deck of the Brent Spence Bridge (Figure 1). The deck width and the number of travel lanes varies as the different ramps converge towards the Brent Spence Bridge. The structure was built by Peneker Construction and opened to traffic in 1963.

The bridge is a 38-span structure with a total length of approximately 2,683' and consists of ten units separated by expansion joints. The units consist of rolled or welded steel girders that support a reinforced concrete deck continuously between the expansion joints. Crossframes are welded or bolted to the transverse stiffeners at varied spacings in all spans. The steel girders frame into steel pier caps or bear on reinforced concrete substructures, including cap and column piers, hammerhead piers, a wall type pier/ abutment, all with deep concrete pile foundations. The River Pier, Piers 1A-13A, and Pier 29B are Fracture Critical steel pier caps on concrete columns; Piers 14A-28B, Pier 1 (FWW) and Piers 3-8 (FWW) are concrete cap-and-column piers; and Pier 2 (FWW) is a Fracture Critical steel box pier cap on a concrete hammerhead pier. Selected sheets from the design plans are attached in Appendix A.

The bridge was built in 1961 and 1962. In 1988, the parapets were refaced, 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 with a total of 10 spans that connected the new alignments of I-71 and Third Street. The FWW spans consist of welded steel plate girders and continuous rolled beams with a composite concrete deck supported on reinforced concrete piers newly constructed in 1999 and the existing Piers 28B and 29B. 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.

The original bridge superstructure consists of seven steel girders that are framed into the steel box pier caps and are continuous through the interior of the 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 connected to seat angles that are bolted/riveted to the pier cap webs. There are interior stiffener plates that transfer the load from the butt plates through and across the pier caps. The girder webs are connected to the pier cap webs using bolted/riveted connection angles.

The FWW superstructure consists of welded steel plate girders and rolled beams. Spans 1 through 4 are made up of five rolled steel beams that run continuously through the Fracture Critical steel pier cap at Pier 2 by end plates that are welded to the beams and bolted to the steel pier cap. There are welded stiffener plates within the steel pier cap that transfer the forces across the pier cap at



Location Map

the beam locations. Span five consists of ten rolled steel beams that include the adjacent beams that carry the extension of Ramp E. As Ramp E transitions, only seven beams are spanning the substructure units in Span 6 and Span 7. Spans 8 and 9 consist of six rolled steel beams and Span 10 consists of five rolled steel beams.

The first 14 piers of the original structure starting from the Ohio River have fracture critical steel box pier caps that support the southbound lanes. The caps on the River Pier and Piers 1A through 9A are riveted, built-up steel boxes simply supported on square reinforced concrete pier columns with the east ends of boxes at Piers 8A and 9A exposed beyond the deck. The caps at Piers 10A through 12A are riveted built-up steel boxes with cantilevers at the west ends, each supported by two square reinforced concrete columns, and partially exposed beyond the upper deck to straddle the lower deck. Pier 13A is a riveted, built-up steel box cantilevered at both ends and supported by two square reinforced concrete columns.

Pier 29B and Pier 2 (FWW), located on the FWW portion that was added in 1999, also have fracture critical steel pier caps. Pier 29B is a built-up I-section cap. Pier 2 (FWW) is a welded steel box that is supported on two bearings with cantilevered ends. The bearings are supported by a reinforced concrete hammerhead pier.

The nomenclature for the bridge follows the original 1960 design plans and the 1999 FWW rehabilitation plans. Spans, crossframes and substructure units are labeled from south to north. For components of the bridge decks in all spans, locations are based on the alignment of the original bridge. Substructure units for the original structure are numbered from the River Pier, Pier 1A to Pier 20A, and Pier 21B to Pier 28B. The FWW spans start at Pier 28B and continue through Pier 29B, Pier 8 to Pier 1, and the Wall Pier (see [Figure 1](#)).

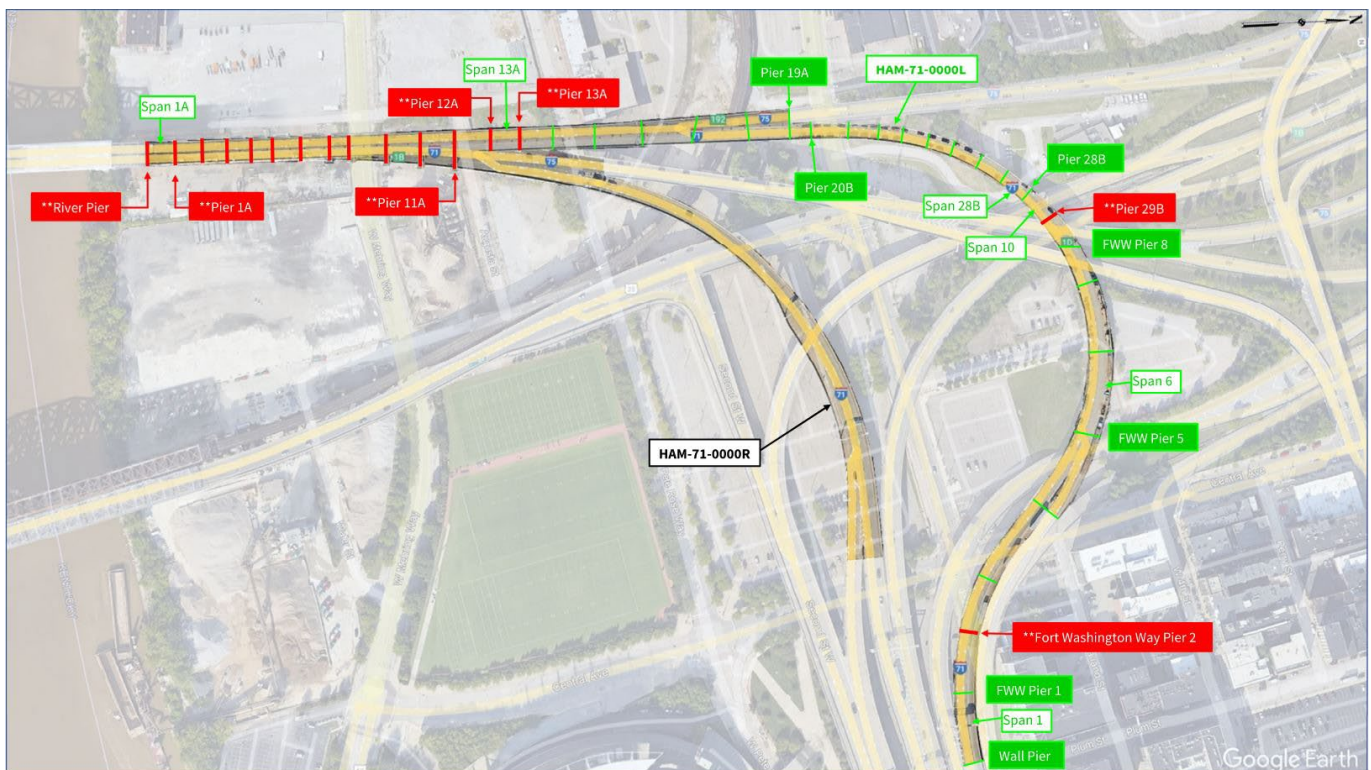


Figure 1 – Overall Location Map and Bridge Nomenclature

RECENT 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 crossframes.
- 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.

INSPECTION SCOPE AND PROCEDURE

Personnel from TranSystems Corporation and TRC Engineers, Inc. performed a fracture critical and in-depth element level inspection of the bridge during the days of Septmeber 18 – 22, 2023 and during the nights of September 17- 20, 2023. All fracture critical members were inspected by team leaders who have completed the *National Highway Institute (NHI) Course No. 130078 - Fracture Critical Inspection Techniques for Steel Bridges*. Access to the structure was gained through the use of a 135-foot manlift, 41-foot bucket truck, 24-foot extension ladder, and on foot. The 80-foot manlift was used to inspect Spans 28B and 10 and Pier 29B. The bucket truck was used during the day to inspect the east end of the structure in the FWW portion including Pier 2 (FWW). The same truck was used at night to access the superstructure components and exterior of the fracture critical pier caps from River Pier to Pier 13A. The 135-foot manlift and 24-foot extension ladder were used to inspect the remainder of the structure including the interior of the fracture critical pier caps. Span 18A was inspected visually from as close as possible to the railroad without fouling the tracks. The fracture critical box pier caps of the original structure were entered through the access hatches at the west ends and the FWW fracture critical box pier was entered through a hatch in the bottom flange of the north overhang. Interior inspections of the box pier caps were performed following non-permit confined space procedures and the hatch perimeters were closed sealed with caulk after the entry was complete.

Traffic control was necessary to perform a hands-on inspection of the exterior of the fracture critical pier caps. A nighttime left lane closure of the I-75 Southbound ramp to Second Street was used the night of September 17, 2023. A two-night double left lane closure of I-75 NB (lower level of north approach to Brent Spence Bridge) was utilized from September 18-19, 2023 to inspect all superstructure elements from Girders A-D in Spans 1A-13A. A similar double right lane closure of I-75 NB (lower level of north approach to Brent Spence Bridge) was utilized on September 20, 2023 to inspect all superstructure elements from Girders E-G in Spans 1A-13A. A daytime, single left lane closure of 3rd street was used to gain access to Pier 2 (FWW). Traffic control was provided by A&A Safety, Inc. and all signs/devices were placed in accordance with the latest Ohio Manual for Uniform Traffic Control Devices.

The inspection findings were recorded on bridge specific field inspection forms, and field sketches were created to document specific conditions. Inspection equipment utilized during the inspection included but was not limited to: chipping hammers, wire brushes, measuring tapes, 6 foot carpenter rules, and flashlights. Color digital photographs were taken of areas of deterioration, condition changes, typical details, and any immediate maintenance needs, if necessary.

INSPECTION TEAM

The inspection team members are as follows:

- Chris Seman, PE, NBIS & FC Team Leader – TranSystems
- Kenny Wagner, PE, NBIS & FC Team Leader - TranSystems
- Jacob Adamrovich, EI – TranSystems
- Christopher Hay, PE – TRC Engineers, Inc.
- Lisa Brown, EI – TRC Engineers, Inc.

CONDITION RATING

State and federal guidelines for evaluating the condition of bridges have been developed to promote uniformity in the inspections performed by different teams and at different times. Condition ratings are used to describe the existing, in-place bridge as compared to the as-built condition. The following table was used as a guide in evaluating the condition of the various members of the bridge.

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

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

1. Manual of Bridge Inspection, Ohio Department of Transportation (ODOT), 2014.
2. Manual for Bridge Element Inspection, 2nd Edition, AASHTO, 2019 (rev 2022).
3. Manual for Condition Evaluation of Bridges, 2nd Edition, AASHTO, 2011 (rev 2016).
4. Bridge Inspector’s Reference Manual, U. S. Department of Transportation, 2022 (rev 2023).
5. Inspection of Fracture Critical Bridge Members, U.S. Department of Transportation, 1986.
6. National Bridge Inspection Standards, U.S. Department of Transportation, 2022.
7. Manual for Bridge Evaluation, AASHTO, 2018 (3rd edition with 2020 and 2022 Interim Revisions).
8. Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation’s Bridges, Federal Highway Administration, 1995 with Latest Revisions.
9. Ohio Manual of Uniform Traffic Control Devices (OMUTCD), ODOT, 2012 (rev 2011).

EXECUTIVE SUMMARY

The HAM-71-0000L Bridge is in SATISFACTORY CONDITION [6-NBIS] overall. Significant findings include:

- Isolated spalls with exposed reinforcement in the deck underside
- Section loss throughout the girders in Spans 15A-28B
- Active corrosion throughout the interior of the steel box pier caps

The overall item ratings can be summarized in Table 1:

Bridge Condition Summary Ratings		
ITEM	RATING	TYPICAL NOTES
DECK	6	Hairline cracks with efflorescence, isolated spalls with exposed reinforcement, and minor delaminations
SUPERSTRUCTURE	6	Paint failure throughout, minor surface and laminate corrosion, up to 1/8" deep section loss throughout girders
SUBSTRUCTURE	6	Isolated spalls with exposed reinforcement and hairline cracking throughout concrete units. Painted-over pitting, active corrosion, and pack rust throughout the steel box pier caps

Table 1 – Bridge Condition Summary Ratings

INSPECTION FINDINGS

ITEM 58 – DECK SUMMARY

The deck is in SATISFACTORY CONDITION [6-NBIS] overall. The deck condition is controlled by the underside which exhibits multiple transverse hairline cracks with isolated areas of efflorescence (see **Photo 1**), as well as spalling throughout, some with exposed reinforcement. Both bridge railings have moderate cracking some with efflorescence, spalls, areas of delaminations and mineral buildup from sodium chloride spray throughout. Although, the downspouts and deck joints were replaced in 2017 there are several deficiencies present.



Photo 1 – Typical underside of deck with transverse cracking and efflorescence throughout (looking northeast in Span 2 (FWW)).

ELEMENT 12 – REINFORCED CONCRETE DECK

The reinforced concrete deck is in SATISFACTORY CONDITION [6-NBIS] overall. Steel grates and wood panel shielding are installed between the girders in Spans 1A through 13A. The panels were lifted to gain access for visual inspection of the deck underside in various locations. The underside of the deck within the limits of the grating and wood panels has hairline transverse and map cracking and one isolated 36" wide by 12" long by 3" deep spall with exposed reinforcement in Span 8A between Girders A and B near Pier 8A. Hairline to moderate width cracks with efflorescence typically spaced between 1' to 6' apart are present throughout the deck underside in Spans 14A through 28B. There was limited access to Span 18A due to the presence of the railroad tracks below. This span typically exhibits a dark layer of soot throughout all framing members and underside of the deck. Cracking with

efflorescence is typical throughout the underside of deck for the full width of the bays between the girders in the FWW spans. Individual cracks are typically spaced 2'-4' apart within each bay.

There are areas of delamination and spalls with exposed reinforcement in isolated locations throughout. The most notable locations are as follows:

- Span 19A – There is a 18" long by 24" wide by 2" deep spall with two exposed transverse reinforcing bars between Girders G and H near Pier 19A.
- Span 20A – 12" diameter by 1" deep spall with one exposed transverse reinforcing bar between Girders A and B at midspan and 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 with two exposed transverse reinforcing bars with 1/16" section loss from Girder A through Girder E at midspan crossframes (see Photo 2). This spall is located above West Third Street and all loose concrete was removed and secured safely at the time of inspection.
- Span 23B – 24" long by 12" wide by 1" deep spall with two exposed transverse reinforcing bars with 1/16" section loss between Girders D and E just past the first crossframe from Pier 22B.
- Span 26B – Four spalls up to 36" long by 36" wide by 3" deep with four transverse and one longitudinal reinforcing bar exposed between Girders D and E at the second crossframe from Pier 25B (see Photo 3).
- Span 27B – 48" long by 36" wide by 3" deep spall with four transverse and three longitudinal reinforcing bars exposed between Girders D and E at the first crossframe from Pier 26B (see Photo 4).

If necessary, loose concrete debris around spalls and delaminations was safely removed and secured during the inspection.

Haunch spalls are typical along the edge of the top flange of Girders A through E in Spans 20B through 28B (see Photo 5). There are typical full depth 48" by 48" 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.



Photo 2 – Full width underside of deck spall at midspan of Span 21B (looking up and south).



Photo 3 – Four spalls with exposed reinforcement in the underside of the deck between Girders D and E in Span 26B (looking up and west).



Photo 4 – Underside of deck spall between Girders D and E in Span 27B (looking up).

The deck overhangs typically exhibit hairline map cracking and isolated spalls with exposed reinforcement. The following are the most significant locations:

- Span 1A – Two 8" diameter by 1" deep spalls with exposed reinforcement in the east overhang near the River Pier and a 21" long by 12" wide by 1" deep edge spall with exposed reinforcement on the east face of the east overhang near midspan (see Photo 6).
- Span 5A – There is a 5" diameter by 1" deep spall with exposed rebar in the east face of the deck at midspan.
- Span 6A – There are two spalls up to 2" long by 4" wide by 2" deep in the underside of the west overhang with exposed reinforcement.
- Span 8A – 24" long by 12" wide by 1" deep spall with exposed reinforcement in the west overhang and a 5' long by 20" wide by 5" deep spall with exposed reinforcement in the east overhang, both near midspan.
- Span 20B – 60" long by 36" wide by 4" deep spall with five transverse and one longitudinal reinforcing bars exposed in the east overhang 15' from Pier 19A (see Photo 7).
- Span 23B - 18" long by 12" wide by 12" high by 5" deep corner spall with one transverse reinforcing bar exposed in the west overhang at the Pier 23B joint
- Spans 26B and 27B – Areas of wide cracking and heavy efflorescence typically throughout the east bottom edge of the deck (see Photo 8).



Photo 5 – Typical haunch spalls along the top flange of Girder A in Span 20B (looking northwest).



Photo 6 – 21" long by 12" wide by 1" deep spall on the east face of the east overhang near midspan of Span 1A (looking west).



Photo 7 – East overhang spall with exposed reinforcement near Pier 19A in Span 20B (looking west).

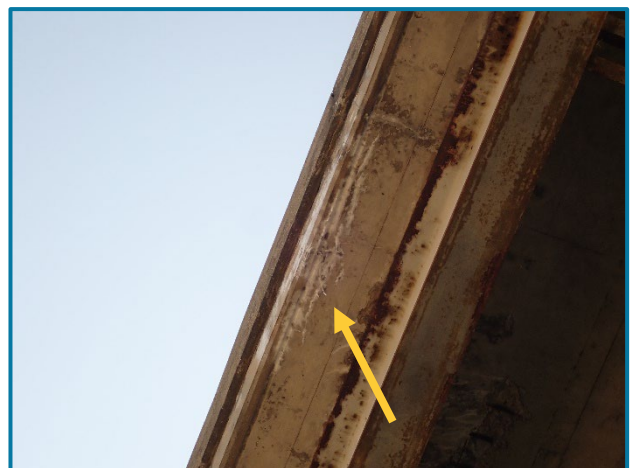


Photo 8 – Heavy cracking and efflorescence throughout the bottom edge of the east overhang in Span 26B (looking up and south).

ELEMENT 510 – WEARING SURFACE

The wearing surface is in SATISFACTORY CONDITION [6-NBIS] overall (see Photo 9) with minor spalls and hairline to moderate longitudinal, diagonal, and transverse cracks throughout. The wearing surface was visually inspected from a 135-foot manlift. Small shallow pop-out spalls less than 6" in diameter are typical throughout all spans (see Photo 10). There are typical full width transverse hairline cracks spaced 2'-4' apart throughout the FWW spans. The high friction treatment of the wearing surface in these spans is worn away in the travel lanes, but still present in the shoulders (see Photo 11). There are multiple isolated concrete and asphalt patches throughout Spans 6A, 8A, and 14A (see Photo 12). There are several areas of delamination throughout based on the 2020 ODOT Concrete Wearing Surface Delamination Report (available from the District).



Photo 9 – Typical wearing surface with hairline transverse cracks throughout (looking northwest in Span 3 (FWW) at Pier 2 (FWW)).



Photo 10 – Typical shallow pop-out spalls in the wearing surface in Span 3A (looking east).

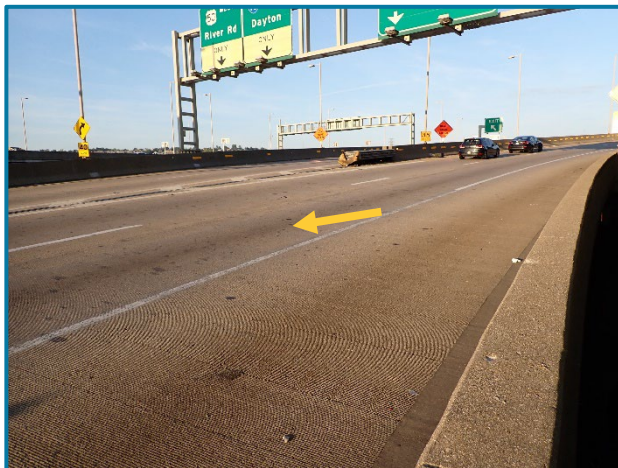


Photo 11 – Typical high friction treatment worn away in the travel lanes but present in the shoulders (looking southwest in Span 1 (FWW)).



Photo 12 – Typical concrete patches near the expansion joint at Pier 8A (looking east).

ELEMENT 300 – STRIP SEAL EXPANSION JOINT

The expansion joints are in FAIR CONDITION [5-NBIS] overall (see **Photo 13**) with minor to heavy debris impaction, deterioration, and isolated areas of leakage. There are strip seal expansion joints located at Piers 4A, 8A, 12A, 15A, 19A, 23B, 28B, 7 (FWW), 4 (FWW), and the Wall Pier. The expansion joints at Piers 4A, 8A, 15A, and 19A were replaced in 2017. All joints typically exhibit minor debris impaction throughout the entire length and minor tears are present at Piers 15A, 23B, 28B, and 7 (FWW). Isolated areas of heavy debris buildup and vegetation growth were noted in the expansion joint at the Wall Pier within the limits of the shoulders (see **Photo 14**). Daylight can be seen through two tears in the Wall Pier strip seal material and the longitudinal joint material between HAM-71-0000L and HAM-50-2091L (see **Photo 15**). Signs of water leakage were noted at these locations.



Photo 13 – Typical expansion joint at Pier 8A (looking east).



Photo 14 – Heavy debris impaction and vegetation growth in the strip seal expansion joint at the Wall Pier (looking south from the north railing).



Photo 15 – Daylight shining through tears in the strip seal material between HAM-71-0000L and HAM-50-2091L (looking north). Note the rust and water staining to the underside of deck surrounding the torn strip seal.

ELEMENT 331 – REINFORCED CONCRETE BRIDGE RAILING

The reinforced concrete bridge railings are in POOR CONDITION [4-NBIS] overall with isolated spalls with exposed reinforcement, isolated minor delaminations, and hairline to wide transverse and longitudinal cracking with efflorescence and rust staining throughout. The exterior face of the railings in all spans typically exhibit full height by hairline vertical cracking with efflorescence spaced 1'-2' apart. The interior faces typically exhibit wide longitudinal cracks 6" located below the top edge (see Photo 16) and full height vertical cracking spaced 1' apart throughout.

There are isolated spalls throughout the railings in the original spans. 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 (see Photo 17). The spall is surrounded by delaminated concrete and wide longitudinal and vertical cracks with water and rust staining. There is an 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 (see Photo 18). The sign visibly moves with the vibration from traffic. Isolated concrete patches are present throughout both railings, typically at the top edge (see Photo 19). The patches are sound and in good condition overall.



Photo 16 – Typical longitudinal cracking on the interior face of the concrete railing (looking northwest in Span 3 (FWW)).



Photo 17 – Spall with exposed reinforcement at the top edge of the west railing at the River Pier (looking east).



Photo 18 – Spall with exposed reinforcement at the top edge of the east railing at the base of a sign connection (looking west).



Photo 19 – Typical concrete patches at the top of the railing (looking southeast at the west railing in Span 7A).

ELEMENT 815 – DRAINAGE

The bridge deck drainage is in FAIR CONDITION [5-NBIS]. No ponding water or evidence of ponding water was noted on the top of deck. Isolated drains were replaced, and all scuppers were cleaned in 2017. Multiple drains are clogged at the downspout and at deck level scupper locations. Scuppers that are 100% clogged are located in Spans 3A, 9A, 10A, 17A, 18A, and at the Wall Pier in Span 1 (FWW) (see Photo 20). The drainage grate over the scupper near the east railing at Pier 19A has multiple broken bars.

There are numerous locations where there is a large gap between the deck drainpipe and the downspout attached to the pier columns. The exposed drainage bells are typically fully clogged with debris (see Photo 21). The downspout T-joint is disconnected on the north face of Column 1 at Pier 12A (see Photo 22) and the pipe is breaking, but this condition does not appear to have changed from the 2022 inspection. 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 (see Photo 23). Various locations throughout are also disconnected from the underground drainage termination, but do not show signs of erosion.



Photo 20 – Typical clogged scupper (looking south in Span 17A near Pier 16A).



Photo 21 – Drainage bell clogged with debris at the west column on the north side of Pier 8A (looking southwest).



Photo 22 – Disconnected downspout T-joint on the north face of Column 1 at Pier 12A (looking south). Note the tearing of pipe.



Photo 23 – Erosion at the base of Column 2 on the north side of Pier 4A (looking east).

ITEM 59 – SUPERSTRUCTURE SUMMARY

The superstructure is in SATISFACTORY CONDITION [6-NBIS] overall. There are localized areas of moderate laminar corrosion with up to 1/8" deep section loss to the top of the bottom flanges, mainly found at the fascia girders. The girders in Spans 15A – 28B exhibit paint failure and active corrosion throughout, this condition is most advanced on the fascia girders (see Photo 24). The rocker bearings typically exhibit minor surface corrosion with paint peeling and some of the rockers have pack rust between the rocker and masonry plate.



Photo 24 – Active corrosion throughout the east fascia girder in Span 16A (looking northwest).



Photo 25 – Typical painted over pack rust between the girder bottom flange and seat angle at the girder to pier cap connection (looking south at Girder A on the north side of the River Pier Cap).



Photo 26 – Section loss throughout bottom flange and web on the east face of Girder H in Span 18A (looking northwest).

ELEMENT 107 – STEEL OPEN BEAMS/GIRDERS

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 all interior bays of Spans 1A-11A and portions of Spans 12A-14A, therefore only the bottom flanges were inspected with hands-on techniques. The shielding could not be removed, so the remaining portions of the girders were inspected visually through the grating. The girders in these spans were painted in 2021 and are in good condition overall. 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 (see Photo 25). The bottom flange of Girder G in Span 1A is bent upward 1/2" over a 18" length. There are two 1" diameter holes in the web of Girder F between the bearing stiffeners at the hinge assembly at Pier 4A.

The girders in the remaining original spans typically exhibit minor surface corrosion and freckled rust throughout due to the failed protective coating system. The bottom flanges, lower webs, and transverse stiffeners of the fascia girders in Spans 16A-22B exhibit isolated areas of laminate corrosion with section loss up to 3/16" deep. 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 (see Photo 26). 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 (see Photo 27). There is a bent stiffener on the east side of Girder E near Pier 21B in Span 22B (see Photo 28).

The end 10' of the girders at the expansion joints at Piers 15A, 19B, and 23B were cleaned and painted in 2017 and remain 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 is a 3/4" diameter inactive corrosion hole in a stiffener 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 (see Photo 29).

There are fatigue-prone welds from previous attachments on the bottom flanges of the girders in Span 15A, 12' from Piers 14A and 15A (see Photo 30).

The girders in Spans 1-10 (FWW) are in good condition, with no significant defects noted.



Photo 27 – Laminate corrosion with up to 1/8" deep section loss to the underside of the bottom flange of Girder A in Span 20A (looking southeast).



Photo 28 – Bent stiffener near the top flange on the east side of Girder E near Pier 21B in Span 22B (looking west).



Photo 29 – Painted over corrosion hole in the web behind the bearing stiffener of Girder D at Pier 19B (looking west).



Photo 30 – Fatigue-prone welds on the underside of the girder bottom flange in Span 15A (looking south at Girder F).

ELEMENT 310 – ELASTOMERIC BEARING

The elastomeric bearings are in SATISFACTORY CONDITION [6-NBIS] overall. There are elastomeric bearings at Piers 15A, 16A, 19A, 23B, and 28B. The bearings typically have some minor areas of surface corrosion and isolated paint failure (see Photo 31). The elastomeric bearing pads beneath Girder A in Spans 23B and 24B at Pier 23B were expanded 7° at an ambient temperature of 73° F (see Photo 32). The bearing for Girder E in Span 23B exhibits a similar condition. The remaining bearings at Pier 23B showed very little signs of expansion and were in a neutral position. Although the bearing pads are distorted, they do not appear to be sliding on the pier cap. There is a painted over 1" diameter hole in the web of the bearing riser of Girder E at Pier 23B. Painted over pitting is typical throughout the bearing risers in Span 24B at Pier 23B (see Photo 33).

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 at the time of the inspection. No indications of bearing distress/cracking/bulging, separation between the load plates and bearings, separation between the bearings and pier cap, permanent displacement/deformation, or uplift were observed.



Photo 31 – Typical elastomeric bearing (looking southwest at the Girder D bearing at Pier 19A).



Photo 32 – Bearing pads expanded beneath Girder A in Spans 23B and 24B at Pier 23B (Looking east).



Photo 33 – Typical painted over pitting throughout the elastomeric bearing assembly (looking southwest at the Girder E bearing at Pier 23B). Note the corrosion on the south bearing.

ELEMENT 311 – MOVABLE BEARING

The moveable bearings are in SATISFACTORY CONDITION [6-NBIS] overall. The original girder rocker bearings typically exhibit paint failure and surface corrosion throughout. Pack rust between the rocker and masonry plate was noted at Bearing A at Pier 14A, Bearing A at Pier 27B, and Bearing E at Piers 22B and 28B, however no bearing uplift was observed (see Photo 34). The anchor rod of Bearing C at Pier 28B is bent 1" to the south. The bearing at Girder A was contracted 7° to the south (see Photo 35) 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.

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. 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 (see Photo 36). 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 (see Photo 37).



Photo 34 – 1/4" thick pack rust between the masonry plate and rocker bearing of Girder E at Pier 22B (looking north).



Photo 35 – Girder A bearing at Pier 14A contracted 7° to the south at Pier 14A (looking west).



Photo 36 – Misaligned bearing at the east end of Pier Cap 11A (looking north).



Photo 37 – Loose anchor bolt nut at the Girder B bearing of Pier 13A (looking southeast).

ELEMENT 313 – FIXED BEARING

The fixed bearings are in SATISFACTORY CONDITION [6-NBIS] overall and typically exhibit paint failure and moderate surface corrosion throughout (see [Photo 38](#)).



Photo 38 – Typical surface corrosion throughout fixed bearings (looking southwest at Girder A bearing at Pier 21B).

ELEMENT 314 – POT BEARING

The pot bearings of the FWW spans are in SATISFACTORY CONDITION [6-NBIS] overall. The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout (see [Photo 39](#)). There are a few instances of the elastomer bulging or becoming extruded from the bearing pot (see [Photo 40](#)). The teflon pad at Bearing 7 on Pier 6 is extruded 6" from the pot bearing (see [Photo 41](#)).



Photo 39 – Corrosion throughout the bearing at Girder 6 of Pier 29B (looking southeast).



Photo 40 – Teflon pad extruded from the Girder 6 bearing at Pier 7 (looking southwest).



Photo 41 – Teflon pad extruded from the Girder 7 bearing at Pier 6 (looking northeast).

ELEMENT 515 – STEEL PROTECTIVE COATING

The steel protective coating system is paint and is in FAIR CONDITION [5-NBIS] overall.

As previously mentioned, Spans 1A-14A were painted in 2020-2021; the paint in these spans is in excellent condition (see [Photo 42](#)). The pier caps were also painted as part of the 2020-2021 paint contract. Some of the steel pier caps have isolated minor rust staining along the bottom of the web.

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. The paint in these locations is in good condition (see [Photo 43](#)).

In the areas of the original spans not recently painted (i.e., Spans 15A-28B), paint failure is typical on all girders with chalking, dulling, flaking, and peeling throughout. Surface corrosion is active at all locations where the paint has failed (see [Photo 44](#)). 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 (see [Photo 45](#)).

The paint on the FWW spans is typically in good condition with small areas of isolated surface rust throughout (see [Photo 46](#)).



Photo 42 – Typical protective coating system condition in Spans 1A-14A (looking southeast towards Pier Cap 5A).



Photo 43 – End 10' of steel members at Pier 19A expansion joint painted during 2017 rehabilitation (looking east).



Photo 44 – Typical surface corrosion throughout Spans 15A-28B (looking northwest at Girder H in Span 16A).



Photo 45 – Typical failed paint on the exterior face of the fascia girder with areas of measurable section loss (looking east at the west face of Girder A in Span 23B).



Photo 46 – Typical paint condition in the FWW spans (looking west in Span 8).

ELEMENT 820 – STEEL SEATED-HINGE ASSEMBLY

The steel seated-hinge assemblies in Spans 4A, 8A and 12A are in FAIR CONDITION [5-NBIS]. The 2021 inspection noted that the bronze shim plate of the Girder C hinge in Span 4A was shifted 2" to the south, but no indication of significant additional displacement was observed during inspection in 2023. There are isolated areas of painted over section loss on several of the bearing plates (see [Photo 47](#)).



Photo 47 – Typical area of section loss painted over on the bearing plates near Pier 4A (looking west).

DIAPHRAGMS AND CROSSFRAMES (no associated element)

The diaphragms and crossframes are in good condition with only minor surface corrosion noted throughout the FWW spans (see [Photo 48](#)), and significant paint failure with minor surface corrosion throughout the original spans (see [Photo 49](#)).



Photo 48 – Typical crossframe with minor surface corrosion in Span 5 (FWW) between Beams 9 and 10 (looking south).



Photo 49 – Typical crossframes with minor surface corrosion in the original spans (looking south in Span 24B between Girders A and B).

ALIGNMENT (no associated element)

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

FATIGUE (no associated element)

The superstructure fatigue prone details are in good condition. See *Element 231 – Steel Pier Cap* for fatigue related deficiencies corresponding to each individual fracture critical member. Due to the previously noted bearings in Span 24B at Pier 23B rocking side-to-side, the span 24B bearings should continue to be monitored.

ITEM 60 – SUBSTRUCTURE SUMMARY

The substructure is in FAIR CONDITION [5-NBIS], with several Fracture Critical pier caps in fair condition. The original bridge substructure consists of twenty-nine reinforced concrete pier bents with fourteen of them having fracture critical steel box pier caps. The FWW portion consists of eight reinforced concrete pier bents, one hammerhead pier with a fracture critical steel box pier cap, and one wall type pier. The fracture critical steel box pier caps exhibit moderate areas of painted over pack rust and isolated paint failures with some minor scrapes to the exteriors. The concrete piers in the original spans typically exhibit minor hairline vertical and horizontal cracking with some isolated areas of spalling with exposed reinforcing. As part of the 2017 rehabilitation, concrete patches and Fiber Reinforced Polymer (FRP) wrapping were applied to Piers 5A, 7A, 15A, 19A, 23B, and 28B (see [Photo 50](#)). There are hairline flexural cracks on the FWW concrete pier cap overhangs.

ELEMENT 205 – REINFORCED CONCRETE COLUMN

The reinforced concrete pier columns are in SATISFACTORY CONDITION [6-NBIS]. Typically, there are isolated minor delaminations and spalls with exposed reinforcement and hairline cracking throughout (see [Photo 51](#)). Isolated portions of Piers 5A, 7A, 12A, 15A, 19A, 23B, and 28B were repaired with concrete patches and FRP wrapping as part of the 2017 rehabilitation project. All patches are sound and the FRP wrapping is in good condition with only isolated areas of peeling/failing protective coating. Shallow spalls with exposed reinforcement due to lack of cover are typical at various pier columns at or near deck level (see [Photo 52](#)).



Photo 50 – Typical concrete piers in the original spans with FRP wrapping throughout (looking southeast at Piers 17A-19A).



Photo 51 – Typical delamination and hairline cracking throughout the concrete column (looking north at Column 2 of Pier 8A).

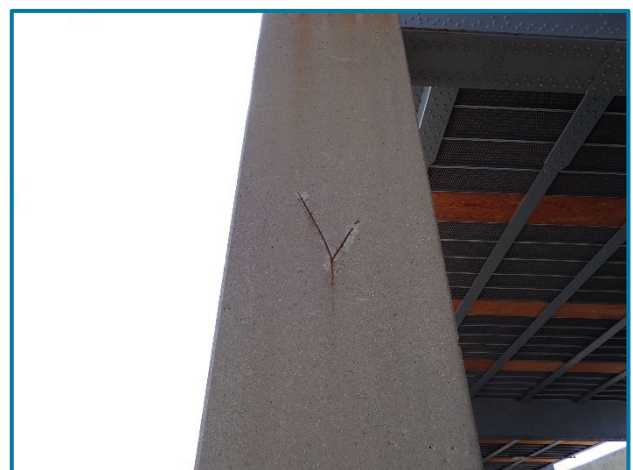


Photo 52 – Typical shallow spall with exposed reinforcement wire ties due to lack of cover (looking south at the north face of Column 1 at Pier 5A).

The locations of the more notable spalls with exposed reinforcement are as follows:

- 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 (see Photo 53).
- Pier 13A, Column 2, South Face – There is a 48" high by 12" wide by 3" deep corner spall with exposed reinforcement.
- Pier 16A, Columns 1 & 2, North and South Faces – There are 12" diameter by 1" deep corner spalls at each existing corner protection bracket (see Photo 54).
- 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 (see Photo 55).
- 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 (see Photo 56).
- Pier 24B, Column 2, Northwest Corner - 36" high by 12" wide by 2" deep corner spall with exposed reinforcement at the base of the column (see Photo 57).
- 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 (see Photo 58).



Photo 53 – Spall with exposed reinforcement at the top northeast corner of Column 2 at Pier 11A (looking north).



Photo 54 – Spalls at the corners of the existing protection brackets at Pier 16A (looking south at the north face of Column 1).



Photo 55 – Spalls with exposed reinforcement on the south face of Column 1 at Pier 17A (looking northwest).



Photo 56 – Spall with exposed reinforcement on the south face of Column 2 at Pier 23B (looking north at the base).



Photo 57 – Spall with exposed reinforcement at the northwest corner of Column 2 at Pier 24B (looking southeast).



Photo 58 – Spall at the east bearing masonry plate of Pier Cap 29B (looking north).

ELEMENT 210 – REINFORCED CONCRETE PIER WALL

The reinforced concrete pier wall is in GOOD CONDITION [7-NBIS] with no significant deficiencies noted. While most of the Wall Pier is inaccessible due to a chain link fence and installed utilities (see [Photo 59](#)), the remaining portions of the pier wall were accessed with the use of a 24-foot extension ladder.

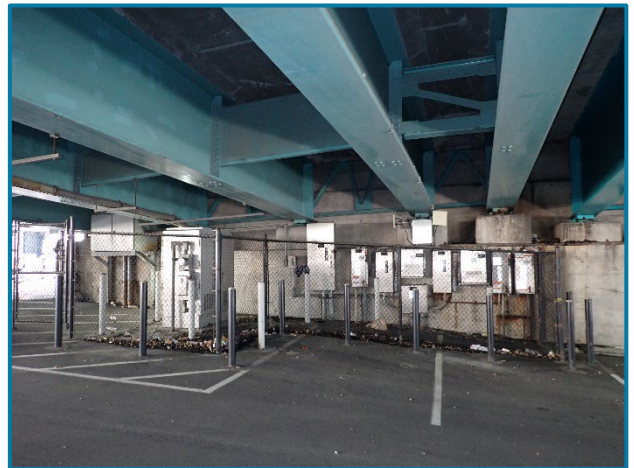


Photo 59 – Utilities fenced in at the Wall Pier (looking north).

ELEMENT 231 – STEEL PIER CAP

RIVER PIER CAP – INSPECTION FINDINGS

The fracture critical 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. 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 (see Photo 60).

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 (see Photo 61). 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.

Pier Cap Interior

The interior of the 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 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 (see Photo 62). 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 misdrilled holes adjacent to the five missing



Photo 60 – Pack rust between the south web plate and bottom flange angles on the exterior of the River Pier Cap (looking west).

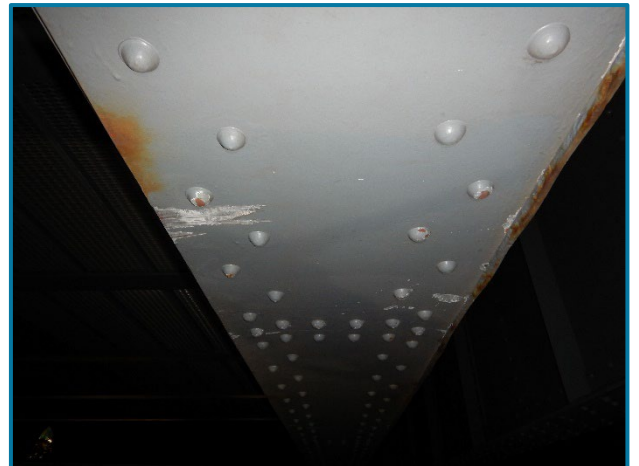


Photo 61 – Minor scrape on the underside of the River Pier Cap bottom flange between Girders B and C (looking east).



Photo 62 – Active corrosion along the bottom flange angle at the north web plate between Girders C and D inside the River Pier Cap (looking north).

bolts/rivets. One bolt is not fully seated at the south top flange angle of Girder E.

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.

River Pier Cap Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*C'	Pier Cap Web Plate	Typical tack welds to interior transverse stiffeners.	63
C	Pier Cap Web Plate	Fillet welds at the ladder rungs on the north web interior near the east end.	64
*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 Web Plate	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.*

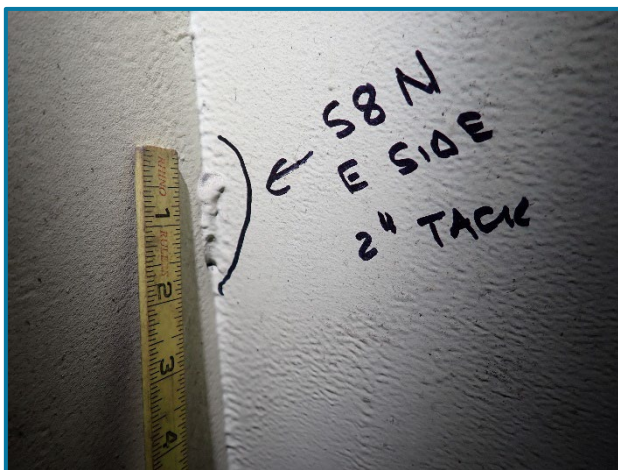


Photo 63 – Typical tack weld between the interior transverse stiffener and web plate (looking northwest inside of the River Pier Cap).



Photo 64 – Fillet weld at the ladder rung on the north web plate on the inside of the River Pier Cap (looking northeast).

PIER CAP 1A – INSPECTION FINDINGS

The fracture critical 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. 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 (see Photo 65) and a 4" wide by 1" long gouge with six damaged rivet heads in the underside of the bottom flange below Girder B.

There is typical pack rust between the web plates and the bottom flange plates/angles that has 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 on either end (see Photo 66).

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 (see Photo 67). Painted over pitting is typical throughout the bottom surface.

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



Photo 65 – Section loss at the base of the Girder C stiffening diaphragm at Pier Cap 1A (looking east).



Photo 66 – Welded drainage support bracket on the north web near the west end of Pier Cap 1A (looking west).



Photo 67 – Active corrosion along the interface between the north vertical web angle and top flange angle at the west end of Pier Cap 1A (looking northwest).

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	Photo
*C'	Pier Cap Stiffener	Typical tack welds to interior transverse stiffeners.	68
C	Pier Cap Web Plate	Fillet welds at the ladder rungs on the north web interior near the east end.	69
*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 angle and the north web.	-
D	Pier Cap Webs and Flanges	Riveted connections	-
D	Pier Cap Web Plate	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.

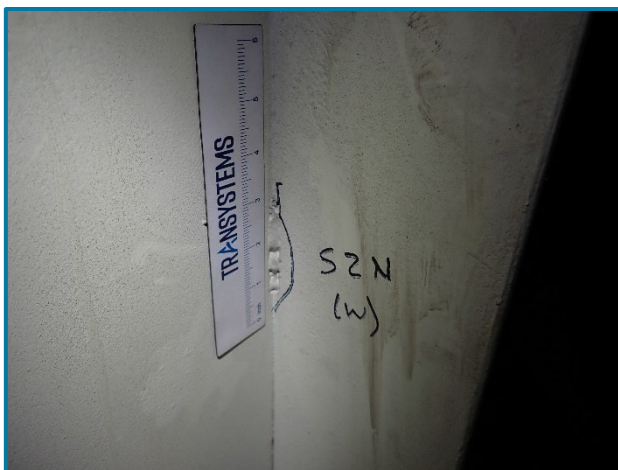


Photo 68 – Typical tack weld to the transverse stiffeners on the interior of Pier Cap 1A (looking northeast).



Photo 69 – Typical fillet weld at the ladder rungs on the interior of the north web plate of Pier 1A Cap (looking north).



Photo 70 – Minor scrape/gouge on the underside of the bottom flange plate of Pier Cap 2A below Girder F (looking northwest).

PIER CAP 2A – INSPECTION FINDINGS

The fracture critical 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 scrapes and gouges are present on the underside of the bottom flange plate by Girder F (see Photo 70). 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.



Photo 71 – Active laminate corrosion and section loss at the top corner of the north web plate, vertical angle, and top flange angle at the east end of Pier Cap 2A (looking northeast).

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

The drainpipe support bracket is welded to the north web plate on either end.

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 72 – Section loss at the base of the Girder G stiffening diaphragm on the interior of Pier Cap 2A (looking east).

There is up to 1/8" deep active pitting throughout the web plates (see Photo 71), 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 and 1/4" section remaining at the base of the stiffening diaphragm of Girder G (see Photo 72).

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	Photo
*C'	Pier Cap Web Plate	Typical tack welds to interior transverse stiffeners.	73
C	Pier Cap Web Plate	Fillet welds at the ladder rungs on the north web interior near the east end.	74
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 73 – Typical tack welds to interior transverse stiffeners inside of Pier Cap 2A (looking southeast).



Photo 74 – Typical fillet weld at the ladder rungs on the interior of the north web plate of Pier 2A Cap (looking north).

Pier Cap 3A – Inspection Findings

The fracture critical 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] (see Photo 75).

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 plastic steel putty and painted in 2017. 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.

There is active corrosion along the edges of the bottom flange angles and bottom flange plate (see Photo 76). 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 (see Photo 77). Isolated areas of painted over pitting are beginning to reactive 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.

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 75 – Pier Cap 3A north elevation (looking southwest).



Photo 76 – Active corrosion along the bottom flange plate and bottom flange angle in the interior of Pier Cap 3A (looking east).



Photo 77 – 3/16" deep pitting in the south web plate and the south bottom flange angle at the east end of Pier Cap 3A (looking southeast).

Pier Cap 3A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*C'	Pier Cap Web Plate	Typical tack welds to interior transverse stiffeners east of Girder B.	78
C	Pier Cap Web Plate	Fillet welds at the ladder rungs on the north web interior near the east end.	79
*C'	Pier Cap Web Plate	2"-3" long tack welds (8 total) 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.*

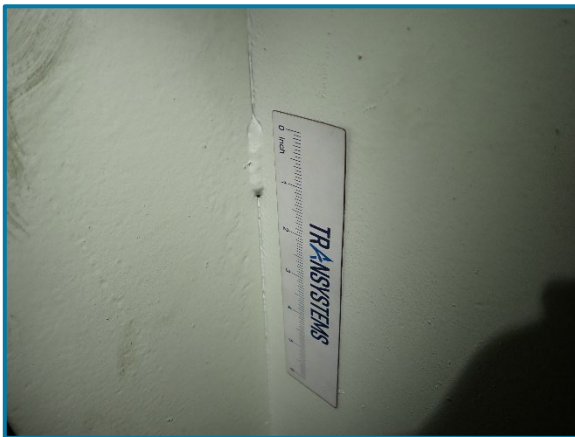


Photo 78 – Typical tack weld between the transverse stiffener and web plate (looking southeast on the interior of Pier Cap 3A).



Photo 79 – Typical fillet weld at the ladder rungs on the interior of the north web plate at the east end of Pier 3A (looking north).

Pier Cap 4A – Inspection Findings

The fracture critical 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] (see Photo 80). There is 1" thick pack rust below the bottom row of rivets, between the web plates and the internal bottom flange connection angles. 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 north adjacent to the pack rust.

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 (see Photo 81).

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 on the sides allowing small amounts of moisture in the west end. The gaps were caulked when reassembling the hatch cap once the inspection was completed.

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



Photo 80 – Pier Cap 4A south elevation (looking northeast).

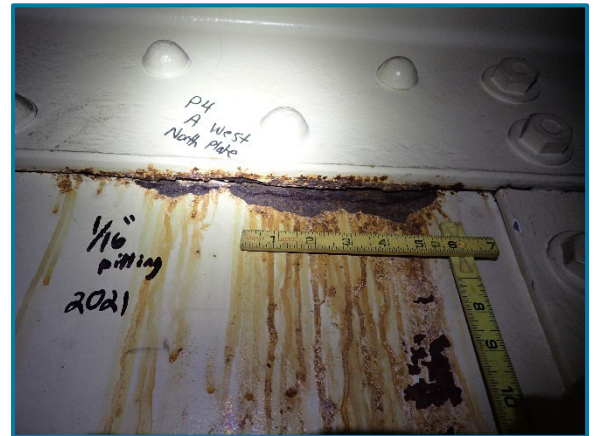


Photo 81 – 1/16" deep pitting at the north top flange angle and web plate at the west end of Pier Cap 4A (looking north).

Pier Cap 4A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
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).	82
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.	83

**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 – Typical tack welds to transverse stiffeners and web plates on the interior of Pier Cap 4A (looking southeast).



Photo 83 – 2" transverse tack weld between the bottom flange plate and the connection angle on the west side of Girder G diaphragm (looking east on the inside of Pier Cap 4A).



Photo 84 – Pier Cap 5A south elevation (looking northeast).

Pier Cap 5A – Inspection Findings

The fracture critical 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. The pack rust has been previously filled with steel putty and painted. The putty is functioning as intended with signs of reactivation noted (see Photo 84).

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 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 east face bottom flange and seat angle 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 the inspection however, rusting granular 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 (see Photo 85). 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 between the top flange angle and the north web plate (see Photo 86).
- Stiffener 2 between the top flange angle and the north web plate.
- Stiffener 5 between the top flange angle and the north web plate.

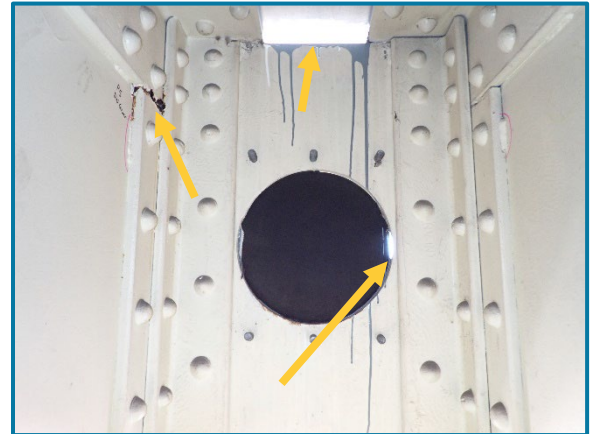


Photo 85 – Pier Cap 5A west end (looking west). Note the gaps in the access plates and corrosion along the south top flange angle.

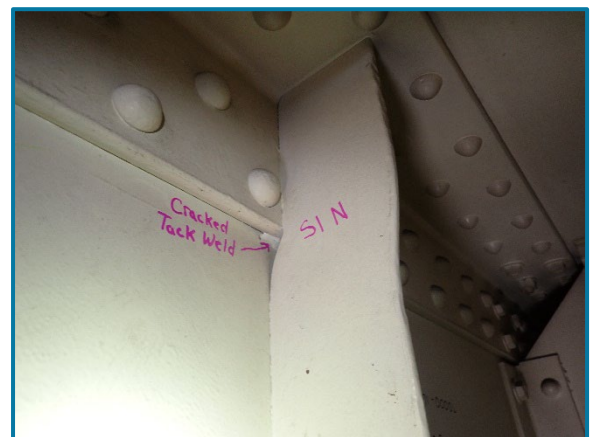


Photo 86 – Pier Cap 5A west end (looking west). Note the gaps in the access plates and corrosion along the south top flange angle.

- Stiffener 6 between the top flange angle and the north web plate.
- Stiffener 7 between the top flange angle and the north web plate.
- Stiffener 7 between the top flange angle and the south web plate.
- Stiffener 8 between the top flange angle and the north 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 the following locations:

- Girder B bottom flange and diaphragm connection angle at the south web plate.
- Girder D bottom flange and diaphragm connection angle at the south web plate.
- Girder E bottom flange and diaphragm connection angle at the south web plate (see Photo 87).



Photo 87 – Cracked tack weld between Girder E bottom flange and diaphragm connection angle (looking southwest at the south web plate of Pier Cap 5A).

The cracks do not propagate into the base metal.

The protective coating on the interior is in satisfactory condition due to the failure on either end of the pier cap causing minor active corrosion.

Pier Cap 5A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*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).	88

Pier Cap 5A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*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.	89
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.*

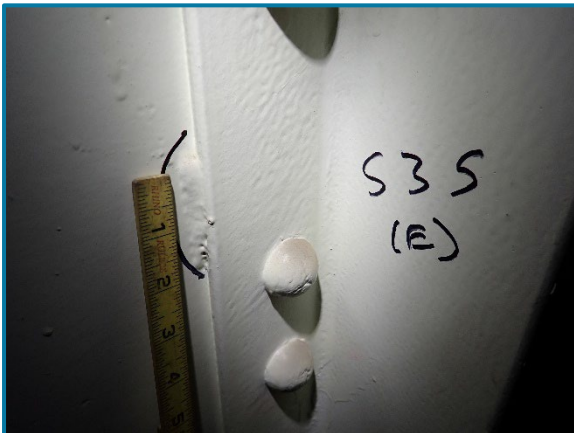


Photo 88 – Typical tack weld on the south web plate and transverse stiffeners on the interior of Pier cap 5A (looking southwest).



Photo 89 – 2" long tack weld along the south edge of the bottom flange plate below Girder F (looking south on the inside of Pier Cap 5A).

Pier Cap 6A – Inspection Findings

The fracture critical 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] (see [Photo 90](#)). 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 the Girder A 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.

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 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 (see [Photo 91](#)). 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 midheight (see [Photo 92](#)).



Photo 90 – Pier Cap 6A north elevation (looking southeast).



Photo 91 – Pier Cap 6A interior bottom flange plate just west of Girder A diaphragm (looking east).

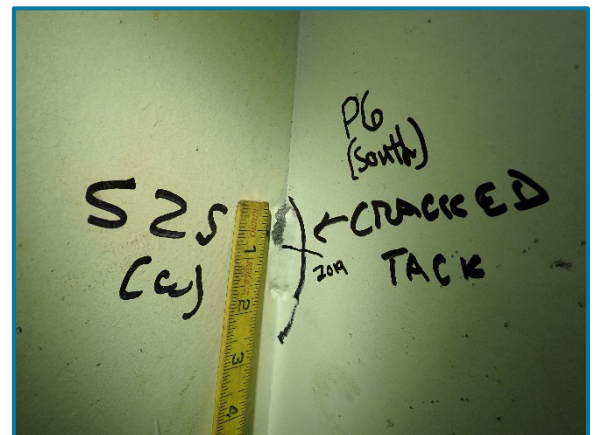


Photo 92 – Cracked tack weld at the second intermediate stiffener between the south web near midheight (looking southeast).

- At Stiffener 8 at the east end of the cap at the top flange angle interface to the south web.
- 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 around the sides allowing small amounts of moisture in 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. Freckled rust was also noted along the top flange angle and web plate interface.

Pier Cap 6A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
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 Plates	Typical 2"-3" tack welds between both web plates and bottom angles at every transverse stiffener angle (16 total).	-
*D	Pier Cap Web Plates	Two 3" tack welds between the south web plate and connection angles on each side of Girder C and G stiffeners (8 total).	93
*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).	-

Pier Cap 6A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*D	Pier Cap Web Plates	3" Tack weld on the south web and girder diaphragm connection angles between Girder D and E (2 total)	94
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 93 – Two 3" tack welds between the south web plate and connection angles on west side of Girder C (looking southeast inside of Pier Cap 6A).



Photo 94 – 3" tack weld on the south web and girder diaphragm connection angles between Girders D and E (looking southeast inside of Pier Cap 6A).



Photo 95 – Pack rust between the south web plate and the bottom flange angle with reactivating rust (looking northeast at the south face of Pier Cap 7A).

Pier Cap 7A – Inspection Findings

The fracture critical 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 (see Photo 95). 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 (see Photo 96). 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.



Photo 96 – Corrosion throughout the bottom flange plate and angles at the west end of Pier Cap 7A (looking down and west).



Photo 97 – Cracked tack weld between the north web plate and stiffening diaphragm of Girder A inside of Pier Cap 7A (looking northeast).

There are cracked tack welds between the north web plate and stiffening diaphragms of Girders A and E (see Photo 97). The cracks do not propagate into the base metal.

A distinct intermittent popping sound was noted at the east end of the pier cap every two to three minutes. The source of the sound could not be determined and therefore should 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	Photo
*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).	98
*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).	99
*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 98 – Typical tack welds between the south web plate and the connection angle on each side of every girder diaphragm (looking south on the inside of Pier Cap 7A).

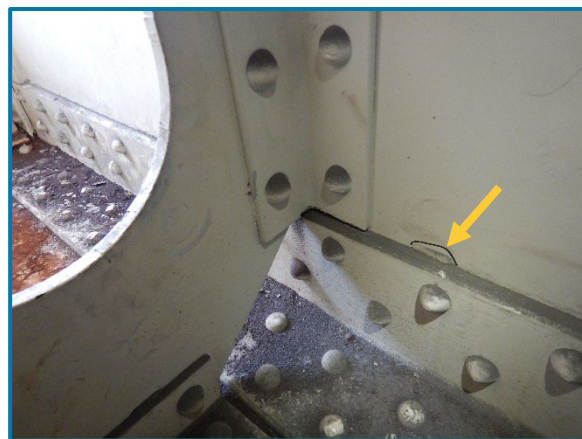


Photo 99 – Typical tack weld between the north web plate and bottom flange angle on the east side of both fascia girders and at every transverse stiffener angle between the west bearing and Girder F (looking northwest on the inside of Pier Cap 7A).

Pier Cap 8A – Inspection Findings

The fracture critical 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 (see Photo 100) that has been filled with steel putty and painted along the entire width of the pier cap. Isolated sections of the steel putty were removed during the 2021 painting contract, but 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 is present between the seat angles and the south web plate at all Girder connection locations.

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 (see Photo 101). 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 propagate into the base metal.

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.



Photo 100 – Pack rust between the south web plate and south bottom flange angle (looking west below Girder C at the underside of Pier Cap 8A).



Photo 101 – Typical cracked tack welds along the Girder C diaphragm connection angle to top flange plate (looking east inside of Pier Cap 8A).

Pier Cap 8A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
B	Pier Cap Web Plate	Two bolted drainpipe support brackets on the north web near the east end.	102
*C'	Pier Cap Flange Plate	Tack welds between the bottom plate and east connection angle of the Girder diaphragms (7 total).	103
*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 102 – Typical bolted drainpipe support bracket connection on the interior of the pier cap web (looking northwest near east end of Pier Cap 8A).



Photo 103 – Tack welds between the bottom plate and east connection angle of the Girder diaphragms (looking west inside of Pier Cap 8A).

Pier Cap 9A – Inspection Findings

The fracture critical 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] (see Photo 104). 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. The pack rust has been previously filled with plastic steel putty and painted. The putty appears to be in good condition and is functioning as intended. There is up to 3/8" thick pack rust is present between the top flange cover plates east of Girder G and intermittent pack rust between the bottom flange cover plates throughout.

There is a 6" wide by 3" high area of 100% section loss at the bottom of the west end vertical access plate (see Photo 105).

There are twenty-six tack welds at nine locations 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 above-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 the presence of moisture. 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 missing bolt in the east top flange of the Girder F diaphragm (see Photo 106).



Photo 104 – Pier Cap 9A north elevation (looking southwest).



Photo 105 – 100% section loss at the bottom of the west end vertical access plate (looking east at Pier Cap 9A).



Photo 106 – Missing bolt in the east horizontal angle leg at the top flange connection of Girder F diaphragm (looking west on the inside of Pier Cap 9A).

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 (see Photo 107).
- Two between between the north and south web plates and flange angles at the first stiffener east of Girder G.
- At the top of the Girder G diaphragm.



The 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.

Photo 107 – Cracked tack weld between the north web plate and top flange angle (looking south inside of Pier cap 9A).

Pier Cap 9A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
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).	108
*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).	109
*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 108 – Cracked tack weld between the east edge of the west bearing diaphragm fill plate and south web plate (looking southwest inside of Pier Cap 9A).



Photo 109 – 2"-3" tack welds at east end bearing fill plate (looking east inside of Pier Cap 9A).

Pier Cap 10A – Inspection Findings

The fracture critical 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 (see Photo 110).



Photo 110 – Scrape on the north face of the north web plate of Pier Cap 10A east of the splice plate (looking south).

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 plate 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 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.

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



Photo 111 – Pier Cap 10A north elevation (looking southwest).

The protective coating system on the exterior of the pier cap is in very good condition (see Photo 111).

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. There are signs of previous moisture intrusion due to 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 (see Photo 112).

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.



Photo 112 – Painted over pitting along the bottom flange connection angle and bottom flange plate of Pier Cap 10A (looking southeast near midspan).

Pier Cap 10A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
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).	113
*C'	Pier Cap Flange Angles	Typical tack welds between the flange angles and each end of interior splice plates (36 total).	114
*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 113 – Typical tack weld along the north web plate and transverse stiffener angle of Pier Cap 10A (looking south between Girder G and F).



Photo 114 – Typical tack weld at the interface between the splice plates and the interior flange angles (looking northwest on the inside of Pier Cap 10A).



Photo 115 – Pier Cap 11A south elevation (looking northwest).

Pier Cap 11A – Inspection Findings

The fracture critical 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] (see **Photo 115**). 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. The putty is in good condition and is functioning 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 east bearing is unseated and shifted to the north (see ELEMENT 311 – MOVABLE BEARING).

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

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 (see **Photo 116**).

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

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.



Photo 116 – Granular debris throughout the interior of Pier Cap 11A (looking west near east end).

Pier Cap 11A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
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.	-

Pier Cap 11A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
*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).	117
*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).	118
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.*

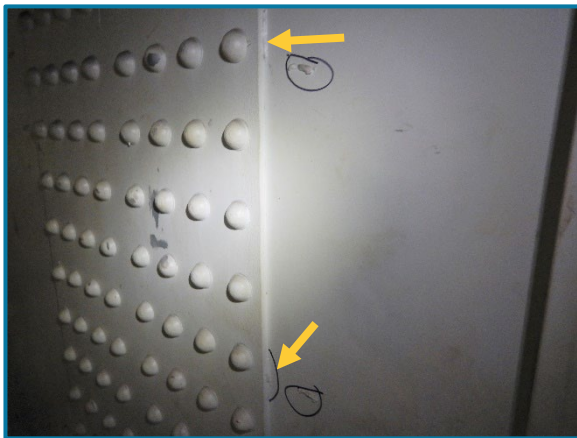


Photo 117 – Typical tack welds at the interface between the web plate and interior splice plate of Pier Cap 11A (looking south at south web plate splice).



Photo 118 – 2"-3" tack welds on bottom moment plate and web plate (looking north on the inside of Pier Cap 11A).

Pier Cap 12A – Inspection Findings

The fracture critical 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. 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.



Photo 119 – Typical granular debris throughout the bottom of the interior of Pier Cap 12A (looking east near the west end of the cap).

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. The entire bottom surface was covered by up to 1/2" of granular debris and dust (see Photo 119). There is a misdrilled 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 (see Photo 120). There is also isolated nonactive surface pitting on the north web plate above the Girder A bottom flange stiffener.



Photo 120 – Typical active corrosion and pitting throughout the bottom flange plate at the west end (looking west inside of Pier Cap 12A).

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 1 broken tack weld at the northwest corner of the top moment plate connection angle at Girder B (see Photo 121).

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



Photo 121 - Typical tack welds between the top angle and girder diaphragms (looking east near the top of Girder B inside of Pier Cap 12A).

Pier Cap 12A Fatigue Prone Details			
Fatigue Category*	Location	Description	Photo
B	Pier Cap Web Plate	Four bolted drainpipe support brackets on the north web plate.	122
*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).	-
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.

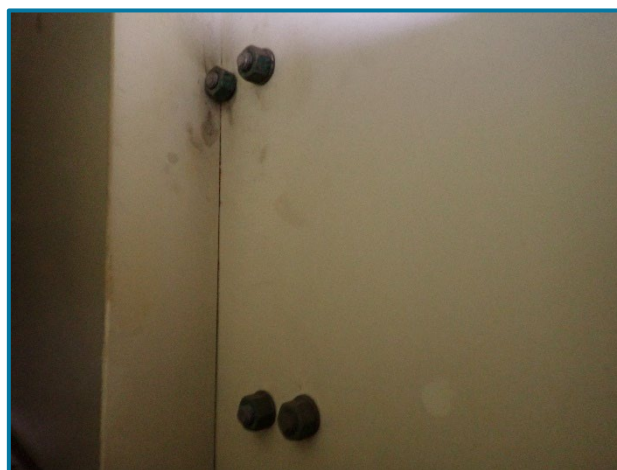


Photo 122 - Typical bolted drainpipe support bracket connection (looking north on the interior of Pier Cap 12A).

Pier Cap 13A – Inspection Findings

The fracture critical 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 (see Photo 123). The putty is in good condition and is functioning 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 (see Photo 124). 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 (see Photo 125).



Photo 123 – Pack rust between the bottom flange plate and north bottom angle below Girder G at Pier Cap 13A (looking southeast).



Photo 124 – Typical granular debris and dust throughout the bottom of the Pier Cap 13A interior (looking east near the west end of the cap).



Photo 125 – Missing bolt at the connection between the north top flange angle and north web plate at Girder C (looking west inside of Pier Cap 13A).

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	Photo
*C'	Pier Cap Web Plate	Tack welds between the diaphragm plate and each side of every diaphragm fill plate (14 total).	126
*C'	Pier Cap Flange Angles	Tack welds between the top and bottom angles and girder diaphragms (14 total).	127
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 126 – Tack weld between the diaphragm fill plate and diaphragm plate at Girder C (looking west inside of Pier Cap 13A).



Photo 127 – Tack welds between the top and bottom angles and girder diaphragms (looking west inside of Pier Cap 13A).

Pier Cap 29B – Inspection Findings

The fracture critical welded steel plate pier cap is in GOOD CONDITION [7-NBIS] overall (see Photo 128). 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 (see Photo 129) and along the welds of the bearing plates. There is also minor active corrosion on the bottom flange splice plate bolts (see Photo 130).



Photo 128 – Pier 29B south face at the west end (looking east).



Photo 129 – Active rust with peeling paint on the Pier 29B bottom flange at the north bearing (looking northeast).



Photo 130 – Surface corrosion throughout the bolts in the bottom flange splice plate of Pier 29B (looking east).

Pier Cap 2 (FWW) – Inspection Findings

The fracture critical steel box pier cap is in GOOD CONDITION [7-NBIS] overall.

Pier Cap Exterior

The exterior of Pier Cap 2 (FWW) is in VERY GOOD CONDITION [8-NBIS]. No deficiencies were noted (see Photo 131).

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 (see Photo 132).

There is a 1-1/2" gap at each end of the pier cap between the flange plates and the fascia girder web plates (see Photo 133). 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 131 – Pier 2 (FWW) south elevation (looking north).



Photo 132 – Area of minor surface corrosion on the bottom flange plate near the east bearing on the interior of Pier 2 (FWW) (looking north).



Photo 133 – Gap between bottom flange plate and web plate on the interior of Pier 2 (FWW) at the west end (looking west). Note the bird debris throughout the surface of the bottom flange plate.



Photo 134 – 2' wide by 2' high by 4" deep corner spall with exposed reinforcement on the west face of Pier Cap 2 (FWW) (looking southeast).



Photo 135 – Typical hairline cracks with minor efflorescence throughout the west face of Pier Cap 6 (FWW) (looking east).



Photo 136 – Flexural cracks between the pier columns at Pier 4 (FWW) (looking west).

ELEMENT 234 – REINFORCED CONCRETE PIER CAP

The reinforced concrete pier caps are in SATISFACTORY CONDITION [6-NBIS]. 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 Reconstruction Project and are in good condition overall. 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) (see Photo 134). Isolated areas between the pier columns and overhangs exhibit hairline vertical cracking with minor efflorescence throughout the FWW pier caps (see Photo 135). There are moderate width flexural cracks with rust staining on the south and bottom faces of Pier Cap 4 between the pier columns (see Photo 136).

During the 2017 rehabilitation project, many of the previously noted delaminations and spalls were repaired on the original concrete pier caps. As part of the same project, many portions of the original piers were partially wrapped with FRP wrapping. The FRP wrapping is typically in good condition with only isolated areas of failing/peeling protective coating at Pier 23B (see Photo 137). Typical map cracking was noted on the vertical faces of the original pier caps. There are also typical horizontal hairline cracks near the top of each original pier cap. There are transverse cracks with rust staining along the bottom south edge of the west overhang of Pier Cap 19A. A 1' diameter by 1" deep spall with rust staining was noted on the east face of Pier Cap 15A. The spall is surrounded by two wide longitudinal cracks with rust staining spanning the full length of the east face and extending onto both the south and north faces (see Photo 138). There is a 10" high by 4" wide by 1" deep spall on the southeast corner of the Pier Cap 18A east overhang. Two 2' long by 1' wide by up to 3" deep spalls with exposed reinforcement were noted on the top of Pier Cap 27B adjacent to either side of the Girder E bearing. Both spalls extend down from the top face onto either vertical face of the cap; however, there was no loss of bearing area noted at the time of the inspection (see Photo 139).



Photo 137 – Typical FRP wrapping with isolated areas of peeling/failing protective coating (looking north at the south face of Pier 23B).



Photo 138 – 1' diameter by 1" deep spall on the east face of Pier Cap 15A (looking southwest). Note the longitudinal cracks extending from spall.



Photo 139 – 2' long by 1' wide by 3" deep spall extending onto the south face of Pier Cap 27B (looking north).

SIGN/UTILITY ITEMS SUMMARY

The signs and utilities are in good condition. The utilities include conduit attached to the bottom of the diaphragms in Bays 1 and 2 in 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 throughout at pier locations.

SIGNS AND SUPPORTS (no associated element)

The structure-mounted sign supports are in satisfactory condition. There is one overhead sign mounted to the structure in Span 1 (FWW) and one in Span 16A (see [Photo 140](#)). There is minor surface corrosion throughout the anchor bolts and cantilever supports at each sign supports.

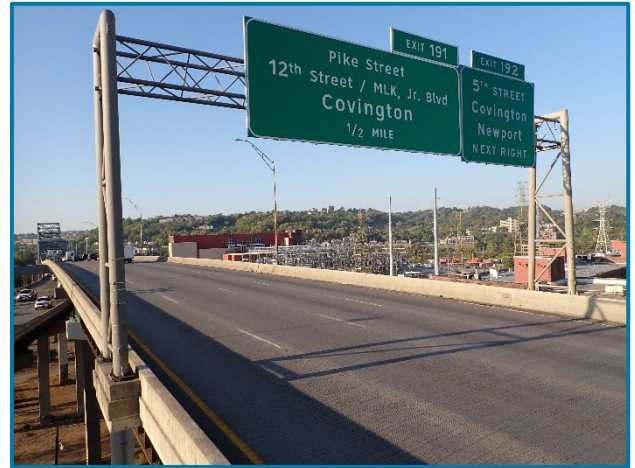


Photo 140 – Exit signs mounted in Span 16A (looking southwest).

UTILITIES (no associated element)

The utilities on the structure are in good condition. There is a utility junction box with areas of 100% section loss throughout the bottom and side plates at Pier 13A. The section loss has exposed the internal electrical wiring and the box is impeding access to the west pier cap hatch (see [Photo 141](#)). 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 (see [Photo 142](#)). Some of the light pole handhole covers are missing.



Photo 141 – 100% section loss throughout the utility junction box at the west access hatch at Pier 13A (looking southeast).

ITEM 41 – OPERATIONAL STATUS

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



Photo 142 – Roadway light with shattered lens between Girders B and C at midspan in Span 11A (looking north).

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the 2023 fracture critical and in-depth element level inspection, the HAM-71-0000L Bridge (SFN 3105946) is in SATISFACTORY CONDITION [6-NBIS] overall. There are minor spalls, delaminations, and hairline cracking throughout the concrete wearing surface and railings. The strip seal expansion joints are in fair condition overall with minor to heavy debris impaction along the entire width of the roadway and some tears. The underside of deck typically exhibits hairline transverse and longitudinal cracks with efflorescence and large isolated spalls/delaminations with exposed reinforcement. Isolated scuppers are clogged with debris and isolated drainpipe downspouts are disconnected. The girders in the original spans that were not recently rehabilitated (Spans 15A-28B) typically exhibit active laminate corrosion and up to 1/8" deep section loss throughout the webs and most notably at the edge of the flanges. The remaining girders are in good condition with minor surface corrosion throughout. There is minor surface corrosion throughout all bearing devices and isolated bearings exhibit elastomeric material bulging and deforming. The steel protective coating is in fair condition overall. Some original spans have been recently painted and are in good condition, but the remaining elements exhibit dulling, chalking, ineffectiveness. The fracture critical steel box pier caps exhibit moderate areas of inactive pack rust and isolated paint failures with some minor scrapes to the exteriors. The interior of the pier caps typically exhibit areas of minor to moderate section loss, cracked tack welds, pitting and paint failure throughout. The concrete substructure units exhibit isolated spalls with exposed reinforcement, hairline cracking and efflorescence, and localized deteriorating FRP wrap.

The four categories of recommendations for the HAM-71-0000L Bridge are as follows:

- | | |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Priority Work:
(Within 1 Year Period) | <p>Work which should be performed as soon as possible to address deficiencies which affect the capacity of the structure or public safety.</p> |
| <ul style="list-style-type: none"> • Rehabilitation/Evaluation:
(Within 5 Year Period) | <p>Recommendations for large-scale deficiencies which are extensive in nature and require engineering analysis.</p> |
| <ul style="list-style-type: none"> • Maintenance:
(As Scheduled) | <p>Recommendations that are minor in nature and can be easily repaired.</p> |
| <ul style="list-style-type: none"> • Monitoring:
(As Recommended) | <p>Regular field observation of defects which are not currently in need of repair but will require corrective action if deterioration continues.</p> |

Priority Work: None.

Rehabilitation/Evaluation: Deck

1. Patch spalls in wearing surface.
2. Patch spalls and remove delaminated concrete from deck underside.
3. Replace torn expansion joint seals throughout.
4. Repair spalls and delaminations in the railings throughout the structure.
5. Seal cracks in railings throughout the structure.
6. Seal cracks in deck underside throughout the structure.

Superstructure

7. Spot paint the pier cap interiors.
8. Replace hatch gasket on pier caps with previously mentioned gaps on the west end.
9. Clean and paint Spans 15A – 28B.

Substructure

10. Patch the isolated spalls and delamination throughout the substructure units.

Signs/Utilities

11. Replace utility box with 100% section loss.
12. Replace missing light pole handhole covers.
13. Patch the concrete railing that has exposed the sign anchorage and reinstall sign with new hardware.

Maintenance: Deck

14. Remove debris from expansion joints.
15. Remove debris from deck shoulders and near scuppers.

16. Replace missing/disconnected/bulging drainpipes and boots throughout.
17. Clean clogged drainpipes and scuppers.
18. Replace bulbs or repair non-functioning lights

Superstructure

19. Tighten loose anchor bolts at Pier 12A and 13A on the east bearings.

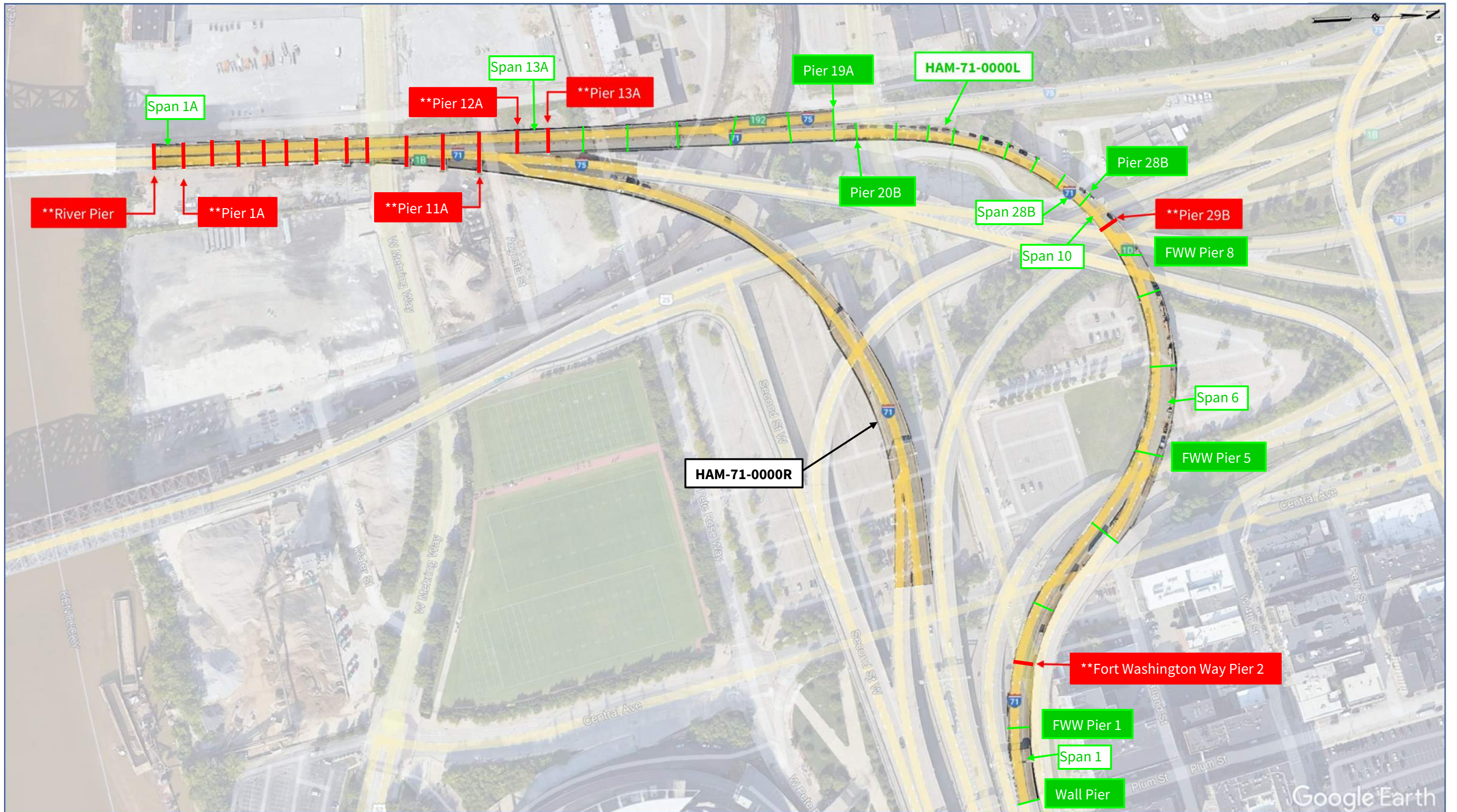
Monitoring:

20. Continue to monitor the lateral movement of the girder ends in Span 24B.
21. Continue to monitor the loud popping sound heard in Pier Cap 7A.
22. Continue to monitor the fatigue prone details of the fracture critical members, especially cracked tack welds.

Appendix A

Select Plan Sheets

TRANSYSTEMS



HAM-71-0000L

Overall location map and nomenclature

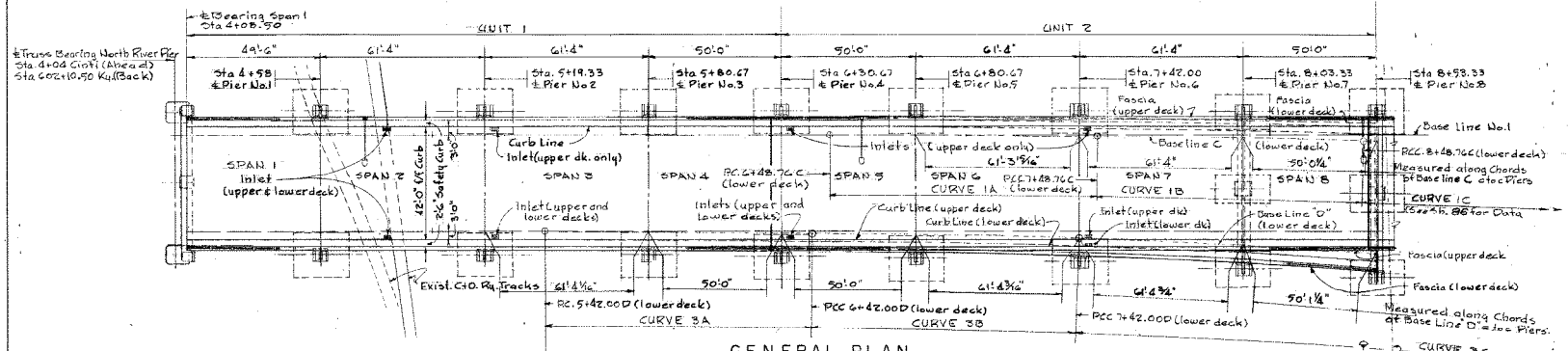
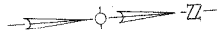
****Fracture critical (NSTM) members are shown in red**

Not to scale

REVISIONS
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REVISION

FILE NO.	STATE	PROJECT	SHEET NO.
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HAM-25-0.04



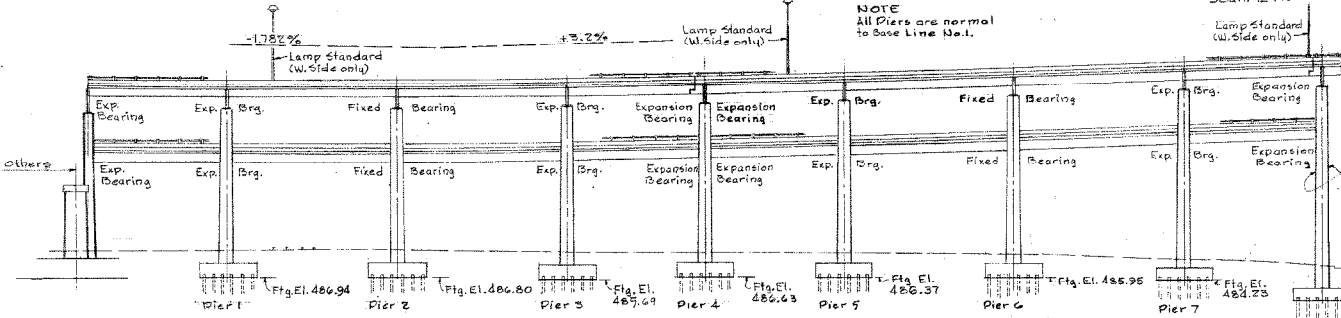
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 $D = 0^{\circ}20'$
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 $L = 100.0'$

CURVE 1B & 3B
 $\Delta = 1^{\circ}40'$
 $D = 1^{\circ}40'$
 $R = 3437.75'$
 $L = 100.0'$

GENERAL PLAN

NOTE
 All Piers are normal
 to Base Line No. 1.

ALIGNMENT NOTE:
 The spiral curves shown on the Site Plan are shown replaced by compound circular curves, in order to facilitate the layout and construction of the bridge. The alignment of the compound curves does not depart more than 0.10 ft. at any point from the alignment of the spirals they replace.



ELEVATION

For Railings and Lighting Details see Sh. 134 252
 For General Notes see Sheet No. 77
 For Estimate of Quantities see sheet No. 97

HAM-71-0000L
SPANS 1A-8A

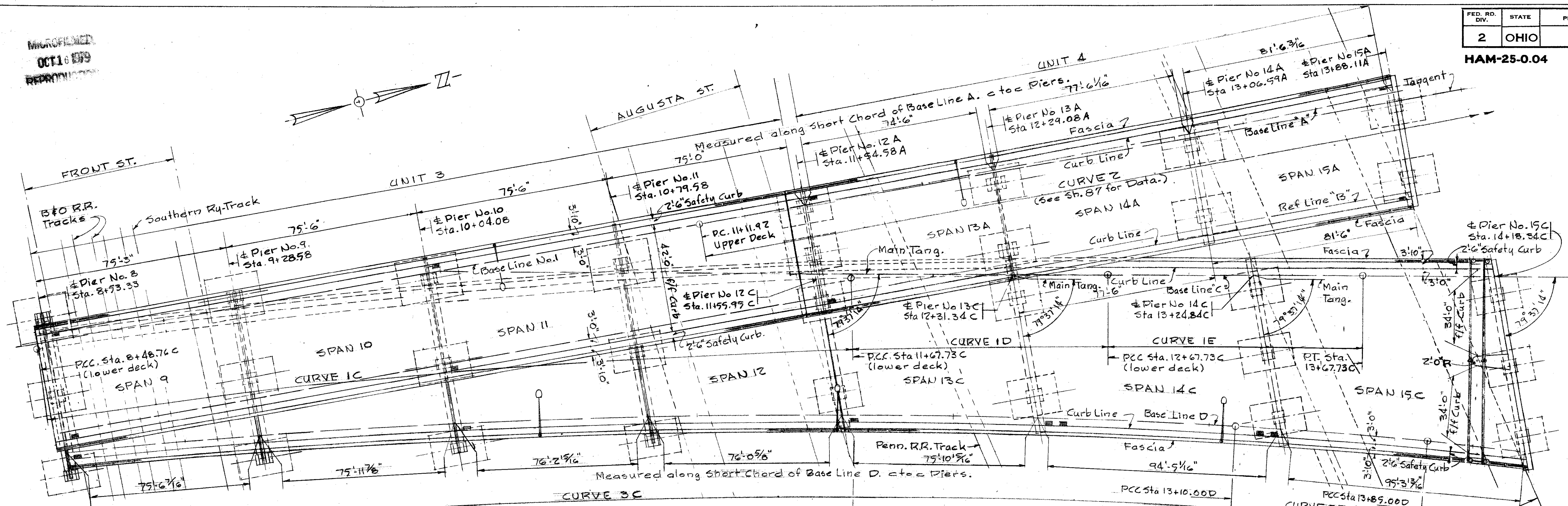
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DESIGNED	DRAWN	TRACED	CHECKED	DATE	REVIEWED
J.C.D.	T.O.S.		J.A.S.	10-13-60	

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OCT 10 1979
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86

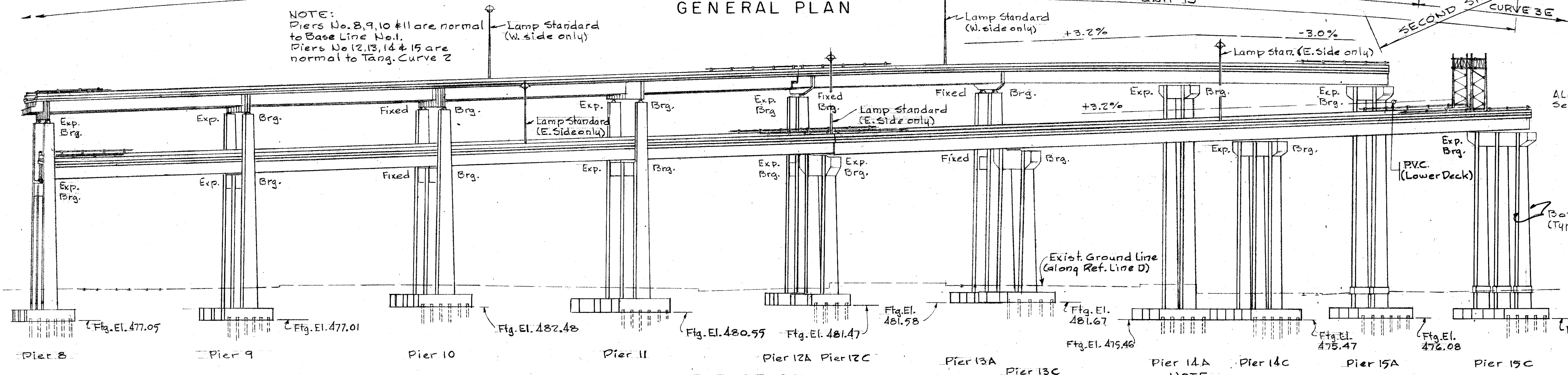
HAM-25-04



- CURVE 1C
Δ = 6°22'46"
D = 2°0'
R = 2864.79'
L = 318.97'
- CURVE 1D
Δ = 1°40'
D = 1°40'
R = 3437.75'
L = 100.0'
- CURVE 1E
Δ = 0°20'
D = 0°20'
R = 1788.74'
L = 100.0'
- CURVE 3C
Δ = 11°21'36"
D = 2°0'
R = 2864.79'
L = 568.0'
- CURVE 3D
Δ = 1°59'21"
D = 2°33'48"
R = 2239.21'
L = 79.0'
- CURVE 3E
Δ = 3°36'33"
D = 4°48'44"
R = 1190.63'
L = 75.0'

NOTE:
Piers No. 8, 9, 10 & 11 are normal to Base Line No. 1.
Piers No. 12, 13, 14 & 15 are normal to Tang. Curve 2

GENERAL PLAN



ELEVATION

ALIGNMENT NOTE
See Sheet 85

NOTE
Elevation is developed on Baseline D
For Railing & Lighting Details See Sheets No. 253 & 259.
For General Notes See Sheet No. 97
For Estimate of Quantities See Sheet No. 97.

HAM-71-0000R
SPANS 9A-15A

HAZELT & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

GENERAL PLAN & ELEVATION
UNITS 3, 4 & 13

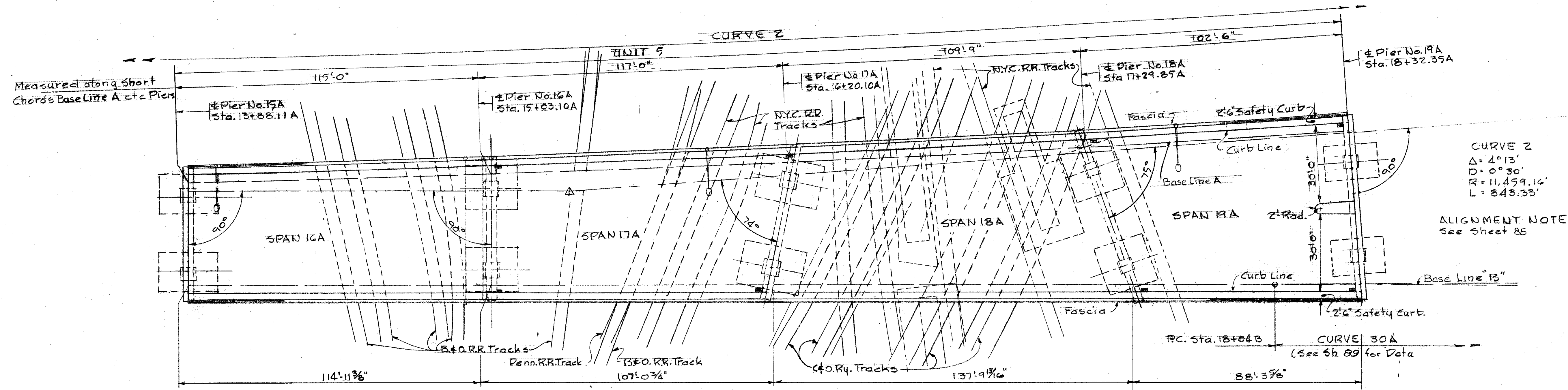
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OCT 1989
REPRODUCTION

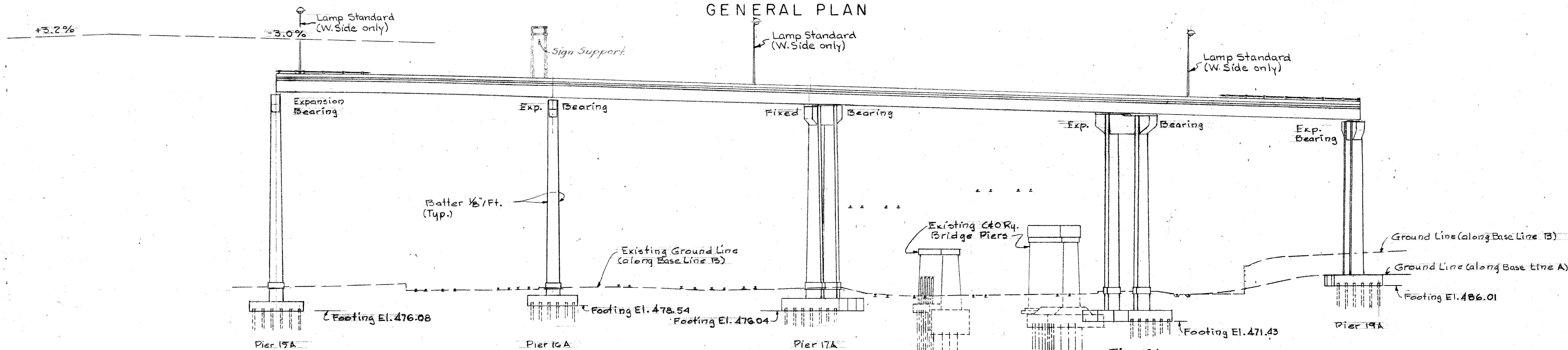
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87

HAM-25-0.04



GENERAL PLAN



ELEVATION

For Railing & Lighting Details See Sheet No. 254
For General Notes see Sheet No. 97
For Estimate of Quantities see Sheet No. 97

HAM-71-0000R
SPANS 16A-19A

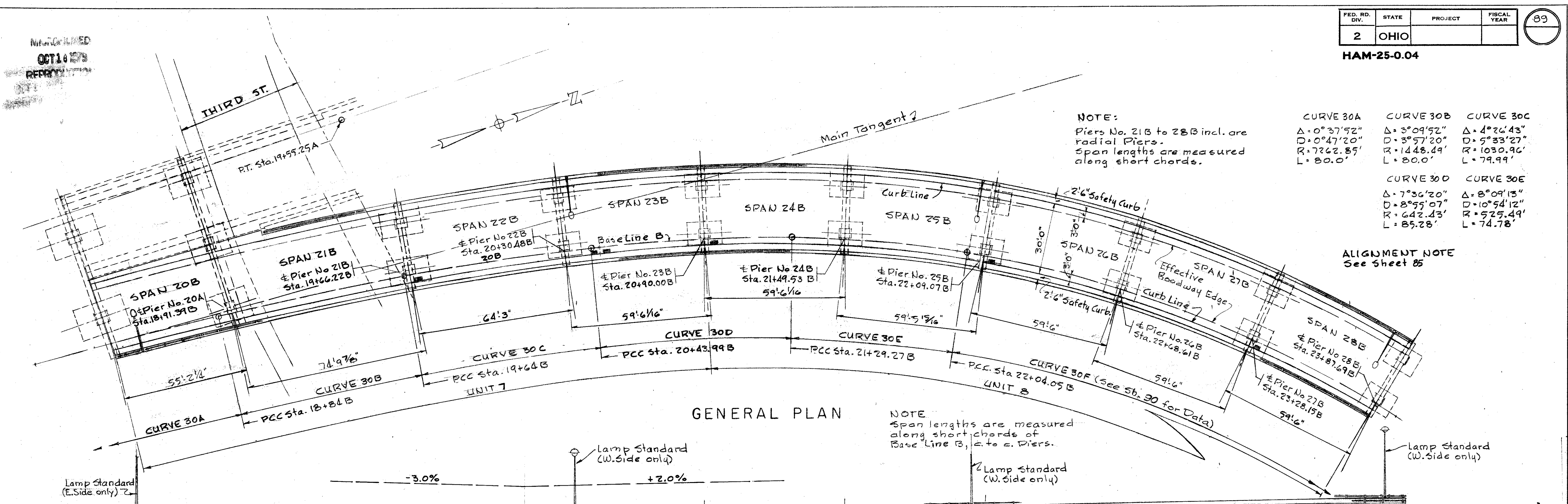
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CONSULTING ENGINEERS
CINCINNATI, OHIO

GENERAL PLAN & ELEVATION
UNIT 5

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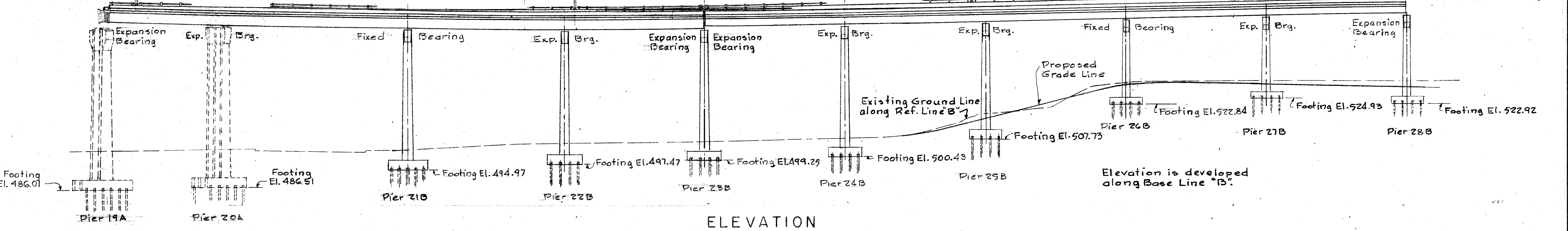
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GENERAL PLAN

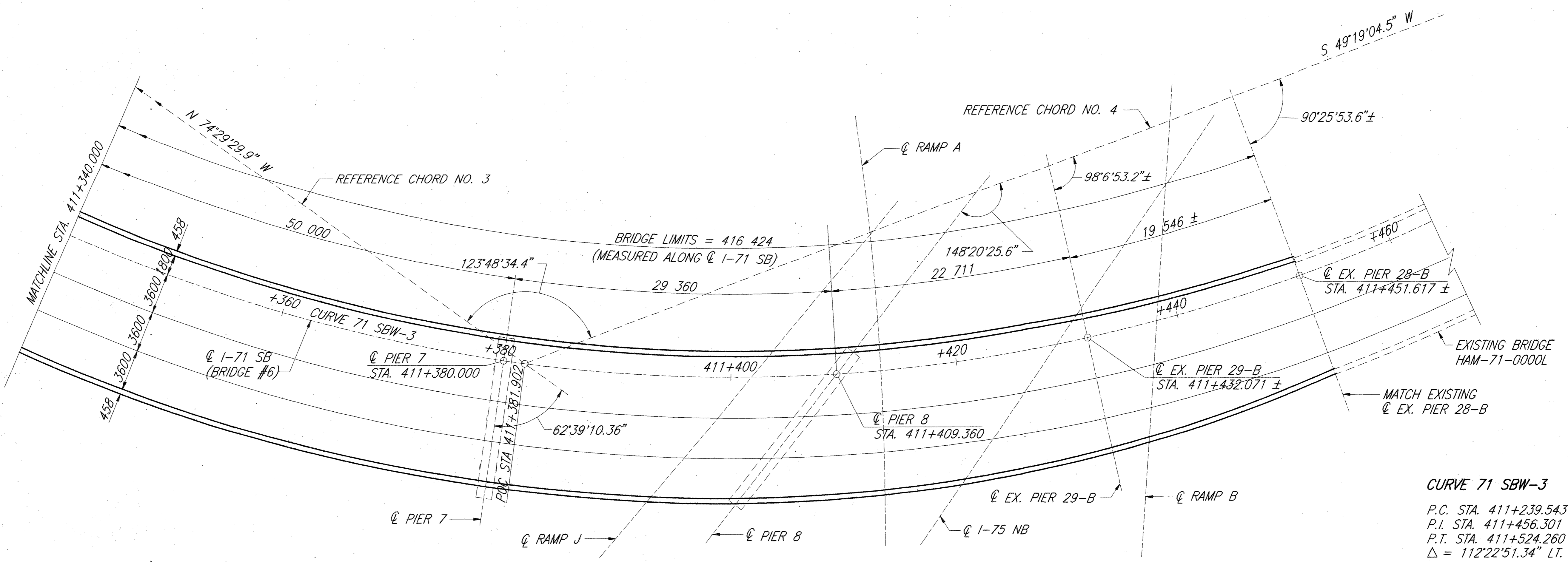
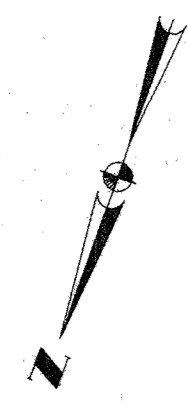
NOTE:
Span lengths are measured along short chords of Base Line B, c. to c. Piers.



For Railing & Lighting Details See Sheet 256
For General Notes See Sheet 97
For Estimate of Quantities See Sheet 97

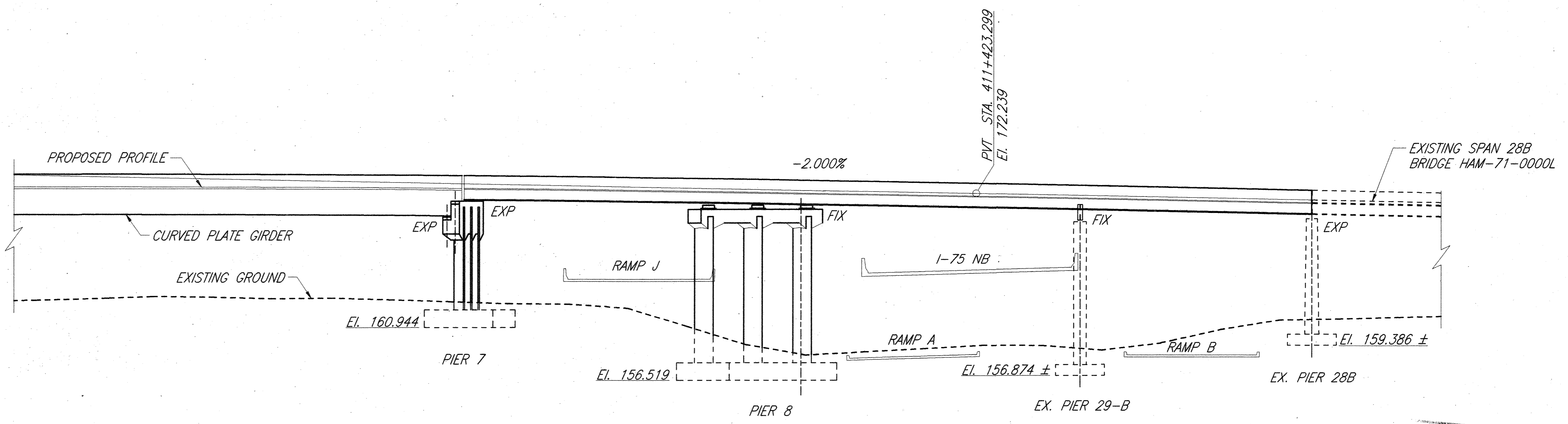
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SPANS 20B-28B

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 P.I. STA. 411+456.301
 P.T. STA. 411+524.260
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 $T = 216.758$ m
 $L = 284.718$ m
 $E = 115.715$ m

GENERAL PLAN



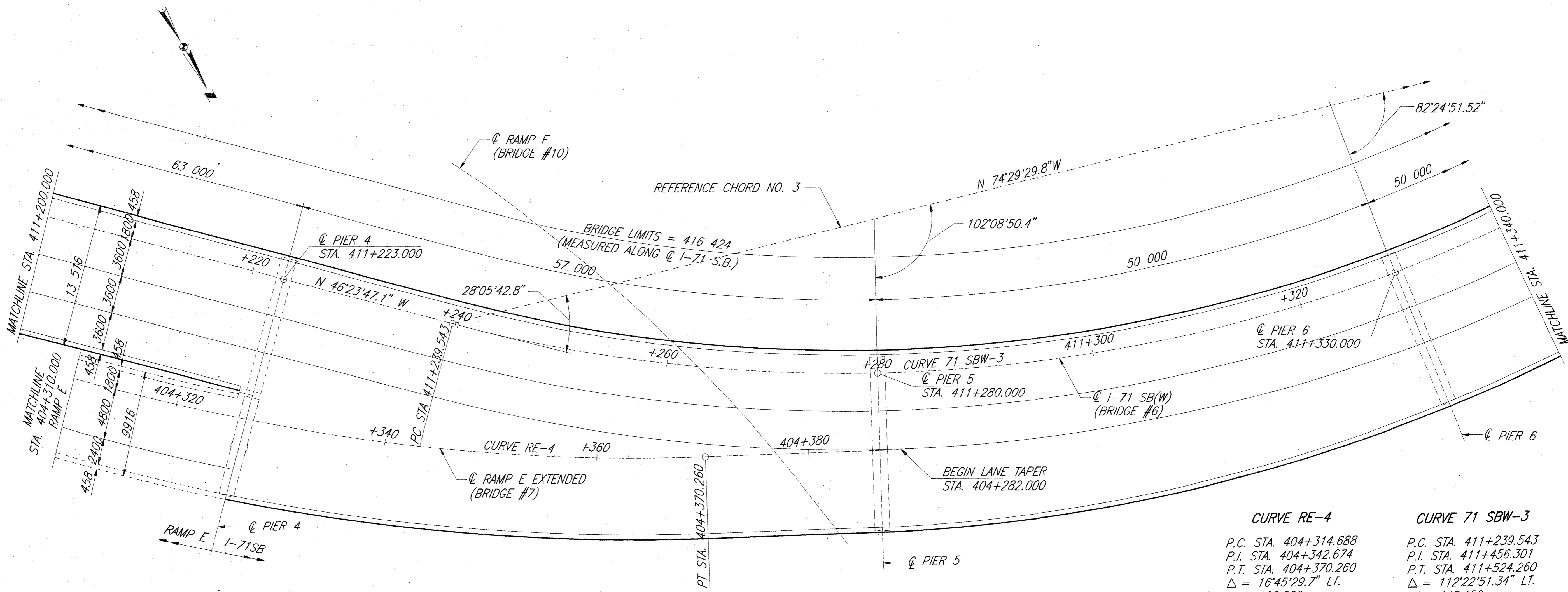
ELEVATION

HAM-71-0000R
SPANS 10-7

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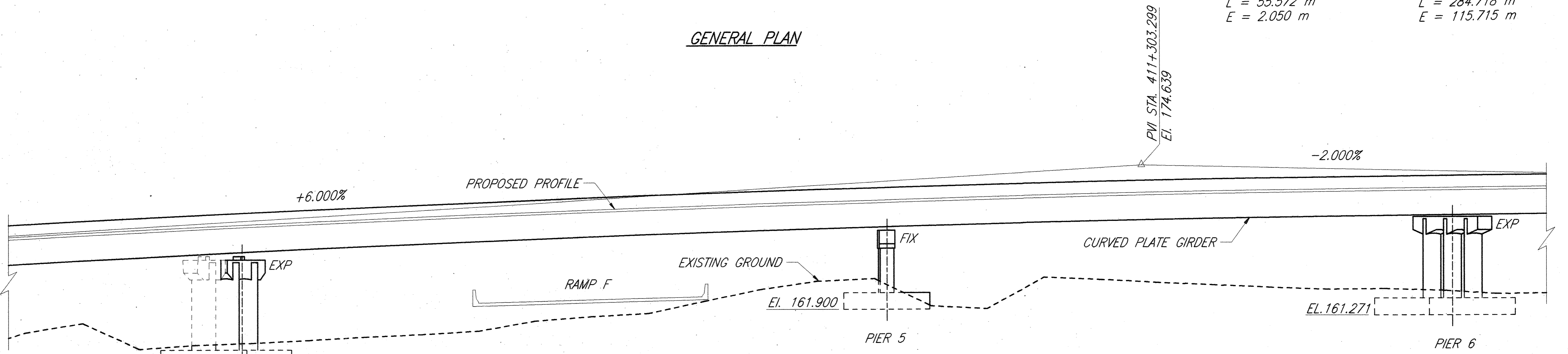
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REVIEWED JRC	DATE 07/12/98
GENERAL PLAN & ELEVATION I-71 S.B.	
BRIDGE 6	
10 / 85	
187 588	



GENERAL PLAN

CURVE RE-4	CURVE 71 SBW-3
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P.I. STA. 404+342.674	P.I. STA. 411+456.301
P.T. STA. 404+370.260	P.T. STA. 411+524.260
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R = 190.000 m	R = 145.159 m
T = 27.986 m	T = 216.758 m
L = 55.572 m	L = 284.718 m
E = 2.050 m	E = 115.715 m



ELEVATION

HAM-71-0000R
SPANS 6-5

FINAL FOR CONSTRUCTION

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A BRW COMPANY

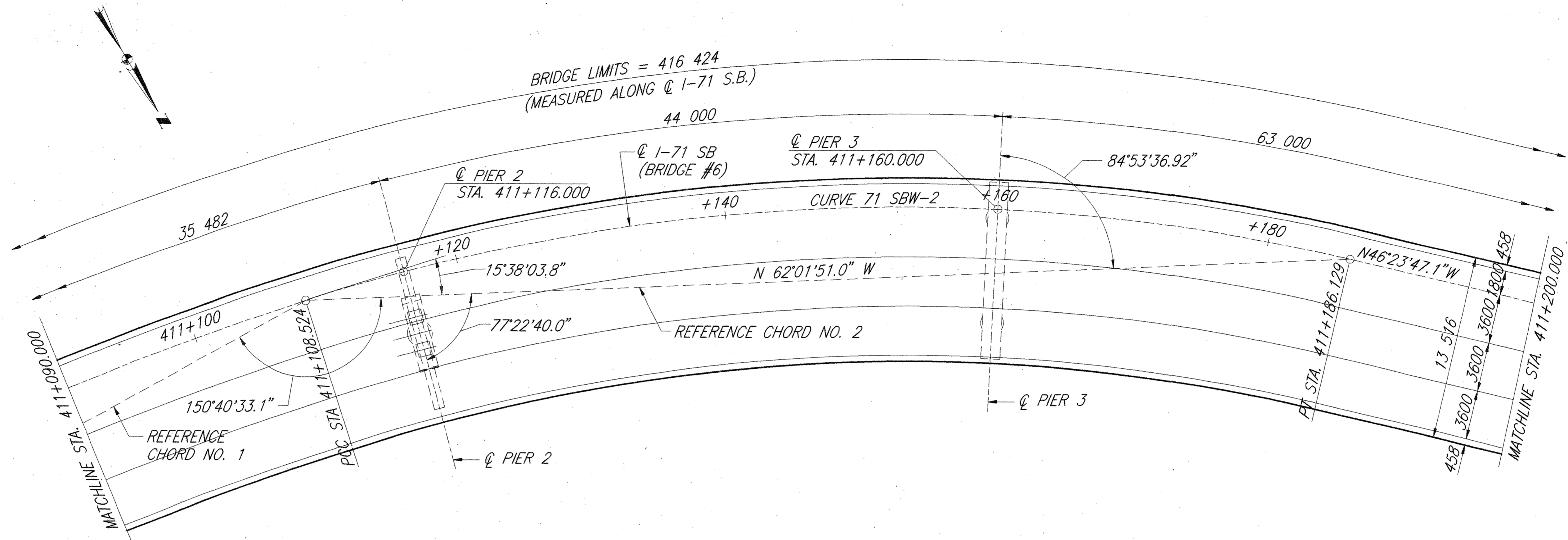
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DRAWN	PLF	REVISED	PLF
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STRUCTURE FILE NUMBER			

GENERAL PLAN & ELEVATION
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BRIDGE 6

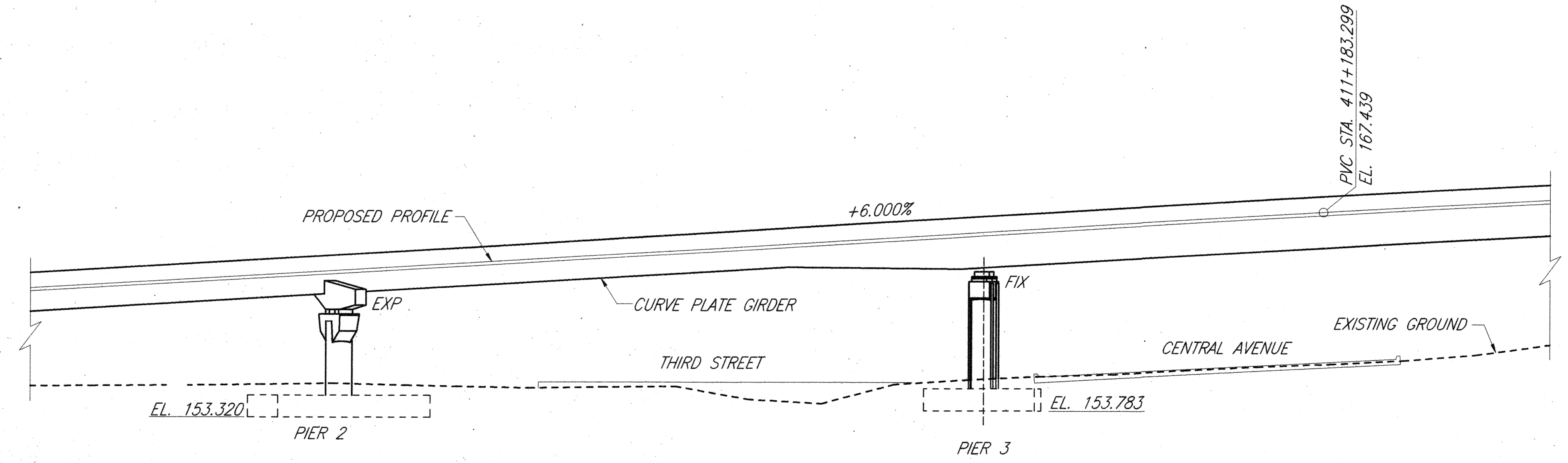
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186
588



GENERAL PLAN

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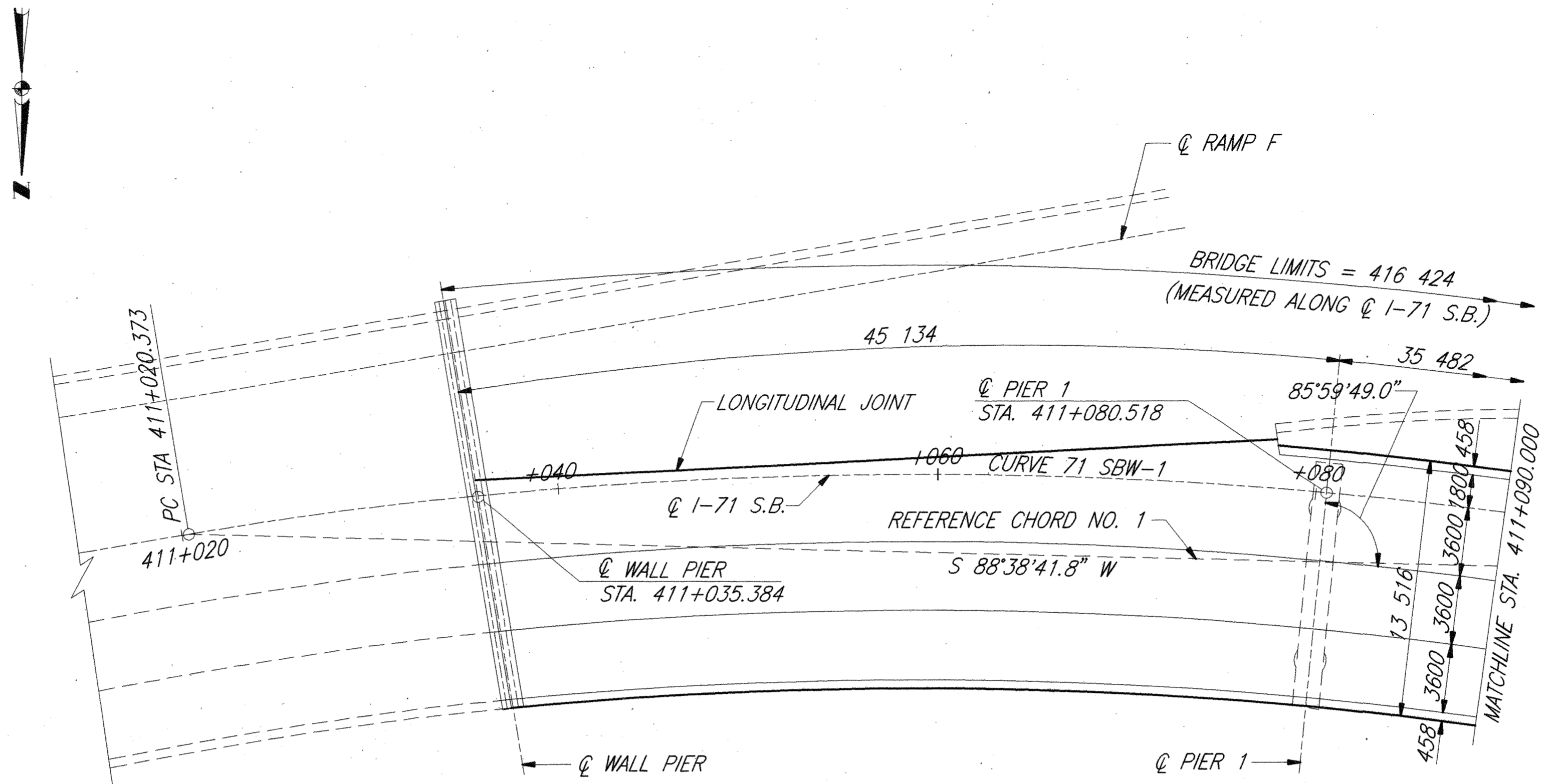
ELEVATION

HAM-71-0000R
SPANS 4-2

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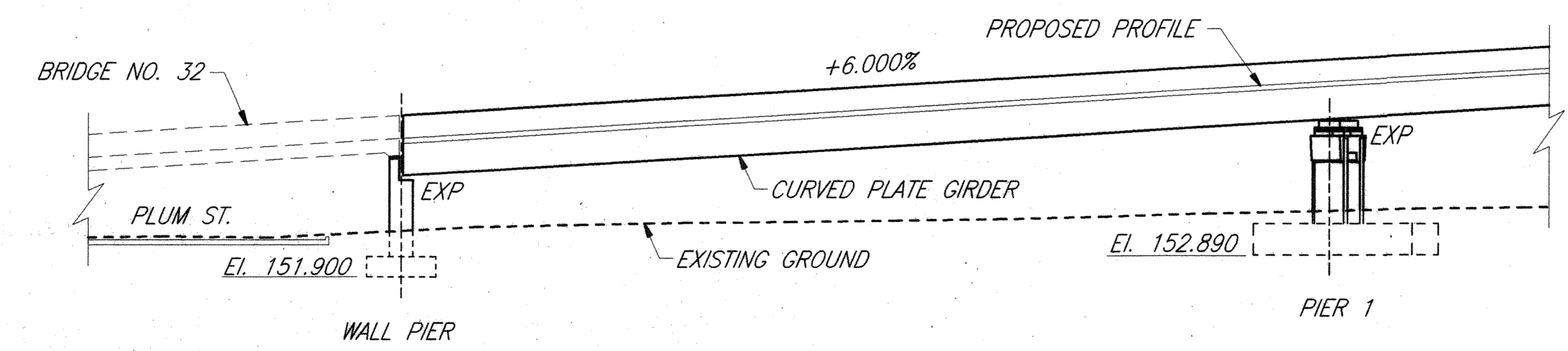
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GENERAL PLAN & ELEVATION I-71 S.B.	
BRIDGE 6	
8 / 85	
185 588	



GENERAL PLAN

CURVE 71 SBW-1
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 P.I. STA. 411+064.996
 P.C.C. STA. 411+108.524
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 $E = 4.289$ m



ELEVATION

HAM-71-0000R
SPAN 1

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BRW HAZELET & ERDAL A BRW COMPANY	

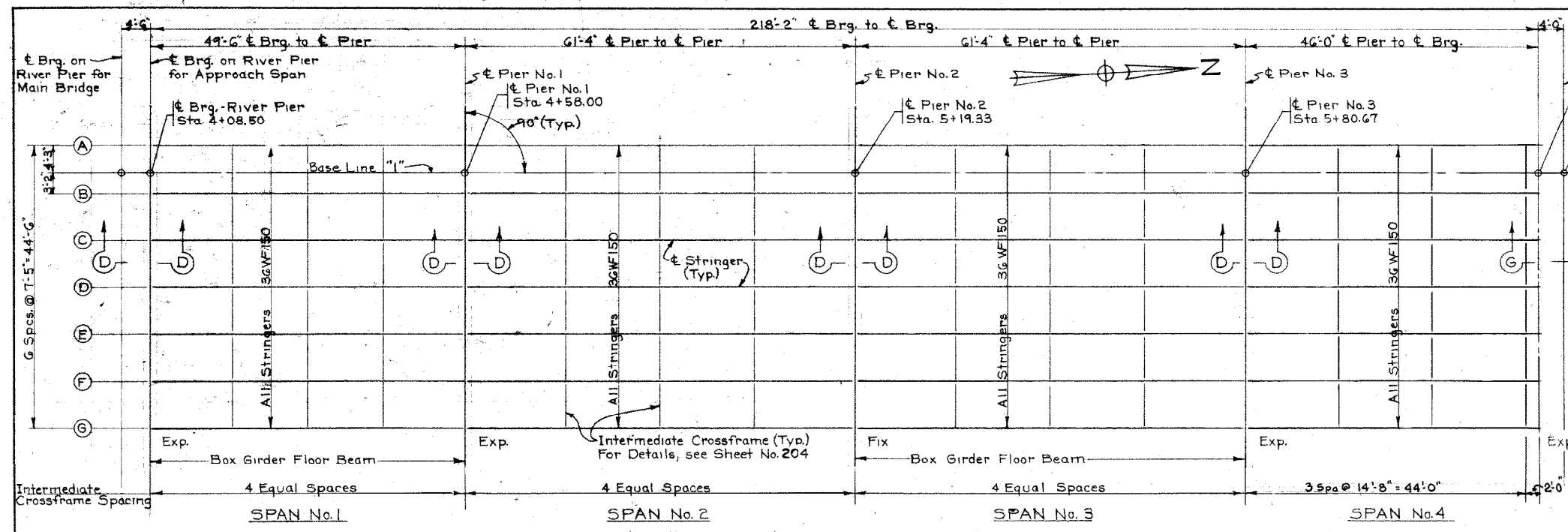
168-250

FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
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168

Red 64

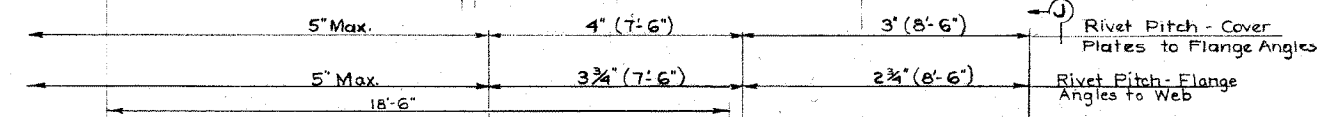
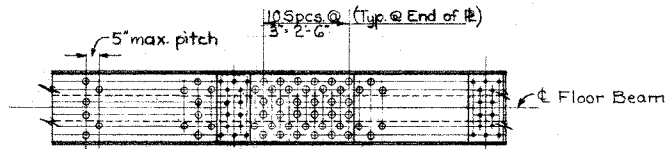
HAM-25-0.04



FRAMING PLAN - UNIT No. 1 - UPPER DECK

Note: Provide 2" ϕ bushed holes at mid-depth of stringers for location of bushed holes see Sh. No. 252. For detail of bushed holes see Sh. No. 265.

REVISIONS
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REVISION

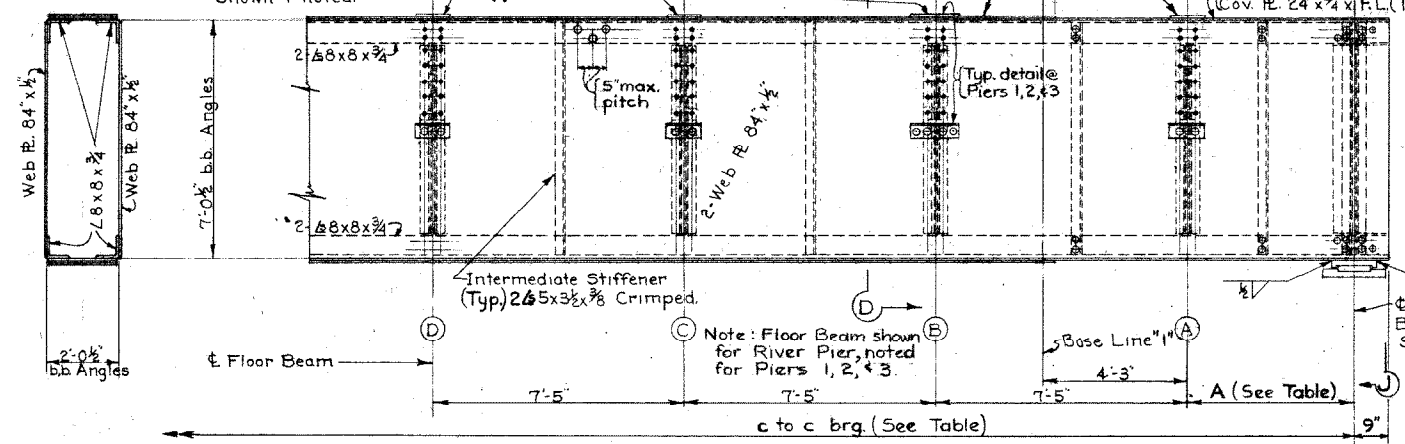


NOTE: Stringers to be level in cross section

NOTE: Floor Beam is symmetrical about ϵ except as shown & noted.

12" x 24" Beveled Fill Plate (3/8" min thickness) at River Pier or 16" x 24" Beveled Fill Plate (3/8" min. thickness) Piers 1, 2, & 3.

16" x 24" Beveled Fill Plate (1" min. thickness at Piers No. 1, 2, & 3) 12" x 24" Beveled Fill Plate (3/8" min. thickness at River Pier) Cov. Pl. 24" x 3/8" x 37'-0" (Top & Bottom) Fl. Bm. at Piers No. 1, 2, & 3. Cov. Pl. 24" x 3/8" x FL (Top & Bottom) Floor Beam at River Pier. Cov. Pl. 24" x 3/8" x FL (Top & Bottom) Floor Beam at Pier No. 1, 2, & 3.



ELEVATION FLOORBEAMS AT RIVER PIER AND PIERS 1, 2, & 3 Looking South

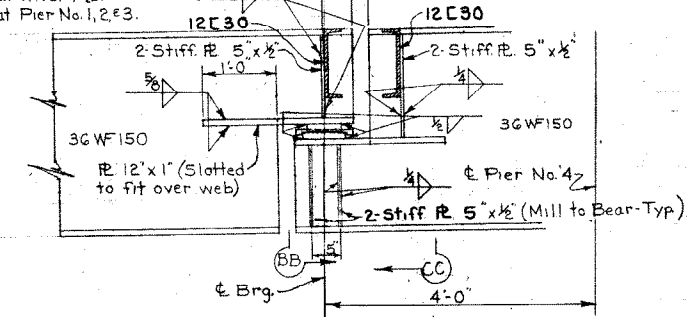
See enlarged detail on Sheet No. 169, showing access manhole and end bearing details.

ϵ Brg. - For Detail of Bearing Plates. See Sheet No. 178

For Section J-J See Sh. No. 169

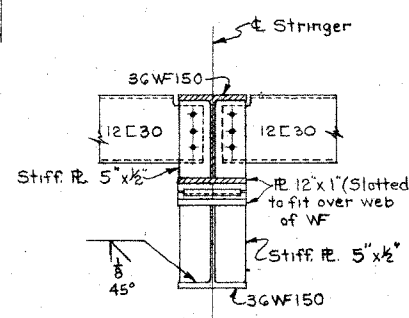
For Detail of Brg. Plate See Sheet No. 169

Note: For detail of Exp. Jt. See Sect. Y-Y, Sh. No. 207

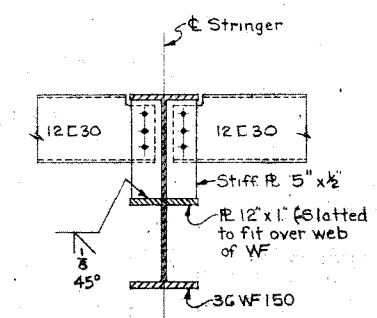


SECTION G-G

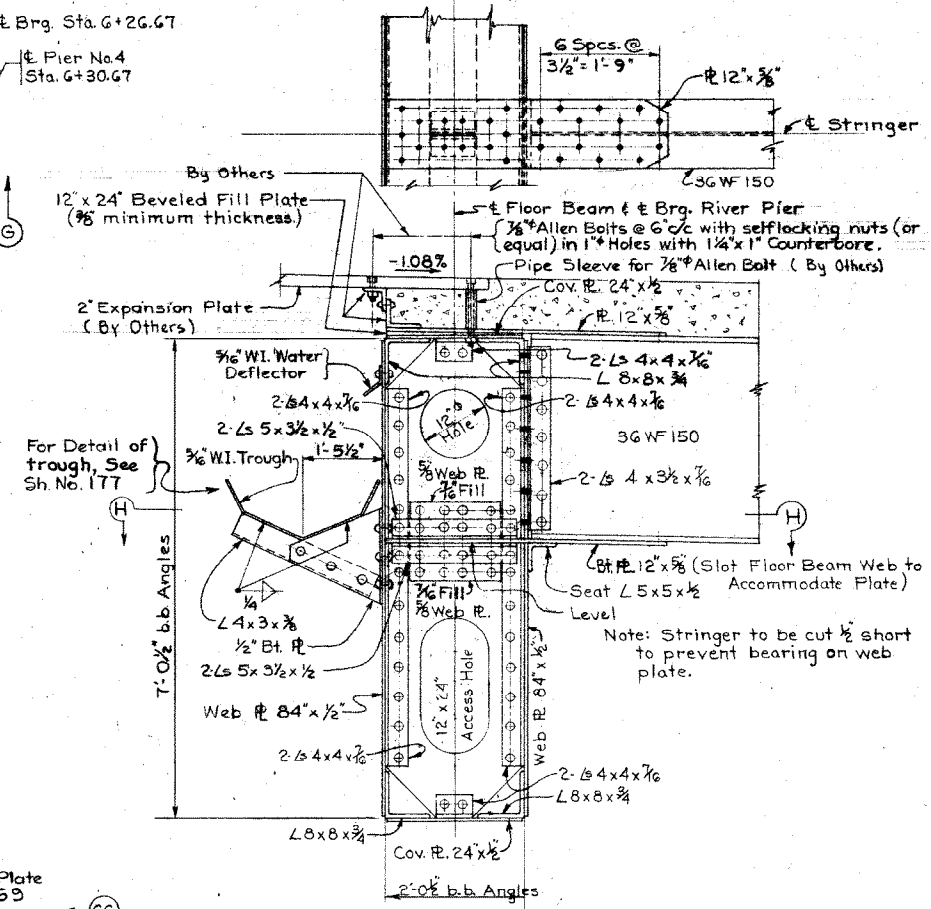
For Stringer Connection to Floor Beam at Pier No. 4 See Sheet No. 170



SECTION BB-BB



SECTION CC-CC



SECTION D-D FOR RIVER PIER

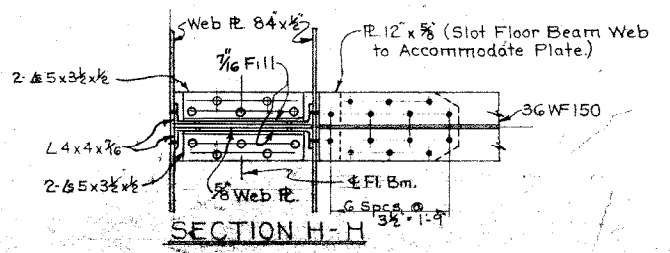
GENERAL NOTES

Shop Connection shall be 7/8" ϕ rivets unless noted otherwise. Field Connection shall be 7/8" ϕ high-strength bolts and nuts with hardened washers according to Supplemental Specifications S-207 unless noted otherwise.

Painting At Stiffener Crimps. The requirement of the last portion of the last sentence in Sec. 5-7.14 of the Construction and Material Specifications which states "..." and any remaining openings shall be filled with a metallic compound of a non-shrinking type before, the shop paint is applied" shall not apply and the following requirement shall be substituted therefor: "Prior to the assembly of a floor beam the web plate, the flange angle and the stiffener angle at the location of the crimp in the stiffener angle shall be given a shop coat of paint."

Floor Beams shall be set vertical

HAM-71-0000L SPANS 1A-4A



SECTION H-H

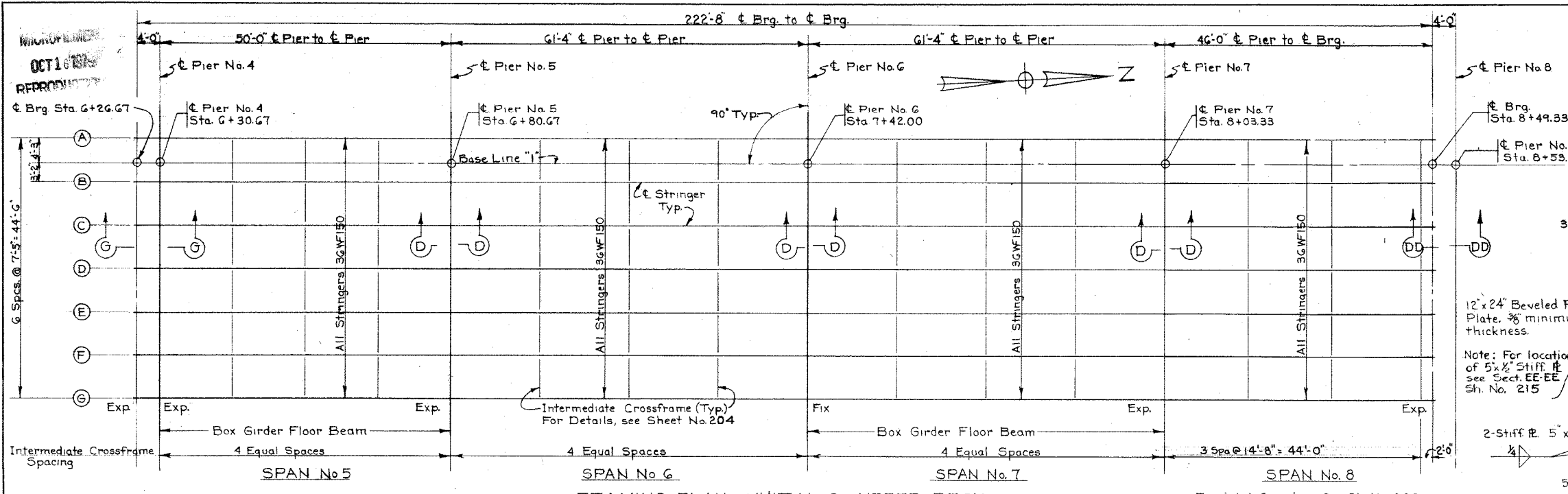
FLOOR BEAM LOCATION	Distance c to c Brg.	A (East End)	A (West End)
At River Pier	54'-1"	4'-9 1/2"	4'-9 1/2"
At Pier No. 1	54'-4"	4'-11"	4'-11"
At Pier No. 2	54'-4"	4'-11"	4'-11"
At Pier No. 3	54'-5"	5'-0"	4'-11"

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STRUCTURAL STEEL DETAILS UNIT NO. 1 (UPP. DECK)

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
CPW	CAF		JHO 10/14/60	10-17-60	

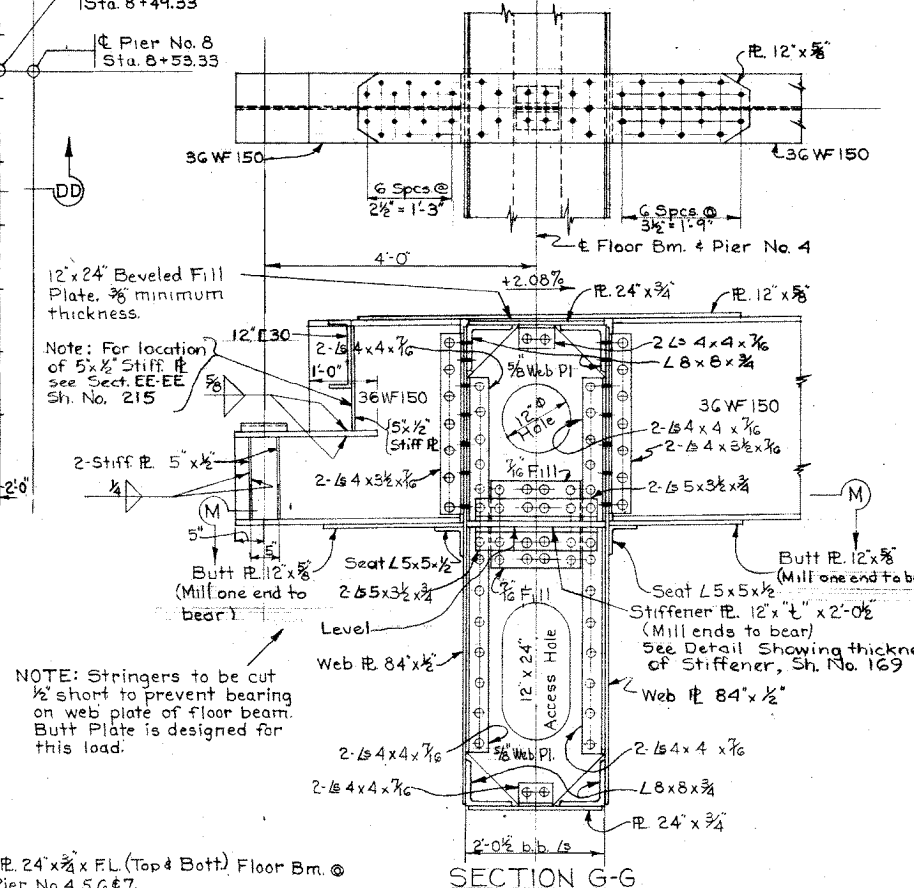
HAM-25-0.04



Note: Provide 2" bushed holes at mid-depth of stringers. For location of bushed holes, see Sh. No. 252. For detail of bushed holes, see Sh. No. 265.

FRAMING PLAN - UNIT No. 2 - UPPER DECK

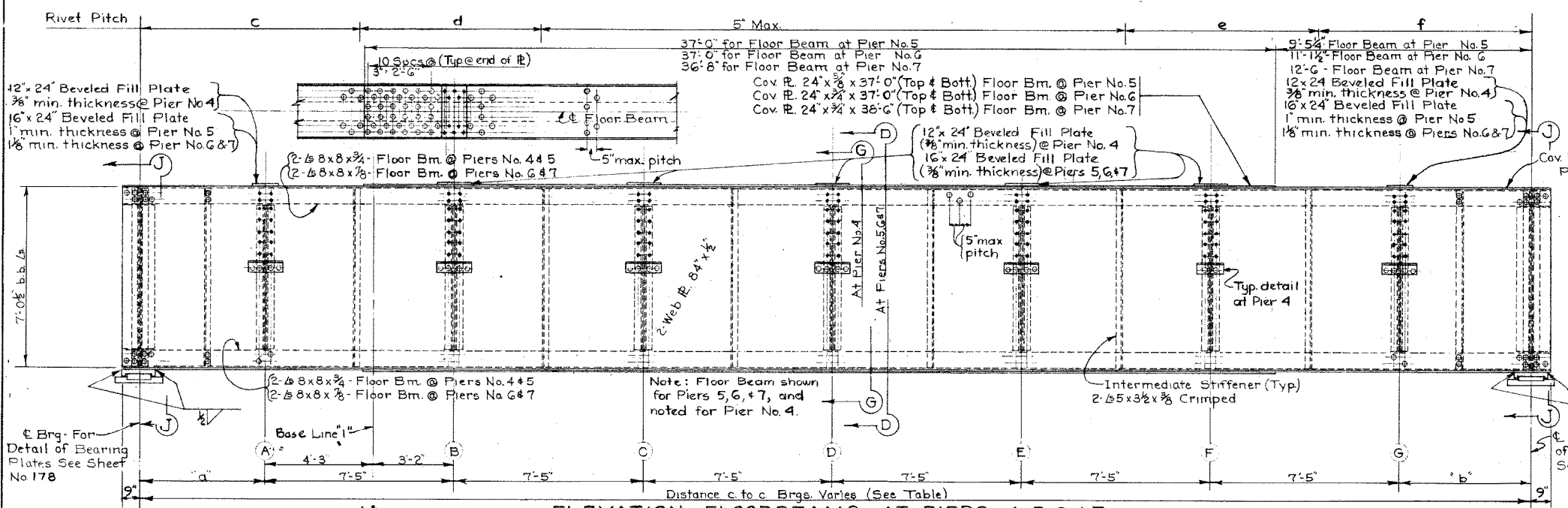
For inlet framing, See Sh. No. 268



NOTE: Stringers to be cut 1/2" short to prevent bearing on web plate of floor beam. Butt Plate is designed for this load.

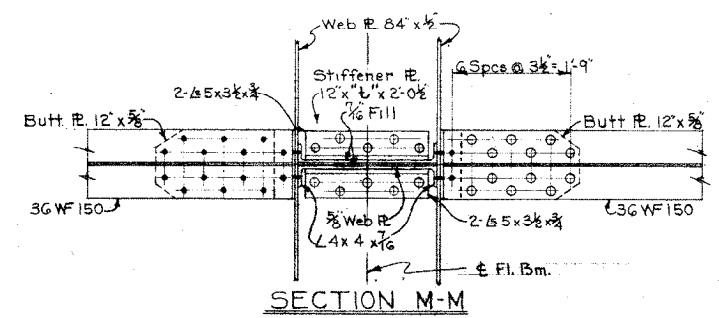
See enlarged detail on Sheet No. 169 showing access manhole and end bearing details.

**HAM-71-0000L
SPANS 5A-8A
PIERS 4A-7A**



ELEVATION FLOORBEAMS AT PIERS 4, 5, 6, & 7 (Looking North)

Floor Beam Location	Distance c to c Brg	Dimension a	Dimension b
At Pier No. 4	54'-7"	4'-11"	5'-2"
At Pier No. 5	55'-1"	4'-10 3/4"	5'-8 1/2"
At Pier No. 6	56'-1"	4'-8 1/2"	7'-4 1/2"
At Pier No. 7	58'-8"	3'-11 1/8"	10'-2 7/8"



SECTION M-M

Defl. due to wt. of steel	DEFLECTION OF STRINGERS			
	Span 5	Span 6	Span 7	Span 8
	1/16"	3/16"	3/16"	1/8"
Defl. due to remaining D.L.	3/16"	1/4"	1/4"	1/8"

(-) indicates upward deflection

Point of Defl.	DEFLECTION OF FLOOR BEAMS						
	A	B	C	D	E	F	G
Bm. @ Pier 5	0"	1/16"	1/16"	1/16"	1/16"	1/16"	0"
Bm. @ Pier 6	1/16"	3/16"	3/16"	3/16"	3/16"	1/4"	1/8"
Bm. @ Pier 7	1/16"	3/16"	3/16"	3/8"	3/8"	3/16"	3/16"
Bm. @ Pier 8	1/16"	3/16"	3/16"	3/8"	3/8"	3/16"	1/4"

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

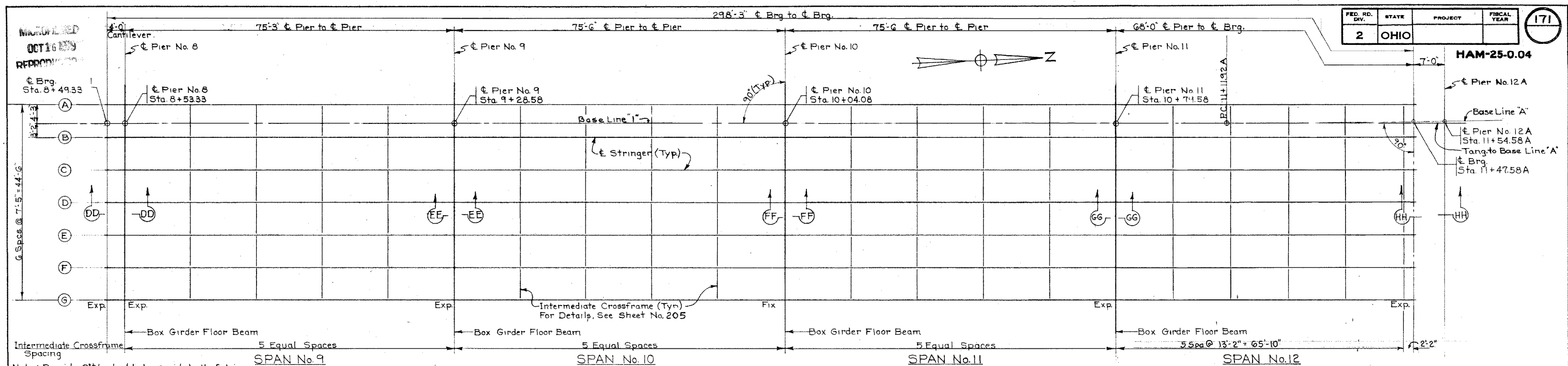
For General Notes see Sheet No. 168. For Section J-J, See Sheet No. 169. For Section D-D, See Sheet No. 169.

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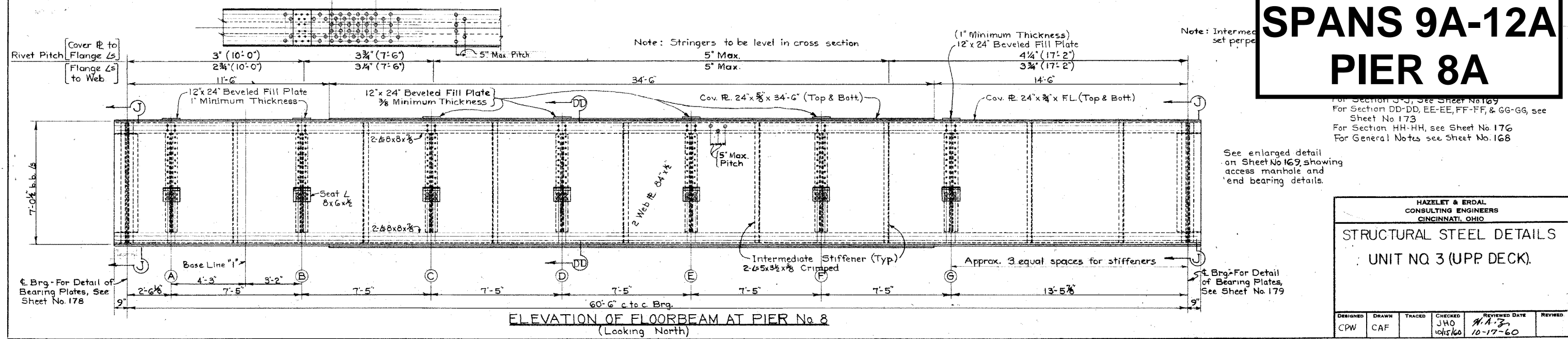
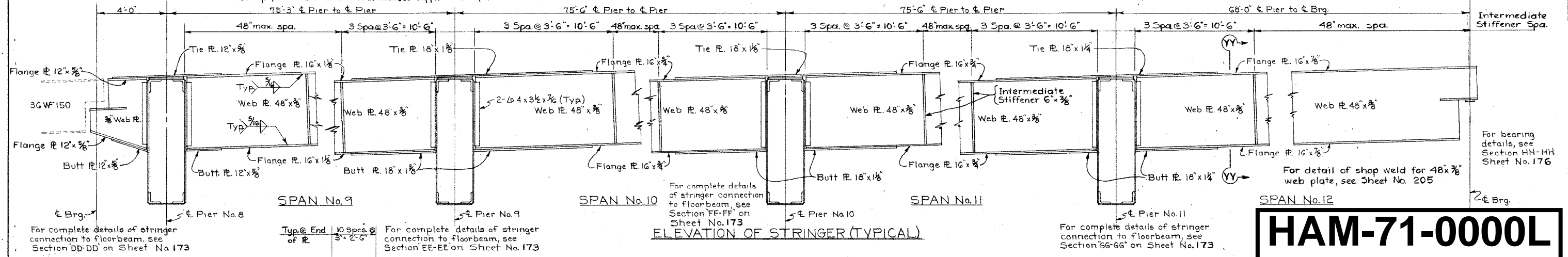
STRUCTURAL STEEL DETAILS UNIT NO. 2 (UPP DECK).

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
CPW	CAF		JHO 10/15/60	H.A.Z. 10-17-60	

HAM-25-0.04



FRAMING PLAN - UNIT No. 3 - UPPER DECK
 Note: Provide 2" bushed holes @ mid-depth of stringer. For location of bushed holes, see Sh. 253. For detail of bushed holes, see Sh. 265.
 Note: For radiographic examination of welds, see Supplemental Specifications No. S-307.
 For inlet framing, see Sheet No. 268.



HAM-71-0000L
SPANS 9A-12A
PIER 8A

For Section J-J, see Sheet No. 169
 For Section DD-DD, EE-EE, FF-FF, & GG-GG, see Sheet No. 173
 For Section HH-HH, see Sheet No. 176
 For General Notes see Sheet No. 168

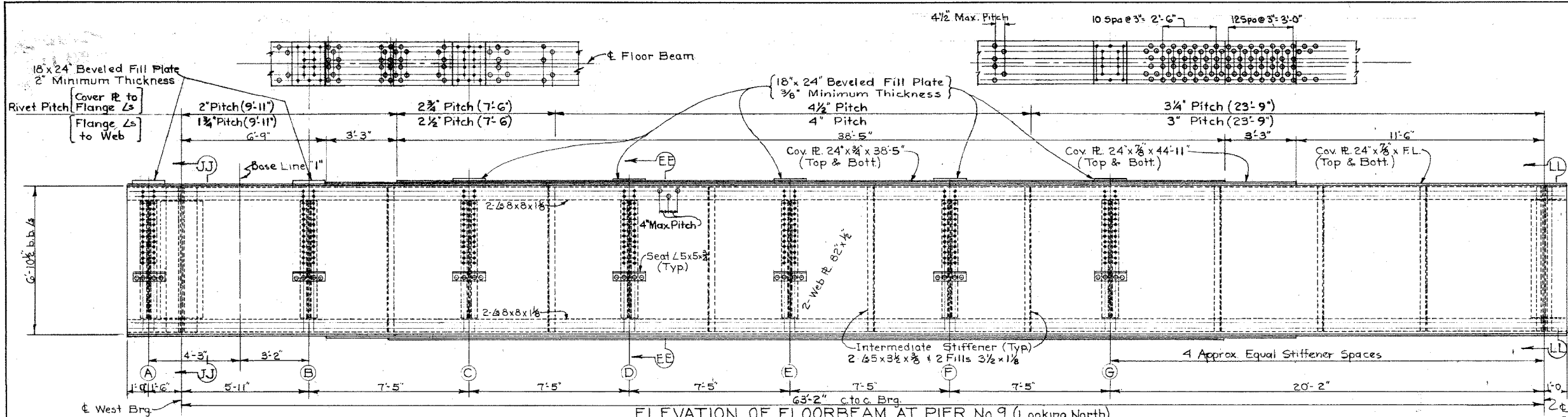
See enlarged detail on Sheet No. 169, showing access manhole and end bearing details.

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 CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS
UNIT NO. 3 (UPP. DECK).

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISION
CPW	CAF		JAO 10/15/60	10-17-60	

HAM-25-0.04

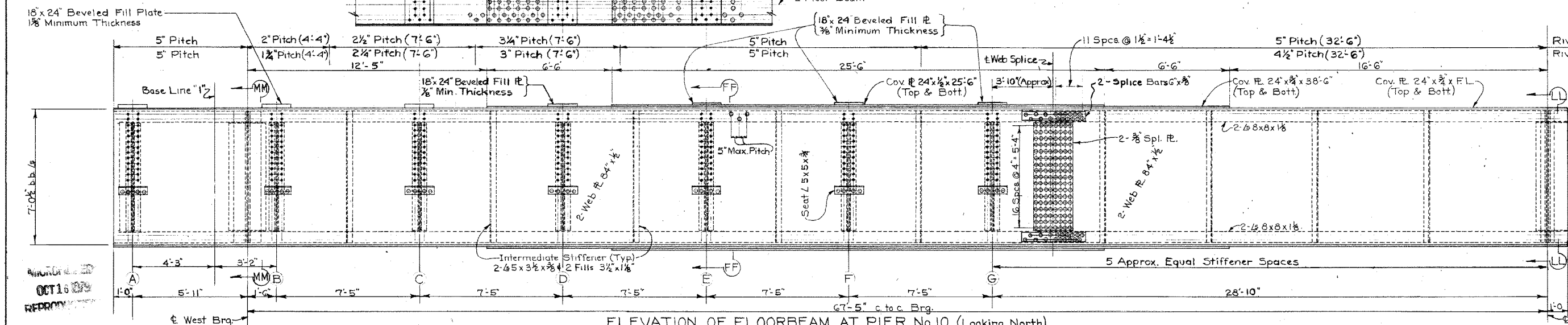


ELEVATION OF FLOORBEAM AT PIER No. 9 (Looking North)

See Enlarged Detail of West End of Floor Beam on Sheet No. 174 showing end bearing details and stringer connection.

See Enlarged Detail of East End of Floor Beam on Sheet No. 174 showing end bearing details and access manhole

Note: Stringers to be level in cross section



ELEVATION OF FLOORBEAM AT PIER No. 10 (Looking North)

See Enlarged Detail of West End of Floor Beam on Sheet No. 174 showing end bearing details and stringer connection.

See Enlarged Detail of East End of Floor Beam on Sheet No. 174 showing end bearing details and access manhole.

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REPRODUCTION

Point of Deflection	A	B	C	D	E	F	G
Bm. @ Pier No. 9	1/16"	3/16"	3/16"	3/8"	7/8"	7/16"	1/4"
Bm. @ Pier No. 10	0"	1/16"	3/16"	3/16"	7/8"	7/16"	3/8"
Bm. @ Pier No. 11	-1/8"	-1/16"	0"	1/8"	1/4"	3/8"	3/8"

(-) indicates upward deflection

LOCATION	Span No. 9			Span No. 10			Span No. 11			Span No. 12			Cont.
	1/4	1/2	3/4	1/4	1/2	3/4	1/4	1/2	3/4	1/4	1/2	3/4	
Deflection Due To Weight of Steel	1/8"	3/16"	1/8"	3/16"	1/4"	3/16"	3/16"	1/4"	3/16"	1/8"	1/8"	1/8"	-1/16"
Deflection Due To Remaining Dead Load	3/16"	3/8"	3/16"	1/16"	3/16"	1/8"	1/8"	1/4"	1/8"	3/16"	3/16"	1/4"	-1/4"
Convexity Required For Vertical Curve	0	0	0	0	0	0	1/16"	1/16"	3/8"	7/8"	5/8"		
Sum of Deflection and Convexity	3/16"	3/16"	3/16"	1/4"	3/16"	5/16"	3/16"	3/8"	1/16"	1 1/16"	1"		
Required Camber	0"	0"	0"	0"	0"	0"	0"	0"	0"	1 1/4"			

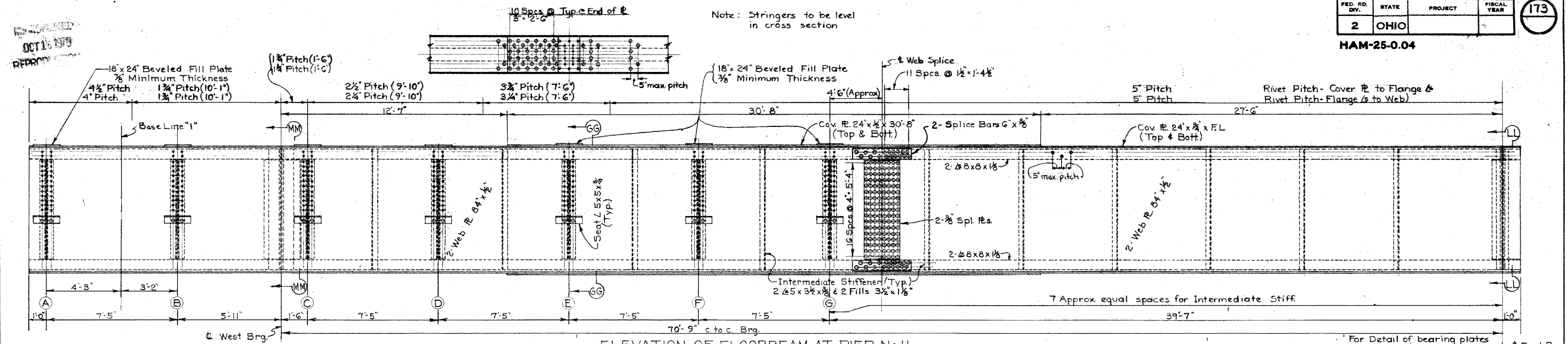
Girder web plates shall be cut to a parabolic crown.

HAM-71-0000L
PIERS 9A-10A

For Sections EE-EE & FF-FF, see Sheet No. 173
For Sections JJ-JJ, LL-LL, & MM-MM, see Sheet No. 174
For General Notes see Sheet No. 168

HAZELET & ERDAL CONSULTING ENGINEERS CINCINNATI, OHIO					
STRUCTURAL STEEL DETAILS UNIT NO. 3 (UPP. DECK).					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVIEWED
CPW	CAF		JHO 10/17/60	H.A.E. 10-17-60	

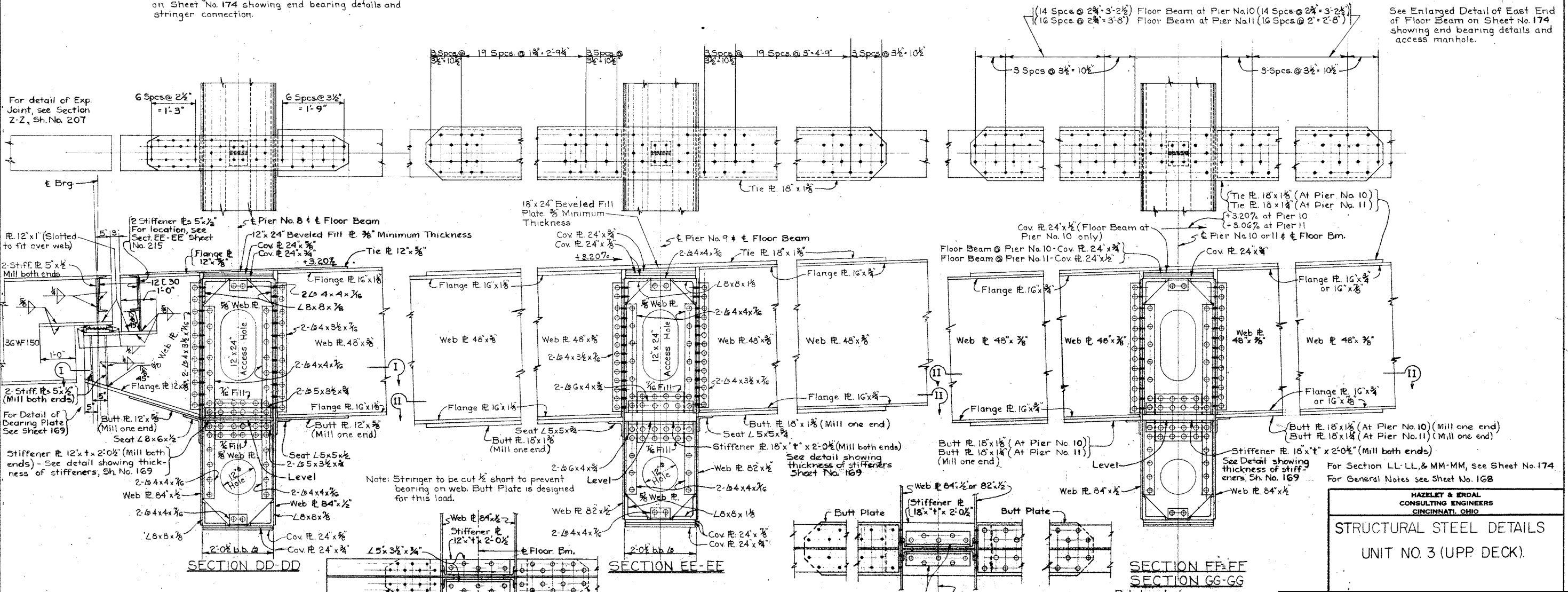
HAM-25-0.04



ELEVATION OF FLOORBEAM AT PIER No. 11

See Enlarged Detail of West End of Floor Beam on Sheet No. 174 showing end bearing details and stringer connection.

For Detail of bearing plates See Sheet No. 179



SECTION DD-DD

SECTION EE-EE

SECTION GG-GG

SECTION II-II

SECTION I-I

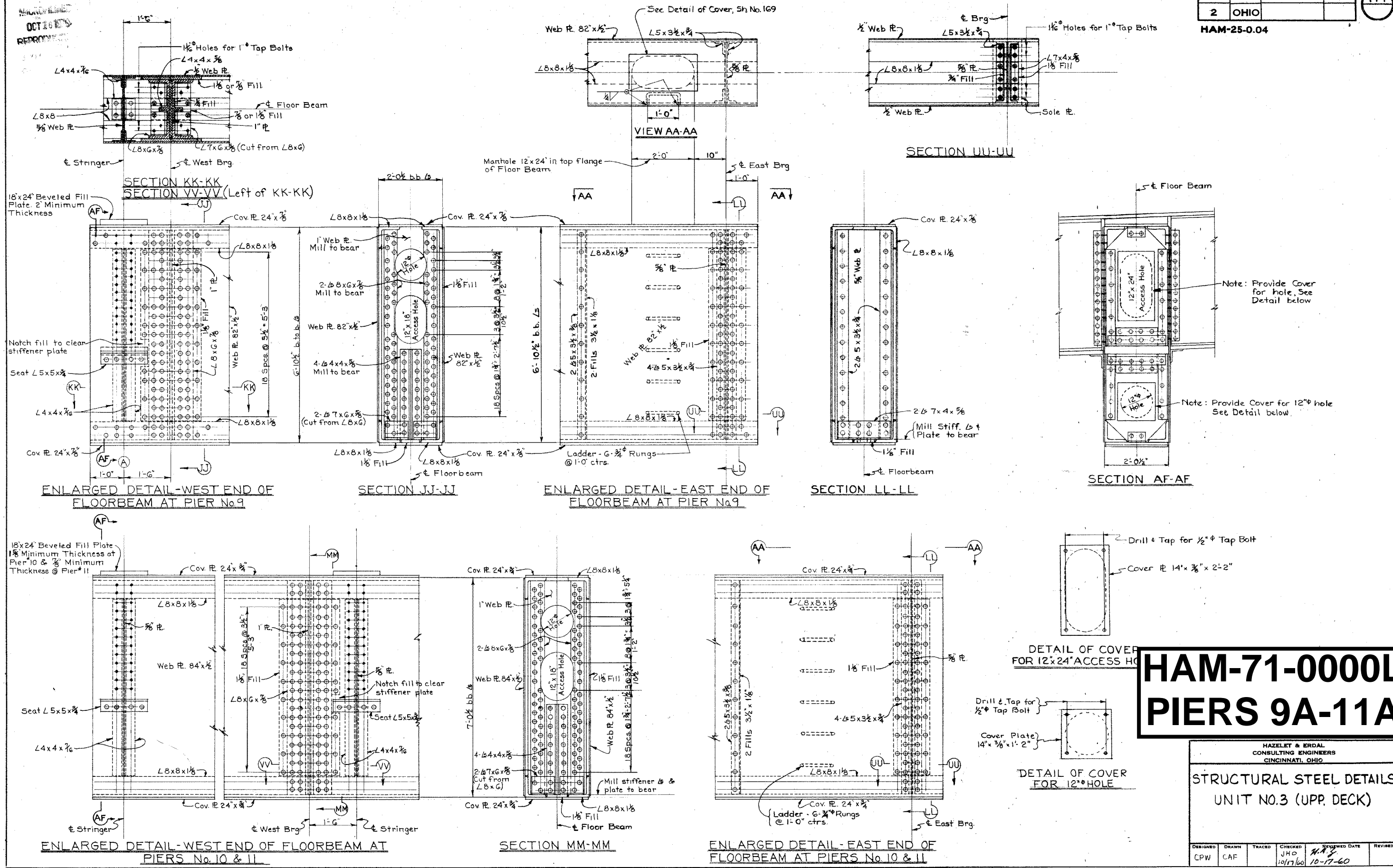
For Section LL-LL, & MM-MM, see Sheet No. 174
For General Notes see Sheet No. 168

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STRUCTURAL STEEL DETAILS
UNIT NO. 3 (UPP. DECK)

HAM-71-0000L
PIER 11A

HAM-25-0.04



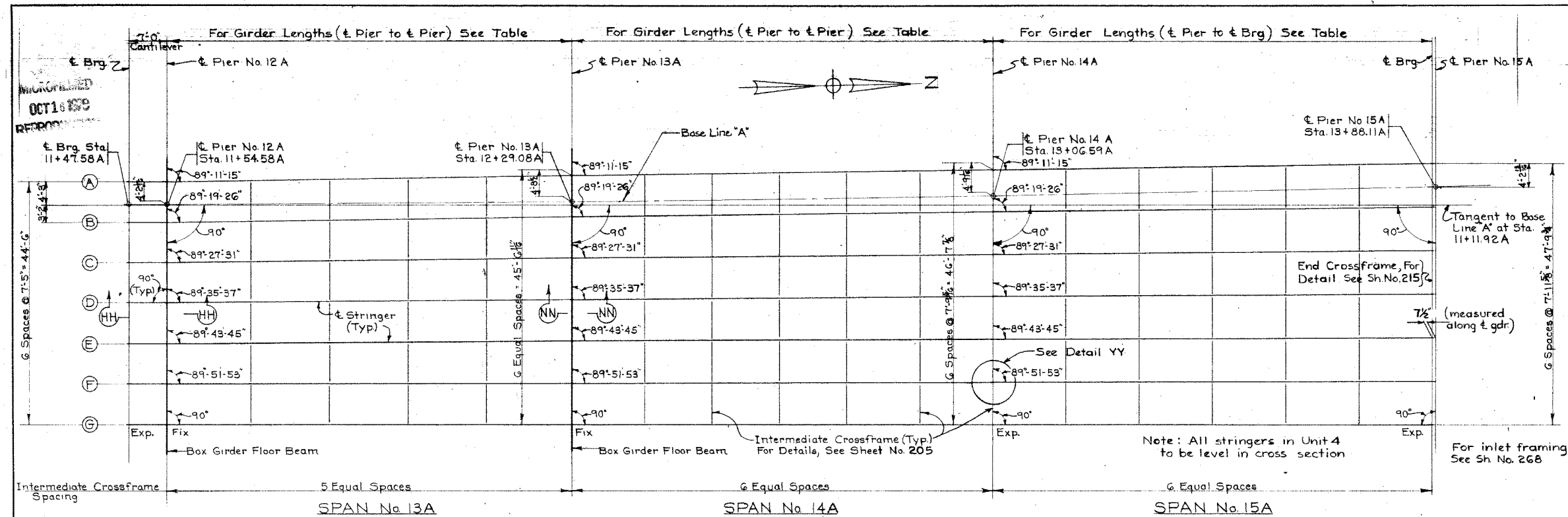
HAM-71-0000L PIERS 9A-11A

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CONSULTING ENGINEERS
CINCINNATI, OHIO

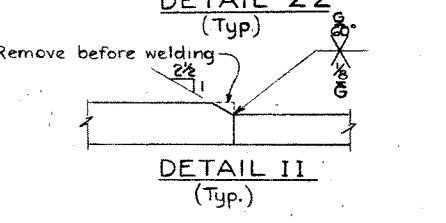
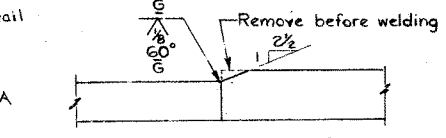
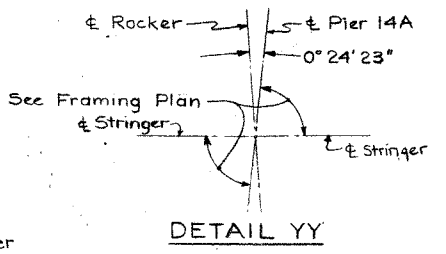
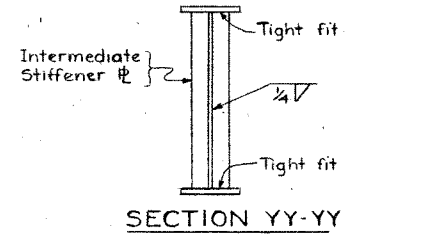
STRUCTURAL STEEL DETAILS
UNIT NO.3 (UPP. DECK)

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CPW	CAF		JHO	10-17-60	

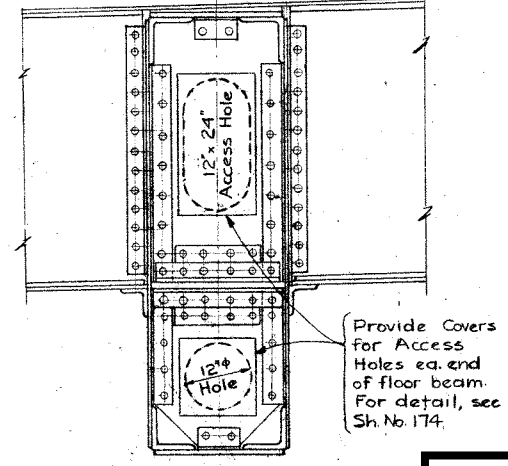
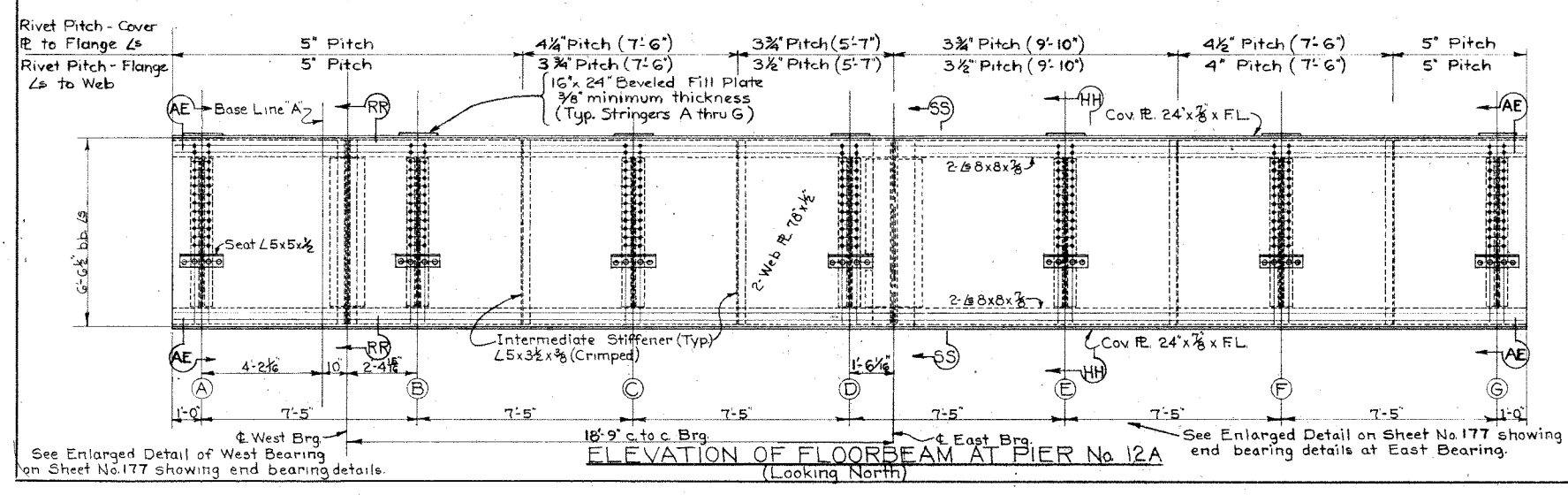
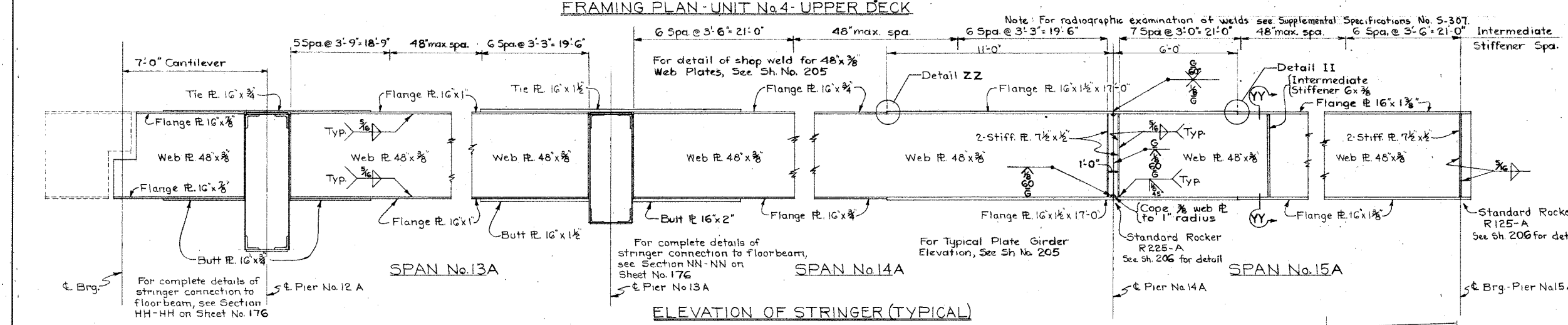
HAM-25-0.04



GIRDER LENGTHS			
GIRDER	SPAN 13A	SPAN 14A	SPAN 15A
A	74'-6 1/8"	77'-6 1/8"	80'-10 3/8"
B	74'-6 1/8"	77'-6 1/8"	80'-10 3/8"
C	74'-6"	77'-6 1/8"	80'-10 3/8"
D	74'-6"	77'-6 1/8"	80'-10 1/2"
E	74'-6"	77'-6"	80'-10 1/2"
F	74'-6"	77'-6"	80'-10 1/2"
G	74'-6"	77'-6"	80'-10 1/2"



For Section HH-HH & NN-NN, see Sheet No. 176
 For Section RR-RR & SS-SS, see Sheet No. 177
 For General Notes see Sheet No. 16B



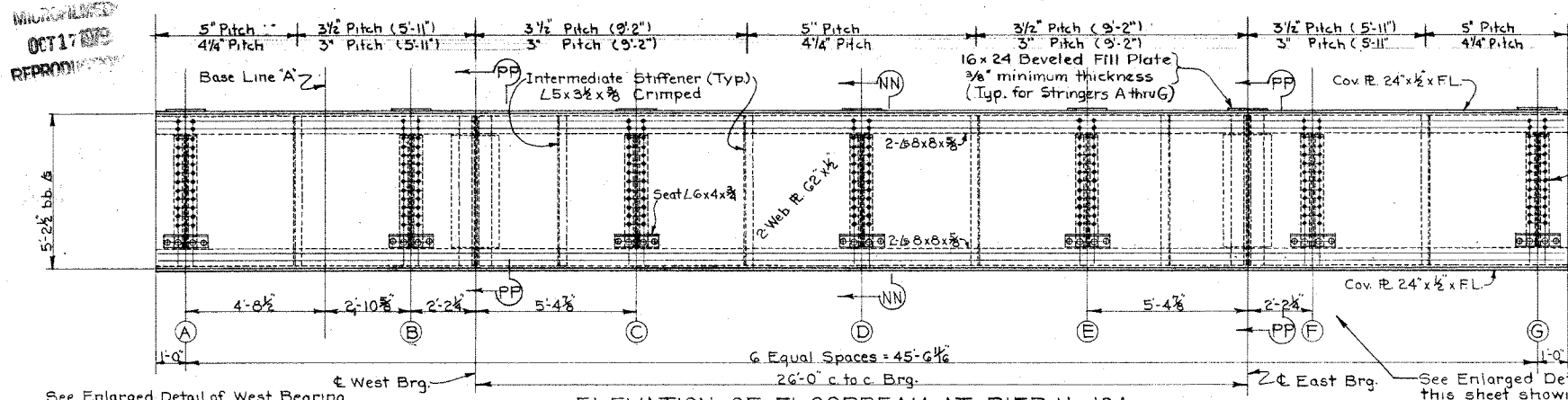
HAZELET & ERDAL
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 CINCINNATI, OHIO
STRUCTURAL STEEL DETAILS
 UNIT NO. 4.

HAM-71-0000L
SPANS 13A-15A
PIER 12A

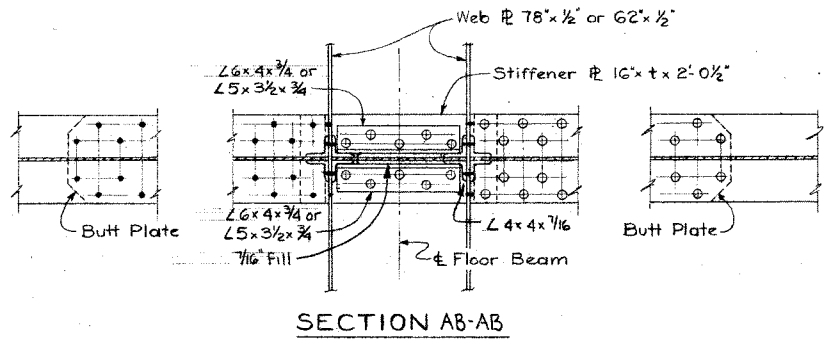
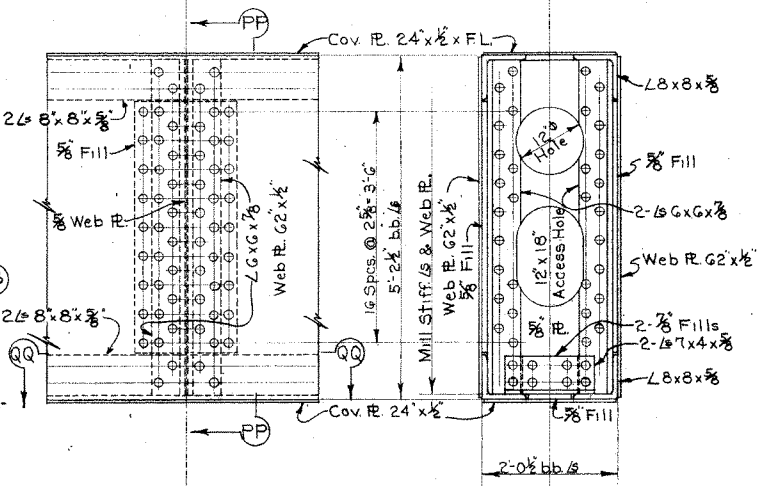
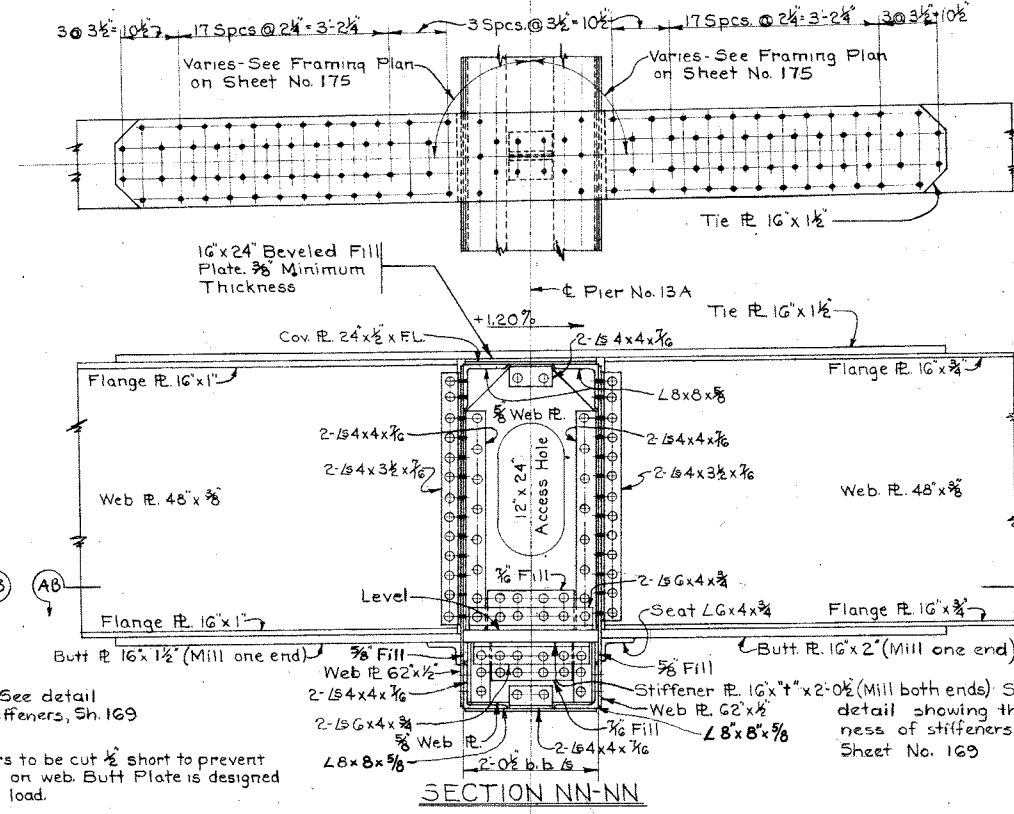
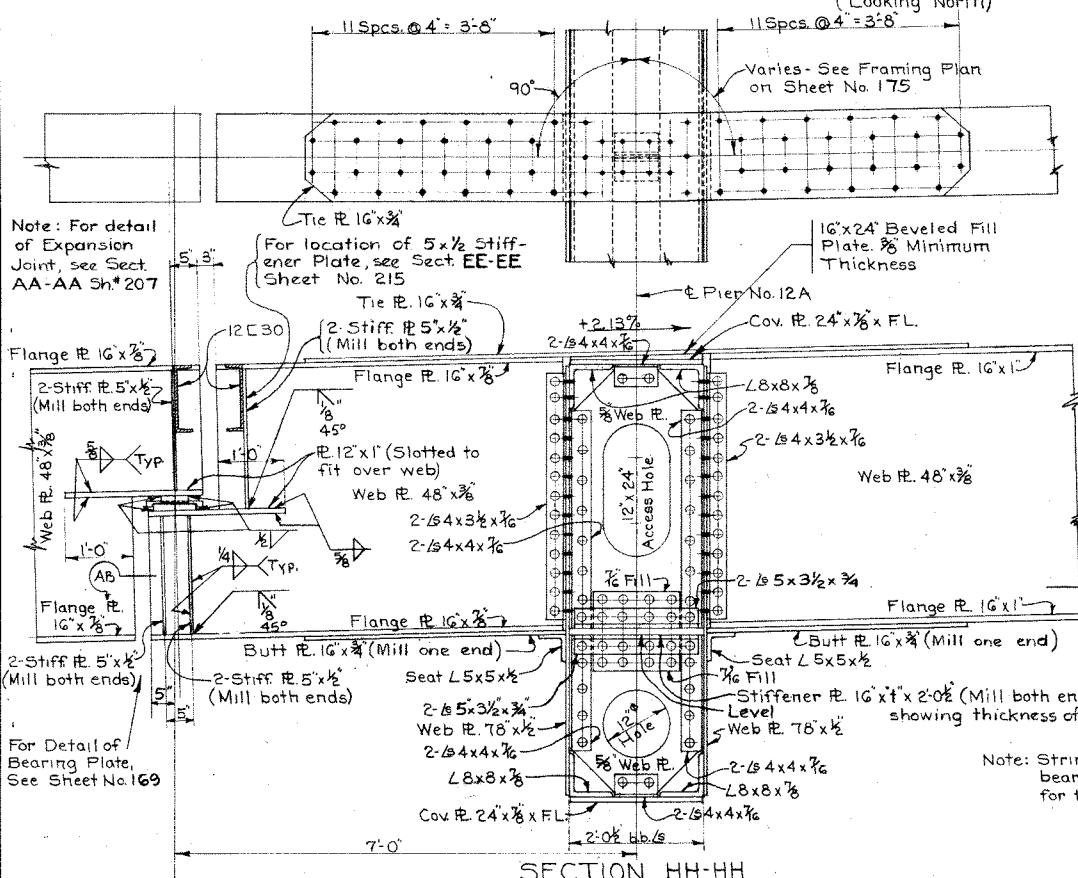
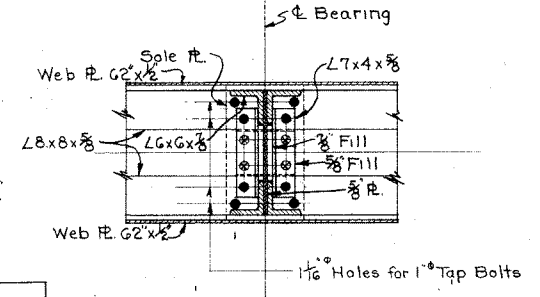
HAM-25-0.04

64 Red
176-250

Note: Stringers to be level in cross section



Note: Provide cover for 12" x 24" Access Hole at Gds. A & G. For similar detail see Sect. AF AF, Sh. No. 174.



Girder web plates shall be cut to a parabolic crown.

DEFLECTION & CAMBER - UNIT 4 UPPER DECK

Location	Span No. 13A			Span No. 14A			Span No. 15A		
	1/4	1/2	3/4	1/4	1/2	3/4	1/4	1/2	3/4
Deflection Due to Weight of Steel	1/8"	3/16"	1/4"	1/8"	1/16"	0"	1/16"	1/8"	1/8"
Deflection Due to Remaining Dead Load	1/4"	3/8"	1/2"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"
Convexity Required for Vertical Curve	3/4"	1"	3/4"	3/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"
Sum of Deflection and Convexity	1 1/8"	1 1/2"	1 1/4"	1 1/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"
Required Camber	1 1/2"			1 1/4"			1 1/8"		

HAM-71-0000L PIER 13A

DEFLECTION OF FLOOR BEAMS

Point of Deflection	A	B	C	D	E	F	G
Bm. @ Pier No. 12A	0"	0"	0"	0"	1/16"	3/16"	3/8"
Bm. @ Pier No. 13A	1/8"	0"	-1/16"	-1/16"	-1/16"	0"	1/8"

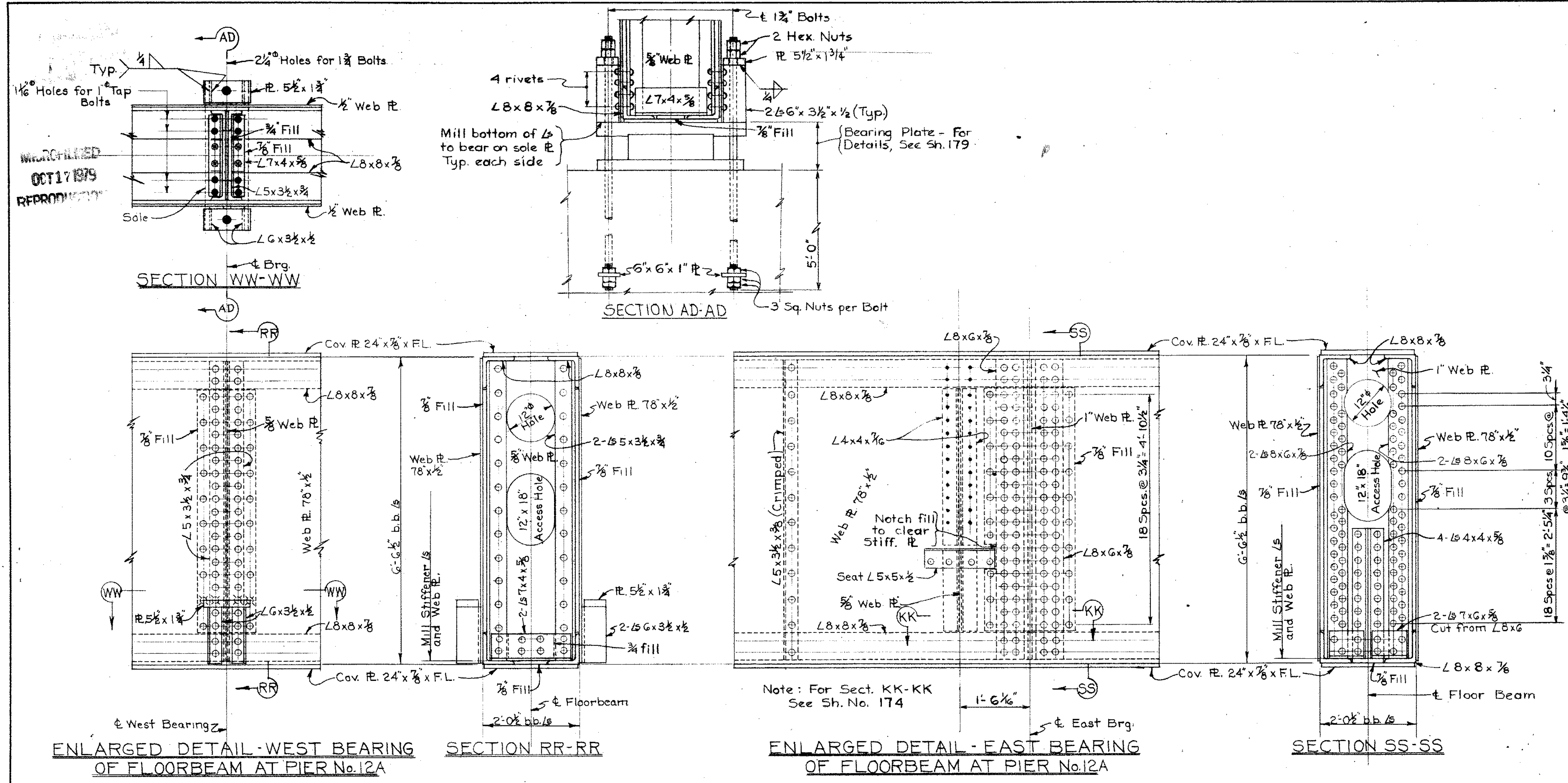
For General Notes See Sheet No. 168

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS
UNIT NO. 4

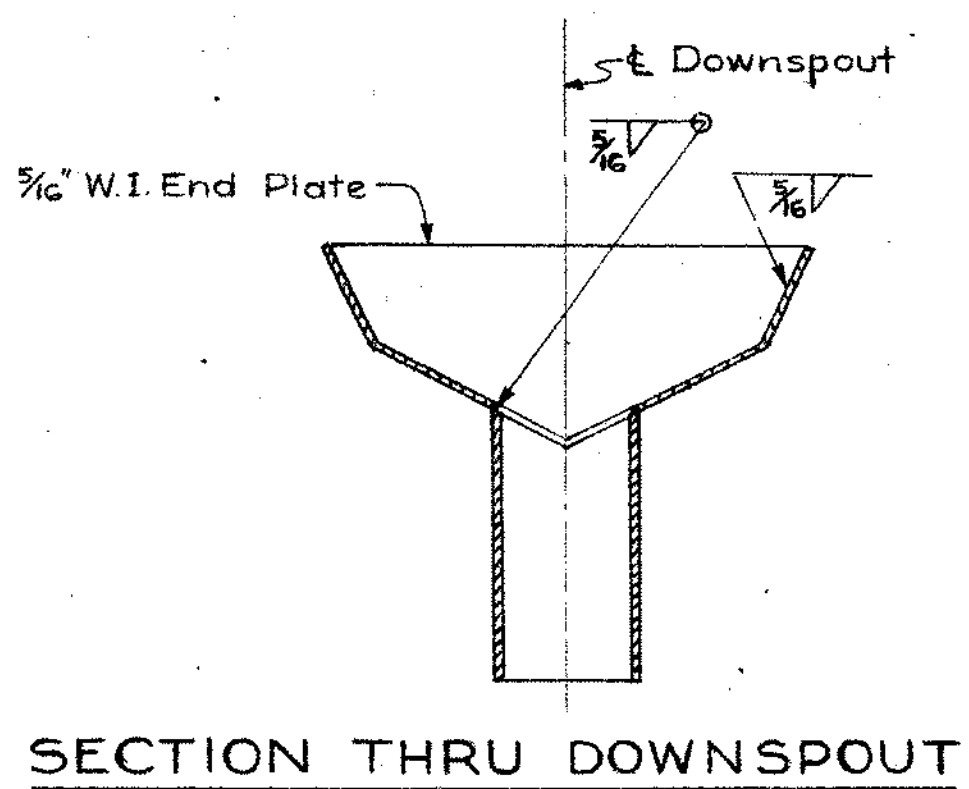
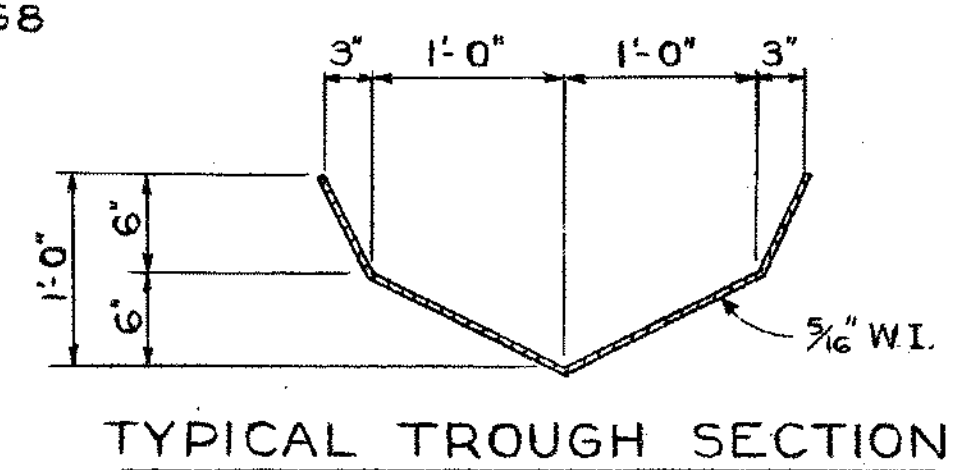
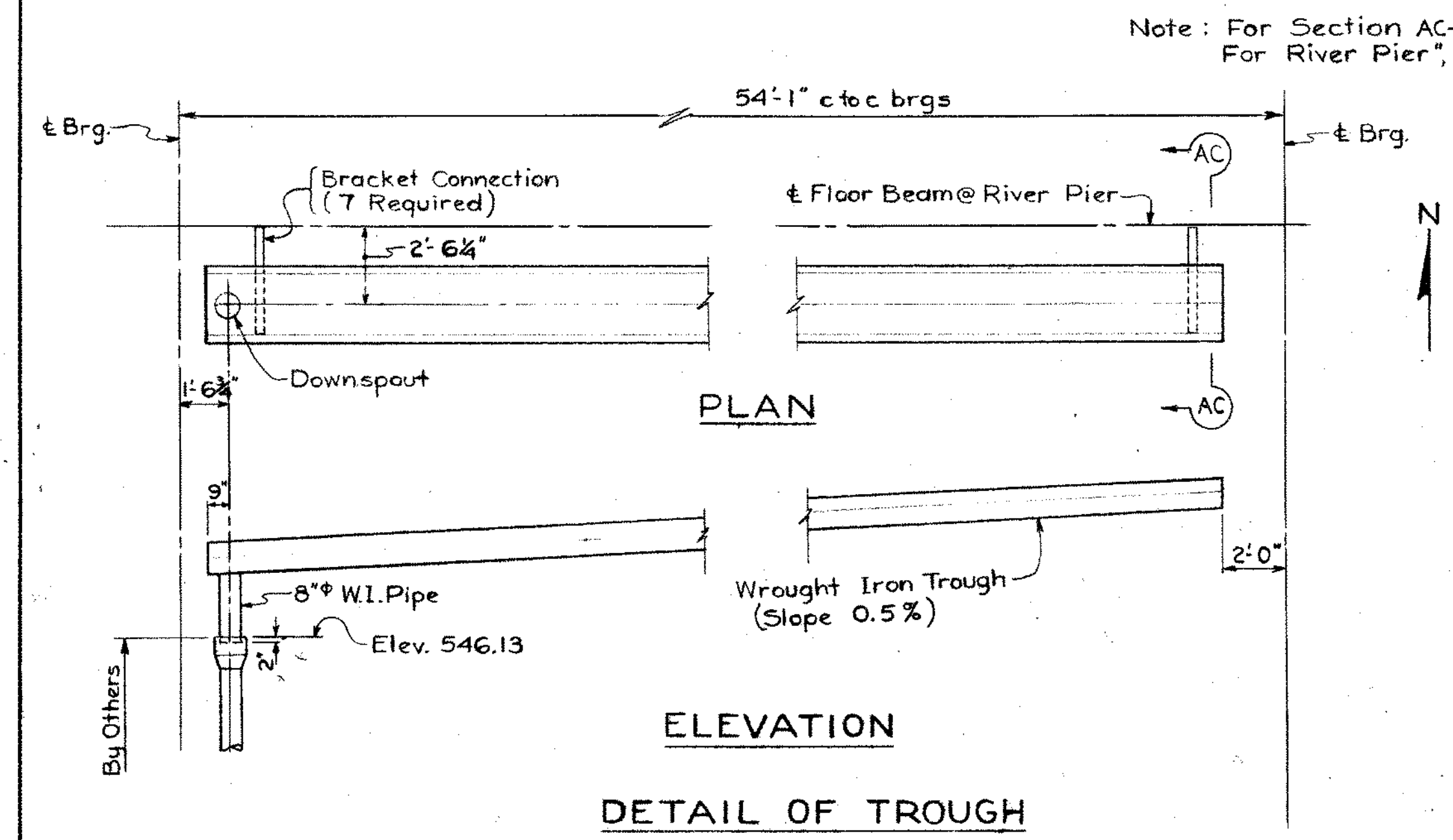
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISION
CPW	CAF		JHD 10/17/60	N. A. Z. 10-17-60	

HAM-25-0.04



Note: For Sect. KK-KK See Sh. No. 174

Note: For Section AC-AC, See "Sect. D-D For River Pier", Sheet No. 168



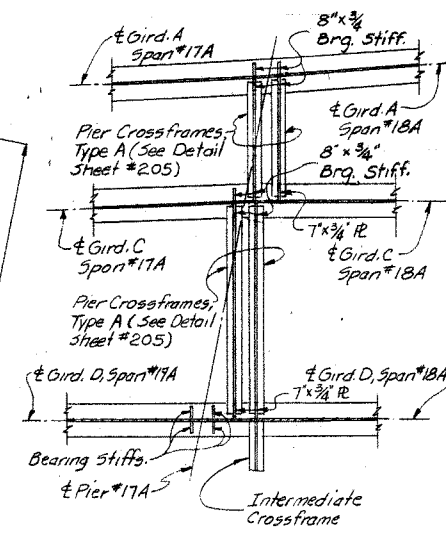
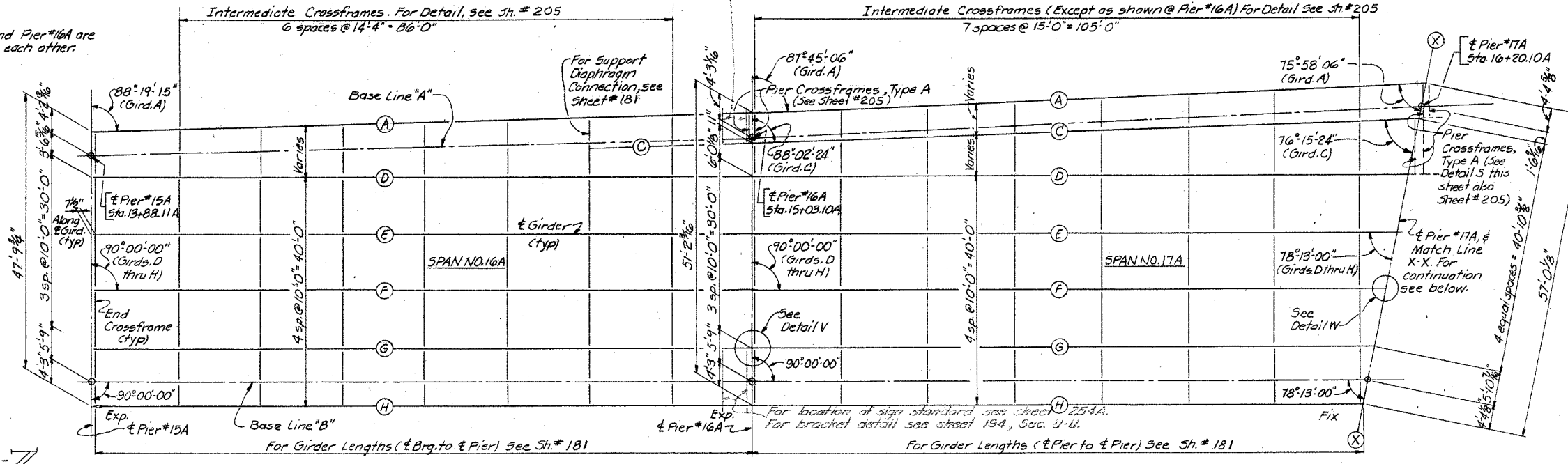
HAM-71-0000L
PIER 12A

For General Notes see Sheet No. 168

HAZELET & ERDAL CONSULTING ENGINEERS CINCINNATI, OHIO				
STRUCTURAL STEEL DETAILS UNIT NO. 4				
DESIGNED CPW	DRAWN CAF	TRACED	CHECKED JHO 10/17/60	REVIEWED DATE H.A.B. 10-17-60

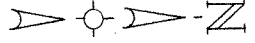
HAM-25-0.04

Note: Pier #15A and Pier #16A are parallel to each other.

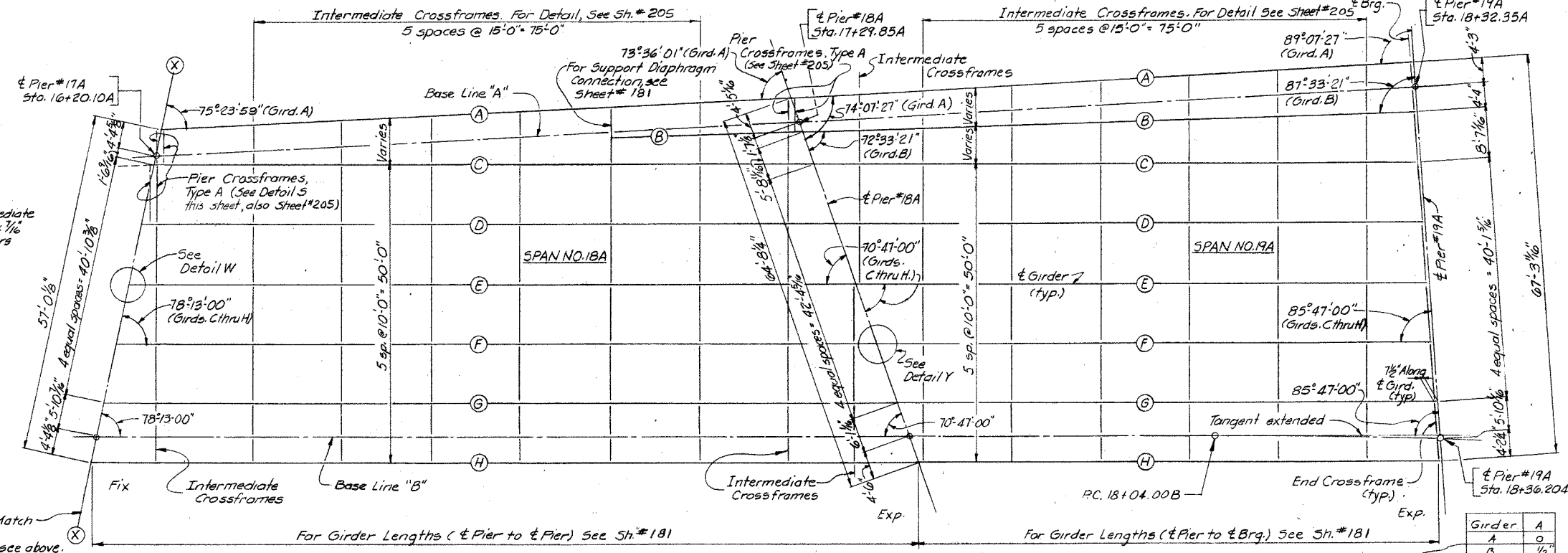


Note: Pier Crossframes are connected to girder bearing stiffeners at locations shown. For bearing stiffener details, see Sh #205.

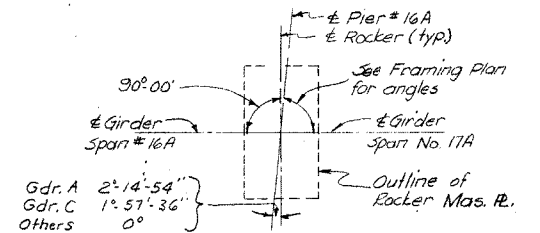
DETAIL S
(Pier crossframes at Pier #17A.)



Note: For inlet Framing see Sh No. 268.

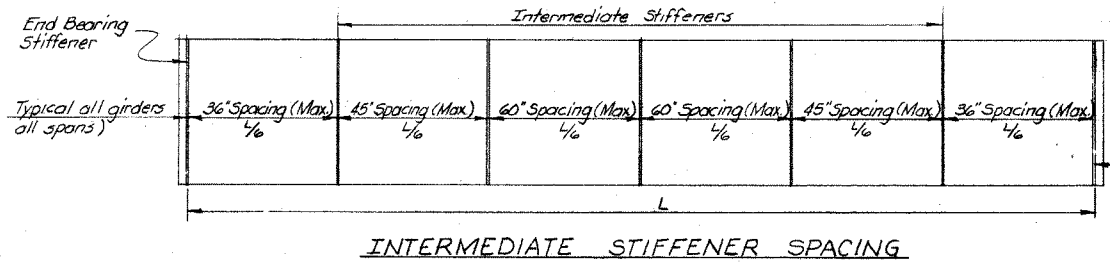


Note: All web plates are 7/8" x 1/2". All intermediate stiffeners are 7" x 1/2". All end brq. stiffeners are 8" x 3/4".

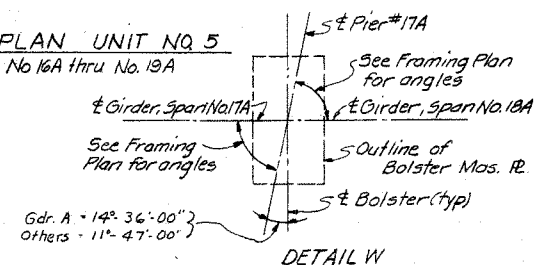


DETAIL V

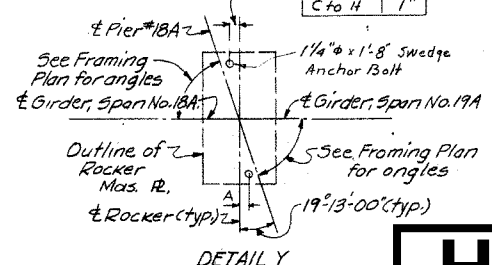
Notes: For Deflection & Camber Table, Girder Splice Welding Procedure, Detail of Flange Plates and Dimensions, and Details of End Crossframe Connections @ Piers #15A & #19A, see sheet #181.
For Details of Crossframes, see sheet #205
For Details of Intermediate & Bearing Stiffeners, see sheet #205
For Rocker & Bolster Details, see sheet #206
For Typical Girder Elevation, see sheet #205



FRAMING PLAN UNIT NO 5
Spans No 16A thru No. 19A



DETAIL W



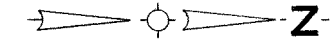
DETAIL Y

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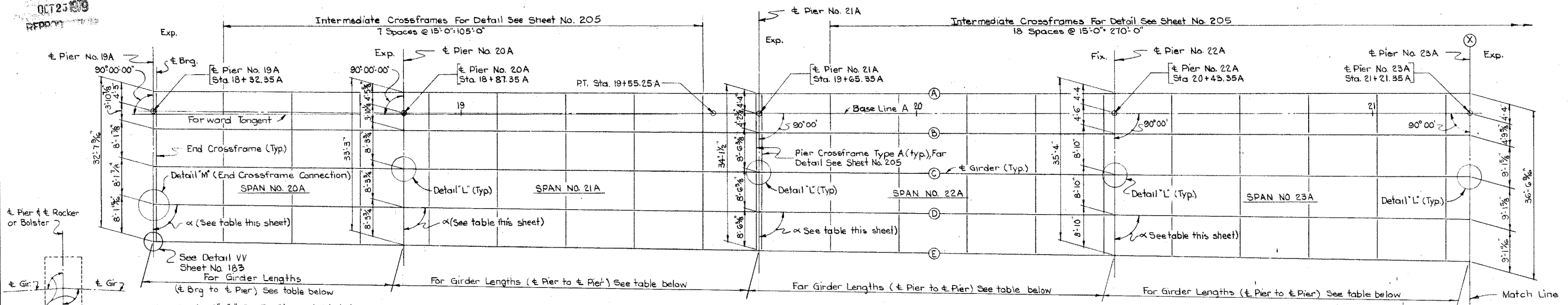
STRUCTURAL STEEL DETAILS
UNIT NO. 5

HAM-71-0000L
SPANS 16A-19A

HAM-25-0.04



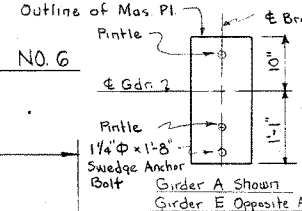
UNRECORDED
OCT 25 1970
RFPD



Note: Web R 48" x 3/8" For Flg. R's see table below
Brg. Stiff 6 1/2" x 1/2" R's Intermediate Stiff 5" x 3/8" R's
For Bearing Details See Sheet No. 206
End Crossframe, for detail see Sheet No. 215
For typical girder elevation see Sheet No. 205

Note: For inlet framing see Sh. No. 208.

FRAMING PLAN UNIT NO. 6
(Spans No. 20A thru 23A)



Girder	Span No. 20A	Spans No. 21A thru No. 24A	Span No. 25A
A, B & C	54'-4 1/2"	78'-0"	62'-0"
D	54'-4 1/2"	78'-0 1/8"	62'-0 1/8"
E	54'-4 3/4"	78'-0 1/8"	62'-0 1/8"

GIRDER SPLICE WELDING PROCEDURE

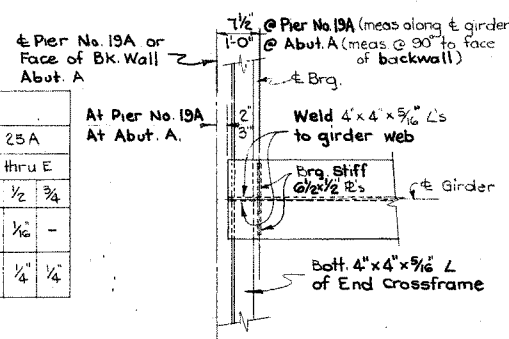
Raise the ends of girders in Span No. 21A, at Pier No. 20A, 1/8" and the ends of girders in Span No. 23A, at Pier No. 23A, 1/8".
Butt weld girder flanges and webs, at Piers No. 21A & 22A, using the sequence outlined in Note 'A' Sheet No. 181.
Weld all pier crossframes at Pier No. 21A into place.
Lower girders to their final positions.
Raise the ends of girders in Span No. 20A, at Pier No. 19A, 1/8" and the ends of girders in Span No. 24A, at Pier No. 24A, 1/8".
Butt weld girder flanges and webs, at Piers No. 20A & 23A, using the sequence outlined in Note 'A' Sheet No. 181.
Lower girders to their final positions.
Raise the ends of girders in Span No. 25A, at N. Abut., 1/8".
Butt weld girder flanges and webs at Pier No. 24A, using the sequence outlined in Note 'A' Sheet No. 181.
Lower girders to their final positions.

Girder	Angle α	
	Piers No. 19A & 20A	Piers No. 21A thru 24A
A	89° 45' 07"	90° 00' 00"
B	89° 35' 23"	89° 46' 39"
C	89° 25' 51"	89° 33' 18"
D	89° 16' 12"	89° 19' 57"
E	89° 06' 36"	89° 06' 36"

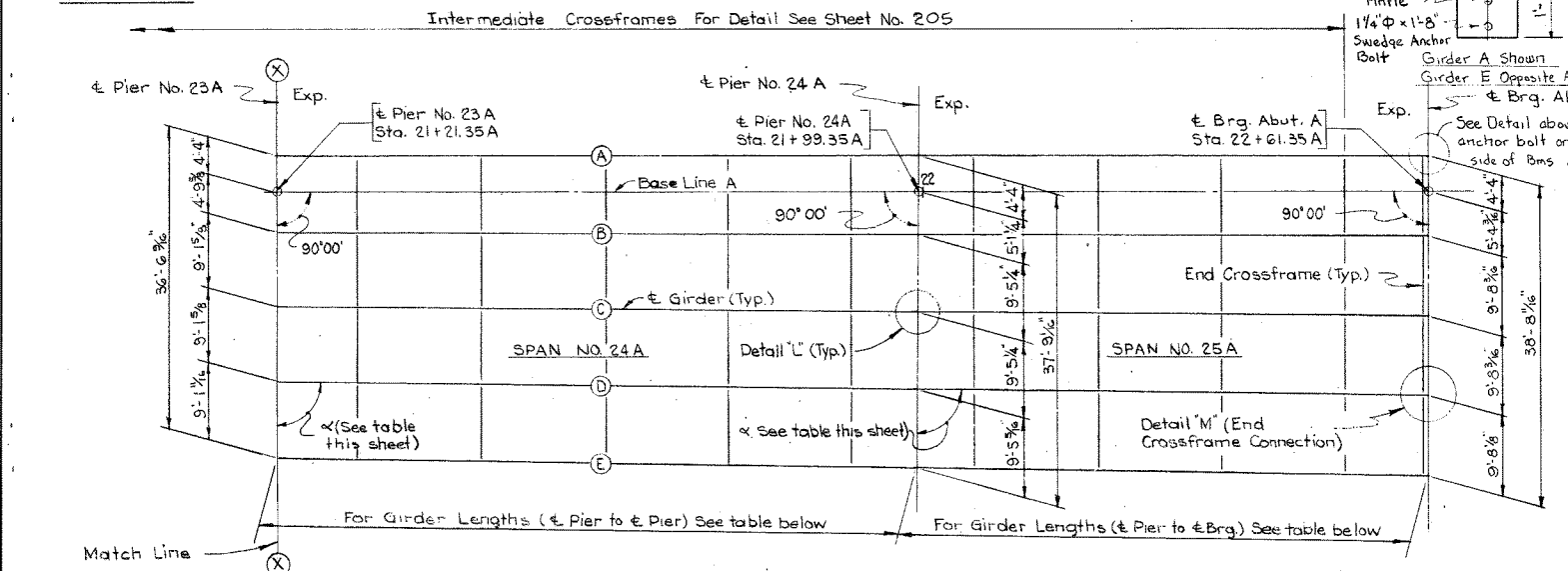
Note: E's of Piers No. 19A thru 24A and E Brq. Abut. A are parallel

Span No.	20A		21A		22A		23A		24A		25A	
	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	A thru E	
Location	1/4	1/2	3/4	1	1/4	1/2	3/4	1	1/4	1/2	3/4	1
Deflection due to weight of steel	-	-	-	1/16	-	1/16	-	1/16	-	1/16	-	1/16
Deflection due to remaining Dead Load	1/8	1/8	1/4	3/8	1/4	3/8	1/4	3/8	1/4	3/8	1/4	3/8

Girders for Unit No. 6 shall not be cambered



DETAIL "M"
(End Crossframe connection at Pier No. 19A, Span No. 20A)
(Rotate thru 180° for connection at Abut. A, Span No. 25A)



FRAMING PLAN UNIT NO. 6
(Spans No. 24A & No. 25A)

	Pier No. 19A	Pier No. 20A	Pier No. 21A	Pier No. 22A	Pier No. 23A	Pier No. 24A	Pier No. 25A
Span No.	Span No. 20A	Span No. 21A	Span No. 22A	Span No. 23A	Span No. 24A	Span No. 25A	
Flg R's Girders A thru E (Top & Bott.)	R100A 14" x 3/4"	R225-B 14" x 1 1/4"	R225-B 14" x 1"	B225-A 14" x 1 5/8"	R225-B 14" x 1 1/8"	R225-B 14" x 1 1/8"	R125-B 14" x 1 1/8"
Flg to Web Weld (Top & Bott.)	1/4" Weld	5/16" Weld	3/8" Weld	5/16" Weld	3/8" Weld	5/16" Weld	5/16" Weld

TABLE OF FLANGE PLATES AND WELD SIZES

	End Brg. Stiff.	Intermediate Stiffeners	End Brg. Stiff.
Span No. 20A	45" Spacing (Max.)	48" Spacing (Max.)	42" Spacing (Max.)
Spans No. 21A thru No. 24A	36" Spacing (Max.)	45" Spacing (Max.)	36" Spacing (Max.)
Span No. 25A	36" Spacing (Max.)	45" Spacing (Max.)	42" Spacing (Max.)

Note: Adjust intermediate stiffener spacing to conform to intermediate crossframe spacing

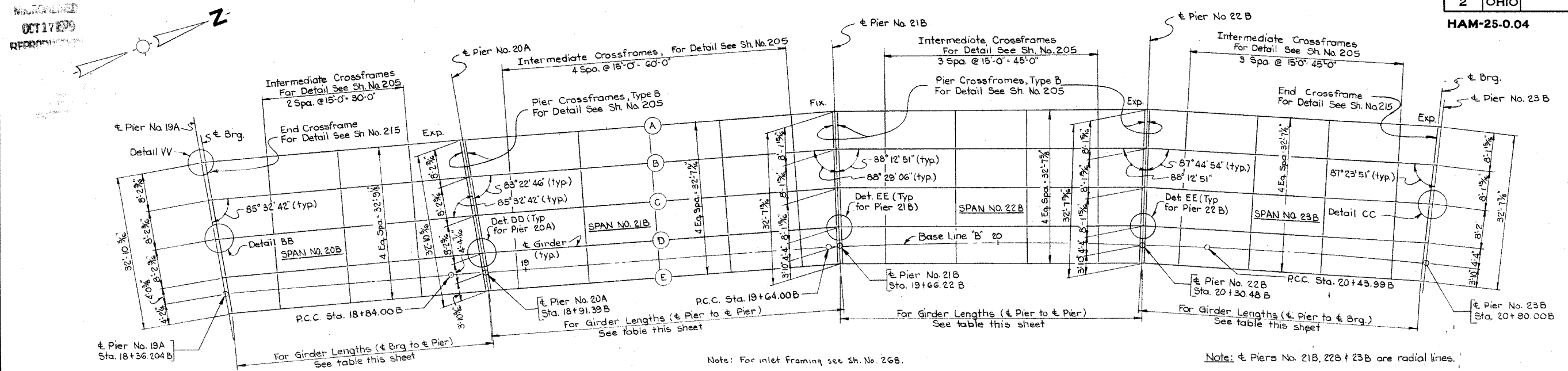
INTERMEDIATE STIFFENER SPACING

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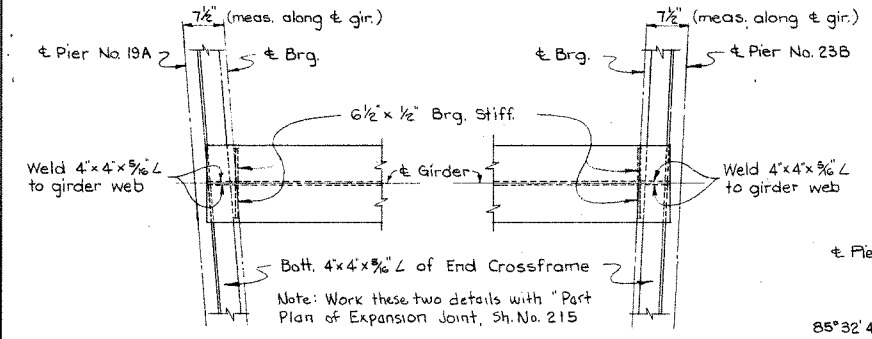
STRUCTURAL STEEL DETAILS
UNIT NO. 6.

HAM-71-0000L
SPANS 20A-23A

HAM-25-0.04

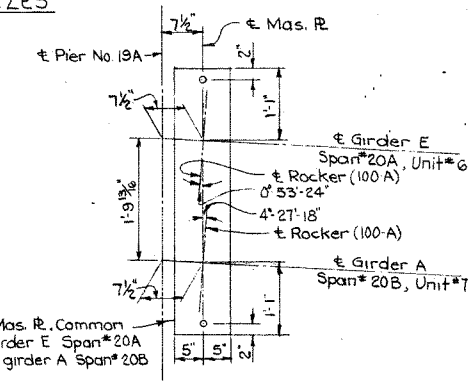
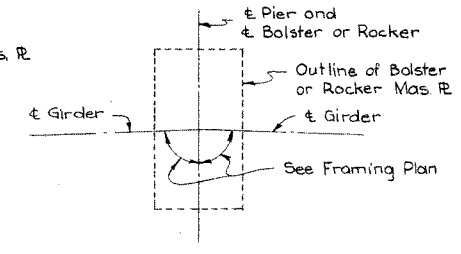
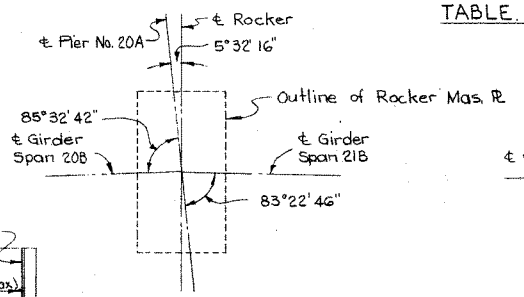


Note: Web R. 48" x 3/8". For flg R's see table below
Brg. Stiff. 6 1/2" x 1/2" R's. Intermediate Stiff. 5' x 3/8" R's
For bearing details see Sheet No. 206
For typical girder elevation see Sheet No. 205



Flg. R's (All girders)	Span No. 20B		Span No. 21B		Span No. 22B		Span No. 23B	
	Top & Bott.	Top & Bott.	Top & Bott.	Top & Bott.	Top & Bott.	Top & Bott.	Top & Bott.	Top & Bott.
Flg. to Web weld size	1/4" Weld	3/8" Weld (Top) 3/8" Weld (Bott.)	5/16" Weld (Top & Bott.)	3/8" Weld (Top) 3/8" Weld (Bott.)	1/2" Weld (Top & Bott.)	5/16" Weld (Top & Bott.)	5/16" Weld (Top & Bott.)	5/16" Weld (Top & Bott.)

TABLE OF FLANGE PLATES AND WELD SIZES



Girder	GIRDER LENGTHS			
	Span 20B	Span 21B	Span 22B	Span 23B
A	54'-6 1/2"	78'-11 3/4"	66'-0 3/4"	61'-3 1/2"
B	do	77'-9 3/4"	65'-6 1/4"	60'-7 1/2"
C	do	76'-7 1/4"	65'-0 3/8"	59'-11 3/4"
D	do	75'-5 3/8"	64'-6 1/4"	59'-2 1/2"
E	do	74'-3 3/8"	64'-0 1/8"	58'-6 3/8"

GIRDER SPLICE WELDING PROCEDURE

Raise the ends of girders in Span No. 22B at Pier No. 22B 1/8" Butt-weld girder flanges and webs at Pier No. 21B using the welding sequence outlined in "Note A" Sheet No. 181

Weld all Pier Crossframes at Pier No. 21B into place.

Lower the girders of Span No. 22B into their final positions.

Raise the ends of girders in Spans No. 20B and 23B, at Piers No. 19A and 23B, 3/8" and 7/16" respectively.

Butt-weld girder flanges and webs at Piers No. 20A and 22B using the welding sequence outlined in "Note A" Sheet No. 181

Weld all Pier Crossframes at Piers No. 20A and 22B into place.

Lower the girders of Spans 20A and 23B into their final positions.

SPAN	SPAN 20B										SPAN 21B										SPAN 22B										SPAN 23B									
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E															
42" Spacing (Max)	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4															
39" Spacing (Max)	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4	1/4	1/2	3/4	1	1 1/4															

Note: Adjust intermediate stiffener spacing to conform to intermediate crossframe spacing.

INTERMEDIATE STIFFENER SPACING

SPAN	SPAN 20B										SPAN 21B										SPAN 22B										SPAN 23B									
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E															
Deflection due to weight of steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0															
Deflection due to remaining dead load	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8	1/8	0	1/8															
Convexity (See note above)	-7/16	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16																
Sum of deflection and convexity	-3/16	-5/8	-7/16	-3/4	-1/2	-3/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16	-5/8	-3/4	-7/16																
Required Camber	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																

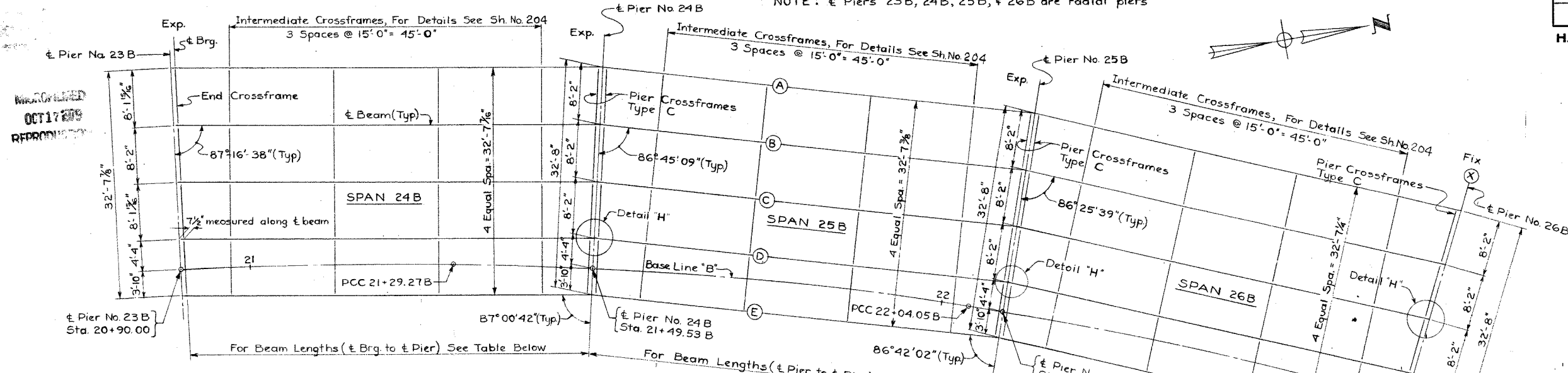
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CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS
UNIT NO. 7.

HAM-71-0000L
SPANS 20B-23B

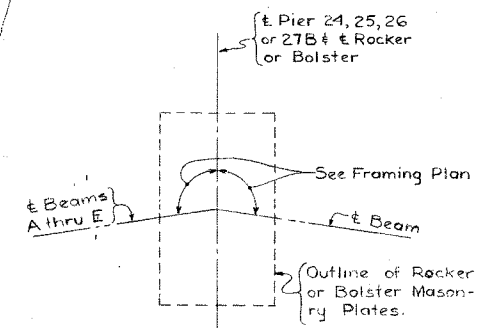
HAM-25-0.04

NOTE: ϵ Piers 23B, 24B, 25B, ϵ 26B are radial piers

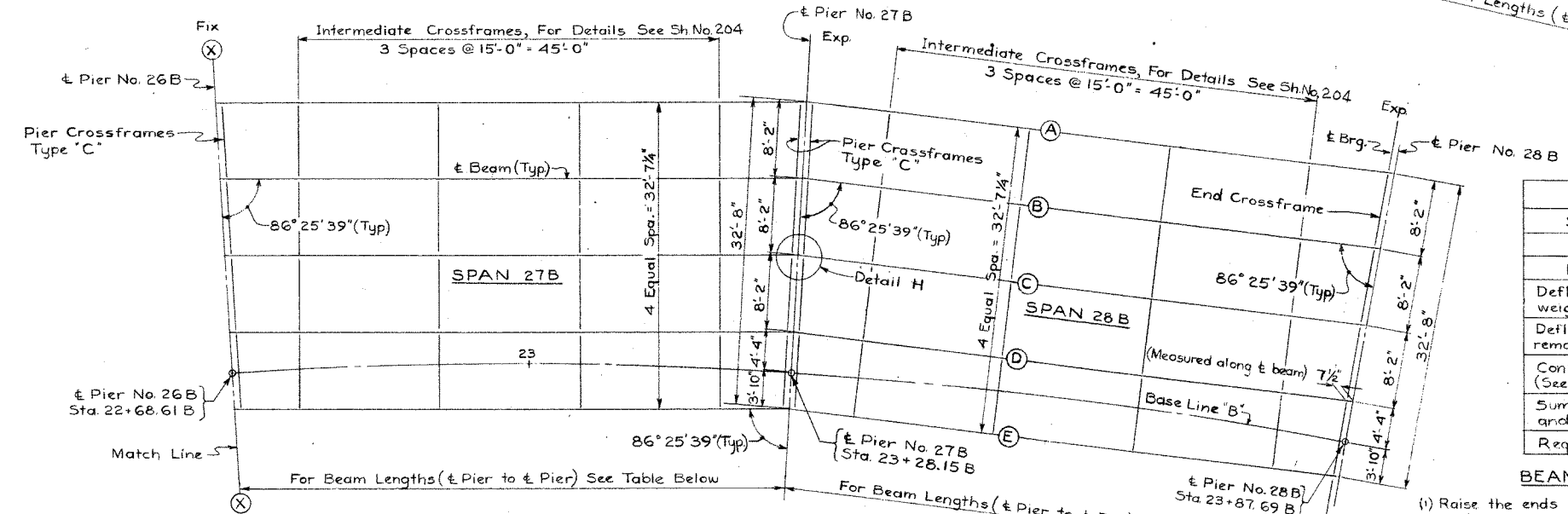


Note: For inlet framing see Sh. No. 268.

FRAMING PLAN UNIT 8
(Spans No. 24B thru 28B)



DETAIL H



Note: Convexity includes variations due to superelevation, horizontal & vertical curvature.

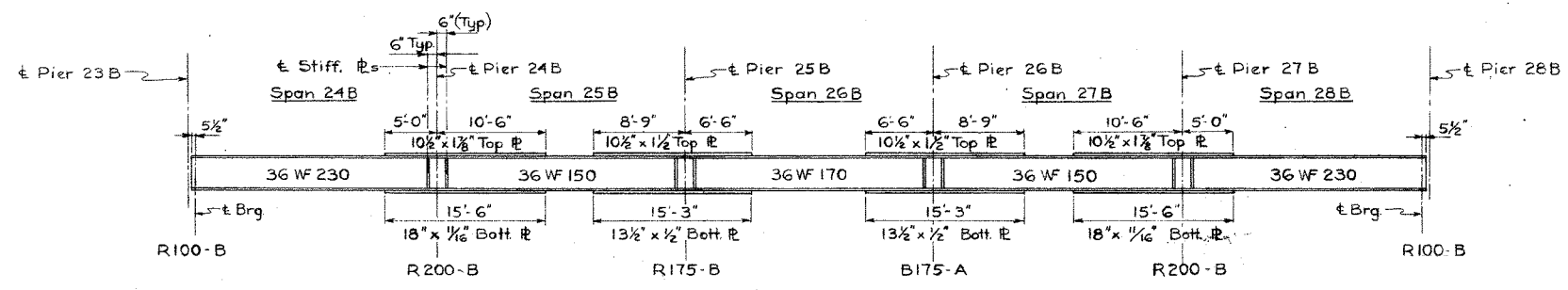
DEAD LOAD DEFLECTIONS AND CAMBER										
Span No.	24B		25B		26B		27B		28B	
	A-E	B,C,D	A-E	B,C,D	A-E	B,C,D	A-E	B,C,D	A-E	B,C,D
Beams										
Location	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span	ϵ Span
Deflection due to weight of steel	1/8"	1/8"	0"	0"	1/16"	1/16"	0"	0"	1/8"	1/8"
Deflection due to remaining Dead Load	3/16"	3/16"	3/16"	3/16"	1/4"	1/4"	3/16"	3/16"	5/16"	5/16"
Convexity (See Note Above)	-1/8"	-1/16"	-1/16"	-5/8"	0"	-3/4"	1/8"	-1/2"	1/16"	0"
Sum of Deflection and Convexity	-1/16"	-1/8"	1/8"	-7/16"	5/16"	-7/16"	5/16"	-5/16"	1/8"	7/16"
Required Camber	0"	0"	0"	0"	0"	0"	0"	0"	1/8"	0"

BEAM SPLICE WELDING PROCEDURE

- 1) Raise the ends of beams in Span 25B at Pier 24B 1", and the ends of beams in Span 27B at Pier 27B 1"
- 2) Butt-weld the beam flanges and web at Piers 25B and 26B 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 25B and 26B.
- 4) Weld all pier crossframes at Piers 25B and 26B into place.
- 5) Lower beams to their final positions.
- 6) Raise the ends of beams in Span 24B at Pier 23B 7/8", and the ends of beams in Span 28B at Pier 28B 7/8".
- 7) Repeat Step 2 at Piers 24B and 27B.
- 8) Weld the bottom and top moment plates at Piers 24B and 27B.
- 9) Weld all pier crossframes at Pier 24B and 27B into place.
- 10) Lower beams to their final positions.

Note: Where no camber is required, the beams shall be fabricated so that any curved beams will be placed with convex flange up.

For Bearing Details, See Sh. No. 206
For Beam Splice Details, See Sh. No. 204
For End Crossframe Details, See Sh. No. 215
For Pier Crossframe Details, See Sh. No. 204



SIZE OF BEAMS AND COVER PLATES

TABLE OF BEAM LENGTHS					
BEAM	Span 24B	Span 25B	Span 26B	Span 27B	Span 28B
A	61'-9"	62'-9 3/8"	63'-1 1/8"	63'-1 1/8"	62'-5 3/8"
B	60'-11 1/4"	61'-10 3/8"	62'-0 3/8"	62'-0 3/8"	61'-5 3/8"
C	60'-1 1/2"	60'-11 1/4"	61'-0 3/8"	61'-0 3/8"	60'-5 3/8"
D	59'-3 3/4"	60'-0 3/8"	60'-0 3/8"	60'-0 3/8"	59'-5"
E	58'-5 3/8"	59'-0 3/8"	59'-0 3/8"	59'-0 3/8"	58'-4 3/4"

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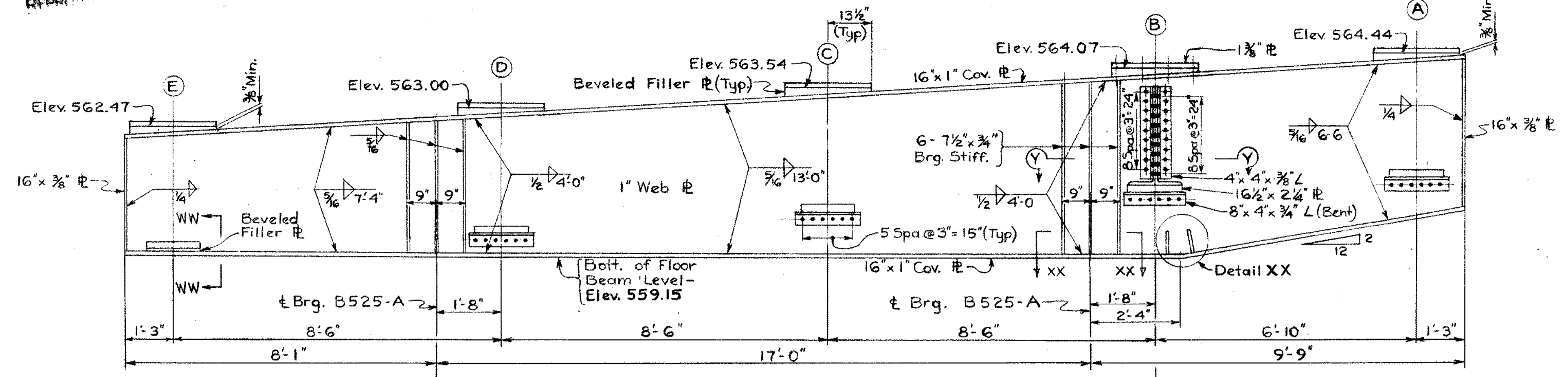
STRUCTURAL STEEL DETAILS
UNIT NO. 8.

DESIGNED J.C. 2-24-60	DRAWN H.L.L. 6-2-60	TRACED	CHECKED J.H.O. 7/17/60	REVIEWED DATE 11/1/60 10-14-60	REVIEWED
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HAM-71-0000L
SPANS 24B-28B

Note: Elevations given below are at the intersection of Floor Beam and of stringers

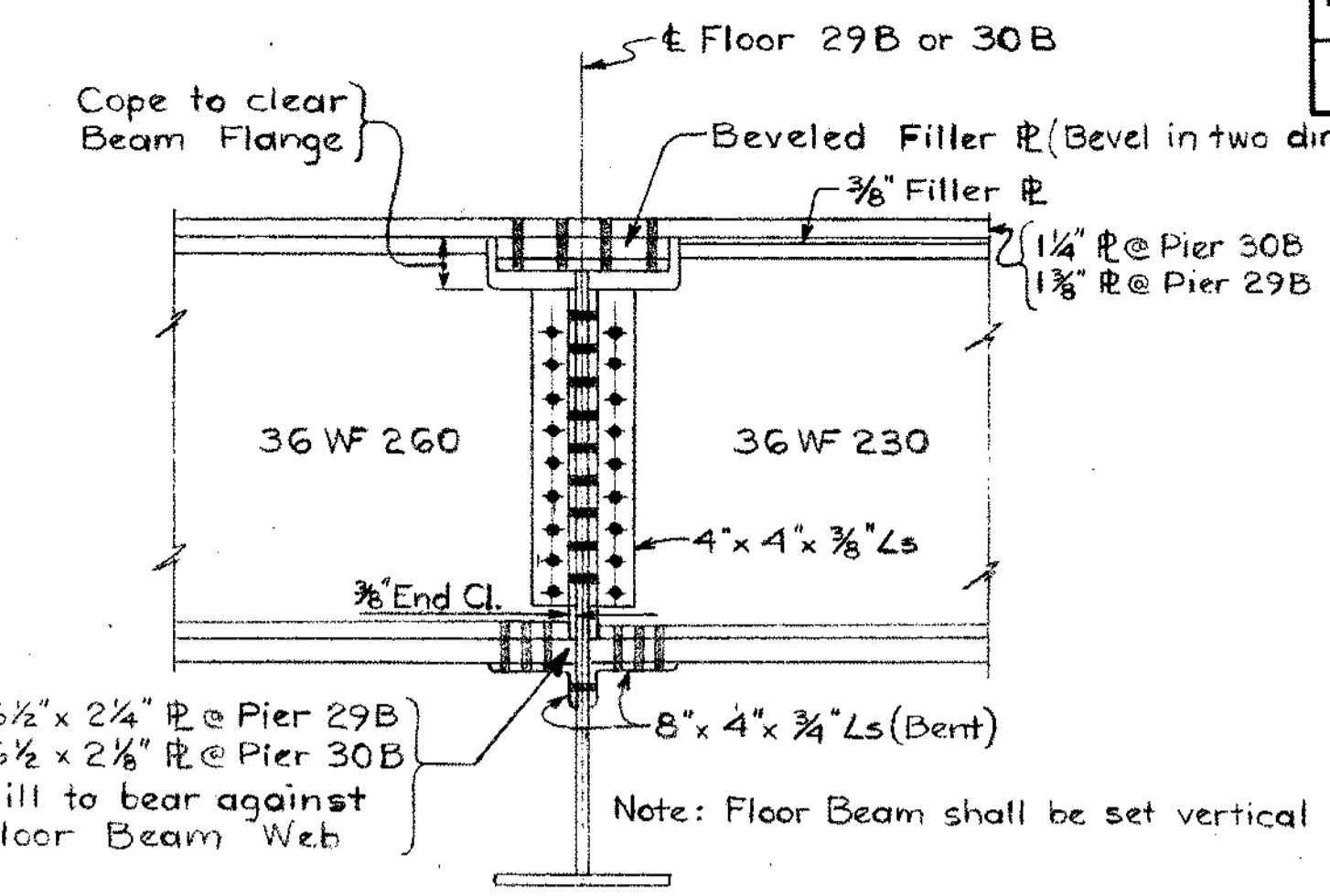
Note: Detail below typical for beams A thru E



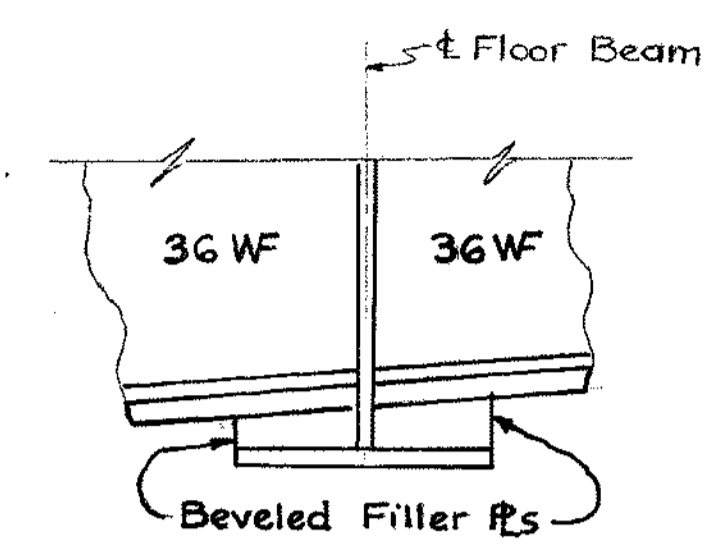
ELEVATION FLOOR BEAM 29B

(Shown Looking West)

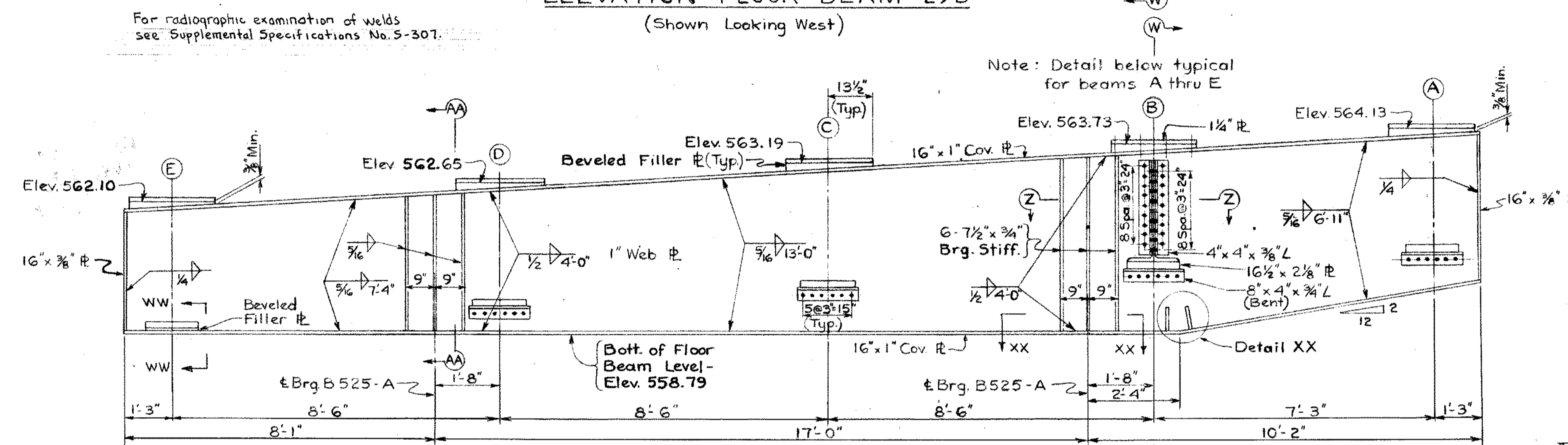
For radiographic examination of welds see Supplemental Specifications No. 5-307.



SECTION W-W



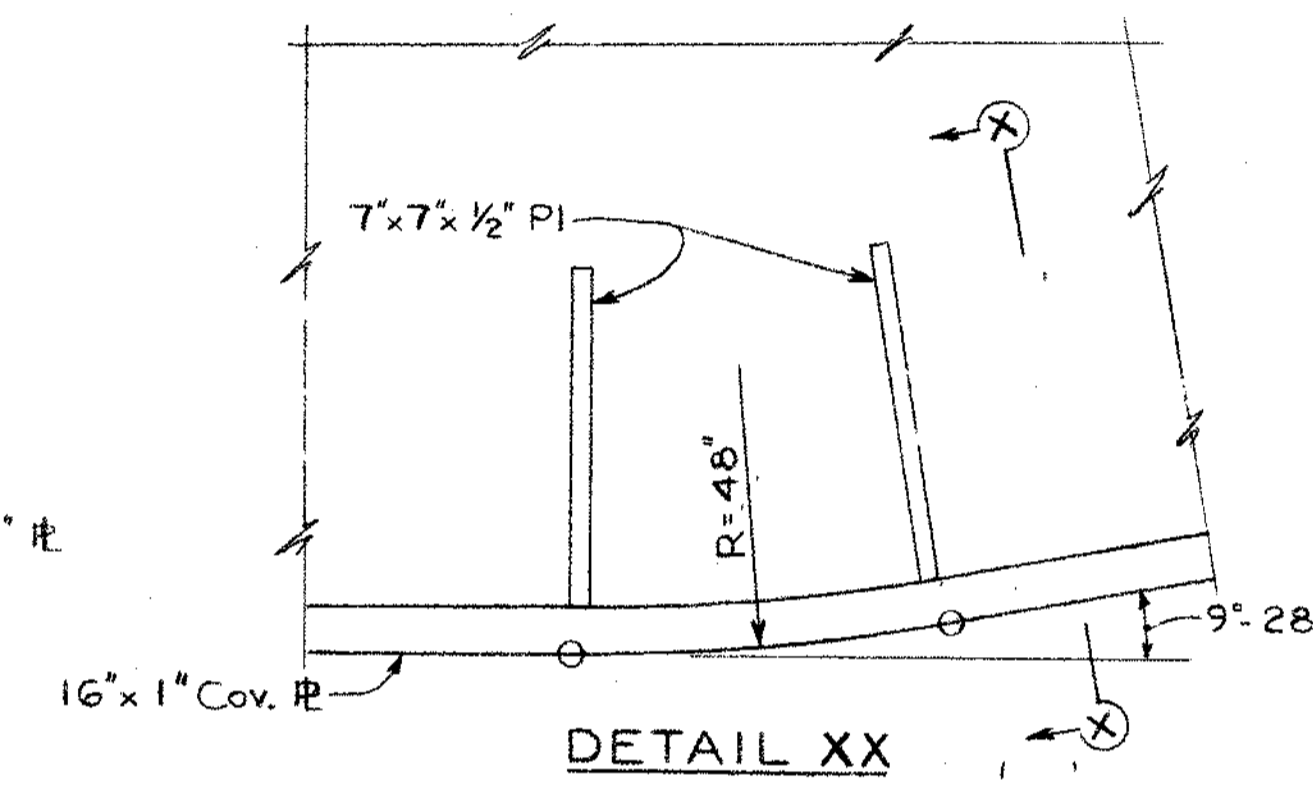
SECTION WW-WW



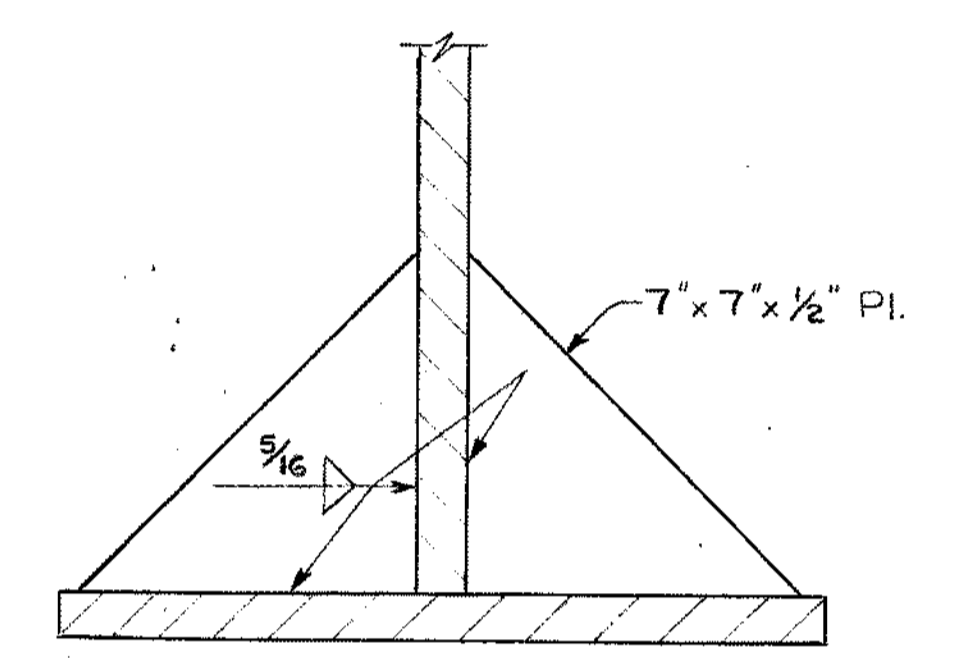
ELEVATION FLOOR BEAM 30B

(Shown Looking West)

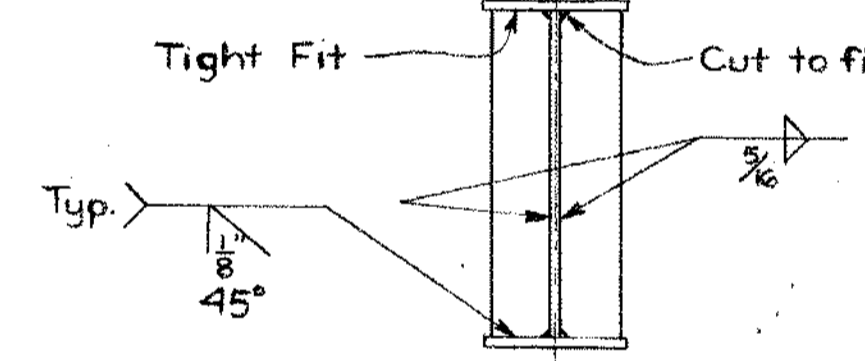
Note: Detail below typical for beams A thru E



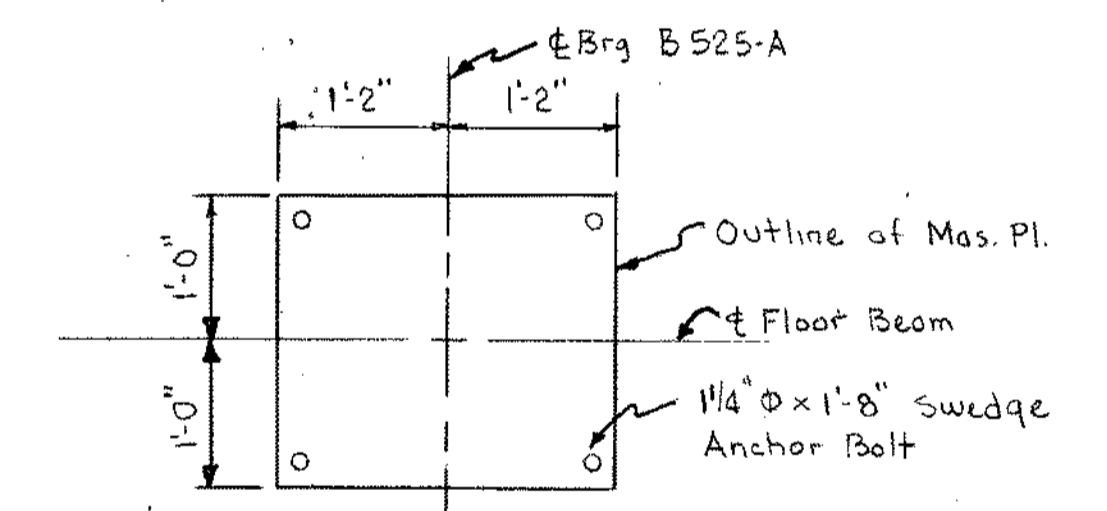
DETAIL XX



SECTION X-X

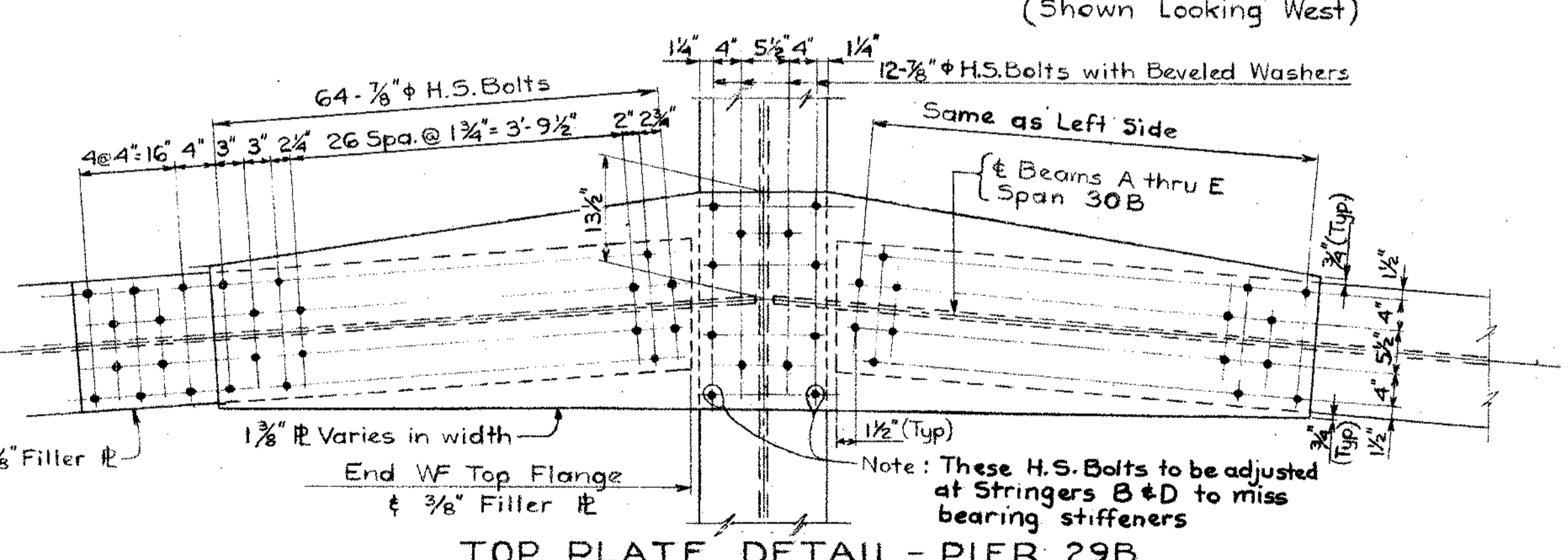


SECTION AA-AA

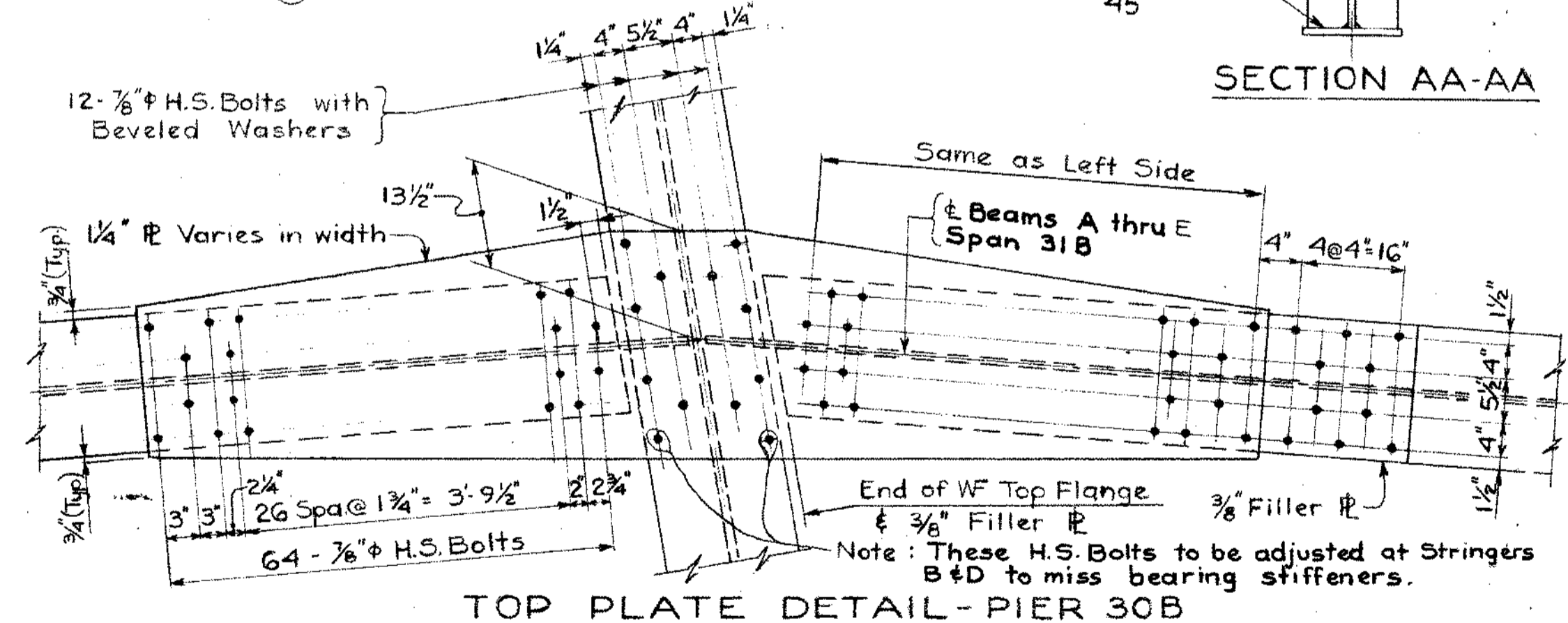


SECTION XX-XX

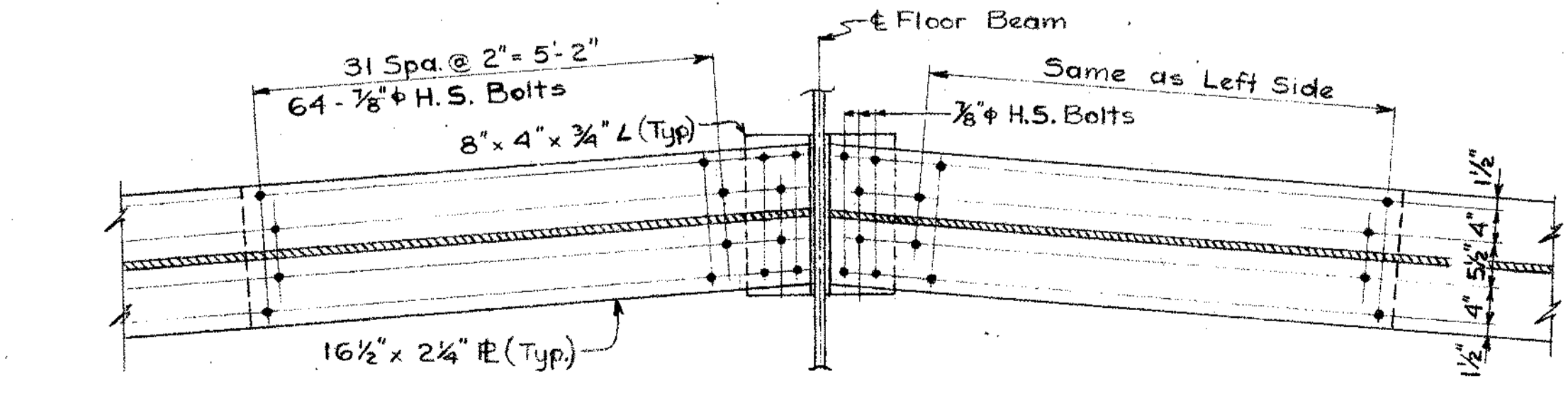
Typical Bolt Bearings



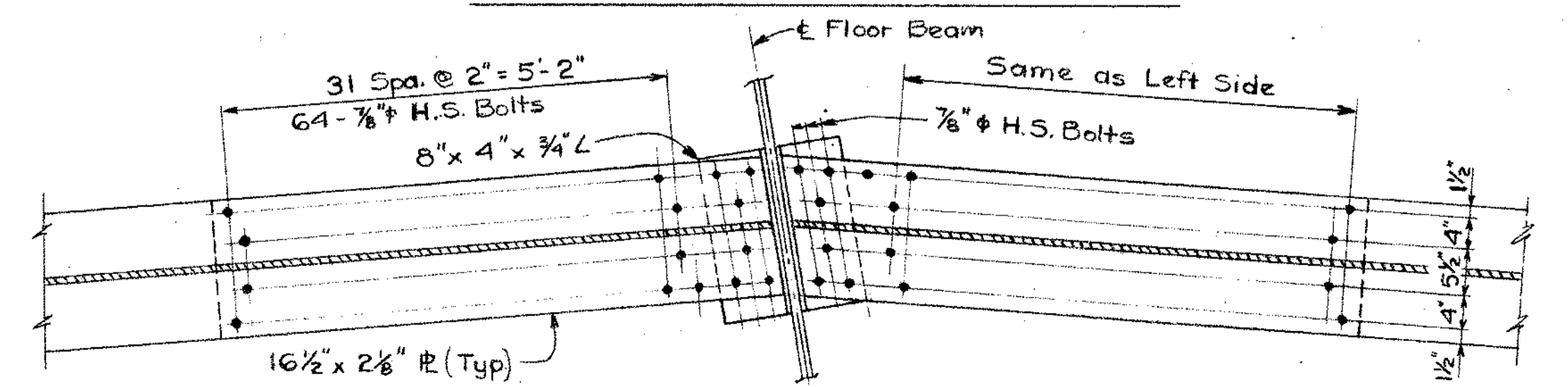
TOP PLATE DETAIL - PIER 29B



TOP PLATE DETAIL - PIER 30B



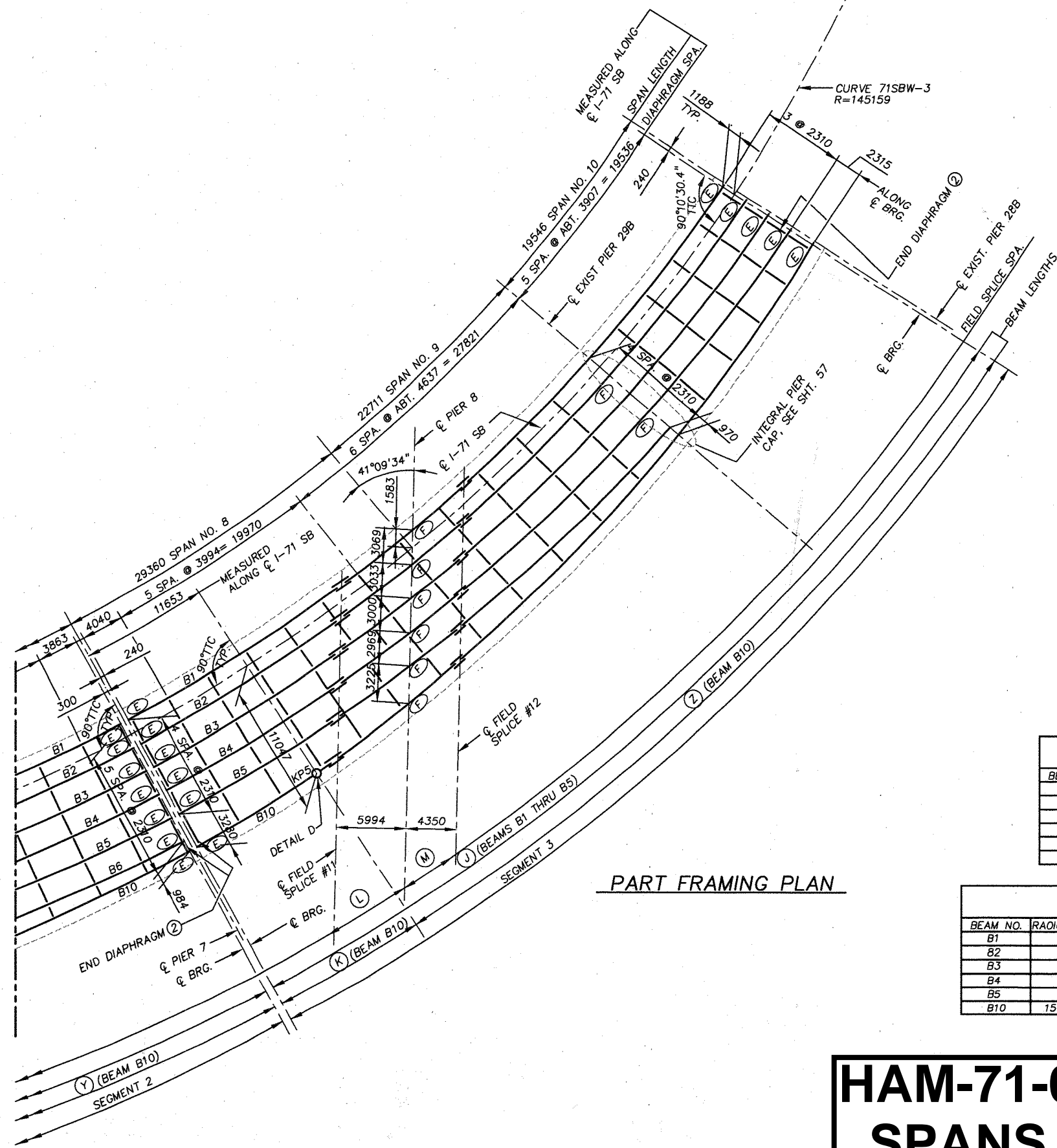
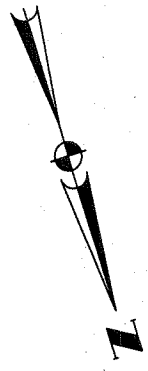
SECTION Y-Y



SECTION Z-Z

HAM-71-0000L PIER 29B

HAZELET & ERDAL CONSULTING ENGINEERS CINCINNATI, OHIO					
STRUCTURAL STEEL DETAILS UNIT NO. 9.					
DESIGNED RCF	DRAWN HLL	TRACED HLL	CHECKED JHO	REVIEWED DATE 10-14-60	REVISED
2-29-60	8-4-60		8/5/60		



- NOTES:**
- ① MEASURED ALDNG ϕ BEAM WEB
 - ② SEE STANDARD CONSTRUCTION DRAWING NO. EXJ-4-87M
- SEE SHEET 39 OF FRAMING PLAN FOR FRAMING NOTES.
 KP = KINK POINT
 SEE SHEET 41 FOR DISTANCE "Y"

FIELD SPLICE DISTANCES ①

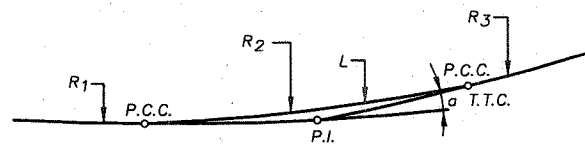
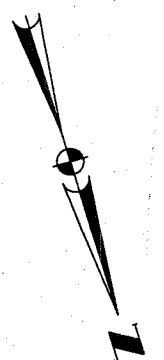
BEAM NO.	LENGTH (L)	LENGTH (M)			
B1	7827	5924			
B2	7742	5846			
B3	7663	5775			
B4	7590	5709			
B5	7523	5648			
B10	7721	5815			

BEAM RADIUS & LENGTHS

BEAM NO.	RADIUS ϕ (K)	LENGTH (K)	RADIUS ϕ (J)	LENGTH (J)	RADIUS ϕ (Z)	LENGTH (Z)
B1	-	-	143971	70556	-	-
B2	-	-	146281	71689	-	-
B3	-	-	148591	72822	-	-
B4	-	-	150901	73954	-	-
B5	-	-	153211	74719	-	-
B10	156741	12315	-	-	154542	63714

HAM-71-0000L
SPANS 10-8

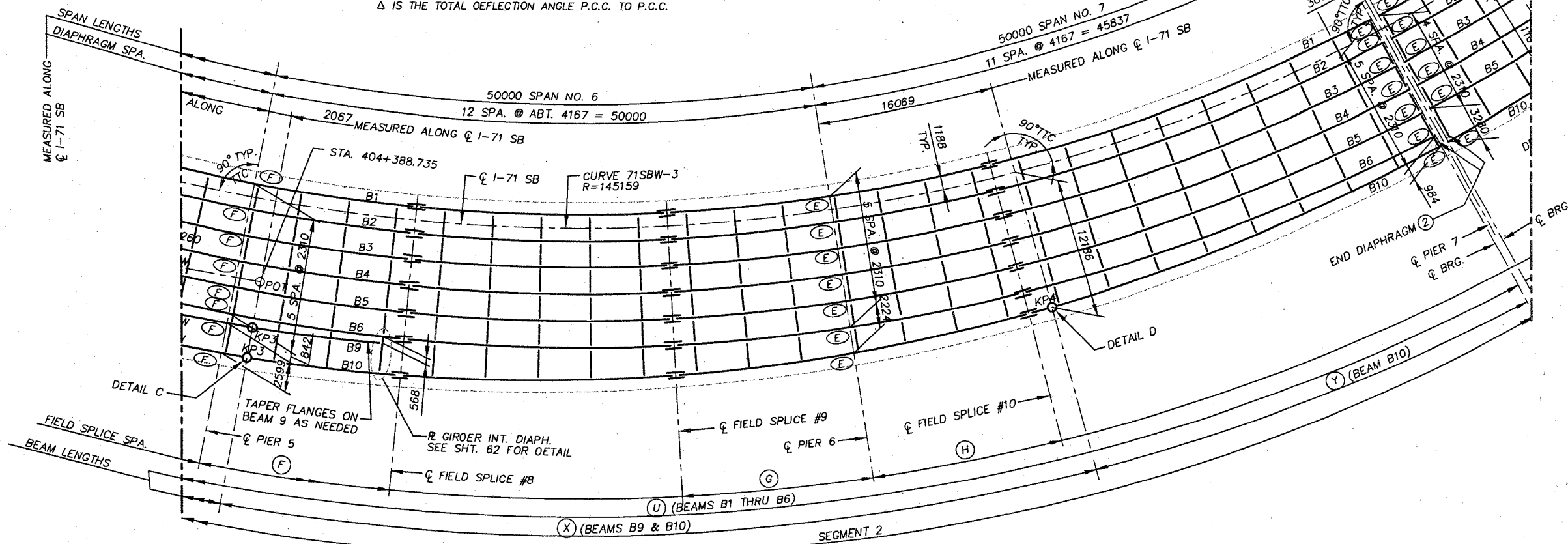
FINAL FOR CONSTRUCTION



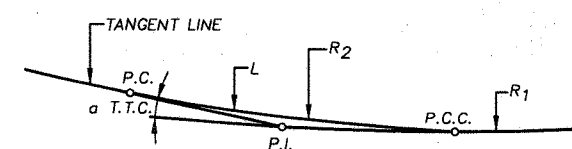
DETAIL D

KP4						
BEAM NO.	L	Δ	a	R ₁	R ₂	R ₃
B10	915	0° 10' 34"	0° 10' 34"	158102	297735	156741
KP5						
BEAM NO.	L	Δ	a	R ₁	R ₂	R ₃
B10	915	1° 28' 21"	1° 28' 21"	156741	35605	154542

Δ IS THE TOTAL DEFECTION ANGLE P.C.C. TO P.C.C.



PART FRAMING PLAN



DETAIL C

KP3					
BEAM NO.	L	Δ	a	R ₁	R ₂
B9	915	1° 23' 48"	1° 23' 48"	155502	37533
B10	915	1° 23' 48"	1° 23' 48"	158102	37533

Δ IS THE TOTAL DEFECTION ANGLE P.C. TO P.C.C.

BEAM RADIUS & LENGTHS				
BEAM NO.	RADIUS @ (X)	LENGTH (X)	RADIUS @ (Y)	LENGTH (Y)
B9	155502	11231		
B10	158102	69746	156741	36390

FIELD SPLICE DISTANCES ①			
BEAM NO.	LENGTH (F)	LENGTH (G)	LENGTH (H)
B1	14054	14054	14054
B2	14280	14280	14280
B3	14505	14505	14505
B4	14731	14731	14731
B5	14956	14956	14956
B6	15182	15182	15182
B10	15507	15420	15385

- NOTES:
- ① MEASURED ALONG Q BEAM WEB
 - ② SEE STANDARD CONSTRUCTION DRAWING NO. EXJ-4-87M
- SEE SHEET 39 OF FRAMING PLAN FOR FRAMING NOTES.
 KP = KINK POINT
 SEE SHEET 40 FOR DISTANCE "U".

**HAM-71-0000L
SPANS 7-6**

**FINAL FOR
CONSTRUCTION**

BRW
A. DAMES & MOORE GROUP COMPANY

DATE
REVISION
STRUCTURE FILE NUMBER

DRAWN
M.F.
REVIEWED

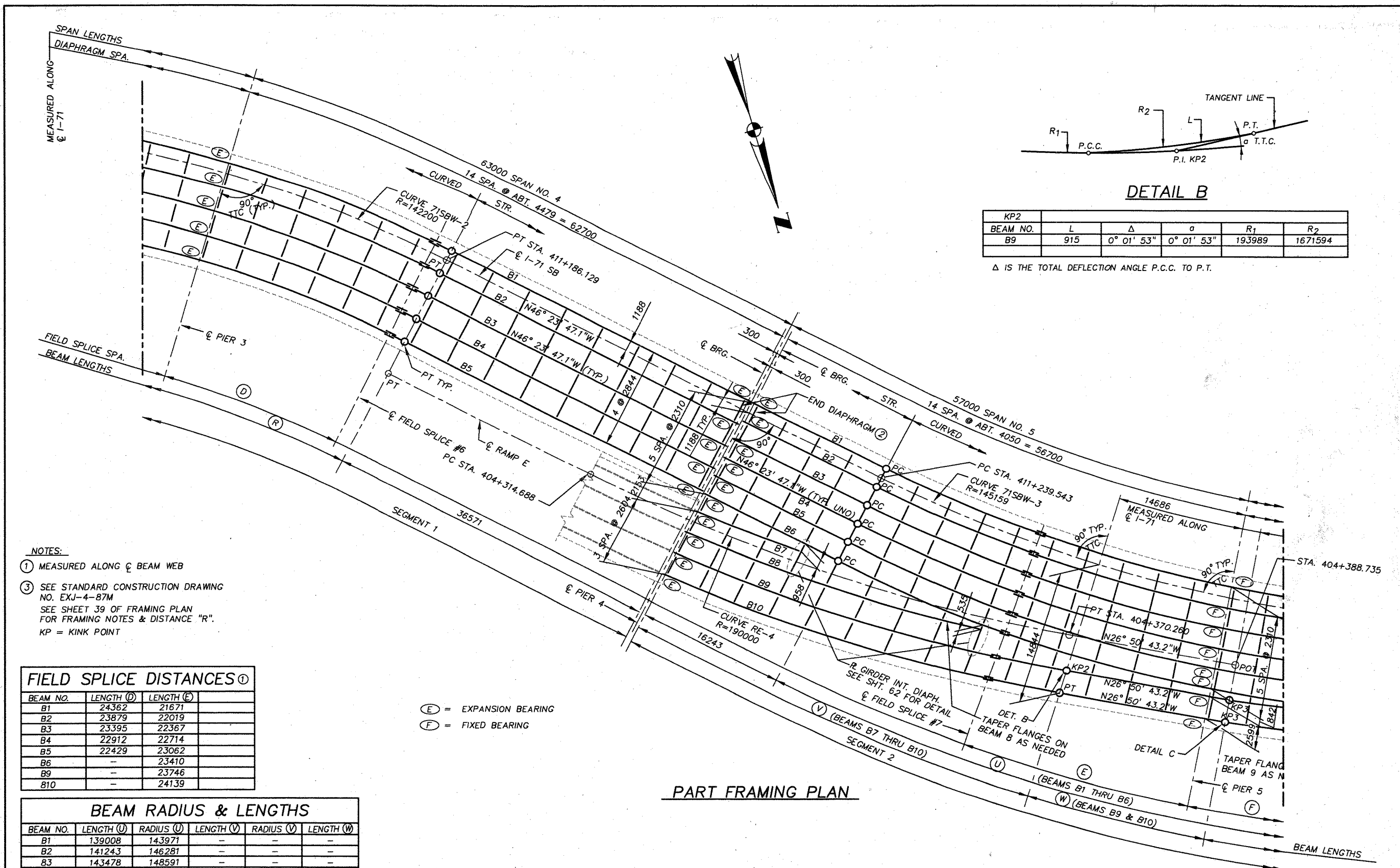
DESIGNED
S.A.
CHECKED
M.M.

FRAMING PLAN
171 S.B.

BRIDGE 6

41/85

218
588



- NOTES:
- ① MEASURED ALONG ϕ BEAM WEB
 - ③ SEE STANDARD CONSTRUCTION DRAWING NO. EXJ-4-87M
SEE SHEET 39 OF FRAMING PLAN FOR FRAMING NOTES & DISTANCE "R".
KP = KINK POINT

BEAM NO.	LENGTH (D)	LENGTH (E)
B1	24362	21671
B2	23879	22019
B3	23395	22367
B4	22912	22714
B5	22429	23062
B6	-	23410
B9	-	23746
B10	-	24139

(E) = EXPANSION BEARING
(F) = FIXED BEARING

BEAM NO.	LENGTH (U)	RADIUS (U)	LENGTH (V)	RADIUS (V)	LENGTH (W)
B1	139008	143971	-	-	-
B2	141243	146281	-	-	-
B3	143478	148591	-	-	-
B4	145713	150901	-	-	-
B5	147948	153211	-	-	-
B6	150183	155521	-	-	-
B7	-	-	12258	188791	-
B8	-	-	34048	191390	-
B9	-	-	44854	193989	18124
B10	-	-	45315	196588	18425

BEAM NO.	L	Δ	α	R ₁	R ₂
B9	915	0° 01' 53"	0° 01' 53"	193989	1671594

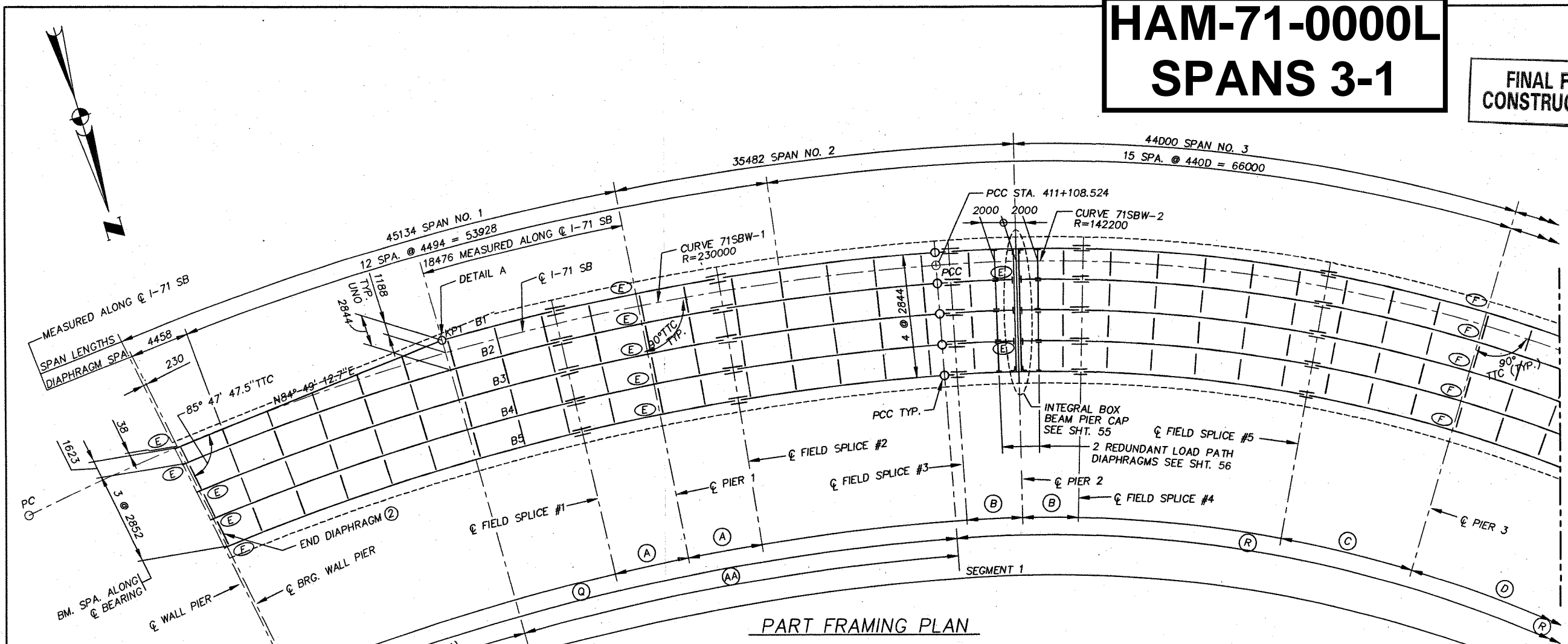
Δ IS THE TOTAL DEFLECTION ANGLE P.C.C. TO P.T.

HAM-71-0000L
SPANS 5-4

FINAL FOR CONSTRUCTION

HAM-71-0000L SPANS 3-1

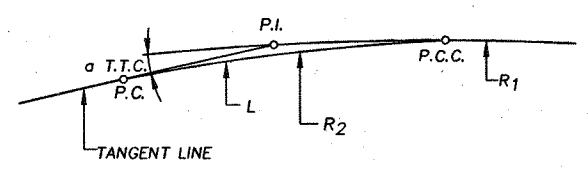
FINAL FOR
CONSTRUCTION



PART FRAMING PLAN

FRAMING NOTES

- ALL DIAPHRAGMS ARE PERPENDICULAR TO ϕ I-71 SB EXCEPT AS NOTED.
- ALL LENGTHS SHOWN IN FRAMING PLAN ARE MEASURED HORIZONTALLY. LONGITUDINAL DIMENSIONS ARE MEASURED ALONG THE CENTER LINE OF I-71 SB EXCEPT AS NOTED.
- ALL BEAMS ARE PARALLEL TO CENTER LINE I-71 SB 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
(F) 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 CVN MATERIAL. ALL SPLICE PLATES, (EXCLUDING FILL PLATES,) CROSS FRAME MEMBERS AND CROSS FRAME CONNECTION STIFFENERS SHALL BE CVN MATERIAL. CVN MATERIAL SHALL MEET THE SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.D1.
- 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 ERECTOR BOLTS. UNLESS REPLACED BY 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 WEIGHT OF STRUCTURAL STEEL.
- WEB & FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS WITH A MINIMUM NUMBER OF SPLICES. LOCATION OF SPLICES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER & SHALL BE A MINIMUM OF 300 mm FROM STIFFENERS OR FLANGE SPLICES.
- FULL ASSEMBLY REAMING WILL BE REQUIRED FOR THE BEAM SPLICES.
- 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 CON-JUNCTION WITH THE IZEU PAINT SYSTEM.
- KINK POINT TRANSITION CURVES (DETAILS A THRU D) ARE AT CONTRACTOR'S OPTION AND BEAM LENGTHS GIVEN IN "BEAM RADIUS & LENGTHS" TABLES ARE GIVEN TO THE UNTRANSITIONED KINK POINTS SHOWN ON THE PLAN VIEWS.



KP1	L	Δ	α	R1	R2
B1	915	5° 59' 37"	5° 59' 37"	231188	8747

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

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

FIELD SPLICE DISTANCES (1)

BEAM NO.	LENGTH (A)	LENGTH (B)	LENGTH (C)
B1	7801	6264	15125
B2	7705	6139	14825
B3	7609	6015	14525
B4	7513	5891	14225
B5	7417	5767	13925

BEAM RADIUS & LENGTHS

BEAM NO.	RADIUS @ (C)	LENGTH (C)	RADIUS @ (R)	LENGTH (R)	RADIUS @ (A)	LENGTH (A)
B1	-	-	143388	78254	231188	46722
B2	228344	72261	140544	76701	-	-
B3	225500	71148	137700	75149	-	-
B4	222656	70034	134856	73596	-	-
B5	219812	68920	132012	72044	-	-

WELD CHART

MAT. THICKNESS OF THICKER PART JOINED	MIN. SIZE OF FILLET WELD
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

BRW GROUP A. DAMES & MOORE GROUP COMPANY

DATE: _____

REVISIONS:

NO.	DATE	BY	REASON

DESIGNED: SA
CHECKED: MKM

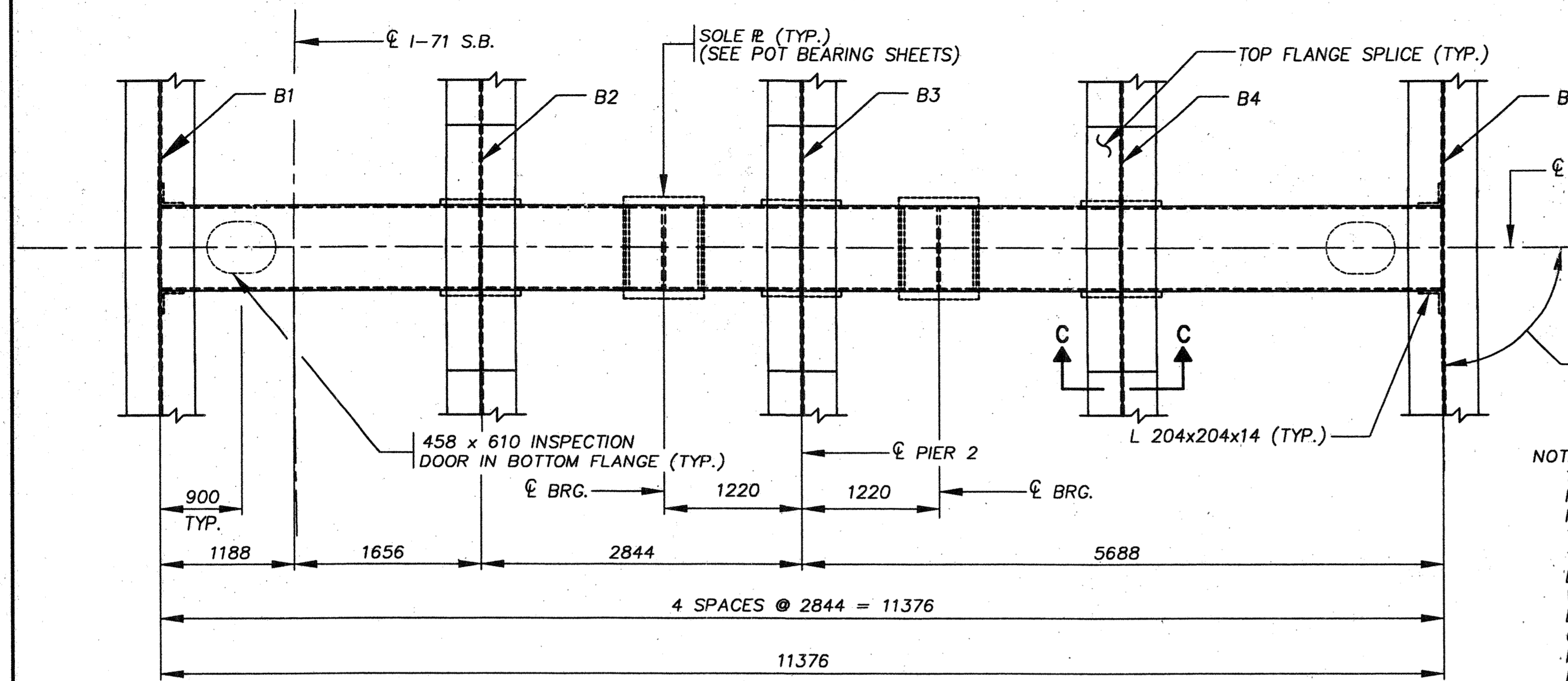
FRAMING PLAN
171 S.B.

BRIDGE 6

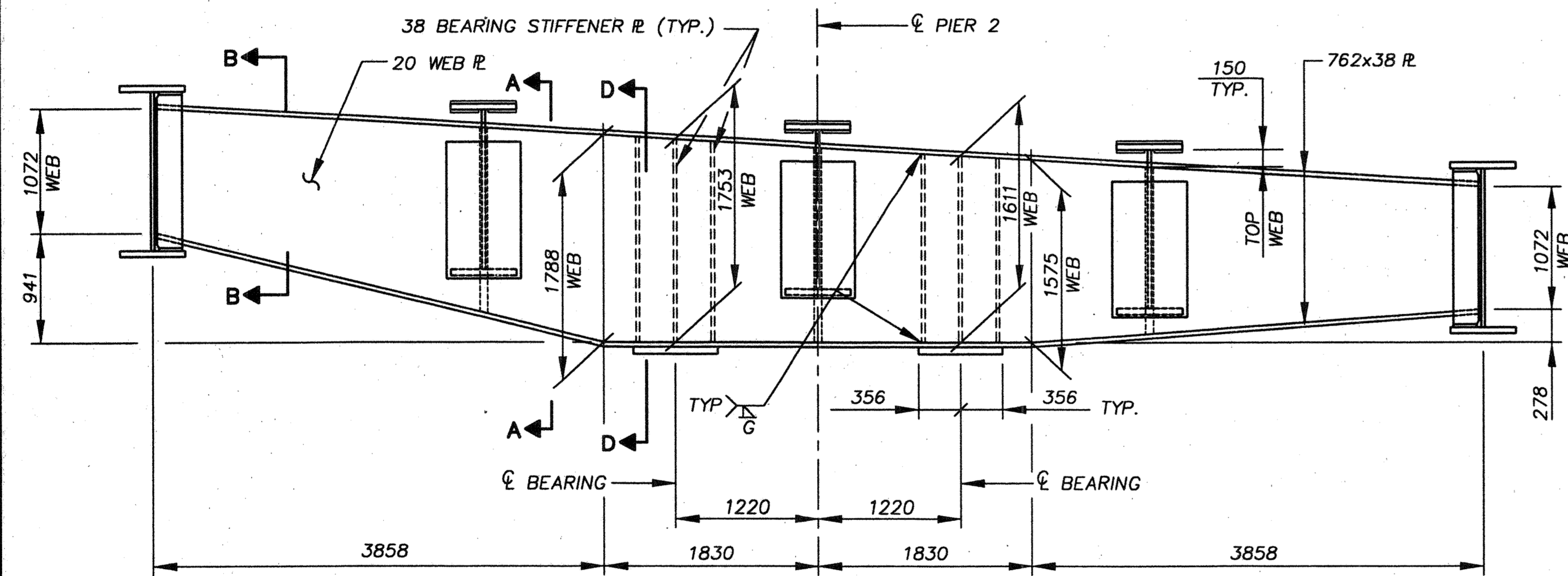
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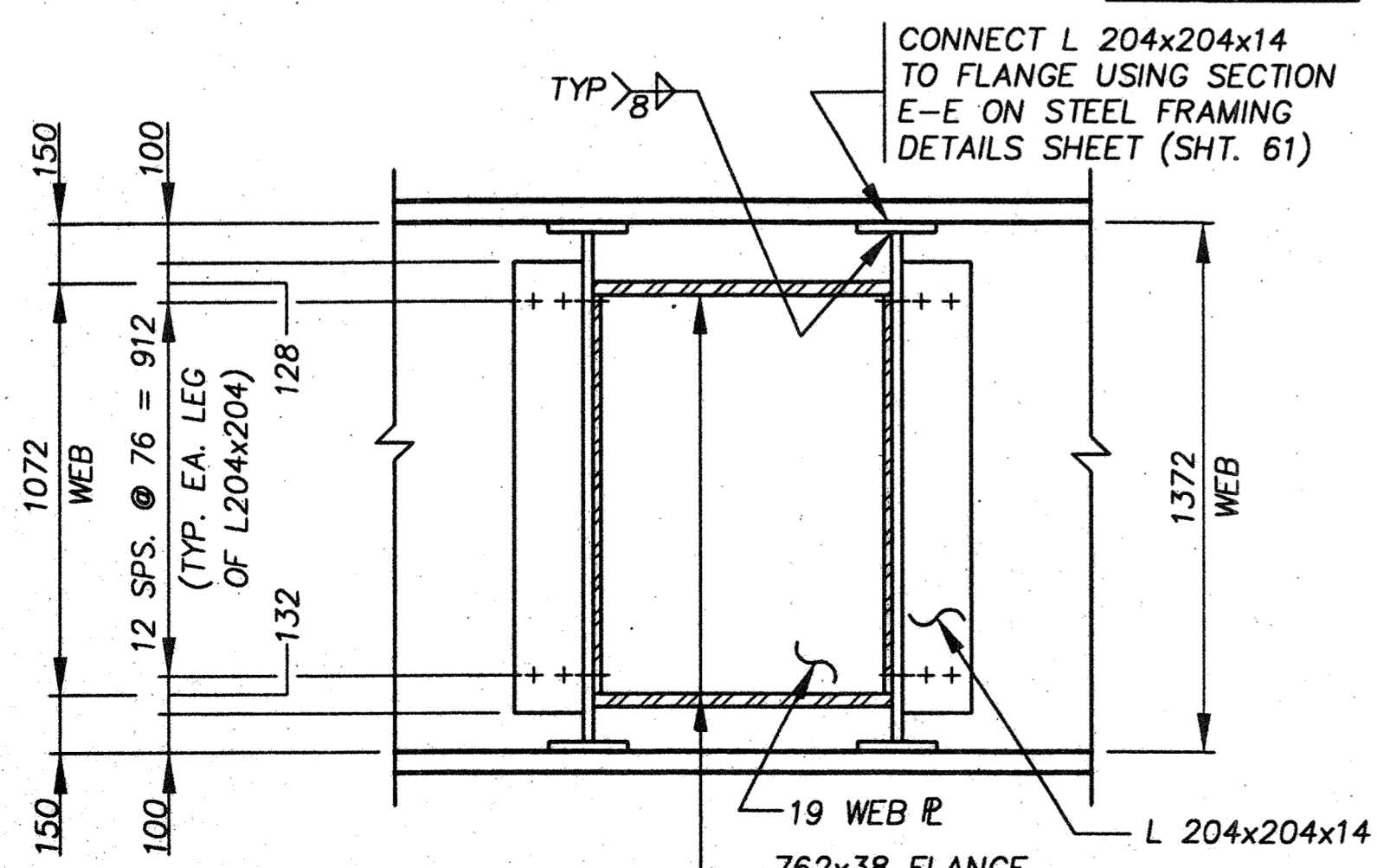
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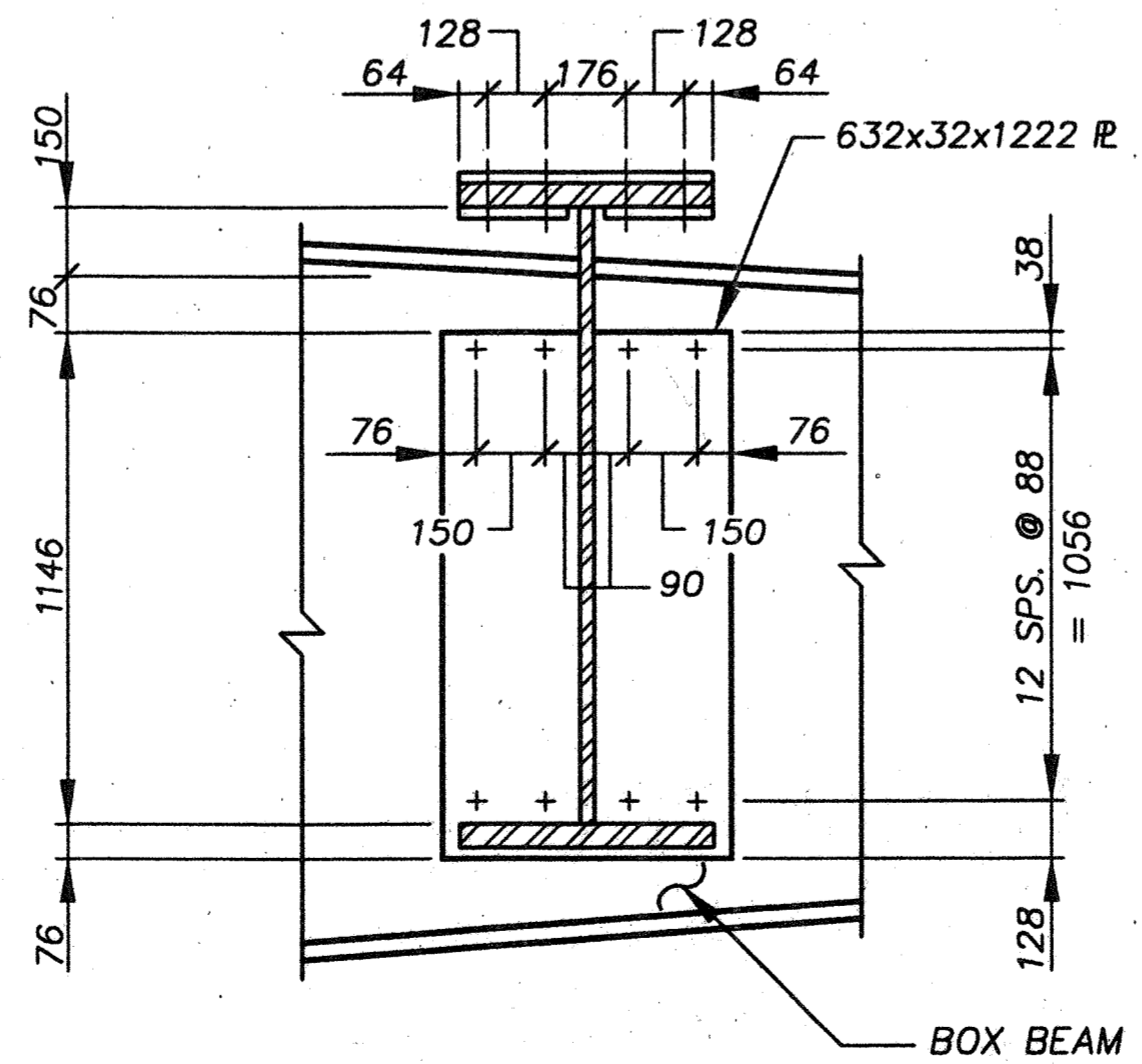
PLAN



ELEVATION



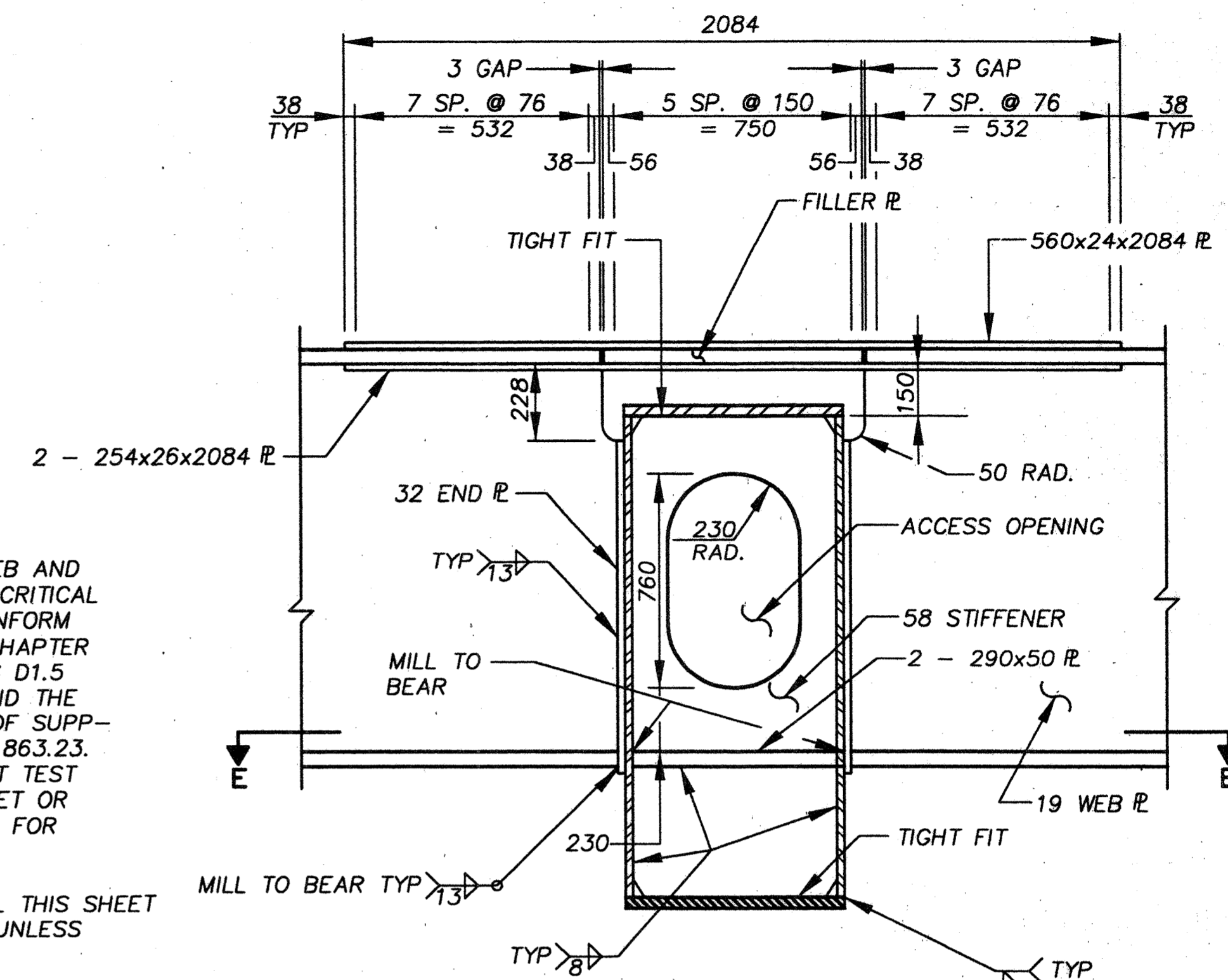
SECTION B-B



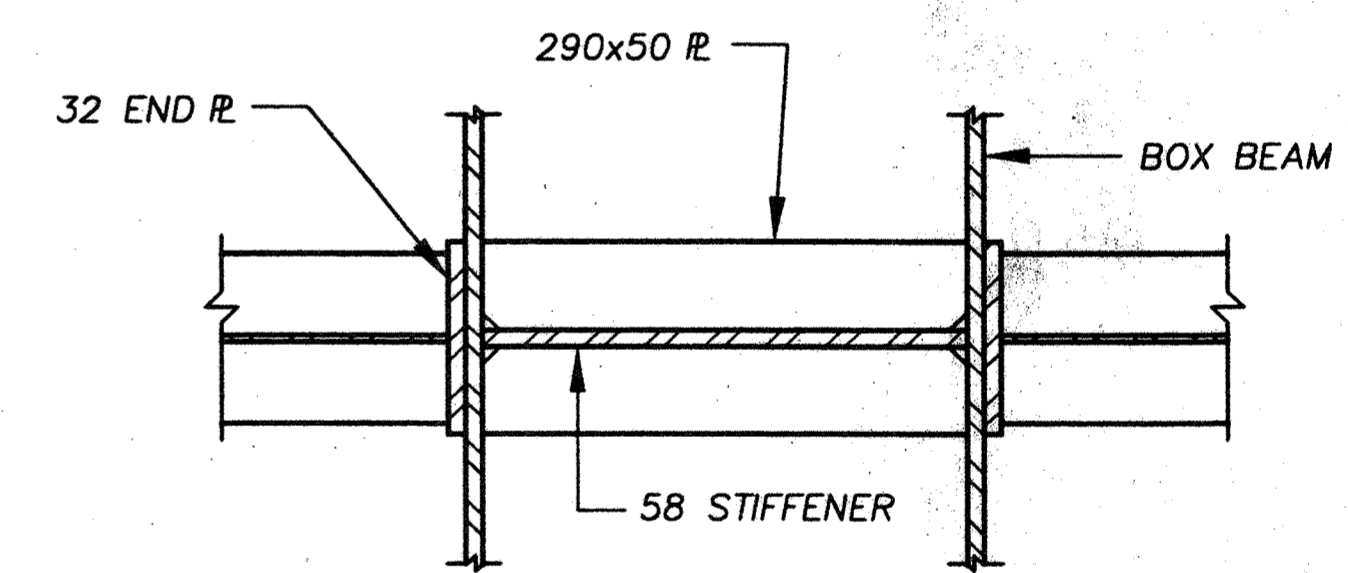
SECTION C-C

HAM-71-0000L PIER 2

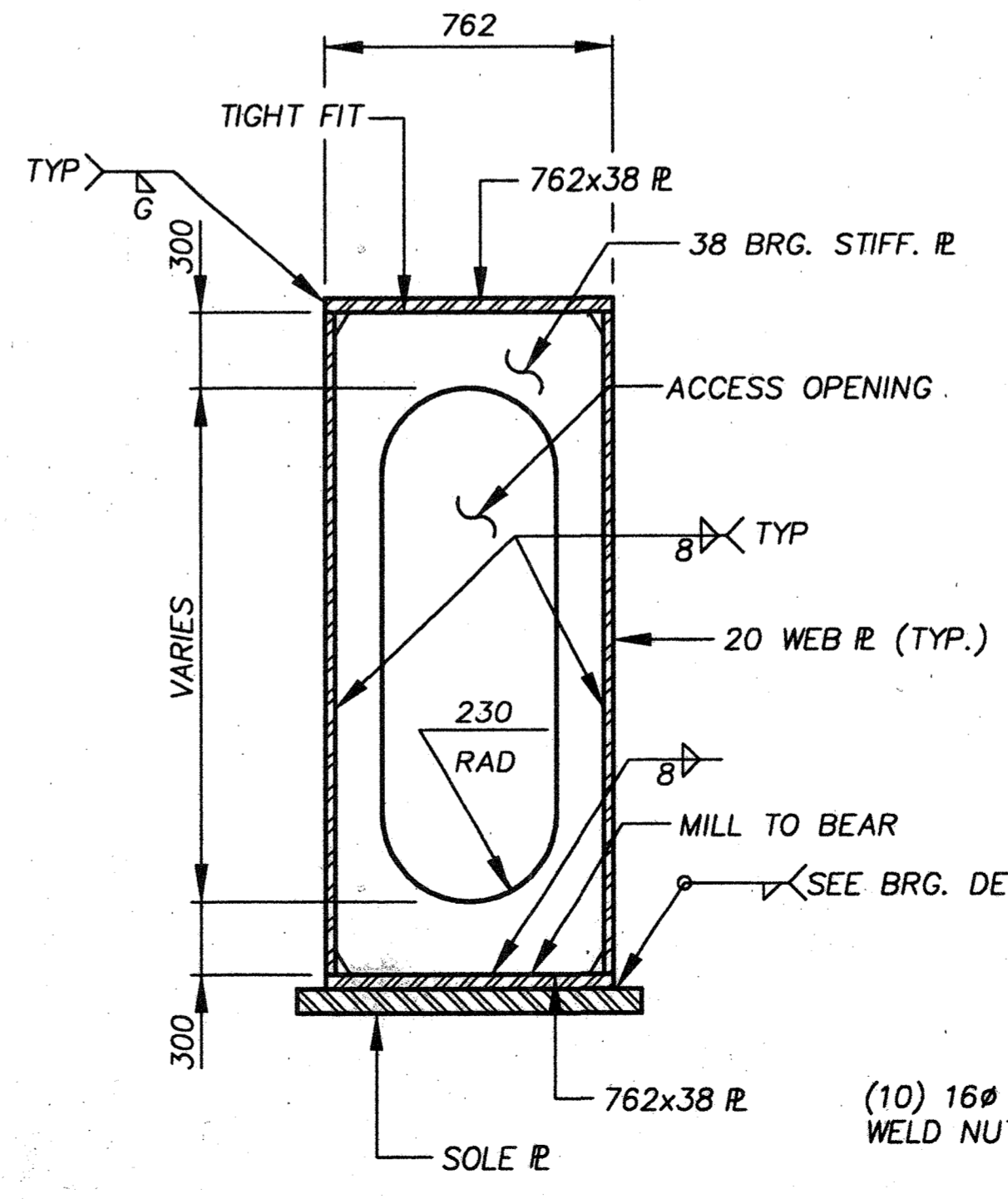
- NOTES:
1. INTEGRAL PIER CAP WEB AND FLANGES ARE FRACTURE CRITICAL MEMBERS AND SHALL CONFORM TO THE PROVISIONS OF CHAPTER 12 OF ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE AND THE WELDING REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 863.23. CHARPY V-NOTCH IMPACT TEST REQUIREMENTS SHALL MEET OR EXCEED THE FCM VALUES FOR ZONE 2.
 2. ALL STRUCTURAL STEEL THIS SHEET SHALL BE A572M GR345 UNLESS OTHERWISE NOTED.
 3. INTERIOR SURFACES OF BOX SHALL BE PRIME PAINTED PRIOR TO WELDING OF FINAL BOX FLANGE.



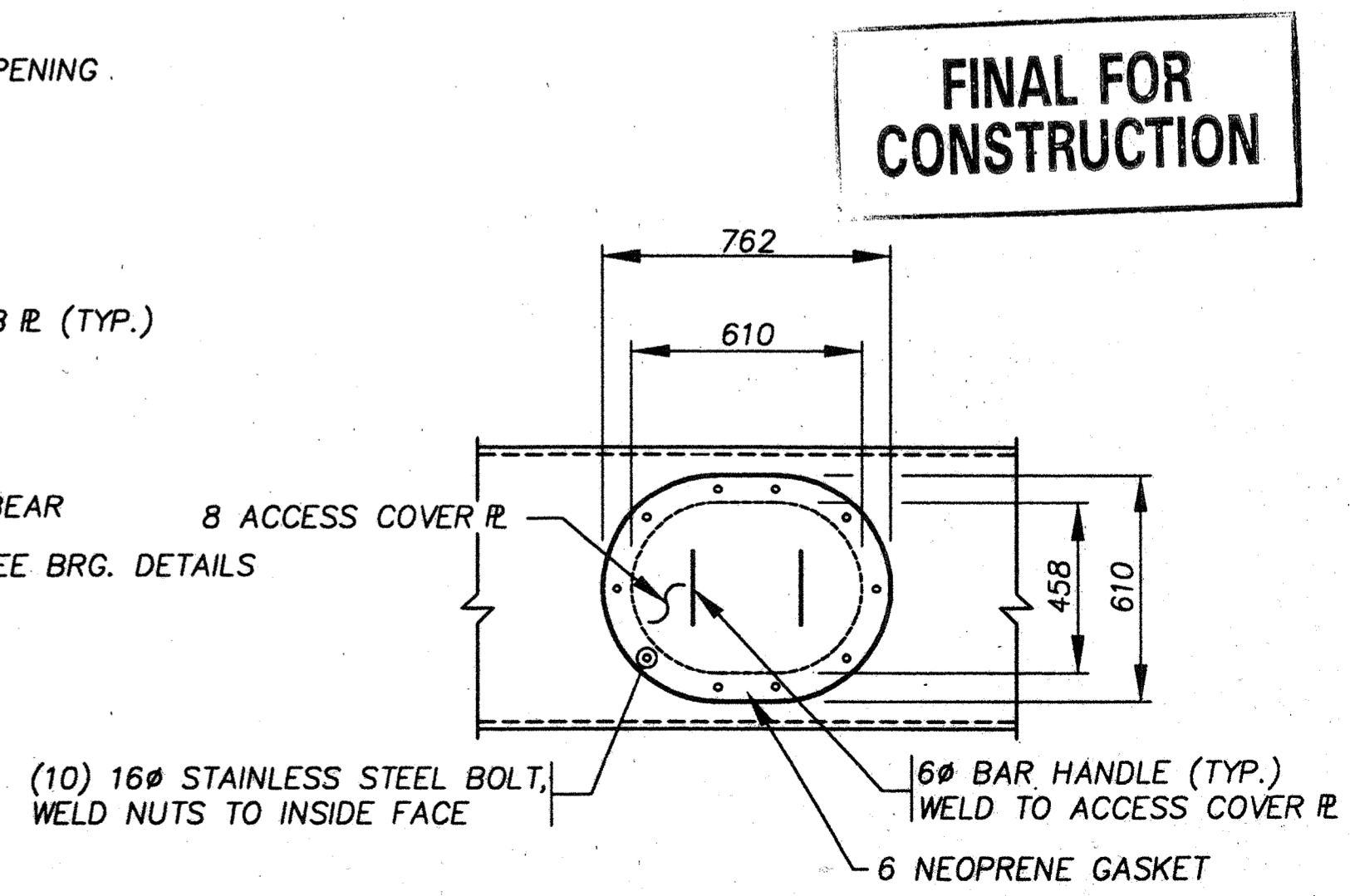
SECTION A-A



SECTION E-E



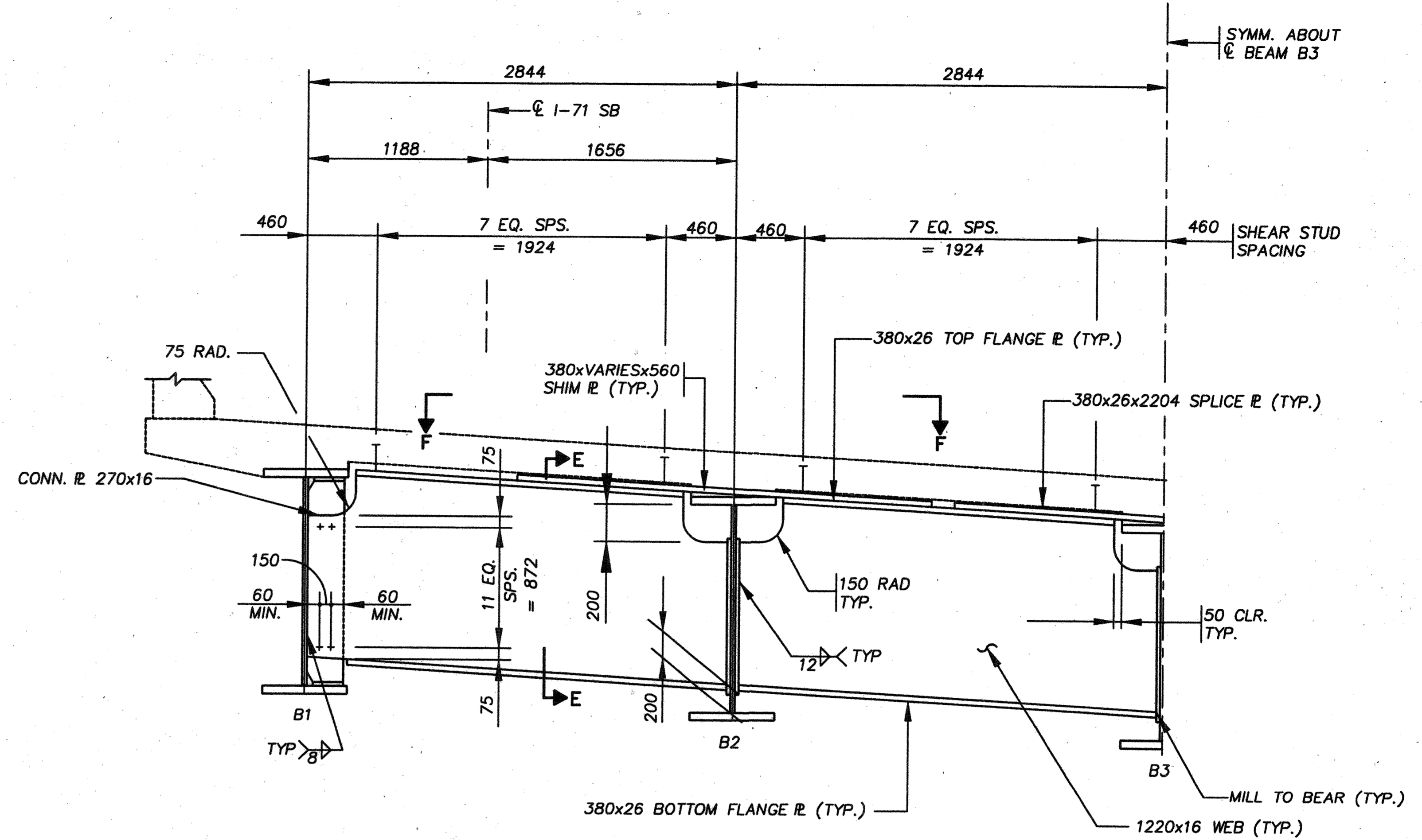
SECTION D-D



INSPECTION ACCESS COVER

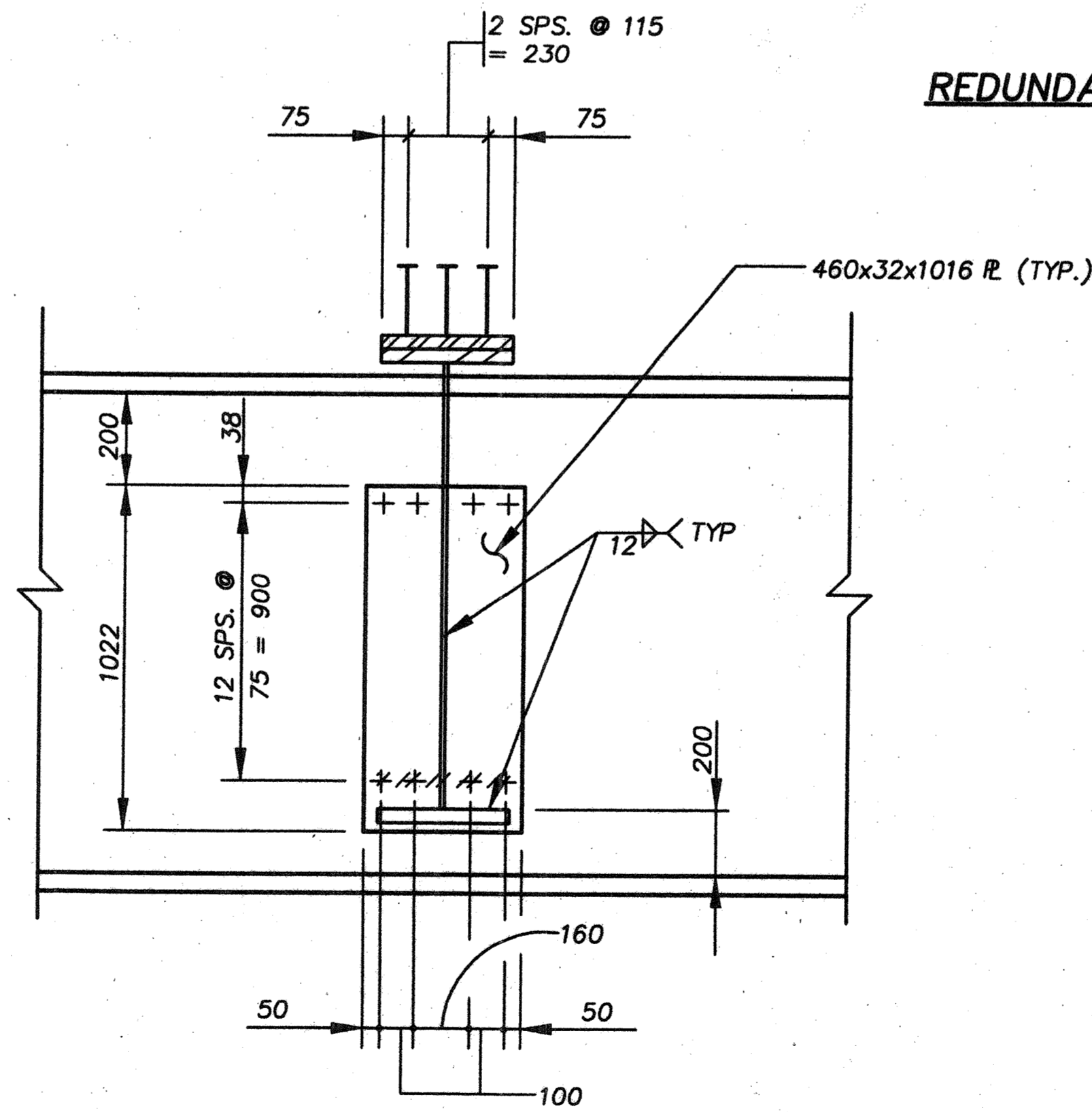
NOTES:
 1. TOP & BOTTOM FLANGES, WEB & SPLICE PLATES OF TOP FLANGE OF DIAPHRAGM ARE FRACTURE CRITICAL MEMBERS AND SHALL CONFORM TO THE PROVISIONS OF CHAPTER 12 OF ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE AND THE WELDING REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 863.23. CHARPY V-NOTCH IMPACT TEST REQUIREMENTS SHALL MEET OR EXCEED THE FCM VALUES FOR ZONE 2.

2. ALL STRUCTURAL STEEL THIS SHEET SHALL BE A572M GR345 UNLESS OTHERWISE NOTED.

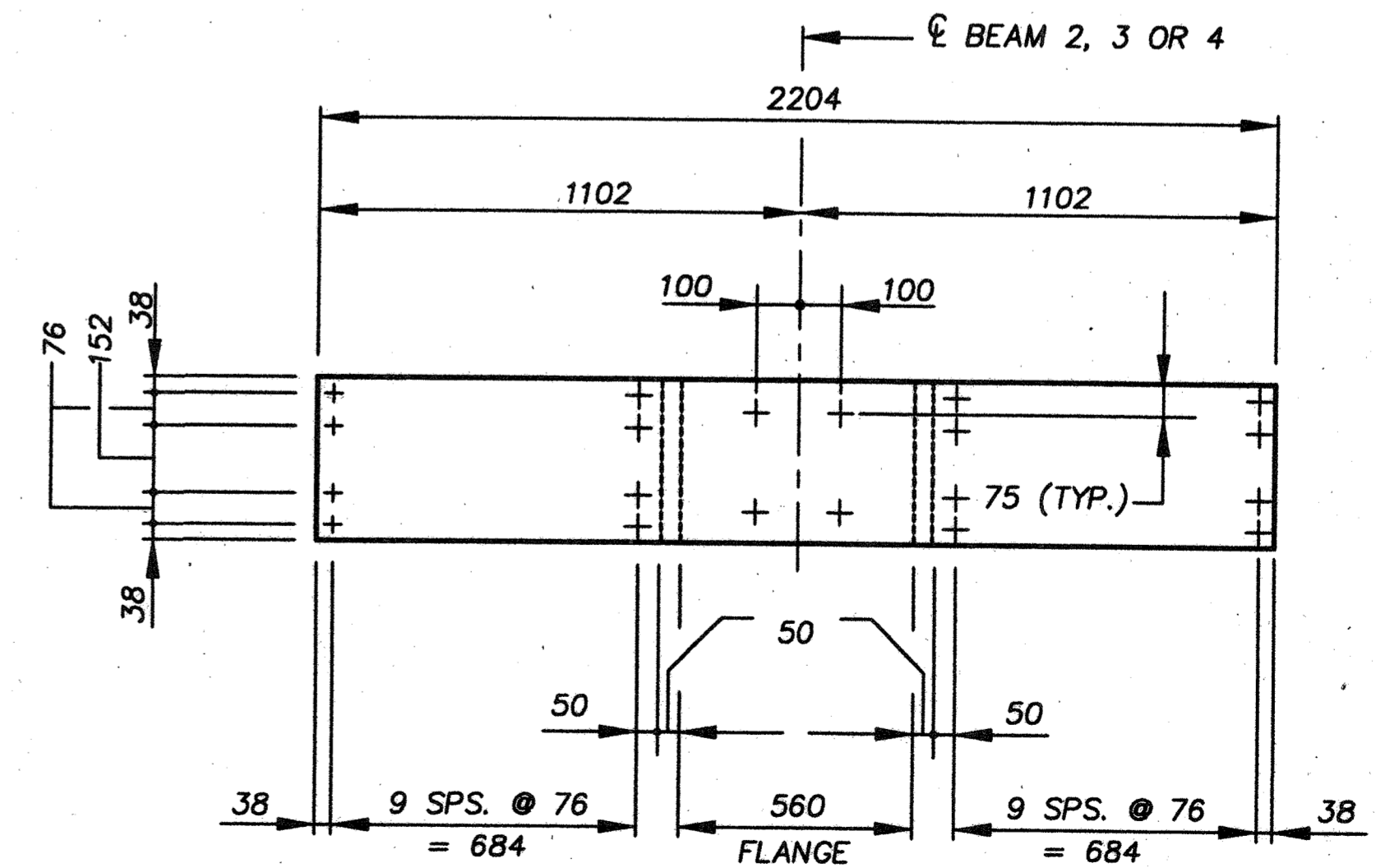


REDUNDANT LOAD PATH DIAPHRAGM

**HAM-71-0000L
 PIER 2
 DIAPHRAGMS**



SECTION E-E



SECTION F-F

FINAL FOR CONSTRUCTION

AUG 18 1998

06-19-98

BRW A DAWES & MOORE GROUP COMPANY	
DATE	STRUCTURE FILE NUMBER
REVIEWED	REVISION
DESIGNED	CHECKED
SA	MCM
REDUNDANT LOAD PATH DIAPHRAGM 171 SB	
BRIDGE 6	
56 / 85	233 / 588

Appendix B

Assetwise Report

TRANSYSTEMS

Inspector: Adamrovich,Jake

Inspection Date: 09/22/2023

Structure Number: 3105946

Facility Carried: SB IR 71

Ohio Bridge Inspection Summary Report

HAM-00071-0000L (3105946)

2: District 15000 - CINCINNATI (HAM county)
District 08

5A: Inventory Route 1 00071

21: Major Maint A/B 01 - State Highway Agency /
225 Routine Main A/B 01 - State Highway Agency /
221 Inspection A/B 01 - State Highway Agency /
220: Inv. Location DISTRICT 08

7: Facility On SB IR 71
6: Feature Ints USR 42
9: Location OH-KY LINE
Lat, Lon 39.093044564 ,-84.522618488

Condition Structure Type

58: Deck **6 - Satisfactory Condition**
58.01 Wearing Surface 6 - Satisfactory (1-10% distress)
58.02 Joint 5- Fair (obvious leaking, 1" offset)
59: Superstructure **6 - Satisfactory Condition**
59.01 Paint & PCS 5 - Fair (10-15% corr.)
60: Substructure **5 - Fair Condition**
61: Channel **N**
61.01 Scour **N - Not Applicable**
62: Culverts **N - Not Applicable**

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)
2- MicroSilica

67.01 GA 5

Appraisal

Sufficiency Rating 75.0 SD/FO 2 - FO
36: Rail, Tr, Gd, Term Std 1 1 N N
72: Approach Alignment 8 - Equal to present desirable criteria
113: Scour Critical N - Not over waterway
71: Waterway Adequacy N - Not Applicable

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)

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	
90: Routine Insp.	12	09/22/2023
92A: FCM Insp.	Y 12	09/22/2023
92B: Dive Insp.	N 0	
92C: Special Insp.	N 0	
92D: UBIT Insp.	N 0	04/09/2014
92E: Drone Insp.	N 0	

Inspector Adamrovich,Jake

Inspector: Adamrovich, Jake
Inspection Date: 09/22/2023

Structure Number: 3105946
Facility Carried: SB IR 71

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12-Reinforced Concrete Deck	3 - Mod.	153754	sq. ft.	107244	46097	413	0
<p>CS2: -Transverse hairline cracks are present throughout the deck underside for the full width of the bay between girders. Spans 1A through 16A exhibit hairline cracking spaced at approximately 6'. Spans 17A through Span 28B exhibit moderate width cracks with efflorescence spaced at approximately 4'-6'. -The FWW spans typically exhibit minor to moderate cracking with efflorescence throughout the deck underside for the full width of the bay between girders; these cracks are spaced at 2-4' on average. -Minor to moderate width map cracking is typical throughout the overhangs of the deck.</p> <p>CS3: -Span 19A has a 18" long by 24" wide by 2" deep spall with two exposed transverse reinforcing bars between Girders G and H near Pier 19A. -Span 20A has a 12" diameter by 1" deep spall with one exposed transverse reinforcing bar between Girders A and B at midspan and 9" diameter by 1" deep spall between Girders D and E just past midspan. -Span 21B has a 18" long by full deck width by 2" deep spall with two exposed transverse reinforcing bars with 1/16" section loss from Girder A through Girder E at midspan crossframes. -Span 23B has a 24" long by 12" wide by 1" deep spall with two exposed transverse reinforcing bars with 1/16" section loss between Girders D and E just past the first crossframe from Pier 22B. -In Span 26B, Bay 4 there are four spalls up to 3' L x 3' W x 3" D with up to four transverse and one longitudinal reinforcing bars exposed. -In Span 27B, Bay 4 there is a 48" L x 36" W x 3" D spall with four transverse and three longitudinal reinforcing bars exposed. -In Span 23B, Girders D and E have haunch spalling; Span 24 B Girders A and E have haunch spalling; all girders in Span 20B and 28B have intermittent haunch spalling throughout. -Full depth 4' x 4' concrete patches are typical at replaced expansion joints at Piers 4A, 8A, 15A, and 19A.</p> <p>Overhangs Span 1A -Two 8" diameter by 1" deep spalls with exposed reinforcement in the east overhang near the River Pier and a 21" long by 12" wide by 1" deep edge spall with exposed reinforcement on the east face of the east overhang near midspan Span 5A – There is a 5" diameter by 1" deep spall with exposed rebar in the east face of the deck at midspan. Span 6A – There are two spalls up to 2" long by 4" wide by 2" deep in the underside of the west overhang with exposed reinforcement. Span 8A – 24" long by 12" wide by 1" deep spall with exposed reinforcement in the west overhang and a 5' long by 20" wide by 5" deep spall with exposed reinforcement in the east overhang, both near midspan. -The east overhang patch at Pier 19A has spalling adjacent to the north side of the patch, two spalls (24" wide by 12" long by 3" deep and 24" wide by 24" long by 3" deep) -In Span 20B on the east overhang there is a spall measuring 5' L x 3' W x 4" D with five transverse and one longitudinal reinforcing bars exposed. Span 23B - 18" long by 12" wide by 12" high by 5" deep corner spall with one transverse reinforcing bar exposed in the west overhang at the Pier 23B joint -There are areas of minor to moderate cracking with heavy efflorescence and spalling in the west overhang of Span 23B and the east overhangs of Span 26B and 27B.</p>							

Inspector: Adamrovich, Jake
 Inspection Date: 09/22/2023

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.	13270	142104	784	0
CS2: -There are locations of hairline to moderate transverse, diagonal, and longitudinal cracks. -There are concrete patches in Spans 6A and 8A; these are in good condition. -The bridge deck was sounded by ODOT in December 2020, multiple delaminated areas were found throughout the wearing surface. CS3: -Minor pop-out spalls were present throughout the surface of the wearing surface. -There are multiple small (6" diameter) spalls in the west lane of Span 14A. -There are asphalt patches in Spans 6A and 8A; these are in good condition.							
107-Steel Open Girder/Beam	3 - Mod.	21338	ft.	13465	7553	320	0
CS2: -There is a minor deformation (approximately 1" out of plane over 6") in the bottom flange of Girder G at Span 1A. -The original girders typically exhibit minor surface corrosion and freckled rust where the paint system has failed, particularly on the fascia girders. -There is a bent stiffener on the east side of Girder E near Pier 21B in Span 22B. -There are isolated areas of spot rust on the fascia girders in the FWW spans. CS3: -Painted-over pack rust up to 3/8" thick is typical on the girder support angles at the steel pier caps. -There is painted- over pitting up to 1/8" deep on the bottom flange of Girder G at the hinge assembly in Span 4A and two 1" diameter holes in the web of Girder F at the hinge assembly in Span 4A. -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 is a 3/4" diameter inactive corrosion hole in a stiffener of Girder G in Span 16A near Pier 15A. -Area of 3/16" deep section loss bottom flange of Girder H in Span 18A -There is a 3" x 1" inactive corrosion hole in the web behind the bearing of Girder D, Span 19B at Pier 19B. -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. -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. -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.	157782	22540	33810	11270
CS2: -Chalking, dulling, and flaking are typical throughout (Spans 15A-28B). -There are small areas of spot rust throughout the FWW spans. CS3: -Paint peeling is typical throughout the structure. CS4: -The paint has failed throughout much of Spans 15A-28B. -Surface corrosion is active at all locations where the paint has failed, and rust staining is evident on the protective system remaining. -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	39	34	7	0

Inspector: Adamrovich, Jake
 Inspection Date: 09/22/2023

Structure Number: 3105946
 Facility Carried: SB IR 71

Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4	
<p>CS2: -Pier 12A, Column 1 has a moderate width vertical crack at the top near the bearing. -Exposed rebar due to lack of cover is common throughout. -Moderate width cracking and minor spalling is typical throughout. -Isolated delaminations on columns.</p> <p>CS3: -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 -Pier 13A, Column 2, South Face – There is a 48" high by 12" wide by 3" deep corner spall with exposed reinforcement. -Pier 16A, Columns 1 & 2, North and South Faces – There are 12" diameter by 1" deep corner spalls at each existing corner protection bracket -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. -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 -Pier 24B, Column 2 has a 7"T x 7"W x 1"D spall with exposed rebar on the south face near the ground; and 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 -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</p>							
210-Reinforced Concrete Pier Wall	3 - Mod.	73	ft.	73	0	0	0
231-Steel Pier Cap	3 - Mod.	910	ft.	67	6	837	0
<p>CS2: -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. -Broken tack welds on the interiors of the original steel box pier caps.</p> <p>CS3: For the original steel box pier caps -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. -Pack rust up to 1/2" thick is typical between the web plates and the girder seat angles. -There are also isolated areas of pack rust up to 1/8" thick under the top flange plates. -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. -Many areas of pack rust were caulked in 2017; the majority of the caulk appears to be functioning as intended. -There is an isolated area of reactivating pack rust between the north web plate and the west end plate connection angle of Pier Cap 12A. -There are areas of painted-over pitting on the web plates, bottom flange plates, and bottom flange angles up to 1/8" deep. -There are inactive corrosion holes in the seal plates at the west end of Pier Caps 9A and 10A. -There are some cracked tack welds on the interiors of the caps.</p>							
515-Steel Protective Coating		27612	sq. ft.	13806	11045	2761	0
<p>CS2: -Some of the steel pier caps have isolated minor rust staining along the bottom of the web.</p> <p>CS3: -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).</p>							
234-Reinforced Concrete Pier Cap	3 - Mod.	1226	ft.	1044	175	7	0

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	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	CS2: -There is typically map cracking on the concrete pier caps between pier columns on the original piers. -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. -There are minor to moderate width cracks with efflorescence on several of the overhangs of the FWW pier caps. -There are also minor to moderate width vertical cracks between pier columns and in the concrete bearing pedestals. CS3: -There is a 1' diameter x 1" deep spall with rust staining on the east face of Pier Cap 15A. -There is a 10" high by 4" wide by 1" deep spall on the southeast corner of the Pier Cap 18A east overhang. -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. -There are cracks with rust stains on Pier Cap 19A. -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). -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 Expansion Joint	3 - Mod.	704	ft.	100	548	20	36
	CS2: -There is loosely packed debris in all expansion joints on the deck. CS3: - Joint at the wall pier has heavy debris. -Minor tears are present at Piers 15A, 23B, 28B, and 7 (FWW). CS4: -The strip seals at the Wall Pier and Pier 4 (FWW) have areas of tearing that has led to leaking through the joint. -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	6	5	0
	CS2: -There are some minor areas of surface corrosion and isolated paint failure on the steel bearing plates. -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. CS3: -There is a 1" diameter corrosion hole in the bearing riser of Girder E, Span 24B. -There is painted-over pitting present on several bearing risers.						
515-Steel Protective Coating		36	sq. ft.	30	0	6	0
	CS3: -There are some minor areas of surface corrosion and isolated paint failure on the steel bearing plates.						
311-Movable Bearing	3 - Mod.	76	each	30	40	6	0
	CS2: -The original girder rocker bearings typically exhibit paint failure and surface corrosion throughout. -The anchor rod of Bearing C at Pier 28B is bent 1" to the south. -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. -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. -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. CS3: -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. -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.						

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	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
515-Steel Protective Coating		76	sq. ft.	36	0	40	0
	CS3: -The original girder rocker bearings typically exhibit paint failure and surface corrosion throughout.						
313-Fixed Bearing	3 - Mod.	27	each	6	18	3	0
	CS2: -The original steel fixed bearings typically exhibit paint failure and moderate surface corrosion throughout. CS3: -Pack rust is typical on the bearings.						
515-Steel Protective Coating		27	sq. ft.	6	0	21	0
	CS3: -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: -The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout. -There are a few instances of the elastomer bulging or walking out of the bearing pot. -The anchor rods of the bearings at Pier 5 and Pier 7 are bent. CS3: -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.	2	0	65	0
	CS3: -The pot bearings typically exhibit minor paint failure and moderate to heavy surface corrosion throughout.						
331-Reinforced Concrete Bridge Railing	3 - Mod.	6496	ft.	3018	3228	250	0
	CS2: -There are moderate to wide transverse and map cracks throughout both bridge railings, spaced 1 ft-3 ft apart with most exhibiting efflorescence, rust staining, and/or moisture staining. -There is minor impact damage to the west railing of Span 21B. -There are concrete patches in the railings throughout; these patches are in good condition. CS3: -There is a 1' x 6" x 2" spall with exposed reinforcement in the north railing at the Wall Pier. -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. -The spall is surrounded by delaminated concrete and wide longitudinal and vertical cracks with water and rust staining. -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	27	0	10	0

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Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4	
<p>CS2: -There are numerous locations where there is a large gap between the deck drainpipe and the downspout attached to the pier columns.</p> <p>CS3: -The drain pipe sections are disconnected at Pier 6A, 8A near the Pier cap. -Scuppers that are 100% clogged are located in Spans 3A, 9A, 10A, 17A, 18A, and at the Wall Pier in Span 1 (FWW) -The downspout at Pier 8A is clogged with debris. -There are disconnected or misaligned drainpipe boots at Piers 18A and 22B. - 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. -The drainage grate in the east gutter at Pier 19A has broken bars. -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.</p>							
820-Steel Seated-Hinge Assembly	3 - Mod.	21	each	18	0	3	0
<p>CS3: -The 2021 inspection noted that the bronze shim plate of the Girder C hinge in Span 4A was walked out 2" to the south; this location was inaccessible for measurement for the 2023 inspection, but no indication of significant additional displacement was observed. -There is isolated painted-over pitting on several of the bearing plates.</p>							

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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

Adamrovich,Jake

Inspection Date 09/22/2023

Reviewer Not Approved

Inspector Comments - Deck and Approach

Deck

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 not removed as part of the routine 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 from the boom lift.

Bridge Railing

Bridge railings were visually inspected from the boom lift.

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 shattered 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.

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Inspector Comments - General Appraisal

Superstructure

Steel Open Girder/Beam

The girders in Spans 1A-14A were painted as part of the 2021 paint contract . Due to the metal grates and wood shielding between bays in Spans 1A-11A and parts of 12A-14A, only the bottom flanges of the girders could be inspected in those spans. 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.

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Steel Pier Cap

The interiors of the steel pier caps were inspected during the 2023 fracture critical element level inspection. Detailed descriptions of each pier cap can be found in the 2023 In-depth and Fracture Critical 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

Waterway Adequacy

N/A

Channel

N/A

Scour Critical

N/A