FRACTURE CRITICAL PIER CAP

INSPECTION REPORT

SFN3106802 (HAM-71-0248R)
I-71 NB OVER FLORENCE AVENUE AND EDEN PARK DRIVE
HAMILTON COUNTY, OH
DISTRICT 8

June 2023

Prepared for:

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

STATE OF OHIO
MICHAEL A.
SEAL
E-70350
10/3/2023
REGISTERED
PROFESSIONAL ENGINEER

Prepared by:

COLLINS ENGINEERS INC.

4999 Easton Way, Suite 200

Columbus, Ohio 43219

614.362.0179 • www.collinsengr.com

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EXECUTIVE SUMMARY

Project: VAR-District 8 Bridge Inspections No. 2023-4. (PID No. 105476)

Purpose of Project: To perform an inspection of fracture critical steel pier caps of bridges for the Ohio Department of Transportation, District 8.

Inspection Team: Team Leader – Michael Seal, P.E. – Collins Engineers, Inc.
Team Member – Trent Graham – Collins Engineers, Inc.
Team Member – Rob Parker – Gannett Fleming, Inc.

Inspection Date(s): June 21-23, 2023

Summary of Findings:

- There was a 3/4 in. growth observed in a previously noted crack between the east bearing and Diaphragm J at the fillet weld on the south web stiffener near the top of the Pier 9 cap. Specifics are detailed in Section 2.1.1.1 below.
- Corrosion is reactivating at multiple locations, mostly towards the ends of the cap. This is occurring at each pier as well as locations of previous section loss. Specifics are detailed in the individual pier sections below.
- Locations of painted over pitting are present on the bottom cap plate at both ends and on the end plates at the hatches. Corrosion is reactivating at some of these locations. Specifics are detailed in the individual pier sections below.
- Triaxial welds are present at most pier caps, usually where diaphragms intersect with the cap web plates and the girder tie plates. Specifics are detailed with the individual pier sections below.
- Tack welds, weld remnants, and gouges are present inside some of the pier caps. These are old comments and have not changed since the prior inspection. Specifics are detailed with the individual pier section below.
- A few of the cuts for the dog bone retrofits are mis-cut, not straight, etc. These have previously been noted and have not changed since the prior inspection. Specifics are detailed with the individual pier section below.
- There were no changes to the cracks at Pier 12, Girder J, the south cap plate.

Summary of Recommendations:

- Consider retrofits of Category E details of intersecting welds.
- Monitor the observed cracks on Pier 9 and Pier 12 for additional growth or changes. Specifics of these cracks are noted under the individual pier section below.
- Monitor locations of section loss and reactivating corrosion for additional deterioration in future inspections. This generally is present at the ends of the pier caps, and specifics are detailed in individual pier sections below. Consideration can be given to cleaning and repainting areas of active corrosion.

- Future inspections should monitor weld remnants, tack welds, gouges, and other defects on the cap interiors resulting from prior rehabilitation efforts. Locations and conditions of each of these are detailed in the individual pier sections below.
- Re-drill retrofit dog bone holes at Girder A for Piers 10, 11, and 12 to be closer (and more effective) to the tie plates.
- Replace missing bolts in hatch connections as needed. The hatches are currently secure.
- Monitor the deteriorated and not fully seated nuts on bearings at a few of the piers. Locations are detailed in their respective pier sections below.
- Remove the caulk and install a bolt in the stress relief hole at Girder D at Pier 12.
- Monitor locations of mis-cut or poor sawcuts for changes or unexpected behavior.

NBI Ratings:

Item ID Description	Condition Rating	Summary
B.C.14 NSTM (steel pier caps)	6-Satisfactory	Painted over section loss, reactivating corrosion.

AASHTO National Bridge Element (NBE) Ratings:

Element #	Description	Units	Total	Condition State			
				1	2	3	4
152	Steel Floor Beam	LF	328	256	42	30	0

Note: Ratings were developed using the FHWA Specifications for the National Bridge Inventory and AASHTO Manual for Bridge Element Inspection, 2nd Edition.

1.0 INTRODUCTION

1.1 Purpose and Scope

This report consists of the results of a detailed inspection of non-redundant steel tension members (fracture critical) performed at the I-71 NB Bridge over Florence Avenue and Eden Park Drive in Hamilton County, OH (see Figure 1). Collins Engineers, Inc. (Collins) conducted the fracture critical pier cap investigation for the Ohio Department of Transportation (ODOT), District 8 on June 21-23, 2023.

1.2 General Description of the Structure

Bridge HAM-71-0248R is a thirteen-span, 1,158.21 ft long bridge built in 1966. In Spans 1 through 8 the superstructure is comprised of rolled steel beams. Spans 9 through 13 carry welded steel plate girders that frame directly into the steel pier caps at Piers 9 through 12.

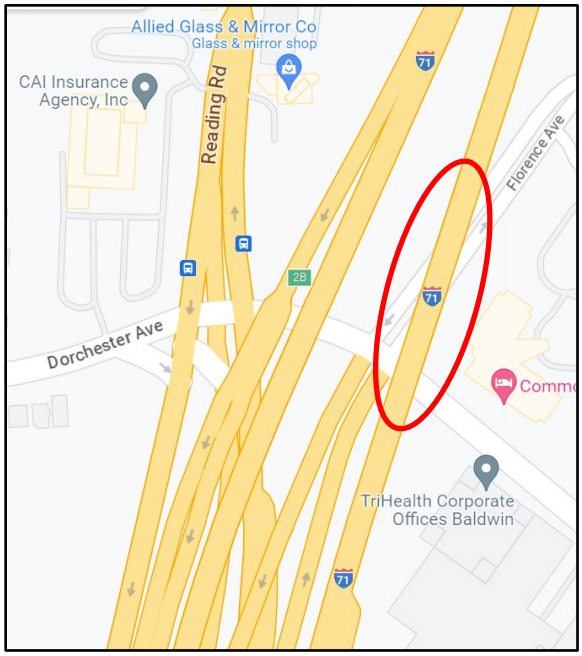


Figure 1: Bridge Location Map

Four fracture critical pier caps are each supported by three concrete columns at Piers 9, 10, 11 and 12. The caps are continuous welded box members with cantilever ends up to 13 ft 7-1/2 in. in length. Nine welded plate girders frame into the box sections. The girder webs are bolted by vertical double angles to the cap webs. The top flange splice plates are bolted to the top flanges of the pier caps and of the girders on each side of the

cap. The bottom flange splice plates pass through the web plates of the pier caps and are bolted to the bottom flanges of the girders on each side of the caps. Refer to Exhibit 1 for existing pier cap plans.

A 2012 rehabilitation project performed the following repairs on this structure:

- Cleaning and painting the interior and exterior surfaces of all pier caps.
- Removal of interior diaphragm knee braces on the caps.
- Bolted retrofit of welded drainage bracket and lateral bracing gusset connections to the web plates of all pier caps.
- Coping of intersecting fillet welds on the knee braces attached to the pier cap webs and girder bottom flanges.
- Grinding of miscellaneous tack welds on the pier caps.
- Drilling and saw-cutting of pressure relief holes in the web plates of the caps.
- Replacement of the center bearing below the cap at Pier 12.

A 2017 rehabilitation project performed the following repairs on this structure:

- Cleaning drainage system to the first manhole, both on structure and below ground
- Retrofit of fatigue cracks at Piers 9, 10, 11, and 12

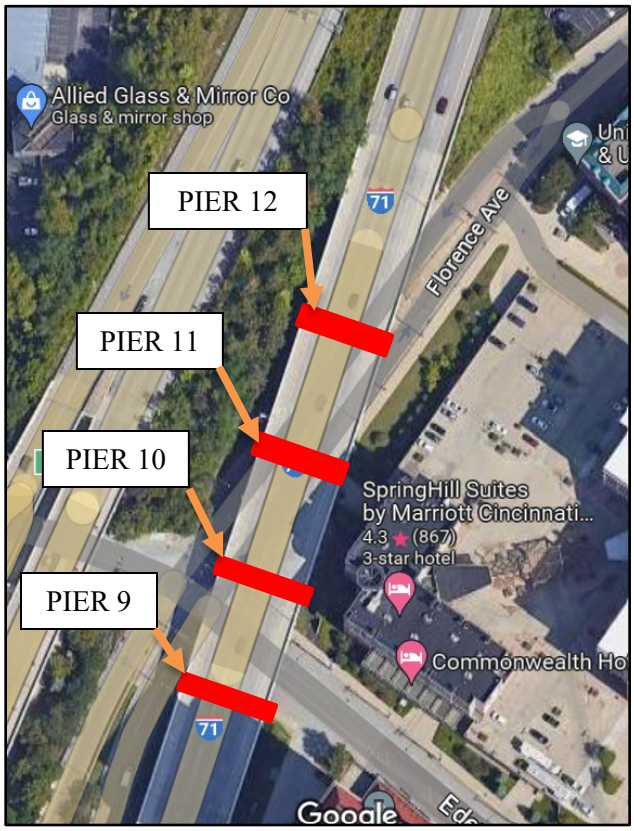


Figure 2: Fracture Critical Pier Caps Locations

1.3 Method of Investigation

From June 21-23, 2023, Collins Engineers, Inc. performed a fracture critical inspection on the HAM-71-0248R fracture critical steel pier caps. A 46 ft bucket truck was used to access the fracture critical pier cap interiors (Pier 9, Pier 10, Pier 11, Pier 12) and perform the "arms-length" inspection of the exteriors. A 28 ft. ladder was utilized on the northern part of the cap exterior for Pier 10. Traffic control provided by A&A Safety was used to gain access to the box cap exteriors and consisted of single lane closures as follows:

- Florence Avenue – One of the four lanes on Florence Avenue was closed between the hours of 8:00 AM to 4:00 PM to inspect the caps at Piers 10, 11 and 12.
- Eden Park Drive – One lane of Eden Park was closed between the hours of 8:00 AM to 4:00PM to inspect the cap at Pier 9.

The nomenclature and girder designation shown on the design plans were used in the inspection of the three pier caps. This bridge is inventoried in a south to north direction, and superstructure units are labeled from

left to right looking north. Substructure units are labeled as Rear and Forward Abutments and Piers 2 through 12. Refer to Photographs 1 and 2 below for overall views of the bridge superstructure.

Photograph 1: General View of Superstructure, Looking South From Pier 12.

Photograph 2: General View of Superstructure, Looking North From Pier 9.

OSHA confined space entry procedures were followed while inspectors were working inside the pier caps. Entry was performed in accordance with complete permit-required confined space entry procedures per GF SOP #10 and 29 CFR 1910.146. This included the use of an entry permit system, pre-entry air monitoring, continuous air monitoring, the designation of qualified entrants, attendants, and supervisor(s), and available emergency response. OSHA compliant safety harnesses and lanyards were worn by inspectors when working in the bucket truck. The bolts securing the pier cap hatches were removed and reinstalled with an impact wrench and the hatches were sealed with exterior-grade caulking once the interior inspection was complete. Various socket sizes from 1/2 in. to 15/16 in. were required to remove the hatch bolts.

Field measurements were taken using tape measures, calipers, and an ultrasonic thickness gauge to verify structural component dimensions. Observed deficiencies were recorded on member-specific field inspection forms. Digital photographs were taken of the fatigue prone details and other areas of interest or concern to further document the physical condition of the pier cap.

1.4 Condition Ratings

State and Federal guidelines for evaluating the condition of bridges have been developed to promote uniformity in the inspections performed by different teams 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 pier cap.

CODE	CONDITION	DESCRIPTION
N	NOT APPLICABLE	Component does not exist.
9	EXCELLENT	Isolated inherent defects.
8	VERY GOOD	Some inherent defects.
7	GOOD	Some minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Some moderate defects; strength and performance of the component are not affected.
4	POOR	Widespread moderate or isolated major defects; strength and/or performance of the component is affected.
3	SERIOUS	Major defects; strength and/or performance of the component is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.
2	CRITICAL	Major defects; component is severely compromised. Condition typically necessitates frequent monitoring, significant load restrictions, and/or corrective actions in order to keep the bridge open.
1	IMMINENT FAILURE	Bridge is closed to traffic due to component condition. Repair or rehabilitation may return the bridge to service.
0	FAILED	Bridge is closed due to component condition, and is beyond corrective action. Replacement is required to restore service.

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, AASHTO, 2019.
3. Bridge Inspector's Reference Manual, U.S. Department of Transportation, 2002 (rev 2012).
4. Inspection of Fracture Critical Bridge Members, U.S. Department of Transportation, 1986.
5. Specifications for the National Bridge Inventory, U.S. Department of Transportation, 2022.

2.0 EXISTING CONDITIONS

2.1 Pier Cap Conditions

2.1.1 Pier Cap 9

Pier Cap 9 is in Satisfactory condition [6] overall. This has been lowered due to the reactivating laminating corrosion at the ends of the cap and the crack growth noted during this inspection (see below). The condition rating was raised in 2019 due to the repairs performed in 2017 (described in Section 1.2 above). Cracks were removed and dog bone crack arrest holes installed, plus drainage improvements were performed. The interior of the cap was again dry at the time of inspection. There were no major changes overall to the cap condition, though active corrosion continues towards the ends of the cap. Specifics on the interior and exterior are detailed below.

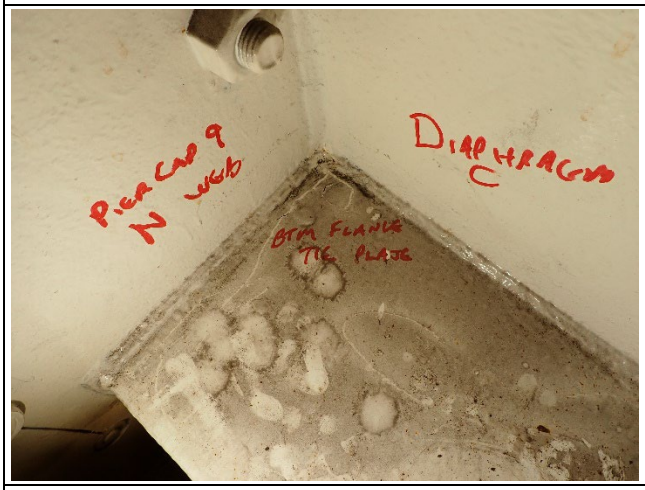
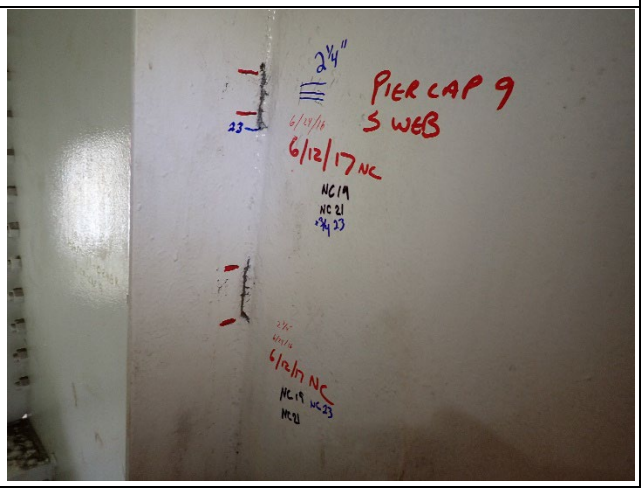
2.1.1.1 Pier Cap 9 Interior

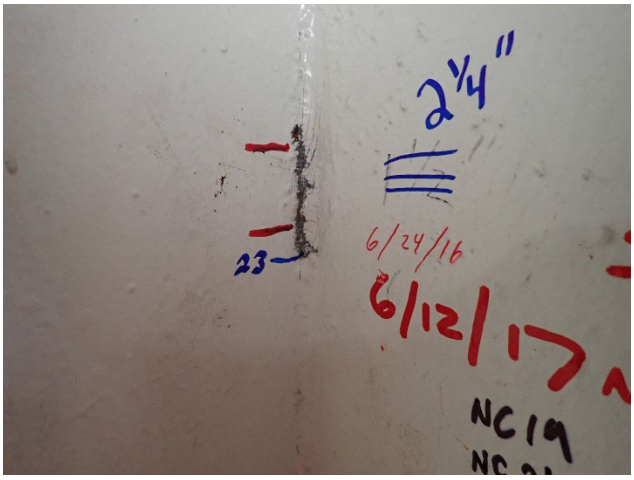
- Corrosion and deterioration have increased slightly at the west end of the interior due to leakage from the hatch cover. Specifics of this include:
    - Three small corrosion holes are present below the bottom of the perforation at the end plate (Photograph 4). The corrosion has reactivated since the prior inspection.
    - At the west access hatch, there is knife edging along the perforation of the hatch due to corrosion. The corrosion in this area has reactivated and increased since the prior inspection. See Photograph 5 below.
    - Laminating corrosion has reactivated along the cap bottom flange plate below the west hatch; this has slightly increased since the prior inspection. Localized section losses of up to 1/8 in. deep are present. Water is able to enter through the hatch seal and at the corners of the west end plate (Photograph 6). The paint is flaking in this area.
- The fillet welds along the pier cap diaphragms, pier cap webs and the girder tie plates are not sufficiently coped resulting in triaxial welds. No discernable pattern to the triaxial weld locations was noticed (Photograph 7). There were no cracks noted during this inspection.
- There were prior cracks noted on the fillet weld of the south web plate stiffener between the east bearing and the Girder J diaphragm, The upper crack measured 2-1/4 in. long for this inspection, compared to 1-1/2 in. length for the 2021 inspection (3/4 in. increase) (Photographs 8 and 9). The other lower crack of 2- 3/4 in. length did not change. The cracks currently do not propagate into the web plate and do not reach the end of the weld.

- There is painted over pitting up to 1/16 in. deep and reactivating laminating corrosion on the bottom flange between the east hatch and Girder J diaphragm (Photograph 10).
- After the removal of the knee braces that were welded to the pier cap top flanges adjacent to each bearing, 5 in. long sections of the knee braces were left in place.
- There is no change with the irregular overlapping welds present on the north web plate east of the Girder F diaphragm at the stiffener.
- Overtop each bearing, the backer bars attached with tack welds have not been removed between the diaphragms, most likely due to space constraints. There was no cracking or changes from the prior inspection noted.
- There is a 2 in. long tack weld on the south web between Girders H and J located just east of the stiffener near the bottom of the web plate. No change from the prior inspection.
- Two tack welds 3 in. or less exist on the interior of the north and south web at both the east bearing and on the south web at the west bearing. No change from the prior inspection.
- There is a 1-1/4 in. long tack weld on the north web between the east bearing and Girder J diaphragm, west of the stiffener (Photo 6). No change from the prior inspection.
- Although there is a plug in in place, there is a missing gasket at the lower drilled hole on the north web at the west face of diaphragm C (Photograph 11).

Photograph 3 – Overall View of Pier 9, Looking North

Photograph 4 – View of 3 Corrosion Holes Present at the West end of the Cap Plate.

	
Photograph 5 – View of Knife Edging And Reactivating Laminating Corrosion Around West Hatch	Photograph 6 – View of Laminating Corrosion On The Bottom Plate at the West Hatch
	
Photograph 7 – General Example of Triaxial Weld Connection. North Cap Web at Diaphragm C, West face shown.	Photograph 8 – Overall View of Two Cracks On South Cap Web Plate Weld to Stiffener, On West Face of Stiffener Between Girder J and East Bearing.



Photograph 9 – Close Up View of Upper Crack For Photograph 8, Note Crack Has Grown 3/4 in.

Photograph 10 – View of Painted over Pitting Up To 1/16 in. Deep with Reactivating Laminating Corrosion between the east hatch and Girder J diaphragm.

Photograph 11 – View of Missing Gasket On North Cap Plate At West Face of Diaphragm C.

Photograph 12 – Typical Diaphragm Configuration, West Face of Diaphragm H Shown.

Photograph 13(left) – Typical Diaphragm Configuration, West Face of Diaphragm H Shown.

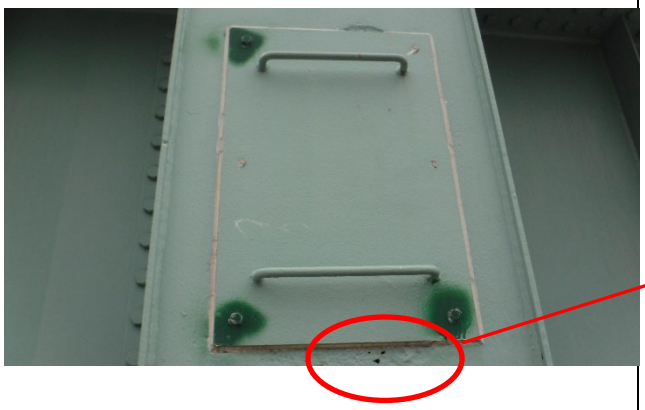
2.1.1.2 Pier Cap 9 Exterior

The pier cap exterior is in Good Condition [7] overall, with only minor surface corrosion and no weld cracks observed. Specific items to note include:

- There are three out of six anchor bolts missing around the perimeter at the west hatch. These bolt holes were caulked over to provide a tight seal. See Photograph 14.
- There are three painted over pinholes, up to 1/4" diameter, below the bottom edge of the perforation. At the exterior this has not changed since the prior inspection. See Photograph 15.
- At the bottom corners of the west end plate, the drain holes at the lower corners of the end plate exhibit localized section loss around the edges of the drain holes. The southernmost hole is still 1-1/2 in. in diameter. The northern most hole exhibited 1/4 in.' growth in section loss, making its diameter up to 1-3/4 in. (from 1-1/2 in.). See Photograph 16.
- There is minor surface rust exhibited on each spherical bearing. Anchor nuts on the middle and west bearings are not correctly seated on the base plate (Photograph 17). The bearing appeared to function properly. Overall, no changes from the prior inspection.
- Due to excessive coping, a 2 in. diameter x up to 3/16 in. deep painted over gouge on the north pier cap web exists at the Girder B east knee brace (Photograph 18) and at the knee brace for Girder E. There are other minor gouges scattered on the plates. This has not changed since the prior inspection.
- The web plates were retrofitted with drilled stress relief holes connected by saw cuts adjacent to the welded connections of the girder bottom flange tie plates. Additionally, the knee braces supporting the girder bottom flange tie plates at the pier cap web plates were coped to remove intersecting fillet welds (Photograph 19).
- In a previous rehabilitation, the welded connections of the drainpipe support brackets and the lower lateral bracing were removed from the web plates and replaced with bolted connections. This has not changed since the prior inspection.
- The exterior paint is overall good, with active corrosion at the top flange ends and minor painted over pitting to 1/16 in. deep on the top of the bottom flange on both ends. Locations of active corrosion include:
    - Active corrosion is present on the cap top flange plate with corrosion staining above the east hatch (Photograph 20). This has not changed since the prior inspection.
    - Minor surface corrosion is present along the majority of the cap top flange plate length along both edges.
    - There is minor corrosion staining from the bolted lower lateral bracing connections due to cracked paint and water infiltration. This occurs on the south web at the west side of Girder C,

the east side of Girder G, and the west side of Girder H. This occurs on the north web on both sides of Girder B and Girder C.

- There is minor section loss and pack rust at the top of the tie plate between Girder J and the north web. This has not changed since the prior inspection.



Photograph 14 – View of 3 of 6 Anchor Bolts Missing At West Hatch

Photograph 15 – Close Up View of 3 Small Corrosion Holes Below West Cap Hatch

Photograph 16 – View of Lower North Corrosion Hole At West Cap Plate, Note Slight Increase From 2021.

Photograph 17 – Typical Example of Bearing Anchor Bolt Nut Not Fully Seated. West Bearing Shown.

	
Photograph 18 – No Change to Gouge For East Knee Brace at Girder B, North Cap Plate.	Photograph 19 – General Example of Stress Relief Retrofit On Cap Web Plates.
	Photograph 20 (left)– View of Corrosion and Rust Staining On The Top Plate At The East End Hatch.

2.1.1.3 Pier Cap 9 Fatigue Prone Details

Fatigue Prone Detail 1

Fillet welds between diaphragms or stiffeners and web or flange plates.

Category: C'

Location: All girder diaphragms and web stiffeners.

Fatigue Prone Detail 3

Tack welds, less than 2", on web and flange

Category: C

Location:

- One tack weld on the interior of the south web at the west bearing.

- Intermittent tack welds on the vertical backer bars and the interior of the web plates between the stiffeners of each bearing.

Fatigue Prone Detail 4

Tack welds, greater than or equal to 2" and less than or equal to 4", on the web plates.

Category: D

Location: One 3" tack weld on each web plate at the east bearing; one 2" weld on the south web plate between Girders H and J (3 total)

Fatigue Prone Detail 5

Fillet weld greater than 4", with a connection

thickness less than 1".

Category: E

Location: 5" fillet welds connecting remaining portions of 2-3/8" Knee braces to the top flange at the diaphragms of Girders B, E, and H, and to the bottom flange at the diaphragms of Girders C, D, F, and G.

Fatigue Prone Detail 8

Intersection of fillet welds.

Category: E

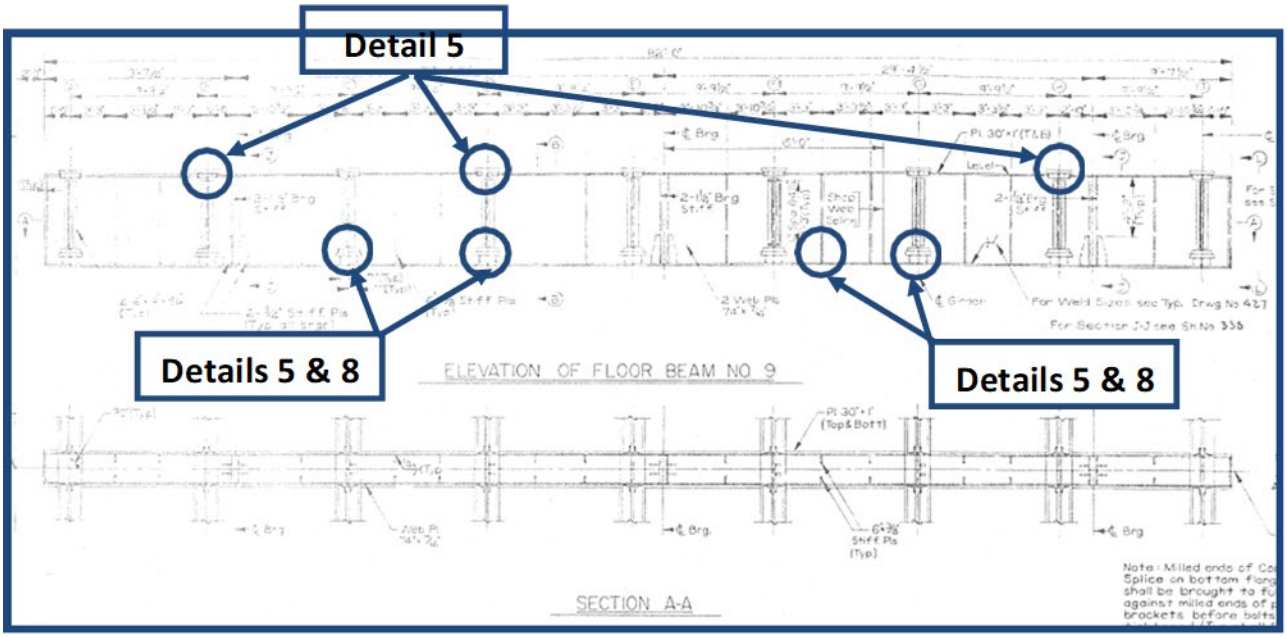
Location: Fillet welds of the web plates and bottom flange tie plates intersecting fillet welds between the diaphragms and both web and tie plates at Girders C, D, F, and G.

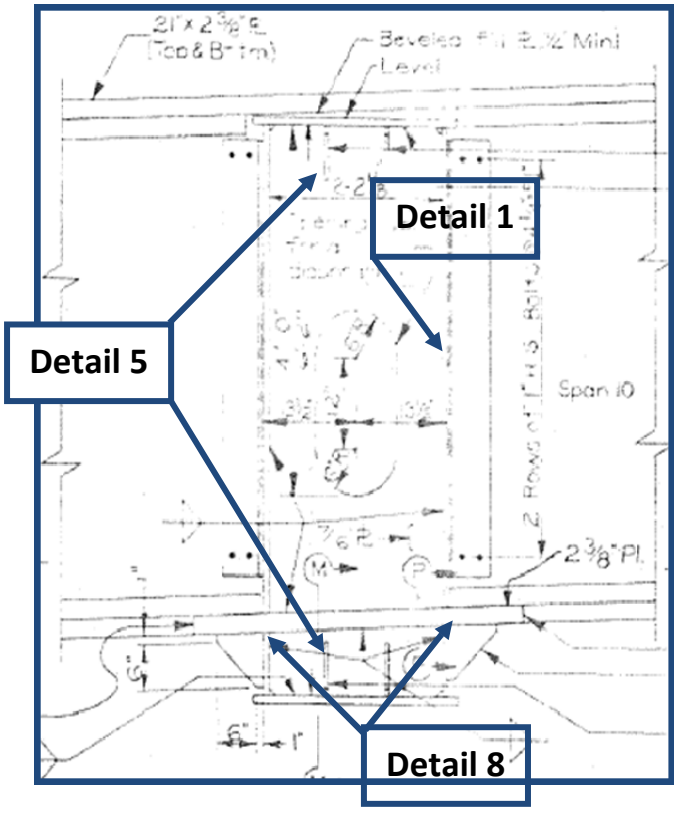
Fatigue Prone Detail 9

Drilled hole stress relief retrofit in web plates.

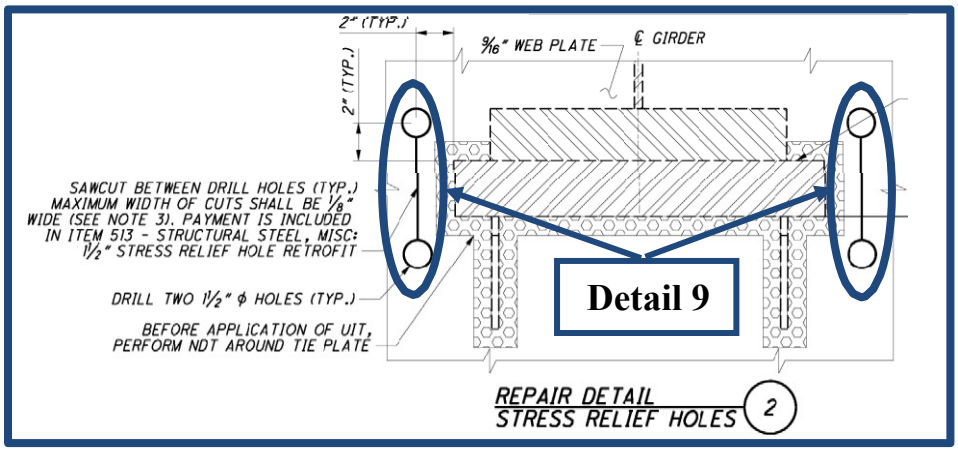
Category: B

Location: Both web plates on each side of all interior girder connections.





Section of Pier Cap 9



Web Plate Retrofit on Pier Cap 9

2.1.2 Pier Cap 10

Pier Cap 10 is in GOOD condition [7] overall (Photograph 21). The condition rating was raised in 2019 due to the repairs performed in 2017 (described in Section 1.2 above). Cracks were removed and dog bone crack arrest holes installed, plus drainage improvements were performed. The interior of the cap was again dry at the time of inspection. There were no major changes overall to the cap condition.

Photograph 21 – Elevation view of Pier Cap 10 looking South

2.1.2.1 Pier Cap 10 Interior

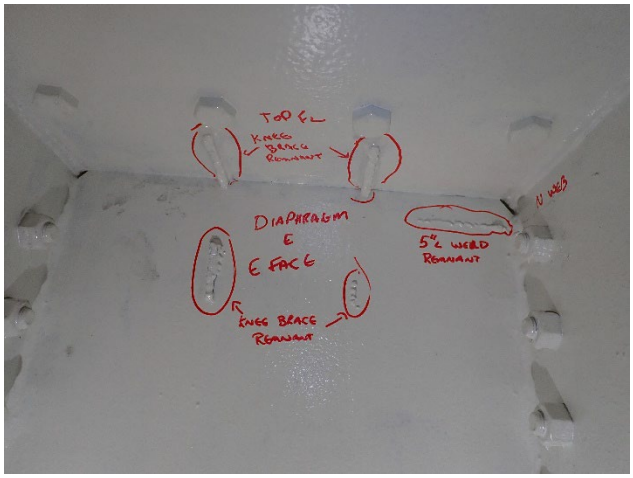
- During a previous rehabilitation the interior surfaces of the pier cap were cleaned and painted. Corrosion has reactivated along the bottom cap plate and at the bottom of the cap web plates at both hatches; painted over pitting up to 1/8 in. deep max but typically 1/16 in. was observed on the bottom cap plate and along the bottom of the web and end plates between both access hatches and the adjacent diaphragms (Photograph 22). Minor painted over pitting and isolated surface corrosion with no section loss occurs at isolated areas in the interior.
- There are couple fillet welds for the diaphragms, pier cap webs, and bottom flange that are not sufficiently coped, resulting in triaxial welds along the bottom flange. This occurs along the top north face of the Girder C diaphragm, the top south face of the Girder D diaphragm (Photograph 23), and at the first stiffener west of the Girder D diaphragm on the south plate (Photograph 24).
- Knee braces were removed from the girder diaphragms and the tension zones of the top and bottom flange plates. On the east side of the Girder E diaphragm, there are knee brace remnants on the diaphragm and top flange (Photograph 25) and an errant 5 in. long horizontal weld (Photograph 26). Additionally, remnants are present on the east face of the east bearing stiffener at the top.

- At each bearing, there are still backer bars attached with tack welds have not been removed between the diaphragms, most likely due to space constraints. No cracks were exhibited at these welds.
- Tack welds have previously been noted and are tracked during each inspection. These occur at:
    - The four tack welds less than 1 in. length on the north web, west of the Girder H diaphragm, are still present and have not changed.
    - A 1-3/4 in. tack weld on the south web was observed on the west side of the Girder C diaphragm. This has not changed.
    - A tack weld was located on the north web just east of Diaphragm G between Girder G and H (Photograph 27).
    - There is no change to the gouges from tack weld removal that were previously noted on the south web at the stiffener west of the Girder B diaphragm.
- Repairs were made with the previously noted cracks at the Girder A diaphragm and were painted. The repairs function as designed.
- The previous weld deficiencies at the Girder D diaphragm that were repaired and painted are functioning as designed.
- A mis-cut dog bone retrofit was observed in the south web west of Girder D. There are no structural problems caused by this.

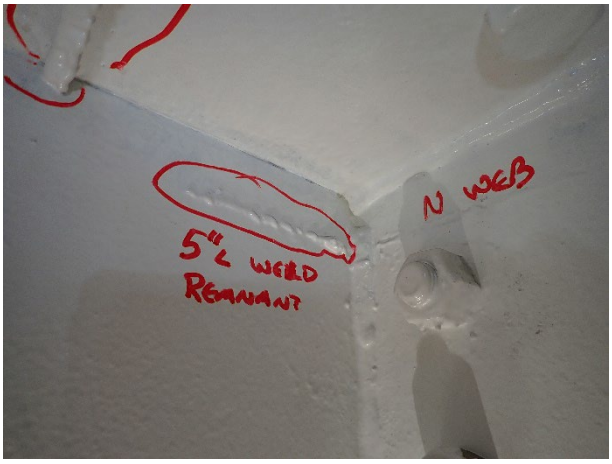
Photograph 22 – View of Painted over Pitting on West End Plate, looking East.

Photograph 23 – View of Top West Corner of Diaphragm D, South Cap Plate. Note Typical Triaxial Weld

Photograph 24 – View of First Stiffener West of Girder D Diaphragm at South Plate. Note Typical Triaxial Weld.



Photograph 25 – View of Remnants Present at Top of Girder E Diaphragm, East Side. No Change.



Photograph 26 – View of 5 in. Long Errant Horizontal Weld on East Face of Girder E Diaphragm.

Photograph 27 – View of Typical Tack Weld Present Inside Cap. Base of North Cap Plate Between Girders G and H Shown.

2.1.2.2 Pier Cap 10 Exterior

- Locations of painted over pitting were present on the cap plates. These overall have not changed since the prior inspection. Specific locations include:
    - Around the perimeter of the west access hatch. This is up to 1/8 in. deep with 1/16 in. typical. See Photograph 22.
    - There is painted over section loss on the north cap plate behind the bottom flange of Girder A (Photograph 28).
    - An area of painted over section loss measuring 21 in. wide x 4 in. high x up to 1/8 in. deep present on the north web above the Girder A tie plate.

  - Painted over pitting up to 1/16 in. deep on the top face of the west end.
  - Painted over pitting of 1/16 in. behind all copes and knee brace locations throughout the cap. In scattered isolated areas the corrosion is reactivating.
  - Surface corrosion and painted over pitting was observed at a 2 ft wide x 8 in. high area of surface corrosion and painted over pitting of 1/16. In. deep on the south cap plate and edge between Girder A and the west bearing (Photograph 30).
- Minor fretting corrosion was noted between the bolted connection on the north web and the lower lateral brace on the west side of Girder H and east side Girder G (Photograph 29).
- As a result of the rehabilitation, the knee braces are properly coped and stress relief holes are present (Photograph 31). On the north web at Girder A, the drilled holes and sawcut retrofit was installed 13 in. away from the bottom flange tie plate, hindering its effectiveness. It is possible that drilling the holes within 2 inches of the tie plate was not feasible due to the previous downspout configuration.
- A 4 in. long x 1 in. high area of minor gouges on the bottom flange exists on the north side of Pier 10 just below the west side of Girder B (Photograph 32).
- During a previous rehabilitation, the welded connections of the drainpipe support bracket and the lower lateral bracing were removed from the web plates and replaced with bolted connections. These remain in good condition.
- Tack welds were previously noted on the structure. These have not changed since the prior inspection. Notable tack welds are present at:
  - There is a 1 in. long tack weld between the south pier cap web plate and the east connection angle of Girder D. This is located above a 3 in. long tack weld near the bottom two bolts of the angle.
  - There is a 2 in. tack weld present between the south web and the east connection angle of girder G.
- The spherical bearings are in good condition and appear to function properly.

Photograph 28 – View of the Painted over Section Loss on the North Web Plate Behind the Bottom Flange Tie Plate at Girder A. No Change.

Photograph 29 – View of Minor Fretting Corrosion Between the Bolted Connection on the North Web and Lower lateral Bracing on the East Side Girder G.

Photograph 30 – View of the 2 ft Wide x 8 in High Area of Surface Corrosion and Painted over Pitting of 1/16in Deep on The South Cap Plate And Edge Between Girder A and the West Bearing.

Photograph 31 – View of the Drilled Holes and Sawcut Retrofits Installed 13 in. away from Bottom Flange Tie Plates. Girder A South Side Shown.

Photograph 32 – View of the 4 in. Long x 1 in Wide Gouge on the Bottom Flange of the North Side of the Pier Below and West of Girder B.

2.1.2.3 Pier Cap 10 Fatigue Prone Details

Fatigue Prone Detail 1

Fillet welds between diaphragms or stiffeners and web or flange plates.

Category: C'

Location: All girder diaphragms and web stiffeners.

Fatigue Prone Detail 2

Full penetration groove weld of flange splice. Category: B

Location: Two bottom flange splices and two top flange splices.

Fatigue Prone Detail 3

Tack welds, less than 2", on web and flange

Category: C

Location:

- Two tack welds between the bottom flange and Girder B diaphragm; three tack welds between the bottom flange and Girder C diaphragm; one tack weld on the interior of the bottom flange between Girders C and D (6 total).
- One tack weld on the interior of each web between Girders B and C; two tack welds on the interior of the north web between Girder D and the center bearing; one tack weld on the interior of each web between the center bearing and Girder E; one tack weld on the interior of the north web between Girders F and G; One tack weld on the interior of the north web between Girder H and the east bearing (8 total).
- Intermittent tack welds on the vertical backer bars and the interior of the web plates between the stiffeners of the center bearing and east bearing.

Fatigue Prone Detail 4

Tack welds, greater than or equal to 2" and less than or equal to 4", on the flange plates.

Category: D

Location: One 2" tack weld between the south web plate and the east connection angle of Girder G.

Fatigue Prone Detail 5

Fillet weld greater than 4", with a connection thickness less than 1".

Category: E

Location: 5" fillet welds connecting remaining portions of 2-3/8" Knee braces to the top flange at the diaphragms of Girder E and to the bottom flange at the diaphragms of Girders A, B, C, D, F, G and H.

Fatigue Prone Detail 8

Intersection of fillet welds.

Category: E

Location:

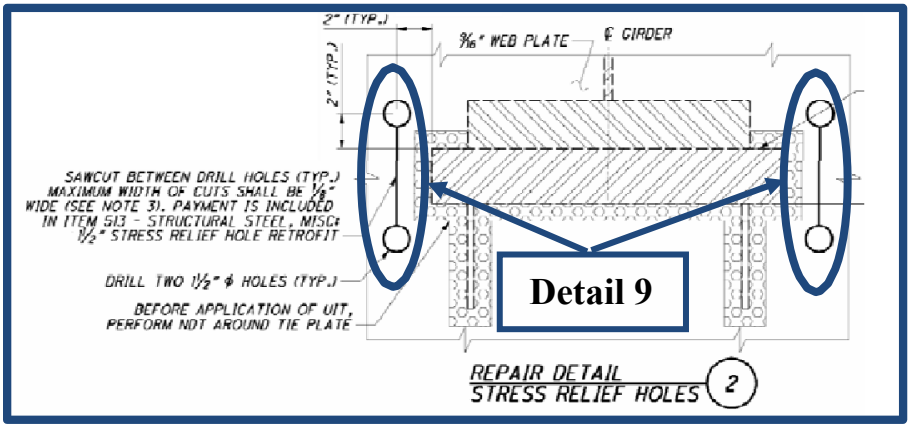
- Fillet weld of the bottom flange and south web plate intersecting fillet welds of the south web plate and stiffeners between the west and center bearings.
- Fillet welds of the web plates and bottom flange tie plates intersecting fillet welds between the diaphragms and both web and tie plates at Girders A, B, C, D, F, G and H.
- Intersection of the horizontal and vertical fillet welds between the east edge of the Girder A bottom flange tie plate and the north web (stress relief web plate retrofit is ineffective).

Fatigue Prone Detail 9

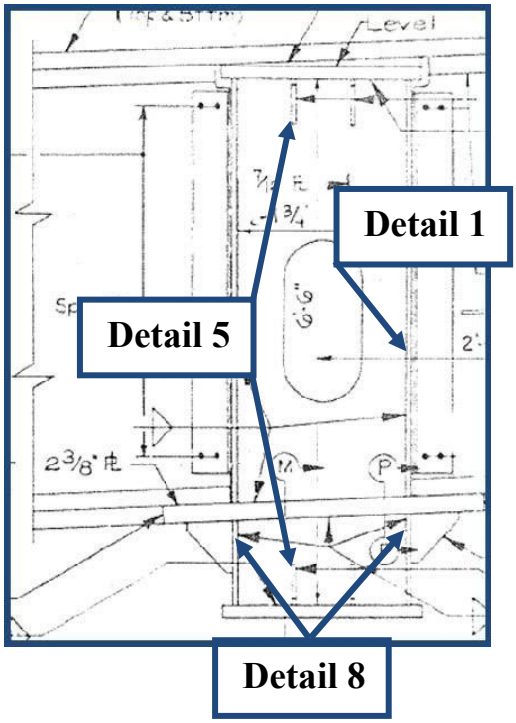
Drilled hole stress relief retrofit in web plates.

Category: B

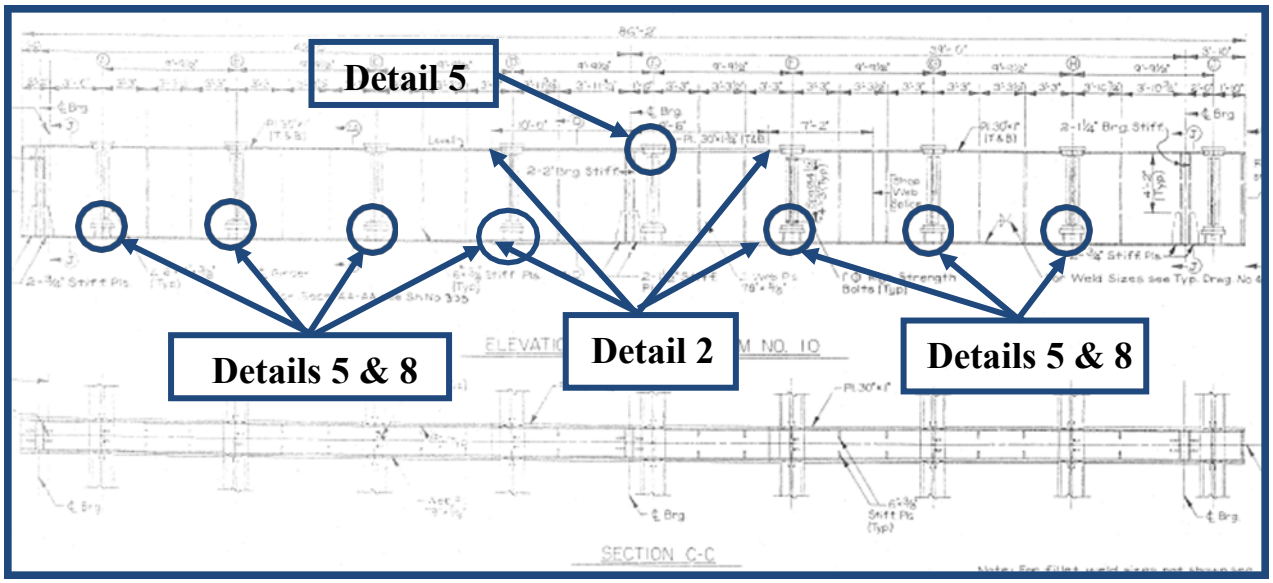
Location: Both web plates on each side of all girder connections.



Web Plate Retrofit on Pier Cap 10



Section of Pier Cap 10



Plan and Elevation of Pier Cap 10

2.1.3 Pier Cap 11

Pier Cap 11 is in GOOD condition [7] overall (Photo 29). At the time of the inspection the cap was free from moisture. Overall there were no major changes since the prior inspection.

2.1.3.1 Pier Cap 11 Interior

- Intersecting fillet welds are insufficiently coped resulting in triaxial welds at the interface of the diaphragm, tie plates, and web at the following locations (no changes for this inspection):
    - The south connection for Girders G, H, and J diaphragms (Photograph 33).
    - Girders E and F. Note the intersection is coped under the tie plate on the south web.
    - Girders B, C, and D. Note the top of the tie plate on the north web and bottom of the tie plate on the south web are coped.
- A curved cut was noted in the dog bone retrofit in the following locations:
    - South Web, west of Girder F
    - North and South Web, west of Girder G
    - North Web west of Girder H
- A crosscut was noted in the dog bone retrofit in the south web west of Girder B (Photograph 34). This has not changed for this inspection.
- A previous rehabilitation included the removal of the knee braces that were welded to the pier cap top and bottom flange plates at each diaphragm. This has not changed for this inspection.
- Repairs were made to a previously noted tack weld crack between the bottom flange and the east side of the Girder A diaphragm. This area has been painted over and the repair appears to function as designed.
- The west access hatch was dry at the time of inspection. Localized active corrosion and peeling paint is present along the bottom cap plate. Painted over pitting up to 1/16 in. deep is present (Photograph 35).
- Over the top of each bearing there are backer bars attached with tack welds; these have not been removed between the diaphragms, most likely due to space constraints. No change for this inspection.
- There are two plug welds between the stiffeners on the south web towards the top of the web between Girder H and J diaphragms. This is an old comment that has not changed.
- On the bottom flange plate there are two 2 in. long fillet weld remnants at the east stiffener between the west bearing and Girder A (Photograph 36). This is an old comment that has not changed.

- The following minor gouges were observed. These likely occurred during tack weld removal):
  - Two in the north web plate between Girder B and Girder C (Photographs 37 and 38).
  - One in the south web plate just west of Girder C.
  - One in the north web plate just east of Girder D.
  - One in the south web plate between Girder E and F.

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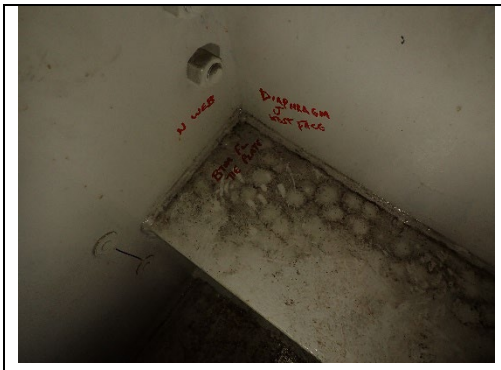
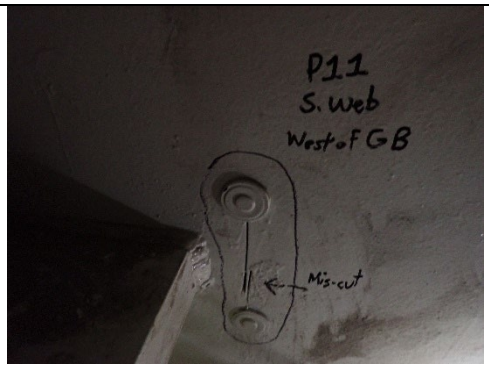
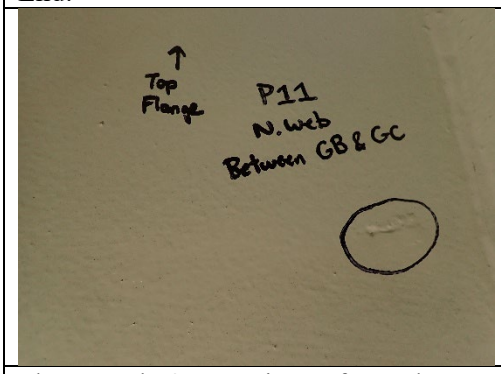
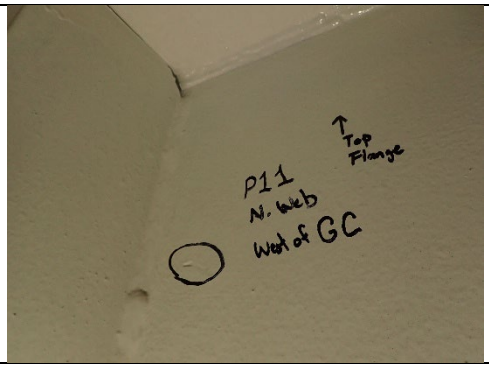
<tr><td>  </td><td> 
</td></tr>
<tr><td>Photograph 33 – General Example of Triaxial Weld, North Cap Web Plate at Diaphragm J Tie Plate Shown.</td><td>Photograph 34 – View of the Crosscut Present In The Dog Bone Retrofit At South Cap Plate West Side of Girder B.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph 35 – View of Active Corrosion and Painted Over Pitting To 1/16 in. Deep at the West End.</td><td>Photograph 36 – View of the Fillet Weld Remnants at the East Stiffener Between the West Bearing and Girder A.</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Photograph 37 – View of North Cap Web Plate Gouge Between Girders B and C.</td><td>Photograph 38 – View of North Cap Web Plate Gouge Between Girders B and C.</td></tr>
</table>

2.1.3.2 Pier Cap 11 Exterior

- As part of a previous rehabilitation, the knee braces are properly coped, and stress relief holes are present. On the north web at east side of Girder A, the drilled holes and sawcut was installed 12 in. away from the bottom flange tie plate, hindering its effectiveness (Photograph 39). It is possible that drilling the holes within 2 in. of the tie plate was not feasible due to the previous downspout configuration. During the previous rehabilitation, welded connections of the drainpipe support brackets and the lower lateral bracing were removed from the web plates and replaced with bolted connections. Remnants of the welded drainpipe connection still exist on the north web, east of Girder J. This has not changed.
- The perimeter of the east access hatch exhibits painted over pitting up to 1/16 in. deep. This has not changed. Only two of the original six nuts remain on the west hatch.
- There is an area of painted over section loss up to 7/16 in. deep in the north pier cap web just east of the web of Girder A and extending to the west side of Girder A (Photograph 40). The area currently measures 18 in. long and up to 3 in. high.
- The spherical bearings appear to function properly. There are two anchor bolt nuts on the east bearing with 50% painted over section loss. This is an old condition that has not changed (Photograph 41). The anchor nut on the southwest corner of the center bearing is not tightly fully seated on the masonry plate (Photograph 42). This has not changed.
- There is plug weld in the north cap plate located 3 ft. west of Girder J. There is no change since the prior inspection.
- The conduit cover on the north side of the cap, east of Girder E is still missing. This has been previously noted.

	
Photograph 39 – View of Sawcut Installed 12 in. Away From Bottom Flange Tie Plate on North Web Plate at East Side of Girder A.	Photograph 40 – View of Painted over Section Loss in the North Cap Plate Behind Girder A.
	
Photograph 41 – View of Anchor Bolt With Greater Than 50% Section Loss, East Bearing. No Change.	Photograph 42 – View of the Not Fully Seated Anchor Bolt Nut On Southwest Corner of the Center Bearing.

2.1.3.3 Pier Cap 11 Fatigue Prone Details

Fatigue Prone Detail 1

Fillet welds between diaphragms or stiffeners and web or flange plates.

Category: C'

Location: All girder diaphragms and web stiffeners.

Fatigue Prone Detail 2

Full penetration groove weld of flange splice.

Category: B

Location: Two bottom flange splices and two top flange splices.

Fatigue Prone Detail 3

Tack welds, less than 2", on web and flange

Category: C

Location:

- One tack weld on the interior of the north web between the west bearing and Girder A; one tack weld on the interior of the south web between Girders B and C (ground, but not completely removed); one tack weld on the interior of the south web between Girders E and F; one tack weld on the interior of the south web between Girders F and G; two tack welds on the interior of the south web between Girders H and J (6 total).
- Intermittent tack welds on the vertical backer bars and the interior of the web plates between the stiffeners of the center bearing.

Fatigue Prone Detail 4

Tack welds, greater than or equal to 2" and less than or equal to 4", on the flange plates.

Category: D

Location: Two 2" fillet welds on the interior of the bottom flange between the west bearing and Girder A.

Fatigue Prone Detail 5

Fillet weld greater than 4", with a connection

thickness less than 1".

Category: E

Location: 5" fillet welds connecting remaining portions of 2-3/8" Knee braces to the top flange at the diaphragms of Girders D and E, and to the bottom flange at the diaphragms of Girders A, B, C, F, G, H and J.

Fatigue Prone Detail 8

Intersection of fillet welds.

Category: E

Location:

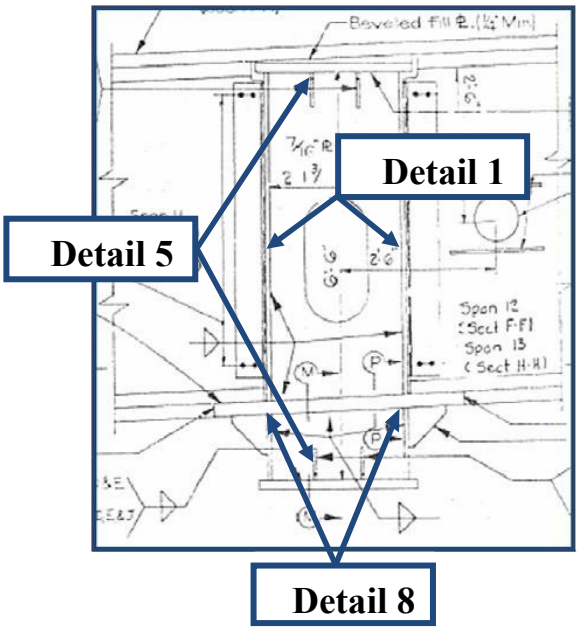
- Fillet weld of the bottom flange and north web plate intersecting fillet welds of the north web plate and stiffeners between the west bearing and Girder B and between Girders C and D.
- Fillet welds of the bottom flange and south web plate intersecting fillet welds of the south web plate and stiffeners between the west bearing and Girder A and between Girders H and J.
- Fillet welds of the web plates and bottom flange tie plates intersecting fillet welds between the diaphragms and both web and tie plates at Girders A, B, C, F, G, H, and J.
- Intersection of the horizontal and vertical fillet welds between the east edge of the Girder A bottom flange tie plate and north web (stress relief web plate retrofit is ineffective).

Fatigue Prone Detail 9

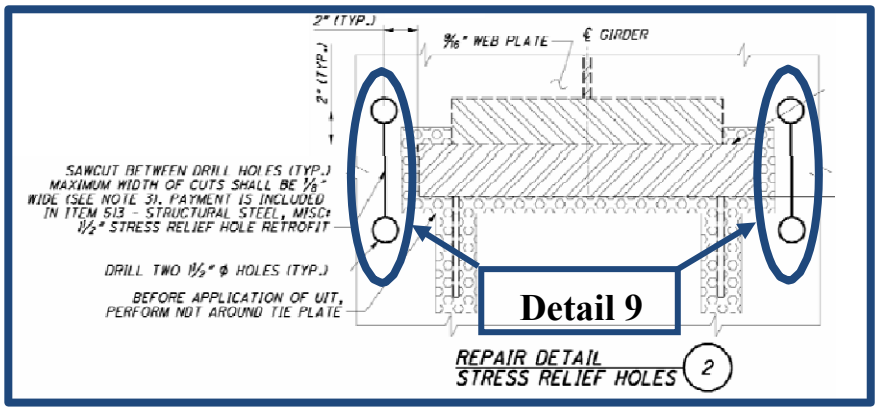
Drilled hole stress relief retrofit in web plates.

Category: B

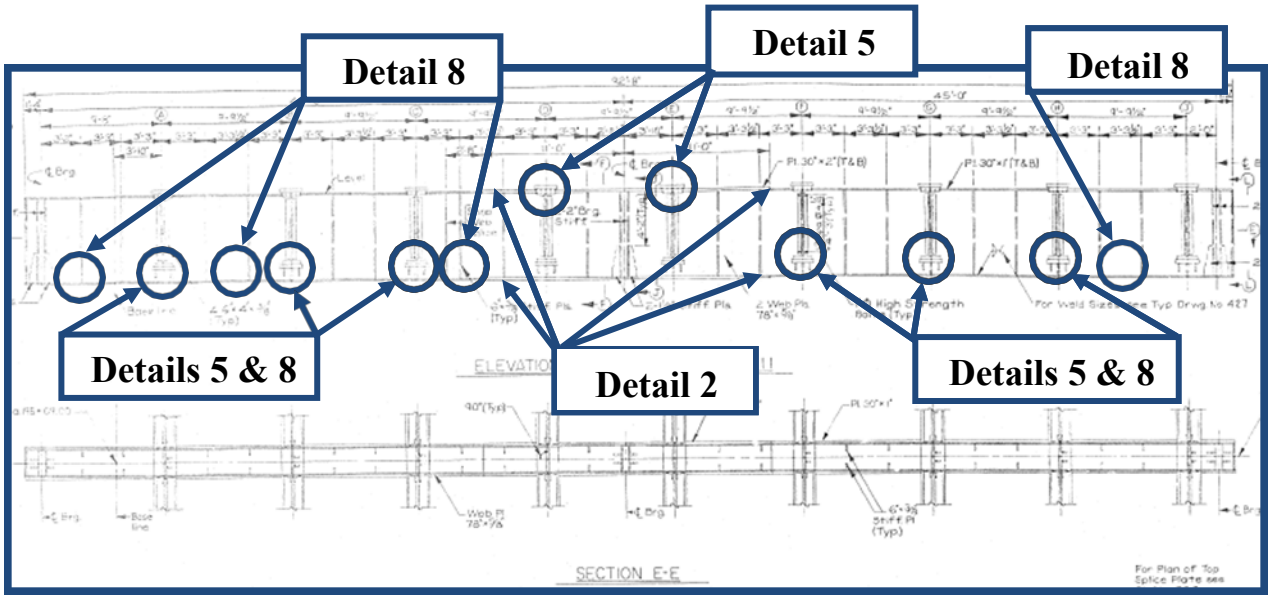
Location: Both web plates on each side of all girder connections.



Section of Pier Cap 11



Web Plate Retrofit of Pier Cap 11



Plan and Elevation of Pier Cap 11

2.1.4 Pier Cap 12

Pier Cap 12 is in SATISFACTORY condition [6] overall (Photo 43). The interior of the cap was dry at the time of inspection. There were no major changes overall to this pier cap, though corrosion has reactivated near the west end plate.

2.1.4.1 Pier Cap 12 Interior

- In a previous rehabilitation project, 6 in. x 6 in. x 1 in. rolled steel angles were bolted to the full height of both cap web plates on each side of the Girder E diaphragm. Additional 6 in. x 6 in. x 1 in. steel angles were bolted to both cap web plates on each side of the Girder E diaphragm between the pier cap bottom flange plate and the girder bottom flange tie plate. The same retrofit was installed on both web plates only on the west side of the Girder D diaphragm. The bolted retrofits were installed to brace the pier cap for a temporary jacking operation during replacement of the bearing plate on the center support.
- A previous rehabilitation included the removal of the knee braces that were welded to the pier cap top and bottom flange plates at each diaphragm.
- A mis-cut vertical cut in the dog bone retrofit was observed in the south web, west of Diaphragm C (Photograph 44). There has not changed.
- The east retrofit at Girder A on the south side of the cap plate is located 12 in. from the end of the tie plate. This likely hinders the effectiveness of this retrofit.
- Painted over heavy pitting up to 1/16 in. is present on the cap bottom plate and along the bottoms of the diaphragms, cap web plates, and cap end plate between the access hatches and fascia girder diaphragms. At the west end the corrosion has reactivated (Photograph 45). The interior surfaces of the pier cap were cleaned and painted during a prior rehabilitation.
- The fillet welds along the intersection of the Girder F and H diaphragms, the pier cap web plates, and the girder tie plates are not sufficiently coped resulting in triaxial welds (Photograph 46). This has not changed for this inspection.
- Gouges have been previously noted on the structure, and have not changed. These are located:
    - On the north web there are two gouges near the top flange and one gouge near the bottom flange between Girder B and Girder C (Photograph 47). These are located between the two stiffeners.
    - On the north web there are three gouges between Girder D and the center bearing diaphragm (Photograph 48).
- Tack welds were previously noted throughout the pier, none of which experienced any change. Locations include:

- Two short tack welds both adjacent to each other on the north cap plate between the east face of the Girder F diaphragm and the bolts.
- A 1in. long tack weld on the top flange just west of the Girder D diaphragm (Photograph 49).
- One short tack weld over the center bearing on the west face of the west diaphragm.
- One tack weld over the center bearing on the east face of the east diaphragm.

- There were 5 in. angle sections of the knee braces and weld beads that have been left in place on the top flange on the east side of Girder D and Girder E diaphragms (Photograph 50). This has not changed.
- Overtop each bearing, the backer bars are attached with tack welds and have not been removed between the diaphragms, most likely due to space constraints.

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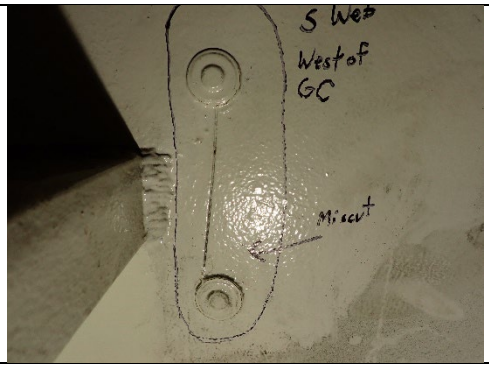
<tr><td>  </td><td> 
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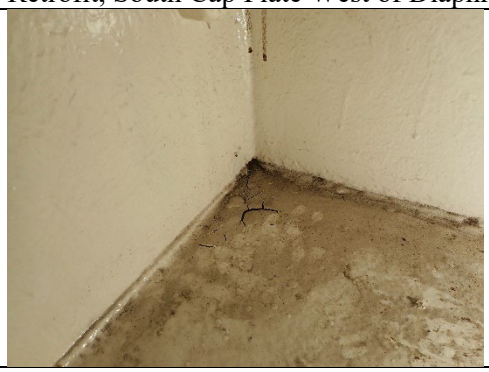
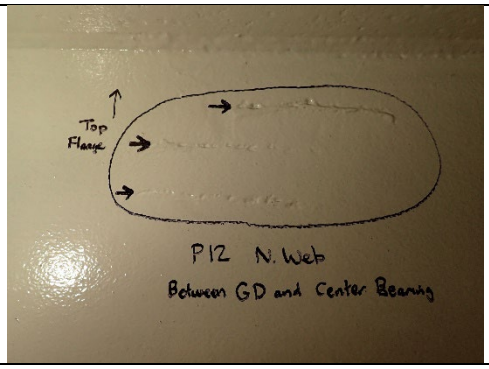
<tr><td>Photograph 43 – Overall View of Pier Cap 12 Looking North.</td><td>Photograph 44 – View of Mis-Cut Vertical Cut In Retrofit, South Cap Plate West of Diaphragm C.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph 45 – View of Reactivating Corrosion and Section Loss on Bottom Cap Plate at West End.</td><td>Photograph 46 – General Example of Triaxial Welds at Intersection of Tie Plates, Cap Plates, and Diaphragms. Diaphragm E South Cap Plate, East Side Shown.</td></tr>
</table>

	
Photograph 47 – View of Gouges in North Cap Plate Between Girders B and C. No Change.	Photograph 48 – View of Three Gouges Between Girder D and Center Diaphragm on the North Cap Plate. No Change.
	
Photograph 49 – View of Typical Tack Weld. One inch Long Tack Weld on the Top Flange Plate West of the Girder D Diaphragm Shown. No Change.	Photograph 50 – View of Weld Beads Left in place on the Top Flange on the East Side of Girder D Diaphragm. No Change.

2.1.4.2 Pier Cap 12 Exterior

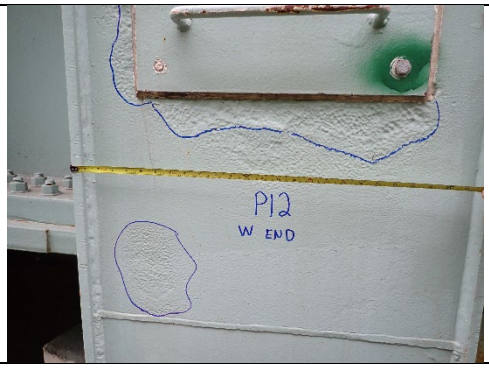
- As part of the previous rehabilitation, the knee braces are properly coped, and stress relief holes are present (Photograph 51). The east retrofit at Girder A on the south cap plate is located 12 in. from the end of the tie plate, hindering its effectiveness. It is possible that drilling the holes within 2 in. of the tie plate was not feasible due to the previous downspout configuration.
- Steel bearing stiffener angles are bolted to each web on both sides of Girder E. The same retrofit has been installed on both webs on the west face of the Girder D diaphragm. These bolted angles are only present at the listed locations. The bolted retrofits were installed to brace the pier cap for a temporary jacking operation during replacement of the bearing plate on the center support.
- At the end cover plates, the bottom 1 ft. was repainted for the full width during the previous rehabilitation. The west end plate has up to 1/8 in. deep painted over pitting within a 6 in. wide area around the bottom perimeter of the west access hatch (Photograph 52).

- No changes were observed to previously noted cracks at the bottom of the knee brace fillet welds to the south web below Girder J (Photographs 53 and 54). None of the cracks propagate into the base metal. Crack measurements include:

Girder J Knee Brace Crack Lengths		
	West Knee Brace	East Knee Brace
West Face	1/4 in.	5/16 in.
Bottom Edge	3/8 in.	3/8 in.
East Face	3/16 in.	3/8 in.

- On the south pier cap web, west of Girder D, the bolt for the bottom retrofit hole is missing and the hole has been filled with caulk and painted over (Photograph 55). No change for this inspection.
- The west access hatch is missing the middle bolt along the south edge, plus the top bolt and the bottom bolt on the north edge is broken. The holes have been filled with caulk to provide a tight seal. No change for this inspection.
- A 15 in. long x 4.5 in. high x up to 3/16 in. deep area of section loss present in the north cap plate on the east side of the Girder A near the bottom flange (Photograph 56). This has not changed.
- There is active corrosion and rust staining noted along the top flange adjacent to Girder J on both the north and south sides. This has not changed.
- The spherical bearings are in good condition and appear to function properly. Minor surface corrosion with no section loss is present on the center bearing at the north side. The west bearing is still seated fully against the west guide.

Photograph 51 – General Example of Retrofits to Pier Cap. North Side Girder E Shown.



Photograph 52 – View of Painted Over Pitting Below The West Hatch on the End Plate.

	
Photograph 53 – View of Cracks To Base of Knee Brace of Girder J, South Cap Plate. Note No Change, Both Legs Shown.	Photograph 54 – View of Cracks To Base of Knee Brace of Girder J, South Cap Plate. Note No Change, West Leg Shown.
	
Photograph 55 – View of Bolt Missing and Caulked for Retrofit On South Cap Plate, West of Girder D.	Photograph 56 – View of Painted over Section Loss on the North Cap Plate on the East Side of Girder A Near the Bottom.

2.1.4.3 Pier Cap 12 Fatigue Prone Details

Fatigue Prone Detail 1

Fillet welds between diaphragms or stiffeners and web or flange plates.

Category: C'

Location: All girder diaphragms and web stiffeners

Fatigue Prone Detail 2

Full penetration groove weld of flange splice.

Category: B

Location: Two bottom flange splices and two top flange splices.

Fatigue Prone Detail 3

Tack welds, less than 2", on web and flange

Category C:

Location:

- Intermittent tack welds along the interior backer bars between the diaphragms at each bearing.
- One tack weld on the west face of the west interior diaphragm at the center bearing.
- One tack weld on the east face of the east interior diaphragm at the center bearing.
- One 1" L tack weld on the interior of the top flange, just west of Girder D.
- One tack weld on the interior of the south web at the bolts of the west side of the Girder F diaphragm.
- Two tack welds on the interior north web between the east face of Girder F and the bolts.

Fatigue Prone Detail 4

Tack welds, greater than or equal to 2" and less than or equal to 4", on the web plates.

Category: D

Location:

- One 2-1/2" L tack weld between the bottom flange and the Girder B diaphragm.
- One 2" L tack weld between the bottom flange and east face of Girder C diaphragm.
- Two 2" L tack welds between the bottom flange and west face of Girder G diaphragm.
- Two 3-1/3" L tack welds between the bottom flange and west face of Girder H diaphragm.
- One 2-1/2" L tack weld on the interior of the south web between Girders F and G.

Fatigue Prone Detail 5

Fillet weld greater than 4", with a connection thickness less than 1".

Category: E

Location:

- 5" fillet welds connecting remaining portions of 2-3/8" knee braces to the top flange at the Girder D and E diaphragms, and to the bottom flange at the Girder B, C, F, G, and H diaphragms.
- 6" weld on the interior of the south web between Girder D and the center bearing.

Fatigue Prone Detail 8

Intersection of fillet welds.

Category: E

Location:

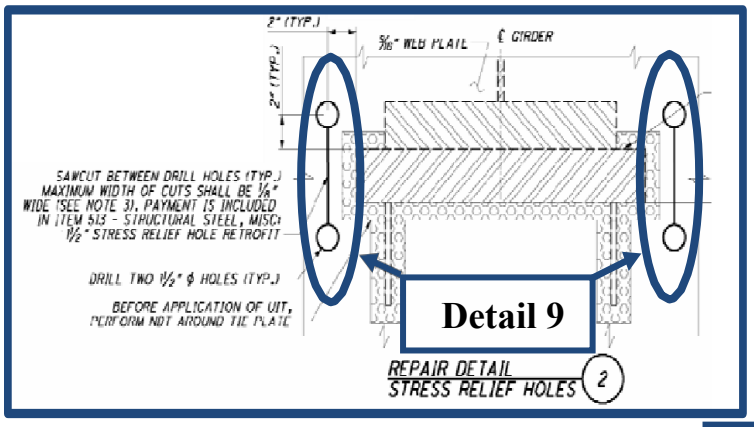
- The fillet welds intersect at the bottom flange, web plates, and the diaphragms or stiffeners between the west bearing and Girder D, and between Girder E and the east bearing.
- The fillet welds intersect at the north web, the bottom flange tie plates, and the diaphragms at Girders F and H.

Fatigue Prone Detail 9

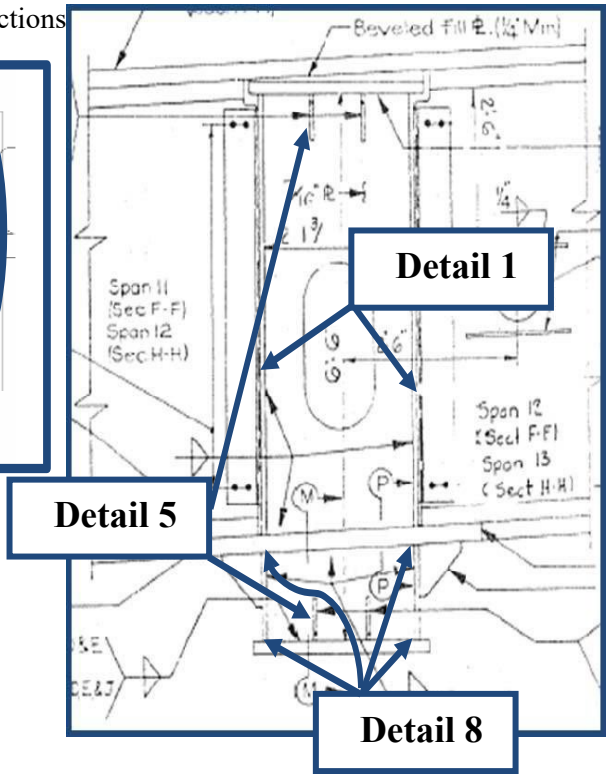
Drilled hole stress relief retrofit in web plates.

Category: B

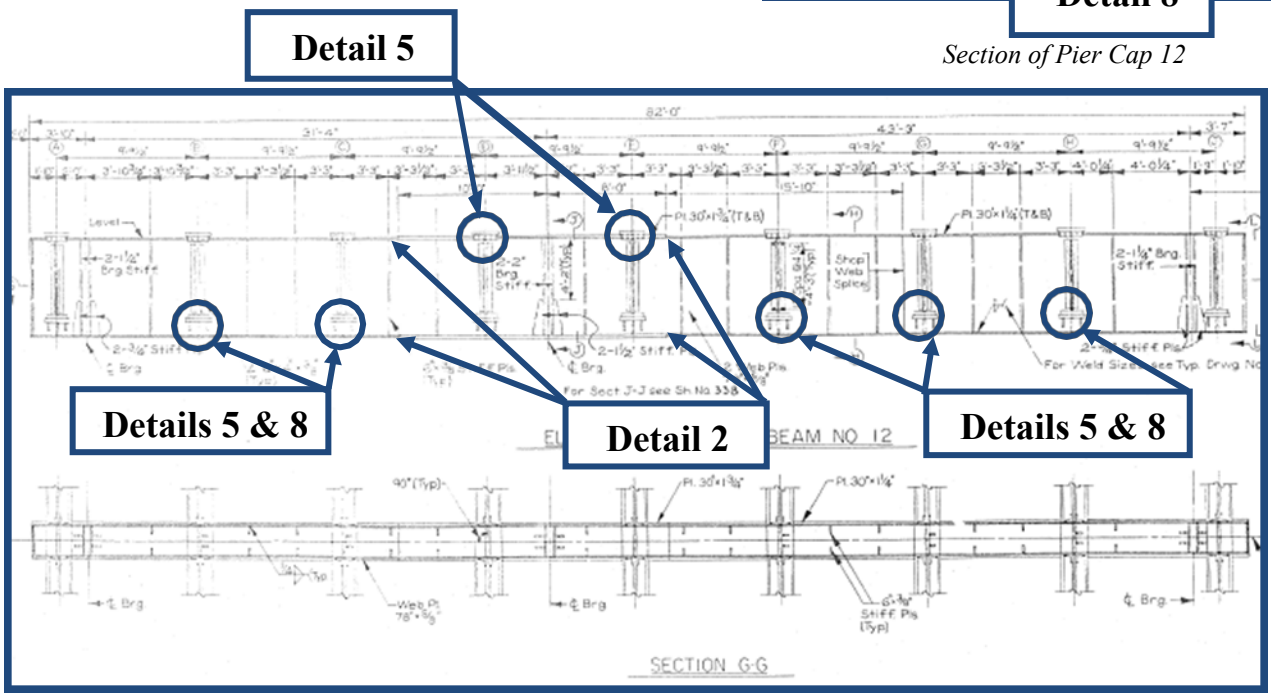
Location: Both web plates on each side of all interior connections



Web Plate Retrofit of Pier Cap 12



Section of Pier Cap 12



Plan and elevation of Pier Cap 12

3.0 EVAULATION AND RECOMMENDATIONS

Based on this inspection, the fracture critical pier caps and associated fatigue prone details of Bridge No. HAM-71-0248R are in SATISFACTORY condition [6] overall. The condition rating was raised in 2019 due to the 2017 rehabilitation work. Previously noted cracks were removed and dog bone crack arrest holes were installed as specified in the repair plans in the appendix below. However, corrosion has reactivated at locations of previously noted section loss. Keeping these areas cleaned and painted will prevent further deterioration.

Collins appreciates the opportunity to work with the Ohio Department of Transportation on this project and looks forward to working together in the future. We would be happy to discuss any aspect of the report with you in person or via phone/email.

Respectfully Submitted,
COLLINS ENGINEERS, INC.

Michael Seal, P.E.
Project Manager

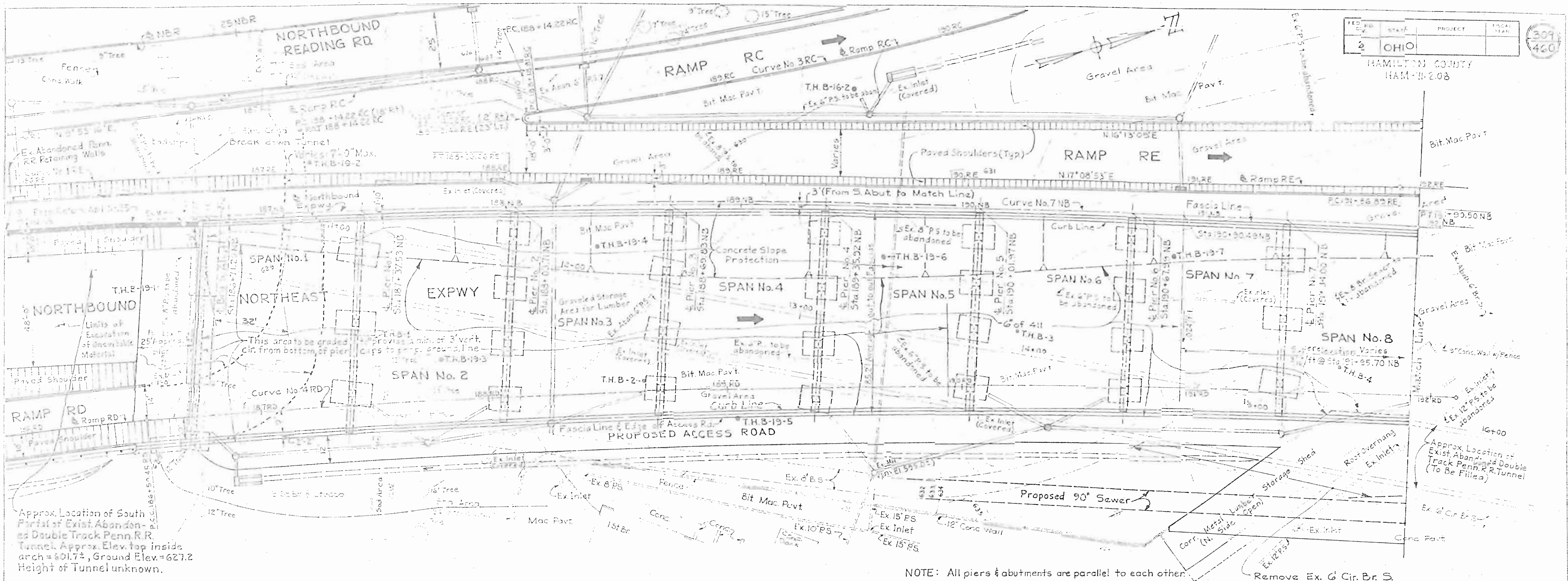
Originated by:
Kevin Mitchell, E.I.T.

EXHIBIT 1 – EXISTING PIER PLANS

FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
2	OHIO		

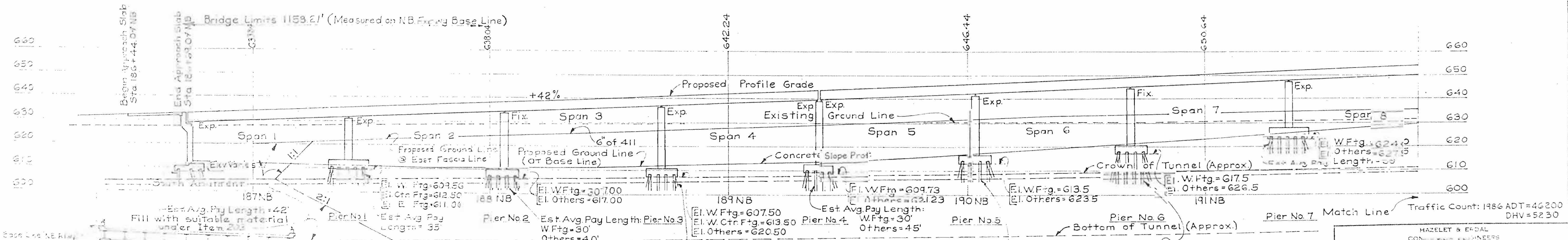
309/460

HAMILTON COUNTY
HAM-71-2.08



NOTE: All piers & abutments are parallel to each other. Span lengths are measured at right angles to piers and abutments.

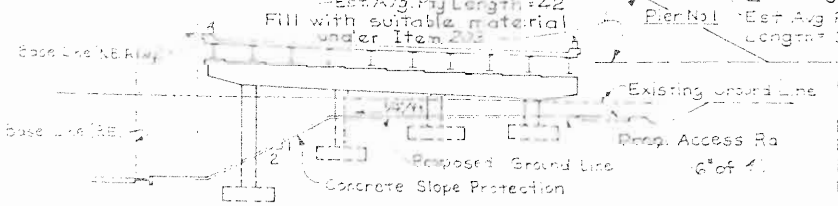
PLAN



Match Line

Traffic Count: 1986 ADT = 46200
DHV = 5230

PROFILE
(Along ℄ N.B. Expressway)



SECTION @ STA. 189 + 00 NB
(Looking North)

GENERAL NOTES
- Symbol denotes drill hole
For test boring data, see sheets 18, 19 & 20 of 23
For Bench Marks, see sheet 39
For curve data, see sheet # 311
For proposed structure block, see Sh. # 311

All piling 12BP53, Steel Piles except as noted at Pier No 10.

SFN 3106802

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

SITE PLAN

BRIDGE No. HAM 71-0224
OVER EDEN PARK ENTRANCE
AND FLORENCE AVE.

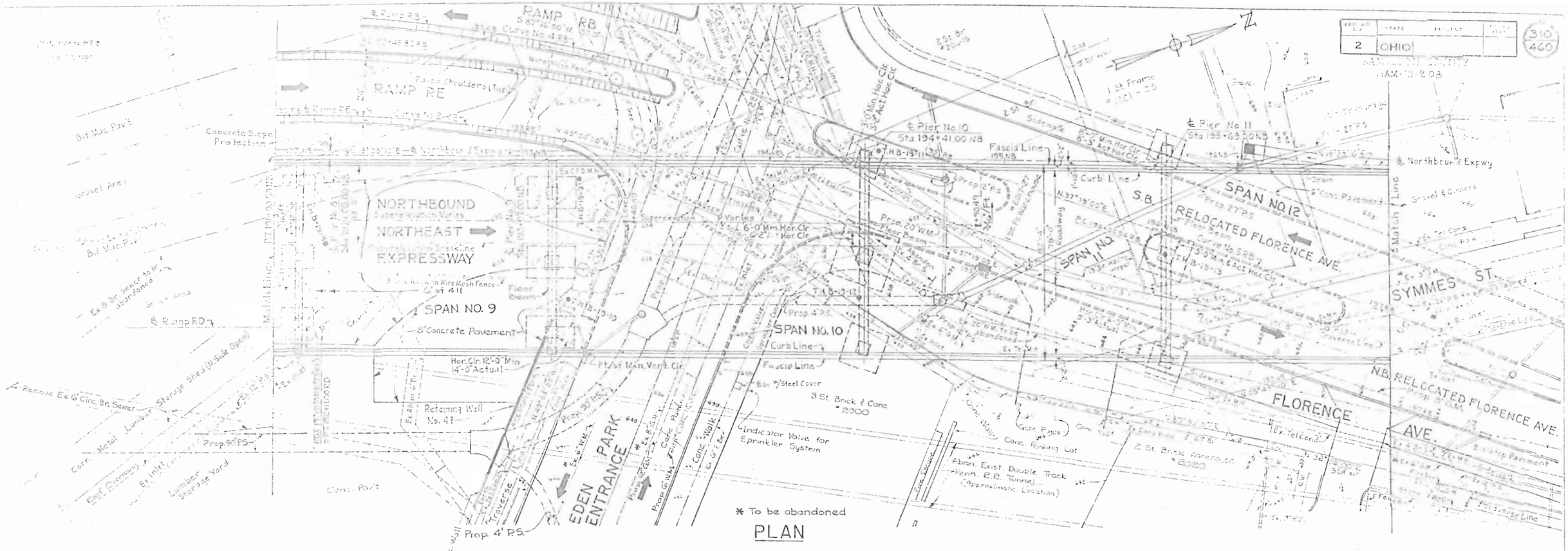
H & E BRIDGE No. 1 SHEET 1 of 3

DESIGNED	DRAWN	TRACED	CHECKED		DATE	SCALE
	CTM					

DIST.	STATE	PROJECT	SHEET NO.
2	OHIO		

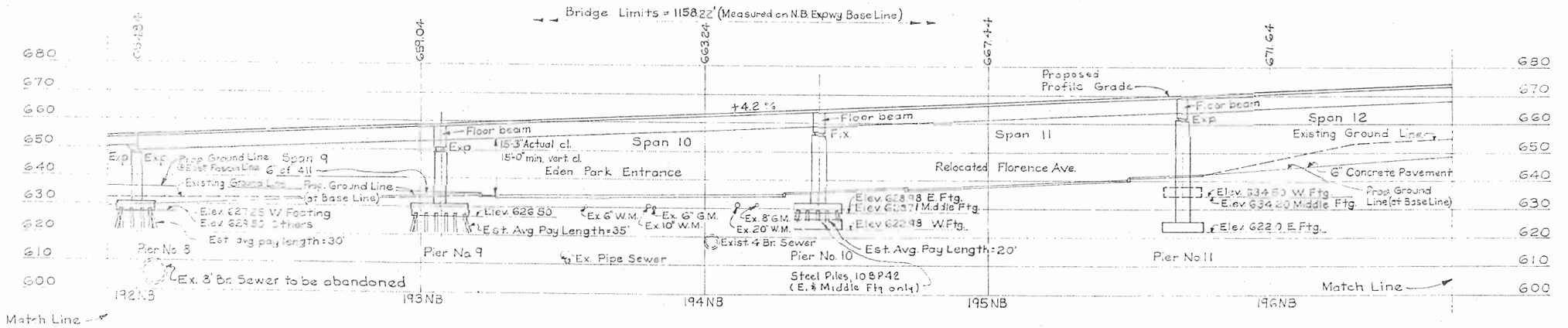
310
460

HAM-71-2.08



* To be abandoned

PLAN



PROFILE
(Along ℄ N.B. Expressway)

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

SITE PLAN

BRIDGE No. HAM-71-0224
OVER EDEN PARK ENTRANCE
AND FLORENCE AVE.

H & E BRIDGE No. 19 SHEET 2 of 3

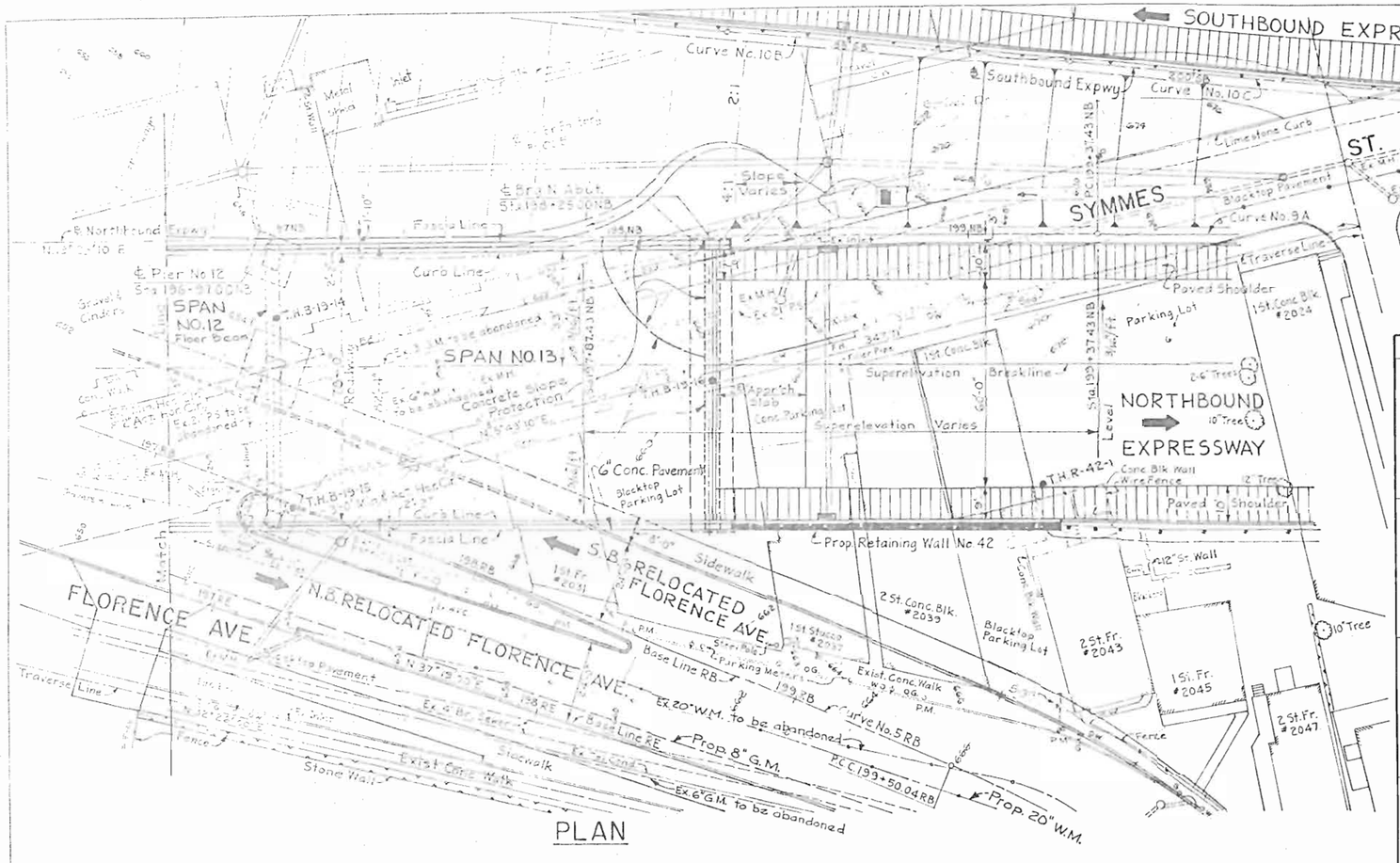
DES.	DRAWN	TRACED	CHECKED	QUANT.	CHECKED
	C.T.M.				

SFN 3106802

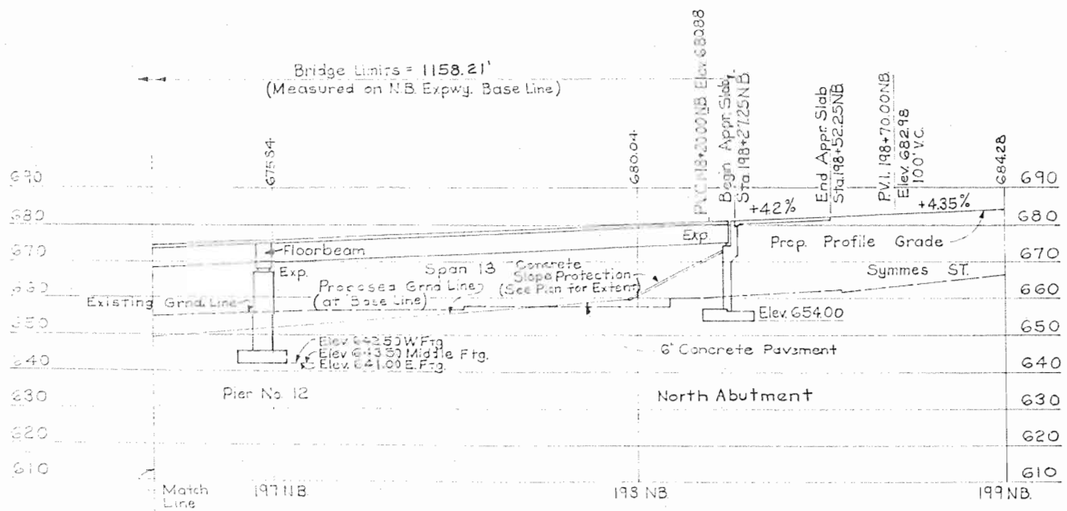
FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
2	OHIO		

311
460

HAMILTON COUNTY
HAM-71-2.08



PLAN



PROFILE
(Along ℄ N.B. Expressway)

CURVE DATA	
Curve No. 7NB P.I. Sta. = 187+35.63 NB Δ = 9°07'00" L = 911.67' D = 1°00'00" T = 456.80' R = 5729.58'	Curve No. 4RB P.I. Sta. = 193+36.59 RB Δ = 13°33'07" L = 180.69' D = 7°30'00" T = 90.77' R = 763.94'
Curve No. 5RB P.I. Sta. = 197+75.42 RB Δ = 5°14'32" L = 349.48' D = 1°30'00" T = 174.86' R = 3819.72'	Curve No. 3 RC P.I. Sta. = 189+75.07 RC Δ = 14°45'46" L = 310.80' D = 4°45'00" T = 156.26' R = 1206.23'
Curve No. 4 RD P.I. Sta. = 189+31.17 RD Δ = 7°56'28" L = 560.55' D = 1°-25' T = 280.72' R = 4044.41'	Curve No. 1 RE P.I. Sta. = 185+99.85 RE Δ = 7°13'37" L = 412.97' D = 1°45'00" T = 206.76' R = 3274.05'
Curve No. 2 RE P.I. Sta. = 192+88.79 RE Δ = 20°10'07" L = 201.69' D = 10°00'00" T = 101.90' R = 572.96'	Curve No. 2 EP P.I. Sta. = 15+41.95 EP Δ = 63°24'22" L = 456.63' D = 13°40'00" T = 253.93' R = 419.24'

PROPOSED STRUCTURE

Type: Continuous steel beams (Spans 1 through 8) and continuous plate girders (Spans 9 through 13) with reinforced concrete deck and substructure.
Spans: 66'-0" (Spans 1 through 8) 107'-0" (Span 9) 134'-0" (Span 10) & 128'-0" (Spans 11 through 13)
Roadway: Varies, see plan; 80' min f/f parapet
Skew: 0° (measured from forward tangent)
Load Frequency: CF=2000(57) Adequate for A.A.S.H.O. alternate loading.
Wearing Surface: 1" Monolithic Concrete
Approach Slab: AS-1-54 (25'-0" Long)
Alignment: See plan.
Superelevation: Varies, see plan.

SFN 3106802

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

SITE PLAN

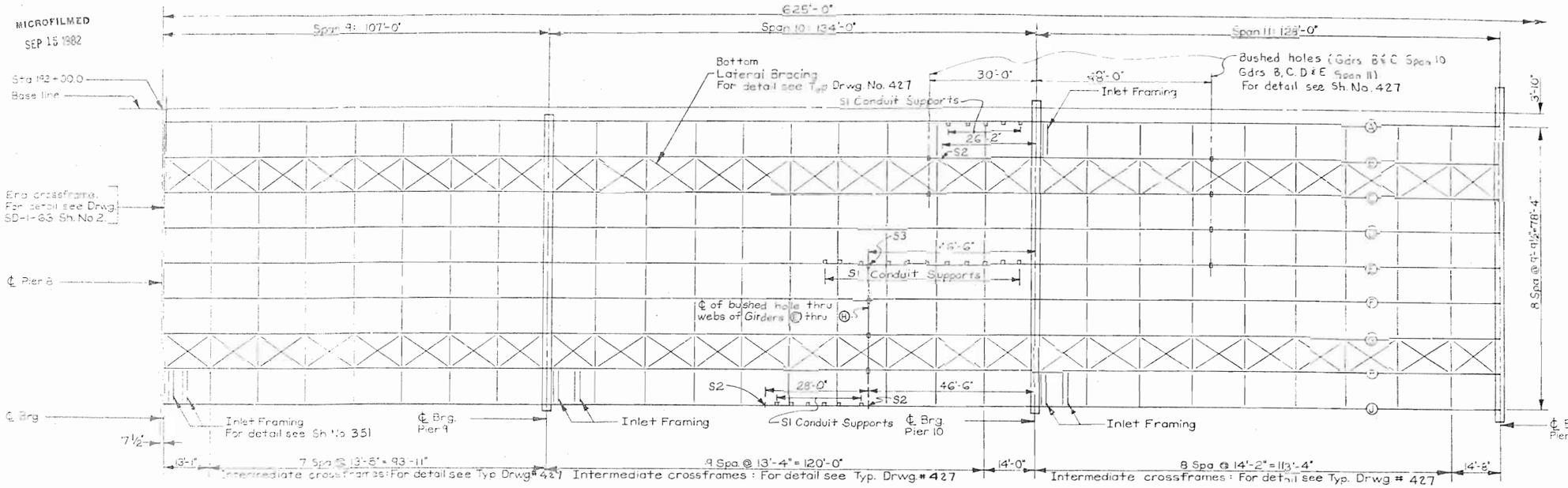
BRIDGE No. HAM-71-0224
OVER EDEN PARK ENTRANCE
AND FLORENCE AVE.
H & E BRIDGE No. 19 SHEET 3 of 3

DES.	DRAWN	TRACED	CHECKED	QUANTITIES	APPROVED	DATE
	C.T.M.					

FED. AID DIV.	STATE	PROJECT	FISCAL YEAR
2	OHIO		

334
460

HAMILTON COUNTY
HAM-71- 2.08



Note:
For Beam Clamp Details see Sh. 220

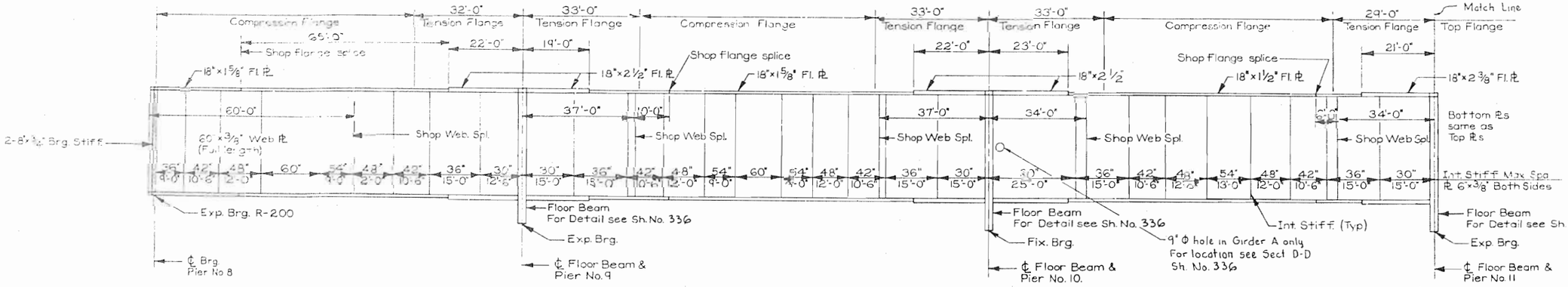
For Details of Conduit and Junction Box Supports see Sh. 220

Conduit and Junction Box Supports must be fastened to the stiffeners or web on the east side of Girder A and on the west side of Girders B, E, and F

Required: Conduit Support Type SI = 22
Junction Box Support Type S2 = 3
Junction Box Support Type S3 = 1
Beam Clamp Type CI = 4

See Sheet 220 for details of Detector Hanger Bars.

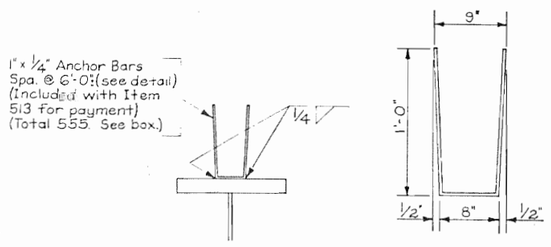
FRAMING PLAN



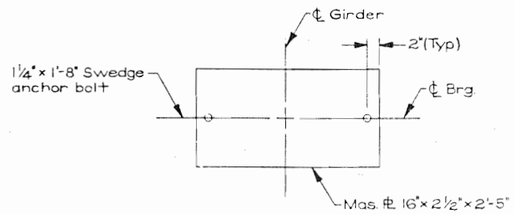
GIRDER ELEVATION

For bearing detail R-200 see Std. Drwg. RB-1-55 except masonry plates modified as shown on Detail A.
For detail of roadway end dam at Pier No. 8 see Sh. No. 339
For bearing details at piers 9, 10, & 11 see Sh. No. 335
For Deflection and Camber Diagram see Sh. No. 338

NUMBER OF ANCHOR BARS REQUIRED					
GIRDER	SPAN 9	SPAN 10	SPAN 11	SPAN 12	SPAN 13
A	15	22	0	0	0
B	8	22	21	21	21
C	8	22	21	21	21
D	8	22	21	21	21
E	8	22	21	21	21
F	18	22	21	21	21



ANCHOR BAR DETAIL



DETAIL A

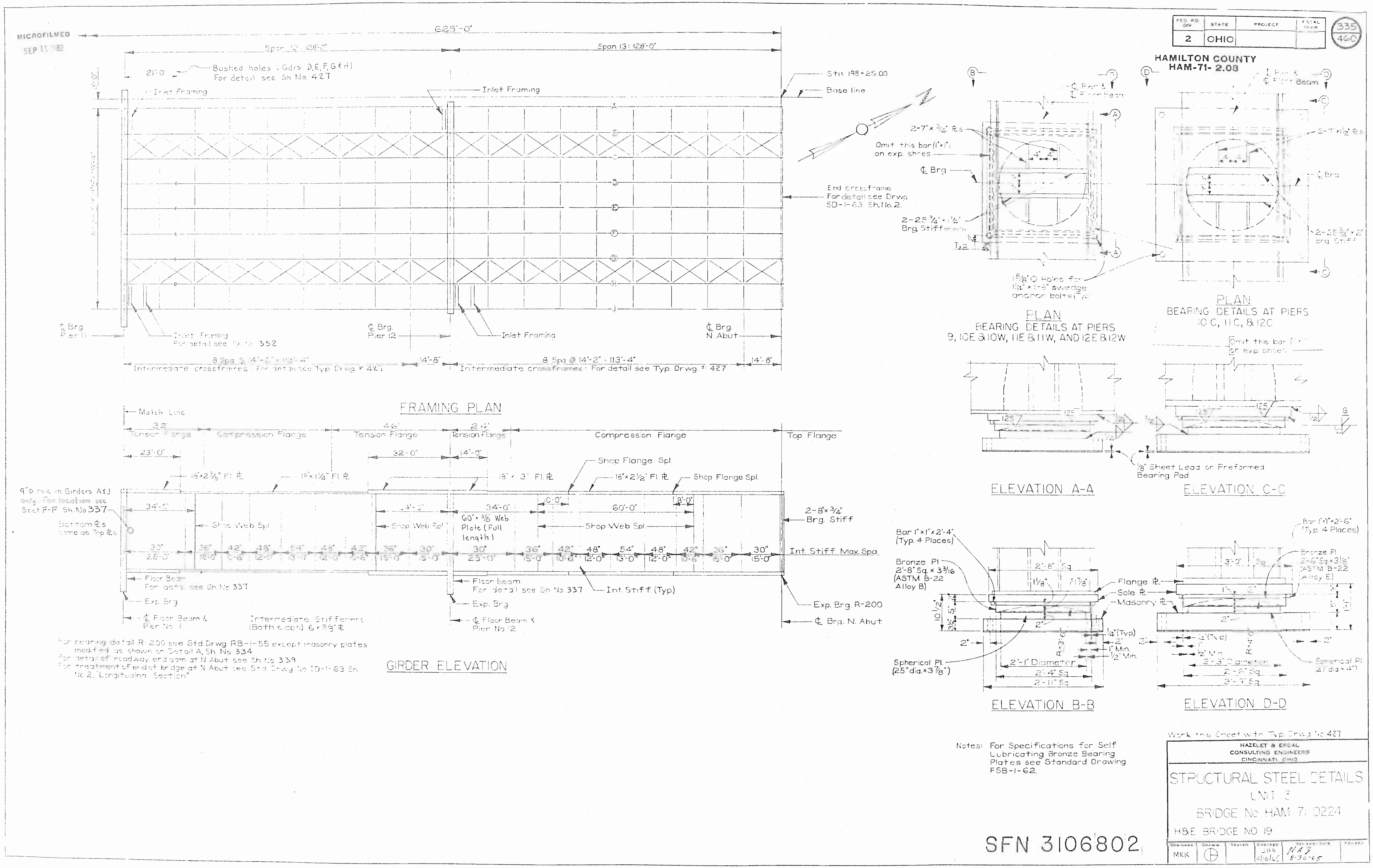
SFN 3106802

Work this Sheet with Typ. Drawing No. 427

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS
UNIT 3
BRIDGE No. HAM.-71-0224
H&E BRIDGE NO. 19

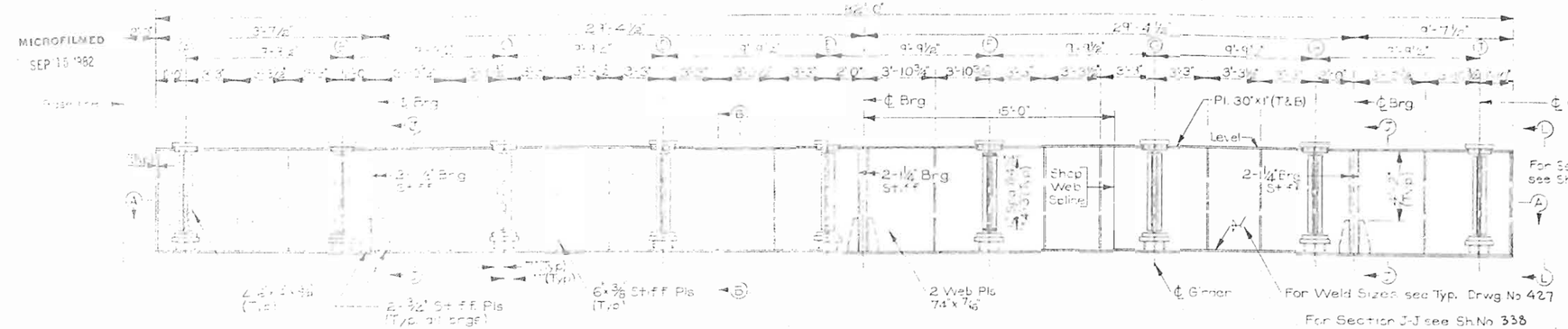
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
M.K.K.			JHO 4/30/65	M.K.K. 8-30-65	


MICROFILMED
SEP 15 1982
FED. RD. DIV. | STATE | PROJECT | FISCAL YEAR
2 | OHIO
335
460
HAMILTON COUNTY
HAM-71- 2.08
625'-0"
Span 12: 128'-0"
Span 13: 128'-0"
21'-0"
Bushed holes - Gdrs. D,E,F,G & H)
For detail see Sh. No. 427
Inlet Framing
Sta. 198+25.00
Base line
End crossframe
For detail see Drwg. SD-1-63 Sh. No. 2.
℄ Brg. Pier 11
Inlet Framing
℄ Brg. Pier 12
℄ Brg. N. Abut.
8 Spa @ 14'-2" = 113'-4"
14'-8"
Intermediate crossframes: For detail see Typ. Drwg. # 427
FRAMING PLAN
Match Line
Tension Flange
Compression Flange
Top Flange
23'-0"
32'-0"
14'-0"
Shop Flange Spl.
18"x2¾" Fl. ℄
18"x1¼" Fl. ℄
18" x 3" Fl. ℄
18"x2½" Fl. ℄
9" Φ hole in Girders A & J only. For location see Sect F-F Sh. No. 337
Bottom ℄s same as Top ℄s
34'-0"
Shop Web Spl.
60" x ⅜" Web Plate (Full length)
60'-0"
8'-0"
10'-0"
2-8"x¾" Brg. Stiff.
Int. Stiff. Max. Spa.
Floor Beam
For detail see Sh. No. 337
Exp. Brg.
℄ Floor Beam & Pier No. 11
℄ Floor Beam & Pier No. 12
Intermediate Stiffeners (Both sides) 6"x⅜" ℄
Int. Stiff. (Typ)
Exp. Brg. R-200
℄ Brg. N. Abut.
For bearing detail R-200 see Std. Drwg. RB-1-55 except masonry plates modified as shown on Detail A, Sh. No. 334
For detail of roadway end dam at N. Abut. see Sh. No. 339
For treatment of end of bridge at N. Abut. see Std. Drwg. No. SD-1-63 Sh. No. 2, "Longitudinal Section"
GIRDER ELEVATION
2-7"x¾" ℄s
Omit this bar (1"x1") on exp. shoes
℄ Brg.
2-2.5¾"x1½" Brg. Stiffeners
1⅝" Φ Holes for 1¼"x1'-6" swedge anchor bolts (Typ)
PLAN
BEARING DETAILS AT PIERS
9, 10E & 10W, 11E & 11W, AND 12E & 12W
PLAN
BEARING DETAILS AT PIERS
10C, 11C, & 12C
Omit this bar (1"x1") on exp. shoes
⅛" Sheet Lead or Preformed Bearing Pad
ELEVATION A-A
ELEVATION C-C
Bar 1"x1"x2'-4" (Typ. 4 Places)
Bronze Pl. 2'-8" Sq. x 3³⁄₁₆ (ASTM B-22 Alloy B)
Flange ℄
Sole ℄
Masonry ℄
Spherical Pl. (25" dia. x 3⅞")
2'-1" Diameter
2'-4" Sq.
2'-11" Sq.
ELEVATION B-B
Bar 1"x1"x2'-6" (Typ. 4 Places)
Bronze Pl. 2'-6" Sq. x 3⅛" (ASTM B-22 Alloy E)
Spherical Pl. 27" dia. x 4"
2'-3" Diameter
2'-6" Sq.
3'-3" Sq.
ELEVATION D-D
Notes: For Specifications for Self Lubricating Bronze Bearing Plates see Standard Drawing FSB-1-62.
Work this Sheet with Typ. Drwg. No. 427
HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO
STRUCTURAL STEEL DETAILS
UNIT 3
BRIDGE No. HAM 71 0224
H&E BRIDGE NO. 19
SFN 3106802
MKK
8-30-65

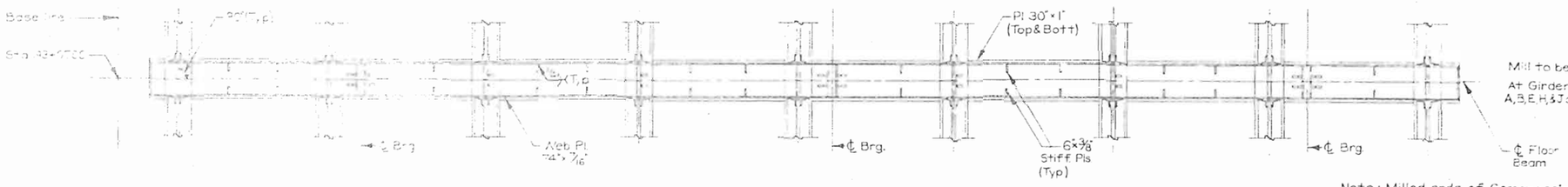
FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
2	OHIO		

336
460

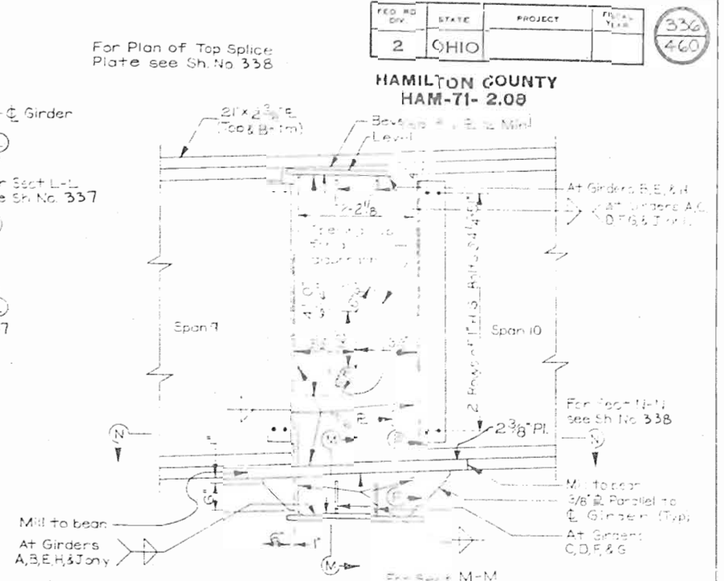
HAMILTON COUNTY
HAM-71- 2.09



ELEVATION OF FLOOR BEAM NO. 9

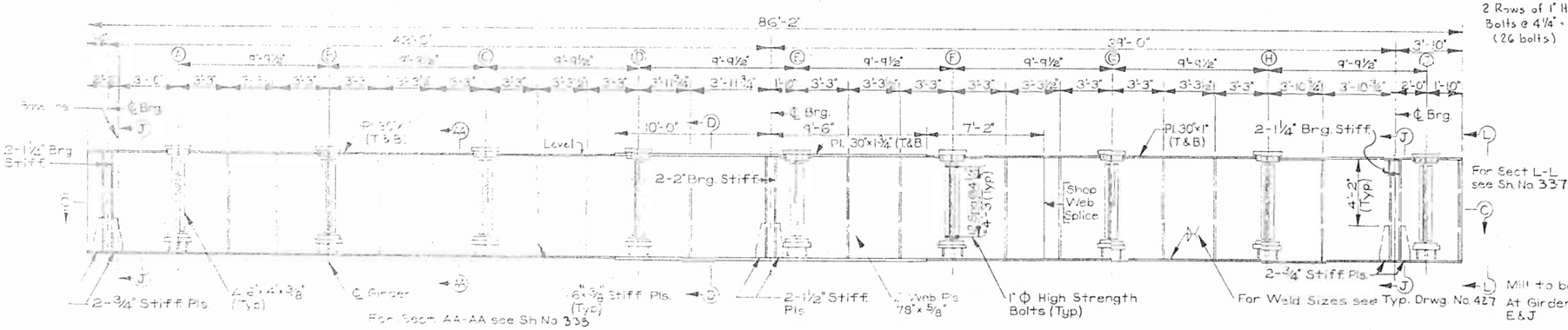


SECTION A-A

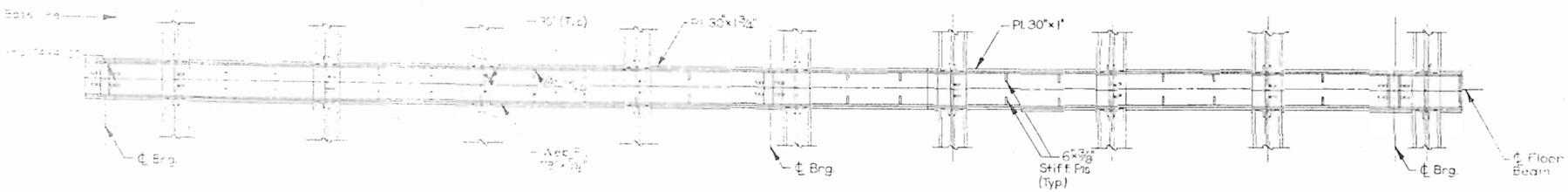


SECTION B-B

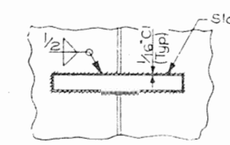
Note: Milled ends of Compression Splice on bottom flanges of girders shall be brought to full bearing against milled ends of pier girder brackets before bolts are tightened. (Typ. at all floor beams)



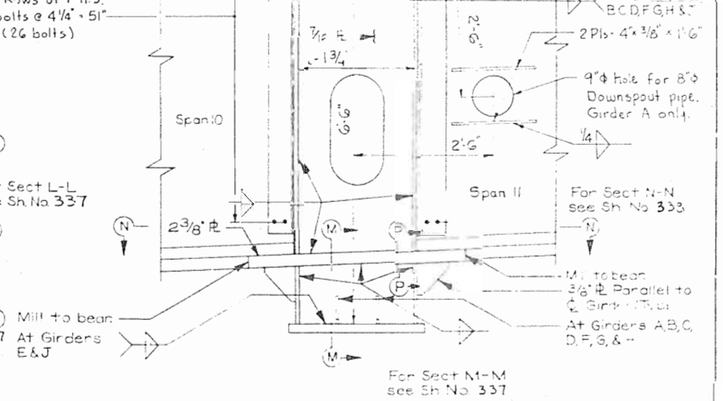
ELEVATION OF FLOOR BEAM NO. 10



SECTION C-C



SECTION P-P



SECTION D-D

Note: For fillet weld sizes not shown see "TABLE OF FILLET WELD SIZES," Sh. No. 427

Work this Sheet with Sheet 337

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS

UNIT 3

BRIDGE No. HAM.-71-0224

H&E BRIDGE NO. 19

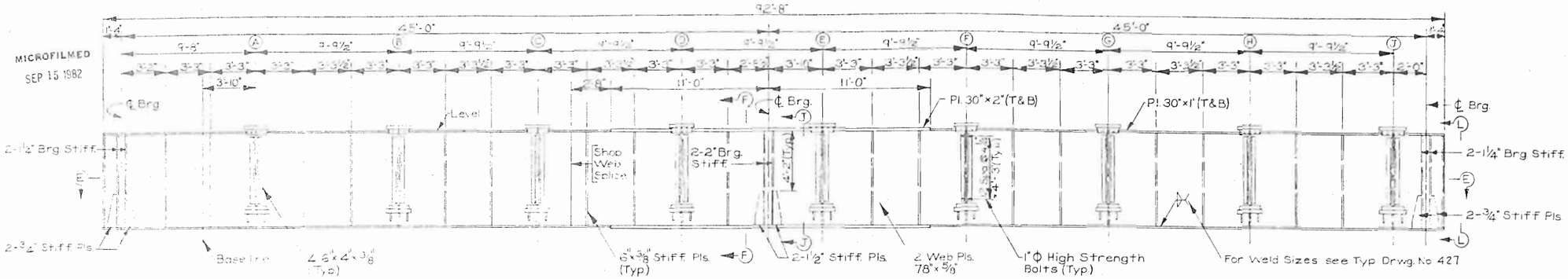
DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
MKK	CJ			5-22-85	

SFN 3106802

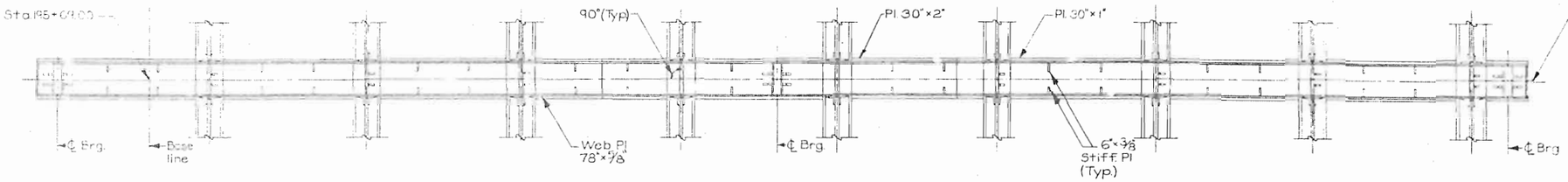
FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
2	OHIO		

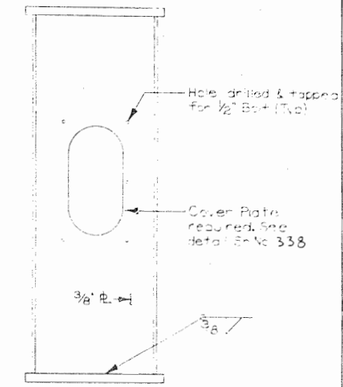
337
460

HAMILTON COUNTY
HAM-71- 2.08



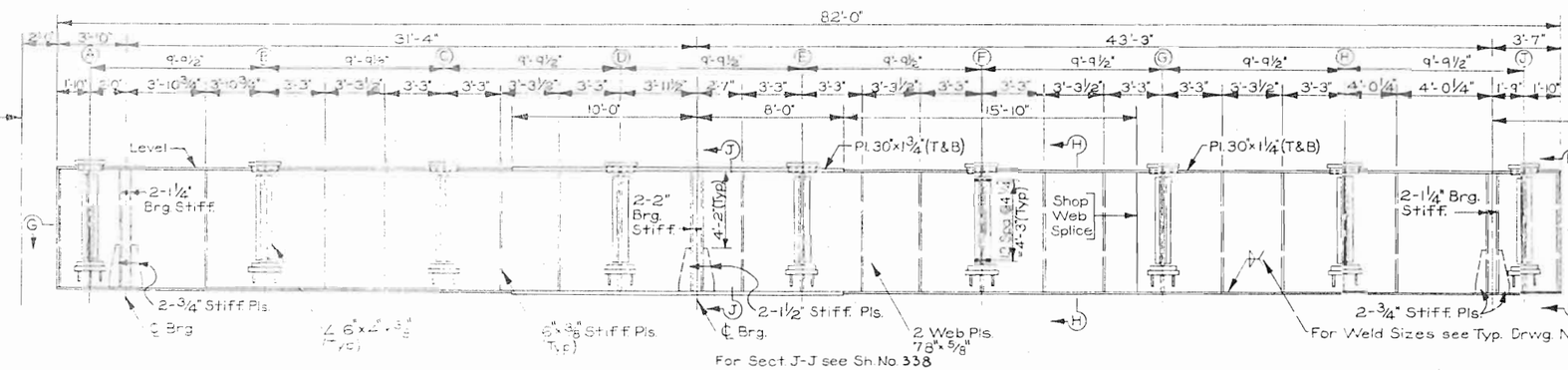
ELEVATION OF FLOOR BEAM NO. 11





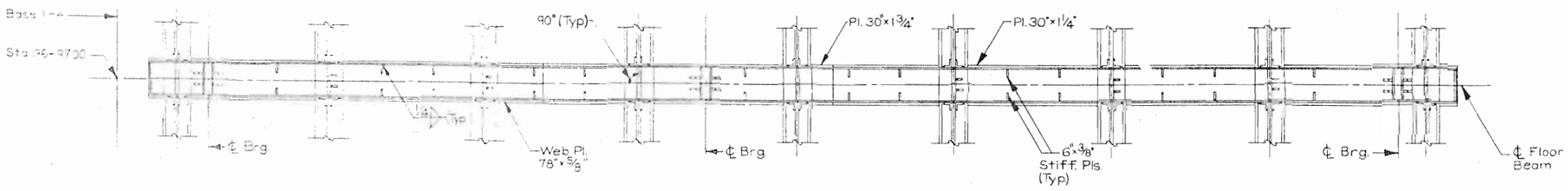
SECTION L-L
Typ @ ends of Floor Beams

SECTION E-E



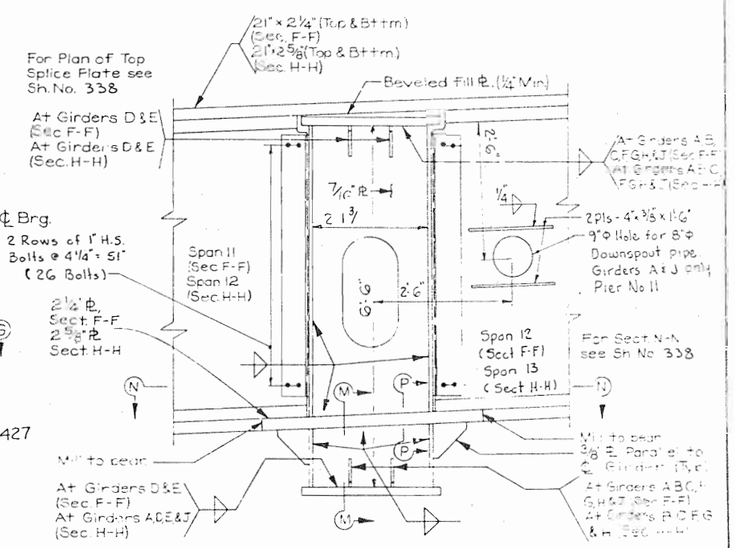
For Sect J-J see Sh. No. 338

ELEVATION OF FLOOR BEAM NO 12

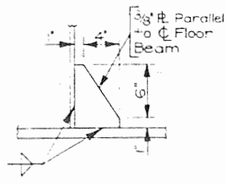


SECTION G-G

For Plan of Top Splice Plate see Sh. No. 338



SECTION F-F & SECTION H-H



SECTION M-M
(Typ Top & Bottom Flange)

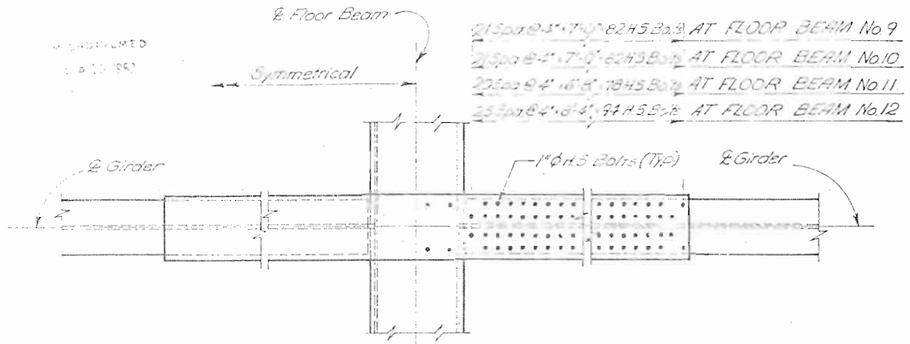
HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS
UNIT 3
BRIDGE No. HAM-71-0224
H&E BRIDGE NO. 19

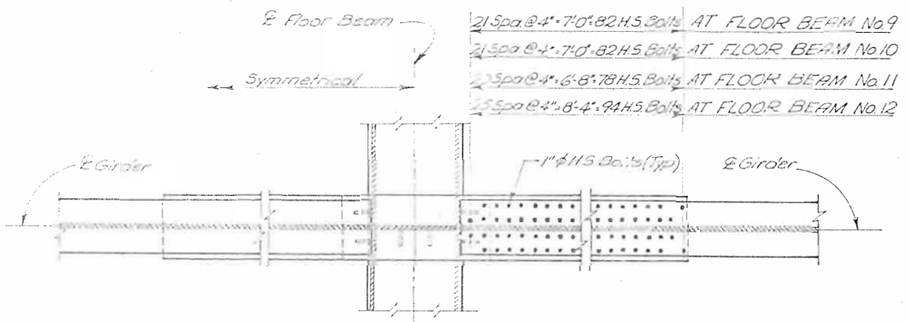
DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
M.K.K.			J.H.O. 4/15/65	M.K.K. 9-30-65	

SFN 3106802

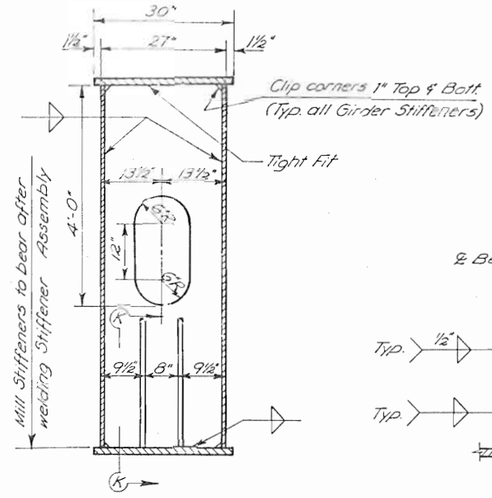
FED. DIV. 5 | STATE 2 OHIO | PROJECT | FISCAL YEAR | 338 460
HAMILTON COUNTY
HAM-71-2.08



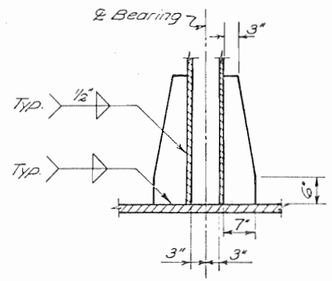
PLAN OF TOP SPLICE PLATE



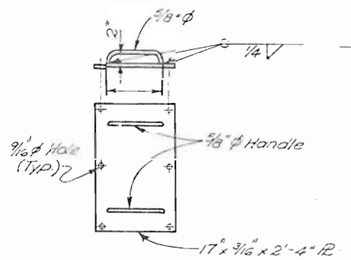
SECTION N-N
(Bottom Splice Plate)



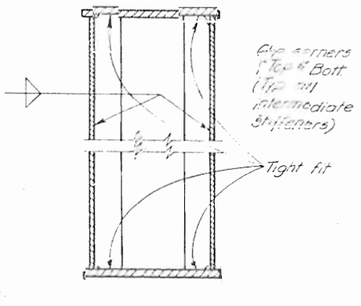
SECTION J-J



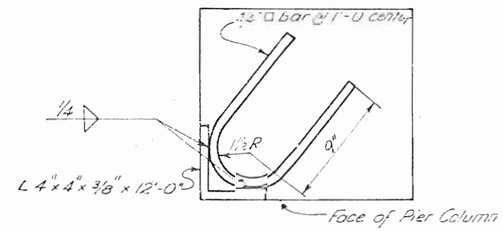
SECTION K-K



COVER PLATE
(For Acces Hole)



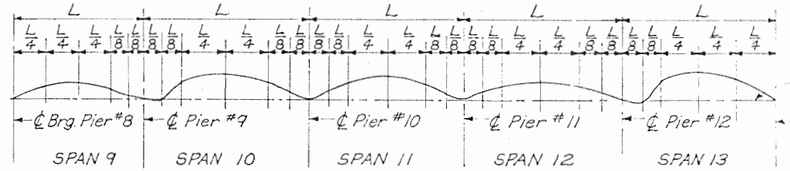
SECTION AA-AA
(Typ. all intermediate Stiffeners)



DETAIL OF ARMOR ANGLES
FOR PIER NO. 9
(Included with Item 513 for pavement)
(As Required)

DEFLECTION AND CAMBER

GIRDER		Span 9			Span 10					Span 11					Span 12					Span 13		
		1/4	1/2	3/4	1/8	1/4	1/2	3/4	7/8	1/8	1/4	1/2	3/4	7/8	1/8	1/4	1/2	3/4	7/8	1/8	1/4	1/2	3/4
A & J	Deflection due to weight of steel	3/8	9/16	3/8			1	1 3/8	1		1 3/16	1 7/16	3/4			7/8	1 1/4	7/8			3/4	1	3/4
	Deflection due to remaining dead load	1/2	9/16	1/4			3/8	3/8	3/8		1/4	3/8	3/8			1/8	1/4	1/16			9/16	1 1/16	7/8
	Adjustment required for vertical curve	0	0	0			0	0	0		0	0	0			0	0	0			0	0	0
	Required shop Camber	7/8	1 1/8	7/8	1/4	-1/16	1 7/16	2	1 3/16	9/16	7/8	1 1/16	1 3/4	1 3/16	1/2	3/4	1	1 1/2	1 3/16	1/2	-3/16	1 1/16	2 1/16	1 5/8
B thru H	Deflection due to weight of steel	3/8	9/16	3/8			1	1 3/8	1		1 3/16	1 7/16	3/4			7/8	1 1/4	7/8			3/4	1	3/4
	Deflection due to remaining dead load	7/16	11/16	5/16			3/8	1/16	3/8		5/16	1/16	3/16			1/8	5/16	1/16			1/16	1/4	1
	Adjustment required for vertical curve	0	0	0			0	0	0		0	0	0			0	0	0			0	0	0
	Required shop Camber	15/16	1/4	1 1/16	1/4	-1/16	1 3/8	2 1/16	1 3/8	9/16	5/8	1 1/8	1 7/8	1 1/16	1/2	3/4	1	1 9/16	5/8	1/2	-3/16	1 1/16	2 1/4	1 3/4



CAMBER DIAGRAM

Camber girders by cutting webs to a smooth curve. (To ordinates indicated in box)

Minus sign in table indicates camber ordinates measured below chord. No sign indicates camber ordinates measured above chord.

Work this sheet with sheet No 336 & 337

HAZELET & ERDAL
CONSULTING ENGINEERS
CINCINNATI, OHIO

STRUCTURAL STEEL DETAILS

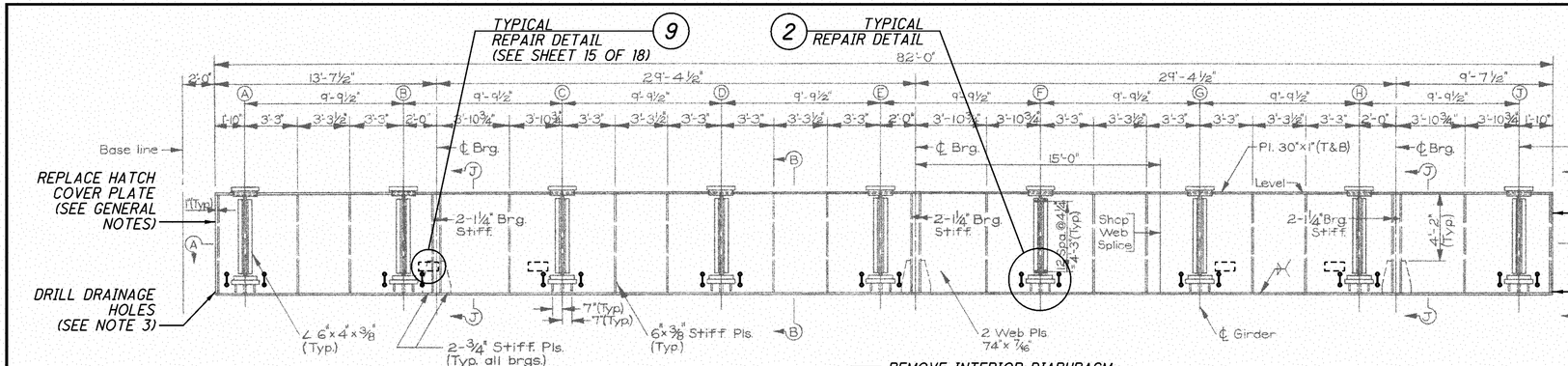
BRIDGE NO. HAM.-71-0224

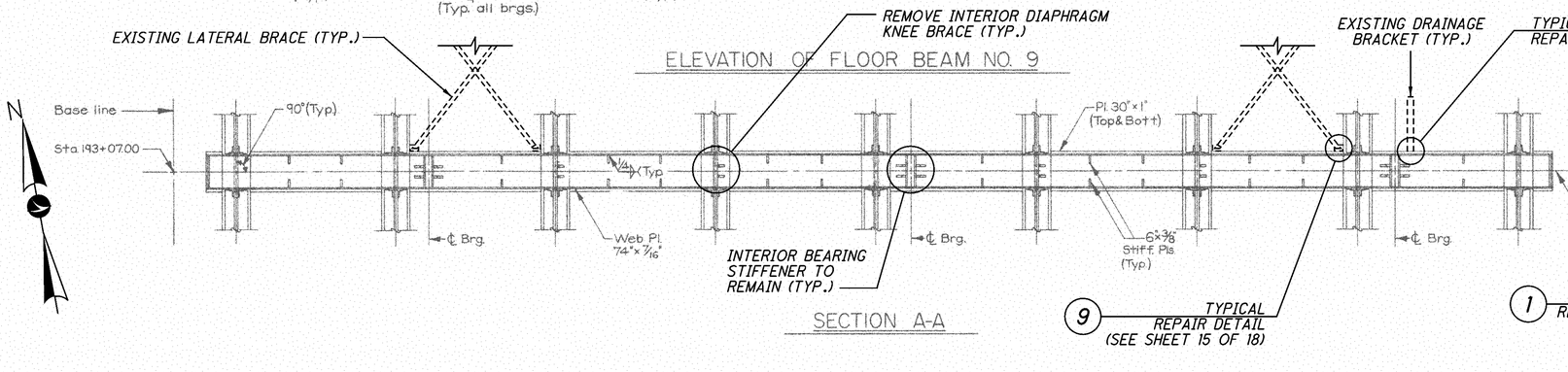
H & E BRIDGE NO. 19

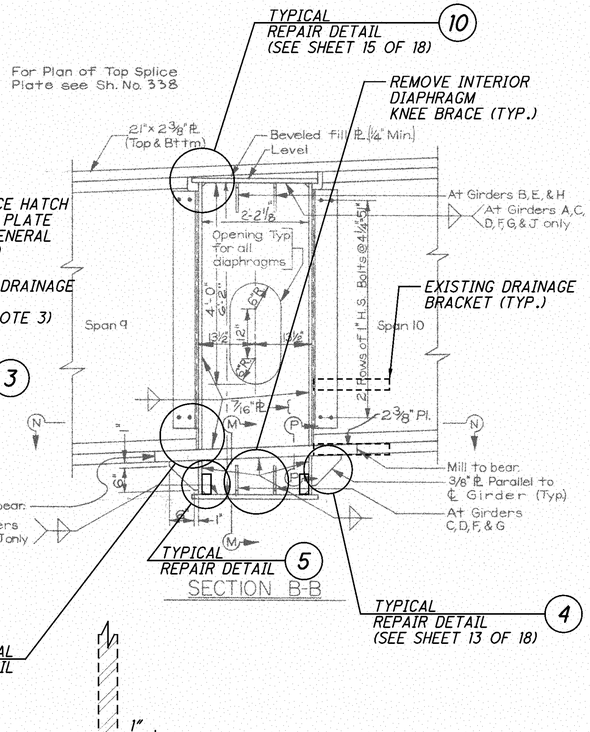
DESIGNED	DRAWN	TRACED	CHECKED	ORIGINAL DATE	REVISED
	H.A.S.	B.Sch.	J.H.D.	8-20-65	

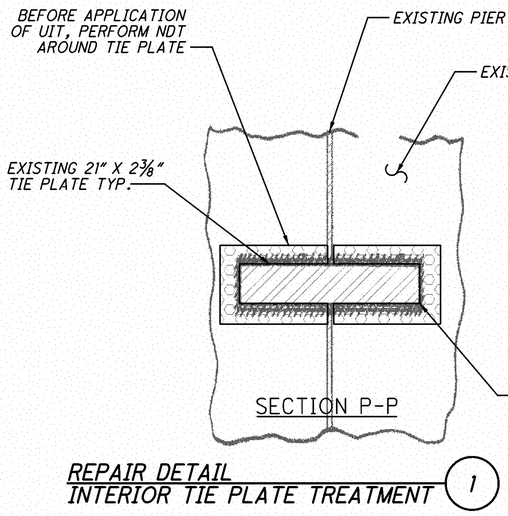
SFN 3106802

EXHIBIT 2 – REHABILITATION PLANS

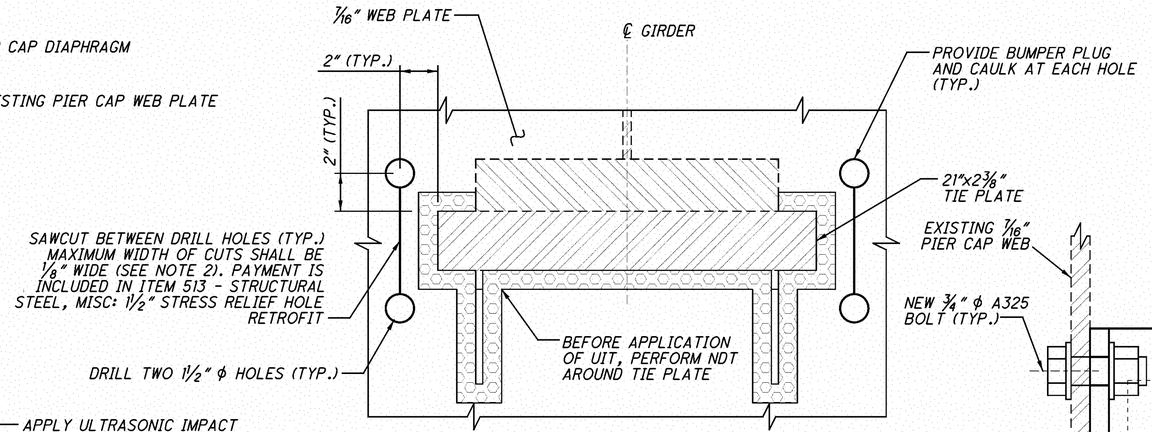






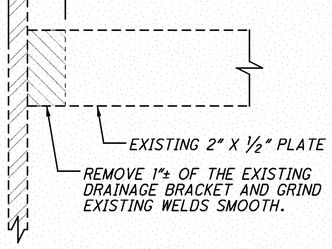


REPAIR DETAIL
INTERIOR TIE PLATE TREATMENT 1

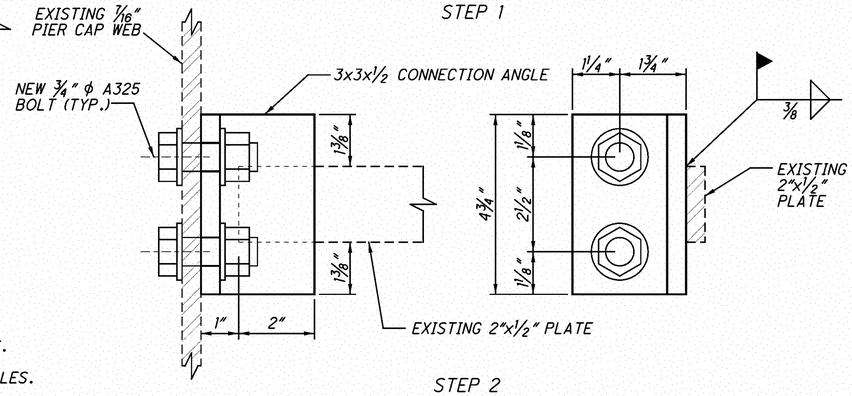


REPAIR DETAIL
1½" STRESS RELIEF HOLES 2

(FOR GIRDERS A THROUGH J AT NORTH AND SOUTH WEB PLATES)
(EXTERIOR VIEW)



STEP 1



STEP 2

REPAIR DETAIL
DRAIN BRACKET RETROFIT 3

LEGEND

- LIMITS OF ½" WIDE ULTRASONIC IMPACT TREATMENT (UIT)

NOTES:

1. PIER ELEVATION AND SECTIONS ARE TAKEN FROM THE ORIGINAL PLANS.
2. CARE SHALL BE TAKEN NOT TO OVERCUT SAWCUT BEYOND DRILLED HOLES. FLAME CUTTING IS NOT PERMITTED.
3. DRILL TWO ½" ϕ HOLES THROUGH THE EACH END PLATE. THE BOTTOM OF THE HOLES SHALL BE FLUSH WITH THE PIER CAP BOTTOM FLANGE. HOLES SHALL NOT PENETRATE OR GOUGE PIER CAP WEB PLATES OR FLANGE PLATE. PAID FOR UNDER ITEM 513 - STRUCTRURAL STEEL, MISC.: ½" DRAINAGE HOLE.
4. SEE REPAIR DETAILS ON SHEETS 13 OF 18 AND 15 OF 18.
5. DRAINAGE BRACKET RETROFIT TO BE INCLUDED WITH ITEM 513 - STRUCTURAL STEEL FOR REHABILITATION.

DESIGN AGENCY
STATE OF OHIO
DEPT. OF TRANSPORTATION
DISTRICT 8 BRIDGE DEPT.

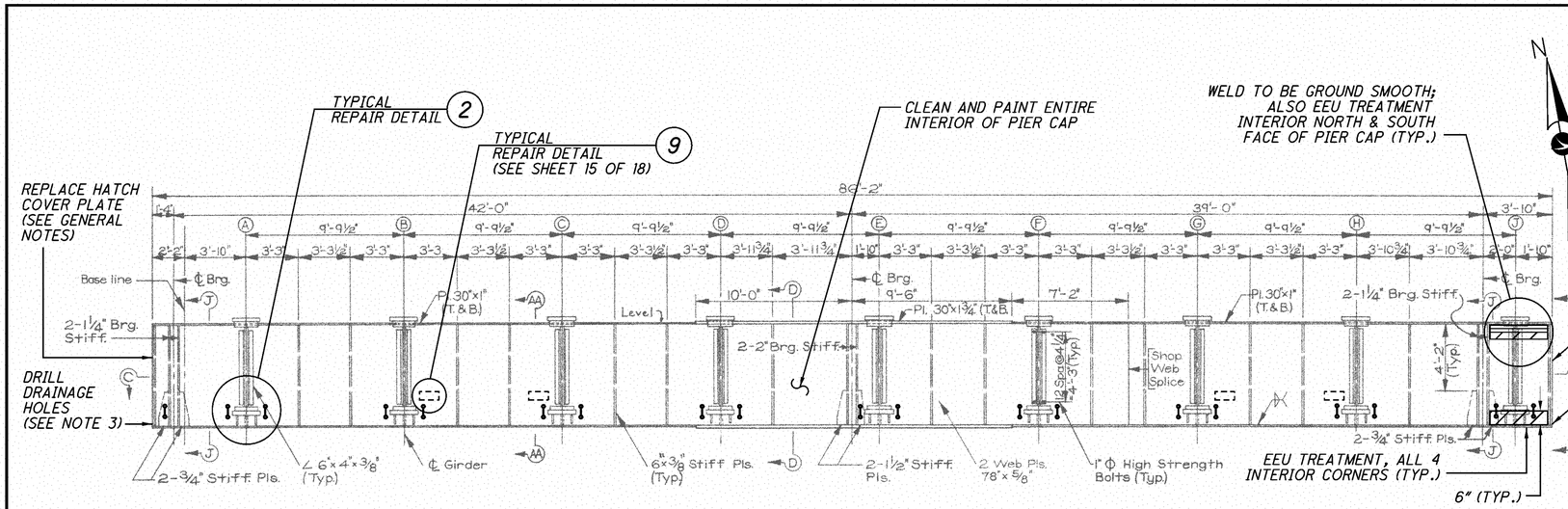
DESIGNED	DRAWN	REVIEWED	DATE
PJL	PJL	SCS	06-08-10
CHECKED	REVISED	STRUCTURE FILE NUMBER	
CAH		3106802	

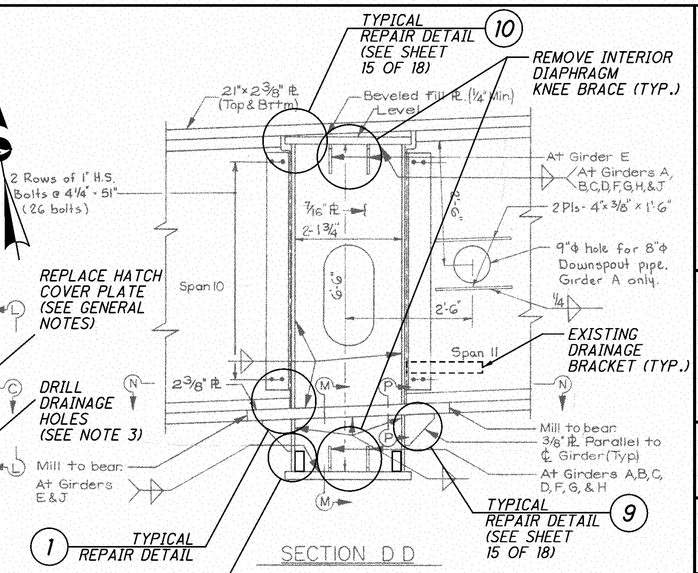
PIER 9 CAP RETROFIT DETAILS
BRIDGE NO. HAM-71-0248R
OVER EDEN PARK ENTRANCE AND FLORENCE DRIVE

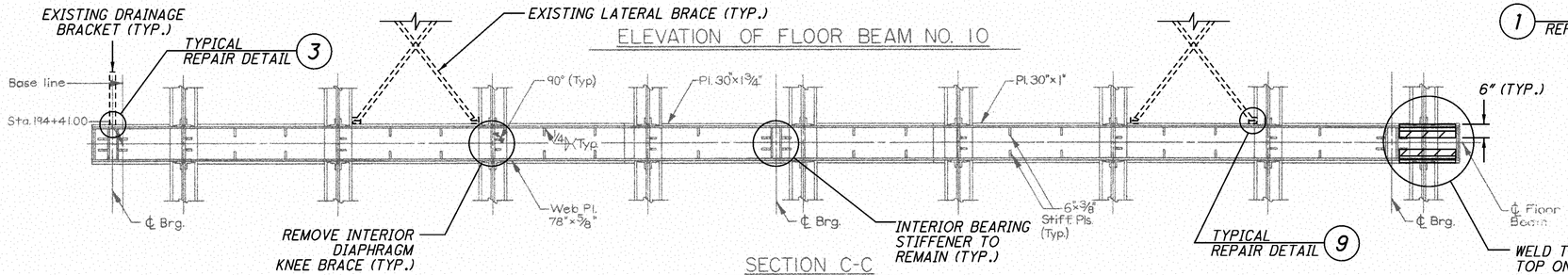
HAM-71-2.48
PID No. 24954

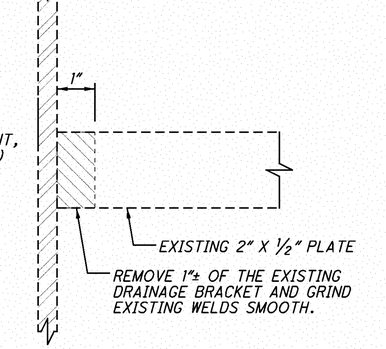
5 / 14

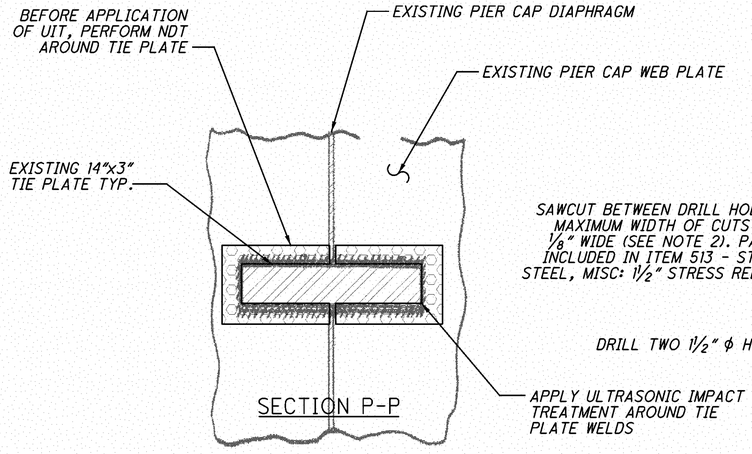
9 / 18







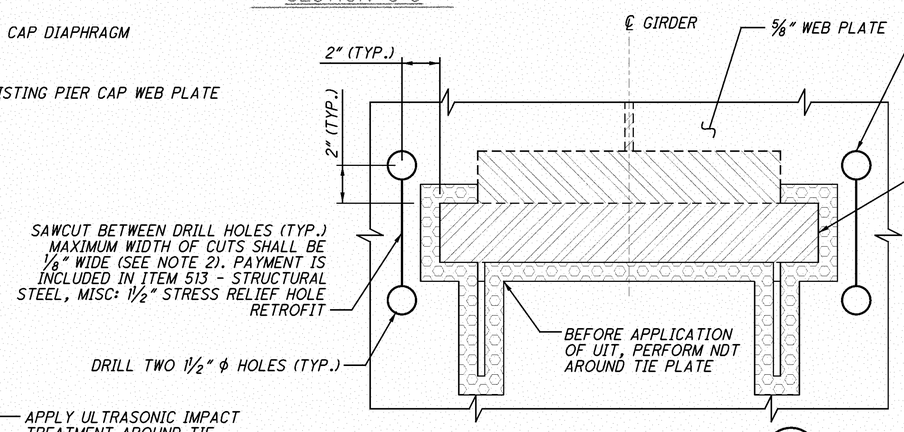




REPAIR DETAIL
INTERIOR TIE PLATE TREATMENT 1

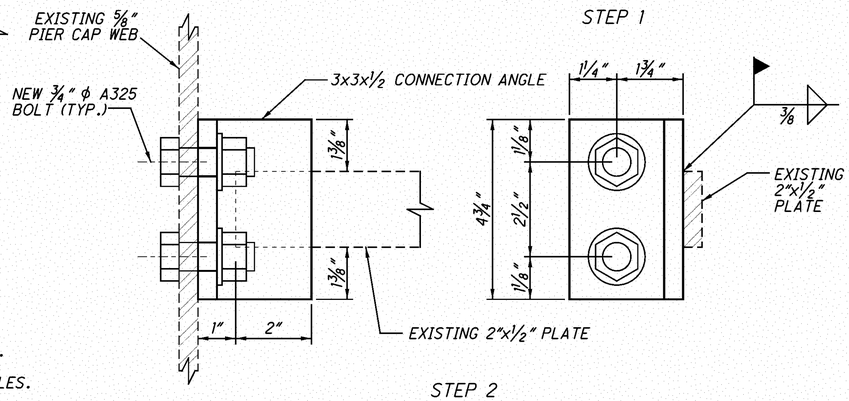
LEGEND

- LIMITS OF ½" WIDE ULTRASONIC IMPACT TREATMENT (UIT)
- EEU SPOT TREATMENT
- EXISTING WELD TO BE GROUND SMOOTH



REPAIR DETAIL
1½" STRESS RELIEF HOLES 2

(FOR GIRDERS A THROUGH J AT NORTH AND SOUTH WEB PLATES)
(EXTERIOR VIEW)



REPAIR DETAIL
DRAIN BRACKET RETROFIT 3

NOTES:

1. PIER ELEVATION AND SECTIONS ARE TAKEN FROM THE ORIGINAL PLANS.
2. CARE SHALL BE TAKEN NOT TO OVERCUT SAWCUT BEYOND DRILLED HOLES. FLAME CUTTING IS NOT PERMITTED.
3. DRILL TWO ½" Φ HOLES THROUGH THE EACH END PLATE. THE BOTTOM OF THE HOLES SHALL BE FLUSH WITH THE PIER CAP BOTTOM FLANGE. HOLES SHALL NOT PENETRATE OR GOUGE PIER CAP WEB PLATES OR FLANGE PLATE. PAID FOR UNDER ITEM 513 - STRUCTRURAL STEEL, MISC.: ½" DRAINAGE HOLE.
4. SEE REPAIR DETAILS ON SHEETS 13 OF 18 AND 15 OF 18.
5. DRAINAGE BRACKET RETROFIT TO BE INCLUDED WITH ITEM 513 - STRUCTURAL STEEL FOR REHABILITATION.

DESIGN AGENCY: STATE OF OHIO DEPT. OF TRANSPORTATION DISTRICT 8 BRIDGE DEPT.

DESIGNED PJL | DRAWN PJL | REVIEWED SCS | DATE 06-08-10 | STRUCTURE FILE NUMBER 3106802 | CHECKED CAH | REVISED

PIER 10 CAP RETROFIT DETAILS

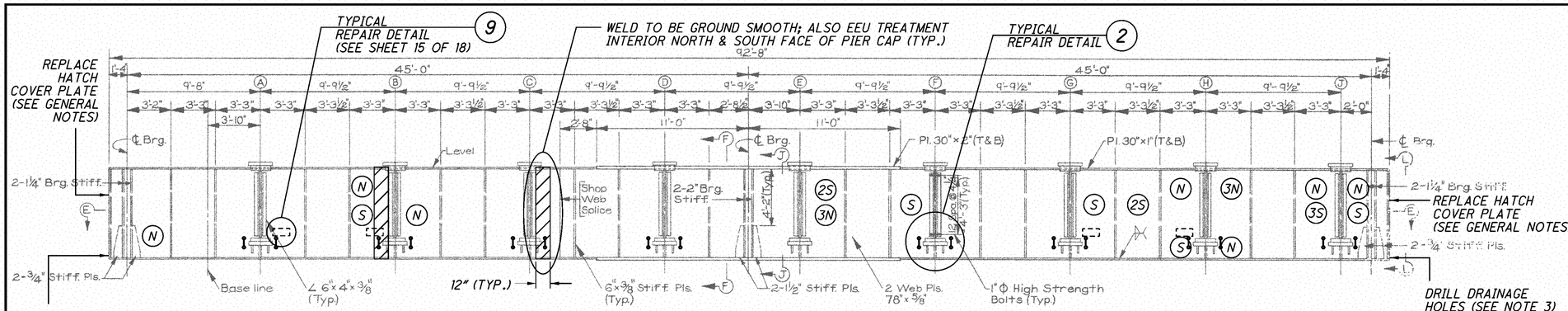
BRIDGE NO. HAM-71-0248R
OVER EDEN PARK ENTRANCE AND FLORENCE DRIVE

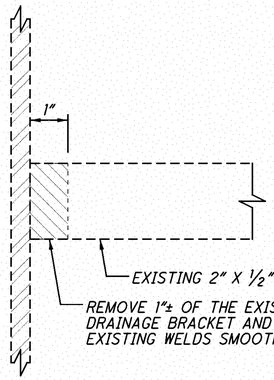
HAM-71-2.48
PID No. 24954

6 / 14

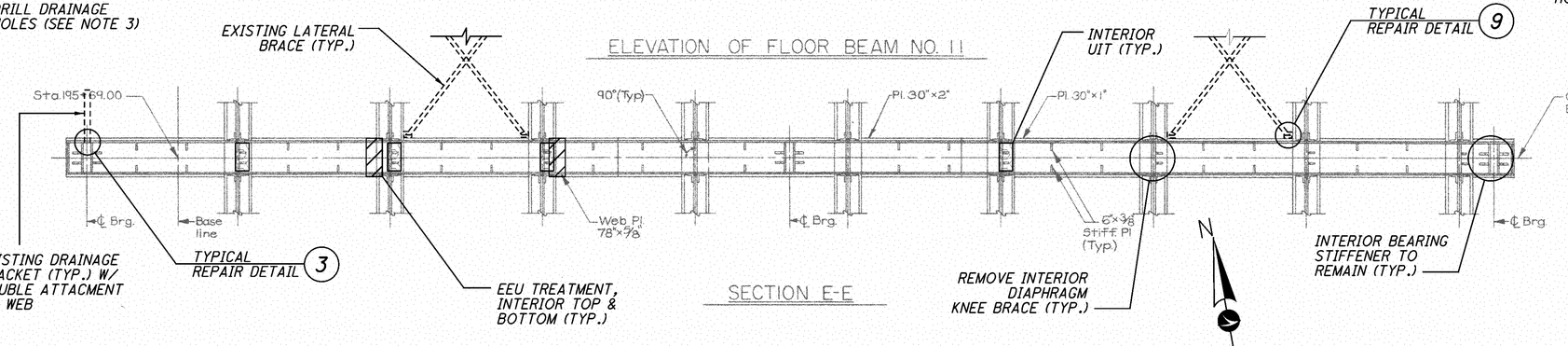
10 / 18

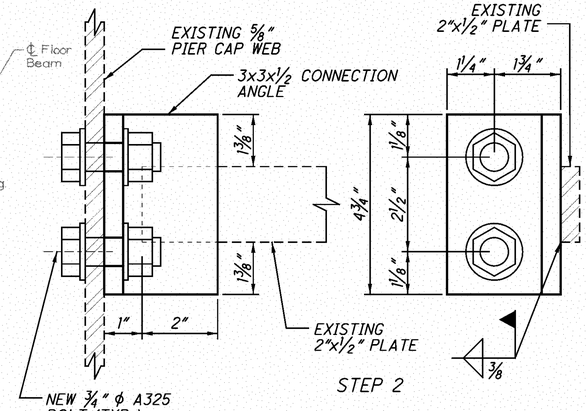
I:\projects\HAM\r071\02.43_PID24954\Design\CADD\Bridge Sheets\24954PI010.dgn 27-OCT-2010 1:34PM plockhar



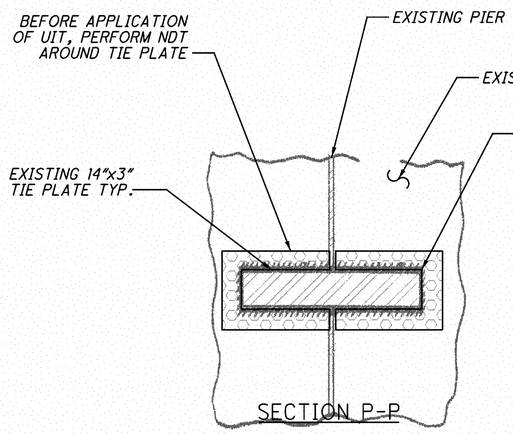


STEP 1

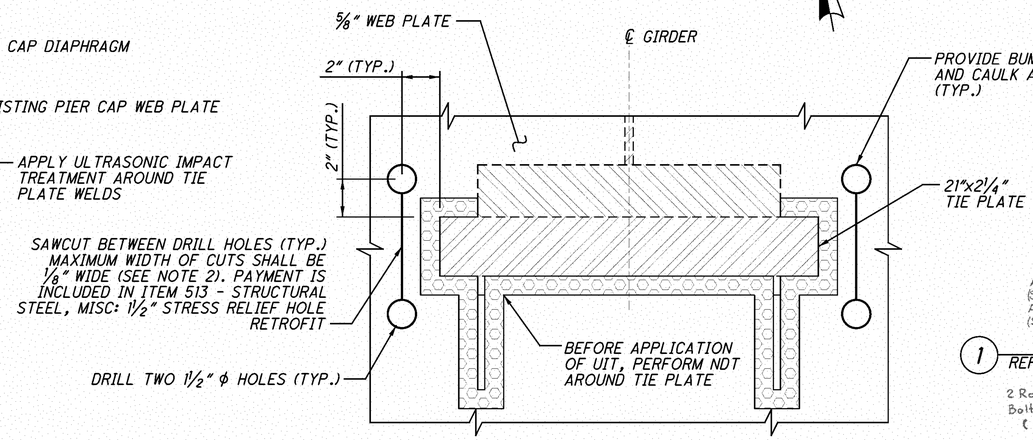




STEP 2



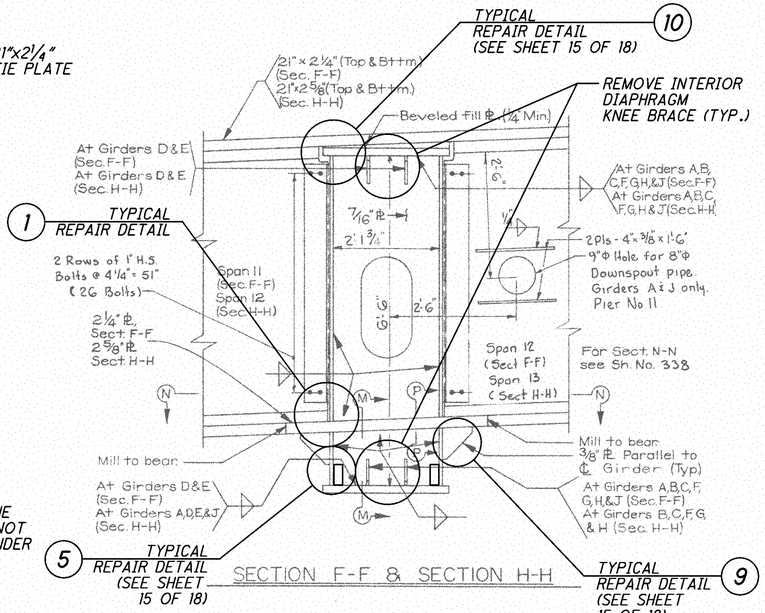
REPAIR DETAIL INTERIOR TIE PLATE TREATMENT 1



REPAIR DETAIL 1½" STRESS RELIEF HOLES 2

(FOR GIRDERS A THROUGH J AT NORTH AND SOUTH WEB PLATES) (EXTERIOR VIEW)

REPAIR DETAIL DRAIN BRACKET RETROFIT 3



LEGEND

- LIMITS OF ½" WIDE ULTRASONIC IMPACT TREATMENT (UIT)
- EEU SPOT TREATMENT
- (N) QUANTITY OF ARC STRIKES ON NORTH SIDE OF PIER CAP*
- (S) QUANTITY OF ARC STRIKES ON SOUTH SIDE OF PIER CAP*

*GRIND MISCELLANEOUS ARC STRIKES IN INTERIOR OF PIER CAP AS DIRECTED BY THE ENGINEER.

NOTES:

1. PIER ELEVATION AND SECTIONS ARE TAKEN FROM THE ORIGINAL PLANS.
2. CARE SHALL BE TAKEN NOT TO OVERCUT SAWCUT BEYOND DRILLED HOLES. FLAME CUTTING IS NOT PERMITTED.
3. DRILL TWO ½" ϕ HOLES THROUGH THE EACH END PLATE. THE BOTTOM OF THE HOLES SHALL BE FLUSH WITH THE PIER CAP BOTTOM FLANGE. HOLES SHALL NOT PENETRATE OR GOUGE PIER CAP WEB PLATES OR FLANGE PLATE. PAID FOR UNDER ITEM 513 - STRUCTRURAL STEEL, MISC.: ½" DRAINAGE HOLE.
4. SEE REPAIR DETAILS ON SHEETS 13 OF 18 AND 15 OF 18.
5. DRAINAGE BRACKET RETROFIT TO BE INCLUDED WITH ITEM 513 - STRUCTURAL STEEL FOR REHABILITATION.

DESIGN AGENCY
STATE OF OHIO
DEPT. OF TRANSPORTATION
DISTRICT 8 BRIDGE DEPT.

DESIGNED	DRAWN	REVIEWED	DATE	STRUCTURE FILE NUMBER
PJL	SCS	PJL	06-08-10	3106802
CHECKED	REVISED			
CAH				

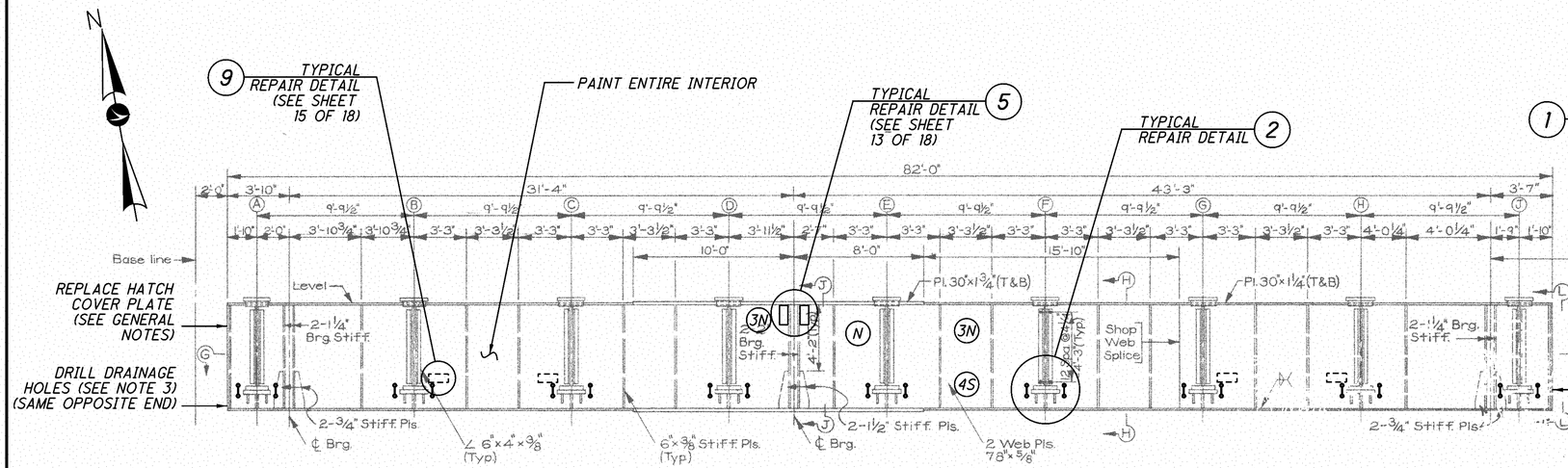
PIER 11 CAP RETROFIT DETAILS

BRIDGE NO. HAM-71-0248R
OVER EDEN PARK ENTRANCE AND FLORENCE DRIVE

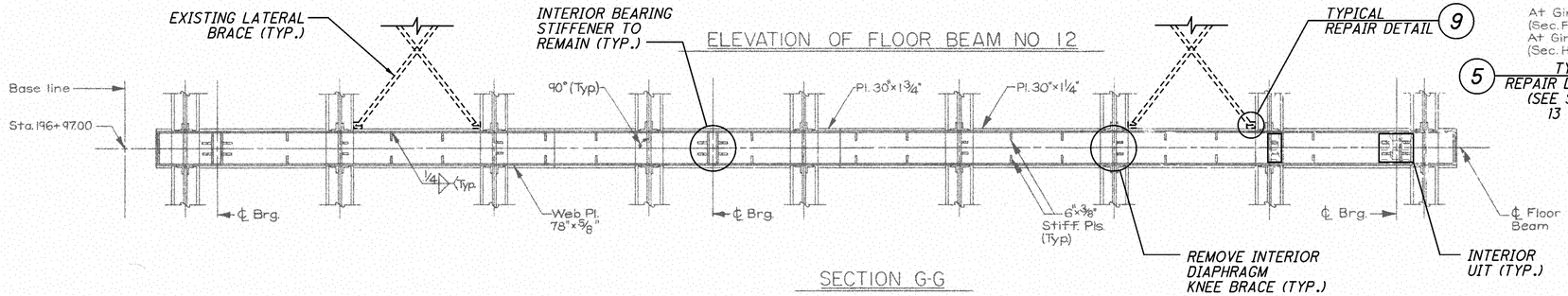
HAM-71-2.48
PID No. 24954

7 / 14

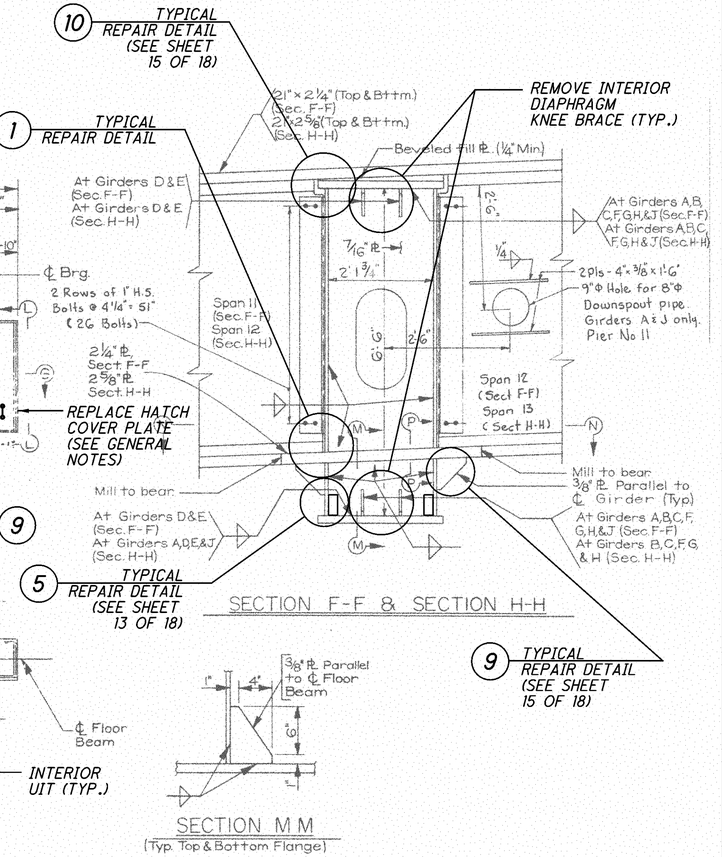
11 / 18



ELEVATION OF FLOOR BEAM NO 12

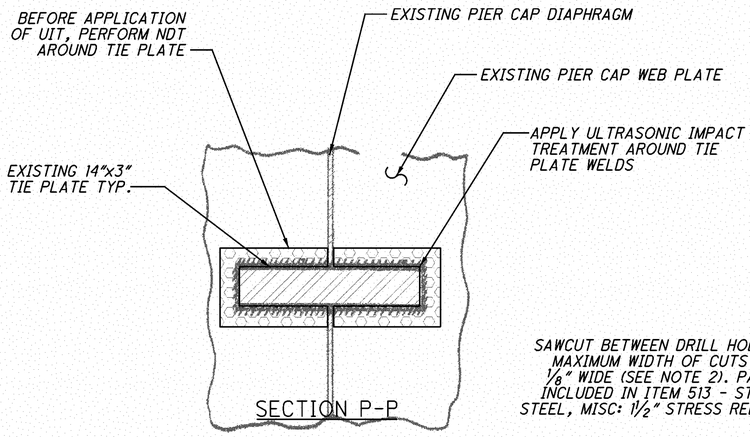


SECTION G-G



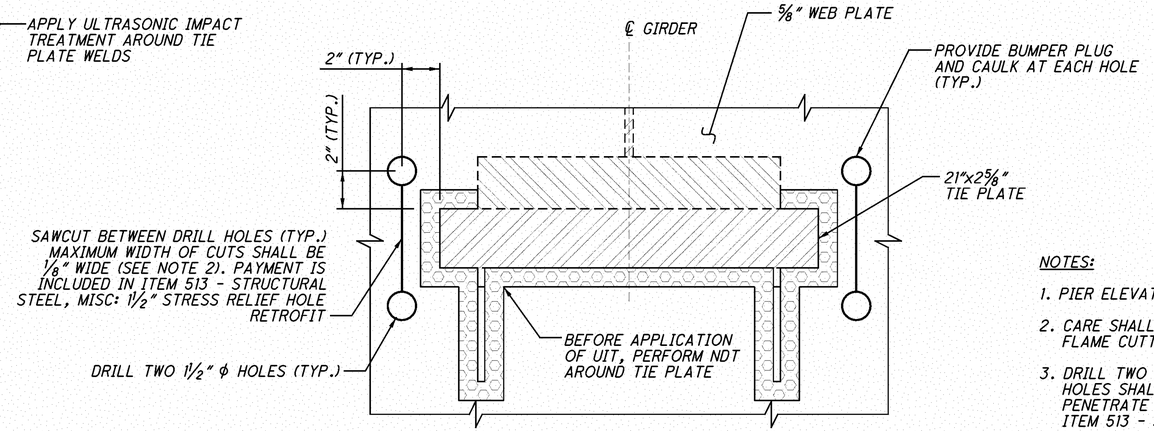
SECTION F-F & SECTION H-H

SECTION M M
(Typ. Top & Bottom Flange)



SECTION P-P

REPAIR DETAIL 1
INTERIOR TIE PLATE TREATMENT



REPAIR DETAIL 2
1½" STRESS RELIEF HOLES
(FOR GIRDERS A THROUGH J AT NORTH AND SOUTH WEB PLATES)
(EXTERIOR VIEW)

LEGEND

- LIMITS OF ½" WIDE ULTRASONIC IMPACT TREATMENT (UIT)

(N) NORTH SIDE ARC STRIKE*

(S) SOUTH SIDE ARC STRIKE*

*GRIND MISCELLANEOUS ARC STRIKES IN INTERIOR OF PIER CAP AS DIRECTED BY THE ENGINEER.

NOTES:

1. PIER ELEVATION AND SECTIONS ARE TAKEN FROM THE ORIGINAL PLANS.
2. CARE SHALL BE TAKEN NOT TO OVERCUT SAWCUT BEYOND DRILLED HOLES. FLAME CUTTING IS NOT PERMITTED.
3. DRILL TWO ½" Φ HOLES THROUGH THE EACH END PLATE. THE BOTTOM OF THE HOLES SHALL BE FLUSH WITH THE PIER CAP BOTTOM FLANGE. HOLES SHALL NOT PENETRATE OR GOUGE PIER CAP WEB PLATES OR FLANGE PLATE. PAID FOR UNDER ITEM 513 - STRUCTRURAL STEEL, MISC.: ½" DRAINAGE HOLE.
4. SEE REPAIR DETAILS ON SHEETS 13 OF 18 AND 15 OF 18.

DESIGN AGENCY
STATE OF OHIO
DEPT. OF TRANSPORTATION
DISTRICT 8 BRIDGE DEPT.

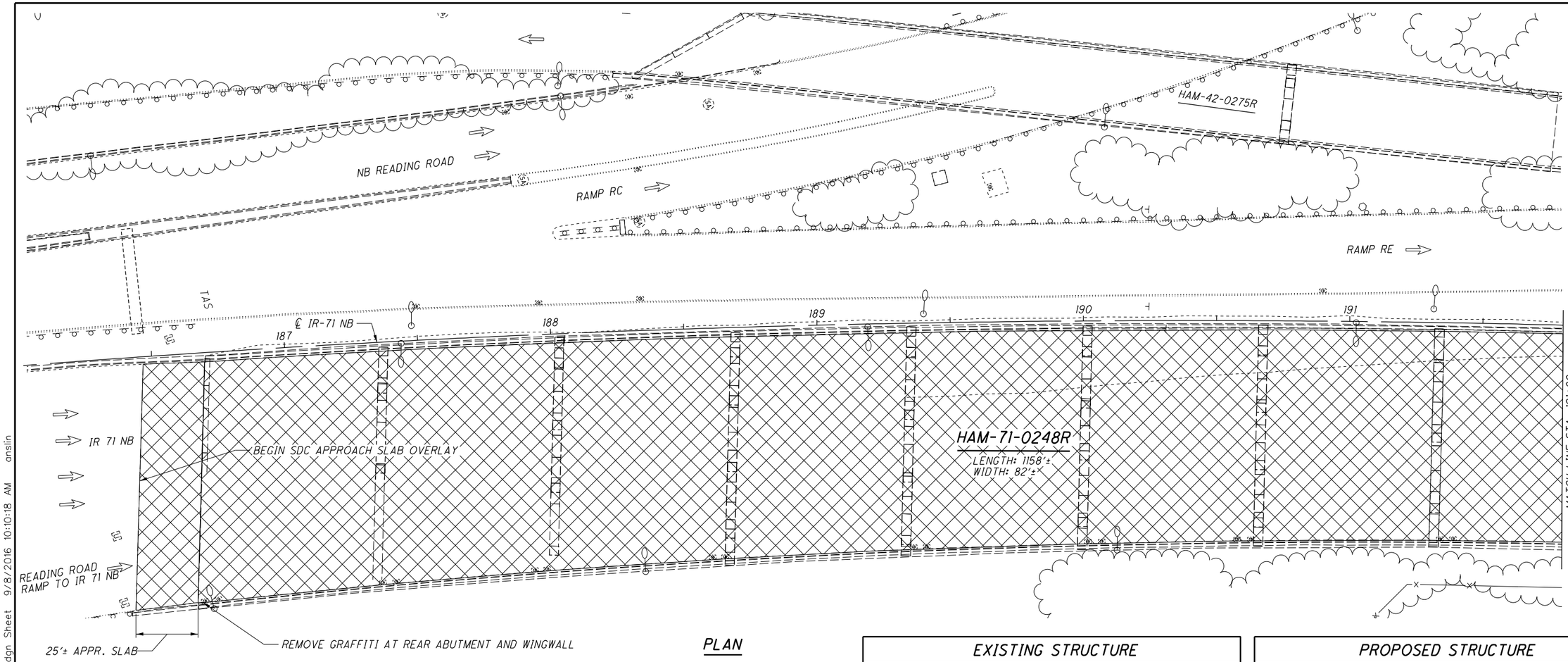
DESIGNED	DRAWN	REVIEWED	DATE
PJL	PJL	SCS	06-08-10
CHECKED	REVISED	STRUCTURE FILE NUMBER	
CAH		3106802	

PIER 12 CAP RETROFIT DETAILS
BRIDGE NO. HAM-71-0248R
OVER EDEN PARK ENTRANCE AND FLORENCE DRIVE

HAM-71-2.48
PID No. 24954

8 / 14

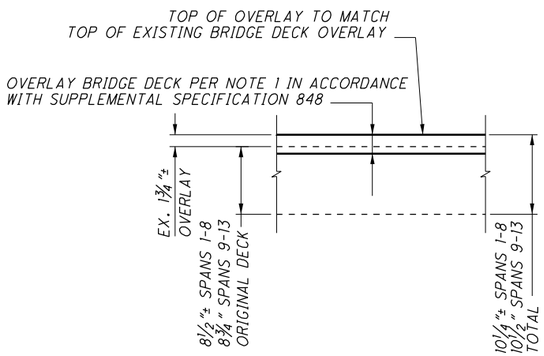
12 / 18



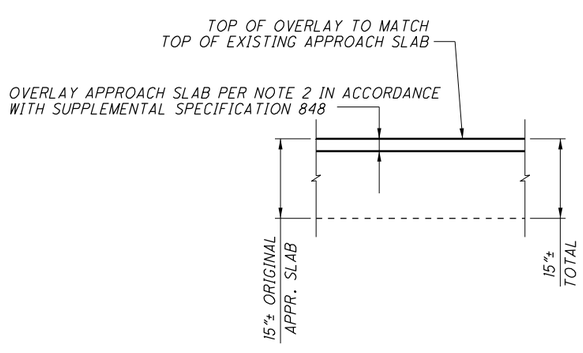
PLAN

LEGEND

SUPERPLASTICIZED DENSE CONCRETE (SDC) OVERLAY



DECK SLAB OVERLAY DETAIL



APPROACH SLAB OVERLAY DETAIL

EXISTING STRUCTURE

TYPE: CONTINUOUS ROLLED BEAM AND WELDED PLATE GIRDERS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE

SPANS: 66'-0"± (SPANS 1 THRU 8), 107'-0"± (SPAN 9), 134'-0"± (SPAN 10) AND 128'-0"± (SPAN 11 THRU 13)

ROADWAY: VARIES, 80'-0"± MIN. F/F PARAPET

LOADING: C.F. = 2000 (57)

SKEW: 0°

APPROACH SLABS: AS-1-54 (25'-0" LONG)

ALIGNMENT: VARIES

SUPERELEVATION: VARIES

STRUCTURAL FILE NUMBER: 3106802

DATE BUILT: 1972

PROPOSED STRUCTURE

TYPE: CONTINUOUS ROLLED BEAM AND WELDED PLATE GIRDERS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE

SPANS: 66'-0"± (SPANS 1 THRU 8), 107'-0"± (SPAN 9), 134'-0"± (SPAN 10) AND 128'-0"± (SPAN 11 THRU 13)

ROADWAY: VARIES, 80'-0"± MIN. F/F PARAPET

LOADING: C.F. = 2000 (57)

SKEW: 0°

APPROACH SLABS: AS-1-54 (25'-0" LONG)

ALIGNMENT: VARIES

SUPERELEVATION: VARIES

COORDINATES: LATITUDE 39°6'58" N
LONGITUDE 84°29'59" W

PROPOSED WORK:

1. REMOVE EXISTING 1¾" LATEX MODIFIED CONCRETE (LMC) WEARING SURFACE AND 1" OF THE ORIGINAL DECK USING HYDRODEMOLITION AND REPLACE WITH 2¾" THICK SUPERPLASTICIZED DENSE CONCRETE (SDC).
2. REMOVE 1¾" OF THE ORIGINAL APPROACH SLAB AND TOP OF BACKWALL USING HYDRODEMOLITION AND REPLACE WITH 1¾" OF SUPERPLASTICIZED DENSE CONCRETE (SDC).
3. CLEAN EXISTING DRAINAGE SYSTEM TO THE FIRST MANHOLE, BOTH ON THE STRUCTURE AND BELOW GROUND.
4. PRESSURE WASH BEAM SEATS, BACKWALLS, AND STRUCTURAL STEEL WITHIN 10 FEET OF ABUTMENT EXPANSION JOINTS.
5. REMOVE GRAFFITI AT REAR ABUTMENT AND WINGWALL. RESEAL ABUTMENT FACE WITH EPOXY URETHANE SEALER (SEE GENERAL NOTES).
6. RETROFIT FATIGUE CRACKS IN PIER 9, 10, 11 & 12 STEEL PIER CAPS.
7. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH MAINTENANCE OF TRAFFIC PLANS AND NOTES.

DESIGN AGENCY
BURGESS & NIPLE
312 PLUM ST. CINCINNATI OH

DESIGNED	DRAWN	REVIEWED	DATE
SJA	SJA	JSB	8/31/2016
CHECKED	REVISED	STRUCTURE FILE NUMBER	
XAC	XXX	3106802	

GENERAL PLAN - 1

HAM-71-0248R
I-71 NB OVER EDEN PARK ENTRANCE AND FLORENCE AVE

HAM-71-1.97
PID No. 82975

PLAN

LEGEND

SUPERPLASTICIZED DENSE CONCRETE (SDC) OVERLAY

DESIGN AGENCY
BURGESS & NIPLE
312 PLUM ST. CINCINNATI OH

DESIGNED	DRAWN	REVIEWED	DATE
SJA	SJA	JSB	8/31/2016
CHECKED	REVISED	STRUCTURE FILE NUMBER	
XAC	XXX	3106802	

GENERAL PLAN -2
HAM-71-0248R
I-71 NB OVER EDEN PARK ENTRANCE AND FLORENCE AVE

HAM-71-1.97
PID No. 82975

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292

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PLAN

LEGEND

SUPERPLASTICIZED DENSE CONCRETE (SDC) OVERLAY

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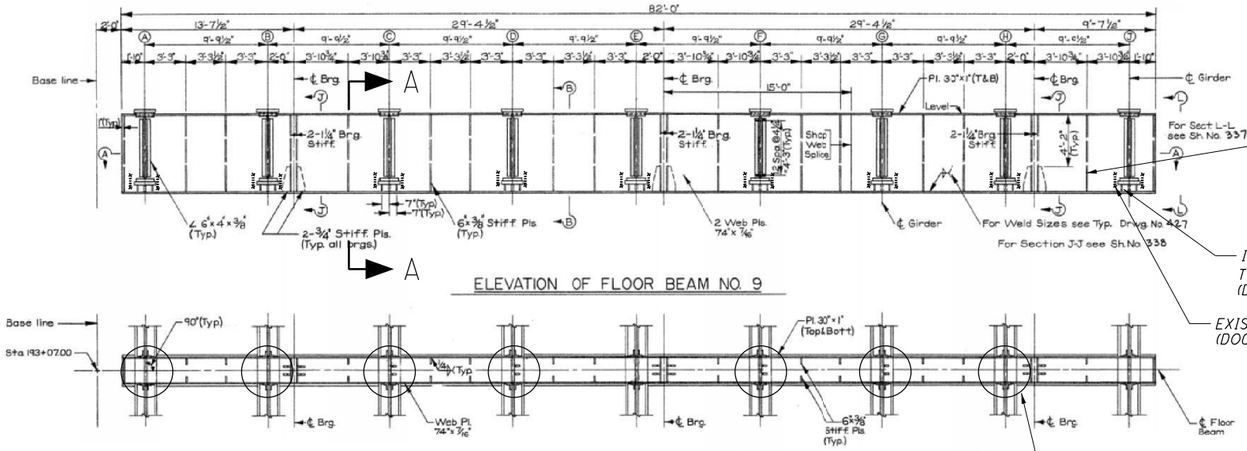
DESIGN AGENCY
BURGESS & NIPLE
312 PLUM ST. CINCINNATI OH

DESIGNED	DRAWN	REVIEWED	DATE
SJA	SJA	JSB	8/31/2016
CHECKED	REVISED	STRUCTURE FILE NUMBER	
XAC	XXX	3106802	

GENERAL PLAN -3
HAM-71-0248R
I-71 NB OVER EDEN PARK ENTRANCE AND FLORENCE AVE

HAM-71-1.97
PID No. 82975



PIER CAP ELEVATION

PIER 9 SHOWN

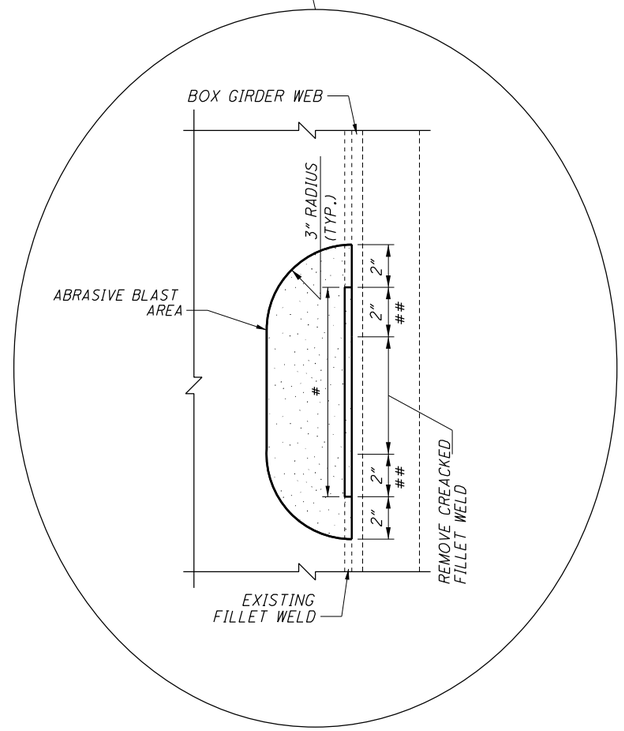
PIERS 10, 11 AND 12 SIMILAR

REMOVE AND REPLACE TWO CRACKS IN THE SOUTH WEB STIFFENER FILLET WELD ON PIER CAP 9. PAYMENT SHALL BE INCLUDED WITH ITEM 513-STRUCTURAL STEEL, MISC.: FILLET WELD CRACK RETROFIT. SEE GENERAL NOTES FOR REPAIR PROCEDURE.

ITEM 513-STRUCTURAL STEEL, MISC.: 2" STRESS RELIEF HOLE RETROFIT TYPICAL AT ALL EXISTING STRESS RELIEF RETROFIT LOCATIONS (DOG-BONE REPAIRS) DONE PREVIOUSLY.

EXISTING STRESS RELIEF RETROFIT LOCATIONS (DOG-BONE REPAIRS) DONE PREVIOUSLY.

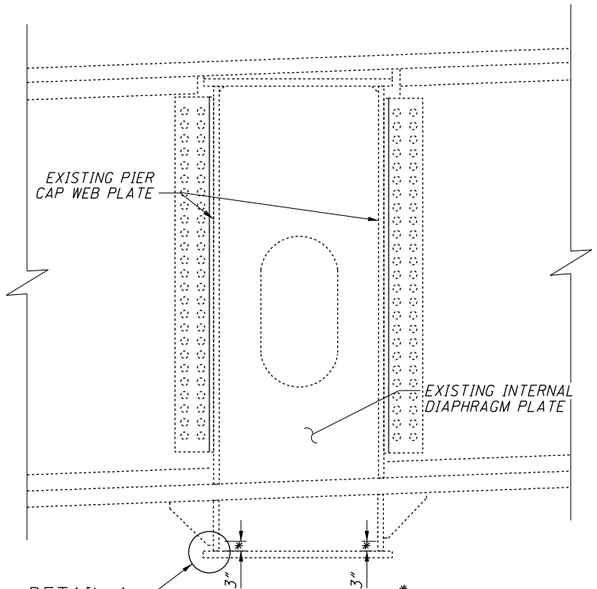
REMOVE FILLET WELDS THAT ATTACH THE REMAINS OF KNEE BRACES TO THE BOTTOM FLANGE PLATE OF PIER CAP 10 AT THE DIAPHRAGMS OF GIRDERS A, B, C, D, F, G AND H (2 KNEE BRACE ATTACHMENTS AT EACH DIAPHRAGM) IN ACCORDANCE WITH ITEM 513 -STRUCTURAL STEEL, MISC.: GRINDING PER FOOT, AS PER PLAN



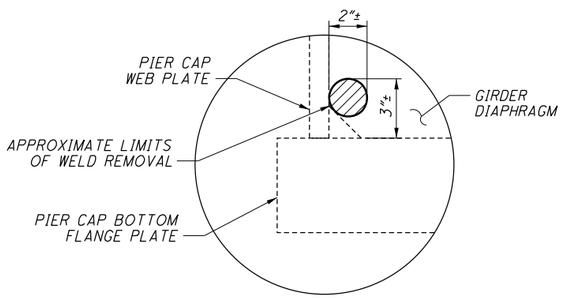
FILLET WELD CRACK RETROFIT DETAILS

(INSIDE ELEVATION)

 # = PROVIDE NEW FILLET WELD
= REMELT EXISTING FILLET WELD AND INCORPORATE IN THE NEW WELD



SECTION A-A



DETAIL A

* *APPROXIMATE LIMITS OF WEB PLATE WELD REMOVAL. PAYMENT INCLUDED UNDER ITEM 513-STRUCTURAL STEEL, MISC.: 2" STRESS RELIEF HOLE RETROFIT.*

ITEM 513-STRUCTURAL STEEL, MISC.: 2" STRESS RELIEF HOLE RETROFIT

PERFORM THE REPAIRS DESCRIBED BELOW AT PIERS 9-12.

PIER 9 - 18 LOCATIONS
PIER 10 - 20 LOCATIONS
PIER 11 - 16 LOCATIONS
PIER 12 - 18 LOCATIONS

SEE GENERAL NOTES FOR REPAIR PROCEDURE:

DESIGN AGENCY
BURGESS & NIPLE
312 PLUM ST. CINCINNATI OH

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SJA	SJA	JSB	8/31/2016
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PIER CAP RETROFIT DETAILS
HAM-71-0248R
I-71 NB OVER EDEN PARK ENTRANCE AND FLORENCE AVE

HAM-71-1.97
PID No. 82975

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