2012 In-Depth Inspection Report

Elevation Looking Southwest

I-71/SR 176 Double Decked Bridge – (I-71 Upper Deck)

CUY-00071-1791
(SFN 1805371)

Owner:
Ohio Department of Transportation
District 12
5500 Transportation Blvd.
Garfield Heights, OH 44125

Inspectors:

HDR Engineering, Inc.
9987 Carver Rd, Suite 200
Cincinnati, OH 45242

Northwest Consultants, Inc.
3220 Central Park West
Toledo, Ohio 43617

Inspection Dates: 07/30/2012 to 08/10/2012

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Inspection Dates: 07/30/2012 to 08/10/2012

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Date Submitted: January 2013

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SUMMARY

Overall, the I-71 bridge (SFN 1805371) is rated a 6, meaning it is in satisfactory condition.

- The deck floors have areas of honeycombing, cracking, spalling, and delaminations.
- Formwork was left in place.
- Scuppers and drains are clogged.
- A portion of the drain has fallen off or is about to fall off near the seated hinges.
- The expansion joint glands show signs of minor leakage.
- There are loose bolts at a few locations along the superstructure.
- Surface corrosion exists at the seated hinges and at various locations on the superstructure.
- There are corrosion holes and tears in the crossbracing.
- There are loose bolts in two of the lower lateral bracing.
- There are 6 bearings that are rocked $\geq 10°$.
- There is a bearing rocked beyond recall.
- The bearings at Pier 21AW have pack rust between the shims causing the masonry plate to be rotated.
- There is a loose bolt in Span 18AW on Beam E.
- The fatigue prone connections have surface corrosion.
- The abutments have hairline cracking.
- The piers have cracking, spalling, and delamination.
- The steel caps have cracks with holes drilled to arrest the crack growth.
- The backwalls have cracking and spalling. The North Abutment AW backwall has a large spalled area with a hole in each corner.
- There is joint material missing or falling out at the North Abutment AW.
- One impact attenuator has vehicular damage.

GENERAL

HDR Engineering, Inc. performed the in-depth inspection of the I-71/SR 176 double decked bridge with the help of Northwest Consultants, Inc. The inspection was performed between July 30, 2012 and August 10, 2012. The purpose of the inspection was to fulfill the annual requirement to inspect and document the existing physical and functional conditions of the bridge and note any changes since the previous inspection. The bridge was inspected using an Aspen Aerial A75 UBIV. The substructure was inspected from the ground and with the Aspen Aerial UBIV.

All inspectors followed the guidelines and standards established by the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO). The condition assessments and bridge ratings coded were in accordance with the Bridge Inspector's Reference Manual and the Ohio Department of Transportation Manual of Bridge Inspection.

Traffic control was used for the UBIV work, using multiple lane closures. Due to the amount of traffic on the bridge, the work was performed at night. The inspection of the I-71 bridge (upper deck) required lane closures on both the upper deck and lower deck, as well as ramps passing underneath. The main concern with inspecting this bridge was working over an active highway. The multiple lane closures were necessary in order to ensure safety during the inspection. The following lane closures were used:

- Single left lane on I-71 with a single left lane on SR 176.
- Single right lane on I-71 with a double right lane on SR 176. Add Ramp BE closure at 1:00 am.
- Single right lane on I-71 with a ramp closure (I-71S Exit 246 to SR 176) – To inspect Span 3.
- Single right lane on I-71 with a right lane closure to on-ramp to Jennings Fwy (South), then switch to left lane closure to on-ramp to Jennings Fwy (South) – To inspect Span 2.

A police officer was not used during this inspection, but it is recommended on future inspections to use one. There were a couple of incidences where motorcycles felt it was okay to drive in the closed lane. The police officer would be most beneficial wherever the bucket is going to be over the roadway.

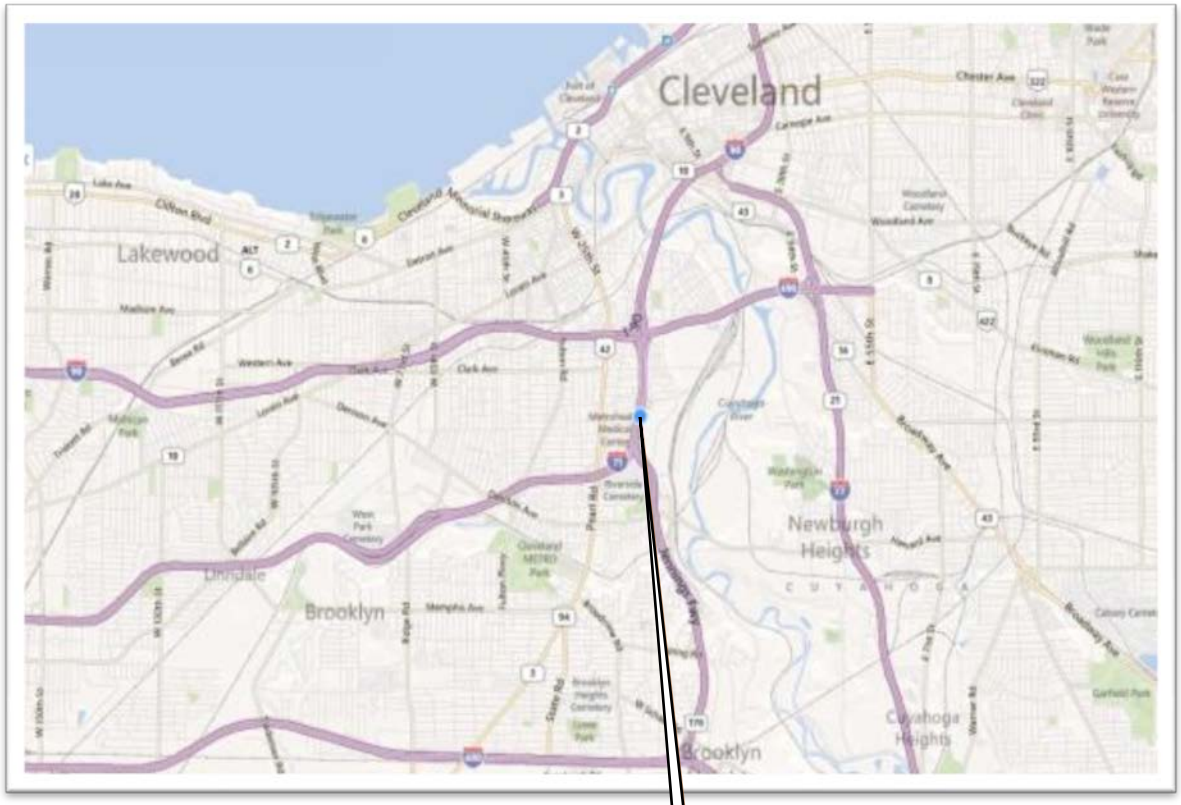
BRIDGE DESCRIPTION

The I-71 bridge (upper deck) is a continuous steel beam structure with a concrete substructure. At the north end, there is a steel box cap at Pier 17 and steel pier caps at Piers 18AE, 19AE, 20AE, 21AE, and 22AE. There are 28 spans with a maximum span length of 121 ft and a total length of 1,811 ft. It was constructed in 1969 and has four lanes of traffic that splits off into two lanes on each ramp. The bridge carries I-71N traffic with an exit ramp toward I-90 and W 14th St. It runs north and south. The girders and piers are called out per the bridge plans.

Elevation View Looking West

End View Looking South

LOCATION MAP



INDIVIDUAL ITEM CONDITION RATINGS

The individual items are rated on a 1-4 rating system as described below.

1 **Good** – Element limited to only minor problems, no repairs necessary.

2 **Fair** – All primary elements are sound, but have minor section loss, deterioration, cracking, spalling or scour, minor repairs, etc.

3 **Poor** – Advanced section loss, deterioration, spalling or scour; item is no longer functioning as designed (load path is significantly redistributed, fatigue cracks, wide shear cracks, local failures possible).

4 **Critical** – Support removed, corrective action or close monitoring necessary, consider partial or full closure, negative response (ex. crushing, bending) to the primary element due to structural loads.

SUMMARY CONDITION RATINGS

Member condition ratings used in this report are in accordance with Report No. FHWA-PD-96-001, *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*, 1995, and are reproduced below. The following rating system also appears in the Bridge Inspector's Reference Manual, FHWA NHI 12-049, Revised February, 2012.

N **Not Applicable**

9 **Excellent Condition**

8 **Very Good Condition** – no problems noted.

7 **Good Condition** – some minor problems.

6 **Satisfactory Condition** – structural elements show some minor deterioration.

5 **Fair Condition** – all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.

4 **Poor Condition** – advanced section loss, deterioration, spalling or scour.

3 **Serious Condition** – loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.

2 **Critical Condition** – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present, or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.

1 **"Imminent" Failure Condition –** major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic, but corrective action may put back in light service.

0 **Failed Condition** – out of service – beyond corrective action.

PROTECTIVE COATING SYSTEM (PCS)

9 There is no evidence of corrosion; the protective coating system (PCS) is sound, fully intact, and functioning as intended to protect the metal or concrete surfaces. No workmanship related issues.

8 Less than 1% of total surface area of the protective coating system is failed. Isolated light surface or freckled rusting along flange edges, cross frame members, end cross frames, bearings, phase or lap marks, or at bolted splices. Isolated chalking or fading or other early evidence of paint system distress. Isolated workmanship issues (painted surfaces only), surface defects less than 5% of total surface area. Workmanship defects include painted over grit, rust, mill scale, heavy paint drips, mud cracking in paint, or other related workmanship issues. No finish coat separation from intermediate coat.

7 Greater than 1% and less than 5% of the total protective coating system is failed. Light surface rusting along flange edges, cross frame members, end cross frames, bearings, phase or lap marks, or at bolted splices. Multiple workmanship issues (painted surfaces only), surface defects less than 10% of total surface area. Workmanship defects include painted over old paint, grit, rust, mill scale, heavy paint drips, mud cracking in paint, or other related workmanship issues. Finish coat separation from intermediate coat less than 10%. Chalking or fading or other early evidence of paint system distress. Candidate for zone painting (outside fascia beams or beam ends near joints).

6 Greater than 5% and less than 10% of the total protective coating system is failed. Surface or freckled rust is prevalent throughout. The paint system is no longer effective at beam ends beneath joints. There may be exposed metal, but there is no corrosion, which is causing loss of section. Peeling, cracking, or separation of any caulking material. Workmanship issues (painted surfaces only), surface defects less than 15% of total surface area. Workmanship defects include painted over old paint, grit, rust, mill scale, heavy paint drips, mud cracking in paint, or other related workmanship issues. Finish coat separation from intermediate coat greater than 10%. Candidate for zone painting (outside fascia beams or beam ends near joints).

5 Greater than 10% and less than 15% of the total protective coating system is failed. Surface or freckled rust is prevalent. The paint system is no longer effective at steel ridge bearings, beam ends near joints at abutments and piers and along outside face of fascia beams. There is exposed metal with active corrosion causing light loss of section or pitting, typically less than 1/8". Peeling, cracking, or separation of any caulking material with rust staining. Workmanship issues (painted surfaces only), surface defects greater than 20% of total surface area. Candidate for zone painting (outside fascia beams and beam ends near joints).

4 Greater than 15% and less than 20% of the total protective coating system is failed. Surface or freckled rust is prevalent. The PCS system is no longer effective. There is exposed steel throughout the structure with active corrosion. Failure of caulking on crevice corrosion. Old paint system was painted over. Candidate for total recoating.

3 Greater than 20% and less than 30% of the total protective coating system is failed. The paint system is no longer effective. There is exposed steel throughout the structure with active corrosion. Candidate for total recoating.

2 Greater than 30% and less than 40% of the total protective coating system is failed. Candidate for total recoating.

1 Greater than 40% and less than 50% of the total protective coating system is failed. Should be programmed for total recoating, or structure replacement.

0 Greater than 50% of the protective coating system has failed. Corrosion has caused section losses. Should be programmed for total recoating or structure replacement.

DECK SUMMARY SATISFACTORY

The deck is rated a 6, meaning that it is in satisfactory condition. The rating is based on the condition of the Floor which is rated 2 – Fair.

The individual items are as follows:

Item	I-71 Rating
Floor	2 – Fair
Wearing Surface	2 – Fair
Railing	2 – Fair
Drainage	2 – Fair
Expansion Joints	2 – Fair

Floor	Fair

The underside of the deck is in fair condition. See the sketch of the floor in Appendix E. The following deficiencies were noted:

- There is hairline to narrow transverse cracking throughout. Efflorescence is typical.
- Nine areas have honeycombing. The largest area is 2 ½' x 1'.

- Map cracking exists in Spans 1, 4, 5, 6, 7, 8, 9, 10, 13, 15, 17, 20AW, 22AW, 18AE, 19AE, 20AE, and 21AE.
- Spalling exists in Spans 2, 3, 5, 7, 8, 9, 10, 11, 16, 17, 20AW, 22AW, 18AE, and 19AE.

- Delaminations exist in Spans 2, 9, and 20AE.
- Formwork was left in place in Span 20AW.

Wearing Surface	Fair

The wearing surface is in fair condition. The following deficiencies are noted in the Supplemental Report found in Appendix C, but are reiterated here. Detailed locations and sizes are located in the deck mapping section of the Supplemental Report.

- Large areas of the deck are patched with good quality, full-depth patches.
- There are transverse cracks spaced roughly at 10 ft intervals in the positive moment regions and at 6 ft intervals in the negative moment regions.
- Isolated areas of map cracking, spalling, and deteriorating patches exist.
- There are numerous locations where RPMs are missing from the wearing surface, leaving shallow holes.

Railing	Fair

The railing is in fair condition. The following deficiencies are noted in the Supplemental Report found in Appendix C, but are reiterated here. Deficiency locations are called out in the deck mapping section of the Supplemental Report. Deficiencies found on the exterior face were noted from the snooper inspection.

- Spalls and deteriorations exist along the large portions of the toe of the barrier, especially on the low side of the structure.
- There are a few vertical cracks throughout.
- One large spall with exposed rebar was noted between Pier 22AE and the North Abutment AE.

- Multiple spalls (2’ x 1’ x 3”, 2’ x 1’ x 1”, 3” x 1’) in the rail’s exterior face near the seated hinge in Span 7.

- Longitudinal cracking with efflorescence is typical in the rail’s exterior face.

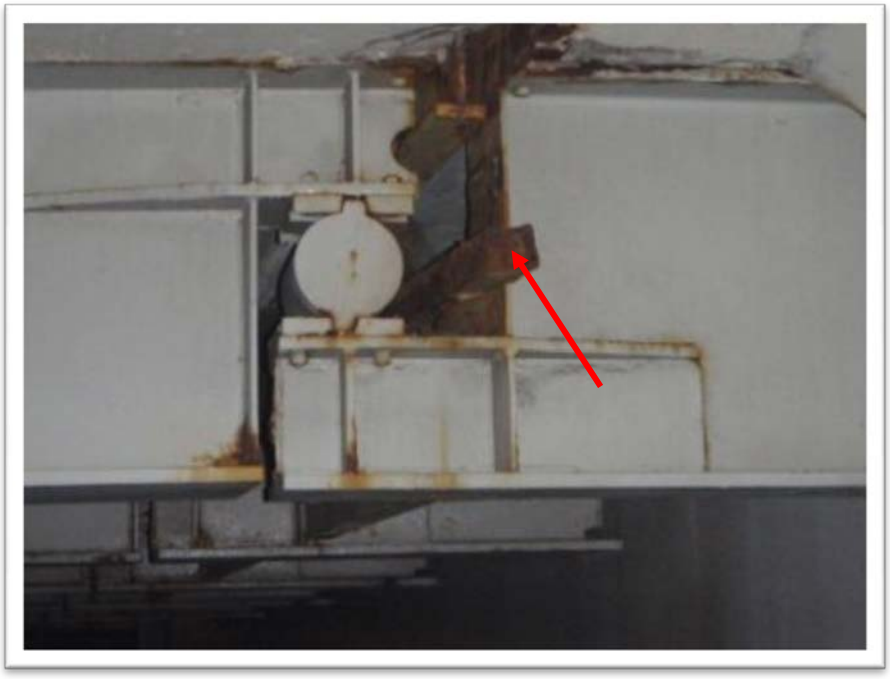
- There is spalling with exposed rebar on the exterior face of the rail in Span 18AE.

Drainage	Fair

The drainage is in <u>fair</u> condition. The deficiencies for the drains on the deck are noted in the Supplemental Report found in Appendix C, but are reiterated here. The following deficiencies were noted:

- There are clogged drains on the east side near Pier 11 and the North Abutment AE. See Appendix C for details.
- The downspout has surface corrosion in Span 23AE near the North Abutment AE.
- The drain is clogged near Pier 6 in Span 7.
- Part of the drain has fallen onto the girder cope next to the seated hinge at the following locations.
    - Span 12

- Span 17



- Span 18AE
- Span 18AW (about to fall)

Expansion Joints	Fair

The expansion joints are in fair condition. The deficiencies for the expansion joints are noted in the Supplemental Report found in Appendix C, but are reiterated here. Detailed findings and expansion joint measurements can be found in the Supplemental Report. The following deficiencies were noted:

- The intermediate expansion joints vary in clear spacing from 2 ⅛" to 2 ½".
- The abutment expansion joints vary in clear spacing from 1 ½" to 2 ⅞".
- The glands show signs of minor leakage.
- Debris exists in most of the joints.
- The concrete adjacent to Expansion Joint 2A has been patched with an epoxy material.

SUPERSTRUCTURE SUMMARY SATISFACTORY

The superstructure is rated a 6, meaning that it is in satisfactory condition. The rating is based on the condition of the Pins/Hangers/Hinges, which are rated 2 – Fair.

The individual items are as follows:

Item	I-71 Rating
Alignment	1 – Good
Beams/Girders/Slabs	1 – Good
Diaphragms or Crossframes	2 – Fair
Lateral Bracing	2 – Fair
Bearing Devices	2 – Fair
Protective Coating System	6 – Satisfactory
Pins/Hangers/Hinges	2 – Fair
Fatigue Prone Connections	1 – Good
Live Load Response	S – Satisfactory

Alignment	Good

The alignment is in good condition. No deficiencies were noted.

Beams/Girders/Slab	Good

The beams and girders are in good condition. The following deficiencies were noted:

- Surface corrosion on splice plates and bolts.
- Two loose bolts in bottom cover plate at the splice at Beam A, Span 17.

- Light surface corrosion with isolated locations of moderate corrosion on the web, stiffeners, and flanges, specifically the bottom flange.

- Surface corrosion at the seated hinges with up to 1/16” section loss.

- ½” pack rust has bowed the bottom cover plate of Beam F in Span 20AW.

Diaphragms or Crossframes	Fair

The crossframes are in <u>fair</u> condition. The following deficiencies were noted:

- There is a missing bolt at Girder F in Span 2.
- There is a missing bolt between Girders C and D in Span 4.

- A 1 ½” corrosion hole exists near Beam K between Beams K and L in Span 18AE.

- The following locations have tears or are beginning to tear.
  - The crossbracing is severed at Beam K between Beams K & F in Span 7.

  - Surface corrosion exists at various locations.
  - Pack rust is beginning to tear at Beam F between Beams K & F in Span 7.

- There is a 1 ¼” tear at Beam K between Beams K & L in Span 18AE.
- There is a 2 ½” tear at Beam L between Beams K & L in Span 12.
- There is a 3” tear at Beam K between Beams F & K in Span 12.
- A full tear exists in Beam F between Beams E & F in Span 12.

Lateral Bracing	Fair

The lateral bracing is in <u>fair</u> condition. The following deficiencies were noted:

- ¾” pack rust is bowing the gusset plate in Span 18AE at Beam K.

- ½” pack rust and a bent gusset plate in Span 19AE at Beam J.
- There is a loose bolt at the gusset plate in Span 21AE at Beam K.

- There is a loose bolt at the gusset plate in Span 23AE at Beam M between Beams M & L.

Bearing Devices	Fair

The bearing devices are in <u>fair</u> condition. The following deficiencies were noted:

- Surface corrosion is typical. The exterior bearings show a moderate amount of corrosion.
- Six bearings are rocked ≥10°.
    - North Abut AW 23°N Bearing G
    - North Abut AW 17°N Bearing H
    - North Abut AW 10°N Bearing J
    - North Abut AW 15°N Bearing K
    - North Abut AW 10°N Bearing M
    - Pier 1 16°N Bearing N

- One bearing is rocked beyond recall (Horizontal Distance > ⅓ H).
    - North Abut AW 23°N Bearing G

- The bearings at Pier 21AW have pack rust between the shims causing the masonry plate to be rotated.

- The following tables list the bearing measurements.

Bearing Measurements – I-71													
Pier/Abut	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**
S Abut	3°S	7°S	9°S	5°S	3°S	9°N				5°S	0°		3°N
Pier 1	1°N	1°N	2°N	4°N	2°N	1°N				1°N	5°N		16°N
Pier 2	2°N	2°S	1°N	1°S	0°	0°				2°S	1°N		4°N
Pier 3	3°N	0°	0°	1°S	0°	0°				1°S	3°S		2°S
Pier 4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed				Fixed	Fixed		Fixed
Pier 5	1°N	1°N	0°	0°	1°N	1°N				3°S	2°S		1°S
Pier 6	3°S	0°	1°N	1°N	0°N	1°N				1°N	3°N		3°N
Pier 7	0°	0°	0°	0°	0°	1°N				1°N	0°		0°
Pier 8	2°S	1°N	0°	0°	1°S	0°				1°S	0°		0°
Pier 9	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed				Fixed	Fixed		Fixed
Pier 10	1°S	0°	0°	1°S	0°	1°S				3°S	1°S		1°S
Pier 11	1°S	2°S	3°S	0°	3°S	2°S				1°S	1°S		1°N
Pier 12	1°N	4°N	3°N	5°N	3°N	2°N				3°N	2°N		2°N
Pier 13	3°N	5°N	4°N	2°N	2°N	0°				2°N	0°		0°
Pier 14	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed			Fixed	Fixed	Fixed		Fixed
Pier 15	0°	1°N	2°N	1°N	1°N	1°S		1°S	0°	0°	1°S		1°S
Pier 16	0°	0°	1°N	1°N	1°N	0°	0°	0°	0°	0°	0°		1°N
Pier 17													
Pier 18AW	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed							
Pier 19AW	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed							
Pier 20AW	0°	0°	0°	1°N	0°	0°							
Pier 21 AW	5°N	4°N	5°N	5°N	4°N	4°N							
N Abut AW	5°S	6°S	9°S	3°N	2°S	1°N							
Pier 18AE							Fixed	Fixed	Fixed	Fixed	Fixed		Fixed
Pier 19AE							Fixed	Fixed	Fixed	Fixed	Fixed		Fixed
Pier 20AE													
Pier 21AE													
Pier 22AE													
N Abut AW							23°N	17°N	10°N	15°N	9°N	10°N	6°N

Below are the bearing measurements under the steel pier caps.

Bearing Measurements – I-71			
Pier	**West**	**Center**	**East**
Pier 17	0°		3°S
Pier 18AE		Fixed	
Pier 19AE	1°N		1°S
Pier 20AE	Fixed		Fixed
Pier 21AE	0°		1°S
Pier 22AE	0°		4°N

Protective Coating System	Satisfactory

The protective coating system is rated a 6, meaning it is in satisfactory condition. The following deficiencies were noted:

- Greater than 5% and less than 10% of the total protective coating system is failed.
- Surface or freckled rust is prevalent throughout.
- Candidate for zone painting (outside fascia beams or beam ends near joints).
- Random locations of peeling paint and surface corrosion.

Pins/Hangers/Hinges	Fair

The seated hinges are in fair condition. The following deficiencies were noted:

- Surface corrosion. Heavier corrosion at the groove.

- Loose bolt in Span 18AW on Beam E.

The following table shows the measurements taken at the seated hinges.

Seated Hinge Measurements – I-71												
Span	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**N**
Span 7	1 ½" S	⅝" S	½" S	½" S	½" S	¼" N				¼" N	½" N	½" N
Span 12	⅞" N	1 ⅛" N	⅝" N	⅜" N	⅞" S	⅜" S				1 ⅜" S	¾" S	1 ⅛" S
Span 18AW	¼" S	¼" S	⅜" S	⅜" S	⅝" S	⅜" S						
Span 18AE							1 ¼" S	1 ¼" S	½" N	1 ⅛" N	⅞" N	1" S

Fatigue Prone Connections	Good

The fatigue prone connections are in good condition. The following deficiencies were noted:

- Surface corrosion on the intersecting welds under the seated hinge.
- Surface corrosion on the welds along the bottom cover plate and at the ends.

Live Load Response	Satisfactory

The live load response is in satisfactory condition, which is normal. There was no excessive deflection or vibration noted under live load.

SUBSTRUCTURE SUMMARY SATISFACTORY

The substructure is rated a 6, meaning that it is in satisfactory condition. The rating is based on the condition of the Piers, which are rated 2 – Fair.

The individual items are as follows:

Item	I-71 Rating
Abutments	1 – Good
Abutment Seats	1 – Good
Piers	2 – Fair
Pier Seats	1 – Good
Backwalls	2 – Fair
Wingwalls	1 – Good
Slope Protection	1 – Good

Abutments	Good

The abutments are in good condition. The following deficiencies were noted (see sketches in Appendix F):

- South Abutment A – There is light cracking.

- North Abutment AW – The abutment breastwall has hairline cracking.

Abutment Seats	Good

The abutment seats are in <u>good</u> condition. The following deficiencies were noted:

- North Abutment AW – There is debris around Bearing A and F.

Piers	Fair

The piers are in <u>fair</u> condition. The following deficiencies were noted (see sketches in Appendix F):

- Pier 1 – There is cracking in the pier cap and a 2’ x 1’ delamination at the base of Column 3.
- Pier 2 – There are areas of exposed steel and hairline cracking in the pier cap. There is a 1’ x 3” spall in Column 2. Paint is missing near the top of Column 5.
- Pier 3 – The pier cap has multiple cracks. The cap has exposed steel on the south side.
- Pier 4 – The pier cap has multiple cracks and one location of exposed rebar on the south side.
- Pier 5 – No significant deficiencies noted.

- Pier 6 – The pier cap has multiple cracks. The bottom edge of the south side has a 6’ x 4” spall with exposed rebar. The bottom edge of the north side has a 5’ x 2’ spall with exposed rebar. The north face of the pier cap has an 8’ x 4’ spall with exposed rebar on the west side.

- Pier 7 – The pier cap has multiple cracks. The north side has three small areas of spalling with exposed rebar.
- Pier 8 – The pier cap has multiple cracks and rust spots.
- Pier 9 – The pier cap has multiple cracks. The base of the column above the SR 176 pier cap has a 1’ x 3” spall on the east column and a 1’ x 8” spall on the west column.
- Pier 10 – The pier cap has multiple cracks. The north face has an 8” x 1” spall with exposed rebar. The west column has a 1 SF spall with exposed rebar and a 2 ft horizontal crack with efflorescence.

- Pier 11 – The pier cap has multiple cracks. The north face has map cracking that mirrors the rebar pattern and alligator cracking. The north face also has several spalls, some with exposed rebar.

- Pier 12 – The pier cap has multiple cracks. The pedestal is spalled under Beam B. The east column has medium sized cracking above the SR 176 pier cap.
- Pier 13 – The pier cap has multiple cracks. The base of the west column has a 3’ x 3’ delamination.

- Pier 14 – The pier cap has multiple cracks. The east column has a 3’ x 9’ spall with delaminations and exposed rebar. There is also a 3 ½’ x 2’ spall with exposed rebar.

- Pier 15 – The pier cap has multiple cracks. The north face has a 2’ x 8” spall and a 2’ x 4” delamination. The west column has a 6” x 1” spall with exposed rebar.
- Pier 16 – The pier cap has multiple cracks. The bottom edge of the south face has a spall with exposed rebar. The north face has small spalls with exposed rebar.
- Pier 17 – This pier cap is a steel box. The exterior has peeling paint and surface corrosion along the bottom edge. The interior has the following deficiencies (sections inside the box cap are labeled from west to east):
    - Corrosion exists at the drain holes at the east end.
    - Corrosion debris is piling below the access ladder.
    - At Section 11N, there is a steel inclusion in the web.

- At Section 9S, there is a steel inclusion in the web.

- At Section 7N, there is a steel inclusion in the web and a 2 1/8" x 1/8" deep gouge.

- At Section 3S, there is a grease-like material on the bottom flange.

- Pier 18AW – There are multiple cracks in the pier cap. The east column has a 5" diameter delamination and a 2' x 2' delamination.
- Pier 19AW – The pier cap has multiple cracks.
- Pier 20AW – The pier cap has multiple cracks.

- Pier 21AW – The pier cap has multiple cracks.
- Pier 18AE – The pier cap is a steel cap. There are multiple cracks that have holes drilled to arrest the crack growth. The following cracks were noted (see Appendix F for exact locations).
    - Beam G – 2” crack
    - Beam H – ¾” crack
    - Beam J – 2 ½” and ½” cracks
    - Beam K – ¾” crack
    - Beam L – ½” crack
    - Beam N – 2” crack
- Pier 19AE – The pier cap is a steel cap. There are multiple cracks that have holes drilled to arrest the crack growth. The following cracks were noted (see Appendix F for exact locations).
    - Beam G – 1 ½” crack
    - Beam H – ½” crack
    - Beam J – ½” crack
    - Beam K – ¾” and ½” cracks
    - Beam N – 1 ¼” crack
- Pier 20AE – No deficiencies noted.
- Pier 21AE – The pier cap is a steel cap. There are multiple cracks that have holes drilled to arrest the crack growth. The following cracks were noted (see Appendix F for exact locations).
    - Beam G – 1 ½” crack
    - Beam H – ¾” crack
    - Beam J – 1” and ½” cracks
    - Beam K – 1” and ½” cracks
    - Beam L – 1” and 1” cracks
    - Beam M – ½” crack
    - Beam N – 1” crack
- Pier 22AE – The pier cap is a steel cap. There are multiple cracks that have holes drilled to arrest the crack growth. The following cracks were noted (see Appendix F for exact locations).
    - Beam G – 4 1/8” crack

- Beam H – ¾” crack
- Beam J – 1 3/8” and 1” cracks
- Beam K – ¾” and 1” cracks
- Beam L – ¾”, 2 7/8”, and 5/8” cracks

- Beam M – ¾” crack
- Beam N – 1” crack

Pier Seats	Good

The pier seats are in <u>good</u> condition. The following deficiencies were noted:

- There are multiple areas along the pier seat edge that are cracking.
- Some of the spalls on the pier face extend up to the pier seat.

Backwalls	Fair

The backwalls are in <u>fair</u> condition. The following deficiencies were noted:

- North Abutment AW – The backwall is failing at the northwest corner (5’ x 2 ½’ x 3”). This area has exposed rebar.

- North Abutment AW – The northwest corner has a hole that goes toward the wingwall.

- North Abutment AW – The northeast corner has a hole measuring 1 ½’ x 1 ½’.

Wingwalls	Good

The wingwalls are in <u>good</u> condition. The following deficiencies were noted.

- North Abutment AW – The east wingwall has missing joint material.

- North Abutment AW – The west wingwall has a 1 ½’ x 1 ½’ spall with exposed rebar.

- North Abutment AW – The west wingwall has joint material falling out at the lower rail level.

Slope Protection	Good

The slope protection is in good condition. No significant deficiencies were noted.

APPROACHES SUMMARY GOOD

The approaches are rated a 7, meaning that they are in good condition.

The individual items are as follows:

Item	I-71 Rating
Pavement	1 – Good
Approach Slabs	1 – Good
Guardrail	1 – Good
Relief Joint	1 – Good
Embankment	1 – Good

Pavement	Good

The pavement is in good condition. The following deficiencies are noted in the Supplemental Report found in Appendix C, but are reiterated here. Detailed locations and sizes are located in the deck mapping section of the Supplemental Report. The following deficiencies were noted:

- There are spalls and patches in the asphalt adjacent to the expansion joints.

Approach Slabs	Good

The approach slabs are in good condition. The following deficiencies are noted in the Supplemental Report found in Appendix C, but are reiterated here. Detailed locations and sizes are located in the deck mapping section of the Supplemental Report. The following deficiencies were noted:

- There is a 6" diameter erosion hole developing at the west end of the abutment joint at the North Abutment AW.

Guardrail	Good

The guardrail is in good condition. The following deficiencies are noted in the Supplemental Report found in Appendix C, but are reiterated here. Detailed locations and sizes are located in the deck mapping section of the Supplemental Report. The following deficiencies were noted:

- The impact attenuator near Pier 17 has been hit by a vehicle.

Relief Joints	Good

The relief joints are in good condition. No significant deficiencies were noted.

Embankment	Good

The embankments are in good condition. No significant deficiencies were noted.

GENERAL SATISFACTORY

The individual items are as follows:

Item	I-71 Rating
Warning Signs	4 – Critical
Sign Supports	1 – Good
Vertical Clearance	1 – Good

Warning Signs	Critical

The warning signs are in critical condition. The following deficiencies were noted:

- There are no bridge end markers.

Sign Supports	Fair

The sign supports are in fair condition. The following deficiencies were noted:

- The sign attached to Pier 15 has two loose bolts.

Vertical Clearance	Good

The vertical clearance is in good condition. No significant deficiencies were noted.

RECOMMENDATIONS

1. **Immediate**
    - The portions of the drain that have broken off should be removed or reattached. It does not appear that they are able to fall past the seated hinge, but it is better to be proactive with them.
2. **Maintenance and Monitoring**
    - Remove the formwork in Span 20AW.
    - Clear the clogged scuppers in the deck.
    - Clear the clogged drain near Pier 6 in Span 7.
    - Clean the expansion joints from debris.
    - Tighten the loose bolts in the bottom cover plate at the splice at Beam A, Span 17.
    - Tighten the loose bolt at the lower lateral bracing gusset plate in Span 21AE at Beam K.
    - Tighten the loose bolt at the lower lateral bracing gusset plate in Span 23AE at Beam M between Beams M & L.
    - Tighten the loose bolt at the seated hinge in Span 18AW on Beam E.
    - Clean the debris from the abutment seats, especially at the North Abutment AW.
    - Remove the corroded debris from inside Pier 17.
    - Repair the impact attenuator near Pier 17.
3. **Short Term**
    - Abrasively clean and paint the exposed rebar in the floor. Patch the spalled areas.
    - Repair the damaged barrier railing between Pier 22AE and the North Abutment AE.
    - Abrasively clean and paint the exposed rebar in the exterior railing. Patch the spalled areas.
    - Repair the broken portion of the drains at:
        - Span 12
        - Span 17
        - Span 18AE
        - Span 18AW
    - Consider spot painting near the bearings and at the seated hinges.
    - Repair the torn crossbracing members in Spans 7, 18AE, and 12.
    - Abrasively clean and paint the exposed rebar. Patch the spalled areas.
    - Remove the delaminated concrete then abrasively clean, paint, and patch the areas.
    - Repair the holes and spalled concrete in the backwall at the North Abutment AW.
    - Replace the missing joint material in the east wingwall at the North Abutment AW.
    - Replace the joint material falling out at the west wingwall at the North Abutment AW.
4. **Rehabilitation**
    - None

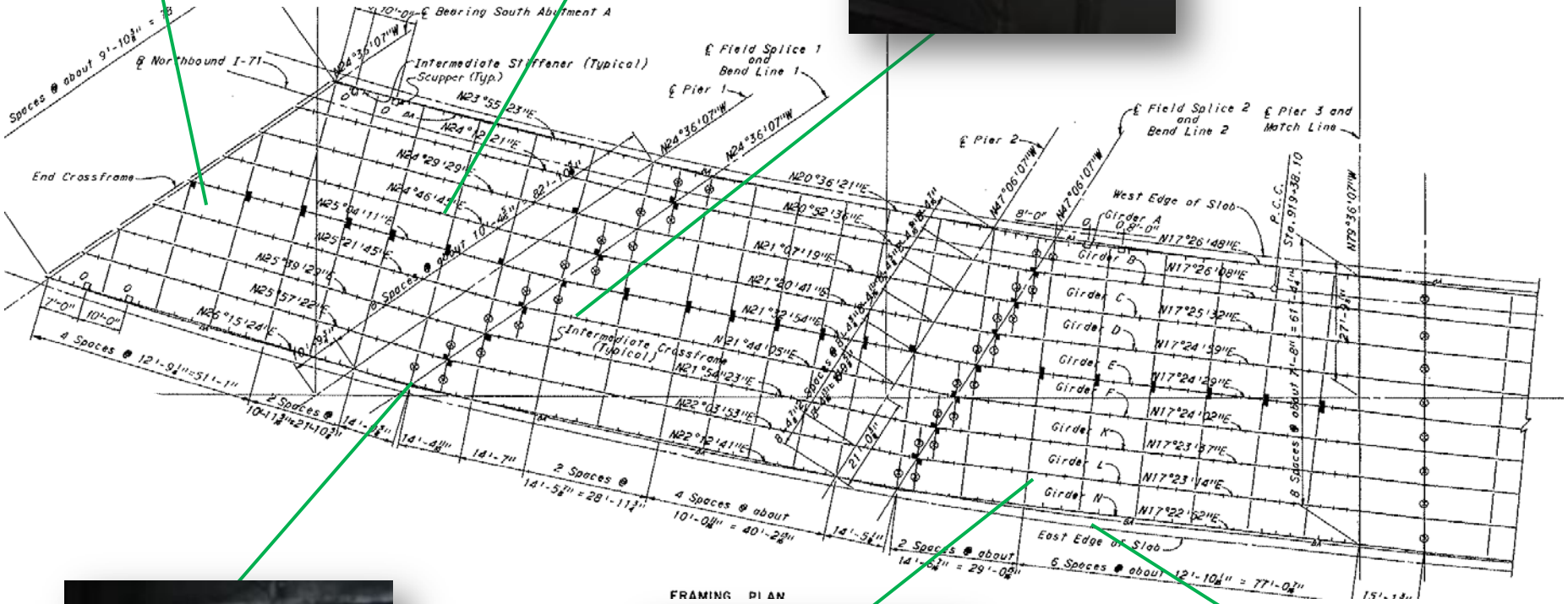
5. Future Inspection or Testing

- Note any changes in the leakage at the expansion joint glands. Replace the glands if the condition worsens.
- Continue to note the condition of the surface corrosion on the superstructure.
- Continue to watch the rotation at the following bearings:
  - North Abut AW 23°N Bearing G
  - North Abut AW 17°N Bearing H
  - North Abut AW 10°N Bearing J
  - North Abut AW 15°N Bearing K
  - North Abut AW 10°N Bearing M
  - Pier 1 16°N Bearing N
- Reset the bearing at the following location:
  - North Abut AW 23°N Bearing G
- Note any changes to the bearings at Pier 21AW.
- Continue to note the amount of corrosion on the fatigue prone details.
- Note any changes near the inclusions and gouge inside Pier 17.
- Note any changes to the cracks in the steel pier caps at Pier 18AE, 19AE, 20AE, and 21AE.

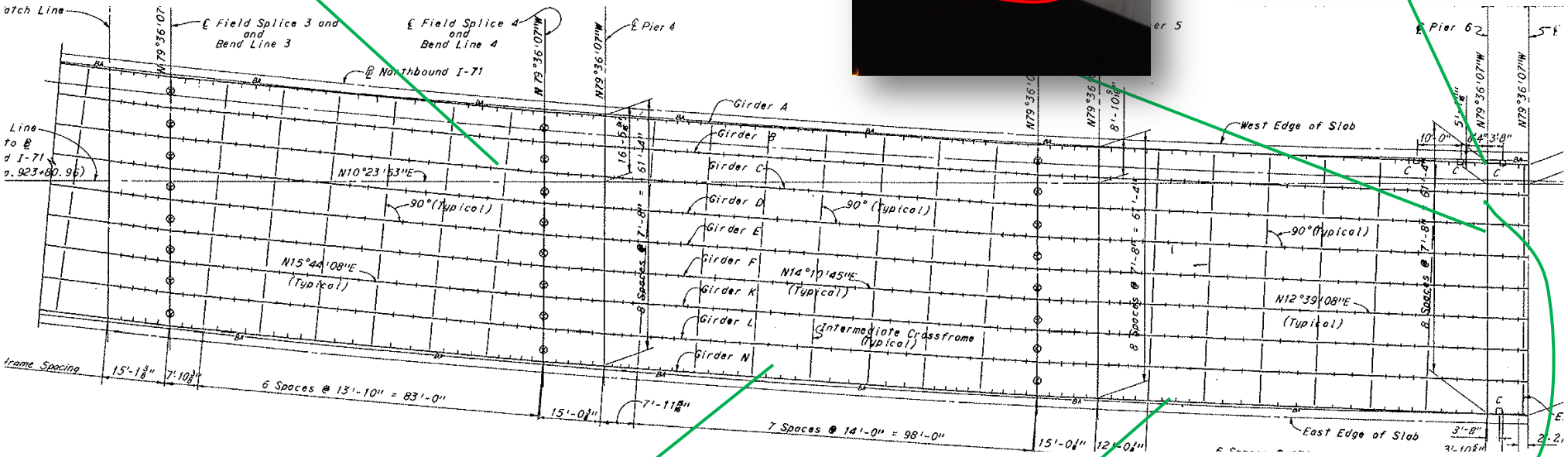
I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
A

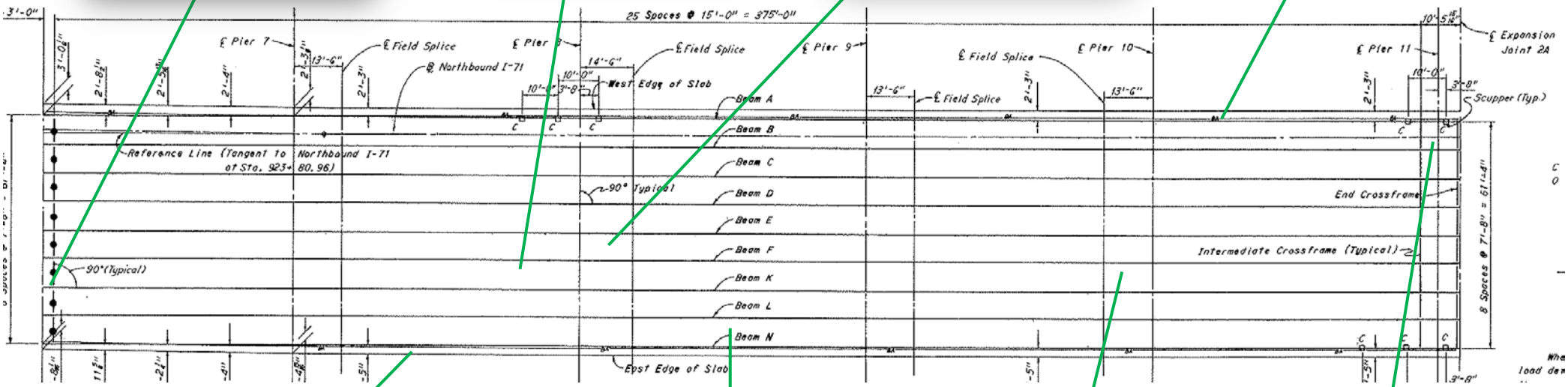
I-71 (Upper Deck)
Spans 1 - 3



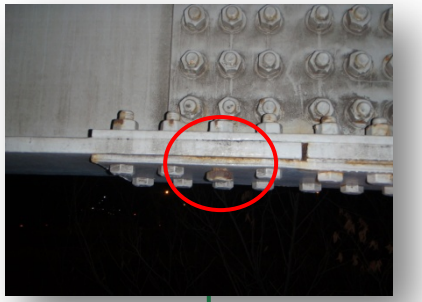
I-71 (Upper Deck)
Spans 4 - 6

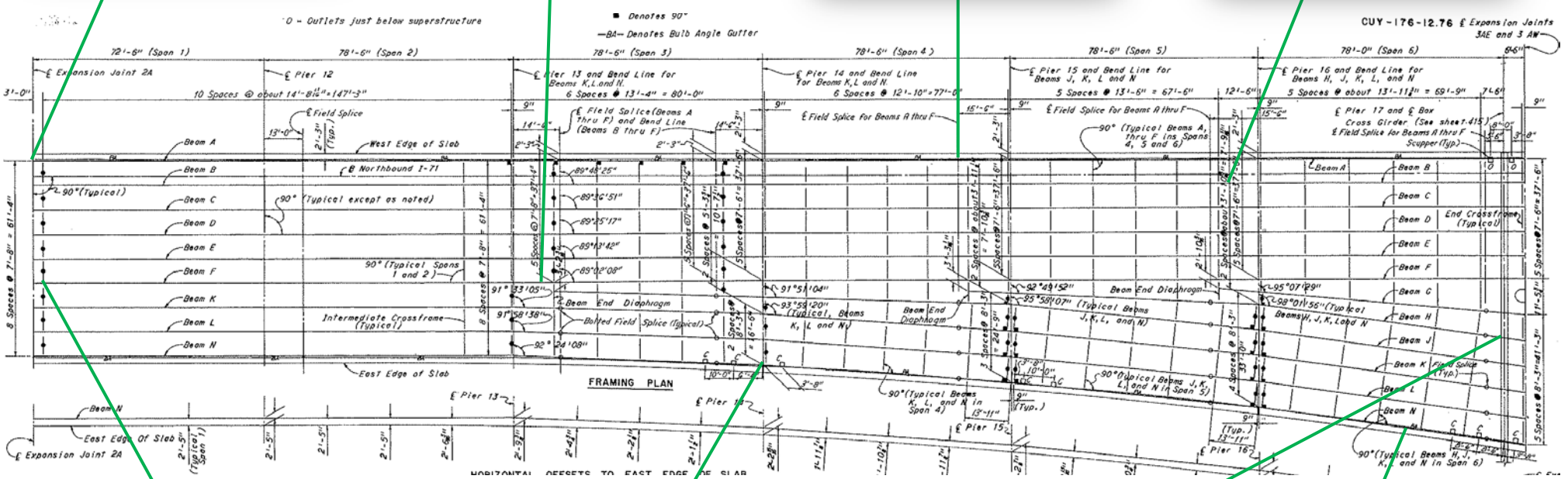


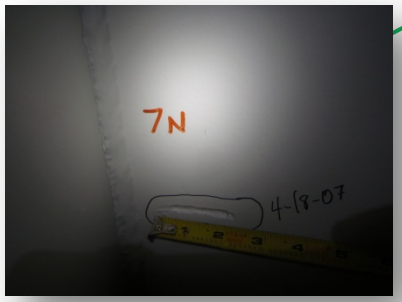
I-71 (Upper Deck)
Spans 7 - 11



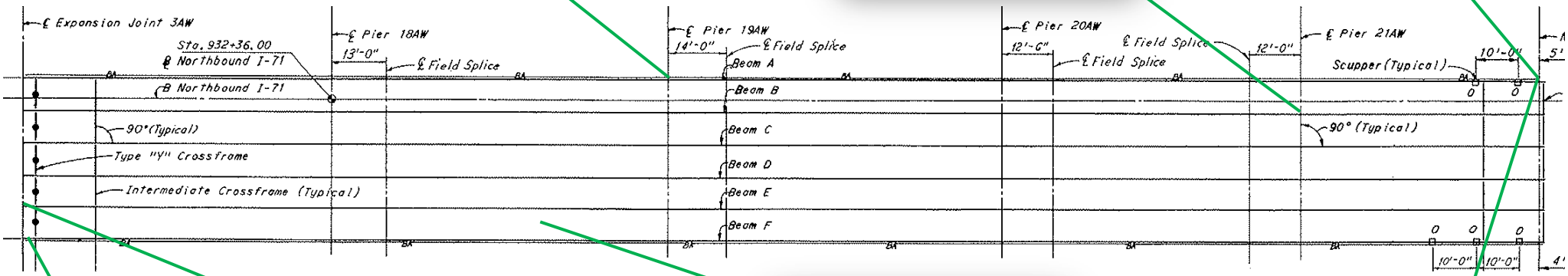
I-71 (Upper Deck)
Spans 12 - 17

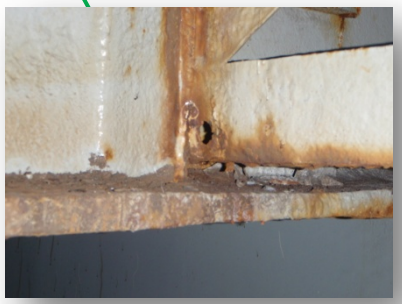




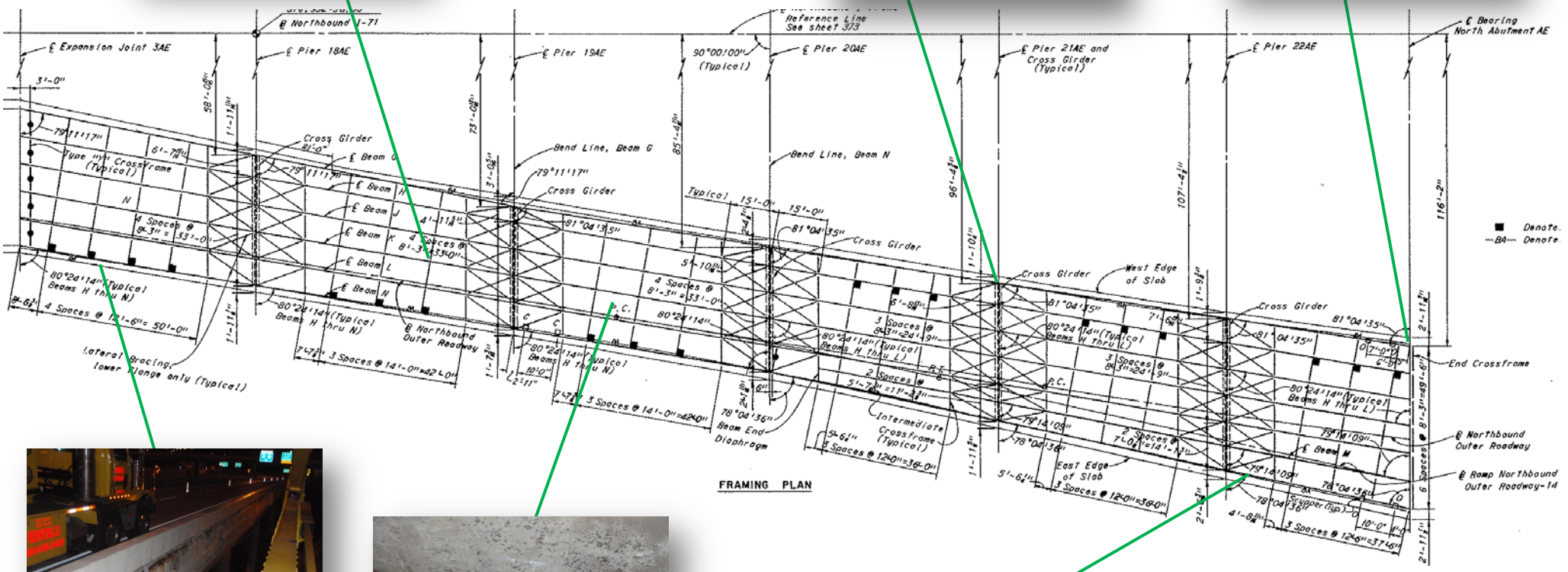


I-71 (Upper Deck)
Spans 18AW – 22AW





I-71 (Upper Deck)
Spans 18AE – 23AE



I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
B

OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE INSPECTION REPORT

STRUCTURE FILE NUMBER	CO	ROUTE	UNIT	YEAR BUILT
1 8 0 5 3 7 1	CUY	00071	1791	7/1/1969

DIST 12 BRIDGE TYPE 322 TYPE OF SERVICE 61 SR 176 (1328) Jennings Fwy

DECK			
1. Floor	2	2. Wearing Surface	2
3. Curbs, Sidewalks & Walkways		4. Median	
5. Railing	2	6. Drainage	2
7. Expansion Joints	2	**8. SUMMARY**	6
SUPERSTRUCTURE			
9. Alignment of Members	1	10. Beams/Girders/Slab	1
11. Diaphragms or Cross frames	2	12. Joists/Stringers	
13. Floorbeams		14. Floorbeam Connections	
15. Verticals		16. Diagonals	
17. End posts		18. Upper Chord	
19. Lower Chord		20. Gusset Plates	
21. Lateral Bracing	2	22. Sway Bracing	
23. Portals		24. Bearing Devices	2
25. Arch		26. Arch Columns or Hangers	
27. Spandrel Walls		**28. Protective Coating System (PCS)**	6
29. Pins/Hangers/Hinges	2	30. Fatigue Prone Detail (E & E')	1
31. Live Load Response *(E or S)*	S	**32. SUMMARY**	6
SUBSTRUCTURE			
33. Abutments	1	34. Abutment Seats	1
35. Piers	2	36. Pier Seats	1
37. Backwalls	2	38. Wingwalls	1
39. Fenders and Dolphins		40. Scour *(Insp Type – 1, 2, 3)*	
41. Slope Protection	1	**42. SUMMARY**	6
CULVERT			
43. General		44. Alignment	
45. Shape		46. Seams	
47. Headwall or Endwalls		48. Scour *(Insp Type - 1,2,3)*	
49. Abutments		**50. SUMMARY**	
CHANNEL			
51. Alignment		52. Protection	
53. Hydraulic Opening		**54. SUMMARY**	
APPROACHES			
55. Pavement	1	56. Approach Slabs	1
57. Guardrail	1	58. Relief Joint	1
59. Embankment	1	**60. SUMMARY**	7
GENERAL			
61. Navigation Lights		62. Warning Signs	4
63. Sign Supports	2	64. Utilities	
65. Vertical Clearance *(1, 2-change, N)*	1	66. **General Appraisal** & Operational Status	6 A

67. Inspected By, First & Last Name: Ann Griessmann — PE Number 068177 — Date 08/10/12

68. Reviewed By, First & Last Name — PE Number — Date

1	1	1	1	1	1	N	N

69. Survey (1, 0, N)

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE INSPECTION REPORT

BR-86 REV 2-95

1 8 0 5 3 7 1
STRUCTURE FILE NUMBER 7

BRIDGE NUMBER CUY 00071 1791 CUYAHOGA YEAR BUILT 1969
CO ROUTE UNIT

DIST 12 BRIDGE TYPE 322 TYPE SERVICE 61 SR 176 (1328) Jennings Fwy

For Full Report, Please See Bridge File. Curbs, Sidewalks, & Walkways do not exist so this item was removed.

DECK

FLOOR: The floor is in fair condition. There are hairline to narrow transverse cracks with efflorescence. A few areas show honeycombing and spalling with exposed rebar. There also are areas of delaminated concrete. Formwork was left in place in Span 20AW.

WEARING SURFACE: The wearing surface is in fair condition. There are areas of full-depth patches that are in good quality. There are transverse cracks spaced roughly at 10 ft intervals in the positive moment regions and at 6 ft intervals in the negative moment regions. There are isolated areas of map cracking, spalling, and deteriorated patches. Several RPMs are missing leaving shallow holes.

RAILING: The railing is in fair condition. There are several spalls along the toe of the barrier. Vertical cracks exist throughout. One large spall is in the rail between Pier 22AE and the North Abutment AE. Multiple spalls with exposed rebar are on the exterior face. There are longitudinal cracks with efflorescence on the exterior face.

DRAINAGE: The drains are in fair condition. Several drains are clogged. There are portions of the drain that have broken off in Spans 12, 17, 18AE, and 18AW.

EXPANSION JOINTS: The expansion joints are in fair condition. The glands show signs of minor leakage. Debris exists in most of the joints.

SUPERSTRUCTURE

BEAMS/GIRDERS: The beams and girders are in good condition. There is surface corrosion at various locations, especially on the bottom flange, splice bolts, and near the seated hinges. The area near the seated hinges has up to 1/16" section loss. A couple of loose bolts exist at the splice at Beam A, Span 17.

DIAPHRAGMS OR CROSSFRAMES: The crossframes are in fair condition. There are locations of missing bolts and corrosion holes. In Spans 7, 12, and 18AE, the crossbracing has tears where it's attached to the beams.

LATERAL BRACING: The lateral bracing is in fair condition. There's pack rust bowing the gusset plate in Span 18AE. There is a bent gusset plate in Span 19AE and a loose bolt in Spans 21AE and 23AE. This item was not previously rated, but they exist in Ramp AE.

BEARING DEVICES: The bearings are in fair condition. There are six bearings that are rocked ≥10°. One bearing is rocked beyond recall; North Abut AW, Bearing G. The bearings at 21AW have pack rust between the shims causing the masonry plate to be rotated.

PAINT: The paint is in satisfactory condition. There is greater than 5% and less than 10% of the total coating system has failed. Surface or freckled rust is prevalent throughout. There are random locations of peeling paint and surface corrosion.

PINS/HANGERS/HINGES: The seated hinges are in fair condition. The hinges have surface corrosion with the corrosion heavier at the groove. There is a loose bolt in Span 18AW on Beam E.

FATIGUE PRONE CONNECTIONS: The fatigue prone connections are in good condition. There is surface corrosion on the welds.

LIVE LOAD RESPONSE: The live load response is in satisfactory condition.

SUBSTRUCTURE

ABUTMENTS: The abutments are in good condition. There is light cracking.

ABUTMENT SEATS: The abutment seats are in good condition. The North Abut AW has debris around Bearings A & F.

PIERS: The piers are in fair condition. There are hairline to medium cracks, spalling with exposed rebar, and delaminations. Pier 17 is a steel box cap and has peeling paint and surface corrosion at various locations. Inside the box cap are steel inclusions and a gouge. Piers 18AW through Pier 22AW have cracks with drilled holes to arrest the cracks.

PIER SEATS: The pier seats are in good condition. There are multiple areas along the pier seat edge that are cracking.

BACKWALLS: The backwalls are in fair condition. The backwall is failing at the northwest corner of North Abut AW. There are holes in the backwall at both the northwest and northeast corners.

WINGWALLS: The wingwalls are in good condition. At the North Abut AW, the east wingwall has missing joint material. The west wingwall has an area of 1 ½' x 1 ½' spall with exposed rebar and the joint material is falling out.

APPROACHES

PAVEMENT: The pavement is in good condition. There are spalls and patches in the asphalt adjacent to the expansion joints.

APPROACH SLABS: The approach slabs are in good condition. There is a 6" diameter erosion hole developing at the west end of the abutment joint at the North Abut AW.

GUARDRAIL: The guardrail is in good condition. The impact attenuator near Pier 17 has been hit by a vehicle.

GENERAL

WARNING SIGNS: There are no bridge end markers.

SIGN SUPPORTS: The sign attached to Pier 15 has two loose bolts. This lowered the rating from a 1 to a 2.

I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX C

2012 Annual Inspection of the I-71 Bridge
CUY-71-1791 SFN 1805371

Supplemental Report of 2012 Inspection Results

Deck

The wearing surface of the bridge deck was visually inspected with deficiencies mapped, but not sounded as part of this inspection. The wearing surface is in overall satisfactory condition, providing a smooth riding surface. Large areas of this deck have been patched with good quality, full-depth concrete patches that are behaving similar to the original deck. Transverse cracking is spaced at roughly 10' intervals in the positive moment regions, and 6' intervals in the negative moment regions. There are isolated areas of map cracking, spalling, and deteriorating patches. There are also numerous locations where RPMs are missing from the wearing surface, leaving shallow holes in the wearing surface. See deck mapping for more detailed locations and sizes of deficiencies.

Railing

The barriers are in satisfactory condition, and are structurally sound. There are spalls and deteriorations along large portions of the toe of the barrier, especially on the low side of the structure. The barriers have few vertical cracks throughout the entire structure. One large spall with exposed rebar was noted between Pier 22-AE and North Abutment AE. The impact attenuator near Pier 17 has been hit by a vehicle. See deck mapping for more detailed locations of deficiencies.

Drainage System

The majority of the scuppers were clear at the deck level down to the first downspout bend. Clogged drains were noted on the east side of the bridge near Pier 11 and North Abument AE. See deck mapping for more detailed locations.

Expansion Joints

The expansion joints are in satisfactory condition. Expansion joints were measured perpendicular to the joints from edge of metal angle to edge of metal angle. The intermediate expansion joints vary in clear spacing from 2⅛" to 2½". The abutment expansion joints vary in clear spacing from 1½" to 2⅞". The glands showed signs of minor leakage. In general, there is debris in most of the joints and some map cracking adjacent to the joints. The concrete adjacent to Expansion Joint 2-A has been patched with an epoxy material. See attached table giving expansion joint measurements and temperatures when the measurements were taken.

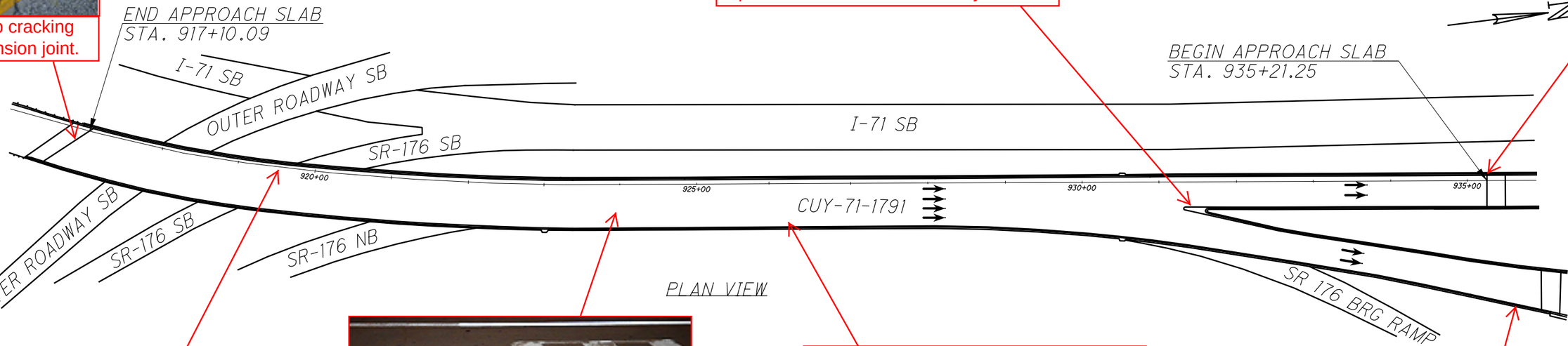
Recommendations

No major issues were found on the deck surface during the bridge inspection. It is recommended to repair the damaged barrier railing section noted above, and to clear the clogged scuppers noted above.

Typical map cracking along expansion joint.

Impact attenuator has been hit by vehicle.

Large erosion hole at approach slab near North Abutment AW.



PLAN VIEW

Typical spall at toe of barrier.

Typical failing asphalt patch.

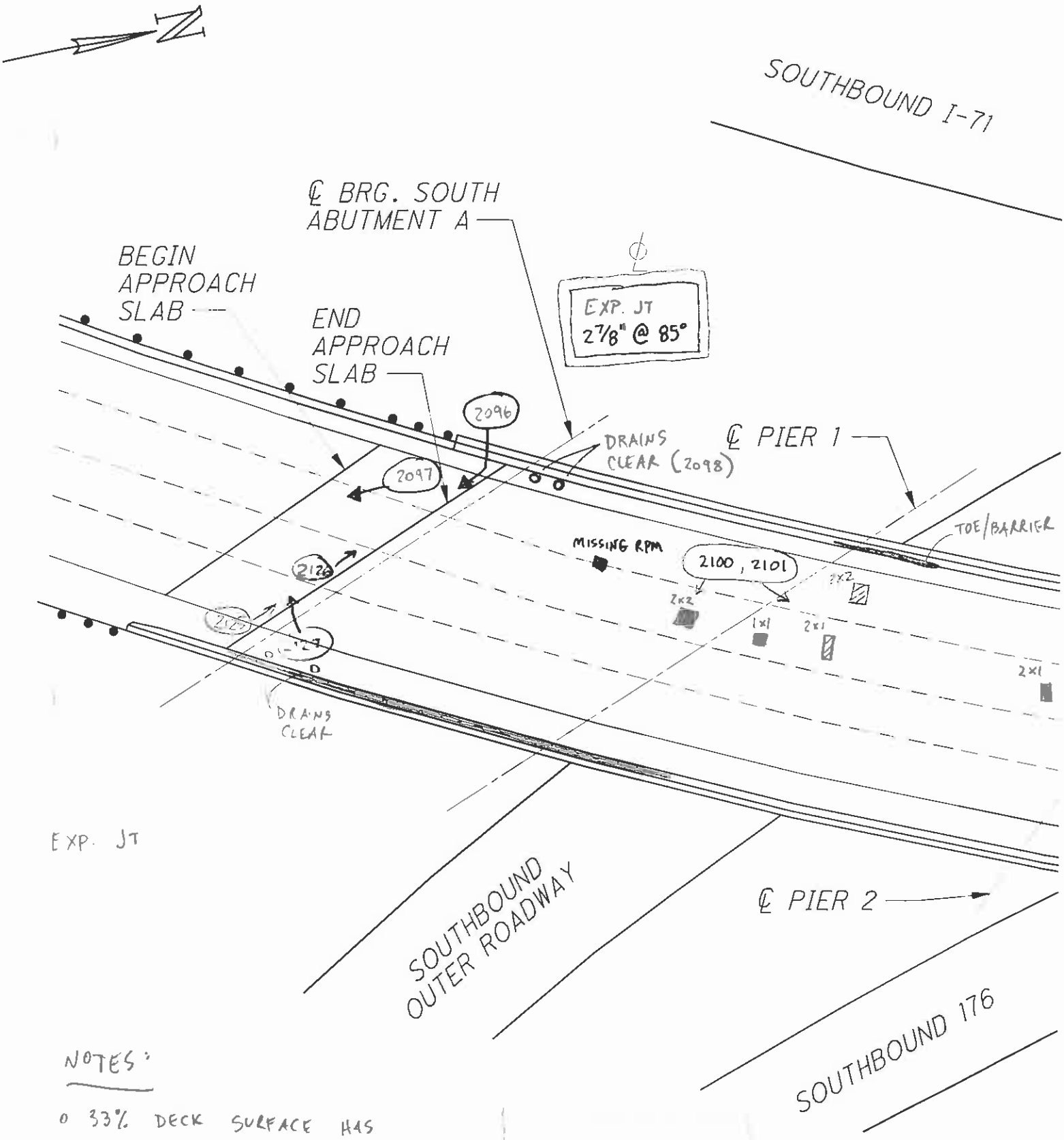
Typical clogged drain.

Spall with exposed reinforcing steel at barrier.

CUY-71-1791

EXPANSION JOINT MEASUREMENT TABLE

Expansion Joint	Measurement (in)	Temperature (°F)
CUY-71-1791		
South Abutment Joint A	2 7/8	85
Expansion Joint 1-A	2 1/8	85
Expansion Joint 2-A	2 1/4	85
Expansion Joint 3-AW	2 1/4	80
Expansion Joint 3-AE	2 1/2	75
North Abutment Joint AW	2 1/8	80
North Abutment Joint AE	1 1/2	75
CUY-176-1331		
South Abutment Joint B	1 5/8	82
Expansion Joint 1-B	1 3/4	82
Expansion Joint 2-BW	1 7/8	76
Expansion Joint 2-BE	1 7/8	74
North Abutment Joint BW	2 1/4	72
Expansion Joint 3-BE	2 1/2	70
North Abutment Joint BE	2 5/8	70



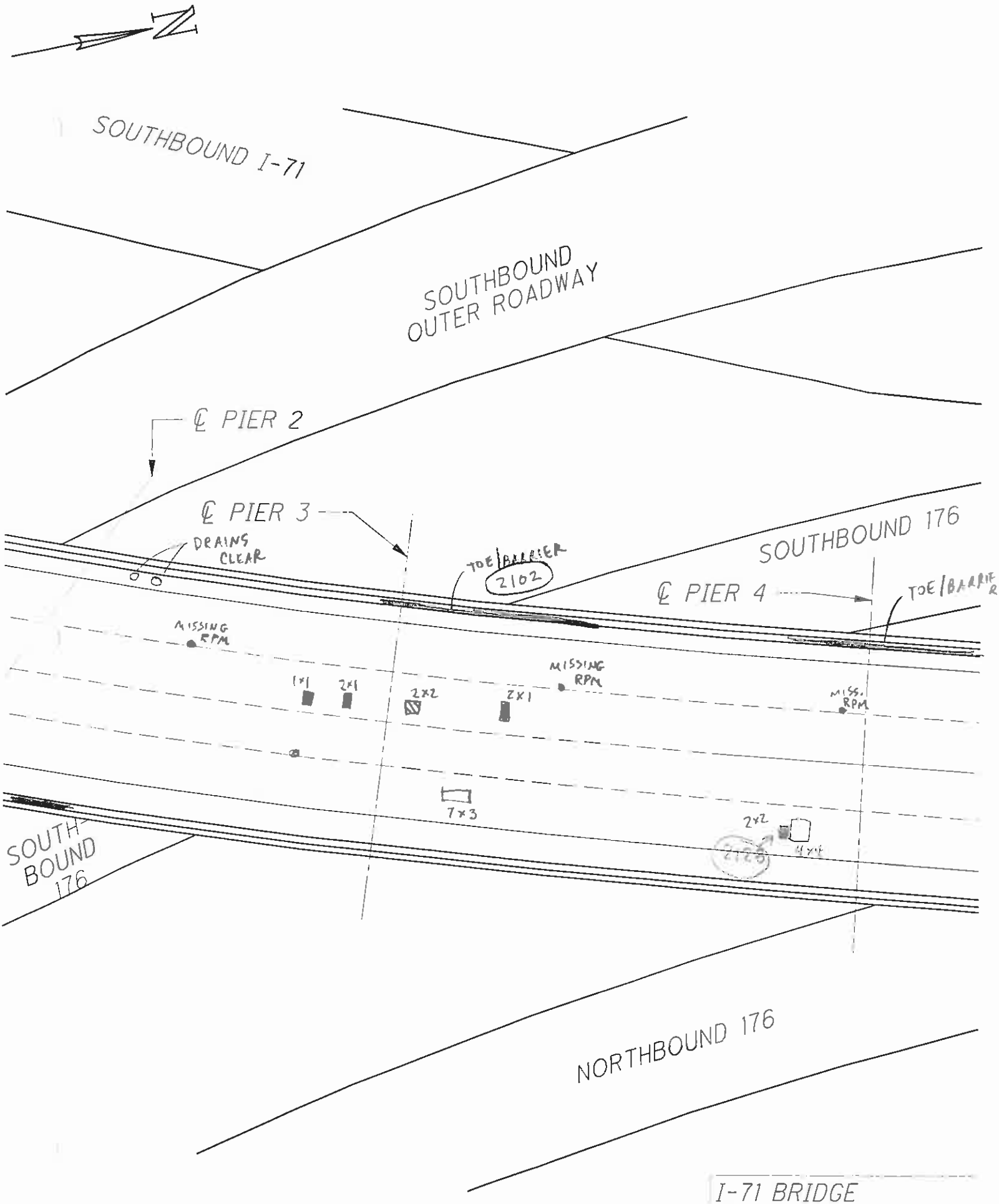
NOTES:

- 33% DECK SURFACE HAS BEEN PATCHED W/ CONCRETE (GOOD CONDITION) 2099
- TRANSVERSE CRACKS @ 10' (+M) 6' (-M)
- EXP. JT. GLAND IN GOOD CONDITION (NO TEARS OR DEBRIS)

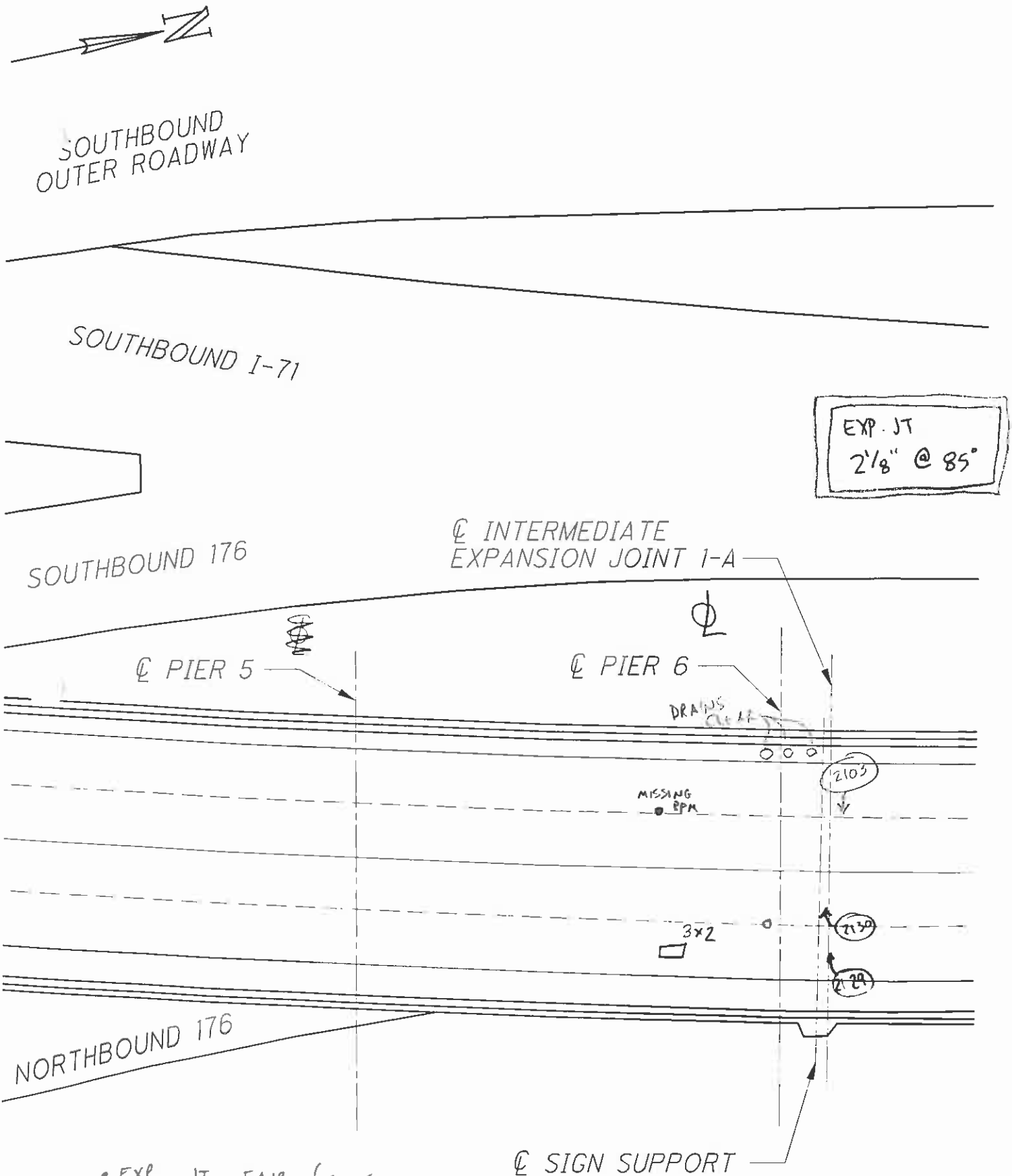
LEGEND

- ▭ - FAILING CONC. PATCH
- ▨ - ASPH. PATCH
- ■ - SPALL
- ● - MISSING RPM

I-71 BRIDGE
PLAN VIEW
SECTION 1 OF 9

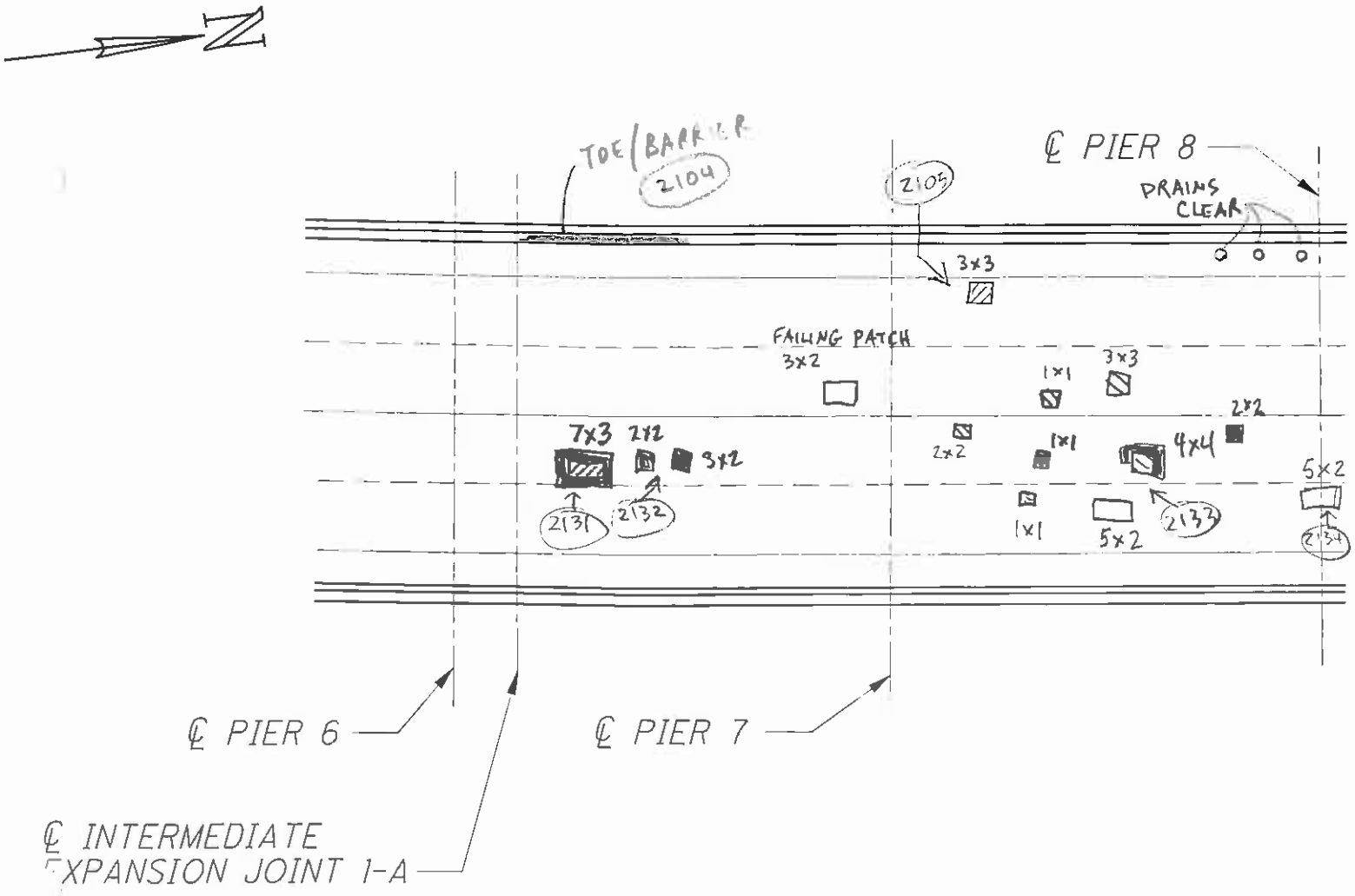


I-71 BRIDGE
PLAN VIEW
SECTION 2 OF 9

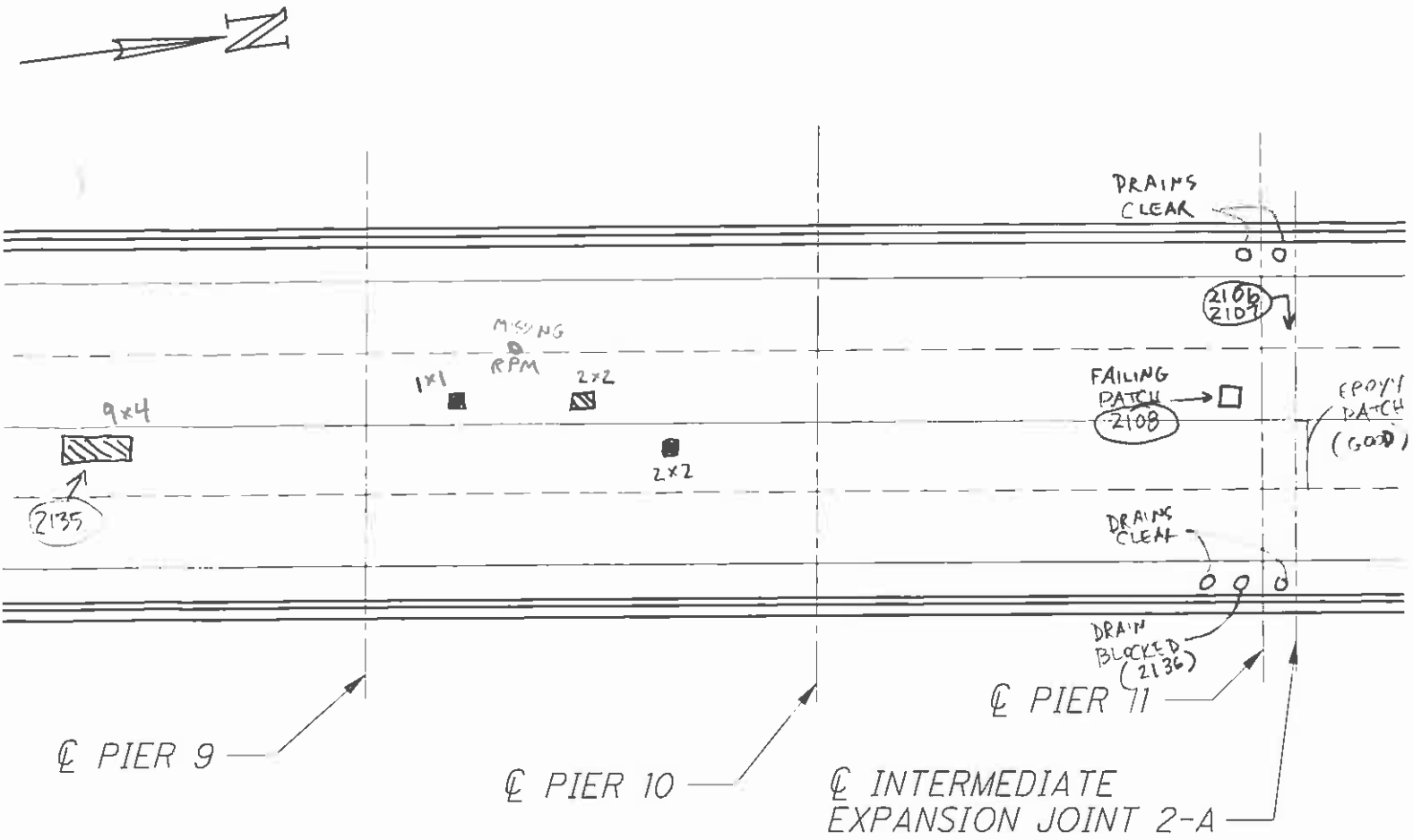


• EXP. JT. FAIR (SOME TEARS IN GLAND & DEBRIS BUILDUP)

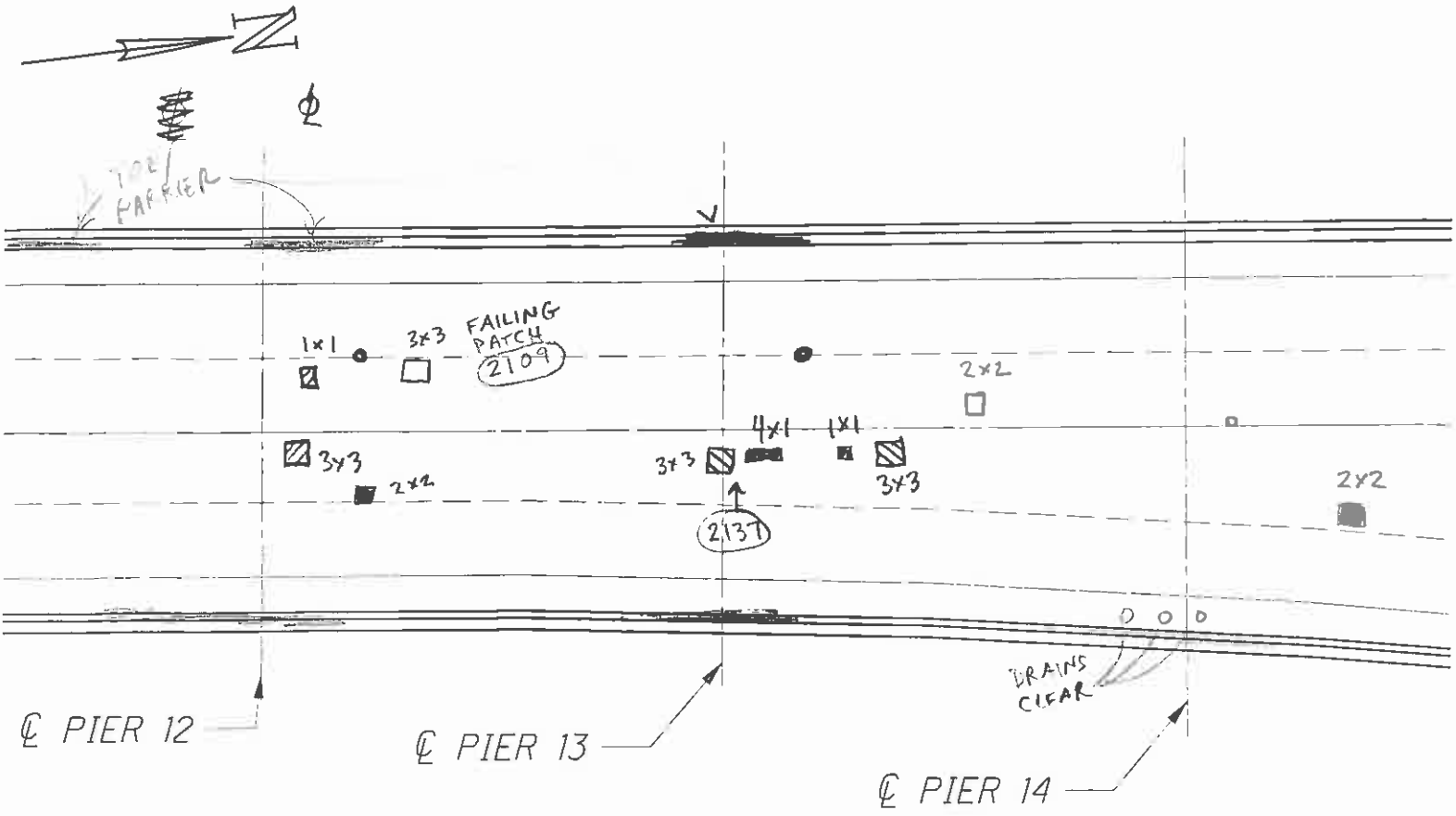
I-71 BRIDGE
PLAN VIEW
SECTION 3 OF 9



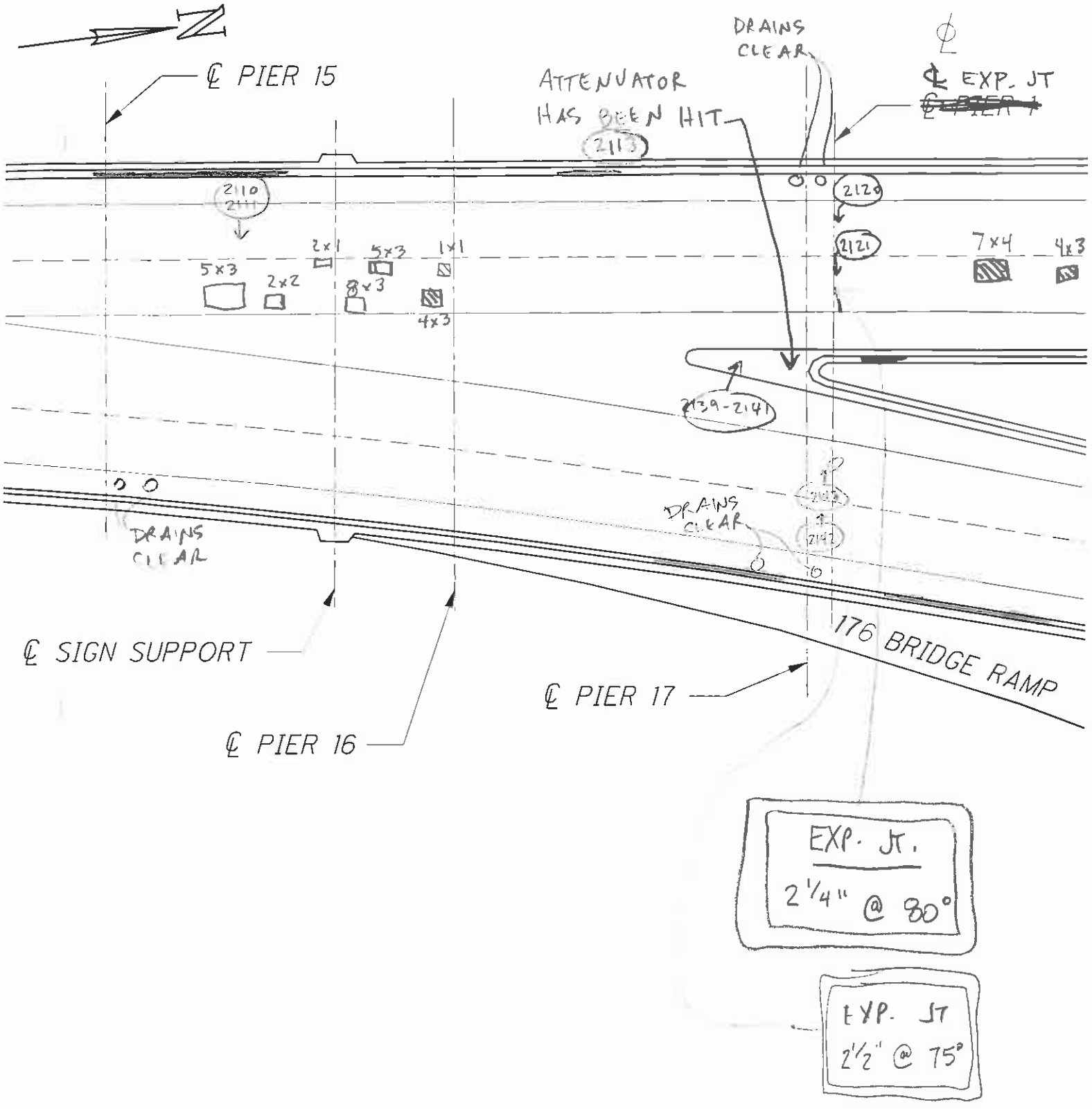
I-71 BRIDGE
PLAN VIEW
SECTION 4 OF 9



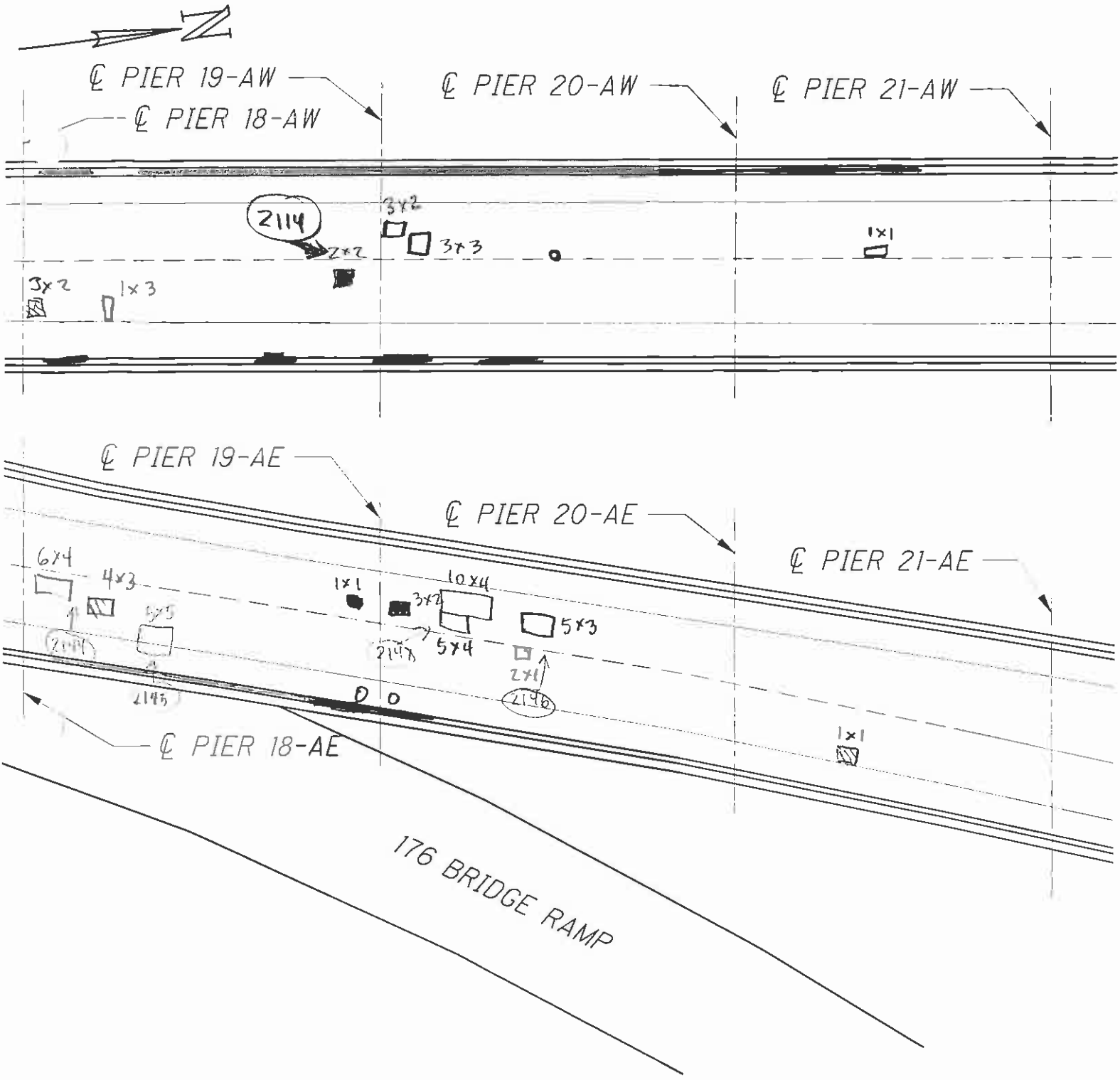
I-71 BRIDGE
PLAN VIEW
SECTION 5 OF 9



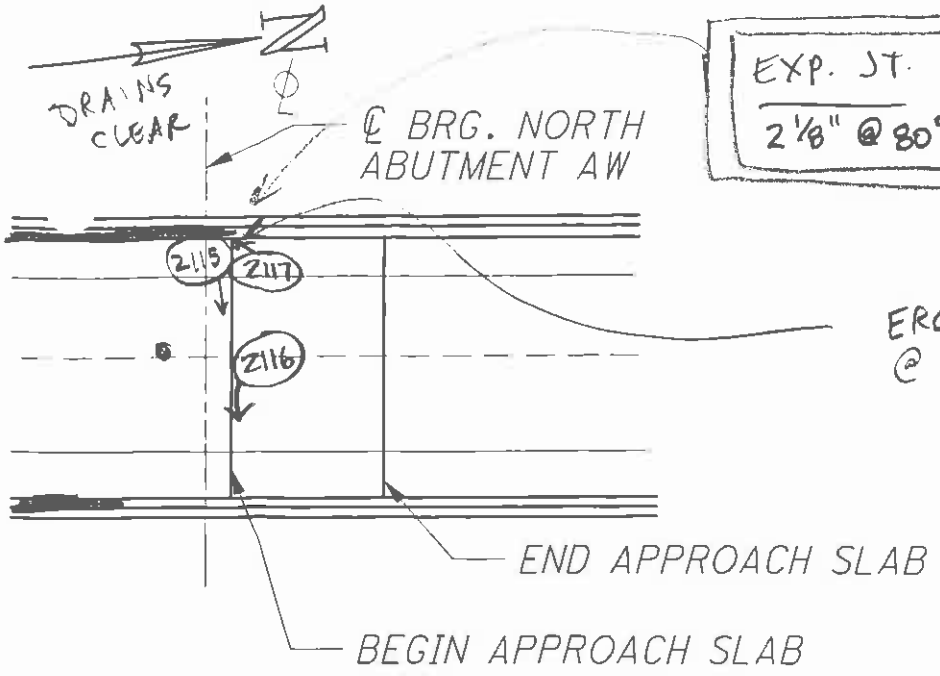
I-71 BRIDGE
PLAN VIEW
SECTION 6 OF 9

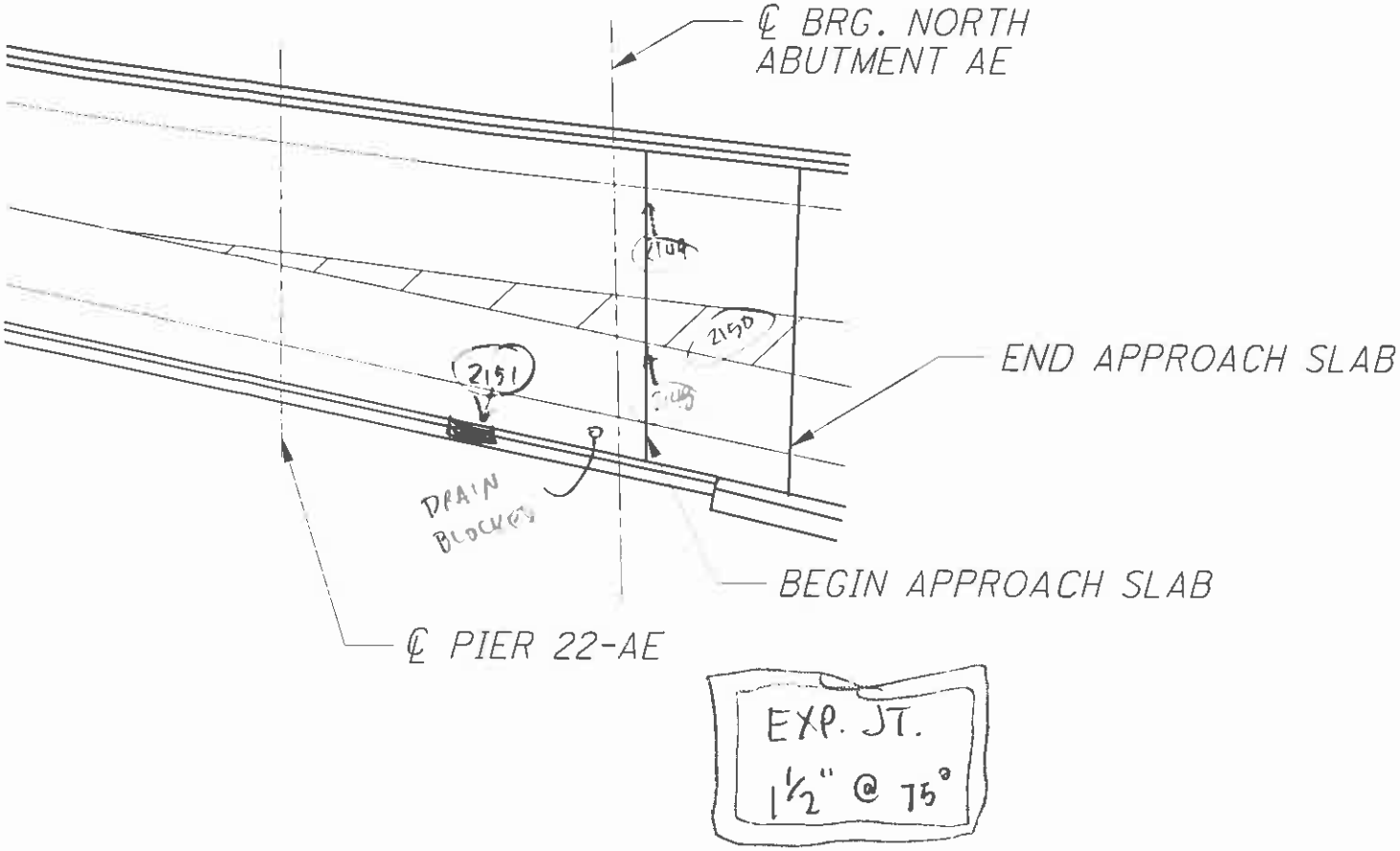


I-71 BRIDGE
PLAN VIEW
SECTION 7 OF 9



I-71 BRIDGE
PLAN VIEW
SECTION 8 OF 9





I-71 BRIDGE
PLAN VIEW
SECTION 9 OF 9

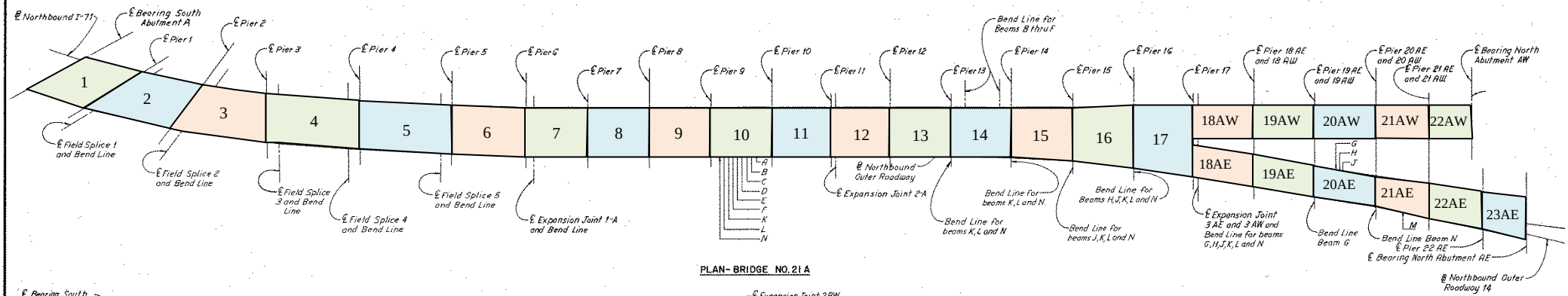
I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
D

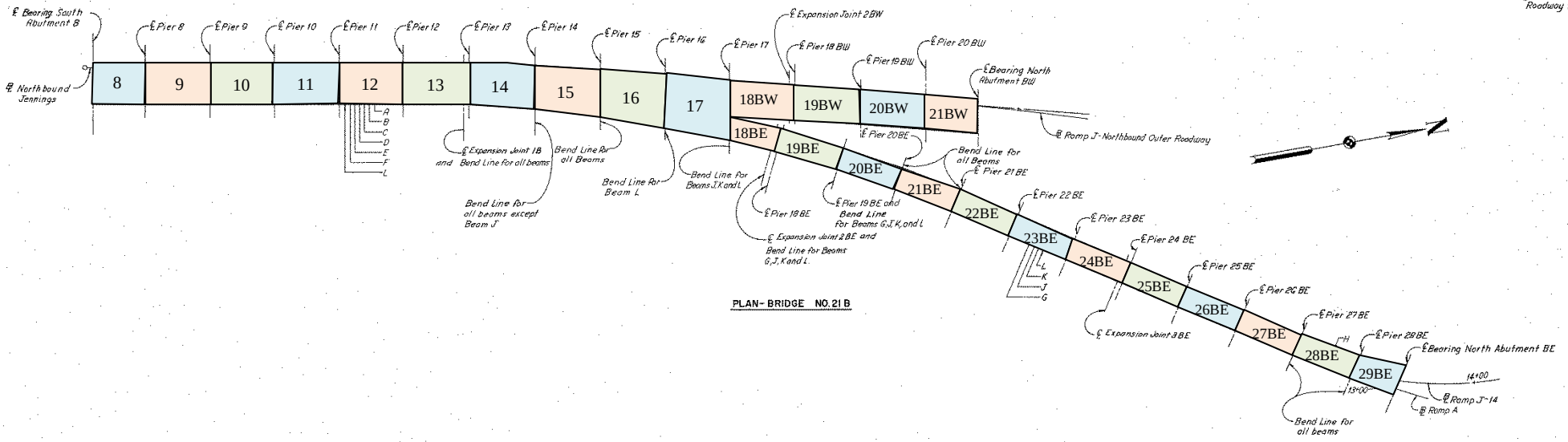
FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

408
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



PLAN - BRIDGE NO. 21 A



PLAN - BRIDGE NO. 21 B

H.N.T.B. BRIDGE NOS. 21 A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SCHEMATIC FRAMING PLAN

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

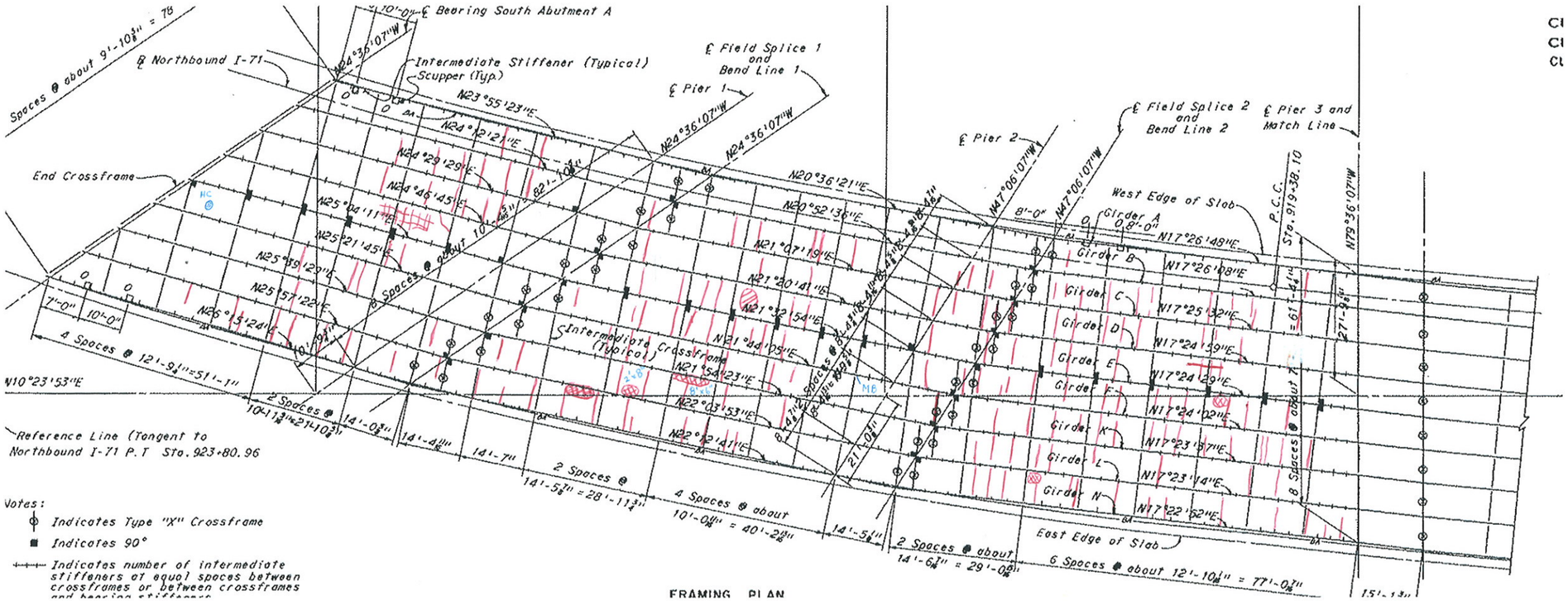
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.M.C.		JMC	RWP	
DATE 12-11-64	DATE	DATE 12-15-64	DATE 12-22-64	SHEET 408

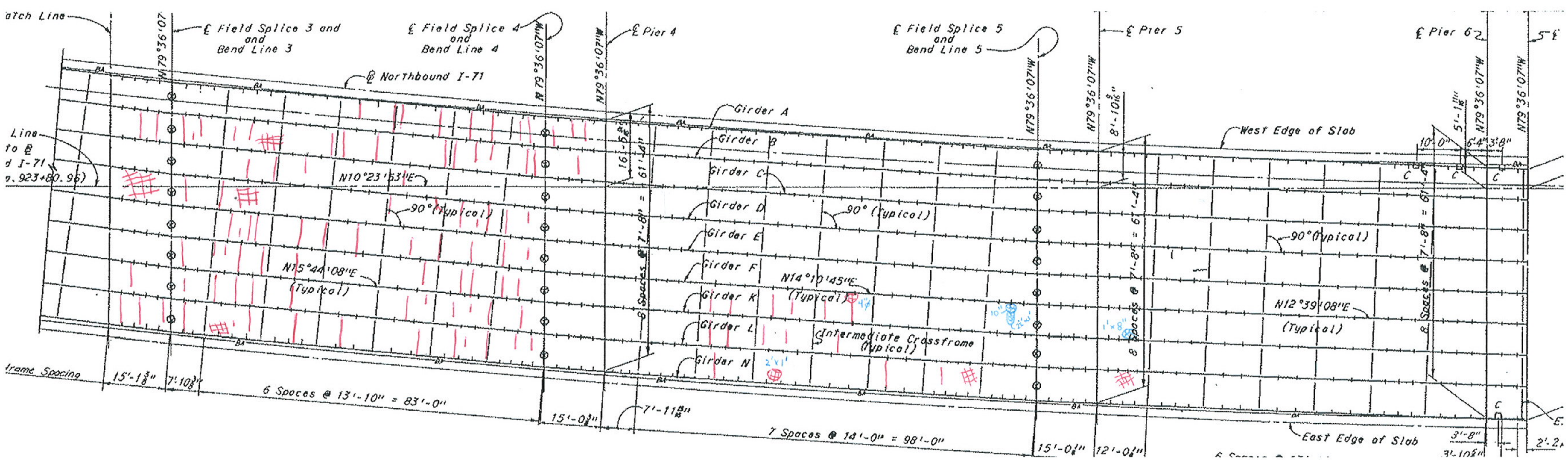
I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
E

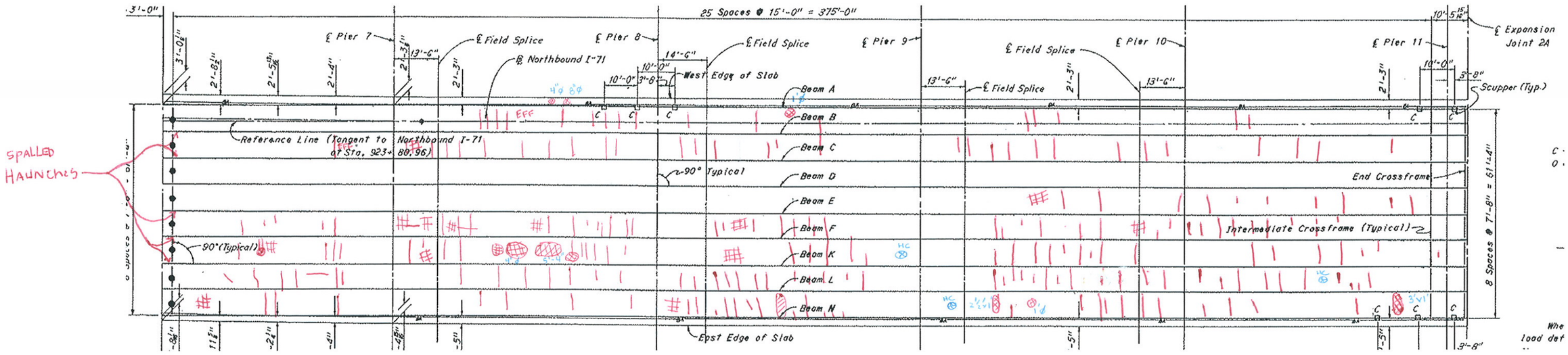


FRAMING PLAN

DELAMINATION
SPALL
HC = HONEYCOMB
MB = MISSING Bolt



Match Line
℄ Field Splice 3 and Bend Line 3
℄ Field Splice 4 and Bend Line 4
℄ Pier 4
℄ Field Splice 5 and Bend Line 5
℄ Pier 5
℄ Pier 6
℄ Northbound I-71
N79°36'07"W
Girder A
Girder B
Girder C
Girder D
Girder E
Girder F
Girder K
Girder L
Girder N
N10°23'53"E
N15°44'08"E (Typical)
N14°10'45"E (Typical)
N12°39'08"E (Typical)
90° (Typical)
Intermediate Crossframe (Typical)
West Edge of Slab
East Edge of Slab
8 Spaces @ 7'-8" = 61'-4"
6 Spaces @ 13'-10" = 83'-0"
7 Spaces @ 14'-0" = 98'-0"
15'-1 3/8"
7'-10 3/8"
15'-0 3/8"
7'-11 5/8"
15'-0 1/4"
12'-0 1/4"
8'-10 3/16"
10'-0"
3'-8"

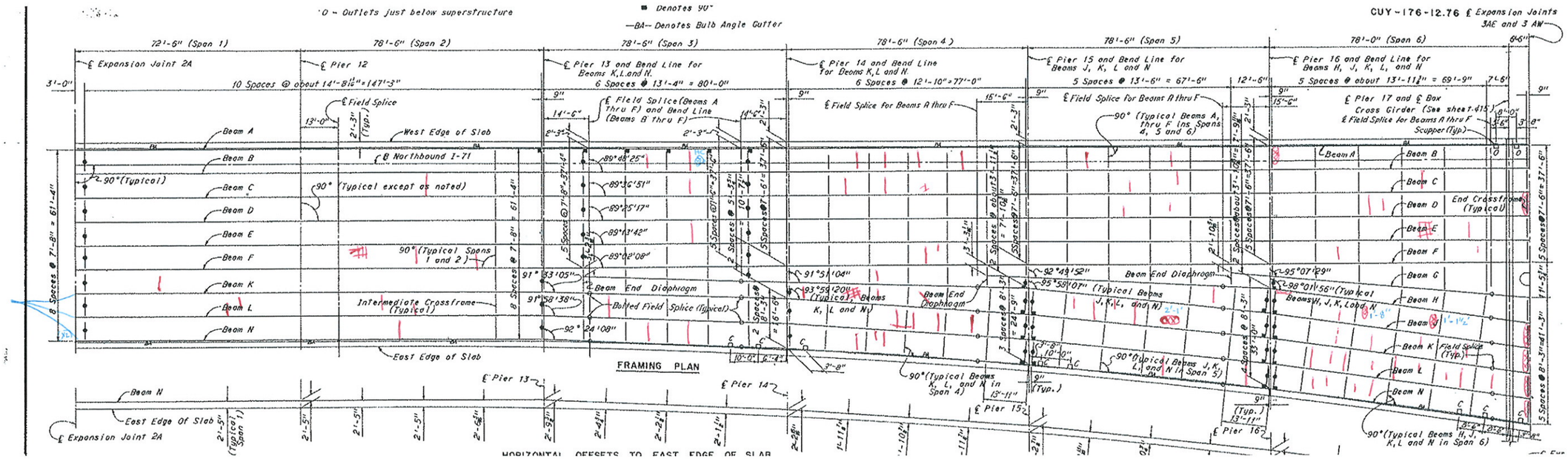

3'-0"
25 Spaces @ 15'-0" = 375'-0"
℄ Pier 7
℄ Field Splice
℄ Pier 8
℄ Field Splice
℄ Pier 9
℄ Field Splice
℄ Pier 10
℄ Pier 11
℄ Expansion Joint 2A
℄ Northbound I-71
West Edge of Slab
Scupper (Typ.)
Beam A
Beam B
Beam C
Beam D
Beam E
Beam F
Beam K
Beam L
Beam N
Reference Line (Tangent to Northbound I-71 at Sta. 923+80.96)
90° Typical
End Crossframe
Intermediate Crossframe (Typical)-2
90° (Typical)
East Edge of Slab
SPALLED HAUNCHES
8 Spaces @ 71'-8" = 61'-4"

CUY-176-12.76 ℄ Expansion Joints 3AE and 3 AW

'O' - Outlets just below superstructure

■ Denotes 90°

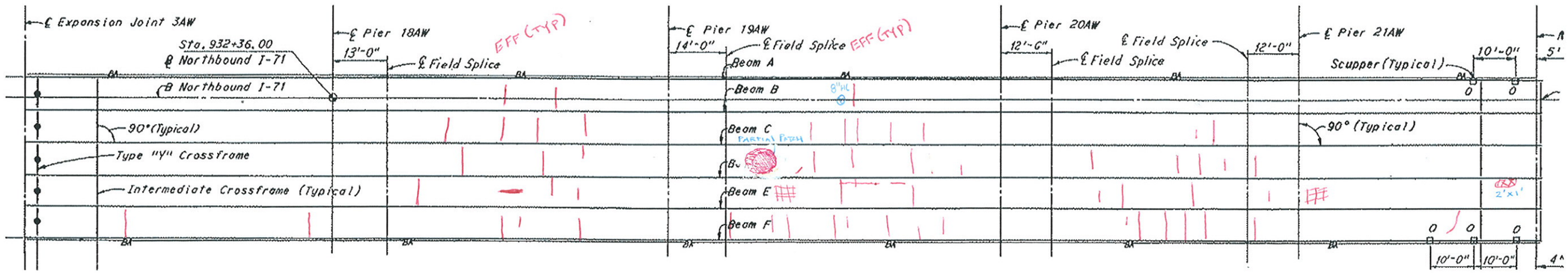
—BA— Denotes Bulb Angle Gutter

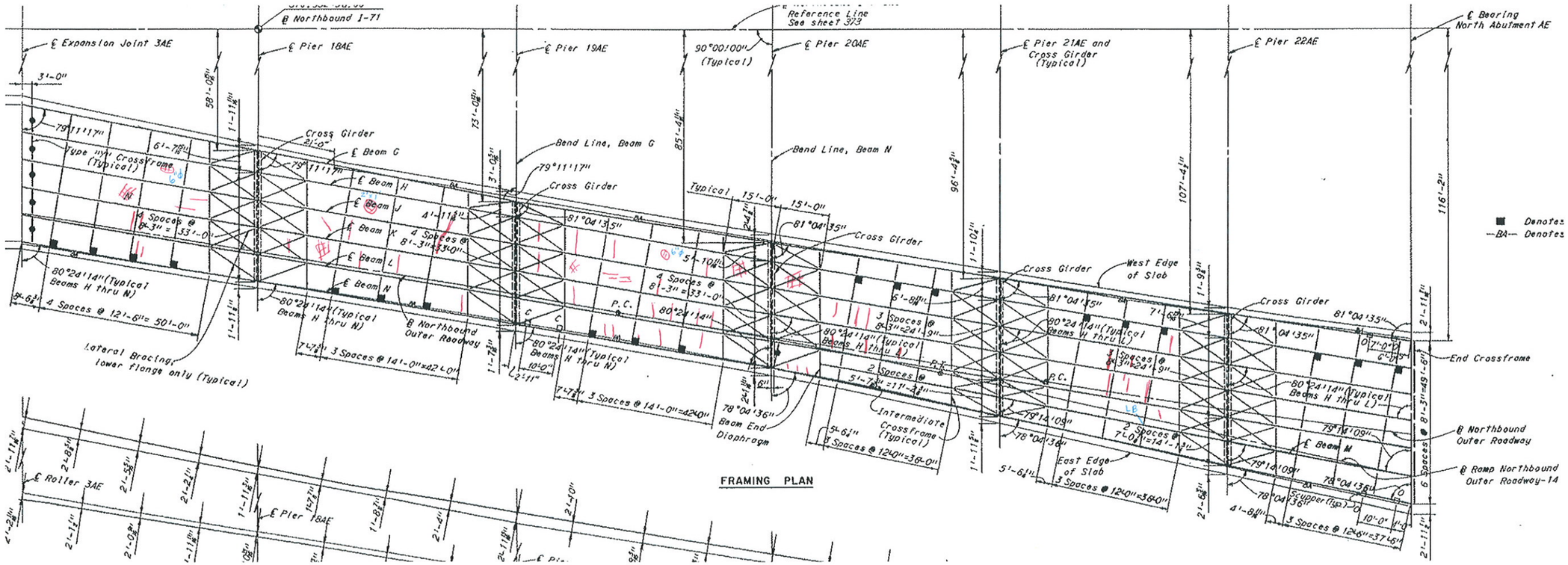


FRAMING PLAN

HORIZONTAL OFFSETS TO EAST EDGE OF SLAB

MB


℄ Expansion Joint 3AW
Sta. 932+36.00
℄ Northbound I-71
℄ Northbound I-71
℄ Pier 18AW
13'-0"
℄ Field Splice
EFF (TYP)
℄ Pier 19AW
14'-0"
℄ Field Splice
EFF (TYP)
Beam A
Beam B
8"HL
℄ Pier 20AW
12'-6"
℄ Field Splice
℄ Field Splice
12'-0"
℄ Pier 21AW
Scupper (Typical)
10'-0"
5'
90° (Typical)
Type "Y" Crossframe
Intermediate Crossframe (Typical)
Beam C
PARTIAL PATCH
Beam E
Beam F
90° (Typical)
2"x1"
10'-0"
10'-0"
4'



FRAMING PLAN

LB = LOOSE BOLT

I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
F

FED. RD DIVISION	STATE	PROJECT	
3	OHIO		

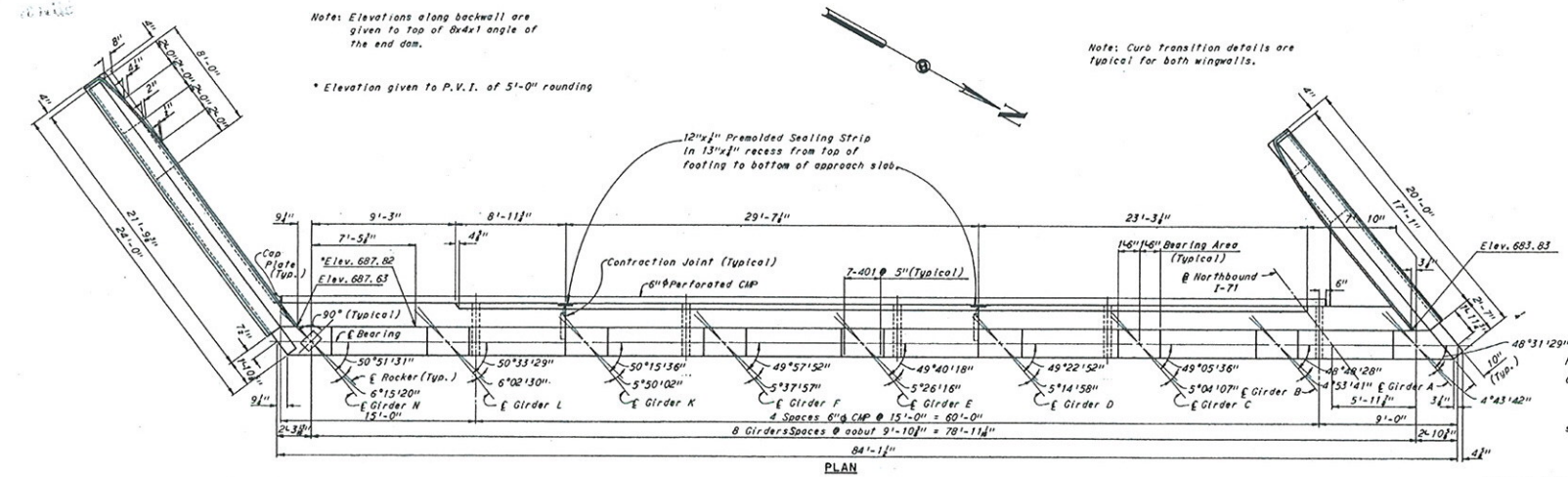
374
646

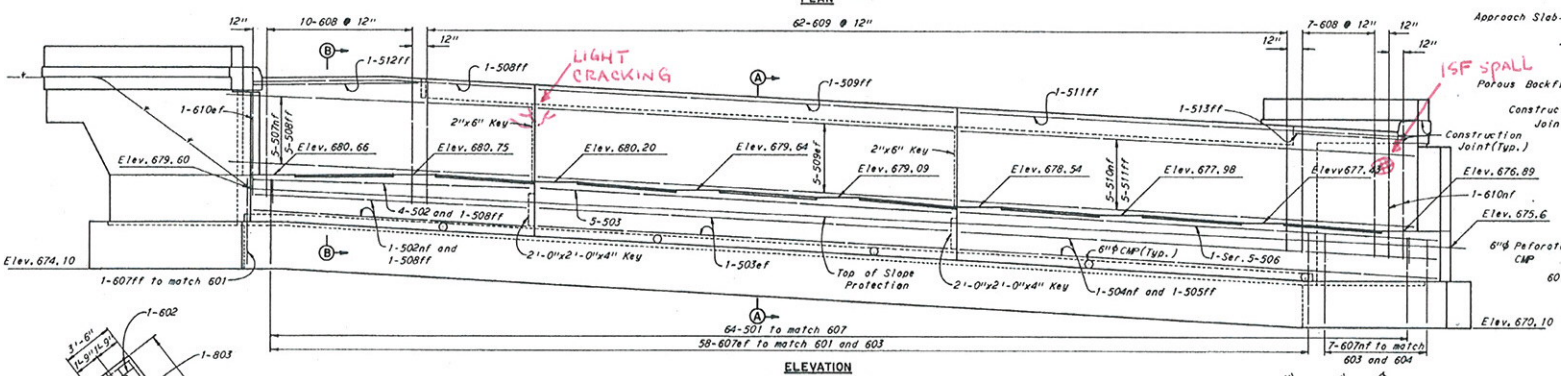
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

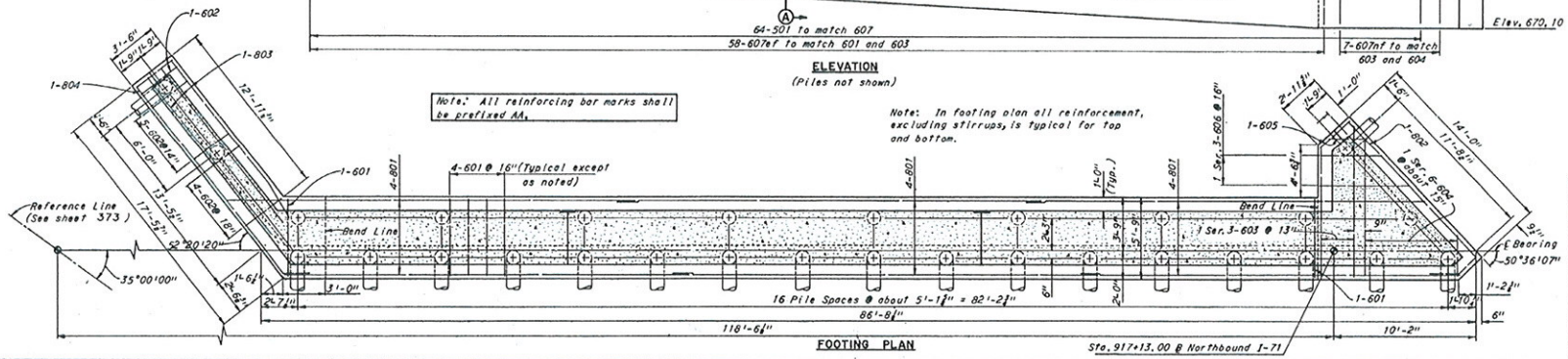
Note: Elevations along backwall are given to top of 6x4x1 angle of the end dam.

* Elevation given to P.V.I. of 5'-0" rounding

Note: Curb transition details are typical for both wingwalls.

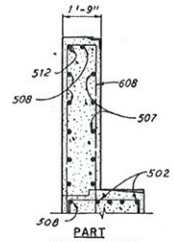




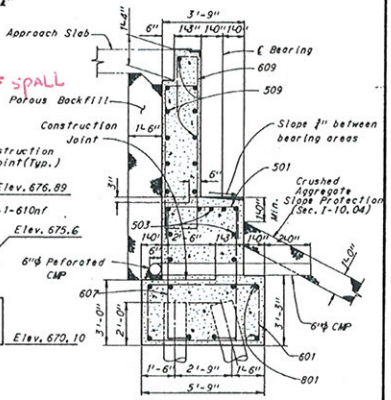


Note: All reinforcing bar marks shall be prefixed AA.

Note: In footing plan all reinforcement, excluding stirrups, is typical for top and bottom.



Notes:
All piles shall be 12"ϕ C.I.P. Reinforced Concrete.
The following abbreviations are used:
nf = near face of = each face
ff = far face
For wingwall details and additional notes see sheet 375.



H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

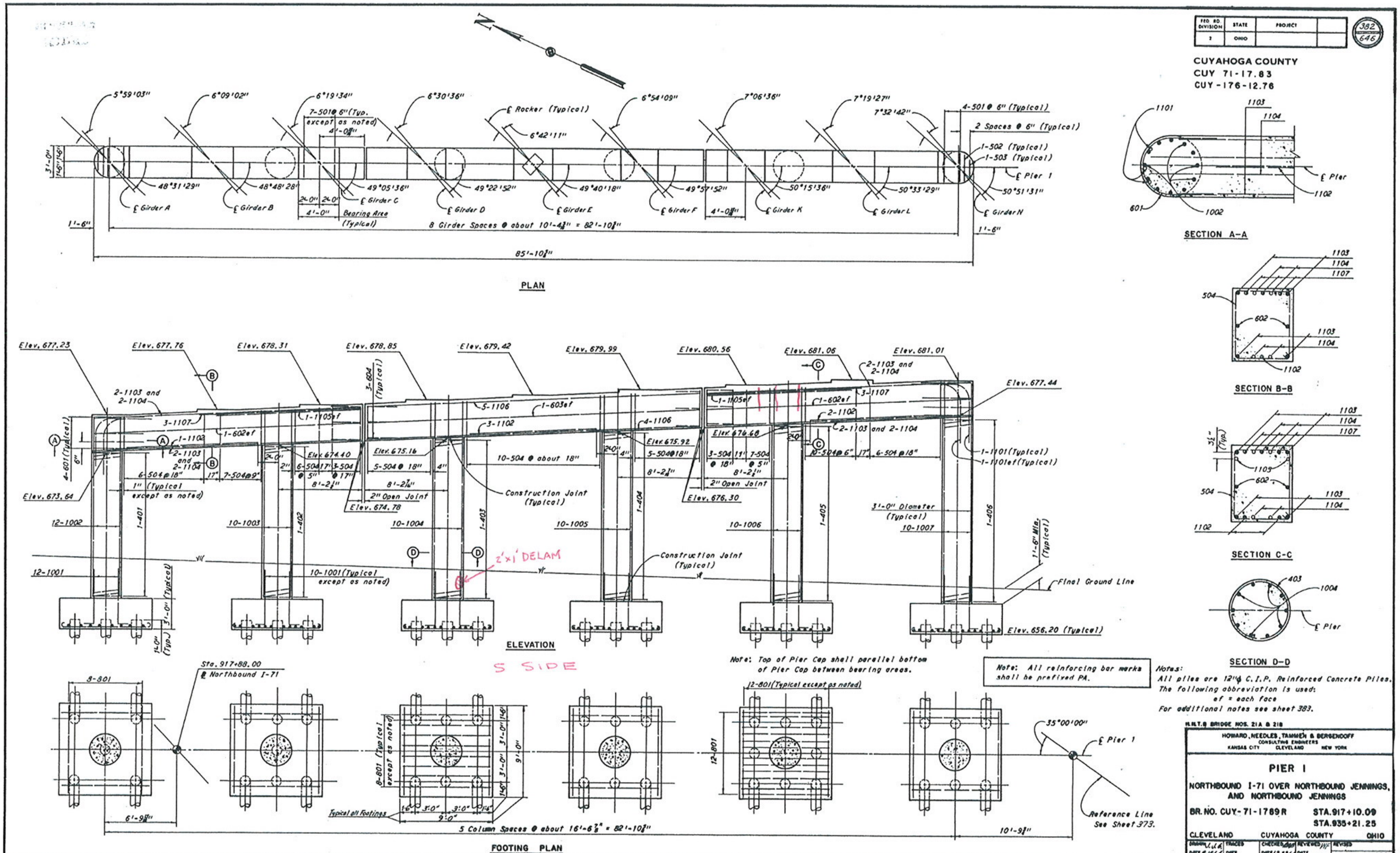
SOUTH ABUTMENT-A

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JMC		DATE 12-22-84	DATE 12-22-84	
DATE 12-20-84	DATE			SHEET 374



FED. RD. DIVISION 3 STATE OHIO PROJECT
382
646
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
PLAN
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
ELEVATION
FOOTING PLAN
S SIDE
2'x1' DELAM
Elev. 677.23
Elev. 677.76
Elev. 678.31
Elev. 678.85
Elev. 679.42
Elev. 679.99
Elev. 680.56
Elev. 681.06
Elev. 681.01
Elev. 677.44
Elev. 673.64
Elev. 674.40
Elev. 675.16
Elev. 674.78
Elev. 675.92
Elev. 676.68
Elev. 676.30
Elev. 656.20 (Typical)
8 Girder Spaces @ about 10'-4 3/8" = 82'-10 7/8"
85'-10 7/8"
5 Column Spaces @ about 16'-6 7/8" = 82'-10 7/8"
Construction Joint (Typical)
2" Open Joint
3'-0" Diameter (Typical)
Final Ground Line
Sta. 917+88.00
℄ Northbound I-71
Typical all Footings
Reference Line See Sheet 373.
℄ Pier 1
Note: Top of Pier Cap shall parallel bottom of Pier Cap between bearing areas.
Note: All reinforcing bar marks shall be prefixed PA.
Notes:
All piles are 12"⌀ C.I.P. Reinforced Concrete Piles.
The following abbreviation is used:
ef = each face
For additional notes see sheet 383.
H.H.T.B BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIER I
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R
STA. 917+10.09
STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 382

DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

BRIDGE NOS. 21A & 21B

HOWARD, NEEGER, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 1

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-17.89R STA.917+10.09
STA.955+21.25

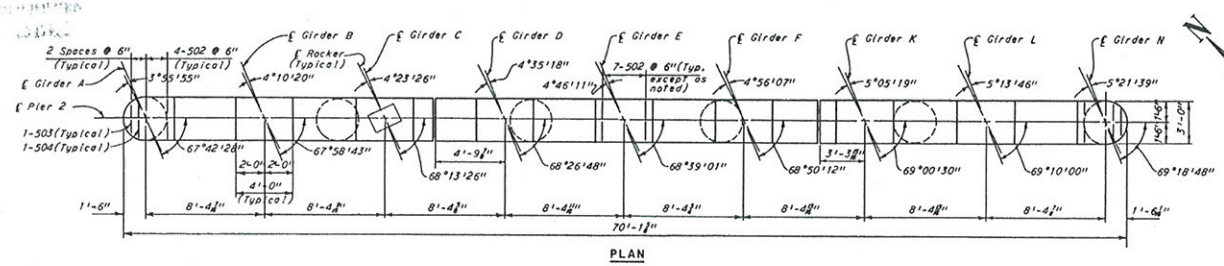
CLEVELAND	CUYAHOGA COUNTY	OHIO
DESIGNED	DETAILED	CHECKED
DATE	DATE	DATE

SHEET 382

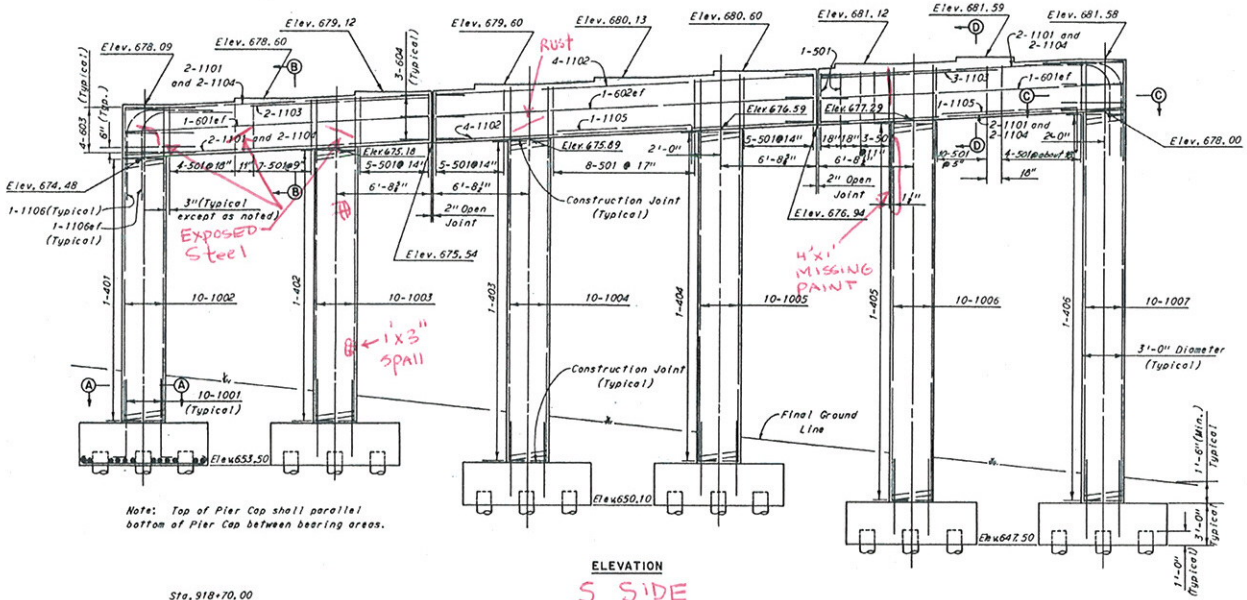
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

383
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



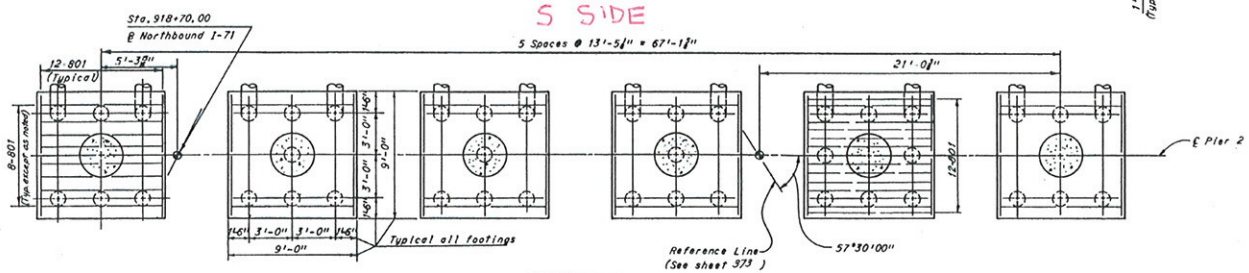
PLAN



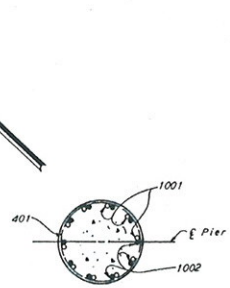
Note: Top of Pier Cap shall parallel bottom of Pier Cap between bearing areas.

ELEVATION

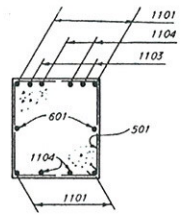
5 SIDE



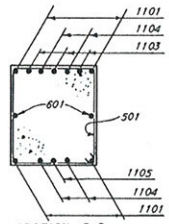
FOOTING PLAN



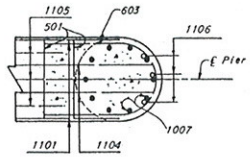
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

Notes:
All piles are 12"ϕ C.I.P. Reinforced Concrete.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile layout dimensions are measured along bottom of footing.
For Reinforcement Schedule and Bar Bending Diagrams see Sheet 452.
The following abbreviation is used:
ef = each face

Note: All reinforcing bar marks shall be prefixed PB.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

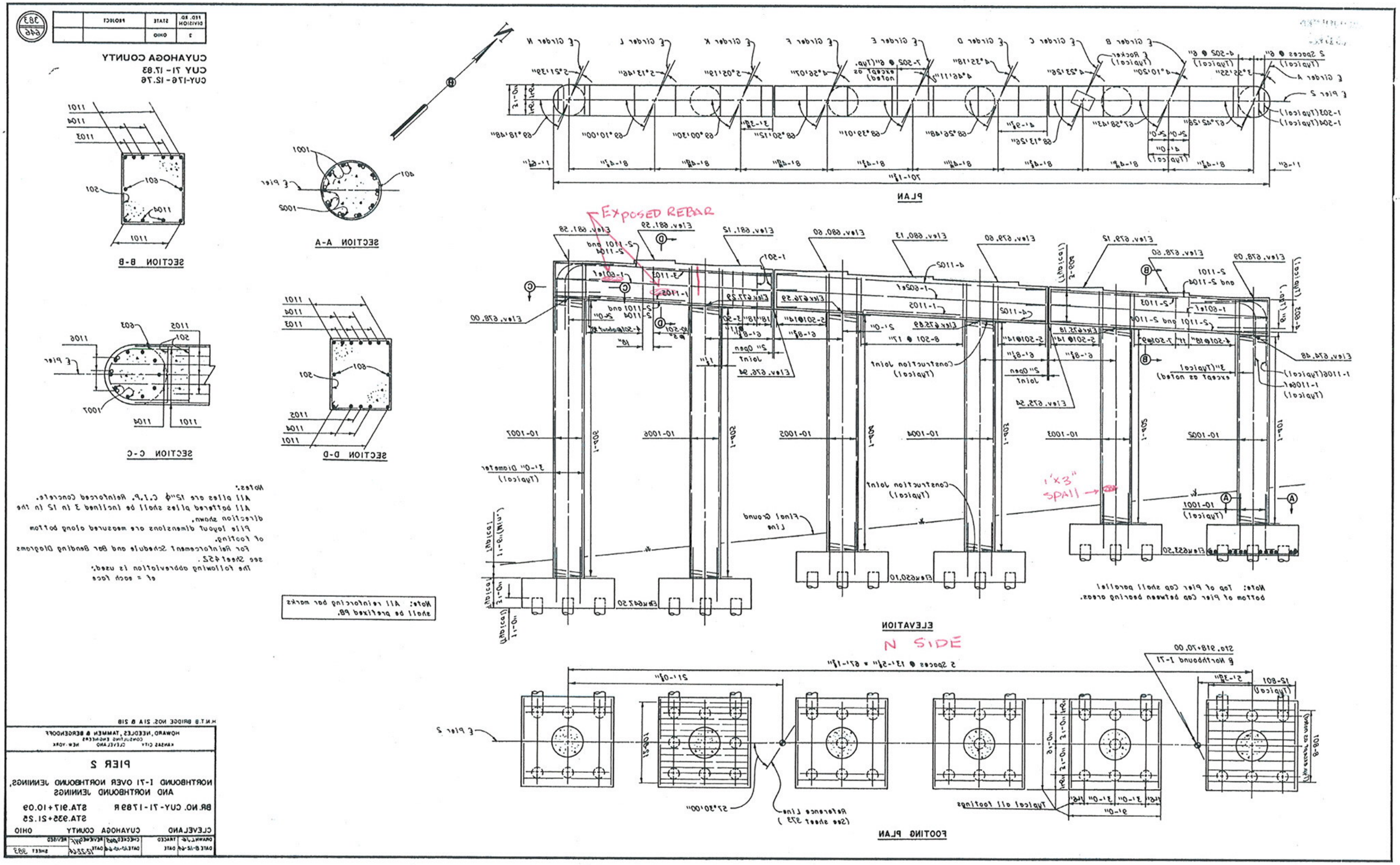
PIER 2

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

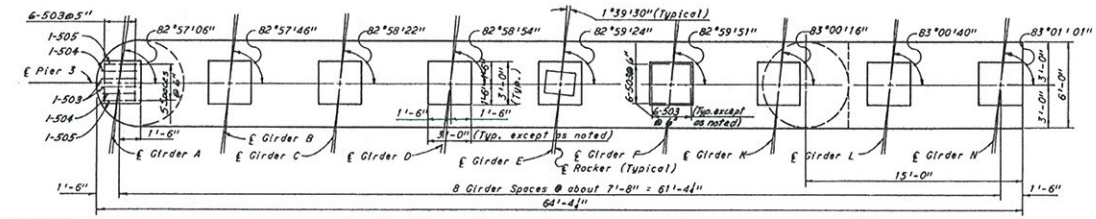
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

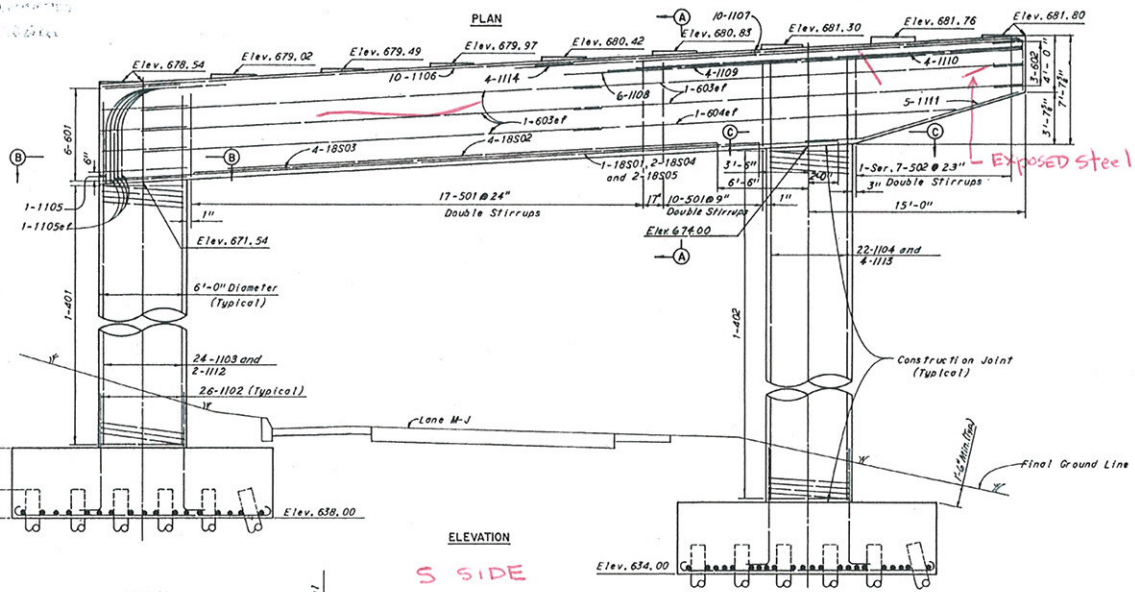
CLEVELAND CUYAHOGA COUNTY OHIO

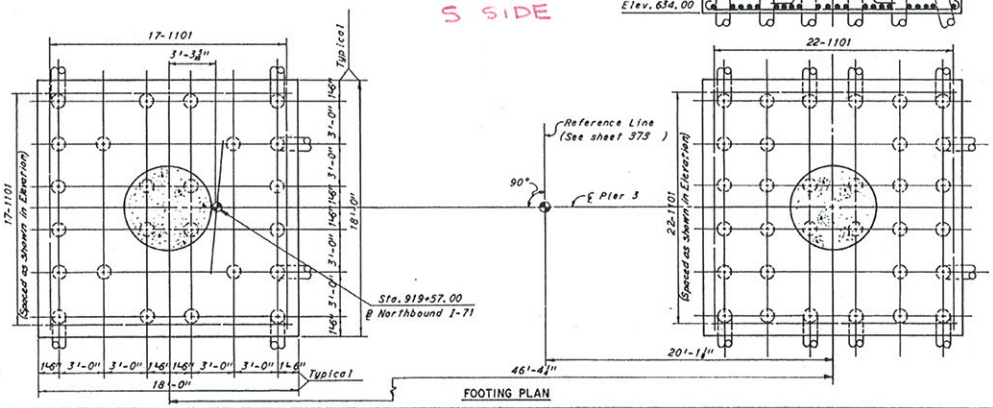
DRAWN J.G.	TRACED	CHECKED JWC	REVIEWED	REVISED
DATE 8-12-64	DATE	DATE 10-64	DATE 12-22-64	SHEET 383

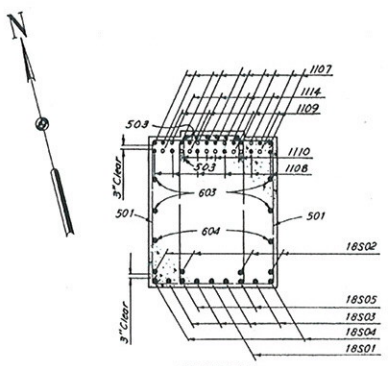


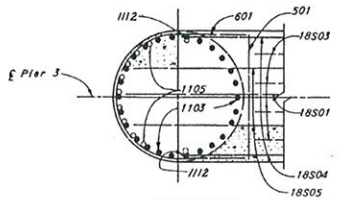
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
PLAN
ELEVATION
FOOTING PLAN
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
EXPOSED REBAR
1'x3' SPALL
N SIDE
Notes:
All piles are 12"φ C.I.P. Reinforced Concrete.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile layout dimensions are measured along bottom of footing.
For Reinforcement Schedule and Bar Bending Diagrams see Sheet 452.
The following abbreviation is used: ef = each face
Note: All reinforcing bar marks shall be prefixed P8.
Note: Top of Pier Cap shall parallel bottom of Pier Cap between bearing areas.
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
PIER 2
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789 R
STA. 917+10.09
STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 383

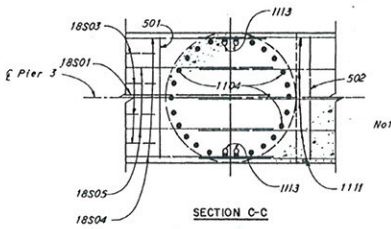


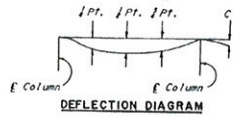












DEAD LOAD DEFLECTION TABLE				
Point of Deflection	1	2	3	C
Initial - Cap Beam Only	0	0	0	0
Initial - Total Structure	1/4"	1/4"	1/4"	1/4"
Ultimate - Total Structure	1/2"	1/2"	1/2"	1/2"

Notes: Cap beam shall be cambered for ultimate dead load deflections.

Bearing Pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Note: All reinforcing bar marks shall be prefixed PC.

Note:
All piles are 12"ø C.I.P. Reinforced Concrete Piles.
The following abbreviation is used:
ef = each face
For additional notes see sheet 383.

FED. RD. DIVISION	STATE	PROJECT	
7	OHIO		

384 / 646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.M.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 3

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

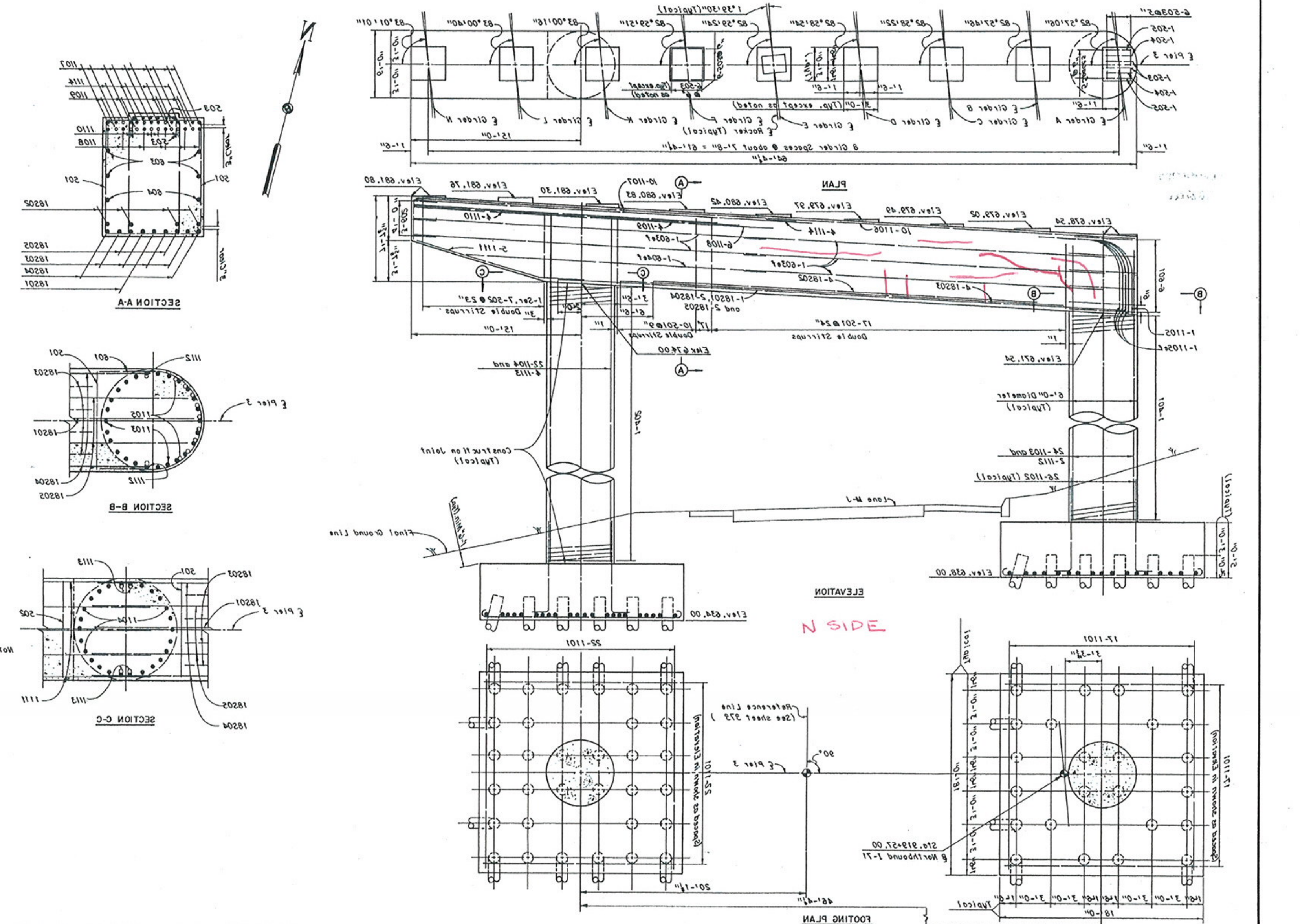
CLEVELAND CUYAHOGA COUNTY OHIO

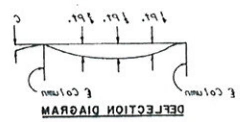
DRAWN DLR	TRACED	CHECKED DMF	REVIEWED WF	REVISED
DATE 11-11-64	DATE	DATE 11-15-64	DATE 12-22-64	SHEET 384

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

384 / 646

FED. RD. DIVISION	STATE	PROJECT
3	OHIO	





DEFLECTION DIAGRAM

DEAD LOAD DEFLECTION TABLE				
Point of Deflection	¼	½	¾	C
Initial - Cap Beam Only	0	0	0	0
Initial - Total Structure	3/16"	1/8"	3/16"	3/16"
Ultimate - Total Structure	5/16"	1/4"	5/16"	1/8"

Notes: Cap beam shall be cambered for ultimate dead load deflections.

Bearing Pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Note: All reinforcing bar marks shall be prefixed PC.

Note: All piles are 12" C.I.P. Reinforced Concrete Piles. The following abbreviation is used: ef = each face. For additional notes see sheet 383.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

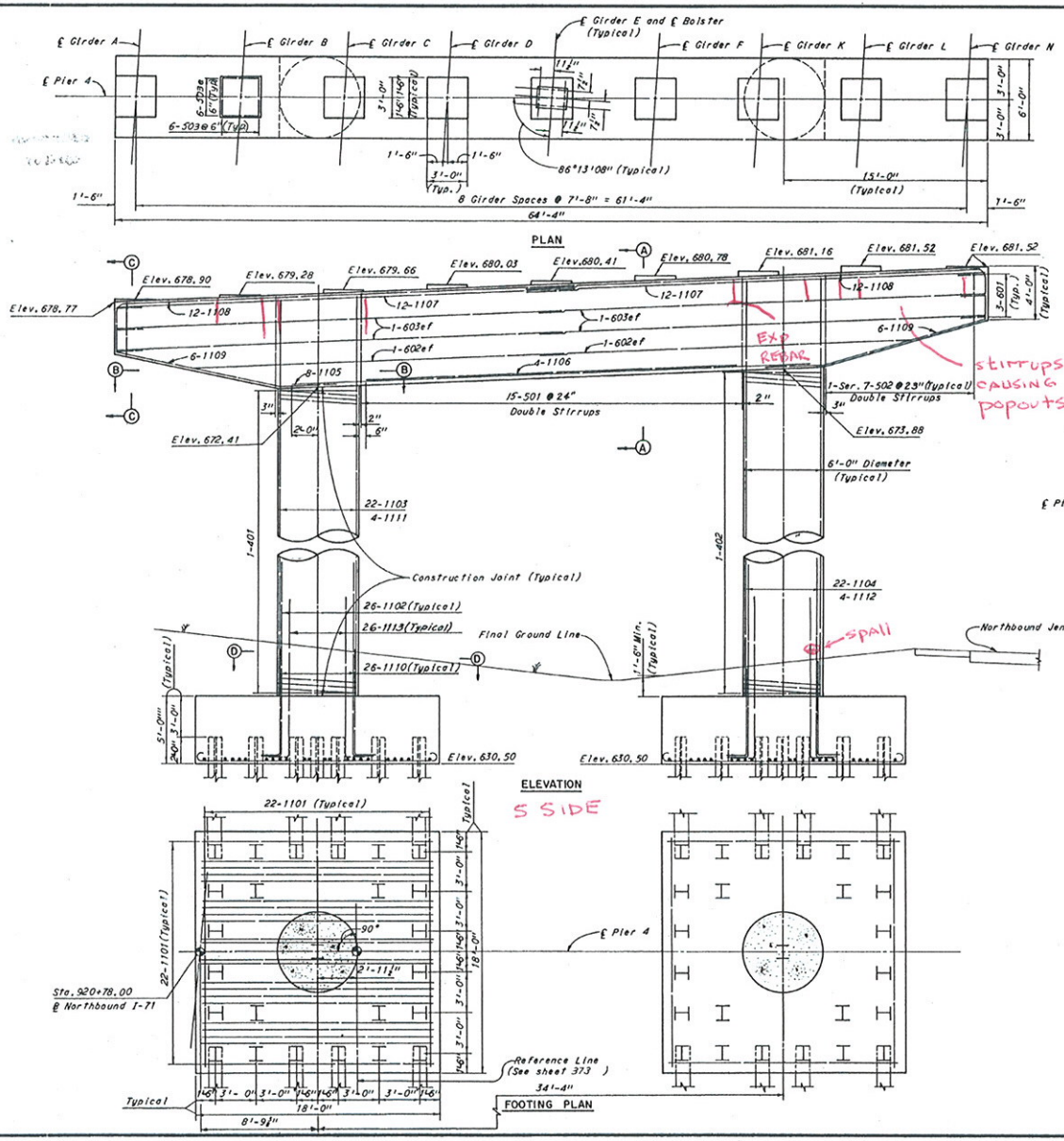
PIER 3

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

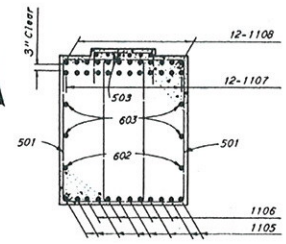
BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

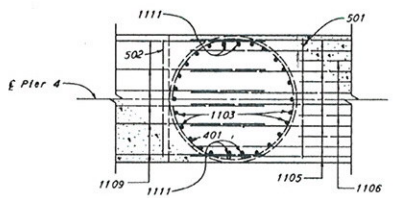
DRAWN DLR DATE 11-11-64 TRACED DATE CHECKED DATE REVIEWED DATE REVISED SHEET 384



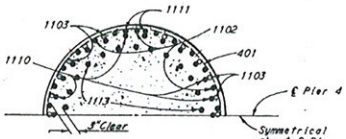
Note:
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



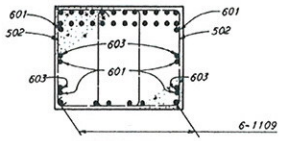
SECTION A-A



SECTION B-B



SECTION D-D



SECTION C-C

Note: All reinforcing bar marks shall be prefixed PD.

Notes:
All piles are 12 BP 53 steel bearing piles.
All battered piles shall be inclined 3 in 12 in the direction shown, except as noted.
Pile layout dimensions are measured along bottom of footing.
For Reinforcement Schedule and Bar Bending Diagrams see Sheets 452, 453, 454, 454A and 454B.
For anchor bolt details see Ohio Standard Drawing RB-1-55.
The following abbreviation is used:
ef = each face

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

385

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

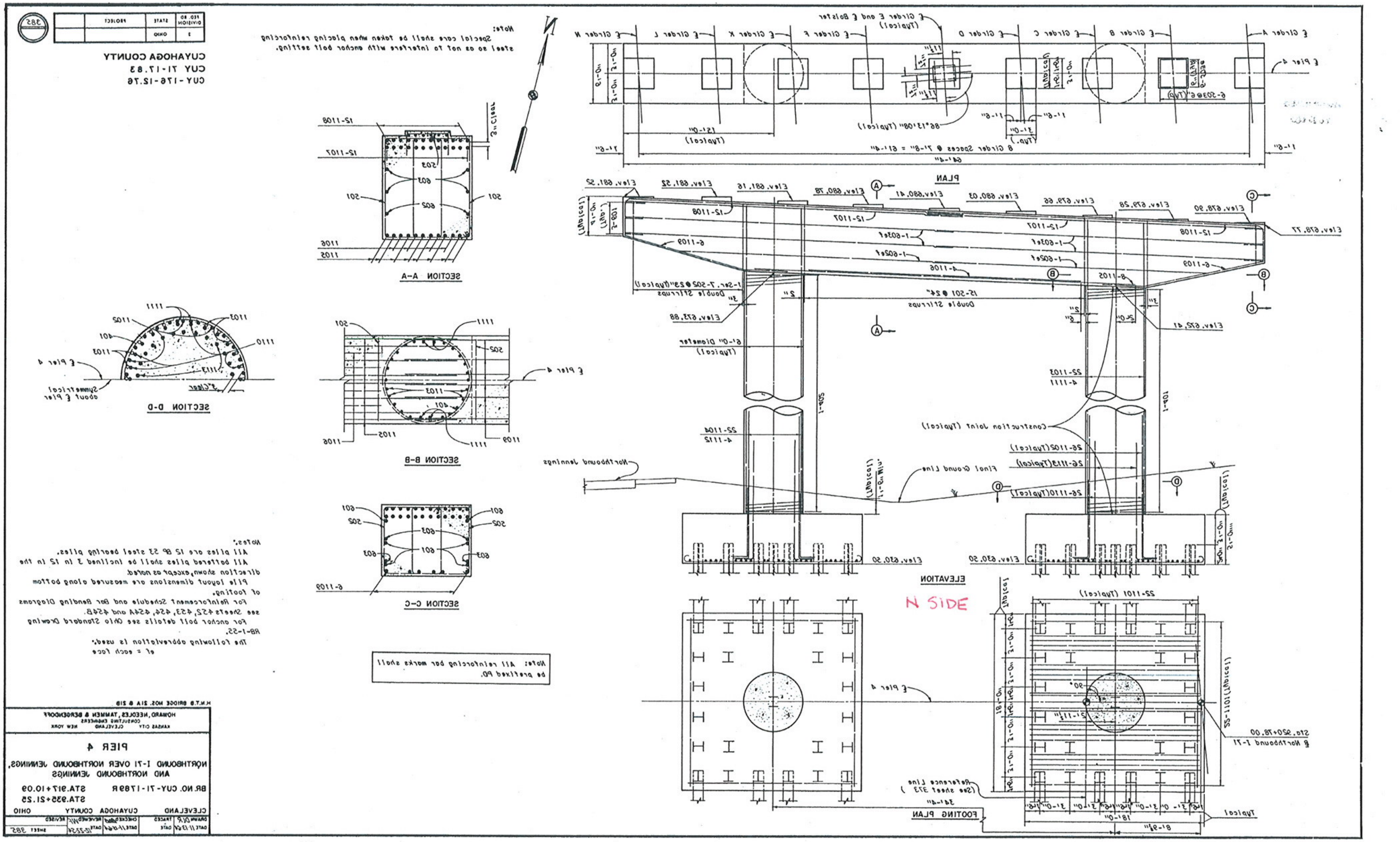
PIER 4

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

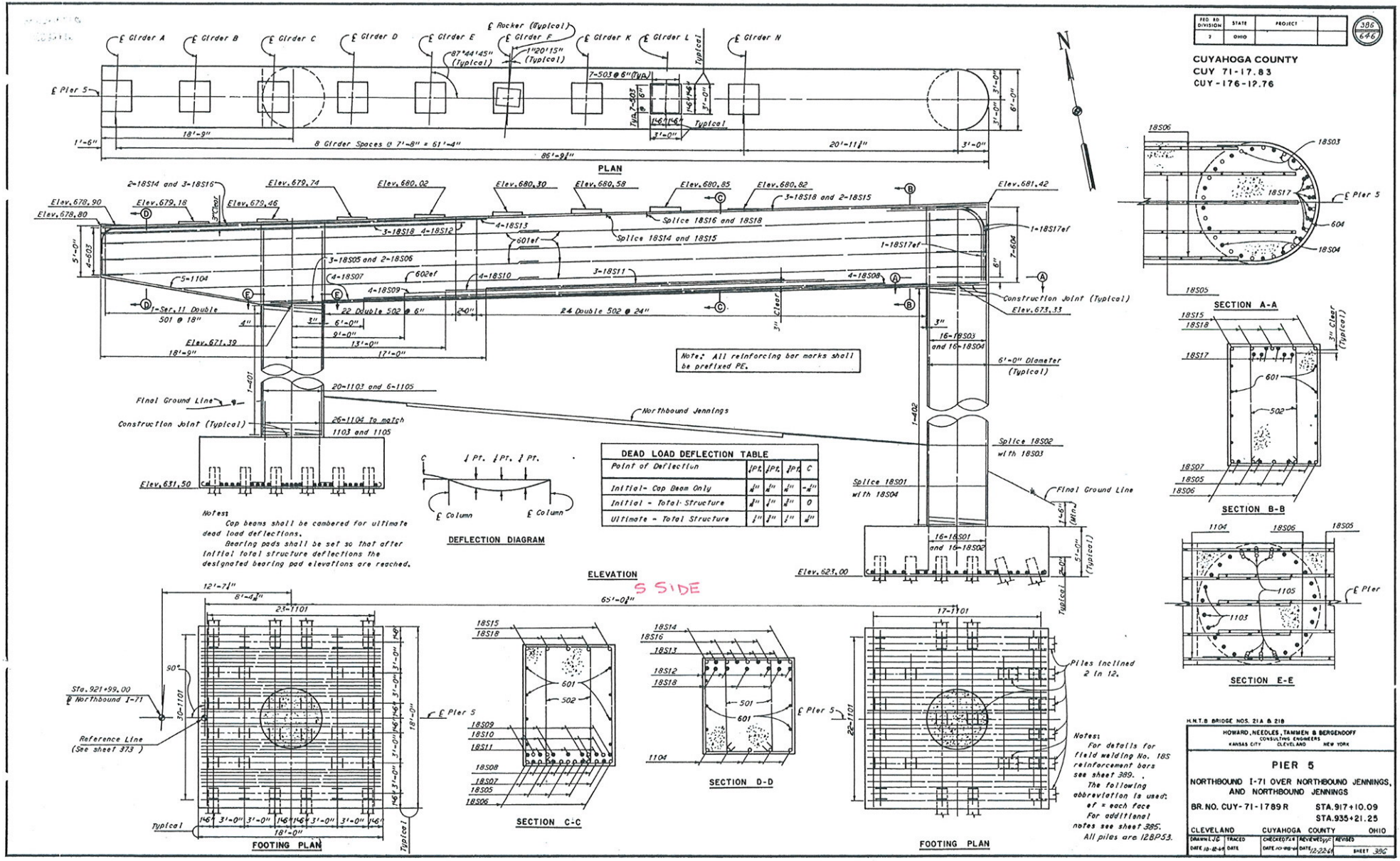
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN DLR	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-13-64	DATE	DATE 11-18-64	DATE 12-22-64	SHEET 385



385
FED. RD. DIVISION 3 STATE OHIO PROJECT
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
Note:
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
PLAN
ELEVATION
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
FOOTING PLAN
N SIDE
Notes:
All piles are 12 BP 53 steel bearing piles.
All battered piles shall be inclined 3 in 12 in the direction shown, except as noted.
Pile layout dimensions are measured along bottom of footing.
For Reinforcement Schedule and Bar Bending Diagrams see Sheets 452, 453, 454, 454A and 454B.
For anchor bolt details see Ohio Standard Drawing AB-1-55.
The following abbreviation is used:
ef = each face
Note: All reinforcing bar marks shall be prefixed P0.
8 Girder Spaces @ 7'-8" = 61'-4"
64'-4"
Elev. 630.50
Final Ground Line
Construction Joint (Typical)
Northbound Jennings
6'-0" Diameter (Typical)
Sta. 920+78.00
℄ Northbound I-71
Reference Line (See sheet 373)
H.N.T.B. BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIER 4
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,
AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 385



FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

386
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 5

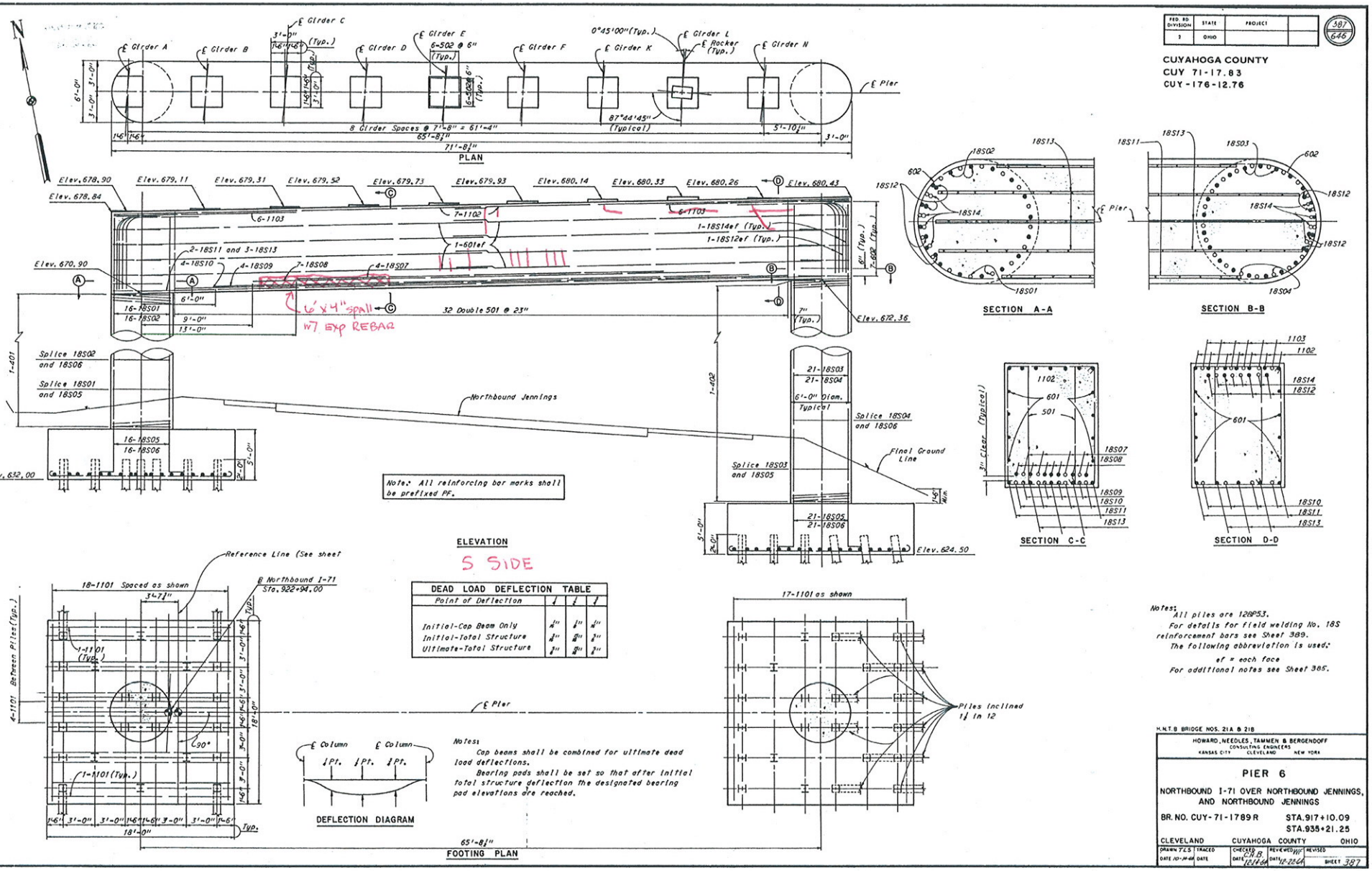
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJE	TRACED	CHECKED J-K	REVIEWED JVF	REVISED
DATE 10-12-64	DATE	DATE 10-19-64	DATE 12-22-64	SHEET 386

PLAN
ELEVATION
SECTION A-A
SECTION B-B
SECTION E-E
SECTION D-D
SECTION C-C
FOOTING PLAN
FOOTING PLAN
DEFLECTION DIAGRAM
DEAD LOAD DEFLECTION TABLE
Point of Deflection
Initial - Cap Beam Only
Initial - Total Structure
Ultimate - Total Structure
Note: All reinforcing bar marks shall be prefixed PE.
Notes:
Cap beams shall be cambered for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflections the designated bearing pad elevations are reached.
Piles inclined 5 in 12.
Notes:
For details for field welding No. 18S reinforcement bars see sheet 389.
The following observation is used: of = rock face
For additional notes see sheet 385.
All piles are 18BP53.
N SIDE
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-19.76
PIER 5
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R
STA.317+10.09
STA.323+21.25
CLEVELAND
CUYAHOGA COUNTY
OHIO
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND
KANSAS CITY
NEW YORK
H.W.T.B. BRIDGE NOS. 21A & 21B



DEAD LOAD DEFLECTION TABLE			
Point of Deflection	℄	℄	℄
Initial-Cap Beam Only	4"	4"	4"
Initial-Total Structure	4"	8"	3"
Ultimate-Total Structure	4"	8"	3"

Notes:
Cap beams shall be combined for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Notes:
All piles are 12BP53.
For details for field welding No. 18S reinforcement bars see Sheet 389.
The following abbreviation is used:
ef = each face
For additional notes see Sheet 385.

FED. RD DIVISION	STATE	PROJECT	
3	OHIO		

387/646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

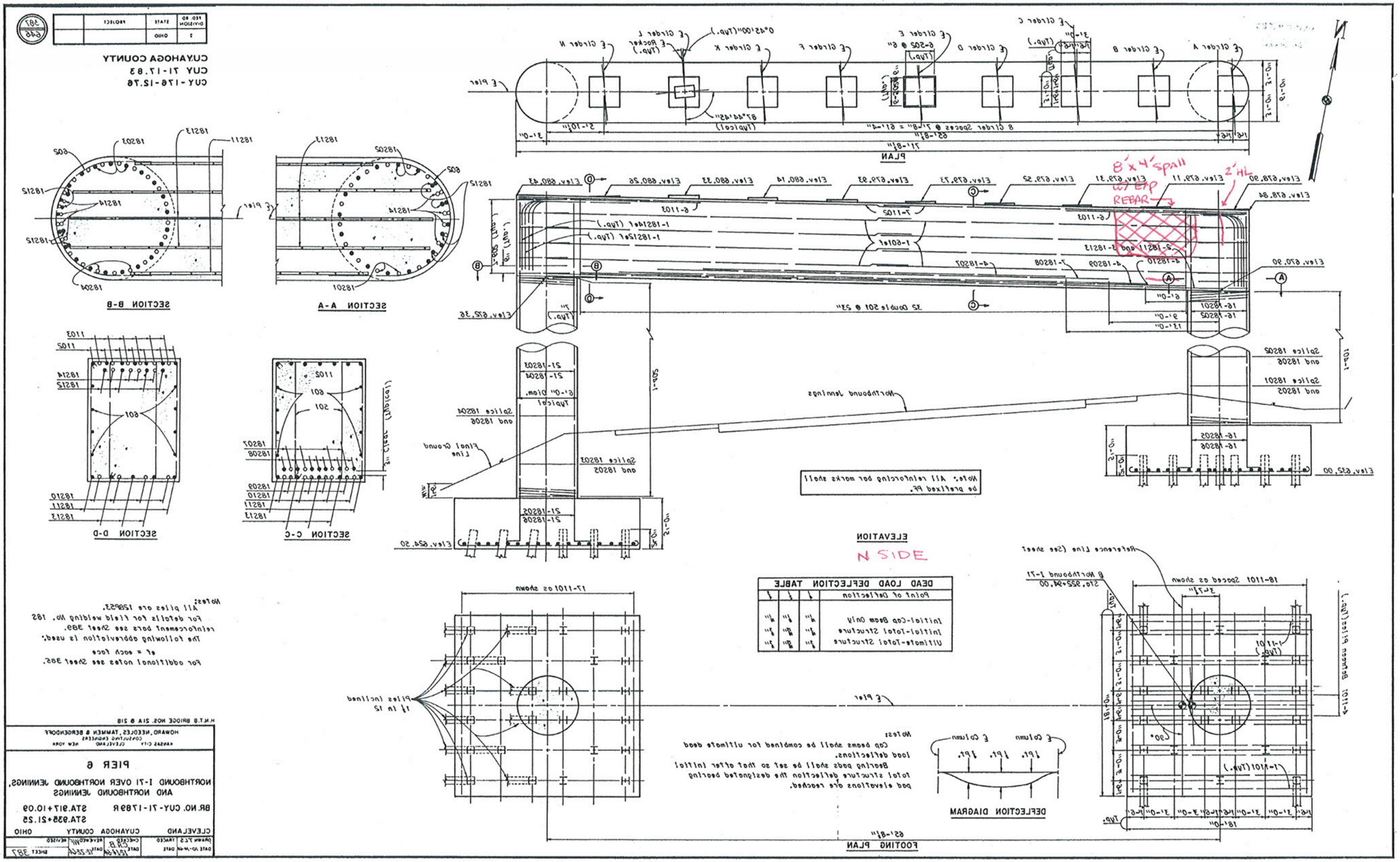
PIER 6

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 10-14-64	DATE	DATE 12-14-64	DATE 12-22-64	SHEET 387

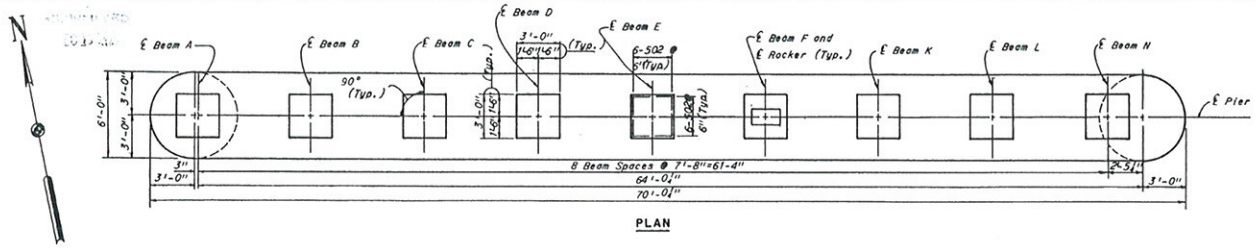


CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
PLAN
ELEVATION
N SIDE
8'x4' spall w/ EXP REBAR
2' HL
SECTION B-B
SECTION A-A
SECTION D-D
SECTION C-C
FOOTING PLAN
DEFLECTION DIAGRAM
DEAD LOAD DEFLECTION TABLE
Note: All reinforcing bar marks shall be prefixed PF.
Notes:
All piles are 12BP53.
For details for field welding No. 185 reinforcement bars see Sheet 389.
The following abbreviation is used: ef = each face
For additional notes see Sheet 385.
Notes:
Cap beams shall be combined for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.
H.N.T.B BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
PIER 6
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789 R
STA. 917+10.09
STA. 938+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 387

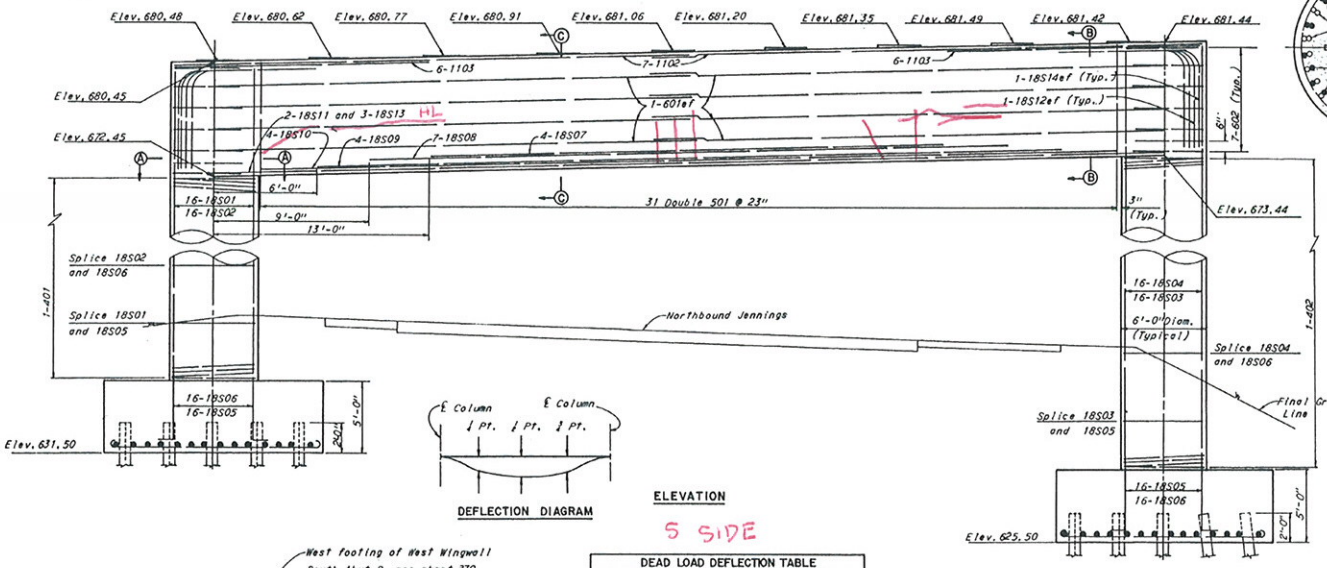
FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

388
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



PLAN



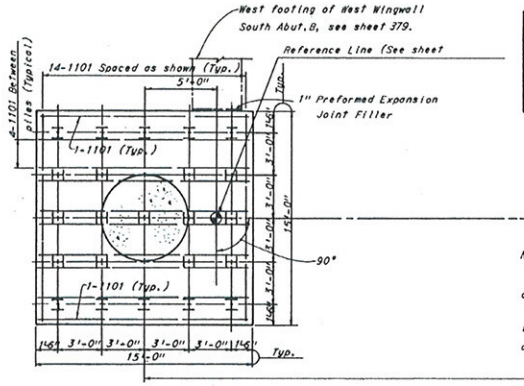
ELEVATION

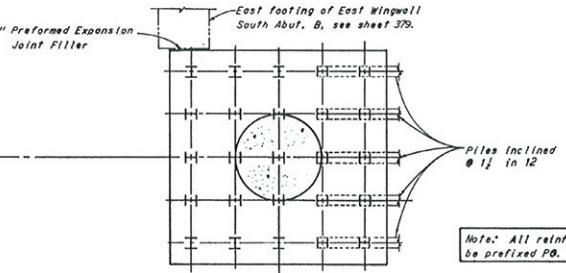
DEFLECTION DIAGRAM

S SIDE

DEAD LOAD DEFLECTION TABLE

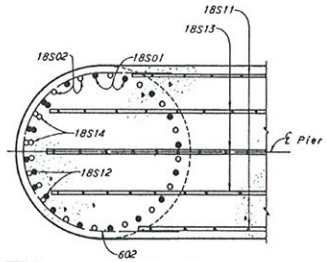
Point of deflection	¼Pt.	¼Pt.	¼Pt.
Initial-Cap Beam Only	¼"	¼"	¼"
Initial-Total Structure	¾"	¾"	¾"
Ultimate-Total Structure	2"	2"	2"



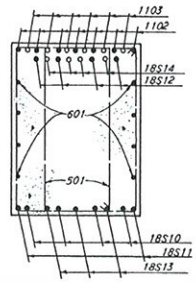


FOOTING PLAN

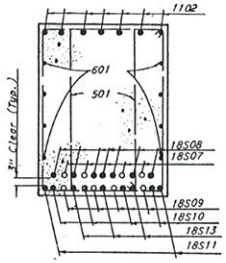
Notes:
Cap beams shall be combined for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.



SECTION A-A



SECTION B-B



SECTION C-C

Notes:
All piles are 12BP53.
For details for field welding No. 18S reinforcement bars see sheet 389.
The following abbreviation is used:
ef = each face
For additional notes see sheet 385.

Note: All reinforcing bar marks shall be prefixed P8.

H.N.T.B BRIDGE NOS. 21A & 21B

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KANSAS CITY CLEVELAND NEW YORK

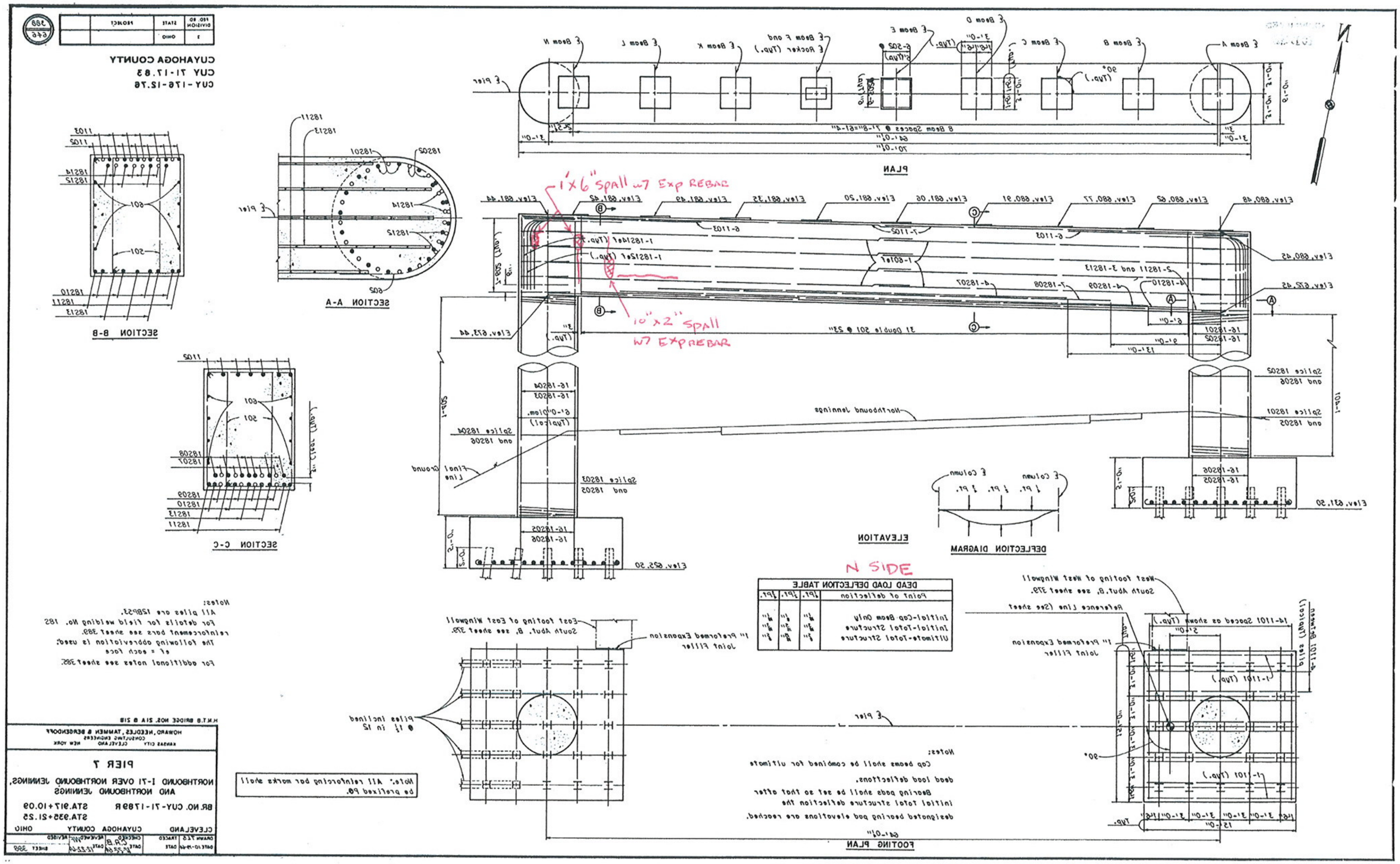
PIER 7

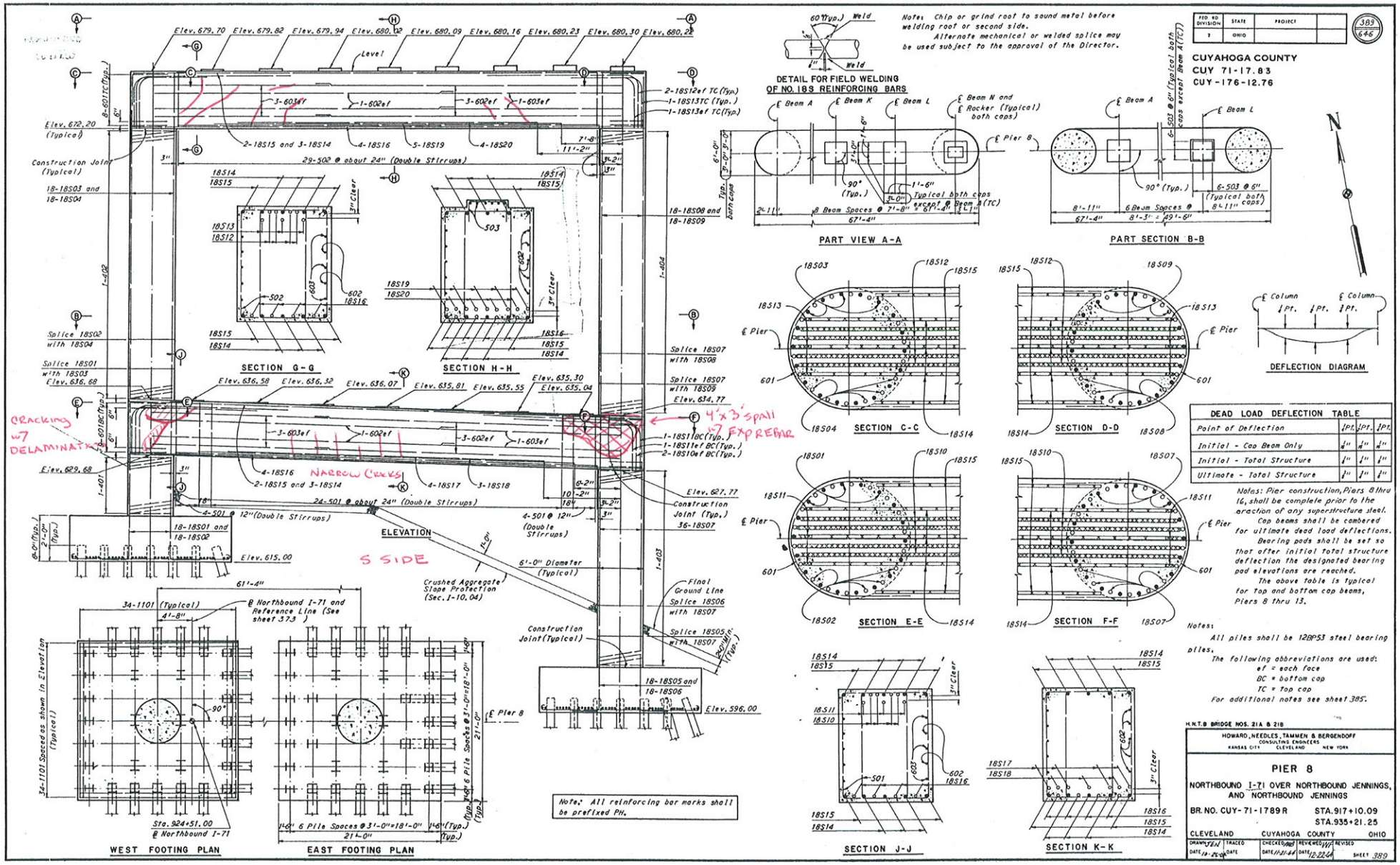
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 10-19-64	DATE	DATE 12-22-64	DATE 12-22-64	SHEET 388


CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
FED. RD. DIVISION | STATE | PROJECT
3 | OHIO
388
646
PLAN
8 Beam Spaces @ 7'-8"=61'-4"
64'-0¼"
70'-0¼"
ELEVATION
31 Double 501 @ 23"
Northbound Jennings
Final Ground Line
1'x6" spall w/ Exp REBAR
10"x2" Spall w/ Exp REBAR
SECTION B-B
SECTION A-A
SECTION C-C
DEFLECTION DIAGRAM
N SIDE
DEAD LOAD DEFLECTION TABLE
Point of deflection
Initial-Cap-Beam Only
Initial-Total Structure
Ultimate-Total Structure
FOOTING PLAN
Piles inclined @ 1½ in 12
1" Preformed Expansion Joint Filler
East footing of East Wingwall South Abut. B, see sheet 379.
West footing of West Wingwall South Abut. B, see sheet 379.
Notes:
All piles are 12BP53.
For details for field welding No. 18S reinforcement bars see sheet 389.
The following abbreviation is used:
ef = each face
For additional notes see sheet 385.
Note: All reinforcing bar marks shall be prefixed P8.
Notes:
Cap beams shall be cambered for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.
H.N.T.B. BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIER 7
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 388



DEAD LOAD DEFLECTION TABLE	℄ Pt.	℄ Pt.	℄ Pt.
Point of Deflection			
Initial - Cap Beam Only	1/4"	1/4"	1/4"
Initial - Total Structure	1"	1"	1"
Ultimate - Total Structure	1"	1"	1"

Notes: Pier construction, Piers 8 thru 16, shall be complete prior to the erection of any superstructure steel.

Cap beams shall be cambered for ultimate dead load deflections.

Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

The above table is typical for top and bottom cap beams, Piers 8 thru 13.

Notes:

All piles shall be 12BP53 steel bearing piles.

The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap

For additional notes see sheet 385.

FED. RD. DIVISION	STATE	PROJECT	
7	OHIO		

383 646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 8

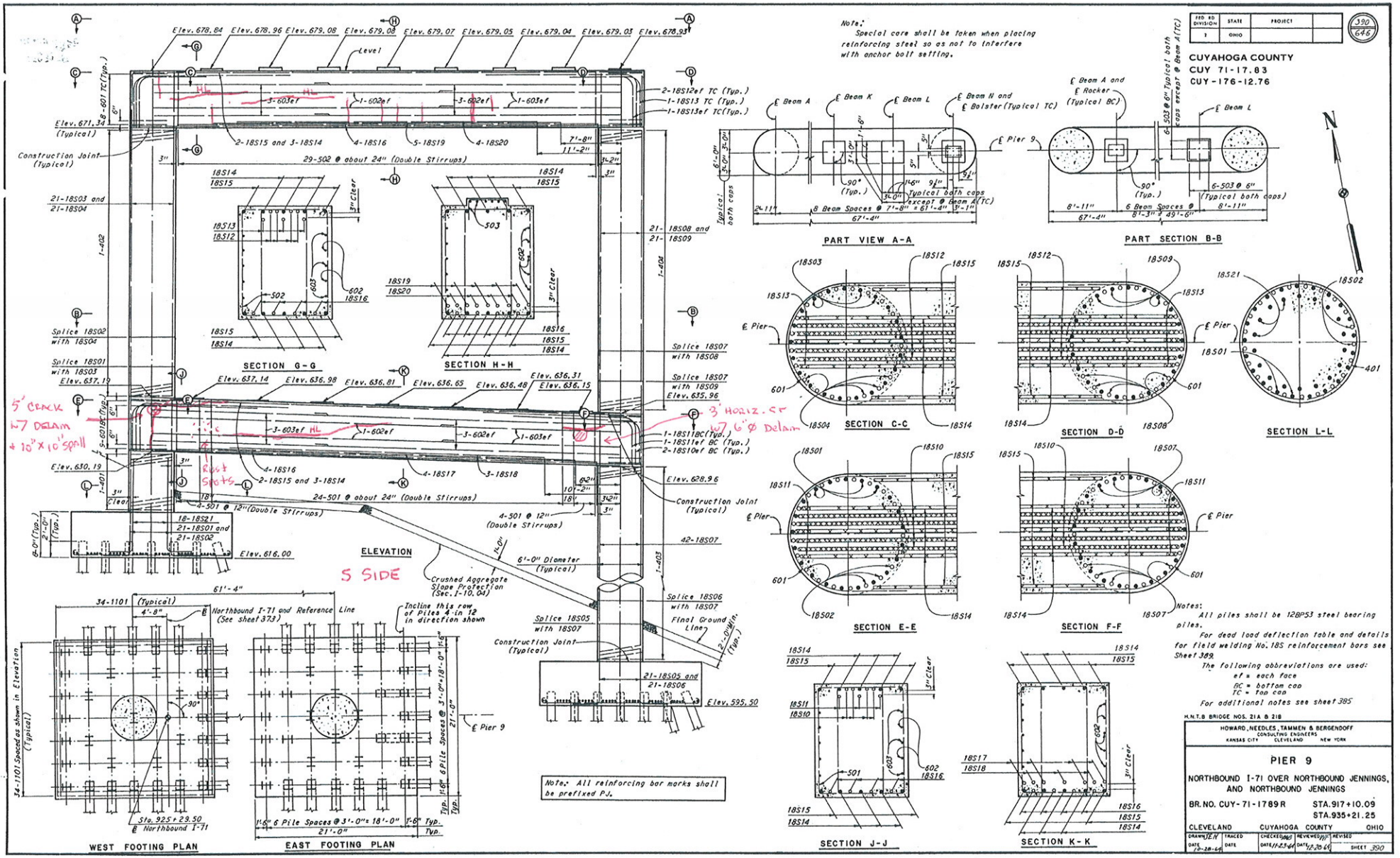
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 12-20-64	DATE	DATE 12-21-64	DATE 12-22-64	SHEET 389

Rust Spots
CRACKING
DELAM
HL Vert.
CR.
N SIDE
ELEVATION
PART SECTION B-B
PART VIEW A-A
DETAIL FOR FIELD WELDING OF NO. 18S REINFORCING BARS
DEFLECTION DIAGRAM
SECTION D-D
SECTION C-C
SECTION H-H
SECTION G-G
SECTION F-F
SECTION E-E
SECTION K-K
SECTION J-J
EAST FOOTING PLAN
WEST FOOTING PLAN
CUYAHOGA COUNTY
CUY TI-17.83
CUY-176-12.76
PIER 8
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-TI-1788R
STA.917+10.09
STA.935+21.25
CLEVELAND
CUYAHOGA COUNTY
OHIO
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY
CLEVELAND
NEW YORK
H.W.T.B. BRIDGE NOS. 21A & 21B
DEAD LOAD DEFLECTION TABLE
Point of Deflection
Initial - Cap Beam Only
Initial - Total Structure
Ultimate - Total Structure
Notes: Pier construction, Piers 8 thru 16, shall be complete prior to the erection of any superstructure steel.
Cap beams shall be computed for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.
The above table is typical for top and bottom cap beams, piers 8 thru 13.
Notes:
All piles shall be 12BP53 steel bearing piles.
The following abbreviations are used:
ef = rock face
BC = bottom cap
TC = top cap
for additional notes see sheet 385.
Note: All reinforcing bar marks shall be prefixed PM.
Note: Chip or grind root to sound metal before welding root or second side.
Alternate mechanical or welded splice may be used subject to the approval of the Director.
385
646



FED. RD. DIVISION	STATE	PROJECT	
3	OHIO		

390
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

Notes:
All piles shall be 12BP53 steel bearing piles.
For dead load deflection table and details for field welding No. 18S reinforcement bars see Sheet 382.
The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap
For additional notes see sheet 385

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

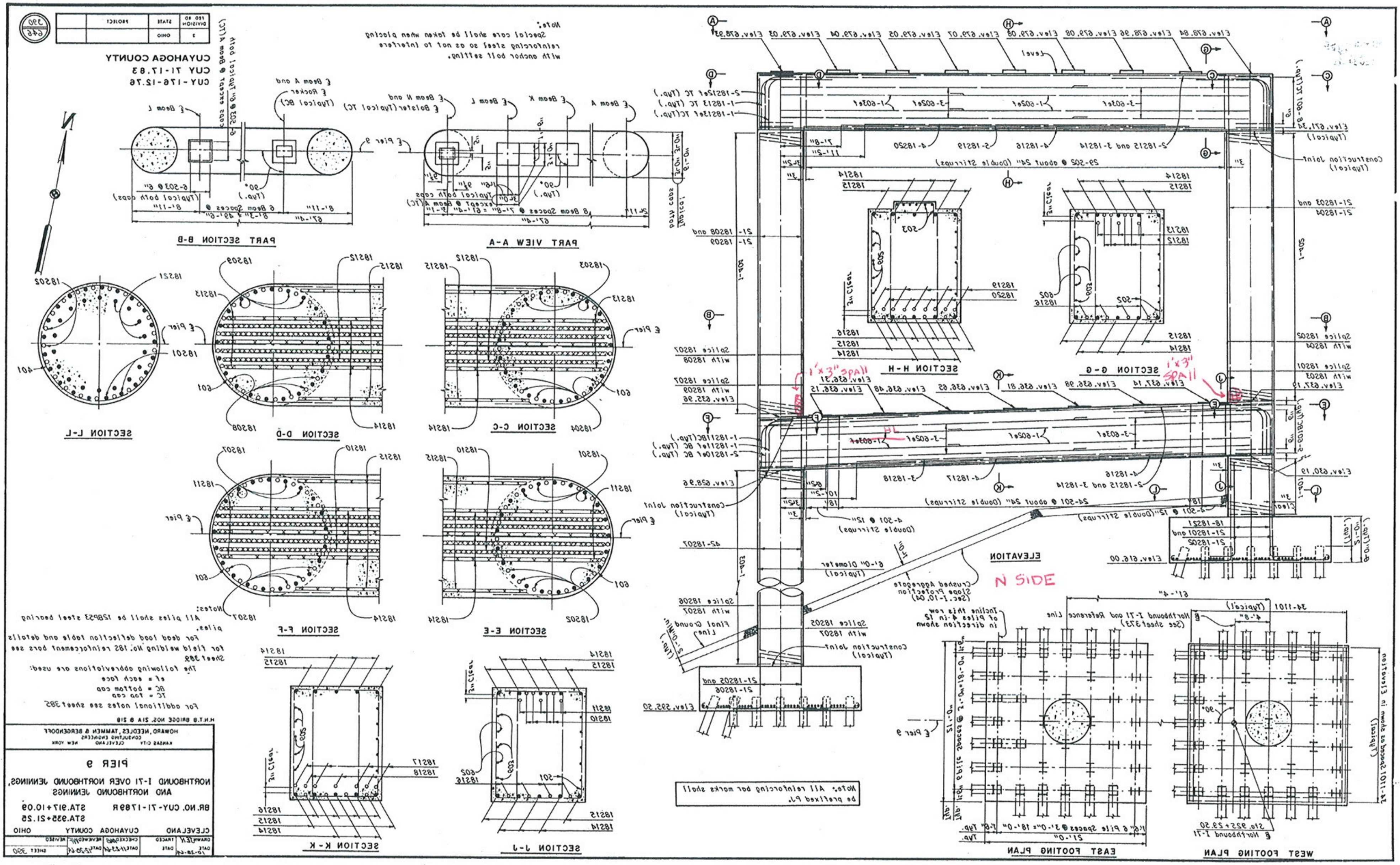
PIER 9

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

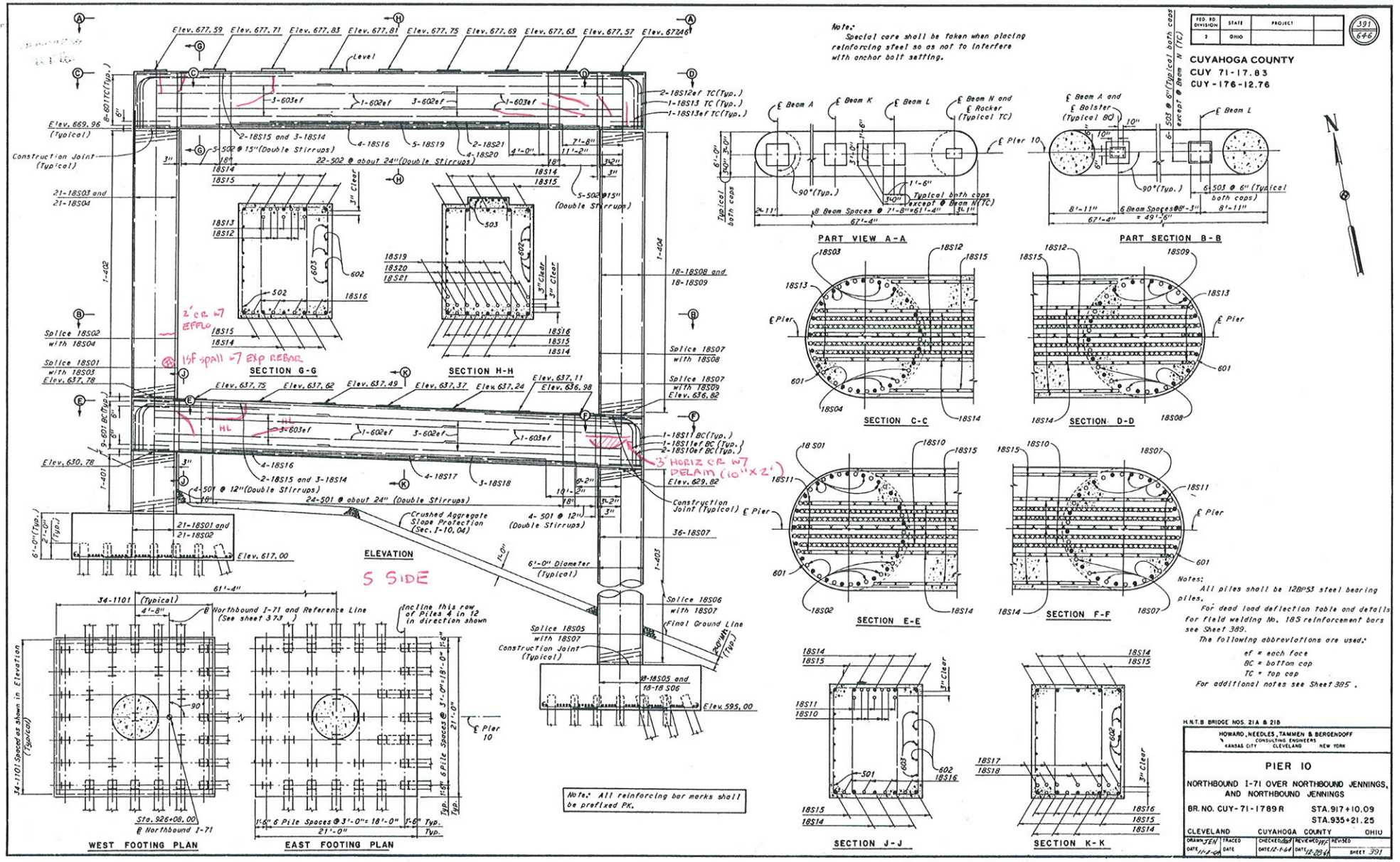
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JEN	TRACED	CHECKED	REVIEWED	REVISED
DATE 12-20-64	DATE	DATE 12-23-64	DATE 12-30-64	SHEET 390



CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
PART SECTION B-B
PART VIEW A-A
SECTION L-L
SECTION D-D
SECTION C-C
SECTION F-F
SECTION E-E
SECTION K-K
SECTION J-J
SECTION H-H
SECTION G-G
ELEVATION
EAST FOOTING PLAN
WEST FOOTING PLAN
1'x3" spall
1'x3" SPALL
N SIDE
Notes: All piles shall be 12BP53 steel bearing piles.
For dead load deflection table and details for field welding No. 18S reinforcement bars see sheet 389.
The following abbreviations are used: ef = each face, BC = bottom cap, TC = top cap
For additional notes see sheet 385.
Note: All reinforcing bar marks shall be prefixed P4.
H.N.T.B BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
PIER 9
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 390



FED. RD. DIVISION	STATE	PROJECT	
3	OHIO		

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646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

Notes:
All piles shall be 12BP53 steel bearing piles.
For dead load deflection table and details for field welding Mk. 18S reinforcement bars see Sheet 389.
The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap
For additional notes see Sheet 395.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 10

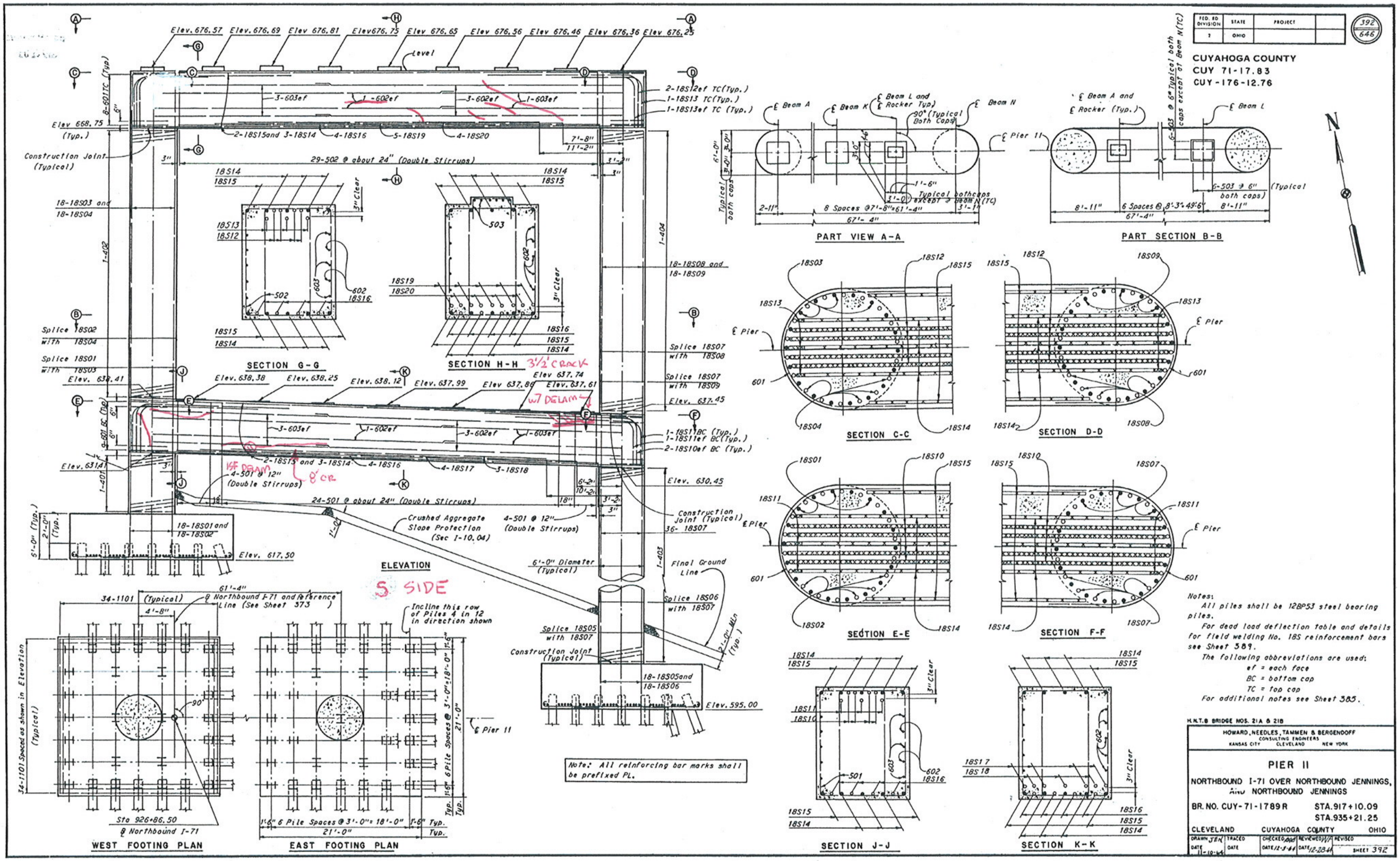
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED	SHEET
JEN					391
DATE 11-2-64	DATE	DATE 12-1-64	DATE 12-28-64		

8"x1" spall w/ EXP. REBAR

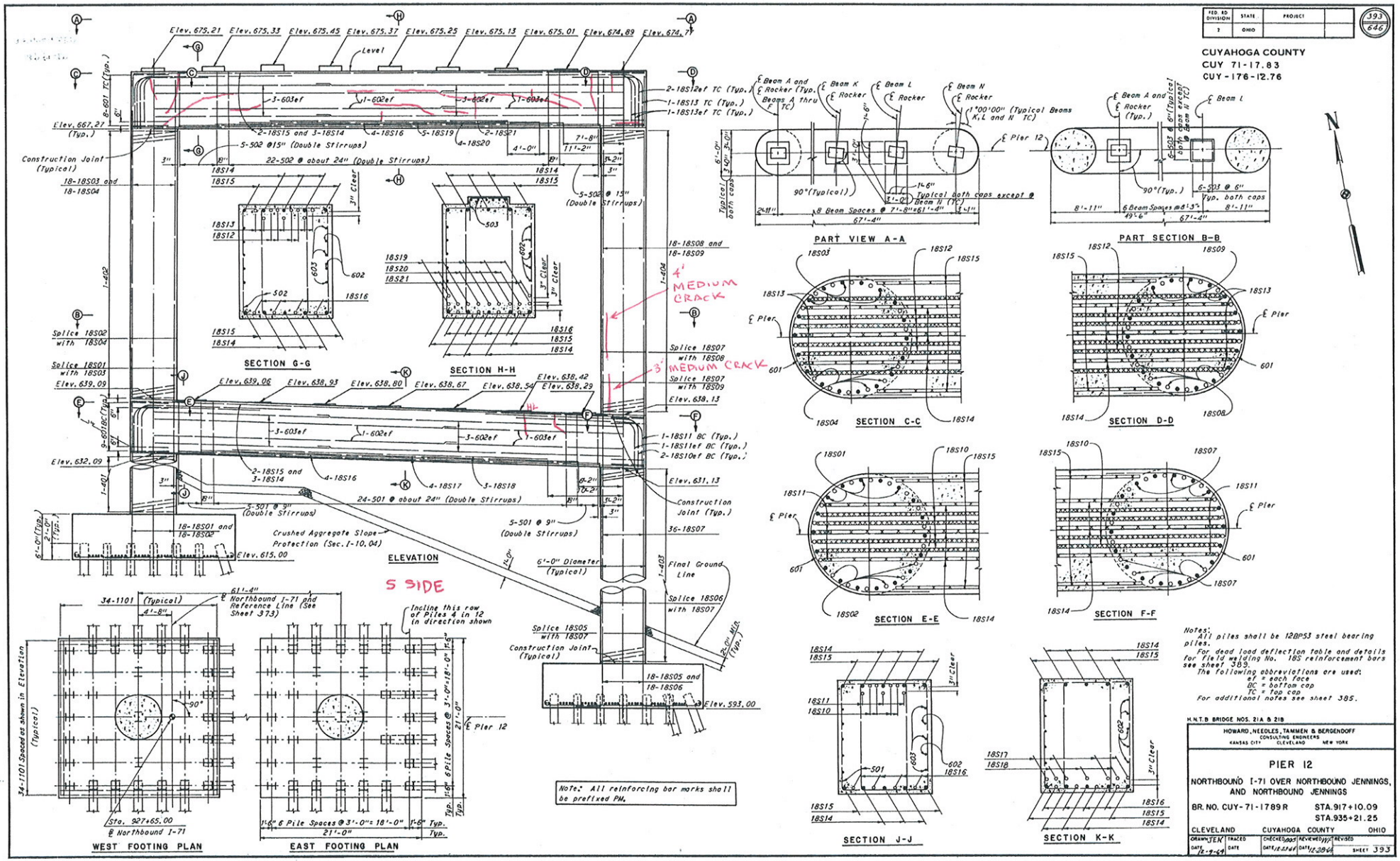

ELEVATION
S SIDE
3 1/2' CRACK
W7 DELAM
SECTION G-G
SECTION H-H
PART VIEW A-A
PART SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SECTION J-J
SECTION K-K
WEST FOOTING PLAN
EAST FOOTING PLAN
Crushed Aggregate Slope Protection (Sec I-10.04)
6'-0" Diameter (Typical)
Final Ground Line
Construction Joint (Typical)
Elev. 617.50
Elev. 595.00
Sta 926+86.50
℄ Northbound I-71
Incline this row of Piles 4 in 12 in direction shown
Note: All reinforcing bar marks shall be prefixed PL.
Notes:
All piles shall be 12BP53 steel bearing piles.
For dead load deflection table and details for field welding No. 18S reinforcement bars see Sheet 389.
The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap
For additional notes see Sheet 383.
FED. RD. DIVISION 3 | STATE OHIO | PROJECT
392 / 646
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
H.N.T.B BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIER 11
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R
STA.917+10.09
STA.935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 392

Spalls w/ Exp Rebar
Alligator cracking
3" x 1 1/2" Spall w/ Exp Rebar
Map Cracking
Rust Stain
Map Cracking
7" x 4" x 10" Spall
ELEVATION
N SIDE
PART SECTION B-B
PART VIEW A-A
SECTION D-D
SECTION C-C
SECTION F-F
SECTION E-E
SECTION K-K
SECTION J-J
SECTION H-H
SECTION G-G
EAST FOOTING PLAN
WEST FOOTING PLAN
CUYAHOGA COUNTY
CUY 71-17.83
CUY-171-15.76
PIER II
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,
NORTHBOUND JENNINGS
BR. NO. CUY-71-1788R
STA.317+10.09
STA.335+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

FED. RD DIVISION	STATE	PROJECT	
7	OHIO		

393
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



Notes:
All piles shall be 12BP53 steel bearing piles.
For dead load deflection table and details for field welding No. 18S reinforcement bars see sheet 389.
The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap
For additional notes see sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 12

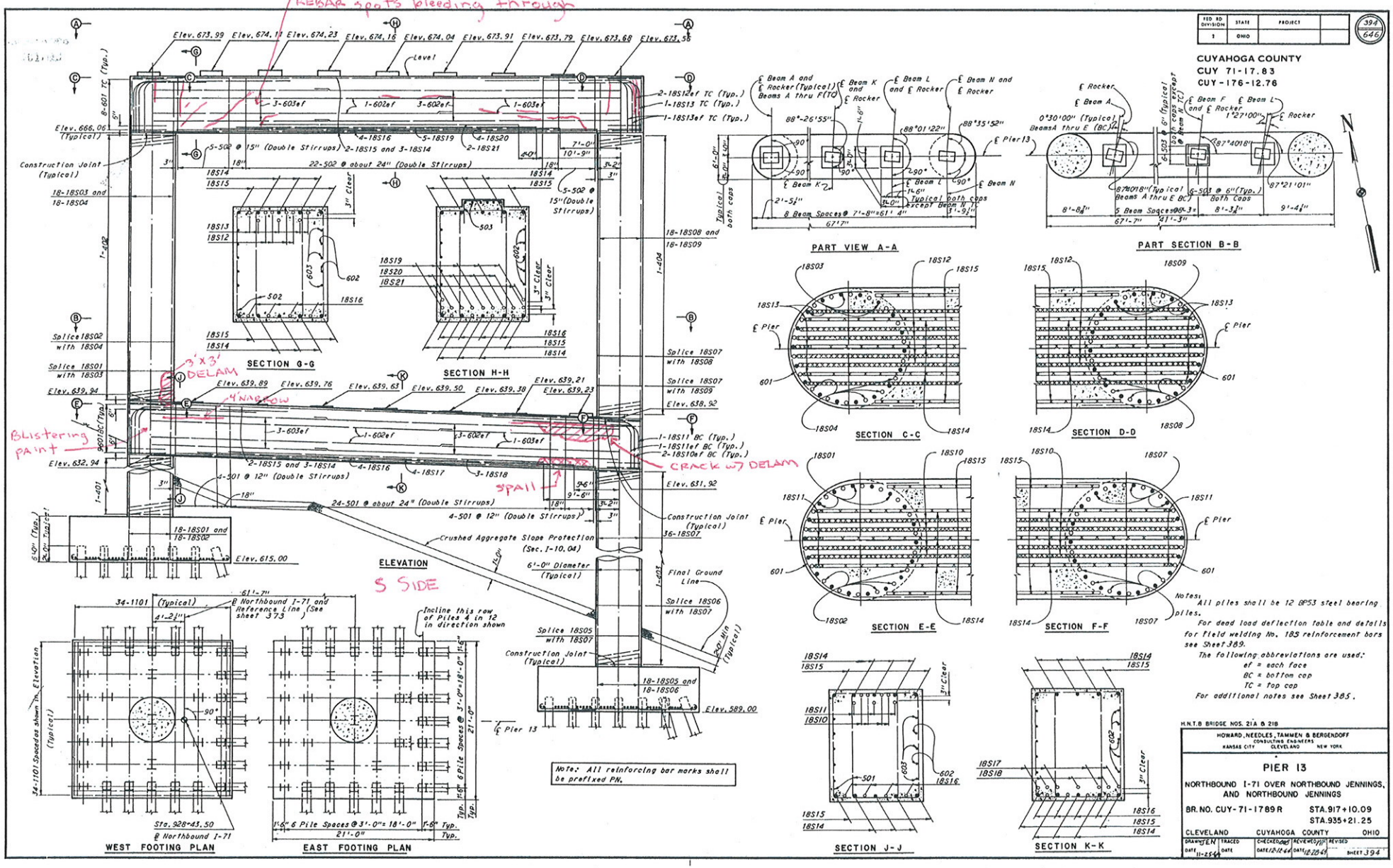
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JEK	TRACED	CHECKED DGS	REVIEWED JJ	REVISED
DATE 12-9-69	DATE	DATE 12-22-69	DATE 12-29-69	SHEET 393

spalled corner of pedestal
PEELING PAINT
16"x3" spall w/ EXP REBAR
6"x2" spall w/ Exp REBAR
4"x3" spall
N SIDE
ELEVATION
SECTION H-H
SECTION G-G
PART VIEW A-A
PART SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SECTION K-K
SECTION L-L
EAST FOOTING PLAN
WEST FOOTING PLAN
Note: All reinforcing bar marks shall be prefixed PM.
PIER 12
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
CUYAHOGA COUNTY OHIO
CUY-71-17.83
CUY-176-12.76



FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

394
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

M.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

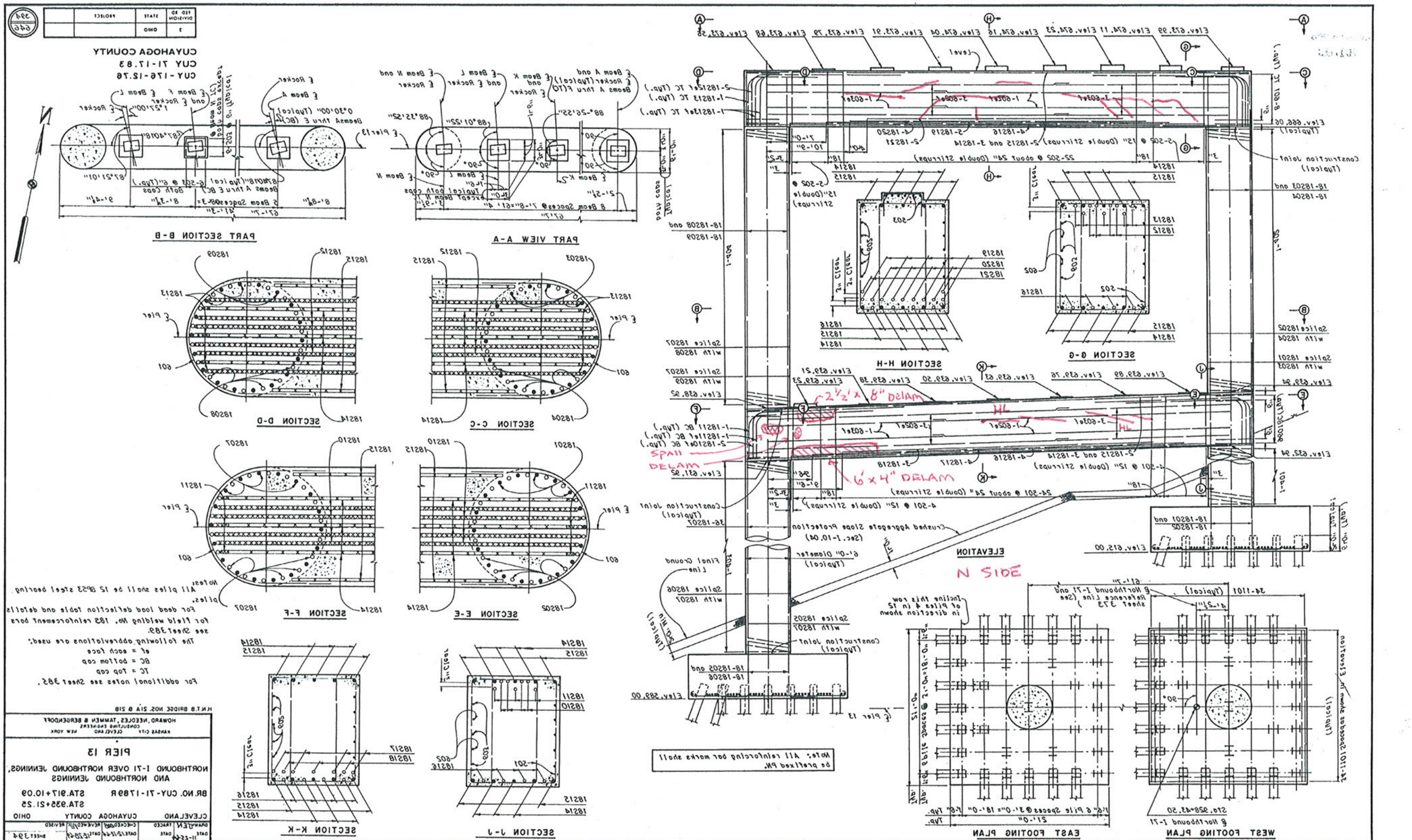
PIER 13

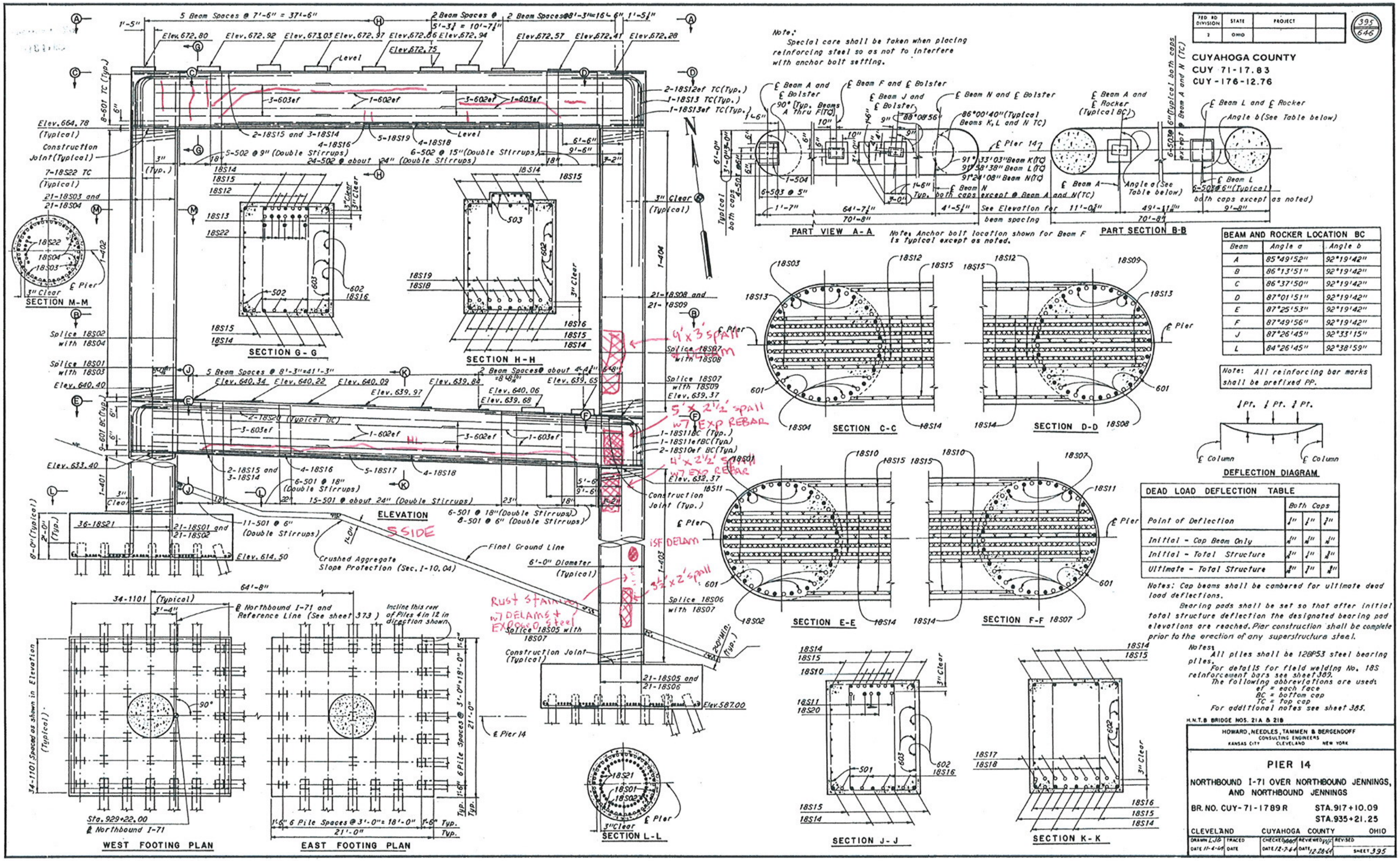
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN EN DATE 11-25-64	TRACED DATE	CHECKED DATE 12-12-64	REVIEWED DATE 12-20-64	REVISED DATE	SHEET 394


CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
PART SECTION B-B
PART VIEW A-A
SECTION D-D
SECTION C-C
SECTION F-F
SECTION E-E
SECTION K-K
SECTION J-J
SECTION H-H
SECTION G-G
ELEVATION
N SIDE
2 1/2" x 8" DELAM
SPALL
DELAM
6' x 4" DELAM
EAST FOOTING PLAN
WEST FOOTING PLAN
Notes:
All piles shall be 12 BP53 steel bearing piles.
For dead load deflection table and details for field welding No. 185 reinforcement bars see Sheet 389.
The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap
For additional notes see Sheet 385.
Note: All reinforcing bar marks shall be prefixed PN.
H.N.T.B BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
PIER 13
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789 R
STA. 917+10.09
STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO



BEAM AND ROCKER LOCATION BC		
Beam	Angle a	Angle b
A	85°49'52"	92°19'42"
B	86°13'51"	92°19'42"
C	86°37'50"	92°19'42"
D	87°01'51"	92°19'42"
E	87°25'53"	92°19'42"
F	87°49'56"	92°19'42"
J	87°26'45"	92°33'15"
L	84°26'45"	92°38'59"

Note: All reinforcing bar marks shall be prefixed PP.

DEAD LOAD DEFLECTION TABLE			
	Both Caps		
Point of Deflection	[illegible]	[illegible]	[illegible]
Initial - Cap Beam Only	[illegible]	[illegible]	[illegible]
Initial - Total Structure	[illegible]	[illegible]	[illegible]
Ultimate - Total Structure	[illegible]	[illegible]	[illegible]

Notes: Cap beams shall be cambered for ultimate dead load deflections.

Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached. Pier construction shall be complete prior to the erection of any superstructure steel.

Notes:

All piles shall be 12BP53 steel bearing piles.

For details for field welding No. 18S reinforcement bars see sheet 389.

The following abbreviations are used:
ef = each face
BC = bottom cap
TC = top cap

For additional notes see sheet 385.

FED RD DIVISION	STATE	PROJECT
3	OHIO	

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CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 14

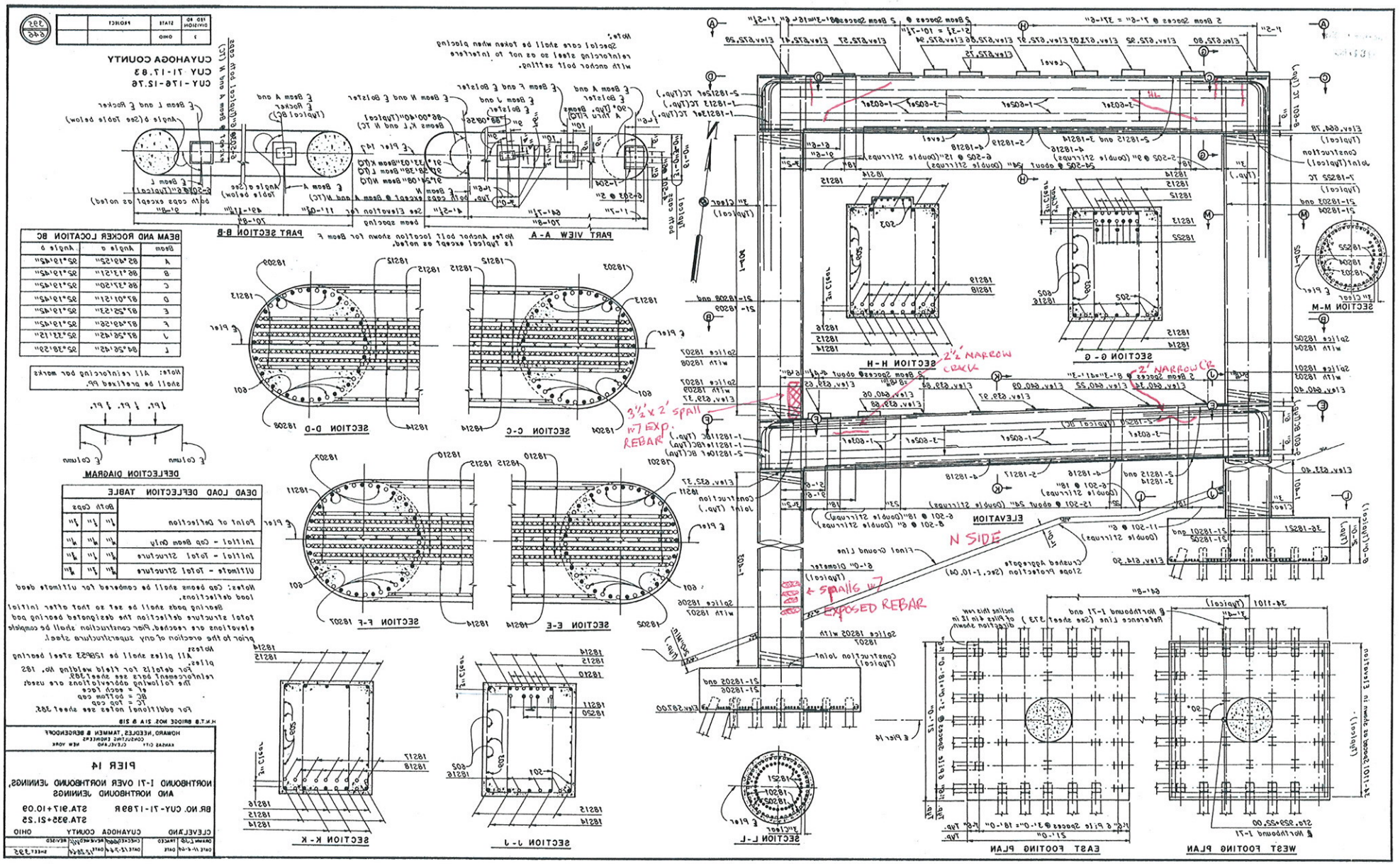
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25

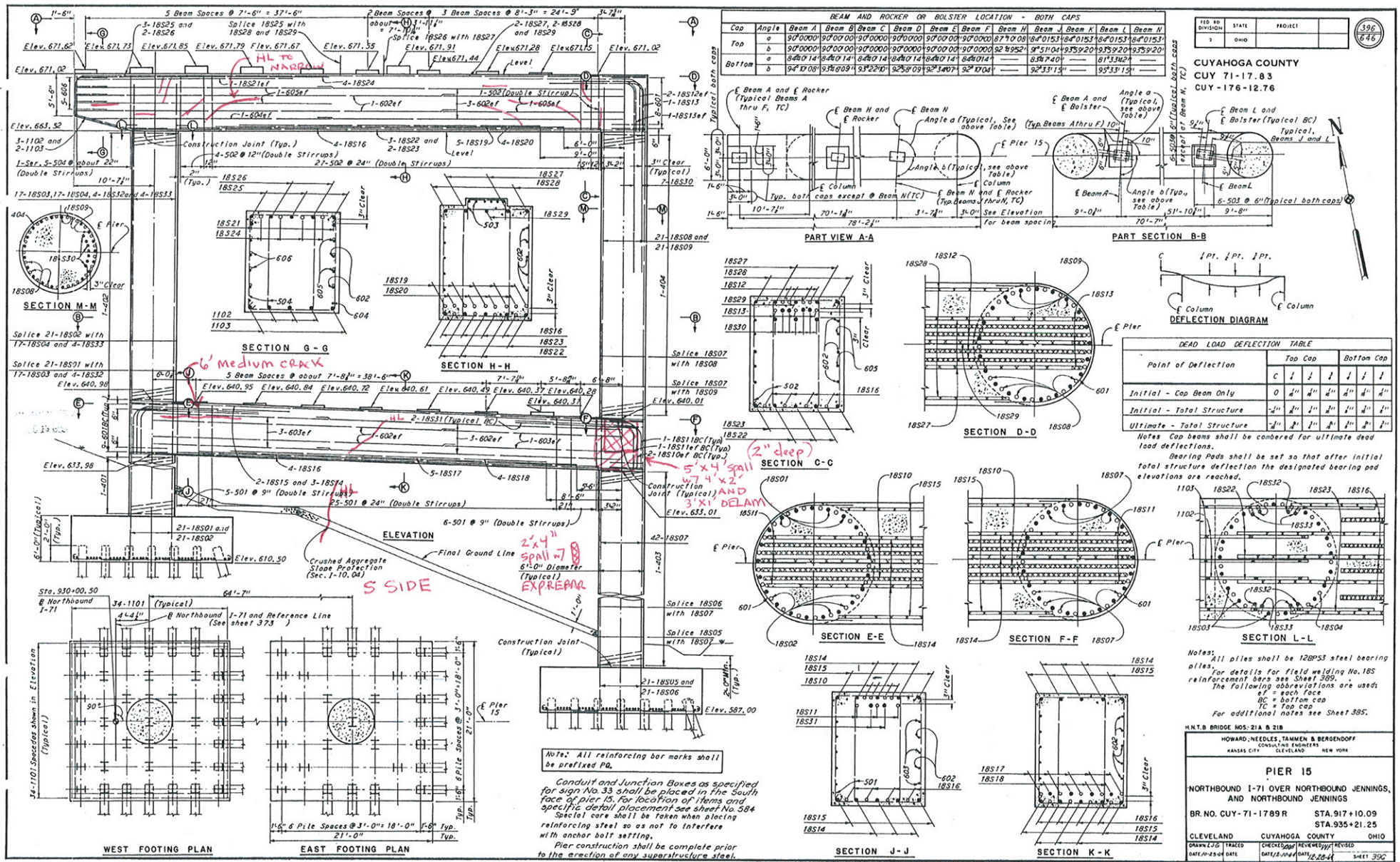
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJG	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-4-64	DATE	DATE 12-7-64	DATE 12-28-64	SHEET 395

PORTION BELOW the SR 176 PIER CAP IS A WALL TYPE. PLANS NOT ACCURATE.

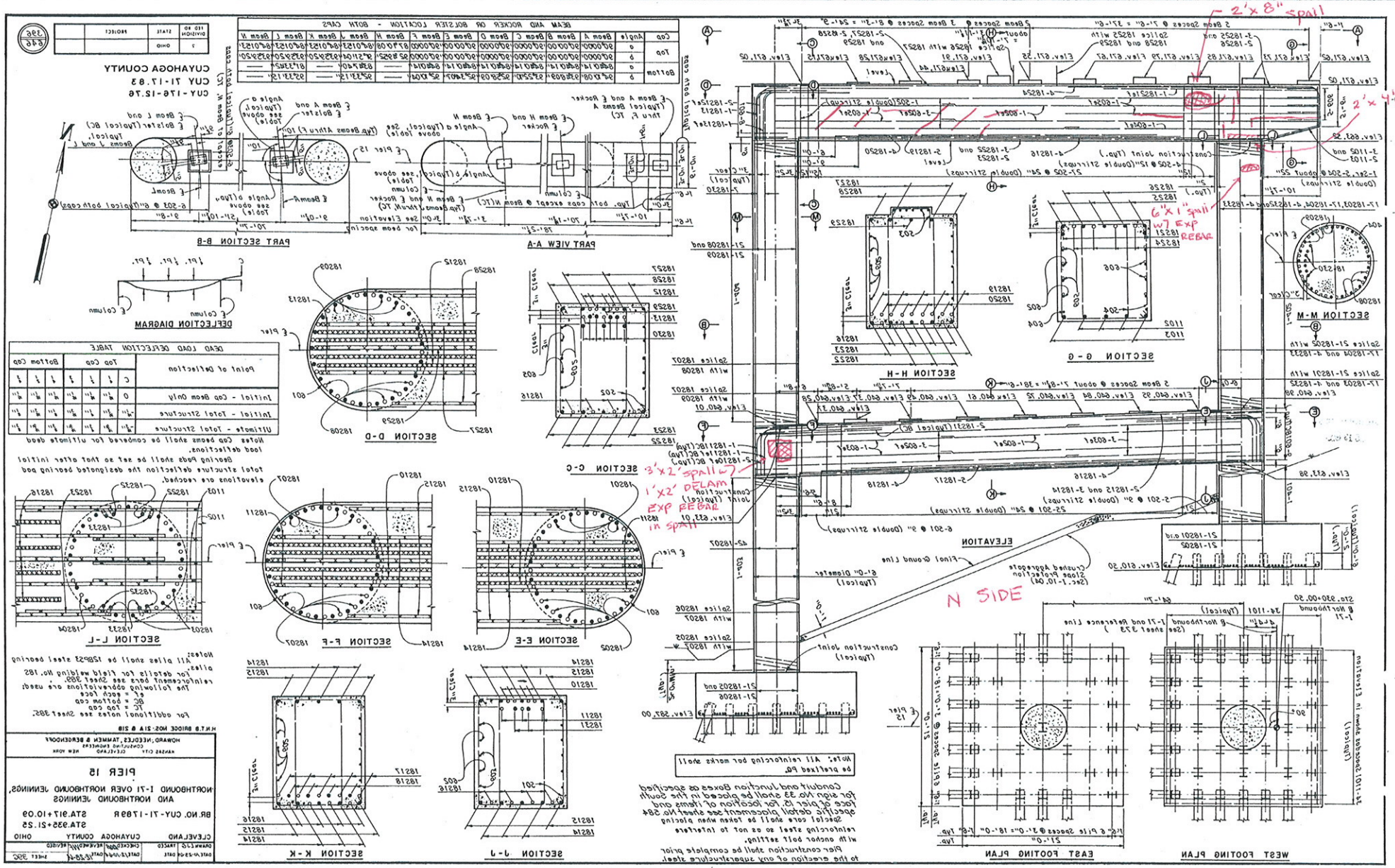


PORTION BELOW THE SR 176 PIER CAP IS A WALL TYPE. PLANS NOT ACCURATE.

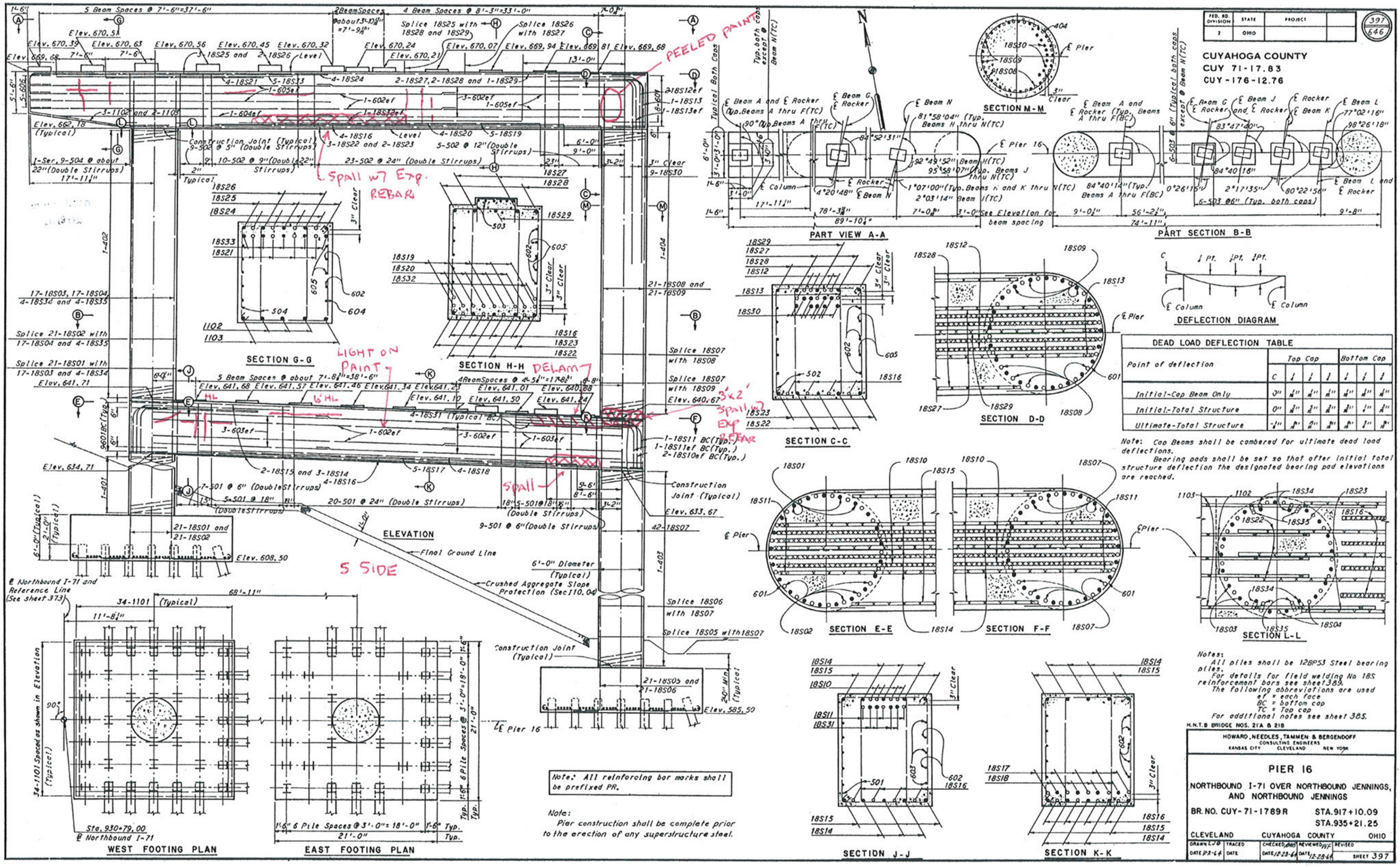


PORTION BELOW SR 176 PIER CAP IS WALL TYPE. PLANS NOT ACCURATE.

SIGNAGE ATTACHED TO PIER



PORTION BELOW SR 176 PIER CAP IS WALL TYPE. PLANS ARE NOT ACCURATE.



DEAD LOAD DEFLECTION TABLE							
Point of deflection	Top Cap				Bottom Cap		
	C	1/4	1/2	1/4	1/4	1/2	1/4
Initial-Cap Beam Only	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"
Initial-Total Structure	0"	3/16"	5/16"	3/16"	3/16"	1/4"	3/16"
Ultimate-Total Structure	-1/4"	9/16"	15/16"	9/16"	9/16"	3/4"	9/16"

Note: Cap Beams shall be cambered for ultimate dead load deflections.
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Notes:
All piles shall be 12BP53 Steel bearing piles.
For details for field welding No 18S reinforcement bars see sheet 389.
The following abbreviations are used
ef = each face
BC = bottom cap
TC = Top cap
For additional notes see sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER 16

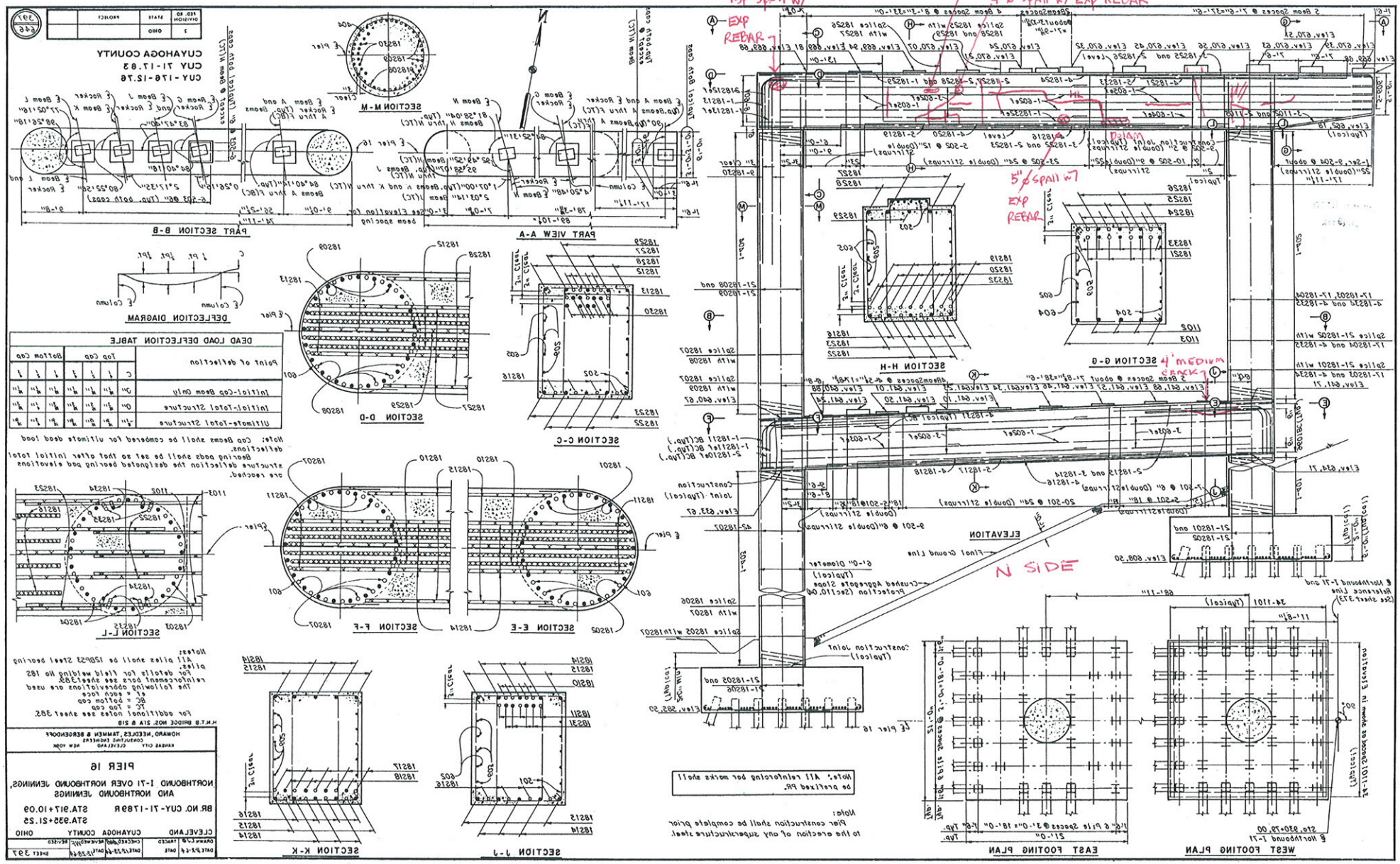
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25

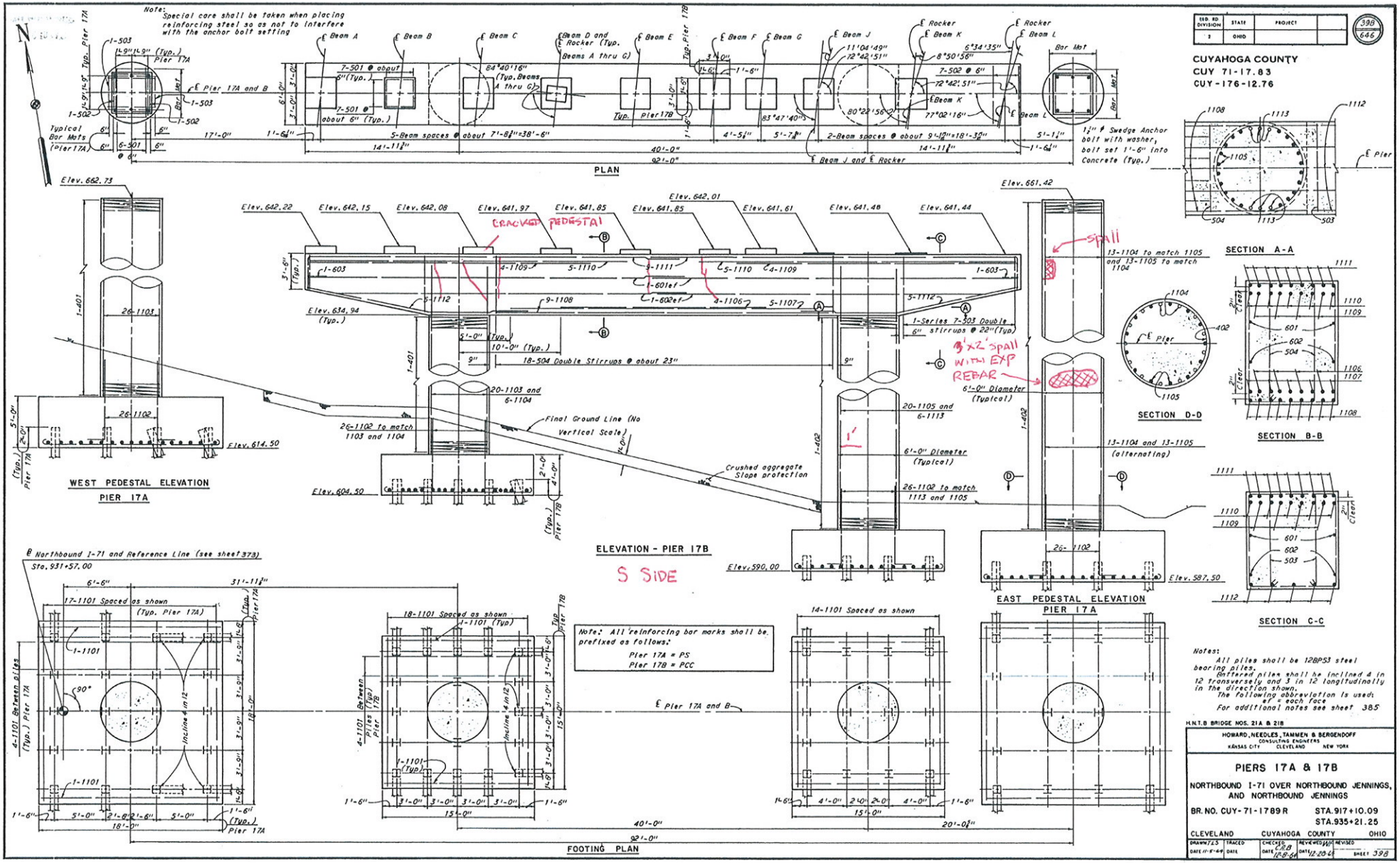
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJD	TRACED	CHECKED	REVIEWED WF	REVISED
DATE 11-2-64	DATE	DATE 12-23-64	DATE 12-28-64	SHEET 397

PORTION BELOW SR 176 PIER CAP IS WALL TYPE. PLANS NOT ACCURATE.



PORTION OF SR176 PIER CAP IS WALL TYPE. PLANS NOT ACCURATE.



SED. RD. DIVISION	STATE	PROJECT
2	OHIO	

398
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

Notes:
All piles shall be 12BP53 steel bearing piles.
Battered piles shall be inclined 4 in 12 transversely and 3 in 12 longitudinally in the direction shown.
The following abbreviation is used: ea = each face
For additional notes see sheet 385

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIERS 17A & 17B

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

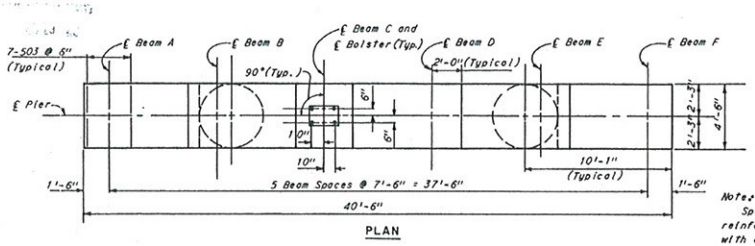
DRAWN 7.25	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-6-69	DATE	DATE 12-8-69	DATE 12-20-69	SHEET 398

PLAN
WEST PEDESTAL ELEVATION
PIER 17A
SECTION A-A
SECTION D-D
SECTION B-B
SECTION C-C
EAST PEDESTAL ELEVATION
PIER 17A
ELEVATION - PIER 17B
N SIDE
FOOTING PLAN
8" Ø DELAM
4'x1'Spall w/ EXP REBAR
5'
3'
HL
CUYAHOGA COUNTY
CUY-71-17.83
CUY-176-12.76
PIERS 17A & 17B
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R
STA.917+10.09
STA.939+21.29
CLEVELAND CUYAHOGA COUNTY OHIO
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
KANSAS CITY CLEVELAND NEW YORK

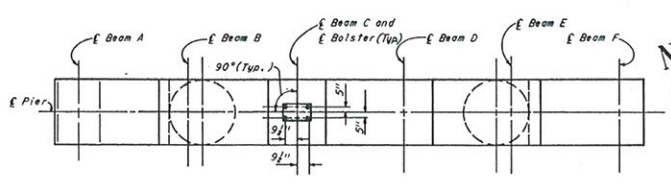
FED. RD. DIVISION	STATE	PROJECT	
3	OHIO		

399
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

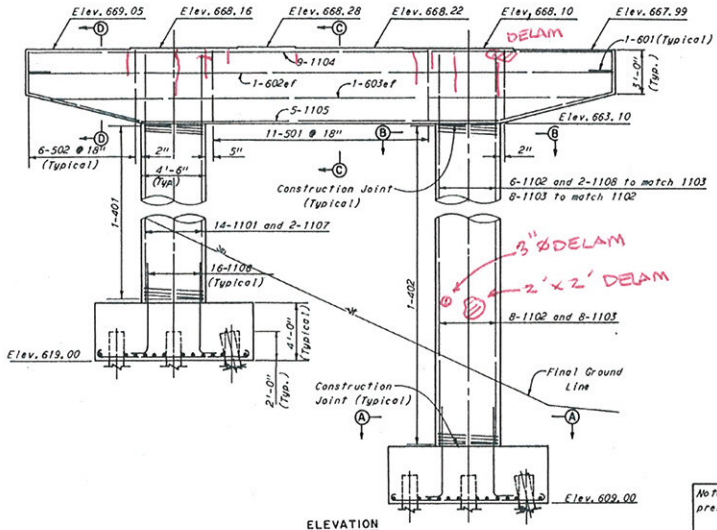


PLAN



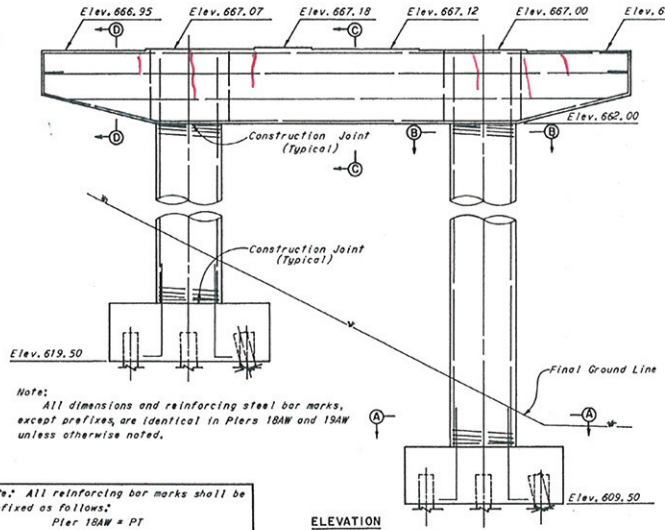
PLAN

Note:
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



ELEVATION

5 SIDE

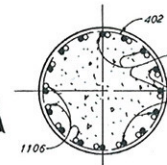


Note:
All dimensions and reinforcing steel bar marks, except prefixes, are identical in Piers 18AW and 19AW unless otherwise noted.

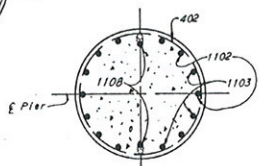
Note: All reinforcing bar marks shall be prefixed as follows:
Pier 18AW = PT
Pier 19AW = PU

ELEVATION

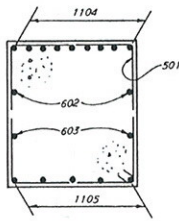
5 SIDE



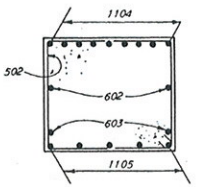
SECTION A-A



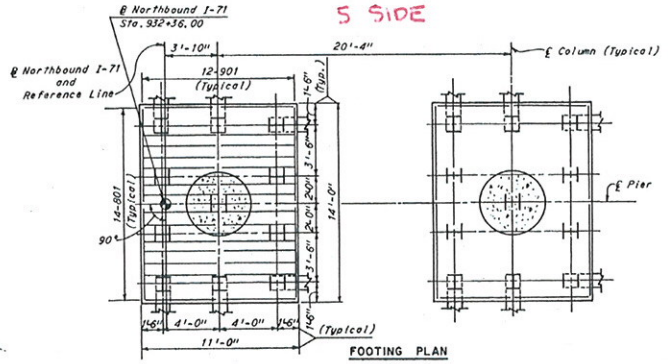
SECTION B-B



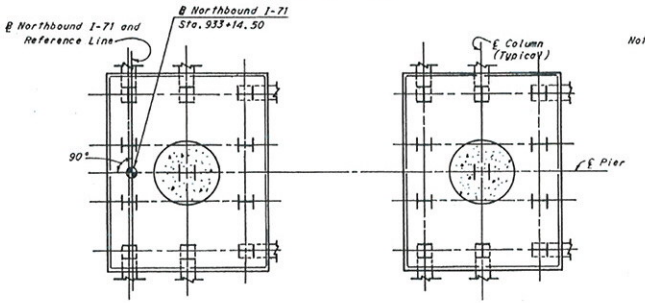
SECTION C-C



SECTION D-D



FOOTING PLAN
PIER 18AW



FOOTING PLAN
PIER 19AW

Notes:
All piles are 12BP53.
The following abbreviation is used: ef = each face
For additional notes see sheet 385.

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIERS 18AW & 19AW

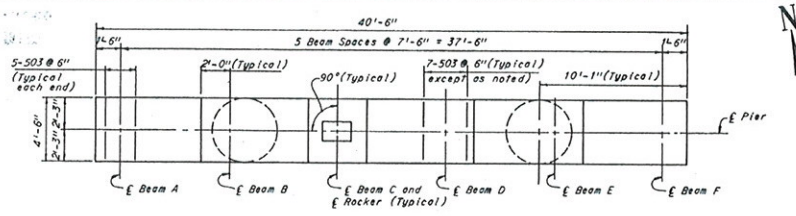
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

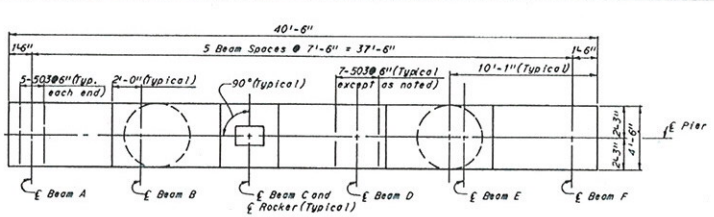
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 8-5-64	DATE	DATE 12-7-64	DATE 12-28-64	SHEET 399

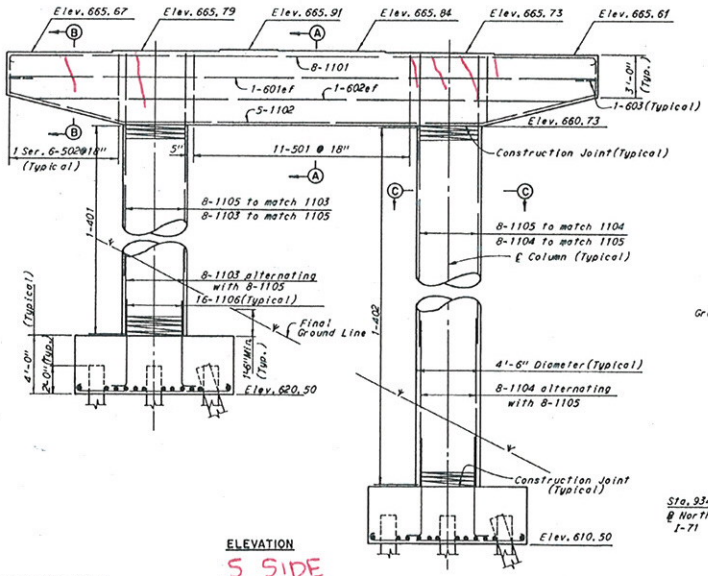
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
PIERS 18AW & 19AW
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,
AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1758R
STA.917+10.09
STA.935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
Consulting Engineers
KANSAS CITY CLEVELAND NEW YORK
H.T.B. BRIDGE NOS. 21A & 21B
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
PLAN
ELEVATION
FOOTING PLAN
PIER 19AW
PLAN
ELEVATION
FOOTING PLAN
PIER 18AW
LEAKAGE
N SIDE
N SIDE
19 AW
18AW



PLAN

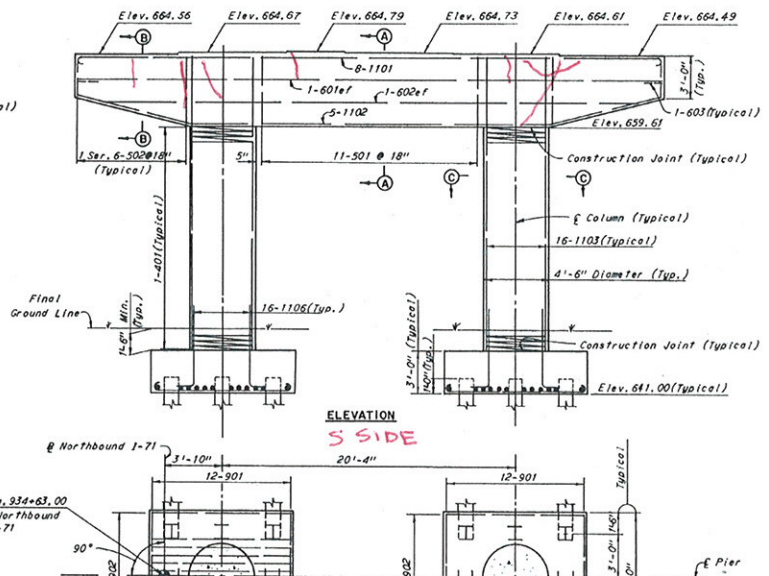


PLAN



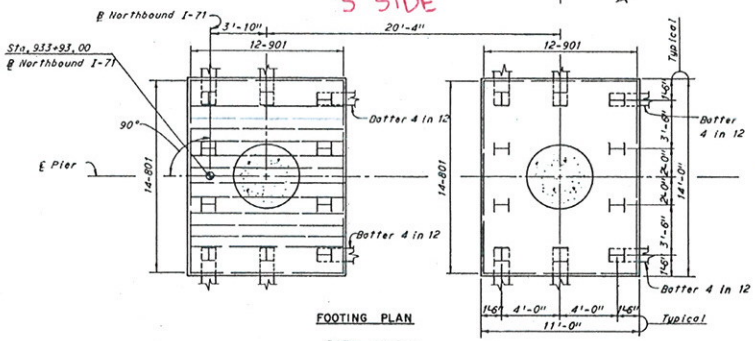
ELEVATION

S SIDE



ELEVATION

S SIDE



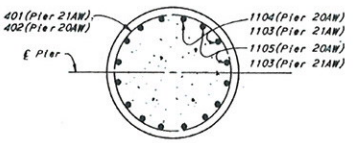
FOOTING PLAN

PIER 20AW

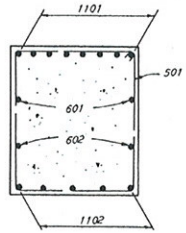
FOOTING PLAN

PIER 21AW

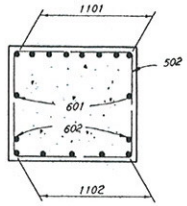
Note: All reinforcing bar marks shall be prefixed as follows:-
Pier 20AW = PV
Pier 21AW = PW



SECTION C-C



SECTION A-A



SECTION B-B

Notes:
All piles are 12BP53.
All battered piles shall be inclined 3 in 12 in the direction shown except as noted.
The following abbreviation is used:
ef = each face
For additional notes see Sheet 385.

FED. RD. DIVISION	STATE	PROJECT	
3	OHIO		

400
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.W.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIERS 20AW & 21AW

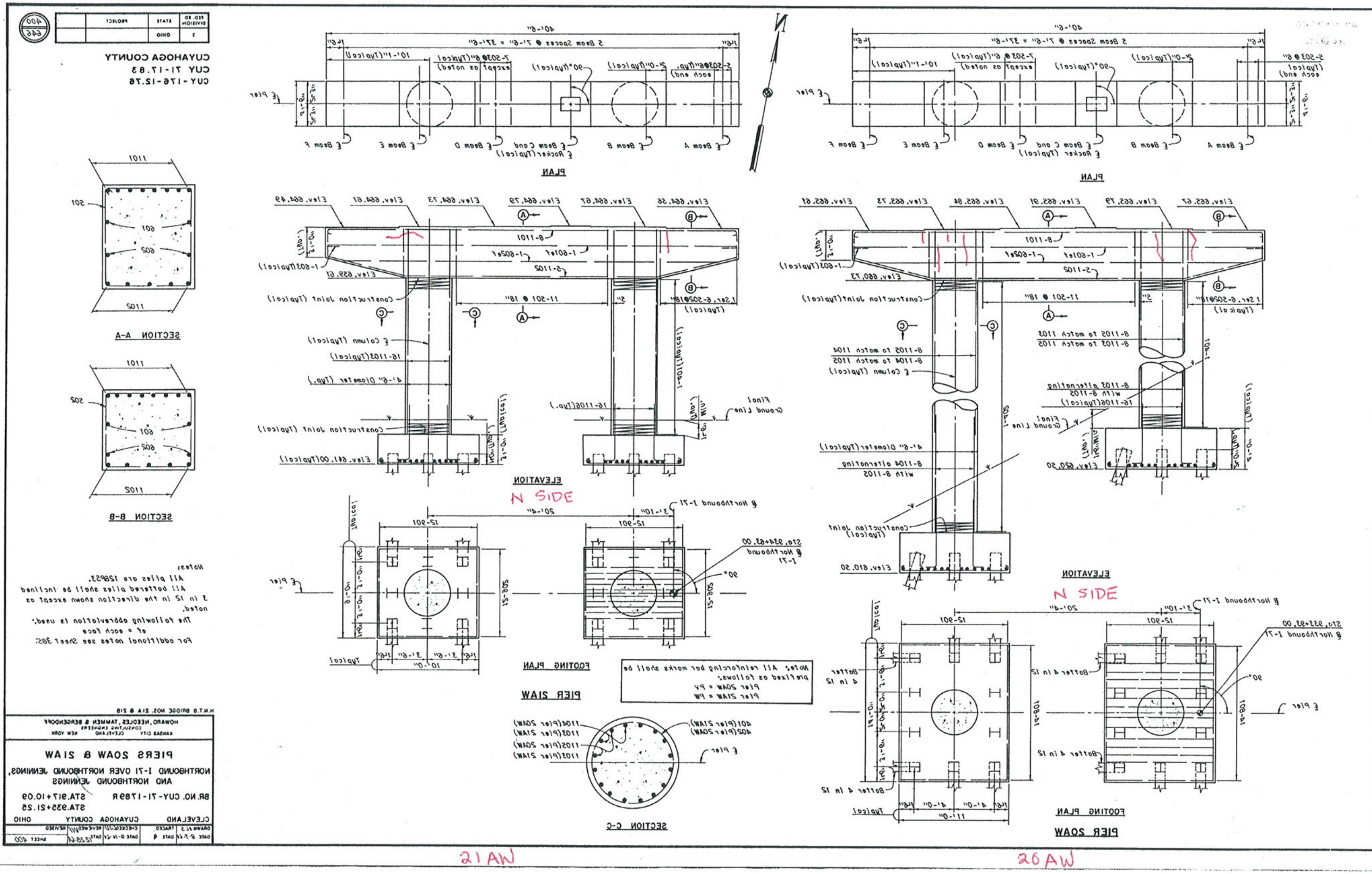
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 8-7-64	DATE	DATE 9-14-64	DATE 10-20-64	

SHEET 400



CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
SECTION A-A
SECTION B-B
PLAN
ELEVATION
N SIDE
FOOTING PLAN
PIER 21AW
PIER 20AW
SECTION C-C
Notes:
All piles are 12BP53.
All battered piles shall be inclined 3 in 12 in the direction shown except as noted.
The following abbreviation is used: ef = each face
For additional notes see Sheet 385.
Note: All reinforcing bar marks shall be prefixed as follows:
Pier 20AW = PV
Pier 21AW = PW
H.N.T.B. BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIERS 20AW & 21AW
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R STA.917+10.09
STA.935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 400
21AW
20AW

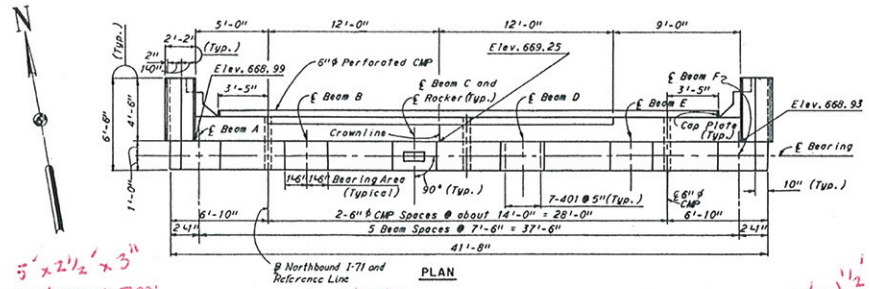
Jt Mat'l Missing

FED. RD. DIVISION	STATE	PROJECT	
7	OHIO		

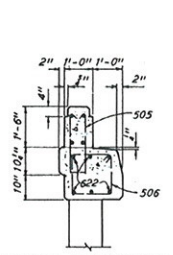
376/646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

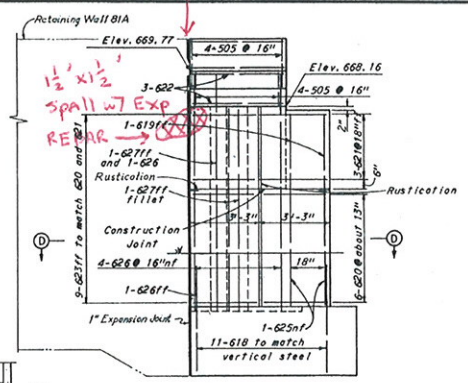
Note: Elevations along backwall are given to top of 8x4x1 angle of the end dam.



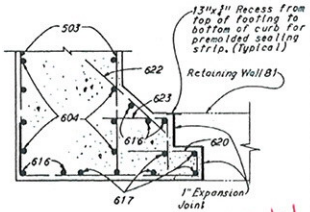
PLAN



TYPICAL CURB SECTION
(Type "M" Railing not shown)



WEST BUTTRESS
(Piles not shown)

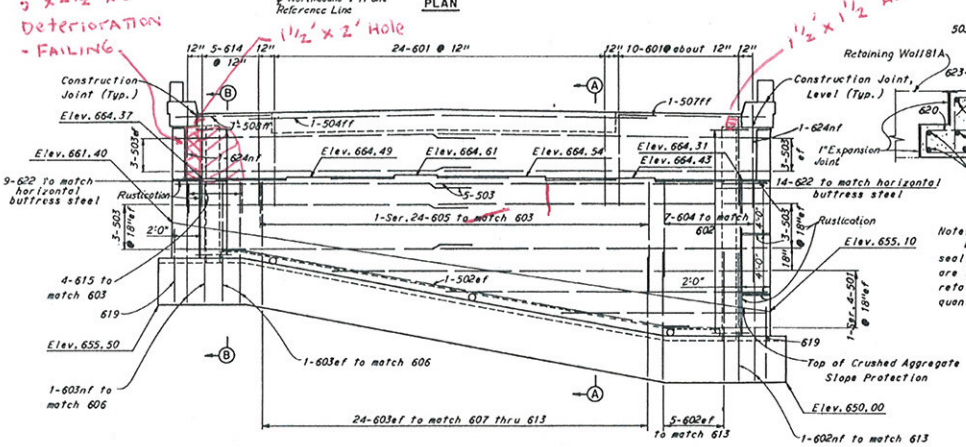


SECTION C-C

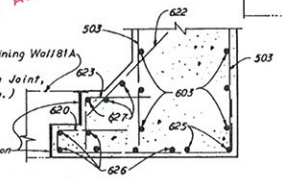
5' x 2½' x 3" Deterioration - FAILING

1½' x 2' Hole

1½' x 1½' Hole



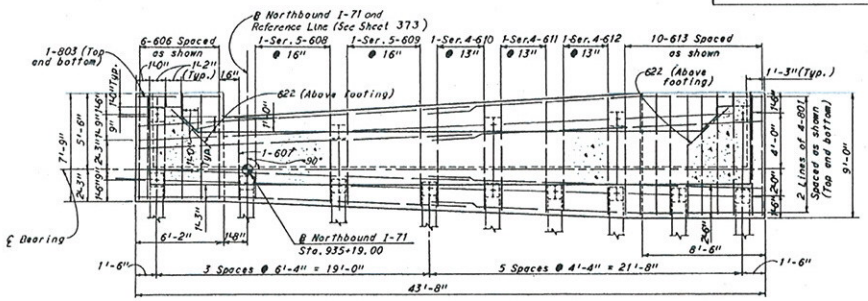
ELEVATION
(Piles not shown)



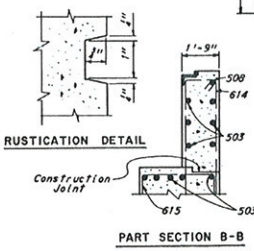
SECTION D-D

Note:
Expansion joint and sealing strip materials are included with retaining wall quantities.

Note.
All reinforcing bar marks shall be prefixed AB.

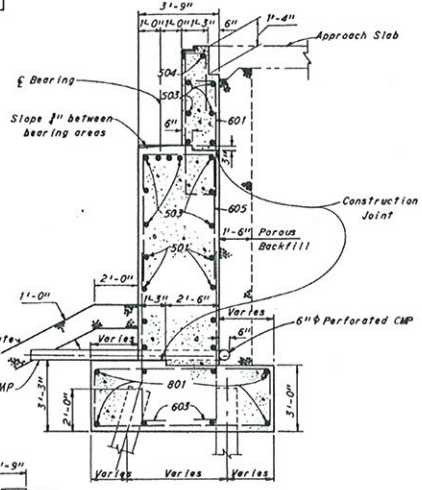


FOOTING PLAN



RUSTICATION DETAIL

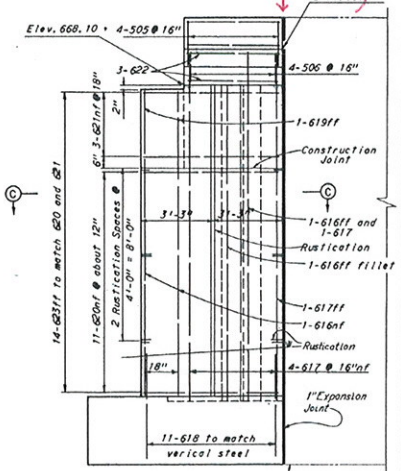
PART SECTION B-B



SECTION A-A

Notes:
All piles shall be 12BP53 steel bearing piles.
Textured finish as described in the General Notes, shall be used on buttresses and shall extend 2'-0" to vertical rustication on front face of abutment.
The following abbreviations are used
nf = near face
ff = far face
ef = each face
For additional notes see sheet 375.

Jt Mat'l Falling Out



EAST BUTTRESS
(Piles not shown)

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

NORTH ABUTMENT - AW

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

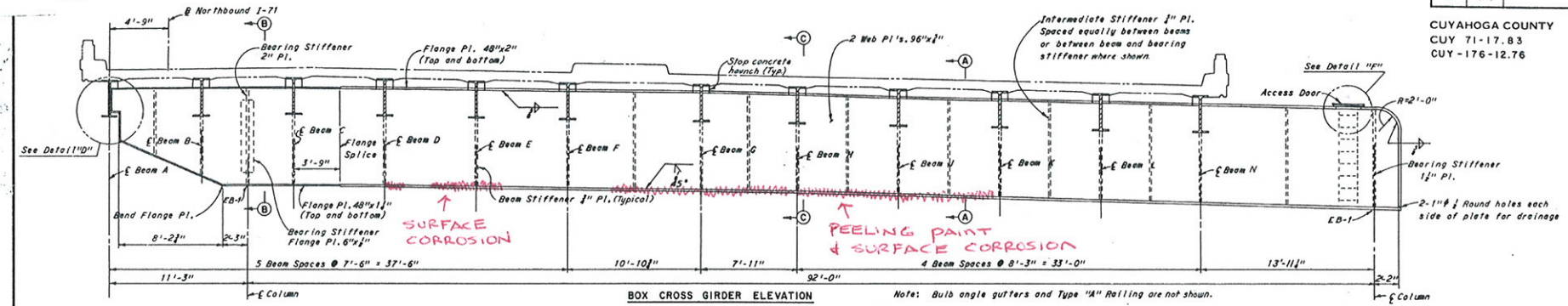
DRAWN TLS	TRACED	CHECKED KJD	REVIEWED WF	REVISED
DATE 8-8-64	DATE	DATE 8-20-64	DATE 11-22-64	SHEET 376

91-W

FED. RD. DIVISION	STATE	PROJECT	
7	OHIO		

415
646

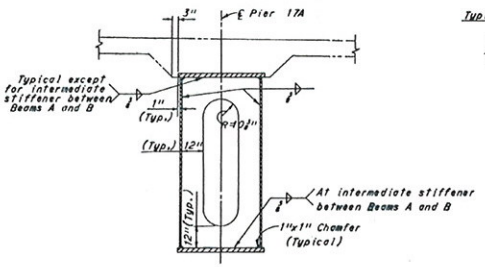
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



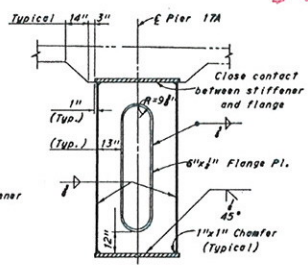
BOX CROSS GIRDER ELEVATION

Note: Bulb angle gutters and Type "A" Railing are not shown.

S SIDE

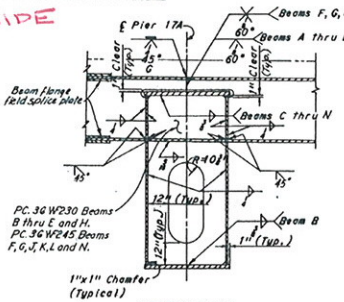


SECTION A-A

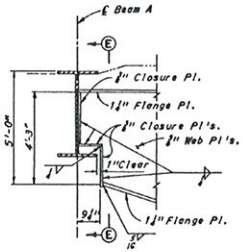


SECTION B-B

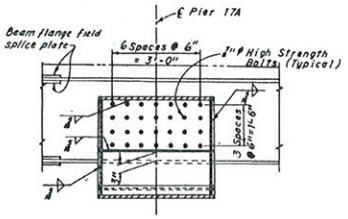
Bearing stiffener at other column similar to above but without 6"x½" flange plate.



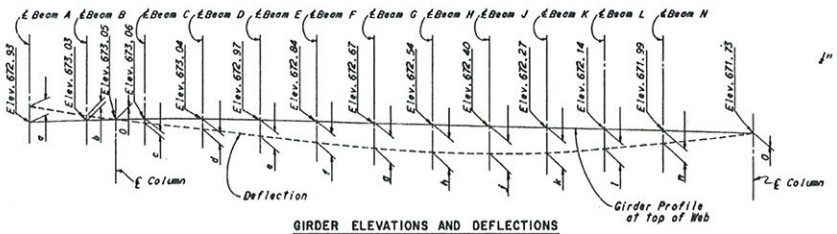
SECTION C-C



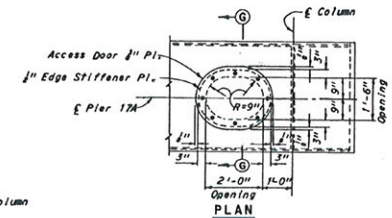
DETAIL "D"



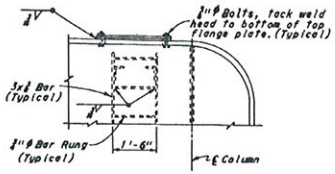
SECTION E-E



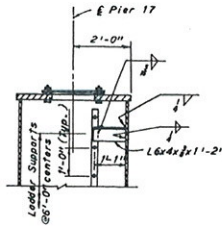
GIRDER ELEVATIONS AND DEFLECTIONS



PLAN



DETAIL "F"



SECTION G-G

DEFLECTION TABLE

Deflection	a	b	c	d	e	f	g	h	i	k	l	n
Girder	½"	0	0	0	½"	½"	½"	½"	½"	½"	½"	½"
Beam framing from South	0	0	0	0	½"	½"	½"	½"	½"	½"	½"	½"
Beam framing from North	0	0	0	0	½"	½"	½"	½"	½"	½"	½"	½"
Total Steel	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"
Total Concrete	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"	½"
Total Steel and Concrete	½"	½"	½"	½"	½"	½"	1"	1"	1"	1"	½"	½"

Note: Deflections are measured to the nearest ½ inch.

The girder shall be fabricated to compensate for the effects of dead load deflections and, under full dead load shall match the girder elevations shown

The web plates may be shop spliced as required by available plate lengths.

The locations of shop web splices and the location and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of material.

Intermediate stiffeners shall be welded to the flange indicated, and shall be fitted to close contact with the other flange.

All stiffeners shall be set normal to the girder flanges.

For shop splice details see sheet 410 .

For top of pavement elevations at the beams see sheet 432.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

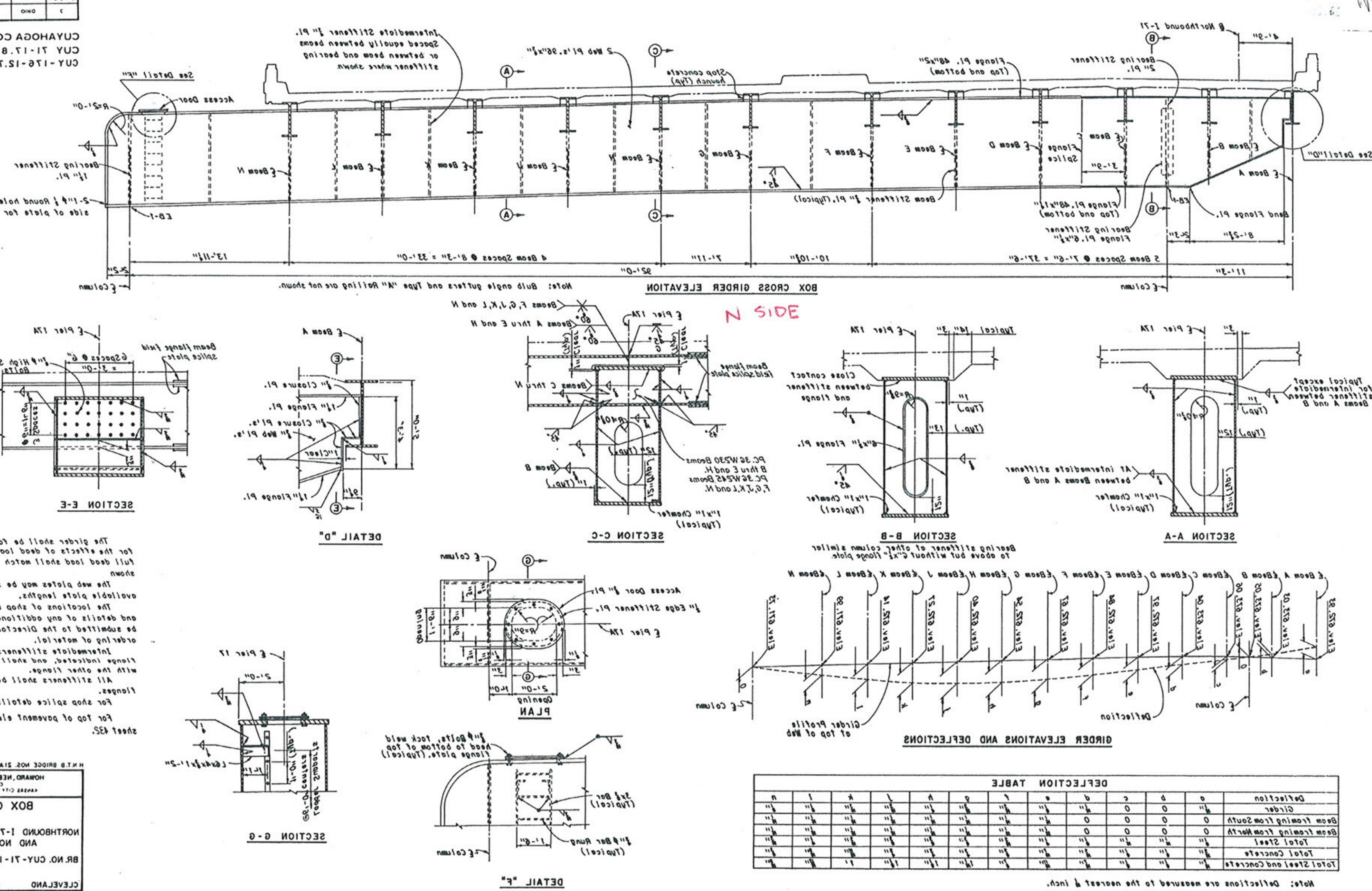
BOX GIRDER DETAILS
UNIT 3-A
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 10-64	DATE	DATE 10-24-64	DATE 12-29-64	SHEET 415

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



The girder shall be fabricated to compensate for the effects of dead load deflections and, under full dead load shall match the girder elevations shown.

The web plates may be shop spliced as required by available plate lengths.

The locations of shop web splices and the location and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of material.

Intermediate stiffeners shall be welded to the flange indicated, and shall be fitted to close contact with the other flange.

All stiffeners shall be set normal to the girder flanges.

For shop splice details see sheet 410.

For top of pavement elevations of the beams see sheet 432.

DEFLECTION TABLE

Deflection	a	b	c	d	e	f	g	h	j	k	l	n
Girder	[illegible]	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beam framing from South	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beam framing from North	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Steel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Steel and Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1"	[illegible]	[illegible]

Note: Deflections are measured to the nearest [illegible] inch.

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

BOX GIRDER DETAILS
UNIT 3-A

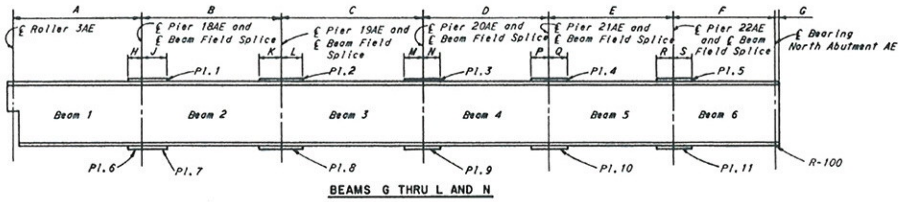
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

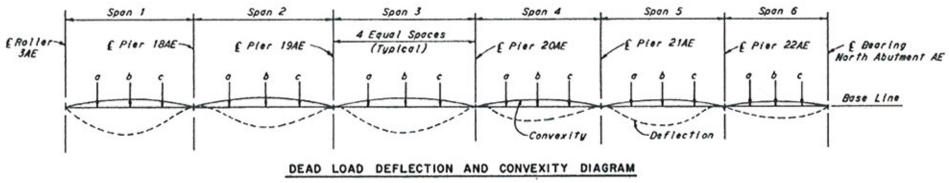
CLEVELAND CUYAHOGA COUNTY OHIO

SHEET 415

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



BEAMS G THRU L AND N



DEAD LOAD DEFLECTION AND CONVEXITY DIAGRAM

DEAD LOAD DEFLECTIONS

Beams	Span 1 a Tot.	Span 1 a Con	Span 1 b Tot.	Span 1 b Con	Span 1 c Tot.	Span 1 c Con	Span 2 a Tot.	Span 2 a Con	Span 2 b Tot.	Span 2 b Con	Span 2 c Tot.	Span 2 c Con	Span 3 a Tot.	Span 3 a Con	Span 3 b Tot.	Span 3 b Con	Span 3 c Tot.	Span 3 c Con
G	[illegible]	[illegible]	1"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1"	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	1"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	1"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	1"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M																	[illegible]*	[illegible]*
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Beams	Span 4 a Tot.	Span 4 a Con	Span 4 b Tot.	Span 4 b Con	Span 4 c Tot.	Span 4 c Con	Span 5 a Tot.	Span 5 a Con	Span 5 b Tot.	Span 5 b Con	Span 5 c Tot.	Span 5 c Con	Span 6 a Tot.	Span 6 a Con	Span 6 b Tot.	Span 6 b Con	Span 6 c Tot.	Span 6 c Con
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Indicates End Diaphragm Deflections for Beam M.

Notes:

Dead Load Deflections and Convexity Corrections are measured to nearest 1/16 inch.

Tot. denotes total deflection due to dead load of concrete and steel.

Con. denotes deflections due to dead load of concrete only.

Negative convexity corrections indicate convexity below the base line.

CONVEXITY CORRECTIONS

Beams	Span 1 a	Span 1 b	Span 1 c	Span 2 a	Span 2 b	Span 2 c	Span 3 a	Span 3 b	Span 3 c	Span 4 a	Span 4 b	Span 4 c	Span 5 a	Span 5 b	Span 5 c	Span 6 a	Span 6 b	Span 6 c
G	+1/4"	+7/16"	+7/16"	-1/16"	-1/8"	-1/16"	-3/16"	-1/8"	-1/16"	+3/16"	+3/16"	+1/4"	0"	-1/16"	-1/16"	-3/16"	-3/16"	-3/16"
H	+5/16"	+3/16"	+1/4"	0"	0"	0"	+1/16"	0"	0"	+1/16"	+1/8"	+1/8"	-1/16"	-1/16"	-1/16"	-3/16"	-1/4"	-1/4"
J	+1/16"	+1/8"	+1/16"	0"	0"	0"	+1/8"	+1/4"	+1/8"	-1/16"	-1/8"	-1/8"	-1/16"	-1/8"	-1/16"	-1/8"	-1/4"	-3/16"
K	0"	0"	0"	0"	0"	0"	+1/4"	+1/8"	+1/16"	-1/16"	-1/8"	-1/8"	-1/16"	-1/8"	-1/8"	-1/8"	-3/16"	-1/8"
L	0"	0"	0"	0"	0"	0"	+1/16"	+1/16"	0"	+1/8"	0"	0"	-1/16"	-1/8"	-1/8"	-1/16"	-1/8"	-1/16"
M										-1/16"*	-1/16"*	+1/16"*	-1/4"	-3/8"	-1/8"	-1/8"	0"	0"
N	0"	0"	0"	0"	0"	0"	+3/16"	+1/8"	0"	-3/16"	-1/4"	-1/8"	-3/16"	-1/2"	-3/8"	+3/16"	+5/16"	+1/4"

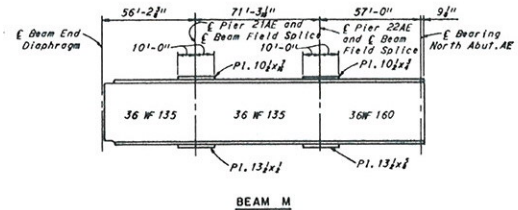
* Indicates 1/4 Point Convexity Corrections for Beam M between End Diaphragm and ℄ Pier 21AE.

TABLE OF DIMENSIONS

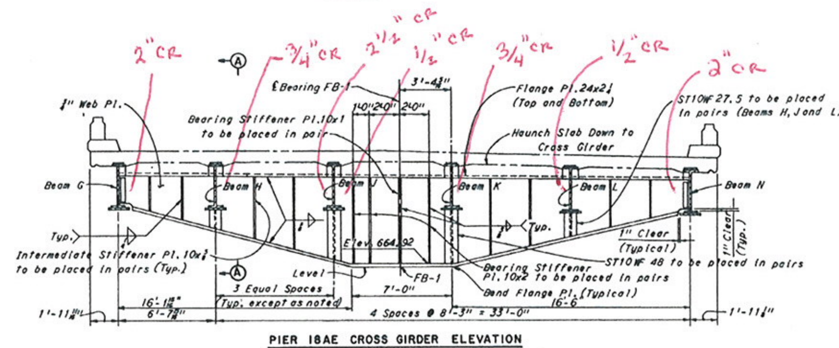
Beams	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
G	73'-9 3/4"	79'-11"	79'-5 1/2"	70'-10 5/16"	70'-10 5/16"	56'-8 1/4"	9 1/16"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
H	73'-6 3/8"	79'-7 3/8"	79'-7 3/8"	70'-11 5/16"	70'-11 5/16"	56'-9 1/2"	9 1/16"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
J	73'-6 3/8"	79'-7 3/8"	79'-7 3/8"	70'-11 5/16"	70'-11 5/16"	56'-9 1/2"	9 1/16"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
K	73'-6 3/8"	79'-7 3/8"	79'-7 3/8"	70'-11 5/16"	70'-11 5/16"	56'-9 1/2"	9 1/16"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
L	73'-6 3/8"	79'-7 3/8"	79'-7 3/8"	70'-11 5/16"	70'-11 5/16"	56'-9 1/2"	9 1/16"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
N	73'-6 3/8"	79'-7 3/8"	79'-7 3/8"	71'-6 1/2"	71'-6 1/2"	57'-2 5/16"	9 1/4"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"

TABLE OF DIMENSIONS

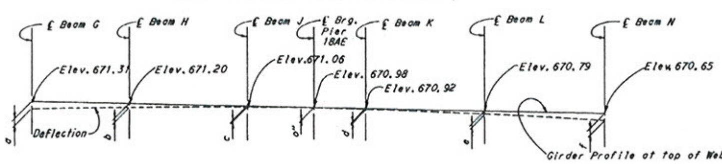
Beams	Plates 1	Plates 2	Plates 3	Plates 4	Plates 5	Plates 6	Plates 7	Plates 8	Plates 9	Plates 10	Plates 11	Beams 1	Beams 2	Beams 3	Beams 4	Beams 5	Beams 6
G	10 1/2x1 1/4	10 1/2x3/4	10 1/2x7/8	10 1/2x3/4	10 1/2x3/4	18x1 1/4	13 1/2x1 1/4	13 1/2x3/4	13 1/2x7/8	13 1/2x7/8	13 1/2x7/8	36WF230	36WF160	36WF170	36WF150	36WF150	36WF160
H	10 1/2x1 1/4	10 1/2x3/4	10 1/2x7/8	10 1/2x3/4	10 1/2x3/4	18x1 1/4	13 1/2x1 1/4	13 1/2x3/4	13 1/2x7/8	13 1/2x7/8	13 1/2x7/8	36WF230	36WF160	36WF170	36WF150	36WF150	36WF160
J	10 1/2x1 1/4	10 1/2x1 1/4	10 1/2x1 1/4	10 1/2x3/4	10 1/2x3/4	18x1 1/4	13 1/2x1 1/4	13 1/2x1	13 1/2x1	13 1/2x3/4	13 1/2x3/4	36WF230	36WF182	36WF194	36WF160	36WF160	36WF160
K	10 1/2x1 1/4	10 1/2x1 1/4	10 1/2x1 1/4	10 1/2x3/4	10 1/2x3/4	18x1 1/4	13 1/2x1 1/4	13 1/2x1	13 1/2x1	13 1/2x3/4	13 1/2x3/4	36WF230	36WF182	36WF194	36WF160	36WF160	36WF160
L	10 1/2x1 1/4	10 1/2x1	10 1/2x1 1/4	10 1/2x7/8	10 1/2x7/8	18x1	13 1/2x1	13 1/2x7/8	13 1/2x1	13 1/2x7/8	13 1/2x7/8	36WF230	36WF194	36WF194	36WF160	36WF150	36WF160
N	10 1/2x1 1/4	10 1/2x1	10 1/2x1 1/4	10 1/2x7/8	10 1/2x7/8	18x1	13 1/2x1	13 1/2x7/8	13 1/2x1	13 1/2x7/8	13 1/2x7/8	36WF230	36WF194	36WF194	36WF160	36WF150	36WF160



BEAM M



PIER 18AE CROSS GIRDER ELEVATION



GIRDER ELEVATIONS AND DEAD LOAD DEFLECTION DIAGRAMS

DEAD LOAD DEFLECTION TABLE

Deflection	a	b	c	d	e	f
Total Concrete	1 1/8"	1/16"	0"	0"	0"	1 1/8"
Total Steel and Conc.	1/8"	1/16"	0"	0"	1/16"	1/8"

Notes:

For cover plate details see Ohio Standard Drawing SD-1-63, sheet 1 of 4.

For Section A-A see sheet 421.

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SUPERSTRUCTURE DETAILS
UNIT 4-AE

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25

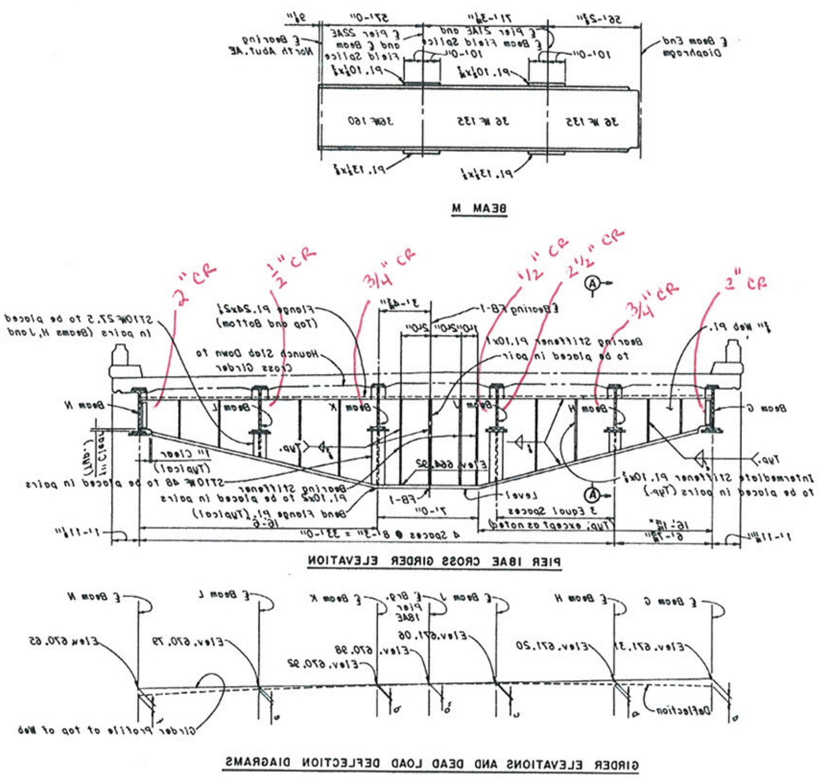
CLEVELAND CUYAHOGA COUNTY OHIO

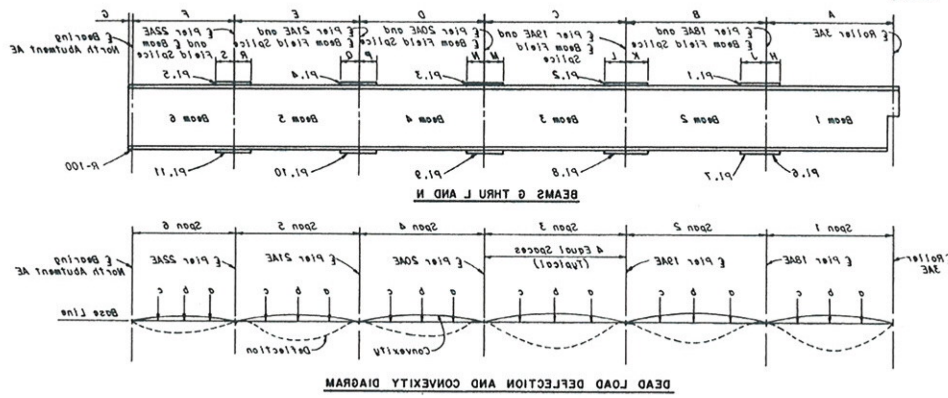
DRAWN JEN DATE 11-3-64	TRACED DATE	CHECKED JKH DATE 12-21-64	REVIEWED DATE 12-22-64	REVISED	SHEET 419

FED. RD. DIVISION	STATE	PROJECT		
3	OHIO			

419 / 646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76





DEAD LOAD DEFLECTIONS

Beams	Span 1 a Tot.	Span 1 a Con.	Span 1 b Tot.	Span 1 b Con.	Span 1 c Tot.	Span 1 c Con.	Span 2 a Tot.	Span 2 a Con.	Span 2 b Tot.	Span 2 b Con.	Span 2 c Tot.	Span 2 c Con.	Span 3 a Tot.	Span 3 a Con.	Span 3 b Tot.	Span 3 b Con.	Span 3 c Tot.	Span 3 c Con.	Span 4 a Tot.	Span 4 a Con.	Span 4 b Tot.	Span 4 b Con.	Span 4 c Tot.	Span 4 c Con.	Span 5 a Tot.	Span 5 a Con.	Span 5 b Tot.	Span 5 b Con.	Span 5 c Tot.	Span 5 c Con.	Span 6 a Tot.	Span 6 a Con.	Span 6 b Tot.	Span 6 b Con.	Span 6 c Tot.	Span 6 c Con.
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Indicates End Diaphragm Deflections for Beam M.

CONVEXITY CORRECTIONS

Beams	Span 1 a	Span 1 b	Span 1 c	Span 2 a	Span 2 b	Span 2 c	Span 3 a	Span 3 b	Span 3 c	Span 4 a	Span 4 b	Span 4 c	Span 5 a	Span 5 b	Span 5 c	Span 6 a	Span 6 b	Span 6 c
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	0"	0"	0"	0"	0"	0"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	0"	0"	0"	0"	0"	0"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M										[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0"	0"
N	0"	0"	0"	0"	0"	0"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Indicates ¼ Point Convexity Corrections for Beam M between End Diaphragm and ℄ Pier 21AE.

Notes:
Dead Load Deflections and Convexity Corrections are measured to nearest ⅛ inch.
Tot. denotes total deflection due to dead load of concrete and steel.
Con. denotes deflections due to dead load of concrete only.
Negative convexity corrections indicate convexity below the base line.

TABLE OF DIMENSIONS

Beams	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
G	73'-9¾"	79'-11"	79'-5¼"	70'-10¾"	70'-10¾"	56'-8¼"	9¾"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
H	73'-6¼"	79'-7¼"	79'-7¼"	70'-11⅝"	70'-11⅝"	56'-9¼"	9¾"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
J	73'-6¼"	79'-7¼"	79'-7¼"	70'-11⅝"	70'-11⅝"	56'-9¼"	9¾"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
K	73'-6¼"	79'-7¼"	79'-7¼"	70'-11⅝"	70'-11⅝"	56'-9¼"	9¾"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
L	73'-6¼"	79'-7¼"	79'-7¼"	70'-11⅝"	70'-11⅝"	56'-9¼"	9¾"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
N	73'-6¼"	79'-7¼"	79'-7¼"	71'-6¼"	71'-6¼"	57'-2⅝"	9¼"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"

TABLE OF DIMENSIONS

Beams	Plates 1	2	3	4	5	6	7	8	9	10	11	Beams 1	2	3	4	5	6
G	10½x1¼	10½x¾	10½x¾	10½x¾	10½x¾	18x1¼	13½x1¼	13½x¾	13½x¾	13½x¾	13½x¾	36WF230	36WF160	36WF170	36WF150	36WF150	36WF160
H	10½x1¼	10½x¾	10½x¾	10½x¾	10½x¾	18x1¼	13½x1¼	13½x¾	13½x¾	13½x¾	13½x¾	36WF230	36WF160	36WF170	36WF150	36WF150	36WF160
J	10½x1¼	10½x1¼	10½x1¼	10½x¾	10½x¾	18x1¼	13½x1¼	13½x1	13½x1	13½x¾	13½x¾	36WF230	36WF182	36WF194	36WF160	36WF160	36WF160
K	10½x1¼	10½x1¼	10½x1¼	10½x¾	10½x¾	18x1¼	13½x1¼	13½x1	13½x1	13½x¾	13½x¾	36WF230	36WF182	36WF194	36WF160	36WF160	36WF160
L	10½x1¼	10½x1	10½x1¼	10½x¾	10½x¾	18x1	13½x1	13½x¾	13½x1	13½x¾	13½x¾	36WF230	36WF194	36WF194	36WF160	36WF150	36WF160
N	10½x1¼	10½x1	10½x1¼	10½x¾	10½x¾	18x1	13½x1	13½x¾	13½x1	13½x¾	13½x¾	36WF230	36WF194	36WF194	36WF160	36WF150	36WF160

DEAD LOAD DEFLECTION TABLE

Deflection	a	b	c	d	e	f
Total Concrete	1/16"	1/8"	0"	0"	0"	1/16"
Total Steel and Conc.	1/4"	1/8"	0"	0"	1/8"	1/4"

Notes:
For cover plate details see Ohio Standard Drawing SD-1-63, sheet 1 of 4.
For Section A-A see sheet 421.

H.N.T.B. BRIDGE NOS. 21A & 21B

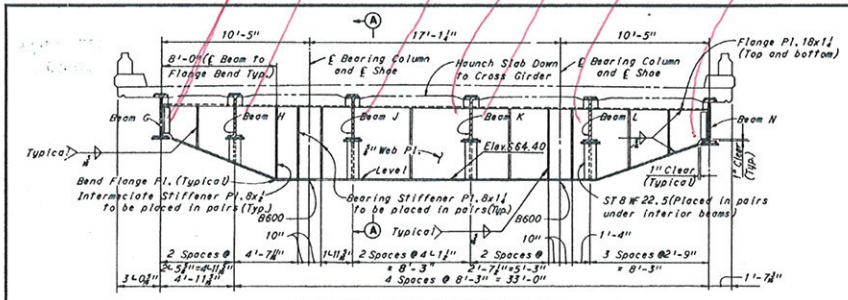
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SUPERSTRUCTURE DETAILS
UNIT 4-AE
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

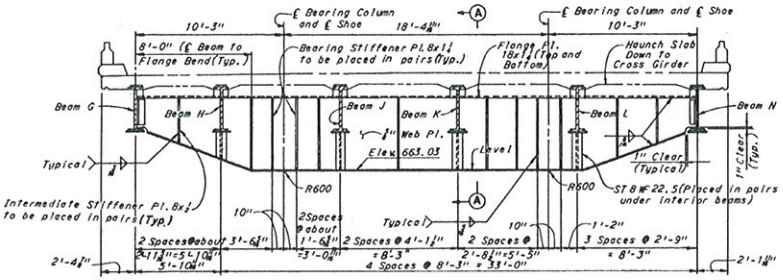
BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

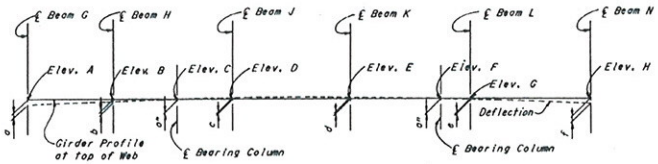
DRAWN JEN	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-3-64	DATE	DATE	DATE	SHEET 419



PIER 19AE CROSS GIRDER ELEVATION



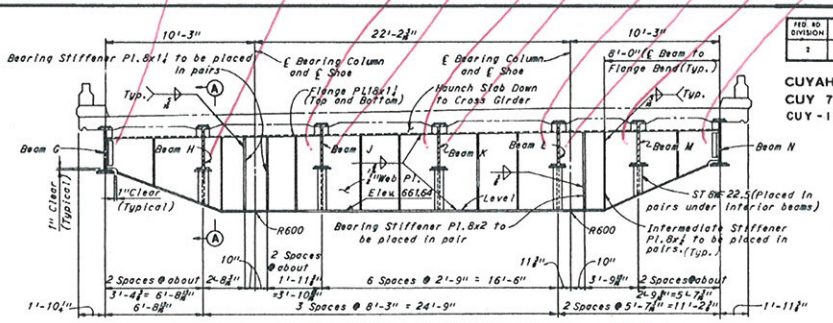
PIER 20A CROSS GIRDER ELEVATION



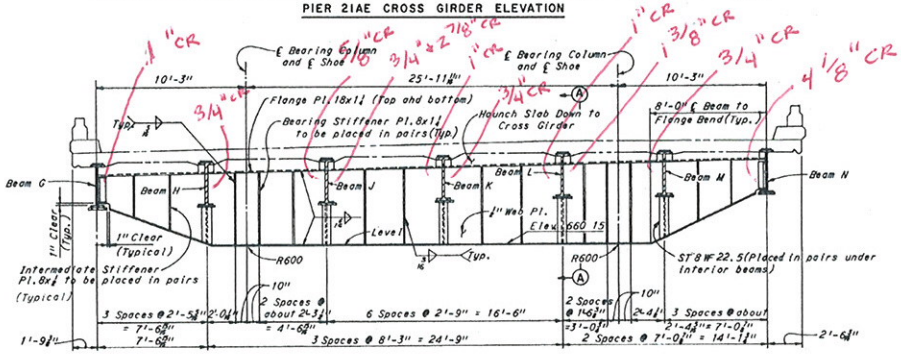
GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS

DEFLECTION TABLE								
Pier	Deflections	a	b	c	d	e	f	
19AE	Total Concrete	1/4"	1/2"	0"	0"	0"	1/4"	
	Total Steel and Conc.	1/4"	1/2"	0"	0"	0"	1/4"	
20AE	Total Concrete	1/4"	1/2"	0"	0"	0"	1/4"	
	Total Steel and Conc.	1/4"	1/2"	0"	0"	0"	1/4"	

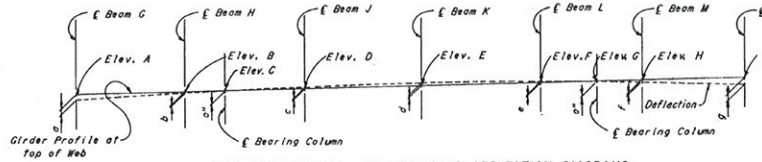
GIRDER ELEVATION TABLE - TOP OF WEB								
Elevations	A	B	C	D	E	F	G	H
Pier 19AE	669.61	669.57	669.54	669.52	669.46	669.42	669.40	669.34
Pier 20AE	668.01	668.02	668.03	668.04	668.06	668.08	668.08	668.10



PIER 21AE CROSS GIRDER ELEVATION



PIER 22AE CROSS GIRDER ELEVATION



GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS

DEFLECTION TABLE									
Pier	Deflections	a	b	c	d	e	f	g	
21AE	Total Concrete	1/4"	1/2"	0"	0"	0"	0"	1/4"	
	Total Steel and Conc.	1/4"	1/2"	0"	0"	0"	0"	1/4"	
22AE	Total Concrete	1/4"	0"	0"	0"	0"	0"	1/4"	
	Total Steel and Conc.	1/4"	0"	0"	0"	0"	0"	1/4"	

GIRDER ELEVATION TABLE - TOP OF WEB									
Elevations	A	B	C	D	E	F	G	H	J
Pier 21AE	666.55	666.63	666.67	666.73	666.82	666.92	666.93	666.98	667.05
Pier 22AE	664.94	665.14	665.20	665.35	665.57	665.78	665.88	665.96	666.14

Note:

Notes:
The rockers at Pier 22AE shall be provided with 4-1/4" shims under the base plates and the rockers at Pier 21AE shall be provided with 2-1/4" shims under the rockers. Other dimensions of shims to match base plate.

Beams shall be fabricated so that the end of web faces are vertical after the beams are in final position and before beam splice welding is done.

For Section A-A see sheet 121.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

420
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SUPERSTRUCTURE DETAILS UNIT 4-AE

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JEK	TRACED	CHECKED JKH	REVIEWED	REVISED
DATE 11-10-66	DATE	DATE 12-21-66	DATE 12/22/66	

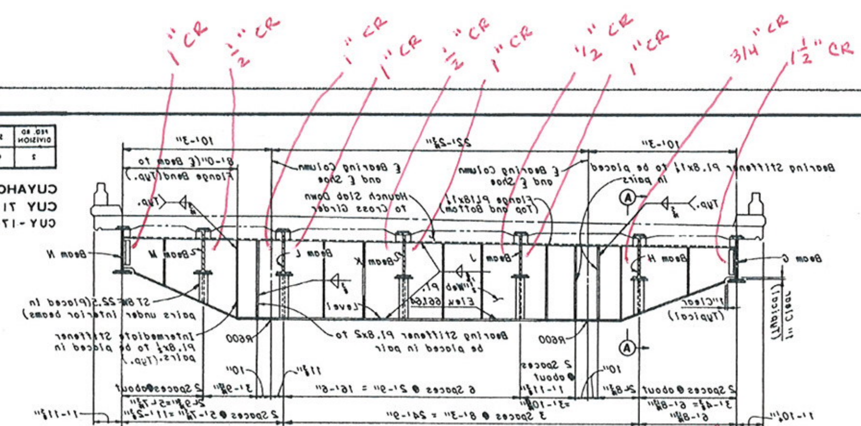
SHEET 420

5 SIDE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

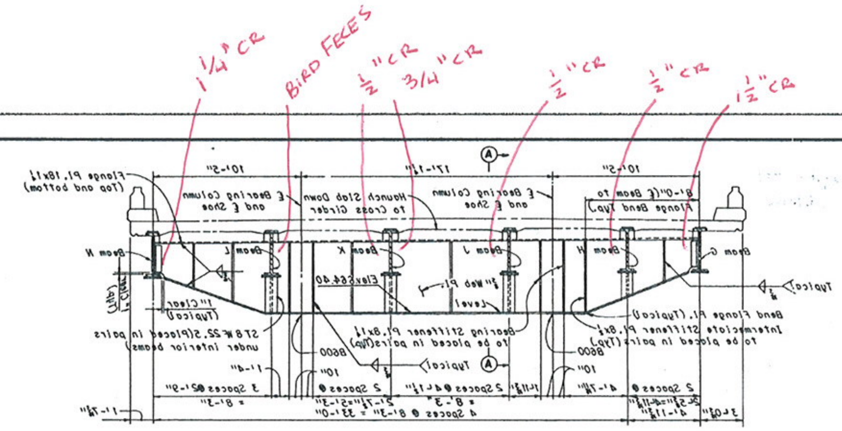
420 / 646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76



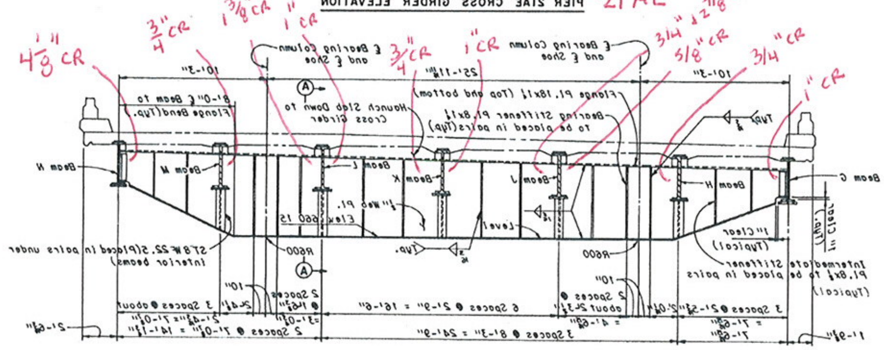
PIER 21AE CROSS GIRDER ELEVATION

21AE



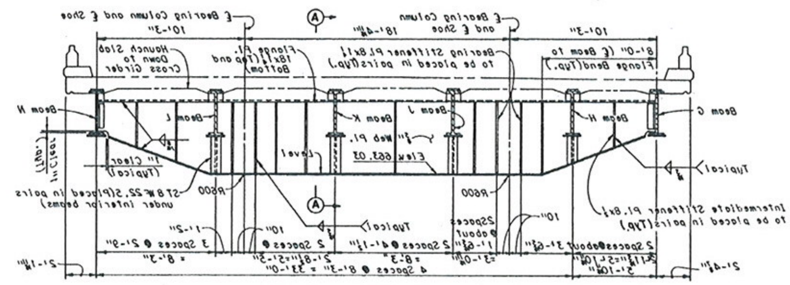
PIER 19AE CROSS GIRDER ELEVATION

19AE



PIER 22AE CROSS GIRDER ELEVATION

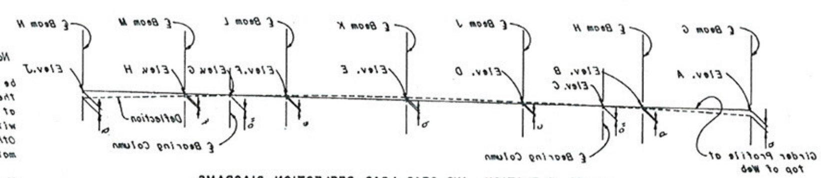
22AE



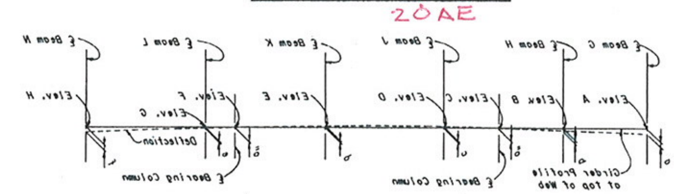
PIER 20A CROSS GIRDER ELEVATION

20AE

Note:



GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS



GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS

Notes:

The rockers of Pier 22AE shall be provided with 4-1/4" shims under the base plates and the rockers of Pier 21AE shall be provided with 2-1/4" shims under the rockers. Other dimensions of shims to match base plate.

Beams shall be fabricated so that the end of web faces are vertical after the beams are in final position and before beam splice welding is done.

For Section A-A see sheet 421.

DEFLECTION TABLE

Pier	Deflections	a	b	c	d	e	f	g
21AE	Total Concrete	1/8"	1/16"	0"	0"	0"	0"	1/8"
	Total Steel and Conc.	1/8"	1/16"	0"	0"	0"	0"	1/8"
22AE	Total Concrete	1/16"	0"	0"	0"	0"	0"	1/16"
	Total Steel and Conc.	1/8"	0"	0"	0"	0"	0"	1/8"

DEFLECTION TABLE

Pier	Deflections	a	b	c	d	e	f
19AE	Total Concrete	1/8"	1/16"	0"	0"	0"	1/8"
	Total Steel and Conc.	1/8"	1/16"	0"	0"	0"	1/8"
20AE	Total Concrete	1/8"	1/16"	0"	0"	0"	1/8"
	Total Steel and Conc.	1/8"	1/16"	0"	0"	0"	1/8"

H.N.T.B BRIDGE NOS. 21A & 21B

GIRDER ELEVATION TABLE - TOP OF WEB

Elevations	A	B	C	D	E	F	G	H	J
Pier 21AE	666.55	666.63	666.67	666.73	666.82	666.92	666.93	666.98	667.05
Pier 22AE	664.94	665.14	665.20	665.35	665.57	665.78	665.88	665.96	666.14

GIRDER ELEVATION TABLE - TOP OF WEB

Elevations	A	B	C	D	E	F	G	H
Pier 19AE	669.61	669.57	669.54	669.52	669.46	669.42	669.40	669.34
Pier 20AE	668.01	668.02	668.03	668.04	668.06	668.08	668.08	668.10

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SUPERSTRUCTURE DETAILS
UNIT 4-AE

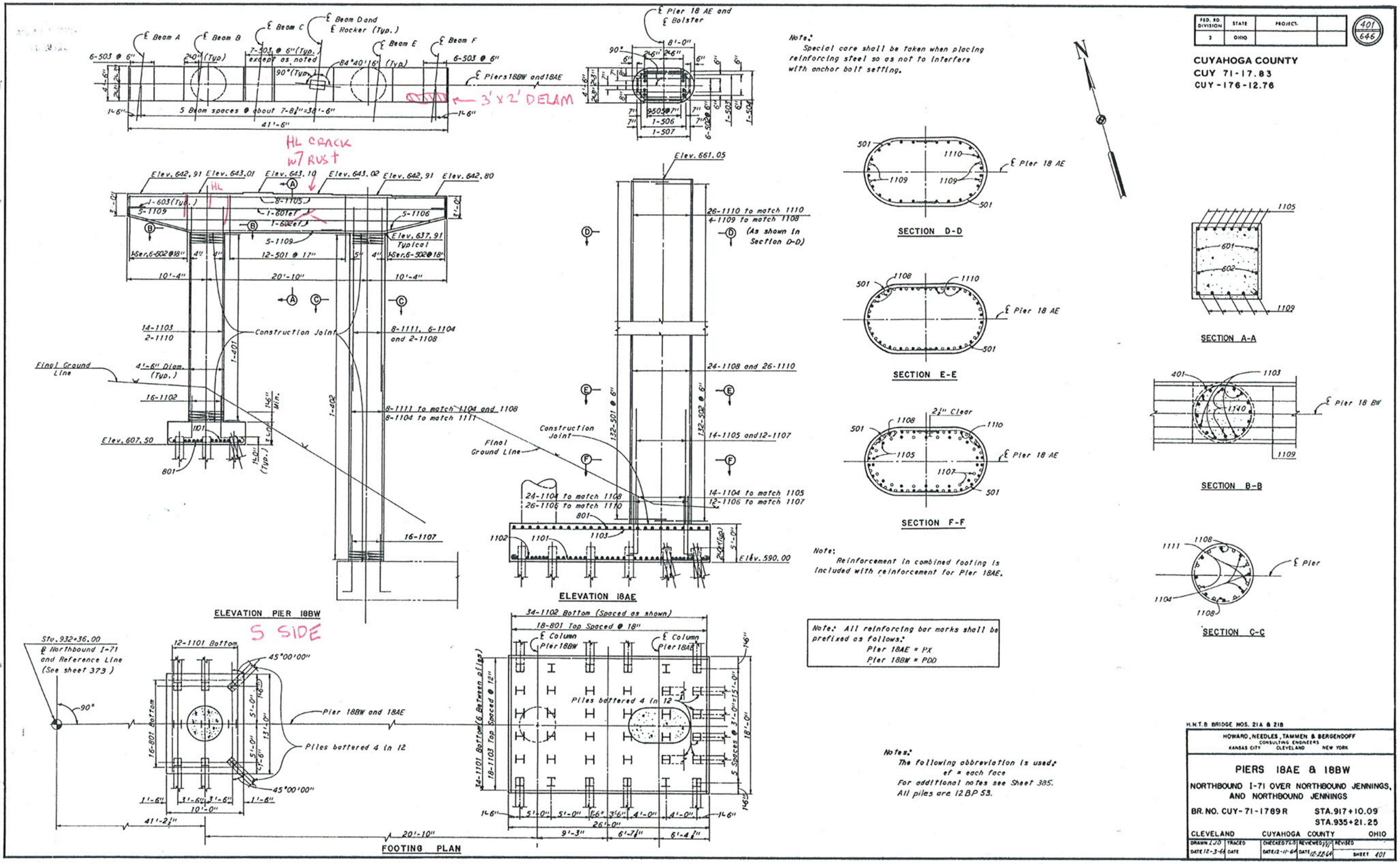
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09
STA. 935+21.25

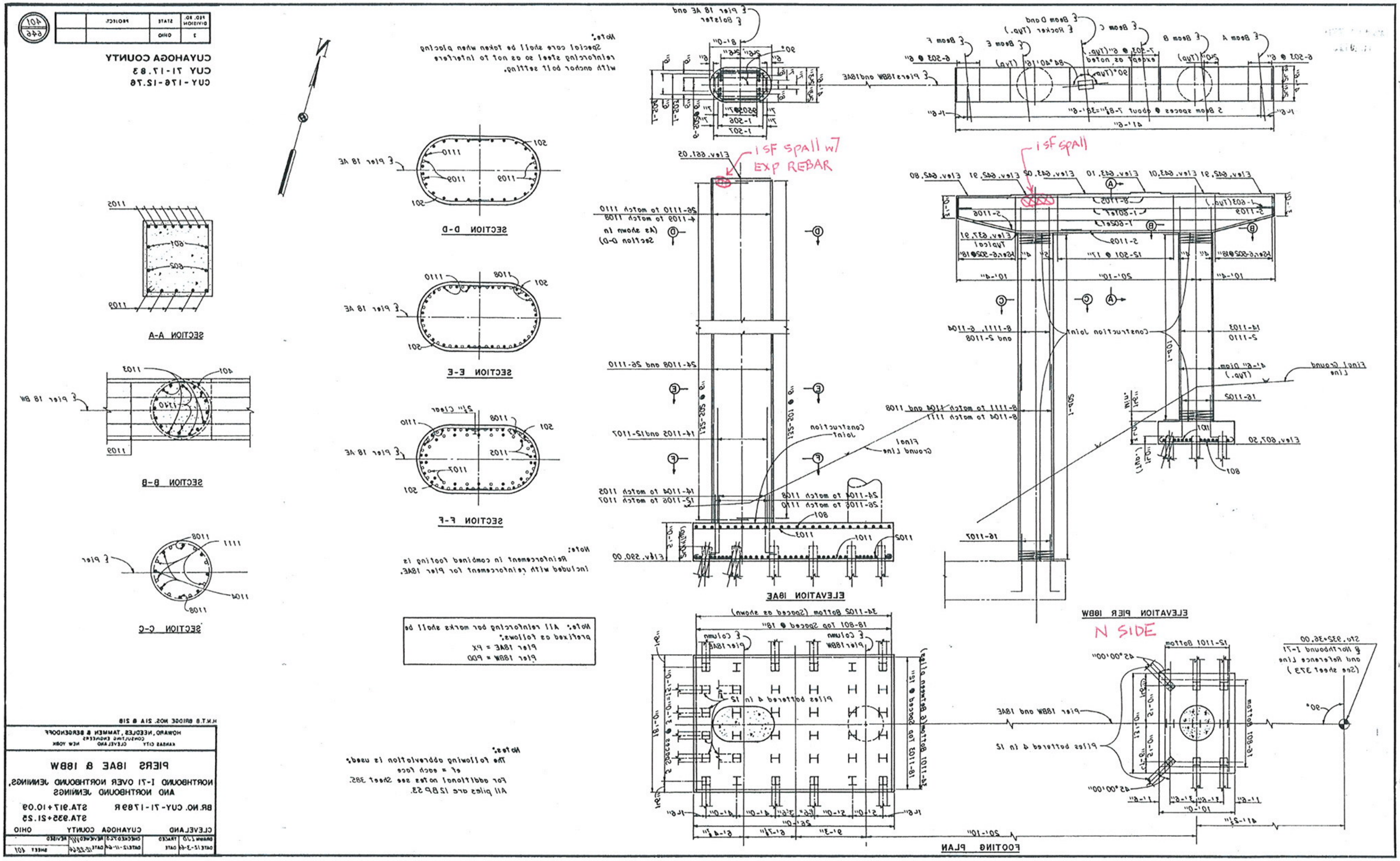
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JEK	TRACED	CHECKED JAH	REVIEWED	REVISED
DATE 11-10-64	DATE	DATE 12-21-64	DATE 12-22-64	SHEET 420

N SIDE



FED. RD. DIVISION 3
STATE OHIO
PROJECT
401
646
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
Note:
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
℄ Beam A
℄ Beam B
℄ Beam C
℄ Beam D and ℄ Rocker (Typ.)
℄ Beam E
℄ Beam F
6-503 @ 6"
7-503 @ 6" (Typ.) except as noted
84°40'16" (Typ.)
℄ Piers 18BW and 18AE
5 Beam spaces @ about 7-8½" = 38'-6"
41'-6"
1'-6"
3'x2' DELAM
℄ Pier 18 AE and ℄ Bolster
8'-0"
1-506
1-507
HL CRACK w/ RUST
HL
Elev. 642.91
Elev. 643.01
Elev. 643.10
Elev. 643.02
Elev. 642.91
Elev. 642.80
Elev. 637.91 Typical
12-501 @ 17"
10'-4"
20'-10"
10'-4"
14-1103
2-1110
Construction Joint
8-1111, 6-1104 and 2-1108
Final Ground Line
4'-6" Diam. (Typ.)
16-1102
8-1111 to match 1104 and 1108
8-1104 to match 1111
Elev. 607.50
16-1107
ELEVATION PIER 18BW
S SIDE
Elev. 661.05
26-1110 to match 1110
4-1109 to match 1108
(As shown in Section D-D)
132-501 @ 6"
132-502 @ 6"
24-1108 and 26-1110
14-1105 and 12-1107
14-1104 to match 1105
12-1106 to match 1107
24-1104 to match 1108
26-1106 to match 1110
Elev. 590.00
ELEVATION 18AE
SECTION D-D
SECTION E-E
SECTION F-F
2½" Clear
℄ Pier 18 AE
Note:
Reinforcement in combined footing is included with reinforcement for Pier 18AE.
SECTION A-A
SECTION B-B
℄ Pier 18 BW
SECTION C-C
℄ Pier
Note: All reinforcing bar marks shall be prefixed as follows:
Pier 18AE = PX
Pier 18BW = PDD
Sta. 932+36.00
℄ Northbound I-71 and Reference Line (See sheet 373)
12-1101 Bottom
16-801 Bottom
45°00'00"
Pier 18BW and 18AE
Piles battered 4 in 12
41'-2½"
10'-0"
20'-10"
34-1102 Bottom (Spaced as shown)
18-801 Top Spaced @ 18"
℄ Column Pier 18BW
℄ Column Pier 18AE
34-1101 Bottom (6 Between piles)
18-1103 Top Spaced @ 12"
5 Spaces @ 3'-0" = 15'-0"
18'-0"
9'-3"
6'-7½"
6'-4½"
26'-0"
FOOTING PLAN
Notes:
The following abbreviation is used:
ef = each face
For additional notes see Sheet 385.
All piles are 12 BP 53.
H.N.T.B. BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
PIERS 18AE & 18BW
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R
STA. 917+10.09
STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 401

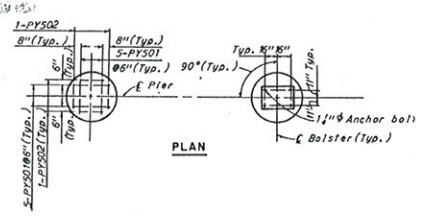


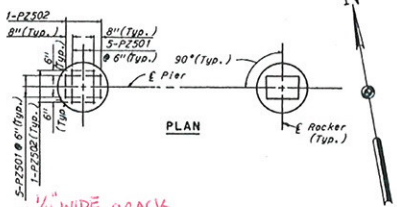
CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76
FED. RD. DIVISION 3 STATE OHIO PROJECT
Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
℄ Pier 18 AE
℄ Pier 18 BW
2¼" Clear
Note: Reinforcement in combined footing is included with reinforcement for Pier 18AE.
Note: All reinforcing bar marks shall be prefixed as follows: Pier 18AE = PX Pier 18BW = PDD
Notes: The following abbreviation is used: ef = each face. For additional notes see Sheet 385. All piles are 12BP53.
Elev. 661.05
1 SF spall w/ EXP REBAR
26-1110 to match 1110
4-1109 to match 1108
24-1108 and 26-1110
14-1105 and 12-1107
135-205 @ 8"
135-201 @ 8"
Construction Joint
Final Ground Line
14-1104 to match 1105
12-1106 to match 1107
24-1104 to match 1108
26-1106 to match 1110
Elev. 590.00
ELEVATION 18AE
1 sf spall
Elev. 642.80 Elev. 642.91 Elev. 643.02 Elev. 643.10 Elev. 643.01 Elev. 642.91
Elev. 637.91 Typical
12-501 @ 17"
10'-4" 20'-10" 10'-4"
8-1111, 6-1104 and 2-1108
14-1103 2-1110
4'-6" Diam. (Typ.)
16-1102
16-1107
Elev. 607.50
ELEVATION PIER 18BW
N SIDE
℄ Piers 18BW and 18AE
5 Beam spaces @ about 7-8¾"=38'-6"
41'-6"
34-1102 Bottom (Spaced as shown)
18-801 Top Spaced @ 18"
Piles battered 4 in 12
Sta. 932+36.00 ℄ Northbound I-71 and Reference Line (See sheet 373)
45°00'00"
12-1101 Bottom
26'-0"
20'-10"
41'-2¼"
FOOTING PLAN
H.N.T.B. BRIDGE NOS. 21A & 21B
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK
PIERS 18AE & 18BW
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS
BR. NO. CUY-71-1789R STA. 917+10.09 STA. 935+21.25
CLEVELAND CUYAHOGA COUNTY OHIO
SHEET 401

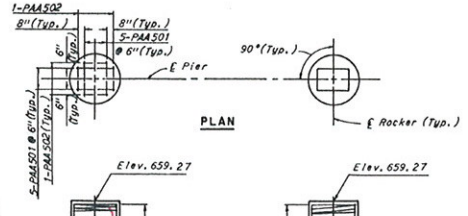
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

402
646

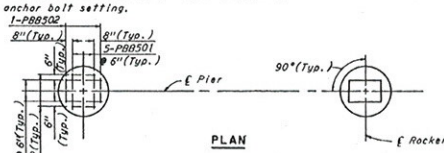
CUYAHOGA COUNTY
CUY-71-17.83
CUY-176-12.76



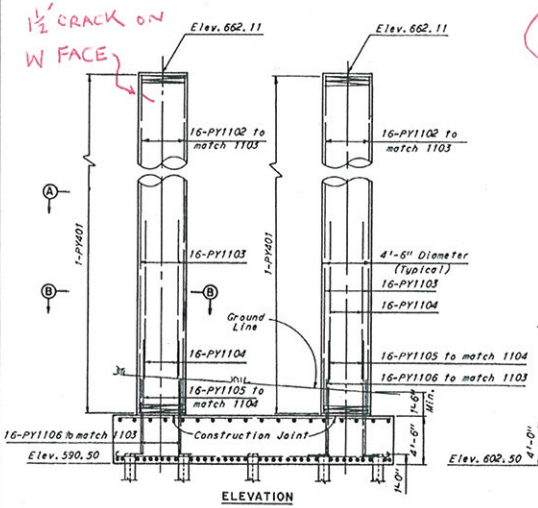




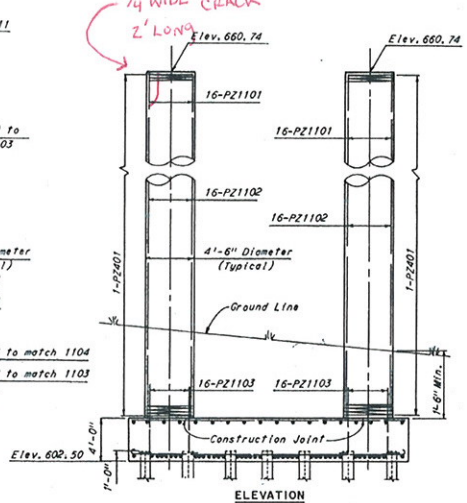
Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.

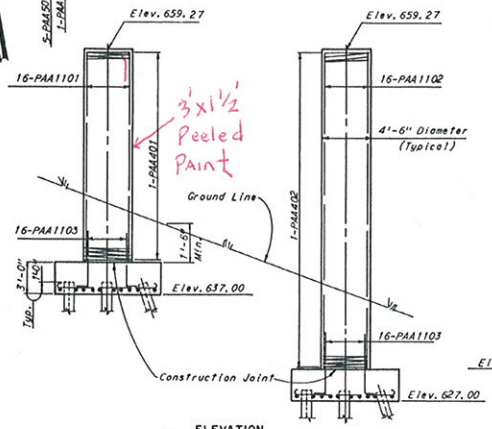


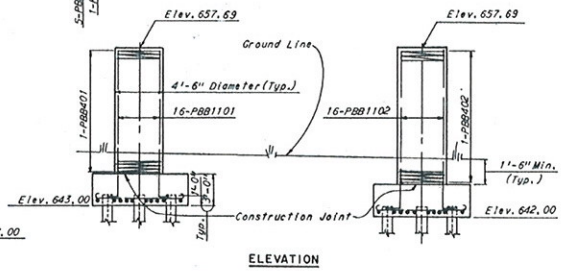
1½' CRACK ON W FACE

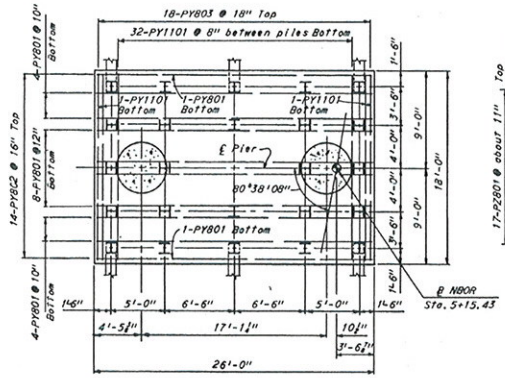


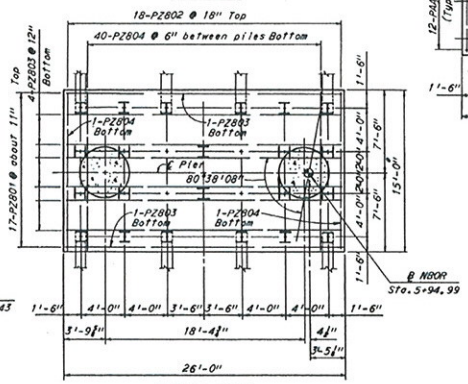
¼" WIDE CRACK 2' LONG

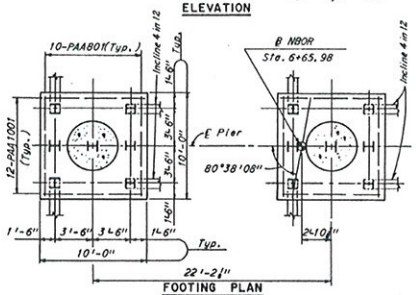


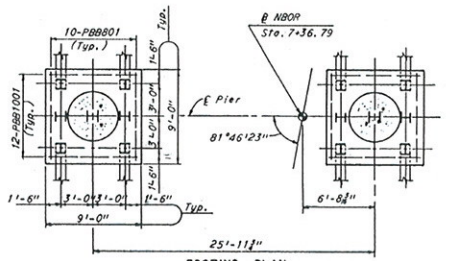


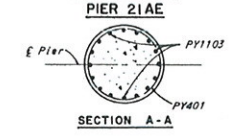


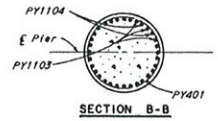












Notes:
All piles are 12BP53.
All reinforcing bar marks shall be prefixed as follows:
Pier 19AE = PY
Pier 20AE = PZ
Pier 21AE = PAA
Pier 22AE = PBB

Notes:
The following abbreviation is used,
ef = each face
For additional notes see Sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIERS 19AE, 20AE, 21AE, & 22AE

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

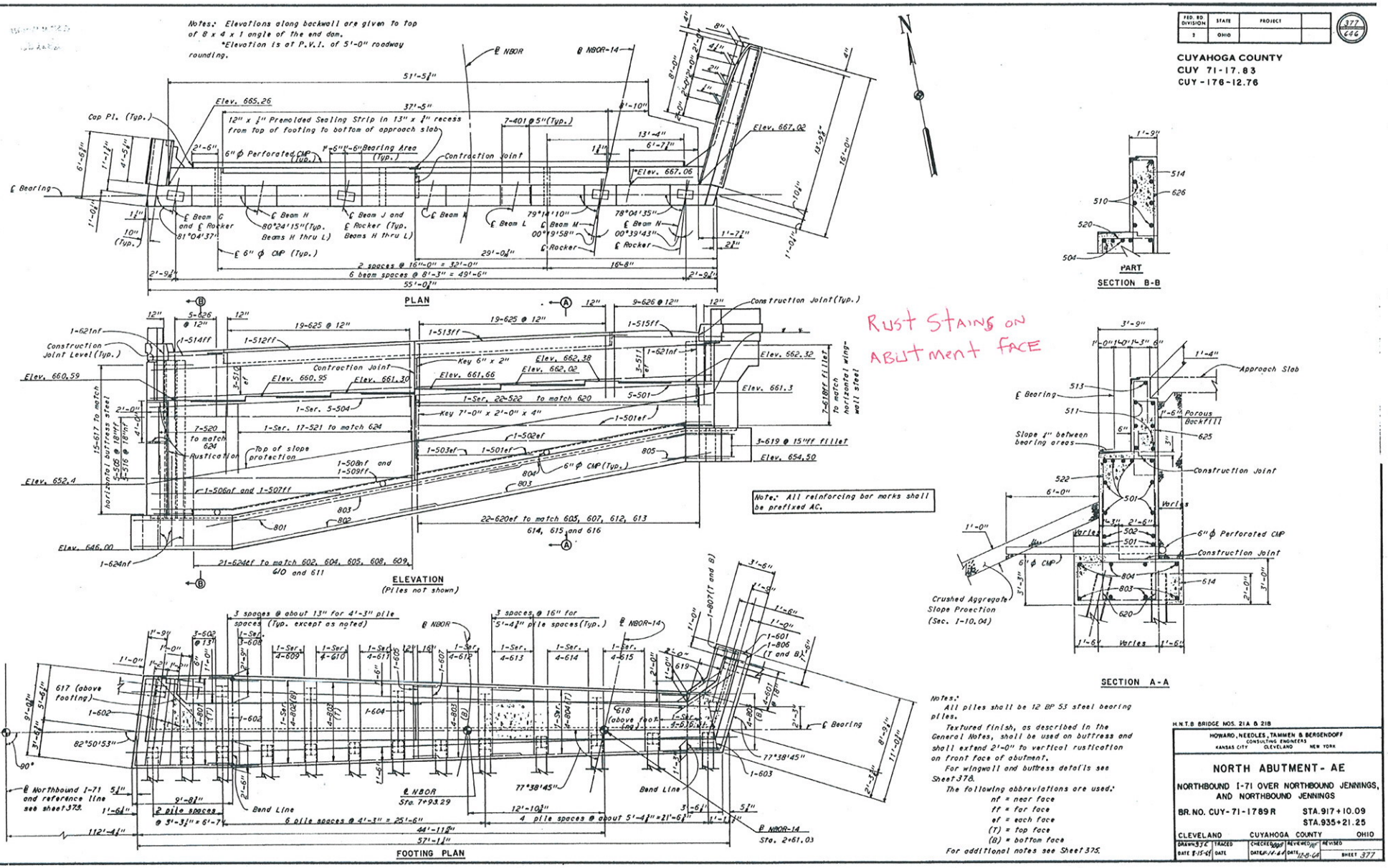
BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN PLS	TRACED	CHECKED LJD	REVIEWED WF	REVISED
DATE 6-10-64	DATE	DATE 12-3-64	DATE 1-22-65	SHEET 402

S SIDE

PLAN
ELEVATION
FOOTING PLAN
PIER 19AE
PIER 20AE
PIER 21AE
PIER 22AE
SECTION A-A
SECTION B-B
Peeling PAINT
4'x1'
6'x1'
Ground line
Construction Joint
Notes:
All piles are 12BP53.
All reinforcing bar marks shall be prefixed as follows:
Pier 19AE = P7
Pier 20AE = P2
Pier 21AE = P4A
Pier 22AE = PBB
Notes:
The following abbreviation is used.
ef = each face
For additional notes see Sheet 3B2.
Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
CUYAHOGA COUNTY
CUY-71-17.83
CUY-TPK-12.76
PIERS 19AE, 20AE, 21AE, & 22AE
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS AND NORTHBOUND JENNINGS
BR.NO. CUY-71-17B9R
STA.917+10.09
STA.933+21.25
CLEVELAND
CUYAHOGA COUNTY
OHIO
DATE 6-10-94
DATE 12-3-96
SHEET 105
22AE
N SIDE
20AE
19AE



FED. RD DIVISION	STATE	PROJECT	
3	OHIO		

377
646

CUYAHOGA COUNTY
CUY 71-17.83
CUY-176-12.76

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

NORTH ABUTMENT - AE

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 8-15-69	DATE	DATE 11-4-69	DATE 12-8-69	SHEET 377

I-71/SR 176 Double Decked Bridge (I-71 Upper Deck)
2012 In-Depth Bridge Inspection

APPENDIX
G

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 07/29/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the lower deck using an A75 UBIV. Inspected the substructure from the ground and from the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	7:00 pm	4:30 am	8.0	1.5
Michael Sondles - HDR	EI	7:00 pm	4:30 am	8.0	1.5
Mike Jennings – N.E. Bridge Contractors, Inc.		7:00 pm	4:30 am	8.0	1.5
A&A Safety – 2 traffic control personnel		6:00 pm	5:00 am	8.0	3.0

2) Equipment

A-Consultant Owned, **B**-Consultant Rented, **C**-ODOT Owned, **D**-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	9.5	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	9.5		Rental Car				
B	9.5	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single RT lane on SR 176		NB	3	7:00 pm	4:30 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 07/30/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the lower deck and Ramp BE using an A75 UBIV. Inspected the substructure from the ground and from the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	8:00 pm	4:00 am	8.0	
Michael Sondles - HDR	EI	8:00 pm	4:00 am	8.0	
Mike Jennings – N.E. Bridge Contractors, Inc.		8:00 pm	4:00 am	8.0	
A&A Safety – 2 traffic control personnel		7:00 pm	5:00 am	8.0	2.0

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	8	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	8		Rental Car				
B	8	0		UBIV	A75			

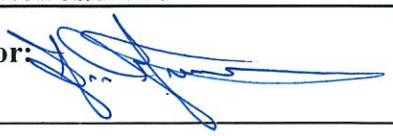
3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single RT lane on SR 176; Closed Ramp BE at 1:00 am		NB	3	8:00 pm	4:00 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor: 

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 07/31/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the lower deck, Ramp BW, and Ramp BE using an A75 UBIV. Inspected the substructure from the ground and from the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	8:00 pm	4:30 am	8.0	0.5
Michael Sondles - HDR	EI	8:00 pm	4:30 am	8.0	0.5
Mike Jennings – N.E. Bridge Contractors, Inc.		8:00 pm	4:30 am	8.0	0.5
A&A Safety – 2 traffic control personnel		7:00 pm	5:00 am	8.0	2.0

2) Equipment

A-Consultant Owned, **B**-Consultant Rented, **C**-ODOT Owned, **D**-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	8.5	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	8.5		Rental Car				
B	8.5	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Double RT lane on SR 176; Closed Ramp BE at 1:00 am		NB	2 & 3	8:00 pm	4:30 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor: 

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 08/01/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the upper deck using an A75 UBIV. Inspected the substructure from the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	7:30 pm	4:00 am	8.0	0.5
Michael Sondles - HDR	EI	7:30 pm	4:00 am	8.0	0.5
Mike Jennings – N.E. Bridge Contractors, Inc.		7:30 pm	4:00 am	8.0	0.5
A&A Safety – 2 traffic control personnel		7:00 pm	5:00 am	8.0	2.0

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	8.5	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	8.5		Rental Car				
B	8.5	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single LT lane on I-71; Single LT lane on SR 176		NB	1	7:30 pm	4:00 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 08/02/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the upper deck and Ramp AW using an A75 UBIV. Inspected the substructure from the ground and using the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	7:30 pm	4:30 am	8.0	1.0
Michael Sondles - HDR	EI	7:30 pm	4:30 am	8.0	1.0
Mike Jennings – N.E. Bridge Contractors, Inc.		7:30 pm	4:30 am	8.0	1.0
A&A Safety – 2 traffic control personnel		7:00 pm	5:00 am	8.0	2.0

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	9	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	9		Rental Car				
B	9	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single LT lane on I-71; Single LT lane on SR 176		NB	1	7:30 pm	4:30 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 08/05/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the upper deck using an A75 UBIV. Inspected the substructure from the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	7:30 pm	5:00 am	8.0	1.5
Michael Sondles - HDR	EI	7:30 pm	5:00 am	8.0	1.5
Mike Jennings – N.E. Bridge Contractors, Inc.		7:30 pm	5:00 am	8.0	1.5
A&A Safety – 2 traffic control personnel		7:00 pm	5:30 am	8.0	2.5

2) Equipment

A-Consultant Owned, **B**-Consultant Rented, **C**-ODOT Owned, **D**-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	9.5	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	9.5		Rental Car				
B	9.5	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single RT lane on I-71; Double RT lane on SR 176; Closed Ramp BE at 1:00 am		NB	3/(2 & 3)	7:30 pm	5:00 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 08/06/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the upper deck and Ramp AE using an A75 UBIV. Inspected the substructure from the ground and using the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	7:30 pm	3:30 am	8.0	
Michael Sondles - HDR	EI	7:30 pm	3:30 am	8.0	
Mike Jennings – N.E. Bridge Contractors, Inc.		7:30 pm	3:30 am	8.0	
A&A Safety – 2 traffic control personnel		7:00 pm	4:00 am	8.0	1.0

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	8	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	8		Rental Car				
B	8	0		UBIV	A75			

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single RT lane on I-71; Double RT lane on SR 176. Single RT lane on I-71; Ramp under Span 3		NB	3/(2 & 3) 3/(1)	7:30 pm	3:30 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	**County/Route/Section:** CUY/00071/1791 CUY/00176/1334	**Date:** 08/07/12
SFN: 1805371/1805436	**BRIDGE NAME:** I-71/SR 176 BRIDGES	
Contractor: HDR, Inc.	**Sub-Contractor:** Northwest Consulting, Inc.	
Description of Work: (use back for detail) Inspected the upper deck using an A75 UBIV. Inspected the substructure from the ground and using the A75 UBIV.		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
Ann Griessmann – HDR	PE	8:00 pm	4:00 am	8.0	
Michael Sondles - HDR	EI	8:00 pm	4:00 am	8.0	
Mike Jennings – N.E. Bridge Contractors, Inc.		8:00 pm	4:00 am	8.0	
A&A Safety – 2 traffic control personnel		7:00 pm	5:00 am	8.0	2.0

2) Equipment

A-Consultant Owned, **B**-Consultant Rented, **C**-ODOT Owned, **D**-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.
A	8	0	2009	2 Harnesses, lanyards, hand tools, helmets, gloves	Yates/ Miller			
B	1.0	8		Rental Car				
B	8	0		UBIV	A75			

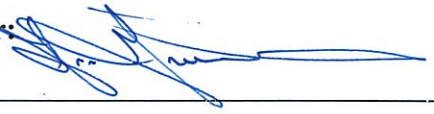
3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
Single RT lane on I-71; Single RT lane on SR 176; Single RT lane under Span 2, then Single LT lane under Span 2		NB	3/(1 & 2 under Sp 2)	8:00 pm	4:00 am
Local Law Enforcement notified?	Yes	Officer:			

4) Material

Quantity	Unit	Description
1		Binders for field notes
2		Paint Sticks

5) Signatures/Date

Contractor: 

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:

Daily Work Activities Report

PID No: 87600	County/Route/Section: CUY-71-1791 ; CUY-176-1331	Date: 7/30/12
SFN: 1805371/1805436	BRIDGE NAME: I-71 OVER SR-176	
Contractor: NORTHWEST CONSULTANTS	Sub-Contractor:	
Description of Work: (use back for detail) DECK INSPECTION (SR-176)		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
JON DRUMMOND	PE	7:00 P	12:00 A	5.0	
JACK EBERT	EI	7:00 P	12:00 A	5.0	

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
(BY HDR)					
Local Law Enforcement notified?		Officer:			

4) Material

Quantity	Unit	Description

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	County/Route/Section: CUY-71-1791 ; CUY-176-1331	Date: 7/31/12
SFN: 1805371/1805436	BRIDGE NAME: I-71 OVER SR-176	
Contractor: NORTHWEST CONSULTANTS	Sub-Contractor:	
Description of Work: (use back for detail) DECK INSPECTION (SR-176)		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
JON DRUMMOND	PE	12:00A	3:00A	3.0	
JACK EBERT	EI	12:00A	3:00A	3.0	
		8:00P	12:00A	4.0	

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
(BY HDR)					
Local Law Enforcement notified?		Officer:			

4) Material

Quantity	Unit	Description

5) Signatures/Date

Contractor: Jon Drummond

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:

Daily Work Activities Report

PID No: 87600	County/Route/Section: CUY-71-1791 ; CUY-176-1331	Date: 8/1/12
SFN: 1805371/1805436	BRIDGE NAME: I-71 OVER SR-176	
Contractor: NORTHWEST CONSULTANTS	Sub-Contractor:	
Description of Work: (use back for detail) DECK INSPECTION (SR-176)		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
JON DRUMMOND	PE				
JACK EBERT	EI	12:00A	4:00A	4.0	

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
(BY HDR)					
Local Law Enforcement notified?		Officer:			

4) Material

Quantity	Unit	Description

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	County/Route/Section: CUY-71-1791 ; CUY-176-1331	Date: 8/2/12
SFN: 1805371/1805436	BRIDGE NAME: I-71 OVER SR-176	
Contractor: NORTHWEST CONSULTANTS	Sub-Contractor:	
Description of Work: (use back for detail) DECK INSPECTION (I-71)		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
JON DRUMMOND	PE	7:00 P	12:00 A	5.0	
JACK EBERT	EI				

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
(BY HDR)					
Local Law Enforcement notified?		Officer:			

4) Material

Quantity	Unit	Description

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant

Consultant Contract Bridge Inspection:
Daily Work Activities Report

PID No: 87600	County/Route/Section: CUY-71-1791 ; CUY-176-1331	Date: 8/3/12
SFN: 1805371/1805436	BRIDGE NAME: I-71 OVER SR-176	
Contractor: NORTHWEST CONSULTANTS	Sub-Contractor:	
Description of Work: (use back for detail) DECK INSPECTION (I-71)		

1) Labor

Name	Class	From	To	Regular Hrs	OT Hrs
JON DRUMMOND	PE	12:00A	4:00A	4.0	
JACK EBERT	EI				

2) Equipment

A-Consultant Owned, B-Consultant Rented, C-ODOT Owned, D-ODOT Rented

A,B,C,D	Hrs Used	Hrs Idle	Year	Type	Model	HP, GVW, Capacity	Gas/Diesel/ Elect	Equip No.

3) Maintenance of Traffic

Location Description:		Direction	Lane No.	Time on	Time off
(BY HDR)					
Local Law Enforcement notified?		Officer:			

4) Material

Quantity	Unit	Description

5) Signatures/Date

Contractor:

ODOT:

Original to ODOT File, Copy to Consultant