



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX EX-46**

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**CUY-090-1524 PID 0.376**

**(Reference Document)**

State of Ohio  
Department of Transportation  
Jolene M. Molitoris, Director

**Innerbelt Bridge  
Construction Contract Group 1 (CCG1)**

L-0

FEB 23 1972

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

STATE OF OHIO  
DEPARTMENT OF HIGHWAYS  
**CUY-90-15.24**  
CUYAHOGA COUNTY  
CITY OF CLEVELAND

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR OF HIGHWAYS IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02, REVISED CODE OF OHIO.

CUYAHOGA COUNTY  
CUY-90-15.24

I-90-1 (87) 24  
**1971 SPECIFICATIONS**

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

THE RIGHT OF WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING OF THE HIGHWAY TO TRAFFIC AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

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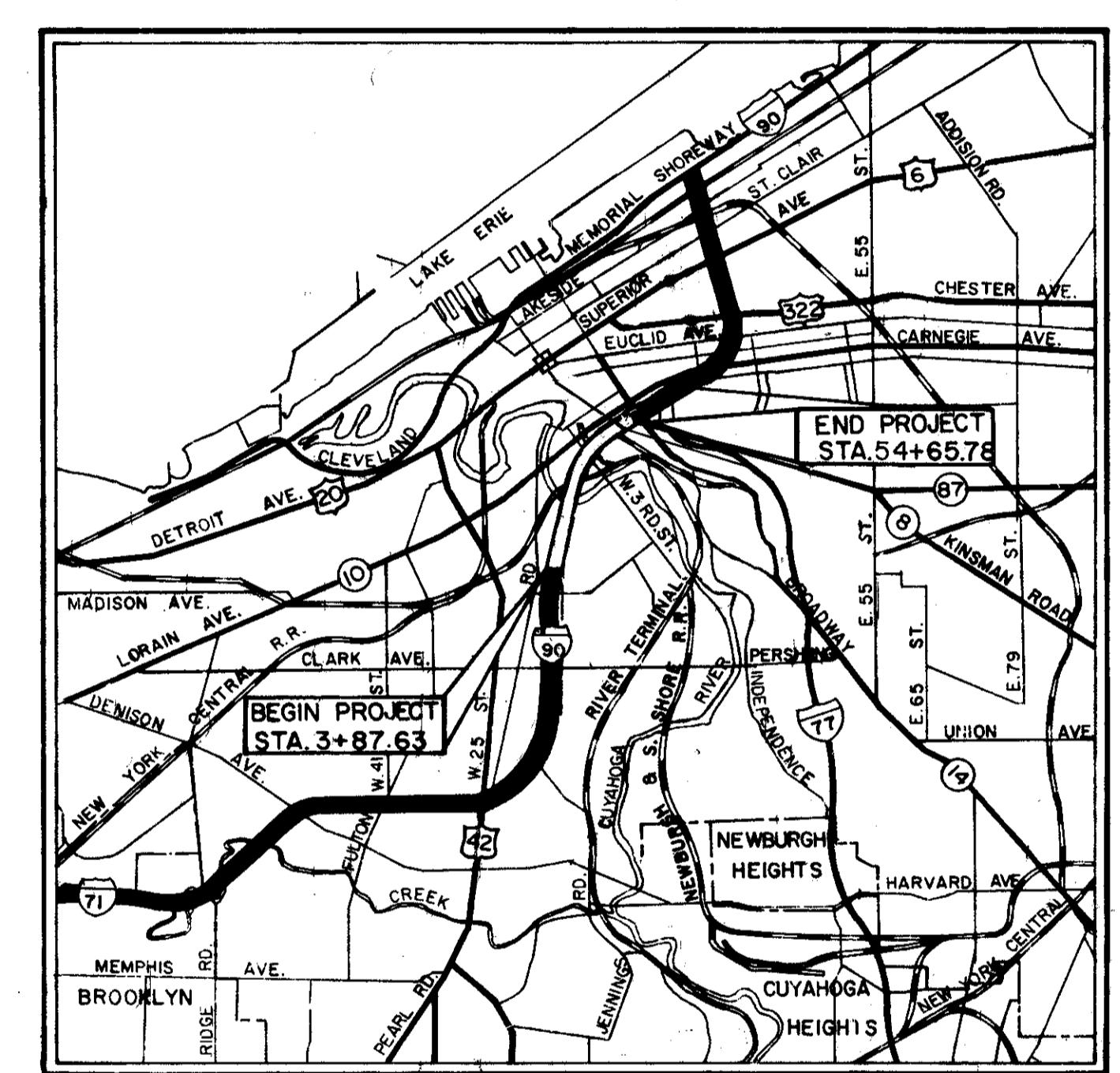
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NOTE: Sheet No. 50 was omitted.  
Sheets No. 5, 42, 43 & 45 revised 11-3-72 A.W.G.

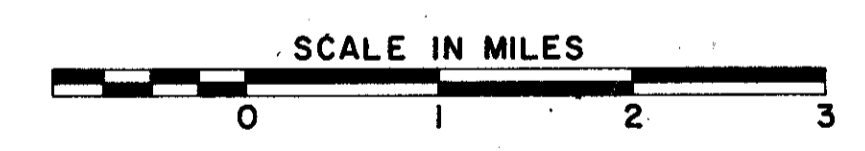
LINE DATA

BEGIN PROJECT STA. 3+87.63  
END PROJECT STA. 54+65.78  
NET LENGTH OF PROJECT = 5,078.15 LIN. FT. = 0.962 MILES

ADD FOR EAST APPROACH  
STA. 54+65.78 TO STA. 54+90.78 = 25 LIN. FT.  
NET LENGTH OF WORK = 5,103.15 LIN. FT. = 0.967 MILES



LOCATION MAP



PORTION TO BE IMPROVED  
STATE ROADS  
OTHER ROADS

PREPARED AND RECOMMENDED BY  
**HOWARD NEEDLES TAMMEN & BERGENDOFF**  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**H.G. SOURS**  
ASSOCIATE  
COLUMBUS

BROWNING CROW



FILE NO.	CUYAHOGA COUNTY	CUY-90-15.24
	DATE OF LETTING	
	CONTRACT NO.	463B

SUPPLEMENTAL SPECIFICATIONS			
NUMBER	DATE	NUMBER	DATE
808	1-1-71		
815	1-1-69		
818	1-1-69		
836	1-1-71		
1001	1-1-69		
930	12-15-69		
944	4-5-72		

STANDARD DRAWINGS			
NUMBER	DATE	NUMBER	DATE
BP-5	6-1-72	MC-4	6-13-69
BP-7	1-1-69		
FACI-1	4-20-71		
FACI-2	4-20-71		
HL-1	11-1-65		
HL-2	11-1-65		
HL-3	11-1-65		
HL-4	1-1-68		
I-2	8-8-69		
MC-3	8-20-69		
SD-1-69	3 of 4	6-12-69	

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED \_\_\_\_\_  
DIVISION ENGINEER DATE \_\_\_\_\_

# GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-90-I (87) 24	

2  
52

CUYAHOGA COUNTY  
CUY-90-15.24

## 1. PROPOSED WORK

A. RESURFACING INCLUDING CONCRETE DECK REPAIR - The existing asphalt concrete wearing surface on the West and East Approach Bridges, the Central Viaduct Bridge and the approach slabs on the East Approach, indicated in the Plans, shall be completely replaced and the wearing surface on the Innerbelt Extension Bridge shall be patched where indicated in the Plans or directed by the Engineer.

Exposed drain tubes, for drainage of the asphalt surface course shall be flushed. The drain tube angle at these locations, shall be removed and replaced except at transverse roadway joints or crossdrains on the Central Viaduct where the drain shall be modified as indicated in the Plans.

The structural concrete deck, after removal of the asphalt concrete, shall be inspected by the Engineer. At the direction of the Engineer, the Contractor shall repair the deck as indicated in the Plans.

B. REPLACEMENT OF DEEP BEAM BARRIER MEDIAN WITH CONCRETE BARRIER MEDIAN - The existing deep beam barrier median, including the 9" high concrete median, shall be removed and replaced with a concrete barrier median. Modifications, as indicated in the Plans, are required to the existing abutments and expansion joints in conjunction with the construction of the new median.

C. LIGHTING UPGRADING - The lighting shall be replaced, at the existing locations and to the limits indicated in the Plans, with new poles and new 400 watt luminaires except on the Innerbelt Extension Bridge where the existing lighting shall remain.

Existing bridge signs, as indicated in the Plans, shall be provided with mercury lighting.

D. DECK MODIFICATIONS AT THE ENTRANCE RAMPS ON BOTH THE EAST AND WEST APPROACH BRIDGES - Ramp traffic at Ramps W-1 and E-1 shall be restricted to one lane and through traffic at Ramp E-1 shall be reduced from four to three lanes by extending the width of the existing safety curbs and providing curbing along a portion of approach roadway. Modifications, as indicated in the Plans are required to the approach pavement, bridge asphalt concrete surface course, roadway drainage system, Abutment W-1, two deck expansion joints and the barrier curb railing.

E. REALIGNMENT OF EXPANSION JOINTS - For the expansion joints specified in the Plans this work shall consist of removing, resetting or burning and grinding of the tooth castings as required to provide the specified opening. The realignment, as indicated in the Plans, also includes removal and replacement of portions of the deck immediately adjacent to the joint; removal, modifying and resetting some support members for the tooth castings and appropriately modifying the existing sliding plates at the safety curb.

In addition to painting all new structural steel, the existing tooth castings, supporting channels and sliding plates at the safety curb, for the expansion joints requiring temporary tooth casting removal, shall be painted as herein described.

F. CLEANOUT AND REPAIR OF BRIDGE DRAINAGE SYSTEM - The location and details of the existing drainage systems are shown in the Plans. The cleanout shall consist of removing all dirt and debris from curb areas, scuppers, crossdrains, drainage troughs, hoppers, horizontal pipe collectors and vertical pipe downspouts including the underground storm sewers to the adjacent manholes or catch basins. After the dirt and debris are removed the entire system shall be flushed out with clean water making certain the water flows smoothly to the adjacent manhole or catch basin.

Repairs and modifications to the existing drainage system, including the addition of deflectors to some drainage troughs, modification and replacement of angles for the subdrainage of the wearing surface course, providing a new splash pad, and shortening a vertical pipe downspout, are as indicated in the Plans.

The Piers on the Central Viaduct Bridge have hollow shafts with a vertical pipe downspout enclosed inside. Prior to beginning work the Contractor shall provide necessary equipment for the purpose of examining the enclosed downspouts. (In at least one instance the inside of the pier must be dewatered) The Contractor shall accompany the Engineer at this time in making a detailed examination of the downspout; replacing the damaged pipes or fittings, in kind, to the satisfaction of the Engineer.

Finally the entire drainage system, above ground, shall be painted as herein described.

G. MISCELLANEOUS REPAIRS AND REPLACEMENT - Included is the repair or the removal and replacement, in kind, of damaged steel handrail and barrier curb rail, including posts; repair to the existing access hatchways in the safety curbs, replacement of spalled concrete in the safety curbs, providing a new lighting junction box cover in the parapet and the repair of a catwalk for an existing overhead sign bridge. It also includes the connection of some existing railing to new posts and the reanchoring of some barrier curb posts. For approximate quantities see Sheets 38, 39 and 40.

H. THERMO-PLASTIC STRIPING AND SIGNING - This work shall consist of furnishing and installing thermo plastic striping in accordance with the General Notes and at the locations shown in the Plans. As a result of the new striping one existing sign has to be replaced and one new sign, mounted on a light pole, provided as shown on sheets 14, 15, and 40.

## 2. FIELD OFFICE

The Contractor shall provide a suitable field office having a minimum of 300 Sq. Ft. of floor space and, in addition to the requirements of Item 619, shall provide and maintain sanitary provisions as per 107.06. All the above is included in the lump sum price bid for Item 619, Field Office.

## 3. ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up on this plan to be used "As directed by the Engineer" shall be made a matter of record by incorporation into the final change order governing completion of this project. Estimated quantities of material shall not be ordered for delivery to the project unless authorized by the Engineer.

## 4. CONSTRUCTION LAYOUT STAKES

See Note in Proposal describing the work included in this lump sum pay item.

## 5. FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

The Contractor shall furnish, erect, maintain and subsequently remove Federal Aid Construction Identification Signs at the following approximate locations:

Sta. 3+50 ± Eastbound  
Sta. 54+90 ± Westbound

Sign details shall be as specified on Standard Drawing FACI-1, "CODE N-55 (1)-132 (3)". The signs shall be erected in accordance with Standard Drawing FACI-2.

Additional requirements shall be in accordance with notes in the Proposal.

## 6. DESIGN SPECIFICATIONS

"Standard Specifications for Highway Bridges" adopted by the American Association of State Highway Officials, 1969, including the 1970 and 1971 Interim Specifications and the Ohio "Supplement" to these specifications. The design loading is HS 20-44 and the Interstate Alternate Loading.

The class of concrete and the grades of structural steel and reinforcing steel, together with the working stresses for each are as follows:

Concrete, Class C ----- basic unit stress 1,200 p.s.i.  
Structural Steel ----- ASTM A36 - unit stress 20,000 p.s.i.  
ASTM A588 (meeting requirement S1 of AASHTO M222)  
unit stress 27,000 p.s.i.  
Reinforcing Steel ----- ASTM A615, A616 or A617 - unit stress 20,000 p.s.i.. If bars in accordance with ASTM A616 are provided they shall be subject to bend tests as per AASHTO Designation M 42-70.

## 7. SUPPLEMENTAL SPECIFICATIONS

Reference shall be made to the Supplemental Specifications listed on the Title Sheet.

## 8. REFERENCE DRAWINGS

Reference shall be made to the Standard Drawings listed on the Title Sheet

## 9. PLANS OF EXISTING BRIDGES

Construction plans for the existing bridges are on file in the Ohio Department of Highways, Division 12 Office, 10100 Broadway Ave., Garfield Hts., Ohio and are available for reference.

## 10. DIMENSIONS

Dimensions given are measured horizontally and at 60°F unless otherwise noted. Dimensions given for existing structures are from the original construction plans unless indicated as field measurements. Some variation from plan dimensions is expected. Any additional cost resulting from variation in plan dimensions is the responsibility of the Contractor and no additional payment will be awarded by the State.

## 11. MAINTENANCE OF TRAFFIC

A minimum of three 11'-0" thru lanes of traffic in each direction shall be maintained at all times during the construction period. One lane of traffic shall be maintained on the connecting ramps at all times.

The Contractor shall maintain and protect traffic and the work during the construction period in accordance with Item 614 and as outlined in the Ohio Manual of Uniform Traffic Control for Streets and Highways, current edition with the latest revisions. In addition the following requirements shall apply:

A. The Contractor shall submit in writing a schedule of operations to the Director of Highways and receive approval before work is started on the project.

B. Closing of existing lanes prior to start of construction and changes in traffic flow during the construction period shall be accomplished between the hours of 10:00 A.M. and 2:00 P.M. The Contractor shall notify the Engineer prior to closing any existing traffic lanes or to making any changes in the traffic flow during construction.

C. A plan for lighting and traffic control for night operations shall be presented to, and be approved by the Engineer, prior to beginning night operations.

D. The Contractor shall use 55 gallon steel drums to divert the flow of traffic from its normal channel into another channel and to protect the work area during construction. The drums shall be painted orange and shall have two 4 inch bands of white reflectorized sheeting around the circumference of the drum. Drums shall be at least half-filled with granular material and spaced at 25 ft. intervals.

E. Traffic shall be restricted to a 35 MPH speed limit during the construction period.

F. Change in the flow of traffic shall be kept to a minimum. Once a traffic lane has been closed; all work within the closed lane shall be completed prior to its being reopened. The only exception is at Expansion Joint 2 where all castings must be removed before any modifications are begun. At this Expansion Joint, the existing steel guardrail shall remain until the median lanes are closed a second time and the new concrete barrier median constructed.

G. Sign supports shall be of sufficient size and height as to support the signs at the proper height in accordance with the Manual.

H. All advance warning signs for any condition which restricts traffic shall be erected before any such restriction is put into effect. All such signs shall be covered whenever they are not applicable.

I. All signs shall be reflectorized with Reflective Sheeting capable of producing a "Retrodirective" reflection.

J. At least one uniformed special duty State Highway Patrolman or other authorized municipal police officer equipped with a marker and flasher equipped police or patrol car shall be on duty at all times (24 hours per day) whenever one or more lanes of I-90 are closed or partially closed. If any lanes are closed or partially closed at the same time in both the eastbound and westbound directions, there shall be at least two such police officers and cars on duty, one assigned to each direction of travel. Such officer shall generally locate himself and his police car off the traveled surface of the highway just in advance of the point at which the lane closing begins, and he shall assist oncoming traffic in maneuvering out of the closed lanes and shall take care that the open lanes remain free of obstructions and that traffic moves steadily through the open lanes. The contractor shall pay directly to the police officers or police agency any cost involved.

K. Whenever any part of the traveled surface is closed, the motorist shall be warned and diverted by the contractor through the use of a flashing arrow, in addition to those provision set forth in the Ohio Manual of Traffic Control for Construction and Maintenance Operations latest edition. The arrow shall consist of a minimum of eight sealed beam amber lights at least 5 inches in diameter and 35 watts. These lights shall be mounted in the shape of an arrow on a panel and shall be elevated to a minimum height of seven feet above the pavement. The lights shall flash either sequentially or simultaneously and shall be placed in a location, as directed by the engineer, which will adequately warn the motoring public of the upcoming merger (minimum size 3' x 5').

L. Payment for all of the above shall be included in the lump sum price bid for 614 Maintaining Traffic.

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

## GENERAL NOTES

OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43  
42R-17 50 STA. 54+65.78  
42-17 50

CUYAHOGA COUNTY OHIO

DRAWN PAB TRACED BMP CHECKED CRB REVIEWED CRB REVISIONS  
DATE 4-3-72 DATE 4-3-72 DATE 5-24-72 DATE 5-26-72 SHEET 2 / 52

REV. 8-4-72

## GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

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CUYAHOGA COUNTY  
CUY-90-1524

## 12. REMOVAL

A. GENERAL - Structural Steel members designated by the plans for removal may be removed by methods of the Contractor's selection and as approved by the Engineer. Care shall be exercised to prevent damage to members which are to be reused.

When so directed by the Engineer, the Contractor shall wet down concrete thoroughly during removal operations to prevent spread of dust. The water shall be provided by the Contractor and included for payment in Item 202, Concrete Portions of Structure Removed.

B. CONCRETE REMOVAL - Concrete shall be removed by means of approved pneumatic hammers employing pointed and blunt chisel edged tools. The outline of the areas of the deck slab to be removed shall first be cut to a depth of three-quarters (¾) of an inch with an approved powersaw prior to the use of pneumatic hammers. The maximum weight of pavement breakers used to chip out old concrete shall not exceed 60 pounds.

Existing reinforcing steel shall not be cut flush at all locations but shall be cut as indicated in the Plans or as directed by the Engineer to serve as dowels or principal reinforcement in the rebuilt structure. Care shall be taken to preserve the bond of such dowels or principal reinforcement in the existing concrete. These bars shall be cleaned of all concrete fragments and foreign matter. Pneumatic hammers shall not be placed in direct contact with the bars; hand tools shall be employed for final cleaning. Damaged areas of reinforcement that are to remain shall be cut and stress transfer accomplished by either a lapped or mechanical splice. Other existing reinforcement within the removal limits shall be removed and disposed of.

The Contractor shall not permit the removed concrete to drop below the bridge deck. Means shall be provided for catching broken concrete. The Contractor shall submit details of the method he proposes to use to collect the concrete, to the Engineer, for approval. The materials so collected shall be removed promptly and not allowed to accumulate.

C. DISPOSAL OF REMOVED MATERIALS - All concrete, reinforcing steel, metal railing, structural metal, lighting fixtures, etc. cut from the structure and not reused shall, unless otherwise specified, become the property of the Contractor and shall be removed by him from the site.

Under no circumstances shall material be permitted to remain on the premises pending sale or disposal of or for any other purpose, unless specified by the Engineer.

## 13. BONDING NEW CONCRETE TO EXISTING CONCRETE

At all locations except at the interface between the deck and concrete barrier median, where new concrete, including pneumatically placed mortar, is placed in contact with existing concrete, Polysulfide-Epoxy Resin adhesive shall be used for bonding the new concrete to the existing concrete. The adhesive shall be Thiobond No. 100, as manufactured by Steelcoat Mfg. Company, St. Louis, Mo., Thio 63 Grout, as manufactured by the W. R. Grace and Company, Resiweld R-7680-G as manufactured by the H. B. Fuller Company, or adhesive meeting the requirements of AASHTO M 200-65 Type A. In the event of application at less than 60°F or more than 104°F, it may be necessary to obtain a slightly modified material depending on the recommendations of the manufacturer.

Preparation of the surface of the existing concrete shall be in accordance with the manufacturer's recommendation. Just prior to application the prepared surface shall be washed with water to remove all dust. When the surface is damp or dry, the adhesive shall be applied by thorough brushing onto the surface to a thickness of not less than 15 mils with the coverage averaging at least one gallon per 100 sq. ft. While the adhesive is tacky, the fresh concrete shall be placed against it. If the adhesive sets and is no longer tacky, a second coat shall be applied.

The adhesive shall be thoroughly mixed and health precautions observed, all in accordance with the manufacturer's recommendation.

Payment for bonding new concrete to old using polysulfide-epoxy adhesive will be made at the unit price bid per square foot for "Polysulfide-Epoxy Adhesive", which price shall be full compensation for all labor and materials, including cleaning and preparing the existing surface. If sandblasting the existing surface is necessary, its cost shall also be included in this item.

## 14. WATERPROOFING BRIDGE DECKS

See Note in Proposal.

## 15. REINFORCING STEEL

(a) All bars are designated on the plans by bar numbers. The bar size is indicated by the first digit of the three-digit numbers.

All bar dimensions are given out to out.

All bars of a series shall vary in length by a constant increment.

(b) The clear distance between reinforcing steel and face of concrete shall be as noted in the plans.

(c) Whenever it is necessary to splice onto existing reinforcing steel, the bars shall be connected by an approved mechanical connector or by overlapping their ends not less than 30 diameters.

## 16. PAINTING

All new structural steel shall be painted in accordance with 514 except where the steel is indicated as A588. New structural steel indicated as A588 shall not be painted.

Existing structural steel, where indicated, shall also be painted in accordance with 514.

Payment for cleaning and painting existing structural steel shall be included with Item 514, Cleaning and Painting Existing Structural Steel, as per plan.

## 17. PAVEMENT MARKING

A. THERMO-PLASTIC PAVEMENT MARKING MATERIALS - The pavement marking shall be reflectorized "Permaline" thermo-plastic compound as manufactured by the Permaline Corporation or reflectorized "Catatherm" thermo-plastic compound as manufactured by Cataphote Corporation, or approved equal and in addition the thermo-plastic materials furnished on this contract shall meet the following specifications.

Glass beads meeting Ohio Specifications No. 712.05 shall be uniformly mixed throughout the material at the rate of not less than 250 lbs. of beads per 1,000 lbs. of thermo-plastic material. Immediate reflectorization shall be accomplished by an application of beads to the surface of the compound at the time the thermo-plastic material is applied. A glass bead dispenser of approved design shall be used for a uniform surface application of beads at a rate of not less than two pounds of beads per 33 square feet of line.

The material shall withstand temperature variation from minus 20° F. to plus 120° F., without deformation or discoloration, and shall maintain its original dimension and placement, free from tack, chipping or spalling. White thermo-plastic material shall be free of dirt or tint.

B. SAMPLES - The contractor shall furnish a 10 lb. material sample of white thermo-plastic compound he proposes to furnish and also white typical samples of line 4 inches wide by 10 inches long.

Material installed on the road on this contract in accordance with the contractor's standard practice shall be compared with the original samples at least 90 days after construction and shall show no darkening or discoloration. The material shall harden sufficiently within 15 minutes after application to allow traffic over the line without pickup or impression.

C. CONSTRUCTION DETAILS - Thermo-plastic material shall be used and extruded to the pavement to a uniform minimum thickness of ¼ inch by a single application and shall be straight and true. The Contractor shall prepare all pavement surface to insure adhesion. All thermo-plastic pavement markings shall be placed over an epoxy resin primer. The primer shall be a two component solvent epoxy adhesive compound of spraying consistency especially compounded for traffic marking. Resin and hardener shall be mixed in the exact proportion recommended by the manufacturer. The primer shall be applied with a minimum tolerance of 1-inch on each side of all pavement markings. The air temperature at the time of application shall not be less than 50 degrees F. the temperature of the compound during application shall never fall below 375 degrees F.

D. METHOD OF MEASUREMENT - Placement of all pavement markings shall be in accordance with the plan, subject to any adjustments as directed by the Project Engineer. The length paid for shall be the number of lineal feet, exclusive of gaps, of the several types of lines installed and accepted, measured in place. Measurements shall be made by a representative of the Contractor and the Engineer.

E. BASIS OF PAYMENT - These items shall be paid for in accordance with Item 621.

## ITEM 519 - PATCHING CONCRETE DECK SLABS, PARTIAL DEPTH

In lieu of the concrete or mortar as called for in 519, spalls 1" deep and over, but not full depth, shall be patched with the mortar mix as follows: The mortar mix shall consist of one part regulated set portland cement, Supplemental Specification 944, 1½ parts silica sand, 1½ parts 703.02 No. 8 limestone aggregate, and an air entraining admixture. The slump of the mortar shall be the minimum practicable for proper workability but in no case shall it exceed 2". Prior to placing the mortar the surface shall be thoroughly drenched with clean water. When dried to a damp condition a bonding grout coat (a mixture of cement and water having the consistency of a thick paint) shall be scrubbed onto the surface and shall not be allowed to dry before the patching mortar is placed. The mortar shall then be placed and the surface restored to the original grade and profile. The mortar shall be spread evenly to a level slightly above the pavement surface and struck off by drawing a vibrating screed slowly across the surface without stopping. Surface texture per 511.16 need not be provided. The patches shall be cured according to 511.14 Method (a) or (b). If Method (b) is used the membrane shall be removed prior to waterproofing. Traffic shall be kept off the repaired areas until the mortar has cured for a period of time as determined by the Engineer.

## ITEM 202 REMOVAL OF UNSOUND BRIDGE DECK (LESS THAN 1" DEPTH)

Disintegrated concrete in spalls less than 1" in depth shall be removed in accordance with 519.03 and 519.04.

The surfaces within the areas from which disintegrated concrete has been removed shall be smoothed by power grinding or other means to the satisfaction of the Engineer.

Payment for all the above shall be included in the unit price bid per Sq. Yd. for item 202, Removal of Unsound Bridge Deck (Less Than 1" Depth).

If Uniroyal is used for waterproofing the bridge deck, the above requirement for smoothing shall be waived and the spalled area shall be patched with 403 material prior to the application of the waterproofing material.

## DETERMINATION OF UNSOUND DECK AREAS

The project Engineer will sound the closed portion of bridge deck and mark removal areas.

The Contractor shall remove the areas marked in accordance with the plan notes and sufficiently clear the debris from the deck so that a check sounding can be made.

The Project Engineer will re-sound the deck and mark any areas of hallowness which were missed on the first sounding or which fractured during the removal operation.

The Contractor shall remove the concrete from these designated areas and completely clean the deck in accordance with the plan and proposal notes.

Payment for the above shall be included in the pertinent patching or removal items.

## TACK COAT

The east approach slab shall have a tack coat applied at the rate of 0.1 Gal. per Sq. Yd. A quantity of 33 Gal. of Item 407 Tack Coat, has been carried to the general summary to perform this operation.

For tack coat requirements for the bridge deck see notes in the proposal.

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

## GENERAL NOTES

OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67 STA. 3+87.63

42R-17 43

42R-17 50

42 -17 50

STA. 54+65.78

CUYAHOGA COUNTY

OHIO

DRAWN RAB TRACED BMP CHECKED CAB REVIEWED CAB REVISED

DATE 4-3-72 DATE 4-3-72 DATE 5-24-72 DATE 5-28-72

SHEET 3 / 52

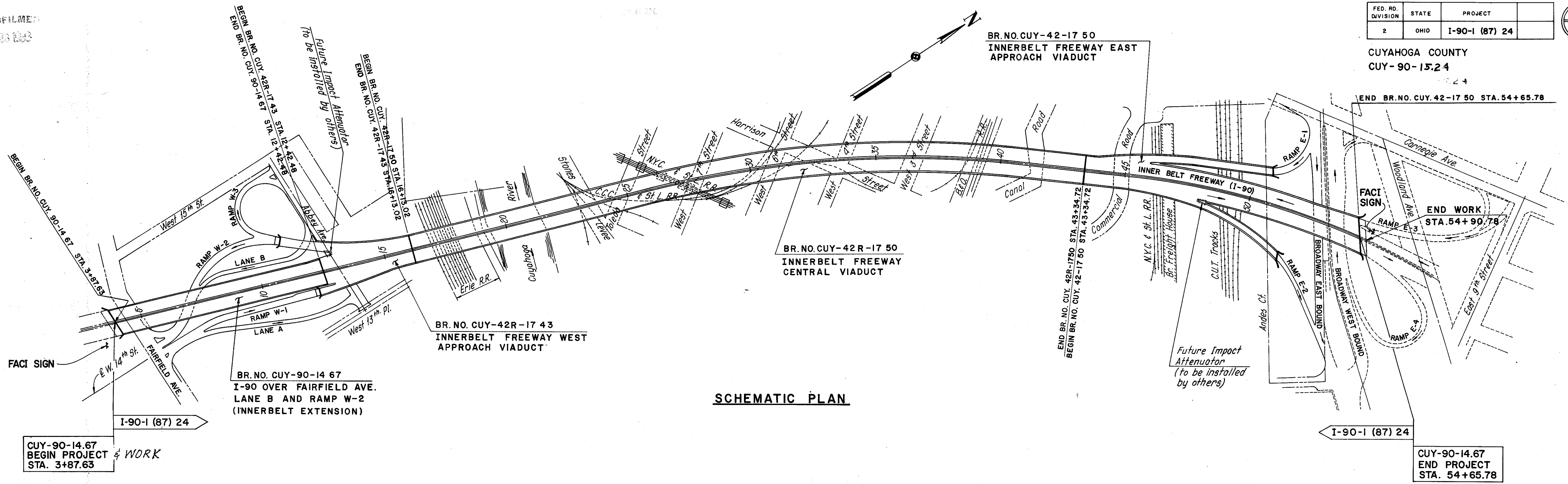
\* For spalls Less than 1" in depth the sawing shall be omitted.

MICROFILMED  
FEB 20 1983

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

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CUYAHOGA COUNTY  
CUY-90-15.2.4



**SCHMATIC PLAN**

**EXISTING STRUCTURE BR. NO. CUY-90-14 67**

*TYPE: Units 1W and 1E - Continuous welded steel girder with reinforced concrete deck and substructure.  
Units 2W, 3W and 2E - Continuous steel beam with reinforced concrete deck and substructure.*

*SPANS: Unit 1W 64'-0", 70'-6", 65'-6", 8'-0" Cantilever.  
Unit 2W 63'-0", 90'-0", 79'-6", 64'-0", 6'-0" Cantilever  
Unit 3W 66'-0", 3 @ 72'-0", 61'-11 1/2"  
Unit 1E 64'-0", 102'-0", 103'-0", 90'-0", 79'-6", 64'-0", 6'-0" Cantilever  
Unit 2E 66'-0", 3 @ 72'-0", 61'-11 1/2"*

*ROADWAY: 2 @ 53'-0" curb to curb with 2'-2" safety curbs and 4'-0" median  
LOAD FREQUENCY: CF2000(57) adequate for A.A.S.H.O. alternate loading.  
SKEW: Varies  
WEARING SURFACE: 2" Asphaltic Concrete  
APPROACH SLAB: AS-1-54 (25' Long)  
ALIGNMENT: Tangent*

**EXISTING STRUCTURE BR. NO. CUY-42R-17 43**

*TYPE: Continuous steel beams and girders with concrete deck and substructure*

*SPAN: Varies (see General Plan)*

*ROADWAY: 2 @ 52'-0" with 2(3'-0") safety curbs*

*LOADING: CF 2000*

*SKEW: Varies*

*WEARING SURFACE: 2 1/2" Asphaltic concrete*

*ALIGNMENT: Tangent*

**EXISTING STRUCTURE BR. NO. CUY-42R-17 50**

*TYPE: Steel Deck trusses with reinforced concrete deck and substructure.*

*SPANS: Varies (see General Plans)*

*ROADWAYS: 2 @ 52'-0" curb to curb with 2(3'-0") safety curbs and 4'-0" median.*

*LOADING: CF 2000, adequate for A.A.S.H.O. alternate loading.*

*SKEW: Varies*

*WEARING SURFACE: 2 1/2" Asphaltic concrete.*

*ALIGNMENT: Tangent, 1° 30' Curve Right, Tangent.*

**EXISTING STRUCTURE BR. NO. CUY-42-17 50**

*TYPE: Continuous steel beams and girders with concrete deck and substructure*

*SPAN: Varies (see General Plans)*

*ROADWAY: 2 @ 52'-0" with 2(3'-0") safety curbs*

*LOADING: CF 2000, adequate for A.A.S.H.O. alternate loading.*

*SKEW: Varies*

*WEARING SURFACE: 2 1/2" Asphaltic concrete*

*ALIGNMENT: 2° Curve Right*

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

**SCHMATIC PLAN**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50 STA. 54+65.78  
42-17 50

CUYAHOGA COUNTY OHIO

DRAWN P.A.B. TRACED B.M.P. CHECKED D.H.S. REVIEWED C.H.B. REVISED  
DATE 2-14-72 DATE 2-17-72 DATE 4-12-72 DATE 5-26-72 SHEET 4/52

TYPE CODE X932

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	NORMAL PARTICIPATION	100 % STATE
<b>BRIDGE REPAIR</b>					
202	54,164	Sq. Yd.	Wearing Course Removed	661	53,503
202	703	Cu. Yd.	Concrete Portions of Structures Removed	682	21
202	600	Sq. Yd.	Removal of Unsound Bridge Deck (Less Than 1" Deep)		600
202	45,100	lbs.	Structural Steel Portions of Structure Removed	39,900	5,200
202	5,048	Lin. Ft.	Guard Rail Removed for Storage, Barrier	5,048	
202	22	Sq. Yd.	Pavement Removed	22	
202	1	Each	Removal of Sign	1	
403	1,507	Cu. Yd.	Asphalt Concrete (60-70 or AC 20)	20	1487
404	1,507	Cu. Yd.	Asphalt Concrete (60-70 or AC 20)	20	1487
407	33	Gallons	Tack Coat: 702.04, MS-2 or RS-1; or 702.02, RC-70 or RC-250		33
509	136,512	lbs.	Reinforcing Steel	136,512	
511	973	Cu. Yd.	Class C Concrete, Superstructure	953	20
513	17,228	lbs.	Structural Steel (A36)	6,240	10,988
513	33,406	lbs.	Structural Steel (A588 Unpainted)	20,055	13,351
514	17,228	lbs.	Field Painting of Structural Steel (A36)	6,240	10,988
514	Lump Sum	Lump Sum	Cleaning and Painting Existing Structural Steel, as Per Plan		Lump Sum
516	106	Sq. Ft.	1" Preformed Expansion Joint Filler	106	
519	5000	Sq. Ft.	Patching Concrete Deck Slabs, Partial Depth		5000
519	5000	Sq. Ft.	Patching Concrete Deck Slabs, Full Depth		5000
520	414	Sq. Ft.	Pneumatically Placed Mortar		414
603	54	Lin. Ft.	12" Conduit Type F, 707.05	54	
604	1	Each	Standard No. 2-20 Median Inlet	1	
609	119	Lin. Ft.	Curb, Standard Type G, Concrete Curb	119	
808	973	Units	Chemical Admixture for Concrete, Type A, B or D	953	20
<b>TRAFFIC CONTROL</b>					
621	4.46	Mi.	4" Thermoplastic Edge Lines	4.46	4.46
621	1.97	Mi.	6" Thermoplastic Lane Lines	1.97	1.97
621	0.03	Mi.	4" Thermoplastic Lane Lines	0.03	0.03
621	1,321	Lin. Ft.	8" Thermoplastic Channelizing Lines	1,321	1,321
621	506	Lin. Ft.	24" Thermoplastic Broad Transverse Stripes	506	506
<i>Traffic Control Quantities Continued on Sheet 45 For Lighting Quantities see Lighting Plans Sheet 45</i>					
815	2	Sq. Ft.	Signs, Aluminum Flat Sheet Type, E-06	2	2
815	32	Sq. Ft.	Signs, Aluminum Flat Sheet Type, E-10	32	32
816	2	Each	Pole Mounted Sign Attachment, as per plan	2	2
<b>BRIDGE REPAIR (Cont'd.)</b>					
Special	7,963	Sq. Ft.	Polysulfide - Epoxy Adhesive	6,837	1,126
Special	54,257	Sq. Yd.	Waterproofing Bridge Deck, Including Protective Cover	754	53,503
Special	6,906	Each	Threaded Sleeve Anchors	6,906	
Special	958	Lin. Ft.	Steel Barrier Curb	958	
Special	Lump Sum	Lump Sum	Cleanout and Repair of Bridge Drainage Systems		Lump Sum
Special	Lump Sum	Lump Sum	Realignment of Expansion Joints		Lump Sum
Special	Lump Sum	Lump Sum	Miscellaneous Repair Details, Overhead Sign Catwalk Support		Lump Sum
614	Lump Sum	Lump Sum	Maintaining Traffic	Lump Sum	Lump
619	Lump Sum	Lump Sum	Field Office	Lump Sum	Lump
	Lump Sum	Lump Sum	Construction Layout Stakes	Lump Sum	Lump

Notes:

Payment for Items 202 Wearing Course Removed, 403, 404, 407 and Item Special, Waterproofing Bridge Decks shall be based on plan quantity except as follows. In addition to the replacement areas indicated in the Plans there may be additional areas at the time of construction which require resurfacing. The Contractor shall repair those areas as directed by the Engineer. Payment will be made for the actual quantity of material removed and used at the unit price bid for the appropriate item.

Concrete and reinforcing steel removals for Items 519 and 520 are not included with Item 202 for payment but are included with Items 519 and 520.

Removal of steel handrail and barrier curb rail, including posts, are not included with Item 202 for payment but are included with Item Special, Miscellaneous Repair Details.

ITEM 509: Item 509 does not include replacement reinforcement which may be required for Items 519, 520 or with Item Special, Realignment of Expansion Joints. The replacement reinforcement is included with each particular Item for payment.

ITEM 511: Areas of new concrete that will receive an asphalt concrete wearing surface overlay shall be cured in accordance with 511.14, Method (a), Water Curing. All other concrete shall be cured in accordance with Supplemental Specification 836.

ITEM 513: The payment quantity for Items 513, Structural Steel (A36 or A588), shall be the quantity of new structural steel incorporated into the completed construction. The payment quantity does not include existing structural steel which is to be removed and reused in the completed structure. Payment for work on the existing structural steel is included elsewhere.

Structural steel that is being furnished as a part of this Contract shall be ASTM A36 steel unless noted as ASTM A588 steel in the plans. The A588 steel shall be unpainted.

All bolted connections of ASTM A588 structural steel shall be made with high strength steel bolts having the corrosion resistance of ASTM A588 steel and having all the mechanical properties of ASTM A325 high strength steel bolts.

ITEMS 519 AND 520: For the work involved with Items 519 and 520 the Plans are indicative only of the type of repairs that will be required. A careful detailed visual inspection has been made of the concrete surfaces of the safety walks including the fascias and underneath surfaces. Based on this inspection estimates have been made of the areas requiring repair.

The extent of the work which will be necessary to remove and restore deteriorated areas of the existing deck slabs cannot be accurately determined at this time. After the removal of the existing wearing surface course the Engineer shall inspect the deck slabs for deterioration. The Contractor shall repair the slab at locations directed by the Engineer according to the repair methods outlined in the plans.

Payment will be made for the actual square feet of repair work for Items 519 and 520, as determined by the Engineer upon completion of each repair. The additional payment will be based on the unit price bid for these items. When a patch extends completely through the slab, payment shall be included with Item 519, Patching Existing Concrete Deck Slabs, Full Depth; and only one exposed surface shall be measured for the basis of payment in lieu of both surfaces as indicated in 519.07.

Item 519 does not include the replacement of deck slabs at the expansion joints where the existing slab has to be removed for new construction. The removal and replacement of this concrete is included in Items 202 and 511 respectively.

All concrete used in Item 519 shall be cured in accordance with 511.14, Method (a), Water Curing in lieu of Supplemental Specification 836.

ITEM 816 - POLE MOUNTED SIGN ATTACHMENT, AS PER PLAN: This item of work shall consist of the furnishing and installation of stainless steel straps, mounting brackets and hardware as detailed on Sheet 40/52.

Basis of payment shall be at the contract bid price per each Pole Mounted Sign Attachment, as per plan which price shall include all labor, material, equipment and incidentals necessary to perform the required item of work.

ITEM SPECIAL - THREADED SLEEVE ANCHORS: The 3/4" self drilling threaded sleeve anchors that anchor the new median reinforcement to the existing deck shall be capable of developing a pullout resistance of not less than 17,500 lbs. Samples shall be provided for laboratory testing, and in addition, the Contractor shall perform non-destructive field pullout tests at six (6) locations designated by the Engineer, stressing each such anchor to not less than 12,000 lbs. The costs of such tests shall be included in the unit price bid for "Threaded Sleeve Anchors".

ITEM SPECIAL - STEEL BARRIER CURB, AS PER PLAN: This item includes payment for all labor, material and equipment necessary for the installation of barrier curb on the new 6" curbing on the West and East Approach Bridges. The existing barrier curb may be reused including the posts and base plates but will have to be reset into the new curb. Providing new anchor bolts, cutting of the old anchor bolts and grouting the holes and all work required on the existing barrier curb necessary to reuse it shall be included in the unit price bid for this item.

ITEM SPECIAL - CLEANOUT AND REPAIR OF BRIDGE DRAINAGE SYSTEMS: Payment for all labor, materials and equipment necessary to complete the work except as noted below shall be included in the lump sum price bid for Item Special, Cleanout and Repair of Bridge Drainage Systems. Payment for modification and replacement of the angles for the subdrainage of the wearing surface course is included in this item for payment. Payment for deflector plates which are being added above some of the existing drainage troughs shall be made at the unit price bid for Item 513, Structural Steel (A588) while cleaning and painting the drainage system is included with Item 514, Cleaning and Painting Existing Structural Steel, as per Plan.

ITEM SPECIAL - REALIGNMENT OF EXPANSION JOINTS: Payment for labor, materials and equipment necessary to complete this item of work except as noted below shall be included in the lump sum price bid for Item Special, Realignment of Expansion Joints.

The concrete removal and replacement thereof is included with Items 202 and 511 for payment.

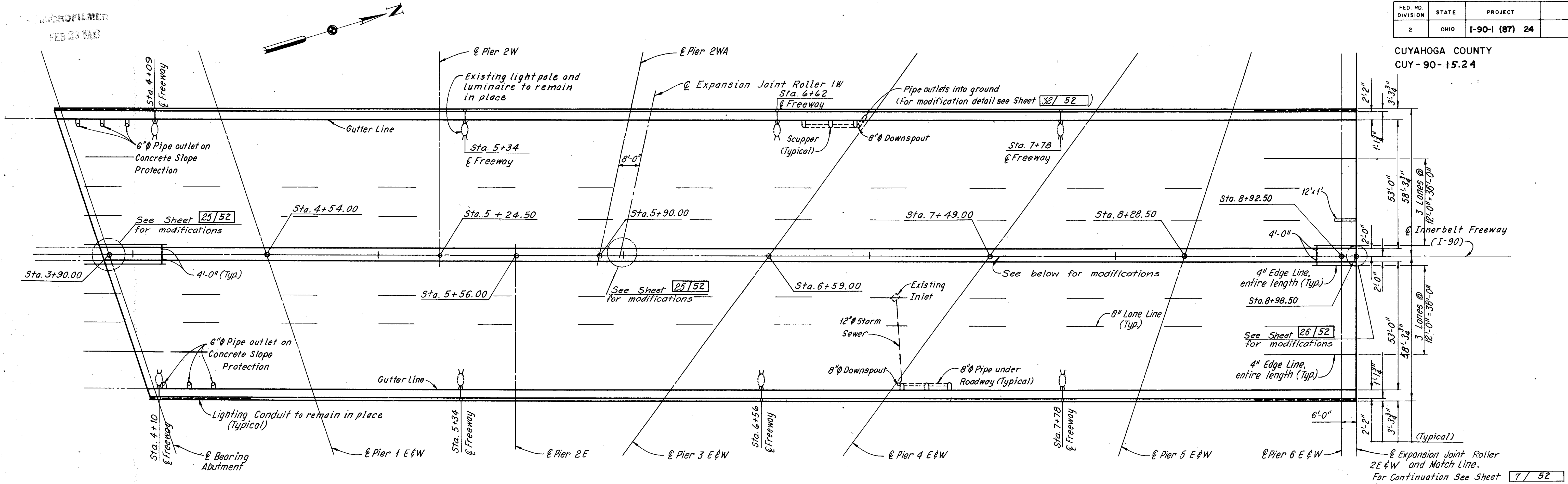
The steel shims, bolts and plates (including flashing plates) permanently required in the new construction are included with Item 513, Structural Steel A588 for payment.

Expansion joint modifications required at the median are not included in this item for payment, but are included in Items 202, Concrete and Structural Steel Portions of Structure Removed, Item 511, Item 513, Item 514, and with Item Special, Polysulfide-Epoxy Adhesive. Cleaning and painting the existing structural steel, to the extent required by this item, is included with Item 514, Cleaning and Painting Existing Structural Steel, as per Plan.

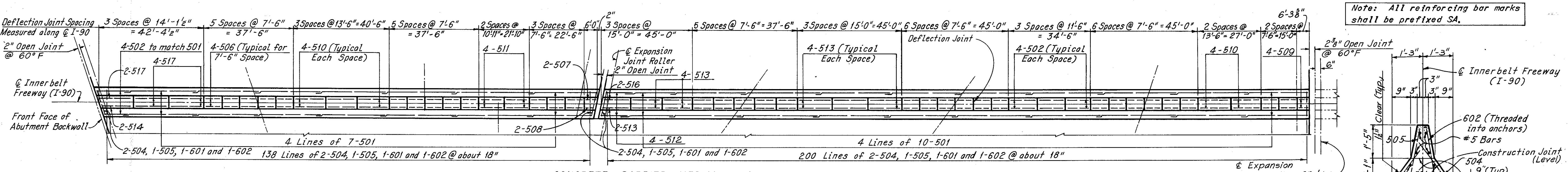
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>ESTIMATED QUANTITIES</b>				
OHIO INTERSTATE SAFETY PLANS				
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42-17 50	STA. 3+87.63 STA. 54+65.78
CUYAHOGA COUNTY OHIO				
DRAWN PAB	TRACED BR	CHECKED DHS	REVIEWED CAB	REVISED
DATE 3-22-72	DATE 4-3-72	DATE 5-9-72	DATE 5-26-72	SHEET 5 / 52

Rev. 11-3-72 A.W.G.

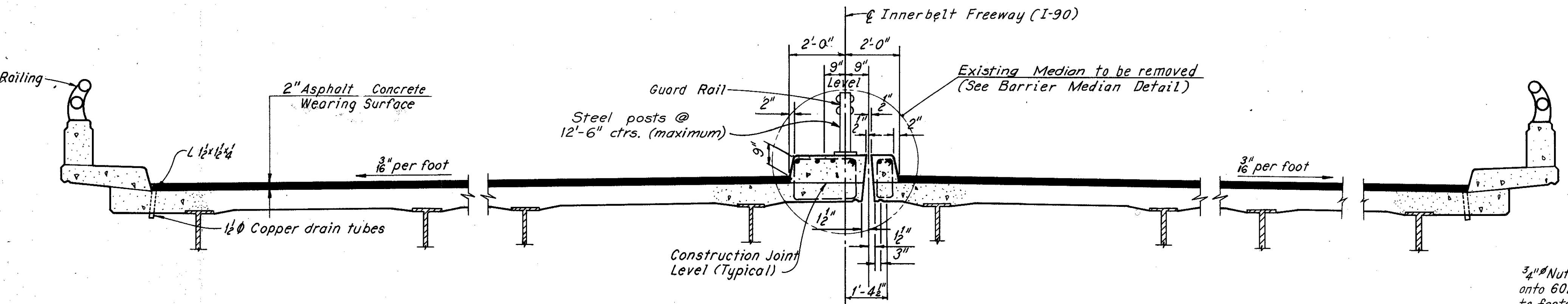
CUYAHOGA COUNTY  
CUY-90-15.24



**GENERAL PLAN**  
(Indicating areas to be modified)



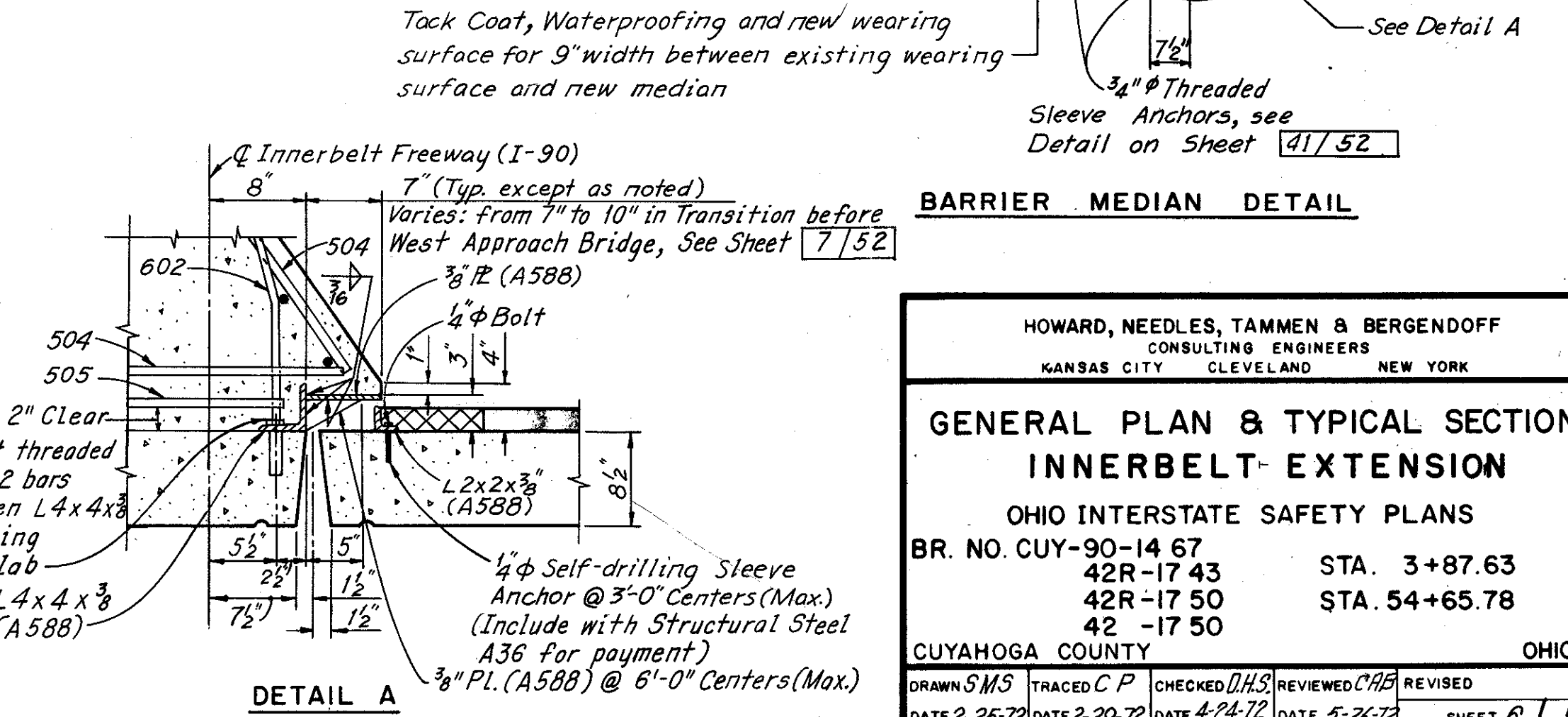
**CONCRETE BARRIER MEDIAN PLAN**



**TYPICAL SECTION**

(Existing reinforcement outside of median not shown)

Notes:  
For Median modification on the Abutment see Sheet 7/52.  
For additional Notes see Sheet 7/52.



**BARRIER MEDIAN DETAIL**

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

**GENERAL PLAN & TYPICAL SECTION  
INNERBELT EXTENSION**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 42+17.50  
42R-17 50 STA. 54+65.78  
42-17 50

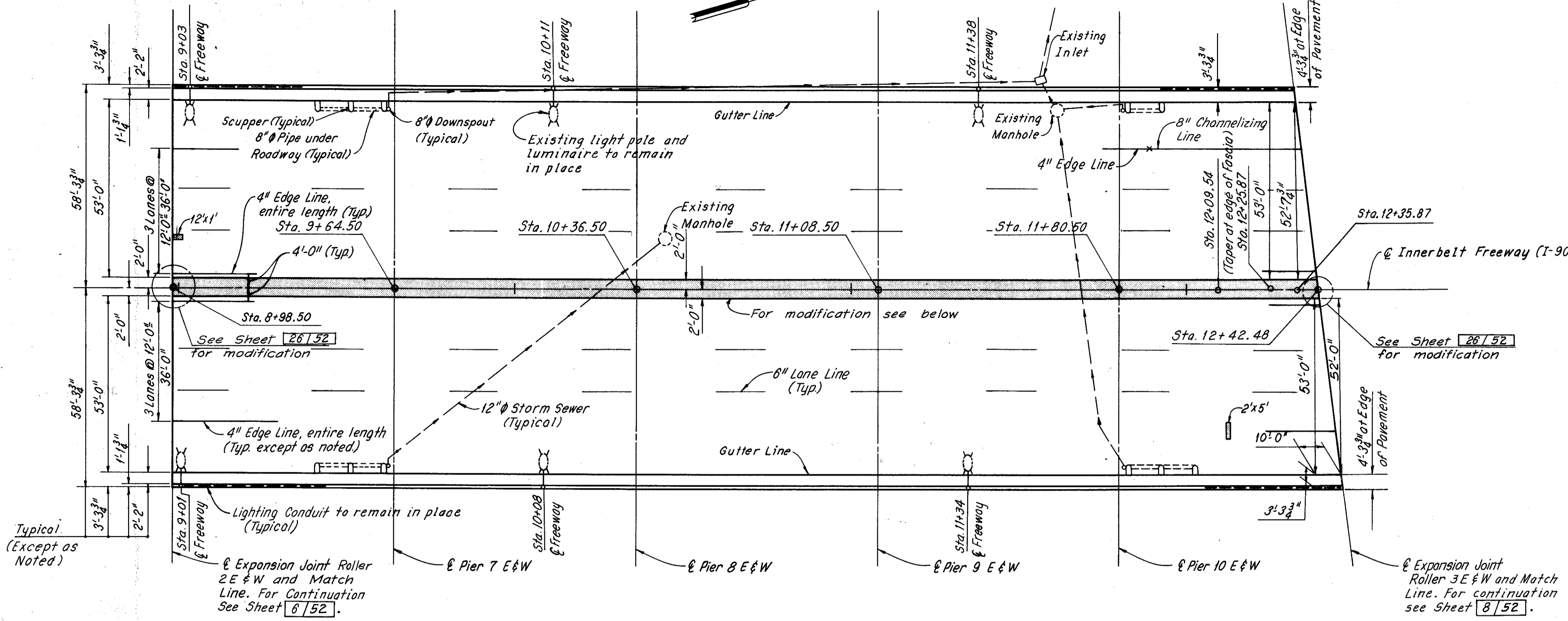
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DRAWN S.M.S. TRACED C.P. CHECKED D.H.S. REVIEWED C.A.B. REVISED  
DATE 2-25-72 DATE 2-29-72 DATE 4-24-72 DATE 5-26-72 SHEET 6 / 52

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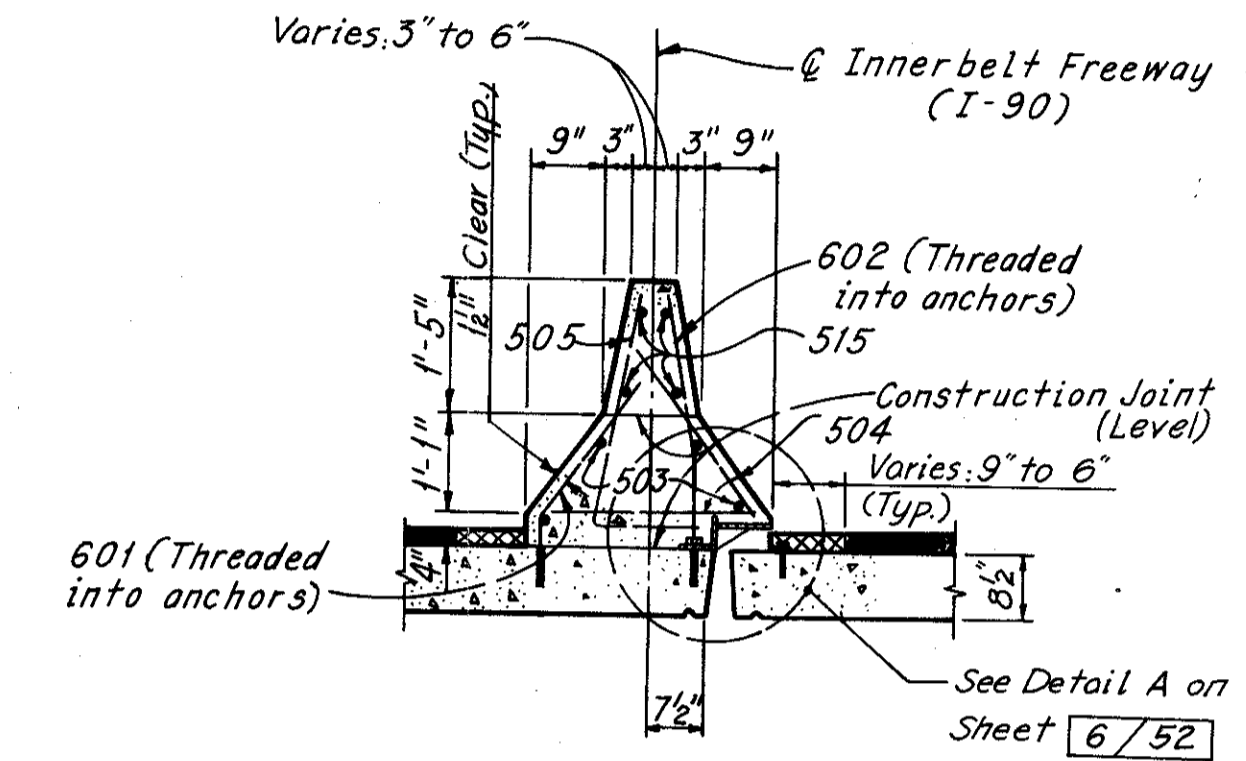
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CUYAHOGA COUNTY  
CUY-90-15.24



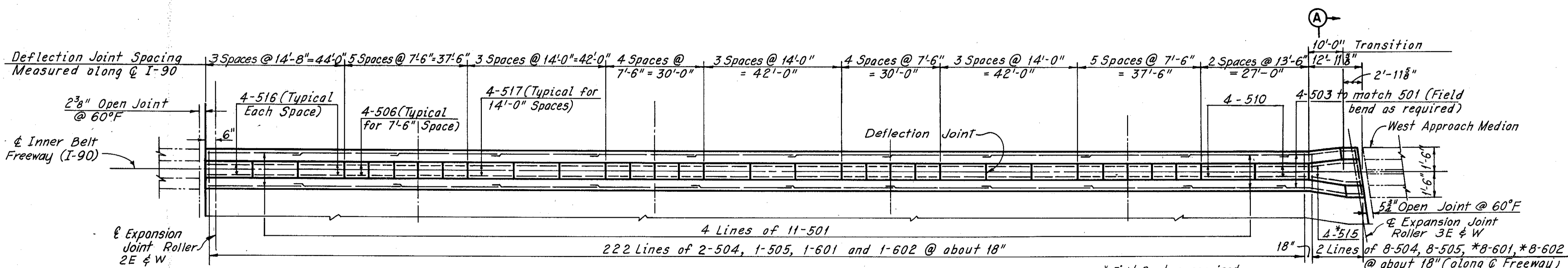
**GENERAL PLAN**

(Indicating areas to be modified)



**SECTION A-A**

Note: For additional callouts and for details outside the transition area see Barrier Median Detail on Sheet 6/52.



**CONCRETE BARRIER MEDIAN PLAN**

Note: All reinforcing bar marks shall be prefixed SA.

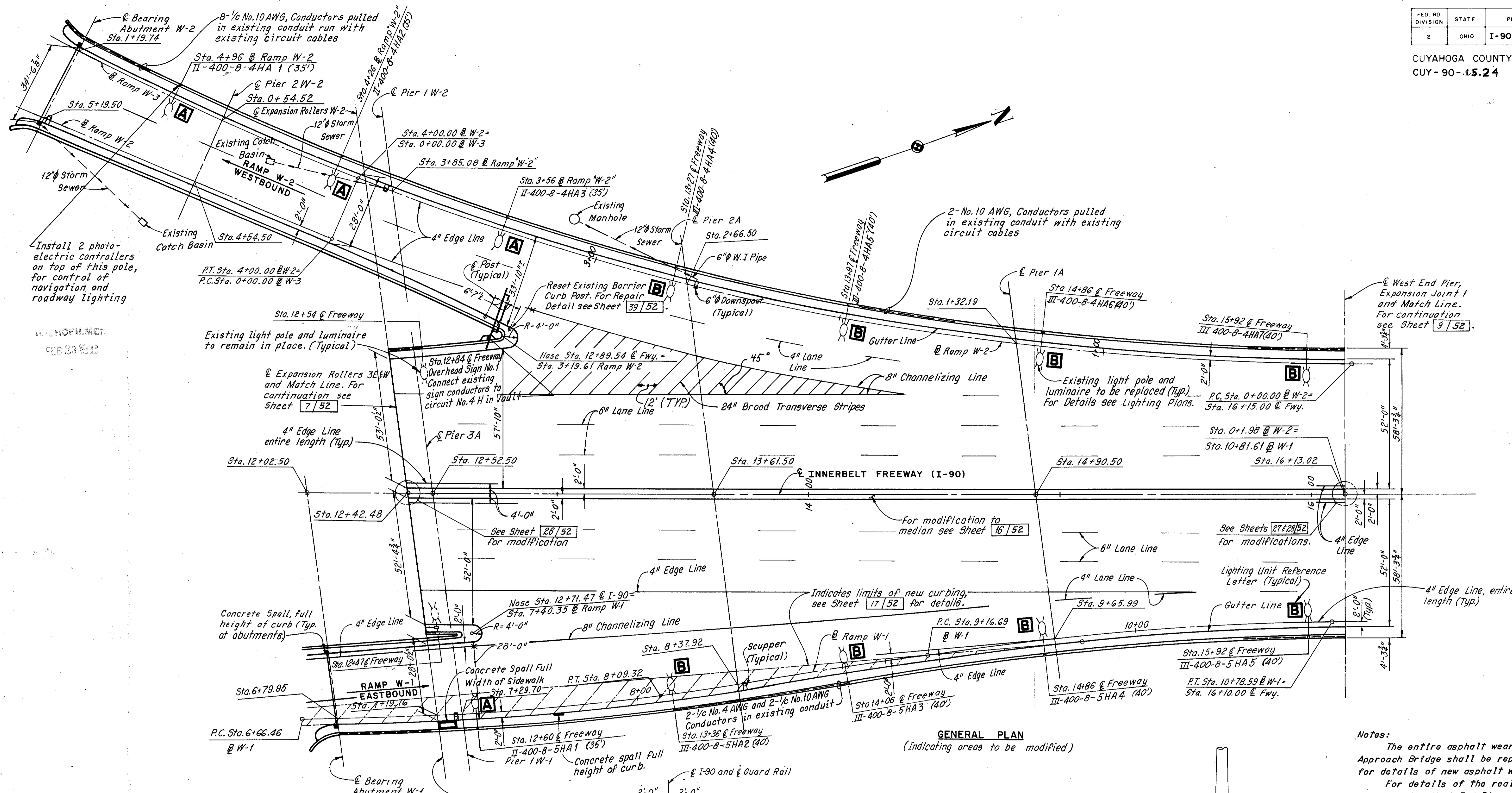
**Notes:**

- Indicates removal of existing median.
- Indicates limits of asphalt concrete wearing surface replacement. See Sheet 37/52 for Detail of new asphalt wearing surface course.
- For details of and modifications to the existing drainage system shown on the General Plans see Sheets 32/52 thru 36/52.
- For concrete repair details see Sheet 37/52.
- For Reinforcement Schedule see Sheet 41/52.
- The deflection joints in the new barrier median shall be 1/2" gray cellular polyvinyl chloride (PVC) sponge or 1/2" gray sponge rubber. If rubber is used it shall meet the requirements of AASHTO M-153. The deflection joint shall extend from the top of parapet to the first construction joint and is included with the concrete for payment. Above the upper construction joint the median shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of expansion joint filler. Exposed edges of the filler shall be flush with the surface of concrete and shall be free of mortar.
- The placement of the threaded sleeve anchors shall be adjusted as required to clear expansion, contraction and cross drain plates under the median.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>GENERAL PLAN</b>			
<b>INNERBELT EXTENSION</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42 -17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN S.M.S.	TRACED C.P.	CHECKED D.H.S.	REVIEWED C.H.B.
DATE 2-25-72	DATE 2-29-72	DATE 4-24-72	DATE 5-26-72
			SHEET 7 / 52

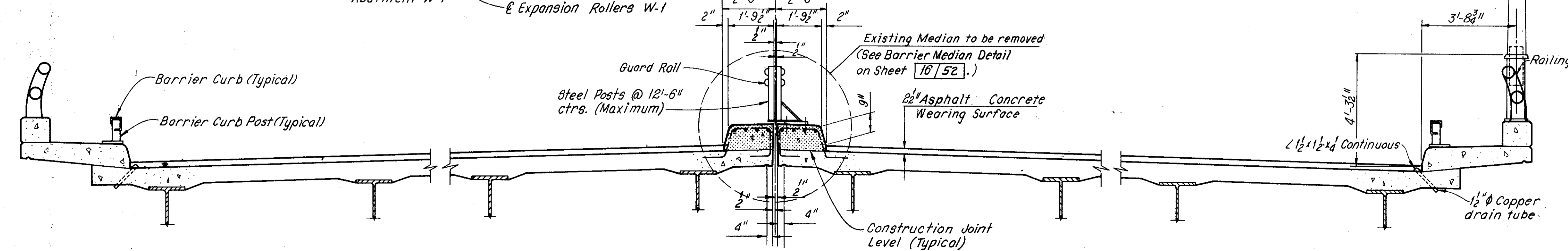


CUYAHOGA COUNTY  
 CUY-90-15.24



**GENERAL PLAN**  
 (Indicating areas to be modified)

**Notes:**  
 The entire asphalt wearing surface on the West Approach Bridge shall be replaced. See Sheet 37/52 for details of new asphalt wearing surface course.  
 For details of the realignment of the Expansion Joint at the West End Pier see Sheet 21/52.  
 For additional Notes see Sheet 7/52.



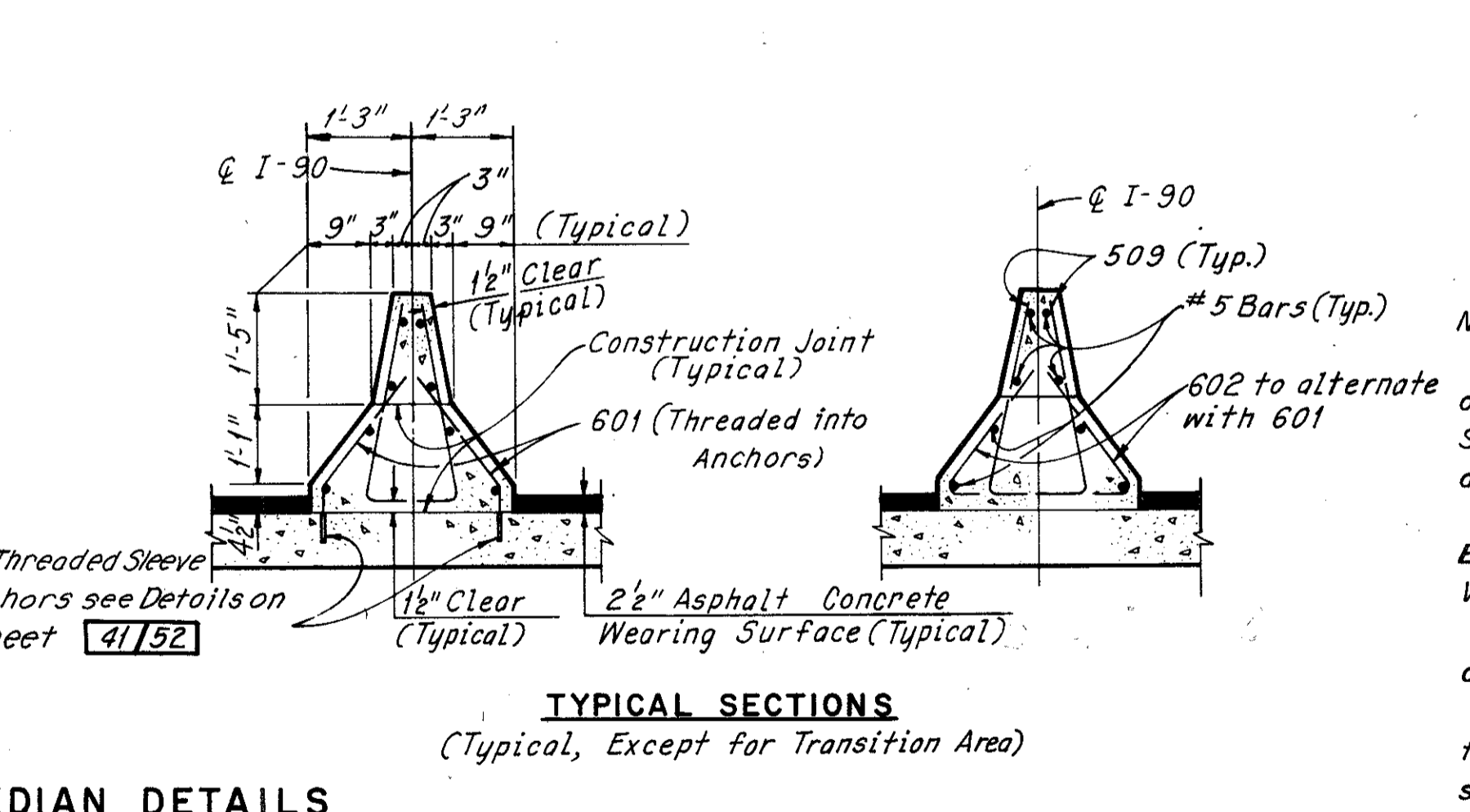
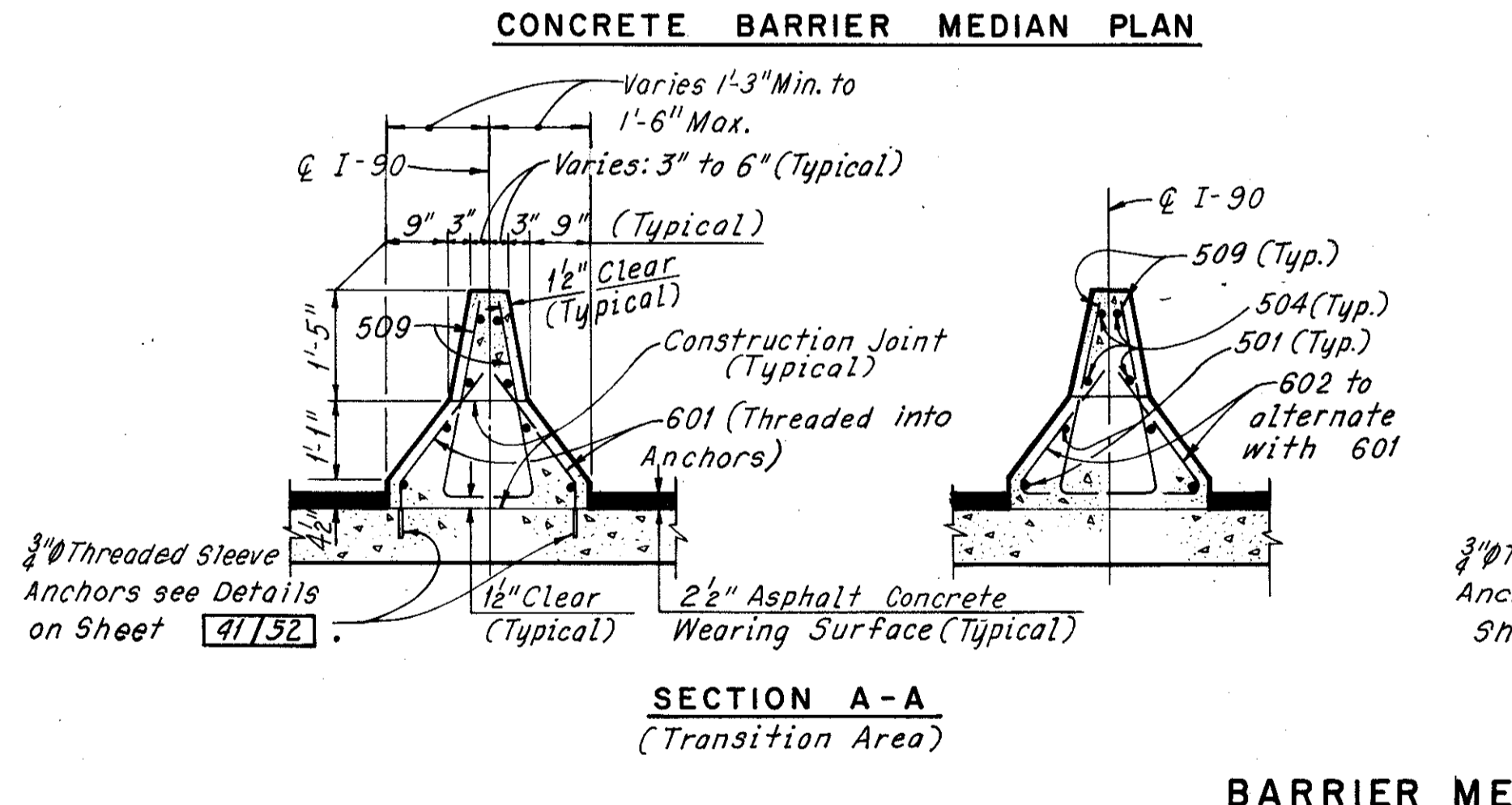
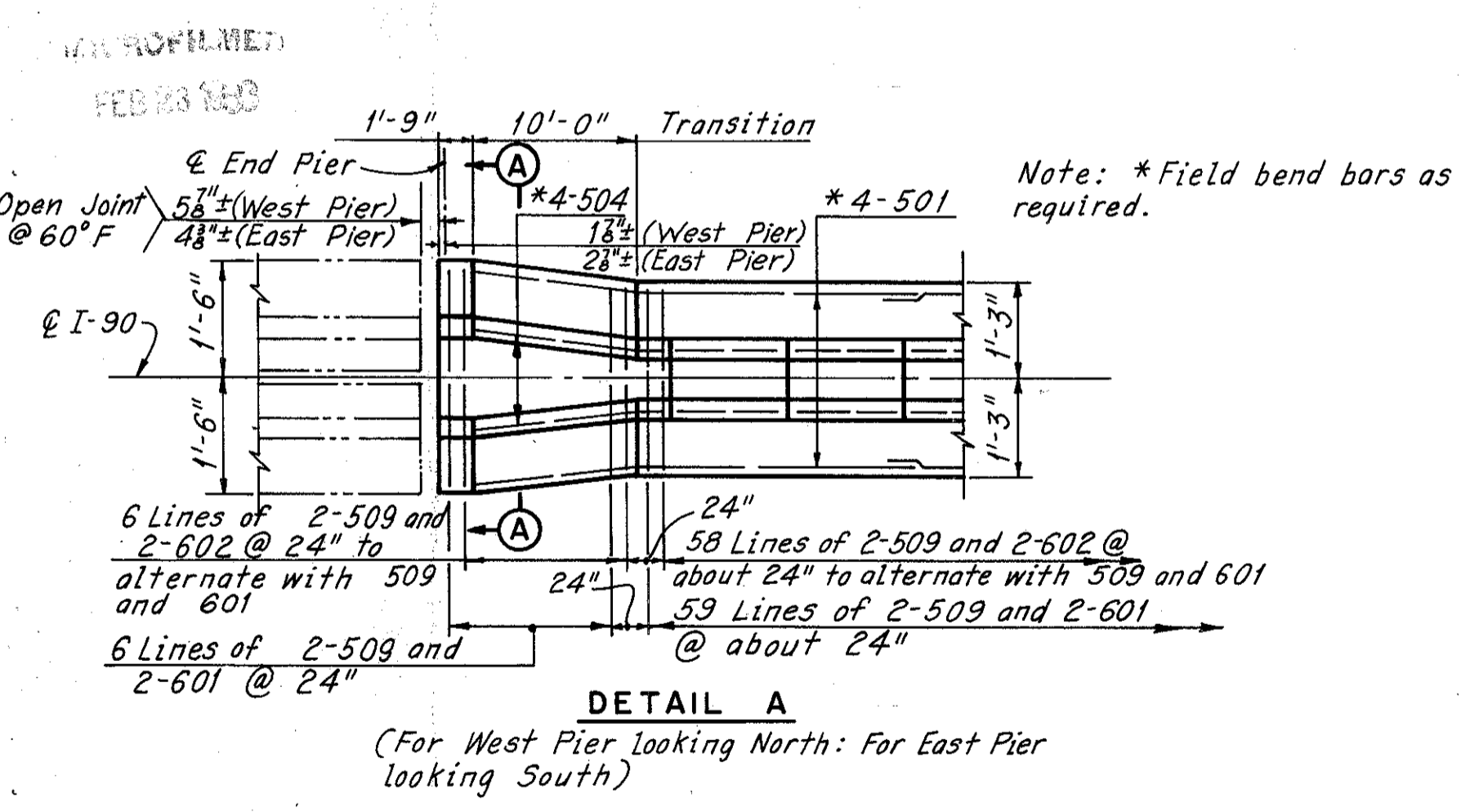
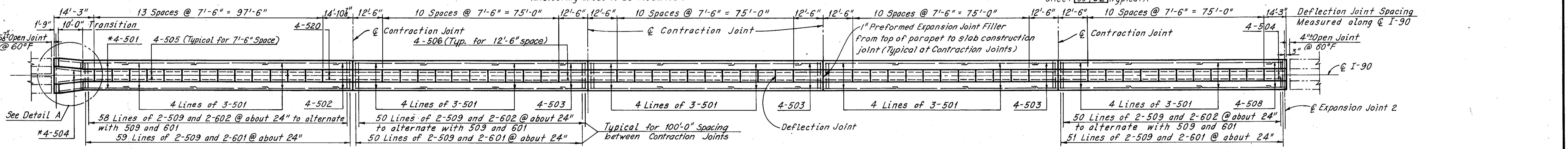
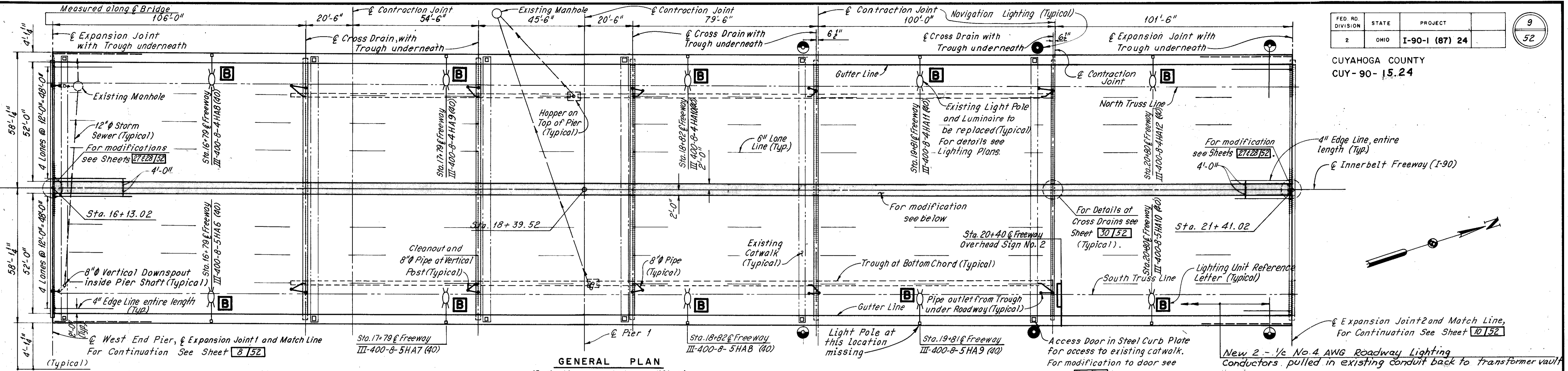
**TYPICAL SECTION**  
 (Existing reinforcement outside of Median not shown.)

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>GENERAL PLAN &amp; TYPICAL SECTION</b>			
<b>WEST APPROACH</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42-17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN S.M.S.	TRACED W.B.	CHECKED D.H.S.	REVIEWED C.A.B.
DATE 2-25-72	DATE 3-17-72	DATE 4-25-72	DATE 5-26-72

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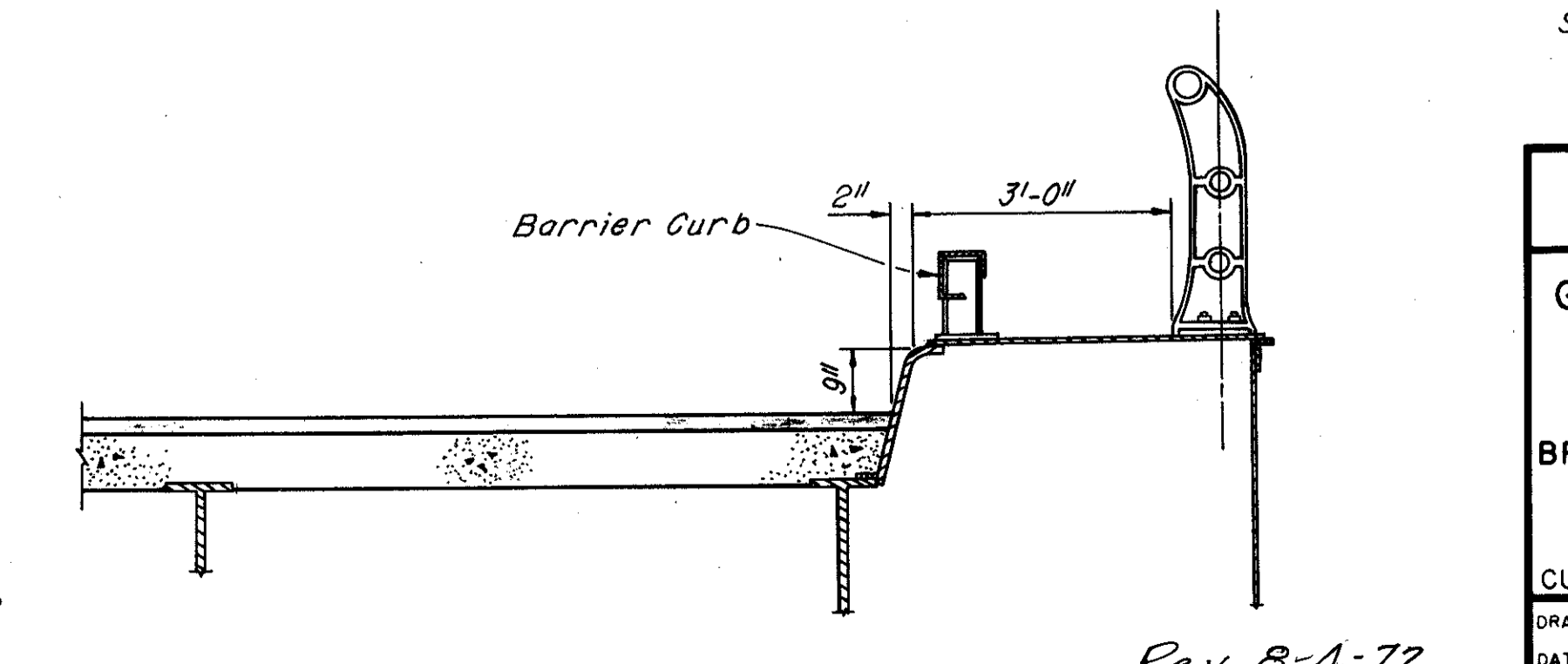
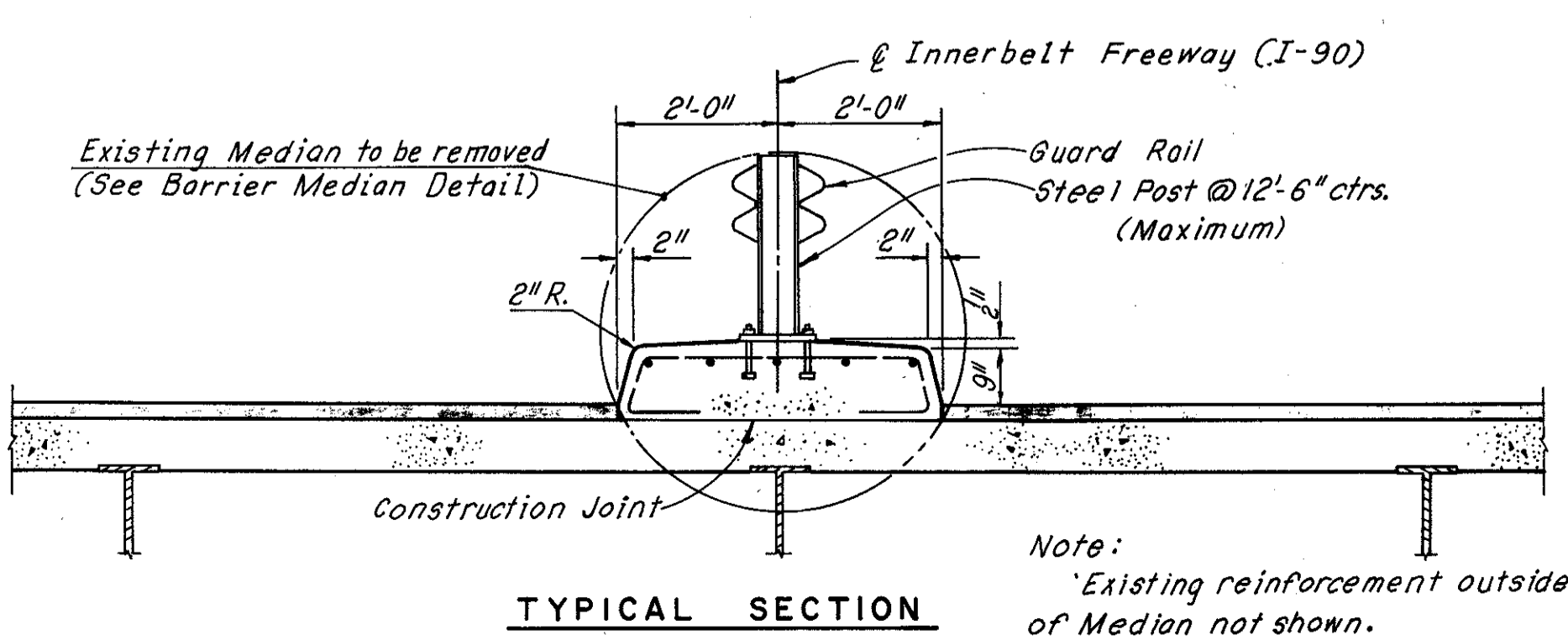
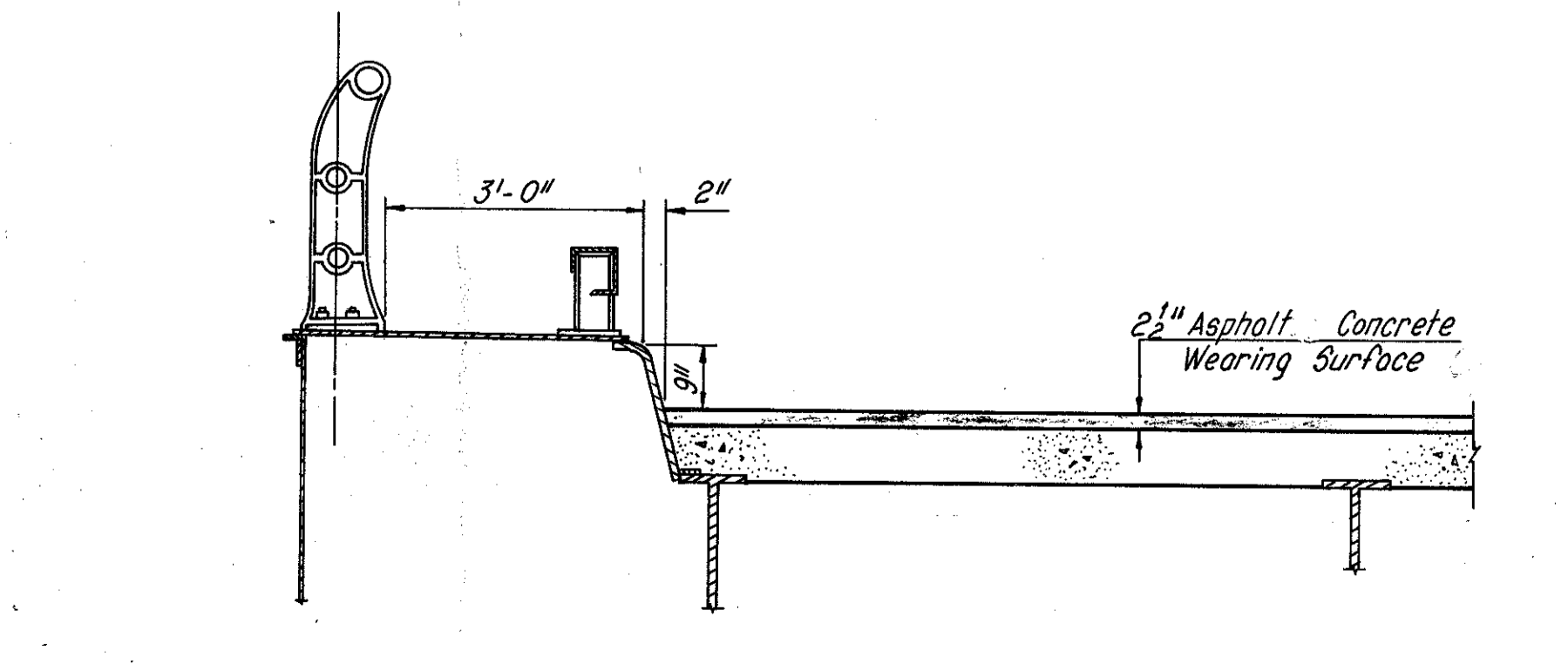
FED. RD. DIVISION	STATE	PROJECT	9
2	OHIO	I-90-1 (87) 24	52

CUYAHOGA COUNTY  
CUY-90-15.24



Note: All reinforcing bar marks shall be prefixed SC.

Notes:  
The entire asphalt wearing surface on the Central Viaduct shall be replaced. See Sheet 37/52 for details of new asphalt wearing surface course.  
For details of realignment of Expansion Joints 1, 2 and 5 on the Central Viaduct see Sheets 21/52 thru 24/52.  
For Section thru the roadway contraction joint see Sheet 30/52.  
For modification to the sub-drainage for wearing surface course on the upgrade side of all contraction joints, expansion joints and roadway cross drains see Sheet 30/52.  
For additional Notes see Sheet 7/52.



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**GENERAL PLAN & TYPICAL SECTION  
CENTRAL VIADUCT**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

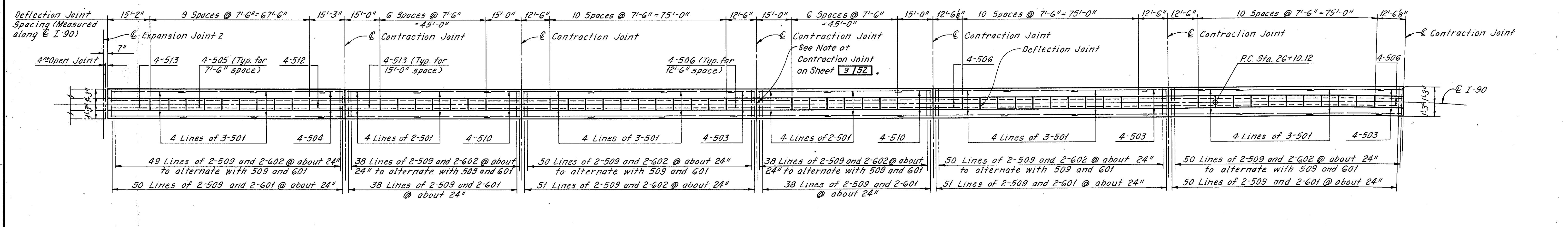
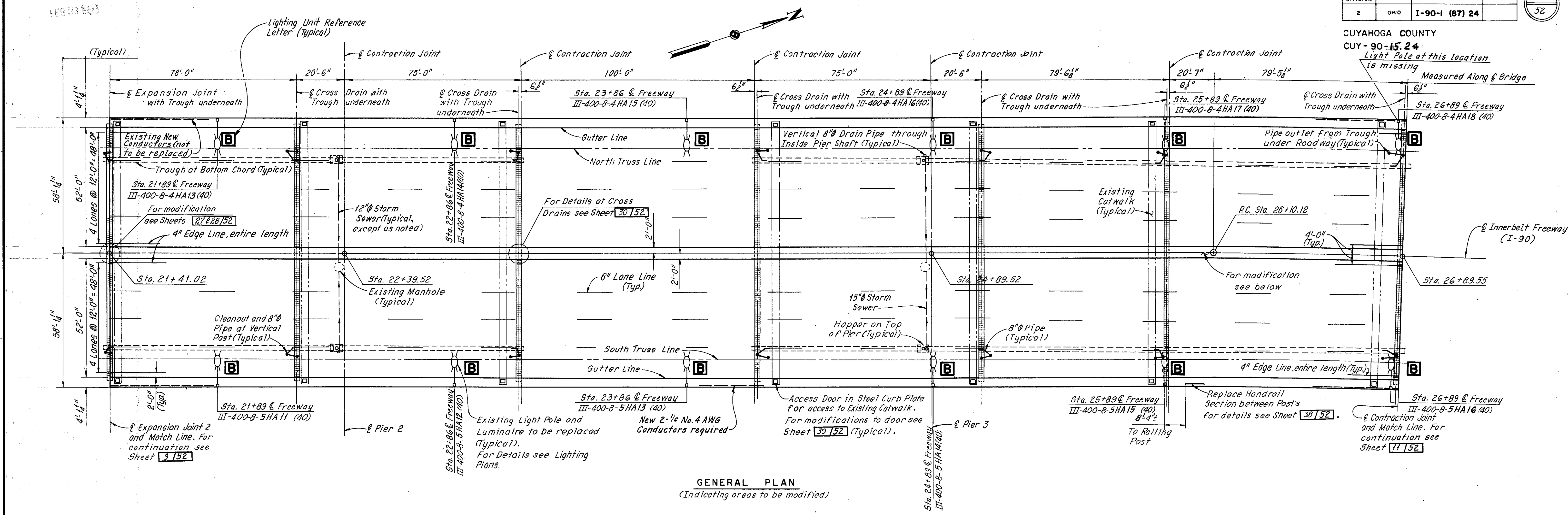
CUYAHOGA COUNTY OHIO

DATE 2-25-72 DRAWN S.M.S. TRACED C.P. CHECKED D.H.S. REVIEWED C.R.B. REVISIONS  
DATE 2-29-72 DATE 4-26-72 DATE 5-28-72 SHEET 9/52

Rev. 8-4-72

CUYAHOGA COUNTY  
 CUY-90-15-24

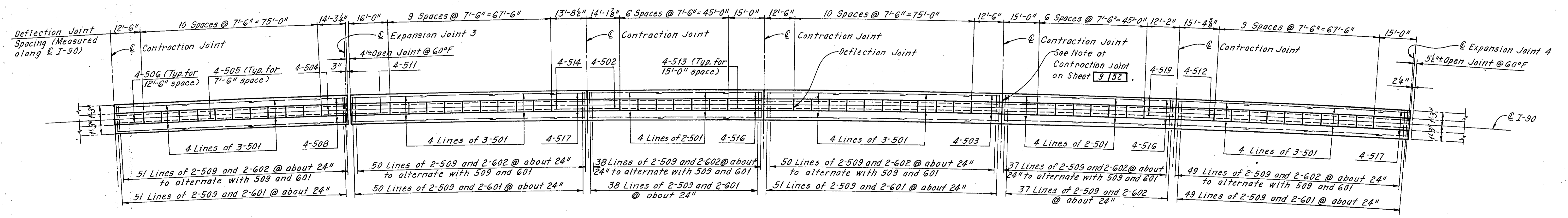
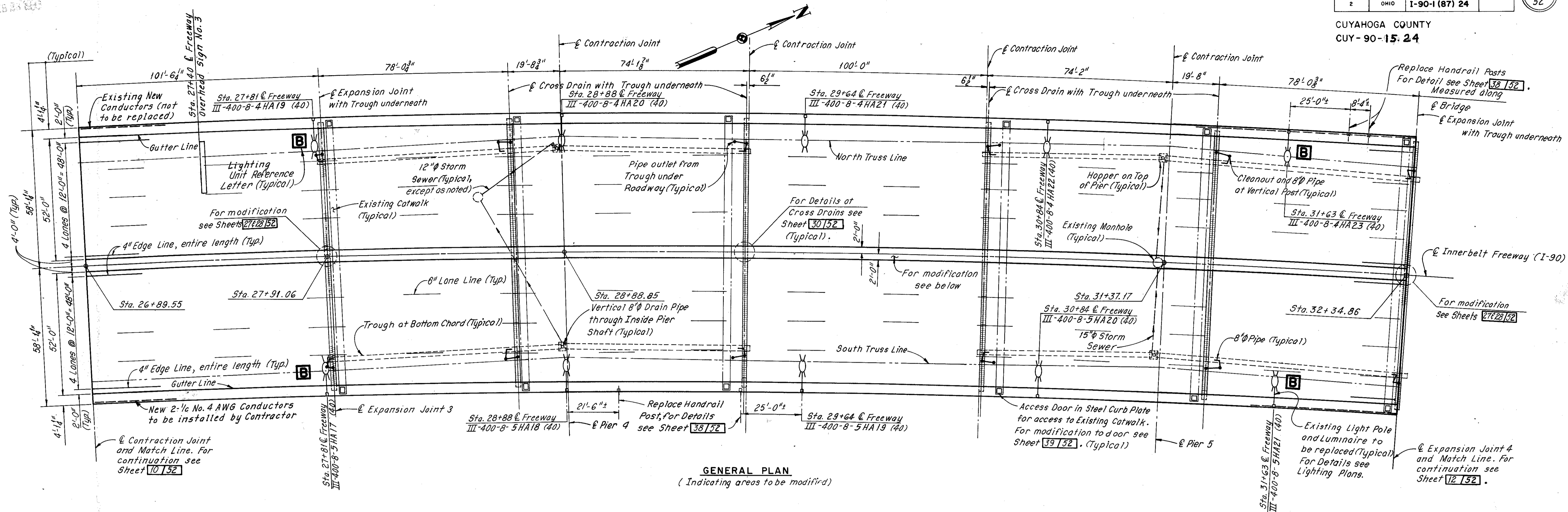
Light Pole at this location is missing  
 Measured Along & Bridge



Note: All reinforcing bar marks shall be prefixed SC.

Note: For Typical Section, Barrier Median Details and Notes see Sheet 9 | 52.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK	
<b>GENERAL PLAN CENTRAL VIADUCT</b>	
OHIO INTERSTATE SAFETY PLANS	
BR. NO. CUY-90-14 67	STA. 3+87.63
42R-17 43	STA. 54+65.78
42R-17 50	
42 -17 50	
CUYAHOGA COUNTY OHIO	
DRAWN SMS	TRACED RCK
CHECKED D.H.S.	REVIEWED C.P.B.
DATE 2-25-72	DATE 4-27-72
DATE 2-29-72	DATE 5-26-72
SHEET 10   52	



Note: All reinforcing bar marks shall be prefixed SC.

Note:  
For Typical Section, Barrier Median Details and Notes see Sheet 9/52.

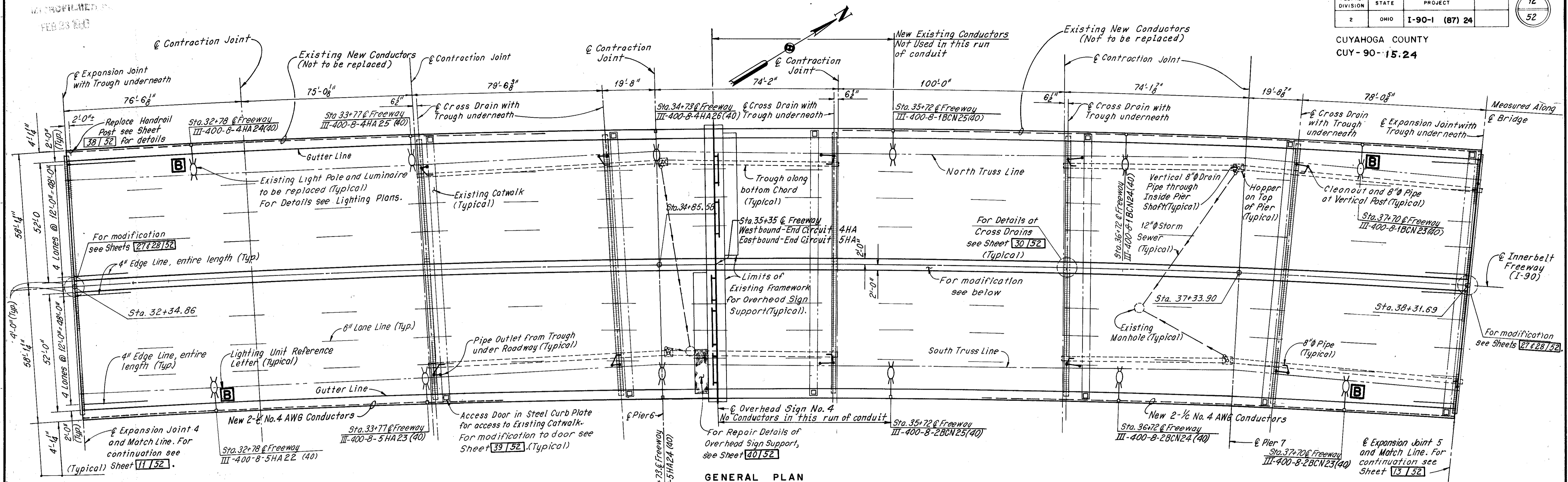
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK	
<b>GENERAL PLAN CENTRAL VIADUCT</b>	
OHIO INTERSTATE SAFETY PLANS	
BR. NO. CUY-90-14 67	STA. 3+87.63
42R-17 43	STA. 54+65.78
42R-17 50	
42-17 50	
CUYAHOGA COUNTY OHIO	
DRAWN SMS	TRACED RCK
DATE 3-14-72	DATE 3-21-72
CHECKED D.H.S.	REVIEWED C.A.B.
DATE 4-28-72	DATE 5-26-72
SHEET 11   52	

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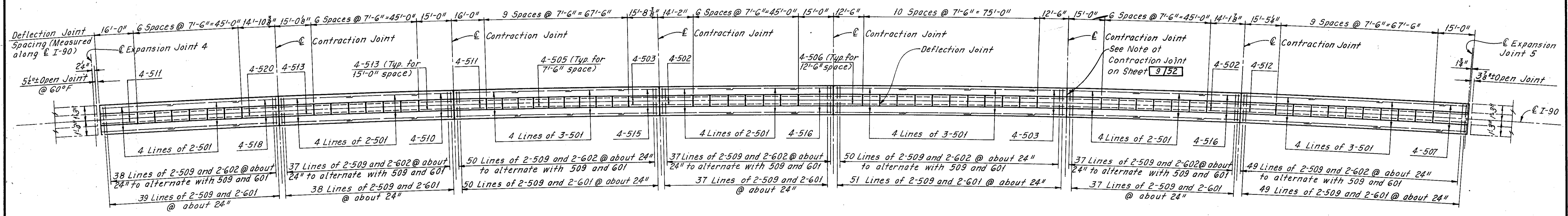
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

12  
52

CUYAHOGA COUNTY  
CUY-90-15.24



**GENERAL PLAN**  
(Indicating areas to be modified)



**CONCRETE BARRIER MEDIAN PLAN**

Note: All reinforcing bar marks shall be prefixed SC.

Note: For Typical Section, Barrier Median Details and Notes see Sheet 9152.

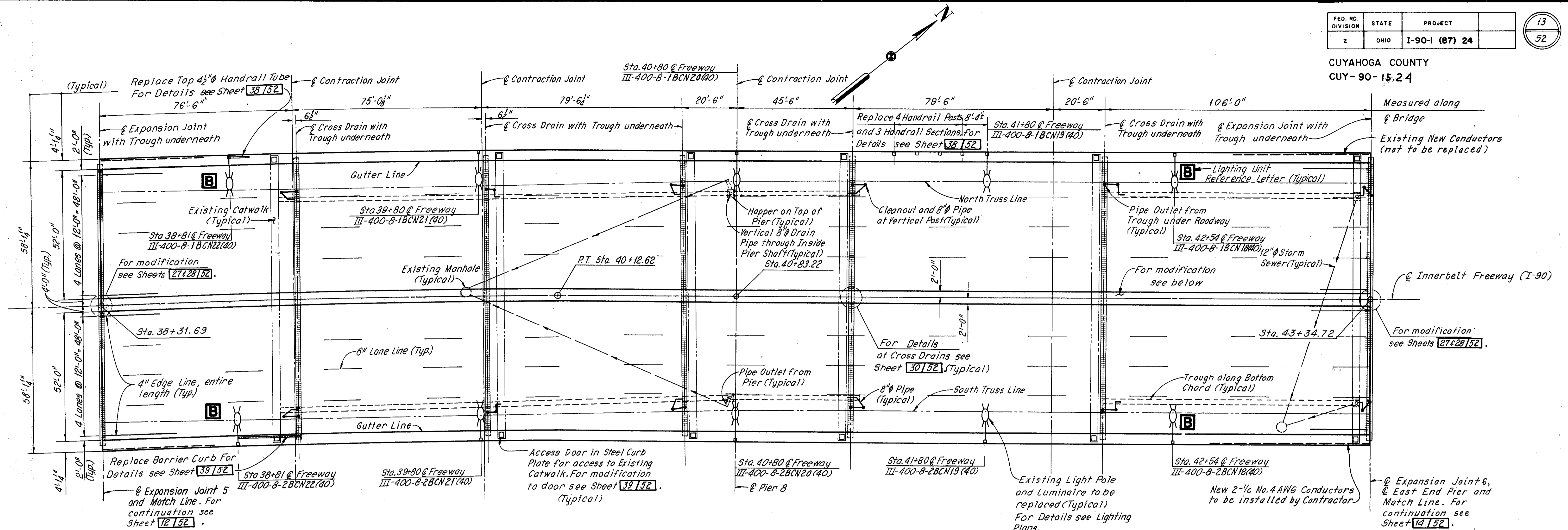
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>GENERAL PLAN CENTRAL VIADUCT</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	STA. 3+87.63	42R-17 43	STA. 54+65.78
42R-17 50	STA. 42-17 50	42-17 50	
CUYAHOGA COUNTY OHIO			
DRAWN SMS	TRACED RAK	CHECKED DHS	REVIEWED CAB
DATE 2-29-72	DATE 3-1-72	DATE 5-18-72	DATE 5-26-72
			SHEET 12 / 52

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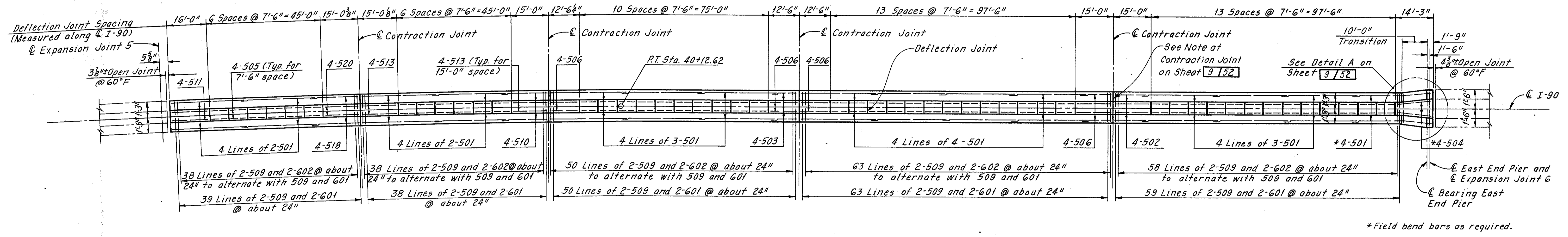
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

13  
52

CUYAHOGA COUNTY  
CUY-90-15.24



**GENERAL PLAN**  
(Indicating areas to be modified)

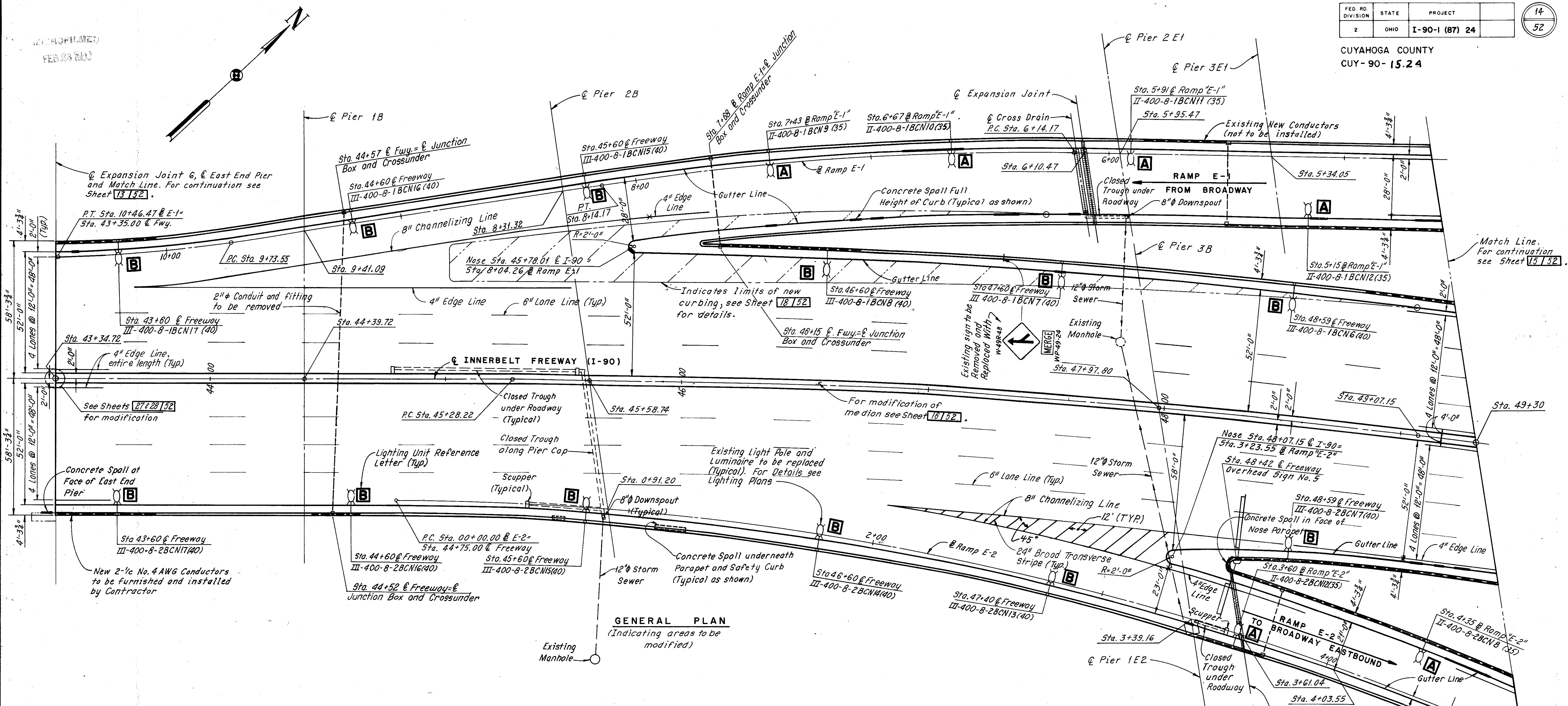


**CONCRETE BARRIER MEDIAN PLAN**

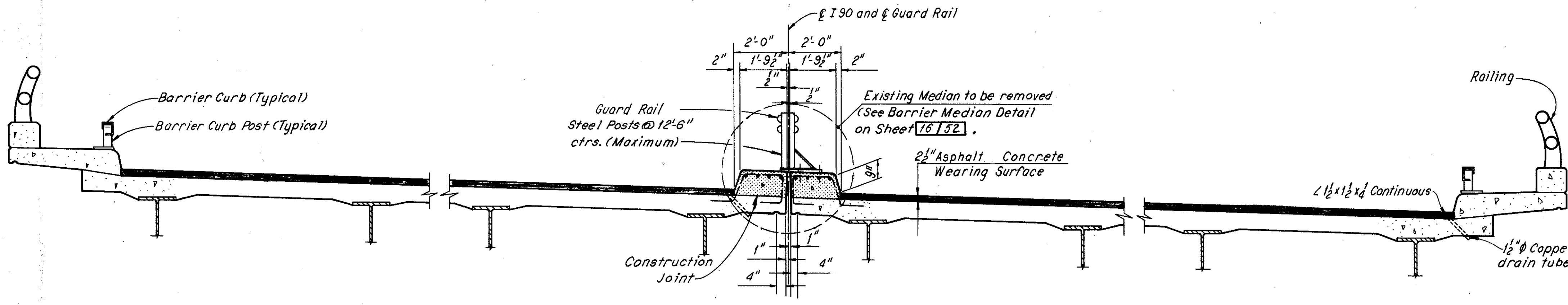
Note: All reinforcing bar marks shall be prefixed SC.

Note:  
For Typical Section, Barrier Median Details and Notes see Sheet 9/52.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK	
<b>GENERAL PLAN</b> <b>CENTRAL VIADUCT</b>	
OHIO INTERSTATE SAFETY PLANS	
BR. NO. CUY-90-14 67	STA. 3+87.63
42R-17 43	42R-17 50
42R-17 50	42R-17 50
42 -17 50	42 -17 50
CUYAHOGA COUNTY	OHIO
DATE 3-1-72	DATE 3-3-72
DATE 5-18-72	DATE 5-26-72
DATE 5-26-72	DATE 5-26-72
SHEET 13 / 52	



**Notes:**  
 The entire asphalt wearing surface on the East Approach Bridge shall be replaced. See Sheet 37/52 for details of new asphalt wearing surface course. For additional Notes see Sheet 7/52.



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CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**GENERAL PLAN & TYPICAL SECTION  
EAST APPROACH**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

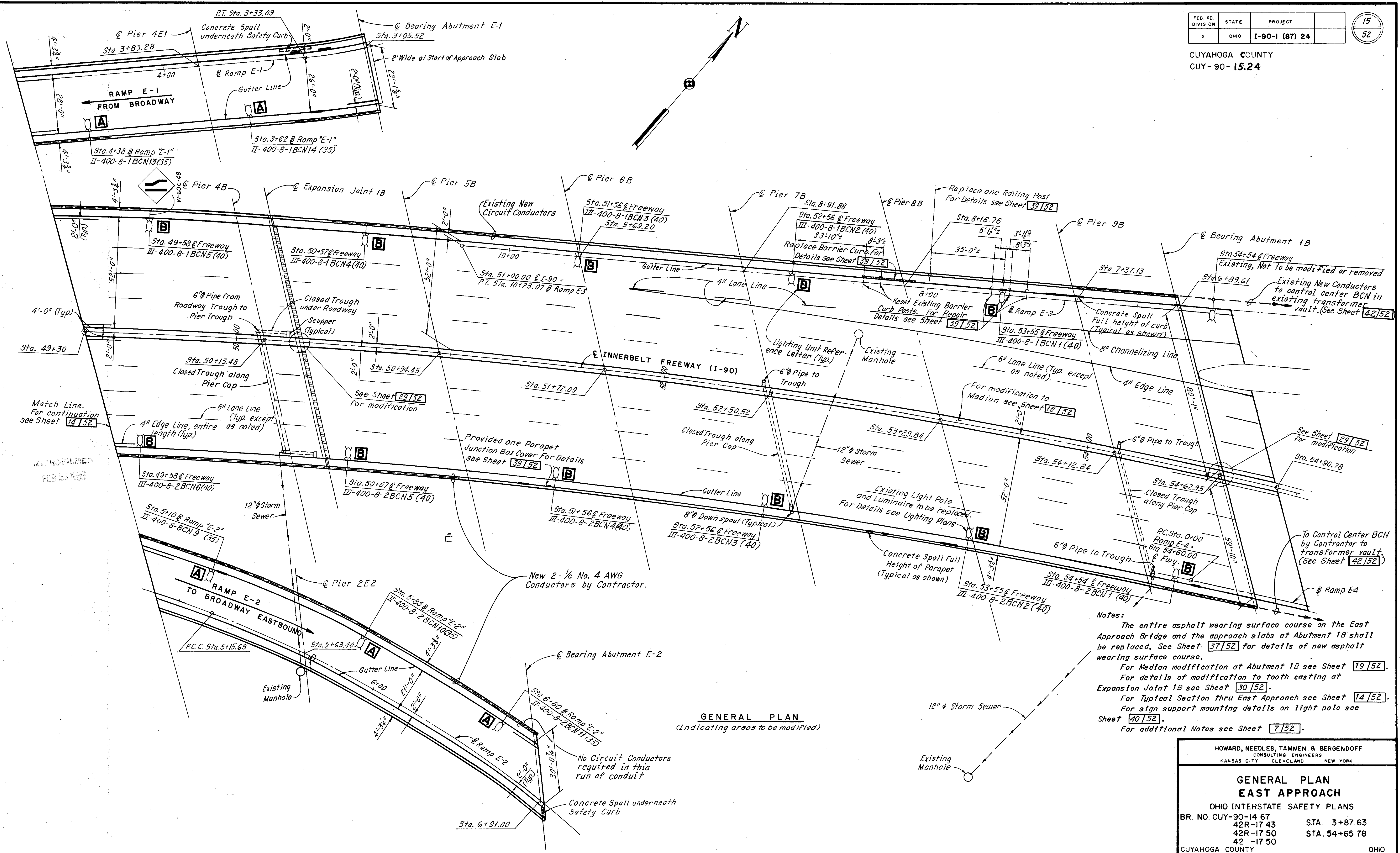
CUYAHOGA COUNTY OHIO

DRAWN S.M.S. TRACED C.P. CHECKED D.H.S. REVIEWED C.H.E. REVISIONS  
DATE 2-18-72 DATE 2-21-72 DATE 5-18-72 DATE 5-26-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-90-1 (87) 24	

15  
52

CUYAHOGA COUNTY  
CUI-90-15.24



**GENERAL PLAN**  
(Indicating areas to be modified)

- Notes:**
- The entire asphalt wearing surface course on the East Approach Bridge and the approach slabs at Abutment 1B shall be replaced. See Sheet 37/52 for details of new asphalt wearing surface course.
  - For Median modification at Abutment 1B see Sheet 19/52.
  - For details of modification to tooth casting at Expansion Joint 1B see Sheet 30/52.
  - For Typical Section thru East Approach see Sheet 14/52.
  - For sign support mounting details on light pole see Sheet 40/52.
  - For additional Notes see Sheet 7/52.

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CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**GENERAL PLAN  
EAST APPROACH**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 42R-17 50  
42R-17 50 STA. 54+65.78  
42 -17 50

CUYAHOGA COUNTY OHIO

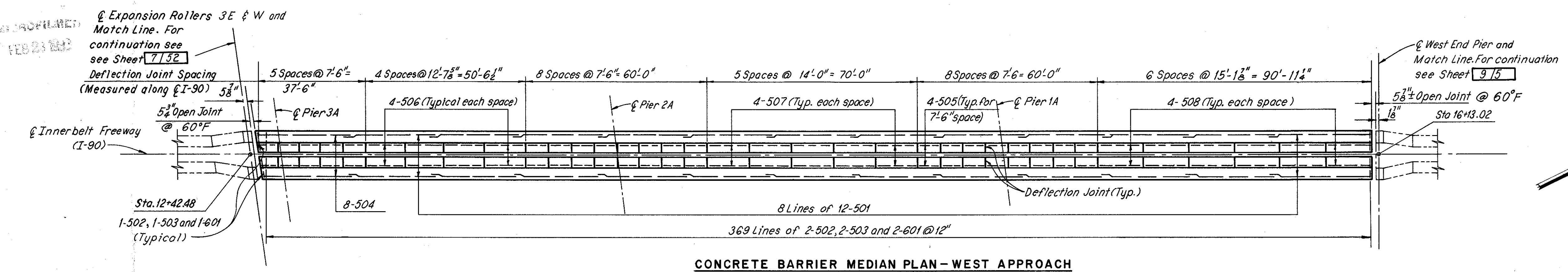
DRAWN M/S TRACED C.P. CHECKED DHS REVIEWED CAB REVISION  
DATE 2/21/72 DATE 2/22/72 DATE 5-18-72 DATE 5-26-72 SHEET 15 / 52



FED. NO.	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

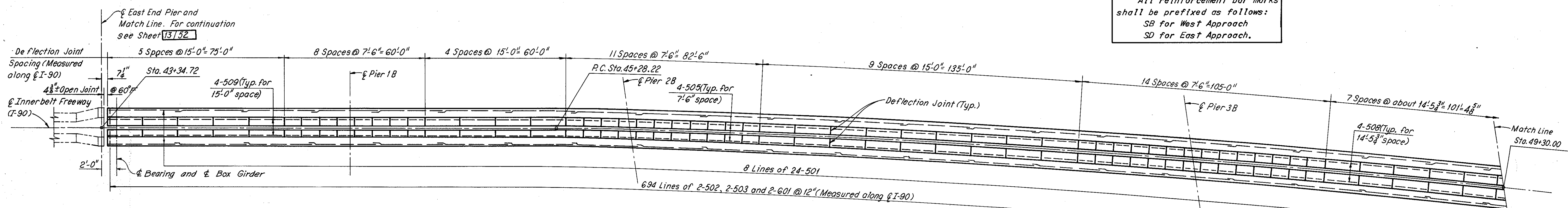
16  
52

CUYAHOGA COUNTY  
CUY-90-15.2.4

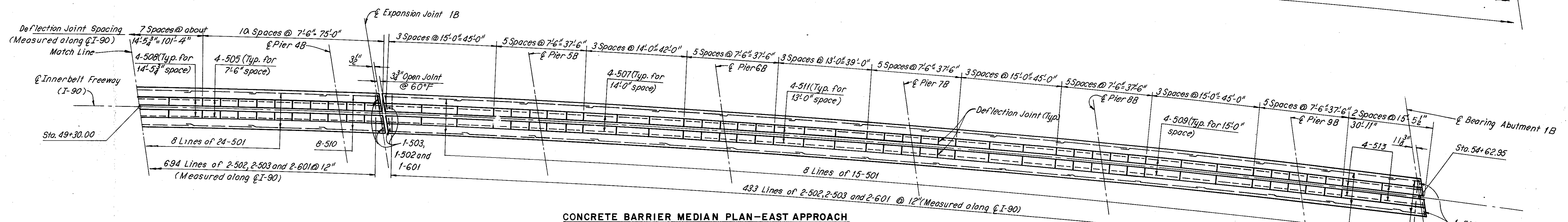


CONCRETE BARRIER MEDIAN PLAN - WEST APPROACH

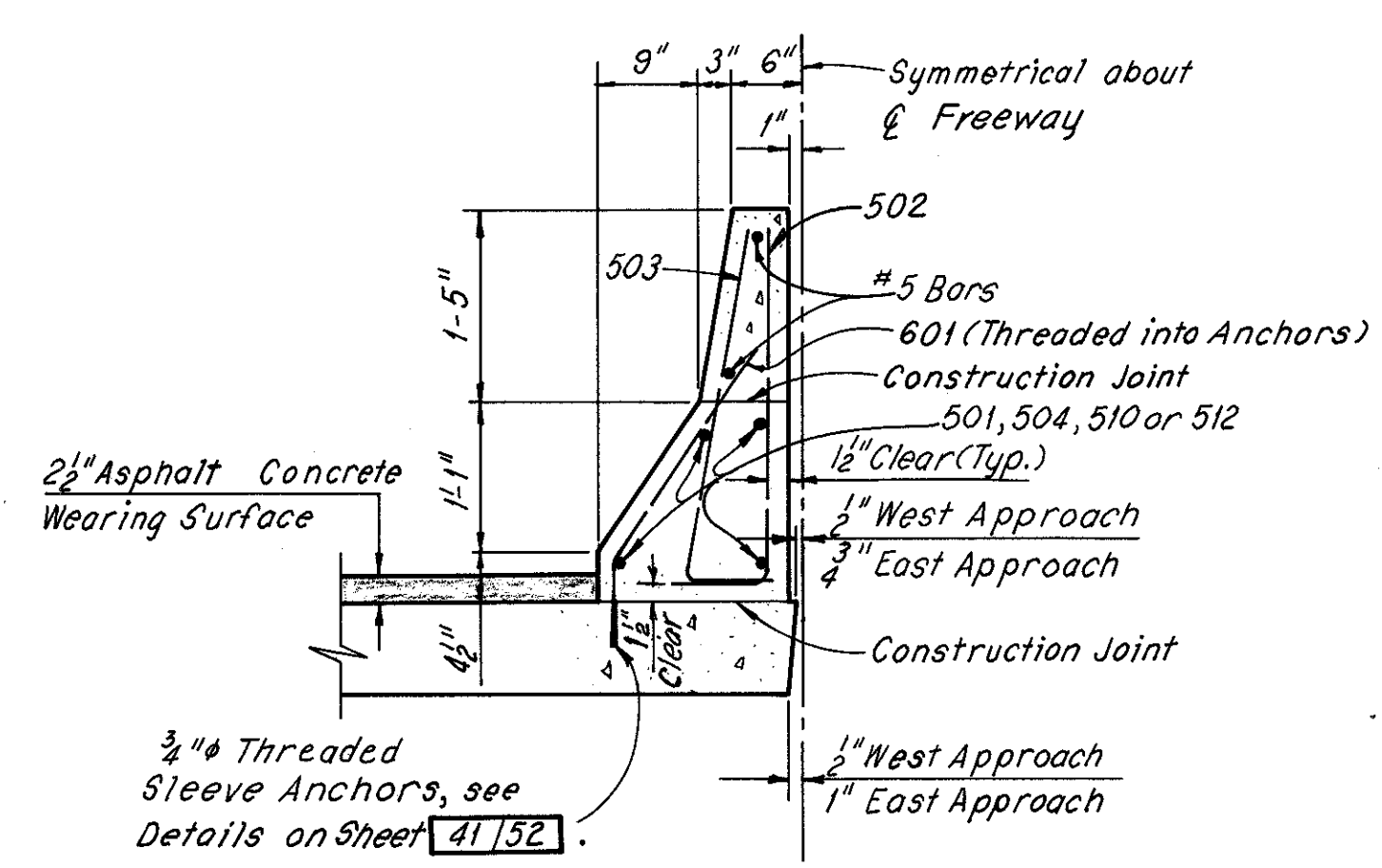
Note:  
All reinforcement bar marks shall be prefixed as follows:  
SB For West Approach  
SD For East Approach.



CONCRETE BARRIER MEDIAN PLAN - EAST APPROACH



CONCRETE BARRIER MEDIAN PLAN - EAST APPROACH



BARRIER MEDIAN DETAIL  
(Existing Slab Reinforcement not shown)

Note:  
For Notes see Sheet 7152

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KANSAS CITY CLEVELAND NEW YORK

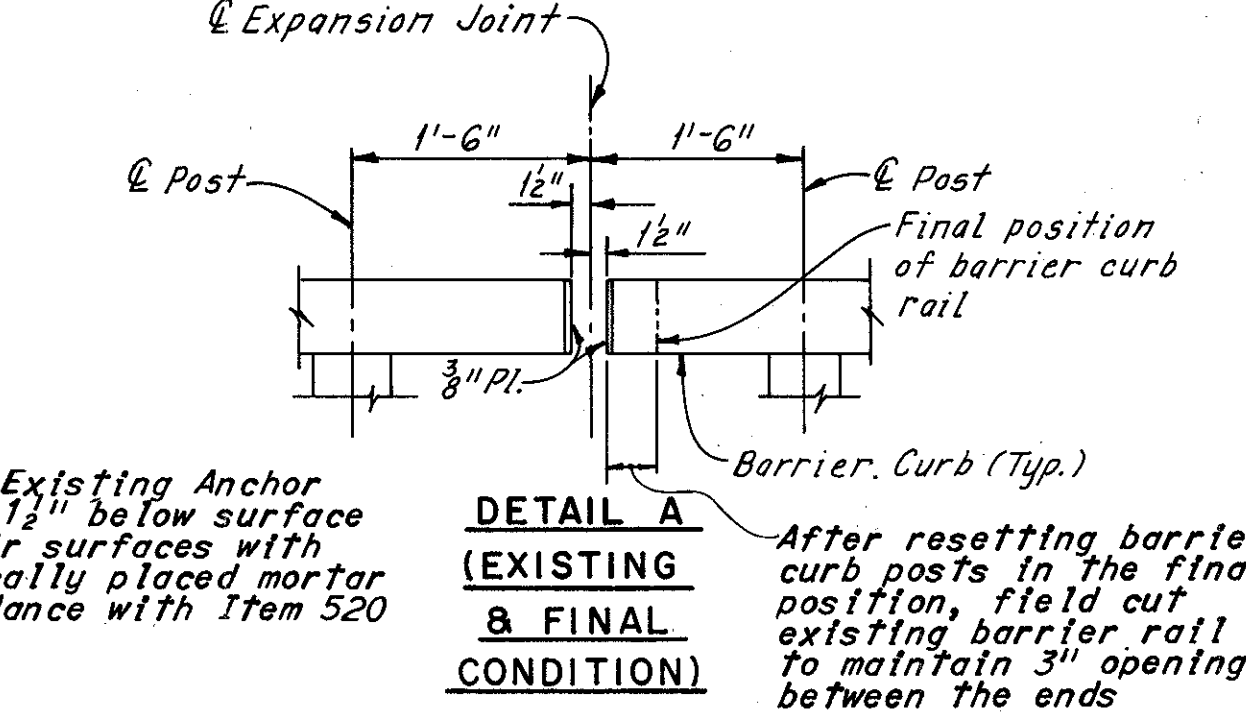
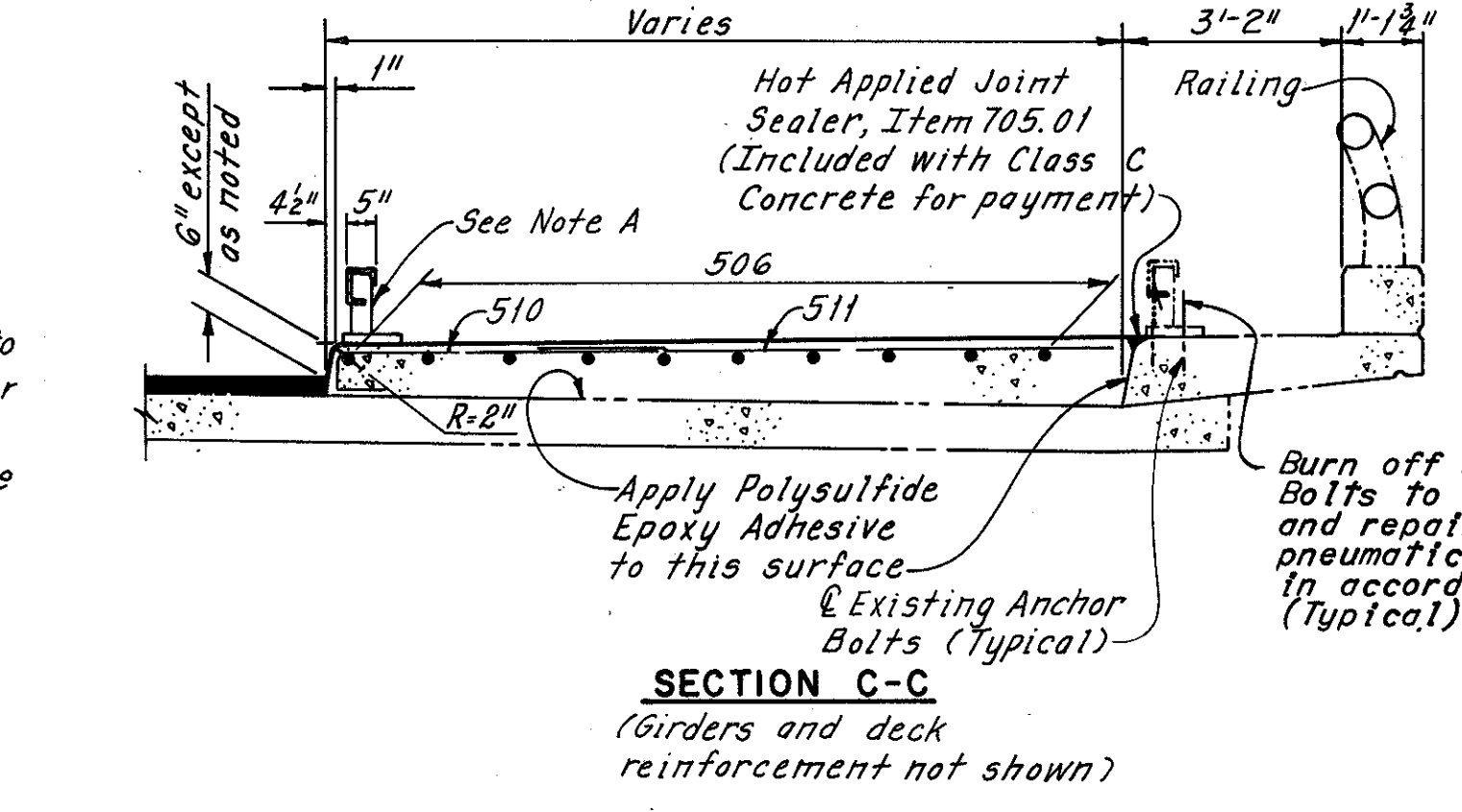
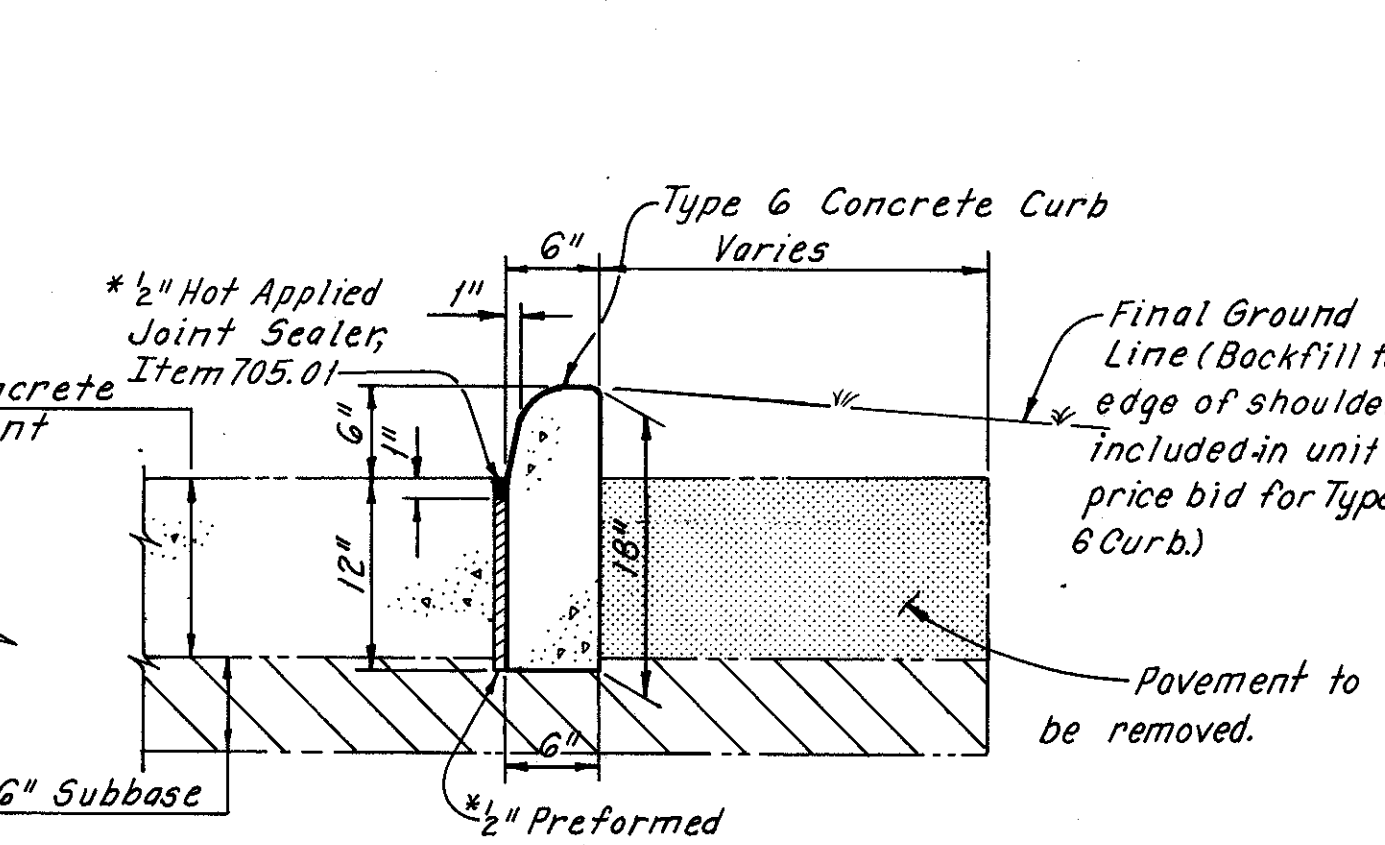
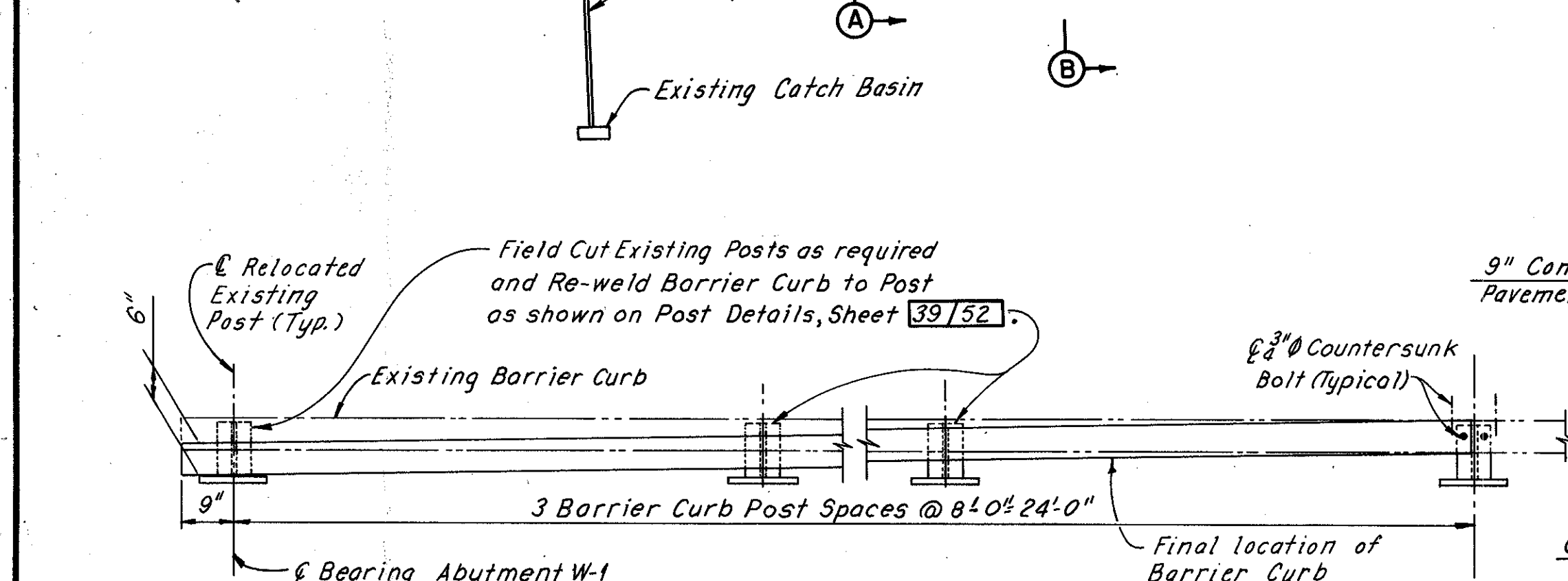
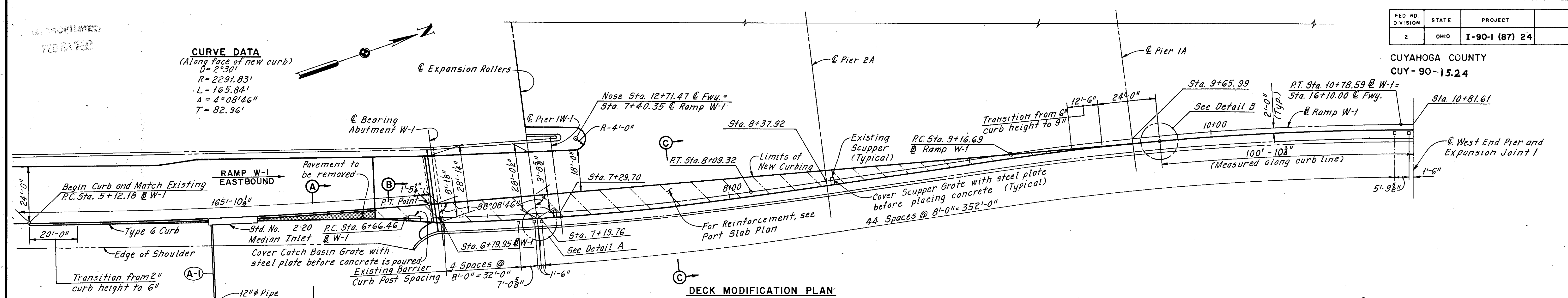
**WEST AND EAST APPROACHES  
CONCRETE BARRIER MEDIAN**  
OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

CUYAHOGA COUNTY OHIO

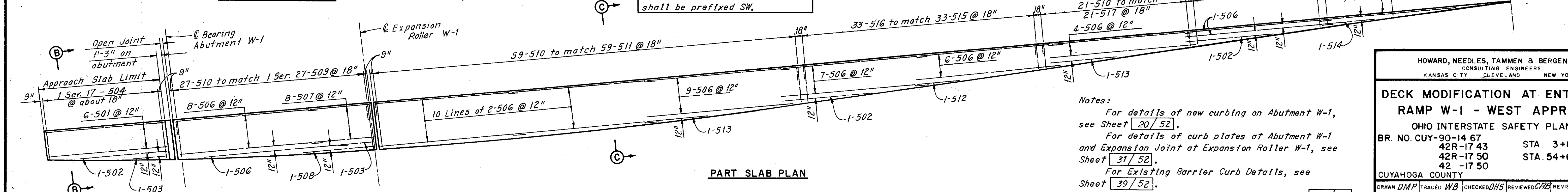
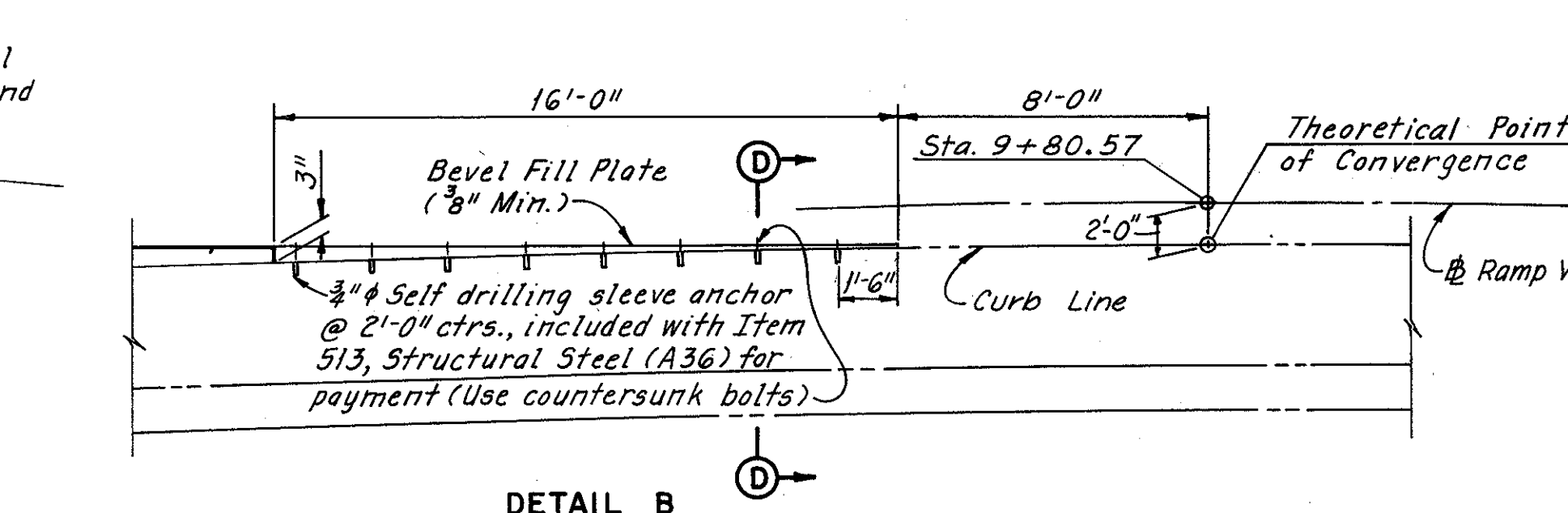
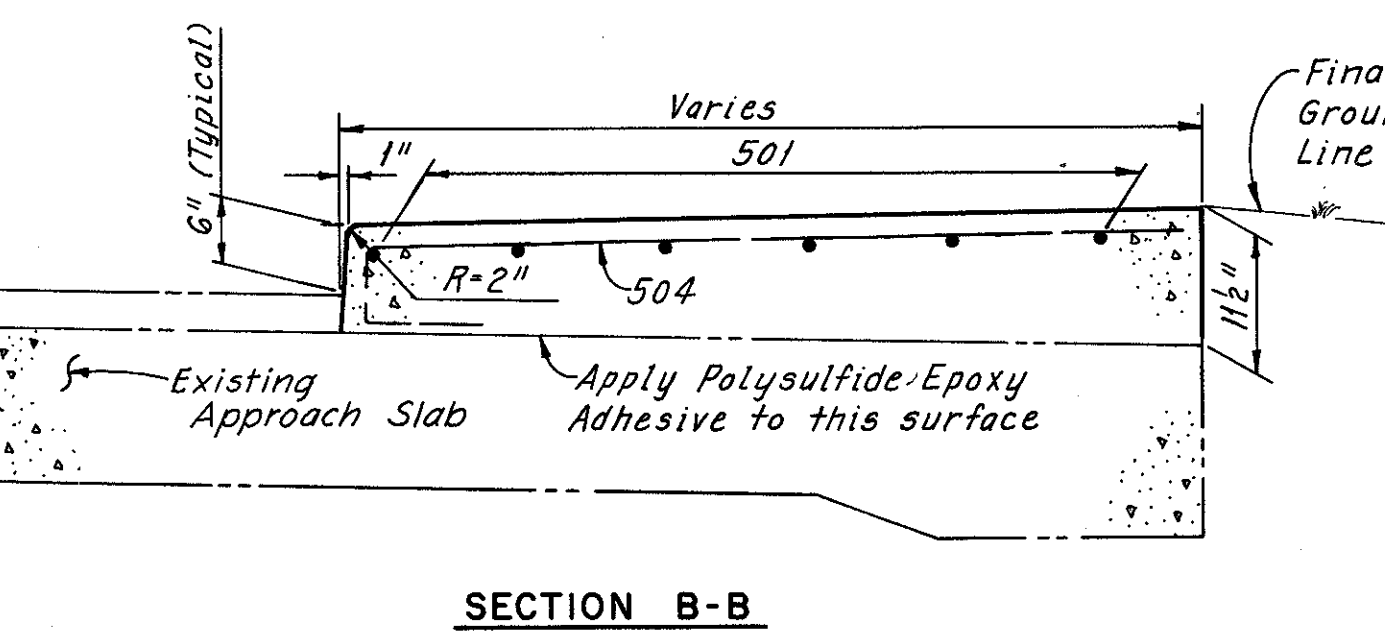
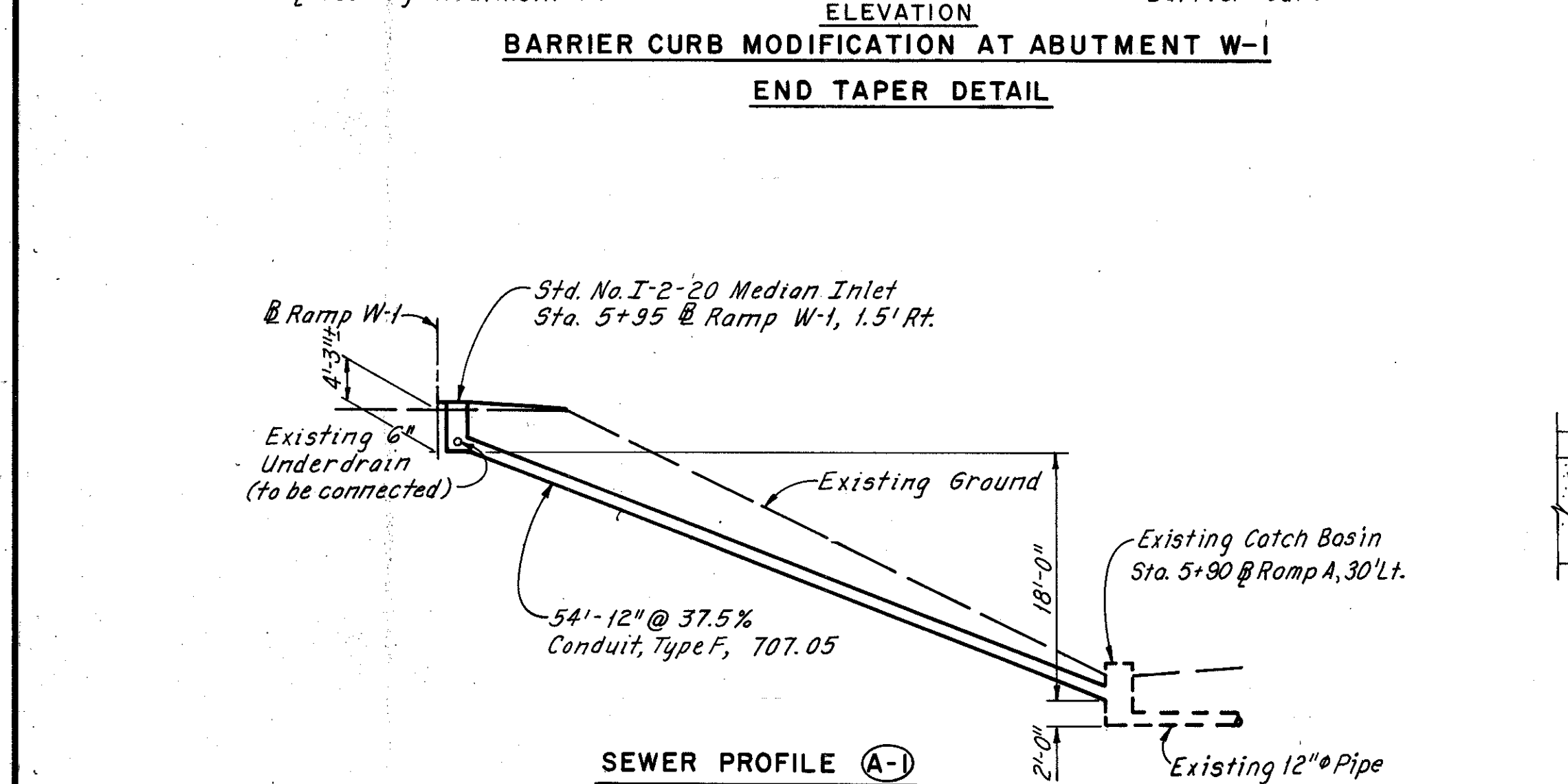
DRAWN S.M.S. TRACED R.C.K. CHECKED D.H.S. REVIEWED C.A.B. REVISED  
DATE 3-3-72 DATE 3-10-72 DATE 4-21-72 DATE 5-26-72 SHEET 16/52

**CURVE DATA**  
(Along face of new curb)  
D = 2°30'  
R = 2291.83'  
L = 165.84'  
Δ = 4°08'46"  
T = 82.96'



**Note A:** Barrier Curb Posts shall be reset along the new face of curb using existing post spacing. Attach post to concrete with 1/4" self drilling anchor bolts with a pullout resistance of not less than 18,000 lbs. If anchor bolts used are of such character as to result in an open annular space between the bolt and the concrete, such space shall be filled to prevent the entrance of water. The filler shall be subject to approval of the Engineer. For adjustment of Barrier Curb at Expansion Joint, see Detail A. For modification to Barrier Curb at Abutment W-1, see End Taper Detail. Payment for resetting of the existing barrier curb, including the cost of the concrete anchor bolts, shall be included in the unit price bid for Item Special, Steel Barrier Curb, as per plan.

\*Included with Item 609, Curb, Type 6 for payment.



Note: All reinforcing bar marks shall be prefixed SW.

**Notes:**  
For details of new curbing on Abutment W-1, see Sheet 20/52.  
For details of curb plates at Abutment W-1 and Expansion Joint at Expansion Roller W-1, see Sheet 31/52.  
For Existing Barrier Curb Details, see Sheet 39/52.  
For Reinforcement Schedule, see Sheet 41/52.

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**DECK MODIFICATION AT ENTRANCE  
RAMP W-1 - WEST APPROACH**  
OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

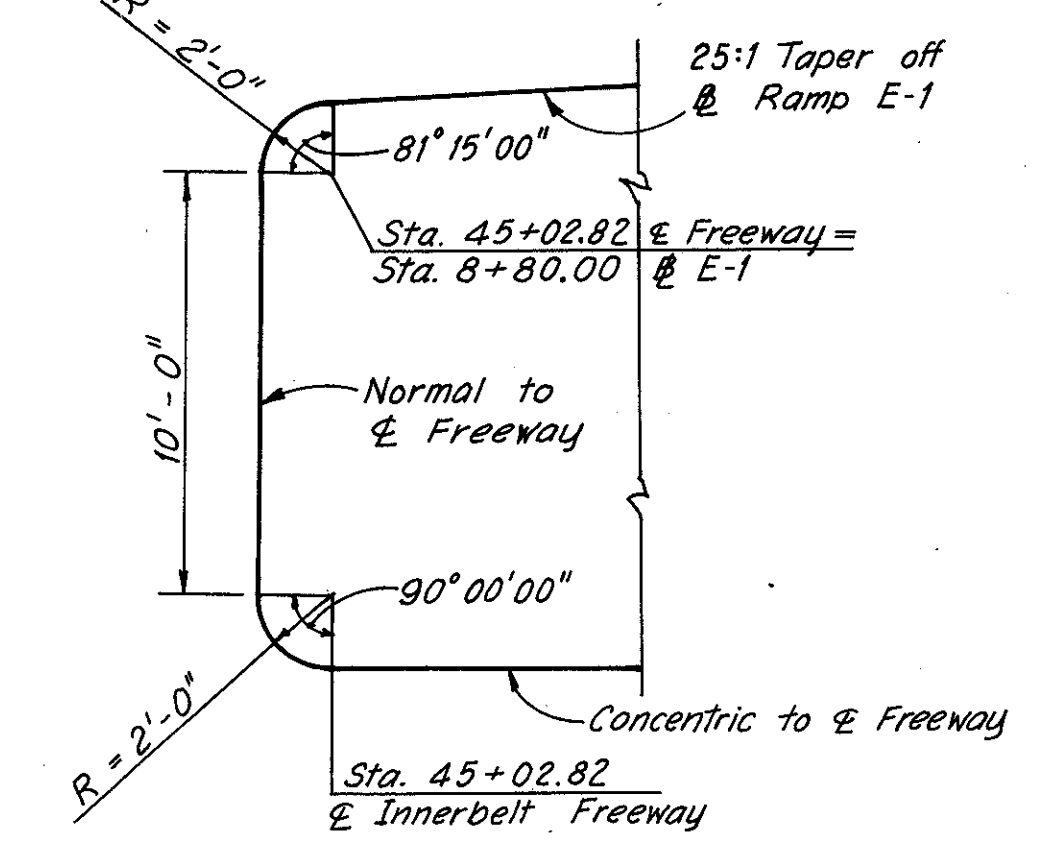
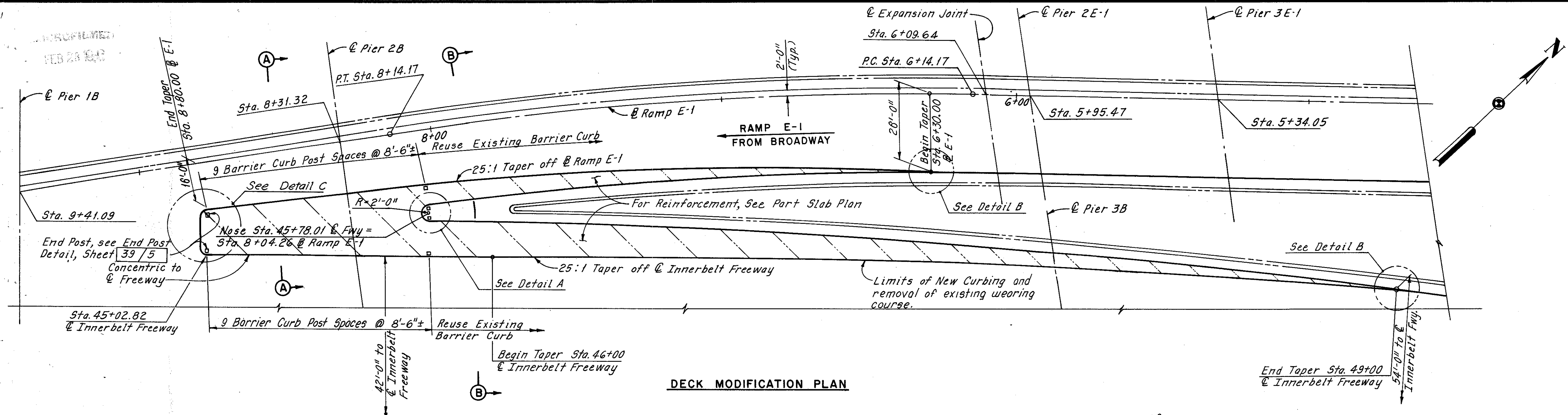
CUYAHOGA COUNTY OHIO

DRAWN DMP TRACED WB CHECKED DHS REVIEWED CAB REVISED  
DATE 3-27-72 DATE 3-29-72 DATE 4-14-72 DATE 5-26-72 SHEET 17/52

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

18  
52

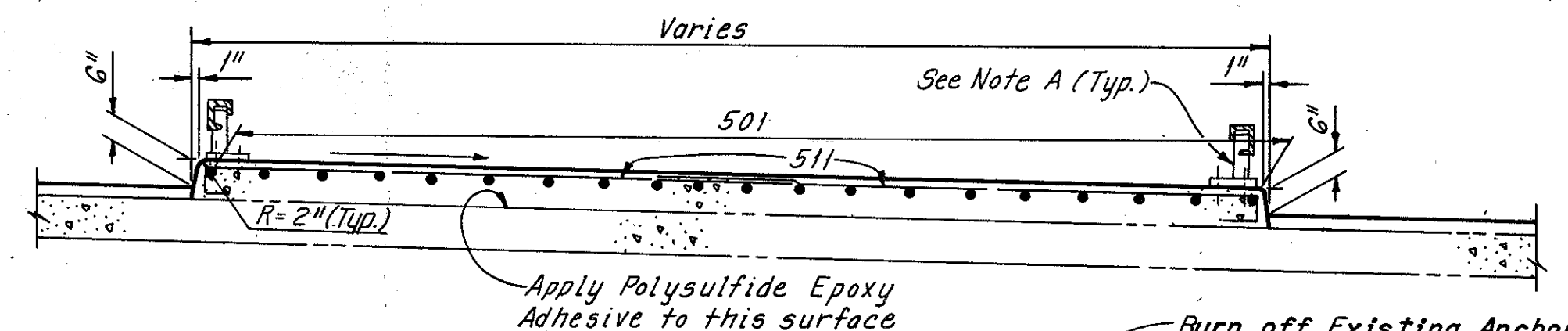
CUYAHOGA COUNTY  
CUY-90-15.24



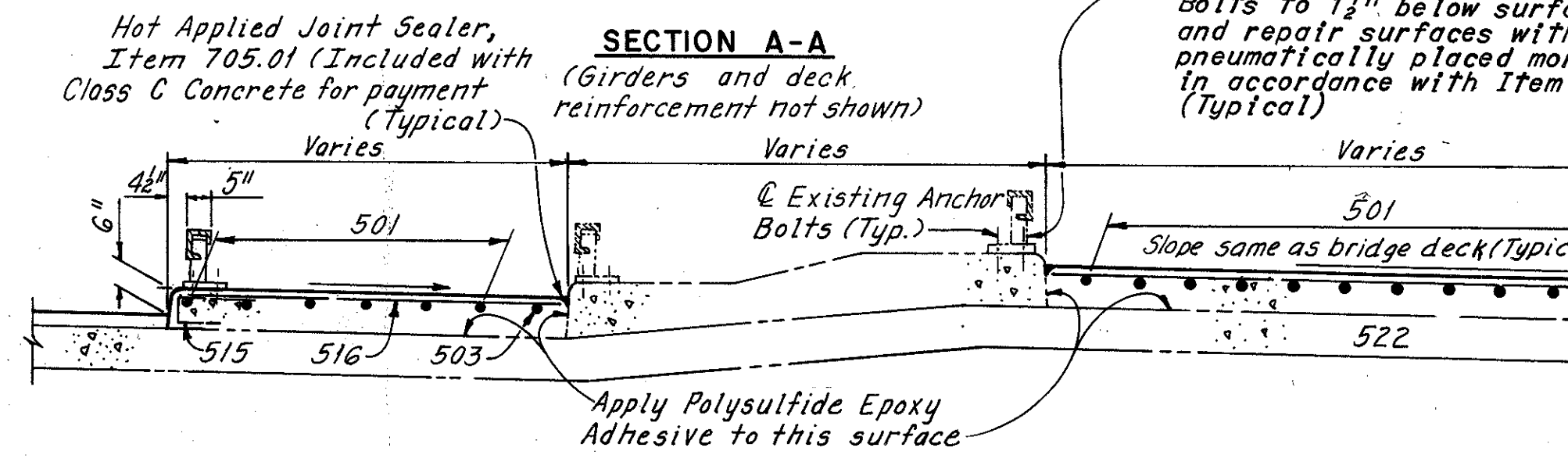
DETAIL C  
(Barrier Curb Posts not shown)

**DECK MODIFICATION PLAN**

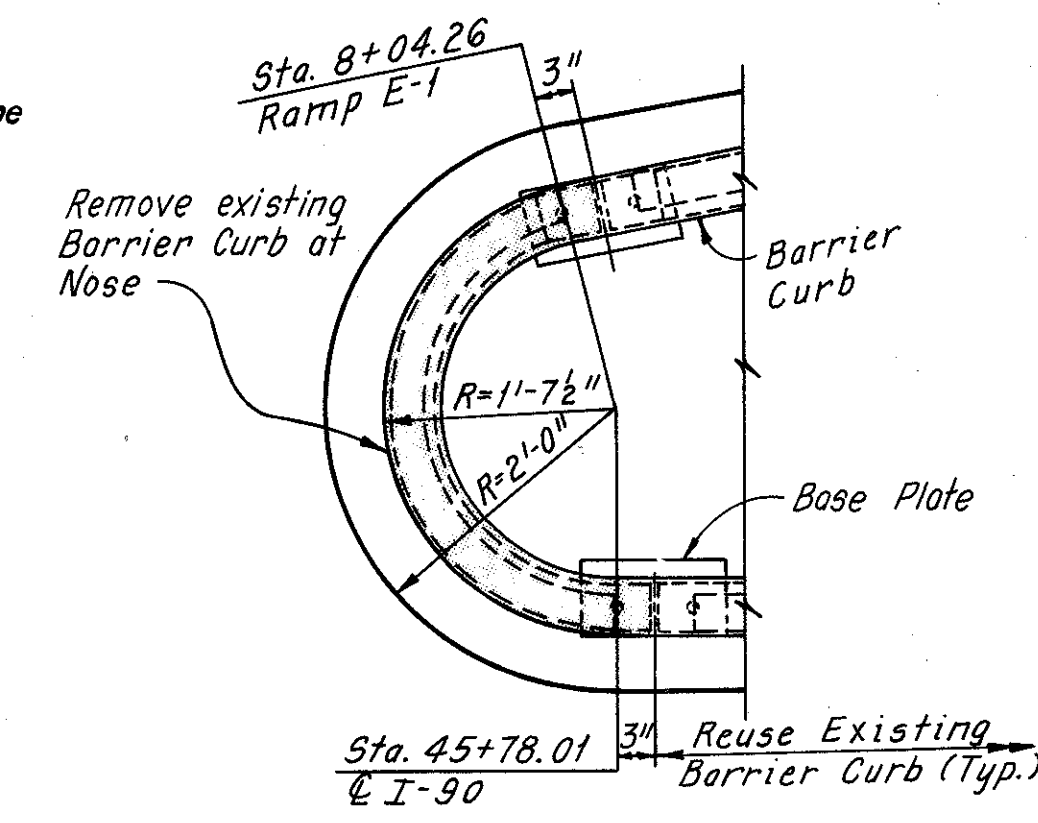
**Note A:** Details of the new barrier curb shall be the same as the existing. For details of the existing barrier curb see Sheet 39/52.  
Attach post to concrete with 3/4" self drilling concrete anchor bolts with a pullout resistance of not less than 18,000 lbs. If anchor bolts used are of such character as to result in an open annular space between the bolt and the concrete, such space shall be filled to prevent the entrance of water. The filler shall be subject to the approval of the Engineer.  
Payment for the new Barrier Curb shall be at the unit price per linear foot for Item Special, Steel Barrier Curb, as per Plan.



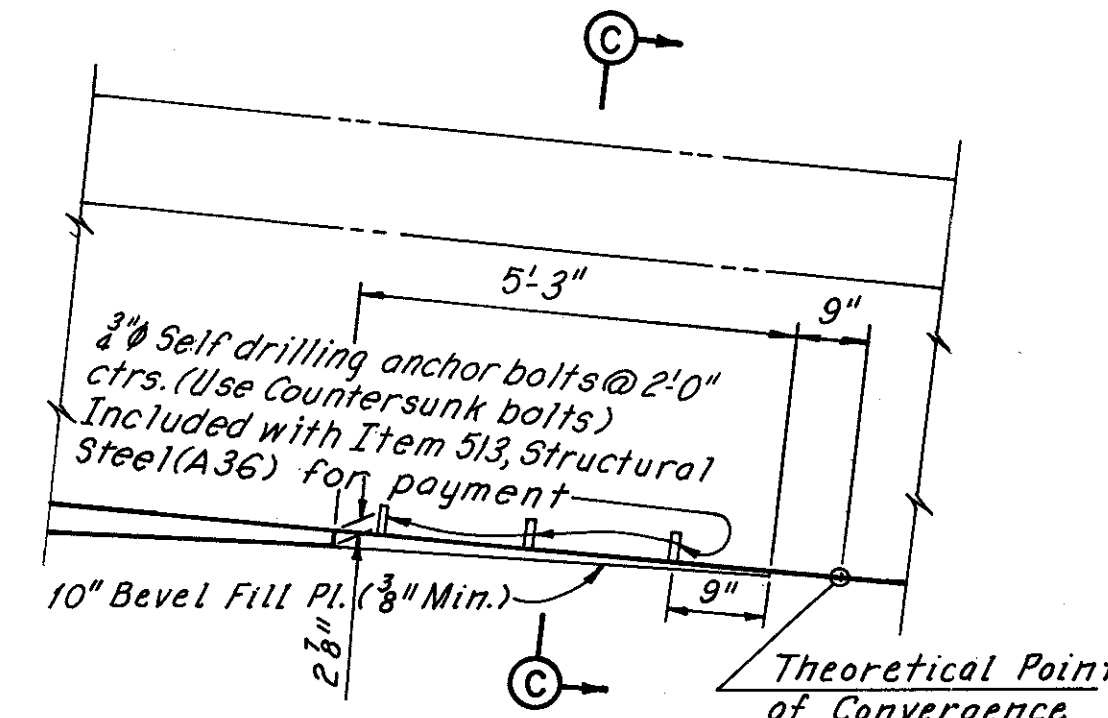
**SECTION A-A**  
(Girders and deck reinforcement not shown)



**SECTION B-B**  
(Girders and deck reinforcement not shown)

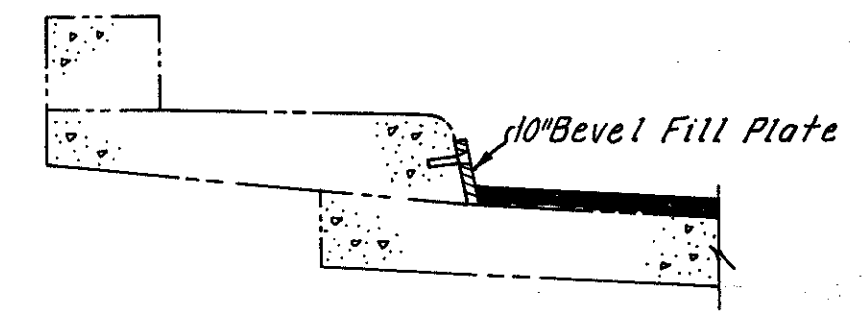


**DETAIL A**

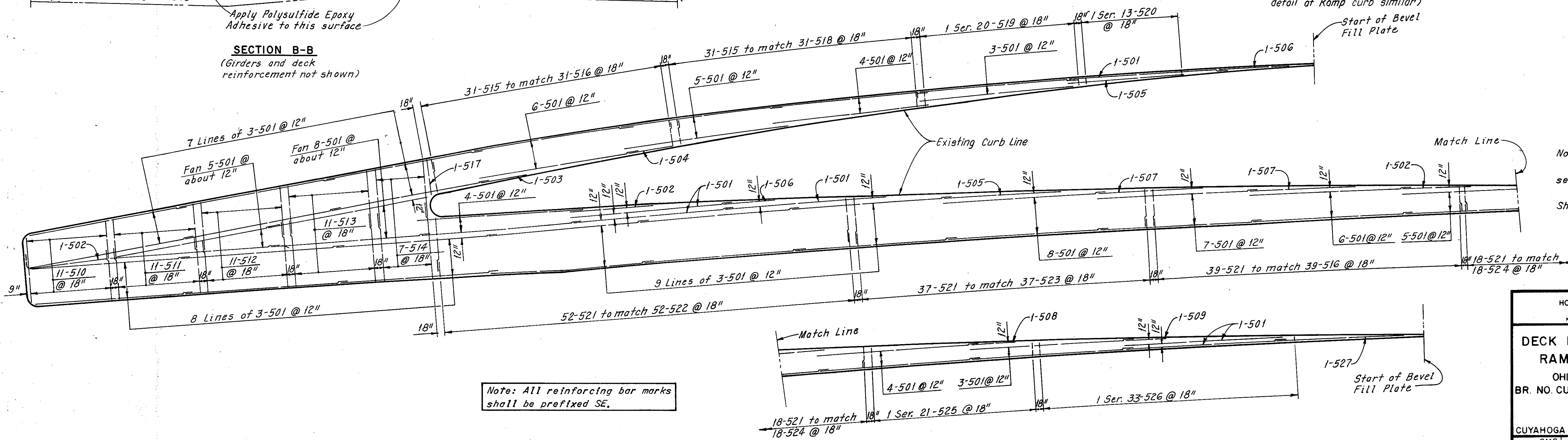


**DETAIL B**

(Shown for curb off @ Innerbelt Fwy, detail of Ramp curb similar)



**SECTION C-C**  
(Railing, Curb Barrier, and Girders not shown)



Note: All reinforcing bar marks shall be prefixed SE.

**PART SLAB PLAN**

**Notes:**  
For Existing Barrier curb Details see Sheet 39/52.  
For Reinforcement Schedule see Sheet 41/52.

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CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**DECK MODIFICATION AT ENTRANCE  
RAMP E-1 - EAST APPROACH**

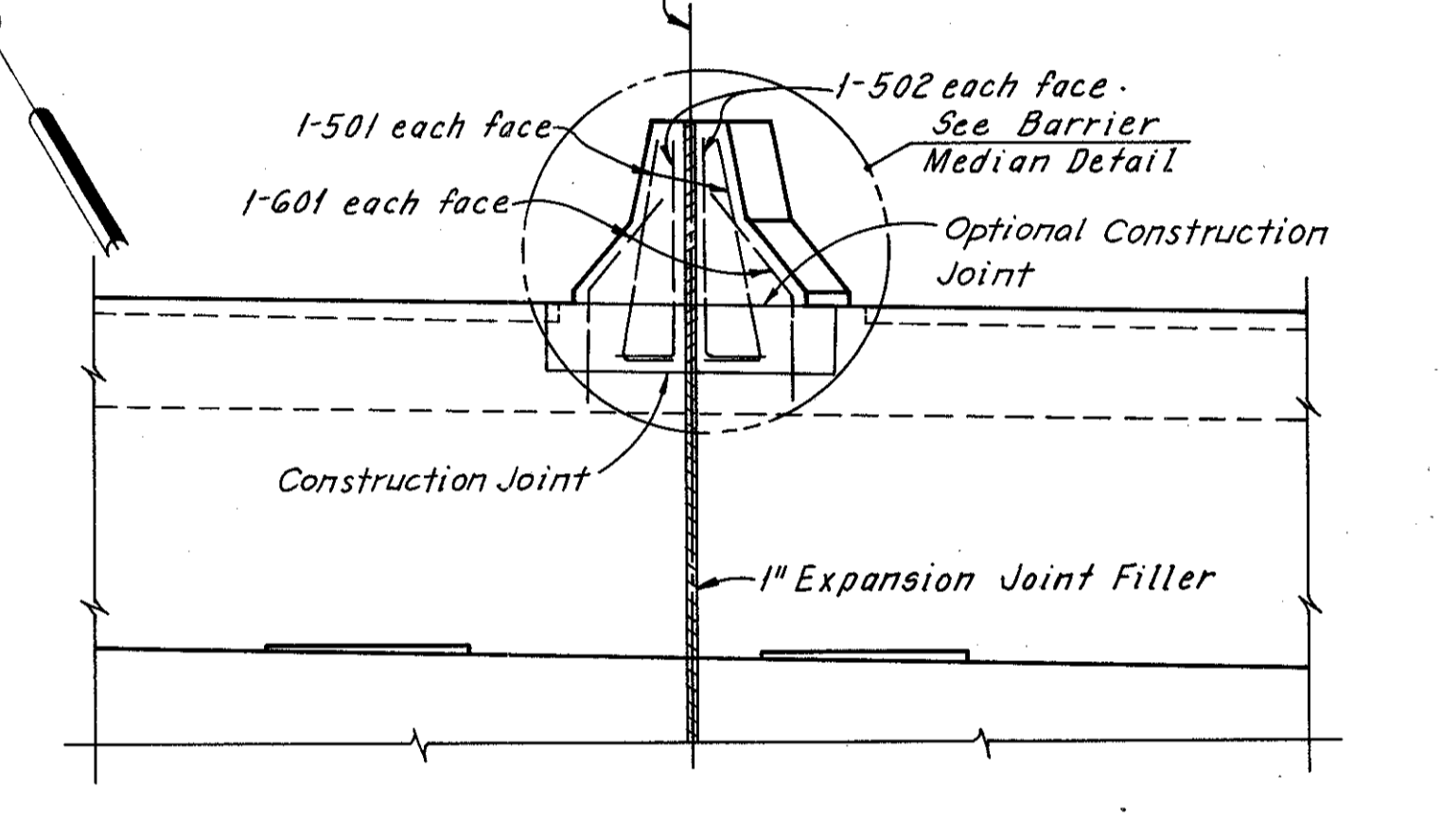
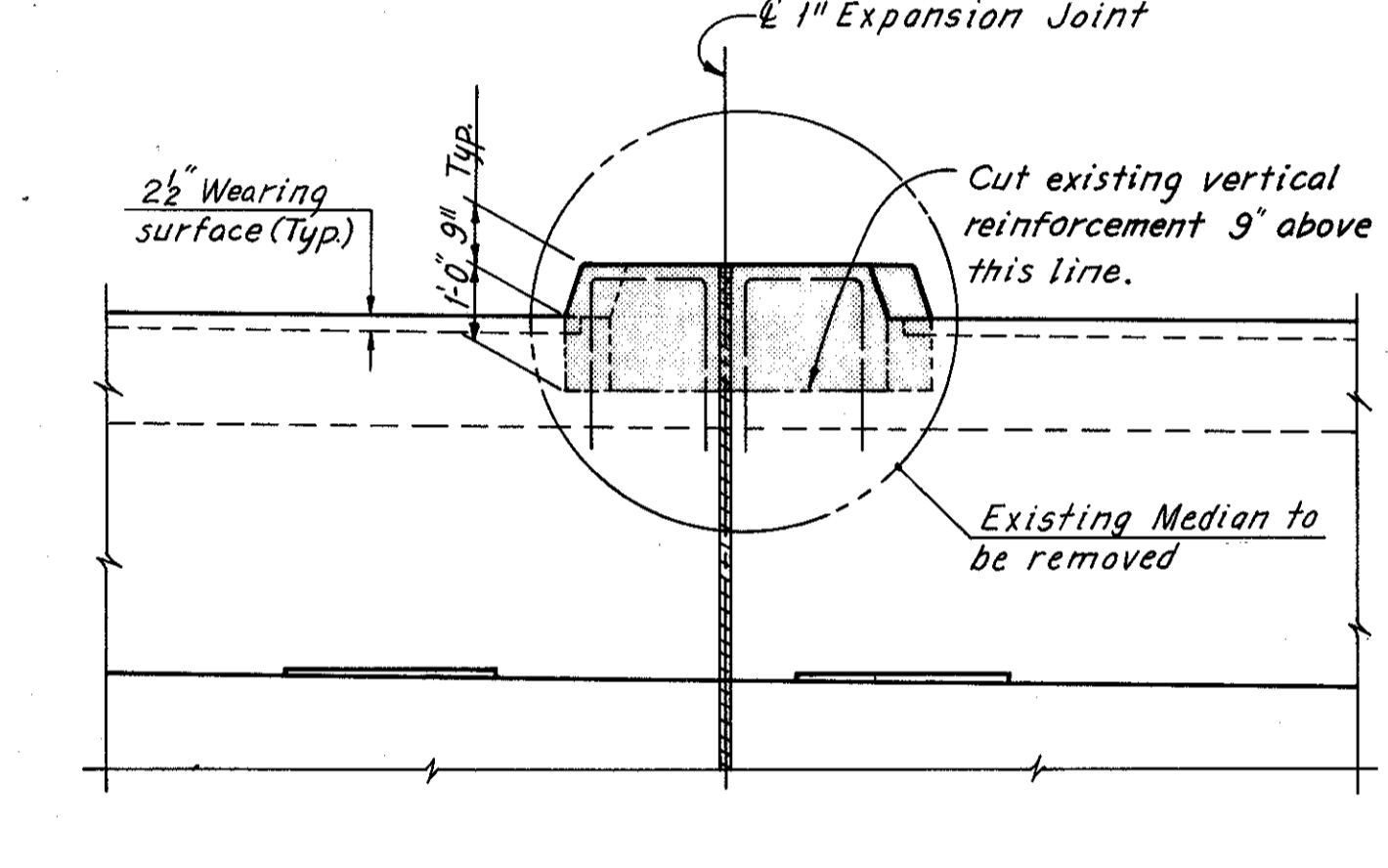
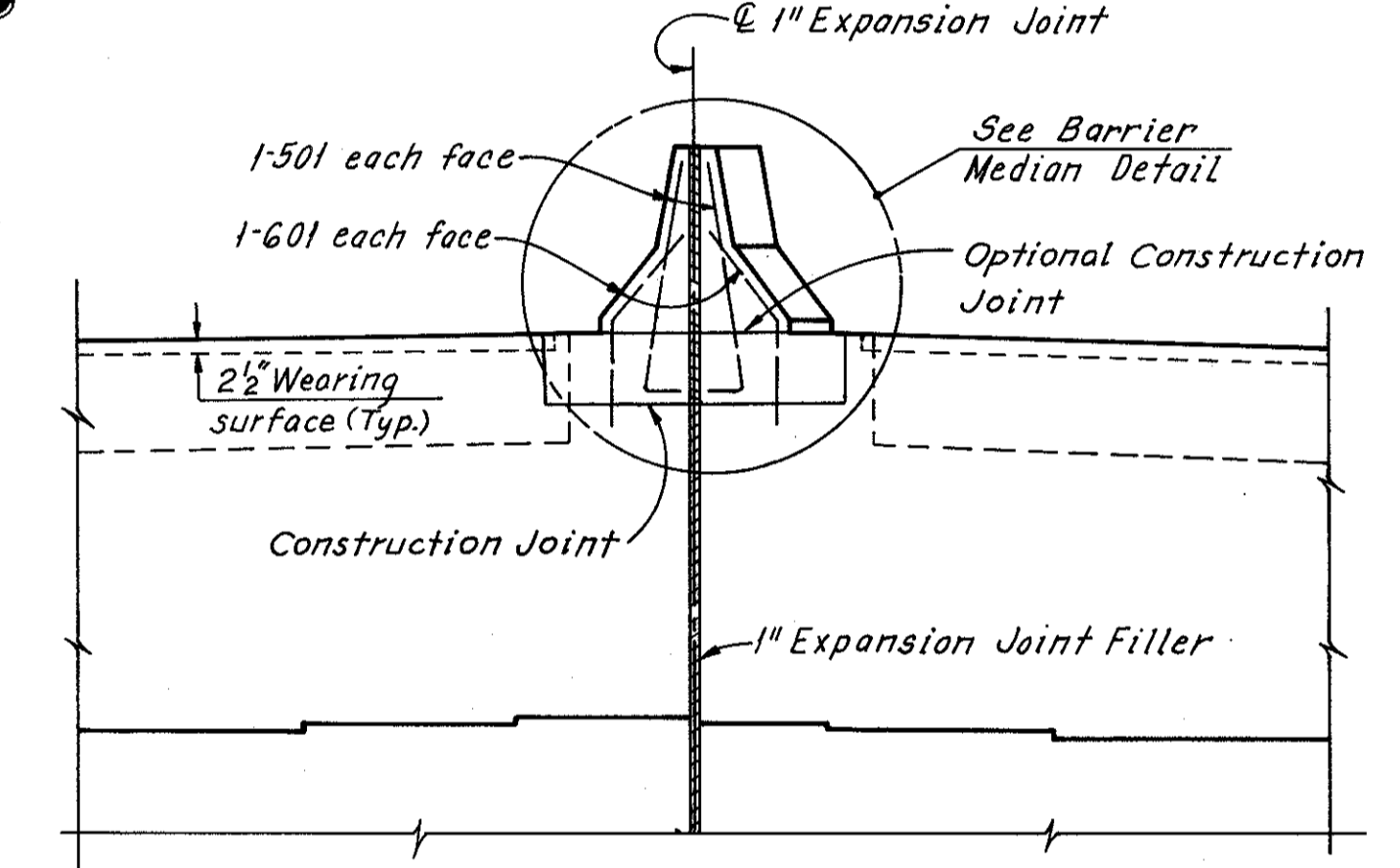
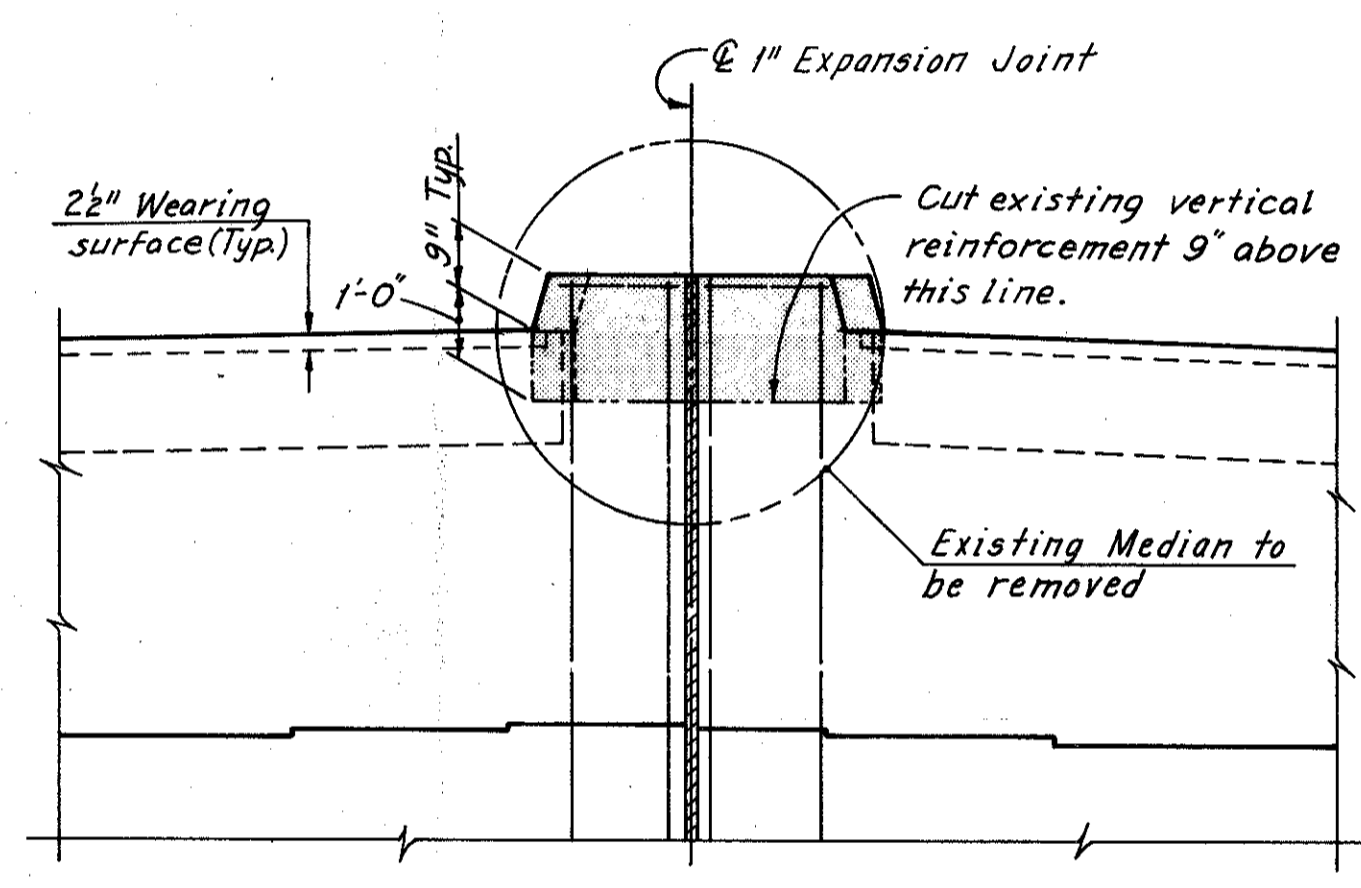
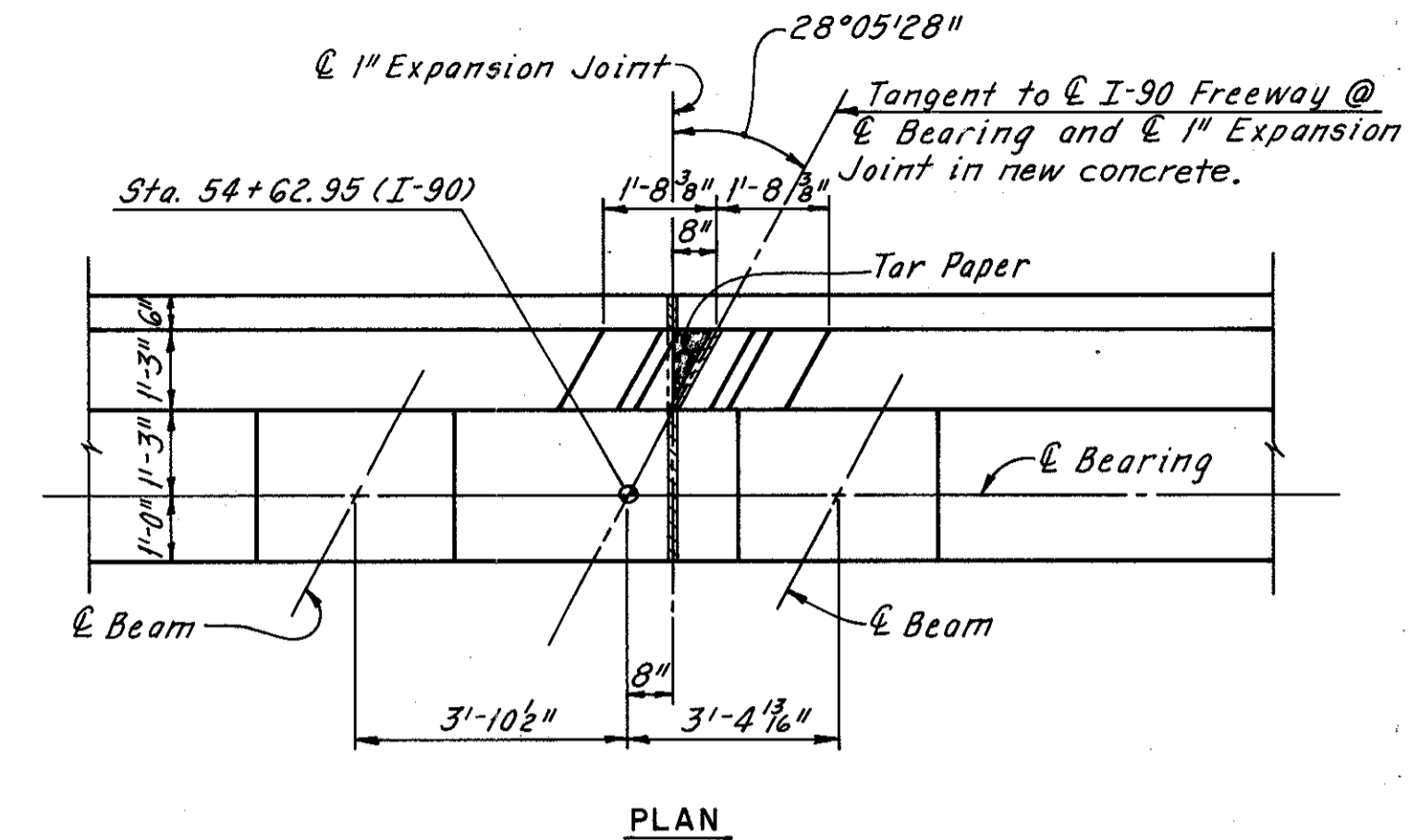
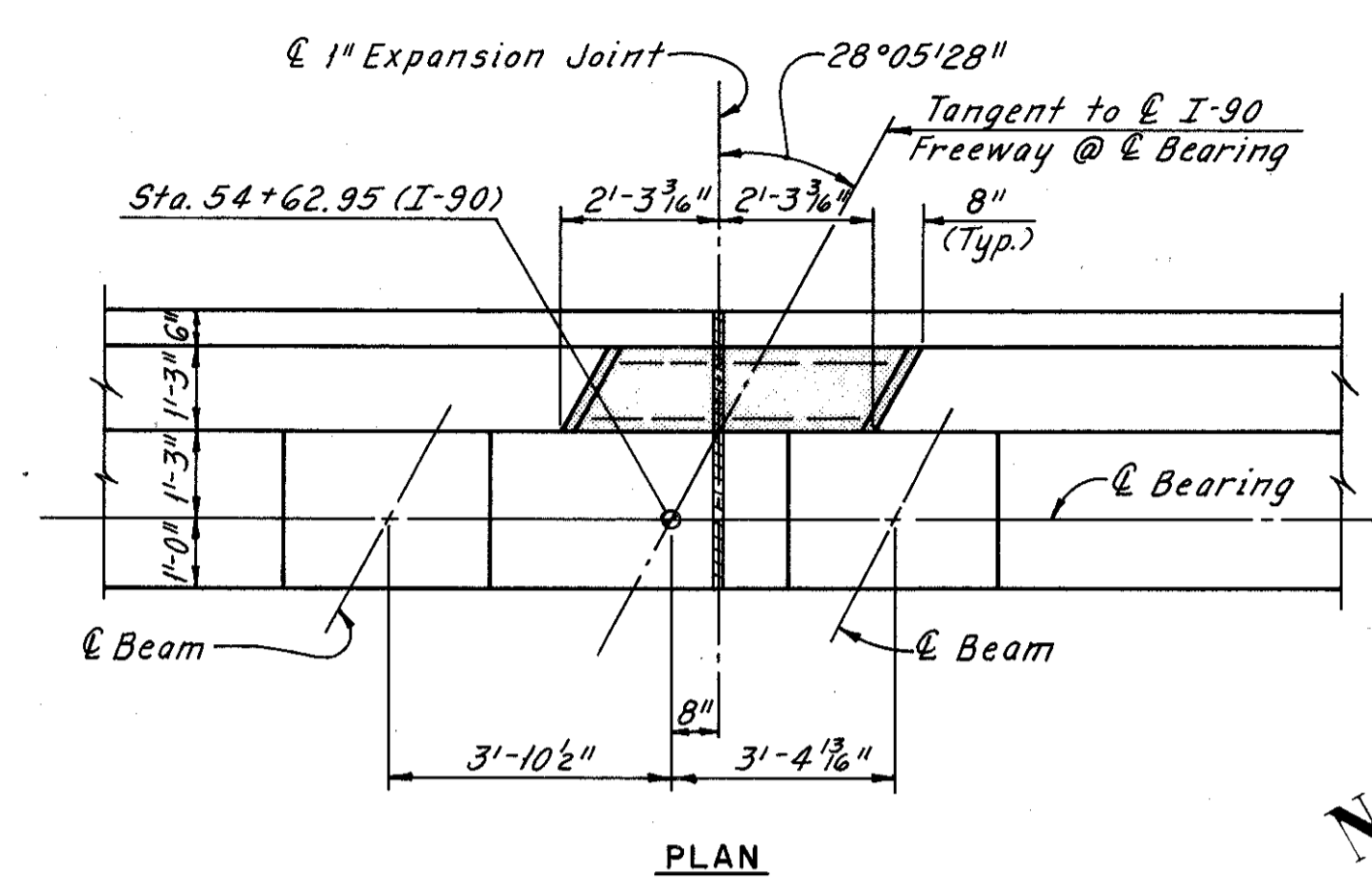
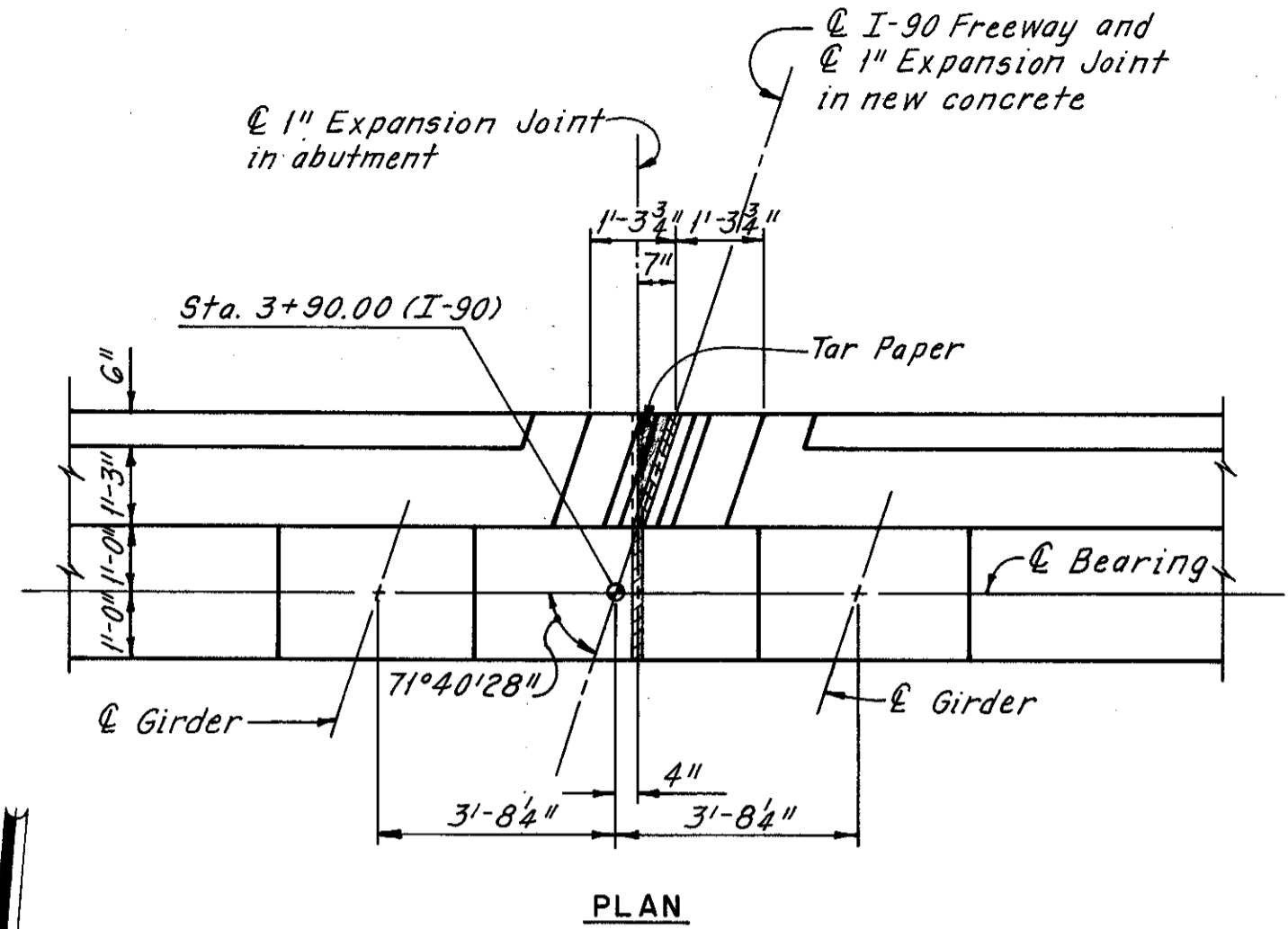
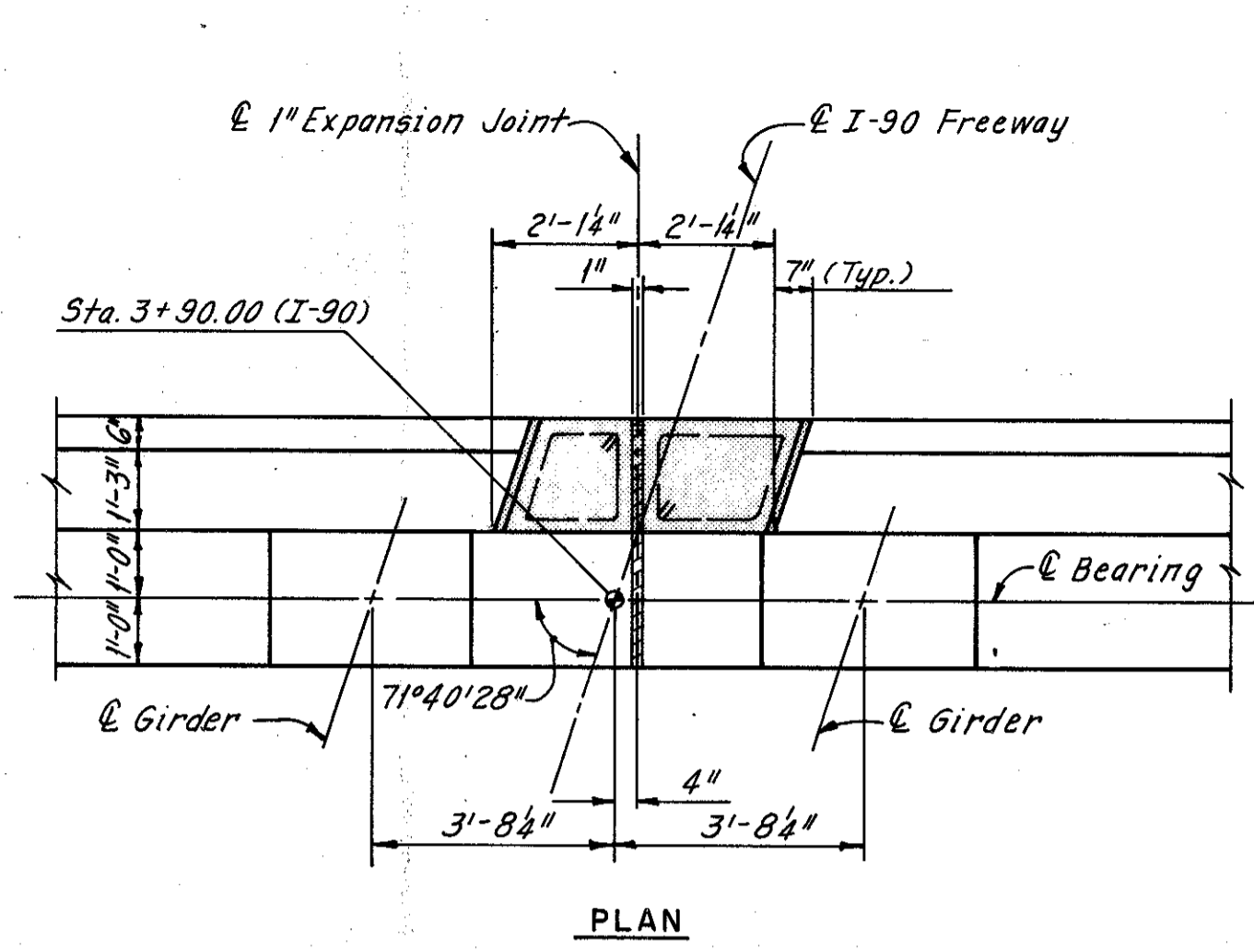
OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

CUYAHOGA COUNTY OHIO

DATE 3-28-72 TRACED WB CHECKED SMS REVIEWED CBA REVISOR  
DATE 3-30-72 DATE 4-5-72 DATE 5-28-72

SHEET 18 / 52

CUYAHOGA COUNTY  
CUY-90-15.24

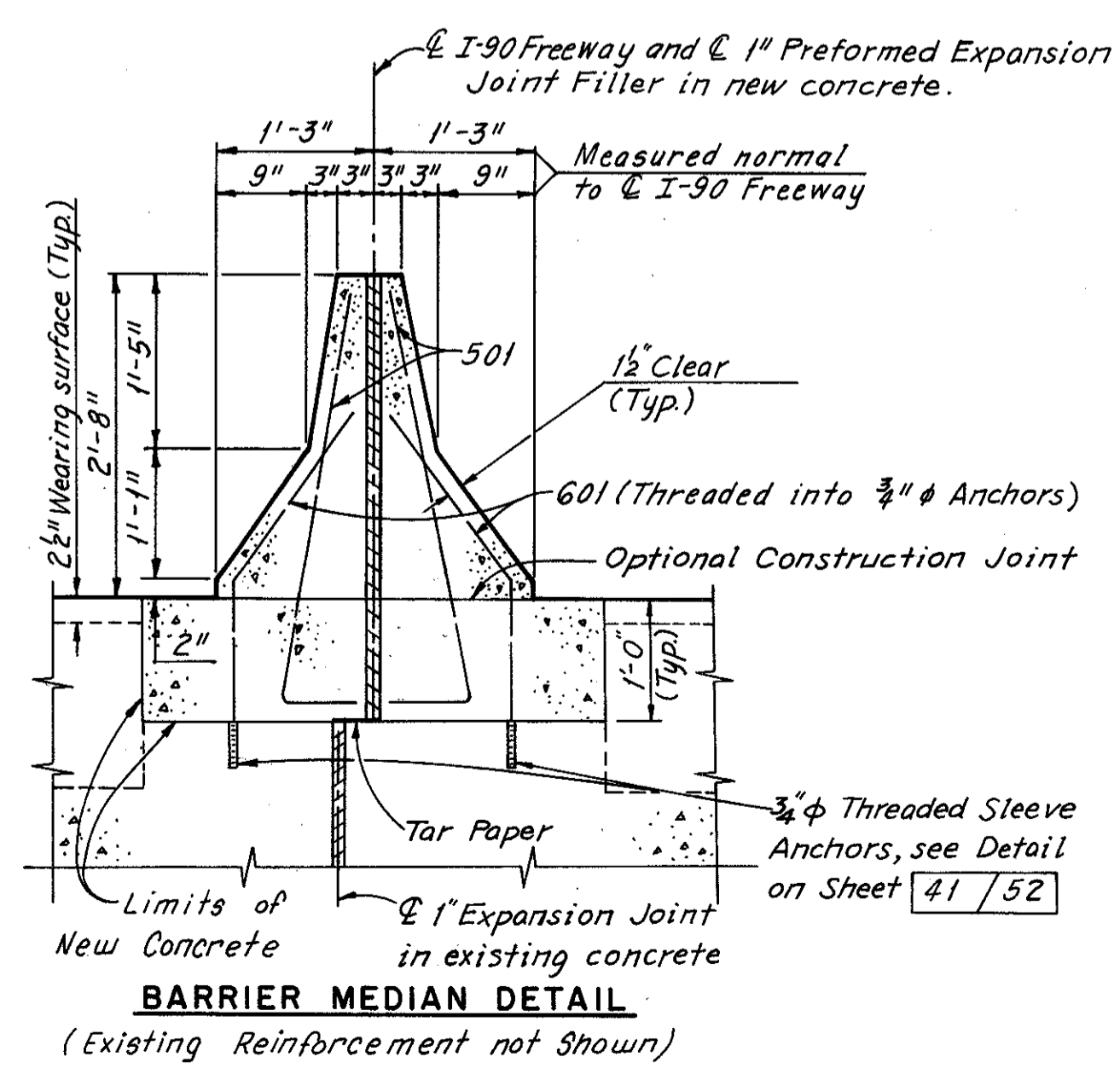


EXISTING

MODIFICATION

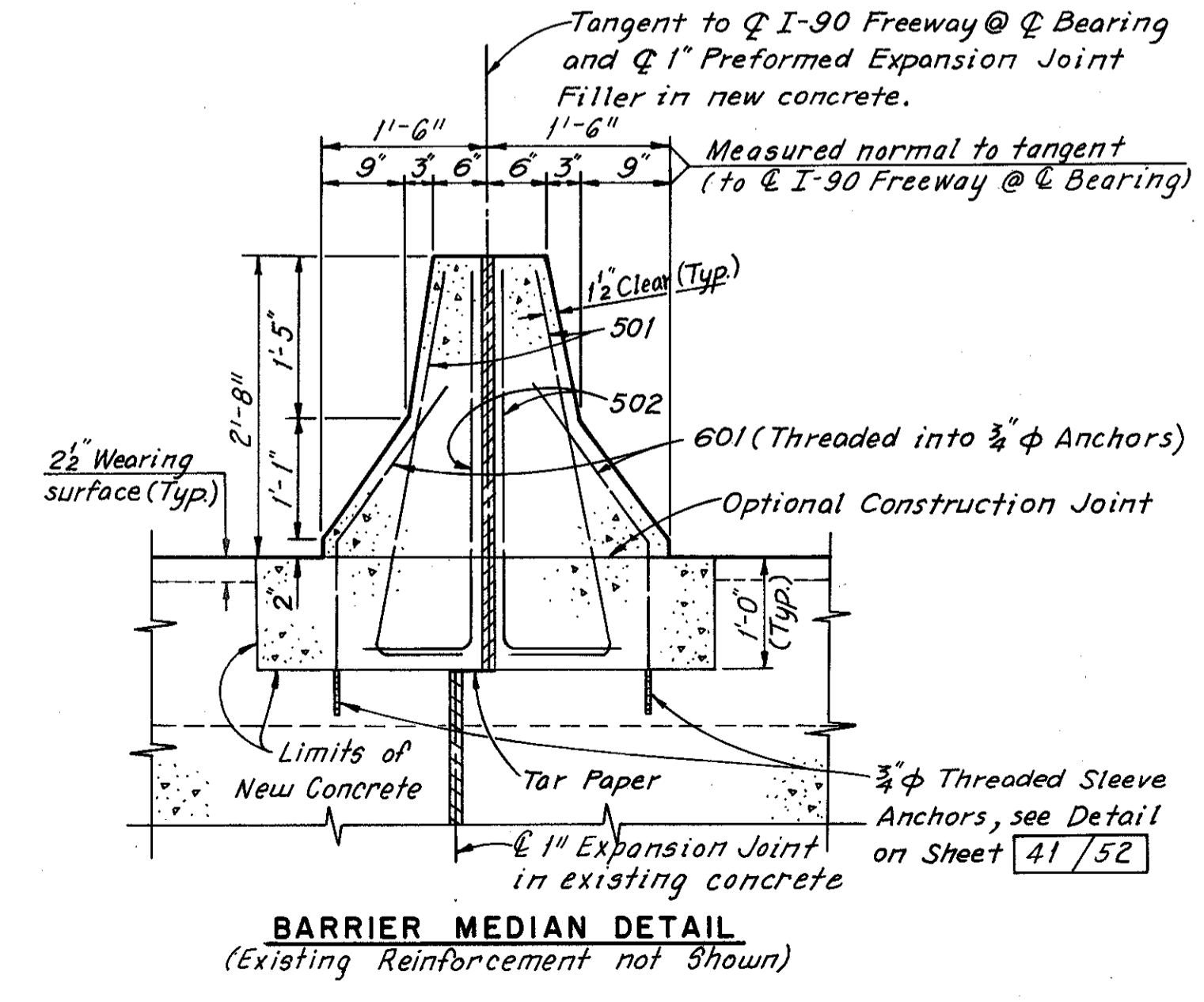
EXISTING

MODIFICATION



INNERBELT EXTENSION

Note: All reinforcing bar marks shall be prefixed as follows:  
AA - Innerbelt Extension Abutment  
AC - East Approach-Abutment 1B



EAST APPROACH - ABUTMENT 1B

Notes:  
For Curb Plate Details at the Innerbelt Extension Abutment see Sheet 25/52 and at Abutment 1B see Sheet 29/52.  
Indicates removal of existing abutment concrete.  
For Reinforcement Schedule see Sheet 41/52.

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**MEDIAN MODIFICATIONS  
ON THE ABUTMENTS**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67  
42R-17 43  
42R-17 50  
42 -17 50

STA. 3+87.63  
STA. 54+65.78

CUYAHOGA COUNTY OHIO

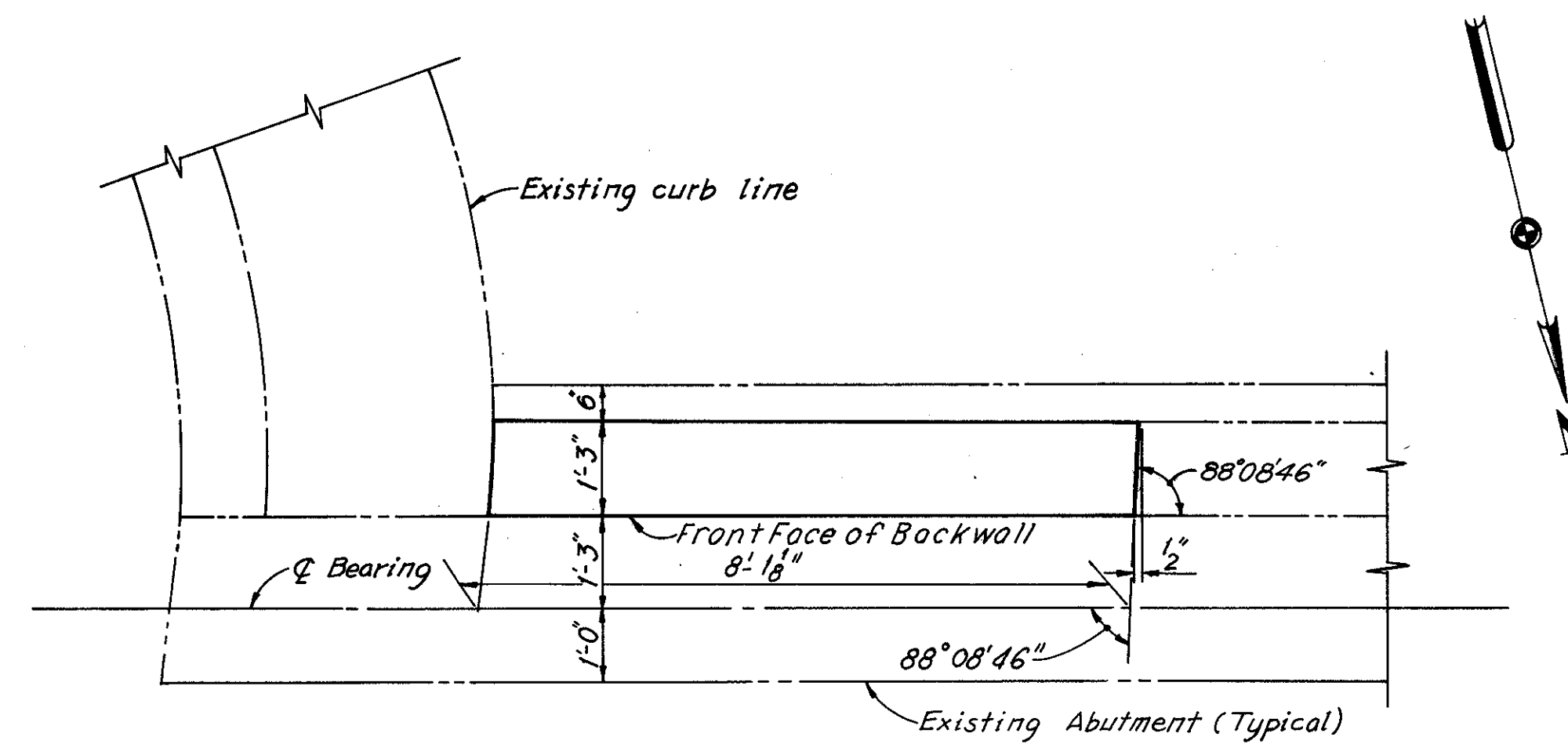
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DATE 3-10-72 DATE 3-15-72 DATE 4-14-72 DATE 5-26-72 SHEET 19/52

UNPROCESSED  
REVISIONS

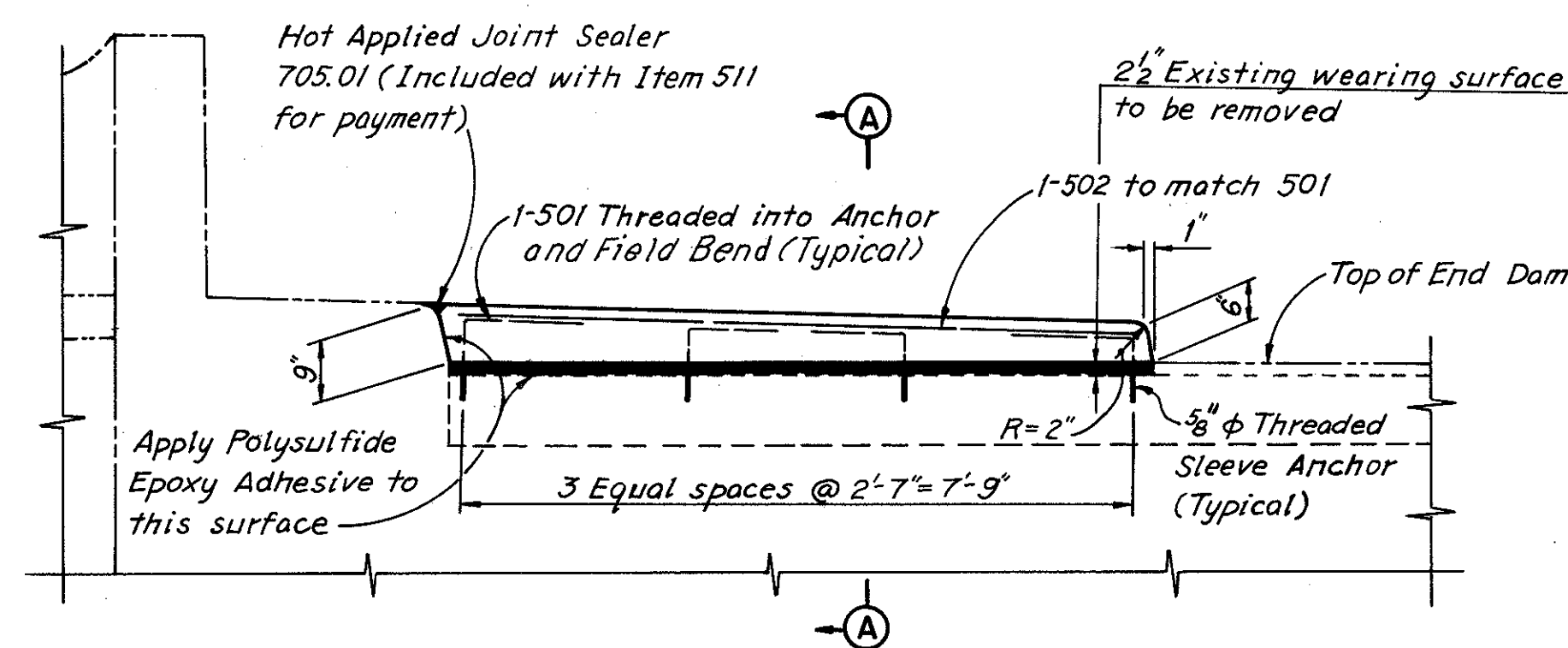
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-90-1 (87) 24	

20  
52

CUYAHOGA COUNTY  
CUY-90-15.24

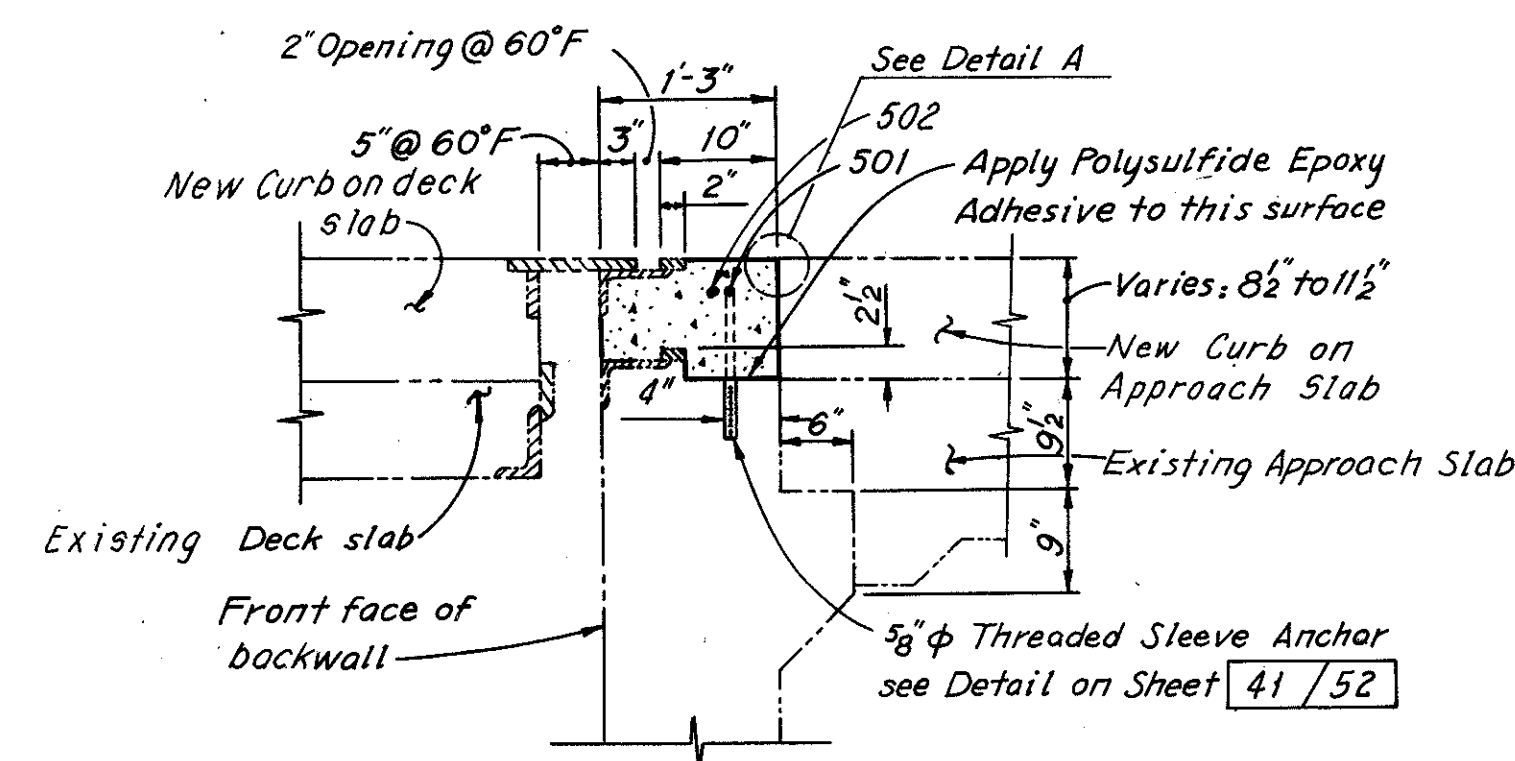


PLAN

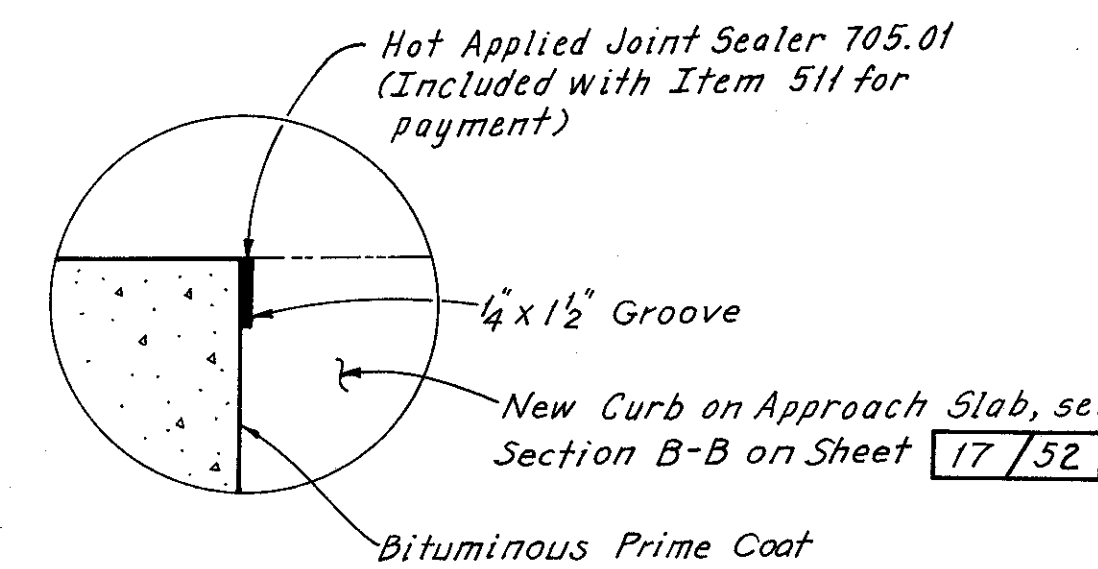


ELEVATION

Note: All reinforcing bar marks shall be prefixed AB.



SECTION A-A  
(Expansion Joint Anchorage not shown)



DETAIL A

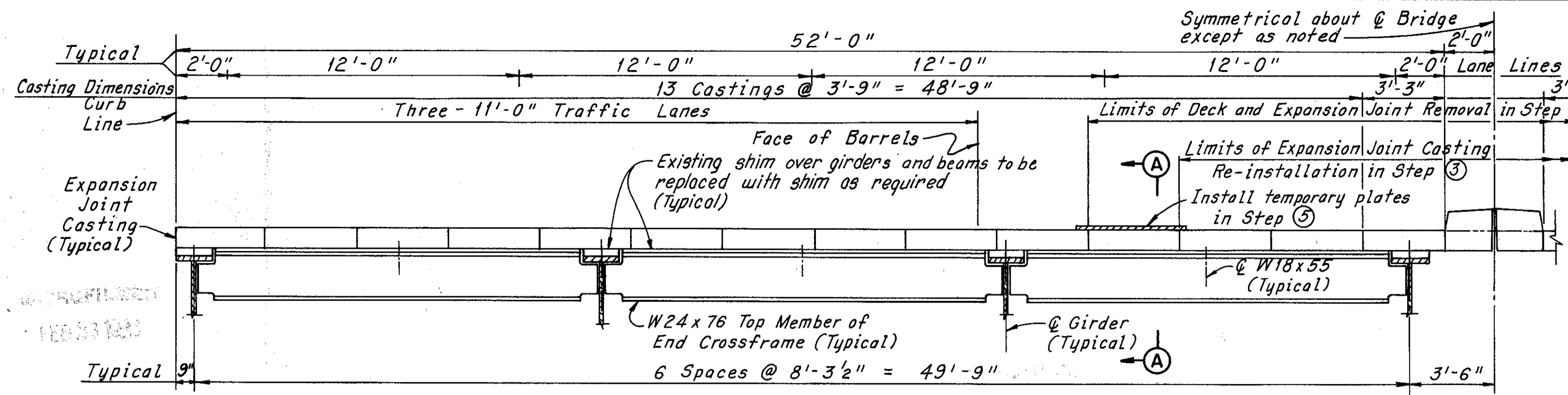
Notes:  
For modification to existing curb plates and for details of new curb plates, see Sheet 31/52.  
For Reinforcement Schedule see Sheet 41/52.

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

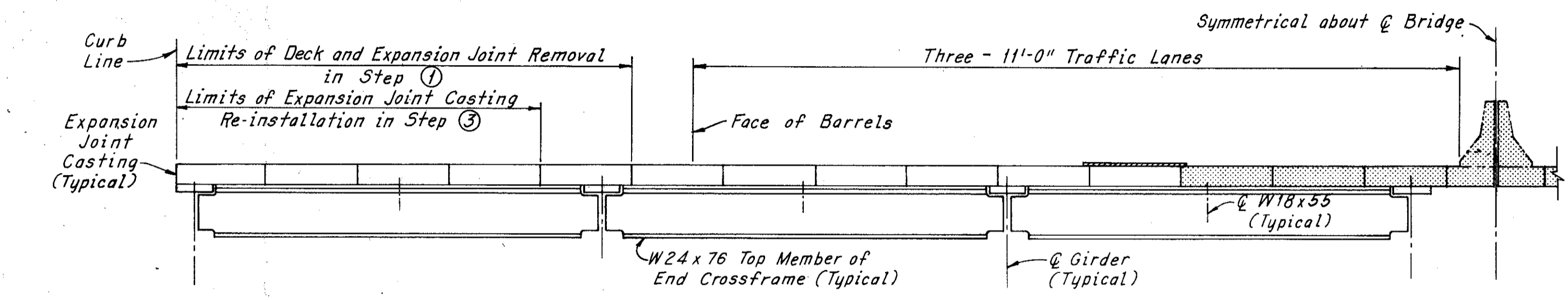
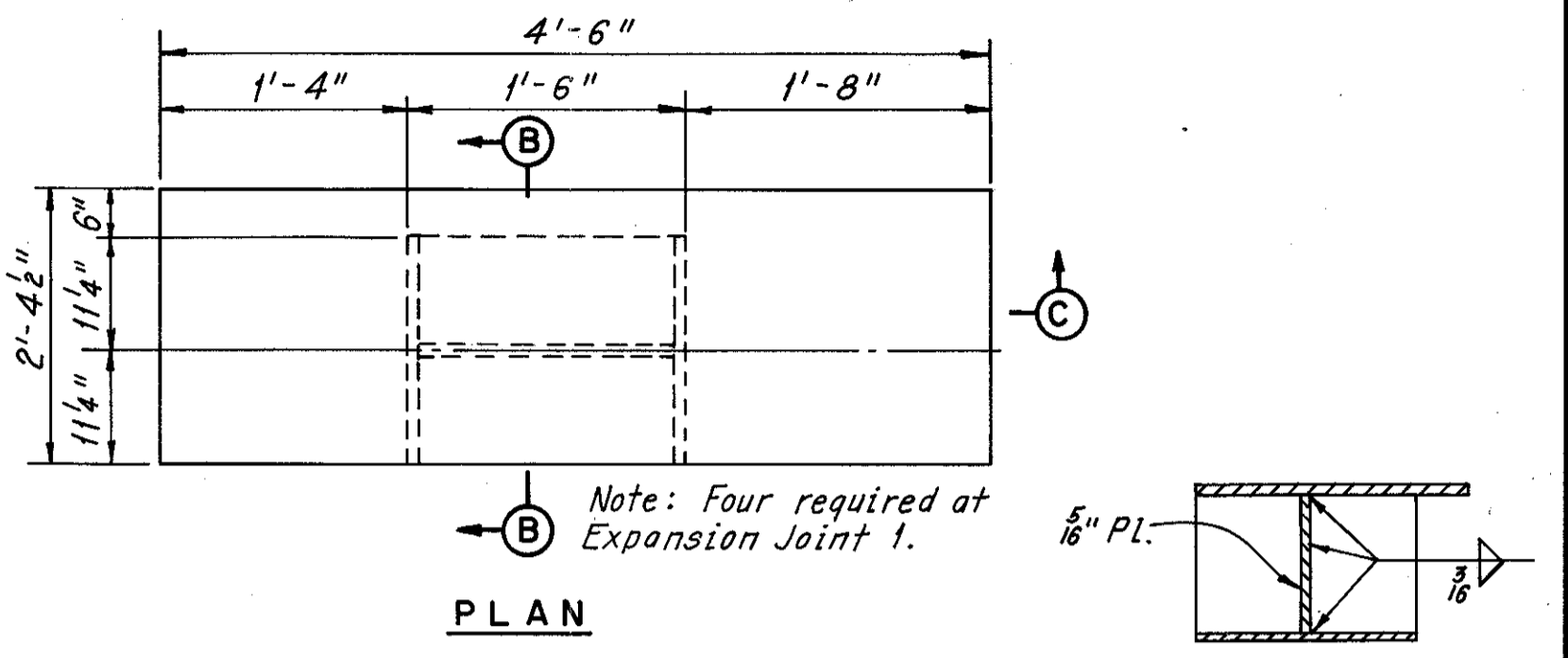
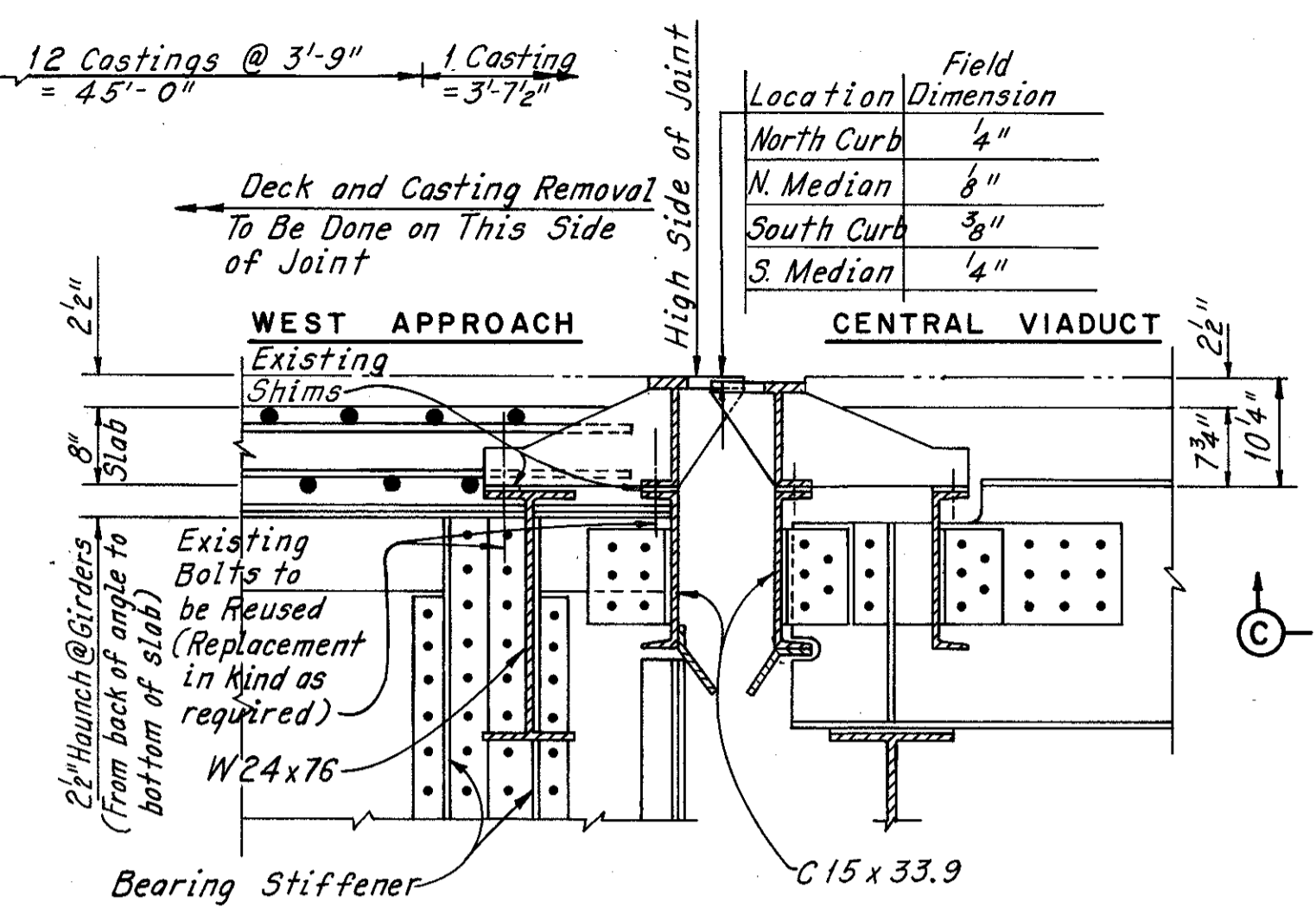
ABUTMENT W1 MODIFICATION  
WEST APPROACH  
OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14.67  
42R-17.43 STA. 3+87.63  
42R-17.50 STA. 54+65.78  
42-17.50

CUYAHOGA COUNTY OHIO  
DRAWN SMS TRACED S.M.S. CHECKED D.M.P. REVIEWED C.H.B. REVISIONS  
DATE 3-28-72 DATE 3-28-72 DATE 4-14-72 DATE 5-28-72 SHEET 20/52

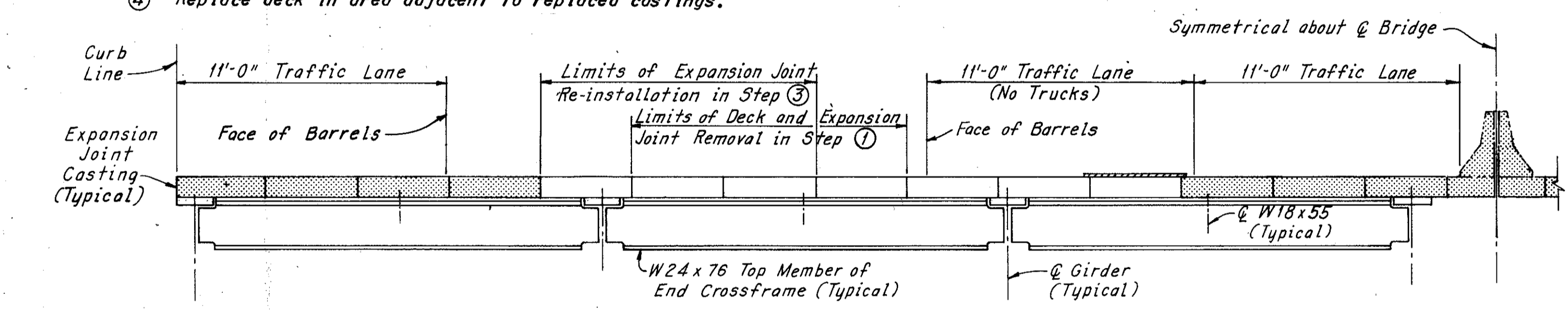
CUYAHOGA COUNTY  
CUY-90-15,24



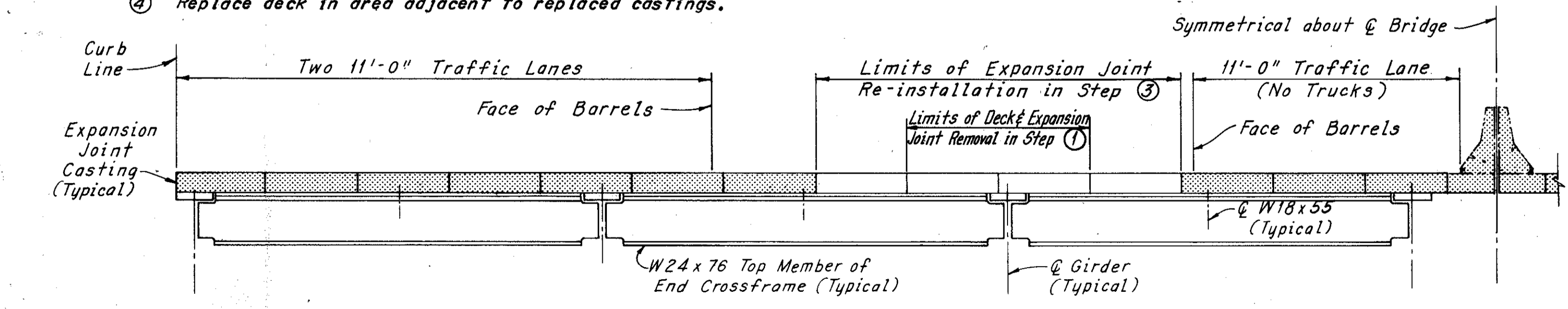
- CONSTRUCTION PROCEDURE:**
- PHASE I**
- Remove deck, eight expansion joint castings and existing median.
  - Adjust shims between castings and supporting channels for vertical correction.
  - Re-install expansion joint castings shown and modify expansion joint at median as shown on Sheet 28/52.
  - Replace deck in area adjacent to replaced castings and at median.
  - Install temporary plate over opening in deck.



- CONSTRUCTION PROCEDURE:**
- PHASE II**
- Remove deck and five expansion joint castings.
  - Adjust shims between castings and supporting channels for vertical correction.
  - Re-install expansion joint castings shown.
  - Replace deck in area adjacent to replaced castings.

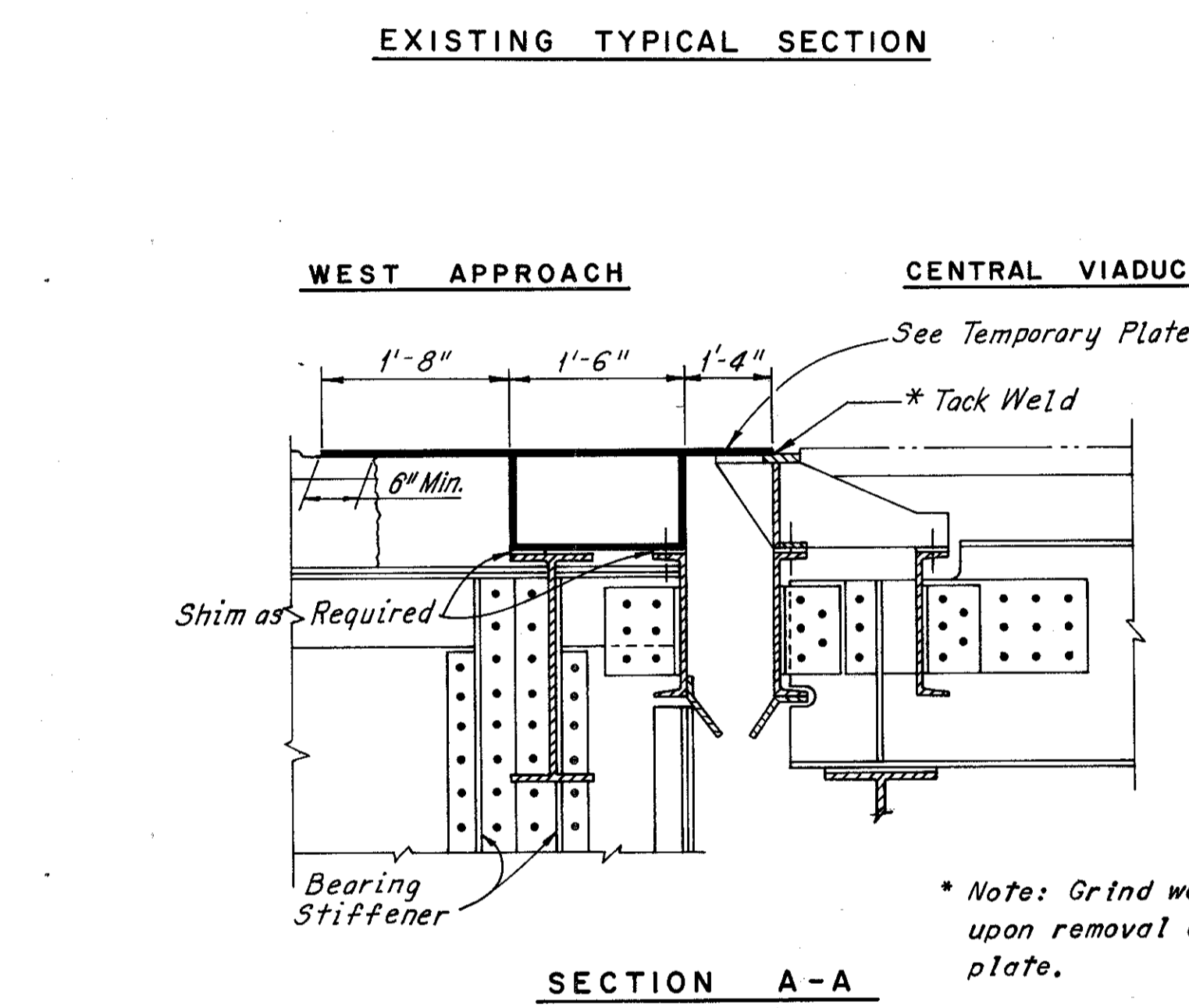


- CONSTRUCTION PROCEDURE:**
- PHASE III**
- Remove deck and three expansion joint castings.
  - Adjust shims between castings and supporting channels for vertical correction.
  - Re-install expansion joint castings shown.
  - Replace deck in area adjacent to replaced castings.



- CONSTRUCTION PROCEDURE:**
- PHASE IV**
- Remove deck and two expansion joint castings.
  - Adjust shims between castings and supporting channels for vertical correction.
  - Re-install expansion joint castings.
  - Replace deck in area adjacent to replaced castings.

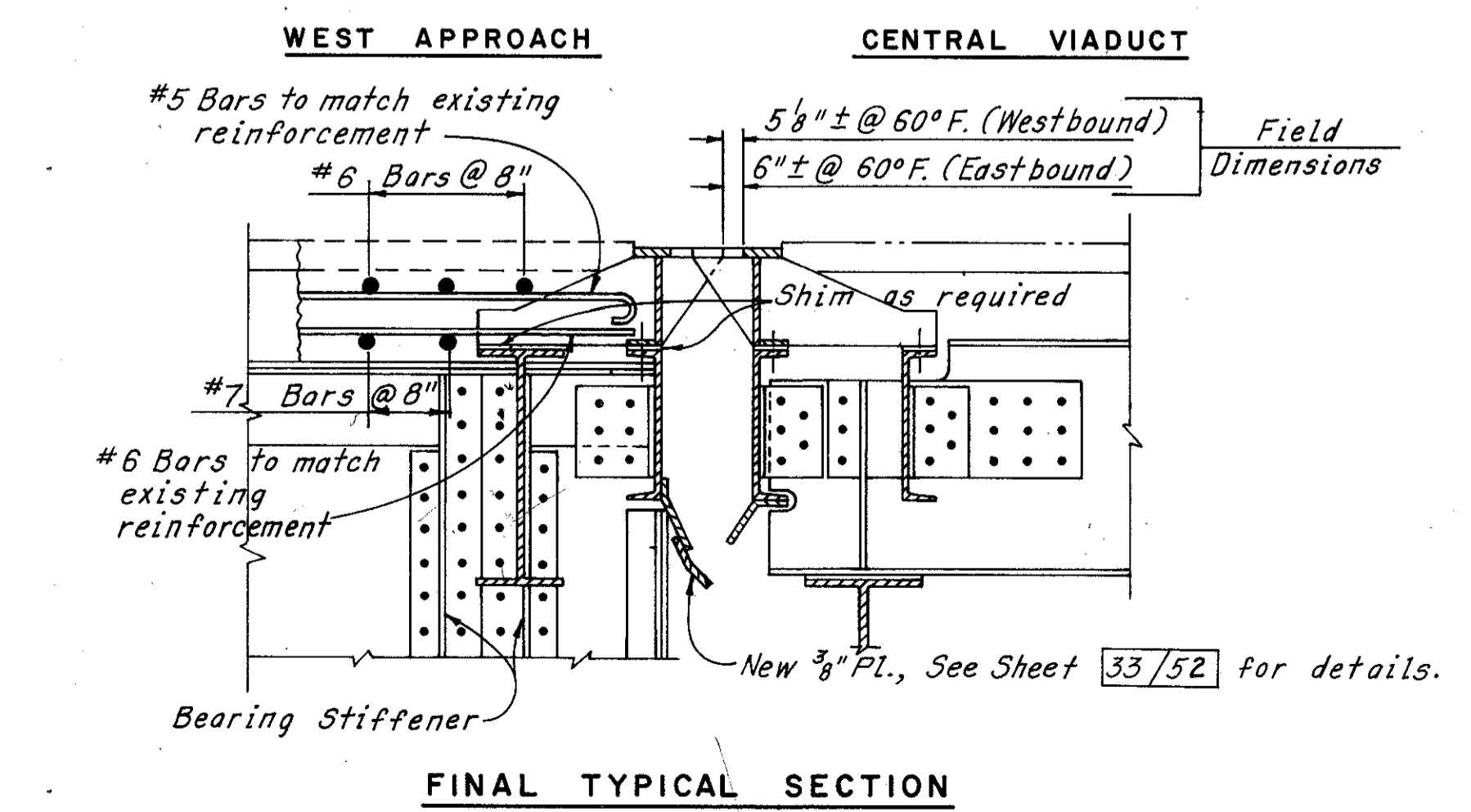
**WEST END PIER EXPANSION JOINT - STA. 16+13.02 @ INNERBELT FREEWAY**  
SECTION THRU WEST APPROACH  
(Looking East)



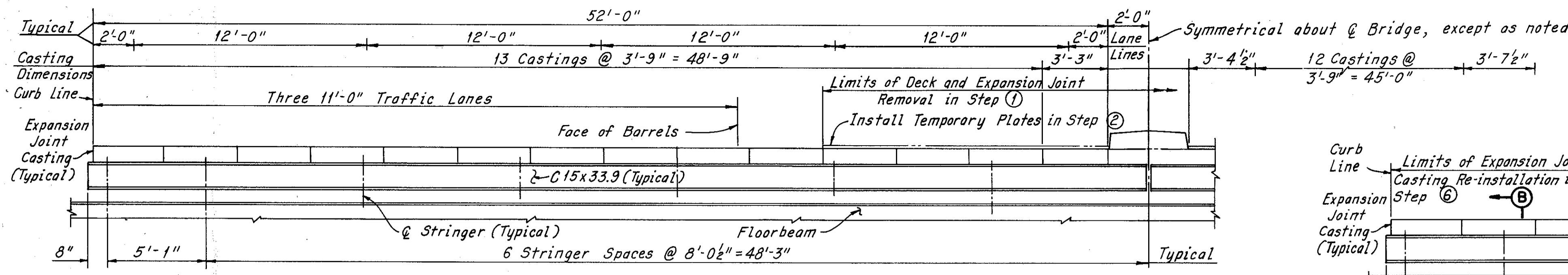
**TEMPORARY PLATE DETAILS**

Note: The cost of the temporary plates is not included as a part of the final pay quantities in the plans. Payment and ownership of the plates shall be by the Contractor.

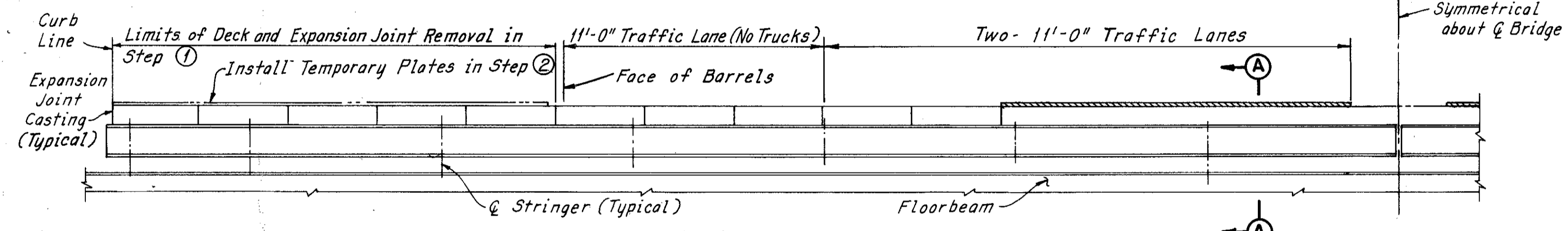
**Notes:**  
The Construction Procedures shown are only suggested and indicate a method of maintaining the required three 11'-0" thru lanes of traffic at all times. The Contractor shall submit in writing his proposed construction procedure including maintenance of traffic details to the Director and receive approval before work is started on the project. The Contractor's construction procedure however must provide for the removal of all the castings at Expansion Joint 2 before any are re-installed.  
The location of the face of barrels shown in the various phases is the minimum position to permit the 11'-0" traffic lanes. The face of barrels shall be as far removed from the outside lane line as construction will permit.  
The existing deck slab shall be removed as required to facilitate removal of the tooth castings. All interrupted deck reinforcement shall be replaced in-kind using either a mechanical or lapped splice.  
Special care shall be taken in the removal of the castings so that they may be reset after their supporting members have been re-aligned.  
For Details of Expansion Joint Castings, see Sheet 24/52.  
See the General Notes for additional Notes concerning the realignment of the expansion joints.  
Limits of reset castings and replaced deck.



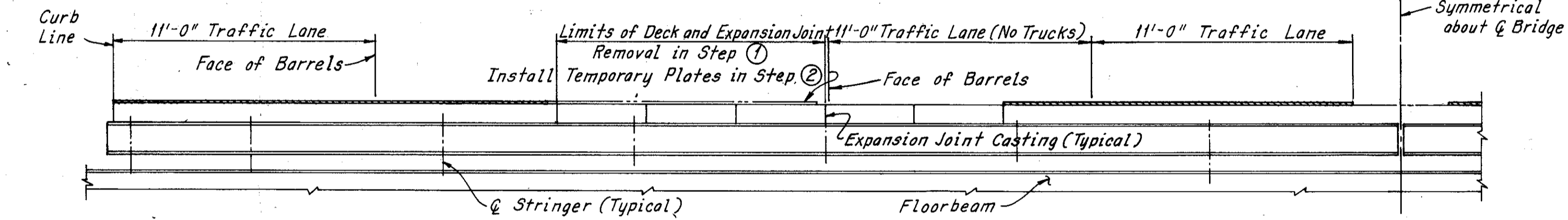
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>EXPANSION JOINT I REALIGNMENT DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42-17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN/DHS	TRACED/CP	CHECKED/DMP	REVIEWED/CHP
DATE 3-24-72	DATE 3-27-72	DATE 4-6-72	DATE 5-26-72
			REVISOR DATE SHEET 21 / 52



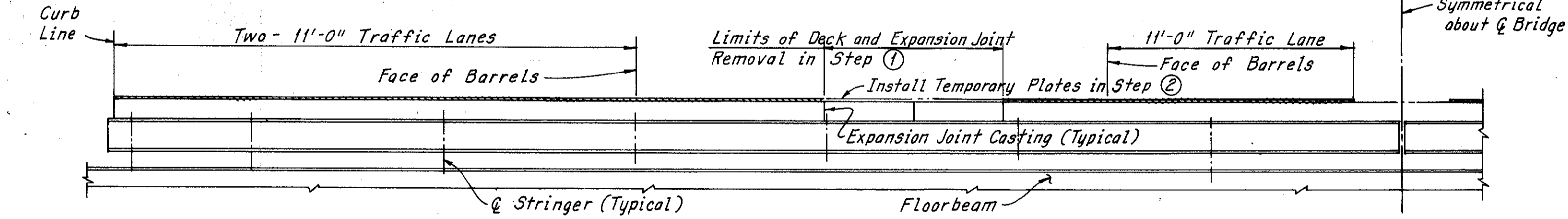
**CONSTRUCTION PROCEDURE:**  
**PHASE I**  
Steps ① Remove deck, eight expansion joint castings and existing median.  
② Install temporary plates at opening in deck. See Section A-A.



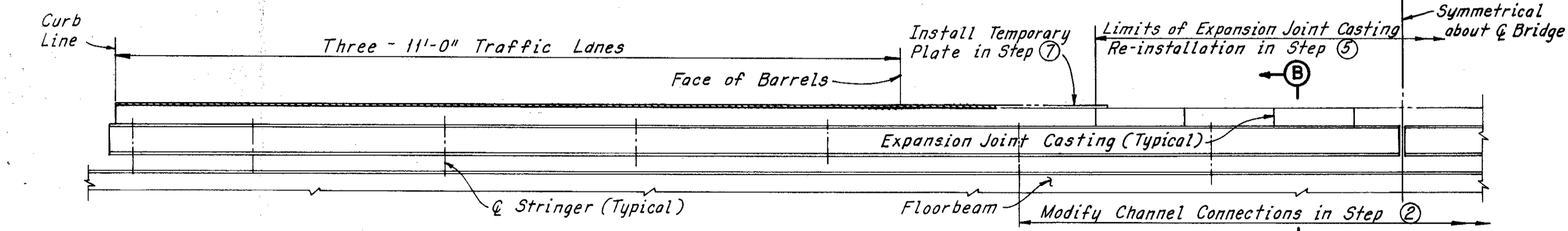
**CONSTRUCTION PROCEDURE:**  
**PHASE II**  
Steps ① Remove deck, five expansion joint castings and cut sliding plates at safety curb joint as indicated on Sheet 30/52.  
② Install temporary plates at opening in deck. See Section A-A.



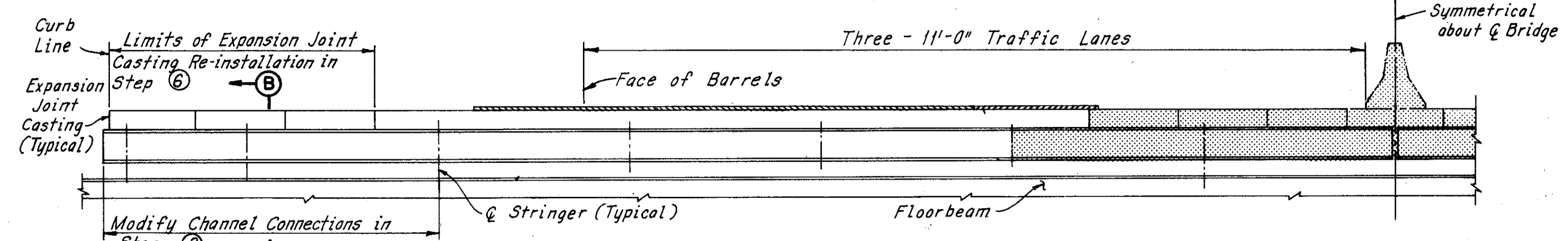
**CONSTRUCTION PROCEDURE:**  
**PHASE III**  
Steps ① Remove deck and three expansion joint castings.  
② Install temporary plates at opening in deck. See Section A-A.



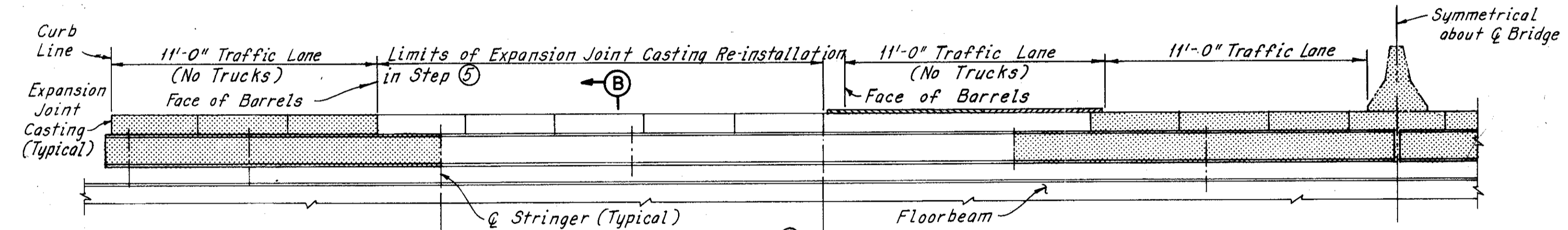
**CONSTRUCTION PROCEDURE:**  
**PHASE IV**  
Steps ① Remove deck and two expansion joint castings.  
② Install temporary plates at opening in deck. See Section A-A.



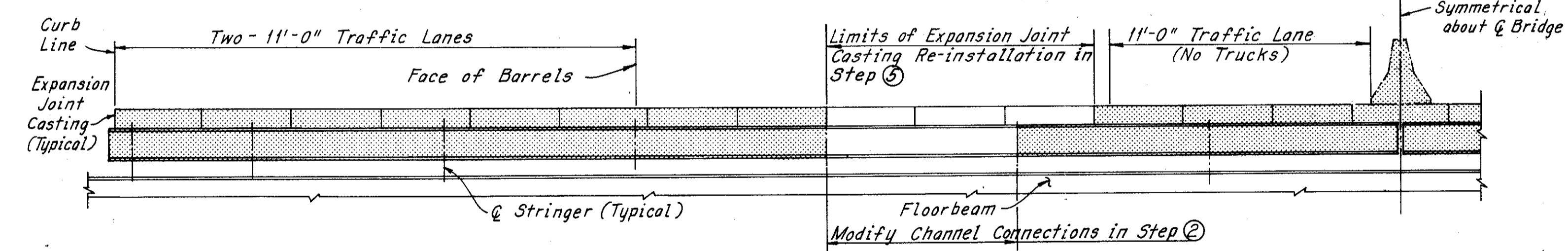
**CONSTRUCTION PROCEDURE:**  
**PHASE V**  
Steps ① Remove temporary plates for access to work area.  
② Modify channel connections. See Section B-B.  
③ Modify removed castings. See Detail on Sheet 24/52.  
④ Install casting support plates. See Section B-B.  
⑤ Re-install expansion joint castings shown, as indicated in Final Typical Cross Section on Sheet 24/52 and modify expansion joint at median as shown on Sheet 28/52.  
⑥ Replace deck in area adjacent to replaced castings and at median.  
⑦ Place temporary plate at opening in deck. See Section A-A.



**CONSTRUCTION PROCEDURE:**  
**PHASE VI**  
Steps ① Remove temporary plates for access to work area.  
② thru ④ Repeat Steps ② thru ④ from Phase V.  
⑤ Install new plates at safety curb, see Details on Sheet 30/52.  
⑥ Re-install expansion joint castings shown, as indicated in Final Typical Cross Section on Sheet 24/52.  
⑦ Replace deck in area adjacent to replaced castings.



**CONSTRUCTION PROCEDURE:**  
**PHASE VII**  
Steps ① Remove temporary plates for access to work area.  
② thru ⑥ Repeat Steps ② thru ⑥ from Phase V, disregarding reference to median.

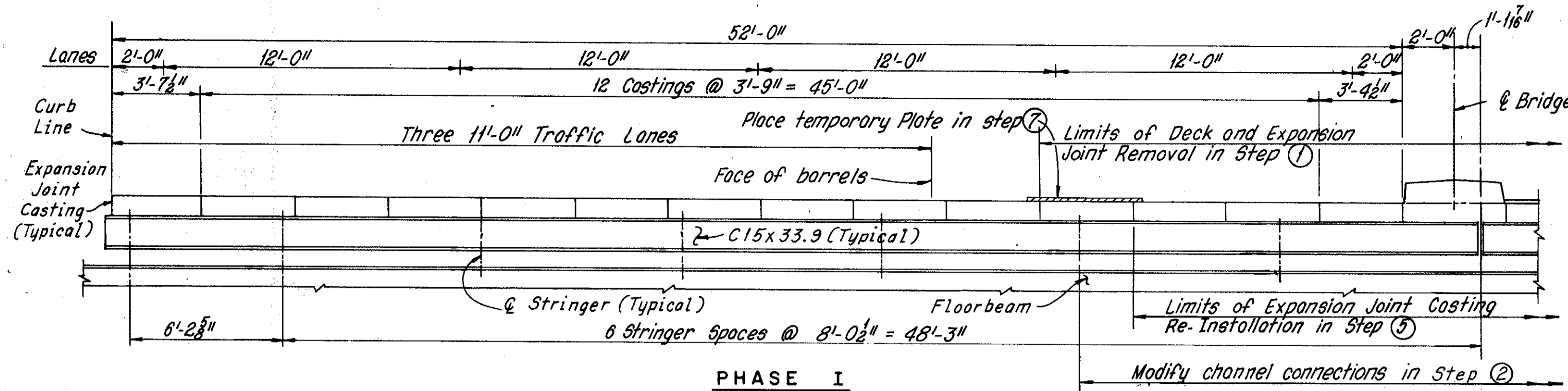


**CONSTRUCTION PROCEDURE:**  
**PHASE VIII**  
Steps ① Remove temporary plates for access to work area.  
② thru ⑥ Repeat Steps ② thru ⑥ from Phase V, disregarding reference to median.

Notes:  
For Existing Typical Section, Temporary Plate Details and for Sections A-A and B-B see Sheet 24/52.  
For additional notes see Sheet 21/52.

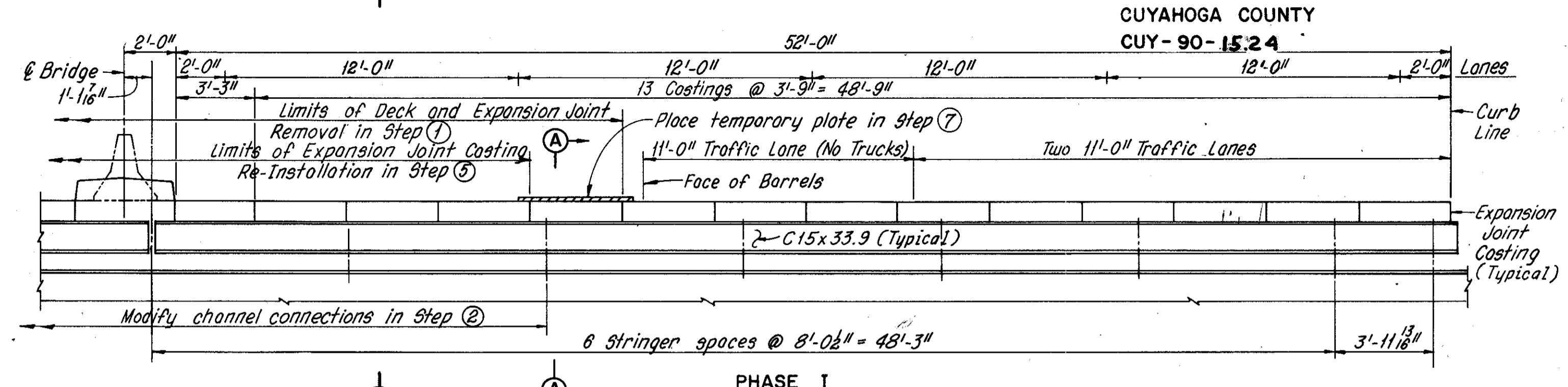
EXPANSION JOINT 2 - STA. 21+41.02 @ INNERBELT FREEWAY  
SECTION THRU WEST SIDE OF JOINT  
(Looking East)

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
EXPANSION JOINT 2 REALIGNMENT DETAILS			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	STA. 3+87.63	
	42R-17 50	STA. 54+65.78	
	42 -17 50		
CUYAHOGA COUNTY			OHIO
DRAWN J.H.S.	TRACED C.P.	CHECKED D.M.A.	REVIEWED C.H.B.
DATE 3-24-72	DATE 3-27-72	DATE 4-6-72	DATE 5-28-72
			REVISOR
			SHEET 22 / 52



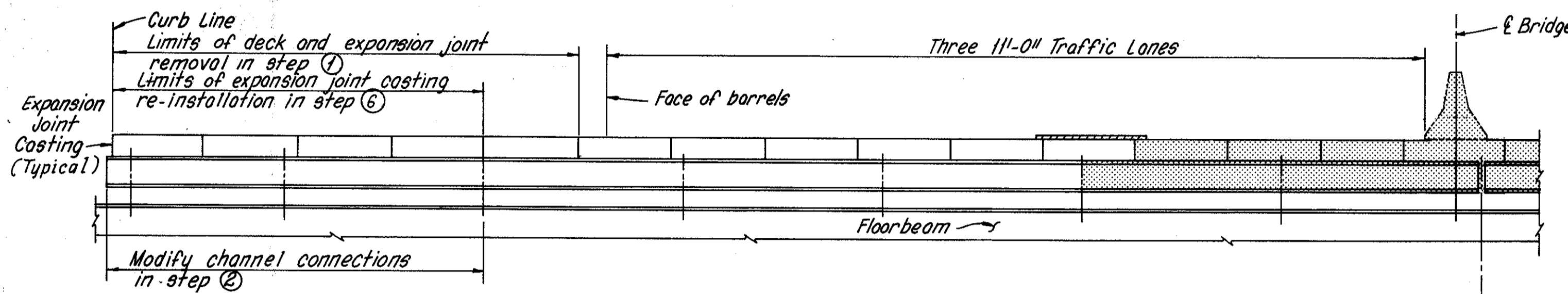
**PHASE I CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck, nine expansion joint castings and existing median.
- 2 Modify channel connections. See Section B-B.
- 3 Modify removed castings. See Detail on Sheet 24/52.
- 4 Install casting support plates. See Section B-B.



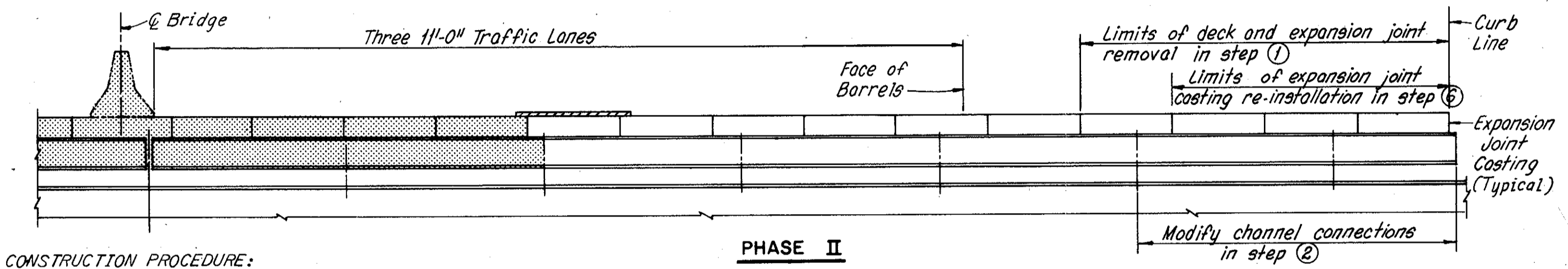
**PHASE I CONSTRUCTION PROCEDURE:**

- 5 Re-install expansion joint castings shown, as indicated in Final Typical Cross Section on Sheet 24/52 and modify expansion joint at median as shown on Sheet 28/52.
- 6 Replace deck in area adjacent to replaced castings and at median.
- 7 Place temporary plate at opening in deck. See Section A-A.



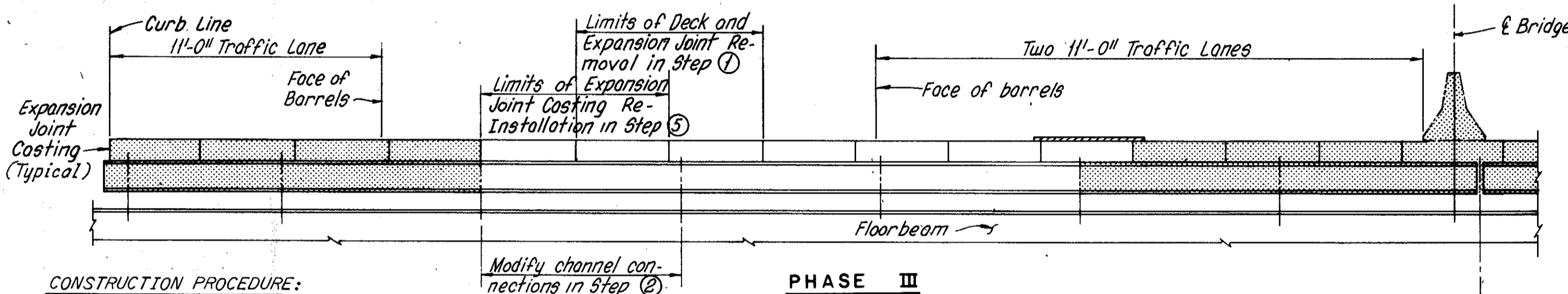
**PHASE II CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and five expansion joint castings and cut sliding plates at safety curb joint as indicated on Sheet 30/52.
- 2 thru 4 Repeat Steps 2 thru 4 from Phase I.
- 5 Install new plates at safety curb, see Details on Sheet 30/52.
- 6 Re-install expansion joint castings shown, as indicated in Final Typical Cross Section on Sheet 24/52.
- 7 Replace deck in area adjacent to replaced castings.



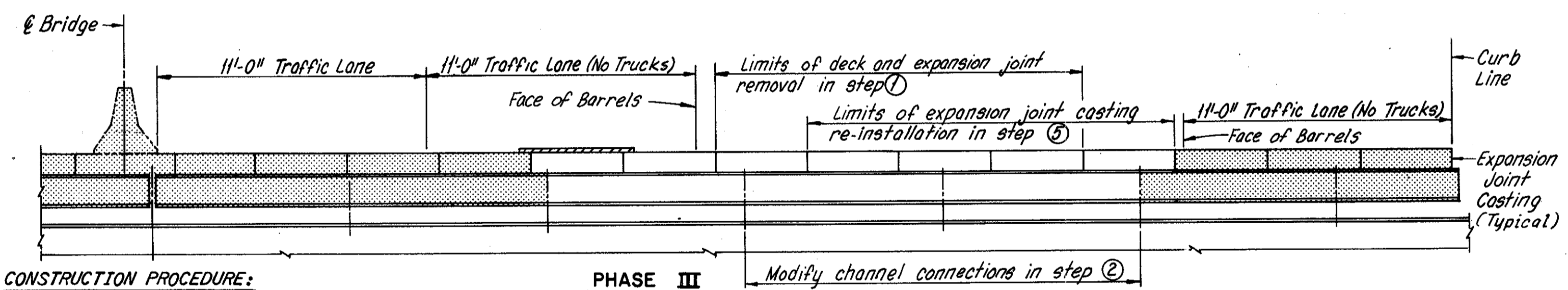
**PHASE II CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and four expansion joint castings and cut sliding plates at safety curb joint as indicated on Sheet 30/52.
- 2 thru 4 Repeat Steps 2 thru 4 from Phase I.
- 5 Install new plates at safety curb, see Details on Sheet 30/52.
- 6 Re-install expansion joint castings shown, as indicated in Final Typical Cross Section on Sheet 24/52.
- 7 Replace deck in area adjacent to replaced castings.



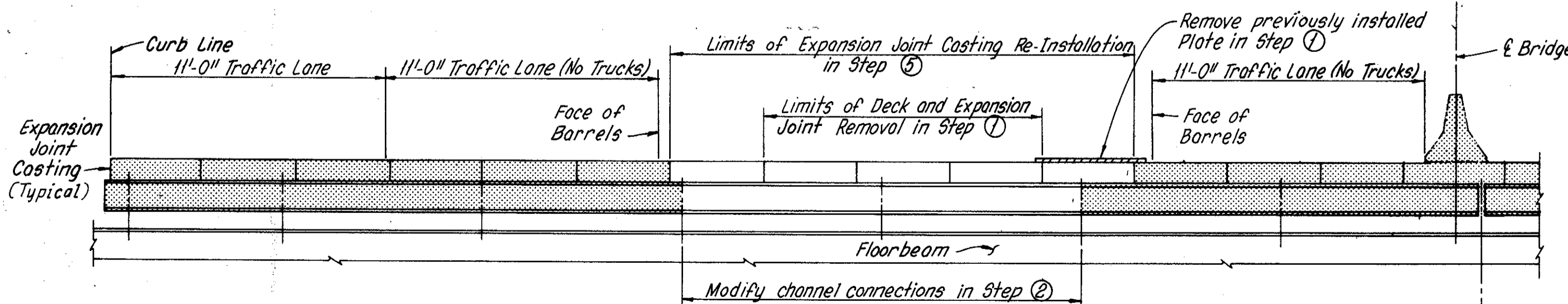
**PHASE III CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and two expansion joint castings.
- 2 thru 6 Repeat Steps 2 thru 6 from Phase I, disregarding reference to median.



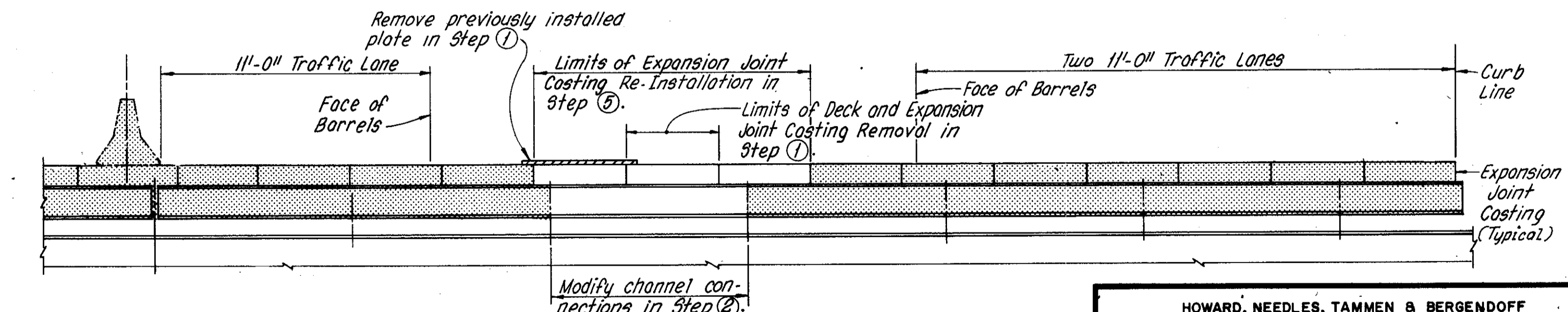
**PHASE III CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and four expansion joint castings.
- 2 thru 6 Repeat Steps 2 thru 6 from Phase I, disregarding reference to median.



**PHASE IV CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and three expansion joint castings.
- 2 thru 6 Repeat Steps 2 thru 6 from Phase I, disregarding reference to median.



**PHASE IV CONSTRUCTION PROCEDURE:**

- Steps 1 Remove deck and one expansion joint casting.
- 2 thru 6 Repeat Steps 2 thru 6 from Phase I, disregarding reference to median.

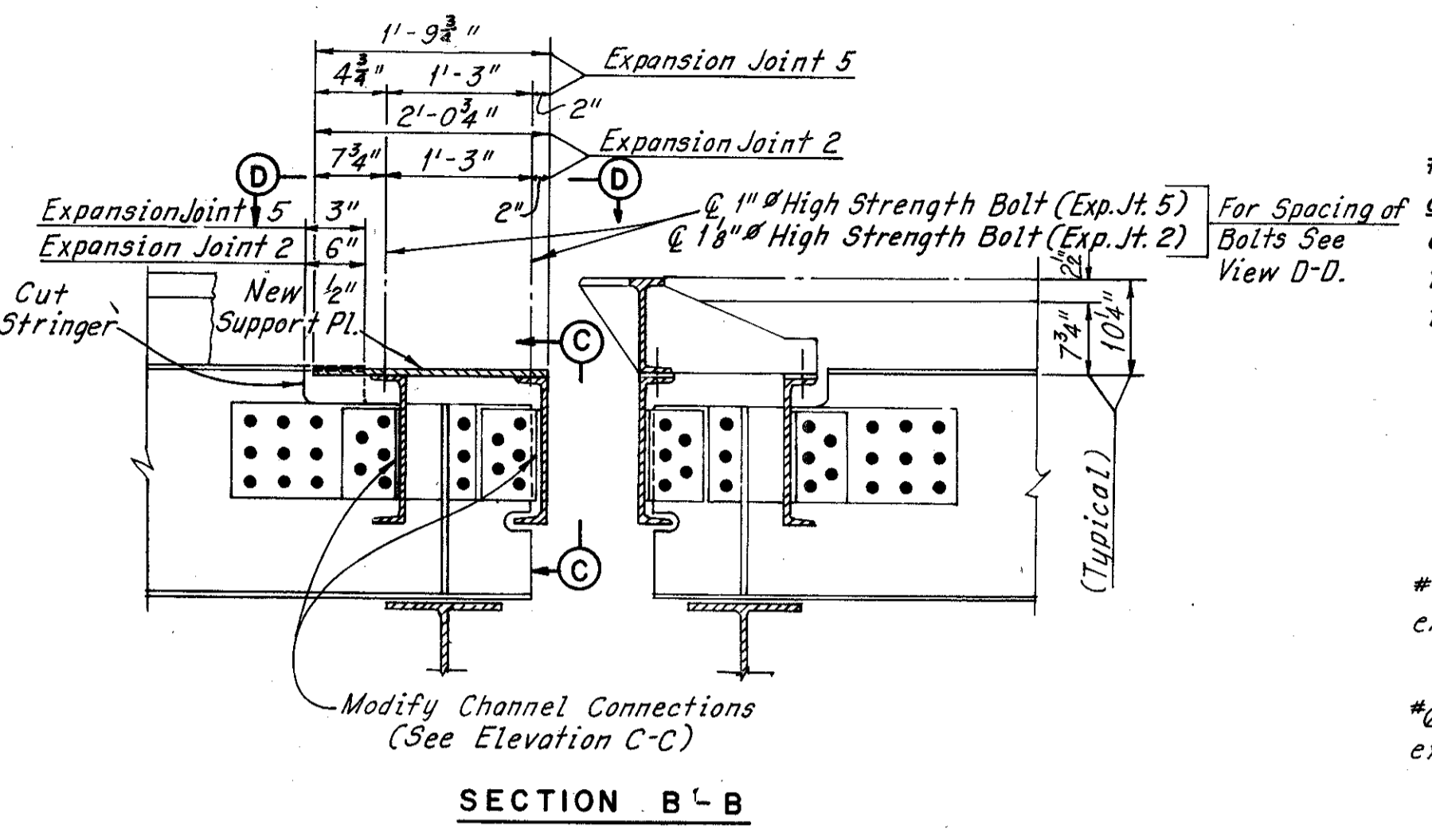
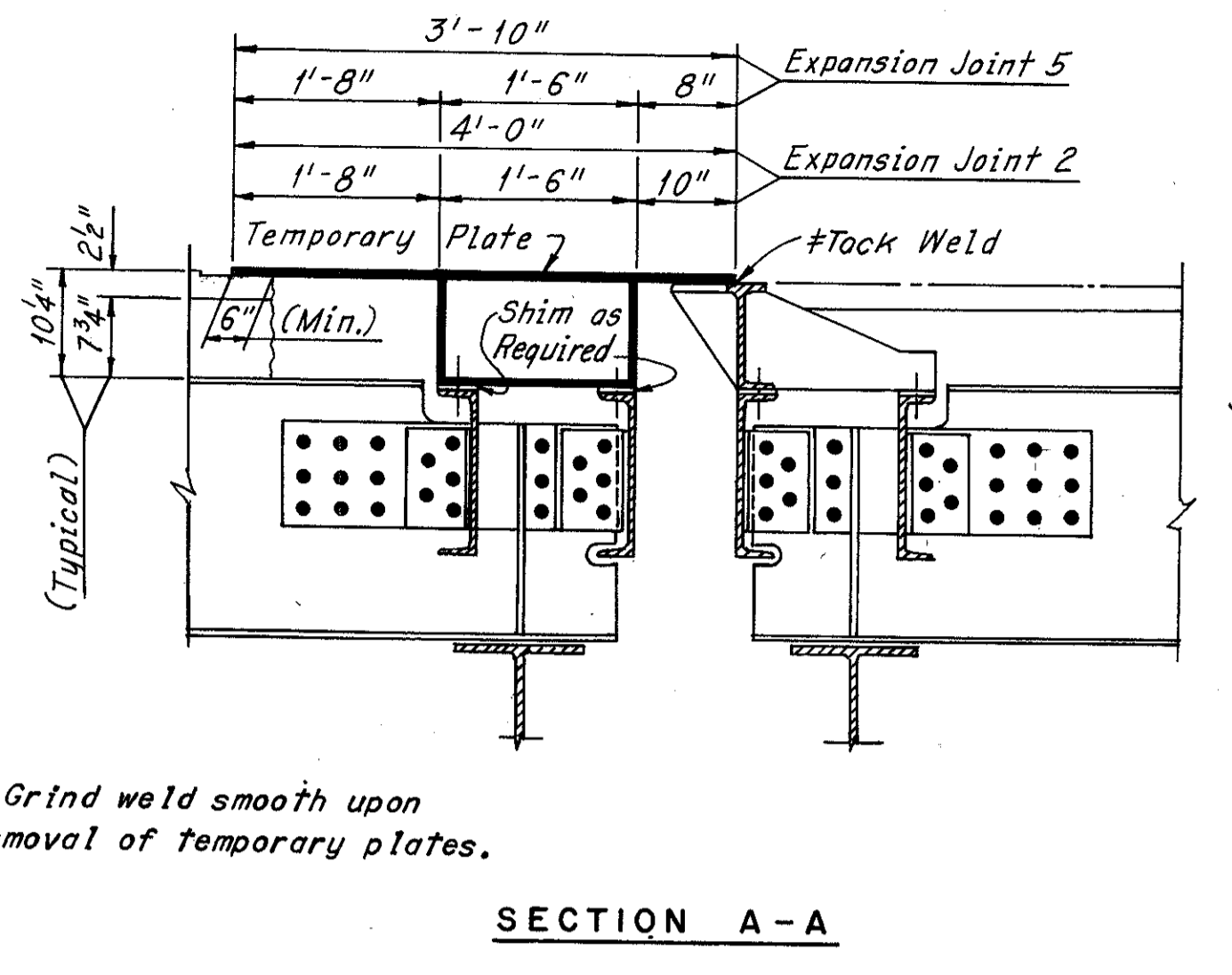
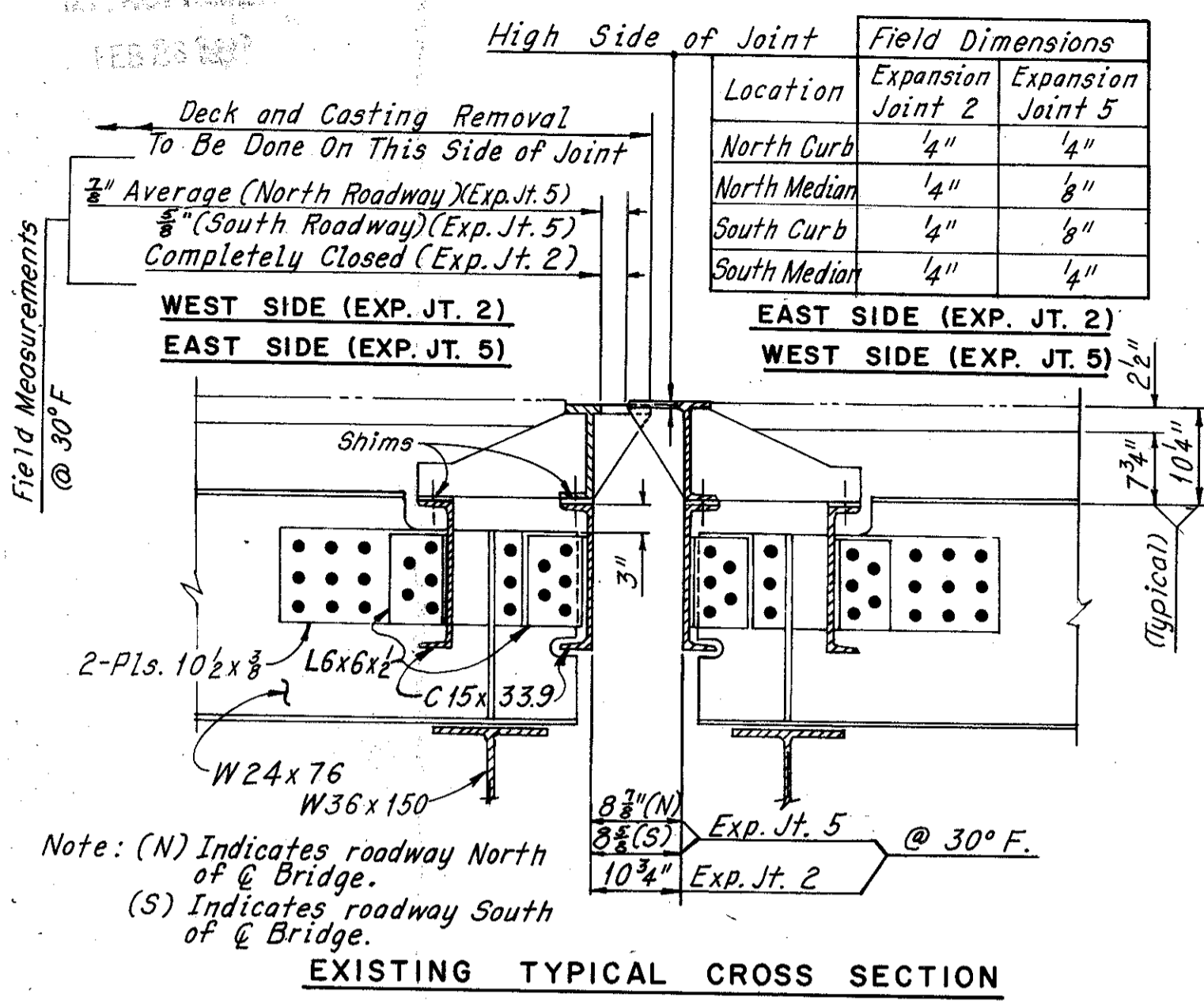
**EXPANSION JOINT 5 - STA. 38+31.69 @ INNERBELT FREEWAY  
SECTION THRU EAST SIDE OF JOINT  
(Looking East)**

Notes:  
For Existing Typical Section, Temporary Plate Details and for Sections A-A and B-B see Sheet 24/52.  
For additional Notes see Sheet 21/52.

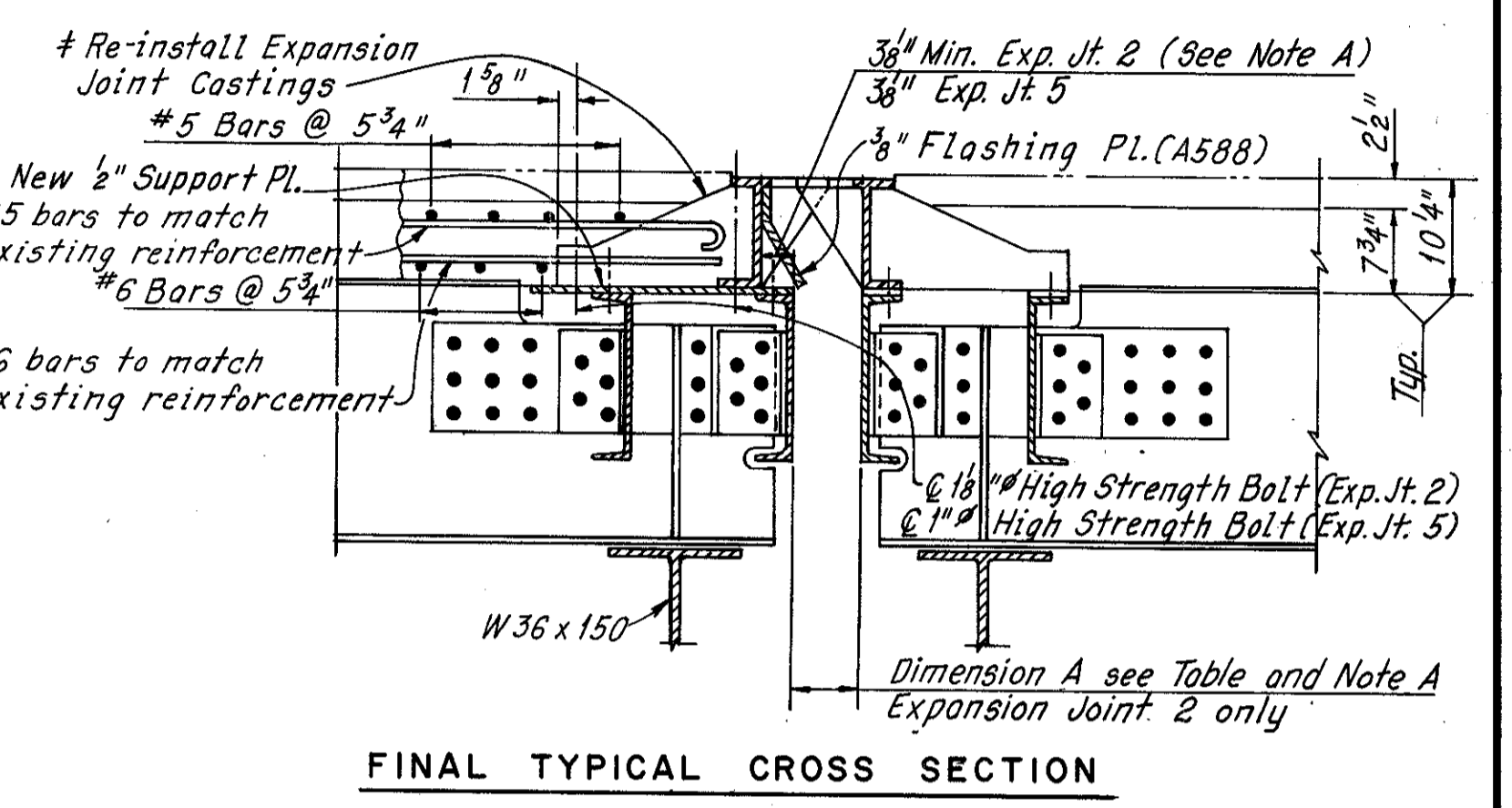
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>EXPANSION JOINT 5 REALIGNMENT DETAILS OHIO INTERSTATE SAFETY PLANS</b>			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42-17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN DHS	TRACED BMP	CHECKED DMP	REVIEWED CAB
DATE 3-23-72	DATE 3-27-72	DATE 4-7-72	DATE 5-26-72
			SHEET 23/52



CUYAHOGA COUNTY  
 CUY-90-15.2.4

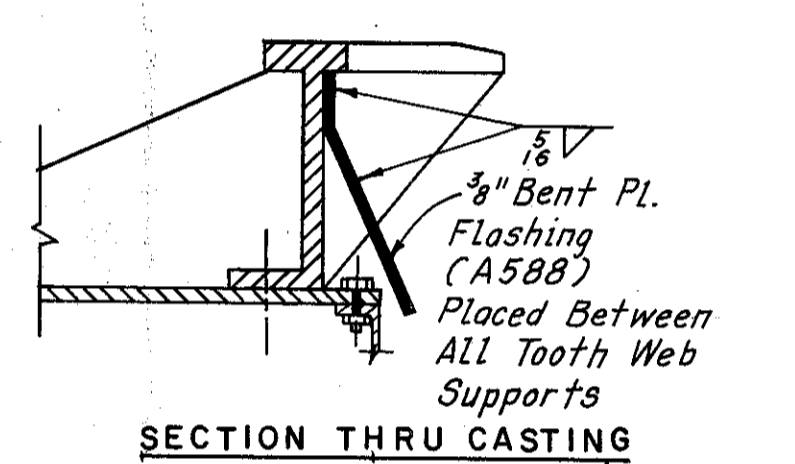


#Note: The Expansion Joint Castings shall be set longitudinally to the grade of the roadway, vertically to match the elevation of the adjacent casting and transversely to provide equal side clearance between adjacent teeth. Bolts connecting the castings to the supporting plates shall have their holes field drilled, after the castings are adjusted to final position.

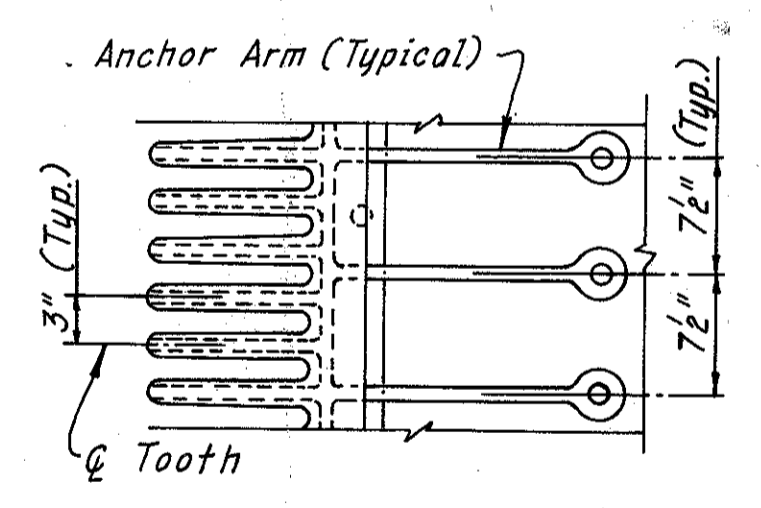


Dimension	DIMENSION A FOR EXPANSION JOINT 2												
	Temperature °F.												
	-20	-10	0	10	20	30	40	50	60	70	80	90	100
A													
7 3/4"													
8 3/4"													
9 3/4"													
10 3/4"													
11 3/4"													
11'-0 3/4"													
11'-1 3/4"													
11'-2 3/4"													

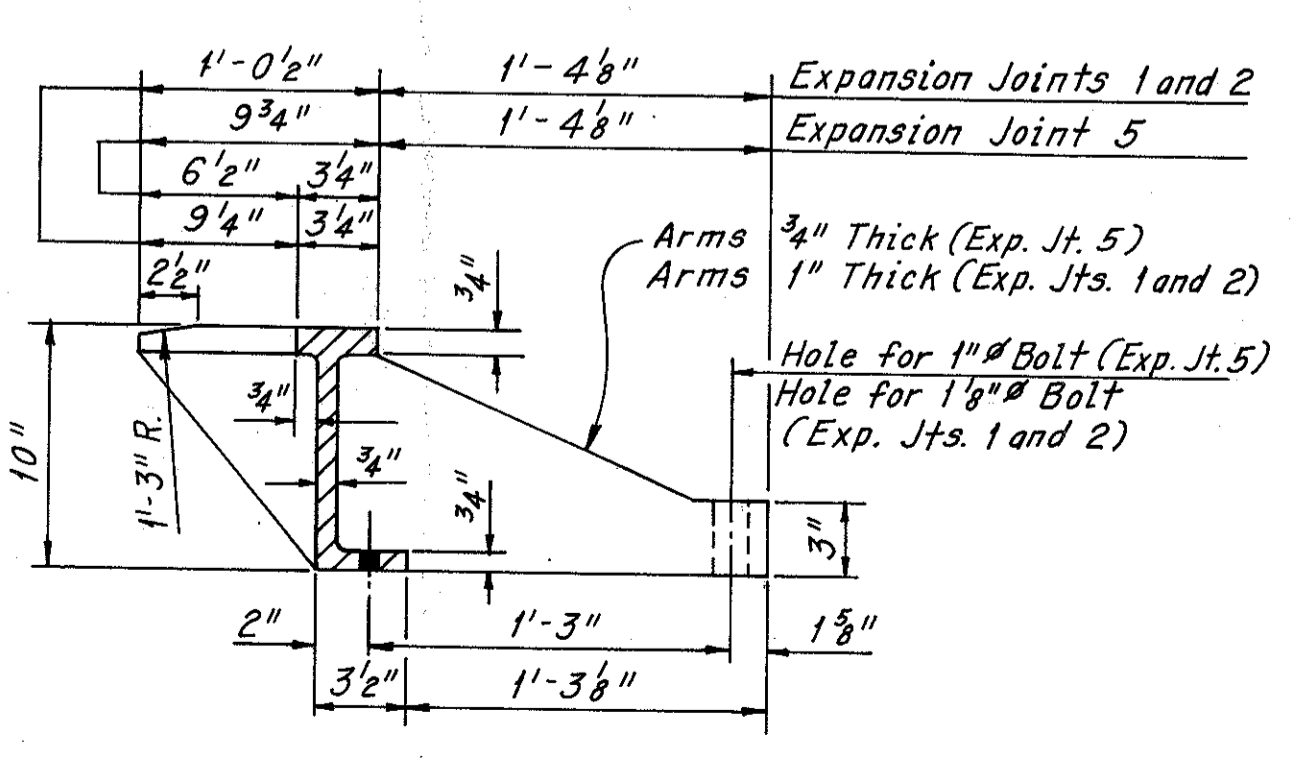
Note A: The Dimension A table shown represents the assumed relative position of the support channels for various temperatures after the removal of the castings. Before the re-installation of the castings this dimension shall be measured in the field and the 3/8" dimension increased, if the field measurement is smaller, by the difference between the field measurement and table measurement for the particular temperature.



SECTION THRU CASTING  
 MODIFICATION TO REMOVED CASTING



PLAN-JOINT CASTING

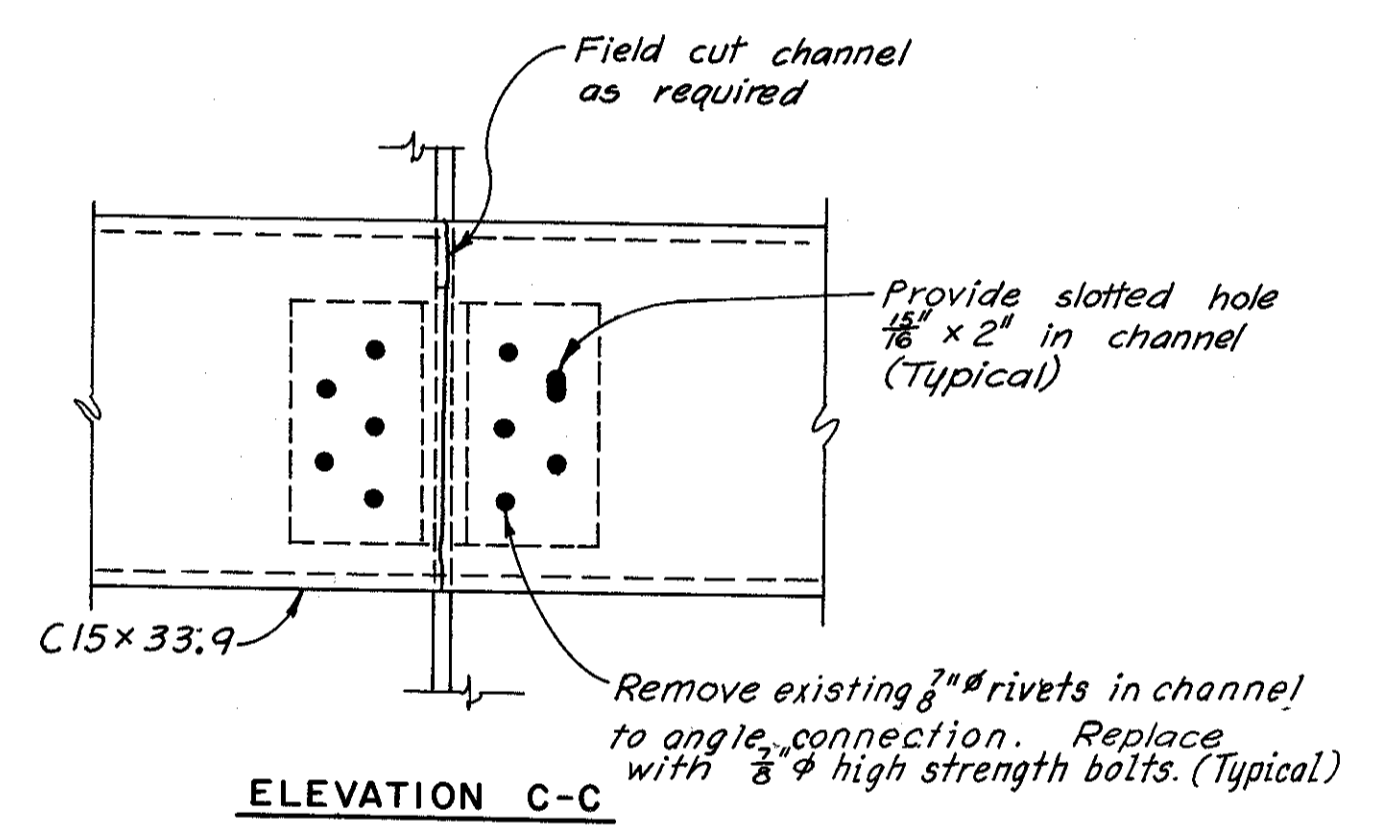


CROSS SECTION OF JOINT CASTING

Dimension	CASTING SIZE			
	3'-9"	3'-7 1/2"	3'-4 1/2"	3'-3"
a	2'-0 3/4"			
b	7 3/4"			
c	3'-9"	3'-7 1/2"	3'-4 1/2"	3'-3"
d	3"	3"	3"	4 1/2"
e	5	5	4	4
f	4 1/2"	3"	7 1/2"	4 1/2"
g	6"	4 1/2"	4 1/2"	6"
h	4	4	3	3
i	11'-0 1/2"	11'-0 1/2"	11 1/2"	10 1/2"
j	11'-4 1/2"	11'-4 1/2"	11'-3"	11'-3"
k	2"	2"	2"	
l	6"	6"	6"	3"
m	2"	2"	2"	2"
n	11'-0 1/2"	10 3/4"	10"	11 1/2"

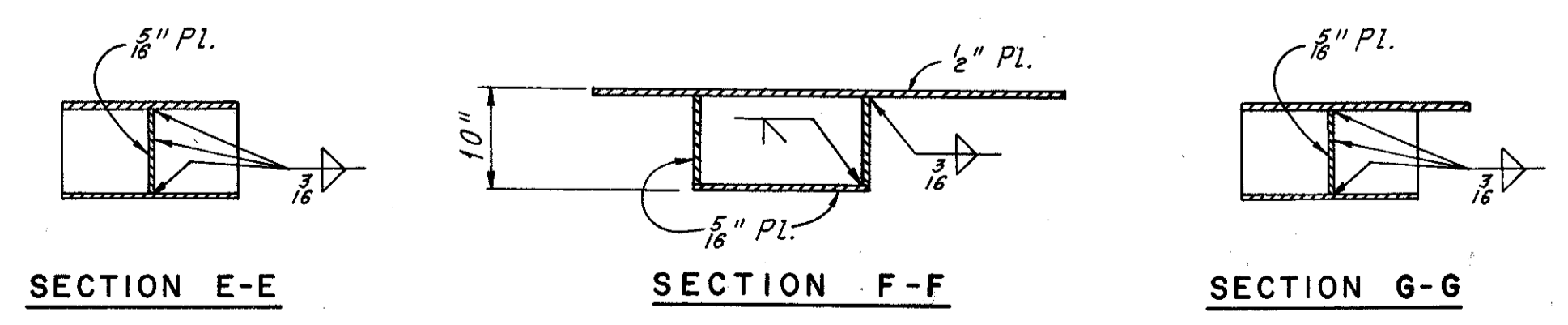
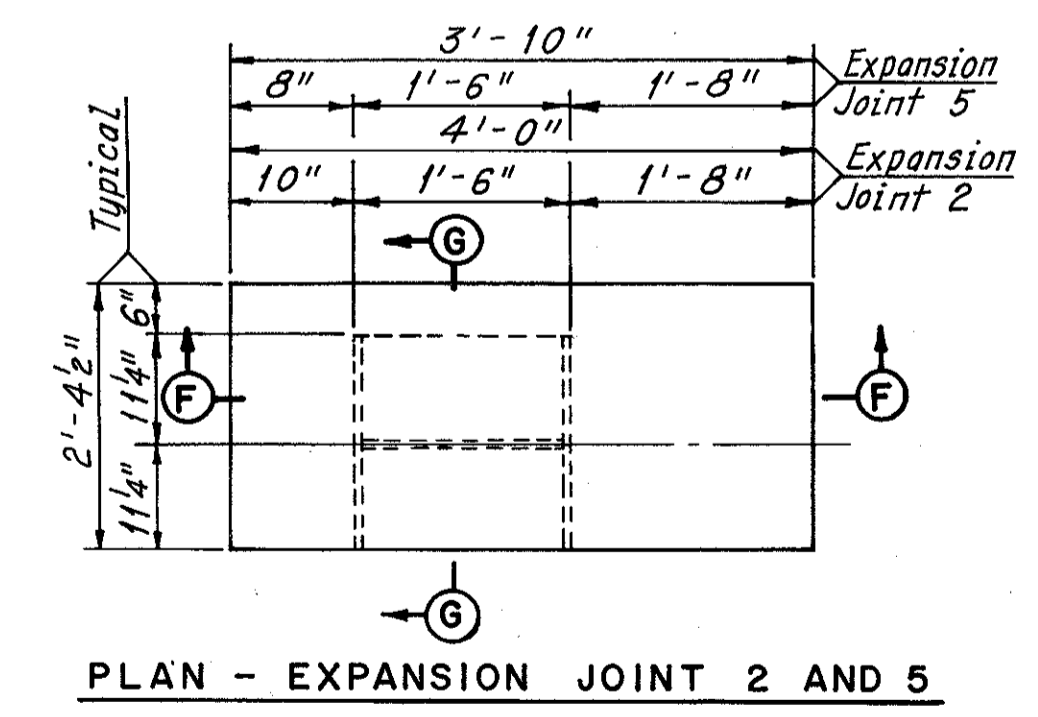
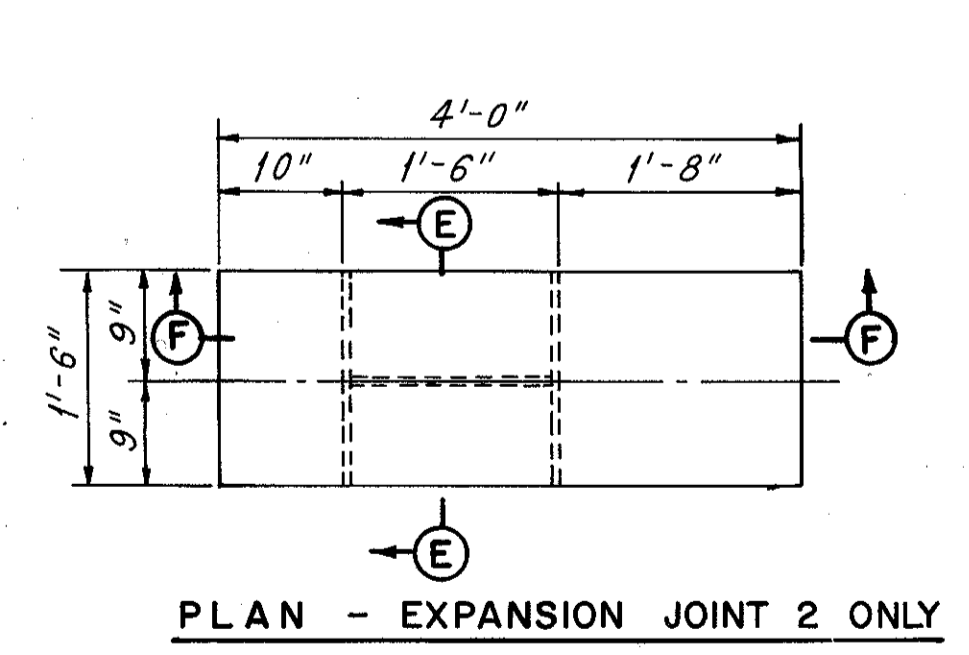
Dimension	CASTING SIZE			
	3'-9"	3'-7 1/2"	3'-4 1/2"	3'-3"
a	11'-9 3/4"			
b	4 3/4"			
c	3'-9"	3'-7 1/2"	3'-4 1/2"	3'-3"

Note: For dimensions d thru n see Support Plate for Expansion Joint 2. For locations of various size castings see Sheet 22/52 and 23/52.



ELEVATION C-C

Construction Procedure:  
 Steps 1 Cut channel as required  
 2 Remove all rivets in channel to angle connections  
 3 Provide slotted holes in channel  
 4 Re-install channels with 3/8" high strength bolts.



TEMPORARY PLATE DETAILS

Note: The cost of the temporary plates are not included as a part of the final pay quantities in the Plans. Payment and ownership of the plates shall be by the Contractor.

Notes:  
 For location of Sections A-A and B-B and for construction sequence see Sheets 22/52 and 23/52.  
 For Notes see Sheet 21/52.

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

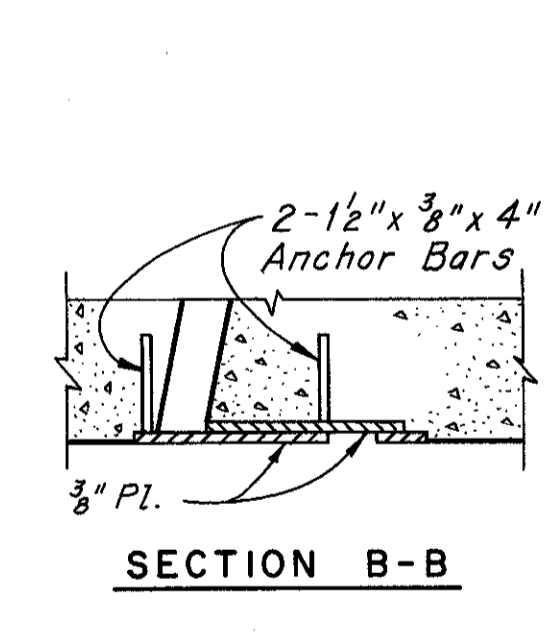
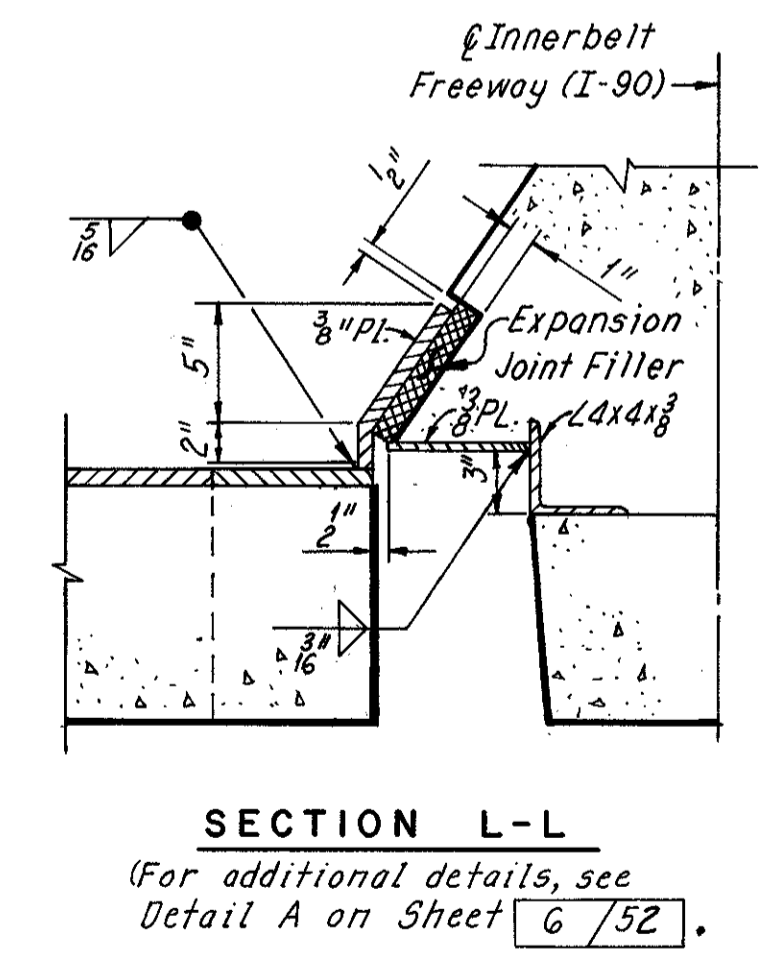
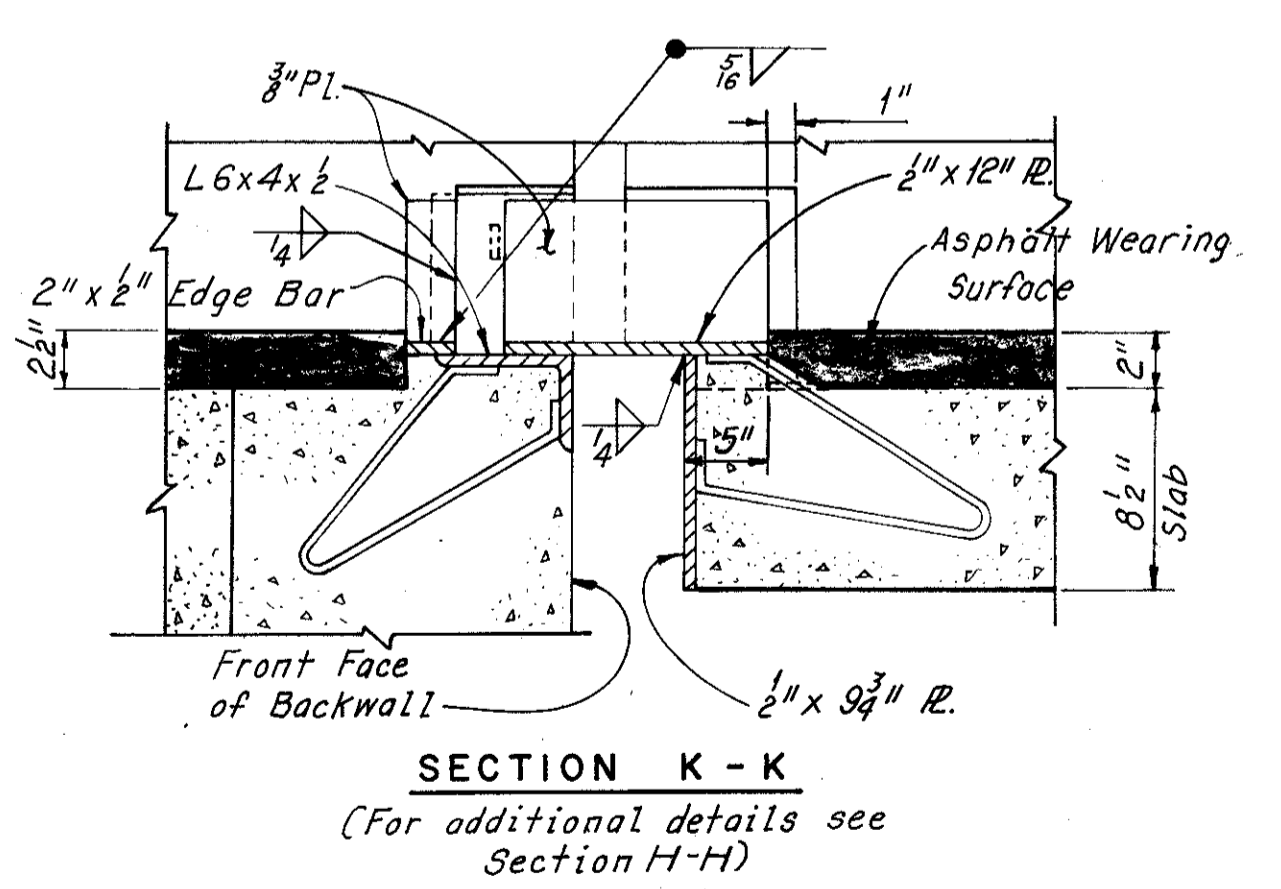
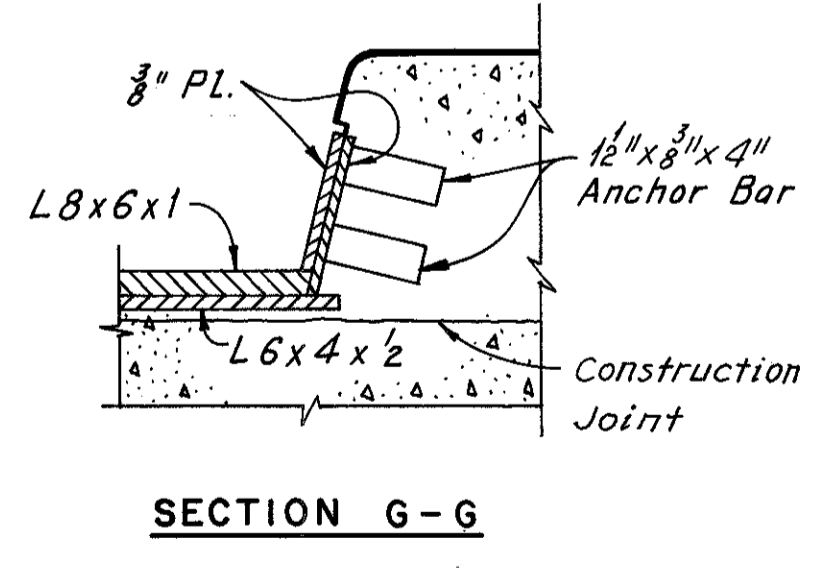
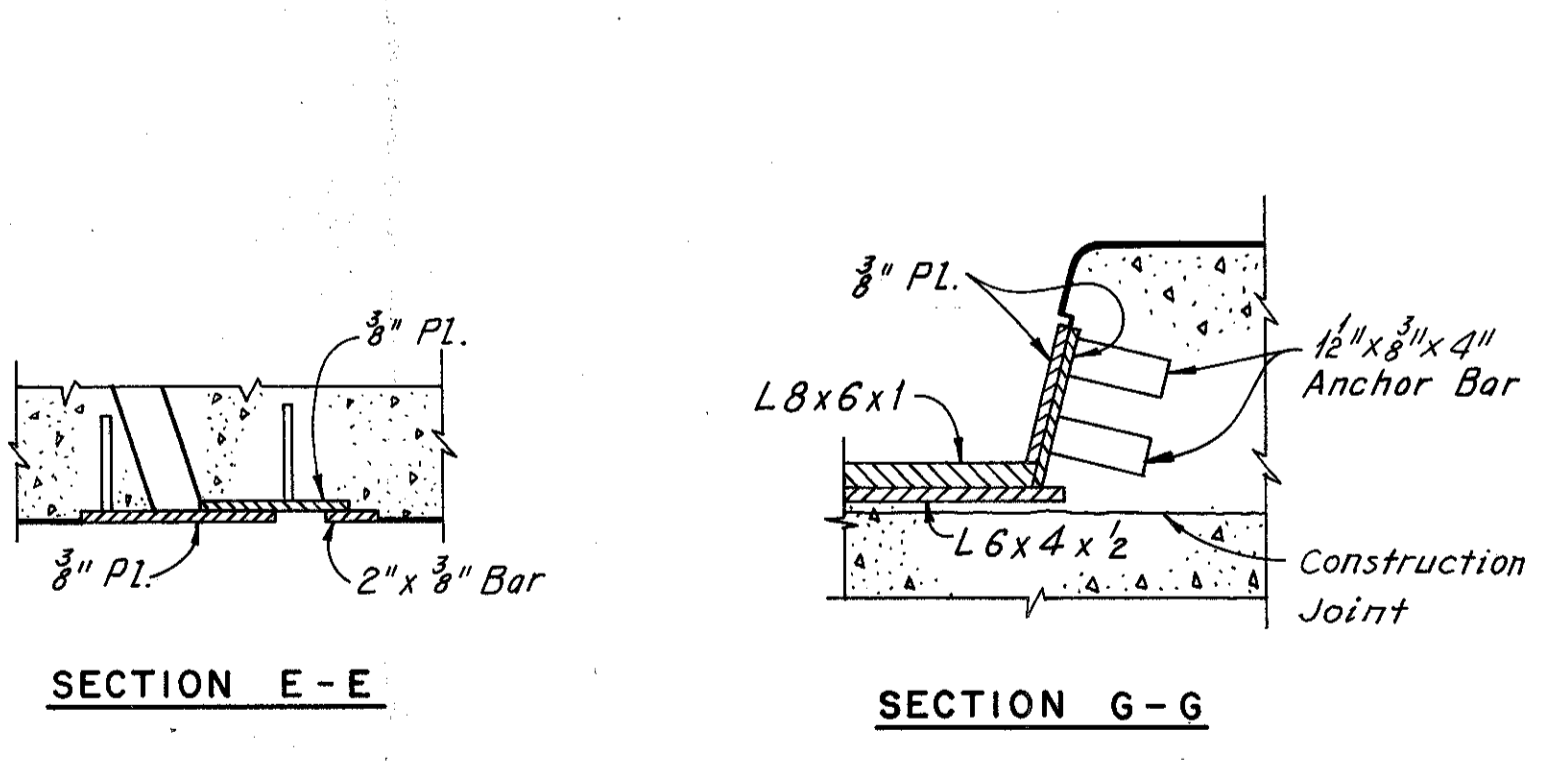
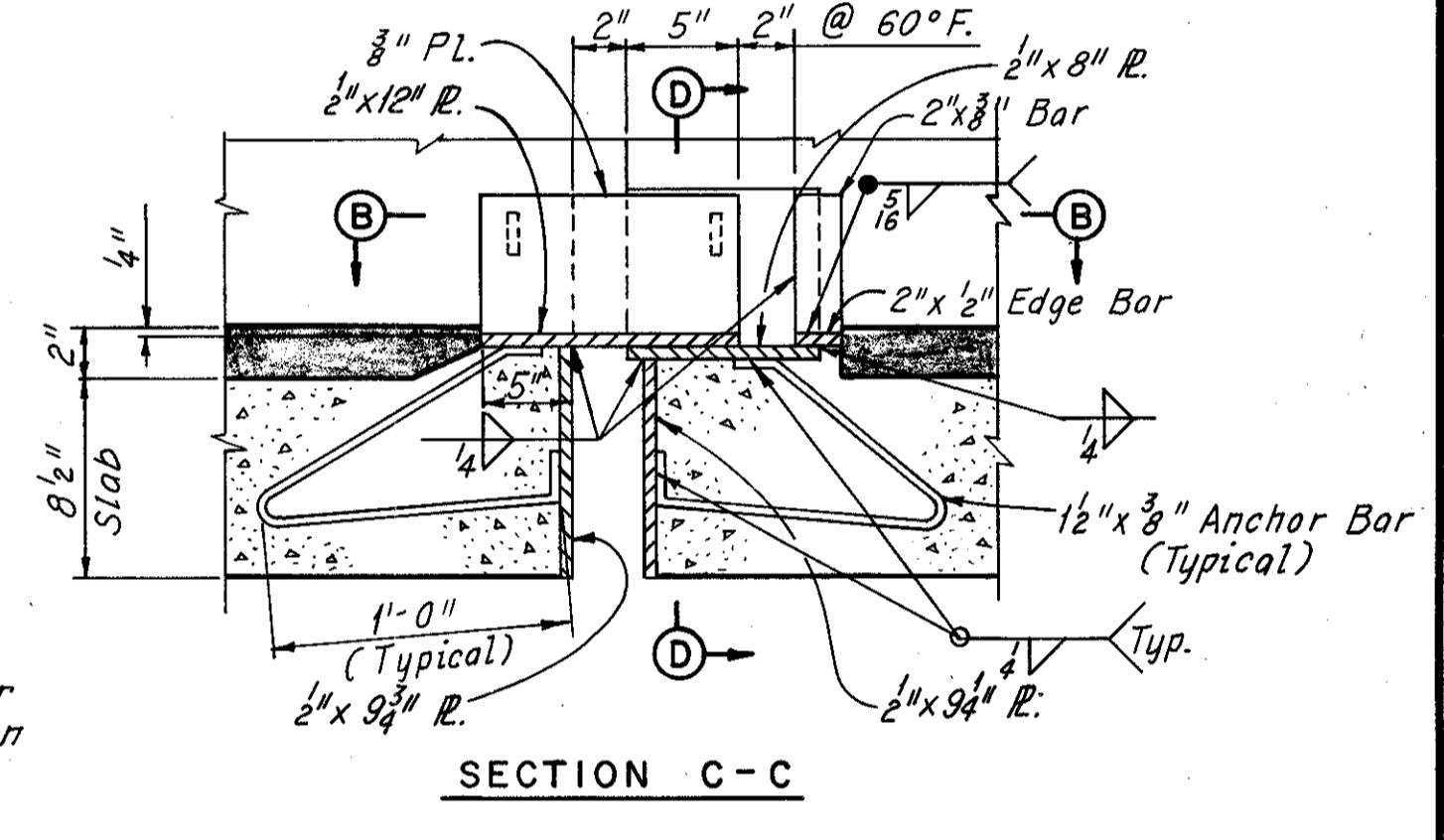
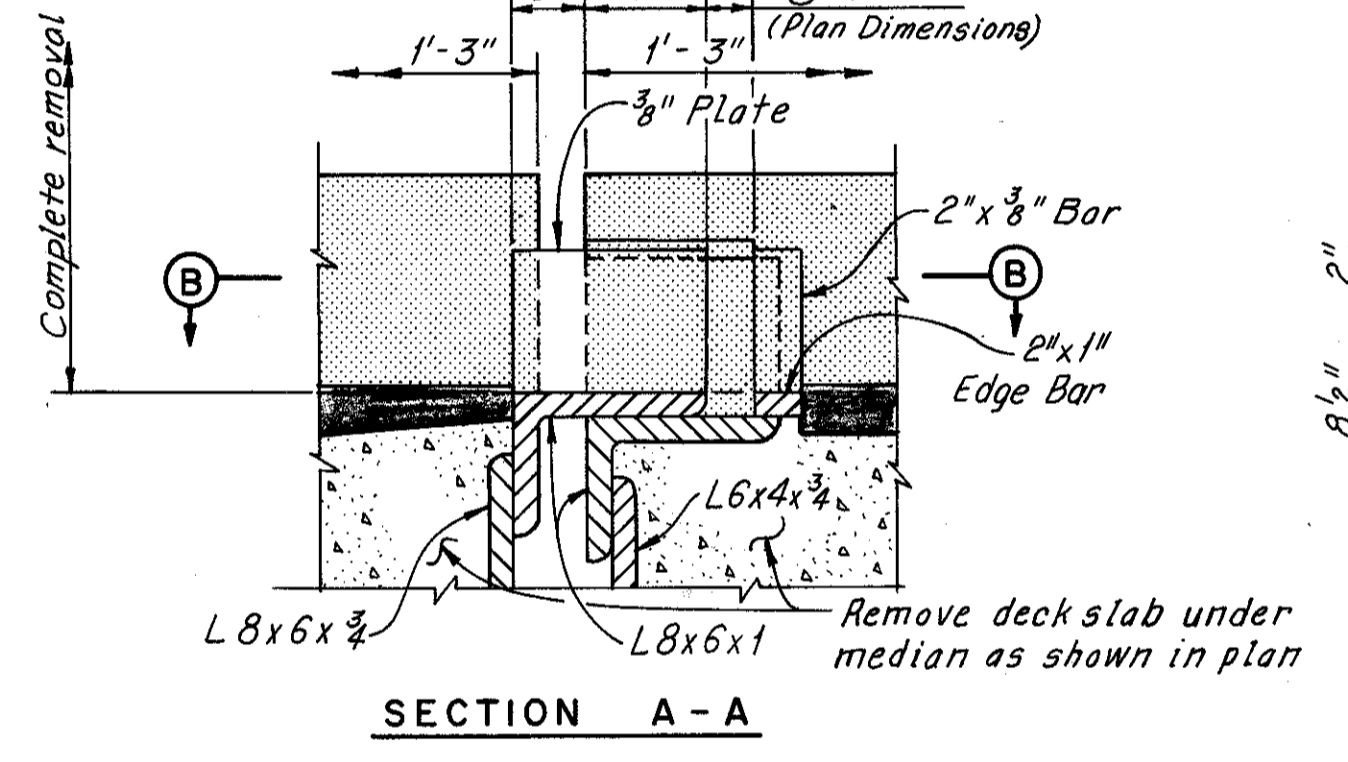
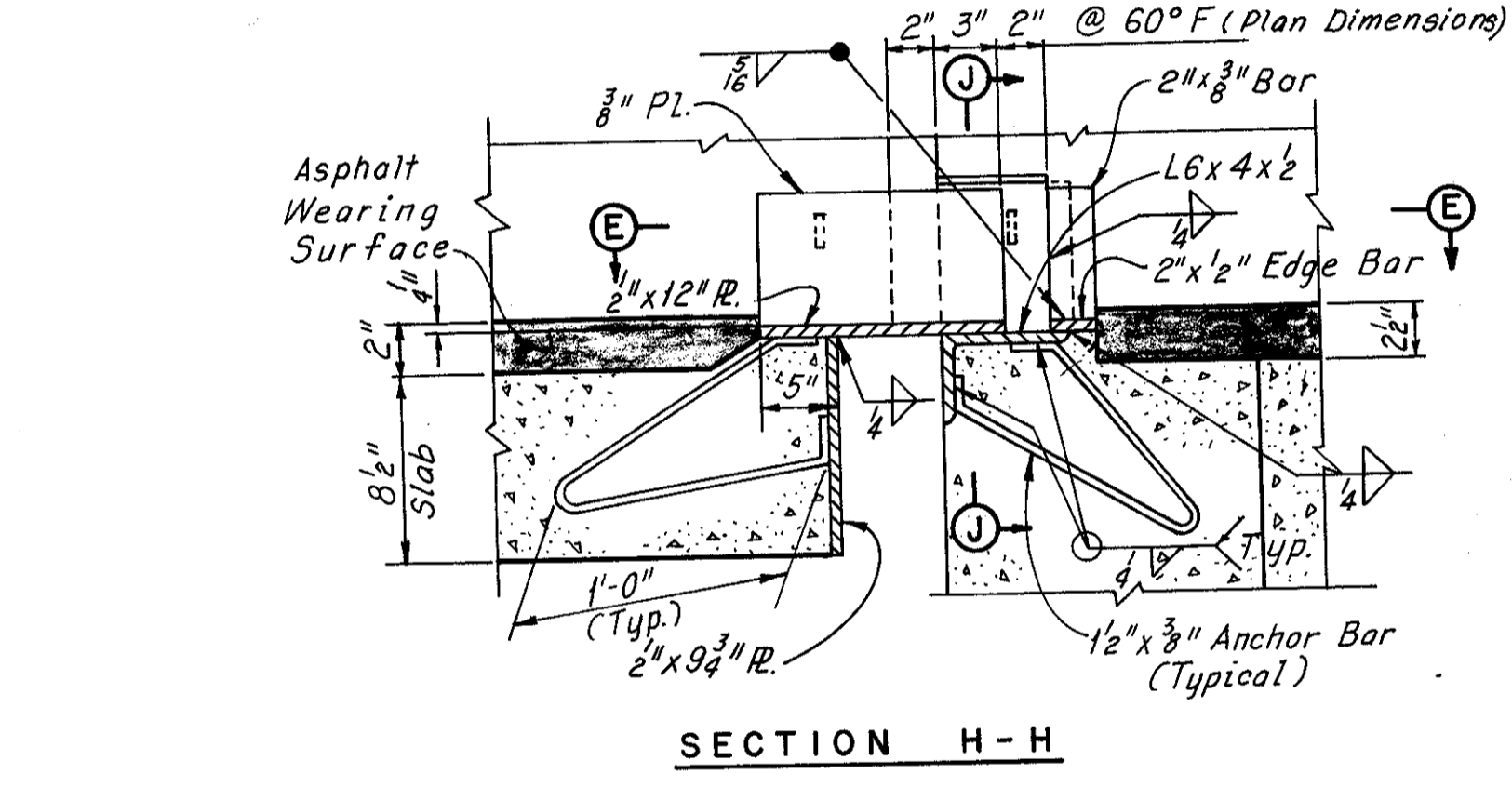
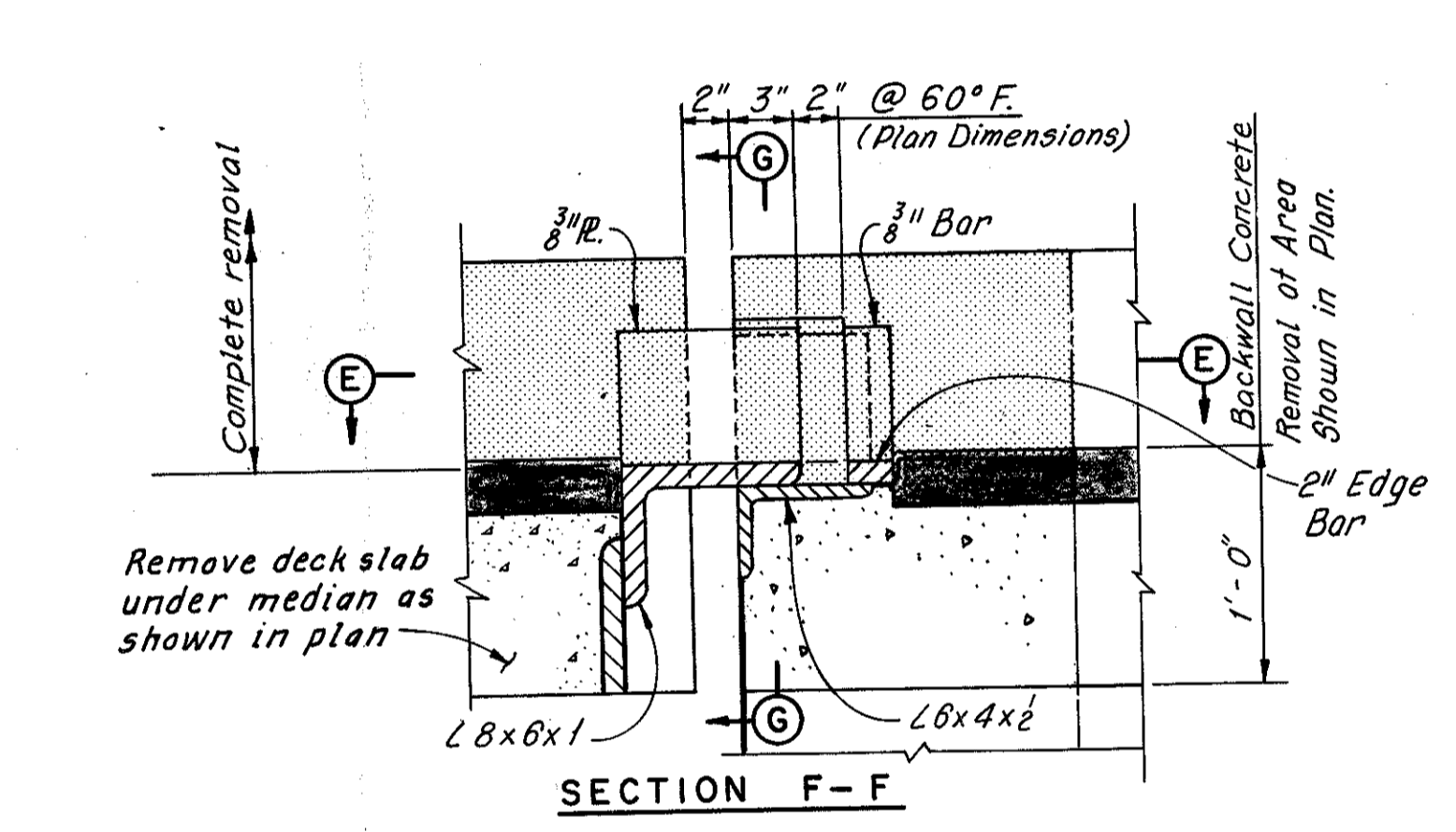
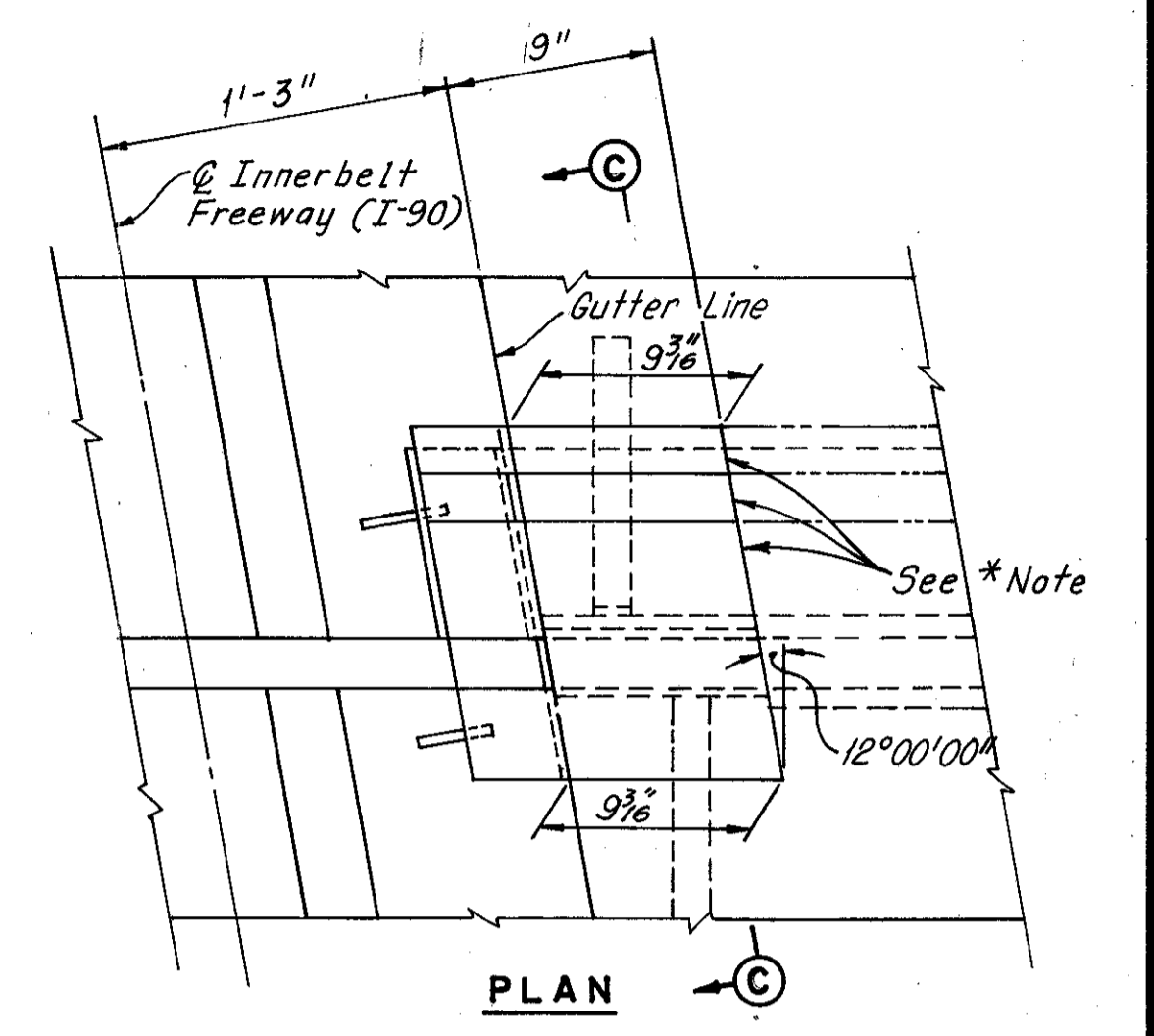
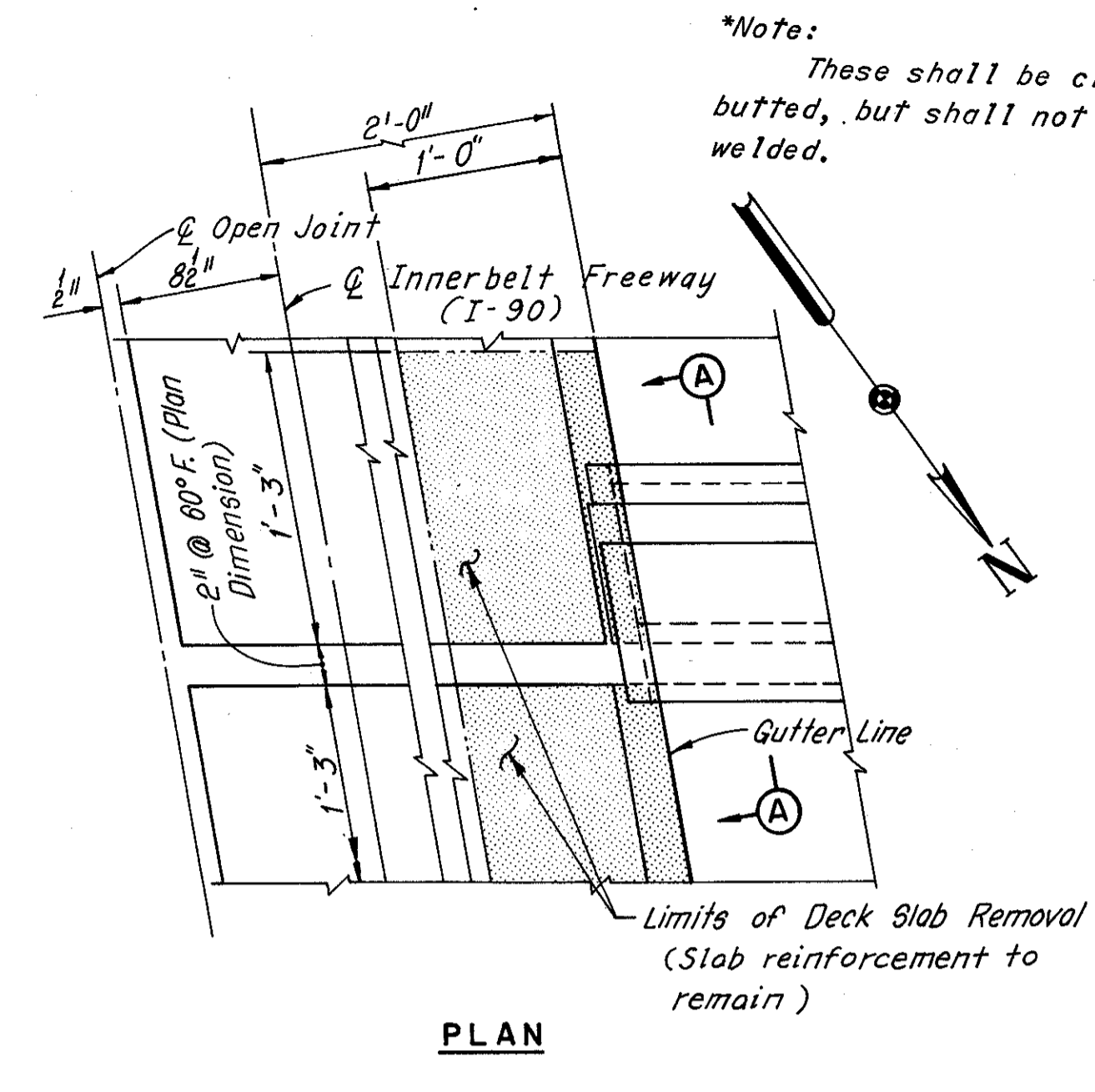
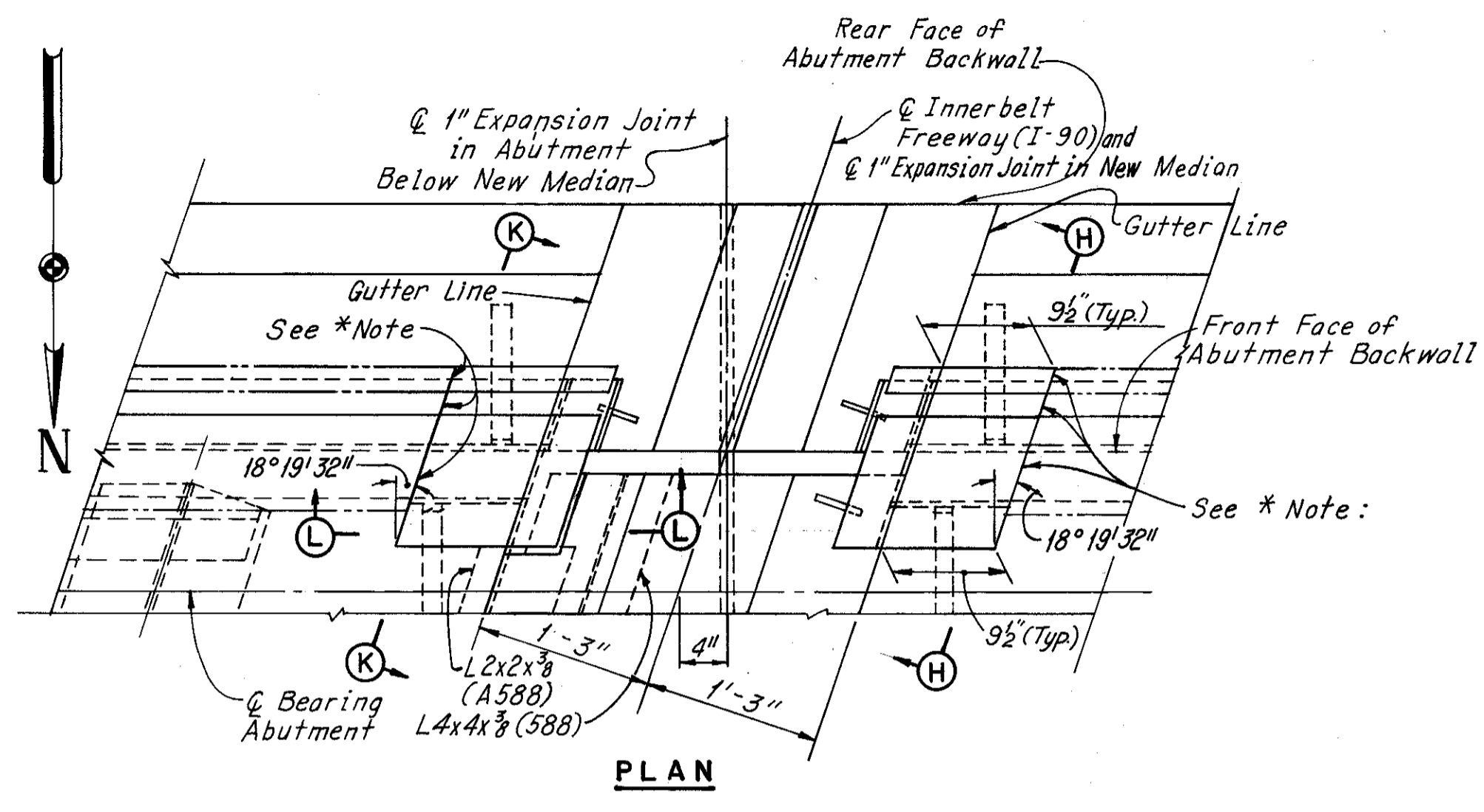
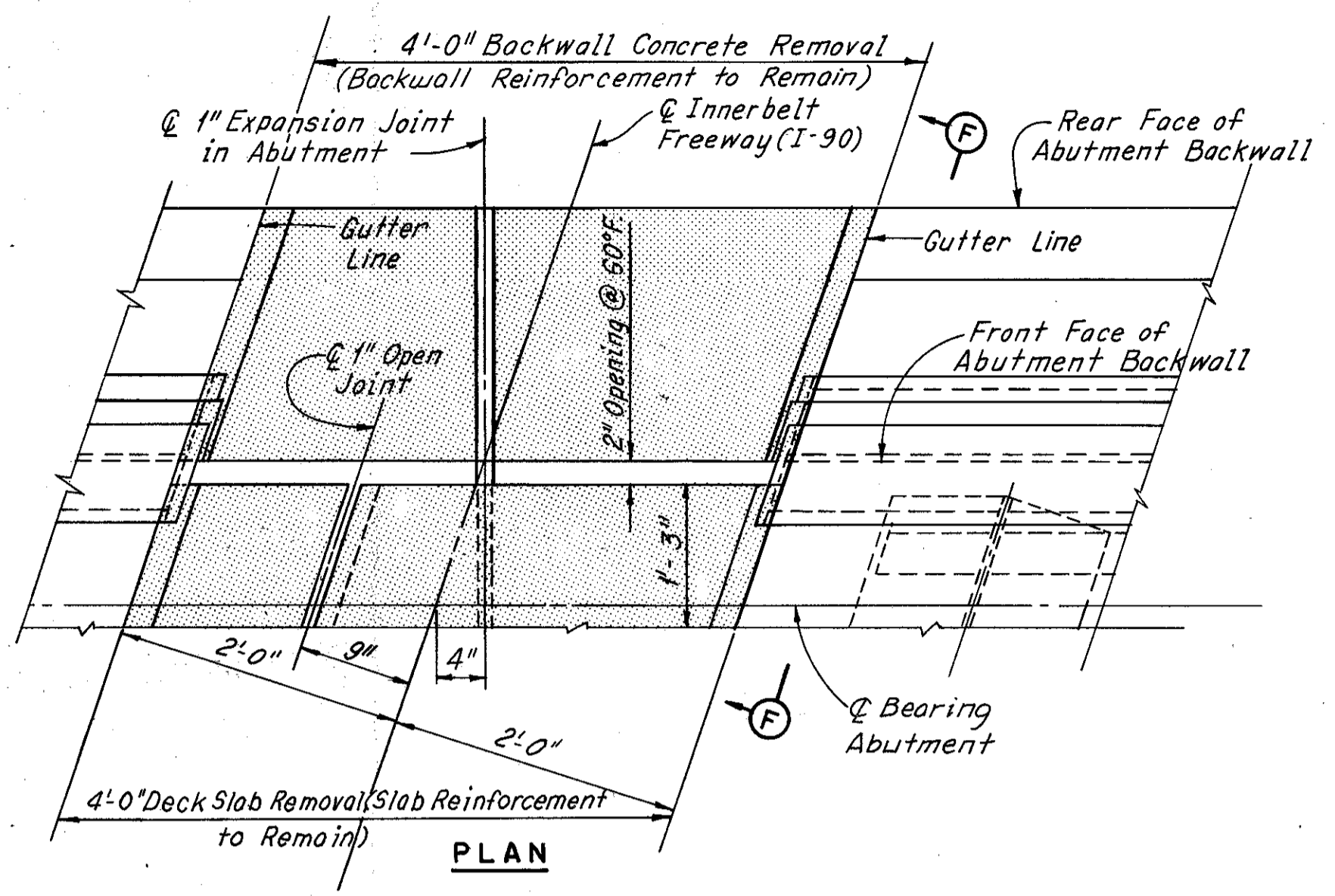
**EXPANSION JOINTS 2 AND 5  
 REALIGNMENT DETAILS**

OHIO INTERSTATE SAFETY PLANS  
 BR. NO. CUY-90-14.67 STA. 3+87.63  
 42R-17.43 STA. 54+65.78  
 42R-17.50 STA. 54+65.78  
 42-17.50

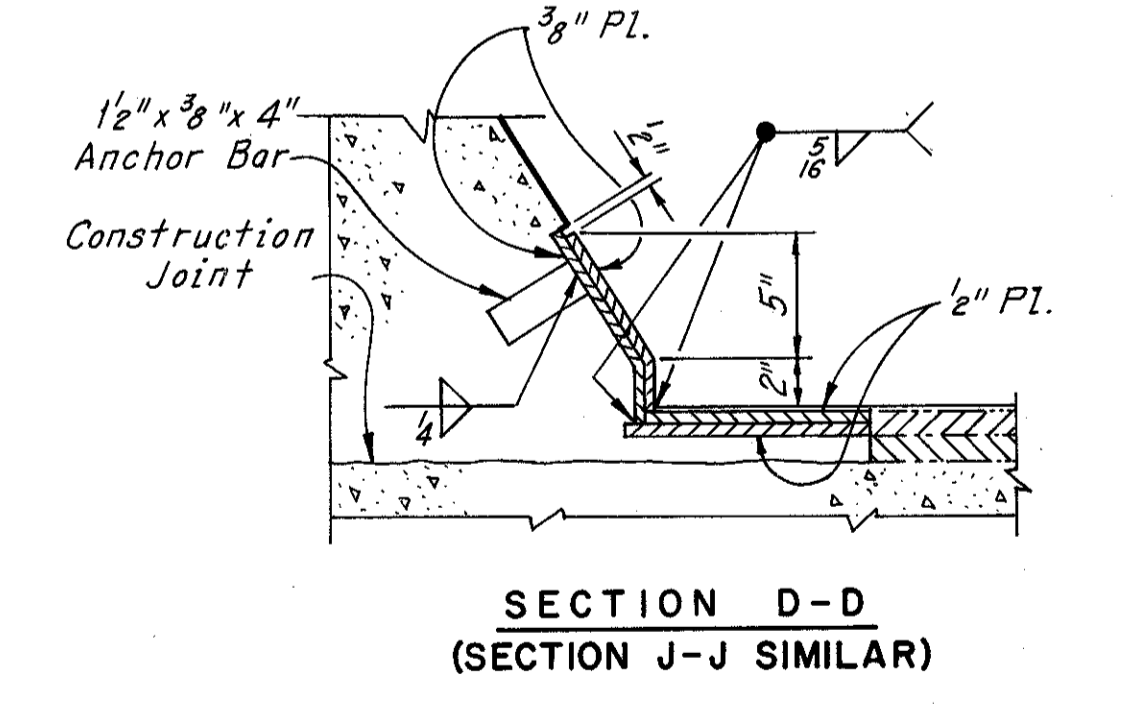
CUYAHOGA COUNTY OHIO

DATE 3-24-72 TRACED C.P. CHECKED D.M.P. REVIEWED C.A.B. REVISED  
 DATE 3-27-72 DATE 4-7-72 DATE 5-26-72 SHEET 24 / 52

CUYAHOGA COUNTY  
CUY-90-15.24



**EXISTING**



**MODIFICATION**

**EXISTING**

**MODIFICATION**

**EXPANSION JOINT AT ABUTMENT**

**EXPANSION JOINT IW**

Notes:  
 Except as otherwise indicated the dimensions at the expansion joints result from the original plan dimensions. The Contractor shall field check these dimensions prior to steel fabrication.  
 Top of sliding plate shall match top surface of adjacent existing sliding plate or tooth casting.  
 The contact surface between sliding plates shall not be painted but shall be cleaned and lubricated with flake graphite in the field.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>EXPANSION JOINT MODIFICATION AT MEDIAN INNERBELT EXTENSION OHIO INTERSTATE SAFETY PLANS</b>			
BR. NO CUY-90-14 67	42R-17 43	42R-17 50	42 -17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN DHS	TRACED CP	CHECKED JNP	REVIEWED CAB
DATE 3-1-72	DATE 3-20-72	DATE 4-14-72	DATE 5-26-72
			SHEET 25/52



UNRECORDED  
REVISION

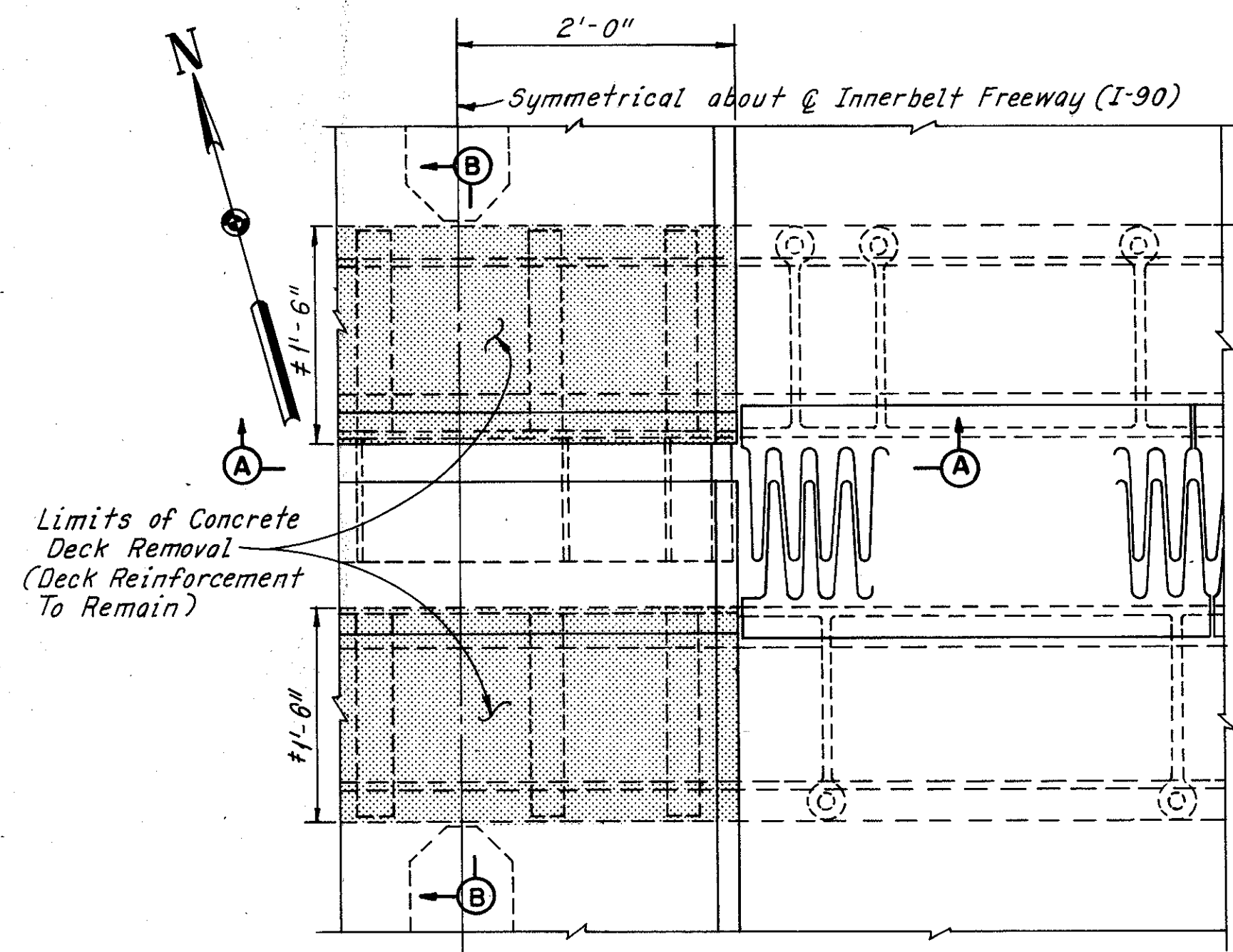
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-90-1 (87) 24	

27  
52

CUYAHOGA COUNTY  
CUY-90-15.24

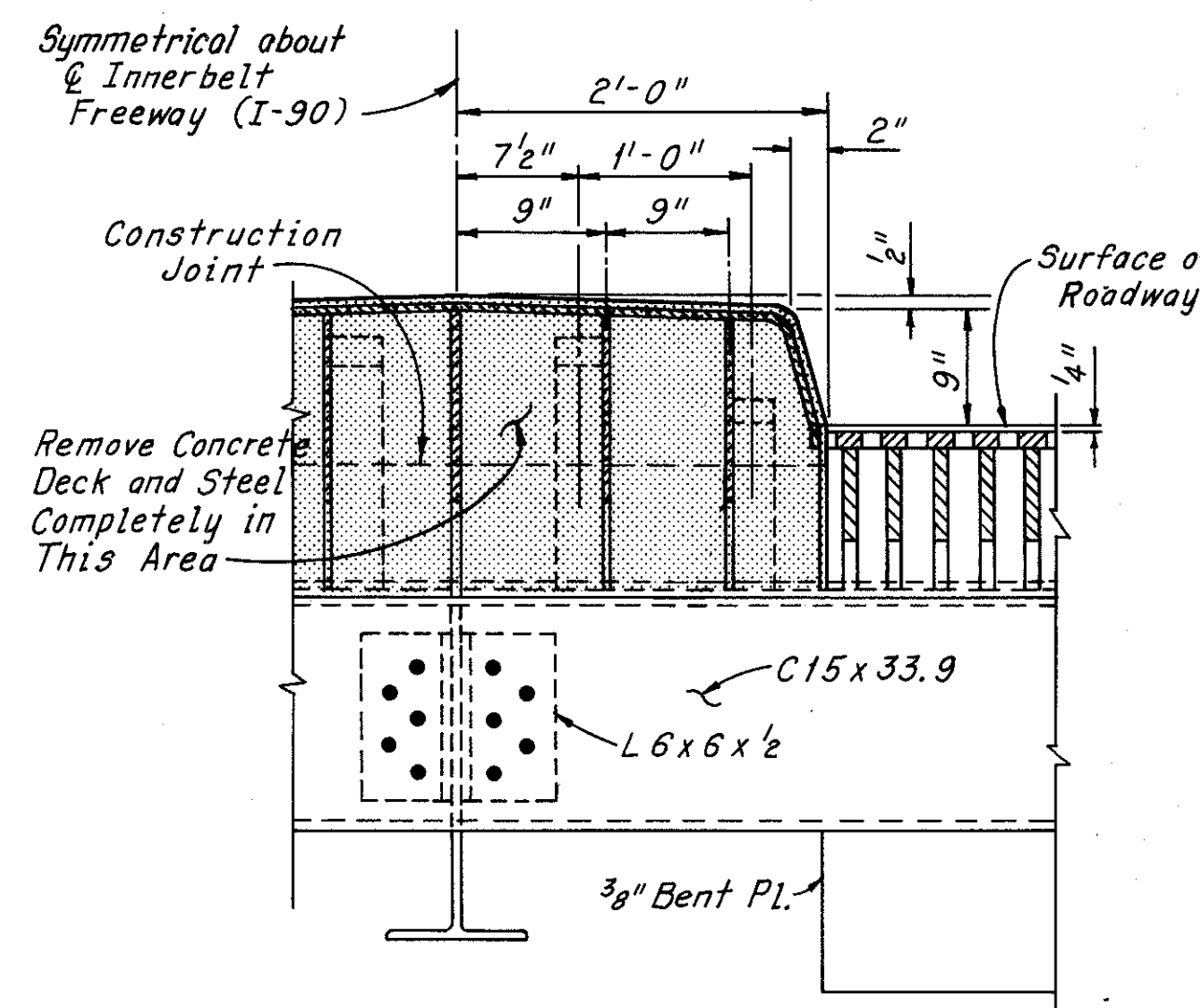
Expansion Joint	Dimension					
	a	b	c	d	e	f
1	1'-4 1/2"	1'-0"	6 3/8"	2 3/8"	6 3/8"	10"
2	11 1/8"	1'-0"	1 1/8"	8 1/8"	3 1/8"	10"
3 and 6	1'-3 1/2"	1'-0"	5 1/2"	4 1/2"	4 1/2"	10"
4	1'-5"	1'-0"	7"	3"	6 1/4"	10"
5	8 3/8"	9 1/4"	1 3/8"	5 3/8"	3 1/8"	7 1/4"

Note: Dimensions a, c, d and e are field measurements.

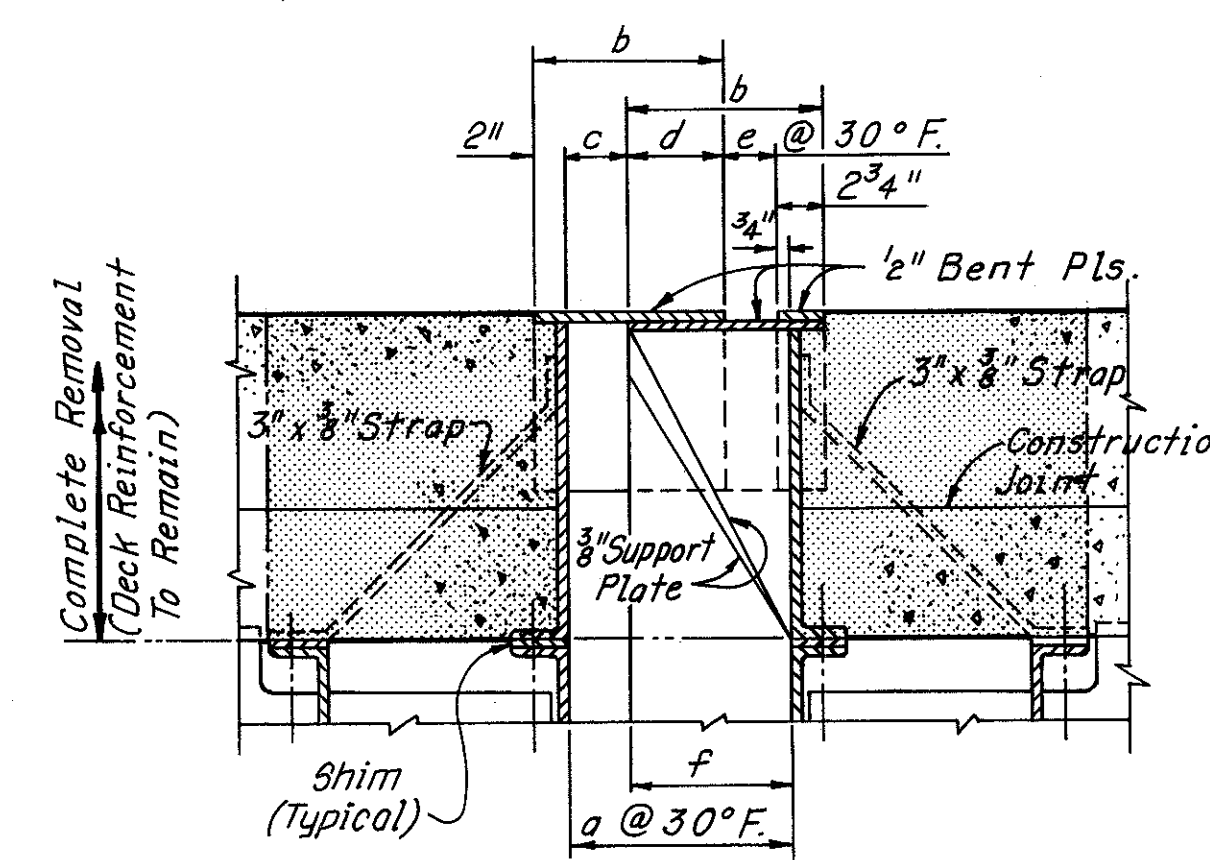


PART PLAN OF EXPANSION JOINTS 2, 3, 4 AND 5

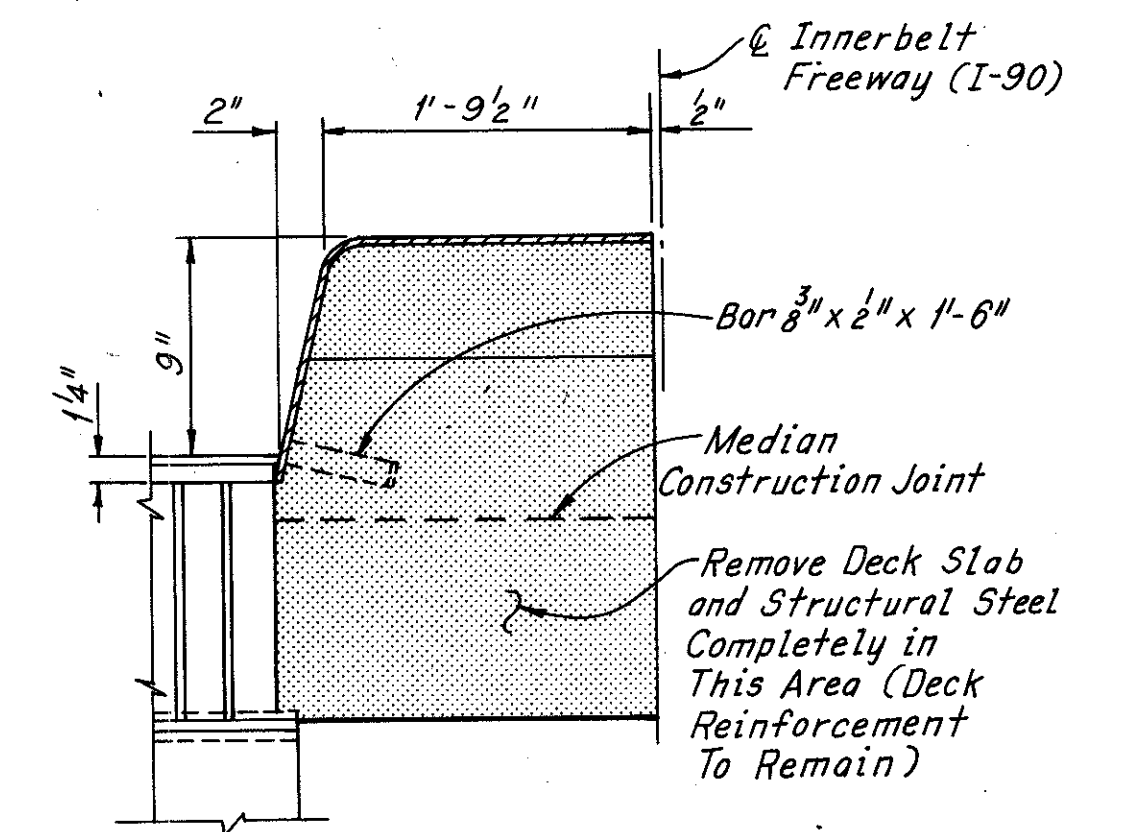
\*Note: The removal of the deck slab concrete at Expansion Joints 1, 2 and 5 has to be co-ordinated with the realignment of these expansion joints. See the Construction Procedure on Sheets 21/52, 22/52, and 23/52 for the overall sequence of operations.



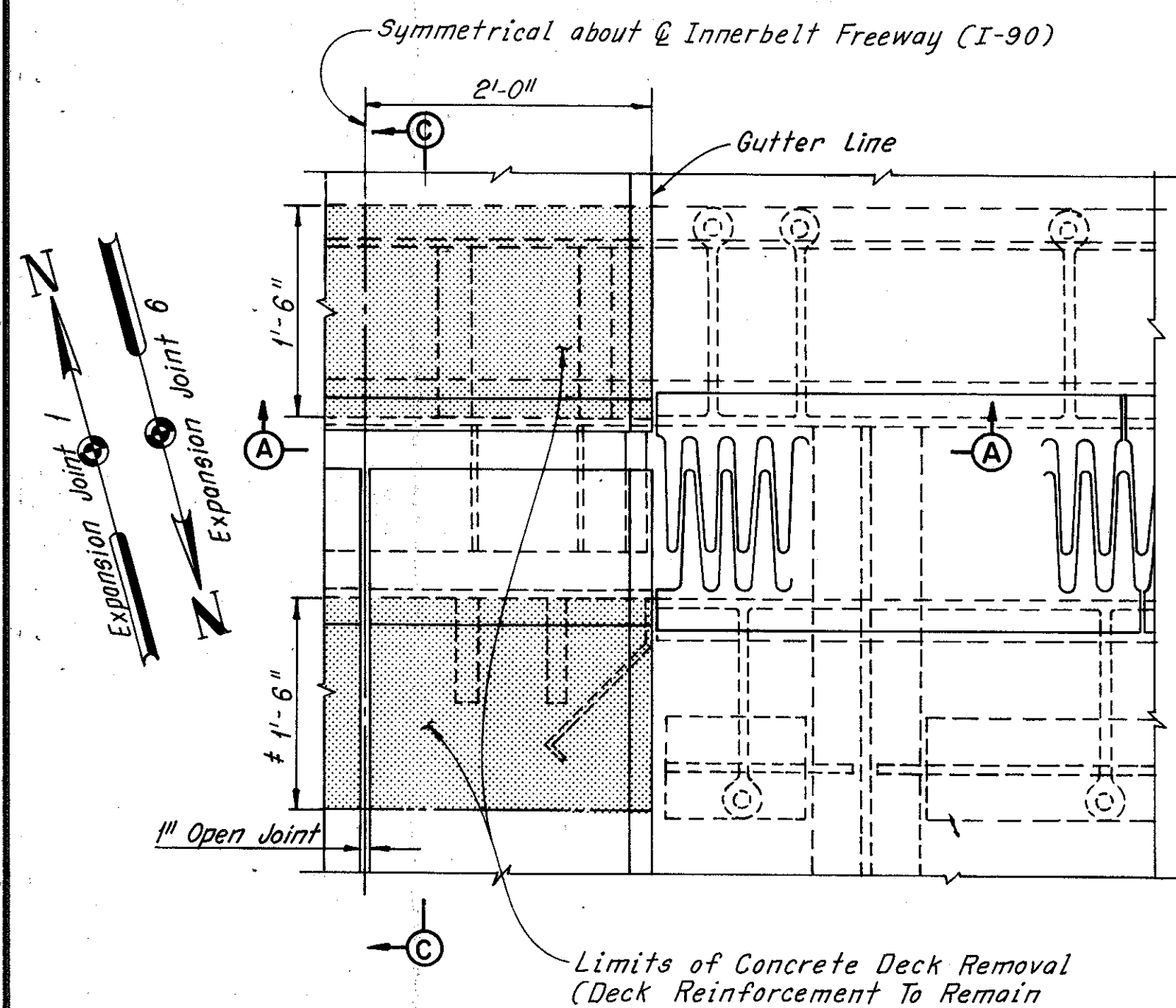
SECTION A-A



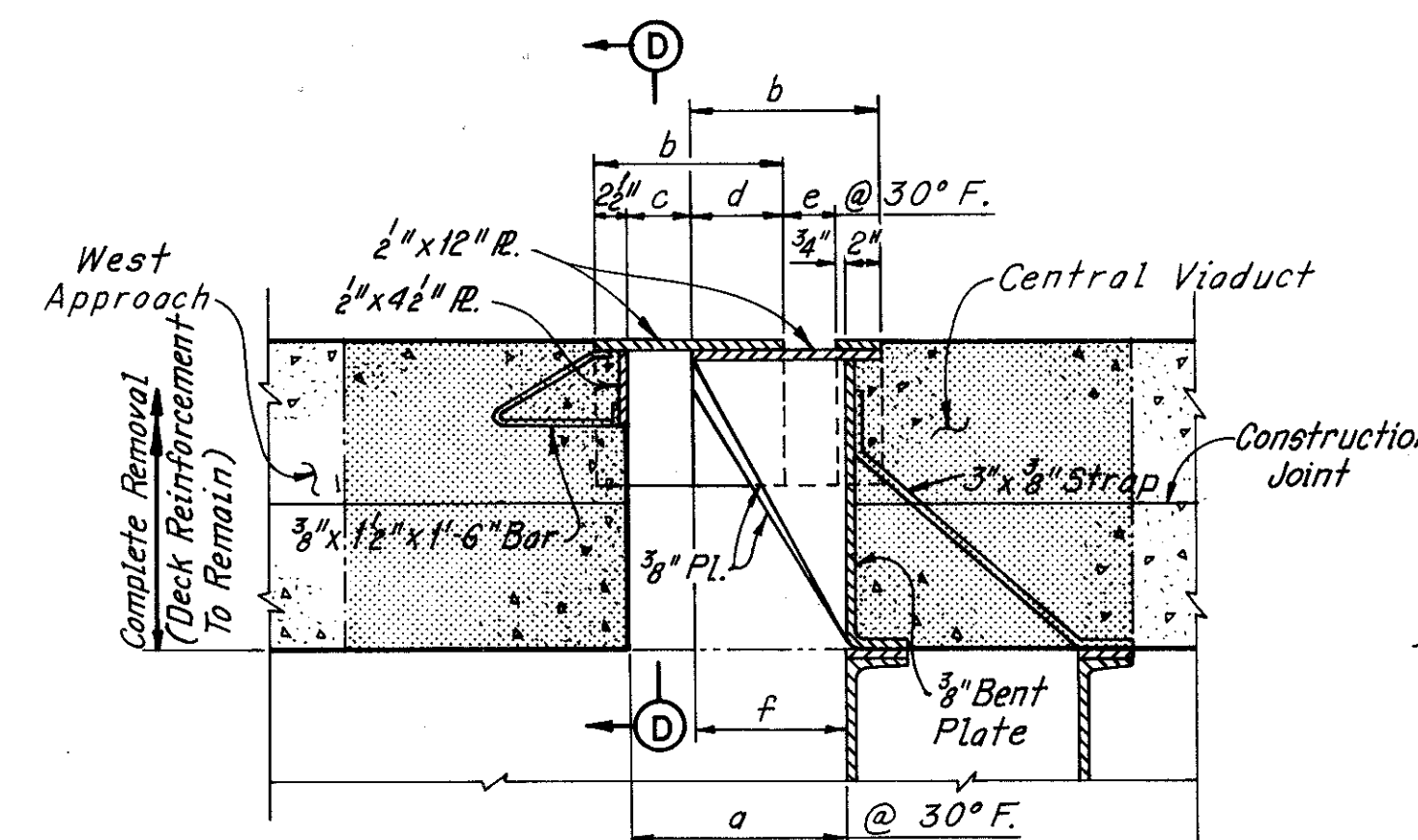
SECTION B-B



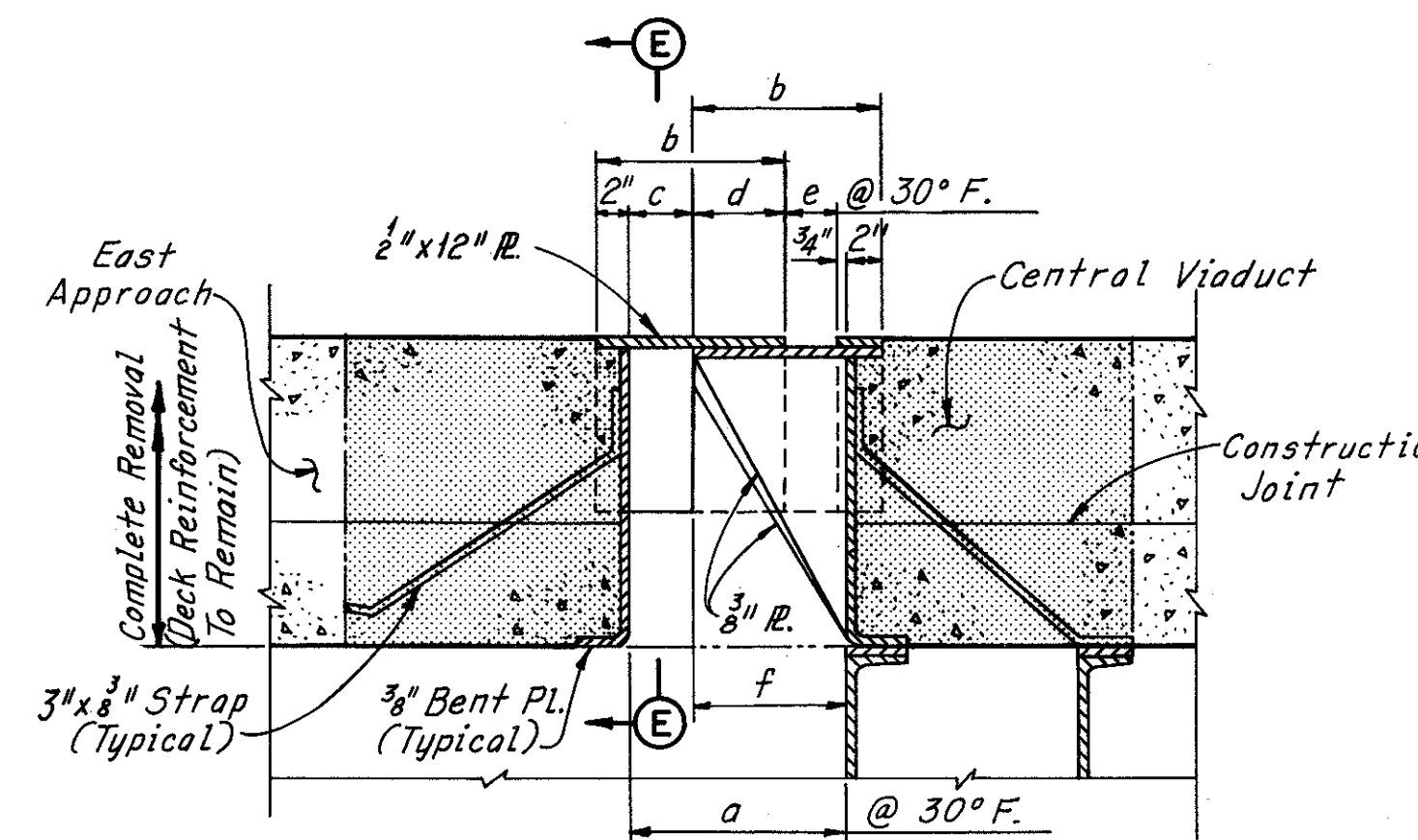
SECTION D-D  
(Expansion Joint 1)



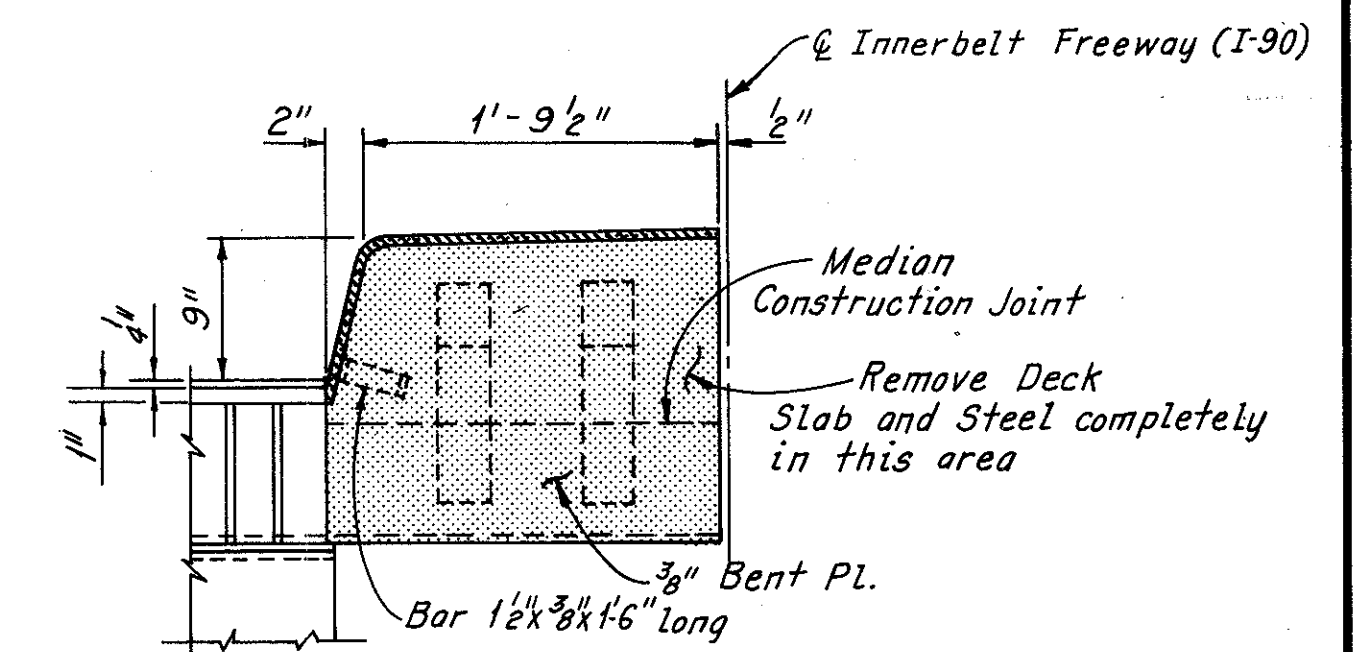
PART PLAN OF EXPANSION JOINTS 1 AND 6



SECTION C-C  
(Expansion Joint 1)



SECTION C-C  
(Expansion Joint 6)



SECTION E-E  
(Expansion Joint 6)

Notes:  
For Joint Modification Details see Sheet 28/52.  
For Notes see Sheet 25/52.

EXISTING CONDITIONS

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

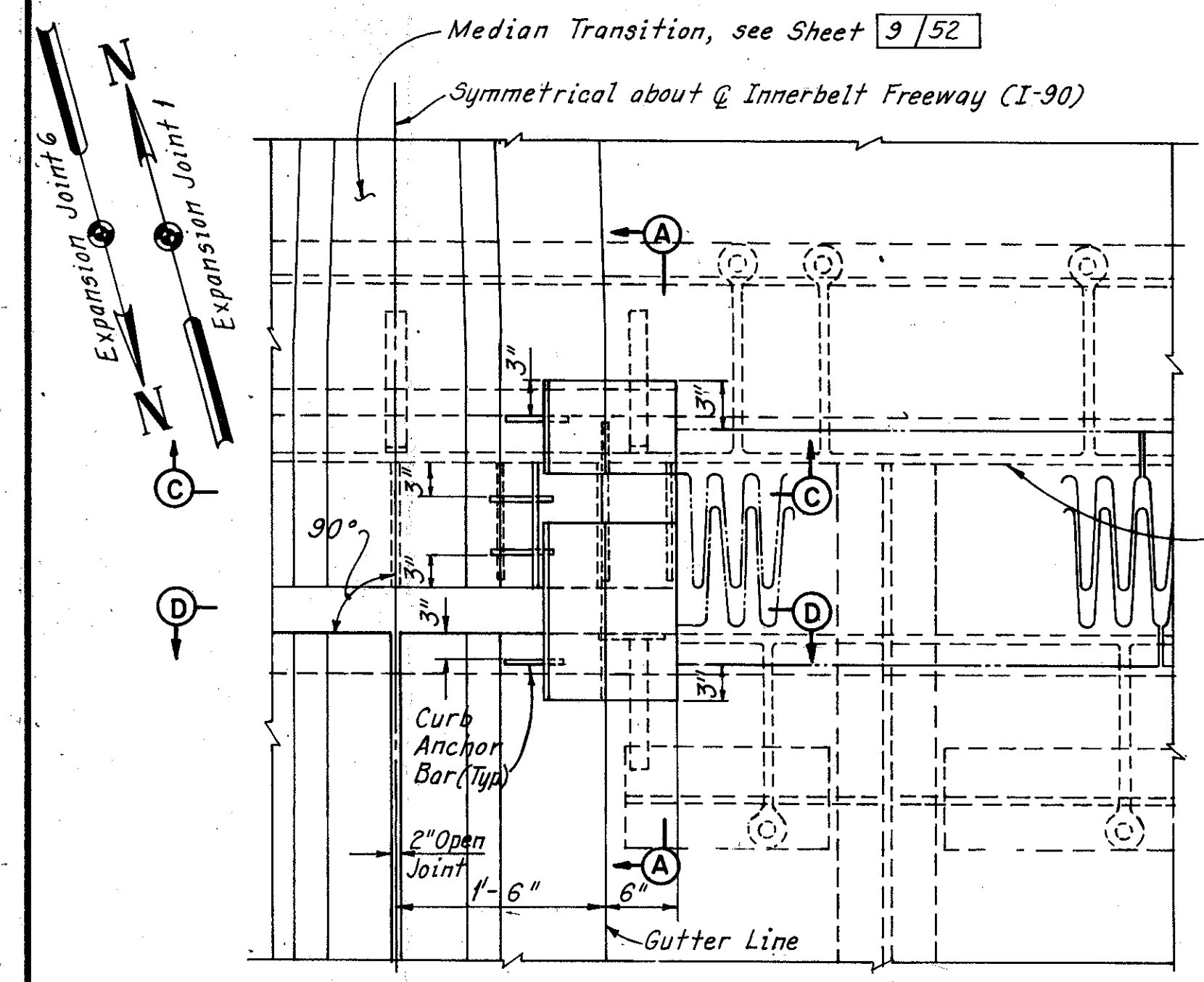
**EXPANSION JOINT MODIFICATION  
AT MEDIAN  
CENTRAL VIADUCT**  
OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

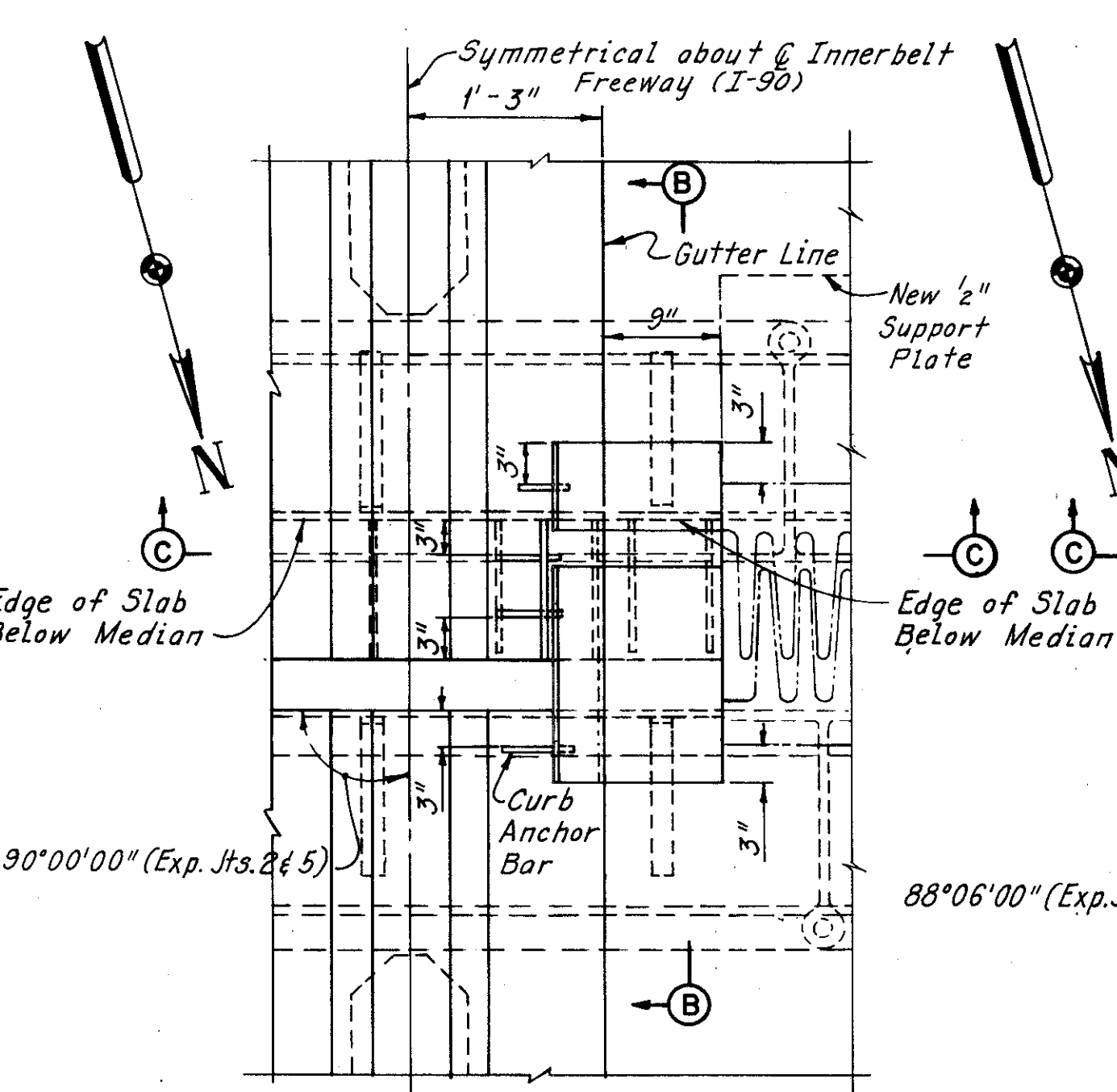
CUYAHOGA COUNTY OHIO

DRAWN D.H.S. THACED C.P. CHECKED D.M.P. REVIEWED C.A.B. REVISED  
DATE 2-21-72 DATE 3-14-72 DATE 4-12-72 DATE 5-26-72 SHEET 27/52

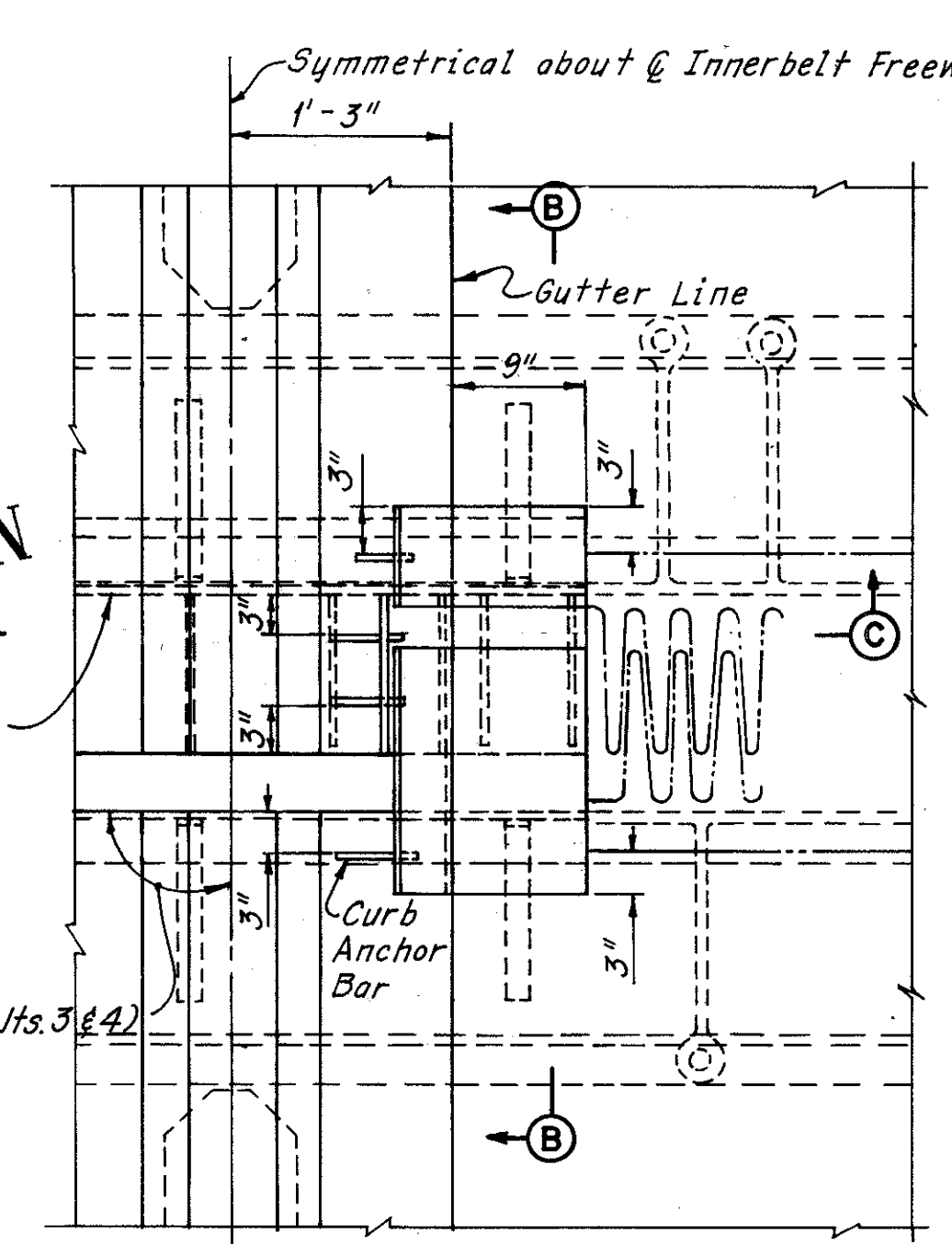
CUYAHOGA COUNTY  
CUY-90-15.24



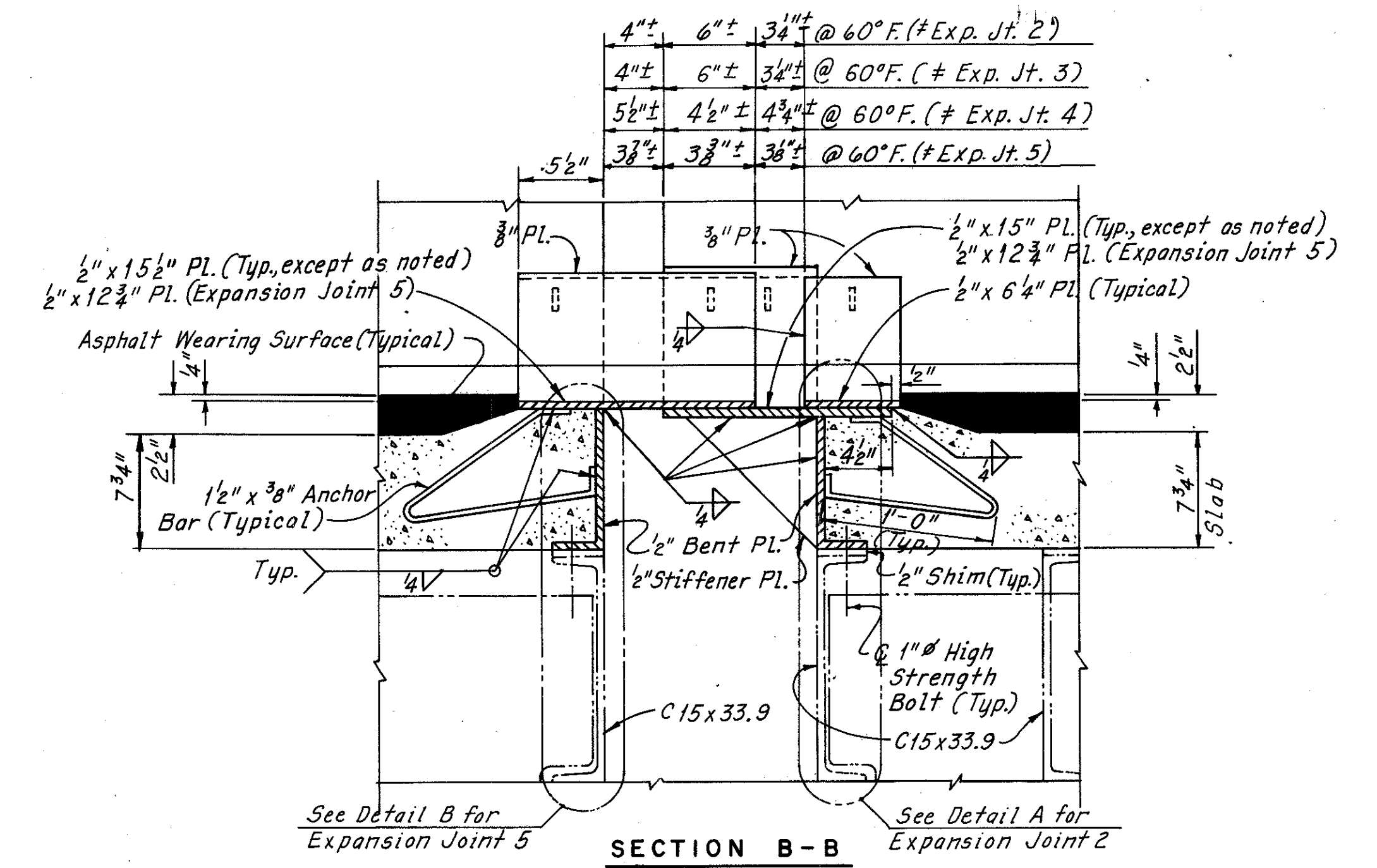
PART PLAN OF EXPANSION JOINTS 1 AND 6



PART PLAN OF EXPANSION JOINT 2  
(EXPANSION JOINT 5 SIMILAR)



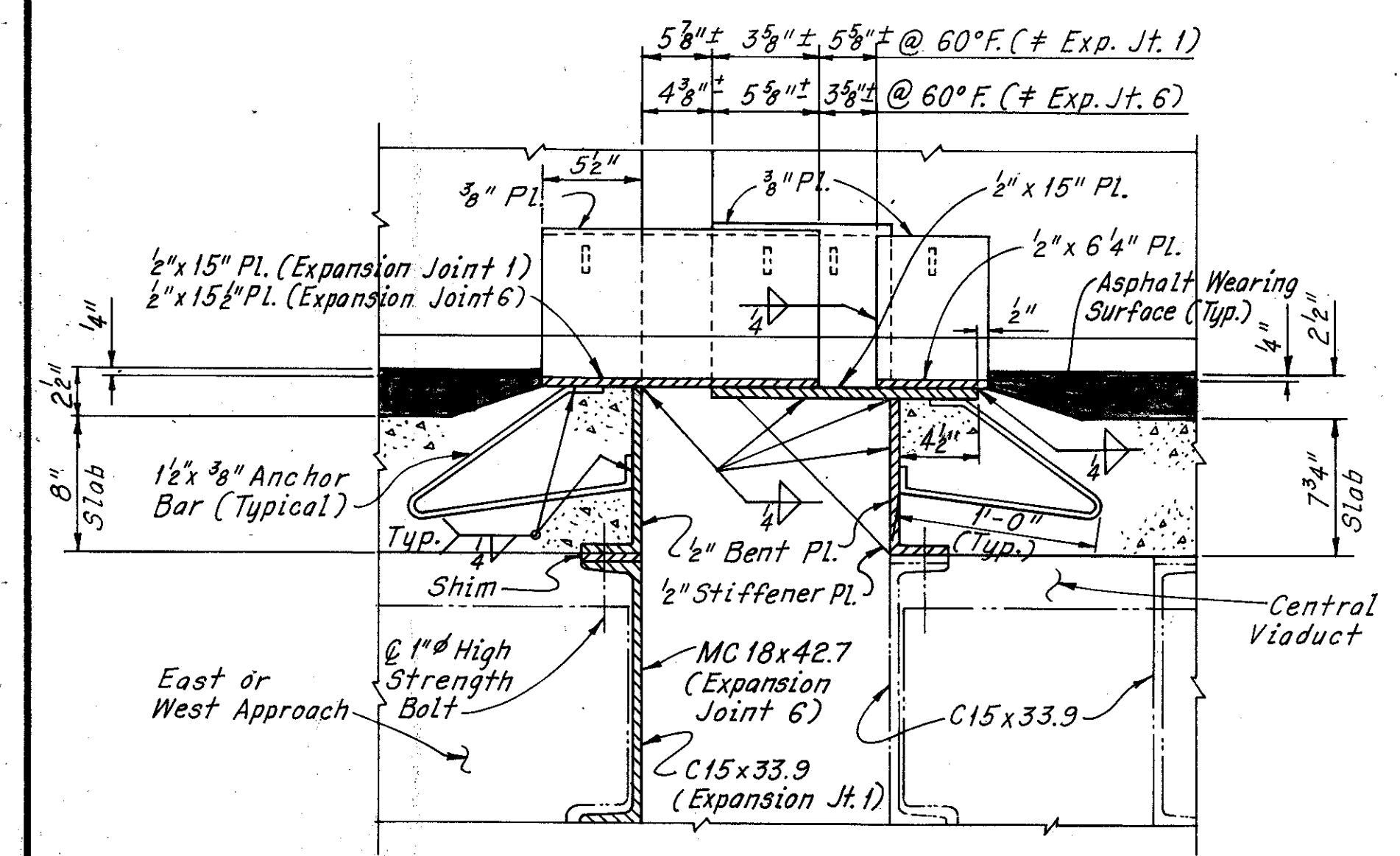
PART PLAN OF EXPANSION JOINTS 3 AND 4



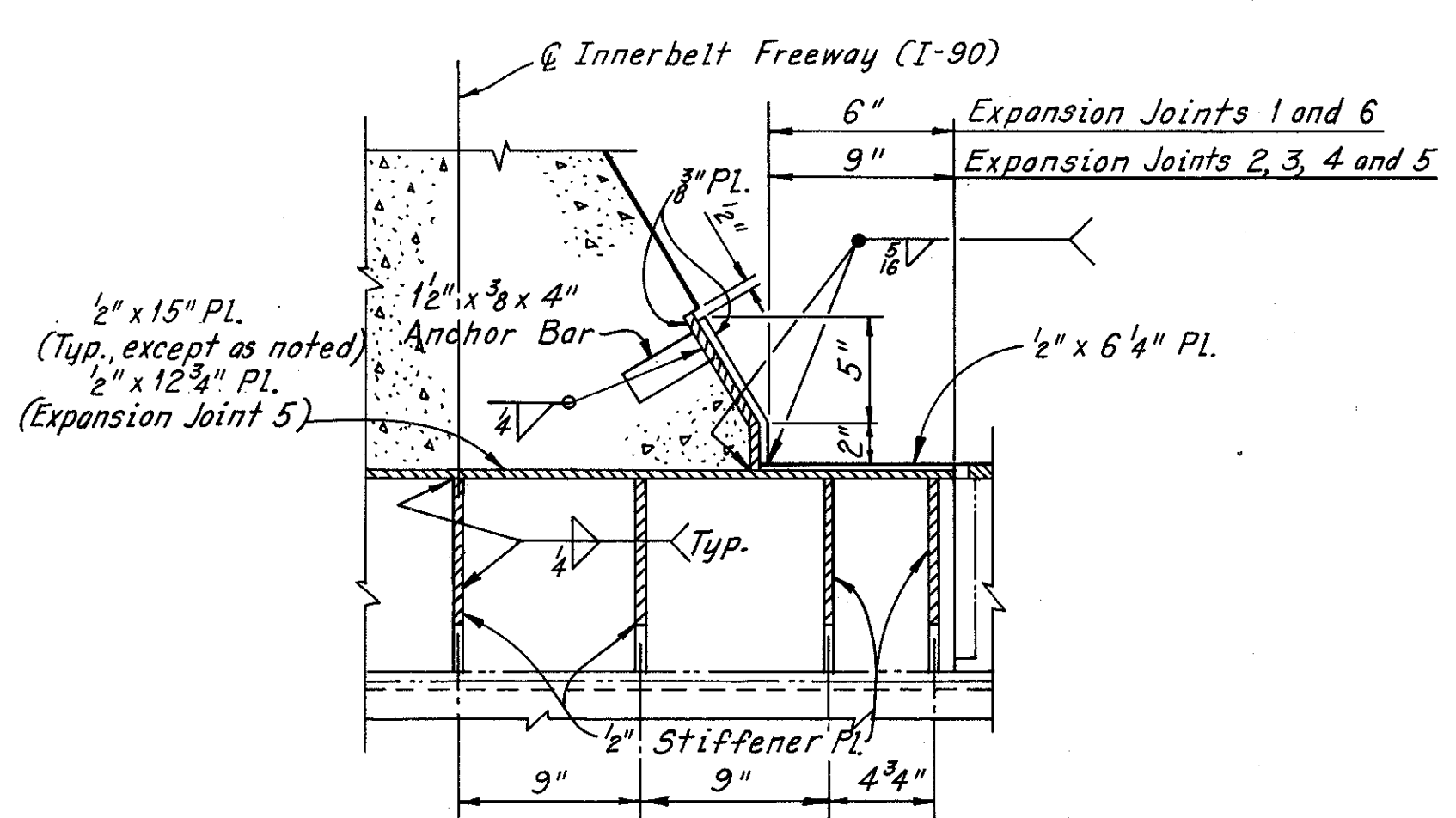
SECTION B-B  
See Detail B for Expansion Joint 5  
See Detail A for Expansion Joint 2

\*Note: These dimensions are extrapolated from the field measurements taken at 30°F. They are shown for information only and should not be used to set the expansion plates.

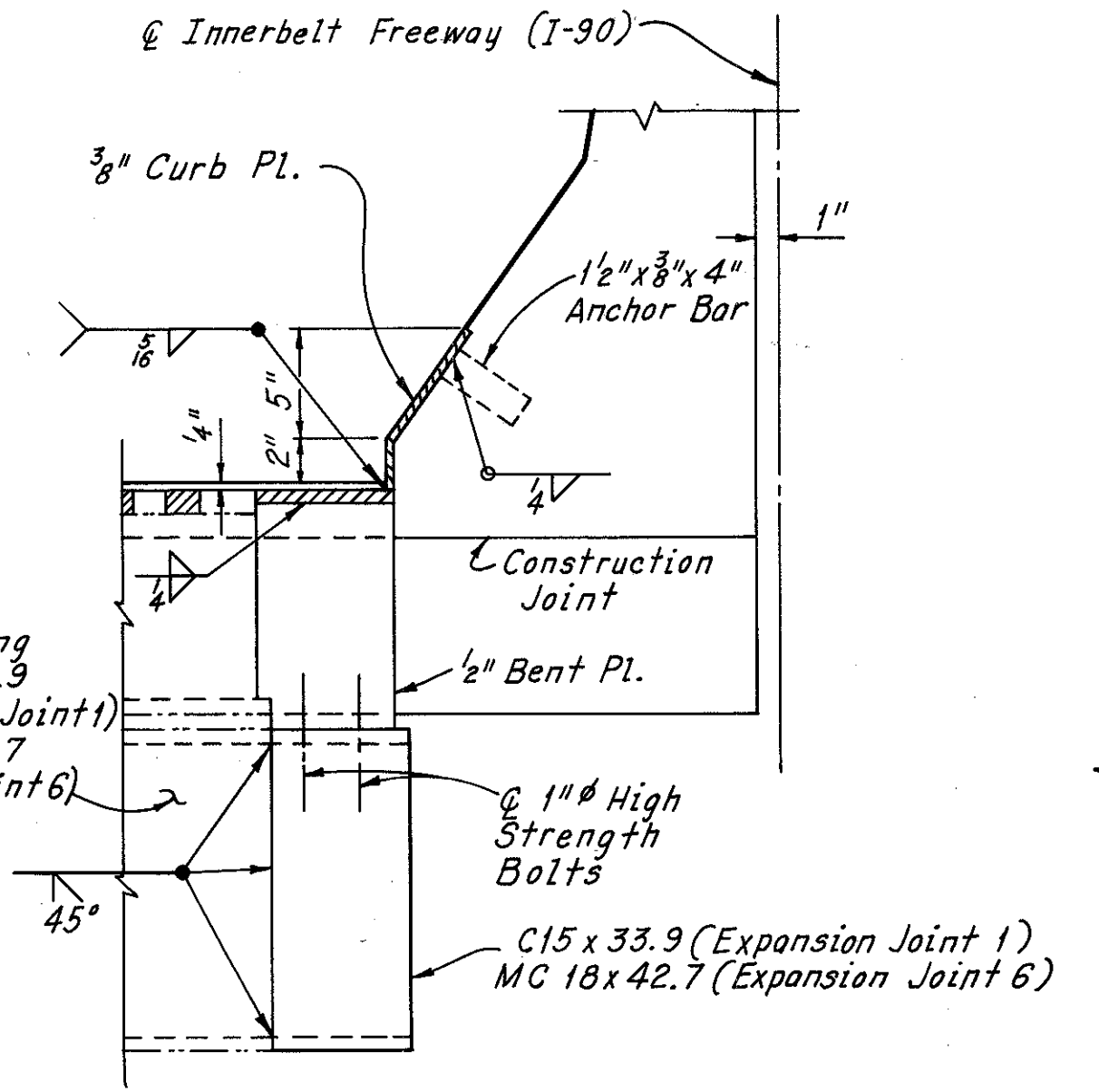
\*Note: For setting of this dimension see Final Typical Cross Section on Sheet 24/52.



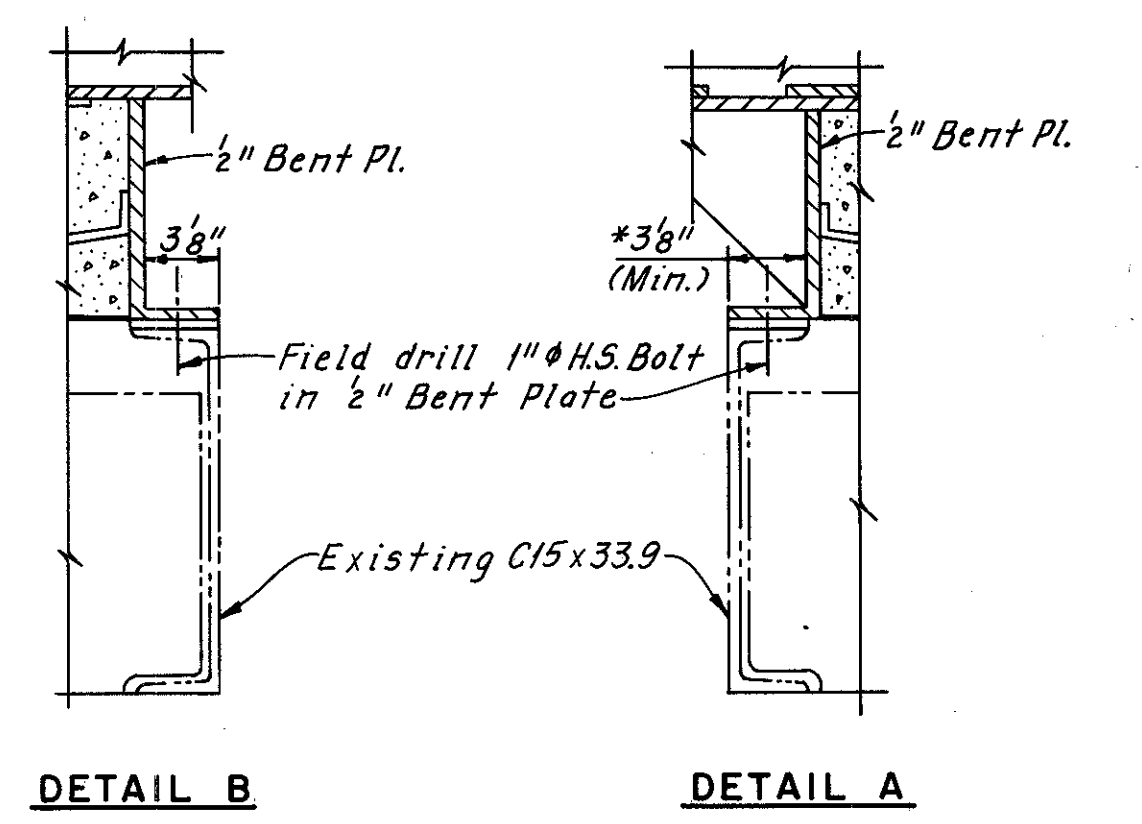
SECTION A-A



SECTION C-C - EXPANSION JOINTS 2 THRU 5  
(Expansion Joints 1 and 6 Similar)



SECTION D-D



DETAIL B

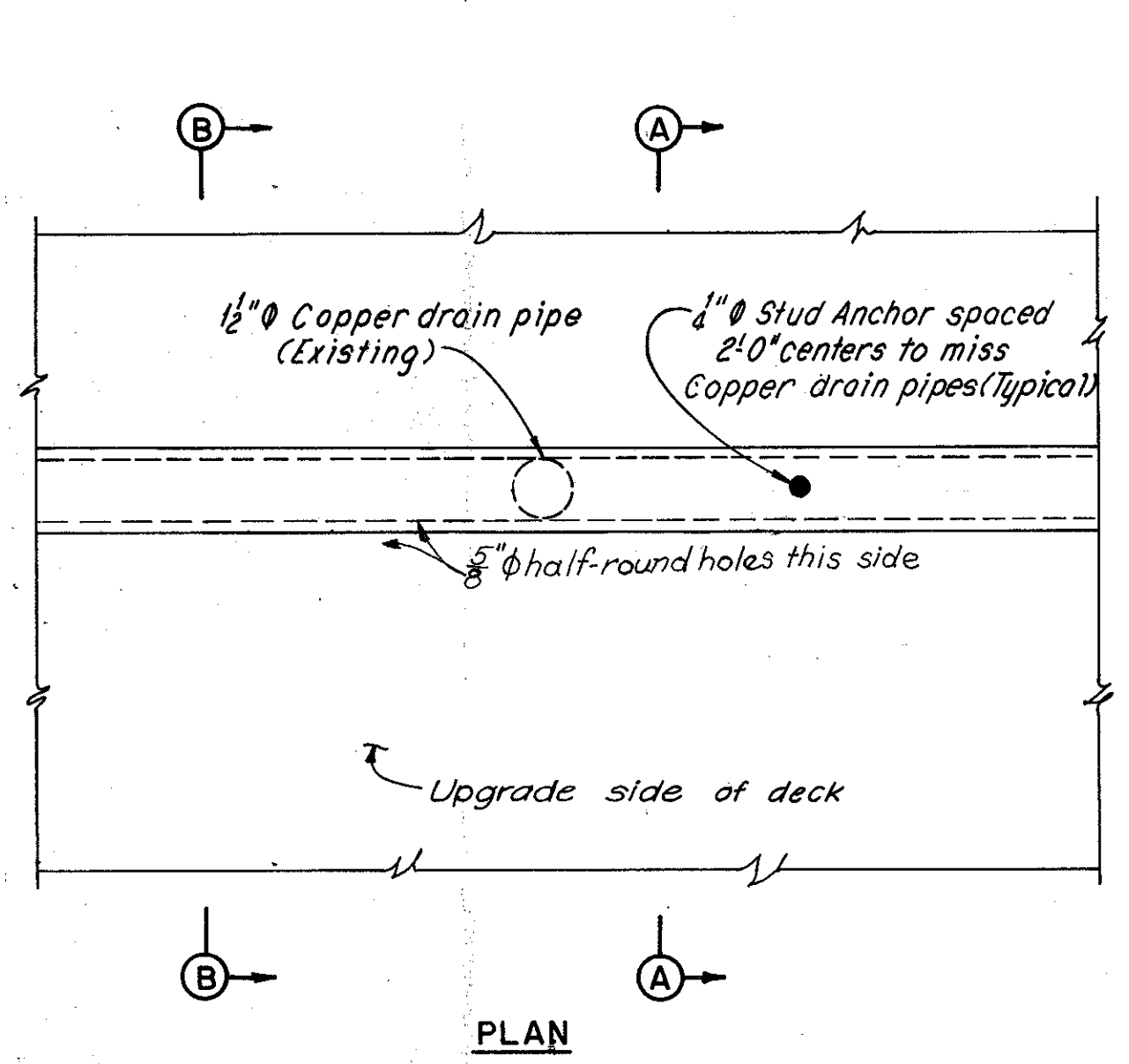
DETAIL A

**MODIFIED CONDITIONS**

Notes:  
The median modification at Expansion Joints 1, 2 and 5 has to be co-ordinated with the realignment of these expansion joints. See the Construction Procedure on Sheets 21/52, 22/52, and 23/52 for the overall sequence of operations. See Sheet 27/52 for the existing conditions at the expansion joints. For additional Notes see Sheet 25/52.

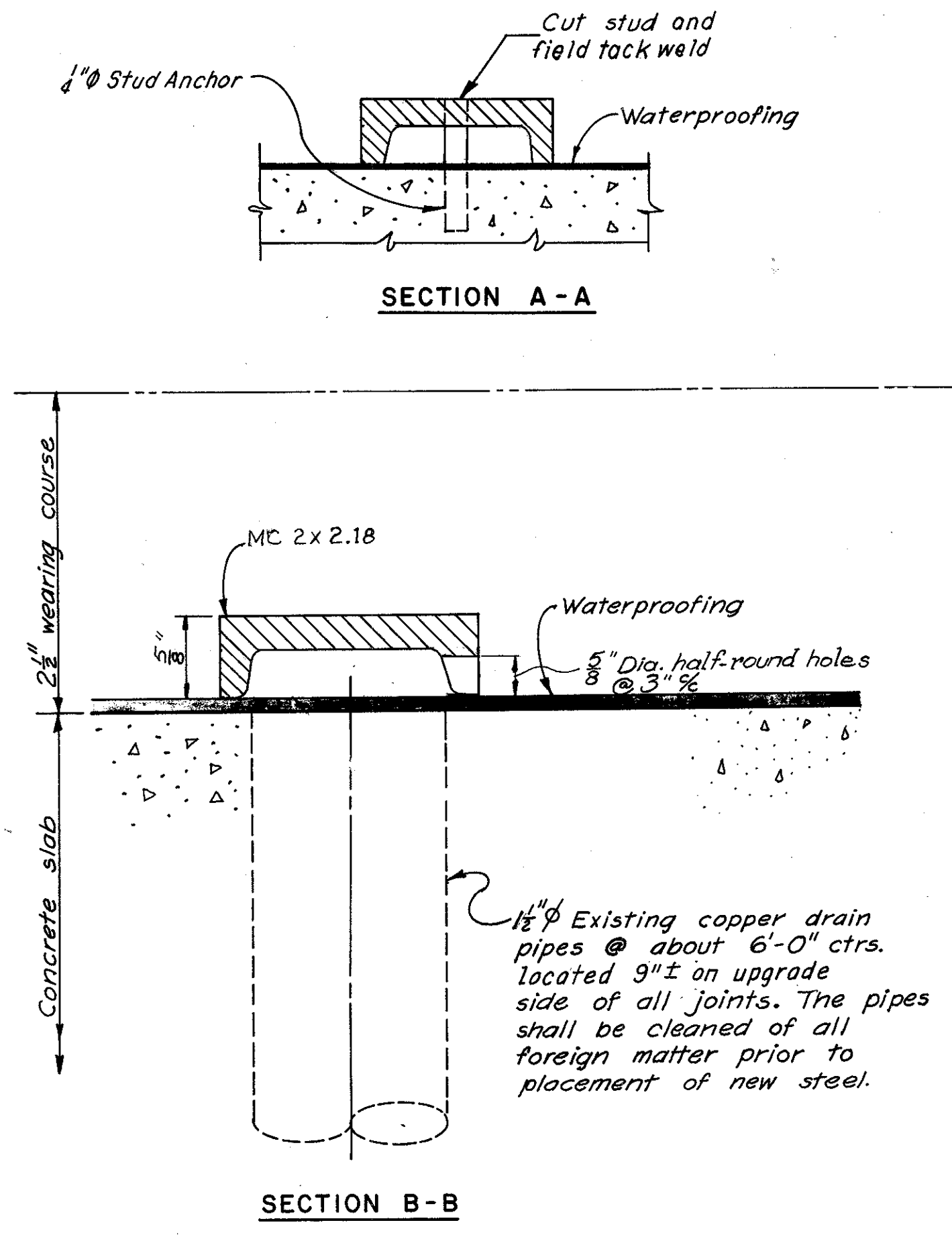
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>EXPANSION JOINT MODIFICATION AT MEDIAN CENTRAL VIADUCT</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42-17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN D.H.S.	TRACED C.P.	CHECKED D.M.P.	REVIEWED C.H.B.
DATE 2-23-72	DATE 3-15-72	DATE 4-12-72	DATE 5-26-72
			SHEET 28/52





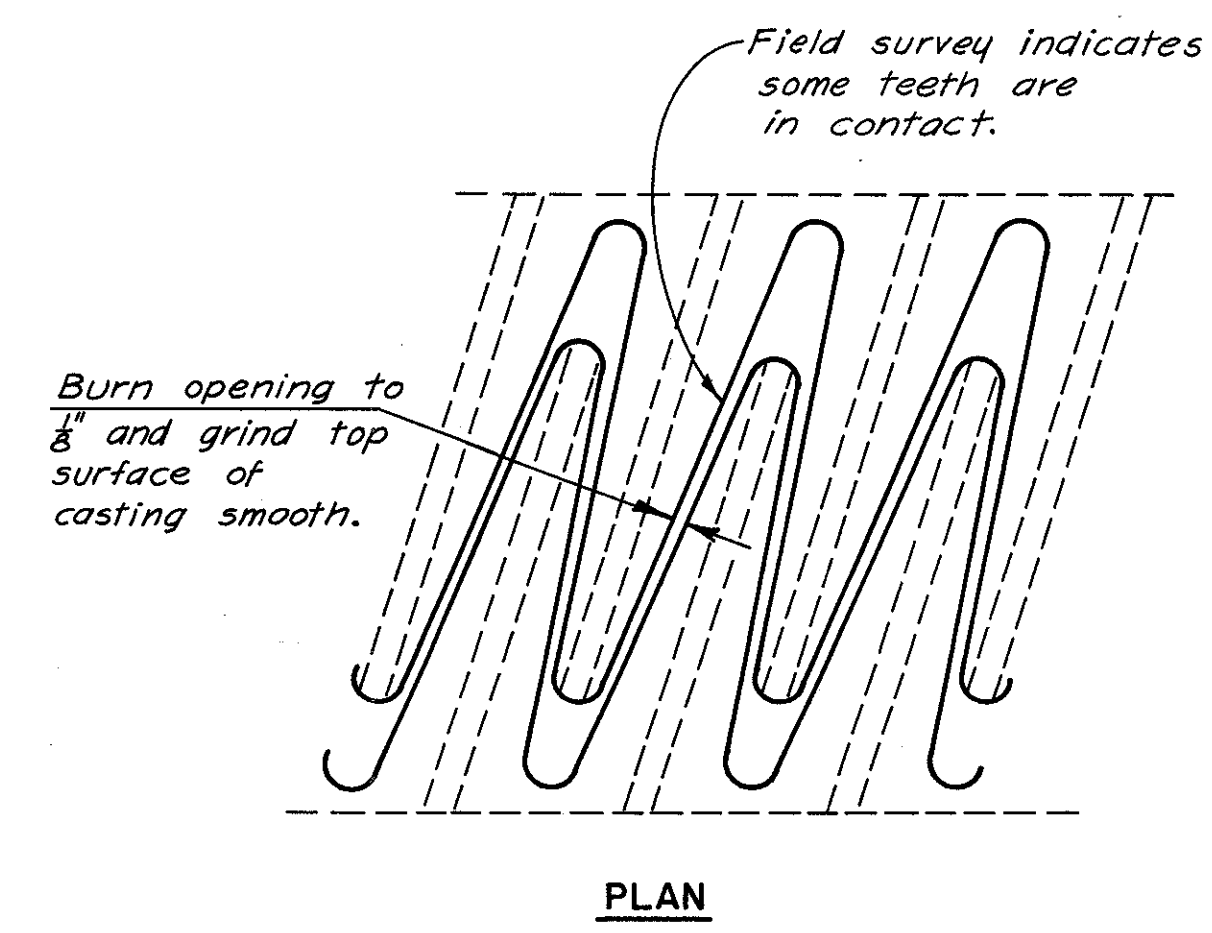
PLAN

**Notes:**  
 The existing subdrainage for wearing surface course shall be modified as shown at all expansion and contraction joints and roadway cross-drains on the Central Viaduct.  
 The existing steel bar or angle over the copper drain pipes shall be removed, and replaced as indicated in Section A-A.  
 Payment for the modification to the existing subdrainage for wearing surface course shall be included in the lump sum price bid for Item Special, Cleanout and Repair of Bridge Drainage System.



SECTION B-B

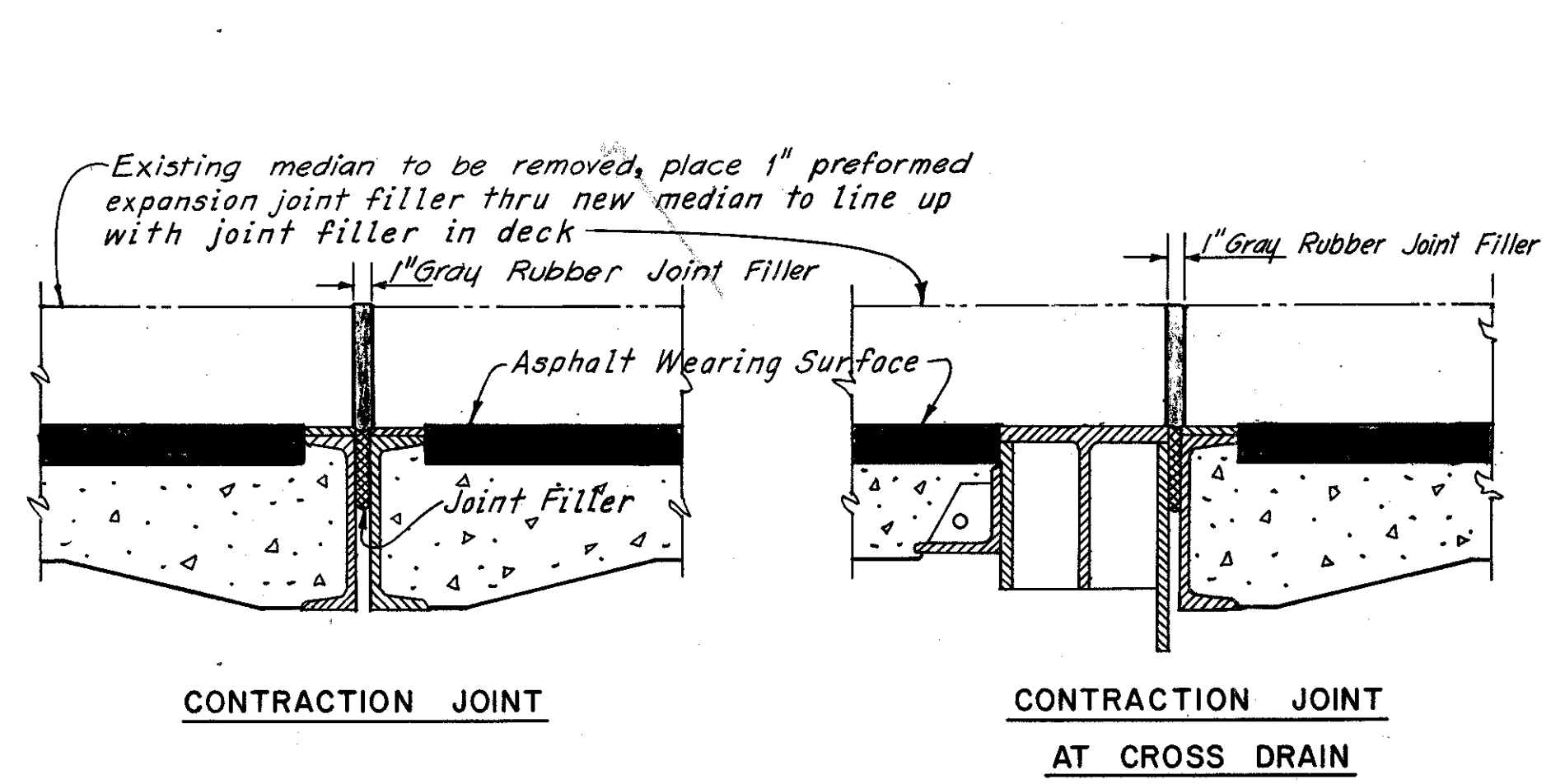
**MODIFICATION TO SUBDRAINAGE FOR WEARING SURFACE COURSE  
CENTRAL VIADUCT**



PLAN

**MODIFICATION TO TOOTH CASTING  
EXPANSION JOINT 1B - EAST APPROACH**

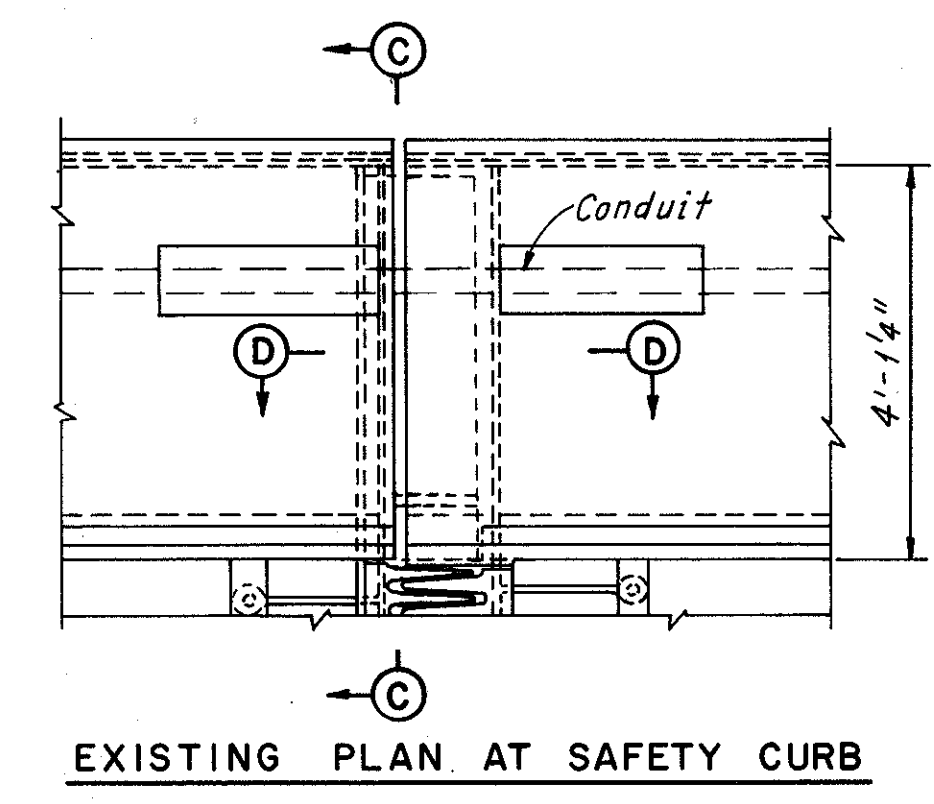
Note: Payment for burning and grinding of the tooth casting shall be included in the lump sum price bid for Item Special, Realignment of Expansion Joints.



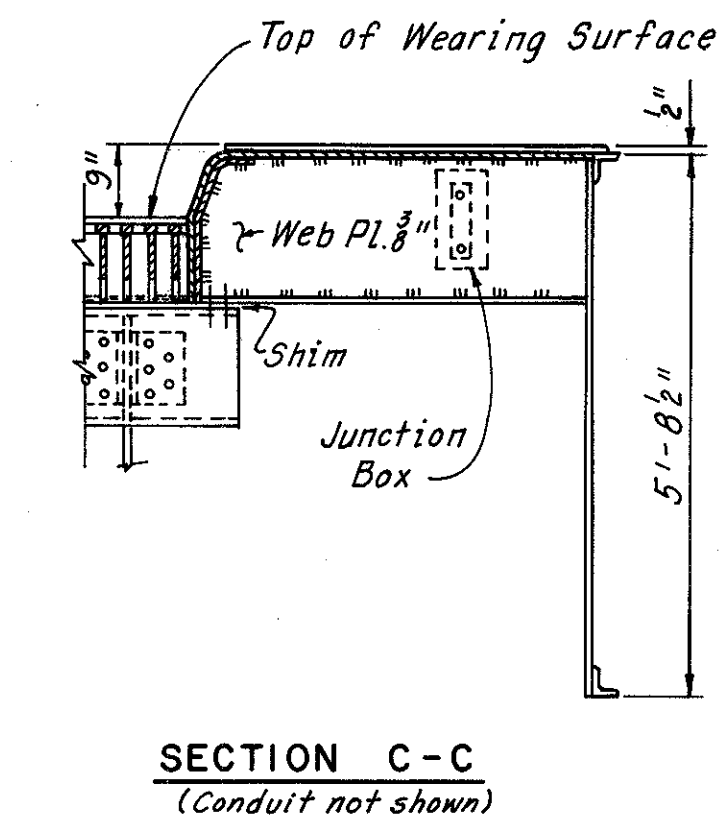
CONTRACTION JOINT

CONTRACTION JOINT  
AT CROSS DRAIN

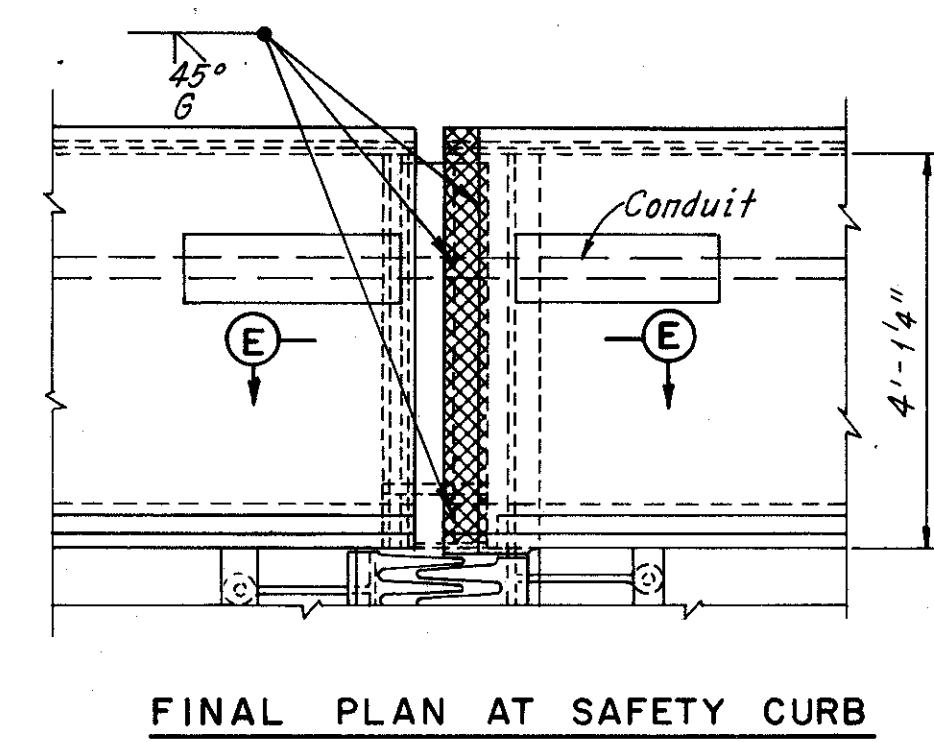
**SECTIONS THRU EXISTING ROADWAY CONTRACTION JOINTS  
CENTRAL VIADUCT**



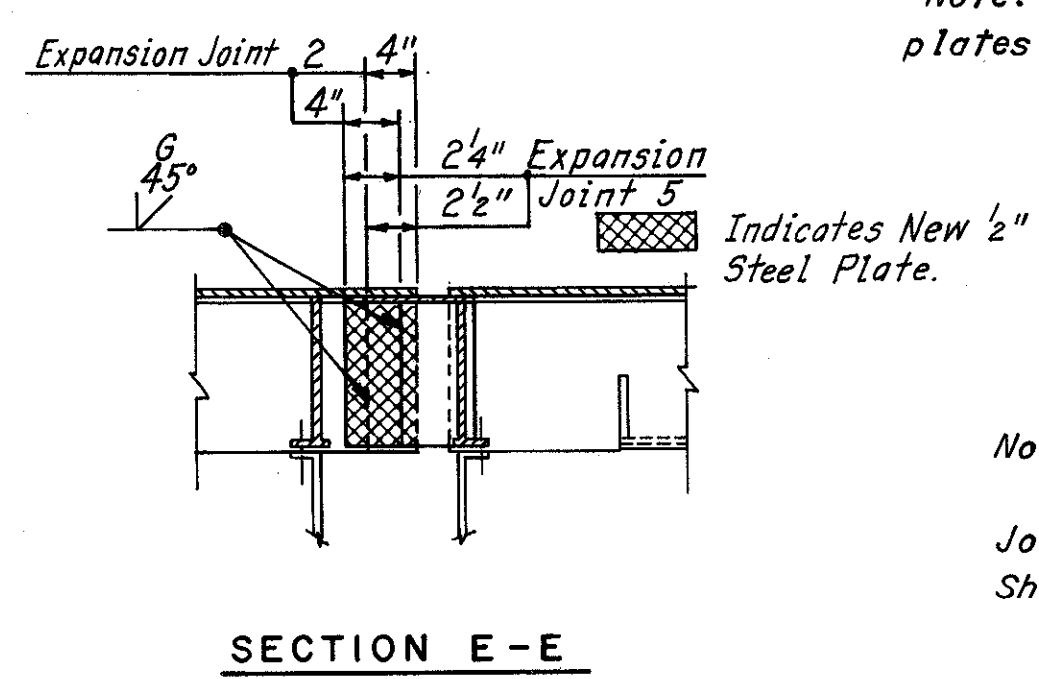
EXISTING PLAN AT SAFETY CURB



SECTION C-C  
(Conduit not shown)



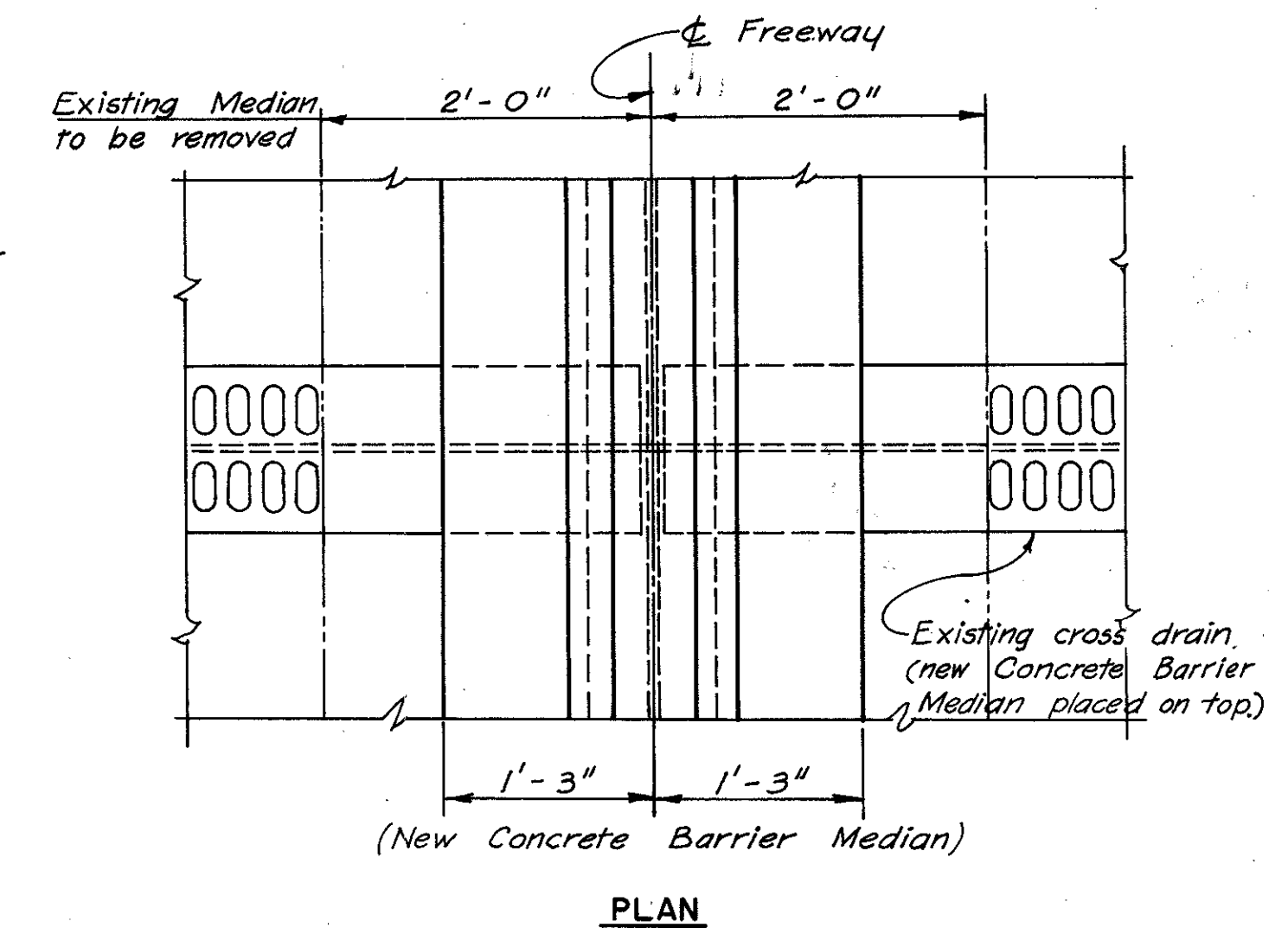
FINAL PLAN AT SAFETY CURB



SECTION E-E

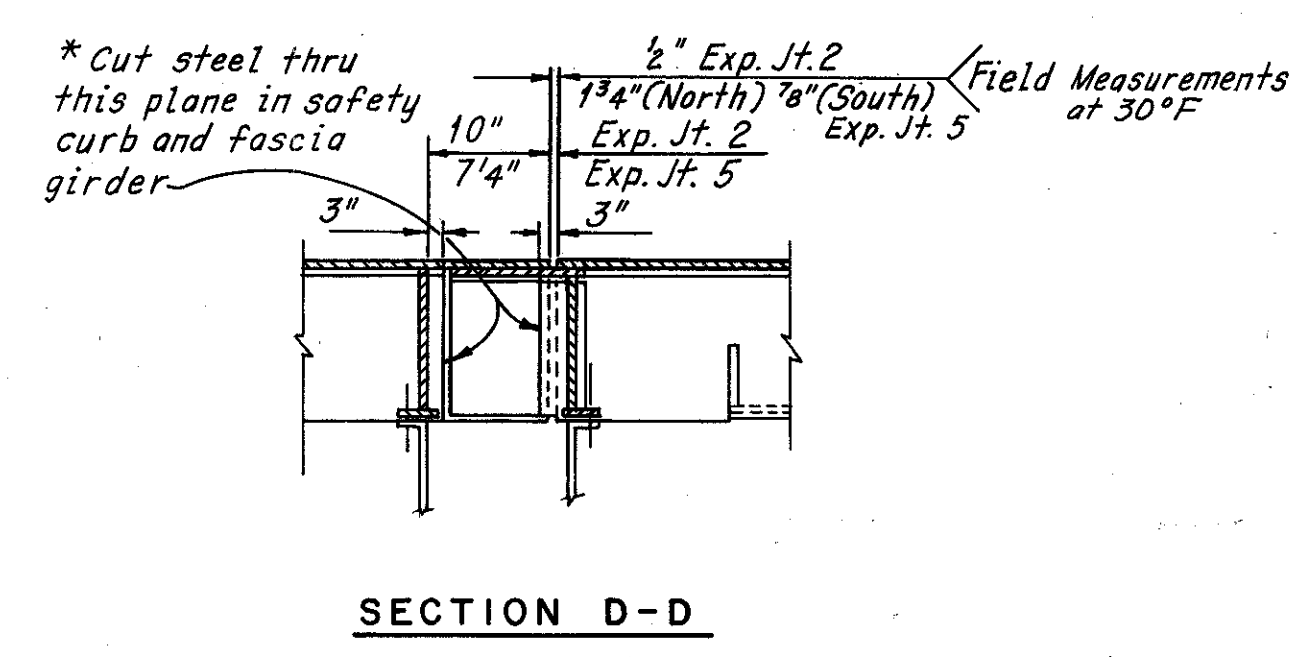
**SAFETY CURB MODIFICATIONS FOR REALIGNMENT OF EXPANSION JOINTS 2 AND 5  
CENTRAL VIADUCT**

Note: The modification to the existing sliding plates of the safety curb joint shall be co-ordinated with the overall realignment of Expansion Joints 2 and 5. See the Construction Procedures on Sheets 22/52 and 23/52.



PLAN

**CONCRETE BARRIER MEDIAN AT CROSS DRAIN  
CENTRAL VIADUCT**

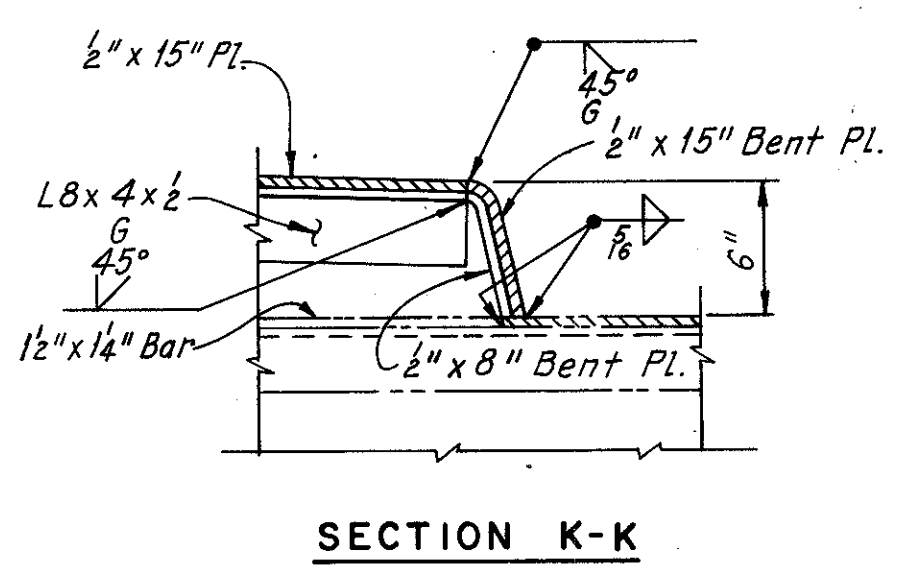
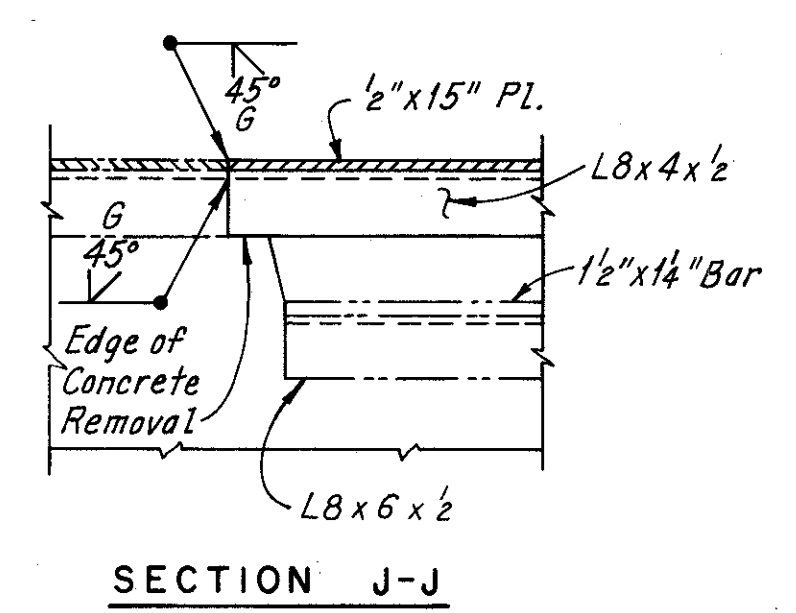
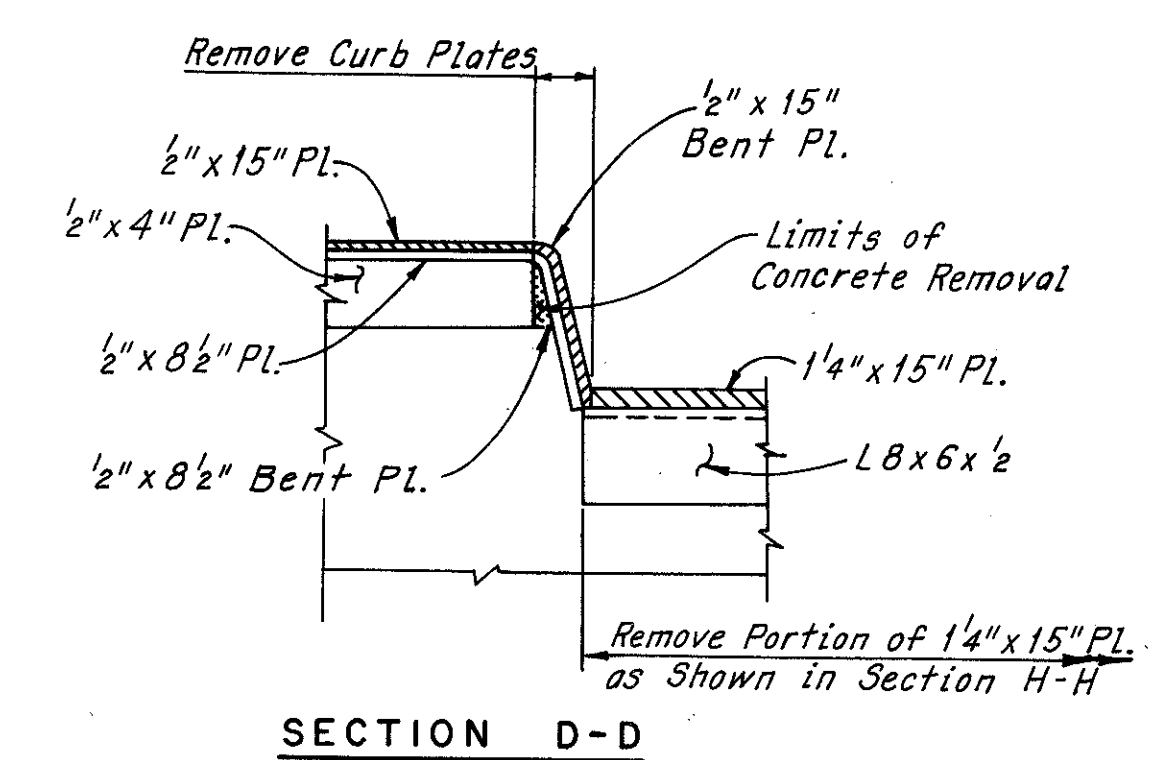
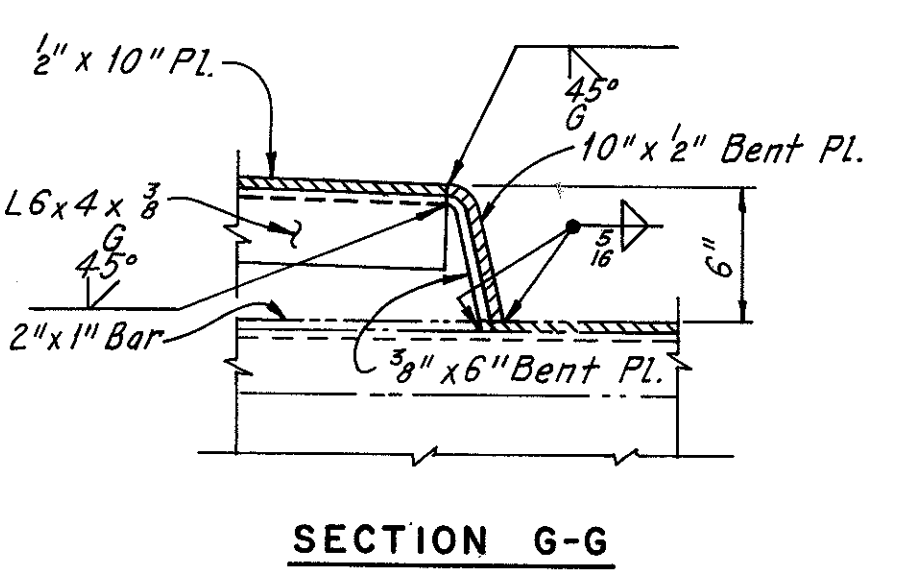
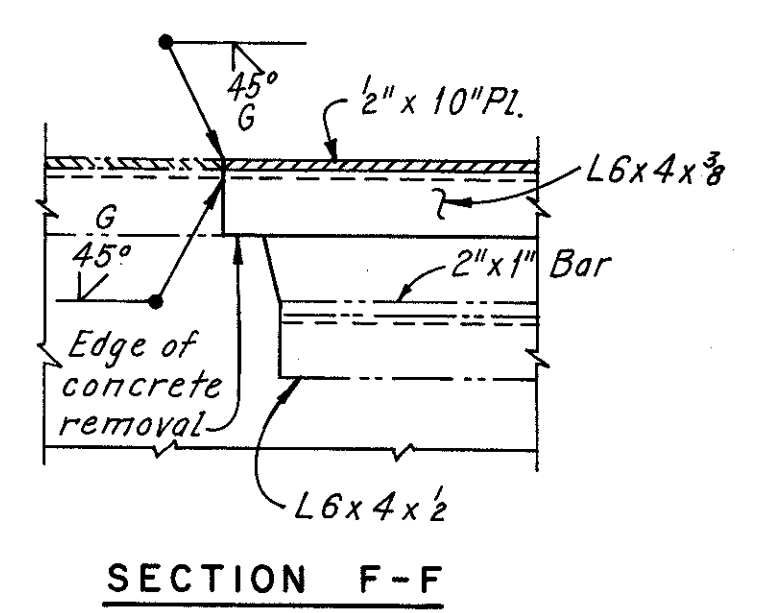
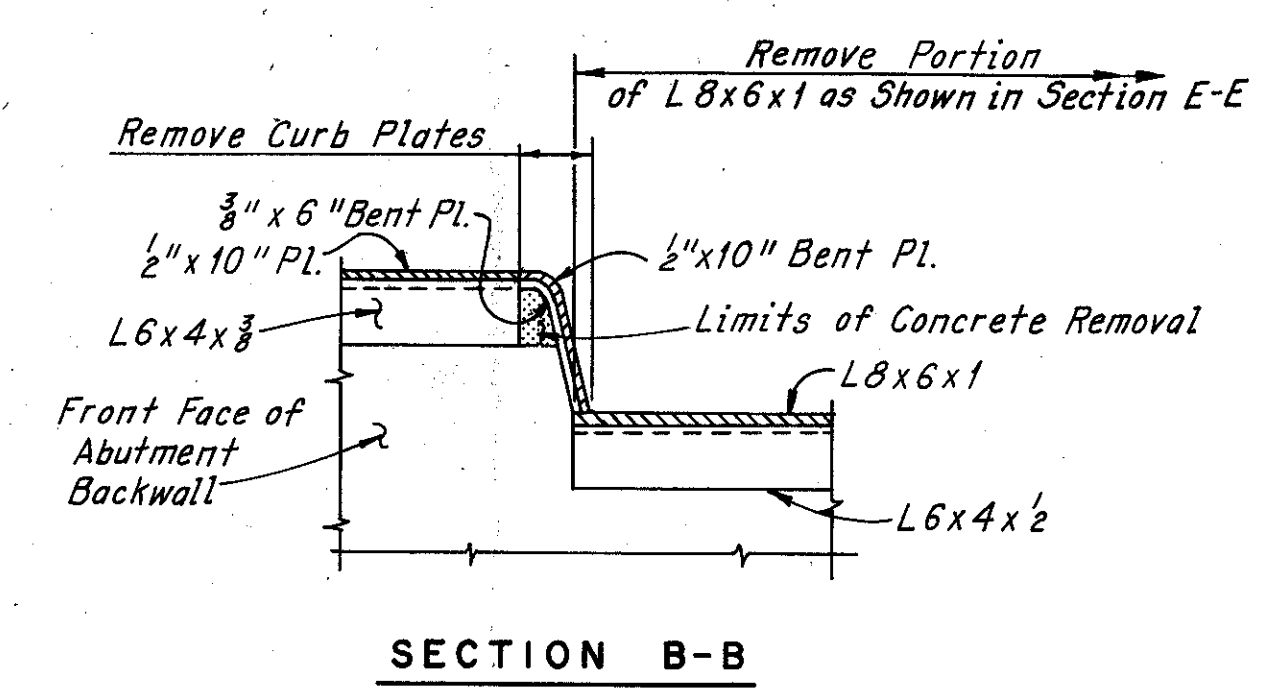
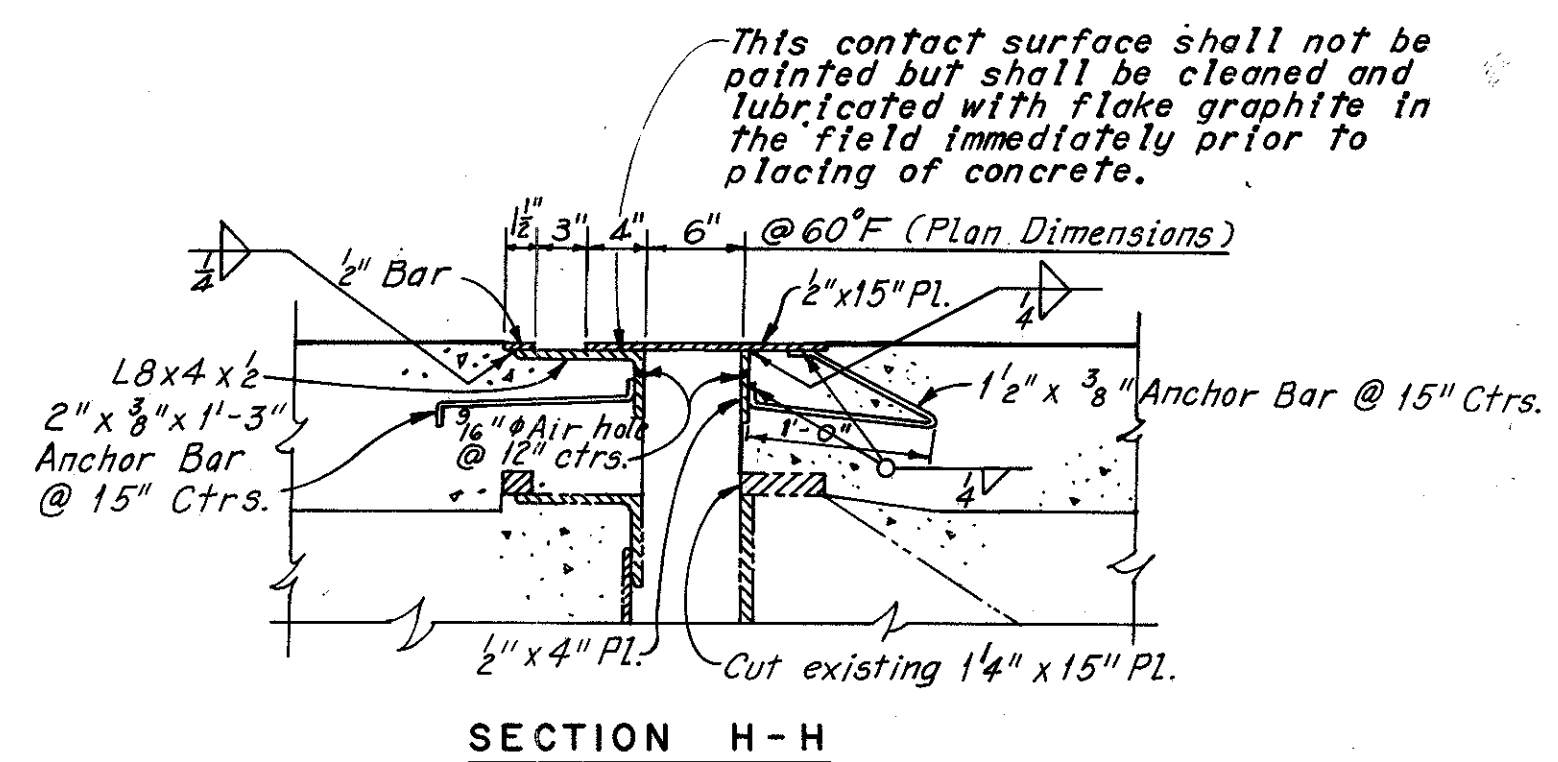
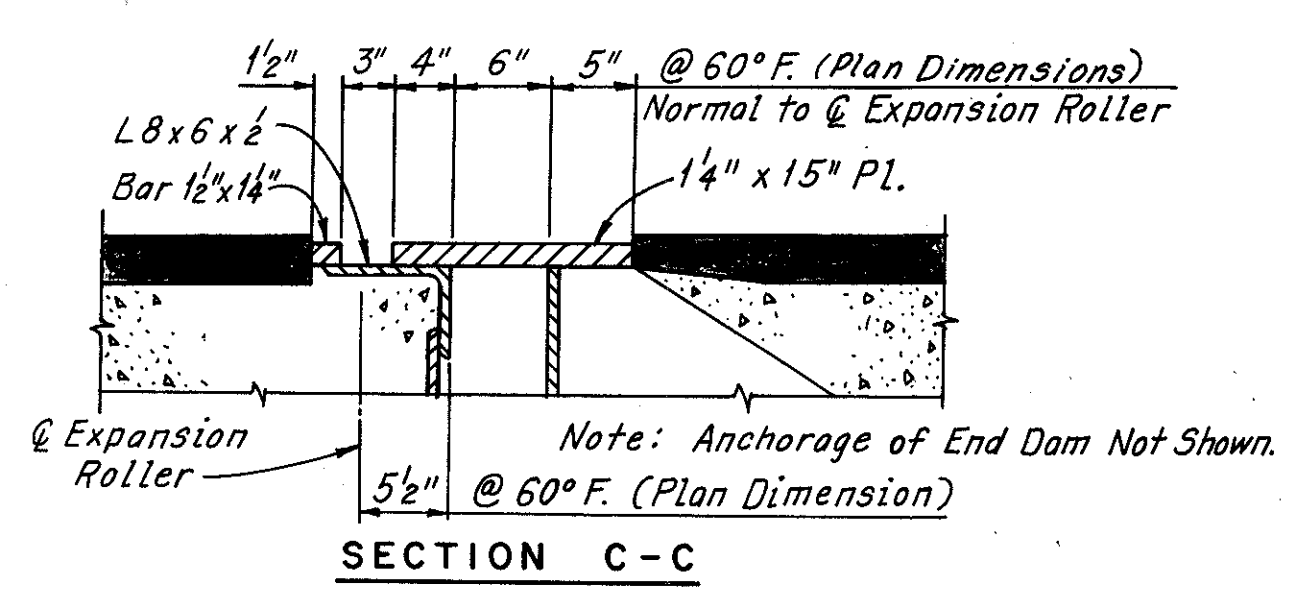
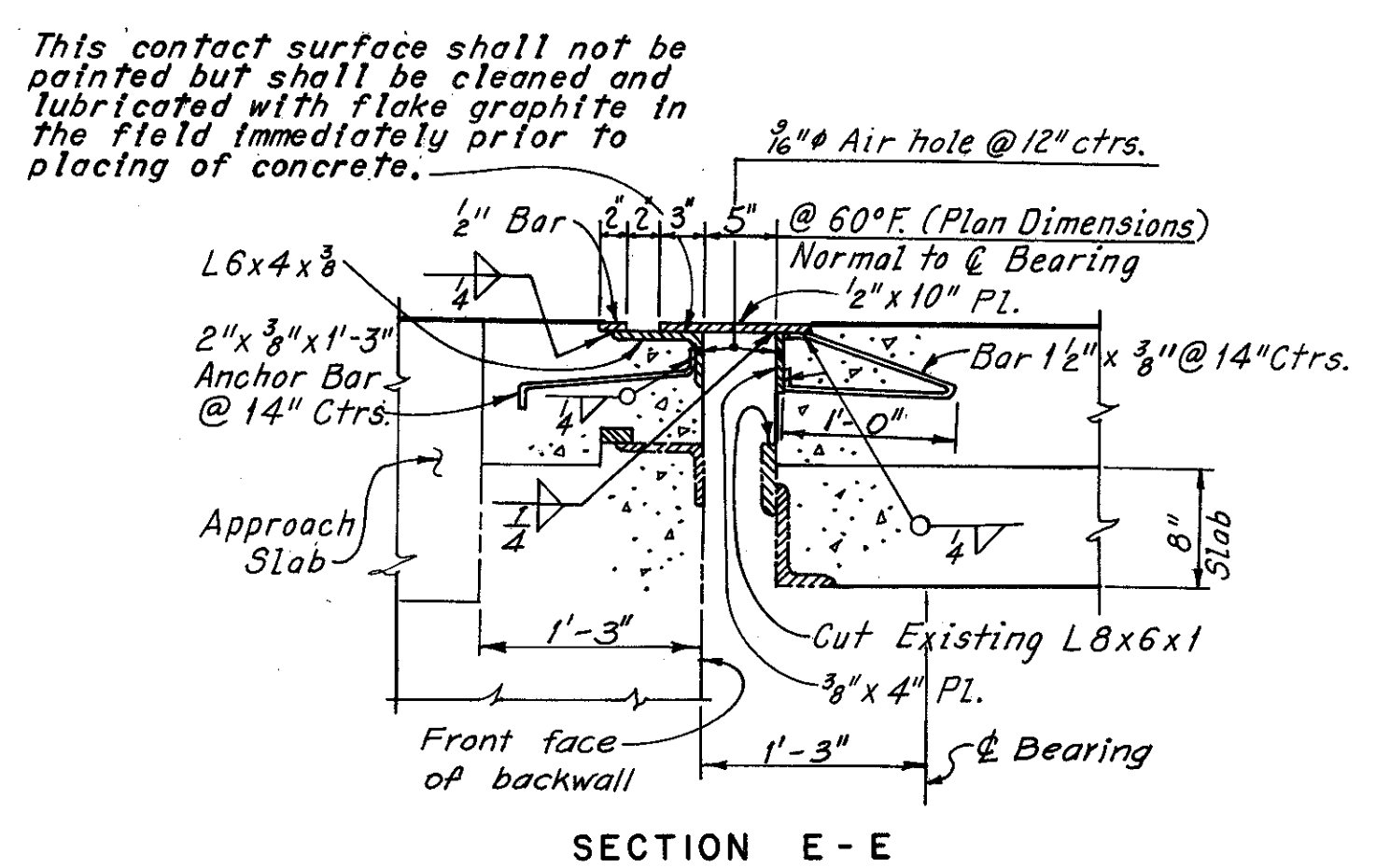
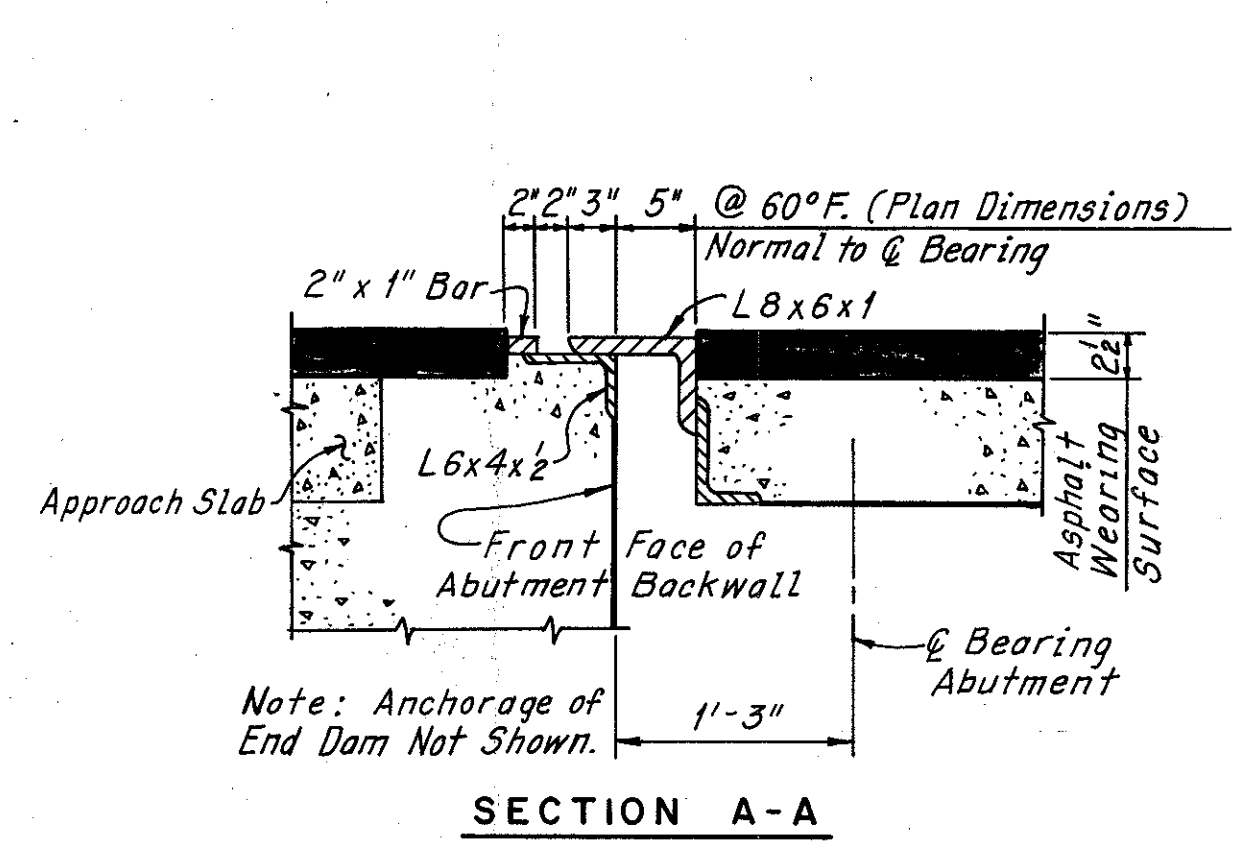
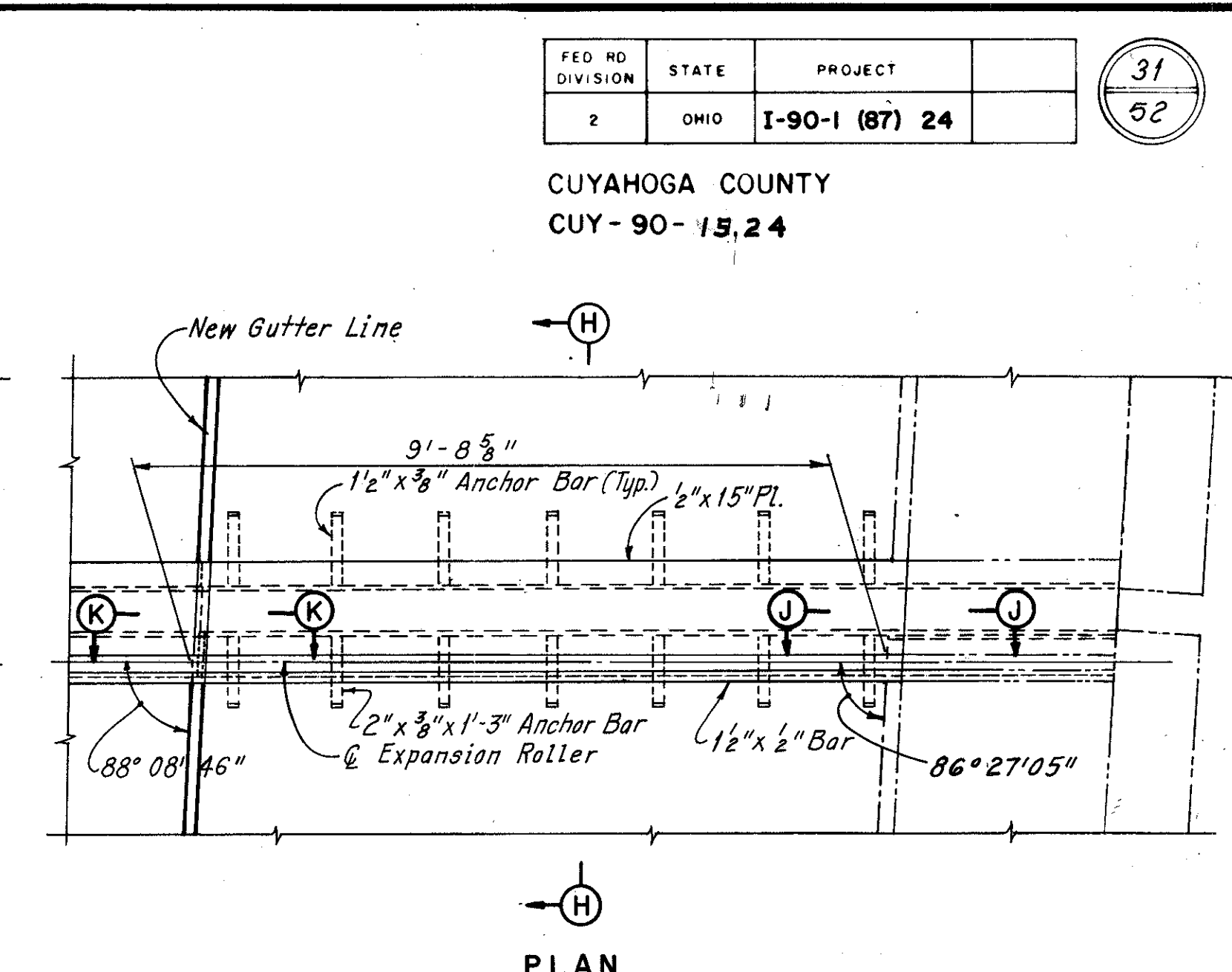
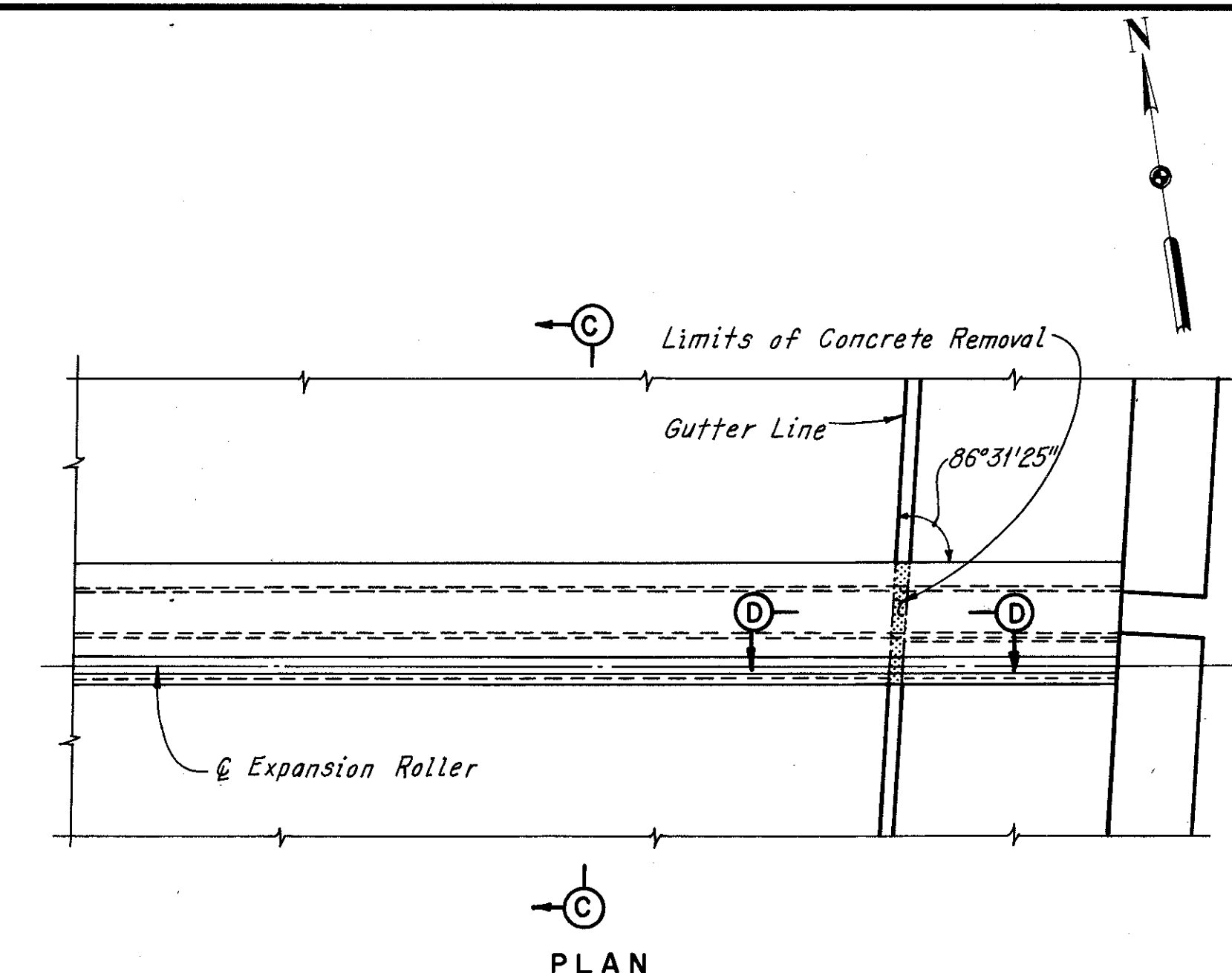
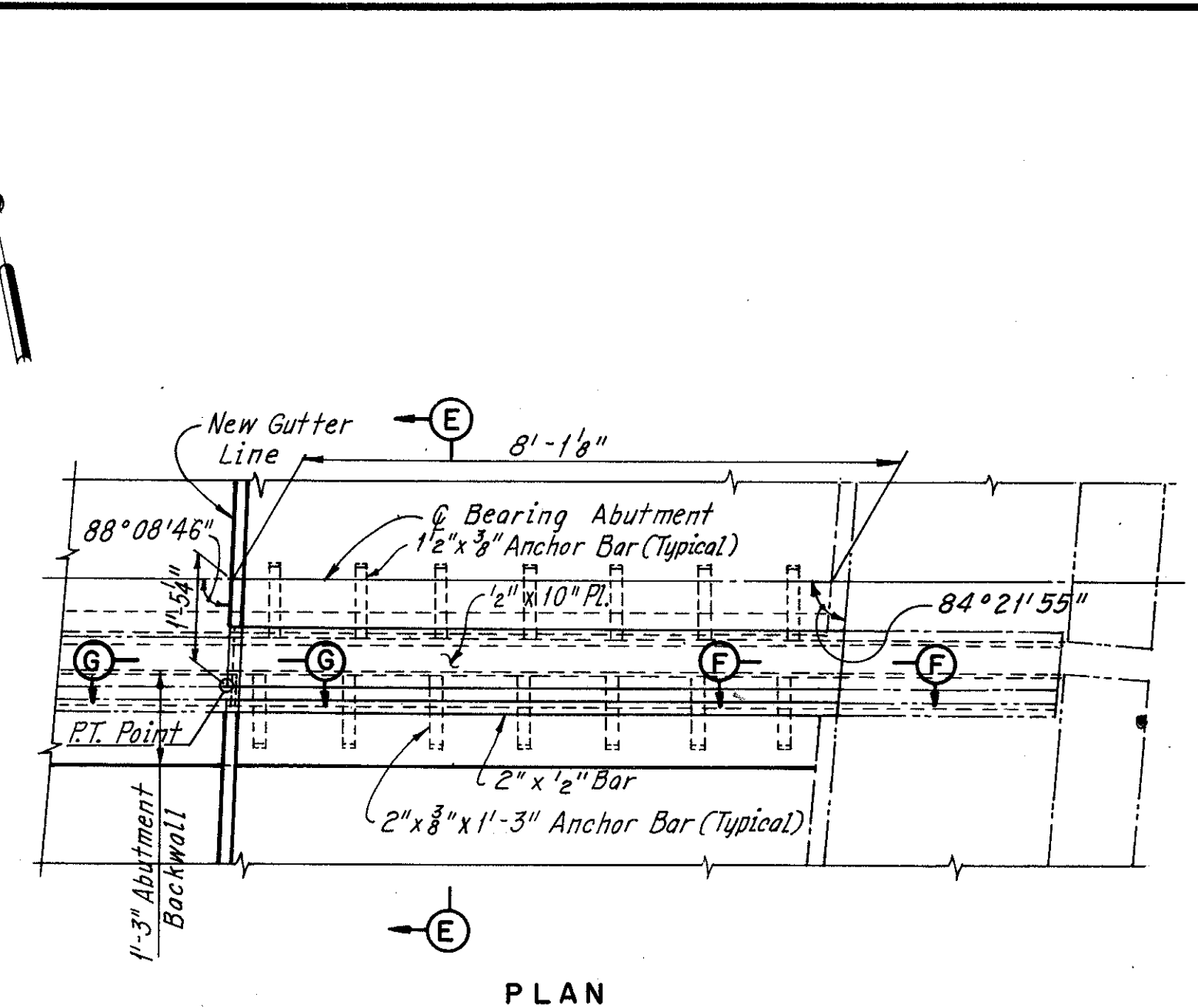
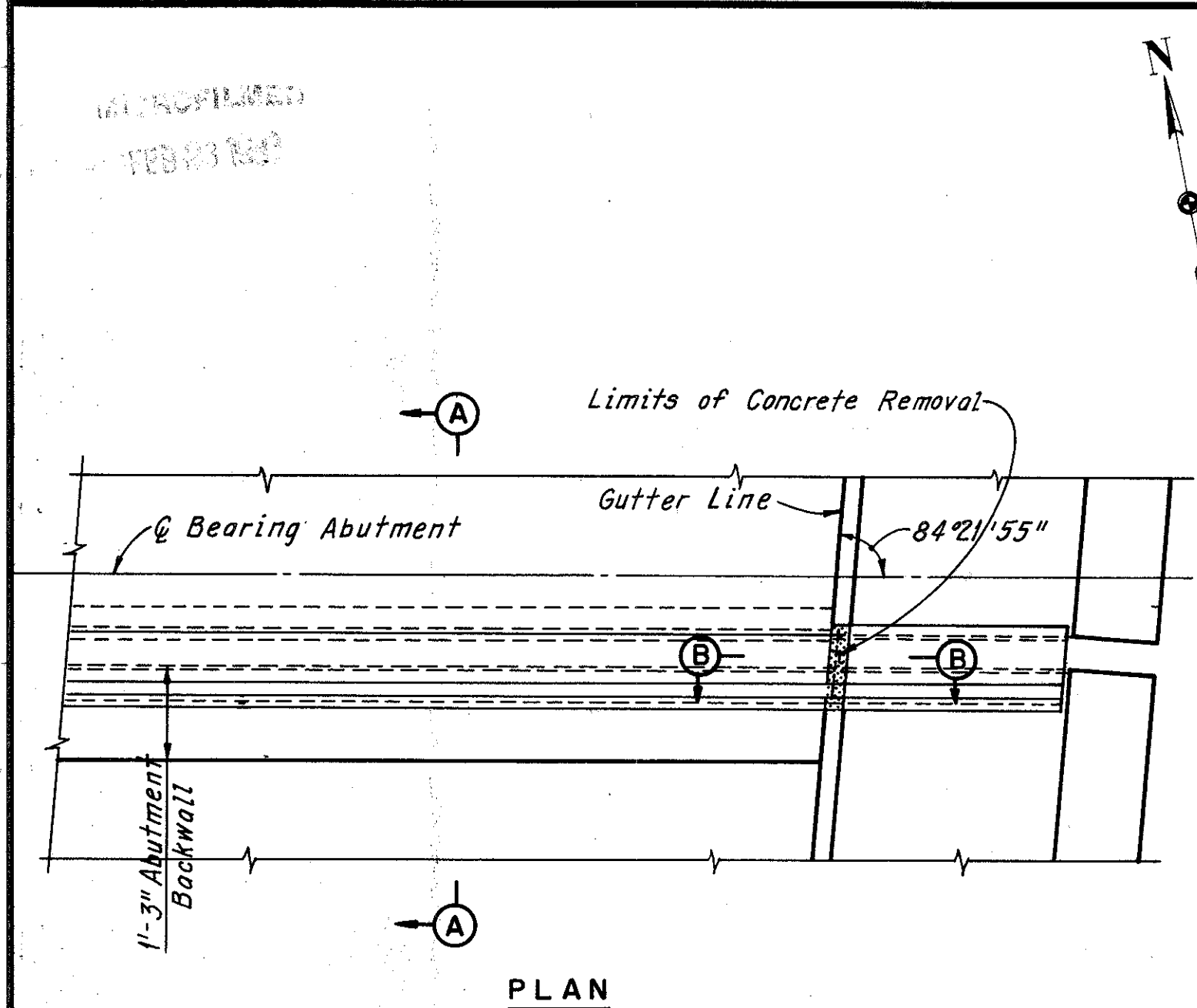


SECTION D-D

\*Note: Extreme care shall be used when cutting plates to avoid damage to the existing conduit.

Note: For location of Expansion Joints, Contraction Joints and Roadway Cross Drains see General Plan Sheets.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
EXPANSION JOINTS, CONTRACTION JOINTS AND ROADWAY CROSS DRAIN DETAILS			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	STA. 3+87.63	
	42R-17 50	STA. 54+65.78	
CUYAHOGA COUNTY OHIO			
DRAWN D/H/S	TRACED B/M/P	CHECKED D/M/P	REVIEWED C/H/B
DATE 3-27-72	DATE 3-28-72	DATE 4-10-72	DATE 5-28-72
			SHEET 30 / 52



EXISTING MODIFICATION  
EXPANSION JOINT AT ABUTMENT W-1

EXISTING MODIFICATION  
EXPANSION JOINT AT EXPANSION ROLLER RAMP W-1

This contact surface shall not be painted but shall be cleaned and lubricated with flake graphite in the field immediately prior to placing of concrete.

This contact surface shall not be painted but shall be cleaned and lubricated with flake graphite in the field immediately prior to placing of concrete.

Note:  
For details of the new curbing on the abutment see Sheet 20/52.

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

**EXPANSION JOINT MODIFICATION  
WEST APPROACH**

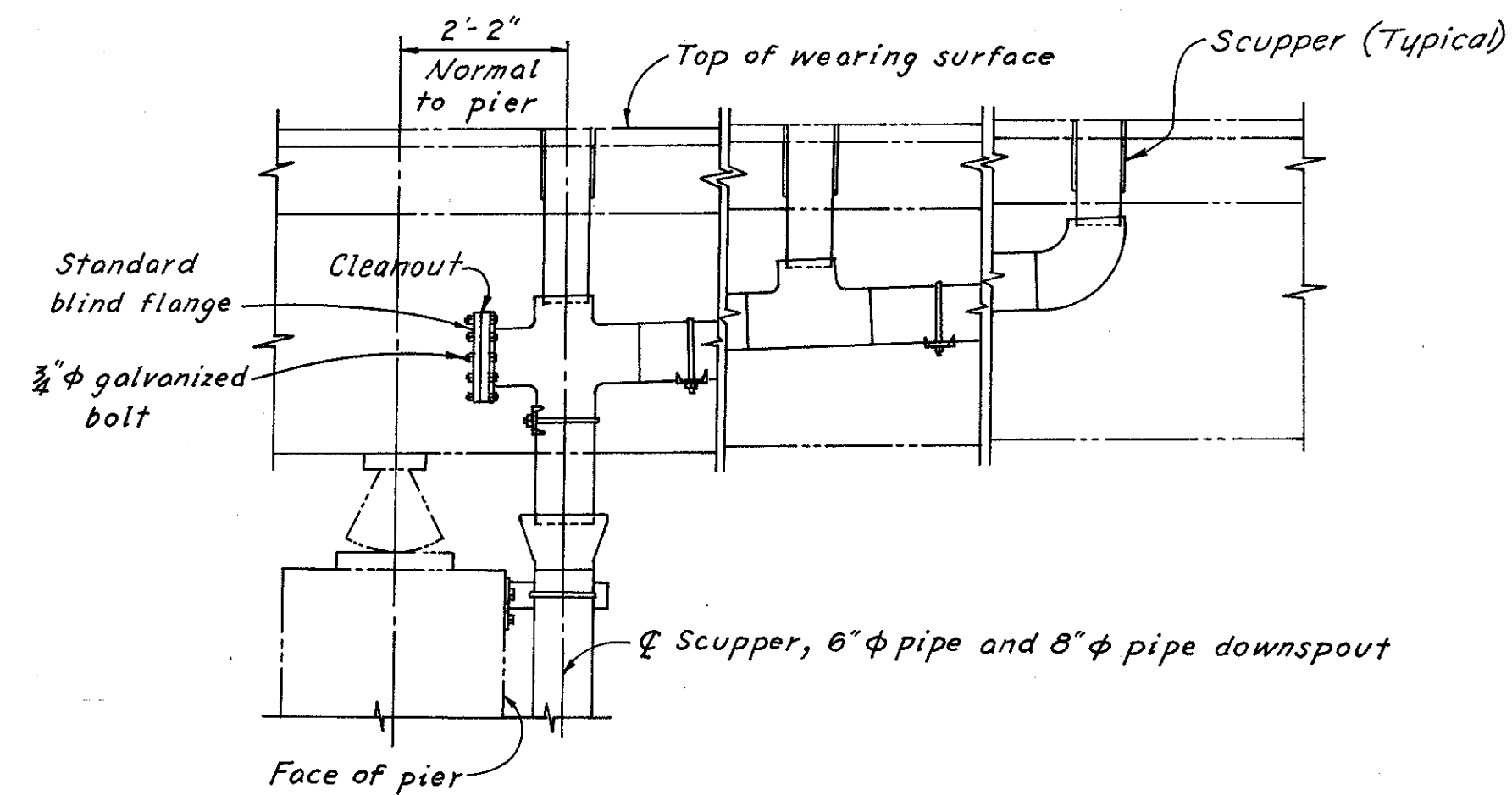
OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50  
42 -17 50

CUYAHOGA COUNTY OHIO

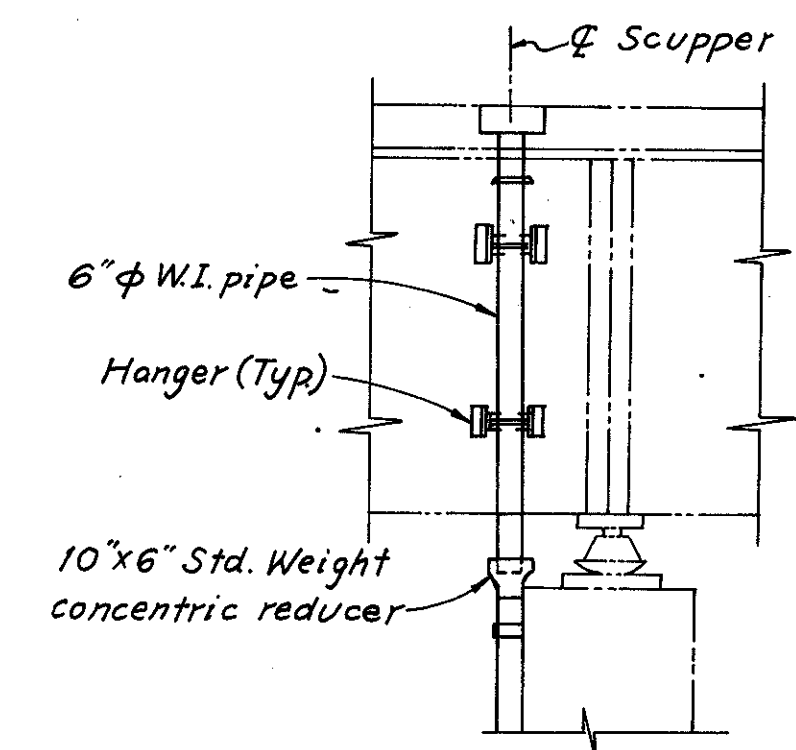
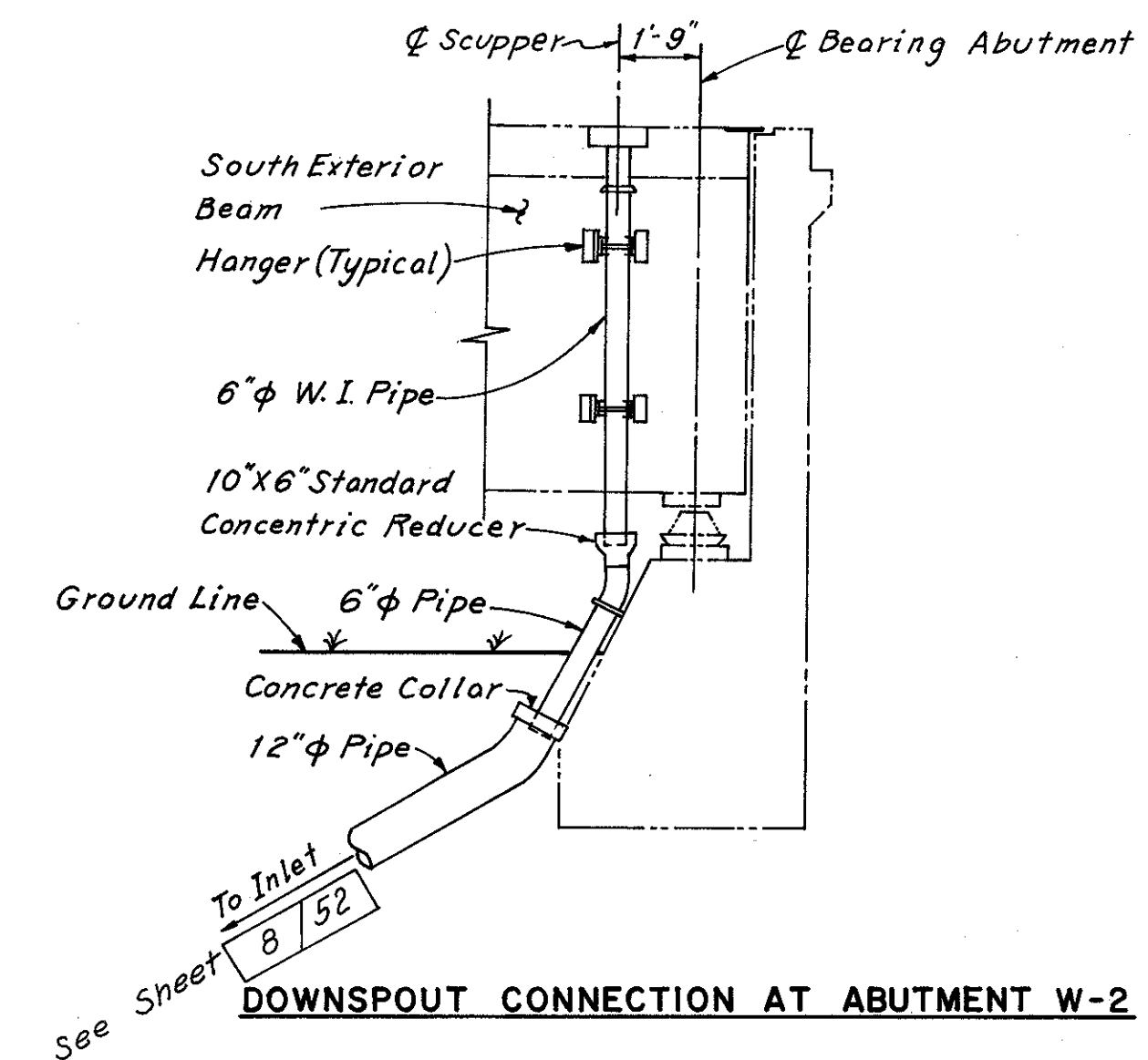
DRAWN DHS THACED CP CHECKED DMP REVIEWED CAB REVISOR  
DATE 3-29-72 DATE 3-31-72 DATE 4-13-72 DATE 5-26-72 SHEET 31 / 52



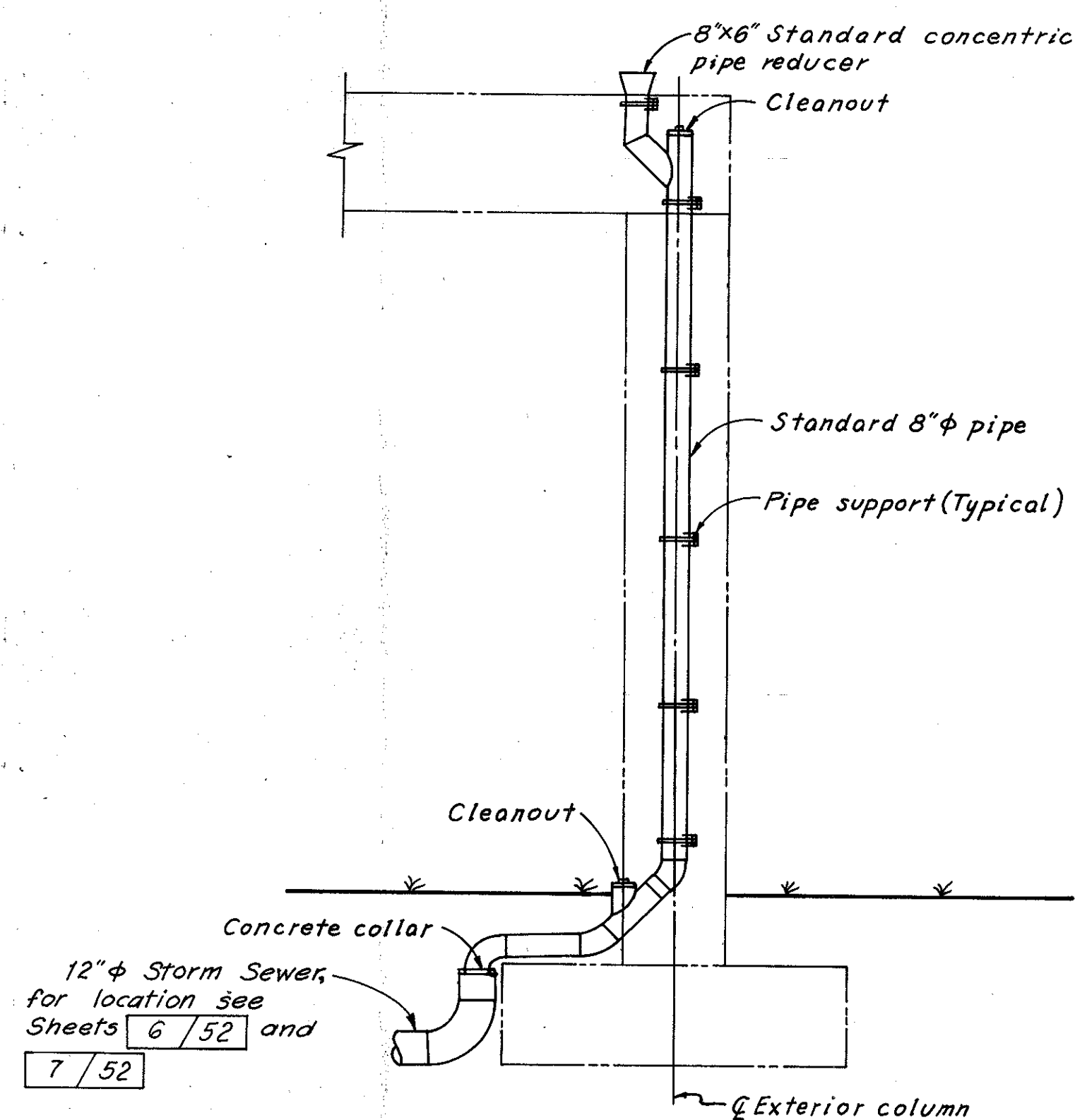
CUYAHOGA COUNTY  
 CUY-90-15,24



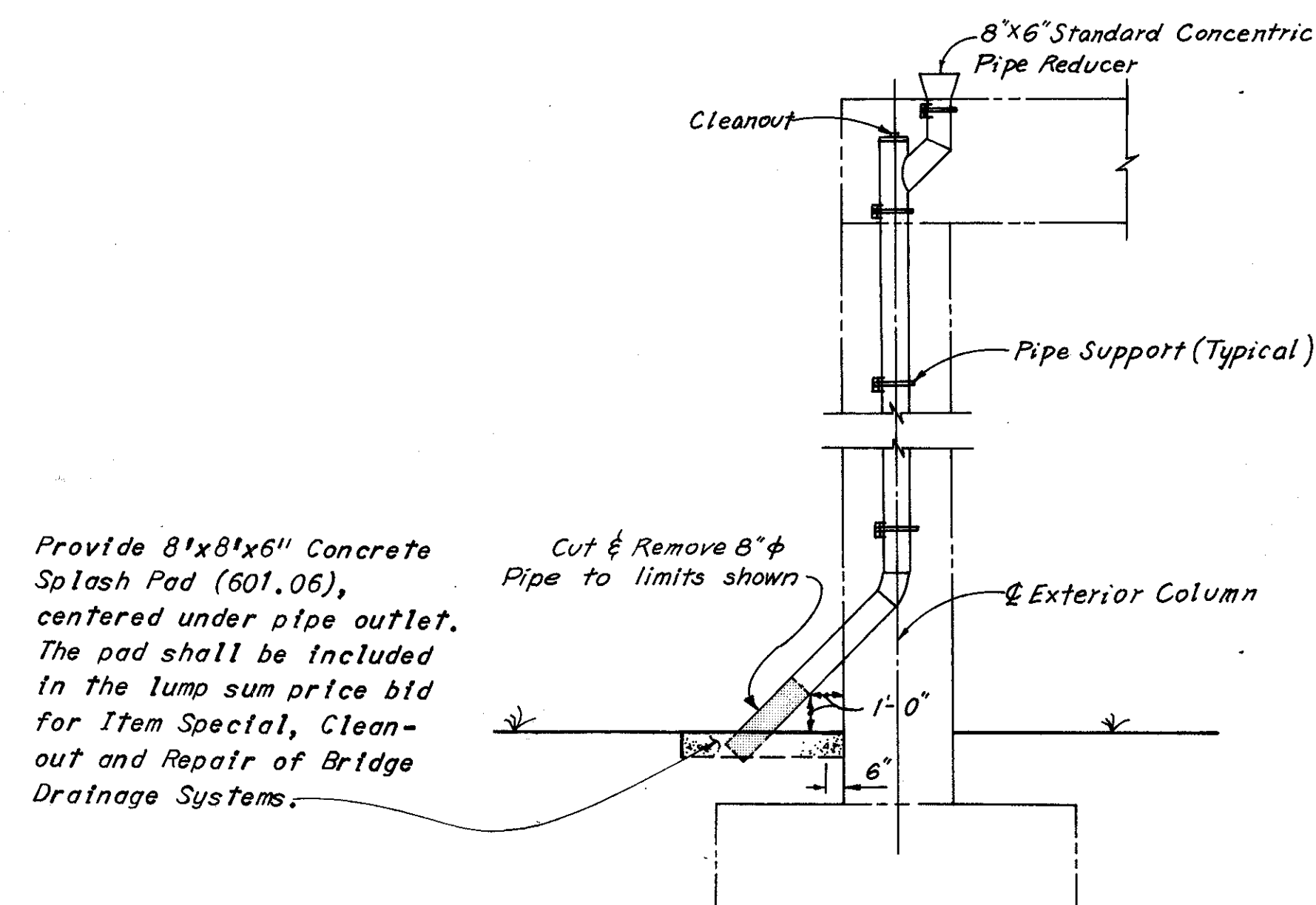
COLLECTOR SYSTEM AT PIERS



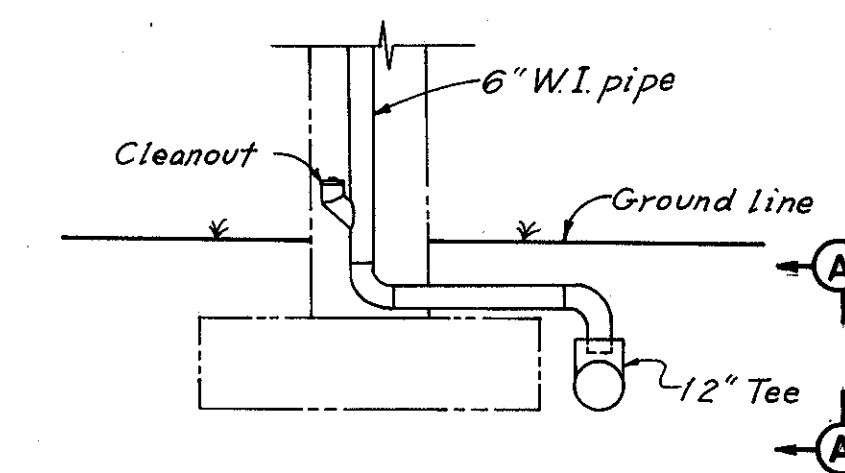
TYPICAL DOWNSPOUT CONNECTION AT PIERS



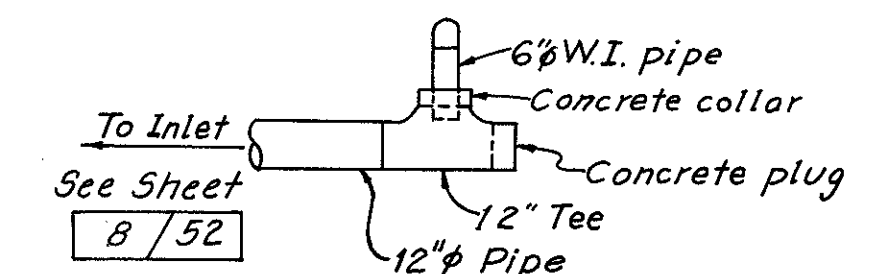
DOWNSPOUTS AT PIERS 4E, 7E, 7W, 10E AND 10W



DOWNSPOUT MODIFICATION DETAIL AT PIER 3W



TYPICAL CONNECTION AT PIERS  
 6" φ W.I. PIPE TO 12" φ STORM SEWER



VIEW A-A

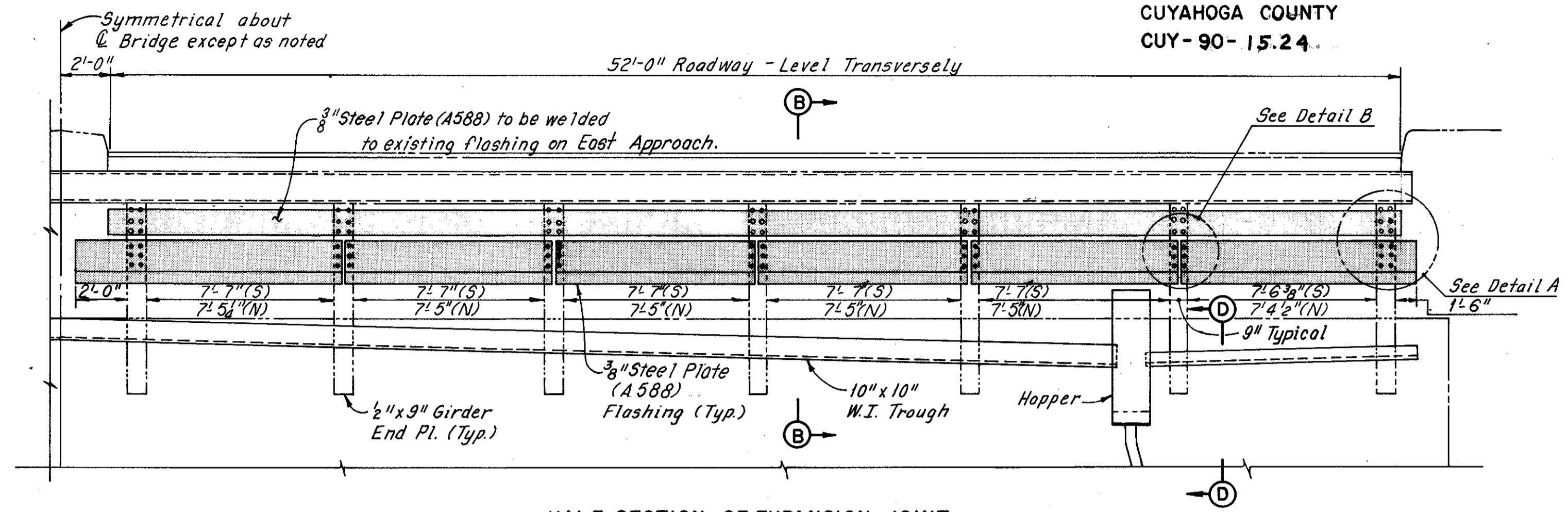
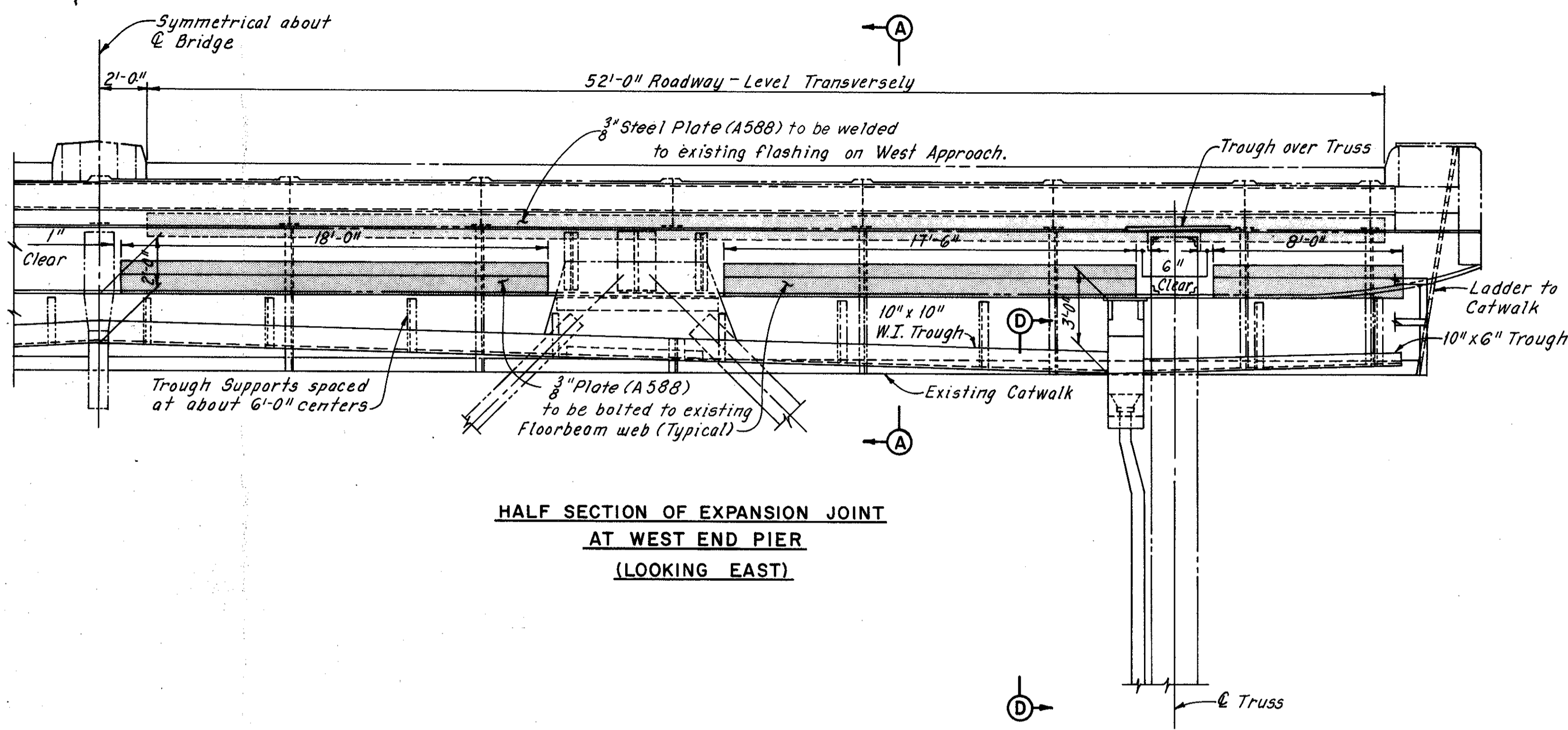
WEST APPROACH

INNERBELT EXTENSION

Notes:  
 The details shown represent the original plan drawings for the drainage system except for the modification at Pier 3W. The existing drainage system shall be cleaned out as indicated in the General Notes.  
 Scupper boxes at Innerbelt Extension are similar to those shown on Ohio Standard Drawing SQ-1-69, Sheet 3 of 4, except there are 12 grate spaces at 3"± with a total inside width of 3'-3"±.  
 Scupper boxes at West Approach are similar to those shown on East Approach Drainage Details, Sheet 36/52.  
 For Scupper Locations see Sheets 6/52, 7/52 and 8/52.

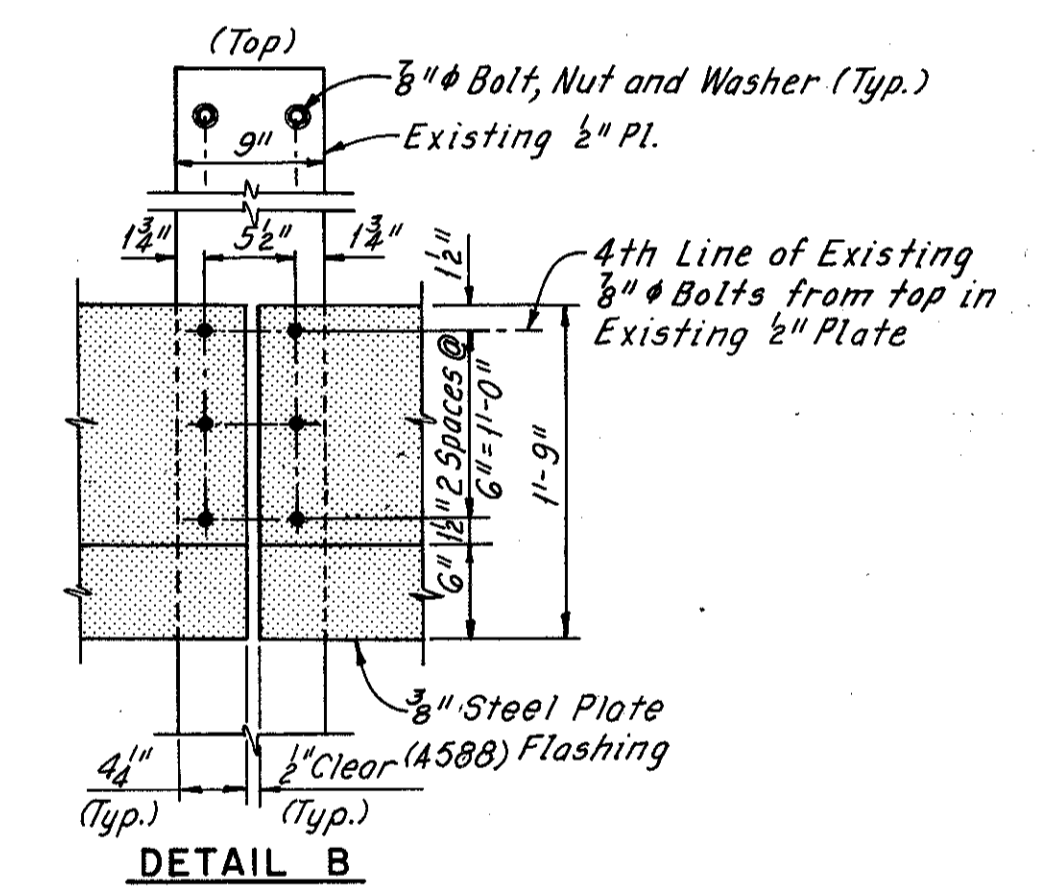
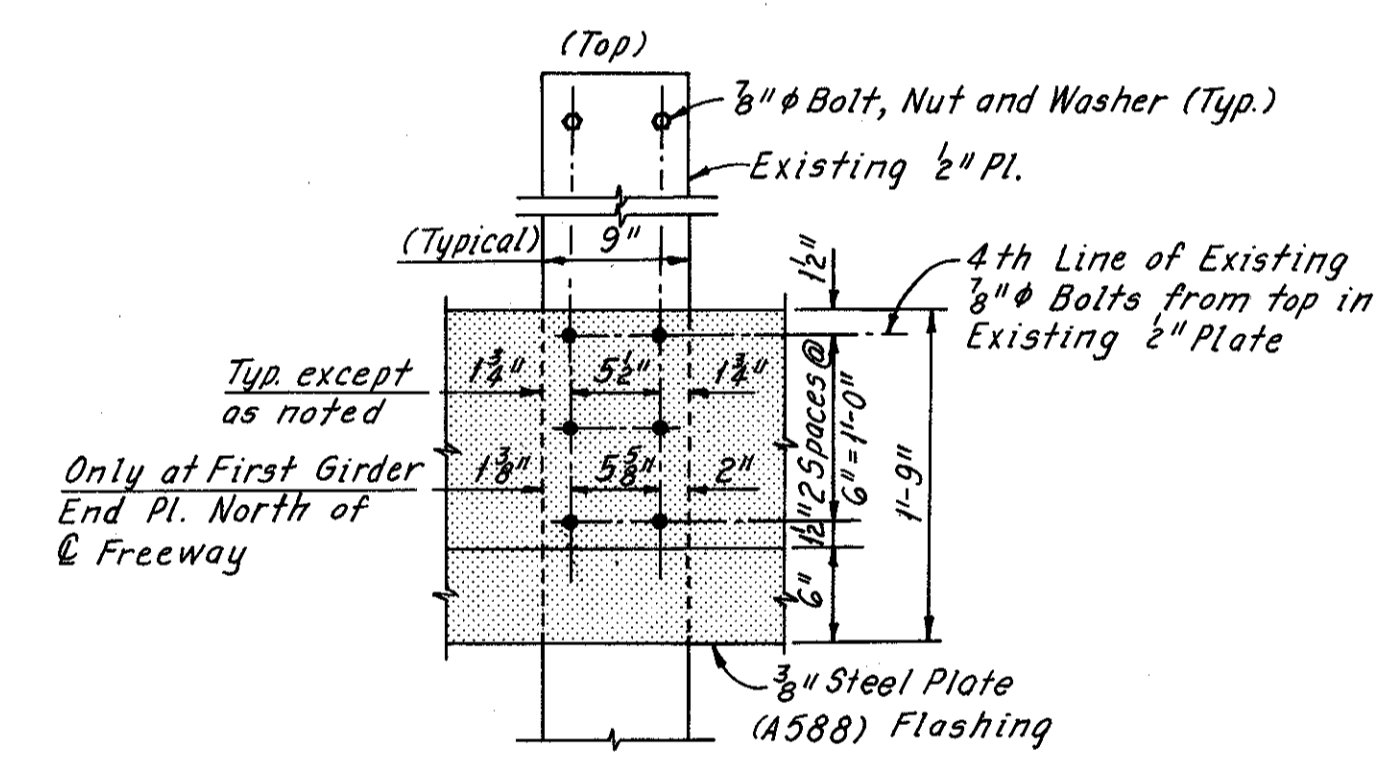
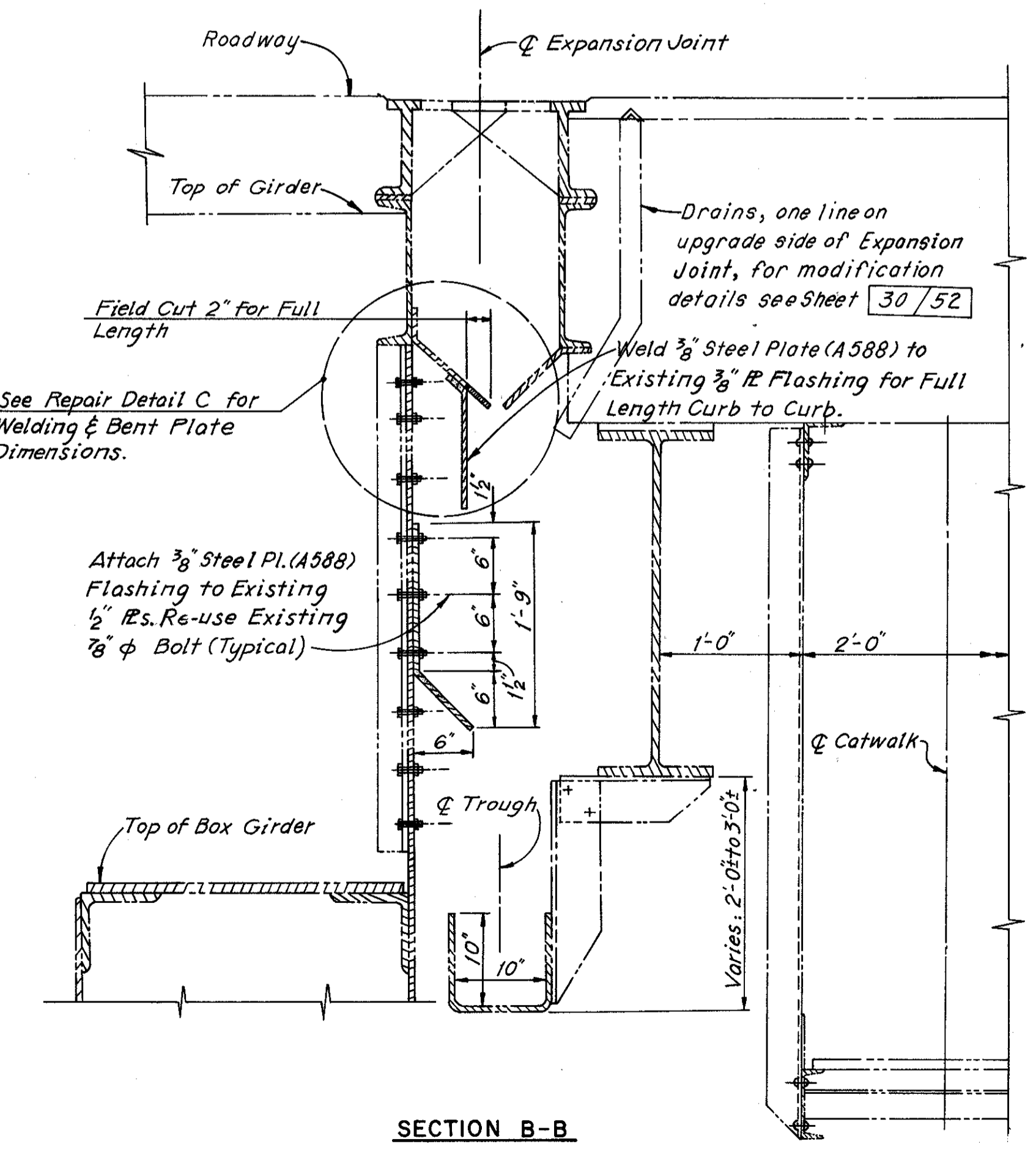
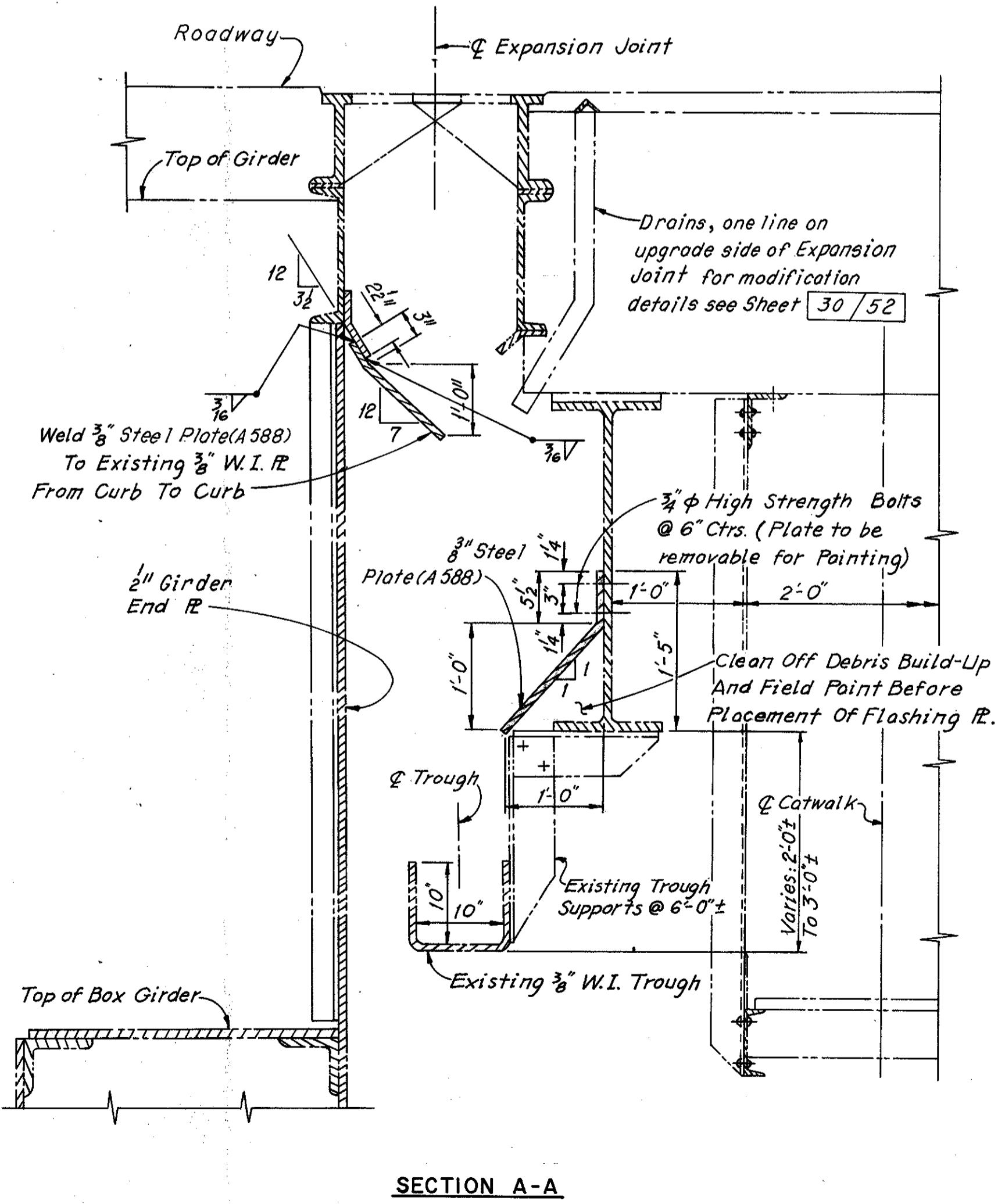
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>INNERBELT EXTENSION AND WEST APPROACH DRAINAGE DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	STA. 3+87.63	
	42R-17 50	STA. 54+65.78	
	42 -17 50		
CUYAHOGA COUNTY			OHIO
DRAWN DMP	TRACED SMS	CHECKED PAB	REVIEWED CFB
DATE 3-14-72	DATE 3-15-72	DATE 4-21-72	DATE 5-26-72
			SHEET 32 / 52

CUYAHOGA COUNTY  
CUY-90-15.24



HALF SECTION OF EXPANSION JOINT AT EAST END PIER (LOOKING EAST)

Note: (N) = Indicates North of  $\bar{Q}$  Bridge  
(S) = Indicates South of  $\bar{Q}$  Bridge



DETAIL A

DETAIL B

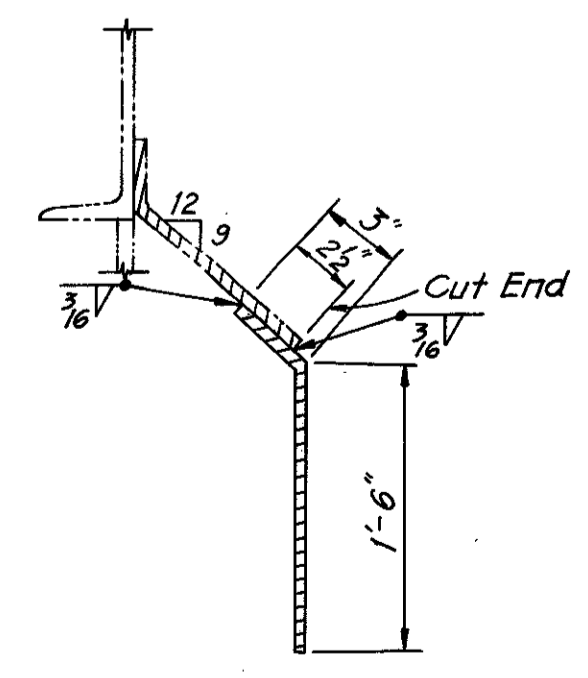
Notes:

The details shown represent the original plan drawings for the drainage system except for the modifications indicated. The existing drainage system shall be cleaned out as indicated in the General Notes.

For location of Expansion Joints see General Plan, Sheets 9/52 and 13/52.

For View D-D and Hopper Detail at top of piers see Sheet 35/52.

Indicates modifications.

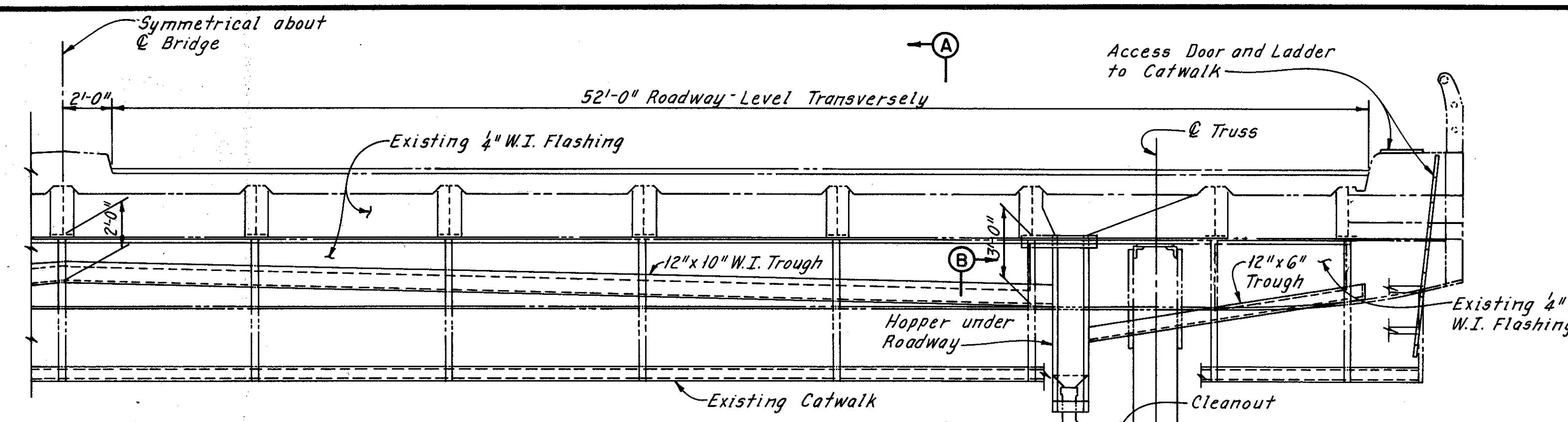


HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>CENTRAL VIADUCT DRAINAGE DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42 -17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN DMP	TRACED W/B	CHECKED DHS	REVIEWED CBE
DATE 3-20-72	DATE 3-22-72	DATE 4-27-72	DATE 5-26-72
			SHEET 33 / 52

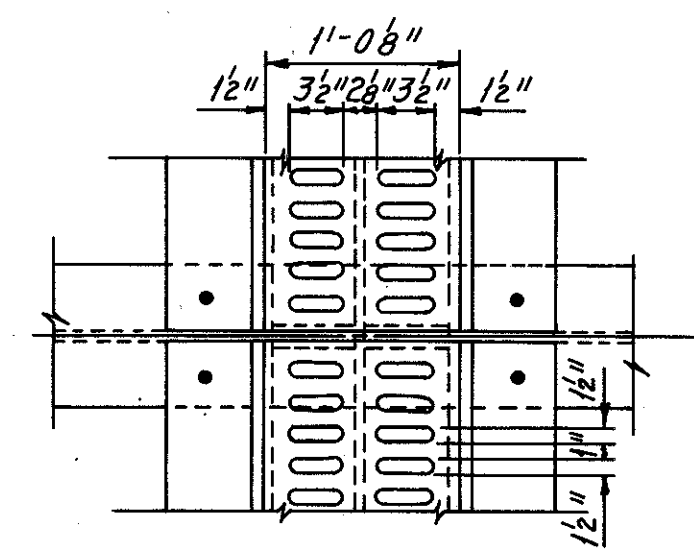
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-90-1 (87) 24	

34  
52

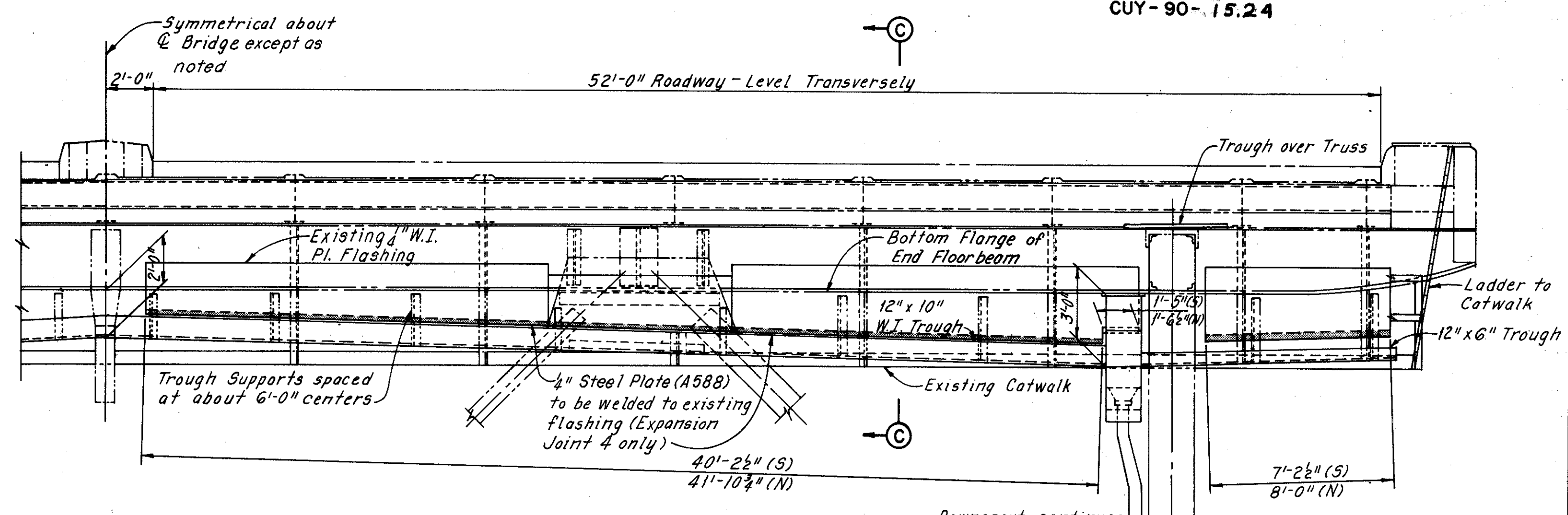
CUYAHOGA COUNTY  
CUY-90-15.2.4



TYPICAL HALF SECTION AT CROSS DRAINS



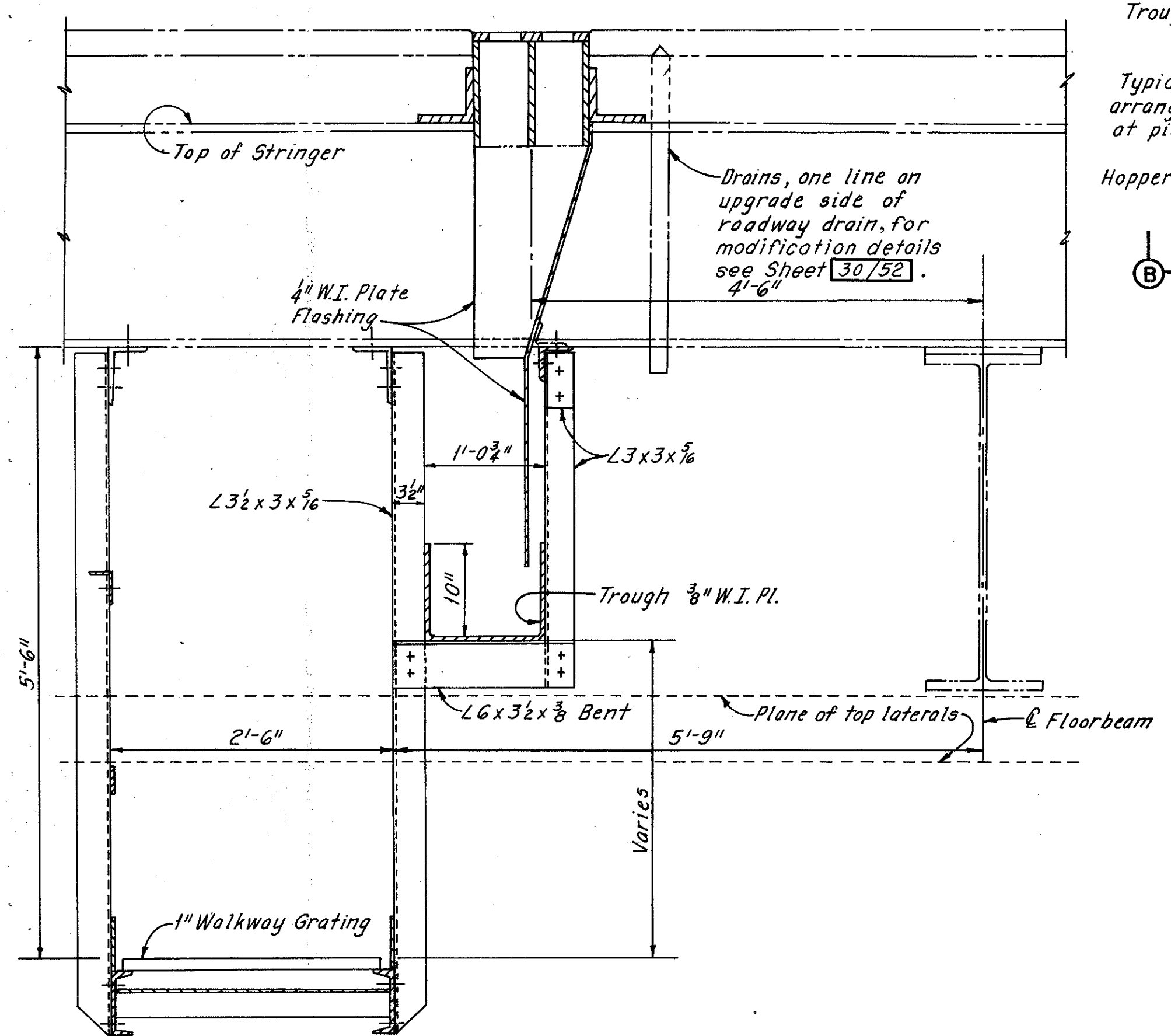
PLAN OF CROSS DRAIN



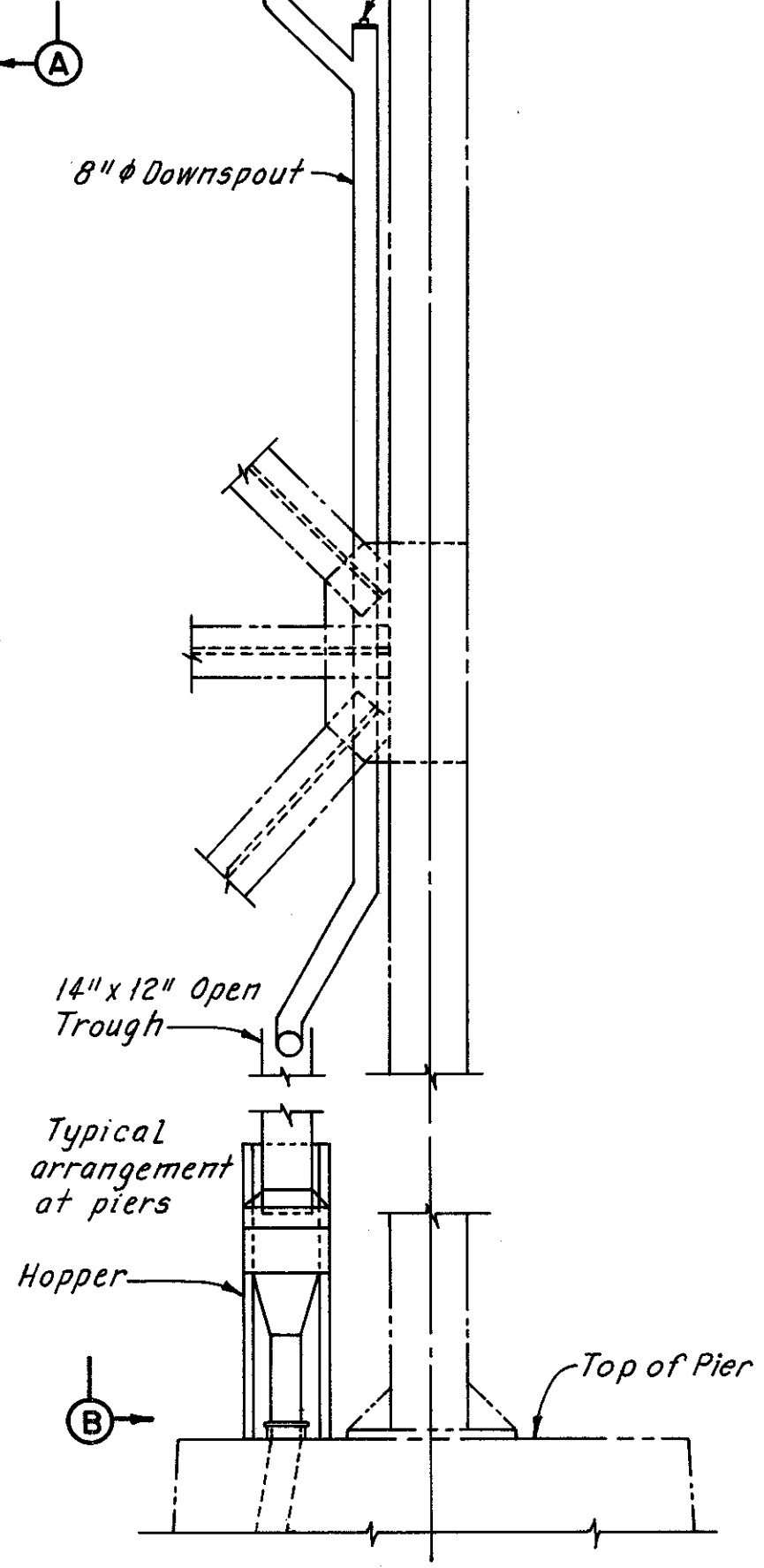
HALF SECTION AT EXPANSION JOINTS  
2 THRU 5

(Looking East - For Expansion Joints 2 & 3)  
(Looking West - For Expansion Joints 4 & 5)

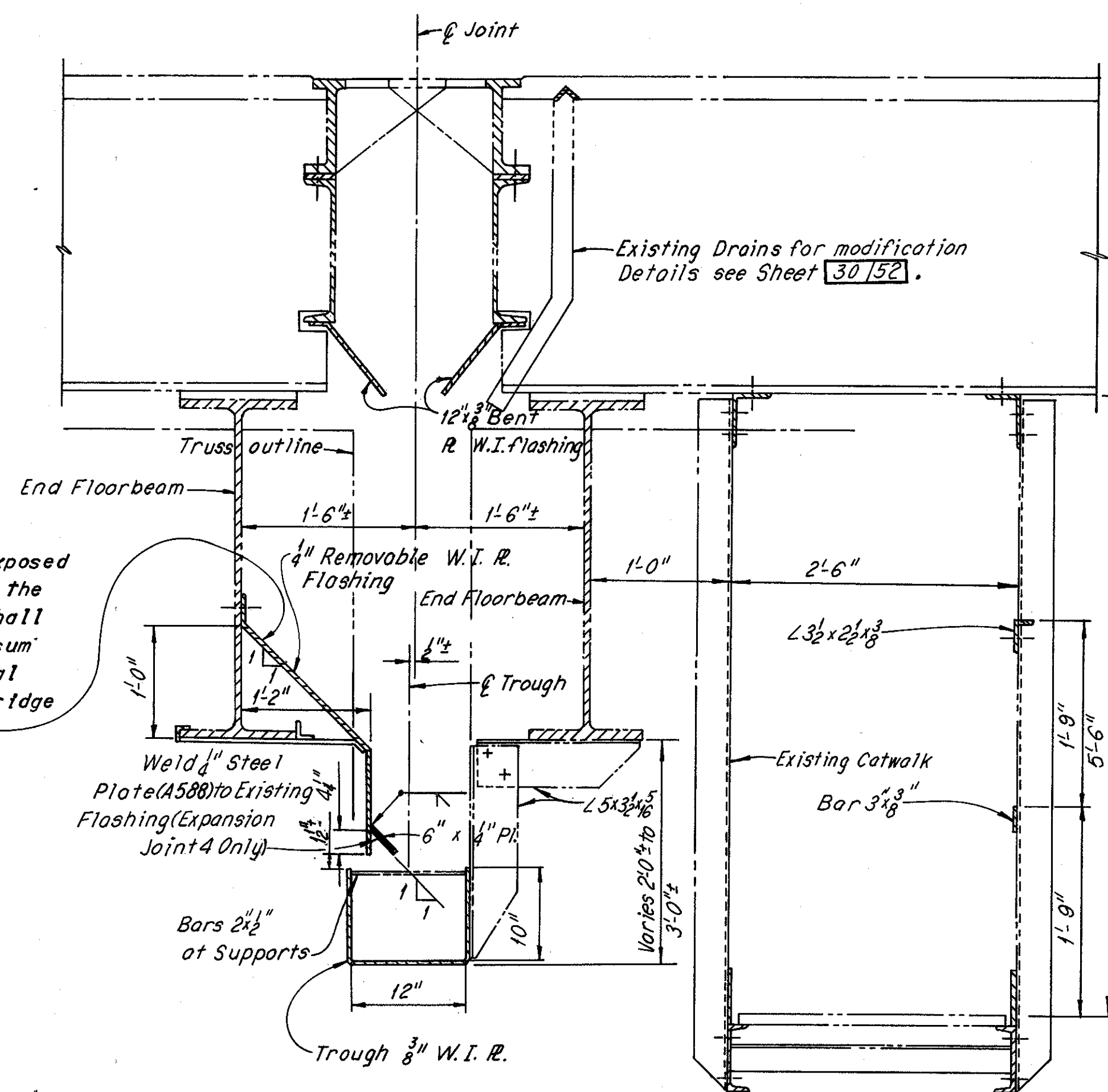
Note:  
(N) - Indicates North of Centerline of Bridge.  
(S) - Indicates South of Centerline of Bridge.



SECTION A-A



Note:  
The Crossdrain Details shown are for a crossdrain not at a Contraction Joint. When a crossdrain is located at a Roadway Contraction Joint, the Details are similar.



SECTION C-C

Remove plate and paint exposed surfaces as indicated in the General Notes. Payment shall be included in the lump sum price bid for Item Special Cleanout and Repair of Bridge Drainage System.

Notes:  
The details shown represent the original plan drawings for the drainage system except for the modifications indicated. The existing drainage system shall be cleaned out as indicated in the General Notes.  
For location of expansion joints and cross drains see General Plan, Sheets 9 | 52 | thru 13 | 52 |.  
For View B-B and Hopper Detail at top of piers see Sheet 35 | 52 |.  
[Hatched Box] Indicates modifications.

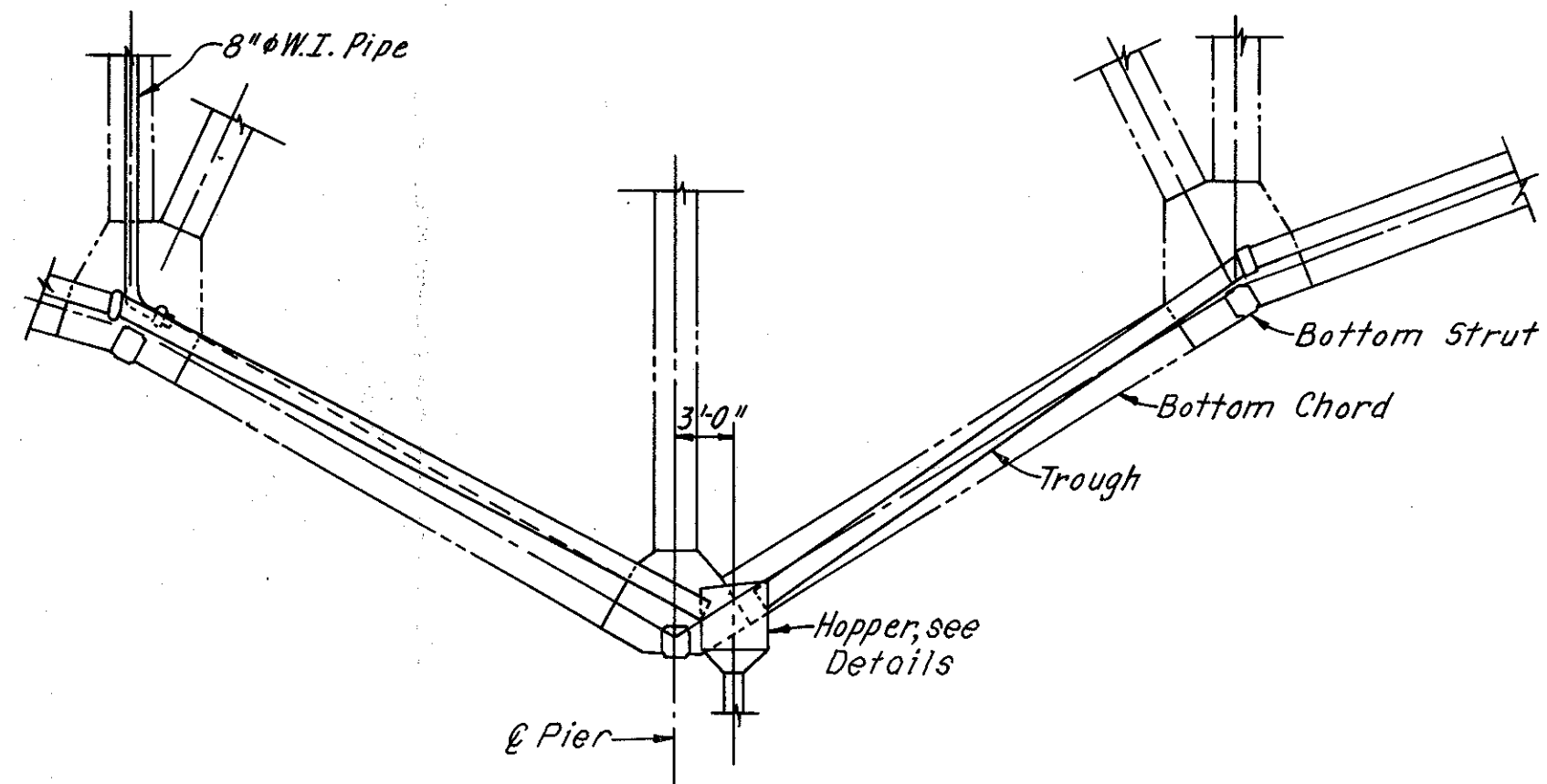
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**CENTRAL VIADUCT  
DRAINAGE DETAILS**

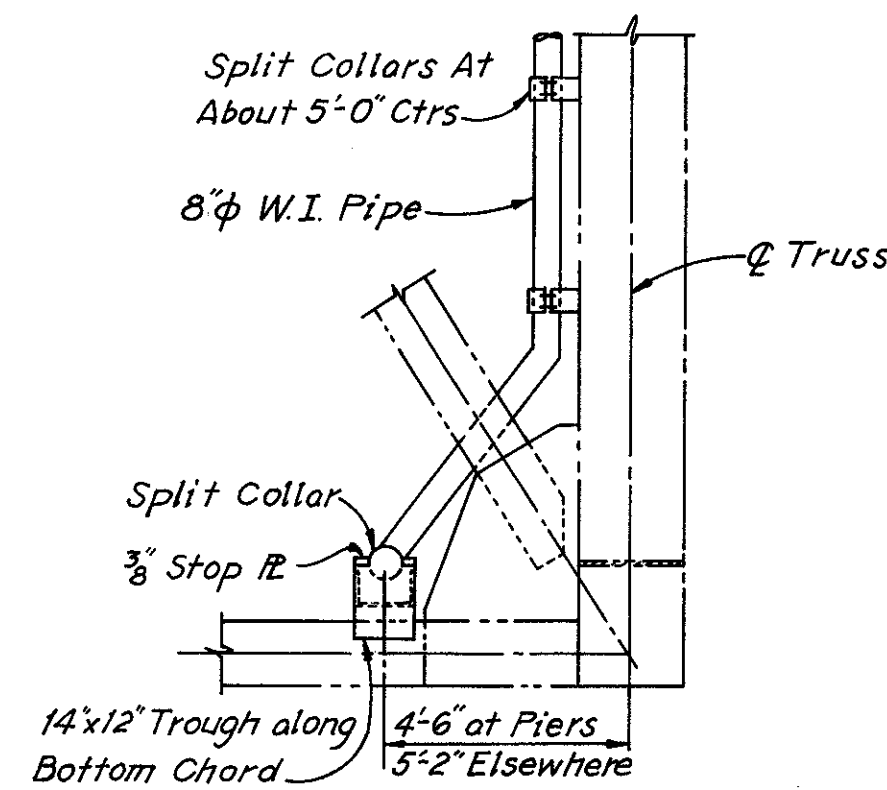
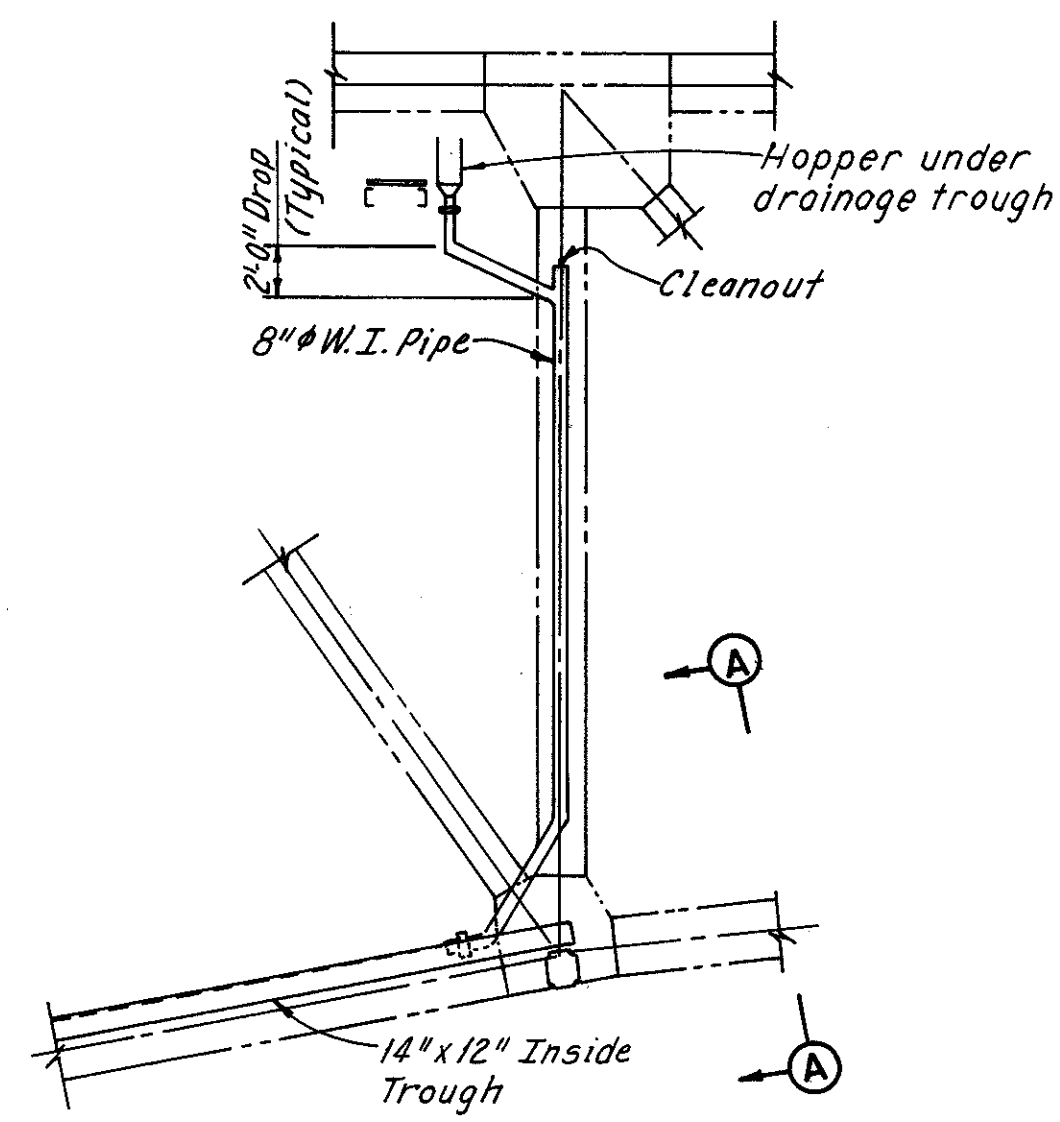
OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 50 STA. 54+65.78  
42 -17 50

CUYAHOGA COUNTY OHIO

DRAWN DMP TRACED WBE CHECKED RMB REVIEWED CAB REVISED  
DATE 3-21-72 DATE 3-29-72 DATE 4-21-72 DATE 5-26-72 SHEET 34 / 52



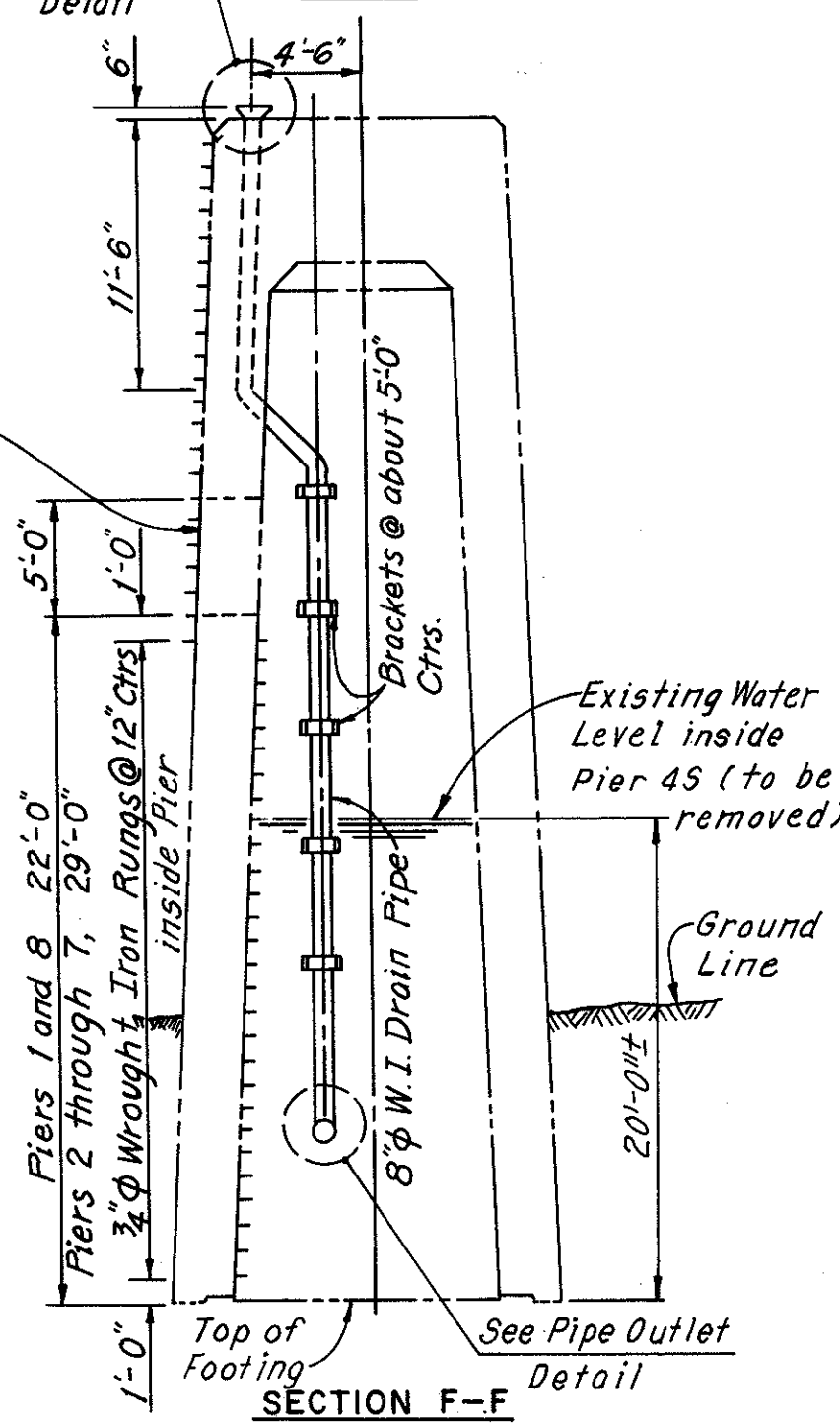
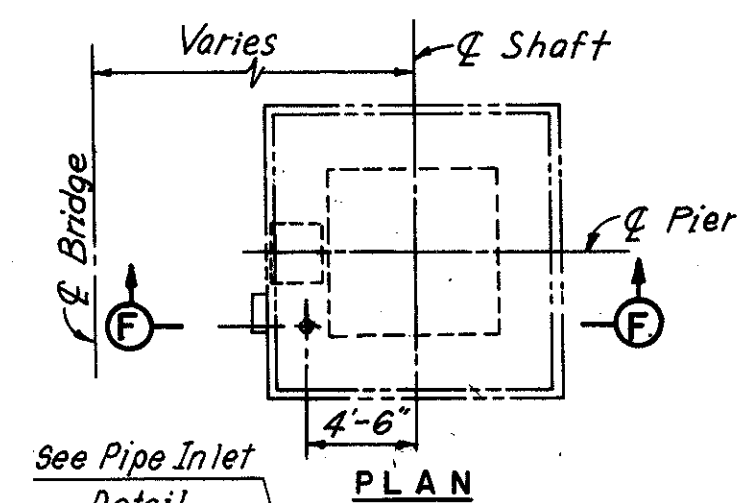
**VIEW B-B**  
(For location of View B-B, see Sheet 34/52.)



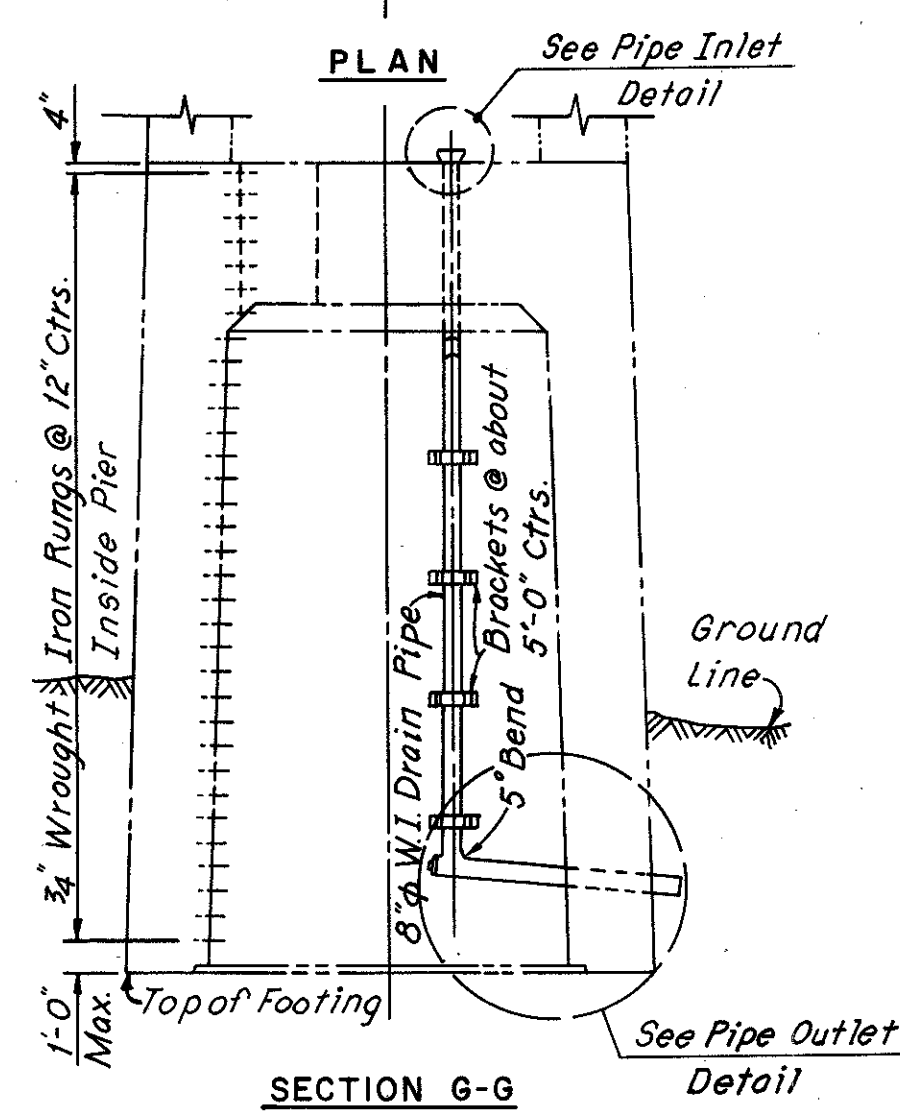
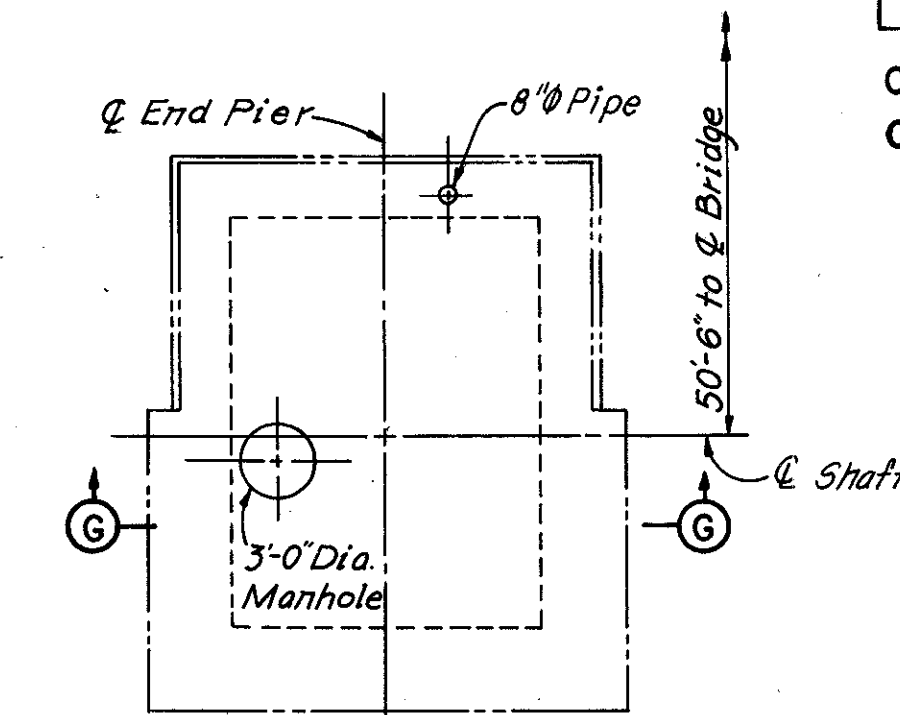
**SECTION A-A**

14x12 Trough along Bottom Chord  
4'-6" at Piers  
5'-2" Elsewhere

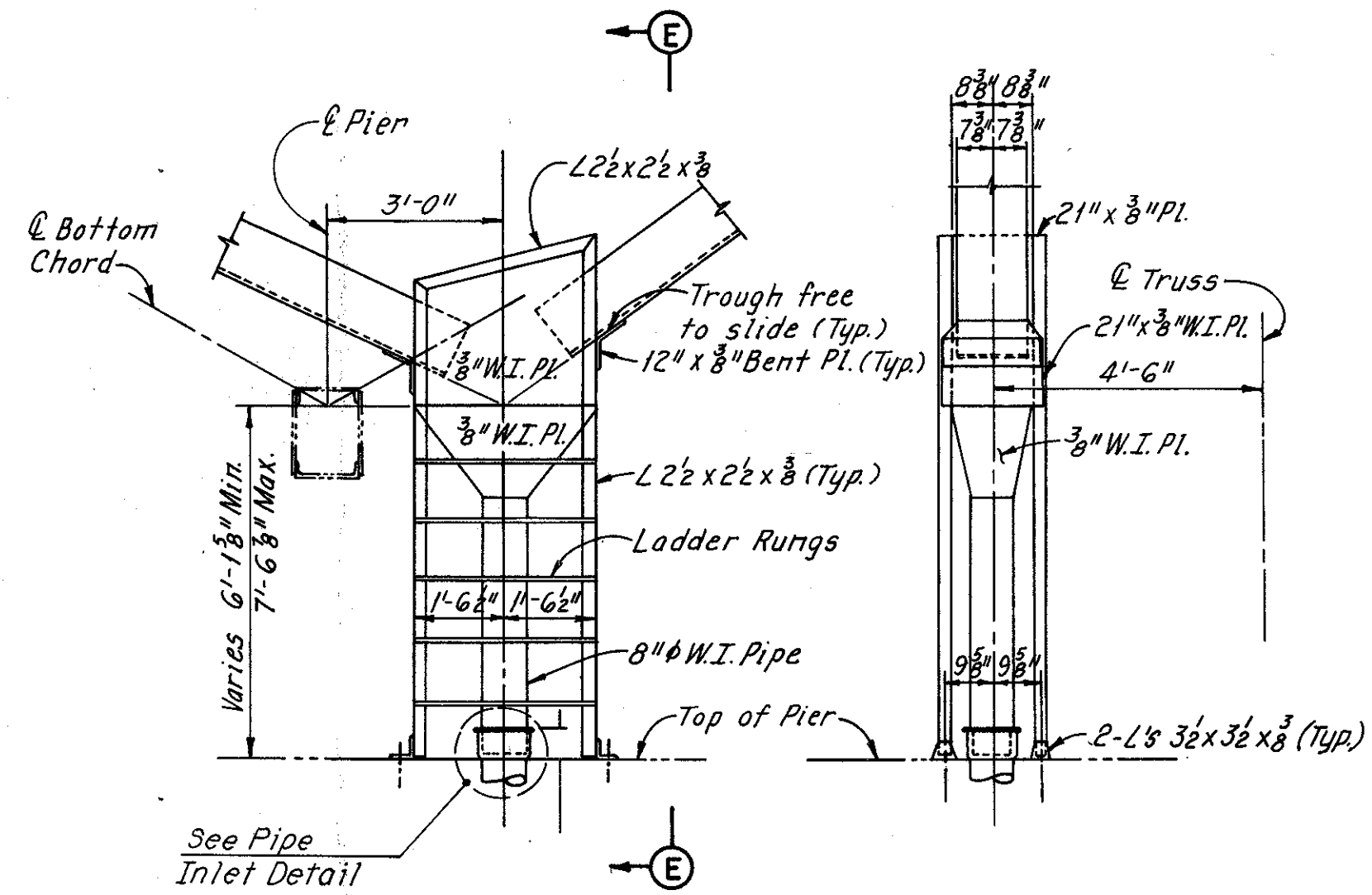
Access door into Piers. Remove rust and thoroughly clean all contact surfaces on the access door latch and hinges necessary to allow proper opening. Payment for this work shall be included in the lump sum price bid for Item Special, Cleanout and Repair of Bridge Drainage System.



**PIERS 1 THRU 8**



**END PIERS**

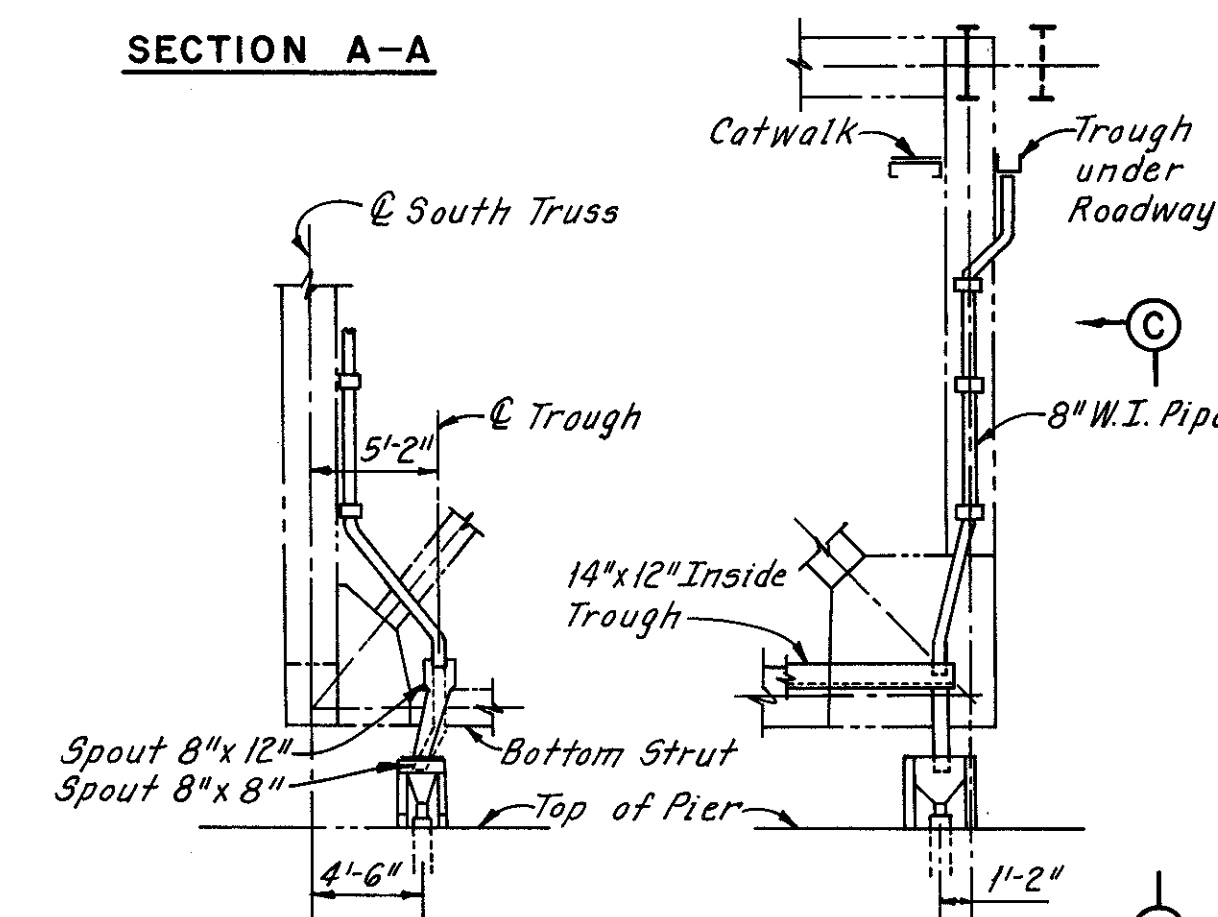


**ELEVATION**

**SECTION E-E**

**TYPICAL DETAIL OF HOPPER AT TOP OF PIERS**

**DRAINAGE DETAILS ABOVE PIERS**

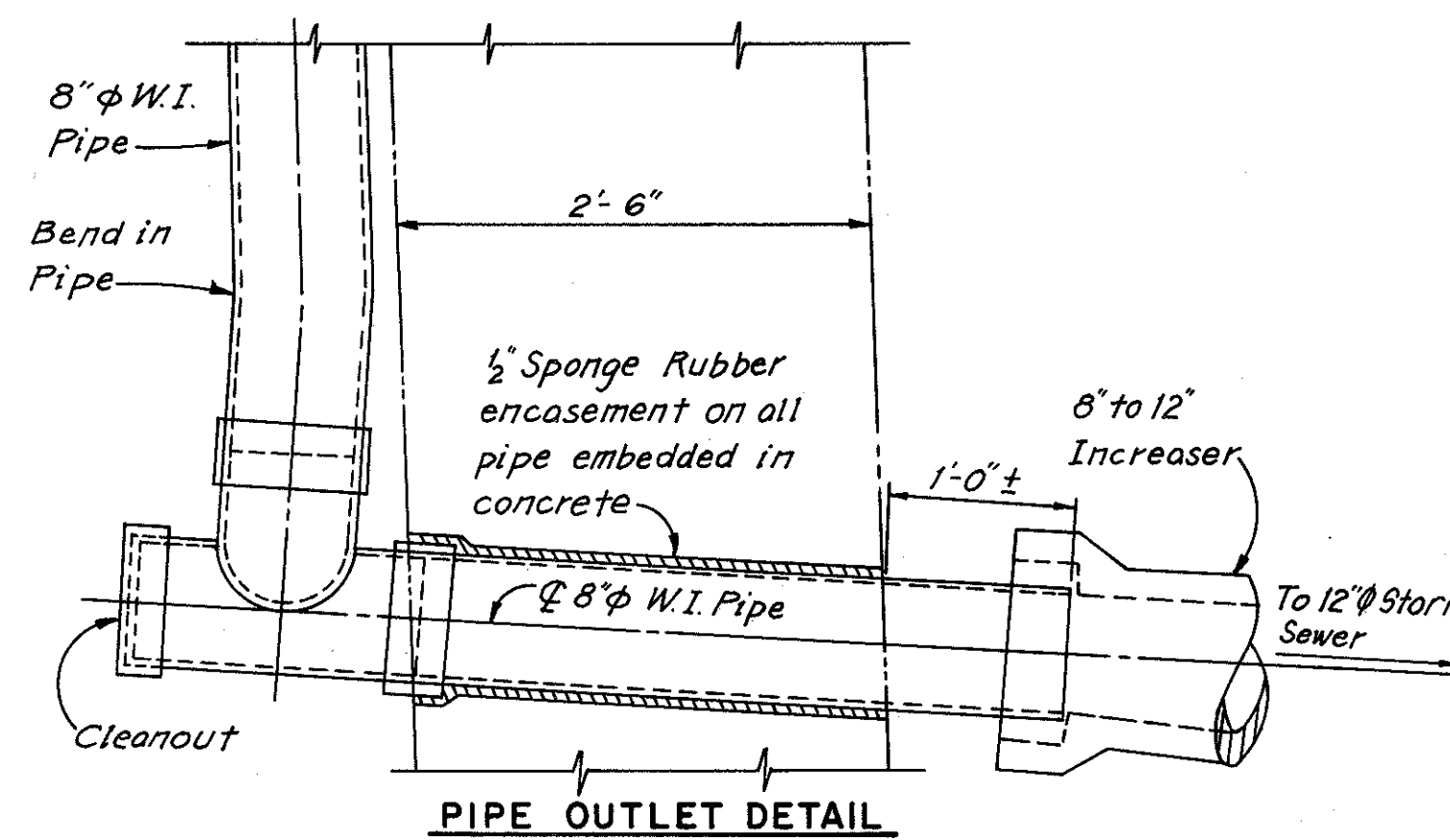


**SECTION C-C**

**VIEW D-D**  
(For location of View D-D, see Sheet 33/52.)

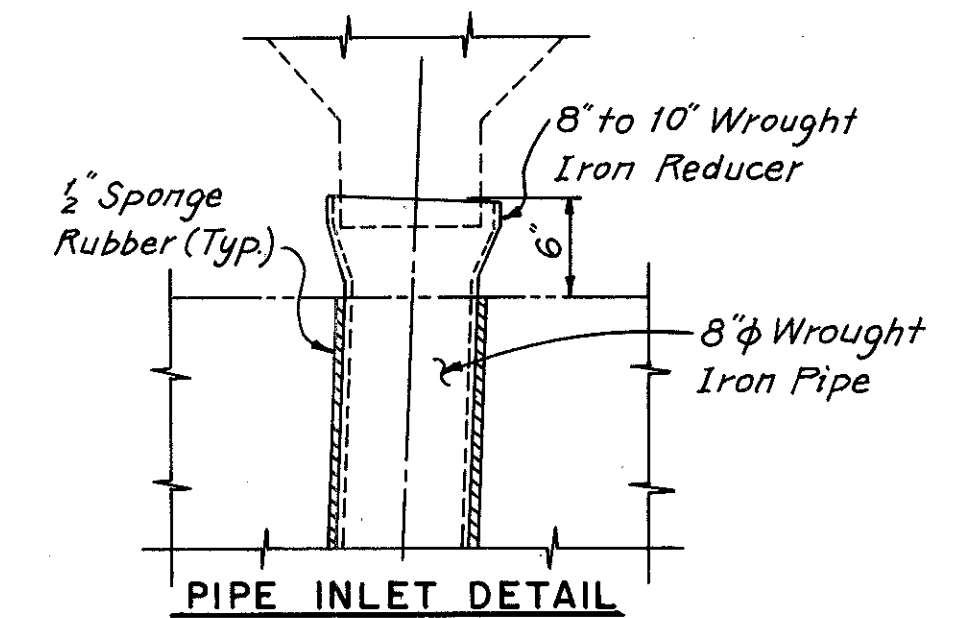
East End Pier is shown. At West End Pier the trough is omitted and the downspout goes down into the hopper.

**SECTION AT END PIERS**



**PIPE OUTLET DETAIL**

**DRAINAGE DETAILS INSIDE PIERS**

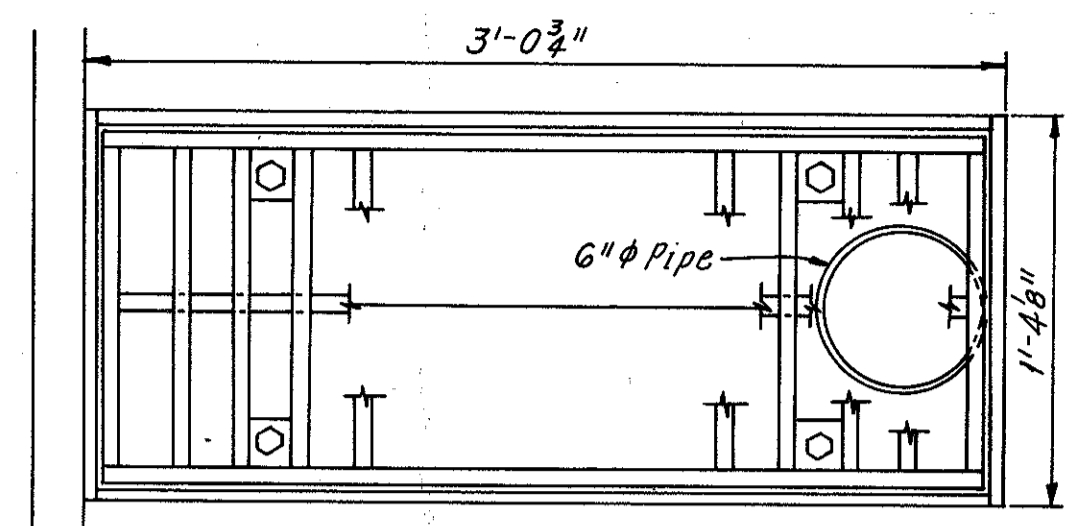


**PIPE INLET DETAIL**

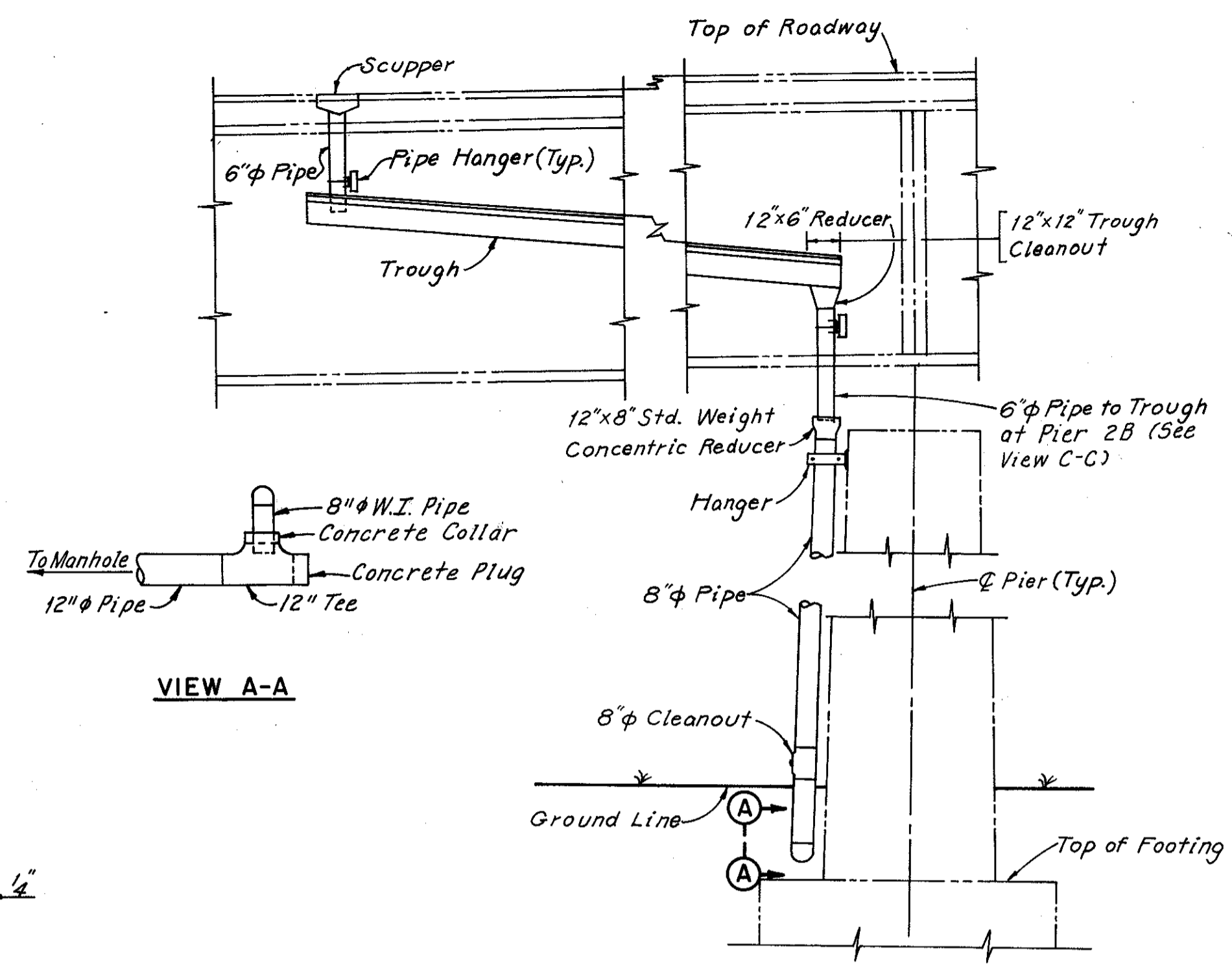
Notes:  
The details shown represent the original plan drawings for the drainage system except for the modifications indicated. The existing drainage system shall be cleaned out as indicated in the General Notes.  
For exact locations of drainage facilities, see Sheets 9/52 thru 13/52.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>CENTRAL VIADUCT DRAINAGE DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42 -17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN DMP	TRACED WBS	CHECKED AAB	REVIEWED CAB
DATE 3-22-72	DATE 3-24-72	DATE 4-21-72	DATE 5-26-72
			SHEET 35 / 52

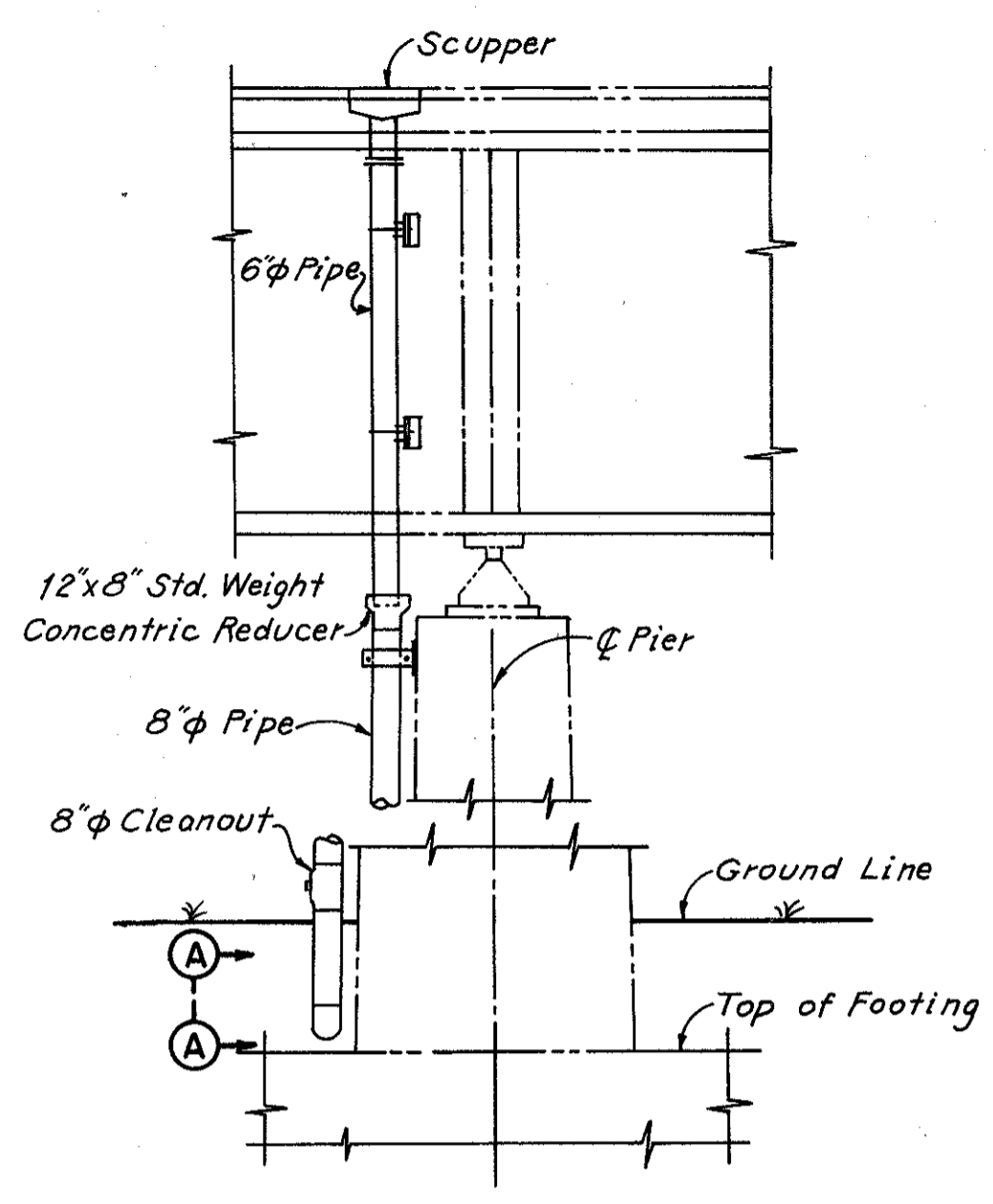
CUYAHOGA COUNTY  
CUY-90-15.24



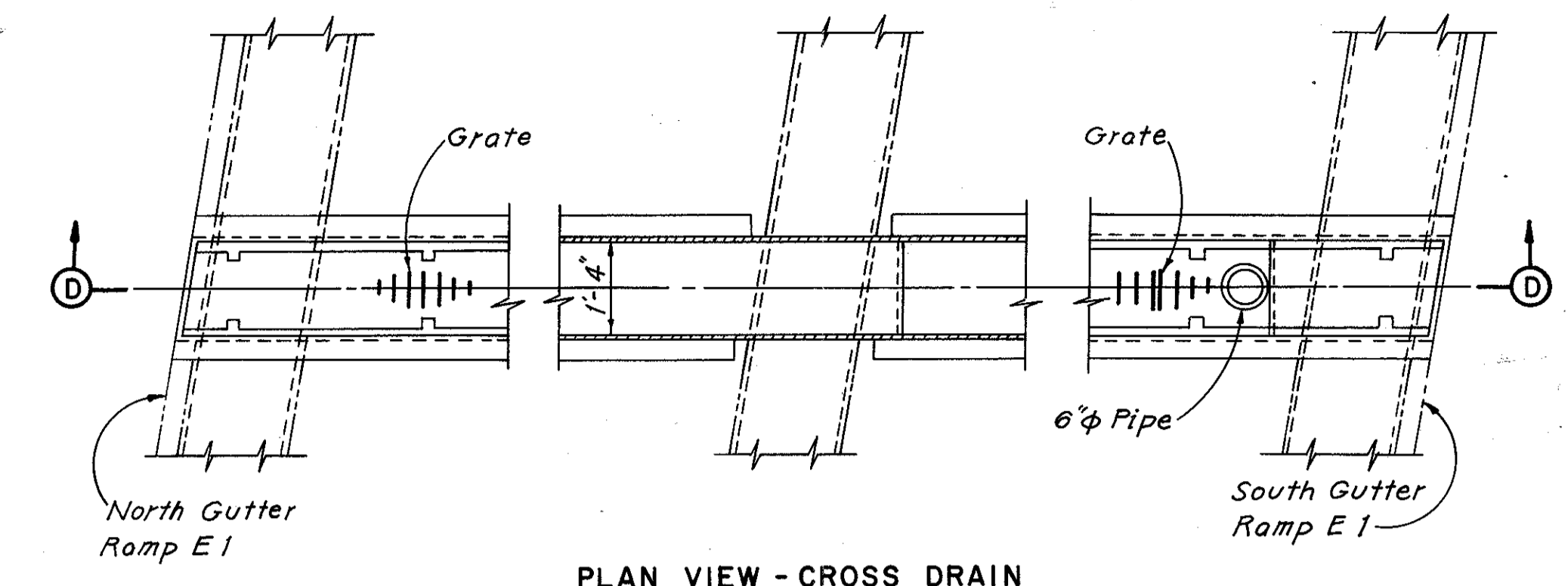
TYPICAL SCUPPER PLAN



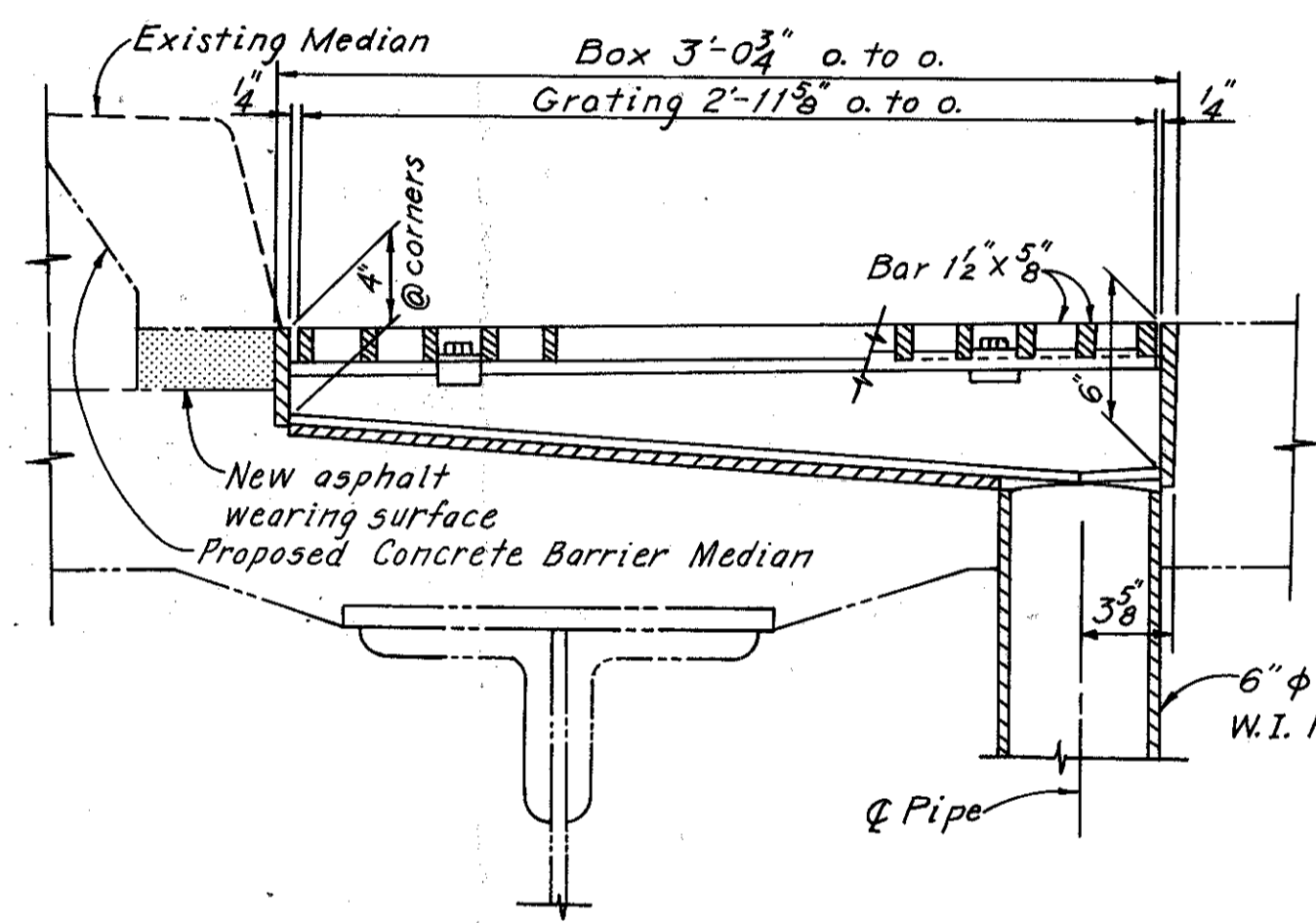
VIEW A-A



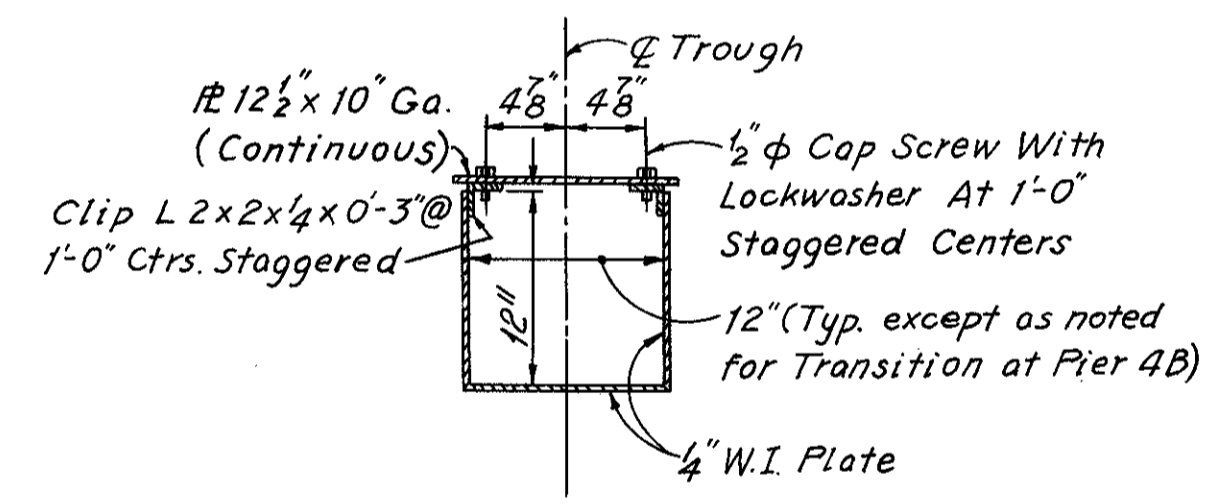
DRAINAGE AT PIER 2E2 (LOOKING SOUTH)



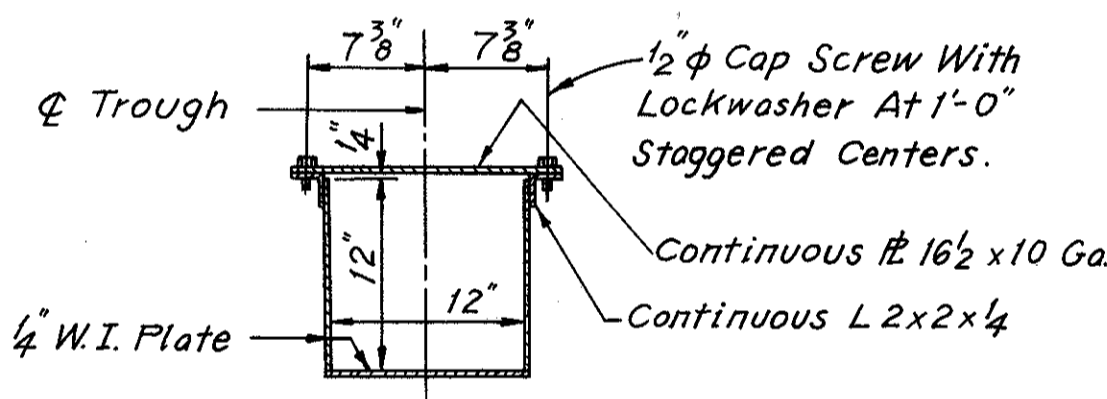
PLAN VIEW - CROSS DRAIN



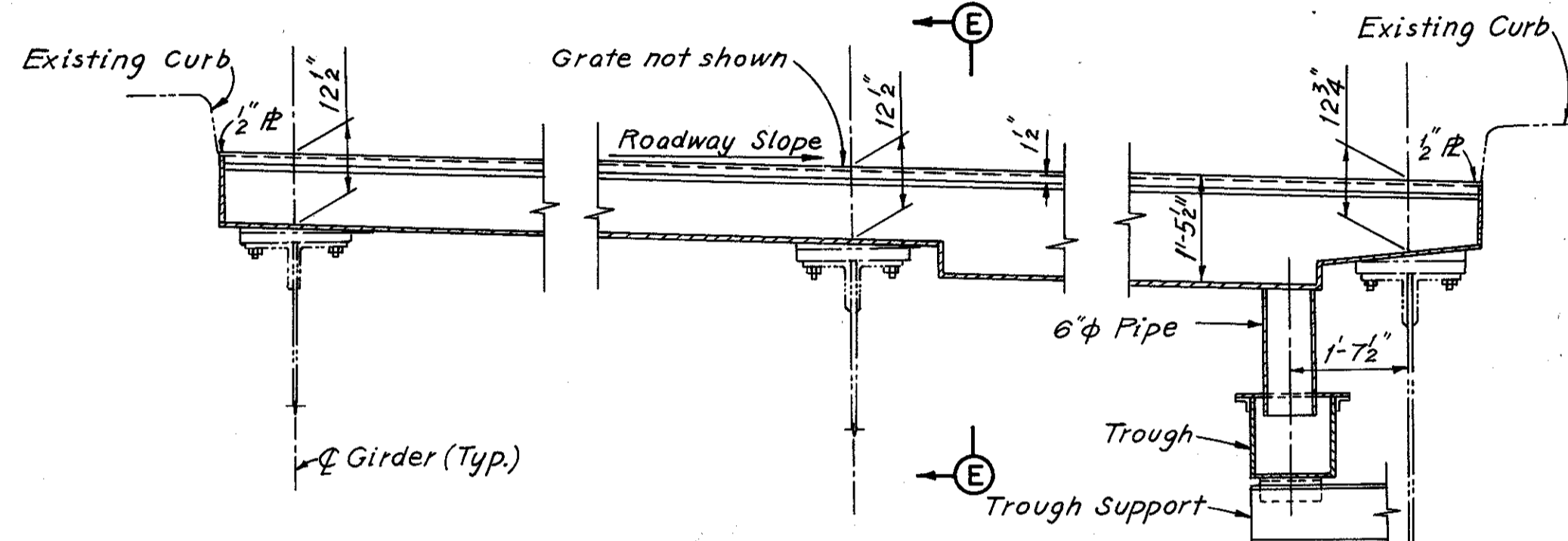
SECTION B-B



TYPICAL TROUGH SECTION ALONG PIER CAPS

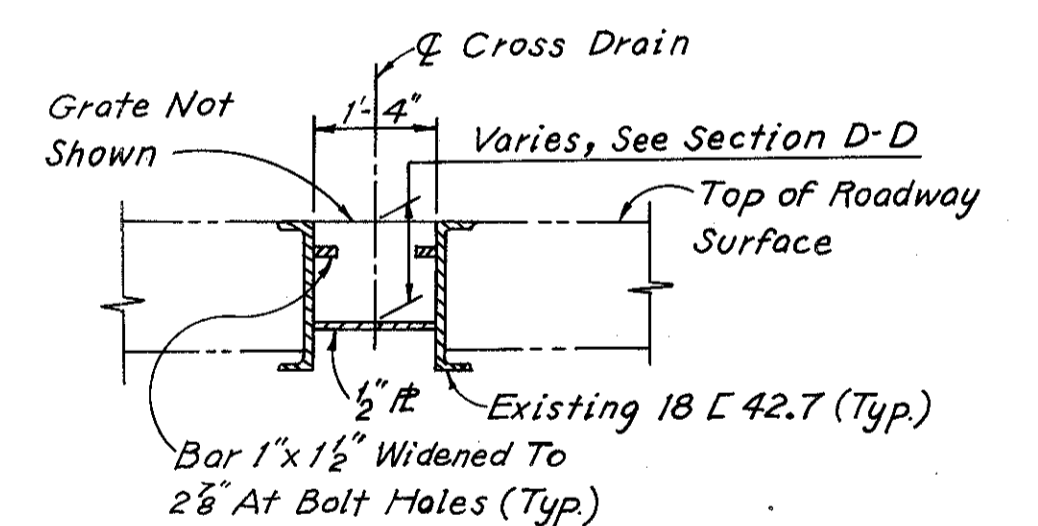


TYPICAL TROUGH SECTION ALONG GIRDERS



SECTION D-D

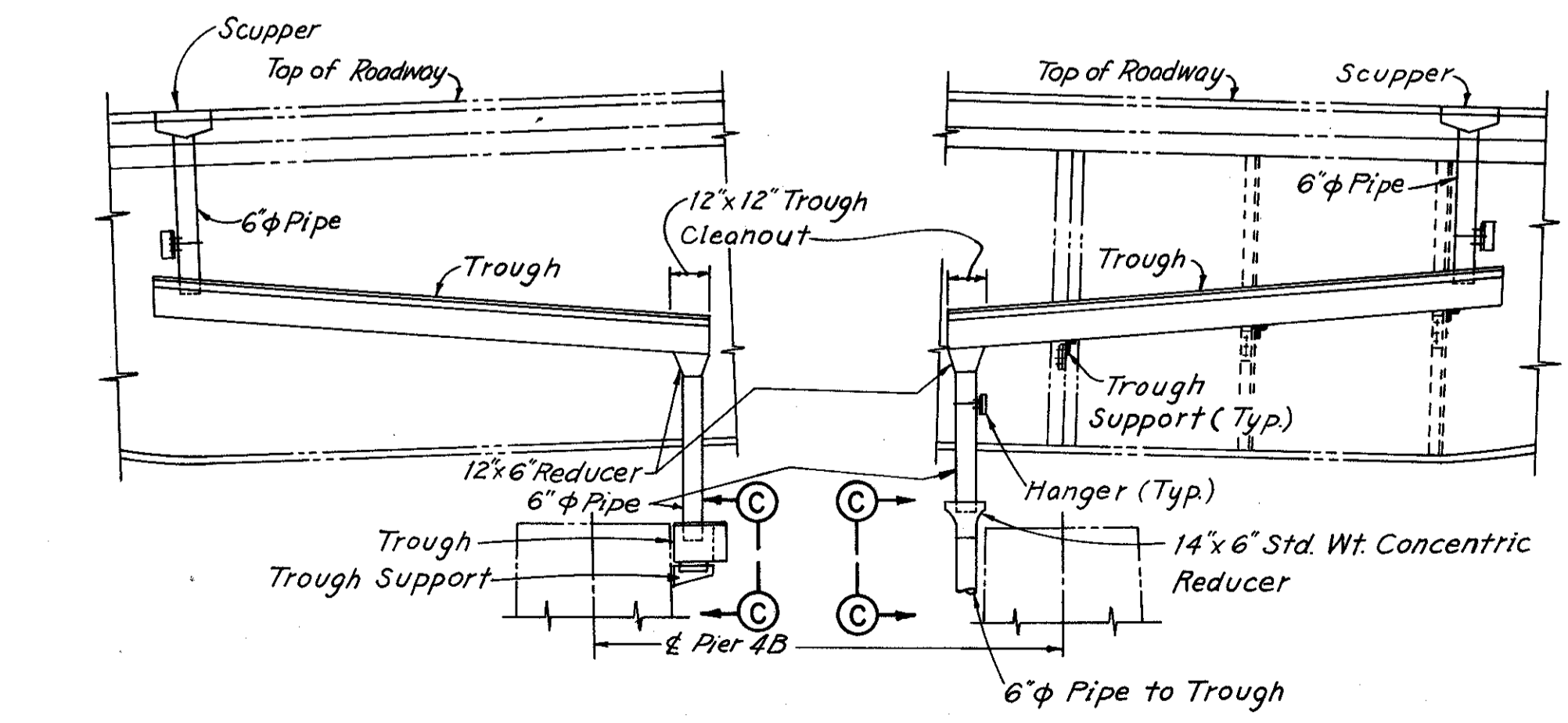
Note: Drainage from trough at Pier 2E1 is similar to Pier 1E2 drainage.



SECTION E-E

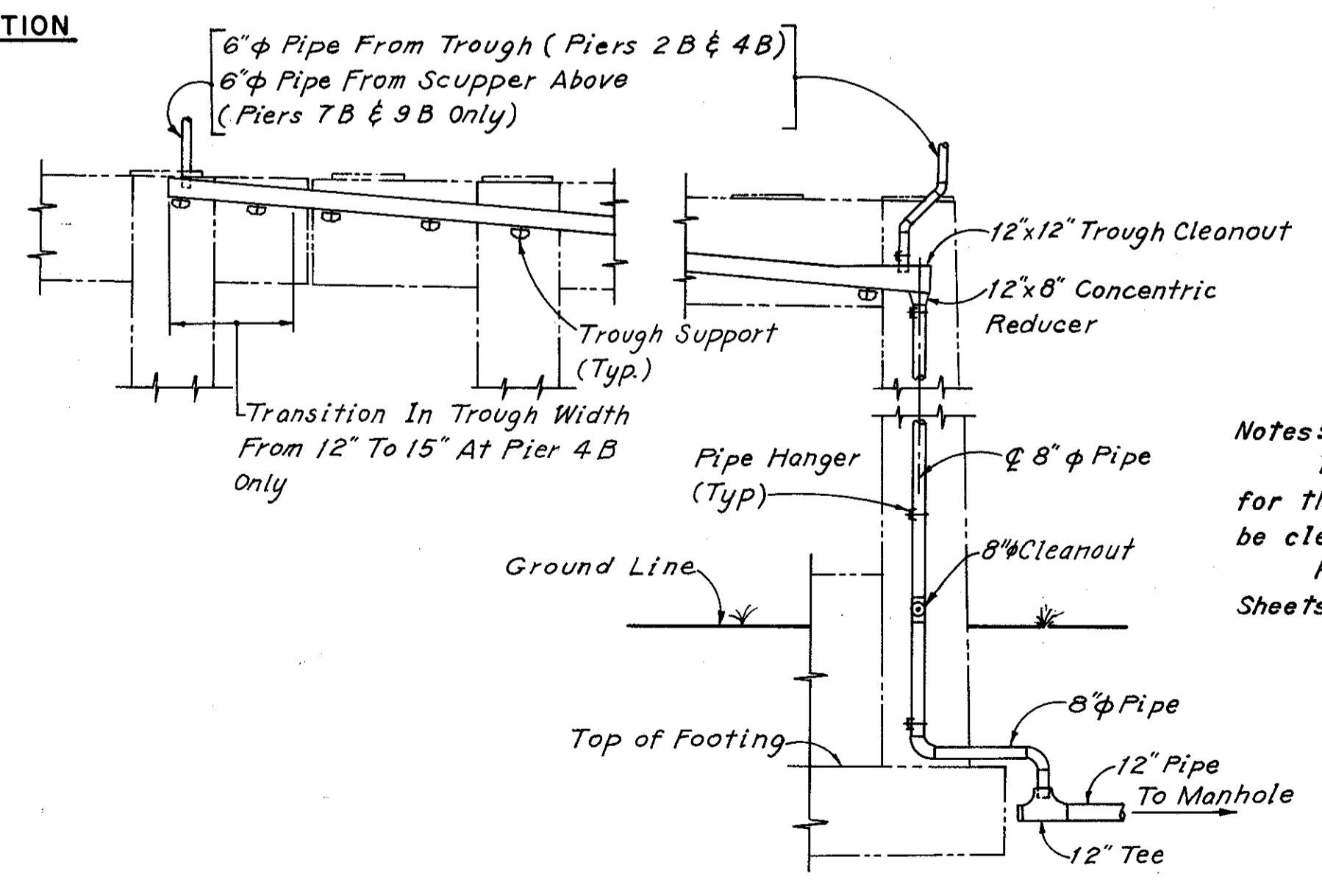
Notes:  
The details shown represent the original plan drawings for the drainage system. The existing drainage system shall be cleaned out as indicated in the General Notes.  
For Scupper and Cross Drain locations see General Plan, Sheets 14/52 and 15/52.

DRAINAGE AT PIER 1E2 - (LOOKING SOUTH)  
DRAINAGE AT PIER 2B SOUTH CURB - (LOOKING NORTH)

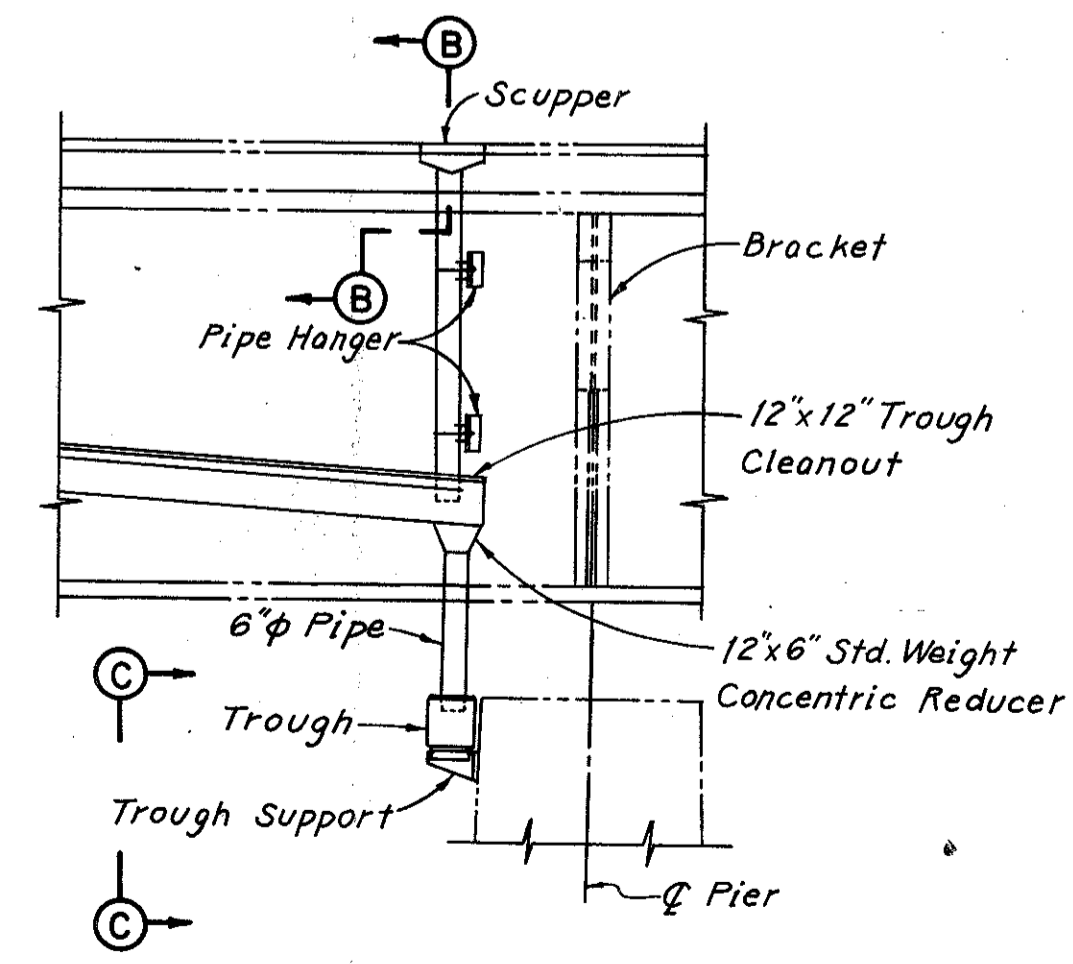


NORTH MEDIAN DRAINAGE AT PIER 4B (LOOKING SOUTH)

SOUTH CURB DRAINAGE AT PIER 4B (LOOKING NORTH)



VIEW C-C AT PIERS 2B AND 4B (Similar at Piers 7B and 9B, except as noted)



NORTH MEDIAN DRAINAGE AT PIER 2B (LOOKING NORTH)

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>EAST APPROACH DRAINAGE DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	42R-17 50	42 -17 50
STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO			
DRAWN DMP	TRACED SMS	CHECKED PAB	REVIEWED CHE
DATE 3-16-72	DATE 3-21-72	DATE 4-21-72	DATE 5-26-72
			SHEET 36 / 52

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1 (87) 24

37  
52

CUYAHOGA COUNTY  
CUY-90-15.24

**CONCRETE DECK REPAIR NOTES - ITEM 519**

All concrete deck repair shall be in accordance with Item 519 except where shown or noted otherwise in the Plans and General Notes or as directed by the Engineer. Only concrete patches shall be used. The concrete shall be Class C where underdeck cracking is present and shall be in accordance with 499.03.

**DECK SLAB REPAIR AT SPALLS**

- For repair of spalls the following steps shall be taken:
1. For spalls 1" deep & over check for underdeck cracking, if present follow repair procedure for underdeck cracking.
  2. If no underdeck cracking is present, the perimeter of the spall shall first be saw cut to a depth of 3/4" and then all unsound concrete shall be removed. In removing unsound concrete be certain the removal limits extend well into sound concrete. Square or preferably slightly undercut shoulders shall be made at the edge of all repair areas. Care shall be used in working around reinforcing steel so as not to loosen or damage the steel, or to shatter the concrete around it, beyond the repair area.
  3. Deteriorated reinforcement shall be restored at locations as directed by the Engineer, in the following manner: Concrete shall be chipped away to expose a length of sound bar either side of the corroded area. The bar will be sandblasted if corroded less than 50% or cut out if corroded more. A new bar with the same area will be lapped 30 diameters either side of the corroded or cut out area.
  4. Thoroughly clean the surface and then apply polysulphide - epoxy adhesive (See Note in General Notes).
  5. Place the concrete as specified in the General Notes.

**DECK SLAB REPAIR AT UNDERDECK CRACKS**

At deep spall locations (1" deep & over) the underneath of the deck slab shall be inspected for underdeck cracking, appearing in a checkerboard pattern and showing efflorescence. If the underdeck cracking is present the entire deck shall be removed to the limits indicated by the Engineer. Existing deck reinforcement shall extend a minimum of 30 bar diameters beyond the limits of concrete removal to serve as dowels for the rebuilt slab. The deck shall then be replaced, in kind. The underdeck inspection on the Central Viaduct Bridge will necessitate the removal of the stay-in-place metal forms. The removed metal form shall not be reused to form the deck upon replacement. After the slab is replaced the form shall be removed to expose the bottom of the slab. \*

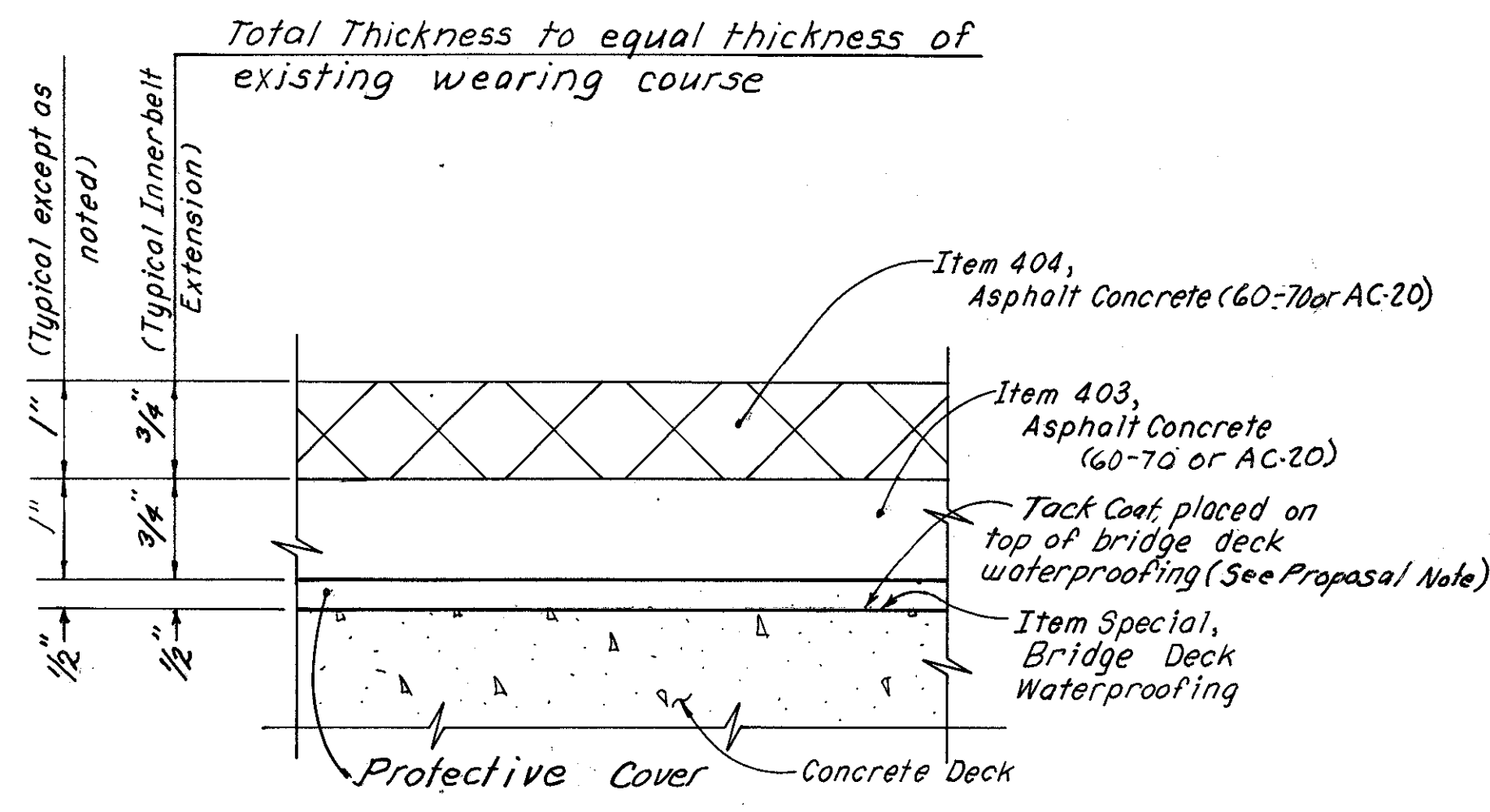
**PNEUMATICALLY PLACED MORTAR REPAIRS - ITEM 520**

All repair work exclusive of the deck slab shall be in accordance with Item 520 except as noted otherwise in the General Notes, where directed by the Engineer, or when the average depth of repair exceeds 6 inches. For spalls over 6" deep, the repair shall be made with concrete in accordance with Item 519, and included for payment in the unit price bid for Item 520.

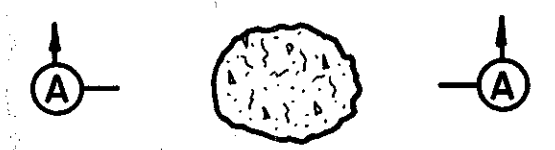
The following procedure shall be followed when existing reinforcement is exposed:

Concrete shall be chipped away to expose a length of sound bar either side of the corroded area. The bar shall be sand blasted if corroded less than 50% or cut out if corroded more. A new bar with the same area shall be spliced either side onto the corroded or cut-out area with an approved mechanical connector or by overlapping their ends not less than 30 diameters.

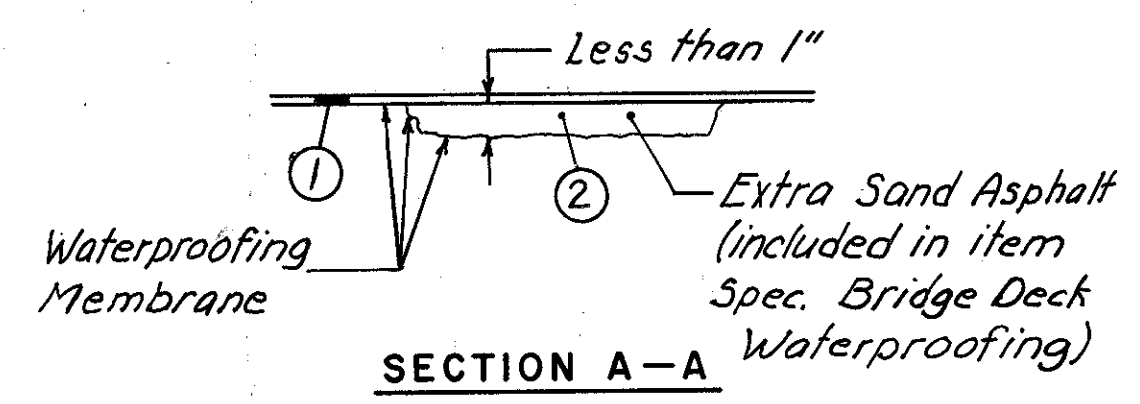
\* Cost of removing the stay-in-place metal form shall be included in the unit price bid for item 519 Patching Concrete Deck Slabs (Partial Depth).



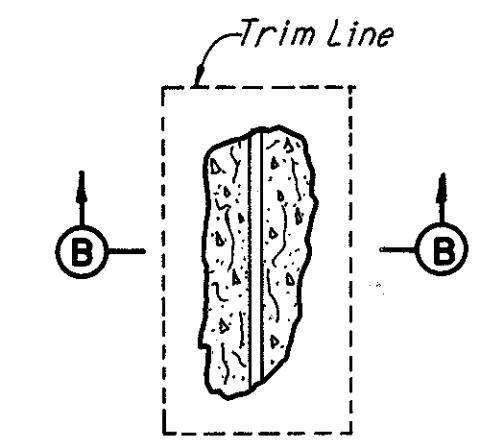
**TYPICAL CROSS SECTION THRU NEW ASPHALT WEARING SURFACE COURSE**



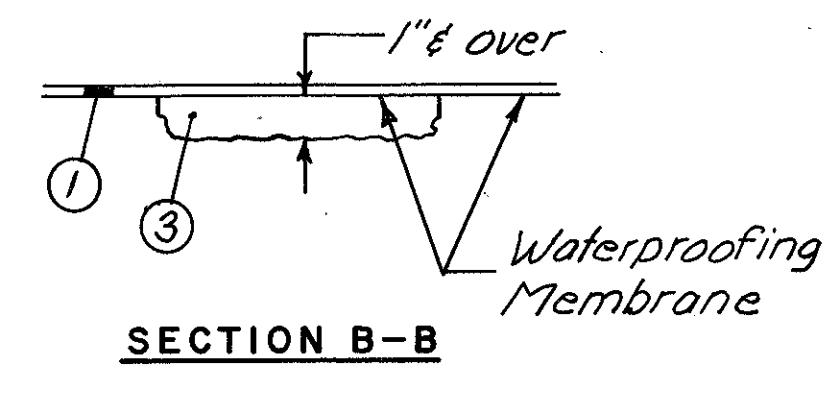
**CONCRETE SPALL LESS THAN 1"**



**SECTION A-A**



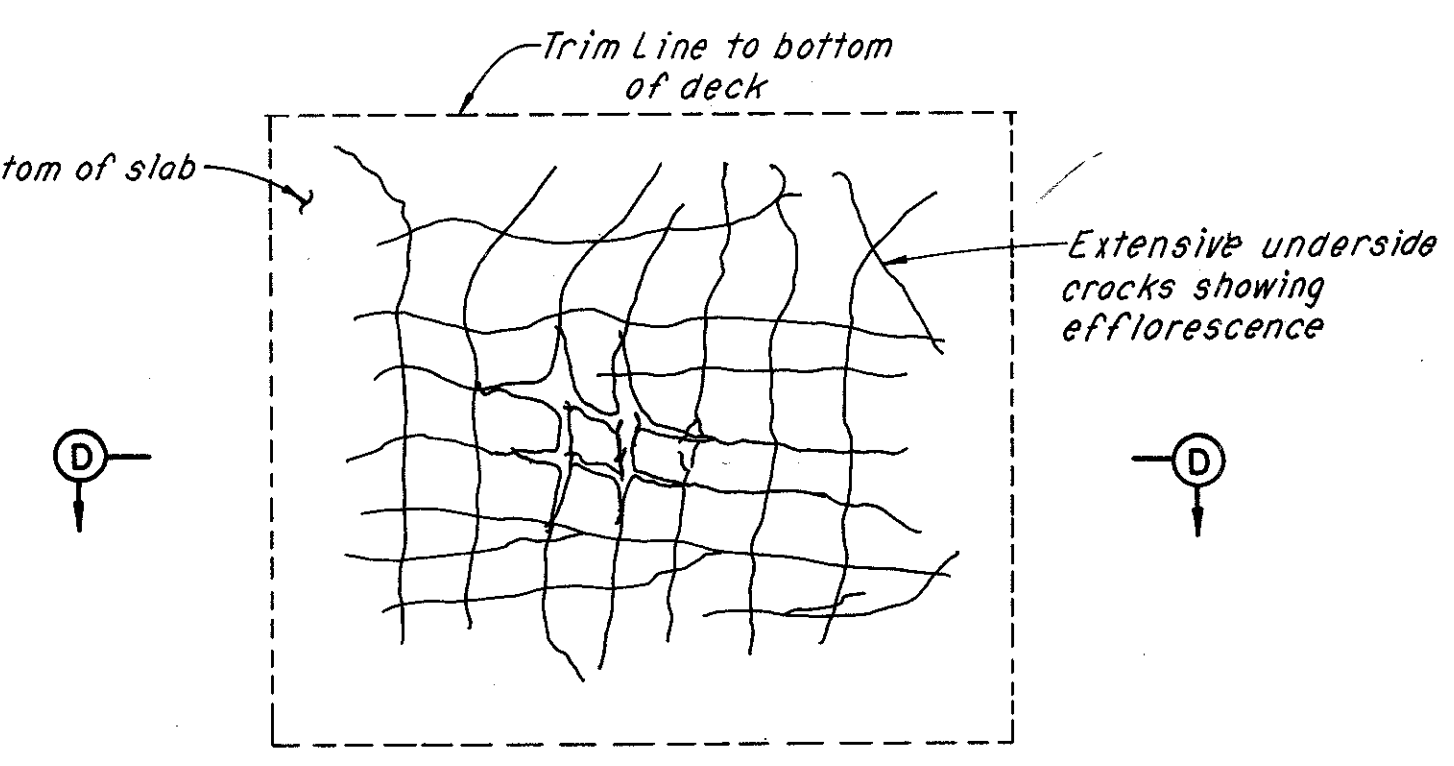
**CONCRETE SPALL 1" & OVER (NOT FULL DEPTH)**



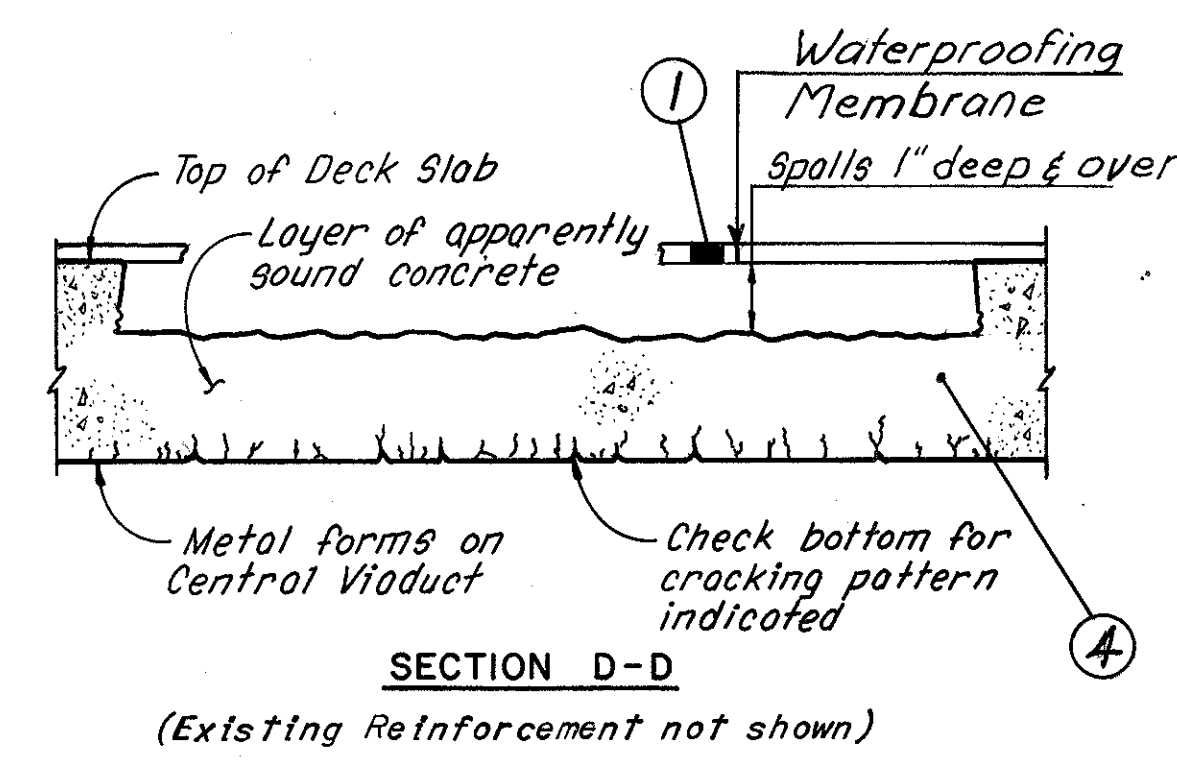
**SECTION B-B**

**LEGEND**

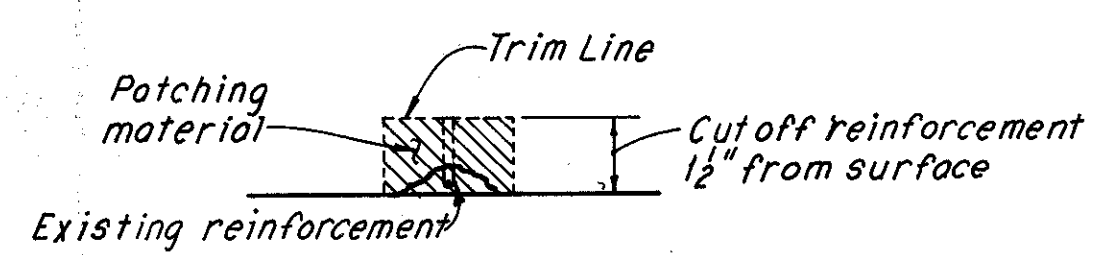
- ① Item Special Bridge Deck Waterproofing Including Protective Cover 1/2" Thickness (See note in Proposal)
- ② Item 202 Removal of Unsound Bridge Deck, Less Than 1" Depth
- ③ Item 519 Patching Concrete Deck Slabs (Partial Depth)
- ④ Item 519 Patching Concrete Deck Slabs (Full Depth)



**UNDERDECK CRACKS ACCOMPANYING SURFACE SPALL IN DECK SLAB ONLY**



**SECTION D-D**



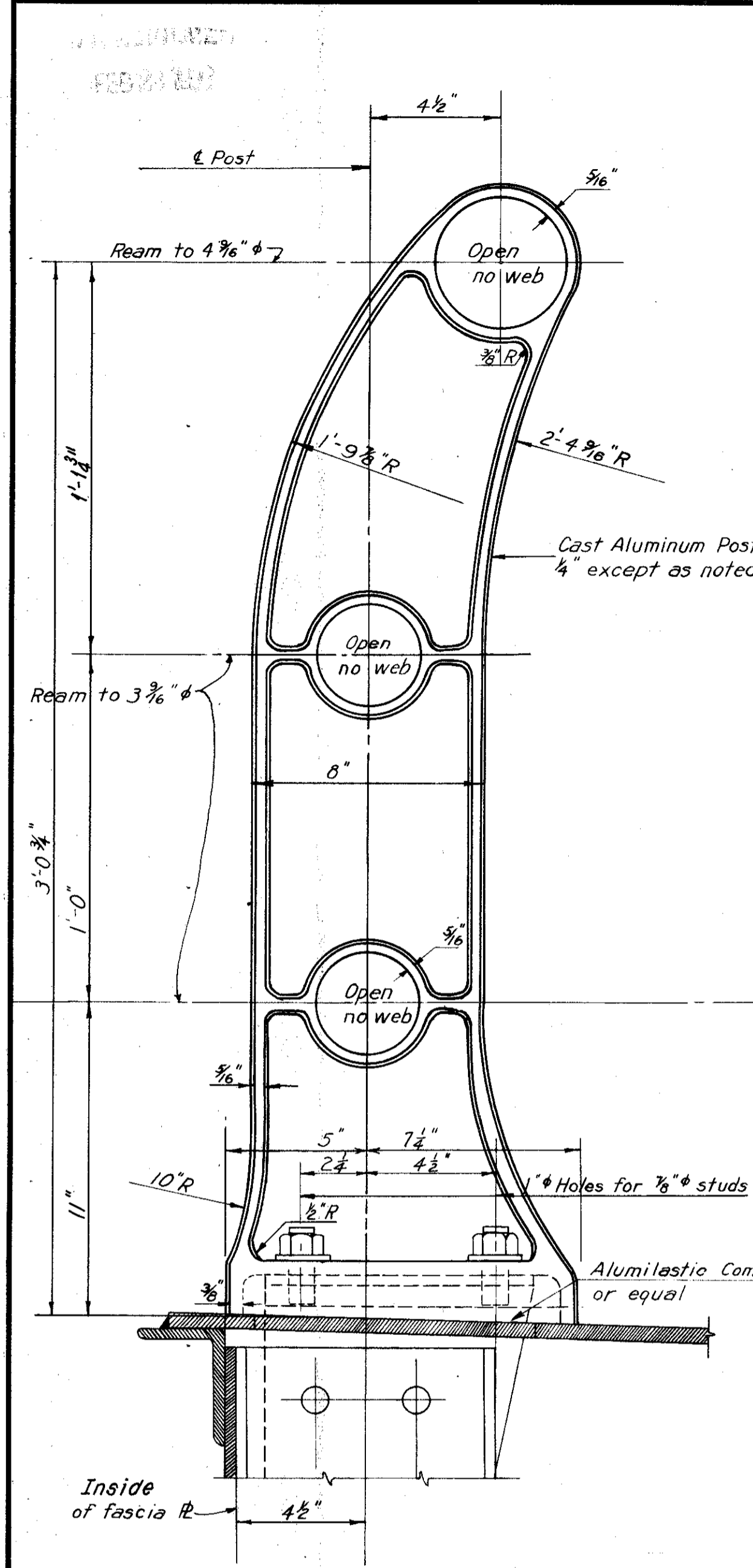
**TYPICAL CONCRETE SPALL WITH END OF REINFORCING BAR EXPOSED**

**EXISTING CONDITIONS  
CONCRETE REPAIR DETAILS**

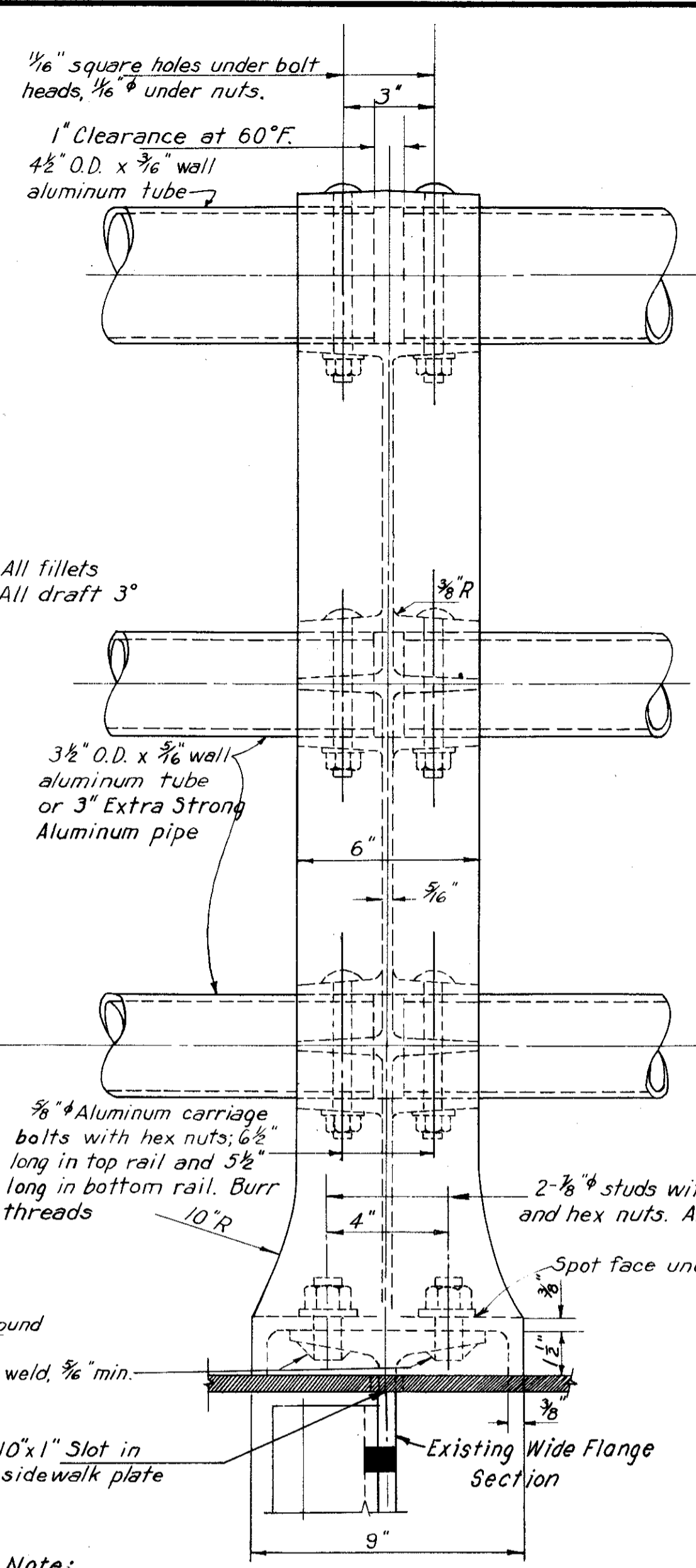
Note:  
For location of required concrete repairs see the General Plan Sheets.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK	
<b>CONCRETE REPAIR DETAILS</b>	
OHIO INTERSTATE SAFETY PLANS	
BR. NO. CUY-90-14 67	STA. 3+87.63
42R-17 43	42 -17 50
42R-17 50	42 -17 50
42 -17 50	
CUYAHOGA COUNTY	OHIO
DRAWN DMP	TRACED R.C.K.
CHECKED RAB	REVIEWED CAB
DATE 2-23-72	DATE 5-26-72
DATE 3-24-72	DATE 4-21-72
SHEET 37 / 52	

CUYAHOGA COUNTY  
CUY-90-15.2.4

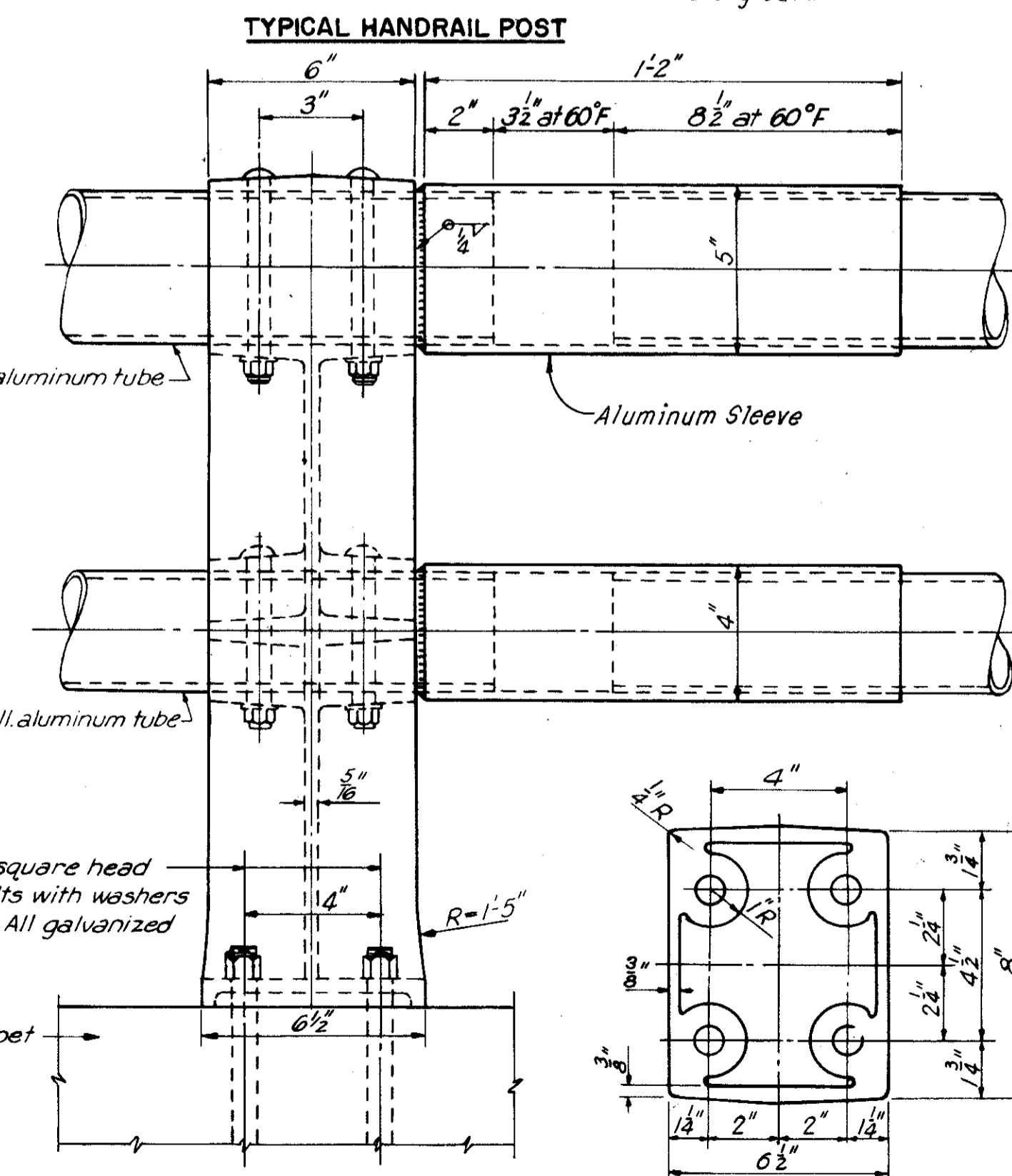
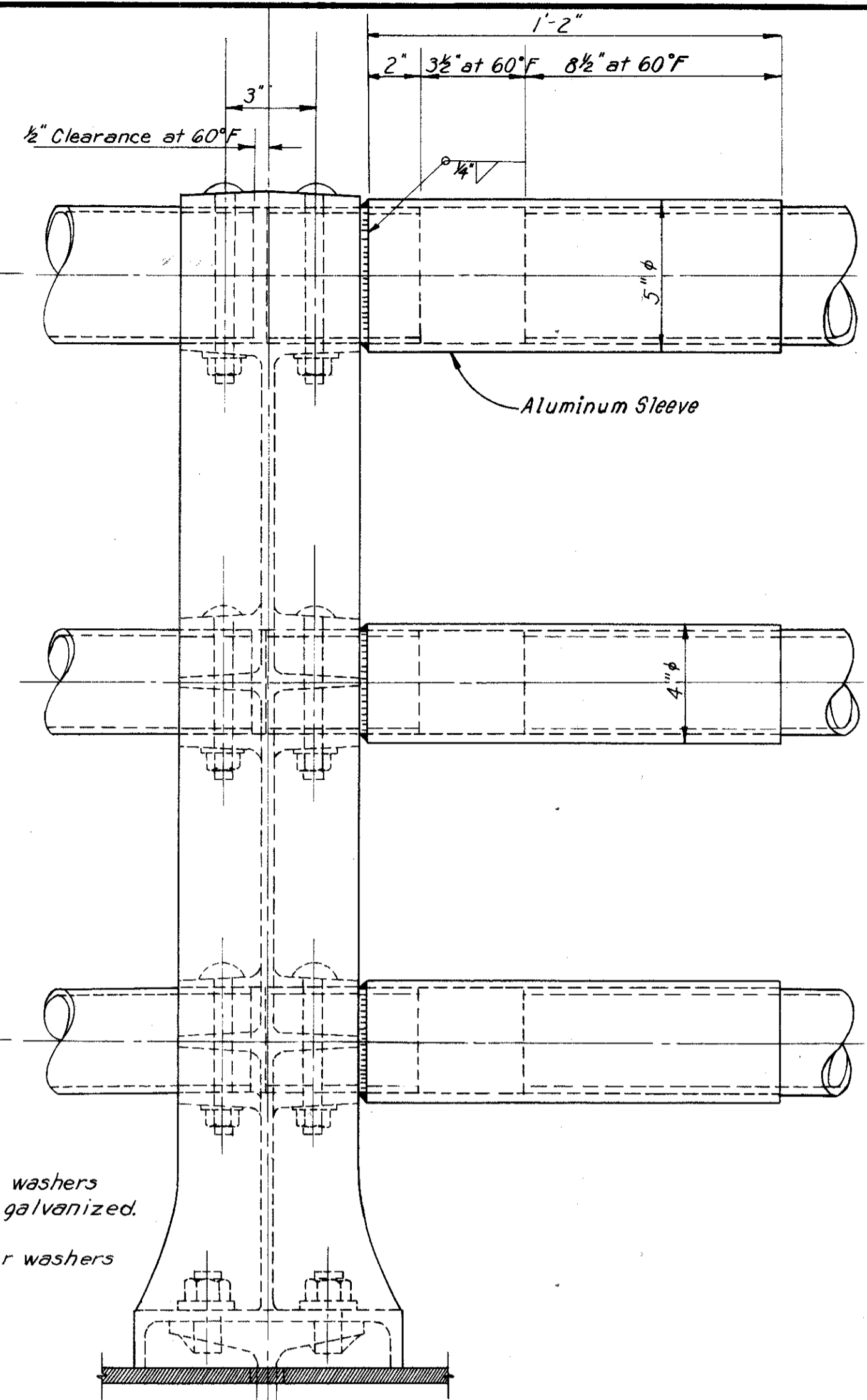


**TYPICAL HANDRAIL POST (CENTRAL VIADUCT)**



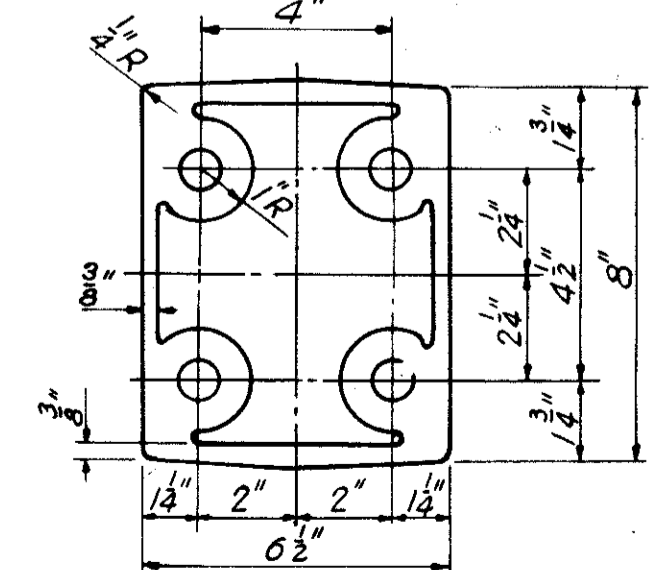
**HANDRAIL POST AT EXPANSION JOINT (CENTRAL VIADUCT)**

**TYPICAL HANDRAIL DETAILS (CENTRAL VIADUCT)**

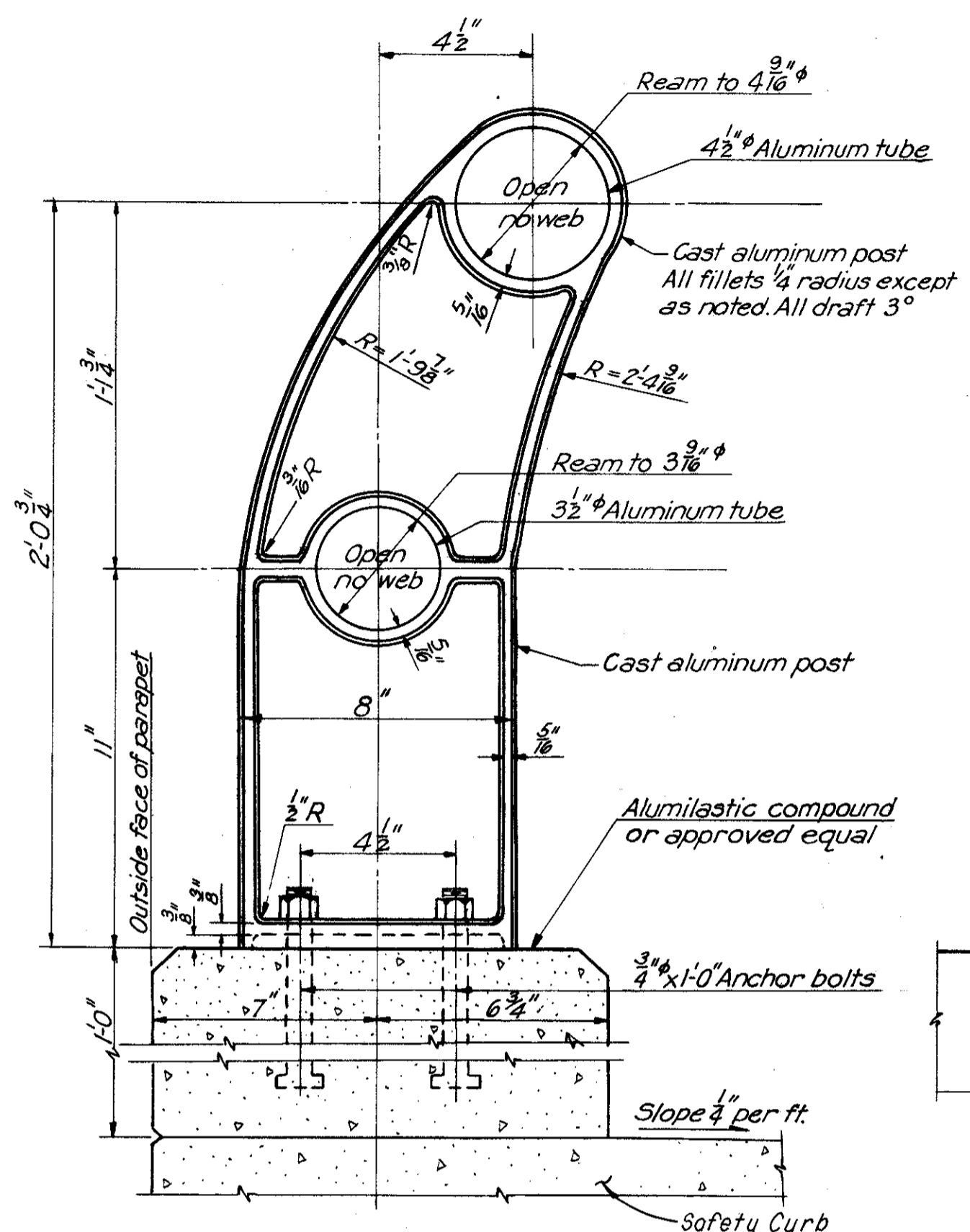


**HANDRAIL POST AT EXPANSION JOINT (EAST APPROACH)**

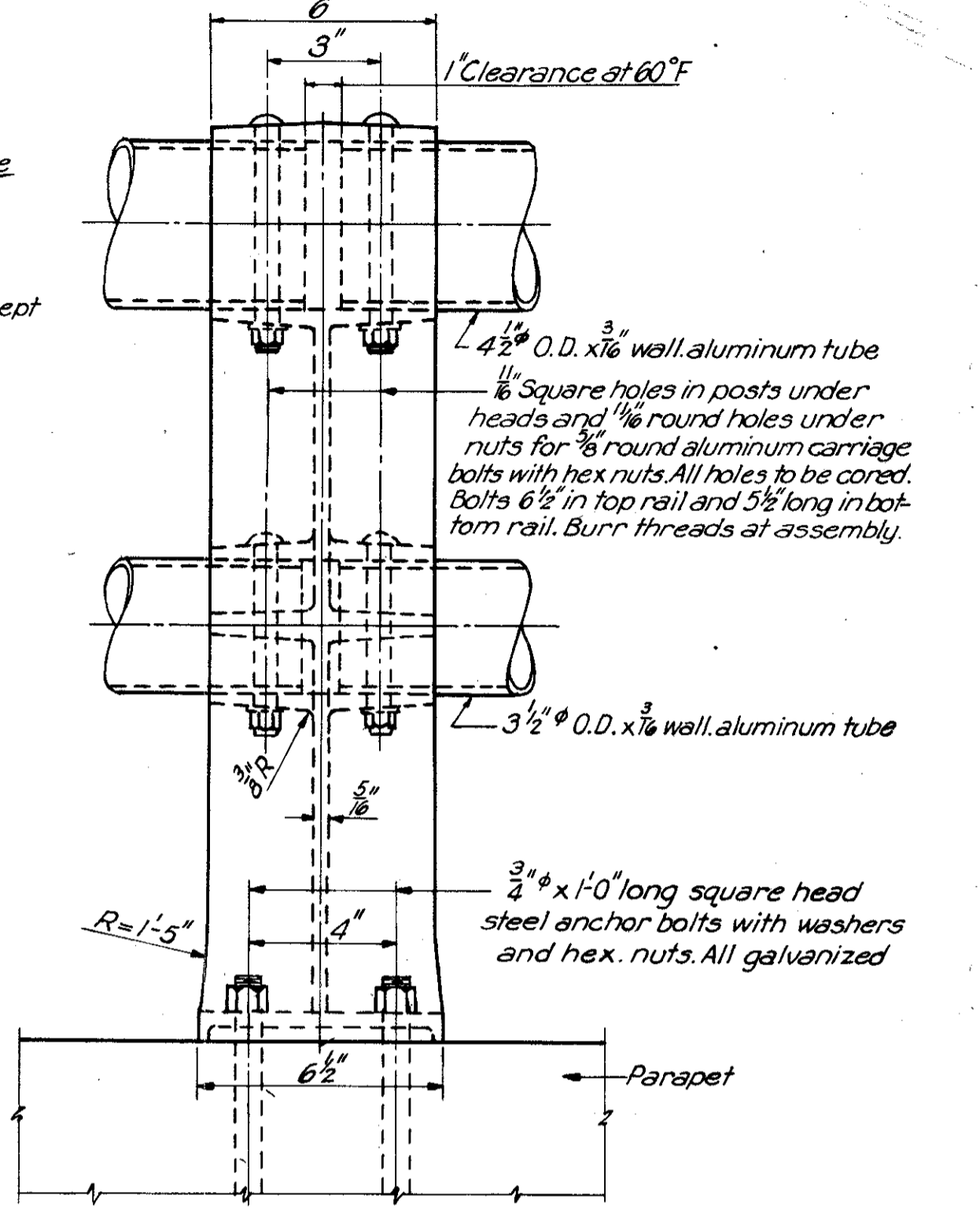
**TYPICAL HANDRAIL DETAILS (EAST APPROACH)**



**BASE PLAN**



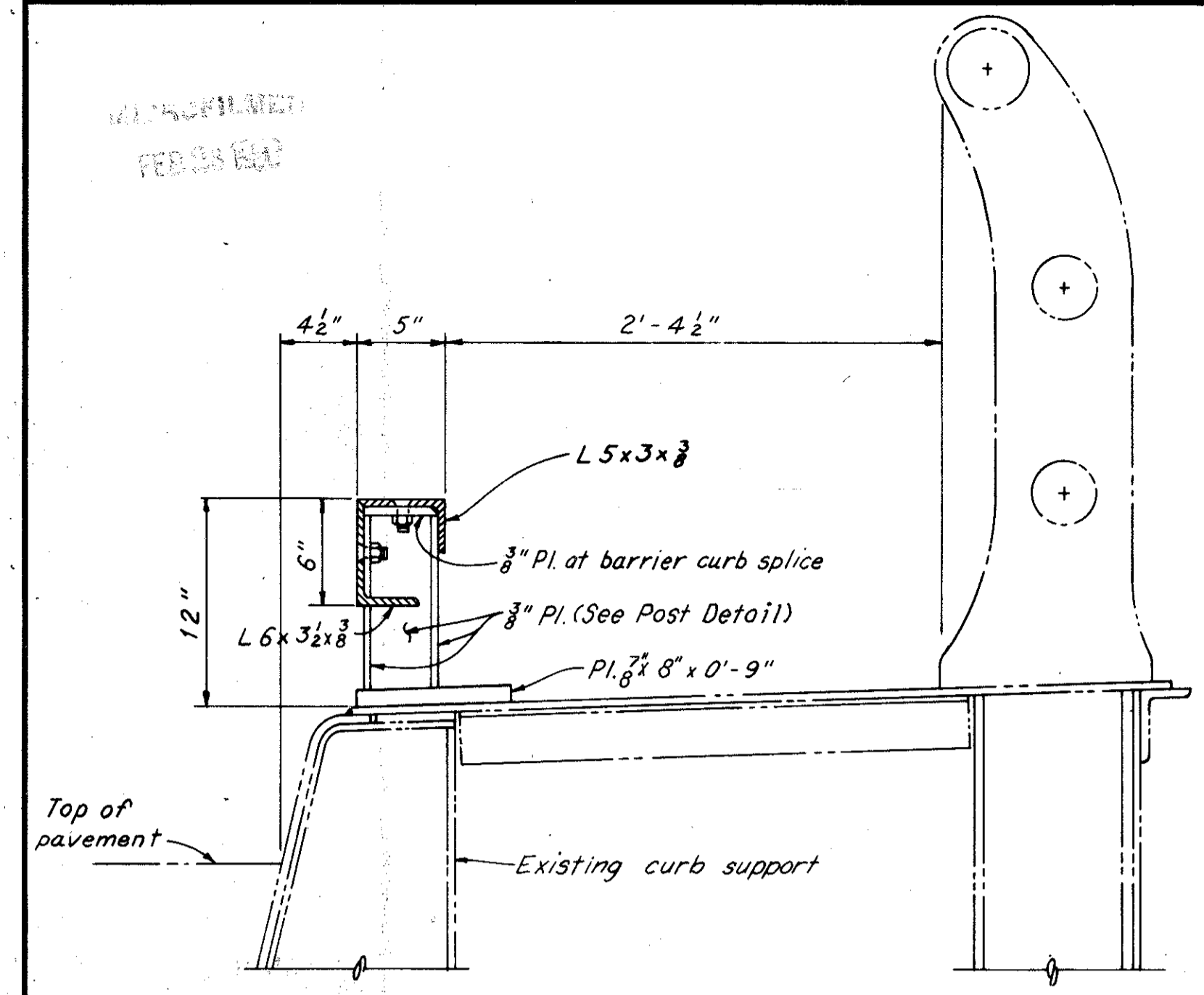
**TYPICAL HANDRAIL POST (EAST APPROACH)**



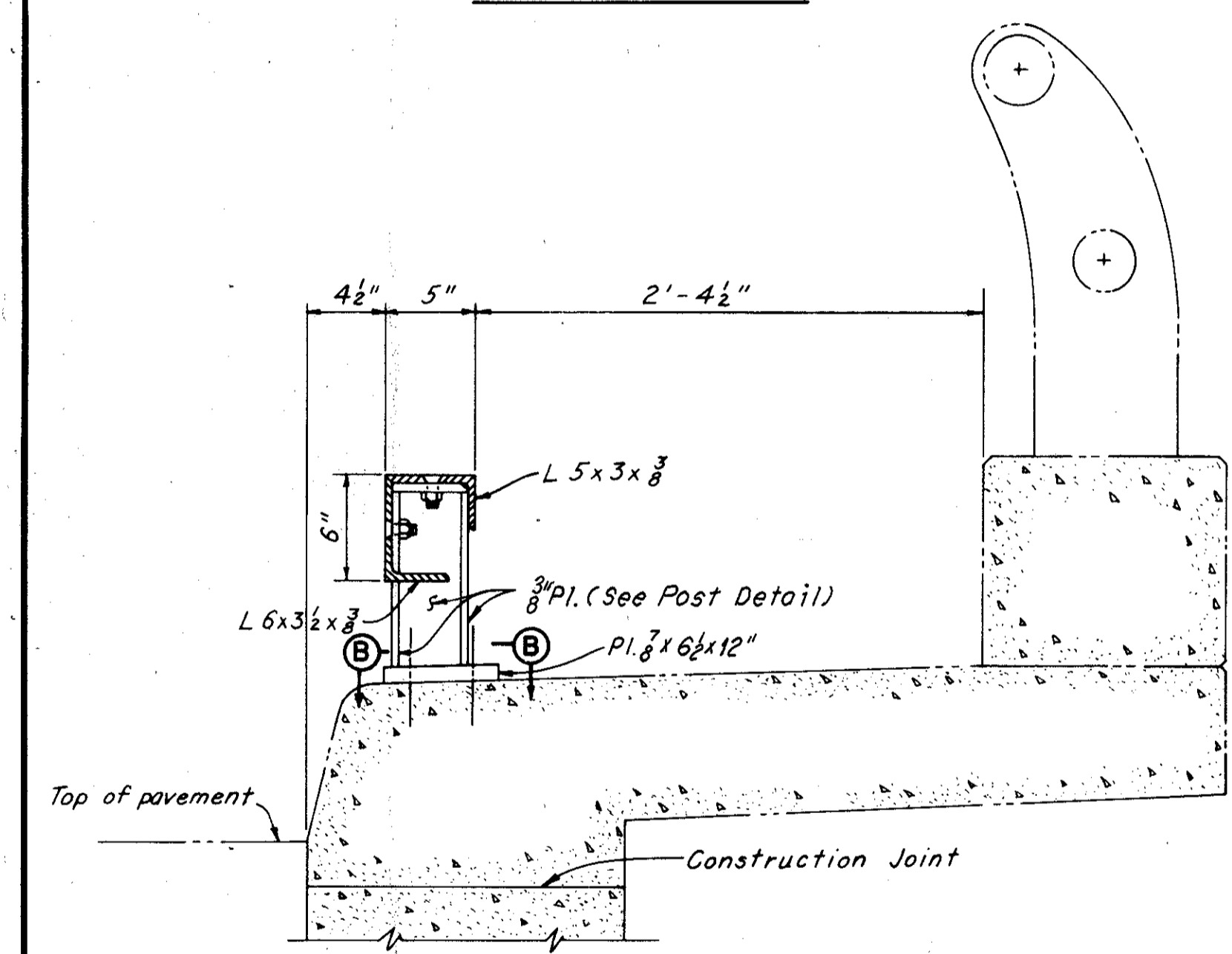
**POST ELEVATION**

**Notes:**  
The drawings shown on this sheet represent the original plan drawings for the railings and posts. The railings and posts shall be replaced, in kind, where indicated on the General Plan sheets.  
Railing tubes shall conform to ASTM B221, 6061-T6 or 6351-T5.  
Bolt holes in tubes shall be 1/8" at one end. Other end shall have slotted holes 1/8" x 1" except rails having expansion sleeve shall have 1/8" holes both ends. Bolts to be centered in slots at 60°F.  
Aluminum washer shims may be used between parapet and post base to align posts. Maximum thickness shall be 1/8". Space below post base plate shall be thoroughly caulked with aluminum-impregnated calking compound.  
Handrail posts shall be set normal to curb grade and tubes shall parallel curb grade.  
Payment for replacement of damaged railing and posts is included in the lump sum price bid for Item Special, Miscellaneous Repair Details. The following is an estimate of the required repairs based on a field inspection; intended as a guide to the bidder in preparing his bid:  
Post Replacements - 10  
Damaged 4 1/2" Handrail Tube - 42 feet  
Damaged 3 1/2" Handrail Tube - 66 feet

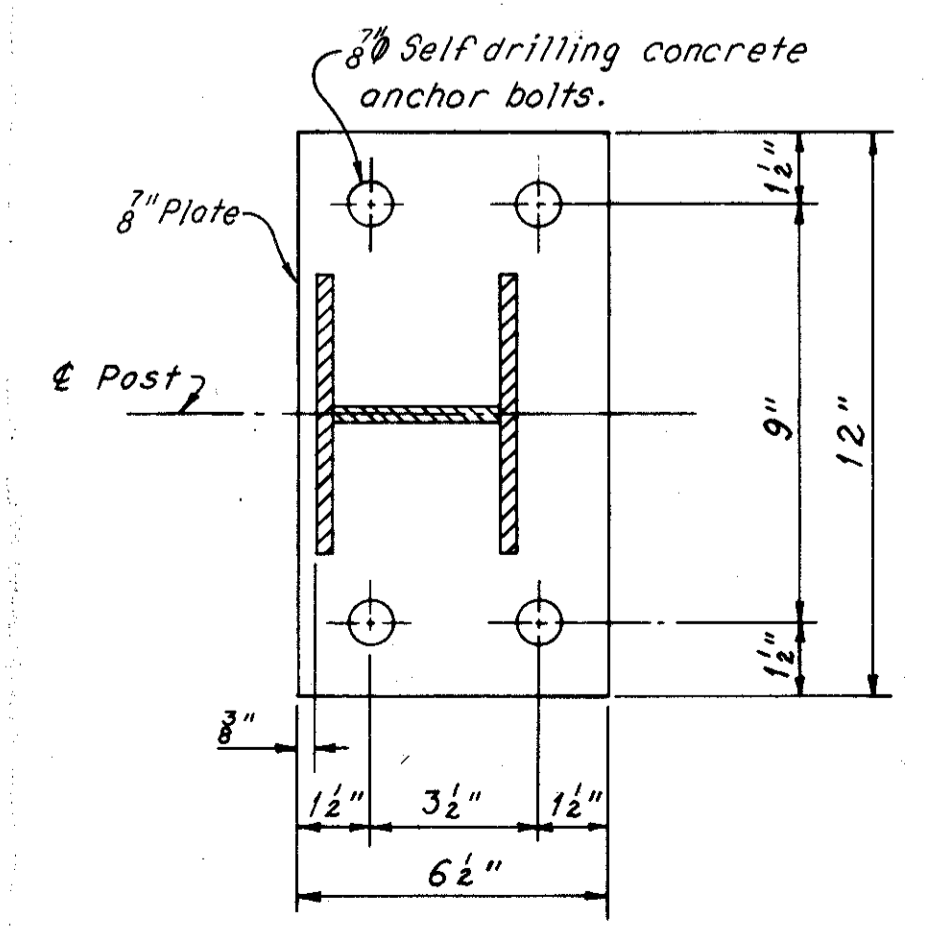
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>HANDRAIL REPAIR DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	STA. 3+87.63	
	42R-17 50	STA. 54+65.78	
	42 -17 50		
CUYAHOGA COUNTY		OHIO	
DRAWN D.M.P.	TRACED R.C.K.	CHECKED R.A.B.	REVIEWED C.R.B.
DATE 03-22-72	DATE 03-23-72	DATE 4-21-72	DATE 5-26-72



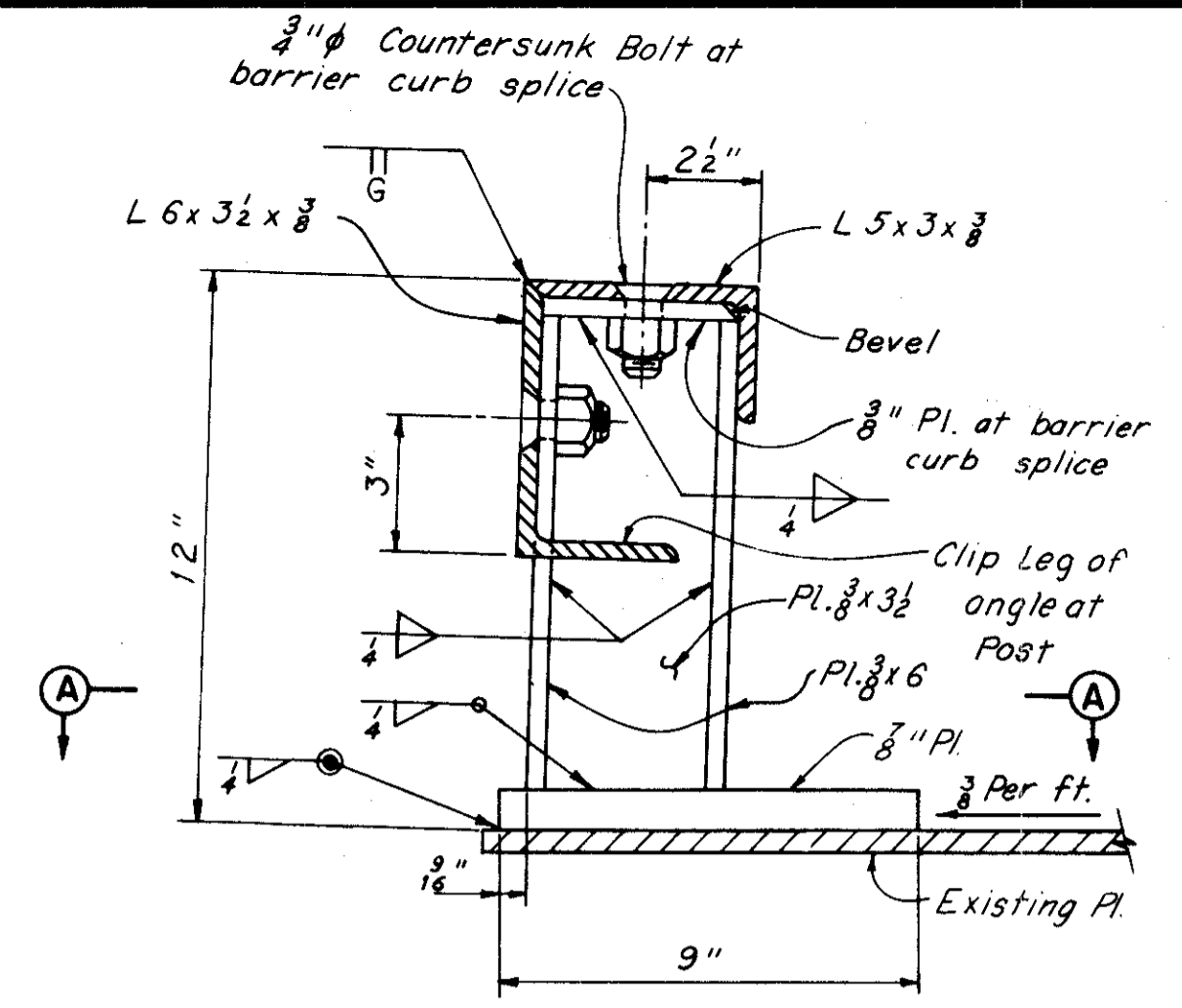
**BARRIER CURB DETAIL  
(CENTRAL VIADUCT)**



**BARRIER CURB DETAIL  
(EAST AND WEST APPROACH)**

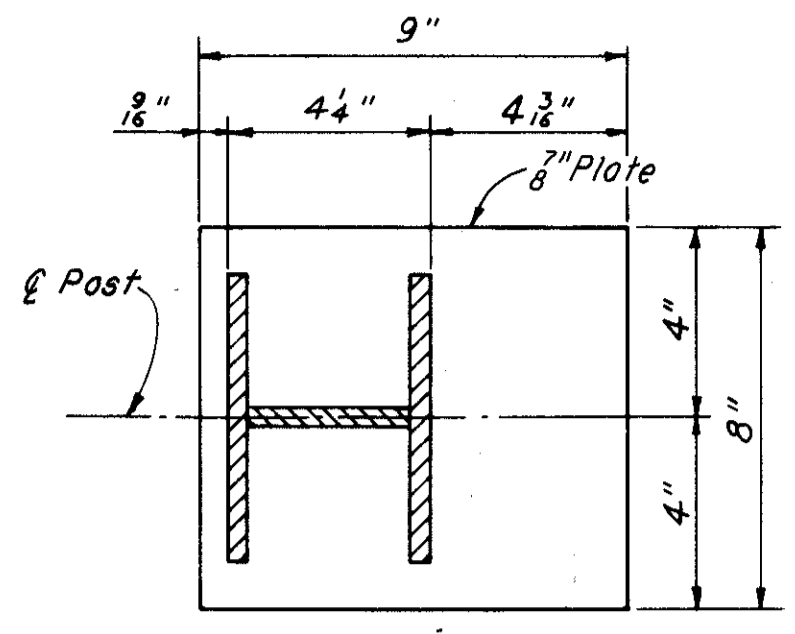


**SECTION B-B**

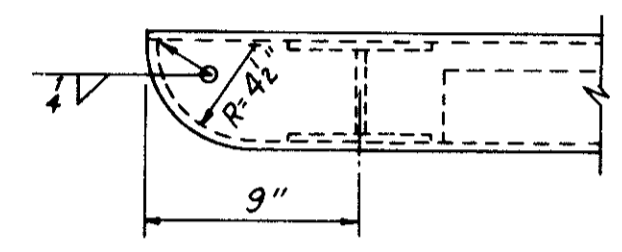


**POST DETAIL**

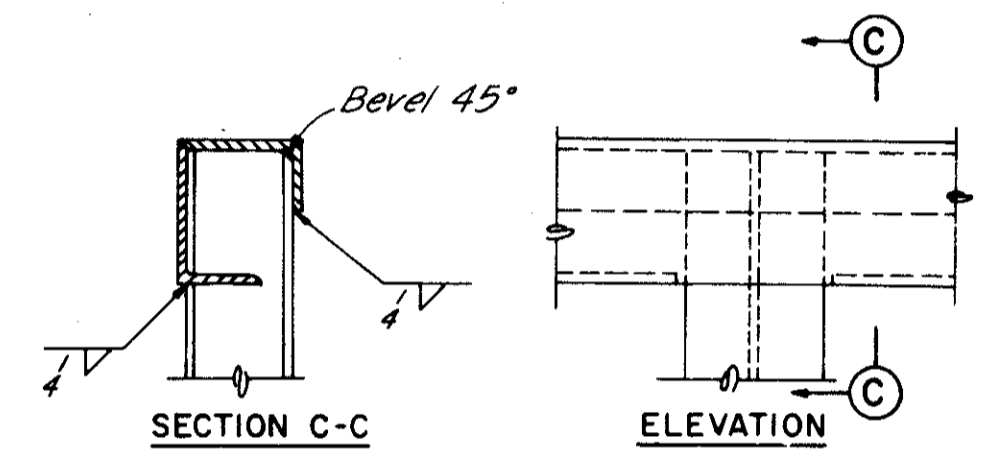
Note:  
Post detail shown for Central Viaduct, Approach spans are the same except for base plate. See Section B-B.



**SECTION A-A  
CENTRAL VIADUCT**

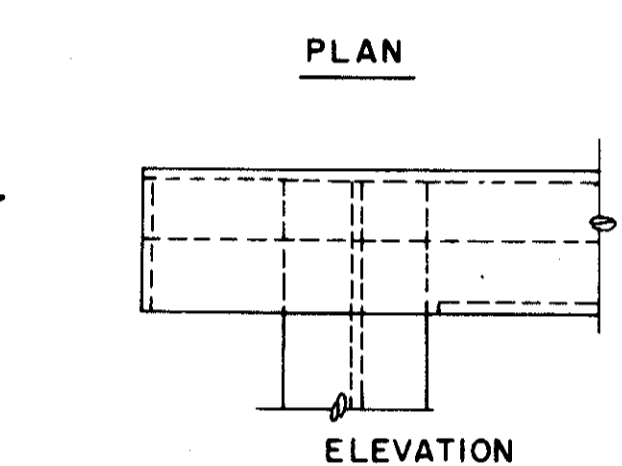


**PLAN**



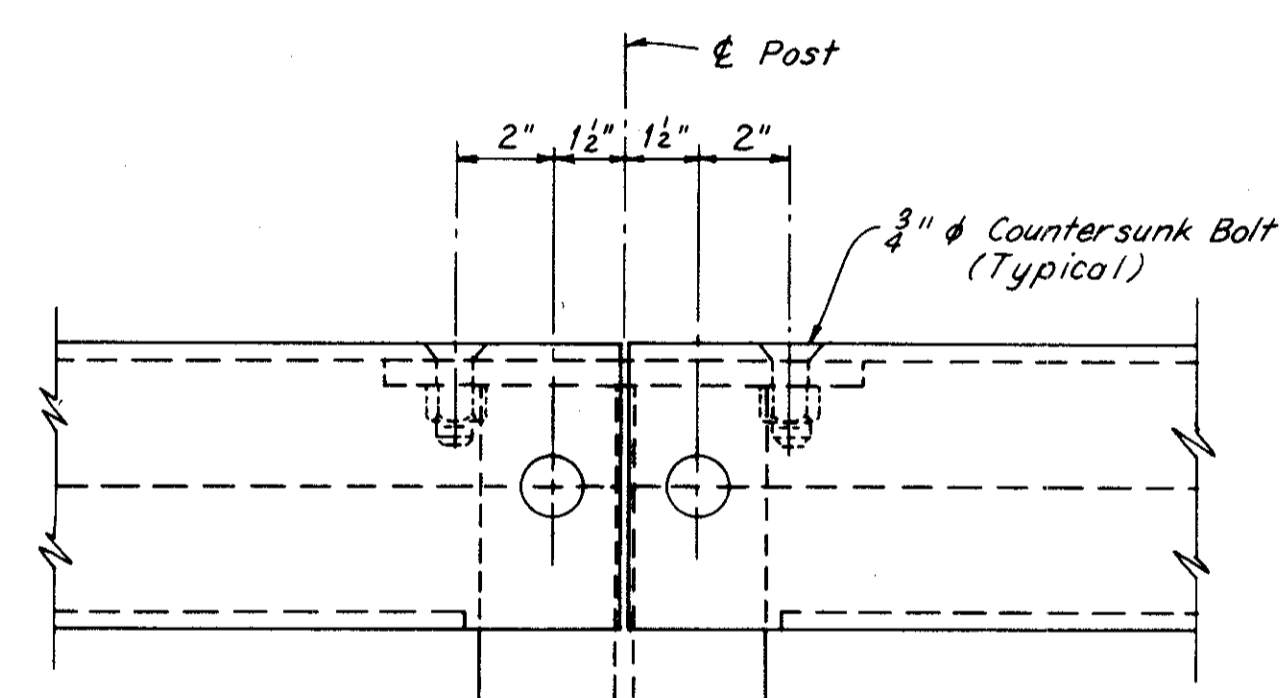
**SECTION C-C  
ELEVATION**

**DETAILS AT POST WITH NO SPLICE**



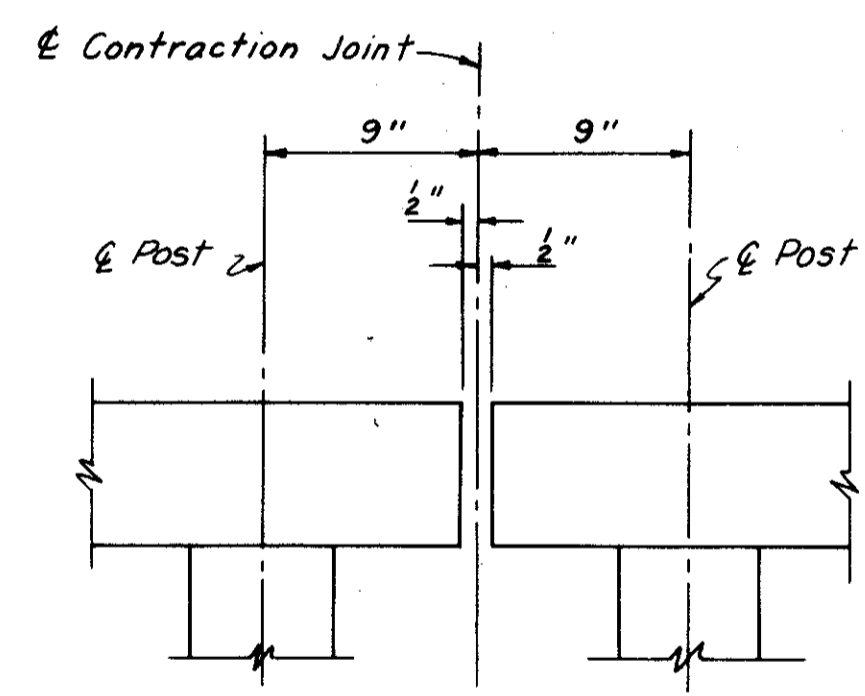
**ELEVATION**

**DETAILS AT END POST**



**ELEVATION  
DETAIL AT**

**BARRIER CURB SPLICE**



**DETAIL AT CONTRACTION JOINT**

**PROCEDURE FOR RESETTNG  
BARRIER CURB POSTS**

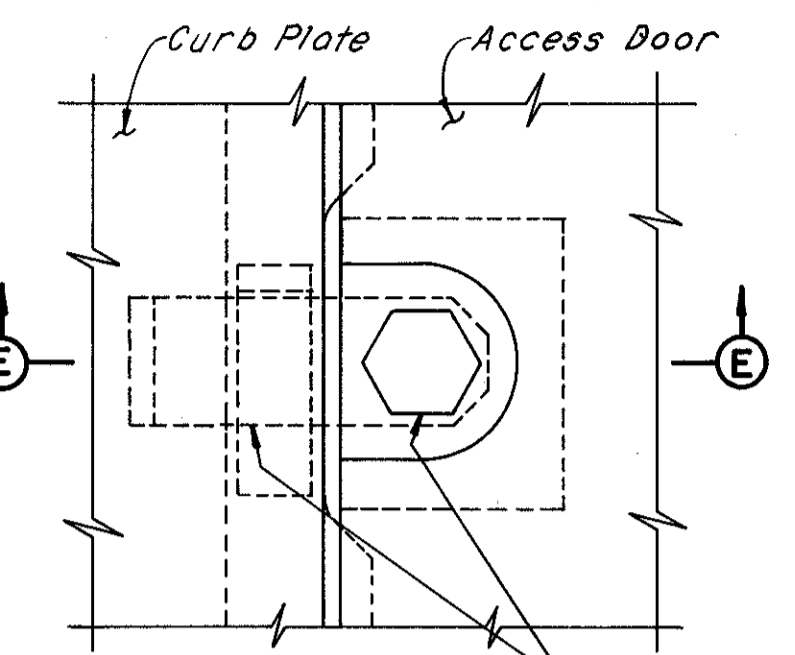
After removing all loose and spalled concrete and thoroughly cleaning existing anchor bolt holes; fill holes with cement grout or rich cement mortar. After mortar has set, attach post to concrete with 3/8" self drilling concrete anchor bolts.

If anchor bolts used are of such character as to result in an open annular space between the bolt and the concrete, such space shall be filled to prevent the entrance of water. The filler being subject to approval of the Engineer.

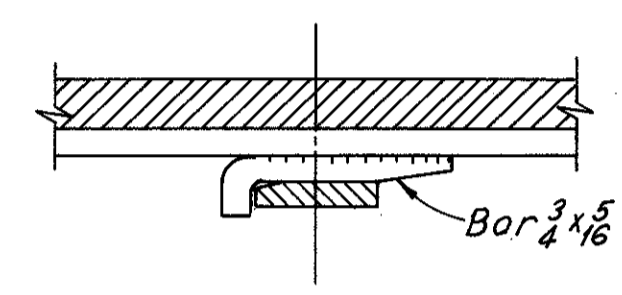
**BARRIER CURB DETAILS**

**REPAIR PROCEDURE:**

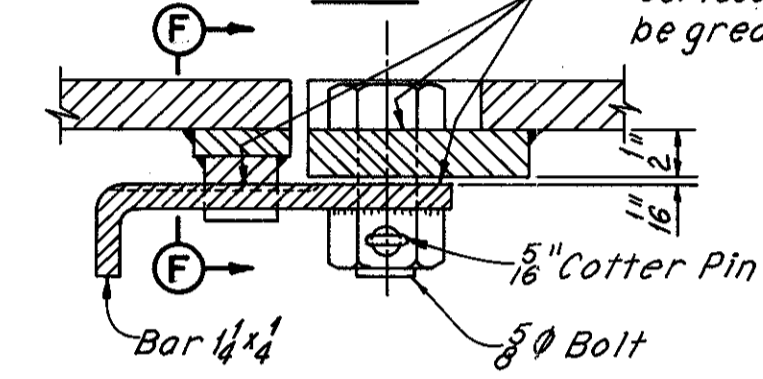
Remove 3/8" bolt and after removing all rust and thoroughly cleaning the surface of the 7/8" plate that is in contact with the bolt head and latch bar, apply grease to those areas. Follow same procedure between latch and 3/4" x 5/16" bar that are in contact.  
Replace all damaged bolts, nuts, cotter pins and latch bars as required.



**PLAN**

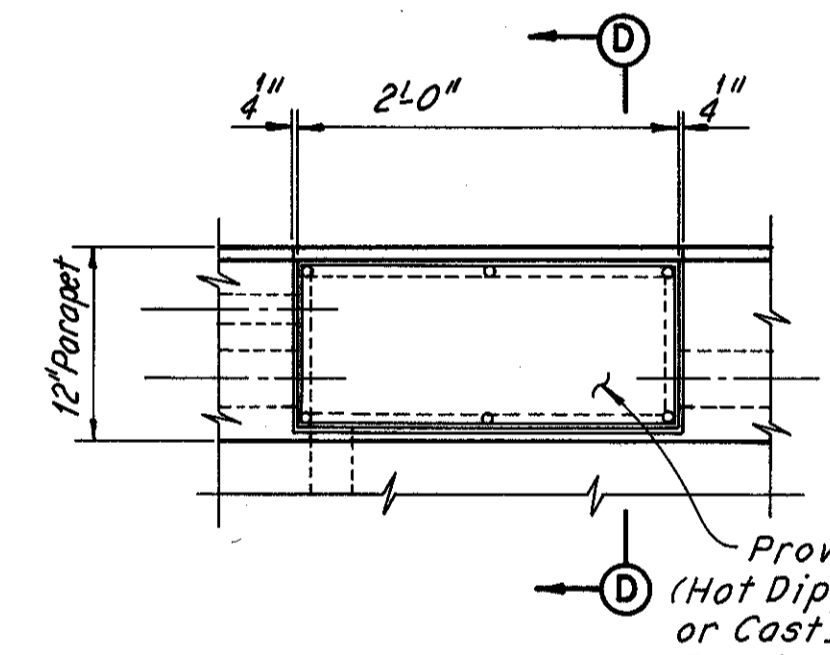


**SECTION F-F**

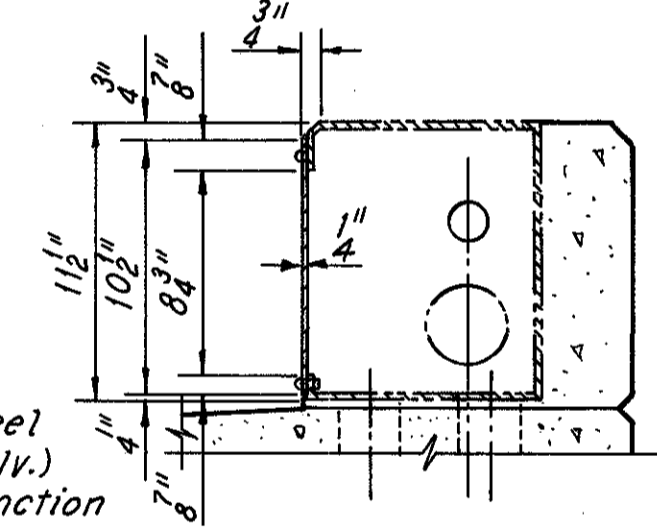


**SECTION E-E**

**LATCH FOR ACCESS DOOR**



**ELEVATION**



**SECTION D-D**

**PARAPET JUNCTION BOX COVER**

Note:  
Cover to be set on rubber gasket and fastened with 6-3/8" screws.

**Notes:**

The drawings shown on this sheet for the Barrier Curb, Junction Box Cover and Access Door Latch represent the original plan drawings for these items. The barrier curb railing and the parapet junction box cover shall be replaced in kind, where indicated on the General Plan Sheets.

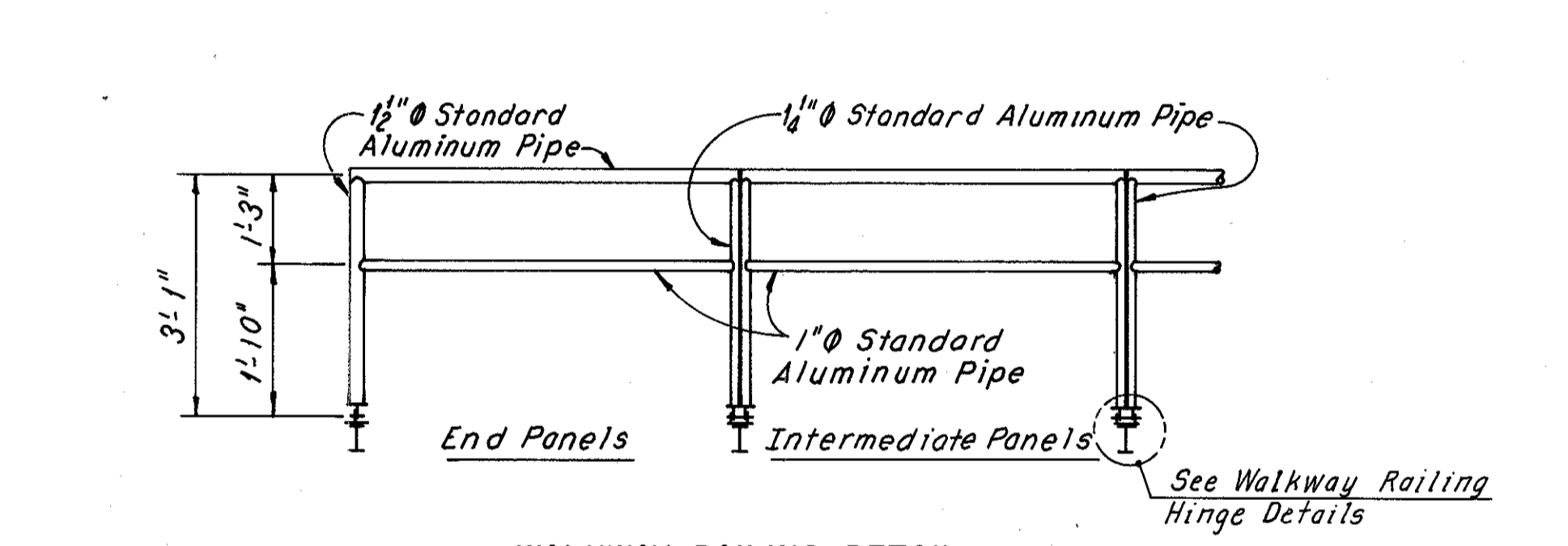
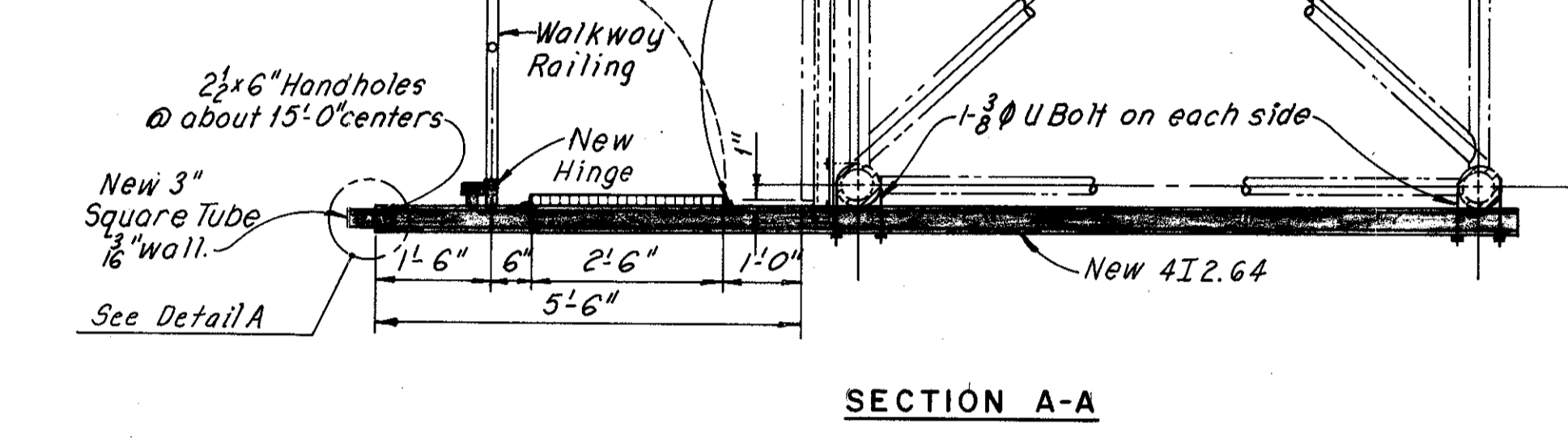
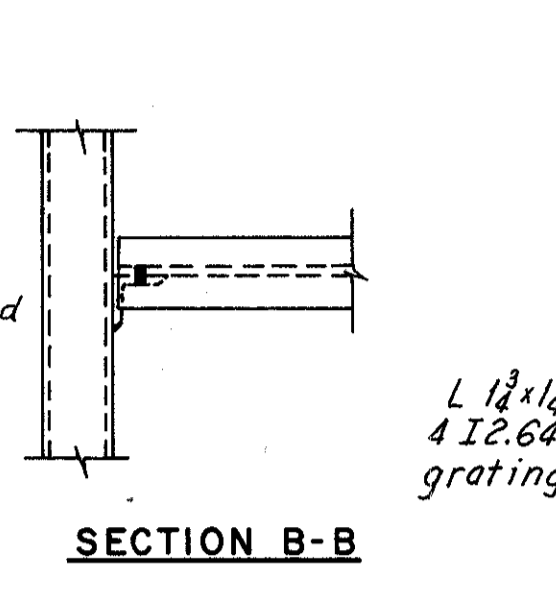
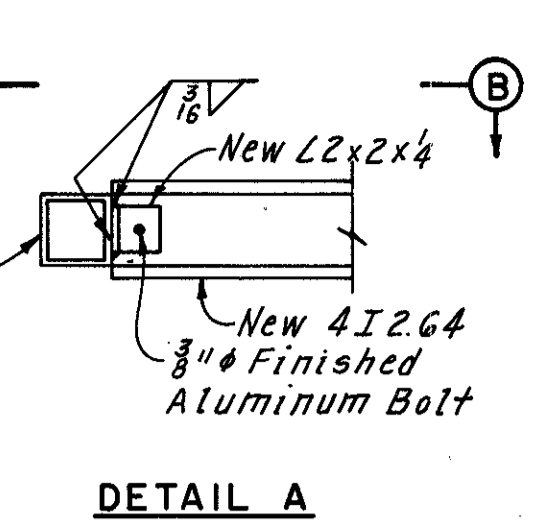
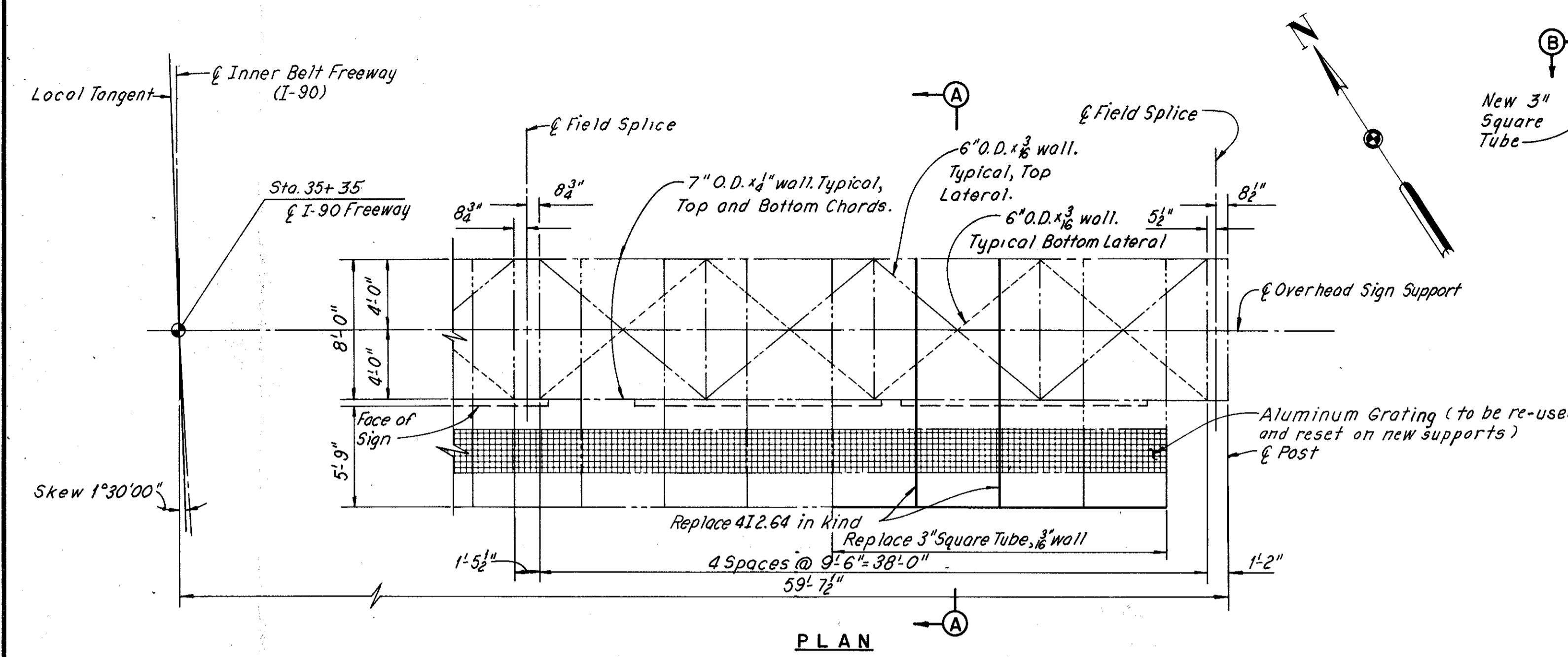
Payment for replacement of barrier curb rail and parapet junction box cover, resetting of existing barrier curb posts and repairing the latches on the access doors is all included in the lump sum price bid for Item Special, Miscellaneous Repair Details. Replacement members for the barrier curb railing shall be galvanized per 711.02.

The following is an estimate of the required repairs based on a field inspection; intended as a guide to the bidder in preparing his bid:

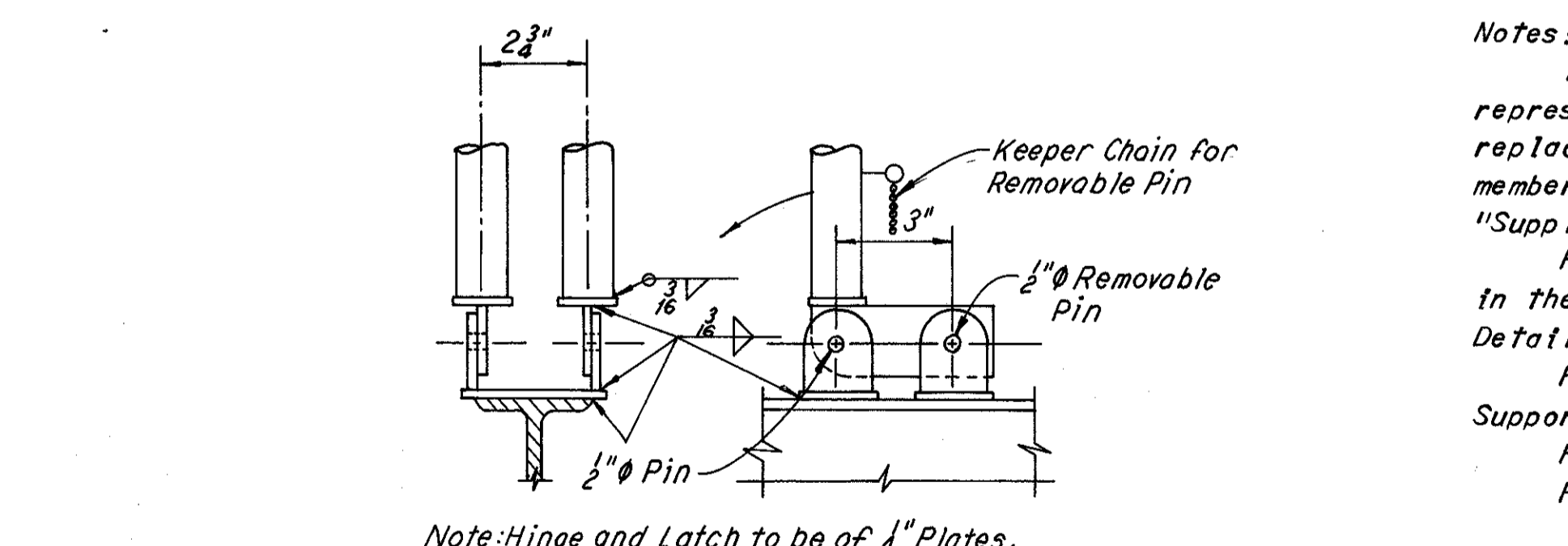
- Parapet Junction Box Covers - 1
- Barrier Curb Railing - 50 feet
- Resetting Existing Barrier Curb Posts - 8

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>MISCELLANEOUS REPAIR DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14 67	42R-17 43	STA. 3+87.63	
	42R-17 50	STA. 54+65.78	
	42 -17 50		
CUYAHOGA COUNTY OHIO			
DRAWN DMP	TRACED RCK	CHECKED RAB	REVIEWED CAB
DATE 03-20-72	DATE 03-24-72	DATE 4-21-72	DATE 5-26-72



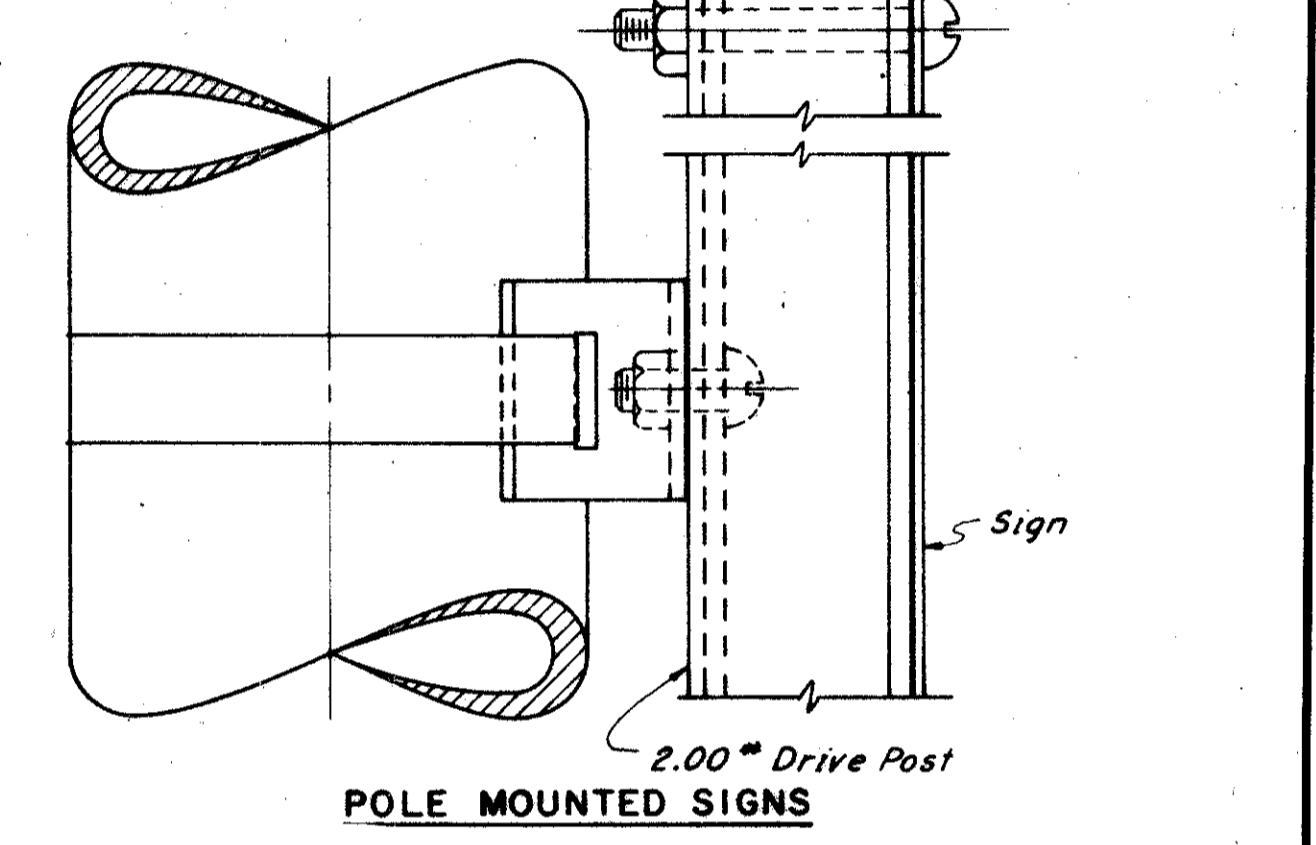
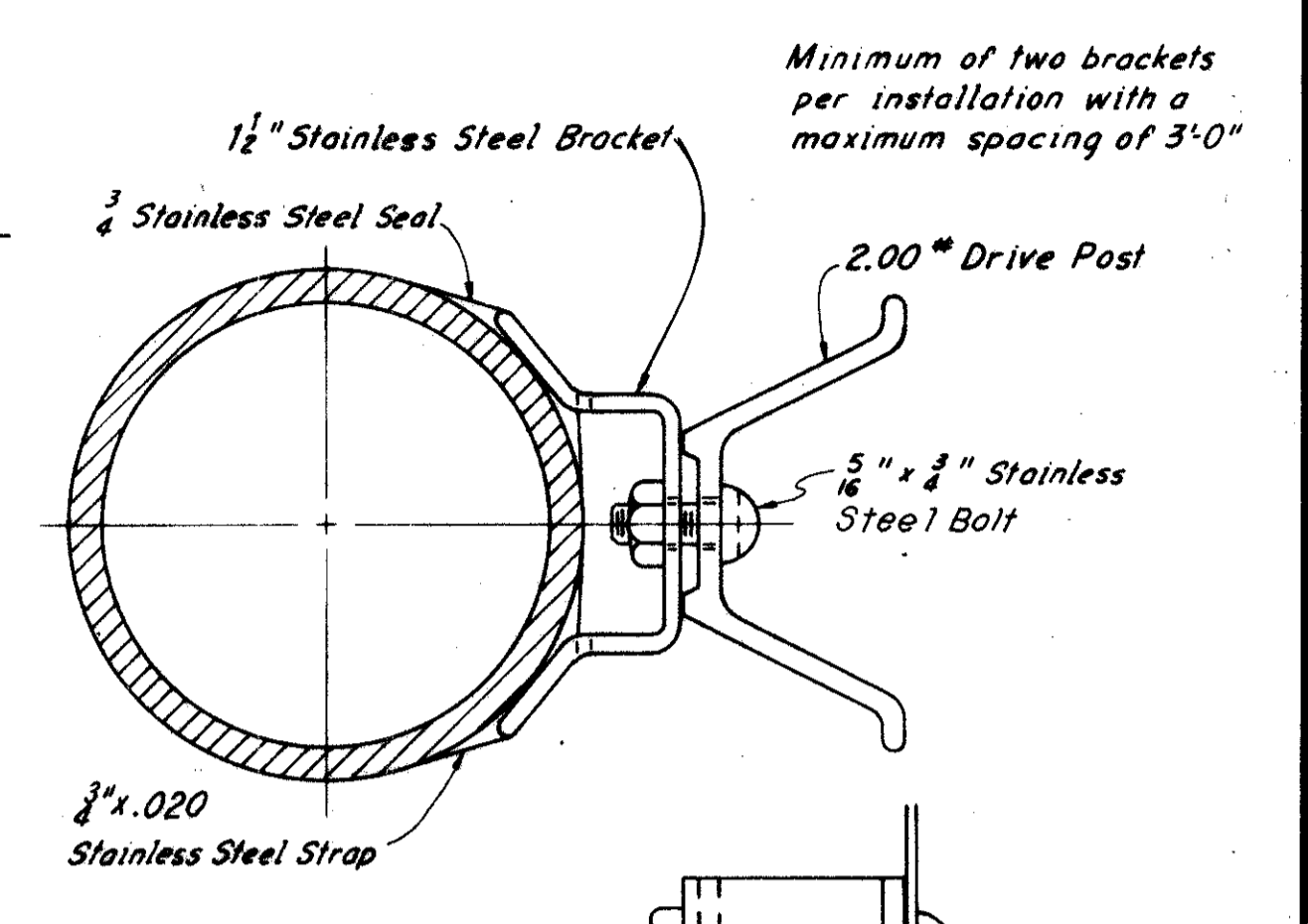


**WALKWAY RAILING DETAIL**  
(The aluminum pipe is in satisfactory condition but the hinges shall be replaced as required.)

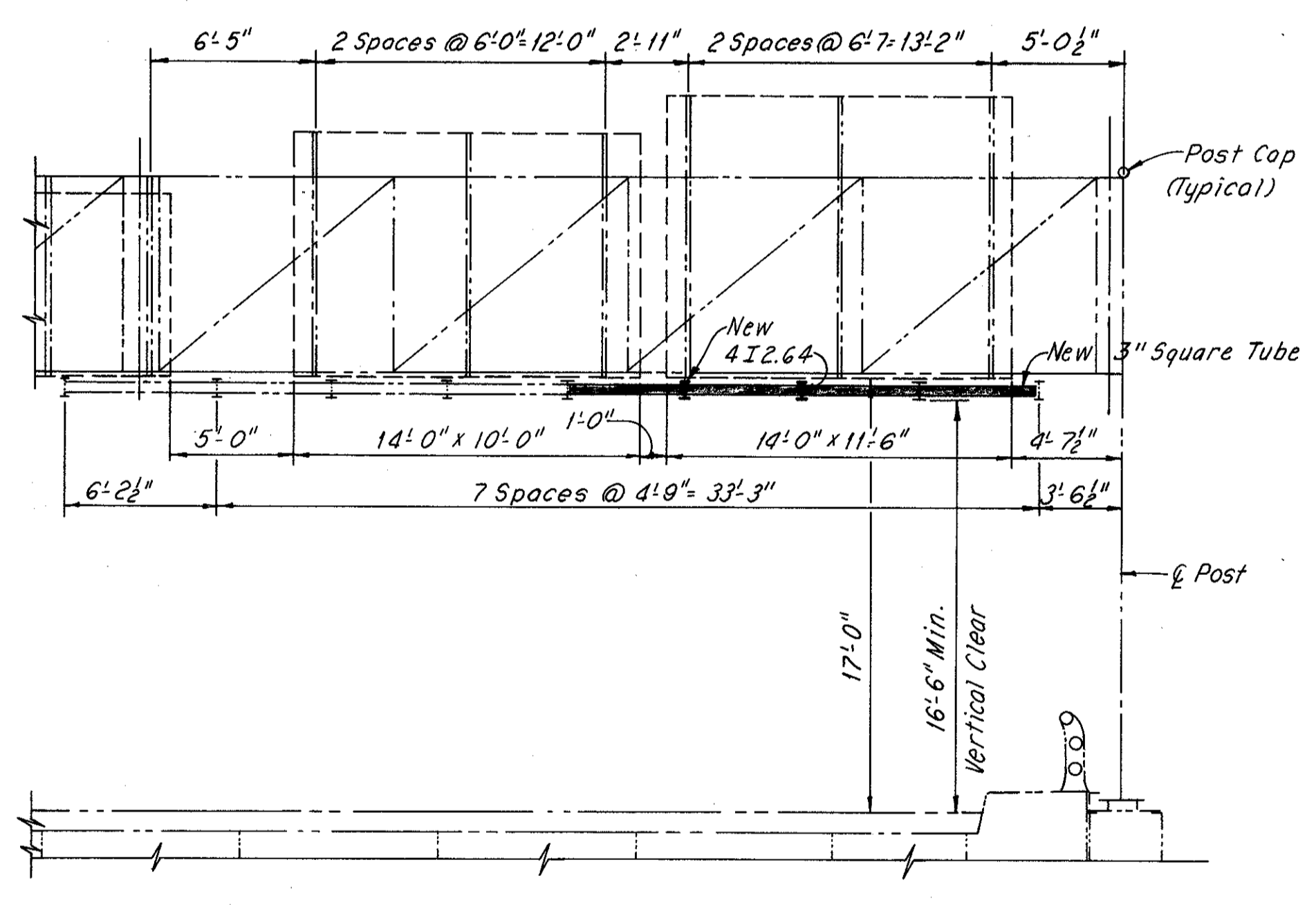


Note: Hinge and Latch to be of 1/4\"/>

**WALKWAY RAILING HINGE DETAILS**



**POLE MOUNTED SIGN ATTACHMENT**



**ELEVATION**  
(Walkway railing not shown)

**OVERHEAD SIGN SUPPORT  
REPAIR DETAILS**

**Notes:**  
The drawings for the Overhead Sign Support on this sheet represent the original plan drawings. The members shall be replaced, in kind, where indicated on the plan. All replacement members shall be aluminum and shall be in accordance with "Supplemental Specifications 816".  
Payment for replacement of damaged members shall be included in the lump sum price bid for Item Special, Miscellaneous Repair Details, Overhead Sign Catwalk Support.  
For details of luminaire assembly on the Overhead Sign Support see Lighting Plans, Sheets 42 thru 52/52.  
For location of Pole Mounted Sign see Sheet 15/52.  
For location of Overhead Sign Support see Sheet 12/52.

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<b>MISCELLANEOUS SIGN DETAILS</b>			
OHIO INTERSTATE SAFETY PLANS			
BR. NO. CUY-90-14.67	42R-17.43	STA. 3+87.63	
	42R-17.5	STA. 54+65.78	
	42-17.50		
CUYAHOGA COUNTY			OHIO
DRAWN D.M.P.	TRACED R.C.A.	CHECKED D.H.S.	REVIEWED C.H.E. REVISOR
DATE 4-29-72	DATE 5-1-72	DATE 5-18-72	DATE 5-26-72
			SHEET 40/52





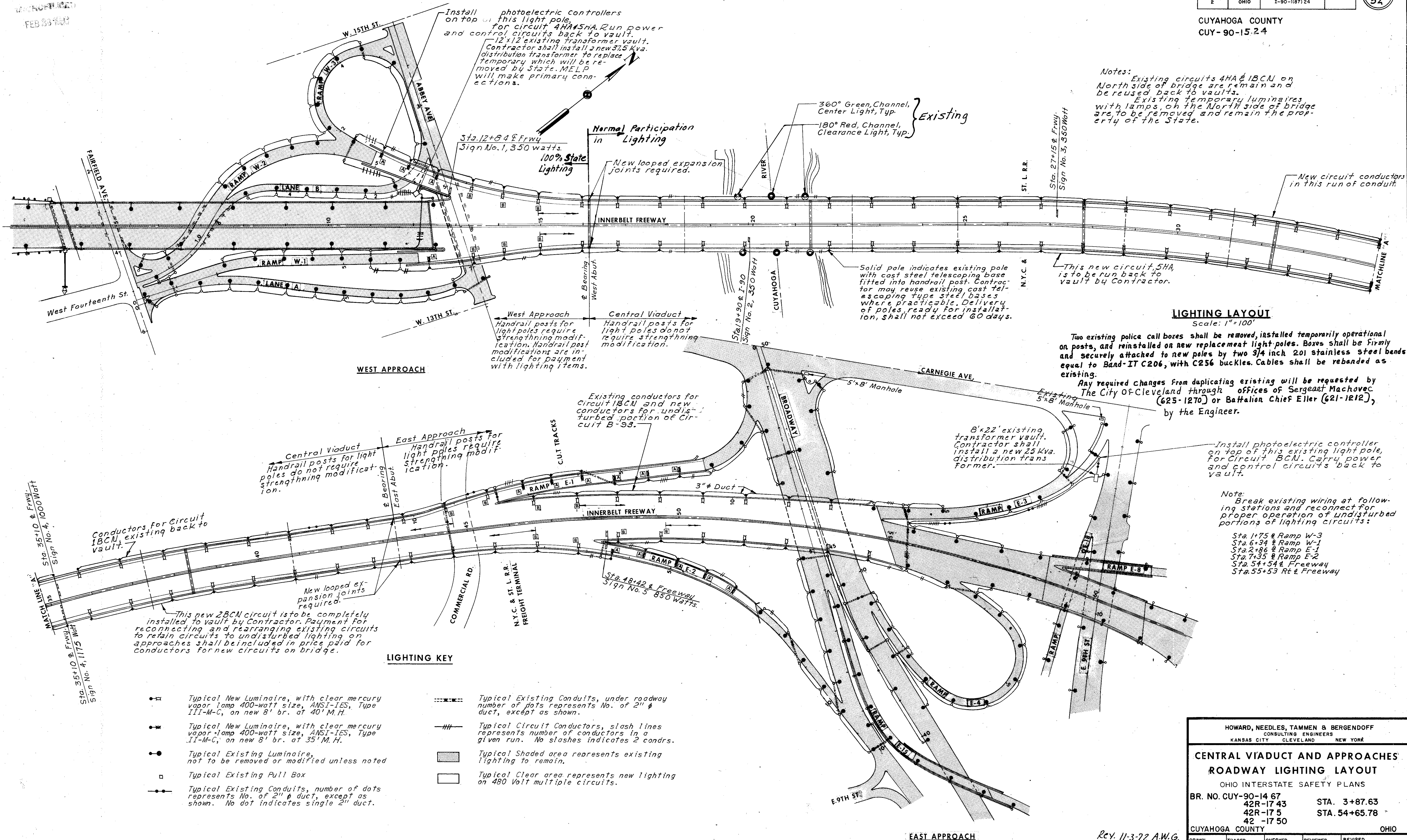
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FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1187124

42  
52

CUYAHOGA COUNTY  
CUY-90-15.2.4

Notes:  
Existing circuits 4HA & IBCM on North Side of bridge are remain and be reused back to vaults.  
Existing temporary luminaires with lamps, on the North side of bridge are to be removed and remain the property of the State.



**LIGHTING LAYOUT**  
Scale: 1"=100'

**LIGHTING KEY**

- Typical New Luminaire, with clear mercury vapor lamp 400-watt size, ANSI-IES, Type III-M-C, on new 8' br. at 40' M.H.
- Typical New Luminaire, with clear mercury vapor lamp 400-watt size, ANSI-IES, Type II-M-C, on new 8' br. at 35' M.H.
- Typical Existing Luminaire, not to be removed or modified unless noted
- Typical Existing Pull Box
- Typical Existing Conduits, number of dots represents No. of 2" duct, except as shown. No dot indicates single 2" duct.
- Typical Existing Conduits, under roadway number of dots represents No. of 2" duct, except as shown.
- /— Typical Circuit Conductors, slash lines represents number of conductors in a given run. No slashes indicates 2 condrs.
- ▨ Typical Shaded area represents existing lighting to remain.
- Typical Clear area represents new lighting on 480 Volt multiple circuits.

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**CENTRAL VIADUCT AND APPROACHES ROADWAY LIGHTING LAYOUT**  
OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67  
42R-17 43  
42R-17 5  
42-17 50

STA. 3+87.63  
STA. 54+65.78

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Rev. 11-3-72 A.W.G.  
Rev. 8-4-72

DATE	DATE	DATE	DATE	DATE
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
				SHEET 42/52.

# LIGHTING AND SIGNING NOTES

FED. RD. DIVISION	STATE	PROJECT
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## GENERAL - 625.03

All construction methods, materials and workmanship shall conform to Items 625 and 713, except as modified or supplemented herein or on the drawings, of the State of Ohio Department of Highway's Construction and Material Specifications dated January 1, 1971.

Reference shall be made to Standard Construction Drawings, HL-1, HL-2, HL-3 and HL-4. In lieu of pertinent details shown on the standard construction drawings, the tops of pull boxes shall not exceed 1-inch above the surrounding ground elevation at the high point of the surrounding ground.

The Contractor shall furnish and install all items of electrical equipment necessary for the satisfactory operation of the complete roadway lighting, sign lighting and navigation lighting systems, whether specifically mentioned or not.

The Contractor shall cooperate with the Cleveland Division of Light and Power, M.E.L.P., whose address is:

Chief  
Bureau of Street Lighting  
City of Cleveland  
1825 Lakeside Avenue  
Cleveland, Ohio 44114

The Contractor will not be required to connect or disconnect any primary feeder cables or series lighting circuits, one week's notice shall be given to the power company of need for such requirements. The contractor will be required to furnish and install transformers in existing underground vaults, 3-pole safety switches in enclosures, grounding, and all connections on the secondary side of the transformer.

The Contractor will be required to remove all existing poles with bracket arms and luminaires, cables, sign lighting fixtures, sign ballasts, damaged pull boxes and covers. He will be required to furnish and install new light poles, luminaires, lamps, cables, pull boxes where required, covers to pull boxes that are damaged or missing, and all incidentals whether specifically mentioned or not.

New cables for new circuits have been installed on the north side of the project, for the old poles, by the State. Any temporary luminaires will be removed by the State and shall remain the property of the State. The Contractor shall furnish and install new connector kits, new poles, new luminaires, with lamps, and new pole and bracket cable for the north side of the project, and shall furnish and install new circuit cables, new connector kits, new poles, new luminaires with lamps and new pole and bracket cable for the south side of the project.

The Contractor shall remove, replace, and make operable the new lighting on the south side of the project before disturbing north side of the project. Existing on north side may be removed only after south side is functioning.

The Contractor may reuse cast pole base castings if he desires, but welds to existing bases shall be done in the pole manufacturer's shops, the existing poles may be cut off about a foot above the existing casting and shipped to the pole manufacturer for removal of old pole and the installation of new pole on the cast base. Any existing cast bases that cap screws have to be drilled out of, shall be redrilled and tapped, and provided with new galvanized high strength cap screws.

The Contractor is advised to key all cast pole base castings with the handrail post so that all custom fit bases will be replaced in the same locations.

~~Shop drawings of poles and luminaires shall be submitted within two weeks of awarding contract and bids shall include an early delivery of all materials, delivery cannot exceed 60 days.~~

The project has been designed on the basis of 5% maximum voltage drop permissible on branch circuits.

## LIGHT POLE - 625.05 and 713.01 (SEE NOTE IN PROPOSAL)

① MECHANICAL PROPERTIES FOR LIGHT POLES														
Reference Letter	Steel Light Pole		Foundation Anchor Bolts		Mounting Height Above Roadway	Elastic Deflection Rate, inches per 100 pounds	At 2/3 of Yield Stress			At Yield Stress			Foundation Size	
	Design	Number	Size	Size			Load 18" Down From Top	Total Deflection Inches	Perm. Set Inches	Load 18" Down From Top	Total Deflection Inches	Perm. Set Inches		
A	Y7H8A30.75D	9" x 6.18" x 28'-3"			35'-0"	1.11	1018	11.8	0.5	1528	19.2	2.20	Hand rail base	Bridge
B	Y7H8A35.7D	9" x 5.68" x 33'-2"			40'-0"	1.96	8.59	17.4	0.5	1289	28.3	3.0	Hand rail base	Bridge

Mechanical Properties for poles are for poles prior to shaft being cut.

Pole Design Number, shown in the TABLE above, is arrived at by the following designation: Example Y7H8A35.7D

Y - Shaft taper = .10" per foot.  
7 - Gauge of pole =  
H - Type of pole base = Handrail Mounting  
8 - Bracket arm length = length in feet  
A - Rise in feet from top of shaft to center of luminaire end A = 2'-6"

35.7 - Luminaire mounting height from top of handrail post to center of bracket arm at end of luminaire.

D - Special base Base to fit handrail post.

As each pole is erected on its foundation the handhole cover shall be installed and closed to prevent dirt and debris from entering.

All light pole shafts shall be complete with a 4" x 10", reinforced, handhole. An alternate 4" x 8", reinforced, cast-steel, handhole as detailed and shown on the detail sheets will be considered as an acceptable alternate.

## LUMINAIRES - 625.07 and 713.11

400 watt luminaires shall have dual rated 240/480 volt, integral, regulator ballasts and shall be General Electric MA400, Westinghouse OV-25, McGraw-Edison "Unistyle", or equal approved by the Engineer.

## LAMPS - 625.08 and 713.14

Mercury lamps shall be General Electric's "Bonus Line", Westinghouse's "Life-guard", Sylvania's "Rough Service", or equal approved by the Engineer.

## 625.14 713.02 ELECTRICAL CABLE

THE SPECIFICATION FOR CABLE IS HEREBY AMENDED FOR THIS PROJECT TO READ:

D.C. Potential Test: Prior to performing this test the main disconnect switch shall be opened or the circuit protection fuses in disconnect switch removed, the pole and bracket cables disconnected at each light pole and each lighted sign disconnected from the circuit. This test shall be performed on each conductor of each circuit and the results recorded as directed by the Engineer. Six copies of the results shall be furnished to the Engineer. This test shall be performed in the following sequence:

- (1) On the neutral conductor of each circuit before the neutral conductor is grounded.
- (2) On the power conductor of each circuit after all permanent grounds are connected to the companion neutral conductor of each circuit.

This test shall be made with an instrument capable of applying a variable, metered D.C. Voltage, from 0 to 6000 volts, to the circuit and with a meter provided to read the system leakage current. With voltage at zero attach high voltage lead to the circuit conductor to be tested and the low voltage lead to ground, ground the companion conductor(s) of the circuit and proceed as follows:

- (1) Gradually raise the voltage in one-minute steps each from 0 to 1500 volts, then to 3000 volts, then to 4500 volts and, finally to 6000 volts taking a current reading at each step.
- (2) Maintain the voltage at 6000 volts for 5 minutes, taking a current reading each minute.
- (3) Turn voltage to zero and ground the tested conductor to remove any capacitive charge.

Temperature of the air and relative humidity should be determined and noted at the time of testing. Any conductors indicating weak insulation shall be repaired and re-tested until satisfactory test results are obtained. Units of measurement for reporting shall be expressed in milliamperes of leakage current.

## DISTRIBUTION CENTERS - 625.19 UPGRADING

The Contractor shall furnish and install, in the existing vault under the Inner-belt Bridge at Abbey Ave., and in the existing manhole, 154 ft. south of Carnegie Ave. and 27 ft. west of E. 9th Street, complete distribution centers, including sub-way type, single-phase, oil-immersed, transformers of sizes as indicated on the drawings, fusible safety switches, in stainless steel enclosures with fuses, and all incidentals required to complete the new multiple roadway, sign, and navigation lighting circuits, whether specifically mentioned or not.

The transformers shall be of C.S.P. type rating, 55 degrees centigrade rise, 60 cycles, single-phase. The primary voltage windings shall be rated for 2400 volts with secondary winding rated at 480 volts. The transformer shall have two primary bushings, shall have primary rated KV taps (2-approximately 2% above and 2-approximately 2% below rated voltage), and manual tap changer. The secondary voltage windings shall be rated for 480 volts with terminals, for single-phase, 480-VAC, 2-wire, one side grounded operation. In addition to the primary protection indicated, each transformer shall be furnished with an internal low voltage circuit breaker, high voltage fuse, and valve-type lightning arrester. All protective and control equipment shall be of the weatherproof type. The primary cutouts to protect the transformers shall be of open-type, load-break, single pole, 100-ampere, 7.8 kv., 5000 AIR, complete with fuse holder and 200 percent rated primary fuses. The lightning arresters for protection of the primary high voltage circuits to the transformers shall be 3000 volts. The cutouts and arresters shall be equal to General Electric, Westinghouse, McGraw-Edison or approved equal.

The lighting circuit secondary shall be switched by a photoelectric controller. The controller shall operate on 120 Volts and shall be socket-mounted, or tubeless circuitry, DPST, 1000 watts, normally closed, closed at night, with the factory set turn-on for 5 footcandles, built-in fuses, and built-in lighting arrester. The relay shall be fail-safe, and have built-in time delay to avoid erroneous operation due to transient lights. The photoelectric controller shall be Fisher-Pierce Model 6690-DE, or equal approved by the Engineer.

## ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

The Contractor shall remove the existing lighting fixtures, ballasts, and all multiple circuit items not required for new mercury vapor 480 volt sign lighting. The Contractor shall install support channels on existing support brackets, conduit, fittings, ballasts, ballast support clamps, conductors and all incidentals required to complete the new 480 V. multiple services to signs as detailed on plans.

## 625 SIGN SERVICE COMPLETE

This item shall consist of the completion of the electrical system and components from the connectors in the junction box (included within the roadway lighting quantities) to the service side of the disconnect switch.

This item will also include the furnishing and installing of two 1/c No. 4 AWG, 600 volt service wire from the connectors in pull box to the disconnect switch.

Basis of payment for this item shall be at contract unit price per each, which shall include all labor, material, and equipment required to complete this item of work.

## 625 DISCONNECT SWITCH WITH TYPE "Y" ENCLOSURE AND MOUNTING BRACKETS

This item shall include furnishing of a two-pole 30-AMP, 600-volt fused disconnect switch of type and make as indicated on details and shall be mounted in a NEMA 4 stainless steel enclosure and attached to each sign support by means of a mounting bracket as described in detail on the plan sheets.

Each switch enclosure shall be furnished with one padlock. Padlocks shall have a brass body and wrought iron shackle equal to Russwin No. 2882 KA or Master No. 4 KA or approved equal.

Basis of payment for this item shall be per each at contract unit price, which shall include all labor, material, and equipment to complete this item of work.

## 625 MERCURY VAPOR SIGN LIGHTING LUMINAIRE, WITH LAMP

The luminaire shall be no more than 8 1/2" high overall by 16" wide by 18 1/2" deep including the ballast enclosure. These measurements shall be checked when the luminaire is resting on a horizontal table top with the lens up.

The outer housing of the luminaire, the frame for the lens and the ballast housing shall be of cast aluminum with a finish of baked acrylic base enamel. The color of the enamel shall be Interstate green.

The lamp housing body shall be 3/8" diameter holes drilled according to the mounting plate shown on detail sheet.

The reflector shall be made of a single piece of aluminum, die formed to shape and processed to distribute the light evenly over the sign area. A heavy duty mogul base lampholder shall be securely fastened to the reflector and the reflector shall be securely fastened to the lamp housing.

The luminaire shall have a borosilicate glass lens capable of withstanding thermal shock and impact of freezing rain and hail. The lens shall be clear. A permanent flexible, waterproof sealer shall be used to seal the lens into its frame. A continuous waterproof gasket shall be provided to seal the lens and frame unit to the lamp housing. This gasket shall be so designed to stay in the proper position for at least 10 years regardless of the number of times the lens unit is opened for service or adjustment.

The lens unit shall be hinged on one edge and fastened on the other edge with spring loaded latches that require no tools to open. The hinges, latches and all other external fasteners shall be of stainless steel.

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## LIGHTING NOTES

OHIO INTERSTATE SAFETY PLANS

BR. NO. CUY-90-14 67 STA. 3+87.63  
42R-17 43 STA. 54+65.78  
42R-17 5  
42 -17 50

CUYAHOGA COUNTY OHIO

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DATE	DATE	DATE	DATE	SHEET 43/52

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The luminaire shall be provided with an integral ballast of at least 90% power factor, and of the constant wattage autotransformer type to provide plus or minus 5% lamp watt variation for a plus or minus 10% line voltage variation. Primary supply voltage shall be 60 hertz and 480 volts. The luminaire shall operate satisfactorily over any expected outdoor temperatures down to -20 degrees F. Selfballasted mercury vapor lamp type luminaires are not acceptable.

Luminaires shall be mounted as shown in the plans. Wiring shall be No. 10 AWG, 600 V. through 1/2" diameter conduit. The wires should be continuous between junction boxes. On multiple sign supports each sign shall have a separate junction box so that, if service is needed, the sign and all electrical devices attached to it can be removed as a unit from the support by disconnecting only two wires and the U bolts attaching it to the support.

Payment for this item shall be at the contract unit price bid for each 250 and 17" watt Mercury Vapor Sign Lighting Luminaire With Lamp. It shall include all labor, ballast, the luminaire, lamp, as described above, and all hardware and aluminum parts shown necessary to mount the luminaire to the support arm. See Sheet 52.

### 625 WIRE AND CABLE

Wire and cable installation shall conform to Section 625.14 of the construction and materials specifications and shall be of the sizes and types shown on the plans.

Wire or cable installed in conduit on or with sign structures shall be 10 RHH, 600 Volt standard copper wire (pole and barcket cable).

Cable installed in conduit from junction box to the disconnect switch shall be No. 4 single conductor circuit cable.

### 625 INSPECTION AND TESTING OF SIGN LIGHTING

The Contractor shall furnish all labor, electrical power, and equipment necessary to demonstrate to the Engineer that no short circuits and unspecified grounds exist and that the sign circuits are properly connected and operable prior to acceptance.

This demonstration shall include a meggering test to show that the power conductors are not grounded and that the resistance to ground for the ground conductor is not more than 25 ohms. Where resistance exceeds 25 ohms, additional length and/or numbers of rods shall be installed per requirements of 625.10.

A voltage and amperage measurement shall be made at the sign support switch.

After the sign lighting system is completed, the entire system shall be operated continuously each night until seven (7) consecutive days elapse without failure or defect. The Contractor shall record and subsequently correct any defects which may develop at no extra cost to the State.

During the test period, adjustments to fixture aiming angles shall be made to obtain maximum uniformity as directed by the Engineer.

The above measurements, notations, and methods of defect correction shall be recorded and delivered to the Engineer for inclusion in the project records.

Inspection and testing of the sign lighting system shall be considered a subsidiary work item and payment therefore shall be included in the unit prices bid for the respective items tested.

### CAPPING OF CONDUIT

All conduit in foundations which will not have wire or cable pulled into it during construction shall have the ends closed with capped bushings or otherwise sealed in an approved manner to completely keep all moisture and foreign matter out of the conduit.

### 625 MODIFYING EXISTING DISCONNECT SWITCH ON SIGNS

This item of work shall include removing any existing disconnect switches, contactor, fuses, wiring, transformer and shall include furnishing and installing a new two-pole 30-amp, 600-volt fused disconnect switch of type and make as indicated on details, and shall be mounted in existing enclosure, after enclosure is approved by the engineer. If disapproved the contractor shall furnish and install a new type "Y" enclosure.

Basis of payment for this item shall be at contract unit price per each, which shall include all labor, material, and equipment required to complete this item of work.

### 625 ELECTRIC POWER SUPPLY FOR SIGNS

Electric power shall be obtained from 480 volt roadway lighting circuits, as shown on the plans. All work necessary to install a complete operative system shall be included in the various electrical bid items in this contract.

### 625 EXISTING LIGHTING FIXTURES REMOVED, AS PER PLAN

This item shall consist of removing sign lighting fixtures from existing overhead sign supports. The parts to be removed and shall include the fixtures, ballasts, conduit, condulets and junction boxes not needed in the new sign installations. Existing electrical items in good condition may be reused in the new installations subject to the approval of the Engineer.

The work for this item shall include all labor and material required to remove the existing light fixtures and appurtenances from the existing overhead sign supports.

Payment shall be at the contract bid price per each "Existing Lighting Fixture Removed" complete and accepted.

### 625 MERCURY VAPOR LIGHTED SIGN, WIRED COMPLETE

Conduit for the mercury vapor sign lighting on new installations shall be as follows, beginning at the 1/2" coupling welded to the top truss chord or the sign support arm and behind each sign:

1. A screw-on-cover, 1 1/2" double hub, junction-box shall be fastened to the 1 1/2" coupling with a short 1 1/2" nipple.
2. A length of 3/4" P.V.C. covered flexible waterproof conduit shall connect the junction box through a 1 1/2"x3/4" bushing to a 3/4" LR or LL conduit on the sign bracket nearest the pole on which the switch enclosure is mounted.
3. 3/4" Rigid conduit shall connect the LR or LL conduit to a 3/4" LB conduit so arranged to line up the short end with the 1 1/2" dia. holes in the sign bracket and fixture support arm. This rigid conduit shall be fastened to the sign bracket with not less than 2 conduit clamps placed within 3" of the conduit fittings and not more than 24" apart O.C.
4. 3/4" Rigid conduit shall connect the above LB conduit to the short end of another LB conduit fitting at the other end of the fixture support arm. This conduit shall be run through both 1 1/2" dia. holes in the fixture support arm, be jagged out of the way of the fasteners on the diagonal bracing rods when required, be fastened near each end and at not less than 24" O.C. and be made to a length that when screwed into both conduit fittings, the rear conduit shall be approximately centered on the sign bracket web and the front conduit shall fit snugly against the outer plate of the fixture support arm. The long end of the front conduit shall be angled downward approximately 30 degrees, when viewed from the front of the sign to allow the next piece of conduit to be jogged easily to lay along the centerline and approximately 3/4" in front of flange of the channel that supports the lighting fixtures.
5. A 3/4" type "T" conduit fitting shall be located within approximate 18" of the rear edge of each fixture on the sign. 3/4" Rigid conduit shall be connected from the LB conduit fitting as described above to the first "T" conduit. Straight lengths of conduit shall connect as many "T" condulets as are required for the number of luminaires specified for the signs. A threaded plug shall be used to close the opening in the last "T" conduit used on each sign installation. Suitable conduit clamps shall be used on 24" centers to hold the entire run of conduit on the centerline of the channel flange as listed under item 4 above. The Type "T" condulets shall be so oriented that the third tapped opening shall be perpendicular to the face of the sign.
6. A length of 3/4" P.V.C. covered waterproof flexible conduit shall connect each fixture to each corresponding "T" conduit. The length of this conduit shall be so arranged as to make a neat and gradual curve into the fixture without either sharp bends or drooping appearance.

Wiring for mercury vapor sign lighting shall be sized and installed according to the National Electric Code but shall be not less than No. 12 THW and shall be spliced only in junction boxes or in the wiring enclosure of the luminaire. All wiring shall be in conduit, inside structural chords and poles, or in electrical boxes and fixtures. Solderless connectors, of the proper size and type, may be used where splices and junctions are allowed above ground level. However, when used, they shall be securely taped with water resistant electrical tape to form a waterproof joint. If solderless connectors are not used, all splices and junctions above ground shall be soldered and double taped to make a waterproof electrical joint.

Any below ground electrical work shall be as covered in Construction and Material Specifications 625.

Payment for this item shall be at the contract unit price bid for each Mercury Vapor Lighted Sign, Wired Complete. It shall include all labor and materials to connect into the disconnect switch enclosure and all luminaires on one sign panel. When more than one sign panel is mounted on a structure, each sign panel shall be considered as a separate pay item.

### PAYMENT FOR LIGHTING ITEMS - 625.25

Payment for all roadway lighting, Item 625, will be made at the contract unit price bid for items as indicated in the schedule of quantities, which payment shall constitute full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary, whether specifically mentioned or not, to complete the entire work, installed and in operating condition, for full acceptance, according to the plans and specifications. Payment will be made as follows:

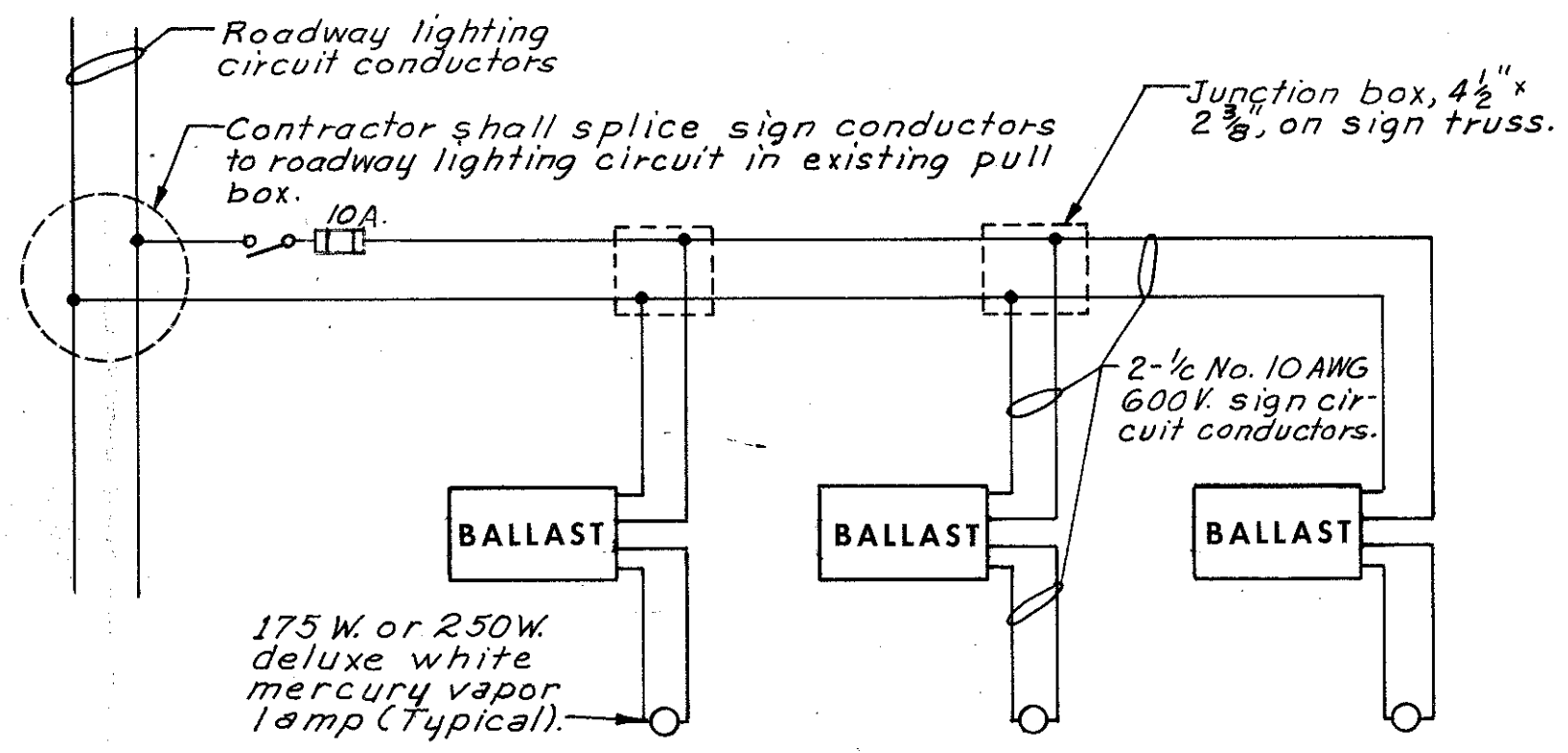
- A. "Light Pole w/B' Br. Des. Y7HBA307SD and Des. Y7HBA35.7.D" per each, and shall include 7 Ga. 9"x5.68"x33"-2" or 7 Ga. 9"x6.18"x28"-3" poles for mounting on hand-rail post, as detailed on plan sheets and all features shown on Ohio Standard sheet No. HL-2.
- B. "Distribution Center HA" per lump sum, in place, completed and accepted, including 37 1/2 Kva transformer, 3-pole safety switch with stainless steel enclosure, grounding, conduits, fittings, fastenings, attachments, and all incidentals required in vault for the new 480 VAC., multiple lighting, control transformer circuits 4HA and 5HA inside the existing transformer vault, photocell, and photocell wiring.
- C. "Distribution Center BCN" per lump sum, in place, completed and accepted, including 25 Kva transformer, 3-pole safety switch, with stainless steel enclosure, grounding, conduits, fittings, fastenings, attachments, and all incidentals required in vault for the new 480 VAC., multiple lighting, control transformer circuits 1 BCN and 2 BCN inside the existing transformer vault, photocell, and photocell wiring.
- F. "Transformer 300 Volt-amp Dry-Type" per each, and shall include, furnished and installed, 480/120 VAC transformer in curb junction boxes, and all incidentals required to provide 120 volts to each navigation light.
- F. "Remove Existing Bridge-Mounted Light Pole" per each removed completely from site and disposed of including steel shaft with anchor base, bracket arm, luminaire lamp and all component parts of the series lighting, the removed items become the property of the Contractor except north side of structure, luminaires and lamps will be removed and are the property of the State.
- G. "Renovate Existing Pull Boxes" per each and shall include removing all debris from inside box and restore box to its useable condition.
- H. "Renovate Existing Conduit" per lineal foot, and shall include providing a 2" or 3" conduit between pull boxes or foundation for pulling new conductors.
- I. "Installing New Pull Box Cover" per each, and shall include removing the old cover that is damaged and installing a new one that fits properly and has the same requirement that the old one had.
- J. "Lifting Rings for Existing Pull Box Cover" per set of two, and shall include the furnishing and installing of two 3/4" diam. eye-bolts in existing pull box covers where the lifting rings have rusted out. Payment shall include the two eye-bolts, drilling new 3/4" diam. holes in concrete cover, locking nuts, and all incidentals required.
- K. "Handrail Post Modification" per each, and shall include removal and disposal of unused portions of existing handrail posts used for light pole bases, on approach structures to the viaduct, all new steel plates, new steel angles, all drilling, all welding, all grinding, all finishing, and all incidentals to modify and renovate the handrail posts to fit the light pole casting and the handrail, as per plans.
- O. "Looped Expansion Joint" per each, and shall include flexible conduit, fittings, fastenings, bonding, drilling, boxes, and all incidentals. (Detail on sheet 48).
- P. "Call Box Reinstallation" per each, and shall include removing box and cable, temporarily mounting on guardrail post, duplicating installation on new posts, and all incidentals.

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			SHEET 44/52

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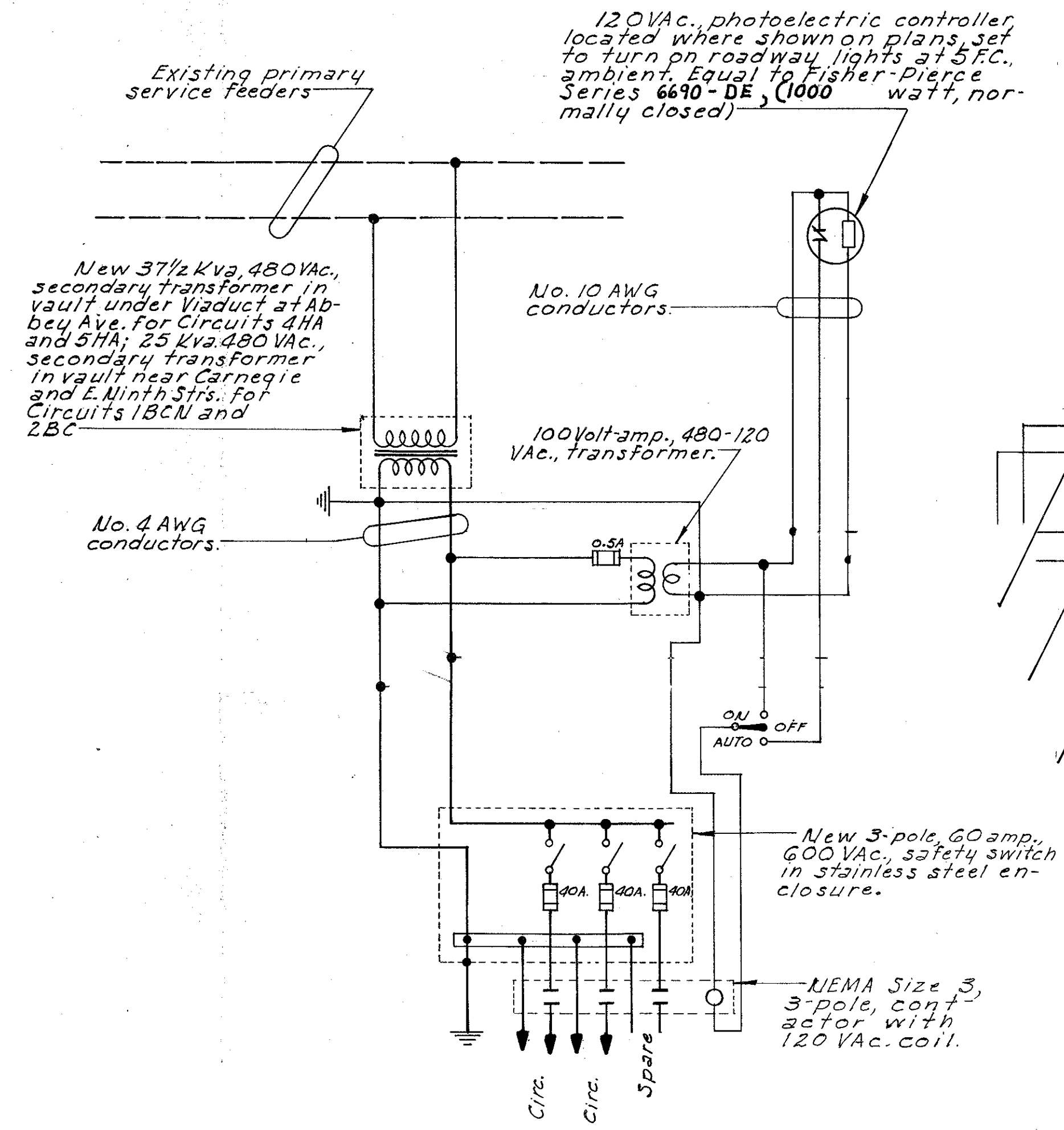
CUYAHOGA COUNTY  
 CUY-90-15.24



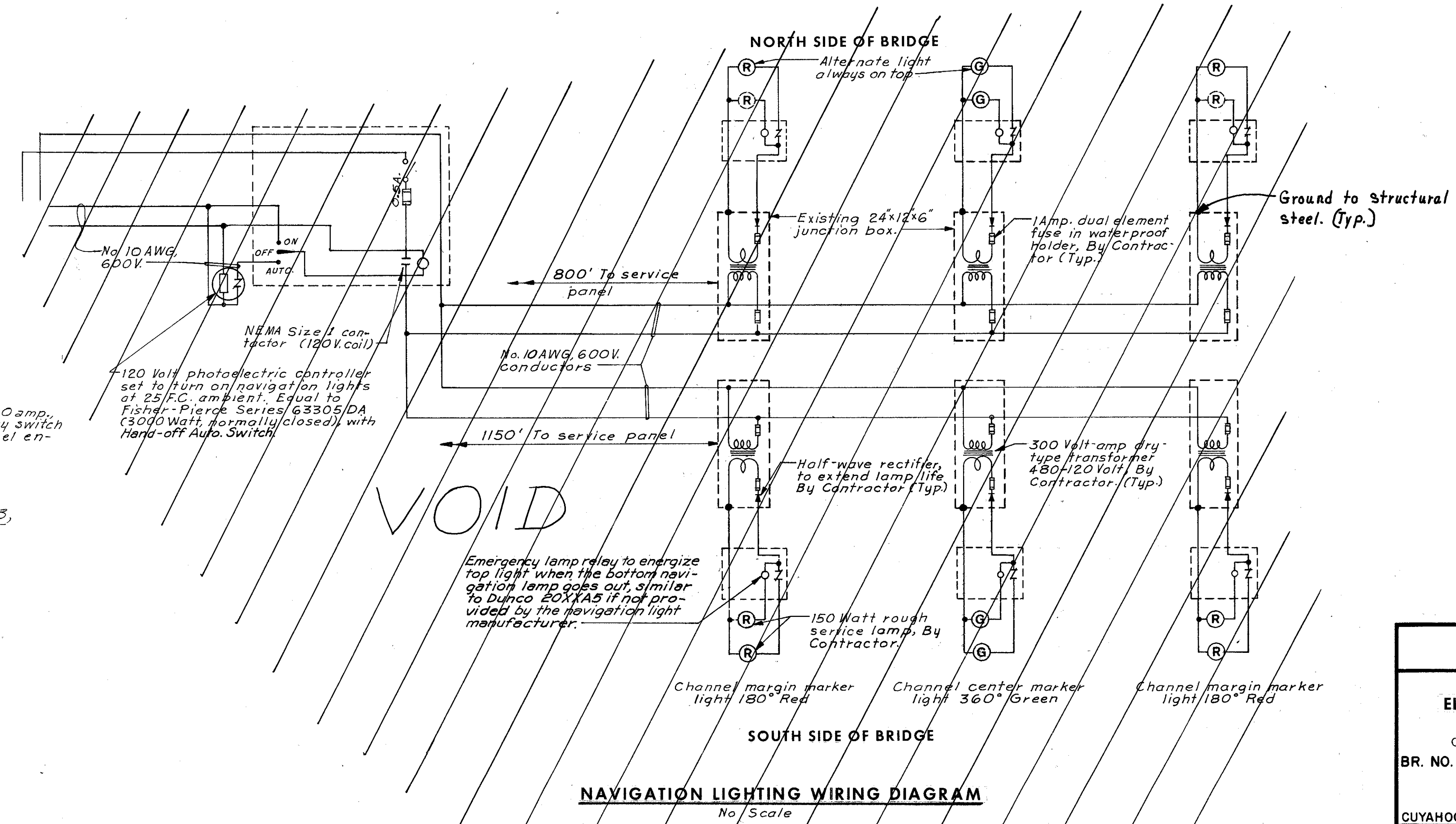
**SIGN LIGHTING WIRING DIAGRAM**  
 No Scale

VAULT UNDER INTERBELT BRIDGE AT ABBEY AVE.			
EXISTING CIRCUITS			
CIRCUIT NO.	REGULATOR SIZE	REMARKS OR MODIFICATIONS	
H-1	20 KW	BREAK EXISTING SERIES WIRING AS PER PLANS AND RECONNECT FOR PROPER OPERATION.	
H-2	25 KW		
H-3	25 KW		
NEW CIRCUITS			
CIRCUIT NO.	TRANSFORMER SIZE	CONDUCTOR SIZE (AWG)	LOAD
4-HA	37.5 KVA	4	26-400W. & SIGN NO:1,3, 4W.
5-HA		4	24-400W. & SIGN NO: 2, 4E.
NAVG.		10	6-150W. NAVIGATION LIGHTS

VAULT AT CARNEGIE AND NINTH STREET			
EXISTING CIRCUITS			
CIRCUIT NO.	REGULATOR SIZE	REMARKS OR MODIFICATIONS	
B-93	30 KW	BREAK EXISTING SERIES WIRING AS PER PLANS AND RECONNECT FOR PROPER OPERATION.	
B-94	30 KW		
B-95	30 KW	REMOVE EXISTING CIRCUIT	
NEW CIRCUITS			
CIRCUIT NO.	TRANSFORMER SIZE	CONDUCTOR SIZE (AWG)	LOAD
1-BCN	25 KVA	4	25-400W.
2-BCN		4	25-400W. & SIGN NO: 5



**TYPICAL ROADWAY LIGHTING CONNECTIONS FOR NEW 480 VOLT MULTIPLE CIRCUITS**



**NAVIGATION LIGHTING WIRING DIAGRAM**  
 No Scale

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

**ELECTRICAL WIRING DIAGRAM**

OHIO INTERSTATE SAFETY PLANS  
 BR. NO. CUY-90-14 67 STA. 3+87.63  
 42R-17 43 STA. 54+65.78  
 42R-17 5  
 42 -17 50

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE	DATE	DATE	DATE	DATE

SHEET 46/52

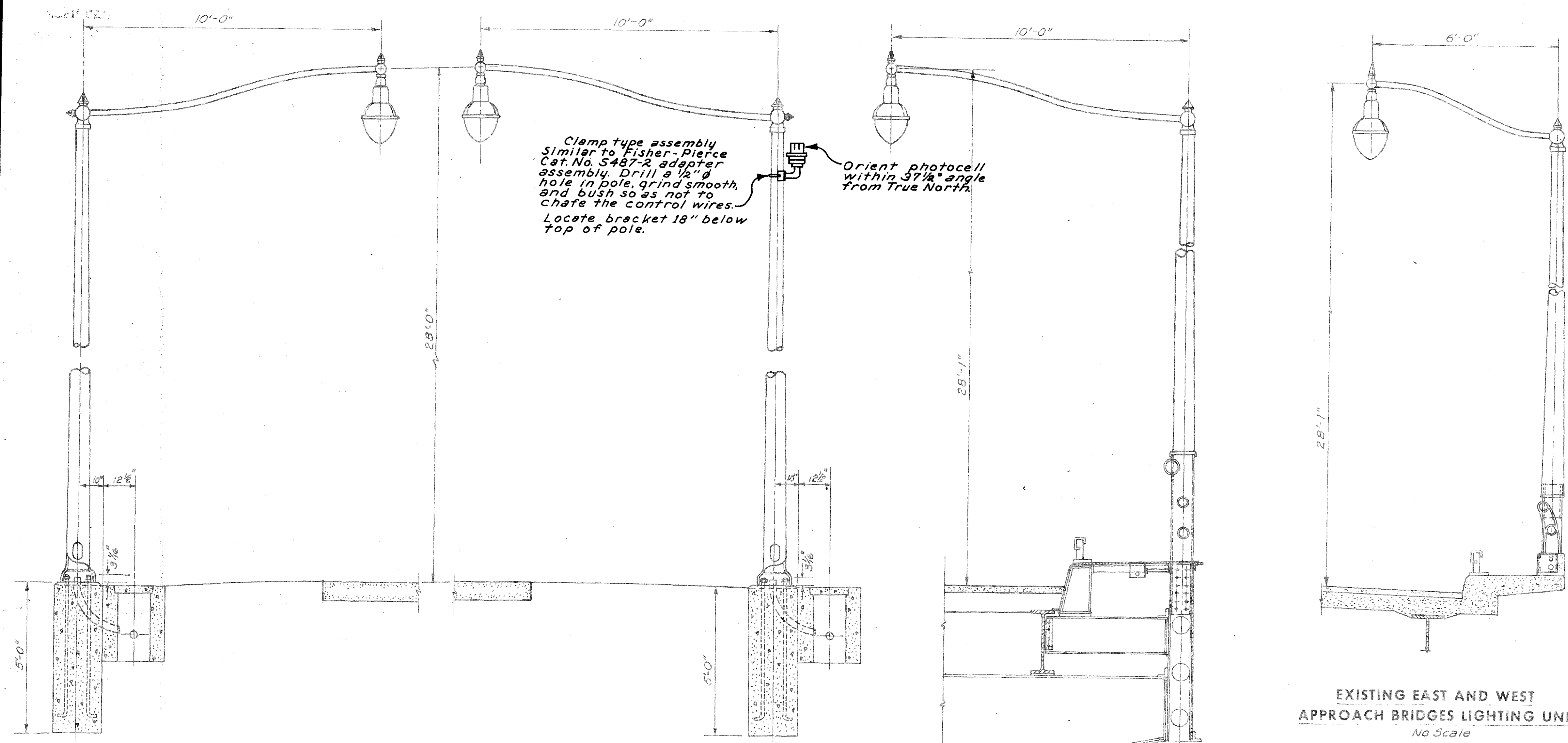
Rev 8-4-72



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-118724

47  
52

CUYAHOGA COUNTY  
CUY-90-1524

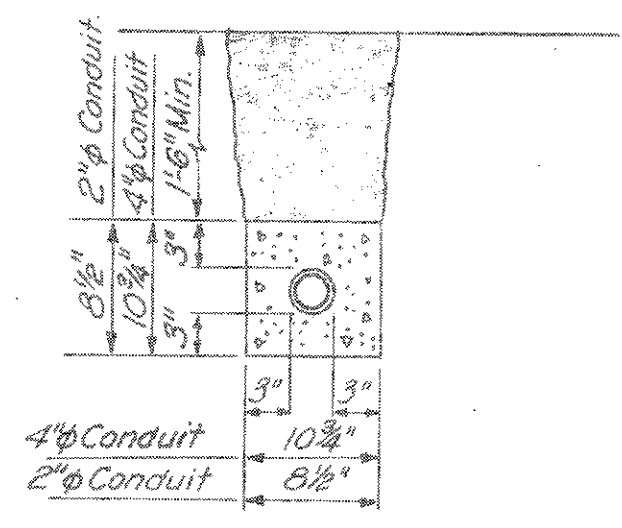


EXISTING GROUND MOUNTED LIGHTING UNIT  
WEST APPROACH  
No Scale

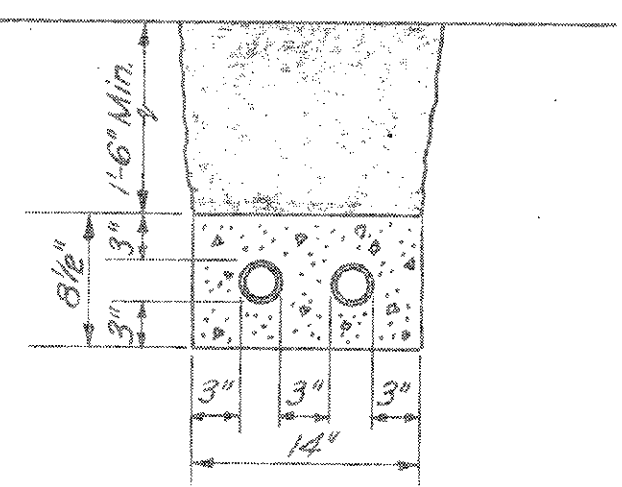
EXISTING GROUND MOUNTED LIGHTING UNIT  
EAST APPROACH  
No Scale

EXISTING CENTRAL VIADUCT  
LIGHTING UNIT  
No Scale

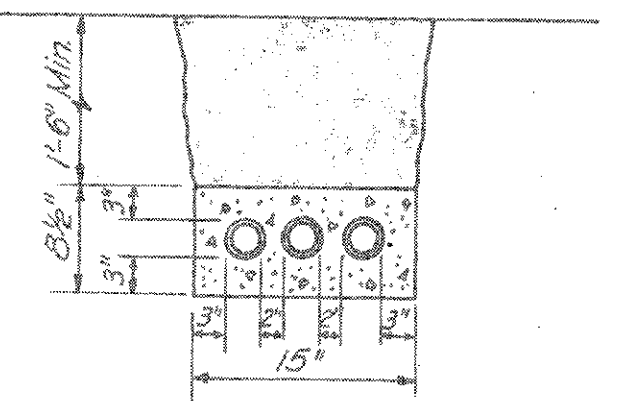
EXISTING EAST AND WEST  
APPROACH BRIDGES LIGHTING UNIT  
No Scale



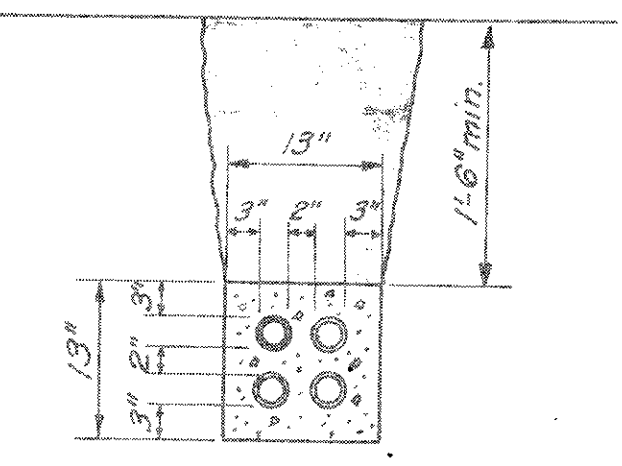
ONE-WAY DUCT BANK  
Scale: 1"=1'-0"



TWO-WAY DUCT BANK  
Scale: 1"=1'-0"

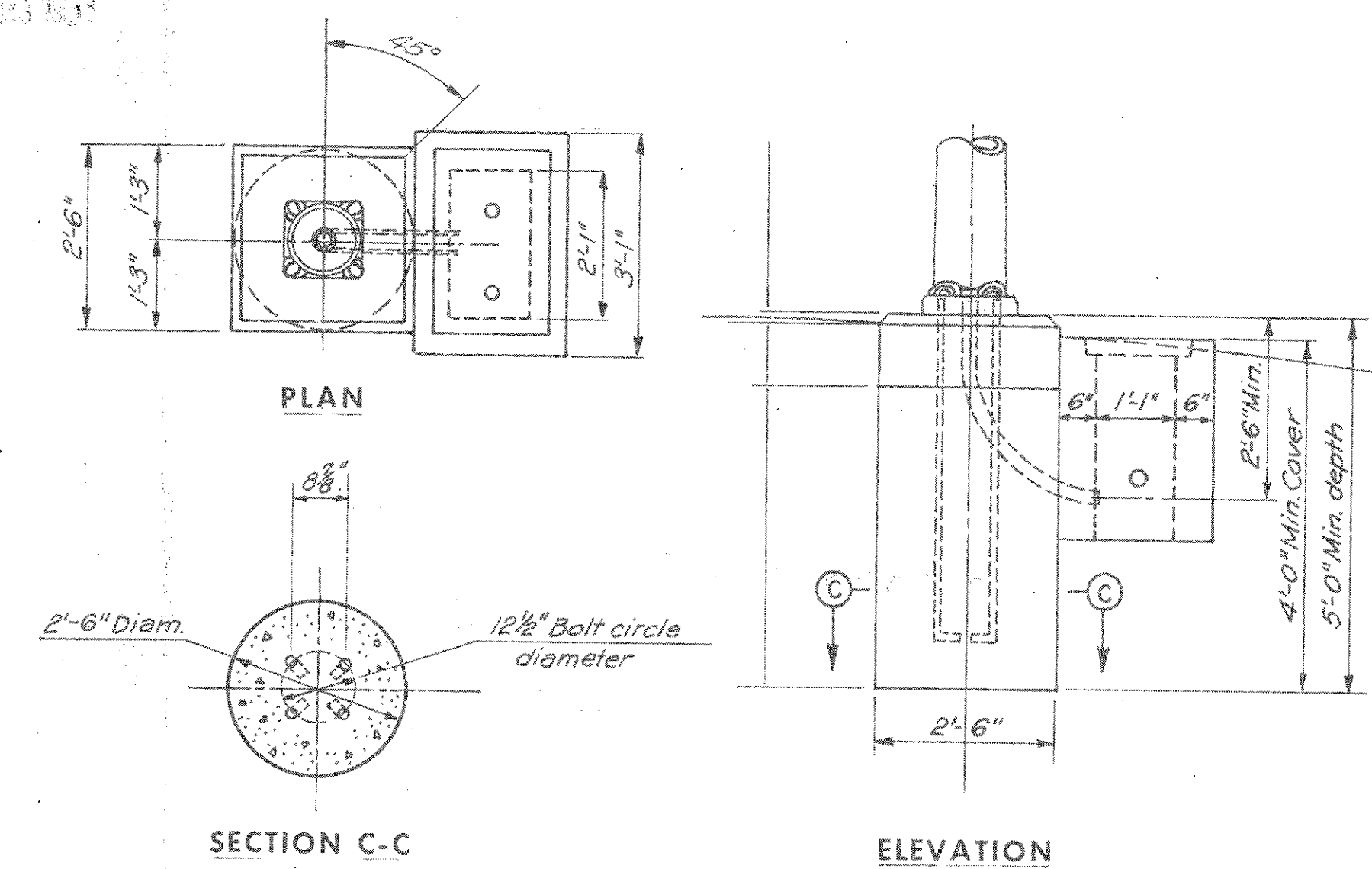


THREE-WAY DUCT BANK  
Scale: 3/4"=1'-0"

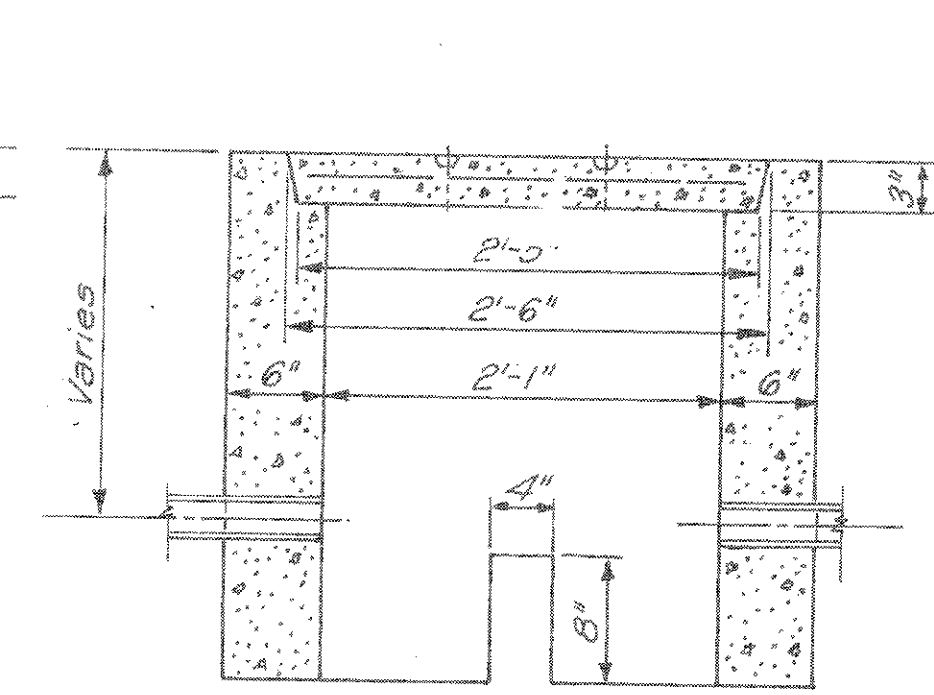
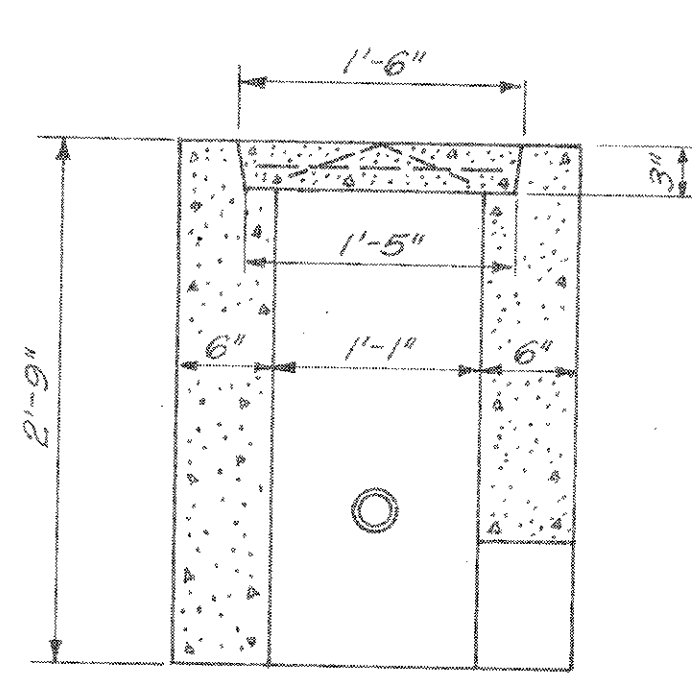
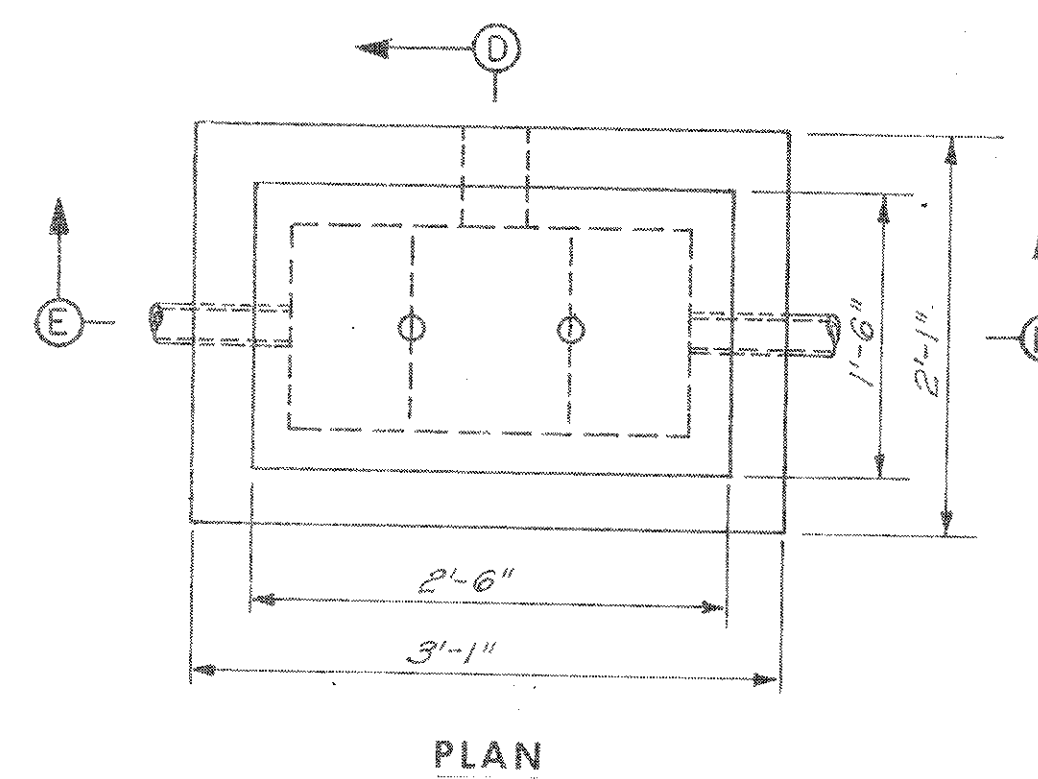


FOUR-WAY DUCT BANK  
Scale: 3/4"=1'-0"

UNREPLAZED  
FEB 13 1951



TYPICAL POLE BASE  
Scale: 1/2"=1'-0"



CONCRETE PULL BOX  
Scale: 1"=1'-0"

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KANSAS CITY CLEVELAND NEW YORK

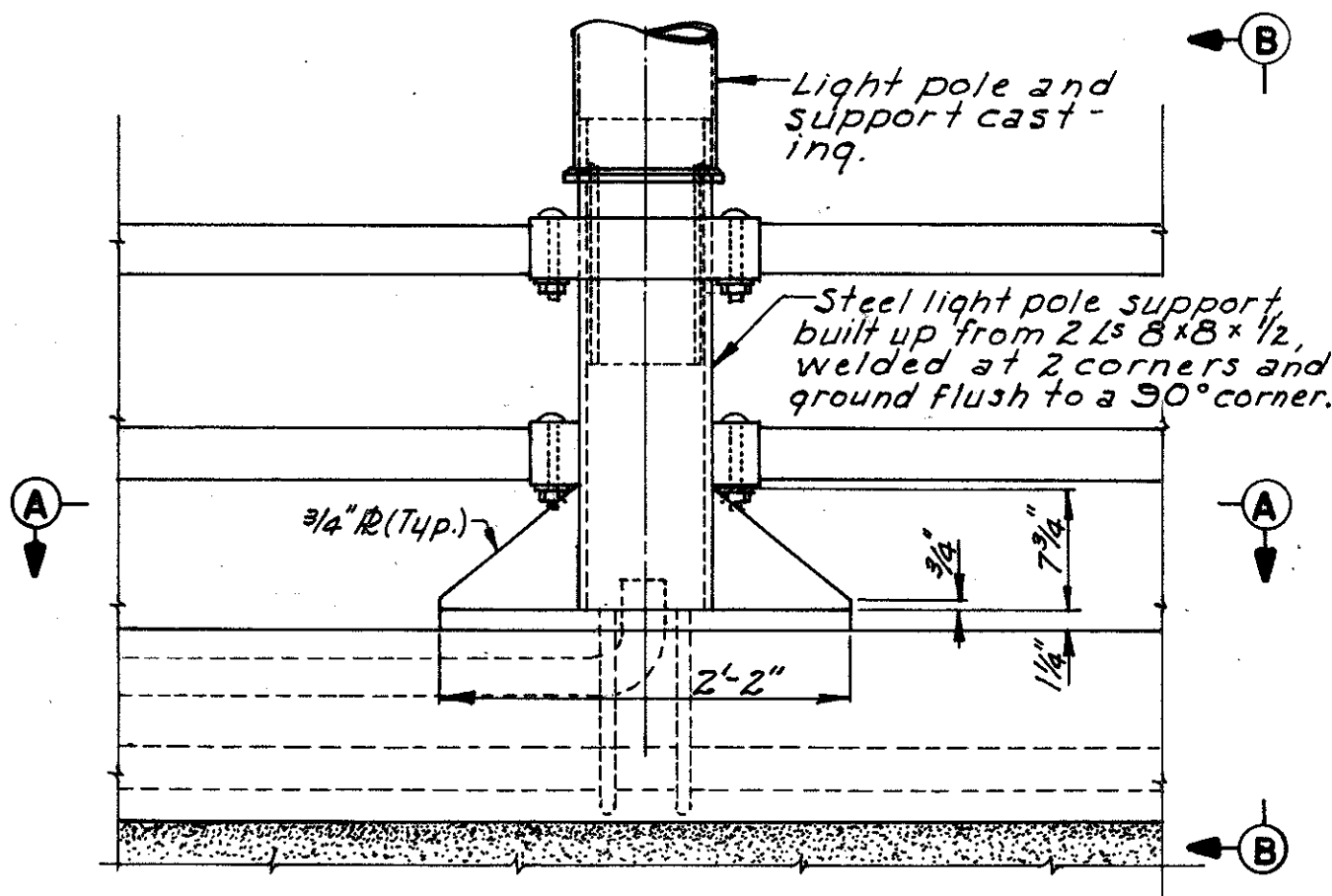
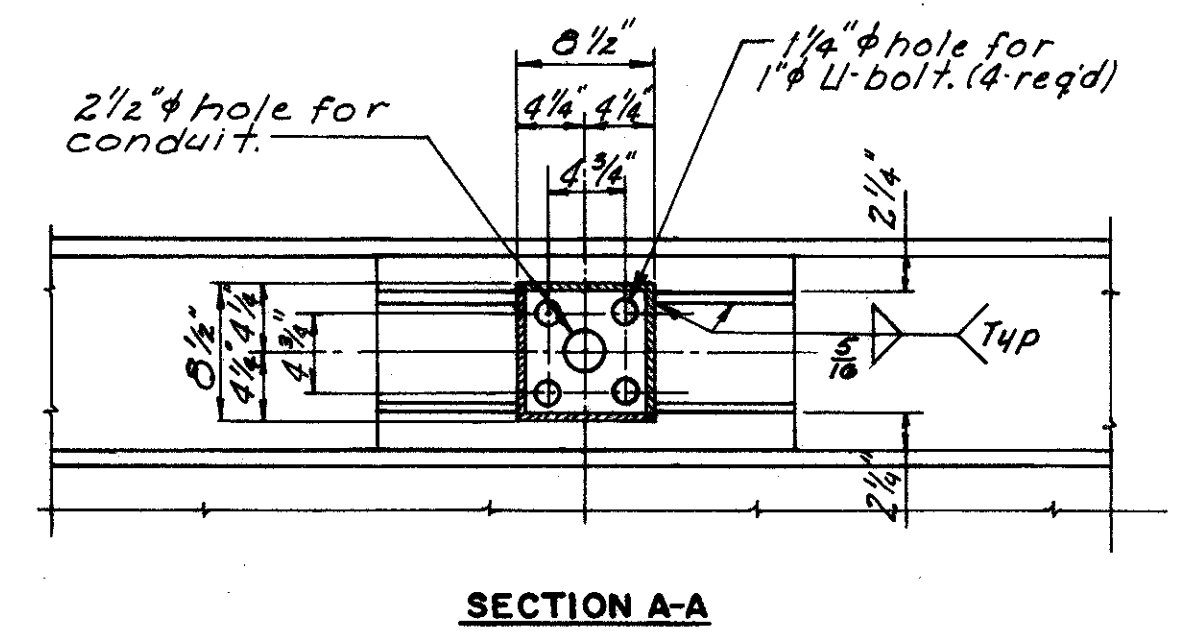
**EXISTING LIGHTING DETAILS**

OHIO INTERSTATE SAFETY PLANS  
BR. NO. CUY-90-14 67  
42R-17 43 STA. 3+87.63  
42R-17 5 STA. 54+65.78  
42-17 50

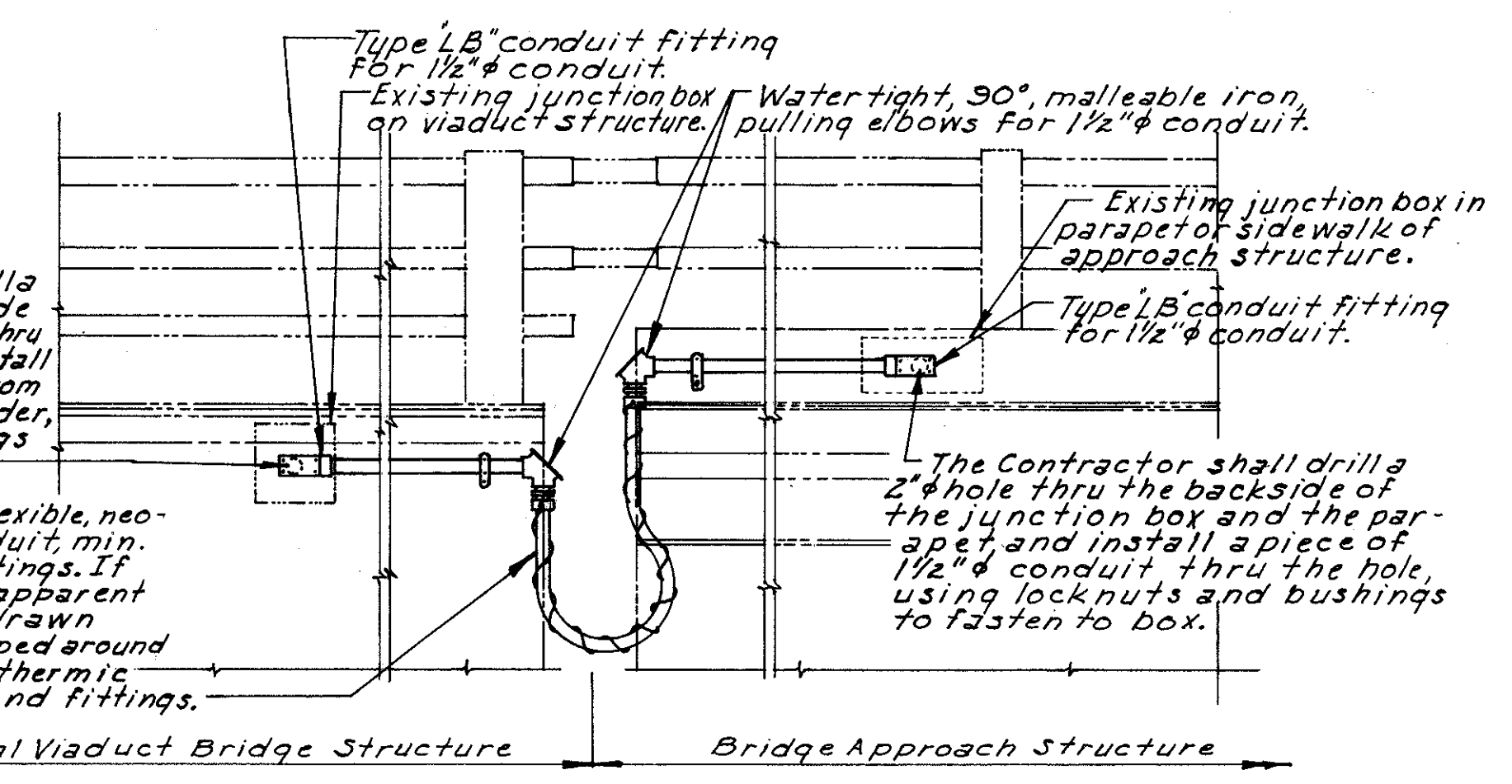
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE	DATE	DATE	DATE	DATE

SHEET 47/52



**ELEVATION**  
**HANDRAIL POST MODIFICATIONS**  
**ON CENTRAL VIADUCT APPROACH STRUCTURES**



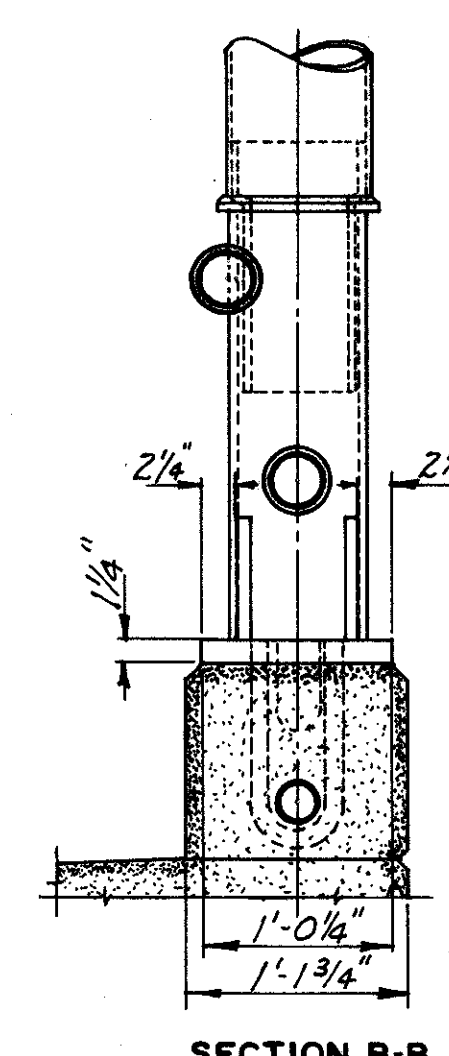
**LOOPED EXPANSION JOINT**  
**(CONDUIT CONNECTIONS**  
**AT APPROACHES TO VIADUCT)**  
Scale: 1/2"=1'-0"  
(d required)

The Contractor shall drill a 2" hole thru the backside of the junction box and thru the web of the girder. Install a piece of 1/2" conduit from the box to outside of girder, use locknuts and bushings to fasten to box.

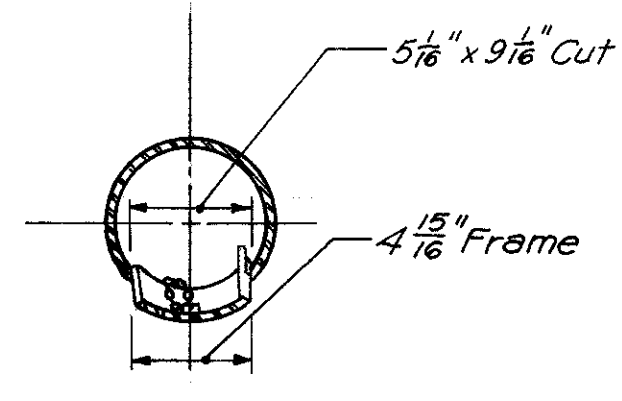
Piece of watertight, flexible, neoprene covered, metallic conduit, min. 5 ft. long, with approved fittings. If an internal ground is not apparent a piece of No. 6 AWG, soft drawn copper shall be loosely wrapped around the flexible conduit and exothermic welded or fastened to the end fittings.

The Contractor shall drill a 2" hole thru the backside of the junction box and the parapet and install a piece of 1/2" conduit thru the hole, using locknuts and bushings to fasten to box.

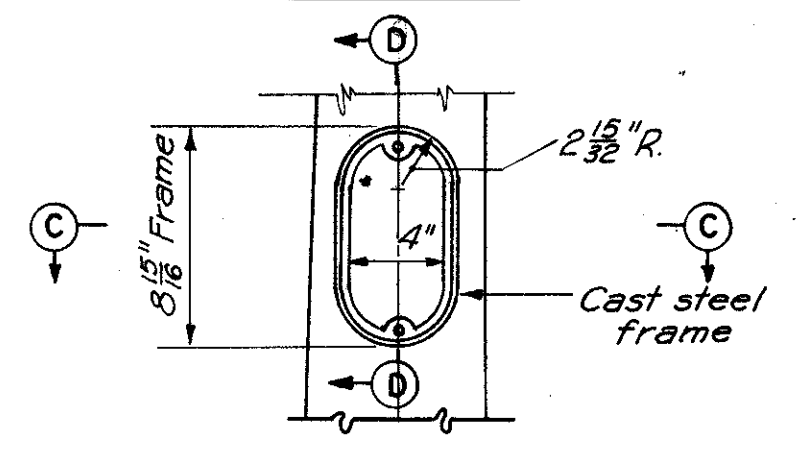
Notes:  
The Contractor has the option of either drilling horizontally thru the box and parapet, as shown, or straight down, and running the conduit on the bottom side of the sidewalk slab.  
Dimensions between ends of structures and junction boxes are not shown, the Contractor shall determine for himself the locations of junction boxes and the lengths of exposed conduits required.



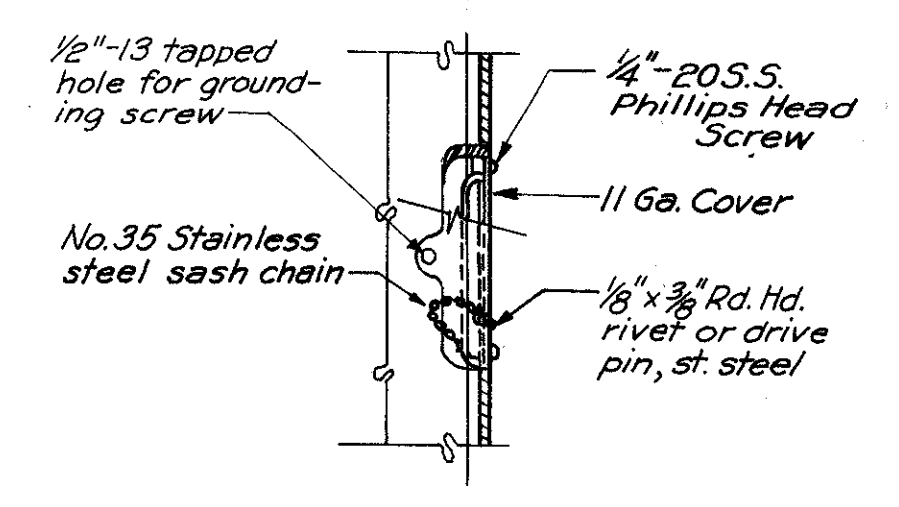
**SECTION B-B**



**SECTION C-C**

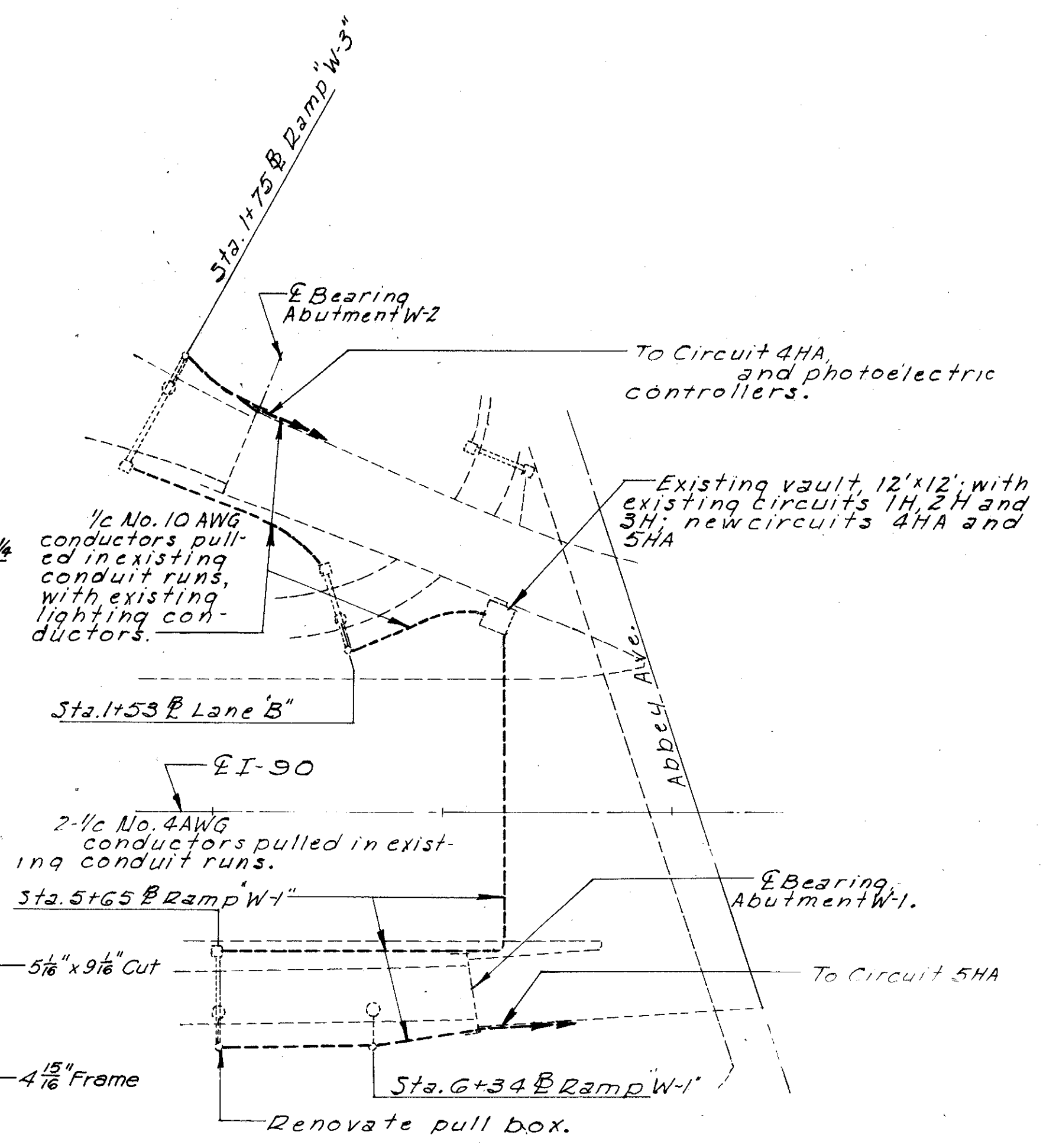


**ELEVATION**



**SECTION D-D**

**ALTERNATE HANDHOLE**



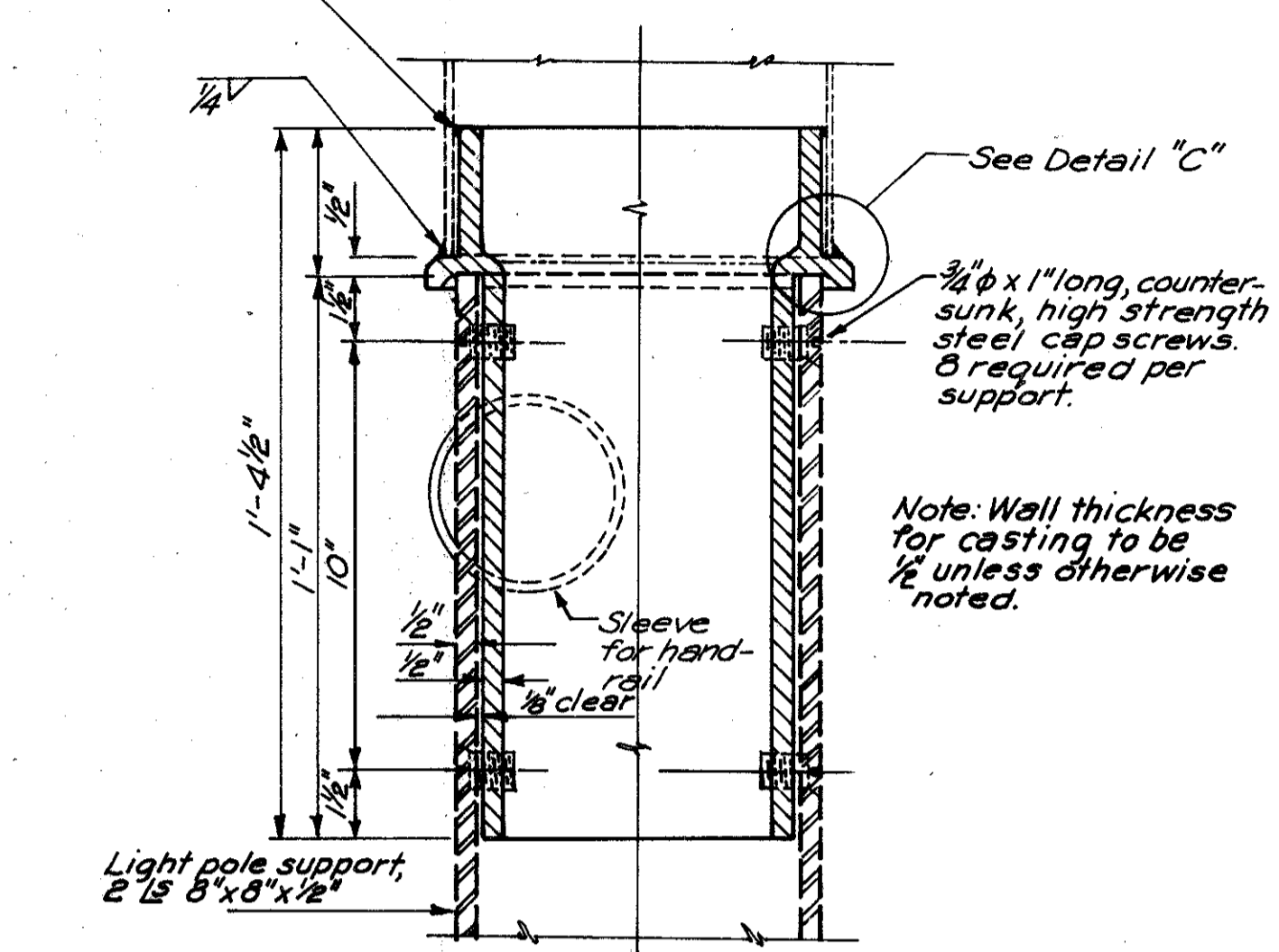
**PLOT PLAN**  
**EXISTING TRANSFORMER VAULT**  
Scale: 1"=30'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>BRIDGE LIGHTING DETAILS</b>				
OHIO INTERSTATE SAFETY PLANS				
BR. NO. CUY-90-14 67	42R-17 43	42R-17 5	42-17 50	
	STA. 3+87.63	STA. 54+65.78		
CUYAHOGA COUNTY OHIO				
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE	DATE	DATE	DATE	DATE
				SHEET 48/52

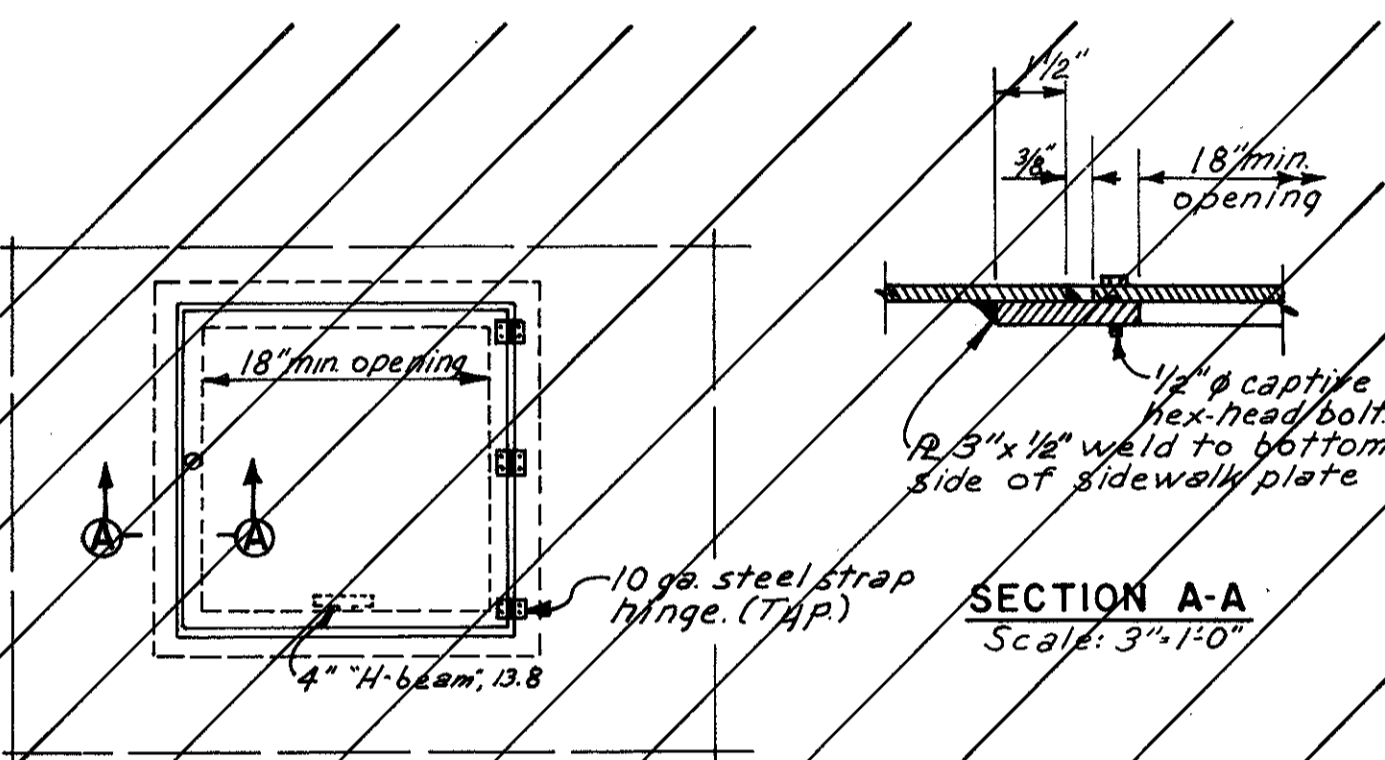
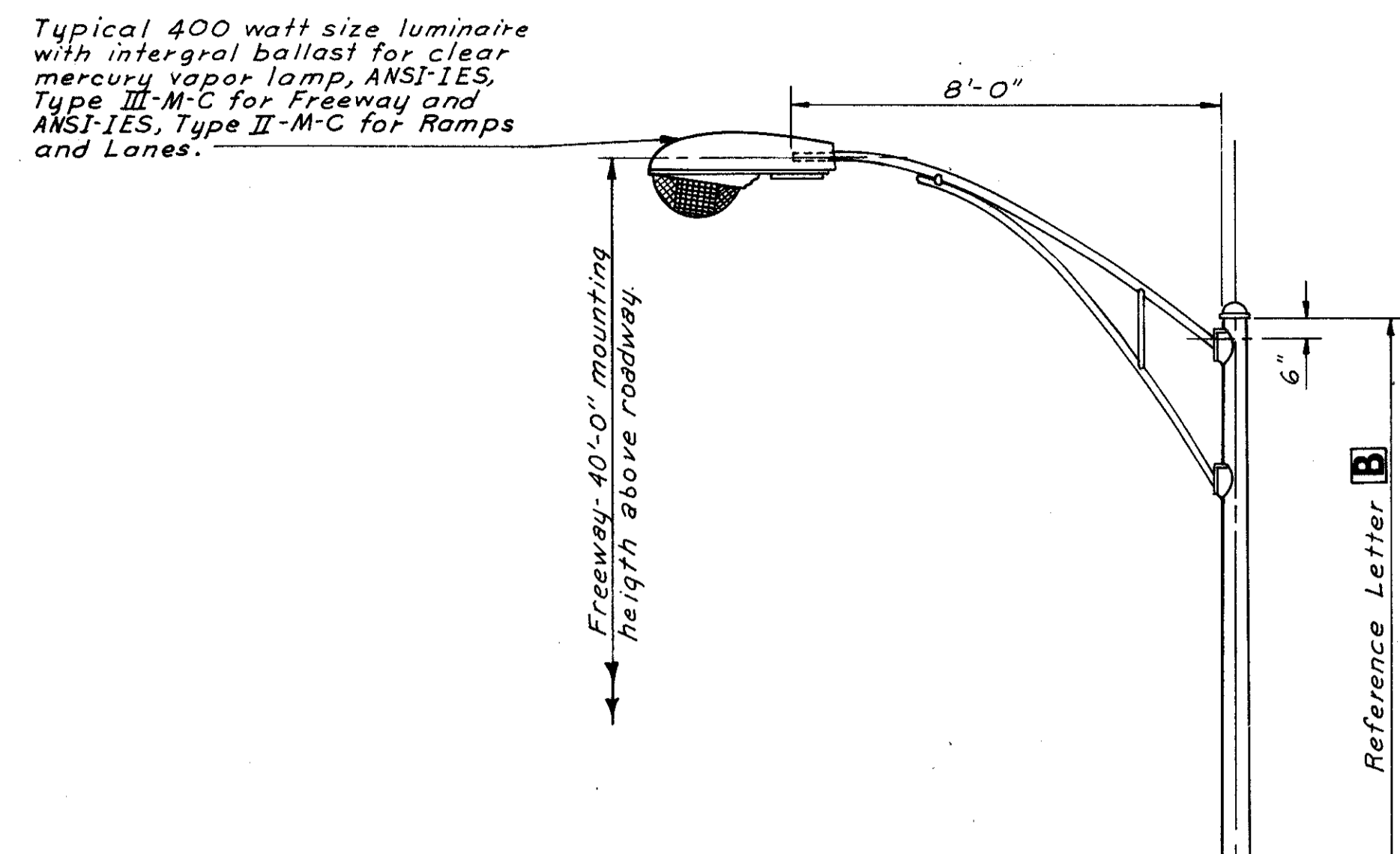
Rev. 8-4-72

CUYAHOGA COUNTY  
CUY-90-1524

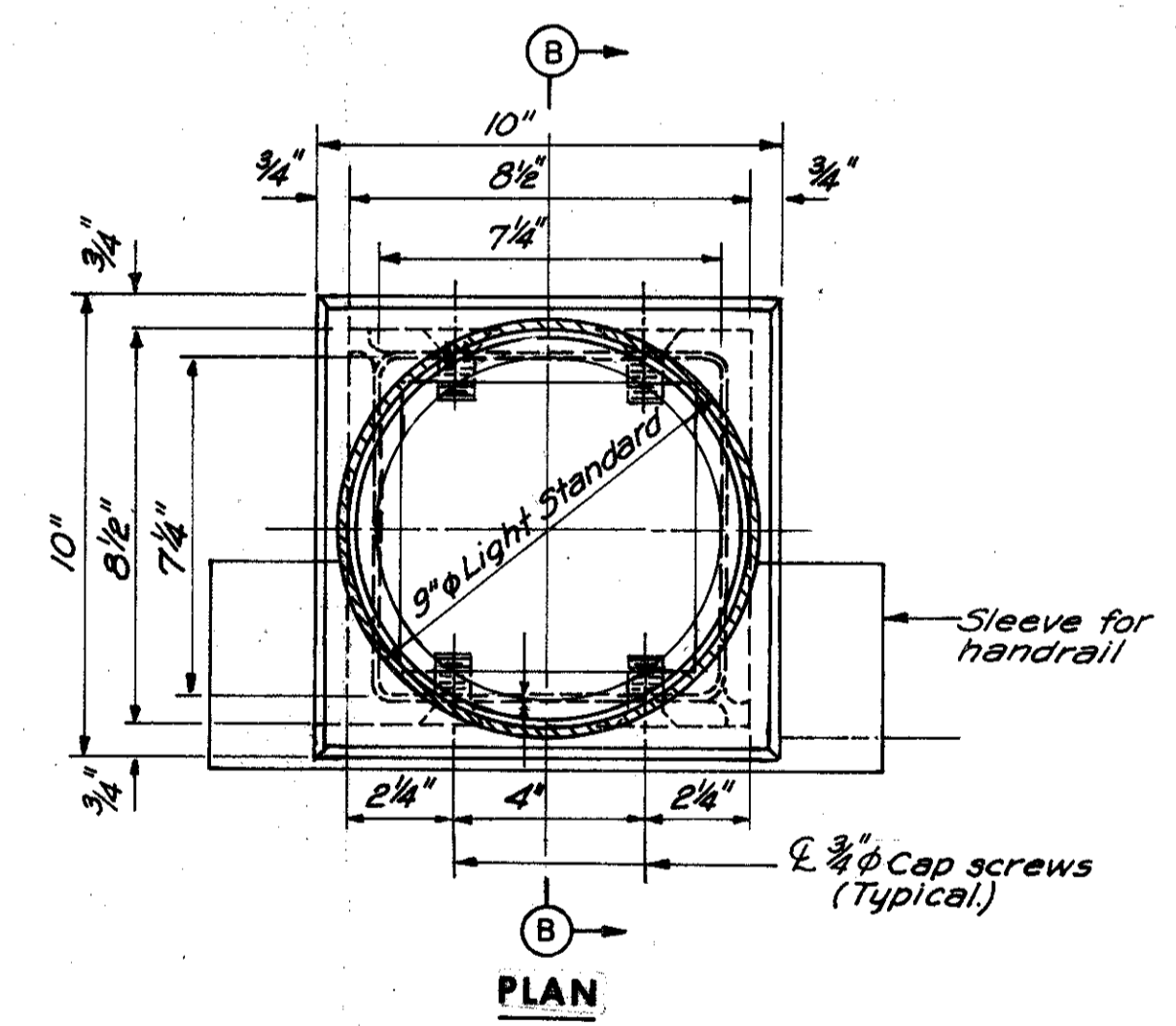
Note: Contractor may reuse the pole insert to fit handrail post if not damaged in removing from pole and handrail post.



SECTION B-B

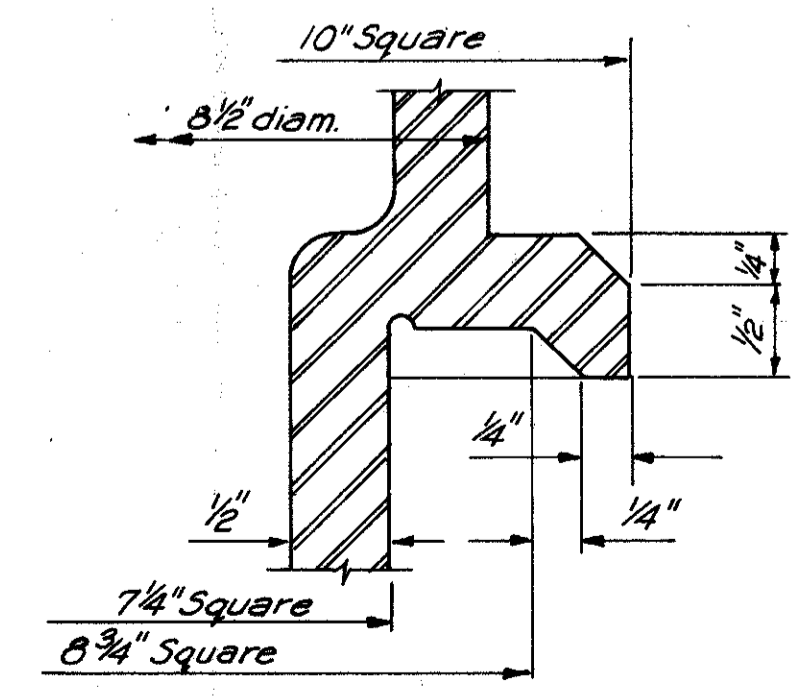


OPENING IN SIDEWALK ABOVE NAVIGATION LIGHT  
Scale: 1"=1'-0"  
(6 required)

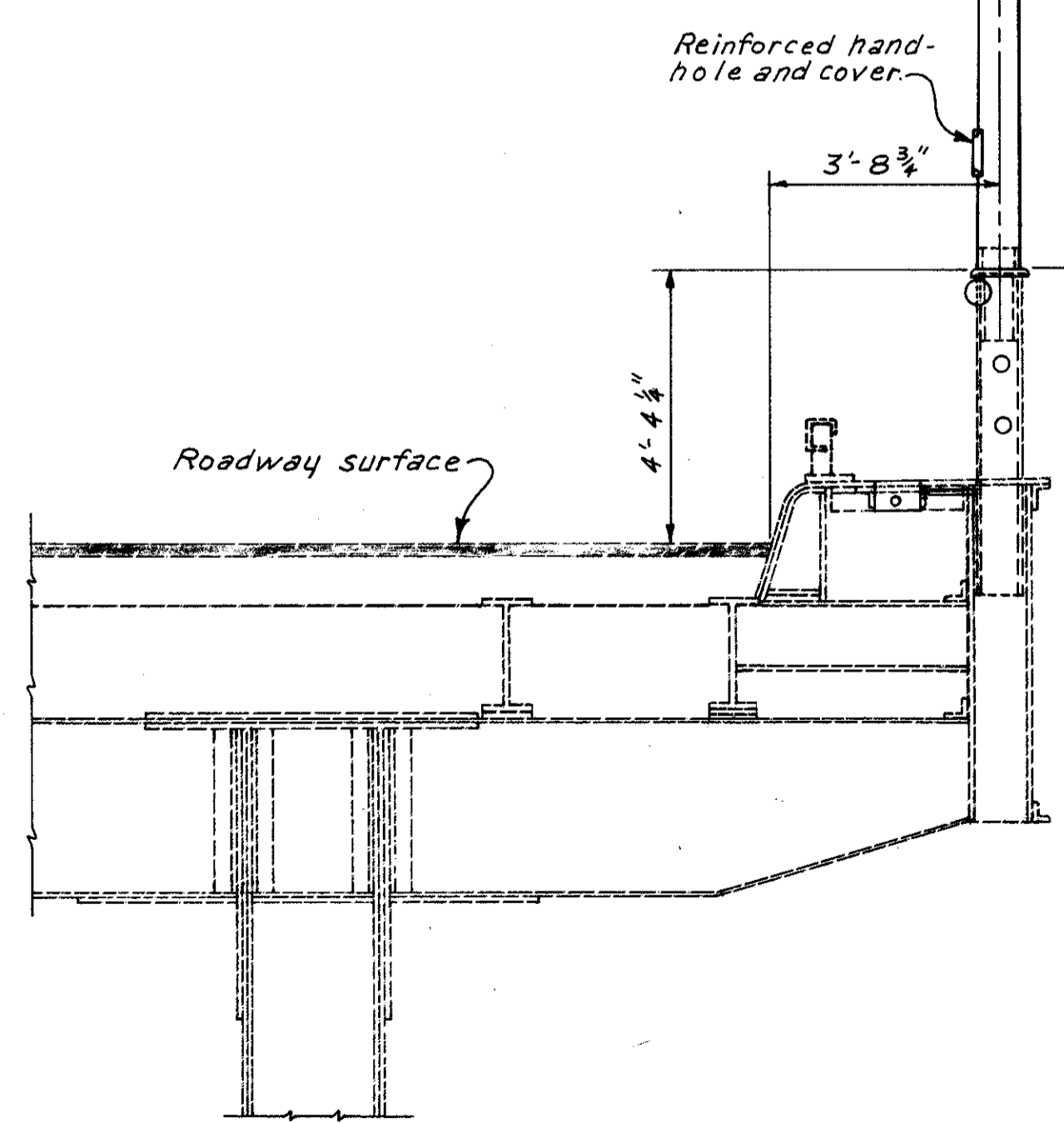


PLAN

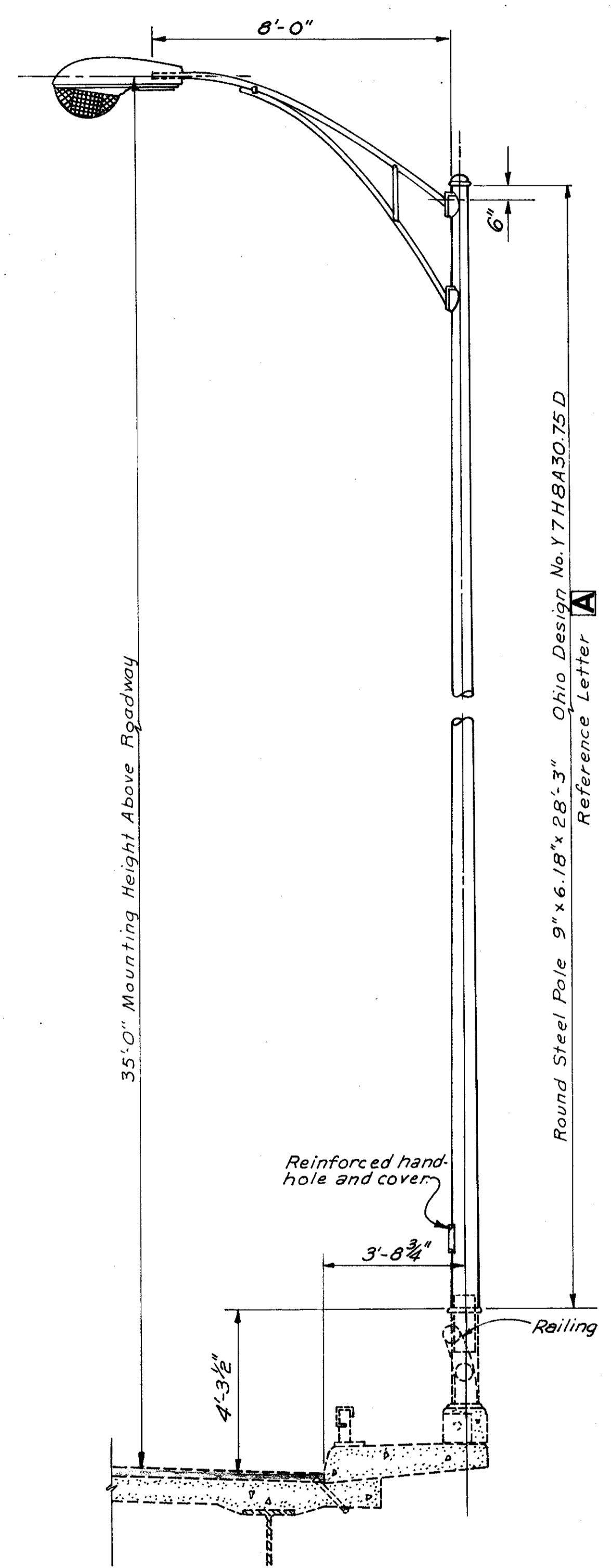
BASE CASTING DETAIL  
Scale: 3"=1'-0"



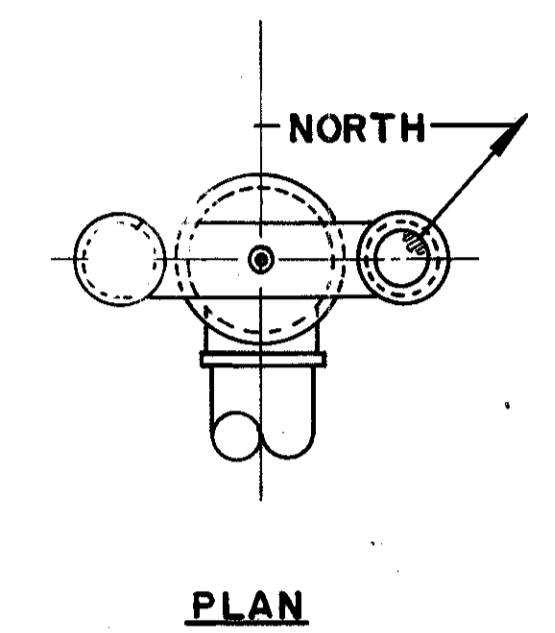
DETAIL "C"  
No Scale



TYPICAL SECTION AT LIGHTING UNIT ON CENTRAL VIADUCT  
No Scale

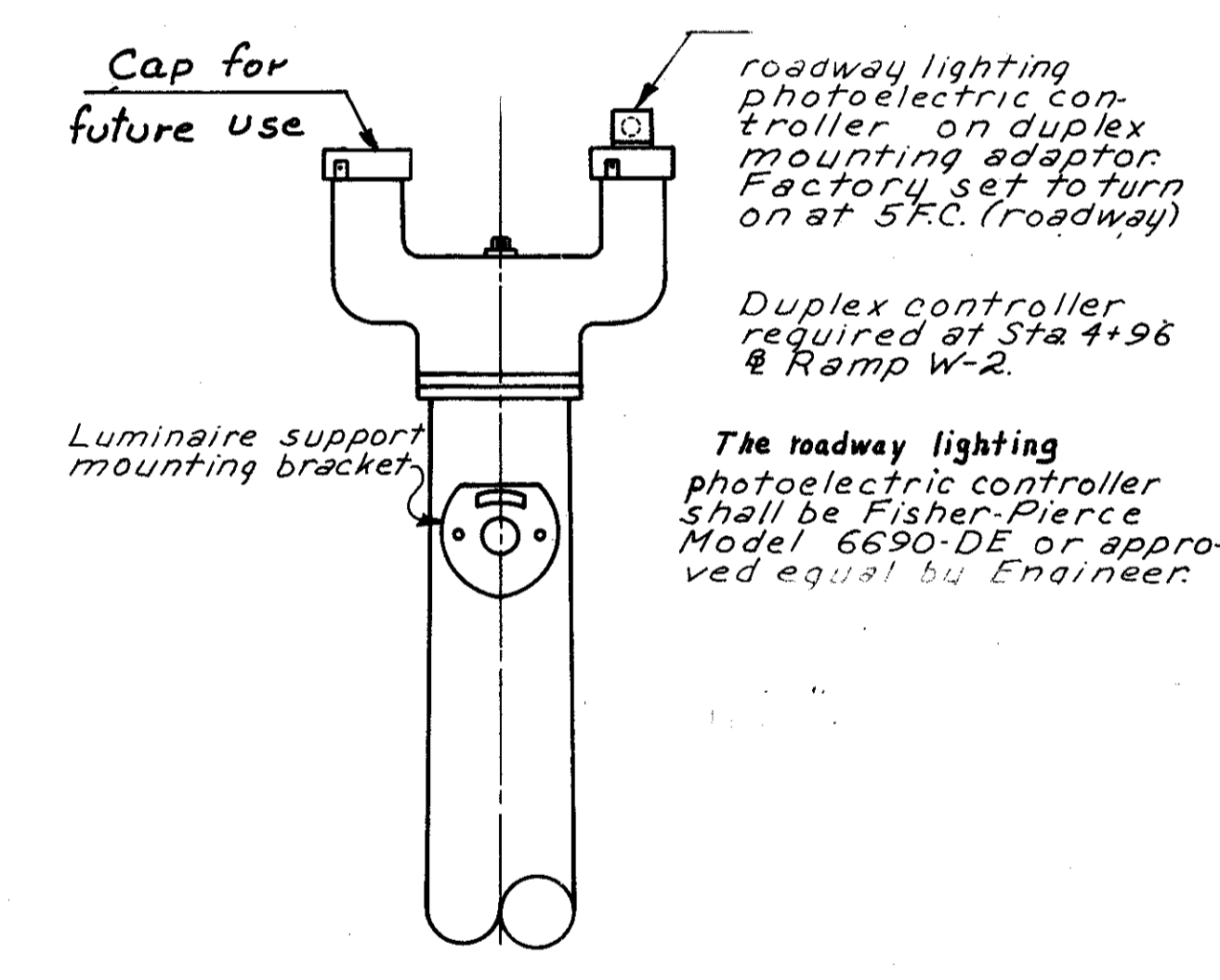


TYPICAL SECTION AT LIGHTING UNIT ON APPROACH BRIDGE  
No Scale



PLAN

Note: Photocell window shall be oriented within 37 1/2 degree angle from True North. Orientation shall be achieved by rotation of photocell, not duplex adaptor.



ELEVATION

DUPLEX MOUNTING OF PHOTOELECTRIC CONTROLLER  
No Scale

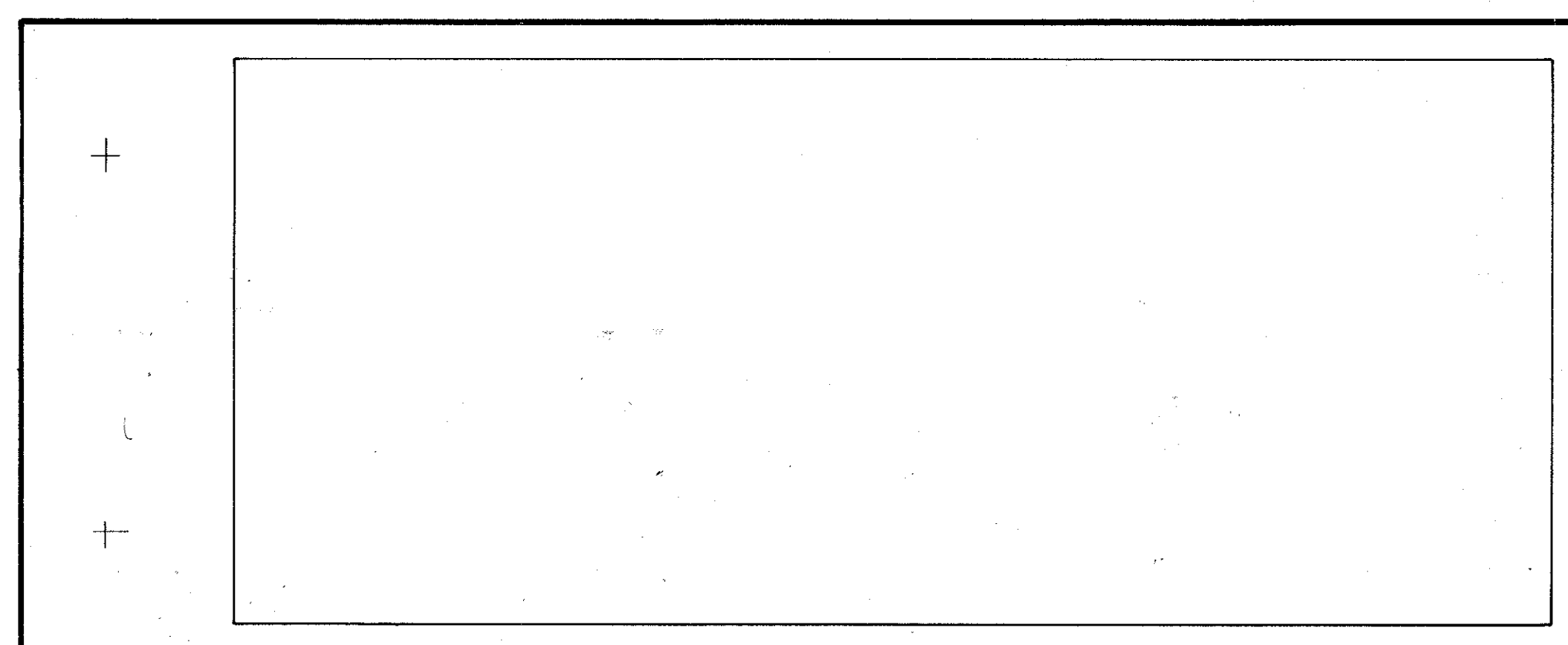
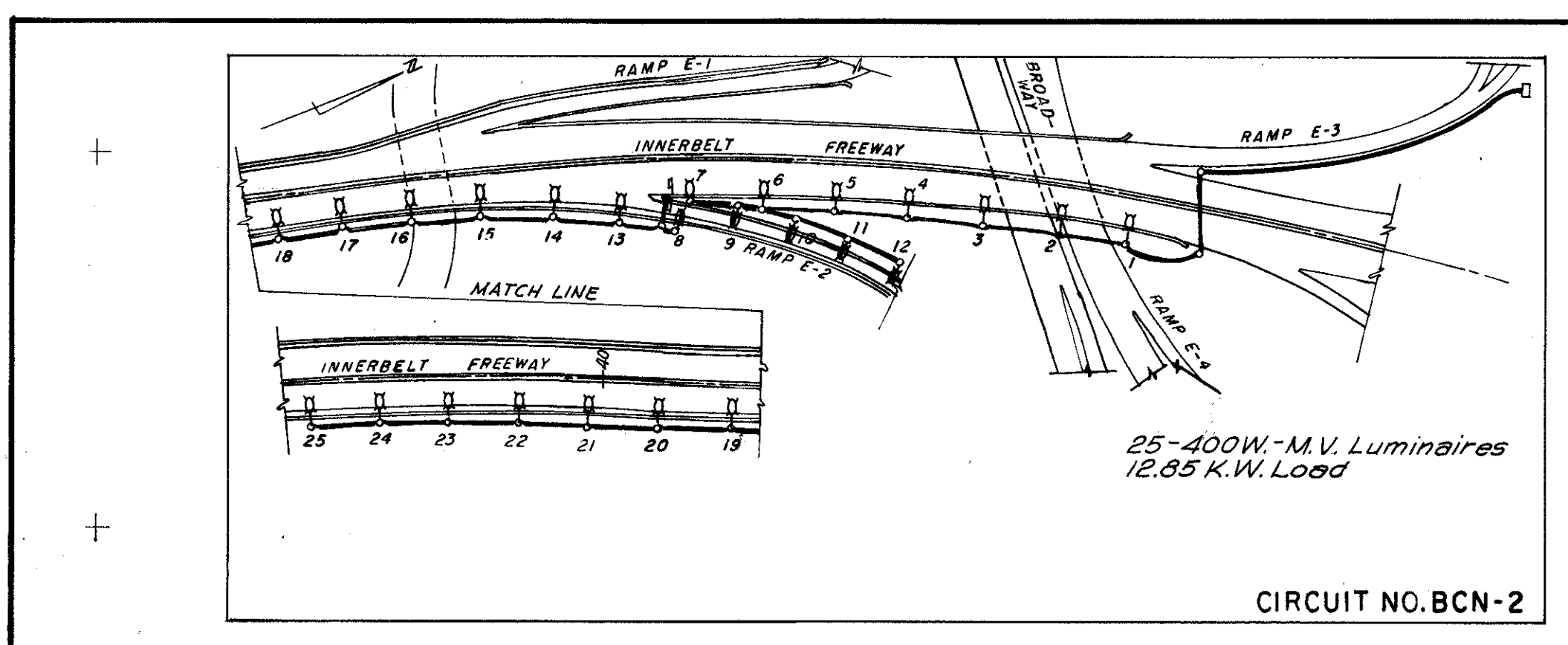
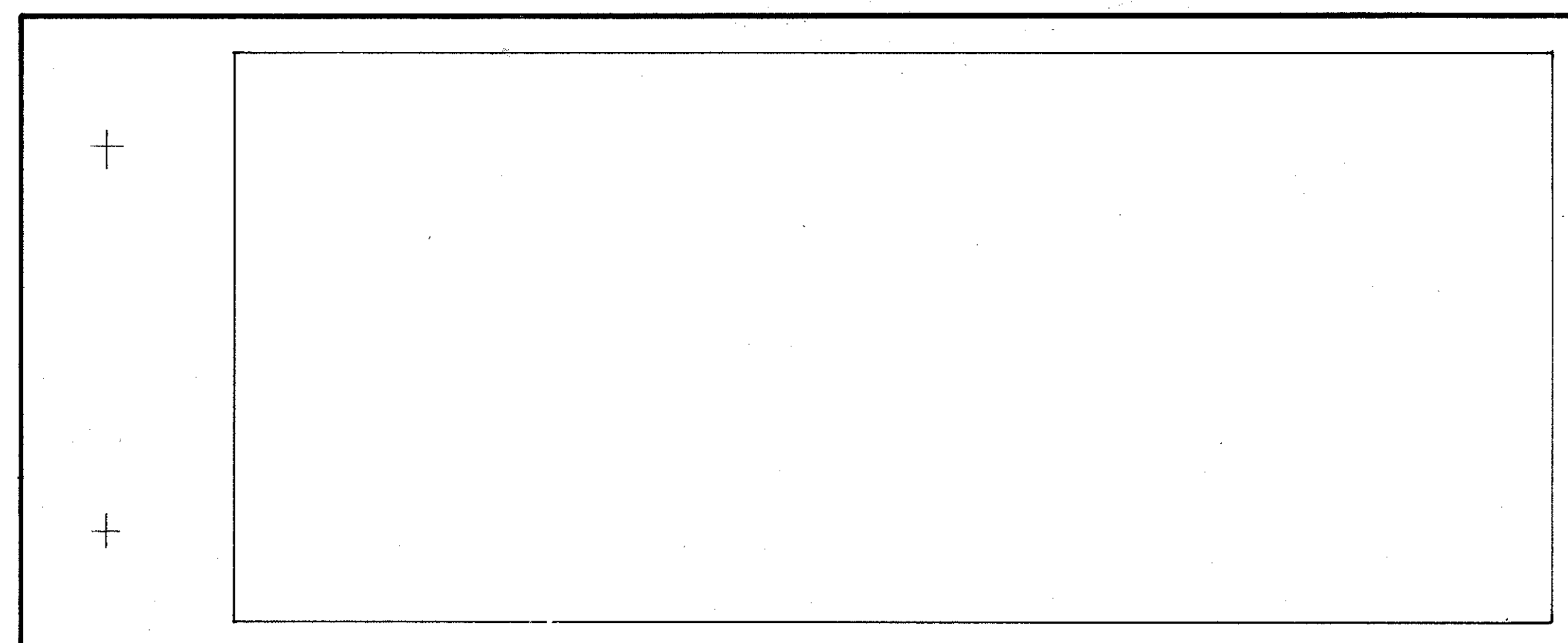
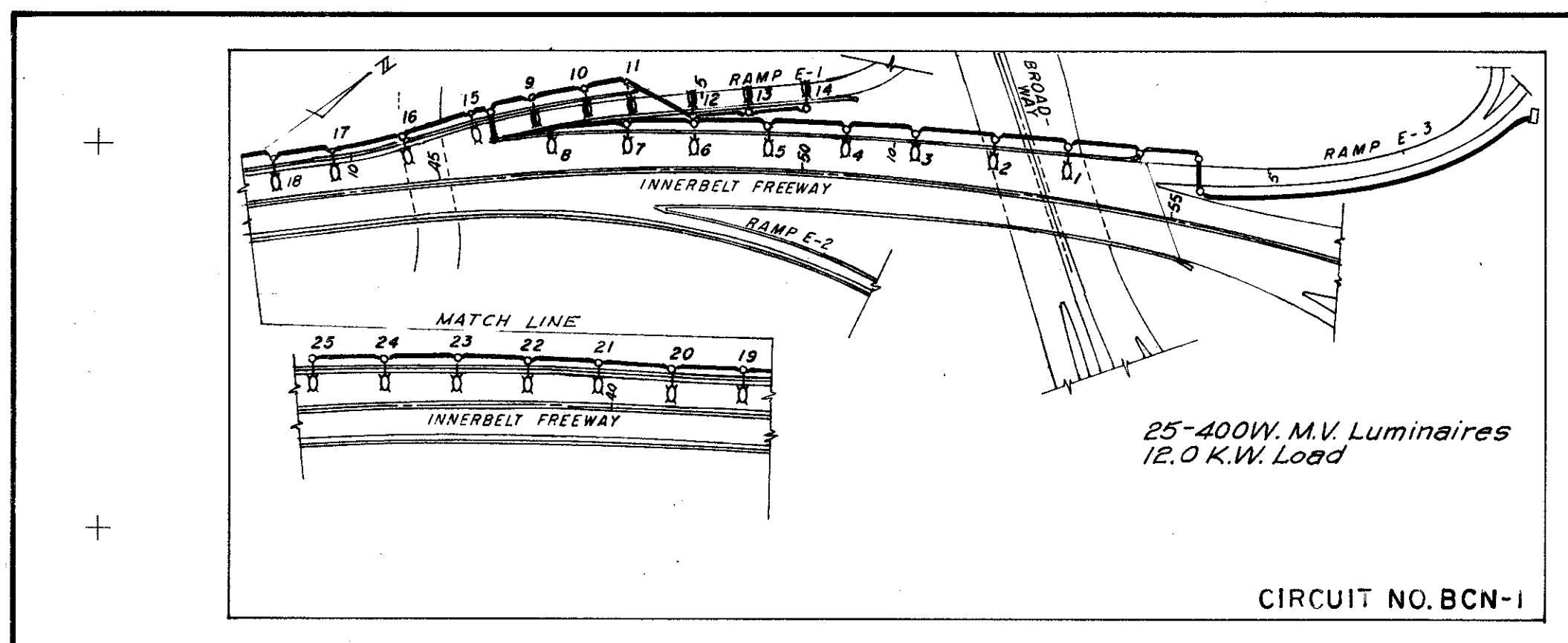
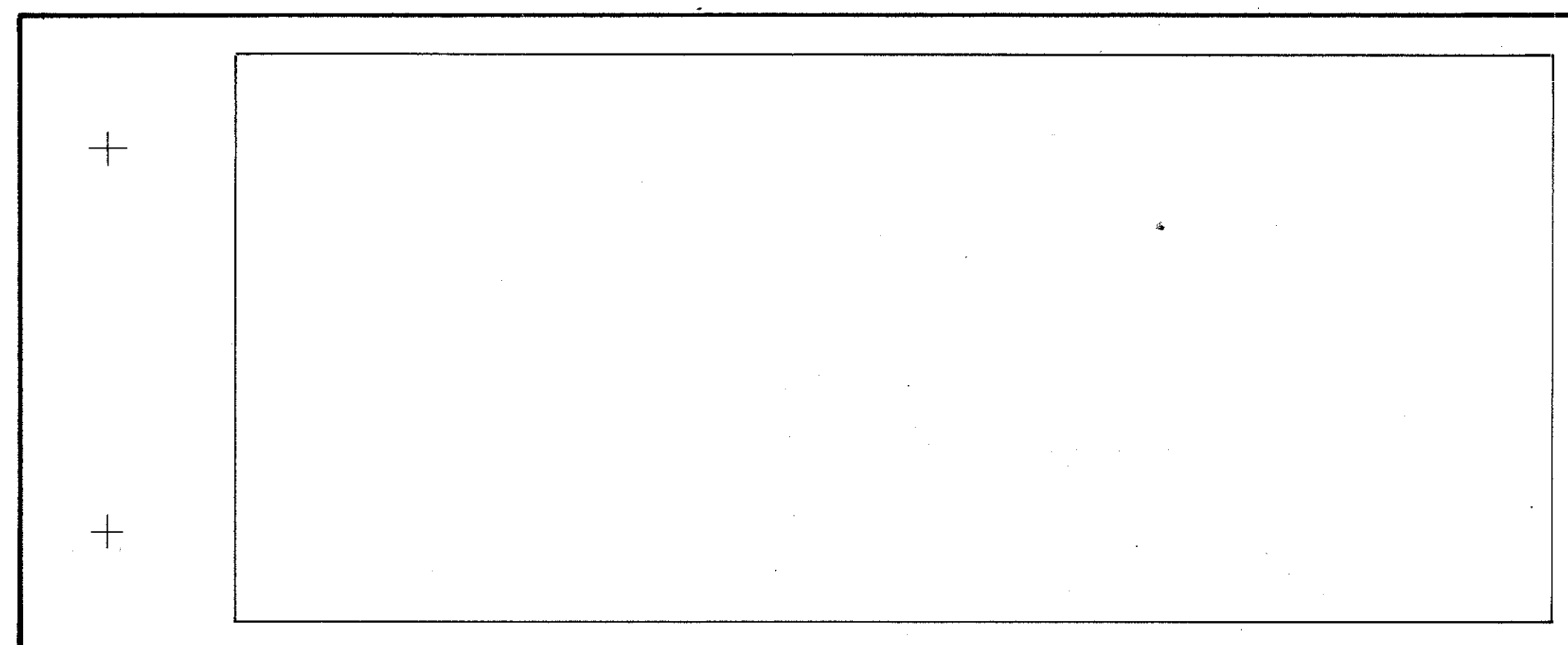
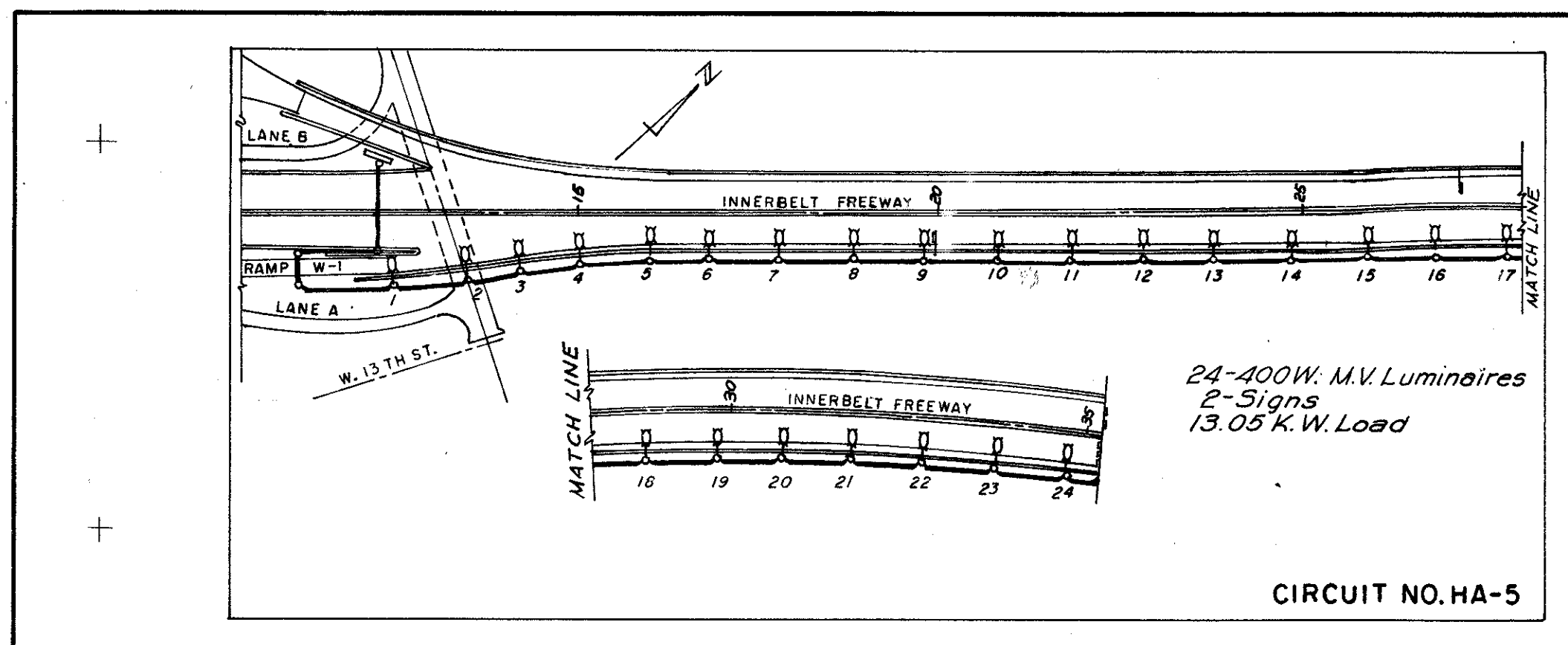
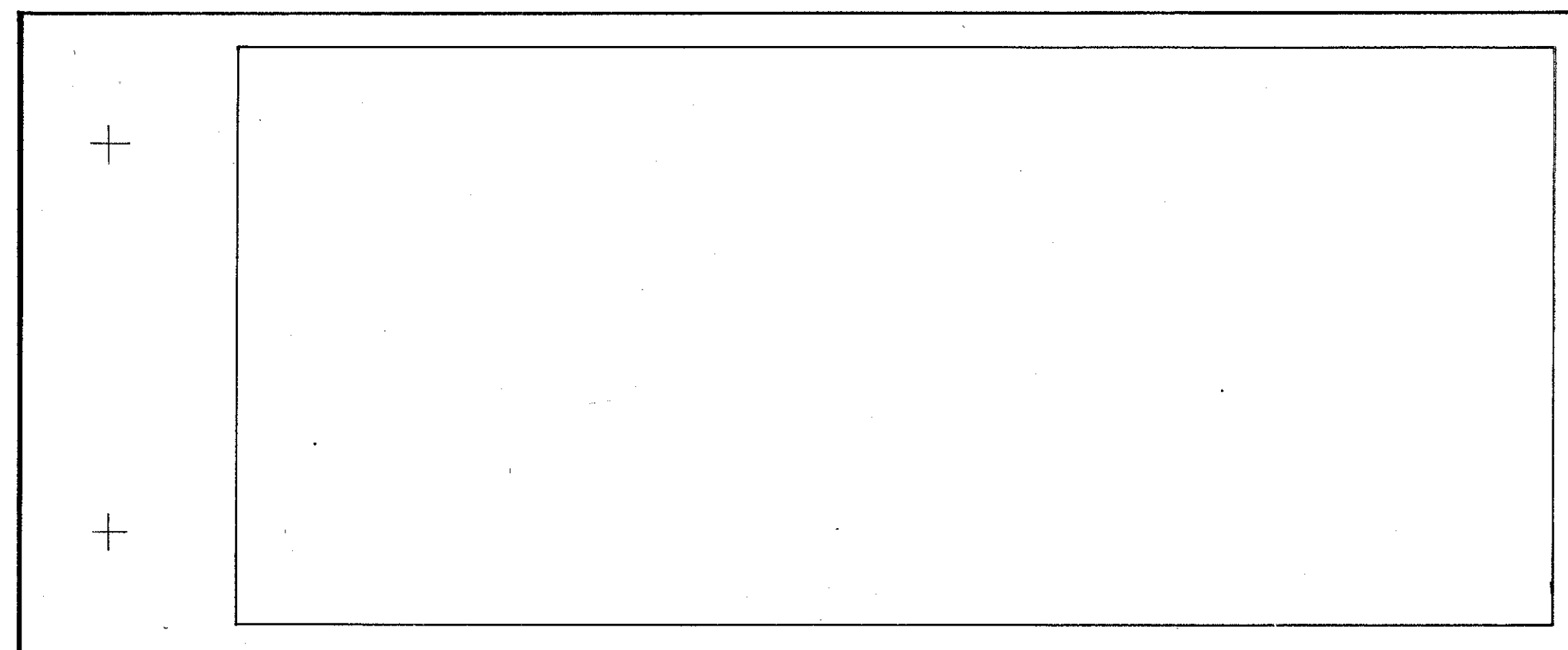
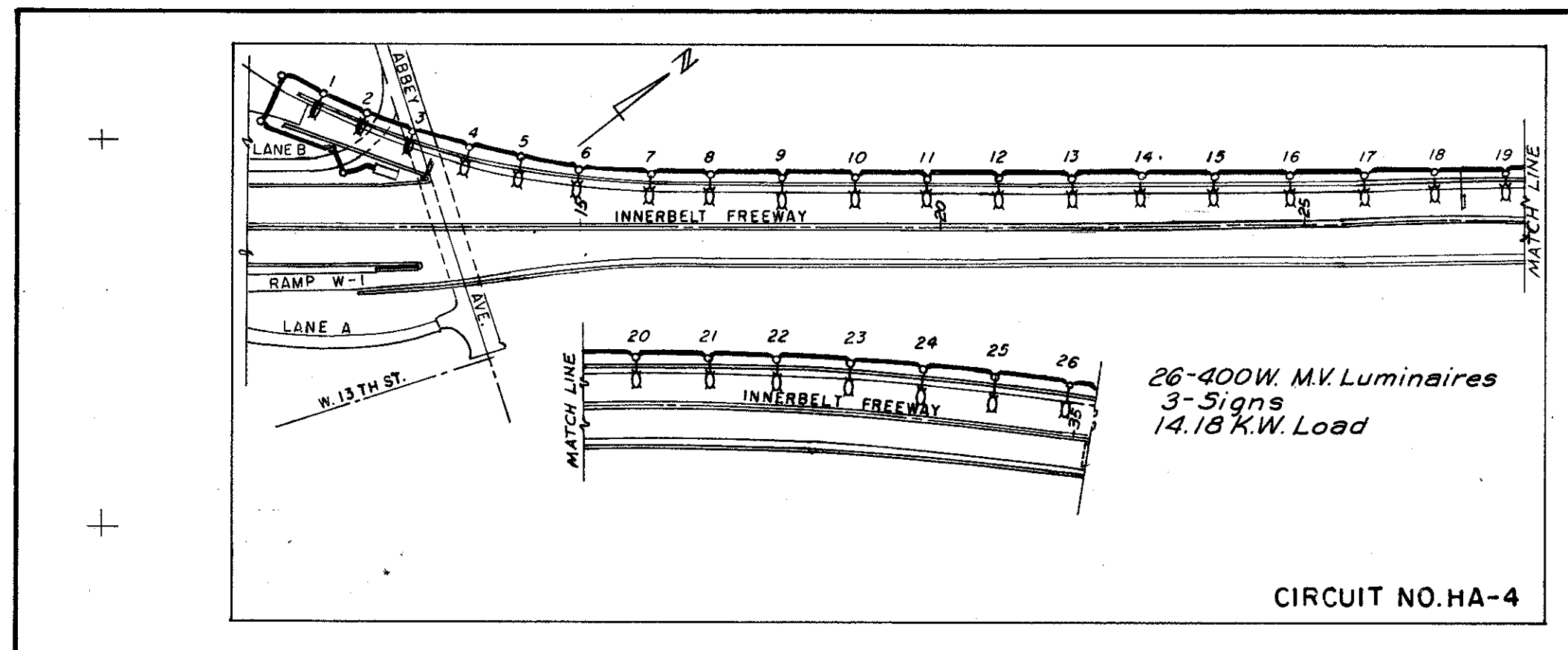
HOWARD, NEEDLES, TAMMEN & BERGENOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>ROADWAY LIGHTING DETAILS</b>				
OHIO INTERSTATE SAFETY PLANS				
BR. NO. CUY-90-14 67		STA. 3+87.63		
42R-17 43		42R-17 5		
42R-17 5		42 -17 50		
CUYAHOGA COUNTY				OHIO
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE	DATE	DATE	DATE	DATE
				SHEET 49/52

Rev. 8-4-72

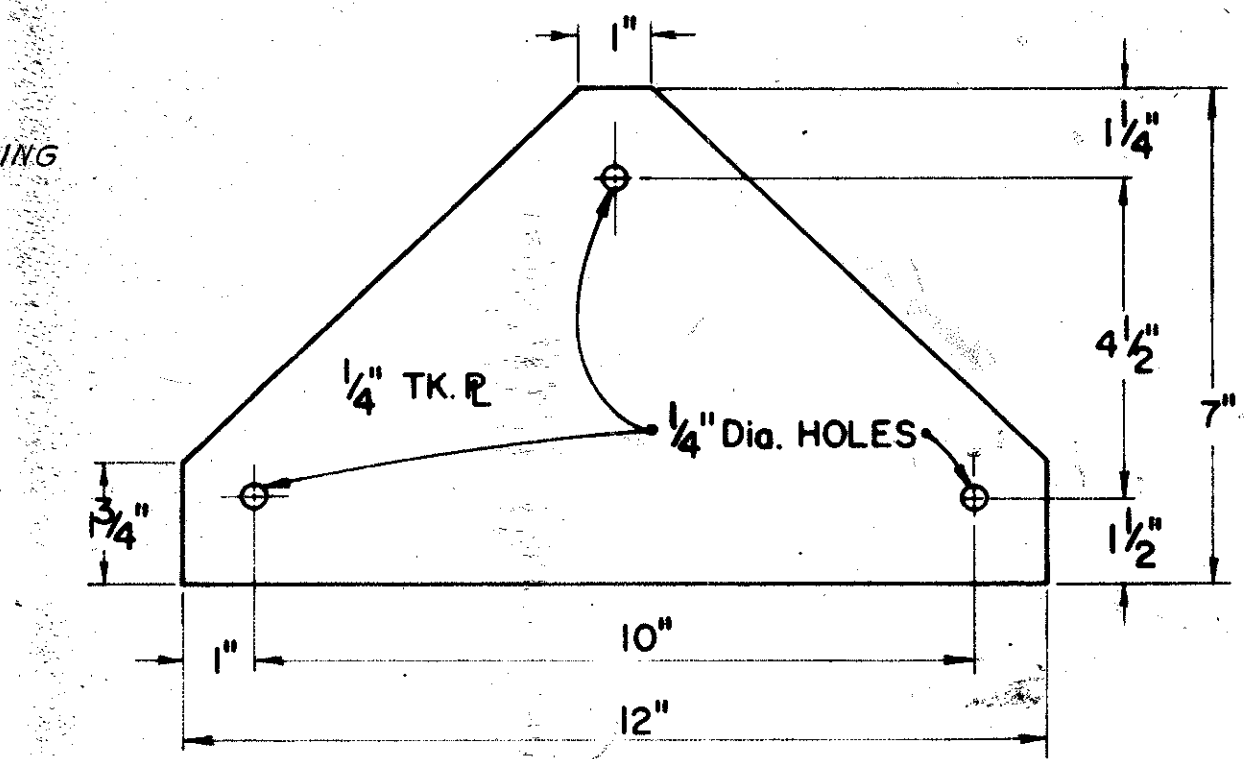
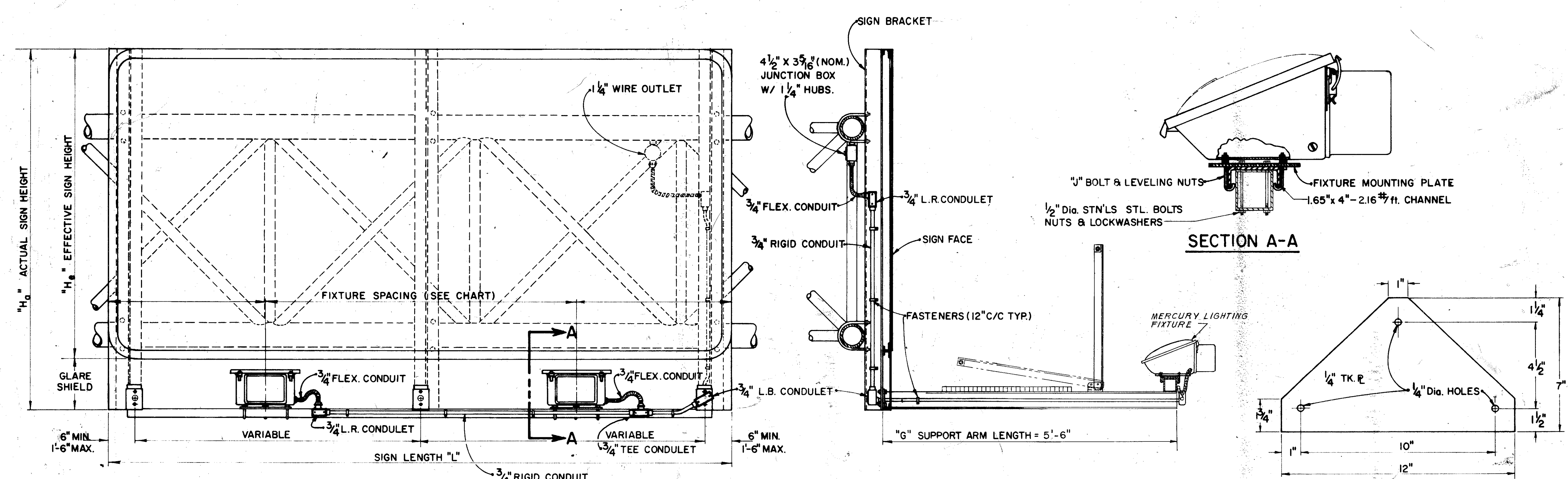
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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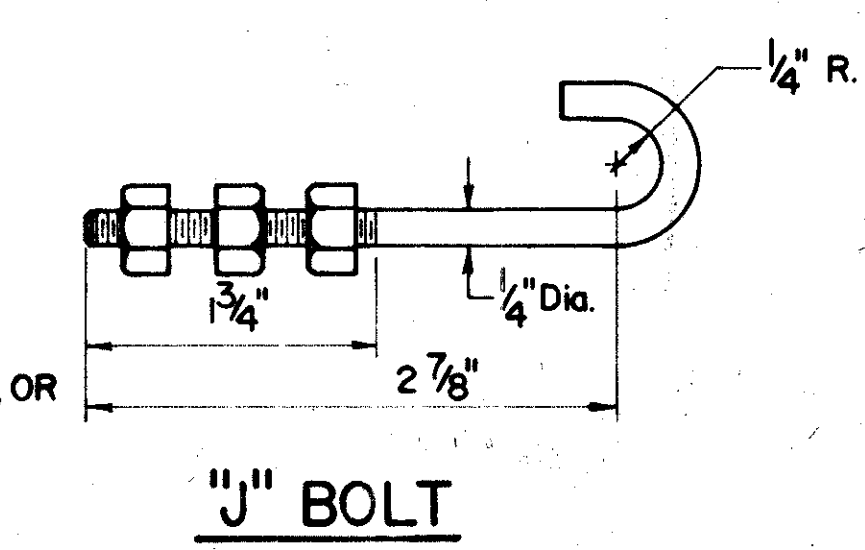
CUYAHOGA COUNTY  
 CUY - 90 - 15.24



HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
CIRCUIT MAPS				
BR. NO. CUY-90-14 67		STA. 3+87.63		
42R-1743		STA. 54+65.78		
42R-175				
42-1750				
CUYAHOGA COUNTY				OHIO
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE	DATE	DATE	DATE	DATE
				SHEET 51/52



FIXTURE MOUNTING PLATE



SIGN LENGTH "L"	NO. OF FIXTURES	LIGHT FIXTURE SPACING				SUPPORT ARM SPACING				NO. OF SIGN BRACKETS	
4'-0"	1	2'-0"	2'-0"			6"	36"	6"		2	
5'-0"	1	2'-6"	2'-6"			6"	48"	6"		2	
6'-0"	1	3'-0"	3'-0"			6"	60"	6"		2	
7'-0"	1	3'-6"	3'-6"			6"	72"	6"		2	
8'-0"	1	4'-0"	4'-0"			10 3/8"	75 3/8"	10 1/4"		2	
9'-0"	1	4'-6"	4'-6"			16 3/8"	75 3/8"	16 1/4"		2	
10'-0"	1	5'-0"	5'-0"			10 3/8"	99 3/8"	10 1/4"		2	
11'-0"	1	5'-6"	5'-6"			16 3/8"	99 3/8"	16 1/4"		2	
12'-0"	2	3'-0"	6'-0"	3'-0"		6"	66"	66"	6"	3	
13'-0"	2	3'-6"	6'-0"	3'-6"		6"	72"	72"	6"	3	
14'-0"	2	4'-0"	6'-0"	4'-0"		8 5/8"	75 3/8"	75 3/8"	8 5/8"	3	
15'-0"	2	4'-6"	6'-0"	4'-6"		14 5/8"	75 3/8"	75 3/8"	14 5/8"	3	
16'-0"	2	4'-0"	8'-0"	4'-0"		8 5/8"	75 3/8"	99 3/8"	8 5/8"	3	
17'-0"	2	4'-6"	8'-0"	4'-6"		14 5/8"	75 3/8"	99 3/8"	14 5/8"	3	
18'-0"	2	4'-0"	10'-0"	4'-0"		8 5/8"	99 3/8"	99 3/8"	8 5/8"	3	
19'-0"	2	4'-6"	10'-0"	4'-6"		14 5/8"	99 3/8"	99 3/8"	14 5/8"	3	
20'-0"	3	4'-0"	6'-0"	6'-0"	4'-0"	7"	75 3/8"	75 3/8"	75 3/8"	6 7/8"	4
21'-0"	3	4'-6"	6'-0"	6'-0"	4'-6"	13"	75 3/8"	75 3/8"	75 3/8"	12 7/8"	4
22'-0"	3	4'-0"	7'-0"	7'-0"	4'-0"	7"	75 3/8"	75 3/8"	99 3/8"	6 7/8"	4
23'-0"	3	4'-6"	7'-0"	7'-0"	4'-6"	13"	75 3/8"	75 3/8"	99 3/8"	12 7/8"	4
24'-0"	3	4'-0"	8'-0"	8'-0"	4'-0"	7"	75 3/8"	99 3/8"	99 3/8"	6 7/8"	4
25'-0"	3	4'-6"	8'-0"	8'-0"	4'-6"	13"	75 3/8"	99 3/8"	99 3/8"	12 7/8"	4
26'-0"	4	4'-0"	6'-0"	6'-0"	6'-0"	7"	99 3/8"	99 3/8"	99 3/8"	6 7/8"	4
27'-0"	4	4'-6"	6'-0"	6'-0"	6'-0"	13"	99 3/8"	99 3/8"	99 3/8"	12 7/8"	4

EFFECTIVE SIGN HEIGHT "H"	SUPPORT ARM LENGTH "G"	APPROX. AIMING ANGLE	LAMP WATTS	ANSI LAMP CODE	BALLAST TYPE
3'-0" to 5'-0"	2'-9"	0°	100	H38-4HT	CMRI-100-(a)
5'-1" to 6'-6"	3'-3"	0°		H38-4HT	CMRI-100-(a)
6'-7" to 10'-0"	4'-3"	2°	175	H39-22KB	CMRI-175-(a)
10'-1" to 13'-0"	5'-9"	8°	250	H37-5KB	CMRI-250-(a)
13'-1" to 15'-0"	7'-3"	8°	250	H37-5KB	CMRI-250-(a)

(a) = OPERATING VOLTAGE (120V., 208V., 240V., 277V., OR 480V.)

NOTE:  
FOR ADDITIONAL MOUNTING DETAILS SEE SHEET 40.

BUREAU OF DESIGN SERVICES OHIO DEPARTMENT OF HIGHWAYS	
MERCURY VAPOR SIGN LIGHTING DETAILS	DATE 4-13-72
STANDARD CONSTRUCTION DRAWING	
APPROVED _____	ENGINEER OF DESIGN SERVICES