



**CUY-90-14.90**

**PID 77332/85531**

---

**APPENDIX EX-45**

---

**CUY-090-1467 PID 0.230**

**(Reference Document)**

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

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

9.0

MICROFILMED  
FEB 24 1963

MICROFILMED  
JUL 1 1967  
GROUND PHOTO LAB

# STATE OF OHIO DEPARTMENT OF HIGHWAYS CUY-90-14.67

## CUYAHOGA COUNTY CITY OF CLEVELAND

LIMITED ACCESS

This improvement is especially designed for through traffic, and has been declared a limited access highway by action of the Director of Highways in accordance with the provisions of Section 5511.02, Revised Code of Ohio.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-90-1(55)25 I-90-1(56)25

1/77

CUYAHOGA COUNTY  
CUY-90-14.67

MICROFILMED  
JUL 1 1967  
GROUND PHOTO LAB

### I-90-1(55)25 I-90-1(56)25

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.

Approved  
Date 4-23-64

*Charles M. Lynch*  
Division Deputy Director

Approved  
Date 6-12-64

*C.H. Albrecht*  
Engineer of Bridges

Approved  
Date 6-10-64

*R.D. Piskette*  
Engineer of Location and Design

Approved  
Date 6-12-64

*R.E. Shultz*  
Deputy Director of Design and Construction

Approved  
Date 4-29-64

*T.H. Brown*  
Deputy Director of Right of Way

Approved  
Date 2-6-64

*R.W. Wilson*  
Deputy Director of Planning and Programming

Approved  
Date

First Assistant Director

Approved  
Date 7/6/64

*P.E. Mahoney*  
Director of Highways

Approved  
Date 9/22/64

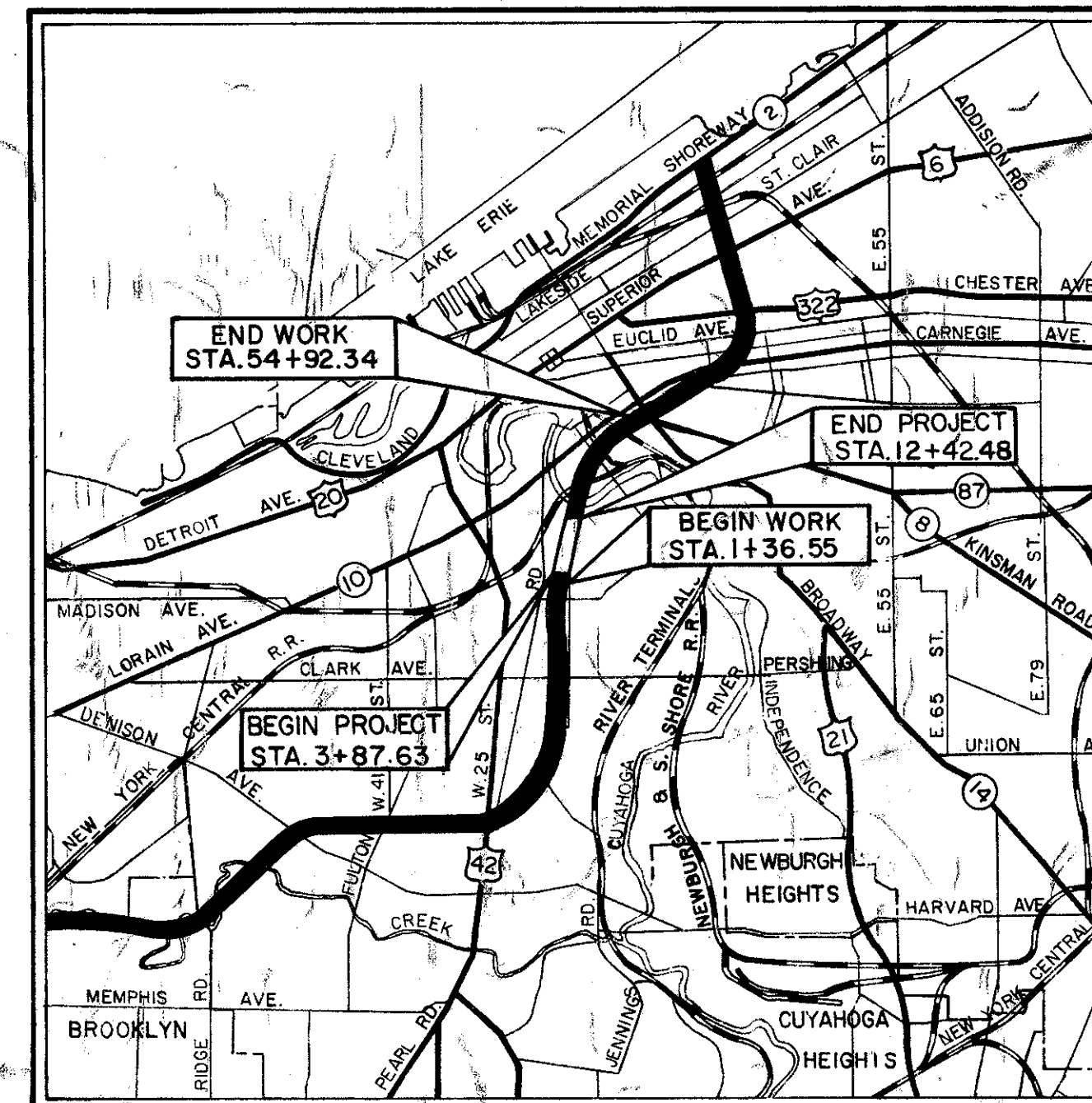
*Louis L. Deuster*  
Director of Public Service, City of Cleveland

### CONVENTIONAL SIGNS

Property Line	-----	-----
Existing Right of Way	-----	-----
Limited Access Line	-----	-----
Right of Way Line	-----	-----
Temporary Right of Way	-----	-----
Center Line	-----	-----
Corporation Line	-----	-----
Fence Line	-----	-----
Guard Rail (Existing)	-----	-----
Guard Rail (Proposed)	-----	-----
Steam Railroad	-----	-----
Power Poles	-----	-----
Telephone Poles	-----	-----
Power & Telephone Poles	-----	-----
Light Poles	-----	-----
Trees (Existing)	-----	-----
Water Line	-----	-----
Gas Line	-----	-----
Telephone Conduit	-----	-----

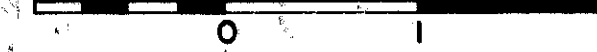
### INDEX OF SHEETS

Title Sheet	1	Cross Sections	18-19
Typical Sections	2-3	Lighting Plans	20-26
General Notes	4-5	General Notes (Structures)	27
Waterwork Notes	6-10	General Plan and Elevation	28-29
Quantity Calculations	11	Abutment Details	30-31
General Summary	12	Pier Details	32-40
Grading and Paving Plan	13	Superstructure Details	41-57
Roadway Profiles	14	Reinforcement Schedule	58-60
Drainage Plan	15	Modifications To Existing Structure	61-66
Water Line Relocations	16	Overhead Signing	67-74
Miscellaneous Details	17-17A	Right-of-Way	75-77



DELIVERY POINT  
NYC R.R.

SCALE IN MILES



Portion to be improved  
State Roads  
Other Roads

SCALE  
PLAN 1" = 50'  
PROFILE: Horizontal 1" = 50'  
PROFILE: Vertical 1" = 5'  
CROSS SECTIONS 1" = 10'

### LINE DATA

I-90-1(55)25  
BEGIN PROJECT STA. 3+87.63  
END PROJECT STA. 12+42.48  
NET LENGTH OF PROJECT = 854.85 L.F. = 0.61 MI.  
ADD FOR APPROACHES:  
I-90 STA. 996+50 TO STA. 999+01.08 = 251.08 L.F.  
RELOCATED W. 15th PL. = 319.19 L.F.  
NET LENGTH OF WORK = 1,425.12 L.F. = 0.269 MI.  
I-90-1(56)25  
BEGIN PROJECT (WORK) STA. 12+42.48  
END PROJECT (WORK) STA. 54+92.33  
NET LENGTH OF PROJ. (WORK) = 4,249.85 L.F. = 0.804 MI.  
TOTAL LENGTH OF PROJECT = 5,104.70 L.F. = 0.966 MI.  
TOTAL LENGTH OF WORK = 5,674.97 L.F. = 1.074 MI.

### SUPPLEMENTAL SPECIFICATIONS

NUMBER	DATE	NUMBER	DATE
I-129	4-3-61		
S-307	8-23-60		
S-101	7-12-62		
M-106.11	1-26-61		

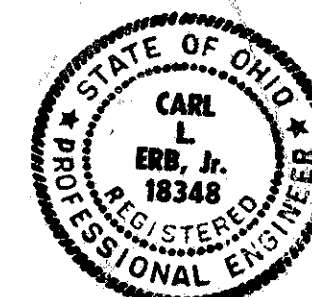
### STANDARD DRAWINGS

NUMBER	DATE	NUMBER	DATE
B-T-70-71	11-15-60	F-1	2-1-63
B-T-71R	3-2-53	F-3	2-1-63
FACI-1	2-25-64	L-1	4-1-50
FACI-2	2-25-64	L-3A	4-1-50
I-1	11-15-60	I-15 No. 2-A	8-17-60
I-8C.B. 2-2A82B	2-1-63	T-35	1-2-56
I-8C.B. NO. 3-A	2-1-63		
I-12	2-1-63		
LJ NO.1	7-1-55		
RI-1	7-15-58		
T.J.	9-12-60		
I-14G	1-22-52		
RB-1-55	2-2-59		
AR-1-57	4-2-62		
L-3	4-1-50		
SD-1-63 SH. 2 of 4	11-12-63		

Sheets 29 & 54 revised 7-4-64.  
Sheets 23, 54, 55 and 57 revised 9-30-64.  
Sheet No. 10 revised 2-3-65 C.E.H.

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

**H. G. SOURS**  
ASSOCIATE  
COLUMBUS



DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS  
APPROVED  
DIVISION ENGINEER  
DATE

FILE NO. CUYAHOGA COUNTY  
DATE OF LETTING \_\_\_\_\_, 196  
CONTRACT NO. \_\_\_\_\_

00315

# TYPICAL SECTIONS

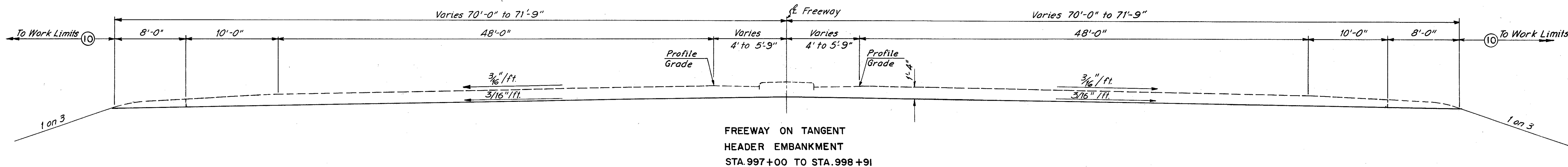
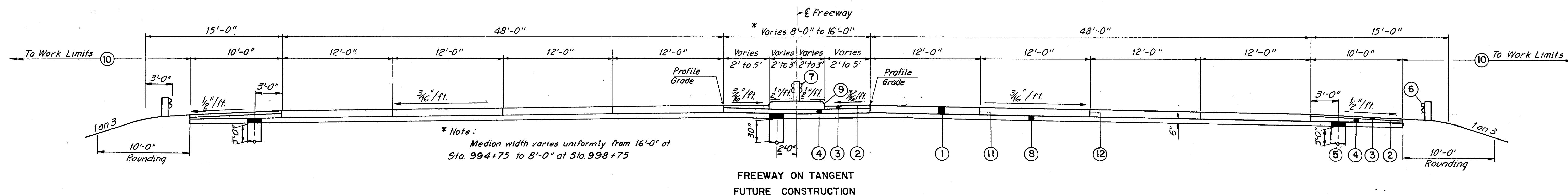
TYPE T - 71

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

2  
77

CUYAHOGA COUNTY  
CUY-90-14.67

MICROFILMED  
FEB 8 1983



### LEGEND

- ① Item T-71 10" Reinforced Portland Cement Concrete Pavement
- ② Item T-31 Bituminous Surface Treatment using 0.008 Cu. Yds. No. 6 aggregate per Sq. Yd. and 0.25 Gal. bituminous material per Sq. Yd.
- ③ Item B-21 3" Waterproofed Aggregate Base Course (Type "A", T-35 material may be used in construction of this course) Thickness is "designed" thickness as described in Sec. B-21.01
- ④ Item B-112 Porous Base Course
- ⑤ Item I-1 6" Pipe, Class I-3
- ⑥ Item I-15 Guard Rail, Steel Beam Standard Type (Deep)
- ⑦ Item I-15 Guard Rail, Steel Beam Barrier Type (Deep)
- ⑧ Item I-22 Subbase, Grading "A" or "B", modified as per General Note.
- ⑨ Item I-21 Standard Type 2 Portland Cement Concrete Median
- ⑩ Item L-9 Seeding and Protecting as per plan
- ⑪ Standard Longitudinal Joint
- ⑫ Longitudinal Key Joint Without Tie Bars

MADE J.E.N. DATE 1-2-64 TRACED DATE  
CHECKED D.R.K. DATE 2-10-64 SCALE 3/16" = 1'-0"

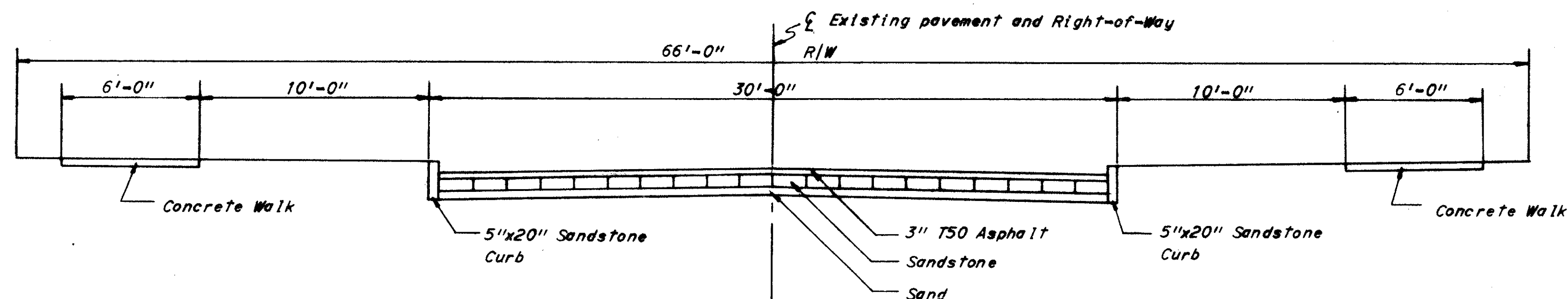
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# TYPICAL SECTIONS

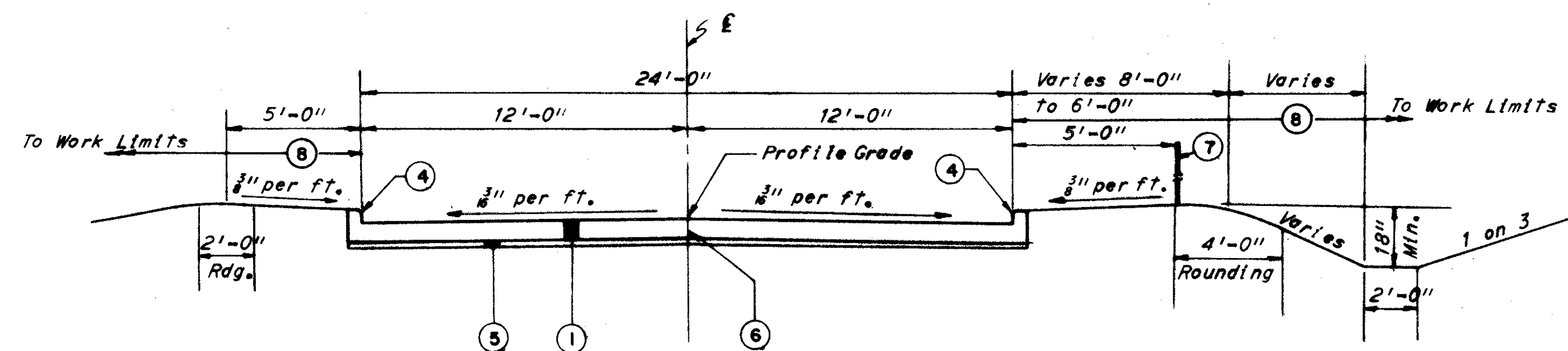
T-71 ON I-19 & T-35 ON B-19

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

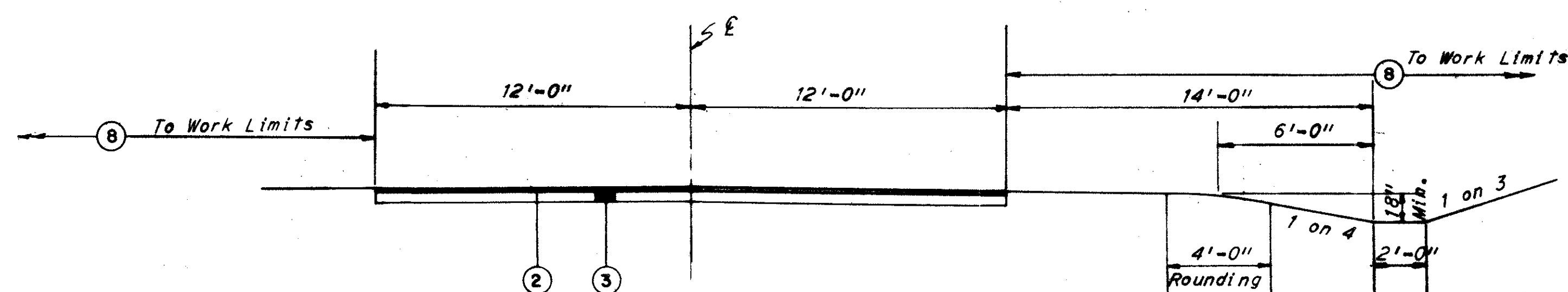
CUYAHOGA COUNTY  
CUY -90-14.67



TYPICAL SECTION - EXISTING FAIRFIELD AVENUE



TYPICAL SECTION - RELOCATED WEST 15TH PLACE



TYPICAL SECTION - DRIVE APRON

**LEGEND**

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item T-35 2" Asphaltic Concrete Surface Course, Type C (70-B5) Thickness shown is "designed" thickness as described in Sec. T-35.01
- ③ Item B-19 5" Aggregate Base Course
- ④ Item I-12 Standard Type 2-A Concrete Curb
- ⑤ Item I-19 3" Insulation Course
- ⑥ Standard Longitudinal Joint
- ⑦ Chain Link Fence (Future)
- ⑧ Seeding and protecting as per plan

# GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

4  
77

CUYAHOGA COUNTY  
CUY-90-14.67

UNRECORDED

FEB 24 1964

## GENERAL

### DESIGN SPEED

The geometric design of the work to be performed under this contract on the roadway and structures to carry Interstate Highway traffic has been prepared for a speed of sixty (60) miles per hour.

### ELEVATION DATUM

All elevations shown on these plans are in feet above the Cleveland Regional Geodetic Survey Datum Plane.

### FIELD OFFICE

The field office required by Section S-0.01(b), shall provide a minimum of 500 square feet of floor space for the exclusive use of the Engineer until final acceptance of the work to be performed under the contract. The Contractor shall install a telephone in the field office and maintain it in service for the exclusive use of the Engineer during the same time period. The Contractor shall install wiring and outlets suitable for connection to office equipment and shall provide 110 volt alternating electric power as may be required by the Engineer until final acceptance. All costs for the telephone and electric power incurred by the Engineer and required by the work shall be included in the contract unit price bid for the various items of the work.

This field office shall be provided within 10 days after start of construction.

### PRIVATE DRIVES

It may become necessary during the progress of construction under this contract for the Engineer to alter the location of private entrances to property adjacent to County or State Highways crossing over or under the Interstate Highways. Should this occur, the Contractor shall accomplish the necessary changes as directed by the Engineer and will be compensated for additional costs incurred in accordance with Section G-4.03, Increased or Decreased Quantities.

### UNDERGROUND UTILITIES

The locations of the underground utilities shown on the plans have been obtained by diligent field checks and searches of available records. It is believed that they are essentially correct, but the State of Ohio makes no guarantee as to their accuracy or completeness.

### UTILITY ADJUSTMENT

Any or all work required for public or private utilities will be done by and at the expense of their respective owners, unless otherwise noted on these plans.

### UTILITIES

Following is a list of the utilities within the limits of construction:

- East Ohio Gas Company, 1717 E. 9th St., Cleveland, Ohio
- Cleveland Electric Illuminating Company, 55 Public Sq., Cleveland, Ohio
- Ohio Bell Telephone Company, 750 Huron Rd., Cleveland, Ohio
- City of Cleveland Water Department, City Hall, Cleveland, Ohio

### ADJACENT CONTRACT

The contract for construction of the adjacent projects may be let prior to or while construction under this contract is in progress. The Contractor for this project shall coordinate his operations with that of the Contractor for the adjacent project so as to complete both projects without undue delay or interference to the other Contractor.

### FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

The Contractor shall furnish, erect, maintain and subsequently remove Federal Aid Construction Identification signs at each of the following locations:

1. Fairfield Ave., Rt. at Sta. 1+00
2. Fairfield Ave., Rt. at Sta. 4+50
3. Rt. approx. Sta. 55+00

Sign details shall be specified on Standard Drawing FACI-1, "Code N-55(1)-132(3)", and shall be erected in accordance with Standard Drawing FACI-2. Additional requirements shall be in accordance with notes in the proposal.

### ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up in 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 the project.

## GENERAL

### MAINTENANCE OF TRAFFIC

Where any of the work called for under this contract involves the closing of existing streets and/or the re-routing of traffic, the Contractor for this project shall prosecute to the fullest extent the work involved so as to reduce to a minimum the length of time that the roadway will be closed to traffic. No street or alley will be closed until necessary for construction as determined by the project Engineer.

Two way traffic on Fairfield Avenue, (24 foot usable pavement width), shall be maintained without obstruction by the Contractor between the hours of 7:00 A.M. and 8:30 A.M.; and 3:00 P.M. and 6:00 P.M.. Three lanes of one-way traffic on the ramp connecting the existing Innerbelt structure to West 14th Street shall be maintained without obstruction by the Contractor between the hours of 3:00 P.M. and 6:00 P.M.. Temporary lighting of the intensity now existing shall be provided along the aforementioned ramp at all times until the permanent fixtures are attached to the new bridge and in service. The Contractor shall safeguard the traveling public on these roads by providing platforms, nets, or other suitable protection above the traveled lanes.

In addition to the above, Section G-4.05, "Maintenance of Local Traffic" will be in force during the entire life of the contract.

Attention is directed particularly to the need for providing adequate facilities to accommodate school children and other pedestrian traffic in the vicinity of the project. The Contractor shall provide and maintain such temporary boardwalks, cinder walks, handrails adjacent to excavation, etc., as the engineer deems necessary to accommodate in a reasonable and safe manner pedestrian traffic in the vicinity of the project.

All of the above are included in the lump sum price bid for "Maintaining Traffic".

### SEEDING AND PROTECTING

Quantities for seeding are calculated for the soil areas between the right-of-way fence lines, between the work limit lines in unfenced areas, and within the work limits for areas outside the right-of-way lines covered by easement.

Seed shall be sown at the rate of three (3) pounds per 1,000 square feet, and shall be a uniform mixture in the following proportions in lieu of the mixture listed in Section L-9.11:

- 20% Kentucky Bluegrass (*Poa pratensis*)
- 45% Kentucky 31 Fescue (*Festuca elatior*, Var. Ky. 31) or Alta Fescue (*Festuca elatior*, Var. arundinacea)
- 20% Creeping Red Fescue (*Festuca rubra*)
- 10% Red Top (*Agrostis alba*)
- 5% Alsike Clover (*Trifolium hybridum*)

### REMOVAL OF TREES AND STUMPS

Unless otherwise shown on the plans or directed by the Engineer, all trees and stumps lying within the construction limits of this project shall be removed under the lump sum price bid for Item E-9, Removal of Trees and Stumps.

The following is an approximate estimate of the number of trees to be removed.

Sizes	No. of Trees
12"-18"	12
18"-24"	3
24"-30"	4

The above estimate is approximate and the State of Ohio reserves the right at any time during the duration of the contract to order the removal of additional trees or stumps outside of the limits of construction but within the right of way and or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item E-9.

### COMMERCIAL FERTILIZER

All areas to be seeded under Item L-9 or sodded under Item L-10 shall have commercial fertilizer 12-12-12, applied at the rate of twenty (20) pounds per 1,000 square feet.

## ROADWAY

### ROUNDING OF CORNERS ON CROSS SECTIONS

The rounded corners shown on Standard Construction Drawing RI-1 as modified by the typical sections apply to all cross sections even though otherwise shown in these plans.

### CONSTRUCTION LAYOUT STAKES

See note in proposal describing the work included in this lump sum pay item.

### AGRICULTURAL LIMING MATERIAL

The location and need for agricultural liming materials will be determined by the Engineer on the basis of laboratory tests after rough grading operations have been performed. The quantity of agricultural liming materials shown on the plans is sufficient for application to the entire exposed soil area of the contract but may be partially or completely omitted, as may be directed by the Engineer if laboratory tests indicate the item is not needed. Agricultural liming material shall be applied at the rate of 100 pounds per 1,000 square feet or surface area, except that on all surfaces of shale it shall be applied at the rate of 10 tons per acre.

The quantity of agricultural liming material is estimated and is included for use only when and in amounts as directed by the Engineer. The amount of this item and its location shall be recorded as used, and payment will be included in the final payment estimate.

### SCARIFICATION OF EXISTING FLEXIBLE PAVEMENT

Within the limits of construction where the existing flexible pavement will have less than six (6) inches of fill placed upon it the pavement shall be thoroughly scarified for its full depth, mixed with sufficient soil and properly recompacted to insure the elimination of any planes of separation between it and the embankment placed thereon. Payment for scarification as described above shall be included in the unit price bid for Item E-1, Roadway Excavation.

### REMOVAL OF EXISTING RIGID PAVEMENT

Existing rigid type pavements shall be removed under Item E-8 when they are located less than three feet below the proposed pavement subgrade in proposed pavement areas or less than three feet below the proposed finished surface in areas outside the proposed pavement.

When existing rigid type pavements lie below the above limits, they shall not be removed. In lieu thereof, they shall be broken up in place into portions not to exceed one square foot in area prior to placement of the proposed embankment. Payment for this operation shall be included in the unit price bid for Roadway Excavation, Item E-1.

### NON-RIGID PAVEMENT REMOVAL

Removal and disposal of existing non-rigid pavement, unless otherwise indicated on these plans, shall be measured and paid for as Item E-1, Roadway Excavation.

### T-35 FOR MAINTAINING TRAFFIC

For description of this item see note in proposal. An estimated quantity of Asphaltic Concrete Surface Course or an approved Bituminous Premixed Surface Course for Maintaining Traffic has been entered in the General Summary under Roadway Quantities, Item T-35.

### ESTIMATED QUANTITIES

Quantities of the following items are estimated and are included for use only when and in amounts as directed by the Engineer. The provisions of Sec. G-4.03 do not apply to these items. The amounts of these items and their location shall be recorded as used, and payment will be included in the Final Payment Estimate.

ITEM T-10, TRAFFIC COMPACTED SURFACE COURSE	100 C.Y.
ITEM I-4, CALCIUM CHLORIDE, FOR DUST CONTROL	2 Tons
ITEM I-4, WATER, FOR DUST CONTROL	100 M. Gal.

### CONTRACTION AND EXPANSION JOINTS

Although specific locations of certain expansion and contraction joints have been detailed on this plan, no waiver of the Specifications is intended. Provision of joints and the maximum spacing between contraction joints shall in all cases be in accordance with Standard Construction Drawing T.J.

### SIDEWALK AND DRIVEWAY REMOVAL OUTSIDE NORMAL CONSTRUCTION LIMITS

After the existing drives and sidewalks as indicated on the plans have been removed, the areas between the construction limits and the proposed right-of-way lines should be plowed, harrowed, and dragged to a smooth grade, the old ditches filled and the entire area sloped to drain and left in a neat condition ready for seeding. Payment for this work shall be included in the unit price bid for pavement removal, Item E-8. Seeding shall be measured and paid for in accordance with Item L-9.

MADE DRK DATE 1-2-64 TRACED DATE  
CHECKED F.V.R. DATE 2-10-64 SCALE

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

# GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

5  
77

CUYAHOGA COUNTY  
CUY -90-14.67

MICROFILMED  
FEB 24 1983

## DRAINAGE

### MANHOLE COVERS

The Contractor shall set the frames for manhole covers at such an elevation and inclination as to place the surface of the cover in the plane of the finished roadway surface.

### SEALING OF PIPE JOINTS

Where connections are made between rigid and flexible pipe sections or between pipe sections of different kind or type of end fabrication, whether required by the plans, arising from permissible use of optional materials, or encountered in connection to existing facilities, the joint shall be sealed, if sealing is required by the Specifications, by means of a concrete collar in accordance with Standard Construction Drawing I-1.

### PLUGGING PIPE

The upstream ends of all pipe or tile lines intercepted by earthwork operations shall be effectively blocked and covered. Broken pieces and portions of pipe or tile shall be removed until a whole length is encountered which shall be blocked with concrete, flat stone or brick laid in mortar, or a precast clay or concrete stopper. Payment for the above work shall be included in the unit price bid for Item E-1, Roadway Excavation.

### PIPE CUT-OFFS

When bell and spigot pipe is used, any necessary pipe cut-offs will be made at the spigot end of the length of pipe adjacent to the end length. When tongue and groove pipe is used, the length of pipe next to the end length shall be cut and butt joint formed with a concrete collar in accordance with Standard Construction Drawing I-1.

### EROSION CONTROL

The Contractor shall place an 18 inch strip of sod along each side of each paved gutter and shall be compensated therefor in accordance with Item L-10, Sodding.

### SODDING FOR SPECIAL BERM AND SLOPE PROTECTION

The work for the Special Berm and Slope Protection shall be performed as outlined under the "Approach Slab Erosion Control" detail shown on the Miscellaneous Details.

### MANHOLES, CATCH BASINS AND INLETS

Removal and disposal of structures, not specifically removed or abandoned under Item I-16 shall be paid for under "Item E-1, Roadway Excavation".

### CONNECTIONS TO EXISTING SEWERS

When the plans provide for proposed drainage pipe to be connected to existing pipe, the Contractor shall locate the existing pipe both as to line and grade before laying the proposed sewer. The cost of this operation shall be included in the unit price bid for the pertinent pipe item.

### EXISTING UNDERDRAINS

Where existing underdrains are encountered and no provision has been made for new underdrains, connection shall be made to new inlet with 6 inch Class I-3 pipe. A quantity of 100' has been provided in the general summary to be used as directed by the Engineer for that purpose.

### DRAINAGE STRUCTURE ELEVATIONS

Normal Grade for all pavement inlets and catch basins is the normal gutter elevation at the intersection of the center of structure and the curb face. Normal Grade for all ditch catch basins is the normal ditch elevation at the center of the structure.

### UNINTERRUPTED FLOW

The Contractor shall so conduct his operations that the flow of all sewers which are to remain in service will be maintained at all times. Any additional labor or cost involved in maintaining this flow by pumping or by any other approved method found necessary for the completion of this project shall be included in the price bid for the pertinent drainage item.

When working in the area adjacent to existing sewers, the Contractor is to proceed with caution in order that no damage is done to the existing sewers. Any damage to existing sewers resulting from the Contractor's operations or negligence as determined by the Engineer shall immediately be repaired by the Contractor at no additional cost to the State.

## ROADWAY

### ITEM E-4 BORROW

The area bounded by West 15th Street on the East, West 16th Street on the West, Branch Avenue on the North and Mentor Avenue on the South is state-owned right-of-way where Item E-4 Borrow material may be obtained at no cost to the Contractor.

The excavated pit shall be fenced with Item I-26 Chain Link Fence. An estimated quantity of 2,000 L.F. has been included in the General Summary for payment of this item.

The Contractor shall obtain approval of the proposed borrow pit in accordance with Section G-5.12 of the Construction and Material Specifications.

MADE DRK DATE 1-2-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED F.V.R. DATE 2-10-64 SCALE \_\_\_\_\_

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

# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		6 77

**CUYAHOGA COUNTY**  
**CUY -90-14.67**

SCOPE OF WORK

The work contemplated under this contract comprises the relocation of the 16" Water Main in West 14th Street produced North of Fairfield Avenue, furnishing and installing of 16" cast iron, cement lined pipe and fittings, as required for proper connection beginning at a point 494 feet North of Fairfield Avenue and ending at a point 676.6 feet North of Fairfield Avenue; the relocation and reconnection of the service connection to the industrial building at No. 1515 Fairfield Avenue; the removal of existing valves and hydrants, and the furnishing and installing of various hydrants, valves and appurtenances all as indicated on the contract drawings.

The Contractor shall do all the work and furnish all the labor and material necessary for the final completion of this contract in the manner and under the conditions herein specified and provided and in accordance with the contract drawings. In the case of any item not specifically mentioned in the "Waterwork Notes", the State of Ohio Department of Highways "Construction and Material Specifications - Jan. 1, 1963" shall govern.

DEFINITIONS

Whenever in these specifications or in any documents or instructions in construction where these specifications govern, the following terms are used, (or pronouns in place of them), The intent and meaning shall be interpreted as follows:

THE STATE

The State is the State of Ohio acting through its authorized representative.

ENGINEER

The Engineer is Division Deputy Director or Division Engineer, the Division Construction Engineer or the Division Maintenance Engineer, the Project Engineer assigned to administer the contract, or their duly designated deputies, agents, or representatives.

THE CITY, OR THE CITY OF CLEVELAND

The City, or The City of Cleveland, is the Director, Department of Public Utilities, of the City of Cleveland.

STATUS OF CITY INSPECTOR

Inspectors as designated by the Director of Public Utilities shall be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the waterworks, and to the preparation or manufacture of the materials to be used in the waterworks. The city inspector as designated by the Director of Public Utilities shall make work instructions through the Project Engineer.

ACCESS TO WORK AND PLACE OF MANUFACTURE

The Contractor shall notify the Engineer and Director of Public Utilities, at least seven (7) days previous to the commencement of the manufacture of any materials, of the time and place where the manufacture is to commence, in order that a representative of the Engineer and Director may be present to inspect the manufacture. The Contractor shall provide, without charge or expense to the State and City, all necessary assistance to the Engineer and Director when required for inspection or verification of work done.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

(A) - Figured dimensions on drawings shall take precedence over measurements by scale, and detailed drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work. If, however, any of the detailed drawings show more elaborate or expensive work than is specified and indicated by the contract drawings, notice thereof must be given to the Engineer by the Contractor within ten (10) days after the receipt of such detailed drawings in order that the drawings may be amended or the additional expense on account of such work may be adjusted and authorized. If the Engineer does not receive such notice from the Contractor within ten (10) days after detailed drawings have been received by him, it is hereby agreed that the Contractor accepts the drawings and will execute them without claim for extra compensation.

FLOODS AND FREEZING WEATHER

Proper facilities shall be provided for protecting the work from damage by flood, rain or frost, and work done in freezing weather shall be done in such manner as the Engineer may approve. Valves shall be protected from freezing until backfilled in the completed work.

ADDITIONAL WORK

(A) - Attention is called to the fact that the work of this contract includes certain performances as incidental to the itemized requirements hereof, though not exclusive as follows: To perform all excavation, backfilling, sheeting, shoring, temporary and final repaving and to test the installation. Sand backfill shall be placed under existing and proposed pavement. For the performances herein described and for other incidental performances of like nature, the State will make no specific or separate payment or allowance, but the cost thereof shall be included in the prices stipulated to be paid for the various items of the work to be done under this contract.

(B) - Preliminary flushing: Before being placed in service all dirt and foreign matter shall be removed from the new water main or extensions to existing mains by a thorough flushing through the hydrants or by other approved means. Each valved section of newly laid pipe shall be flushed independently. This shall be done after the pressure test and may be done before or after the trench shall have been backfilled.

(C) - Chlorination: Following the preliminary flushing, the newly laid water pipe shall be chlorinated. The process of chlorinating, the method of procedure, the chlorinating agent, and the rate of application shall be determined by the Engineer. The City of Cleveland will furnish the necessary labor and material required for such chlorination and install the necessary taps at the ends of the water main sections to be chlorinated. The Contractor shall pay for chlorination or sampling of the water at the rate of ten cents (10¢) per linear foot for the first thousand feet, and five cents (5¢) per foot thereafter of the water main proper, with a minimum charge of one hundred dollars (\$100.00). The Contractor shall furnish the necessary labor for excavating and backfilling which will be required for the installation of taps for injecting the chlorine solution, operating pumps and flushing mains. In cases where the water main installation does not exceed 350 feet in length, the Contractor shall pay a minimum charge of thirty-five dollars (\$35.00) for flushing and sampling water.

(D) - Final flushing and test: Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremities until the replacement water throughout its length shall, upon test, both chemically and bacteriologically, be proven equal to the water quality served the public from the existing water supply system.

(E) - For the performances described in paragraphs B, C and D, The State will make no specific or separate payment or allowances, but the cost thereof shall be included in the prices stipulated to be paid for each linear foot of pipe furnished and installed.

MAINTENANCE OF SERVICE AND CONNECTING RELOCATED MAINS

The Contractor shall follow strictly the sequence of construction shown on the plans. All existing fire hydrant leads and house services shall be hand tunneled using special care to avoid any damage which might require shutting down the existing main until the new main is ready to be placed in service.

When the new mains have been tested and chlorinated and are ready to be connected to the old main, the Contractor shall make such connections at a time designated by the City. Prior to shutting down the existing mains, the Contractor shall take suitable precautions to assure a minimum interruption to service, including the following:

1. Perform all necessary excavation, including bell holes exposing the existing main sufficiently for the operation of the pipe saw by the City.
2. Remove the cap or plug from the end of the new main.
3. Swab the inside of all pipes, bends and sleeves to be used in connection thoroughly with a chlorine solution of at least 100 p.p.m.
4. Make-up as much of the connection as possible outside the ditch to eliminate the need for caulking most of the necessary joints during the shutdown. By careful measurement all pipe cuts can be made by the Contractor prior to shutting down.
5. Have sufficient manpower and equipment on the site to perform the operation in a minimum of time.

PAINTING

(A) - It is the intention of these specifications to provide that all metal work subject to corrosion shall be satisfactorily protected by a durable coating of paint or other approved material and that all metal surfaces not buried in earth, or in concrete, shall be left clean and well painted at the completion of the contract. Unless otherwise specified, the protection shall be at least that given by three (3) coats of approved paint. The first coat is to be applied at the shop before the metal has rusted and after all grease, dirt and scale has been removed. Bolts and nuts shall not be shop coated, but shall receive three (3) coats of approved paint after installation.

(B) - All metal work which has not been coated before the arrival on the job shall be given a temporary protective coating of such a nature as to permit the ready adherence of future coatings. The temporary coating shall be a good grade asphaltic paint or other approved material. This temporary protection shall apply particularly to the valve boxes and covers, and elsewhere when in the opinion of the Engineer, such protection is necessary.

(C) - All surfaces of metal which will be in contact after assembling shall be painted, at least one coat, before assembling. The final coat of paint on all exposed work shall be given shortly before the completion of the contract.

(D) - Where painting clauses appear hereinafter, they shall take precedence over this section, except that temporary protection herein described may be required.

TESTS, INSPECTION AND REPORTS

Notwithstanding the requirements of any other provisions of these specifications, the Contractor shall arrange for and pay all costs involved for shop inspection of all materials furnished, manufacture of all pipe, valves, fittings, etc., field and shop welds and welding, and furnish to the State and the City of Cleveland copies of all shop, fabrication, manufacture and other related inspection reports of materials furnished. This inspection shall be done by a recognized inspection laboratory approved by the City of Cleveland.

HANDLING PIPE AND ACCESSORIES

(A) - Unloading: Cast iron pipe, fittings, valves, hydrants, and other accessories shall, unless otherwise directed, be unloaded at the point of delivery, hauled to and distributed at the site of the project by the Contractor. They shall at all times be handled with care to a void damage. In loading and unloading they shall be lifted by hoists or slid, or rolled on skidways in such manner as to avoid shock. Under no circumstances shall they be dropped. Pipe handled on skidways must not be skidded or rolled against pipe already on the ground.

(B) - At site of work: In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

(C) - Protection of pipe coating: Pipe shall be handled in such manner that a minimum amount of damage to the coating will result. Any cast iron pipe or fitting, the coat of which has been damaged in shipping or handling, shall have the damaged portion well cleaned and covered with an asphalt paint, approved by the Engineer, before being placed in the work. The Contractor shall thoroughly coat all exposed parts of bolts and nuts with an approved asphalt paint, after all pipe has been laid and before backfilling has been placed. All field coating shall be furnished by the Contractor.

(D) - Pipe kept clean: The interior of the pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.

(E) - Frost protection: Valves and hydrants before installation shall be drained and stored in a manner that will protect them from damage by freezing.

CHANGES IN WATER PIPES

(A) - Wherever it becomes necessary in the opinion of the Engineer to change the location of house connections, such changes will be made as work to be done by the City. The Contractor shall notify the City in ample time to permit the City to make such changes and avoid unnecessary delay in the completion of the work. The Contractor shall also cooperate with the City in making these changes and shall do all excavating, backfilling and repaving as may be required. The City will furnish the piping material for and make all changes required, including tapping, in the location of existing house service connections and meters. The City will charge the Contractor for materials and labor furnished in making these service connections and alterations and costs thereof shall be included in the unit price bid for "Service Connections" or "Water Meters Relocated".

(B) - Wherever it becomes necessary, in the opinion of the Engineer, to change the location or elevation of water mains and hydrants, and where connections are to be made between existing distribution mains and water mains under this contract, the Contractor shall remove and dispose of all existing water line materials required to make the connection, and shall furnish and install complete, all the cast iron or ductile iron pipe, fittings and valves to make the connections indicated. The Contractor shall also furnish all necessary labor, materials, tools and equipment and make the excavation, backfill and repaving for such connections. Payment for this will be included in price bid under appropriate item for size of water main or connection to be installed. All pipes, valves, hydrants and appurtenances removed shall become the property of the Contractor.

APPROVED

DATE 4-15-1964

*Madanallo*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. H.*  
COMMISSIONER OF WATER AND HEAT

*Arnold Proter*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. R. Connor*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Auer*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th Street 16" Water Main between Fairfield Avenue and Abbey Avenue.

MADE F.V.R. DATE 12-18-63 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED D.R.K. DATE 2-10-64 SCALE \_\_\_\_\_

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

# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

7  
77

**CUYAHOGA COUNTY**  
CUY-90-14.67

(C) - In locations shown on the plans the Contractor will be required to sleeve-in to the existing mains. To speed up this operation, it is called to the Contractor's attention that the water department has on hand at Harvard Yards motor operated pipe cutters which are available for cutting pipe by City forces at the following rates. The prices include cost of labor, use of pipe cutting machine, and truck. The Contractor shall do all necessary excavation, backfilling and repaving and all air compressor equipment shall be furnished by the Contractor.

Size of Pipe	Cost Per Cut
16"	\$ 35.00

**EXCAVATION**

(A) - The Contractor shall remove all existing structures, roadways, driveways and other similar materials and make to the lines and grades given, all excavation necessary for the proper construction of the water main, pipe connections and appurtenant structures, including tunnel and shaft excavation. The excavation shall include the removal, handling, rehandling and disposal of materials encountered in the work and shall include all pumping, bailing, draining, sheeting and bracing. Moreover, the Contractor must assume all responsibility for any added expense or other liability which may arise by means of quicksand, obstacles or conditions foreseen or unforeseen and encountered in the work of this contract.

(B) - Trenches shall in every case be of sufficient width to permit solid packing of refill under and around pipes, and satisfactory construction of all appurtenances and for such sheeting and shoring, pumping and draining as may be necessary.

(C) - The trench shall be dug to the alignment and depth required and only so far in advance of pipe laying as the Engineer shall permit. The trench shall be so braced and drained that workmen may work therein safely and efficiently. It is essential that the discharge from pumps be led to natural drainage channels, to drains, or to sewers.

(D) - The trench width may vary with and depend upon the depth of trench and the nature of the excavated material encountered; but in any case shall be of ample width to permit the pipe to be laid and jointed properly and of the backfill to be placed and compacted properly. The minimum width of unsheeted trench shall be eighteen (18) inches and for pipe ten (10) inches or larger, at least twelve (12) inches larger than the outside diameter of the pipe for concrete pipe and eighteen (18) inches larger than the outside diameter of the pipe for cast iron and steel pipe, except by consent of the Engineer; The maximum clear width of trench shall be not more than two (2) feet greater than the outside pipe diameter. When sheeting and bracing is used, the trench width shall be increased accordingly.

(E) - The trench, unless otherwise specified, shall have a flat bottom conforming to the grade to which the pipe is to be laid. The pipe shall be laid upon sound soil cut true and even, so that the barrel of the pipe will have a bearing for its full length.

(F) - Any part of the trench excavated below grade shall be corrected with approved material, thoroughly compacted.

(G) - When the uncovered trench bottom at subgrade is soft and in the opinion of the Engineer cannot support the pipe, a further depth and/or width shall be excavated and refilled to pipe foundation grade as required under (F), or other approved means shall be adopted to assure a firm foundation for the pipe.

(H) - Ledge rock, boulders, large stones, and shale shall be removed to provide a clearance of at least six (6) inches below all parts of the pipe, valves, or fittings, and to a clear width of six (6) inches on each side of all concrete pipe and nine (9) inches on each side of all cast iron and steel pipe shall be provided.

(I) - Excavation below subgrade in rock, shale or in boulders shall be refilled to subgrade with approved material, thoroughly compacted.

(J) - Bell holes of ample dimensions shall be dug in earth trenches at each joint to permit the jointing to be made properly. Adequate clearance for properly jointing pipe laid in rock shall be provided at bell holes.

(K) - The use of excavating machinery will be permitted except in places where operation of same will cause damage to trees, buildings, or existing structures above or below ground; in which case hand methods shall be employed.

(L) - Trees, fences, poles and all other property shall be protected unless their removal is authorized; Any property damaged shall be satisfactorily restored by the Contractor.

(M) - Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility controls shall be left unobstructed and accessible during the construction period.

(N) - The Contractor shall maintain all excavations in good order during the construction, so as not to hinder or injure the pipe laying, masonry or other work. He shall take all reasonable precautions to prevent movement of the sides of such excavation, and shall remove at his own expense any material sliding into the excavation.

**SHEETING AND BRACING**

(A) - The Contractor shall furnish and put in place such sheeting and bracing as may be required to support the sides of trenches or other excavation and shall remove such sheetings and bracings, as the trench or excavation is filled up, unless the Engineer shall order it left in place, in which case the Contractor shall cut the plank off at a height as ordered by the Engineer, or as called for on the contract drawings. That portion of the timber ordered to be left in place will be paid for at the rate of eighty dollars (\$80.00) per thousand feet board measure. No payment will be made for wasted ends.

(B) - Whenever the excavations for the work herein to be done are immediately adjacent to other subsurface structures, the Contractor shall furnish and place sheeting and bracing where noted on contract drawings and as may be necessary so as to reduce to a minimum the possibility of injuring or damaging the same.

(C) - If the Engineer is of the opinion that at any point sufficient or proper supports, sheeting, or bracings have not been provided, he may order additional supports, sheeting or bracing, at the expense of the Contractor, and the compliance with such orders by the Contractor shall not relieve or release him from his responsibility for sufficiency of such supports.

**REMOVAL OF EXCAVATED MATERIAL**

This item shall be as specified in section E-106 of the State Highway Specifications.

**LAYING PIPE**

(A) - Proper implements, tools, and facilities, satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench piece by piece by means of derrick, proper slings, and other suitable tools or equipment, in such manner as to prevent damage to pipe or coating, under no circumstances shall pipe or accessories be dropped or dumped into the trench. If any defective piece be discovered while pipe is suspended or after being laid, a new piece shall be furnished and installed by the Contractor at the site of the work.

(B) - All foreign matter or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying.

(C) - At times when pipe laying is not in progress, the open ends of pipe shall be closed by approved means, and no trench water shall be permitted to enter the pipe. No pipe shall be laid in water, or when the trench conditions or the weather is unsuitable for such work, except by permission of the Engineer.

(D) - Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane to avoid obstructions, to plumb stems, or for other reasons, the degree of deflection shall be approved by the Engineer.

(E) - Before laying cast iron or ductile iron pipe, all lumps, blisters and excess coal tar coating shall be removed from the bell and spigot ends of each pipe, the pipe ends shall then be kept clean until joints are made.

**FLOATING**

The Contractor shall take every precaution against the floating of the pipe due to water coming into the trench, or through caving in, flushing or puddling. In case of such floating the Contractor shall replace the pipe at his own expense, and make wholly good any injury or damage which may have resulted.

**TESTING MAINS**

(A) - All pipes, valves, fittings, etc., shall be laid in such a manner as to leave all joints watertight. After the pipe is laid, and before backfilling is placed around the joints, such lengths of the water main as the Engineer may determine, shall be tested under a hydrostatic pressure of seventy-five (75) pounds per square inch above the static pressure, but nowhere less than 100 pounds per square inch.

(B) - The test shall be under the direction of the Engineer and Director of Public Utilities or his designate. The Contractor may obtain water for testing by observing the rules and regulations enforced in the municipalities or townships in which the work is being done. The City will furnish a pressure gage for measuring the pressure on the water main, but the Contractor shall furnish a suitable pump, pipes, test heads and all appliances, labor, fuel and other appurtenances necessary to make these tests.

(C) - The test pressure shall be maintained for a sufficient length of time to allow for a thorough examination of joints and elimination of leakage where necessary. The pipe lines shall be made absolutely tight under the test pressure.

(D) - After a section of the water main has been tested, the Contractor shall drain same.

(E) - In cold weather immediately after testing a section of the water main, the Contractor is to open all valves, air cocks, by-passes and drains and properly drain bonnets of all valves in the section of the water main, and take all other precautions necessary to prevent injury to water main and appurtenances due to freezing.

**CLOSING VALVES**

The closing of all gate valves on existing mains for making connections, tests, or for any other cause, shall be done by the City of Cleveland and sufficient notice shall be given to the City, by the Contractor, so that the work may be done with a minimum of inconvenience to the public and delay to the Contractor.

**PLUGGING DEAD ENDS**

Standard plugs with clamps shall be inserted into the bells of all dead ends of pipes, tees, or crosses, and spigot ends capped and clamped by the Contractors, on all mains constructed by him. Concrete piers shall be placed when called for on the contract drawings, or ordered by the Engineer. The Contractor shall mark all dead ends by means of a one-inch metal pipe which shall extend from the water line to four feet above finished ground. The cost of furnishing the plugs and markers shall be included in the per linear foot price bid for the various sizes of new water mains.

**BACKFILLING**

(A) - This work includes all backfilling, together with ramming, puddling, and rolling, as required; The regrading of grounds; The replacing of surface and subsurface structures; The placing and maintaining of temporary sidewalks, and driveways; The furnishing of suitable material for backfill, reseeding lawns and replacing trees and shrubbery damaged by the Contractor; and all appurtenant work incidental thereto. Pavements, curbs, sidewalk and driveways within the limits of the work shall be temporarily surfaced, maintained and finally replaced or repaved as set forth under roads, surfaces, sidewalks driveways and curbing.

(B) - Backfill, unless otherwise specified, may be made with material excavated from the trenches, providing same is satisfactory to the Engineer. If, in the opinion of the Engineer, the material excavated is unsatisfactory, then the Contractor shall furnish at his own expense other material suitable for backfill. All backfill shall be free from slag, cinders, rubbish and other objectionable material.

(C) - Before laying the pipe, the bottom of the trench shall be brought to the grade of the bottom of the pipe, except of field joints. Wherever the bottom of the trench has been excavated below the bottom of the pipe, the Contractor shall place sand, or other material satisfactory to the Engineer to bring the bottom of the trench to the grade of the bottom of the pipe. This bed shall be thoroughly tamped before the pipe is laid.

(D) - Unless otherwise specified, the backfill under, around and to a depth of one (1) foot above the top of all pipe, shall be made with material satisfactory to the Engineer, which material shall be free from stone and other objectionable material noted above. The Contractor must use special care in placing this portion of the backfill, so as to avoid injuring, distorting or moving the pipe when compacting same. Above this level the backfill shall be made with material satisfactory to the Engineer. However, where specified, sand shall be used for the entire portion of the backfill. See below.

(E) - Backfilling as noted in paragraph (D) shall be tamped in thin layers, simultaneously on each side of the pipe, and thoroughly compacted so as to provide a solid backing against the external surface of the pipe.

(F) - Only after the backfill previously mentioned has been satisfactorily compacted, may work proceed in placing the remaining backfill which must be carefully placed and compacted by tamping, puddling, or rolling. All precautions must be taken to eliminate future settlement. The number of men tamping shall be not less than the number backfilling, and additional men shall be kept in the trench to spread the material.

(G) - Backfilling shall not be done in freezing weather, except by permission of the Engineer, and it shall not be made with frozen material, nor shall any fill be made where the material already in the ditch is frozen.

(H) - The entire backfill shall be made with sand where permanent pavements, curbs, driveways, or sidewalks, have been opened for or undercut by the excavation.

APPROVED

DATE 4-15-1964

*Wm. J. ...*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. ...*  
COMMISSIONER OF WATER AND HEAT

*Arnold ...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. P. ...*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William ...*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th Street 16" Water Main between Fairfield Avenue and Abbey Avenue.

MADE F.V.R.	DATE 12-18-63	TRACED	DATE
CHECKED D.R.K.	DATE 2-10-64	SCALE	

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



# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

8  
77

**CUYAHOGA COUNTY**  
**CUY-90-14.67**

(I) - All sand to be used for backfill shall be a natural bank sand, graded from fine to coarse, not lumpy or frozen, and free from slag, cinders, ashes, rubbish, or other deleterious or objectionable material. It shall not contain a total of more than 10 per cent by weight of loam and clay, and all material must be capable of being passed through a 3/4 inch sieve. Not more than 5 per cent shall remain on a No. 4 sieve.

ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING

(A) - The Contractor shall remove all pavements and road surfaces within the lanes of excavation. After the pipe has been laid, all appurtenant work constructed and backfill completed, he shall furnish, place and maintain, wherever the pavement or road surface has been removed or damaged by him, a temporary pavement in the paved portion of streets, or a temporary road surface in the unpaved portion of streets, so as to provide a safe and passable roadway until such time as the final pavement or road surface is completed.

(B) - All pavements, road surfaces, sidewalks, driveways, or curbs, which the Contractor is required to replace or to have replaced, shall, at the expiration of this contract, be in at least as good condition as at the time of awarding the contract.

(C) - Tunneling will not be permitted without permission of the Engineer. In backfilling tunnels, sand shall be used as far as possible and balance of backfilling made with Class E concrete, rammed in place.

(D) - No specific or separate payment will be made for all of this work, but the cost thereof shall be included in the prices bid for the various items of the work to be done under this contract. Restoration as noted above will only be required in areas where the plans do not otherwise propose new construction of pavement, sidewalks, and curbs, except that temporary restoration in such areas may be required by the Engineer in order to maintain traffic or local access.

LIST AND INVOICES

(A) - The Contractor shall furnish the Engineer with the list in duplicate of pieces in each shipment of pipe and specials, giving the serial number and designation of each pipe and special sent at that time.

(B) - The material shall be shipped in such sections as the Engineer may order.

CAST IRON PIPE AND FITTINGS

WORK INCLUDED

The Contractor shall furnish, all the materials for and shall properly construct and connect in place, at the locations shown on the drawings or as directed, all cast iron pipe and fittings, including all excavation work, the cutting into and removal of existing pipe, backfilling, sand backfill, and repaving, all as required for the proper completion of the work included under this contract.

CAST IRON PIPE AND FITTINGS

(A) - All pit cast pipe shall be manufactured in all respects in accordance with, and shall meet the requirements of the latest "Standard Specifications for Cast Iron Pipe and Special Fittings" as adopted by the American Water Works Association which specifications except as herein modified are made a part of these specifications.

(B) - All pit cast pipe and fittings shall be cement lined and of the size and classes noted on the respective contract drawings.

(C) - In lieu of pit cast pipe above the Contractor will be permitted to furnish either centrifugal or high strength cement lined pipe. The metal shall have a modulus of rupture of not less than 40,000 pounds and a tensile strength of not less than 18,000 pounds and shall be for class noted on the contract drawings. Pipe may be furnished in 12, 16, or 18 foot lengths. The centrifugally cast pipe shall conform to the American Standard Specification A21.6-1952 and all subsequent amendments thereto.

(1) - The thickness of the centrifugally cast iron pipe shall conform to the following table:

STANDARD THICKNESS OF CENTRIFUGALLY CAST IRON PIPE

SIZE	WORKING PRESSURE	STANDARD THICKNESS	CLASS
6"	250	.48	25
12"	200	.56	24
12"	250	.60	25
16"	200	.68	25
16"	250	.73	26

(2) - All fittings, such as bends, tees, crosses, offsets, hydrant branches, etc., shall have bell and bell or bell and spigot ends with cast lead joints, pipe between offsets or bends and on hydrant branches, shall also be of bell and spigot type with lead joints.

(D) - All pipe shall have bell and spigot ends for cast lead joints or a slip-on type joint with compressed rubber ring inserts. All pipe and fittings shall be cement lined.

(E) - Gaskets shall be of rubber or other equally effective protection against uneven distortion of the gasket.

(F) - Where fittings are shown which are not covered by the above specifications, they in such particulars as are lacking thereon, shall conform to the dimensions and otherwise meet the specifications for the respective type which are carried in the latest revisions to the current edition of the "Handbook of Cast Iron Pipe" by the Cast Iron Pipe Research Association or which are otherwise shown on the contract drawings.

(G) - Wherever changes in line and grades of the main as shown on the drawings are not standard fitting deflections, the Contractor will be permitted to submit details using combinations of standard fittings and small deflections (not to exceed a maximum of one half (1/2) inch joint opening) in the adjoining lengths of pipe.

(H) - Plugs for bell and spigot pipe and caps for lugged pipe shall be furnished with two (2) plugged two (2") inch taps for drain and air cock connections.

(I) - Closure pieces shall be accurately measured and cut in the field and installed using solid type pattern sleeves as shown or as required.

(J) - Tests, inspection, reports and analyses of tests of samples for all materials shall be furnished as set forth elsewhere in these notes.

(K) - Bitumastic coating shall be applied on the exterior of all cast iron pipe and fittings in accordance with AWWA specifications.

CEMENT LINING

All cast iron pipe and fittings shall be given a cement mortar lining at the point of manufacture. The lining shall conform to the American Standard Specification A 21.4-1952 and all subsequent amendments thereto.

MARKING

All cast iron pipe and fittings shall be suitably marked to denote the manufacturer, class, date, weight and other elements of identification.

LAYING

(A) - Proper and suitable tools and appliances for the safe and convenient handling and laying of the pipes and fittings shall be used. Great care shall be taken to prevent the pipe coating from being damaged, particularly on the inside of pipes and fittings and any such damage shall be remedied as directed. All pipes and fittings shall be carefully examined by the Contractor for defects just before laying and no pipe or fitting shall be laid which is known to be defective.

(B) - If any defective pipe is discovered after having been laid, it shall be removed and replaced with a sound pipe or fitting in a satisfactory manner, by the Contractor at his own expense. All pipes and fittings shall be thoroughly cleaned before they are laid, shall be kept clean until they are used in the completed work, and, when laid, shall conform to the lines and grades given by the Engineer. Open ends of pipes shall be kept plugged with a bulkhead during construction. In no event shall any portion of the damaged pipe be permitted to remain in the line. Any approval stamps found on the pipe shall be removed or the pipe broken up for scrap.

(C) - Pipe laid in trench shall be laid to a firm and even bearing for its full length. Precautions shall be taken against floating.

(D) - It is the intention of these specifications to secure first class workmanship in the placing of pipe and accessories. In such details as are not specifically mentioned herein or called for on the drawings, the Contractor will be required to conform with the applicable sections of the latest "Standard Specifications for Laying Cast Iron Pipe" as adopted by the American Water Works Association.

CUTTING PIPE

Whenever the pipes require cutting to fit into the lines, the work shall be done in a satisfactory manner so as to leave a smooth end at right angles to the axis of the pipe. In no event shall flame cutting be used. When a piece of pipe is cut to fit into the line, no payment will be made for the portion cut off and not used in the line.

JOINTS

(A) - Lead joints: In jointing all bell and spigot pipe and fittings having lead joints, the spigot of each pipe shall be properly seated in the bell of the next adjacent piece and adjusted so as to give a uniform annular space. The joint shall be made with twisted hard jute and soft pig lead. Before placing the jute, it shall be sterilized either by boiling or by dipping in a concentrated solution of "HTH". The jute shall be twisted and thoroughly driven into the bell, so that the lead, after having been caulked, shall have a depth of 2 1/2 inches.

The furnace and melting pot shall be kept near the joint to be poured and each joint shall be made with one pouring. Dross shall not be allowed to accumulate in the melting pot. The joints shall be thoroughly caulked by competent pipe joiners and in such manner as will secure a tight joint without overstraining the iron of the bell.

PAINTING

After erection, all exposed or damaged coatings and all bolts for lugged joints shall be cleaned and painted with three (3) field coats of Inertol 50 or Bitumastic 50 or equivalent.

DRAWINGS

(A) - The Contractor shall submit to the Engineer for approval duplicate prints of all shop drawings for pit cast iron pipe and fittings and miscellaneous details which are not standard construction, and are not mentioned in the regular catalogue of the company furnishing the pipe. No work shall be done in the shop until after the drawings have been approved.

(B) - The approval of the drawings by the Engineer shall not relieve the Contractor of any of his obligations in connection with this contract.

MEASUREMENT

The number of lineal feet of cast iron pipe line and connections to be paid for shall be the actual number of lineal feet furnished and placed in accordance with these specifications as measured along the axis of the piping including fittings and valves connected up in place. For connections between new and existing mains, measurement shall be the distance from centerline to centerline of mains and the actual length of existing main ordered to be removed to make the connection.

PAYMENT

The footage measured as provided above shall be paid for at the contract price bid per lineal foot for "Item Special - Water Main" classified as to size and type, which price and payment shall constitute full compensation for excavating and for furnishing, hauling, and placing the pipe, pipe bends, concrete piers, sheeting and bracing, backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item, except for the items specifically listed as separate pay items.

SERVICE CONNECTION RELOCATIONS

WORK INCLUDED

The City will furnish the piping materials, (1 1/2" connection - 1 1/2" service line - 3/4" water meter - 1 1/2" meter vault), and install all piping to and including the meter. All changes required in the location of the existing service connection and meter, and 1 1/2" service connection from the meter to the existing building shall be done by the Contractor. The Contractor shall do all the necessary excavation, backfilling, and repaving required for all work. The City will charge the Contractor, (\$400.00), for the materials and labor furnished in making this service connection and the cost thereof shall be included in the unit price bid for "Service Connection Relocation and Fittings, Valve Box, Water Meter and Vault complete."

SERVICE CONNECTIONS DISCONNECTED AND PLUGGED AT THE MAIN

WORK INCLUDED

The Contractor shall disconnect and plug the service connections, indicated in these plans, at the mains on Fairfield Avenue and West 14th Street, and shall do all the necessary excavation, backfilling, and repaving required. The removal of curb boxes is also included in this item. Payment for all the above is included in the unit price bid per each for "Service Connections disconnected and plugged at the Main."

APPROVED

DATE 4-15-1964

*J. R. Gorman*  
DIRECTOR OF PUBLIC UTILITIES

*J. S. Smith*  
COMMISSIONER OF WATER AND HEAT

*Arnold Probst*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. R. Gorman*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Sussner*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th Street 16" Water Main between Fairfield Avenue and Abbey Avenue.

MADE F.V.R. DATE 12-10-63 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED D.R.K. DATE 2-10-64 SCALE \_\_\_\_\_

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

# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

9  
77

CUYAHOGA COUNTY  
CUY-90-14.67

FURNISHING AND SETTING 6" HYDRANTS

**WORK INCLUDED**

The Contractor shall furnish all hydrants, caulking material, labor, tools and equipment for and shall properly connect at the location shown on the Contract Drawings, 6" hydrants, complete, as required for the proper completion of the work included under this contract.

**HYDRANTS**

The 6" hydrants shall be City of Cleveland Standard and shall conform to the City's specifications on file in Room 624 Lincoln Building, Cleveland 14, Ohio.

**SETTING**

(A) - General Location: Hydrant shall be located in a manner to provide complete accessibility, and in such manner that the possibility of damage from vehicles or injury to pedestrians will be minimized. Unless otherwise directed, the setting of any hydrant shall conform to the following:

(B) - Location Regarding Curb Lines: When placed behind curb the hydrant barrel shall be set so that center of barrel will be no less than 3 feet from the gutter face of the curb, or deviate from location indicated on contract drawings, except by consent of the Engineer.

(C) - Location Regarding Sidewalk: When set in the lawn space between the curb and the sidewalk, or between the sidewalk and the property line, no portion of the hydrant or nozzle cap shall be within 6 inches of the sidewalk.

(D) - Position of Nozzles: The hydrant shall stand plumb, with the nozzles pointing toward the road and at an angle of forty-five degrees therefrom. Where hydrant branch piping is parallel with, or not at right-angles to the curb, the Contractor shall release swivel head bolts and adjust the hydrant nozzles to face the road at the proper angle. A hydrant without swivel heads will be adjusted by the City where necessary to correct the angle on nozzles. The elevation shall conform to the established grade with tops of frost casing at least four (4) inches above grade.

(E) - Connection to Main: The hydrant shall be connected to the main pipe with a cast iron branch controlled by the independent gate valve of the same size as hydrant, except as otherwise directed.

(F) - Drainage at Hydrant: Drainage shall be provided at the base of the hydrant by filling around the elbow with coarse gravel or crushed stone to at least six (6) inches above the waste opening. Wherever a hydrant is set in rock, clay or other impervious soil, the trench shall be widened and deepened on each side of the hydrant base, which space shall be filled compactly with coarse gravel or broken stone mixed with coarse sand of sufficient quantity to absorb all water to be drained from the hydrant when the valve is closed.

(G) - Anchorage for Hydrant: The hydrant shall be set on a stone slab or similar foundation and base of hydrant and hydrant tee well braced against unexcavated earth at the end of the trench with concrete backing, or it shall be tied to the pipe with suitable rods or clamps as directed by the Engineer.

(H) - Cleaning: The hydrant shall be thoroughly cleaned of dirt or foreign matter before setting.

VALVES

**WORK INCLUDED**

The Contractor shall furnish all the materials for and shall properly set in place and connect at the locations shown on the drawings, or as directed, all gate valves of the various sizes and types specified or ordered, all as required for the proper completion of the work included under this contract.

**GATE VALVES**

(A) - Type of Valves: The gate valves shall be manufactured in full compliance with the Standard Specifications for Gate Valves for Ordinary Water Works Service of the American Water Works Association A.W.W.A. C 500-52 T or latest revision thereof, and, in addition, shall comply with the following supplementary requirements. All gate valves 16 inches and under in size shall be double disc parallel or tapered seat bottom wedge or side wedge type.

(B) - Valves with Stationary Stems: All gate valves, unless otherwise ordered, shall be made with single, non-rising stems.

(C) - Hub Ends: The dimensions of the bells on valves up to and including 24 inches in diameter shall conform to those for Class D pressure fittings, as required by A.W.W.A. C 100.

(D) - Marking: All gate valves 3 inches and over shall have the identity of maker, size and the year when made, and also the letters "C.W.D." cast upon its body or dome in raised letters.

(E) - Stuffing Boxes: The stuffing box on each gate valve 3 inches or over, must be separate from the dome and fastened to it by bolts. For 2 inch valves and under, the stuffing boxes may be formed in the dome of the valve. When required by the Engineer, valves 16 inches and smaller shall be furnished with "O" ring type seal plate. The seal plate shall be fitted with at least two "O" rings, the lower "O" ring serving as the pressure seal and the upper "O" ring as a combined dirt and moisture seal. The "O" rings shall be Precision Rubber Corporation Quality Compound No. 122-70, or approved equal.

(F) - Seat and Gate Rings: Dimensions of the bronze seat and gate rings shall be proportioned to fit the test pressure required, and shall meet the approval of the Engineer. The rings shall be firmly secured in place by an approved device which will prevent them from working loose, particularly when the valve is left partly open. Dimensions of the bronze seat and gate rings for gate valves shall be not less than that specified in the following tables. Body seat rings shall be made of Grade One bronze. Gate seat rings shall be made of grade five bronze.

BODY AND GATE RINGS

BOTTOM WEDGE

BODY RINGS			GATE RINGS					
VALVE SIZE	FACE	DEPTH	THICKNESS AT BASE OF THREADS	FACE THICKNESS	FACE	FACE THICKNESS	DEPTH	
6"	11/16	9/16	3/16	5/32	11/16	5/32	5/16	

SIDE WEDGE

6"	1/2	11/16	9/32	1/4	5/8	5/32	21/64
----	-----	-------	------	-----	-----	------	-------

DIMENSIONS IN INCHES

(G) - Valve Stem: All gate valves shall be of the single screw type. The stems shall be of Grade Three bronze. The threads of stems and stem nuts shall be of Acme, modified Acme, or one-half V type. If requested, a manufacturer's certificate of test shall be furnished with all bronze stems. All stem collars shall be cast integral with stems. The diameters of stems at the base of the thread shall not be less than those shown below. The stem opening and thrust-bearing recess shall be Grade One, bronze bushed. The number of threads per inch shall be as given below.

SIZE OF VALVE INCHES	DIAMETER OF STEM AT BASE OF THREAD - INCHES	NO. OF THREADS PER INCH
6	1.000	3

(H) - Wrench Caps: The wrench caps and retaining nuts on heads of valve stems and pinion shafts shall be of Grade Three bronze. On valves 4 inches to 20 inches inclusive, they shall be 1-3/4 inches square on top, 1-1/2 inches square at base, and 1-3/8 inches deep. On 3 inch valves and under, they shall be 1-1/4 inches square on top, 1-3/8 inches square at base, and 1-1/2 inches deep. Machined wrench caps for valves 3 inches to 48 inches inclusive shall be fitted to a machined square stem or pinion shaft and held in place by a retaining nut. Wrench caps shall have a cut-away skirt to permit easy access to gland belts.

(I) - Valves are to open clockwise, except 2 inch and under. All gate valves 3 inches and over shall be made to open by turning in a clockwise direction. Valves 2 inches and under shall be made to open by turning in a counter-clockwise direction. All valves are to be so made that they can be easily operated.

(J) - Facing of Gates: All discs or gates and threads for seat rings in the body shall be machined true and a groove or grooves shall be machined in each disc or gate for the reception of the face ring. The disc and seat rings shall be securely and rigidly attached to the discs or body seats in a manner approved by the Engineer, and the rings are to be finished to a true surface.

(K) - Bronze Parts: The stems, stem nuts, operating nuts, retaining nuts, disc and seat rings, shall be of solid bronze. Other parts, such as wedges, glands, thrust-bearings, and all other parts coming together in operation, shall be of bronze, or substantially lined with bronze or stainless steel of a thickness not less than 1/4 of an inch and as shown on drawings submitted and approved. All 2" valves and under shall be made entirely of bronze, except hand-wheels, which shall be made of malleable iron.

(L) - Cast Iron Parts: The bodies, covers, disc frames, etc., of all gate valves 3 inches and over, shall be of cast iron.

**MATERIAL SPECIFICATIONS**

(A) - Strength of Valves: The gate valve shall be designed for 150 lb. working pressure and shall withstand an internally applied hydrostatic pressure at all points of at least 300 lbs. per square inch. A factor of safety of not less than 10 shall be used on the design. Should tests develop any weakness, the valves from that design shall be rejected and a new design made.

(B) - Reinforcement at Flanges: All valve flanges shall be reinforced by fillets in accordance with the manufacturer's practice proven satisfactory in actual service.

(C) - Joints: All joints of the valves shall be faced true in a lathe or planer, and put together with a gasket of some material acceptable to the Engineer.

(D) - Bolt Holes: All bolt holes shall be accurately drilled from templates and spaced equal distances apart.

(E) - Bolts and Nuts: All bolts and nuts shall be made of silicone bronze (A.S.T.M. B 98-55, Alloy A) or stainless steel (A.S.T.M. A 276-55, Type 302).

(F) - Parts to be Interchangeable: All parts of valves of the same size and make must be perfectly interchangeable and all work done in a thorough and workmanlike manner.

(G) - Castings: All castings, whether of bronze, iron or steel, shall be sound and smooth without cold shuts, swells, lumps, scabs, blisters, sand holes or other imperfections, and shall be made in accordance with the best modern foundry practice to obtain castings of the best quality and of uniform thickness. No welding, plugging, or filling of holes or other defects will be permitted. For parts whose thickness is less than one (1) inch, casting being thinner than the specified thickness by .06 of an inch or more shall be rejected, and for parts whose thickness is one (1) inch or more, castings being thinner than specified by .08 of an inch or more shall be rejected.

(H) - Bronze Parts: (1) Bronze for parts, other than those listed below, shall be Grade One. (2) Valve stems, pinion shafts, stem nuts, wrench caps and retaining nuts shall be made of Grade Three bronze. (3) Disc rings shall be made of Grade Five bronze.

(I) - Tests of Bronze: (1) If demanded, a manufacturer's certificate of test shall be furnished with all bronze stems. (2) For all stems of gate valves, smaller than 16 inches, not less than two test pieces shall be cast from the molten metal of each heat from which valve stems are being made. (3) All stems made from bronze showing less strength, elongation and/or ductility than required above shall be rejected. (4) Tests of valve stems, or the various parts of any valve, may be made at any time before or after delivery, and if found to be deficient in strength or unsatisfactory to the Engineer, the whole lot or shipment may be rejected.

(J) - Cast Iron: (1) Quality: Cast iron shall conform to A.S.T.M. Specifications A 126, Class B, or latest revision thereof. All iron castings shall be tough and without brittleness such as may be cut, drilled and shipped by hand with due ease. A blow from a hammer shall produce an indentation on the edge of the casting without flaking the metal.

(2) - Tests: Bars from the molten metal from which the valves are being made shall be tested at such time and in such manner as the Engineer may require. The requirements of A.S.T.M. Specifications A 126 shall govern testing procedures to determine the physical and chemical characteristics of the iron castings. Should the result obtained from the bar tested fail to show that the cast iron meets the requirements herein specified, the entire melt will be rejected. Test bars, however, whose failure is due to inherent defects shall not be considered. All valves made from iron showing less strength than called for in the A.S.T.M. Specifications shall be rejected.

(K) - Quality of Wrought Iron: All wrought iron shall be tough, fibrous, and uniform in character. Specimens cut from bars and broken in a testing machine shall show a tensile strength of not less than 45,000 PSI, with an elongation of 18 per cent in eight diameters.

APPROVED

DATE 4-15-1964

*J. J. D'Amato*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. Potts*  
COMMISSIONER OF WATER AND HEAT

*Arnold P. Powell*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*A. R. Connor*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Sweeney*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th Street 16" Water Main between Fairfield Avenue and Abbey Avenue.

MADE F.V.R. DATE 3-27-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED DRK. DATE 3-27-64 SCALE \_\_\_\_\_

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

# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

10  
77

CUYAHOGA COUNTY  
CUY-90-14.67

INCORPORATED  
FEB 24 1963

PAYMENT

(L) - Quality of Materials: Grade One cast bronze shall conform to the properties of A.S.T.M. B 62.

Grade Two cast bronze shall conform to the properties of A.S.T.M. B 132, Alloy A.

Grade Three cast bronze shall conform to the properties of A.S.T.M. B 132, Alloy B.

Grade Four rolled bronze shall conform to the properties of A.S.T.M. B 21, Alloy A (one-half hard).

Grade Five bronze shall be sufficiently malleable to conform to dovetailed grooves when peened or rolled, and shall have a minimum compressive strength, without deformation, of 4,000 PSI., and shall have the following chemical composition:

Copper, per cent	91.0
Tin, per cent	0.0
Zinc, per cent	5.0
Lead, per cent	4.0

Silicon Bronze - This bronze shall conform to A.S.T.M. Specification B-98, Alloy A.

Stainless Steel - The stainless steel shall conform to A.S.T.M. Specifications A-276, Type 302.

Cast Iron - The cast iron shall conform to A.S.T.M. Specification A 126, Class B.

(M) - Other Materials: All other materials used in the manufacture of these valves and not specified in the specifications shall be of the best quality of their respective kinds, and subject to inspection, tests, and approval by the Engineer.

(N) - Chemical Analysis: Chemical analysis of the material used shall be furnished by the Contractor whenever required by the Engineer.

(O) - Cleaning of Castings: All iron castings shall be thoroughly cleaned on the outside and inside surfaces, and protected from rain or moisture until they are painted.

PLACING AND TESTING

(A) - All valves shall be set accurately and carefully to the lines and grades given. All connections to pipe shall have the necessary lead or screwed ends as required under the following items: Cast iron pipe and fittings, furnishing and setting 6" (six inch) hydrants, and 2-inch galvanized wrought iron pipe and brass pipe and as shown on the valve schedule.

(B) After the valves are set in place and ready to operate, the Contractor shall test them under working pressure and conditions herein specified under the Specification "Testing Mains", and any valve found to leak shall be made water-tight and, if found to be of faulty design, shall be satisfactorily repaired or replaced by the Contractor.

PAINTING

(A) - Iron body valves shall either be dipped in asphalt paint and all bronze parts cleaned, or all iron castings shall be painted inside before assembling with two (2) coats of an approved paint and, after passing the hydraulic test, shall be given at least two (2) coats of approved paint outside.

(B) - After erection, all exposed metal surfaces of valves except brass or bronze shall be painted with (2) field coats of coal tar pitch paint equal to Inertol 56 or Koppers Bitumastic 50.

INSPECTION

The Engineer or his authorized designate will inspect the material and work done, as the interests of the respective Cities or State may require. Such officer shall have unrestricted access to the Contractor's plant, and to all parts of the work, and other places at which the preparation of the material and the construction of the different parts of the work to be done under these specifications are carried on, and he shall receive all facilities and assistance to carry out his work of inspection and testing in a manner satisfactory to the Engineer. Such inspection shall not relieve the Contractor from any obligation to perform said work strictly in accordance with the specifications, or any modifications thereof as herein provided, and work not so constructed shall be removed and made good by the Contractor at his own expense.

DRAWINGS

(A) - Prior to the manufacture of any valves, the Contractor shall submit for the approval of the Engineer and Director of Public Utilities of the City of Cleveland, complete working, detail, and dimension drawings showing thicknesses and kinds of material, and similar information.

(B) - One print of each of the drawings submitted will be returned with the criticisms or approval of the Engineer. In case the drawings are not approved, the Contractor shall again send for approval duplicate revised prints of the drawings to take care of the criticisms noted, and after the drawings have been finally approved, the Contractor shall again furnish to the Engineer fourteen additional prints, six of which shall be furnished to the Director of Public Utilities of the City of Cleveland, of each drawing. No work shall be done in the shop until after the drawings have been finally approved.

MISCELLANEOUS METAL WORK

WORK INCLUDED

(A) - The Contractor shall furnish and install all miscellaneous metal work which is required for the proper completion of the work included under this contract and is not specifically included under the other items of these specifications.

(B) - In general, the work shall include the furnishing and installing of valve boxes, extension stems and brace, structural members, bronze bolts, and other similar items required for the proper completion of the work.

MATERIALS

All castings shall conform to the requirements of Section O-7.81 of the "Standard Specifications for Construction of Pavements, Sidewalks, and Sewers" or the City of Cleveland dated January, 1950, except that the cast iron shall be Class No. 30. Wrought iron shall meet the requirements of the A.S.T.M. Specifications A 207-39. All structural steel shall meet the requirements of the A.S.T.M. Specifications A 7-46. All bronze bolts and nuts shall conform to U.S. Standard sizes, and shall be clean cut and have well fitted threads. All bronze bolts and nuts shall be of Tobin or Manganese Bronze, or of similar approved materials.

CLEANING AND TESTING

All castings shall be thoroughly cleaned and subjected to a careful hammer test. No castings shall be coated unless clean and free from rust, and approved in these respects by the Engineer or his authorized inspector immediately before being dipped.

COATING

Each casting shall be sprayed or brushed inside and out with one coat of asphaltic compound varnish. The varnish shall be made of high grade asphalt fluxed and blended with properly treated drying oils and thinned to a proper consistency with a volatile solvent. The varnish shall be Black Asphalt Varnish as manufactured by the Excelsior Varnish Works, Inc., Cleveland 2, Ohio, Koppers Asphalt Varnish or approved equal. Other methods of coating and types of coating materials shall be subject to the approval of the Engineer, in addition to the shop coat the castings shall receive two (2) coats of approved paint.

INSPECTION

The Engineer or his authorized assistant, shall have the right to inspect the material and work done, as the interests of the City or State may require. Such inspection shall not relieve the Contractor from any obligation to perform said work strictly in accordance with the specifications, or any modification thereof, as herein provided, and work not so constructed shall be removed and made good by the Contractor, at his own expense. All manhole rings and covers must be sound and shall conform to these specifications, and any defective castings which may have passed the inspector at the works, or elsewhere, shall be at all times liable to rejection when discovered, until the date of final payment under this contract.

VALVE BOXES AND COVERS

The contractor shall furnish and install, over each vertically set valve of the locations shown on the drawings, or as required, valve boxes and covers of the types and sizes indicated on the contract plans. These shall be carefully located over the valve nuts, and shall be set plumb and true to elevation as required.

DETAILED DRAWINGS

Complete detailed drawings of miscellaneous metal work shall be submitted to the Engineer for approval, prior to the manufacture of any work to be furnished under this item, in accordance with these specifications.

PAINTING

All miscellaneous metal work not galvanized shall be thoroughly cleaned and given three (3) field coats of coal tar pitch equal to Inertol 50 or Bitumastic 50.

VALVE BOXES

Materials and specifications shall conform to State of Ohio Specification I-8.

ITEM SPECIAL - FIRE HYDRANTS REMOVED

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Fire Hydrants Removed", which price and payment shall constitute full compensation for excavating, removal of fire hydrant and appurtenances, furnishing, hauling and placing plugs, clamps and blocking, sheeting and bracing, backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item. The Hydrants removed under this Item shall become the property of the Contractor and shall be disposed of by him.

ITEM SPECIAL - 6" FIRE HYDRANTS

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - 6" Fire Hydrants", which price and payment shall constitute full compensation for excavating and for furnishing, hauling and placing the 6" fire hydrants and appurtenances, sheeting and bracing, backfill, water used for compaction, the removal of all surplus excavation, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item.

ITEM SPECIAL - VALVES

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Valves", classified as to size, which price and payment shall constitute full compensation for all excavation and backfill, and for furnishing, hauling, and placing the valves, roadway boxes, connections and other material, and for all labor, equipment, tools and incidentals necessary to complete this item.

ITEM SPECIAL - SHEETING AND BRACING LEFT IN PLACE

The number of board feet of sheeting and bracing left in place when ordered by the Engineer, shall be paid for at the unit price of eighty dollars (\$80.00) per thousand feet of "Item Special - Sheeting and Bracing Left in Place", which price and payment shall include full compensation for all labor, equipment, tools and incidentals necessary to complete this item.

EXISTING VALVES

Existing valves and boxes designated in the plans to be abandoned shall be removed to a depth of 2 feet below grade. The valve box remaining in place shall be backfilled and the topography and surface of the immediately surrounding area shall be matched as nearly as is practical. The backfilling shall be according to the specifications for backfilling on page 7 of these plans.

Payment will be made for each valve so abandoned at the unit price bid for "Existing Valves, to be Abandoned".

VALVES, TO BE ABANDONED

APPROVED

DATE 4 - 15 - 1964

*G. J. Smith*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. Smith*  
COMMISSIONER OF WATER AND HEAT

*Arnold D. Miller*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. R. Connor*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Sweeney*  
ENGINEER OF DESIGN

Revised C.E.H. 2-3-65

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th Street 16"  
Water Main between Fairfield Avenue and  
Abbey Avenue.

MADE F.V.R. DATE 3-27-64 TRACED DATE  
CHECKED D.R.K. DATE 3-27-64 SCALE

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

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		11 77

CUYAHOGA COUNTY  
CUY-90-14.67

RECORDED  
FEB 24 1963

Item T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT		
	Sq. Yds.	Total
Relocated West 15th Place. Station 0+00 to Station 3+06.0; $306.00 \times 25 \div 9 =$	850.0	
Southwest Radius; $\frac{(24.50 \times 27.00) - (\pi \times 24.50^2 \div 4)}{9} =$	21.1	
Southeast Radius; By Planimeter =	145.0	
<b>Total 9" Reinforced Concrete Pavement</b>		<b>1016.1</b>

Item B-19 AGGREGATE BASE COURSE	
Area of Drive Apron required to serve parking area of Industrial Building left of Station 995+00: $65 \times 24 = 1,560$ Sq. Ft.	
Volume of B-19 = $\frac{1,560 \times 5}{9 \times 36} =$	<b>24.1</b> Cu. Yds.

Item E-11 WATER	
Volume of Material for which payment will be made for the addition of water. Item E-1 Embankment = 35,252 C.Y. Item B-19 Aggregate Base = $\frac{24}{35,276}$ C.Y.	
Volume of Water = $\frac{35,276 \times 5 \text{ Gal.}}{1000 \text{ C.Y.}} =$	<b>176</b> M Gal.

Item I-12 STANDARD TYPE 2-A CURB		
	Lin. Ft.	Total
Southwest Radius Relocated West 15th =	39.6	
Southeast Radius Relocated West 15th =	112.8	
Station 0+00 to Station 2+78.43 Left Side Relocated West 15th =	278.4	
Station 0+00 to Station 2+44.65 Right Side Relocated West 15th =	244.6	
<b>Total Item I-12 Standard Type 2-A Curb</b>		<b>675</b>

EARTHWORK		
	Cubic Yards	
	Excavation	Embankment
Cross Section Sheet 18	1,579	16,934
Cross Section Sheet 19	63	18,318
Additional Excavation to be performed left of Fairfield Avenue after retaining wall is removed $\frac{(50+128)(12.5) + 128(89.5)}{2(27)} =$	182	
<b>Total Item E-1 Excavation, Method B</b>	<b>1,824</b>	
<b>Total Embankment</b>		<b>35,252</b>
<b>Total Item E-4 Borrow = <math>\frac{35,252(1.18) - 1,824}{1.024} =</math></b>		<b>39,773</b>

Item E-8 REMOVAL AND DISPOSAL OF EXISTING STONE CURB		
	Lin. Ft.	Total
From Station 1+04.16 along the south side of Fairfield and the west side of Existing West 15th Street	170	
South side of Fairfield Avenue from West 15th Street to West 14th Street	240	
West side of West 14th Street to a point 266 feet south of E Fairfield Avenue	260	
<b>Total E-8 Removal and Disposal of Existing Stone Curb</b>		<b>670</b>

Item T-35 ASPHALTIC CONCRETE SURFACE COURSE (70-85)	
Area of Drive Apron required to serve parking area at Industrial Building left of Station 995+00: $65 \times 24 = 1,560$ Sq. Ft.	
Volume of T-35 = $\frac{1,560 \times 2}{9 \times 36} =$	<b>9.6</b> Cu. Yds.

Item I-19 INSULATION COURSE AND SUBBASE COURSE		
Area to be covered by I-19 is the same as the T-71, 9" Pavement? T-71 Area = 1016.1 Sq. Yds.		
<b>Total I-19 3" Insulation Course</b>	<b>1016.1</b>	<b>Sq. Yds.</b>

Item E-8 REMOVAL AND DISPOSAL OF EXISTING PAVEMENT		
	Sq. Yds.	Total
Fairfield Avenue: Station 1+04.16 to 2+30.47 = $\frac{130 \times 2}{9}$	29	
<b>Total Item E-8 Removal and Disposal of Existing Pavement</b>		<b>29</b>

Item E-8 REMOVAL AND DISPOSAL OF EXISTING SIDEWALK		
	Sq. Ft.	Total
Fairfield Avenue: Sta. 2+36, Rt. Estimate 3' x 28' =	84	
Sta. 2+79, Rt. Estimate 3' x 52' =	156	
Sta. 3+09, Rt. Estimate 3' x 50' =	150	
Sta. 1+04 to 1+95, Rt. 6' x 91' =	546	
Sta. 2+20 to 4+05, Rt. 6' x 195' =	1170	
West 14th Street (West Side): 44' South of E Fairfield 5' x 44' =	220	
72' South of E Fairfield 5' x 41' =	205	
206' South of E Fairfield 4' x 41' =	164	
206' South of E Fairfield 3' x 27' =	81	
242' South of E Fairfield 3' x 120' =	360	
<b>Total E-8 Removal and Disposal of Existing Sidewalk</b>		<b>3136</b>

Item I-13 4" CONCRETE SIDEWALK		
Sta. 1+04.16 to Sta. 2+05 Fairfield	Sq. Ft.	Total
6' x 20' =	120	
6' x 65' =	390	
$\frac{(25 + 48) 138 + 48 \times 16}{2} =$	5,421	
6' x 12' =	72	
<b>Total I-13 4" Concrete Sidewalk</b>		<b>6,003</b>

Item L-9 SEEDING AND PROTECTING		
	Sq. Yds.	Total
The area to be seeded extends from Sta. 997+00 to Fairfield Avenue and includes the existing treelawns along Fairfield Avenue and West 14th Street which are adjacent to the Limited Access Lines. All areas are by Planimeter: Left of I-90, Sta. 997 to Fairfield	3,222	
Left of Relocated West 15th	390	
Right of I-90, Sta. 997 to Fairfield	2,900	
Fairfield Treelawn	90	
West 14th Treelawn	410	
Area to be site graded North of Fairfield	215	
<b>Total L-9 Seeding and Protecting</b>		<b>7,227</b>

Item E-8 REMOVAL AND DISPOSAL OF EXISTING DRIVES AND APRONS		
	Sq. Yds.	Total
Drive and Apron Sta. 3+45 Fairfield: $\frac{8 \times 11 + 56 \times 10}{9} =$	72.0	
Drives and Aprons along W. 14th Street: 130' South of Fairfield = $\frac{30 \times 39 + 37 \times 16.5}{9} =$	197.8	
172' South of Fairfield = $\frac{8 \times 58 + 10 \times 16.5}{9} =$	69.9	
<b>Total Item E-8 Removal and Disposal of Existing Drives and Aprons</b>		<b>340</b>

Item S-22 REMOVAL OF PORTION OF EXISTING STRUCTURE		
	Cu. Yds.	Total
Existing wall left of Fairfield Avenue Sta. 2+62 to Sta. 3+64 $\frac{5 \times 20 \times 1.5}{27} =$	5.6	
$\frac{(5 + 9) 12 \times 1.5}{2 \times 27} =$	4.7	
$\frac{9 \times 90 \times 1.5}{2 \times 27} =$	22.5	
<b>Total S-22 Portion of Existing Structure to be removed</b>		<b>32.8</b>

Item I-12 STANDARD TYPE 6 CURB		
Fairfield Avenue Right Side Sta. 2+30.47 to Sta. 4+57 =	Lin. Ft.	Total
	227	
Radius =	25'	
West 14th Street to a point 266' South of the E Fairfield Avenue =	235'	
<b>Total Item I-12 Standard Type 6 Curb</b>		<b>487'</b>

Item L-9 AGRICULTURAL LIMING MATERIAL		
The area to be treated with lime is the same area as that to be seeded 9x7227 Sq. Yds. @ .05 Ton = 1000 Sq. Ft.	3.25	Tons

Item L-10 SODDING FOR SPECIAL BERM AND SLOPE PROTECTION		
Sta. 998+62, Left Wingwall	Sq. Yds.	Total
$\frac{[(100 \times 9) - (3 \times 15) + (20 \times 7) + (10 \times 20)] \div 9}{9} =$	133	
Sta. 999+02, Right Wingwall $\frac{[(47 \times 9) - (3 \times 15) + (6.5 \times 16) + (7 \times 5)] \div 9}{9} =$	58	
<b>Total Item L-10 Sodding for Special Berm and Slope Protection</b>		<b>191</b>

Item L-9 COMMERCIAL FERTILIZER (12-12-12)		
The area to be treated with fertilizer is the same areas that to be seeded. 9x7227 Sq. Yds. @ .01 Tons = 1000 Sq. Ft.	0.65	Tons

MADE DRK DATE 1-2-64 TRACED DATE  
CHECKED S.D.H. DATE 2-10-64 SCALE

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

MICROFILMED  
FEB 24 1983

# GENERAL SUMMARY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

12  
77

CUYAHOGA COUNTY  
CUY -90-14.67

SHEET NUMBERS						TOTAL QUANT.	UNIT	ITEM	I-90-1(55)25	DESCRIPTION
4	5	11	15	16						
<b>ROADWAY (TYPE CODE 7221)</b>										
		1824				1,824	Cu. Yds.	E-1		Roadway Excavation, Method B
		39773				39,773	Cu. Yds.	E-4		Borrow
		29				29	Sq. Yds.	E-8		Removal and Disposal of Existing Pavement
		3136				3,136	Sq. Ft.	E-8		Removal and Disposal of Existing Sidewalk
		670				670	Lin. Ft.	E-8		Removal and Disposal of Existing Curb
		340				340	Sq. Yds.	E-8		Removal and Disposal of Existing Concrete Driveways and Aprons
						Lump	Lump	E-9		Removal of Trees and Stumps
		176				176	M. Gal.	E-11		Water
		6003				6,003	Sq. Ft.	I-13		4" Concrete Sidewalk
2						2	Tons	I-4		Calcium Chloride for Dust Control
100						100	M. Gal.	I-4		Water for Dust Control
		2000				2,000	Lin. Ft.	I-26		Chain Link Fence
		7227				7,227	Sq. Yds.	L-9		Seeding and Protecting, as per plan
		0.65				0.65	Tons	L-9		Commercial Fertilizer (12-12-12)
		3.25				3.25	Tons	L-9		Agricultural Liming Material, as per plan
		81				81	Sq. Yds.	L-10		Sodding
		191				191	Sq. Yds.	L-10		Sodding for Special Berm and Slope Protection, as per plan
		33				33	Cu. Yds.	S-22		Removal of Portion of Existing Structure
100						100	Cu. Yds.	T-10		Traffic Compacted Surface Course for Maintaining Traffic
25						25	Cu. Yds.	T-35		Asphaltic Concrete Surface Course, or an approved Bituminous Premixed Surface Course, for Maintaining Traffic
<b>PAVEMENT (TYPE CODE 7221)</b>										
		24				24	Cu. Yds.	B-19		Aggregate Base Course
		675				675	Lin. Ft.	I-12		Standard Type 2-A Concrete Curb
		487				487	Lin. Ft.	I-12		Standard Type 6 Concrete Curb
		1016				1,016	Sq. Yds.	I-19		3" Insulation Course and Subbase Course
		10				10	Cu. Yds.	T-35		Asphaltic Concrete Surface Course, Type C (70-85)
		1016				1,016	Sq. Yds.	T-71		9" Reinforced Portland Cement Concrete Pavement
<b>DRAINAGE (TYPE CODE 7221)</b>										
100						100	Lin. Ft.	I-1		6" Pipe, Class I-3
100						100	Lin. Ft.	I-1		8" Pipe, Class J-1
		35				35	Lin. Ft.	I-1		12" Pipe, Class J-1
		6				6	Lin. Ft.	I-1		15" Pipe, Class F-4
		30				30	Lin. Ft.	I-1		21" Pipe, Class E-1
		83				83	Lin. Ft.	I-1		21" Pipe, Class J-1, Sec. M-6,6(b) or Sec. M-6,8(b)
		1				1	Each	I-8		Standard 2-2-A Catch Basin
		3				3	Each	I-8		Standard 3-A Catch Basin
		253				253	Lin. Ft.	I-14		Standard Type 1 Paved Gutter
		1				1	Each	I-16		Manhole Abandoned
		2				2	Each	I-16		Catch Basin Abandoned
<b>WATERWORK (TYPE CODE Y060)</b>										
		123				123	Lin. Ft.	Special		16" Water Main A.S.A., Cl. 25 C.I. Pipe, Cement Lined, Lead or Slip-on Joints (Includes Fittings and Concrete Piers)
		27				27	Lin. Ft.	Special		16" Water Main A.W.W.A., Cl. "D", C.I. Pipe and Offsets, Cement Lined, Lead Joints
		1				1	Each	Special		Service Connection Relocation and Fittings, Valve and Box, Water Meter and Vault, complete
		18				18	Each	Special		Service Connections disconnected and plugged at the Main
		2				2	Each	Special		Existing Valves to be abandoned
		20				20	Lin. Ft.	Special		6" Water Main, A.S.A., Cl. 25, C.I. Pipe, Cement Lined, Lead Joints

SHEET NUMBERS						TOTAL QUANT.	UNIT	ITEM	I-90-1(55)25	DESCRIPTION
<b>WATERWORK (TYPE CODE Y060)</b>										
		1				1	Each	Special		6" Valve
		1				1	Each	Special		6" Fire Hydrant
		1				1	Each	Special		Fire Hydrant Removed
										For Estimated Quantities - Lighting, see Sheet No. 23
										For Estimated Quantities - Bridge (Innerbelt Extension) see Sheet No. 29
										For Estimated Quantities - Overhead Sign Structures, see Sheet No. 67
						Lump	Lump			Construction Layout Stakes
						Lump	Lump	I-3		Maintaining Traffic
<b>BUILDING REMOVAL (TYPE CODE 7221)</b>										
						Lump	Lump	E-10	Parcel 4278 WL	Removal of one 2 story frame residence, and one 2 car frame garage
						Lump	Lump	E-10	Parcel 4284 WL	Removal of one 2 1/2 story frame residence, one 2 story frame residence, and one 4 car frame garage
						Lump	Lump	E-10	Parcel 4285 WL	Removal of one 2 1/2 story frame residence and one 2 story frame residence
						Lump	Lump	E-10	Parcel 4287 WL	Removal of one 2 1/2 story frame residence and one 2 story frame residence
						Lump	Lump	E-10	Parcel 4289 WL	Removal of one 2 + story brick residence, one 2 story brick residence, and one 4 car brick garage
						Lump	Lump	E-10	Parcel 4291 WL	Removal of one 1-story brick commercial building

MADE DEK DATE 1-3-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED F.V.R. DATE 2-10-64 SCALE \_\_\_\_\_

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

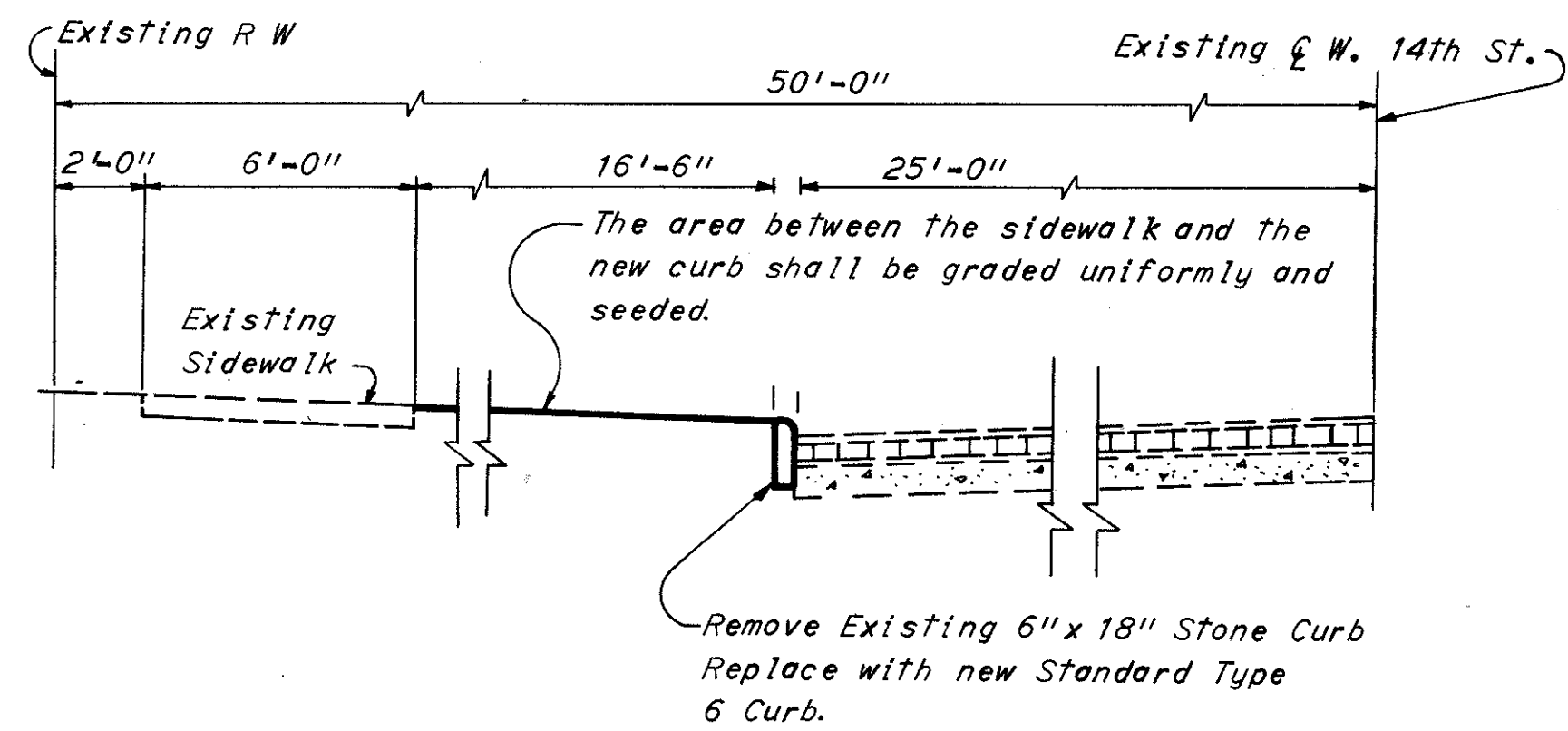
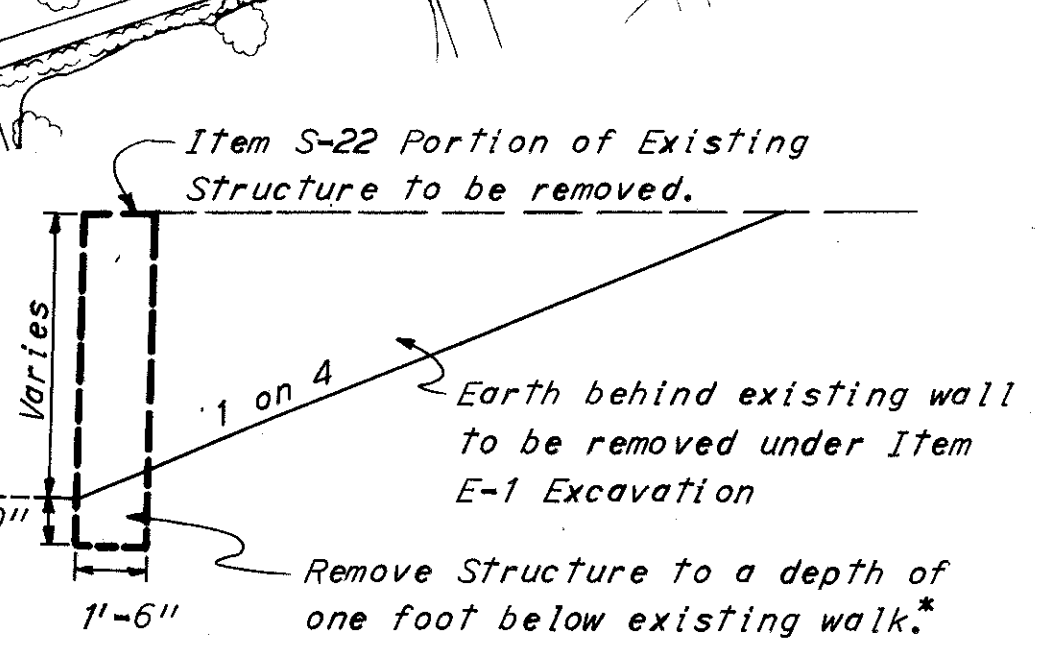
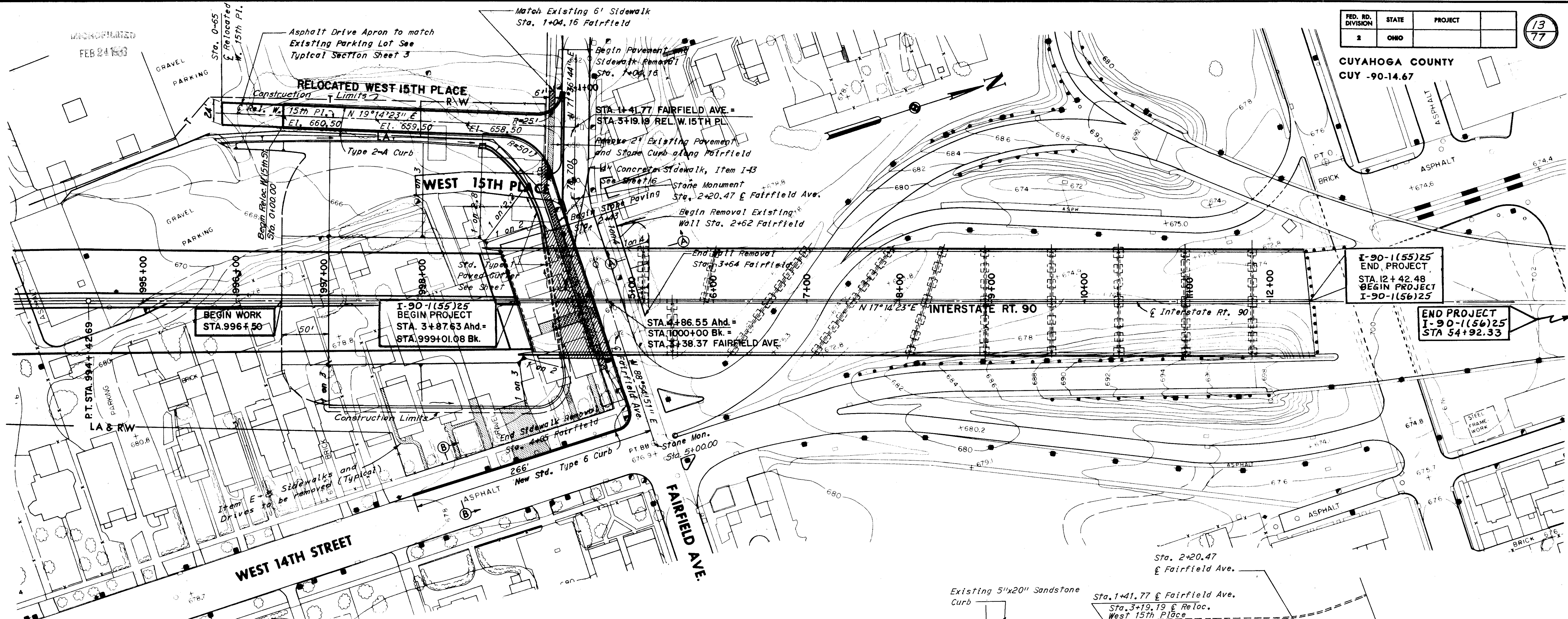
Rev 7-2-64

MICROFILMED  
FEB 24 1963

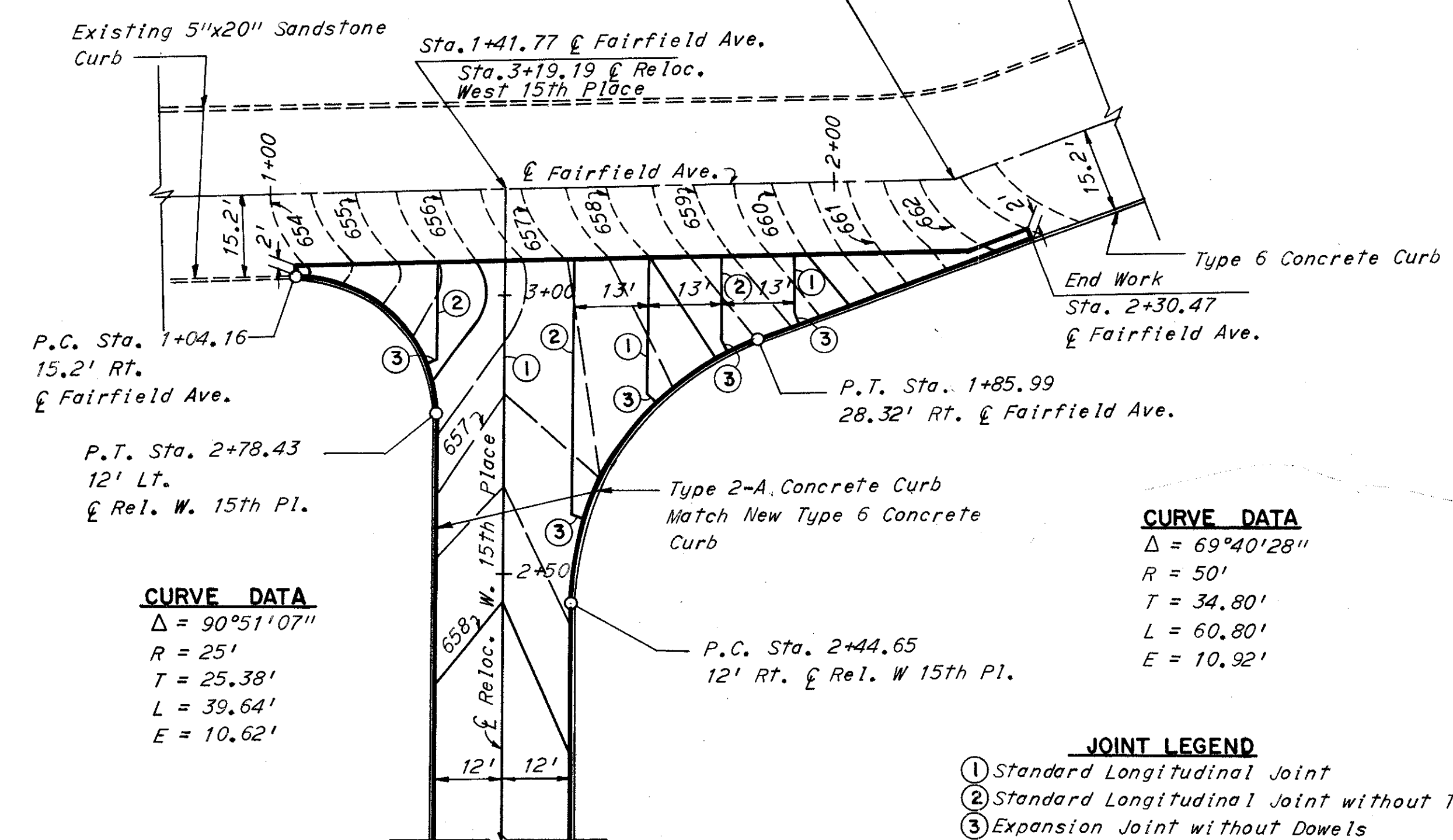
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

13  
77

CUYAHOGA COUNTY  
CUY -90-14.67



Note:  
The grading required in the treelawn along W. 14th Street and Fairfield Avenue shall be included for payment with Item E-8 Removal and Disposal of Existing Driveways and Aprons.



MADE DRK DATE 1-2-64 TRACED DATE  
CHECKED F.V.R. DATE 2-10-64 SCALE 1" = 50' or As Shown

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

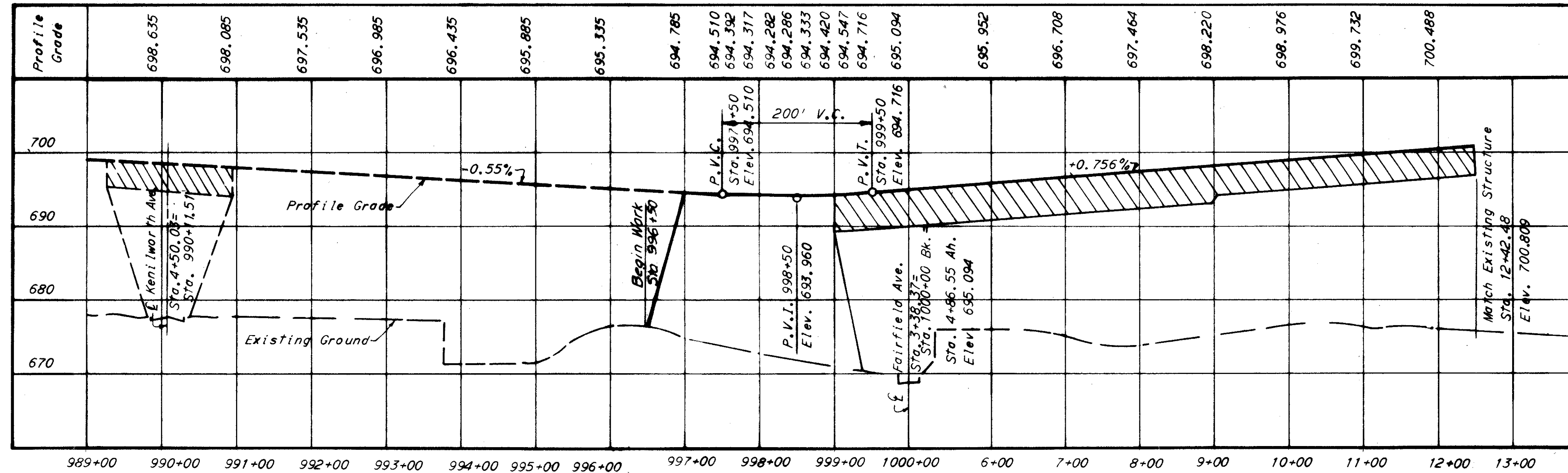
UNCORRECTED  
FEB 24 1963

# PROFILES

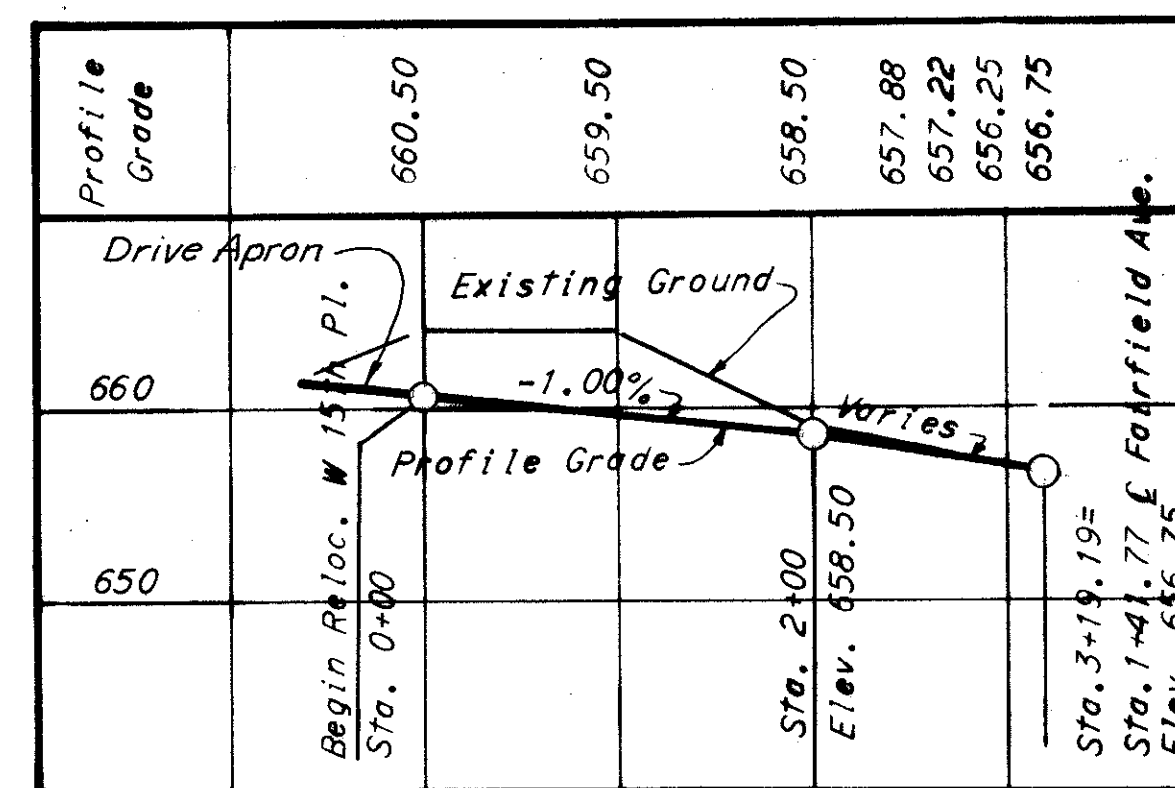
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

14  
77

CUYAHOGA COUNTY  
CUY-90-14.67



**MEDINA FREEWAY**



**RELOCATED WEST 15TH PLACE**

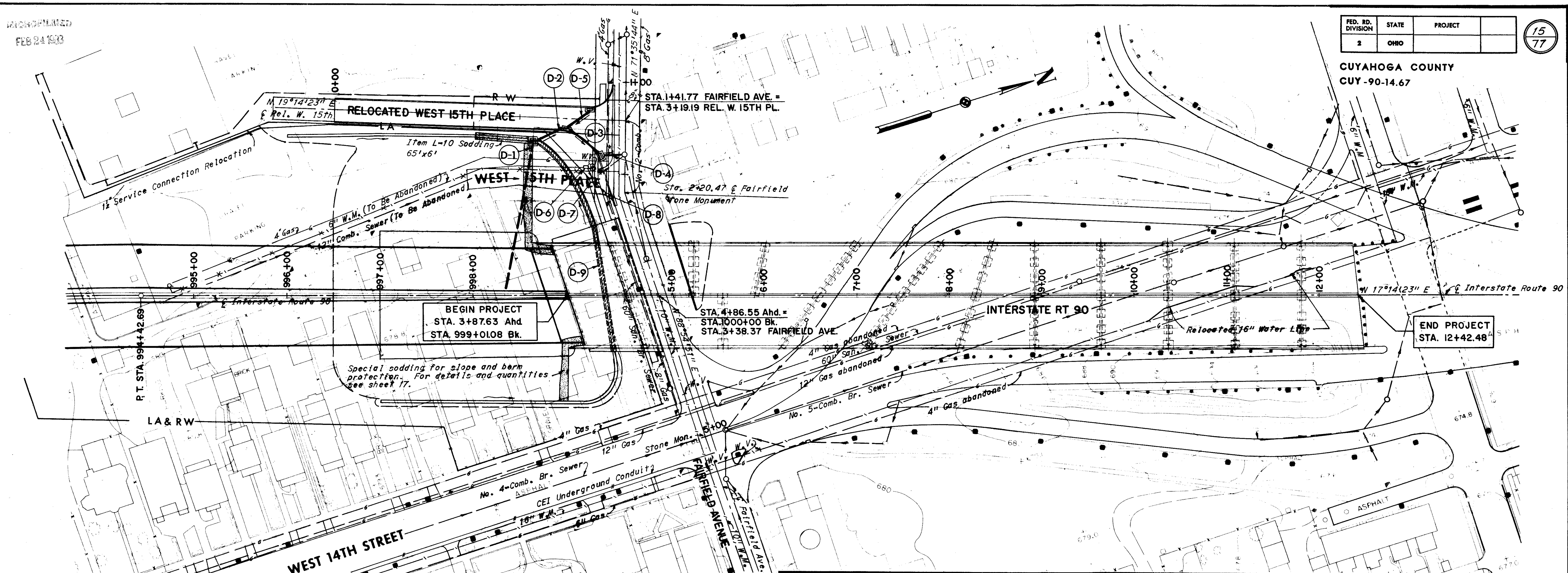
MADE DRX DATE 1-2-64 TRACED DATE  
CHECKED F.V.R. DATE 2-10-64 SCALE 1"=100' Hor., 1"=10' Vert.

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

REVISIONS  
FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		15 77

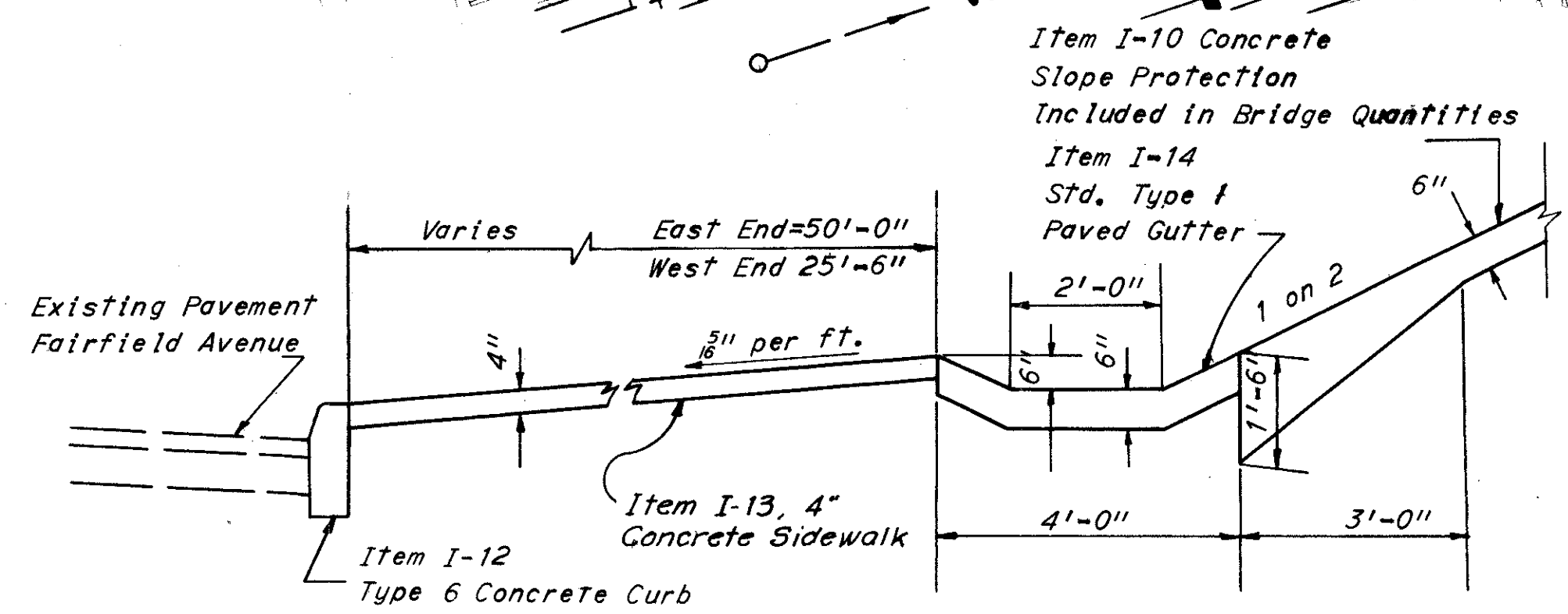
CUYAHOGA COUNTY  
CUY-90-14.67



BEGIN PROJECT  
STA. 3+87.63 Ahd  
STA. 999+01.08 Bk.

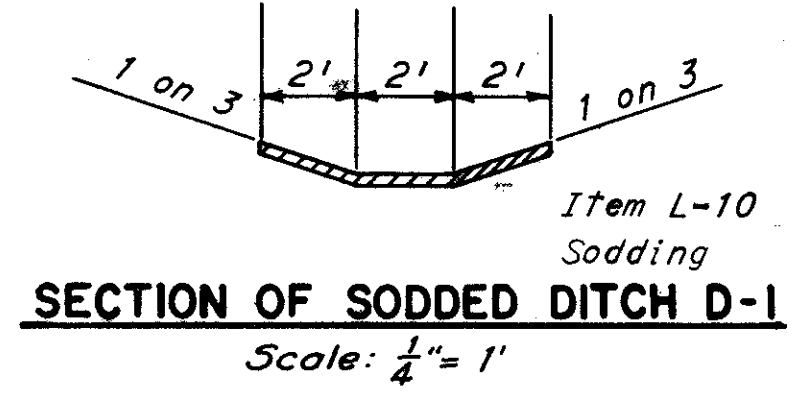
END PROJECT  
STA. 12+42.48

Special sodding for slope and berm protection. For details and quantities see sheet 17.



**FAIRFIELD AVENUE PAVED GUTTER DETAIL**  
Scale: 1/2" = 1'

Notes:  
For Standard Type 1 Paved Gutter Details refer to Standard Construction Drawing I-14G. Distances from Existing Curb, Fairfield Avenue to Paved Gutter, are measured along outside edges of slope protection. Flow Line, East End 674.5  
Flow Line, West End 663.5



**SECTION OF SODDED DITCH D-1**  
Scale: 1/4" = 1'

Station	Std. No. 2-2-A C.B. Sta. 998+65 E I-90 169' Lt. N.G. = 656.70	Sta. No. 3-A C.B. Sta. 2+50 E Reloc. W. 15th 12' Rt. N.G. = 657.34	Std. No. 3-A C.B. Sta. 1+82 E Fairfield Ave. 29' Rt. N.G. = 658.30	Existing Manhole Sta. 1+79 Fairfield E
660			Existing Ground	
650	30'-21" @ 2.0%	Finished Ground 53'-21" @ 2.0	30'-21" @ 2.0	
640	653.33	649.30 648.90 648.86	Class J-1 Sec. or M. 6.6(b) or M. 6.8(b)	647.80 647.76 647.16 648.6
*Plug End of F-4 Pipe for Future Connection				
	<b>D-1</b>	<b>D-2</b>	<b>D-3</b>	<b>D-4</b>

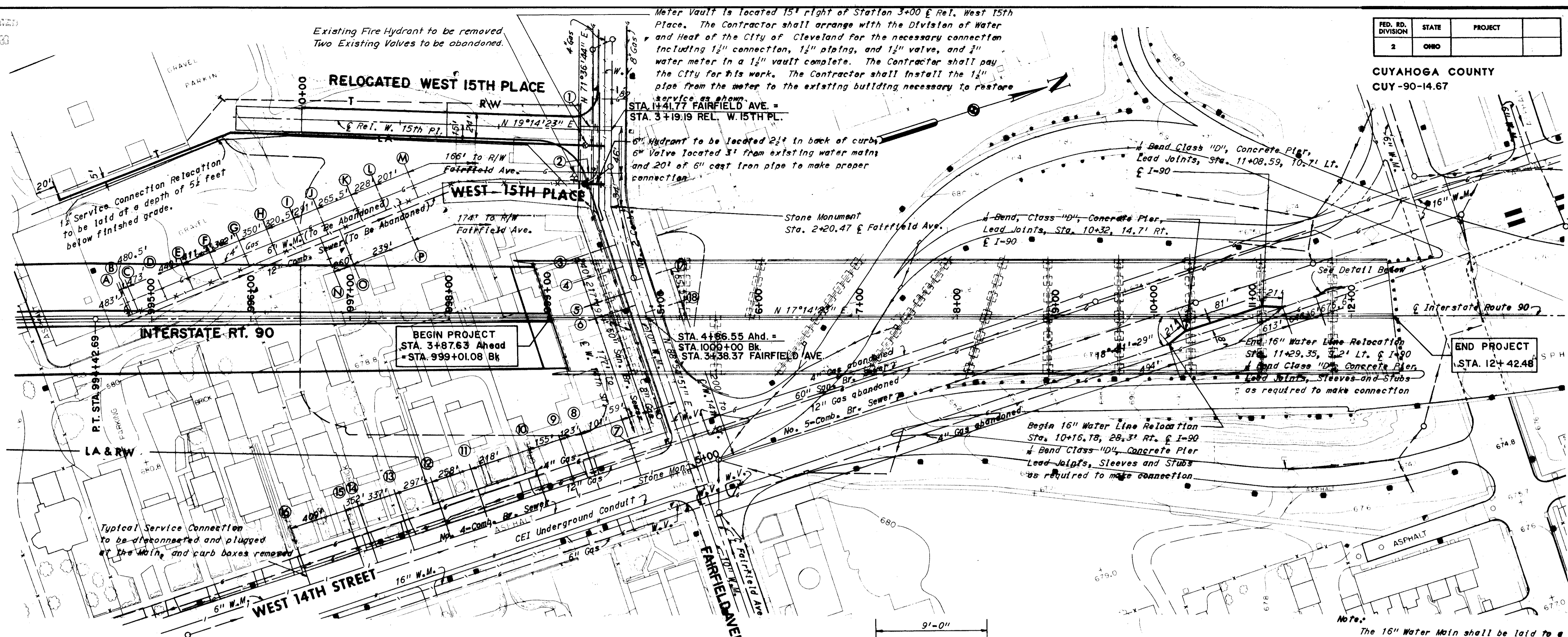
Station	Std. No. 3-A C.B. Sta. 2+75 E Reloc. W. 15th 12' Lt. N.G. 656.50	Std. No. 3-A C.B. Sta. 2+50 E Reloc. W. 15th 12' Rt. N.G. 657.34
660		
650	35'-12" @ 0.5% Class J-1	653.00 652.83
640		
	<b>D-5</b>	

Ref. No.	Station	Side	DRAINAGE QUANTITIES														
			Class J-1		Class F-4		I-1		I-8		I-14		I-16		L-10		
			12"	15"	12"	15"	Class E-1	Class M6.6b	Std. 2-2-A	Std. 3-A	Std. Type 1 Paved Gutter	Manhole Aban-doned	C.B. Aban-doned	Sodding			
D-1	998+65	Lt.															
D-2	998+65	Lt.		6		30			1								43
D-3	998+92	Lt.				53			1								
D-4	999+37	Lt.				30											
D-5	2+75	Lt.	35														
D-6	999+23	Lt.															1
D-7	999+29	Lt.															1
D-8	999+47	Lt.															1
D-9	999+50	Lt.															38
	Total		35	6		30	83		1	3		253		1	2		81

MADE BY F.V.R. DATE 12-21-63 TRACED DATE  
CHECKED DRK. DATE 2-10-64 SCALE 1" = 50'

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





WATERWORK QUANTITIES			
Item	Description	Unit	Quantity
Special	6" Water Main A.S.A., Cl. 25, C.I. Pipe, Cement Lined, Lead Joints	Lin. Ft.	20
Special	16" Water Main A.S.A., Cl. 25, C.I. Pipe, Cement Lined, Lead or Slip-on Joints (Includes Fittings and Concrete Piers)	Lin. Ft.	123
Special	16" Water Main, A.W.W.A., Cl. "D", C.I. Pipe and Offsets, Cement Lined Lead Joints	Lin. Ft.	27
Special	Service Connection Relocation and Fittings, Valve and Box, Water Meter and Vault complete	Each	1
Special	Service Connections disconnected and plugged at the Main	Each	18
Special	Existing Valves, to be abandoned	Each	2
Special	6" Valve	Each	1
Special	6" Fire Hydrants	Each	1
Special	Fire Hydrants Removed	Each	1

SERVICE CONNECTIONS TO BE ABANDONED			
A.	B.	C.	D.
136723*	57929	66102	57930
57928	57933	57931	57937
I.	J.	K.	L.
57938	64334	57932	58070
M.	N.	O.	P.
67596	86175	109711	217684

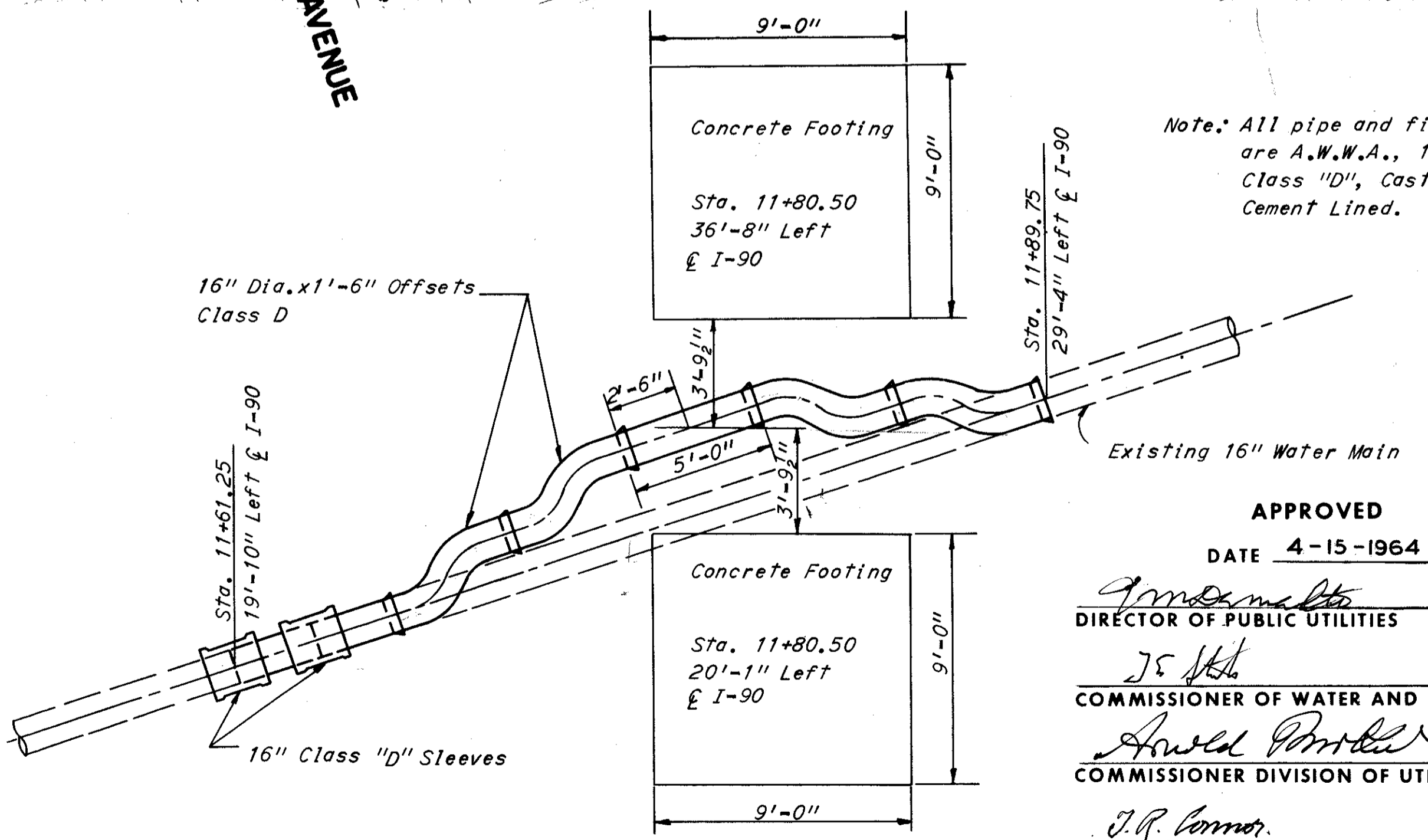
SERVICE CONNECTIONS PLUGGED AT THE MAIN			
1.	2.	3.	4.
99488*	38805	13388	91385
94395	95401	31505	33558
99108	10.	11.	12.
3279	125063	73286	3287
10254	28935	8598	99492
7303	13.	14.	15.
	16.	17.	18.

Note: \* Numbers indicated are Cleveland Water Department Service Connection Designations.

MADE F.V.R. DATE 12-20-63 TRACED DATE  
CHECKED D.R.K. DATE 2-10-64 SCALE 1" = 50'

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

**16" WATERLINE RELOCATION DETAIL**



Note: All pipe and fittings are A.W.W.A., 16" Dia., Class "D", Cast Iron Cement Lined.

APPROVED  
DATE 4-15-1964  
*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES  
*[Signature]*  
COMMISSIONER OF WATER AND HEAT  
*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*[Signature]*  
ENGINEER OF DESIGN

Note: The 16" Water Main shall be laid to a uniform grade to be determined by the Engineer. The Relocated Main shall match the Existing Main and the grade shall be such that no portion of the Main will be high enough to entrap air when the Main is filled. The 16" Water Main shall be shut off while piles are being driven.

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT: Relocation of West 14th Street 16" Water Main between Fairfield Avenue and Abbey Avenue.

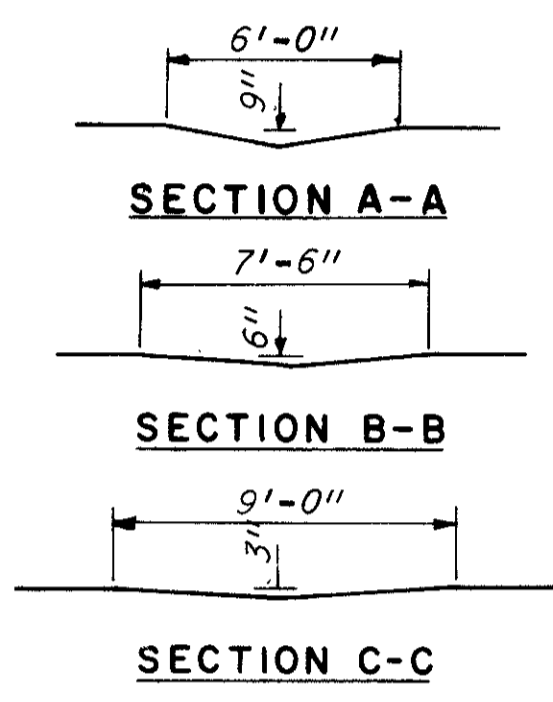
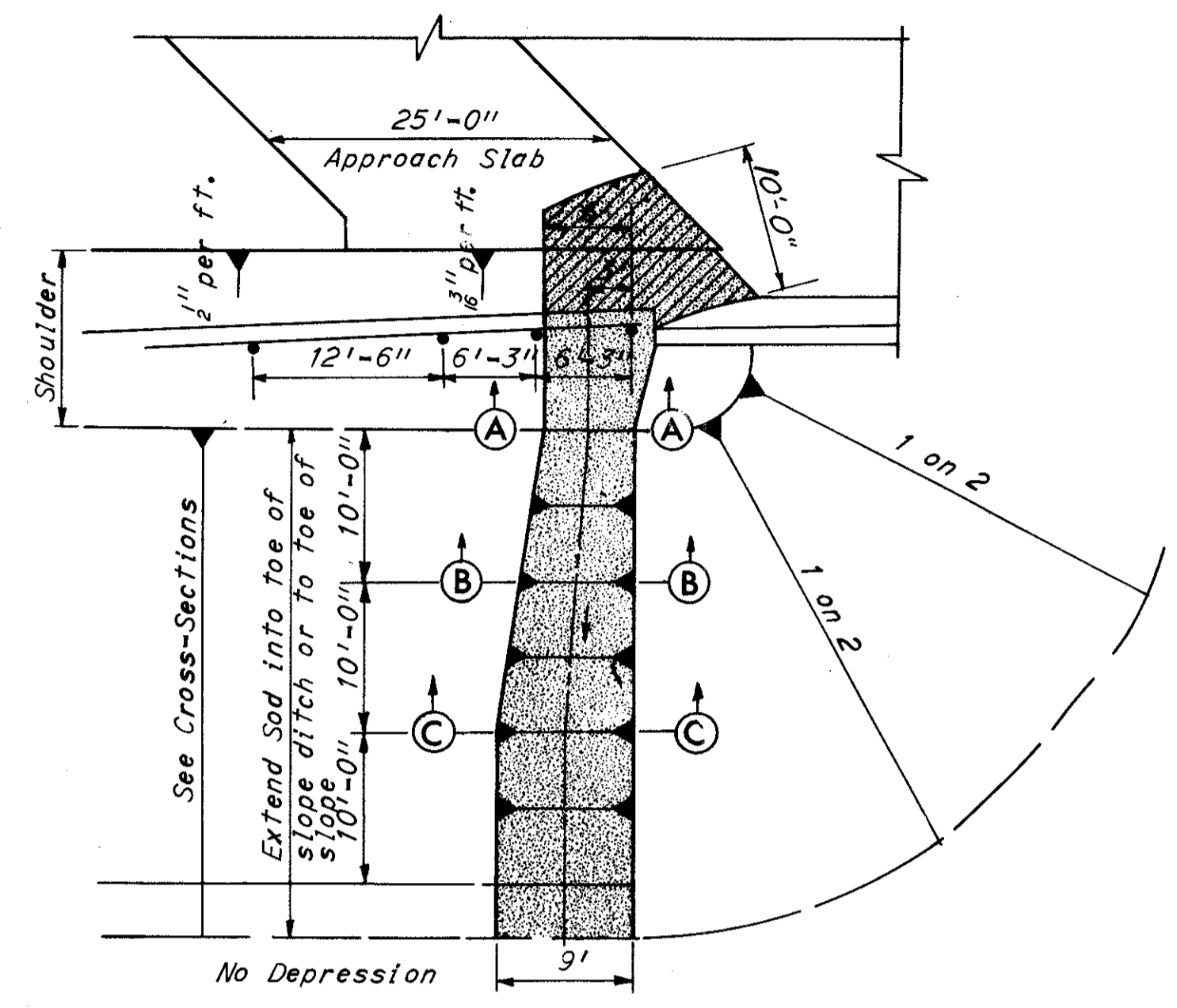
**B-1885**

REVISIONS  
FEB 24 1962

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

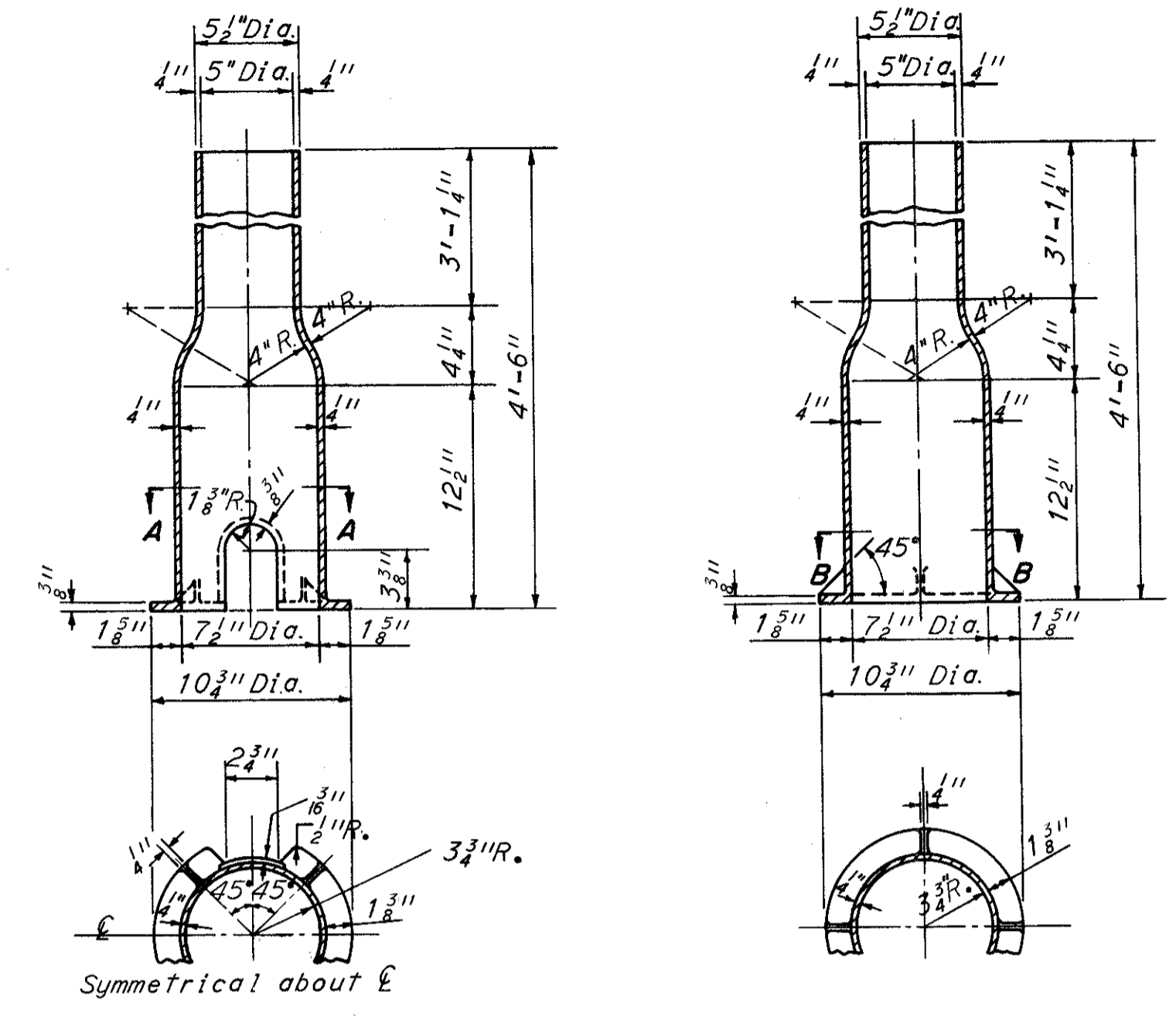
17  
77

CUYAHOGA COUNTY  
CUY-90-14.67



**APPROACH SLAB EROSION CONTROL**  
Scale: 1"=10'

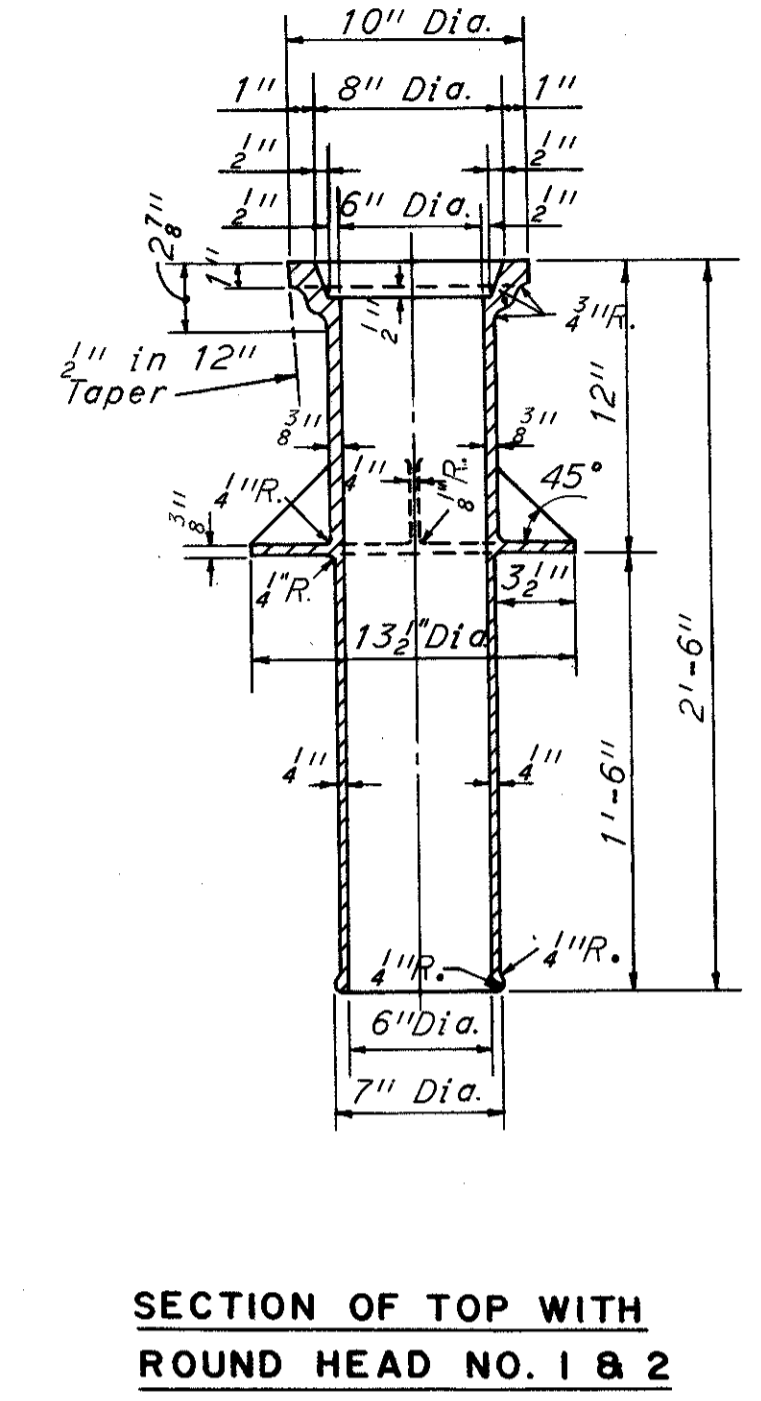
Note: Prior to placement of sod in the berm and slope, galvanized poultry fence shall be placed on the finished grade in strands which shall be at right angles to the direction of flow. Each strand shall be staked securely on top and bottom with stakes spaced at four foot intervals and alternated in rows four feet apart. Omit Poultry Fence in cross-hatched area. Stakes shall be 1"x1"x8" wood stakes and shall be perpendicular to the ground and flush with the finished grade. The fence shall be Straight Line Poultry Fence of equivalent with strand width of four feet, having a two inch mesh and all wires No. 20 gauge. Each strand of fencing shall be fastened together at twelve inch intervals by means of hog rings. The fence shall be secured to the stakes by metal staples. Sod shall be laid in accordance with Construction and Materials Specifications Section L-10.07. For quantities see Quantity Calculations, Sheet 11.



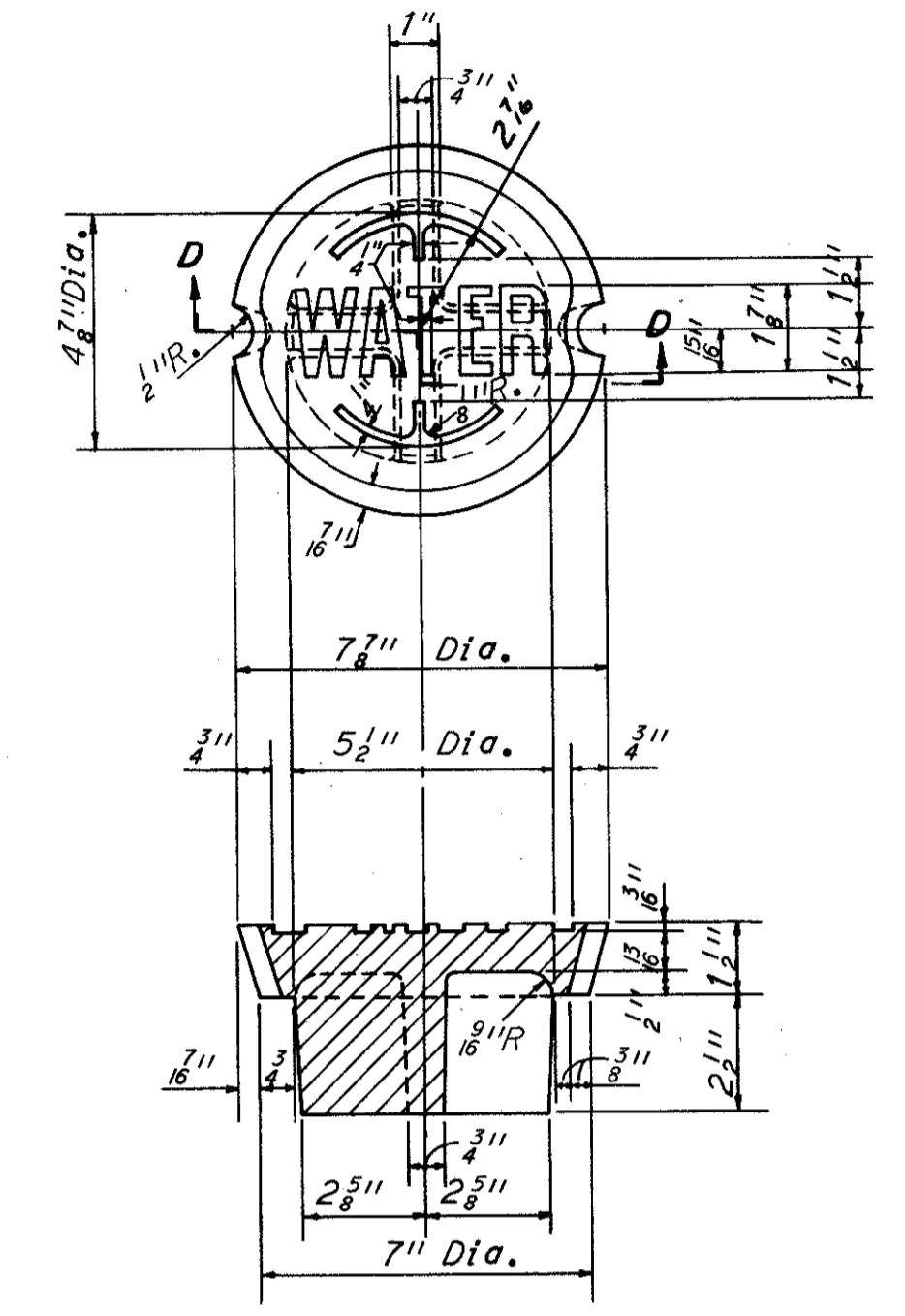
**SECTION A-A**  
Base No. 1 for 1 1/2" and 2" Valves  
Est. Wt. 69#

**SECTION B-B**  
Base No. 2 and 3 for 3", 4", 6" and 8" Valves  
Est. Wt. 71#

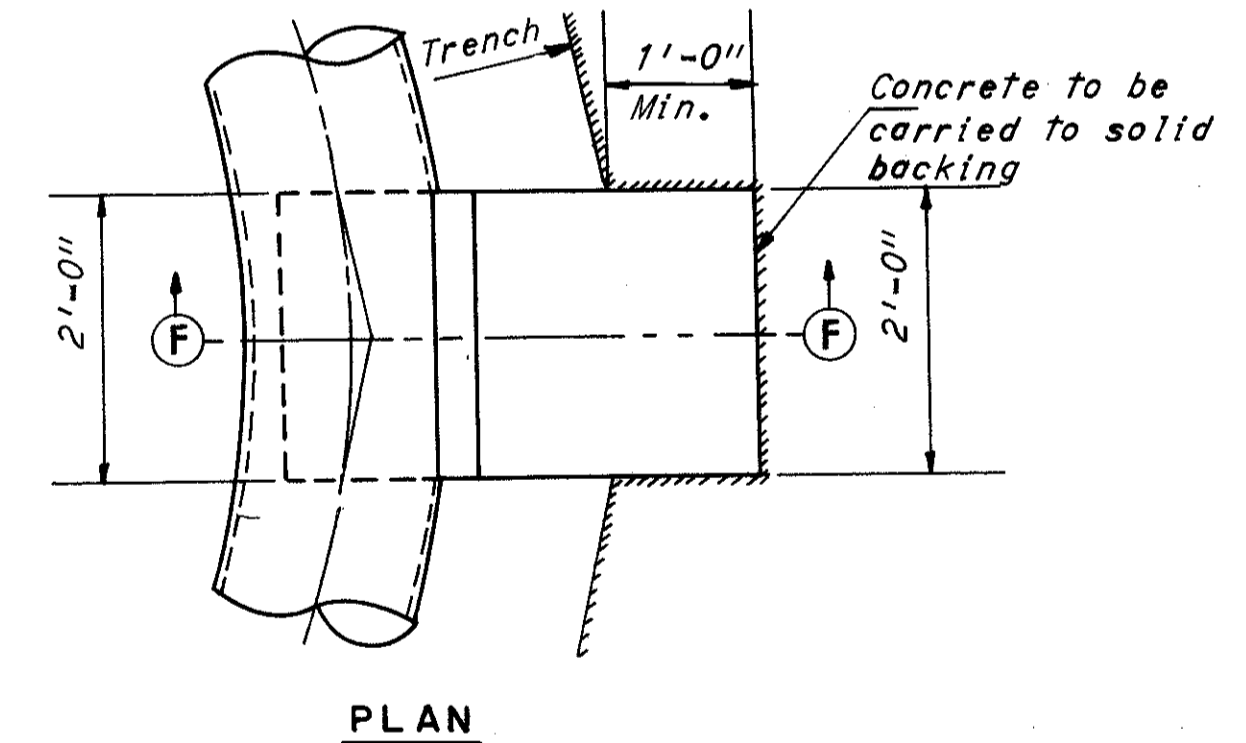
**STANDARD VALVE BOX DETAILS**  
Scale 3/8"=1"



Est. Wt. 73#

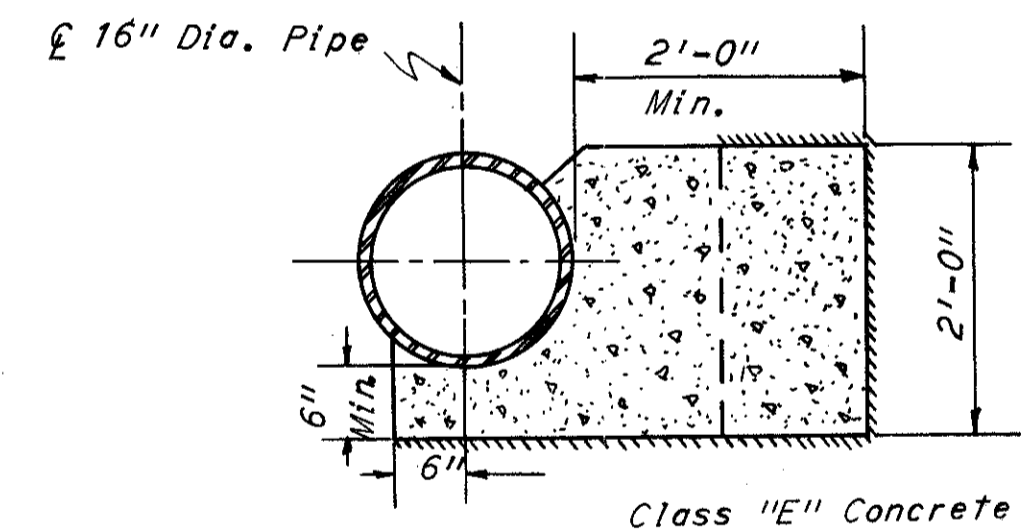


**SECTION D-D**  
Detail of round cover for No. 1 and 2 top  
Est. Wt. 20#



Note: Payment for Concrete Piers is included in the unit price bid per foot for the relocated 16" Water Main.

**CONCRETE PIER FOR BENDS**  
Scale: 3/4"=1'



**SECTION F-F**

APPROVED  
DATE 4-15-1964

*J. J. ...*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. ...*  
COMMISSIONER OF WATER AND HEAT

*Arnold ...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. R. ...*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. ...*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of West 14th St. 16" Water Main between Fairfield Avenue and Abbey Avenue.

MADE DRK DATE 1-2-64 TRACED DATE  
CHECKED F.V.R. DATE 2-10-64 SCALE AS SHOWN

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

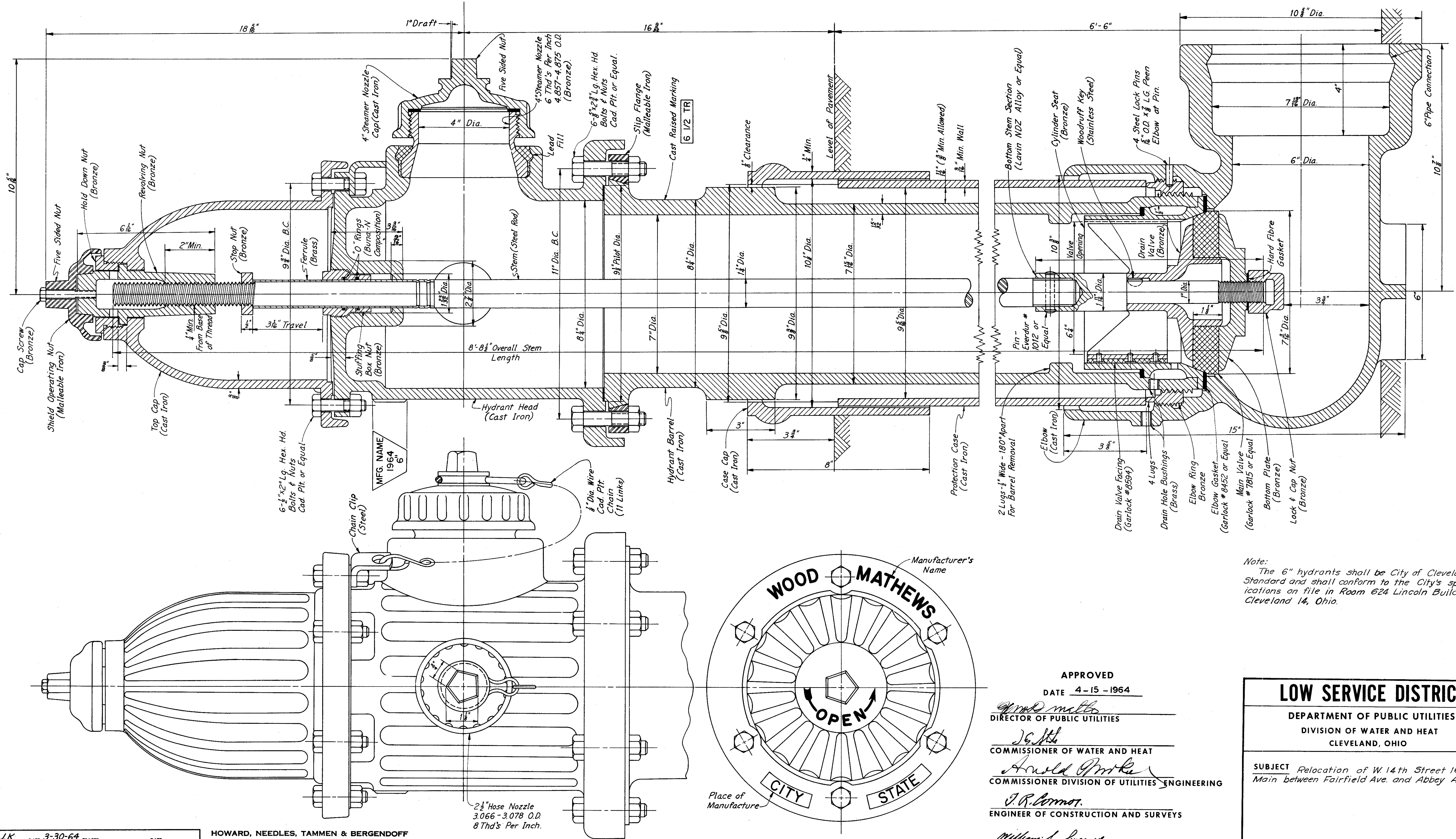
REPRODUCED  
FEB 24 1963

# FIRE HYDRANT DETAIL

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

17A  
77

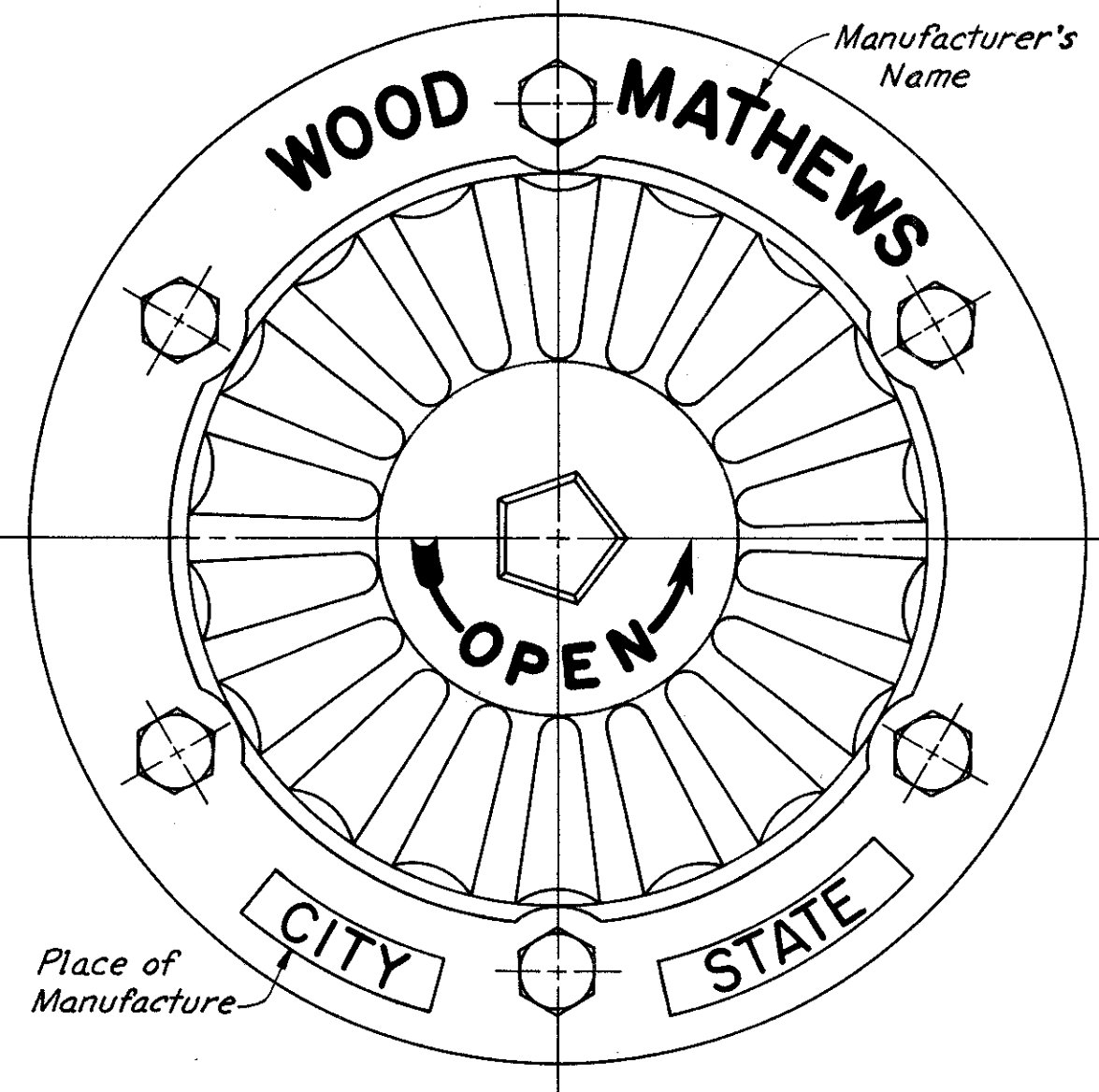
CUYAHOGA COUNTY  
CUY - 90-14.67



MADE R.J.K. DATE 3-30-64 TRACED DATE  
CHECKED DATE SCALE

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

2 1/2" Hose Nozzle  
3.066 - 3.078 O.D.  
8 Thd's Per Inch.



APPROVED  
DATE 4-15-1964  
*Wood Mathews*  
DIRECTOR OF PUBLIC UTILITIES  
*J.G. Holt*  
COMMISSIONER OF WATER AND HEAT  
*Arnold Proke*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*J.R. Cormot*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William A. Sweeney*  
ENGINEER OF DESIGN

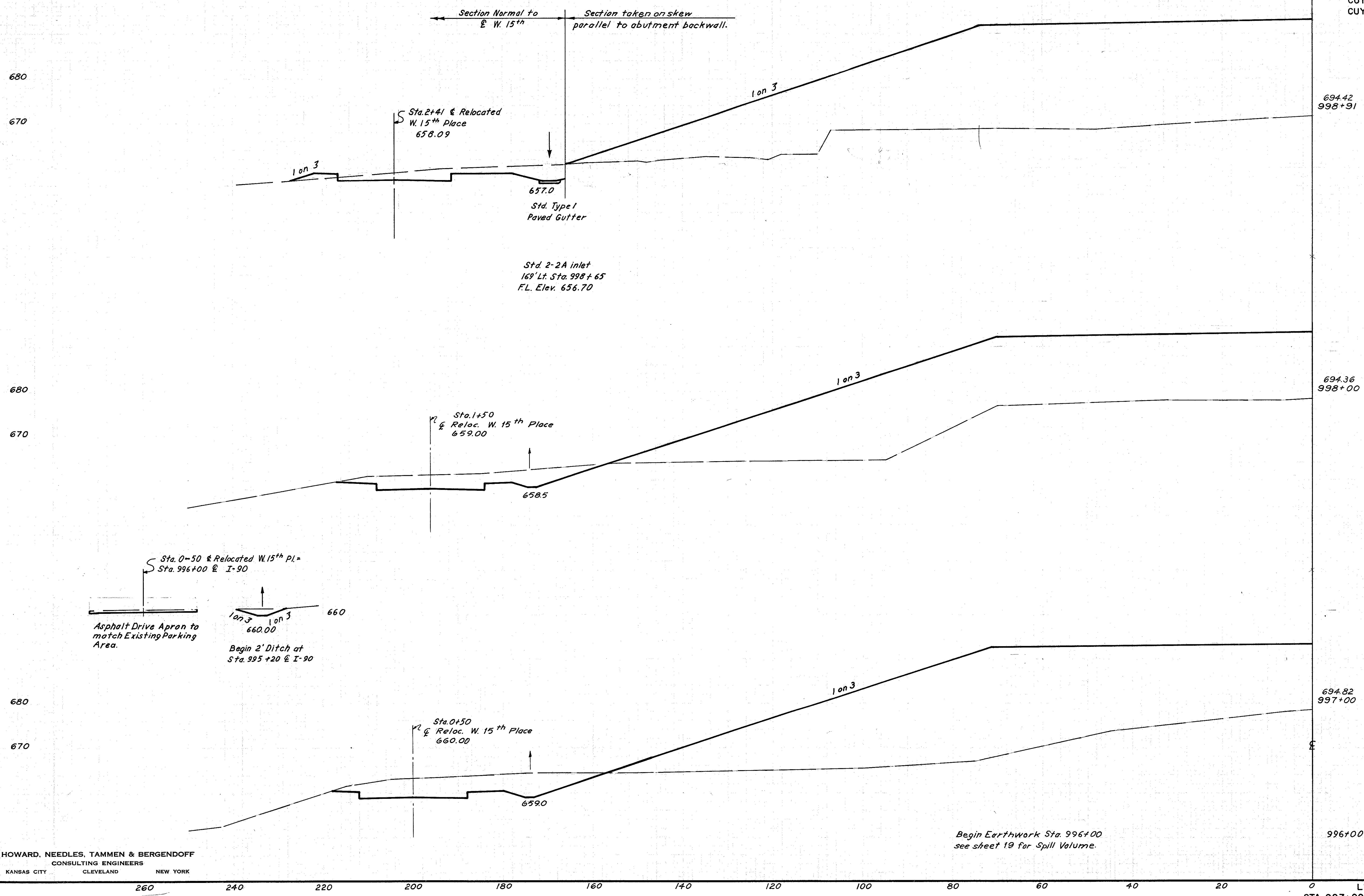
Note:  
The 6" hydrants shall be City of Cleveland Standard and shall conform to the City's specifications on file in Room 624 Lincoln Building, Cleveland 14, Ohio.

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Relocation of W. 14th Street 16" Water Main between Fairfield Ave. and Abbey Ave.

For Spill Volume at South Abutment  
see sheet 19

CUYAHOGA COUNTY  
CUY-90-14.67



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
103	2745		
		434	8249
154	2150		
		693	8685
220	2540		
		452	
24			

MD 08/11/63  
FEB 24 1963

T.J.T.  
 T.J.T.  
 T.J.T.  
 JAG  
 JAG  
 JAG  
 11-11-63  
 11-12-63  
 11-15-63  
 END AREA  
 JAG

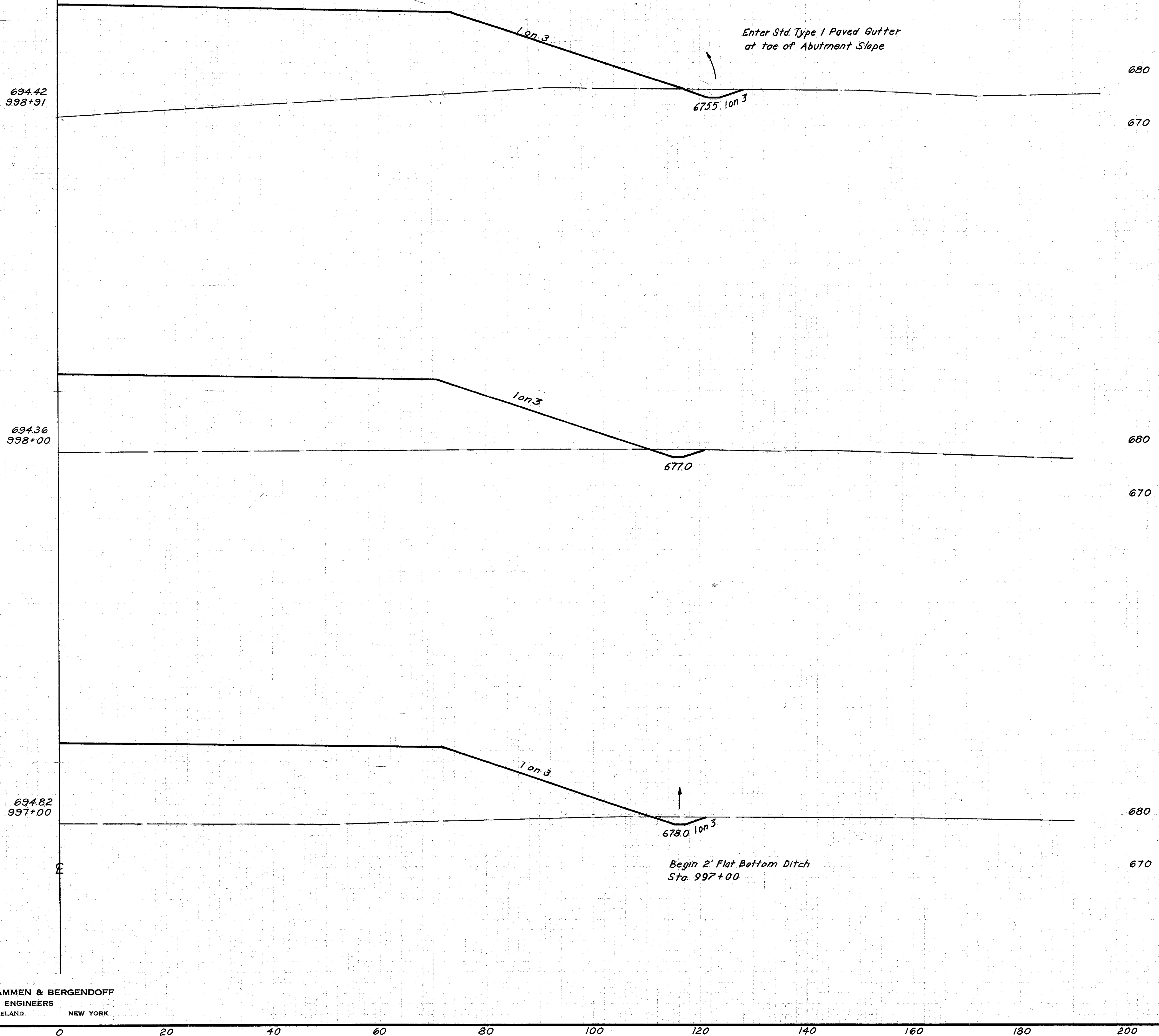
Begin Earthwork Sta. 996+00  
see sheet 19 for Spill Volume.

DATE: FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

19  
77

CUYAHOGA COUNTY  
CUY-90-14.67



Total Spill Volume at South Abutment

$$\frac{50 \times 21 \times 140}{2 \times 27} + \frac{6080 \times 23}{3 \times 27} + \frac{1375 \times 17.5}{3 \times 27} = 4,678 \text{ C.Y.}$$

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
10	1707		4,678
		33	5,123
8	1,333		
		30	5,037
8	1,387		
			3,480

Begin Earthwork Sta. 996+00

$$\text{Total Spill Volume} = \frac{15 \times 50 \times 143}{2 \times 27} + \frac{1725 \times 15}{3 \times 27} + \frac{3,400 \times 28}{3 \times 27} = 3,480$$

T.J.T.  
 T.J.T.  
 T.J.T.  
 ✓ JAG  
 ✓ JAG  
 11-11-63  
 11-12-63  
 11-13-63  
 END AREA ✓ JAG

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

RIGHT HALF  
STA. 997+00 TO STA. 998+91

# LIGHTING NOTES

## GENERAL

These notes supplement the State of Ohio's Construction and Material Specifications dated January 1, 1963, for the materials used and for the installation of a bridge and underpass lighting system for the south Inner Belt Bridge extension portion of Interstate Route 90 on the Cuyahoga County, City of Cleveland Medina Freeway. The cable installation shall be underdeck wired in rigid metal conduits. Mercury street-lighting luminaires with 175 watt clear lamps on expressway and 250 watt clear lamps in underpasses shall be provided. These notes shall include the complete installation of deck lighting units on the structures and mercury underpass lighting units under deck. Included are lighting units to be provided for two handrail posts on the existing Inner Belt Bridge, removal and delivery to the City of two existing lighting units on Ramp W-2, and re-establishment of series circuits. The work to be performed consists of furnishing all labor, supplies, equipment, materials, services, plant and transportation, and performing all operations necessary for the installation of all lighting work in strict accordance with these notes, the Standard Specifications, proposal, supplemental specifications, instructions, notices, and drawings, subject to the terms and conditions of the Contract, and including such instructions as may be furnished by the Director during prosecution of the work in interpretation of said drawings and specifications. These notes, schedules, and the accompanying drawings are intended to provide for all material and labor required to furnish and install the complete lighting system.

The Contractor shall furnish and install all lighting equipment, including all lamps, ballasts, luminaires, standards, base castings, wiring, luminaire brackets, anchor bolts, anchor rods, pull boxes, junction boxes, mountings, conduit, cable, grounds, fused disconnects, and all incidentals necessary for the complete portion of the system, installed, adjusted, regulated, inspected, tested, connected for operation, energized, operating and accepted. Materials not specifically covered shall be of first quality and bear the Underwriters Laboratories' seal of approval. All equipment and devices shall be carefully adjusted and balanced by the Contractor to the complete satisfaction of the Director and the Cleveland Division of Light and Power.

Insofar as practicable, all major items of electrical equipment, such as luminaires, cables, standards, etc., installed under the Contract, shall be of the same type and consist of products of the same manufacturer in order to secure uniformity, single responsibility, and most satisfactory service. Unless specifically noted otherwise, all lighting equipment shall be equal to the latest and best grade of that type of equipment as manufactured by the General Electric Company, Line Material, Westinghouse Electric Corporation, or other approved manufacturer. Throughout the plans, the use of trade names for electrical lighting equipment is meant to be descriptive only. Comparable products of other electrical firms are acceptable if accessories and main members are compatible with one another and serve the intended purpose. Subject to the approval of the Director, equivalent materials and equipment will be allowed.

All materials furnished shall be new, shall be of the best quality and workmanship, shall be the best standard product of a manufacturer regularly engaged in the production of this type of equipment, and shall be of the manufacturer's latest approved design. The responsibility for the correct and satisfactory installation and operation of all materials and equipment required herein shall rest with the Contractor. Before any equipment is ordered or installation of the lighting system is begun, a complete schedule of materials and equipment proposed for installation shall be submitted for the approval of the Director and the Cleveland Division of Light and Power. The schedule shall initially include six sets of catalog cuts, diagrams, drawings, brochures, or other such descriptive data as may be required by the Director. In the event any items of material or equipment contained in the schedule fail to comply with the specification requirements, such items will be rejected. A layout diagram showing in general the arrangement and location of the cables, conduits and equipment is shown. This shall be considered only as illustrative, and subject to the approval of the Director, the Contractor shall modify it as necessary for complete and proper construction and operation. The locations of the branches, conduits, grounds, cables, and luminaires shown on the plans are diagrammatic only, and may be subject to slight shifting as the Director may require in order to conform to local conditions, subject to the maintenance of the lighting intensity indicated on the plans. The Contractor will not be required to submit "As-Built" drawings of the lighting layout portion of the work. The design layout drawings will serve as working "As-Built" drawings. However, the Contractor shall submit to the Director and to the City of Cleveland Division of Light and Power complete sets of corrected prints marked up in colored pencil to show all deviations from the plans.

All electrical materials, construction, and installation shall be in accordance with the National Electrical Code. The lighting installations, when completed, shall comply with the current applicable provisions of the I.E.E.E.

Standards and Practices, American Standards, and National Electric Manufacturer's Association Standards, and shall conform to all local and special laws, codes, or ordinances of the Federal, State and Municipal Departments, commissions, etc., governing such installation, and to the special requirements herein set forth. Should the plans and detail specifications be in conflict with these requirements, through error or omission, the Contractor shall call such conflict to the attention of the Director, and the Contractor shall make the necessary corrections in the installation as he may be directed.

In order to prevent deterioration due to corrosion, all bolts, nuts, studs, washers, pins, terminals, springs and similar fastenings and fittings shall be, where practicable, of an approved corrosion-resisting material such as brass or bronze, or of a material treated in an approved manner to render it adequately resistant to corrosion. Cap screws, set screws, and tap bolts shall be of brass or bronze. Hot-dip galvanizing per A.S.T.M. Specification A 153 will be considered such approved treatment for all ferrous hardware.

## BOXES IN BRIDGE CURBS

Cast iron curb junction boxes shall be provided flush in the bridge walks for branches to standards and underpass lighting units. Boxes shall be complete with bosses, wiring to poles and underpass units, grounding through conduits and bushings, and shall be as shown. Boxes shall be galvanized cast iron of not less than 3/8-inch thickness, not less than 24 inches by 12 inches by 8 inches deep, and shall be complete with checked sidewalk cover, mounting flanges, bosses with drilled and tapped holes, Neoprene gasket, flush brass cover screws, and 1 inch screwed copper drain to below concrete. Boxes shall be O.Z., Hope, or Spring City. The parapet junction boxes at the two existing handrail posts to be provided with lighting units are without covers. The Contractor shall provide covers, gaskets and brass screws, but they will not be measured or paid for separately or directly, but shall be considered as work included in the boxes in bridge curbs.

Item S-25, "Junction Box in Bridge Curb", will be paid for at the contract unit price each, which price shall be full compensation for furnishing and installing box and all appurtenances, conduit connections, checkered covers, gaskets, screws, drain, grounding, splices, and all incidentals.

## BOXES UNDER BRIDGE DECKS

The work to be performed under this specification shall consist of furnishing and installing on the underside of the deck slabs junction boxes of conduit size changes for branches to underpass lighting units. The boxes to be furnished under slabs shall be of not less than 8 inch by 8 inch by 6 inch inside dimensions, surface-mounted, of not less than 9/32 inch walls, unflanged, weatherproof, and constructed of close grain, gray iron castings of machineable quality. The covers and boxes shall be machined for close fitting joints. A hot-dip galvanized finish shall be applied after all surfaces are smoothed, banded, drilled and tapped. Entrances or slip holes with watertight hubs shall be provided for at least five full threads. Boxes shall be complete with reinforcing corner posts, anti-loss chain riveted or welded to box and cover, interior mounting buttons gasket resistant to oil, age, fungus and cold flow, and brass cover screws. Boxes shall be attached to the concrete slabs or girders by not less than four fasteners each, each providing not less than 450 lbs. safe pull-out value as established by Pittsburg Testing Laboratories. Anchors may be pre-set insert fasteners, explosive power tool fasteners, lead and malleable iron fasteners, or self drilling expansion type.

Junction boxes installed, will be measured separately as junction boxes. Item S-25, "Junction Box Under Bridge", will be paid for at the contract price each, which price shall be full compensation for furnishing and installing the complete box with all appurtenances, including conduit connections, fittings, fastenings, grounding, bushings, and all incidentals required.

## PULL BOXES

Concrete pull boxes shall be provided where shown on the layout. The construction of boxes, reinforcing mesh slots, handles and covers shall be as shown in the details. Boxes may be precast or cast-in-place. The walls shall be composed of monolithic reinforced concrete as shown. All entering conduits and sleeves shall be cast or grouted in place. Reinforcing steel 4x4/8 mesh and concrete shall conform to requirements of the Standard Specifications. Precast boxes shall be Reinforced Concrete Pipe, Sec. M-6.6(a), modified as shown in the details. Covers shall be seated. Cable connector assemblies for 3-way cable connections shall be provided on each branch circuit through pull boxes. Plug unused openings.

The work under Item S-25, "Pull Box", each, furnished in place, measured as provided in the foregoing, will be paid for at the contract price per box, which price shall be full compensation for furnishing all required materials, including excavation, forms, concrete, reinforcing steel, cover, impressed "conduit", handle, "Y" cable connectors, grouting conduit, removing waste, and all incidentals.

① Rigid conduit, buried in ground, where it leaves a structure or service pole to nearest pull box shall be galvanized wrought iron pipe or seamless alloy steel pipe. Suppl. Specification M-106.11. Such pipe shall be galvanized inside and outside after threading and shall be further coated inside, with enamel or plastic to provide a smooth raceway.

## CABLE CONNECTORS

Cable connector assemblies for 3-way cable connections shall be provided in pole base handholes for Taps to luminaires, in bridge curb junction boxes for No. 10 AWG branches to underpass lighting units, and in branches through pull boxes. Connectors shall be approved, field applied, waterproof type, and shall be capable of repeated quick disconnects without damage. Conducting parts shall be copper. Bodies and housings shall be of water-resistant synthetic rubber suitable for direct burial or installation in sunlight. Metal and rubber parts shall be lubricated with silicone compound "0" for easy assembly. The loadside housing of fused connectors shall be constructed to retain the fuse when disconnected, and shall be permanently marked "loadside". The "Y" insert body shall retain the second fuse contact. Fused "Y" connectors in ungrounded cables shall be similar to ESNA Style 82. Insert plastic plugs in unused openings in pull boxes and at the dead-end poles. Fuses shall be 4-ampere, 13/32x1/2" midget type, 600 volt, high interrupting capacity type. Fuses shall carry 110% continuously and open at 135% in one hour or less. The unfused cable connector shall be similar to ESNA Style 83.

Item S-25, "Cable Connector, Fused" or "Cable Connector, Unfused", each, furnished in place, will be paid for at the contract price per 3-way connection, which price shall be full compensation for furnishing spring loaded contacts, terminal lugs, bolts, plastic stop nuts, housings, insert bodies, water seals, silicone, mounting pin, fuse in fused connectors, instructions, and all incidentals.

## CABLES

The work to be performed under this specification consists of furnishing and installing all cables required. Conductors shall be in rigid conduit or non-metallic concrete-encased conduits as indicated. All lighting units shall be connected for nominal 460 volt multiple branch circuits. Cables shall be provided where indicated. Feeder cables shall be insulated for 600 volts. All cable shall have been manufactured less than two years prior to installation. "Cables shall be to FAA specification L-824, Type A (dated May 10, 1960), single conductor, 600 volt, No. 6 or No. 10 AWG, 7-strand or 19-strand coated annealed copper (ASTM Spec. B8 and B33) with 4/64-inch (3/64-inch for No. 10) type insulation (Specification D353 natural rubber or D755 synthetic rubber) and 3/64-inch Neoprene jacket (ASTM Specification D752)". Two insulated conductors shall be run to each pole base (one identified). The pole and bracket cable between handholes and ballasts shall be to the foregoing specifications single conductor type for 600 volt rating, No. 12 AWG, 7-strand copper, with 3/64-inch insulation and over-all 3/64-inch Neoprene jacket. Cables that are approved for this installation are cables of the aforementioned construction by Okonite, Phelps-Dodge, Anaconda, General Electric, Rome, General Cable, Kaiser and Simplex. Cables shall be installed in continuous lengths without splices between handholes. Care shall be taken to insure watertight joints. No. 10 cables paired are included for payment with 1/2" and 3/4" conduits. Measurement for all other cables will be made per foot of cable in place, each foot for payment including one insulated conductor.

Item S-25, "Circuit Cable-1/C No. 6-600 V.", will be paid for at the contract unit price per lineal foot, in place, completed and accepted including all cables in conduits, between curb junction boxes and handholes, splicing, terminals, connections, testing, and all incidentals necessary. Item S-25, "Pole and Bracket Cable-1/C No. 12-600V.", will be made at the contract unit price per lineal foot, in place, completed and accepted, including all cables in poles and brackets, splices, terminals, and all incidentals.

## CONDUITS

The Contractor shall provide where indicated non-metallic or metallic conduits for roadway and underpass lighting branch circuits. Conduits underdeck and to service shall be galvanized rigid, and of the sizes indicated. The conduits shall be of a standard weight, hot-dip galvanized inside and outside rigid conduit, conforming to the requirements of American Association Specifications for Rigid Steel Conduit, Designation C80.1. The conduits shall be 4-inch, 3-inch, 2-inch, 1 1/2-inch, or 1-inch as required, and shall be placed as indicated. Three inch longitudinal conduits are required for runs matching conduits on existing bridge. Conduits shall be kept clear of concrete or any other substances during construction. Ground each metallic run with 1/0, 7-strand, bare copper wire Exothermic welded to conduit and top flange of adjacent beam. See Notes 1. and 2. below.

Conduits will be measured by length in lineal feet (in the horizontal plane only) along the back of the curb line or along the edge of the pavement, as required. Vertical sections of runs of conduits will not be measured separately, but shall be considered incidental to and as a part of the work and materials included in light poles or horizontal runs. Payment for galvanized rigid conduits will be made at the Contract unit price per lineal foot for Item S-25, "Conduit-4 Inch Rigid Galv. Steel", "Conduit-3 Inch Rigid Galv. Steel", "Conduit-2 Inch Rigid Galv. Steel", "Conduit-1 1/2 Inch Rigid Galv. Steel", or "Conduit-1 Inch Rigid Galv. Steel", in place, completed and accepted, including all conduits, couplings, wire

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>LIGHTING NOTES</b>			
I-90 OVER FAIRFIELD AVE., LANE B AND RAMP W-2			
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN G.J.C.	TRACED	CHECKED J.R.H.	REVIEWED
DATE 2-13-64	DATE	DATE 3-4-64	DATE
			SHEET

Rev. 7-2-64

REV. 7-2-64

# LIGHTING NOTES

chairs, tamping, trenching, backfilling and compacting for 4-inch; encasing, supports, elbows, bushings, expansion couplings, grounding, drains, bends, flexible sections for 4" where required, threading, reaming, fastenings, and all incidentals. The 1" and 1/2" conduit sizes shall also include two No. 10 AWG branch conductors. Payment for concrete-encased 4-inch conduits under pavement will be made at the contract unit price per linear foot for 4 1/2-Way Duct - 4 Inch Non-Metallic, Concrete-encased, in place, completed and accepted, including both conduits, forms for concrete, concrete encasement, trenching, backfilling, compacting, joint sealer, couplings, and all required features.

LUMINAIRES

Luminaires shall be provided for all deck lighting units, shall meet the distribution pattern Type III as defined by ASA and IES, and be located as shown on the plans. The luminaires shall be complete lighting devices, and the roadway units shall be supported with light centers at 32'-0" above the pavement as indicated. Each luminaire shall consist of a cast aluminum housing, main reflector, slip fitter, seals, refractor, holding ring, automatic latch, socket, lamp, 240/480 volt integral ballast, terminal board, and wiring - all wired and assembled. Luminaires shall have a natural aluminum finish. The refractor for each luminaire shall be high quality, diffusing, pressed clear crystal glass of the Borosilicate type as Endural or Pyrex, well annealed and homogeneous, and free from imperfections and striation. It shall contain prisms pressed on the inside surface and, where necessary, on the outside surface, that are optically designed to redirect, by refracting the light from the lamp and upper reflector to produce the ASA-IES type distribution curve required. The inside surface of the top section of the refractor in the driver angles of view shall contain prisms with substantially flat surfaces to be used optically in cooperation with the reflector and lamp for producing the main beam. The refractor shall be clearly embossed with designations "Street Side" and "House Side". For diffusing of the light and good appearance, and continuous pattern of adjoining diffusing flutes or configurations shall be pressed on the outside surface. The refractors shall be so contoured and of sufficient thickness for high mechanical strength to resist malicious breakage and carefully tempered to withstand sudden changes in temperature. They shall be centered in holding rings to prevent bearing of steel projections on glassware. Good lamps shall be burning in all luminaires for acceptance. The 12,500 initial lumen horizontal, hard glass mercury vapor lamps shall be 400-watt clear, ASA H33-I-CD type, shall be rated for 16,000 hours average life, and shall be installed in roadway luminaires as indicated on the plans. The mercury lamps shall be suitable for operating on a 240/480-watt circuit through constant wattage type ballasts. Lamp sockets shall be heavy-duty, and shall incorporate all the latest design features available, such as center spring loaded contacts, plated parts, and locking-devices. The socket position shall be adjustable vertically and horizontally, but factoryset for Type III distribution from H33-ICD lamp. Enclosed luminaires shall be 400-watt size, and shall be Westinghouse OV-25, Line Material Unistyle 400, General Electric Form M-400, or approved equal.

The Contractor shall provide ballasts for all mercury roadway lighting units. Ballasts shall be of the type suitable for mounting in the luminaires. Ballasts shall be high power factor regulator output type for 400-watt lamps as indicated on the plans, shall be radio interference free, and shall be designed for parallel operation from a nominal 240/480-volt circuit, with constant performance characteristics when 480-volt circuit varies between 420 and 540 volts. Power factor shall be not less than 95 per cent. The ballast secondary regulation to the lamps shall be within 1/2 per cent.

All deck luminaires shall be carefully adjusted after pole erection and plumbing operations are complete. On roadway sections without grades, luminaires shall be perfectly horizontal according to the manufacturer's instructions and the design of the luminaires. All luminaires shall be horizontal transversely to the roadway, and in addition, luminaires where on grades shall be rotated on bracket pipes so as to be normal to the surface of the roadway in the longitudinal plane. The leveling of the luminaires for uniform brightness is considered an essential feature of the installation of the roadway lighting, and no perceptible variations will be accepted.

Luminaires will be paid for at the contract unit prices paid for, "400 W. Luminaire, Type III, With Integral 400 W. Ballast," per each, in place, and shall include 400-watt clear lamp, 400-watt ballast, housing, reflector, refractor, lamp receptacle, wiring, corrosion resistant fittings, latches, gaskets, terminal board, seals, leveling slip fitter, glass sleeveings, and all incidentals.

STANDARDS

Each luminaire standard shall be installed completely as a part of the lighting units. Each standard shall be complete with a tapered, round, steel pole with cast steel telescoping sleeve base, cap screws, welds, steel bracket arm, pole and bracket cable, steel pipe head assembly, handhole, cover, J-hook, and a final as required. The Contractor shall provide all poles and bracket arms for mounting luminaires at 32'-0" above roadway. Each lighting unit shall comprise a 26-foot

steel pole with a 10-foot steel bracket adequate for 400-watt integral ballast mercury type luminaire. Light standards shall conform as nearly as possible to the Specifications and drawings of the City of Cleveland and to the notes, herein, and shall be similar to the designs referenced as to general design and finish, height, base, mast arm, dimensions, and to general appearance. Standards shall be fabricated in a continuous round, true taper of approximately 0.14 inch per foot and shall be of the dimension indicated. Standards shall be made of steel. Metal poles shall be formed from one length of sheet steel and welded with only one longitudinal, automatically electrically welded joint and shall have no intermediate transverse joints or welds. The shaft material shall be hot-rolled basic open hearth steel not less than No. 11 manufacturer's standard gauge. After forming and welding, the tapered shaft shall be cold-rolled or worked under sufficient pressure to flatten out the weld (eliminating need for finish grinding) to increase the elastic limit of the metal in the completed shaft (providing a minimum yield strength of 48,000 psi), and to produce a true tapered tube without flat spots and a true round cross-section throughout the length of the shaft. Standards shall be complete with 4 inch by 6 1/2 inch reinforced handholes on the roadway side. The poles, brackets and bases shall be galvanized inside and outside in conformance with Sec. M-7.4(d). The poles shall contain all modifications as required and called for on the plans. All hardware shall be plated, galvanized or stainless steel.

Light poles manufactured by means other than that specified above shall be made of not less than No. 11 manufacturer's standard gauge steel including the weld area with a minimum yield strength of 48,000 psi, meet the permanent set and deflection values tabulated herein and otherwise meet the requirements of these specifications. All such poles shall be shot blasted to remove mill scale and weld slag preparatory to galvanizing. All shafts throughout the project shall have the same transverse section configuration.

Light poles shall be capable of withstanding loading (applied 18" from the top) as indicated in the following without exceeding the permanent set and deflection (measured 18" from top of pole).

Pole Size	Arm Length	Elastic Defl. Rate, Inches Per 100 Lbs.	At 2/3 of Yield Load Total Perm.		At Yield Load Total Perm.	
			Lbs.	Defl. Set	Lbs.	Defl. Set
9.0"x5.36"	10'	1.35	753	10.67	0.5	1130 17.29 2.03

Single member type bracket arms shall be provided for the standards where indicated. Brackets shall have ends for luminaires formed to accommodate 2-inch slip fitters. The inner end of each bracket arm shall be continuously welded to steel pipe head, and shall be so designed, with a steel retainer ring continuously welded inside, so that it will fit over a steel plate welded to the pole top, and be triple bolted to a loose steel plate placed on top of the retainer ring. Bracket arms and their related pole attachment devices shall sustain a vertical load of 250 pounds applied within 3 inches of the luminaire end of the support without collapse or rupture of any portion of the pole assembly. The bracket arms and their related pole attachment devices shall sustain a vertical load of 100 pounds applied within 3 inches of the luminaire end of the support with the support attached to a rigid structure. The vertical deflection shall not exceed 5/2 per cent of the support length. This includes a maximum allowance of 1/2 of 1 per cent of the support length for testing methods and permanent set. The bracket arms and their related pole attachment devices shall sustain a transverse, horizontal load of 50 pounds applied within 3 inches of the luminaire end of the support with the support attached to a rigid structure. The horizontal deflection shall not exceed 5 per cent of the support length and the pole attachment devices shall not develop any looseness within the specified loading range. This test shall be conducted with a vertical load of 30 pounds on the support. Deflection shall be defined as the total transverse displacement of the longitudinal centerline of the shaft or luminaire support at the point of test load application between its initially unloaded and fully loaded position.

Lighting standards shall have welded-on cast steel pole anchorages having a top flange. Each base shall be provided with four holes drilled and tapped to receive the flat, countersunk head screws. Cast steel bases shall be one piece, and shall comply with the requirements of ASTM A 27, Grade 65-35, having a minimum yield of 35,000 p.s.i. The base shall telescope the shaft and one continuous electric arc weld shall be on the inside of the base at the end of the shaft, with the other similar weld on the outside at the top of the base. Welds shall be a minimum of 1/2 inches apart. The standards shall be of such design as to make a complete wiring raceway after the standards have been assembled and erected. The bracket arms shall be normal to the edges of the roadway, and shall not be less than 2 1/2" inside diameter standard steel pipe, ASTM-120, Schedule 40. Poles shall be carefully set and they shall be raked so that the back tapered side is vertical. The careful aligning and grading of poles is considered to be an essential feature of the installation. The work shall be as nearly perfect as practicable, and no perceptible tolerances will be permitted. In order to accomplish the desired perfection of alignment of the luminaires, the poles shall be carefully aligned in place, supported as required, and securely bolted and welded. After erection, the standard shall be inspected for scratches in the galvanized surfaces. Such scratches shall be given two coats of a zinc rich paint. Second coat shall be applied after first coat has completely dried. Major damage to the galvanized surface shall result in the rejection of the standard.

Payment for steel standards with brackets and cast steel pole anchorages will be made at the contract unit price for, "Type III, 10 Ft. Bracket and Special Base Casting," completely assembled, erected in place and accepted, including pole, pole anchorage, bracket, steel pipe head, loose rod plate, pole top plate, bolts, J-hook, removable final, galvanizing, rake, modifications, finishing, cleaning, grading, and all incidentals.

TRANSFORMER AND PANEL STATION

The Contractor shall provide a complete transformer and panel station for the 480 volt branch circuits where indicated on the plans. The design of the station shall follow the most modern practice. The pole-mounted distribution transformer shall be furnished with all standard accessories in accordance with this specification and to the applicable NEMA and ASA Standards. The transformer shall be 25.0 Kva, 55 C, 60 cycles, single phase, oil-immersed, self-protected. The primary-voltage winding shall be dual-rated 2400-4160 volts complete with two bushings, four rated Kva taps, (2 approx. 2% above and 2 approx. 2% below rated voltage), and manual tap-changer. Taps shall be accessible from the top through a removable cover. The secondary voltage winding shall be rated 480 volts with terminals for single-phase, 2-wire operation. Mount shall be EET-NEMA Type C. In addition to primary protection indicated, the transformer shall be furnished with internal low voltage circuit breaker, high voltage fuse, and valve-type arrester. All protective and control equipment shall be of the outdoor, weather-proof type. The primary cutout to protect the transformer shall be open-type, load-break, single-pole, 100-ampere, 7.8 Kv, 5000 AIR, complete with fuse holder and 40 amp. fuses or as recommended by the Cleveland Division of Light and Power. The lightning arrester for the protection of the primary high voltage circuit at the transformer shall be 3000 volts. The cutout and arrester shall be equal to General Electric, Westinghouse, Line Material, or approved equal.

The branch circuits shall be switched in the secondary feeders by enclosed magnetic contactors, operated by a photoelectric relay. The controller shall include a selector switch for manual on, off, and automatic positions, and a 200 volt-amp., 480-120 volt control dry-type transformer. The photoelectric relay shall be socket-mounted, of tubelless circuitry, 115-volt, 3000 W. SPSTDB contacts, normally closed, closed at night, with factory set turn-on of 5 footcandles, built-in fuses, and built-in lightning arrester. The relay shall be fail safe, and have built-in time delay to avoid erroneous operation due to transient lights. The internal pilot relay contacts shall be rhodium-plated silver. The relay shall be General Electric, Hughey and Phillips, Tork, Fisher Pierce Model 63303-DA, or approved equal. The photoelectric controller shall be attached on the pole about 20 feet above ground level, and oriented to the north as indicated. The socket and mounting bracket shall be galvanized. The selector switch shall be enclosed in a general purpose case within the general enclosure, and may be General Electric Type CR 2940-MA 101 D oil-tight type. The controller shall be electrically held and enclosed with service switch in a 7/32-inch thick waterproof, NEMA Type 3, weather resistant, galvanized, sheet steel general enclosure similar to one required for the distribution panelboard. Contactors shall be rated on the basis of 8 hours enclosed, and shall be 90 amp, 600 volt, NEMA Size 3.

The lighting 8-circuit branch distribution panelboard shall be 100-amp., and consist of automatic short-circuit and overcurrent protective devices of the circuit-breaker type, assembled into a single interior NEMA Type 1 general purpose enclosure which in turn shall be mounted inside a separate 7/32-inch thick waterproof, galvanized sheet steel NEMA Type 3 weather resistant enclosure, consisting of a box, gasket, copper screened drain and lockable front design, mounted on two short crossarms on a pole. Hinges shall be flush. The cylinder tumbler lock shall be combination catch and lock. The panelboard be of the dead-front type and shall be in accordance with Underwriters Laboratories, Inc. standards for panelboards and enclosing cabinets, and so labeled. The panelboard shall be designed for connection to a two-wire single-phase, 480 volt A-C, one side grounded source. The mains of panelboard shall be with solderless lugs only. The service connection to the panelboard shall be through a service entrance switch. (See paragraph below for Branch Circuit Breaker Specifications.)

The service entrance switch shall be a 480-volt, 100 amp., combination device, consisting of switch mechanism and high-interrupting capacity current-limiting fuses. The combination device shall be capable of closing against remaining closed and safely limit interrupting short-circuit currents up to 200,000 amperes rms symmetrical with no derating. The switch mechanism shall have a load-interrupting capacity of twelve times the continuous-current rating of the combination device. The switch mechanism shall be quick-make, quick-break type with the speed of operation in both closing and opening independent of the operator. The allowable temperature rise, for carrying rated load current, of the switch and fuse shall be 55° C rise over 40° C ambient at the connecting terminal. The switch door shall be interlocked. There shall be a provision for locking switch open. The branch overcurrent protective devices shall be molded-case circuit breakers. The panel shall contain eight single pole Type F molded-case, 600-volt, 50-ampere, 15,000 RMS amperes interrupting rating breakers. The branch breakers shall have quick-make and quick-break toggle mechanisms, inverse-time trip characteristics, and shall be trip-free

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>LIGHTING NOTES</b>			
I-90 OVER FAIRFIELD AVE., LANE B AND RAMP W-2			
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN J.C.	TRACED	CHECKED J.R.Z.	REVIEWED
DATE 2-19-64	DATE	DATE 3-4-64	DATE
			SHEET

Rev. 7-2-64

RECEIVED  
FEB 24 1963

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	TYPE FUNDS	22 77
2	OHIO			

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

# LIGHTING NOTES

on overload or short circuit. Automatic release is to be secured by a bimetallic thermal element releasing the mechanism latch. In addition, a magnetic armature shall be provided to trip the breaker instantly for short-circuit currents above the overload range. Automatic tripping shall be indicated by a handle position between the manual OFF and ON positions. The individual breakers shall be calibrated and sealed to eliminate tampering or unauthorized changes in calibration. Breakers shall be of the interchangeable type and capable of being operated in any position. The directory shall be typewritten and plasticized, and shall indicate clearly the location of each branch circuit.

Wiring shall be installed in galvanized rigid steel conduit. Conduit fittings shall be installed as required for the watertight entrance of wiring into the conduits. Conduits shall be securely held in place on pole structure by pipe straps located at intervals not exceeding 6 feet. The neutral conductors and noncurrent-carrying metallic parts of all equipment at the transformer station shall be grounded to 1-inch x 10'-0" solid wrought iron ground rods for not over 15 ohms resistance. The ground conductor shall be protected by a half-round wood molding from below the ground line to a point at least 8 feet above the ground line. The distance between ground rod and pole shall be not less than 3 feet. If additional rods are installed, the distance between ground rods and pole shall not be less than 6 feet. Pole line hardware at the transformer stations shall be hot-dip galvanized and shall be in accordance with the standards of the Cleveland Division of Light and Power. Suitable washers shall be installed under bolt heads and nuts on wood surfaces. Eye bolts, strain plates and clevises shall be used wherever required to adequately support and protect the pole, crossarms, guy wires and insulators. Ogee washers shall be provided wherever the bolt heads bear directly on timber.

The wood pole at the transformer station shall be 40-foot, Class 2, either treated Southern Pine, full-treated from bottom to top with creosote or pentachlorophenol, with a minimum retention of 6 pounds per cubic foot, or butt-treated Douglas Fir or Western Red Cedar, and shall conform to the American Standards OS.1 as to shape, condition and fiber stress. Pole shall be machine-shaved, roof-sawed, round, sound, well-proportioned from butt to top without short kinks or crooks. Butt-treated poles shall be treated by an approved process from the bottom to a point not less than one foot above the finished ground line and shall be set not less than 6'-6" deep in normal firm ground. When setting pole, the hole shall be of ample size to allow the easy entrance of the butt, and the size of the hole at the bottom shall be large enough to permit the proper use of tampers. When backfilling hole, minimum of 3 tampers shall be used for each shoveler, in order to insure that the earth is tightly packed. In no case shall the earth be thrown into a greater depth than 4 inches without being tamped hard before the next layer is deposited. The surplus earth shall be placed around the pole in a conical shape and packed tightly in order that water will drain away from the pole. The poles shall be carefully aligned and graded with arms at right angles to the direction of the primary line. Crossarms shall be straight-grained, standard crossarm grade Douglas Fir. The vertical and longitudinal strength of crossarms, the requirements for climbing space and pin spacing shall conform to the requirements of the Cleveland Division of Light and Power. The Contractor shall retreat the pole and arms with preservative after cutting or boring.

All construction practices and materials shall be in accordance with the usual practices of the Cleveland Division of Light and Power. The Contractor shall prepare a shop drawing of the transformer station ne purposes to install, and shall submit same for review by the Director, the Cleveland Division of Light and Power.

Approval of the shop drawing(s) shall be obtained before any materials are procured or the fabrication is begun. Drawing(s) shall include crossarms and other timber work, framing, connections, bracing, anchorage, make and type of equipment, and spacing of the equipment to be installed. The Contractor shall make all necessary arrangements for power. The initial service to be supplied to the transformer station for the roadway lighting will be 2400-volt primary. The service will be extended overhead by the Cleveland Division of Light and Power to the transformer station, which shall be located approximately as shown on the plans. The Power Company will provide the insulators and guy for dead-ending their lines at the station. All costs to the Contractor in connection with the introduction of this service shall be included in the unit cost for the transformer and panel station in the proposal. The Contractor shall consult and cooperate with the Company in locating its distribution lines so that lines will be as short and direct as possible, but he will not be required to furnish, install, or make any provisions for metering.

Payment for Item S-25, "Transformer and Panel Station", will be made at the lump sum price, in place, completed and accepted, including transformer, primary service and connections, primary cutout, primary fuse, insulators, primary arrester, secondary disconnect, fuse, magnetic switch, conduit on pole for feeders, conduits to underground for branches, bushings, general enclosures, cable, pothead or sealed conduit terminal fittings, excavation, backfilling, tamping, seeding, ground wires, grounding, crossarms, distribution panel, eight branch breakers, photoelectric relay, controller, on-off-automatic selector switch, treated pole, painting, locks,

secondary feeder wiring, warning sign, adjustments, joint compound, couplings, saddles, fittings, fastenings, attachments, anchor bolts, ground lugs, welds, ground rods, ground wire moulding on pole, clamps, grounding bushings, and all necessary incidentals. All costs incurred with obtaining service shall be included in this item.

## STRUCTURE GROUNDING

This item shall consist of furnishing and installing a complete grounding system of one outside end of Piers 2W, 4W, 6W, 3E and 8E on Bridges CUY-90-1467 L/R. Grounds shall be complete, and each shall consist of a bare copper coil under the footing concrete, lead to above top of pier and welded connection to superstructure steelwork. \*The coil under the footing shall be a lap, as large as the excavation will permit of No. 0 bare copper. No. 0 grounding conductors between loops and above pier tops shall be as straight and direct as practicable. The connections between ground loops and superstructure steelwork shall be with continuous No. 0 bare copper. The loop of bare wire shall be placed on the base in the bottom of the footing before pouring the footings. One end of each loop shall be brought up and connected by Exothermic weld to a superstructure girder or beam flange. Grounding shall be accomplished as soon as the steelwork to which the grounding wires are to be attached is in place. At each expansion joint between framing units near Piers 2W, 6W, and 6E, the Contractor shall provide one No. 0 stranded copper wire suitably looped to provide for expansion across the joint and Exothermic welded to one pair of the outside, adjacent, abutting girders. All disturbed painting shall be restored. Two layers of tarpaper shall be placed between 25' spiralled loop of No. 0 wire and the bottom of footing concrete. Ground system components for superstructure grounding will not be measured separately as items, but will be lumped into ground system units. The three loops between abutting outside girders across the roller expansion joint in the bridges at about Sta. 5+95 and 9+00 shall be installed by the Contractor, but will not be measured or paid for directly, but shall be considered as subsidiary work to and included in the unit price for each of the five individual ground systems, Item S-25, "Bridge Structure Grounding", in place, completed and accepted, including loops, groundings, leads, welds, cables, loops between girders, tests, and all incidentals.

## UNDERPASS LIGHTS

Underpass lighting shall be provided under the bridges at Ramp W-2 and Fairfield Avenue. The outdoor, weatherproof, 250-watt mercury vapor fixtures for lighting the underpasses shall be installed under the deck as indicated, and connected to the underpass branch circuit cables through conduit to the junction boxes in the bridge curbs. The 10,500 initial lumen horizontal, hard-glass mercury vapor lamps shall be 250-watt clear, ASA H37-5KB type, and shall be installed in all fixtures. Lamps shall be rated for an average life in excess of 16,000 hours. Units shall be complete, consisting of an optical train which includes a single-piece prismatic reflector mounted in an aluminum door assembly, Type SF-2 fixture wire, an asymmetric polished aluminum reflector, an anodized aluminum visor, an integral cast guard, an integral auto transformer ballast, and a cast aluminum housing. Built-in auto transformer ballast shall be designed for 480 volt circuit, with two 5% under voltage taps and operate at 95% of better power factor. The reflector shall be made of molded, thermal shock-resisting borosilicate glass. The door assembly shall be equipped with stainless steel pressure latches, stainless steel hinges, and a safety chain. The housing shall be dust, bug, and moisture resisting with captive neoprene and double felt gasketing, and shall have a rear access hole in a gasketed aluminum coverplate and three tapped 1/2 inch conduit entries, one on each side and one on the top, with conduit plugs. The fixture shall be not less than about 16 inches overall width, with maximum height and depth about 11 inches and 8 inches respectively. Its inner and outer surface shall be covered with an array of reflecting and refracting prisms and diffusing flutes which shall be designed to provide an asymmetric light distribution. The vertical maximum candlepower output shall occur at 64 degrees through 0 degree lateral. The lateral distribution in the 64 degree cone with a 250-watt clear mercury vapor lamp shall be as follows:

- 0° not less than 6760 candlepower
- 15° not less than 6300 candlepower
- 25° not less than 5340 candlepower
- 35° not less than 4350 candlepower
- 45° not less than 3080 candlepower
- 55° not less than 2450 candlepower
- 65° not less than 1855 candlepower
- 75° not less than 2020 candlepower
- 85° not less than 1935 candlepower
- 90° not less than 1470 candlepower
- 105° not less than 410 candlepower

\* If the shells of the cast-in-place piles are of the type that are left in place, structure grounding may be accomplished by bonding, using exothermic welds, the No. 0 ground wire to the shell of any pile in each footing and there by eliminate the 25' spiralled coil.

The installation work shall include the 8 inch by 8 inch by 4 inch junction box at unit, 1/2-inch liquid-tight flexible conduit to junction box, mounting lugs, Type SF-2 fixture wire to junction box, and 3 amp. fuse, install a 600 volt, high interrupting capacity in-line fused disconnect in the ungrounded lead to the fixture. The fused connector assemblies shall be Buss, ESMA Style 64, or approved equal, with Type KTK fuses, rated 600 Volts.

Item S-25, "250W. Mercury Underpass Luminaire", will be paid for at the contract unit price each, in place, completed and accepted, including lamp, integral ballast, reflector, refractor, corrosion resistant fittings, bracket plate for units on superstructure steel, fixture wire, fixture wires to junction box, junction box, all connections and splices, 1/2-inch liquid-tight flexible conduit to junction box, mounting lugs, in-line fused connector, fuse, fastenings, and all incidentals.

## REMOVING EXISTING LIGHTING UNITS

The Contractor shall remove two construction-obstructing, existing, ground-mount, incandescent lighting units and light pole foundations from Ramp W-2 under the bridge extensions, and completely restore series circuits and non-metallic conduits through the area of construction. Conductors for the series type circuits shall be new No. 8 AWG solid, soft-drawn copper of not less than 98% conductivity, and shall be coated with lead, tin, or antimony alloy. Insulation shall consist of 10/64 inch of rubber-like compound known commercially as ozone resistant type insulation. The insulating compound shall conform in every respect, and shall be tested in accordance with ASTM Des. D574-62, or the latest revision thereof. The outside jacket or sheath shall be 1/64 inch thick and shall be made of GR-M poly-chloroprene (neoprene) sheath compound. The sheath compound shall conform in every respect, and shall be tested in accordance with ASTM Designation D753-60, or the latest revision thereof. The cable shall carry the manufacturer's descriptive data for the conductor and insulation. All conductors shall be placed in continuous conduits between existing undisturbed units. Existing series circuits shall not be inoperable during any night hours. Non-metallic conduits shall be Federal Specifications W-C-581-c. Burial shall be 2'-ft. minimum.

Payment for removal of the two existing, construction obstructing lighting units and restoration of series circuits will be made at the contract lump sum price for Item S-25 "Removing Existing Lighting Units", completed and accepted, and shall include removing two existing lighting units with 10 ft. brackets, incandescent luminaires, and insulating transformers; touching up damaged paint, replacing broken parts, returning lighting units to City, removing and disposing of pole bases and boxes, new 3-inch conduit, trenching, backfilling, compacting, new No. 8 AWG 5 Kv cables, and all incidentals indicated and required.

## INSPECTION AND TESTING

The Contractor shall furnish all equipment and appliances necessary to test the completed cable systems, and a burning test will be required for the lights. It shall be the Contractor's responsibility to demonstrate to the satisfaction of the Director of Highways and the Cleveland Division of Light and Power that all lighting circuits are continuous and free from short circuits and unspecified grounds, that all circuits are properly connected in accordance with the applicable wiring diagrams and that the resistance to ground of each non-grounded circuit is not less than 50,000 ohms. The Contractor shall furnish a complete report of megohm readings on all circuits installed to the Cleveland Division of Light and Power and the Highway Department's Lighting Engineer. Costs of all inspections, energy and tests shall be considered incidental to, and included in the unit prices bid for the various items, S-25, on this project. The installation of all street lighting equipment will be inspected by a representative of the Cleveland Division of Light and Power while being installed. Before the inspections and tests are to be made, the Contractor shall notify the Cleveland Division of Light and Power and the Highway Department's Lighting Engineer by written order when he is ready. Upon completion of the lighting system, and approval of the inspection arrangement, the following tests will be conducted by the Cleveland Division of Light and Power.

The potential of the system shall be considered satisfactory when the test voltage of twice the operating voltage plus 1,000 volts is held on each circuit for one minute. The completed lighting system shall be operated from sunset to sunrise each night for a period of one week prior to acceptance. During this trial operation, the Contractor shall correct any defects which may develop, at no extra cost to the State.

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

## LIGHTING NOTES

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

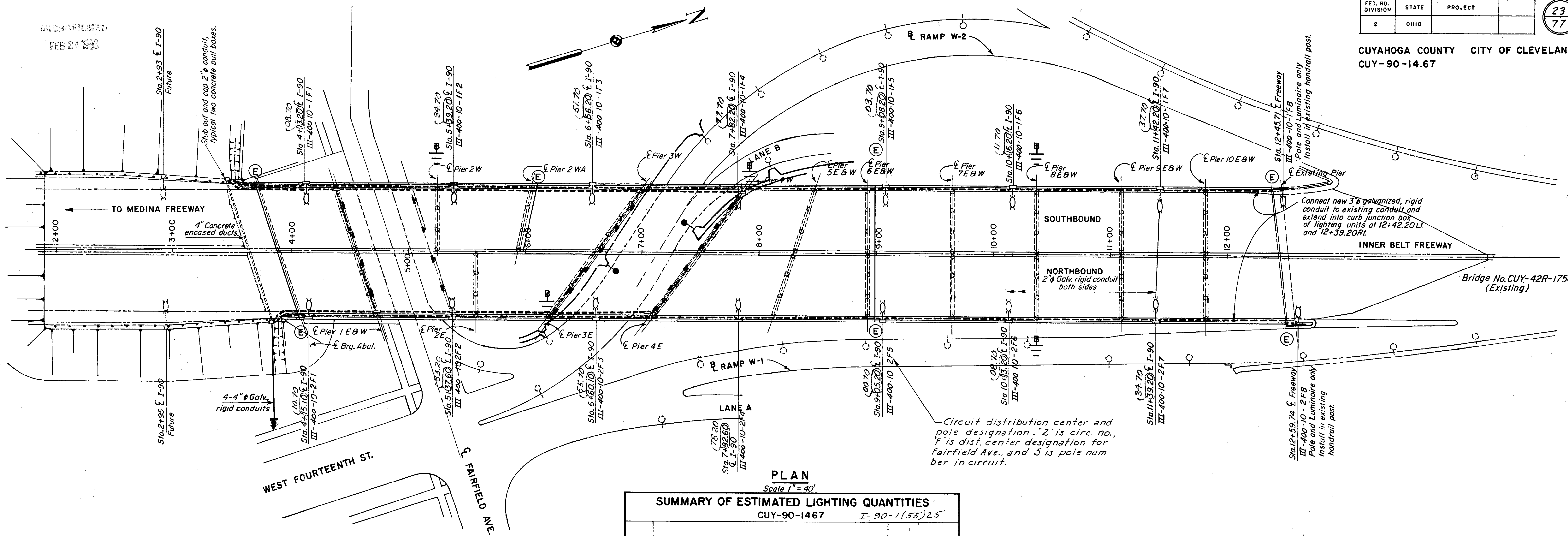
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN/J.C.	TRACED	CHECKED/RK
DATE 2-13-63	DATE	DATE 3-4-64
	REVIEWED	REVISED
		SHEET

REV. 7-2-64



UNCORRECTED  
FEB 24 1963

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



PLAN  
Scale 1" = 40'

Circuit distribution center and pole designation: "2" is circ. no., "F" is dist. center designation for Fairfield Ave., and "5" is pole number in circuit.

LIGHTING KEY

- Mercury roadway lighting unit with pole integral with structure handrail post and curb junction box. Designation: III represents ASA-IES type, 400 is lamp wattage and 10 is bracket length.
- 250 Watt Mercury underpass lighting unit.
- Existing incandescent lighting unit to be removed.
- Existing incandescent lighting unit to remain.
- Curb junction box for branch to underpass lighting units.
- 2-inch (or 3 inch where indicated) galvanized rigid steel conduit longitudinal in structures with No. 6 AWG, 600 volt circuit cables.
- Transformer and Panel Station
- 1/4 inch, or 3/4 inch galvanized rigid conduit with 2 No. 10 AWG, 600 volt circuit cables to underpass lighting units
- Bridge structure ground
- Conduit Expansion Joint
- 2-Way Duct, 4 inch non-metallic, concrete encased
- Concrete Pull Box

SUMMARY OF ESTIMATED LIGHTING QUANTITIES  
CUY-90-1467 I-90-1(55)25

ITEM	DESCRIPTION	UNIT	TOTAL BRIDGE
S-25	400 W, Luminaire, Type III, with 200 Lamp & Ballast	Each	16
S-25	250 W, Mercury Underpass Luminaire with lamp & ballast	Each	20
S-25	Pole with 10 Ft. Bracket & Special Base Casting (round)	Each	16
S-25	Conduit - 4 in. Rigid Galv. Steel	Lin. Ft.	380
S-25	Conduit - 3 in. Rigid Galv. Steel	Lin. Ft.	210
S-25	Conduit - 2 in. Rigid Galv. Steel	Lin. Ft.	2500
S-25	Conduit - 1 1/4 in. Rigid Galv. Steel	Lin. Ft.	60
S-25	Conduit - 3/4 in. Rigid Galv. Steel	Lin. Ft.	400
S-25	Junction Box in Bridge Curb	Each	22
S-25	Junction Box Under Bridge Deck	Each	8
S-25	Bridge Structure Ground	Each	5
S-25	Pull Box, Concrete	Each	2
S-25	Circuit Cable - 1/c No. 6, 600 V.	Lin. Ft.	6820
S-25	Pole & Bracket Cable - 1/c No. 12, 600 V.	Lin. Ft.	1220
S-25	Removing Existing Lighting Units	Lump	Lump
S-25	2-Way Duct, 4 inch, Non-metallic, Concrete encased	Lin. Ft.	125
S-25	Cable Connector, Unfused	Each	16
S-25	Cable Connector, Fused	Each	16
S-25	Transformer & Panel Station	Lump	Lump
S-25	ALTERNATE: BID ITEM pole, other than round, 10' bracket & special base casting.	Each	16

LIGHTING DESIGN DATA

EXPRESSWAY-400WATT		UNDERPASS-250 WATT	
Roadway Class	2-48' Rdwy. with 8' Median	Roadway Class	58' Rdwy. Fairfield Ave.
Traffic Class	Heaviest	Traffic Class	Medium
Pedestrian Class	None	Pedestrian Class	Light
Intensity Maintained	1.2 FC	Intensity Maintained	5.0 FC
Intensity Minimum	.49 Actual	Intensity Minimum	1.25 FC, Maint.
Pavement Reflectance	10%	Pavement Reflectance	10%
Maintenance Factor	.75% (Luminaire & Lamp)	Ceiling Reflectance	60% Assumed
ASA Lamp Designation	H-33-j-C.D	Maintenance Factor	.75% (Luminaire & Lamp)
Lamp Design Output	19000 Initial Lumens Horiz.	ASA Lamp Designation	H-37-5K B Mercury
ASA-IES Distribution	Type III	Lamp Design Output	10,500 Lumens, Initial Horiz.
Photometric Data	LM Curve E-359-6.2	Photometric Data	Holophane Test No. 20172
Luminaire Overhang	6 Ft.	Luminaire Overhang	See Below
Mounting Height	32 Ft.	Mounting Height	15 Ft.
Design Spacing	120 Ft. Opposite	Design Spacing	13'0" Staggered 11'0" Staggered, Ramp W-2

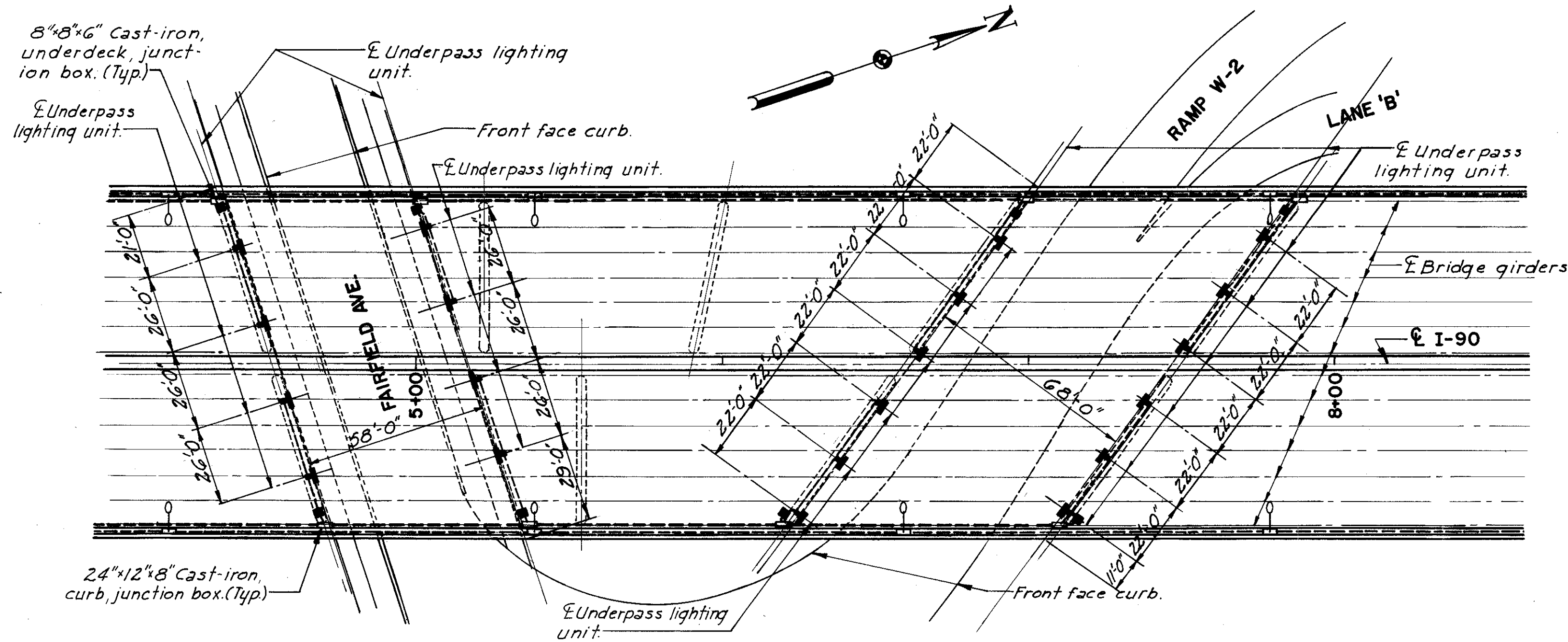
\*Fairfield Avenue: Locate over back edge of sidewalk. (58' C to C of fixtures.)  
Ramp W-2: Locate on face of adjacent piers. (68' C to C of fixtures.)

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

**LIGHTING LAYOUT**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

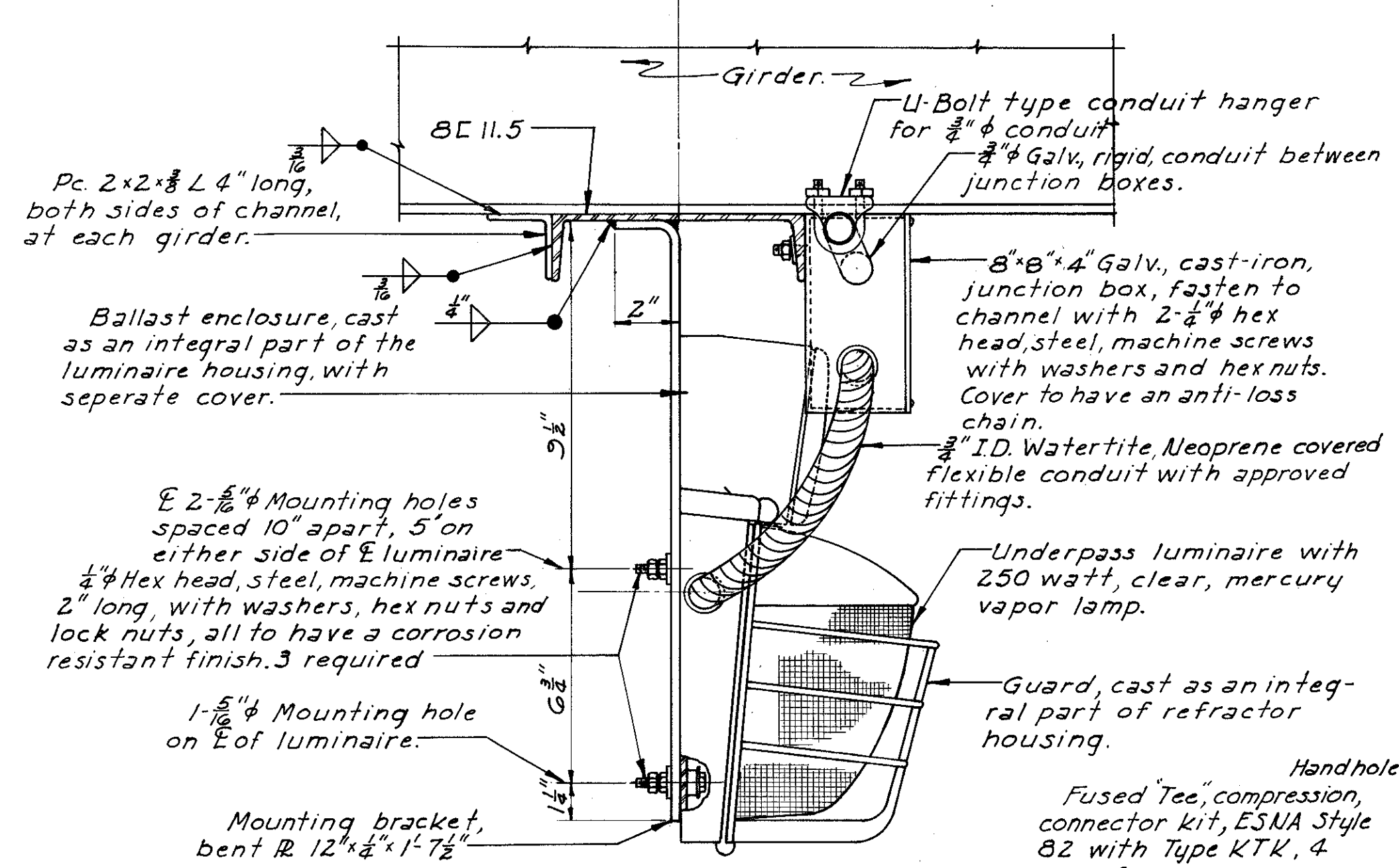
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.P.K.	TRACED .	CHECKED G.J.C.
DATE 12/1/62	DATE	DATE 3-4-64
	REVIEWED	REVISED 9-30-62
		SHEET

Rev 7-2-64

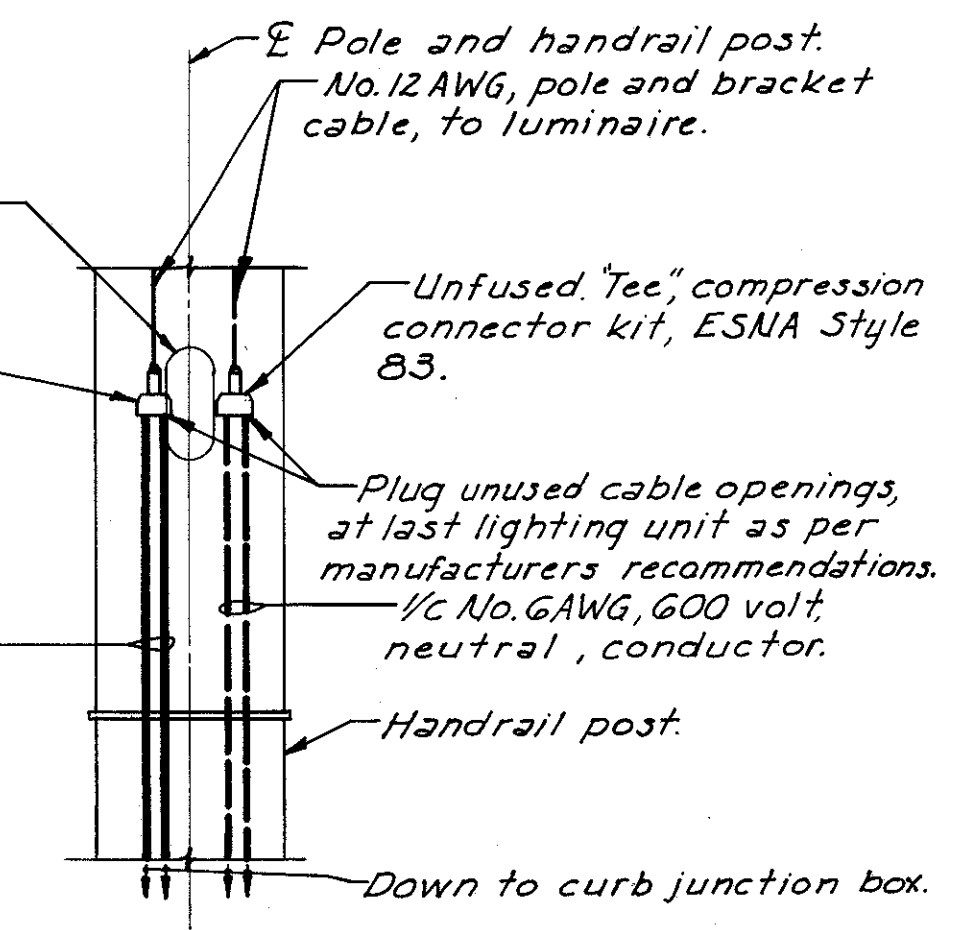


**UNDERPASS LIGHTING LAYOUT**  
Scale: 1"=30'

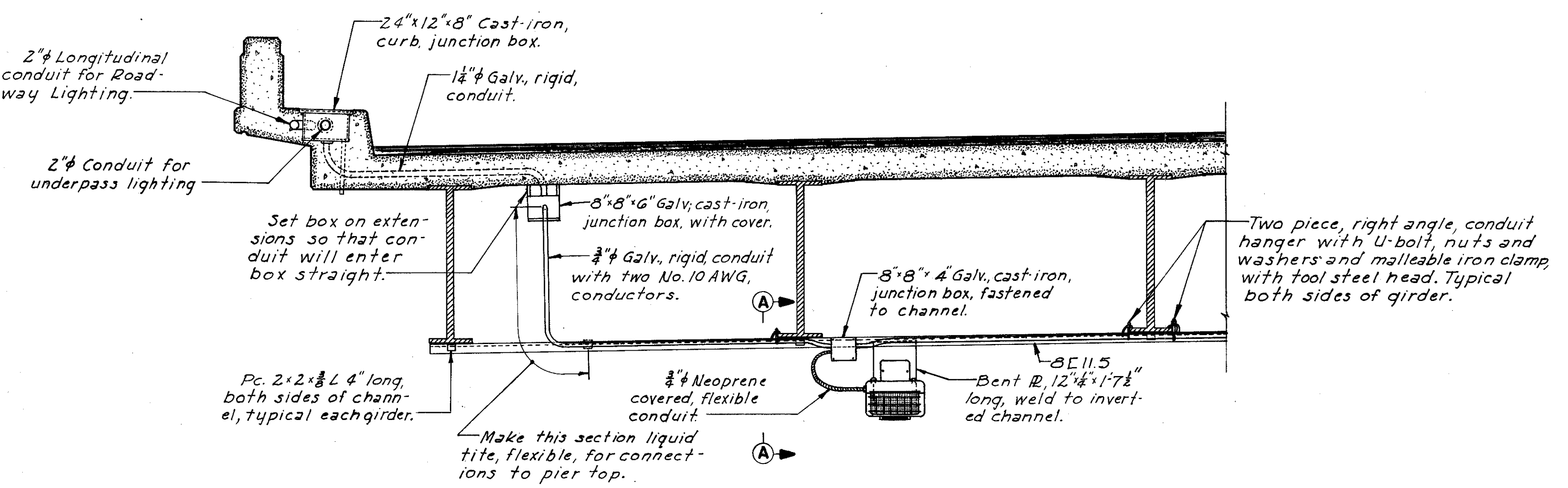
REPRODUCED  
FEB 24 1963



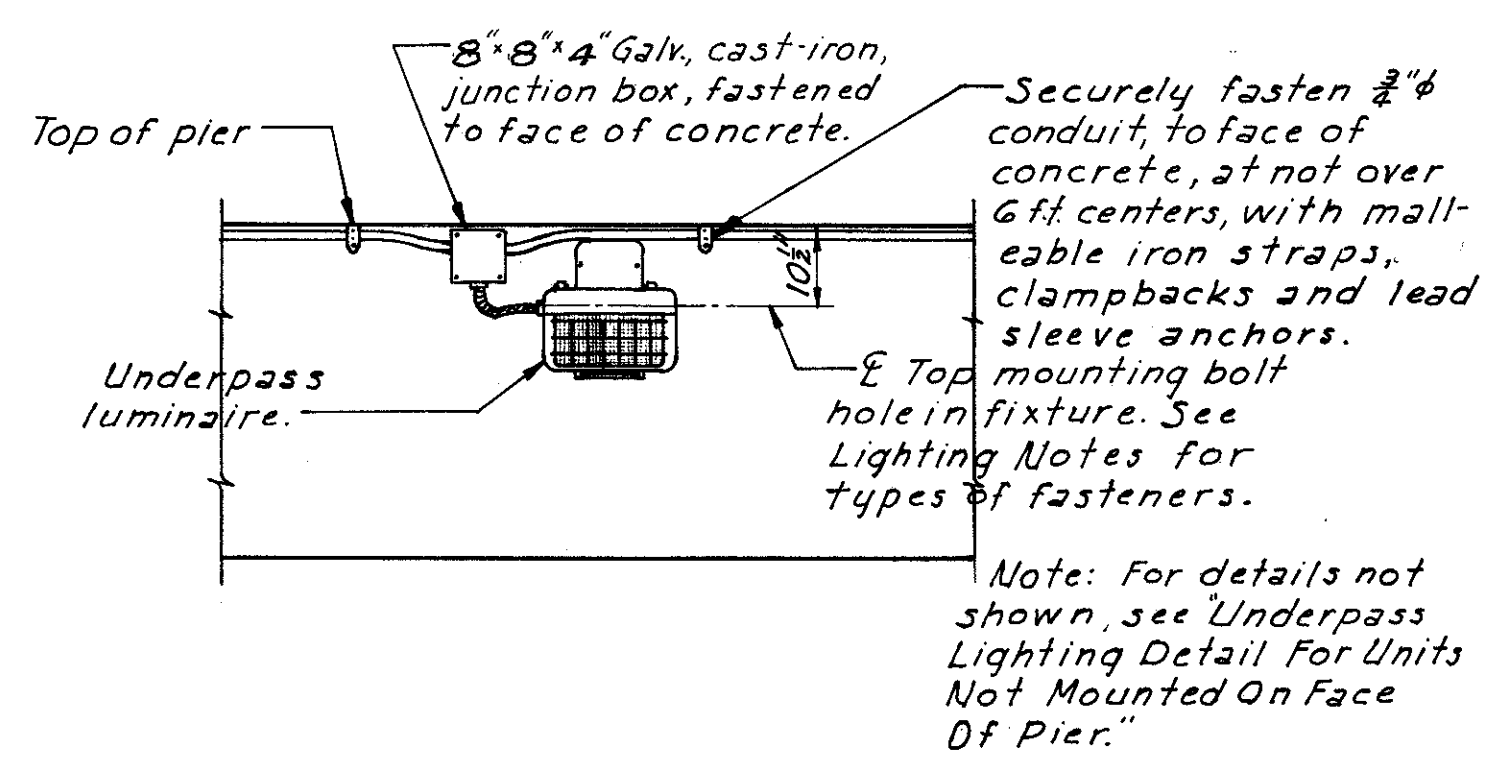
**SECTION A-A**  
Scale: 3"=1'0"



**CIRCUIT CABLE CONNECTIONS IN POLE BASE**  
No Scale



**UNDERPASS LIGHTING DETAIL FOR UNITS NOT MOUNTED ON FACE OF PIER**  
Scale: 1/2"=1'0"  
(On North side of Fairfield Ave.)



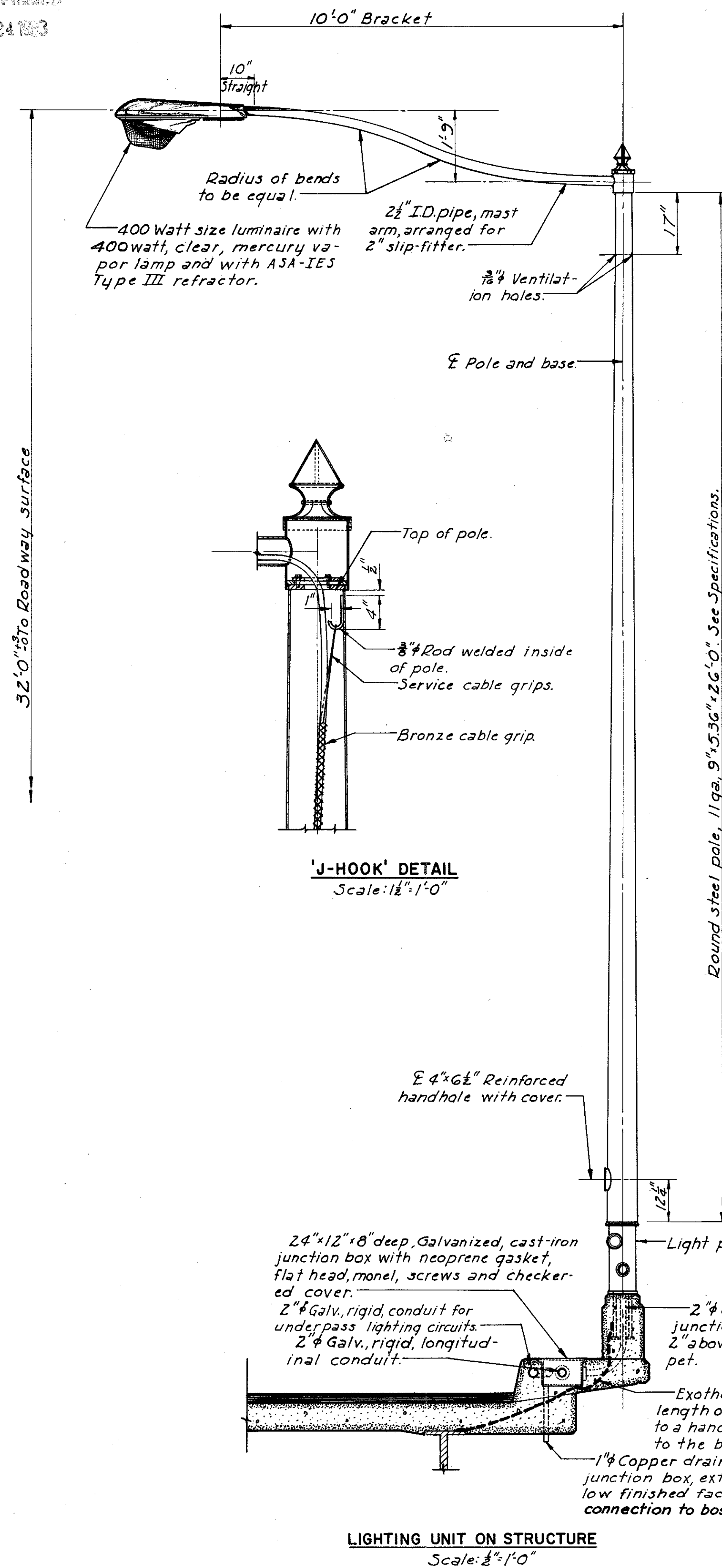
**UNDERPASS LIGHTING DETAIL FOR UNITS MOUNTED ON FACE OF PIER**  
Scale: 1/2"=1'0"

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

**UNDERPASS LIGHTING DETAILS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

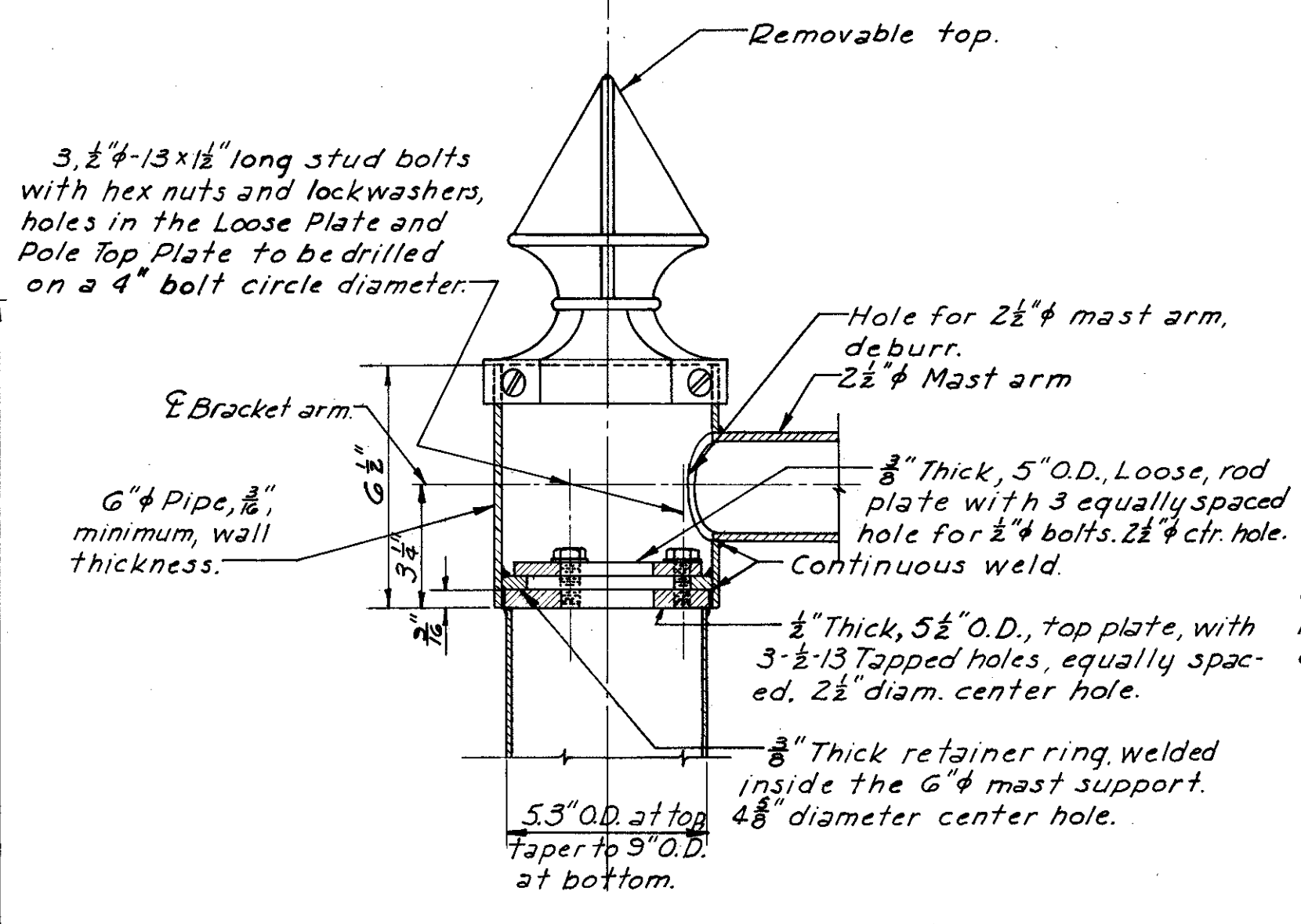
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.R.K.	TRACED	CHECKED J.C.
DATE 12-19-63	DATE	DATE 3-5-64
		REVIEWED
		REVISED
		SHEET

Rev 7-2-64

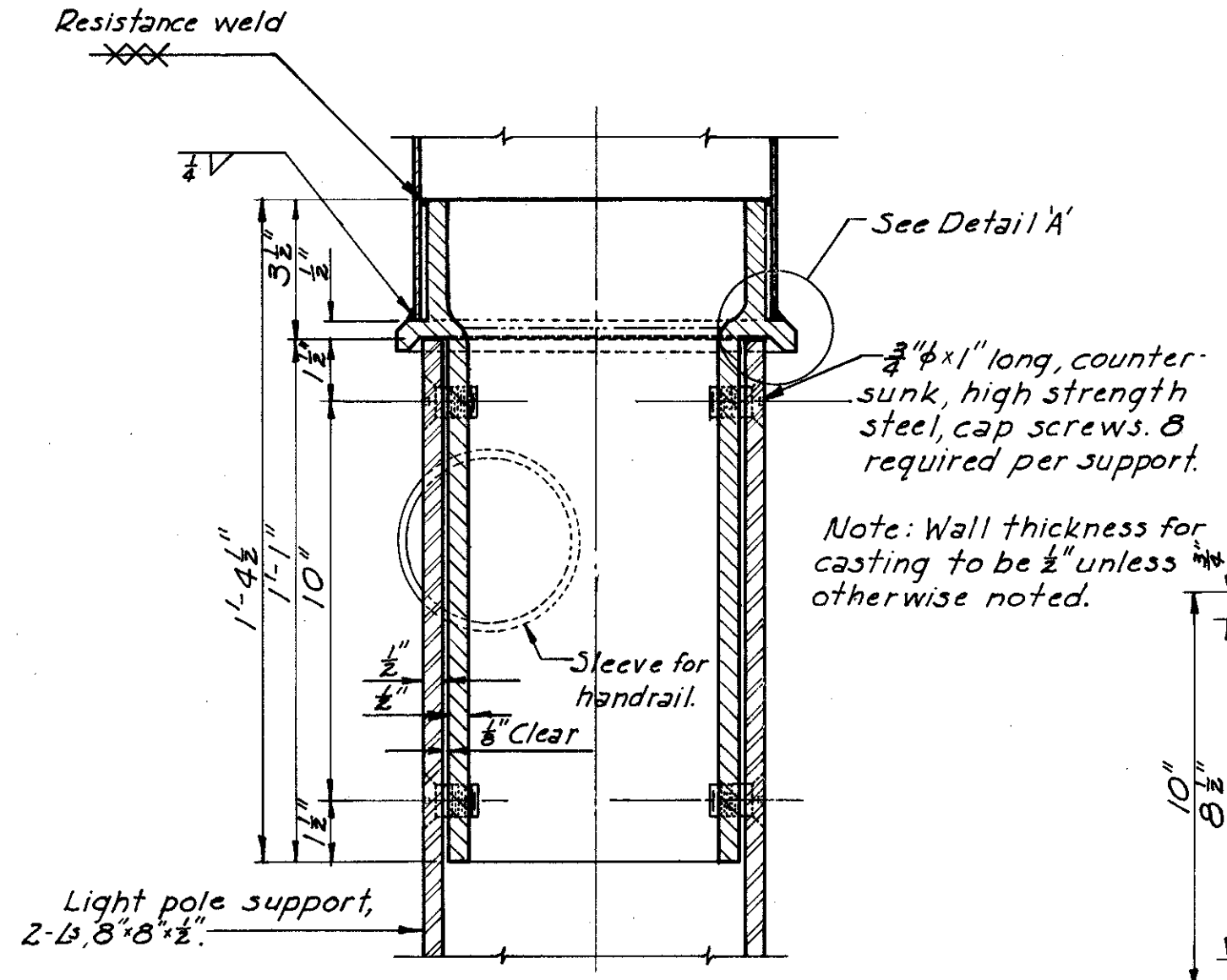


'J-HOOK' DETAIL  
Scale: 1/2" = 1'-0"

LIGHTING UNIT ON STRUCTURE  
Scale: 1/2" = 1'-0"

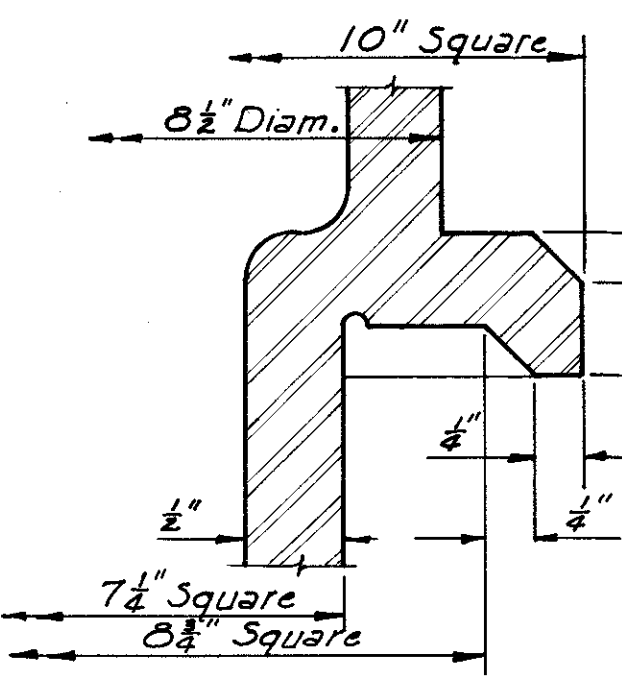


LIGHT POLE HEAD  
Scale: 3" = 1'-0"

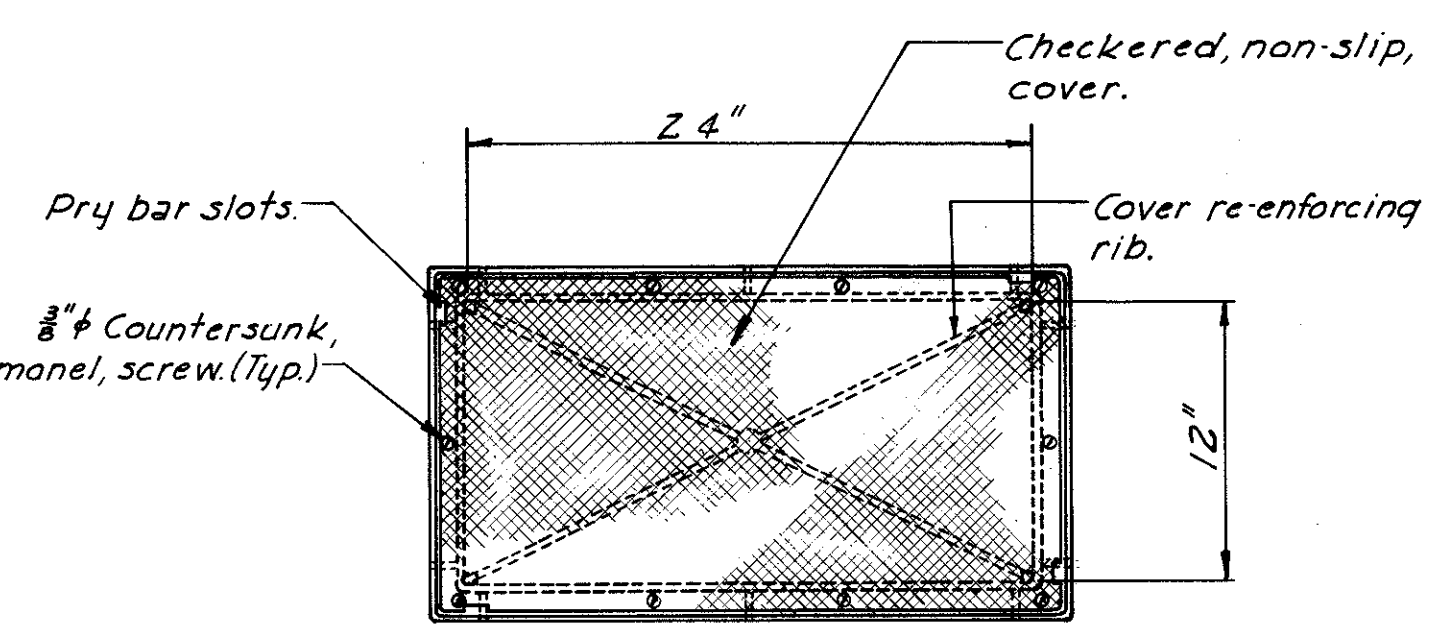


SECTION A-A

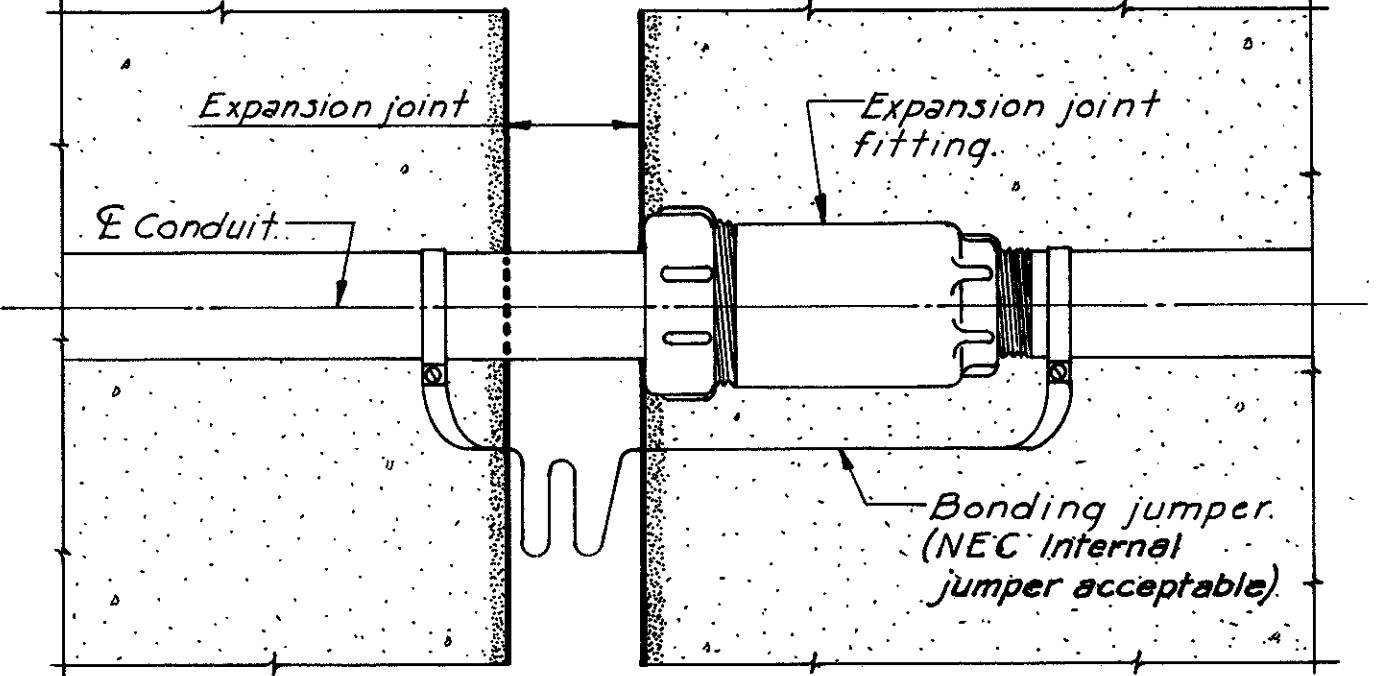
BASE CASTING DETAIL  
Scale: 3" = 1'-0"



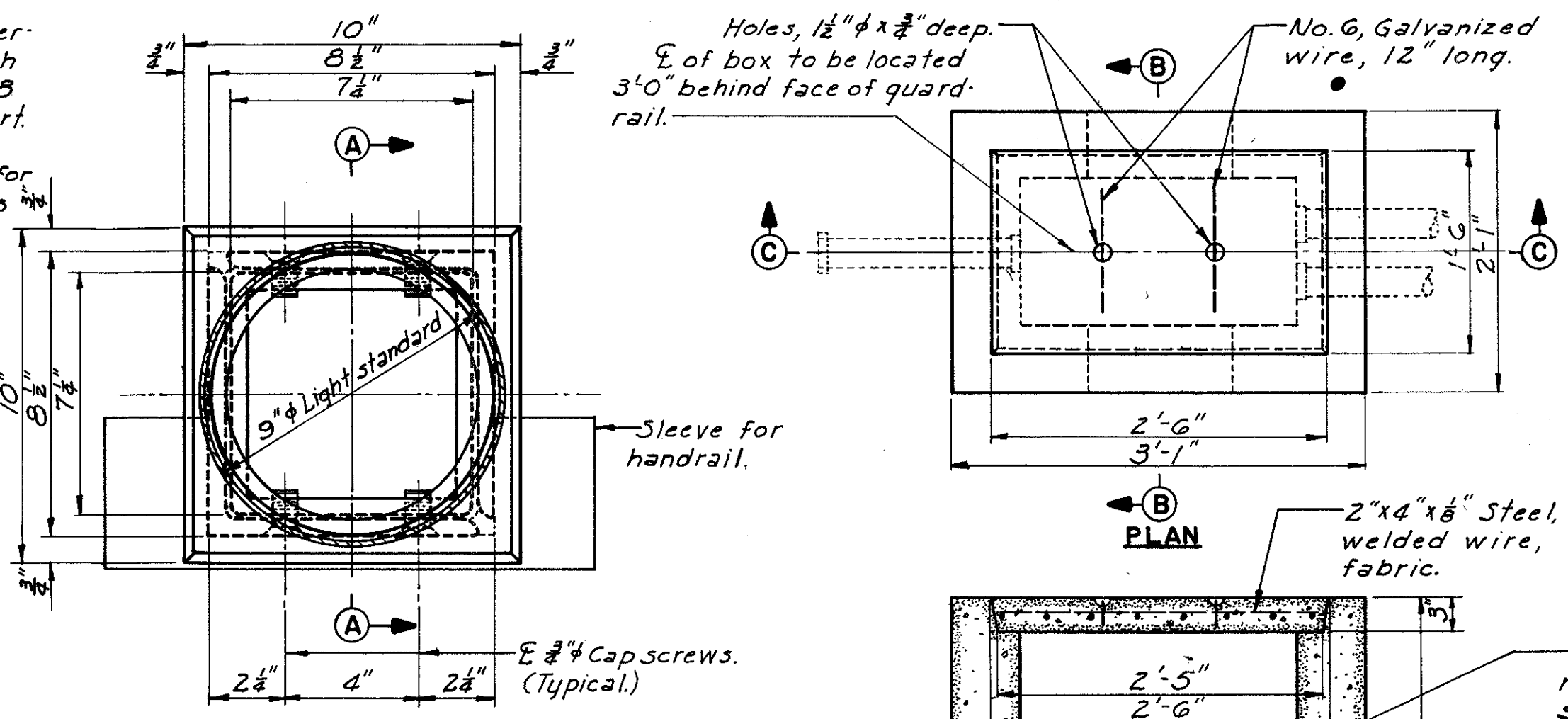
DETAIL "A"  
No Scale



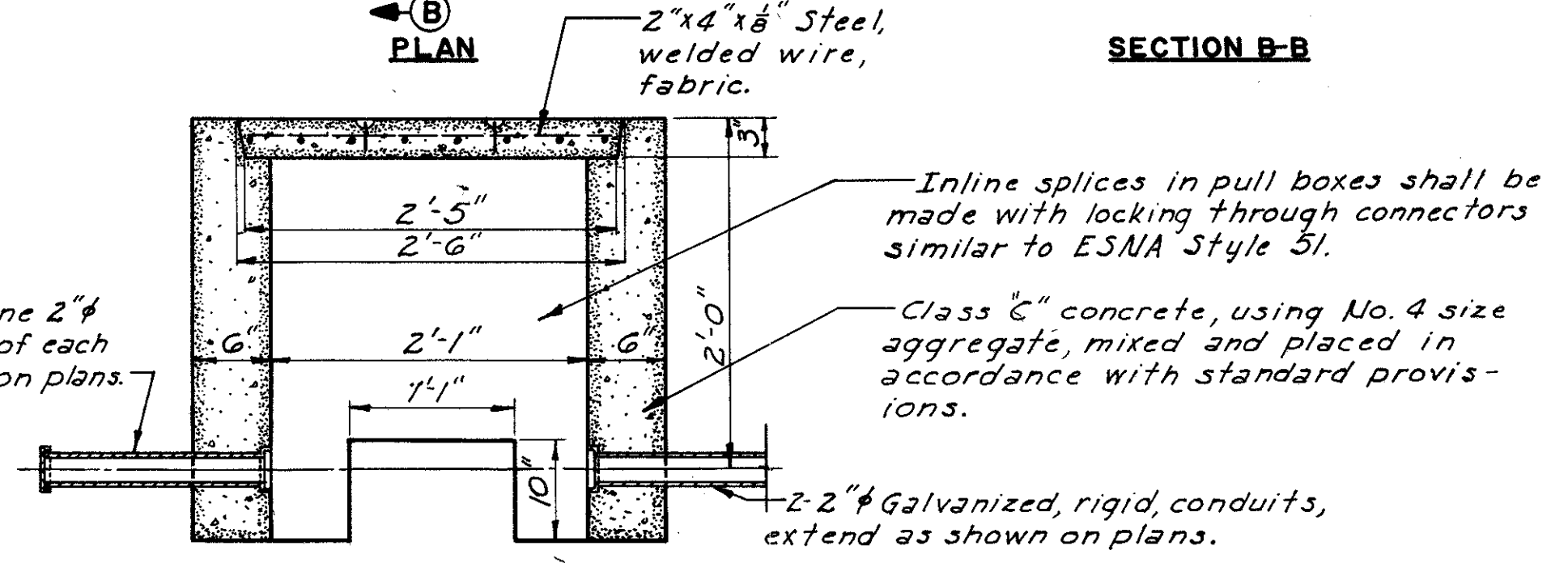
TYPICAL CURB JUNCTION BOX  
Scale: 1 1/2" = 1'-0"



EXPANSION JOINT FITTING  
No Scale



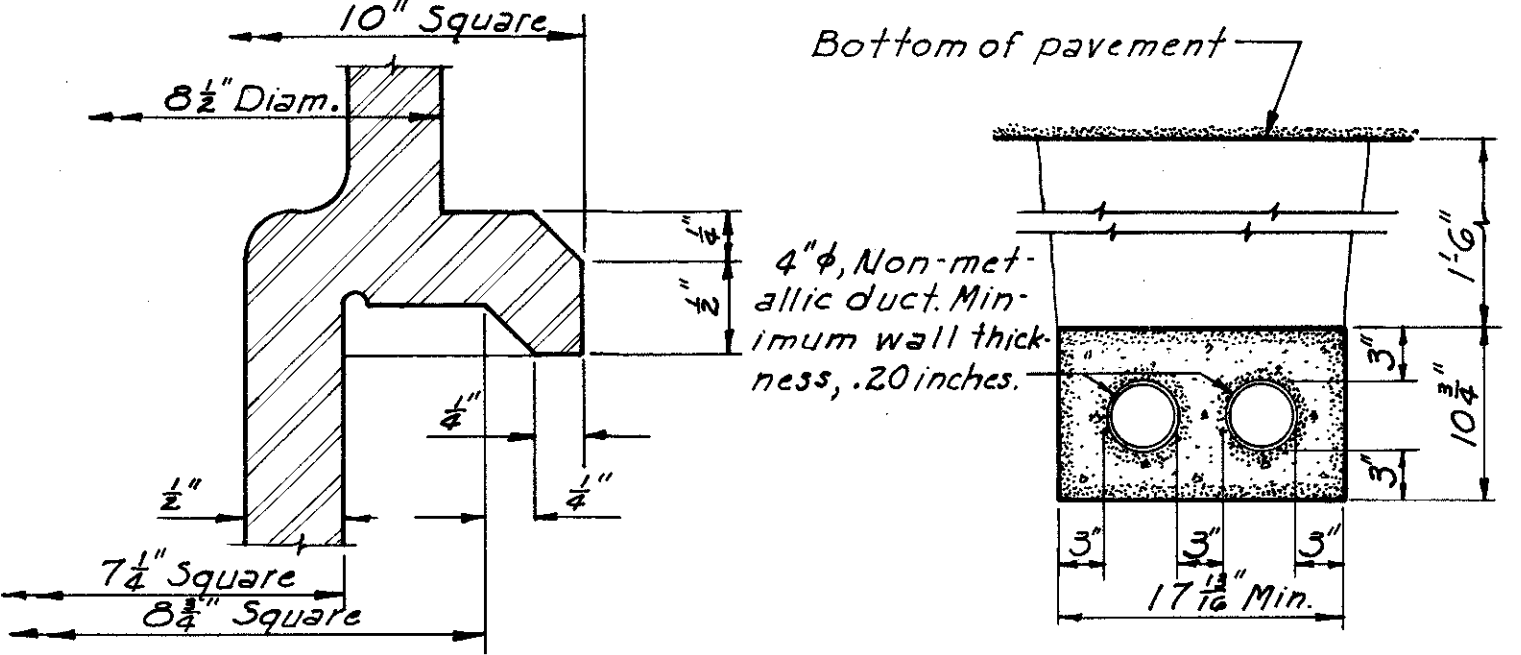
SECTION C-C  
CONCRETE PULL BOX  
Scale: 1" = 1'-0"



Note: Contractor to fill with grout any unused holes in sides of boxes. Conduits or ducts shall be pitched to drain, toward boxes, a minimum of one inch per one hundred feet.

Install and cap, one 2" conduit in one end of each pull box, as shown on plans.

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

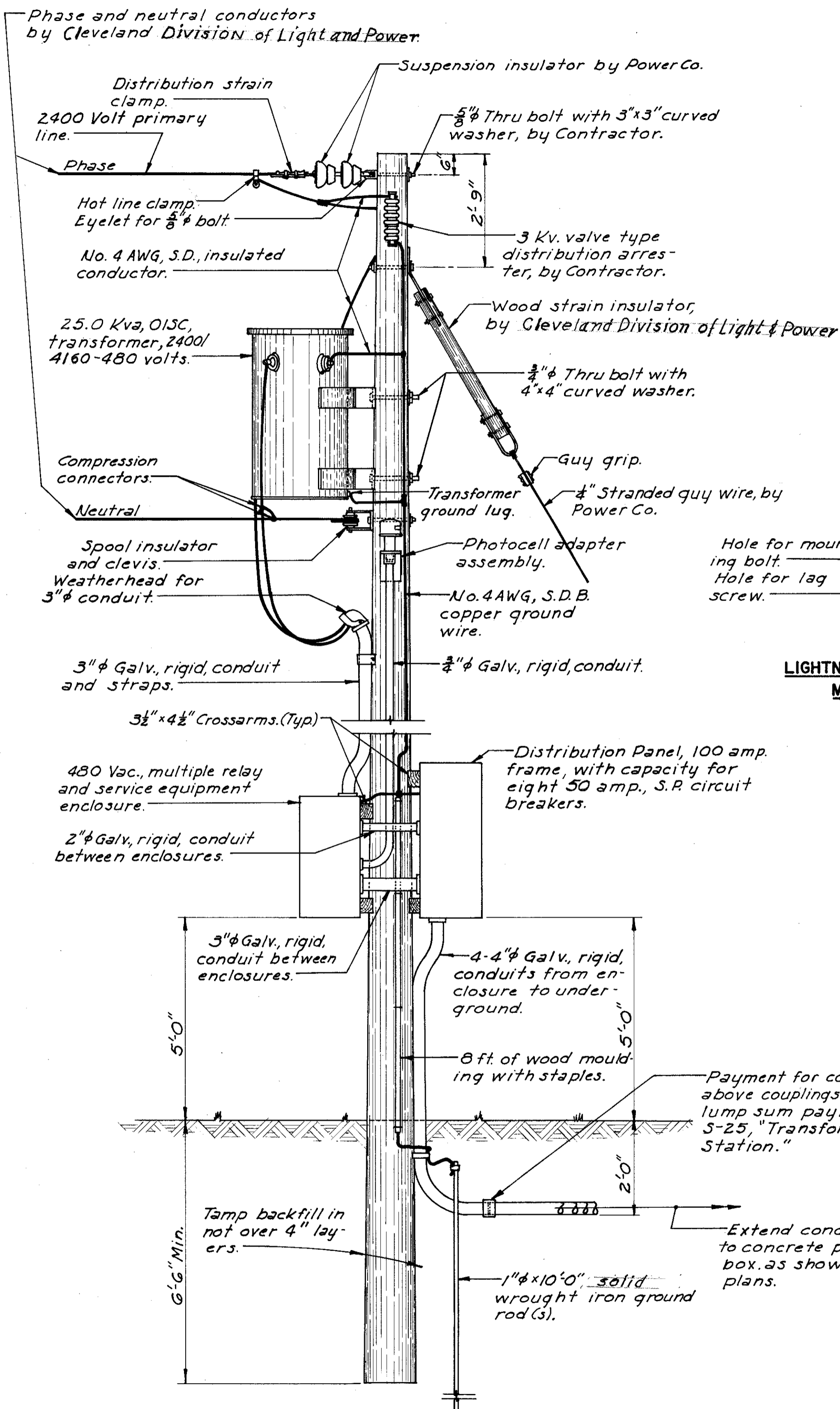


UNFOUNDED  
FEB 24 1963

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	TYPE FUNDS
2	OHIO		

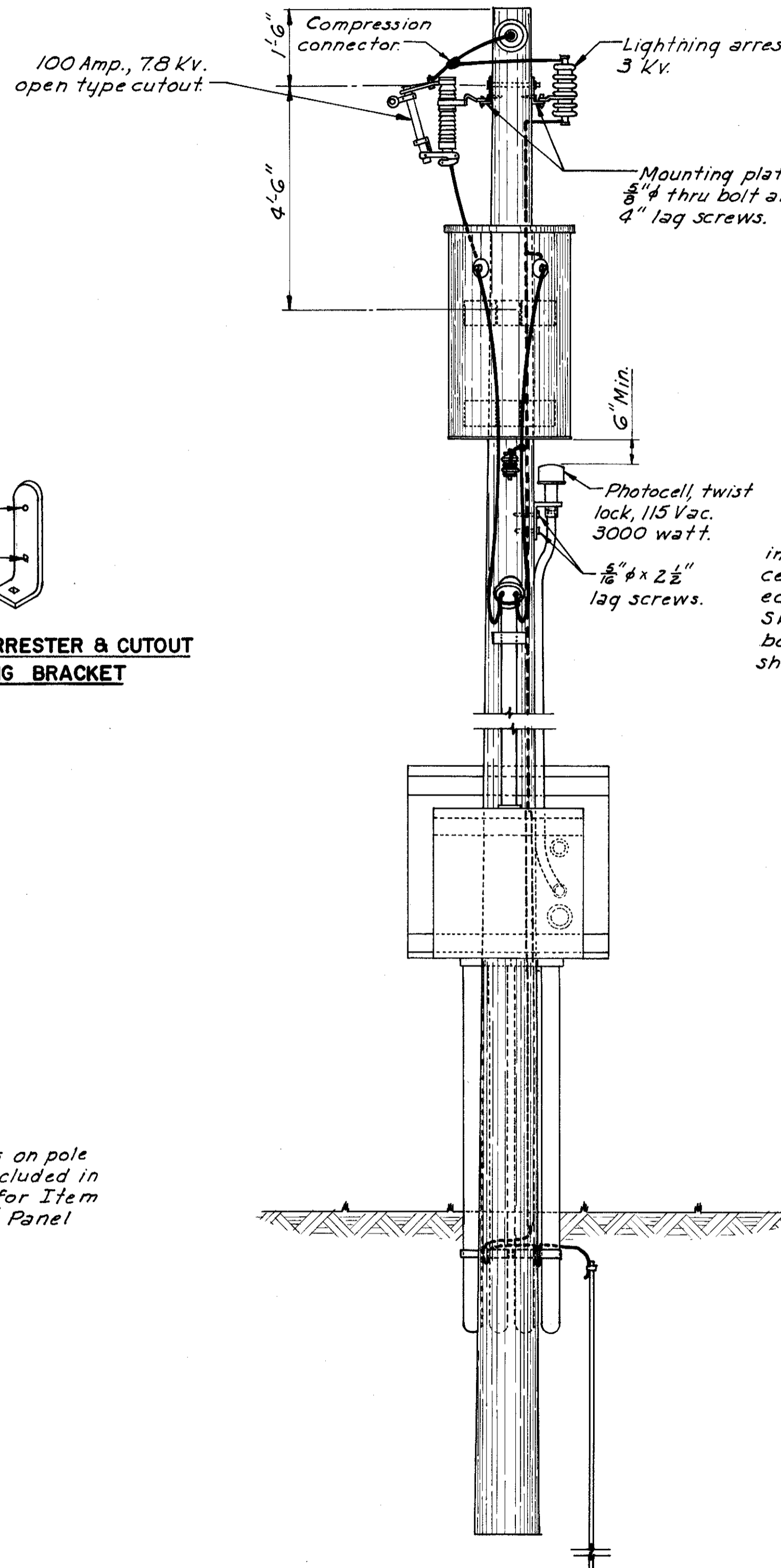
26  
77

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

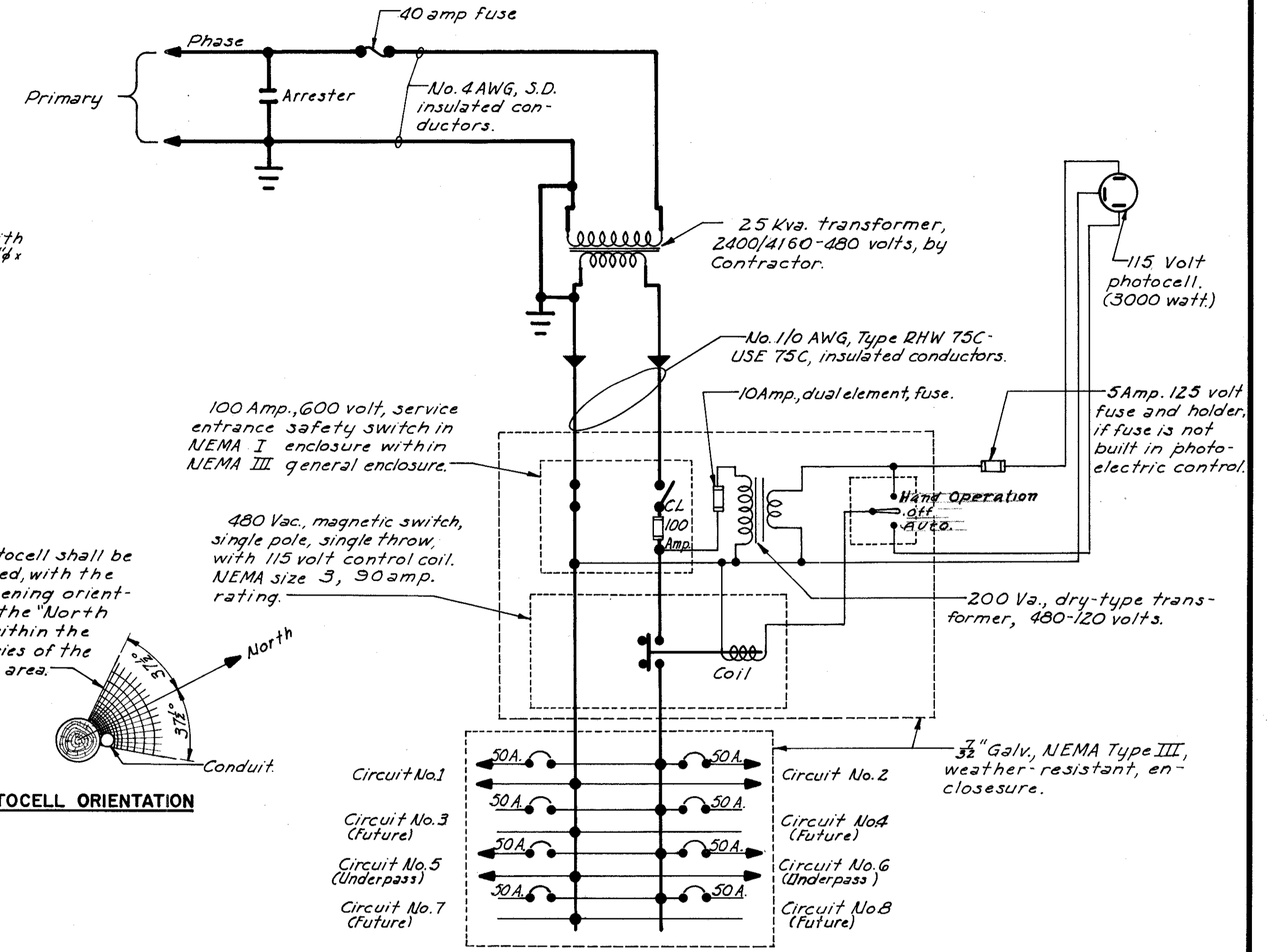
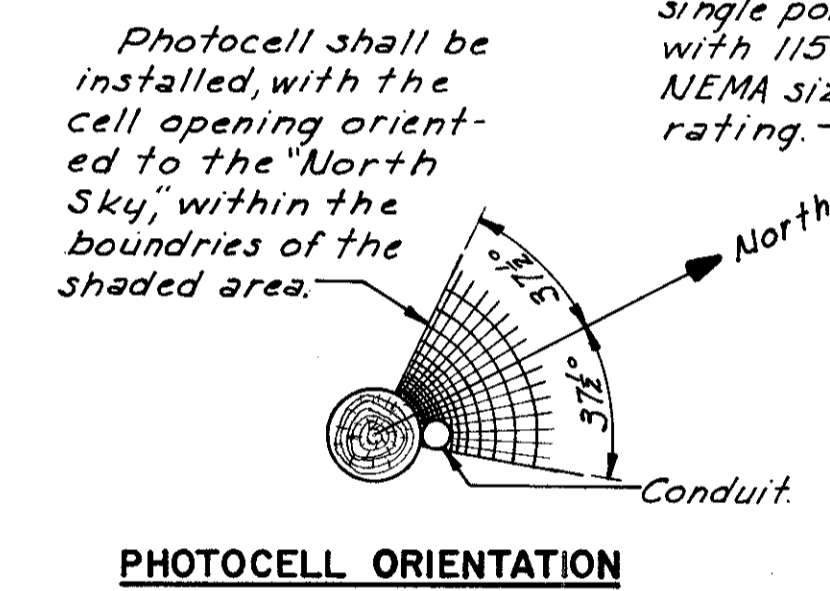


SIDE ELEVATION

TRANSFORMER AND PANEL STATION



FRONT ELEVATION



WIRING DIAGRAM

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

**TRANSFORMER AND PANEL DETAILS**

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: JDA	TRACED	CHECKED: J.C.	REVIEWED	REVISED
DATE: 2-28-64	DATE	DATE: 3-4-64	DATE	SHEET

Rev 7-2-64

UNRECORDED  
FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

27  
77

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

#### 1. DESIGN SPECIFICATIONS

Design specifications for Highway Structures of the State of Ohio, Department of Highways, dated September 1, 1957, together with current revisions thereof. The design loading is CF 2000(57).

The classes 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 1,333 p.s.i.

Concrete Class E - basic unit stress 1,133 p.s.i.

Structural Steel - ASTM A 36 - basic unit stress 20,000 p.s.i. Except Rollers and Roller Bearing Plates ASTM A-237-55, Class B, (ASTM A7 and ASTM A373 steel not permitted)

Reinforcing Steel - ASTM A15, A16, A160, Deformed, Intermediate or Hard Grade. Basic unit stress 20,000 p.s.i. Except, spiral reinforcement may be plain, Structural grade with basic unit stress of 18,000 p.s.i.

#### 2. SUPPLEMENTAL SPECIFICATIONS

Reference shall be made to Supplemental Specifications No. S-307, Radiographic Examination of Welds, dated August 23, 1960; and to No. S-101, Water-Reducing, Set-Retarding Admixtures, dated July 12, 1962 and to No. I-129, Traffic Sign Supports, dated April 5, 1961.

#### 3. REFERENCE DRAWINGS

Reference shall be made to Standard Drawing Numbers RB-1-55 revised 2-2-59, AR-1-57 revised 4-2-62 and to SD-1-63 (Sheet 2 of 4) dated November 12, 1963.

#### 4. DIMENSIONS

Dimensions given are measured horizontally and at 60° F. unless otherwise noted.

#### 5. UTILITIES

Any existing privately owned utility facilities encountered at the site of the work which will interfere with portions of the finished roadways or structures will be removed or relocated by the owners. The Contractor shall coordinate his operations with the work of the utility owners or others who may be making the relocations, and shall notify the owners of his schedule sufficiently in advance to permit them to make the necessary alterations.

Extreme care shall be exercised by the Contractor while driving piles in the vicinity of the 5'-0" and No. 5-C Brick Sewers to insure against any damage to the sewers. The sewers shall be inspected during the driving of critical piles and, if damaged in any way, work shall be stopped immediately and remedial action taken.

#### 6. EXCAVATION AND BACKFILL

The embankment shall be placed and compacted for its entire length to the finished spill-thru slope and to the level of the subgrade, as shown on the plans, after which the excavation shall be made for the abutment.

The excavation quantity includes the removal of embankment material required for the construction of the abutments.

#### 7. FOUNDATION SOUNDINGS

Foundation design and foundation quantities are based on a study of soil-sampling soundings made at the site. This sounding information, the accuracy of which the State does not guarantee, is included with these plans but is not to be construed as a part of the plans governing construction of the project.

#### 8. 12" $\phi$ CAST-IN-PLACE REINFORCED CONCRETE PILES

All piles for the abutment shall be driven to a minimum bearing capacity of 35 tons per pile and all piles for the piers shall be driven to a minimum bearing capacity of 40 tons per pile.

A maximum pile length is shown in the plans for certain piles at Piers 4E, 5E and 7W. If bearing is not attained in the maximum length indicated for these piles, the Director shall be notified immediately and his approval of the actual bearing value shall be obtained.

#### 9. CONCRETE DECK

(a) The steel girders and beams shall be fabricated with camber, as specified on the plans, to compensate for the deflections due to weight of concrete and steel and for vertical curvature of the roadway. The theoretical deflections are tabulated on the plans.

(b) The final surface of the roadway shall conform as nearly as practicable to the elevations shown on the plans. To compensate for deflections due to dead load of the concrete, the screeds used to strike off the surface of the concrete to the final desired grade line shall be adjusted by amounts equal to deflections shown for this dead load. Screeds may require further adjustments due to irregularities in the fabricated steel.

(c) The depth of concrete over each beam or girder (top of concrete to top of flange or top of web) at the supports is given on the plans. The concrete slab shall be of uniform thickness between beams or girders, with adjustments obtained by varying the thickness of the haunches over the beams or girders.

(d) The aforementioned depth of concrete over each beam or girder is the nominal dimension. The quantity of deck concrete to be paid for shall be based on this dimension, even though deviation from it may be necessary because the top flange may not have the exact camber or conformation required to place it parallel to the finished grade.

(e) In order to facilitate water curing, the placing of concrete shall progress upgrade. The slab may be placed in sections between transverse construction joints which are parallel to transverse reinforcing steel and are located near the center of any span.

#### 10. SURFACE FINISH OF CONCRETE

The requirements of Section S-1.22, Rubbed Finish, shall apply to the following exposed concrete surfaces:

(a) The entire superstructure except the top surface of safety curbs and median and the bottom surface of the deck between outside beams or girders.

(b) The entire surface of piers and abutment except bridge seats, backwall and the face of the abutment between outside girders.

#### 11. REINFORCING STEEL

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

All bar dimensions are given out to out.

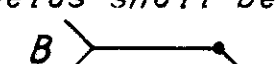
All bars of a series shall vary in length by a constant increment.

(b) The clear distance between reinforcing steel and face of concrete shall be 3" at the bottom of footings, 2 $\frac{1}{2}$ "  $\pm$  at bar mats under shoes and 2" elsewhere unless otherwise shown on the plans.

#### 12. CONTINUOUS BEAM SHOP ASSEMBLY

Reference paragraph 4, Section S-7.12 of the Construction and Material Specifications, if rolled beams are field spliced only at supports, for the purpose of checking the fit-up of weld joint preparation, only two adjacent beams need be shop assembled at a time in their correct, unloaded positions. All beams shall be assembled and match marked.

#### 13. WELDING

Welds shown as field welds may, at the option of the Contractor, be made in the shop. All welds shall be Class "A" except as otherwise shown. Class "B" welds are shown thus: 

#### 14. MODIFICATIONS AND ADDITIONS TO THE EXISTING STRUCTURE

Work to be done on the existing structure, as a part of this project, consists of the removing and replacing 69.70 feet of concrete parapet and aluminum railing, erecting two light poles, five overhead sign supports, 10,544 feet of barrier curb, and 4,240 feet of barrier guard rail, all as shown on the plans.

#### 15. TEMPORARY BARRICADE

The temporary barricades on the south end of the existing structure shall be maintained during construction and shall be left in place when construction is completed.

#### 16. LIGHTING NOTES

For general notes pertaining to lighting, see sheets 20 thru 26 of the Roadway Plans.

#### 17. ITEMS NOT INCLUDED IN BRIDGE PLANS

The following items are not included in the bridge plans. See Roadway Plans for details.

1. Approach grading and sod flumes
2. Relocation or removal of existing utilities
3. Removal of existing retaining wall, pavements, etc.

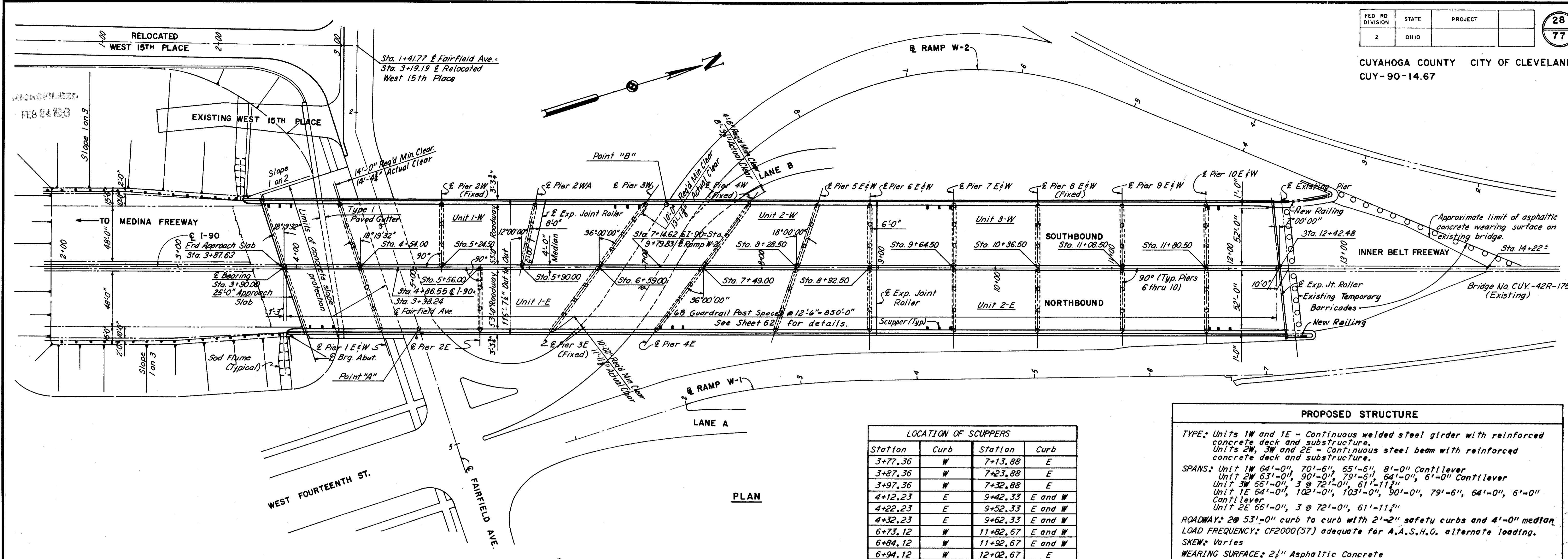
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

#### GENERAL NOTES

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN C.P.	TRACED	CHECKED W.F.	REVIEWED B.F.	REVISED
DATE 4-13-64	DATE	DATE 4-13-64	DATE 4-14-64	SHEET 27



LOCATION OF SCUPPERS

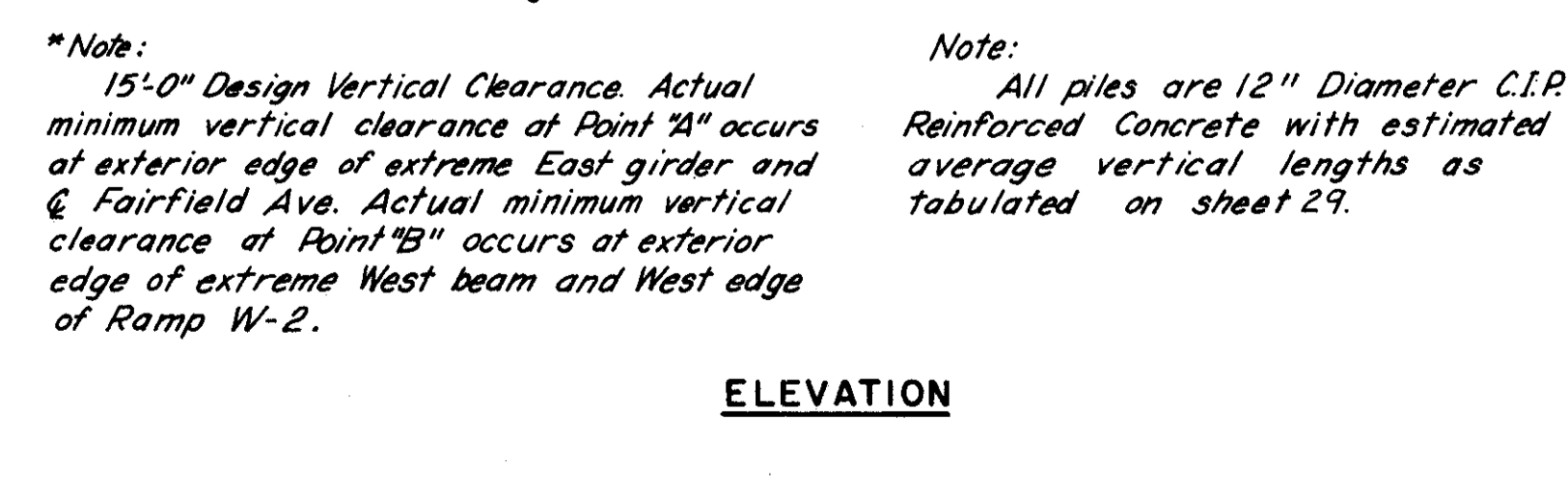
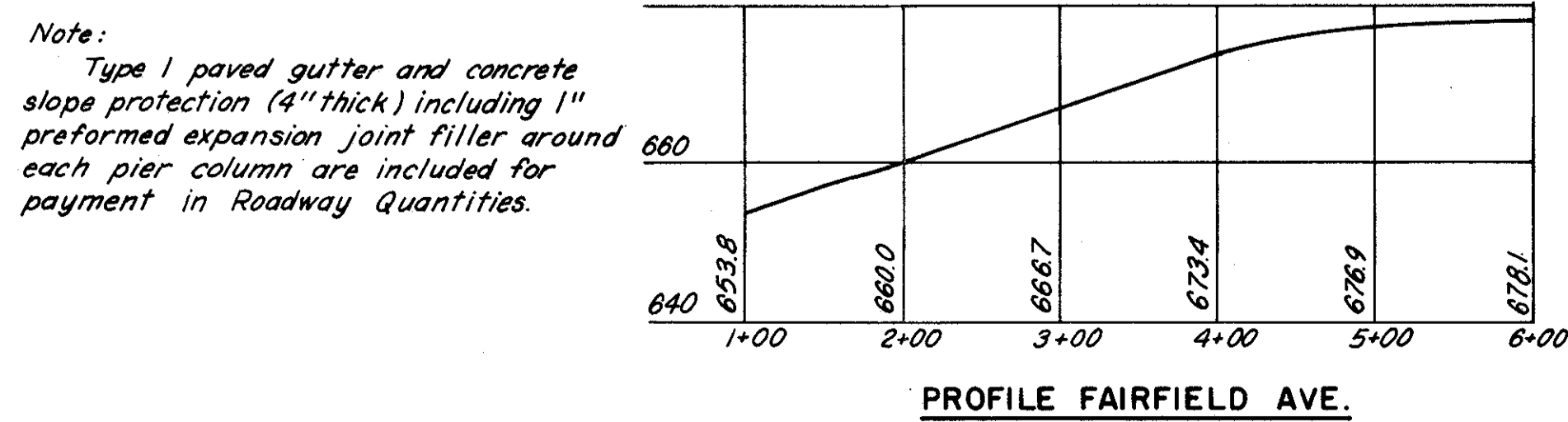
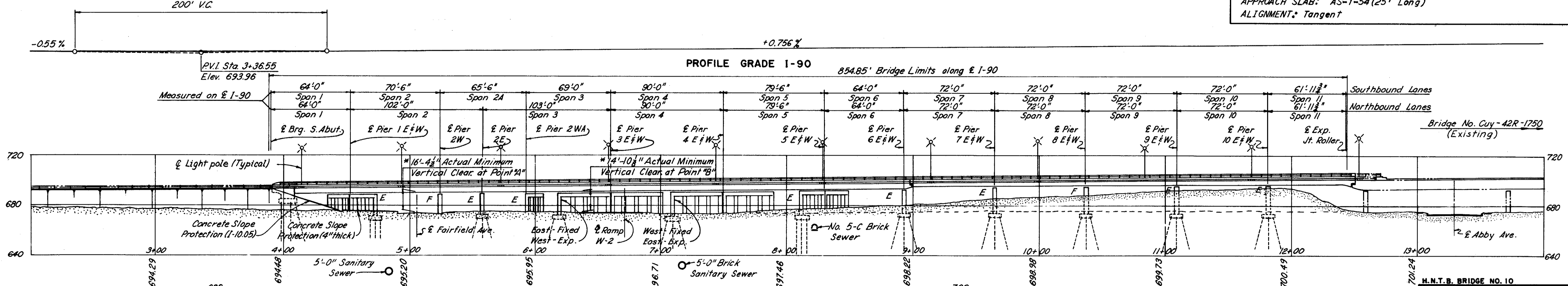
Station	Curb	Station	Curb
3+77.36	W	7+13.88	E
3+87.36	W	7+23.88	E
3+97.36	W	7+32.88	E
4+12.23	E	9+42.33	E and W
4+22.23	E	9+52.33	E and W
4+32.23	E	9+62.33	E and W
6+73.12	W	11+82.67	E and W
6+84.12	W	11+92.67	E and W
6+94.12	W	12+02.67	E

**PROPOSED STRUCTURE**

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 1/2" Asphaltic Concrete  
APPROACH SLAB: AS-1-54 (25' Long)  
ALIGNMENT: Tangent



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

**GENERAL PLAN AND ELEVATION**

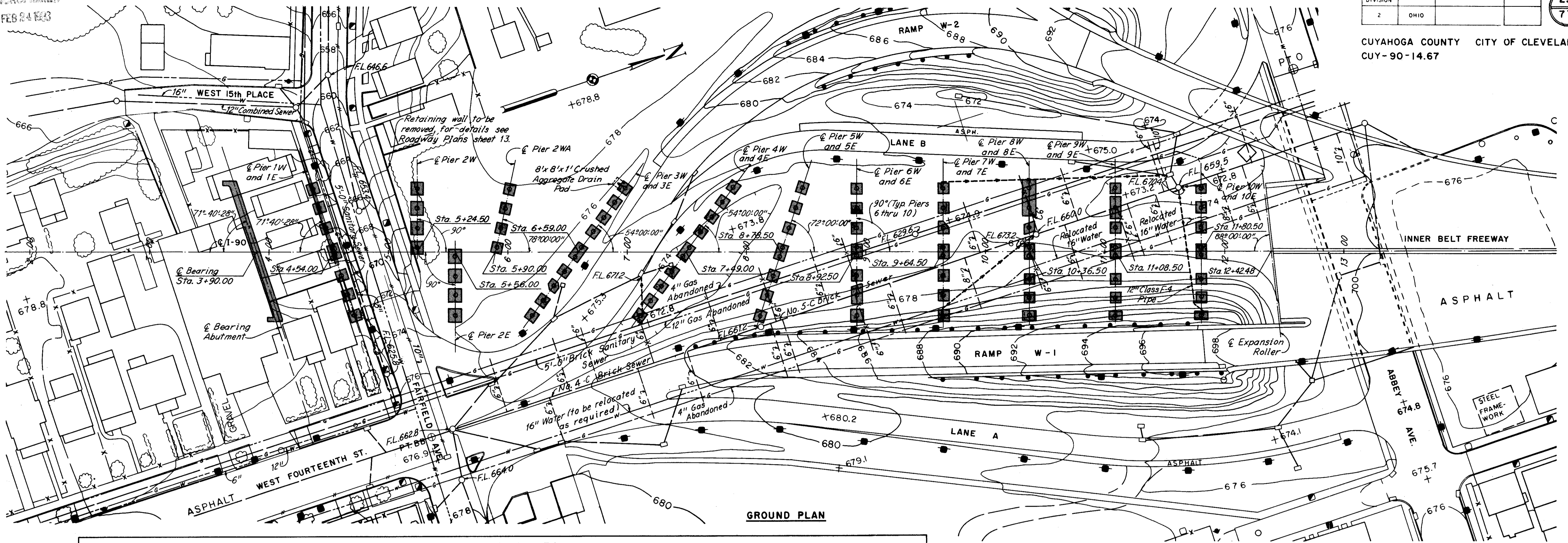
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: 1" = 40'-0" STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DATE 1/14/63

UNRECORDED  
FEB 24 1963

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



GROUND PLAN

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	I-90-1(55)25				TOTAL
			ABUTMENT	PIERS	SUPER-STRUCTURE	EXISTING STRUCTURE	
E-2	Cofferdams, Crib and Sheeting	Lump Sum					Lump Sum
E-2	Unclassified Excavation	Cu. Yd.	270	2,290			2,560
S-1	Class "C" Concrete, Superstructure	Cu. Yd.			2,821	2,960	2,821 2,960
S-1	Class "C" Concrete, Pier Caps and Columns	Cu. Yd.		809			809
S-1	Class "E" Concrete, Abutment (Above Footing)	Cu. Yd.	131				131
S-1	Class "E" Concrete, Footings	Cu. Yd.	92	817			909
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	28				28
S-4	Reinforcing Steel	Pounds	16,390	326,060	875,570		1,218,020
S-7	Structural Steel	Pounds			2,838,500		2,838,500
S-8	Field Painting of Structural Steel	Pounds			2,838,500		2,838,500
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	29				29
S-9	1/2" Preformed Expansion Joint Filler	Sq. Ft.				69	69
S-14	Railing, Type "C" (Aluminum Rails and Supports and Concrete Parapet and Terminal Posts)	Lin. Ft.	30.40		1,707.74		1,738.14
S-14	Railing Type "C" (On Existing Structure)	Lin. Ft.				69.70	69.70
S-14	Barrier Guard Rail, Type I-15.11 rails with steel posts, brackets & bolts, galvanized	Lin. Ft.			850	4,240	5,090
Special	Barrier Curb, as per plan	Lin. Ft.				10,544	10,544
S-16	First Test Pile	Lump Sum					Lump Sum
Special	Preboring for Piling (Including Backfill)	Lin. Ft.		600			600
S-18	12" Φ C.I.P. Reinforced Concrete Piles	Lin. Ft.	1,290	16,390			17,680
S-25	For Lighting Quantities see sheet 23.						
S-29	Porous Backfill	Cu. Yd.	55				55
S-29	Scuppers, Including Supports	Each			23		23
S-29	Collector Systems, Including Supports	Lin. Ft.				150	150
S-29	8" Φ Downspouts Including Specials, Wrought-iron or galvanized steel	Lin. Ft.				130	130
S-29	6" Φ CMP (Including Specials), M-Q-F (H) non-perforated	Lin. Ft.		69			69
S-29	6" Φ Perforated CMP (Including Specials), M-Q-F (H)	Lin. Ft.	115				115
S-101	Water Reducing Set Retarding Admixture	Each			2,821		2,821
I-1	12" Φ Class D-1 Pipe	Lin. Ft.				335	335
I-1	12" Φ Class F-4 Pipe	Lin. Ft.				105	105
I-10	Concrete Slope Protection	Sq. Yd.				712	712
I-129	For Signing Quantities See Sheet 67.						

① Backfill (after piles are driven) shall conform to Item I-22 of the Construction Specifications.

LEGEND

- Existing Sewer
- - - Proposed Sewer (12" Φ Class D-1 Concrete Pipe except as noted)
- W Water Line
- - - Relocated Water Line
- G Gas Line
- # — # Electric Line
- Sewer Manhole
- Inlet
- Light Pole
- Power Pole
- Power and Telephone Pole

ESTIMATED PILE LENGTHS (FEET)

Abutment	W	E
Pier 1	20	20
Pier 2	20	25
Pier 2WA	25	
Pier 3	25	25
Pier 4	30	30
Pier 5	30	33
Pier 6	30	33
Pier 7	32	34
Pier 8	35	35
Pier 9	33	35
Pier 10	32	35

Note: See General Note No. 5 for driving of piles adjacent to 5'-0" and No. 5-C brick sewers.

NOTE:

The abandoned house connections marked thus — X — X shall be capped at the No. 4-C and 5-C brick sewer prior to driving piles for the footings in the vicinity of the house connections. The capping of the connections, including any excavation, bulkheading of the sewers and backfilling required therefor, shall be included with Item E-2, Unclassified Excavation for payment.

H.N.T.B. BRIDGE NO. 10

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

**GROUND PLAN**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: 1" = 40' STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/CHEK	TRACED	CHECKED	REVIEWED	REVISION
DATE 10-21-62	DATE	DATE 11-7-62	DATE 2-13-63	7-1-63

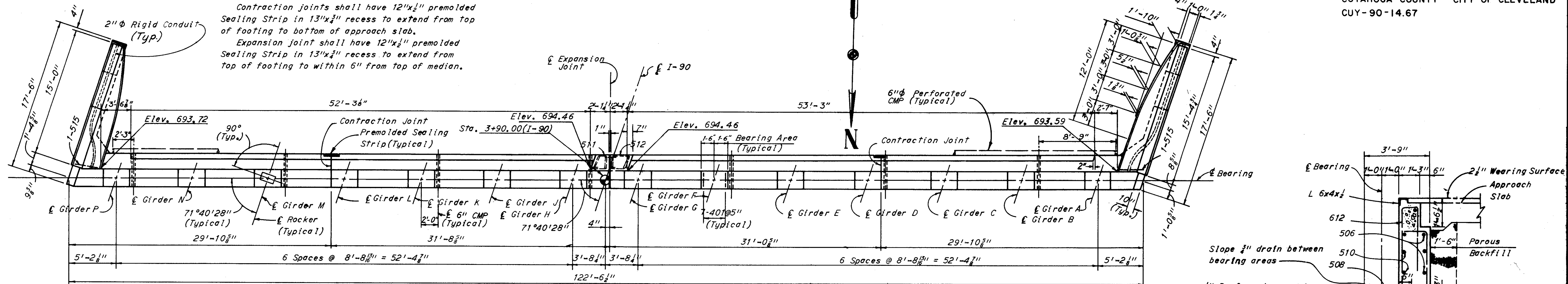
SHEET 29

REPRODUCTION  
FEB 24 1963

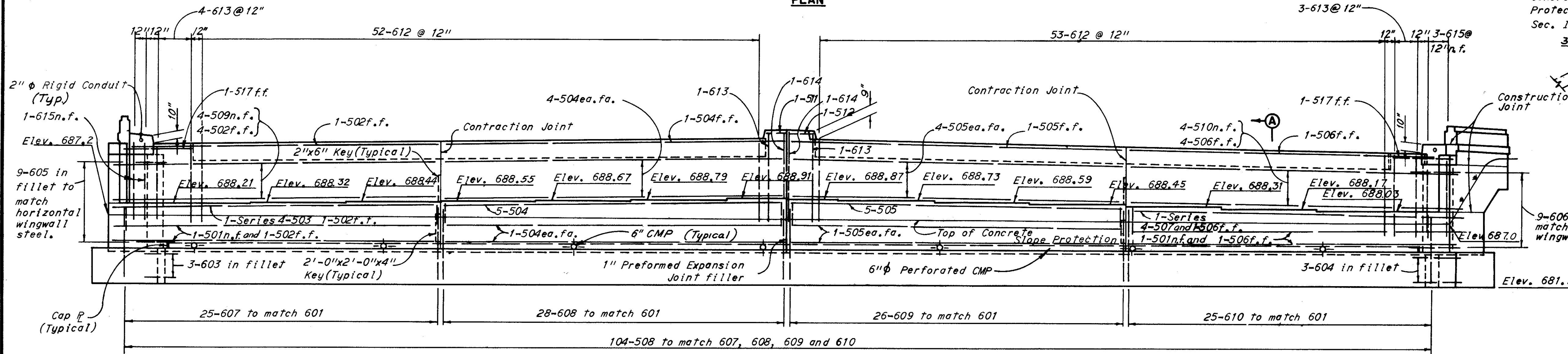
Note:  
Dimensions for curvature of curb are typical for both wingwalls.  
Backwall elevations are given to top of 8x6x1 angle of the end dam.  
Contraction joints shall have 12"x $\frac{1}{2}$ " preformed Sealing Strip in 13"x $\frac{3}{4}$ " recess to extend from top of footing to bottom of approach slab.  
Expansion joint shall have 12"x $\frac{1}{2}$ " preformed Sealing Strip in 13"x $\frac{3}{4}$ " recess to extend from top of footing to within 6" from top of median.

FED. RD. DIVISION	STATE	PROJECT	30
2	OHIO		77

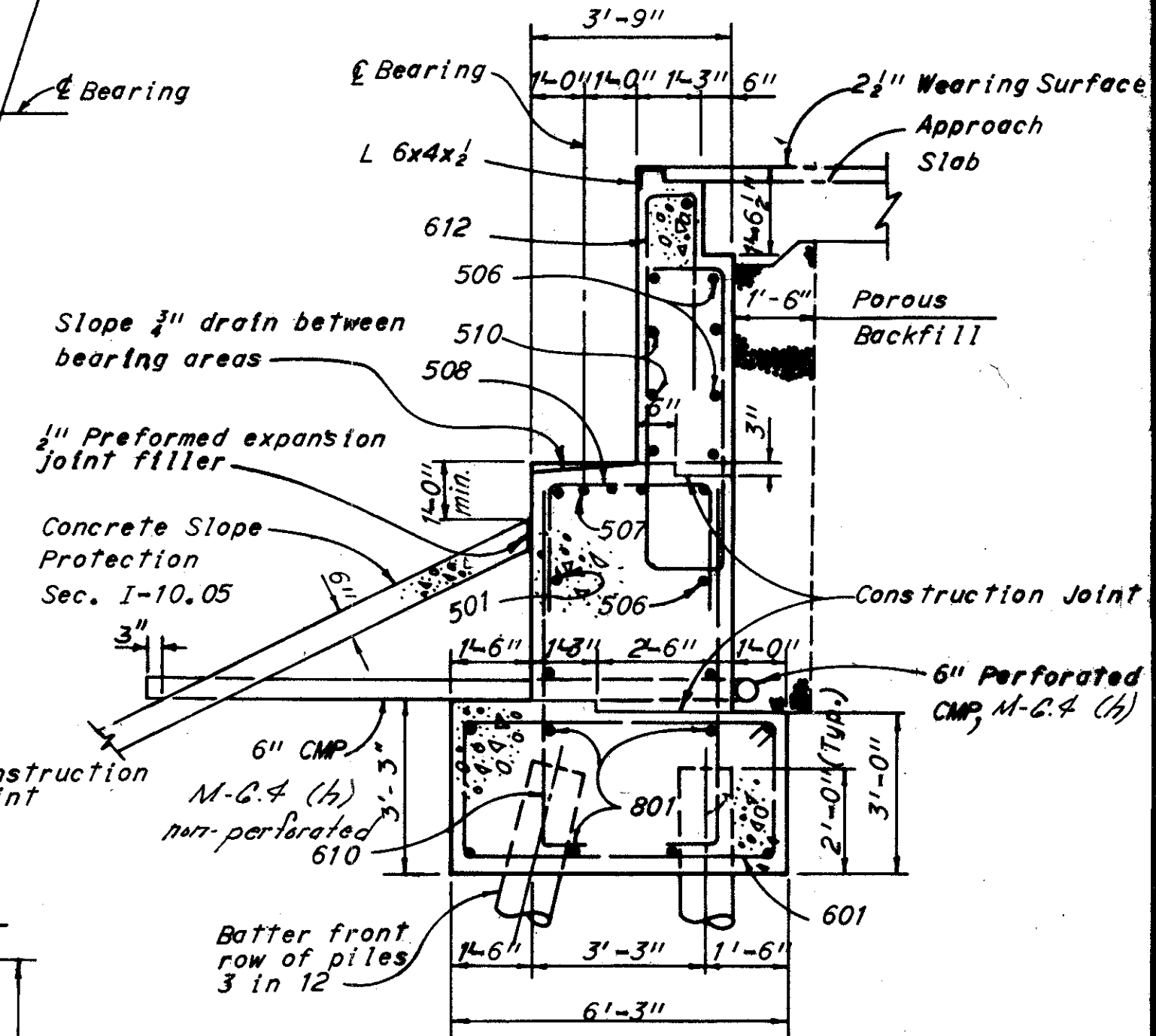
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



PLAN



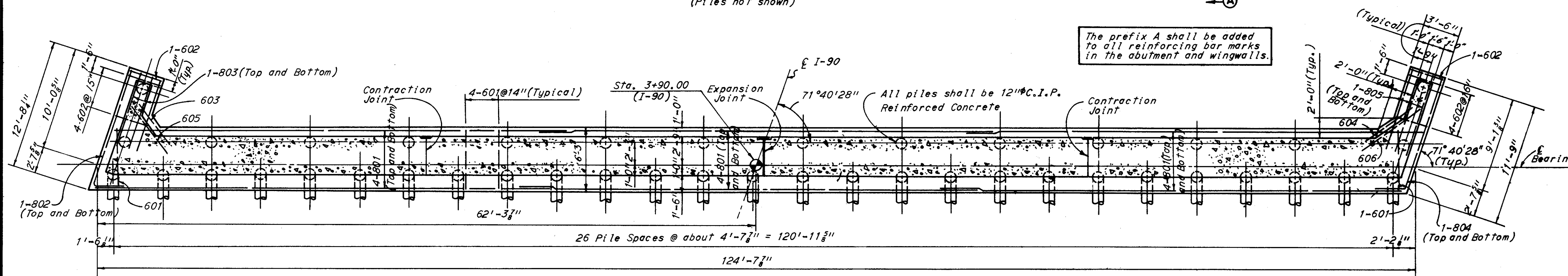
ELEVATION  
(Piles not shown)



SECTION A-A

Notes:  
For Wingwall Elevations and additional sections see sheet 31.  
For roadway end dam details see Ohio Standard Drawing SD-1-63, sheet 2 of 4.  
For curb plate details see sheet 52.  
For reinforcement schedule and bar bending diagrams see sheet 5B.  
The following abbreviations are used:  
ea. fa. = each face, n.f. = near face, f.f. = far-face.

The prefix A shall be added to all reinforcing bar marks in the abutment and wingwalls.



FOOTING PLAN

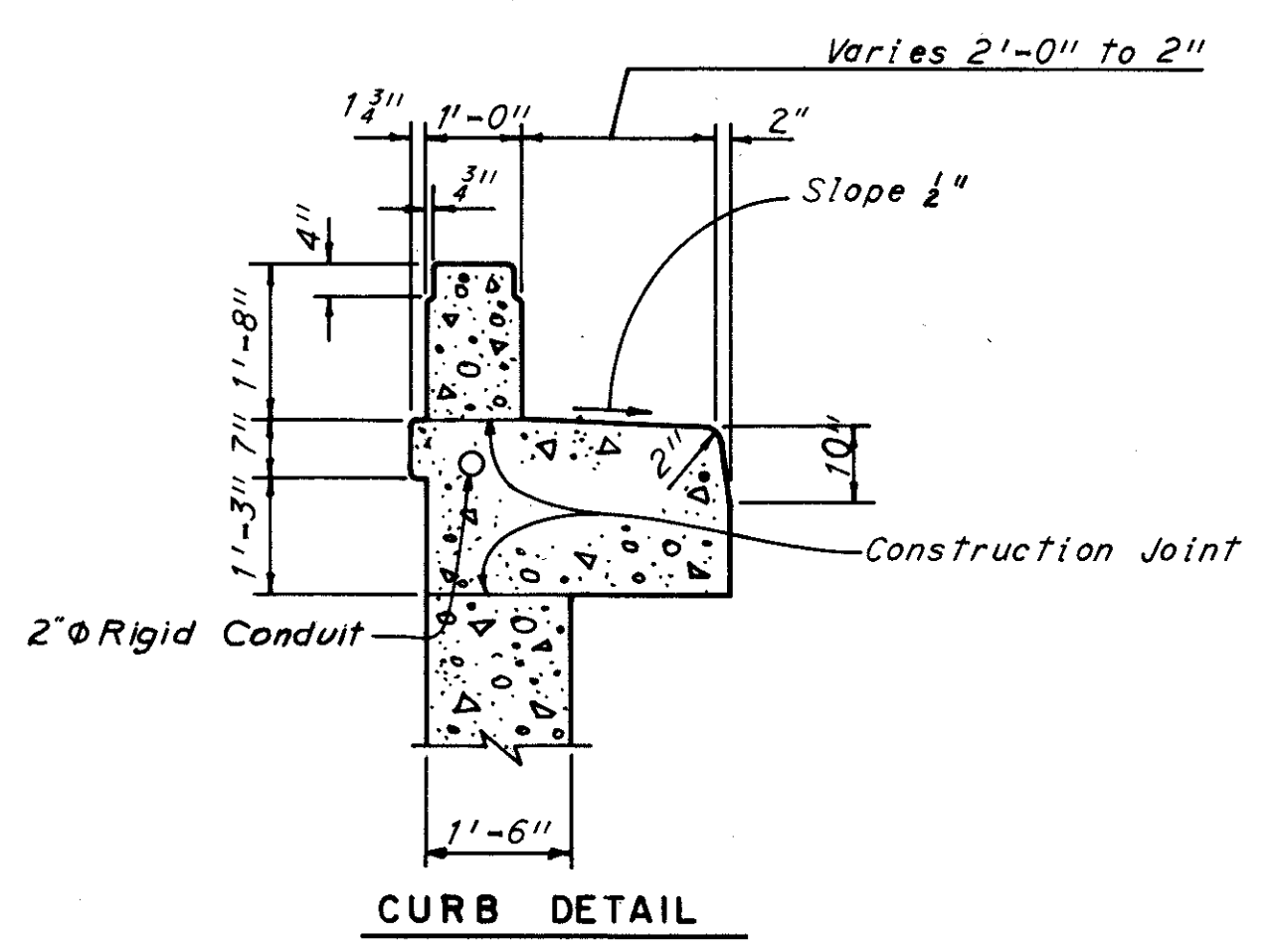
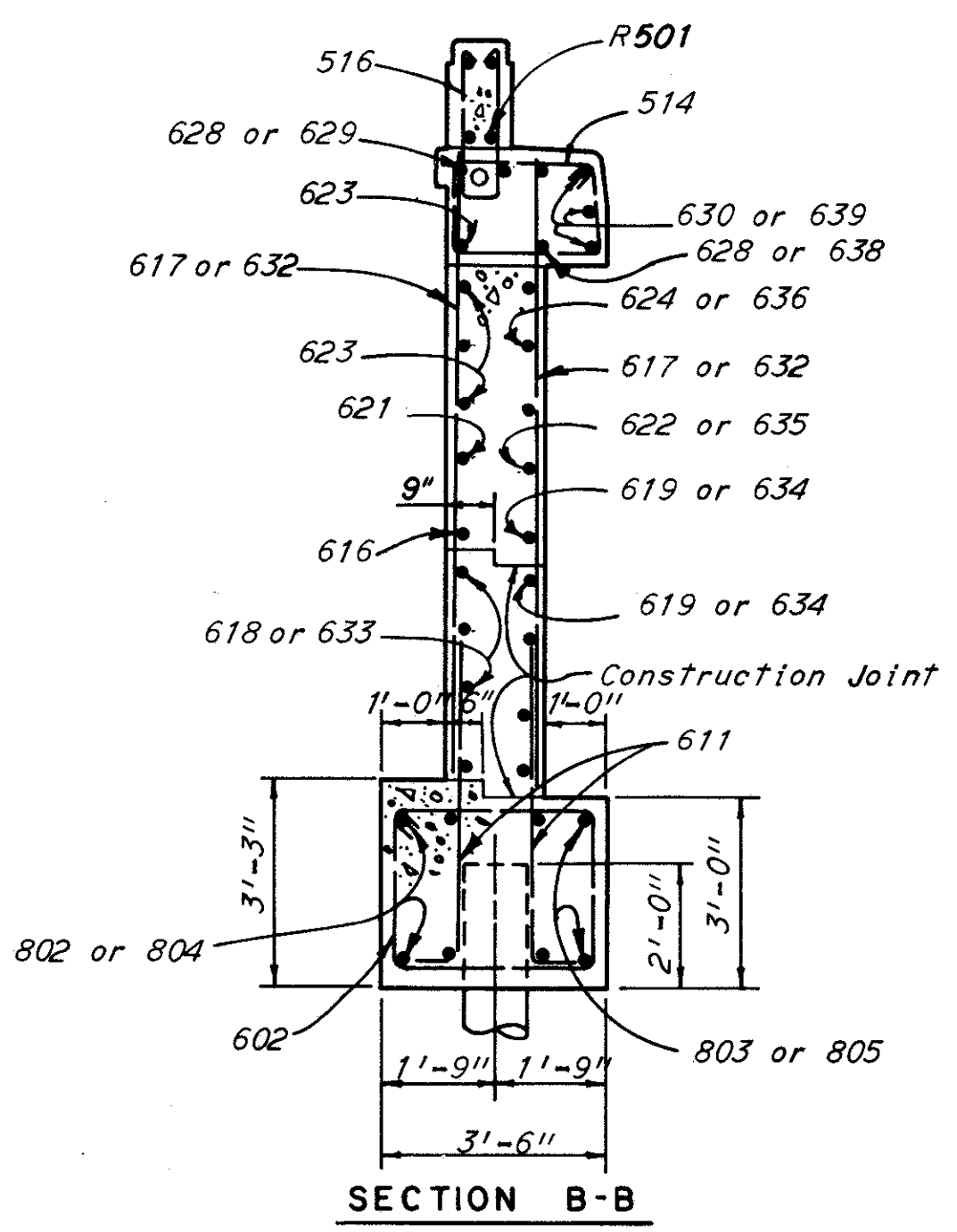
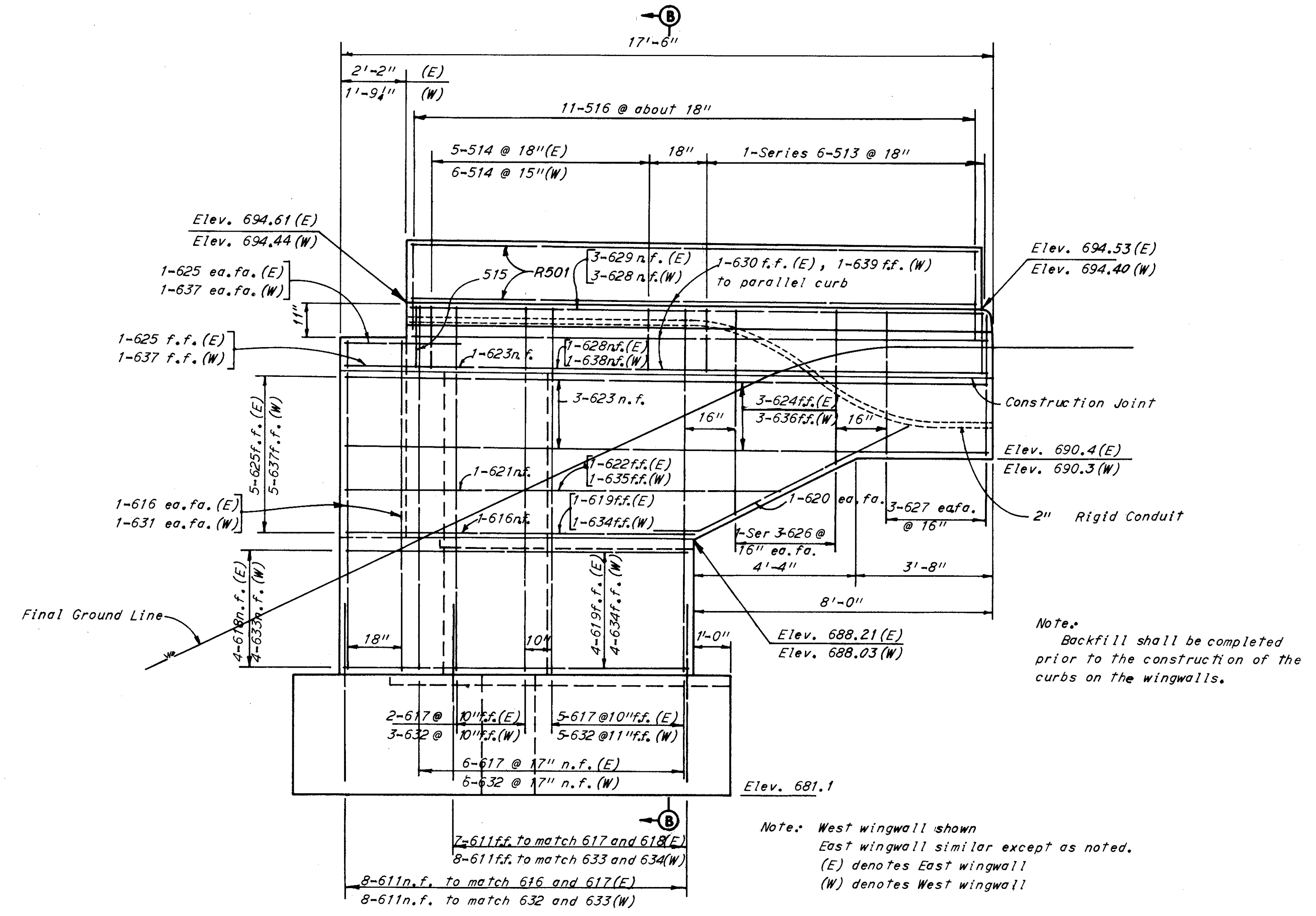
H.N.T.B. BRIDGE NO. 10			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>ABUTMENT</b>			
I-90 OVER FAIRFIELD AVE., LANE B AND RAMP W-2			
BR. NO. CUY-90-1467	STA. 3 + 87.63		
SCALE: None	STA. 12 + 42.48		
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN LEE	TRACED	CHECKED RSD	REVIEWED WJ
DATE 7-4-63	DATE	DATE 3-17-64	DATE 2-1-64



MICROFILMED  
FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	31 77
2	OHIO		

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



Notes:  
For railing details see Ohio Standard Drawing AR-1-57.  
For longitudinal reinforcement in the parapets, railing post spacing, and railing and terminal post details see sheet 51.  
The following abbreviations are used:  
n.f. = near face, f.f. = far face, ea. fa. = each face.

H.N.T.B. BRIDGE NO. 10

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

**WINGWALL ELEVATION**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

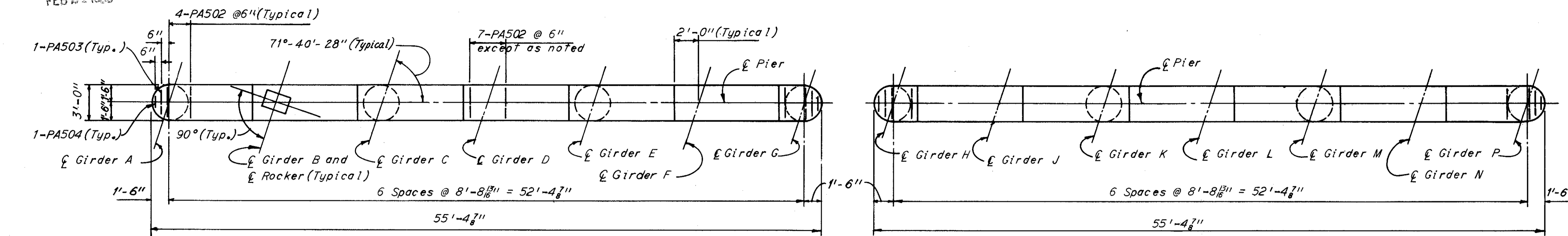
DRAWN Lee	TRACED	CHECKED ASD	REVIEWED WJF	REVISED
DATE 9-11-63	DATE	DATE 3-17-64	DATE 4-1-64	

SHEET 31

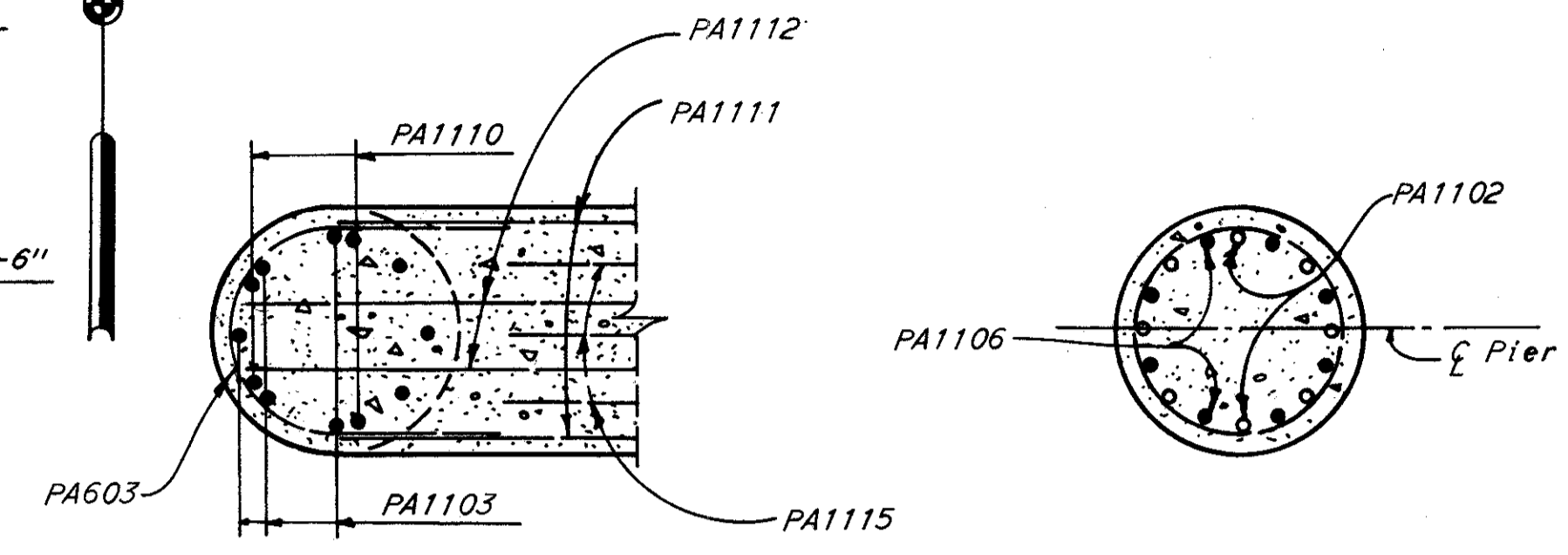
UNCLASSIFIED  
FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	32
2	OHIO		77

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

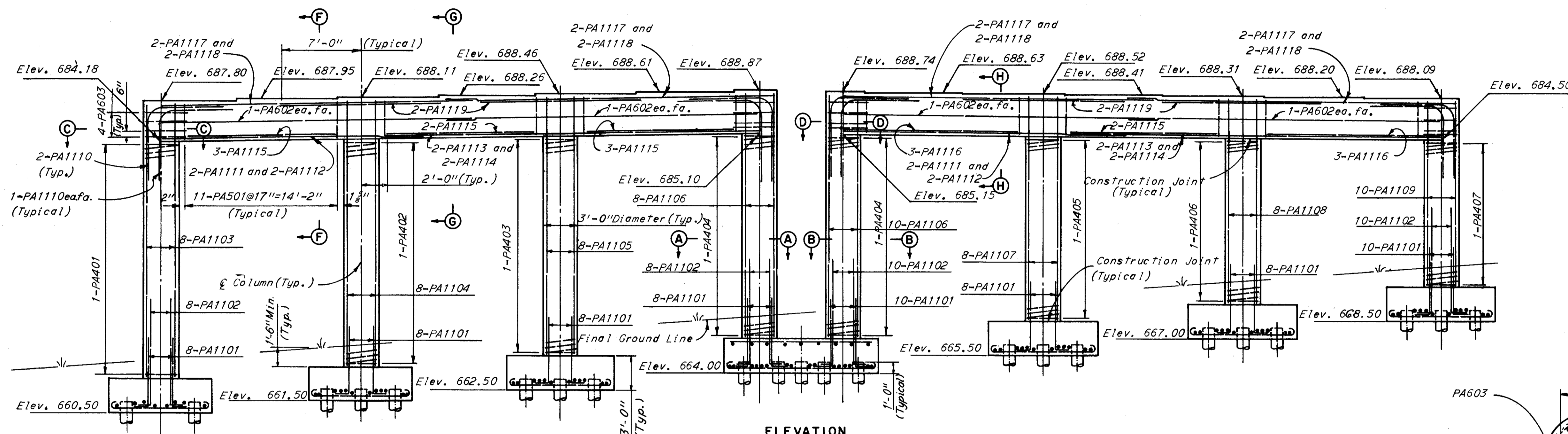


PLAN

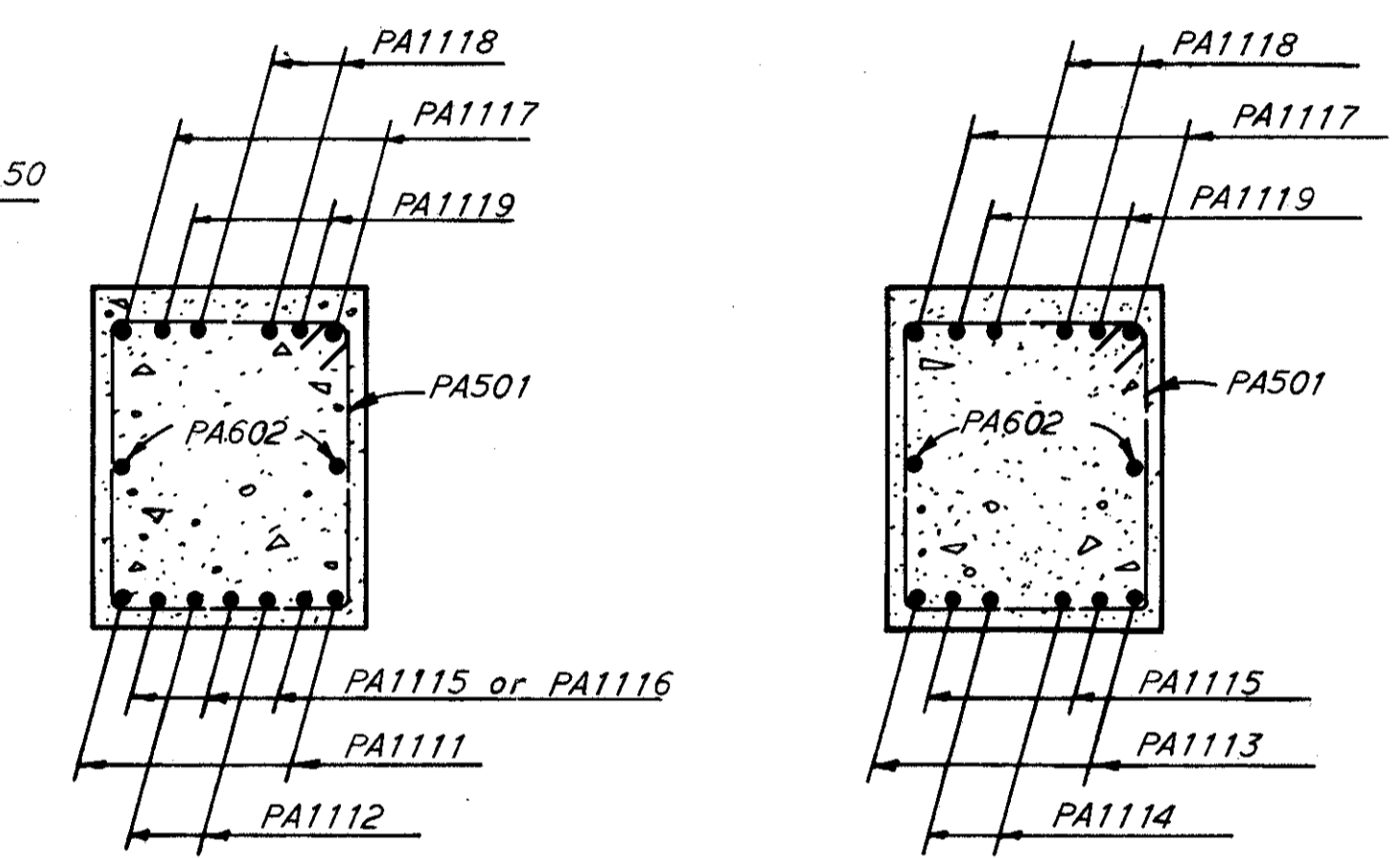


SECTION C-C

SECTION A-A

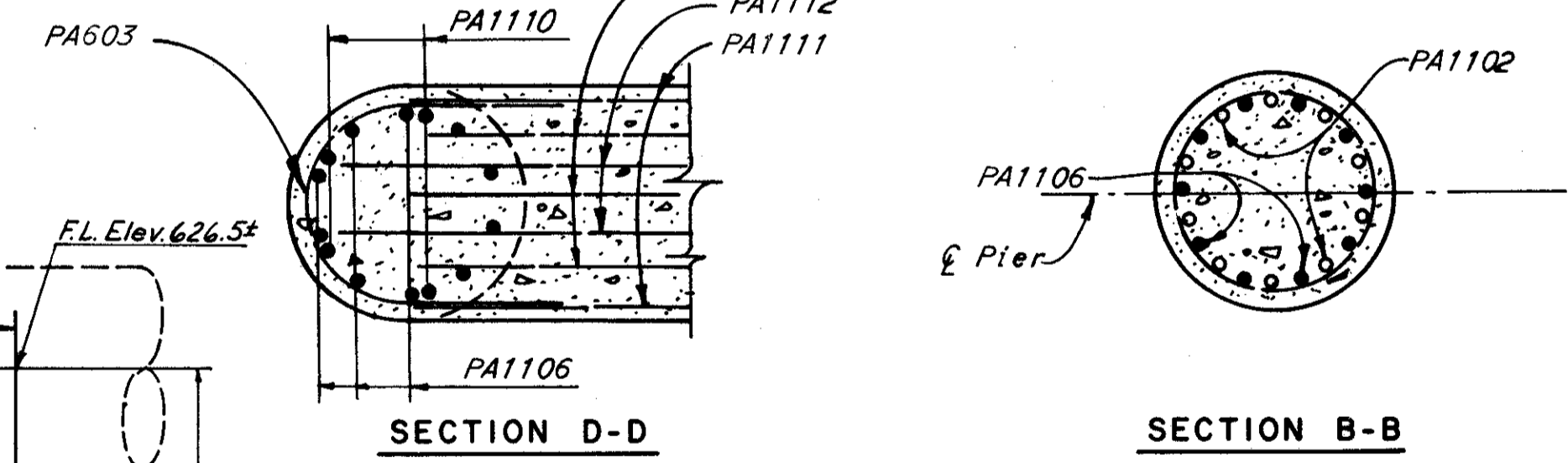


ELEVATION



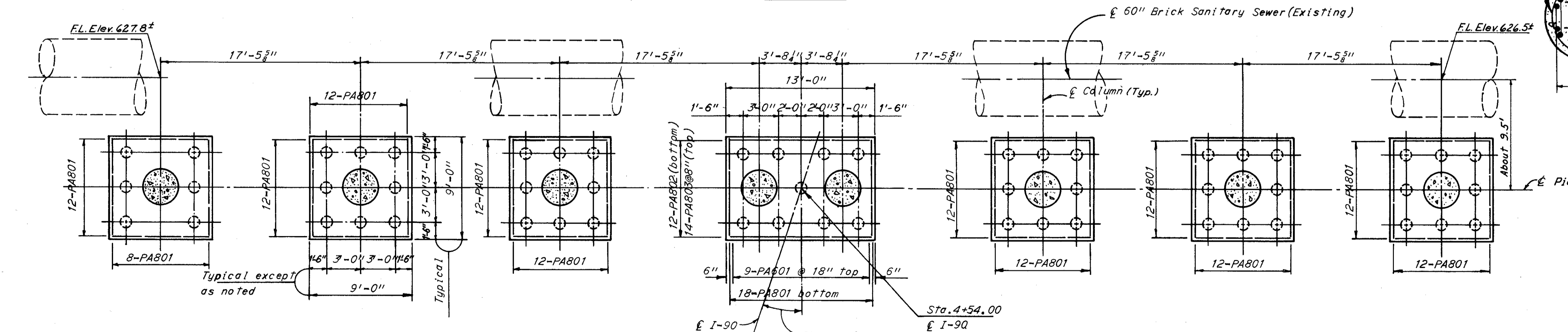
SECTION F-F AND SECTION H-H

SECTION G-G



SECTION D-D

SECTION B-B



FOOTING PLAN

PIER IW

PIER IE

For notes see sheet 33.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIER I**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

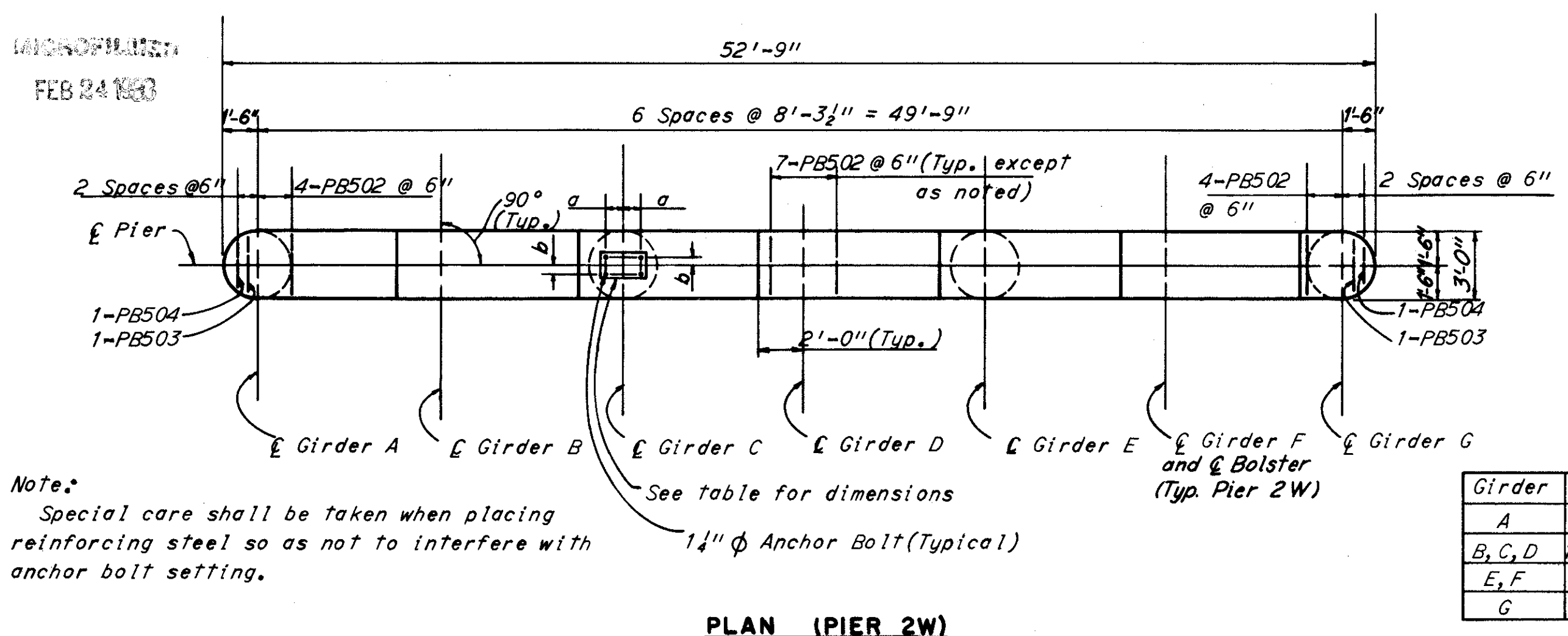
BR NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN Lee	TRACED	CHECKED WLB	REVIEWED WLB	REVISED
DATE 10/26/63	DATE	DATE 9/30/63	DATE 4-1-64	

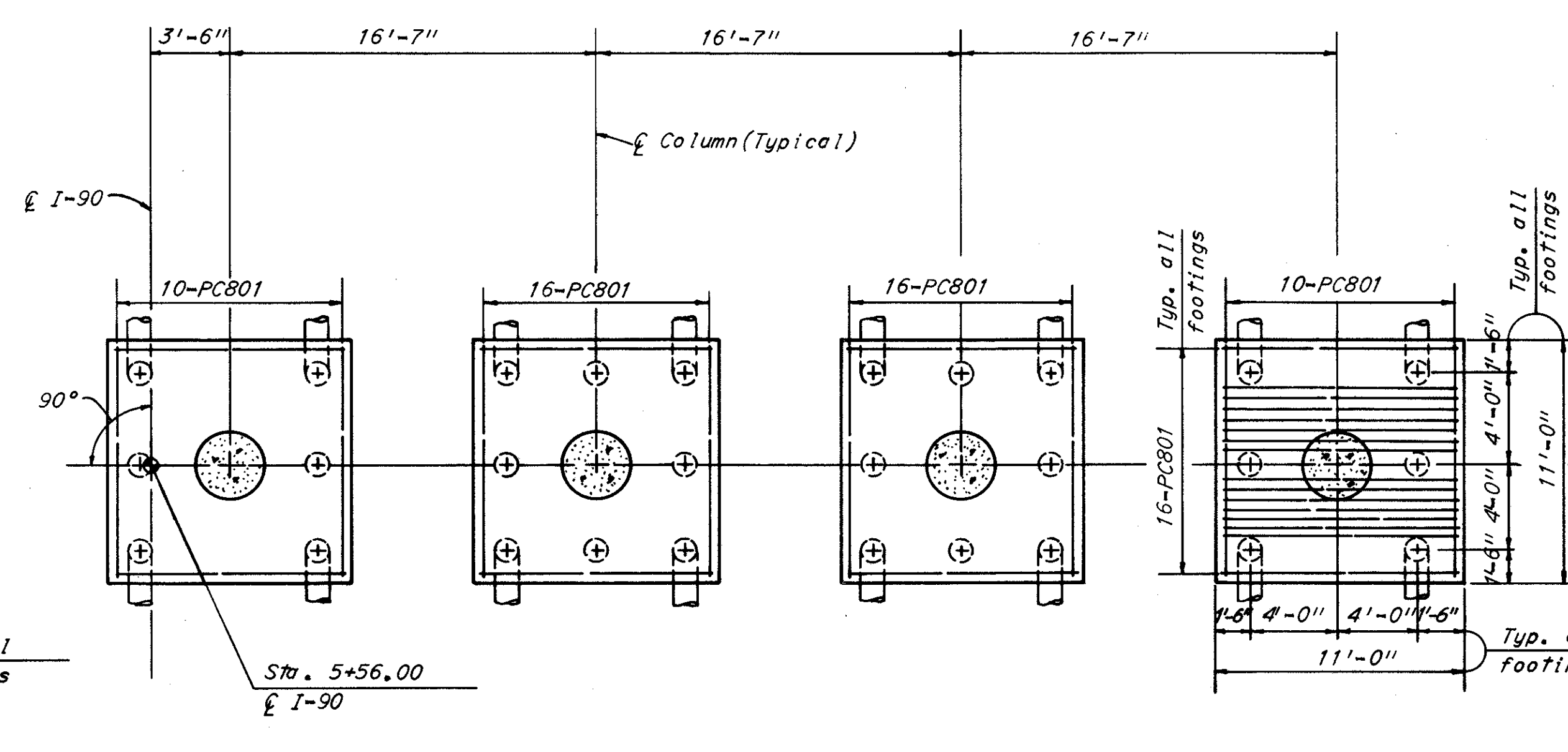
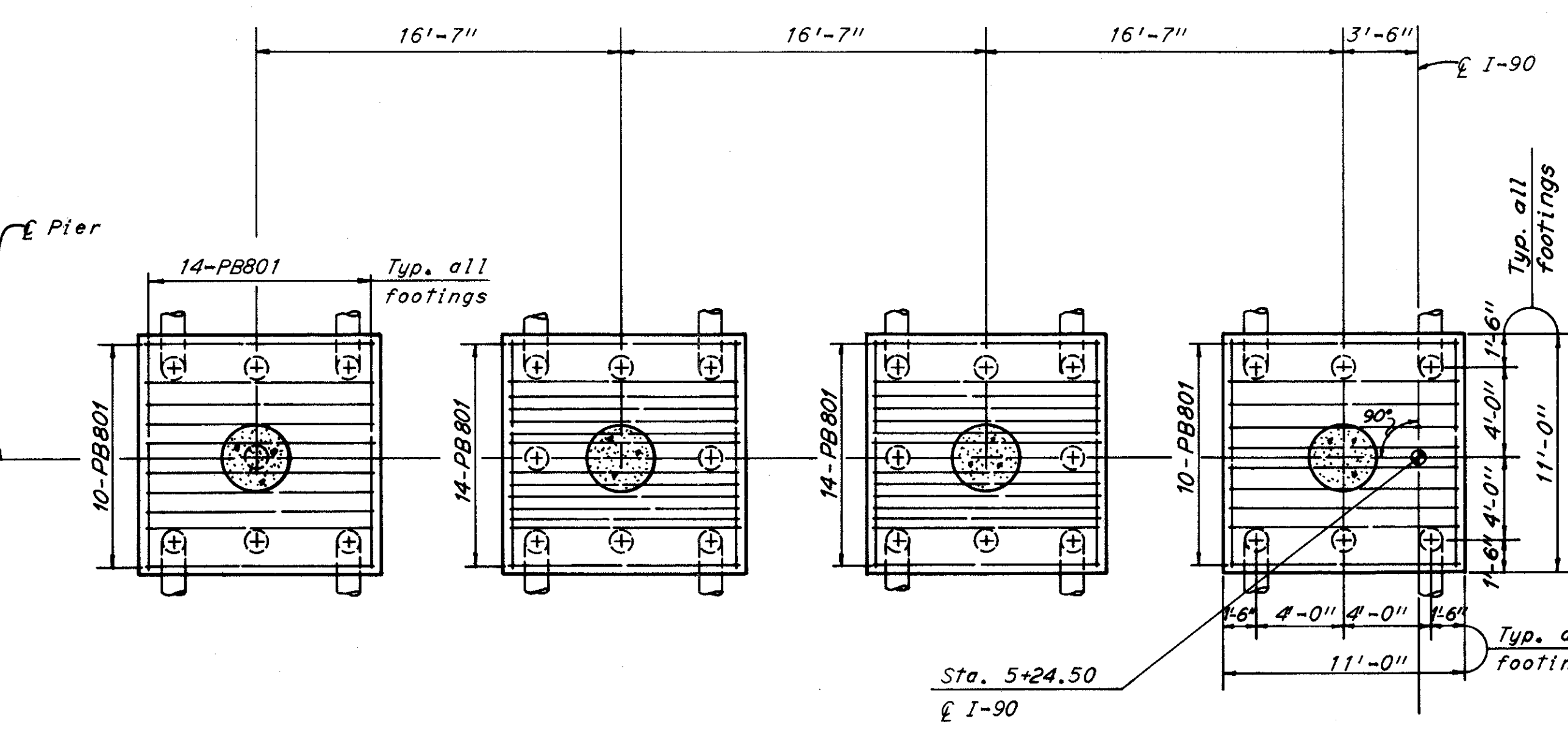
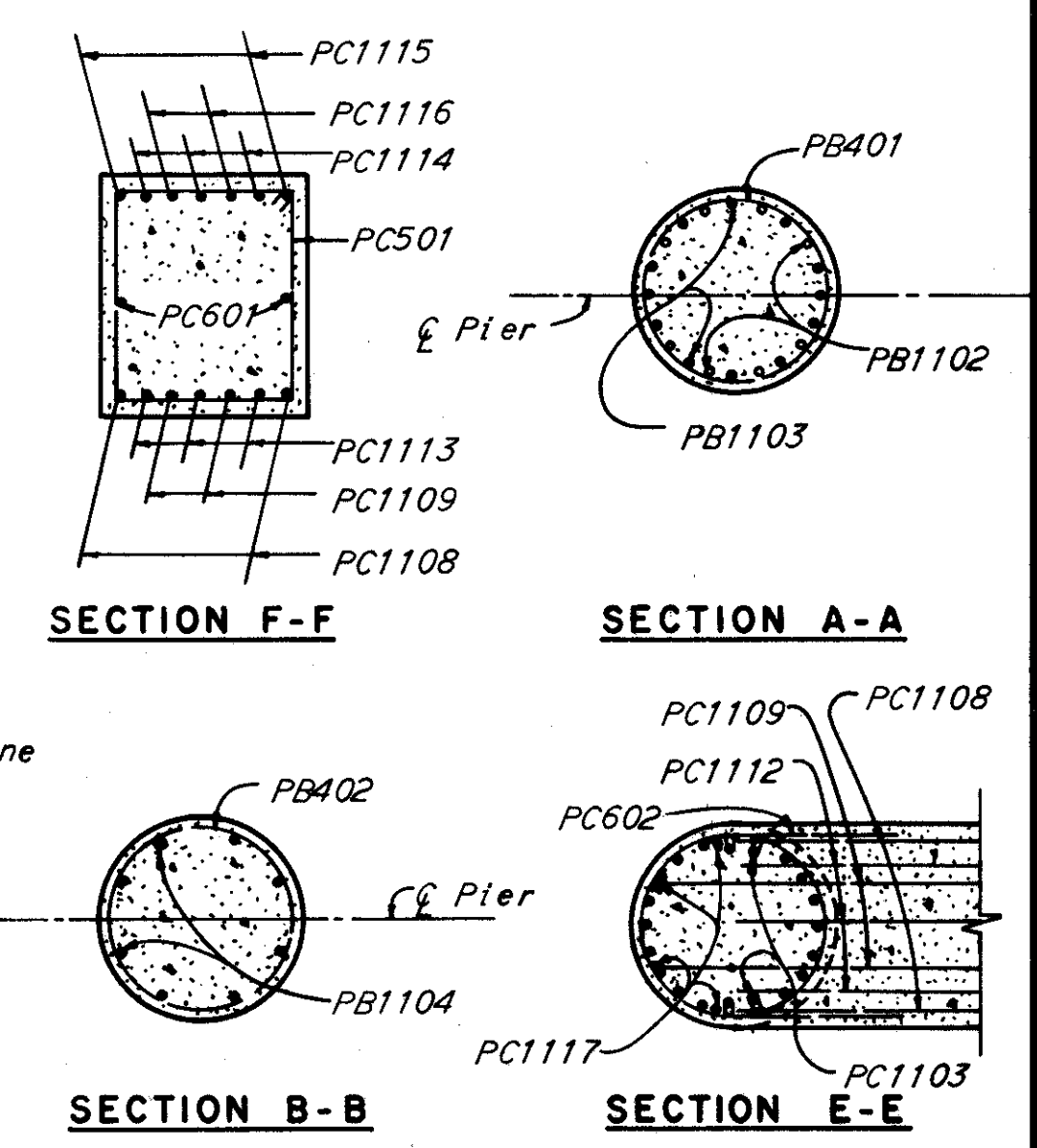
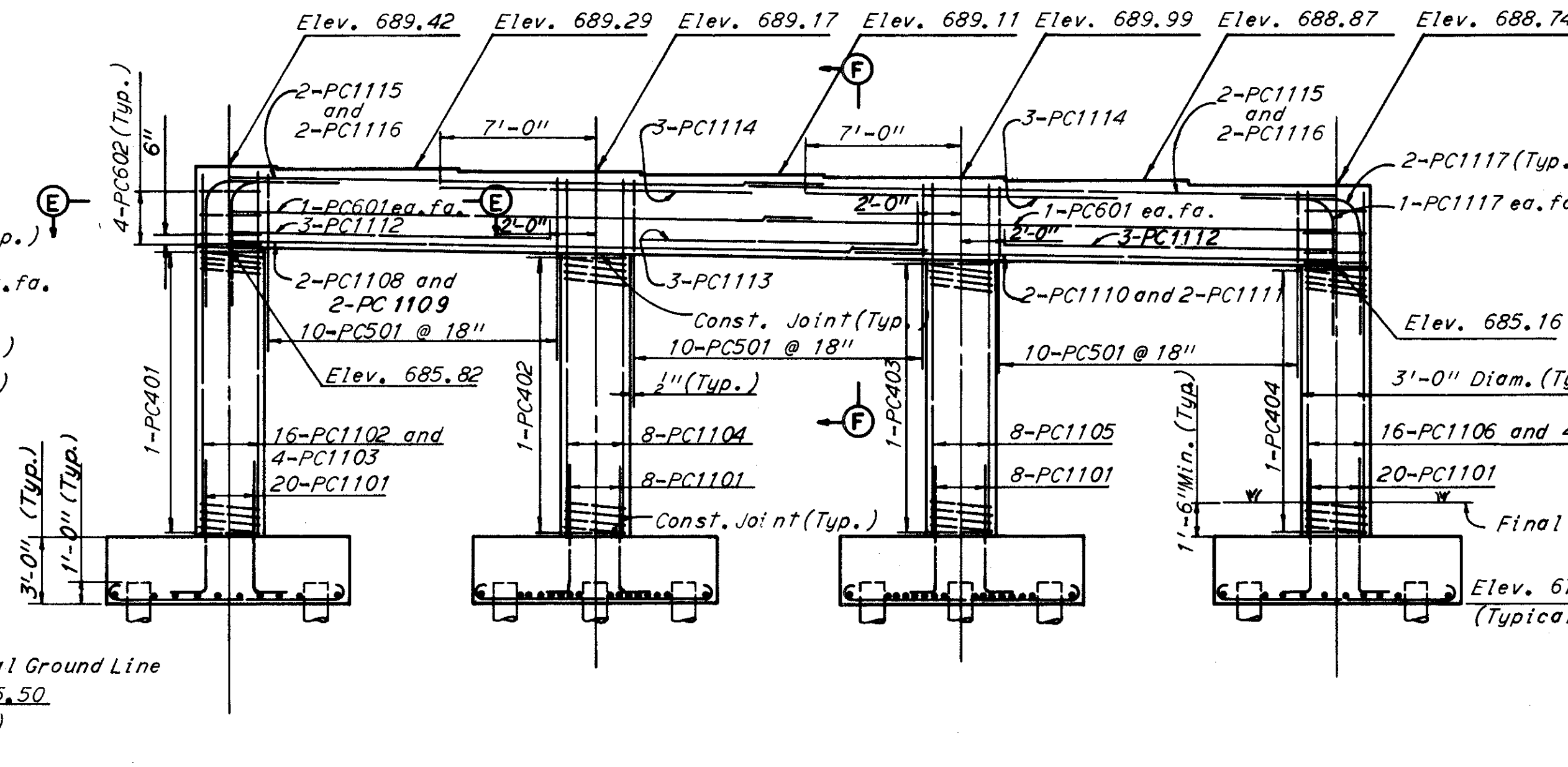
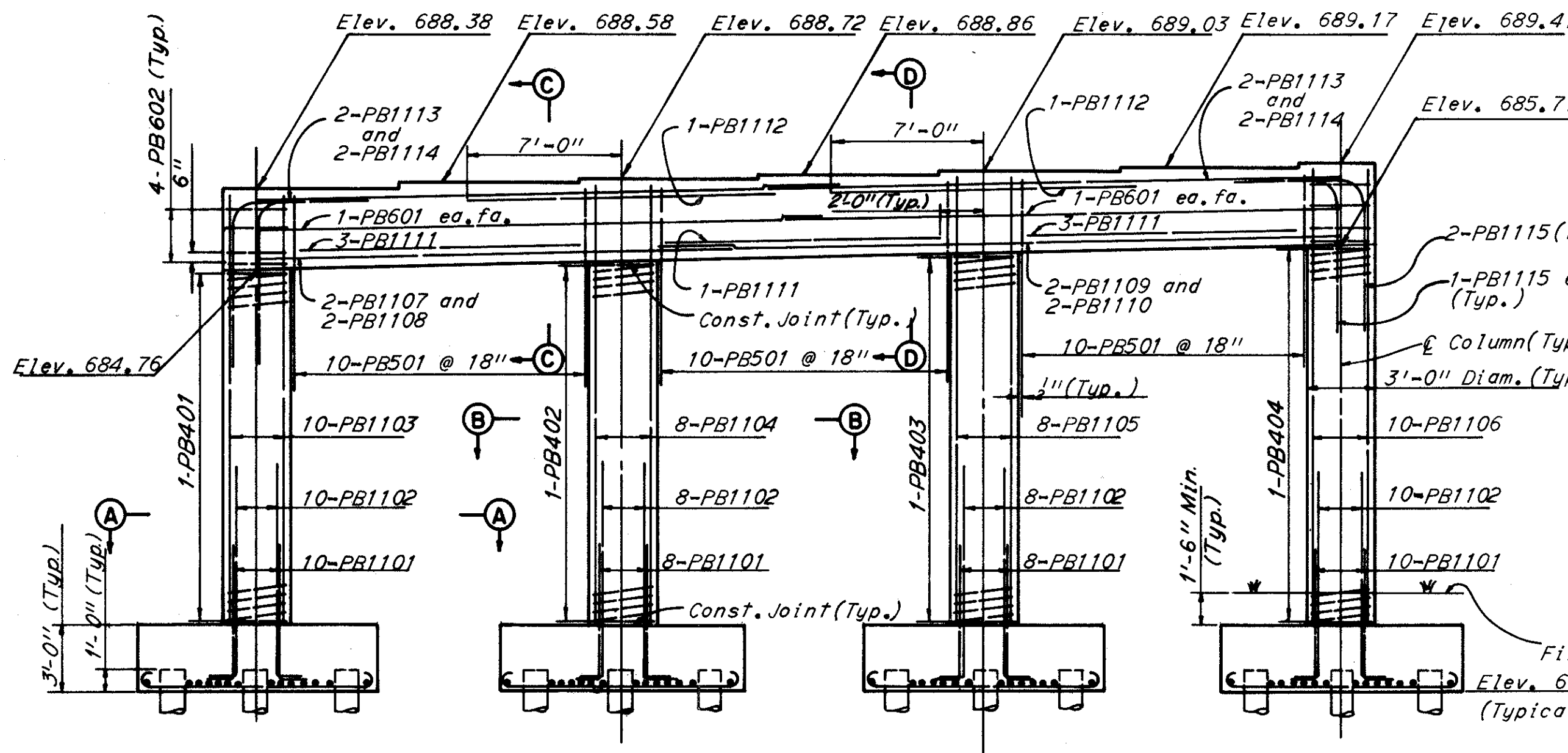
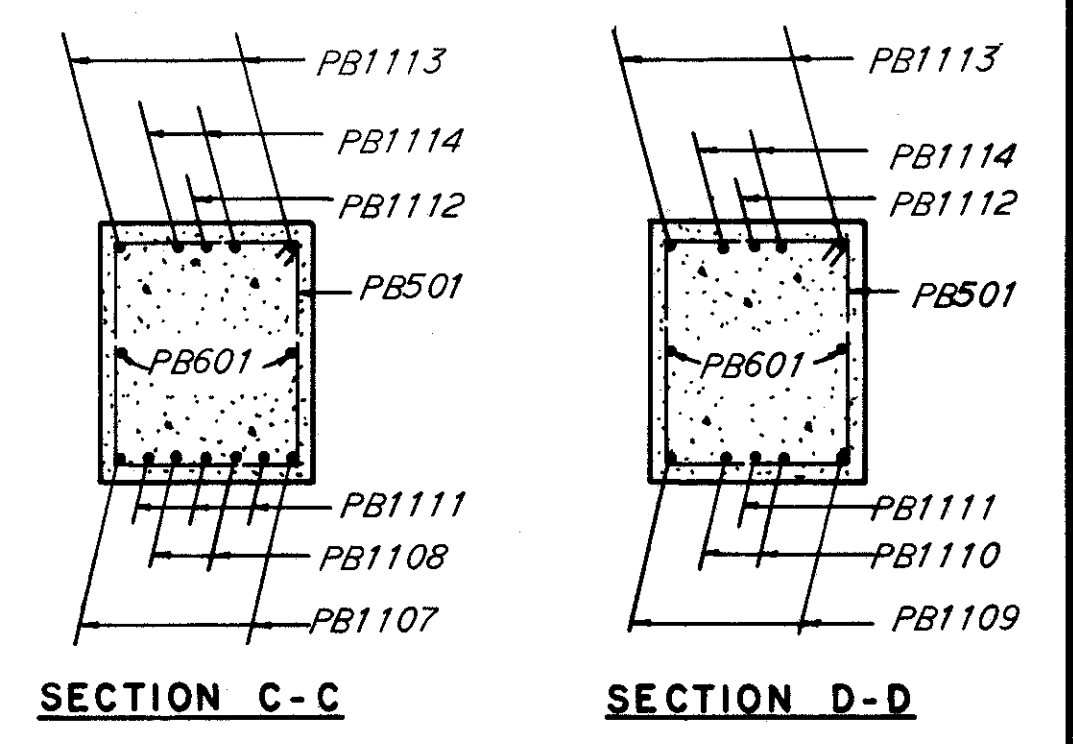
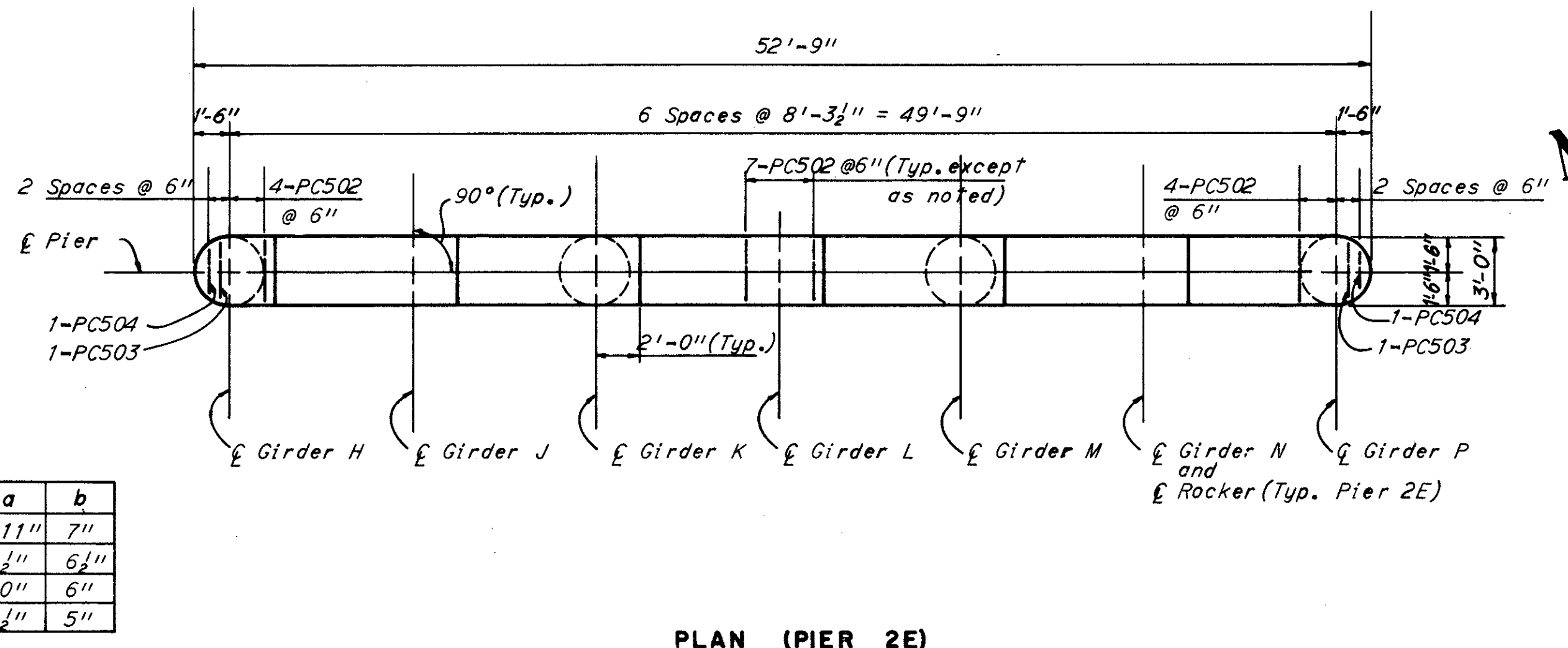
SHEET 32

REVISIONS:  
FEB 24 1963

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



Girder	a	b
A	11"	7"
B, C, D	10 1/2"	6 1/2"
E, F	10"	6"
G	9 1/2"	5"



Notes:  
All piles are 12" C.I.P. Reinforced Concrete.  
All battered piles shall be inclined 3 in 12 in direction shown except as noted.  
Pile layout dimensions are measured along bottom of footing.  
The following abbreviation is used:  
ea. fa. = each face  
For Reinforcement Schedule and Bending Diagrams see sheets 59 and 60.  
For anchor bolt details see Ohio Standard Drawing RB-1-55.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIER 2W AND PIER 2E**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JMC	JMC	JMC	JMC	JMC
DATE	DATE	DATE	DATE	DATE
10-2-63		3-30-64	4-1-64	

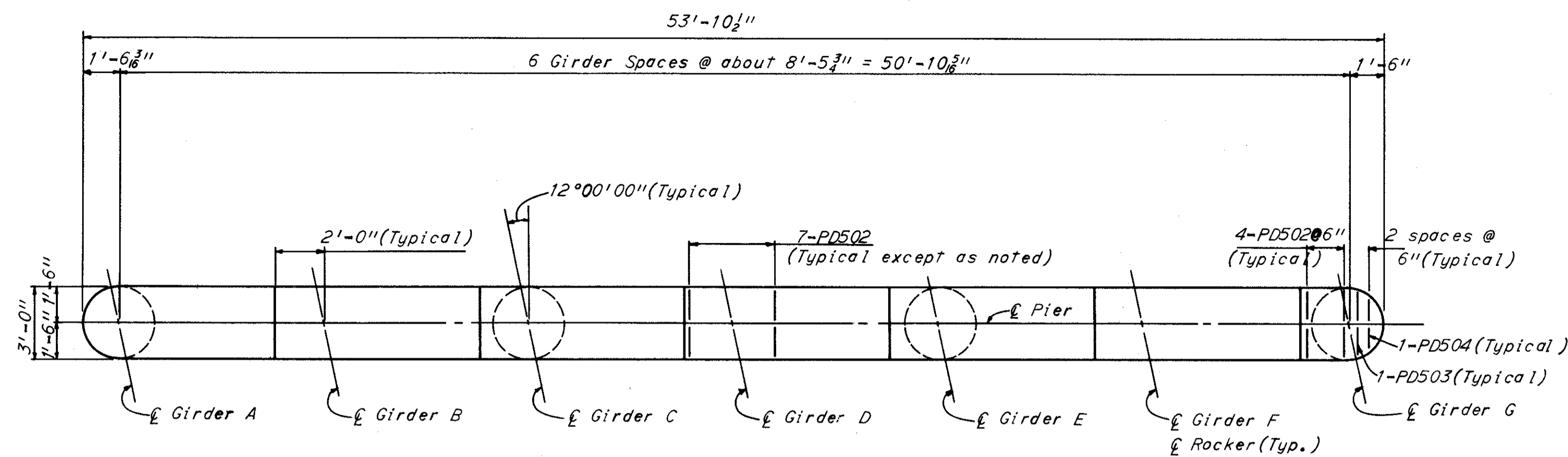
SHEET 33

UNRECORDED  
FEB 24 1963

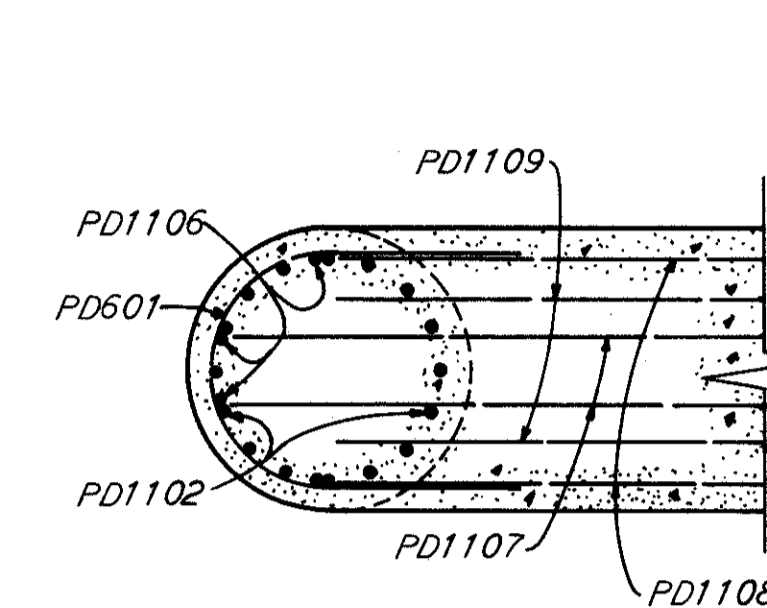
FED RD DIVISION	STATE	PROJECT
2	OHIO	

34  
77

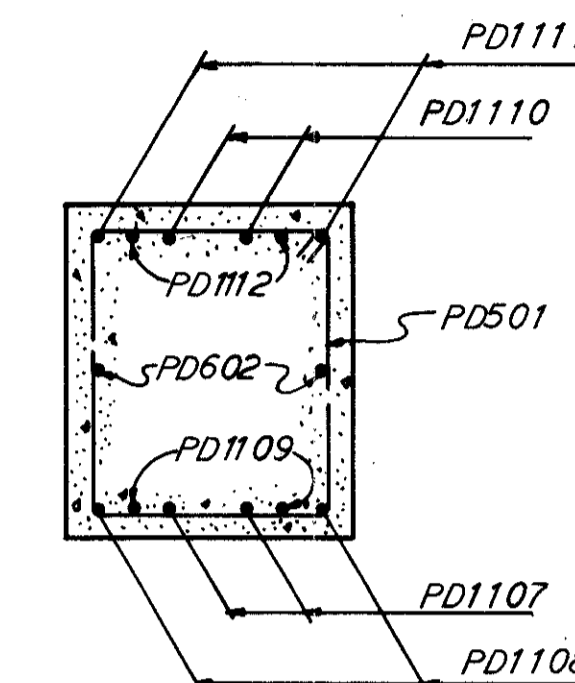
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



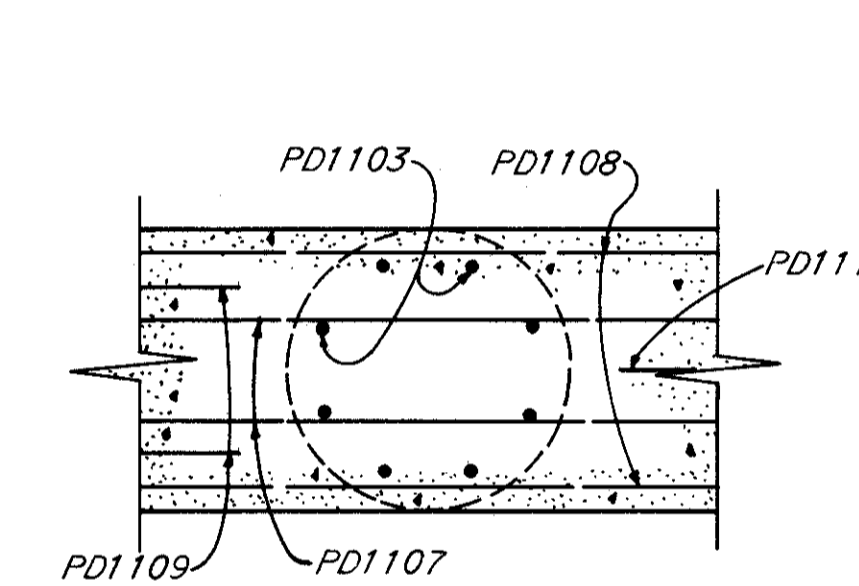
PLAN



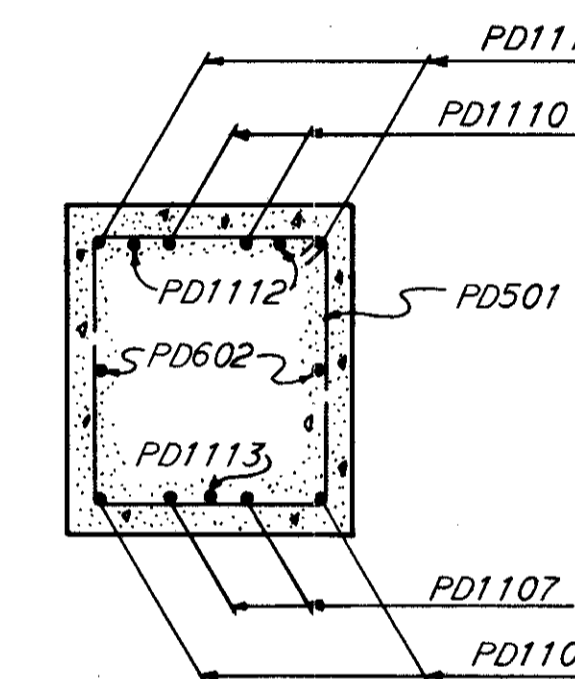
SECTION A-A



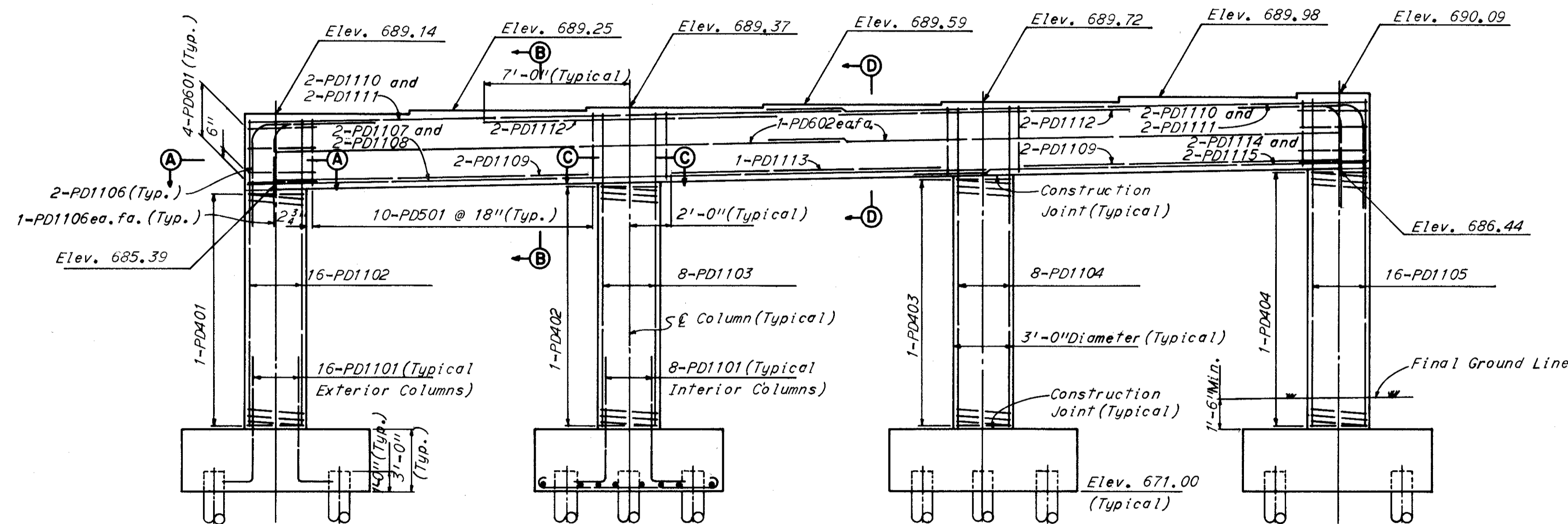
SECTION B-B



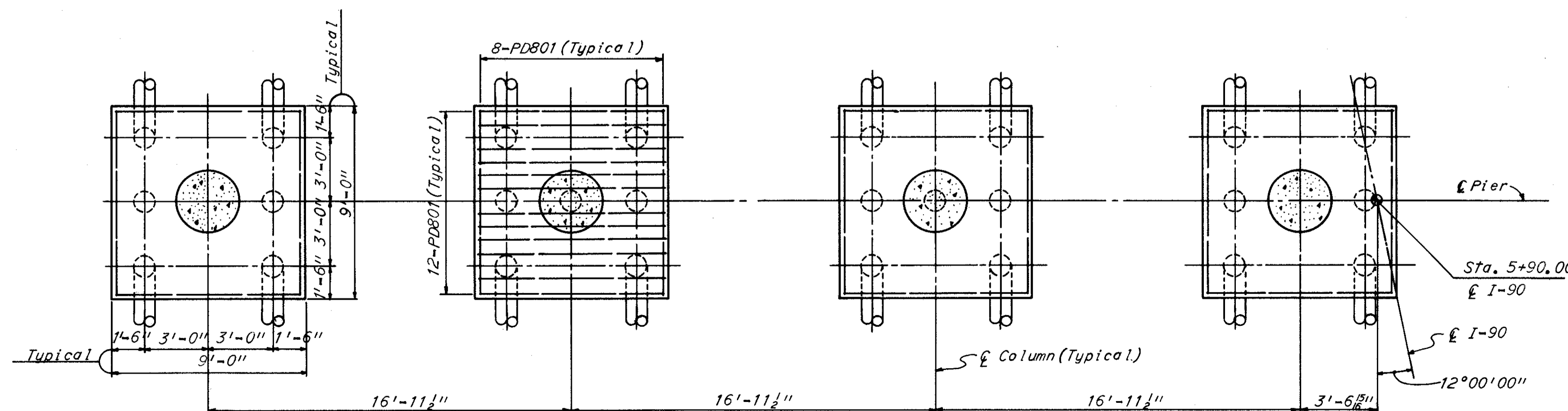
SECTION C-C



SECTION D-D



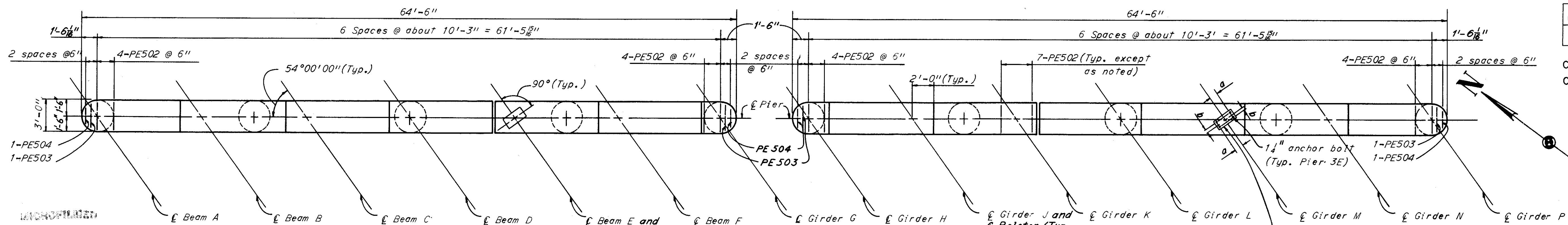
ELEVATION



FOOTING PLAN

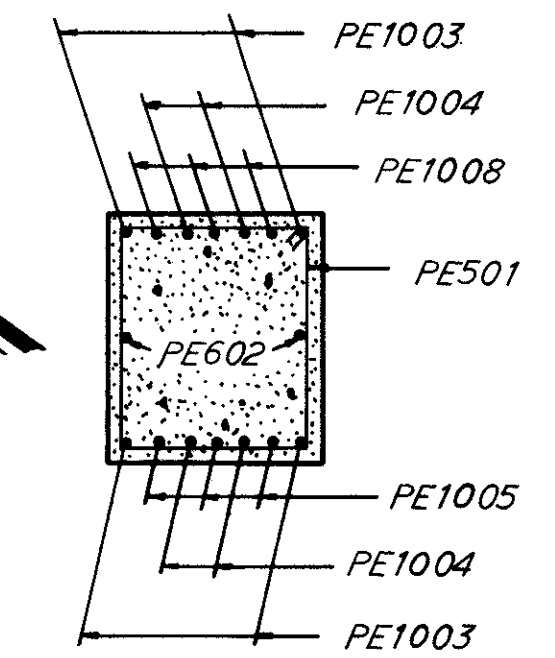
For notes see sheet 33.

H.N.T.B. BRIDGE NO. 10				
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>PIER 2WA</b>				
I-90 OVER FAIRFIELD AVE., LANE B AND RAMP W-2				
BR. NO. CUY-90-1467		STA. 3 + 87.63		
SCALE: None		STA. 12 + 42.48		
CLEVELAND		CUYAHOGA COUNTY OHIO		
DRAWN V.J.D. DATE 10-22-63	TRACED DATE	CHECKED C.H.L. DATE 2-20-64	REVIEWED W.K. DATE 4-1-64	REVISED
				SHEET 34

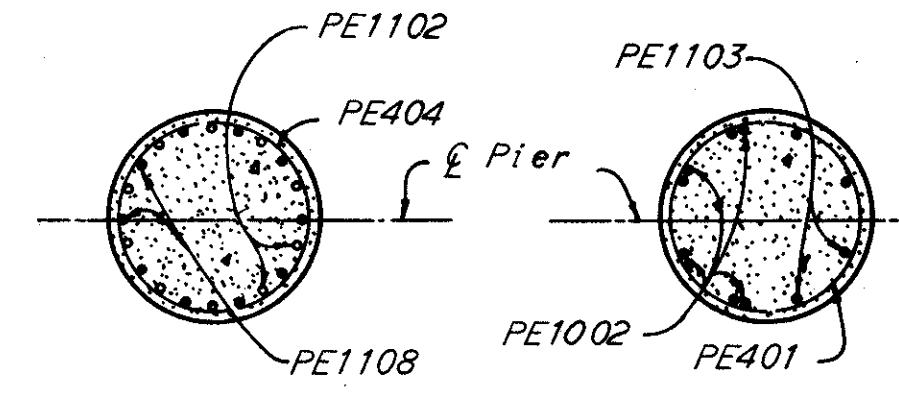


Girder	a	b
H, J, K, L	10 1/2"	6 1/2"
M, N, P	10"	6"

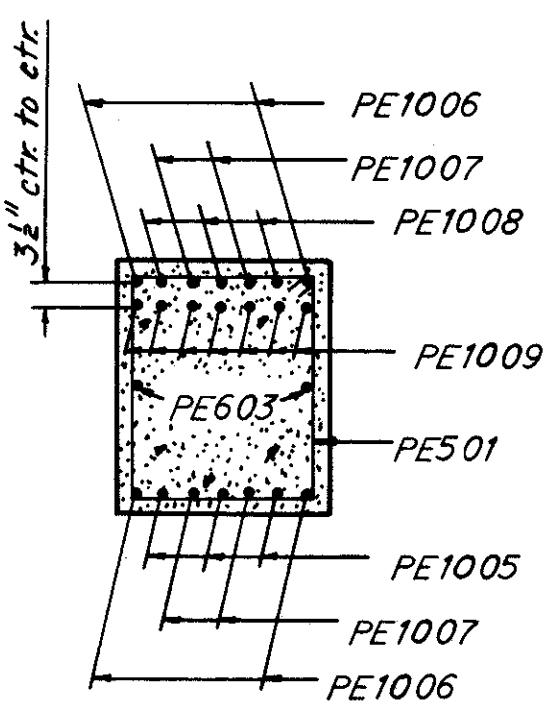
Note: Special care shall be taken when placing reinforcement steel so as not to interfere with anchor bolt setting.



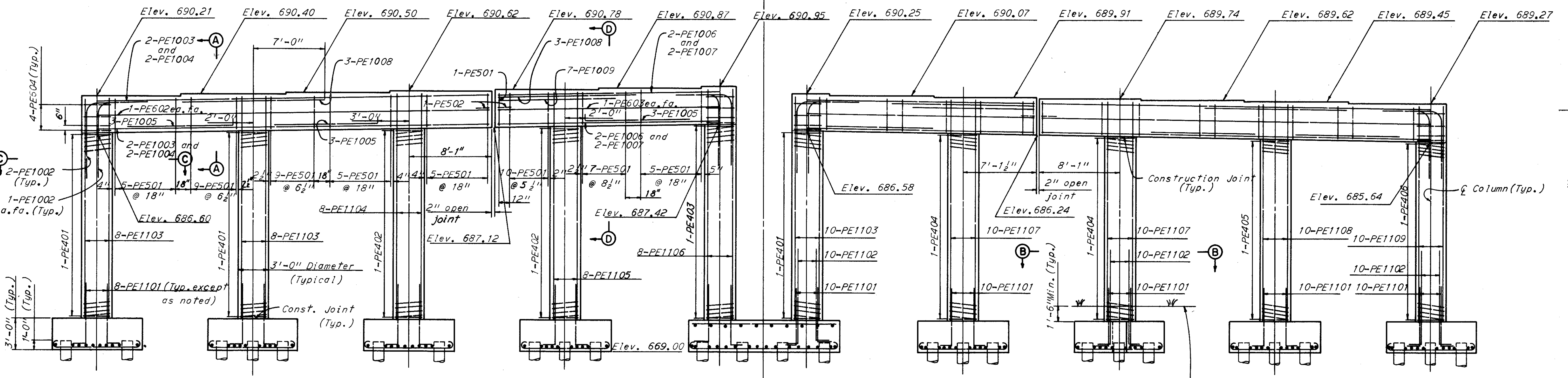
SECTION A-A



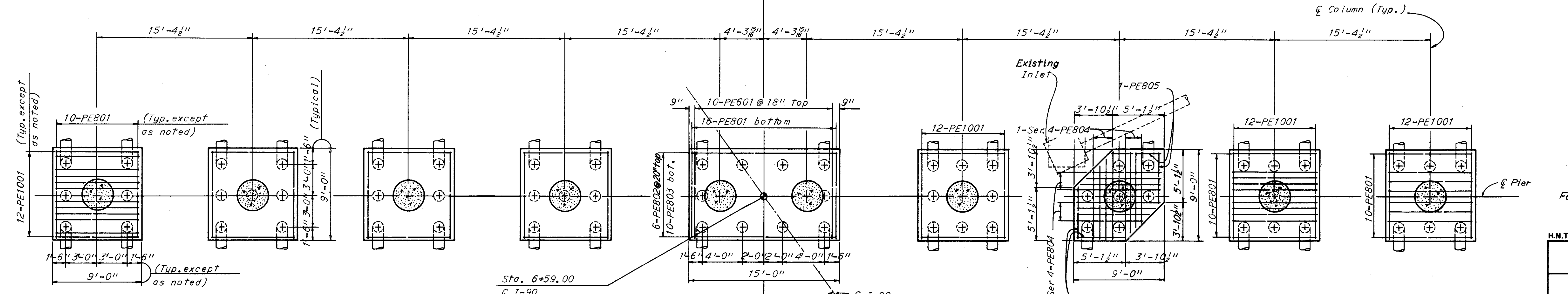
SECTION B-B SECTION C-C



SECTION D-D



ELEVATION



PIER 3W

FOOTING PLAN

PIER 3E

For notes see sheet 33.

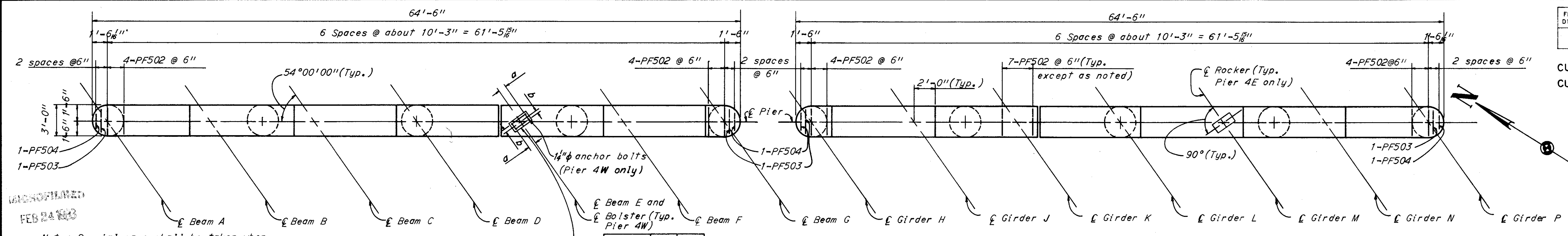
H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIER 3**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

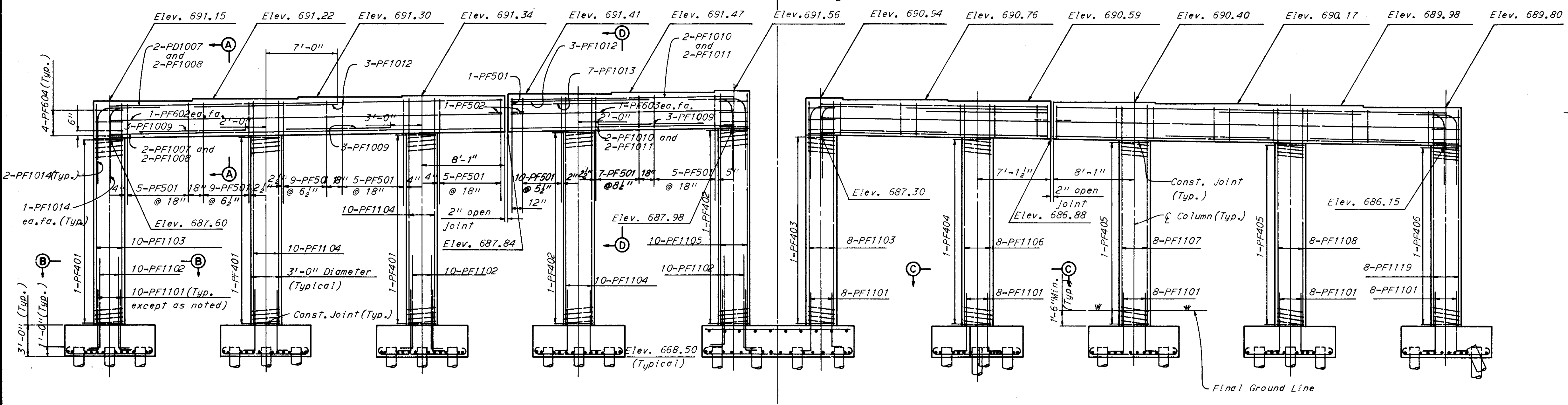
DRAWN JMC	TRACED	CHECKED LHB	REVIEWED WJ	REVISED
DATE 10-25-63	DATE	DATE 9-30-64	DATE 4-1-64	

SHEET 35

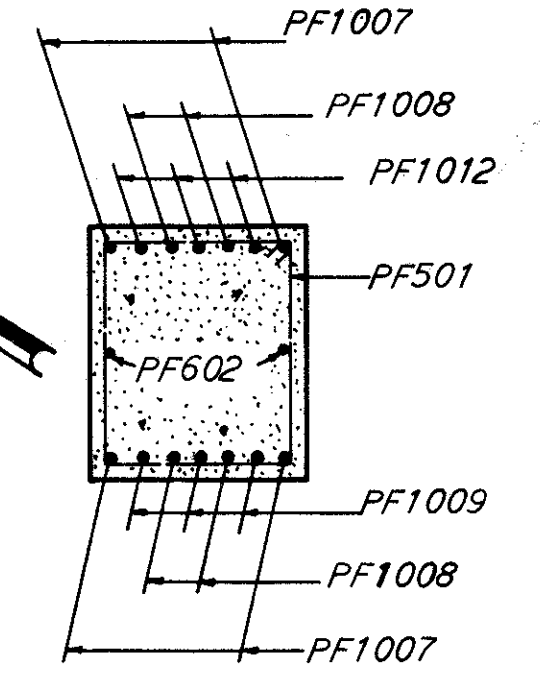


Beam	a	b
A, B, C	10"	6"
D, E, F, G	10 1/2"	6 1/2"

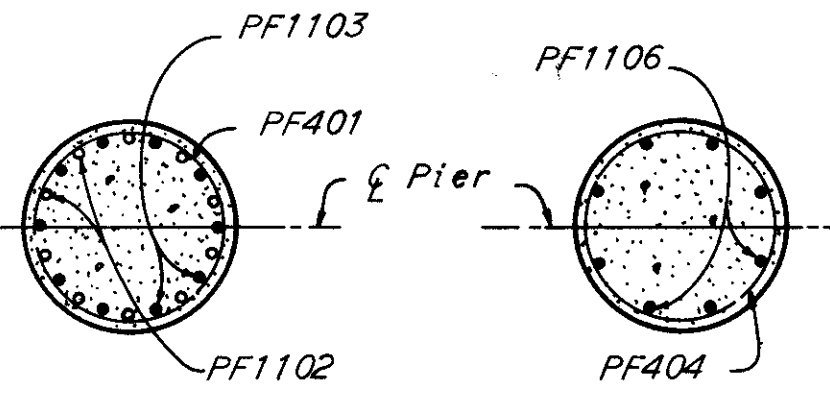
Note: Special care shall be taken when placing reinforcement steel so as not to interfere with anchor bolt setting.



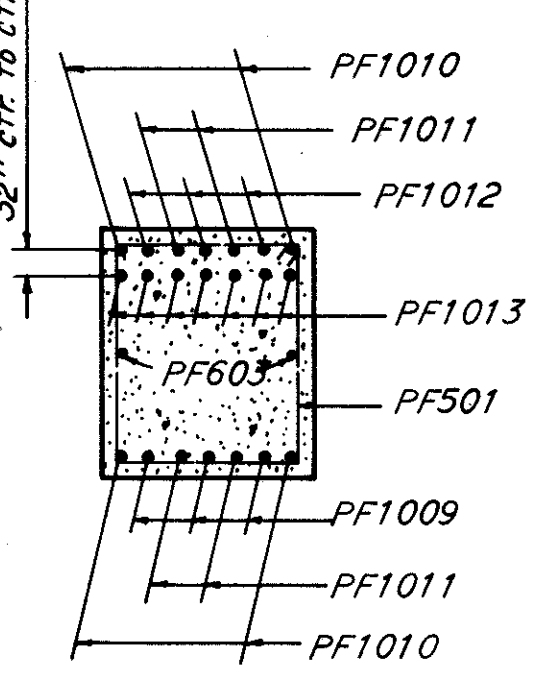
ELEVATION



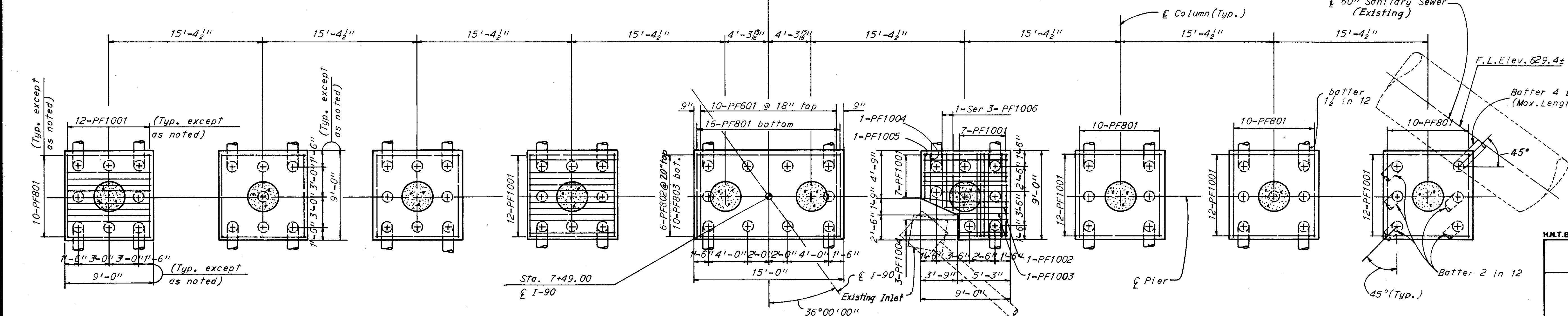
SECTION A-A



SECTION B-B SECTION C-C



SECTION D-D



PIER 4W

FOOTING PLAN

PIER 4E

H.N.T.B. BRIDGE NO. 10  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY, ILLINOIS NEW YORK

**PIER 4**  
 I-90 OVER FAIRFIELD AVE.,  
 LANE B AND RAMP W-2

BR NO. CUY-90-1467 STA. 3 + 87.63  
 SCALE: None STA. 12 + 42.48  
 CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: JMC TRACED: JMC  
 DATE: 10-21-63 DATE: 3-30-64 DATE: 4-1-64

SHEET 36

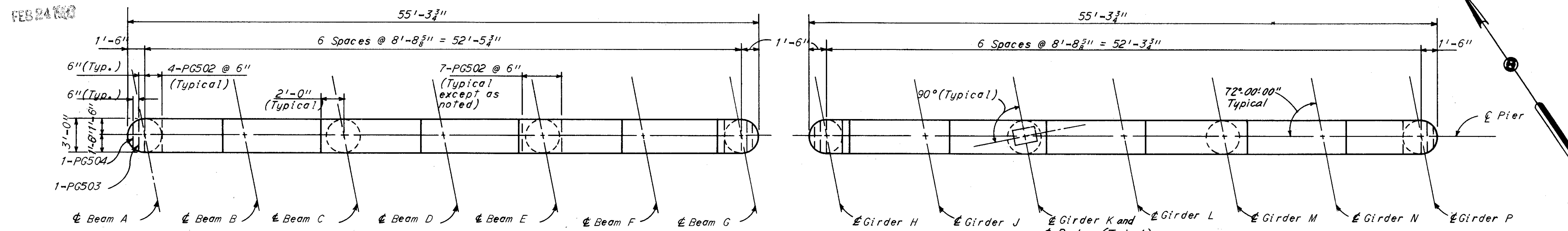
For notes see sheet 33.

9.0

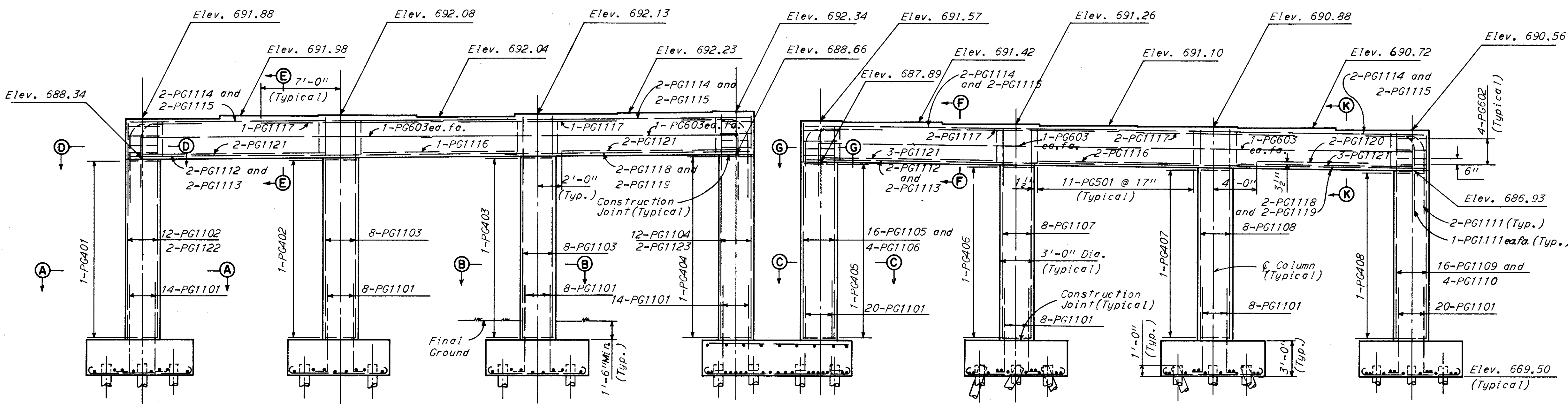
RECORDED  
FEB 24 1960

FED. RD. DIVISION	STATE	PROJECT	37
2	OHIO		77

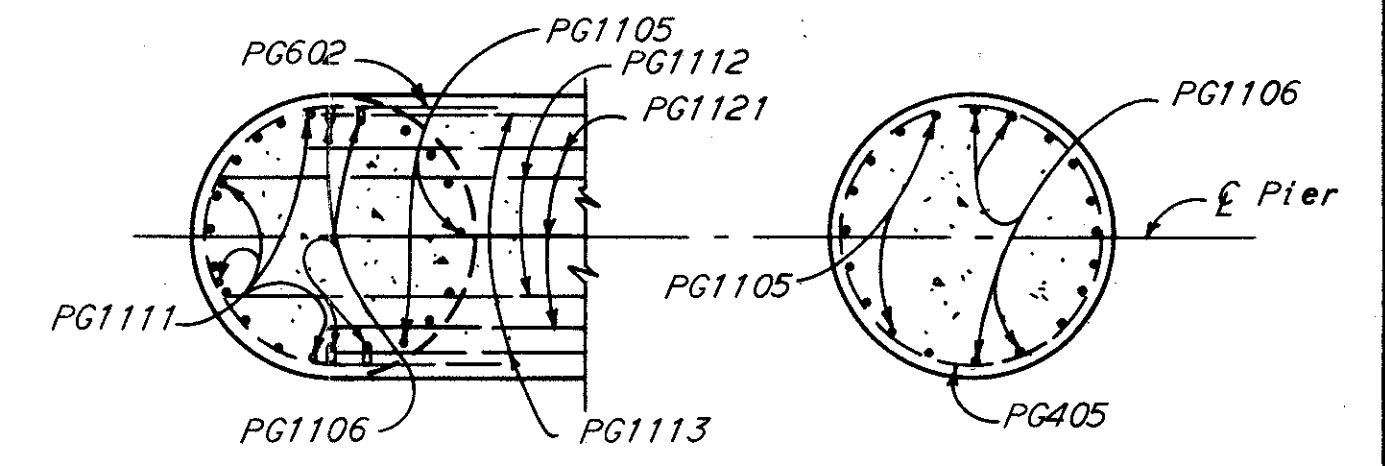
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



**PLAN**

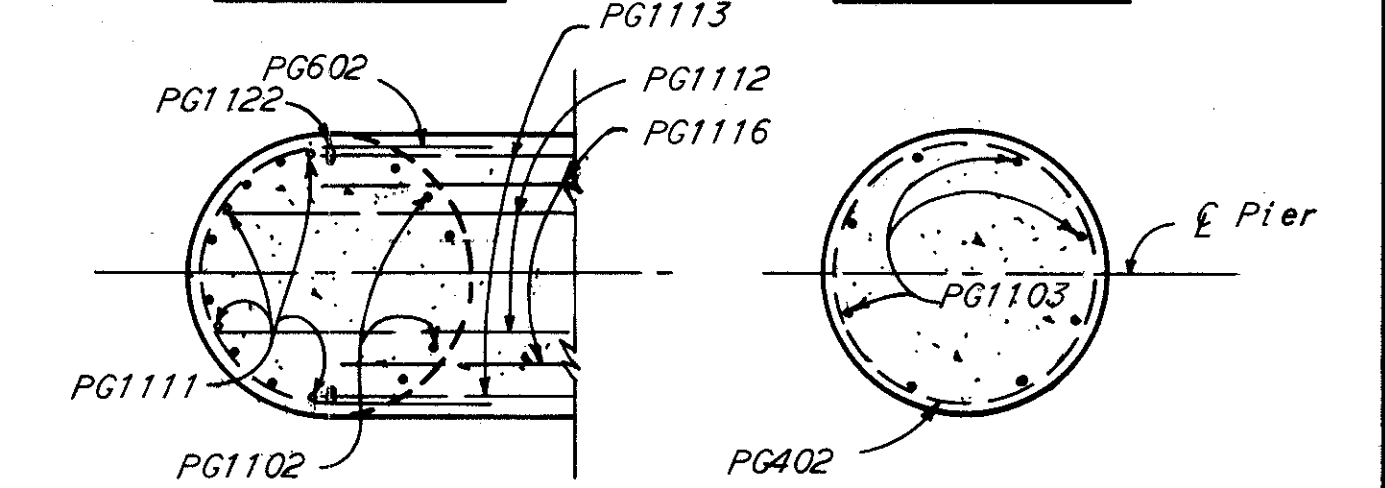


**ELEVATION**



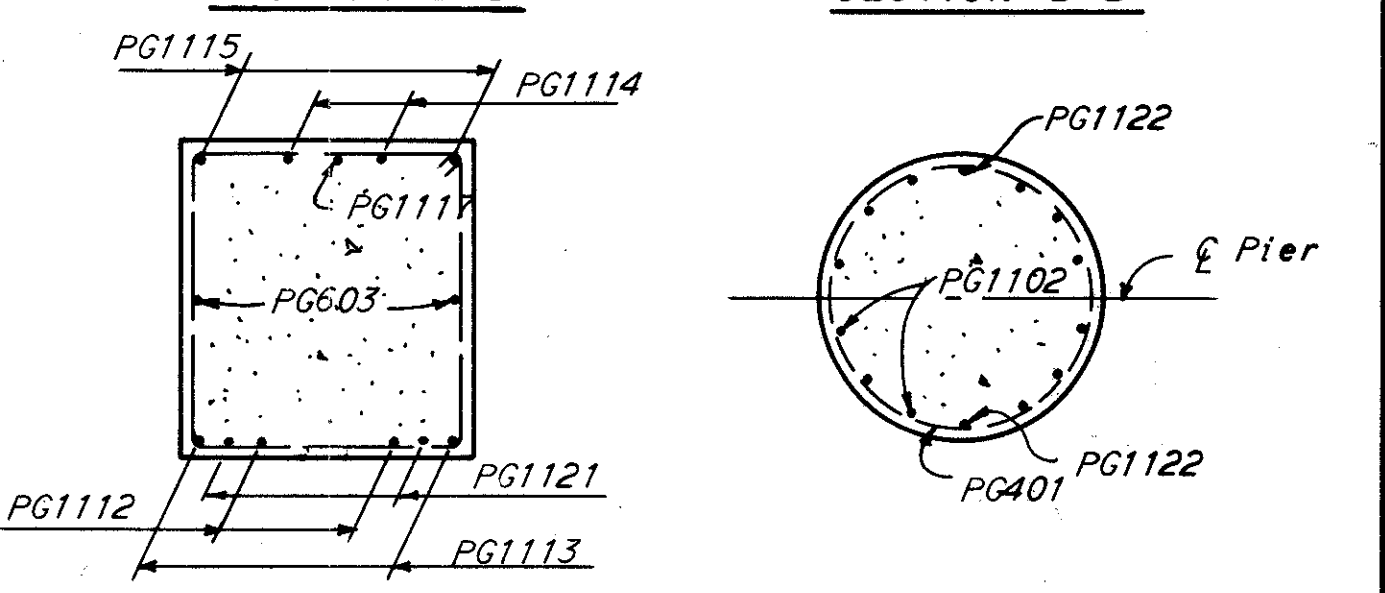
**SECTION G-G**

**SECTION C-C**



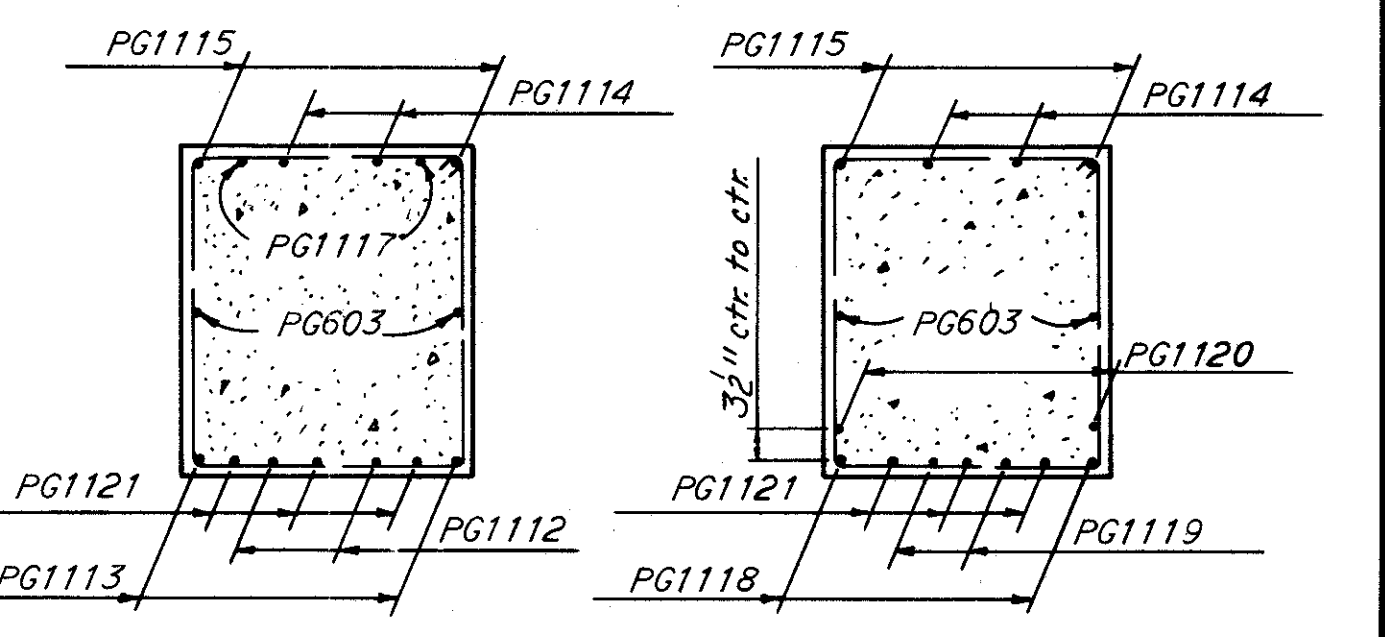
**SECTION D-D**

**SECTION B-B**



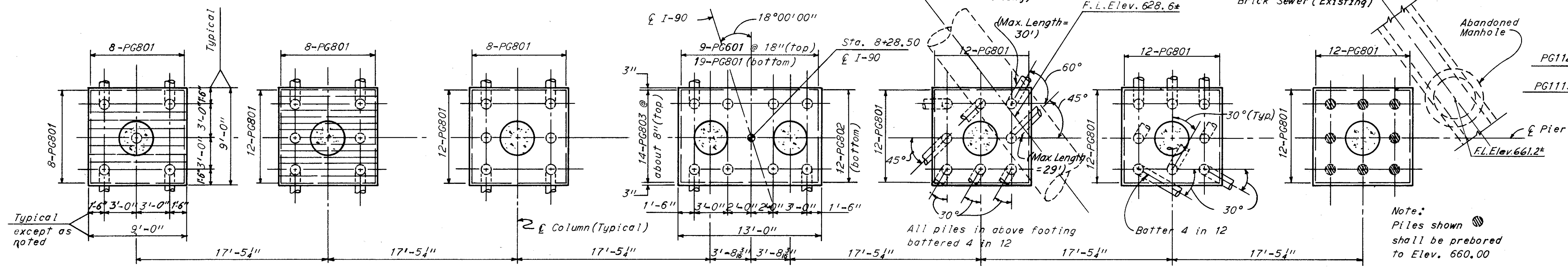
**SECTION E-E**

**SECTION A-A**



**SECTION F-F**

**SECTION K-K**



**FOOTING PLAN**

For notes see sheet 33.

**H.N.T.B. BRIDGE NO. 10**  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIER 5**  
**I-90 OVER FAIRFIELD AVE.,  
 LANE B AND RAMP W-2**

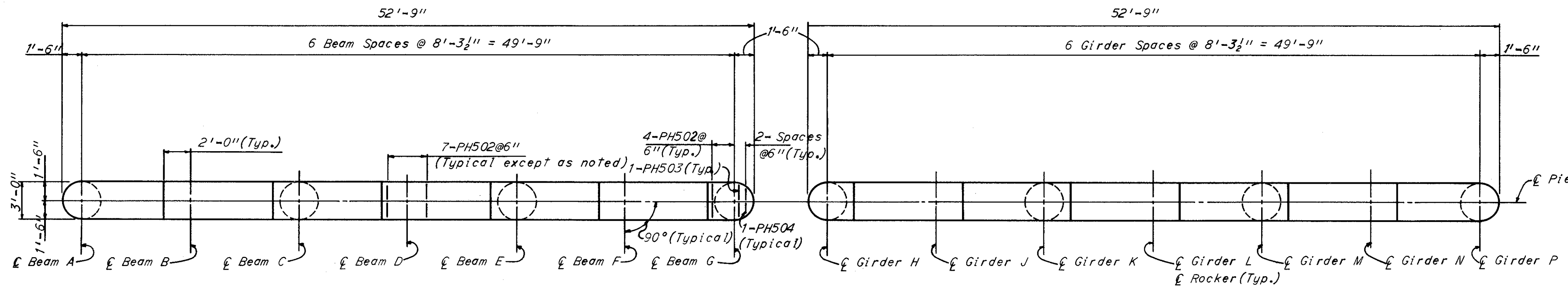
BR. NO. CUY-90-1467 STA. 3 + 87.63  
 SCALE: None STA. 12 + 42.48  
 CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN P.S.D. TRACED CHECKED P.A.B. REVIEWED W.W. REVISED  
 DATE 10.25.61 DATE 3/17/64 DATE 4-1-64 SHEET 37

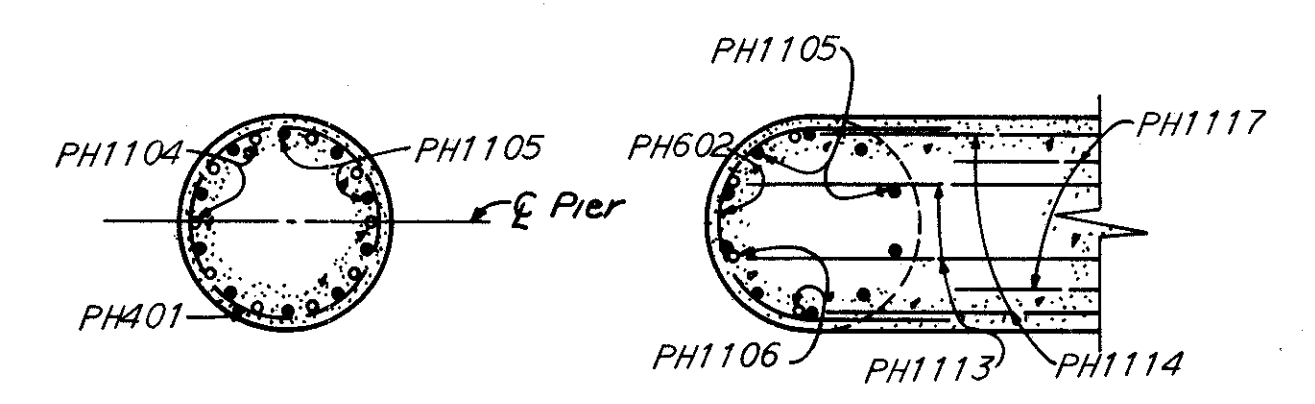
UNCORRECTED  
FEB 24 1967

FED. RD. DIVISION	STATE	PROJECT	38 77
2	OHIO		

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

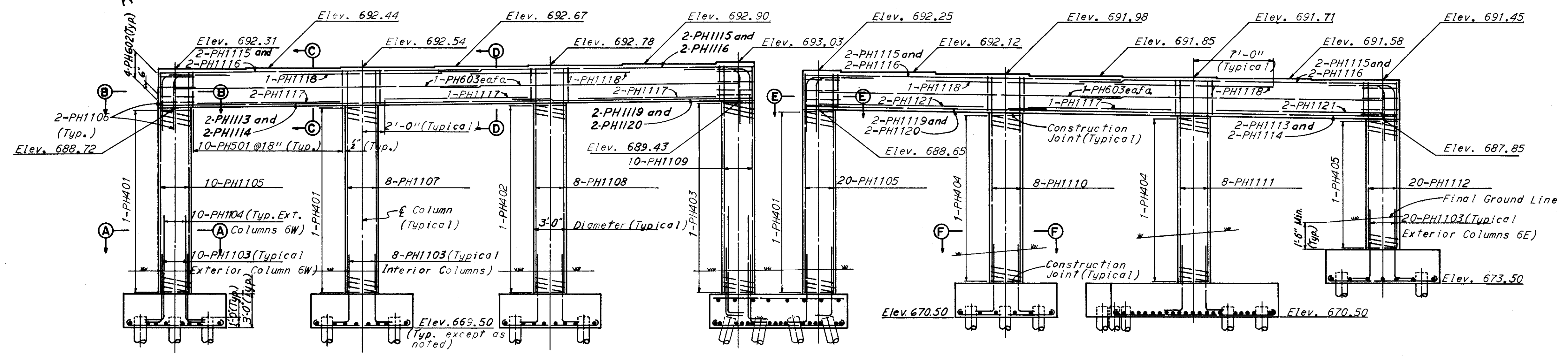


PLAN

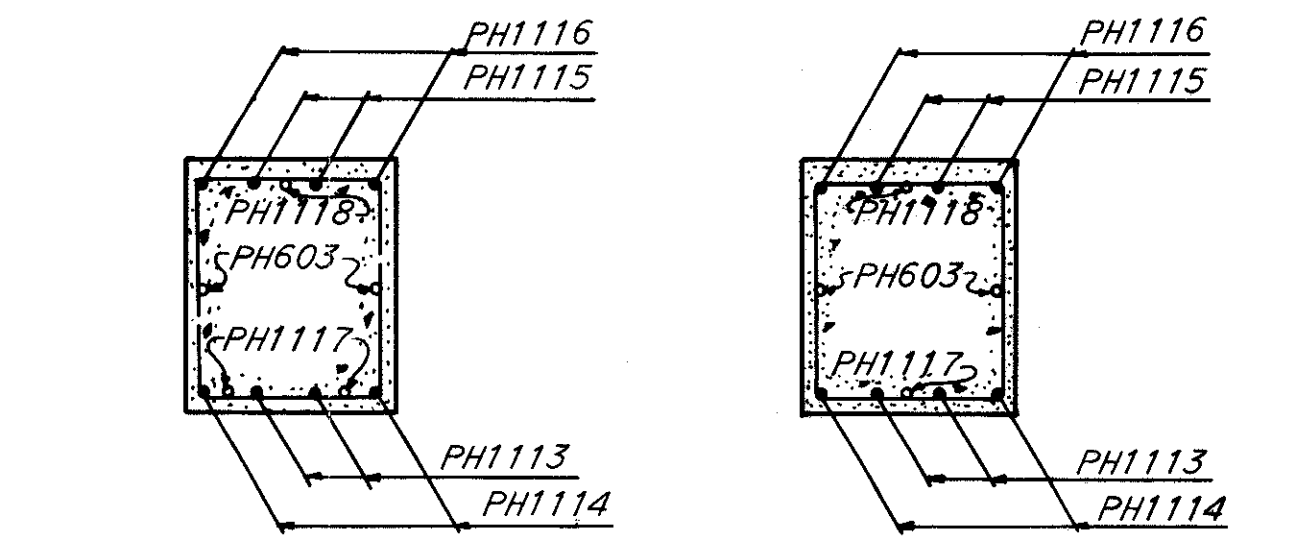


SECTION A-A

SECTION B-B

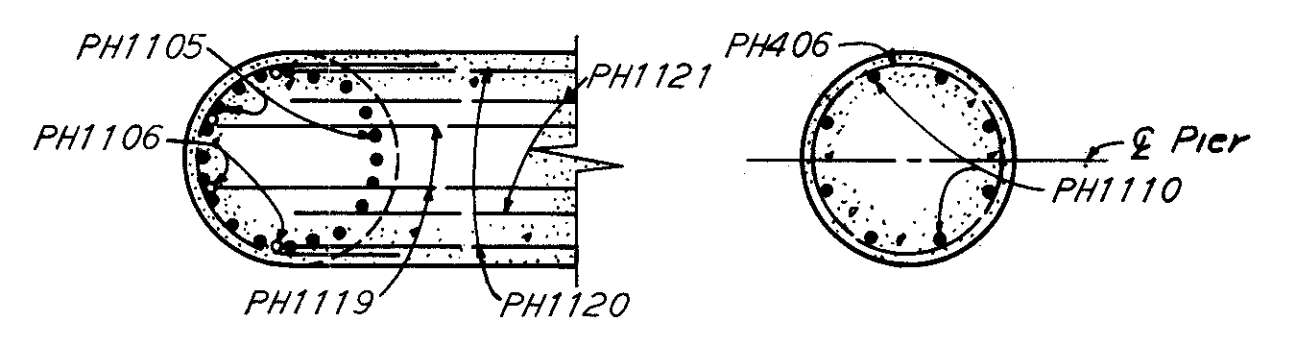


ELEVATION



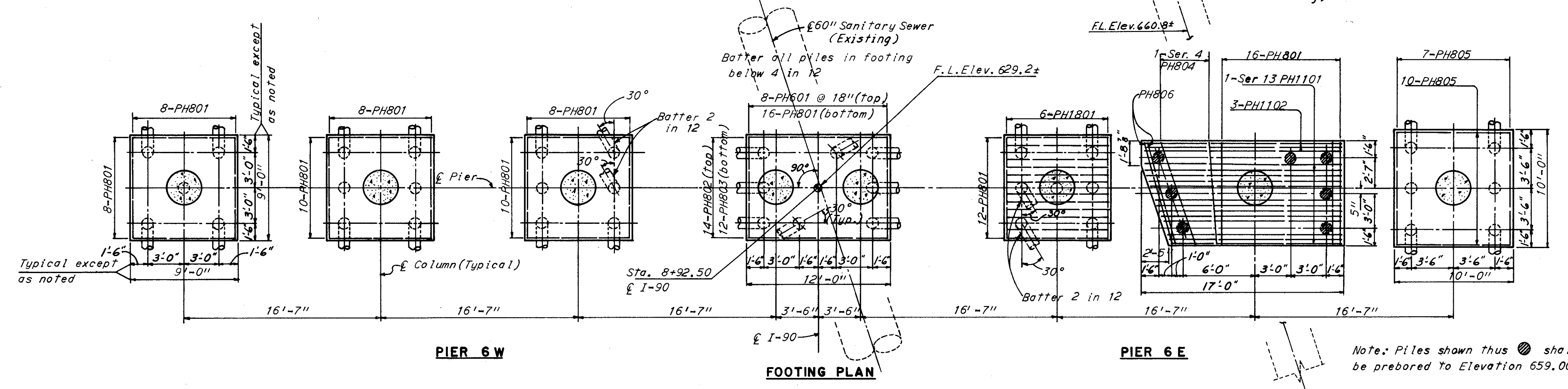
SECTION C-C

SECTION D-D



SECTION E-E

SECTION F-F



PIER 6 W

FOOTING PLAN

PIER 6 E

Note: Piles shown thus shall be prepared to Elevation 659.00

For notes see sheet 33.

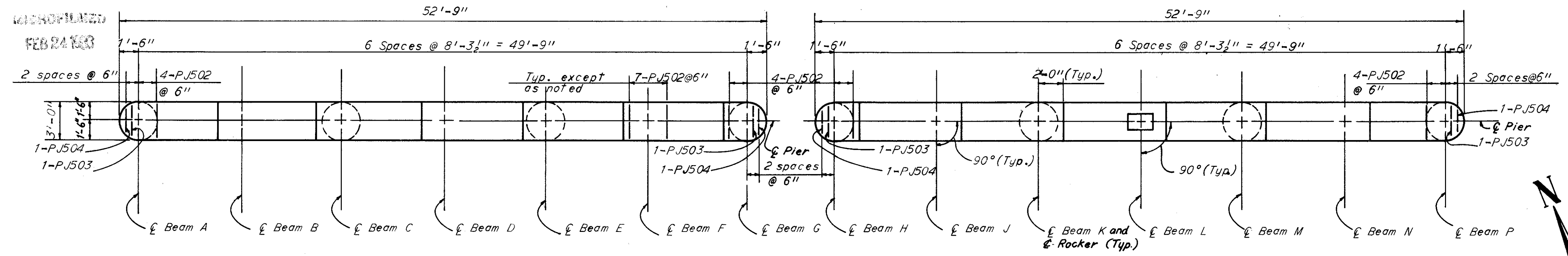
H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

PIER 6  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2  
BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

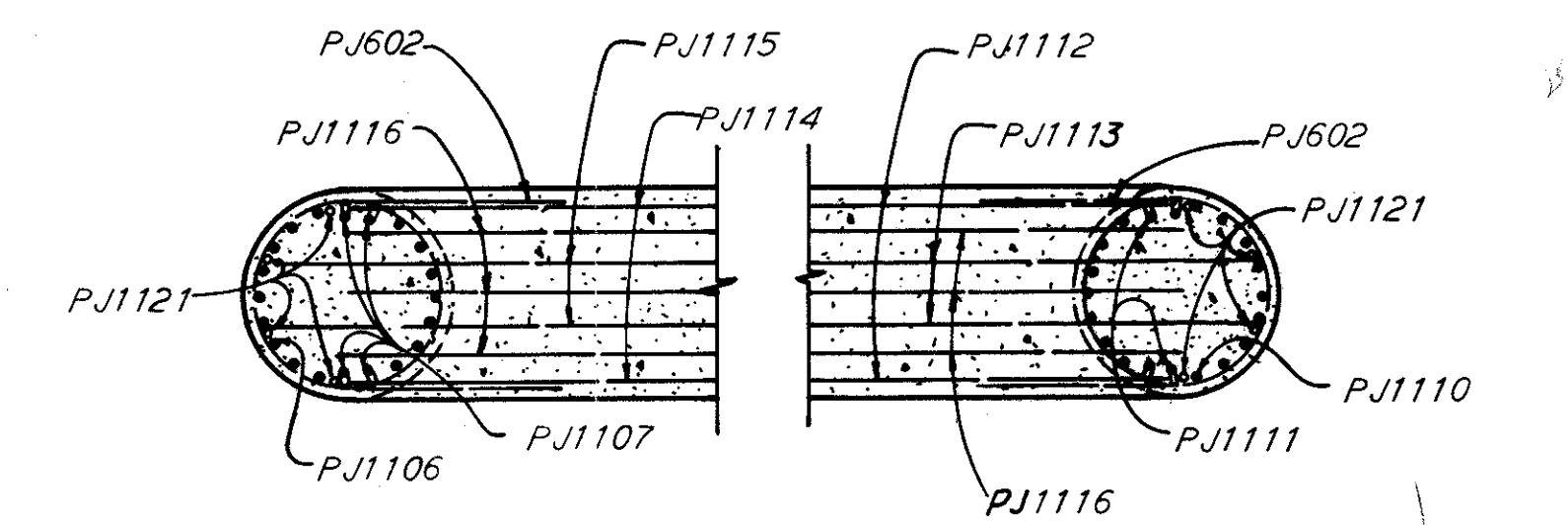
DRAWN	TRACED	CHECKED	REVIEWED
W/D	E.D.	E.D.	W/D
DATE 10/1/63	DATE 3/23/64	DATE 4-1-64	DATE



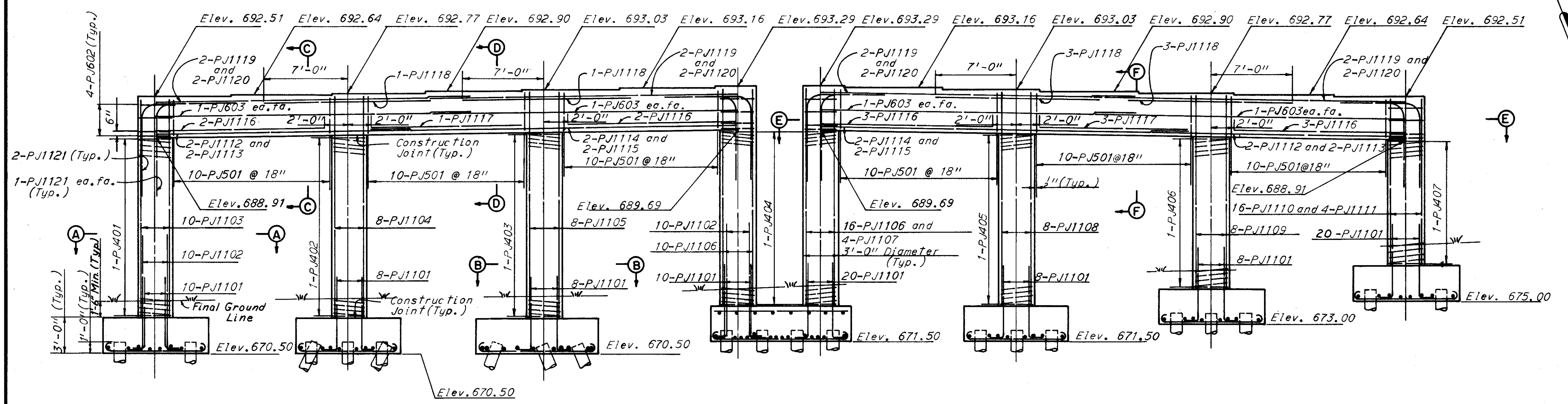
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



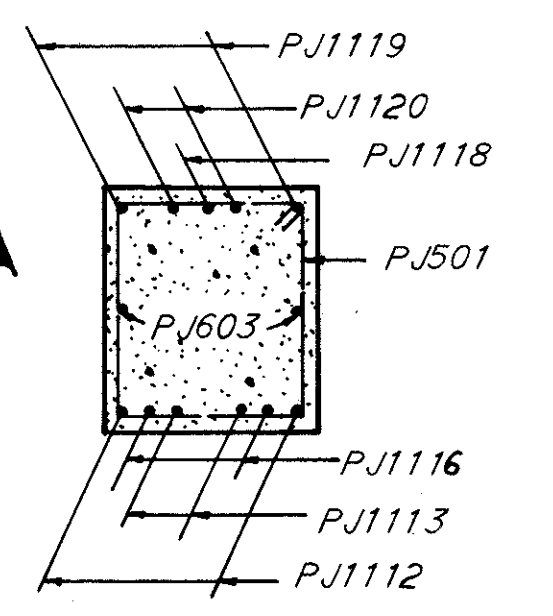
PLAN



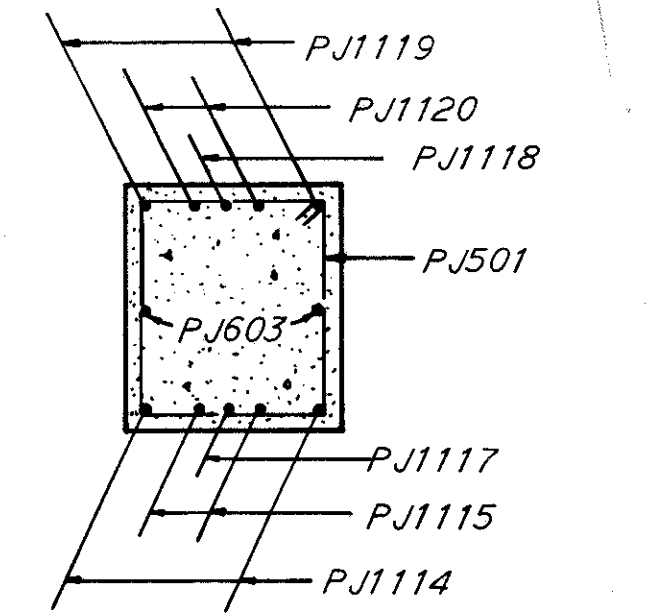
SECTION E-E



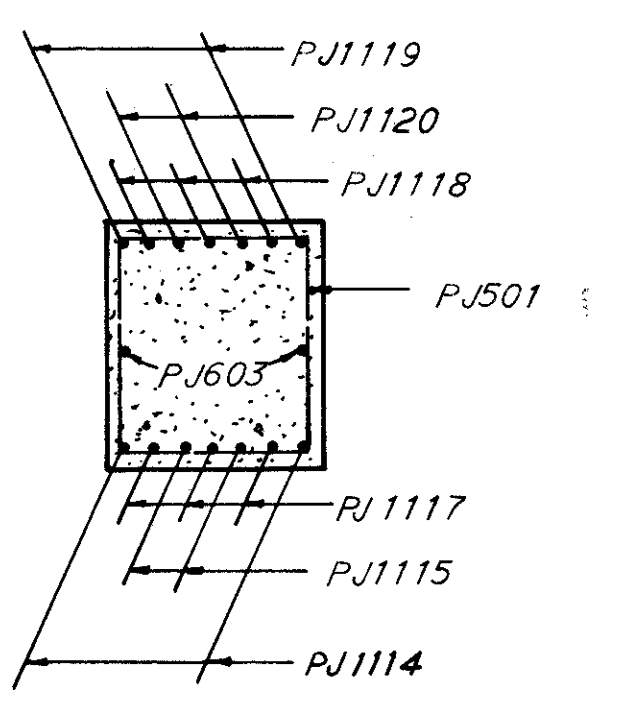
ELEVATION



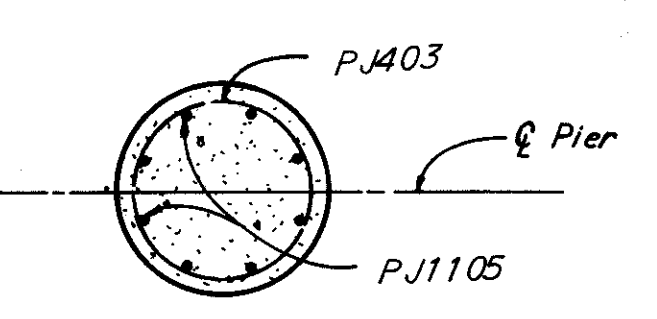
SECTION C-C



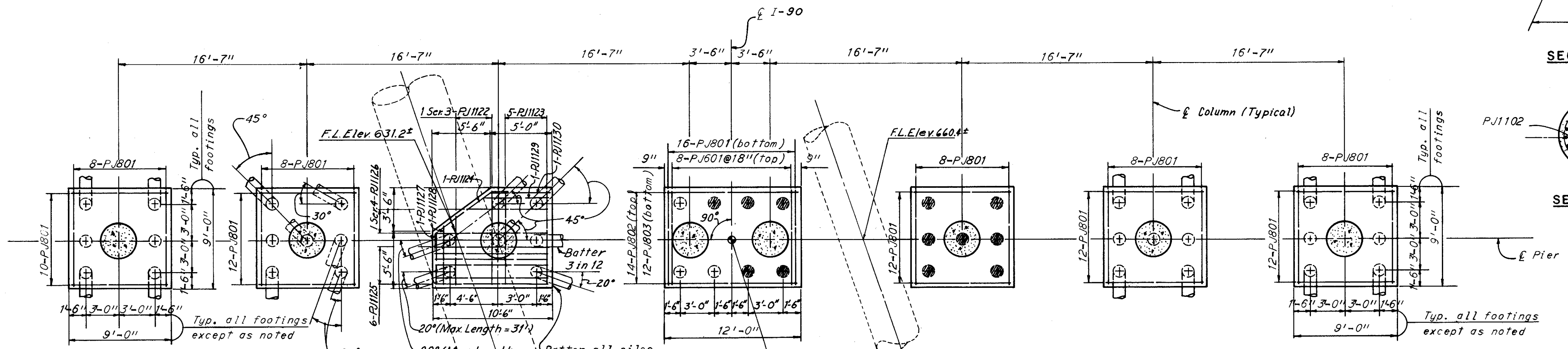
SECTION D-D



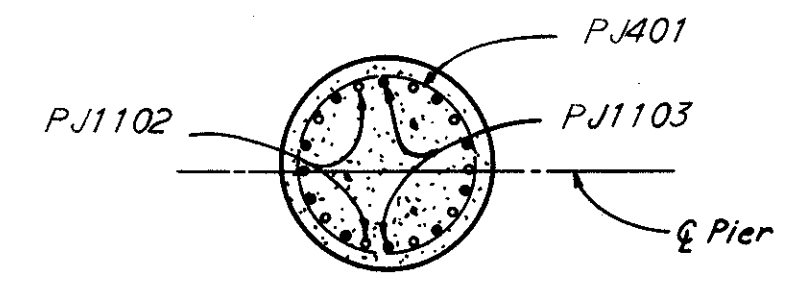
SECTION F-F



SECTION B-B



FOOTING PLAN



SECTION A-A

For notes see sheet 33.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

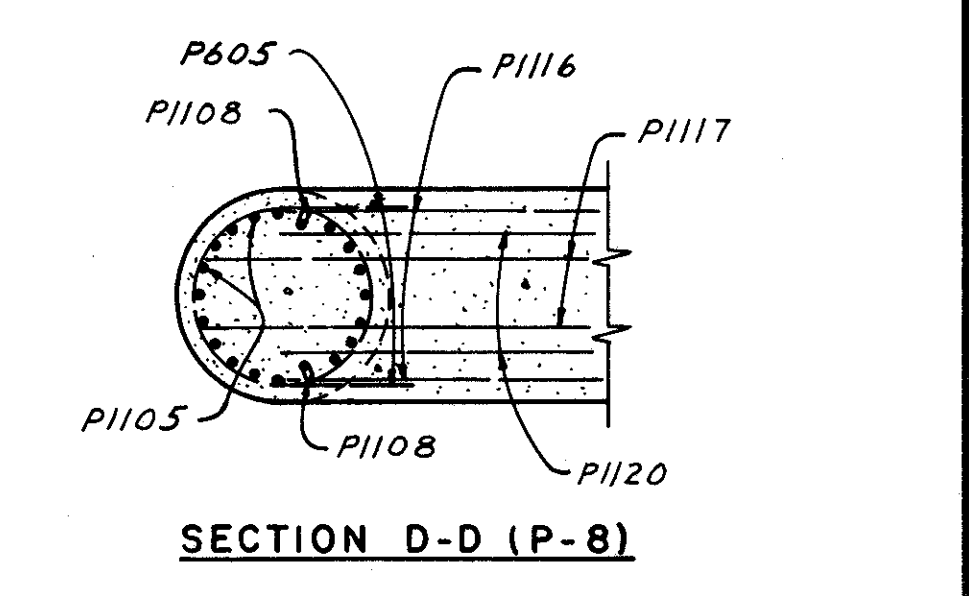
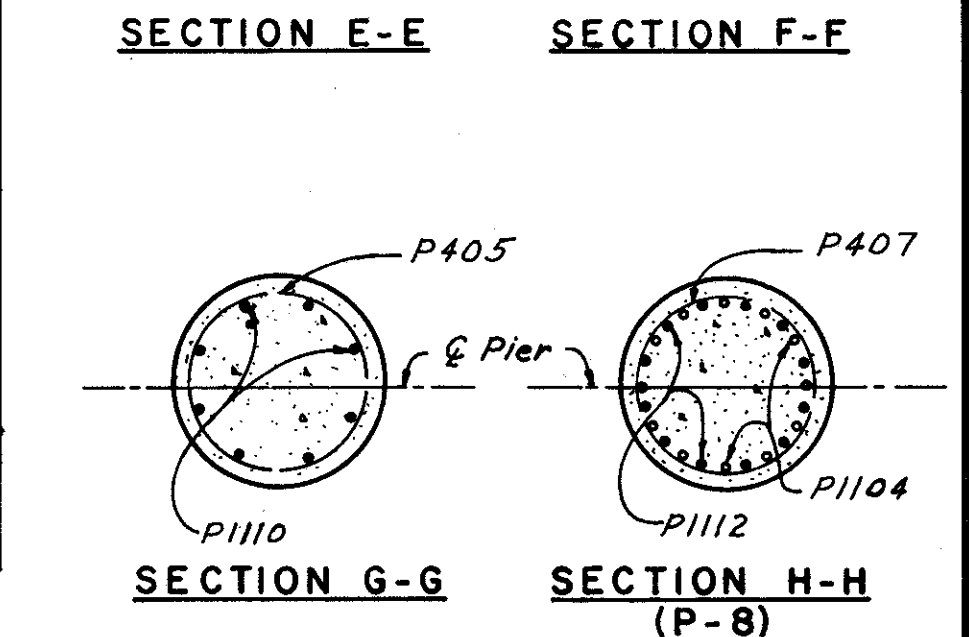
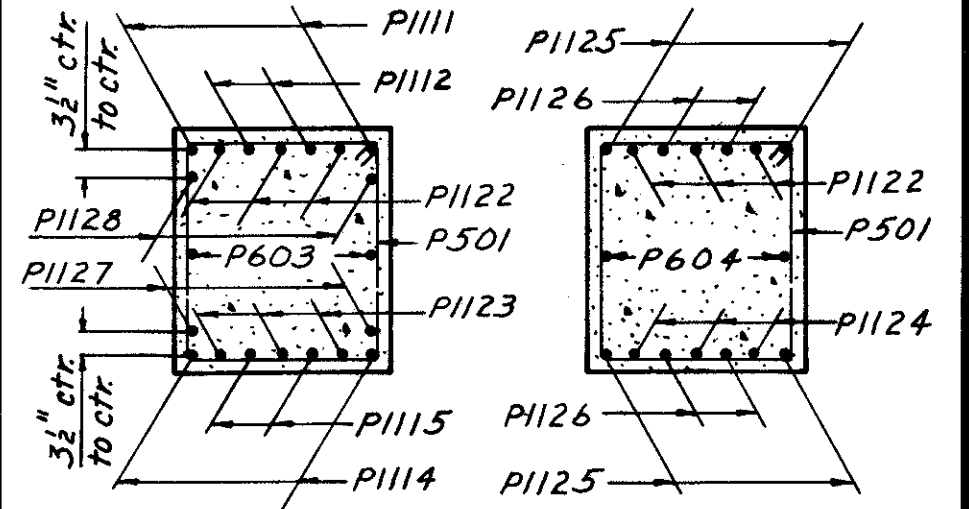
**PIER 7**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JMC	TRACED	CHECKED	REVIEWED	REVISED
DATE 10-3-63	DATE	DATE 5-31-64	DATE 4-1-64	

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

ELEVATIONS			
WEST BRIDGE			
Pier 8	Pier 9	Pier 10	
A	693.06	693.61	694.15
B	693.19	693.74	694.28
C	693.32	693.87	694.40
D	693.45	694.00	694.53
E	693.58	694.12	694.64
F	693.71	694.25	694.77
G	693.84	694.38	694.90
R	689.46	690.01	690.56
S	690.24	690.78	691.30
FA	669.50	668.50	668.00
FR	669.50	667.50	669.50
FC	670.50	669.50	669.50
FD	671.50	670.50	671.00
EAST BRIDGE			
Pier 8	Pier 9	Pier 10	
H	693.84	694.38	694.89
J	693.71	694.25	694.76
K	693.58	694.12	694.67
L	693.45	694.00	694.54
M	693.32	693.87	694.41
N	693.19	693.74	694.28
P	693.06	693.61	694.15
T	690.24	690.78	691.29
U	689.82	690.37	690.91
V	689.46	691.01	690.55
FE	672.50	672.50	672.50
FF	674.00	675.50	677.00
FG	679.50	681.50	683.00



Notes:  
Reinforcing bar marks shall have the following prefixes:  
Pier 8 - PK  
Pier 9 - PL  
Pier 10 - PM  
i.e. - PK501  
The following abbreviations are used: (P-8)=Pier 8, (P-9)=Pier 9, (P-10)=Pier 10.  
For additional notes see sheet 33.

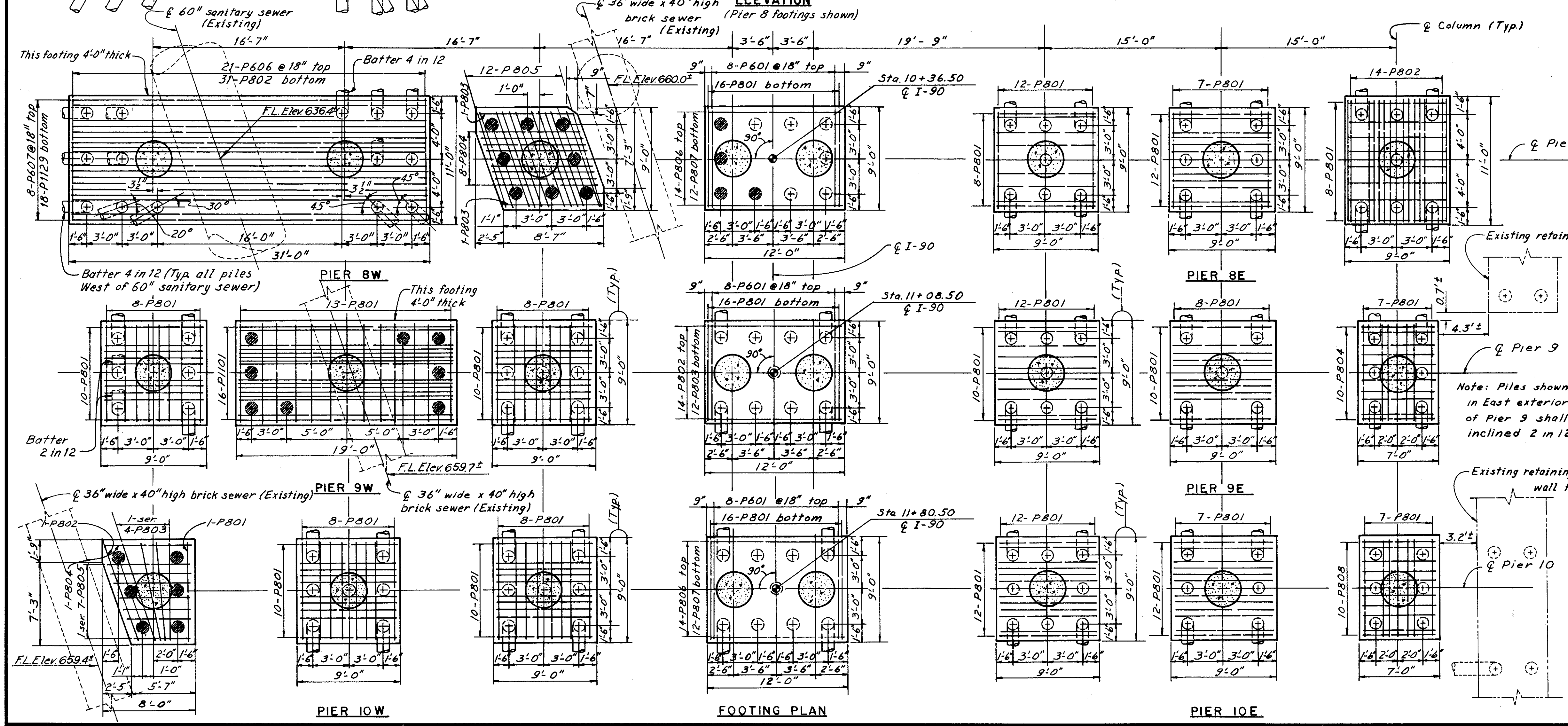
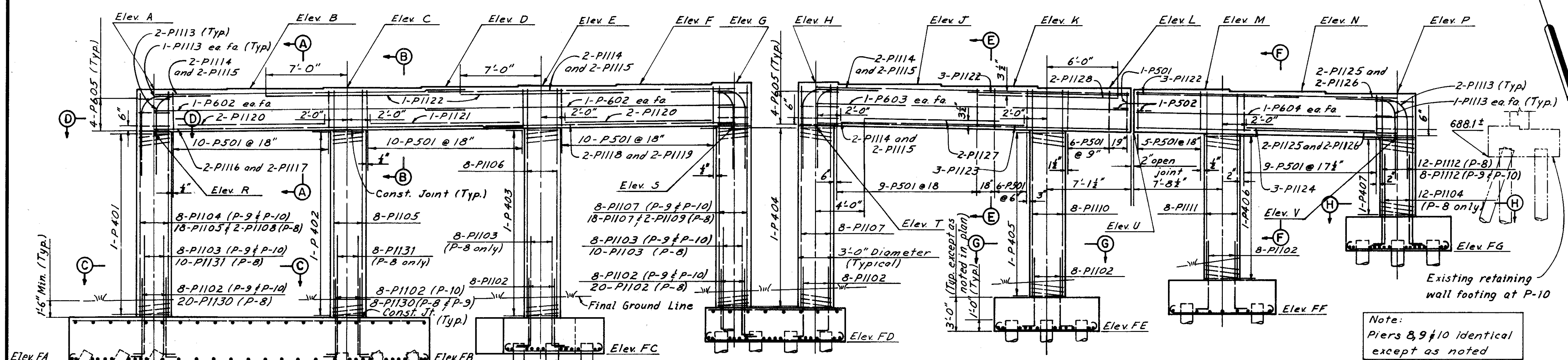
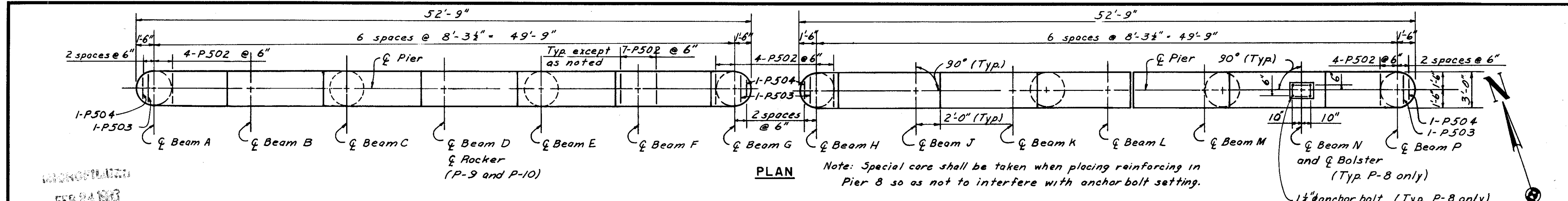
H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIERS 8, 9, AND 10**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JMC	TRACED	CHECKED JAL	REVIEWED W/F	REVISED
DATE 9-27-63	DATE	DATE 9-3-64	DATE 1-1-64	

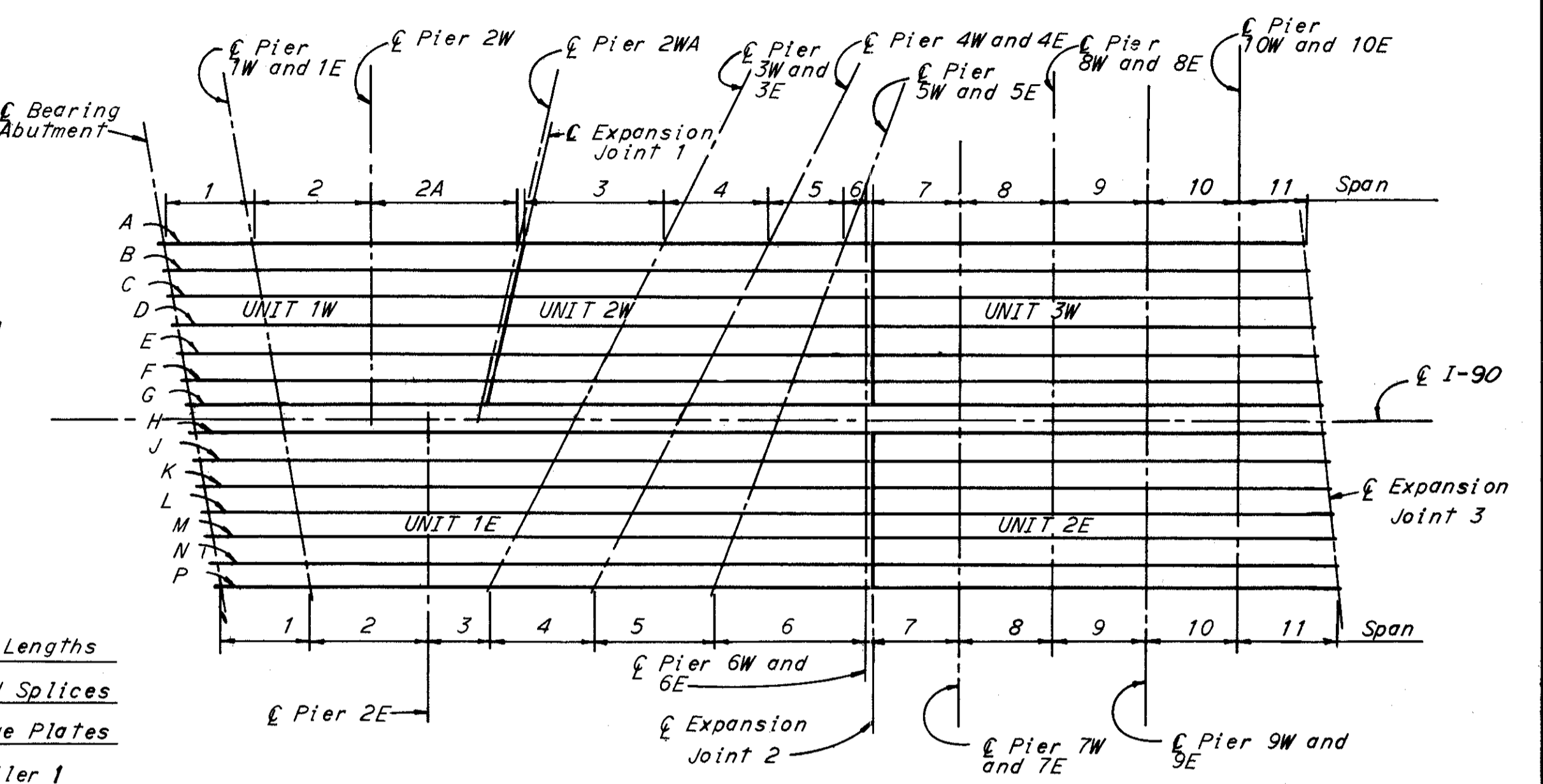
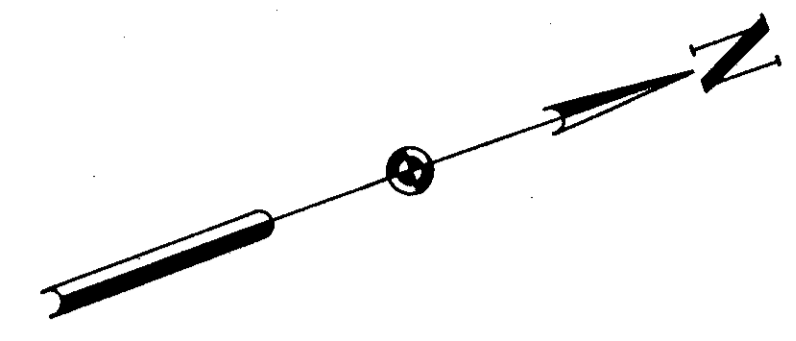
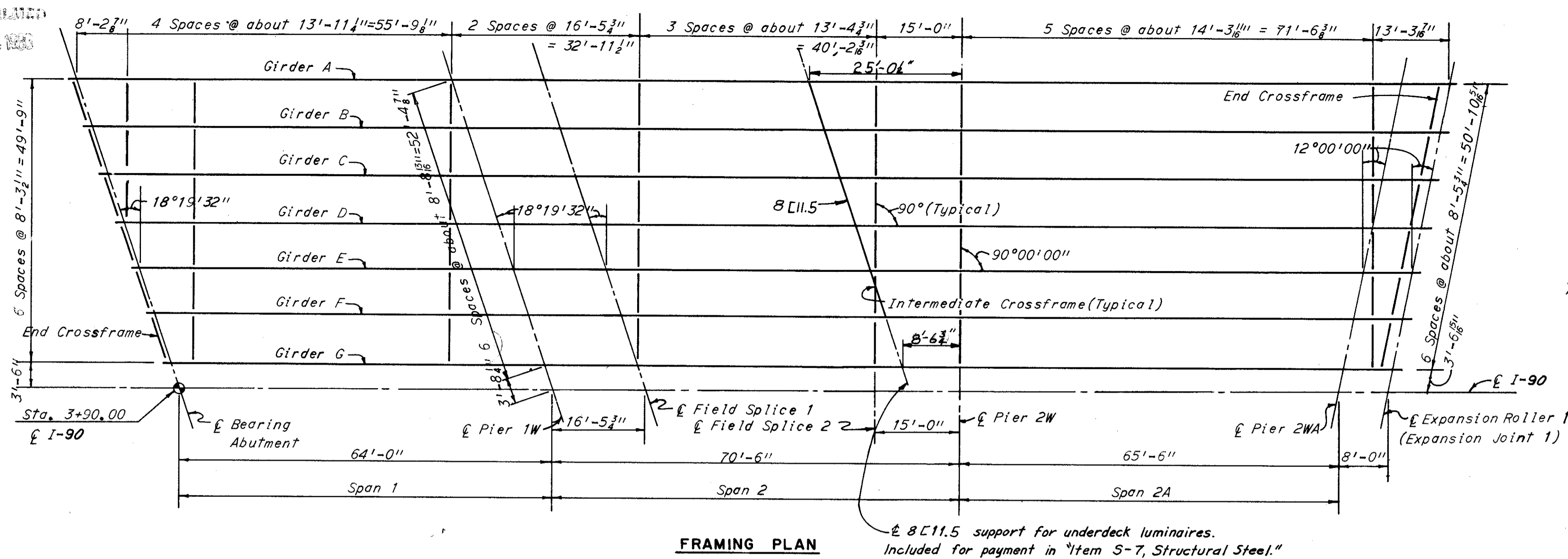
SHEET 40



FEB 24 1963

FED. RD. DIVISION	STATE	PROJECT	41
2	OHIO		77

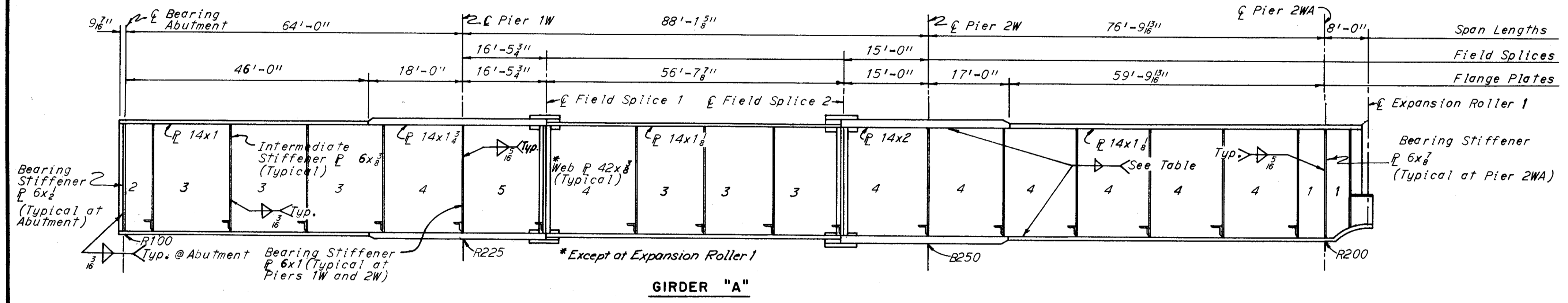
CUYAHOGA COUNTY CITY OF CLEVELAND  
 CUY-90-14.67



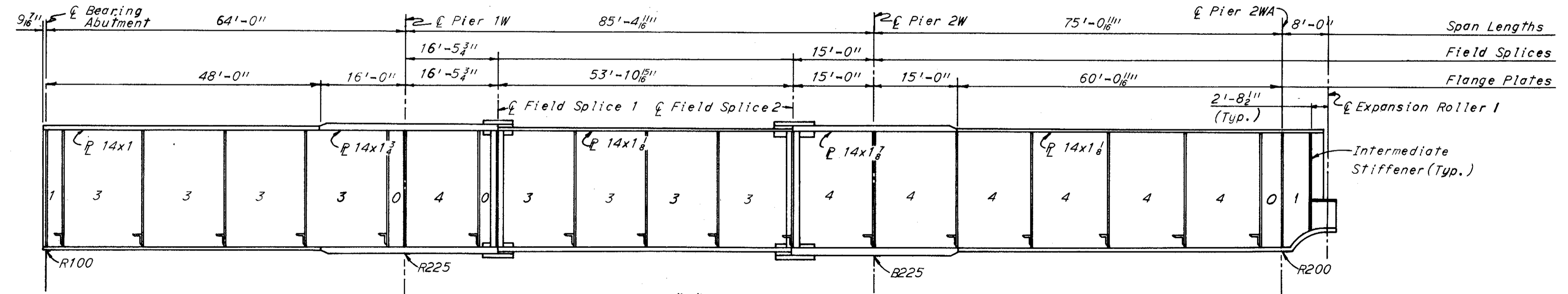
SCHEMATIC FRAMING PLAN

WELD SIZE	
WEB TO FLANGE	
Flange Plate Thickness	Fillet Weld Size
7" thru 1 1/2"	5/8"
1 1/2" thru 1 3/4"	3/8"

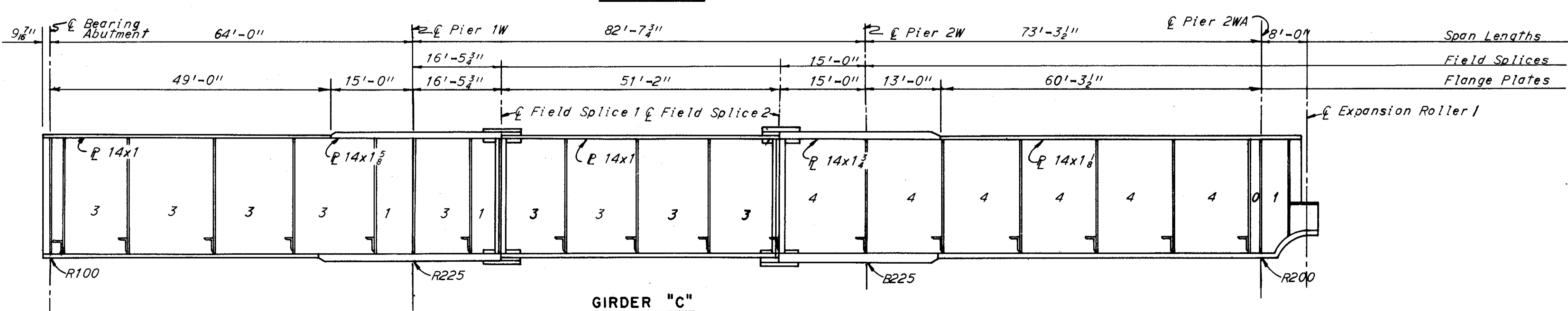
Notes:  
 For Girder notes see sheet 42.  
 For Girder shop and field splice details see sheet 53.  
 For details at Expansion Joint 1 see sheet 49.  
 For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.  
 For details of roadway end dam at the abutment see Ohio Standard Drawing SD-1-63, sheet 2 of 4. The supporting angle shown in the "Roadway End Dam Data" table shall be increased from 6x4x 1/2 to 8x4x 1/2 and the main angle shall be 8x6x1.  
 For details of crossframes see sheet 52.  
 All crossframes are intermediate crossframes unless shown otherwise.  
 For scupper locations see sheet 28.  
 For scupper and drainage details see sheet 56.  
 For top of pavement elevations see sheet 48.  
 For safety curb and median plate details at the abutment and expansion joint 1 see sheets 49 and 52.  
 For additional underdeck lighting details see sheet 24.



GIRDER "A"



GIRDER "B"



GIRDER "C"

H.N.T.B. BRIDGE NO. 10  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**UNIT IW FRAMING PLAN  
 AND GIRDER ELEVATIONS**  
 I-90 OVER FAIRFIELD AVE.,  
 LANE B AND RAMP W-2

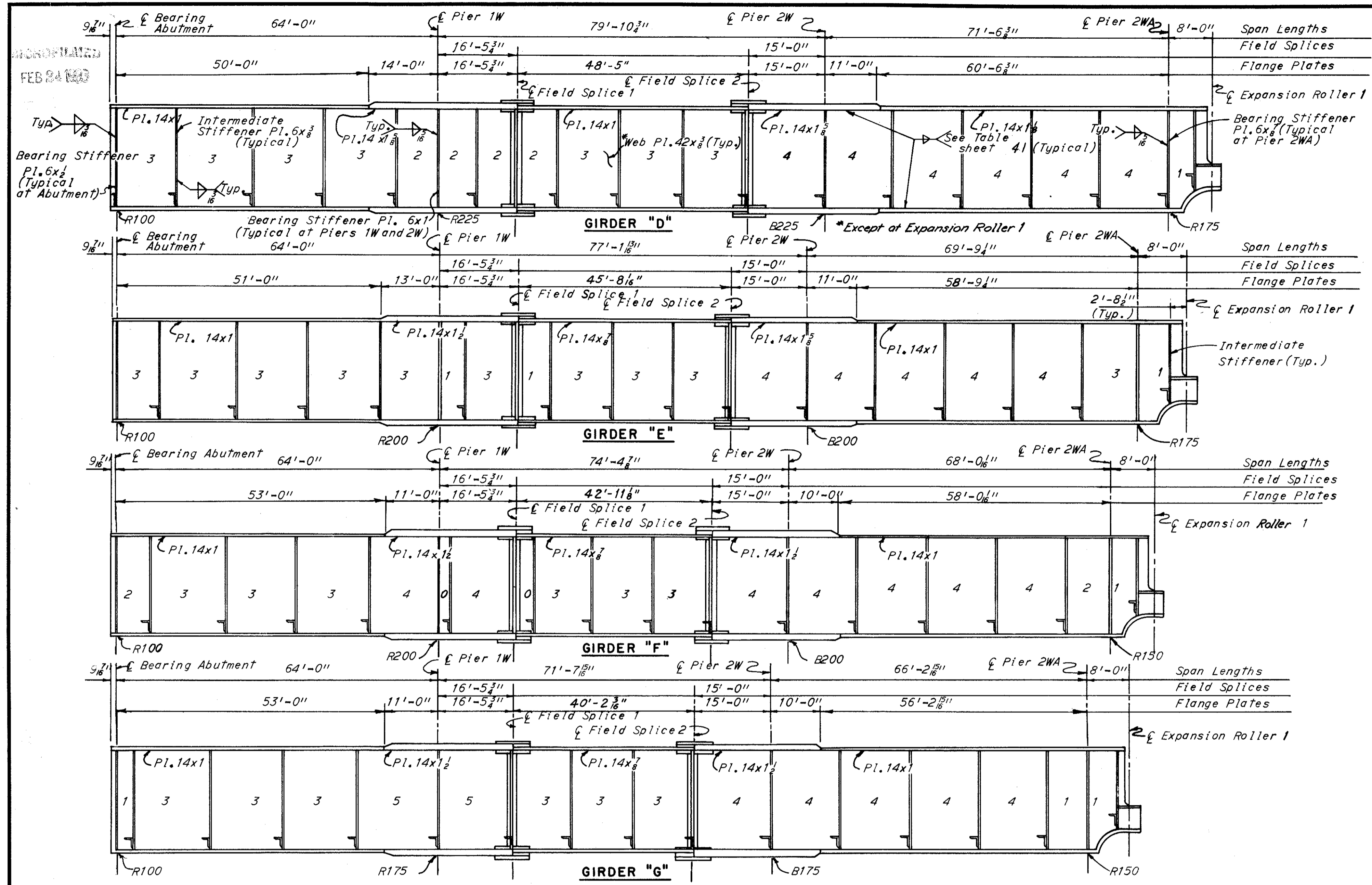
BR. NO. CUY-90-1467 STA. 3 + 87.63  
 SCALE: None STA. 12 + 42.48  
 CLEVELAND CUYAHOGA COUNTY OHIO

BR. NO. CUY-90-1467 STA. 3 + 87.63  
 SCALE: None STA. 12 + 42.48  
 CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN R.S.D.	TRACED	CHECKED	REVIEWED	REVISED
DATE 9/12/63	DATE	DATE 9/13/63	DATE 4-1-64	

SHEET 41

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



**GIRDER NOTES**

The girders shall be fabricated to compensate for the effects of vertical curvature and dead load deflections and, under full dead load, shall parallel the profiles formed by the top of the pavement elevations directly over the girders.

Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevation.

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

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

Numbers shown on girder webs indicate the number of pairs of intermediate stiffeners which shall be equally spaced between crossframes or crossframes and field splices or crossframes and bearing stiffeners. Intermediate stiffeners shall have contact bearing with the bottom flange on each side of the piers from the centerline of bearing to the change in flange plate size except that adjacent to the intermediate expansion joint's contact with the bottom flange shall be maintained for a distance of 17 feet from the joint. For the remaining length of the girders the intermediate stiffeners shall have contact bearing with the top flange. A clearance of not more than 1/8 inch shall be maintained from the opposite flange. In shop painting care shall be taken to make certain that point is forced through the 1/8 inch opening.

Bearing stiffeners at the piers and abutment shall be placed in pairs and shall be beveled and fully butt welded to the lower flange and fitted to the upper flange without welding.

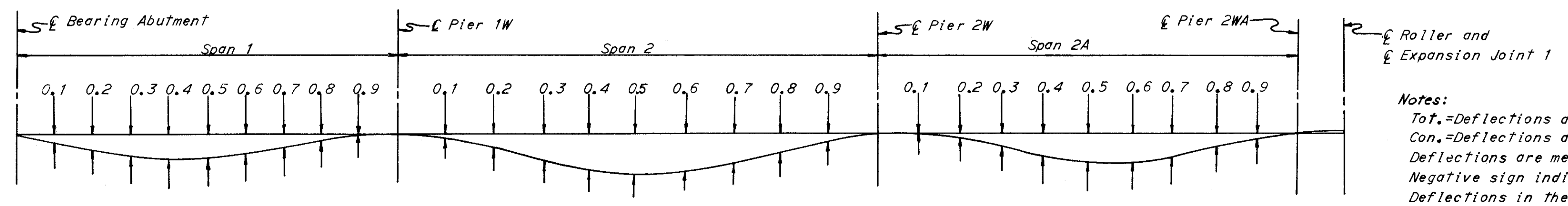
All stiffeners shall be set normal to girder flanges.

The Contractor shall submit to the Director for approval three prints showing his proposed erection procedure.

For additional notes see sheet 41.

**DEAD LOAD DEFLECTIONS**

Girder	SPAN 1										SPAN 2										SPAN 2A										Expansion Joint																																
	Abutment		0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		Pier 1		0.1		0.2		0.3		0.4			0.5		0.6		0.7		0.8		0.9		Pier 2		0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		Pier 3	
	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.		Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.		
"A"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0							
"B"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					
"C"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					
"D"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					
"E"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					
"F"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					
"G"	0	0	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36	40	40	44	44	48	48	52	52	56	56	60	60	64	64	68	68	72	72	76	76	80	80	84	84	88	88	92	92	96	96	100	100	0	0	0	0	-16	-16					



**Notes:**  
 Tot.=Deflections due to dead load of steel, concrete and wearing surface.  
 Con.=Deflections due to dead load of concrete and wearing surface only.  
 Deflections are measured to the nearest 1/16 inch.  
 Negative sign indicates upward deflection.  
 Deflections in the above table are given along  $\epsilon$  of girders at  $\epsilon$  of bearings and at tenth points between  $\epsilon$  bearings.

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

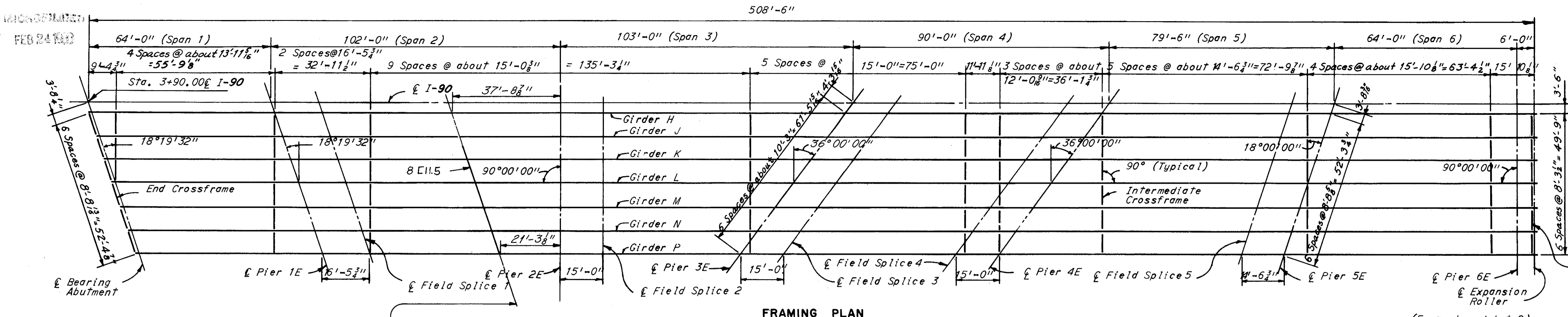
**UNIT 1W, GIRDER ELEVATIONS AND DEFLECTIONS**  
 I-90 OVER FAIRFIELD AVE.,  
 LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
 SCALE: None STA. 12 + 42.48  
 CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN ASD TRACED CHECKED [Signature] REVIEWED [Signature] REISED [Signature]  
 DATE 9-12-63 DATE 9-12-63 DATE 4-1-64 SHEET 42

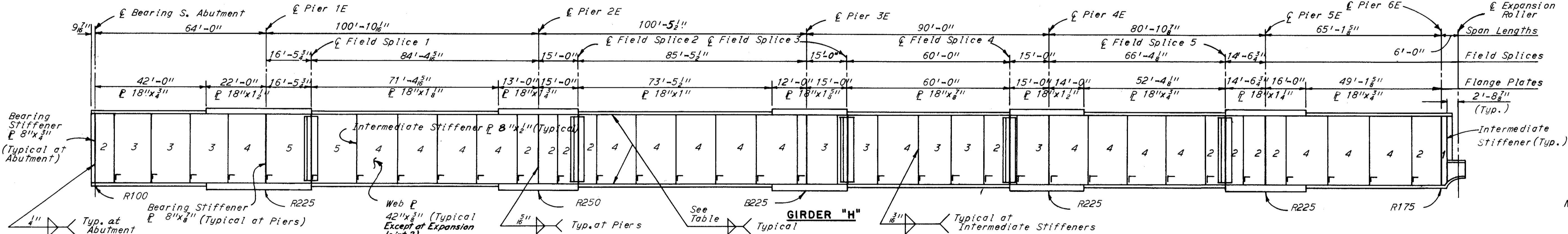
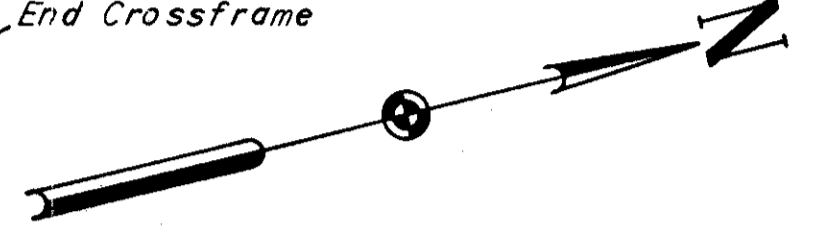
H.N.T.B. BRIDGE NO. 10

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



**FRAMING PLAN**

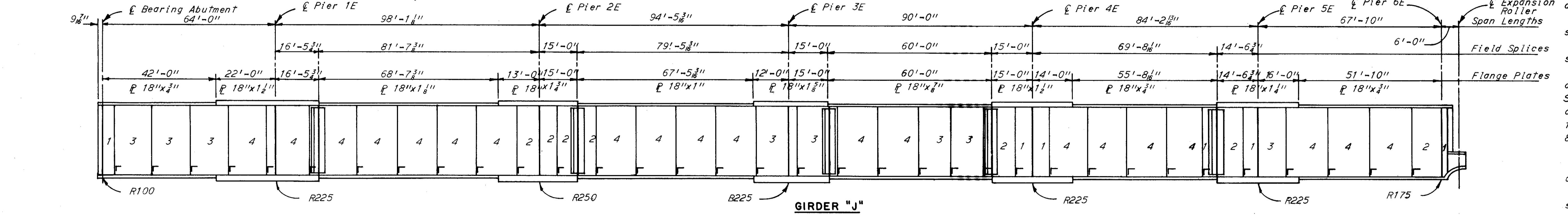
8 C11.5 support for underdeck luminaires. Included for payment in Item 5-7, Structural Steel.



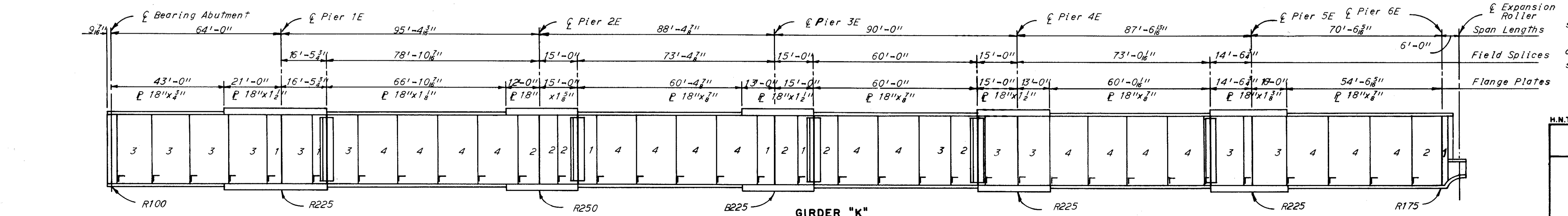
**GIRDER "H"**

WELD SIZE		
WEB TO FLANGE		
Flange Thickness	Flange Fillet	Web Fillet
3/4" through 1 1/2"	5/16"	5/16"
1 3/4" through 1 7/8"	3/8"	3/8"

Notes:  
 For Girder Notes see sheet 42.  
 For girder shop and field splice details see sheet 53.  
 For details at Expansion Joint 2 see sheet 50.  
 For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.  
 For details of roadway end dam at the abutment see Ohio Standard Drawing SD-1-63, sheet 2 of 4. The supporting angle shown in the "Roadway End Dam Data" table shall be increased from 6x4x2 to 8x4x2 and the main angle shall be 8x6x1.  
 For details of crossframes see sheet 52.  
 All crossframes are intermediate crossframes unless shown otherwise.  
 For scupper and drainage details see sheet 56.  
 For scupper locations see sheet 28.  
 For top of pavement elevations see sheet 48.  
 For safety curb and median plate details at the abutment and expansion joint 2 see sheets 49 and 52.  
 For additional underdeck lighting details see sheet 24.



**GIRDER "J"**



**GIRDER "K"**

H.N.T.B. BRIDGE NO. 10

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

**UNIT IE FRAMING PLAN  
AND GIRDER ELEVATIONS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3+87.63  
SCALE: None STA. 12+42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

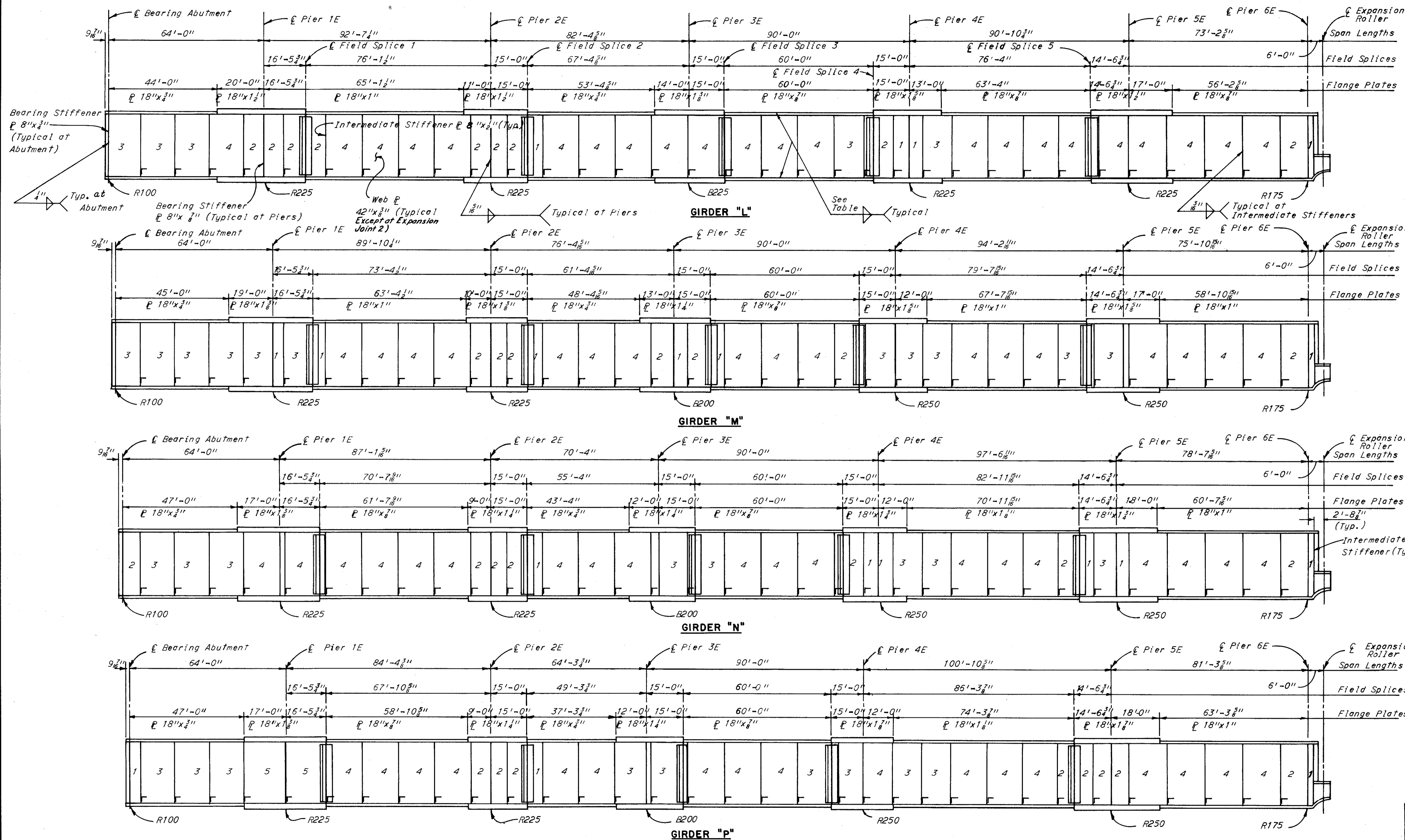
DRAWN Lee TRACED [initials] CHECKED [initials] REVIEWED [initials] REISED [initials]  
DATE 9-26-63 DATE [initials] DATE [initials] DATE [initials]

SHEET 43

REVISIONS  
FEB 24 1964

FED. RD. DIVISION 2	STATE OHIO	PROJECT CUYAHOGA COUNTY CITY OF CLEVELAND CUY-90-14.67	44 77
------------------------	---------------	--	----------

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



WELD SIZE WEB TO FLANGE	
Flange Thickness	Fillet Weld Size
3/4" through 1 1/2"	5/16"
1 3/8" through 1 7/8"	3/8"

For notes see sheet 43.

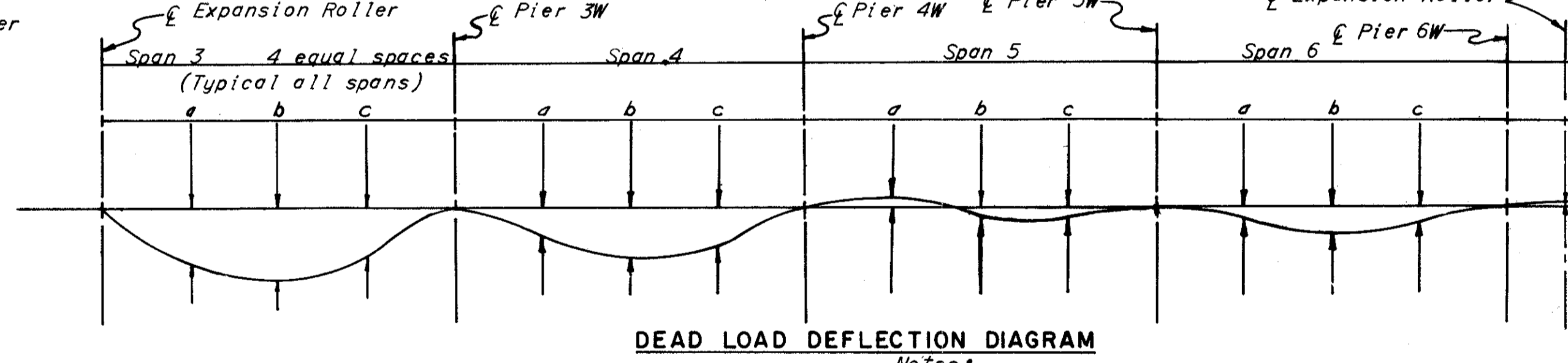
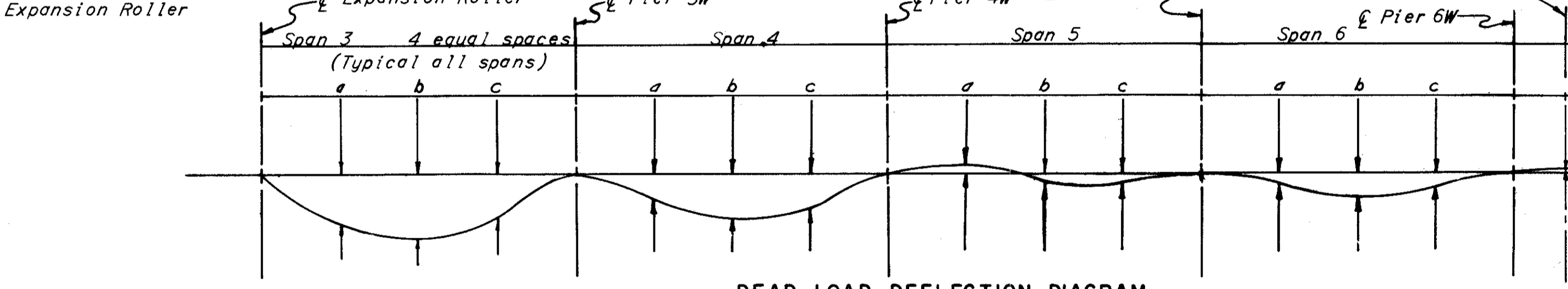
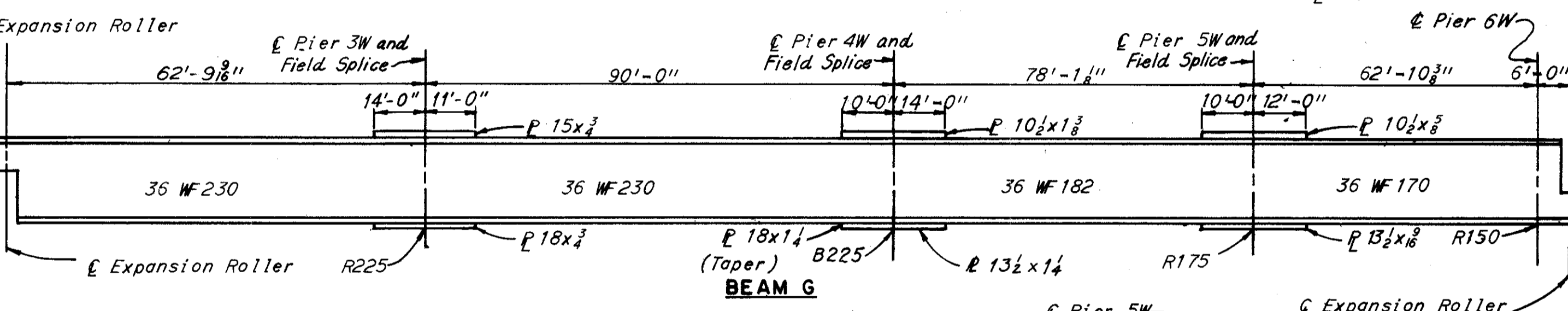
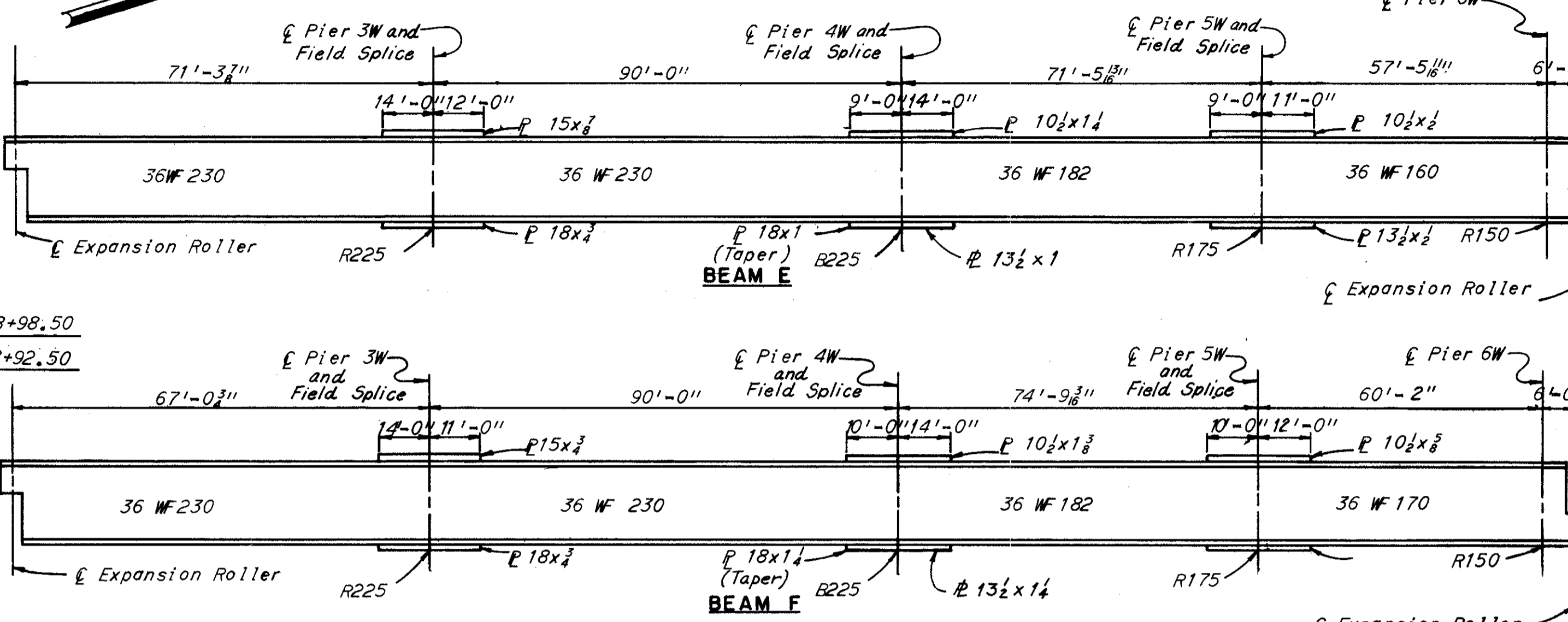
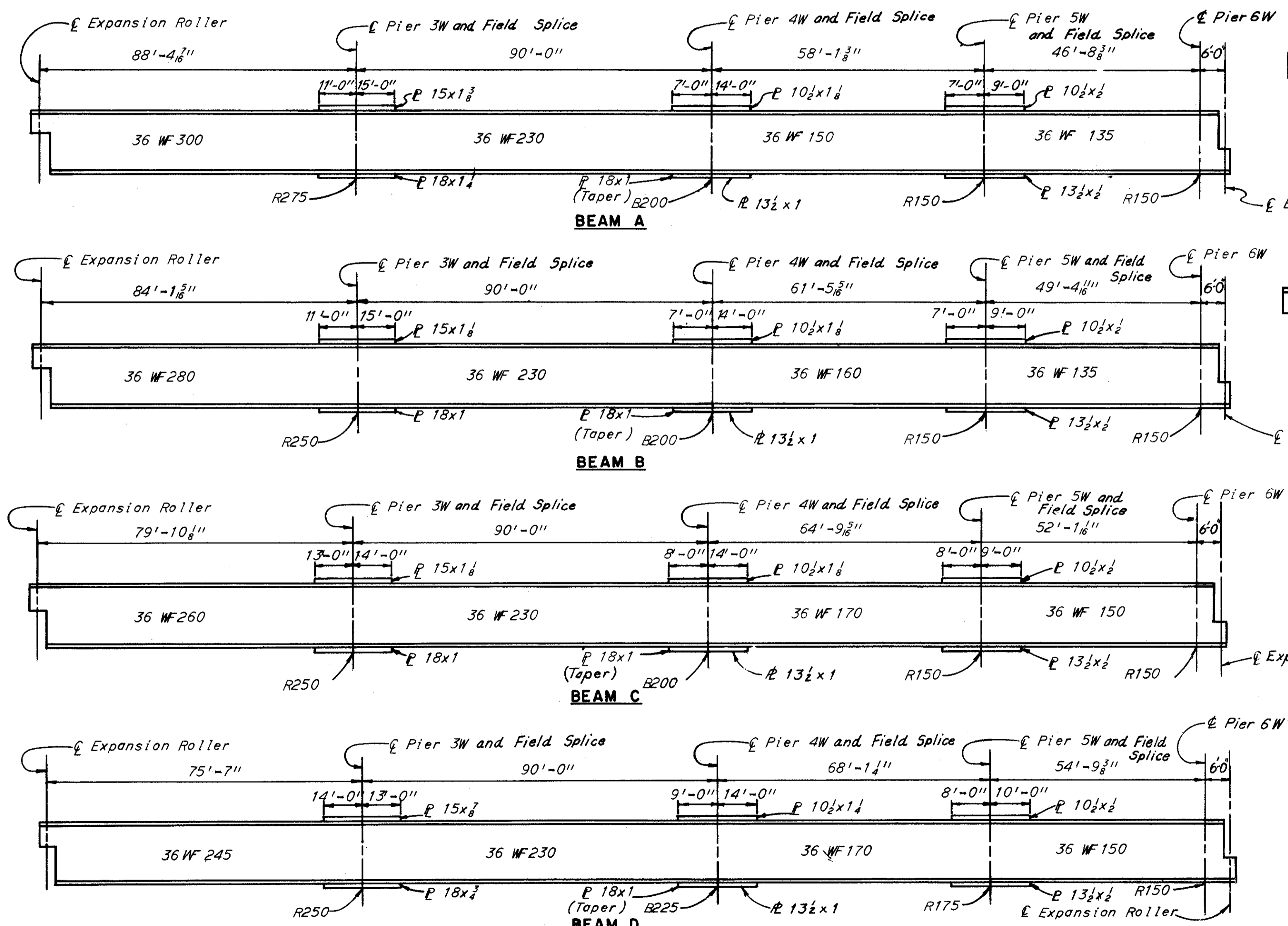
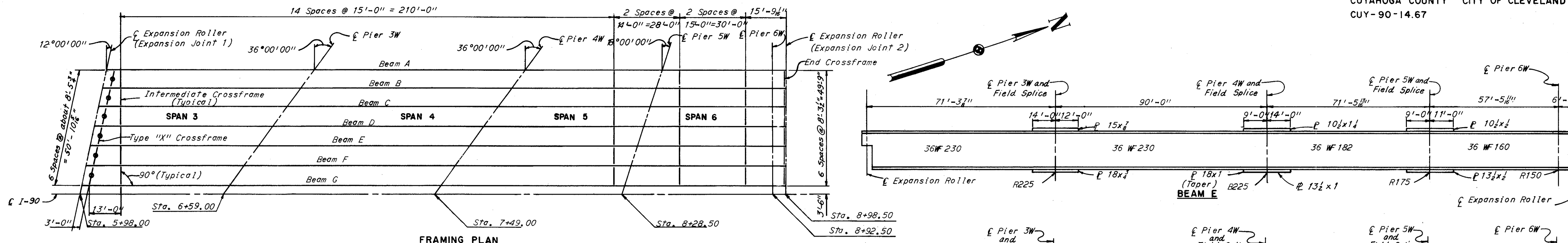
H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**UNIT 1E GIRDER ELEVATIONS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN L.e. TRACED CHECKED J.M. REVIEWED W.F. REVISIONS  
DATE 9-26-63 DATE 3/7/64 DATE 4-1-64 SHEET 44





Beam	Pier 5W	Expansion Joint 1	Pier 6W
A	2 1/2"	3 3/4"	0"
B	2 1/4"	3 3/4"	0"
C	2 3/8"	3"	3/8"
D	2 3/4"	2 3/8"	1"
E	3"	2 1/4"	5/8"
F	3 3/8"	1 3/8"	7/8"
G	3 3/8"	1 3/8"	1"

- BEAM JACKING PROCEDURE**
1. Raise ends of beams in Spdn 5 at Pier 5W by amount shown in Beam Jacking Table.
  2. Splice at Pier 4W.
  3. Lower the beam ends into final position.
  4. Raise ends of beams in Span 3 and Span 6 at Expansion Joint 1 and Pier 6W respectively, by the amounts shown in the Beam Jacking Table.
  5. Splice beams at Pier 3W and Pier 5W.
  6. Lower the beams into final position.
- For beam splice details see sheet 53.

BEAM	SPAN 3			SPAN 4			SPAN 5			SPAN 6			EXTR.
	a	b	c	a	b	c	a	b	c	a	b	c	
A	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
B	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
C	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
D	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
E	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
F	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0
G	18 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	0	0	0	0	0	0	0

Notes: T=Deflections due to dead load of steel, concrete and wearing surface.  
C=Deflections due to dead load of concrete and wearing surface only.  
Deflections are measured to the nearest 1/8 inch.  
Negative signs indicate upward deflections.

**BEAM CAMBER NOTE**  
Beams A, B and C in Span 3 shall be cambered by the amounts shown in the table. All the beams in Span 4 shall be cambered 3/4". The remaining beams in Span 3 and all the beams in Span 5 and 6 do not require camber but they shall be fabricated so that any curved beam will be placed with the convex flange up.

Notes:  
For details at expansion joints 1 and 2 see sheets 49 and 50.  
For crossframe details see sheet 52.  
For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.  
For scupper locations see sheet 28.  
For scupper and drainage details see sheet 56.  
For top of pavement elevations see sheet 48.  
For additional underdeck lighting details see sheet 24.

H.M.T.B. BRIDGE NO. 10

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

**UNIT 2W FRAMING PLAN  
AND BEAM ELEVATIONS**

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

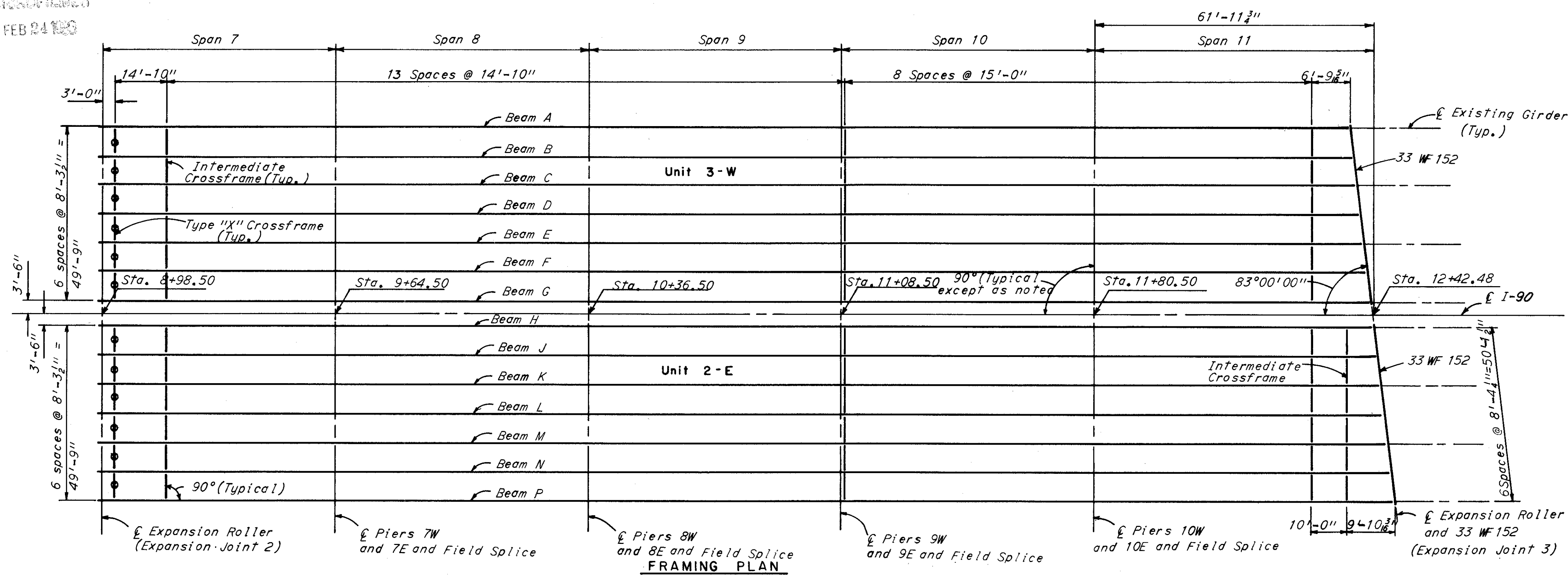
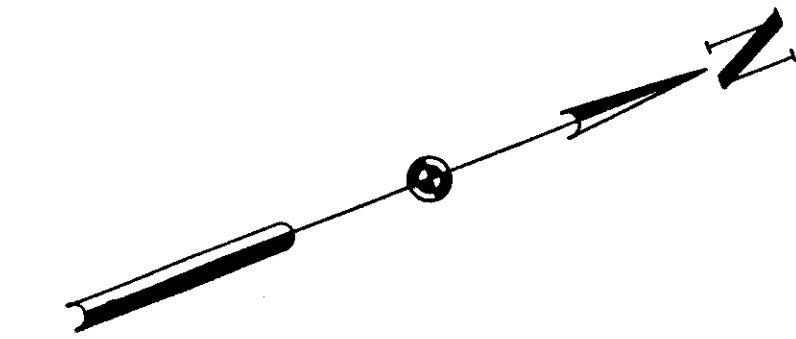
BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY [Signature] TRACED BY [Signature] CHECKED BY [Signature] REVIEWED BY [Signature] REVISIONS  
DATE 9-1-63 DATE 9-18-63 DATE 4-1-64 SHEET 46



UNRECORDED  
FEB 24 1963

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67

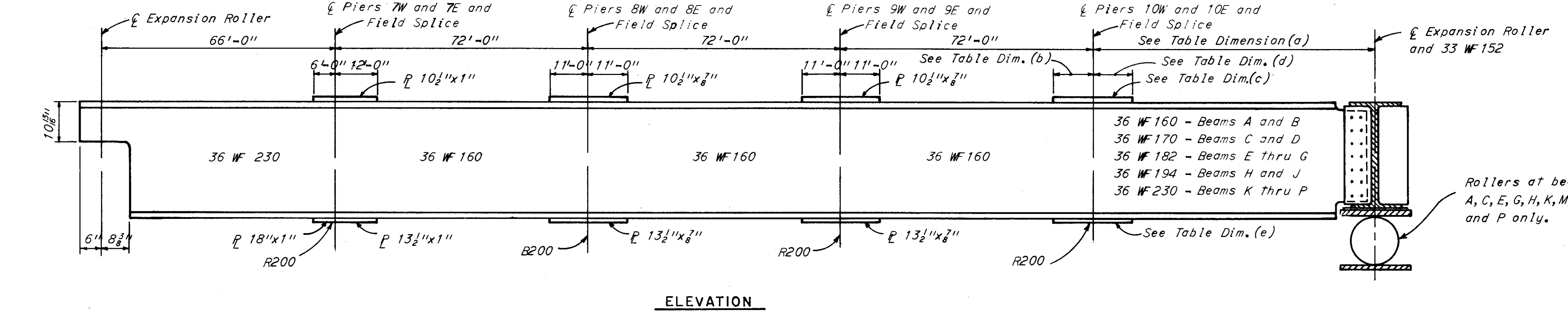


**BEAM JACKING PROCEDURES**

1. Raise ends of beams in Spans 8 and 10 at Piers 7 and 10 respectively by 2 1/4".
2. Splice at Piers 8 and 9.
3. Lower beam ends to final position.
4. Raise ends of beams in Span 7 at Expansion Joint 2 by 1 1/4".
5. Splice at Pier 7.
6. Raise ends of beams in Span 11 at Expansion Joint 3 by the amounts shown in the Beam Jacking Table.
7. Splice at Pier 10.
8. Lower beam ends at Expansion Joints to final position.

Beam	Jacking
A	7"
B	7"
C	1"
D	1"
E	1"
F	1 1/8"
G	1 1/8"
H	1 1/8"
J	1 1/4"
K	1 1/4"
L	1 1/4"
M	1 3/8"
N	1 3/8"
P	1 1/2"

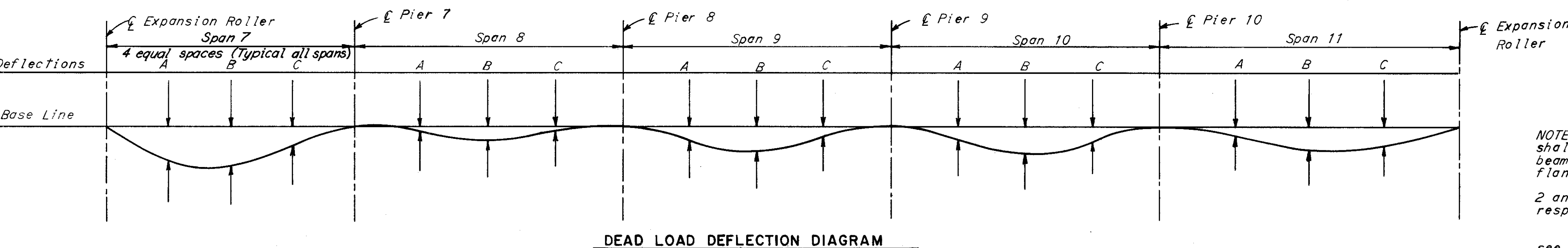
NOTE: For beam splice details see sheet 53.



Beam	Dim. (a)	Dim. (b)	Dim. (c)	Dim. (d)	Dim. (e)
A	55'-5 3/8"	10'-0"	10 1/2" x 7"	12'-0"	13 1/2" x 7"
B	56'-5 1/2"	10'-0"	10 1/2" x 7"	12'-0"	13 1/2" x 7"
C	57'-5 3/8"	10'-0"	10 1/2" x 7"	12'-0"	13 1/2" x 7"
D	58'-5 5/8"	10'-0"	10 1/2" x 7"	12'-0"	13 1/2" x 7"
E	59'-6 3/8"	10'-0"	10 1/2" x 7"	10'-0"	13 1/2" x 7"
F	60'-6 3/8"	10'-0"	10 1/2" x 7"	10'-0"	13 1/2" x 7"
G	61'-6 9/8"	10'-0"	10 1/2" x 7"	10'-0"	13 1/2" x 7"
H	62'-4 1/8"	10'-0"	10 1/2" x 7"	8'-0"	13 1/2" x 7"
J	63'-5 1/8"	10'-0"	10 1/2" x 7"	8'-0"	13 1/2" x 7"
K	64'-5 5/8"	10'-0"	10 1/2" x 7"	8'-0"	*18" x 1"
L	65'-5 3/8"	12'-0"	10 1/2" x 1"	6'-0"	*18" x 1"
M	66'-5 3/8"	12'-0"	10 1/2" x 1"	6'-0"	*18" x 1"
N	67'-6"	12'-0"	10 1/2" x 1"	6'-0"	*18" x 1"
P	68'-6 3/8"	12'-0"	10 1/2" x 1"	6'-0"	*18" x 1"

\*Taper to 13 1/2"

NOTES: Beams shall not be cambered but shall be fabricated so that any curved beam will be placed with the convex flange up.  
For details at expansion joints 2 and 3, see sheets 50 and 51, respectively.  
For crossframe details see sheet 52.  
For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.  
For scupper locations see sheet 28.  
For scupper and drainage details see sheet 36.  
For top of pavement elevations see sheet 48.



beam	TABLE OF DEFLECTIONS														
	SPAN 7			SPAN 8			SPAN 9			SPAN 10			SPAN 11		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
A & B	7/16	5/16	2/16	7/16	4/16	3/16	0	3/16	3/16	1/16	1/16	1/16	1/16	1/16	1/16
C, D, & E	7/16	5/16	2/16	7/16	4/16	3/16	0	3/16	3/16	1/16	1/16	1/16	1/16	1/16	1/16
F, G, H, & J	7/16	5/16	2/16	7/16	4/16	3/16	0	3/16	3/16	1/16	1/16	1/16	1/16	1/16	1/16
K, L & M	7/16	5/16	2/16	7/16	4/16	3/16	0	3/16	3/16	1/16	1/16	1/16	0	0	0
N & P	7/16	5/16	2/16	7/16	4/16	3/16	0	3/16	3/16	1/16	1/16	1/16	0	0	0

NOTES: Tot. = Deflections due to dead load of steel, concrete and wearing surface.  
Con. = Deflections due to dead load of concrete and wearing surface only.  
Deflections are measured to the nearest 1/16 inch.

H.N.T.B. BRIDGE NO. 10

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

**UNITS 3W AND 2E  
FRAMING PLAN**

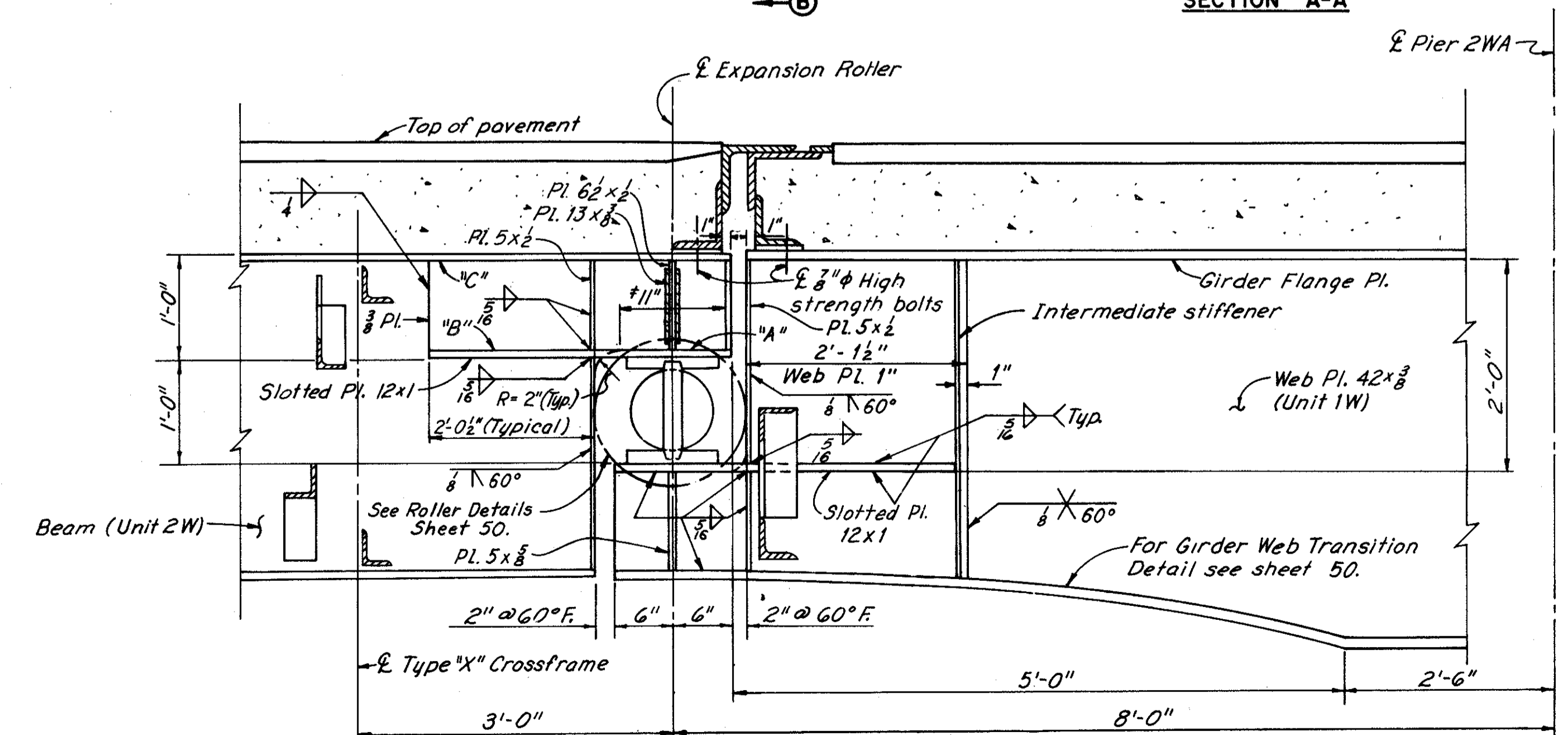
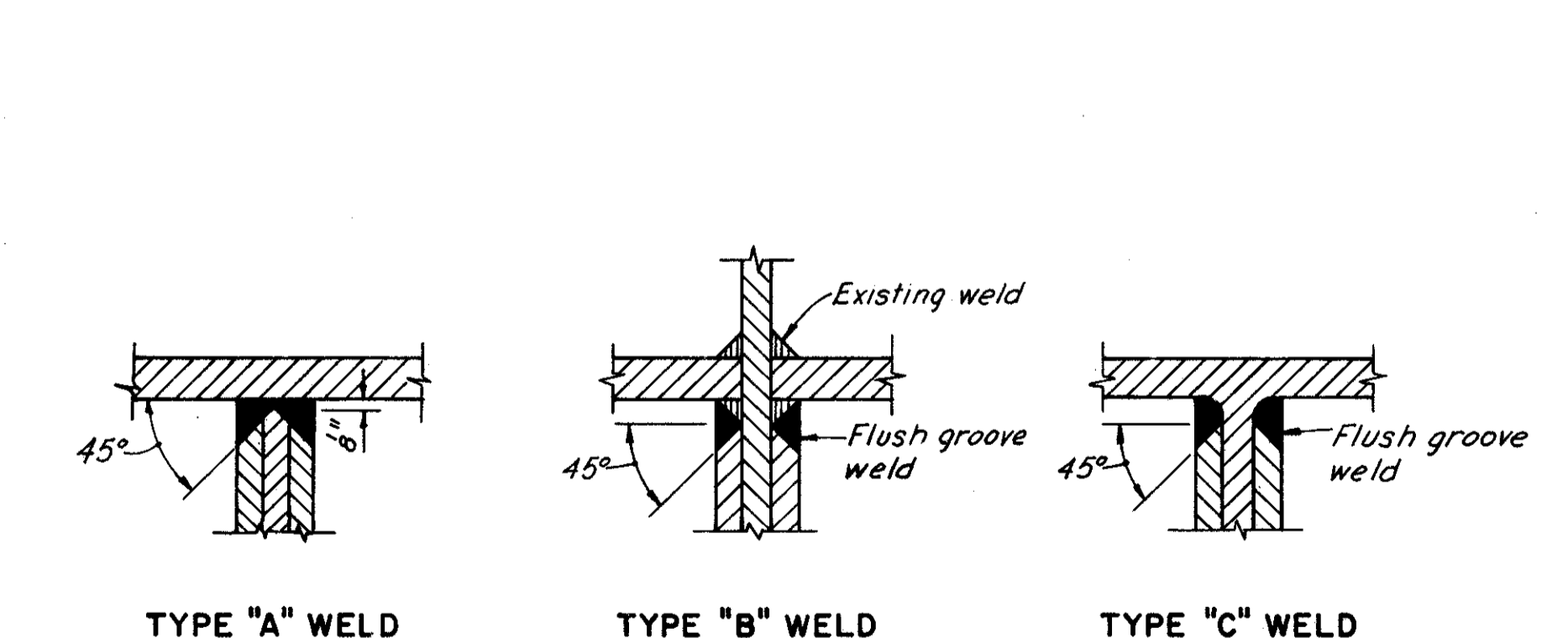
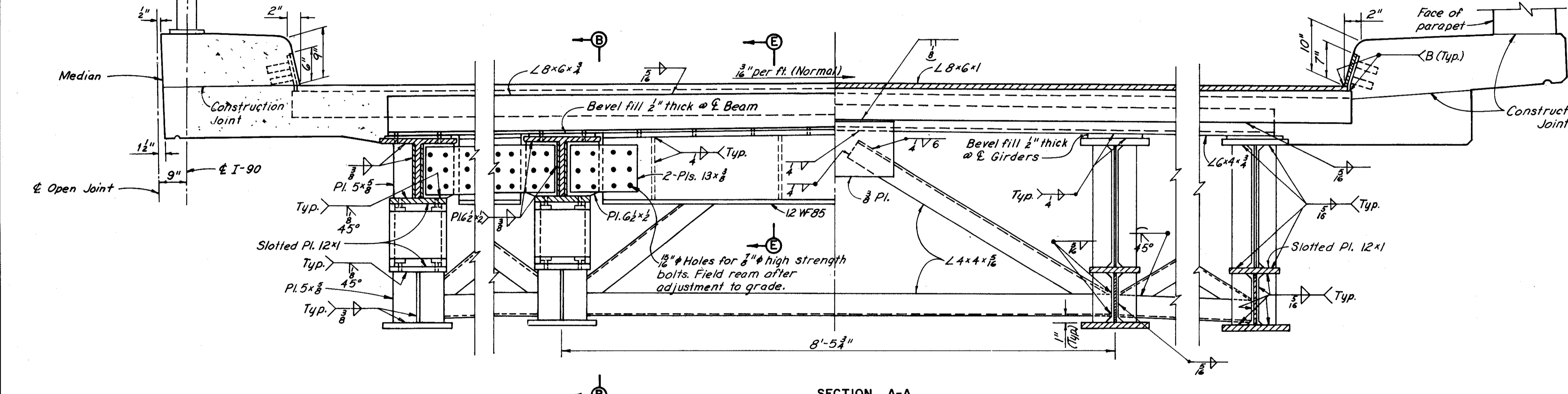
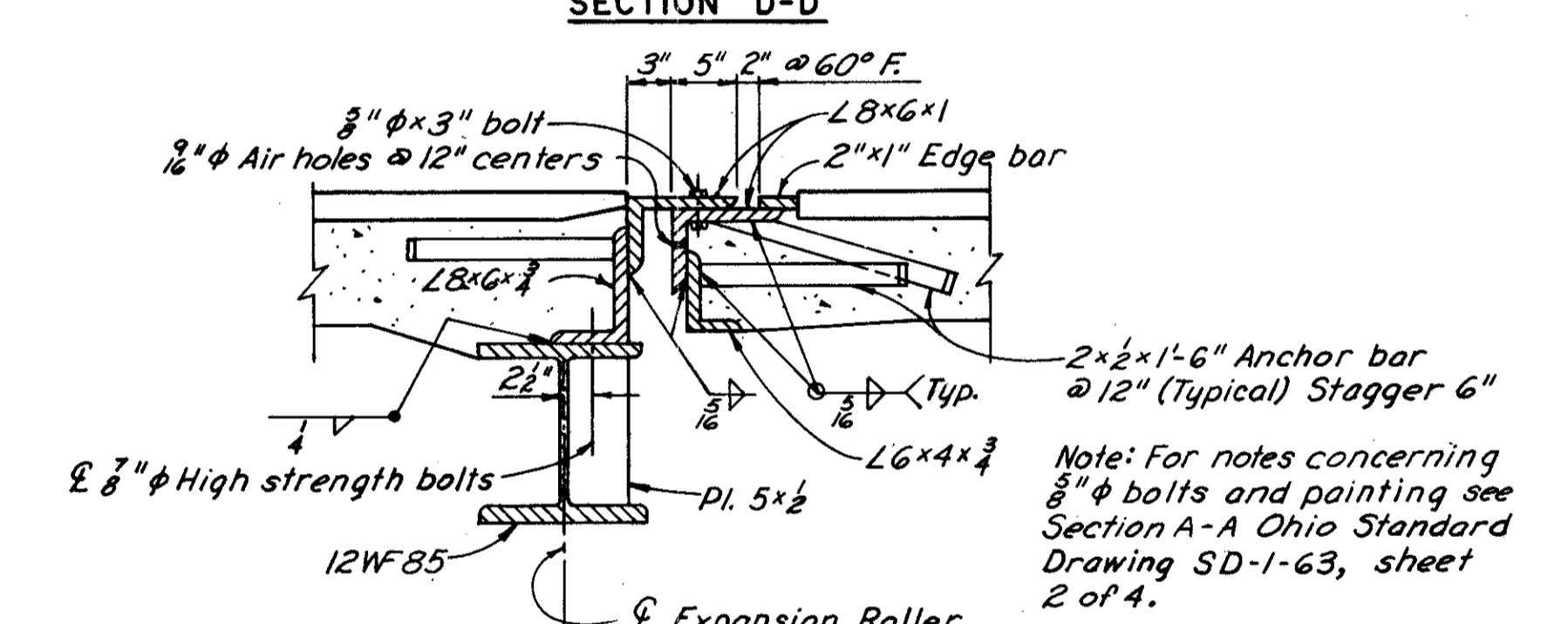
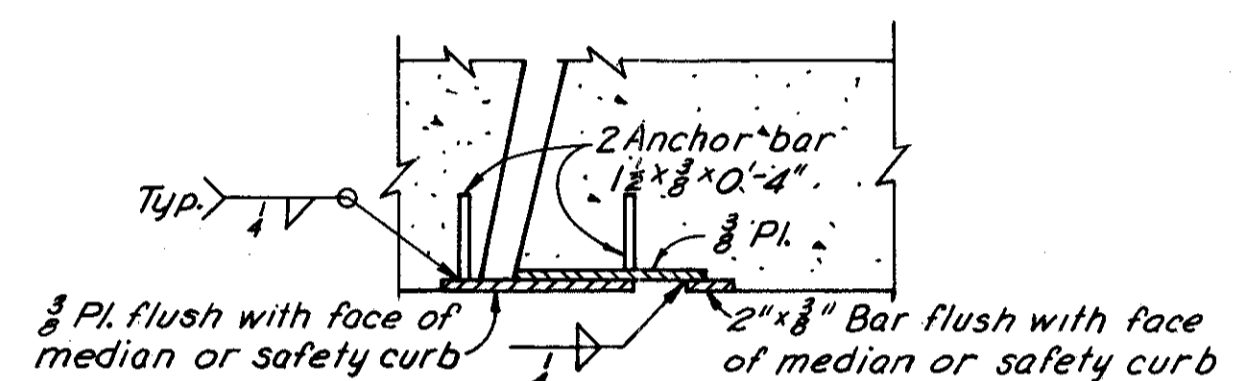
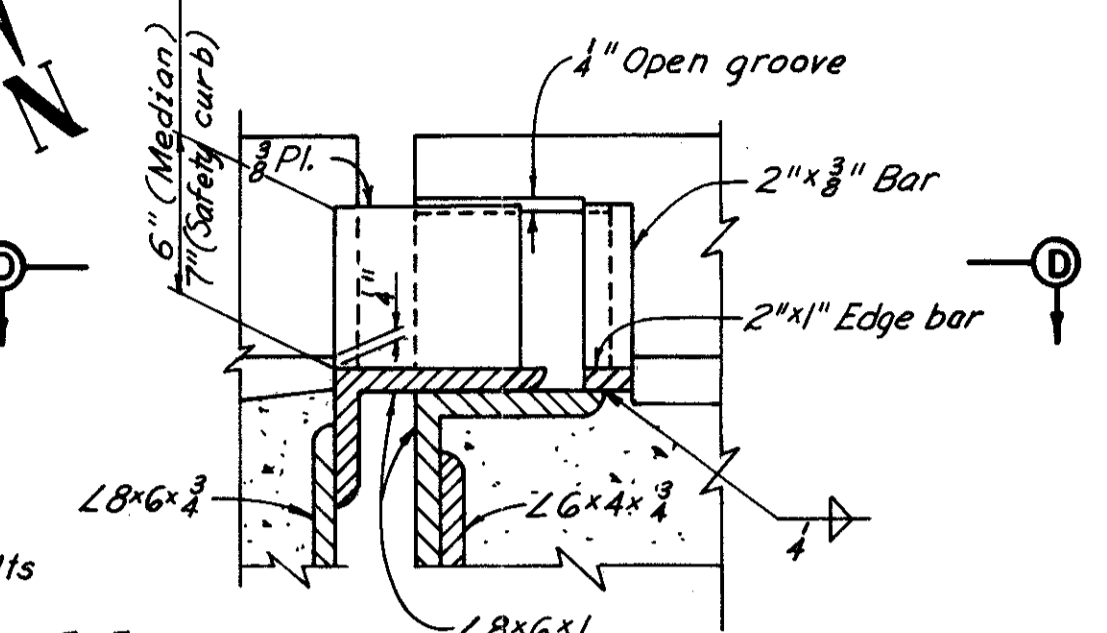
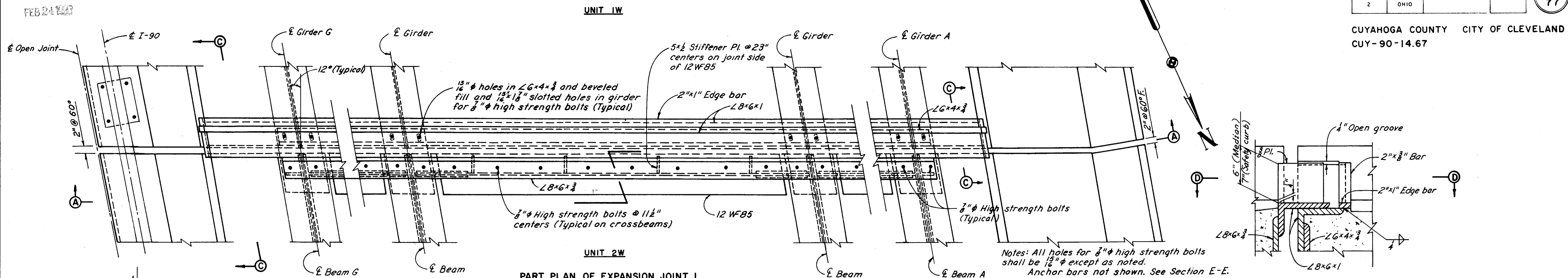
1-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: PJA TRACED: [ ] CHECKED: DRK REVIEWED: [ ]  
DATE: 4-63 DATE: 9-1-63 DATE: 4-1-64

SHEET 47





Notes: "A" designates Type "A" weld.  
"B" designates Type "B" weld.  
"C" designates Type "C" weld.  
\* Dimension shown is for length of Type "A" weld.

Notes:  
The rollers and adjustable bearing plates shall be alloy steel forgings conforming to ASTM A-237-55 Class B and shall be included with "Item S-7, Structural Steel" for payment.  
All sliding contact surfaces shall not be painted but shall be lubricated with flake graphite.  
For Roller, Slotted Plate and Roller Positioning Details see sheet 50.

H.N.T.B. BRIDGE NO. 10

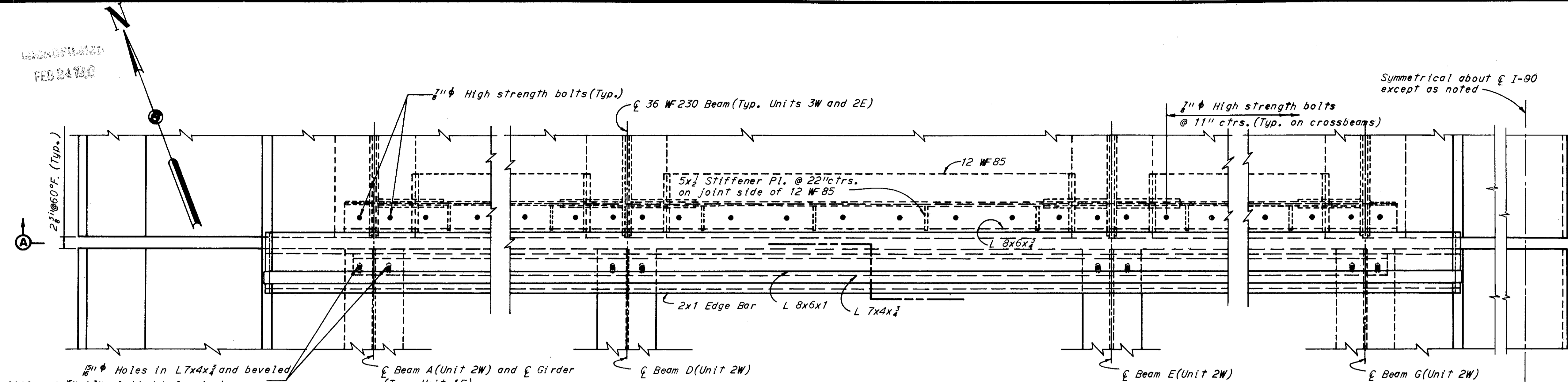
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

**EXPANSION JOINT I DETAILS**

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467      STA. 3 + 87.63  
SCALE: None      STA. 12 + 42.48  
CLEVELAND      CUYAHOGA COUNTY      OHIO

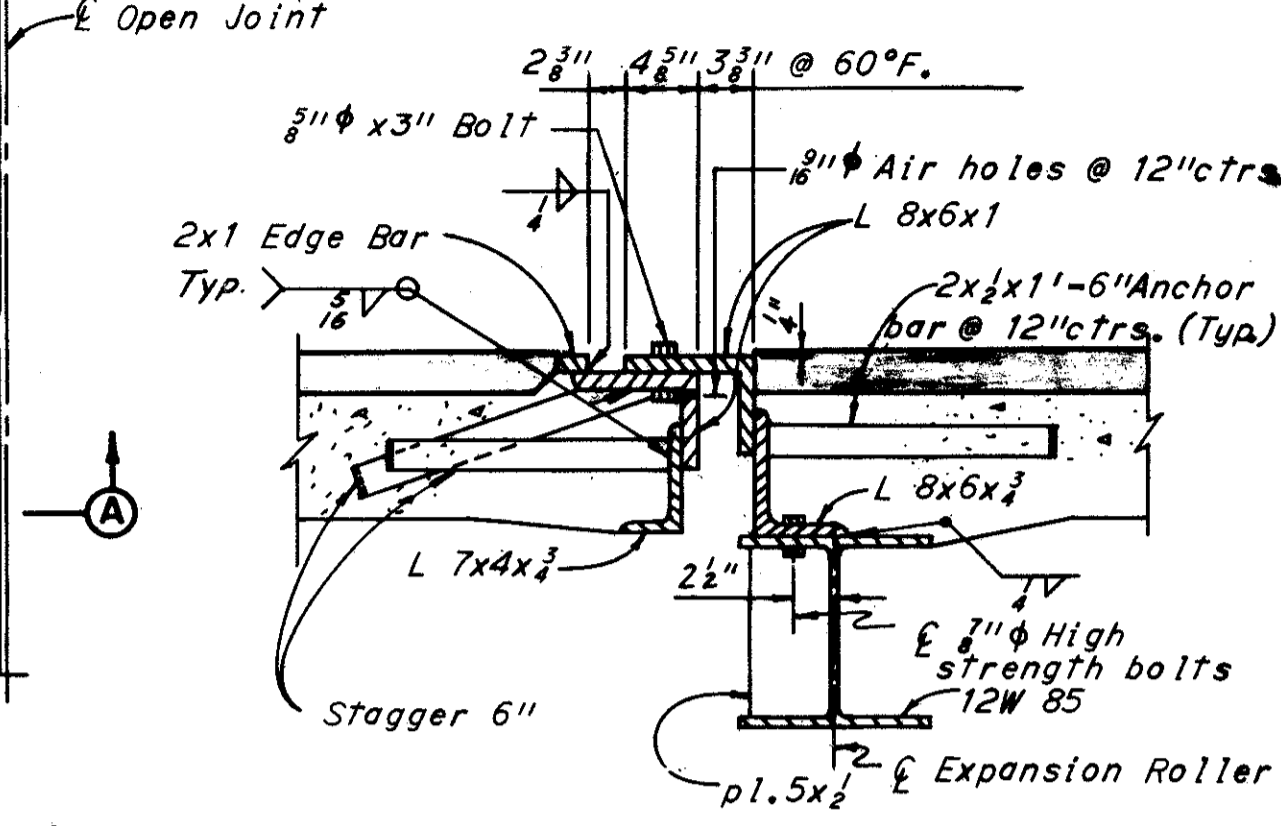
DRAWN R.S.D. TRACED      CHECKED J.S.      REVIEWED W.C.      REVISED  
DATE 9.30.63      DATE 10-1-63      DATE 1-1-64      SHEET 49



**PART PLAN OF INTERMEDIATE EXPANSION JOINT 2**

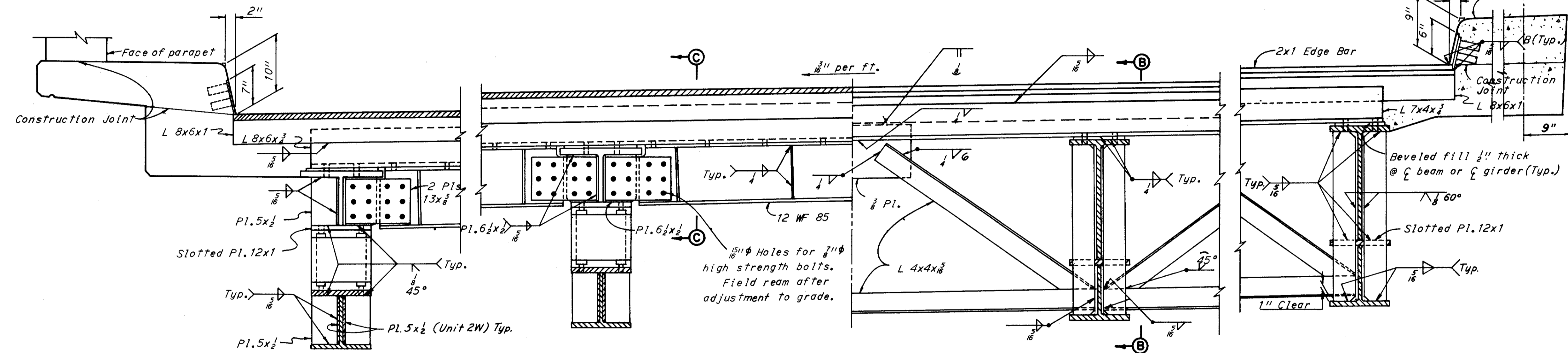
7/8" Holes in L7x4x1/2 and beveled fill and 1/2"x1/2" slotted holes in beam or girder for 7/8" high strength bolts (Typ.)

Notes: All holes for 7/8" high strength bolts shall be 1/2" except as noted. Anchor bars not shown. See Section C-C.

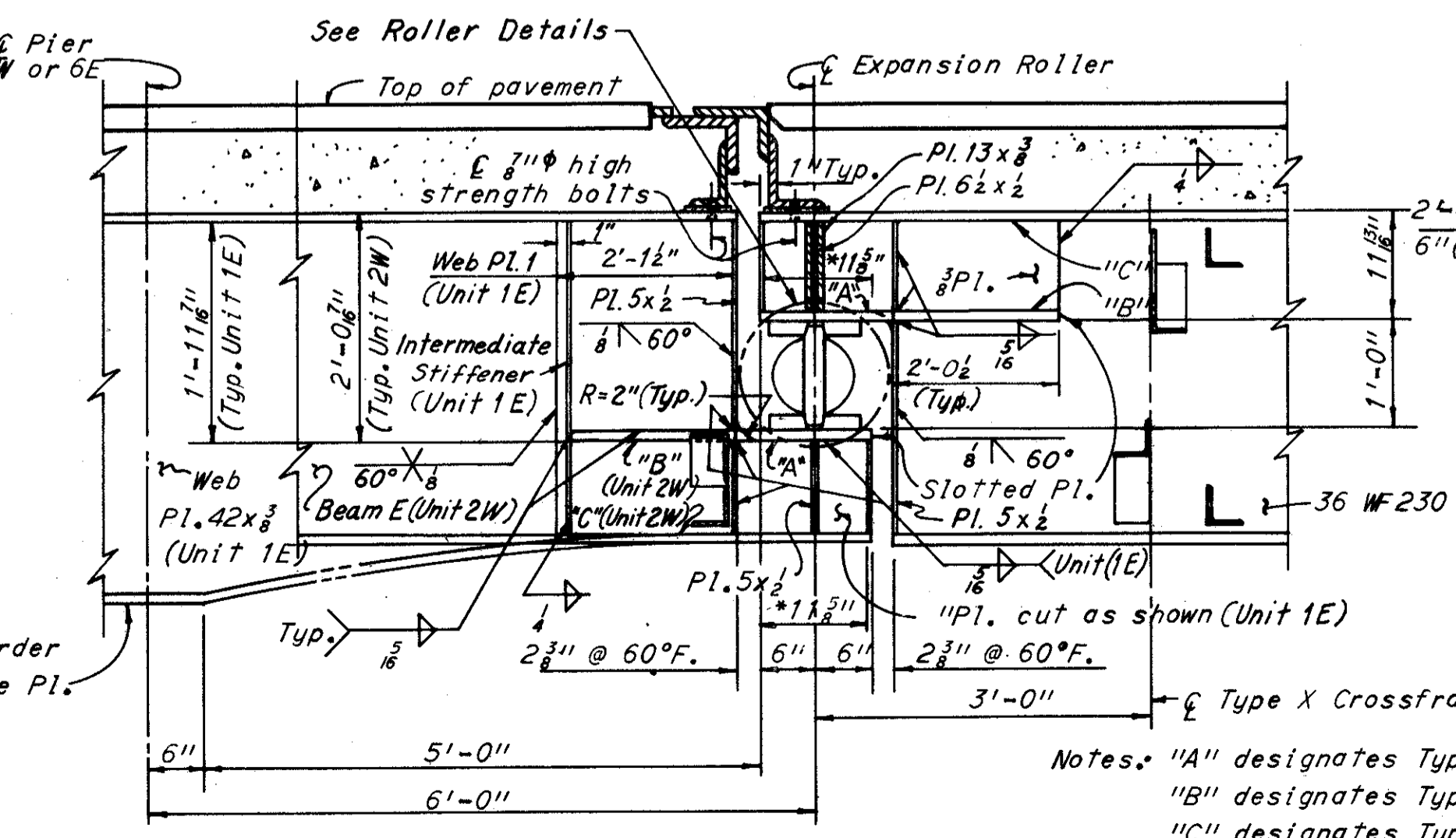


**SECTION C-C**

Note: For notes concerning 7/8" bolts and painting see Section A-A Ohio Standard Drawing SD-1-63, sheet 2 of 4.

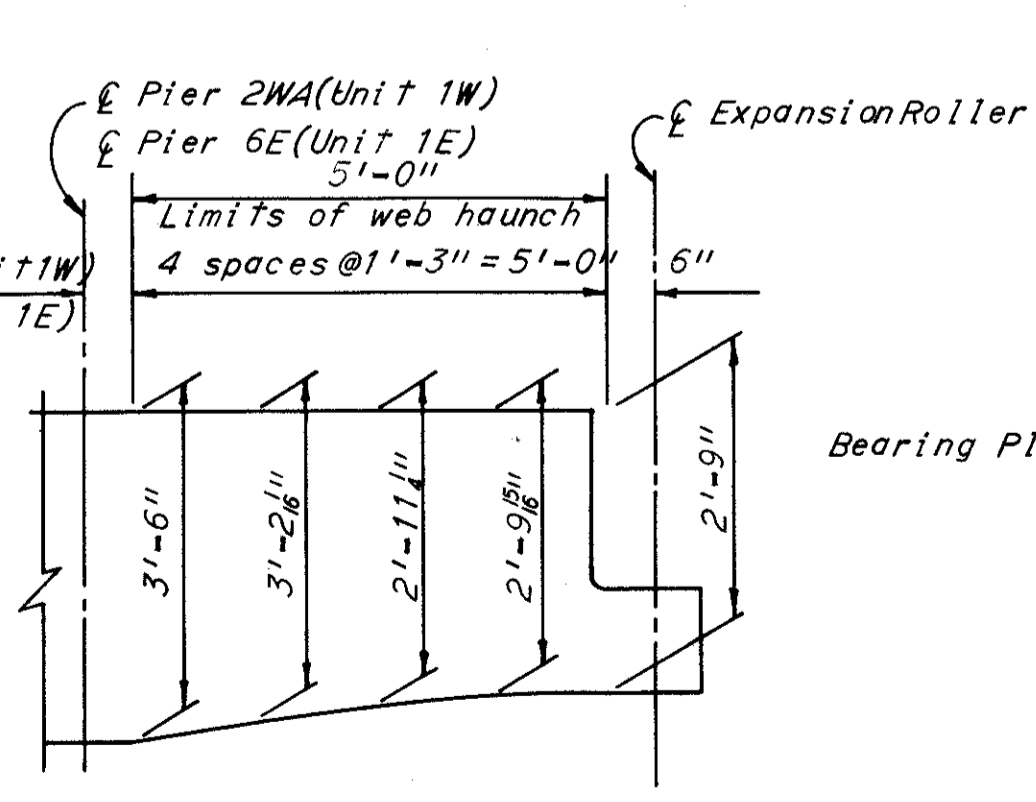


**SECTION A-A**

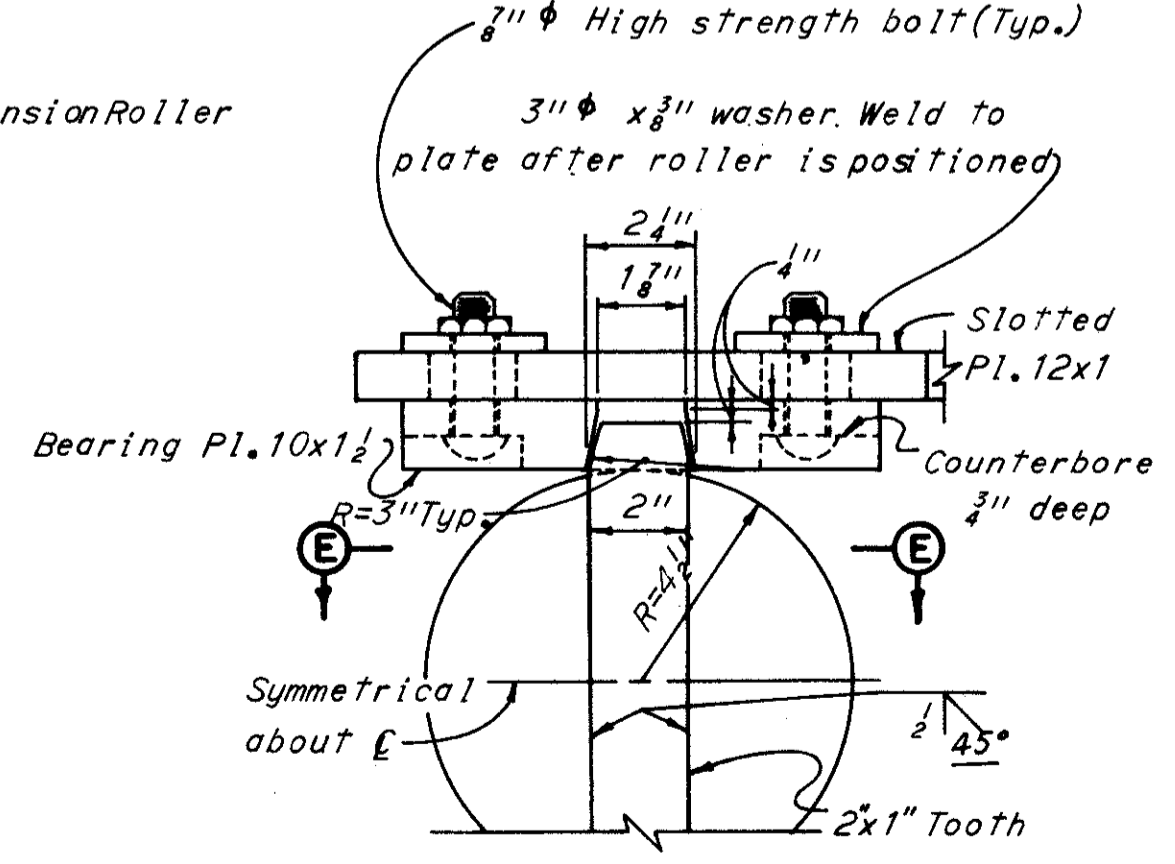


**SECTION B-B**  
No Scale

Notes: "A" designates Type "A" weld. "B" designates Type "B" weld. "C" designates Type "C" weld. \* Dimension shown is for length of Type "A" weld.



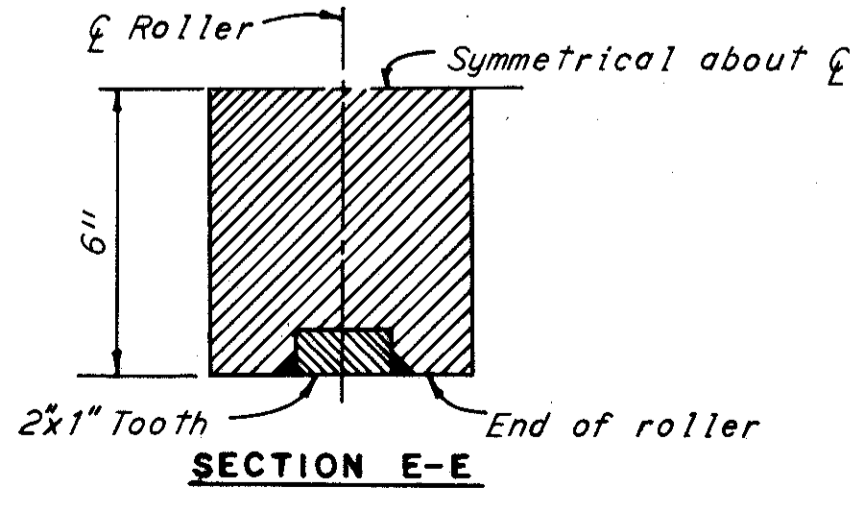
**GIRDER WEB TRANSITION DETAIL**  
No Scale



**ELEVATION**

Note: Set bearing plates so that the centerline of the roller is vertical at 60 degrees.

**ROLLER DETAILS**  
Scale 3" = 1'-0"



**SECTION E-E**

Notes:  
All sliding contact surfaces shall not be painted but shall be lubricated with flake graphite.  
Rollers and adjustable bearing plates shall be alloy steel forgings conforming to ASTM A237-55 Class B and shall be included with "Item S-7, Structural Steel" for payment.  
For Median and Safety Curb Plate Details see Sections C-C and D-D sheet 49.  
For Type "A", Type "B", and Type "C" Weld see sheet 49.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**EXPANSION JOINT 2 DETAILS**

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

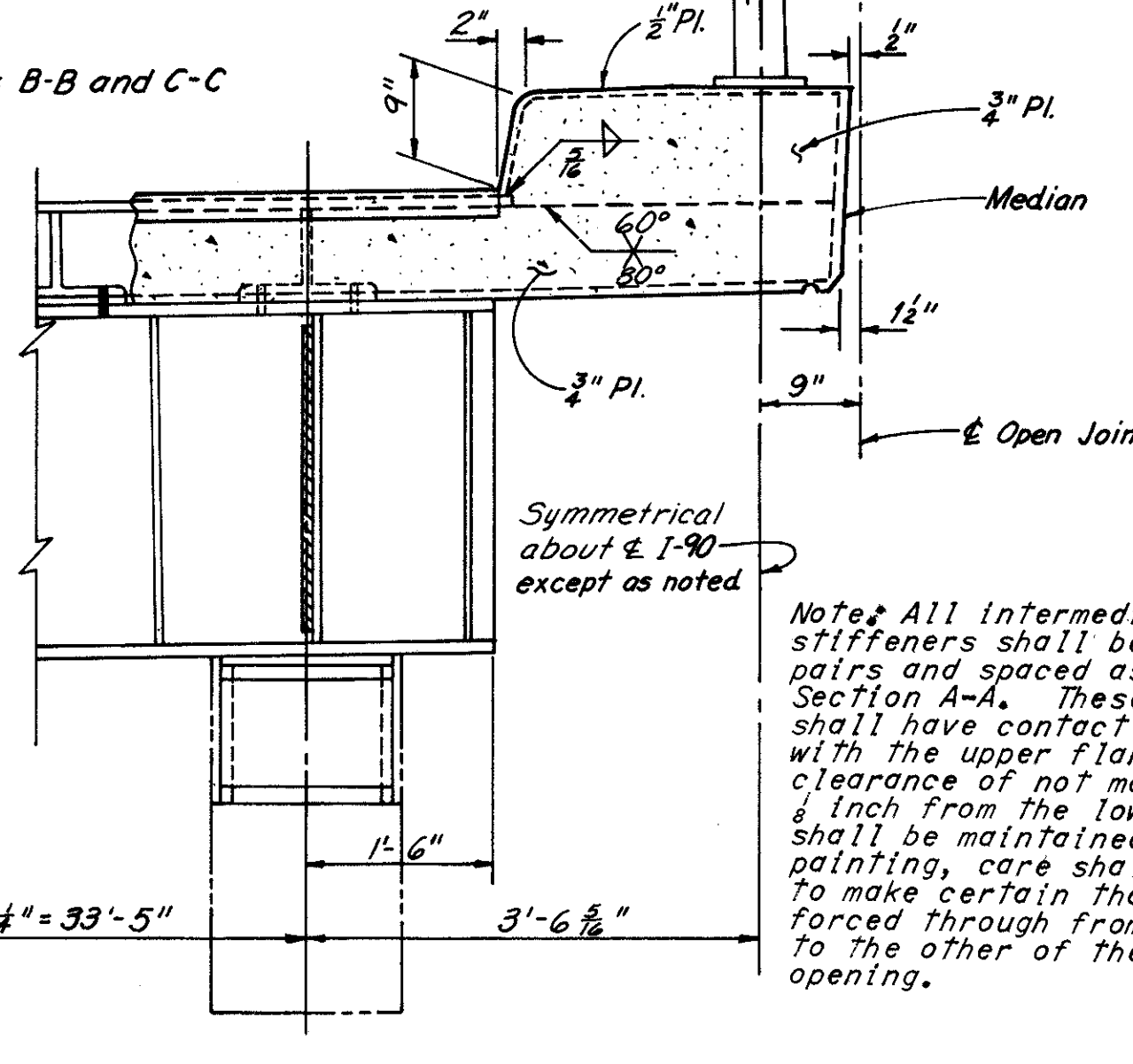
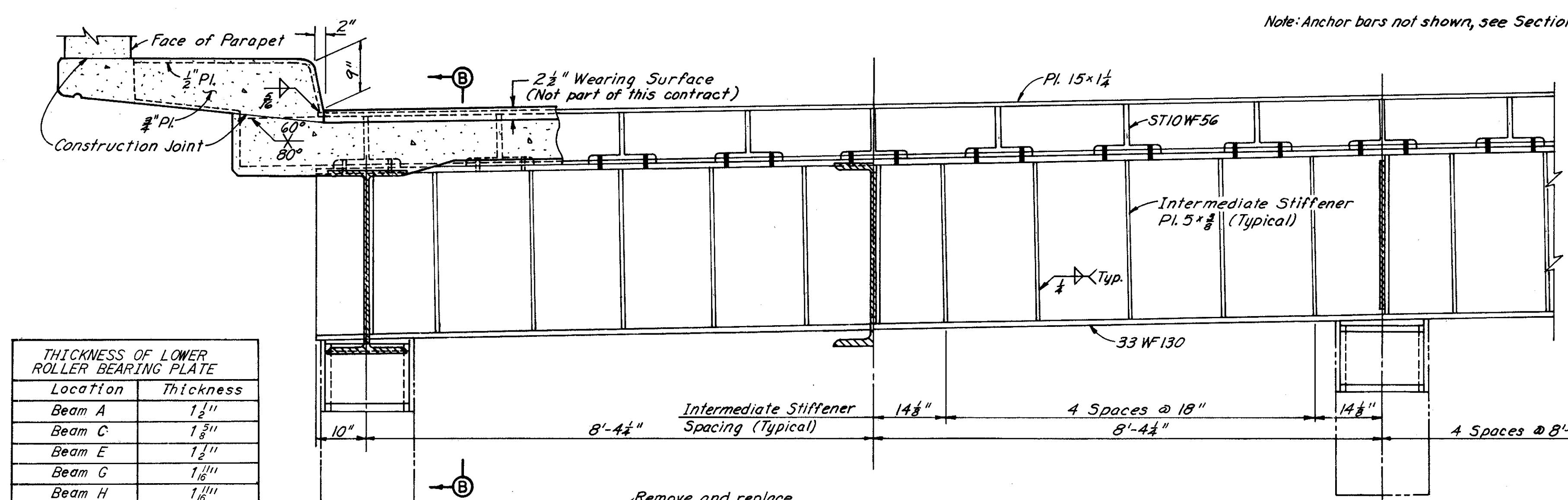
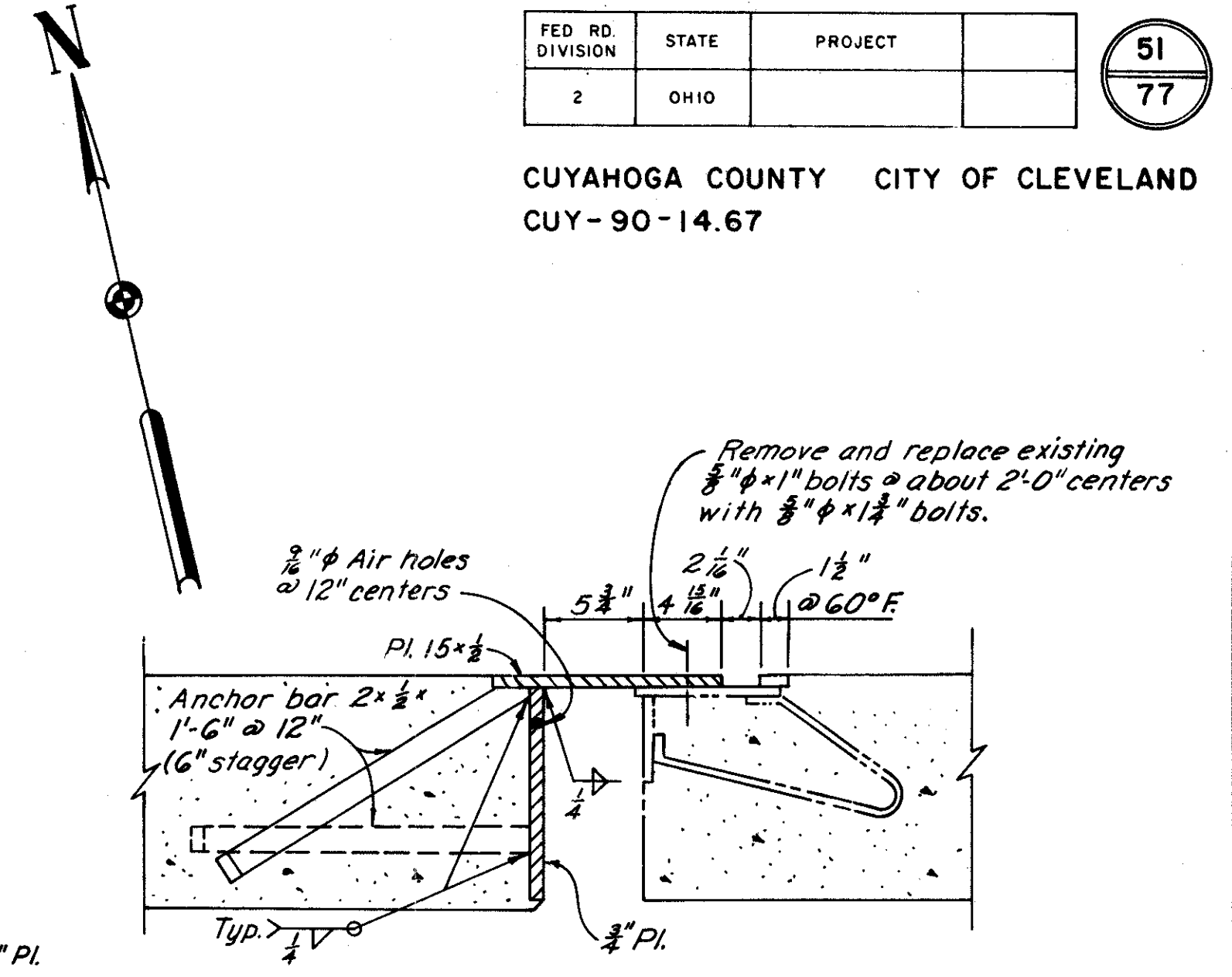
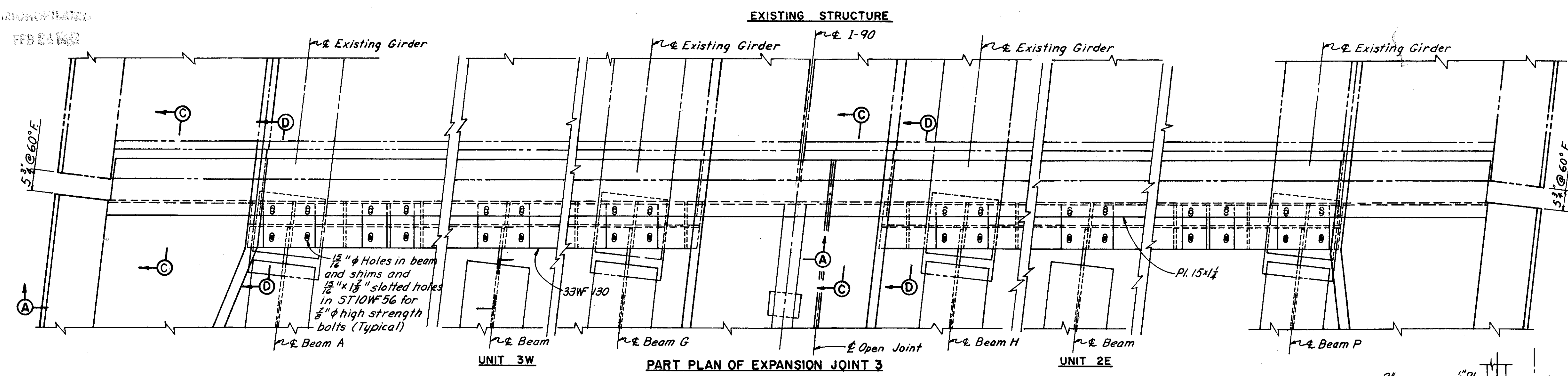
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 9-5-63	DATE	DATE 3-26-64	DATE 4-1-64	

SHEET 50

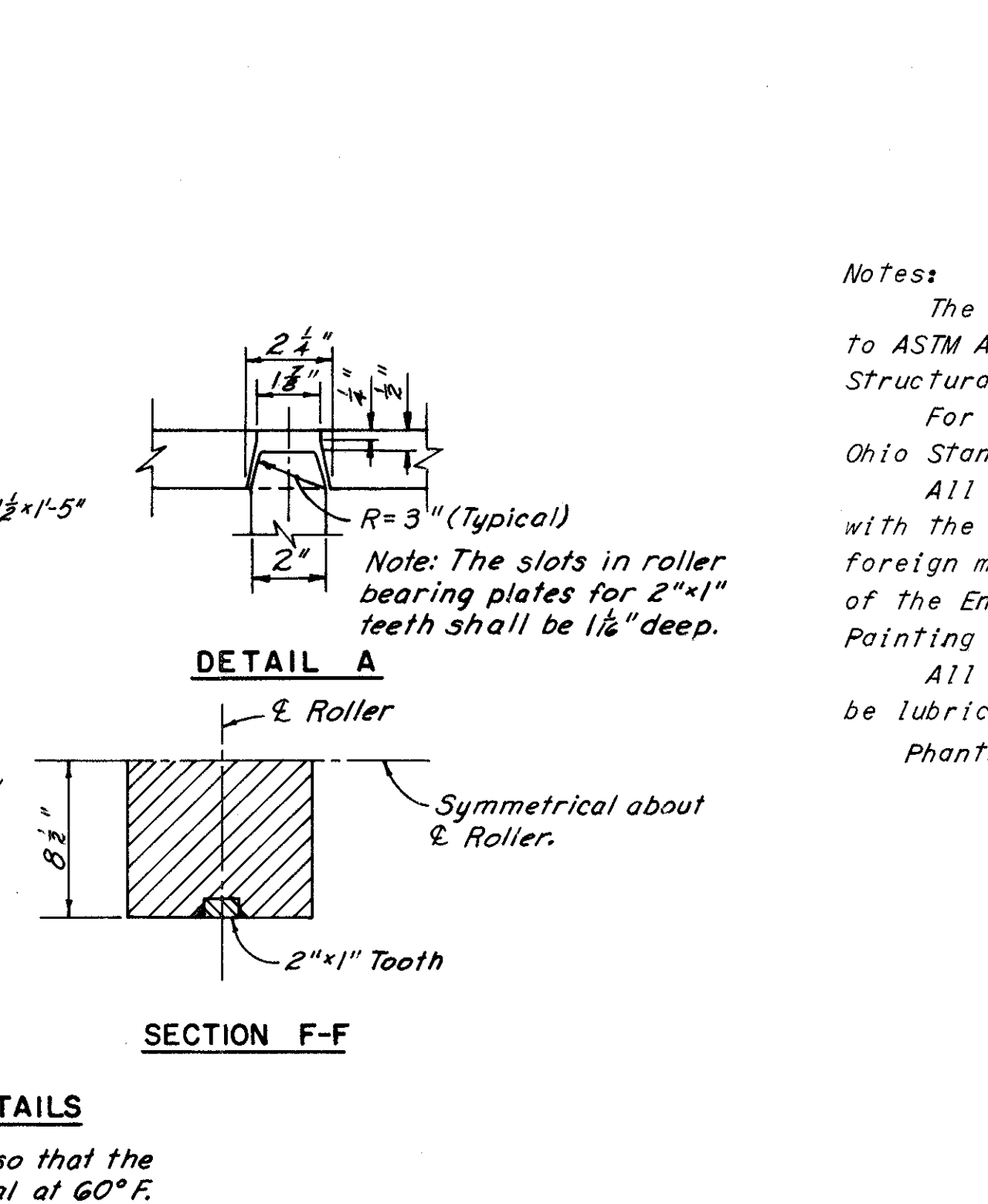
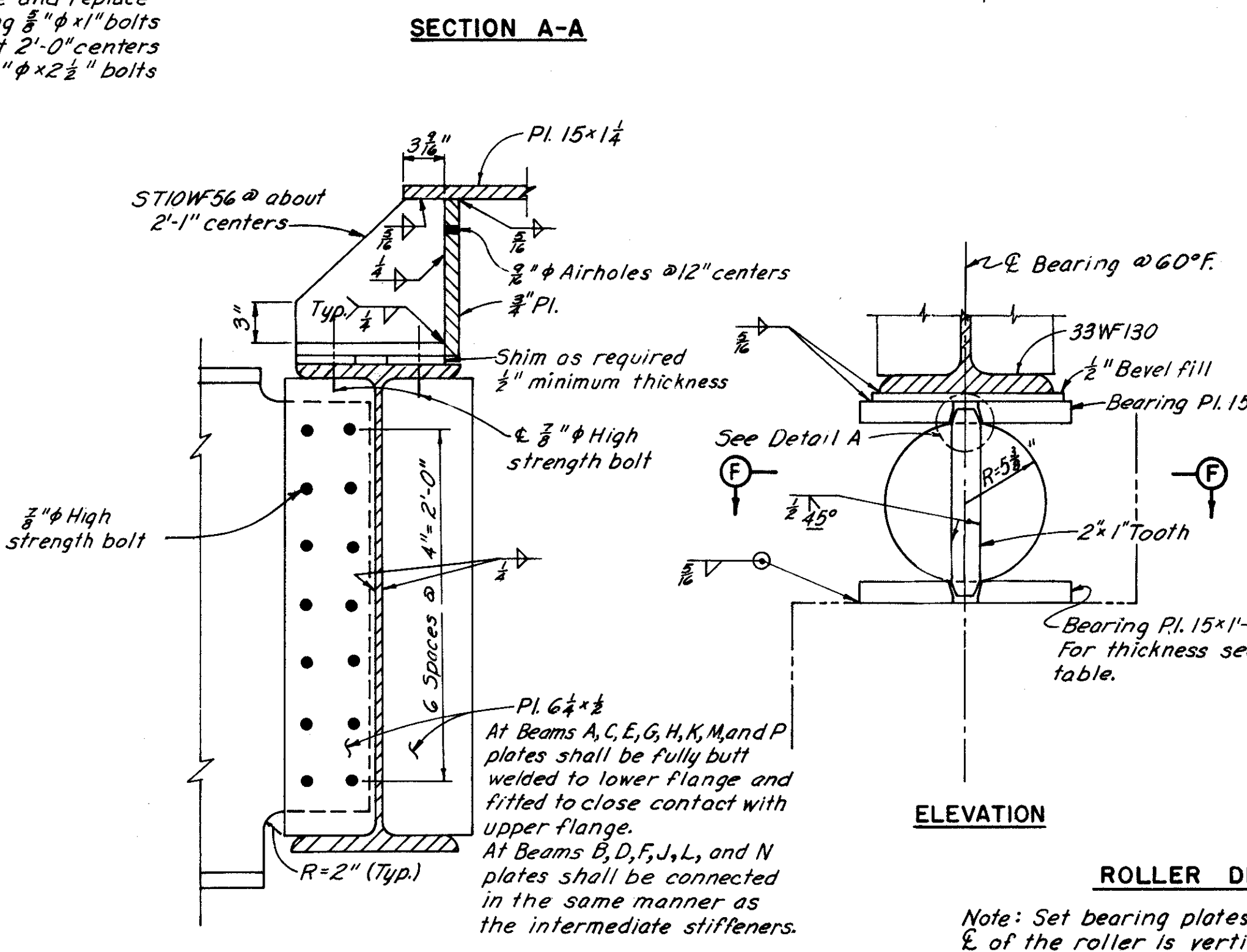
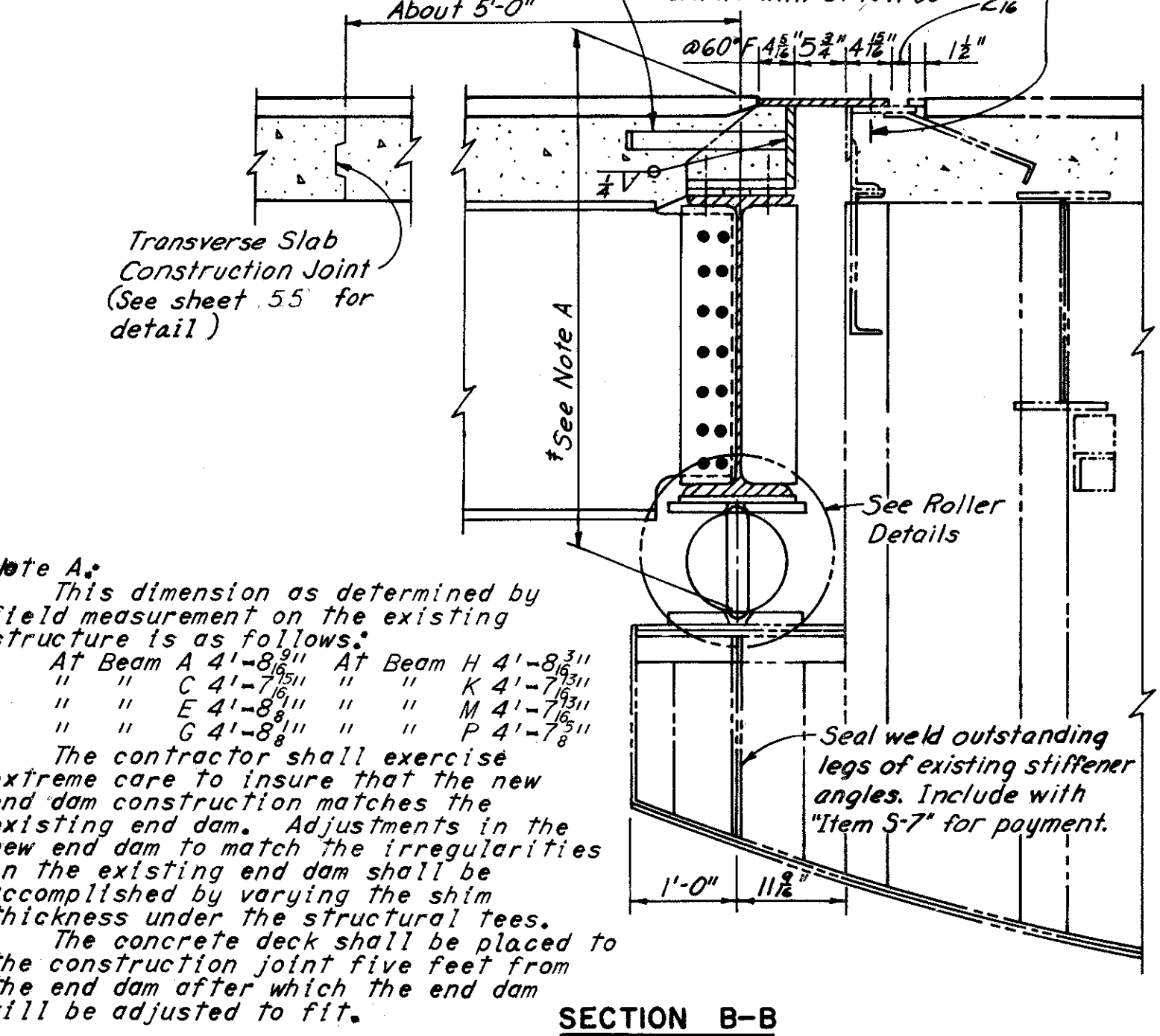
REVISIONS  
FEB 21 1960

FED. RD. DIVISION	STATE	PROJECT	51
2	OHIO		77

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



Location	Thickness
Beam A	1 1/2"
Beam C	1 3/8"
Beam E	1 1/2"
Beam G	1 1/8"
Beam H	1 1/16"
Beam K	1 1/2"
Beam M	1 1/2"
Beam P	1 1/16"



**Notes:**  
The rollers and bearing plates shall be alloy steel forging conforming to ASTM A 237-55, Class B and shall be included for payment with "Item S-7, Structural Steel."  
For details and notes concerning 3/8" bolts and painting see Section A-A, Ohio Standard Drawing SD-1-63, sheet 2 of 4.  
All steel surfaces on existing structure which will have sliding contact with the new structure shall be cleaned of all paint, rust, dirt, and other foreign matter without excessively roughening the surface to the satisfaction of the Engineer. Payment for cleaning shall be included in "Item S-8, Field Painting of Structural Steel."  
All sliding surfaces of expansion joint shall not be painted, but shall be lubricated with flake graphite.  
Phantom lines (---) indicate existing structure.

**\*Note A:**  
This dimension as determined by field measurement on the existing structure is as follows:  
At Beam A 4'-8 3/4" At Beam H 4'-8 3/4"  
" C 4'-7 1/2" " K 4'-7 1/2"  
" E 4'-8 1/2" " M 4'-7 1/2"  
" G 4'-8 1/2" " P 4'-7 1/2"  
The contractor shall exercise extreme care to insure that the new end dam construction matches the existing end dam. Adjustments in the new end dam to match the irregularities in the existing end dam shall be accomplished by varying the shim thickness under the structural tees.  
The concrete deck shall be placed to the construction joint five feet from the end dam after which the end dam will be adjusted to fit.

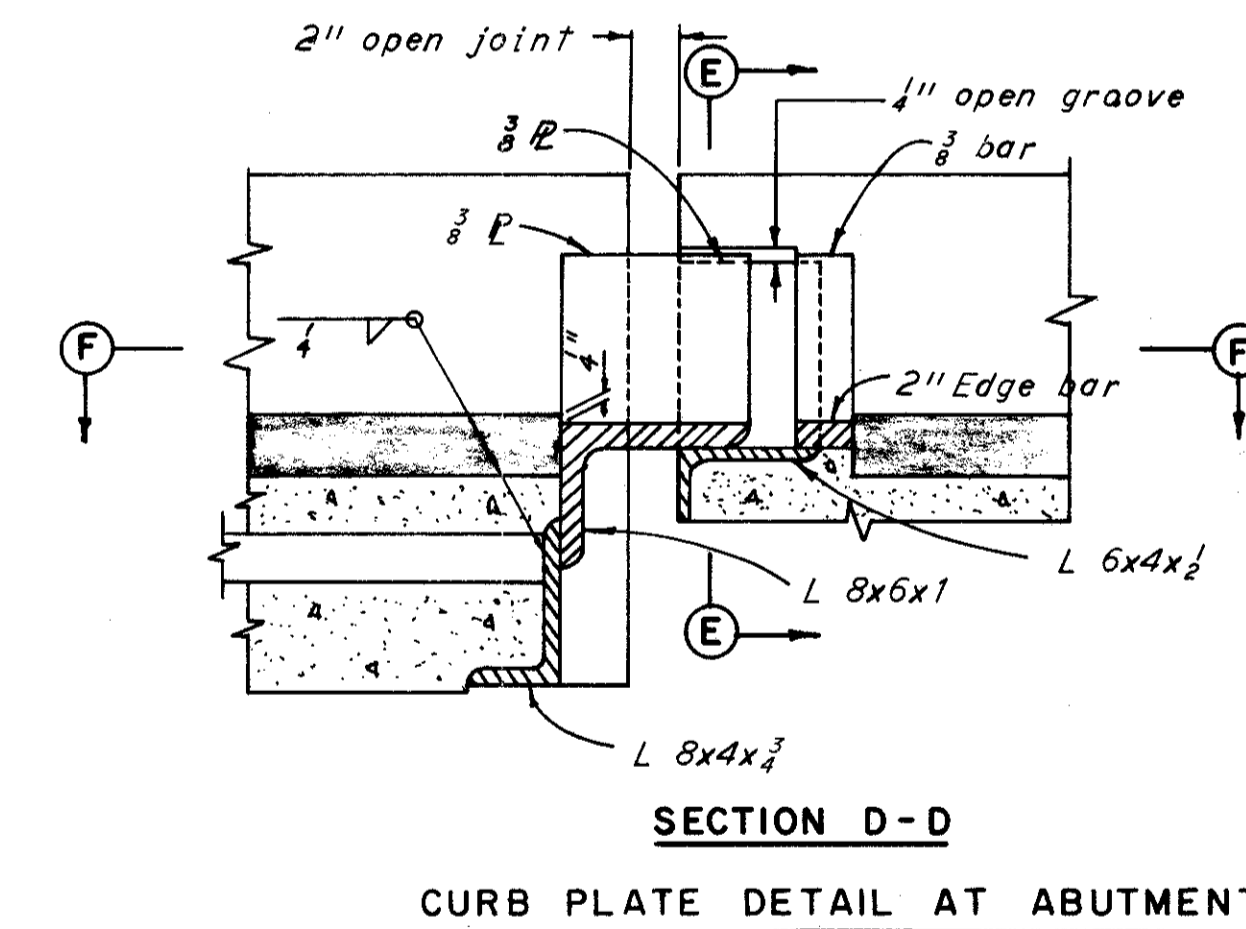
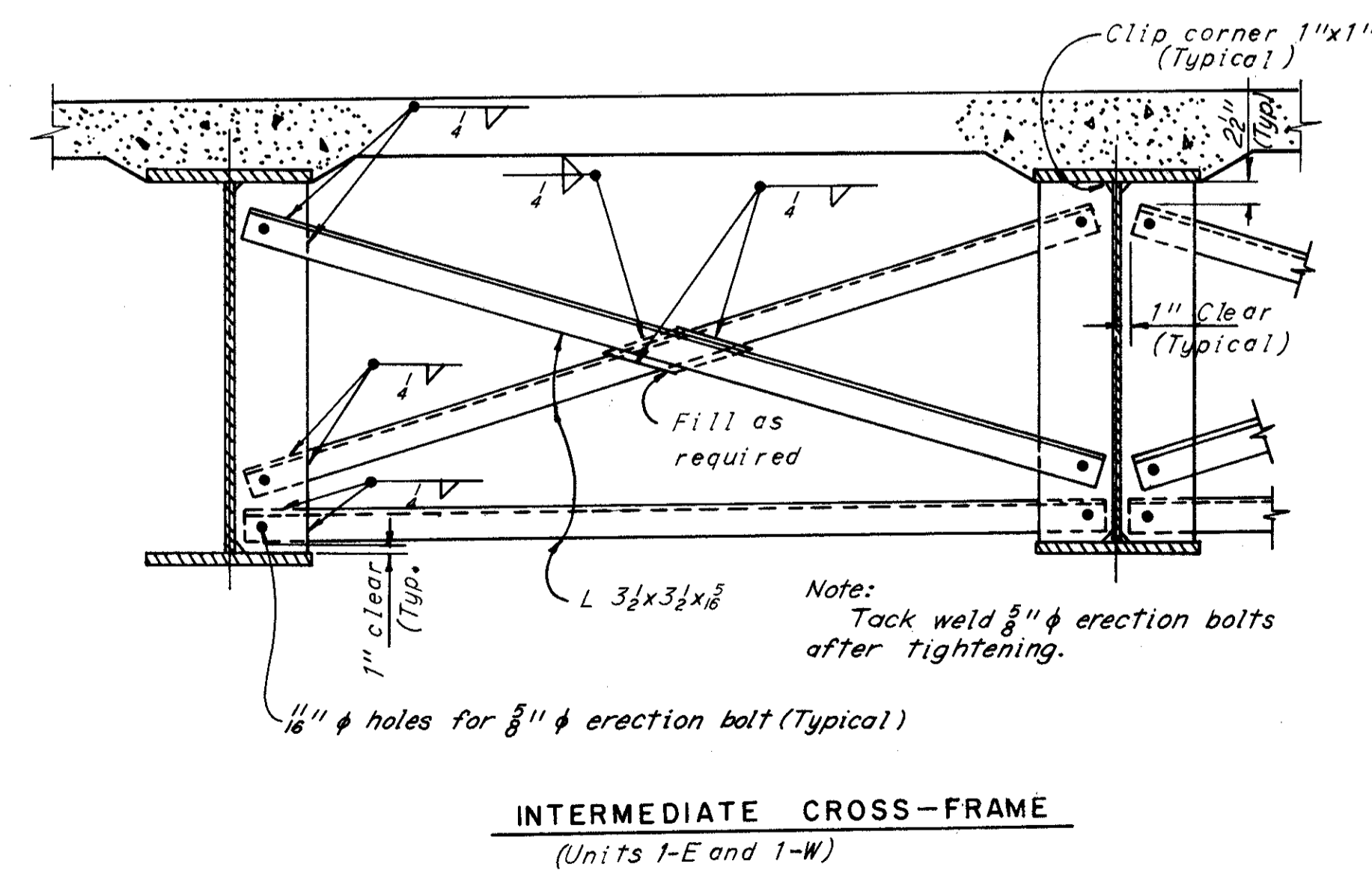
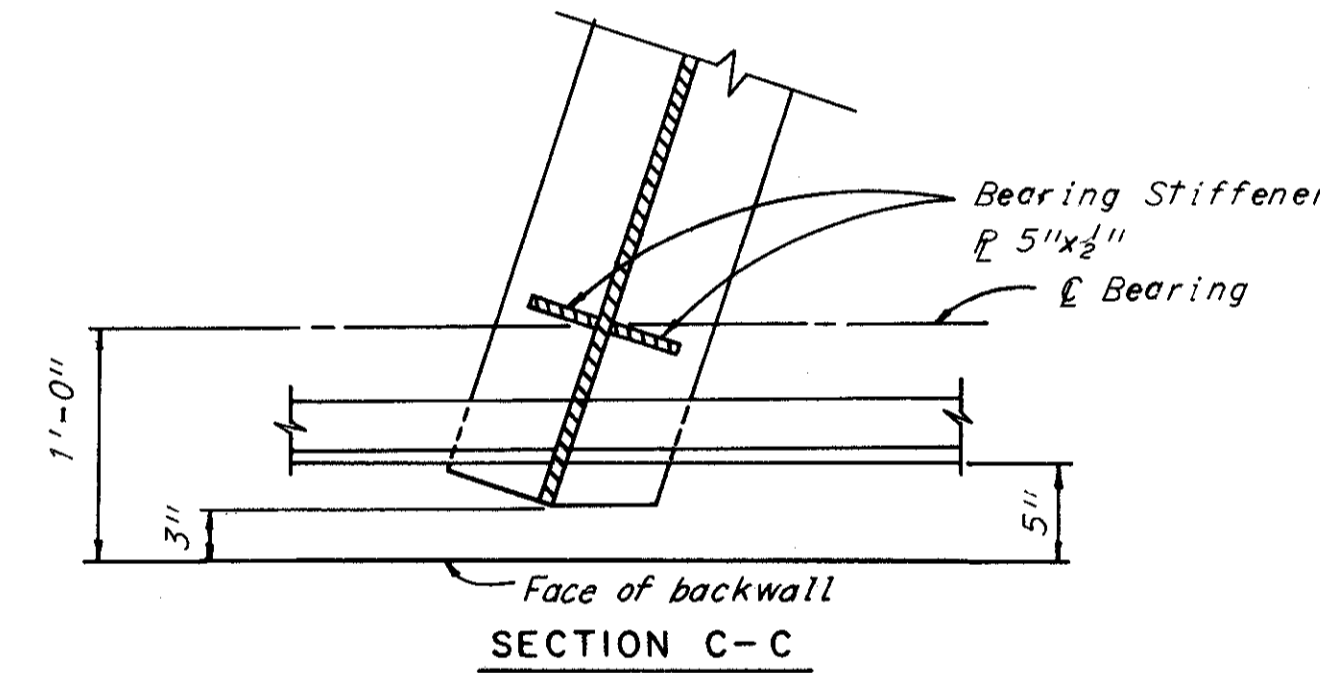
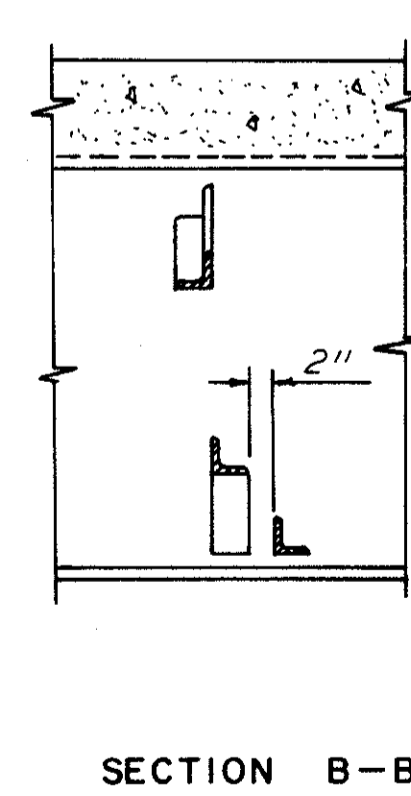
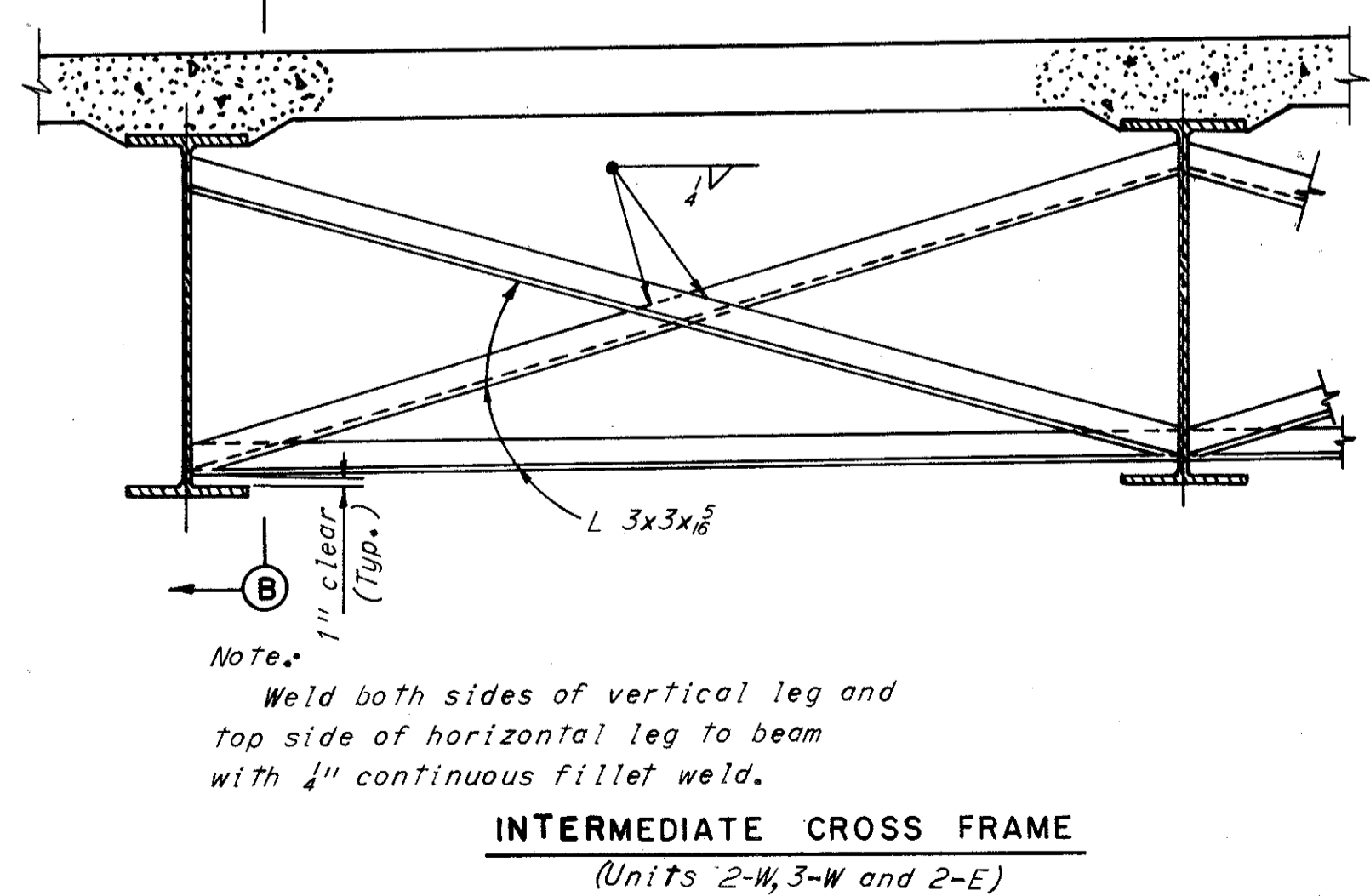
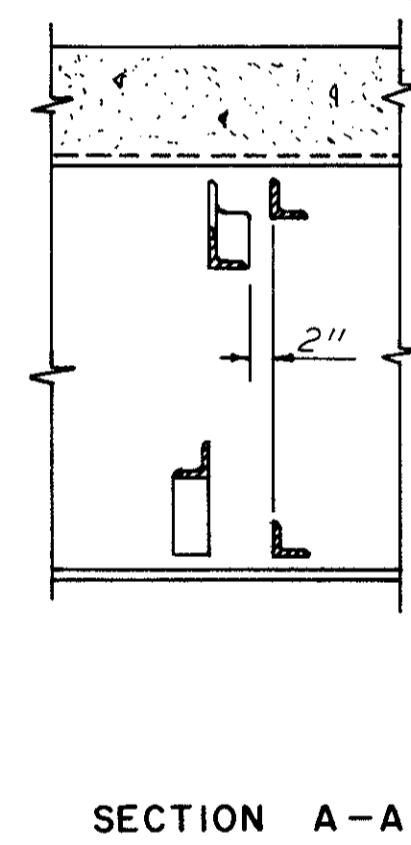
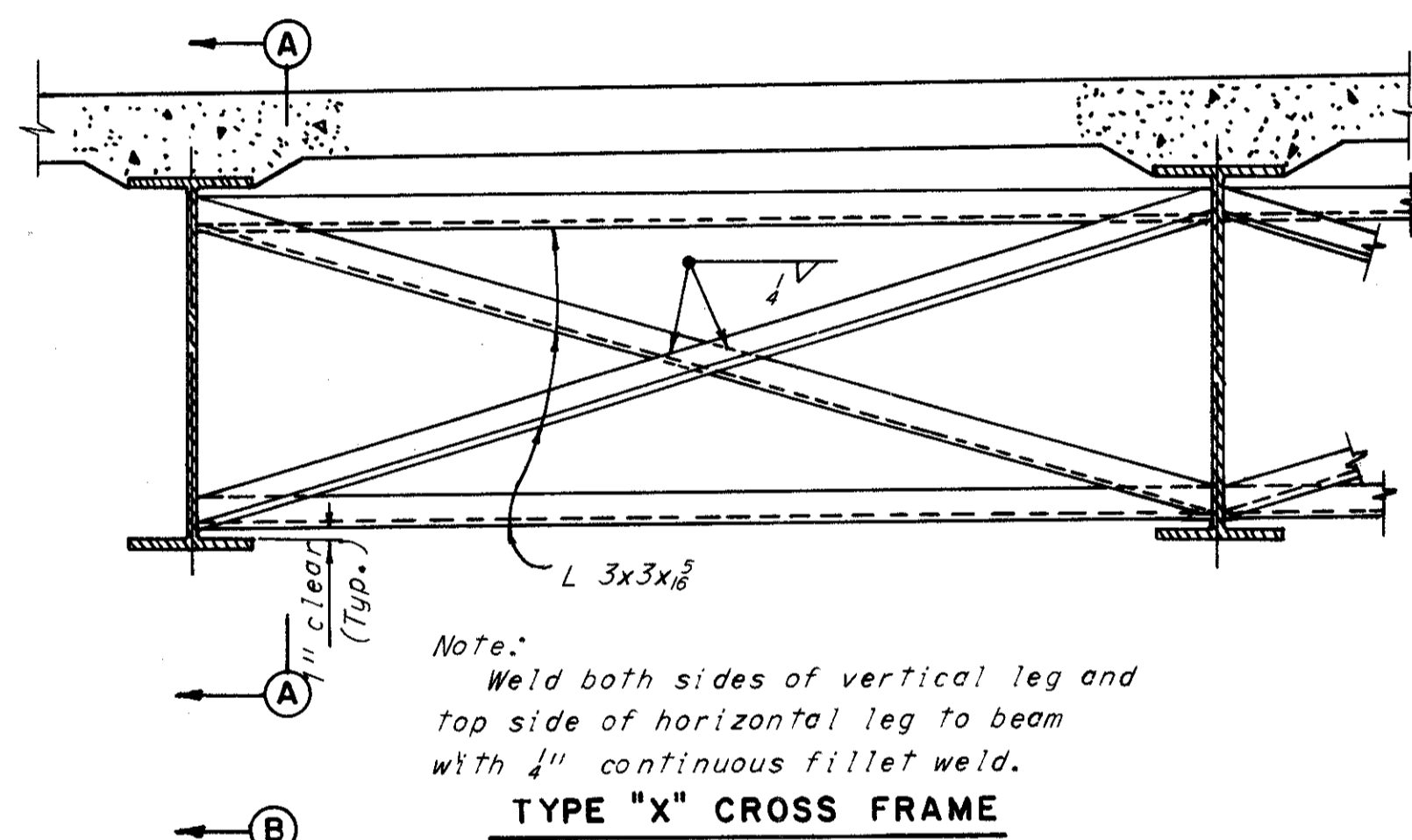
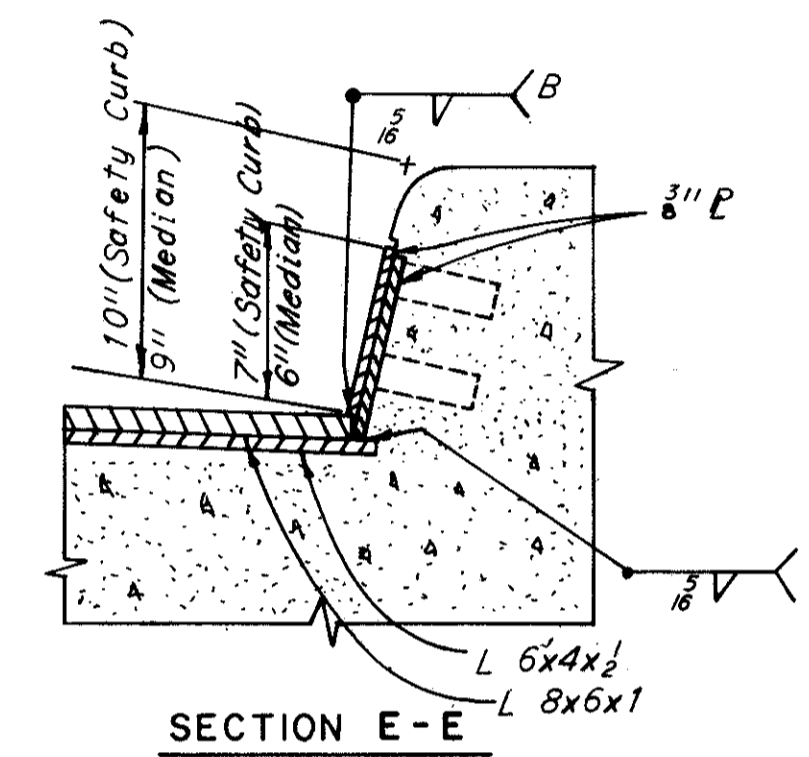
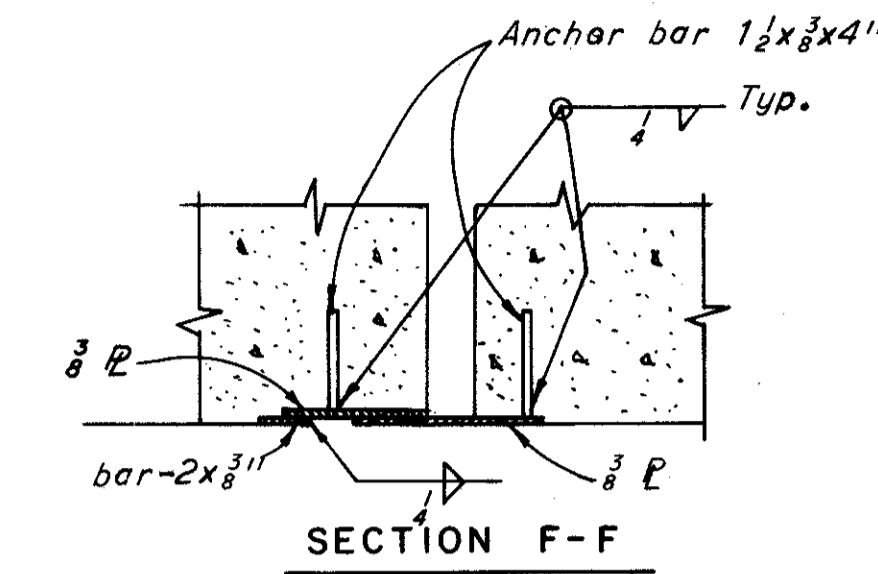
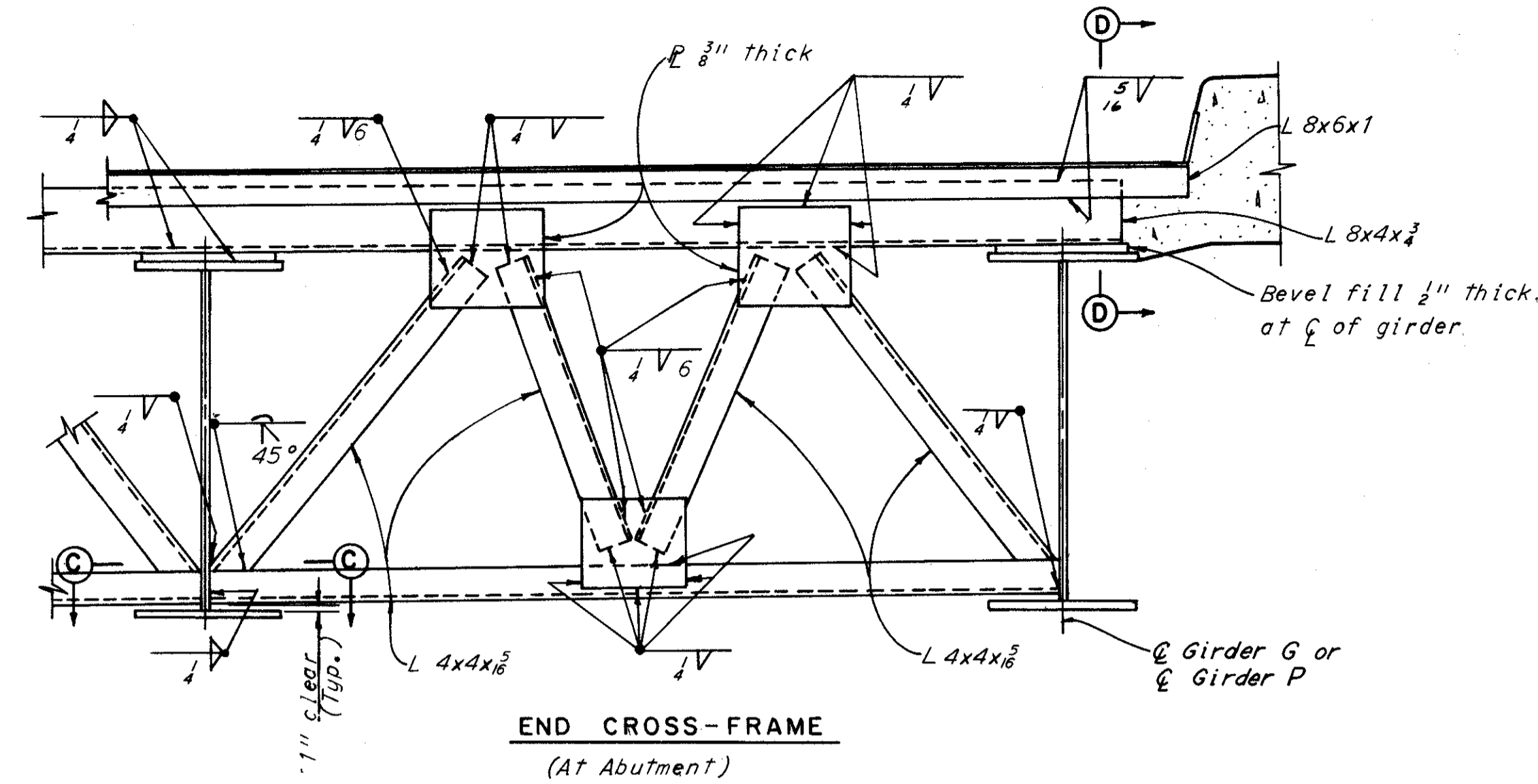
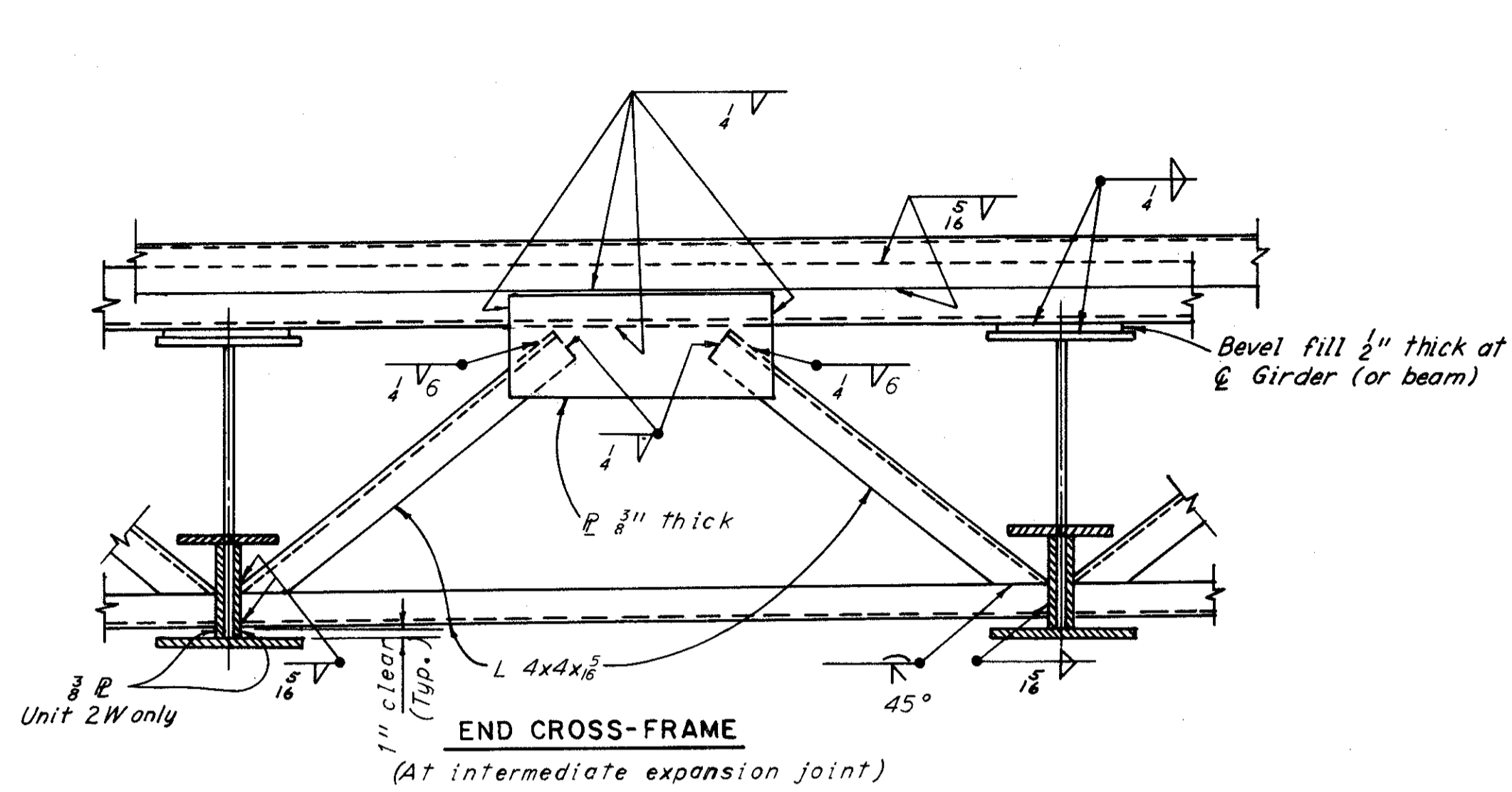
H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**EXPANSION JOINT 3 DETAILS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

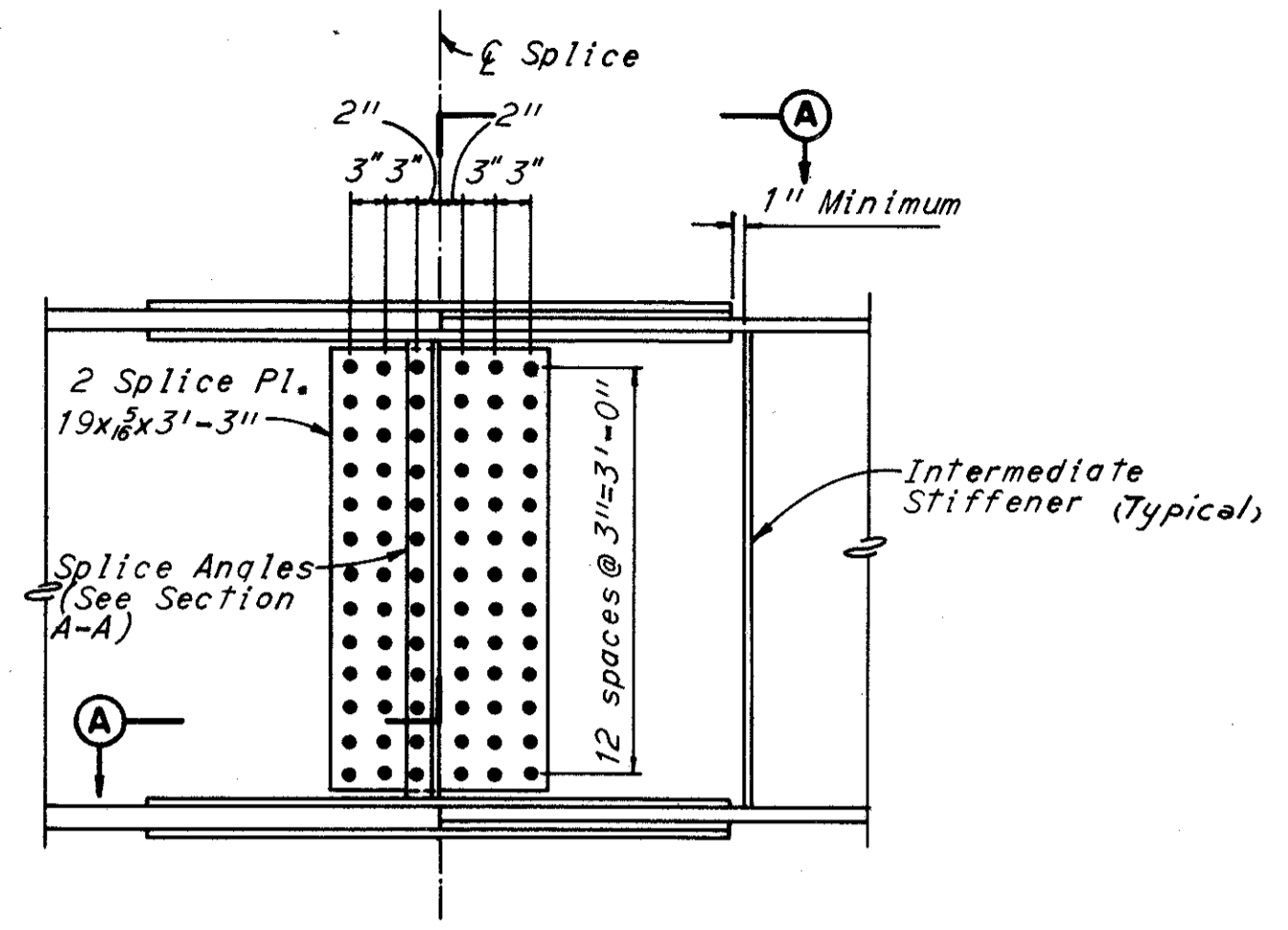
BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN R.S.D. TRACED CHECKED E.C.D. REVIEWED W.J. REWIS  
DATE 9.13.63 DATE 3-26-64 DATE 4-1-64

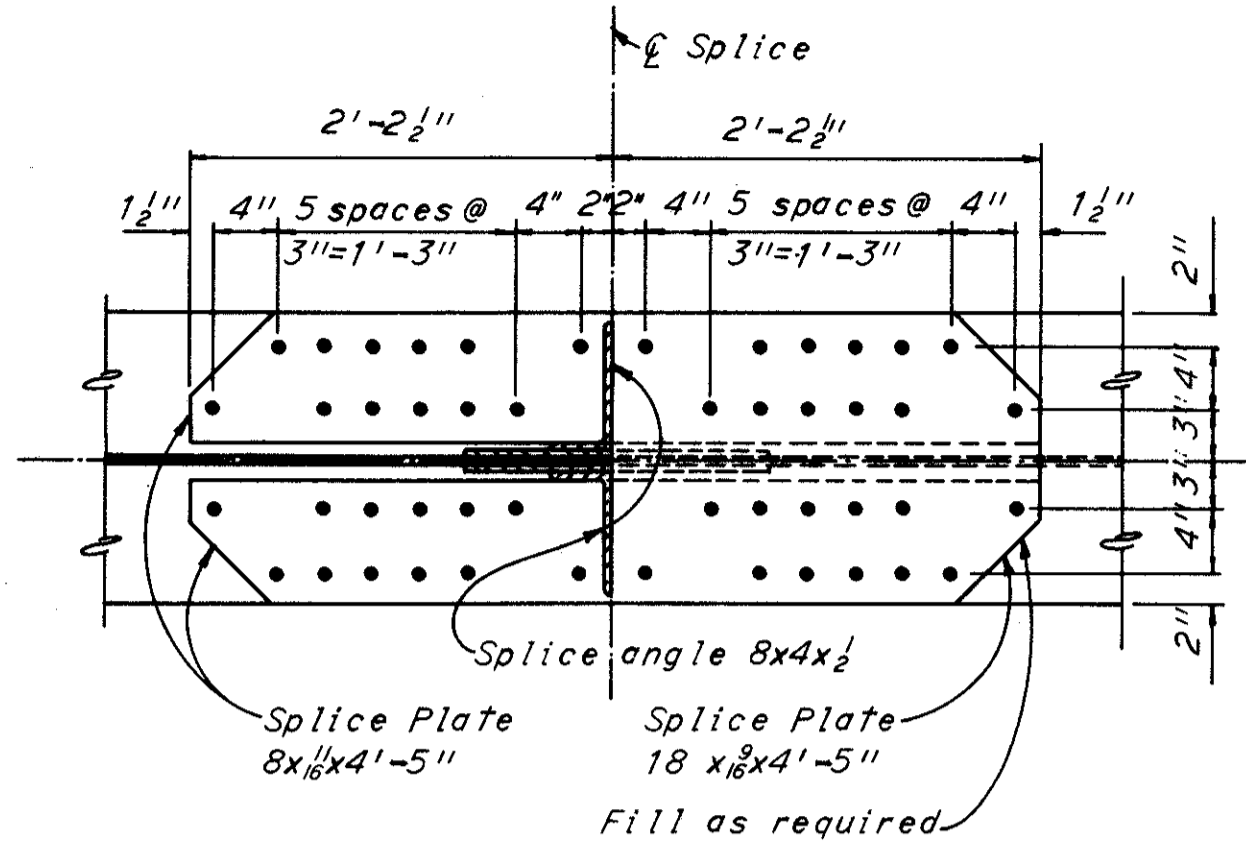
SHEET 51



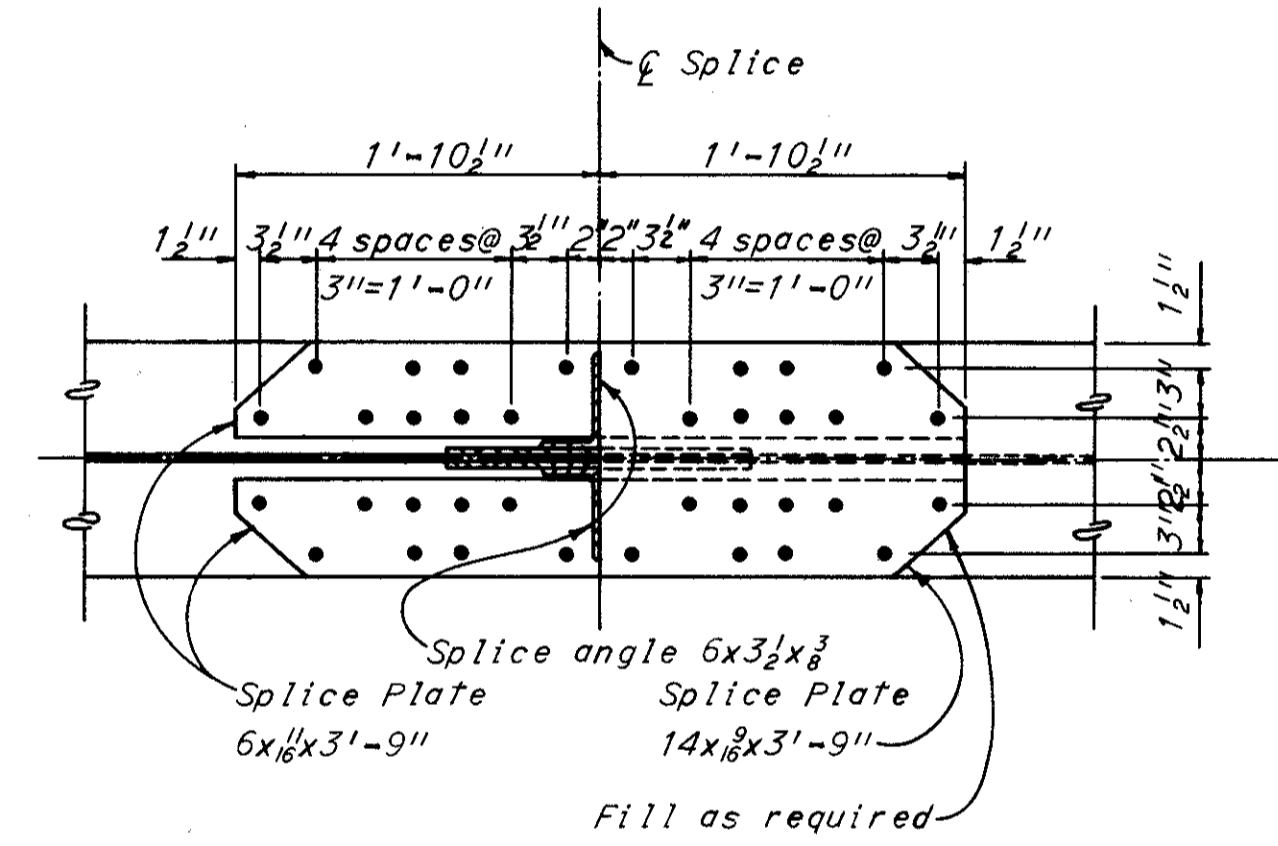
H.N.T.B. BRIDGE NO. 10				
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>CROSS FRAME DETAILS</b>				
I-90 OVER FAIRFIELD AVE., LANE B AND RAMP W-2				
BR. NO. CUY-90-1467		STA. 3 + 87.63		
SCALE: None		STA. 12 + 42.48		
CLEVELAND		CUYAHOGA COUNTY OHIO		
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE JMC	DATE	DATE 3/17/67	DATE 4-1-67	
8-28-67				SHEET 52



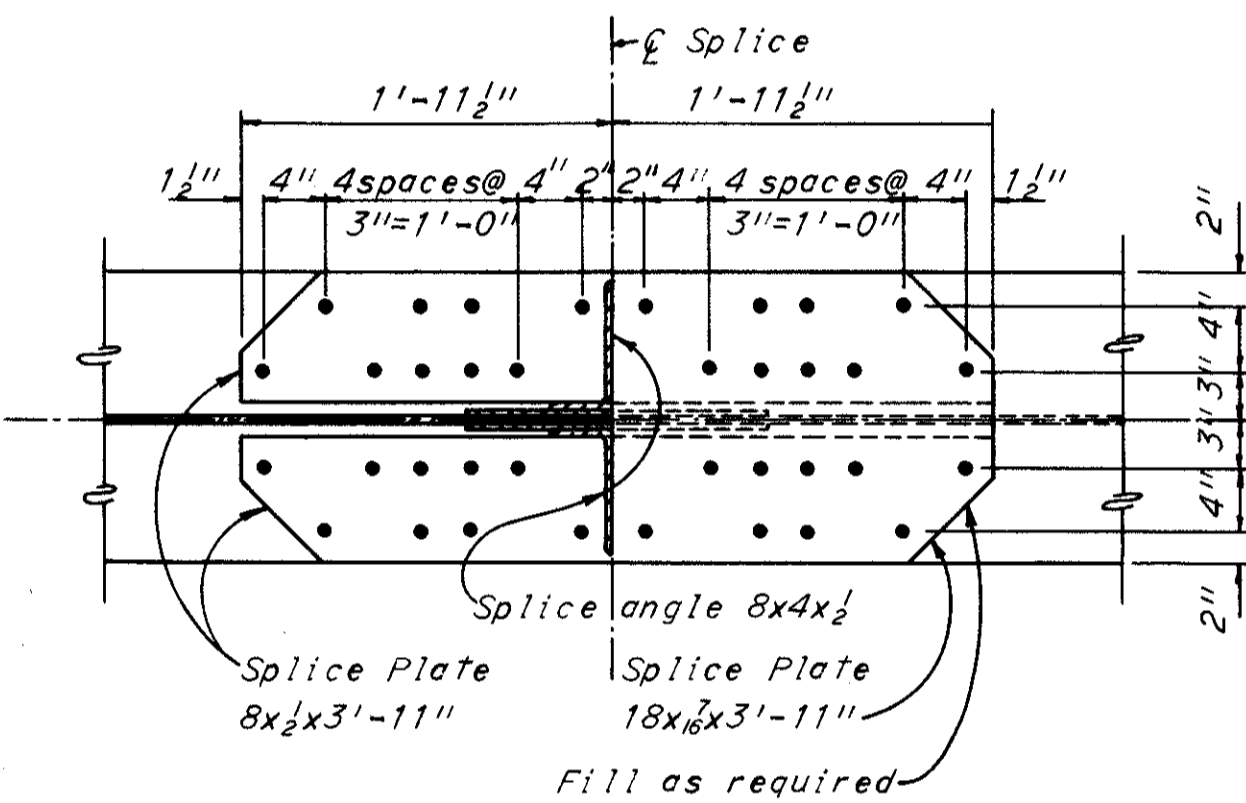
**WEB SPLICE**



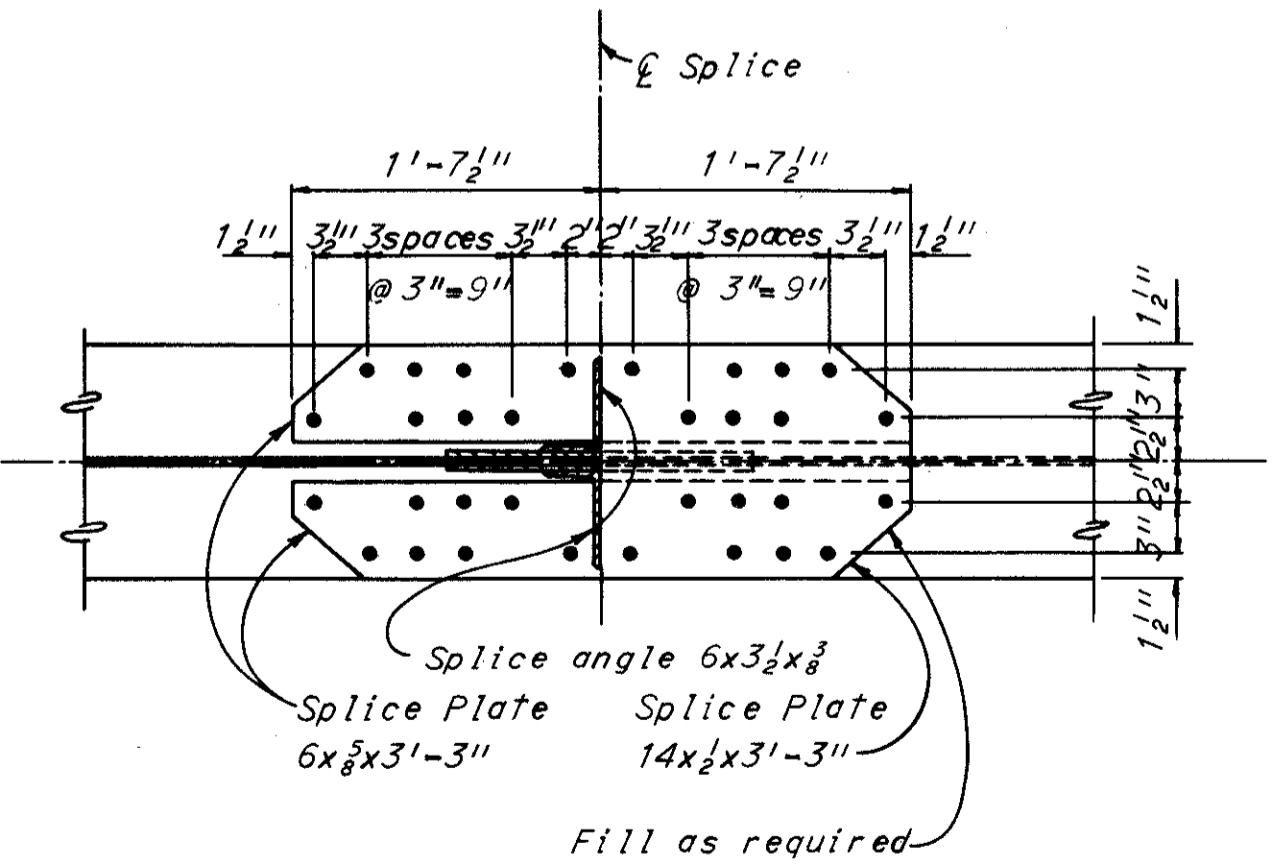
SPLICE 1 GIRDERS H, J, K, L, AND M  
SPLICE 2 GIRDERS H AND J  
SPLICE 5 GIRDERS M, N, AND P



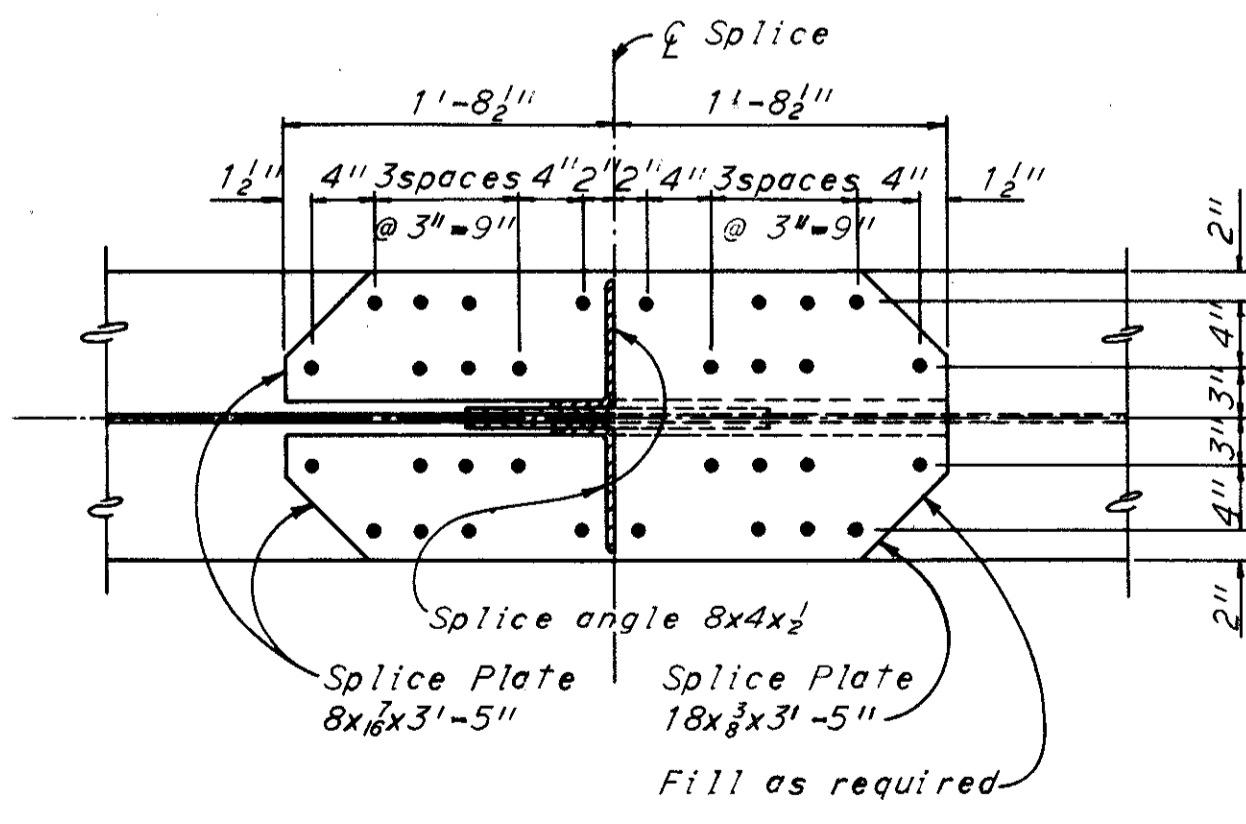
SPLICE 1 GIRDER A AND B  
SPLICE 2 GIRDER A AND B



SPLICE 1 GIRDERS N AND P  
SPLICE 2 GIRDER K  
SPLICE 3 GIRDERS H THRU P  
SPLICE 4 GIRDERS H THRU P  
SPLICE 5 GIRDERS H, J, K, AND L



SPLICE 1 GIRDERS C, D, E, F, AND G  
SPLICE 2 GIRDERS C, D, E, F, AND G



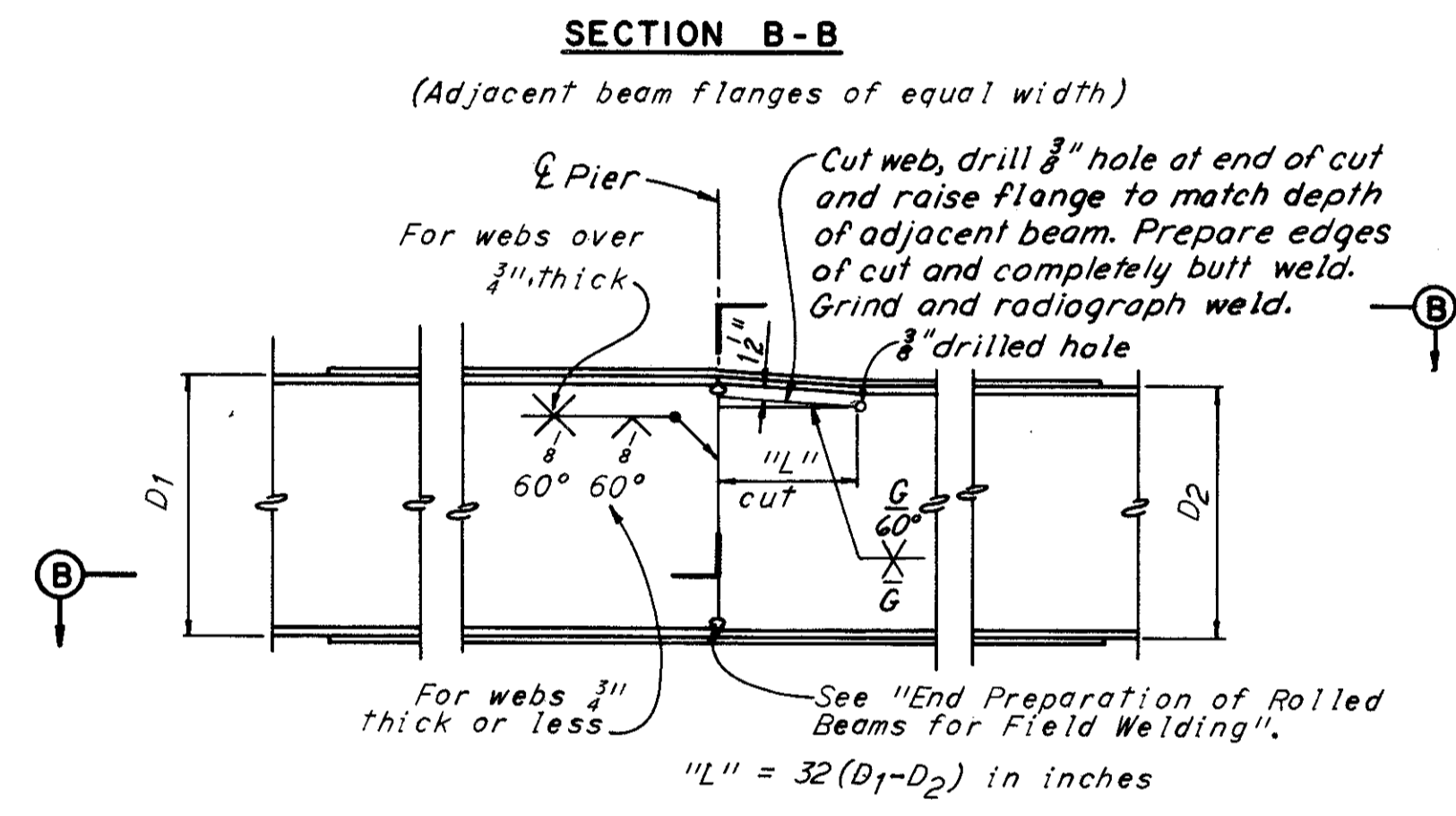
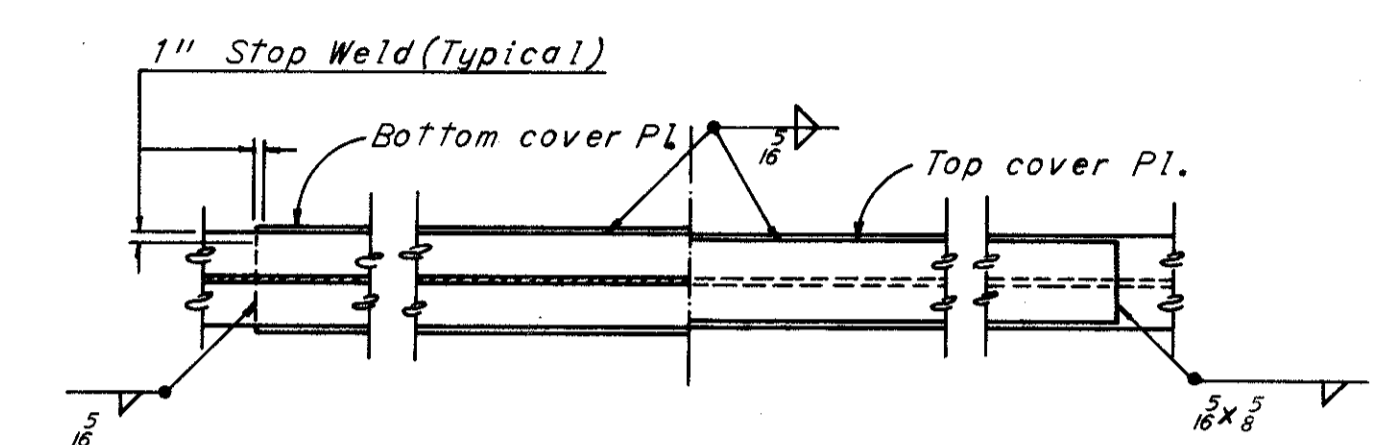
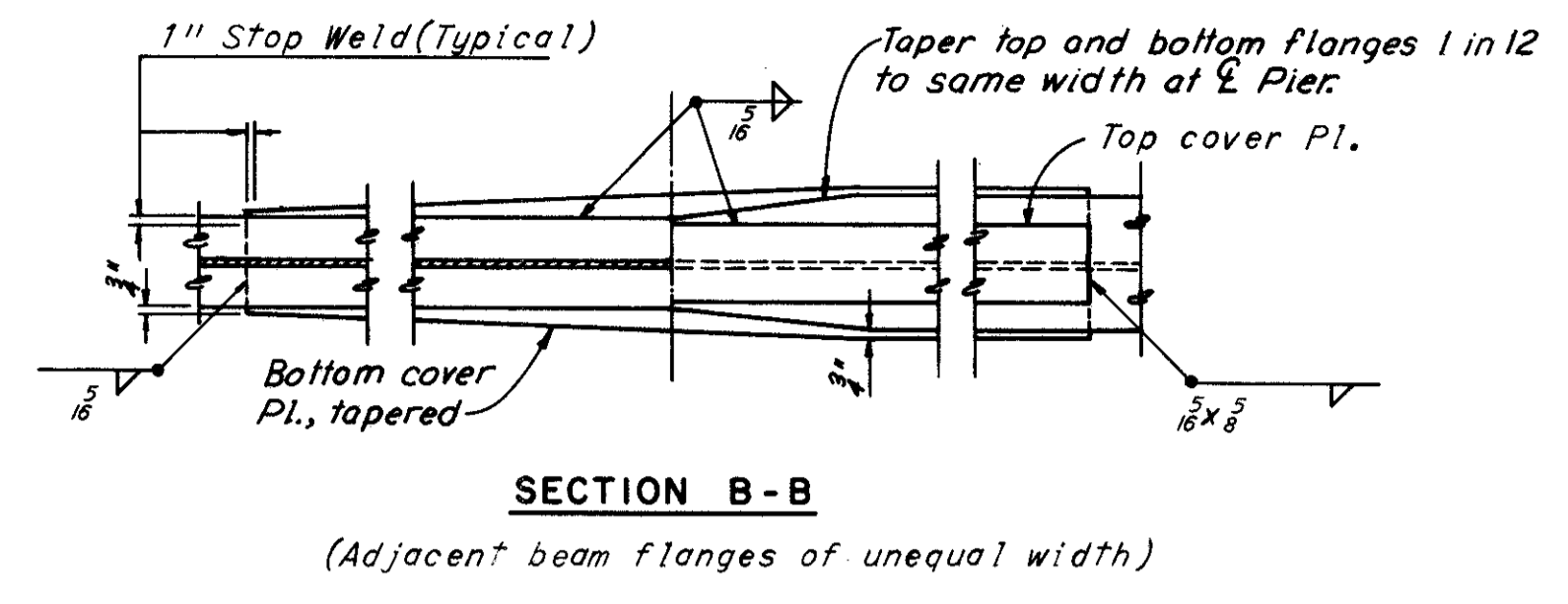
SPLICE 2 GIRDERS L, M, N, AND P

**SECTION A-A  
FLANGE SPLICES**

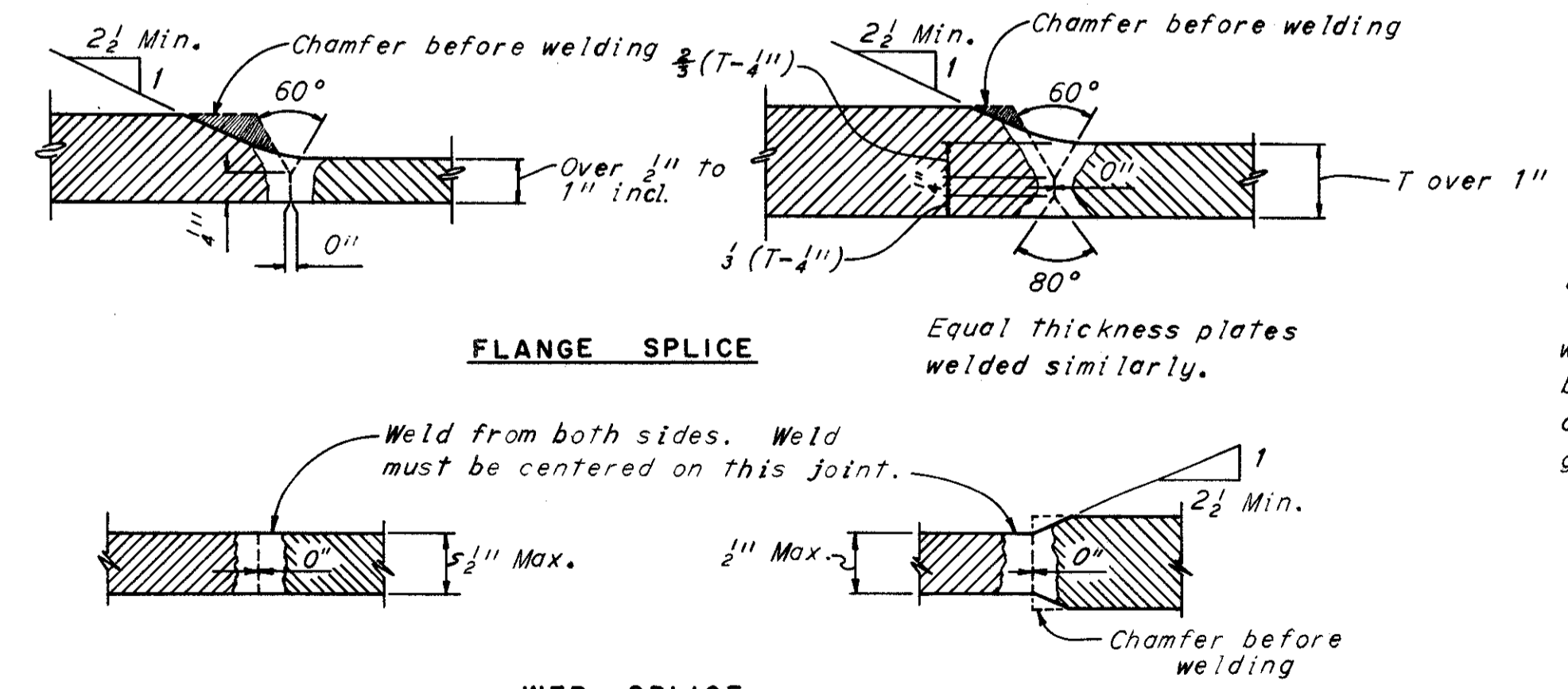
**GIRDER FIELD SPLICE DETAILS**

3-710, High Strength Bolts, Nuts and Washers, paragraph 1st sentence of the fourth paragraph with the following: "Bolt lengths determined by the use of Table 1 shall be adjusted to the next 1/4-inch length increment."

3-710, High Strength Steel Bolts Nuts and Washers, paragraph 2nd shall be completely revised to read as follows: "In the final assembly of the parts to be bolted, drift pins shall be placed in the outer corner of holes, but not less than 25 per cent for field erection, to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact. Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts, tightened in the same manner."

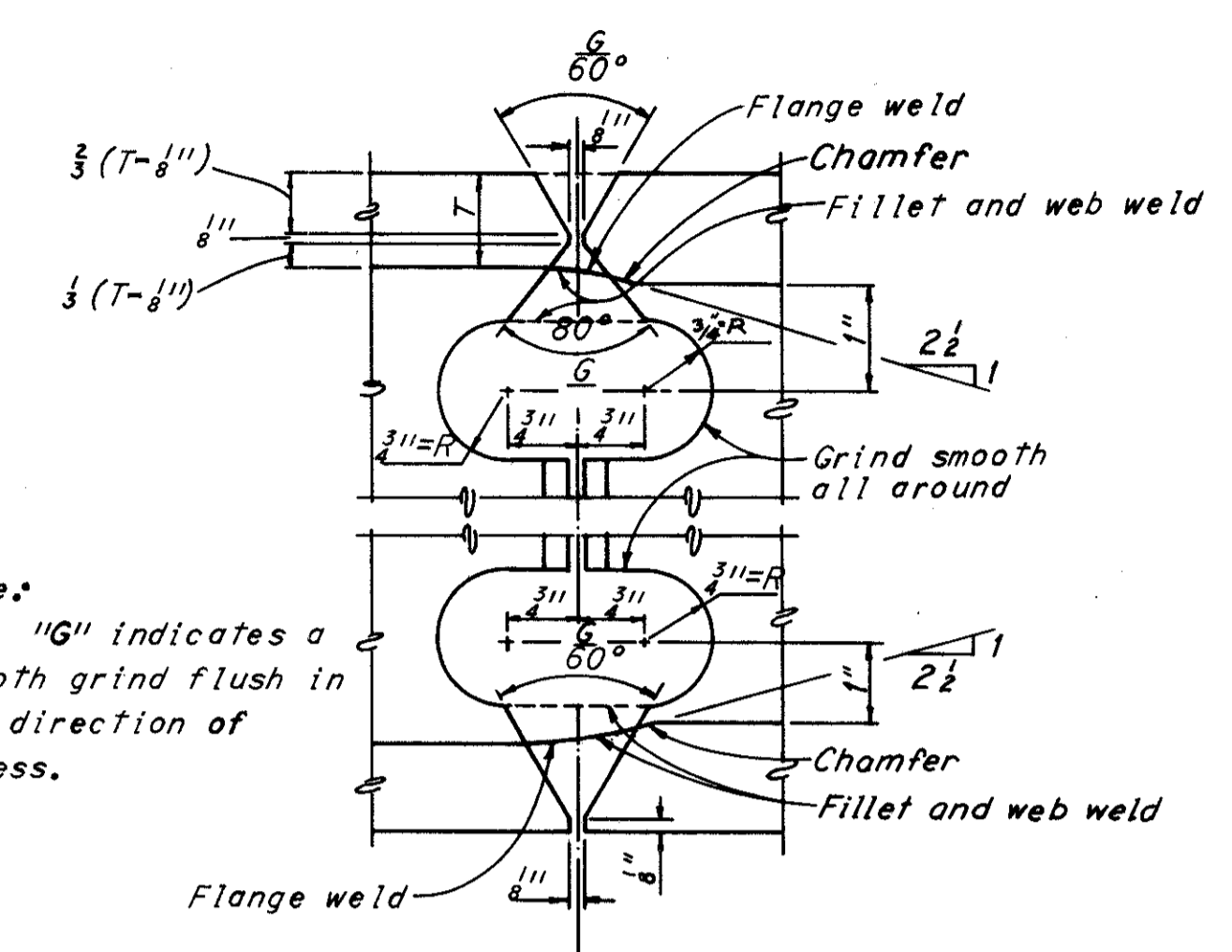


**BEAM SPLICE DETAILS**  
Note: Web cut is not required in the smaller depth beam where the difference in D<sub>1</sub> and D<sub>2</sub> is 1/4" or less.



All the above full penetration welds shall be back-gauged and welded after welding far side. Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

**GIRDER SHOP WELDING DETAILS**



Note: "G" indicates a smooth grind flush in the direction of stress.

**END PREPARATION OF ROLLED BEAMS FOR FIELD WELDING**

**BEAM SPLICE WELDING PROCEDURE**

1. With beams in welding position, butt-weld the beam flanges and web, using the following sequence: make one pass on each flange, then two on the web; repeat, using one pass at each location, until welds are completed.
2. Weld the top and bottom cover plates.

Note: All girder field splices shall be made with 3/4" high strength bolts. The bolts shall be placed with their heads on the outside face of exterior girders and on the bottom of all girder flanges.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

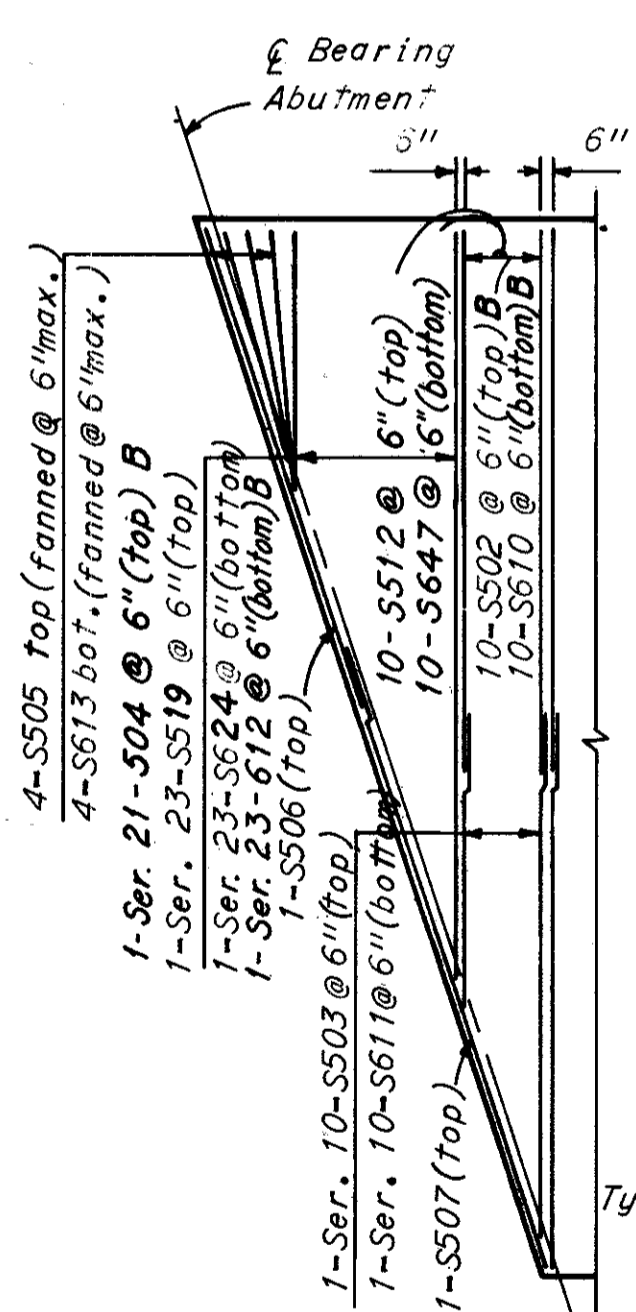
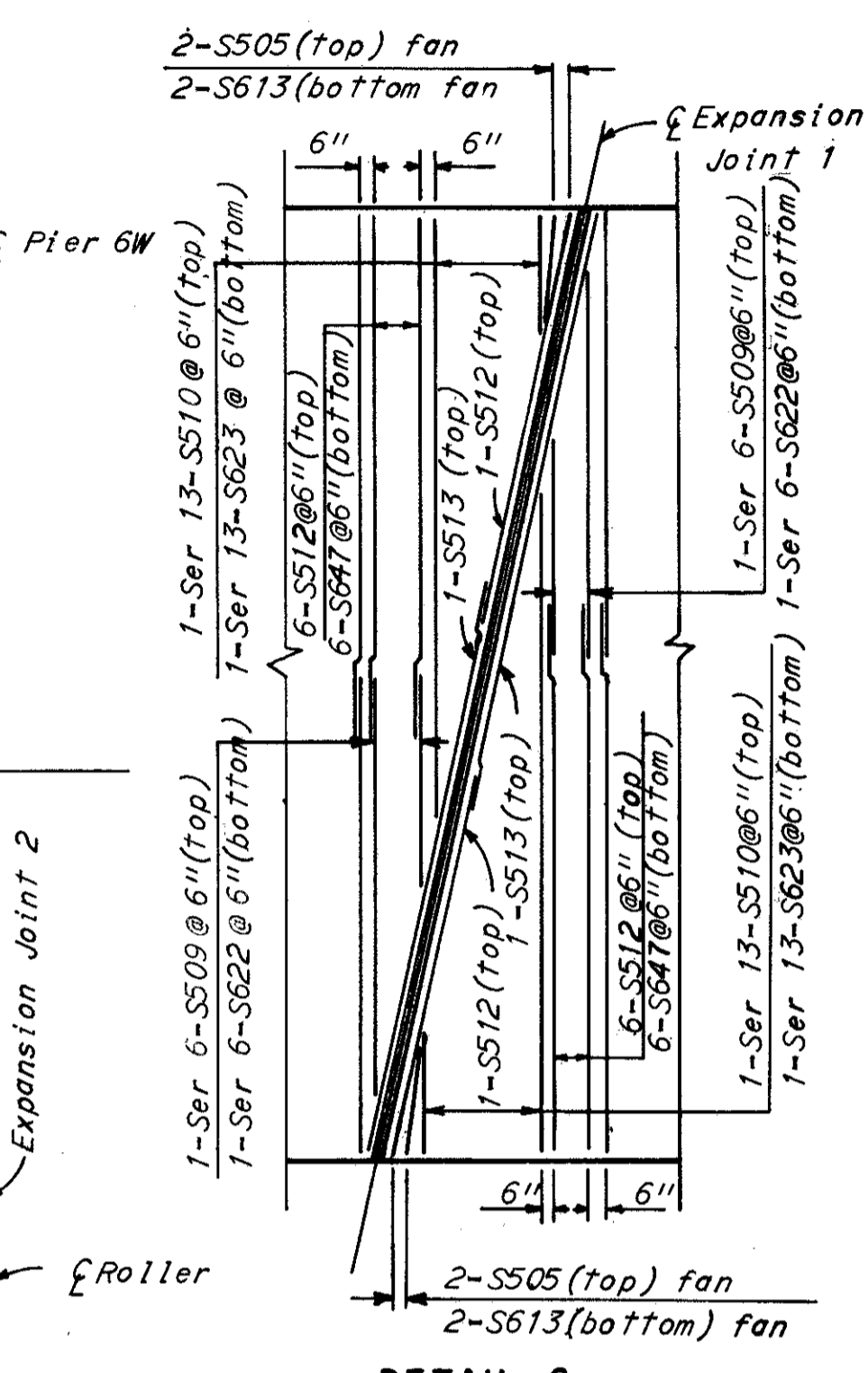
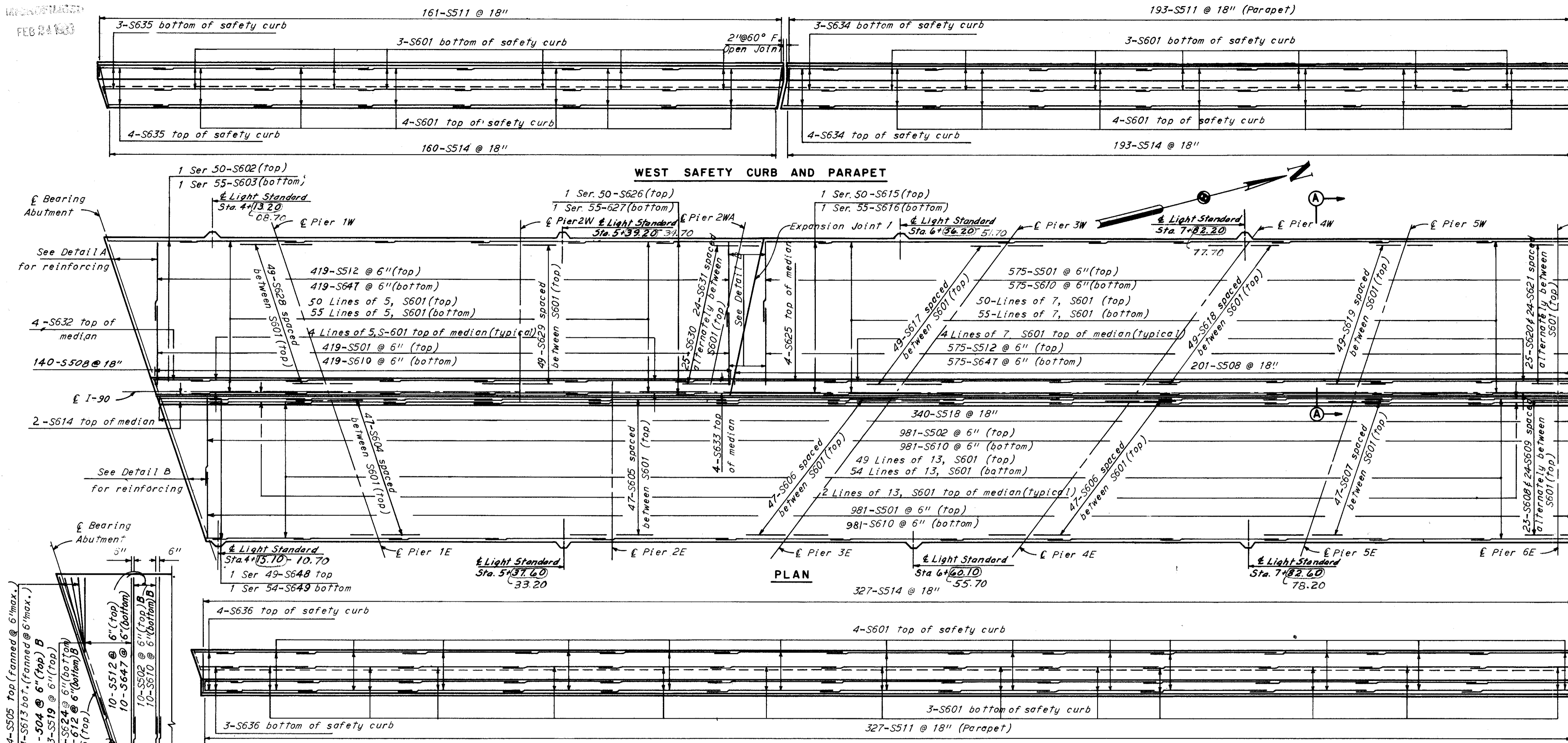
**BEAM AND GIRDER SPLICE DETAILS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

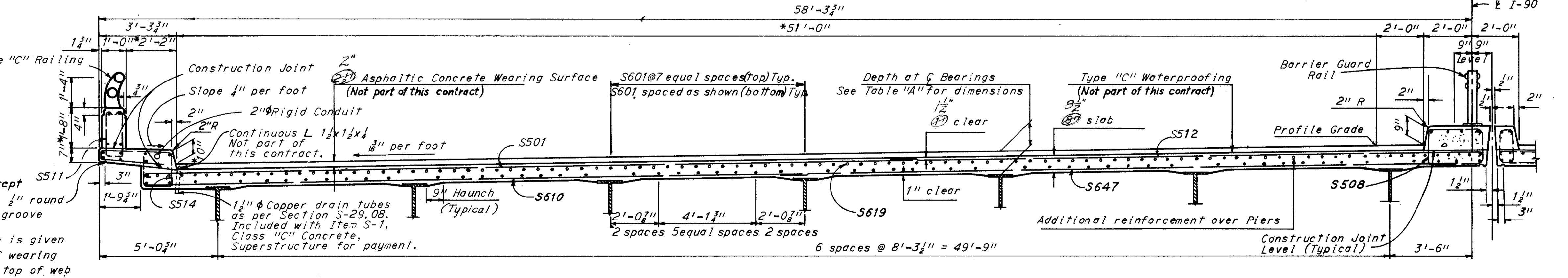
DRAWN: C.H.B. TRACED CHECKED: R.S.D. REVIEWED: W.A. REVISOR  
DATE: 8-27-63 DATE: 3-31-69 DATE: 4-1-64 SHEET 53

UNAPPROVED  
FEB 24 1963

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



Note: Top of parapet shall be chamfered 1/2", both sides.



Parapet, safety curb, and longitudinal reinforcement in slab not shown.

**NOTES:** For Reinforcement Schedule and Bending Diagrams see sheet 5B.

For railing post and parapet joint spacing and longitudinal reinforcement in the parapet see sheet 57.

For additional details of railing see Ohio Standard Drawing AR-1-57.

For optional transverse slab construction joint, see sheet 55.

For details of intermediate expansion joints, see sheets 49 and 50.

Top and bottom indicates reinforcing location within the slab.

For placement of additional bars over piers, see sheet 55.

For safety curb and median plate details at the abutment, see sheet 52.

For light standard support details see sheet 55.

**TABLE "A"**

Unit	Depth
1W	13"
2W	12"*
3W	11 3/4"
1E	13"
2E	11 3/4"

NOTE: Depth is given from top of wearing surface to top of web for girders and from top of wearing surface to top of flange for beams.

\* Dimension is 11 3/4" at piers 3W and 4W.

\* Dimension varies in transition area adjacent to existing structure. For details see sheet T 59

**NOTE.** The deck slab adjacent to the top of the steel beams or girders which is shown as 9" wide may vary from this dimension with a minimum of 6" and a maximum of 12". Maximum slope of the haunch shall be 1 vertical to 4 horizontal. Payment for the deck slab concrete shall be based on the 9" width.

H.N.T.B. BRIDGE NO. 10

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

**UNITS 1W, 1E, AND 2W  
DECK REINFORCEMENT  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2**

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

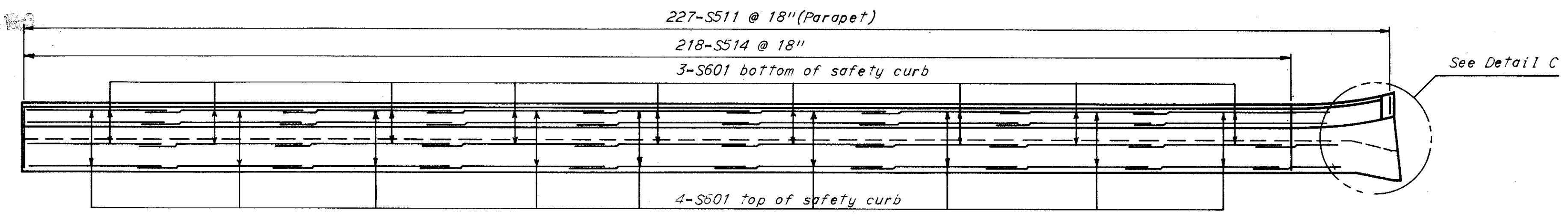
DRAWN RDA TRACED DATE 8-27-64  
CHECKED DATE 3-24-64  
REVIEWED DATE 4-1-64  
REVISED DATE 9-4-64

SHEET 54  
Revised 9-30-64

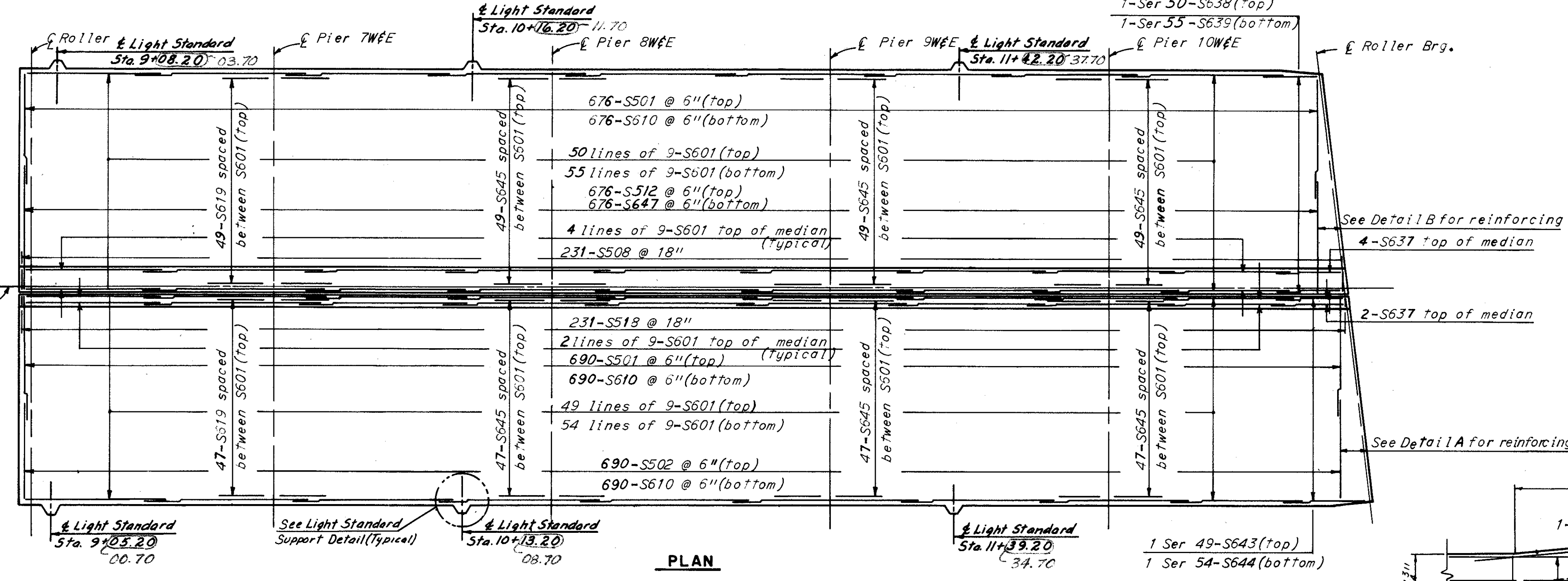


FEB 24 1964

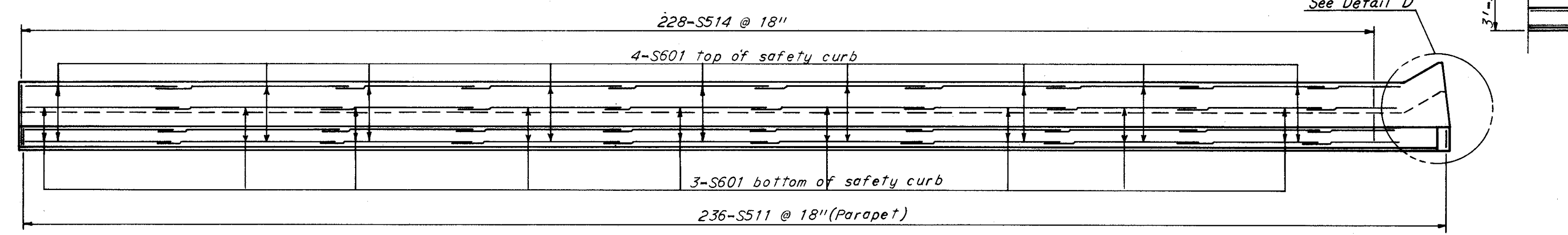
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



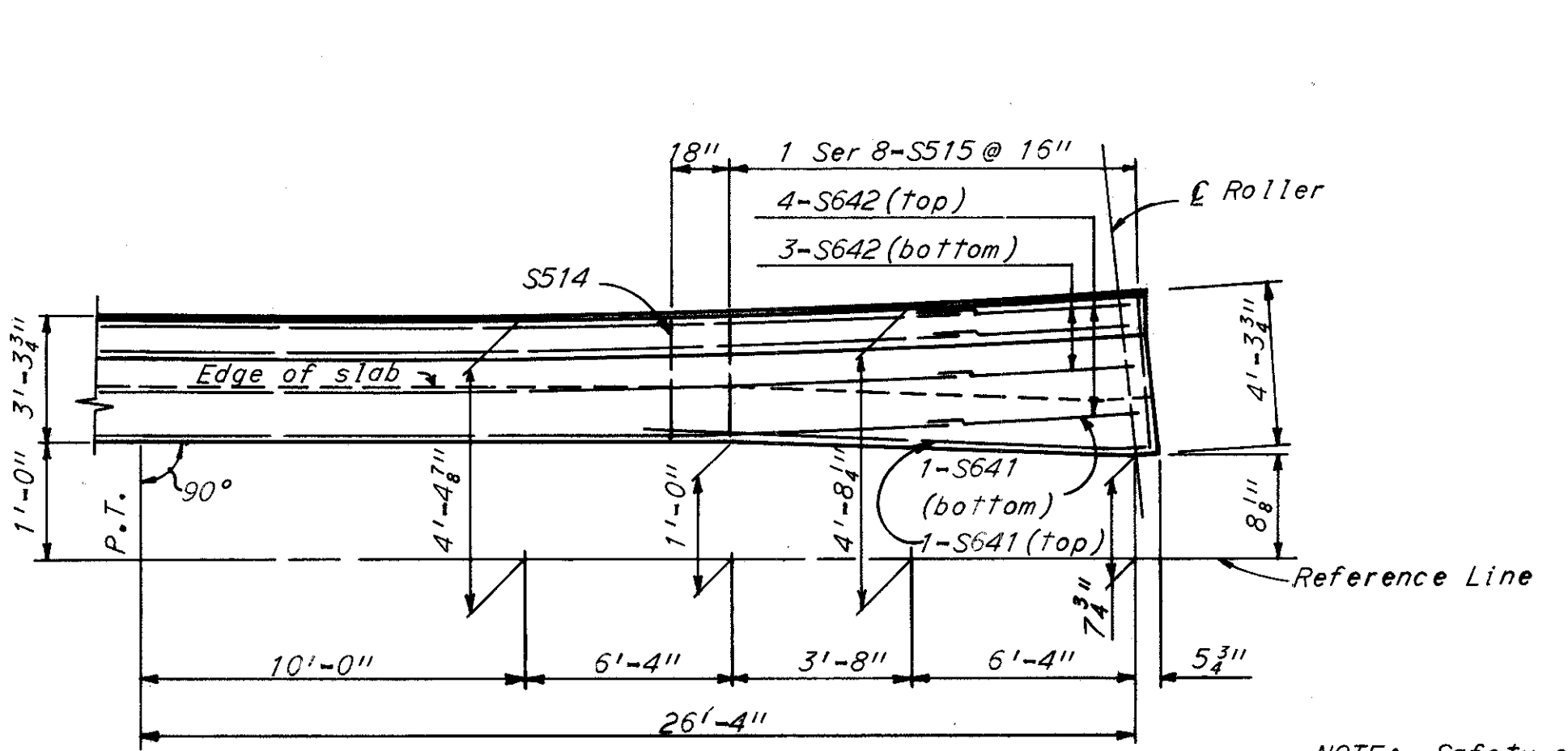
**WEST SAFETY CURB AND PARAPET**



**PLAN**



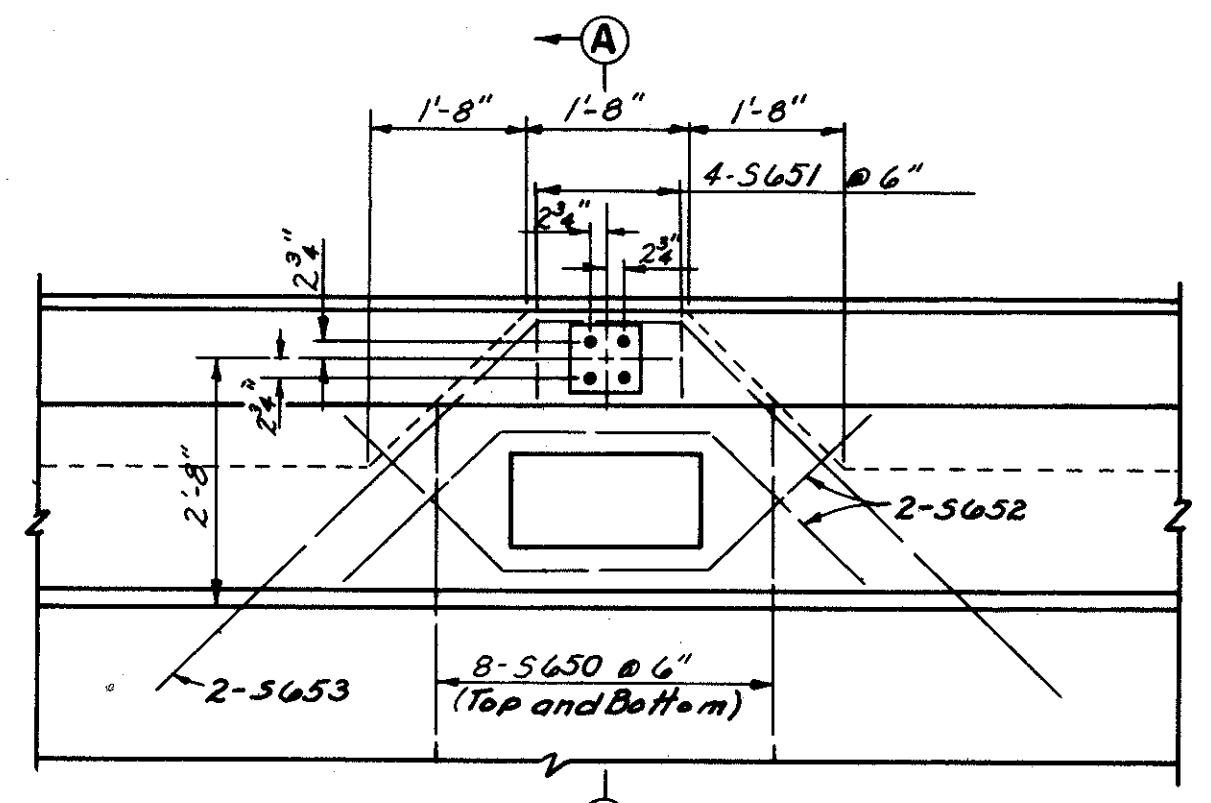
**EAST SAFETY CURB AND PARAPET**



**DETAIL C**

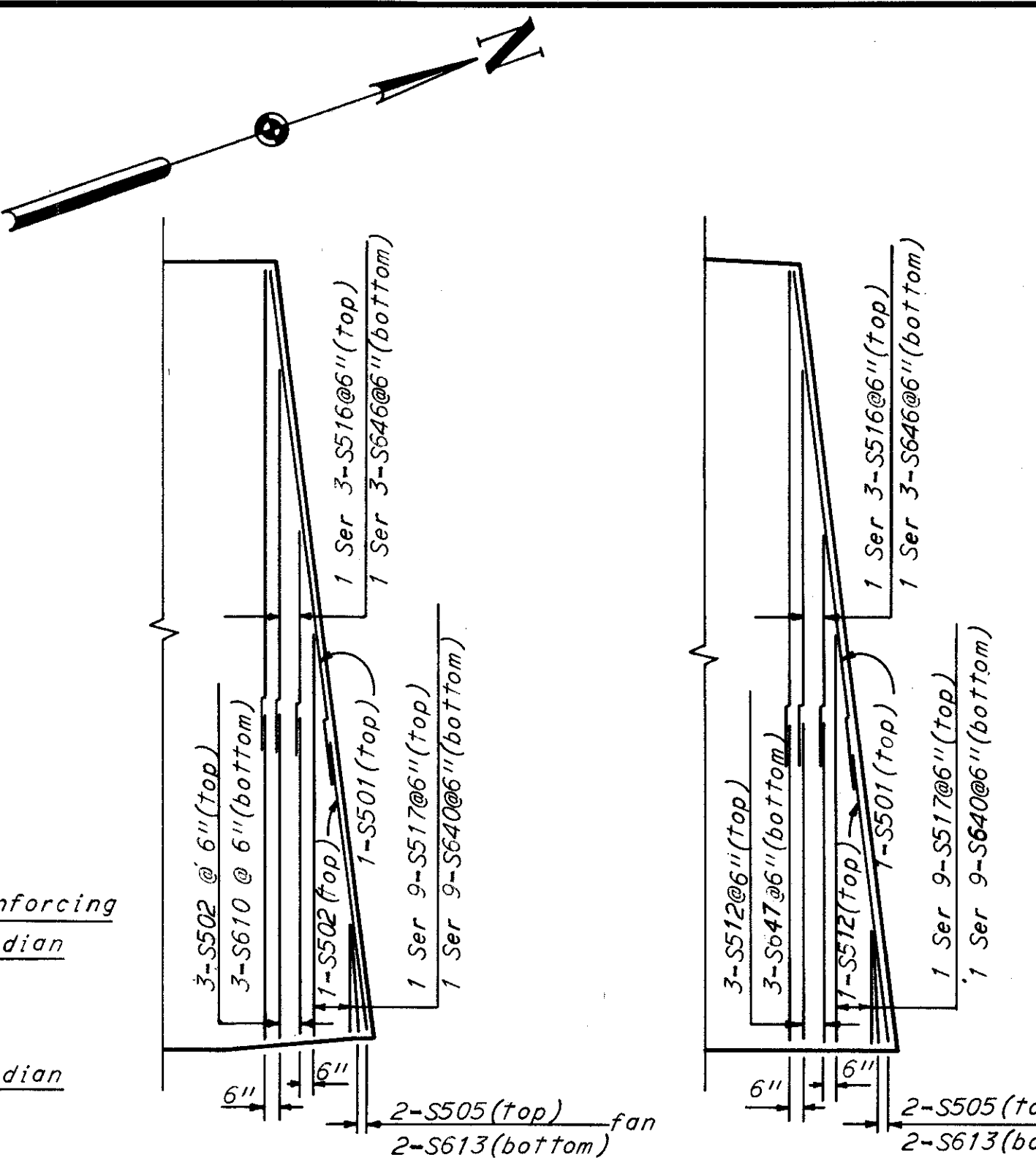
NOTE: Parapet and outside edge of sidewalk only are on curve.

NOTE: Safety curb height shall transition from 9" at the existing structure to 10" in a distance of 10'-0" from roller.



**PLAN**

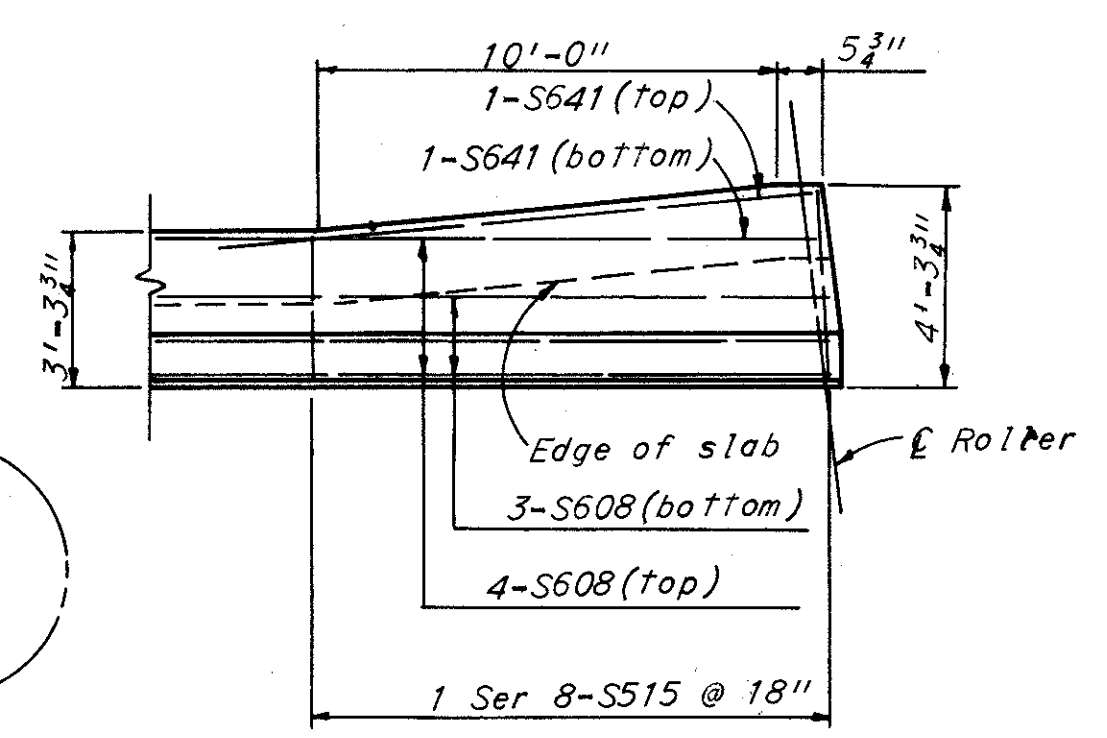
**LIGHT STANDARD SUPPORT**



**DETAIL A**

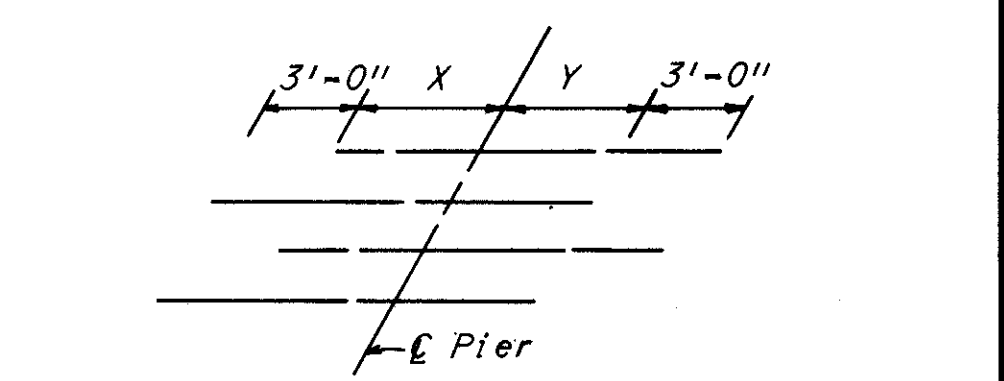
**DETAIL B**

NOTE: Parapet, safety curb and longitudinal reinforcement in slab not shown in detail.

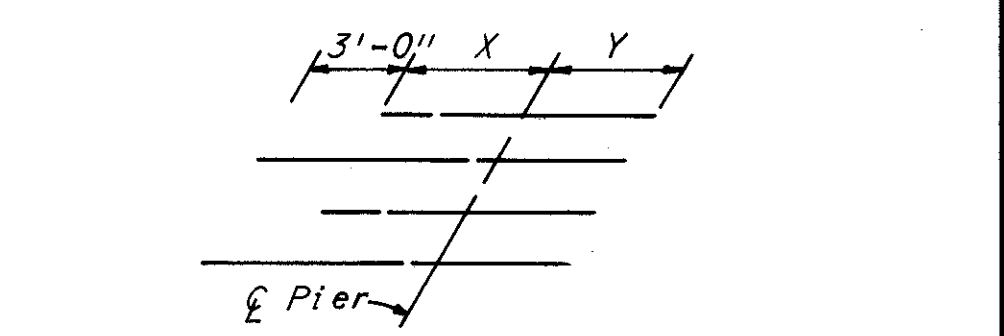


**DETAIL D**

**OPTIONAL TRANSVERSE SLAB CONSTRUCTION JOINT**



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER ALL PIERS EXCEPT 2WA, 6W AND 6E

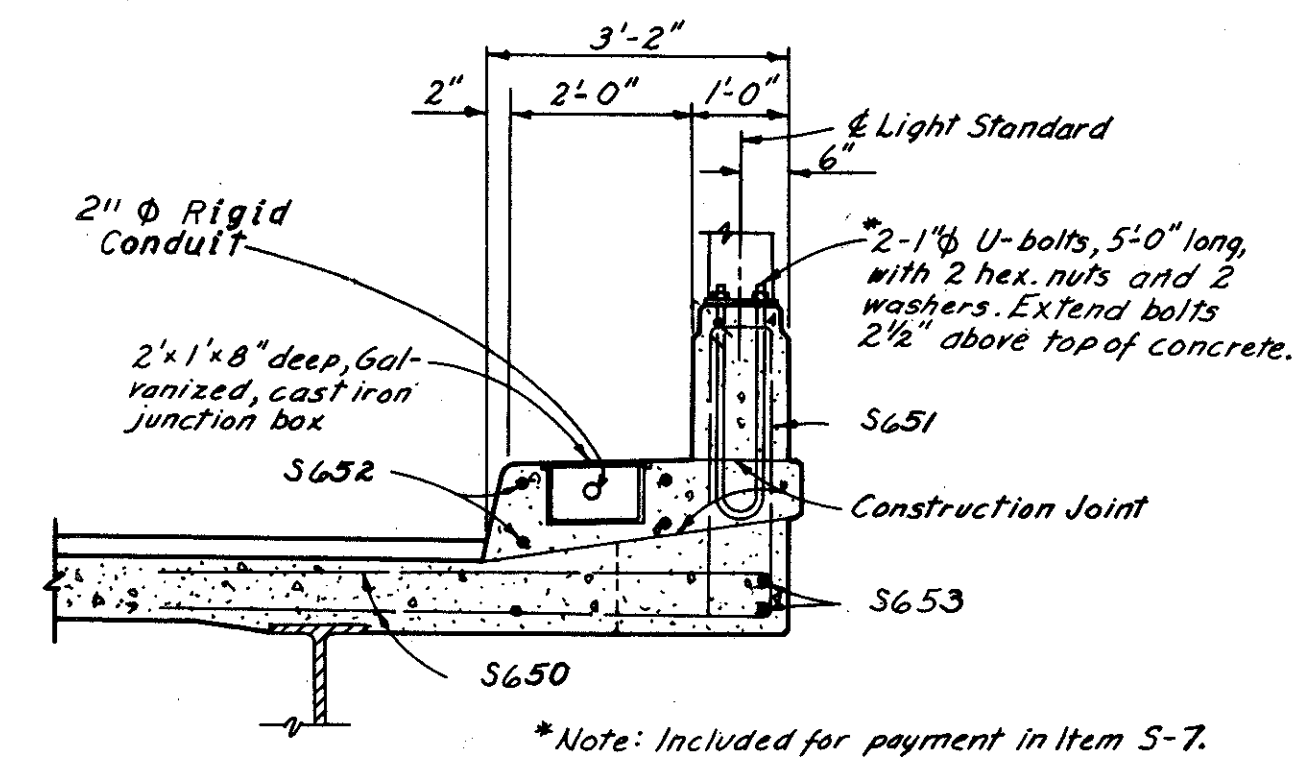


PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS 2WA, 6W AND 6E ONLY

**TABLE OF DIMENSIONS**

Pier	Bar Mark	Dim. X	Dim. Y
1W	628	9'-6"	13'-6"
1E	604	9'-6"	15'-3"
2W	629	13'-6"	11'-6"
2WA	630 & 631	11'-6"	7'-6"
2E	605	15'-3"	15'-6"
3W	617	13'-3"	13'-6"
3E	606	15'-6"	13'-6"
4W	618	13'-6"	11'-9"
4E	606	13'-6"	15'-6"
5W	619	11'-9"	9'-6"
5E	607	15'-3"	12'-3"
6W	620 & 621	9'-6"	5'-0"
6E	608 & 609	12'-3"	5'-0"
7W & 7E	619	9'-9"	10'-9"
8W & 8E	645	10'-9"	10'-9"
9W & 9E	645	10'-9"	10'-9"
10W & 10E	645	10'-9"	10'-9"

NOTES:  
For a general plan of deck and safety curb width transition from the existing structure see sheet 61.  
For details of expansion joint at the existing structure see sheet 51.  
For typical cross section, see sheet 54.  
Longitudinal slab and safety curb bars in the transition area shall be field bent as required. Field bending shall be included in "Item S-4, Reinforcing Steel" for payment.  
For additional notes see sheet 54



**SECTION A-A**

Notes:  
Normal slab reinforcement not shown. Field cut S-601 Bars as required to place junction boxes.

H.N.T.B. BRIDGE NO. 10  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**UNITS 3W AND 2E  
DECK REINFORCEMENT**

1-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

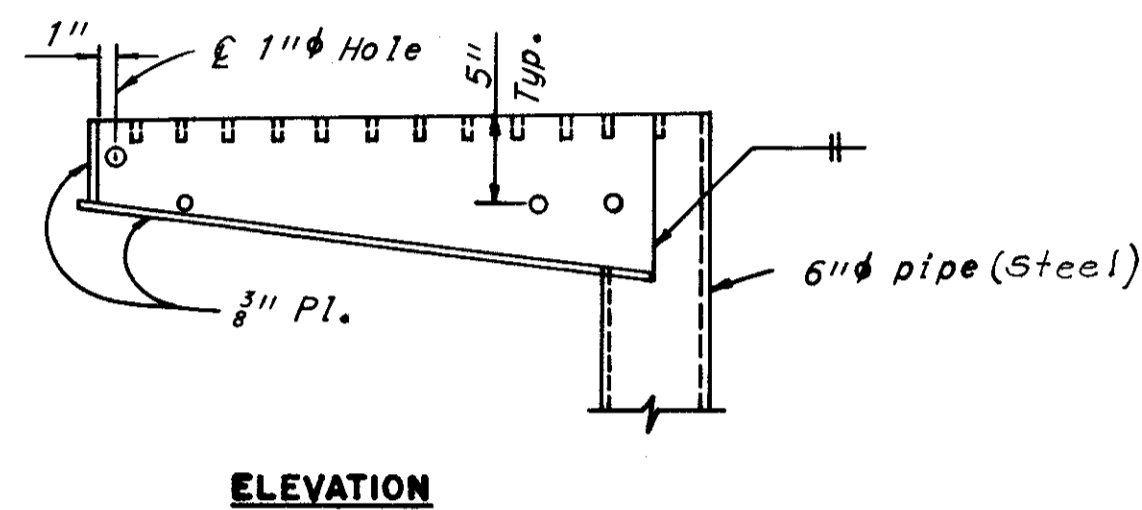
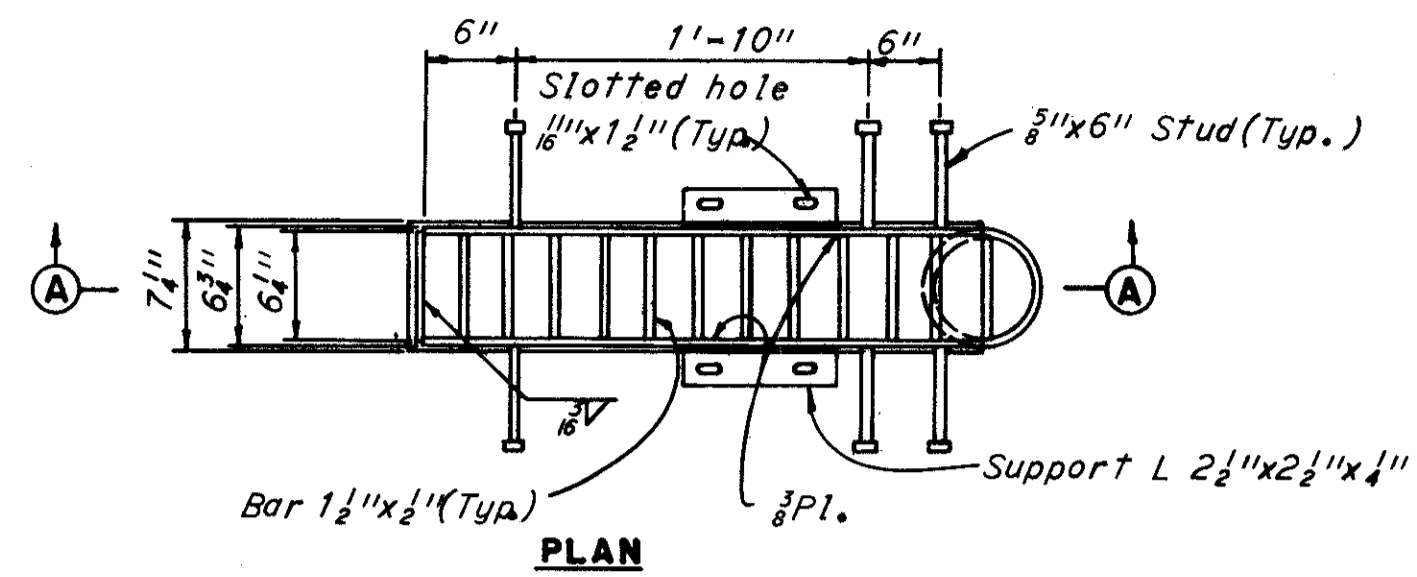
BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY DATE 9-9-63 TRACED DATE 3-24-64 CHECKED DATE 4-1-64 REVIEWED DATE 9-30-64 REVISIONS SHEET 55

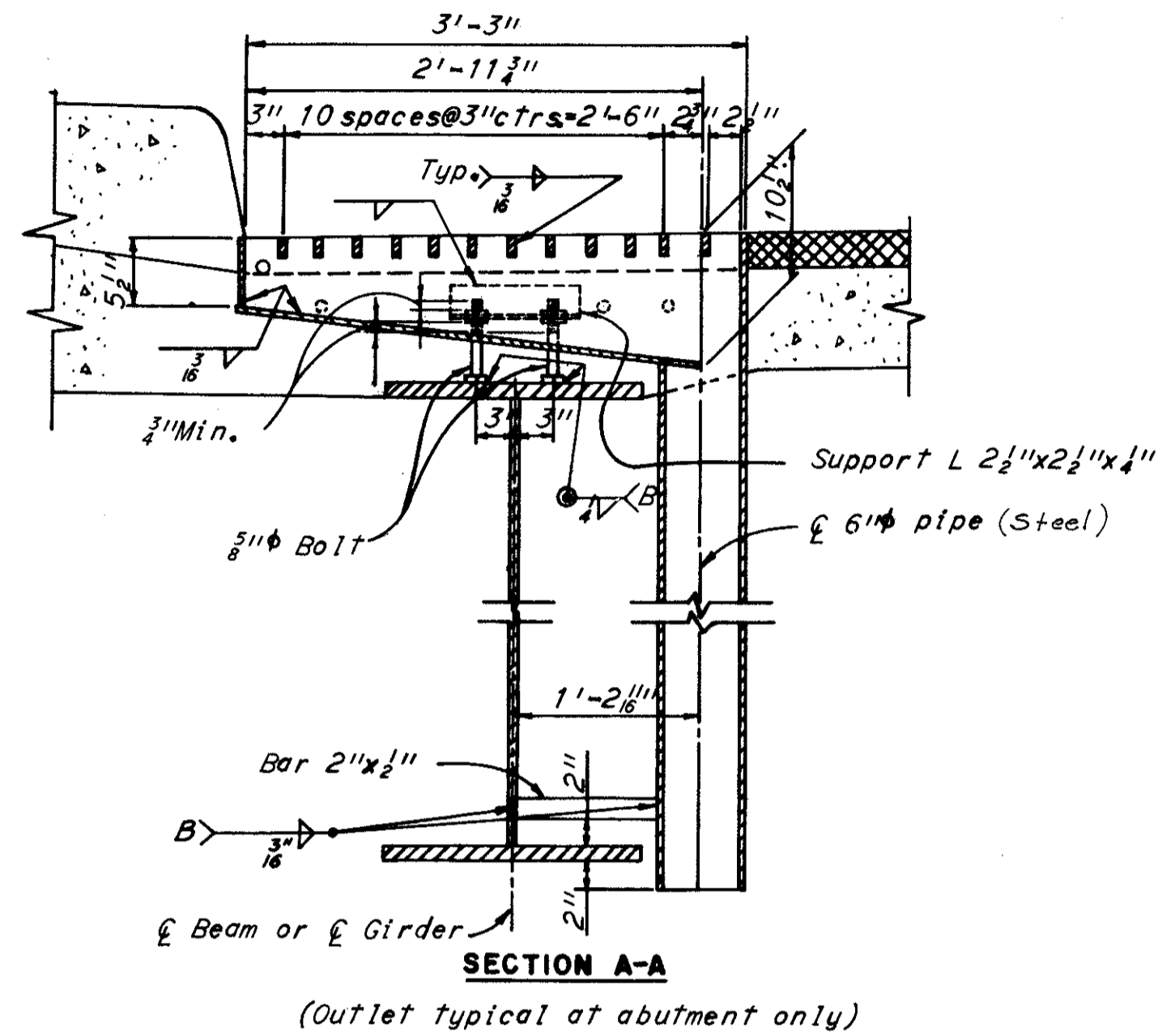
MICROFILMED  
FEB 24 1980

FED. RD. DIVISION	STATE	PROJECT	56 77
2	OHIO		

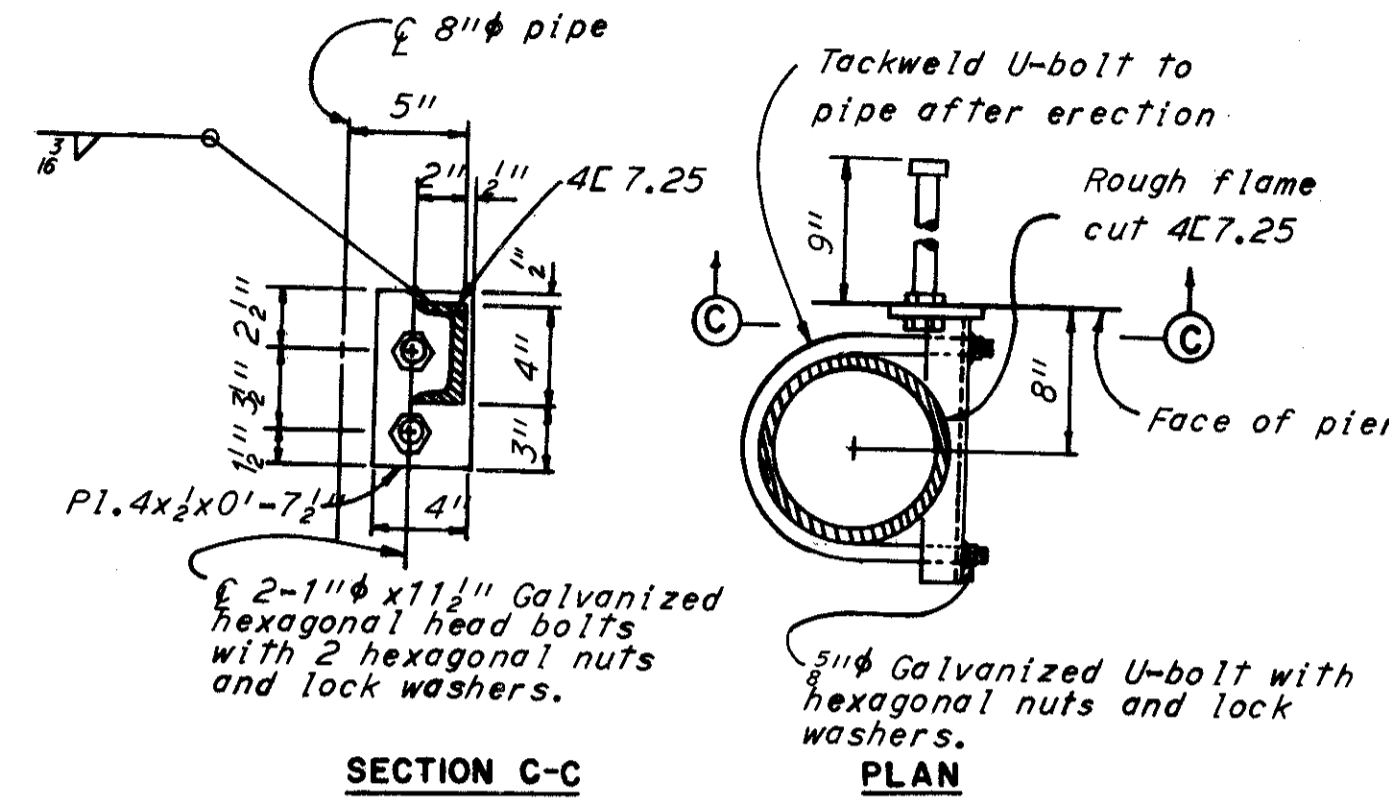
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



SCUPPER DETAILS

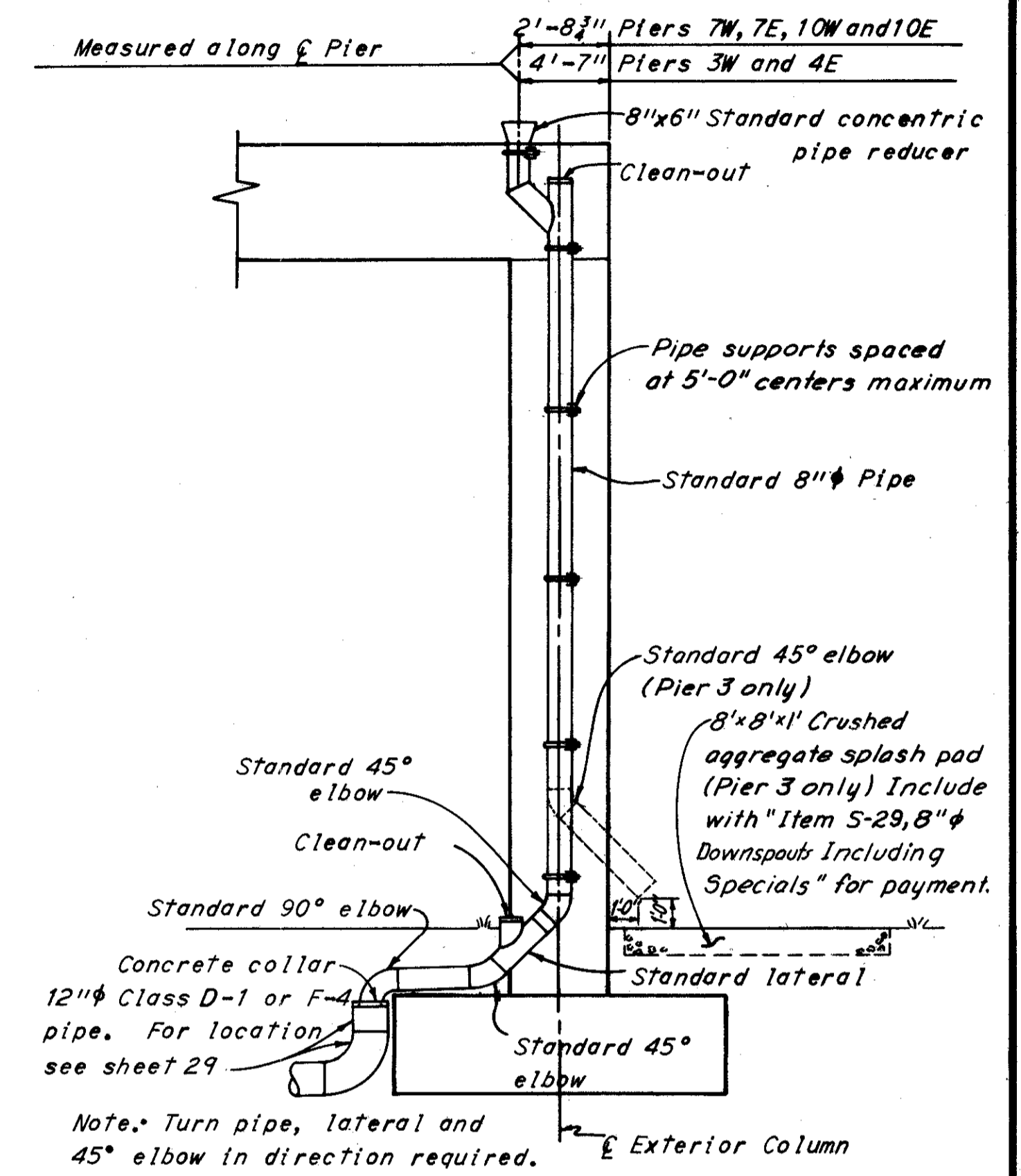


(Outlet typical at abutment only)



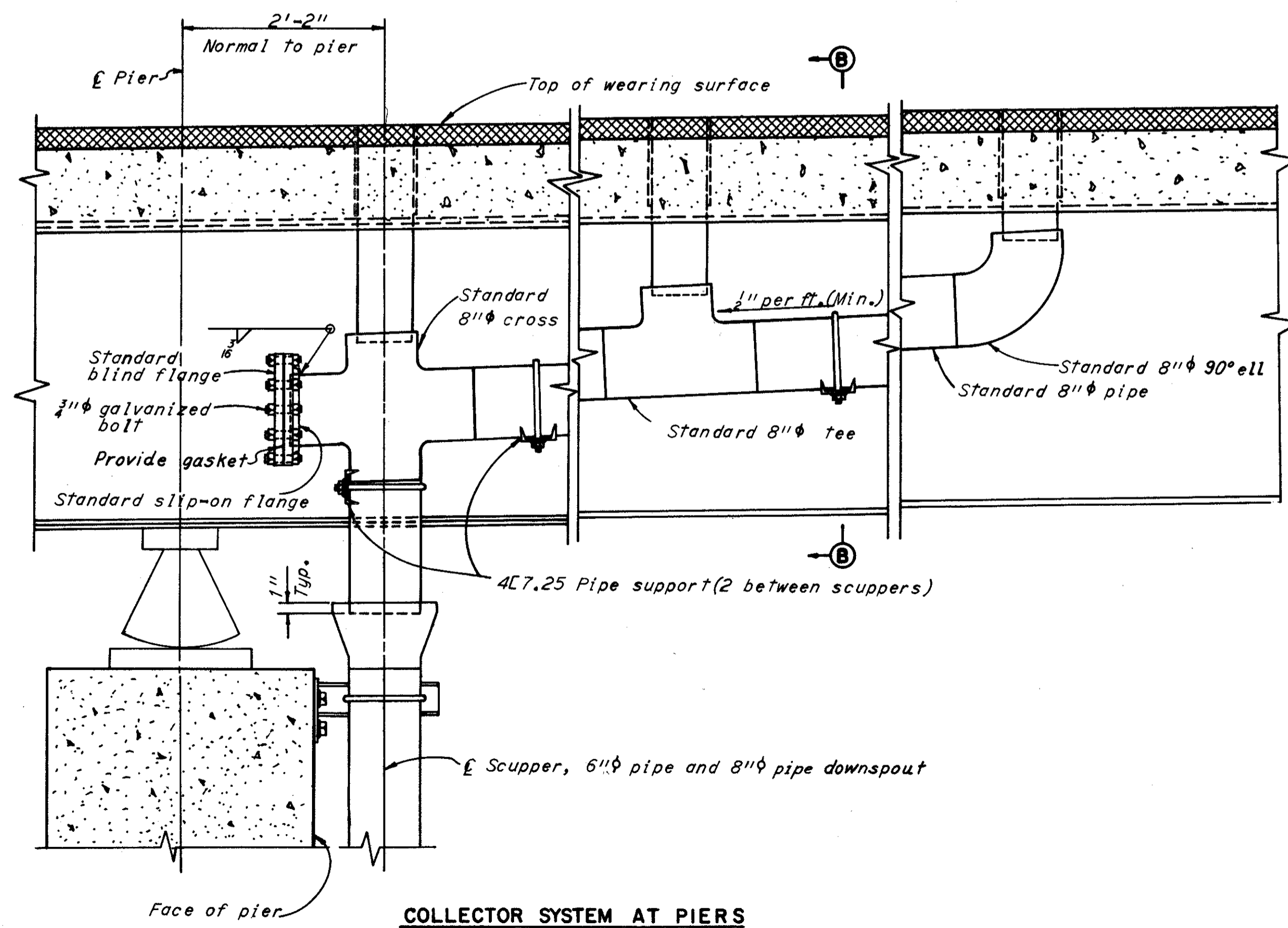
SECTION C-C

PIPE SUPPORT DETAIL ON PIERS

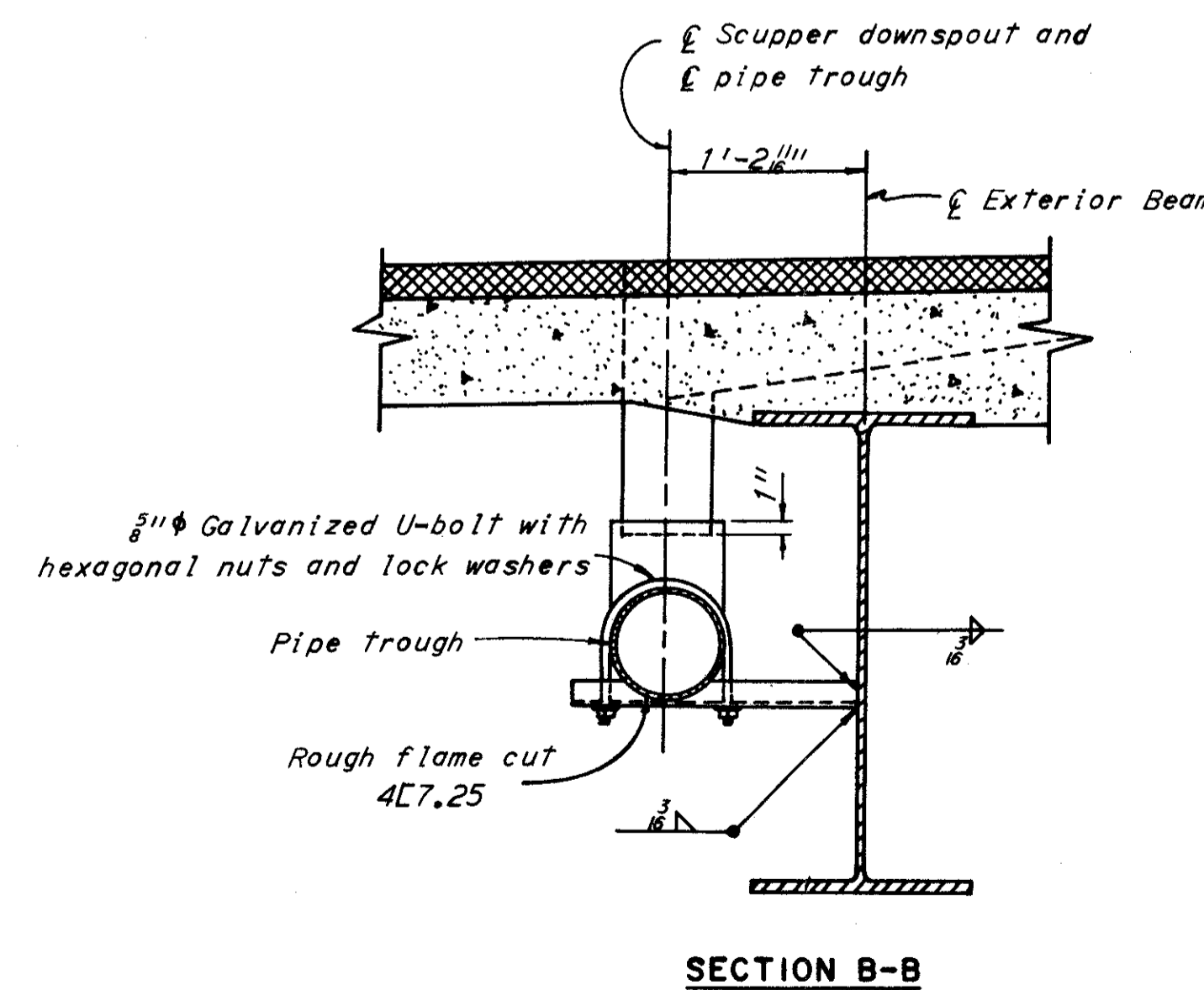


Note: Turn pipe, lateral and 45° elbow in direction required.

DOWNSPOUTS AT PIERS 3W, 4E, 7W, 7E, 10W & 10E



COLLECTOR SYSTEM AT PIERS



SECTION B-B

Notes:

- The 6" and 8" standard weight pipes, including specials, shall be wrought iron pipe or hot-dipped galvanized steel pipe.
- The pipe joints for downspouts and collector systems shall be made by welding or by a clamp-type coupling with a ring gasket. Steel pipe, if welded, shall be galvanized after the welded joints have been completed.
- Pipe supports shall be carbon steel and painted in accordance with Item S-8 unless shown otherwise.
- Galvanizing as specified in Section M-10.30 will be considered sufficient for bolts.
- Scuppers, including two supporting Ls 2 1/2" x 2 1/2" x 1/4", attached 6" pipe, and 1 1/2" x 1/2" bar supports are included with "Item S-29 Scuppers" for payment.
- The 8" pipe attached to superstructure included fittings, supports and accessories is included with "Item S-29, 8" pipe, Collector System, including supports" for payment.
- The 8" pipe attached to substructure, including fittings, supports and accessories is included with "Item S-29, 8" pipe, Downspouts, including Specials" for payment.
- All 12" Class D-1 or F-4 pipe, including all materials and labor necessary for connections to the 8" downspouts and to the existing manholes or catch basins, shall be included with the appropriate "Item I-1," for payment.

H.N.T.B. BRIDGE NO. 10

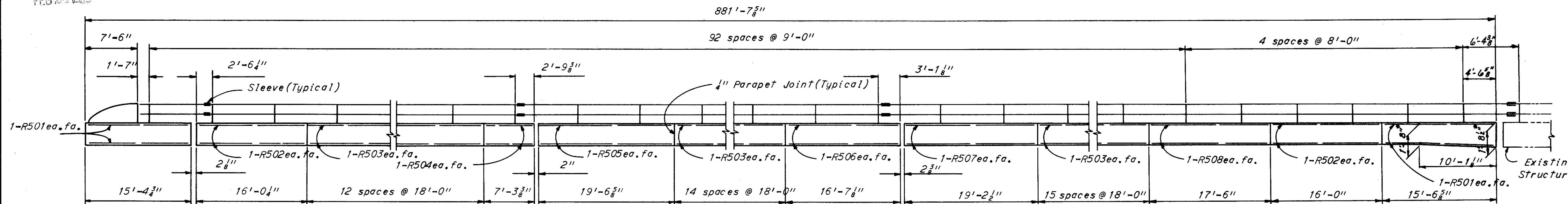
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

DRAINAGE DETAILS

I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None - STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 9-1-67	DATE	DATE 3-31-68	DATE 4-1-68	



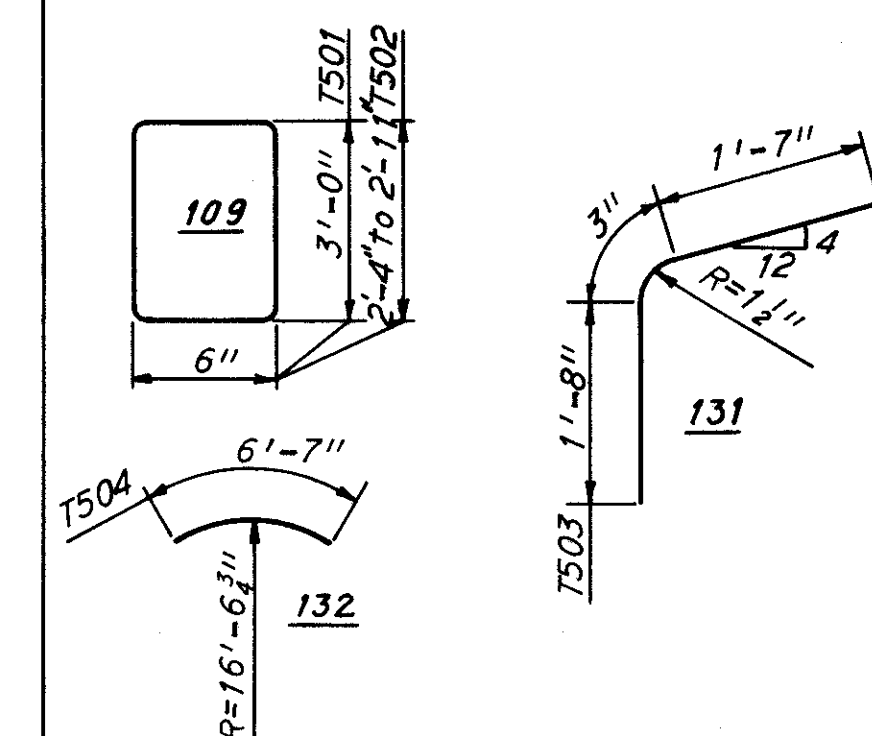
TYPE "C" RAILING - WEST PARAPET

\* Parapet height transitions as shown to compensate for transition in height of safety curb.

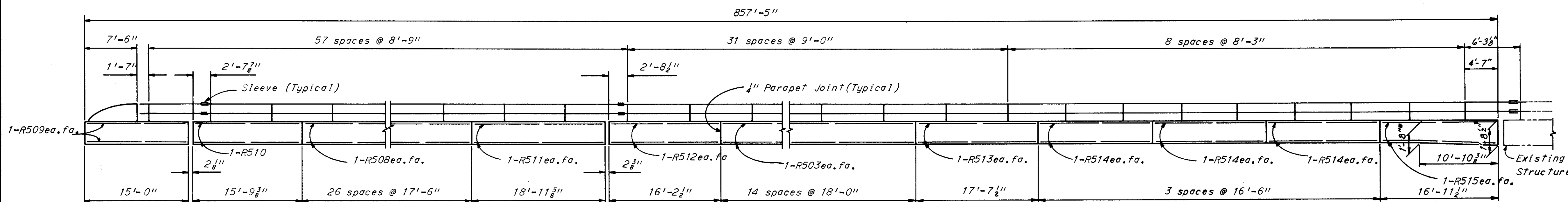
Note: For Type "C" Railing on existing structure see sheet 61.

REINFORCEMENT AND BENDING DIAGRAMS FOR TERMINAL POSTS

Mark	No.	Length	Sp. Trc.	Type
T501	2	7'-6"		109
T502	1 Ser. 3	6'-2" to 7'-4"	7"	109
T503	2	3'-6"		131
T504	2	6'-7"		132
T505	2	6'-6"		Str.

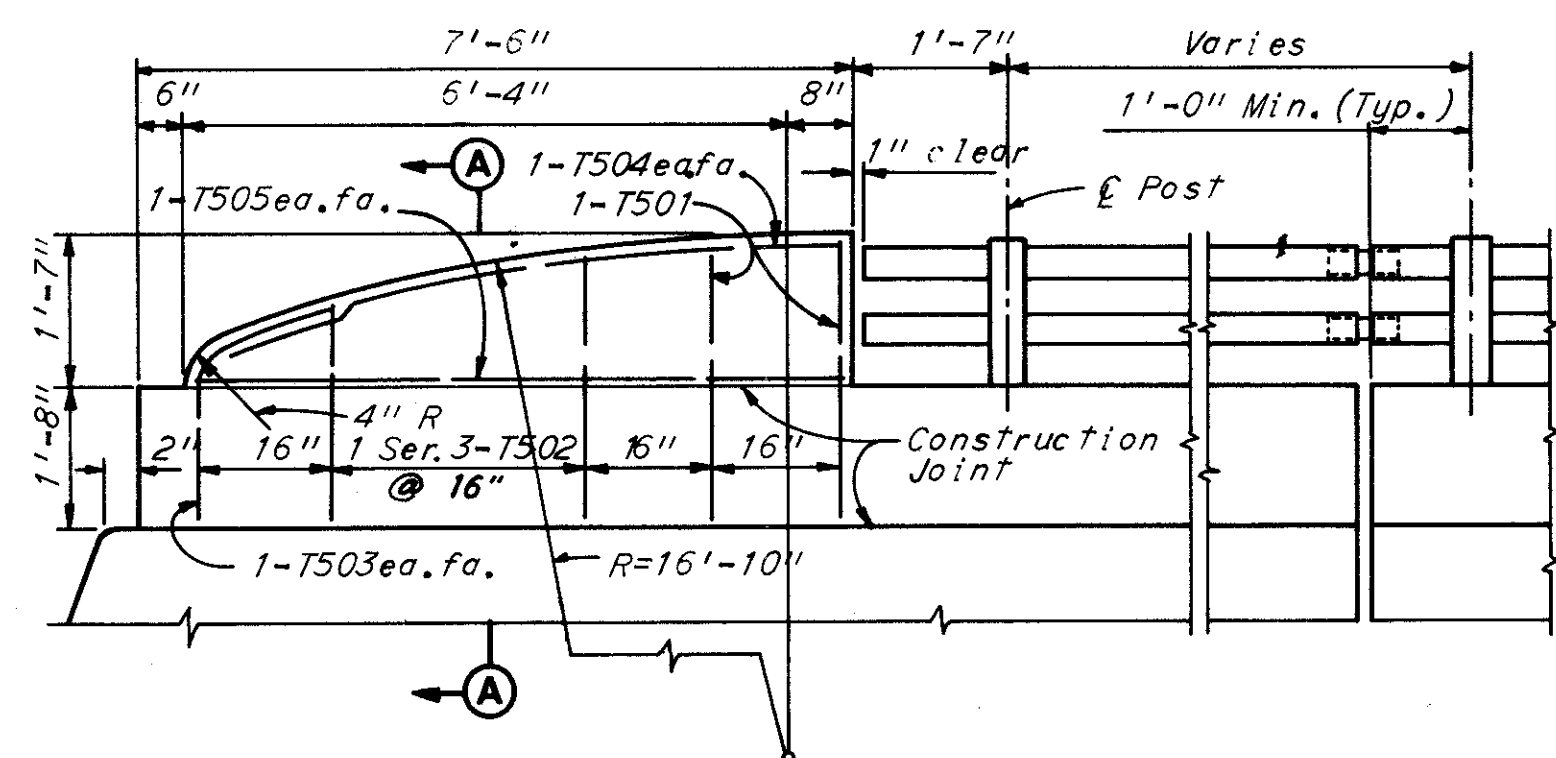


Note: Reinforcement Schedule is for one Terminal Post only.

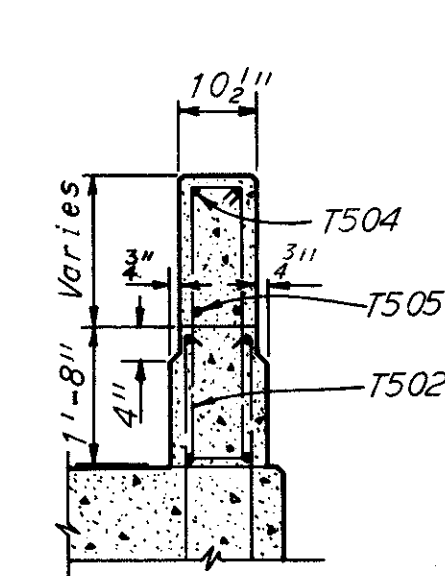


TYPE "C" RAILING - EAST PARAPET

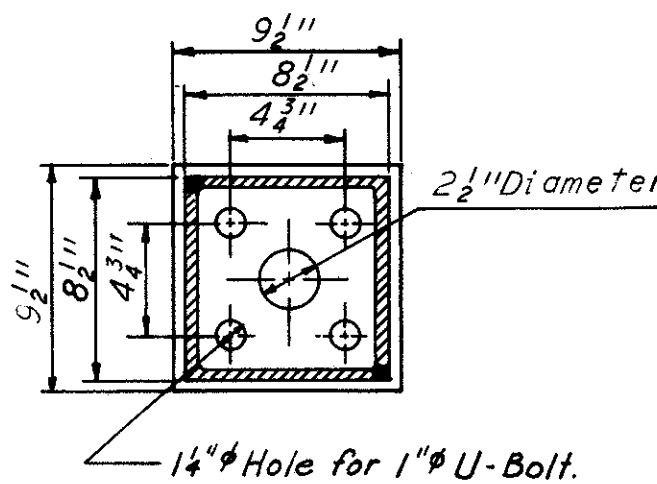
Abutment



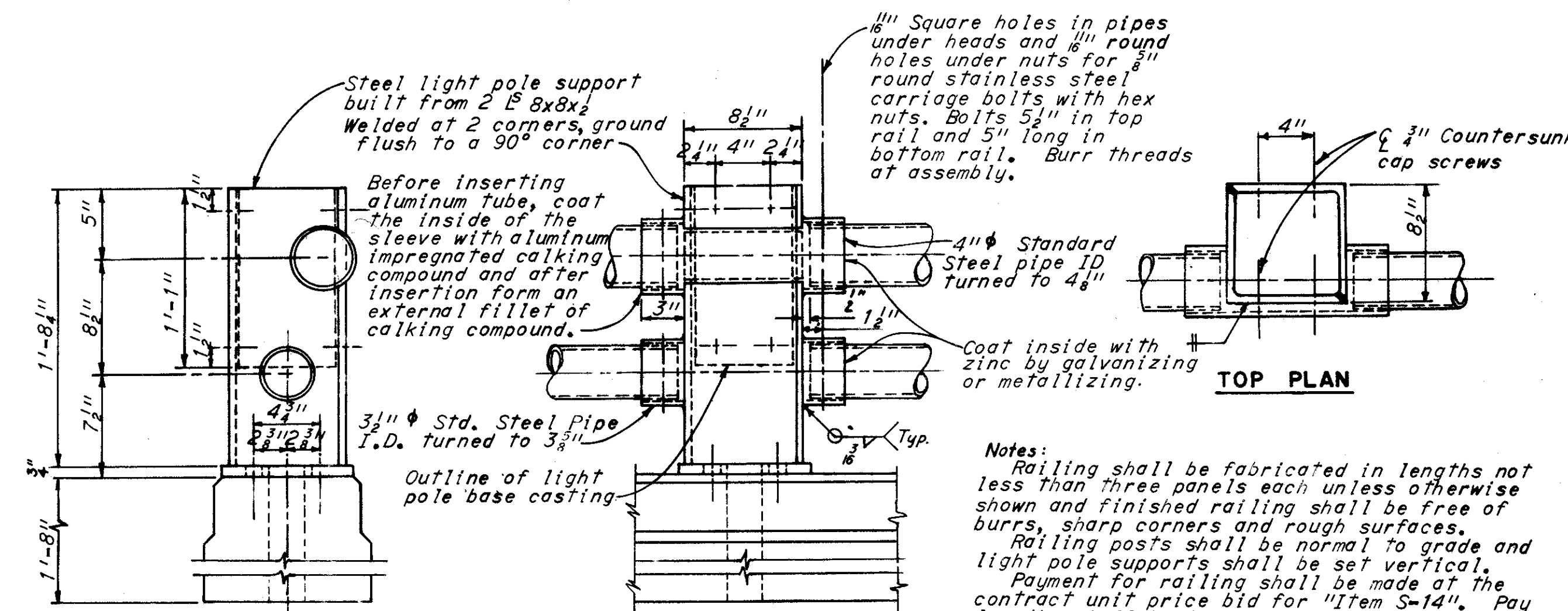
TERMINAL POST DETAILS



SECTION A-A



BASE PLAN



LIGHT POLE SUPPORT

REINFORCEMENT SCHEDULE FOR PARAPETS

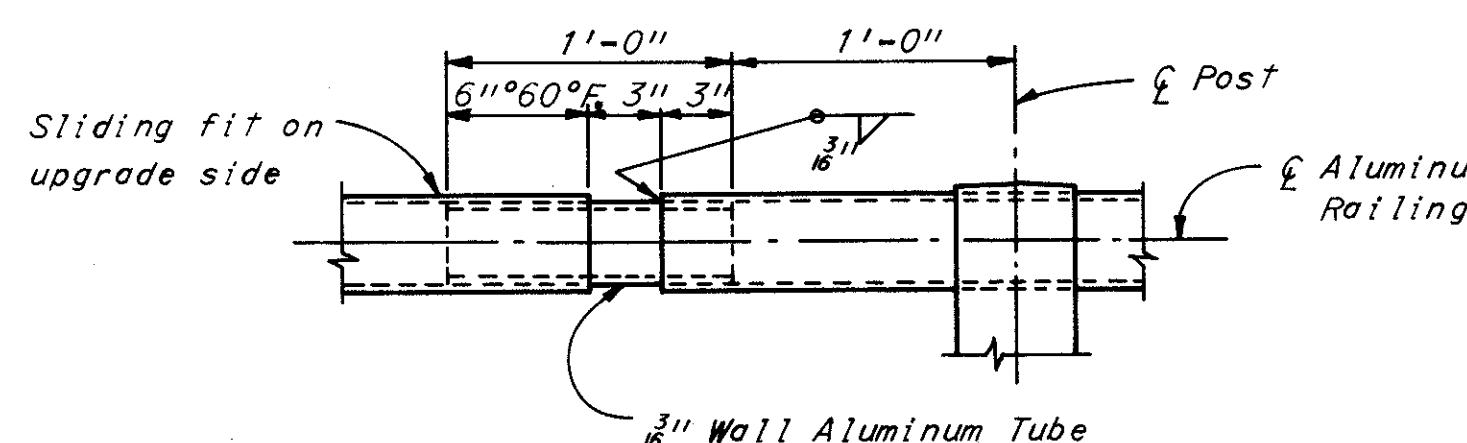
Mark	No.	Length
R501	8	15'-0"
R502	8	15'-6"
R503	220	17'-6"
R504	4	6'-9"
R505	4	19'-0"
R506	4	16'-3"
R507	4	18'-9"
R508	108	17'-0"
R509	4	14'-6"
R510	4	15'-3"
R511	4	18'-6"
R512	4	15'-9"
R513	4	17'-3"
R514	12	16'-0"
R515	4	16'-6"

Light pole supports shall be provided in lieu of railing posts at the following locations:

West Parapet Station	East Parapet Station
*12+46.0±	*12+60.0±
11+42.20	11+39.20 34.70
10+16.20	10+13.20 08.70
9+08.20	03.70 9+05.20 00.70
7+82.20	17.70 7+62.60 79.20
6+56.20	51.70 6+60.10 55.70
5+39.20	34.70 5+47.60 33.20
4+13.20	08.70 4+15.10 10.70

\*On existing structure

Note: The following abbreviation is used:  
ea. fa. = each face



SLEEVE DETAIL

Notes:  
Railing shall be fabricated in lengths not less than three panels each unless otherwise shown and finished railing shall be free of burrs, sharp corners and rough surfaces.  
Railing posts shall be normal to grade and light pole supports shall be set vertical.  
Payment for railing shall be made at the contract unit price bid for "Item S-14". Pay lengths shall be the overall length of the parapets and shall include cost of light pole supports, anchor bolts, set screws, nuts, shims, etc., necessary to complete the installation of railing. Concrete, expansion joint material, longitudinal reinforcing steel in the parapet and all reinforcing steel and concrete in the terminal posts shall be included in "Item S-14" for payment. All other reinforcing steel in the parapet shall be included in "Item S-4" for payment.  
For additional details and notes regarding railing see Ohio Standard Drawing AR-1-57.  
H.N.T.B. BRIDGE NO. 10

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

**RAILING AND TERMINAL POST DETAILS**  
I-90 OVER FAIRFIELD AVE.,  
LANE B AND RAMP W-2

BR. NO. CUY-90-1467 STA. 3 + 87.63  
SCALE: None STA. 12 + 42.48  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: J.K.H. TRACED: [initials] CHECKED: [initials] REVIEWED: [initials] REVISION: 5-30-67  
DATE: 3-12-63 DATE: 3/17/64 DATE: 4-1-64 SHEET 57



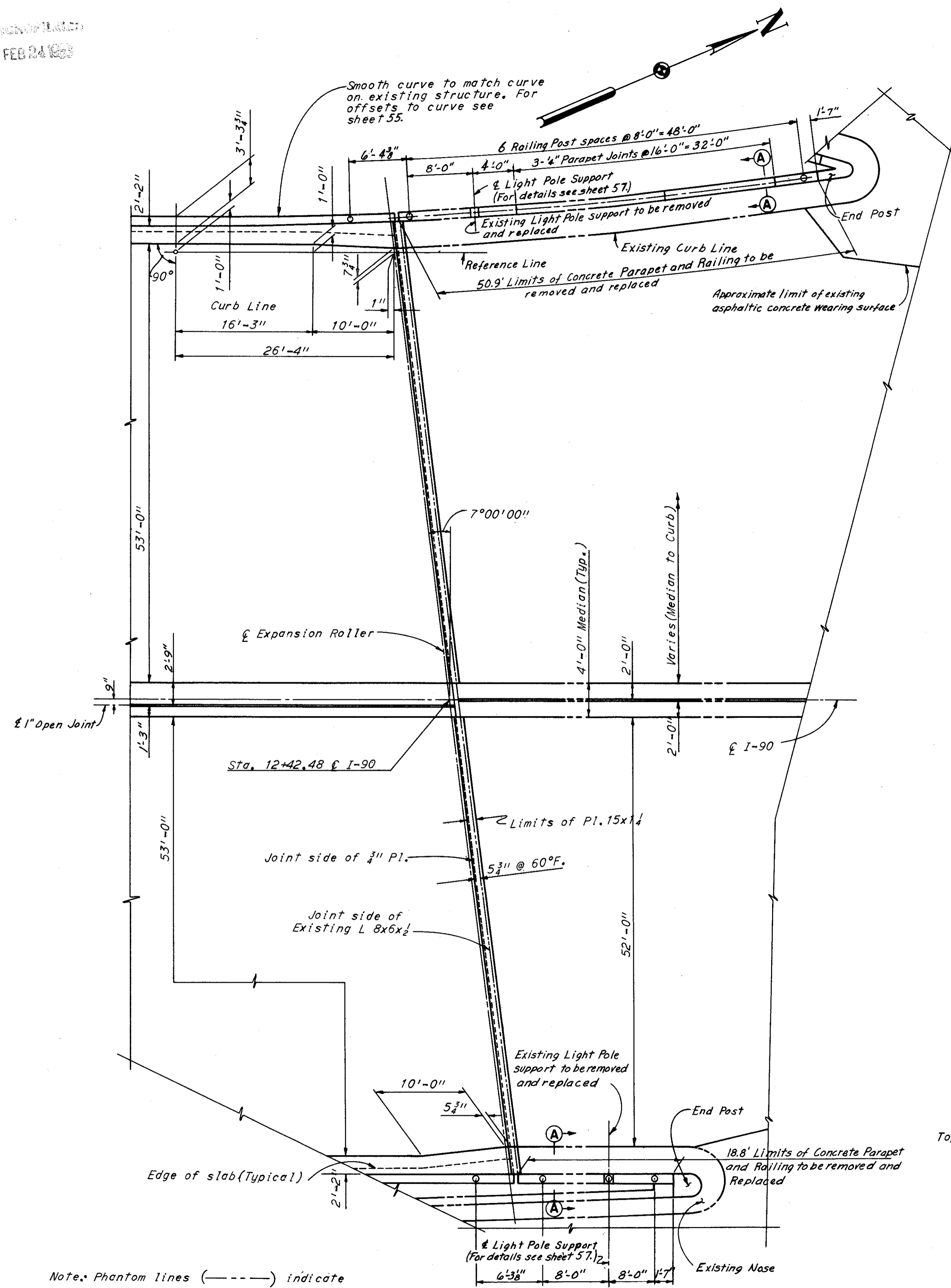




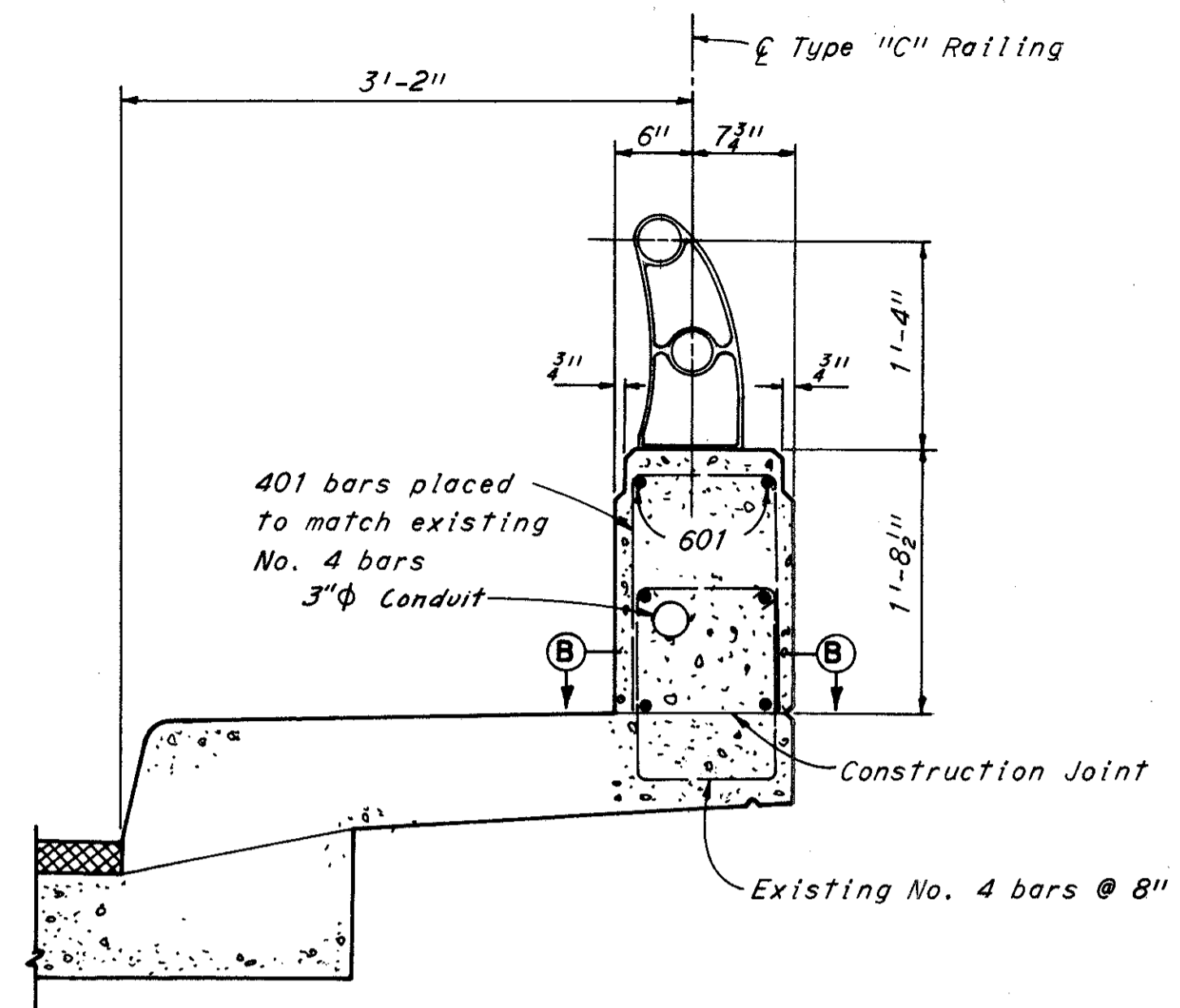
REVISED  
FEB 24 1964

FED. RD. DIVISION	STATE	PROJECT	61
2	OHIO		77

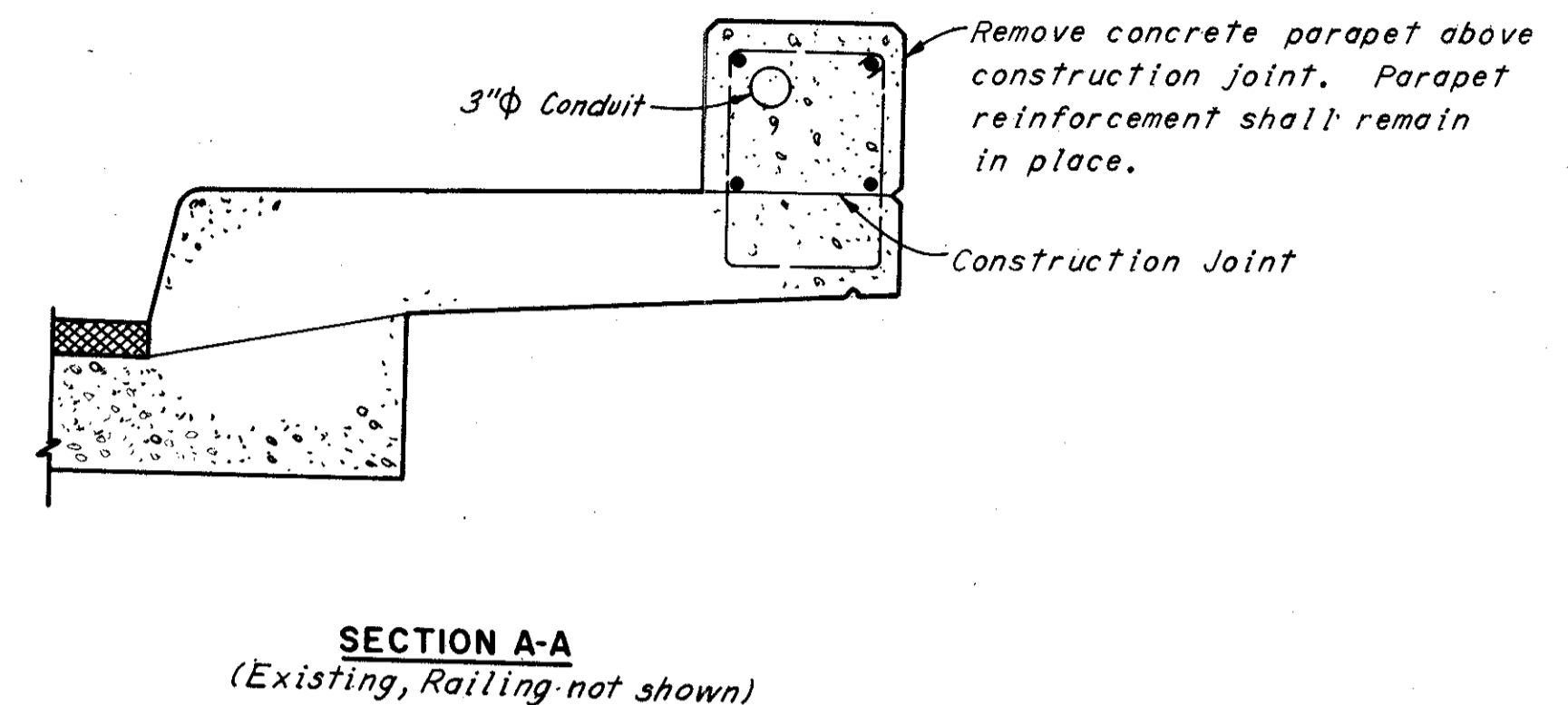
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



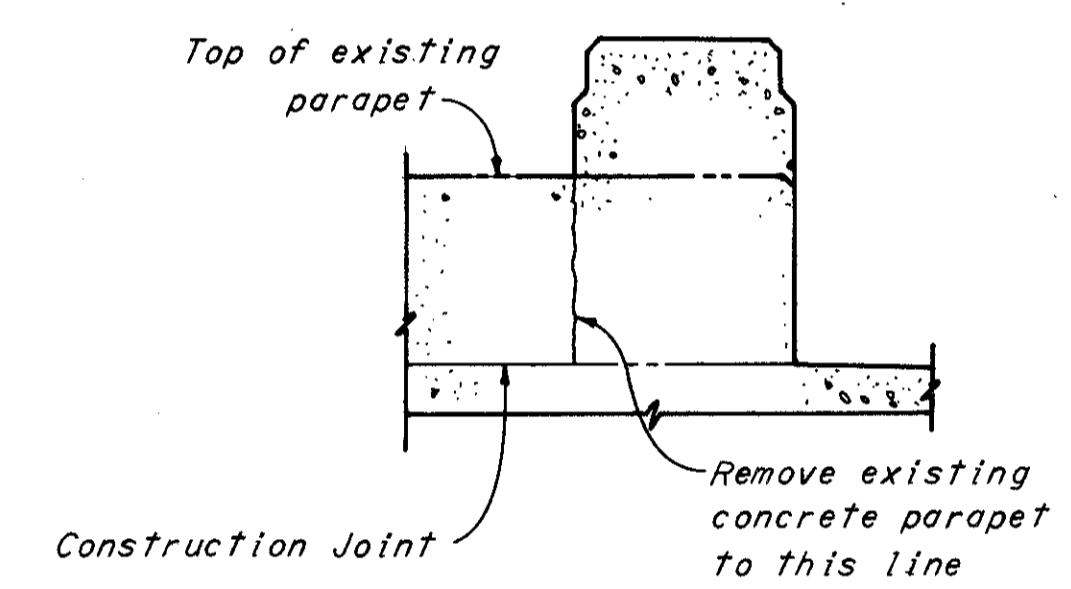
PART DECK PLAN AT EXISTING STRUCTURE



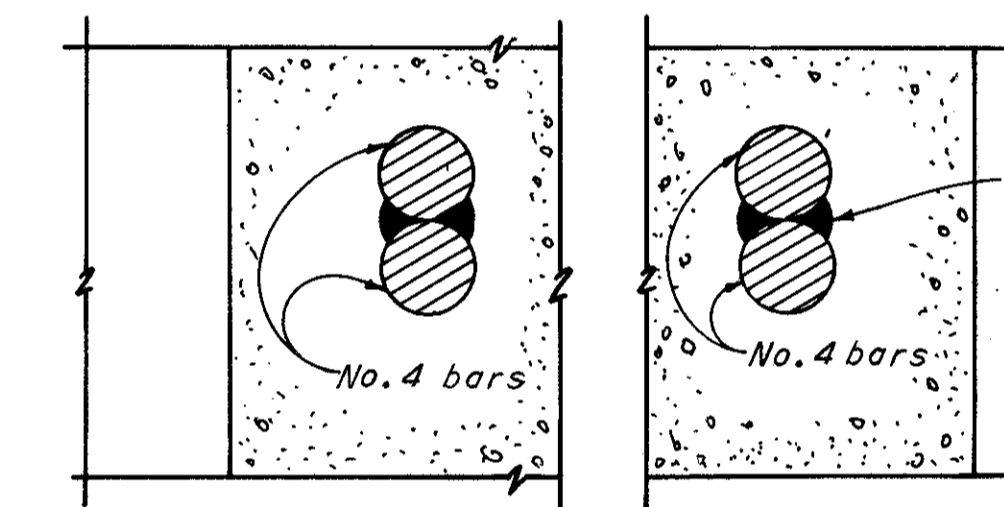
SECTION A-A



SECTION A-A  
(Existing, Railing not shown)

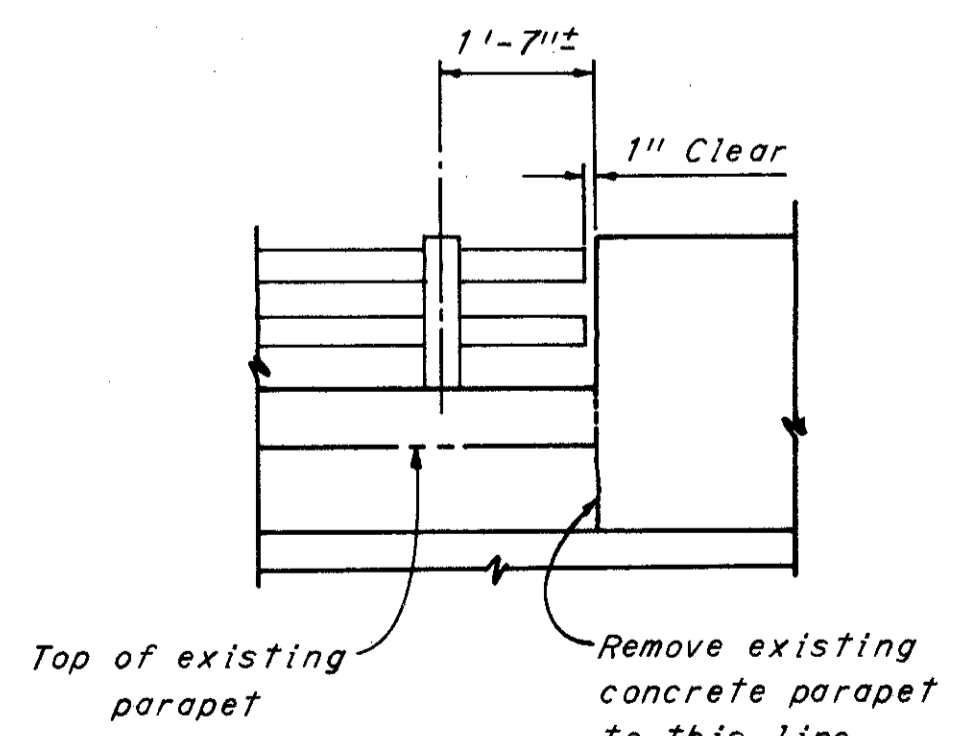


SECTION C-C  
(Railing not shown)

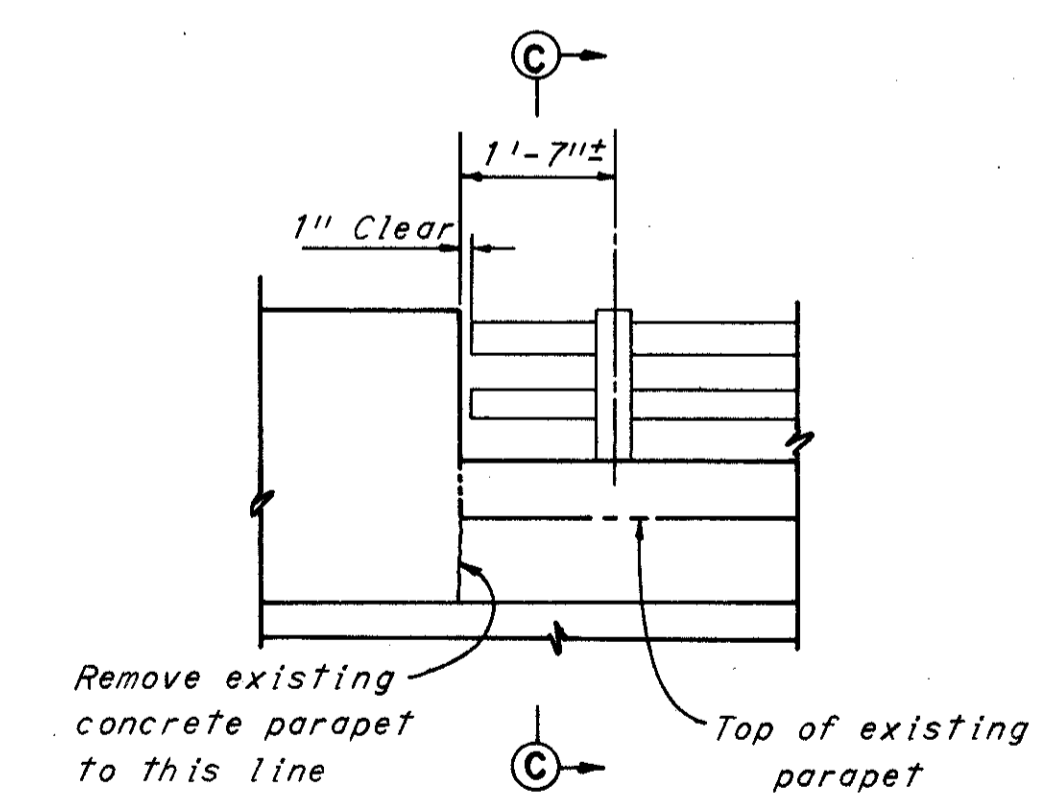


SECTION B-B

Provide 6" min. weld each side (Typ.).  
The existing reinforcement shall be cleaned to the satisfaction of the engineer before the welded splice is made.



WEST PARAPET END POST DETAILS



EAST PARAPET END POST DETAILS

Notes:  
Railing shall be fabricated in lengths not less than three panels each unless otherwise shown and finished railing shall be free of burrs, sharp corners and rough surfaces.  
Railing posts shall be normal to grade and light pole supports shall be set vertical.  
Payment for railing shall be made at the contract unit price bid for "Item S-14, Railing, Type 'C' (On Existing Structure)." Pay lengths shall be the overall length of the parapets and shall include cost of light pole supports, anchor bolts, set screws, nuts, shims, etc., necessary to complete the installation of railing. Also included in the cost shall be the removal of the existing concrete parapet, cleaning of reinforcing steel, the new parapet, and the replacement, in kind, of conduit and junction boxes.  
For additional details and notes regarding railing see Ohio Standard Drawing AR-1-57.

REINFORCEMENT SCHEDULE				
Mark	No.	Length	Type	Bending Diagrams
WEST PARAPET				
PW401	77	31'-7"	105	PW401 10" PW401 7'-6"
PW601	4	26'-6"	Str.	
EAST PARAPET				
PE401	29	31'-7"	105	105
PE601	2	18'-9"	Str.	

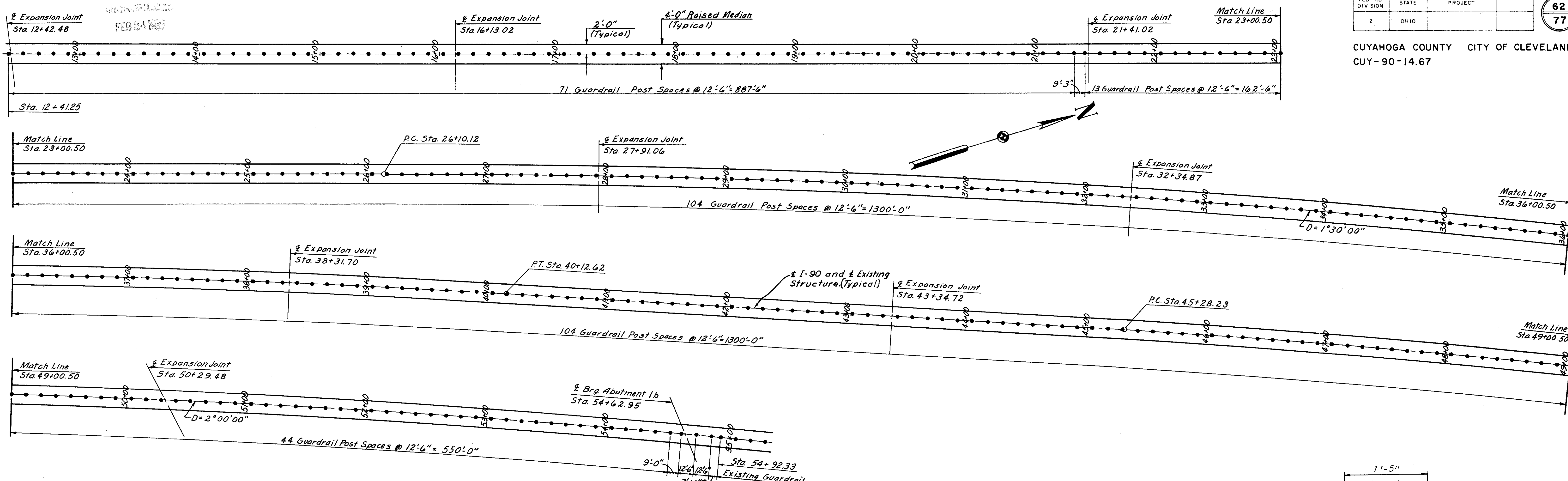
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**RAILING AND PARAPET MODIFICATIONS  
EXISTING INNER BELT VIADUCT**

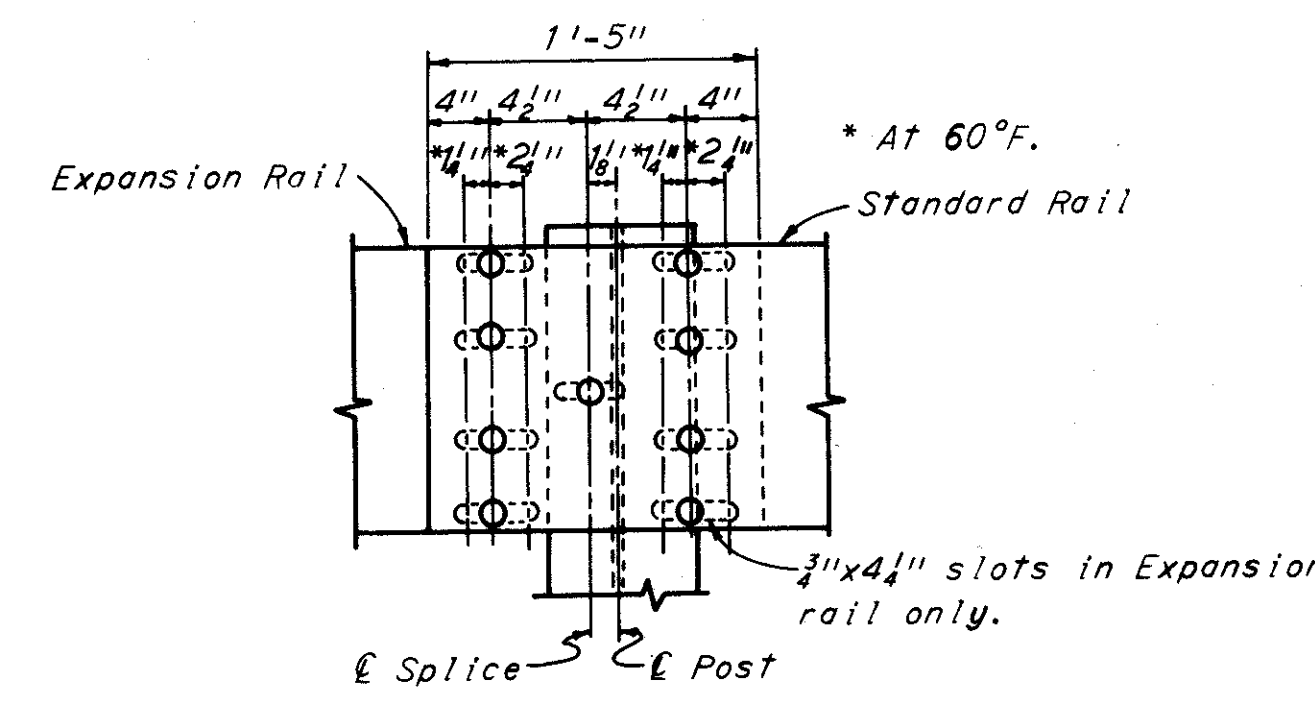
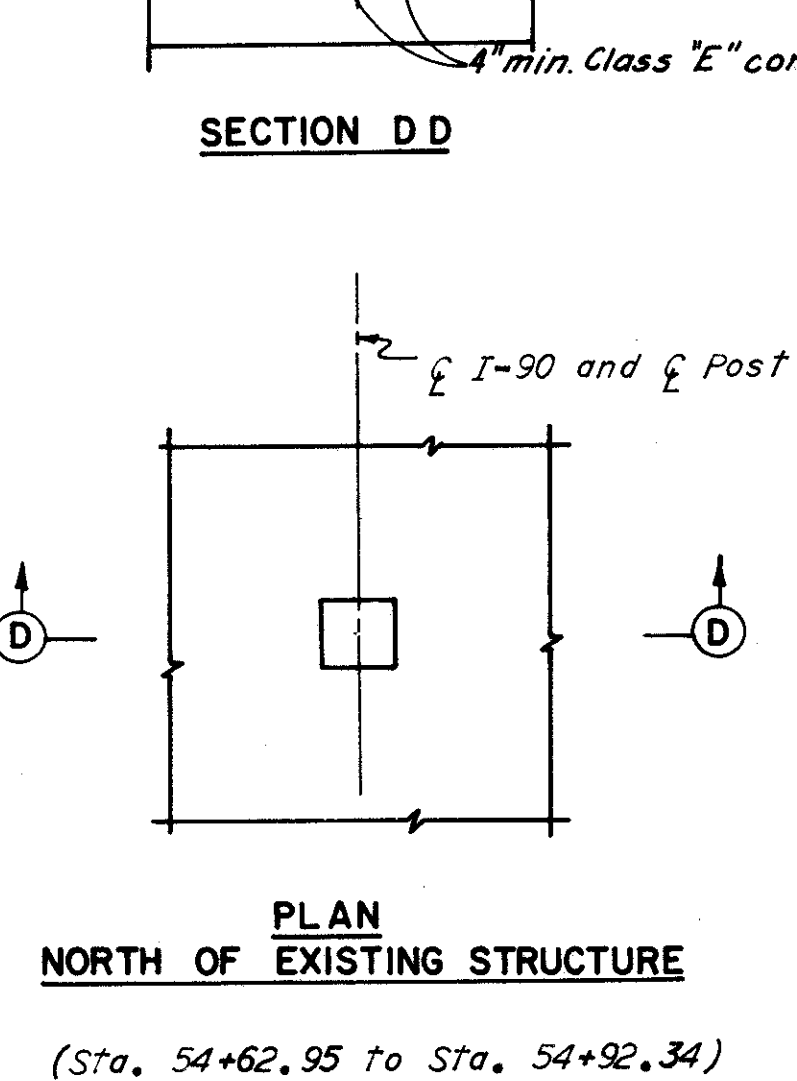
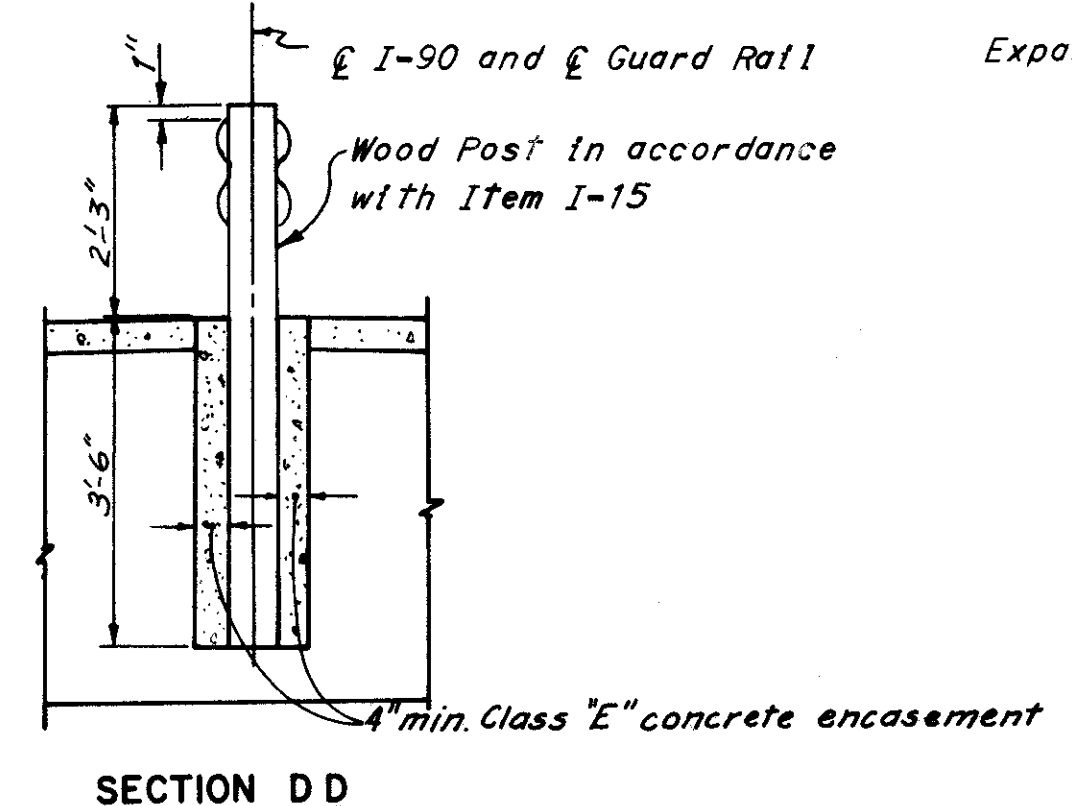
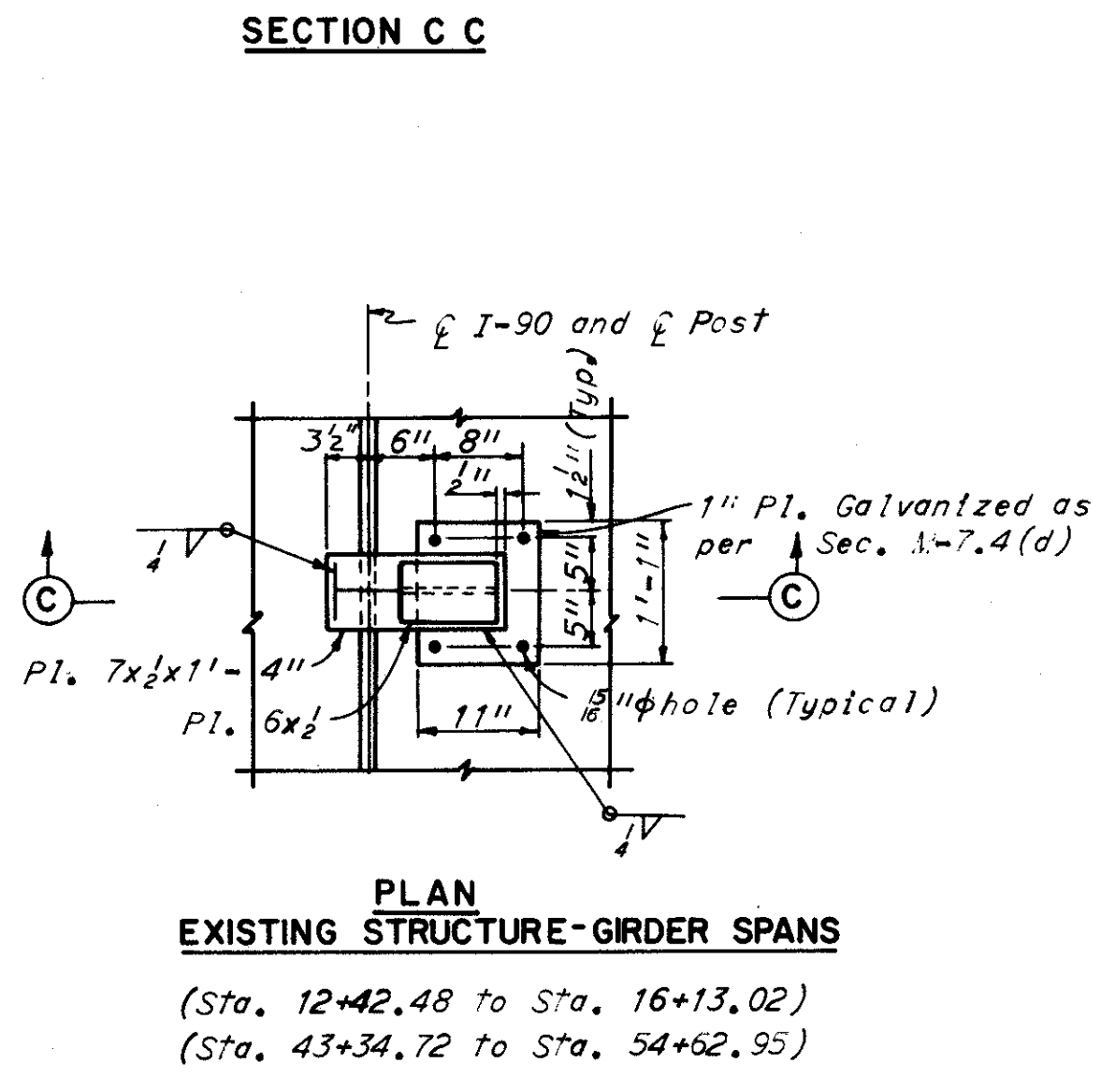
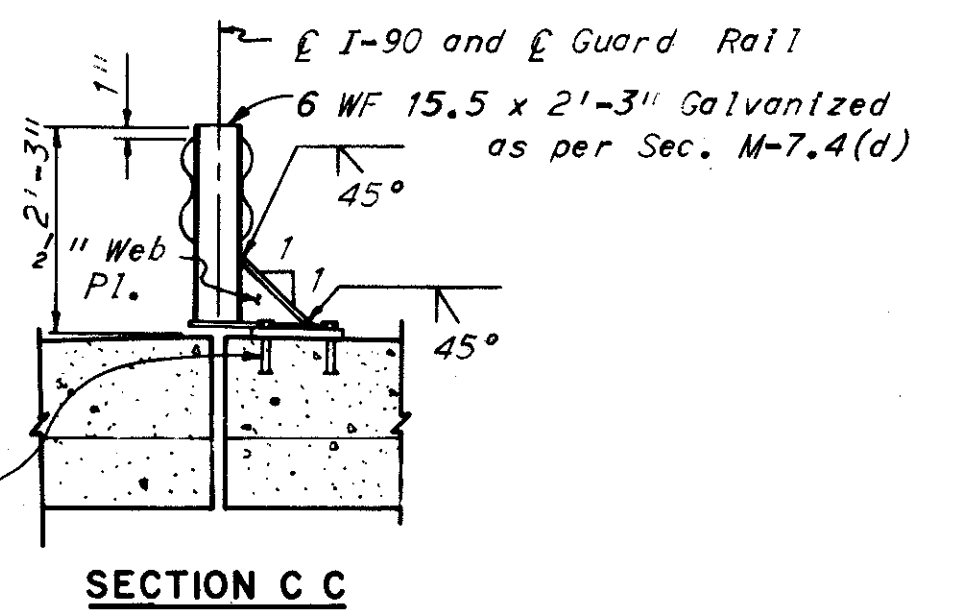
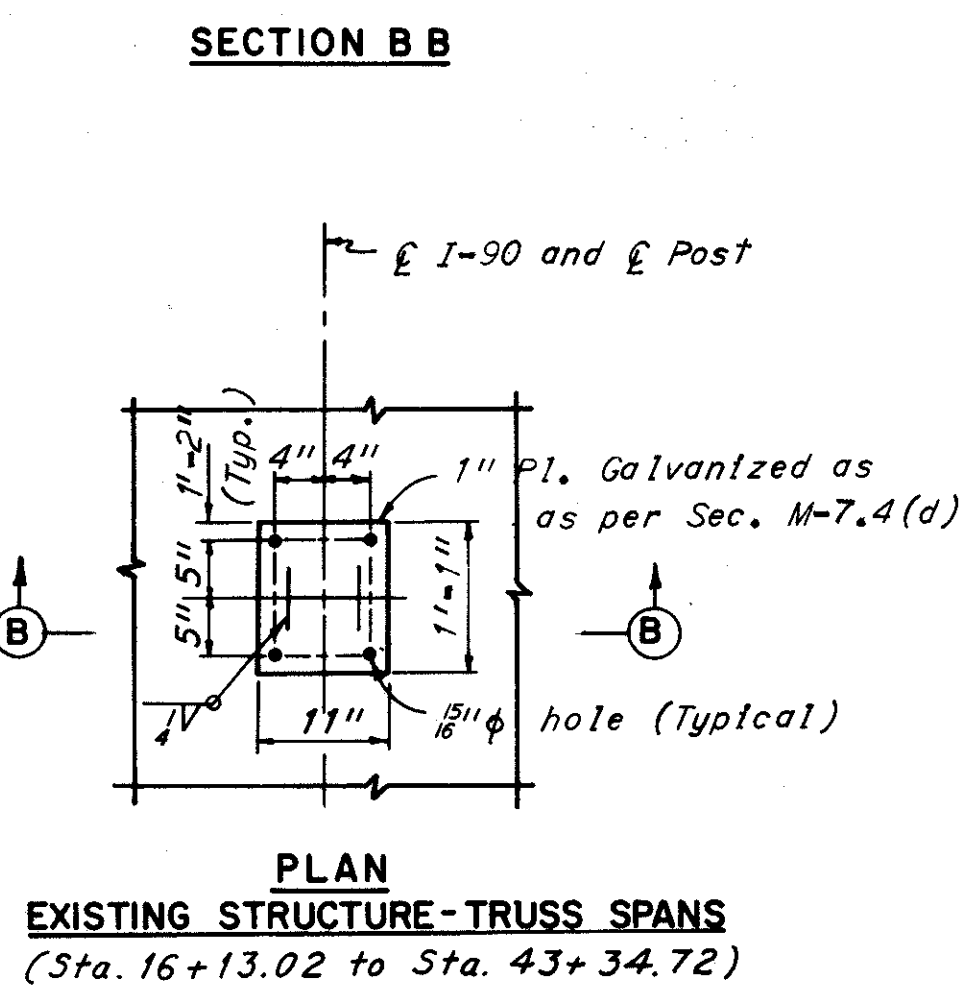
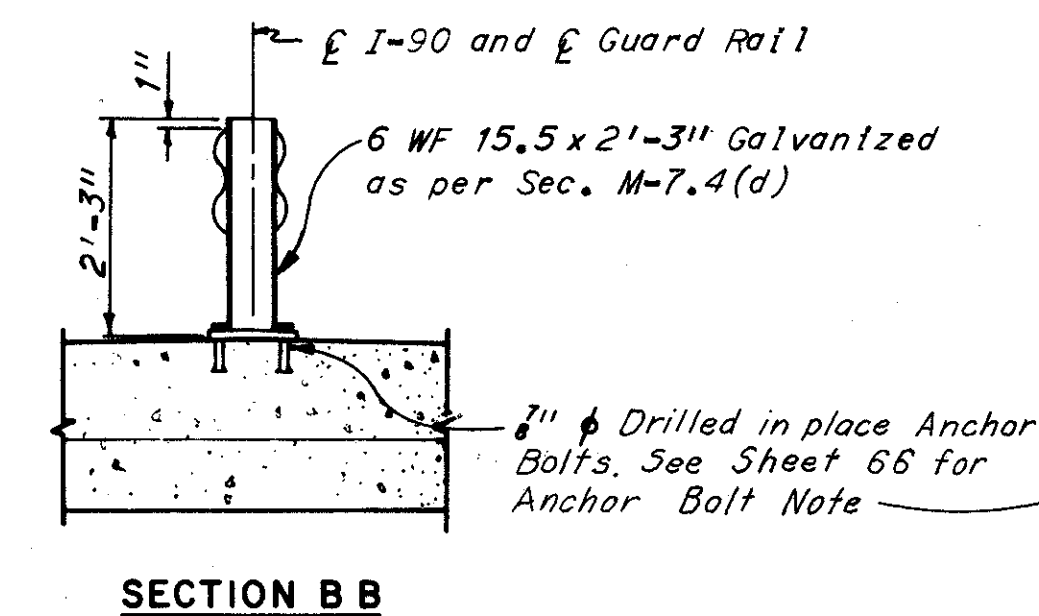
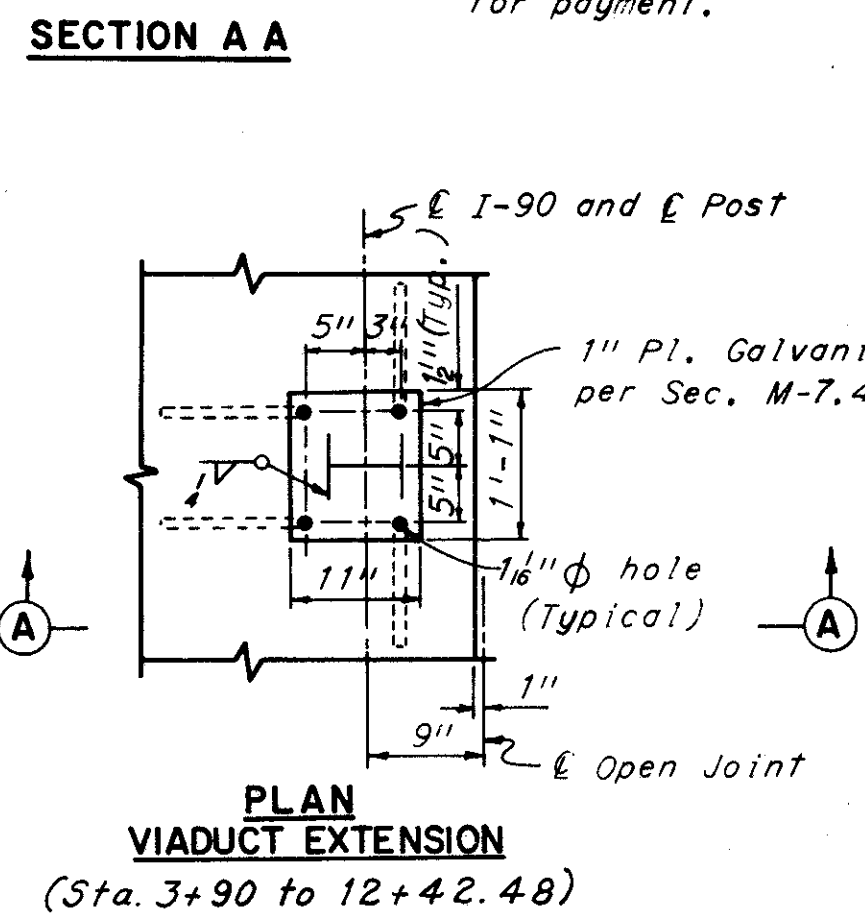
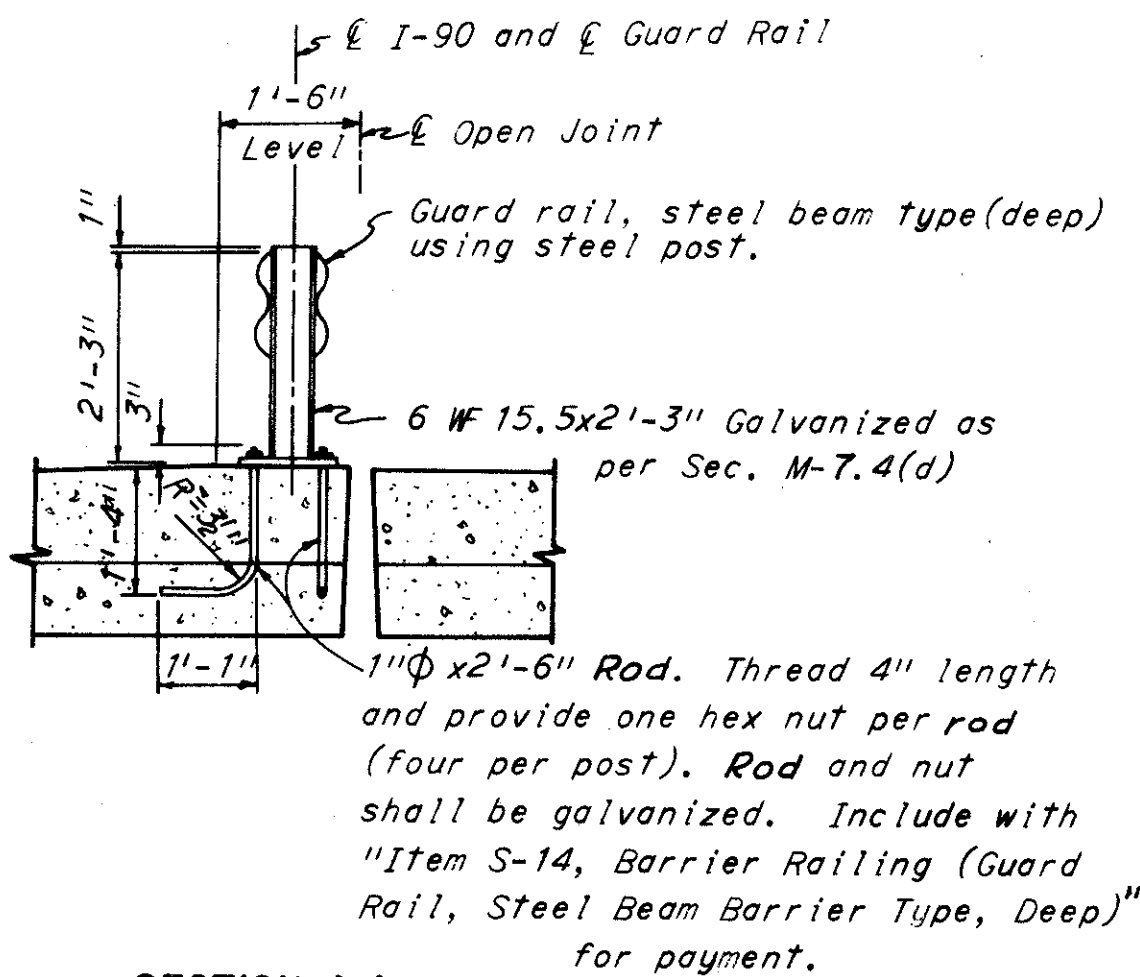
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN R.A.B. TRACED DATE 3-23-64  
CHECKED W.F. DATE 4-1-64  
REVIEWED P.E.E. DATE 4-16-64  
REVISED

SHEET 61



**BARRIER GUARD RAIL POST SPACING ON EXISTING STRUCTURE**



**SPECIAL PANEL AT EXPANSION JOINTS**

Notes:  
 Steel post spacing is measured from  $\bar{E}$  Splice to  $\bar{E}$  Splice.  
 For additional guard rail details, see Ohio Standard Drawing I-15 (No. 2-A).  
 For guard rail post locations between Stations 3+90.00 and 12+42.48 see sheet 28.  
 Payment for barrier guard rail shall be made at the contract unit price bid per linear foot for Item S-14, Barrier Guard Rail, (Type,  $\bar{E}$  Splice) with steel posts, and shall include payment for Anchor bolts, washers and all items necessary to complete the installation.  
 Guard rail shall be galvanized in accordance with Item I-15.

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

**MEDIAN BARRIER GUARD RAIL  
 STA. 3+91.25 TO STA. 54+92.33**

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY: AAB	TRACED	CHECKED BY: JLD
DATE: 1/29/64	DATE:	DATE: 4-14-64
		REVIEWED BY: JLD
		DATE: 4-14-64

SHEET 62

**BARRIER GUARD RAIL DETAILS**

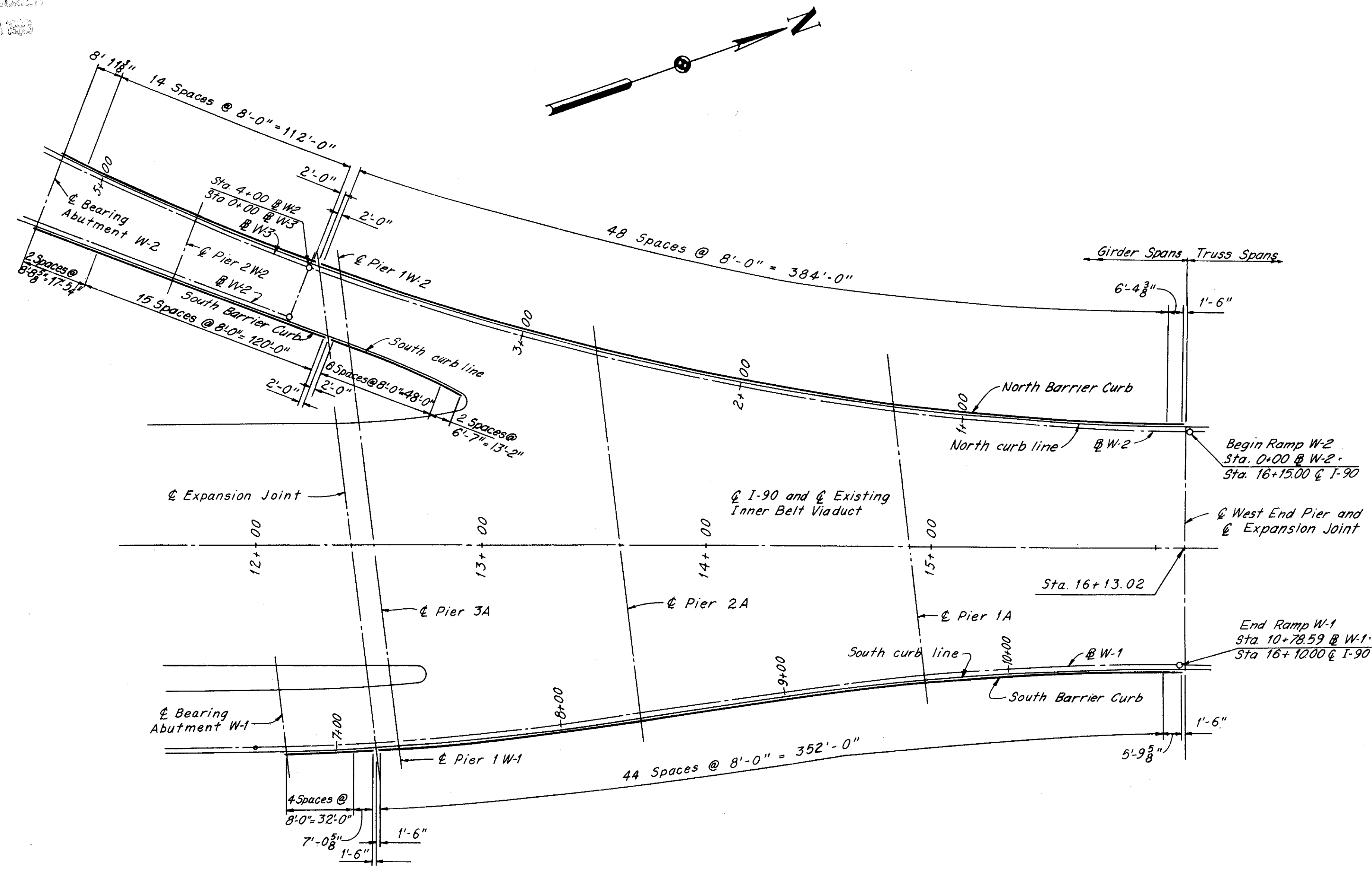


REVISIONS  
FEB 24 1964

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

63  
77

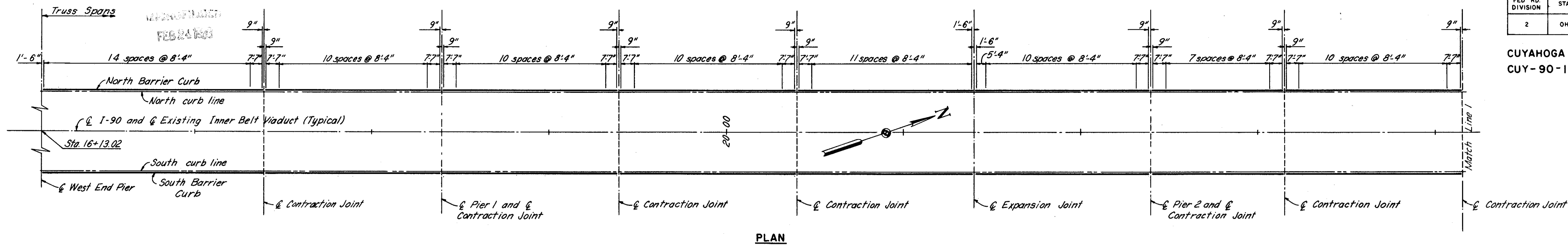
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



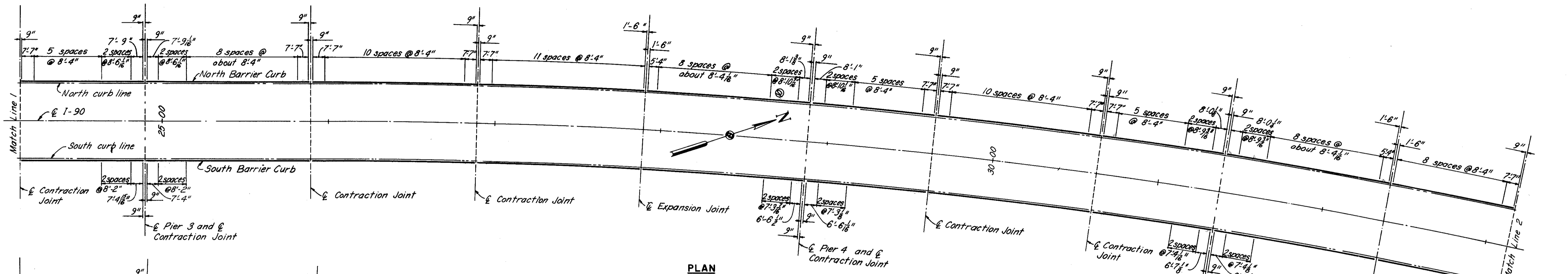
PLAN

Notes:  
For barrier curb details see sheet 66.  
"Spaces" denotes Barrier Curb post spacing.

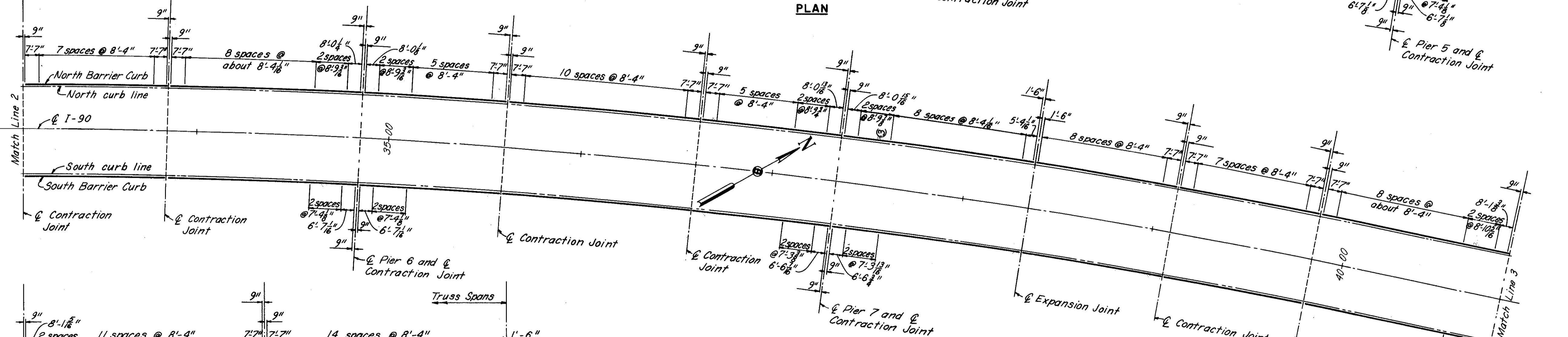
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>BARRIER CURB EXISTING INNER BELT VIADUCT</b>			
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN <i>CHB</i>	TRACED	CHECKED <i>TMA</i>	REVIEWED <i>WVF</i>
DATE 3-30-64	DATE	DATE 3-31-64	DATE 4-1-64
			SHEET 63



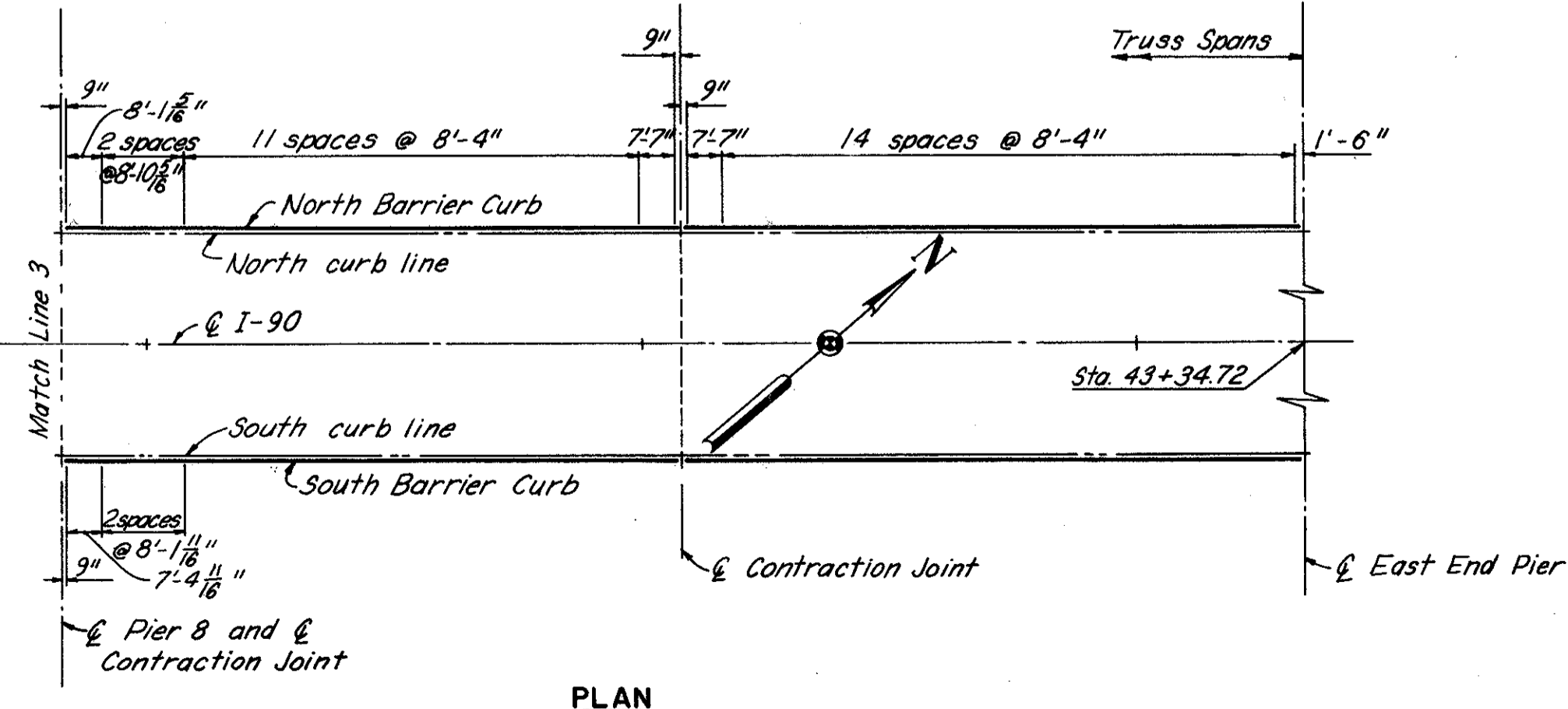
PLAN



PLAN



PLAN



PLAN

Notes:  
Post spacing for the South Barrier Curb is the same as the North Barrier Curb, except as noted.  
For barrier curb details see sheet 66.

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

**BARRIER CURB  
EXISTING INNER BELT VIADUCT**

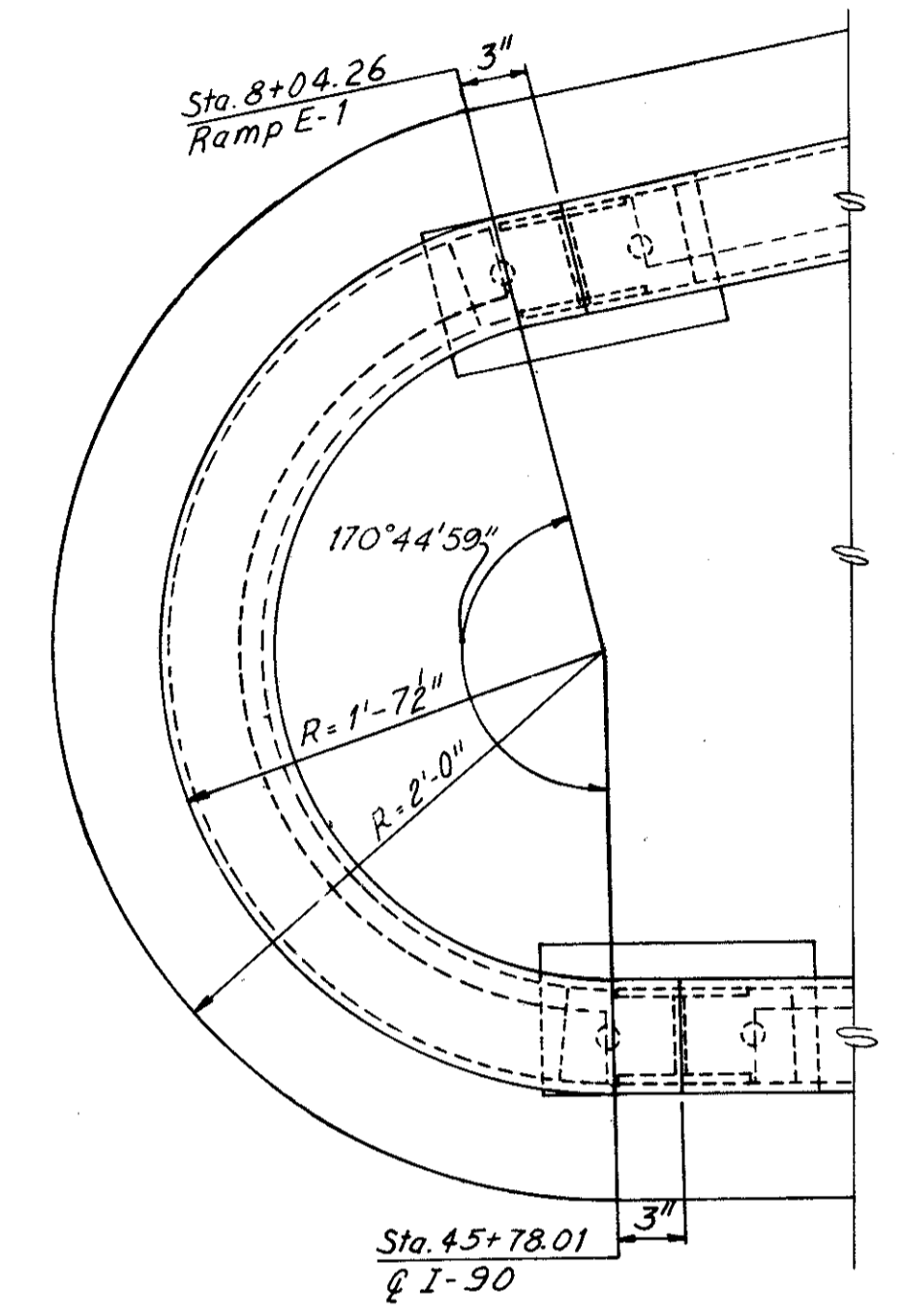
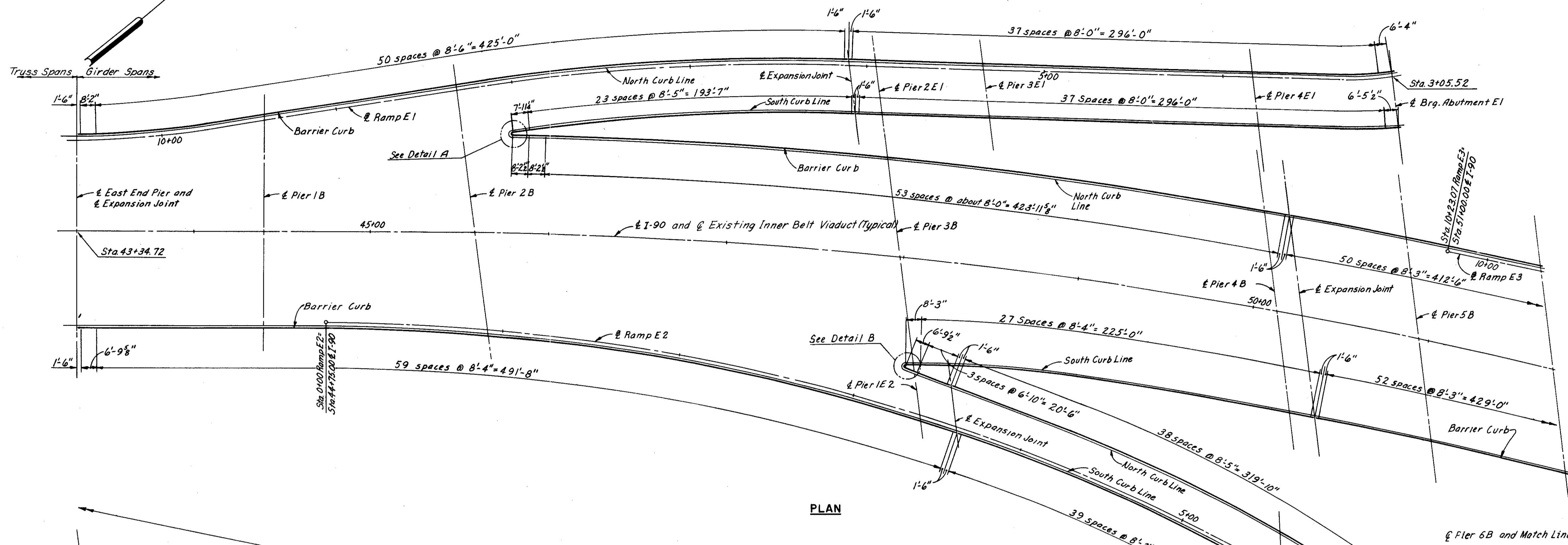
CLEVELAND CUYAHOGA COUNTY OHIO  
DRAWN *CHB* TRACED CHECKED *JMC* REVIEWED *WJ* REVISIONS  
DATE *2-28-64* DATE *3-24-64* DATE *4-1-64* SHEET **64**

REVISIONS  
FEB 24 1966

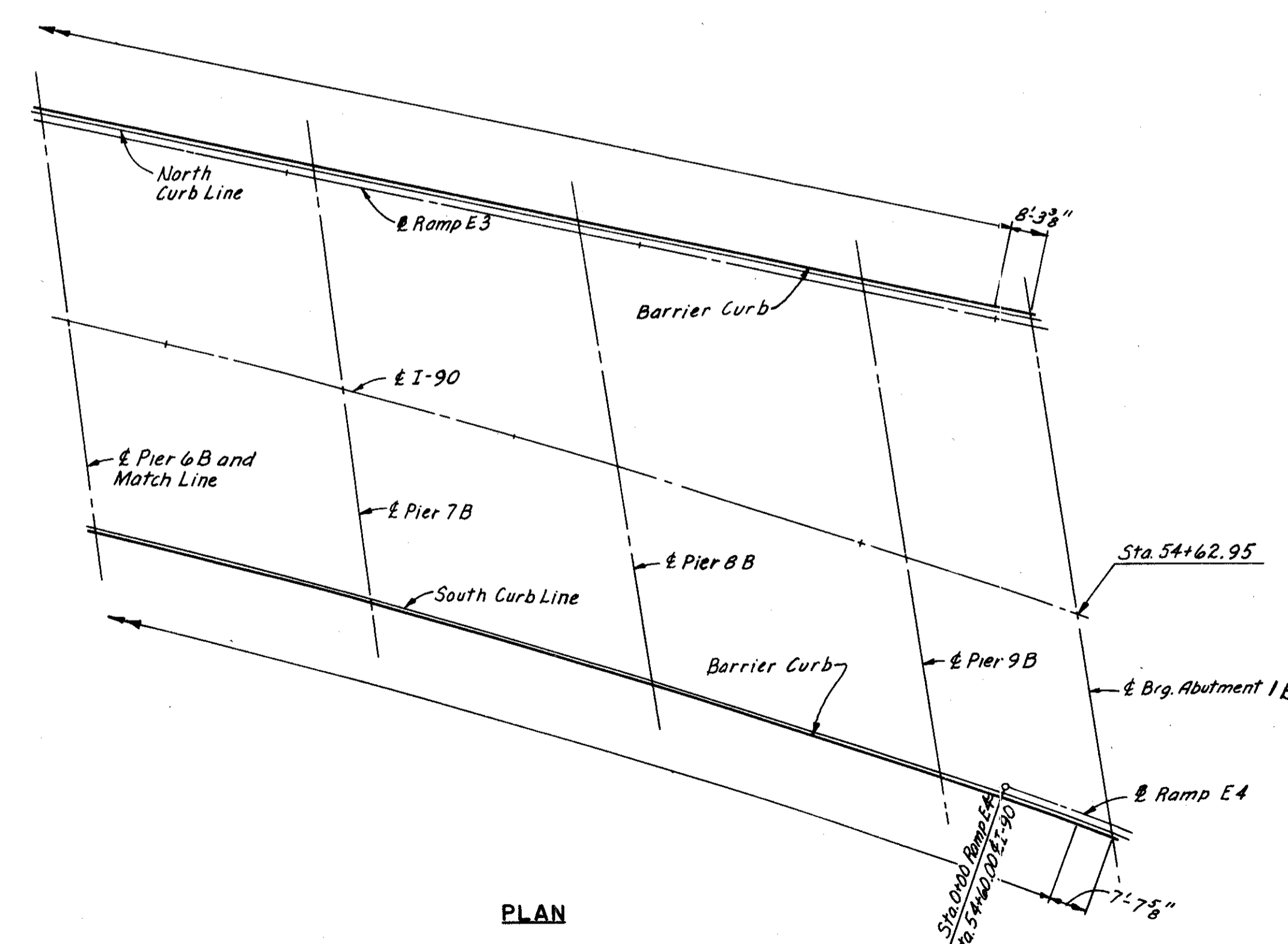
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

65  
77

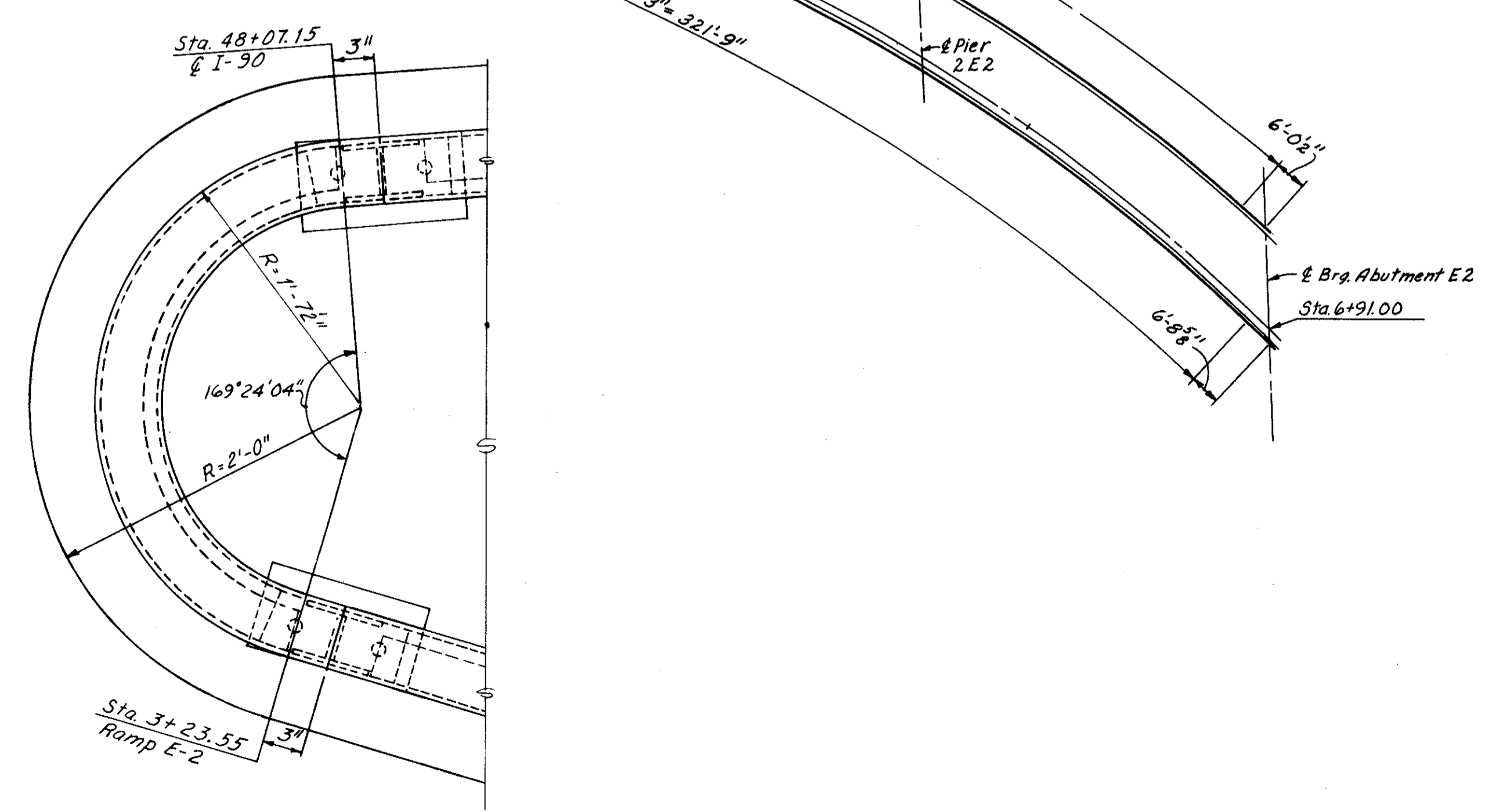
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



DETAIL A



PLAN



DETAIL B

Notes:  
For barrier curb details see sheet 66.  
"Spaces" denotes Barrier Curb post spacing.

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

### BARRIER CURB EXISTING INNER BELT VIADUCT

CLEVELAND CUYAHOGA COUNTY OHIO

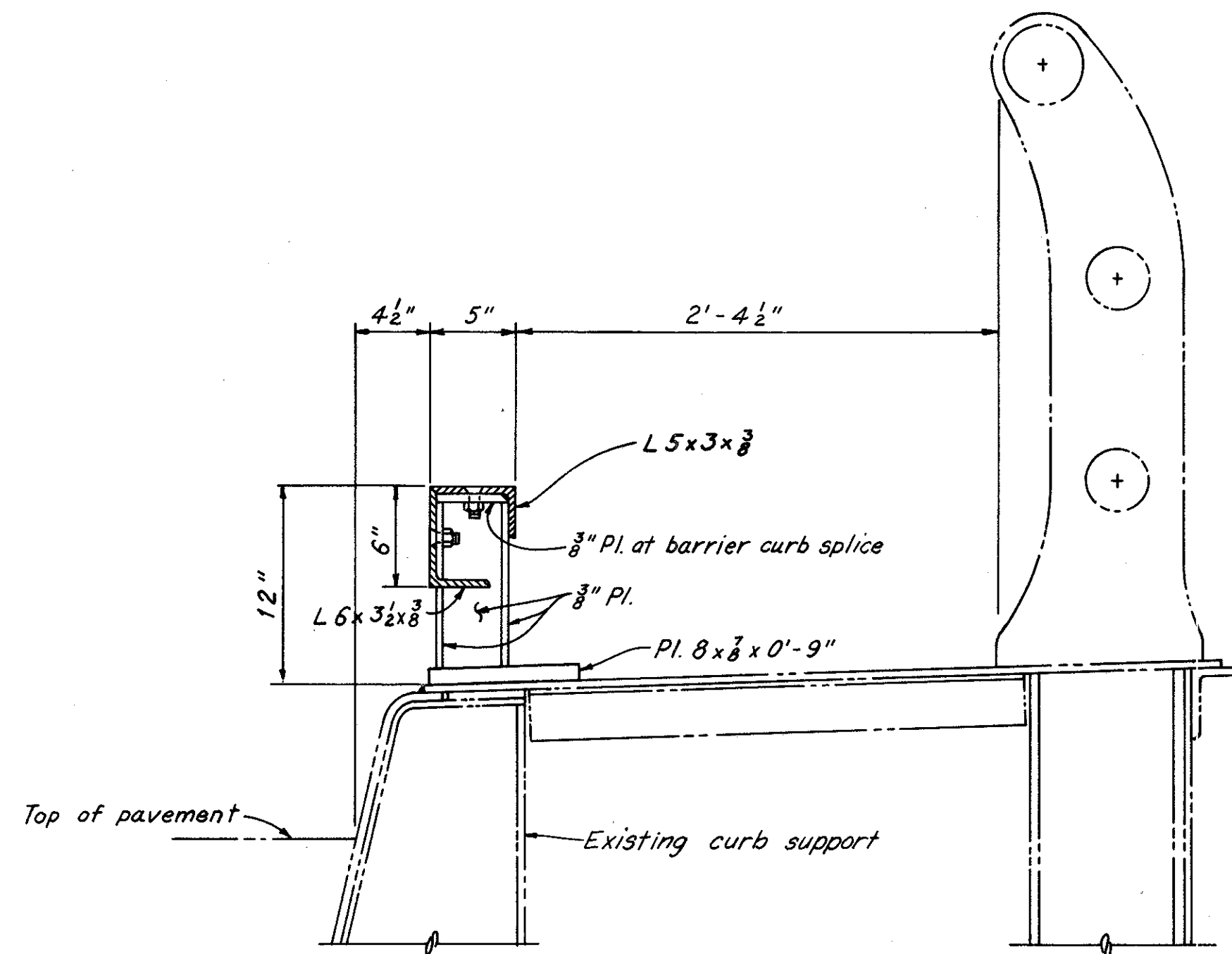
DRAWN BY DATE	TRACED DATE	CHECKED BY DATE	REVIEWED BY DATE	REVISED
DATE 3-29-64	DATE 3-29-64	DATE 4-1-64		SHEET 65

REVISED  
FEB 24 1960

FED RD DIVISION	STATE	PROJECT	
2	OHIO		

66  
77

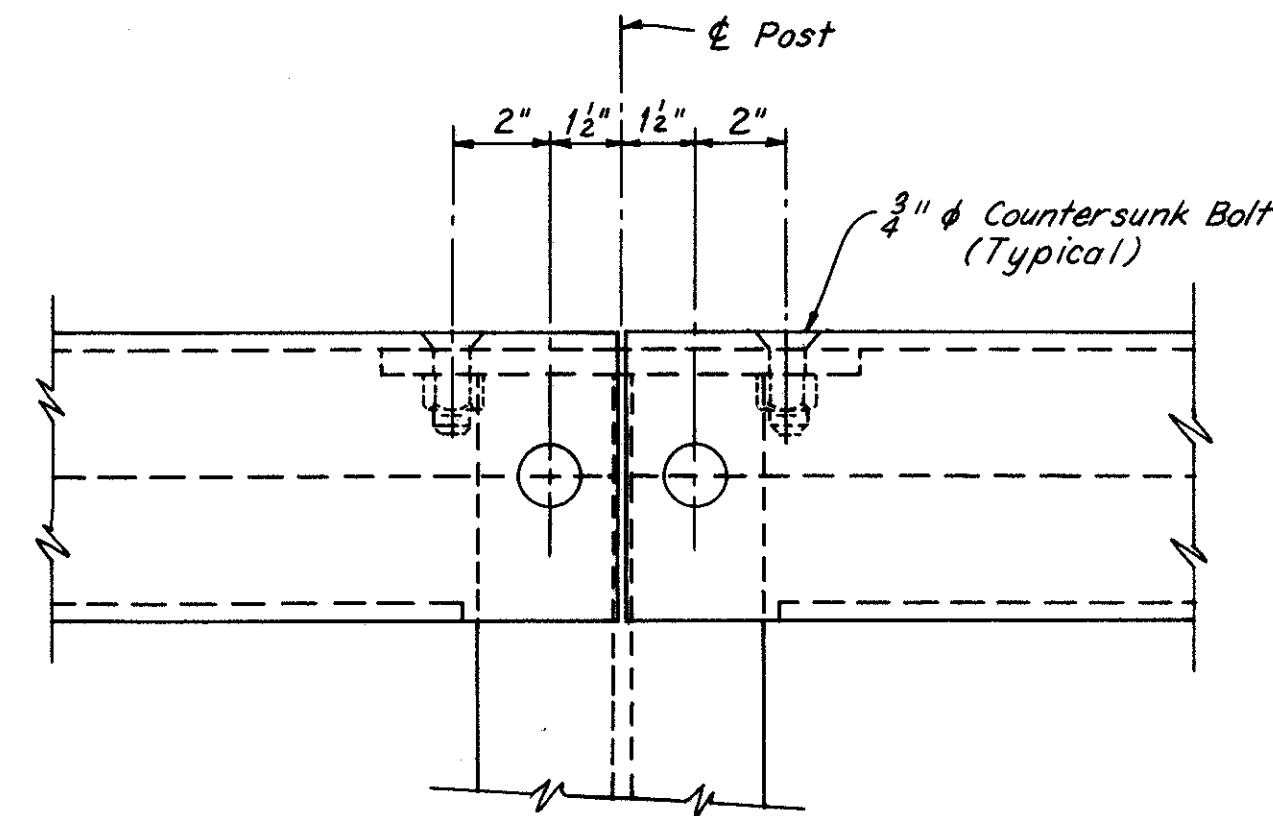
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



Note: Barrier curb posts are centered over curb supports.

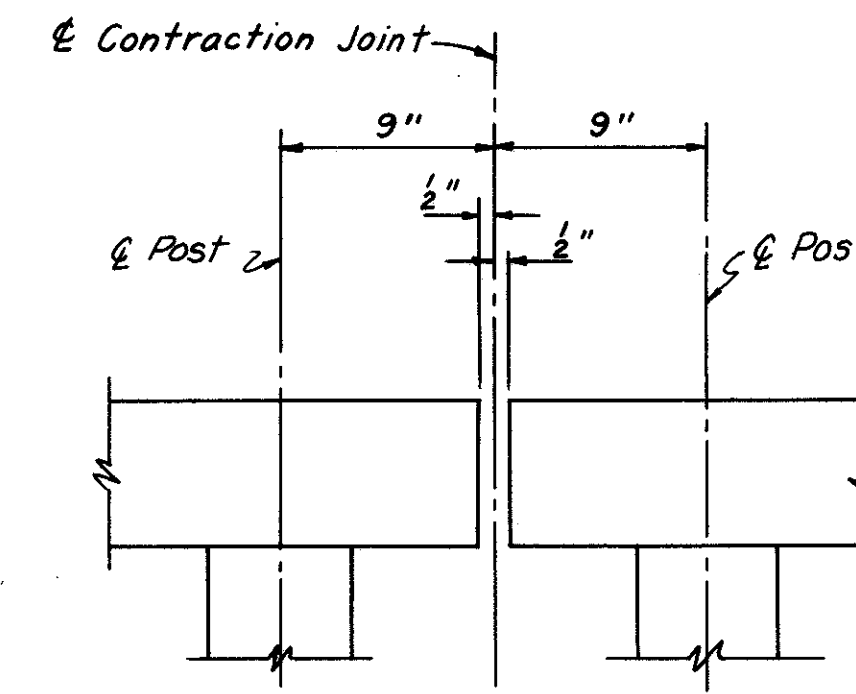
**BARRIER CURB DETAIL**

Existing Structure-Truss Spans  
(Sta. 16+13.02 to Sta. 43+34.72)  
Scale: 1 1/2" = 1'-0"



**DETAIL AT BARRIER CURB SPLICE**

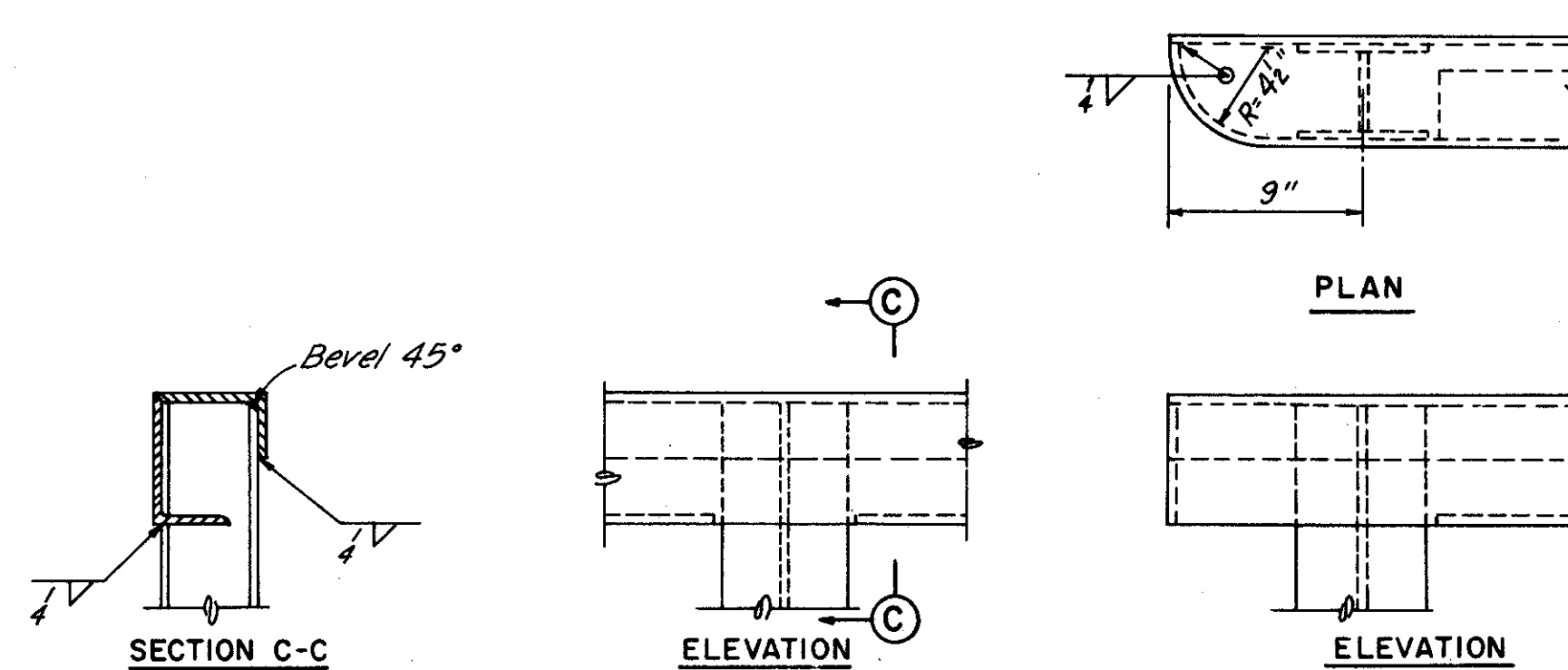
Scale: 3" = 1'-0"



**DETAIL AT CONTRACTION JOINT**

Scale: 1 1/2" = 1'-0"

\* Note:  
1'-6" Typical except at Expansion Joint on Ramp W-2.  
2'-0" at Expansion Joint on Ramp W-2.

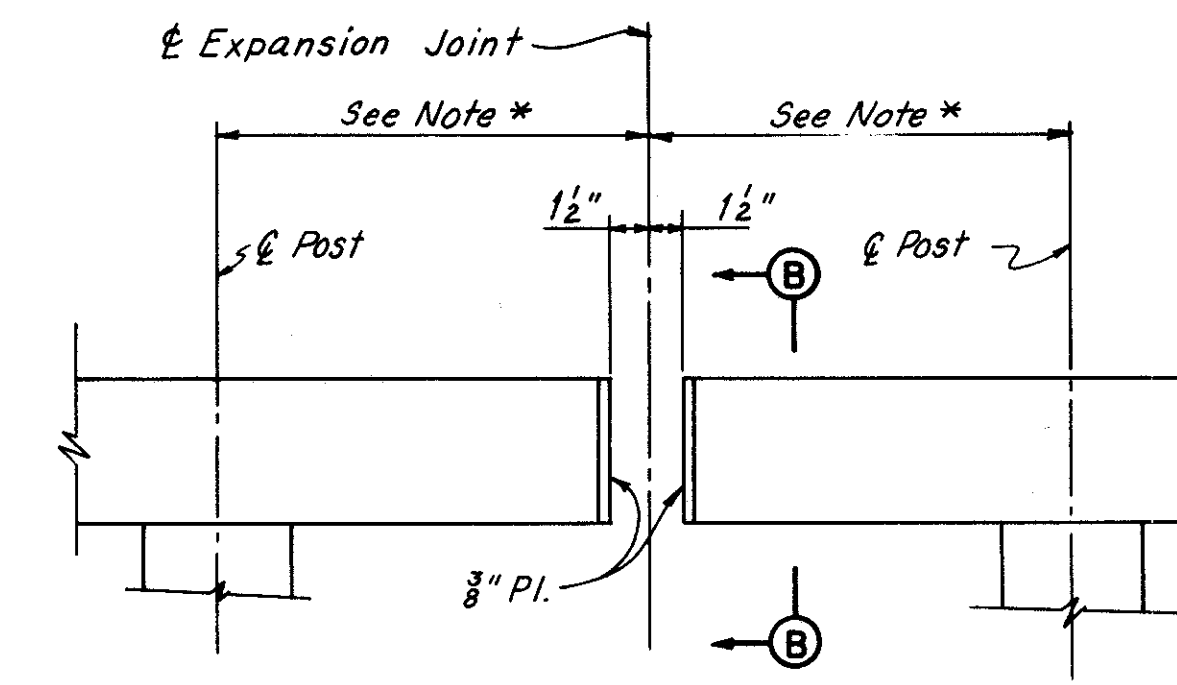


**DETAILS AT POST WITH NO CURB SPLICE**

Scale: 1 1/2" = 1'-0"

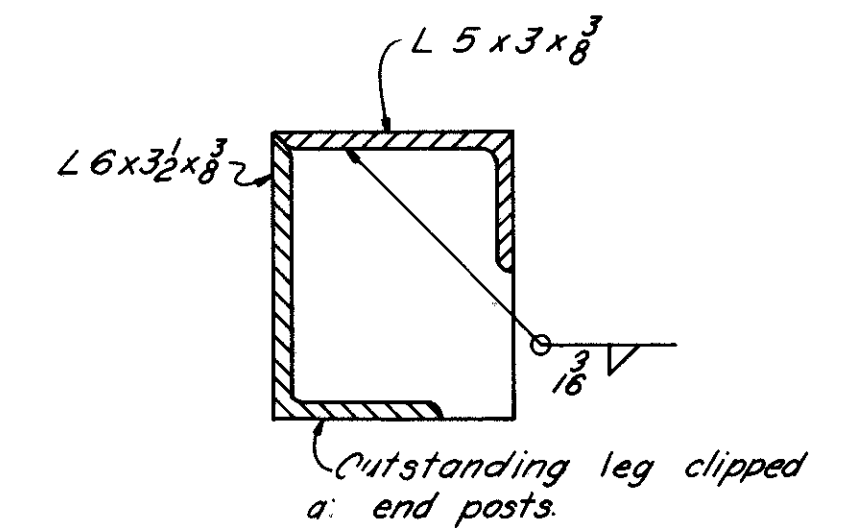
**DETAILS AT END POST**

Scale: 1 1/2" = 1'-0"



**DETAIL AT EXPANSION JOINT**

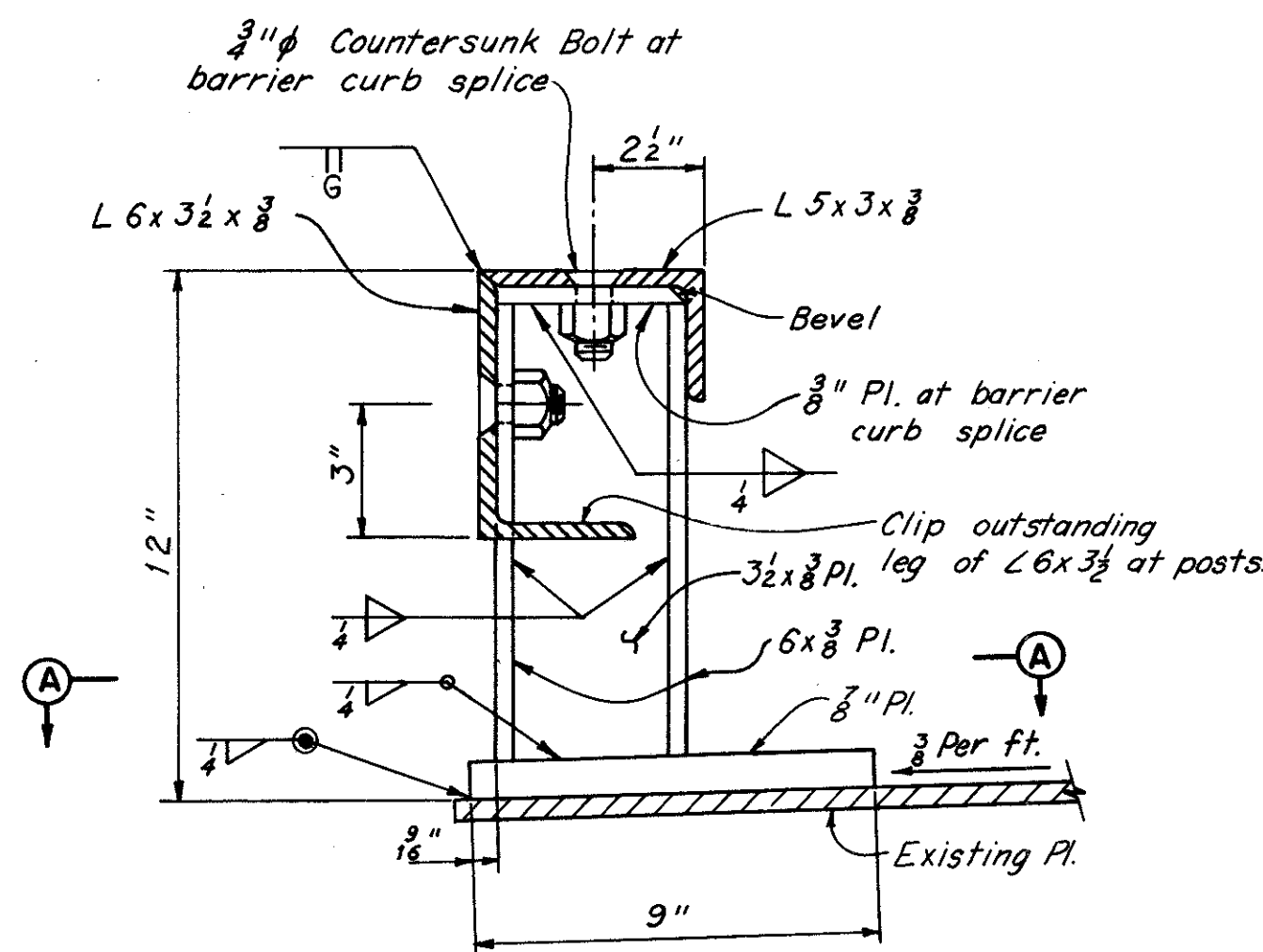
Scale: 1 1/2" = 1'-0"



**SECTION B-B**

Scale: 3" = 1'-0"

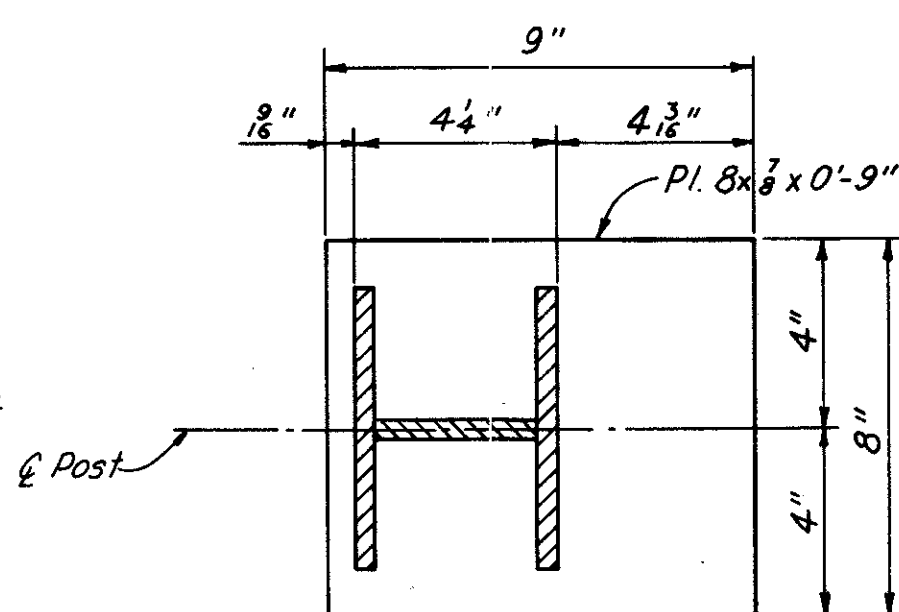
Notes:  
Barrier Curb shall preferably be fabricated in lengths not less than three panels each and shall be galvanized in accordance with Section M-7.4 (d).  
Payment for barrier curb shall be made at the contract unit price per linear foot bid for Item Special, Barrier Curb, and shall include payment for concrete anchors, bevelled washers and all items necessary to complete the installation.  
Anchor bolts shall be 3/8 inch diameter drilled in place and capable of developing a pullout resistance of not less than 18,000 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.  
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 moisture. The filler being subject to approval of the Engineer.



**POST DETAIL**

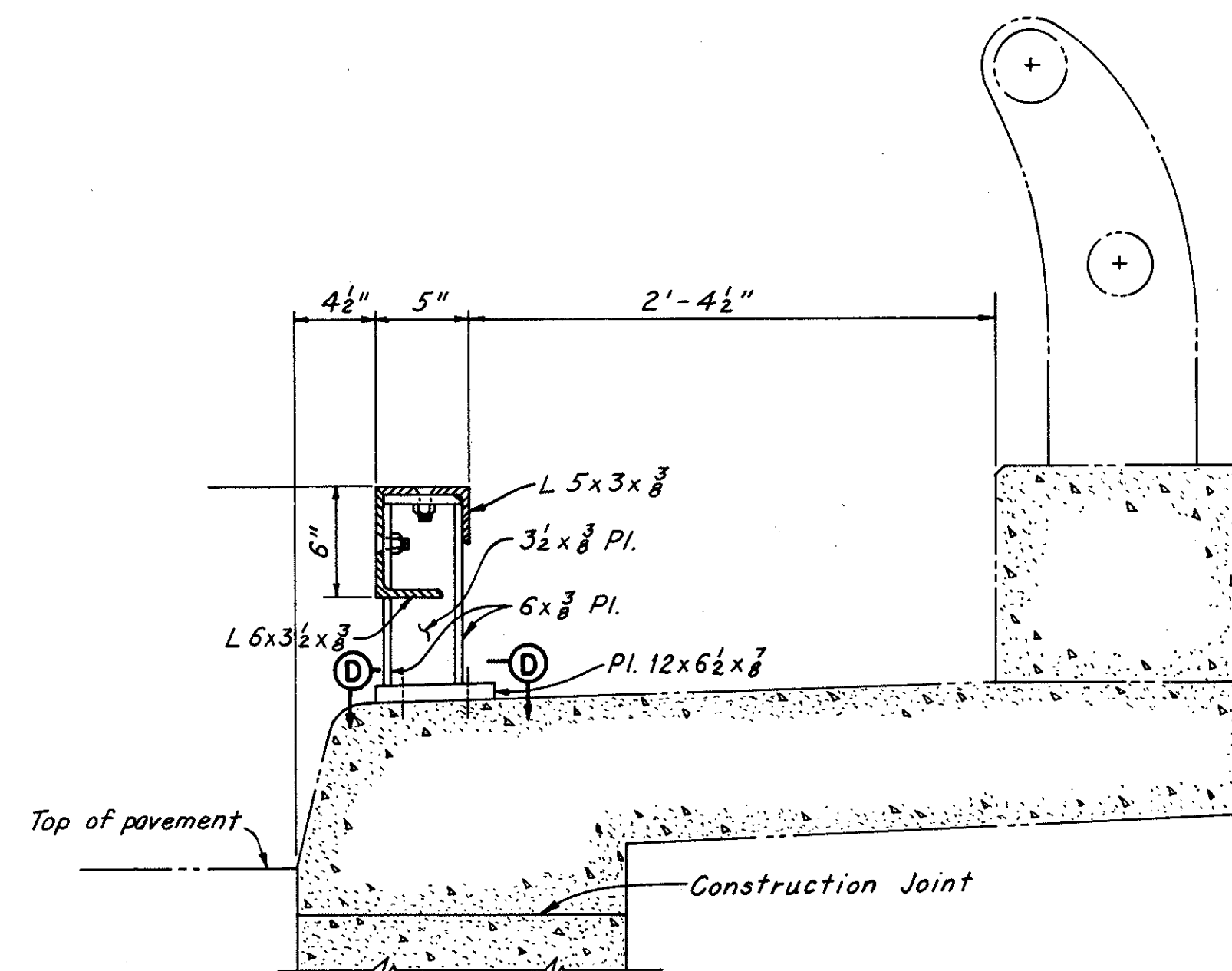
Scale: 3" = 1'-0"

Note:  
Post detail shown for truss spans, girder spans same except for base plate.



**SECTION A-A**

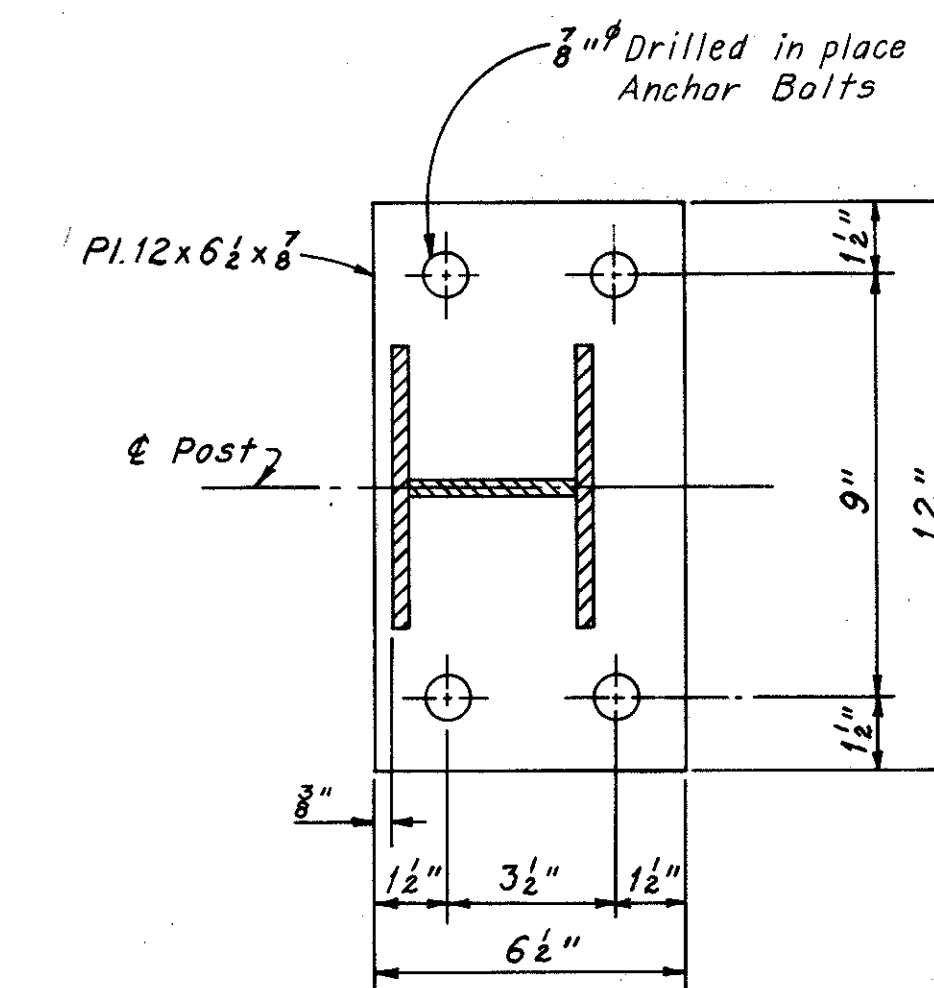
Scale: 3" = 1'-0"



**BARRIER CURB DETAIL**

Existing Structure - Girder Spans

Scale: 1 1/2" = 1'-0"



**SECTION D-D**

Scale: 3" = 1'-0"

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

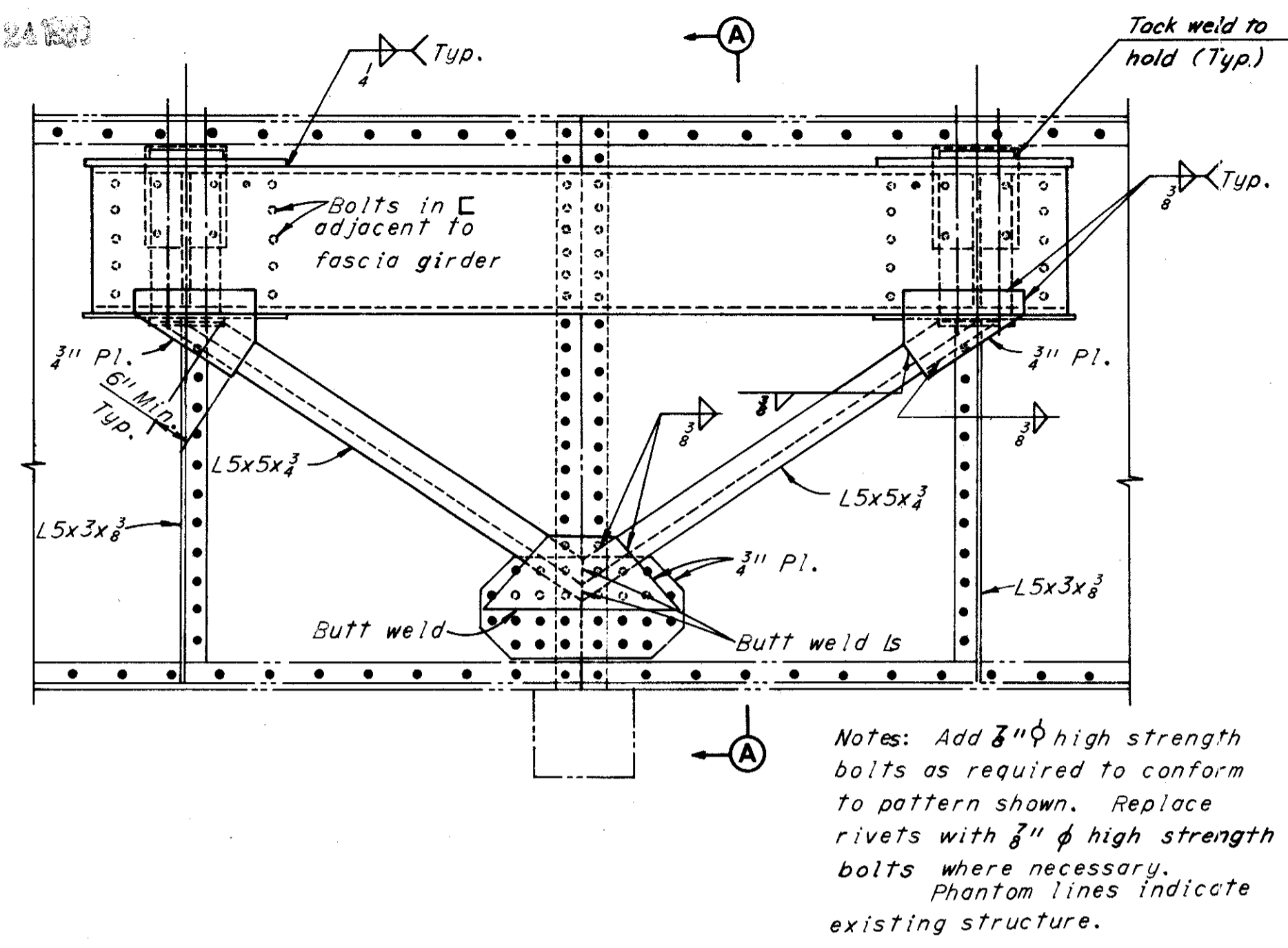
**BARRIER CURB  
EXISTING INNER BELT VIADUCT**

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN C.H.B. DATE 2-28-60	TRACED DATE	CHECKED DATE 4-1-60
REVIEWED DATE 4-14-60	REVISOR	SHEET 66

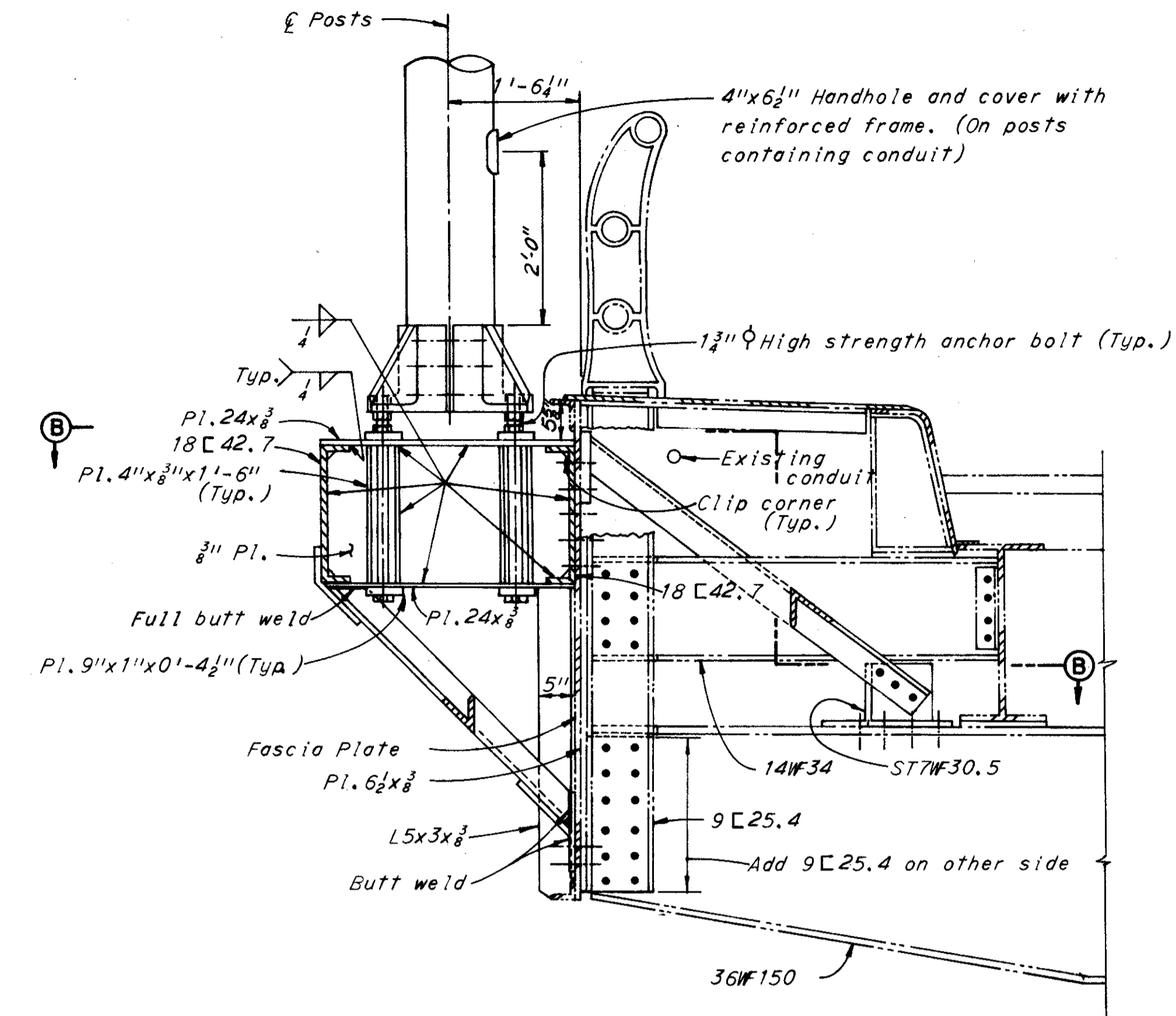
WORKING DRAWING  
FEBRUARY 1967

FED. RD. DIVISION	STATE	PROJECT	71 77
2	OHIO		

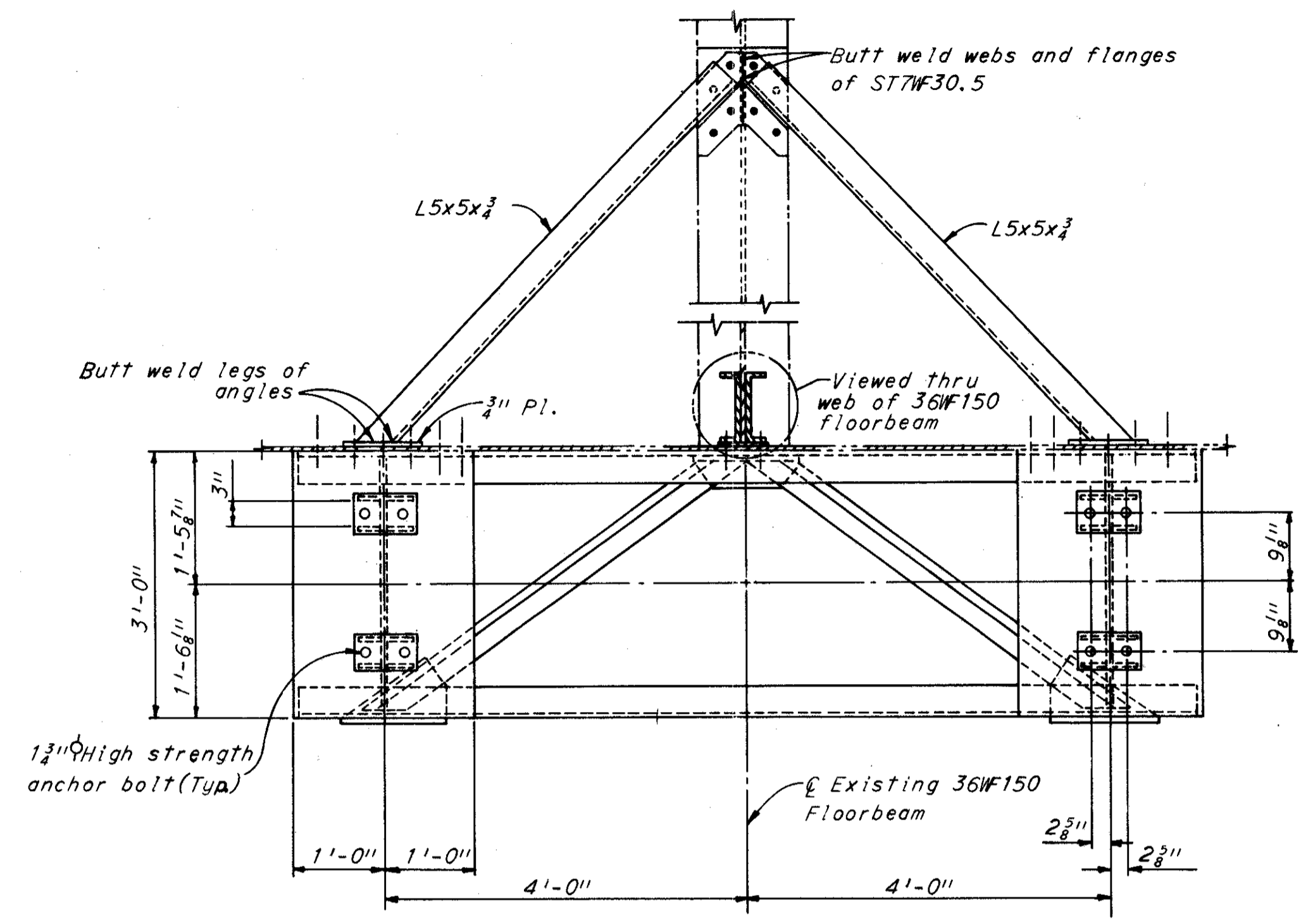
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



ELEVATION

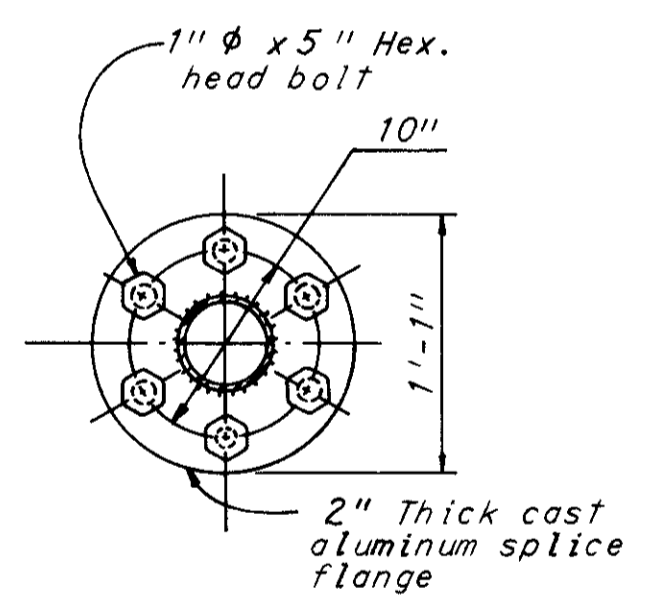
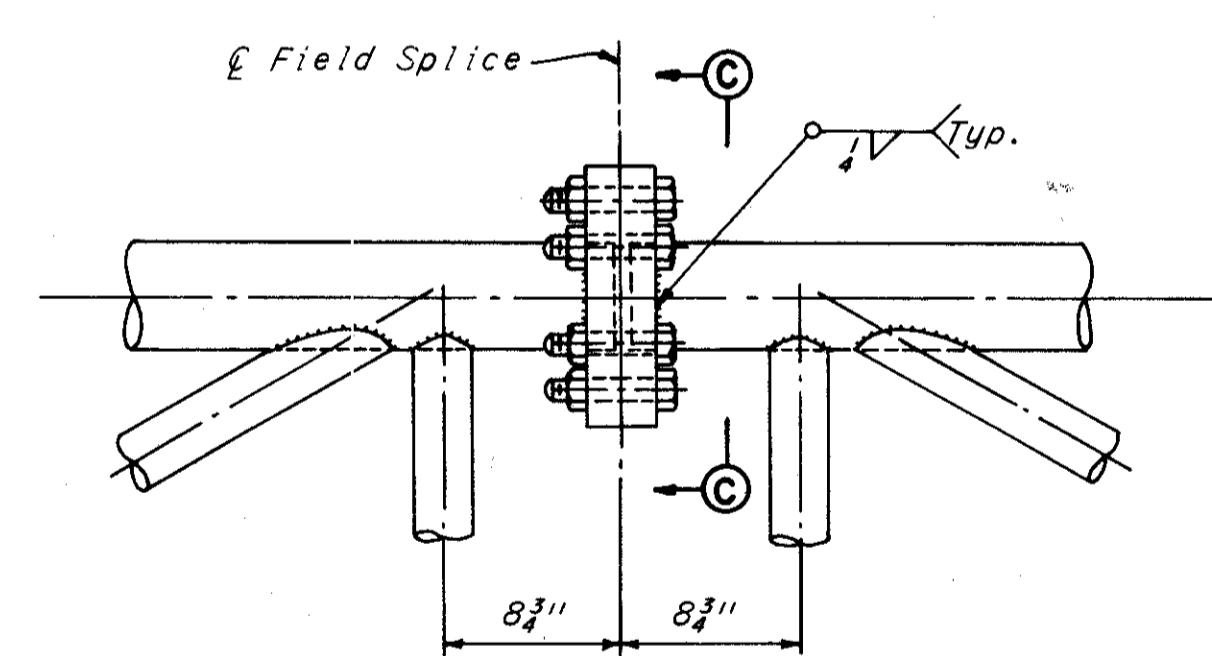
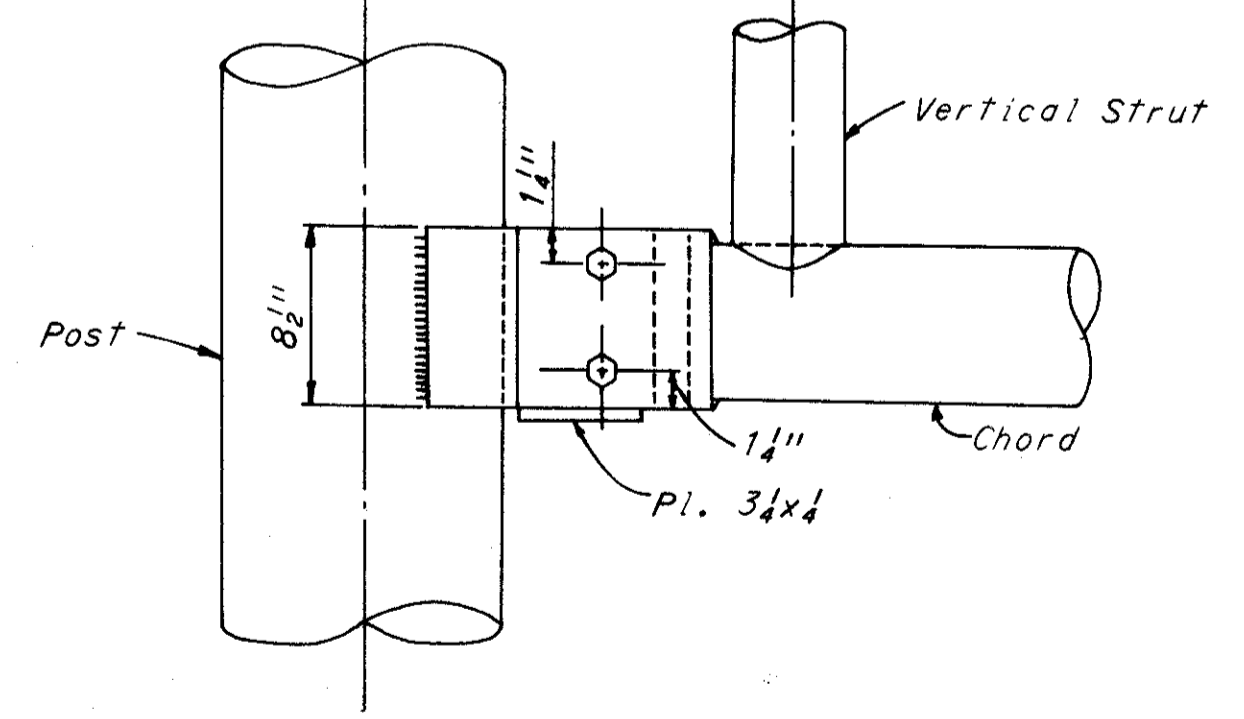
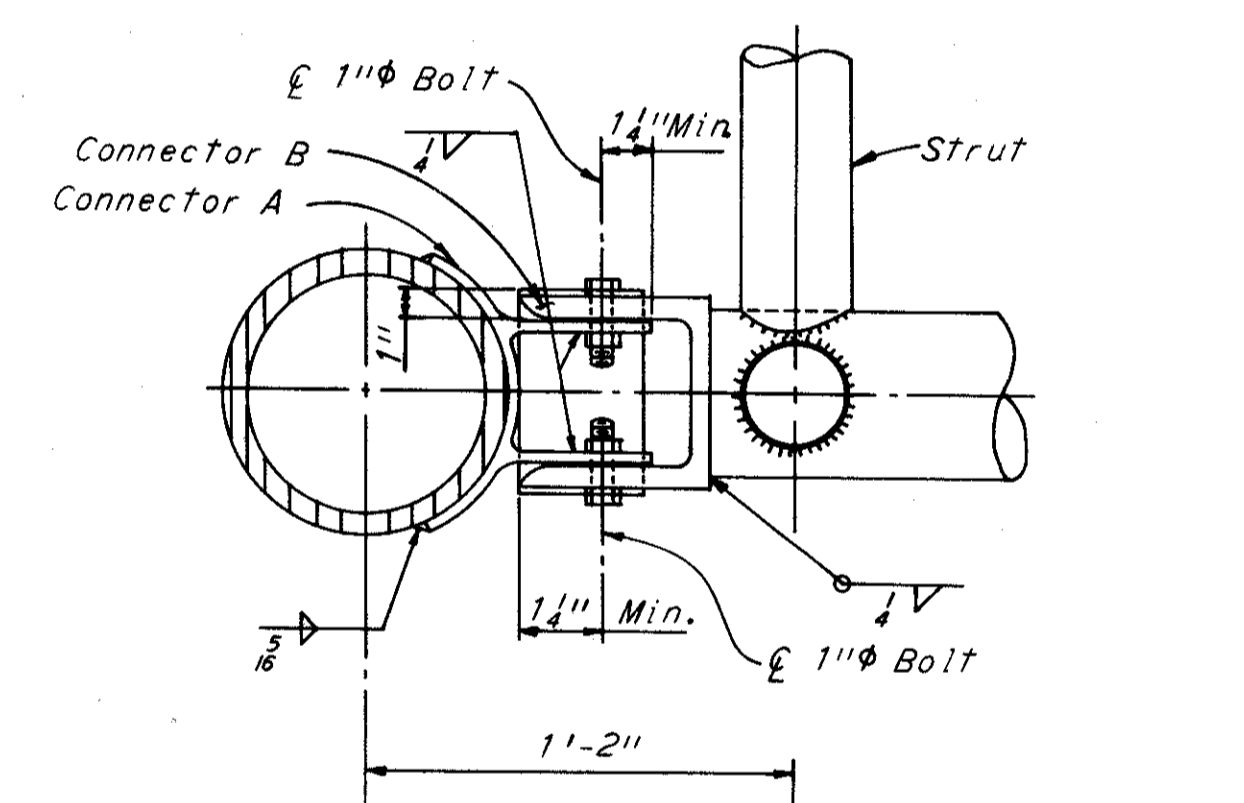


SECTION A-A

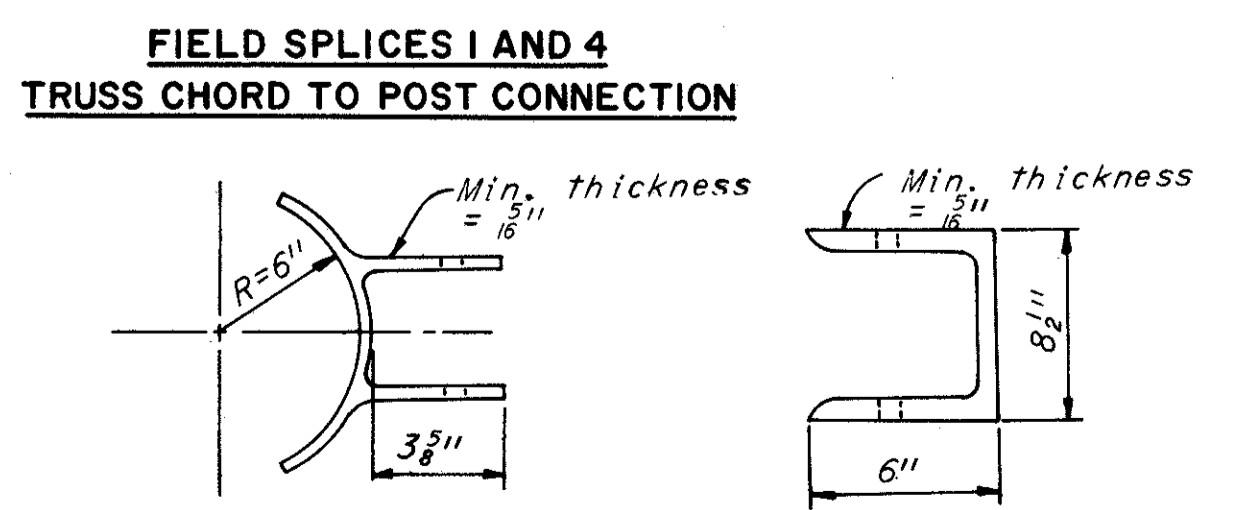


SECTION B-B

BRACKET DETAILS

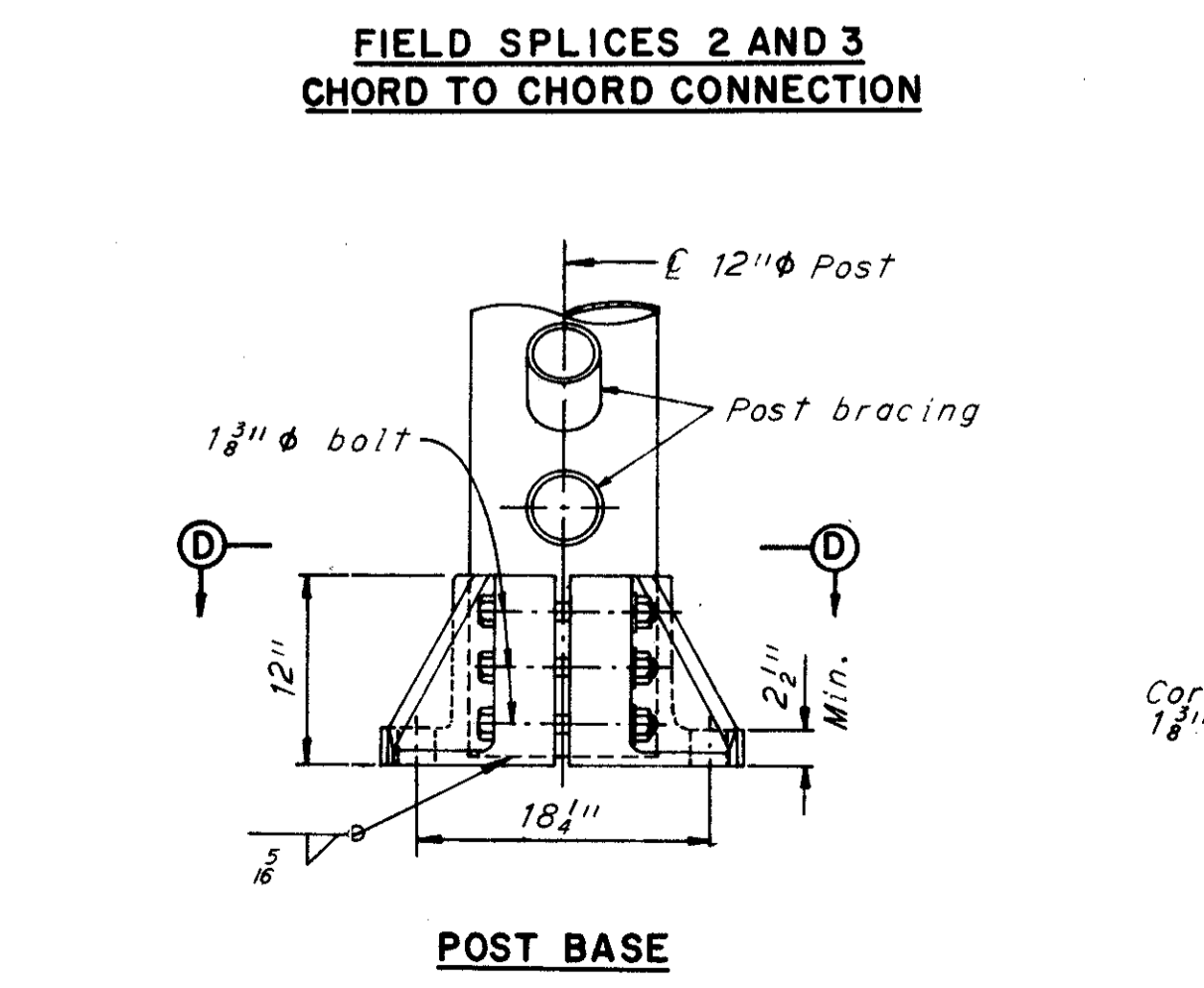


SECTION C-C

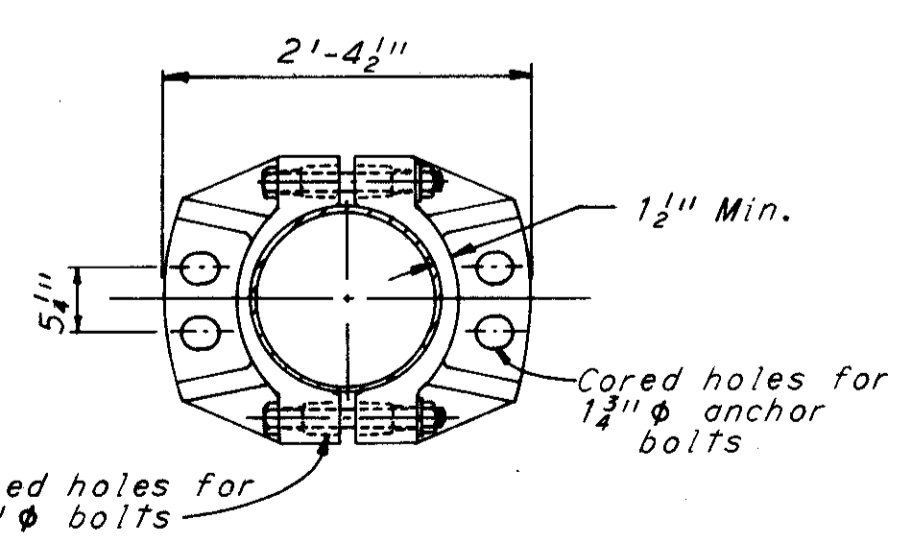


CONNECTOR A

CONNECTOR B



POST BASE



SECTION D-D

NOTES:

- MATERIALS**
- The Overhead Span Truss and End Frames shall be aluminum, and the Brackets shall be steel.
  - Span Truss and End Frames, including hardware, shall be in accordance with "Supplemental Specification I-129" unless otherwise noted.
  - Materials shall conform to the following ASTM designations:
    - Posts, truss chords, post bracing members and sway braces--ASTM B-235, alloy 6062-T6.
    - Truss bracing members--ASTM B-235, alloy 6062-T6.
    - Standard structural shapes--ASTM B-308, alloy 6062-T6.
    - Connections between truss chords and posts--ASTM B-221, alloy 6062-T6.
    - Pipe handrail--ASTM B-241, alloy 6063-T6.
    - Walkway grating--ASTM B-221, alloy 6062-T6.
    - Sheet and plate--ASTM B-209, alloy 6061-T6.
    - Post bases--ASTM B-26, alloy 356-T6.
    - Chord splicing flanges--ASTM B-26, alloy 356-T7.
    - Post caps--ASTM B-26, alloy 356-F.
    - Anchor bolts--ASTM A-307, galvanized steel.
    - All Span truss bolts--ASTM B-211, alloy 2024-T4, and with an anodic coating 0.0002 inch minimum thickness with dichromate or boiling water seal. Bolts must be coated with a suitable lubricant.
    - Washers--ASTM B-209, alloy 2024-T4.
    - Nuts (3/8 inch tap and over)--ASTM B-211, alloy 6262-T9, coated with a suitable lubricant.
    - Weld filler wire--ASTM B-285, alloy ER5356 or ER5556.
    - Structural steel--ASTM A36-basic unit stress 20,000psi.
    - High strength bolts--ASTM A-325.

DESIGN

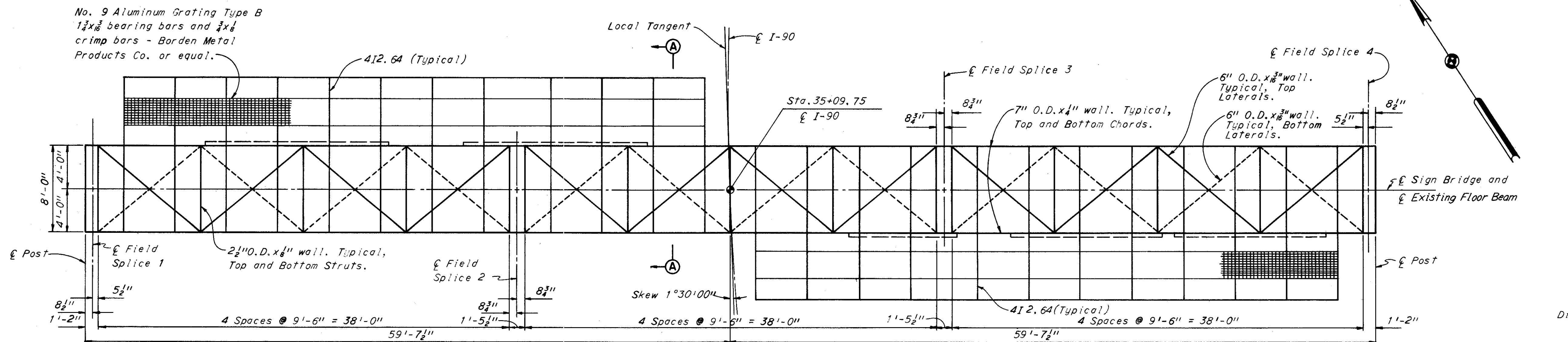
The design of overhead supports is in accordance with "A.A.S.H.O. Specification for the Design and Construction of Structural Supports for Highway Signs" adopted June 12, 1961.

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

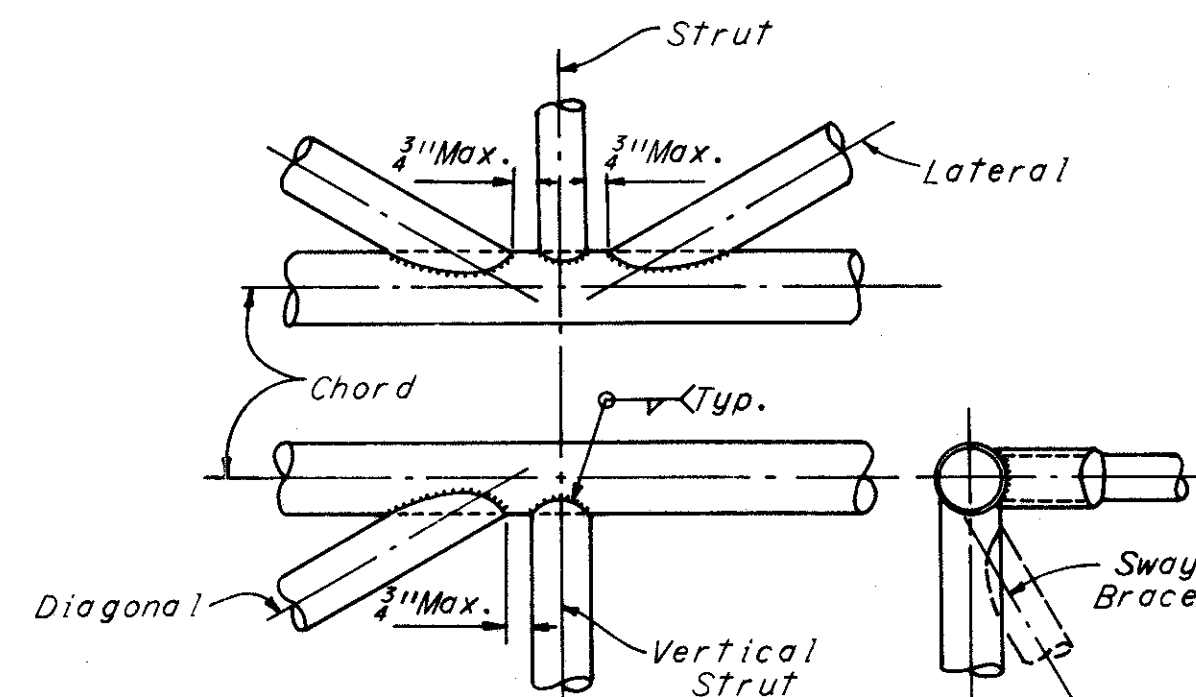
**OVERHEAD SIGN SUPPORT NO. 4  
EXISTING INNER BELT VIADUCT**

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN LED	TRACED	CHECKED CNB
DATE 3-26-67	DATE	DATE 4-1-64
		REVIEWED WFF
		DATE 4-14-66
		REVISOR
		SHEET 71

SIGN SUPPORT DETAILS

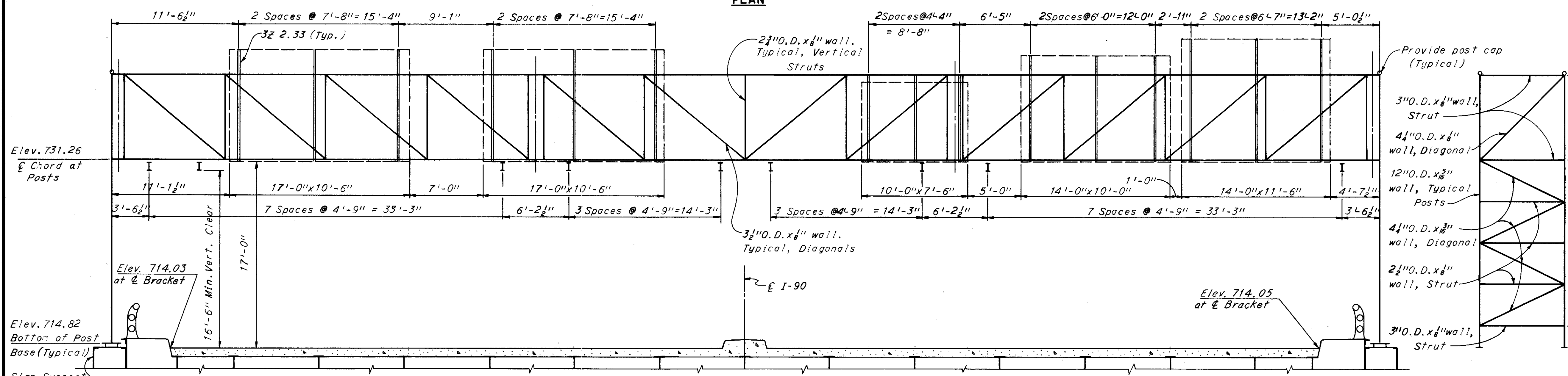


PLAN



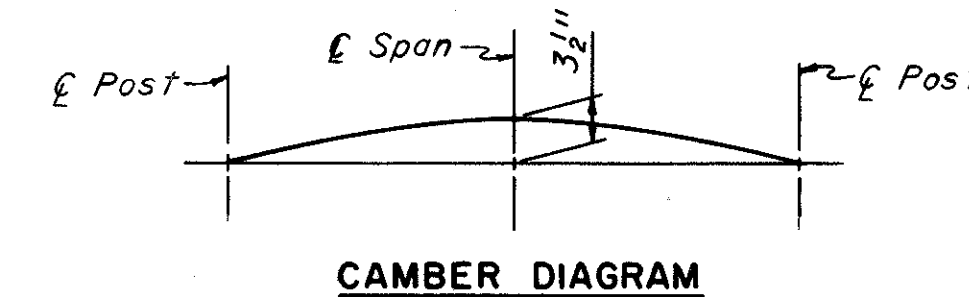
Note: Fillet weld size to be tube thickness plus 1/16".

TYPICAL JOINT DETAILS



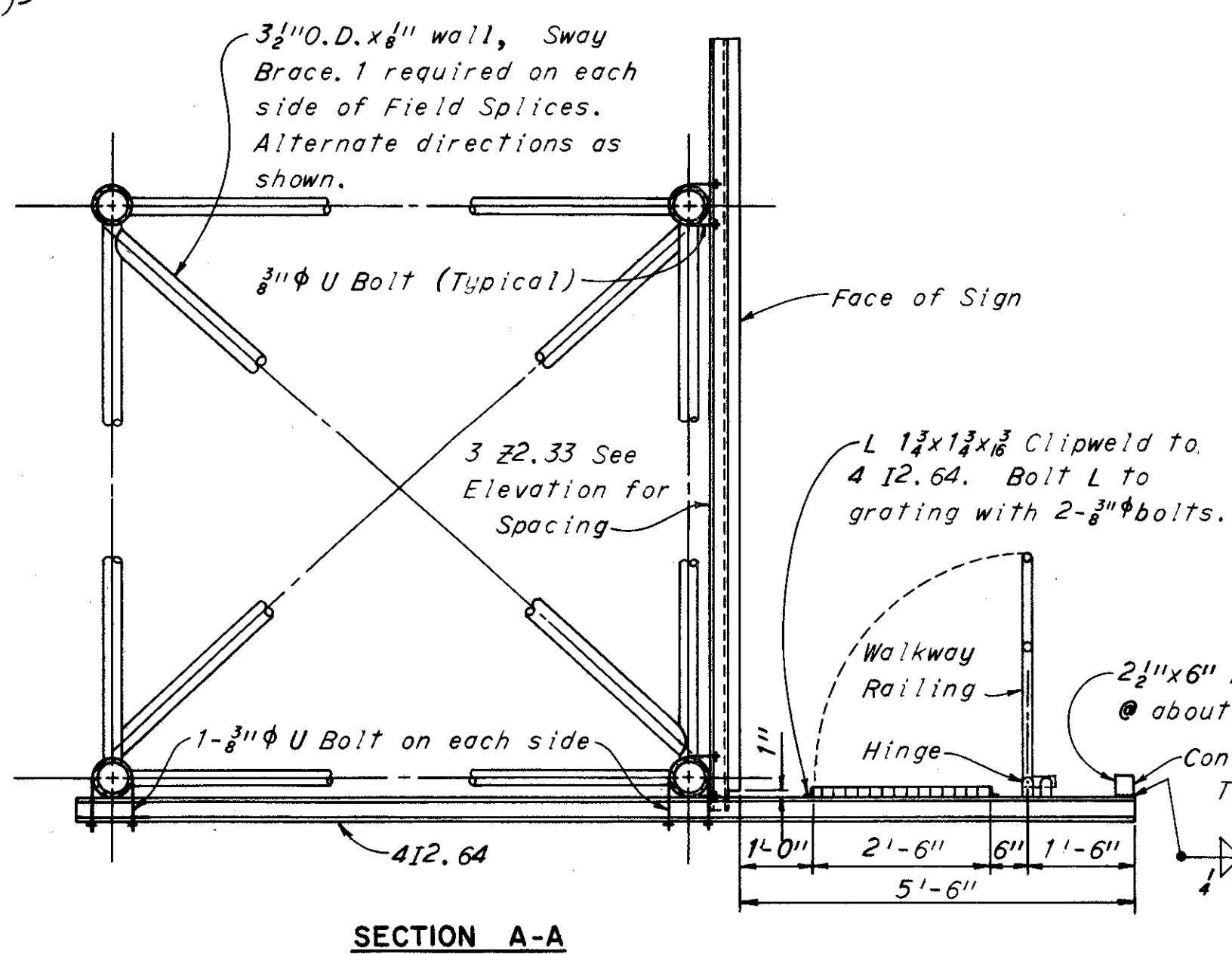
ELEVATION

END ELEVATION

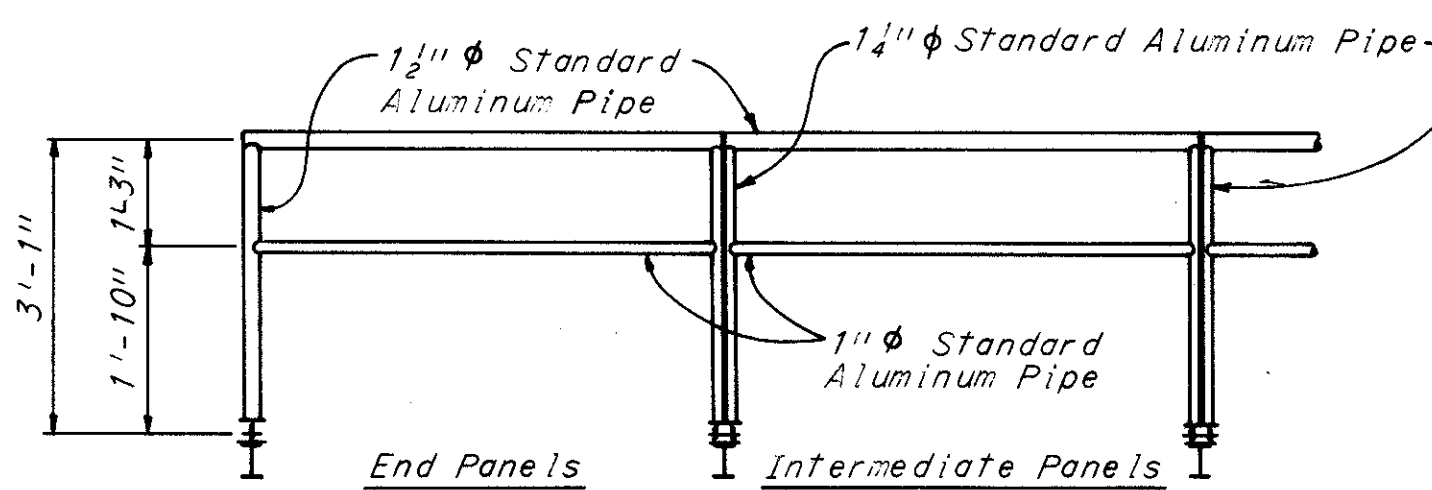


CAMBER DIAGRAM

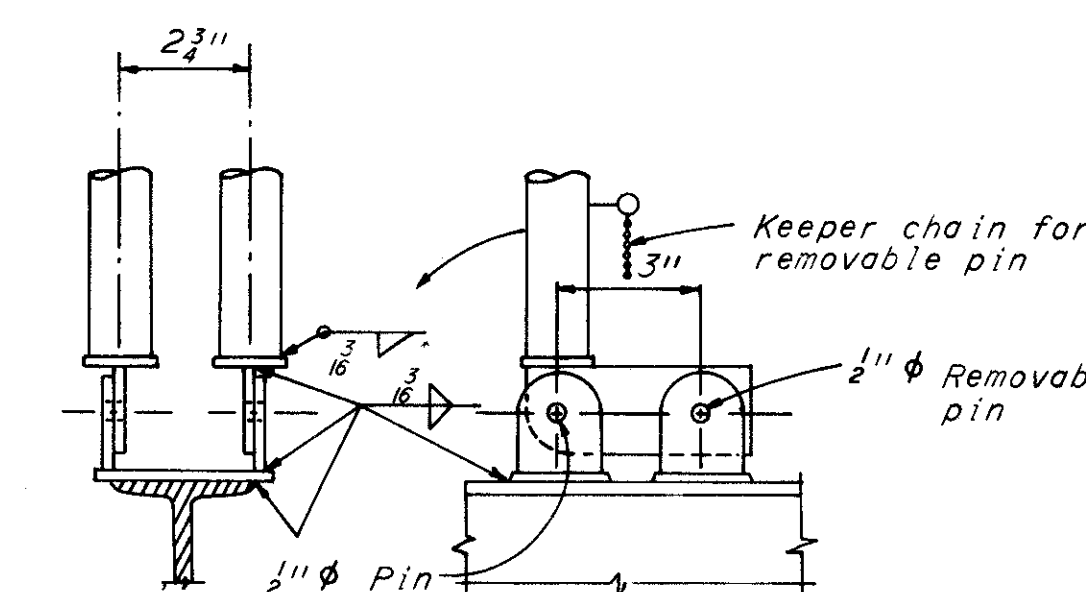
Note: For additional details and notes see sheet 71.



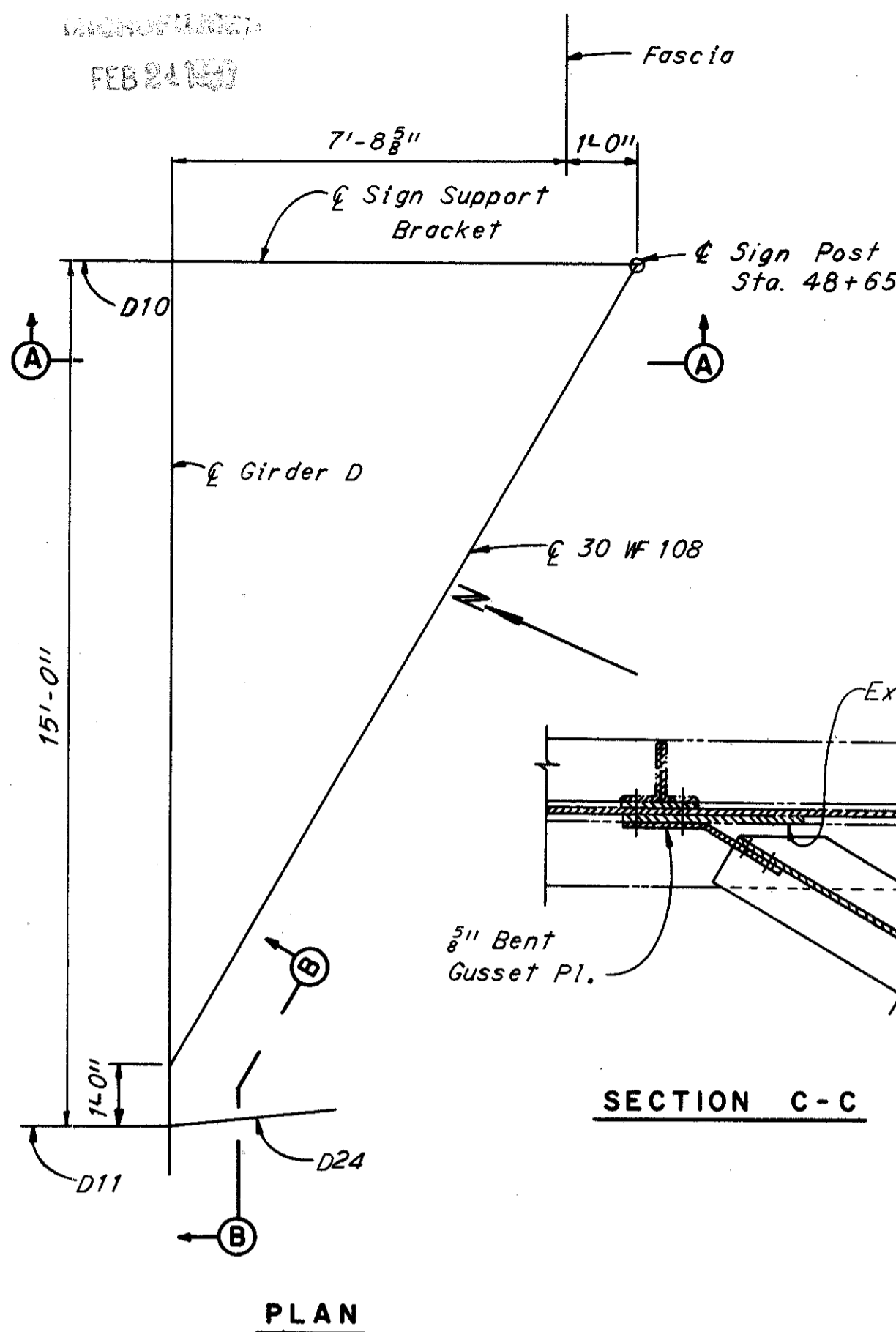
SECTION A-A



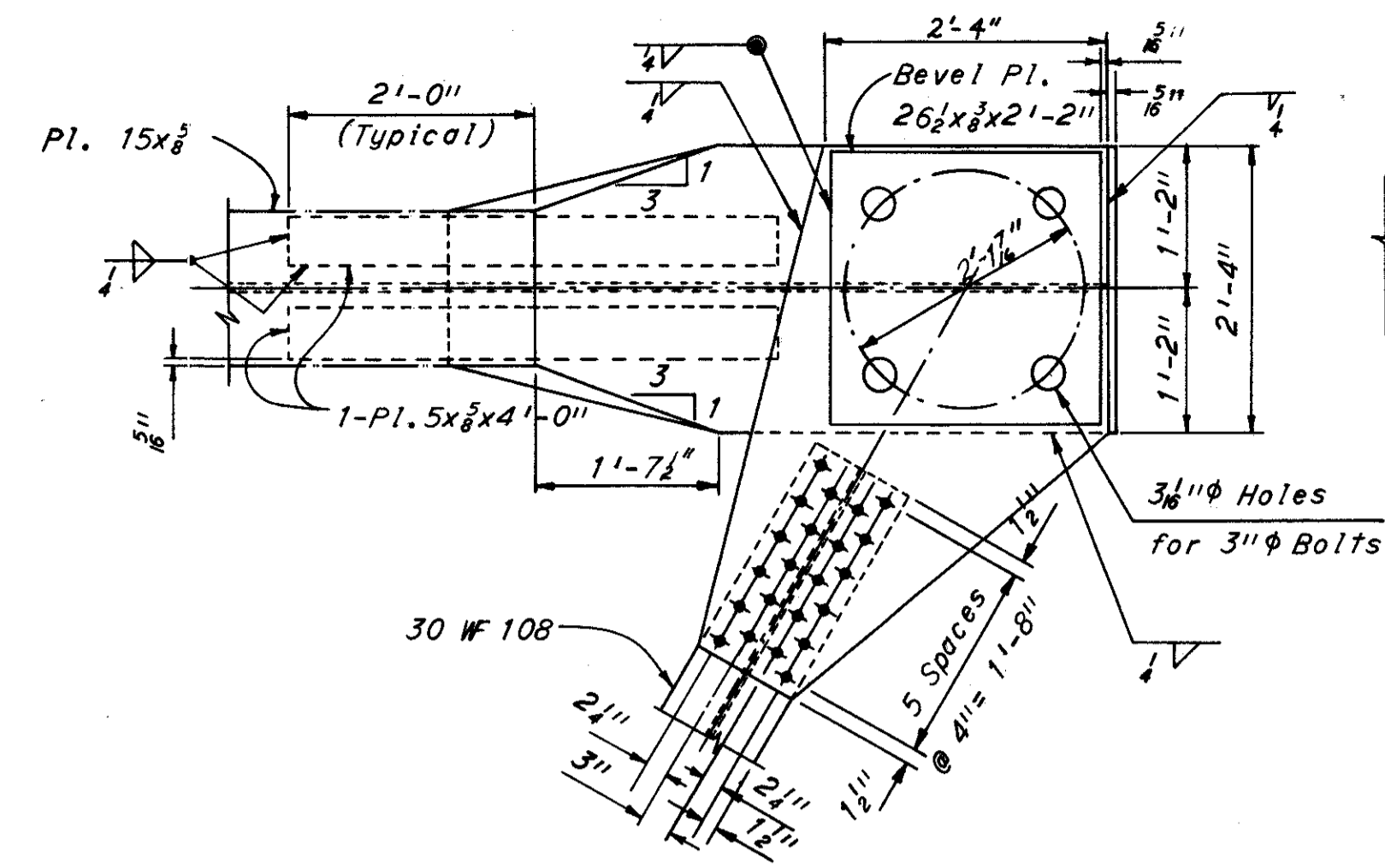
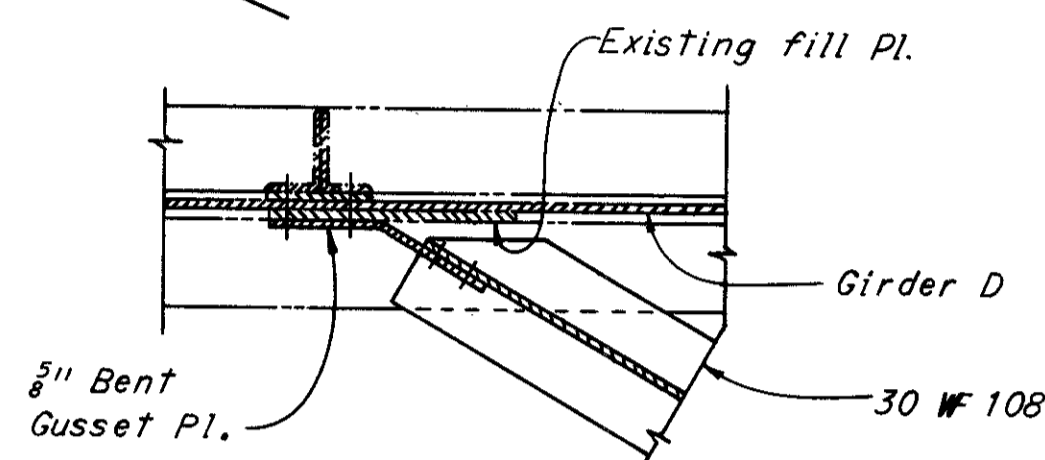
WALKWAY RAILING DETAIL



Note: Hinge and latch to be of 1/4" plates.  
WALKWAY RAILING HINGE DETAILS

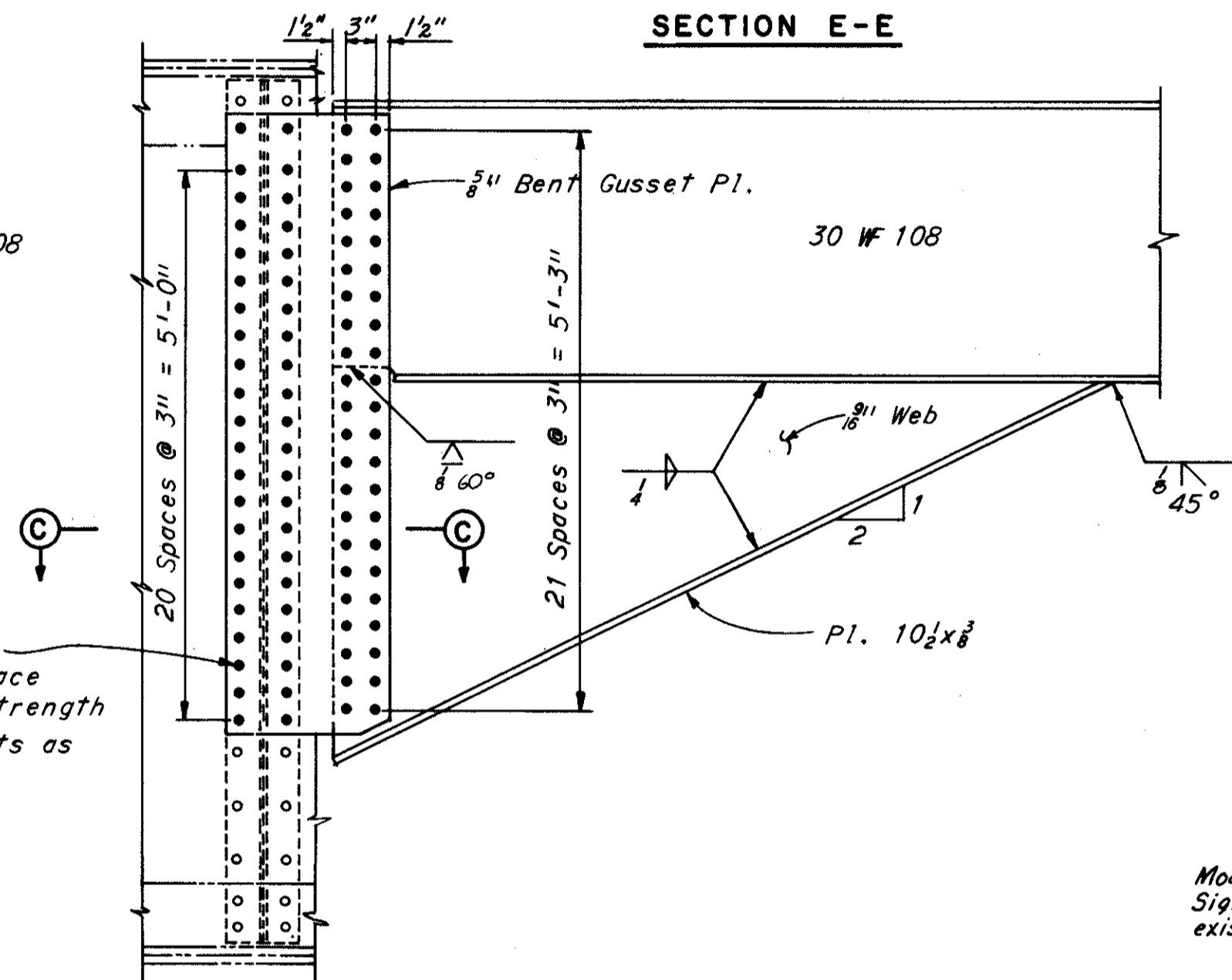


SECTION C-C

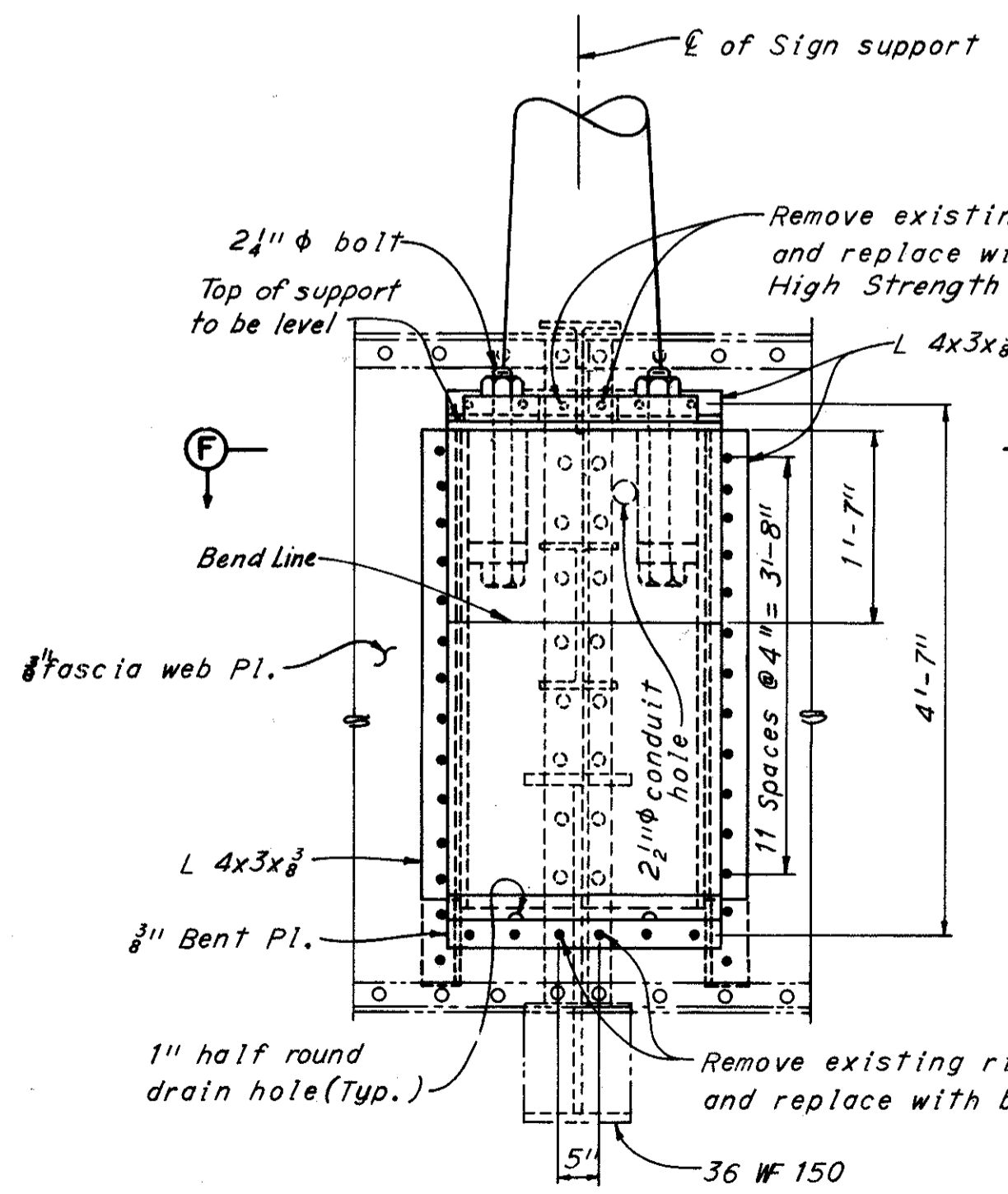


SECTION E-E

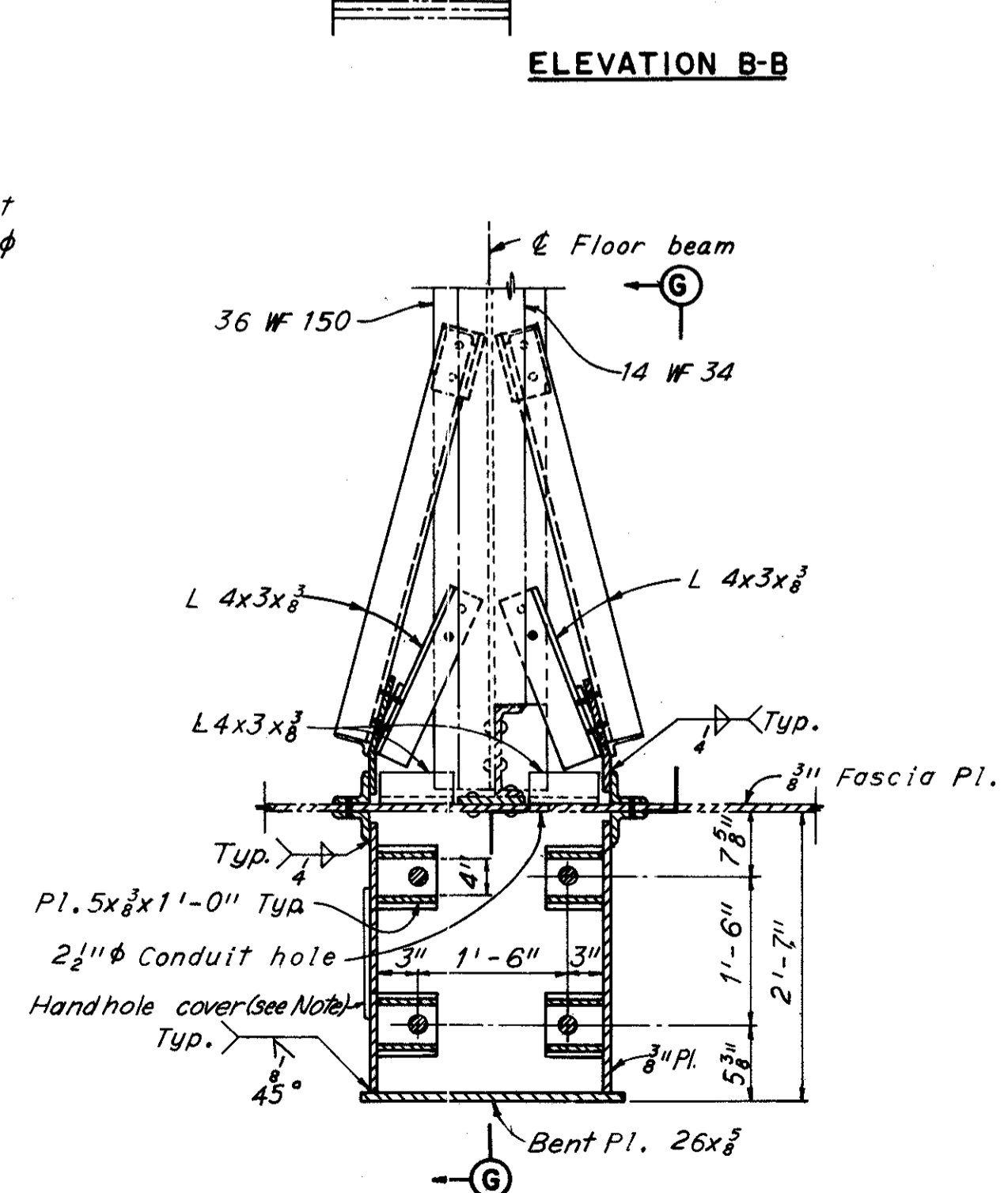
Remove existing rivets and replace with 3/4" High Strength Bolts. Add bolts as required.



ELEVATION B-B



ELEVATION  
(Railing Post and Railing not shown)

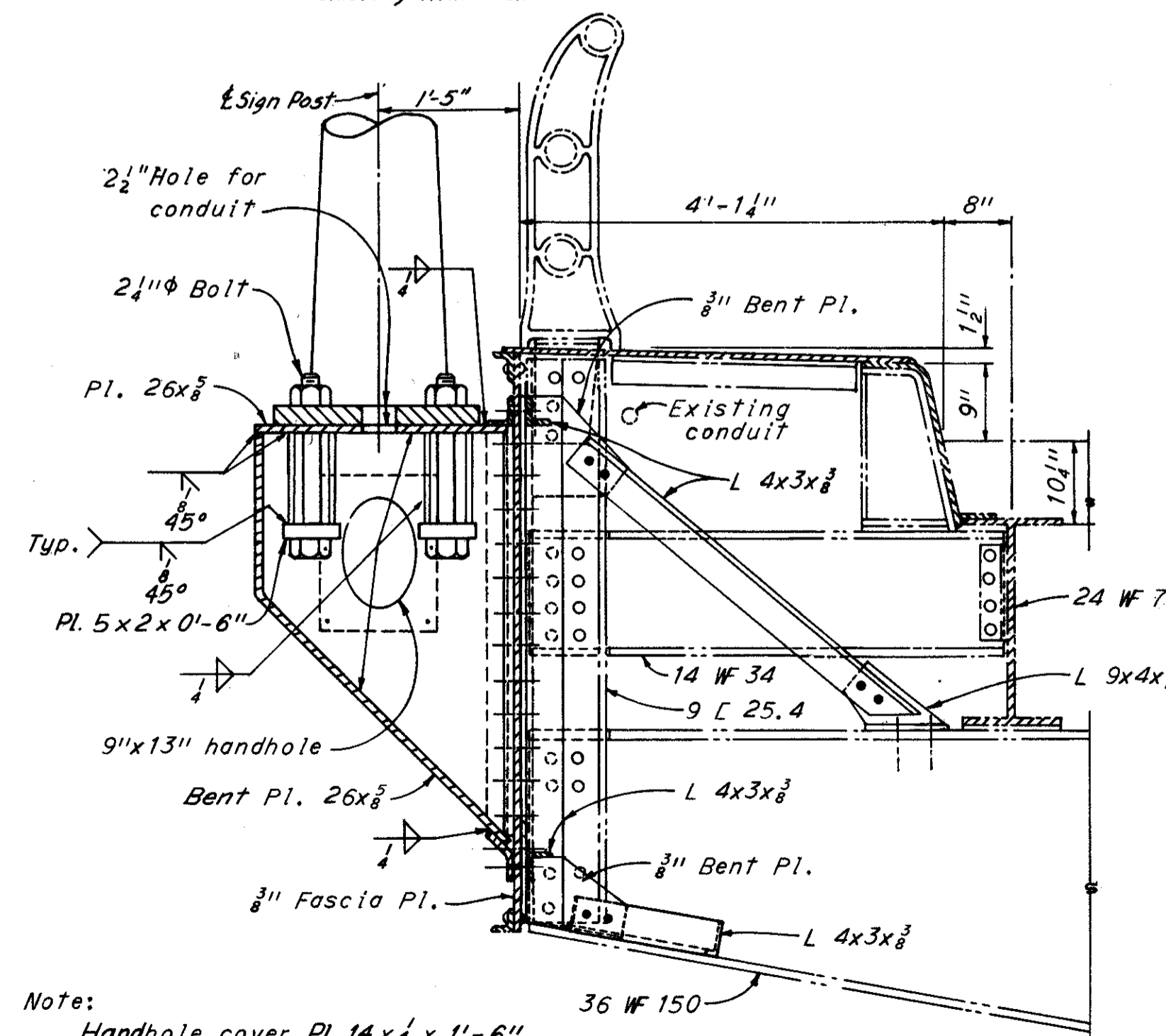


SECTION F-F

SIGN NO. 2 & 3

SIGN NO. 5

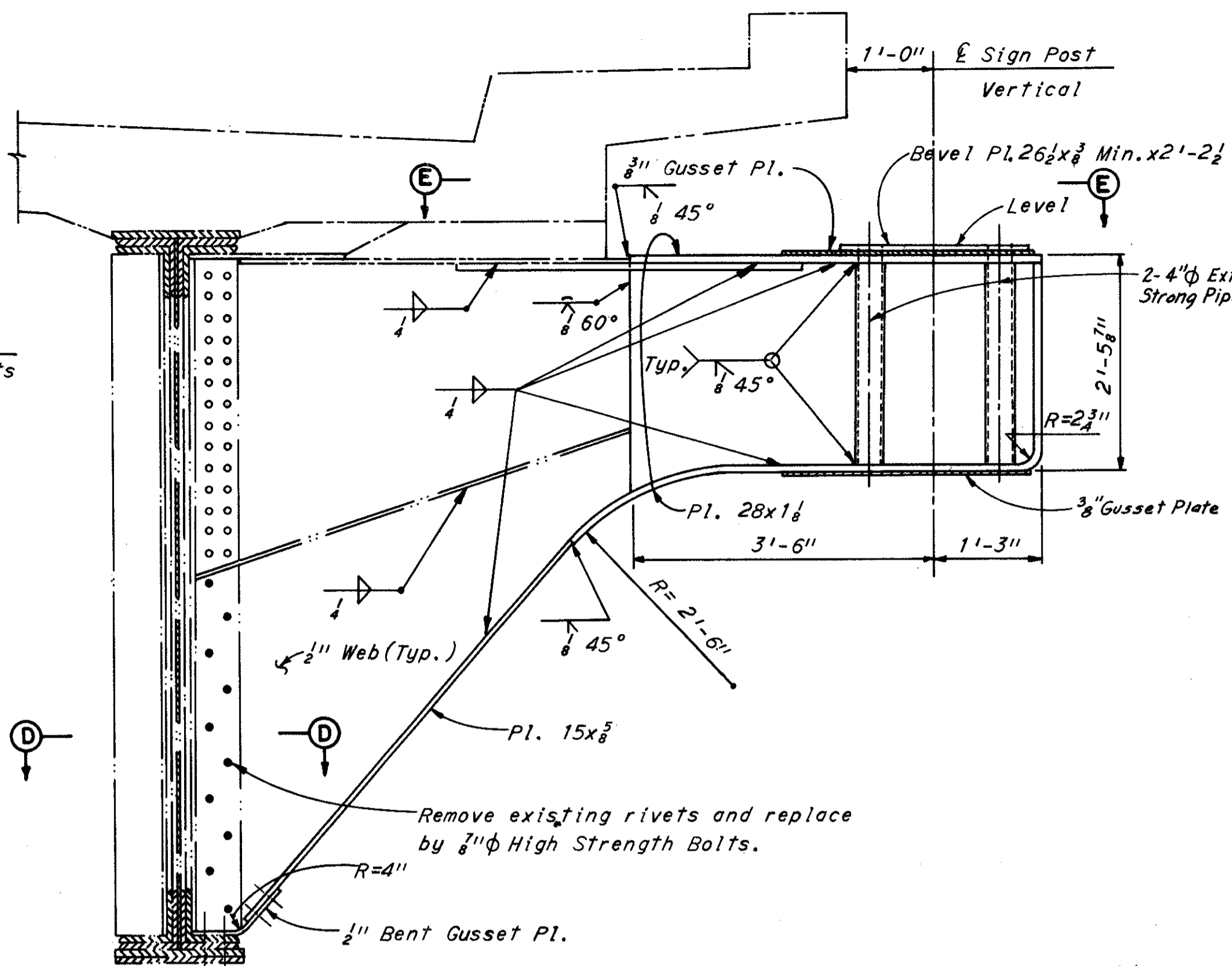
Modifications and Additions to Existing Sign Support Bracket. Indicates existing material.



SECTION G-G

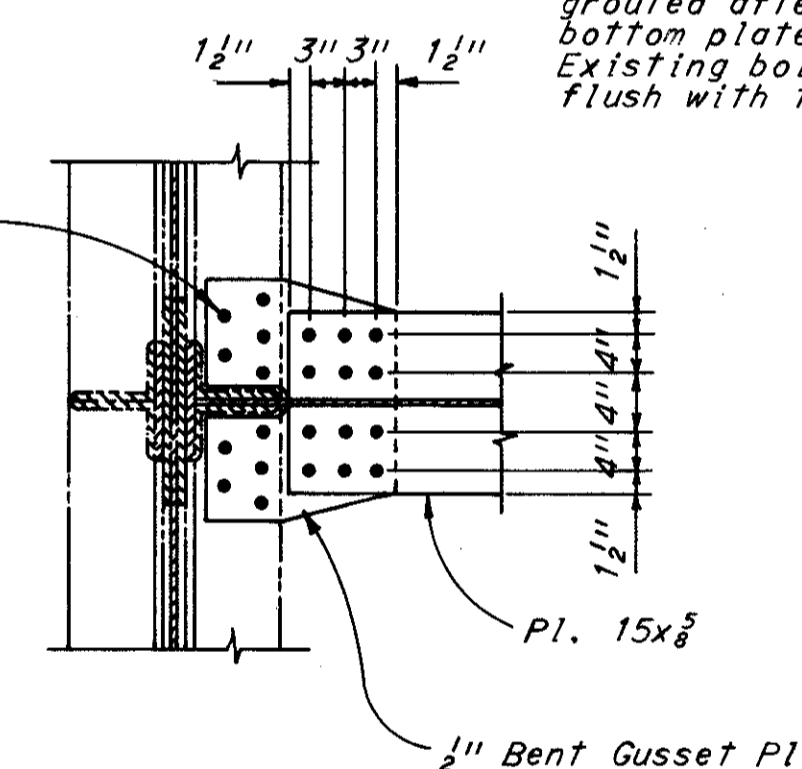
Note:  
Handhole cover Pl. 1/4 x 1/4 x 1'-6" fastened by 6-1/2" cap screws.

SECTION G-G

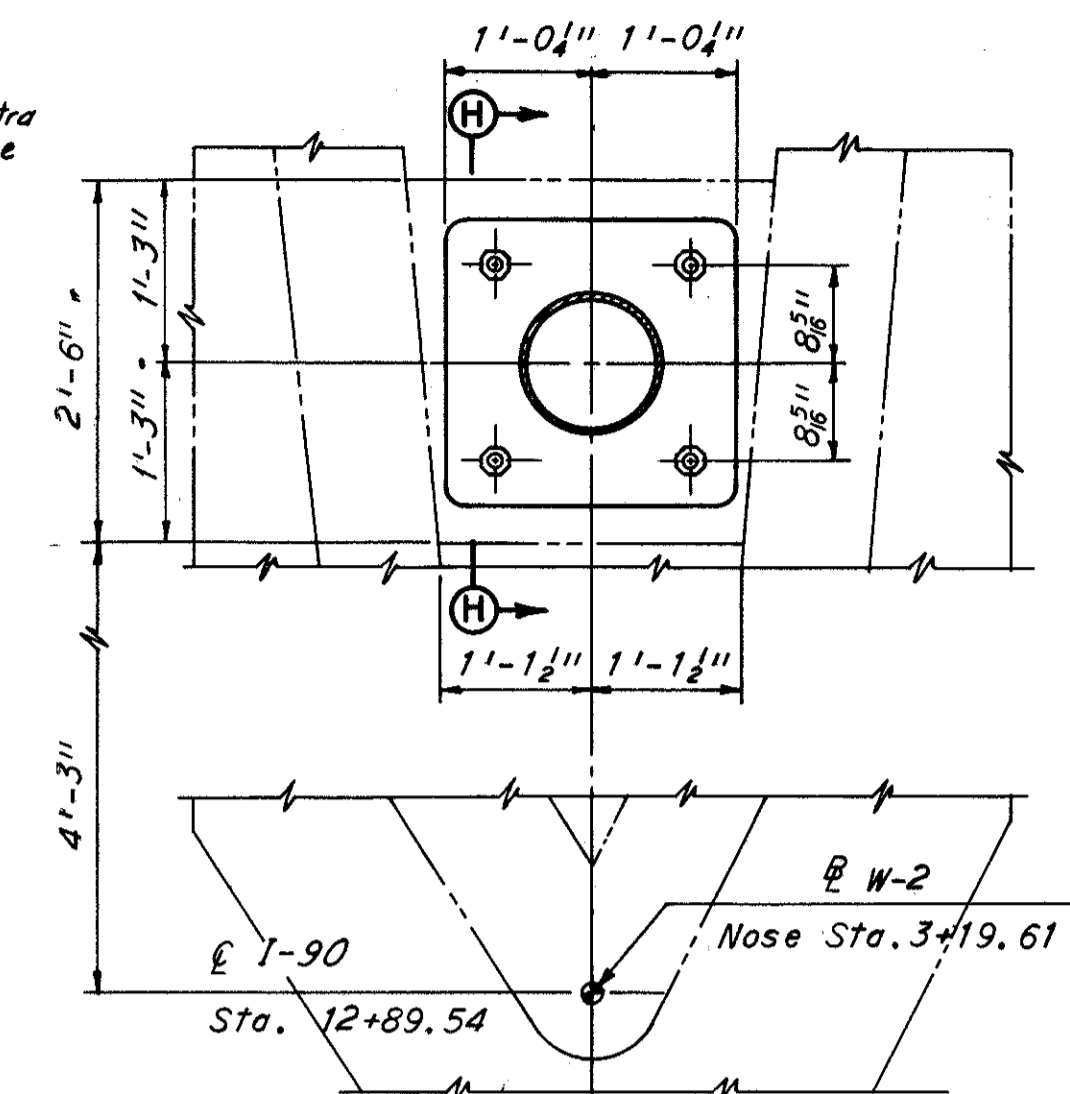


SECTION A-A

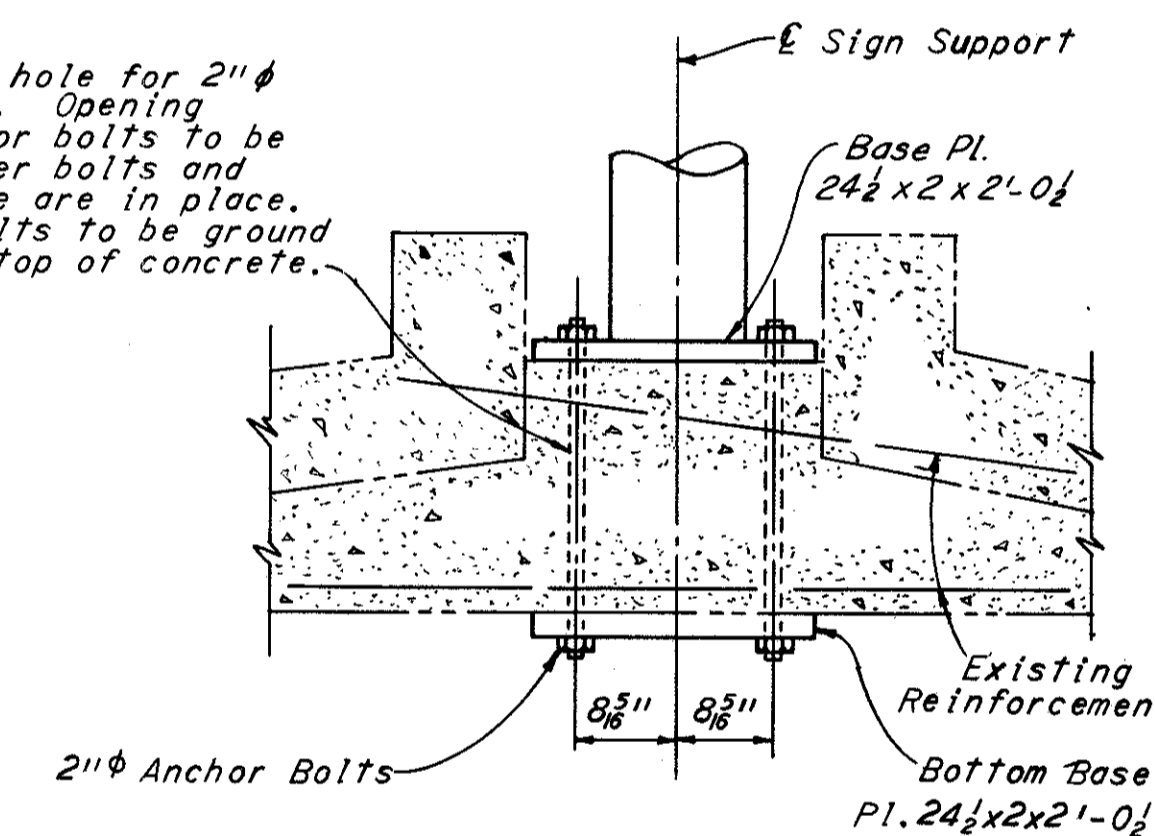
Replace existing rivets by 3/4" High Strength Bolts.



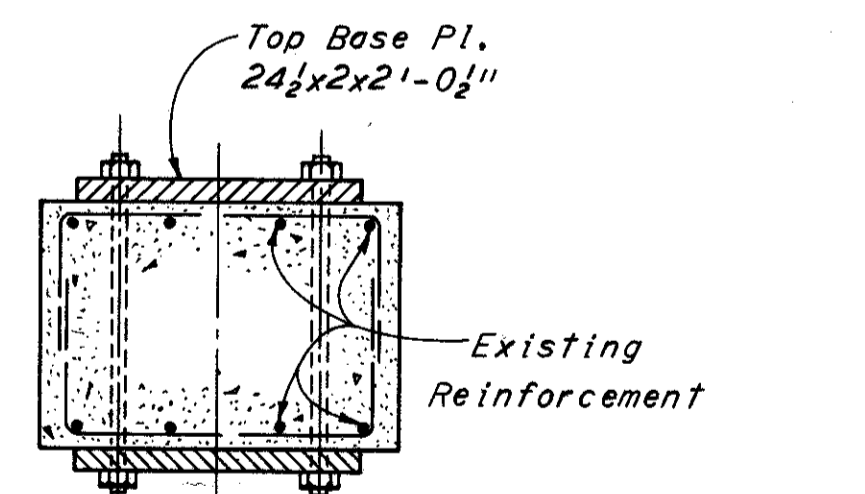
SECTION D-D



PLAN



ELEVATION



SECTION H-H

SIGN SUPPORT NO. 1

(Modification of Existing Sign Support)

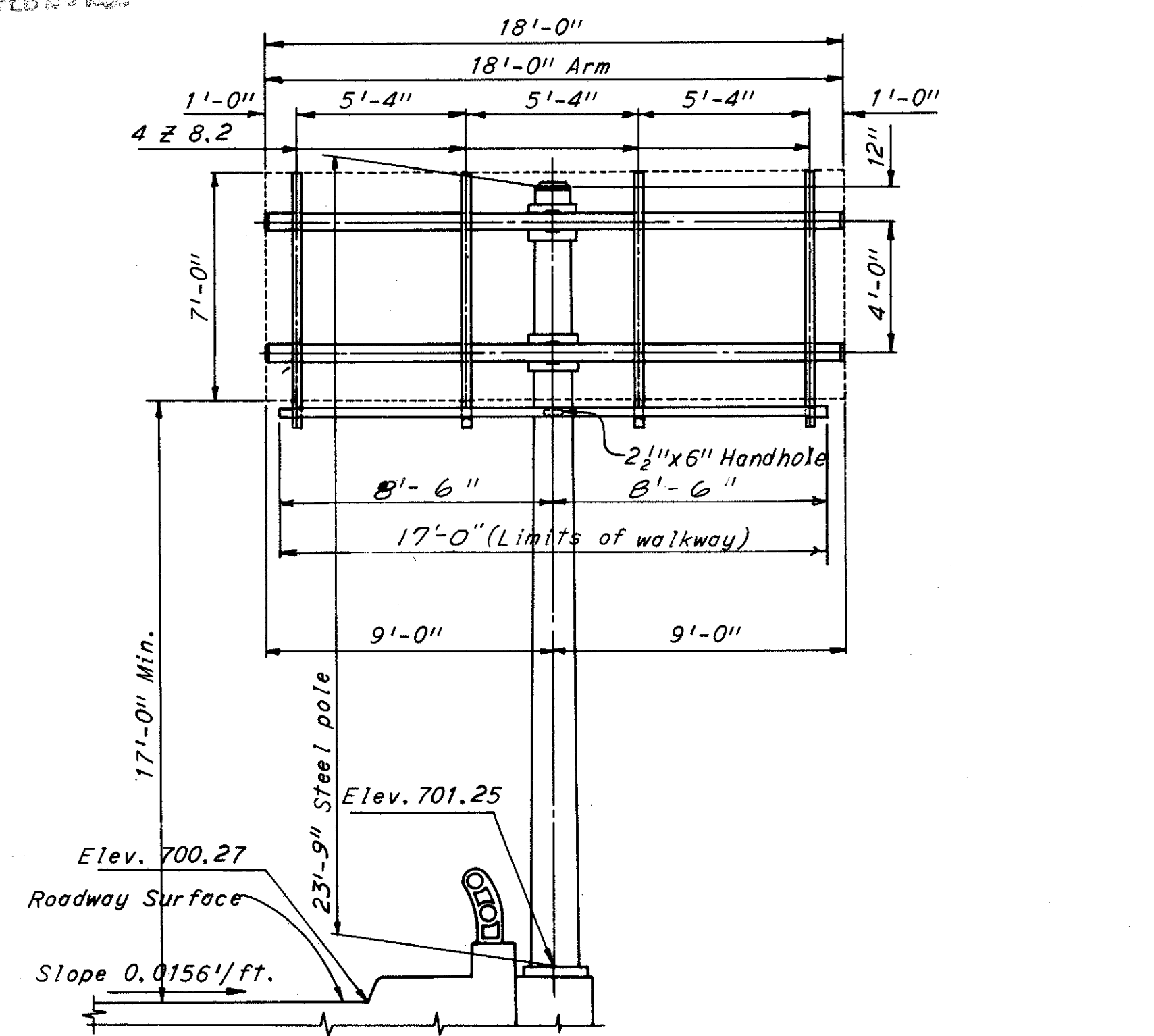
OVERHEAD SIGNS 1, 2, 3 & 5  
BRACKET DETAILS  
EXISTING INNER BELT VIADUCT

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY	TRACED	CHECKED
DATE	DATE	DATE
3-26-67	3-31-67	4-1-67

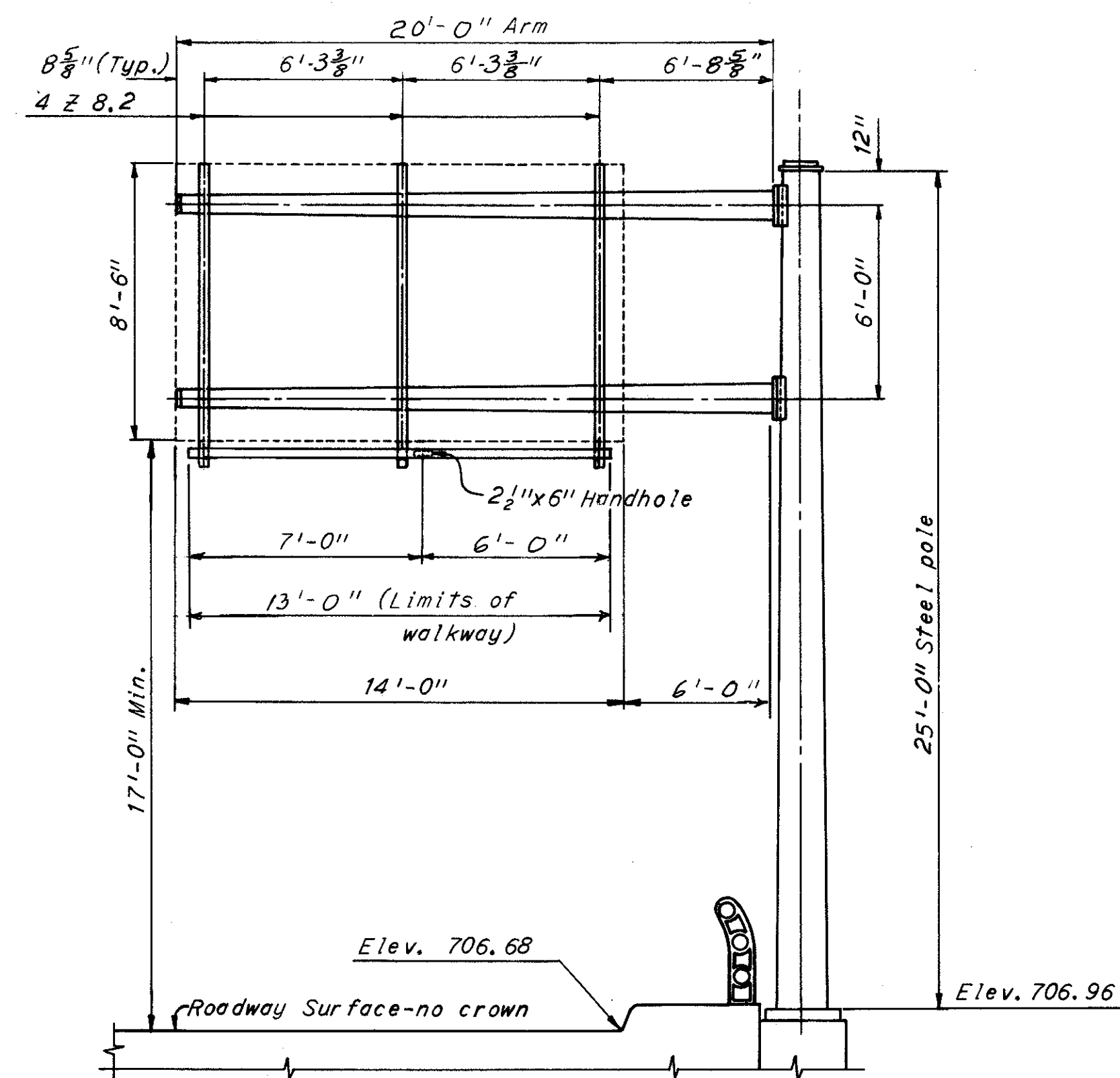
Notes:  
For Overhead Sign Supports see sheet 68.  
All connections to existing structure shall be made with 3/4" High Strength Bolts.

UNIFORMED  
FEB 24 1964

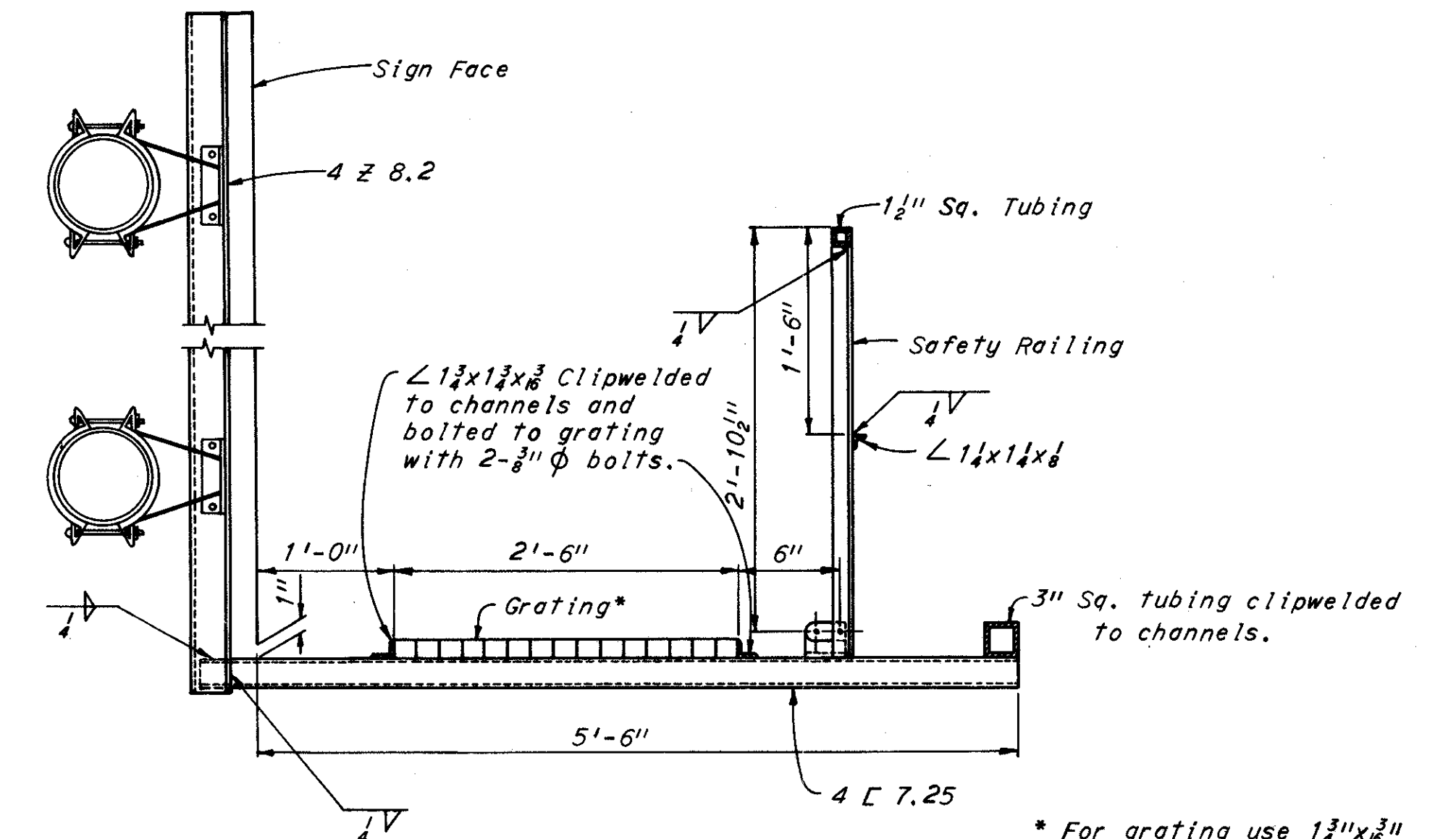
CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



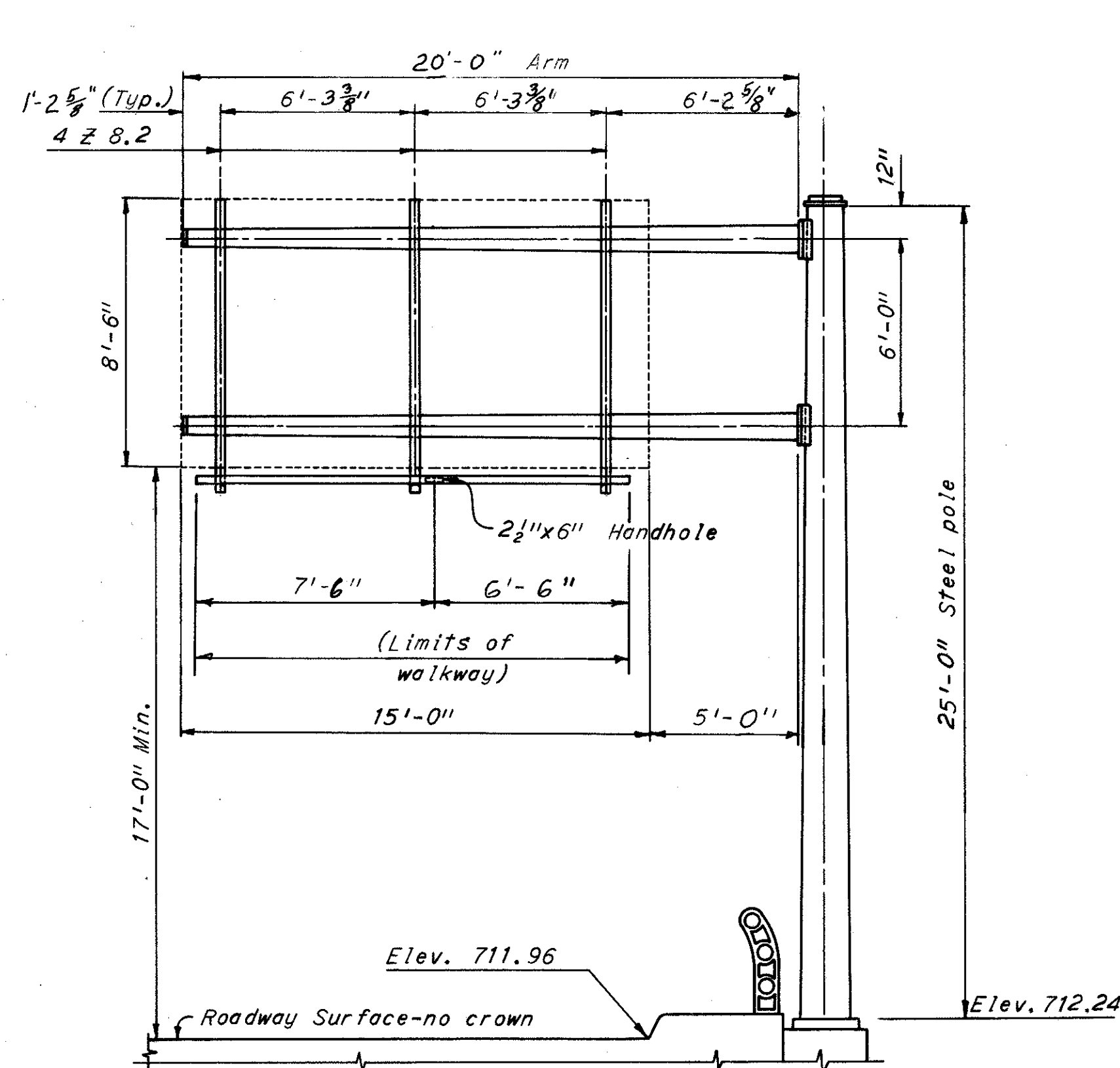
**OVERHEAD SIGN NO. 1**  
STANDARD NO. 9.24-DESIGN NO. 3 (MODIFIED)  
STATION 12+48 W.B. I-90



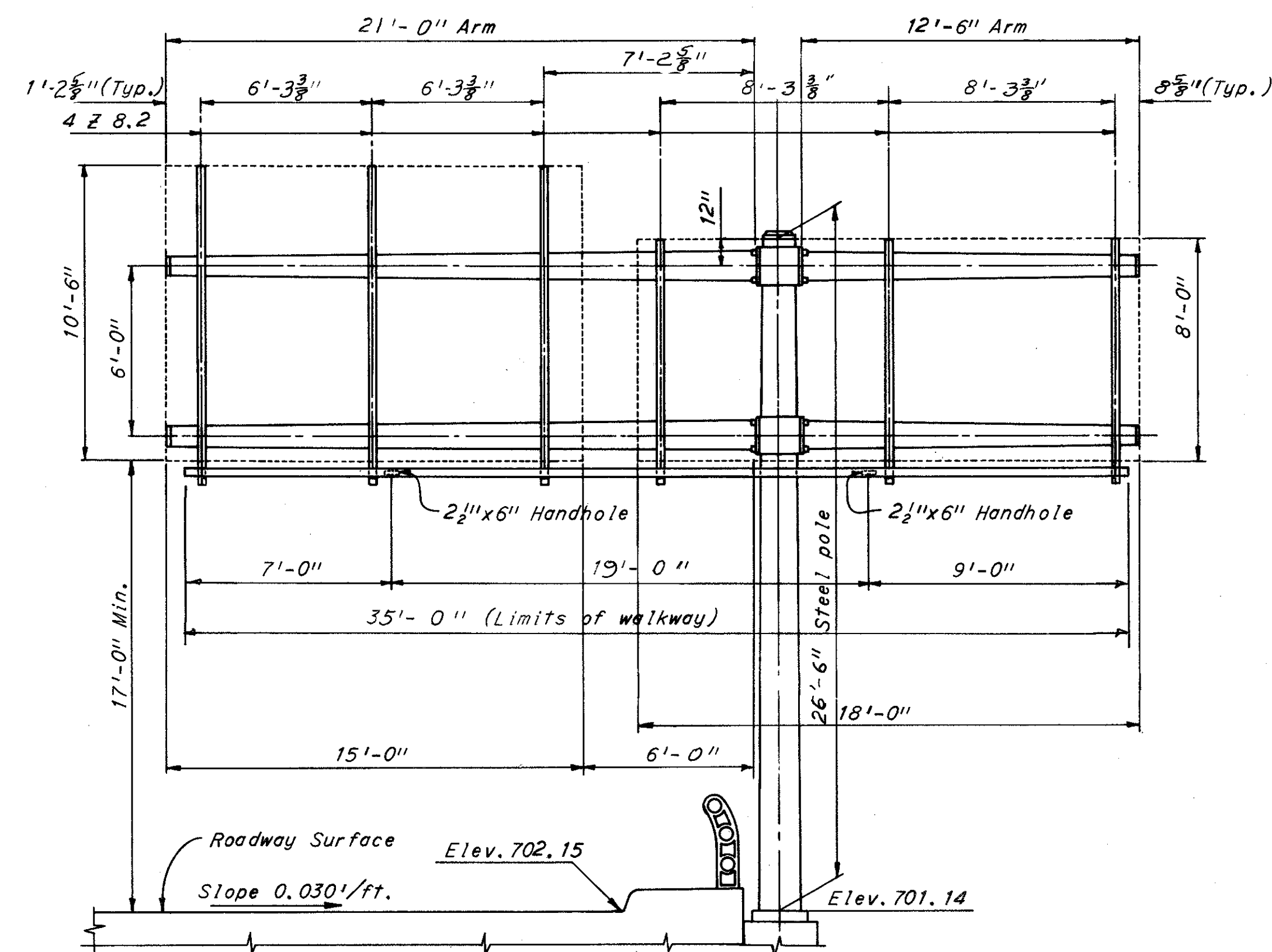
**OVERHEAD SIGN NO. 2**  
STANDARD NO. 12.24-DESIGN NO. 5 (MODIFIED)  
STATION 19+90 E.B. I-90



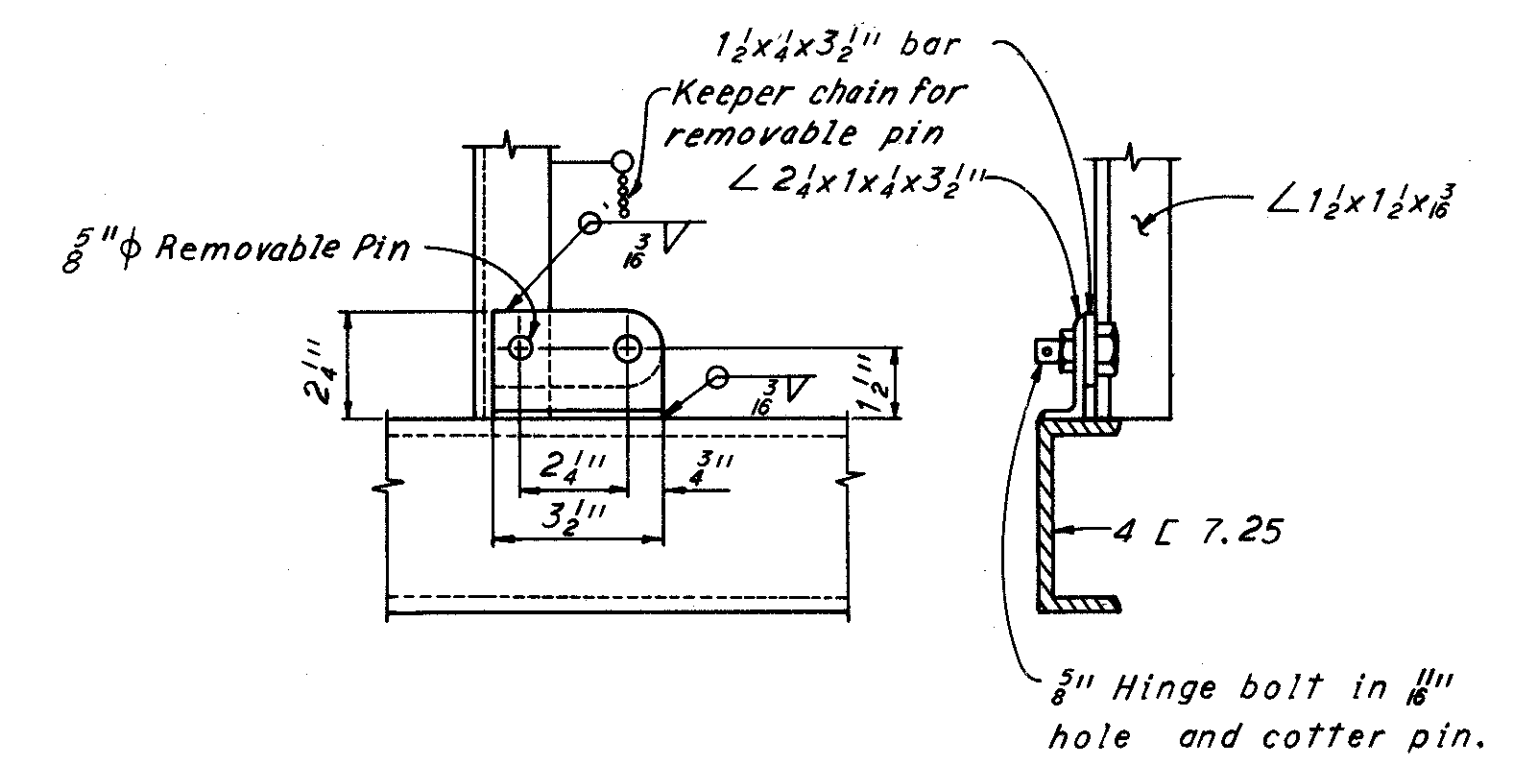
**TYPICAL WALKWAY SECTION**



**OVERHEAD SIGN NO. 3**  
STANDARD NO. 12.24-DESIGN NO. 5 (MODIFIED)  
STATION 27+15 W.B. I-90



**OVERHEAD SIGN NO. 5**  
STANDARD NO. 10.48-DESIGN NO. 8 (MODIFIED)  
STATION 48+42 E.B. I-90



**HINGE AND LOCK DETAIL**

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

**OVERHEAD SIGN SUPPORTS 1,2,3 & 5  
EXISTING INNER BELT VIADUCT**

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN JMC	TRACED	CHECKED
DATE 3-24-64	DATE	DATE 4-1-64
	REVIEWED	REVISOR
	DATE 4-1-64	DATE
		SHEET 68

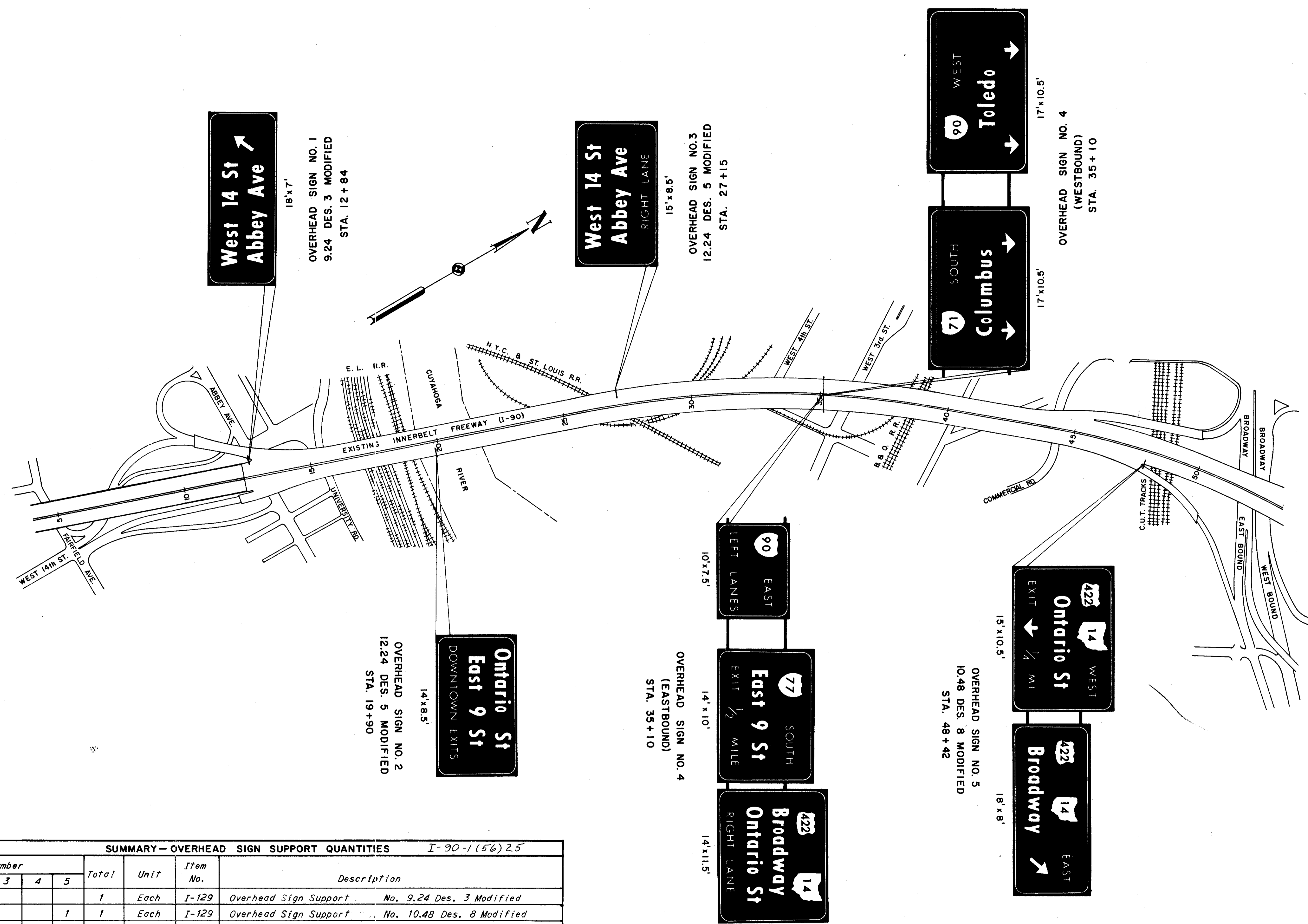


REVISIONS  
FEB 24 1966

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

67  
77

CUYAHOGA COUNTY CITY OF CLEVELAND  
CUY-90-14.67



SUMMARY - OVERHEAD SIGN SUPPORT QUANTITIES I-90-1(56)25

Sign Number					Total	Unit	Item No.	Description
1	2	3	4	5				
1				1	Each	I-129	Overhead Sign Support No. 9,24 Des. 3 Modified	
				1	Each	I-129	Overhead Sign Support No. 10,48 Des. 8 Modified	
1	1			2	Each	I-129	Overhead Sign Support No. 12,24 Des. 5 Modified	
			1	1	Each	I-129	Overhead Sign Bridge, As Per Plan	
1233	1233	5580	4975	13,021	Pounds	S-7	Structural Steel for overhead sign support, including all painting	

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

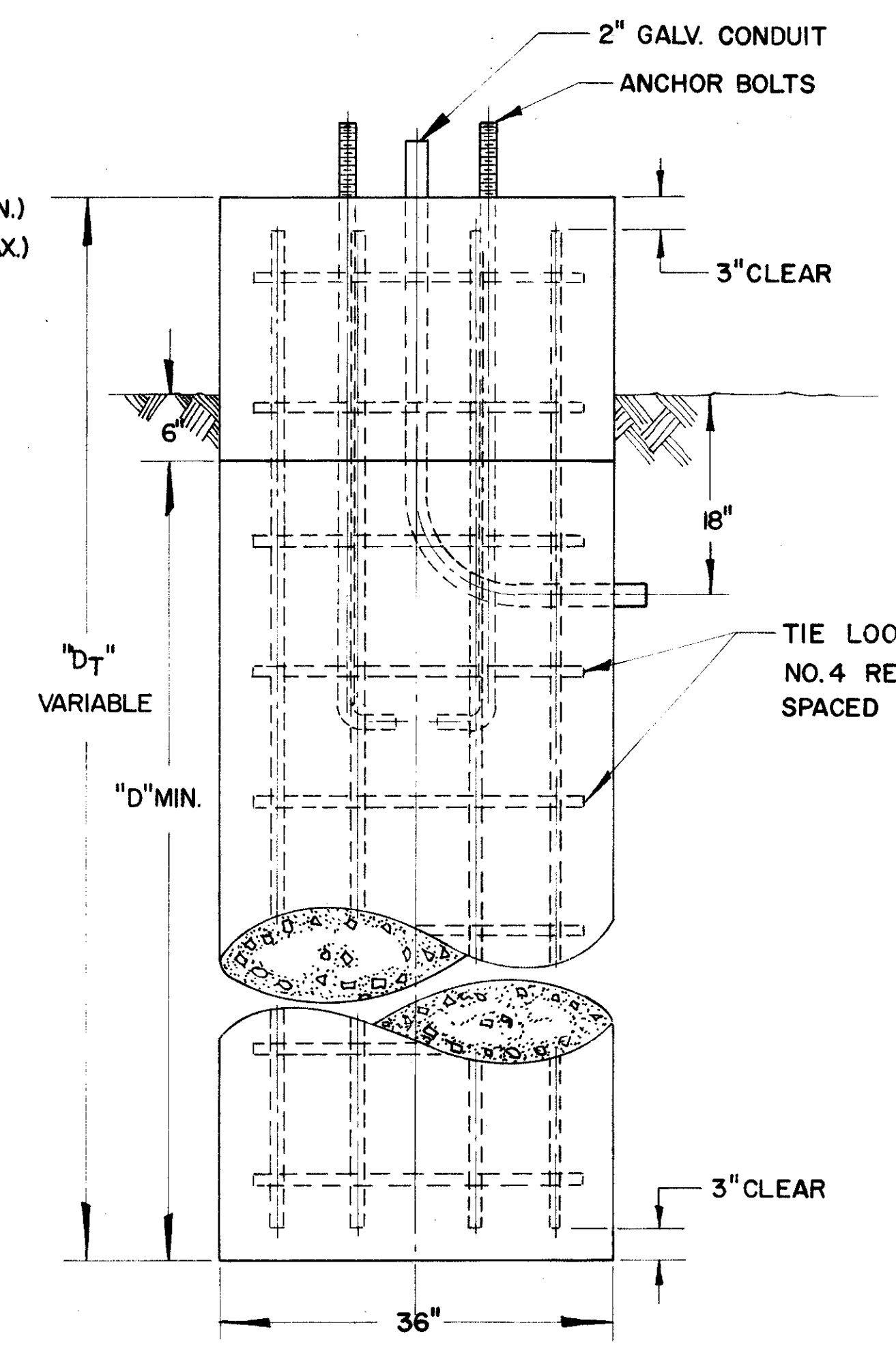
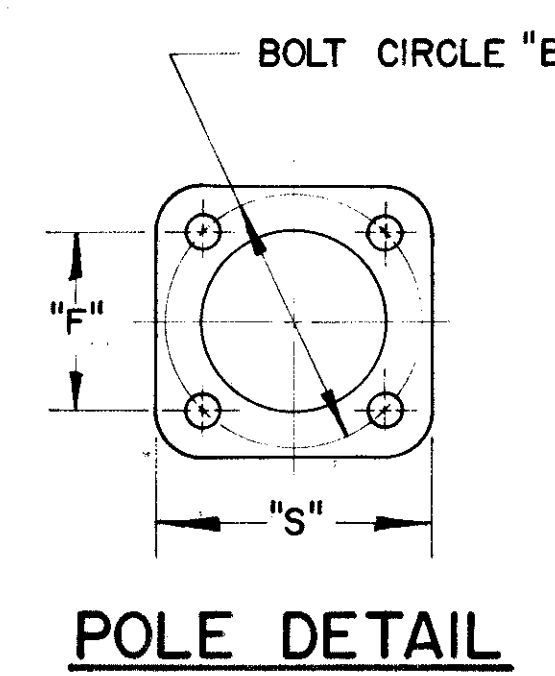
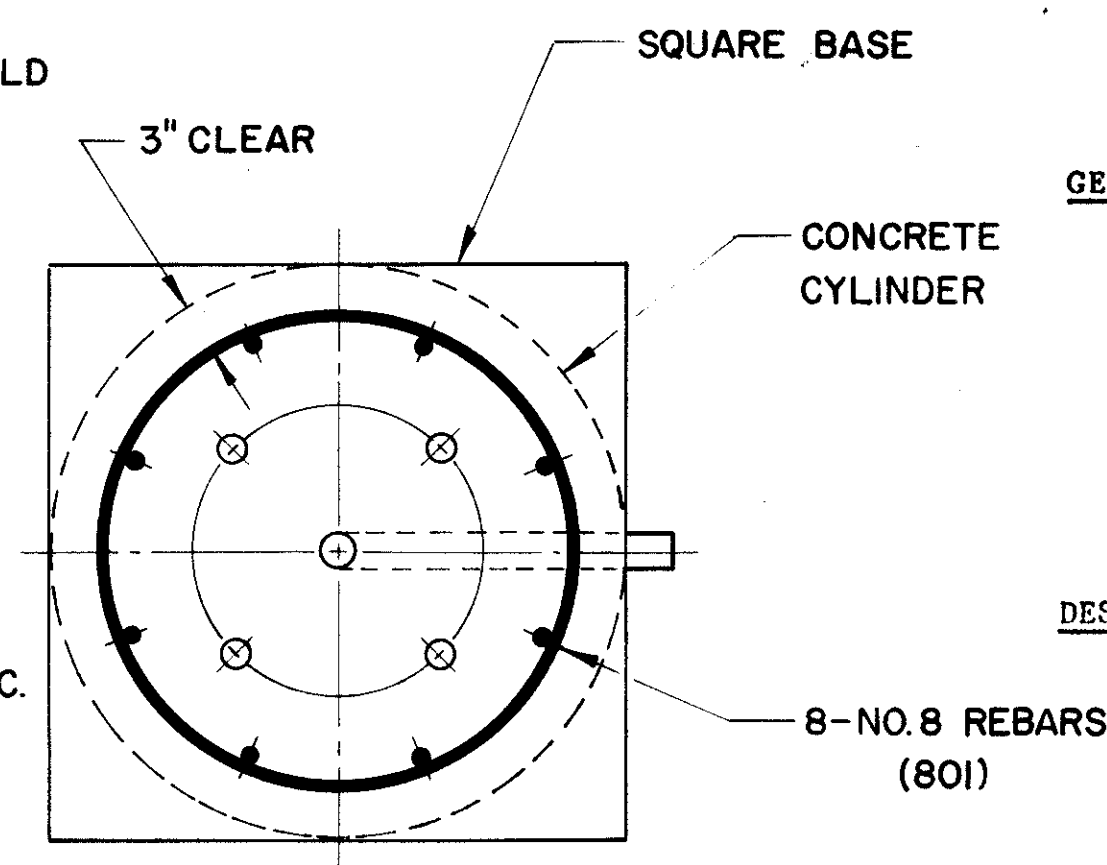
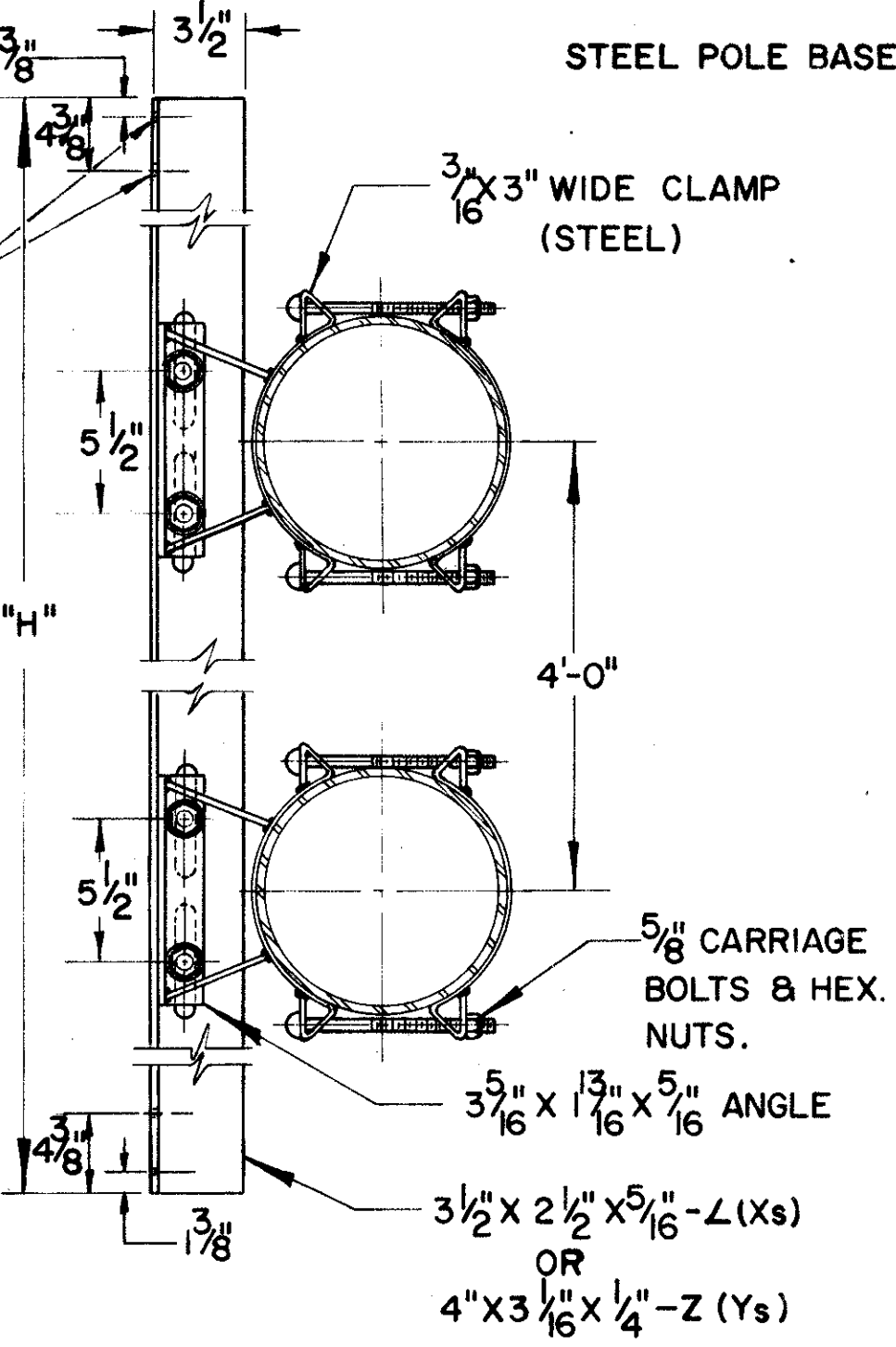
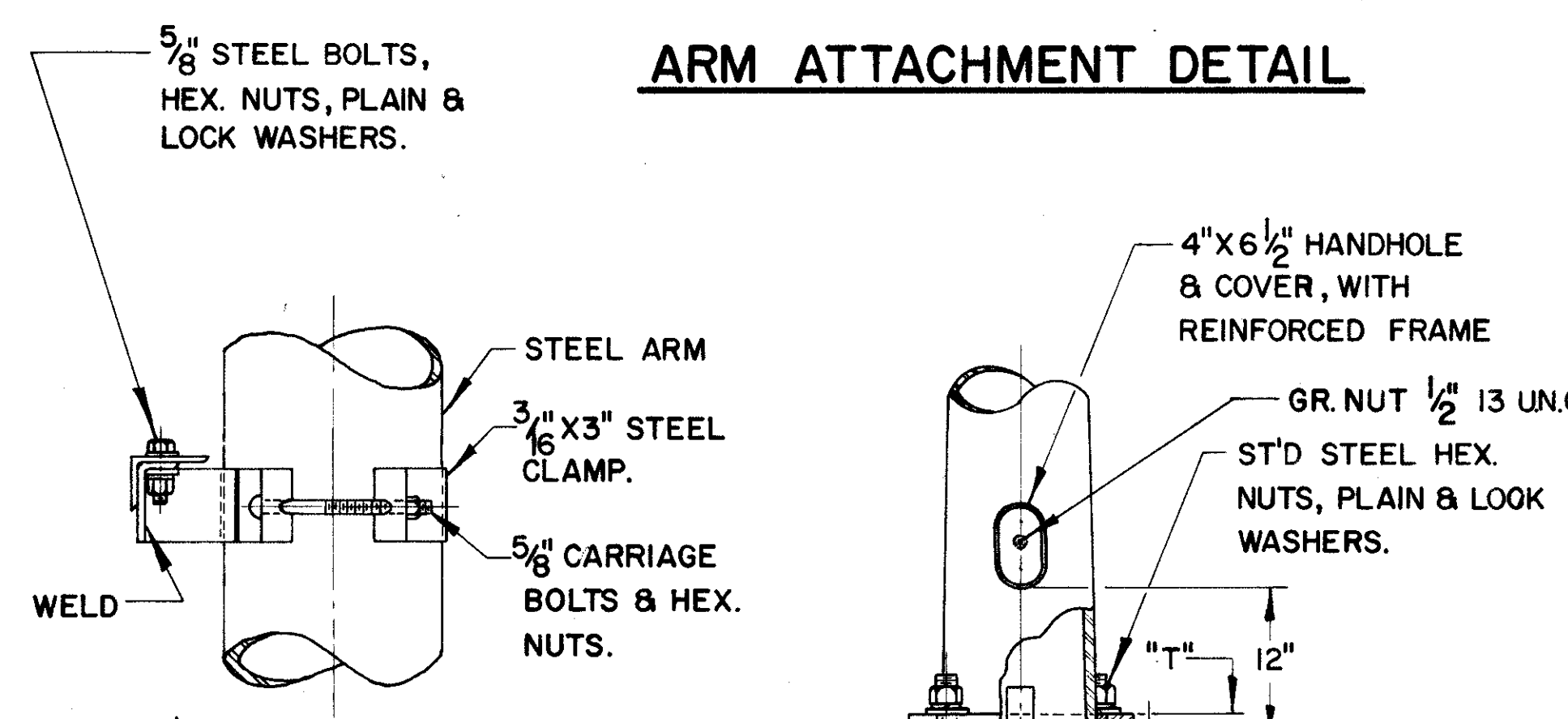
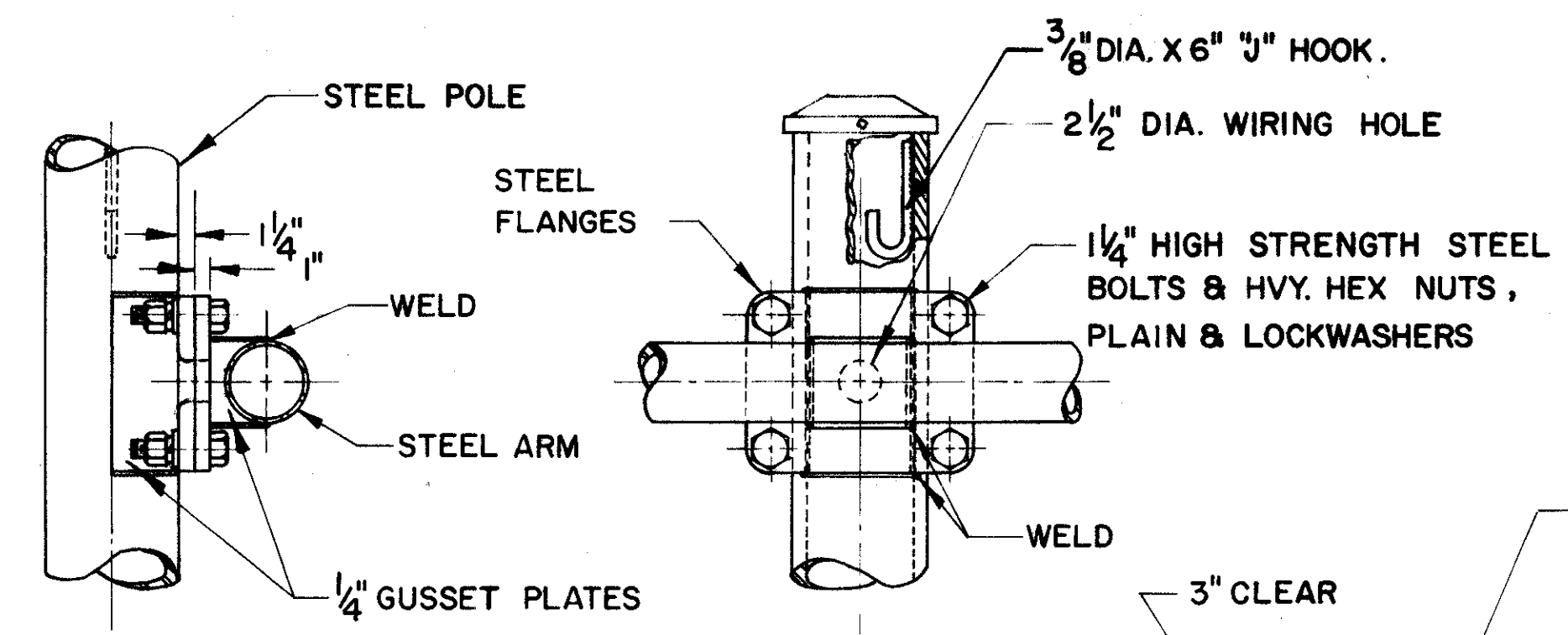
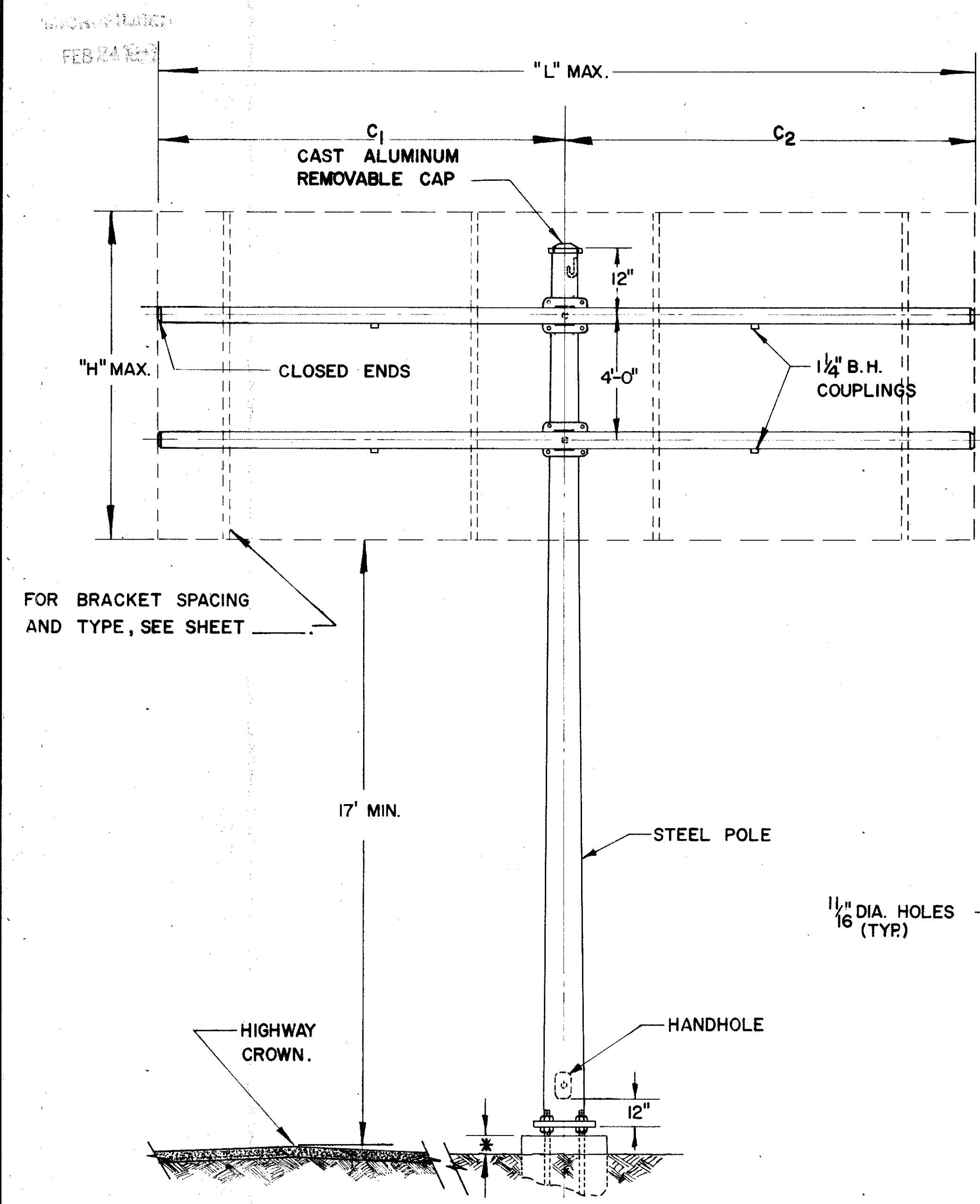
OVERHEAD SIGNING PLAN  
EXISTING INNER BELT VIADUCT

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY: C.H.B.	TRACED	CHECKED BY: U.M.C.
DATE: 3-1-66	DATE: 3-31-66	REVIEWED BY: W.P.
		DATE: 4-1-66
		REVISOR
		SHEET 67

CUY-90-14.67

**NOTES**

- GENERAL**  
 MAXIMUM SIGN AREAS AND ARM LENGTHS SHOWN IN TABLE, ARE FOR BALANCED DESIGN ( $C_1 = C_2$ ).  
 FOR UNBALANCED DESIGN ( $C_1 \neq C_2$ ), THE PRODUCT OF THE ACTUAL SIGN AREA ( $C_1 H$  or  $C_2 H$ ) TIMES 1/2 OF ACTUAL ARM ( $1/2 C_1$  or  $1/2 C_2$ ) SHALL BE LESS THAN THE PRODUCT OF 45% OF MAXIMUM SIGN AREA TIMES 1/2 MAX ARM FOR BALANCED DESIGN. ( $0.45 H 2C_1 1/2C_1$  or  $0.45 H 2C_2 1/2C_2$ )
- DESIGN**  
 THE DESIGN OF OVERHEAD SUPPORTS SHALL BE IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 13, 1961.
- \* FOUNDATION**  
 THE TOP ELEVATION OF FOUNDATIONS SHALL BE VARIED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 17' BETWEEN THE BOTTOM OF THE SIGN AND THE HIGHWAY CROWN.
- SOILS**  
 THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.
- FINISH**  
 ALL STRUCTURAL PORTIONS OF THE SIGN SUPPORTS, SIGN BRACKETS, HARDWARE AND CONDUIT SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH S.S. I-129.02 (EXCEPT AS OTHERWISE SHOWN).
- MATERIALS**  
 ALL MATERIALS TO BE FURNISHED SHALL BE IN ACCORDANCE WITH S.S. I-129.02 WITH THE FOLLOWING ADDITIONS:  
 TAPERED TUBES SHALL BE STEEL, SAE 1015 AND COLD ROLLED TO OBTAIN A MINIMUM YIELD STRENGTH OF 48,000PSI.  
 STEEL PIPE: 4" DIAMETER AND UNDER SHALL BE STEEL-ASTM-A120 OVER 4" DIAMETER SHALL BE ASTM-A53, GRADE B  
 ANCHOR BOLTS SHALL BE HIGH STRENGTH STEEL ASTM-A107, GRADE C-1035  
 HIGH STRENGTH CLAMPS SHALL BE STEEL-ASTM-A242
- PAYMENT FOR CONDUIT**  
 PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.
- REINFORCING STEEL**  
 COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.  
 BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

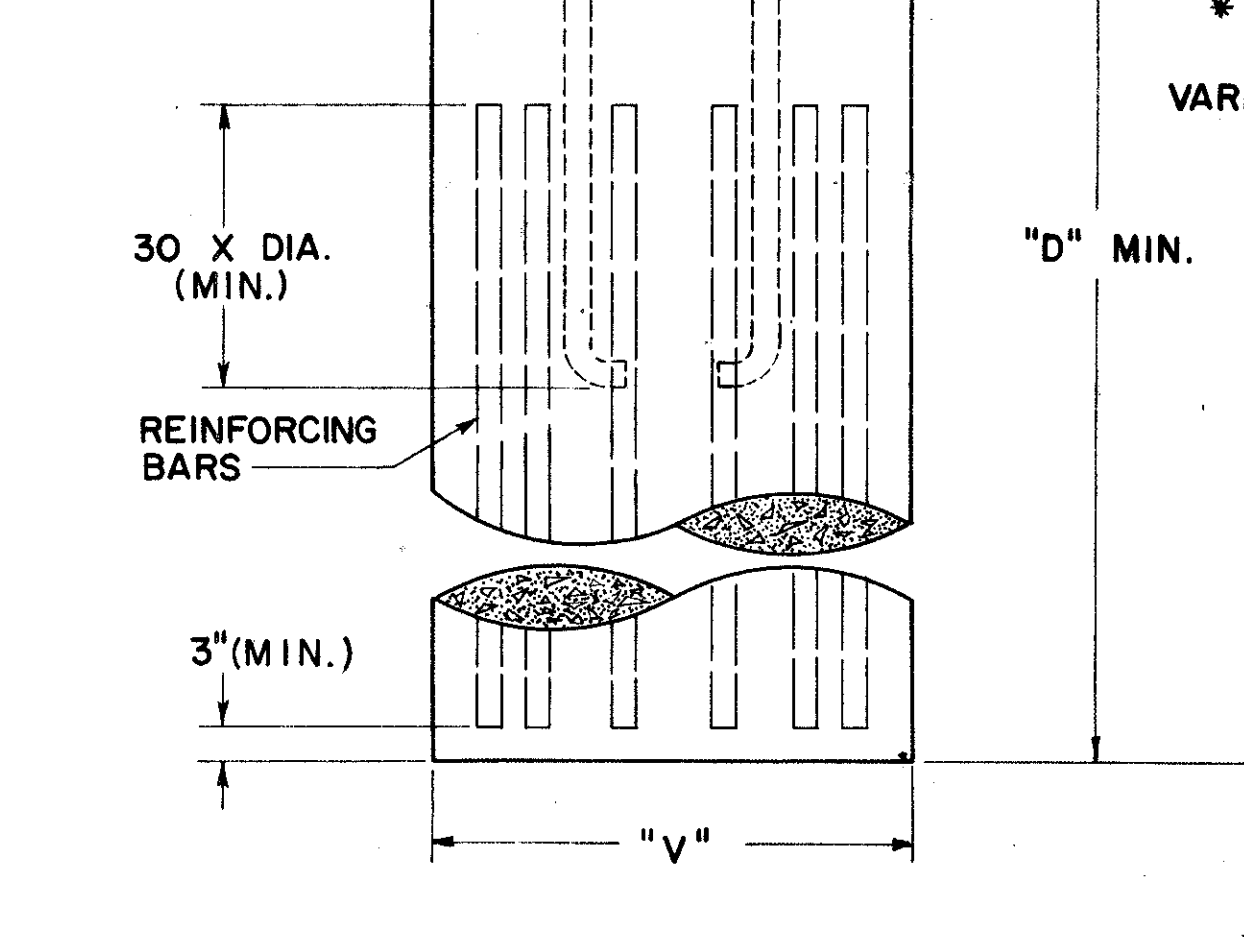
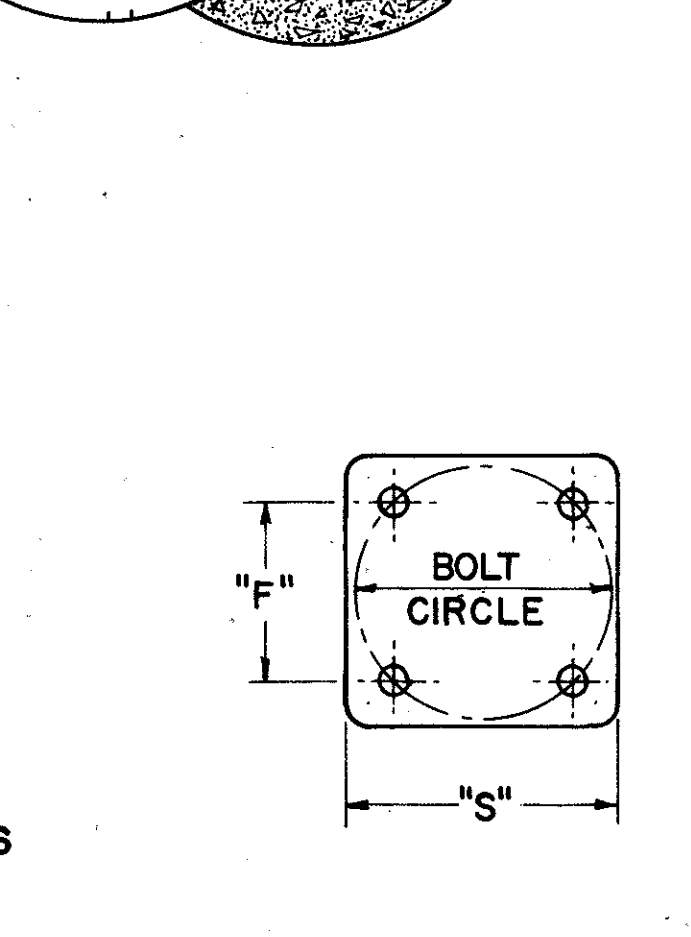
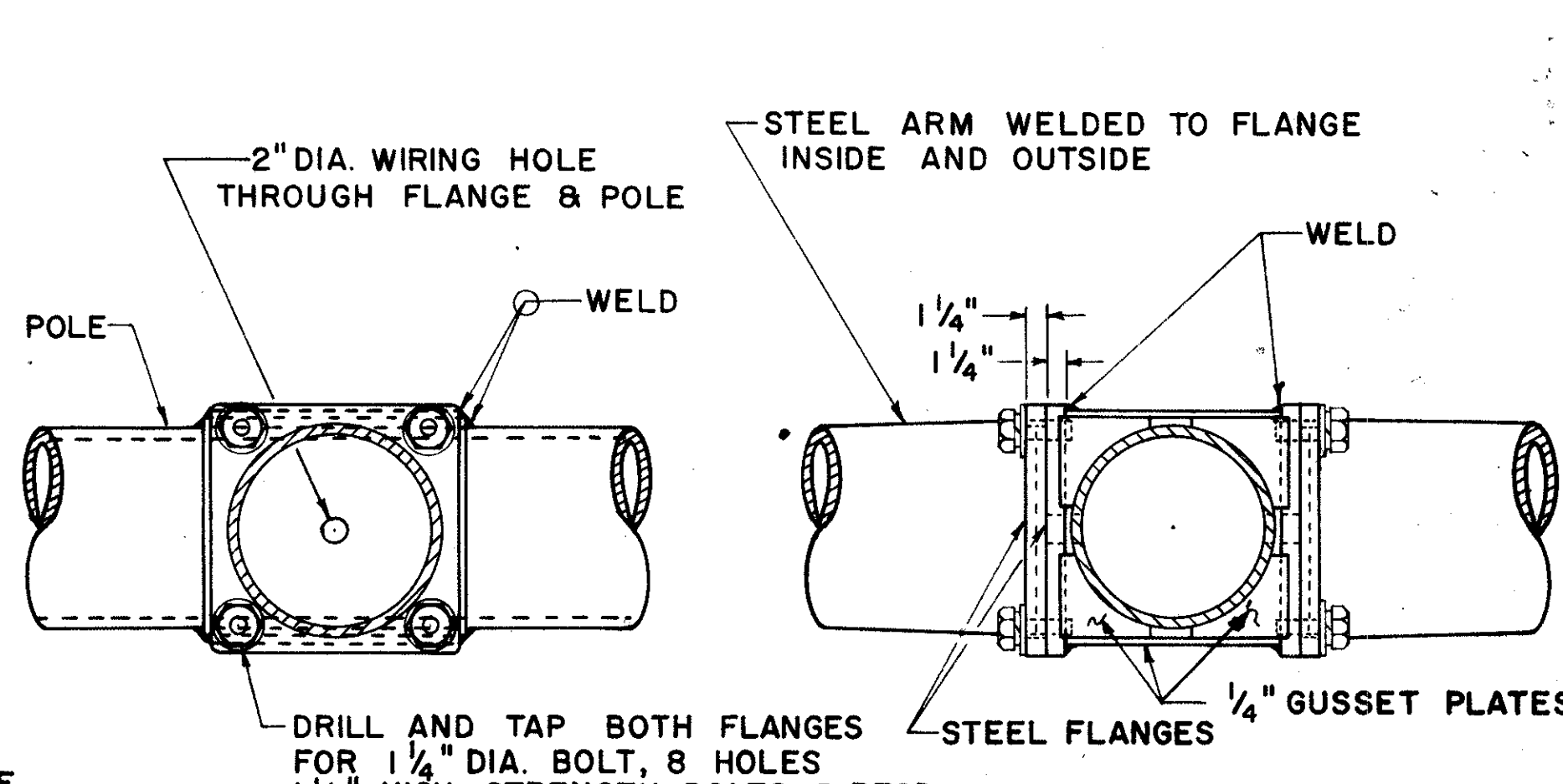
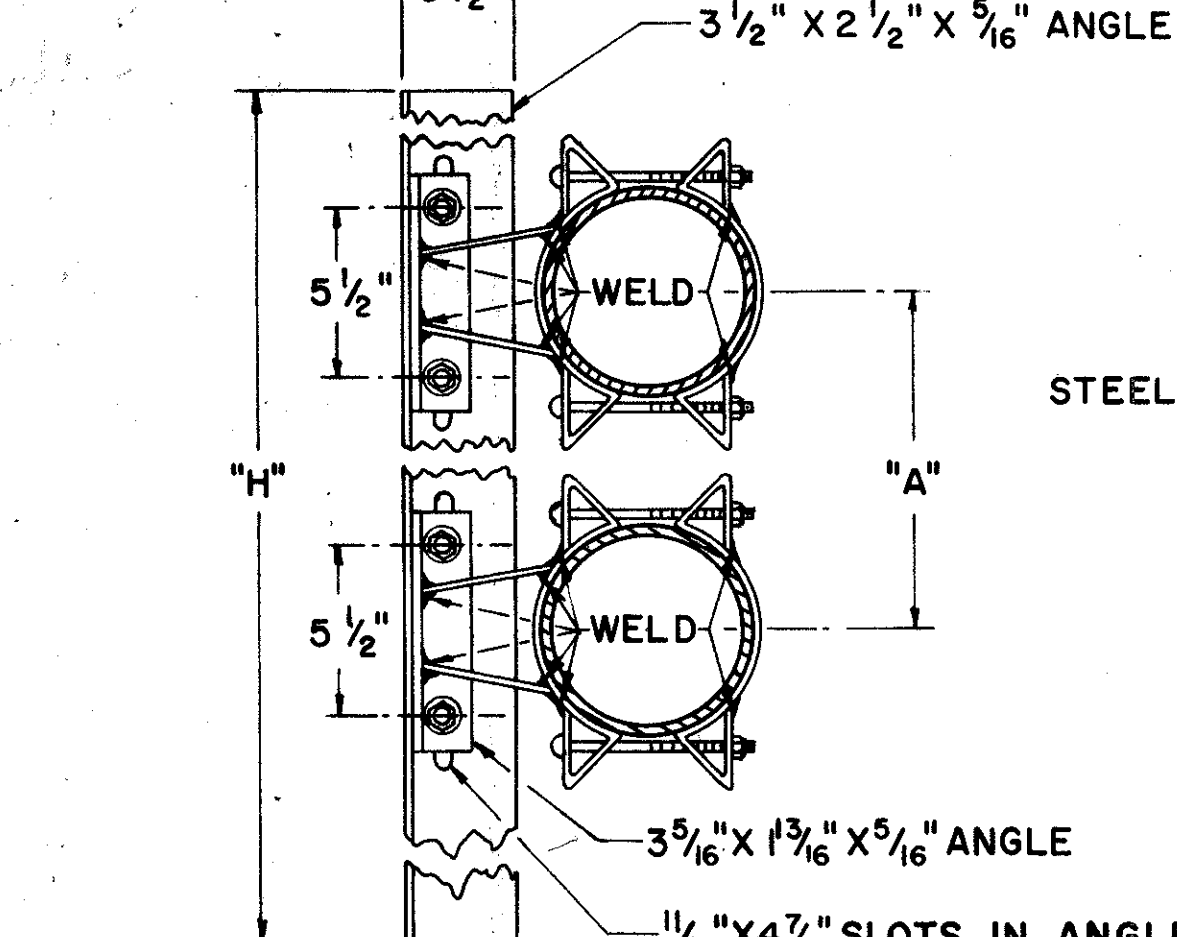
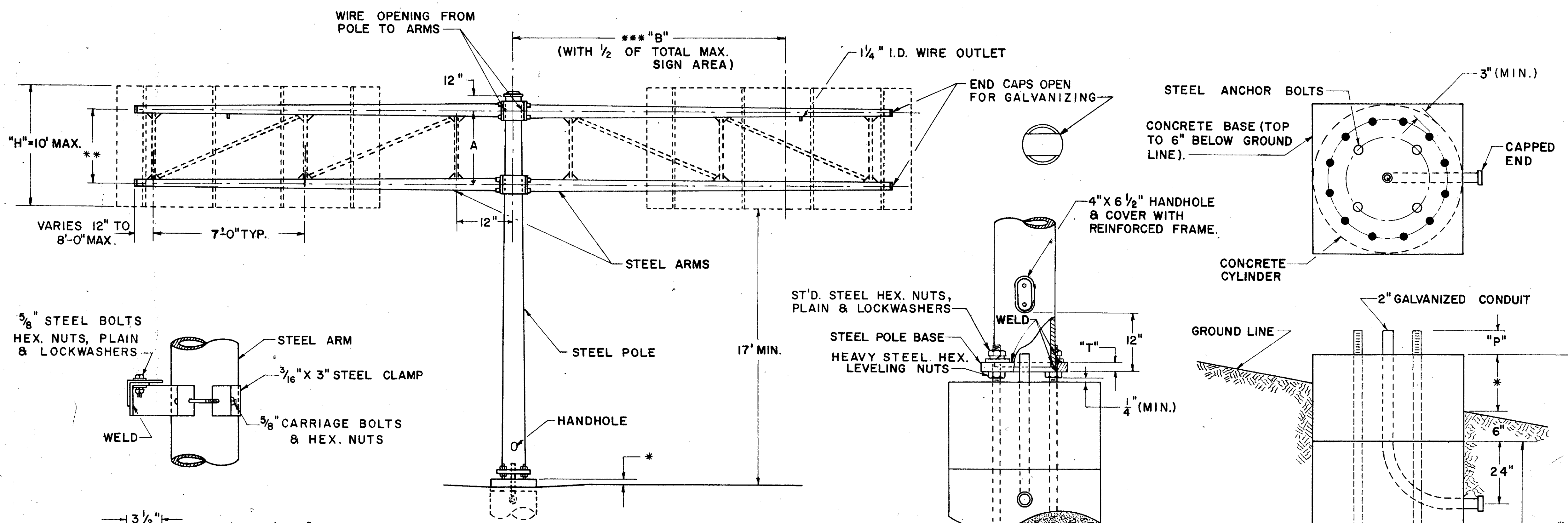


DESIGN	POLE SIZE (STD.)	MAX. ARM SIZE	MAX. SIGN LENGTH "L"	MAX. SIGN AREA	B	F	P	S	T	ANCHOR BOLTS	"D" MIN.
1.	3GA. 14" X 10.76" X 23'	4" SCH. 40 12'-0"	24'-0"	120 SQ FT	20"	14 1/8"	7"	20 1/2"	2"	3/4" X 90"	9'
2.	3GA. 16.5" X 13" X 25'	4" SCH. 40 9'-0"	18'-0"	180 SQ FT	23 1/2"	16 5/8"	8"	24 1/2"	2"	2" X 96"	11'
3.	3GA. 16.5" X 13.28" X 23'	6" SCH. 40 12'-0"	24'-0"	180 SQ FT	23 1/2"	16 5/8"	8"	24 1/2"	2"	2" X 96"	11'
4.	OGA. 18" X 14.5" X 25'	6" SCH. 40 12'-0"	24'-0"	240 SQ FT	25 1/2"	18"	9"	26 1/2"	2 1/2"	2 1/4" X 96"	13'

REINFORCEMENT SCHEDULE			
MARK	NO.	LEN.	TYPE
402	12'6"	8'-6"	103
801	8	D <sub>T</sub> 6"	STR.

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

<b>OVERHEAD SIGN SUPPORT</b>	<b>I-129 No.924</b>	DATE 6-17-64
APPROVED _____ ENGINEER OF TRAFFIC		



**NOTES**

**FABRICATION** - ALL PORTIONS OF THE SIGN SUPPORT INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. S-25.08 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS FOR PAYMENT.

**\*FOUNDATION** - THE TOP ELEVATION OF ALL FOUNDATIONS SHALL BE BUILT UP 1'-0" ABOVE THE HIGHWAY CROWN.

**\*\*ERECTION** - ARMS OVER 20' IN LENGTH SHALL BE TRUSS TYPE USING 3"X3"X 3/8" ANGLES WELDED TO GUSSET PLATES WITH THE INSIDE EDGES OF THE ARMS PARALLEL.

**\*\*\*VALUES OF "B"** MAY BE EXCEEDED PROVIDED THE PRODUCT OF ACTUAL SIGN AREA TIMES THE DISTANCE FROM C OF POLE TO C OF SIGN DOES NOT EXCEED THE PRODUCT OF "B" TIMES 1/2 THE MAX. SIGN AREA.

**GENERAL** - THE MAX. SIGN AREA ON EACH SIDE OF THE POLE EQUALS 1/2 THE MAX. TOTAL AREA IN THE CHART.

**MATERIAL** - STEEL POLE BASES, AND FLANGES SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 30 GRADE B. HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM SPECIFICATION A 193 GRADE B7. AFTER FABRICATION TAPERED POLES AND ARMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**SOILS** - THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

**REINFORCING STEEL** - REINFORCING STEEL AS SHOWN IN TABLE SHALL BE INSTALLED WHEN "D" EXCEEDS THE ANCHOR BOLT LENGTH BY MORE THAN 3 FT. THE COST AND PLACEMENT OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

**DESIGN**  
THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

DESIGN NO.	POLE SIZE	** ARM SIZE	DIM. A	DIM. ***B	DIM. "D" MIN.	DIM. F	DIM. P	DIM. S	DIM. T	BOLT CIRCLE	ANCHOR BOLT SIZE	DIM. V	MAX SIGN AREA	REINF. BARS SIZE	REINF. BARS NO.
1	3ga. 18"X14.64"X24'-0"	7ga., 5.7"X4.02"X12'-0"	4'	8'	9'	18"	8 3/8"	26 1/2"	2"	25 1/2"	2" X 96"	3'-0"	160	3/4"	12
2	3ga. 18"X14.64"X24'-0"	7ga., 6.9"X4.66"X16'-0"	4'	12'	9'	18"	8 3/8"	26 1/2"	2"	25 1/2"	2" X 96"	3'-0"	160	3/4"	12
3	0ga., 18"X14.64"X24'-0"	7ga., 7.5"X5.82"X12'-0"	4'	8'	11'	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 108"	3'-0"	240	1"	12
4	0ga., 18"X14.64"X24'-0"	7ga., 8.3"X6.06"X16'-0"	4'	12'	11'	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 108"	3'-0"	240	1"	12
5	0ga., 18"X14.64"X24'-0"	7ga., 10"X7.2"X20'-0"	4'	16'	11'	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 108"	3'-0"	220	1"	12
6	2ply 3ga., 18"X14.5"X25'-0"	7ga., 10"X7.48"X18'-0"	6'	10'	14'	18"	11 1/4"	26 1/2"	3'	25 1/2"	3" X 144"	3'-0"	360	1 1/8"	12
7	2ply 3ga., 18"X14.5"X25'-0"	7ga., 11"X7.92"X22'-0"	6'	14'	14'	18"	11 1/4"	26 1/2"	3'	25 1/2"	3" X 144"	3'-0"	360	1 1/8"	12
8	2ply 0ga., 18"X14.5"X25'-0"	7ga., 12.5"X9.14"X24'-0"	6'	14'	17'	18"	11 1/4"	26 1/2"	3'	25 1/2"	3" X 168"	3'-0"	480	1 1/4"	12
9	2ply 0ga., 18"X14.5"X25'-0"	3ga., 12.5"X8.58"X28'-0"	6'	18'	17'	18"	11 1/4"	26 1/2"	3'	25 1/2"	3" X 168"	3'-0"	480	1 1/4"	12

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORT**

I-129 No.10.48

APPROVED *Robert E. Loman*  
ENGINEER OF TRAFFIC

DATE 11-2-61  
1-18-62  
3-30-62  
4-18-62

**NOTES**

**FABRICATION** - ALL PORTIONS OF THE SIGN SUPPORT, INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. S-25.08 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS FOR PAYMENT.

\* **FOUNDATION** - THE TOP ELEVATION OF FOUNDATIONS SHALL BE VARIED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 17' BETWEEN THE BOTTOM OF THE SIGN AND THE HIGHWAY CROWN.

\* \* **ERECTION** - VALUES OF "B" MAY BE EXCEEDED PROVIDED THE PRODUCT OF ACTUAL SIGN AREA TIMES THE DISTANCE FROM C OF POLE TO C OF SIGN DOES NOT EXCEED THE MAX SIGN AREA TIMES "B".

\* \* \* **ARMS** 20' LONG OR LONGER ARE TO BE TRUSS TYPE WITH 3" X 3" X 5/16" ANGLES WELDED TO GUSSET PLATES.

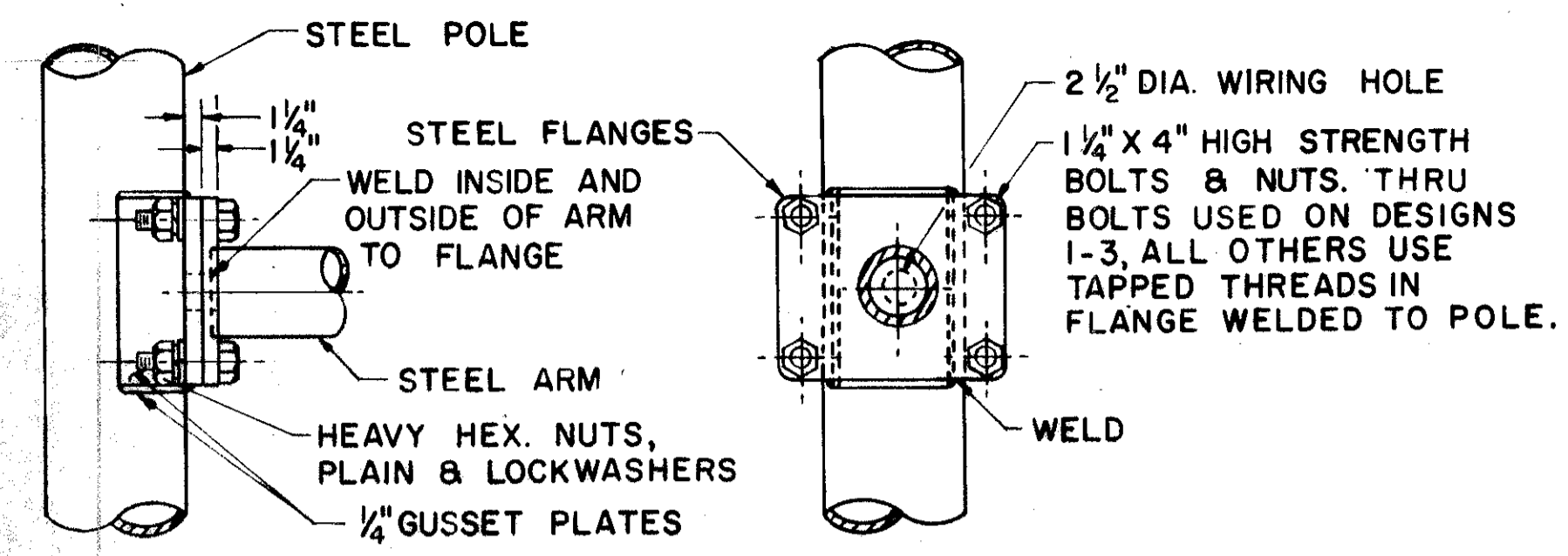
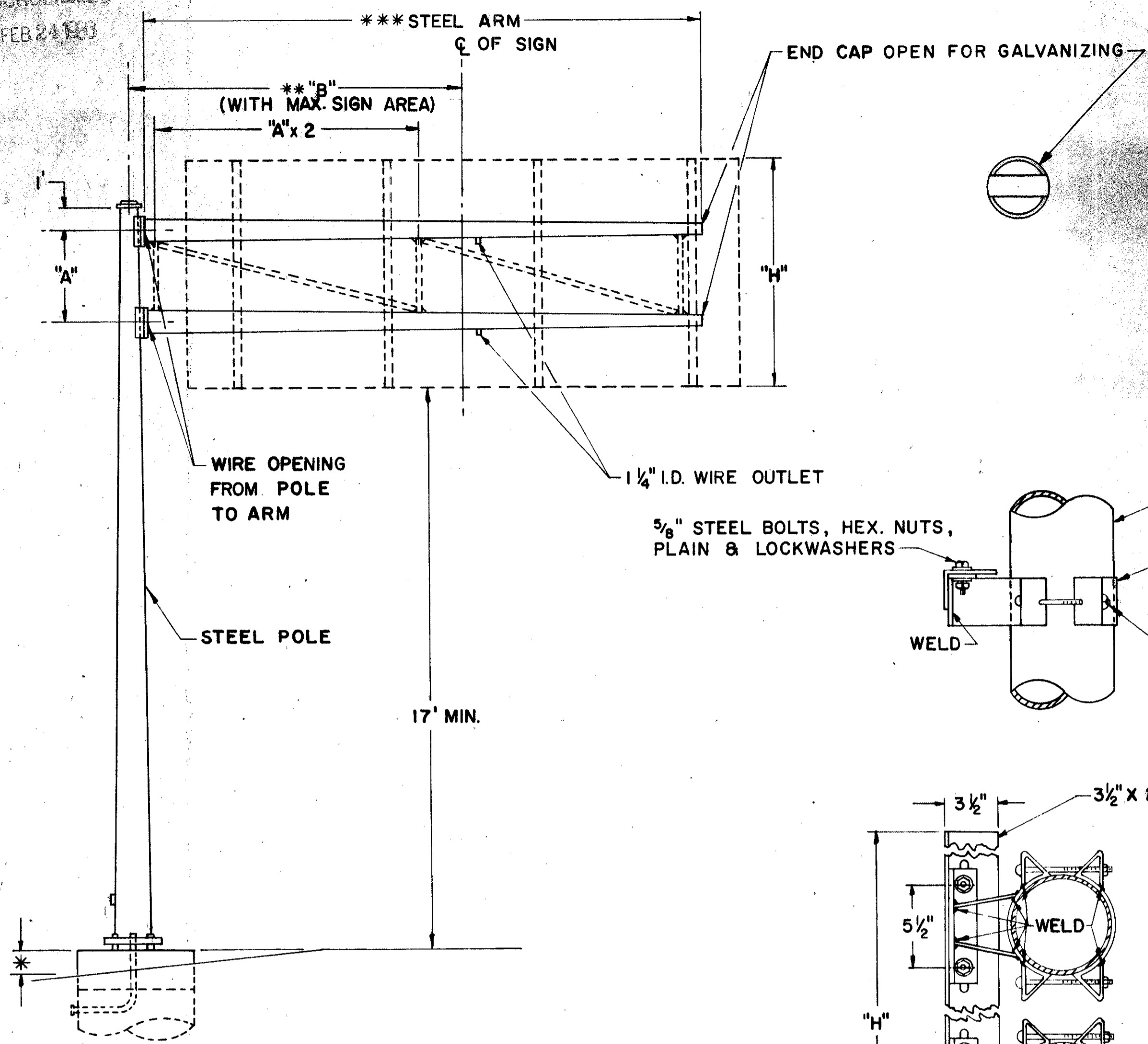
**MATERIAL** - STEEL POLE BASES, FLANGES, AND END CAPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 30. GRADE B. HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM SPECIFICATION A 193 GRADE B. AFTER FABRICATION TAPERED POLES AND ARMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**SOILS** - THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" BY 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

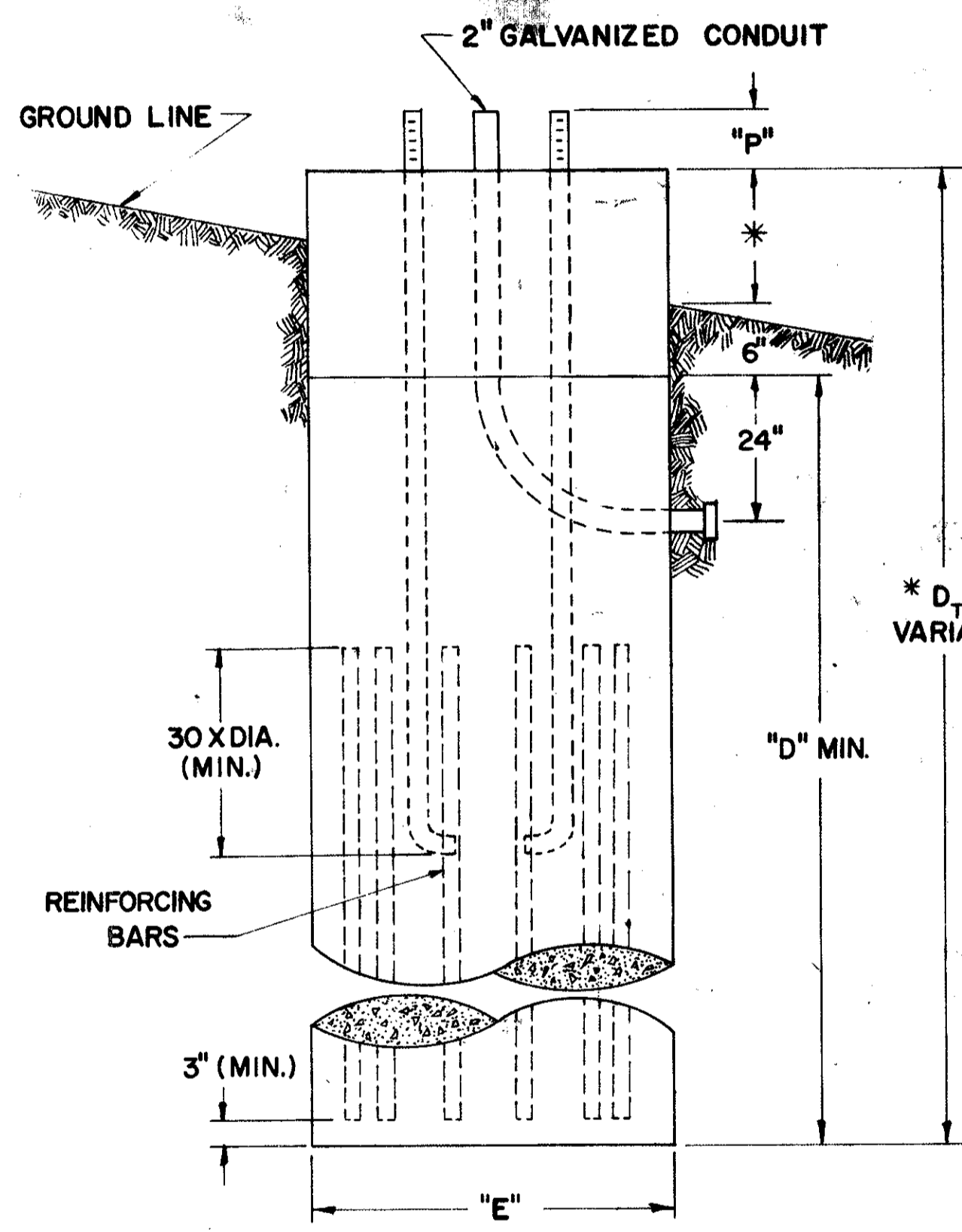
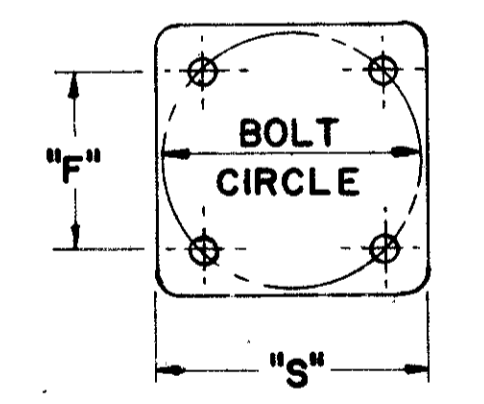
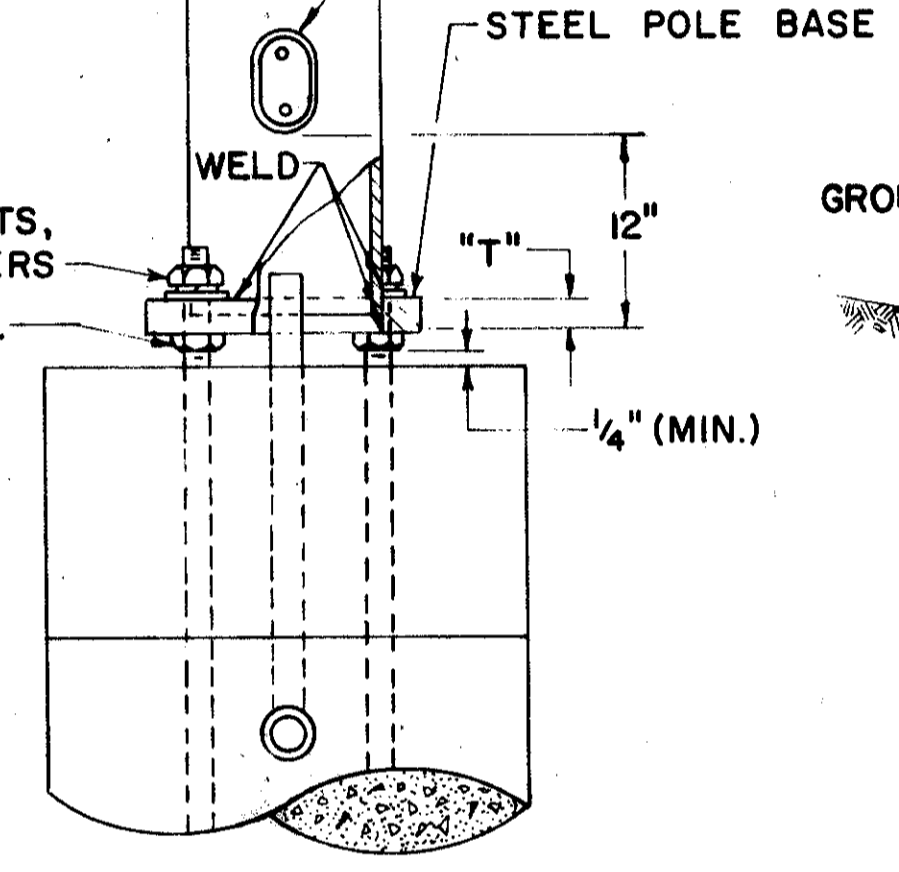
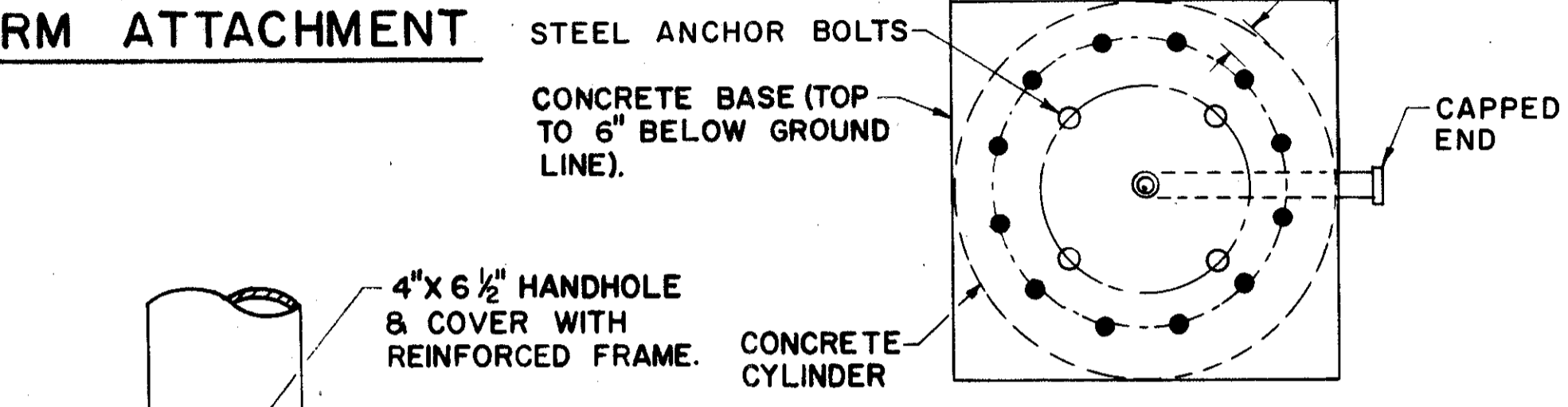
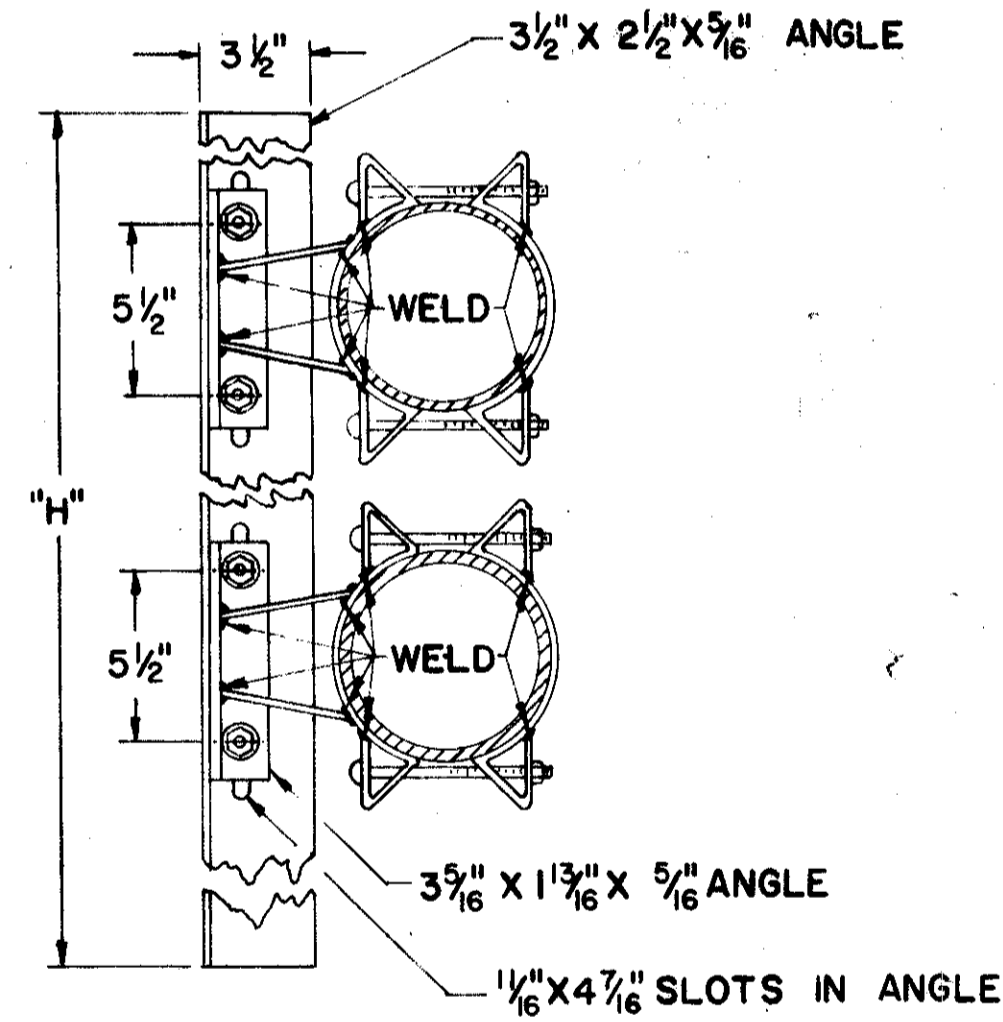
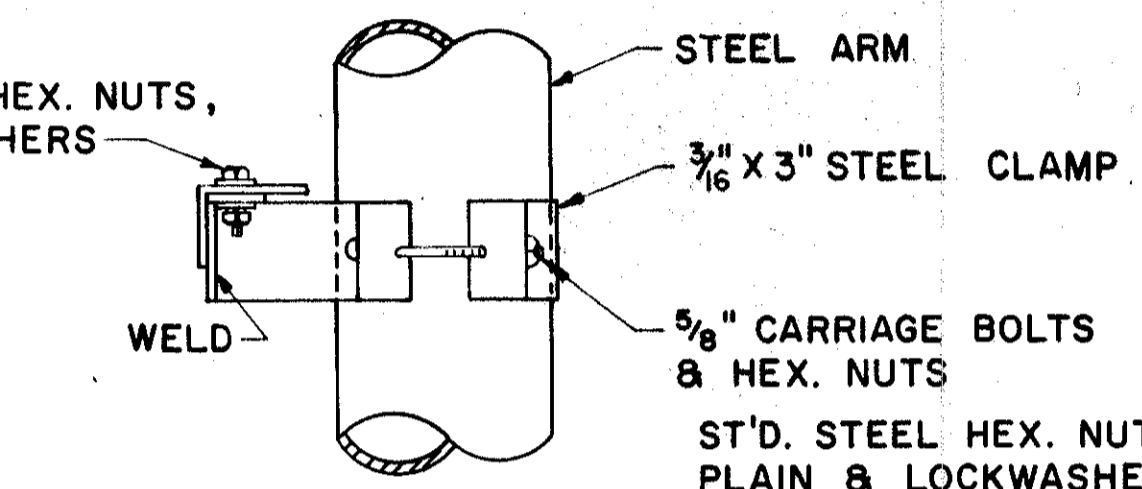
**REINFORCING STEEL** - REINFORCING STEEL AS SHOWN IN TABLE SHALL BE INSTALLED WHEN "D" EXCEEDS THE ANCHOR BOLT LENGTH BY MORE THAN 3 FT. THE COST AND PLACEMENT OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

**DESIGN**

THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



**ARM ATTACHMENT**



**FOUNDATION DETAIL**

DESIGN NO.	POLE SIZE	*** ARM SIZE	DIM A	DIM **B	DIM "D" MIN.	DIM E	DIM F	DIM P	DIM S	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	REIN. BARS	
														SIZE	NO.
1	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 6.9" X 4.66" X 16'-0"	4'	12'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
2	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 8" X 5.2" X 20'-0"	4'	16'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
3	3 Ga, 15" X 11.5" X 25'-0"	7 Ga, 8.3" X 6.06" X 16'-0"	4'	12'	11'	3'-0"	15 1/2"	8 3/8"	23"	2"	22"	2" X 96"	120	1"	12
4	3 Ga, 16" X 12.5" X 25'-0"	3 Ga, 9.2" X 6.40" X 20'-0"	4'	16'	11'	3'-0"	16 5/16"	8 3/8"	24 1/2"	2"	23 1/2"	2" X 96"	120	1"	12
5	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 11" X 7.92" X 22'-0"	6'	14'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
6	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 8.86" X 26'-0"	6'	18'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
7	2 PLY 7 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 9.14" X 24'-0"	6'	14'	15'	3'-0"	18"	9 3/4"	26 1/2"	2 1/2"	25 1/2"	2 1/2" X 144"	240	1 1/4"	12
8	2 PLY 1/4", 18" X 14.36" X 26'-0"	3 Ga, 12.5" X 8.58" X 26'-0"	6'	18'	15'	3'-0"	18"	11 1/4"	26 1/2"	3"	25 1/2"	3" X 144"	240	1 1/4"	12

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORT** I-129 No. 12.24

APPROVED *Robert E. Connor*  
ENGINEER OF TRAFFIC

DATE 9-18-61  
4-11-62

**NOTES**

FABRICATION - ALL PORTIONS OF THE SIGN SUPPORT, INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. S-2508 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS FOR PAYMENT.

\* FOUNDATION - THE TOP ELEVATION OF FOUNDATIONS SHALL BE VARIED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 17' BETWEEN THE BOTTOM OF THE SIGN AND THE HIGHWAY CROWN.

\* \* \* ERECTION - VALUES OF "B" MAY BE EXCEEDED PROVIDED THE PRODUCT OF ACTUAL SIGN AREA TIMES THE DISTANCE FROM C OF POLE TO C OF SIGN DOES NOT EXCEED THE MAX SIGN AREA TIMES "B".

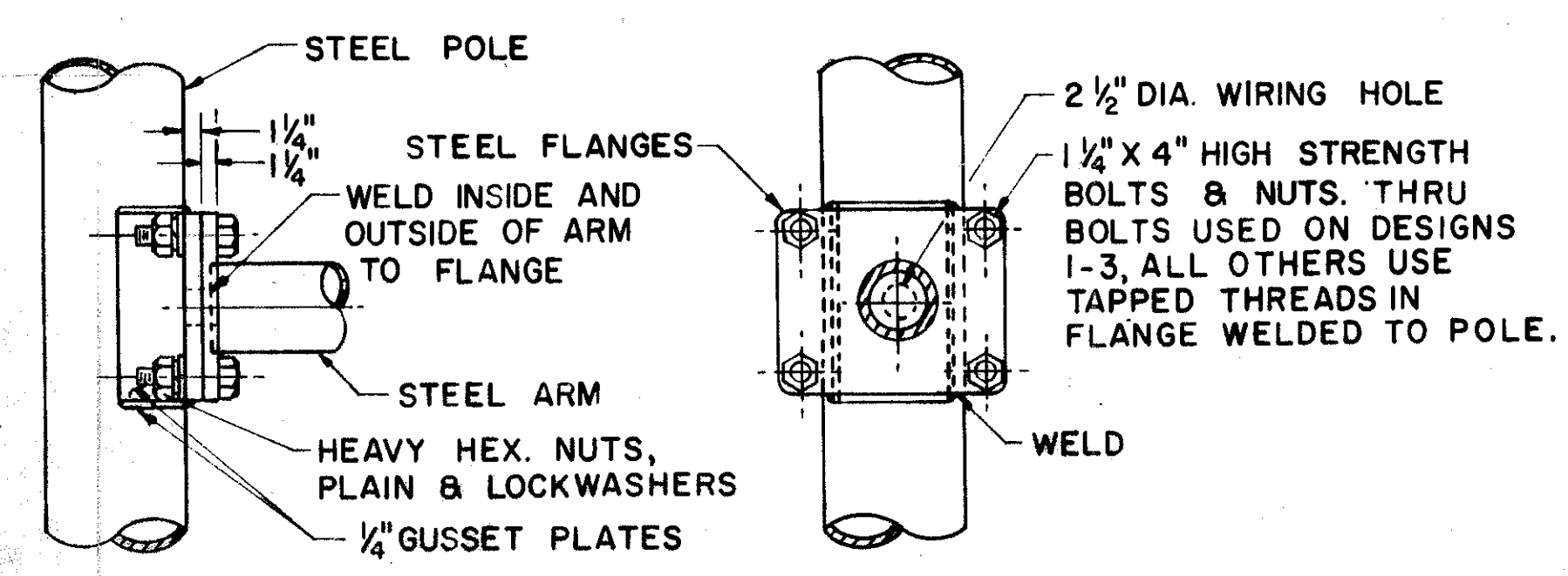
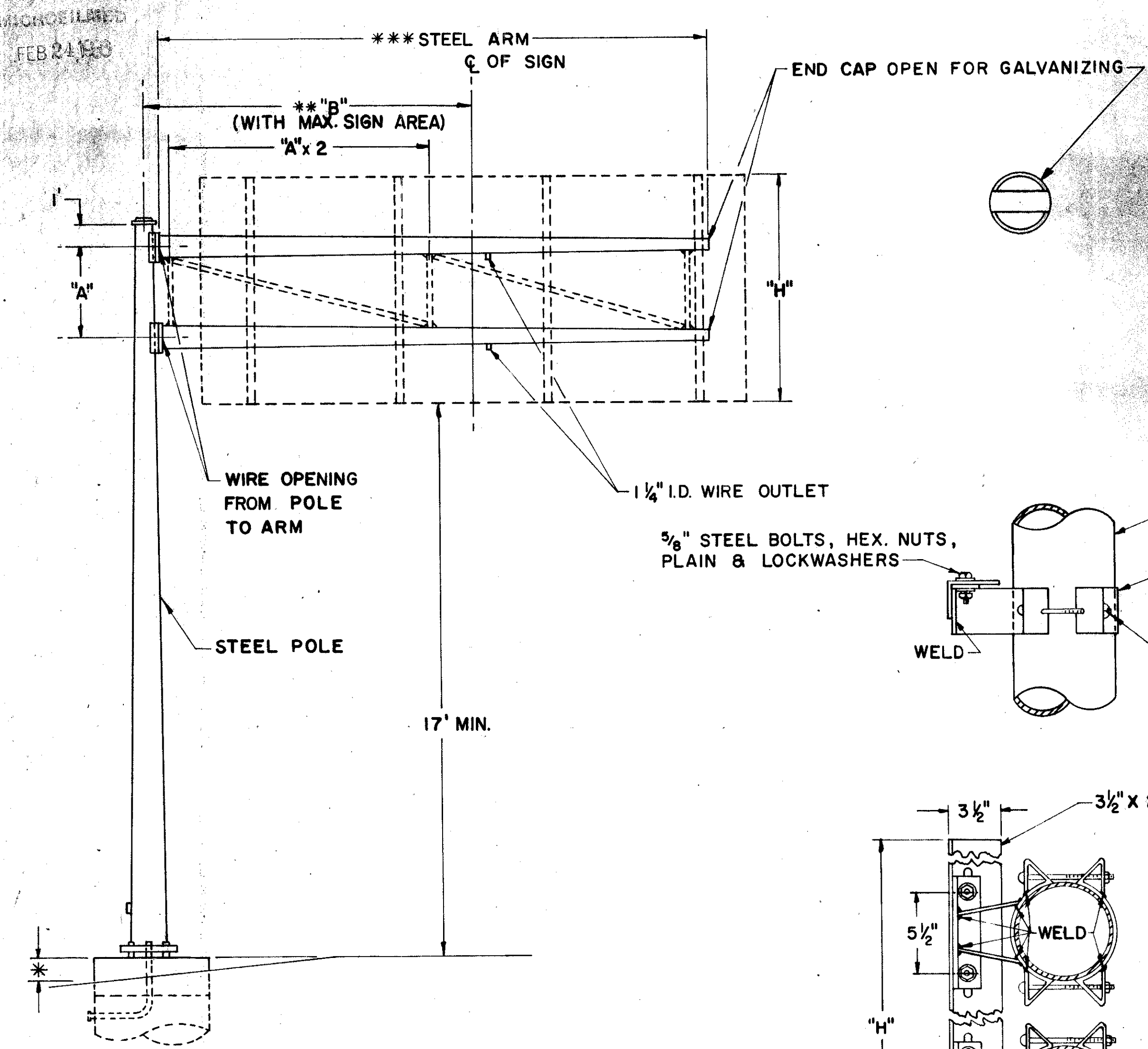
\* \* \* ARMS 20' LONG OR LONGER ARE TO BE TRUSS TYPE WITH 3" X 3" X 5/8" ANGLES WELDED TO GUSSET PLATES.

MATERIAL - STEEL POLE BASES, FLANGES, AND END CAPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 30 GRADE B. HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM SPECIFICATION A 193 GRADE B7. AFTER FABRICATION TAPERED POLES AND ARMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

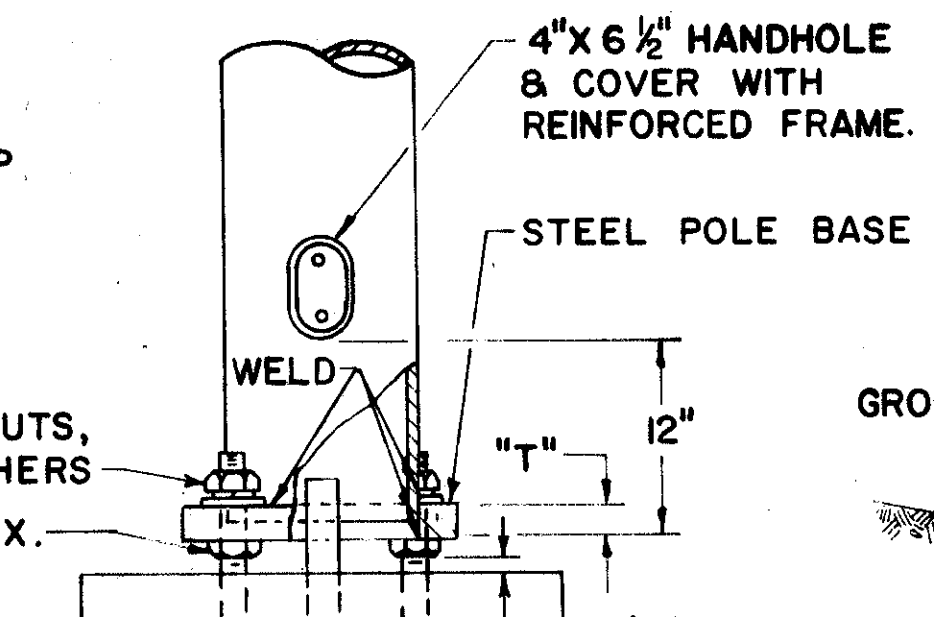
SOILS - THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

REINFORCING STEEL - REINFORCING STEEL AS SHOWN IN TABLE SHALL BE INSTALLED WHEN "D" EXCEEDS THE ANCHOR BOLT LENGTH BY MORE THAN 3 FT. THE COST AND PLACEMENT OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

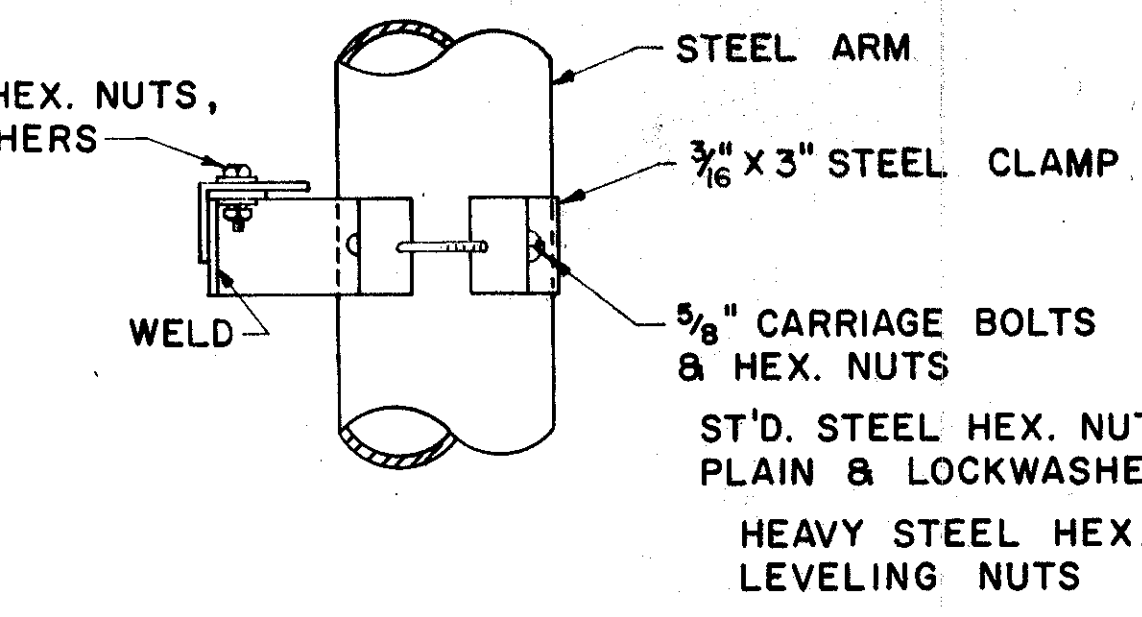
DESIGN - THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



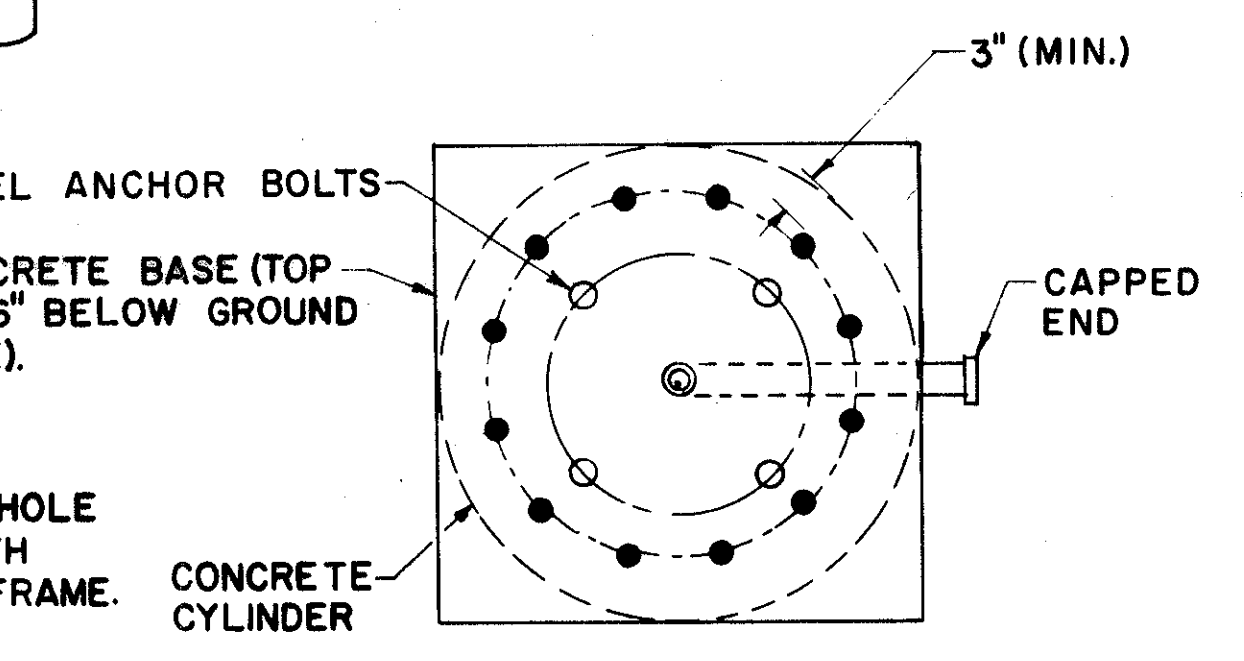
**ARM ATTACHMENT**



**POLE DETAIL**



**SIGN ATTACHMENT DETAIL**



**FOUNDATION DETAIL**

DESIGN NO.	POLE SIZE	*** ARM SIZE	DIM A	DIM **B	DIM "D" MIN.	DIM E	DIM F	DIM P	DIM S	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	REIN. BARS SIZE	NO.
1	3 Ga, 12" X 8.78" X 23'-0"	7Ga, 6.9" X 4.66" X 16'-0"	4'	12'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
2	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 8" X 5.2" X 20'-0"	4'	16'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
3	3 Ga, 15" X 11.5" X 25'-0"	7 Ga, 8.3" X 6.06" X 16'-0"	4'	12'	11'	3'-0"	15 1/2"	8 3/8"	23"	2"	22"	2" X 96"	120	1"	12
4	3 Ga, 16" X 12.5" X 25'-0"	3 Ga, 9.2" X 6.40" X 20'-0"	4'	16'	11'	3'-0"	16 5/16"	8 3/8"	24 1/2"	2"	23 1/2"	2" X 96"	120	1"	12
5	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 11" X 7.92" X 22'-0"	6'	14'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
6	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 8.86" X 26'-0"	6'	18'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
7	2 PLY 7 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 9.14" X 24'-0"	6'	14'	15'	3'-0"	18"	9 3/4"	26 1/2"	2 1/2"	25 1/2"	2 1/2" X 144"	240	1 1/4"	12
8	2 PLY 1/4", 18" X 14.36" X 26'-0"	3 Ga, 12.5" X 8.58" X 26'-0"	6'	18'	15'	3'-0"	18"	11 1/4"	26 1/2"	3"	25 1/2"	3" X 144"	240	1 1/4"	12

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORT** I-129 No. 12.24

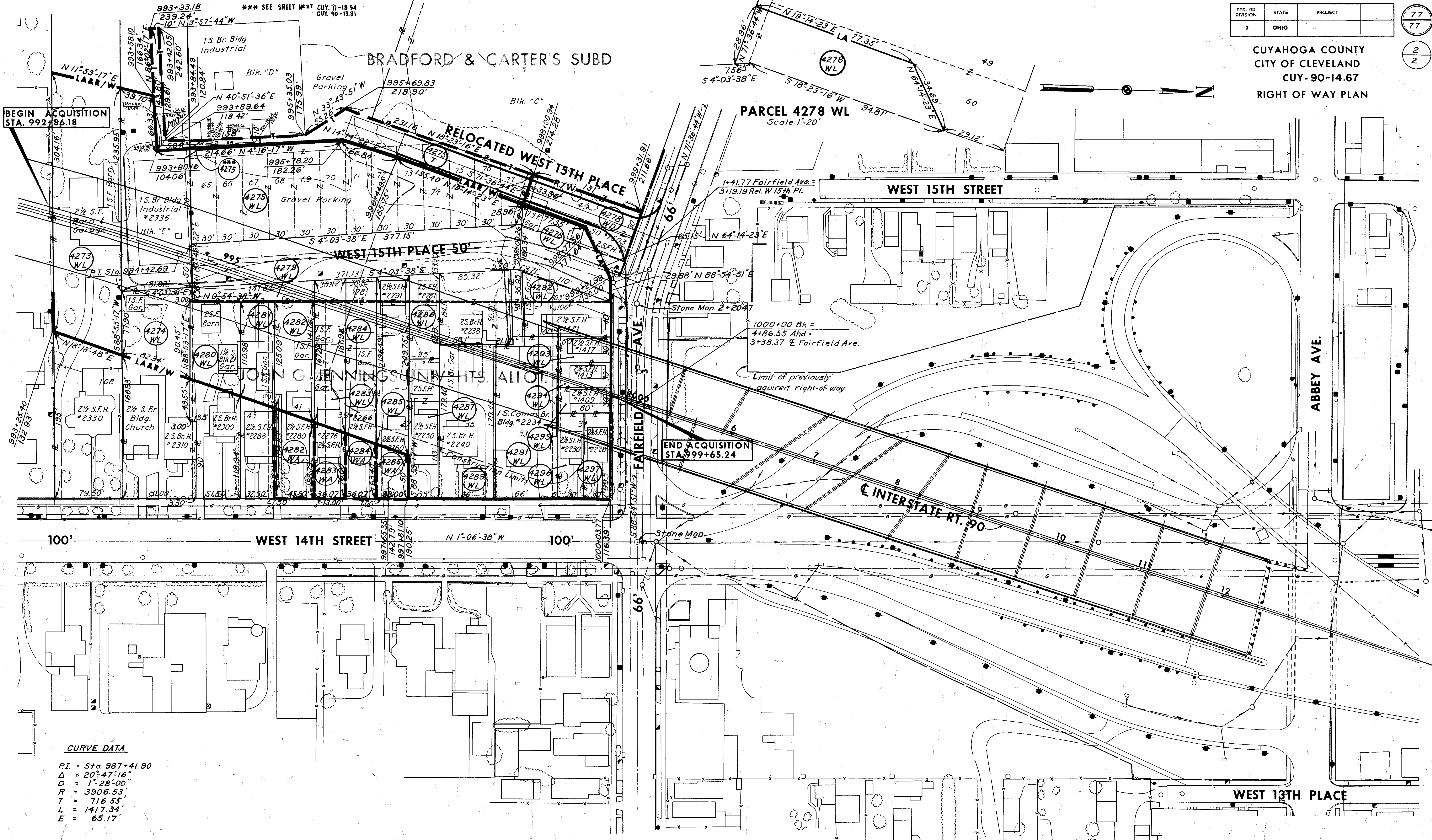
DATE 8-18-61 4-11-62

APPROVED *Robert E. Connor*  
ENGINEER OF TRAFFIC



FED. RD. DIVISION	STATE	PROJECT	77
2	OHIO		77

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
CUY-90-14.67  
RIGHT OF WAY PLAN



**CURVE DATA**  
 P.I. = Sta. 987+41.90  
 Δ = 20°-47'-16"  
 D = 1'-28'-00"  
 R = 3906.53'  
 T = 716.55'  
 L = 1417.34'  
 E = 65.17'

CITY OF CLEVELAND - BROOKLYN TOWNSHIP  
TOWN 7, RANGE 13, O.L. 87

SCALE 1" = 50'  
 MADE T.U.T. DATE 12-30-63  
 TRCD T.U.T. DATE 2-30-63  
 CKD DATE  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

2	Part of Parcel 4278 WL assigned		
	Parcel No. 4278 WD	4-6-64	T.U.T.
1	Corrected West R of Parcel 4275	3-23-64	T.U.T.
NO.	REVISION	DATE	BY