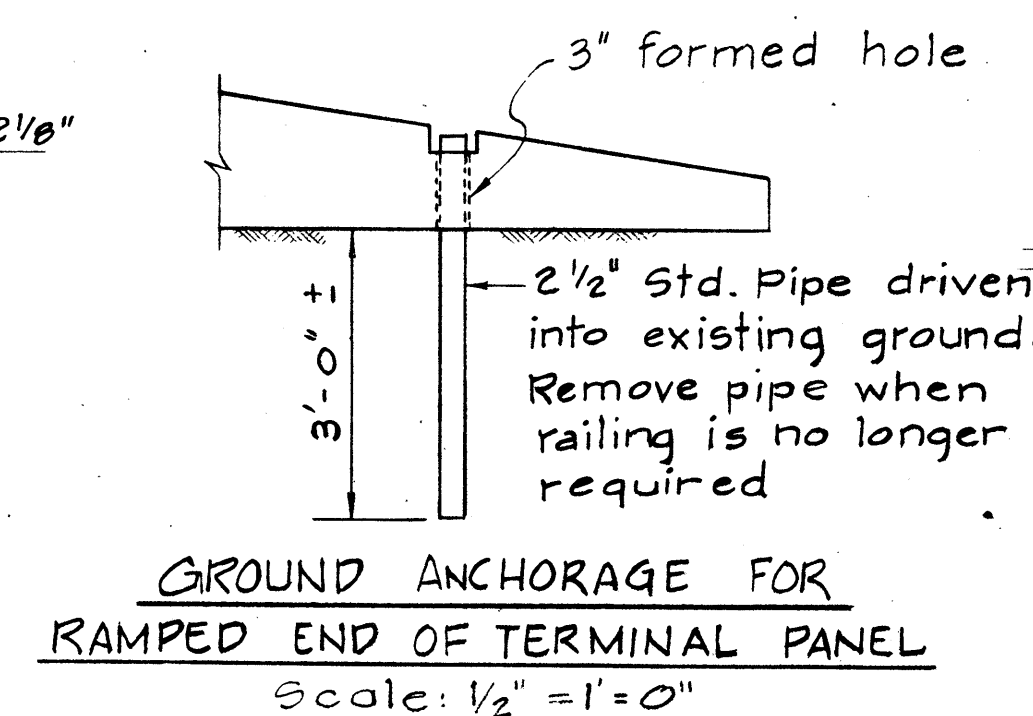
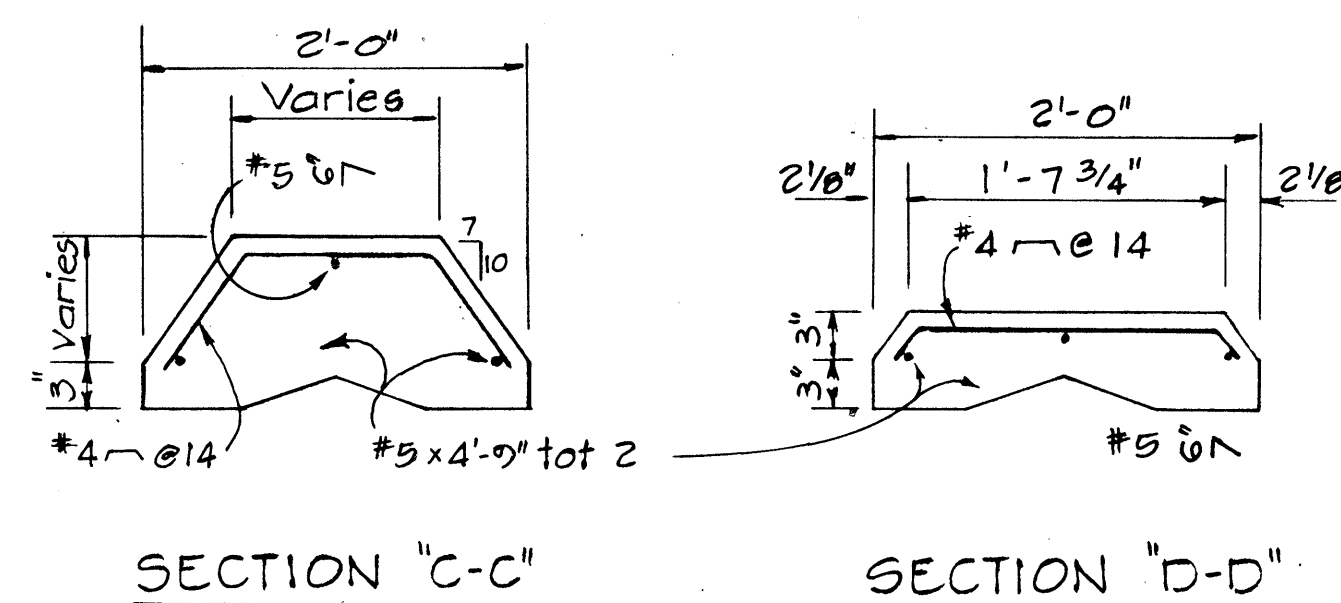
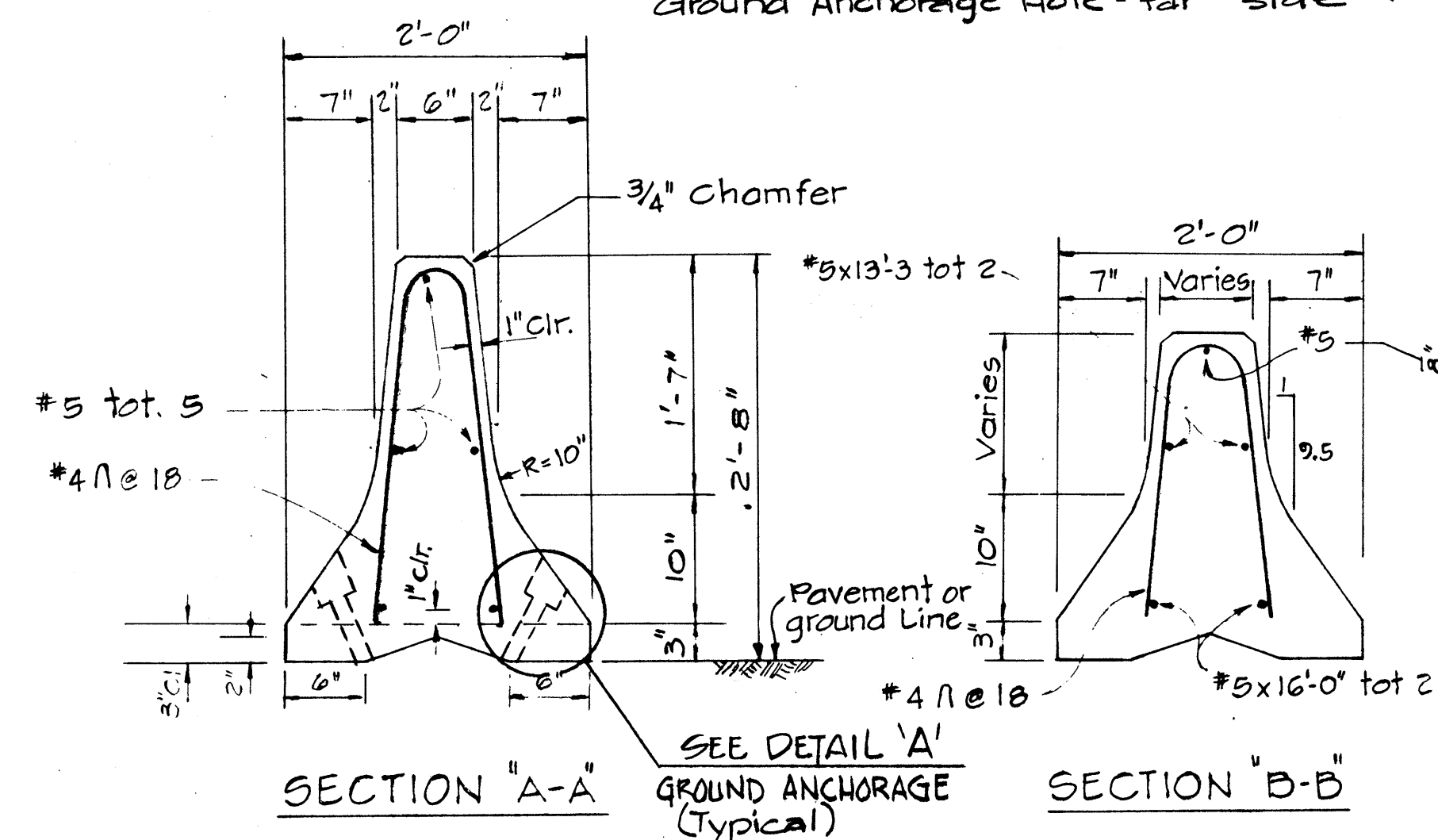
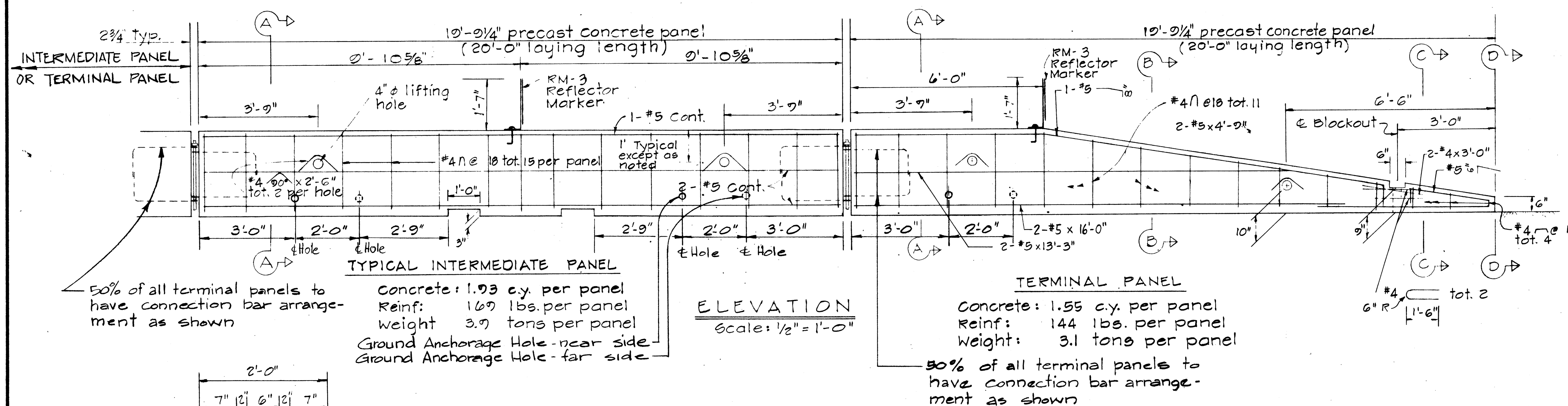
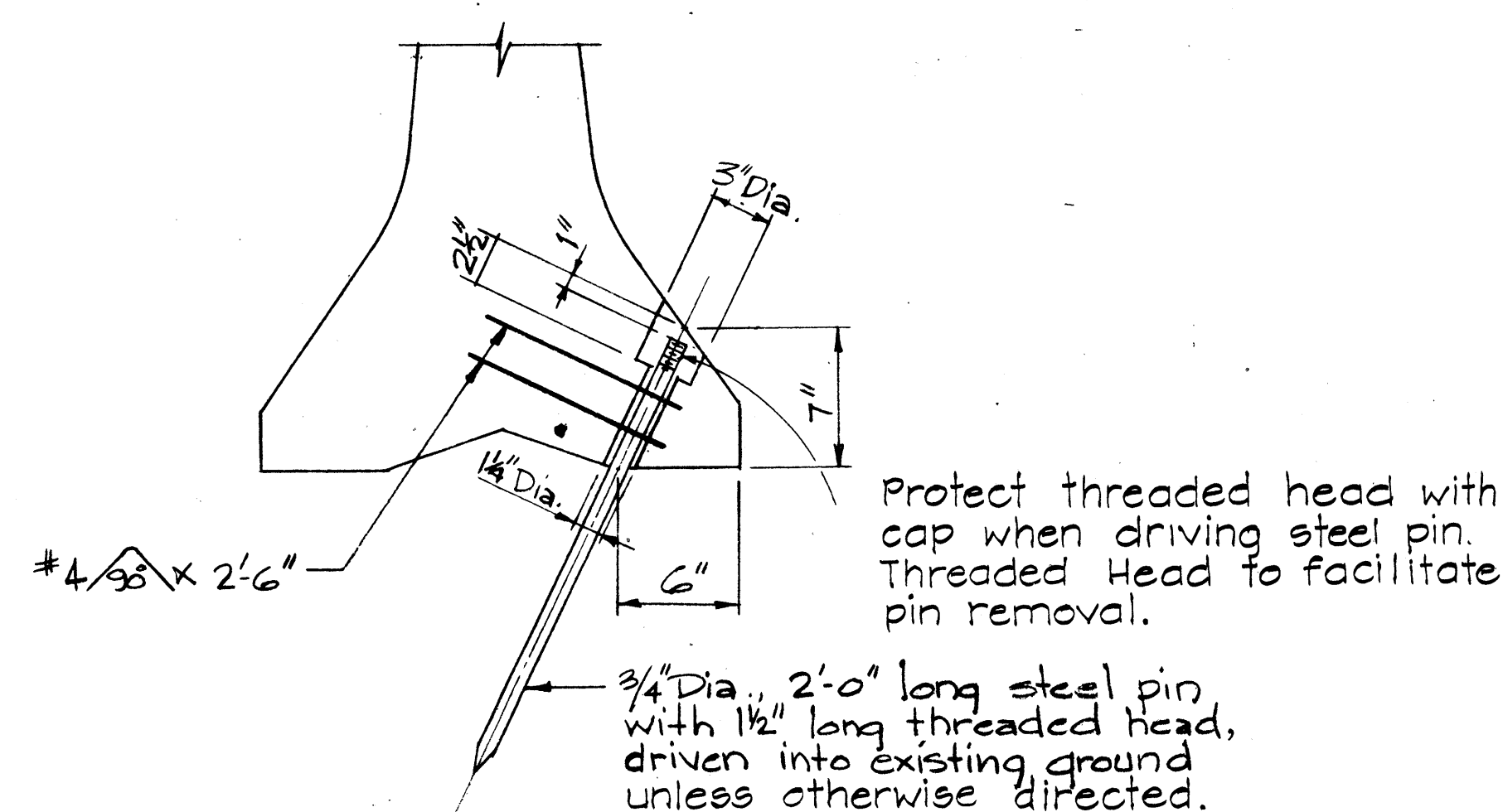
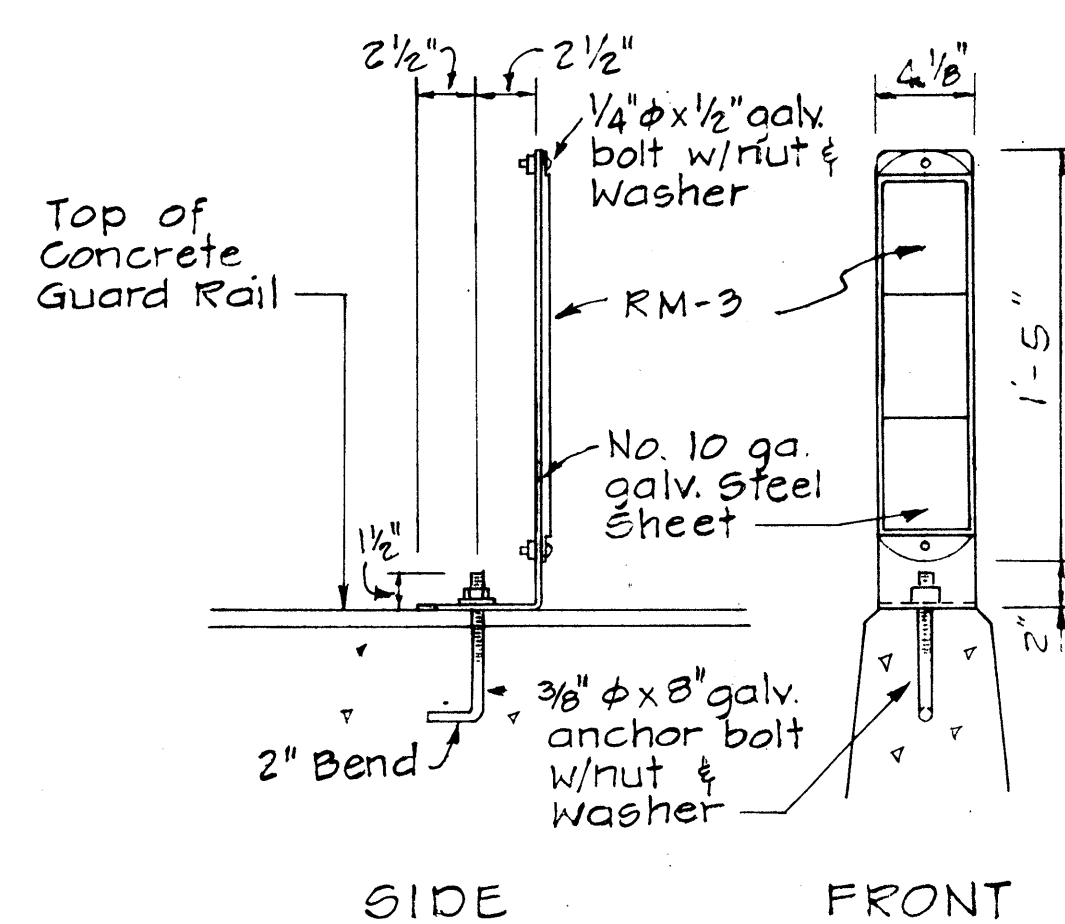
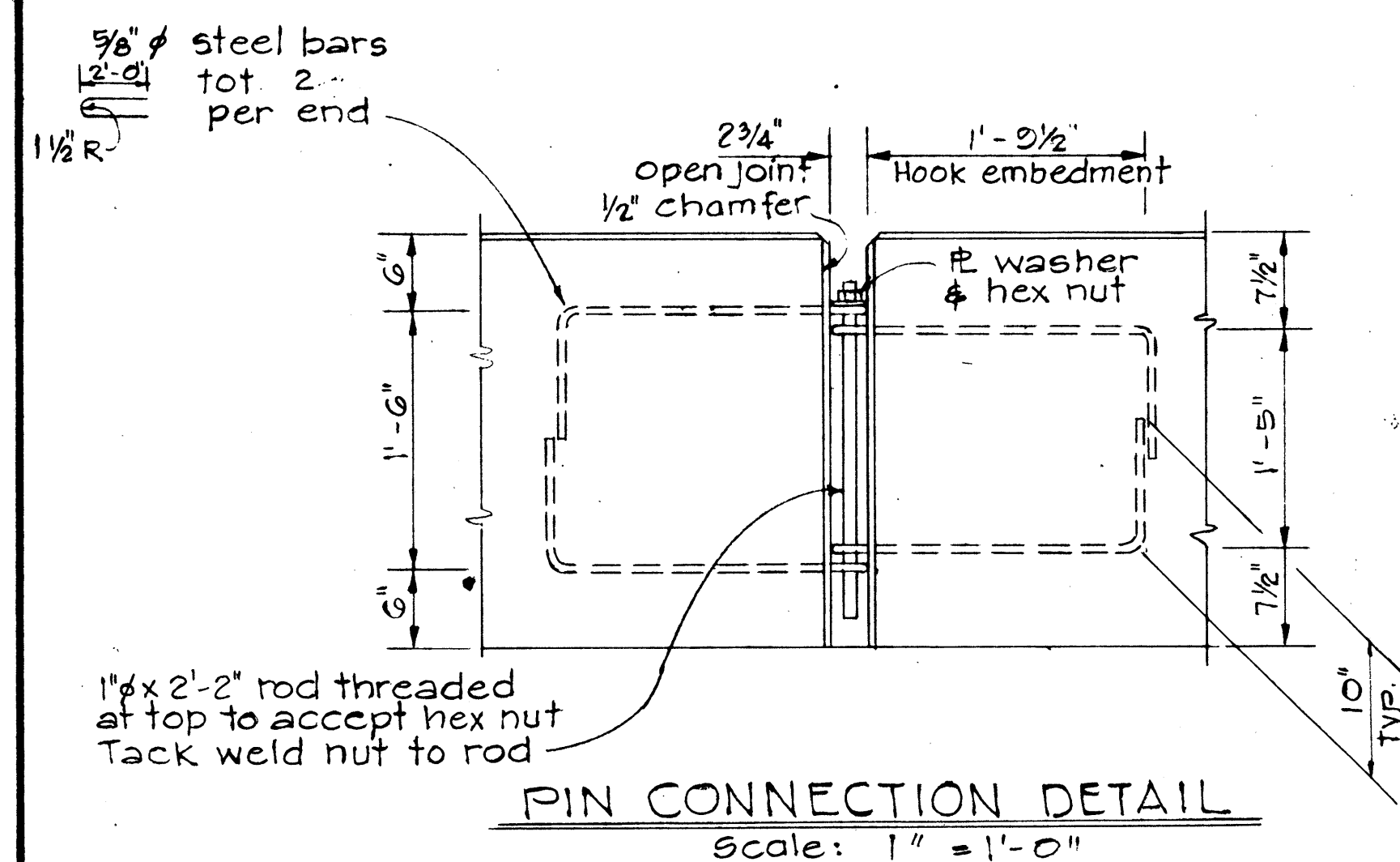


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | I-13-1(28):13      | 1977        | 4         | 55           |



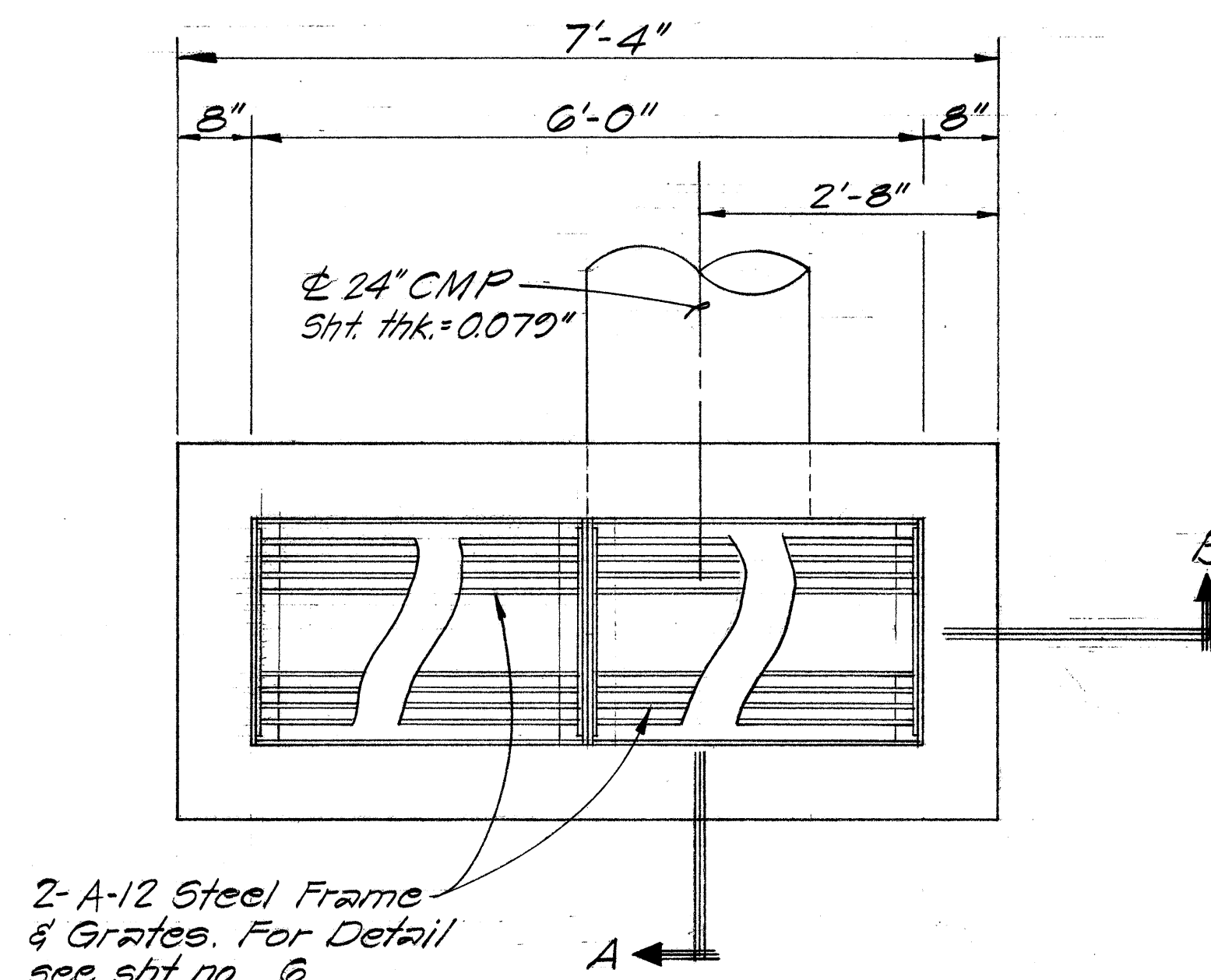
# NOTES

- For details not shown in Sections B-B, C-C, & D-D, see Section A-A.
- Reflector Marker shall not be paid for separately but shall be considered incidental to "Portable Concrete Guard Rail."
- Concrete shall be Class "A".
- All bolts to have cut washers unless otherwise noted.
- RM-3s on Portable Concrete Barrier to be placed in view of oncoming traffic.

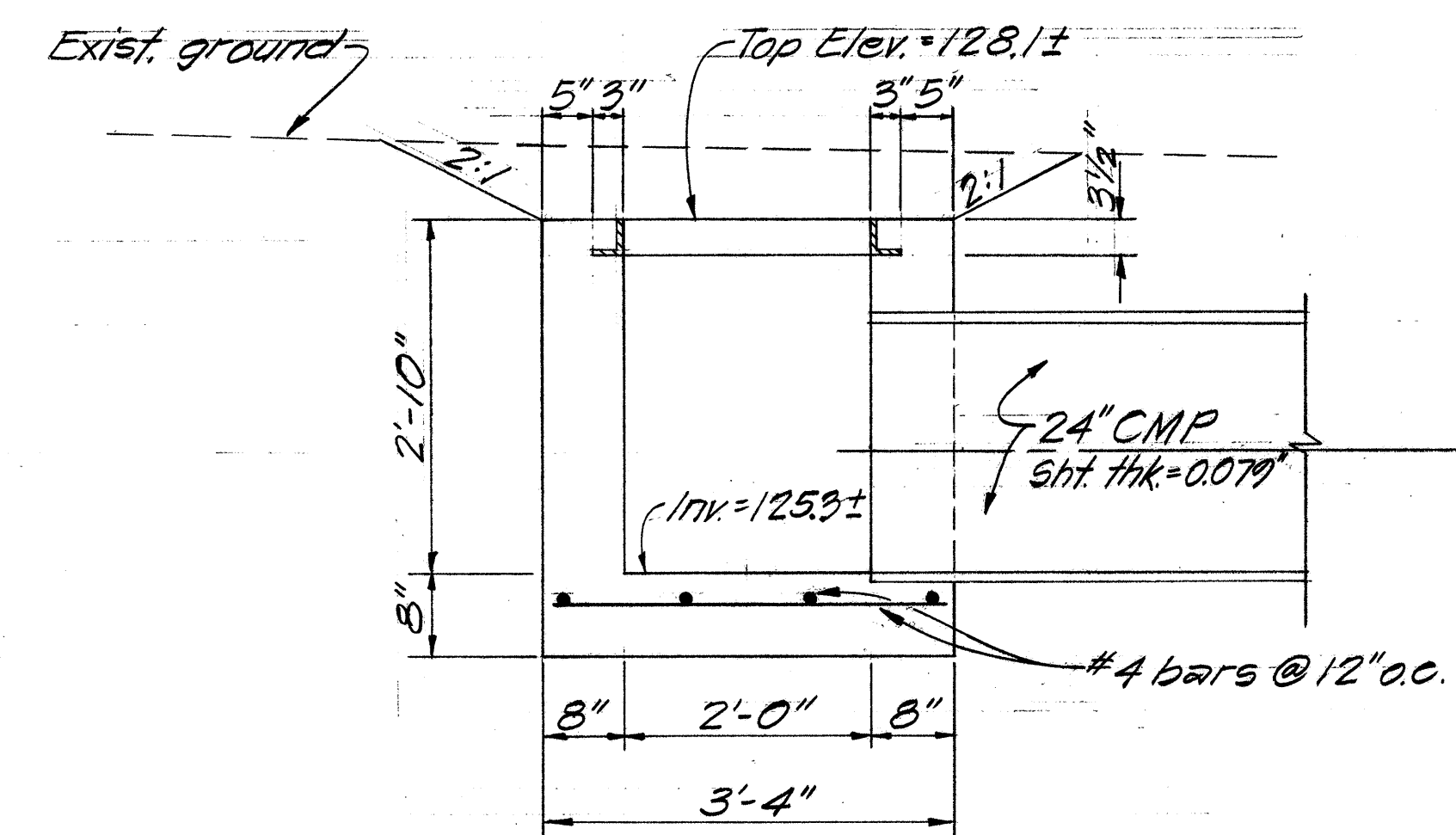


|                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION                                                                                                                                        |
| PORTABLE CONCRETE GUARD<br>RAIL TYPICAL DETAILS<br>INTERSTATE ROUTE H-3<br>Temporary Connection at Kailua I.C.<br>FAI Proj. No. I-H3-1(28):13<br>Scale: As Noted Date: Nov. 1976<br>SHEET No. 1 OF 5 SHEETS |

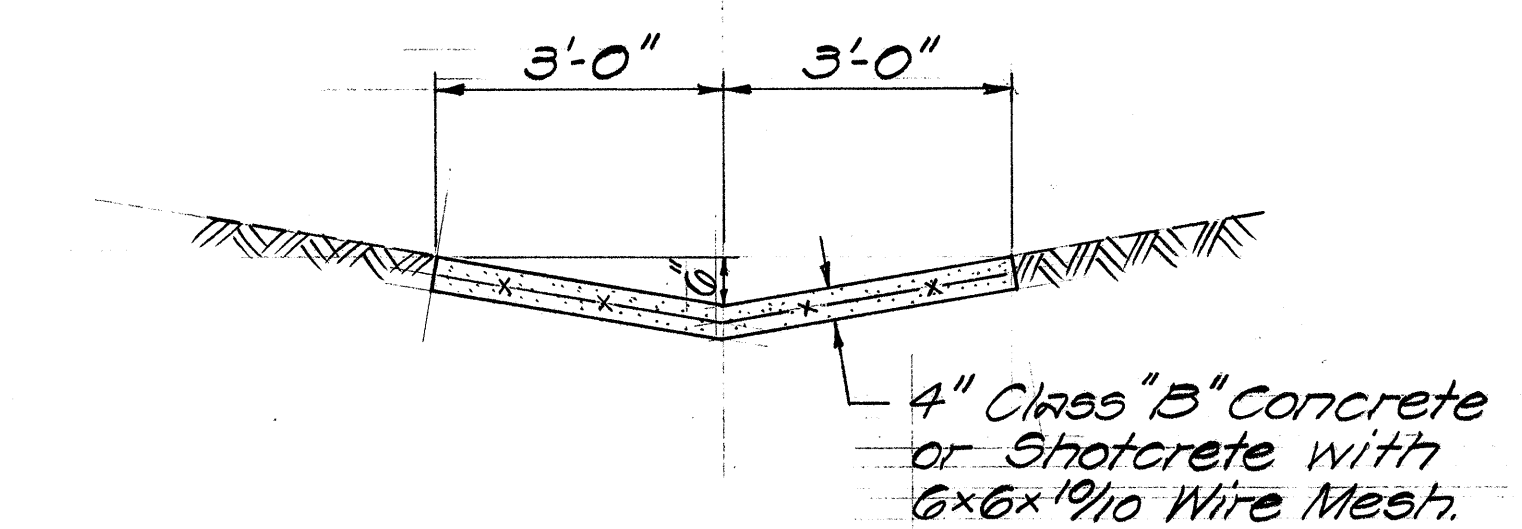
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | I-43-1(28)13       | 1977        | 5         | 55           |



PLAN

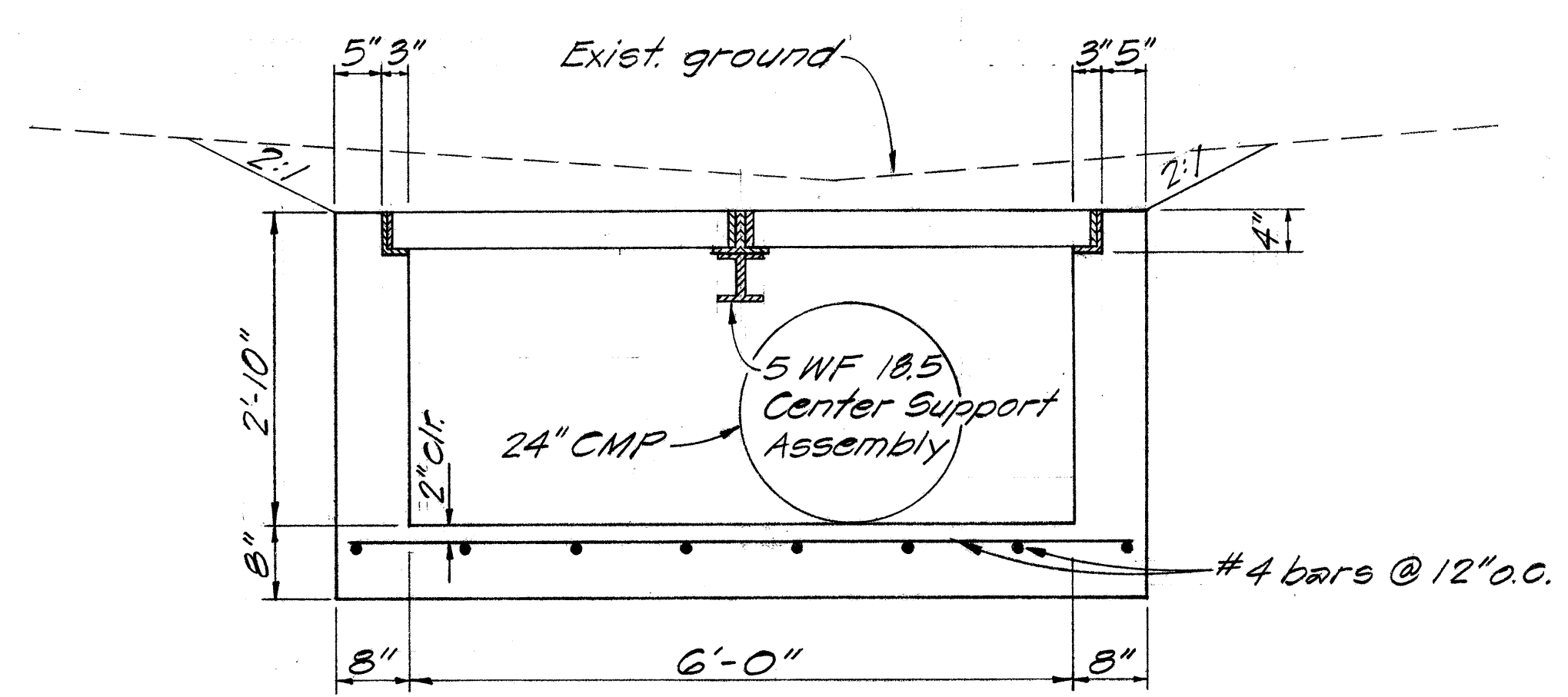


SECTION "A"



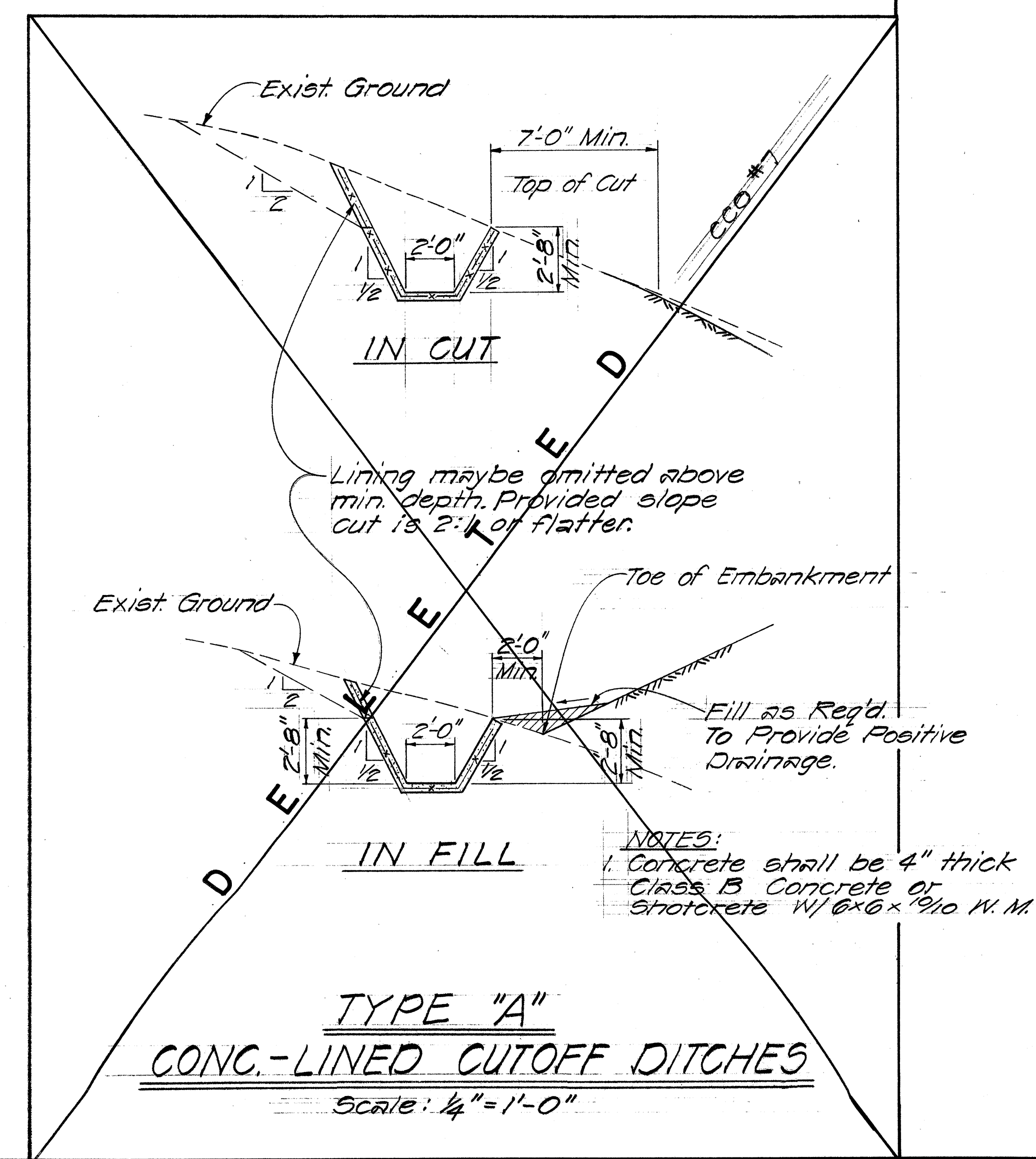
TYPE "C" CONC.-LINED DITCH  
Scale: 1/2" = 1'-0"

- NOTE:
- All concrete shall be Class A
  - Exact location of Concrete Drop Intake shall be determined by the Engineer.



SECTION "B"

CONCRETE DROP INTAKE  
Scale: 3/4" = 1'-0"



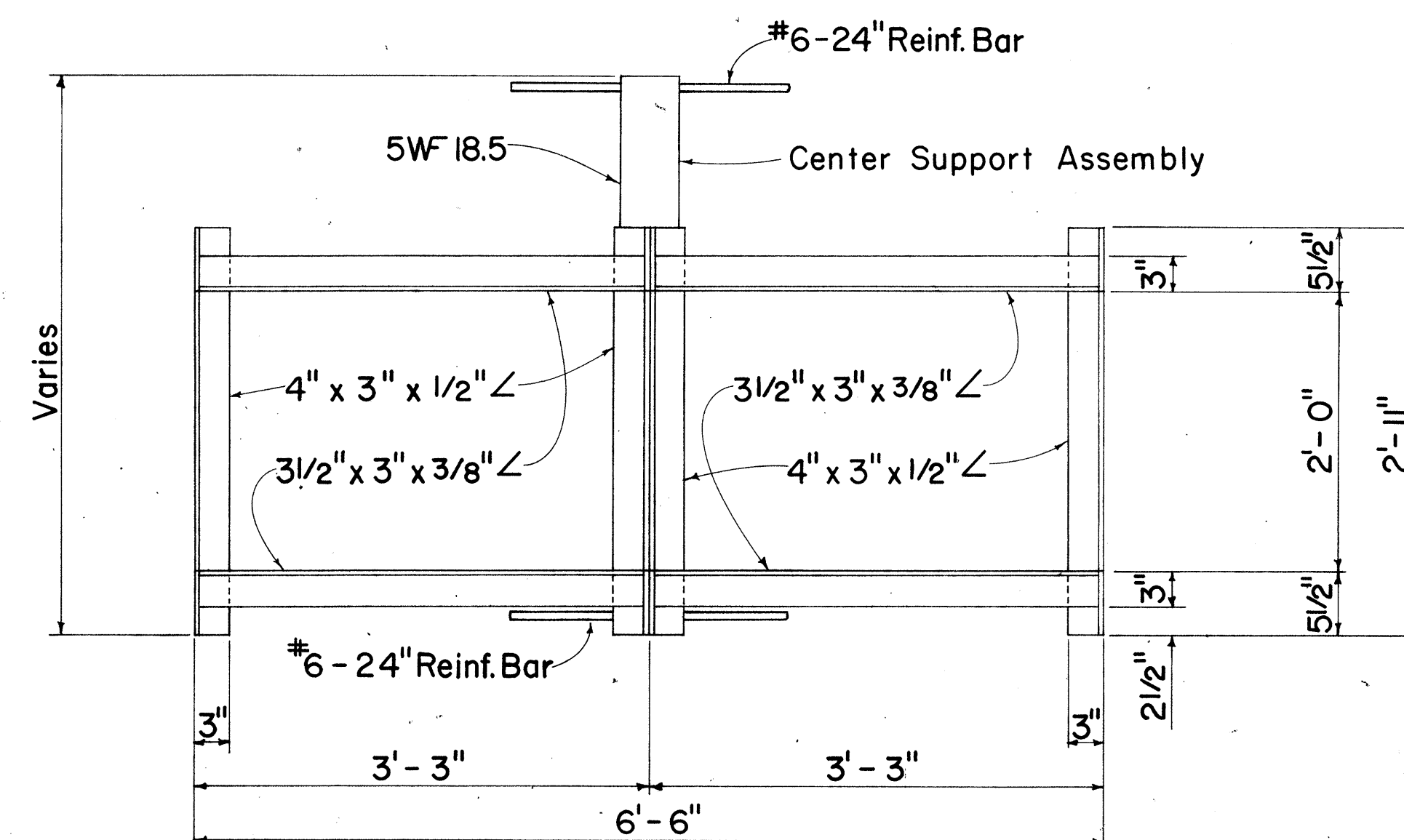
TYPE "A"  
CONC.-LINED CUTOFF DITCHES  
Scale: 1/4" = 1'-0"

| DATE     | REVISION                                                                |
|----------|-------------------------------------------------------------------------|
| 12/21/76 | Revised Conc. Drop Intake top and invert elevations, per Addendum No.2. |
|          |                                                                         |
|          |                                                                         |

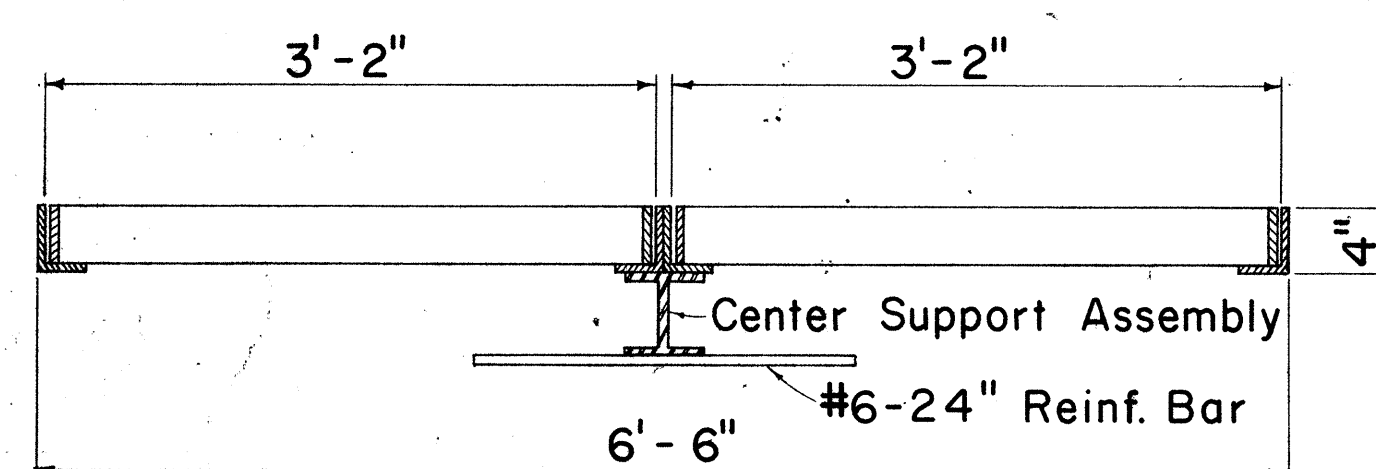
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**CONCRETE DROP INTAKE DETAILS**  
INTERSTATE ROUTE H-3  
Temporary Connection at Kailua I.C.  
F.A.I. Proj. No. I-43-1(28)13  
Scale: 3/4" = 1'-0" Date: Nov. 1976  
SHEET NO. 2 OF 5 SHEETS

ADD. 5R

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | 143-1(28)13        | 1977        | 6         | 55           |

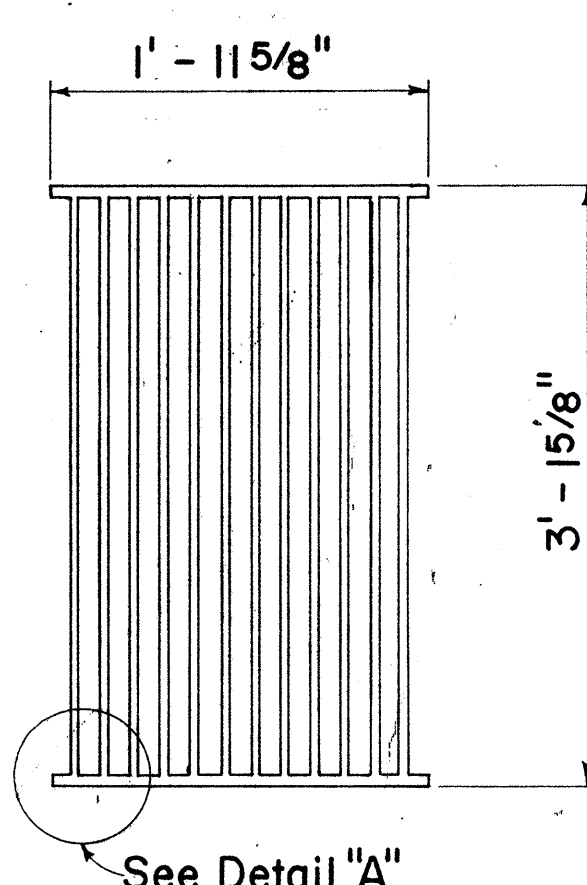


**PLAN**  
(Two or More Grates)



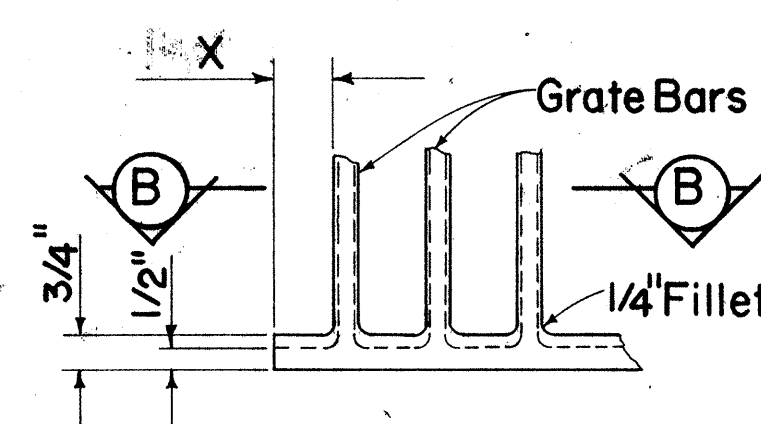
**LONGITUDINAL SECTION**  
(Thru Frame & Grate)

**FRAME DETAILS**  
Scale: 1" = 1' - 0"

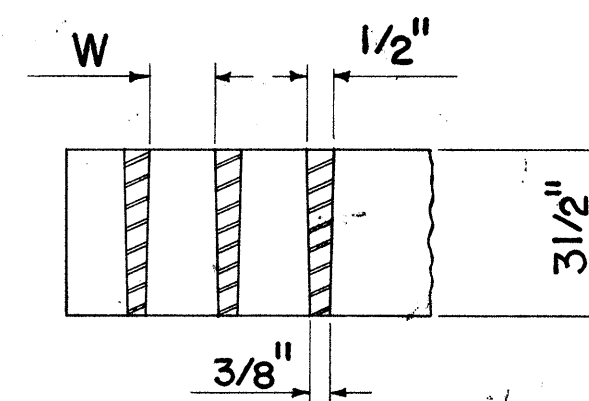


**PLAN**  
Scale: 1" = 1' - 0"

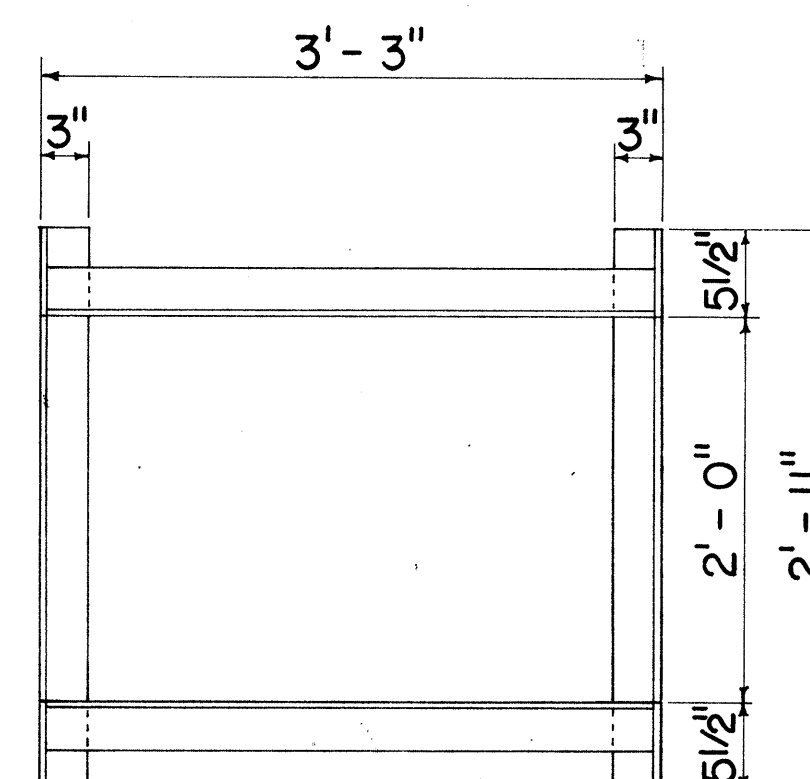
**ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE**



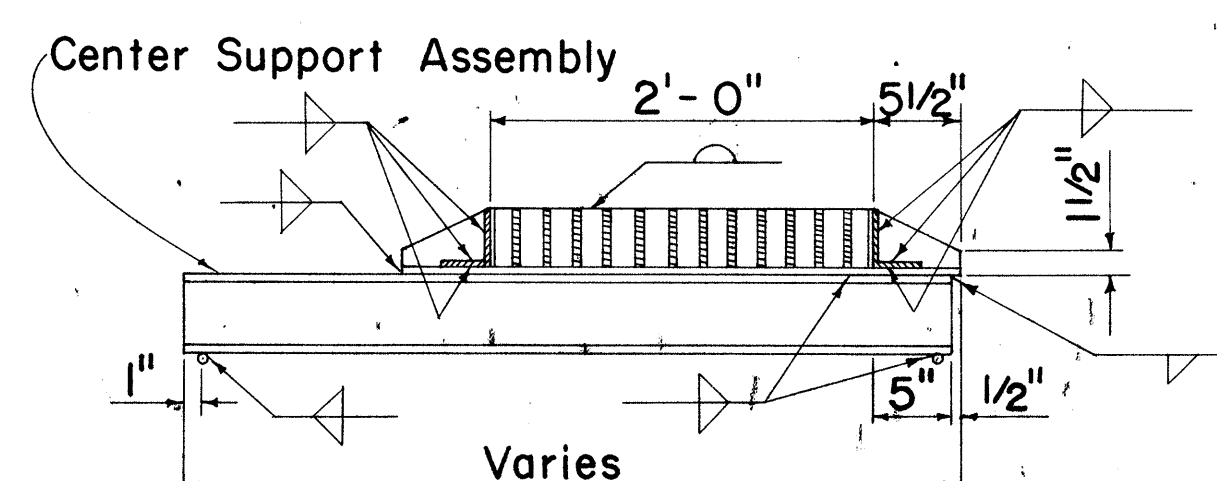
**DETAIL "A"**  
Scale: 3" = 1' - 0"



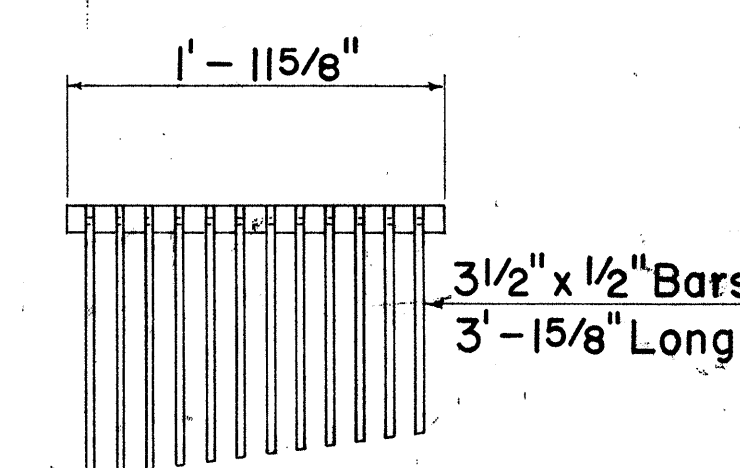
**SECTION "B-B"**  
Scale: 3" = 1' - 0"



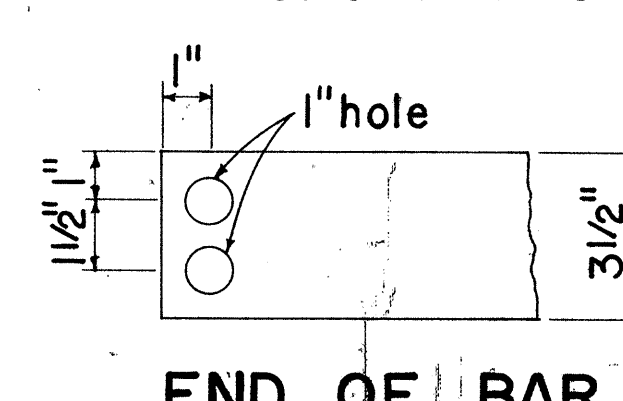
**PLAN**  
(Single Grate)



**CROSS SECTION**  
(Thru Frame & Grate)

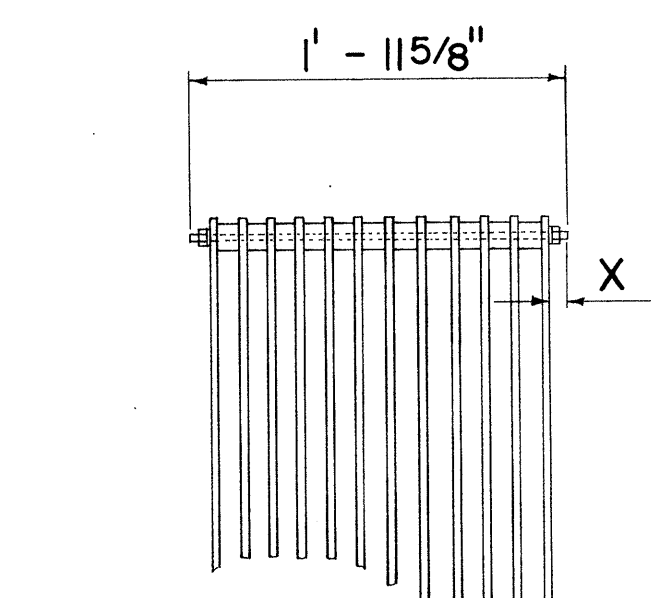


**CAST END BLOCK**  
Scale: 1" = 1' - 0"

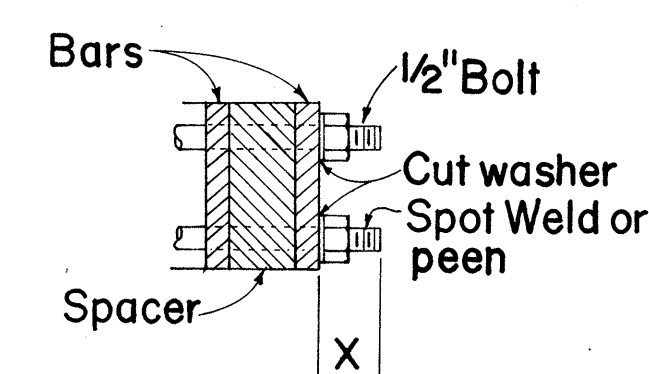


**END OF BAR**  
Scale: 3" = 1' - 0"

**ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE**

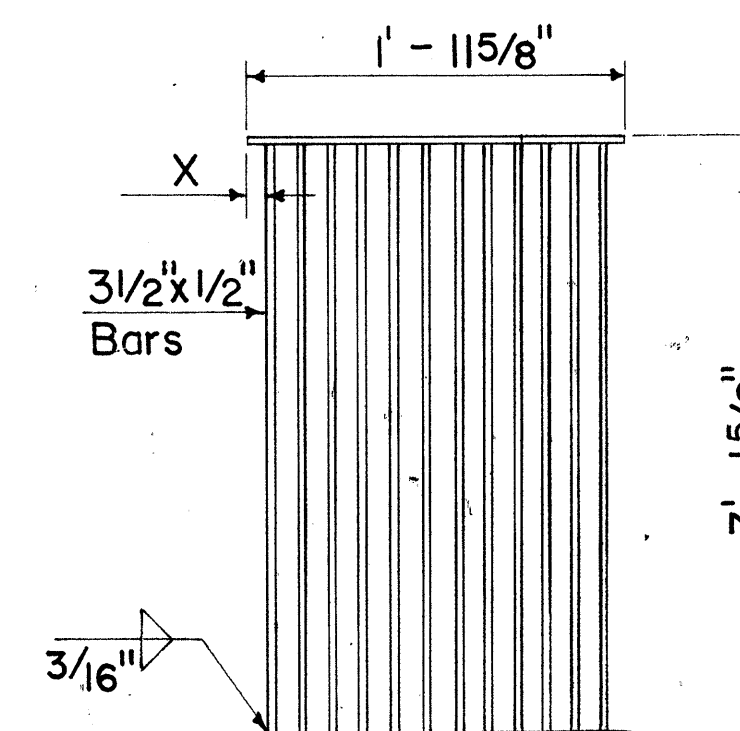


**BOLTED END BLOCK**  
Scale: 1" = 1' - 0"

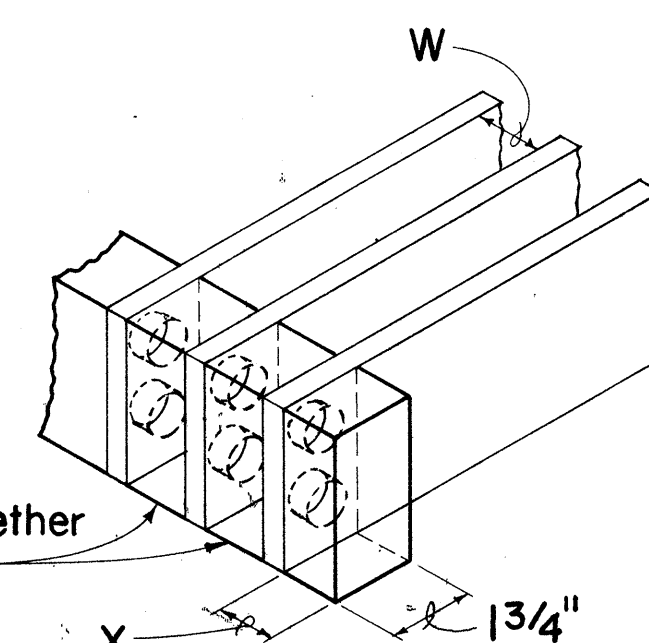


**BOLTING DETAIL**  
Scale: 3" = 1' - 0"

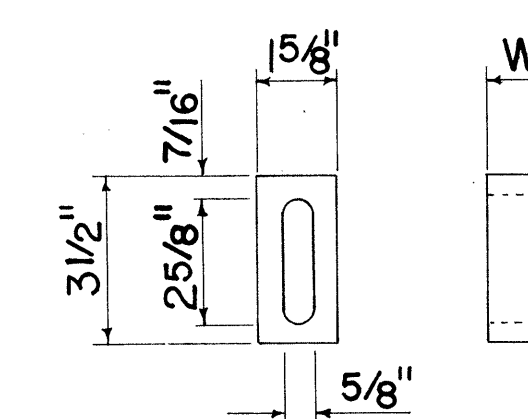
**ALTERNATIVE BOLTED GRATE**



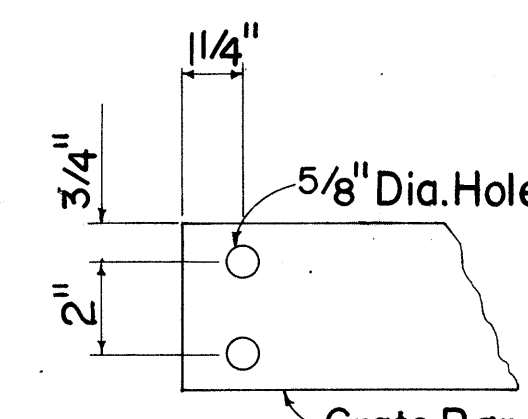
**PLAN**  
**ALTERNATIVE BOLTED GRATE**  
Scale: 1" = 1' - 0"



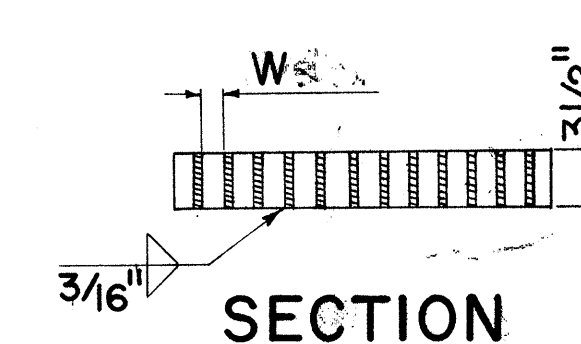
**ALTERNATIVE WELDED GRATE**  
Scale: 1" = 1' - 0"



**BAR SPACER**  
Scale: 3" = 1' - 0"



**END OF BAR**  
Scale: 3" = 1' - 0"



**SECTION**

# GENERAL NOTES

- Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
- Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
- All welds 3/8" unless otherwise noted.
- Center support assembly shall be used when two or more grates are specified incidental to Types A-9 or A-12 Frame and Grates.
- Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
- The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.

| Material               | ASTM Designation   |
|------------------------|--------------------|
| Structural Steel       | A283, Grade D      |
| Cast Steel             | A27, Grade 65-35   |
| Malleable Iron Casting | A47, Gr. No. 35018 |

| TYPE | NO. BARS | CLEAR BAR SPACING - W | X       |
|------|----------|-----------------------|---------|
| A-9  | 9        | 2"                    | 1 9/16" |
| A-12 | 12       | 1 3/8"                | 1 1/4"  |

## NOTE:

- Type A-9 - Use in locations off the roadbed on all types of highways.
- Type A-12 - Use within the roadbed on all types of highways.

## APPROVAL RECOMMENDED:

HYDRAULIC DESIGN ENGINEER 12-17-67 DATE

## APPROVED:

ASSISTANT CHIEF, ENGINEERING 12-11-67 DATE

| NO. | REVISION | APPROVED BY | DATE |
|-----|----------|-------------|------|
|     |          |             |      |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

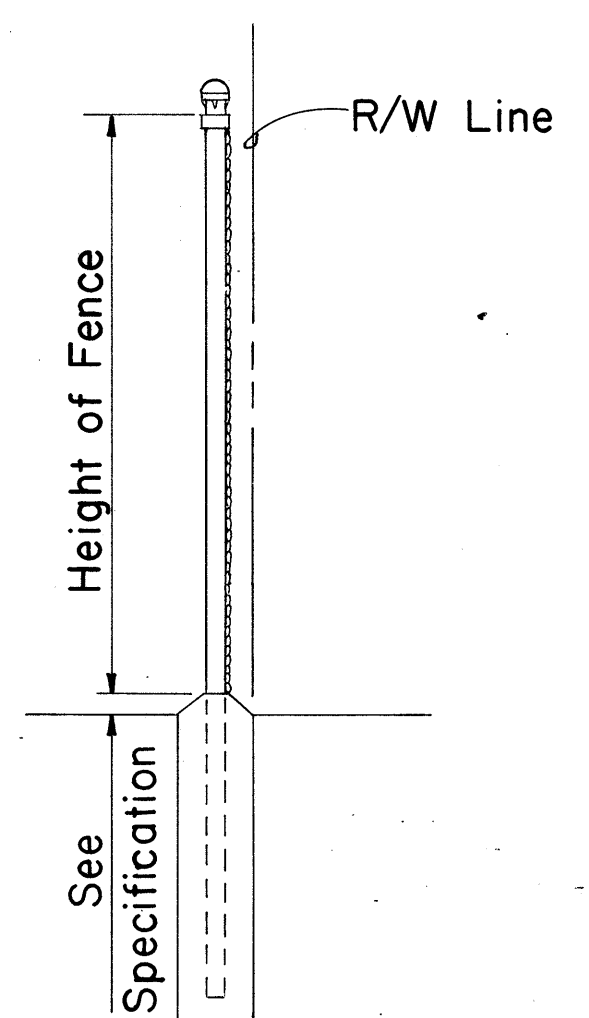
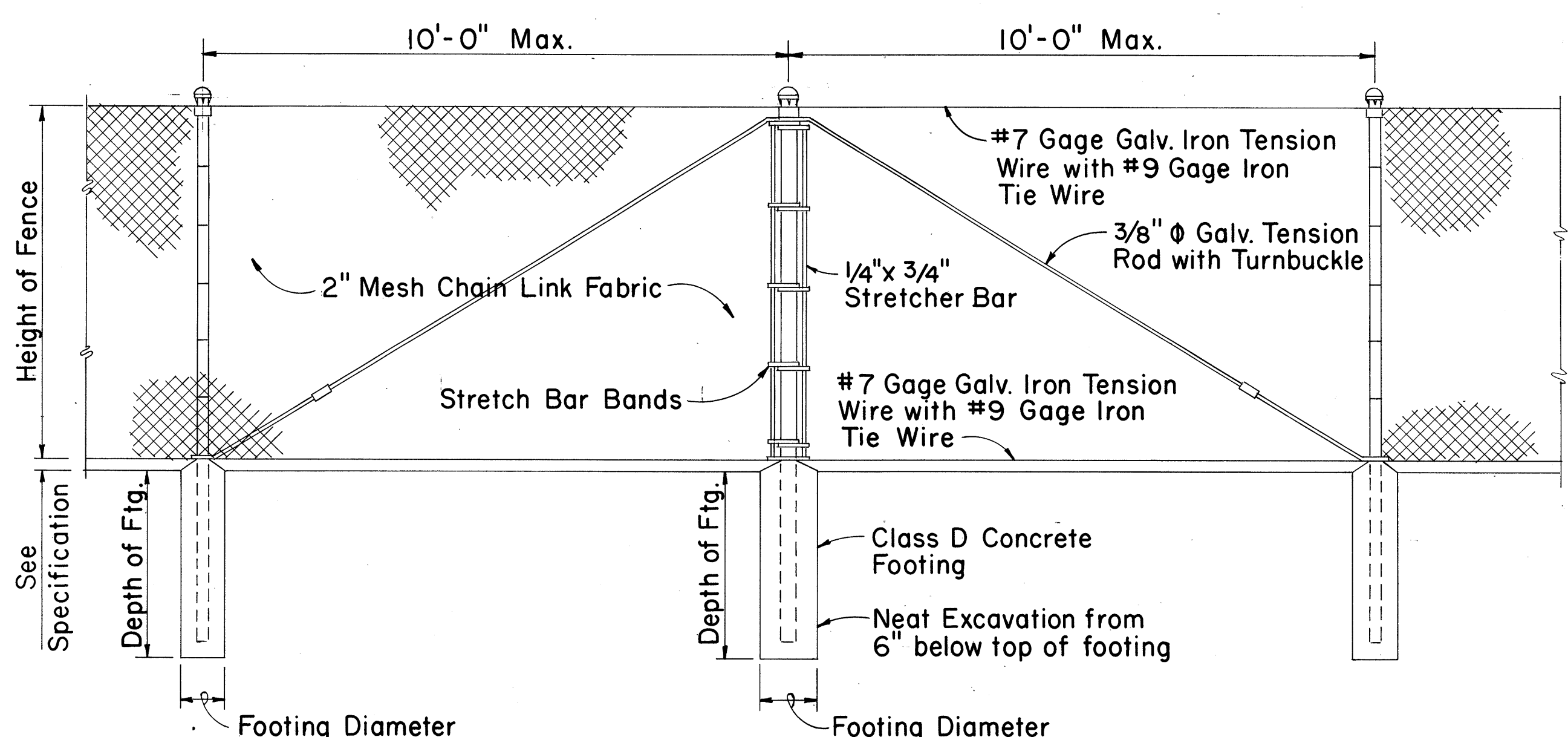
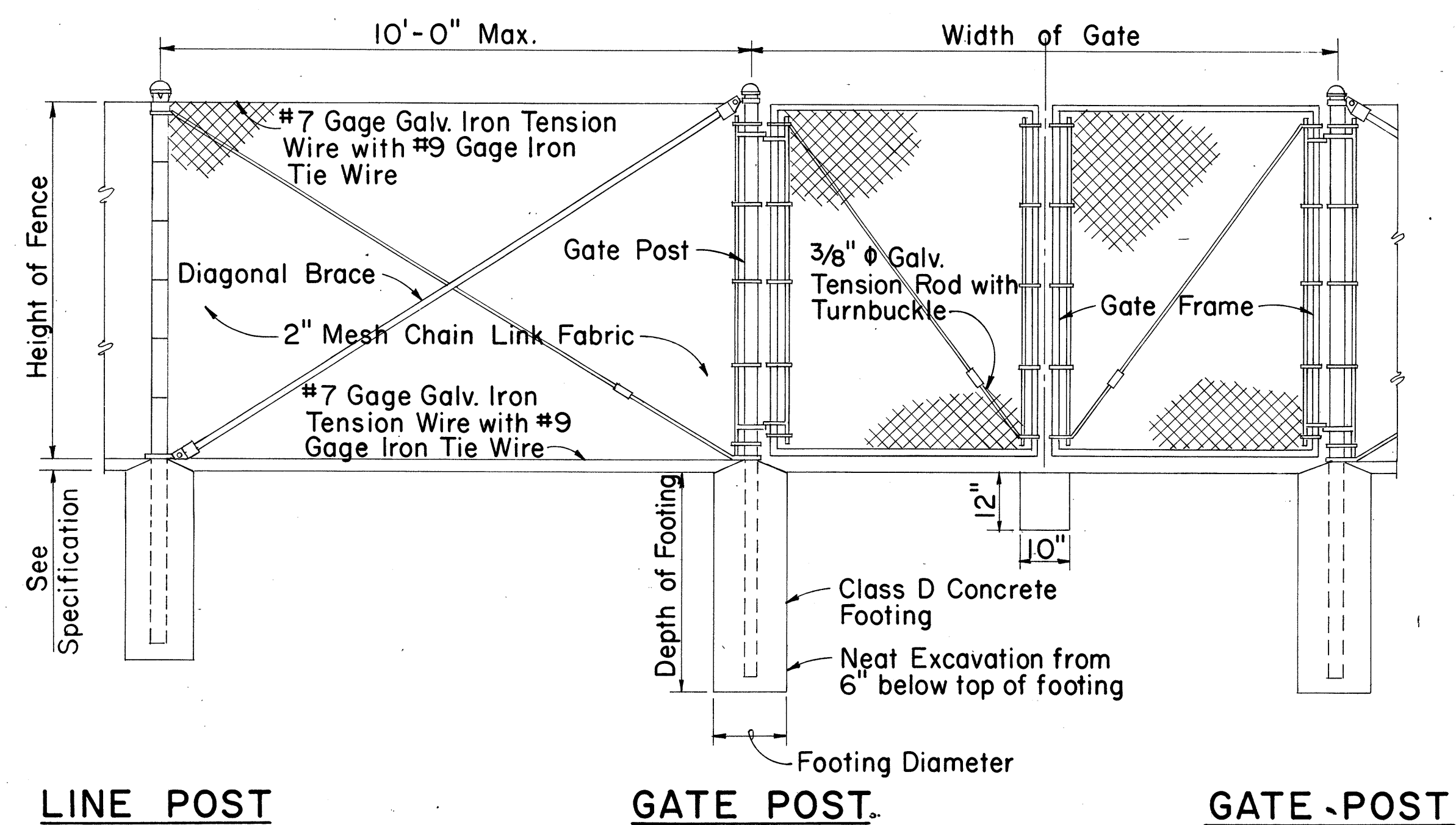
## STANDARD DETAILS

TYPE A-9 AND A-12  
FRAMES AND GRATES

Scales: As Noted Date: Aug. 1968

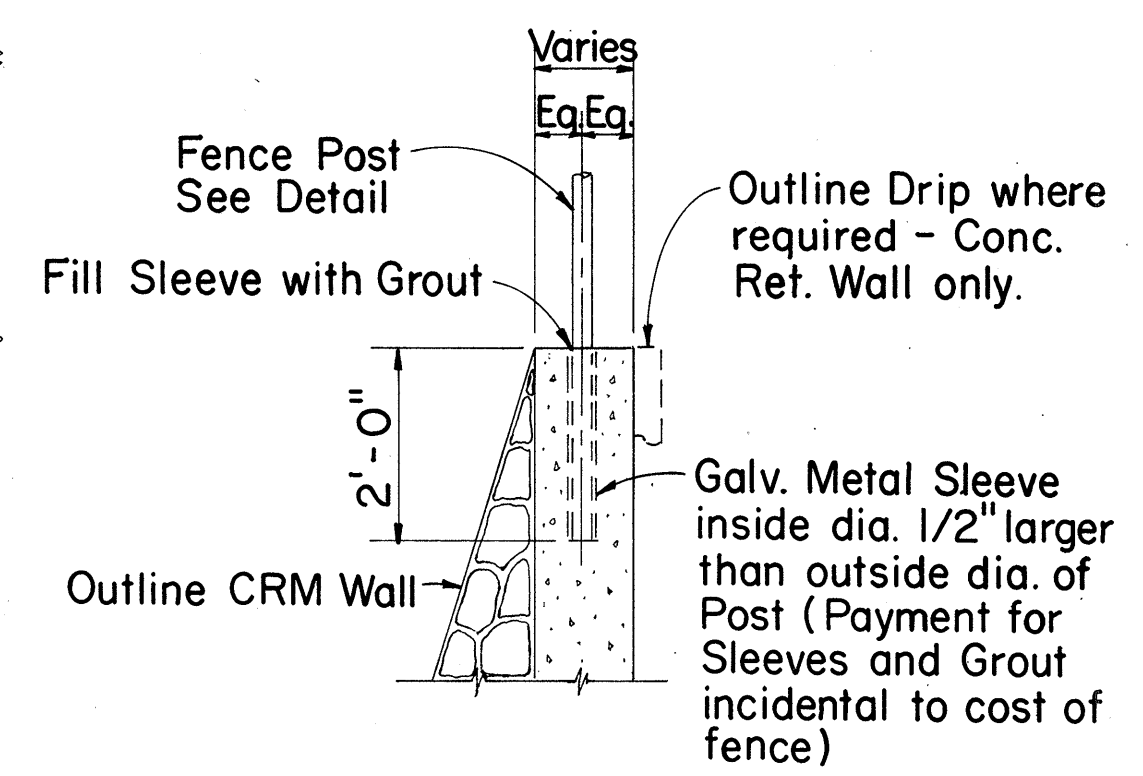
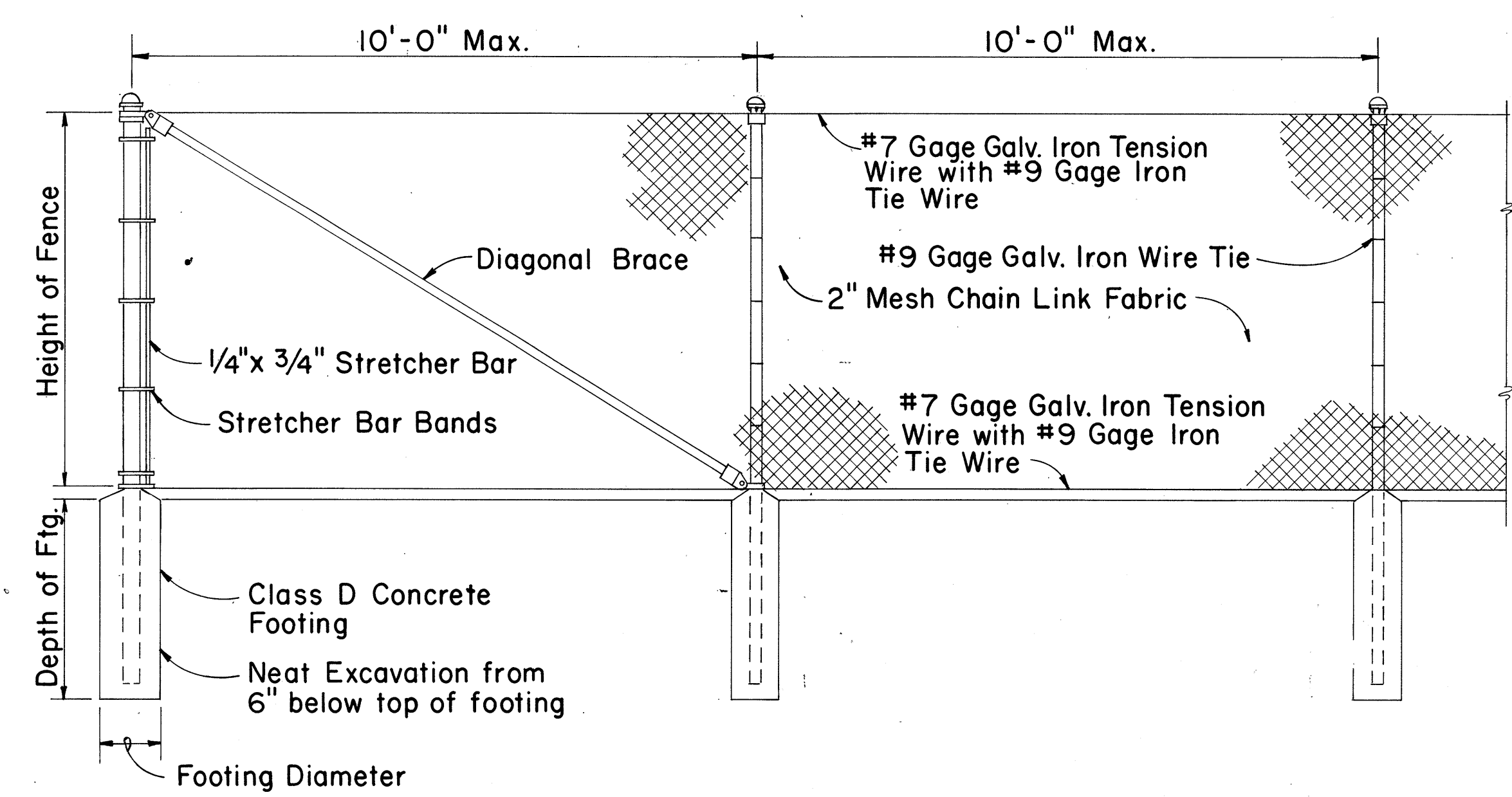
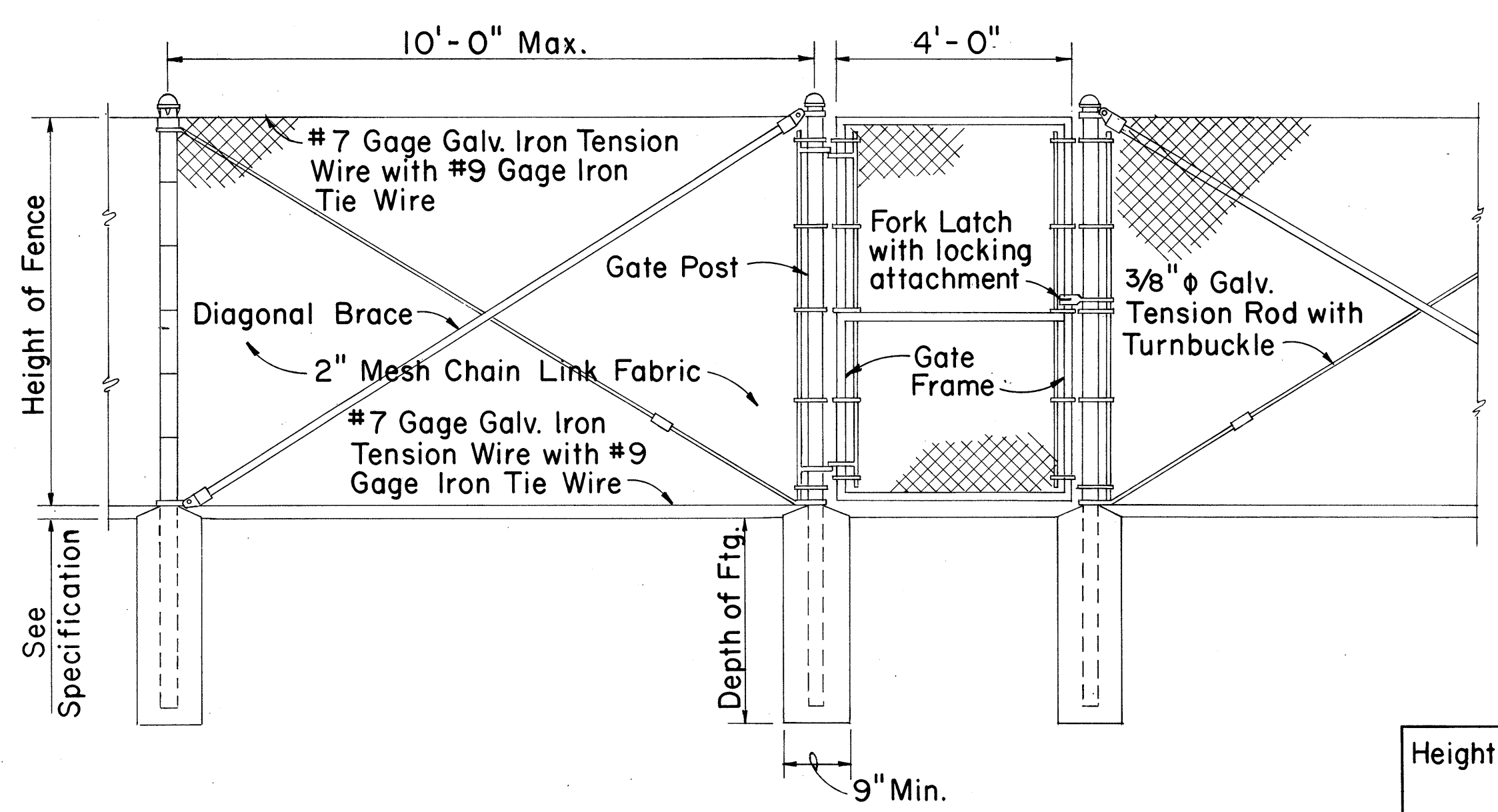
SHEET No. 3 OF 5 SHEETS DH-7

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | 1-13-1(28)13       | 1977        | 7         | 55           |



### DETAIL OF CHAIN LINK GATE

- NOTE: 1. Gate fork latch and lock, flush plate and anchor, and plunger shall be installed with Gates, and shall be considered as incidental to Chain Link Fence Gate.  
2. Gate frames shall be mitered and welded at corners.  
3. Fence detail not shown shall be in accordance with the Standard Specifications.



### CHAIN LINK FENCE DETAILS

| Height of Fence | Minimum Depth of Footing |                                  | Minimum Footing Diameter |                            |
|-----------------|--------------------------|----------------------------------|--------------------------|----------------------------|
|                 | Line Post                | Corner, Pull, End and Gate Posts | Line Post                | Corner, Pull and End Posts |
| 3'              | 2'-0"                    | 2'-6"                            | 8"                       | 8"                         |
| 4'              | 2'-6"                    | 2'-6"                            | 8"                       | 8"                         |
| 5'              | 3'-0"                    | 3'-0"                            | 8"                       | 8"                         |
| 6'              | 3'-0"                    | 3'-0"                            | 8"                       | 9"                         |

APPROVAL RECOMMENDED:  
 HIGHWAY DESIGN ENGINEER  
 12-4-69  
 DATE

APPROVED:  
 ASSISTANT CHIEF, ENGINEERING  
 12-10-69  
 DATE

| NO. | REVISION | APPROVED BY | DATE |
|-----|----------|-------------|------|
|     |          |             |      |

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

**STANDARD DETAILS**

**CHAIN LINK FENCE**  
 (WITHOUT TOPRAIL)

Scale: 1/2" = 1'-0"      Date:     

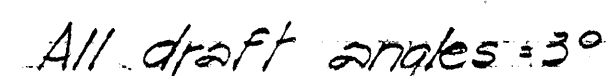
DATE:       
 SURVEY PLOTTED BY:       
 PLAN:       
 DESIGNED BY:       
 NOTE BOOK:       
 QUANTITIES BY:       
 CHECKED BY:



END ELEVATION

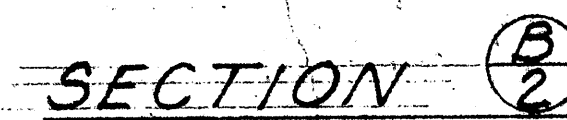
Castings to be neatly trimmed and any protruding flash to be broken off.  
Unless otherwise specified, draft angles to be  $3^\circ$ , corner radii to be  $\frac{3}{32}''R$ ,  
fillet radii to be  $\frac{3}{8}''R$ , casting tol. to be  $\pm \frac{1}{16}''$ , wall thickness to be  $\pm \frac{1}{32}''$ .  
Dimensions may be as shown or as shown in parenthesis ( ).

Scale: 3" = 1'-0"

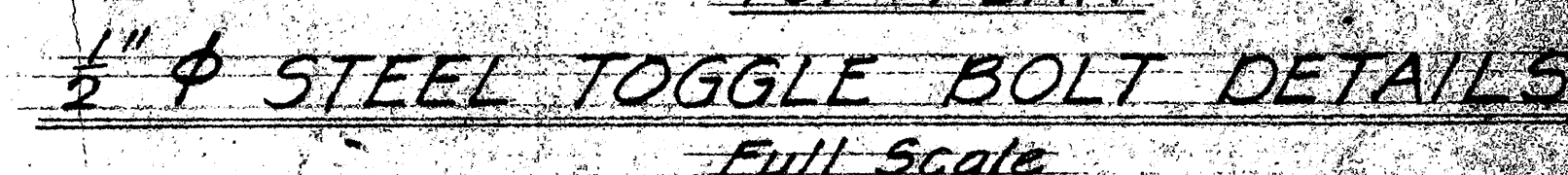
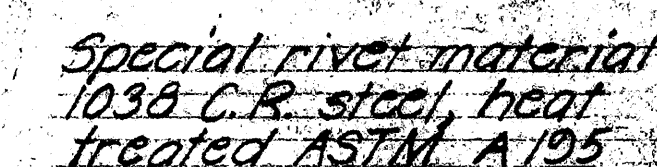


Scale:  $3'' = 1'-0''$

Scale: 3" = 1'-0"



SIDE ELEVATION ASSEMBLAGE



APPROVED *Paul T. Yamashita*  
For ASSISTANT CHIEF, ENGINEERING

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

STANDARD DETAILS  
ALUMINUM BRIDGE RAILING  
ONE RAIL COMBINATION TYPE  
ON PARAPET

Scale as noted Date Nov. 1971

SHEET No 5 OF 5 SHEETS DBH