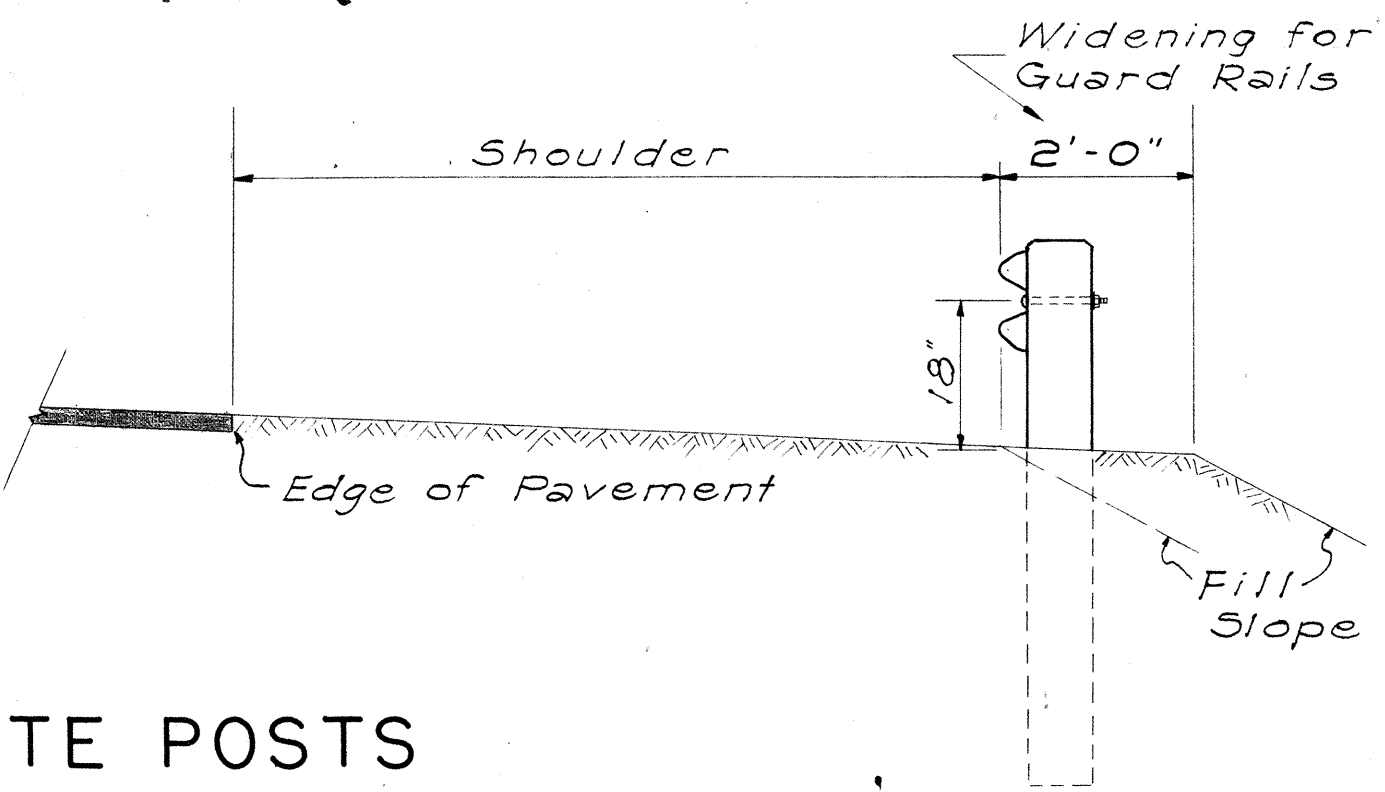
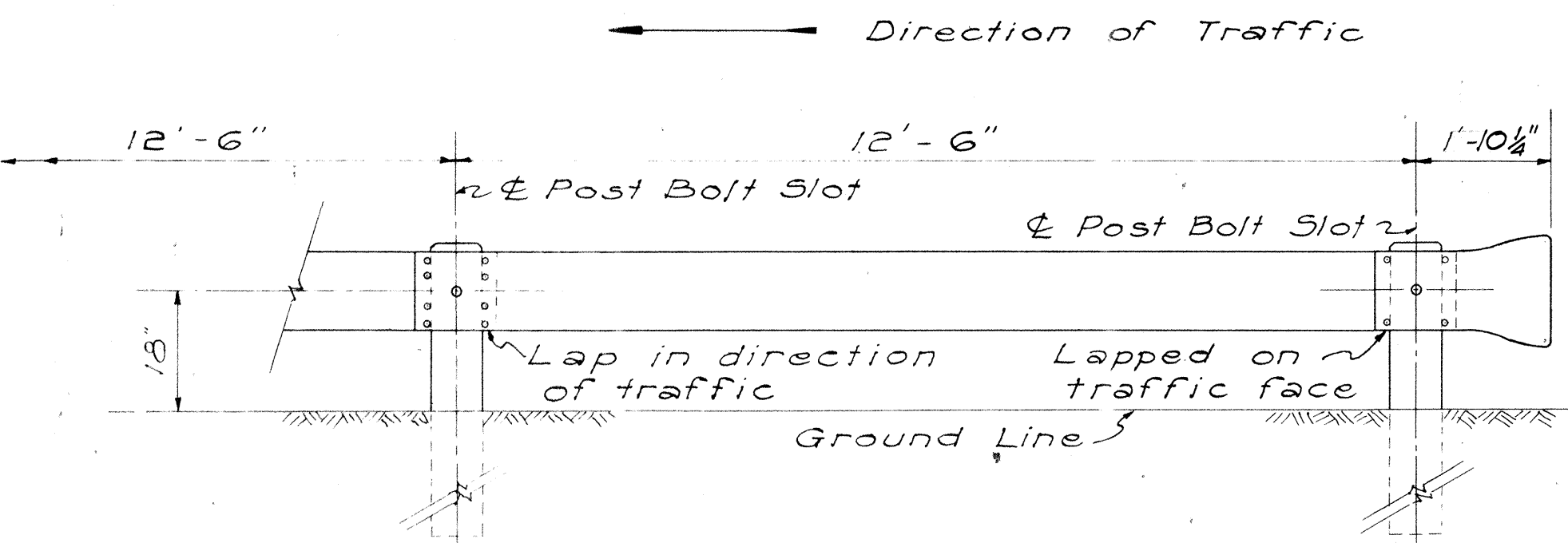
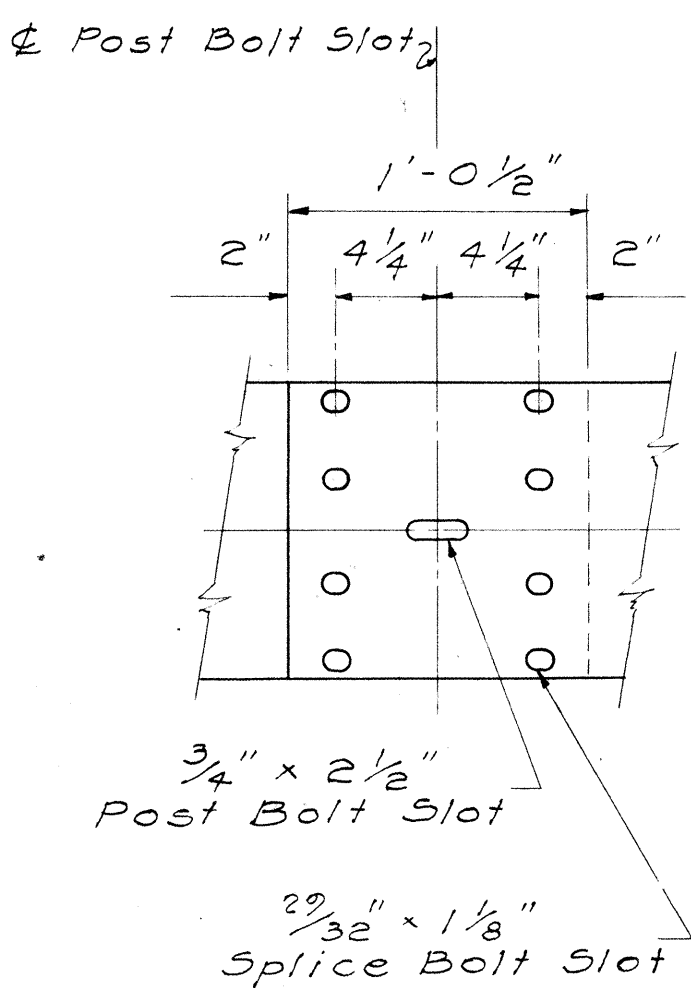


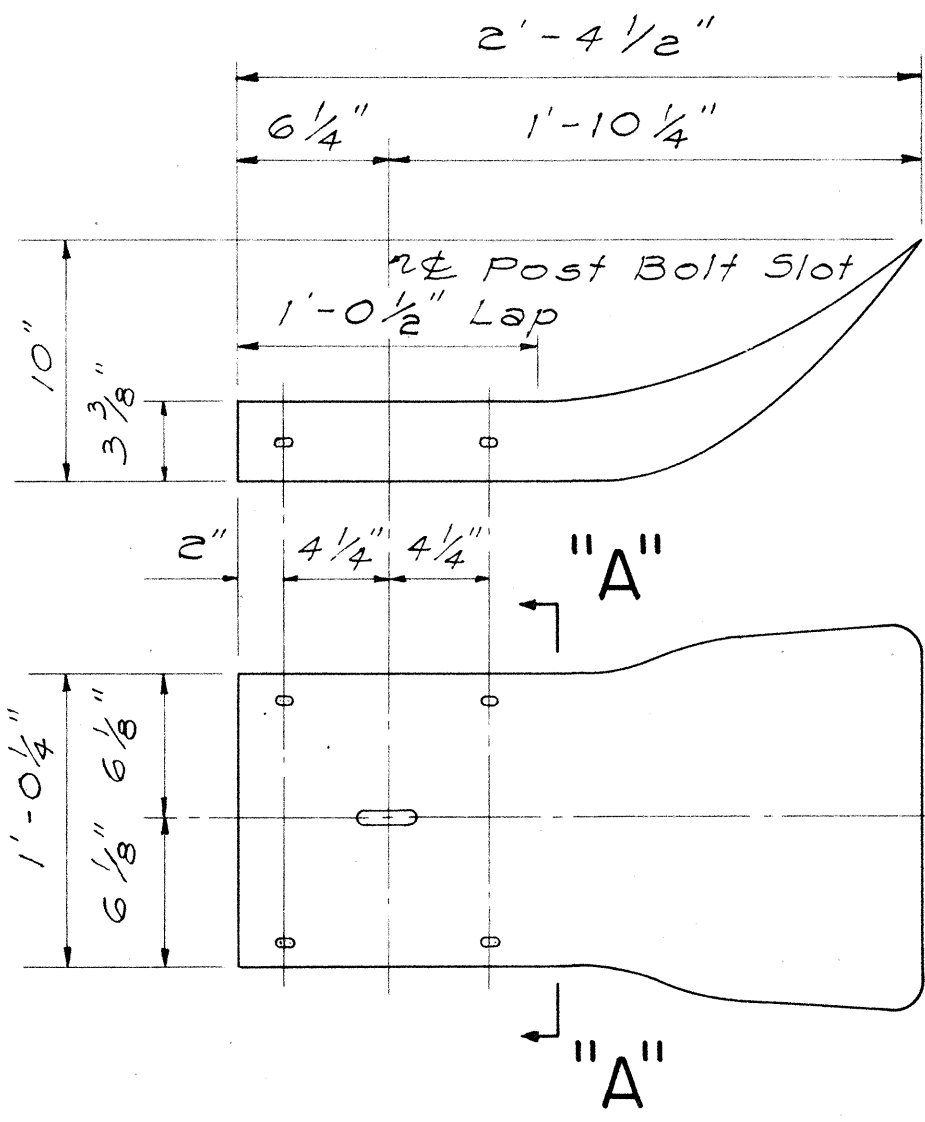
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0560(2) UNIT 2	1963	20	105



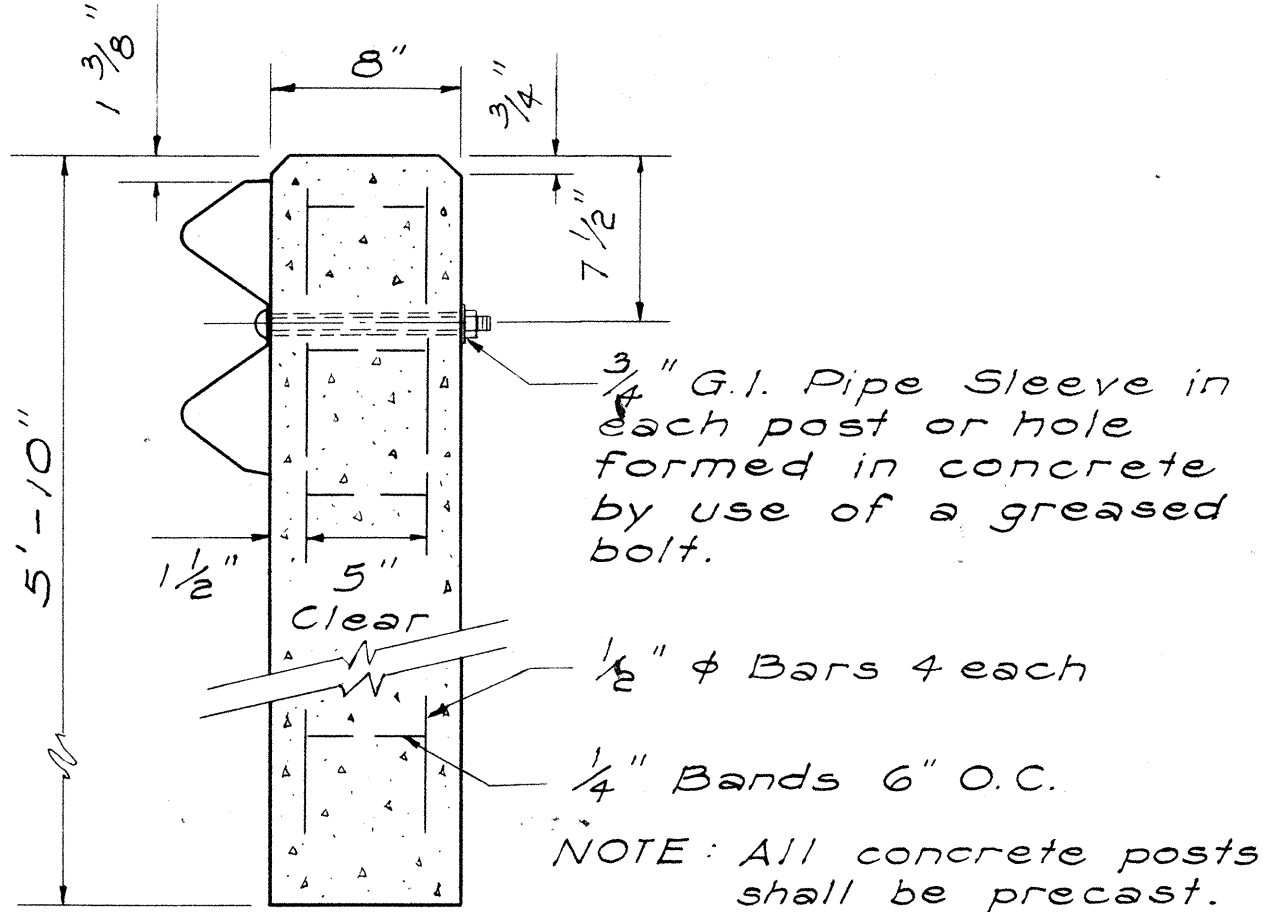
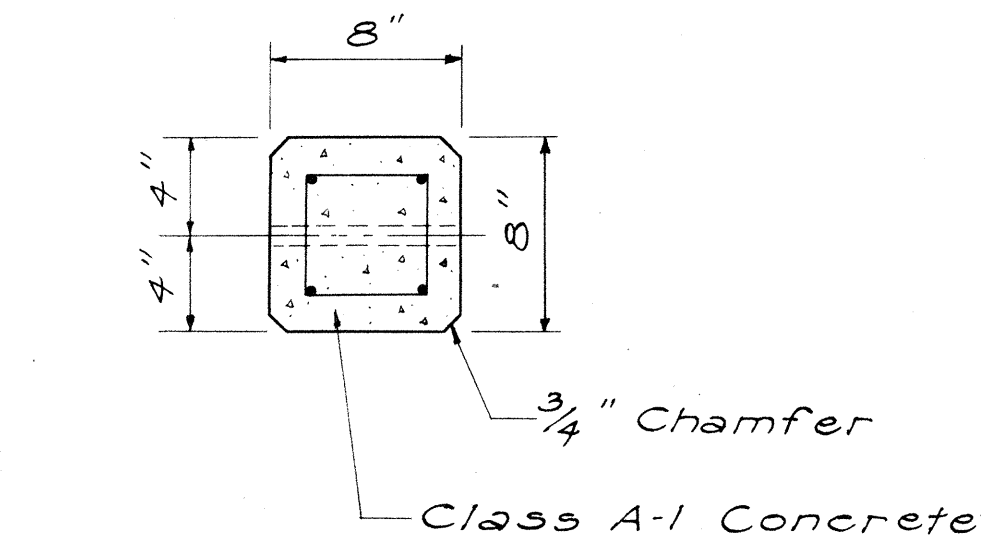
METAL GUARD RAIL WITH CONCRETE POSTS
SCALE : 1/2" = 1'-0"



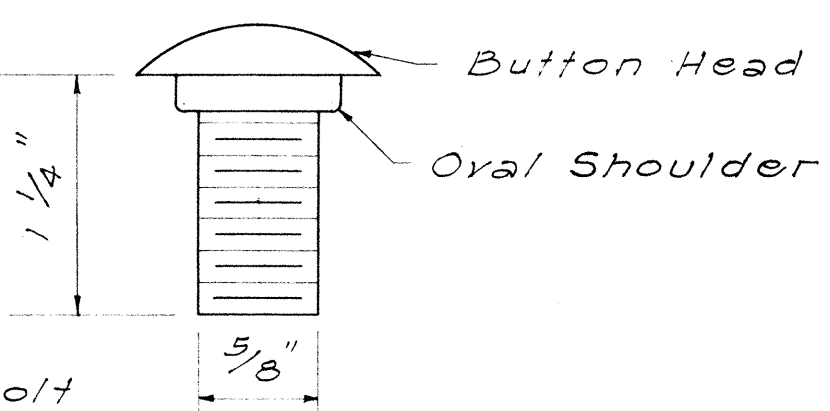
RAIL SPLICE
SCALE : 1 1/2" = 1'-0"



TERMINAL SECTION
SCALE : 1 1/2" = 1'-0"

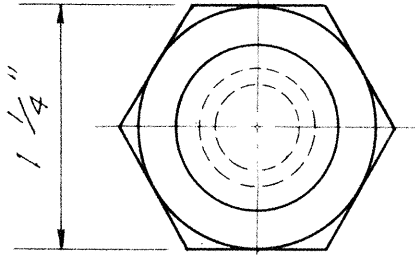


DETAIL OF CONCRETE POST
SCALE : 1 1/2" = 1'-0"

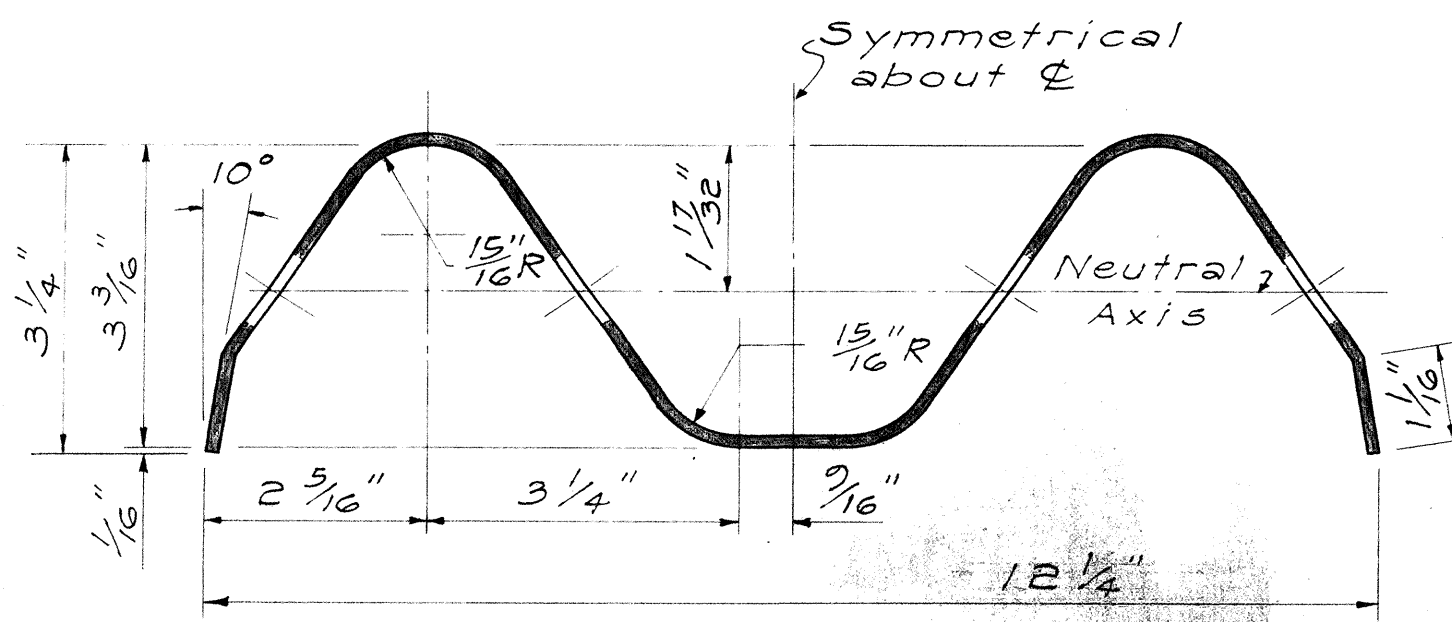


NOTE: Post, bolt similar except length.

SPLICE BOLT
SCALE : 1" = 1"



NUT
SCALE : 1" = 1"



SECTION "A" - "A" THRU RAIL ELEMENT
SCALE : 1/2" = 1"

STATE OF HAWAII

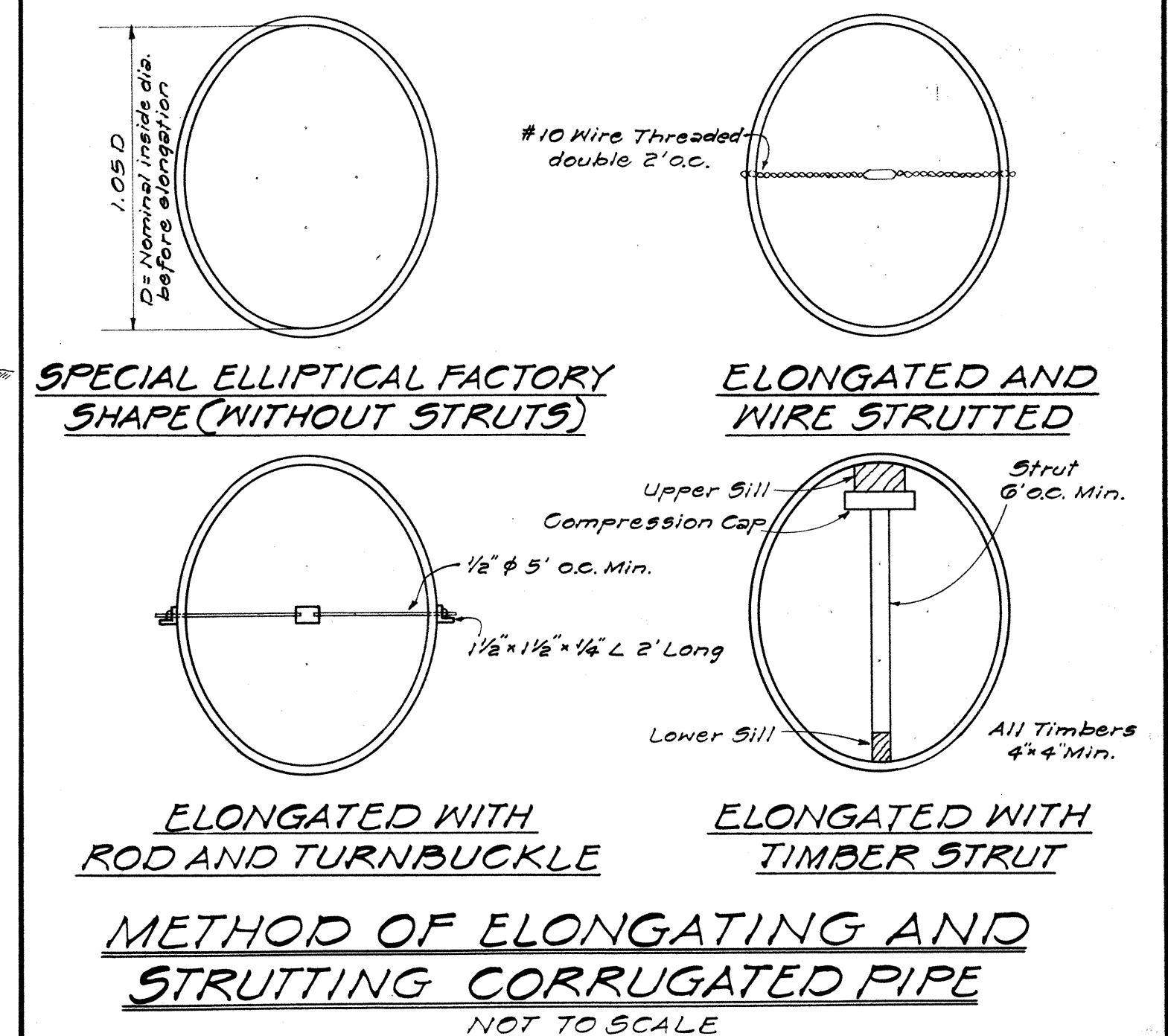
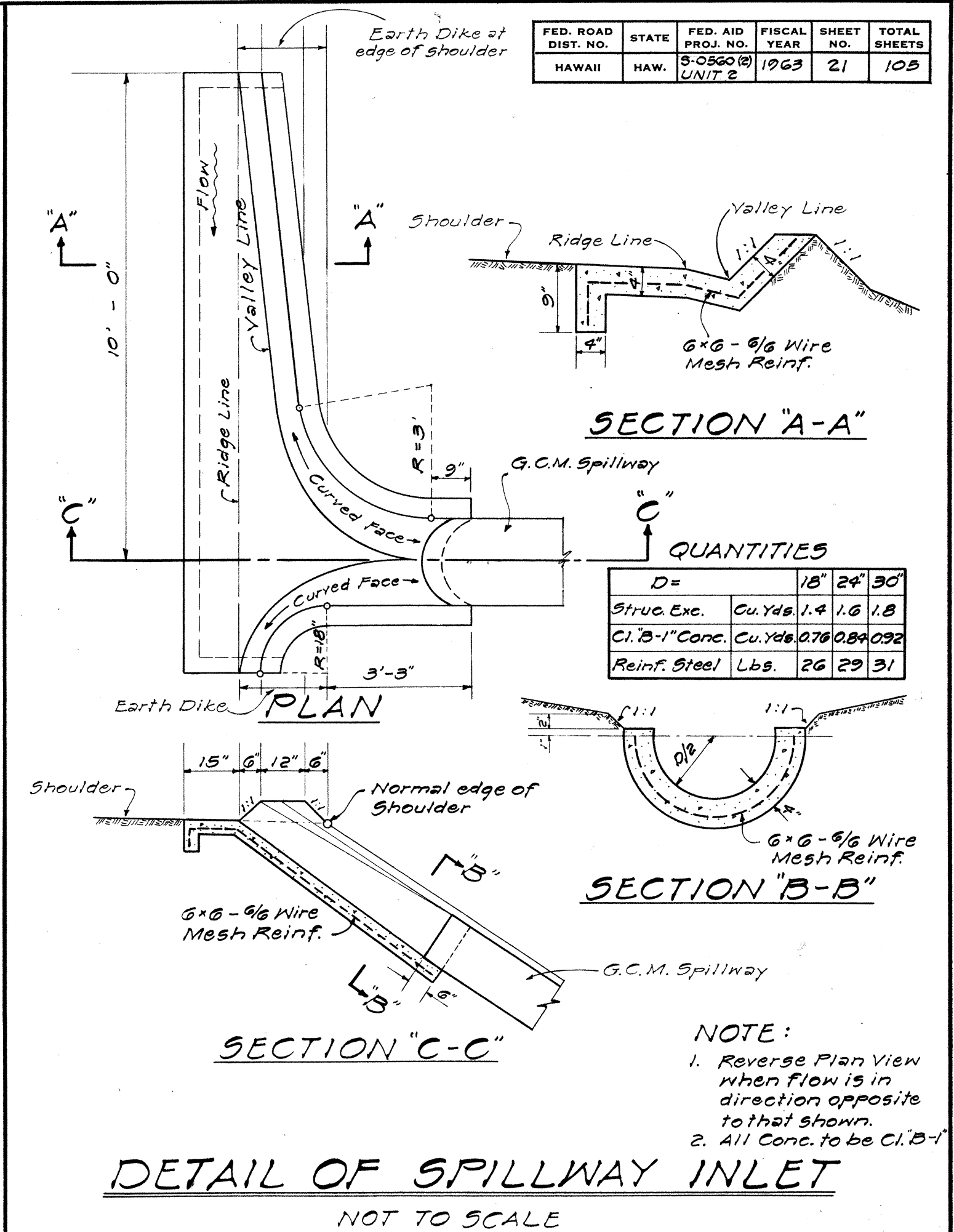
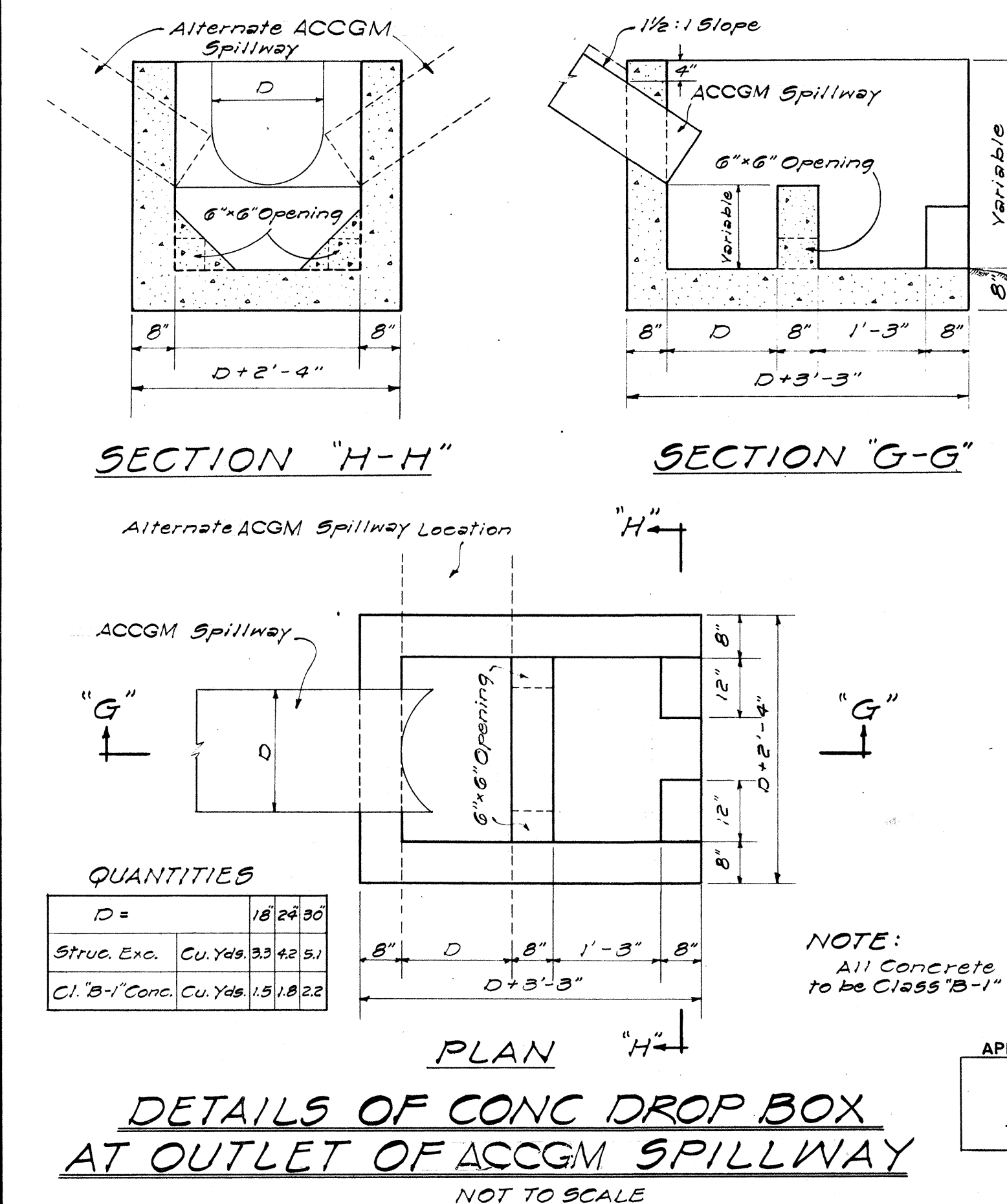
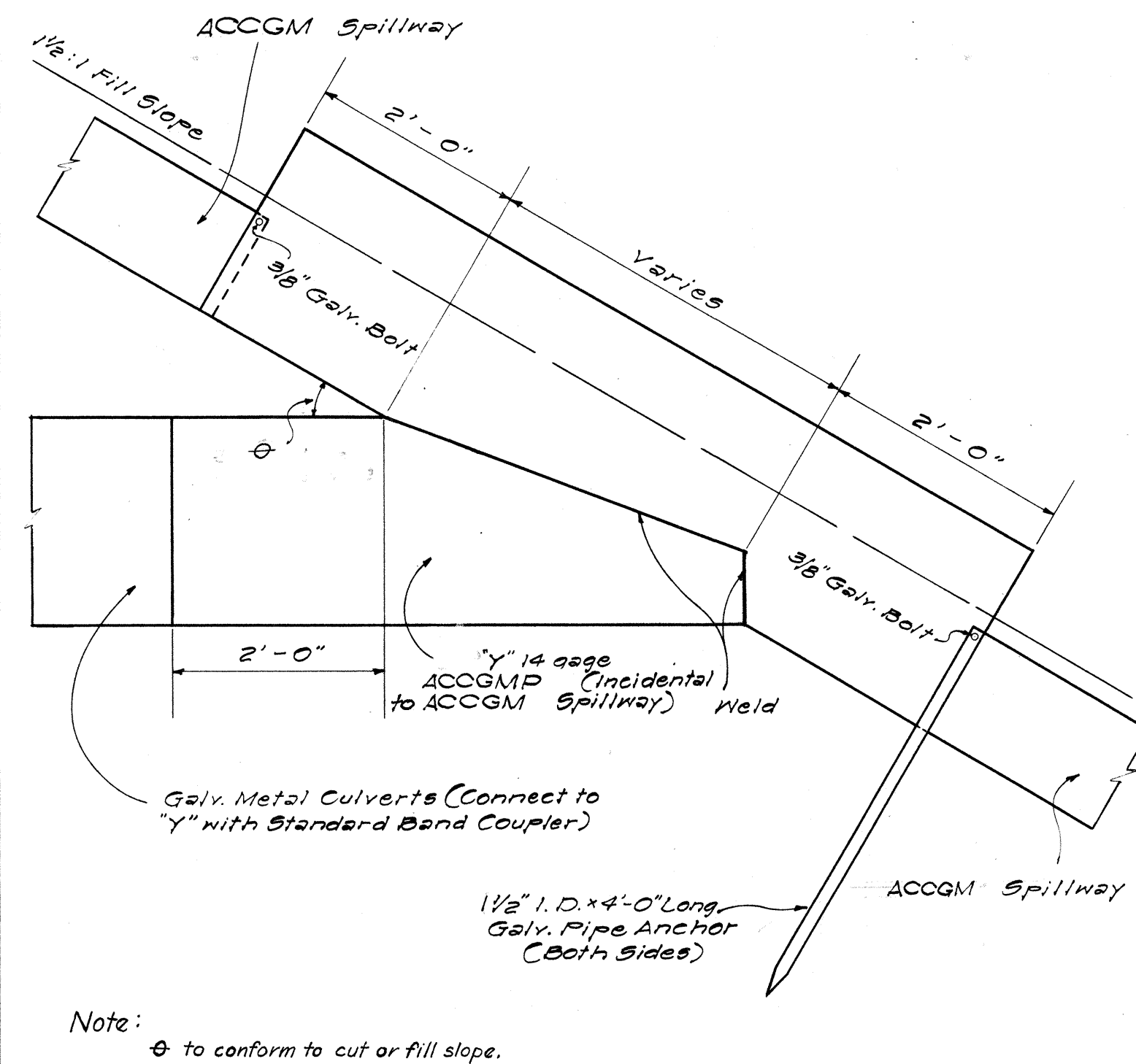
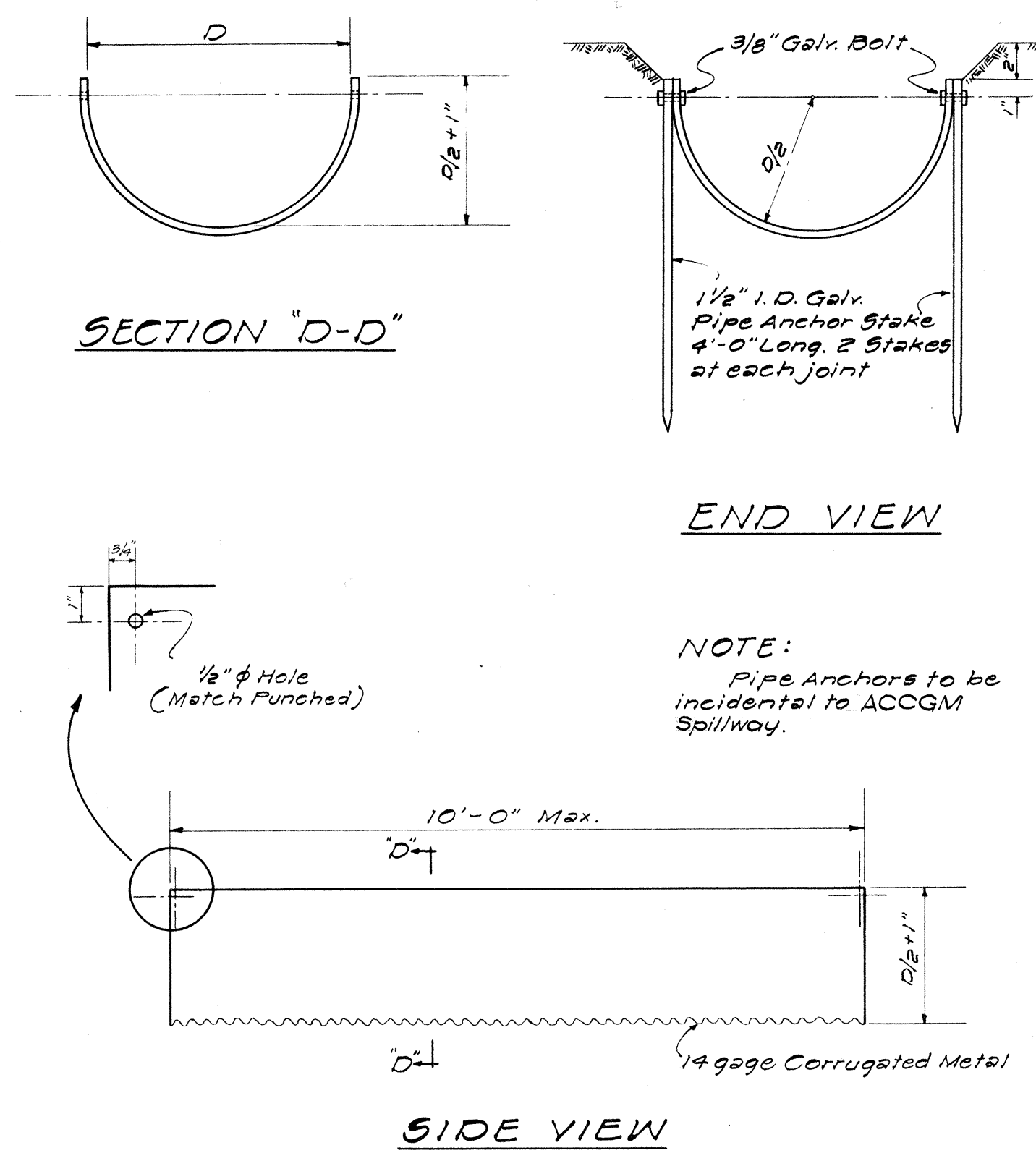
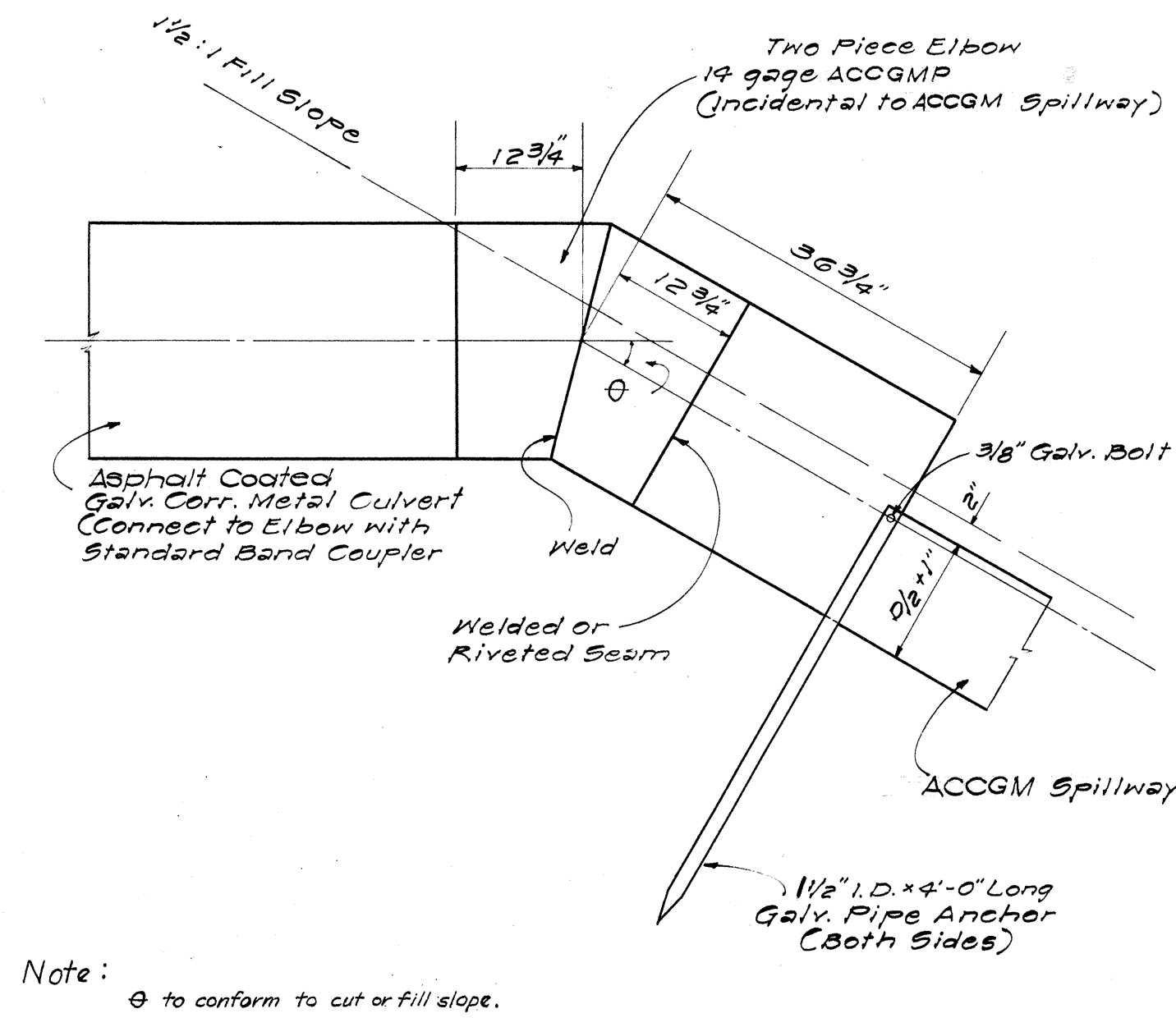
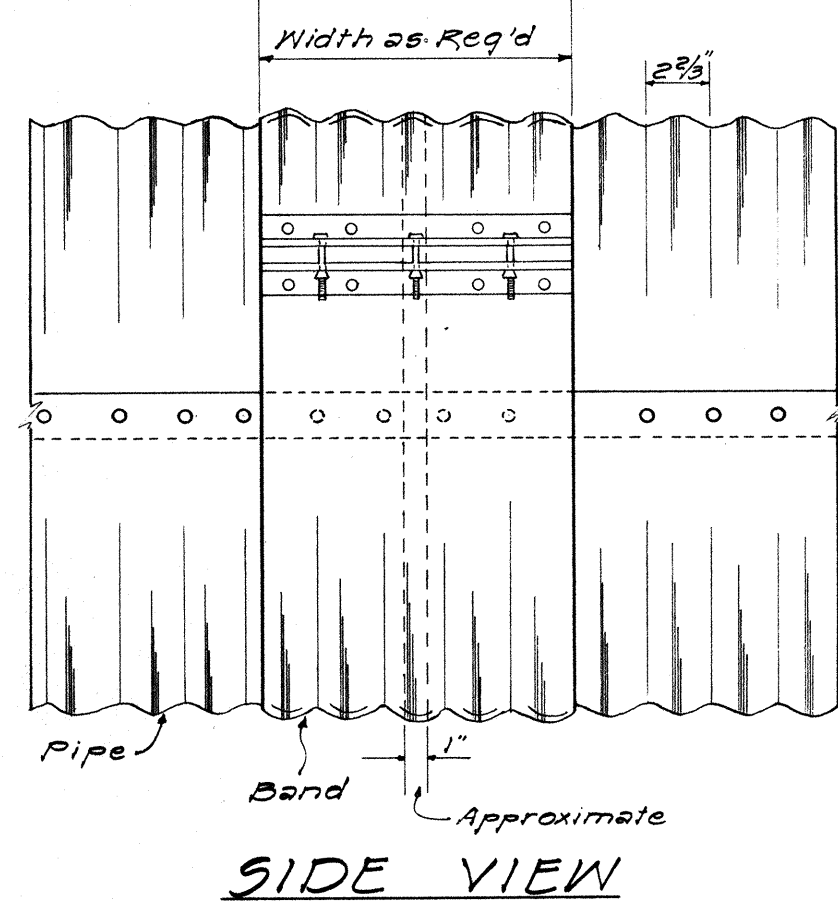
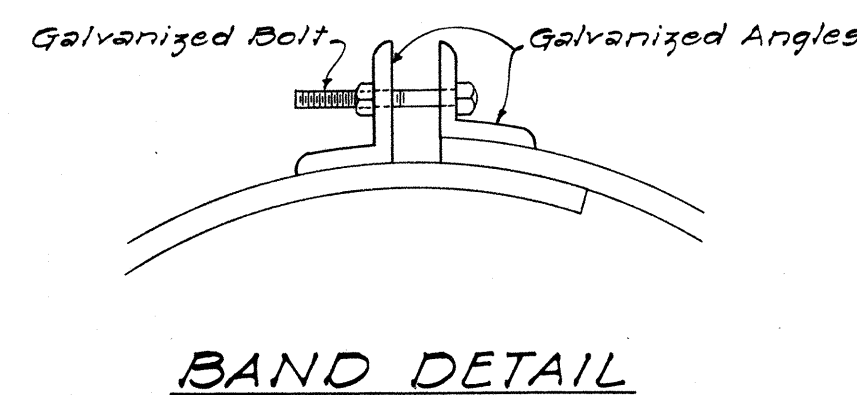
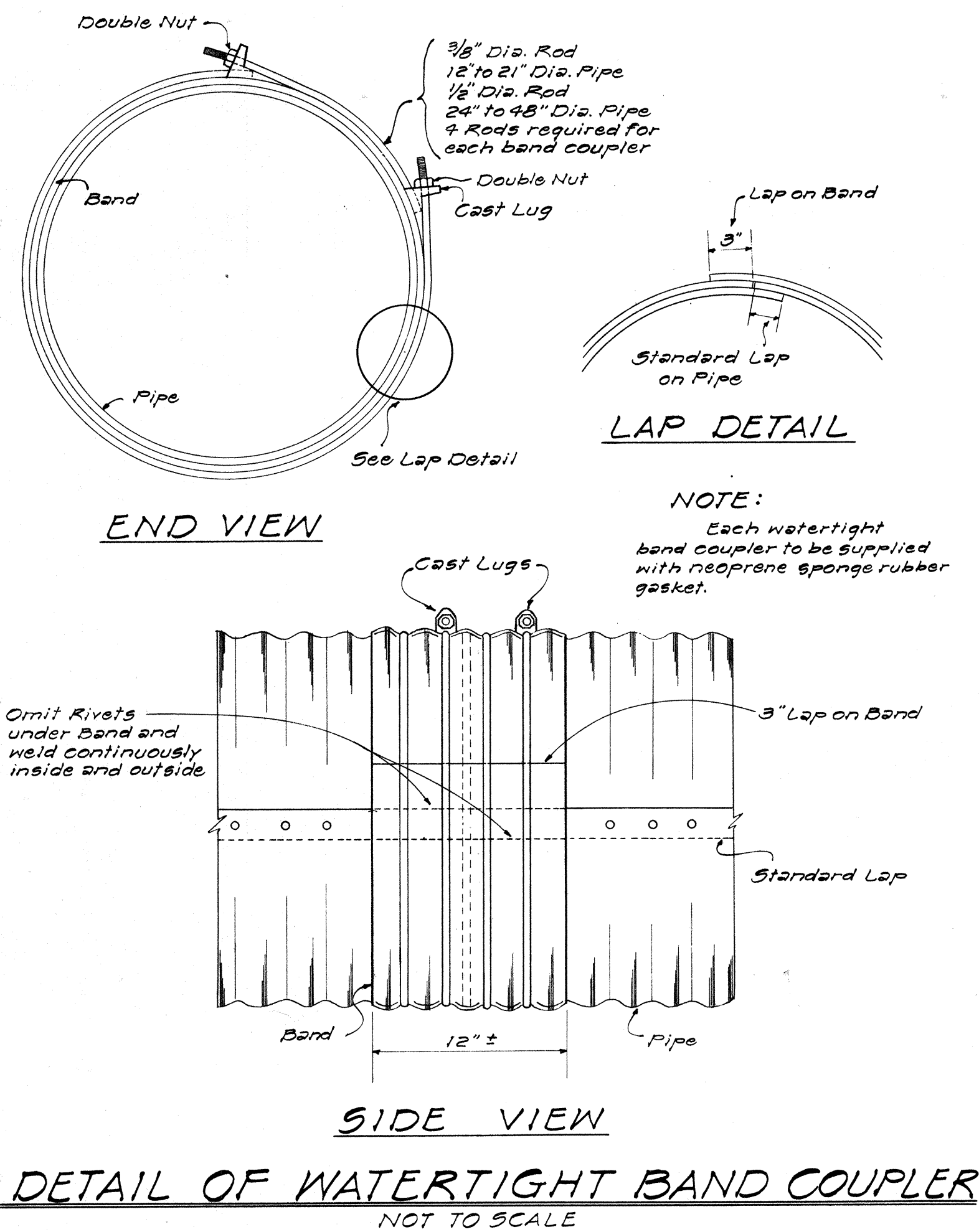
DEPARTMENT OF TRANSPORTATION

DETAILS OF

METAL GUARD RAIL

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

ORIGINAL PLAN	DATE 5-24-6
DESIGNED BY O.M.	TRACED BY
NOTED BY	QUANTITIES BY
CHECKED BY	
No.	

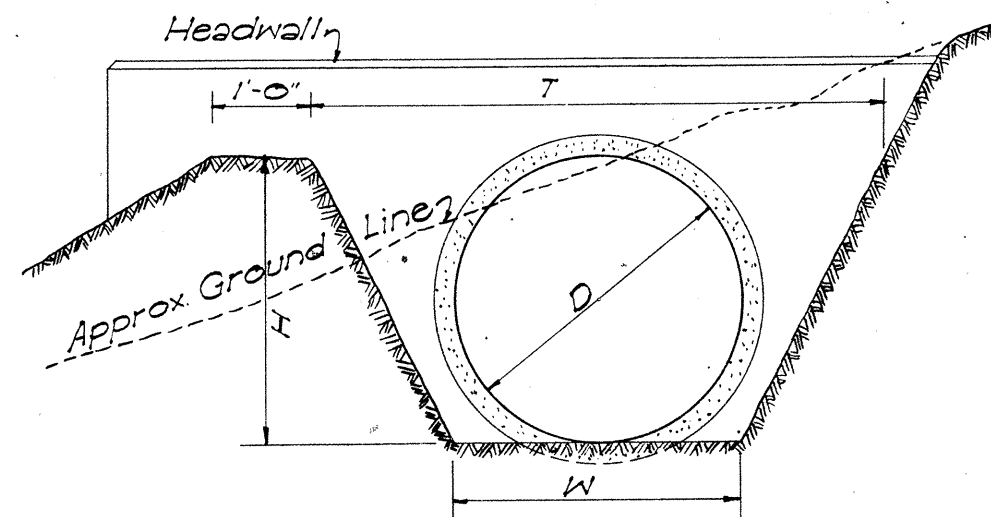


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
GALVANIZED CORRUGATED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
SHEET NO. OF SHEETS

DATA FOR OUTLET DITCH				
D	W	H	T=H+H	
18"	24"	2'-0"	4'-0"	
24"	30"	2'-0"	4'-6"	
30"	30"	2'-0"	5'-0"	
36"	36"	3'-0"	6'-0"	

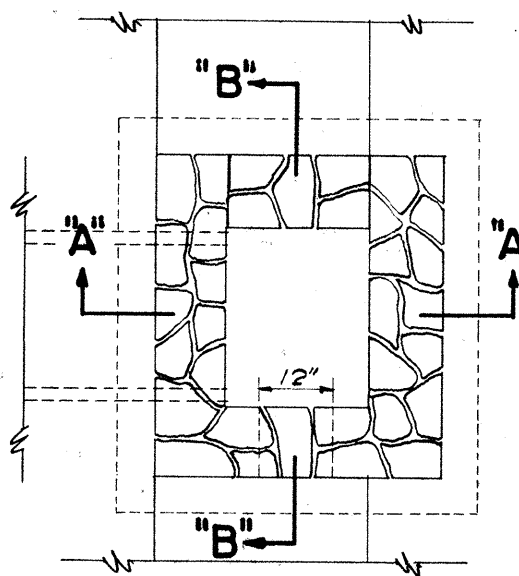
DETAIL OF OUTLET DITCH

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



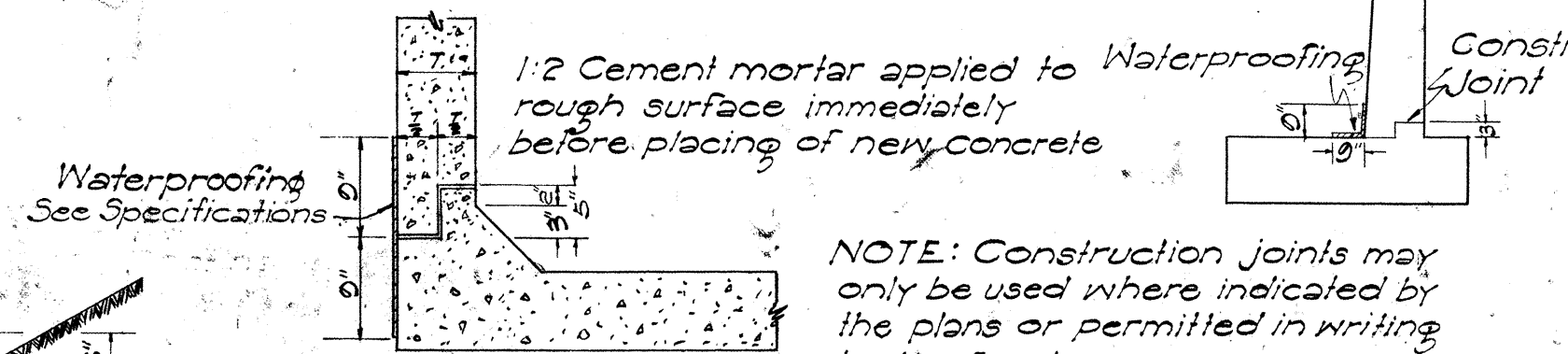
DATA FOR MASONRY DROP INTAKE					Where Variables Equal
D	D	L=D+G	Cu. Yds.		
23"	18"	2'-5"	3.02		4'-6"
30"	24"	3'-0"	3.61		5'-0"
37"	30"	3'-7"	4.21		5'-6"
44"	36"	4'-2"	4.85		6'-0"

NOTE: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



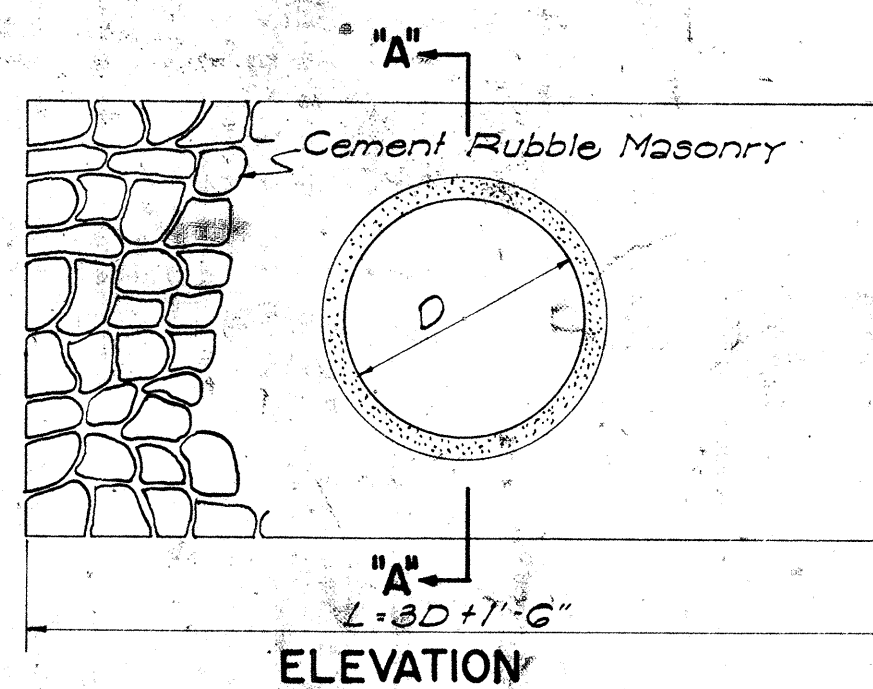
DETAIL OF MASONRY DROP INTAKE

Scale: 3/8" = 1'-0"



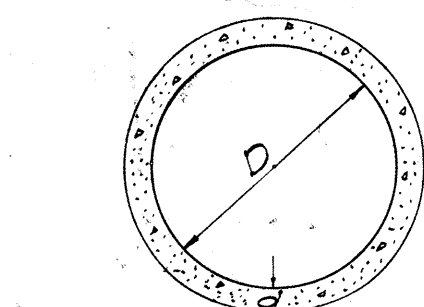
CONSTR. JOINT DETAILS

DATA - MASONRY HEADWALL			Cast-in-Place Conc. Culvert	Cast-in-Place Conc. Culvert	Corrugated Pipe Culvert
D	H	B	L	Cu. Yds.	Cu. Yds.
18"	3'-6"	1'-0"	6'-0"	0.85	0.95
24"	4'-0"	2'-0"	7'-6"	1.28	1.41
30"	4'-6"	2'-6"	9'-0"	1.83	2.00
36"	5'-0"	2'-6"	10'-6"	2.40	2.72



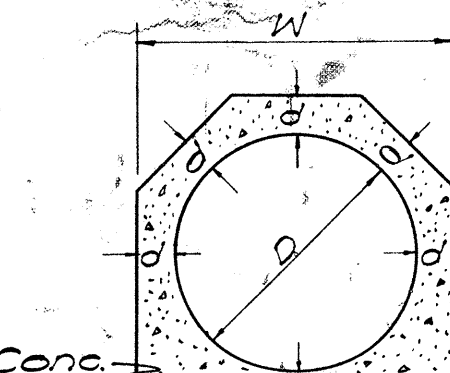
DETAIL OF MASONRY HEADWALL

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



SECTION CONG. PIPE CULVERT

NOTE: Thickness "d", reinforcing, and concrete used, are to conform with the approved design as provided by the Specifications.



SECTION CAST-IN-PLACE CONG. CULVERT

DATA - CAST-IN-PLACE CONG. CULVERT				
D	d	W	Cu. Yds. per ft.	
18"	4"	2'-2"	0.11	
24"	4 1/2"	2'-0"	0.14	
30"	5"	3'-4"	0.19	
36"	5 1/2"	3'-11"	0.26	

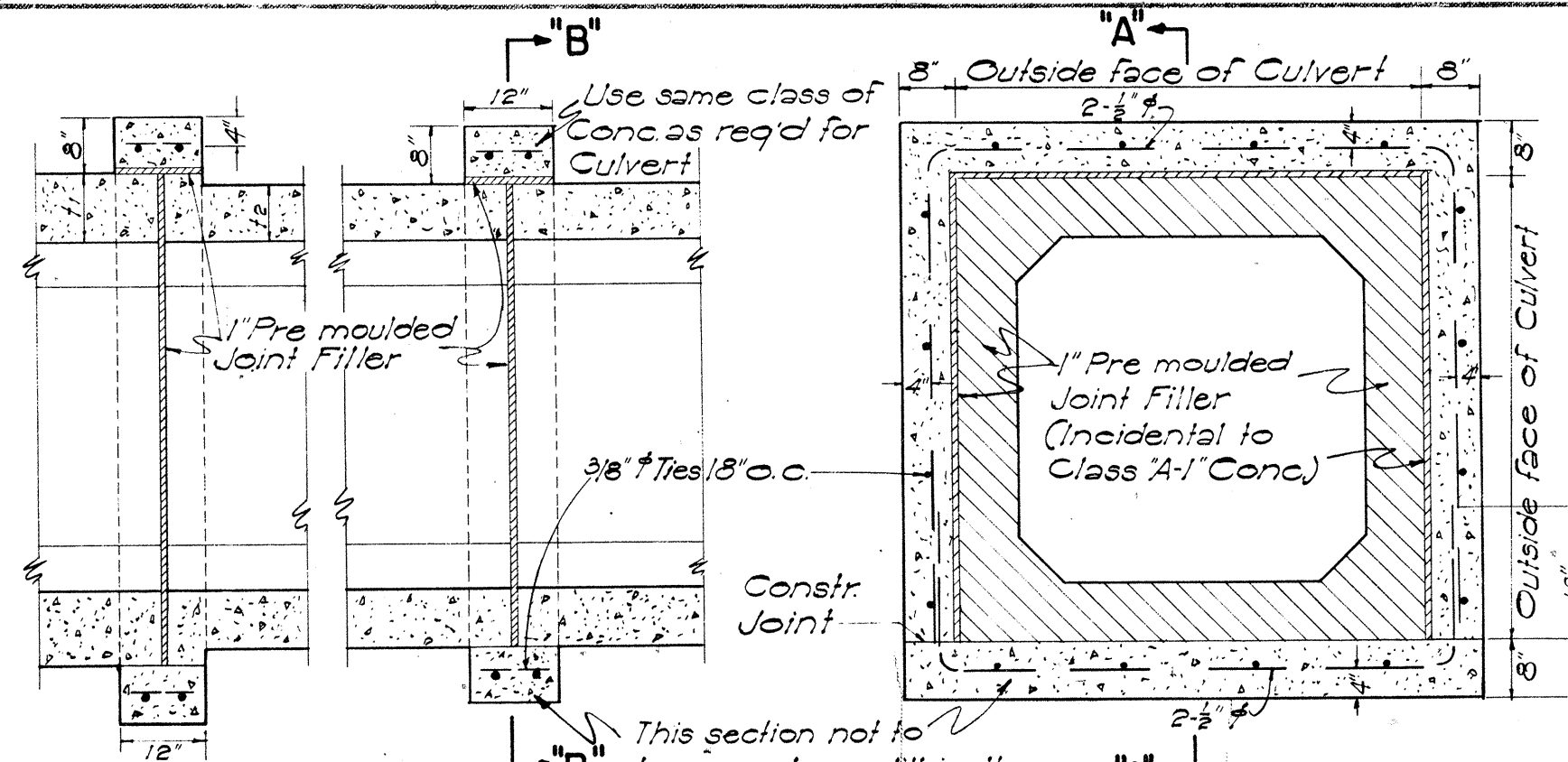
DETAIL OF CONCRETE HEADWALL

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

DATA FOR CONG. HEADWALL			Cast-in-Place Conc. Culvert	Cast-in-Place Conc. Culvert	Steel For One Headwall
D	B	L	Cu. Yds.	Cu. Yds.	No. of Bars Size Length Lbs.
18"	1'-6"	6'-0"	0.92	1.00	4 3/4" 5'-6" 93
24"	1'-6"	7'-6"	1.25	1.38	4 3/4" 7'-0" 122
30"	2'-0"	9'-0"	1.95	2.17	4 3/4" 8'-6" 151
36"	2'-0"	10'-6"	2.43	2.74	4 3/4" 10'-0" 200
42"	2'-6"	12'-0"	3.87	4.26	4 3/4" 11'-6" 260
48"	2'-6"	13'-6"	4.66	5.11	4 3/4" 13'-0" 378

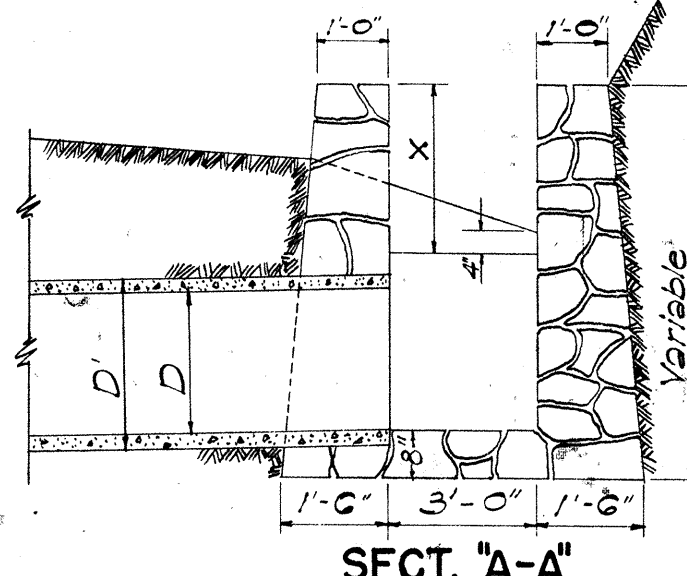
DETAIL OF CONCRETE HEADWALL

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

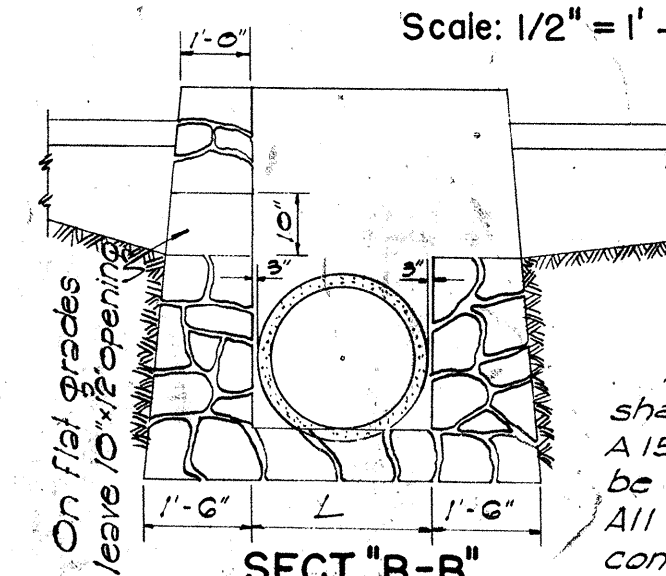


CONC. COLLAR FOR CONG. BOX CULVERT

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



SECT. "A-A"

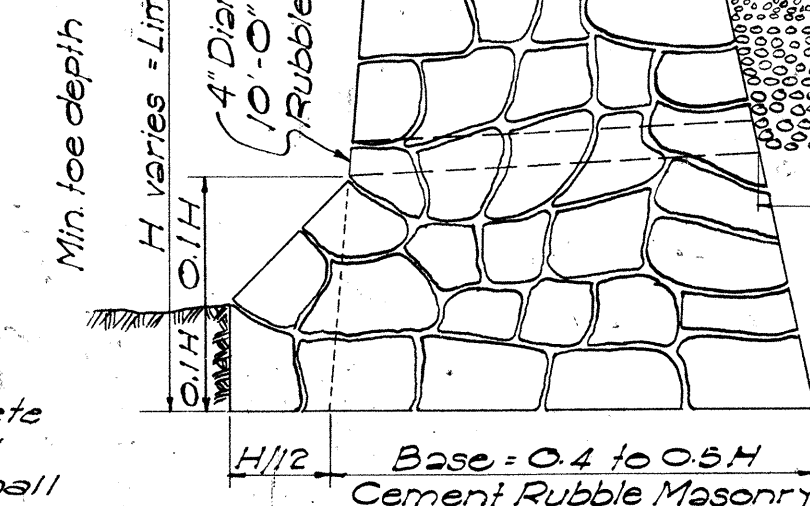


SECT. "B-B"

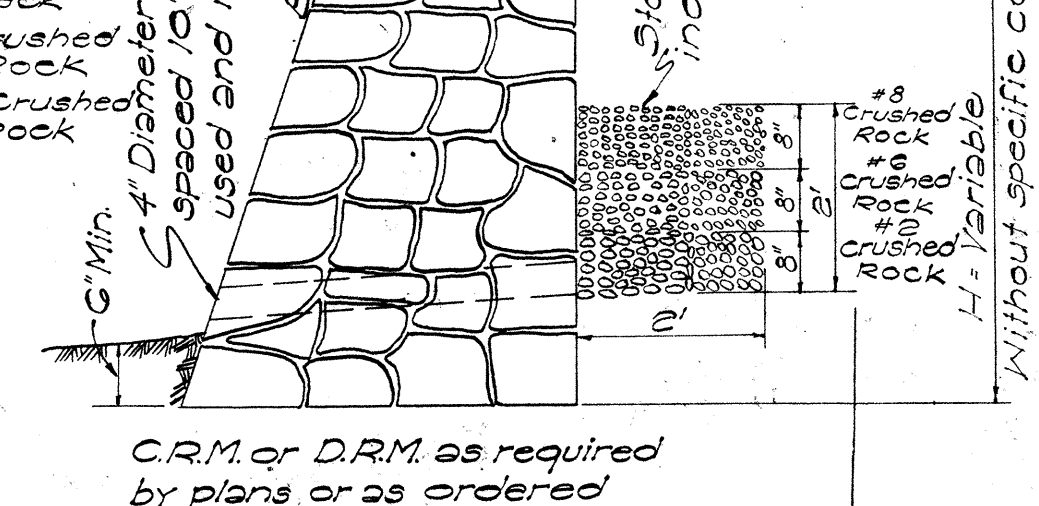
REINFORCING BARS

All reinforcing bars for concrete shall be Billet Steel bars, ASTM A15, intermediate grade. Steel shall be made by the open-hearth process. All bars shall be deformed type conforming to ASTM A-305.

SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL



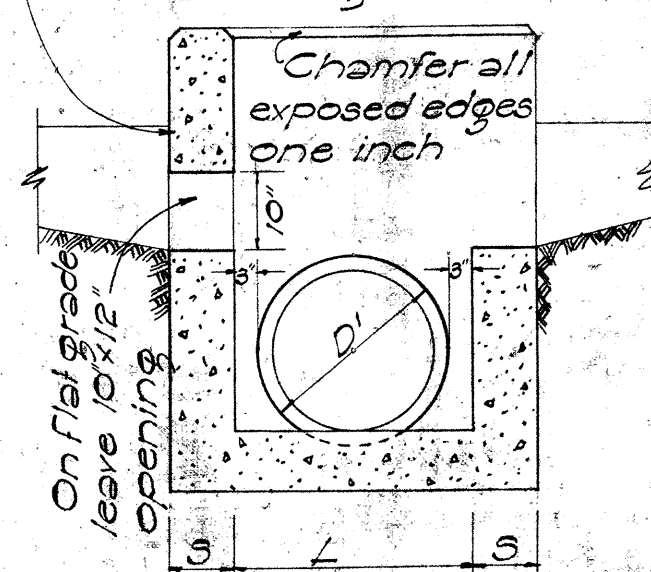
SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL



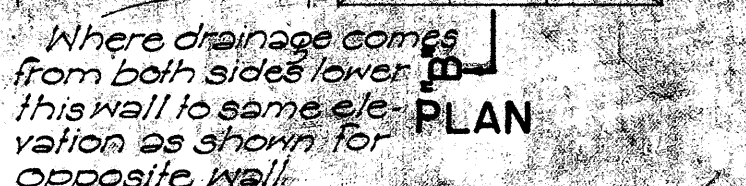
DATA - CONG. DROP INTAKE					Where Variables Equal
D	D	L=D+G	Cu. Yds.		
23"	18"	2'-5"	1.41		4'-6"
30"	24"	3'-0"	1.72		5'-0"
37"	30"	3'-7"	2.32		5'-6"
44"	36"	4'-2"	2.73		6'-0"
51"	42"	4'-9"	3.54		6'-6"
58"	48"	5'-4"	4.01		7'-0"

Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.

Note: This type of structure shall also be used for the Drop Intakes of Siphons connected with Irrigation Ditches or Flumes with appropriate changes to dimensions. In this case all joints must be made water tight.



SECTION "B-B"



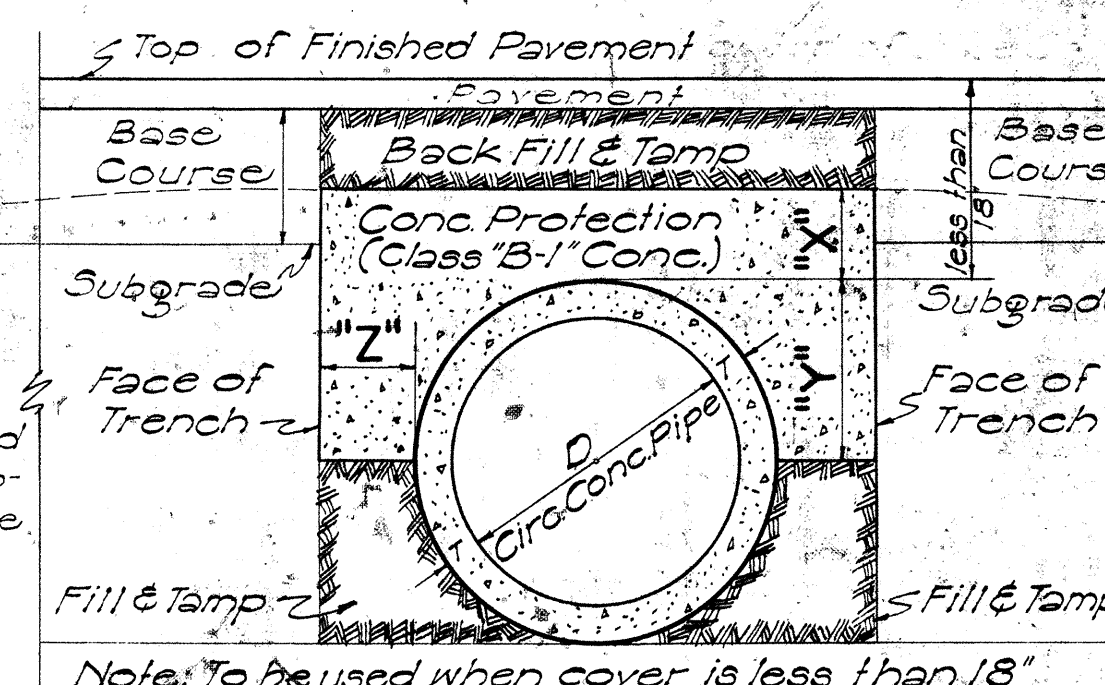
SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

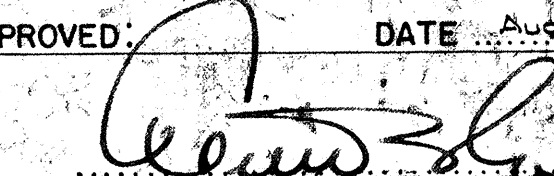
Scale: 1/2" = 1'-0"

SECT. OF CULVERT WITH CONG. PROTECTION

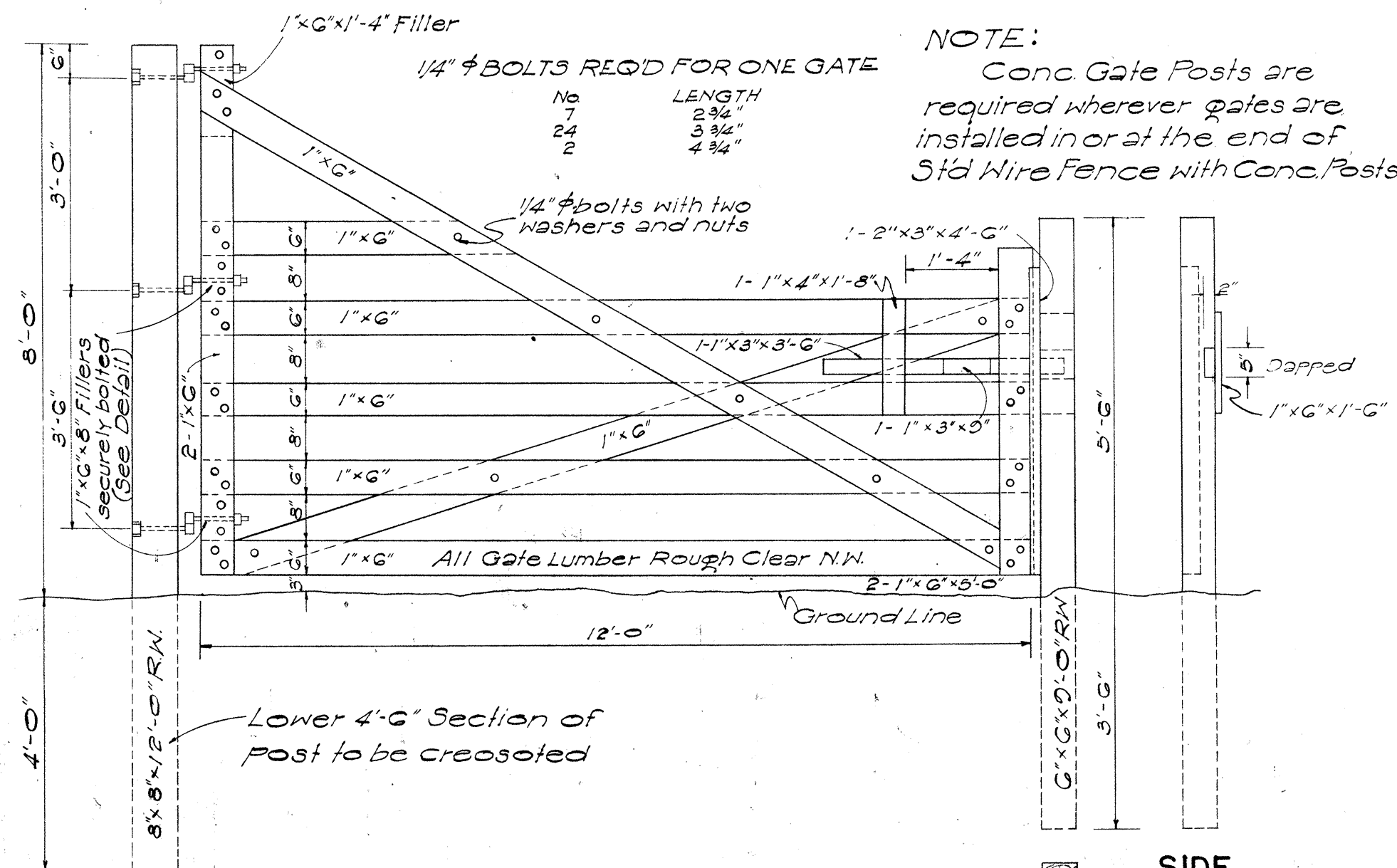
Scale: 1" = 1'-0"



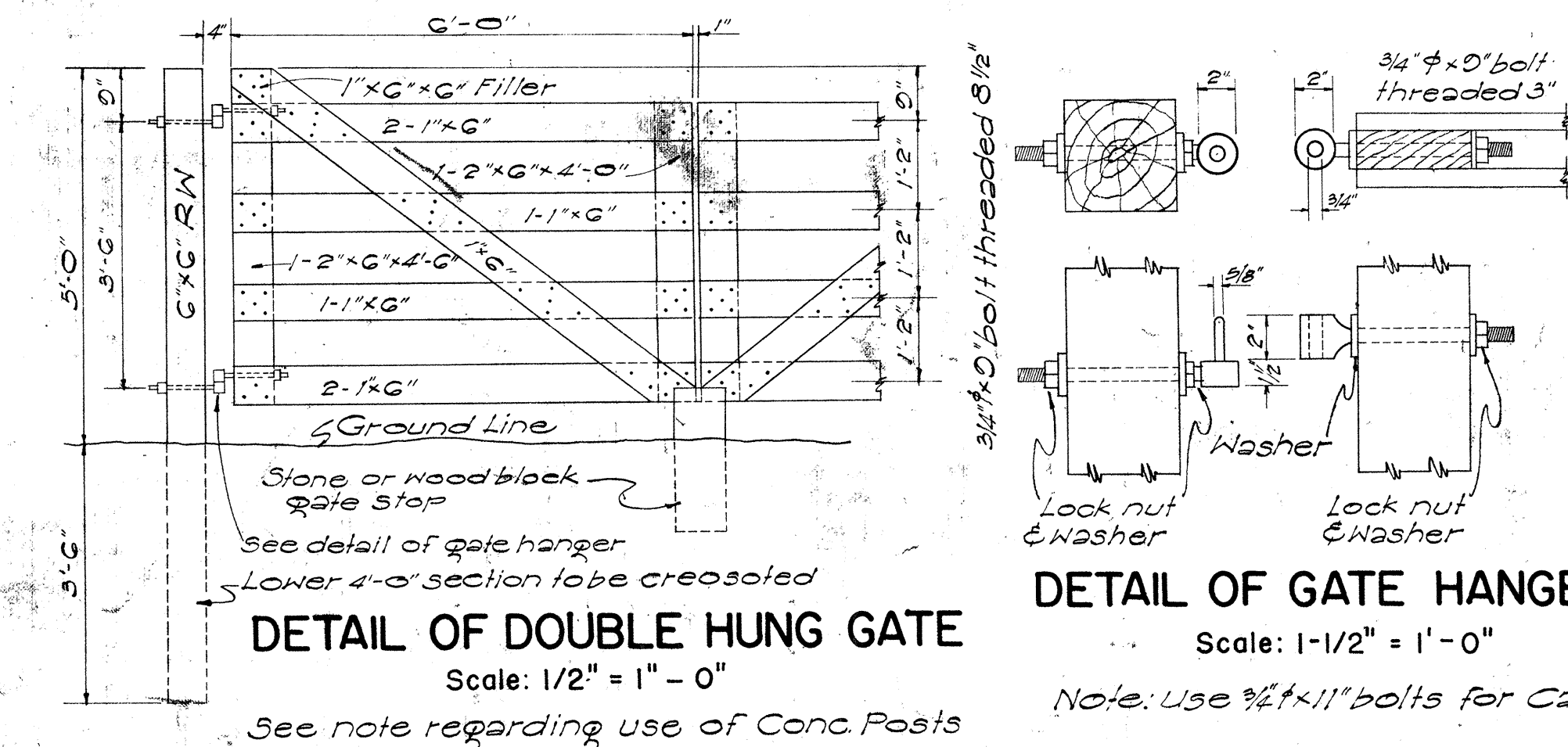
DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D		Z must be from pipe to face of trench
7" " 24" D		Minimum = X
8" " 30" D		Maximum pay quantity will be Z=12"
9" " 36" D		
10" " 42" D		
11" " 48" D		
12" " 54" D		

APPROVED:  DATE: AUG. 26, 1957
STATE HIGHWAY ENGINEER

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED
SHEET NO. OF SHEETS



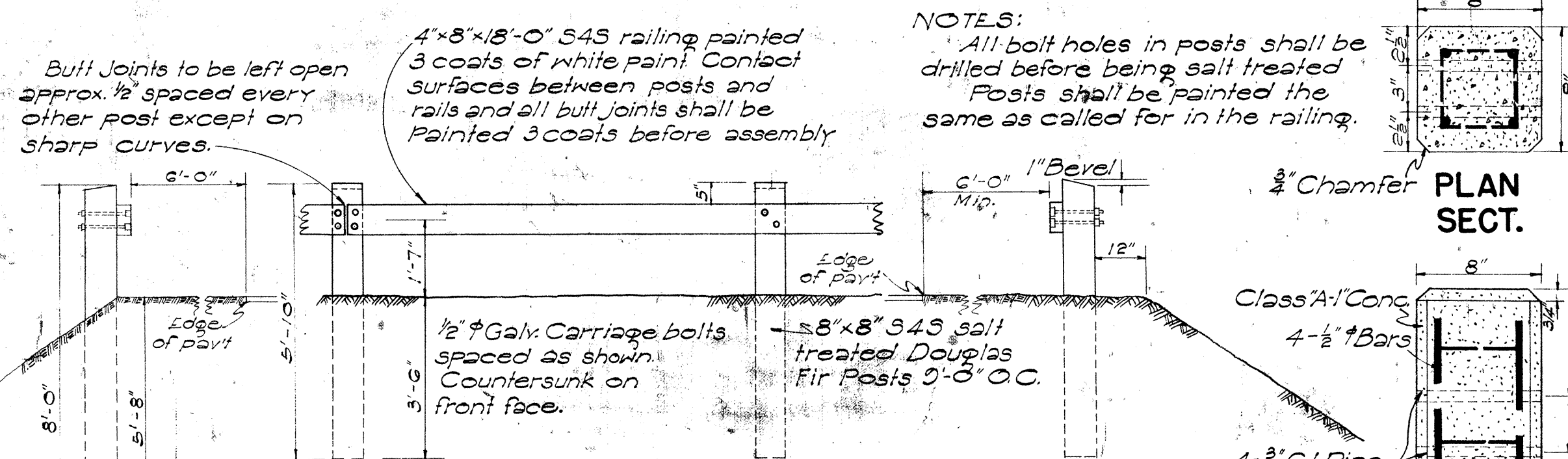
DETAIL OF CATTLE GATE
Scale: 1/2" = 1' - 0"



DETAIL OF DOUBLE HUNG GATE
Scale: 1/2" = 1' - 0"

DETAIL OF GATE HANGER
Scale: 1-1/2" = 1' - 0"

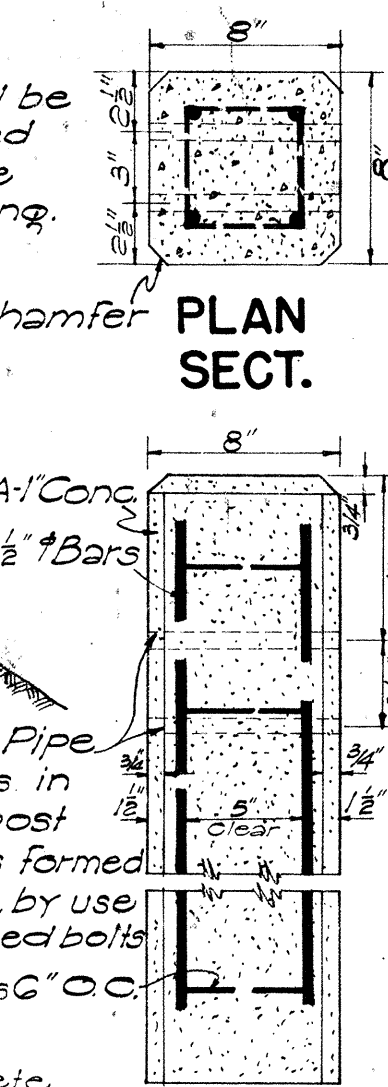
Note: Use 3/4" x 11" bolts for Cattle Gate



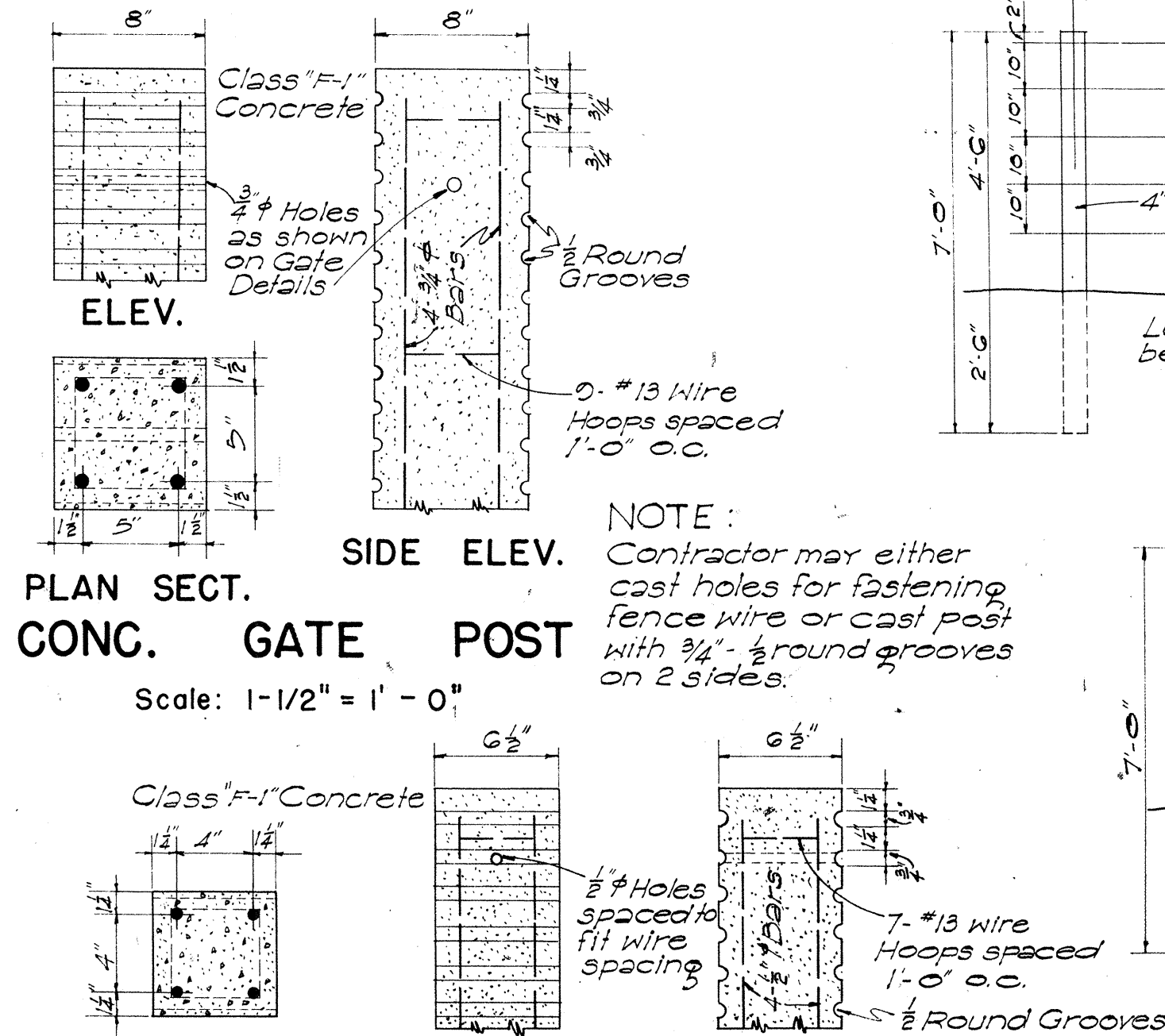
WOOD GUARD RAIL WITH WOOD POSTS
Scale: 3/8" = 1' - 0"

NOTE: For Conc Post see detail at right

GUIDE POSTS: Wood or Conc Guide Posts are the same as those used for Wood Guard Rail spaced as shown on plans.



DETAIL OF CONC. POST
Scale: 1-1/2" = 1' - 0"

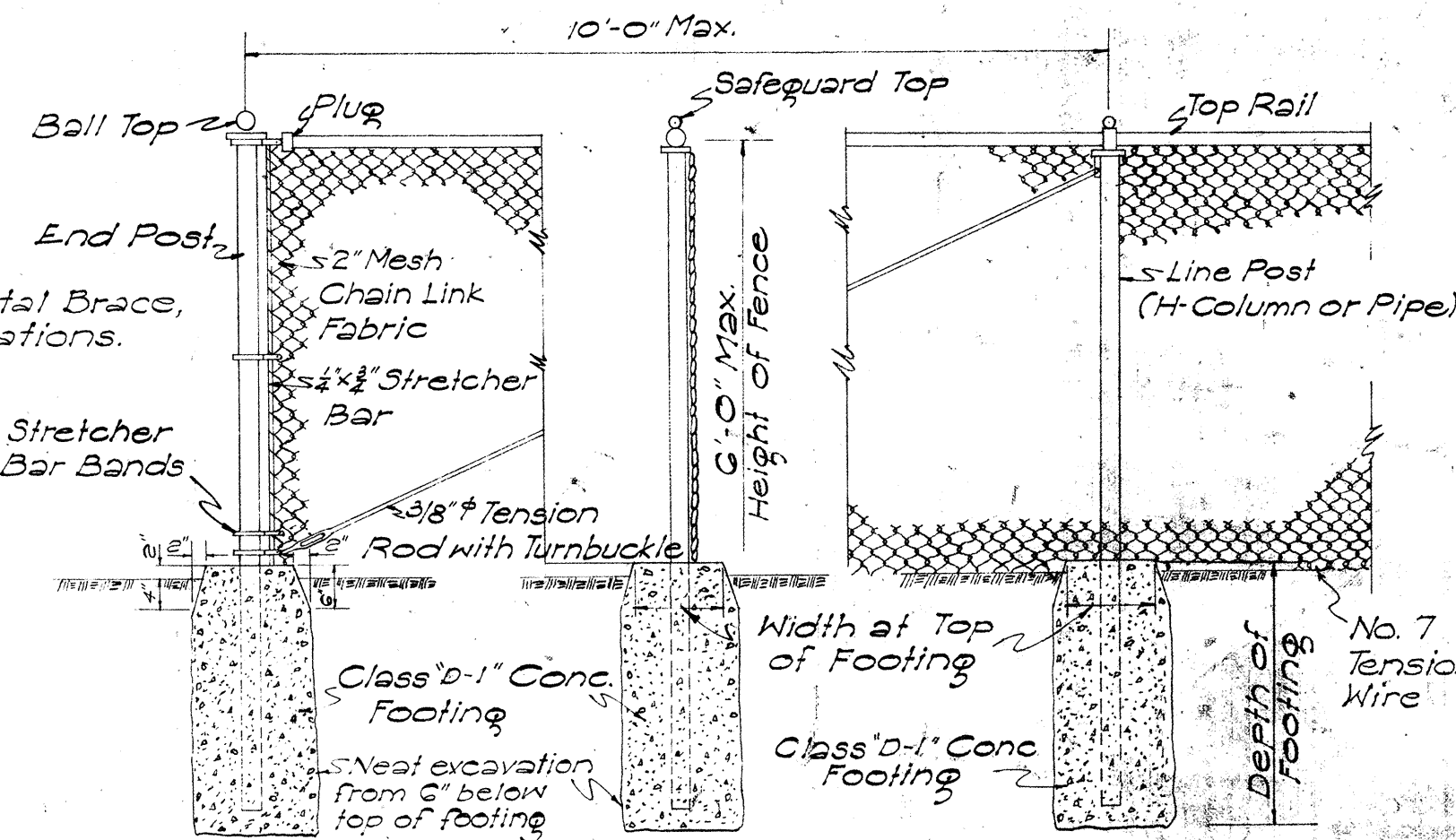


CONC. GATE POST
Scale: 1-1/2" = 1' - 0"

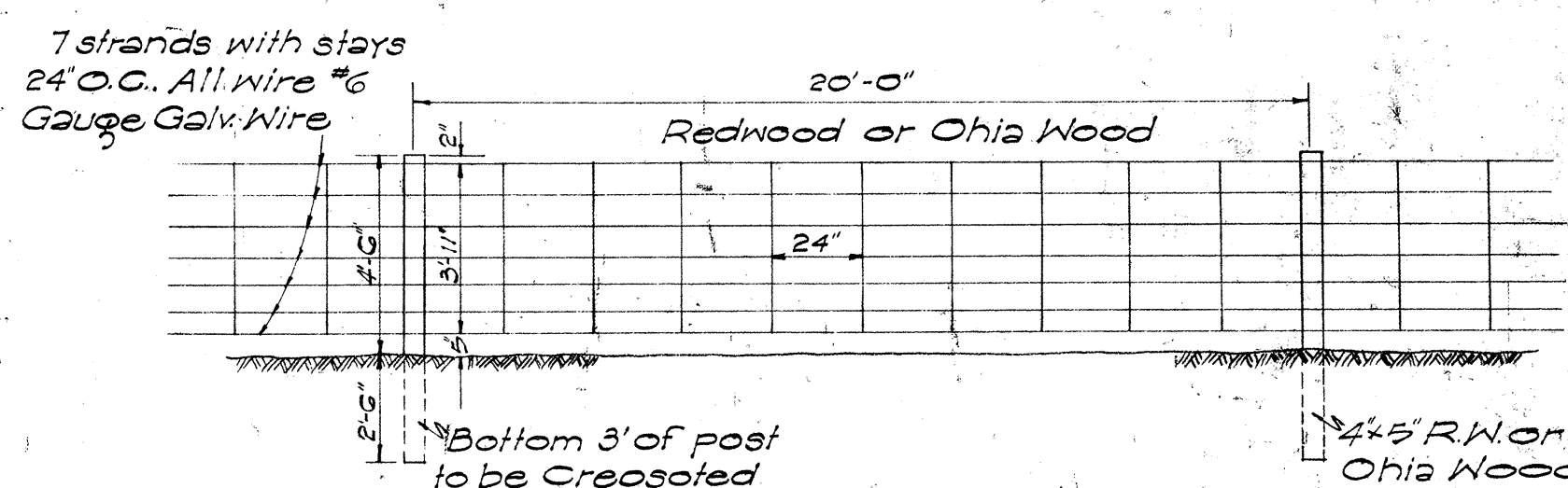
CONC. FENCE POST
Scale: 1-1/2" = 1' - 0"

DETAILS OF STANDARD WIRE FENCE WITH WOOD POSTS
Scale: 3/8" = 1' - 0"

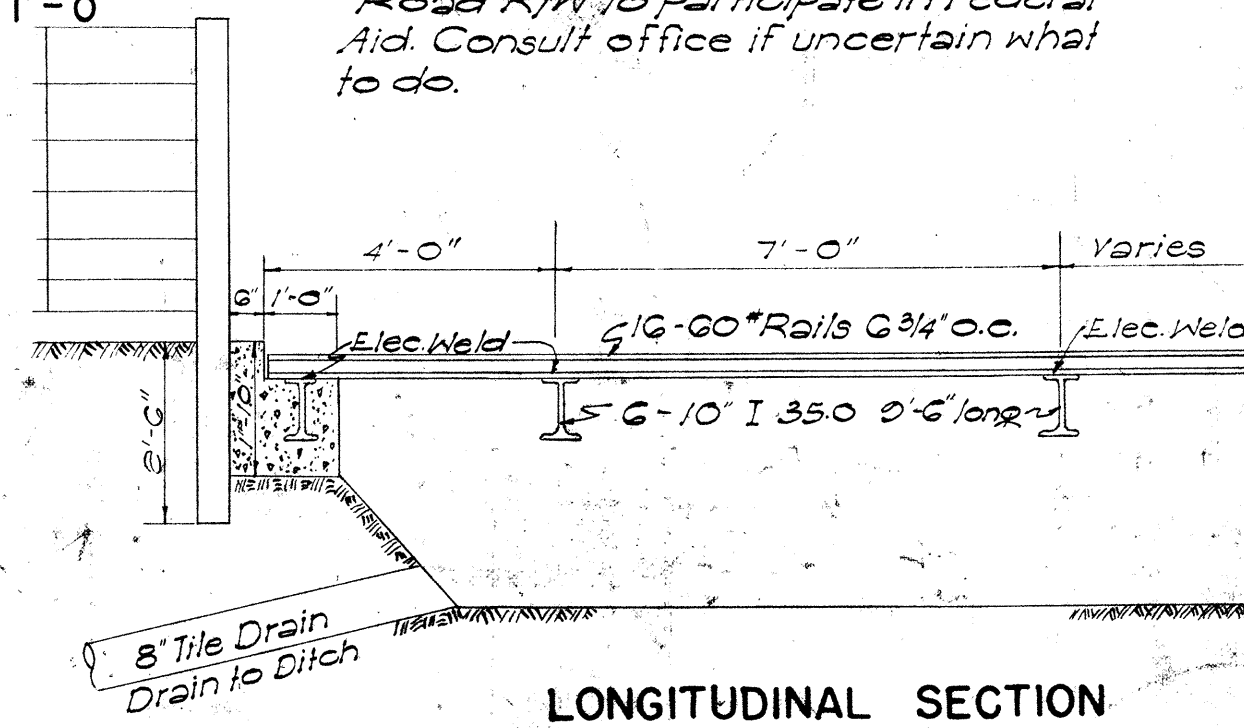
NOTE: This Project requires Std Wire Fence with 12' post spacing (If spacing is not indicated above use 10' ft)



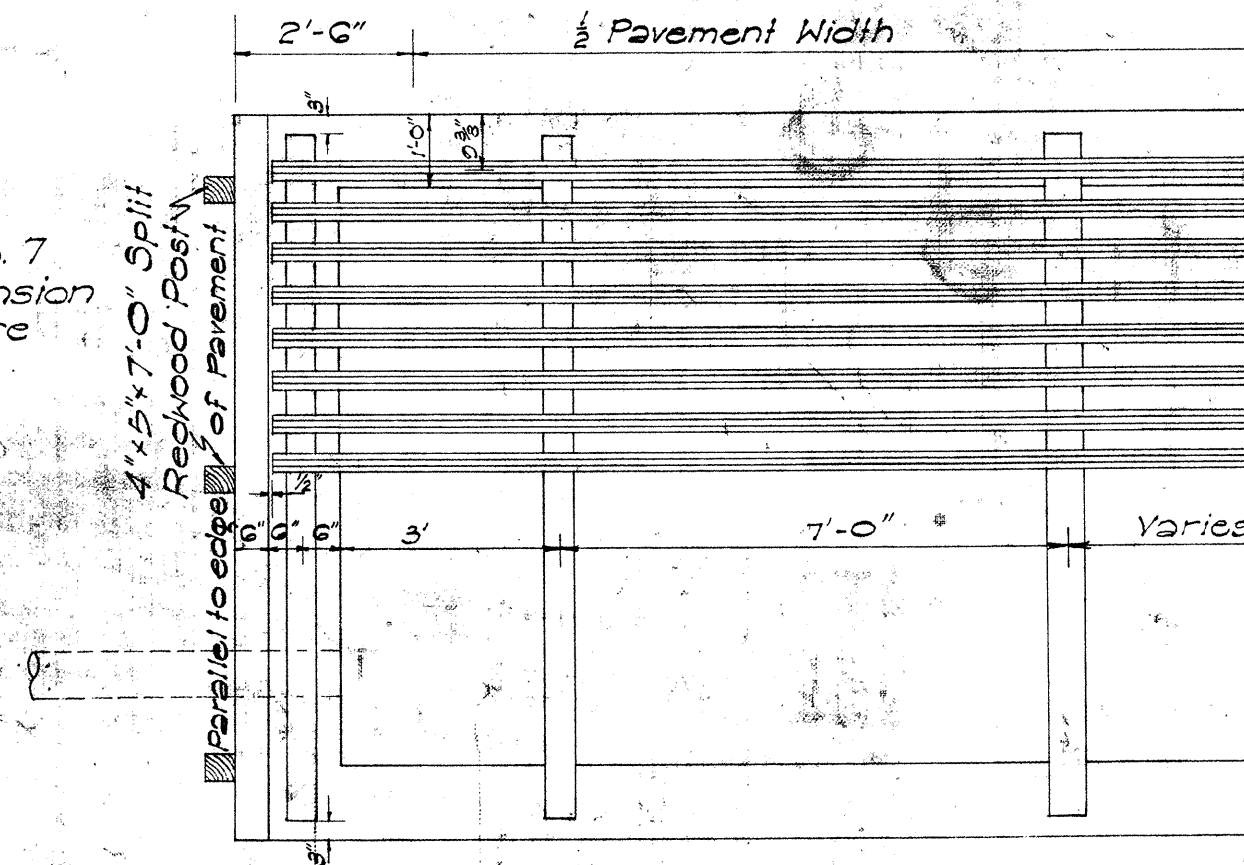
DETAIL OF CHAIN LINK FENCE
Scale: 1/2" = 1' - 0"



DETAIL OF WOVEN WIRE FENCE
Scale: 1/4" = 1' - 0"



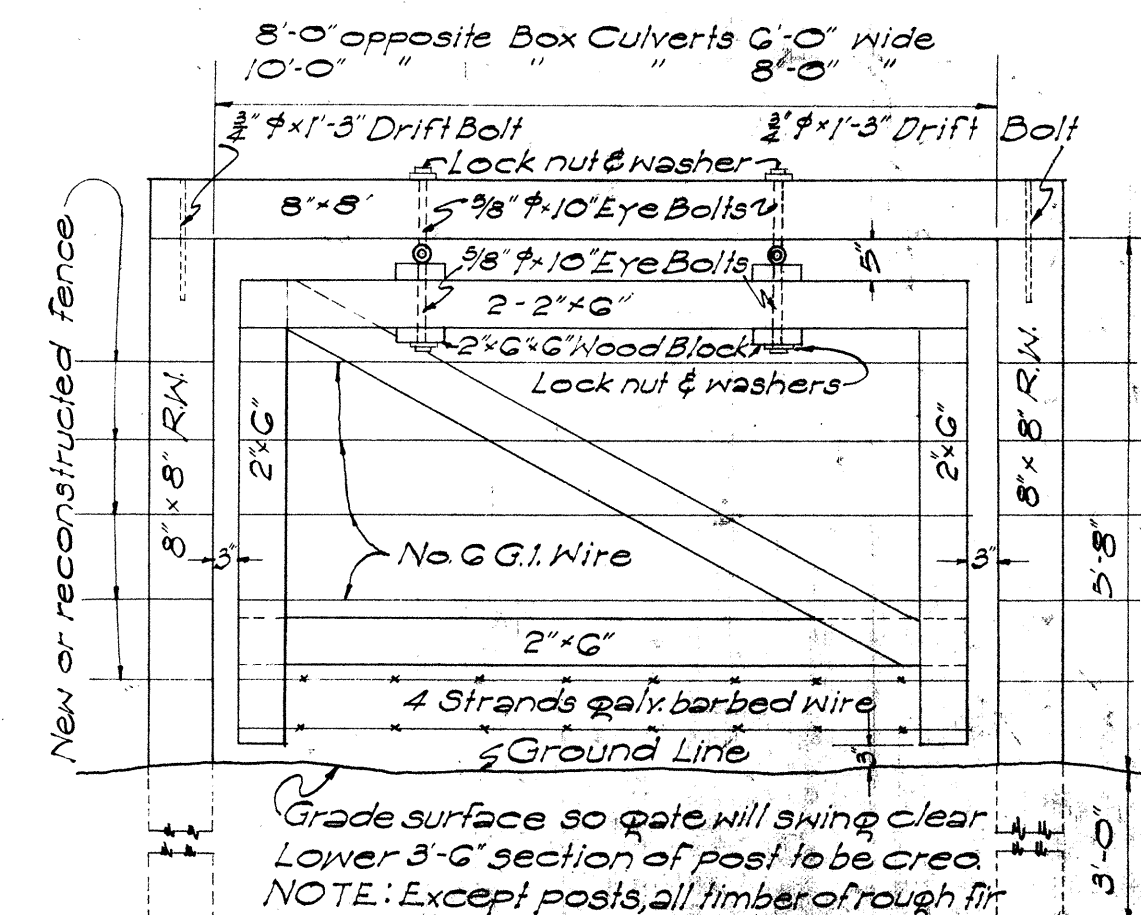
LONGITUDINAL SECTION



HALF SECTION

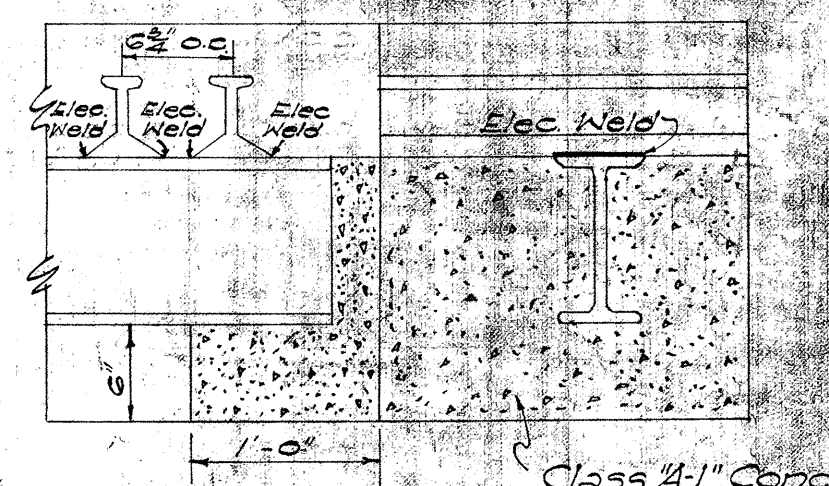
DETAIL OF CATTLE GUARD
Scale: 3/8" = 1' - 0"

APPROVED: [Signature] DATE: AUG. 20, 1959
STATE HIGHWAY ENGINEER



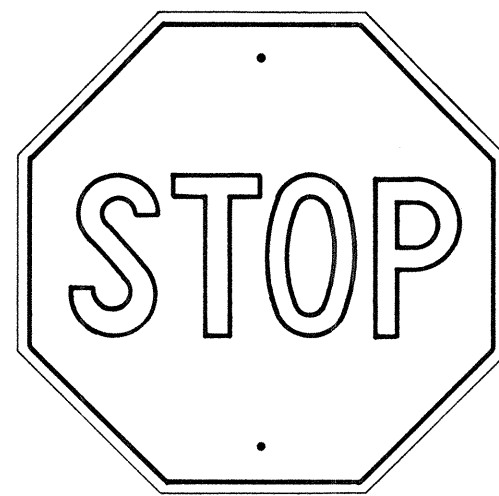
DETAILS OF HURDLE

LAYOUT SHOWING HURDLE PLACED BELOW CULVERT IN A POSITION WHICH WILL BE CATTLE TIGHT

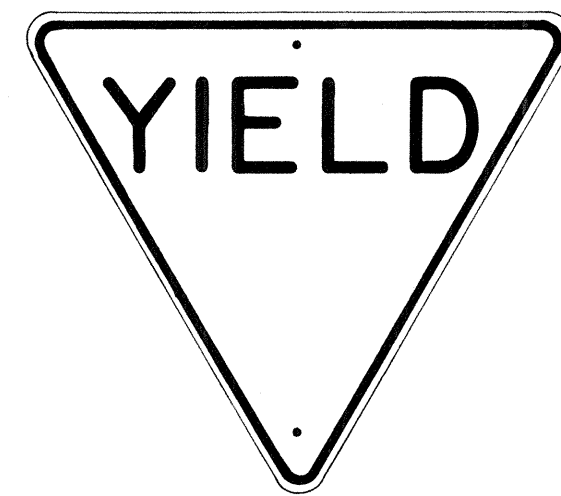


SECTION

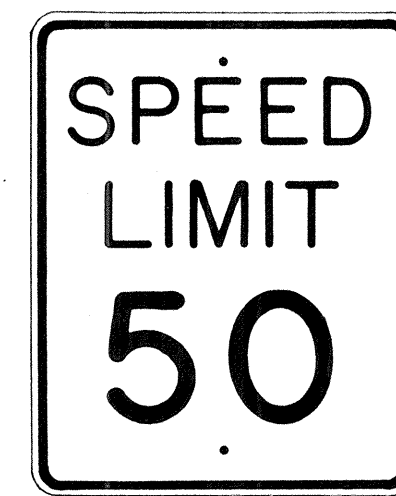
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
FENCES, GATES, GUARD RAILS,
GUIDE POSTS, CATTLE GUARD
SCALES AS NOTED



R1-1 30"x30"



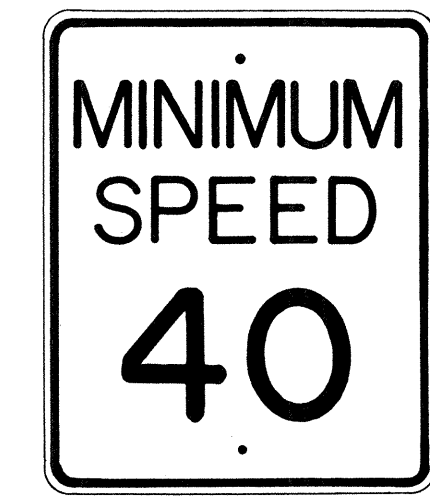
R1-2 36"x36"x36"
R1-2-E 48"x48"x48"
R1-2-I 60"x60"x60"



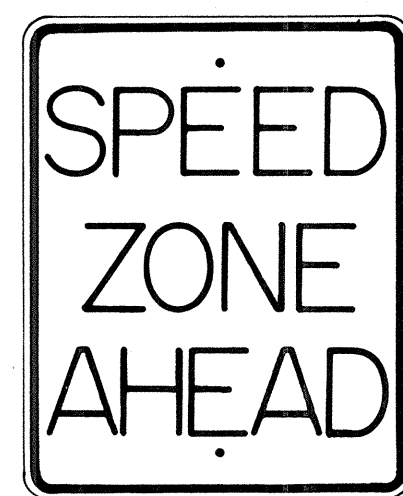
R2-1(50) 24"x30"
R2-1(50)-E 36"x48"
R2-1(50)-I 48"x60"



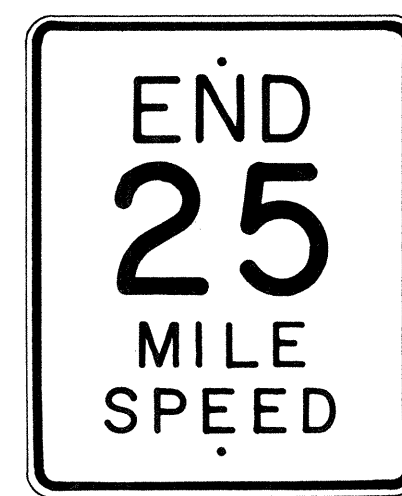
R2-2(40) 24"x24"
R2-2(40)-E 36"x36"
R2-2(40)-I 48"x48"



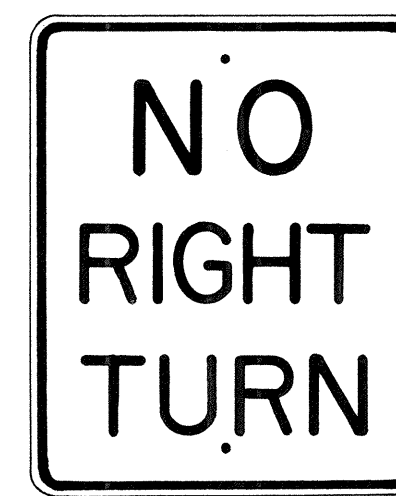
R2-4(40) 24"x30"
R2-4(40)-E 36"x48"
R2-4(40)-I 48"x60"



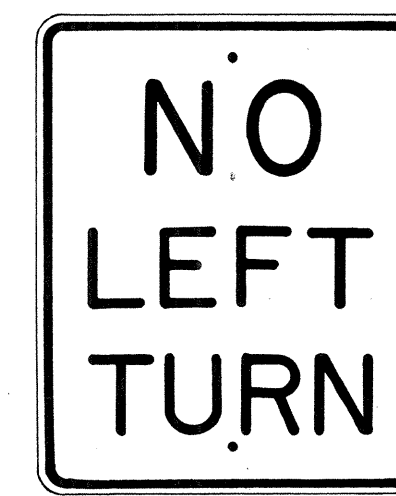
R2-5 24"x30"
R2-5-E 36"x48"
R2-5-I 48"x60"



R2-6(25) 24"x30"
R2-6(25)-E 36"x48"



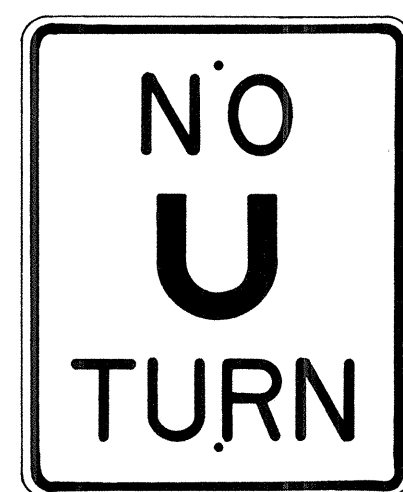
R3-1 24"x30"
R3-1-E 36"x48"



R3-2 24"x30"
R3-2-E 36"x48"



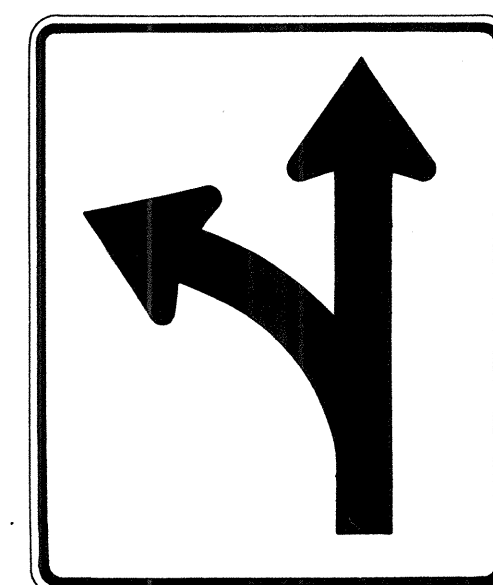
R3-3 24"x24"



R3-4 24"x30"
R3-4-E 36"x48"
R3-4-I 48"x60"



R3-5(L) 30"x36"



R3-6(L) 30"x36"

NOTE:

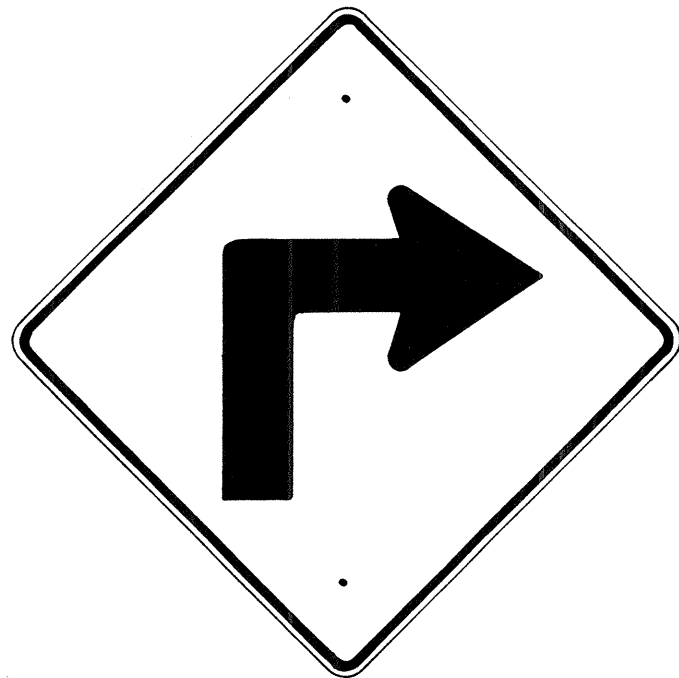
1. The shape, color, dimensions, symbols, wording, lettering and reflectorization of all signs shall be in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways," dated June 1961 and the BPR manual "Standard Highway Signs," dated September 1961 unless otherwise specified.
2. All regulatory signs shall be reflectorized unless otherwise specified.
3. All regulatory signs shall have 3/8" bolt holes drilled at appropriate locations unless otherwise noted.
4. The suffix "E" denotes Expressway signs and "I" denotes Interstate signs.
5. For R2 signs, number in () indicates speed and shall be as shown on the plans.

APPROVED: _____ DATE 1/22/62
DIRECTOR OF TRANSPORTATION

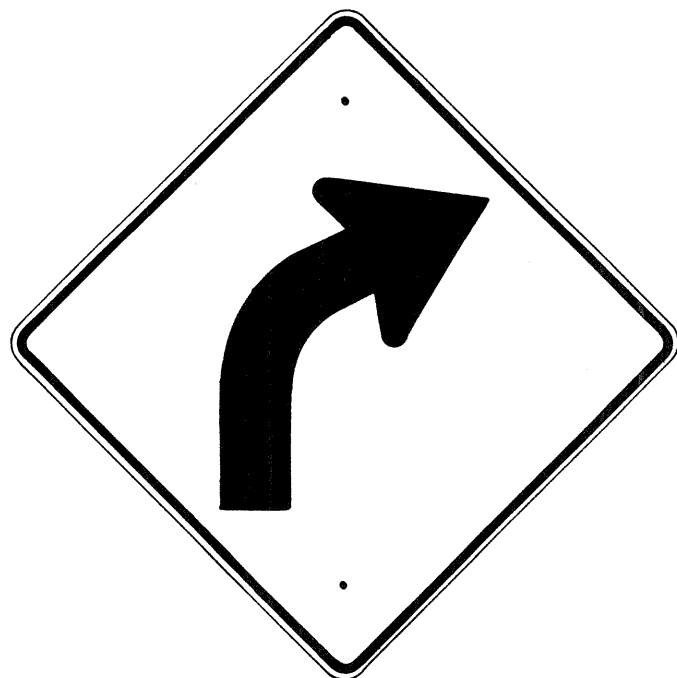
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
REGULATORY SIGNS

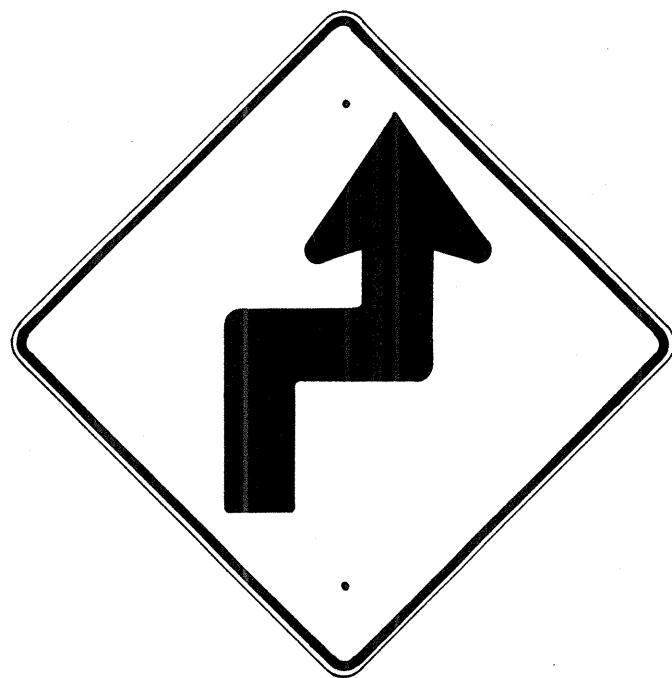
Scale: 1" = 1' - 0"



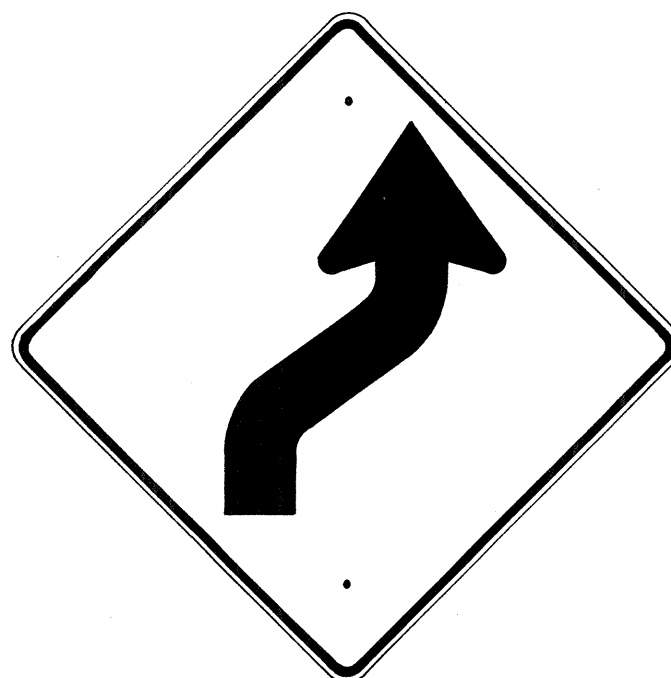
W1-1R 30" x 30"



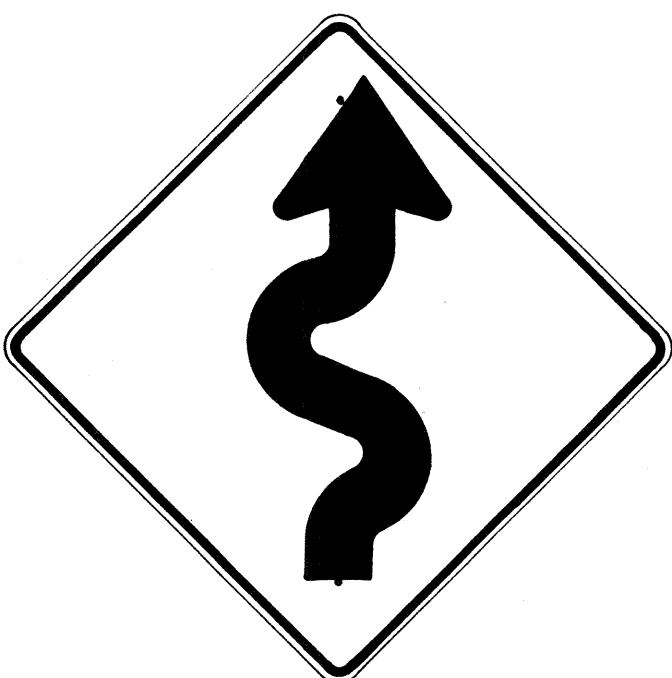
W1-2R 30" x 30"



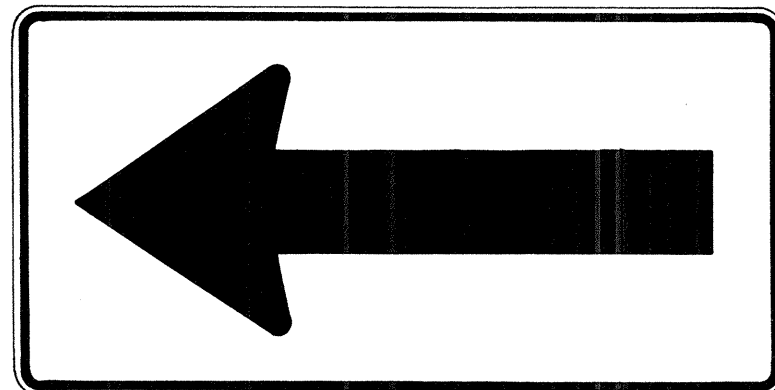
W1-3R 30" x 30"



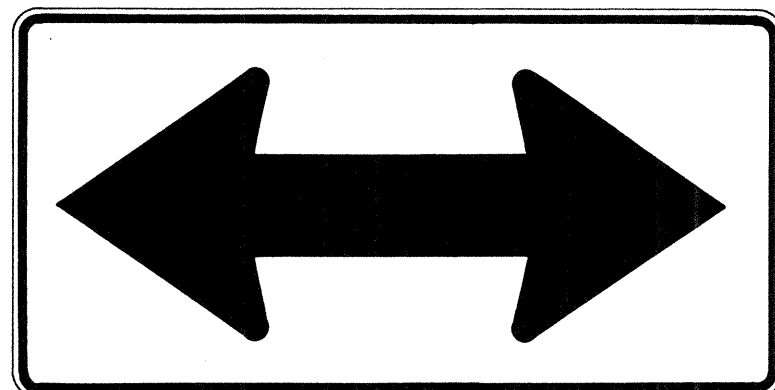
W1-4R 30" x 30"



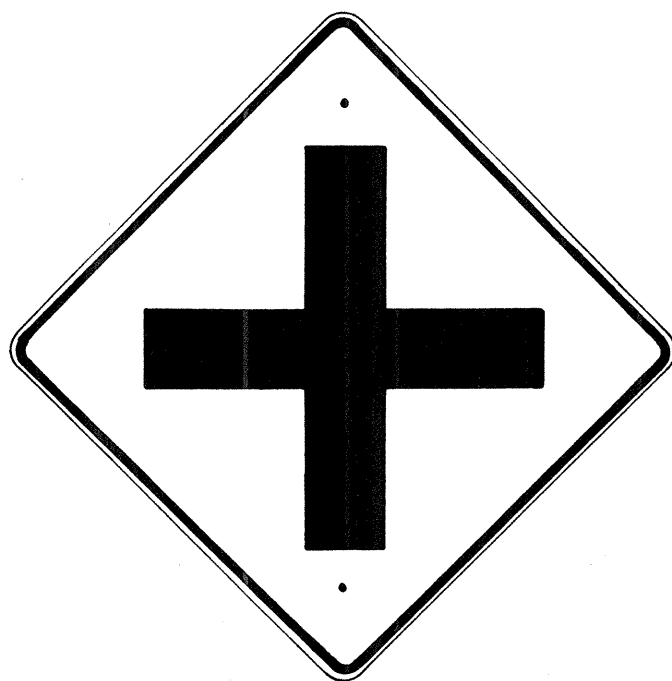
W1-5R 30" x 30"



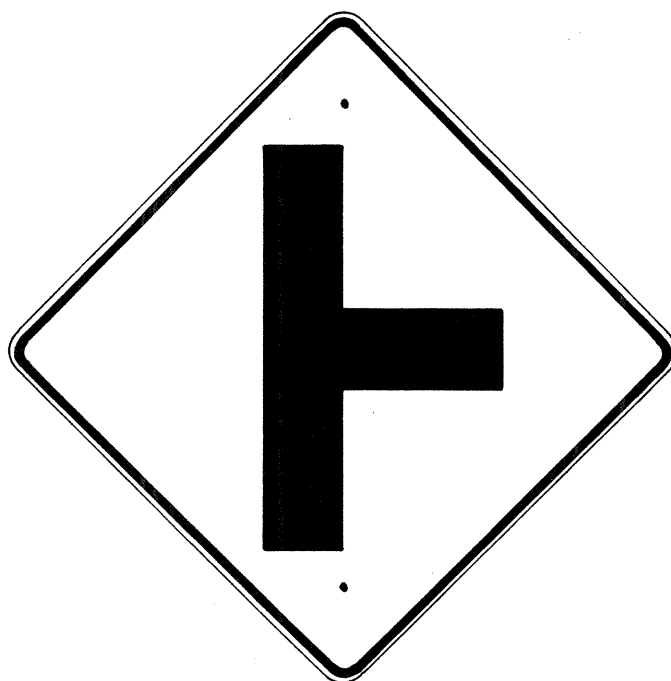
W1-6 48" x 24"



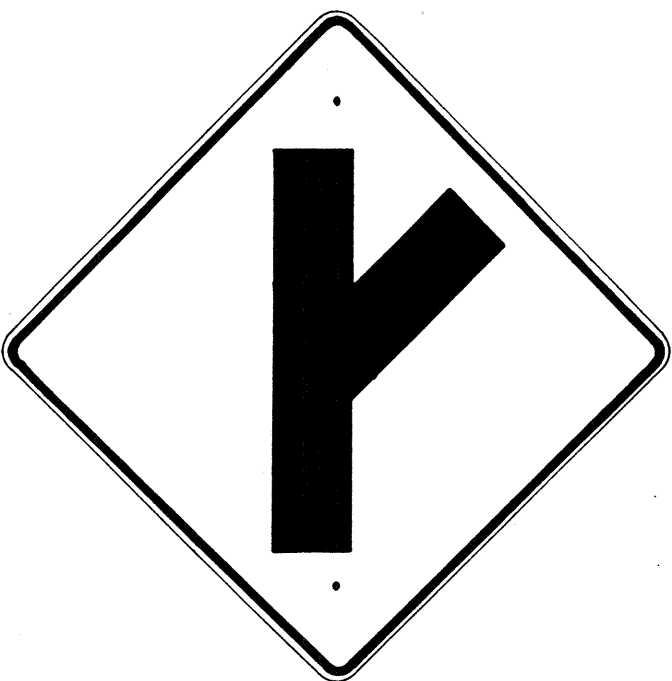
W1-7 48" x 24"



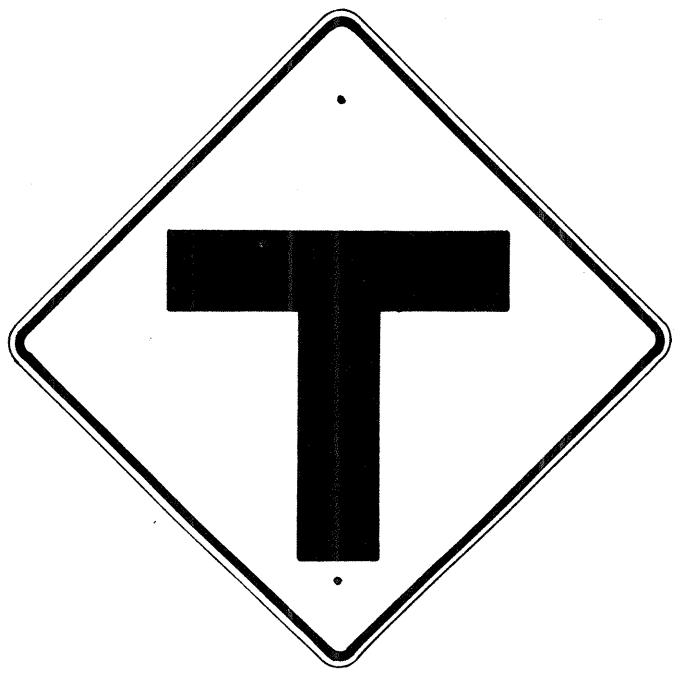
W2-1 30" x 30"



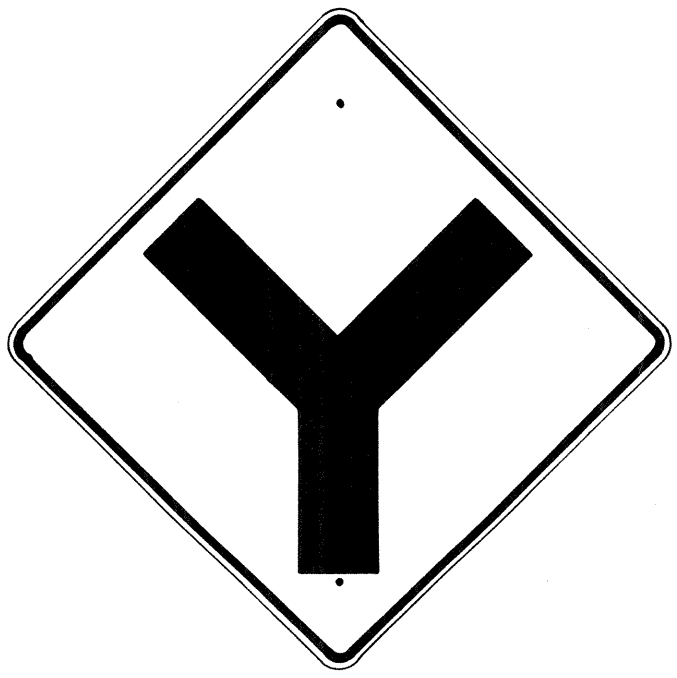
W2-2 30" x 30"



W2-3R 30" x 30"



W2-4 30" x 30"



W2-5 30" x 30"



W3-1 30" x 30"



W5-1 30" x 30"

NOTE:
 1. The shape, color, dimensions, symbols, wording, lettering and reflectorization of all signs shall be in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways," dated June 1961 and the BPR manual "Standard Highway Signs," dated September 1961 unless otherwise specified.
 2. All warning signs shall be reflectorized unless otherwise specified.
 3. All warning signs shall have 3/8" bolt holes drilled at appropriate locations unless otherwise noted.

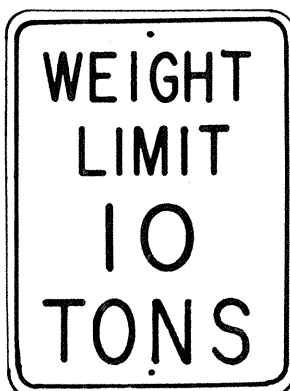
APPROVED: _____ DATE: 1/22/62
 DIRECTOR OF TRANSPORTATION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 WARNING SIGNS
 Scale: 1" = 1'-0"

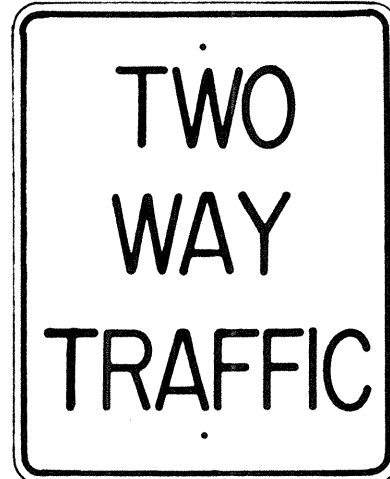
FED. ROAD DIST. No.	STATE	FED. AID FISCAL YEAR	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	2-0550(2) UNIT 2	1963	26	105



R 10 - 2 48" x 30"



R 10 - 4(10) 18" x 24"



R 6 - 3 24" x 30"



W 20 - 1a 48" x 48"



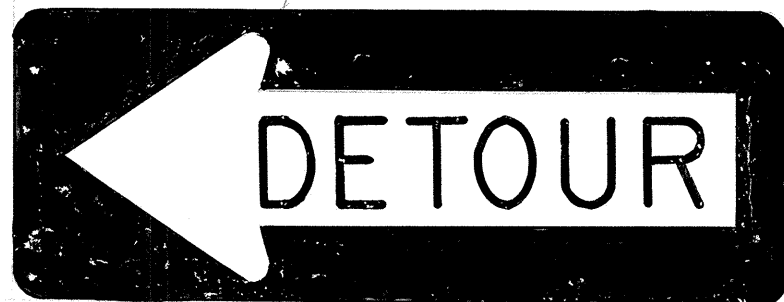
W 20 - 2d 48" x 48"



W 20 - 3b 48" x 48"



W 20 - 4d 48" x 48"



M 5 - 7(L) 48" x 18"

- NOTE:
- 1. The shape, color, dimensions, symbols, wording, lettering and reflectorization of all signs shall be in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways," dated June 1961 and the BPR manual "Standard Highway Signs," dated September 1961 unless otherwise specified.
 - 2. All signs shall be reflectorized unless otherwise specified.
 - 3. All signs shall have 3/8" bolt holes drilled at appropriate locations unless otherwise noted.
 - 4. For R10-4 sign, number in () indicates weight and shall be as shown on the plans.
 - 5. For W20 series signs, suffixes a, b, c and d are as follows a 1500 FT, b 1000 FT, c 500 FT and d AHEAD.

APPROVED: _____ DATE 1/22/62
DIRECTOR OF TRANSPORTATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONSTRUCTION SIGNS

Scale: 1" = 1'- 0"

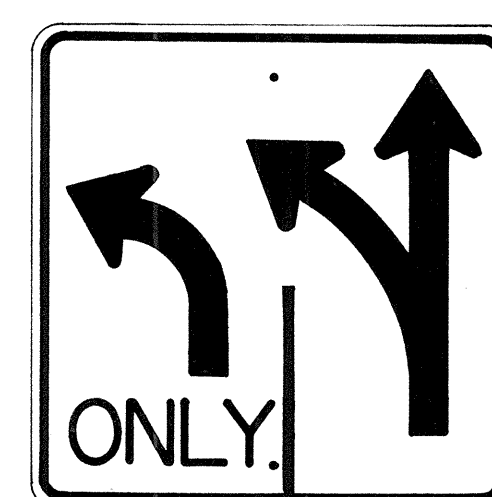
1. All signs and road delineators shall be placed 2' outside the usable roadway shoulder or 1' outside unmountable curbing present and within the limits shown below.
2. Except as noted below, sign posts shall be 3" galv. std. pipe for signs larger than 24" in any dimension and 2" galv. std. pipe for signs not over 24" in any dimension, with two $\frac{3}{8}$ " ϕ bolt holes or adjustable band brackets.
3. Sign shall be attached to post with $\frac{5}{16}$ " galvanized carriage bolts with nuts and $\frac{7}{8}$ " x $\frac{1}{16}$ " x .120 stainless - steel washers with neoprene rubber gasket.
4. Clearance Markers (RM-4, RM-3) shall be installed with the inside edge of the marker in line with the inner edge of the obstruction.
5. Signs 48" and wider or larger than 10 sq. ft. in area shall be mounted on two 3" galv. std. pipe with appropriate $\frac{3}{4}$ " bolt holes.



R 3 - 7 (L) 30"x30"



R 3 - 7 (R) 30"x30"



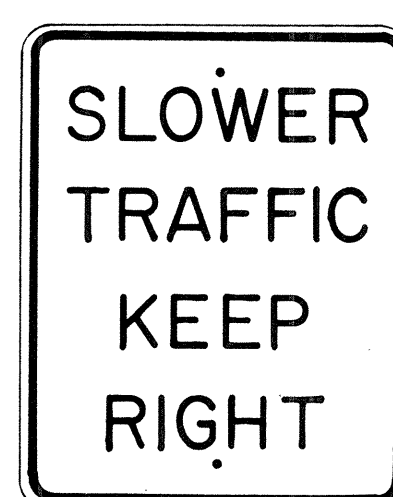
R 3 - 8 (L) 30"x30"



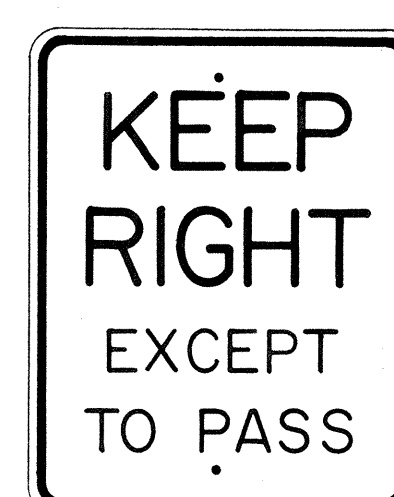
R 4 - 1 24"x30"



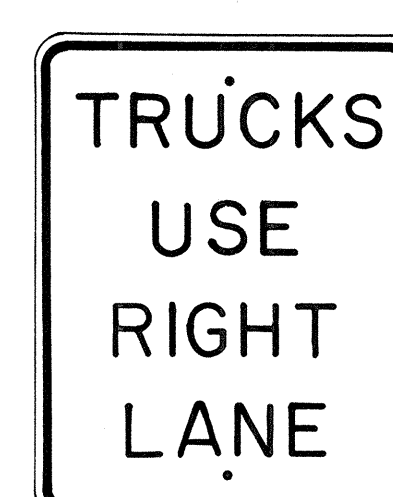
R 4 - 2 24"x30"



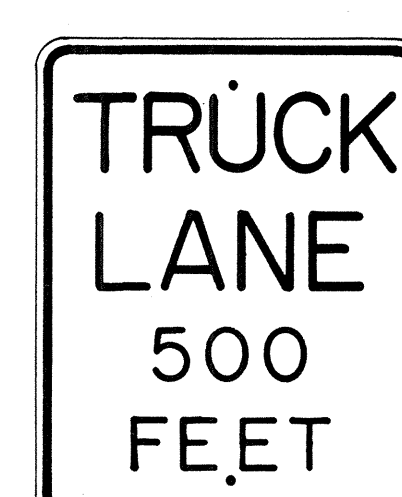
R 4 - 3 24"x30"
R 4 - 3 - E 36"x48"
R 4 - 3 - I 48"x60"



R 4 - 4 24"x30"
R 4 - 4 - E 36"x48"
R 4 - 4 - I 48"x60"



R 4 - 5 24"x30"
R 4 - 5 - E 36"x48"



R 4 - 6 24"x30"
R 4 - 6 - E 36"x48"



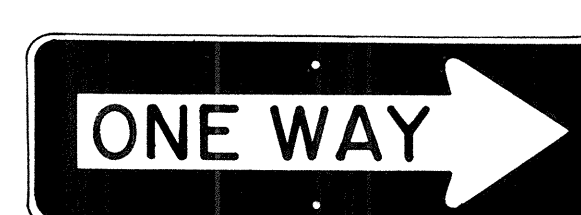
R 4 - 7 (R) 24"x30"
R 4 - 7 (R) - E 36"x48"



R 4 - 7 (L) 24"x30"
R 4 - 7 (L) - E 36"x48"



R 5 - 1 24"x24"



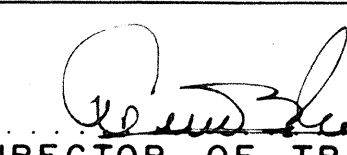
R 6 - 1 (R) 36"x12"



R 6 - 2 (R) 18"x24"

NOTE:

1. The shape, color, dimensions, symbols, wording, lettering and reflectorization of all signs shall be in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways," dated June 1961 and the BPR manual "Standard Highway Signs," dated September 1961 unless otherwise specified.
2. All regulatory signs shall be reflectorized unless otherwise specified.
3. All regulatory signs shall have 3/8" bolt holes drilled at appropriate locations unless otherwise noted.
4. The suffix "E" denotes Expressway signs and "I" denotes Interstate signs.

APPROVED:  DATE: 1/22/62
DIRECTOR OF TRANSPORTATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
REGULATORY SIGNS

Scale: 1" = 1'-0"