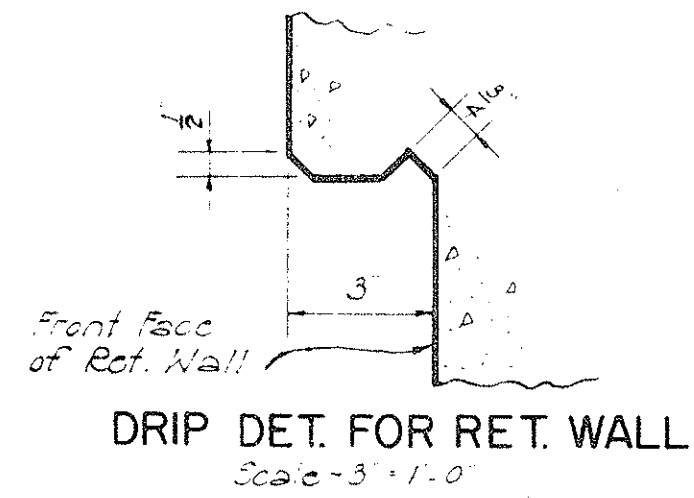


NAME DATE

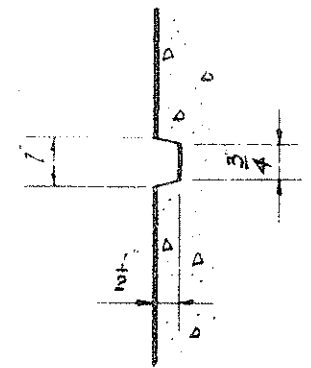
Use correct name of bridge LEFT HAND SIDE Date of year built RIGHT HAND SIDE

DETAIL OF LETTERS AND FIGURES AT BOTH APPROACHES

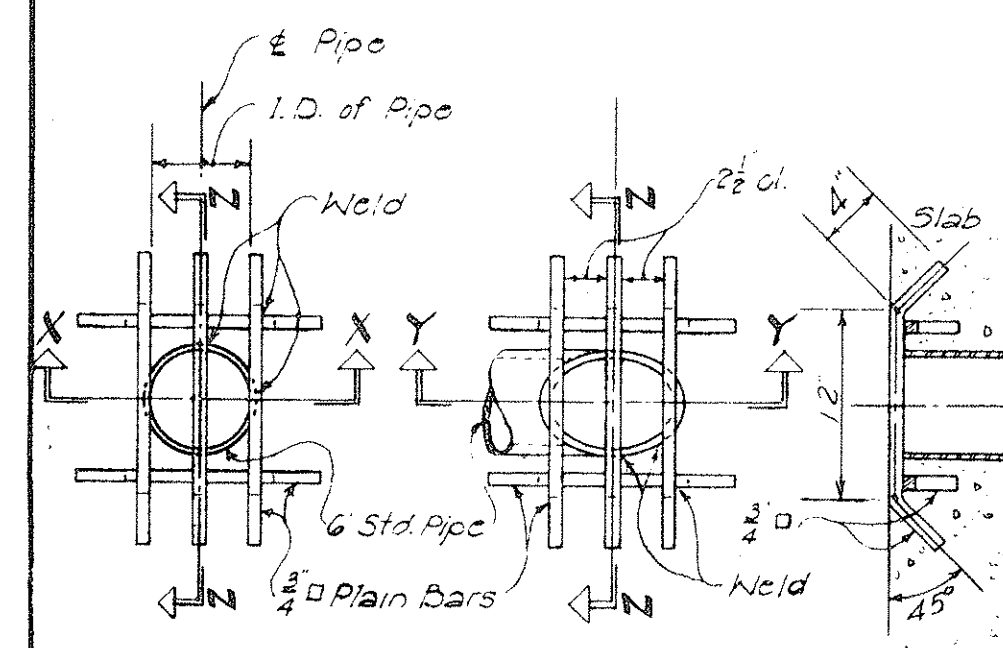
NOTE: Name of bridge to be placed in left end post panels and date in right post panels on entering bridge using modified block letters 3" in height. In case of stream crossings use name of stream for name of bridge. For all others use name as designated by the Engineer.



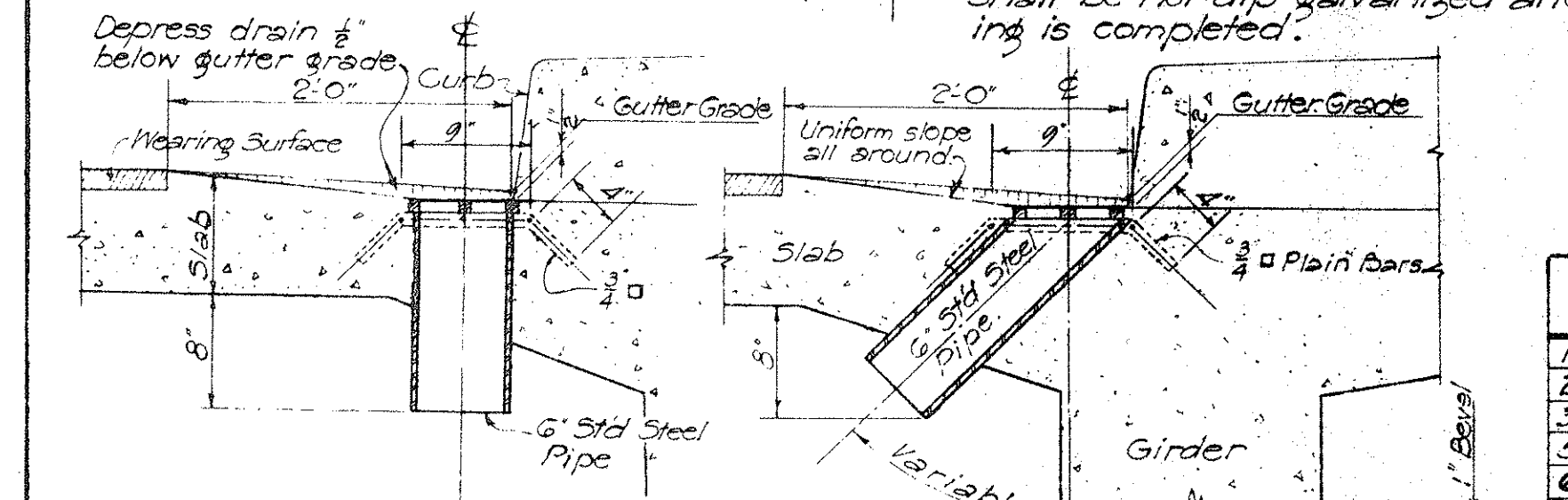
DRIP DET. FOR RET. WALL Scale: 3/4"=1'-0"



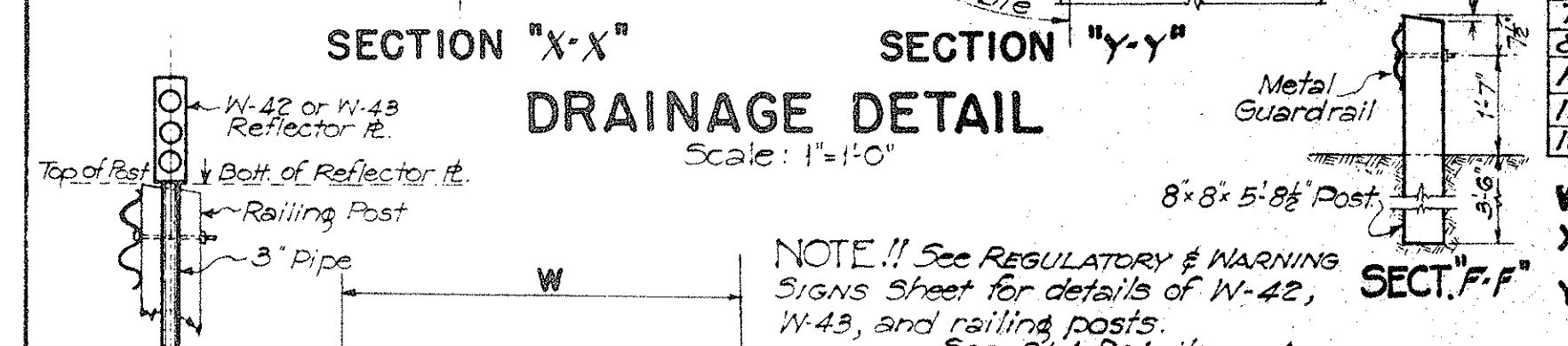
END POST GROOVE DET. Scale: 3/4"=1'-0"



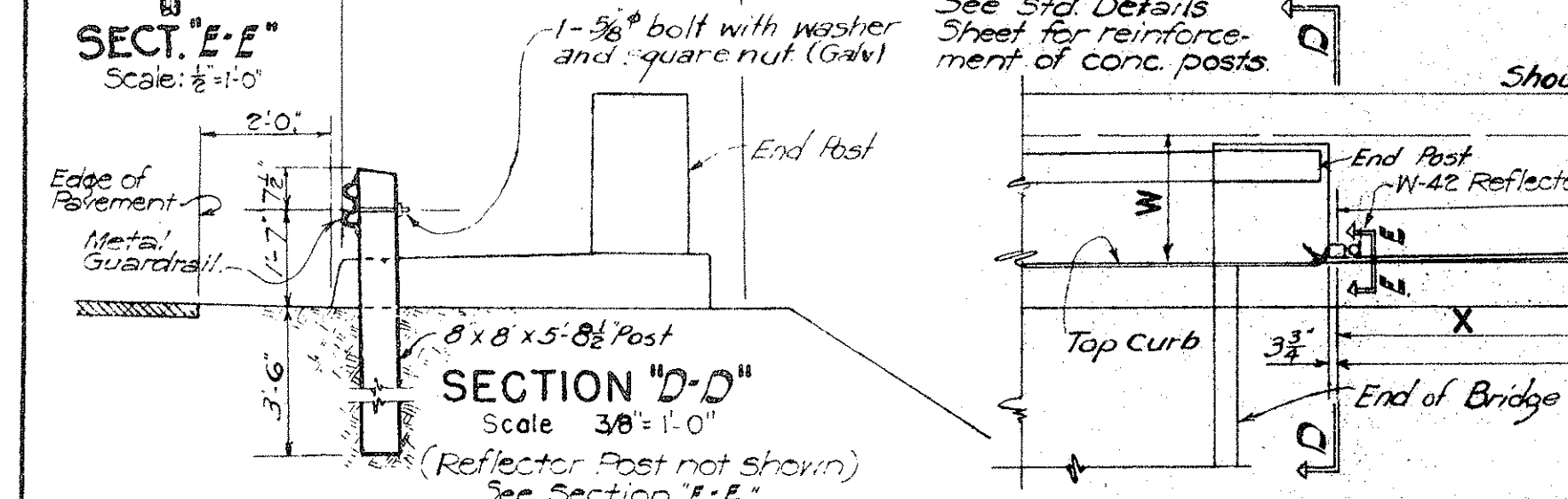
SECTION "Z-Z" Scale: 3/4"=1'-0"



SECTION "X-X" DRAINAGE DETAIL Scale: 1"=1'-0"



SECTION "Y-Y" Scale: 1"=1'-0"



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

GENERAL NOTES

CONCRETE: Class of concrete to be used in different parts of the structure are as noted on the plans.

REINFORCING STEEL: All reinforcing steel shall be Billet Steel Bars A.S.T.M. A15 intermediate grade.

Steel shall be made by the open-hearth process. Deformations shall conform to A.S.T.M. A305.

Splicing of reinforcing other than in main deck slab, girder and frame bars shall be done as shown in above sketch except where shown otherwise. Splices are to be staggered. Splices in main girder and frame bars are permitted only in bars exceeding 60'-0" in length at points to be indicated by the Engineer. These splices to be electrical, are welded according to detail and specifications. No allowance will be made in the quantities for extra weight of steel required for splices not shown on the plans.

Minimum spacing between parallel bars shall be 2 1/2 times the diameter of bars, but in no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate.

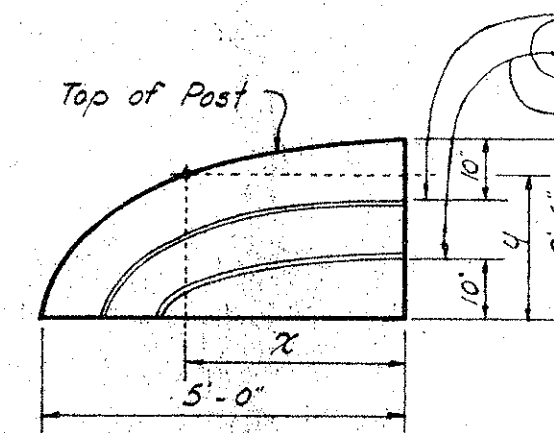
Minimum covering, measured from the surface of the concrete to the face of any reinforcing bar, shall be not less than 2 inches except in slabs where the minimum covering shall be 1 1/2 inch. In the footings of abutments and retaining walls and in piers the minimum covering shall be 3 inches. In work exposed to the action of sea water the minimum covering shall be 4 inches except in precast concrete piles where a minimum of 3" may be used.

All dimensions relating to reinforcing are to centers of bars unless otherwise noted.

CONSTRUCTION JOINTS: All construction joints to have surface roughened and 1:2 cement grout applied immediately before the second pour. Construction joints to be located at places indicated in the plans. See Sec. 46.3.F(3) of the "Standard Specifications."

ELLIPSE COORDINATES

Top of Post	X	0	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	4'-10"	5'-0"
	Y	0	2'-6"	2'-5 1/2"	2'-4 1/2"	2'-3 1/2"	2'-2"	2'-0"	1'-9 1/2"	1'-6"	1'-3 1/2"	1'-0"
Top Line of Upper Groove	X	0	6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	4'-10"
	Y	0	1'-8"	1'-7 1/2"	1'-7 1/2"	1'-6 1/2"	1'-5 1/2"	1'-4"	1'-1 1/2"	1'-0 1/2"	10 1/2"	8 1/2"
Bot. Line of Lower Groove	X	0	6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	4'-10"
	Y	0	10"	9 1/2"	9 1/2"	8 1/2"	8"	6 1/2"	5 1/2"	4 1/2"	3 1/2"	2 1/2"

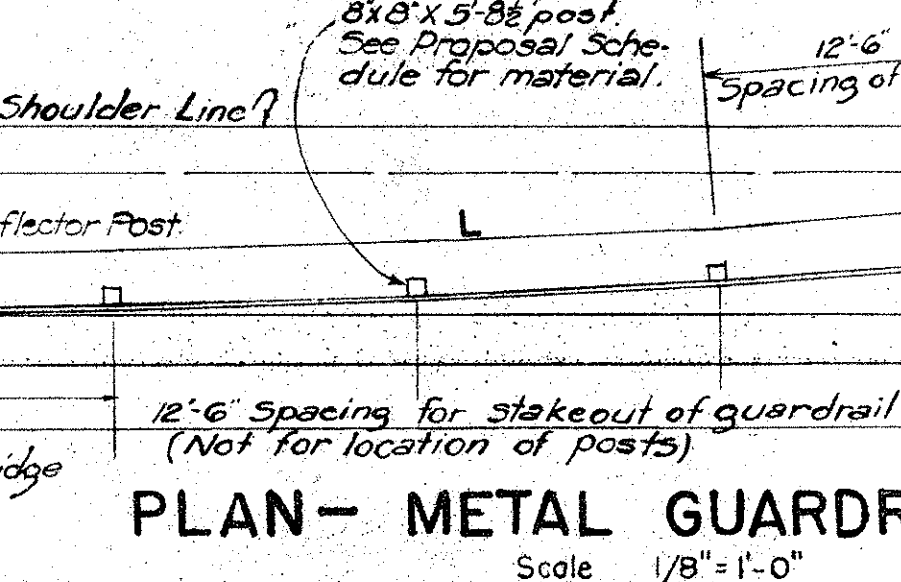


ELLIPTICAL CURVE AT END POST

GUARDRAIL OFFSET

X	W=3'	W=4'	W=5'	W=6'	W=7'	W=8'
12.5	0.19	0.16	0.14	0.12	0.09	0.08
25.0	0.75	0.64	0.55	0.49	0.35	0.32
37.5	1.69	1.44	1.25	1.10	0.78	0.72
50.0	3.00	2.56	2.22	1.96	1.36	1.28
62.5	4.00	3.47	3.06	2.76	2.00	1.88
75.0	4.41	3.84	3.41	3.11	2.08	1.92
87.5	4.75	4.16	3.75	3.45	2.32	2.16
100.0	5.00	4.41	4.00	3.70	2.56	2.40
112.5	5.12	4.59	4.18	3.88	2.72	2.56
125.0	5.20	4.68	4.28	3.98	2.80	2.64

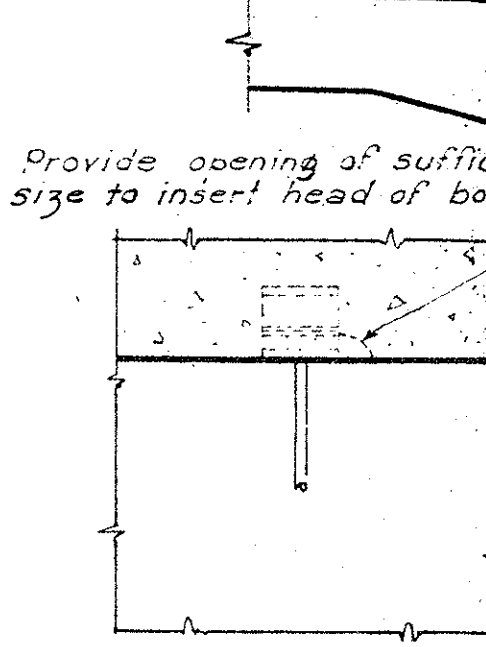
W = Guardrail flare
X = Distance from post at bridge to offset points.
Y = Guardrail flare offset



PLAN - METAL GUARDRAIL FLARE Scale: 1/8"=1'-0"

LAP DETAIL

(In columns and walls lap bars 32 Dia.)

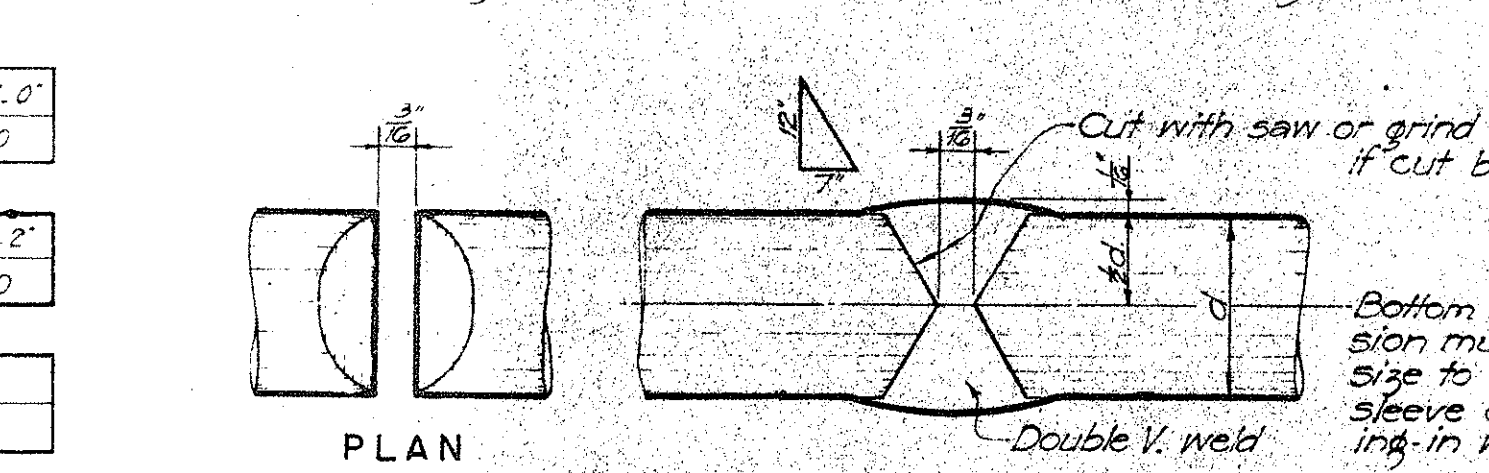


SECTION "G-G" Scale: 3/4"=1'-0"

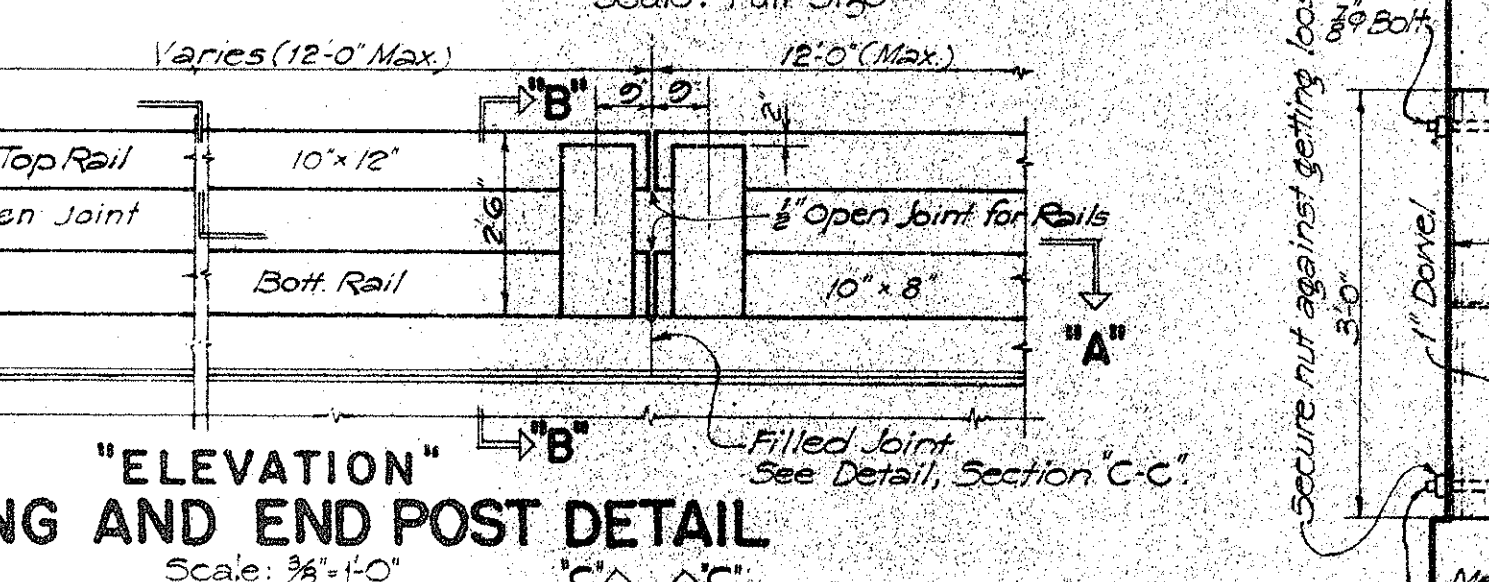
JOINT FILLER: Joint filler when called for in plans, shall be incidental to concrete and will not be paid for separately.

DETAIL OF PIPE HANGERS AND INSERTS

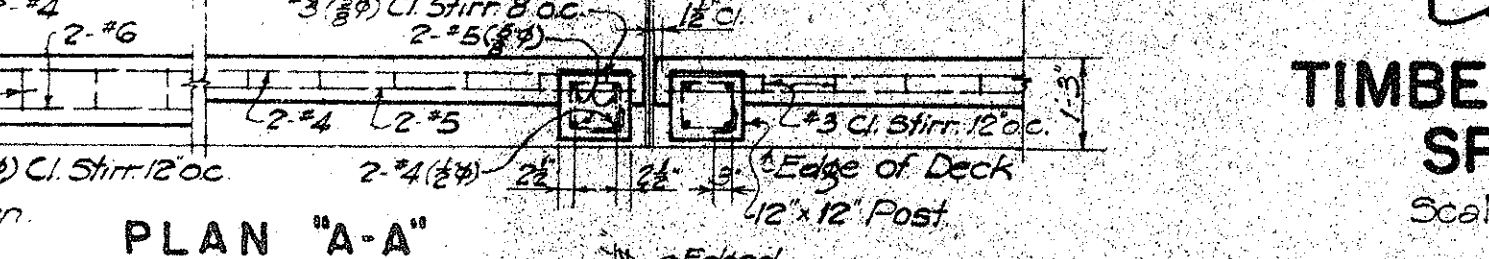
NOTE: Inserts, bolts, plates, nuts & washers to be Bronze conforming to A.S.T.M. Designation B22 and shall be Class 'D' grade.



REINFORCING BAR SPLICE Scale: Full Size

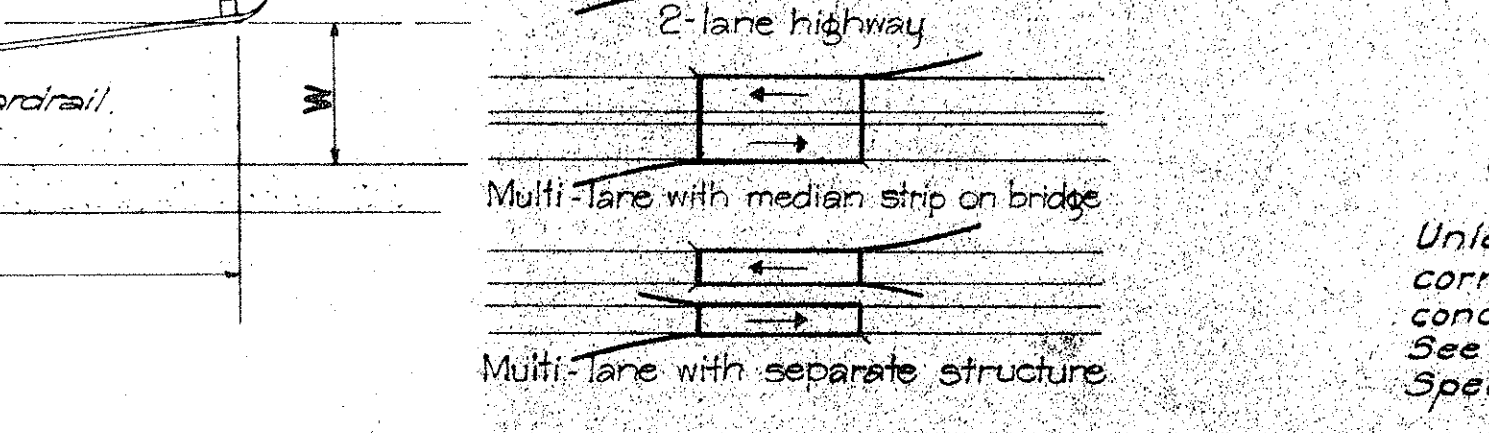


"ELEVATION" RAILING AND END POST DETAIL Scale: 3/8"=1'-0"



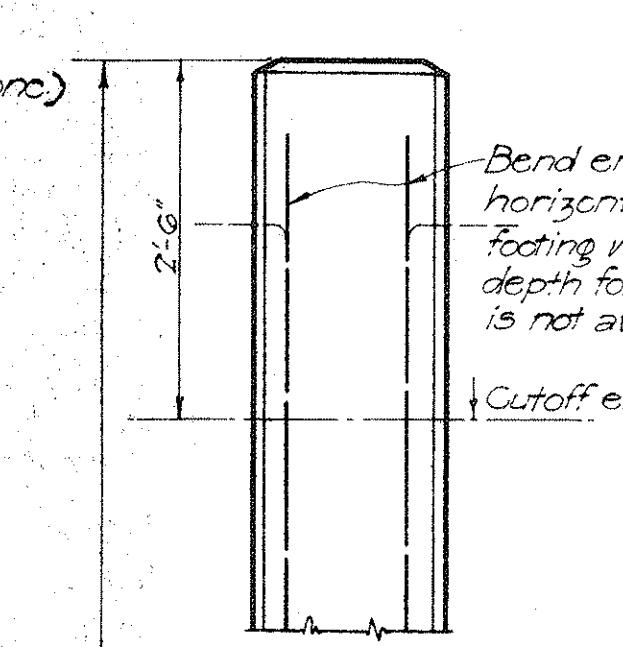
PLAN "A-A" Scale: 3/8"=1'-0"

TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.



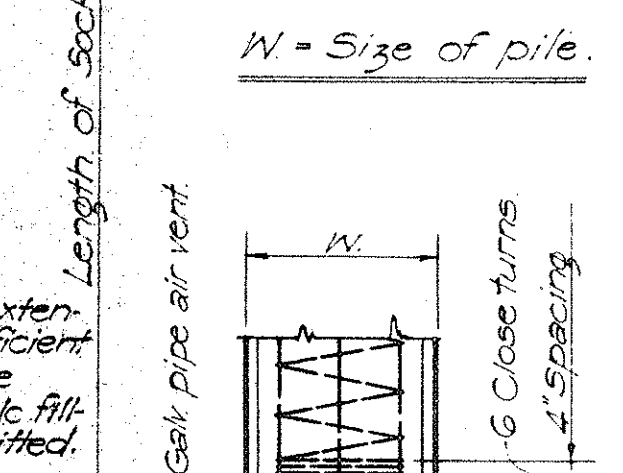
SECTION "C-C" Scale: 3/8"=1'-0"

CONSTRUCTION JOINT, WATERPROOFING AND WEEPHOLES.

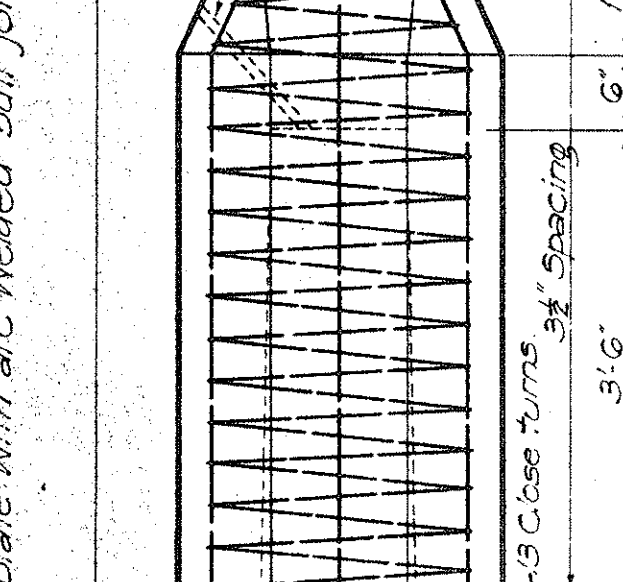


PILE CUTOFF Scale: 3/4"=1'-0"

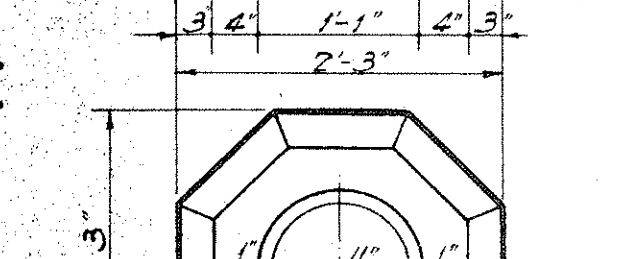
NOTE: Inserts, bolts, plates, nuts & washers to be Bronze conforming to A.S.T.M. Designation B22 and shall be Class 'D' grade.



REINFORCING BAR SPLICE Scale: Full Size

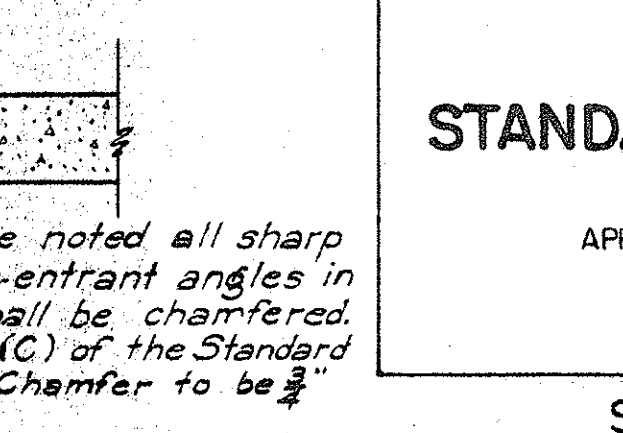


"ELEVATION" RAILING AND END POST DETAIL Scale: 3/8"=1'-0"



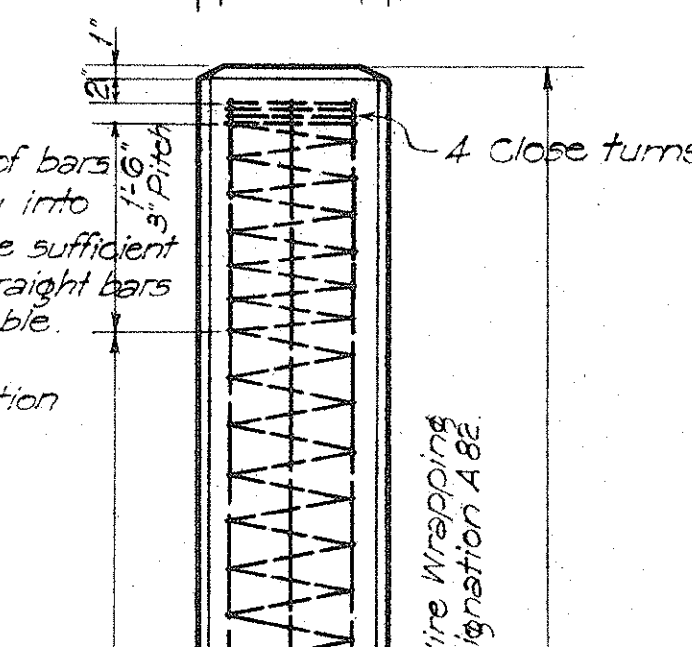
PLAN "A-A" Scale: 3/8"=1'-0"

TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.



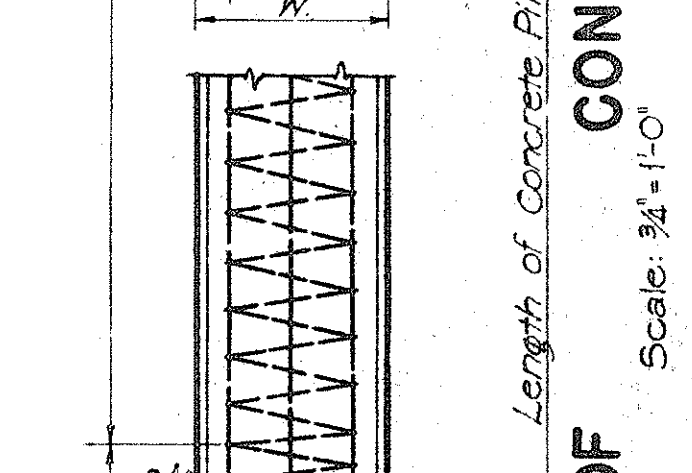
SECTION "C-C" Scale: 3/8"=1'-0"

CONCRETE PILE

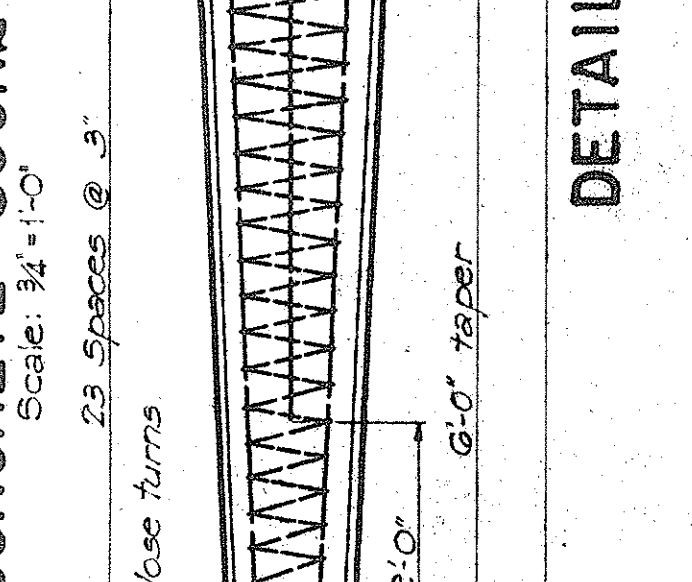


PILE CUTOFF Scale: 3/4"=1'-0"

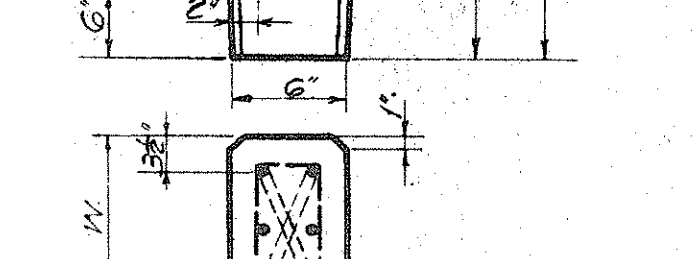
NOTE: Inserts, bolts, plates, nuts & washers to be Bronze conforming to A.S.T.M. Designation B22 and shall be Class 'D' grade.



REINFORCING BAR SPLICE Scale: Full Size

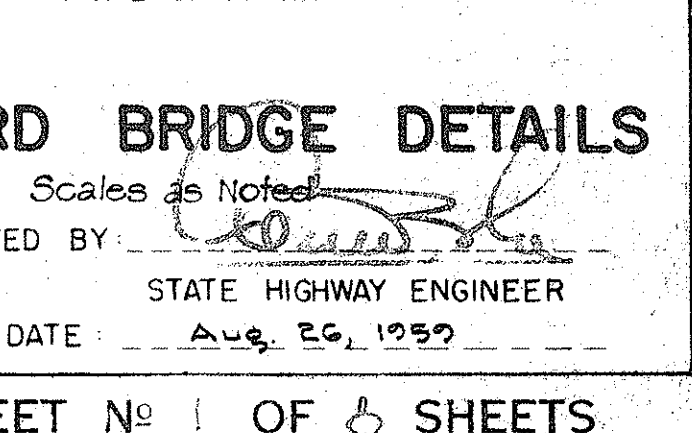


"ELEVATION" RAILING AND END POST DETAIL Scale: 3/8"=1'-0"



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

TOP RAIL - Bottom forms for top rails shall be kept in place a minimum of 14 days from date of pour.



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

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD BRIDGE DETAILS

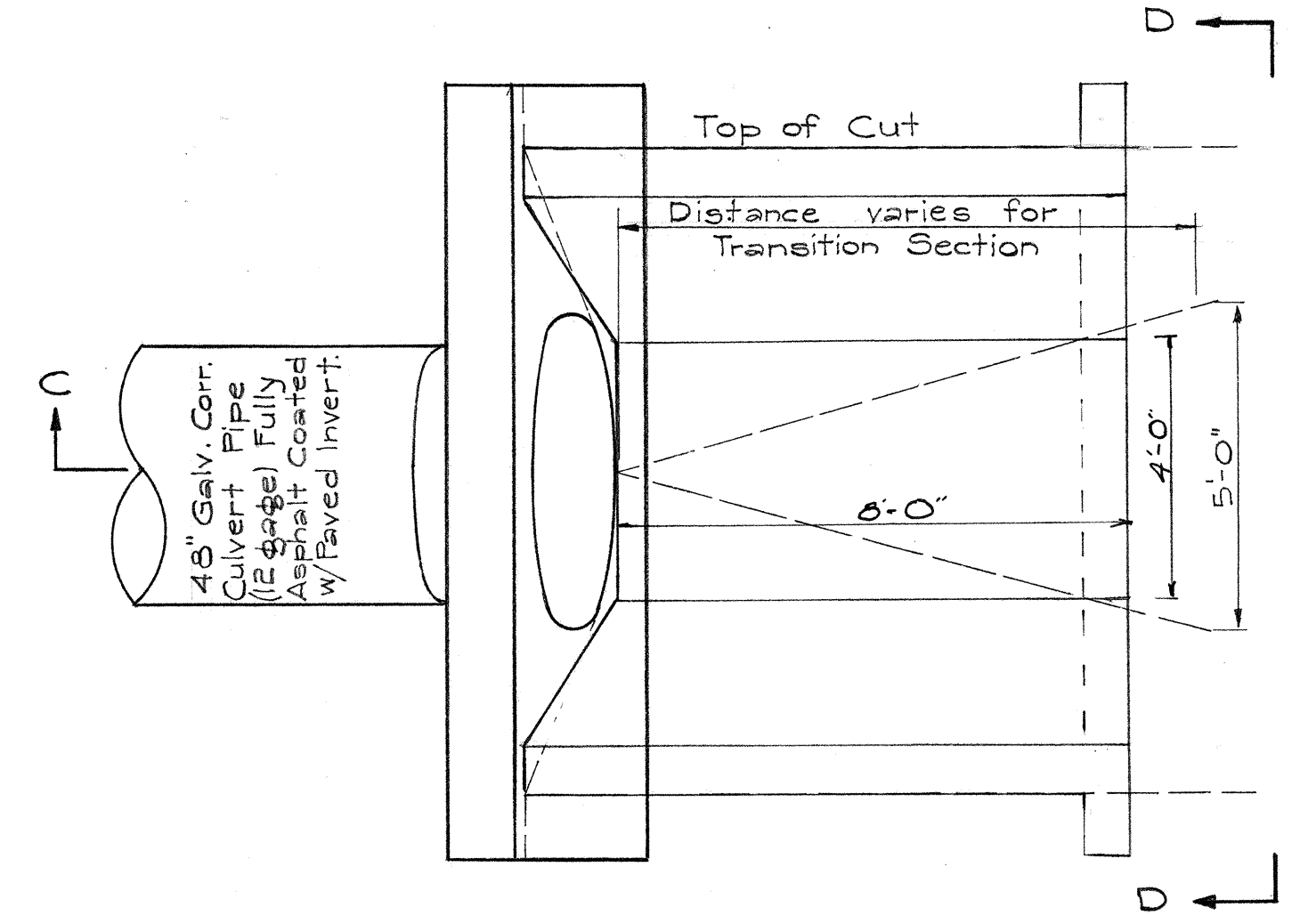
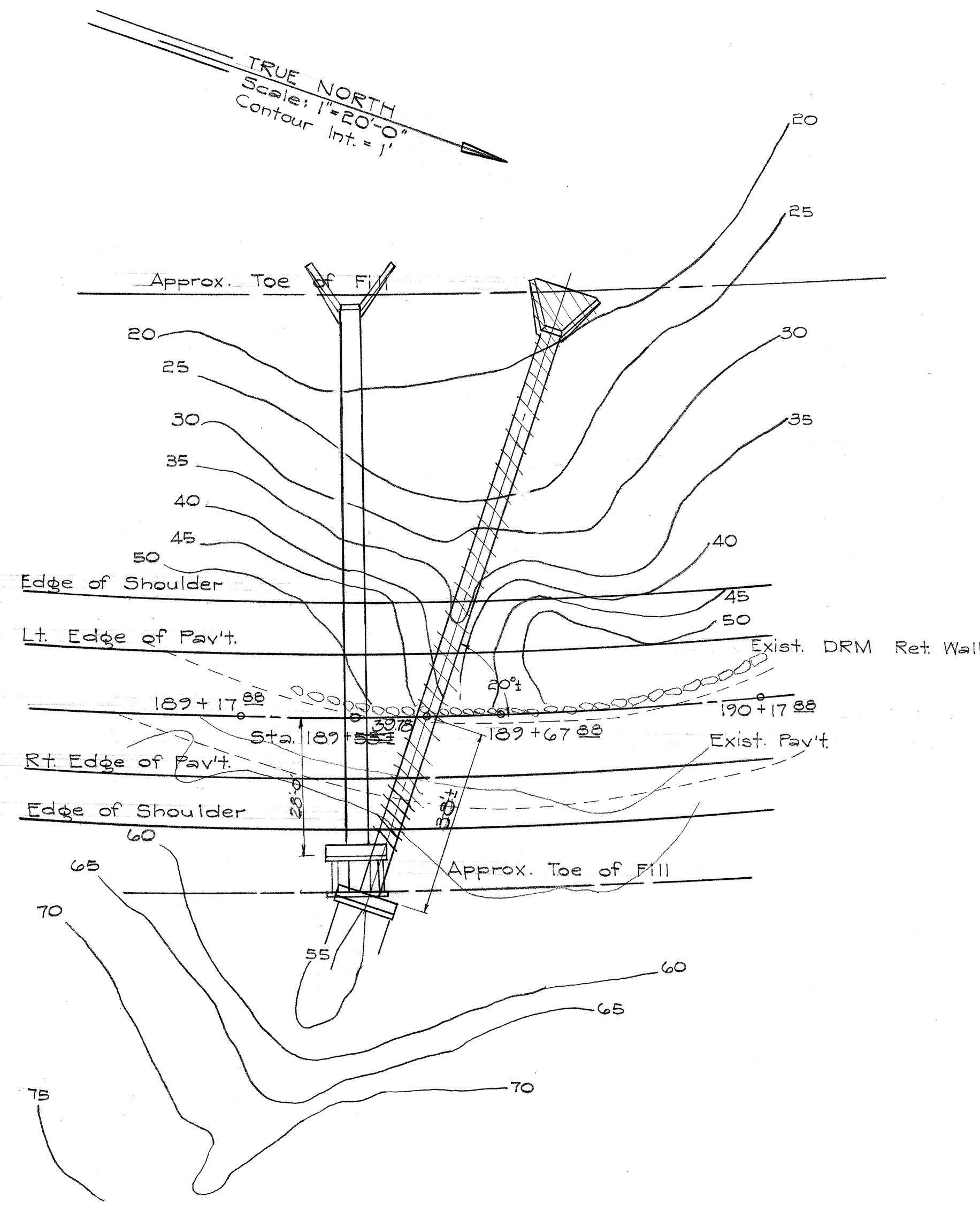
Scales as Noted

APPROVED BY: [Signature]
STATE HIGHWAY ENGINEER

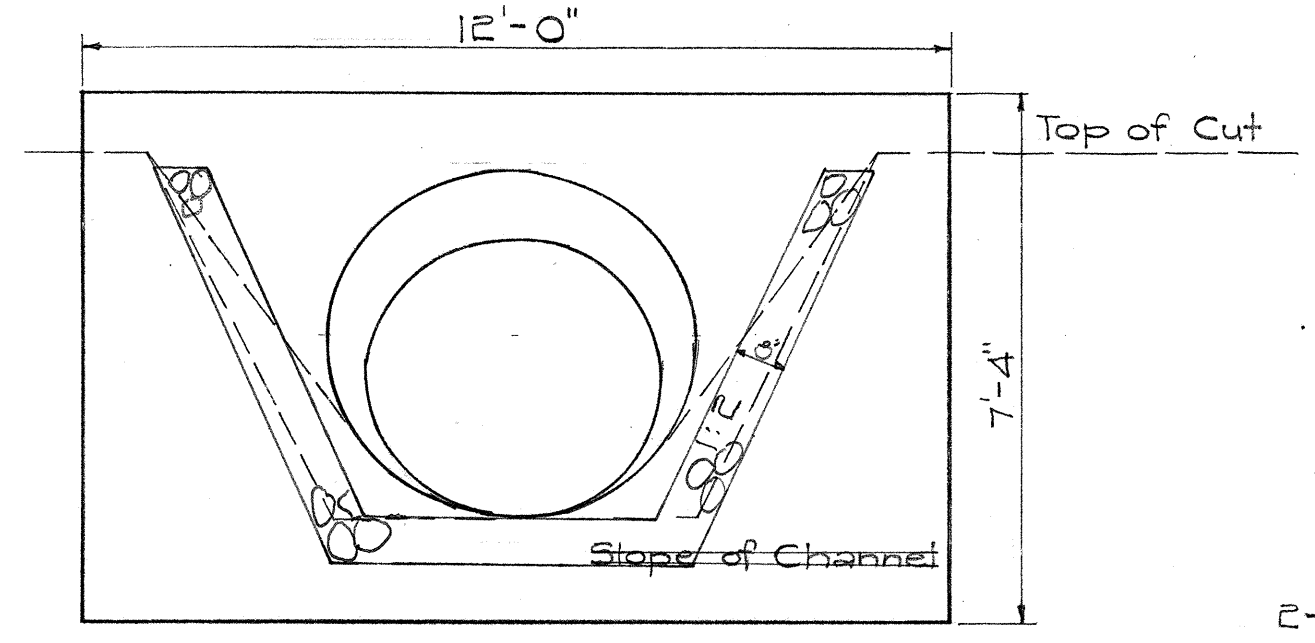
DATE: Aug. 26, 1959

SHEET No. 1 OF 6 SHEETS

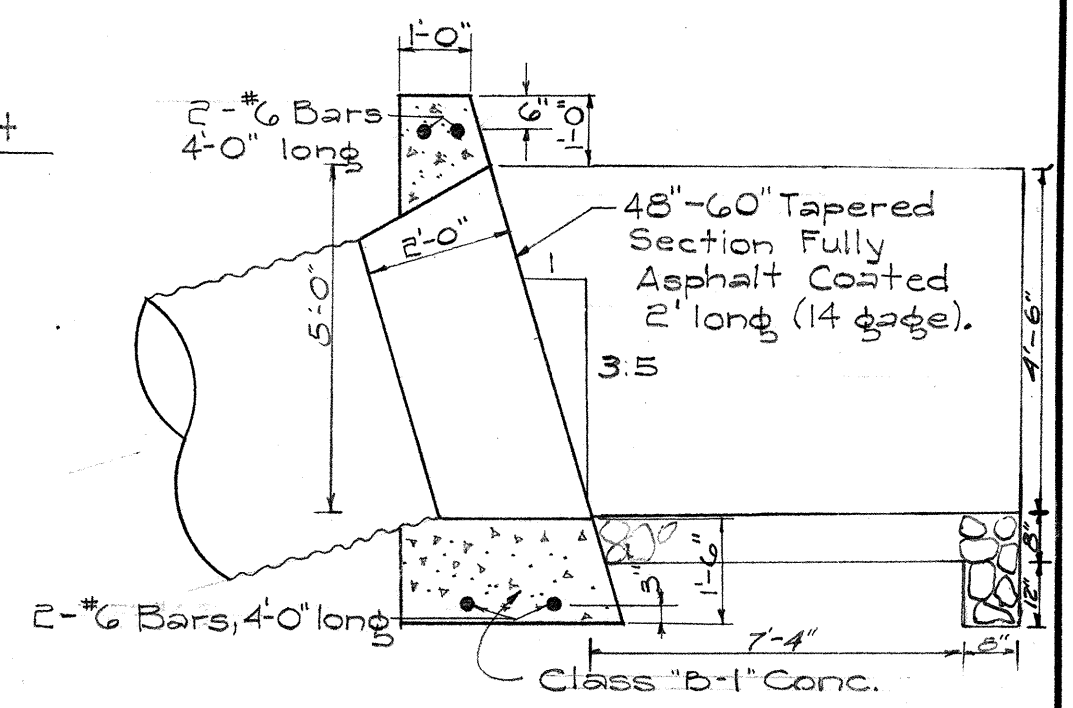
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F036-10	1959	17	50



PLAN

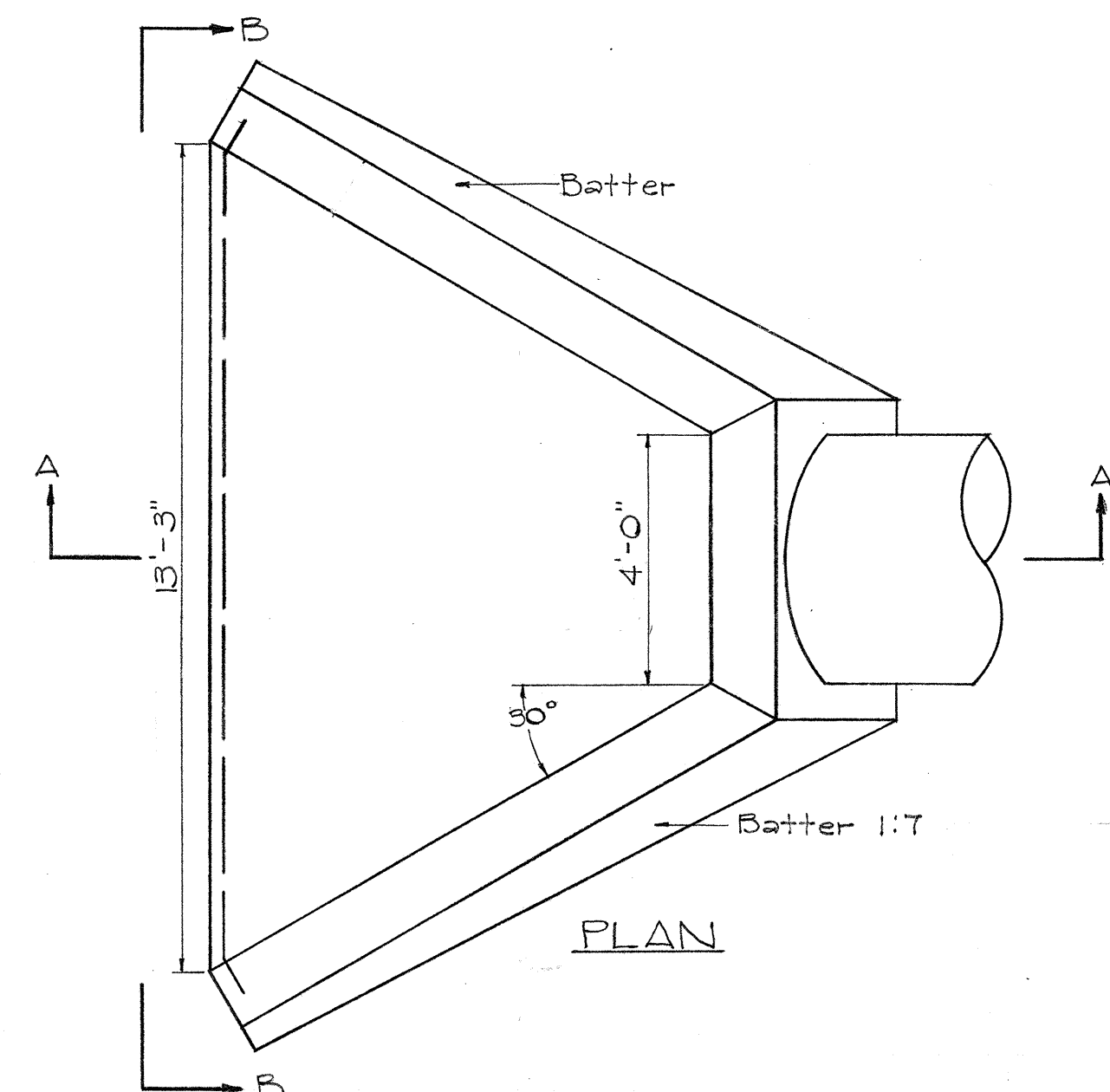


ELEVATION D-D

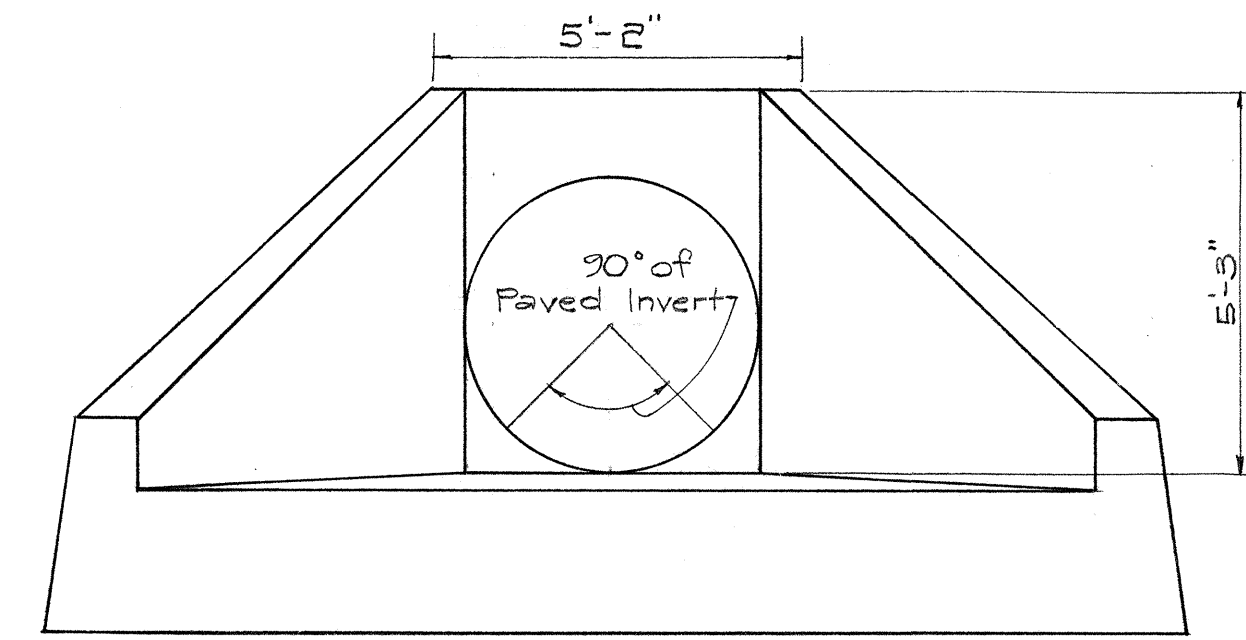


SECTION C-C

DETAIL OF INTAKE END
Scale: 3/8"=1'-0"

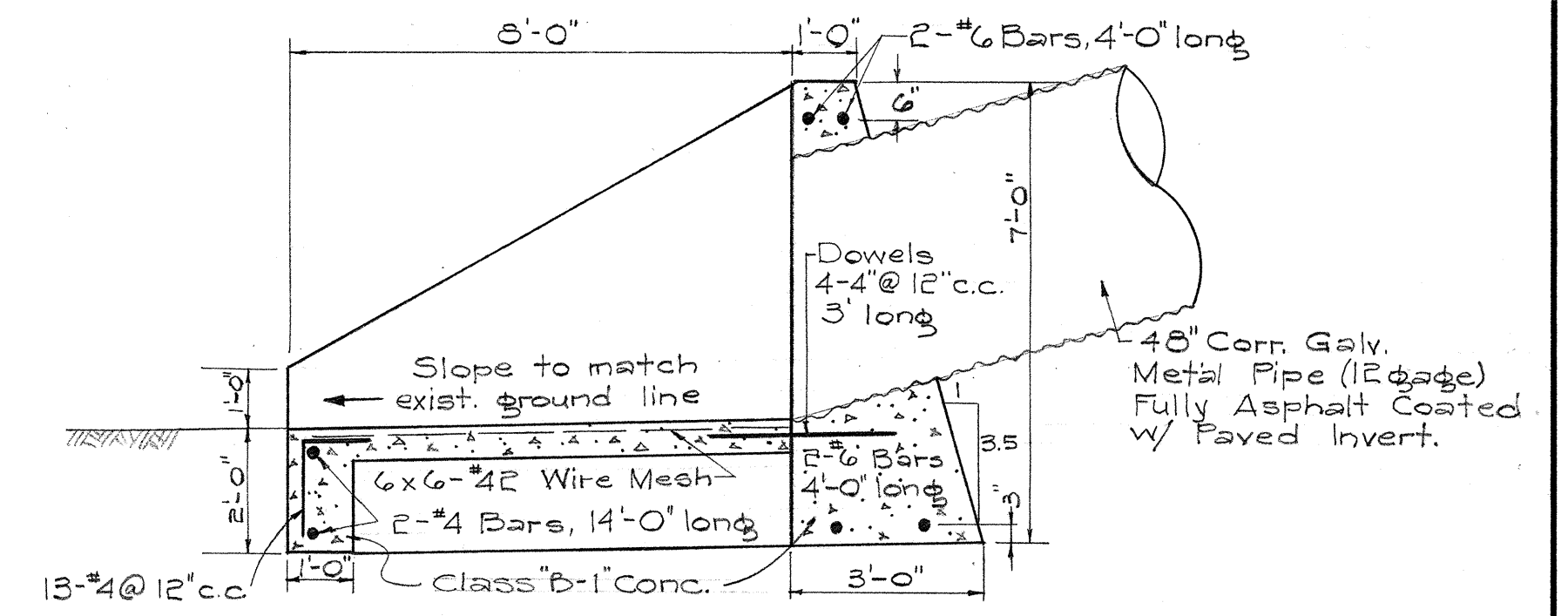


PLAN

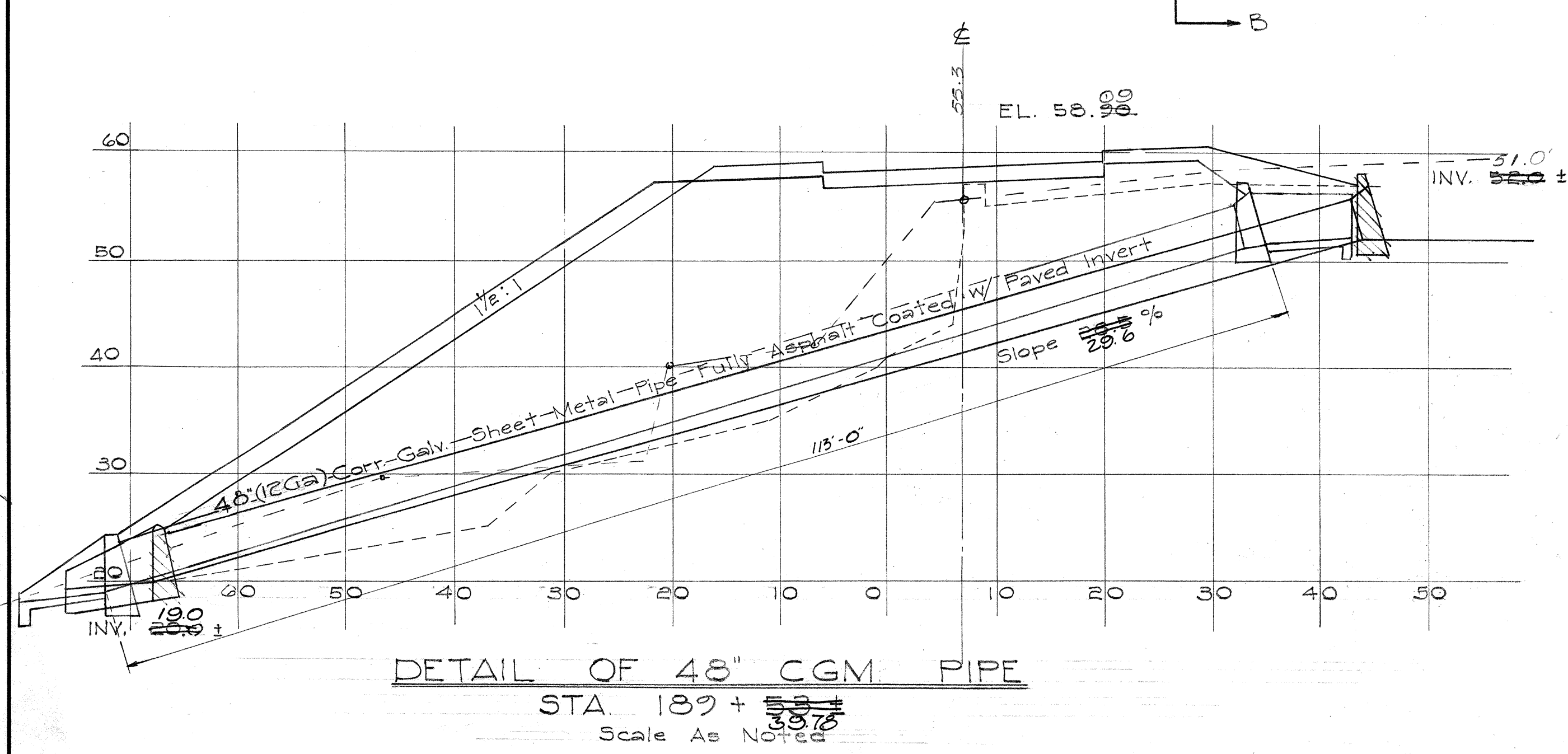


ELEVATION B-B

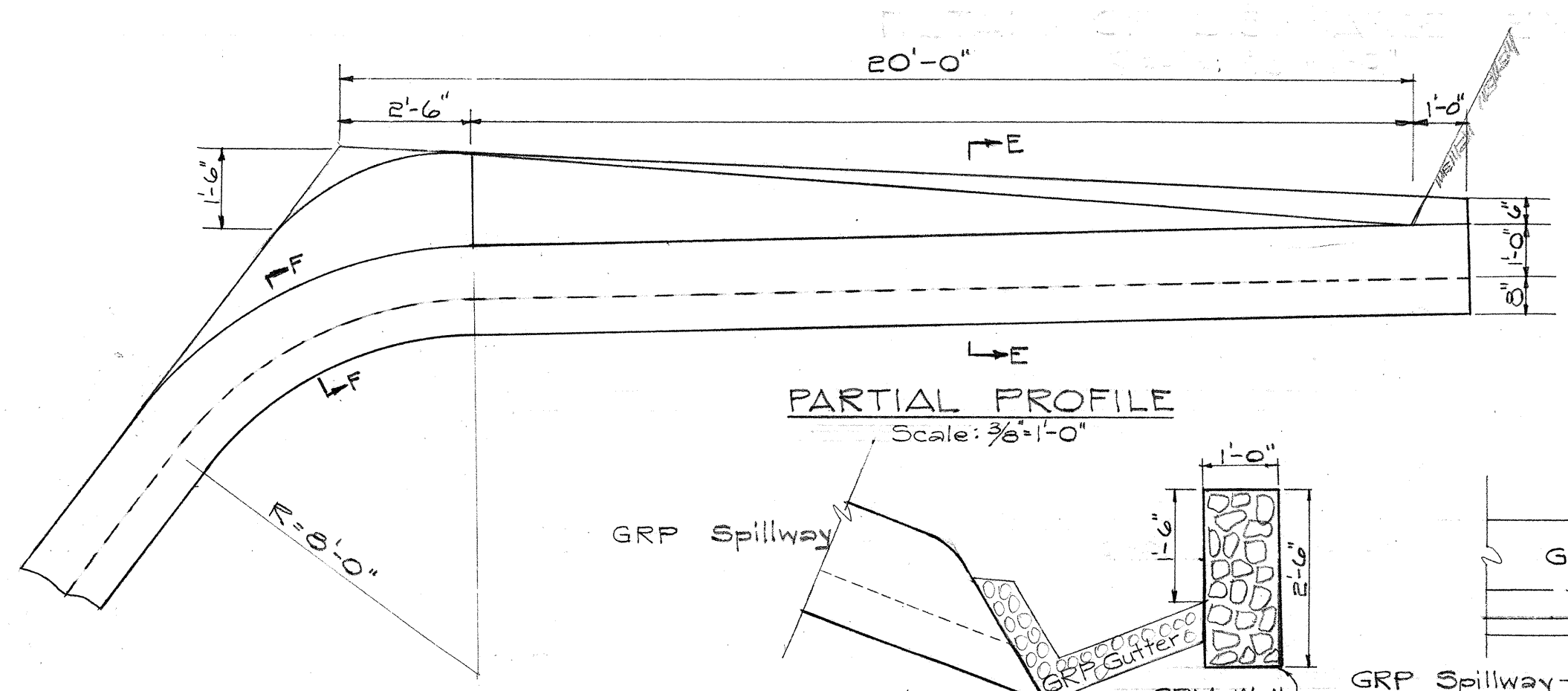
DETAIL OF DISCHARGE END
Scale: 3/8"=1'-0"



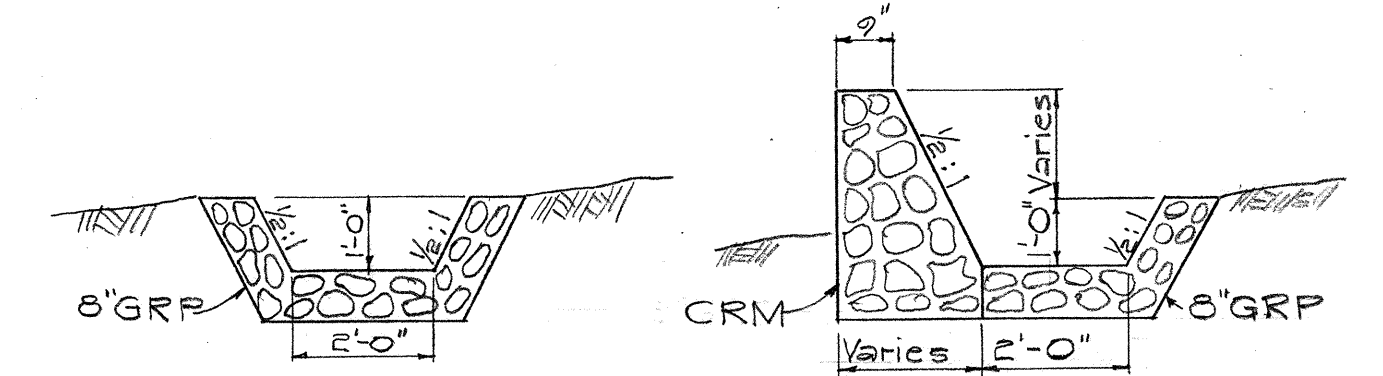
SECTION A-A



DETAIL OF 48" CGM PIPE
Scale As Noted



DETAIL OF GRP SPILLWAY
Scale As Noted



SECTION F-F

SECTION E-E

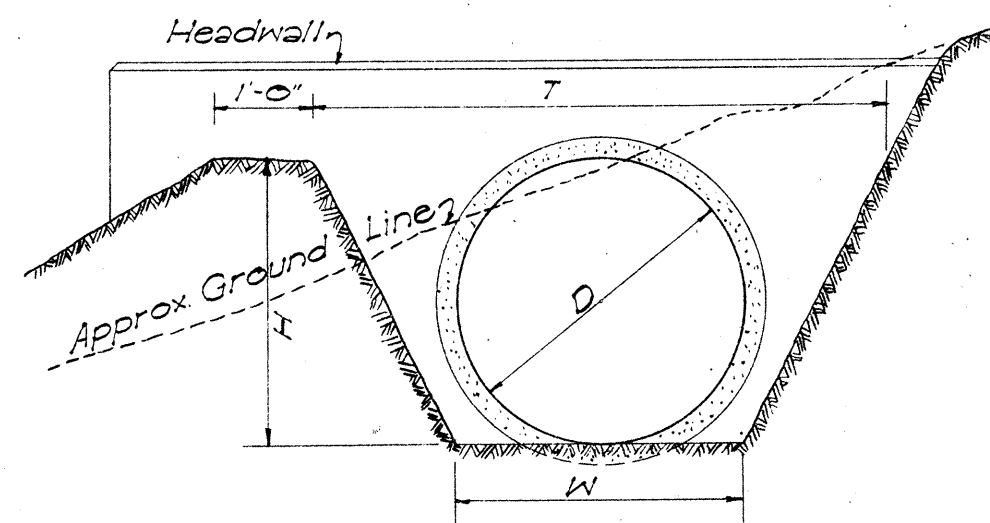
CONNECTION OF SPILLWAY TO GUTTER
Scale: 1/2"=1'-0"

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

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
DETAILS FOR
DRAINAGE
HANA BELT ROAD
PROJ. No. F036-1(1)
SCALE: AS NOTED
AUG. 1959

AUG. 1957

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'-6"	5'-0"	
36"	36"	3'-0"	6'-0"	



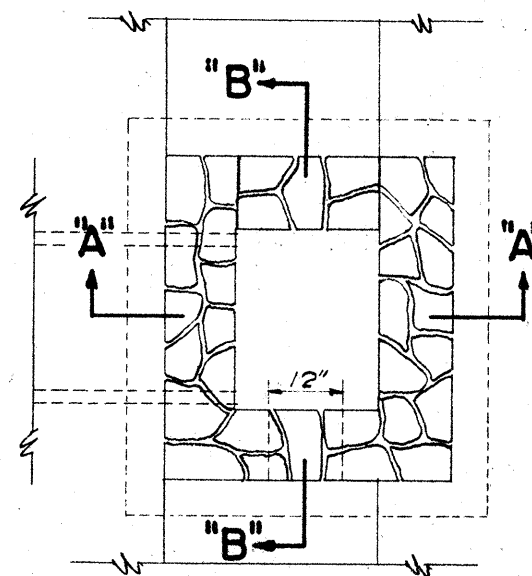
DETAIL OF OUTLET DITCH

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

DATA FOR MASONRY DROP INTAKE					Where Variables Equal
D	D	L=D+6"	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:

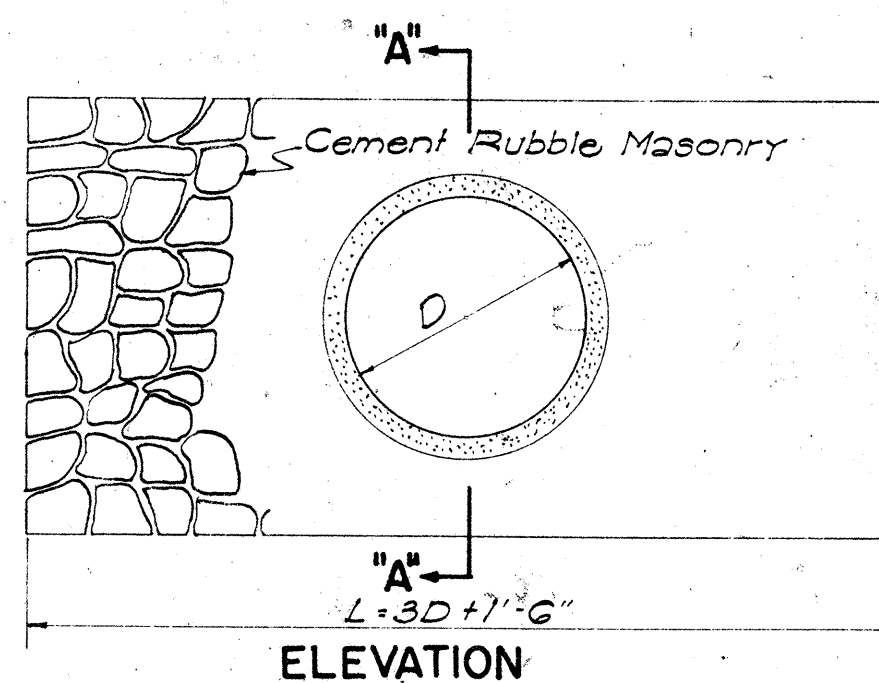
Dimension "X" is assumed as 2'-4" in figuring the above quantities.



DETAIL OF MASONRY DROP INTAKE

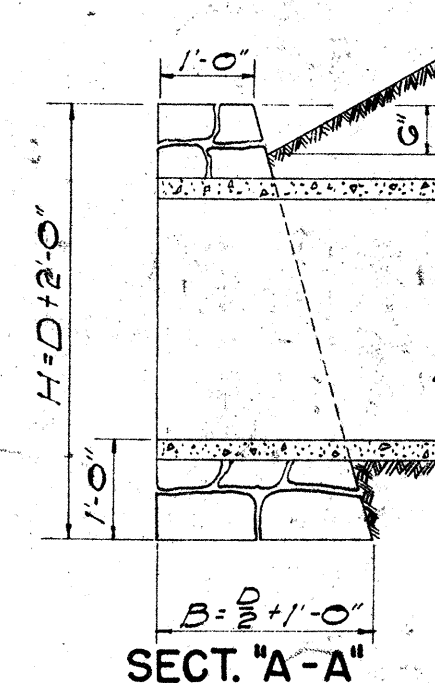
Scale: 3/8" = 1'-0"

DATA - MASONRY HEADWALL					Where Variables Equal
D	H	B	L	Cu. Yds.	
18"	3'-6"	1'-0"	6'-0"	0.85	0.23
24"	4'-0"	2'-0"	7'-6"	1.28	1.41
30"	4'-6"	2'-3"	9'-0"	1.83	2.00
36"	5'-0"	2'-6"	10'-6"	2.40	2.72

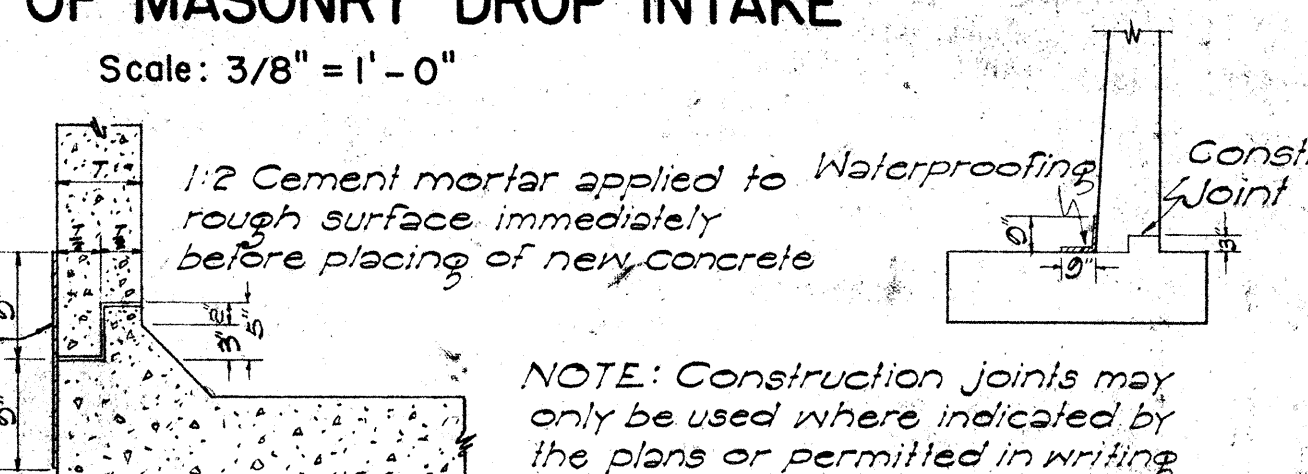


DETAIL OF MASONRY HEADWALL

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



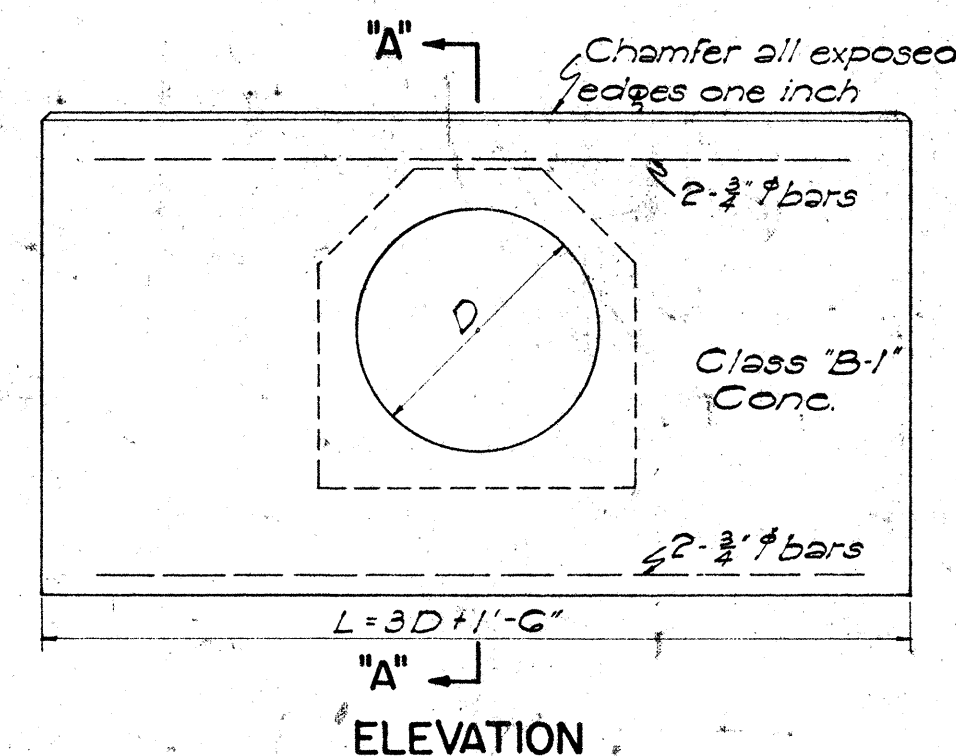
SECTION "A-A"



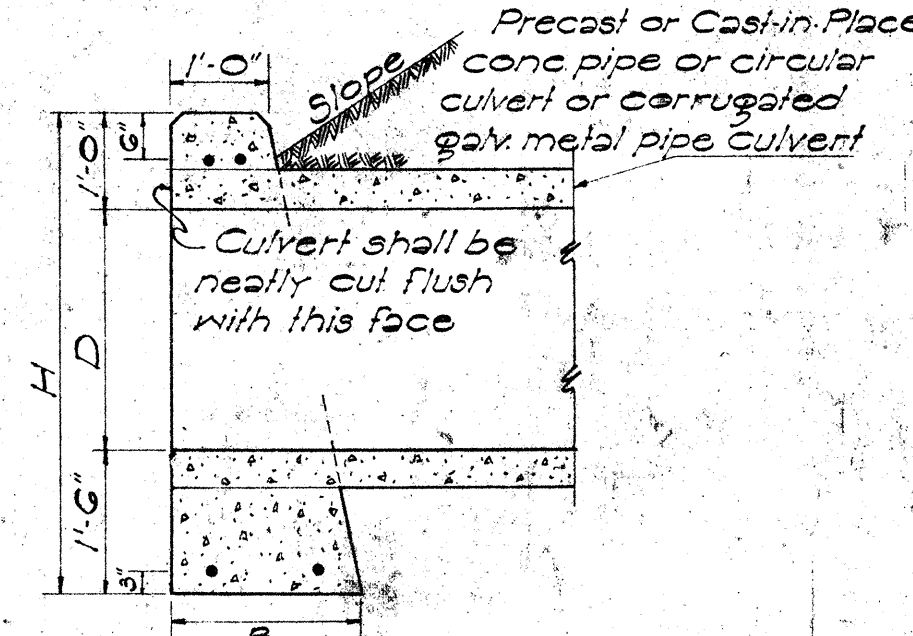
CONSTR. JOINT DETAILS

NOTE: Construction joints may only be used where indicated by the plans or permitted in writing by the Engineer.

Note: When subgrade is below top of jacket, it shall be fully compacted to this line and then re-excavated (Struc. etc.) to proper subgrade. This surface shall be rolled again.



ELEVATION

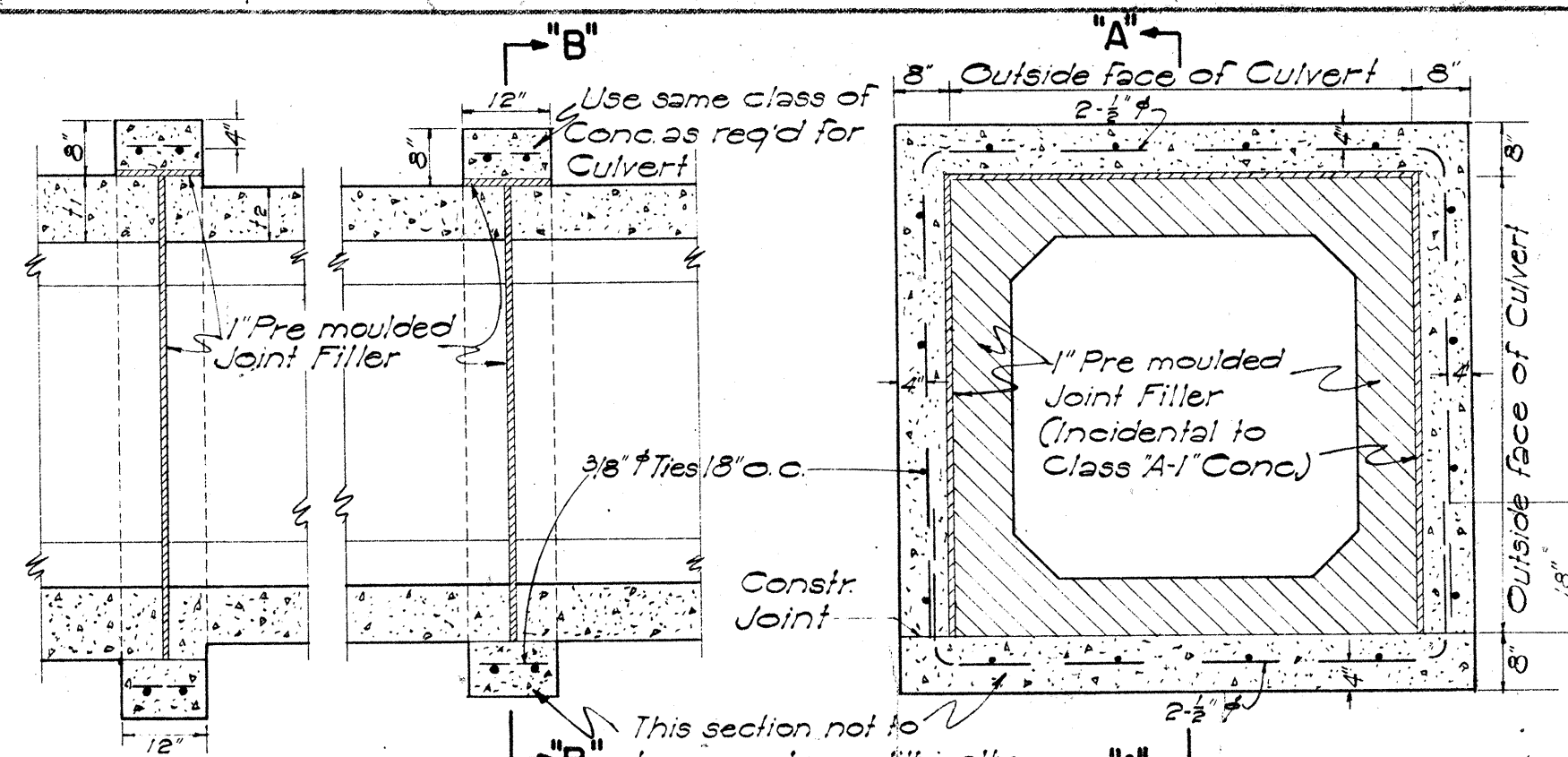


SECTION "A-A"

DATA FOR CONC. HEADWALL					Cast-in-Place Conc. Culvert	Conc. Pipe Culvert	Steel For One Headwall
D	B	L	H	Cu. Yds.	Cu. Yds.	No. of Bars	Length
18"	1'-0"	6'-0"	4'-0"	0.22	1.00	4	3'-0"
24"	1'-6"	7'-0"	4'-6"	1.28	1.38	4	3'-6"
30"	2'-0"	9'-0"	5'-0"	1.83	2.17	4	4'-0"
36"	2'-6"	10'-6"	5'-6"	2.40	2.74	4	4'-6"
42"	3'-0"	12'-0"	6'-0"	3.00	3.87	4	5'-0"
48"	3'-6"	13'-6"	6'-6"	3.60	4.66	4	5'-6"

DETAIL OF CONCRETE HEADWALL

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

SECTION "A-A" SECTION "B-B"
CONC. COLLAR FOR CONC. BOX CULVERT

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

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 - CONC. DROP INTAKE					Where Variables Equal
D	D	L=D+6"	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"
51"	42"	4'-9"	5.50		6'-6"
58"	48"	5'-4"	6.15		7'-0"

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

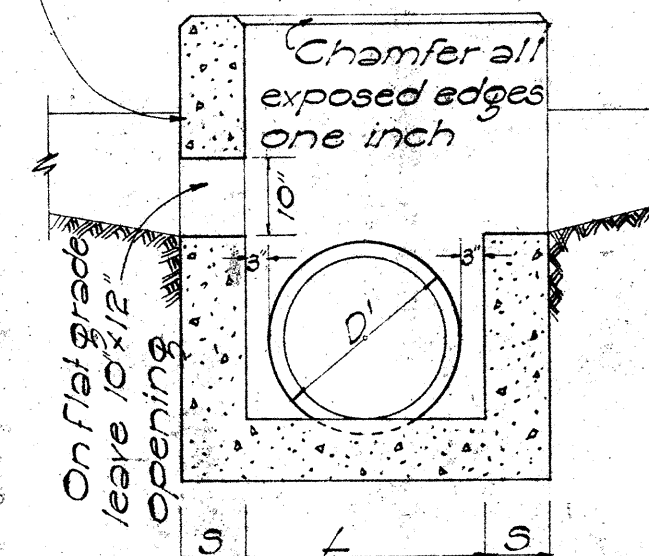
Where drainage comes from both sides over this wall to same elevation as shown for opposite wall.

Excavate recess in roadway excavation slope for inlet to dimensions and form designated by Engineer. This is "Unclassified" Excavation.

Top limits of structure excavation other than at bridges.

12" unless otherwise noted

Class "B-1" Conc.

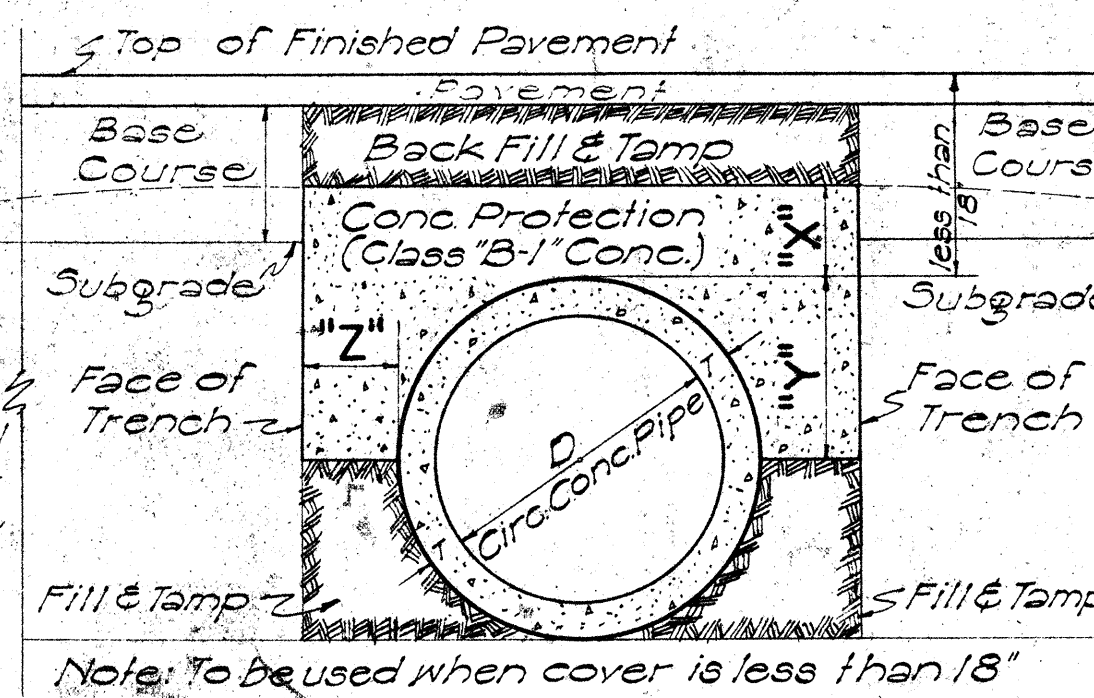


SECTION "B-B"

SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

Scale: 1/2" = 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		
8" " 30"D		
9" " 36"D		
10" " 42"D		
11" " 48"D		
12" " 54"D		

SECT. OF CULVERT WITH CONC. PROTECTION

Scale: 1" = 1'-0"

APPROVED:

DATE: AUG. 23, 1957

STATE HIGHWAY ENGINEER

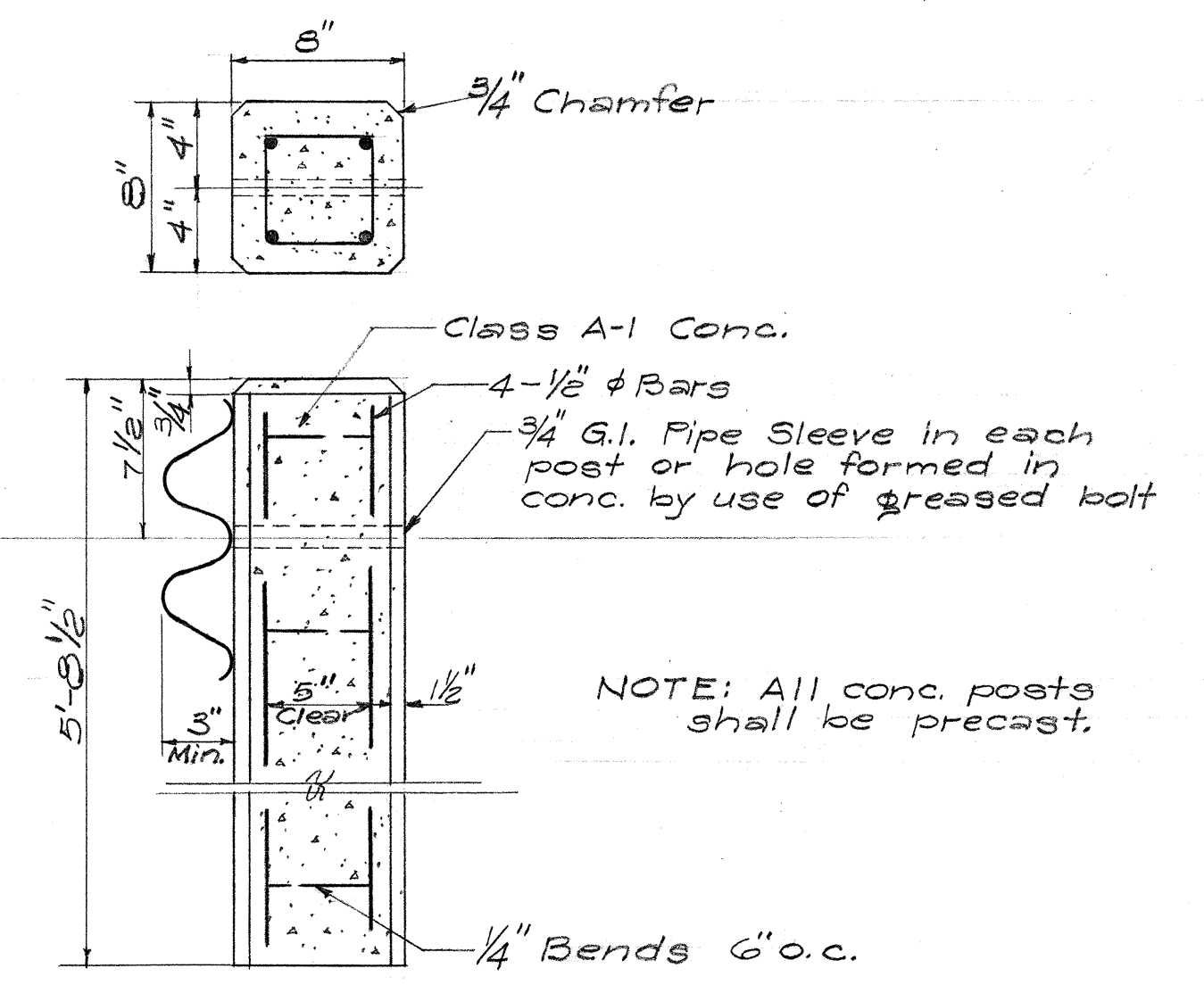
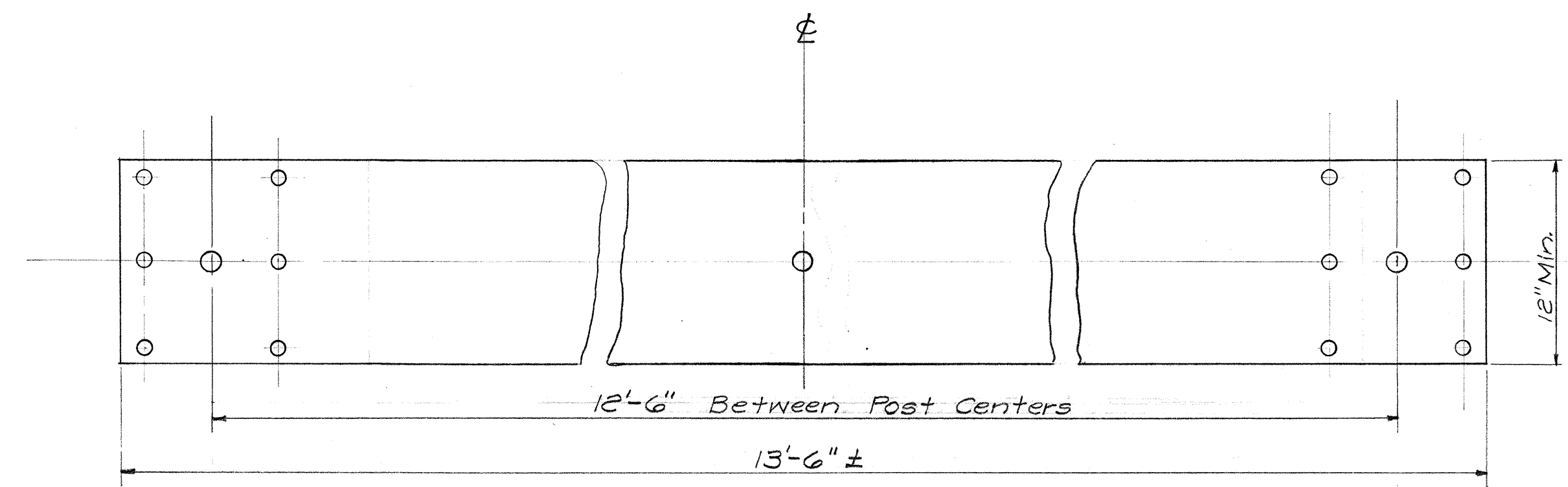
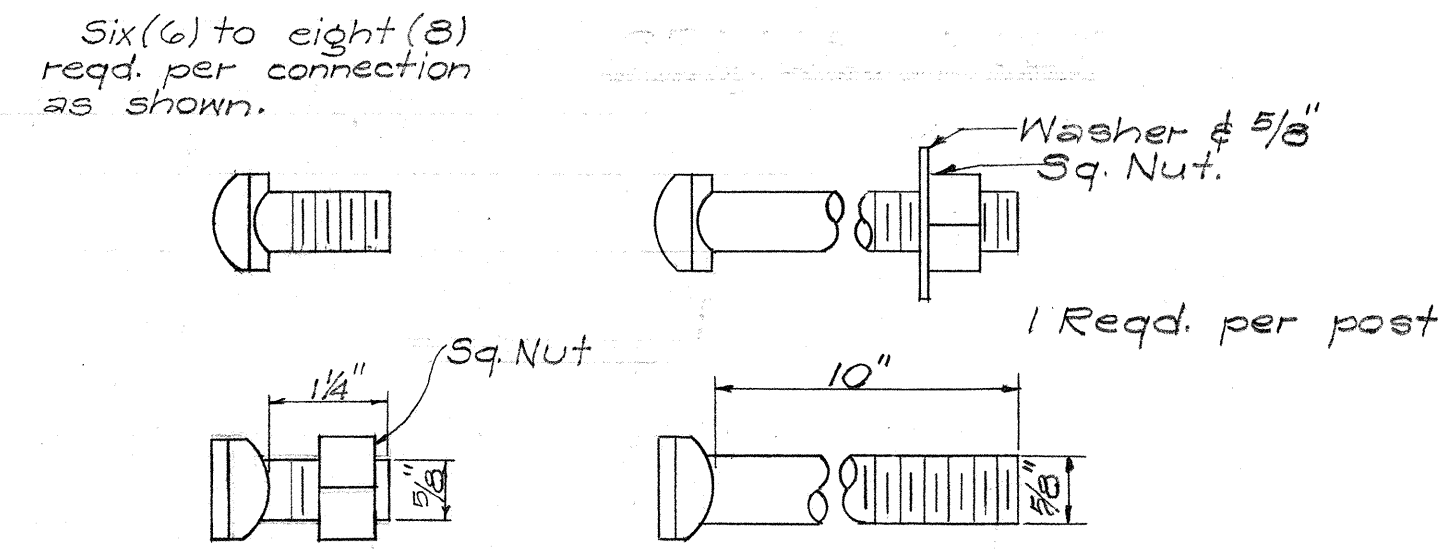
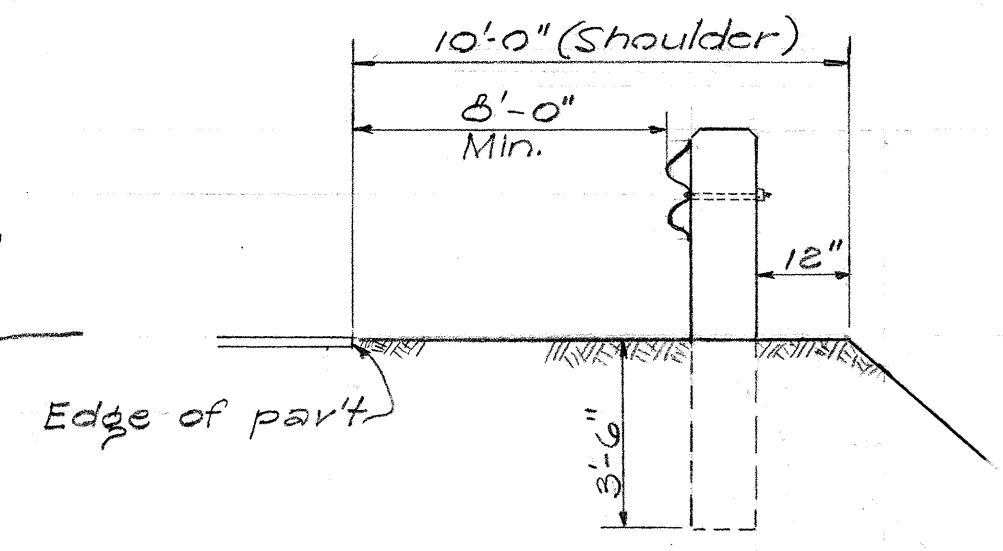
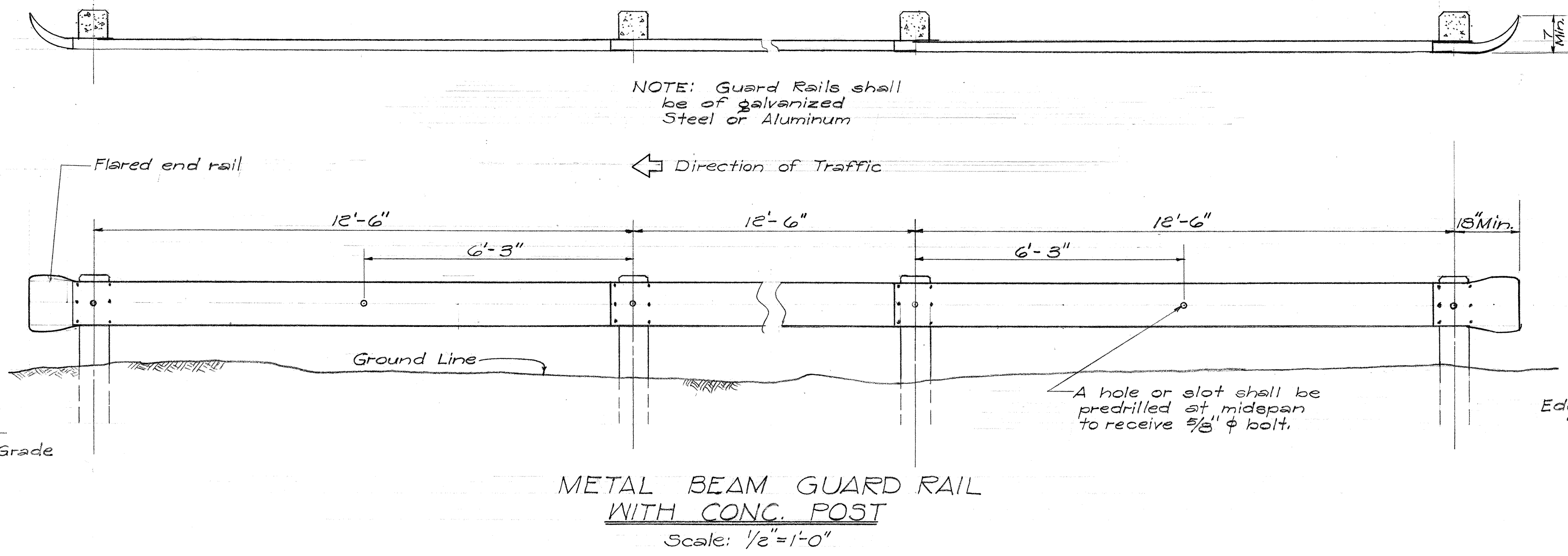
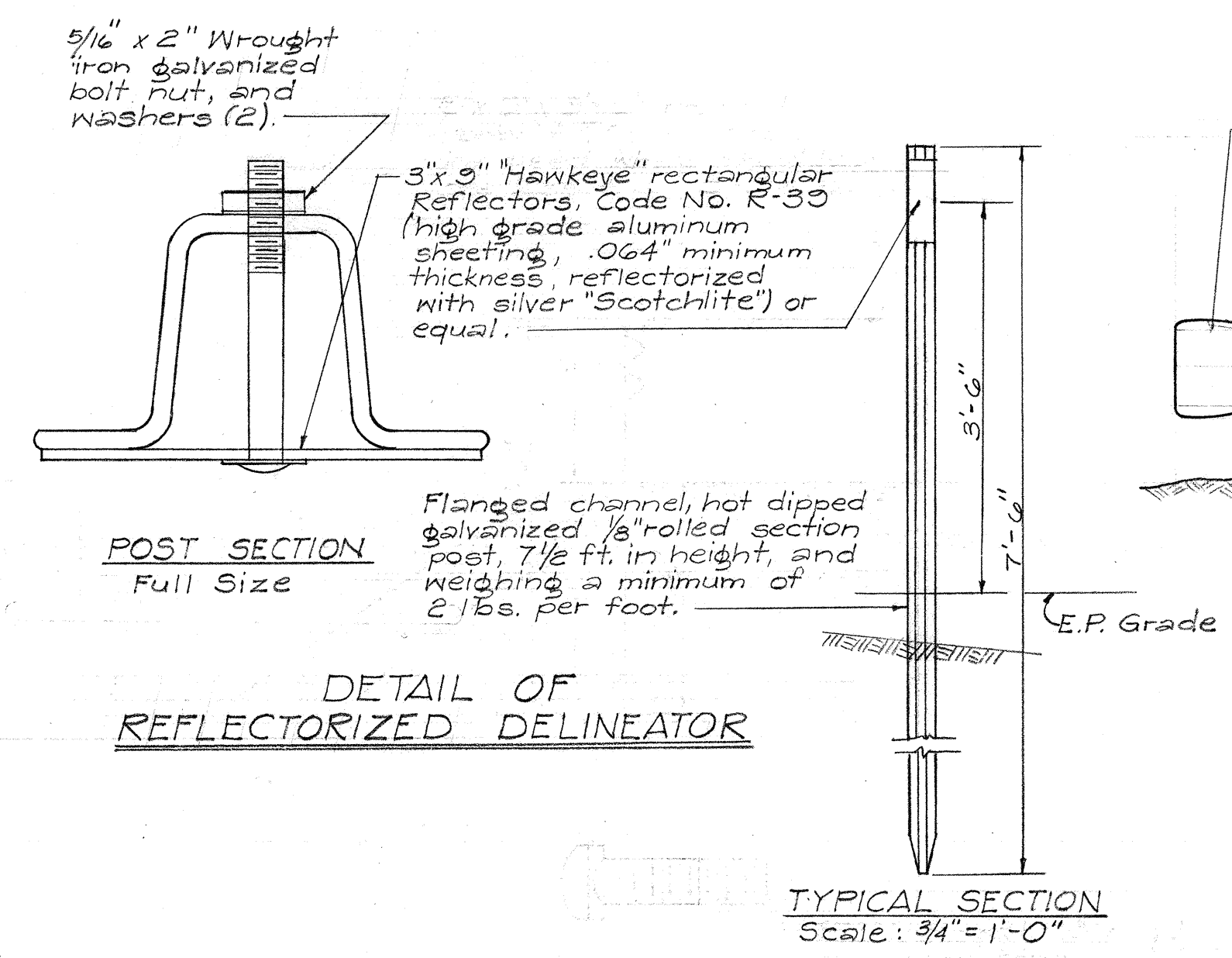
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS

DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED

SHEET No. 4 OF 6 SHEETS

NOTE: Reflectorized Delineators shall be spaced a maximum of 200 ft apart and the exact spacing shall be determined by the Engineer in the field

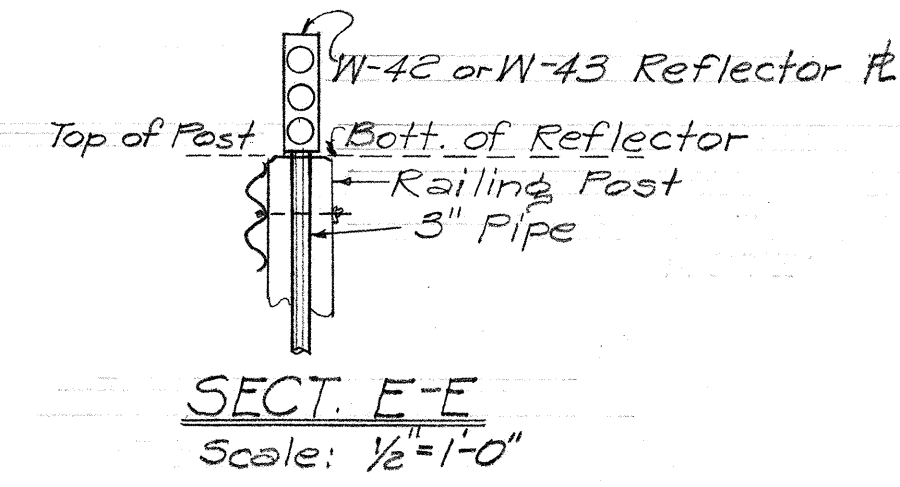
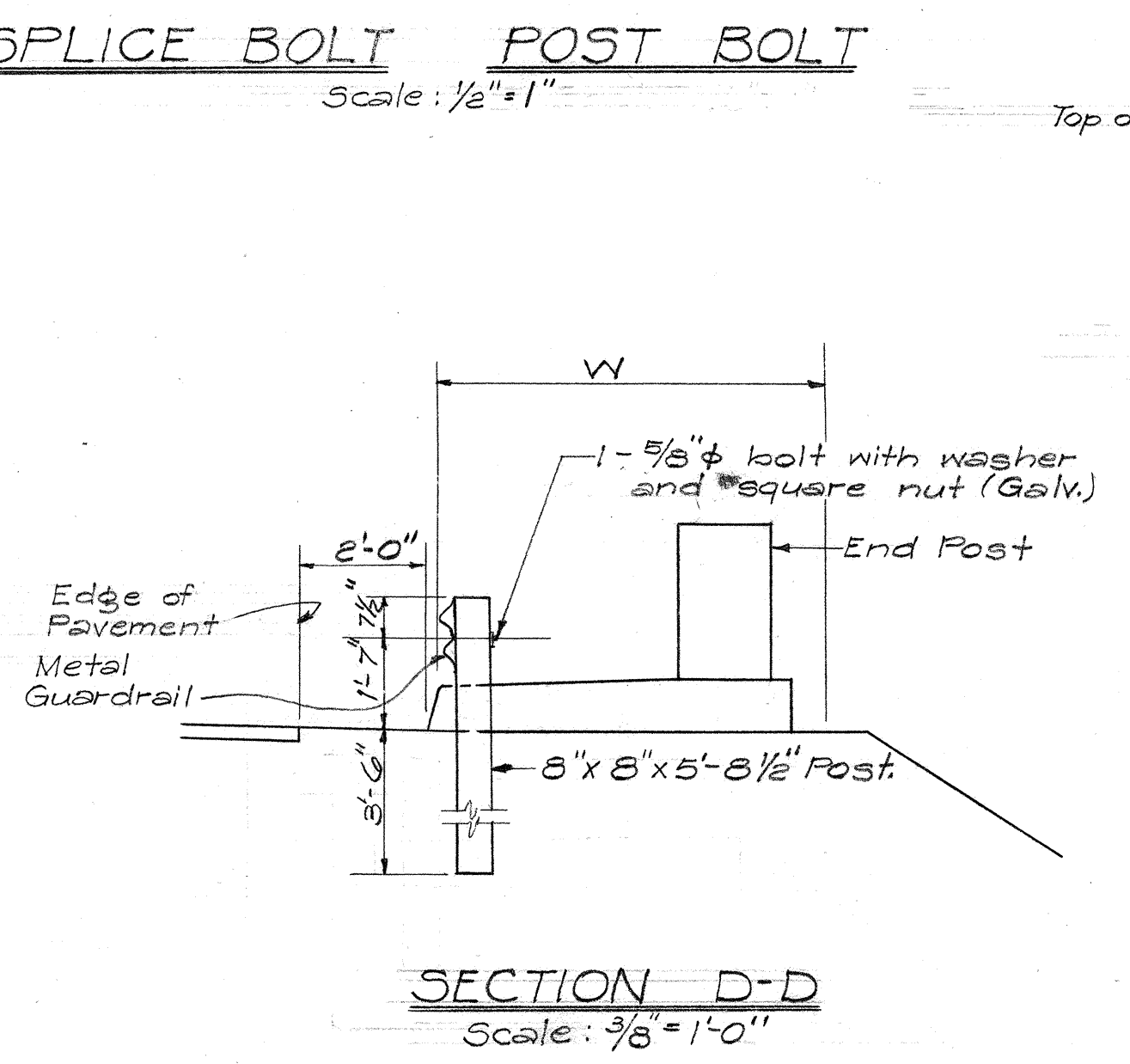


DETAIL OF CONC. POST
Scale: 1/8" = 1'

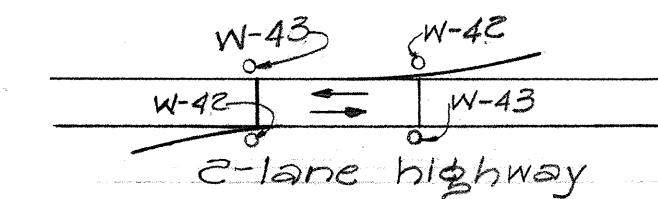
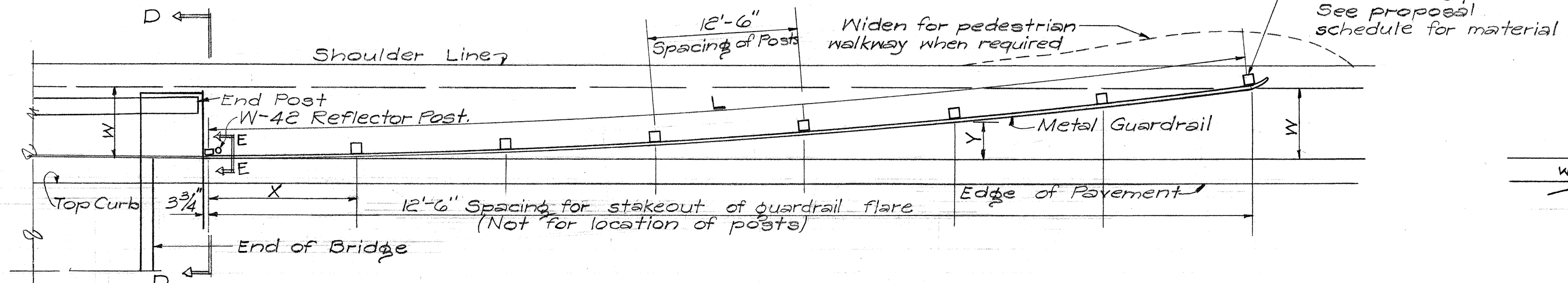
GUARDRAIL OFFSET

X	Y					
	W=3'	W=4'	W=5'	W=6'	W=7'	W=8'
12.5	0.19	0.16	0.14	0.12	0.09	0.08
25.0	0.75	0.64	0.55	0.49	0.37	0.35
37.5	1.69	1.44	1.25	1.10	0.78	0.72
50.0	3.00	2.56	2.25	1.96	1.38	1.28
62.5		4.00	3.47	3.06	2.16	2.00
75.0			5.00	4.41	3.11	2.88
87.5				6.00	4.23	3.92
100.0					5.23	5.12
112.5					7.00	6.48
125.0						8.00

W = Guardrail flare
X = Distance from post at bridge to offset points
Y = Guardrail flare offset

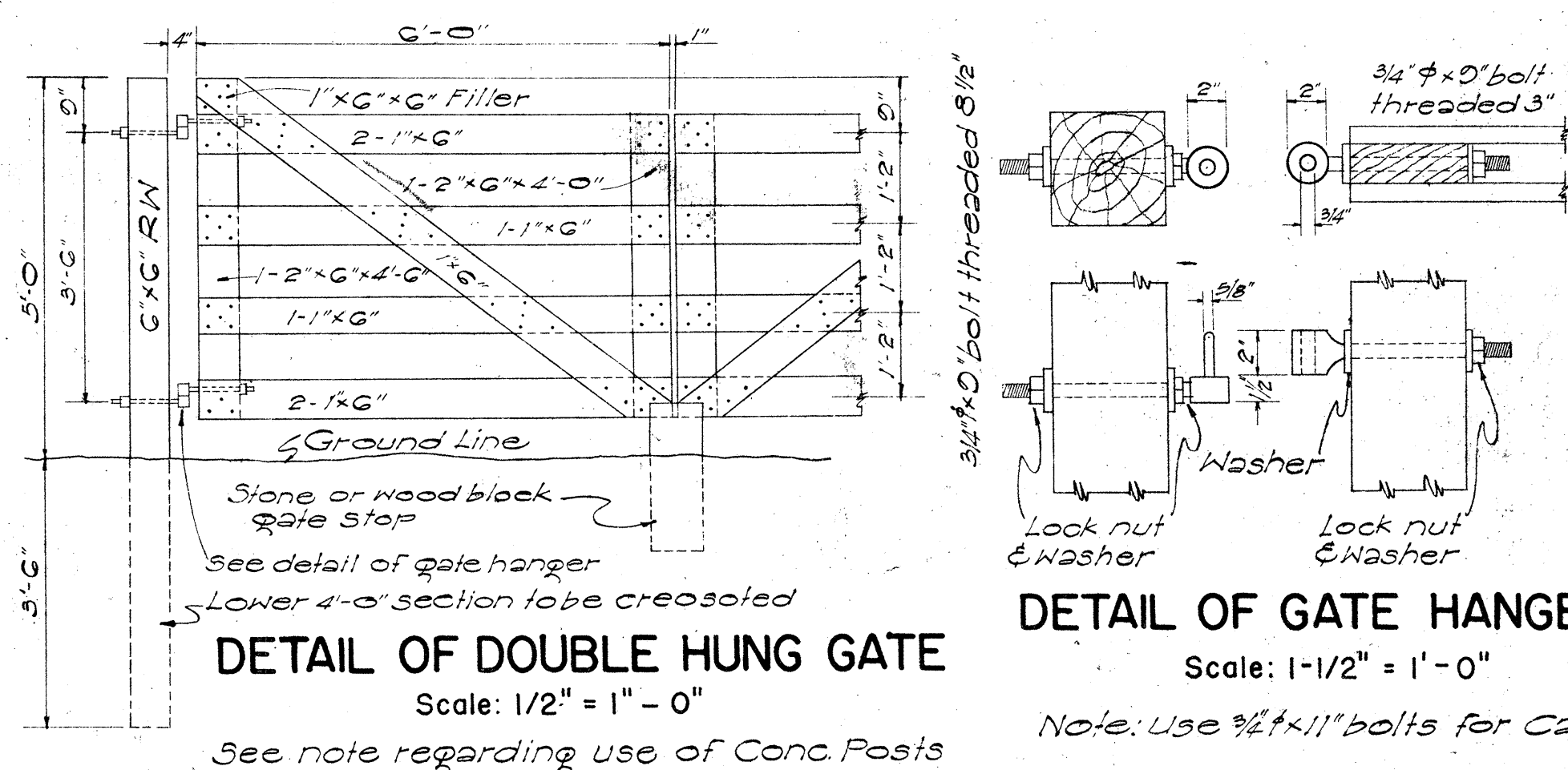
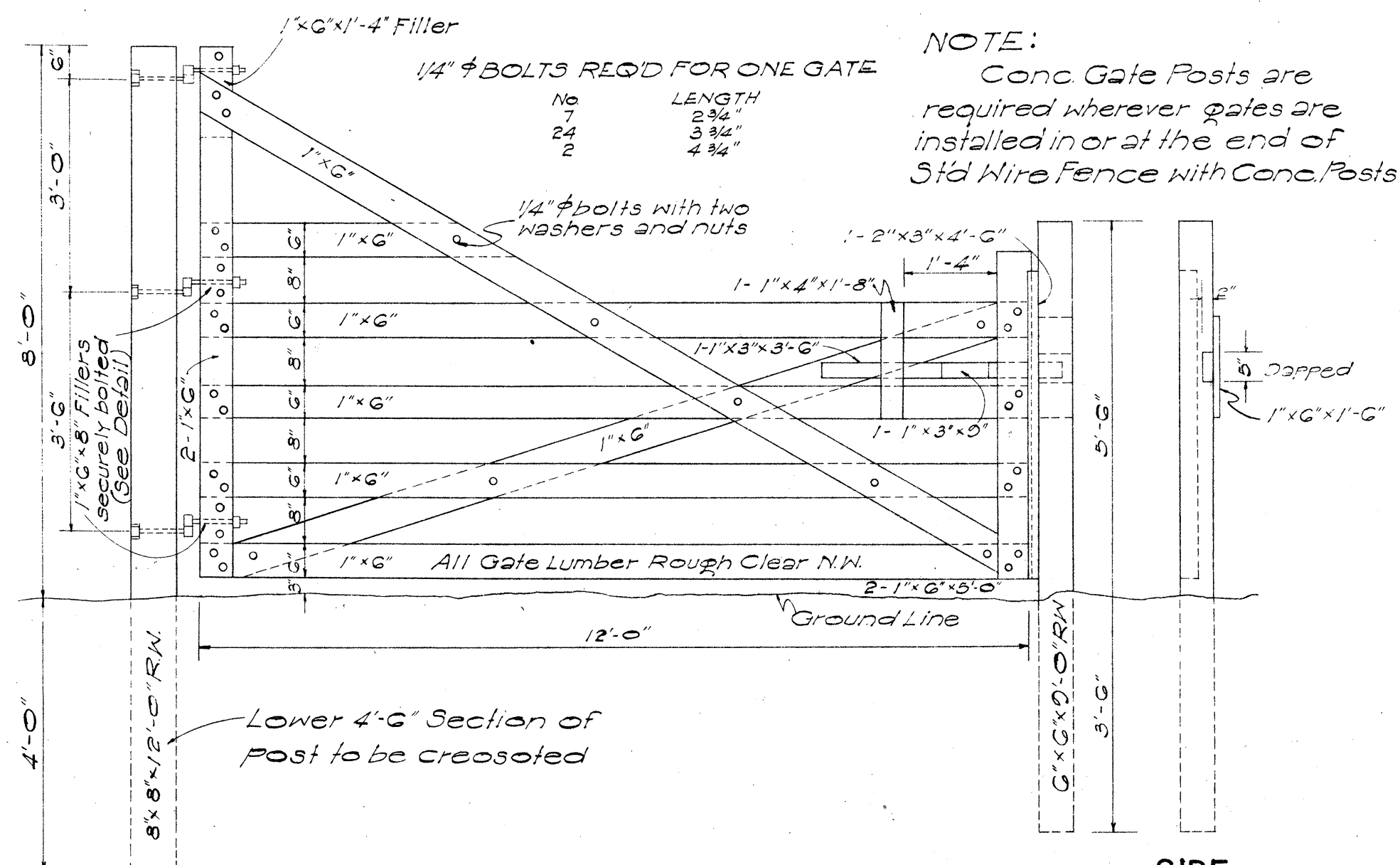


NOTE: See Regulatory & Warning Signs sheet for details of W-42, W-43 and railing posts. See Detail of Conc. Post



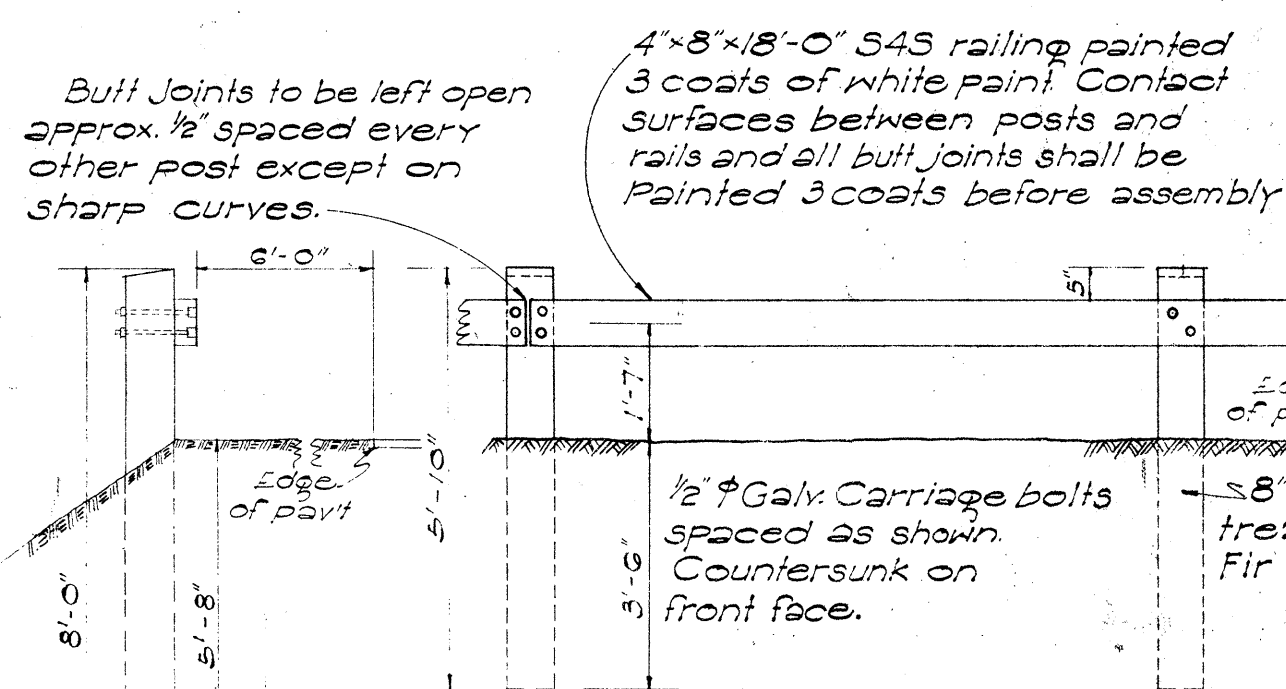
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
MISCELLANEOUS DETAILS FOR
GUARD RAILS
LANA BELT ROAD
PROJECT No. F-036-1(1)
SCALE: AS NOTED AUG. 1959

AUG. 1957

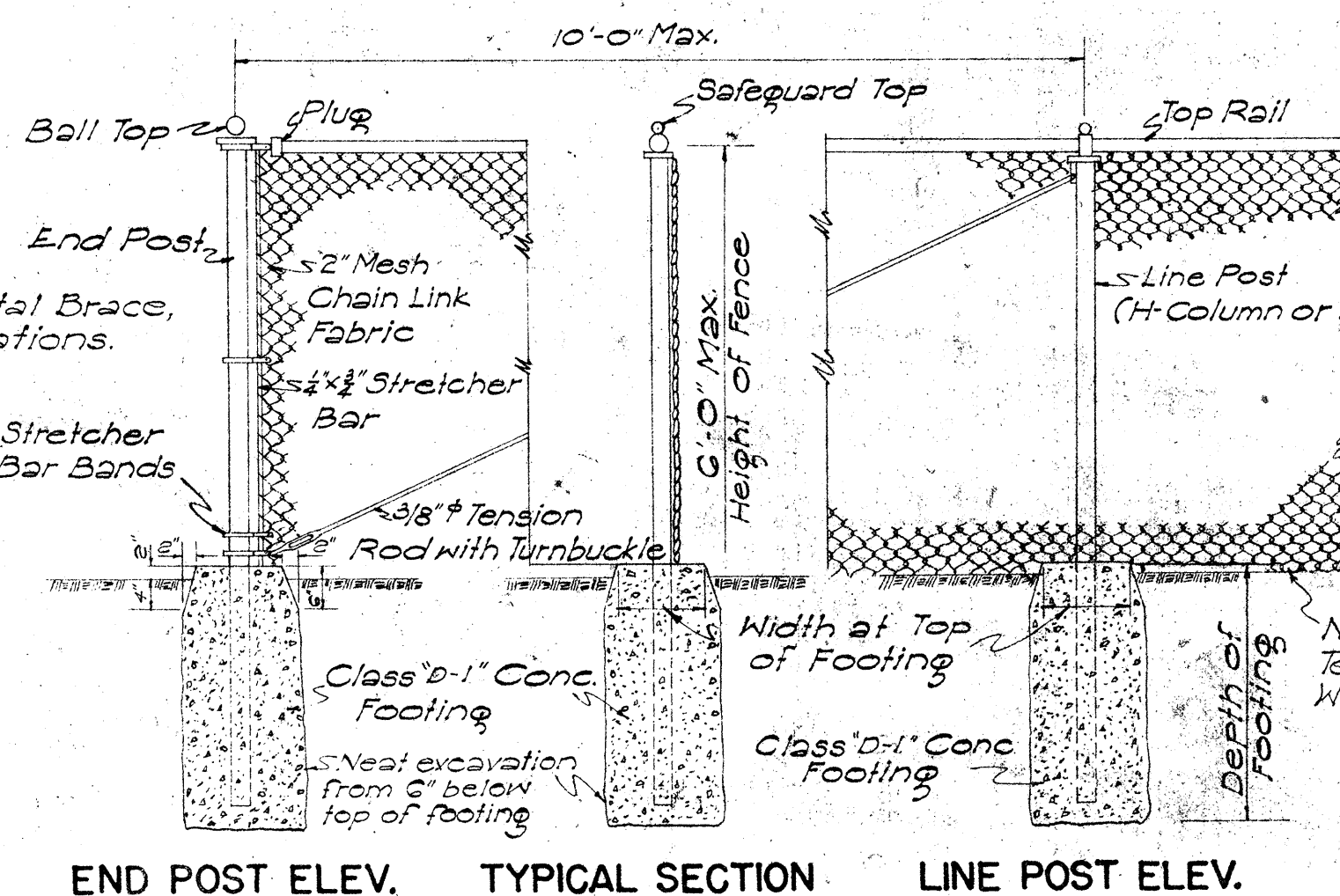
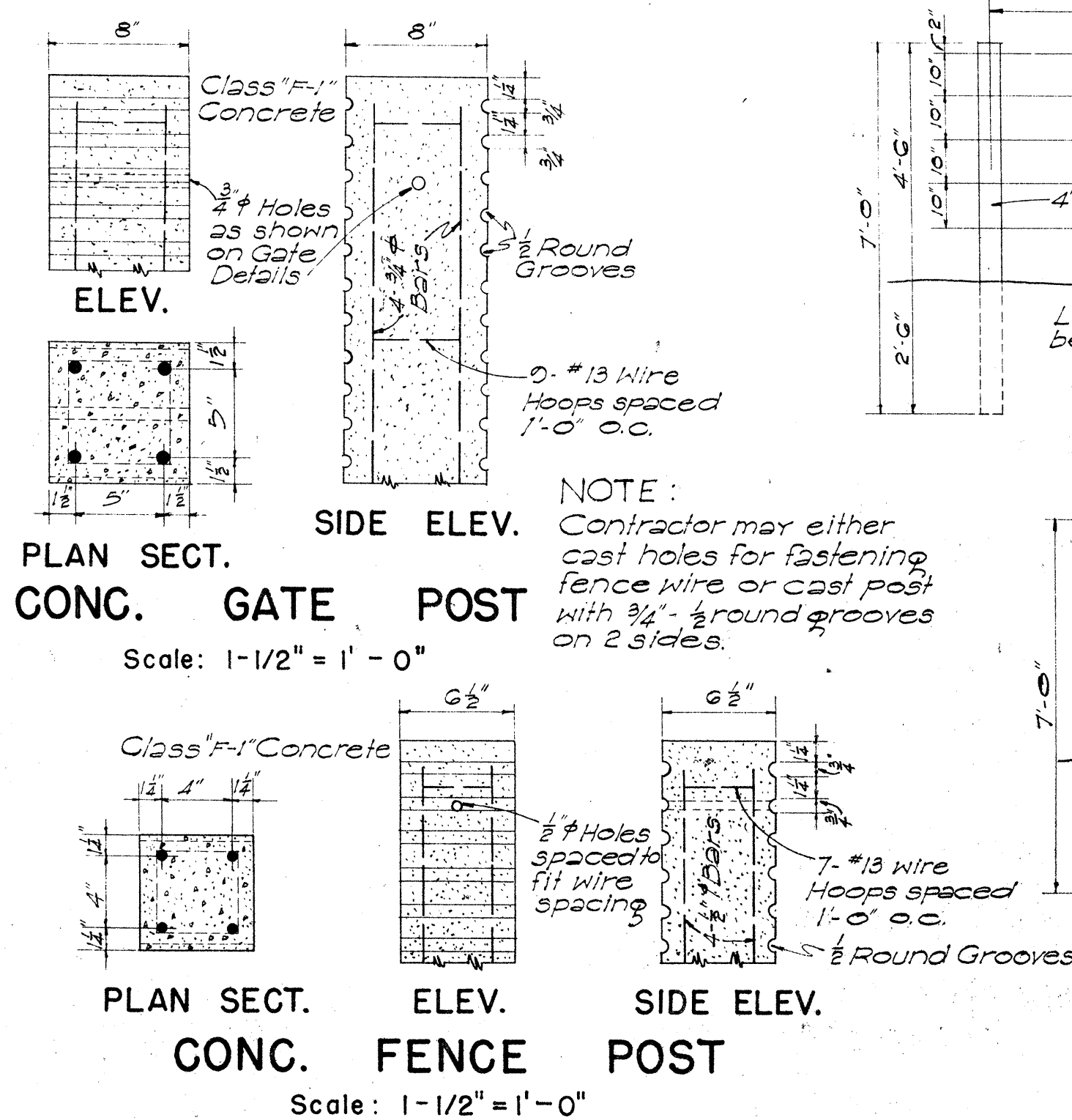
**DETAIL OF GATE HANGER**

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

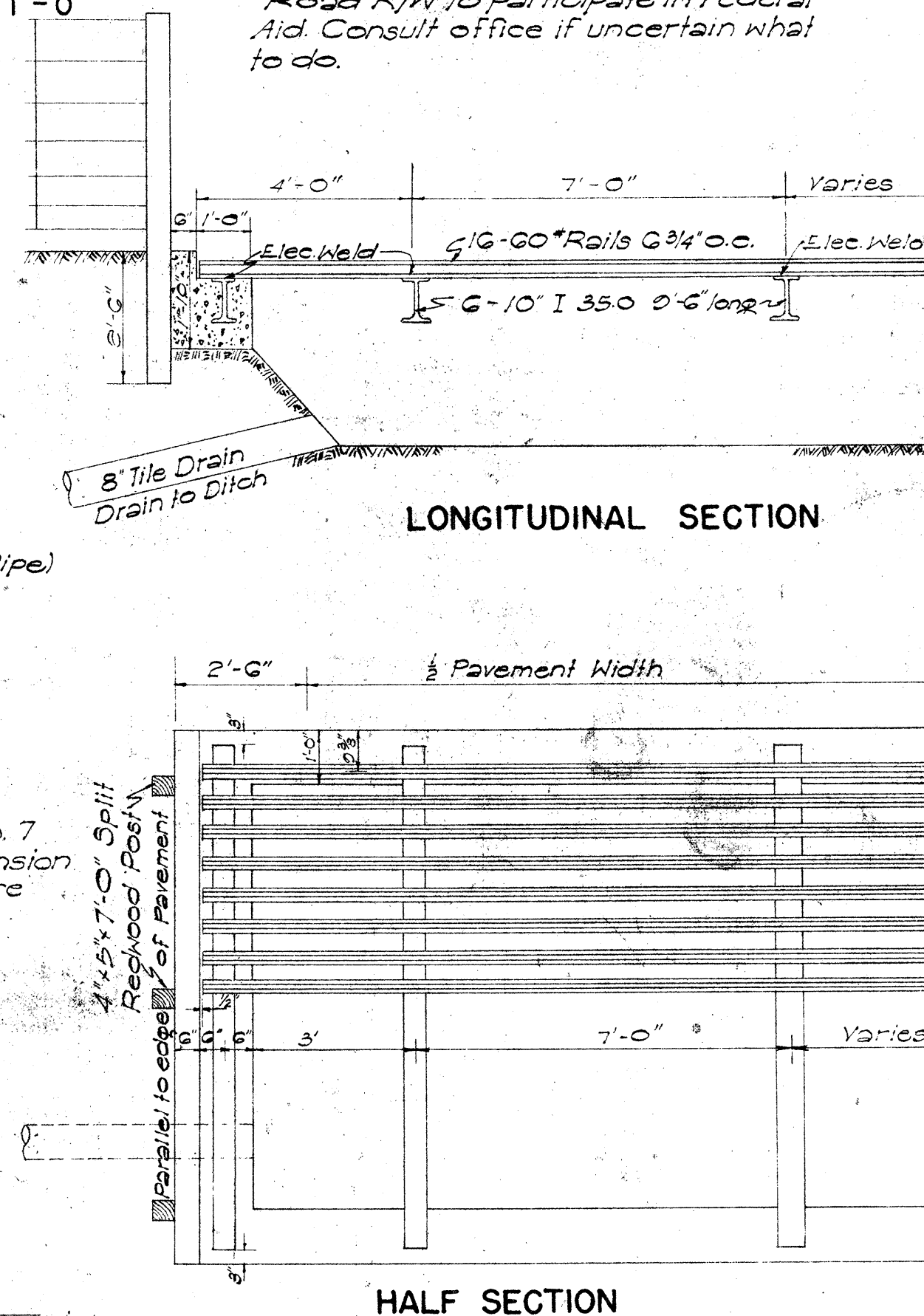
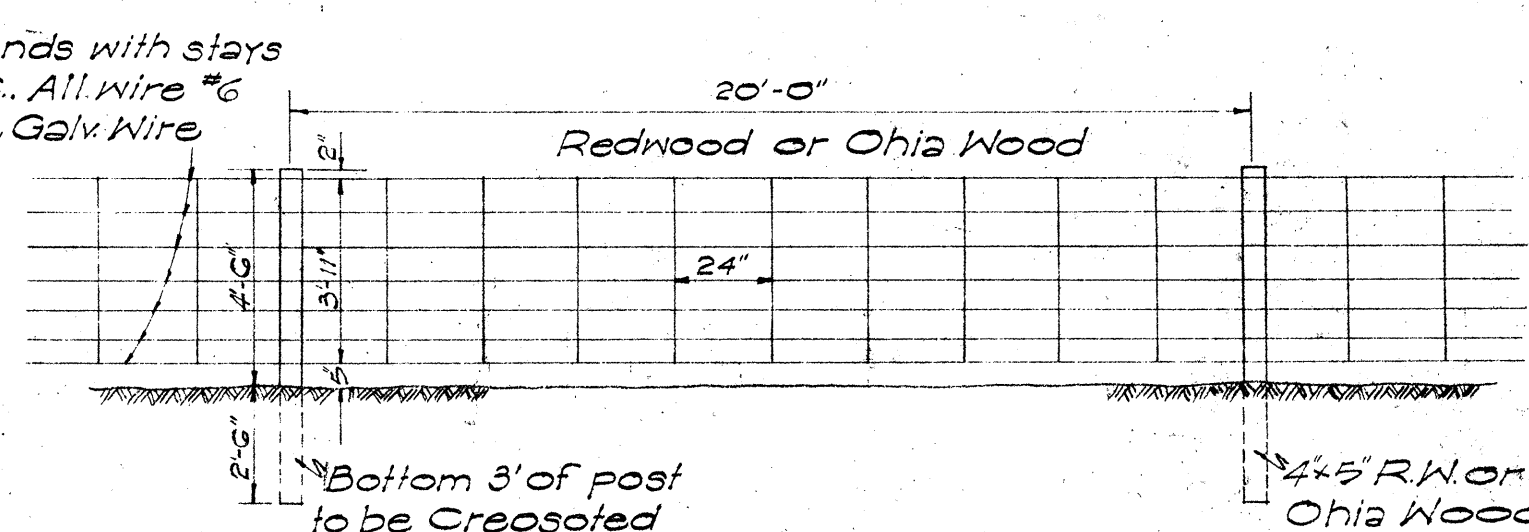
Note: Use 3/4" x 11" bolts for Cattle Gate

**GUIDE POSTS:**

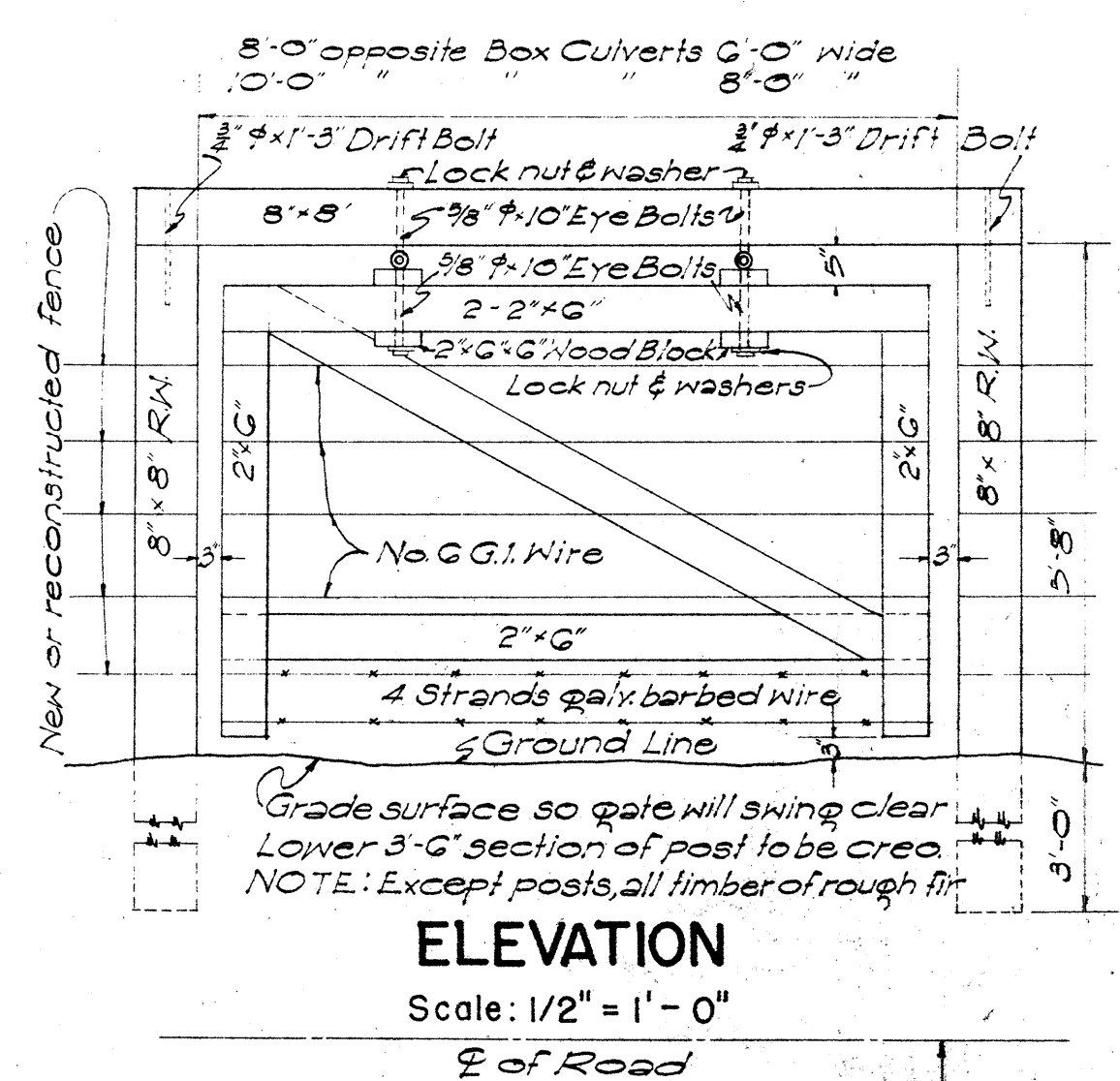
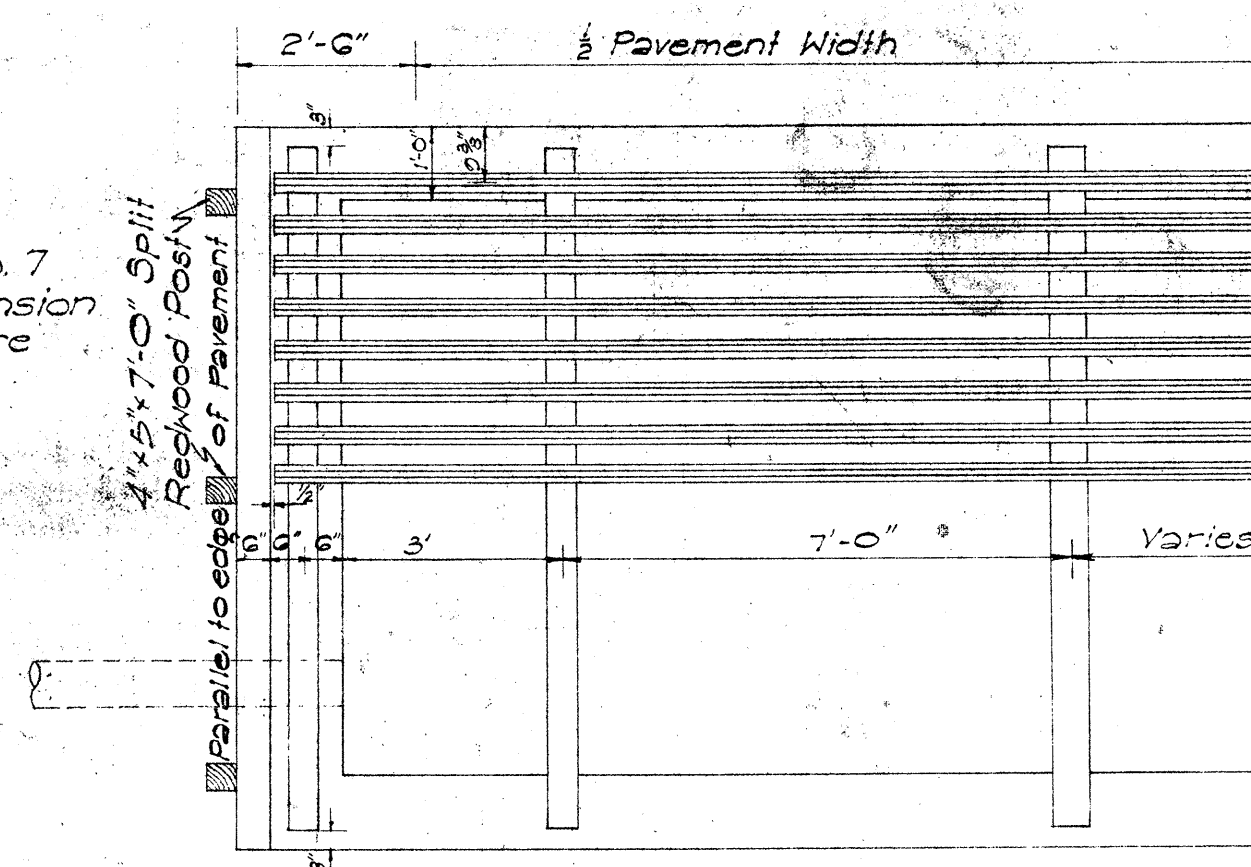
Wood or Conc. Guide Posts are the same as those used for Wood Guard Rail spaced as shown on plans.

**DETAIL OF WOVEN WIRE FENCE**

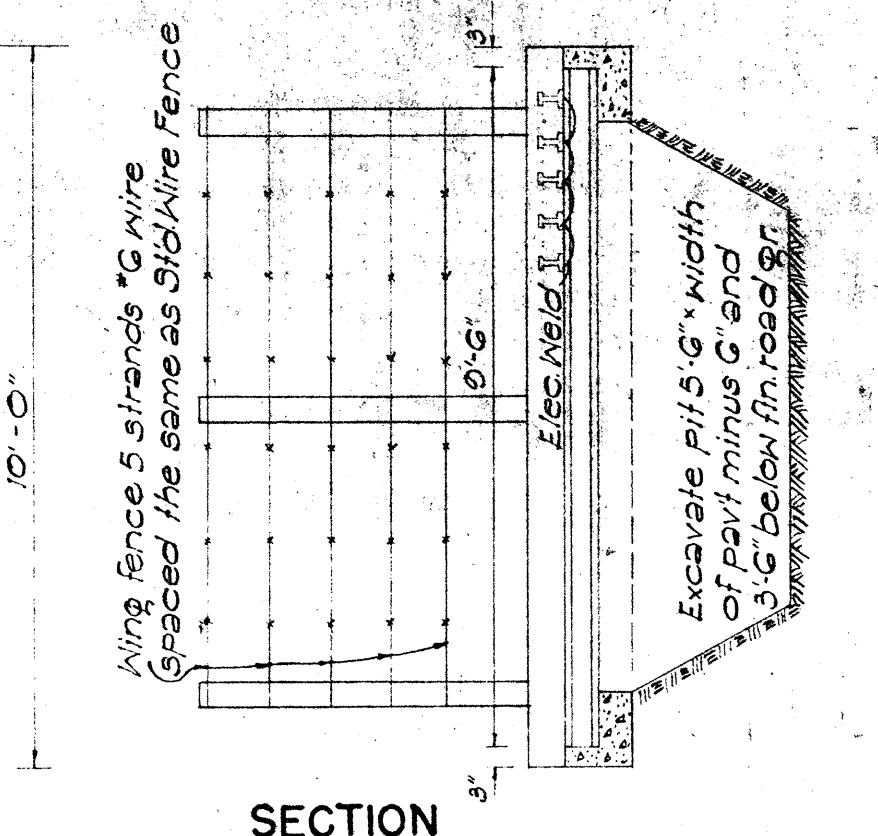
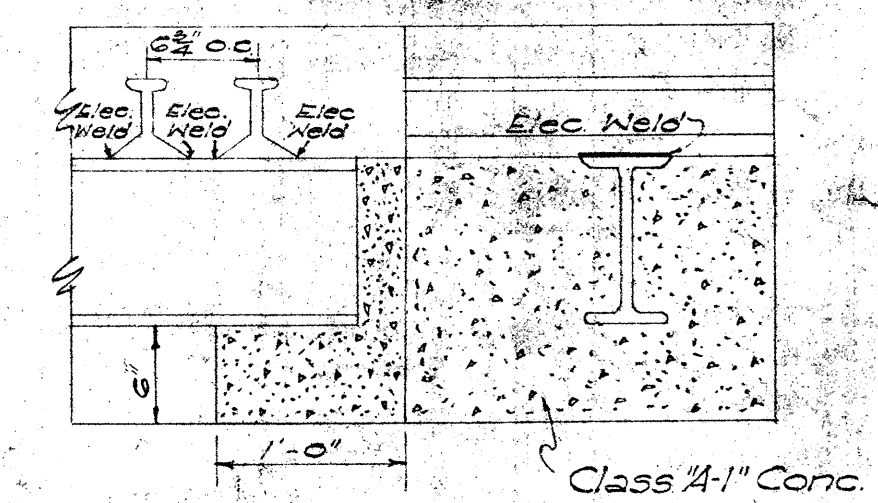
Scale: 1/4" = 1'-0"

**DETAIL OF CATTLE GUARD**

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



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

DETAILS OF HURDLE

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS
FENCES, GATES, GUARD RAILS,
GUIDE POSTS, CATTLE GUARD
SCALES AS NOTED

SHEET NO. 6 OF 8 SHEETS

2/17/50
4/6/59

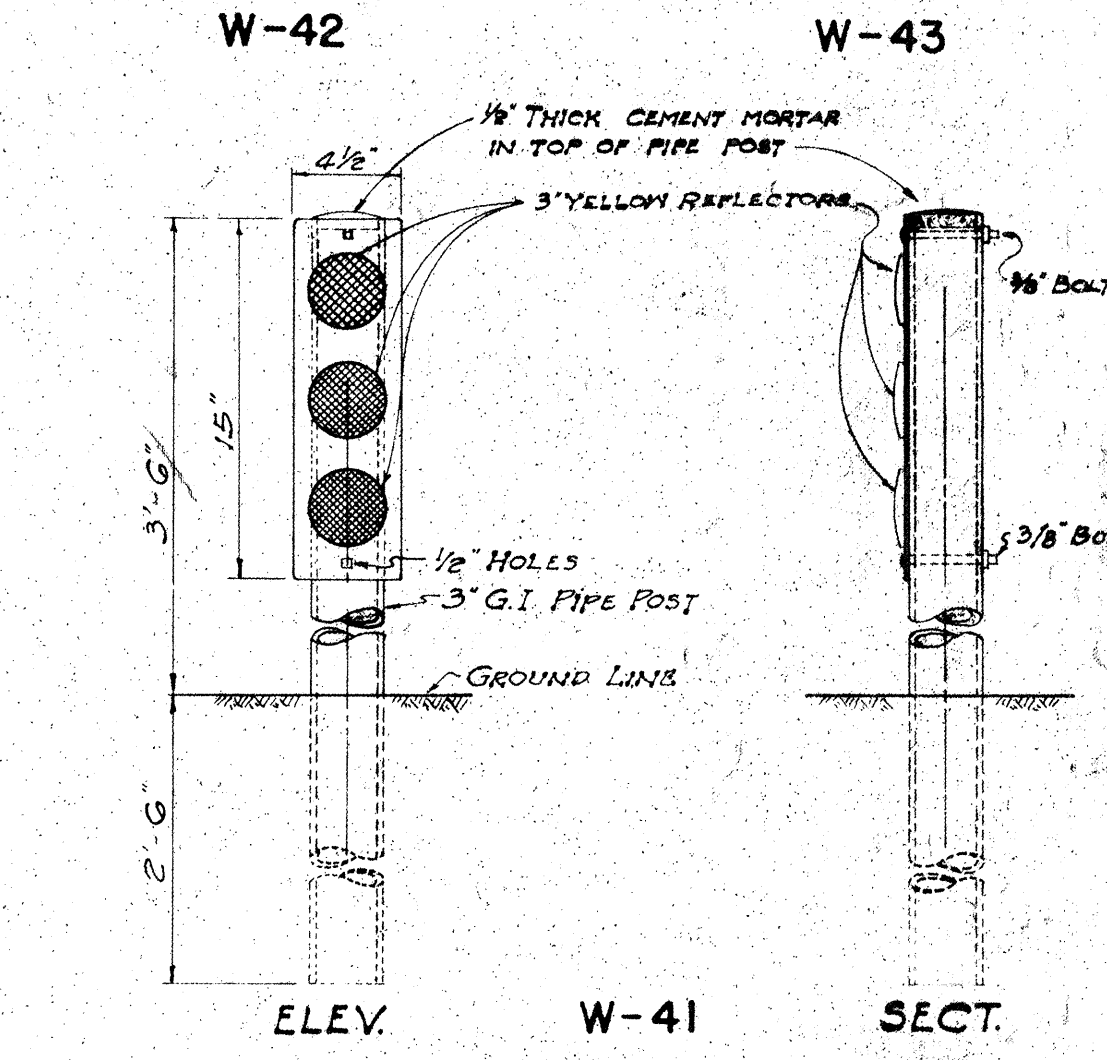
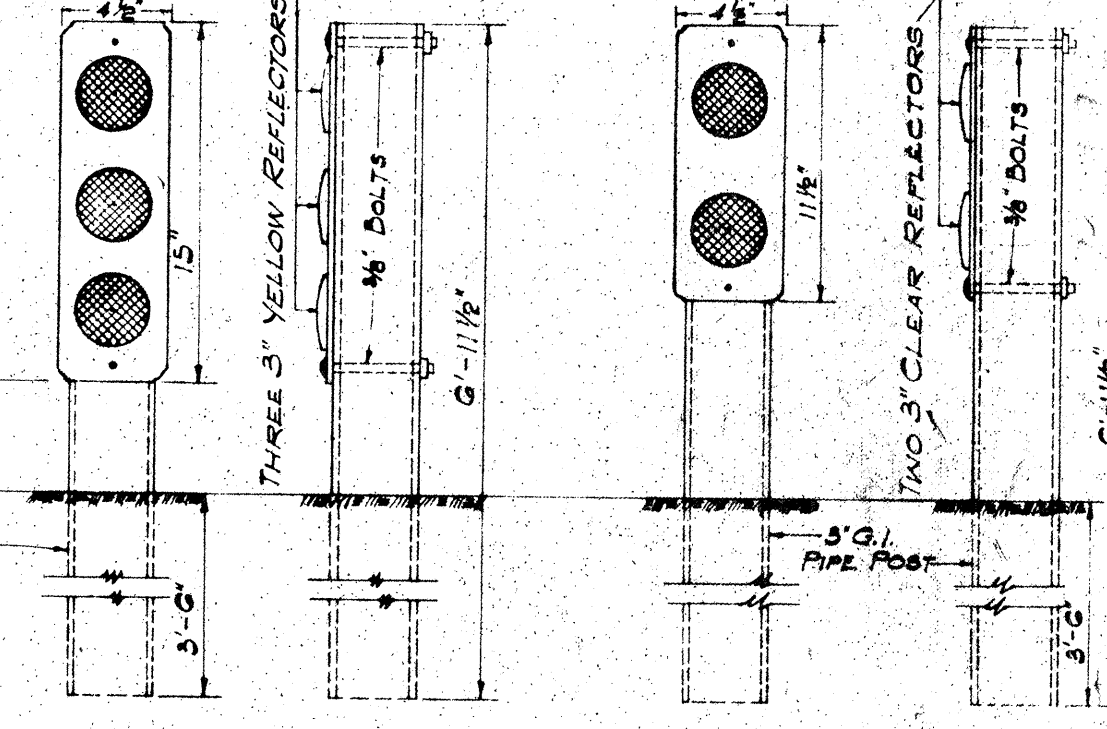
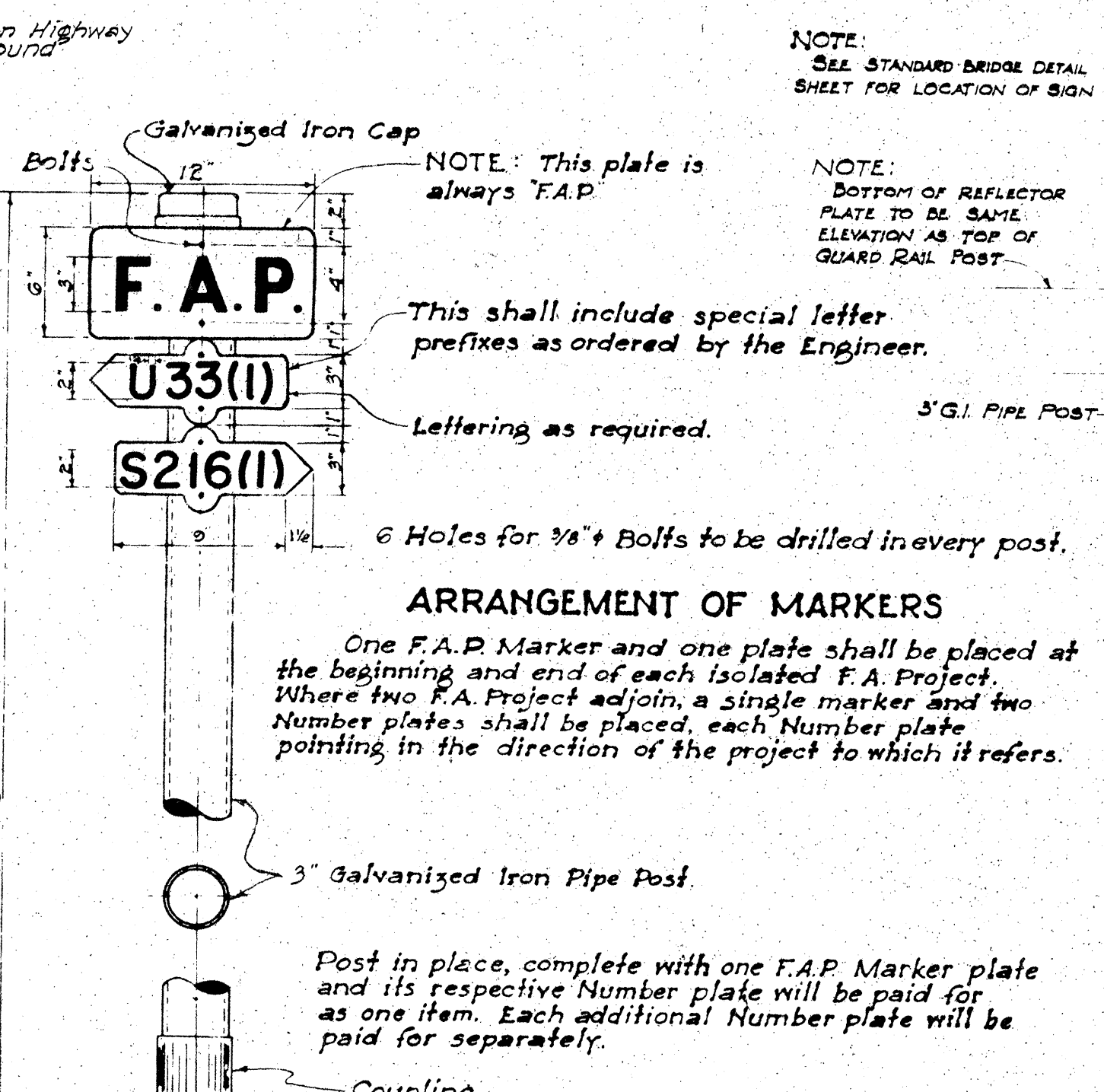
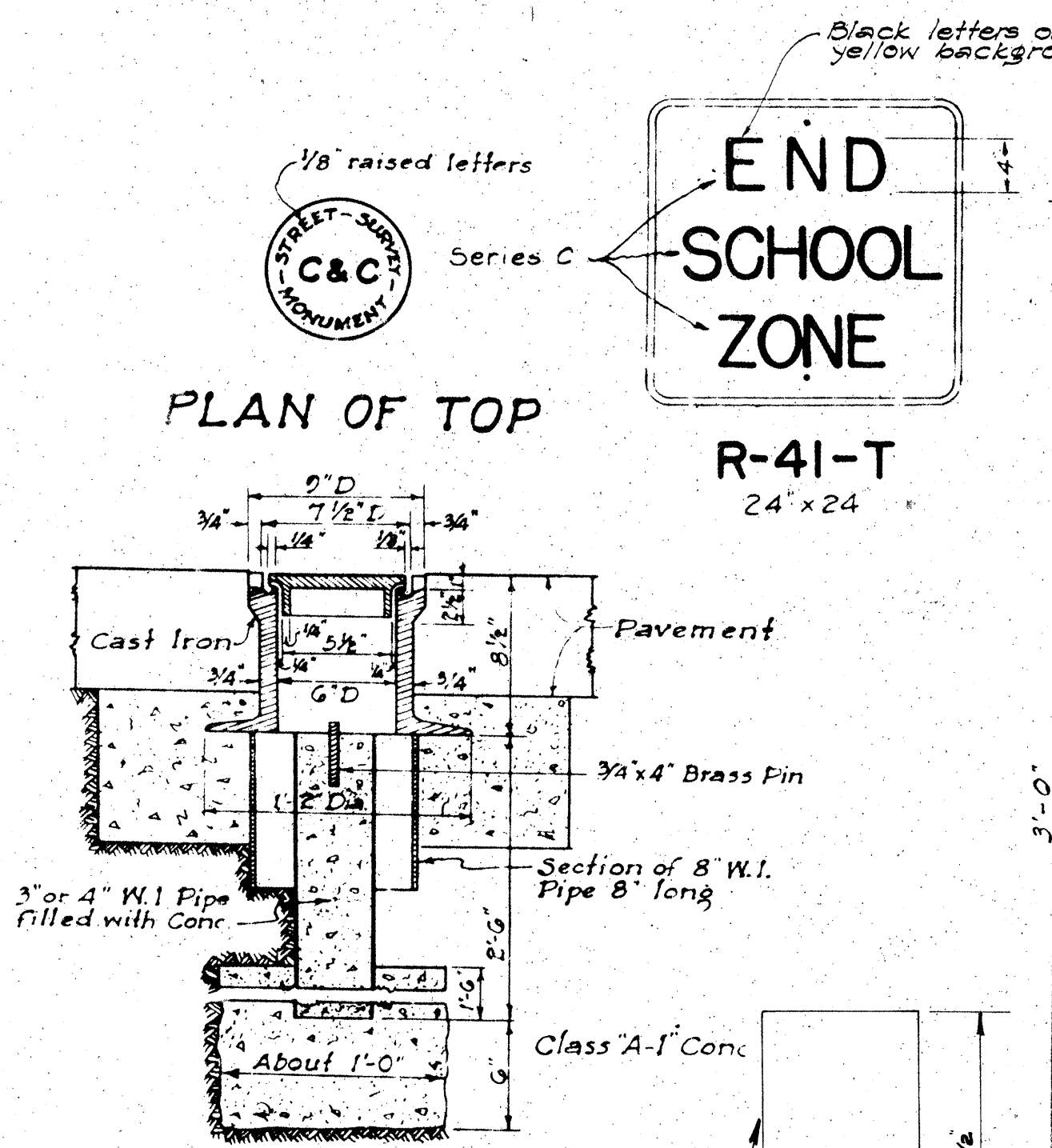
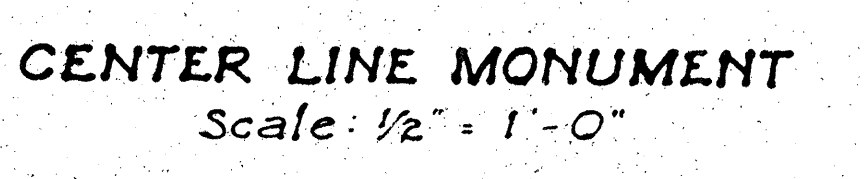
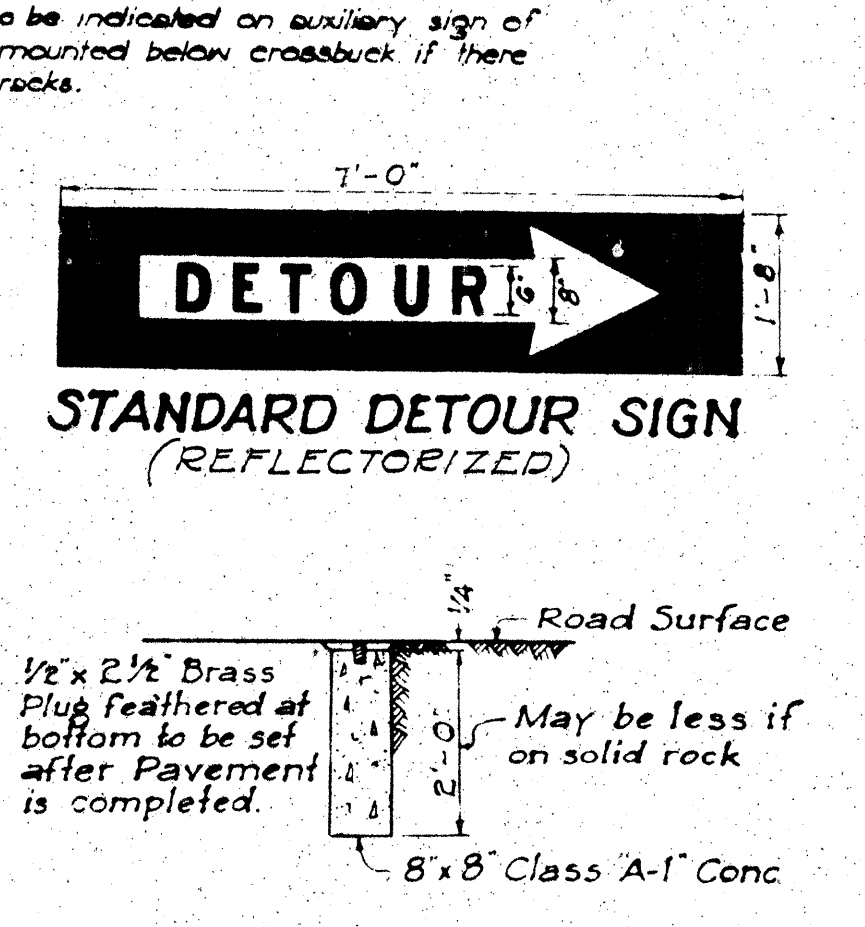
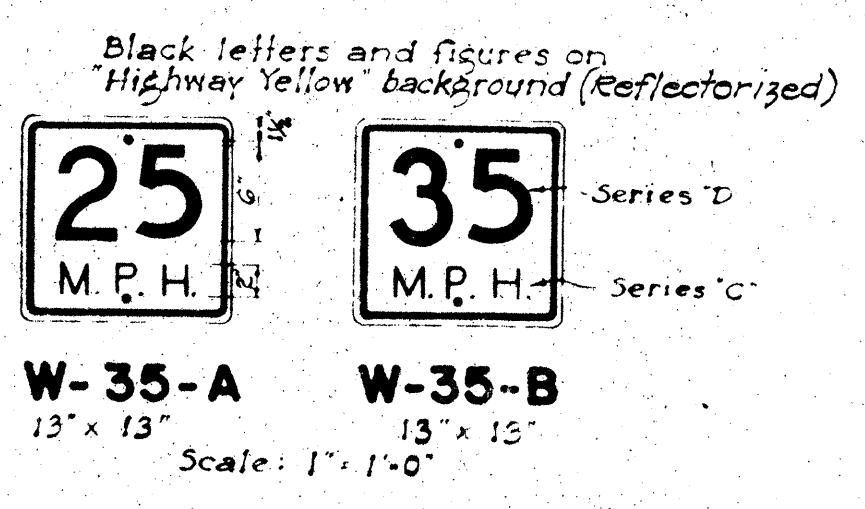
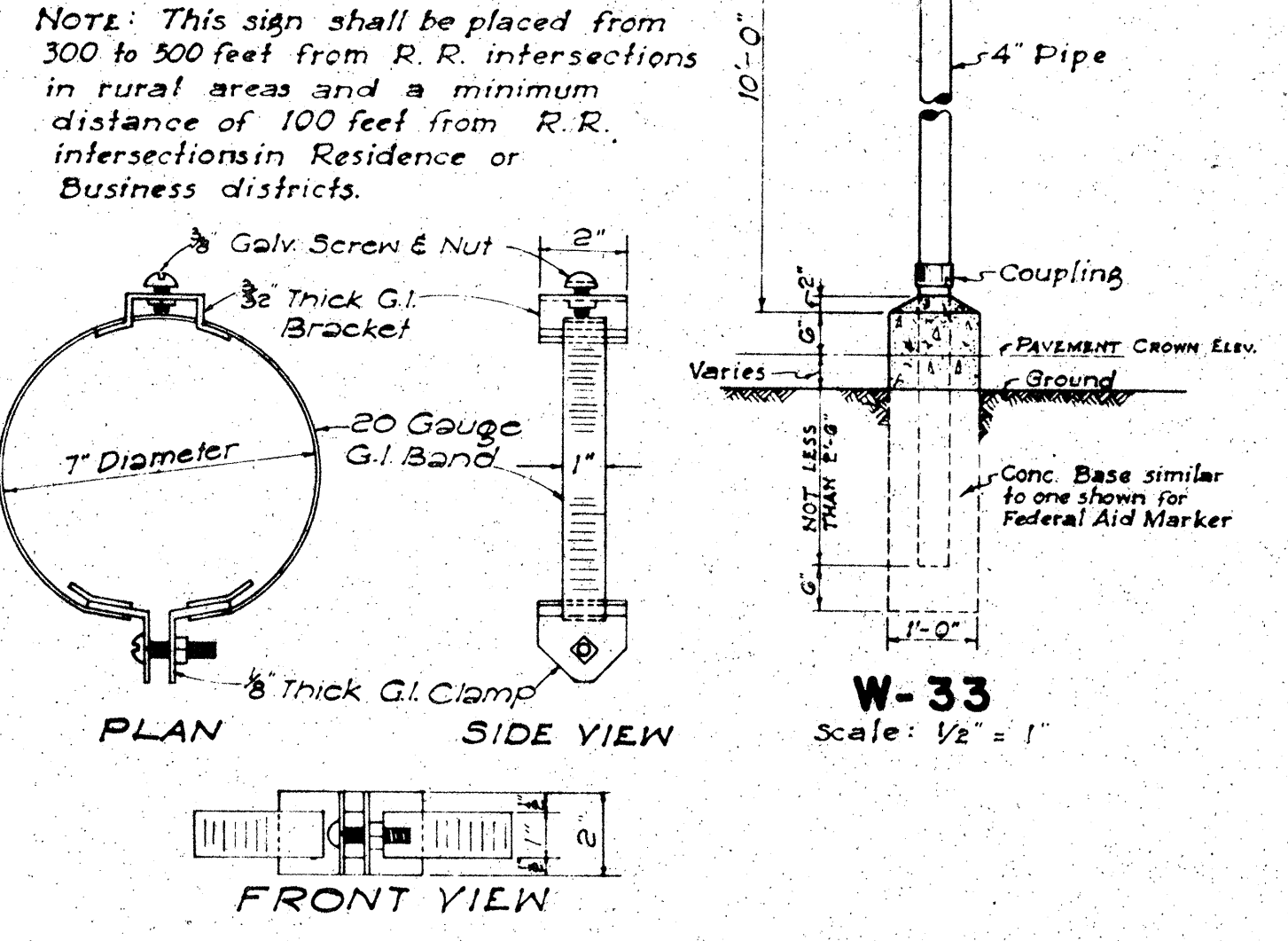
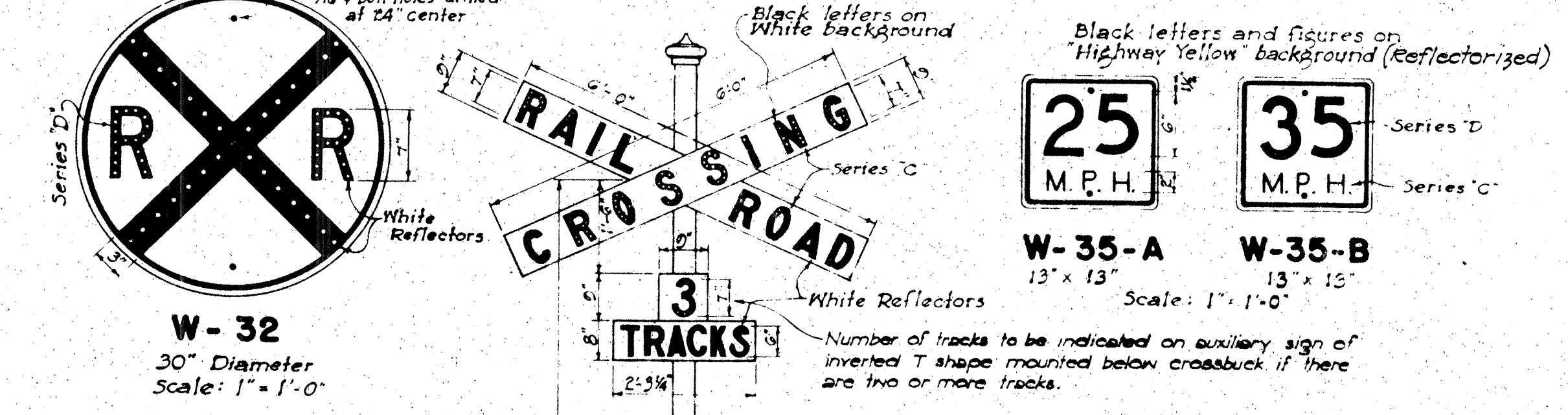
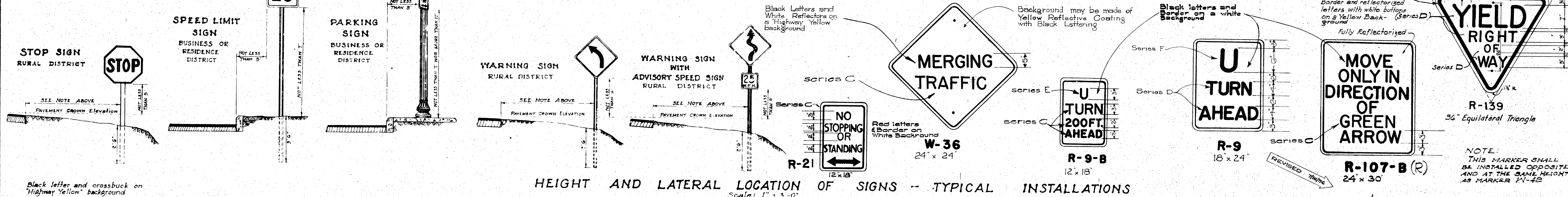
NOTE:

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.
Two (2) 1/4" bolt holes drilled at location shown.
Two (2) 3/8" bolts with 20 gauge galvanized washers with neoprene rubber gasket attached against face and back of sign.

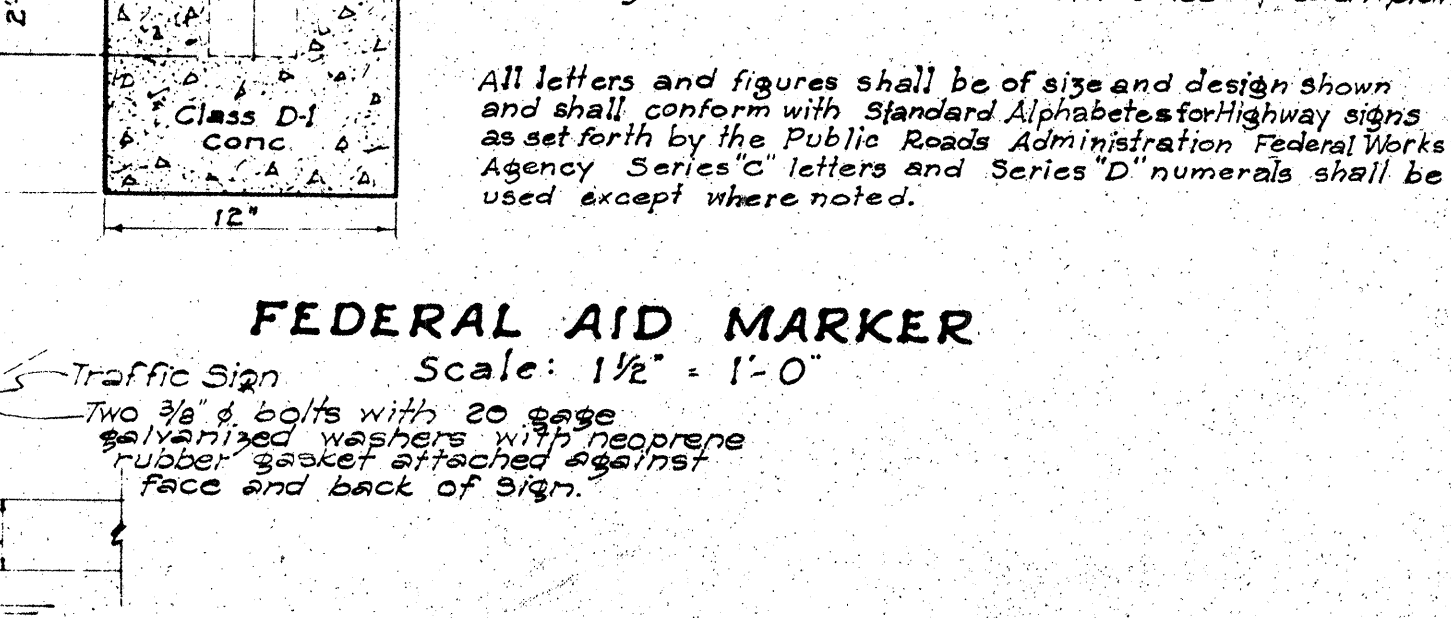
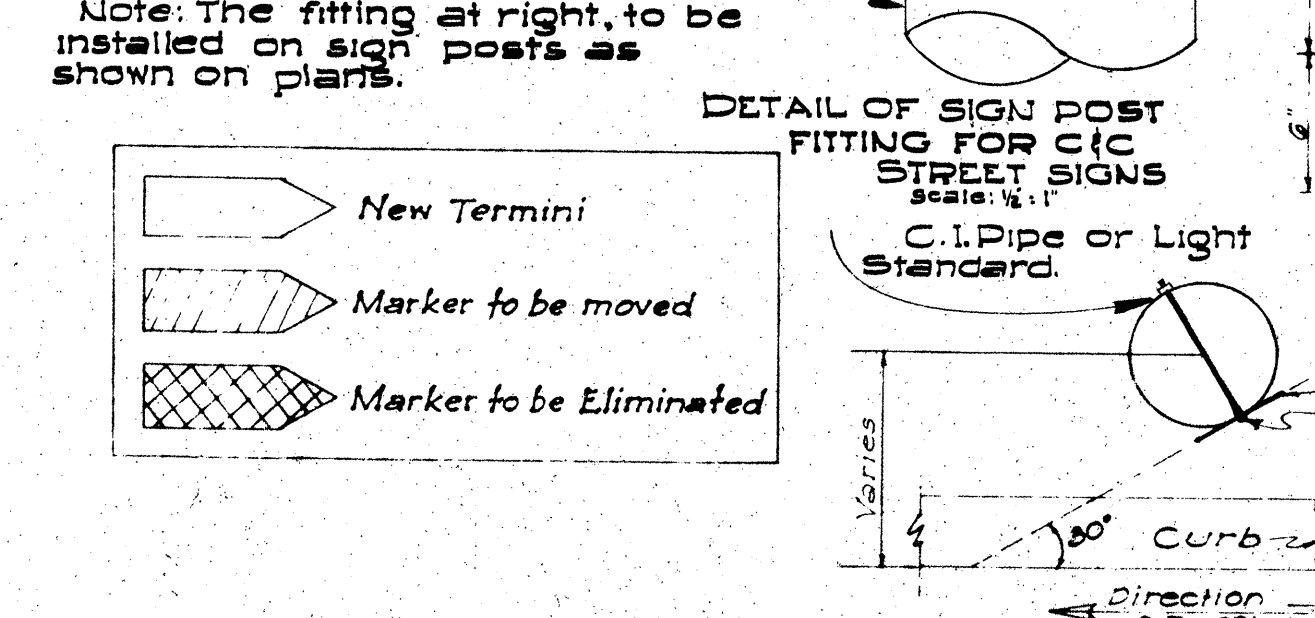
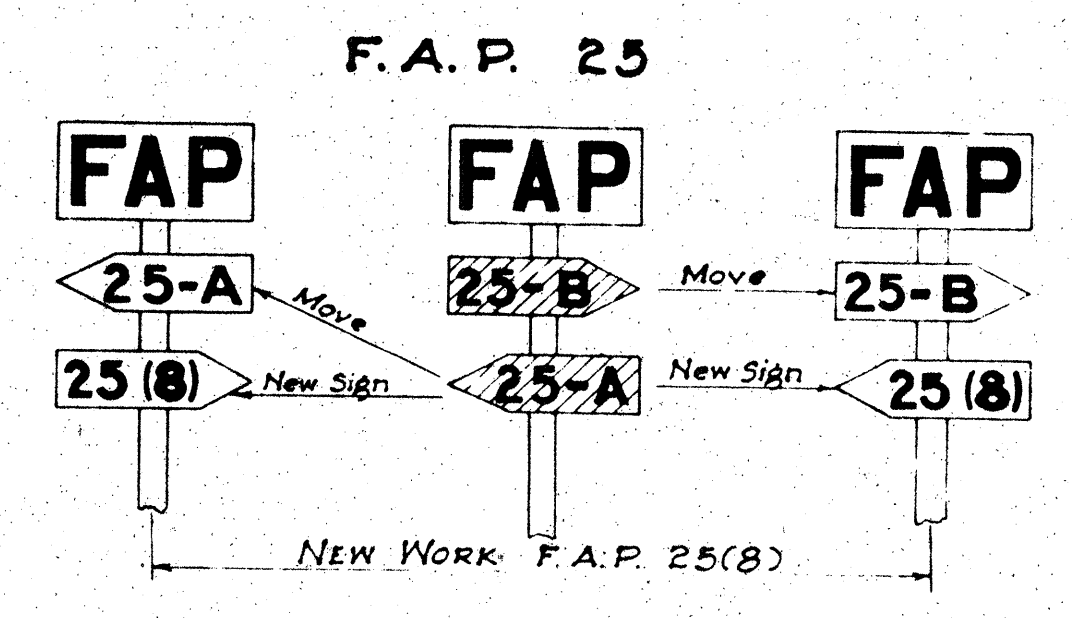
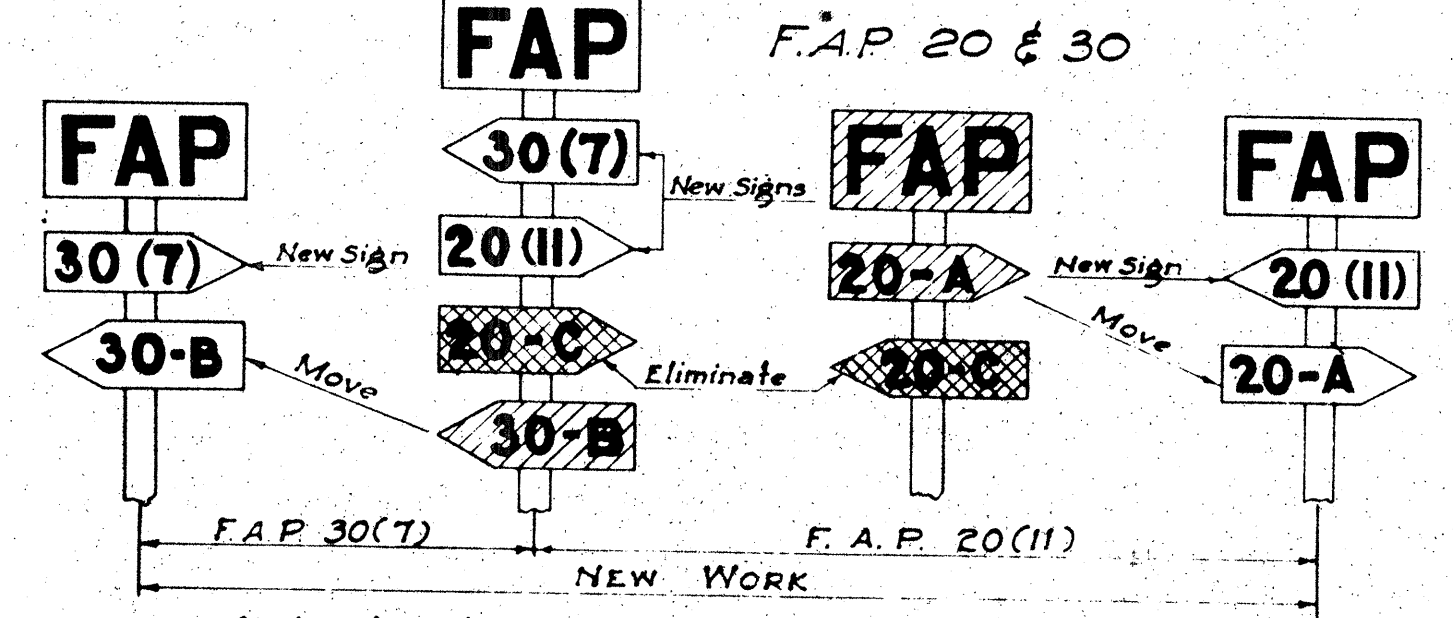
NOTE: All signs shall be placed 10' from edge of pavement except where shoulder width is less than 10', in which case signs shall be placed at edge of shoulder.

NOTE: For R-39, Black Border and Letters on Yellow Reflective Background OR Black Border and reflectorized letters with white buttons on a Yellow Back- (Series D) ground.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-056(10)	1959	21	50



ADJUSTABLE BAND BRACKET FOR SUPPORTING TRAFFIC SIGNS ON MONOTUBE LIGHTING STANDARDS
Scale: 3/4" = 1'-0"



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

Note: W-44 3"-5" yellow reflectors mounted on plate
W-45 2"-3" clear reflectors mounted on plate

NOTE: Federal Aid Markers should be placed at the termini of suffix designated sections. Intermediate letter designated markers of adjacent sections located within the limits of new improvements should be moved to the termini of the new work.

The same procedure would be followed on each successive improvement until all markers for letter designated sections are eventually eliminated.

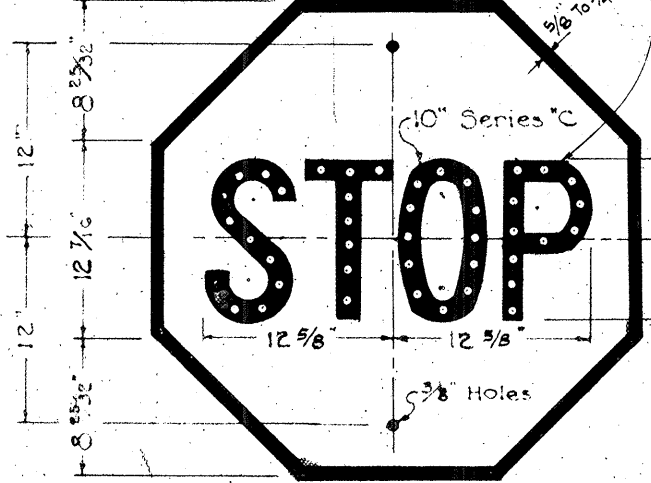
DETAIL SHOWING ANGLE OF TRAFFIC SIGNS AND CURB LINE
Scale: 1" = 1'-0"

APPROVED: _____ DATE: 4/28/59
HIGHWAY ENGINEER

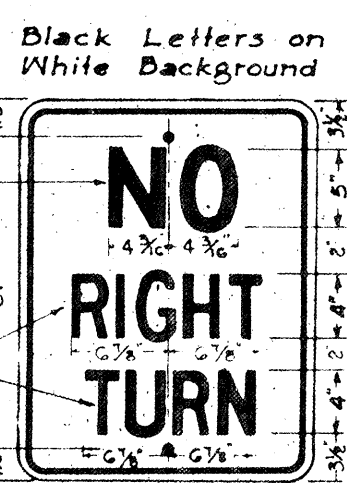
HAWAII STATE HIGHWAY DEPARTMENT
OF HAWAII
STANDARD DETAILS
F.A. MARKERS, MONUMENTS
SIGNS & LOCATION OF SIGNS
SCALES AS NOTED

2/17/57
4/6/59

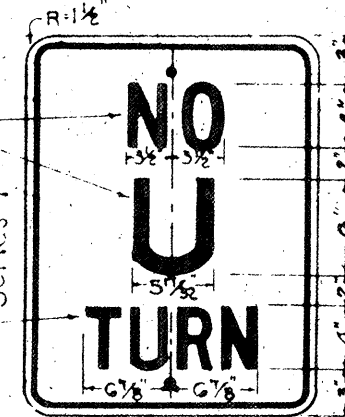
White Letters and Border on Red Background (Background may be of red reflective sheeting). Letters to be reflectorized with buttons or reflective sheeting.



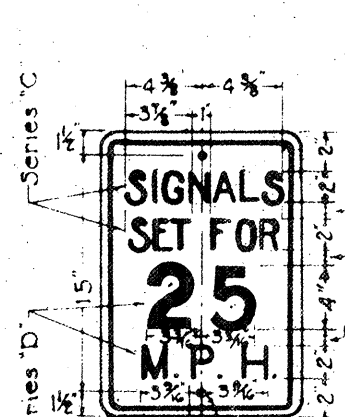
R-1
30" x 30"



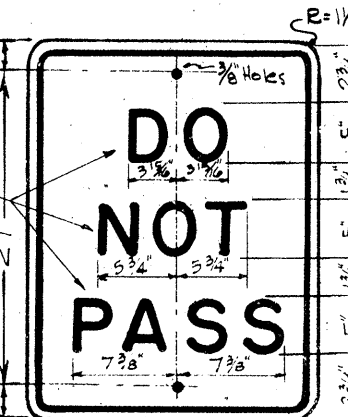
R-6
18" x 24"



R-8
18" x 24"



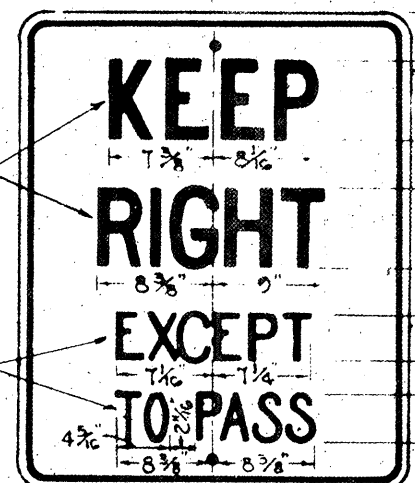
R-10
12" x 18"



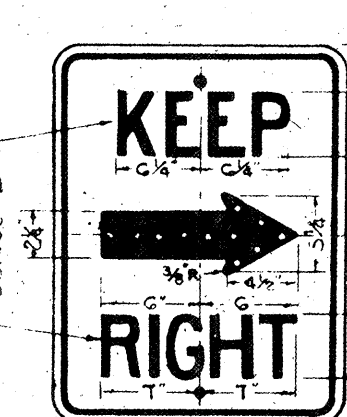
R-11
18" x 24"



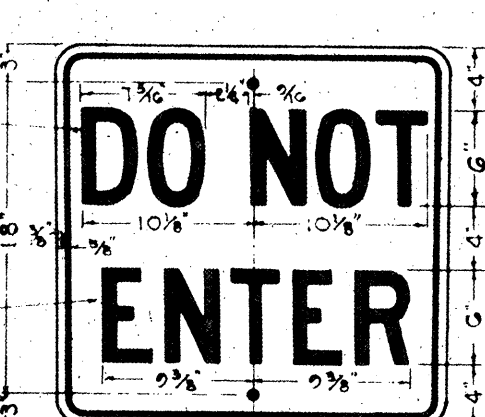
R-12
18" x 24"



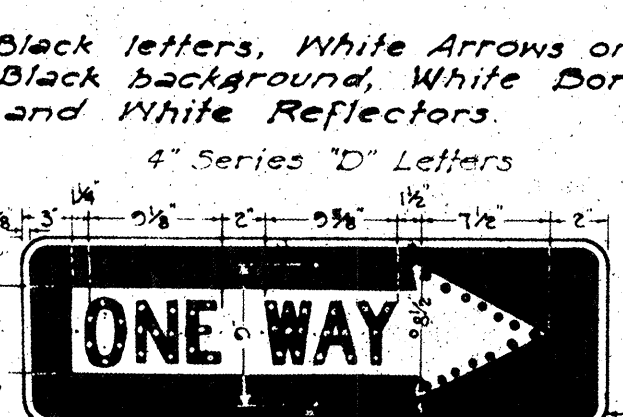
R-13
24" x 30"



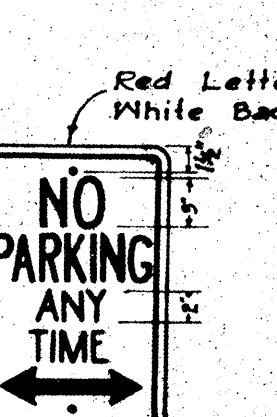
R-14 (R)
18" x 24"



R-15
24" x 24"



R-16-R (R)
R-16-L (R)
36" x 12"



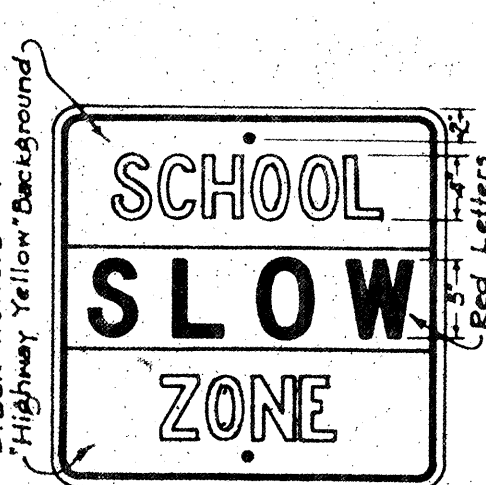
R-18
12" x 18"



R-26
12" x 18"



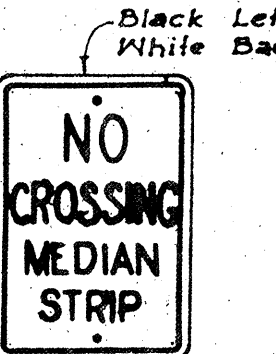
R-29
24" x 30"



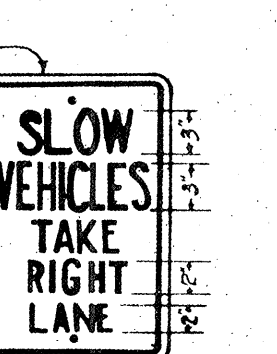
R-41-S
24" x 24"



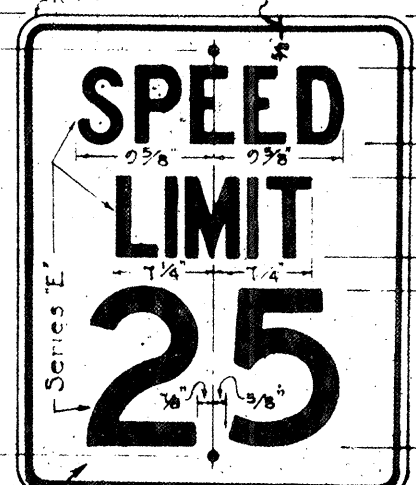
R-42-S
12" x 18"



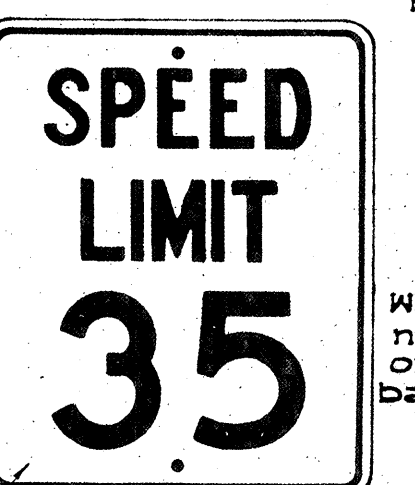
R-43-S
12" x 18"



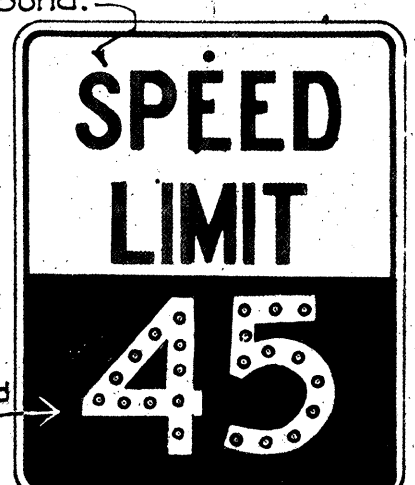
R-44-S
12" x 18"



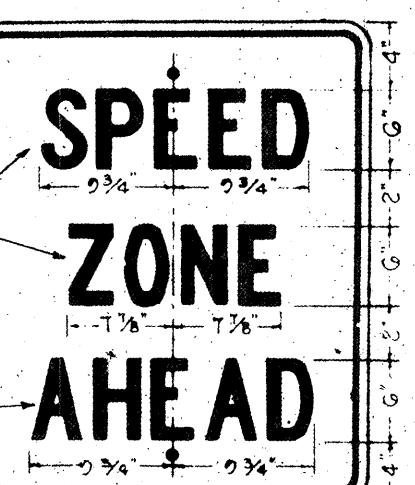
R-102-A
24" x 30"



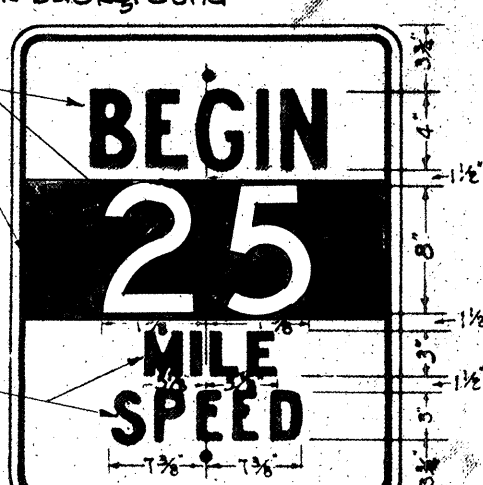
R-102-B
24" x 30"



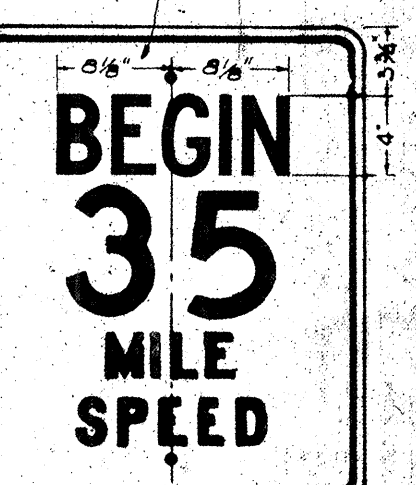
R-102-C (R)
24" x 30"



R-104
24" x 30"



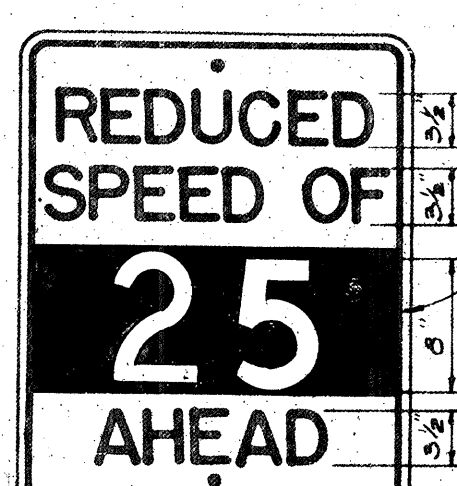
R-105-A (R)
24" x 30"



R-105-B
24" x 30"



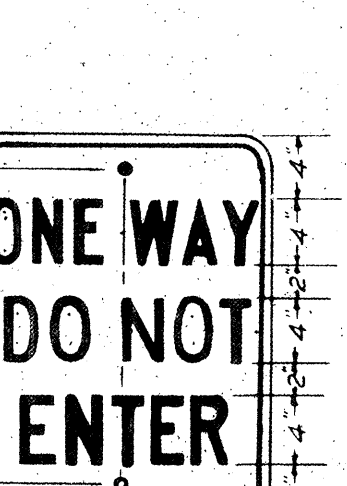
R-105-C
24" x 30"



R-104-A
24" x 30"



R-7
18" x 24"



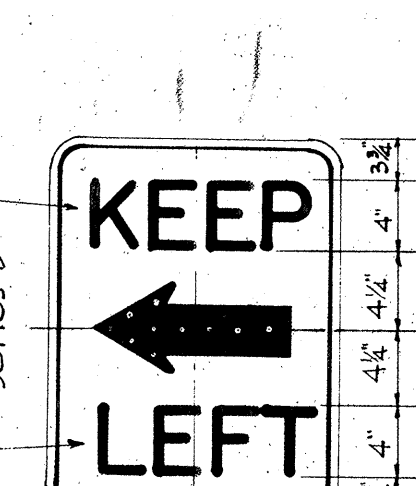
R-66
18" x 24"



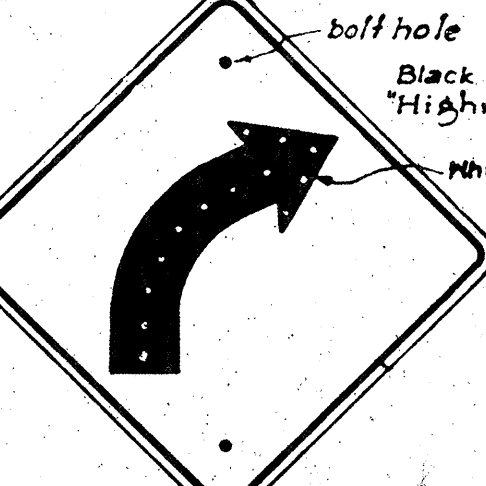
R-106
24" x 30"



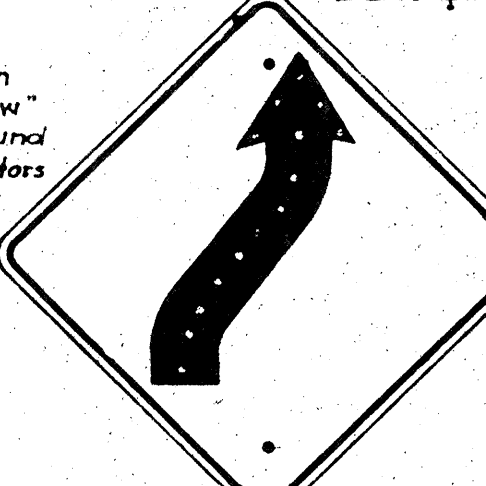
R-107-A
24" x 30"



R-14-A
24" x 24"



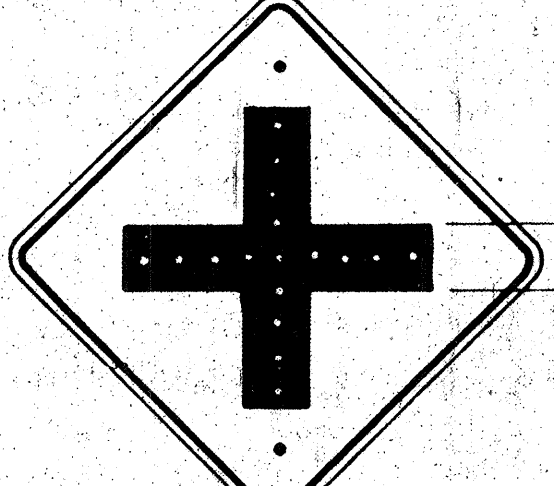
W-2-R
*W-2-L
24" x 24"



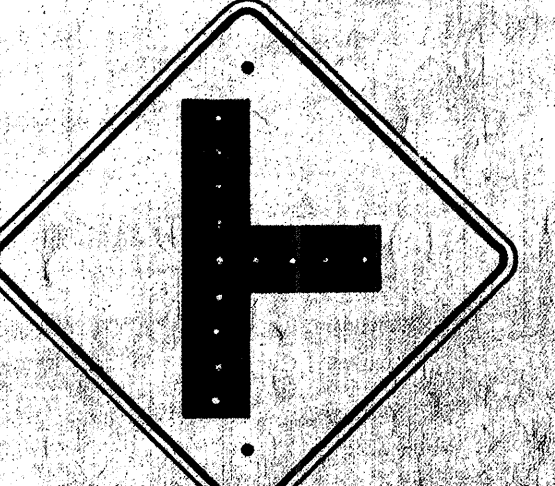
W-4-R
*W-4-L
24" x 24"



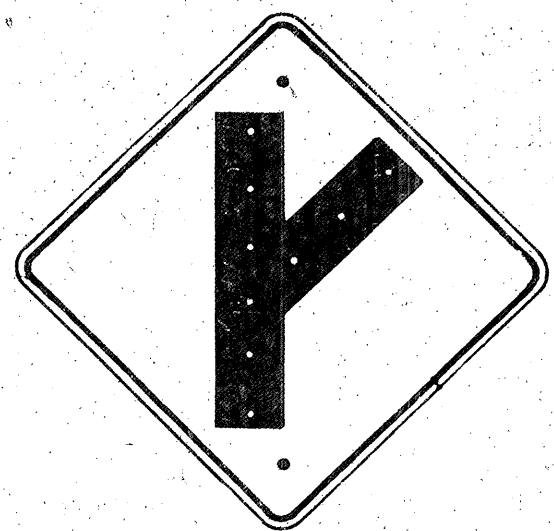
W-5-R
*W-5-L
24" x 24"



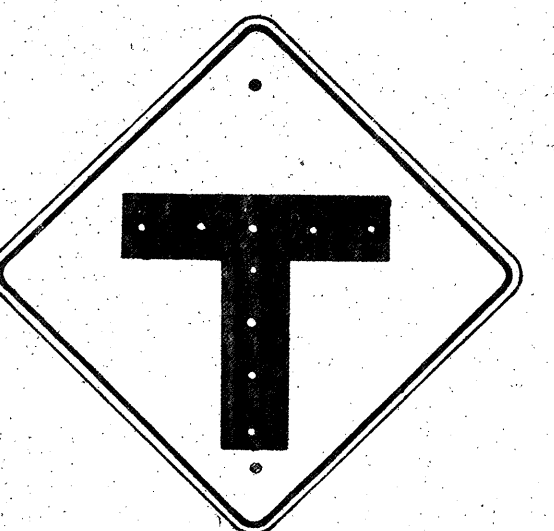
W-6
24" x 24"



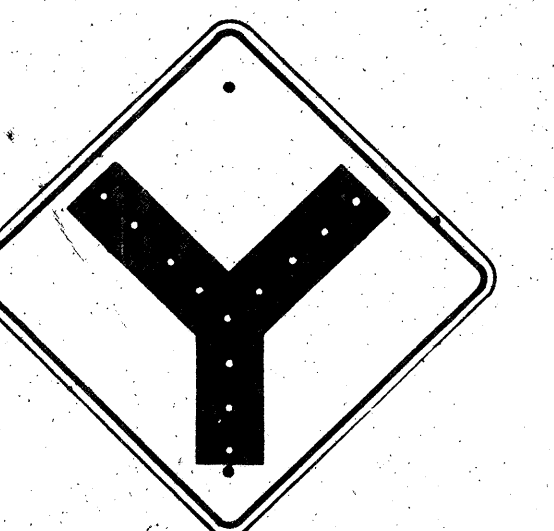
W-7
24" x 24"



W-8-R
*W-8-L
24" x 24"



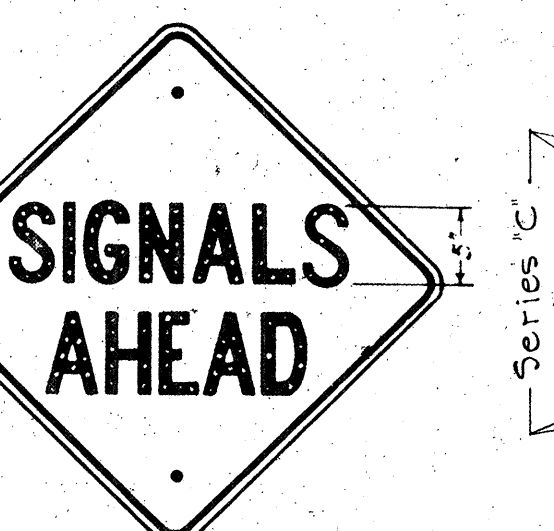
W-9
24" x 24"



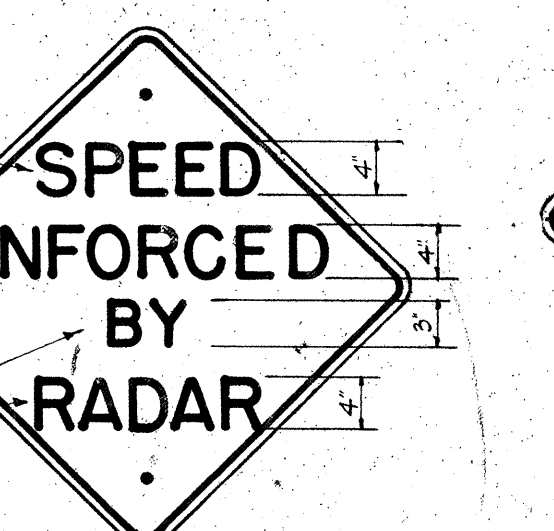
W-10
24" x 24"



W-13
24" x 24"



W-14
24" x 24"



W-40
24" x 24"



W-19
30" x 30"



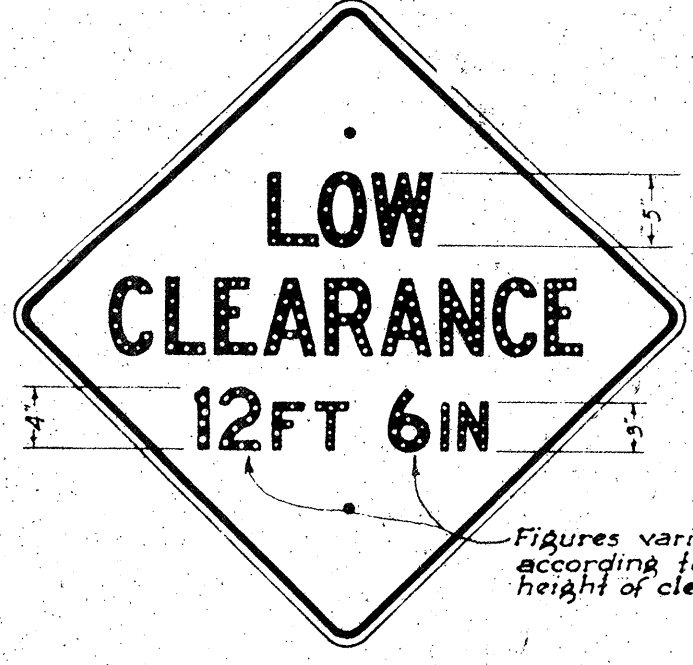
W-20
30" x 30"



W-21
30" x 30"



W-22
24" x 24"



W-24
30" x 30"



W-25
24" x 24"



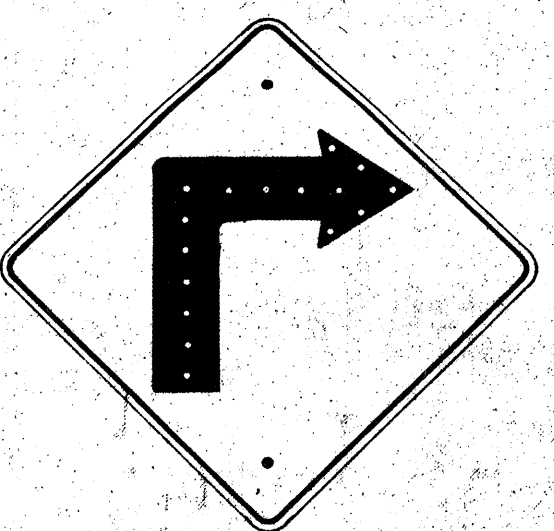
W-29
24" x 24"



W-59
24" x 24"



W-39
24" x 24"



W-1-R
*W-1-L
24" x 24"

NOTE: Signs noted with an (R) designation indicate reflectorization with either buttons or reflective sheeting.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F030-1(1)	1959	22	50

JULY 3, 1957

Black letters, White Arrows on Black background, White Border and White Reflectors.

Red Letters & Border on White Background

Note: R-102, A, B, C signs with (R) designation: Lower half with white numerals, reflectorized with buttons or reflective sheeting, on black background.

Note: R-105, A, B, C signs with (R) designation shall have white numerals, reflectorized with buttons or reflective sheeting on a black background.

Note: R-104, A, B, C signs with (R) designation shall have white numerals, reflectorized with buttons or reflective sheeting on a black background.

Background may be made of Yellow Reflective sheeting.

Unless otherwise specified, all signs shall conform with requirements of "Manual on Uniform Traffic Control Devices for Streets and Highways."

All letters and figures shall be of size and design shown and shall conform with Standard Alphabets for Highway signs as set forth by the Public Roads Administration, Federal Works Agency. Series 'C' letters and Series 'D' numerals shall be used except where noted.

Note: All Regulatory signs shall have black letters on a white background except where noted. All Warning (W) signs shall have black letters or figures on a "Highway Yellow" background. Signs shall be similar but opposite in direction. See Specifications for Materials and Finish.

HAWAII STATE HIGHWAY DEPARTMENT OF HAWAII	
REGULATORY & WARNING SIGNS	
Scale: 1" = 1'	APR 23 1959
APPROVED: <i>[Signature]</i>	HIGHWAY ENGINEER

SHEET No 22 OF 50 SHEETS

Note: Signs shown have been revised 12/10/54 6/8/55 1/1/57

DESIGNED BY: T. Tokunaga
DRAWN BY: J. J. ...
CHECKED BY: A. ...