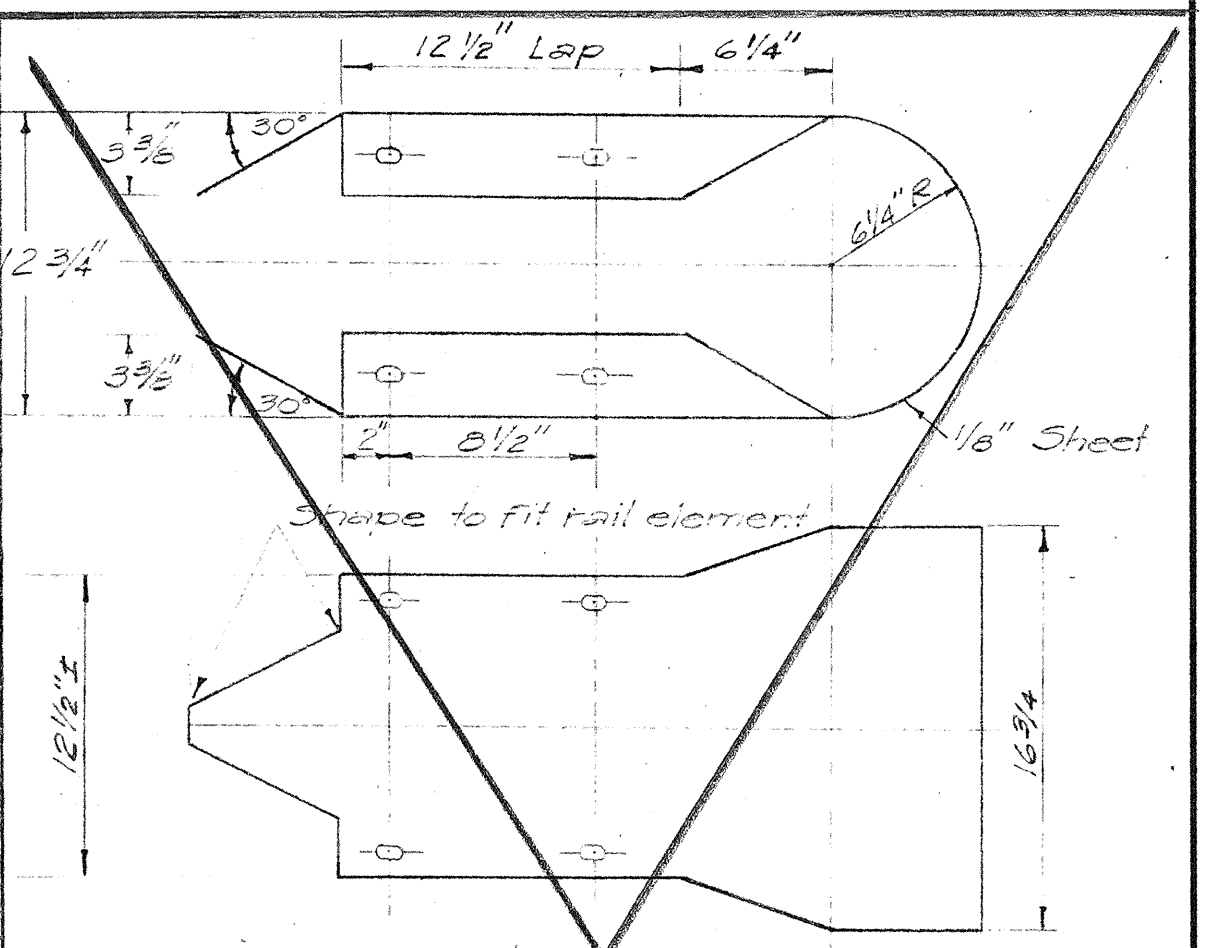
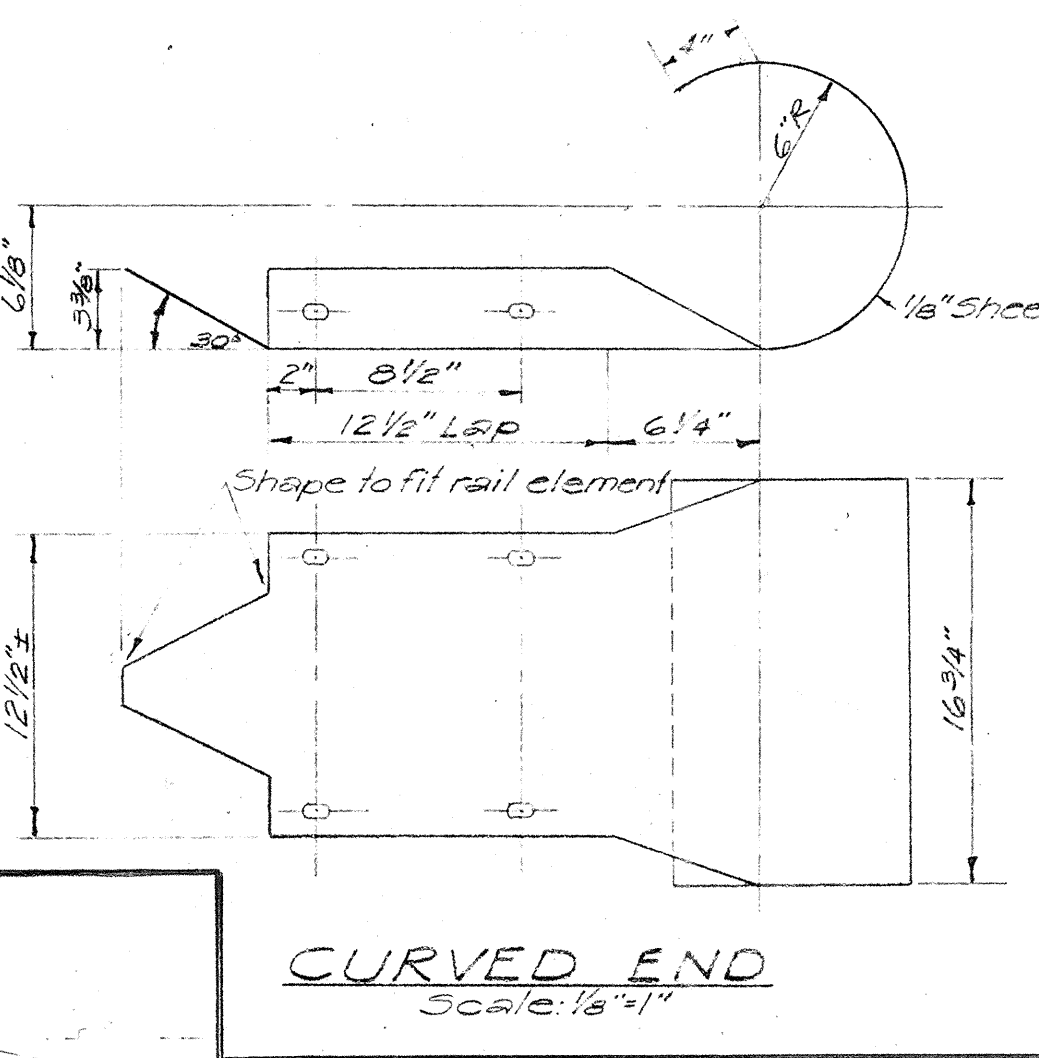
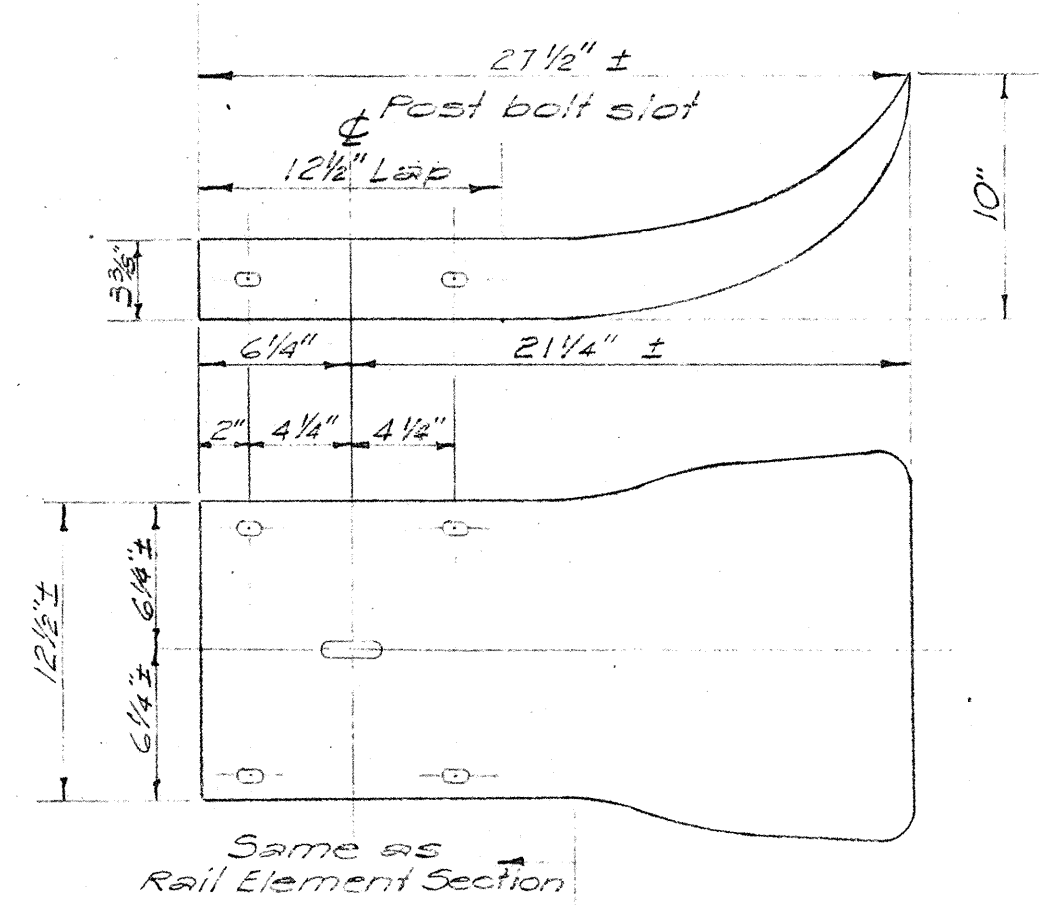
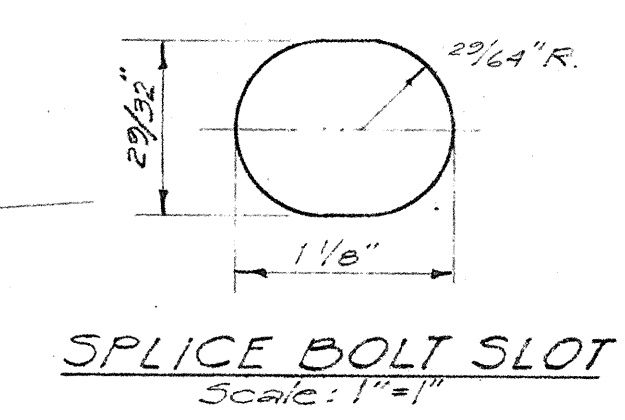
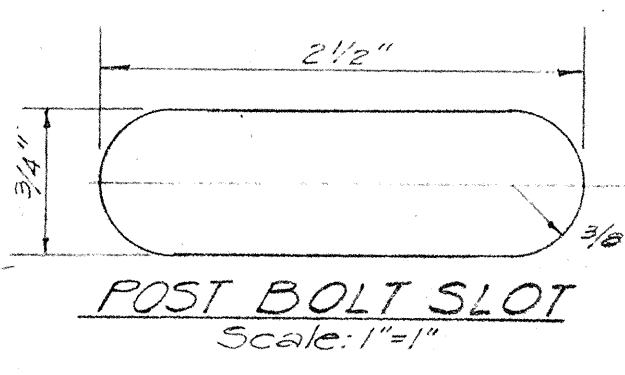
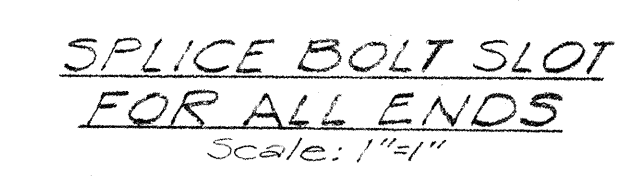
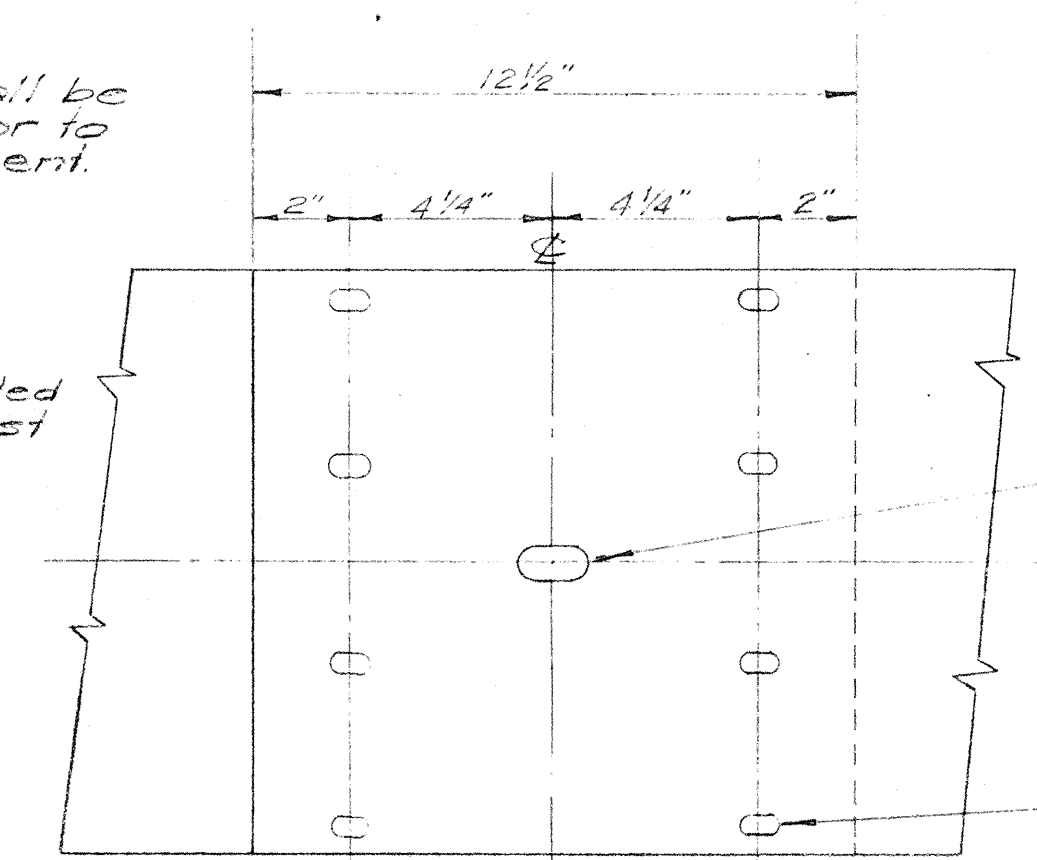
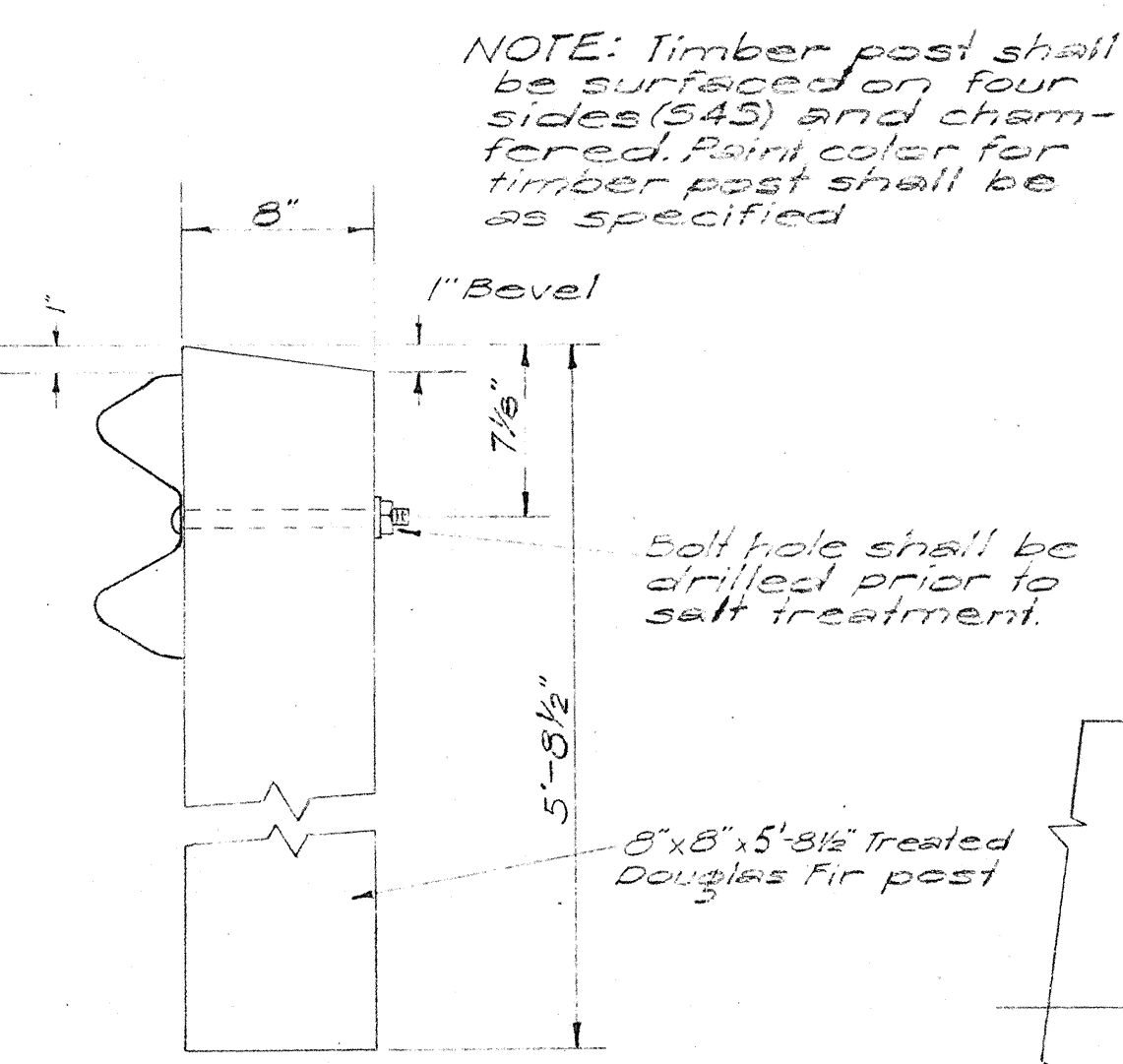
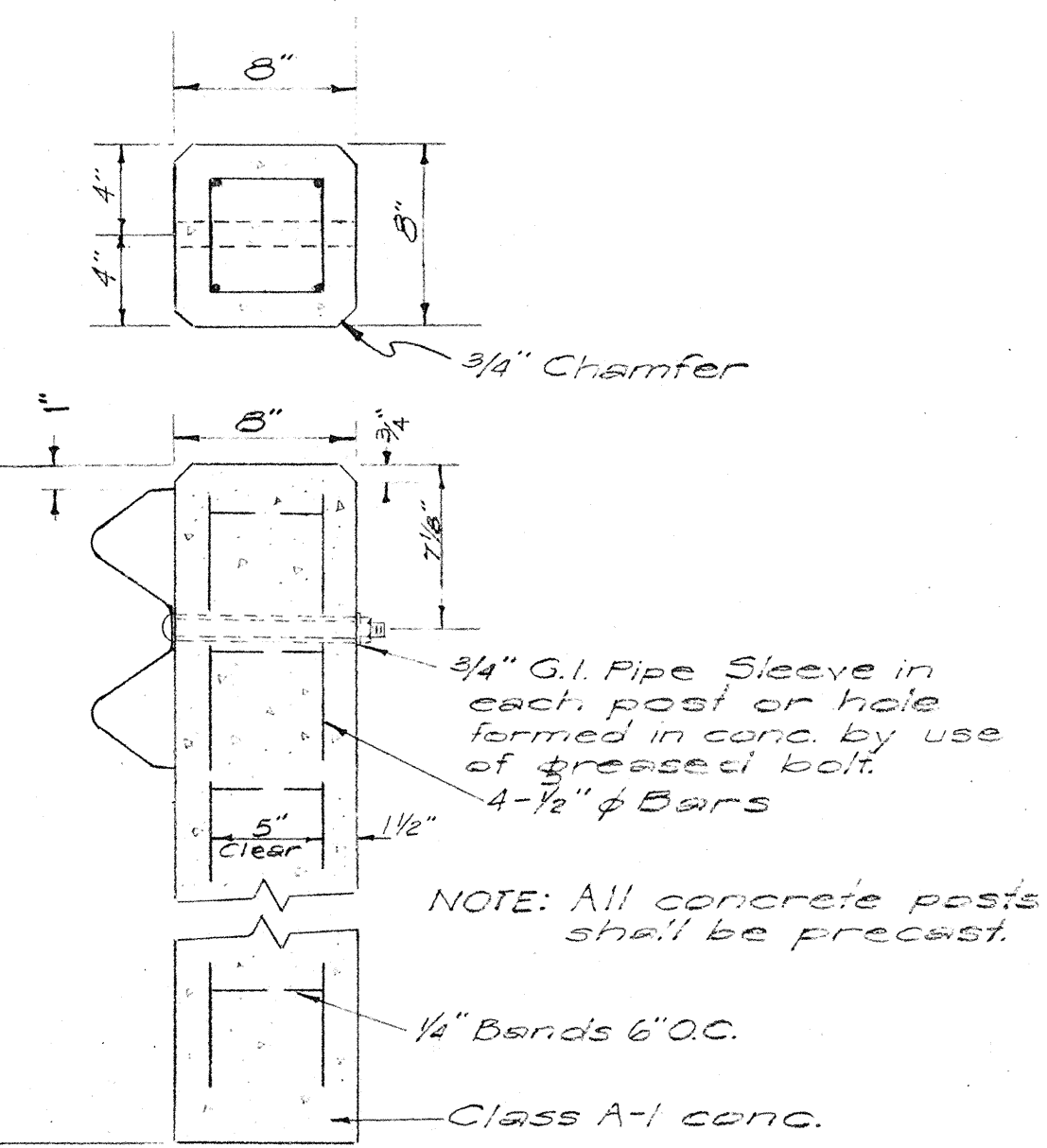
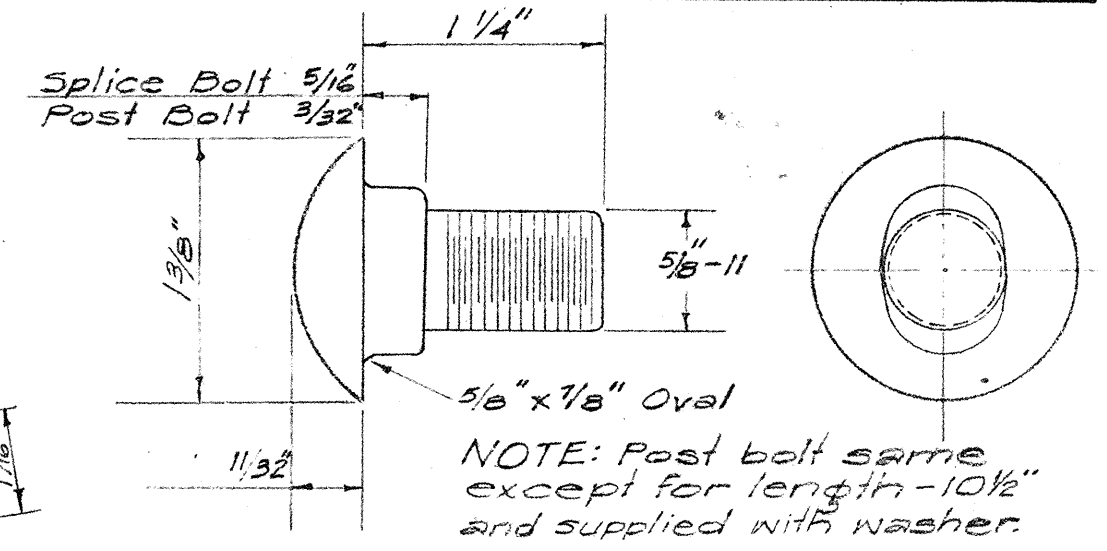
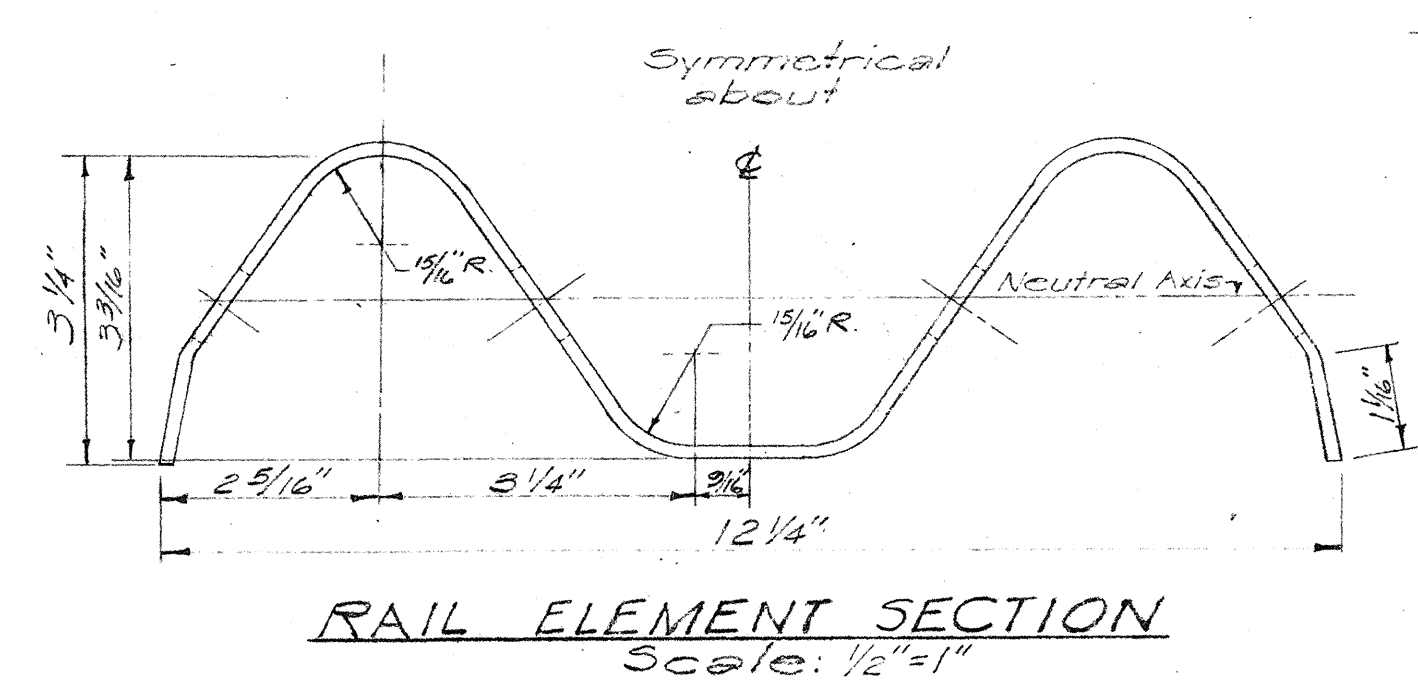
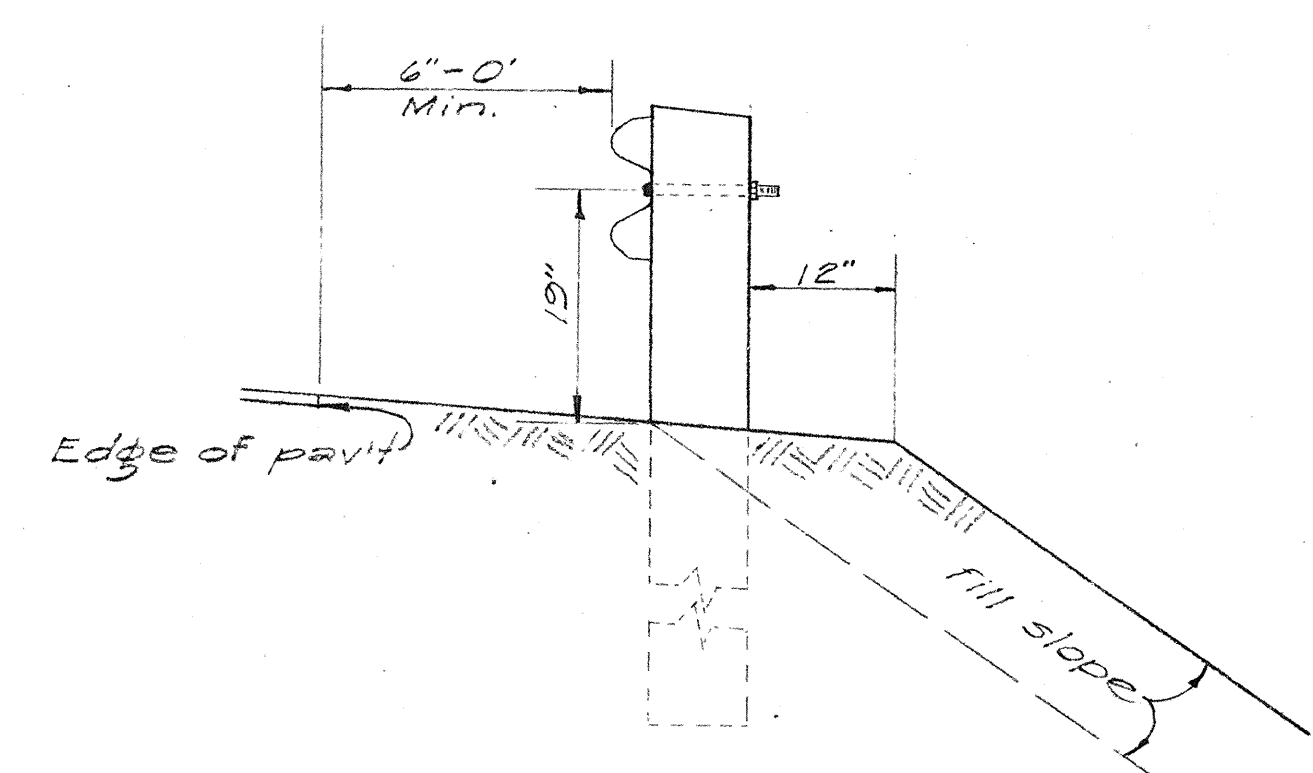
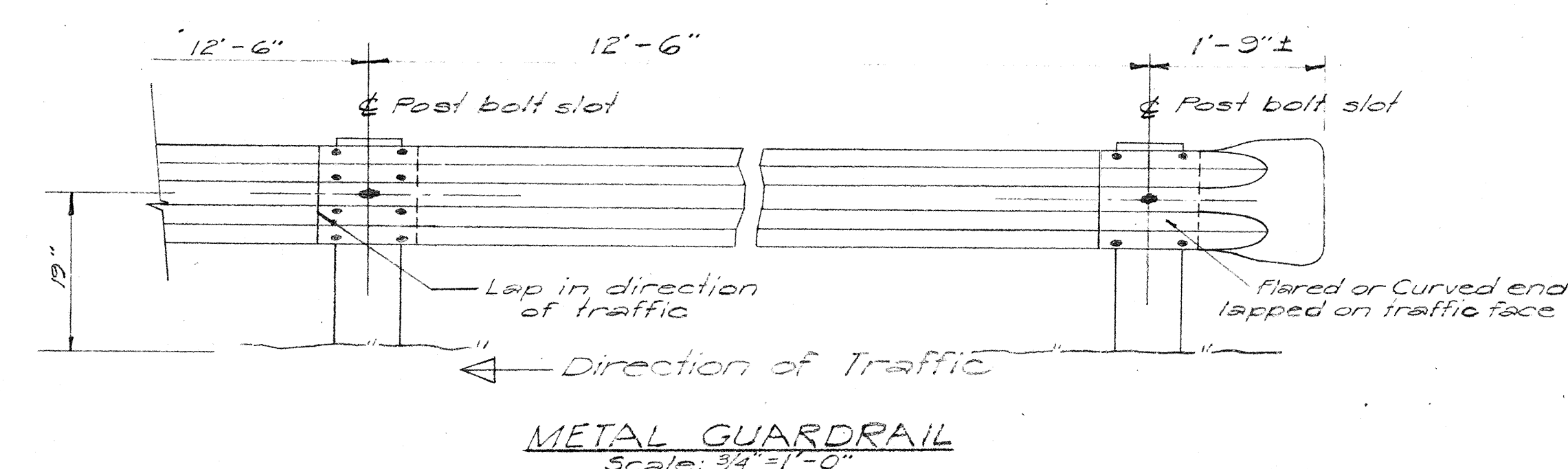


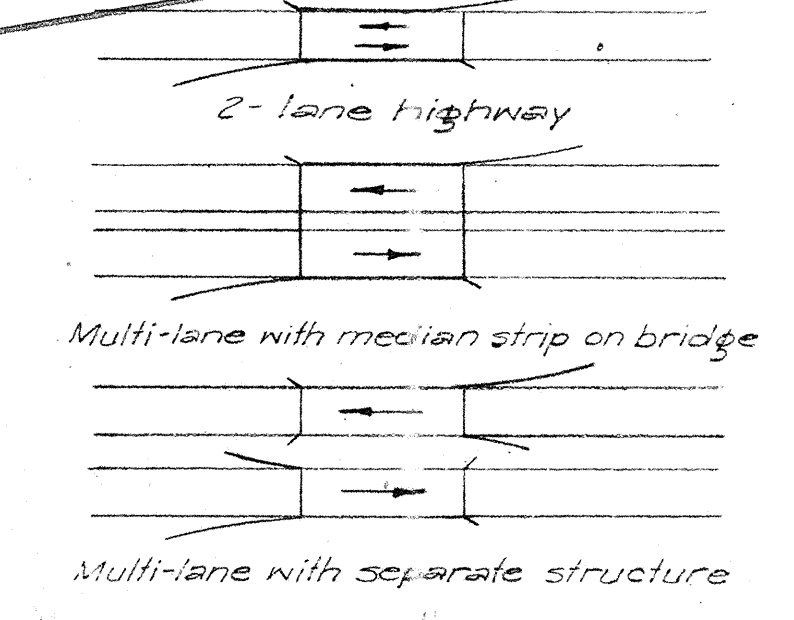
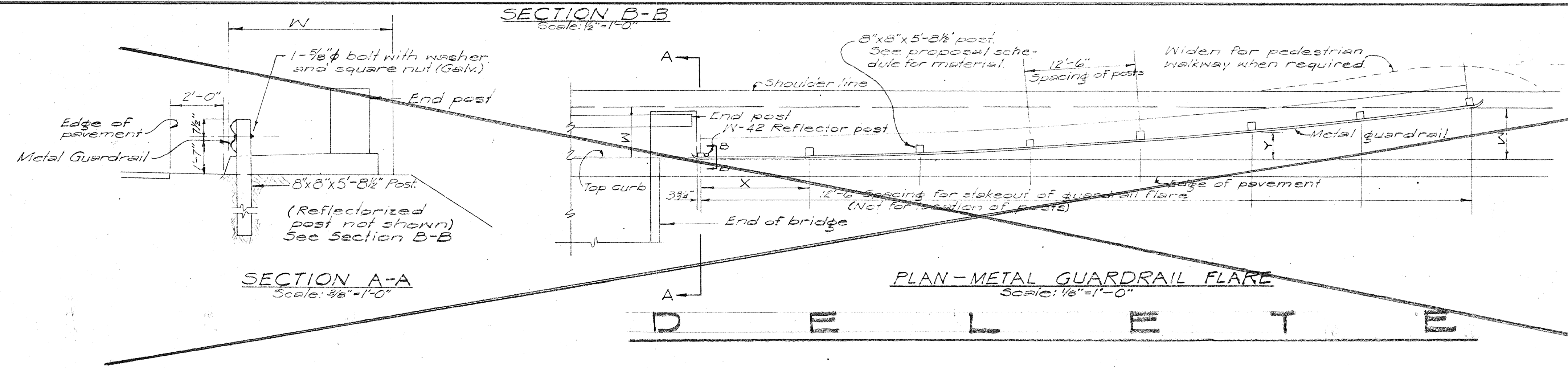


DELETE

GUARDRAIL OFFSET

X	N=3	N=4	N=5	N=6	N=7	N=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	1.38	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					5.53	5.12
112.5						6.48
125.0						8.00

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



2/17/50
4/6/59
4/28/59
7/30/59

NOTE: Sign Post size has been revised 5/13/58

NOTE: Yield Sign has been revised 11/1/57

NOTE: Stop Sign has been revised 12/10/54

DATE

SURVEY PLOTTED BY

DESIGNED BY

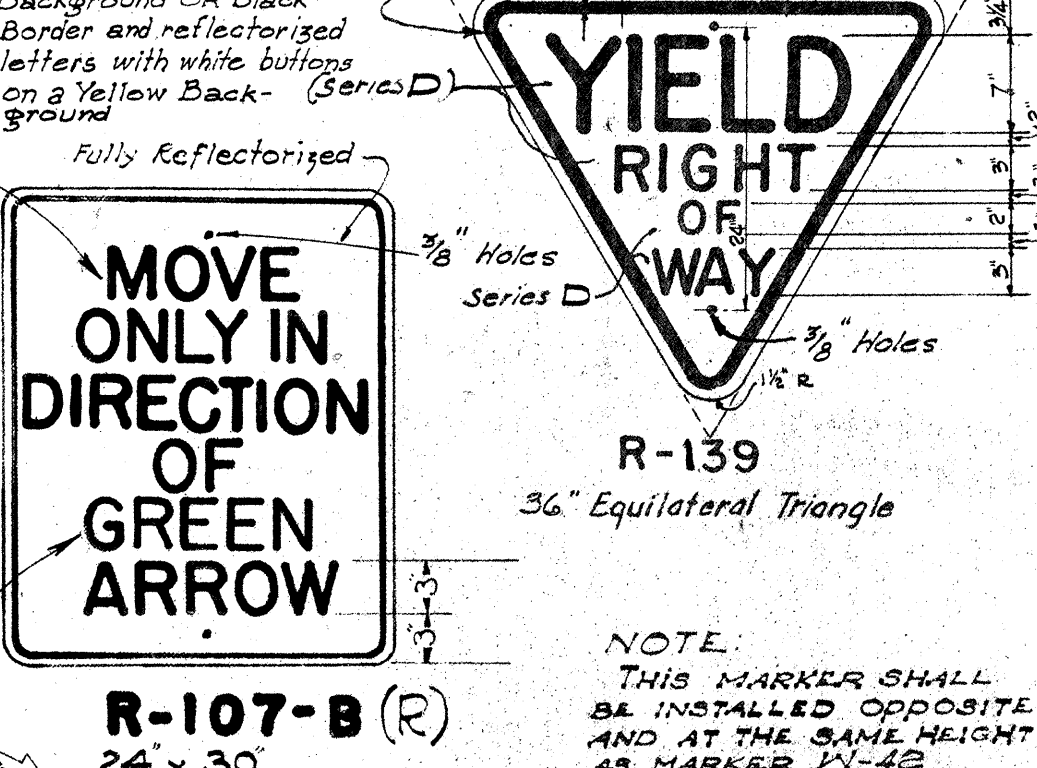
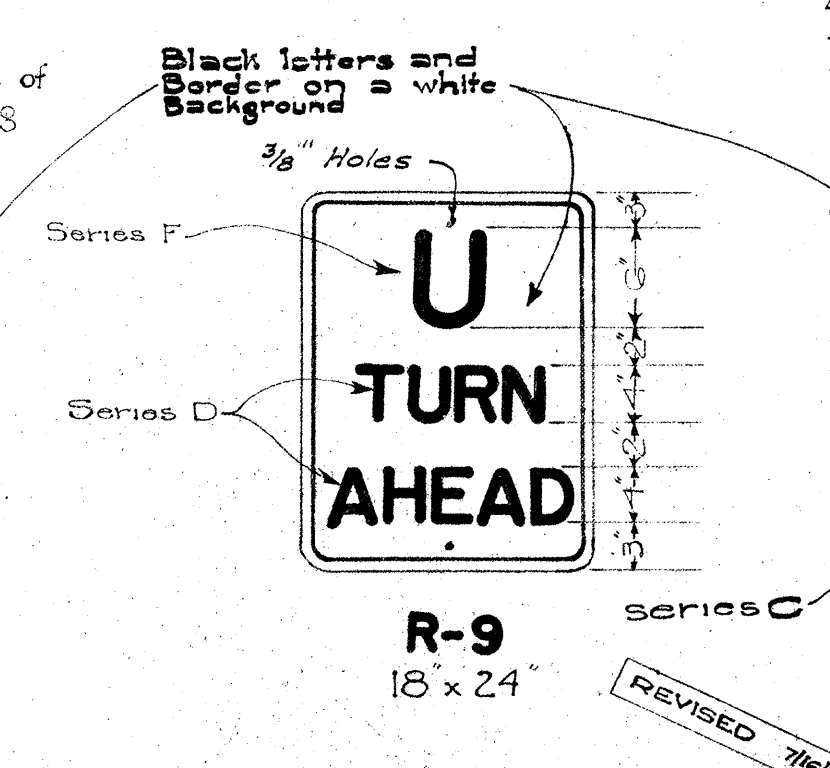
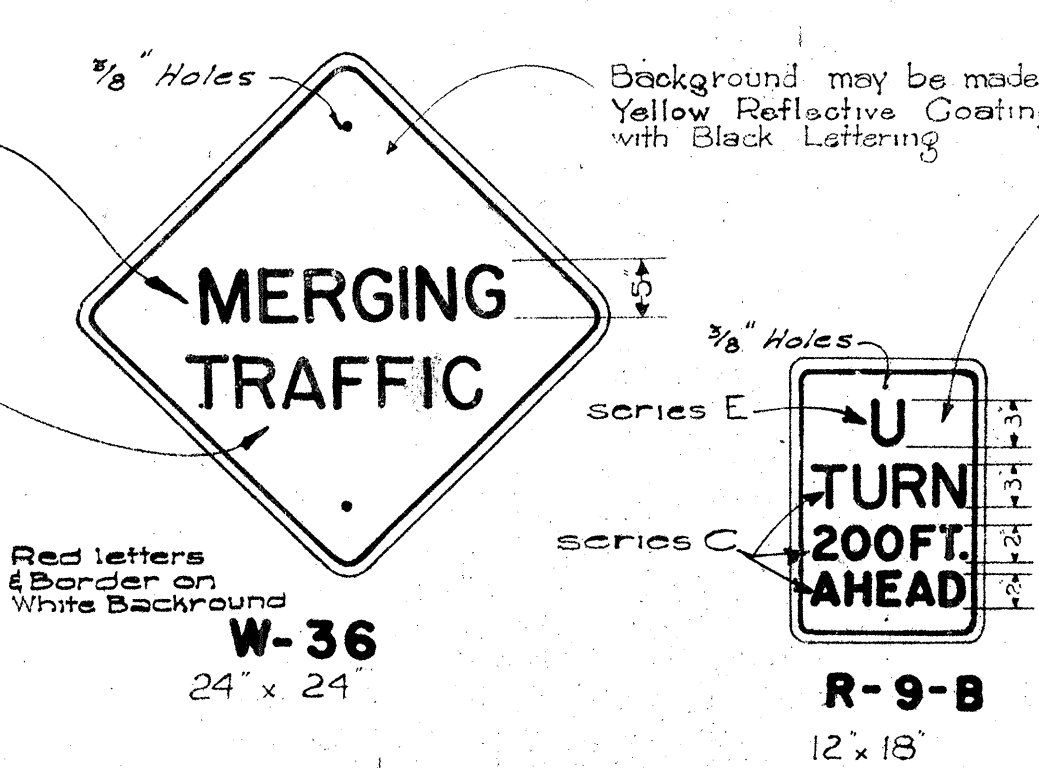
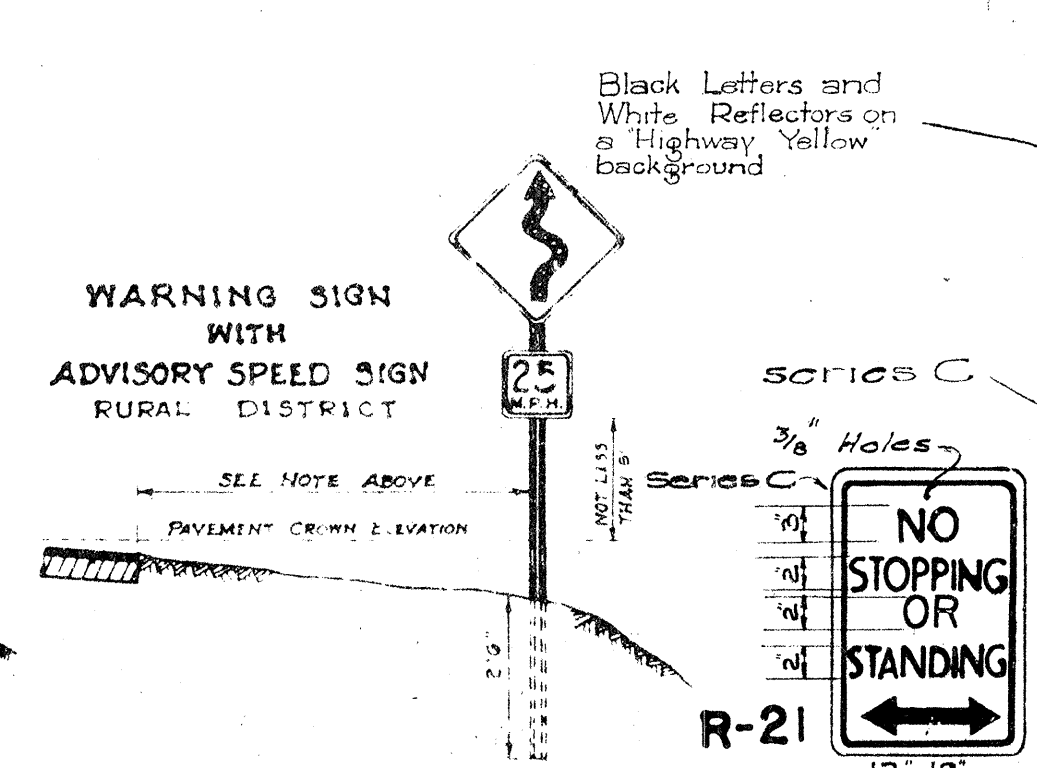
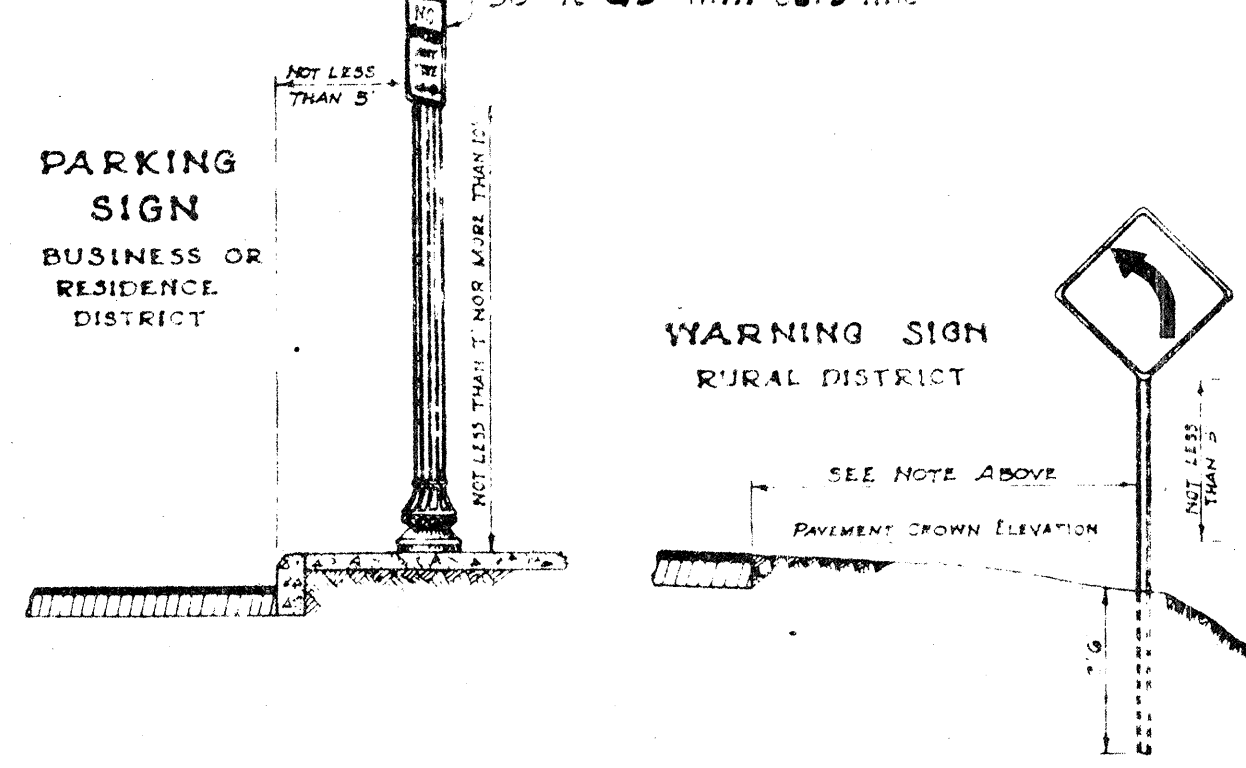
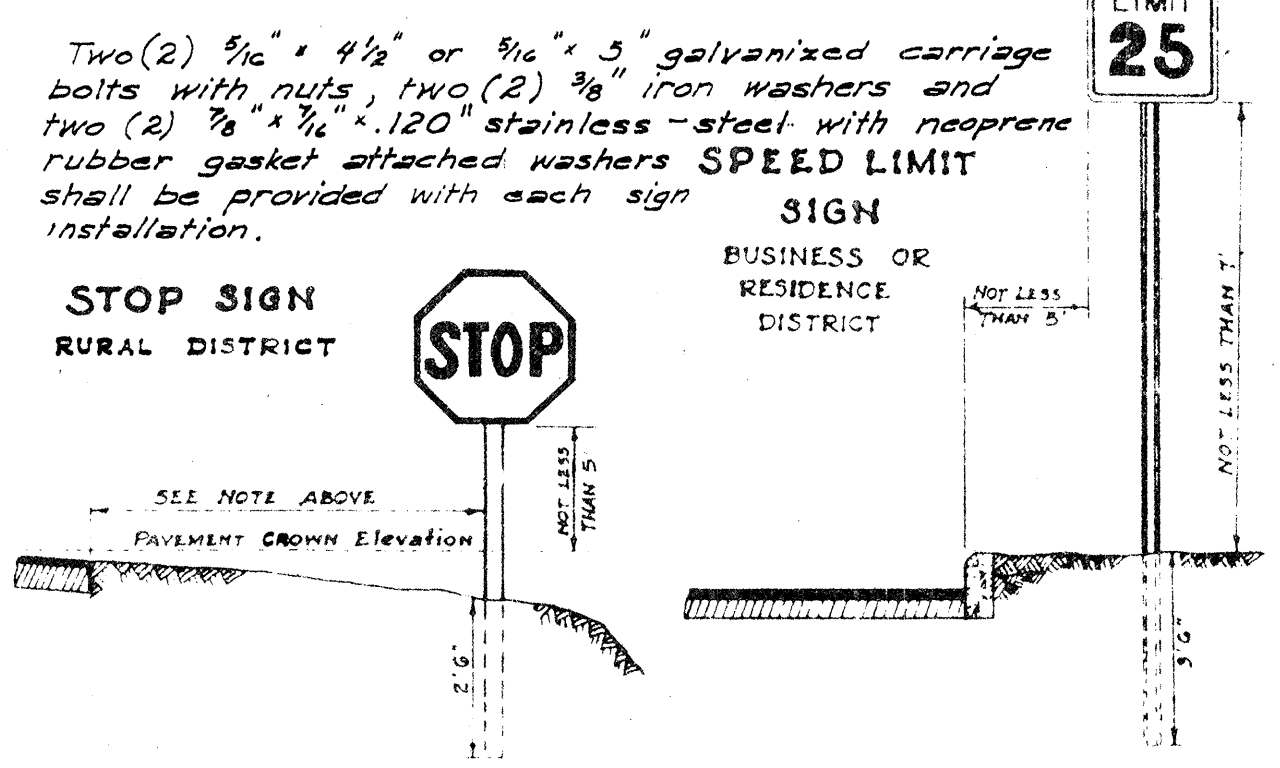
QUANTITIES BY

QUANTITIES CHECKED BY

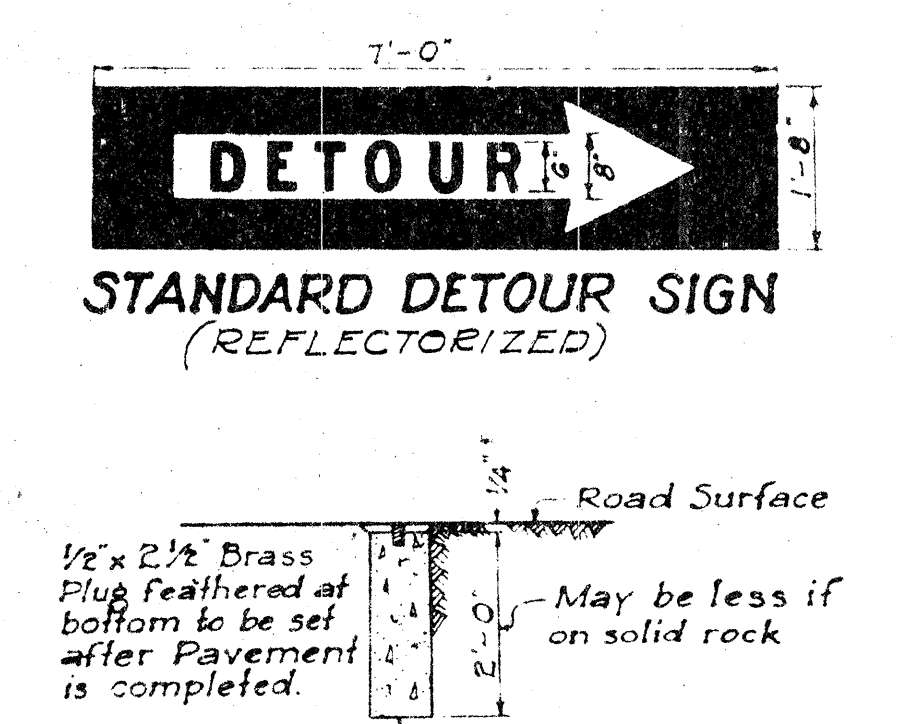
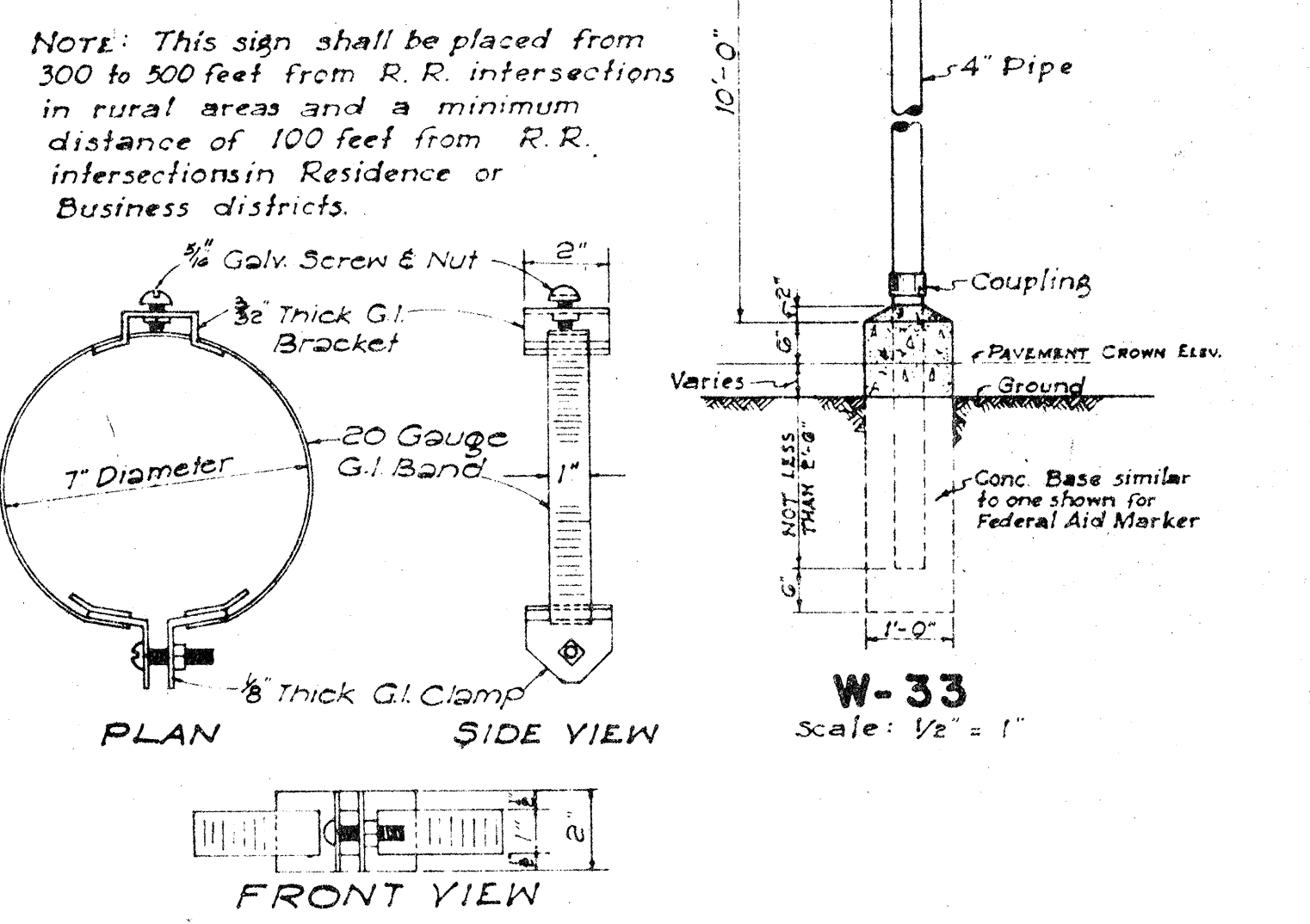
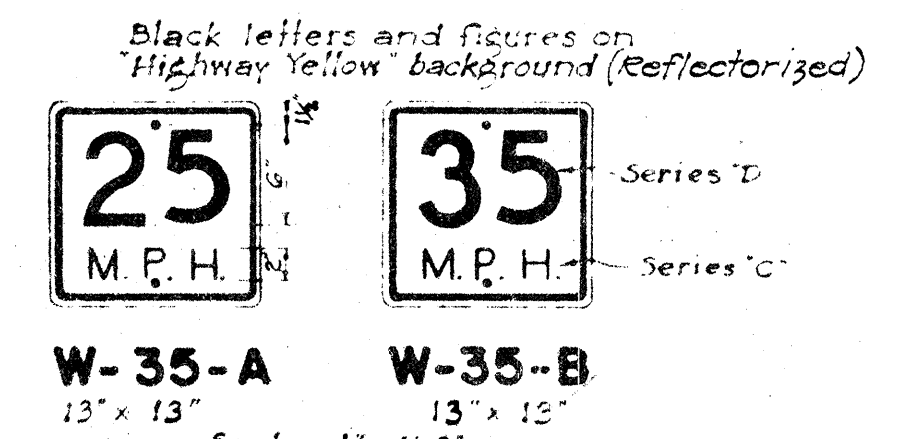
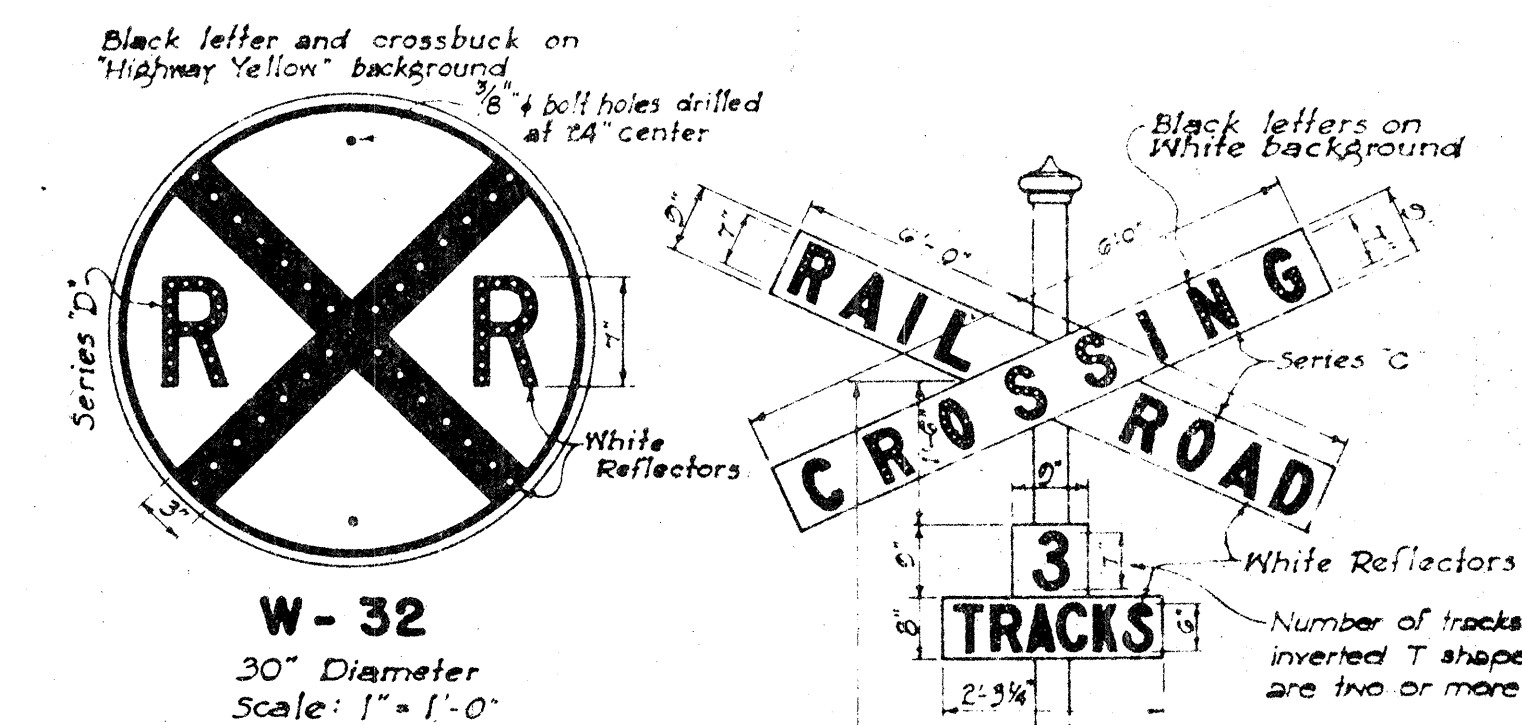
ORIGINAL PLAN

NO.

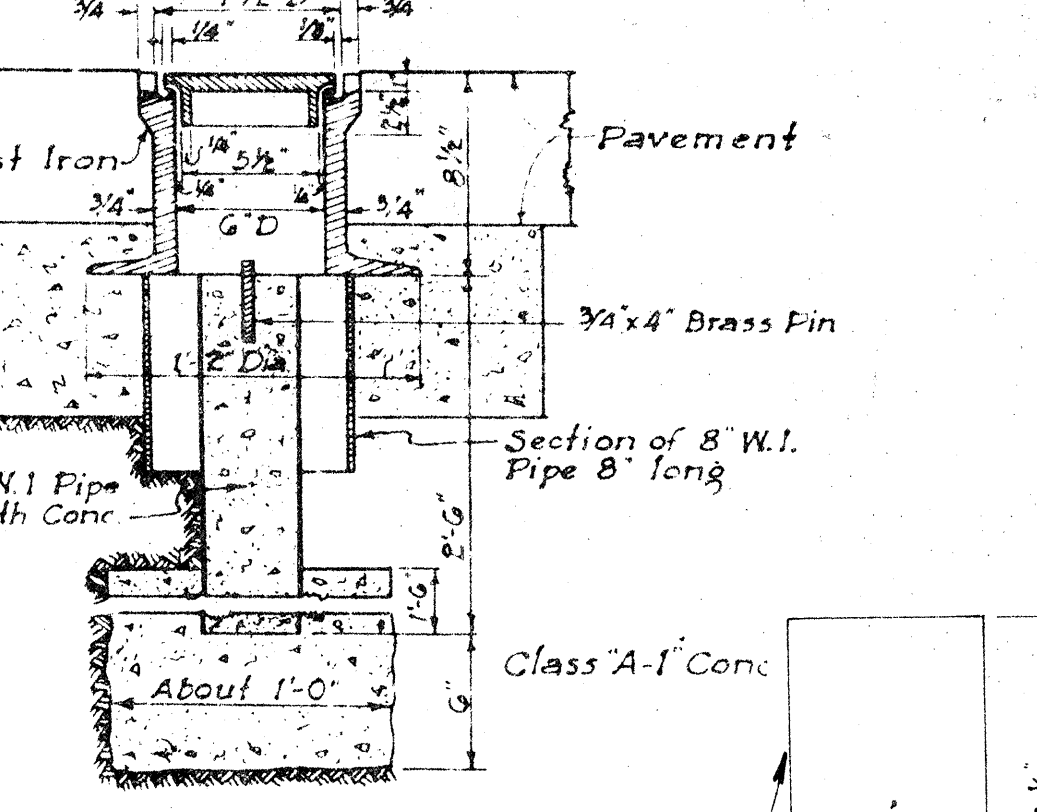
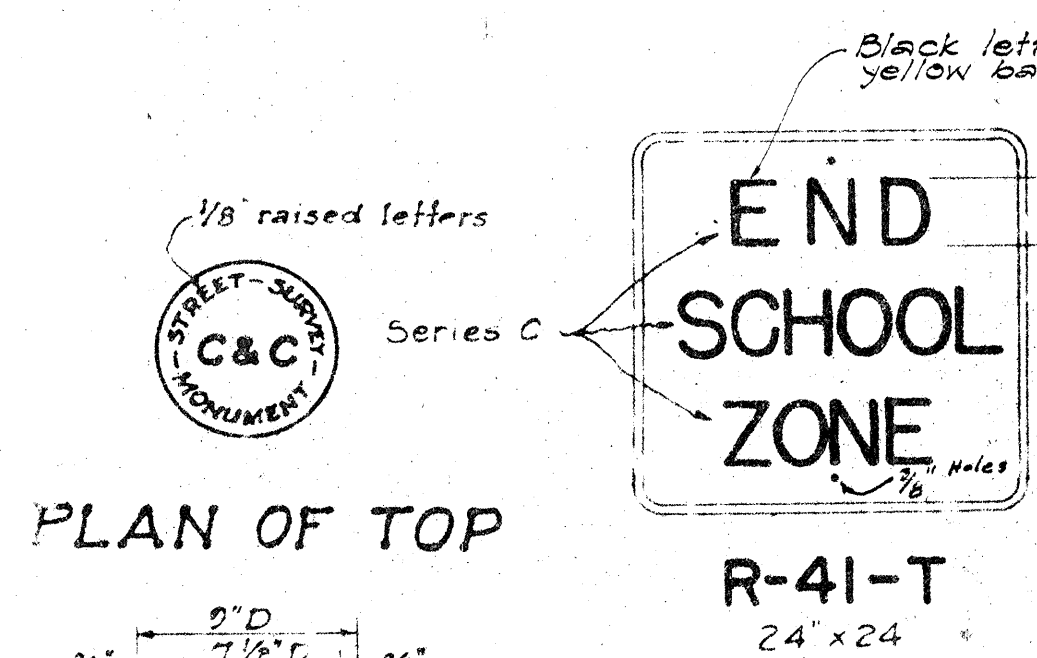
NOTE: Sign Posts shall be 3" galv std pipe for signs larger than 24" in any dimension and 2" galv std pipe for signs not over 24" in any dimension.
Two (2) 3/8" bolt holes drilled at location shown



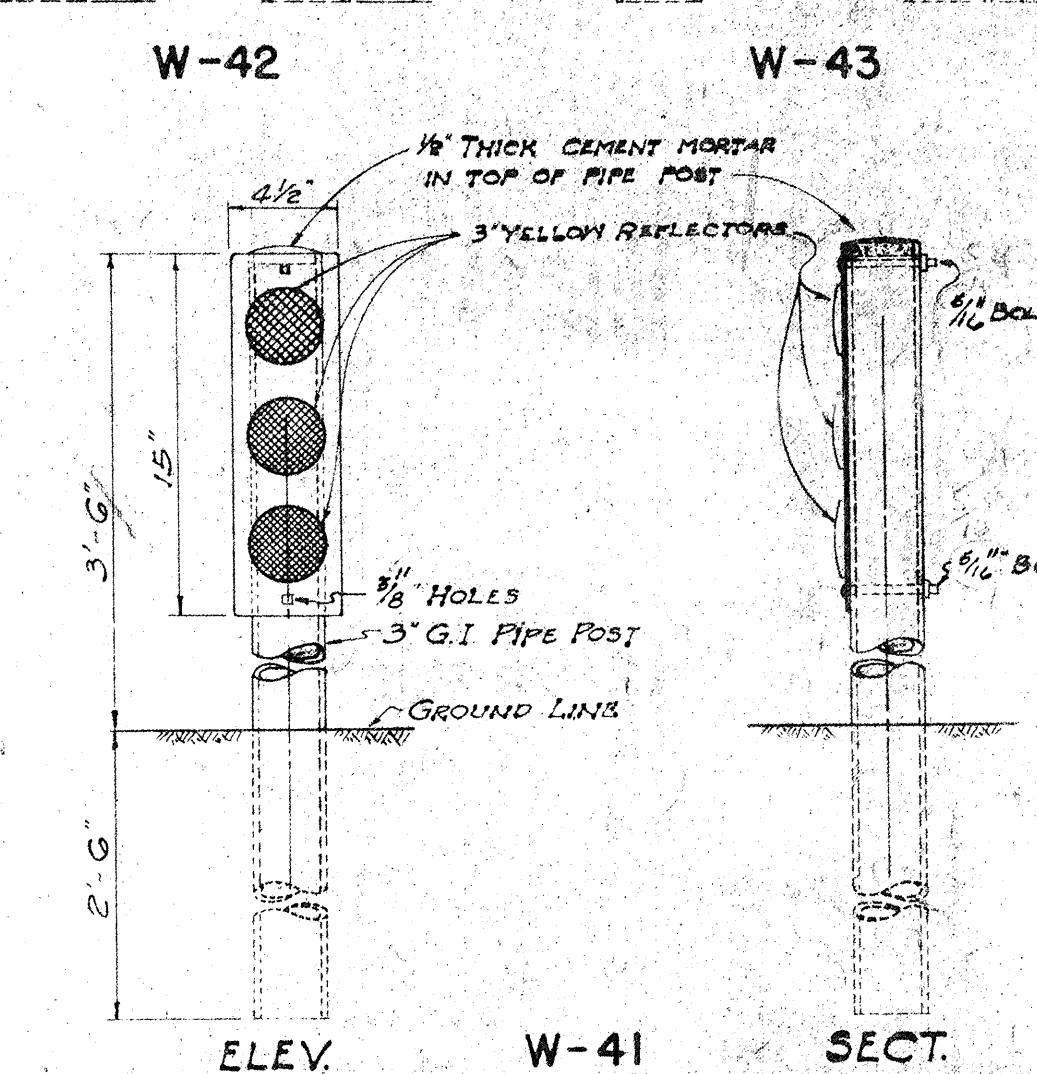
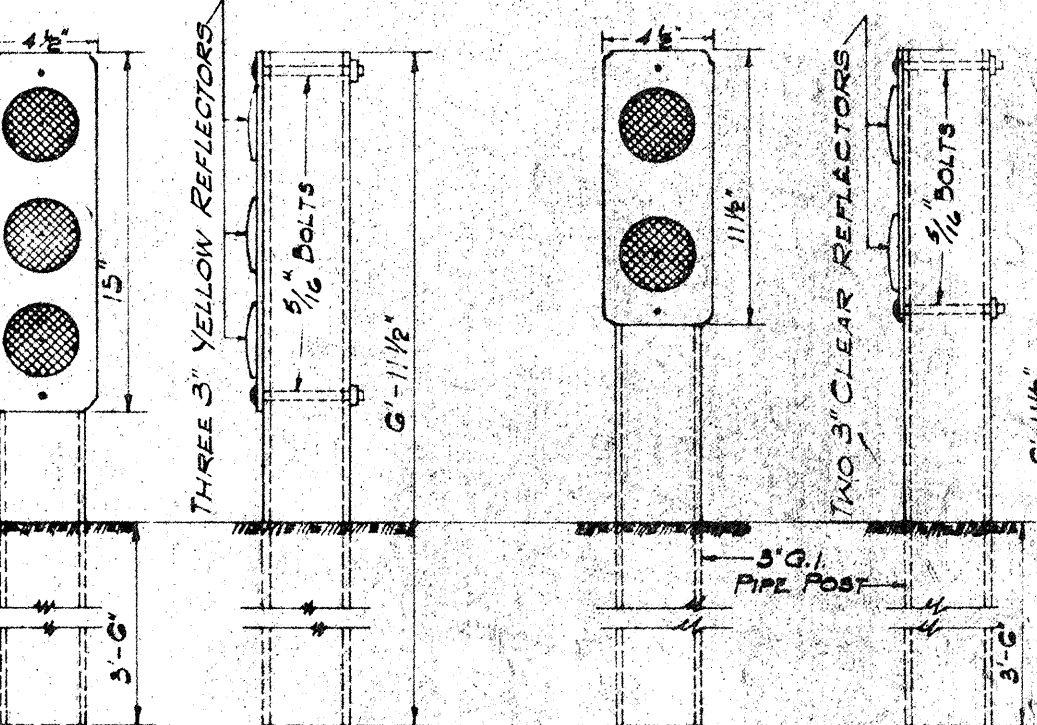
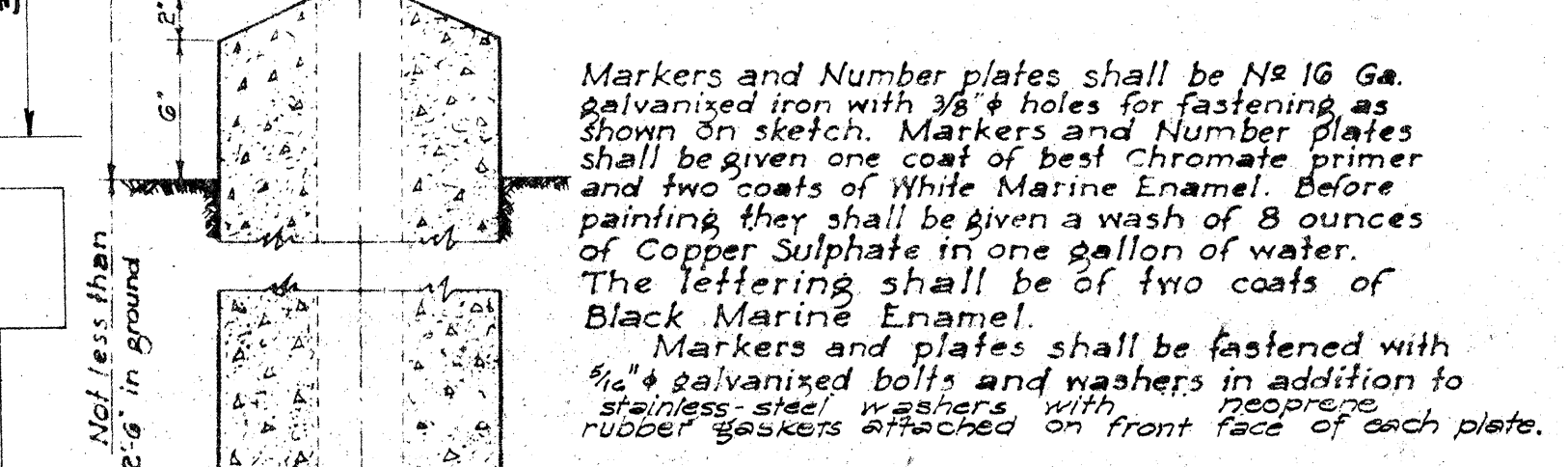
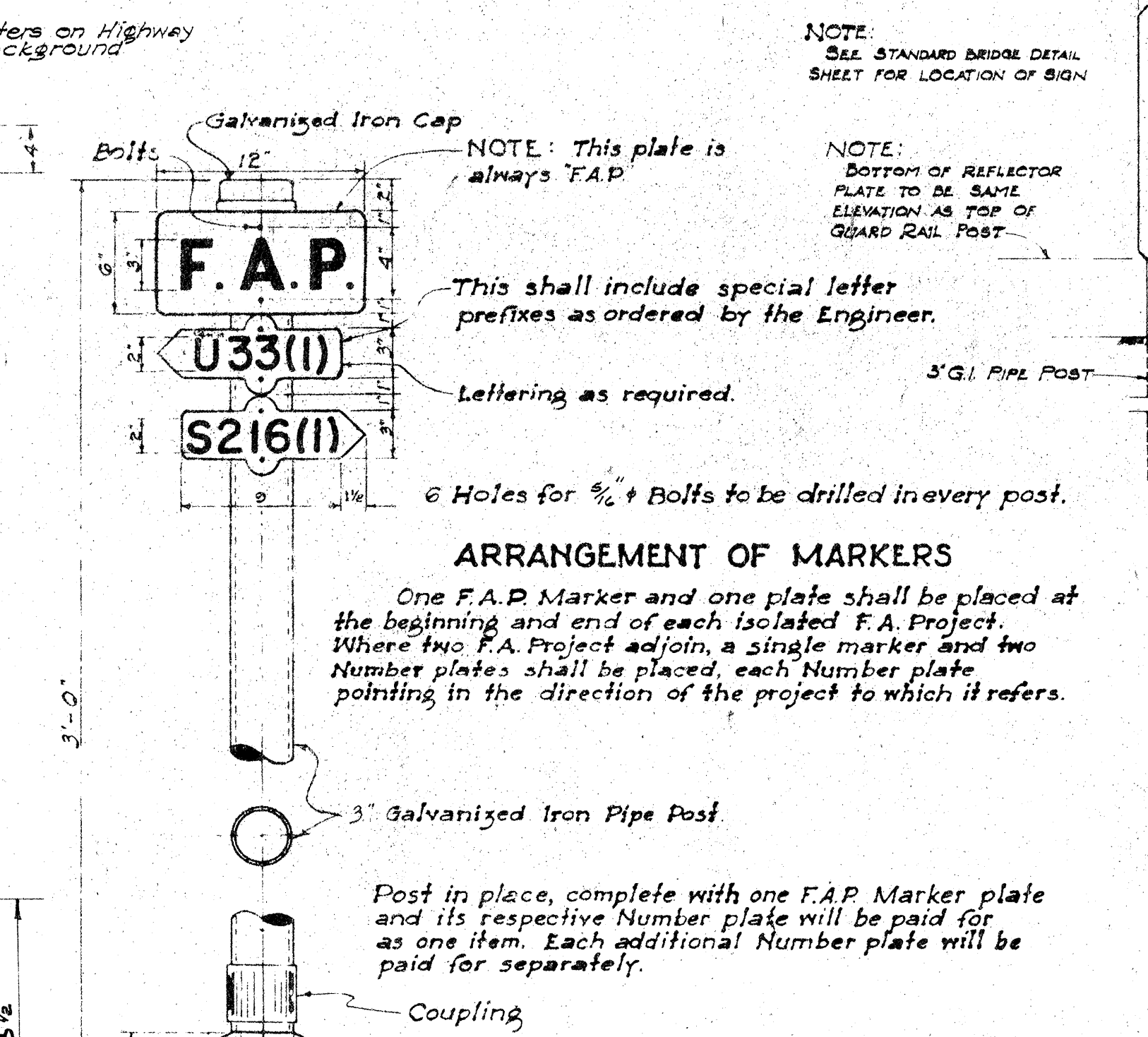
HEIGHT AND LATERAL LOCATION OF SIGNS - TYPICAL INSTALLATIONS



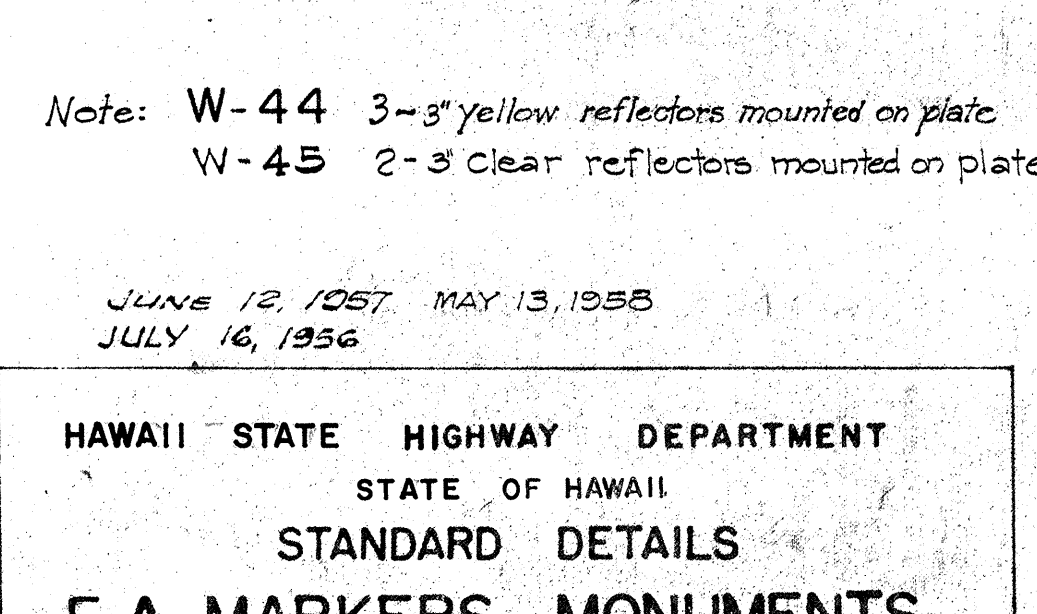
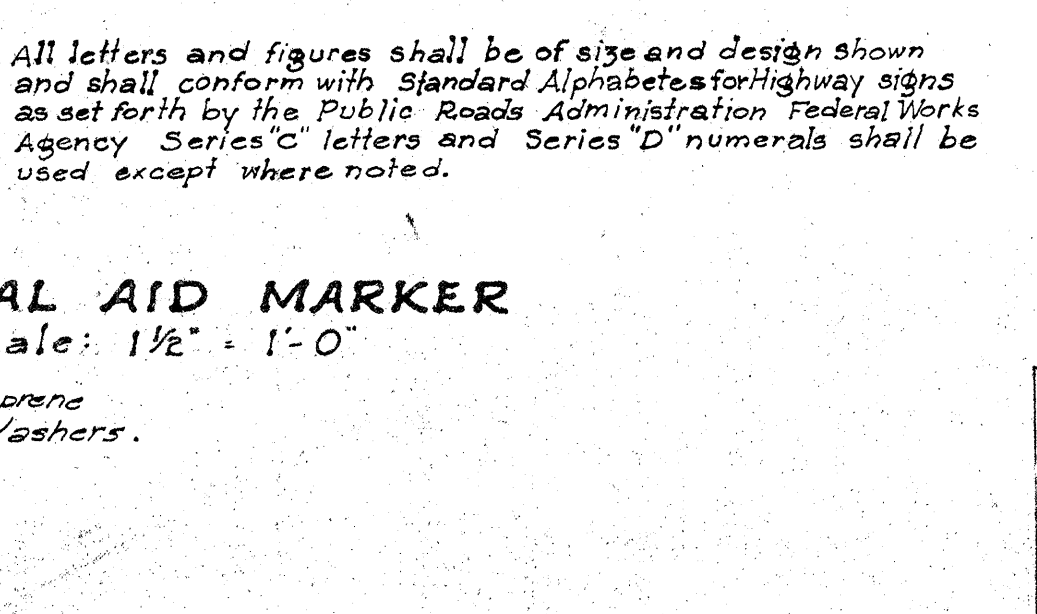
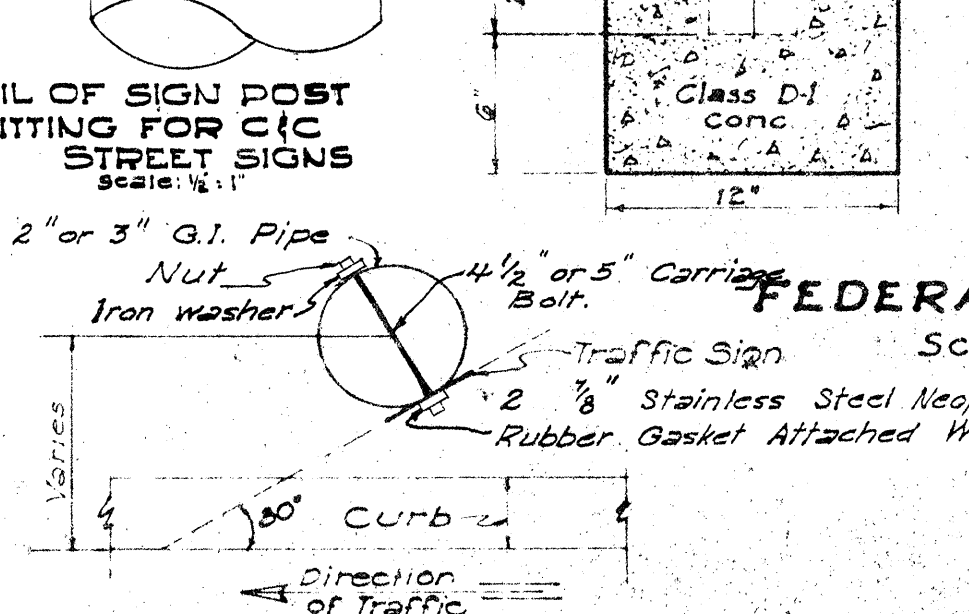
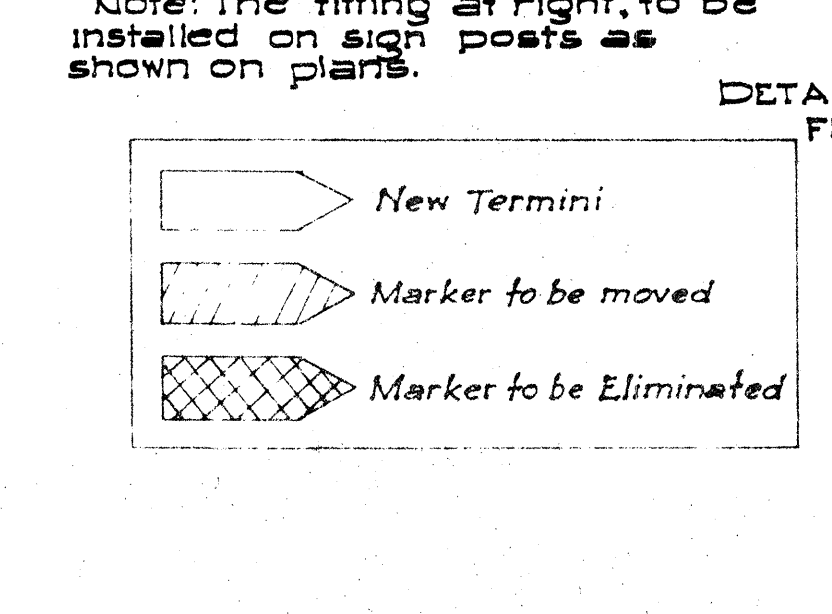
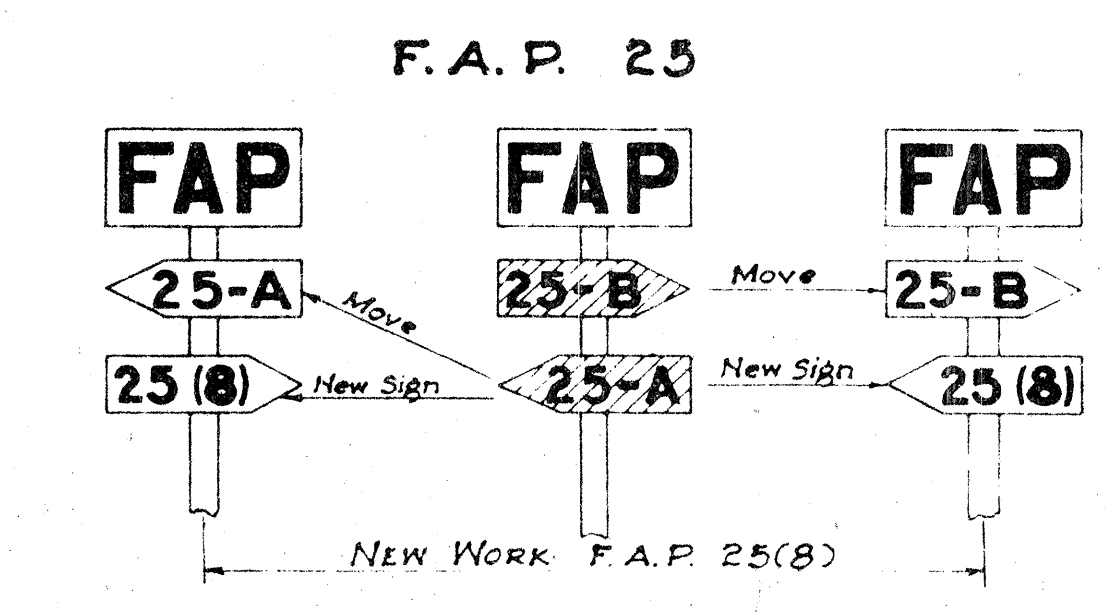
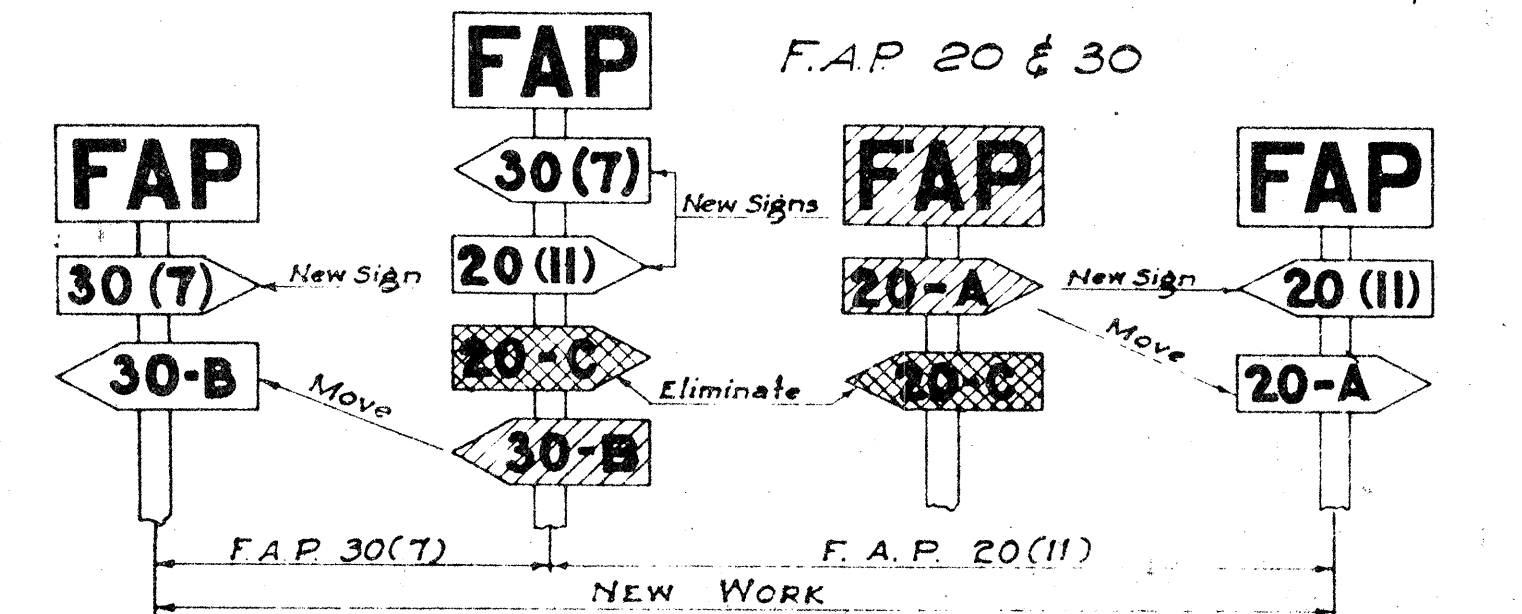
CENTER LINE MONUMENT
Scale: 1/2" = 1'-0"



STANDARD C&C STREET SURVEY MONUMENT



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



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

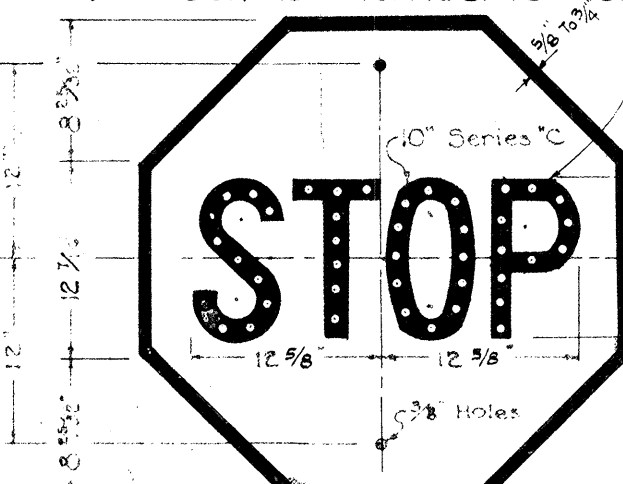
2/17/59
4/6/50
4/22/59

White Letters and Border on Red Background (background may be of red reflective sheeting). Letters to be ReflectORIZED with Buttons or Reflective Sheeting

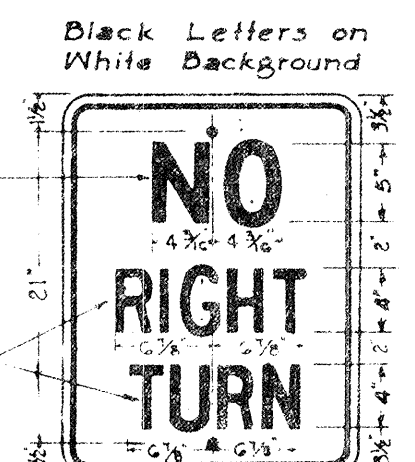
Note: All Regulatory and Warning Signs Shall Have 5/8" Bolt Holes.

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

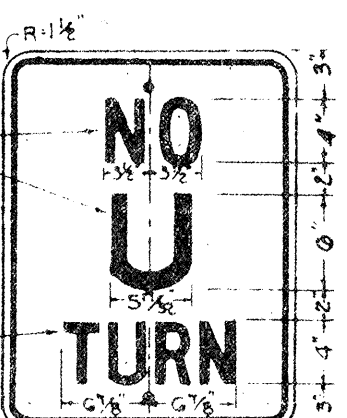
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	5-0440(1)	1959	17	78



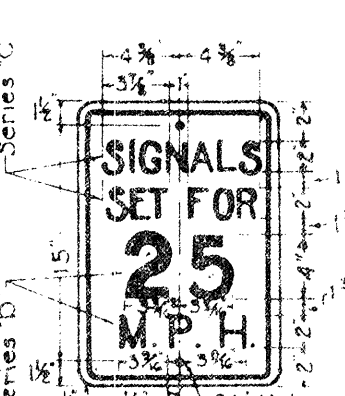
R-1
30" x 30"



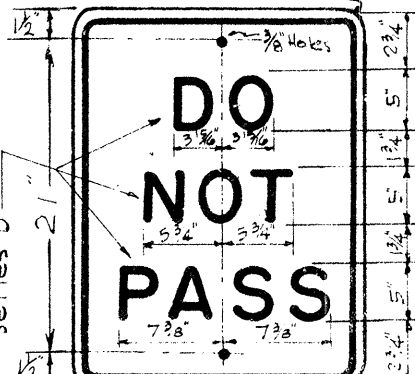
R-6
18" x 24"



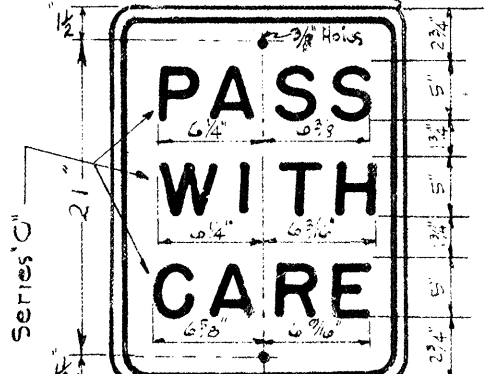
R-8
18" x 24"



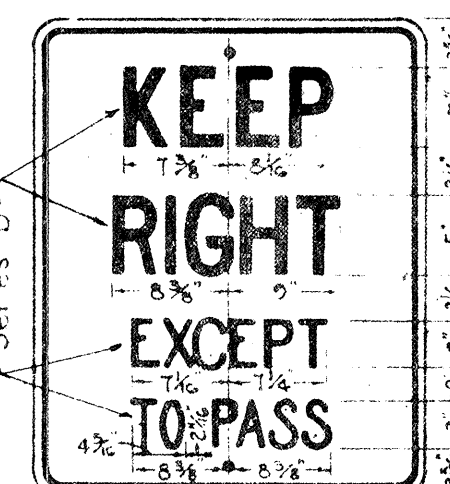
R-10
12" x 18"



R-11
18" x 24"



R-12
18" x 24"



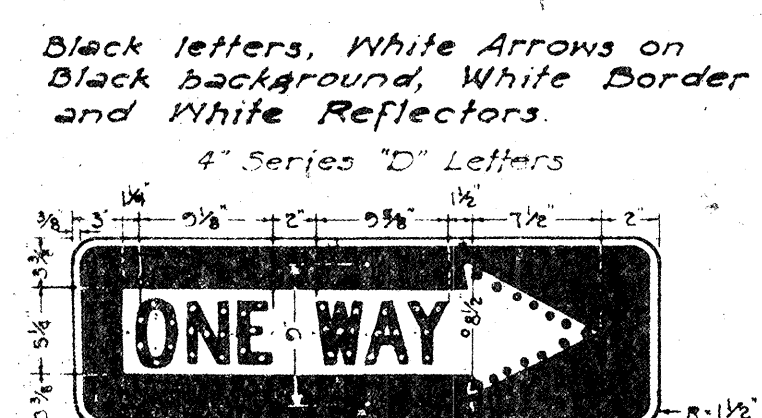
R-13
24" x 30"



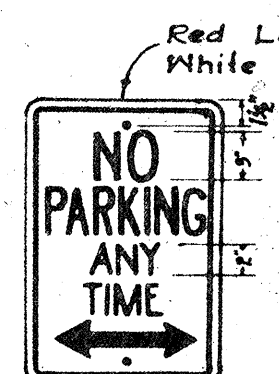
R-14 (R)
18" x 24"



R-15
24" x 24"



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



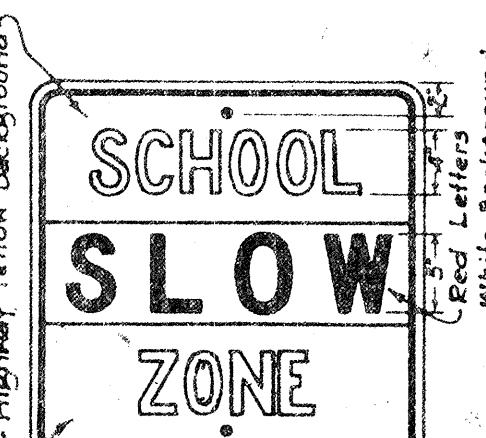
R-18
12" x 18"



R-26
12" x 18"



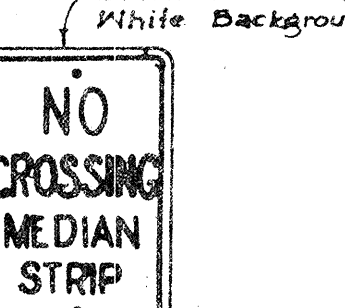
R-29
24" x 30"



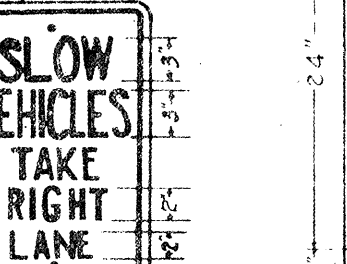
R-41-S
24" x 24"



R-42-S
12" x 18"



R-43-S
12" x 18"



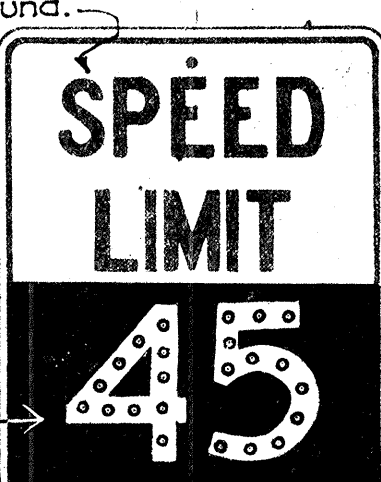
R-44-S
12" x 18"



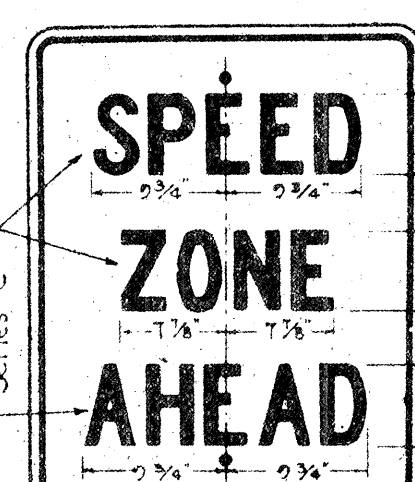
R-102-A
24" x 30"



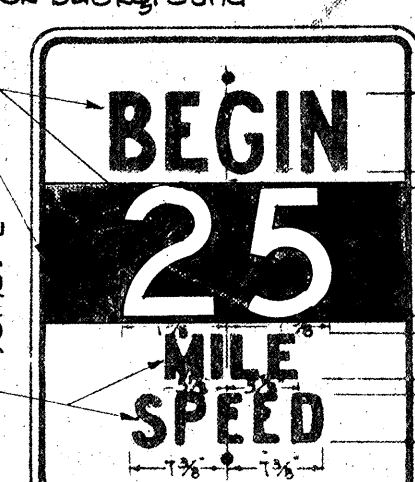
R-102-B
24" x 30"



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



R-104
24" x 30"



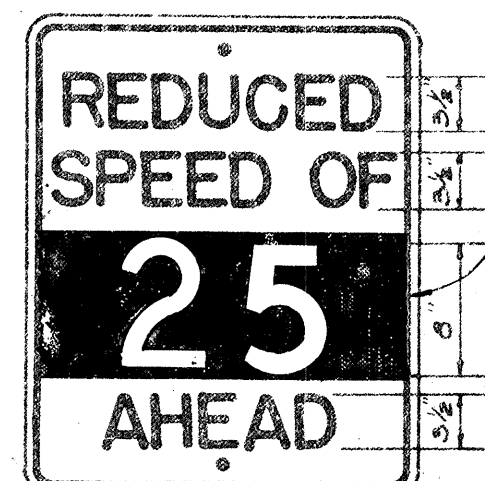
R-105-A (R)
24" x 30"



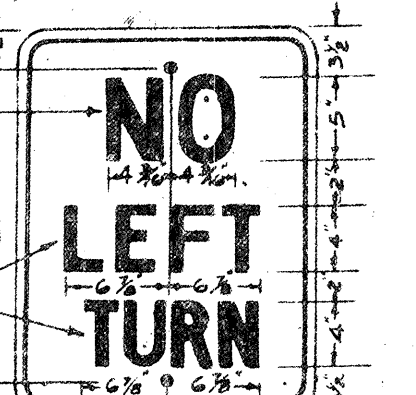
R-105-B
24" x 30"



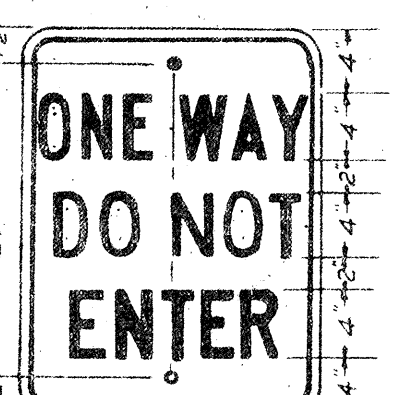
R-105-C
24" x 30"



R-104-A
24" x 30"



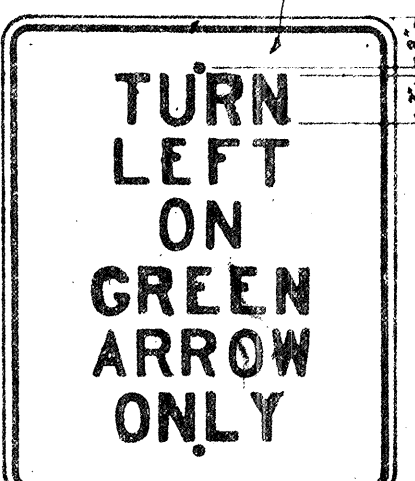
R-7
18" x 24"



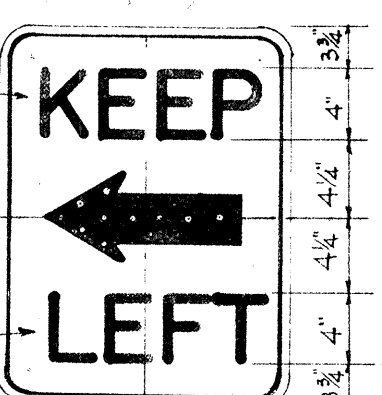
R-66
18" x 24"



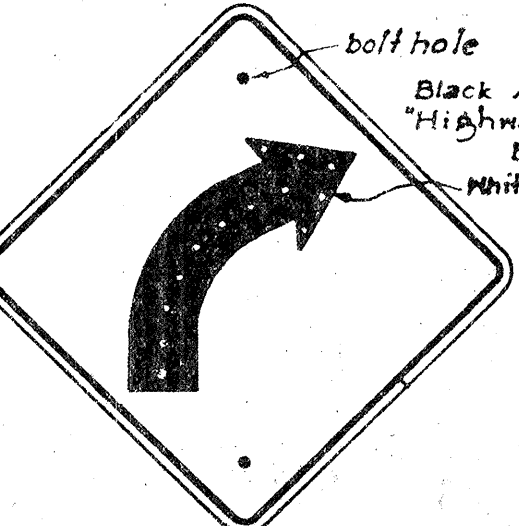
R-108
24" x 30"



R-107-A
24" x 30"



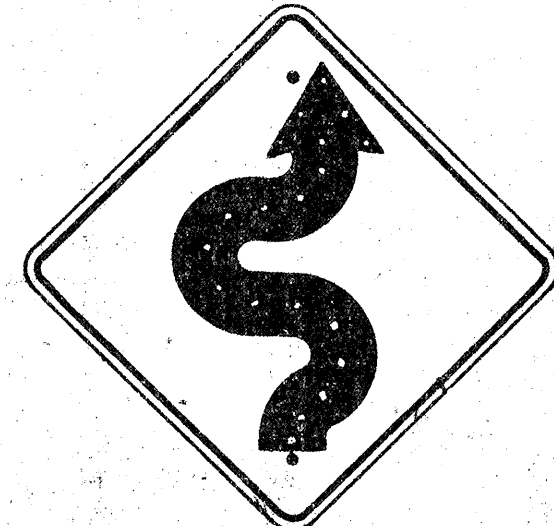
R-14-A
24" x 24"



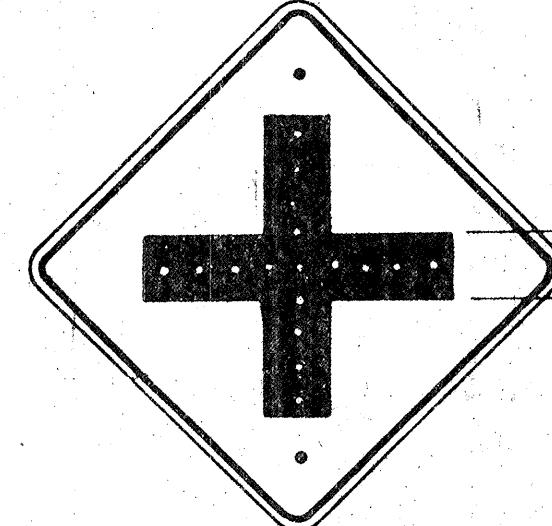
W-2-R
*W-2-L
24" x 24"



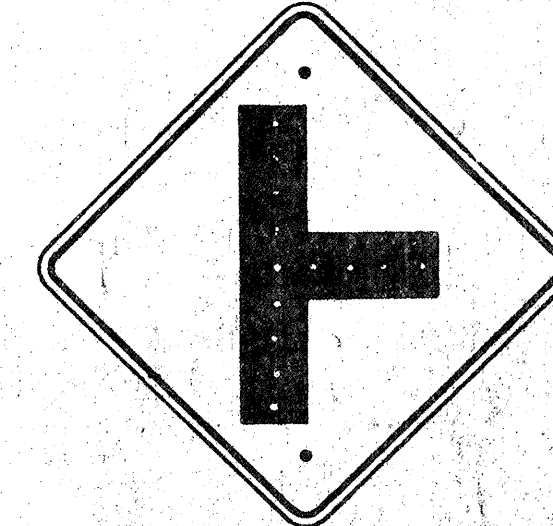
W-4-R
*W-4-L
24" x 24"



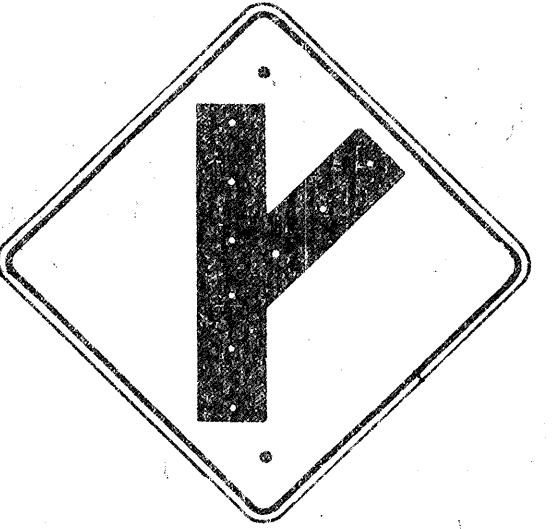
W-5-R
*W-5-L
24" x 24"



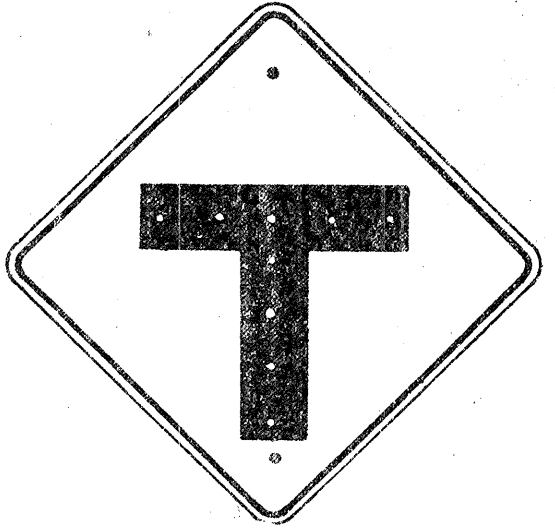
W-6
24" x 24"



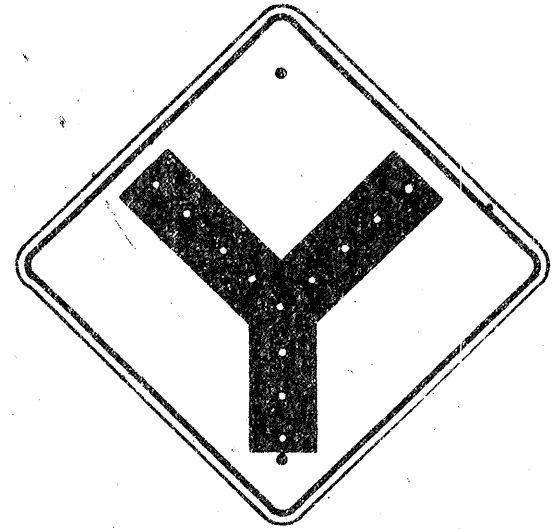
W-7
24" x 24"



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



W-9
24" x 24"



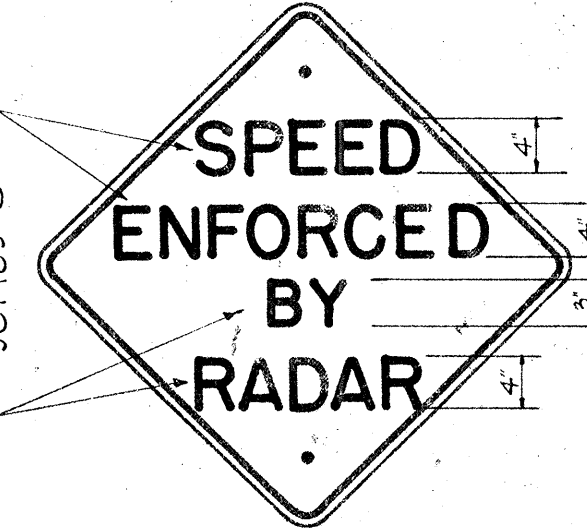
W-10
24" x 24"



W-13
24" x 24"



W-14
24" x 24"



W-40
24" x 24"



W-19
30" x 30"



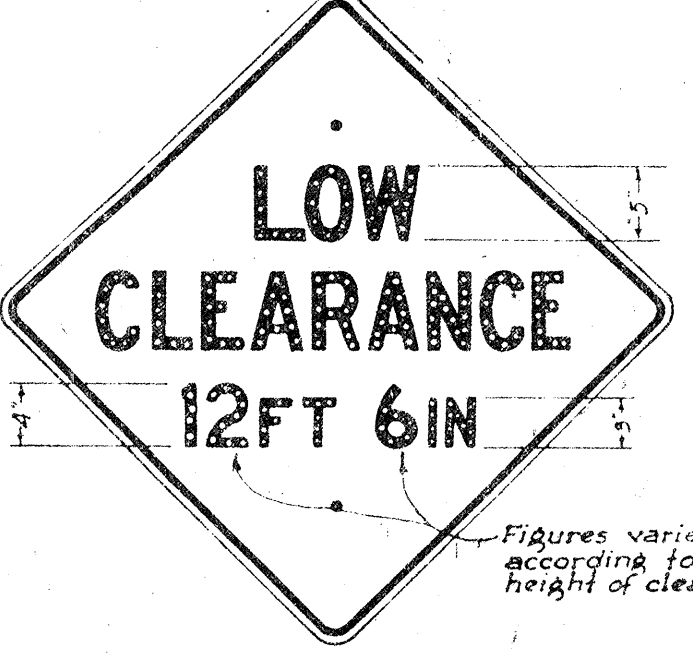
W-20
30" x 30"



W-21
30" x 30"



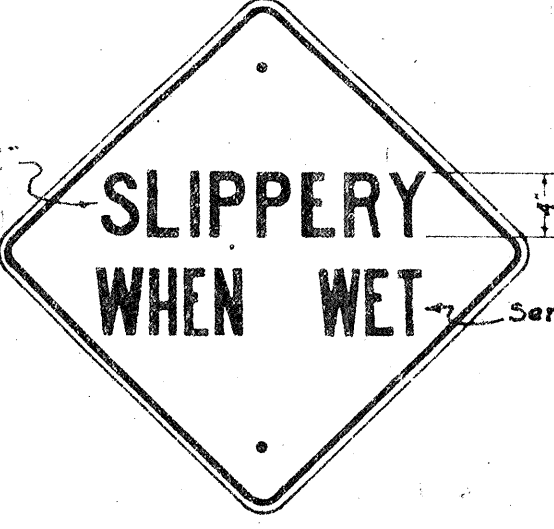
W-22
24" x 24"



W-24
30" x 30"



W-25
24" x 24"



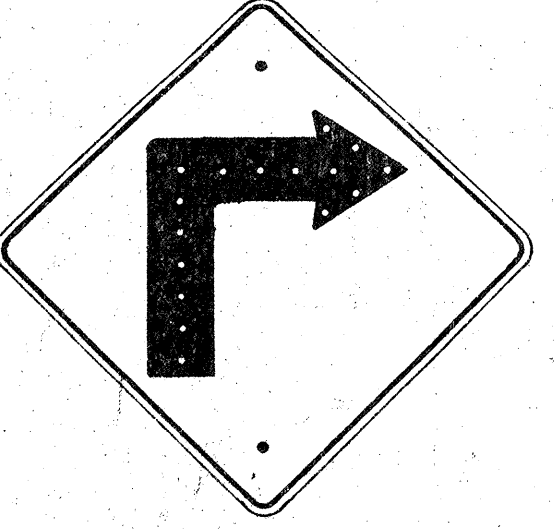
W-29
24" x 24"



W-59
24" x 24"



W-39
24" x 24"



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

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

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.

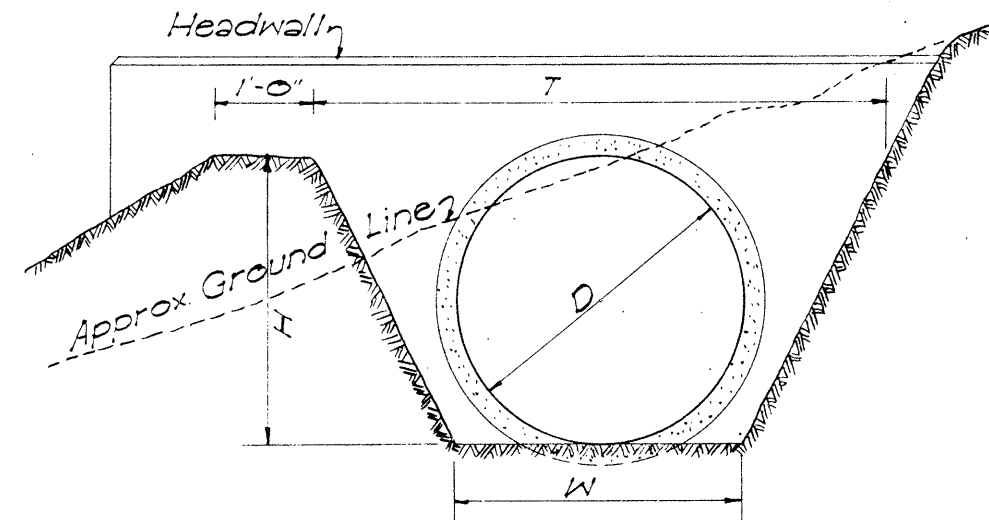
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
REGULATORY & WARNING SIGNS
Scale: 1" = 1'
APPROVED: _____ April 23, 1959
STATE HIGHWAY ENGINEER

8238.17

2/17/59

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	50-4400	1959	18	78

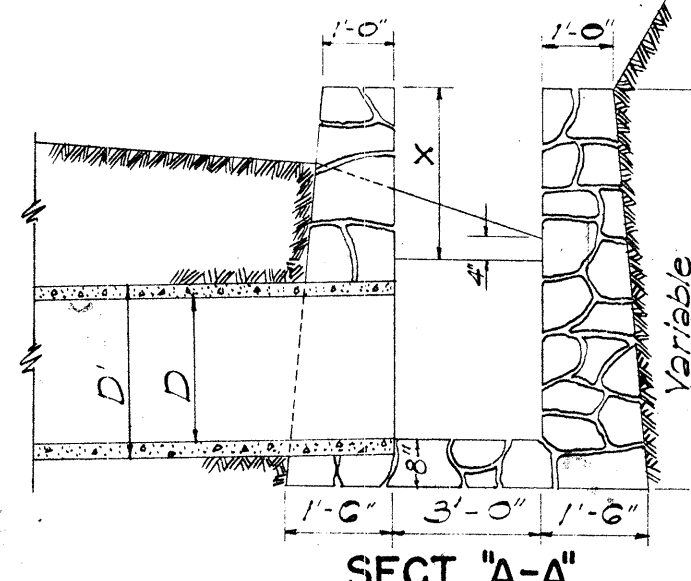
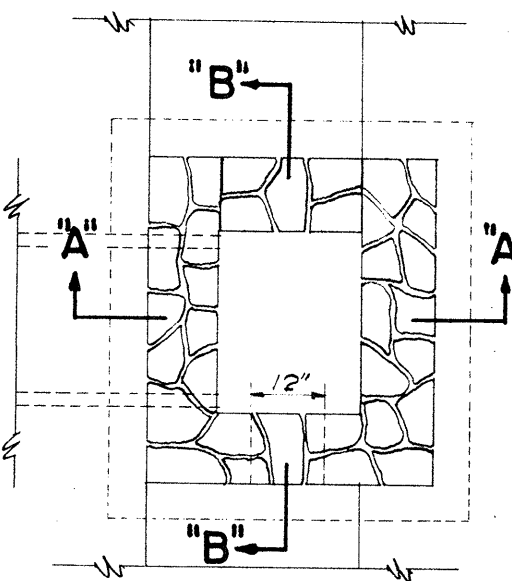
DATA FOR OUTLET DITCH				
D	W	H	T=H+H	
18"	24"	2'-0"	4'-0"	
24"	30"	2'-0"	4'-6"	
30"	36"	3'-0"	5'-0"	
36"	42"	3'-0"	6'-0"	



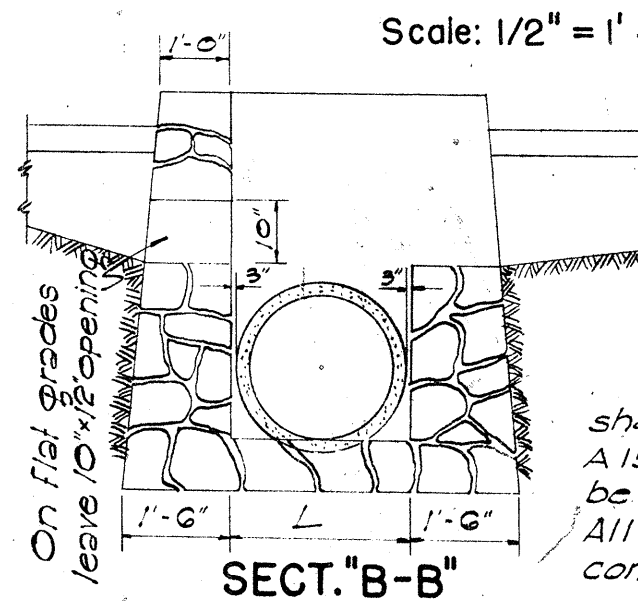
DETAIL OF OUTLET DITCH
Scale: 1/2" = 1'-0"

DATA FOR MASONRY DROP INTAKE					Where Variables Equal
D	H	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.

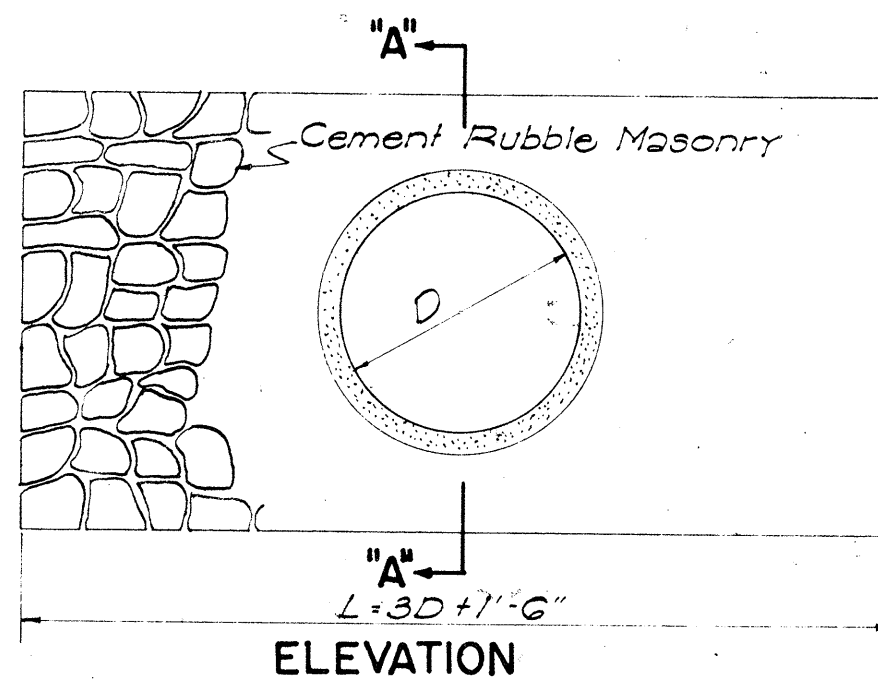


SECTION "A-A"
CONC. COLLAR FOR CONC. BOX CULVERT
Scale: 1/2" = 1'-0"

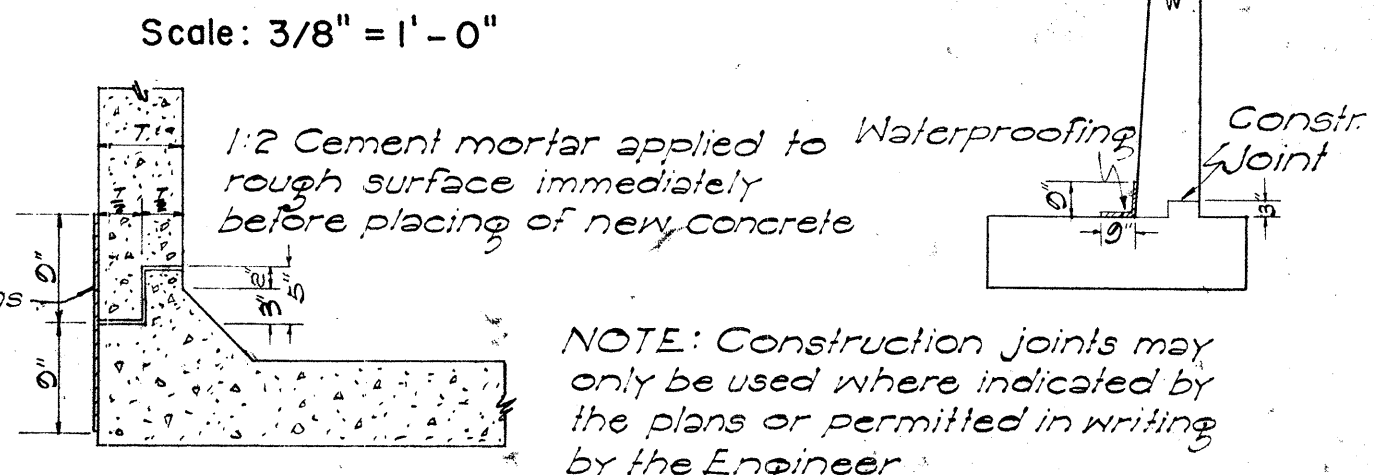
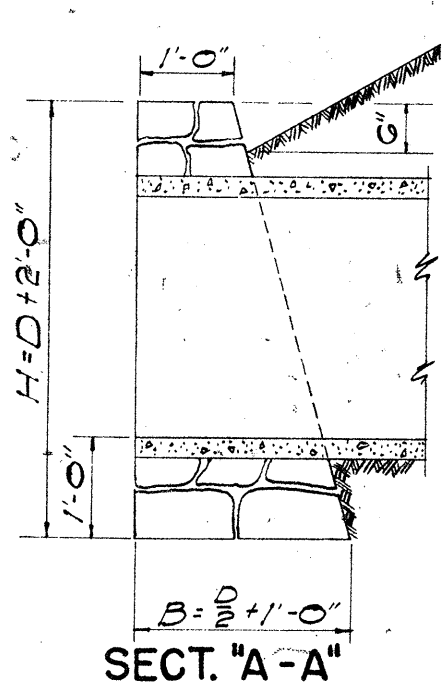


REINFORCING BARS
All reinforcing bars for concrete shall be Billet Steel bars, ASTM A15, intermediate grade. Steel shall be made by the open-hearth process. All bars shall be deformed type conforming to ASTM A-305.

DATA-MASONRY HEADWALL					Cash-in-Place Conc. Culvert	Cash-in-Place Conc. Pipe	Corrugated Pipe Culvert
D	H	B	L		Cu. Yds.	Cu. Yds.	Cu. Yds.
18"	3'-6"	1'-0"	6'-0"		0.85	0.05	0.03
24"	4'-0"	2'-0"	7'-6"		1.28	1.48	1.41
30"	4'-6"	2'-3"	9'-0"		1.83	2.06	2.00
36"	5'-0"	2'-6"	10'-6"		2.40	2.84	2.72

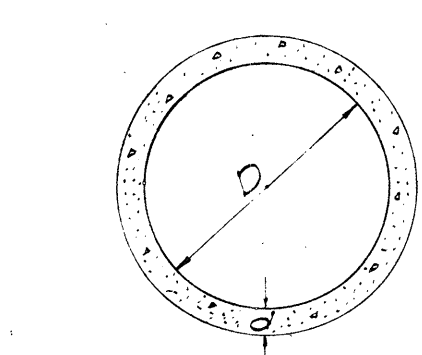


DETAIL OF MASONRY HEADWALL
Scale: 1/2" = 1'-0"



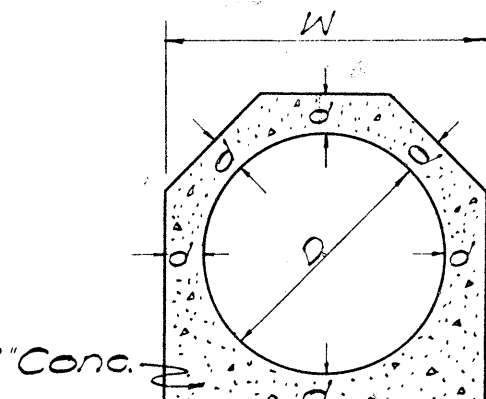
CONSTR. JOINT DETAILS

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

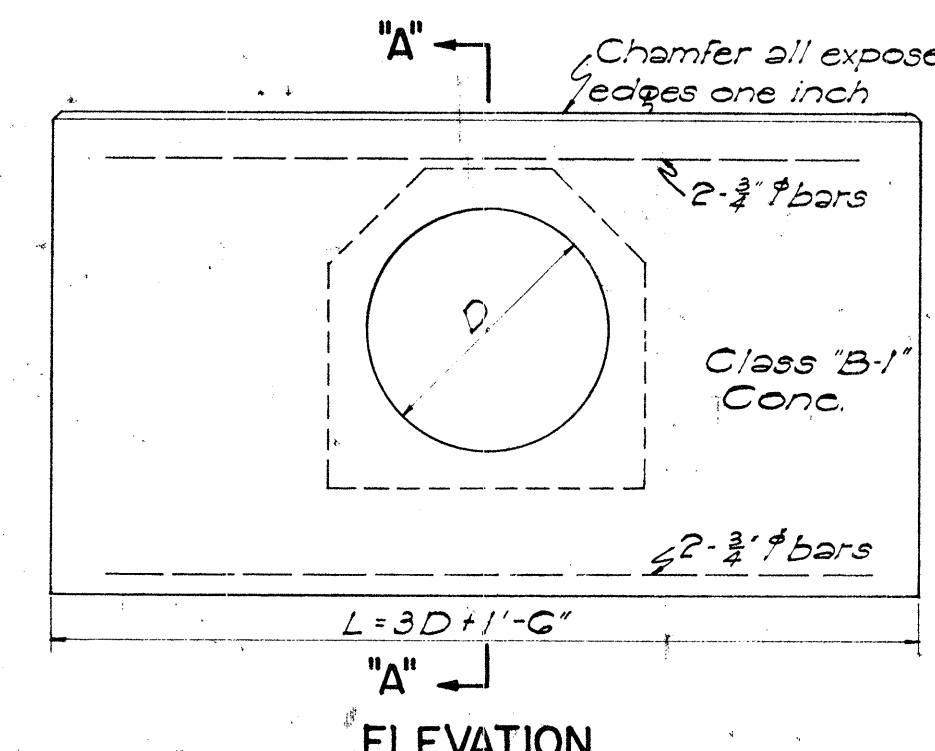


SECTION
CONC. PIPE CULVERT

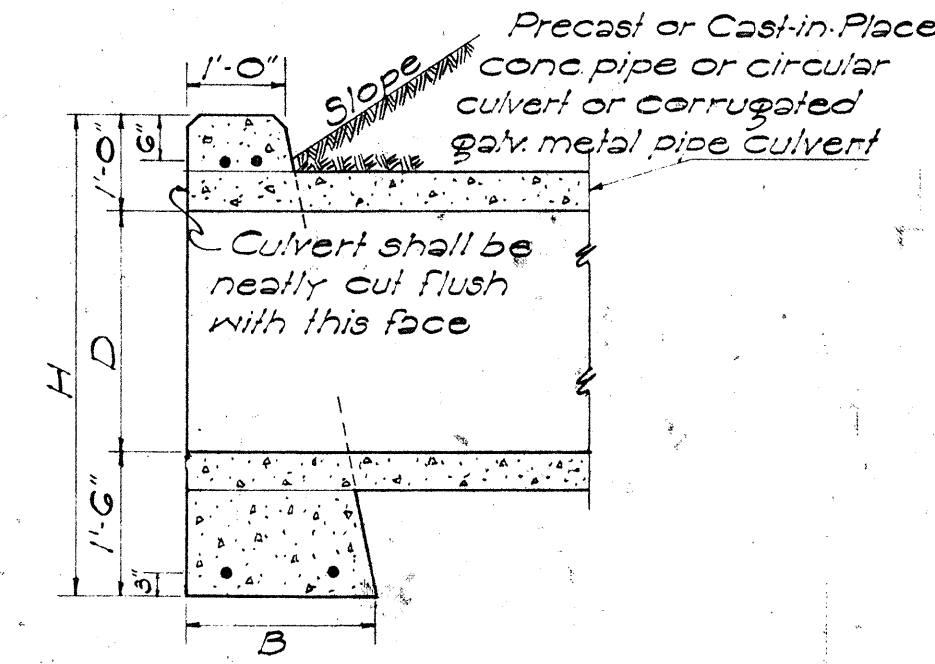
NOTE:
Thickness "d", reinforcing, and concrete used, are to conform with the approved design as provided by the Specifications.



SECTION
CAST-IN-PLACE CONC. CULVERT



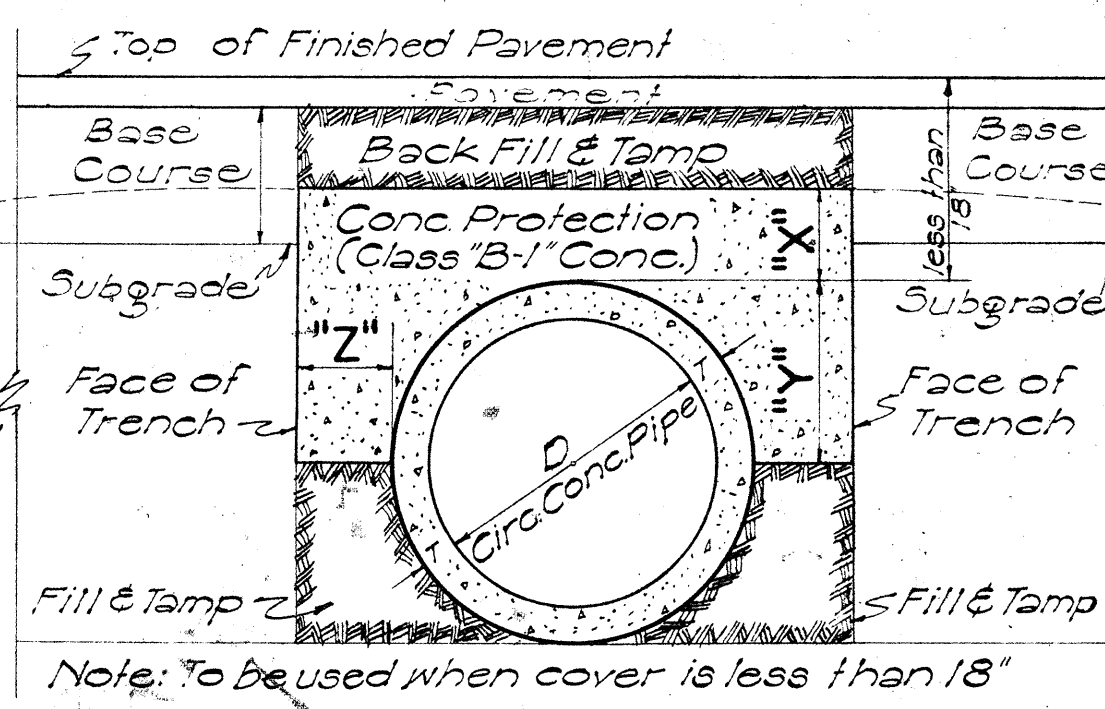
ELEVATION



SECTION "A-A"

DATA FOR CONC. HEADWALL					Cash-in-Place Conc. Culvert	Cash-in-Place Conc. Pipe	Steel For One Headwall
D	B	L	H		Cu. Yds.	Cu. Yds.	No. of Bars Size Length Lbs.
18"	1'-6"	6'-0"	4'-0"		0.02	1.00	4 #4 5'-6" 33
24"	1'-6"	7'-6"	4'-6"		1.23	1.38	4 #4 7'-0" 42
30"	2'-0"	9'-0"	5'-0"		1.05	2.17	4 #4 8'-6" 51
36"	2'-0"	10'-6"	5'-6"		2.45	2.74	4 #4 10'-0" 60
42"	2'-6"	12'-0"	6'-0"			3.87	4 #4 11'-6" 60
48"	2'-6"	13'-6"	6'-6"			4.66	4 #4 13'-0" 78

DETAIL OF CONCRETE HEADWALL
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"

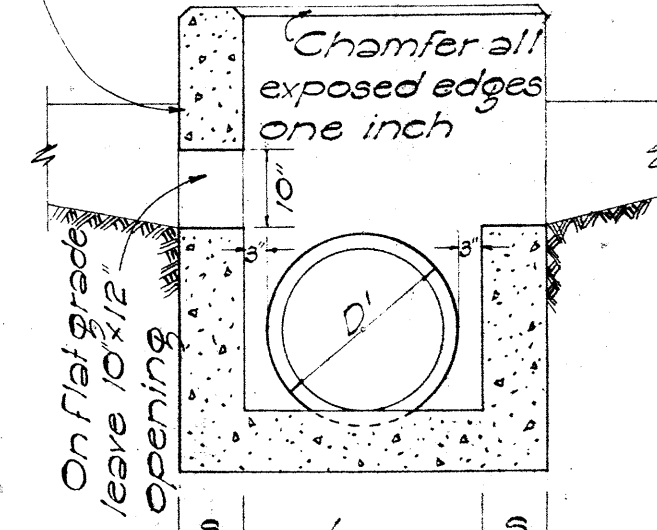
SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

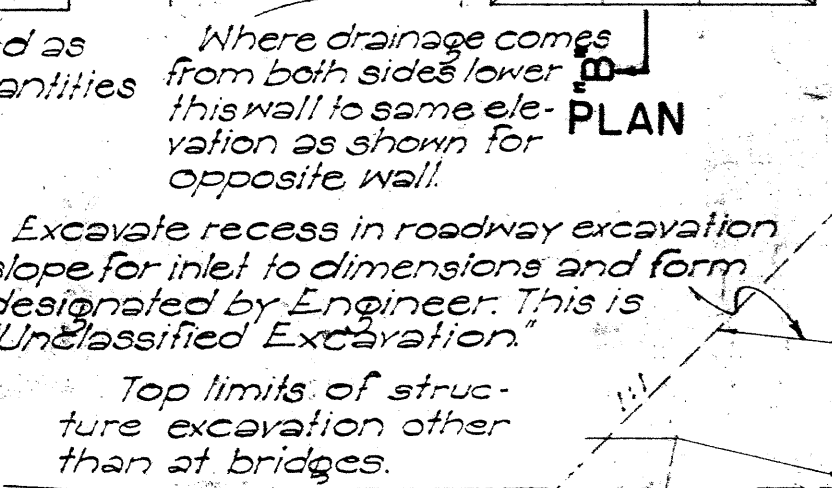
DATA-CONC. DROP INTAKE					Where Variables Equal
D	H	L=D+G	S		
23"	18"	2'-5"	8	1'-4"	4'-6"
30"	24"	3'-0"	8	1'-7"	5'-0"
37"	30"	3'-7"	9	2'-3"	5'-6"
44"	36"	4'-2"	9	2'-7"	6'-0"
51"	42"	4'-9"	10	3'-5"	6'-6"
58"	48"	5'-4"	10	4'-0"	7'-0"

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.

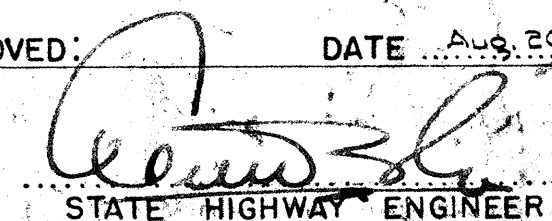


SECTION "B-B"



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

APPROVED:  DATE: Aug. 29, 1959
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 4 SHEETS

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