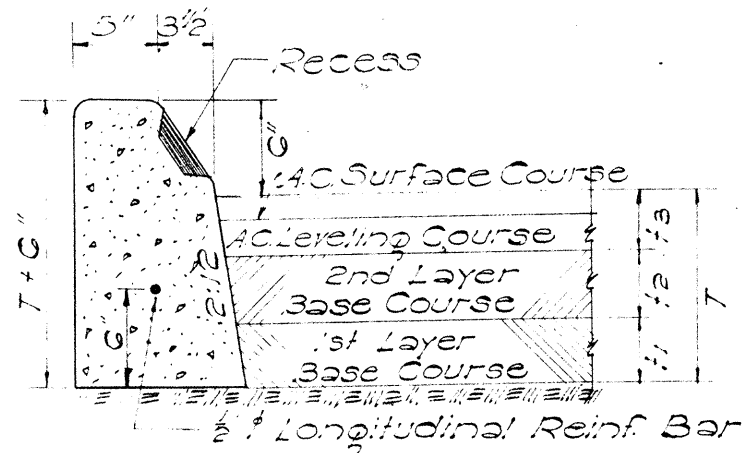


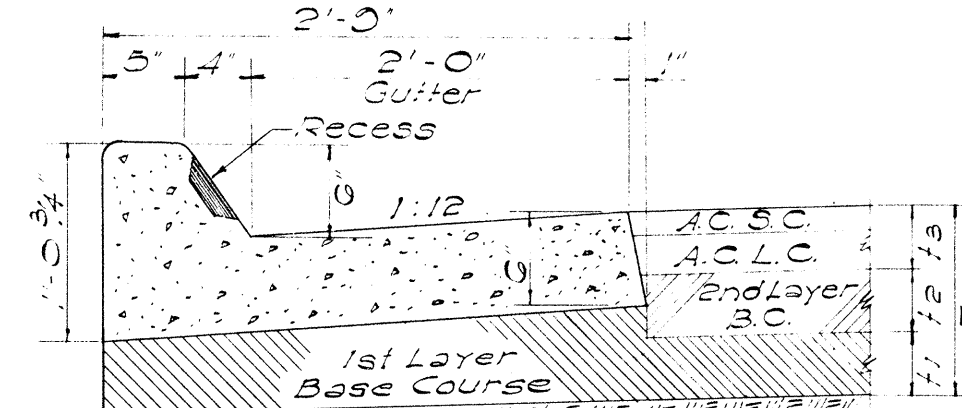
2/17/59
9/22/61

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-572-1(3)	1953	46	246
		U-599-1(4)	1953	16	85
		F-599-1(5)	1953	15	93

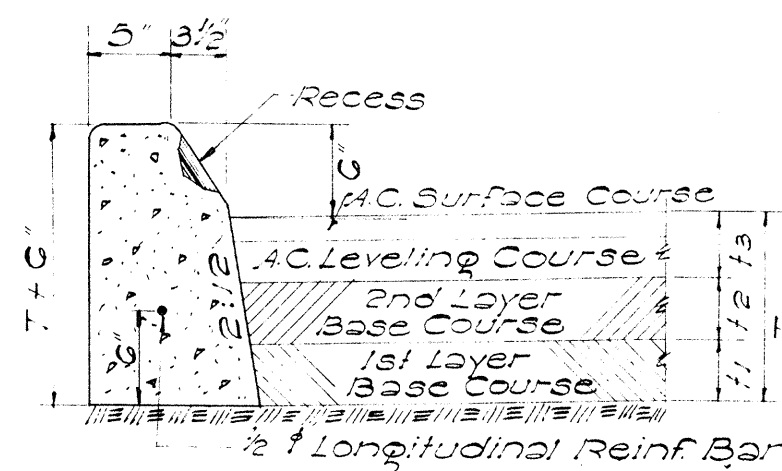
AUG. 1957



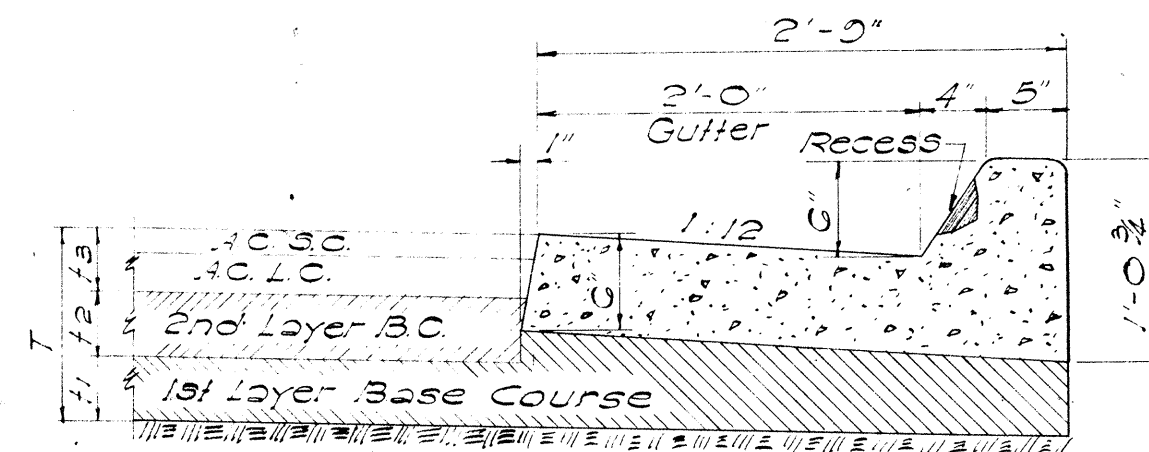
TYPE "A" & "B" CURB
SCALE: 1" = 1'-0"



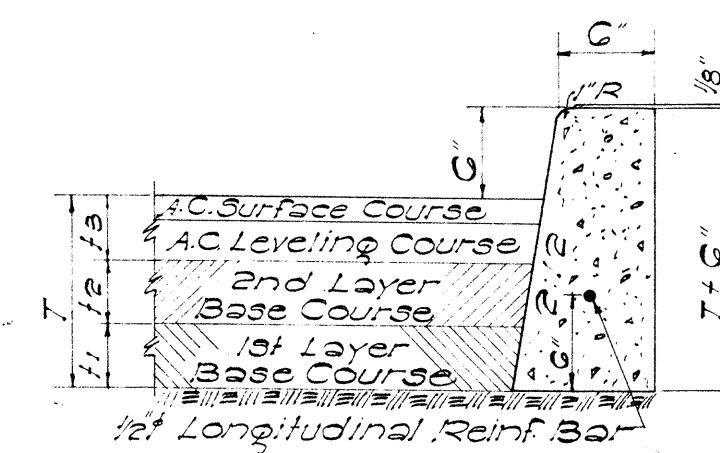
TYPE "AG" & "BG" CURB & GUTTER
SCALE: 1" = 1'-0"



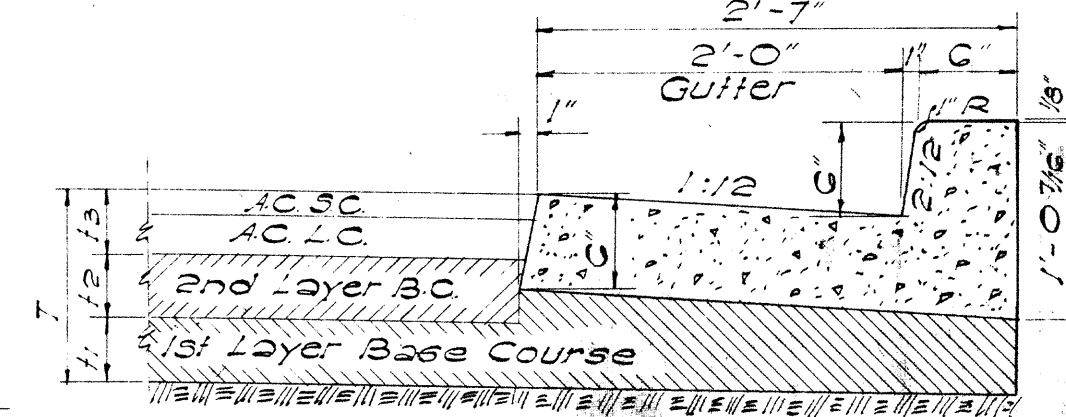
TYPE "C" CURB
SCALE: 1" = 1'-0"



TYPE "CG" CURB & GUTTER
SCALE: 1" = 1'-0"

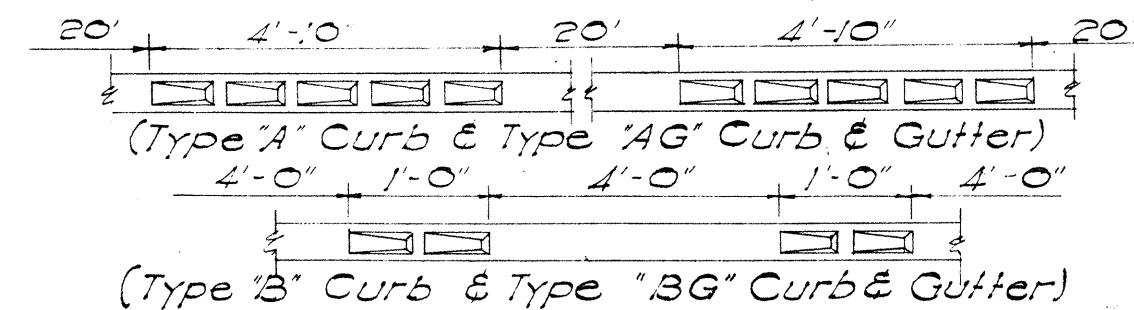


TYPE "D" CURB
SCALE: 1" = 1'-0"

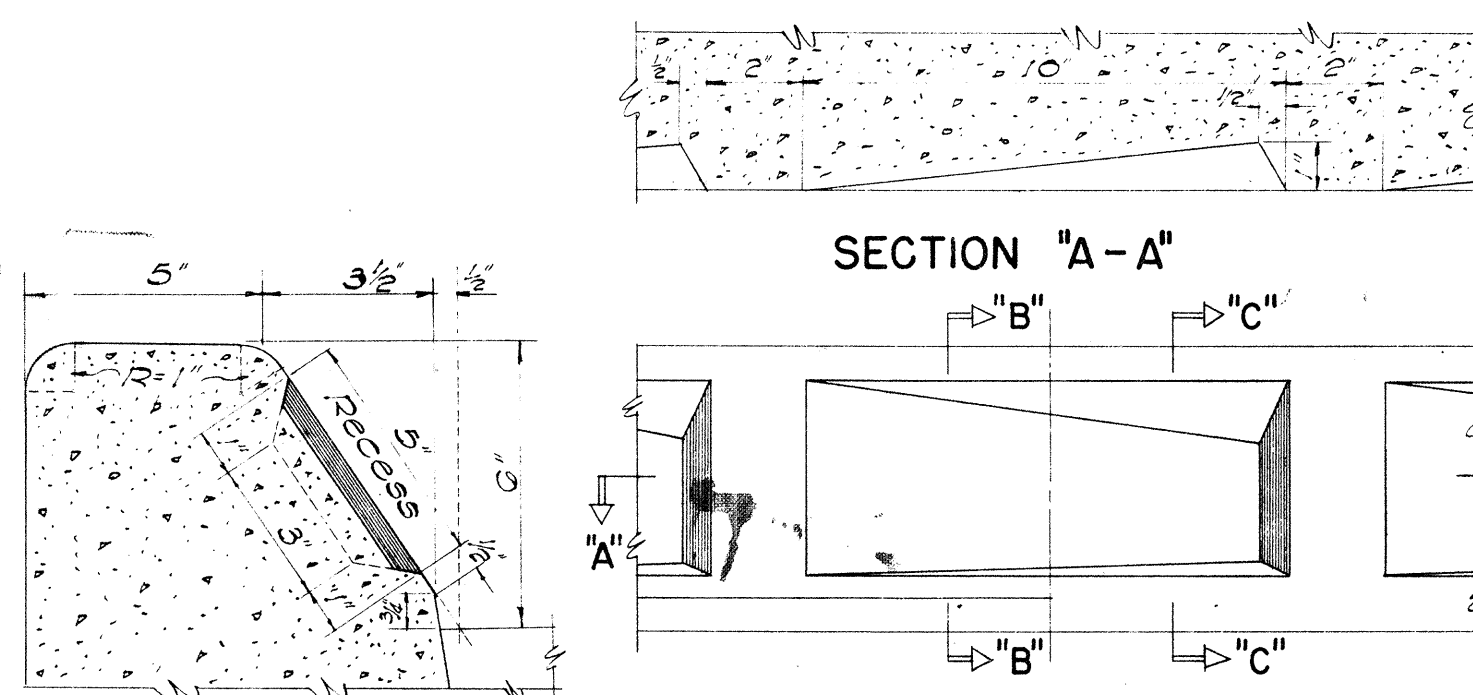


TYPE "DG" CURB & GUTTER
SCALE: 1" = 1'-0"

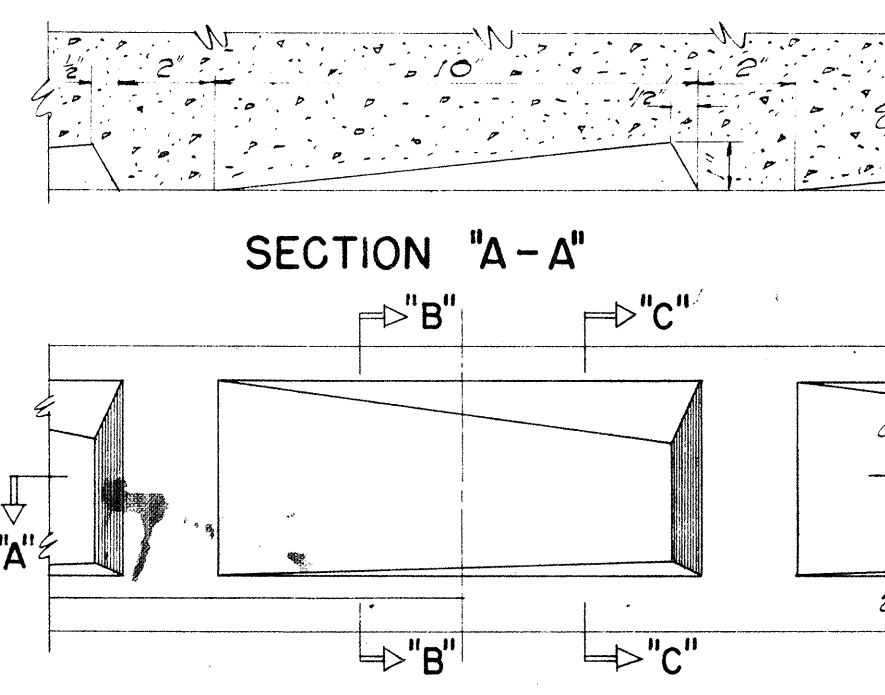
General Note Covering All Types of Curbs:
Occasionally curb rests on first layer
of base course. See typical sections.



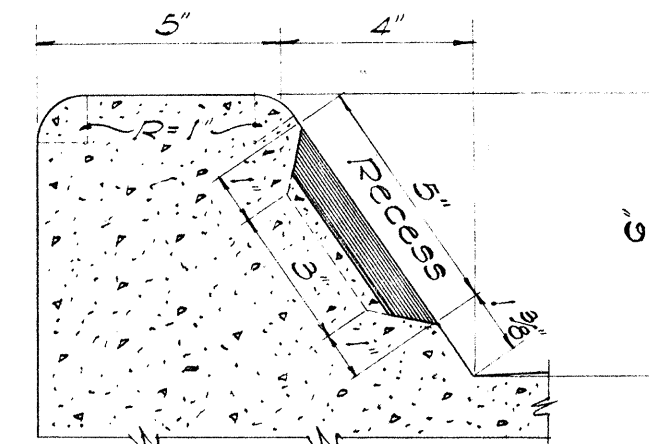
TYPE AND SPACING OF RECESSES



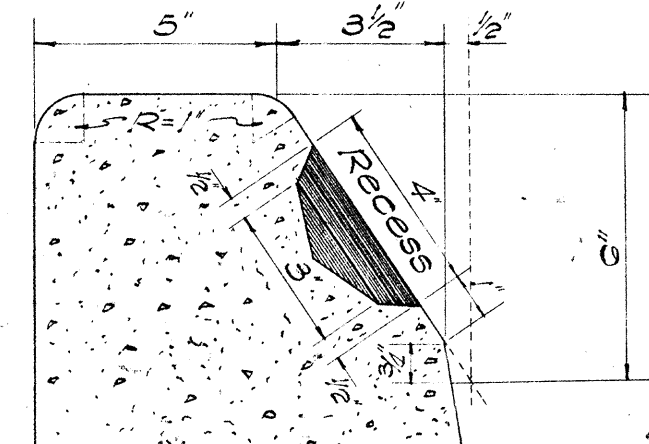
SECTION "B-B"
TYPE "A" & "B" CURB



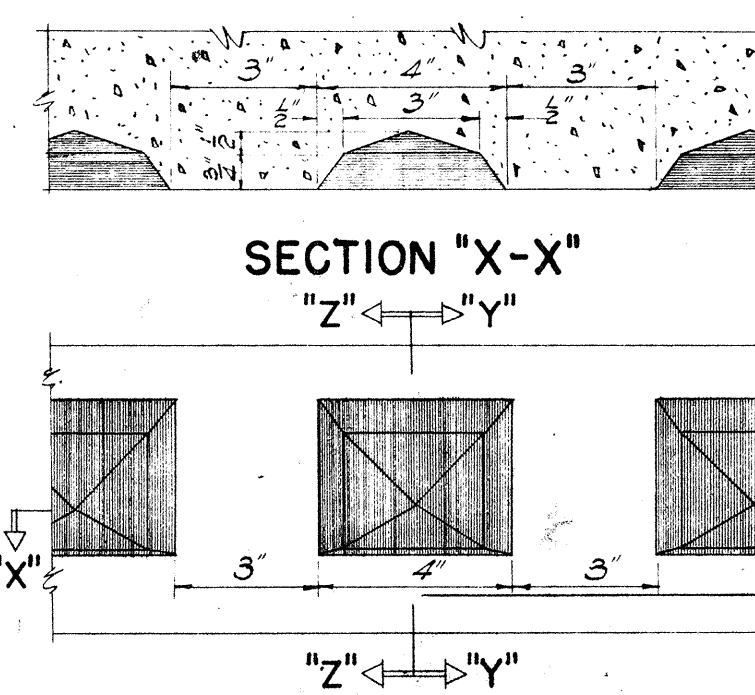
ELEVATION
SCALE: 3" = 1'-0"



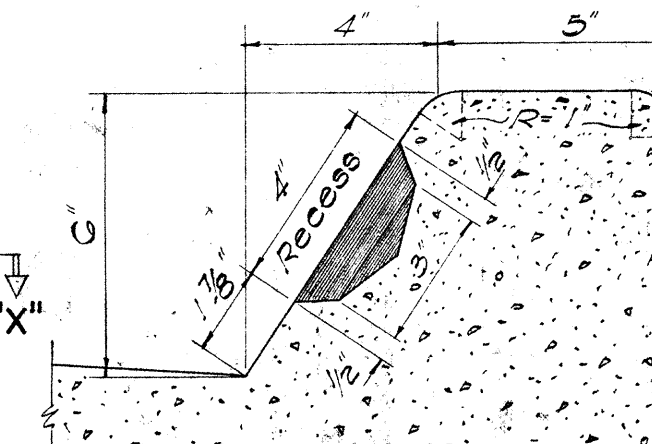
SECTION "C-C"
TYPE "AG" & "BG" CURB



SECTION "Y-Y"
TYPE "C" CURB

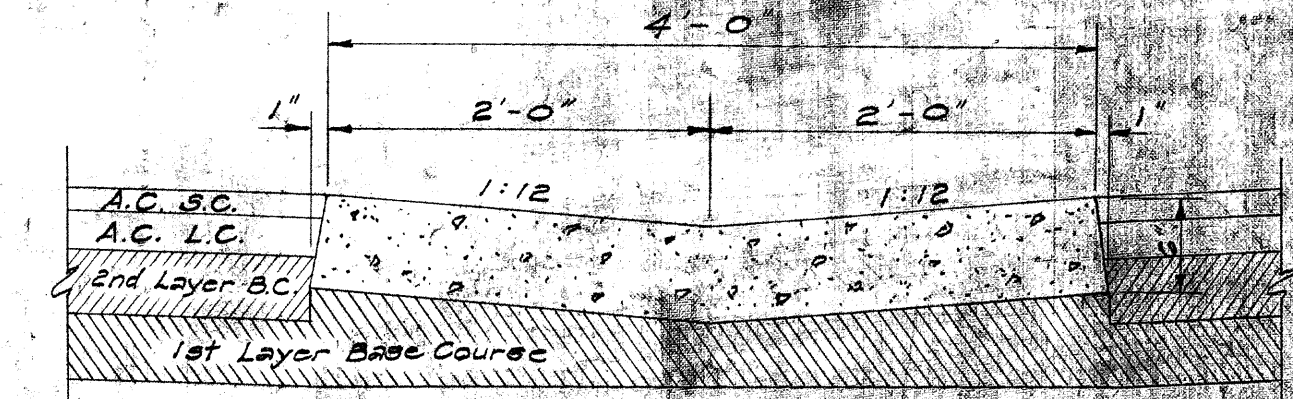


ELEVATION
SCALE: 3" = 1'-0"



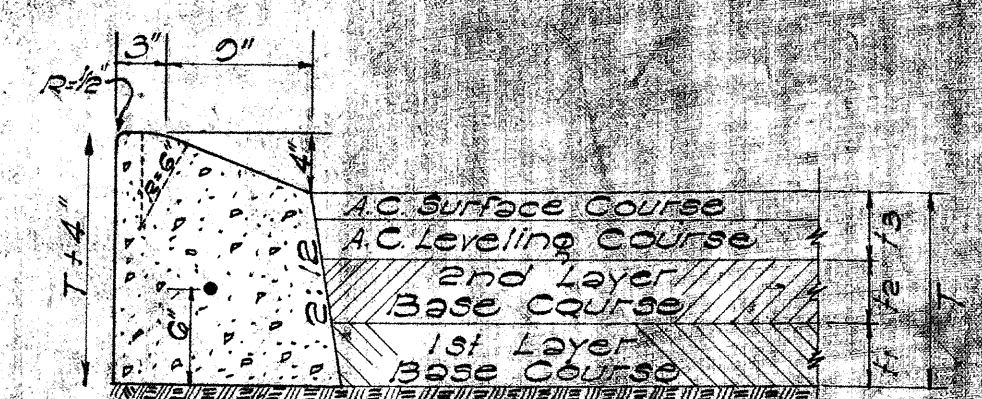
SECTION "Z-Z"
TYPE "CG" CURB

- NOTES:
- 1) Types "AG", "BG", "CG", "DG" and "EG" Concrete Curbs and Gutters are to be poured monolithically.
 - 2) Types "A", "B", and "C" Curbs and Types "AG", "BG" and "CG" Curbs and Gutters occur at Median Strips and Traffic Islands.
 - 3) Shaded area in Curbs are to be painted with an approved white lacquer (One Coat).
 - 4) All Concrete Curbs and Gutters shown herein are to be of Class "A-1" Conc. and Cast in Place.

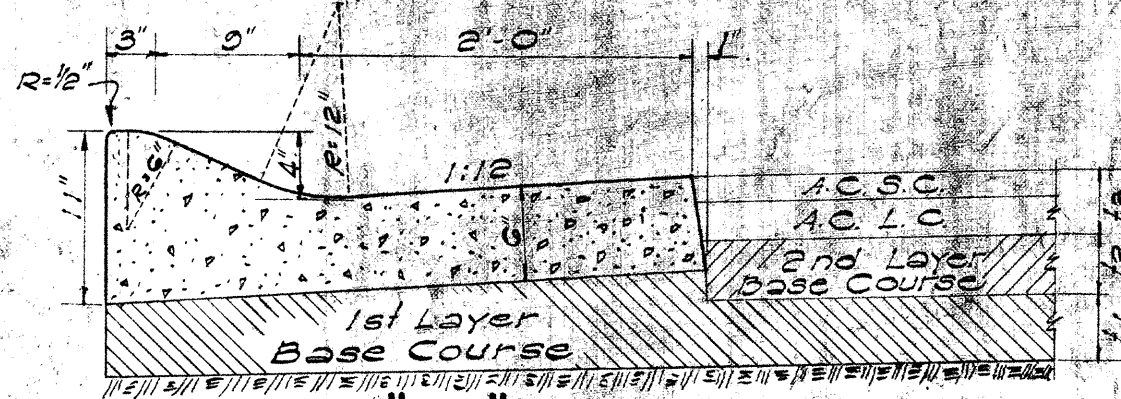


TYPE "G" GUTTER
SCALE: 1" = 1'-0"

DETAILS OF CAST-IN-PLACE CONC. CURBS AND GUTTERS



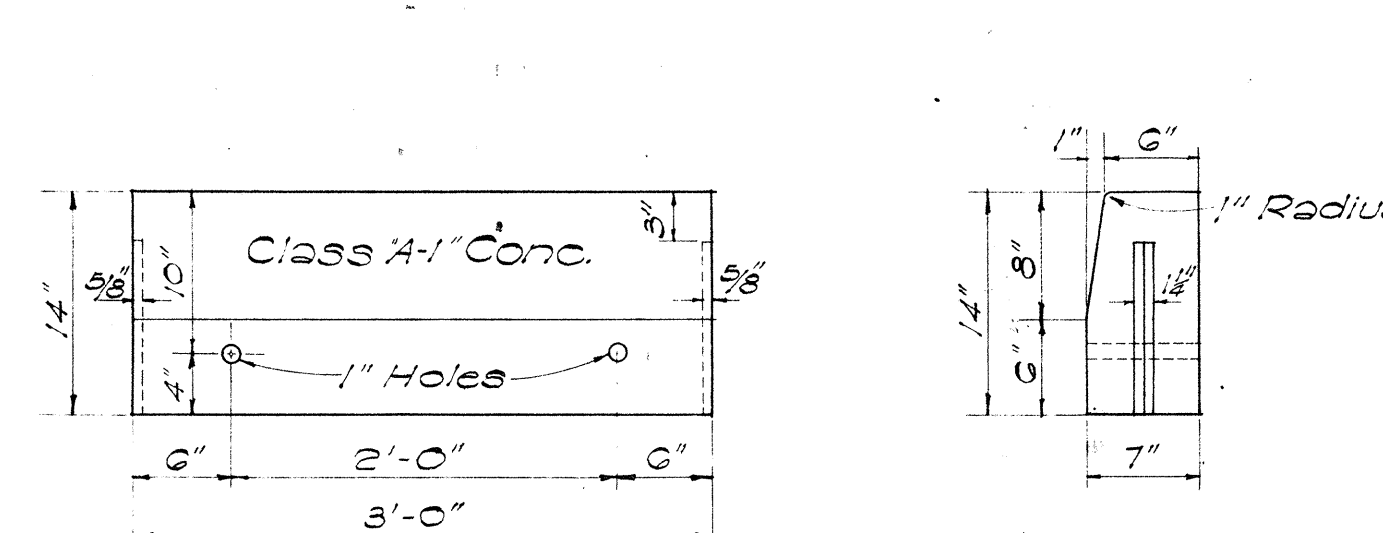
TYPE "E" CAST-IN-PLACE
CONCRETE CURB
SCALE: 1" = 1'-0"



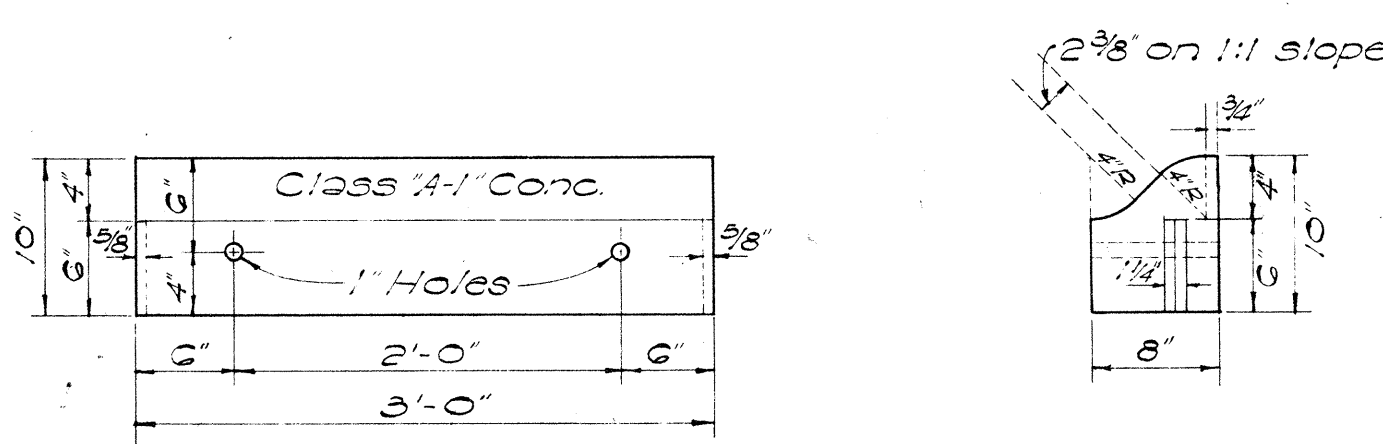
TYPE "EG" CAST-IN-PLACE
CONC. CURB & GUTTER
SCALE: 1" = 1'-0"

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CONCRETE CURBS,
CONCRETE CURBS & GUTTERS
SCALES AS NOTED

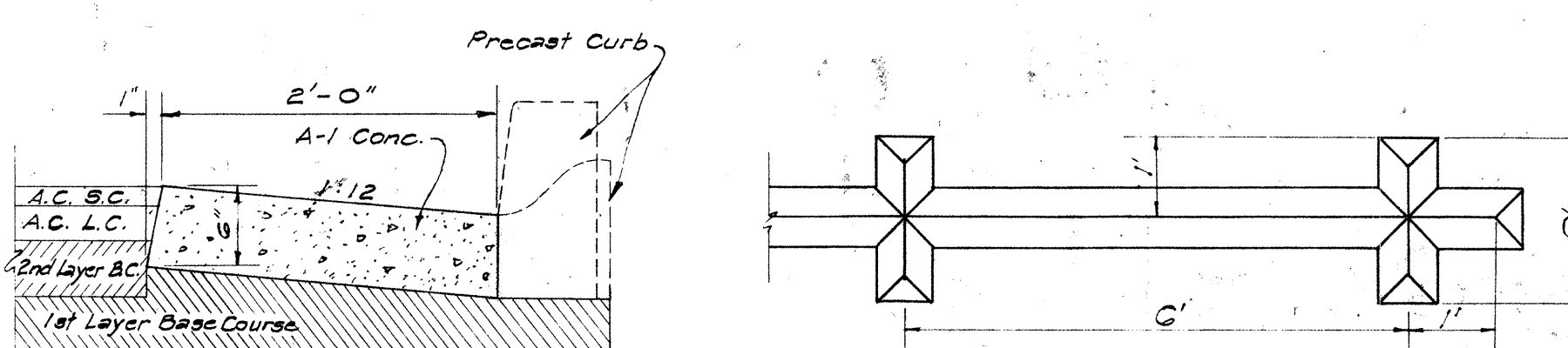
SHEET NO. 1 OF 8 SHEETS



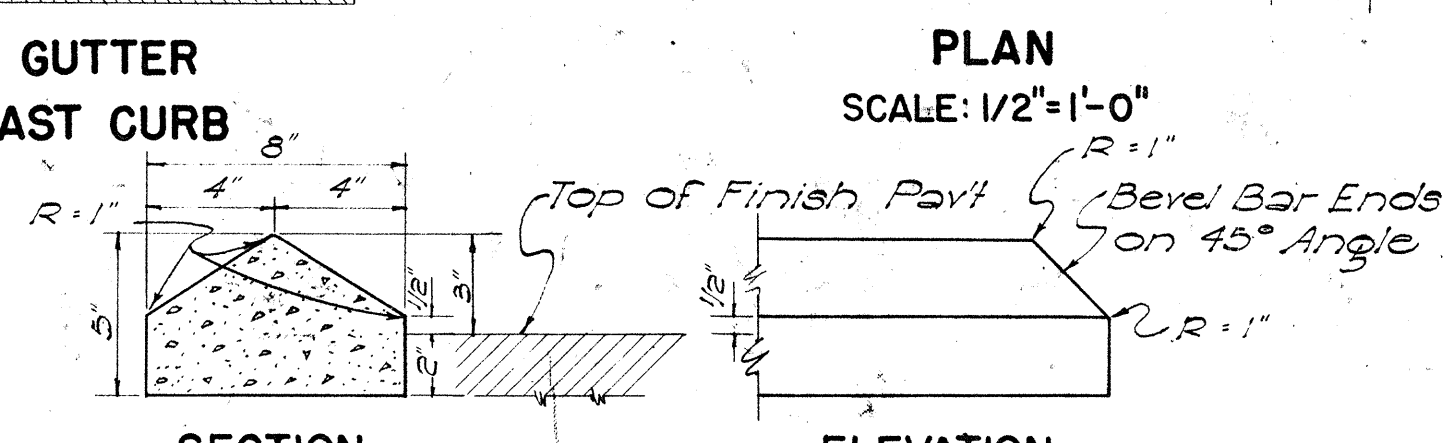
FRONT ELEV.
END ELEV.
PRECAST CONC. CURB
SCALE: 1" = 1'-0"



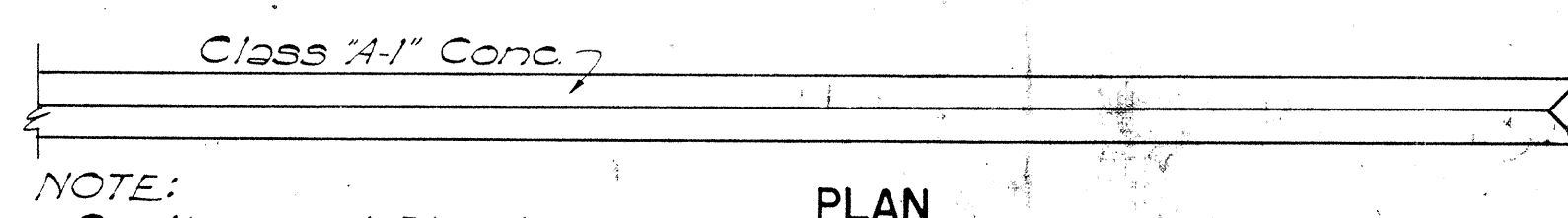
FRONT ELEV.
END ELEV.
PRECAST CONC. ROLL CURB
SCALE: 1" = 1'-0"



TYPE "F" GUTTER
FOR PRECAST CURB

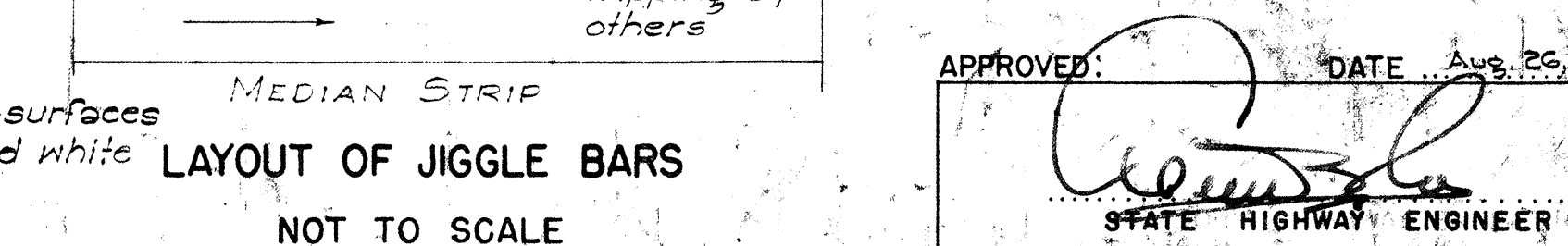
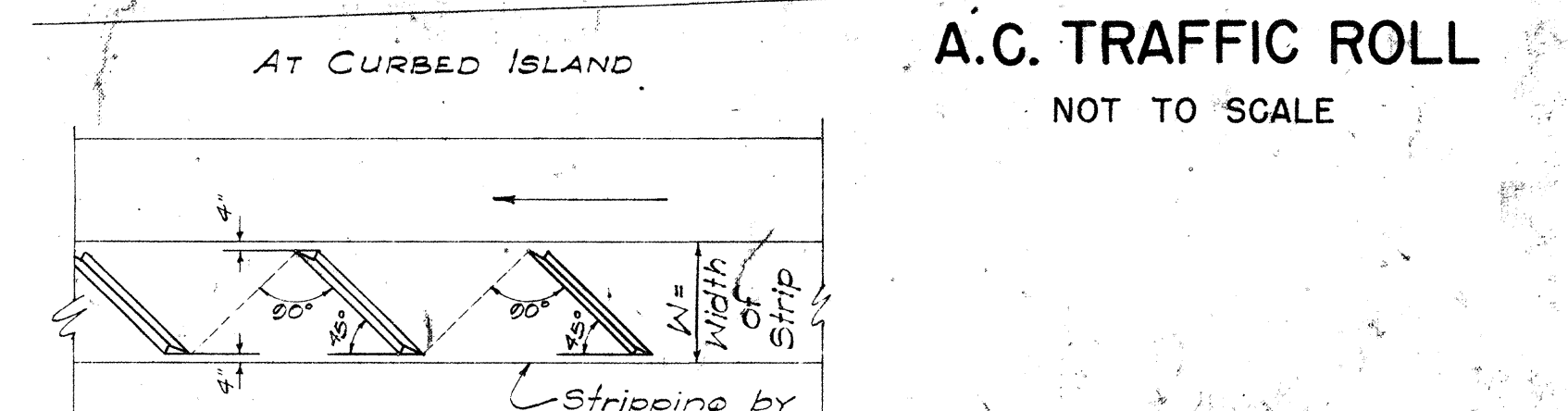
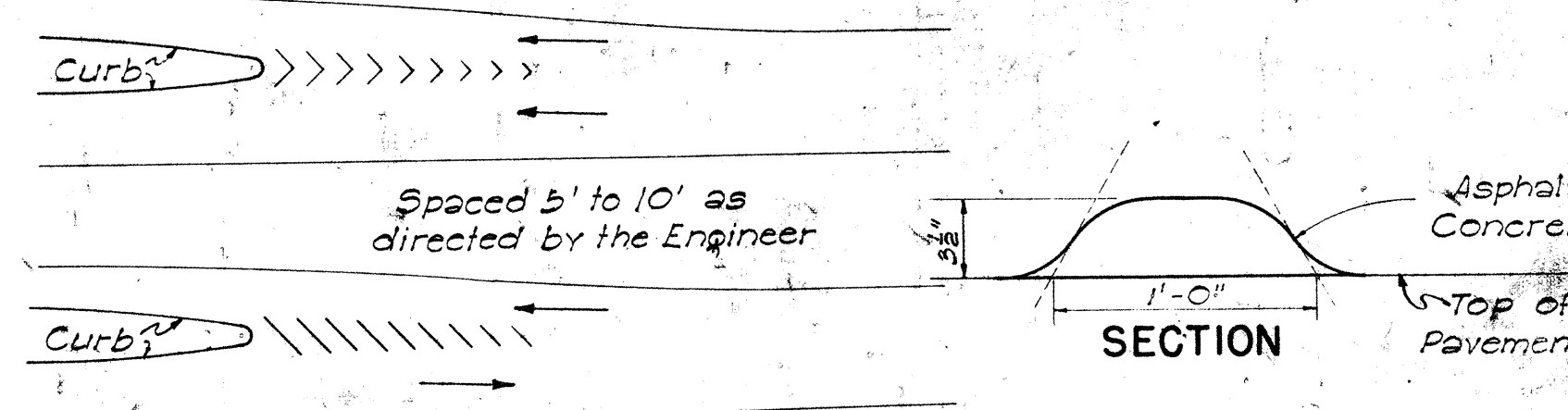
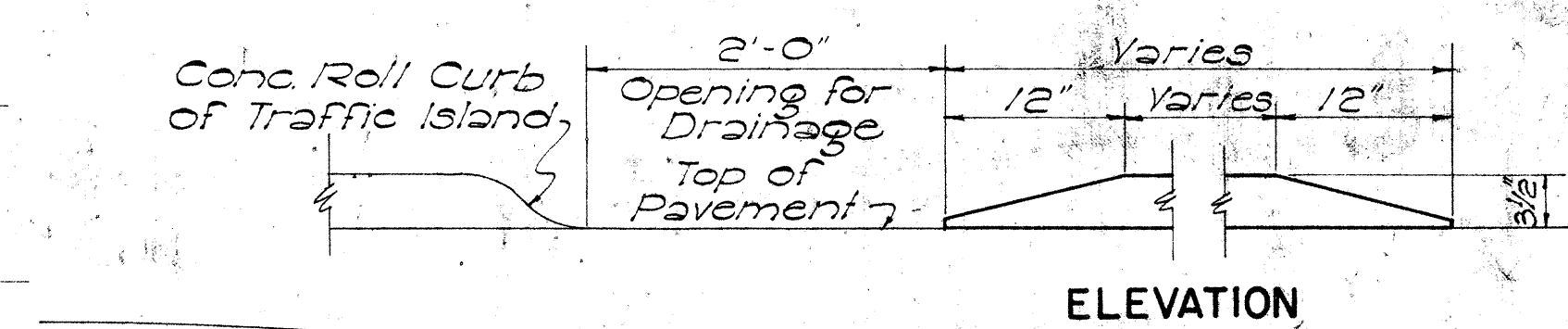


RAISED TRAFFIC BARS
SCALE: 2" = 1'-0"



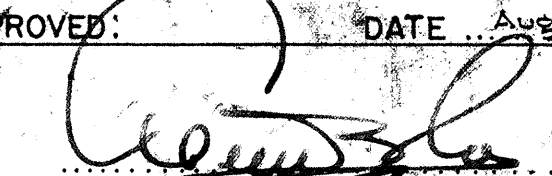
NOTE:
Section and Elevation
for Joggle Bars are same
as the Traffic Bars.

RAISED JOGGLE BARS
SCALE: 1/2" = 1'-0"



LAYOUT OF JOGGLE BARS
NOT TO SCALE

A.C. TRAFFIC ROLL
NOT TO SCALE

APPROVED:  DATE: Aug. 26, 1959
STATE HIGHWAY ENGINEER

"E" and "EG" Curbs have been revised 7-26-57
"G" and "F" Gutters have been added 9-22-61

DATE	2/17/59
DESIGNED BY	L. C. S. / S. / O.
QUANTITIES CHECKED BY	
NOTE BOOK	
CHECKED BY	

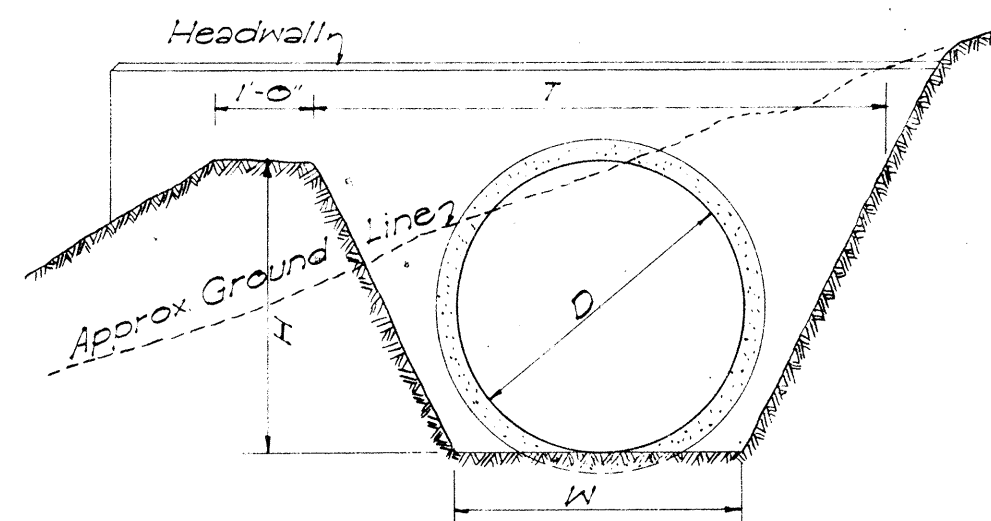
109010200.12

U09810400.16

U05210300.46

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



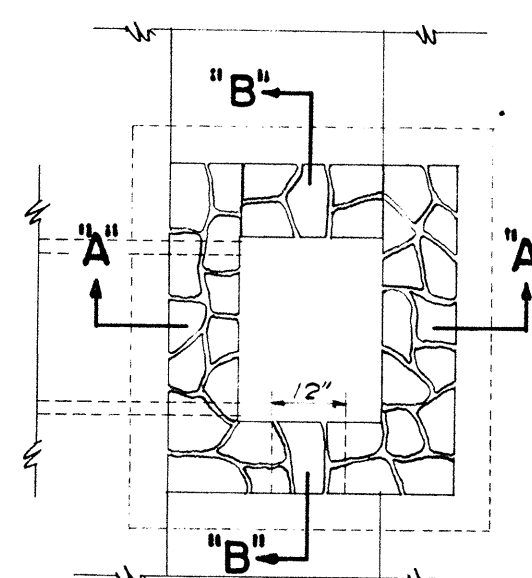
DETAIL OF OUTLET DITCH

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

D	D	L+D+G	Cu Yds	Where Variables Equal
23"	18"	2'-5"	3.09	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:

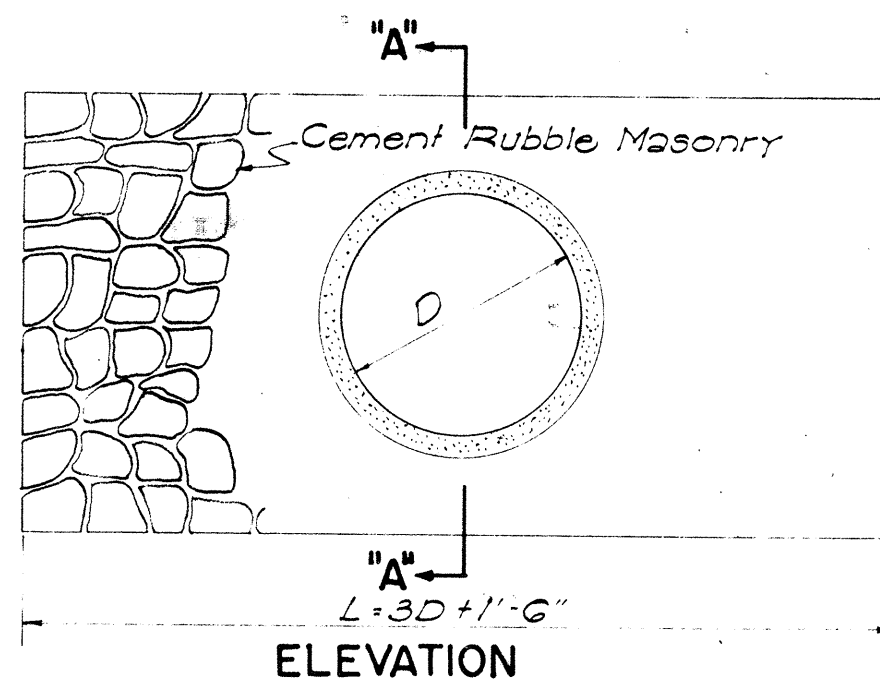
Dimension "X" is assumed as 2'-4" in figuring the above quantities.



DETAIL OF MASONRY DROP INTAKE

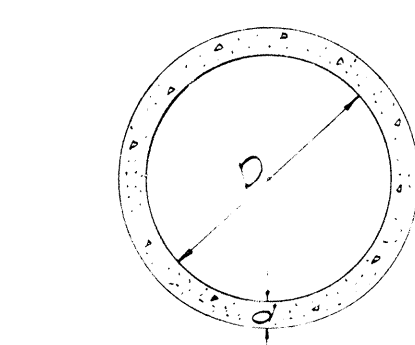
Scale: 3/8" = 1'-0"

D	H	B	L	Cast-in-Place Conc. Culvert Cu Yds	Conc. Pipe Culvert Cu Yds	Corrugated Pipe Culvert Cu Yds
18"	3'-6"	1'-0"	6'-0"	0.85	0.05	0.03
24"	4'-0"	2'-0"	7'-6"	1.28	1.42	1.41
30"	4'-6"	2'-3"	9'-0"	1.83	2.06	2.00
36"	5'-0"	2'-6"	10'-6"	2.45	2.84	2.72



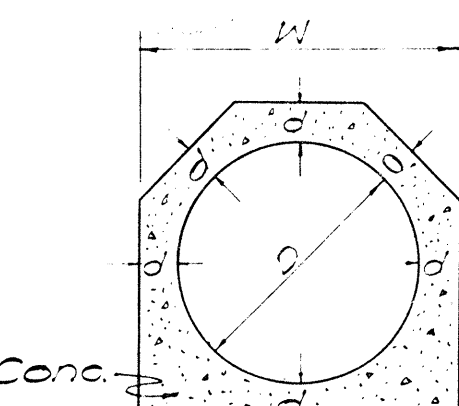
DETAIL OF MASONRY HEADWALL

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

SECTION
CONC. PIPE CULVERT

NOTE:

Thickness of reinforcing and concrete used are to conform with the approved design as provided by the Specifications.

SECTION
CAST-IN-PLACE CONC. CULVERT

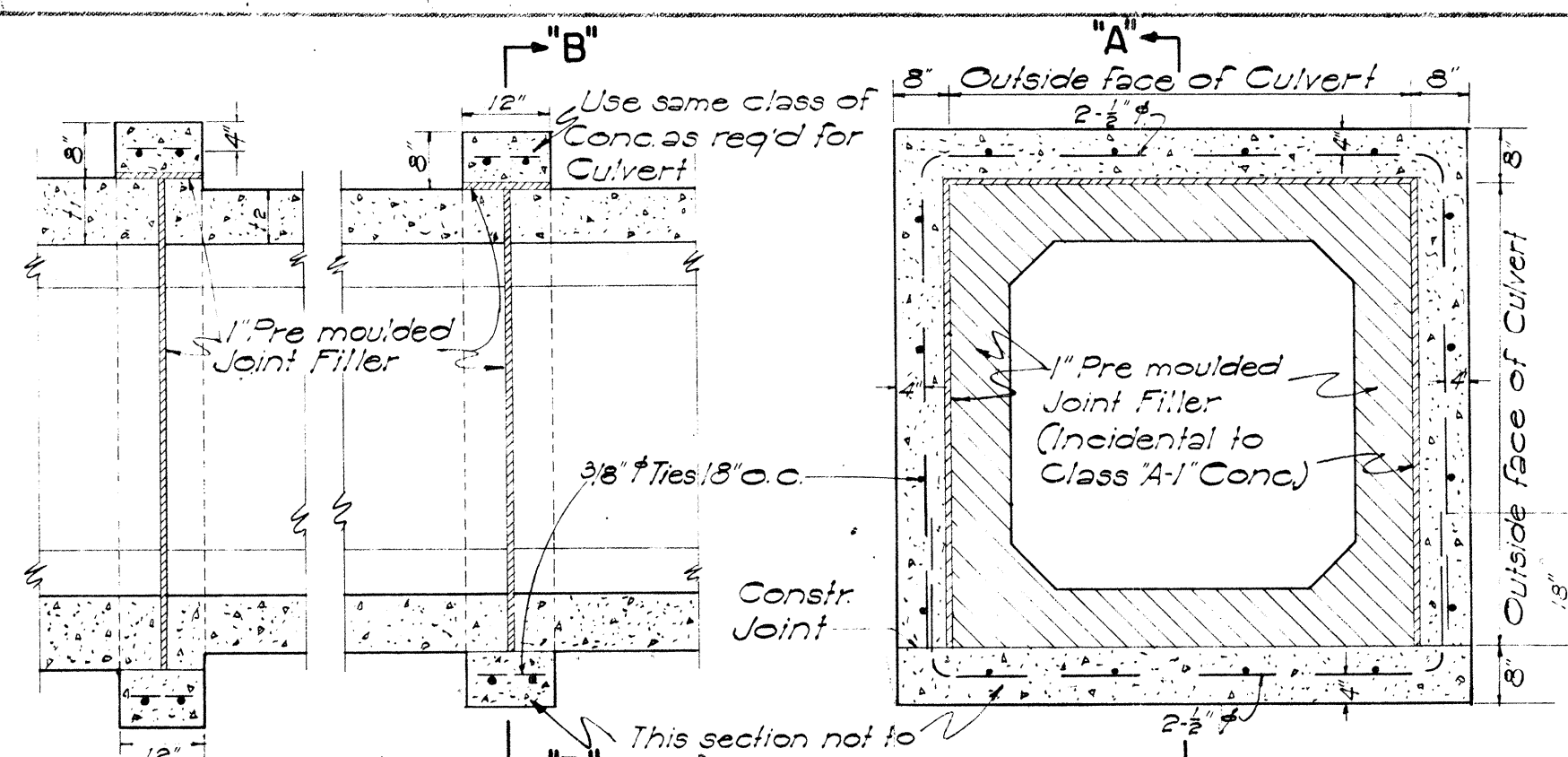
D	d	W	Cu Yds per Ft.
18"	4"	2'-2"	0.11
24"	4 1/2"	2'-0"	0.14
30"	5"	3'-4"	0.19
36"	5 1/2"	3'-11"	0.26

CAST-IN-PLACE CONC. CULVERT

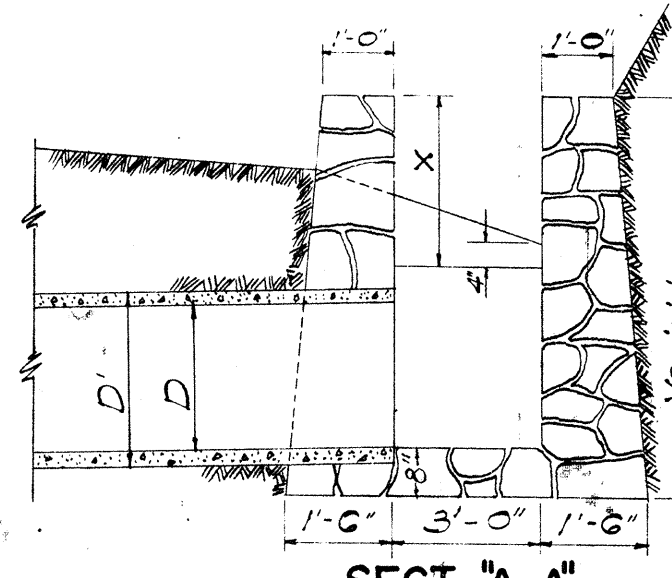
D	B	L	H	Cast-in-Place Conc. Culvert Cu Yds	Conc. Pipe Culvert Cu Yds	Steel For One Headwall No. of Bars Size Length Lbs.
18"	1'-6"	6'-0"	4'-0"	0.02	1.00	4 3/4" 2'-6" 33
24"	1'-6"	7'-6"	4'-0"	1.25	1.38	4 3/4" 2'-6" 42
30"	2'-0"	9'-0"	5'-0"	1.95	2.17	4 3/4" 3'-0" 51
36"	2'-0"	10'-6"	5'-0"	2.45	2.74	4 3/4" 3'-0" 60
42"	2'-6"	12'-0"	6'-0"		3.87	4 3/4" 3'-0" 69
48"	2'-6"	13'-6"	6'-0"		4.66	4 3/4" 3'-0" 78

DETAIL OF CONCRETE HEADWALL

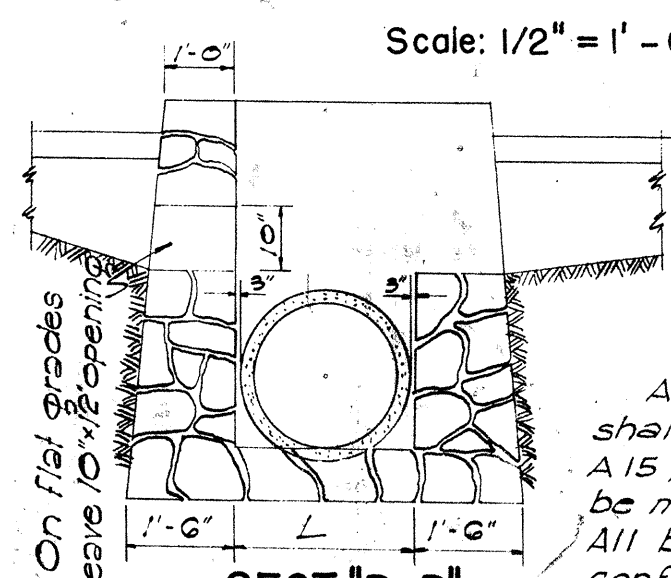
Scale: 1/2" = 1'-0"

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

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



SECT. "A-A"



SECT. "B-B"

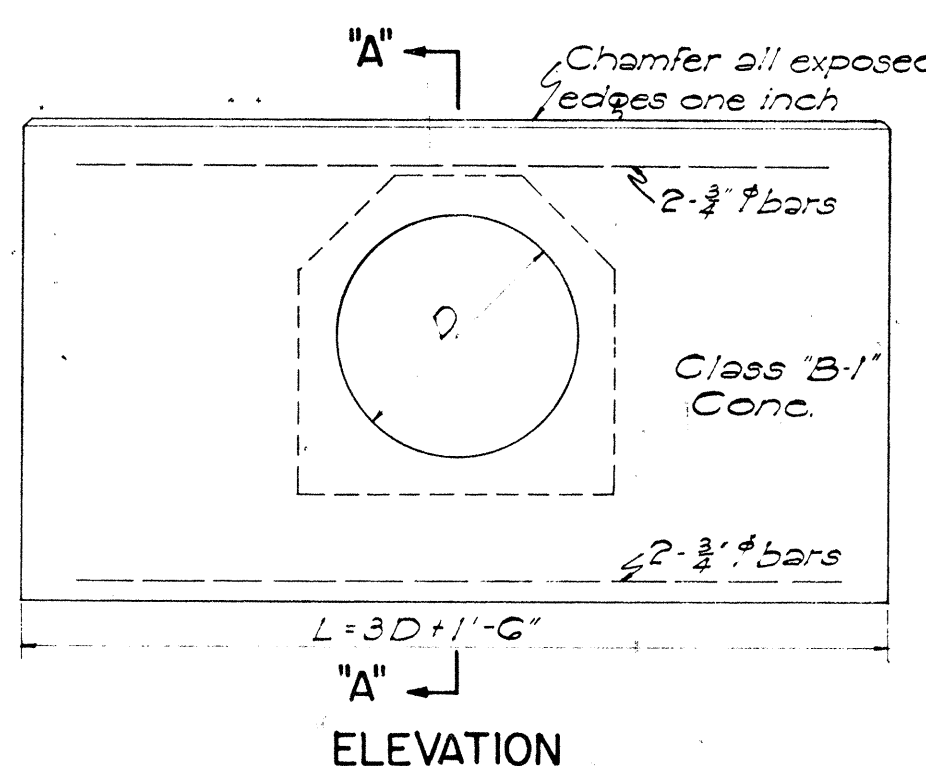
REINFORCING BARS

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.

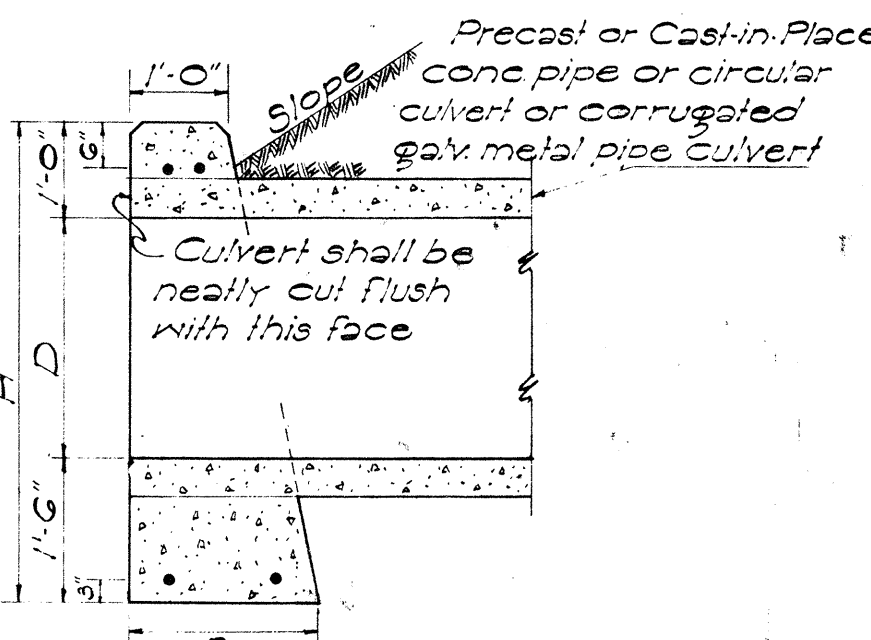


CONSTR. JOINT DETAILS

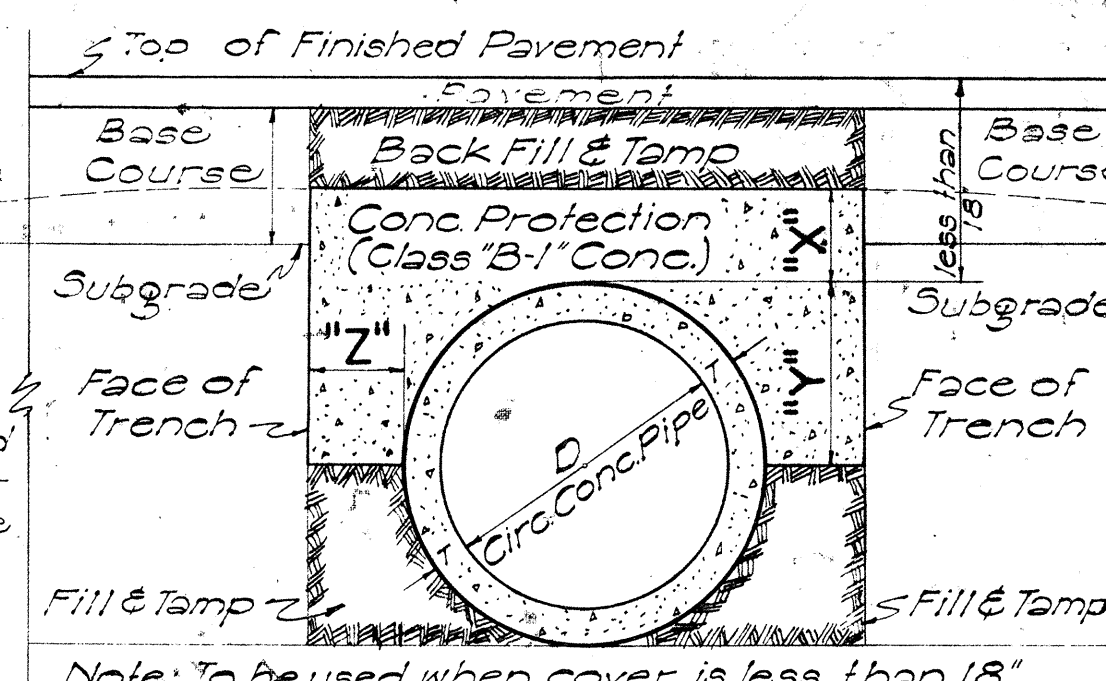
NOTE: Construction joints may only be used where indicated by the plans or permitted in writing by the Engineer.



ELEVATION



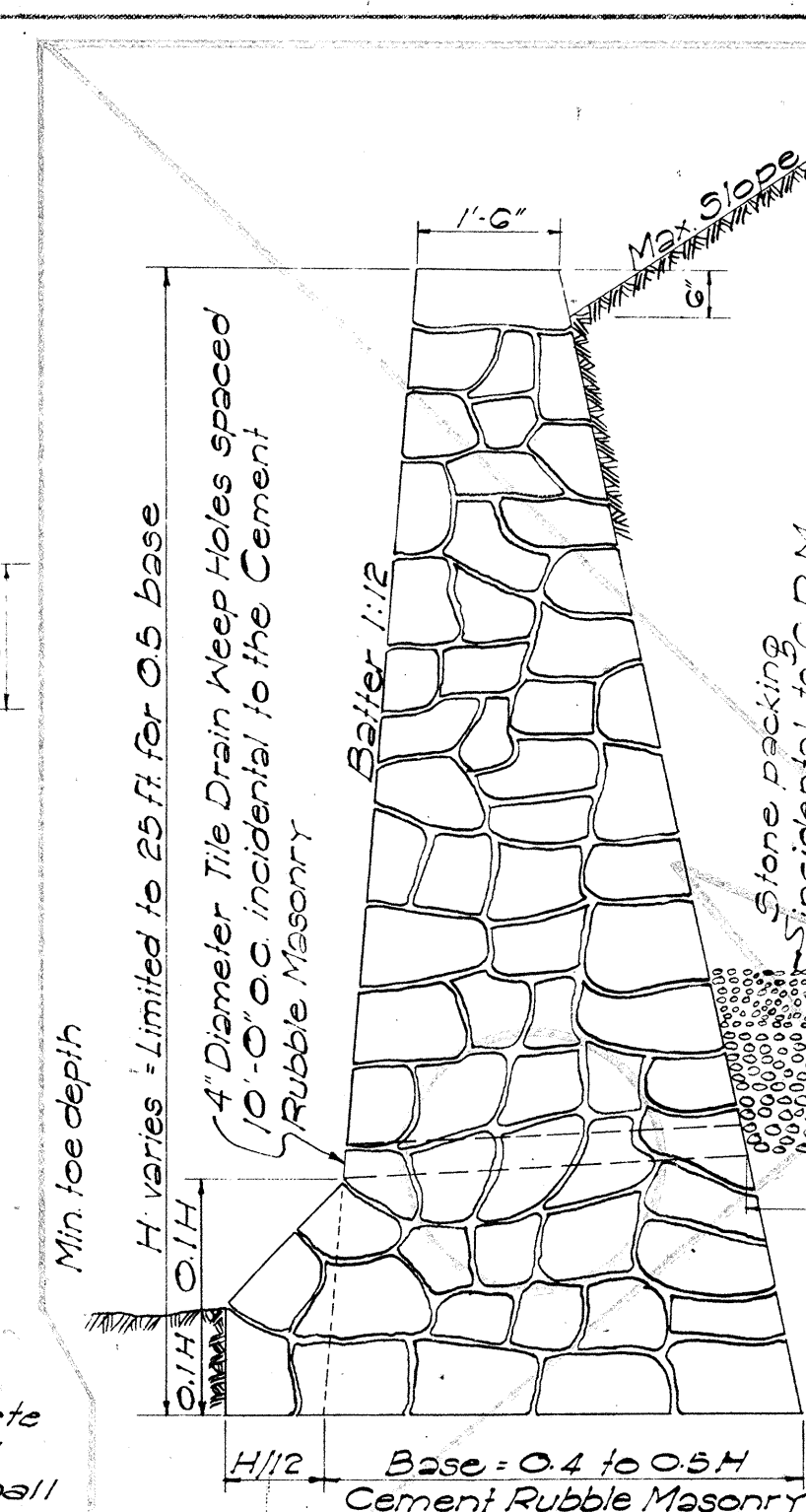
SECTION "A-A"



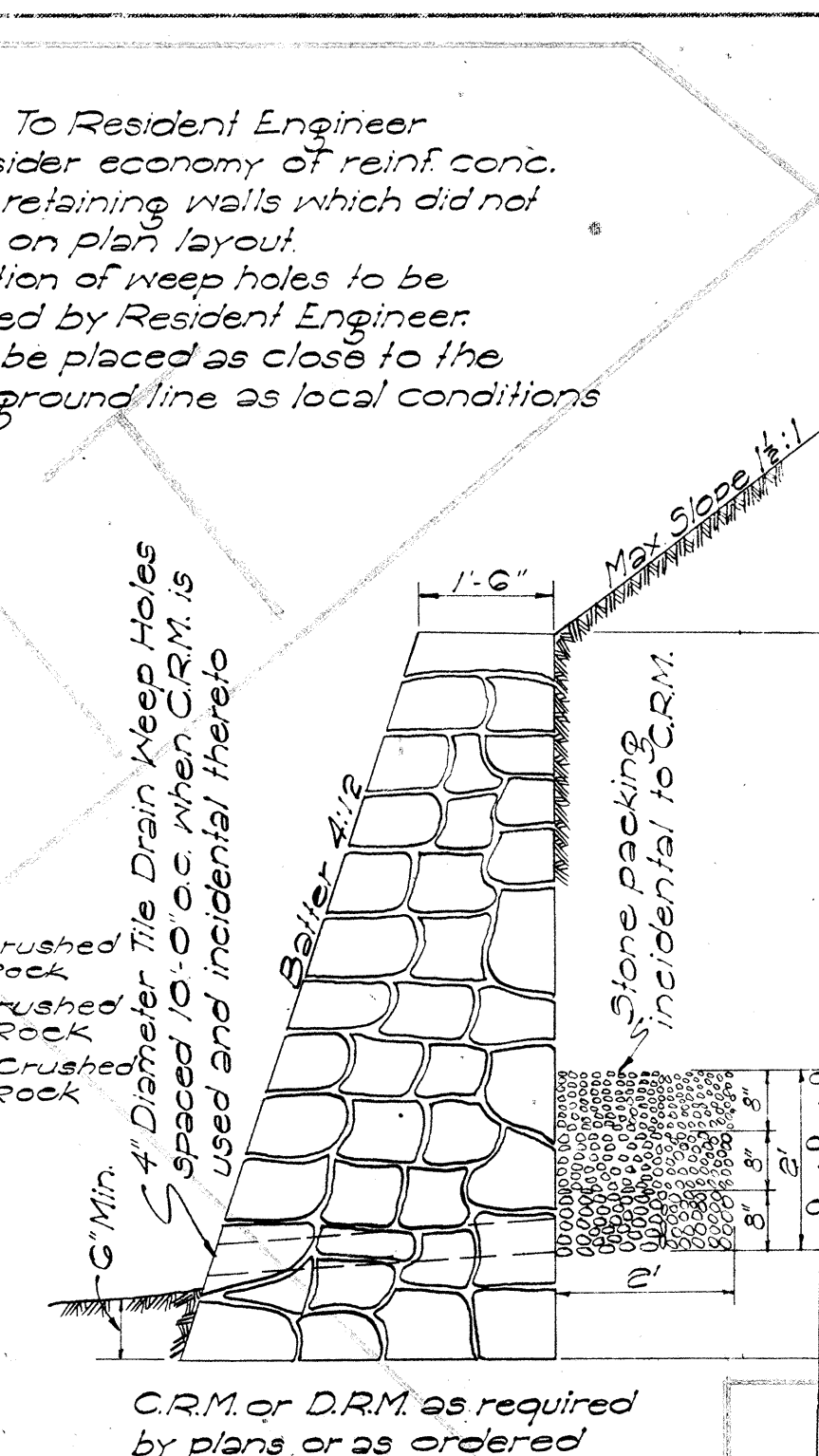
DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18"D		Z must be from pipe to face of trench
7" " 24"D		
8" " 30"D		
9" " 36"D	D/2 + T	Minimum = X
10" " 42"D		Maximum pay quantity will be Z = 12"
11" " 48"D		
12" " 54"D		

SECT. OF CULVERT WITH CONC. PROTECTION

Scale: 1" = 1'-0"



SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

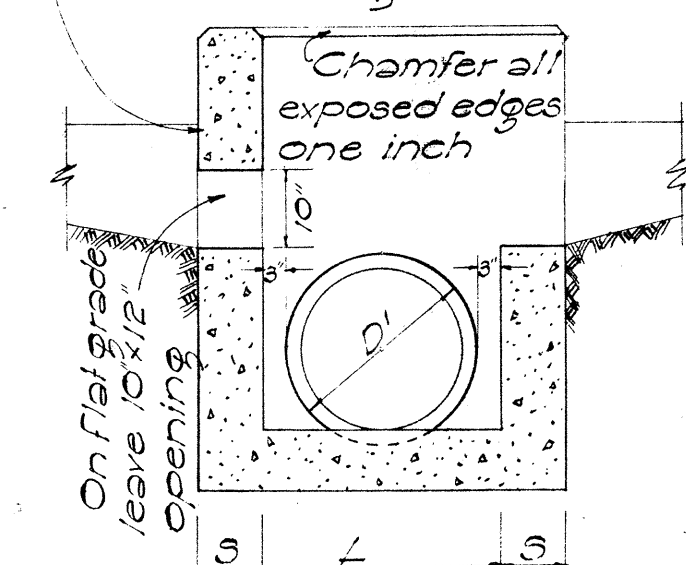


SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

D	D	L+D+G	S	Cu Yds	Where Variables Equal
23"	18"	2'-5"	8"	1.41	4'-6"
30"	24"	3'-0"	8"	1.72	5'-0"
37"	30"	3'-7"	9"	2.32	5'-6"
44"	36"	4'-2"	9"	2.73	6'-0"
51"	42"	4'-9"	10"	3.54	6'-6"
58"	48"	5'-4"	10"	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.

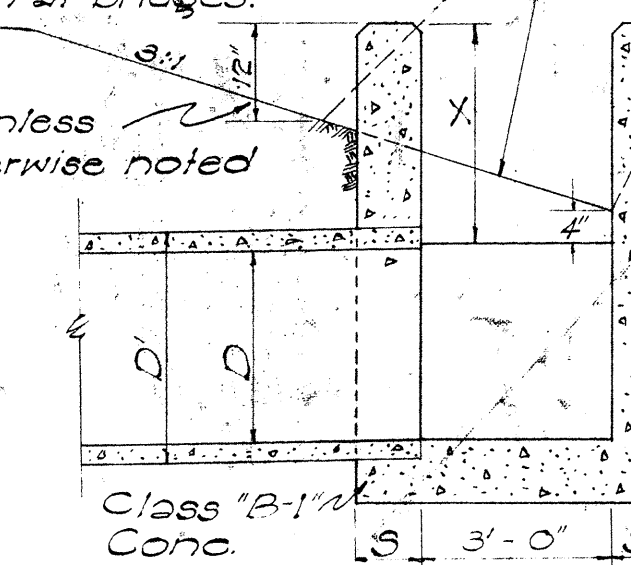


SECTION "B-B"

Where drainage comes from both sides lower 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.



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

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

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

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

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

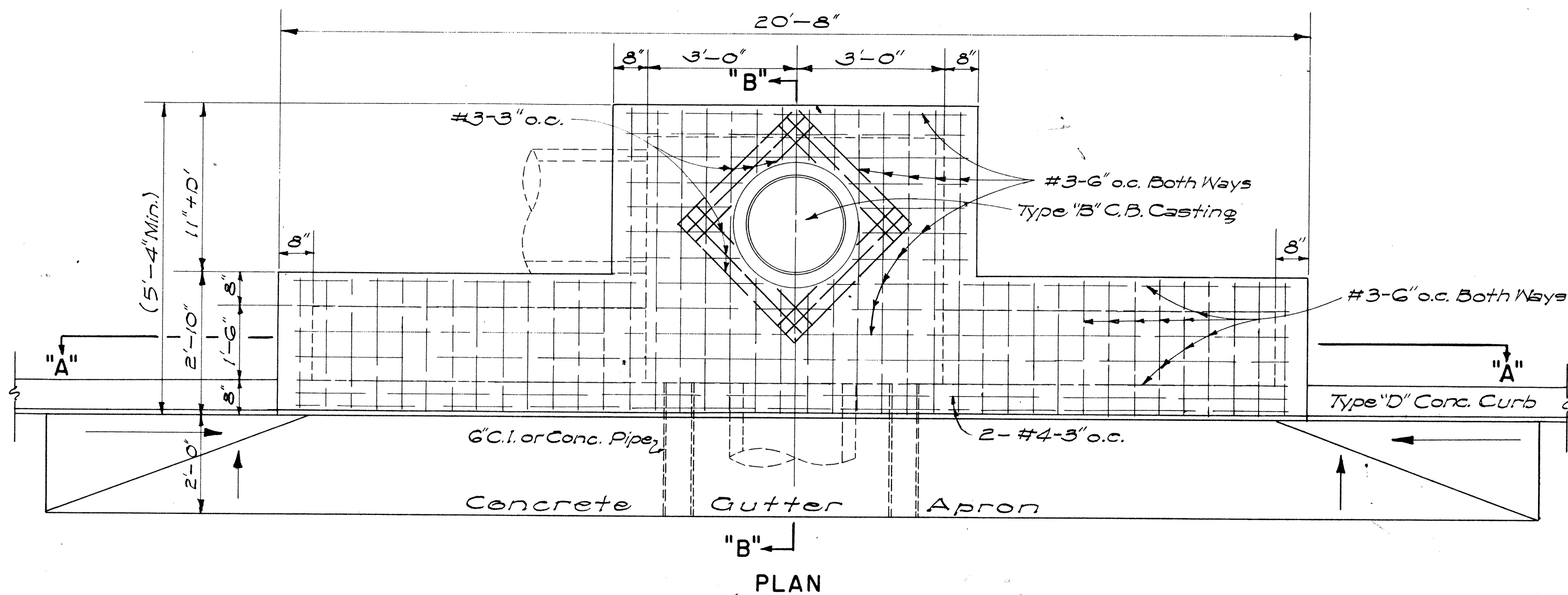
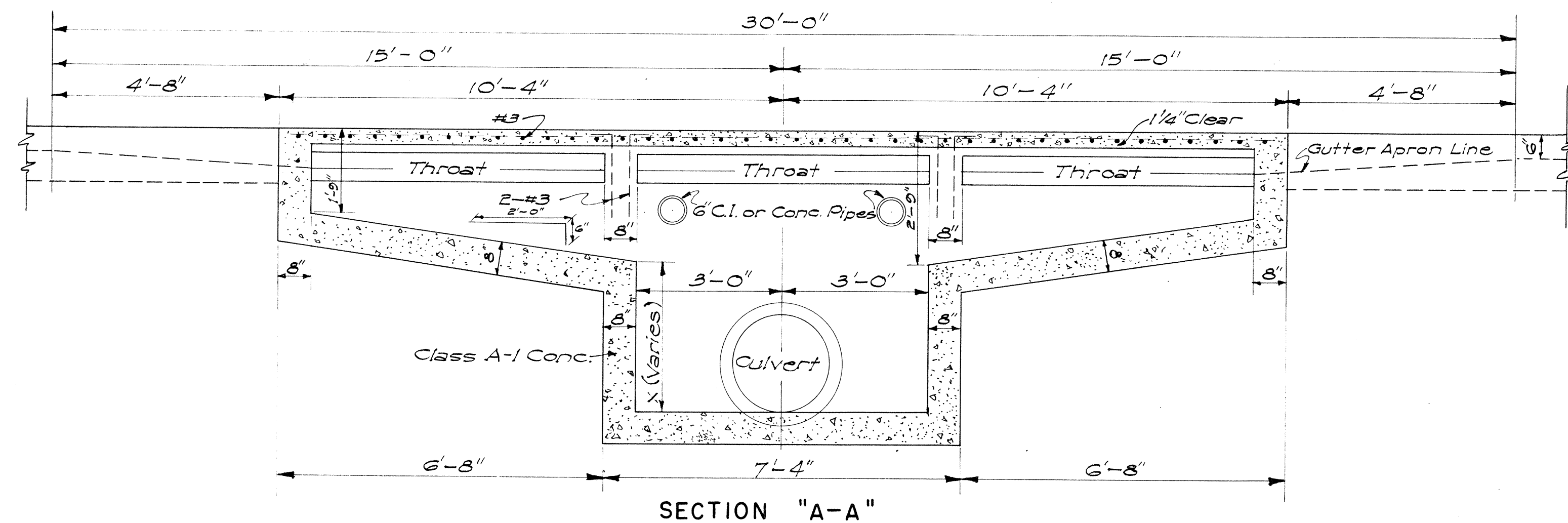
SHEET No 2 OF 8 SHEETS

109010200.13

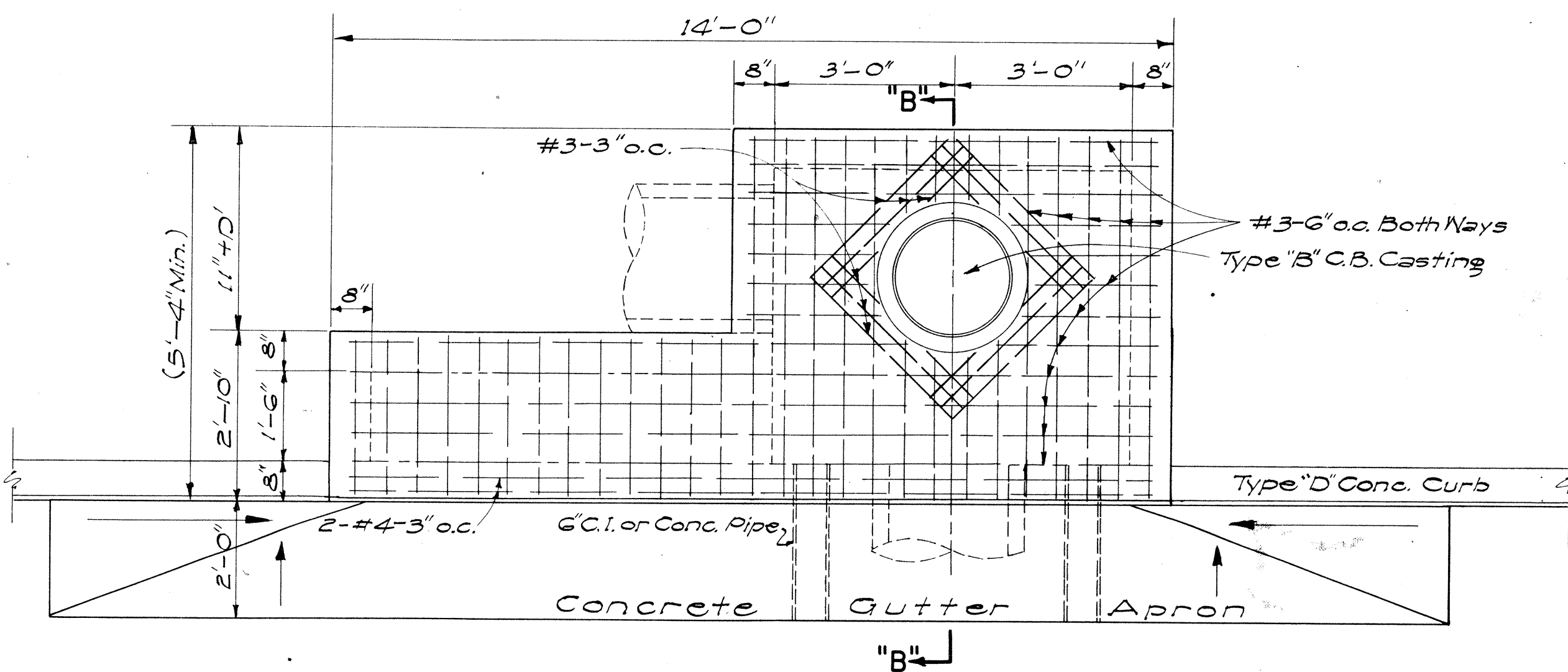
U09810400.15

U07210300.47

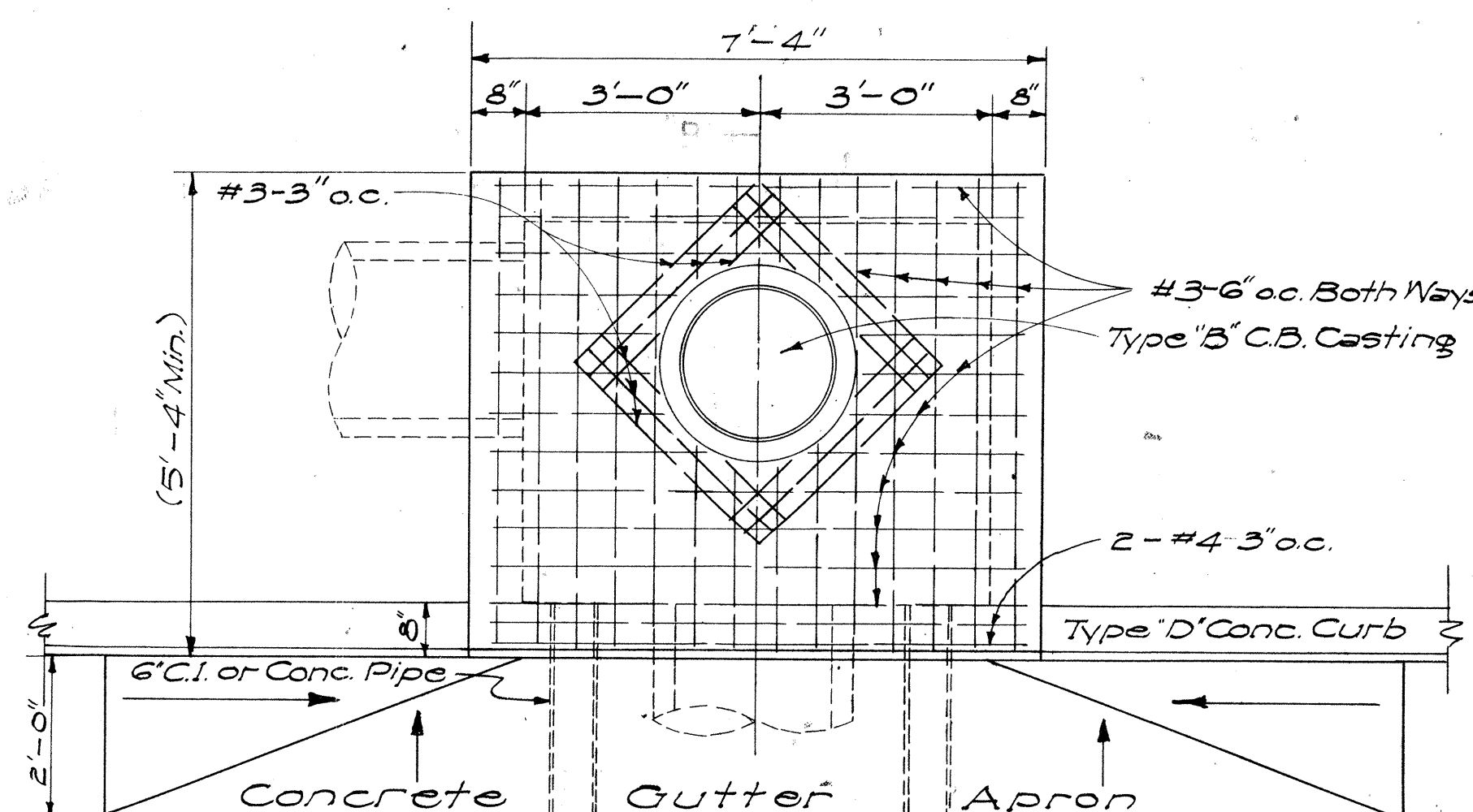
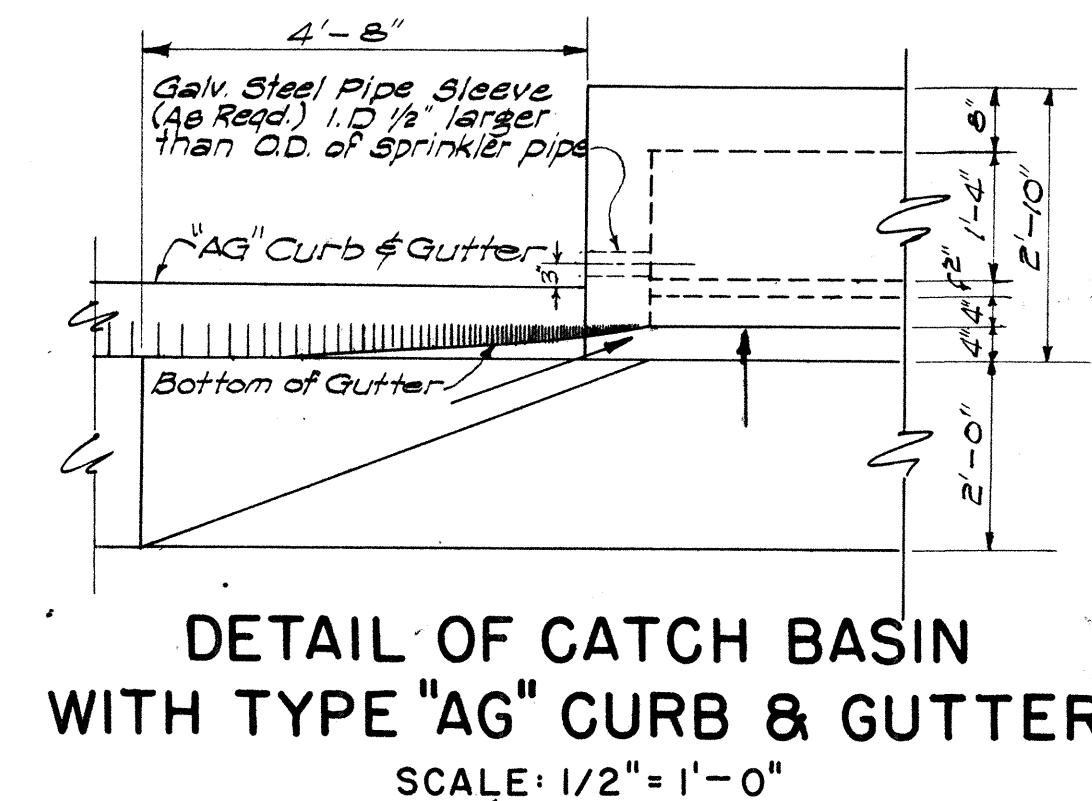
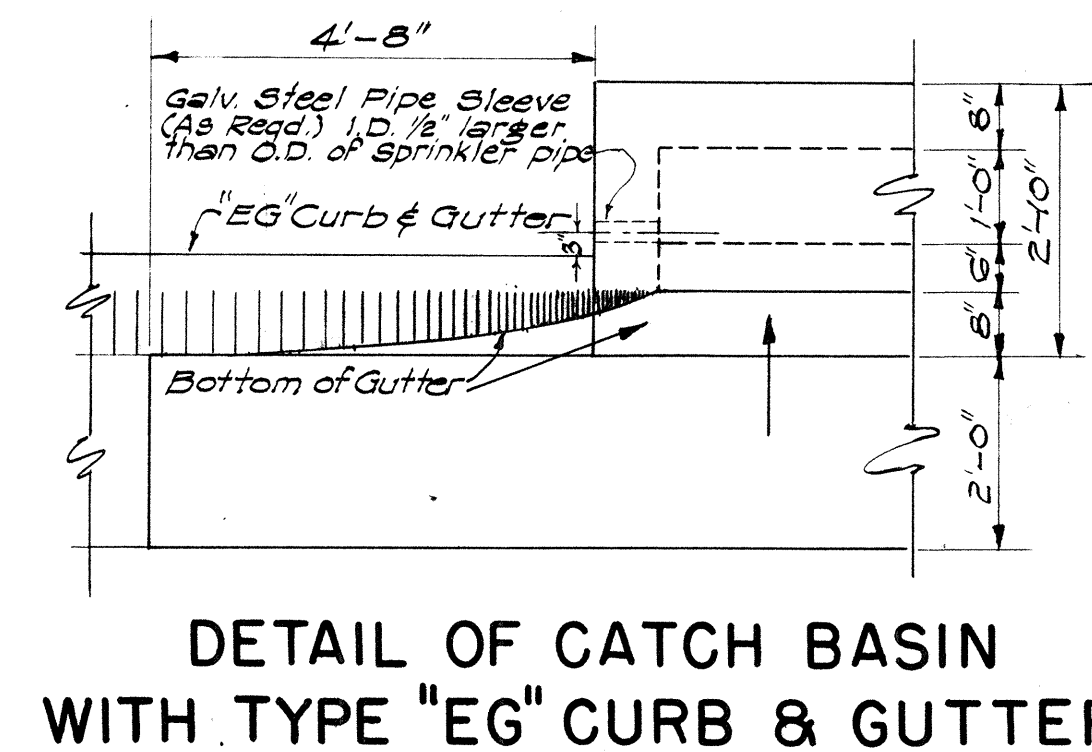
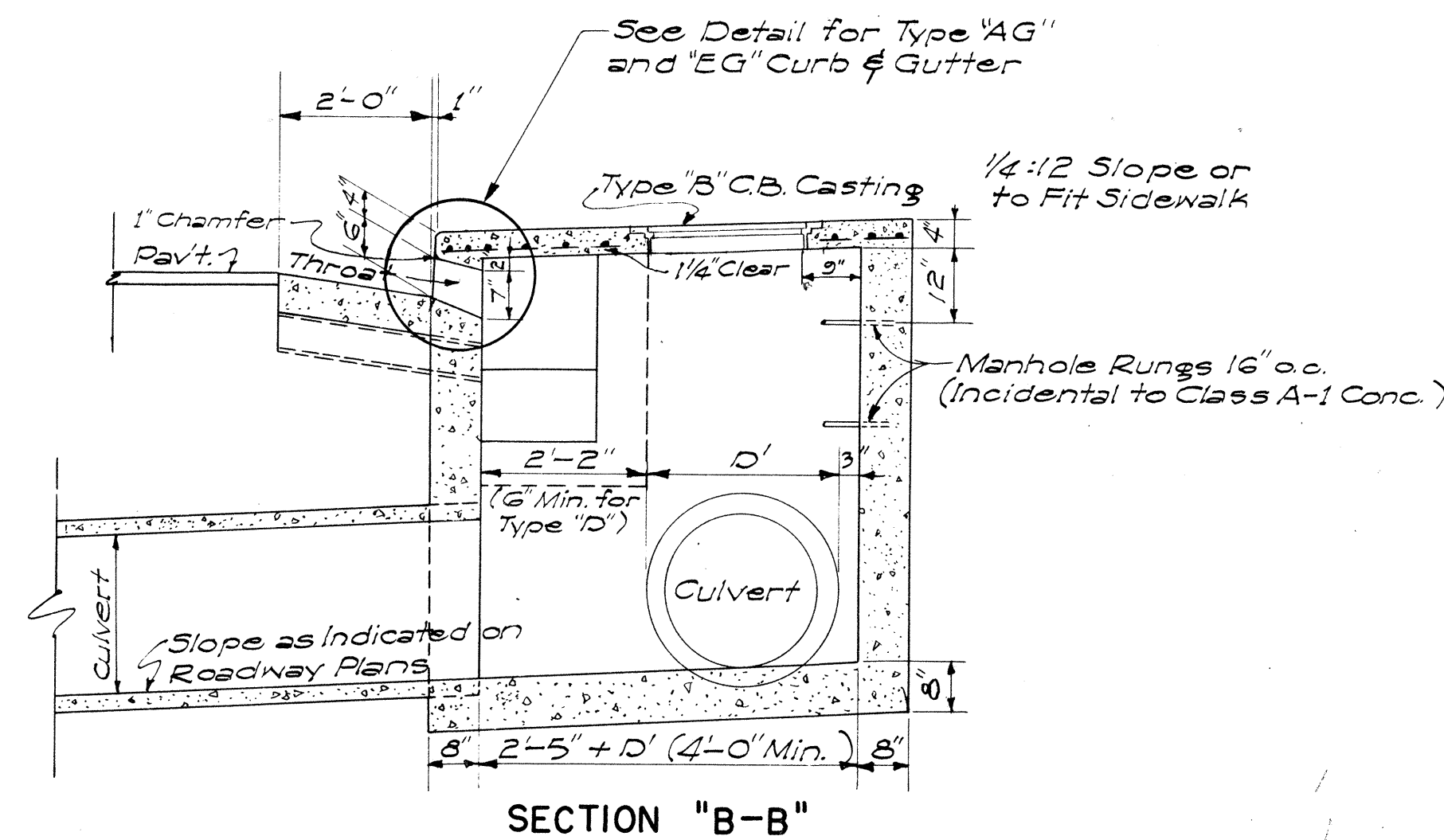
2/17/59



DETAIL OF TYPE "A" CATCH BASIN
SCALE: 1/2" = 1'-0"

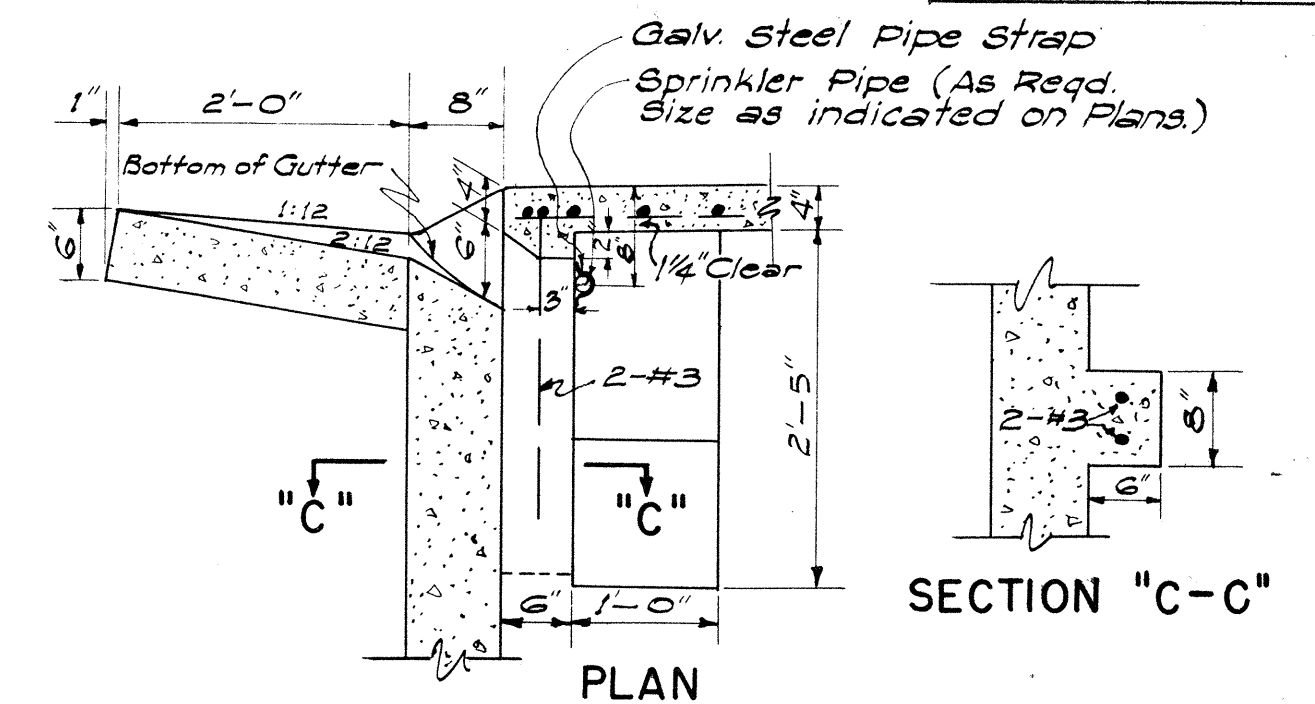


DETAIL OF TYPE "B" CATCH BASIN
SCALE: 1/2" = 1'-0"
NOTE: TYPE "C" C.B. SIMILAR BUT OPPOSITE HAND

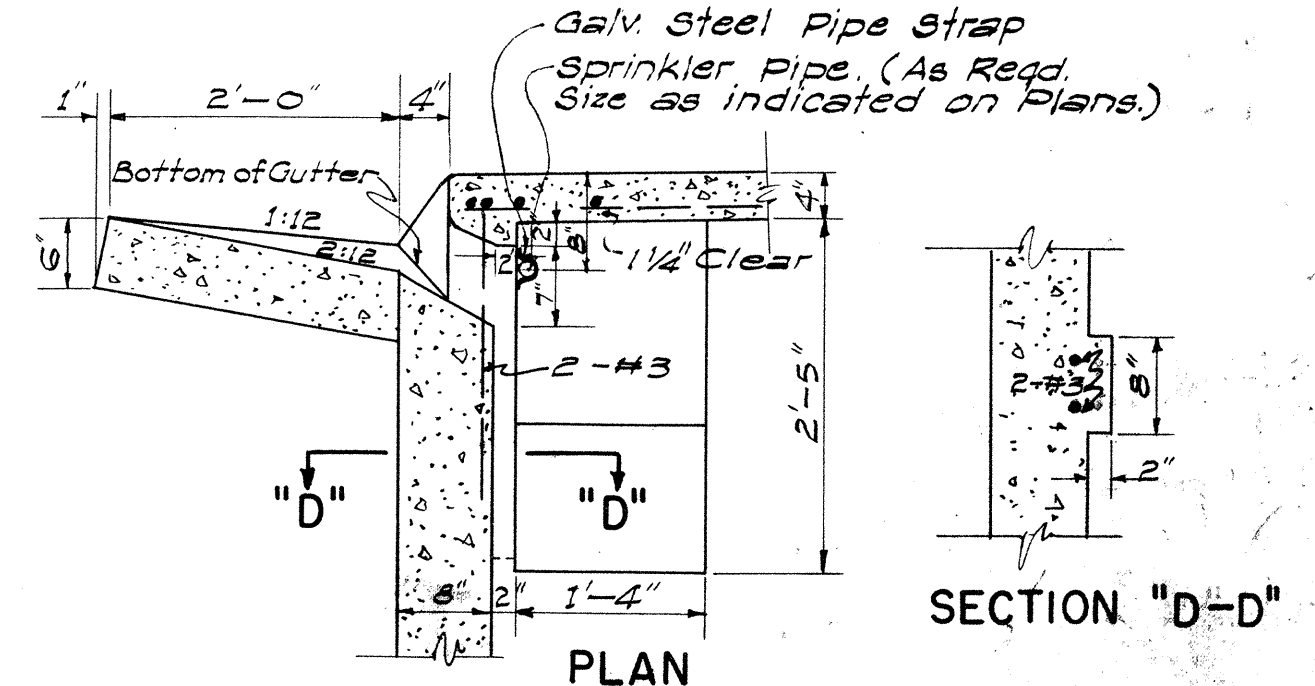


DETAIL OF TYPE "D" CATCH BASIN
SCALE: 1/2" = 1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
0-275-1(6)	HAWAII	1953	1953	28	28
0-275-1(6)	HAWAII	1953	1953	28	28
0-275-1(6)	HAWAII	1953	1953	28	28



THROAT DETAIL FOR TYPE "EG" CURB & GUTTER
SCALE: 3/4" = 1'-0"



THROAT DETAIL FOR TYPE "AG" CURB & GUTTER
SCALE: 3/4" = 1'-0"

ESTIMATED QUANTITIES

Type	Class A-1 Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D"	4.0 c.y.	16.5 c.y.	77 lb.	16'-8"

NOTES:

- Quantities based on X=3'-0" and D=30"
- Quantities do not include concrete for Gutter Apron.
- The Contractor shall install 2'-6" Cast Iron or Concrete Pipes as incidental to Class A-1 Concrete for Construction Drainage.
- Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
- The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.

APPROVED: _____ DATE: 4-23-59
STATE HIGHWAY ENGINEER

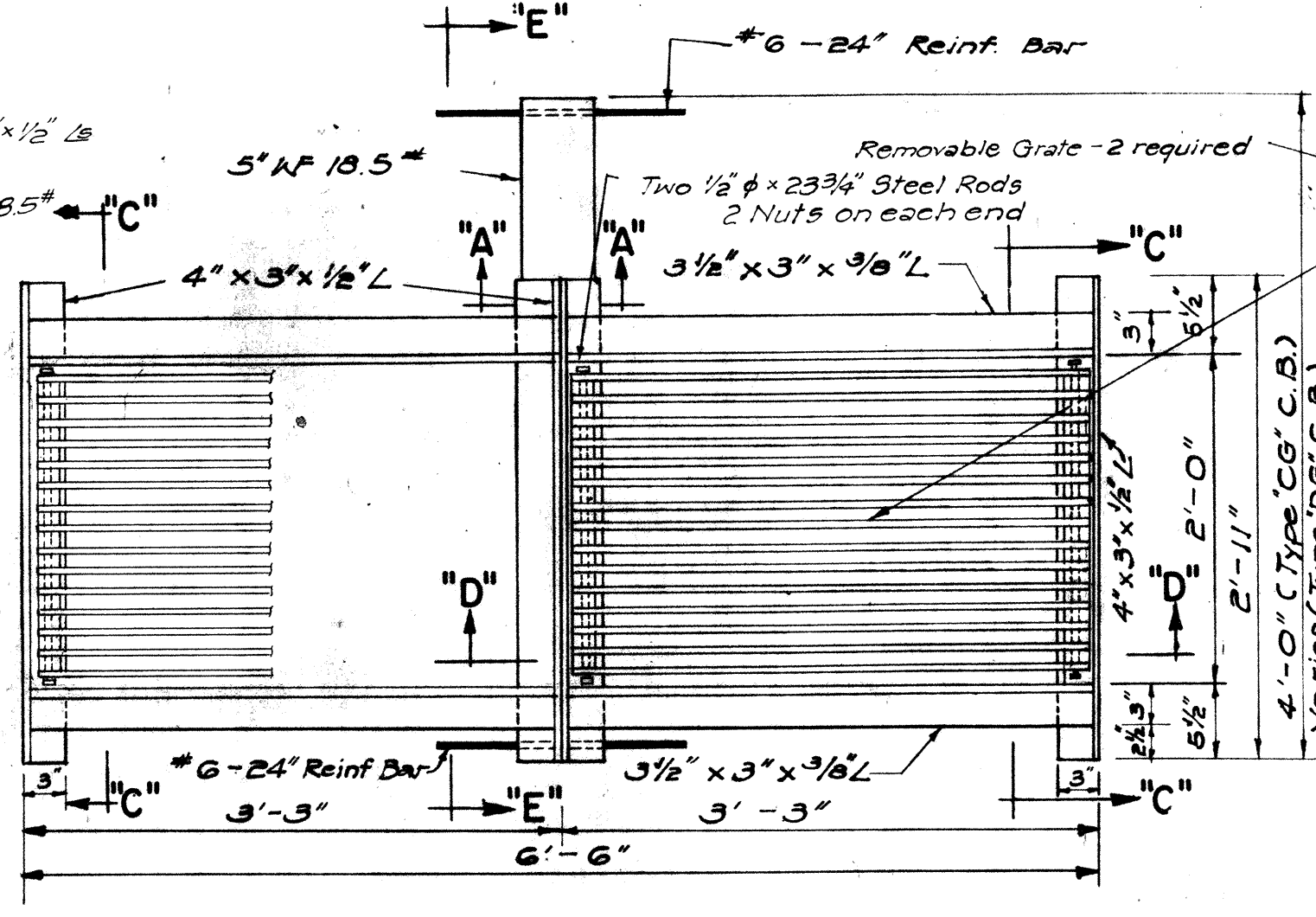
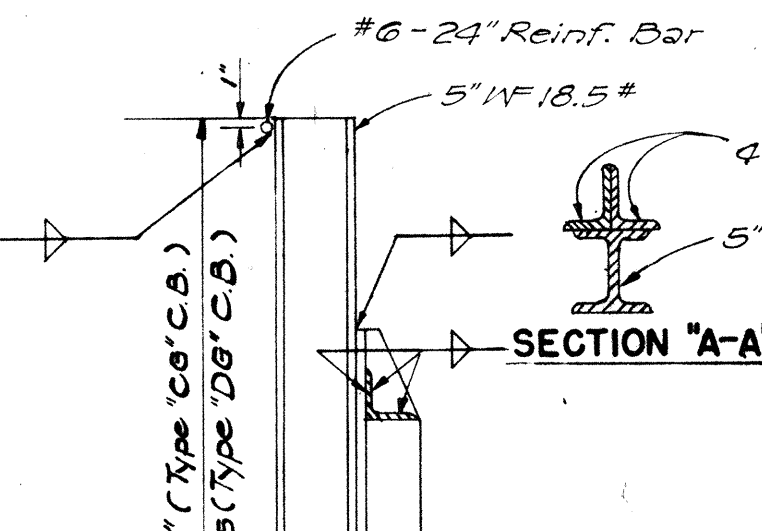
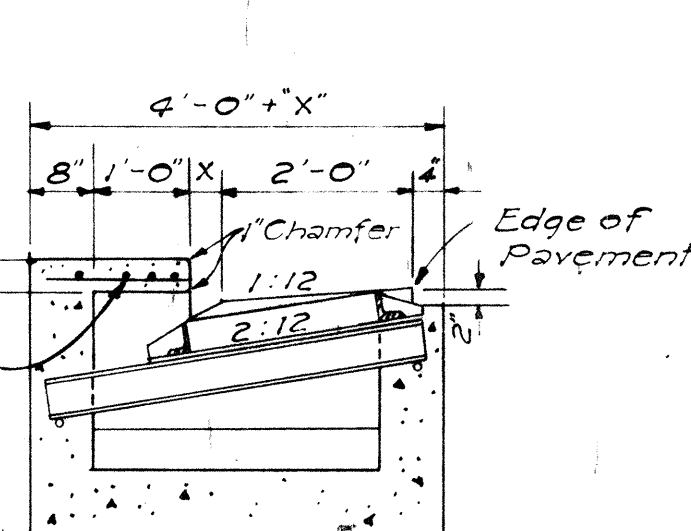
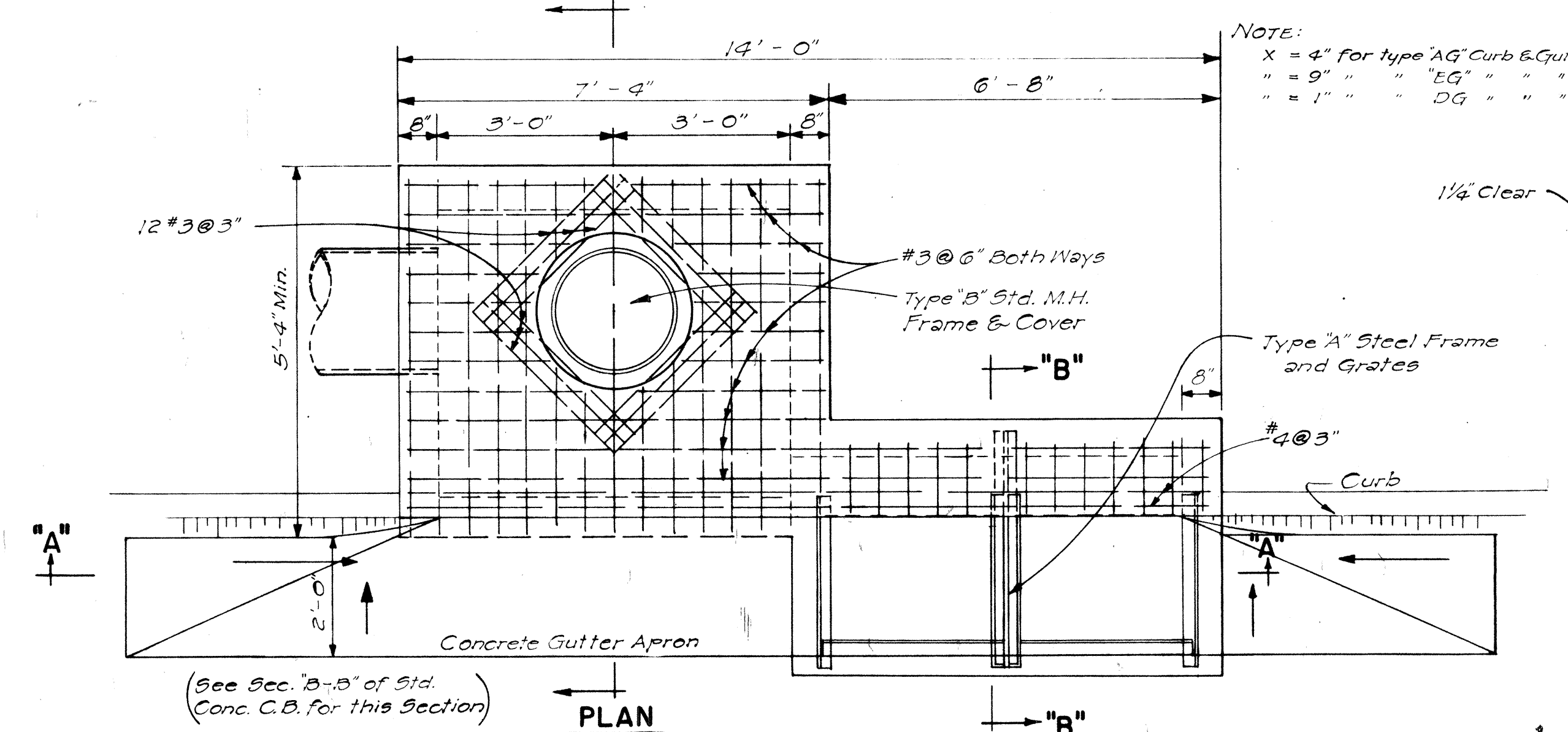
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CONCRETE CATCH BASINS

SCALES AS NOTED
SHEET NO 3 OF 8 SHEETS

DESIGNED BY: _____
DRAWN BY: _____
CHECKED BY: _____
DATE: _____
ORIGINAL PLAN NO. _____
NOTE BOOK NO. _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4-078-1(3)	HAWAII	1-025-1(3)	1968	49	246
4-078-1(4)		1-025-1(4)	1968	13	23
1-025-1(5)		1-025-1(5)	1968	19	23

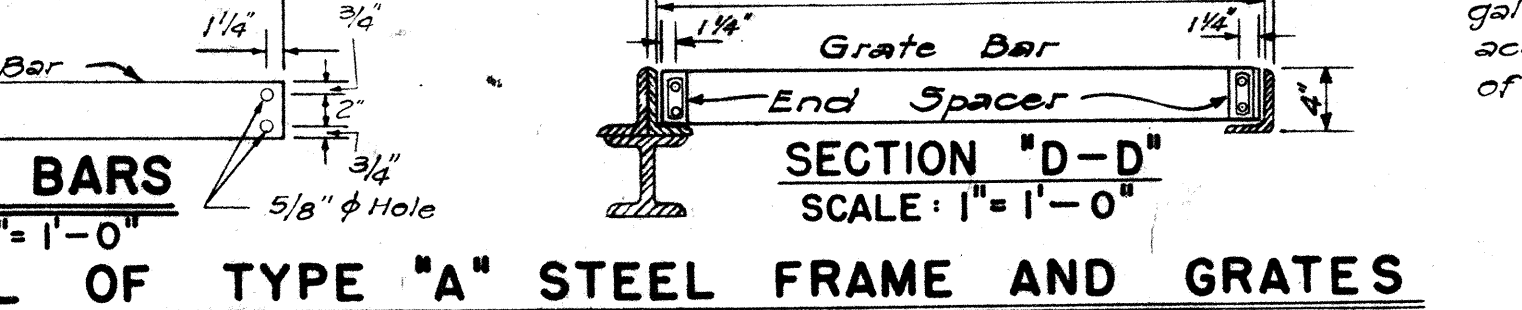
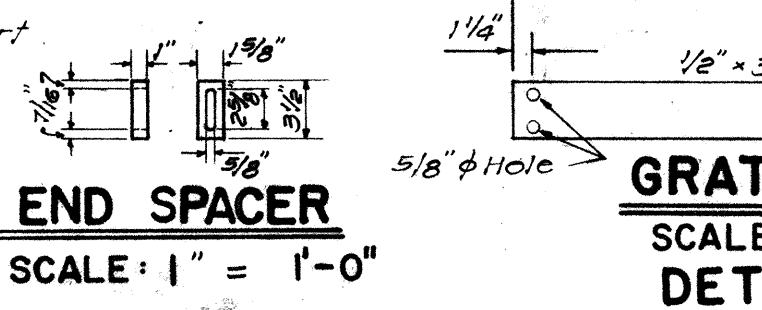
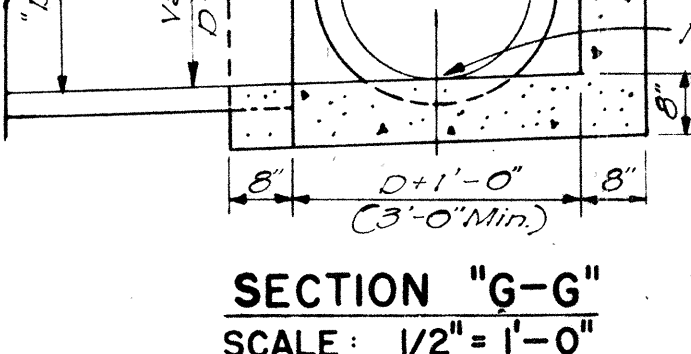
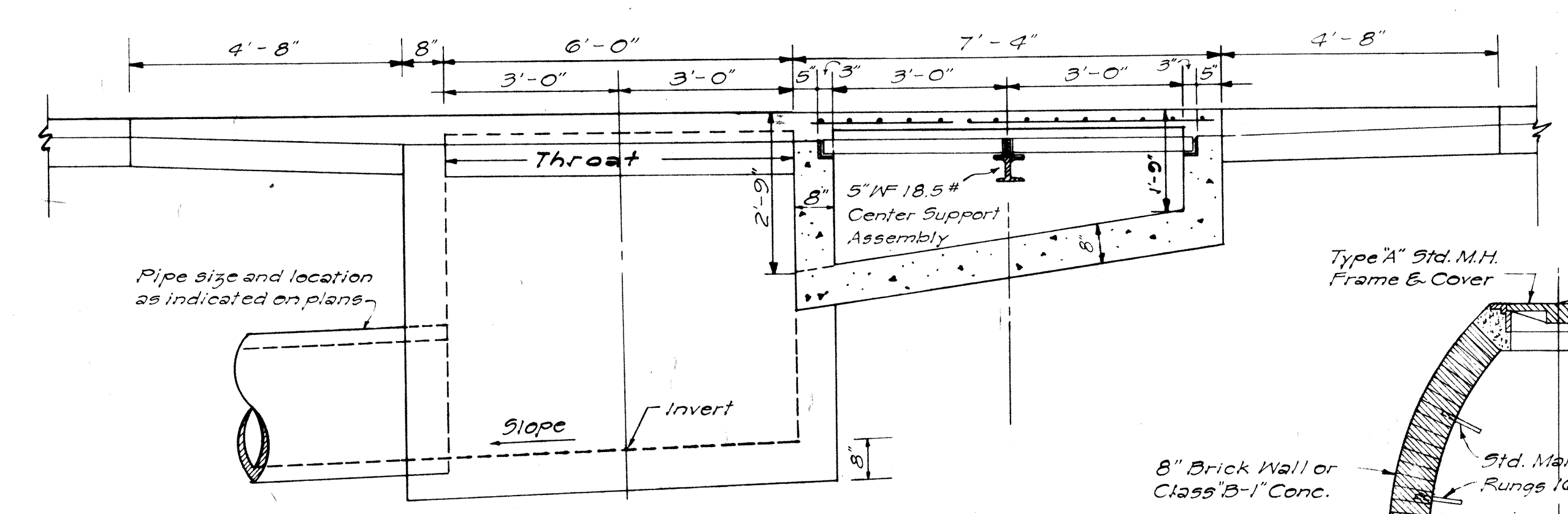
REVISED: SEPT. 1, 1961



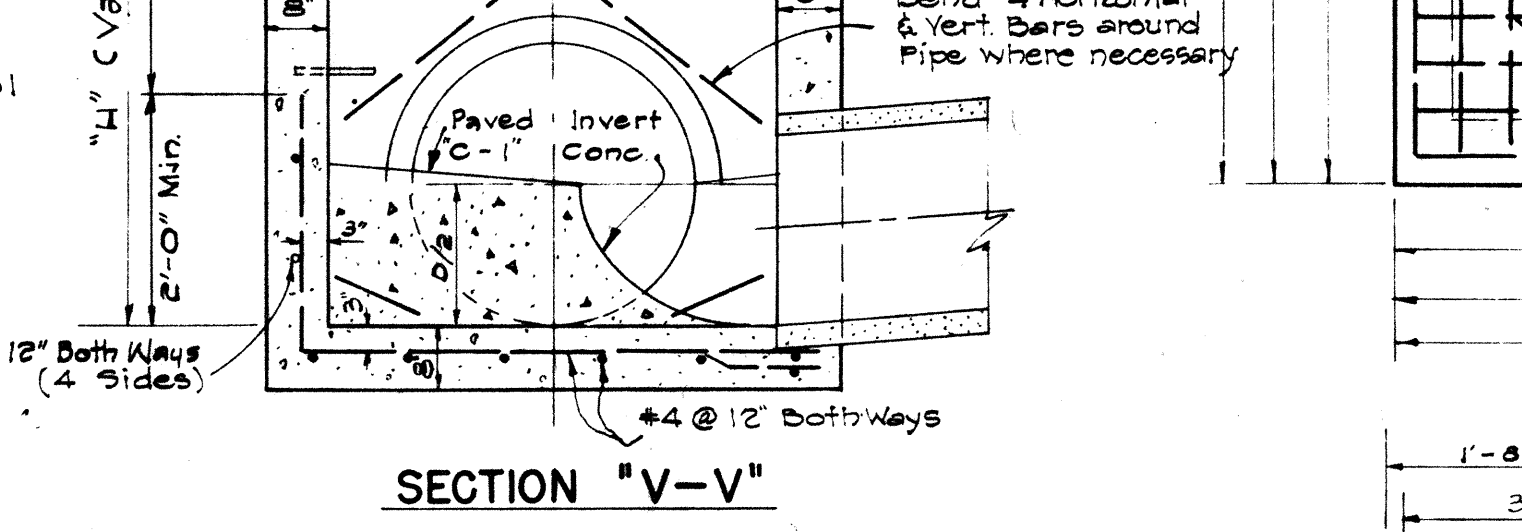
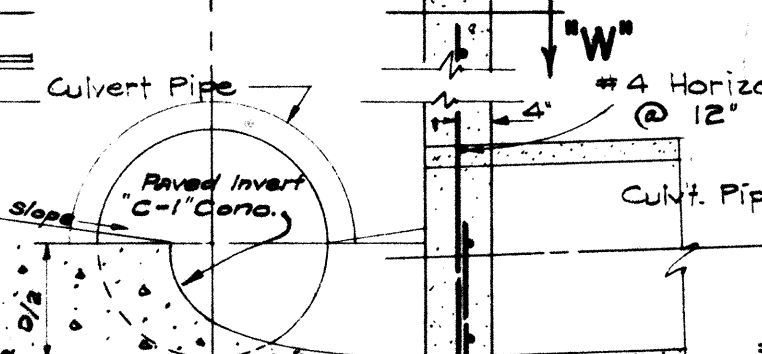
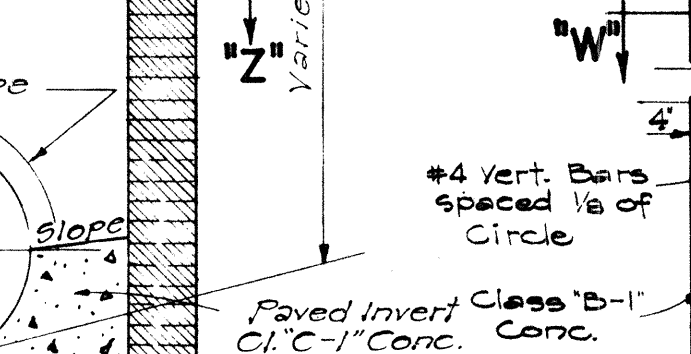
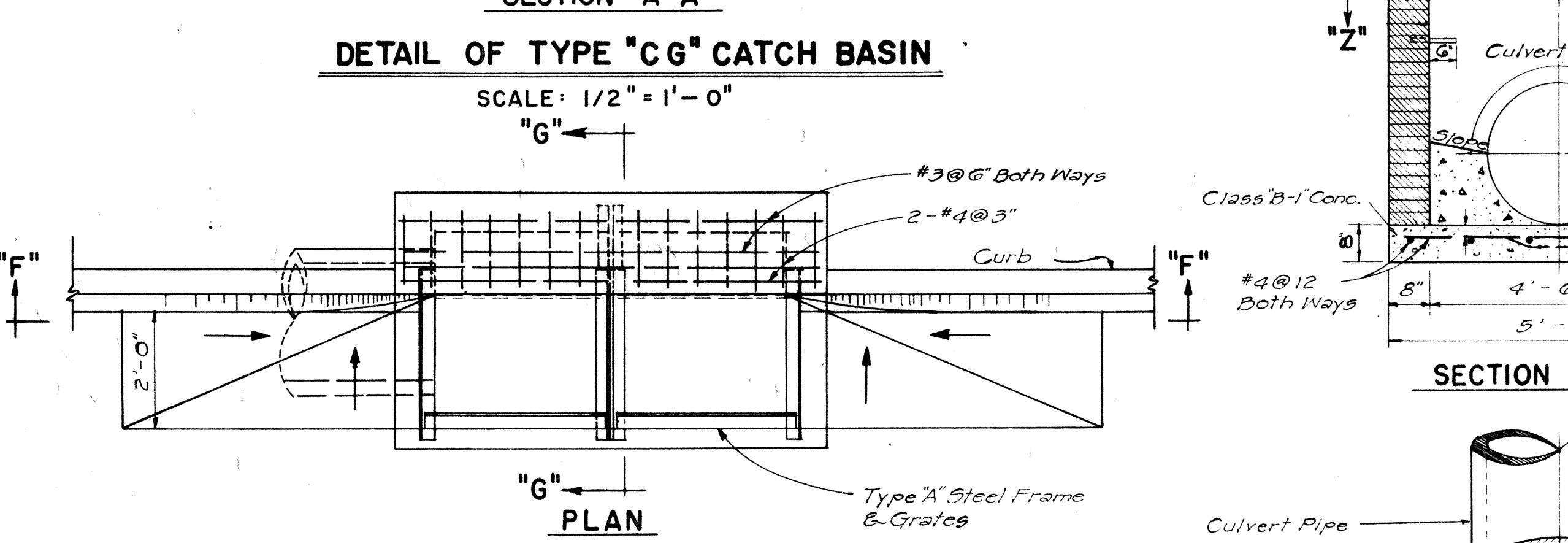
SECTION "C-C"

SCALE: 1" = 1'-0"

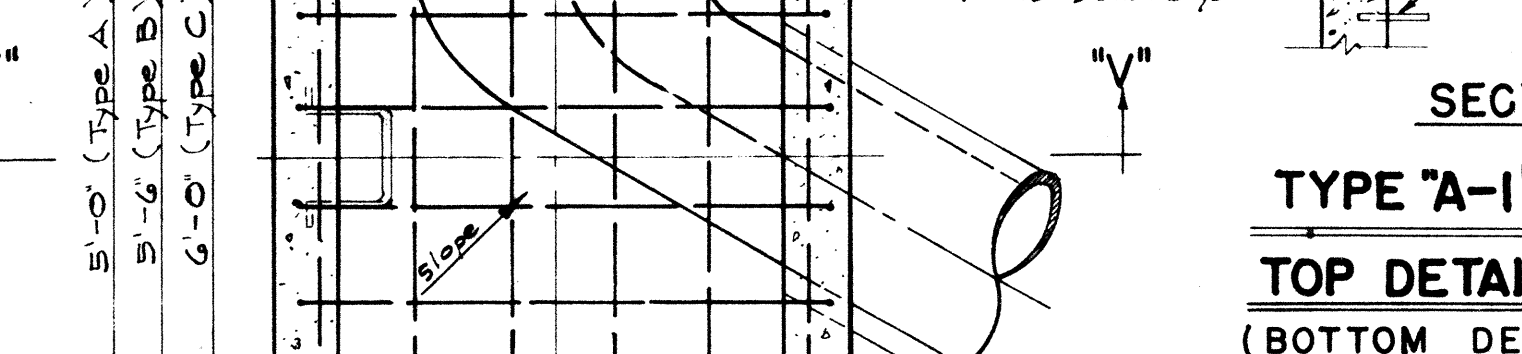
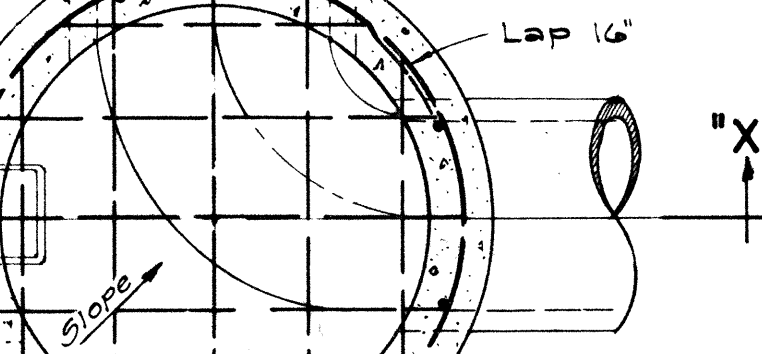
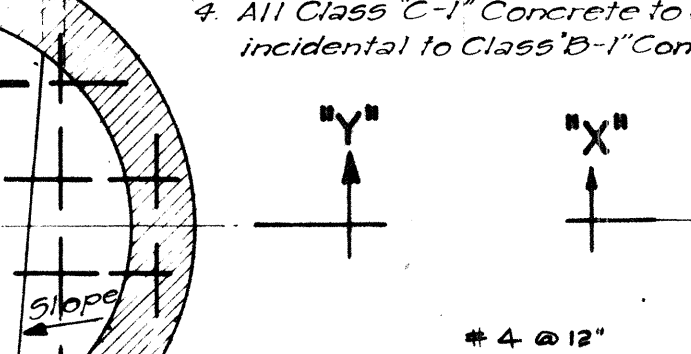
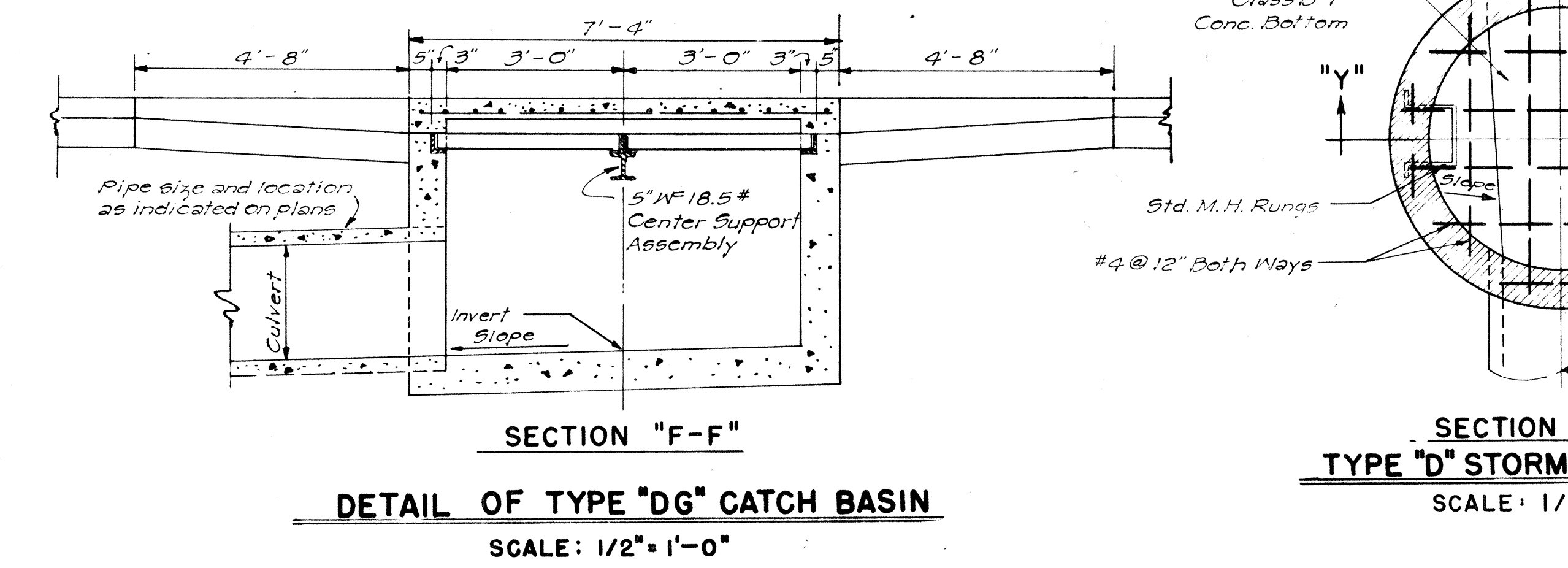
- NOTE:
- All welds 3/8" unless otherwise noted.
 - All steel shall be structural grade.
 - Grates and frame shall be hot dip galvanized after fabrication in accordance with Section 44 (H) of the Standard Specifications.



DETAIL OF TYPE "A" STEEL FRAME AND GRATES



PLAN



SECTION "T-T"

TYPE "A-1", "B-1", & "C-1" S.D.M.H.

TOP DETAIL UNDER PAVEMENT

(BOTTOM DETAIL SIMILAR TO TYPE "A", "B", & "C")

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

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

STATE OF HAWAII

STANDARD DETAILS

GRADED CATCH BASINS & STORM DRAIN MANHOLES

SCALES AS NOTED

SHEET NO. 4 OF 8 SHEETS

ORIGINAL PLAN	DATE: May 51
DESIGNED BY: C.M.	TRACED BY: M.M.
NOTE BOOK	QUANTITIES BY: S.M.
CHECKED BY: S.M.	

APPROVED: [Signature]

STATE HIGHWAY ENGINEER

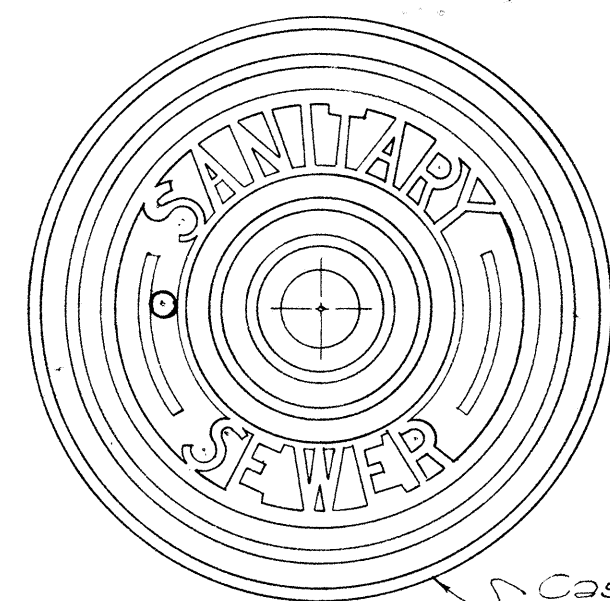
DATE: Aug. 26, 1959

2/17/59
3/14/59

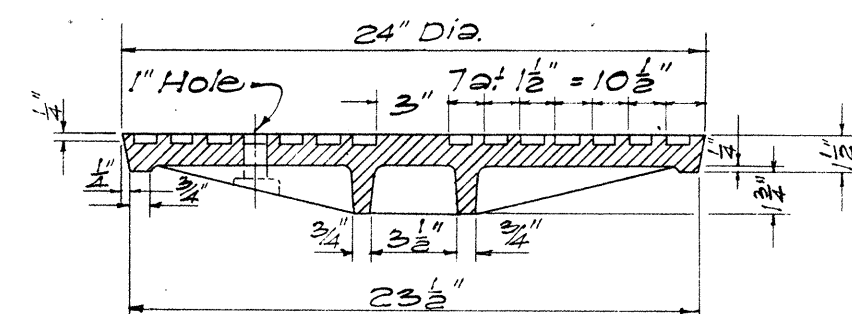
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-578-1(3)	1958	20	246
		U-578-1(4)	1958	22	38
		U-578-1(3)	1958	16	98

August 1957

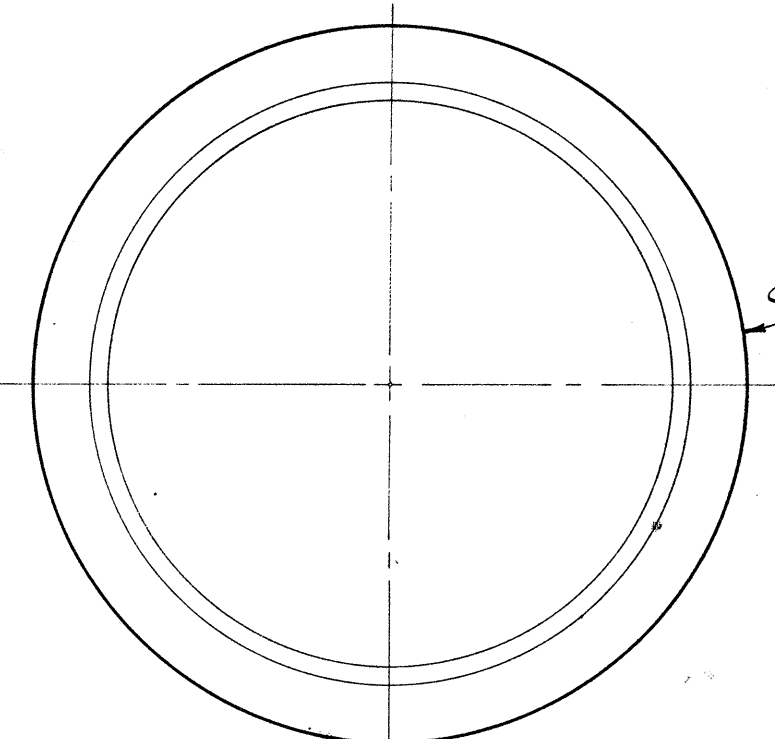
NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



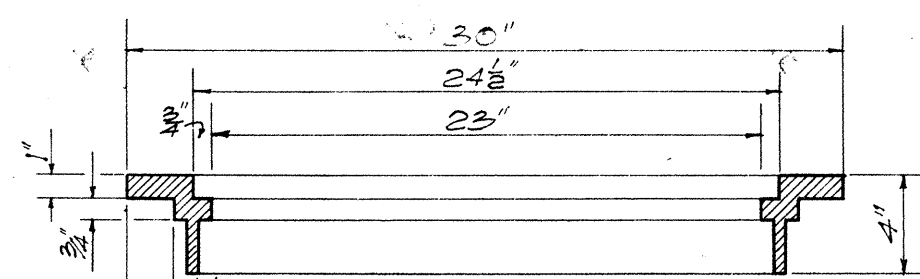
TOP VIEW OF COVER



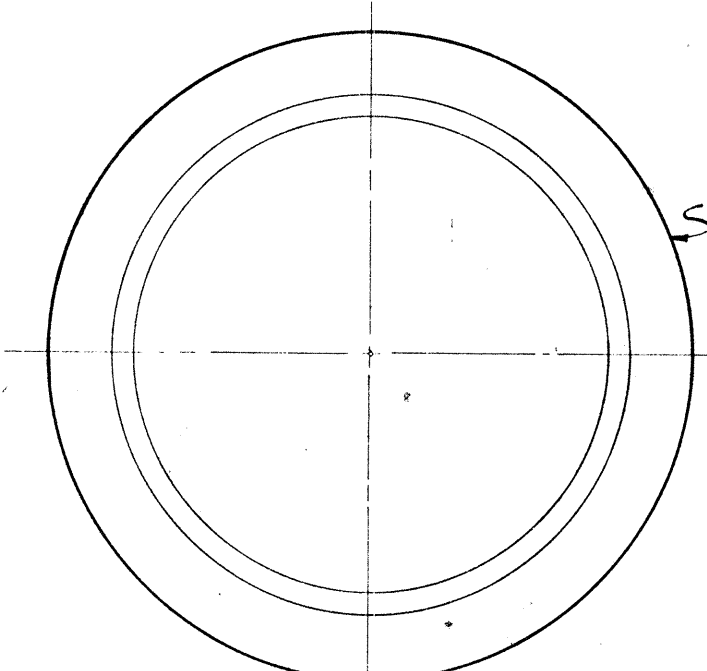
SECTION



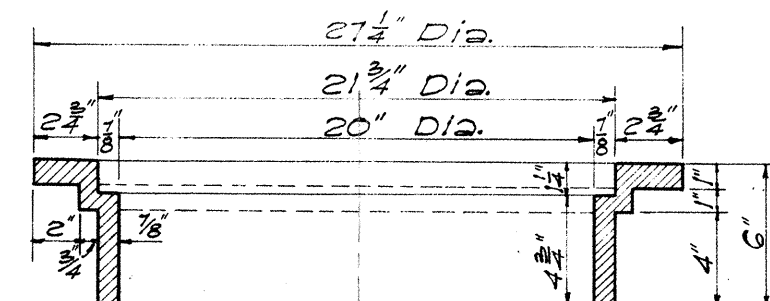
PLAN OF RIM



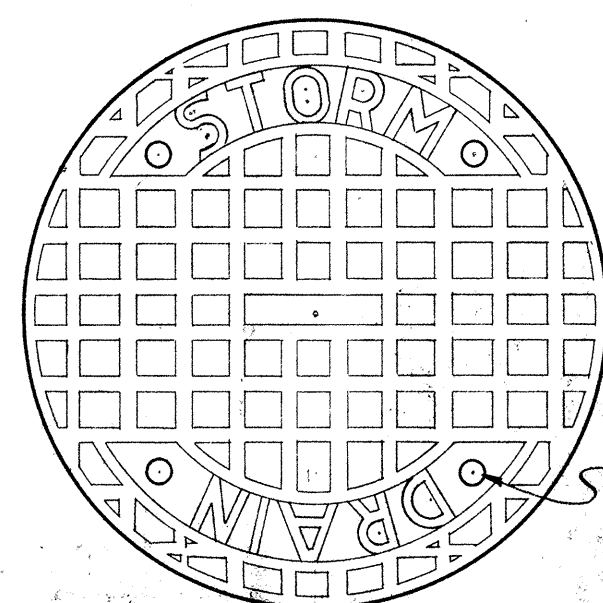
SECTION OF RIM



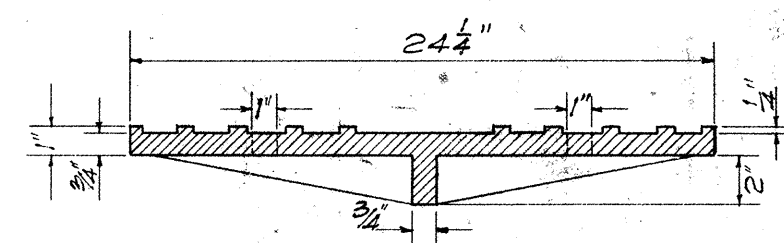
PLAN OF RIM



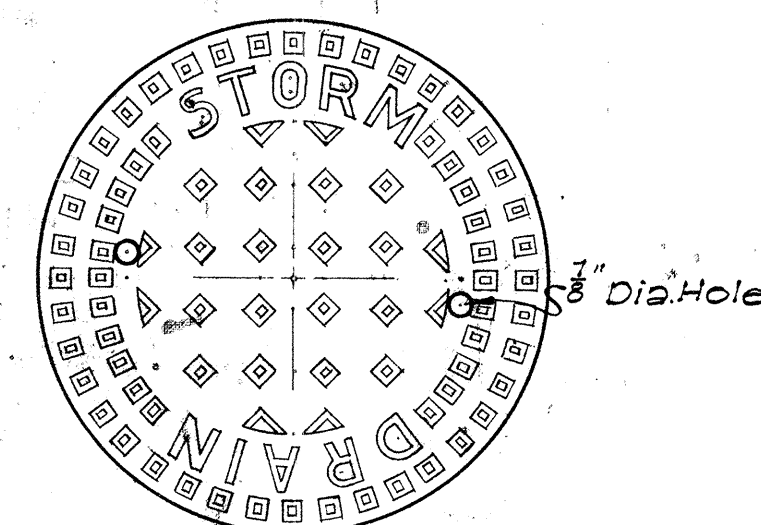
SECTION OF RIM



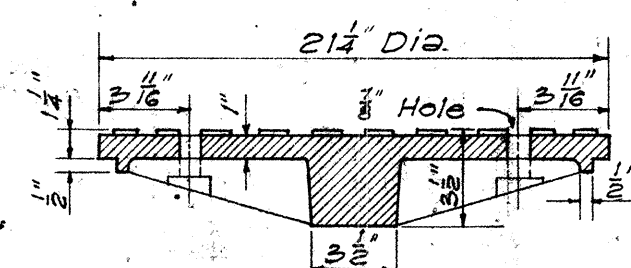
TOP VIEW OF COVER



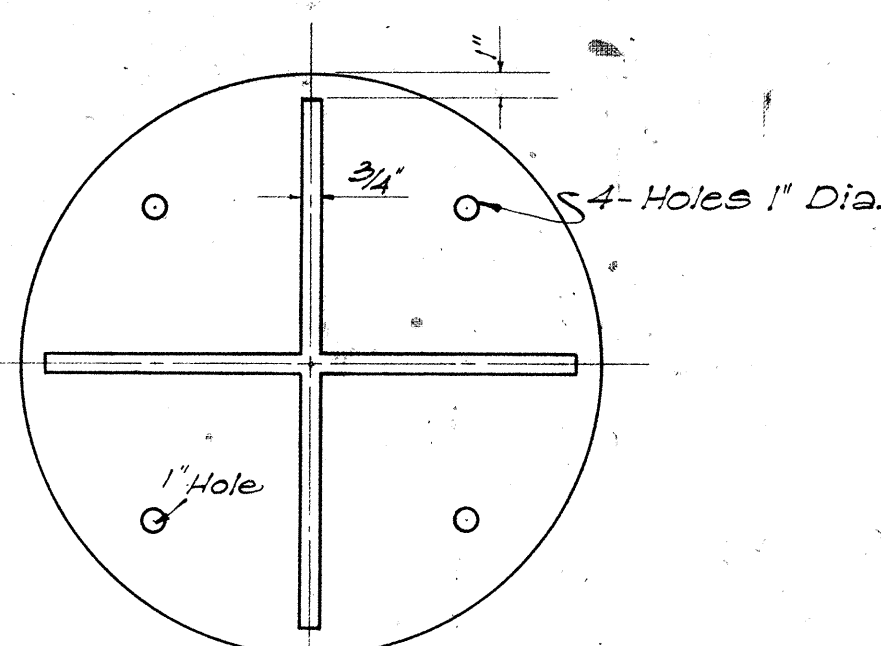
SECTION



TOP VIEW OF COVER



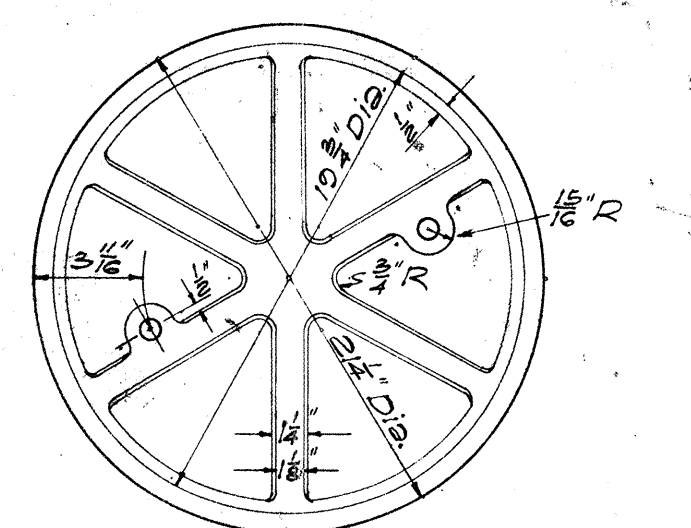
SECTION



BOTTOM VIEW OF COVER

DETAILS OF TYPE "B"
CATCH BASIN CASTINGS

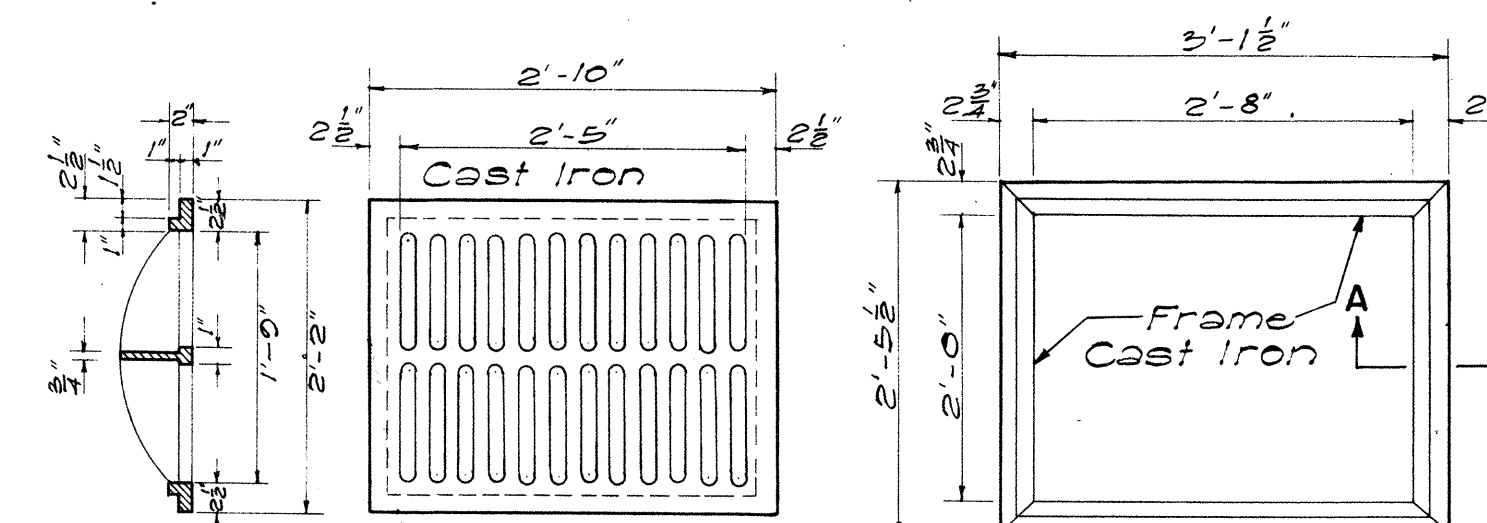
SCALE: 1-1/2" = 1'-0"
(STORM DRAIN)



BOTTOM VIEW OF COVER

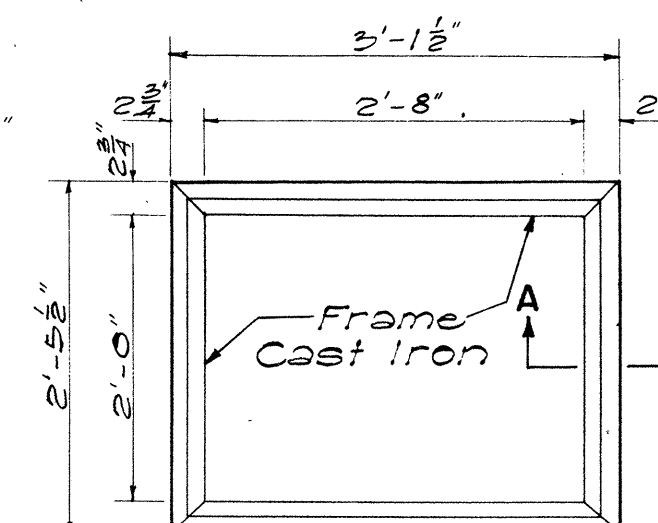
DETAILS OF TYPE "A"
MANHOLE CASTINGS

SCALE: 1-1/2" = 1'-0"
(STORM DRAIN)



SECTION

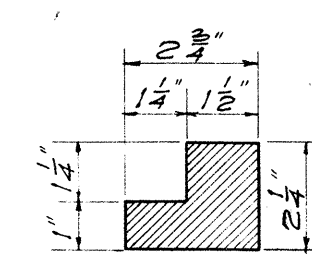
TOP VIEW



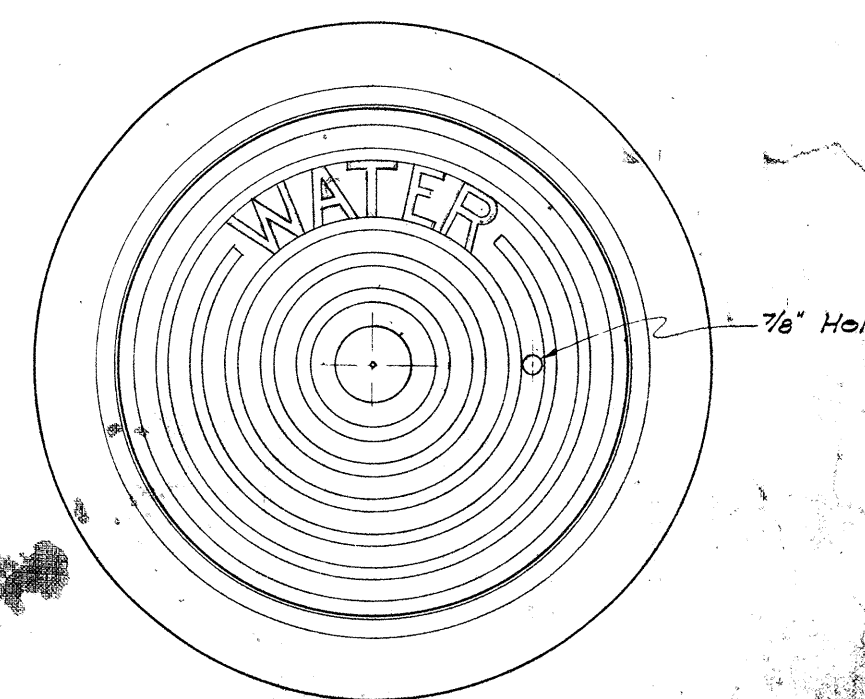
TOP VIEW

TYPE C C.I. FRAME AND GRATING

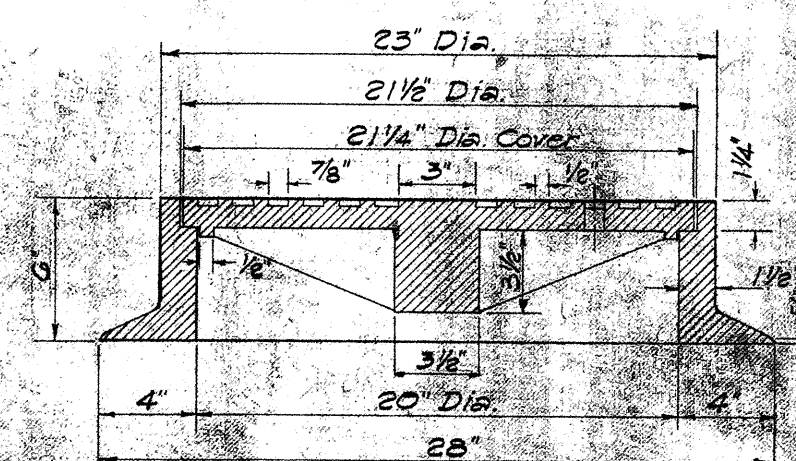
SCALE: 3/4" = 1'-0"



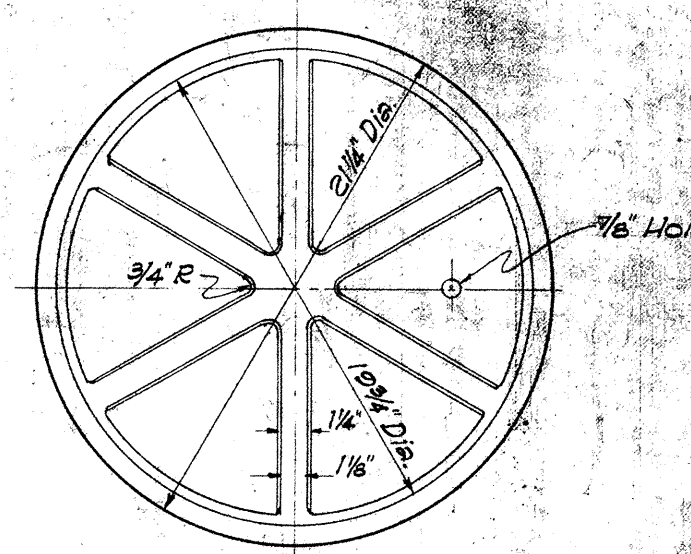
SECTION "A-A"
SCALE 3" = 1'-0"



PLAN OF FRAME AND COVER



SECTION OF FRAME AND COVER



BOTTOM VIEW OF COVER

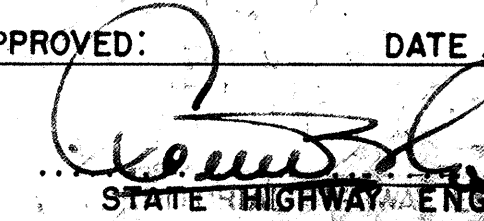
DETAILS OF 20" CAST IRON
FRAME AND COVER FOR
WATER MANHOLE

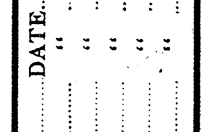
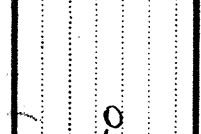
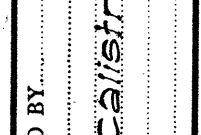
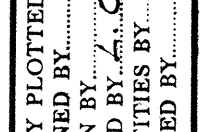
SCALE: 1 1/2" = 1'-0"

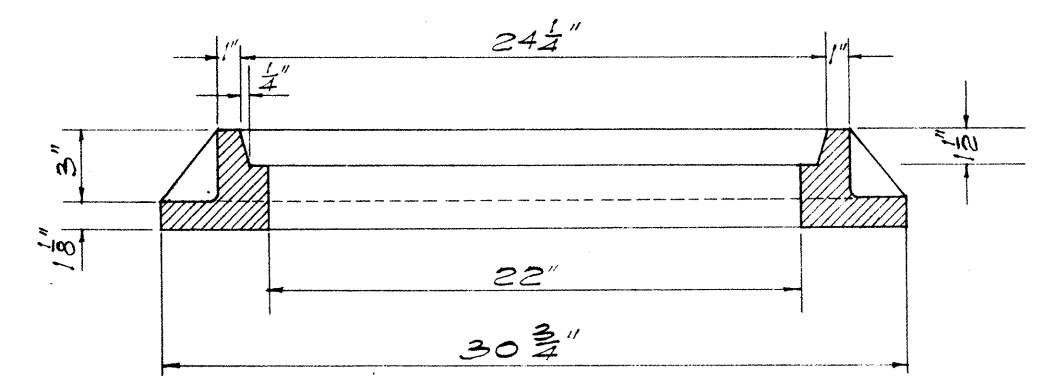
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII
STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

SCALES AS NOTED

SHEET NO 5 OF 8 SHEETS

APPROVED:  DATE: Aug. 26, 1959
STATE HIGHWAY ENGINEER

ORIGINAL PLAN
DESIGNED BY: 
DRAWN BY: 
CHECKED BY: 
NOTE BOOK
No. 



SECTION OF RIM
DETAILS OF STANDARD
MANHOLE CASTINGS (SEWER)

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

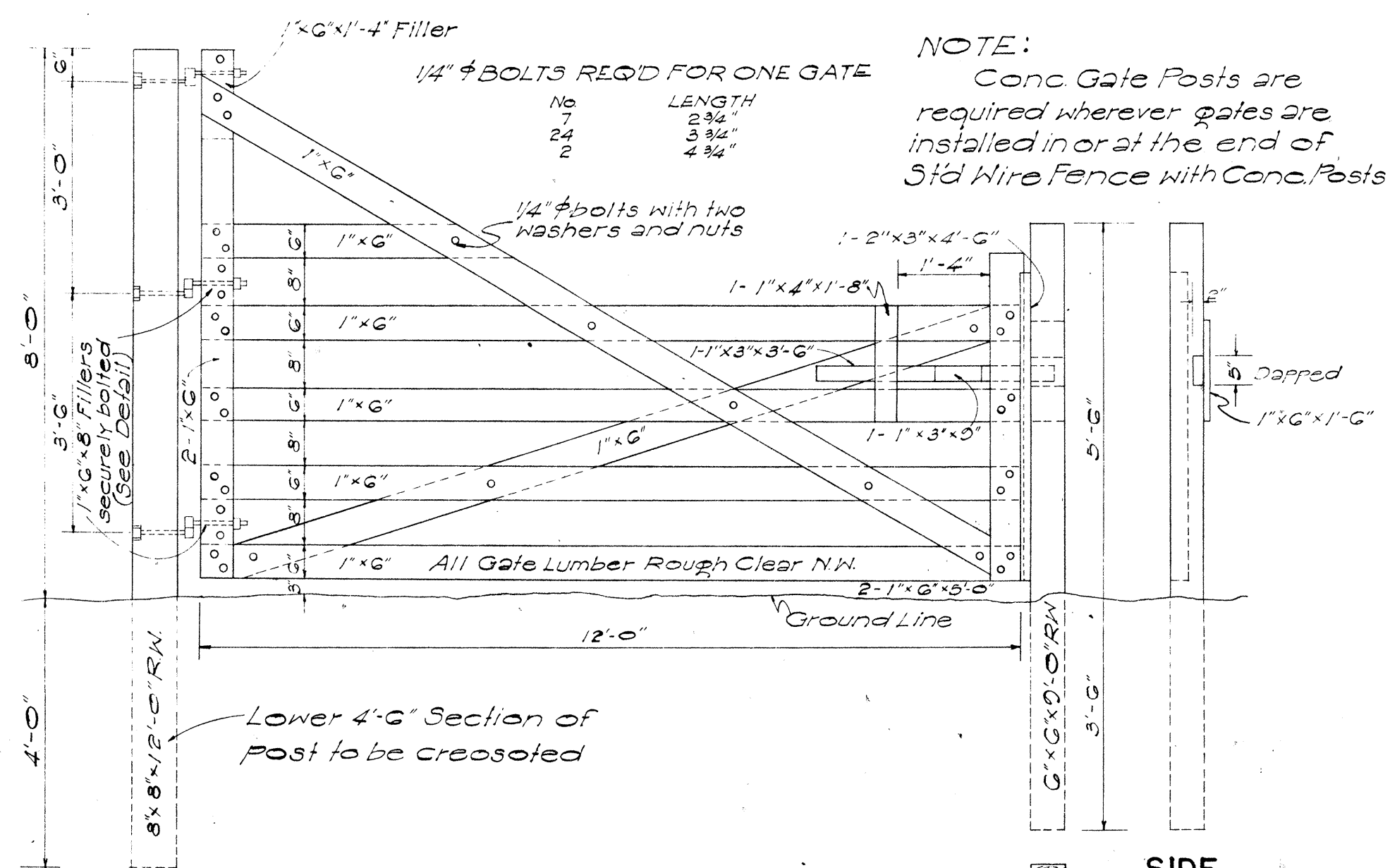
109010200.16

009810400.20

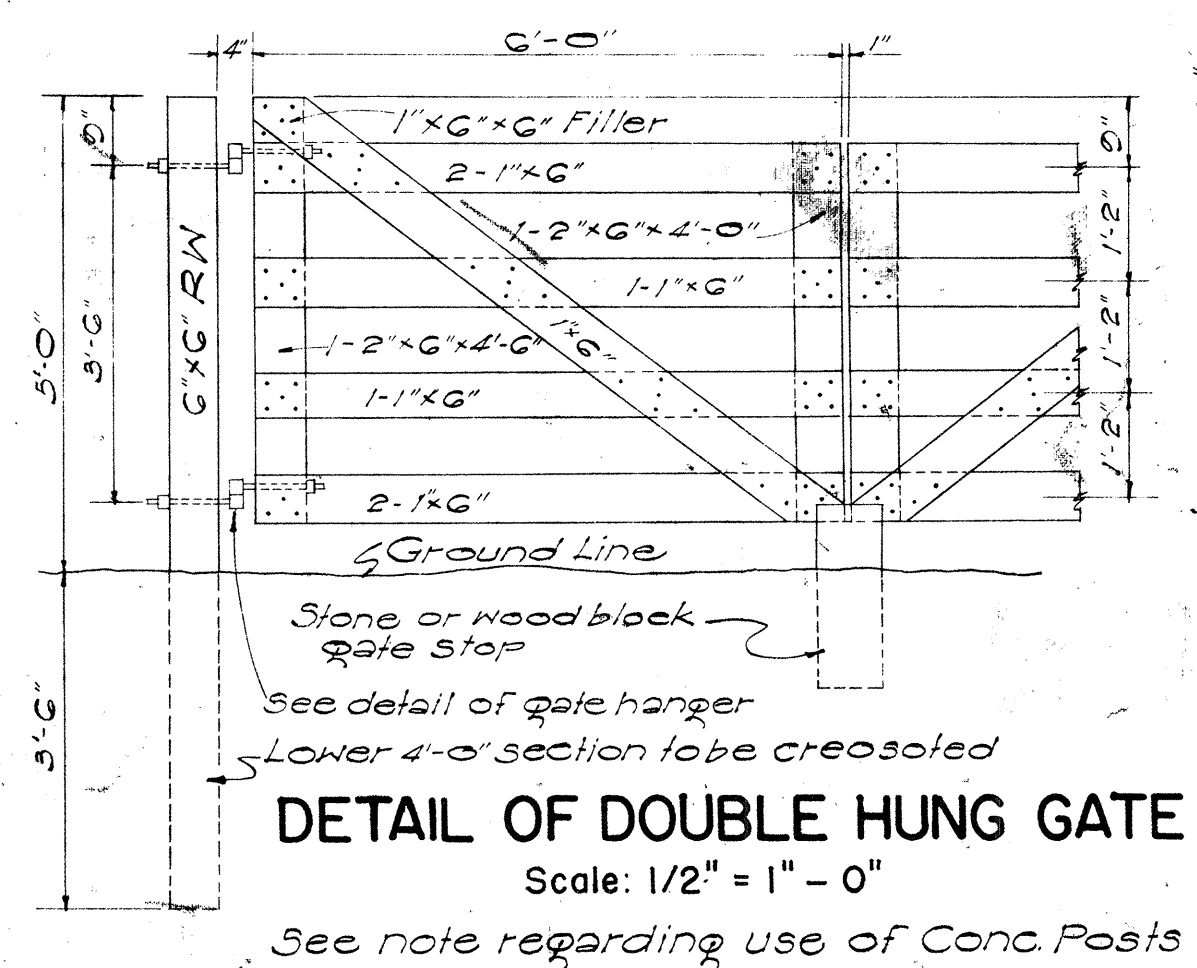
007210300.50

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII-113	HAW.	U-078-113	1955	52	246
U-098-114			1955	22	83
F-099-115			1955	18	83

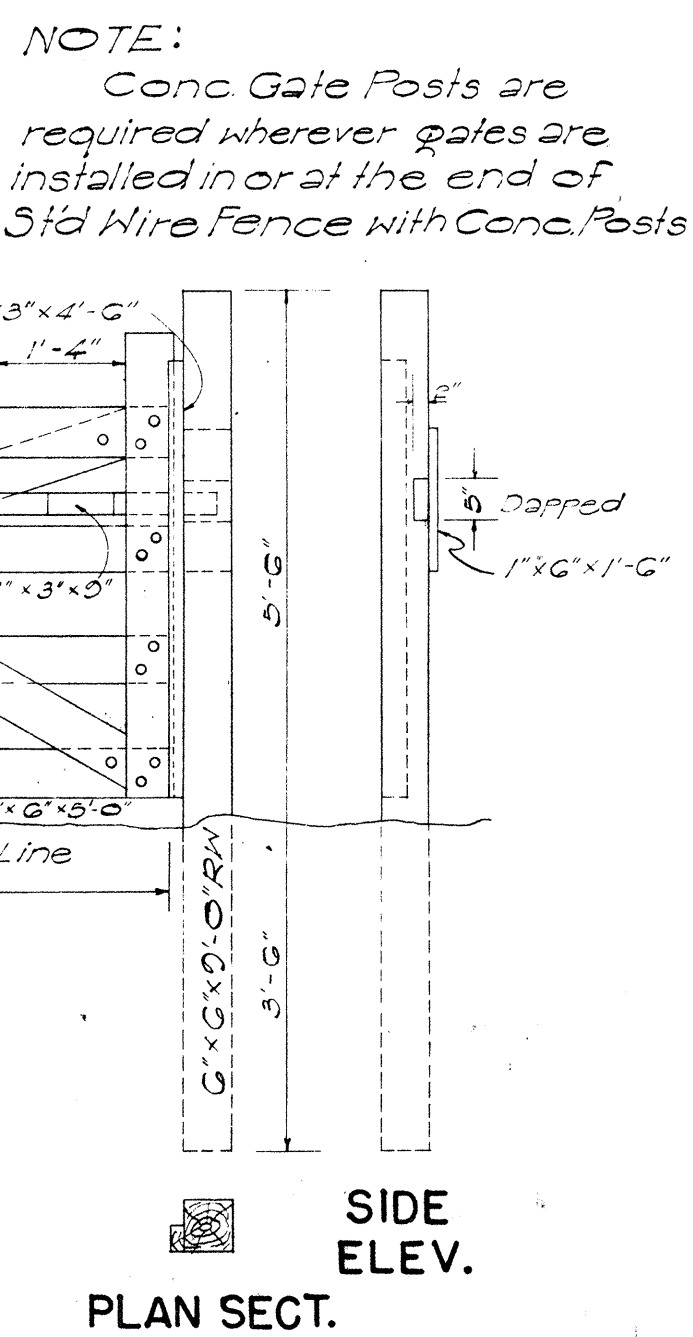
AUG. 1957



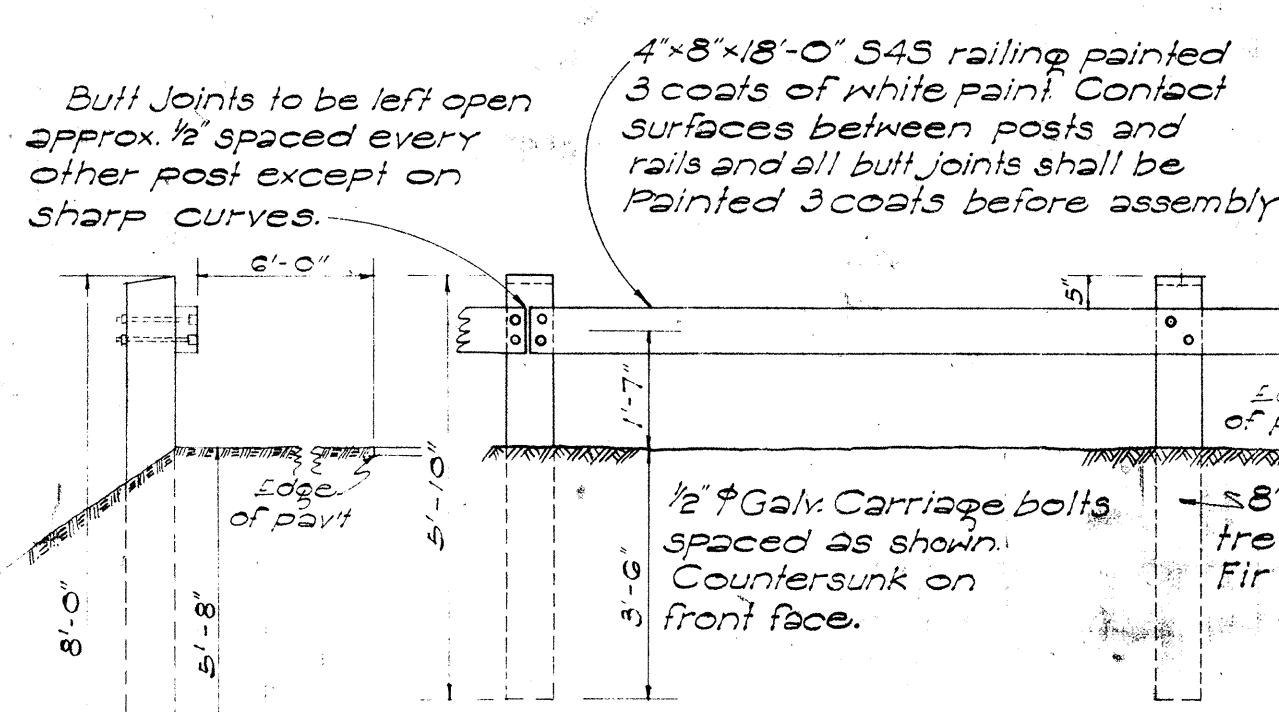
DETAIL OF CATTLE GATE
Scale: 1/2" = 1'-0"



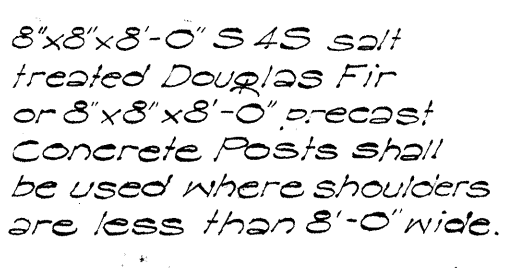
DETAIL OF DOUBLE HUNG GATE
Scale: 1/2" = 1'-0"



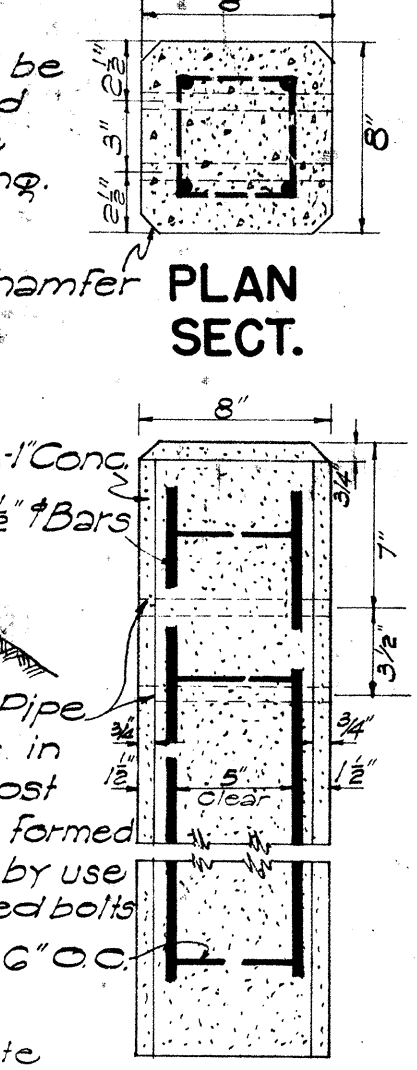
DETAIL OF GATE HANGER
Scale: 1-1/2" = 1'-0"



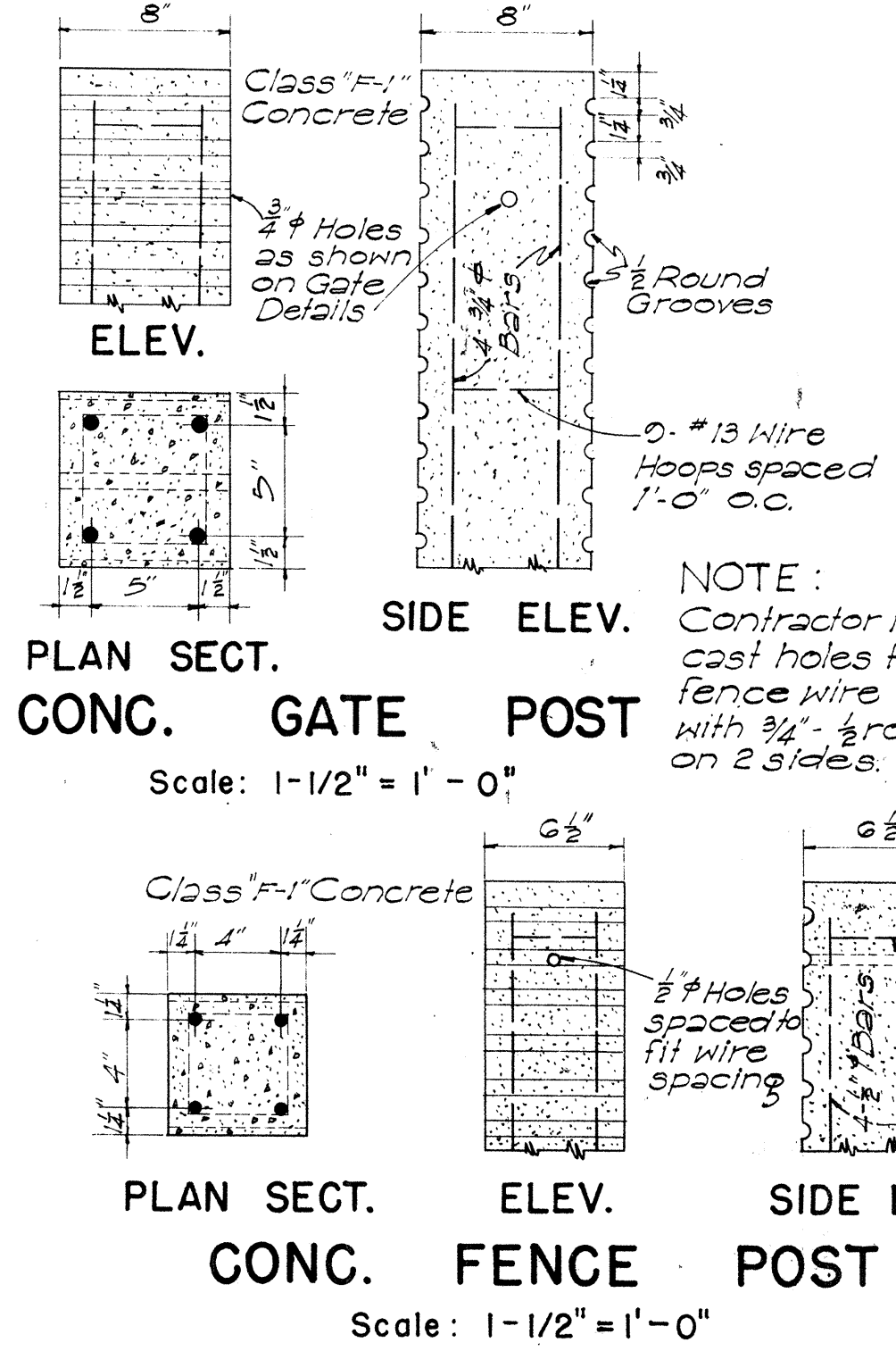
WOOD GUARD RAIL WITH WOOD POSTS
Scale: 3/8" = 1'-0"



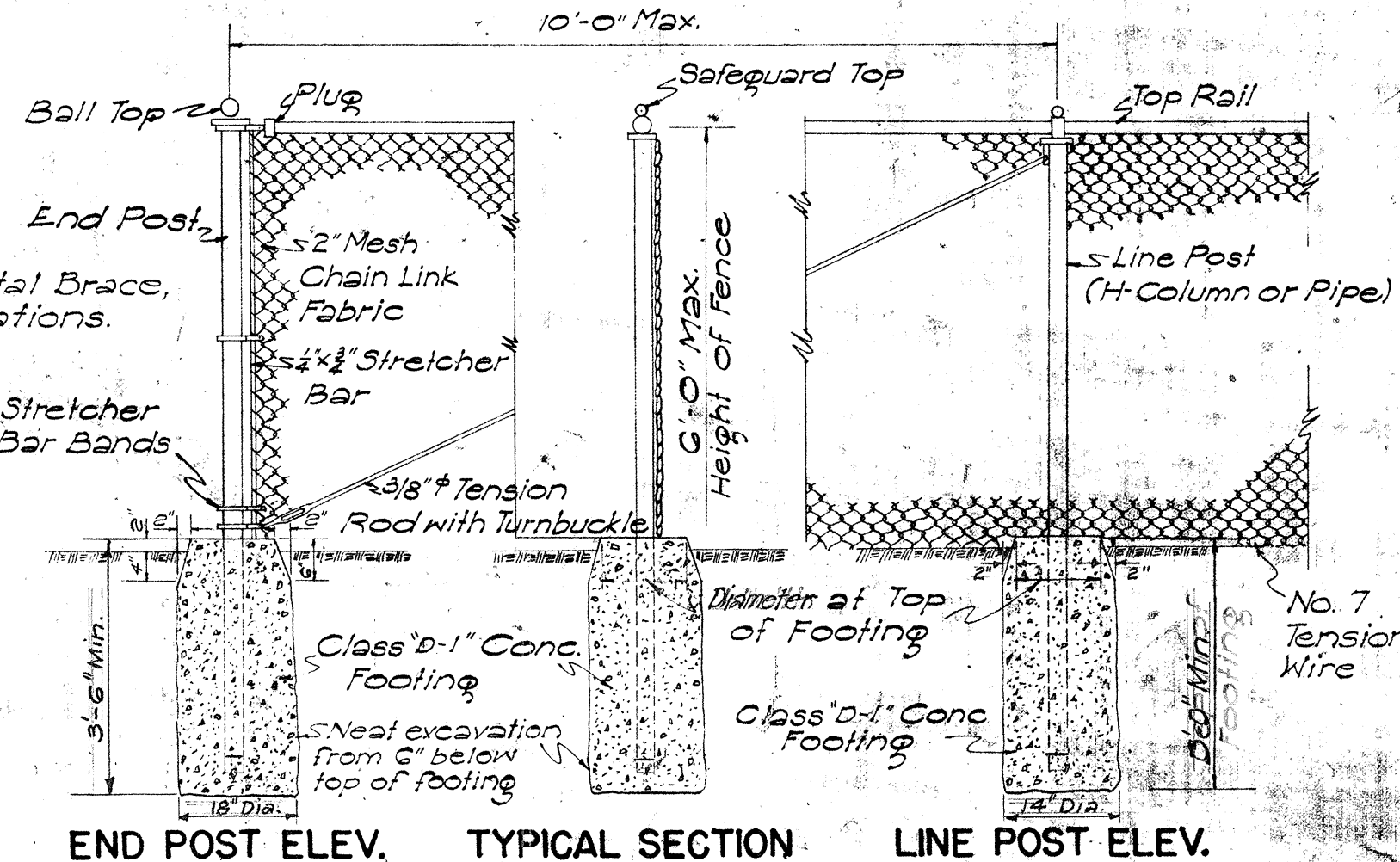
GUIDE POSTS: Wood or Conc. Guide Posts are the same as those used for Wood Guard Rail spaced as shown on plans.



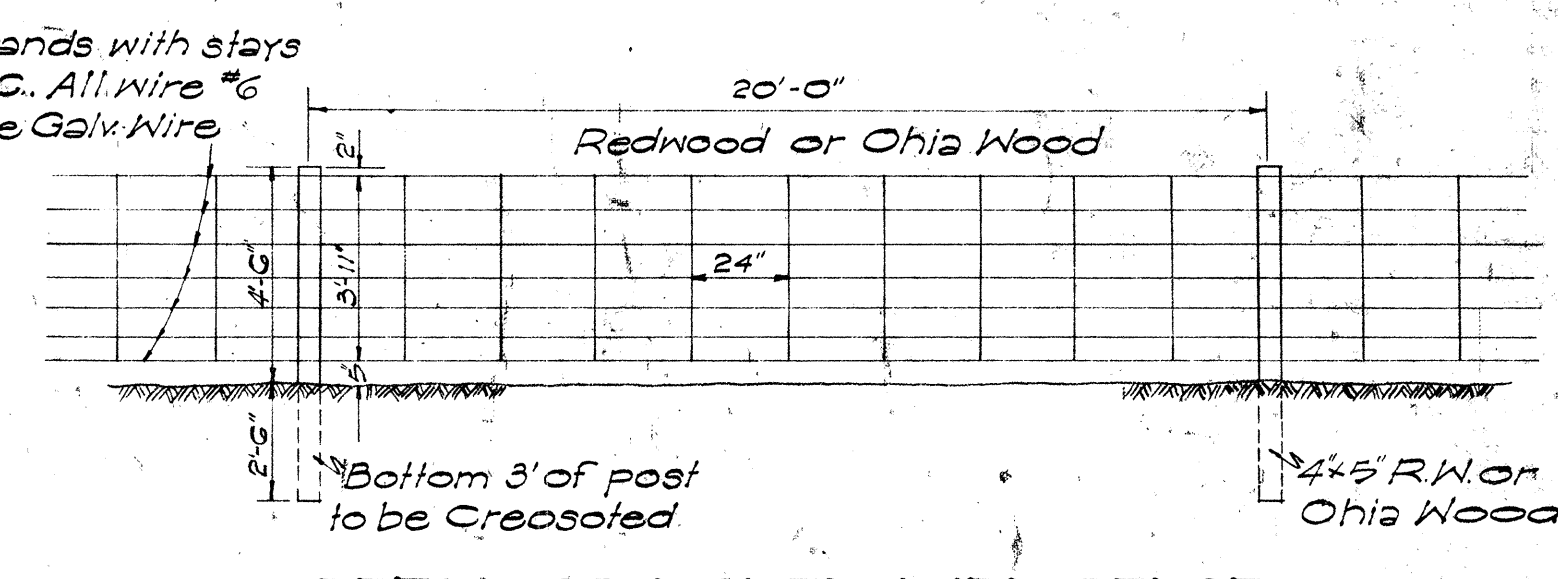
DETAIL OF CONC. POST
Scale: 1-1/2" = 1'-0"



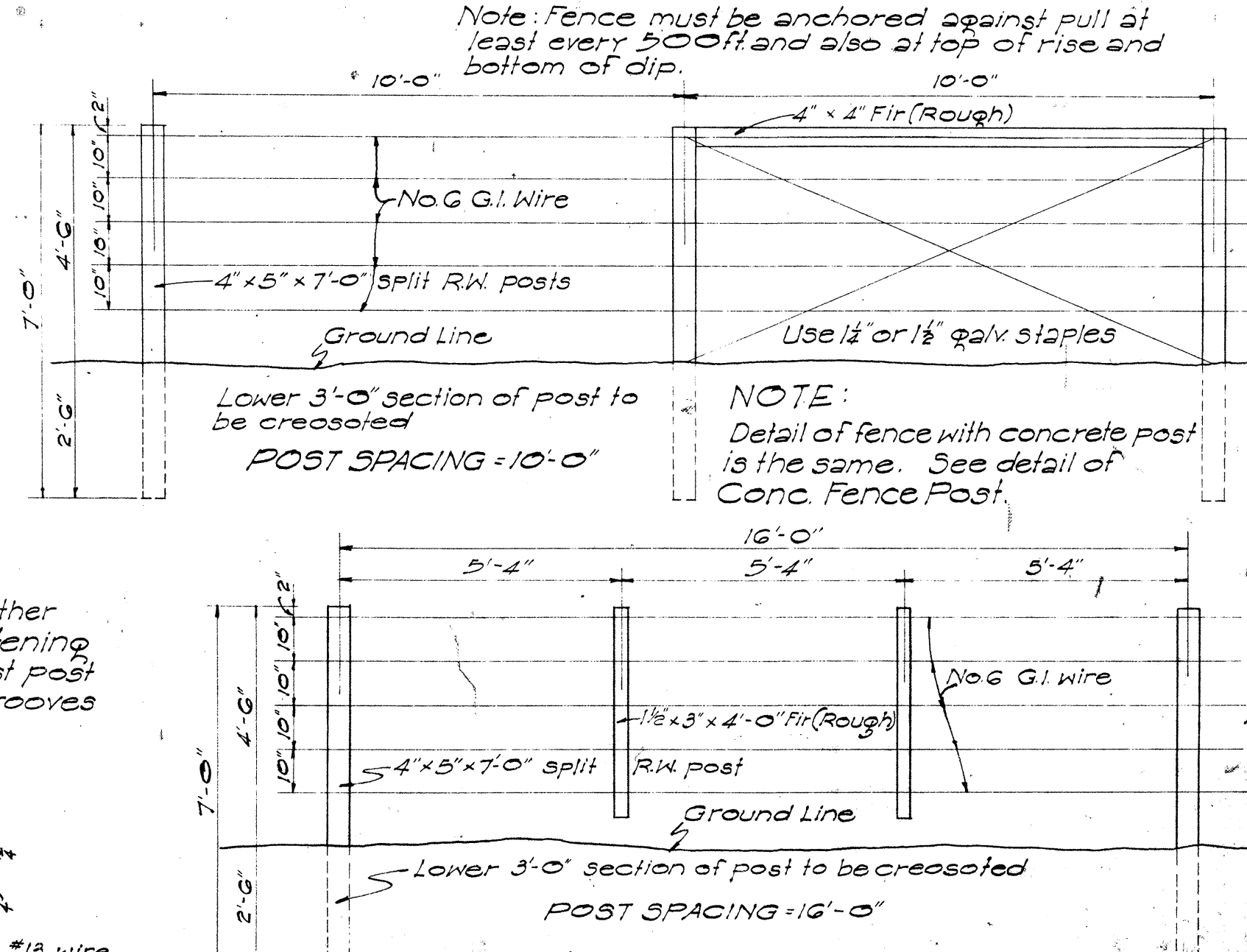
DETAILS OF STANDARD WIRE FENCE WITH WOOD POSTS
Scale: 3/8" = 1'-0"



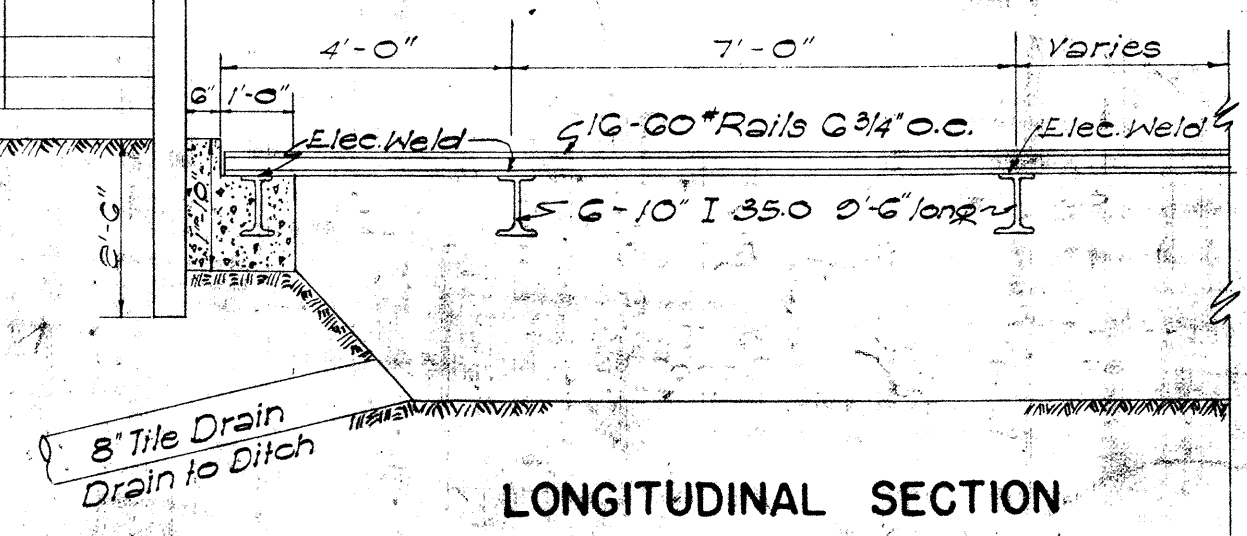
DETAIL OF CHAIN LINK FENCE
Scale: 1/2" = 1'-0"



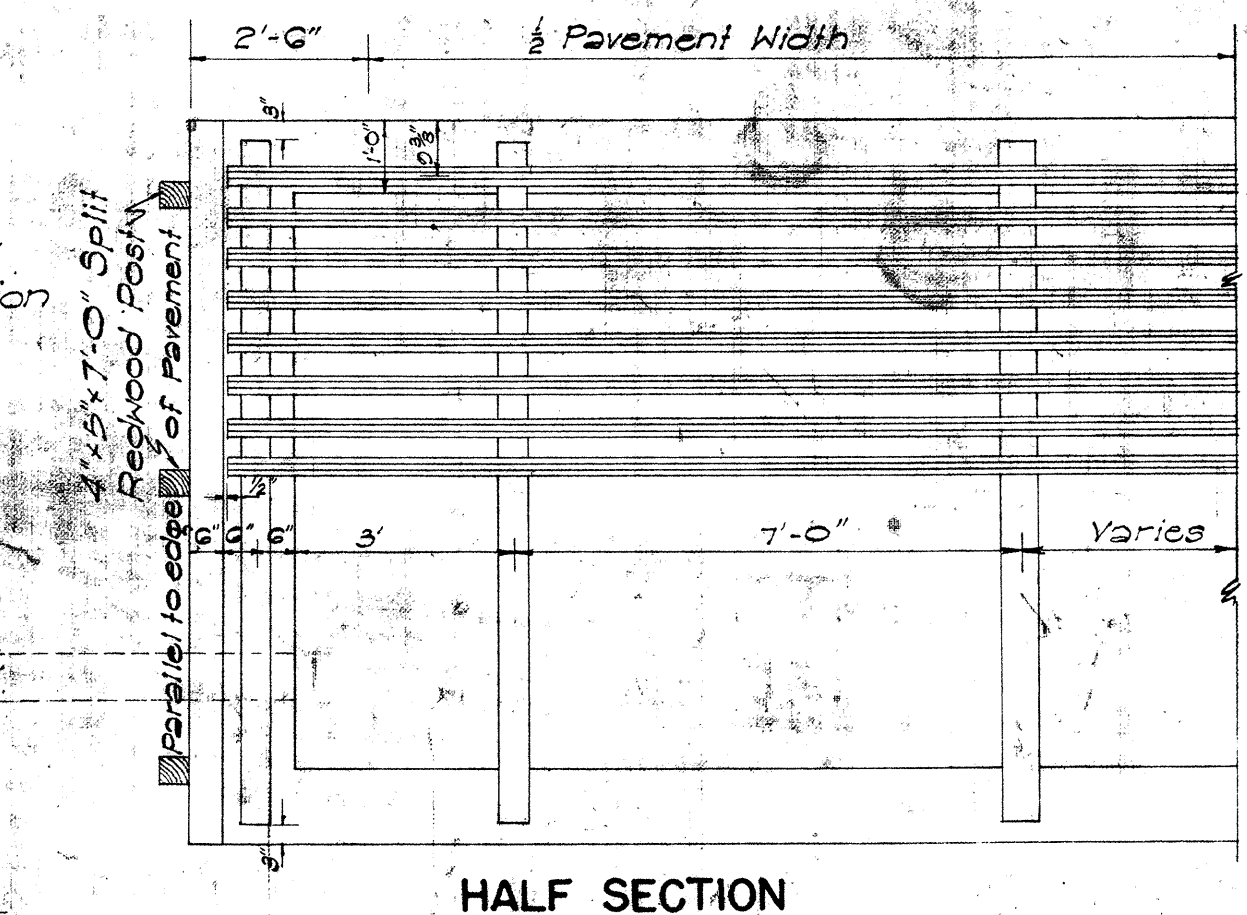
DETAIL OF WOVEN WIRE FENCE
Scale: 1/4" = 1'-0"



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

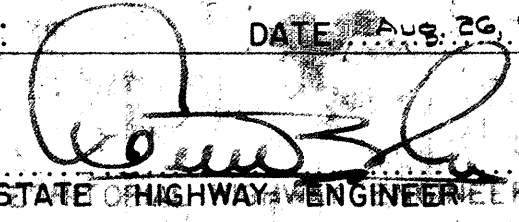


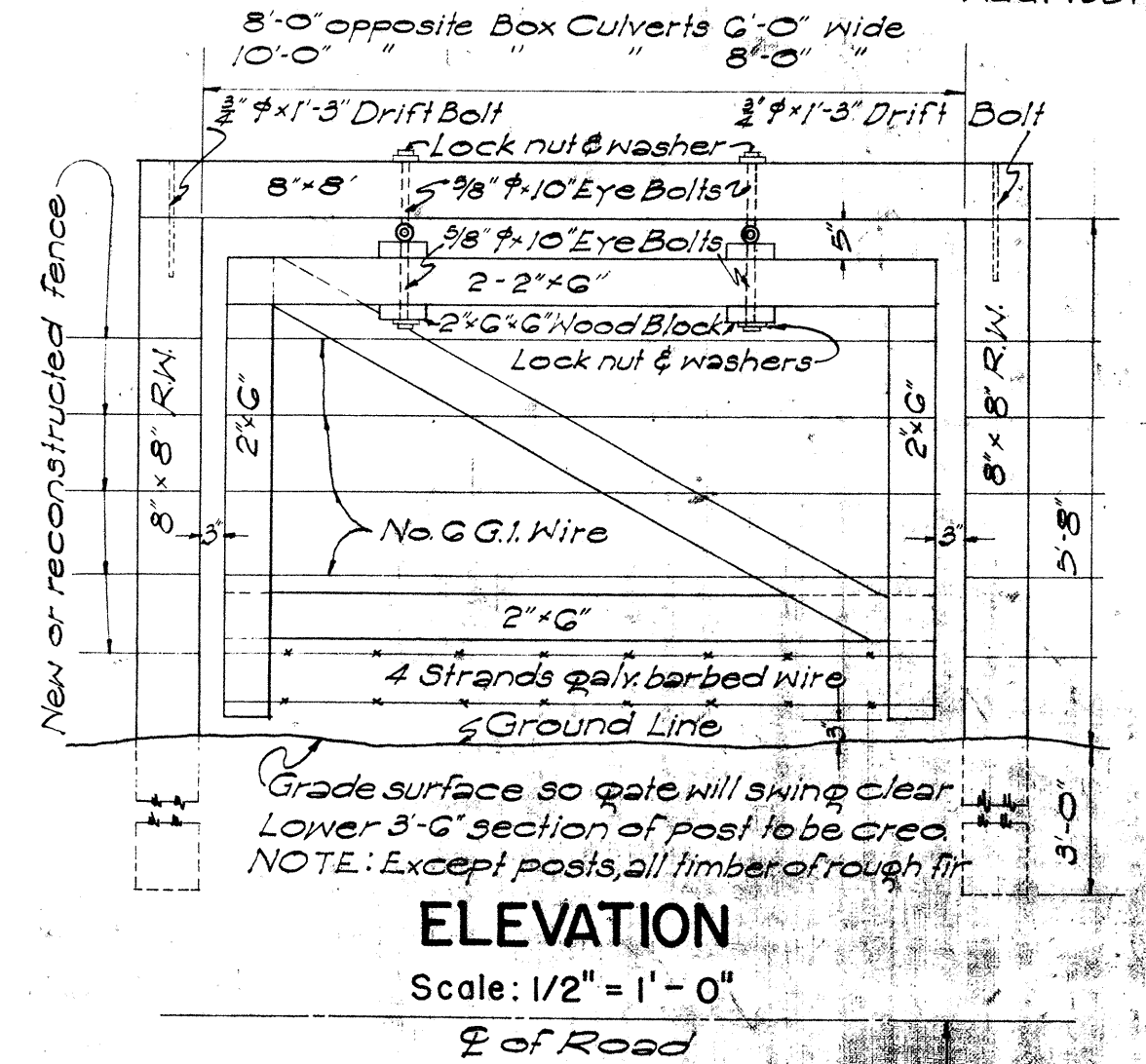
LONGITUDINAL SECTION



HALF SECTION

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

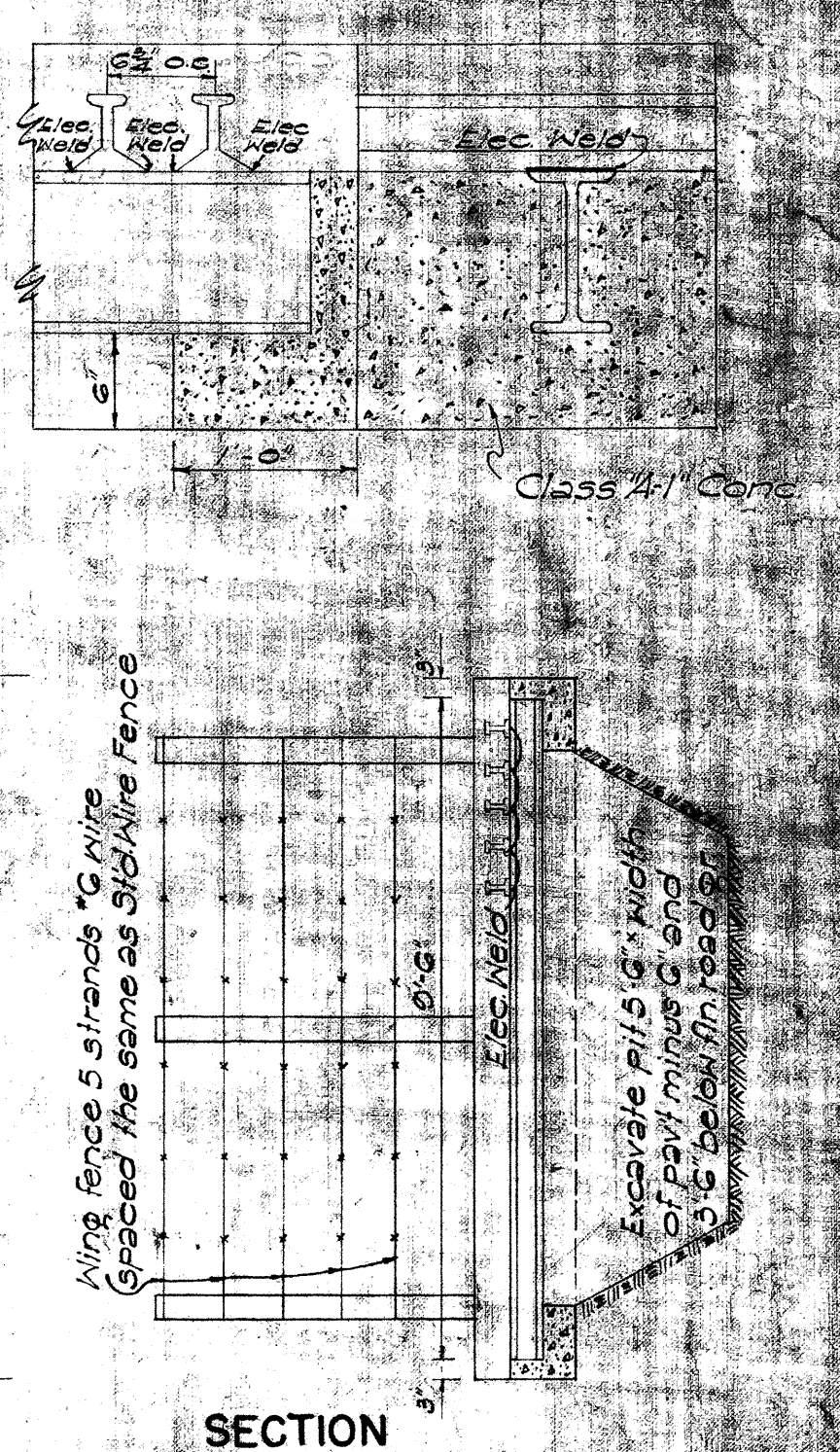
APPROVED:  DATE: AUG. 25, 1957
STATE HIGHWAY ENGINEER



DETAILS OF HURDLE
Scale: 1/2" = 1'-0"

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

DETAILS OF HURDLE



SECTION

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

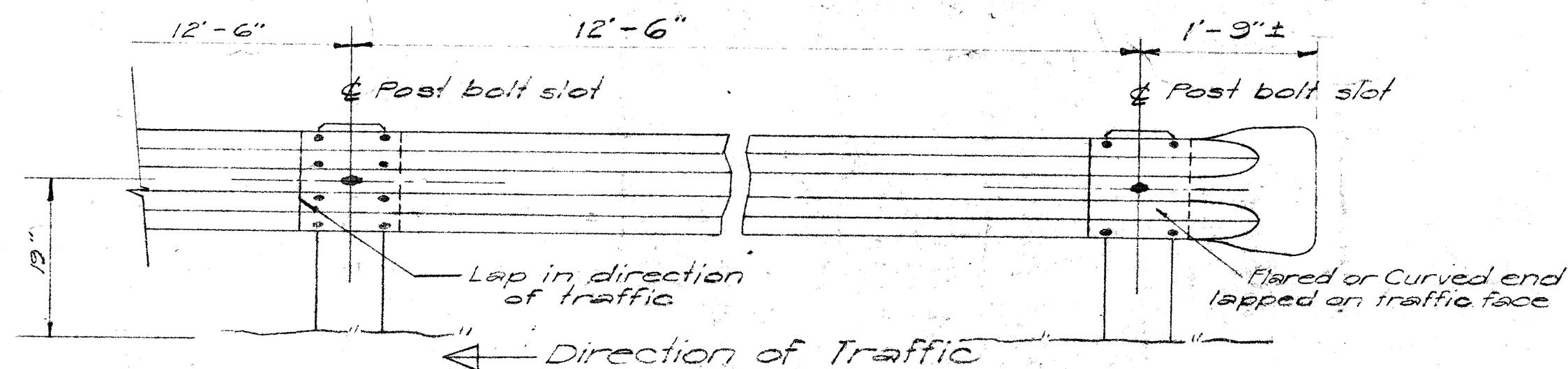
SHEET No 7 OF 8 SHEETS

F 0 9 0 1 0 2 0 0 . 1 8

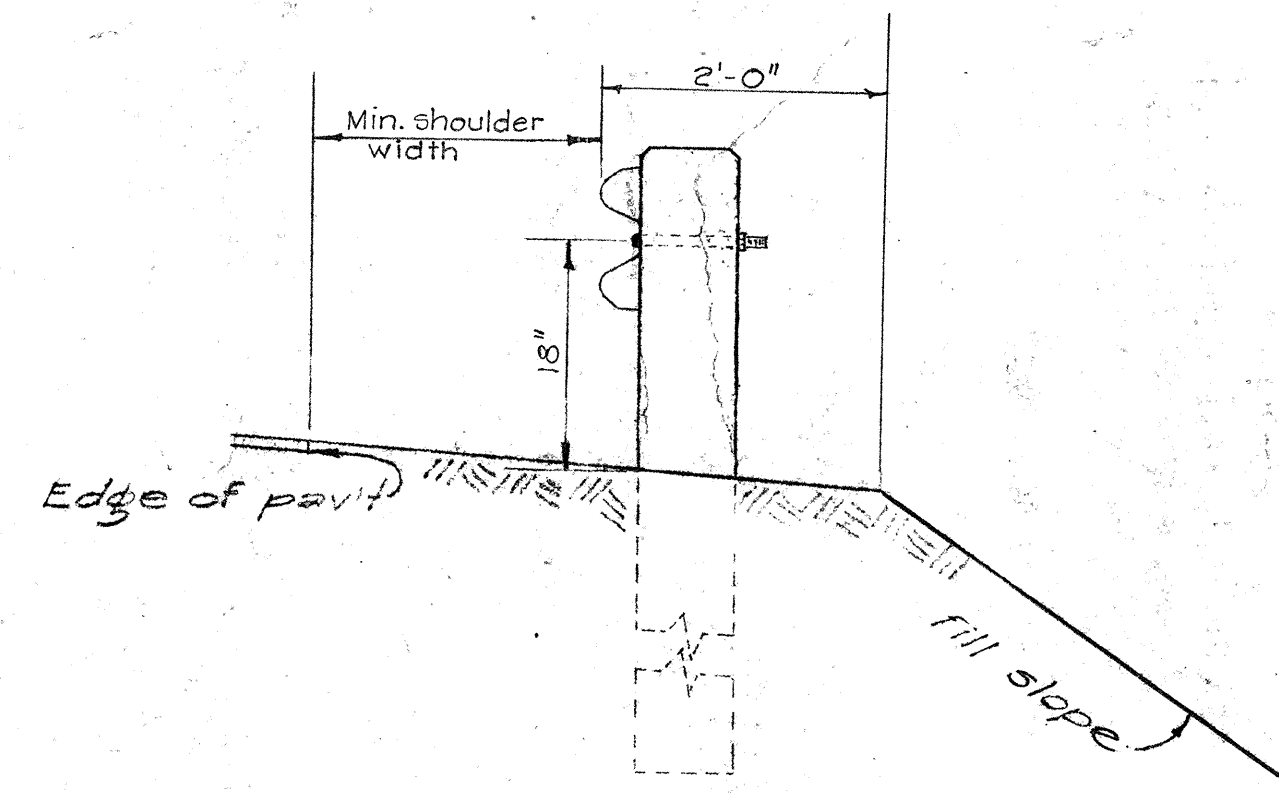
W 0 9 8 1 0 4 0 0 . 2 2

W 0 7 2 1 0 3 0 0 . 5 2

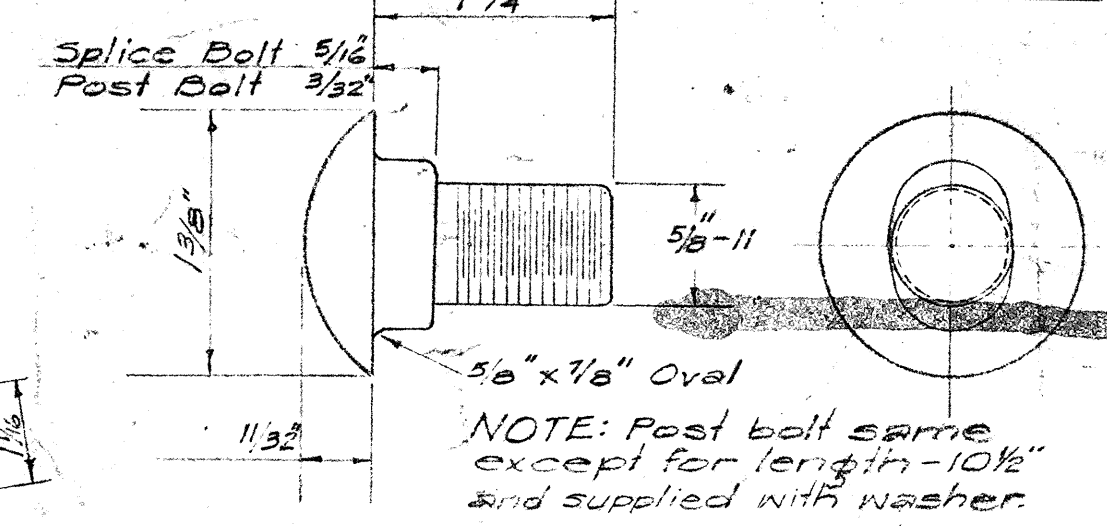
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	53	240
		U-098-1(4)	1963	23	88
		F-090-1(2)	1965	78	93



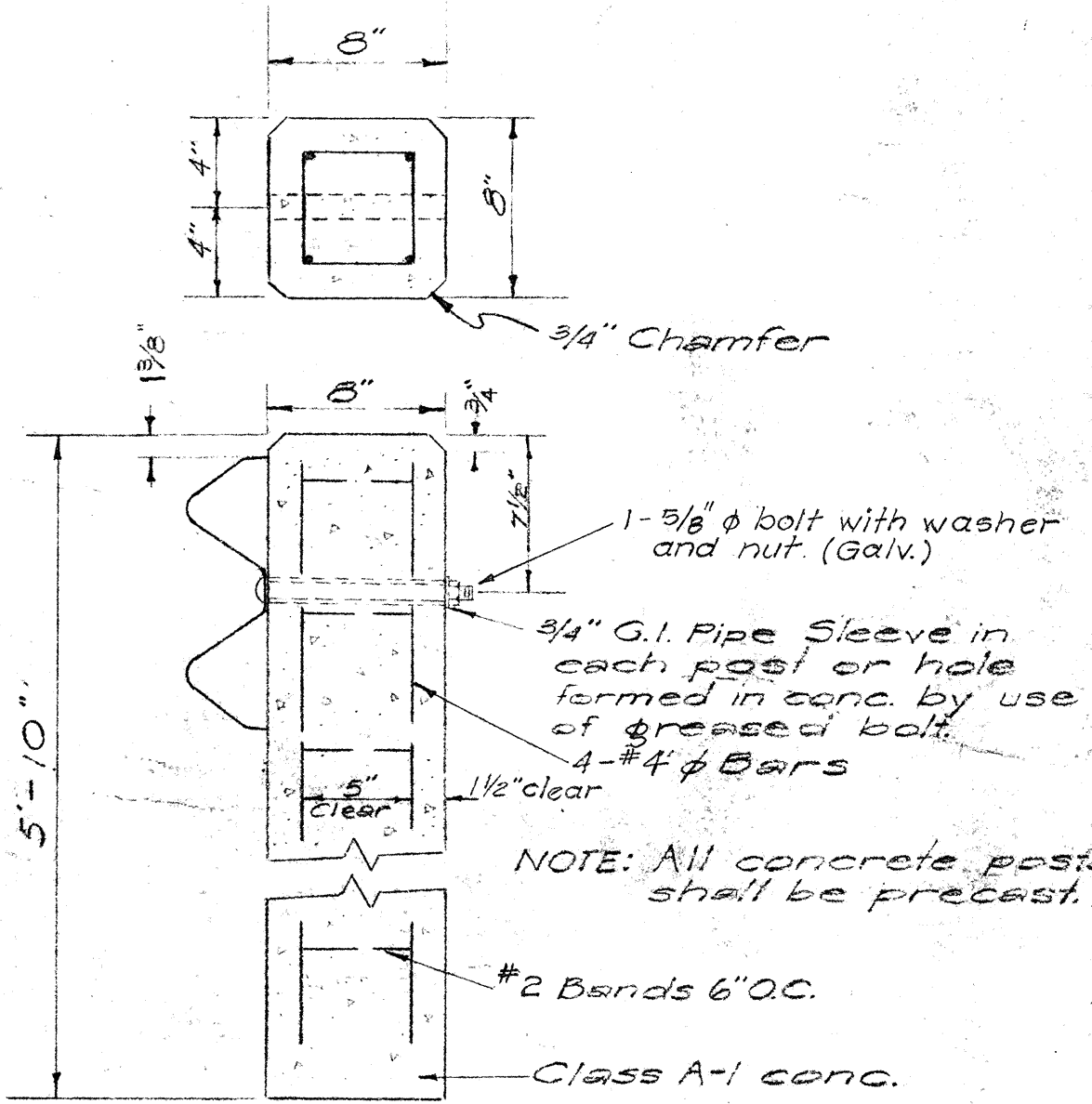
METAL GUARDRAIL
Scale: 3/4"=1'-0"



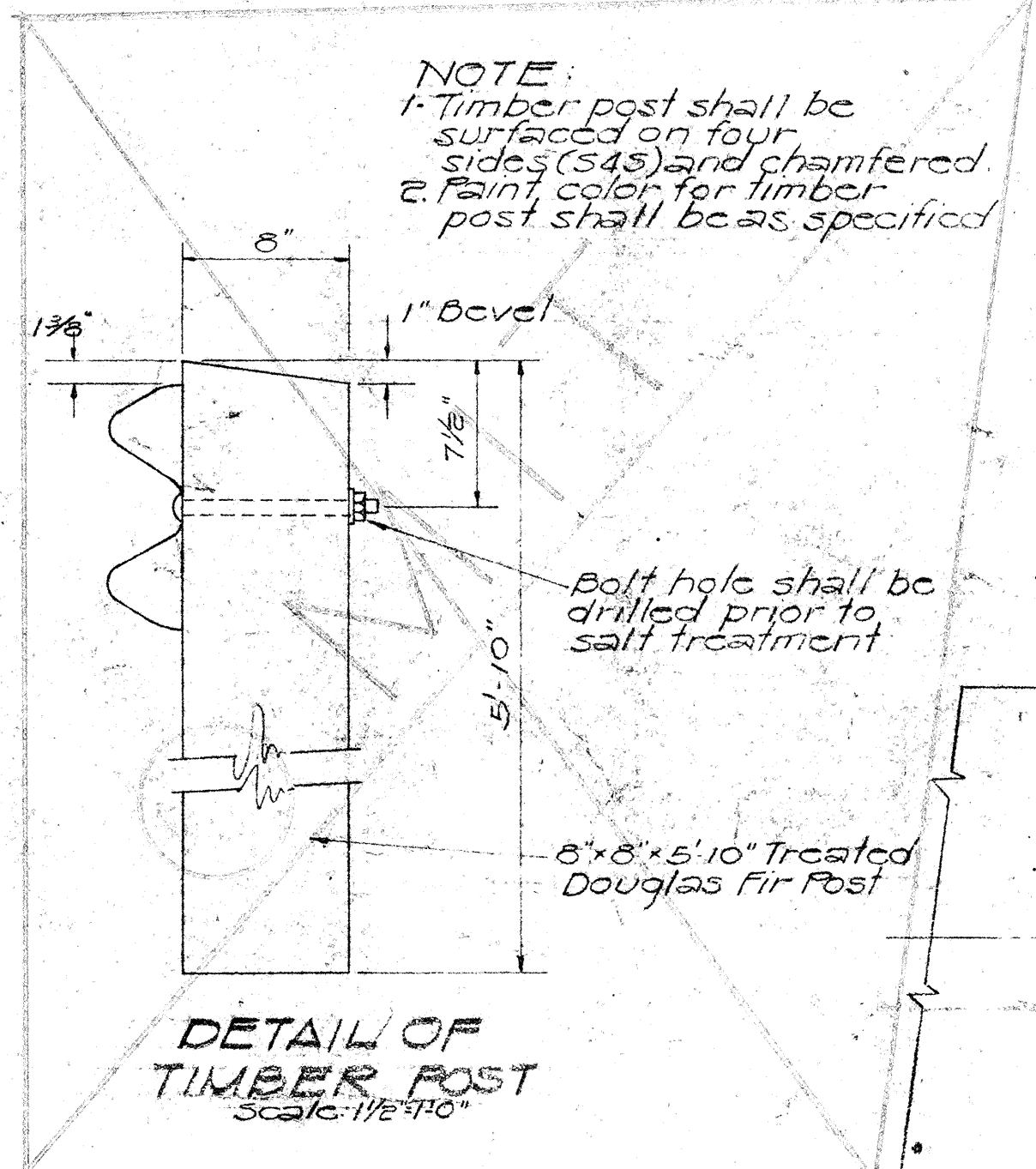
RAIL ELEMENT SECTION
Scale: Half Size



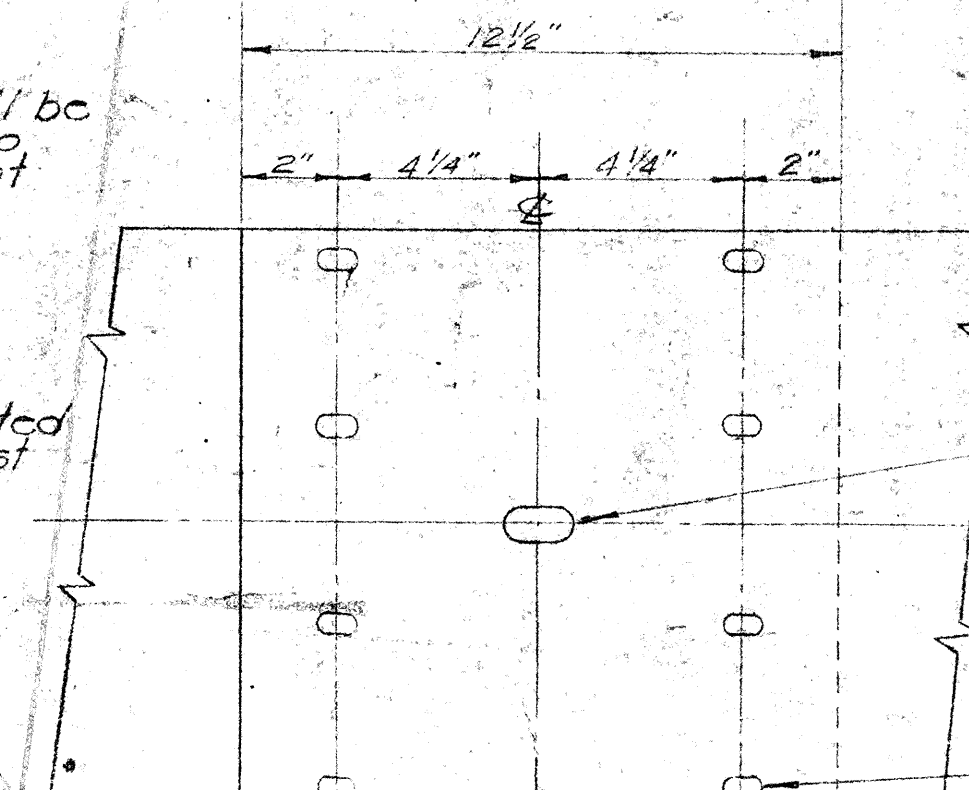
SPLICE BOLT POST BOLT
Scale: Full Size



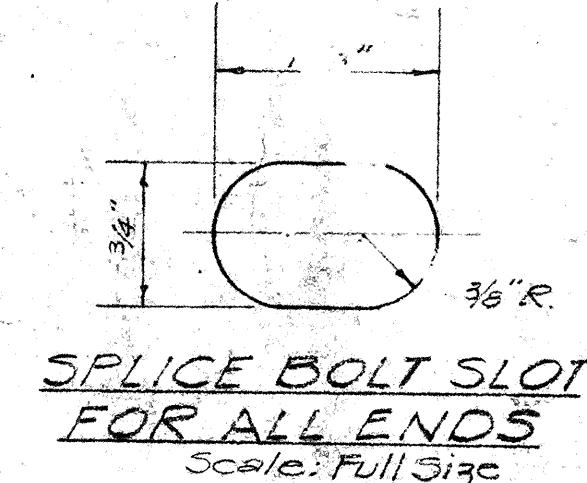
DETAIL OF CONC. POST
Scale: 1 1/2"=1'-0"



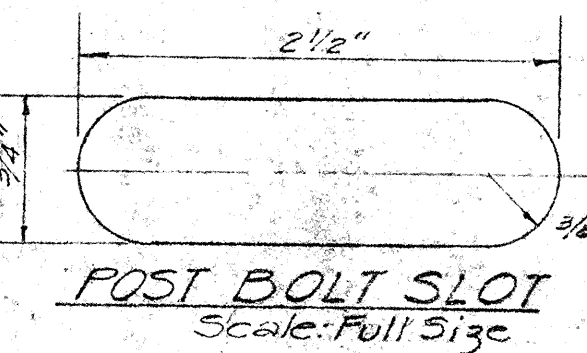
DETAIL OF TIMBER POST
Scale: 1 1/2"=1'-0"



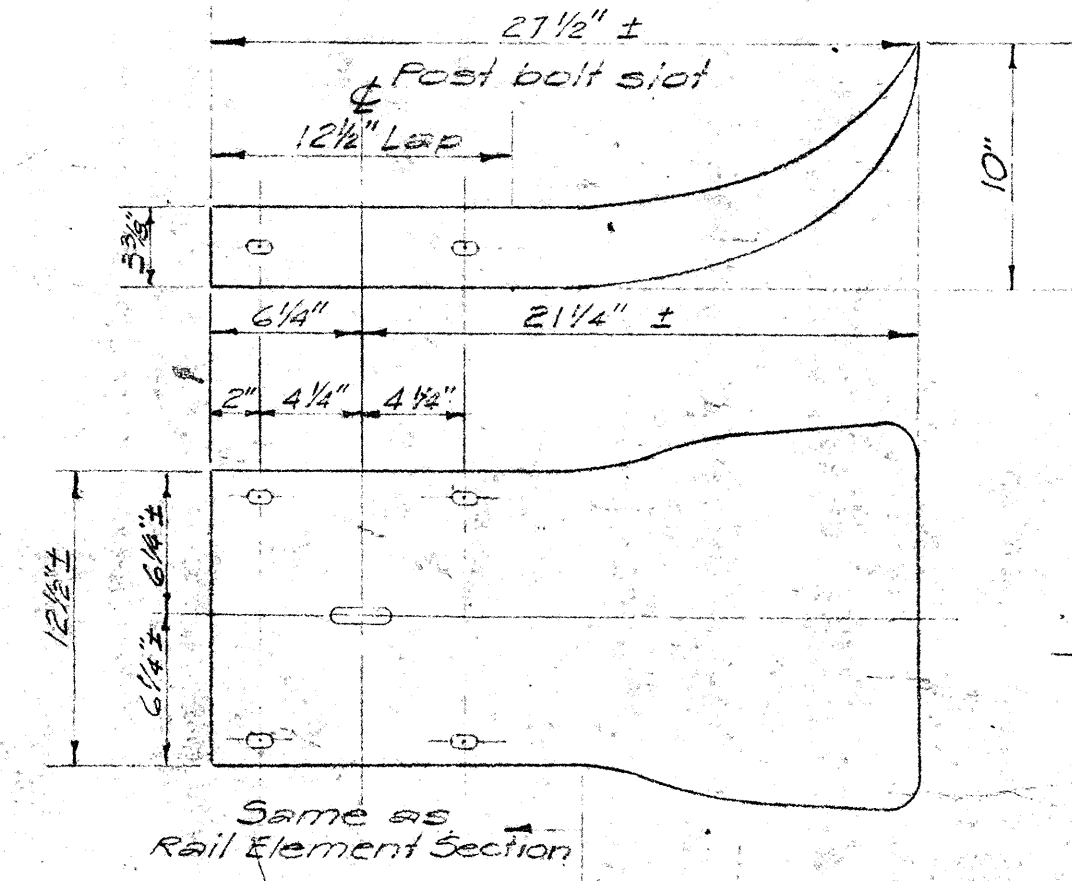
RAIL SPICE
Scale: 3 1/2"=1'-0"



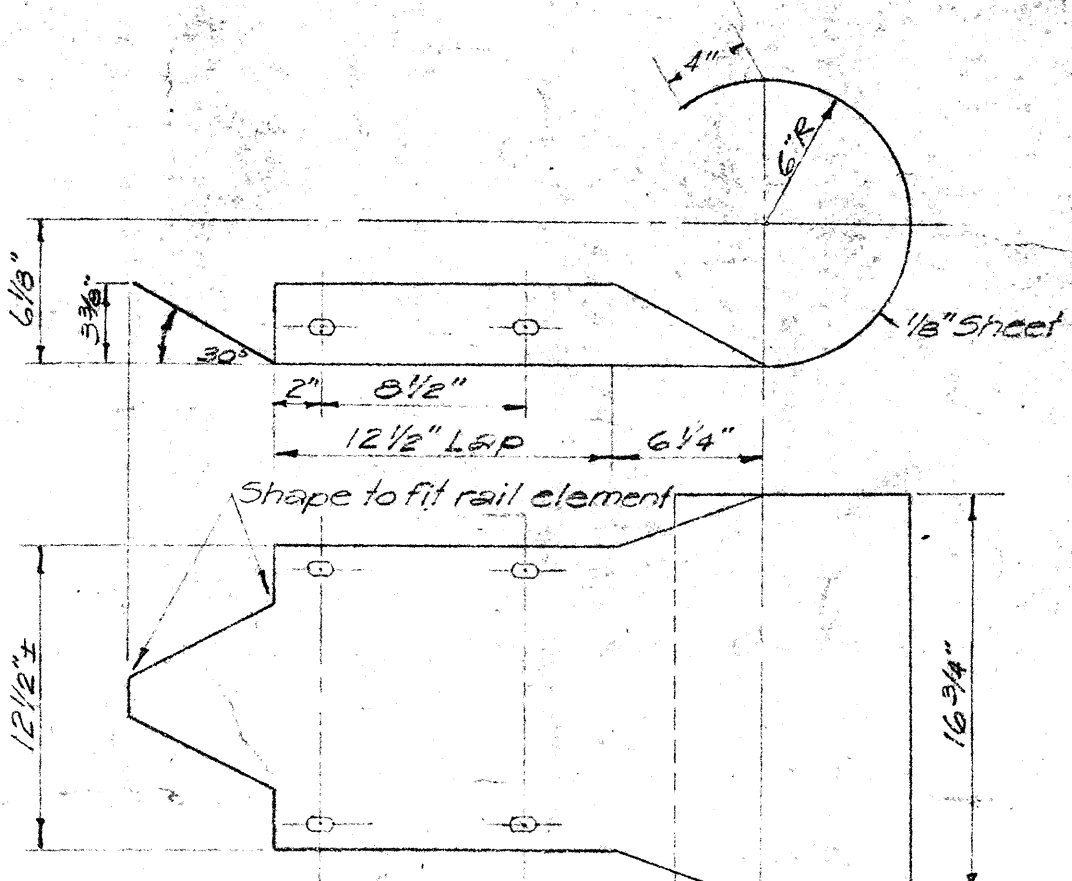
SPLICE BOLT SLOT FOR ALL ENDS
Scale: Full Size



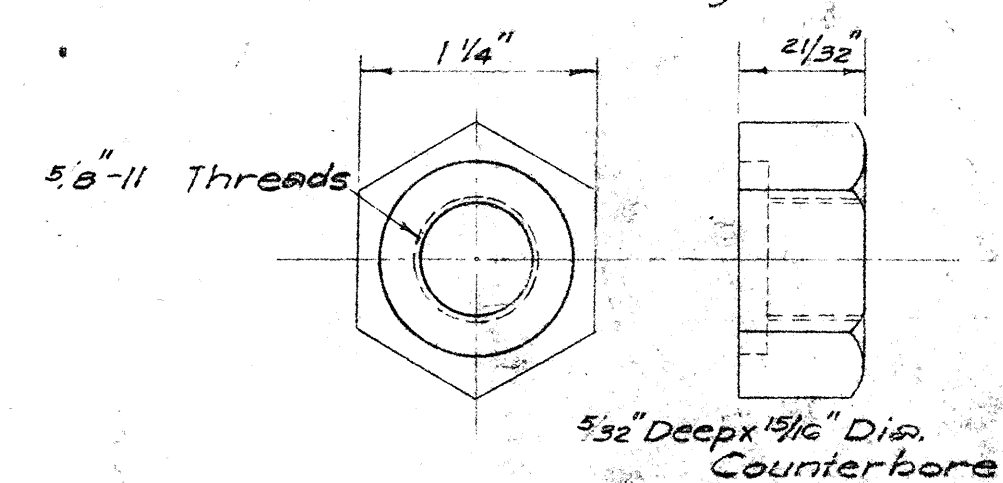
POST BOLT SLOT
Scale: Full Size



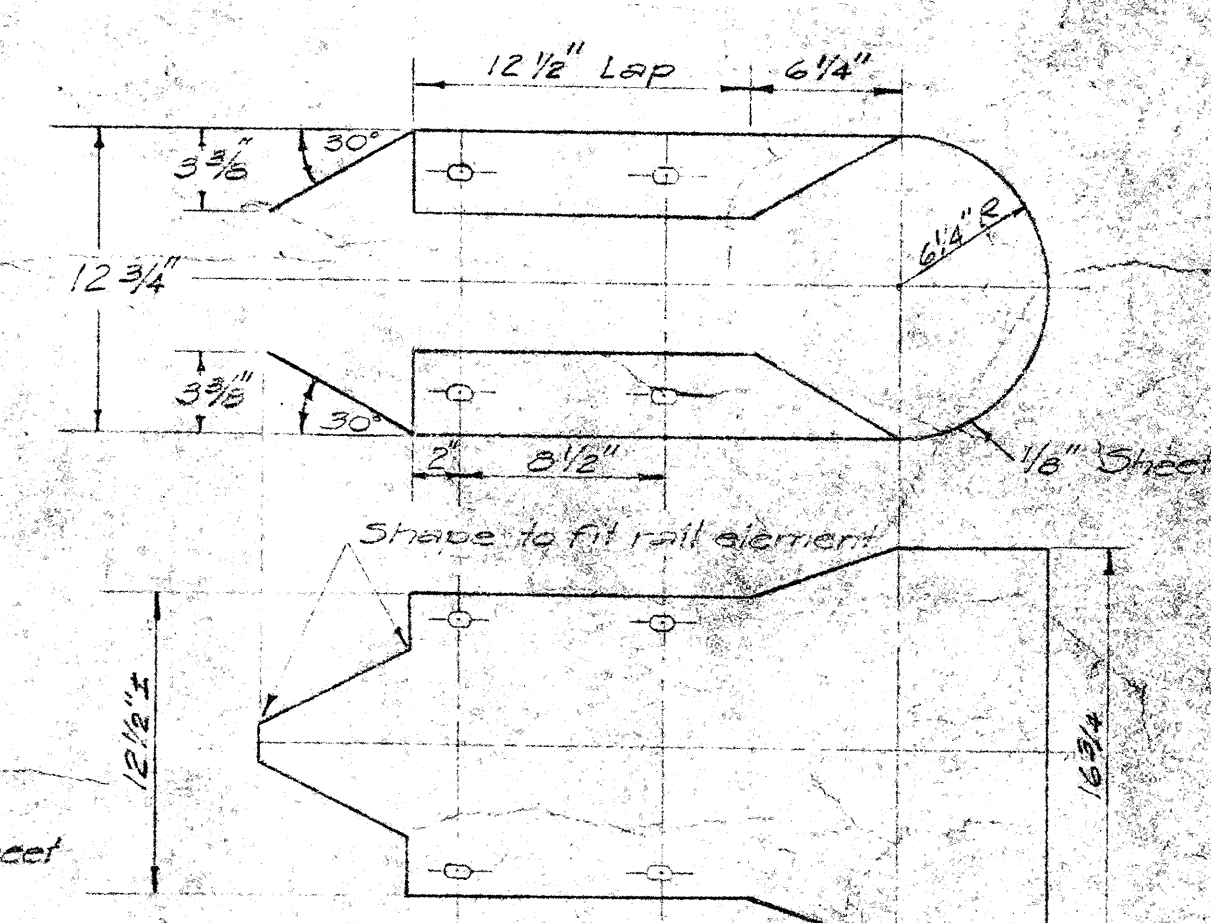
FLARED END
Scale: 1 1/2"=1'-0"



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



HEXAGON NUT
Scale: Full Size

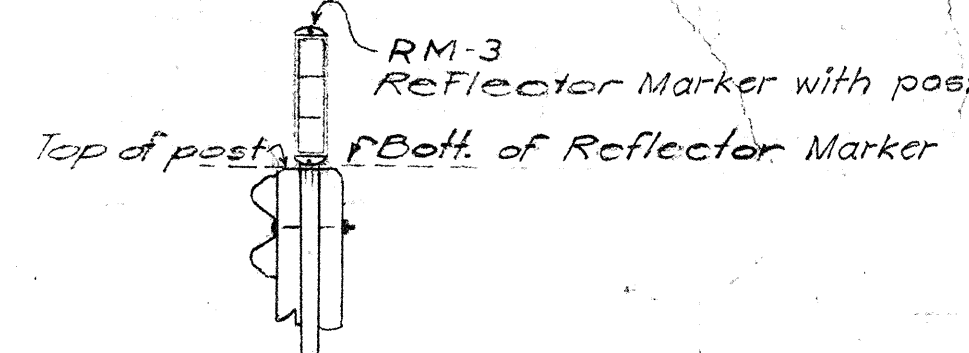


MEDIAN END
Scale: 1 1/2"=1'-0"

GUARDRAIL OFFSET

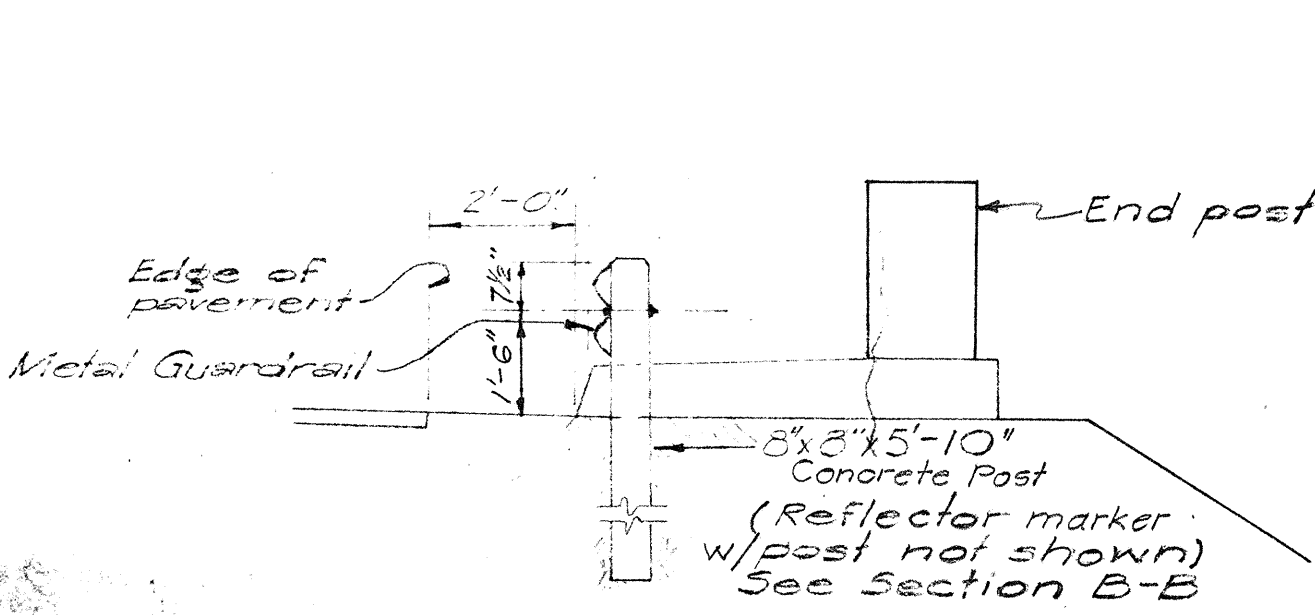
X	N=3	N=4	N=5	N=6	N=7	N=8
12.5	0.19	0.16	0.14	0.12	0.09	0.08
25.0	0.75	0.64	0.55	0.49	0.35	0.32
37.5	1.69	1.44	1.25	1.10	0.78	0.72
50.0	3.00	2.56	2.22	1.96	1.38	1.28
62.5		4.00	3.47	3.06	2.16	2.00
75.0			5.00	4.41	3.11	2.88
87.5				6.00	4.23	3.92
100.0					5.55	5.12
112.5					7.00	6.48
125.0						8.00

N = Guardrail Flare
X = Distance from post at bridge to offset point.
Y = Guardrail Flare effect.

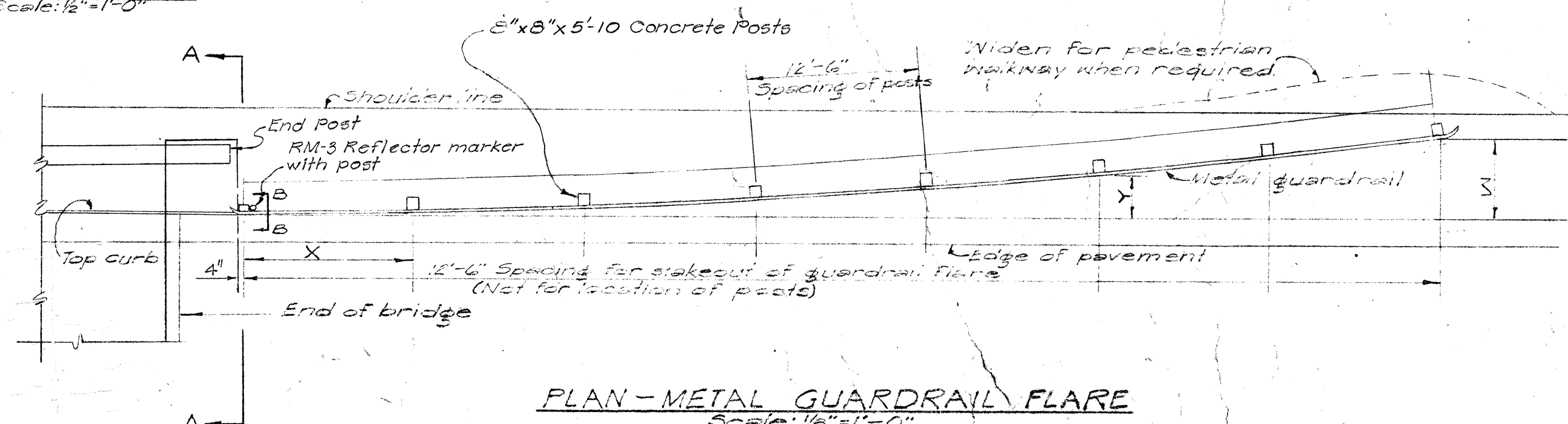


SECTION B-B
Scale: 1 1/2"=1'-0"

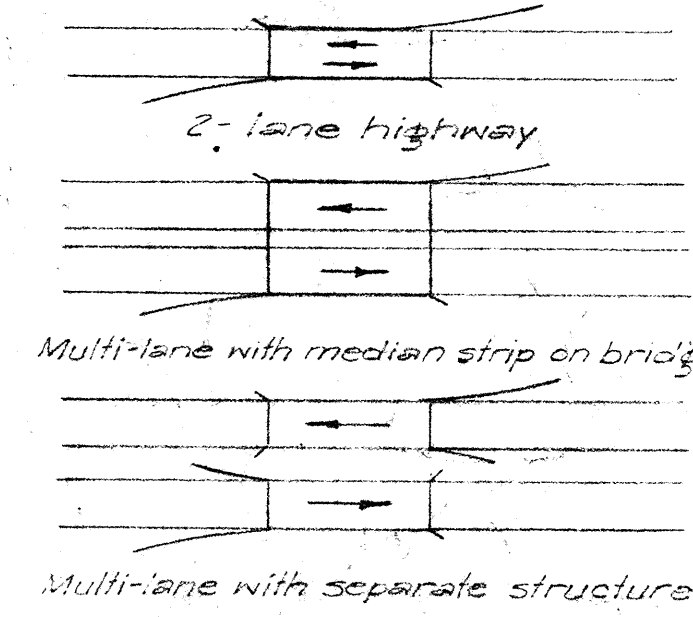
NOTE: See F.A. Marker and Misc. Sign Detail Sheet for details of RM-3 reflector marker with post.



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



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



DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

**STANDARD DETAILS
METAL GUARD RAILS**

LUNALILO FREEWAY
VINEYARD BOULEVARD
LILIHAE STREET
SCALE: AS NOTED

U-072-1(3)
U-098-1(4)
F-090-1(2)
DATE: 1963

DATE: _____

SURVEY PLOTTED BY: _____

ORIGINAL PLAN: _____

NOTED BY: _____

QUANTITIES CHECKED BY: _____

NO. _____

109010200.19

009810400.23

007210300.53