

2/17/59
4/6/59
4/28/59

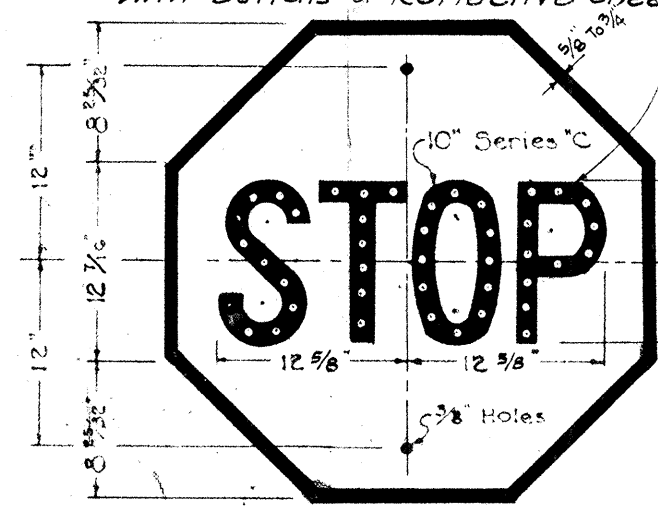
Note: All Regulatory and Warning Signs shall have 3/8" Bolt Holes.

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

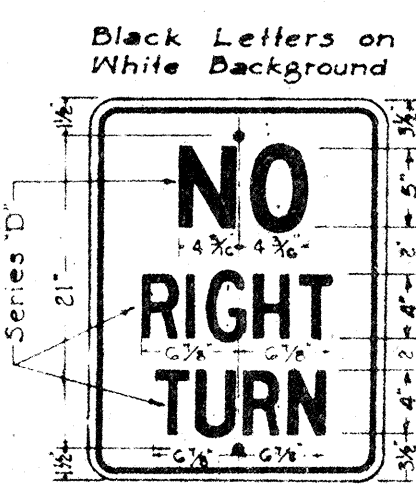
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-012-118	1959	44	81

JULY 3, 1957

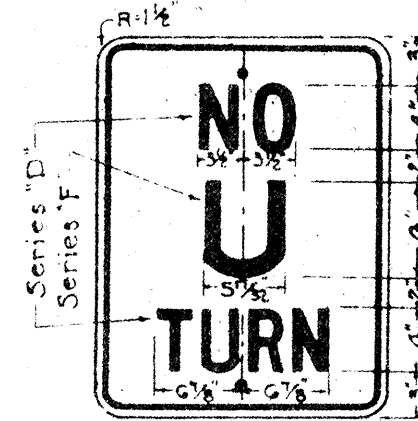
White Letters and Border on Red Background (Background may be of red reflective sheeting). Letters to be Reflectorized with Buttons or Reflective Sheeting.



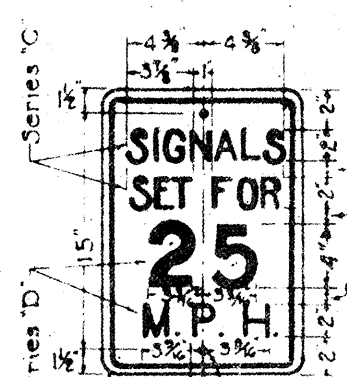
R-1
30" x 30"



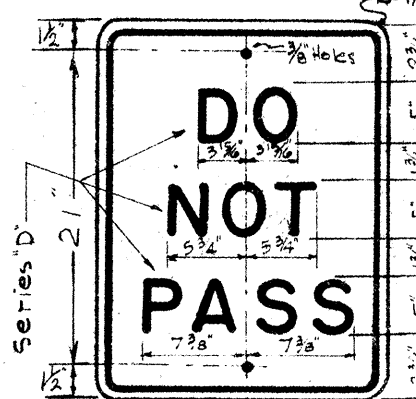
R-6
18" x 24"



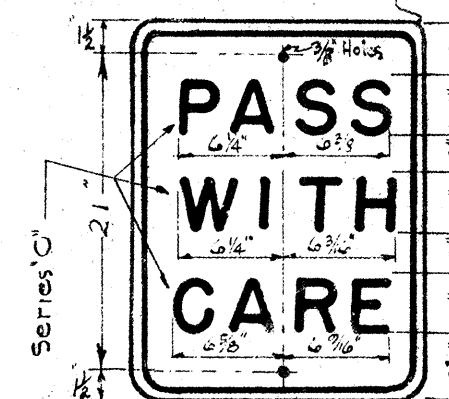
R-8
18" x 24"



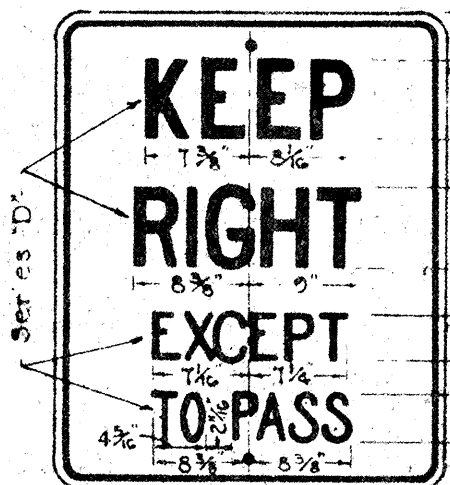
R-10
12" x 18"



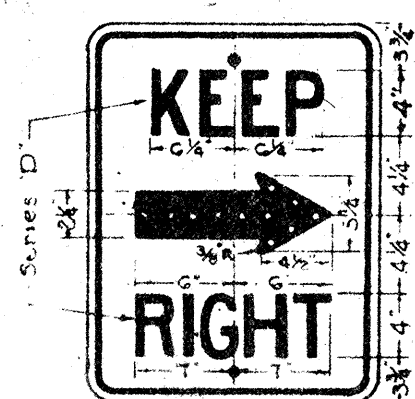
R-11
18" x 24"



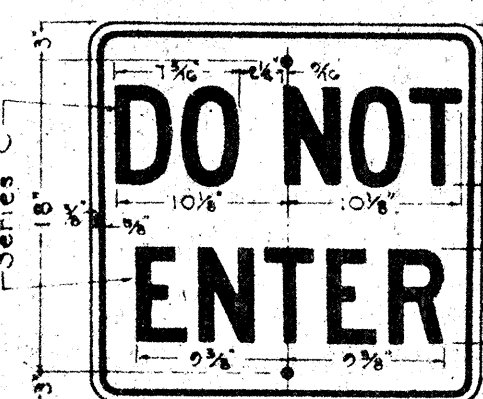
R-12
18" x 24"



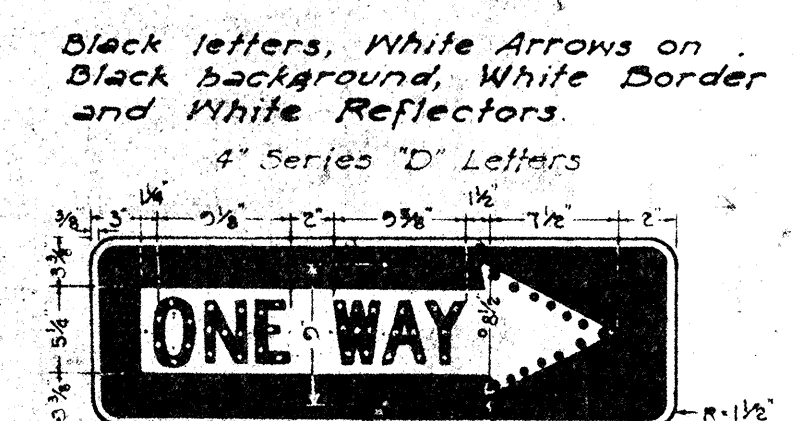
R-13
24" x 30"



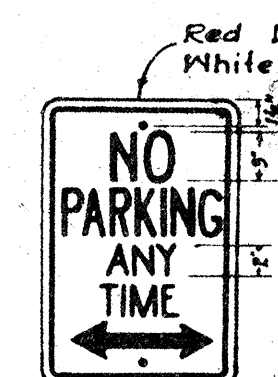
R-14 (R)
18" x 24"



R-15
24" x 24"



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



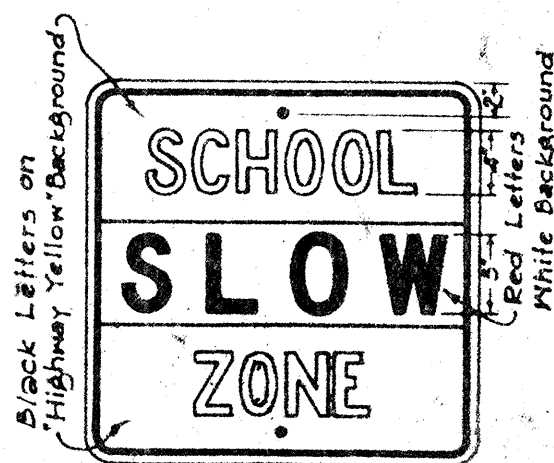
R-18
12" x 18"



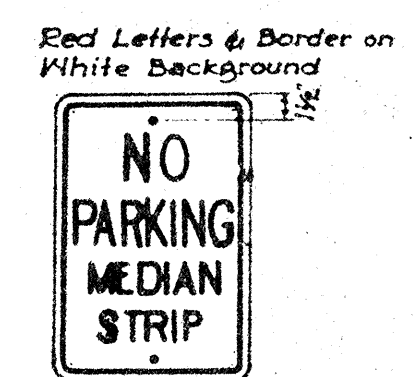
R-26
12" x 18"



R-29
24" x 30"



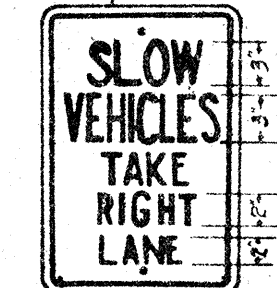
R-41-S
24" x 24"



R-42-S
12" x 18"



R-43-S
12" x 18"



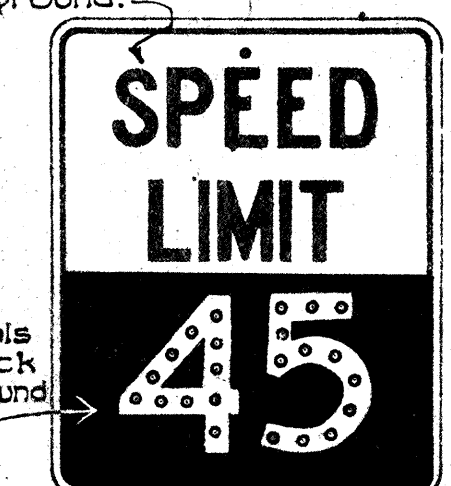
R-44-S
12" x 18"



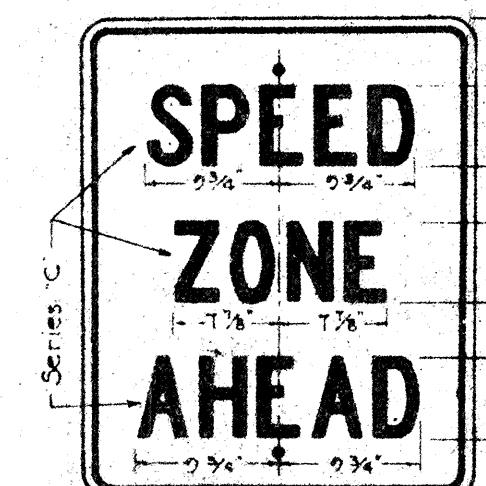
R-102-A
24" x 30"



R-102-B
24" x 30"



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



R-104
24" x 30"



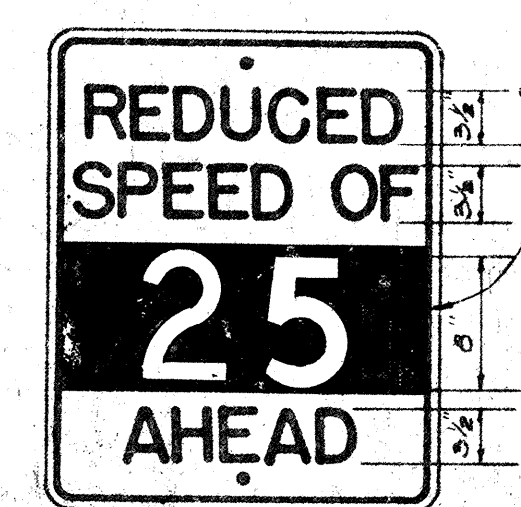
R-105-A (R)
24" x 30"



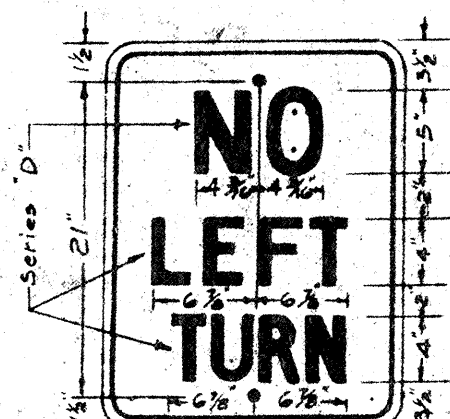
R-105-B
24" x 30"



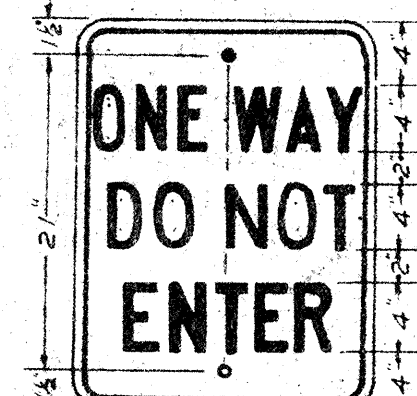
R-105-C
24" x 30"



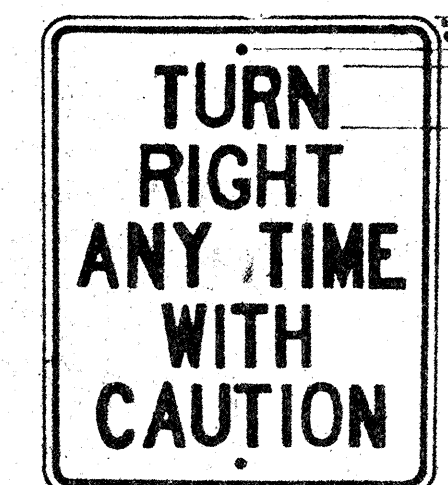
R-104-A
24" x 30"



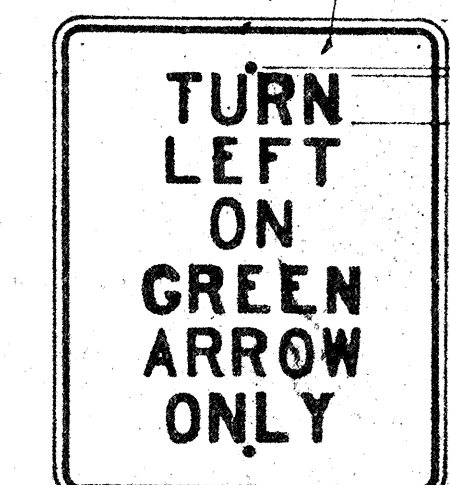
R-7
18" x 24"



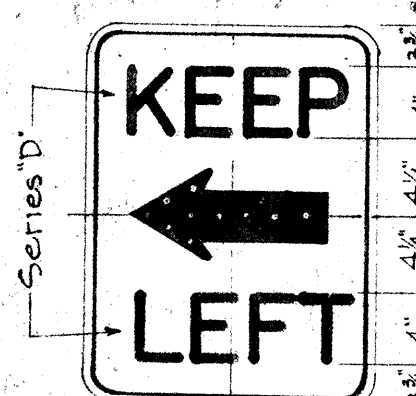
R-66
18" x 24"



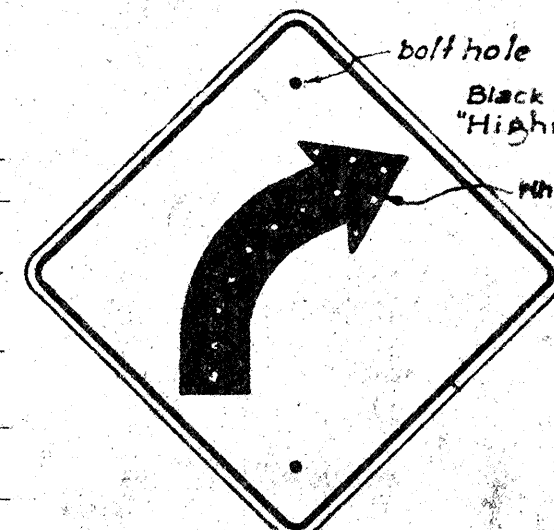
R-106
24" x 30"



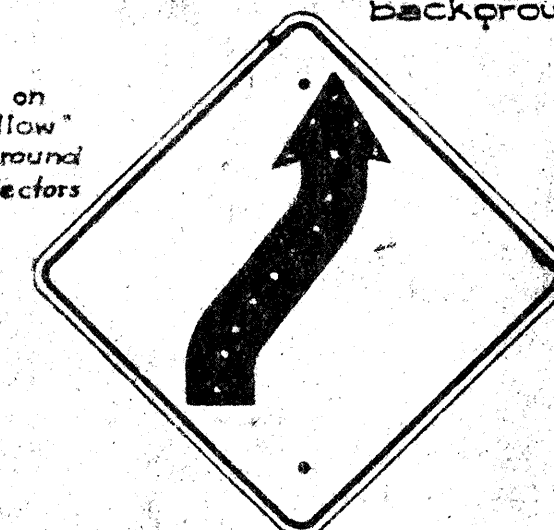
R-107-A
24" x 30"



R-14-A
24" x 24"



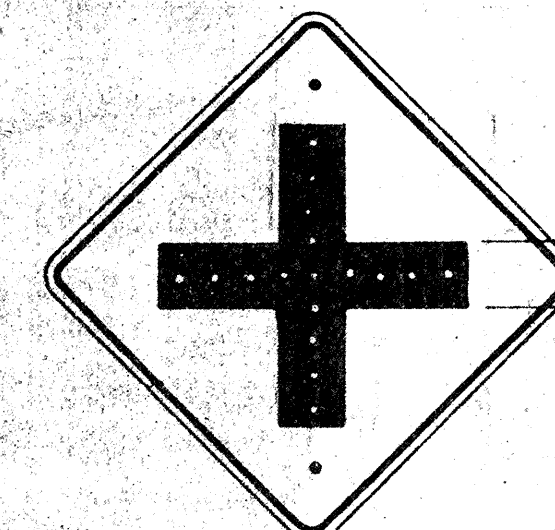
W-2-R
*W-2-L
24" x 24"



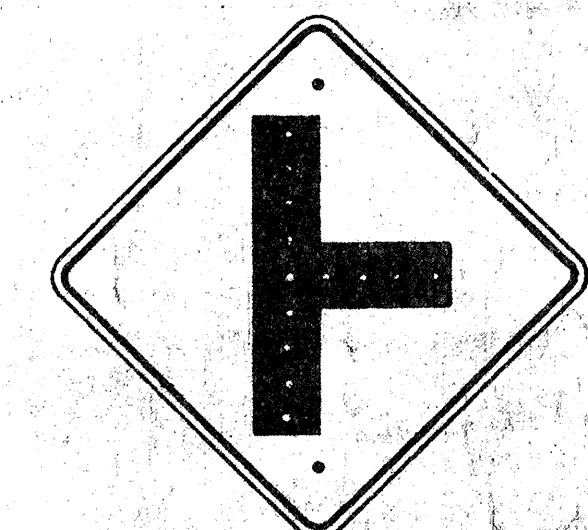
W-4-R
*W-4-L
24" x 24"



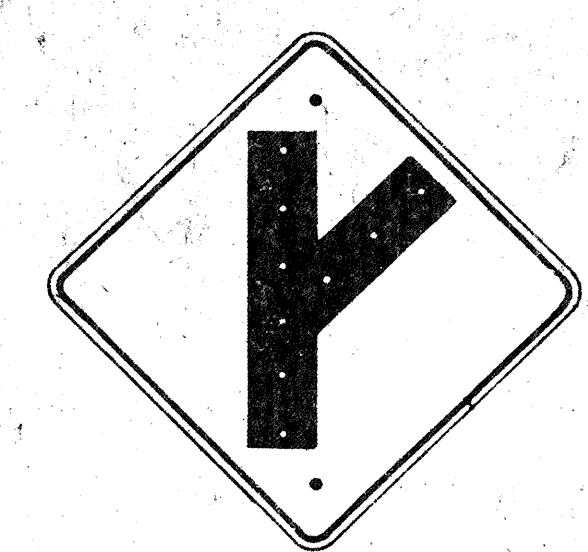
W-5-R
*W-5-L
24" x 24"



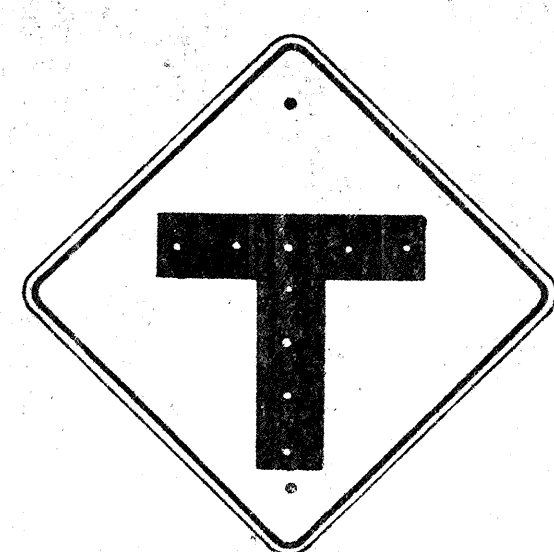
W-6
24" x 24"



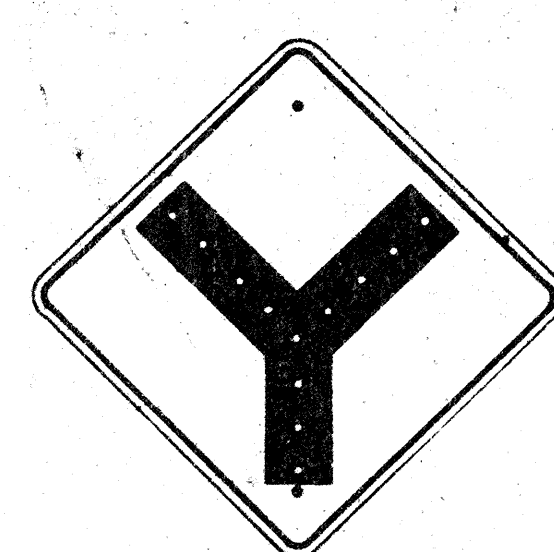
W-7
24" x 24"



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



W-9
24" x 24"



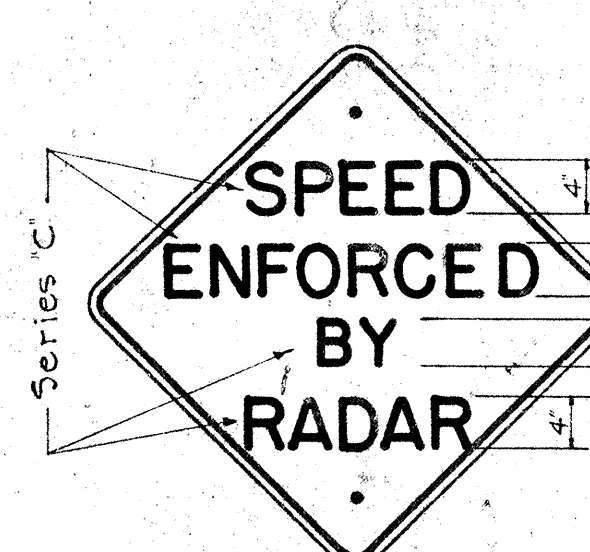
W-10
24" x 24"



W-13
24" x 24"



W-14
24" x 24"



W-40
24" x 24"



W-19
30" x 30"



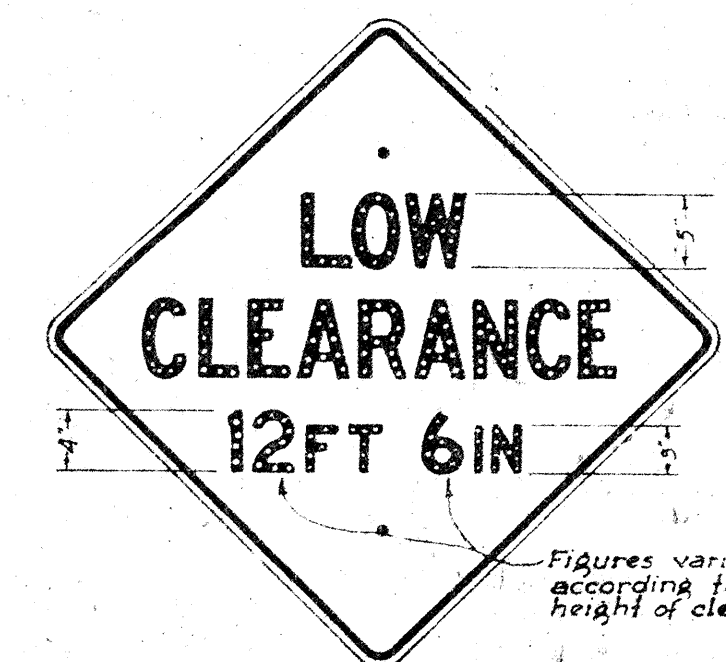
W-20
30" x 30"



W-21
30" x 30"



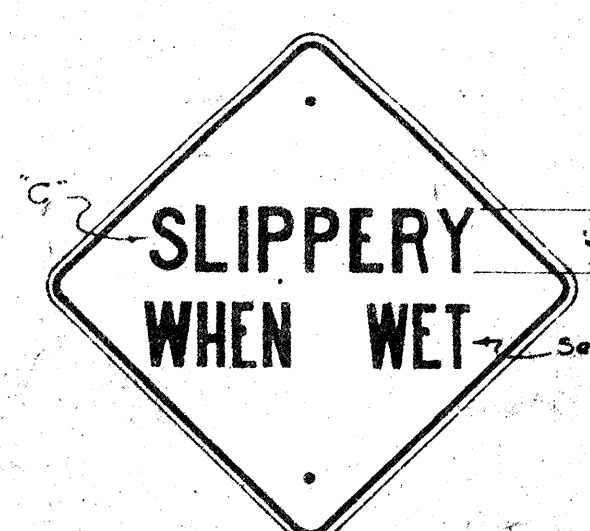
W-22
24" x 24"



W-24
30" x 30"



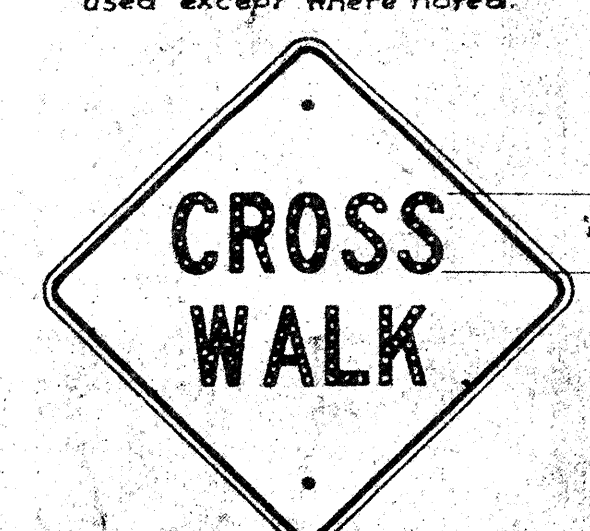
W-25
24" x 24"



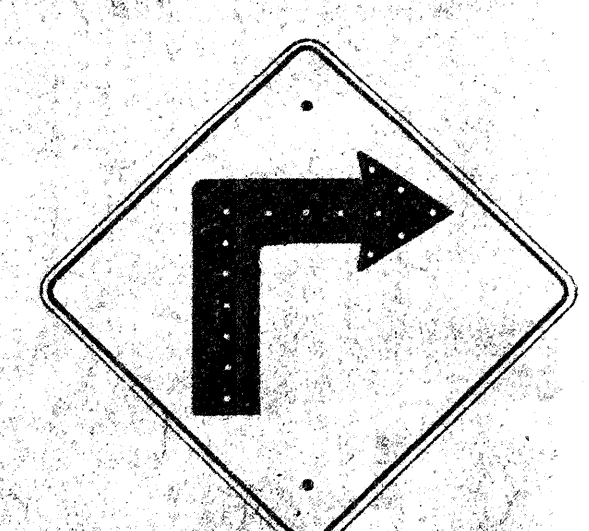
W-29
24" x 24"



W-59
24" x 24"



W-39
24" x 24"



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

NOTE: 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' DATE: APR 29, 1959
APPROVED: _____
STATE HIGHWAY ENGINEER

SHEET No 44 OF 80 SHEETS

8183.44

DATE: 1/1/57
CHECKED BY: T. Tokunaga
DRAWN BY: T. Tokunaga
DESIGNED BY: T. Tokunaga
ORIGINAL: T. Tokunaga

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) $\frac{3}{8}$ " ϕ bolt holes drilled at location shown.

STOP SIGN
RURAL DISTRICT

SEE NOTE ABOVE
PAVEMENT CROWN ELEVATION

NOT LESS THAN 5

RESIDENCE DISTRICT

NOT LESS THAN 5

NOTE: This sign shall be placed from 300 to 500 feet from R. R. intersections in rural areas and a minimum distance of 100 feet from R. R. intersections in Residence or Business districts.

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

This product to be as shown in Catalogue No 48 of Cataphote Corp or equal.

The diagram illustrates the proposed changes to the F.A.P. 20 & 30 sign system. It shows three vertical signposts. The left signpost has a rectangular 'FAP' sign above a diamond '30 (7)' sign, with a 'New Sign' arrow pointing to a new diamond '30-B' sign below it. The middle signpost has a rectangular 'FAP' sign above a diamond '30 (7)' sign, with a 'New Signs' arrow pointing to a new diamond '20 (II)' sign below it. The right signpost has a rectangular 'FAP' sign above a diamond '20 (II)' sign, with a 'New Sign' arrow pointing to a new diamond '20-A' sign below it. A 'Move' arrow points from the old '30-B' sign to the new '30-B' sign. An 'Eliminate' arrow points from the old '20-C' sign to the new '20-C' sign. A horizontal line at the bottom indicates the 'NEW WORK' area, with 'F.A.P. 30(7)' on the left and 'F.A.P. 20(II)' on the right.

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

METHOD OF MARKING F.A. PROJECTS AT OVERLAPS

(USING NUMBER SUFFIX ON NEW WORK)

Note:
All Regulatory and Warning Signs
shall have $\frac{3}{8}$ " Bolt Holes.

NOTE: For R 439, Black
Border and Letters
on Yellow ReflectORIZED -
Background OR Black
Border and reflectORIZED
letters with white buttons
on a Yellow Back- (Series
ground

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(8)	1959	45	87

NOTE:
THIS MARKER SHALL
BE INSTALLED OPPOSIT
AND AT THE SAME HEIGHT
AS MARKER W-42

HEIGHT AND LATERAL LOCATION OF SIGNS - TYPICAL INSTALLATIONS

PLAN OF TOP

STANDARD C&C STREET
SURVEY MONUMENT

Note: The fitting at right, to be installed on sign posts as shown on plans.

DETAIL OF SIGN POST
FITTING FOR C/C
STREET SIGNS

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

ARRANGEMENT OF MARKERS

One F.A.P. Marker and one plate shall be placed at the beginning and end of each isolated F.A. Project. Where two F.A. Project adjoin, a single marker and two Number plates shall be placed, each Number plate pointing in the direction of the project to which it refers.

Post in place, complete with one F.A.P. Marker plate and its respective Number plate will be paid for as one item. Each additional Number plate will be paid for separately.

Markers and Number plates shall be No 10 Ga. galvanized iron with 3/8" holes for fastening as shown on sketch. Markers and Number plates shall be given one coat of best Chromate primer and two coats of White Marine Enamel. Before painting they shall be given a wash of 8 ounces of Copper Sulphate in one gallon of water. The lettering shall be of two coats of Black Marine Enamel.

Markers and plates shall be fastened with 1/4" galvanized bolts and washers in addition to stainless steel washers with neoprene rubber gaskets attached on front face of each plate.

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.

FEDERAL AID MARKER
Scale: 1 1/2" = 1'-0"

APPROVED:  DATE: AUG 26 1952

STATE HIGHWAY ENGINEER

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

JUNE 12, 1957 MAY 13, 1958
JULY 16, 1956

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS
F.A. MARKERS, MONUMENTS
SIGNS & LOCATION OF SIGNS
SCALES AS NOTED

SHEET 3 OF 20 SHEETS

\$1 \$3.45

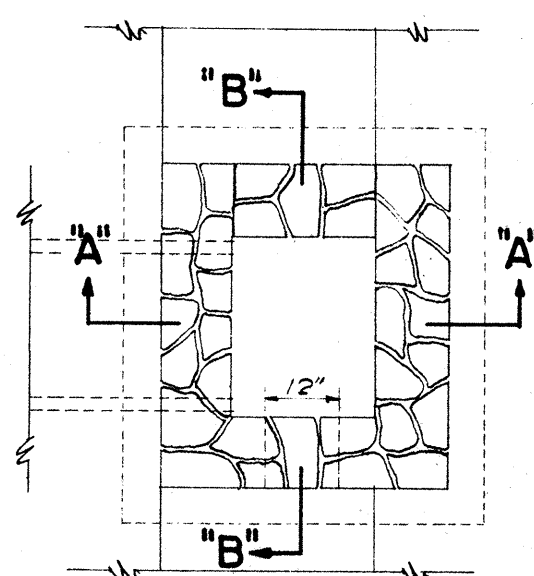
D	W	H	T=W+H
18"	24"	2'-0"	4'-0"
24"	30"	2'-0"	4'-6"
30"	30"	2'-6"	5'-0"
36"	36"	3'-0"	6'-0"

DETAIL OF OUTLET DITCH

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

D	D	L=D+G	Cu Yds.	Where Variables Equal
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"

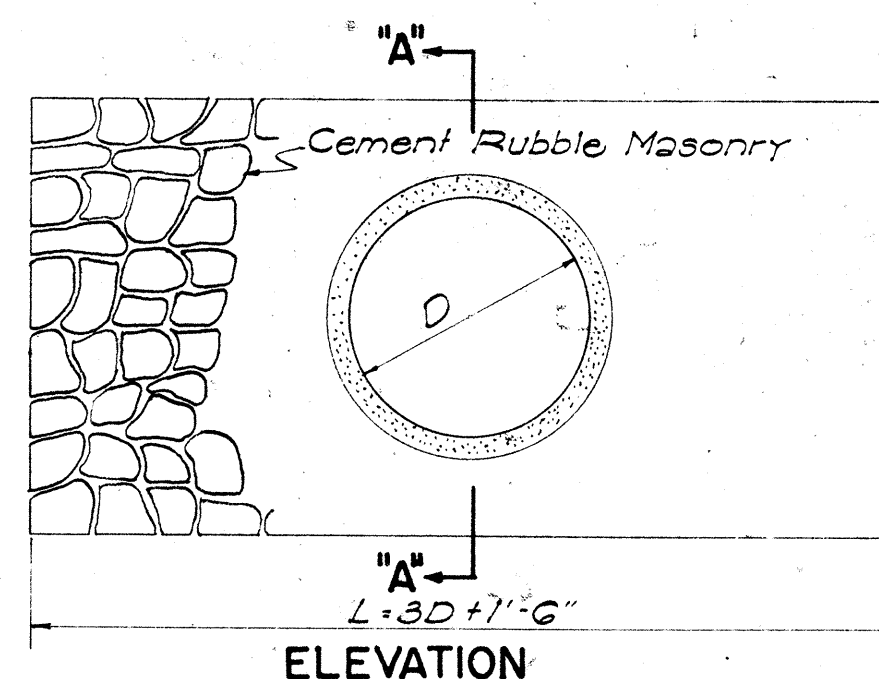
NOTE: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



DETAIL OF MASONRY DROP INTAKE

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

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	1.45	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"

SECTION CONC. PIPE CULVERT

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

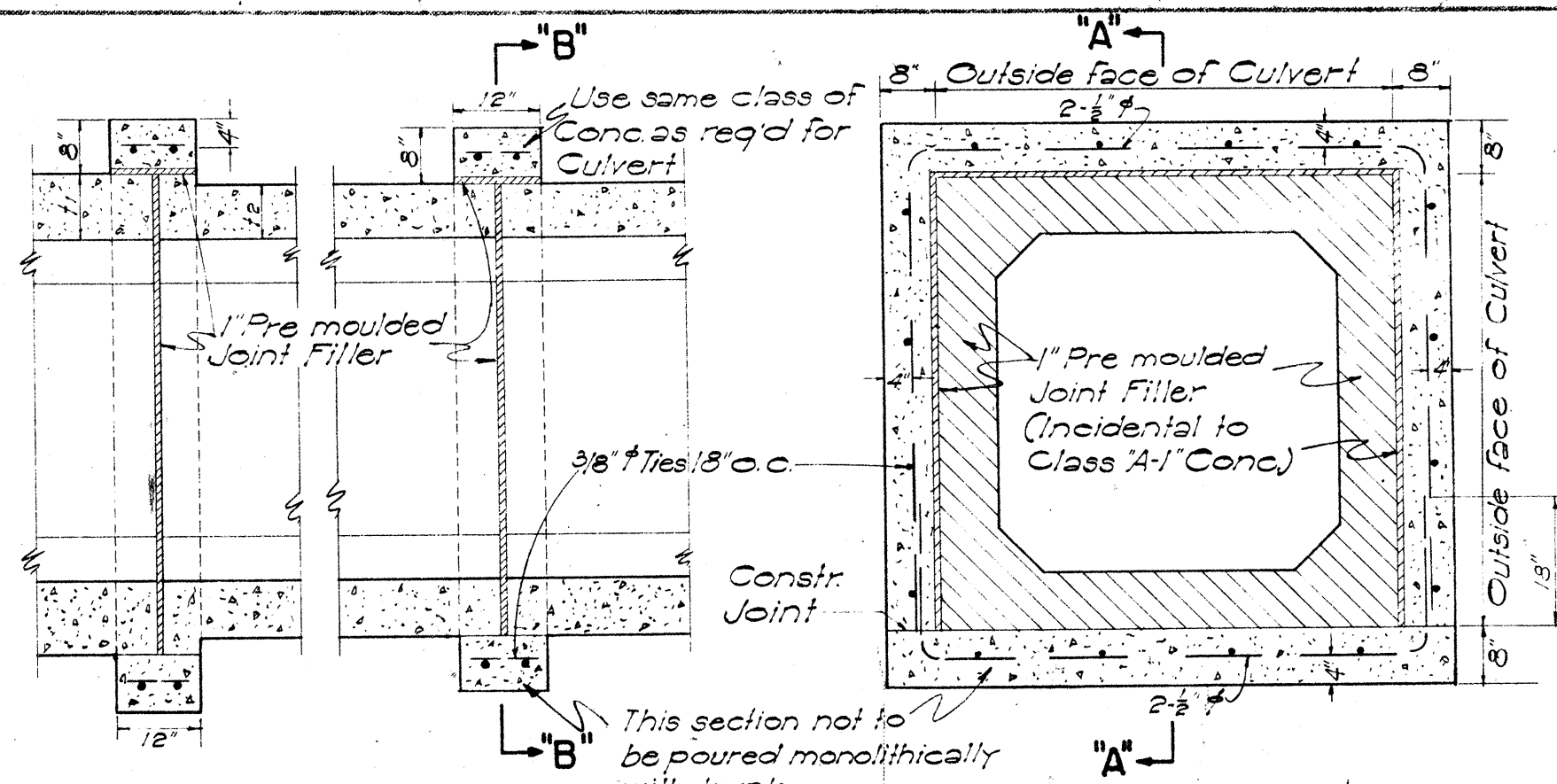
CAST-IN-PLACE CONC. CULVERT

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

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" 5'-6" 33
24"	1'-6"	7'-6"	4'-6"	1.25	1.38	4 3/4" 7'-0" 42
30"	2'-0"	9'-0"	5'-0"	1.95	2.17	4 3/4" 8'-6" 51
36"	2'-0"	10'-6"	5'-6"	2.45	2.74	4 3/4" 10'-0" 60
42"	2'-6"	12'-0"	6'-0"	3.87	3.87	4 3/4" 11'-6" 60
48"	2'-6"	13'-6"	6'-6"	4.66	4.66	4 3/4" 13'-0" 78

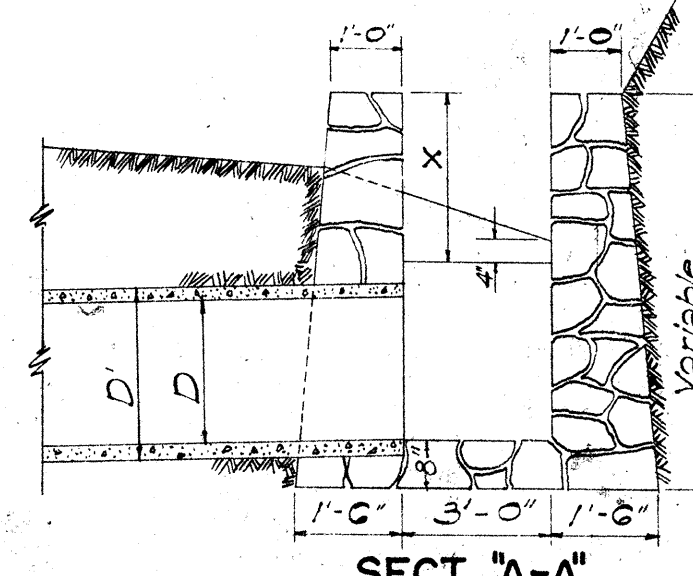
DETAIL OF CONCRETE HEADWALL

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



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

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



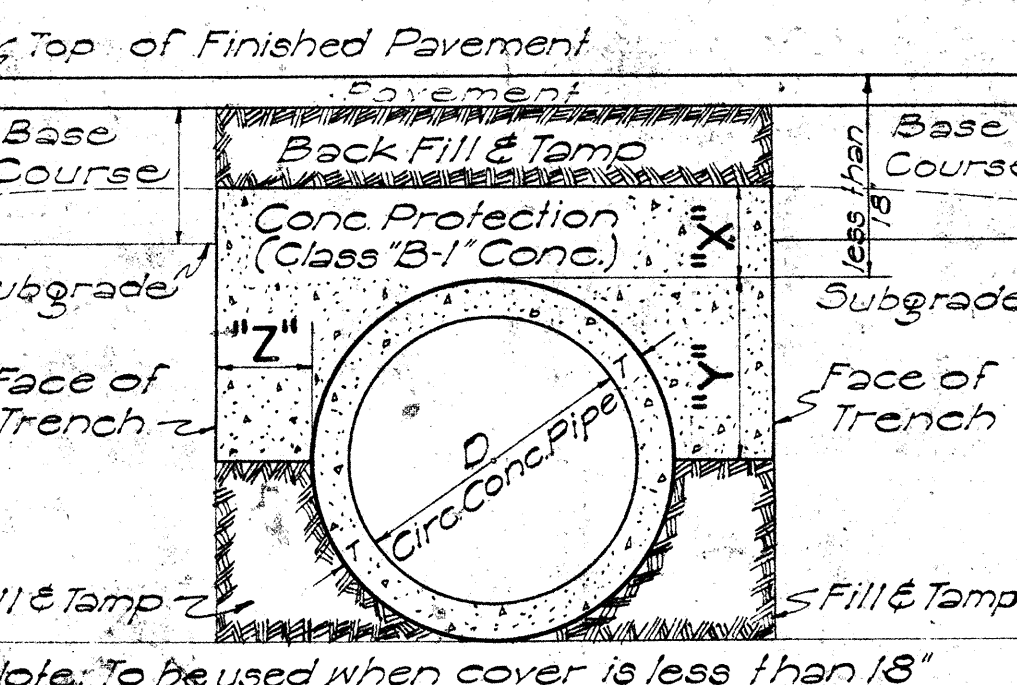
SECT. "A-A"

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



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

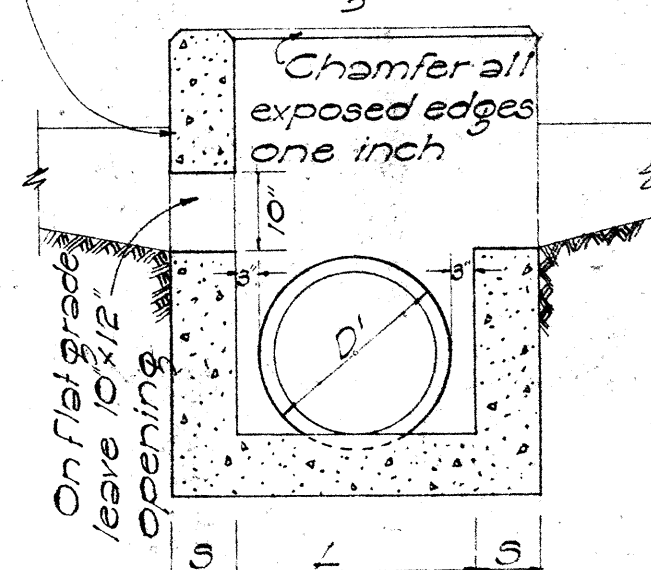
Scale: 1" = 1'-0"

SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

D	D	L=D+G	Cu Yds.	Where Variables Equal
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.

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"

DETAIL OF CONCRETE DROP INTAKE

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

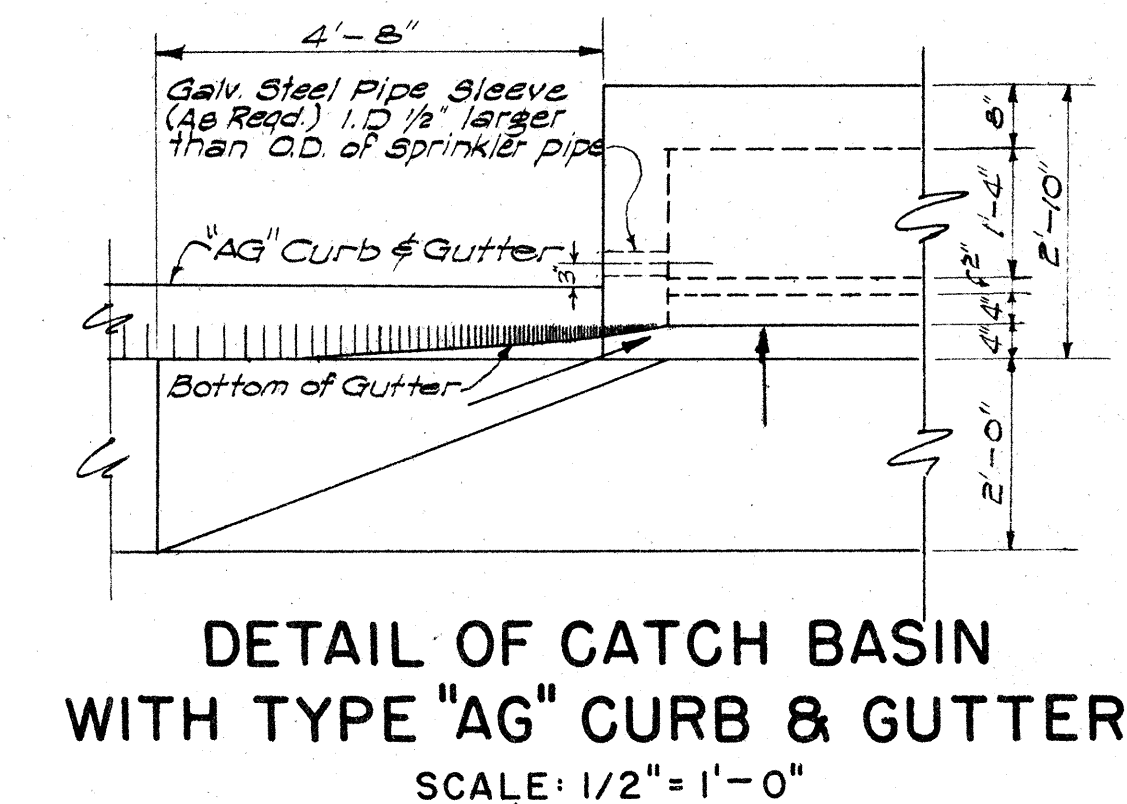
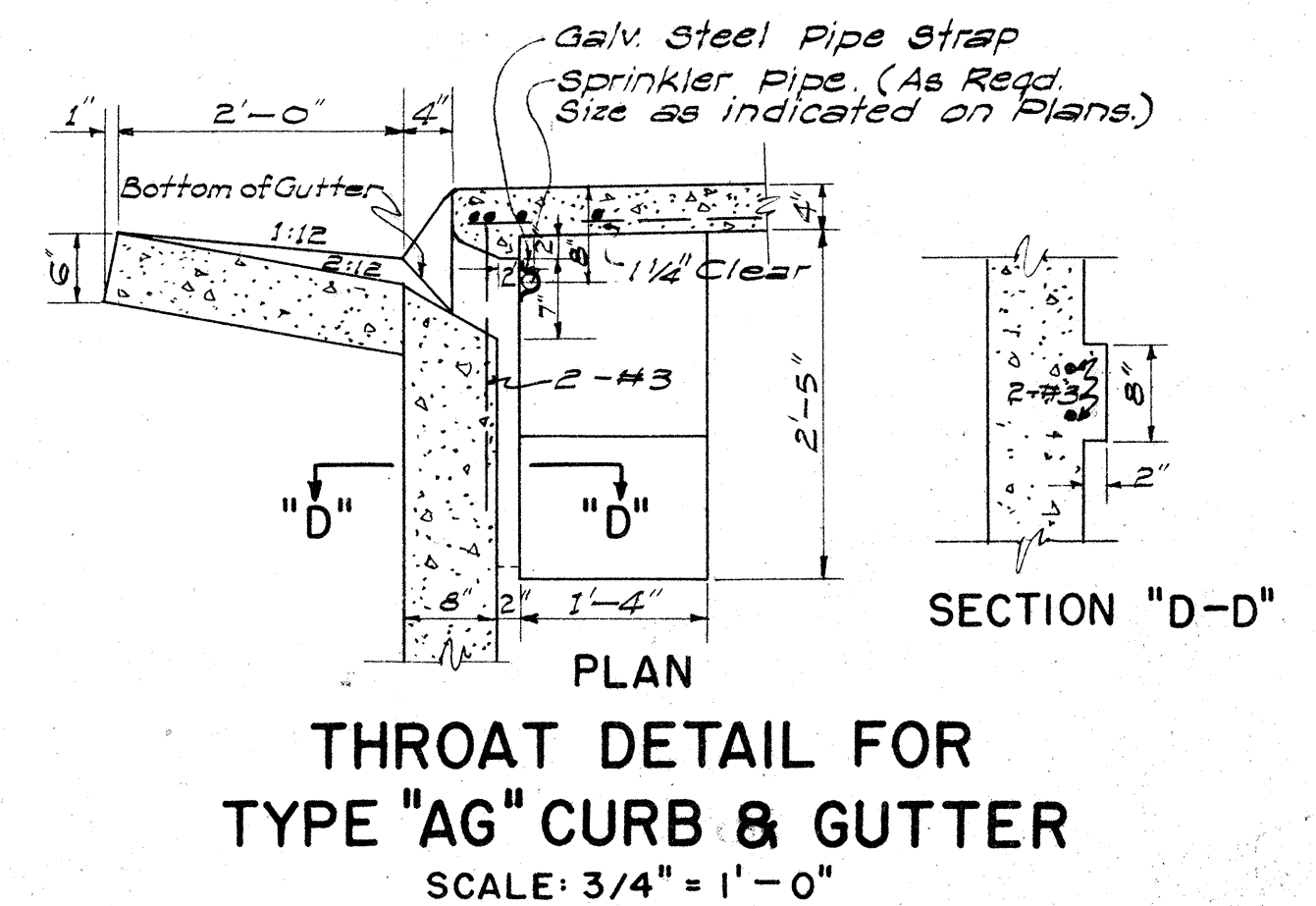
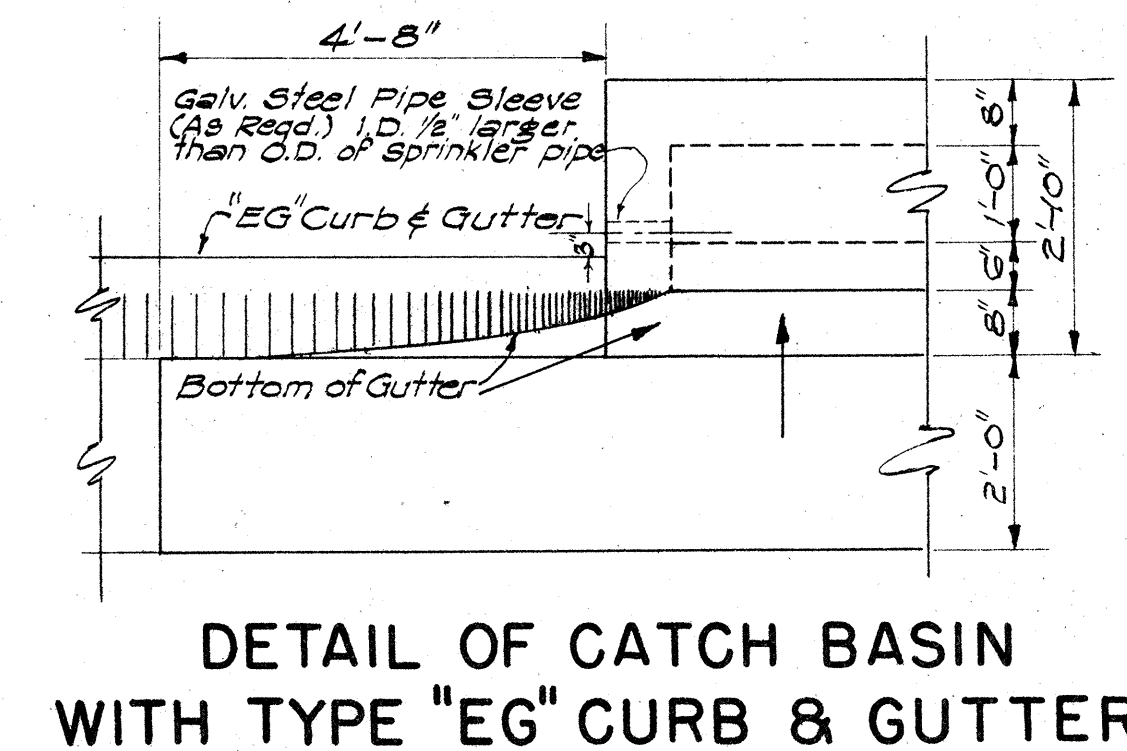
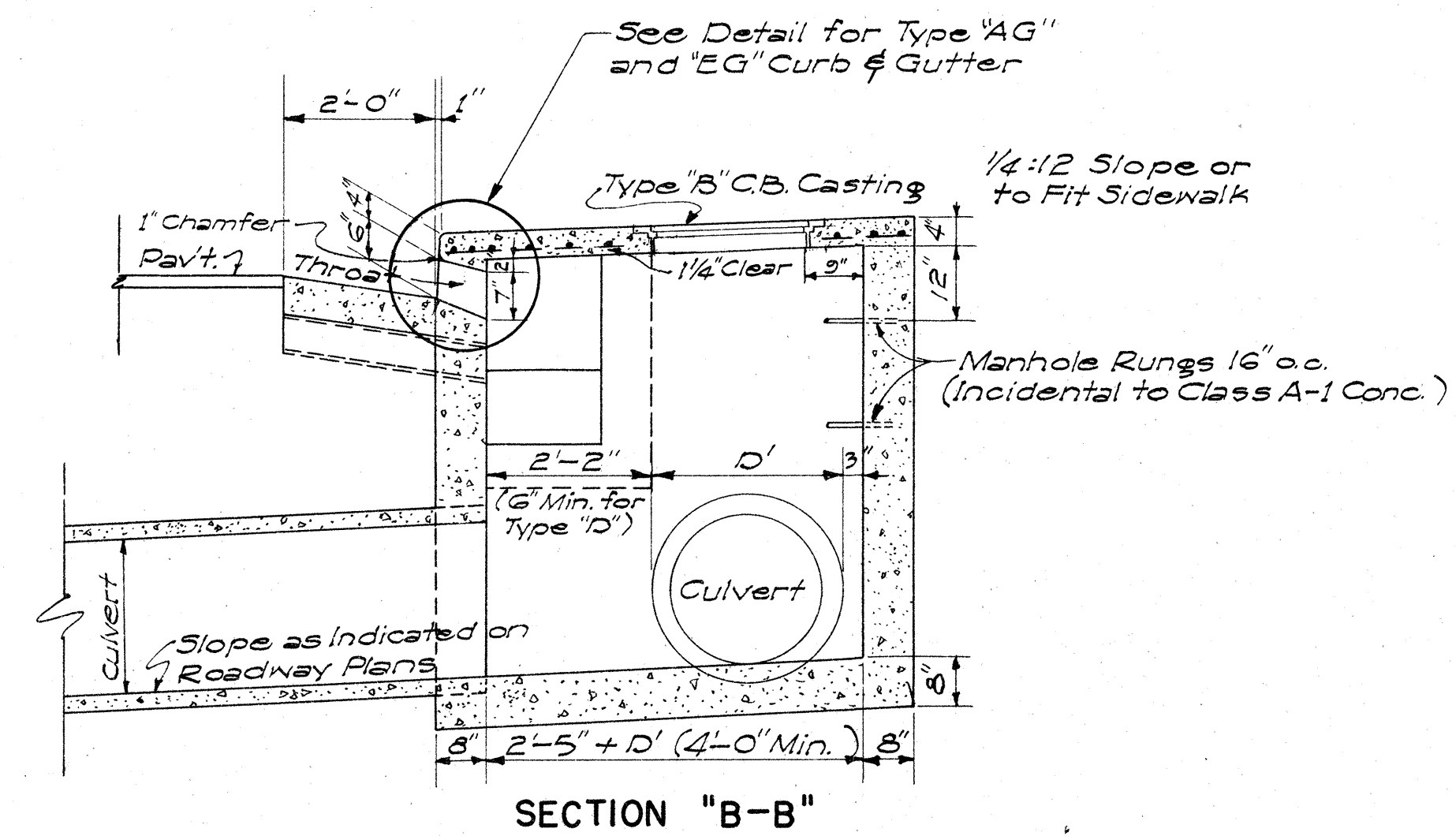
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS

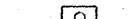
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED

SHEET NO. 4 OF 20 SHEETS

\$183.46

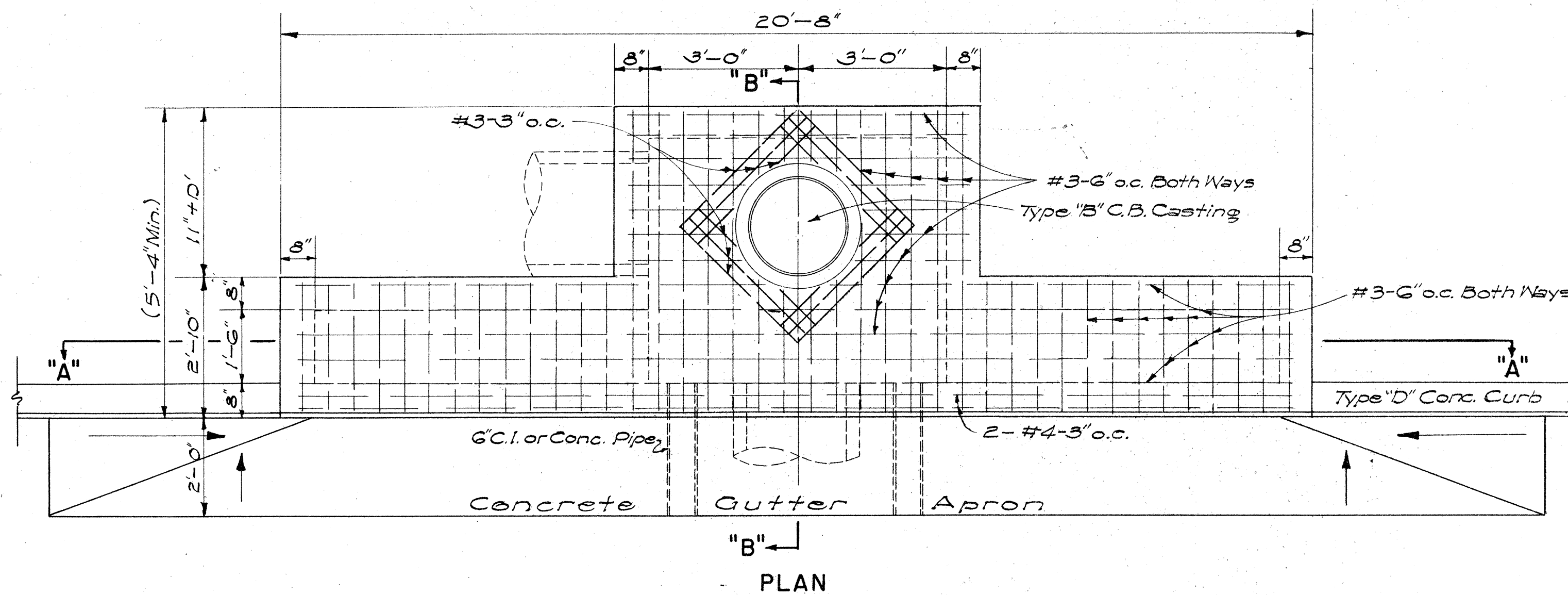


ESTIMATED QUANTITIES

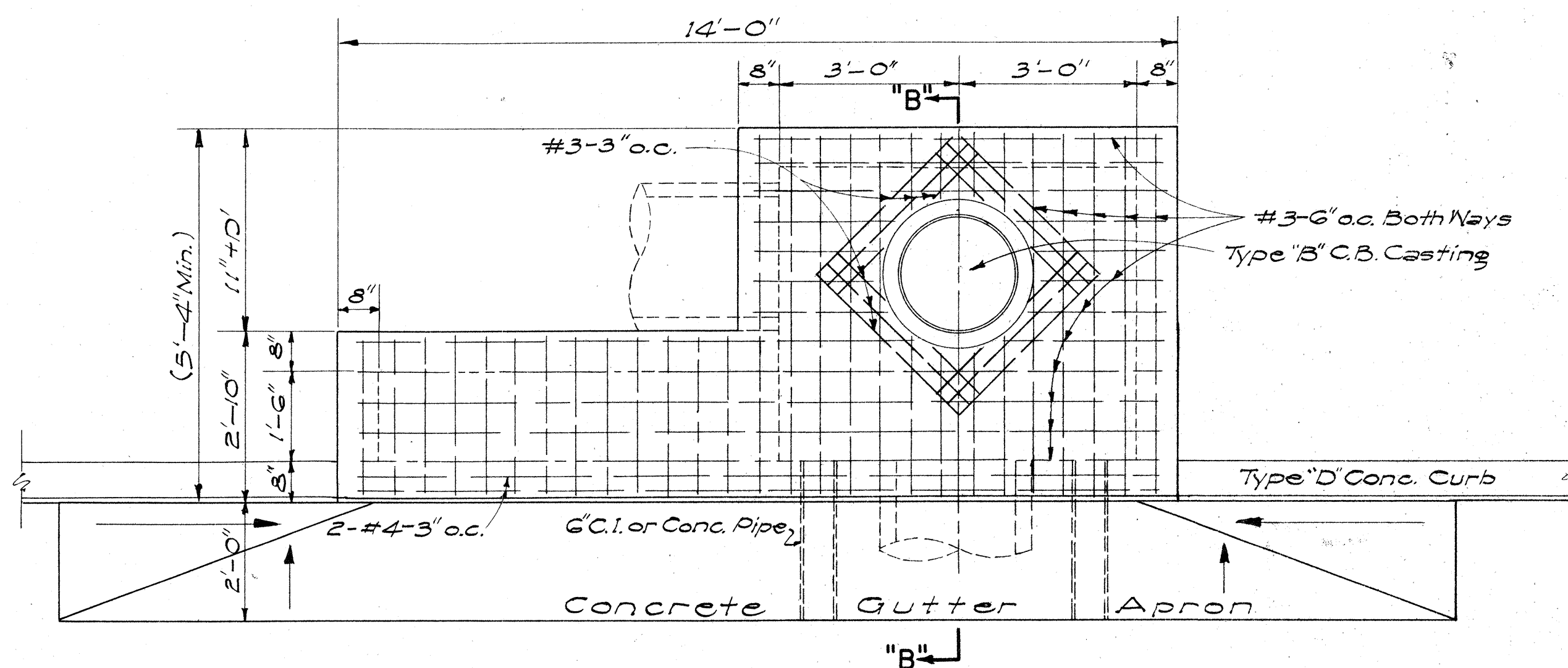
Type	Class A-I Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A" 	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B" 	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C" 	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D" 	4.9 c.y.	16.5 c.y.	77 lb.	16'-8"

NOTES:

1. Quantities based on $X = 3'-0"$ and $P' = 3'0"$
2. Quantities do not include concrete for Gutter Apron.
3. The Contractor shall install 2'-6" Cast Iron or Concrete Pipes as incidental to Class A-I Concrete for Construction Drainage.
4. 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.
5. The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.

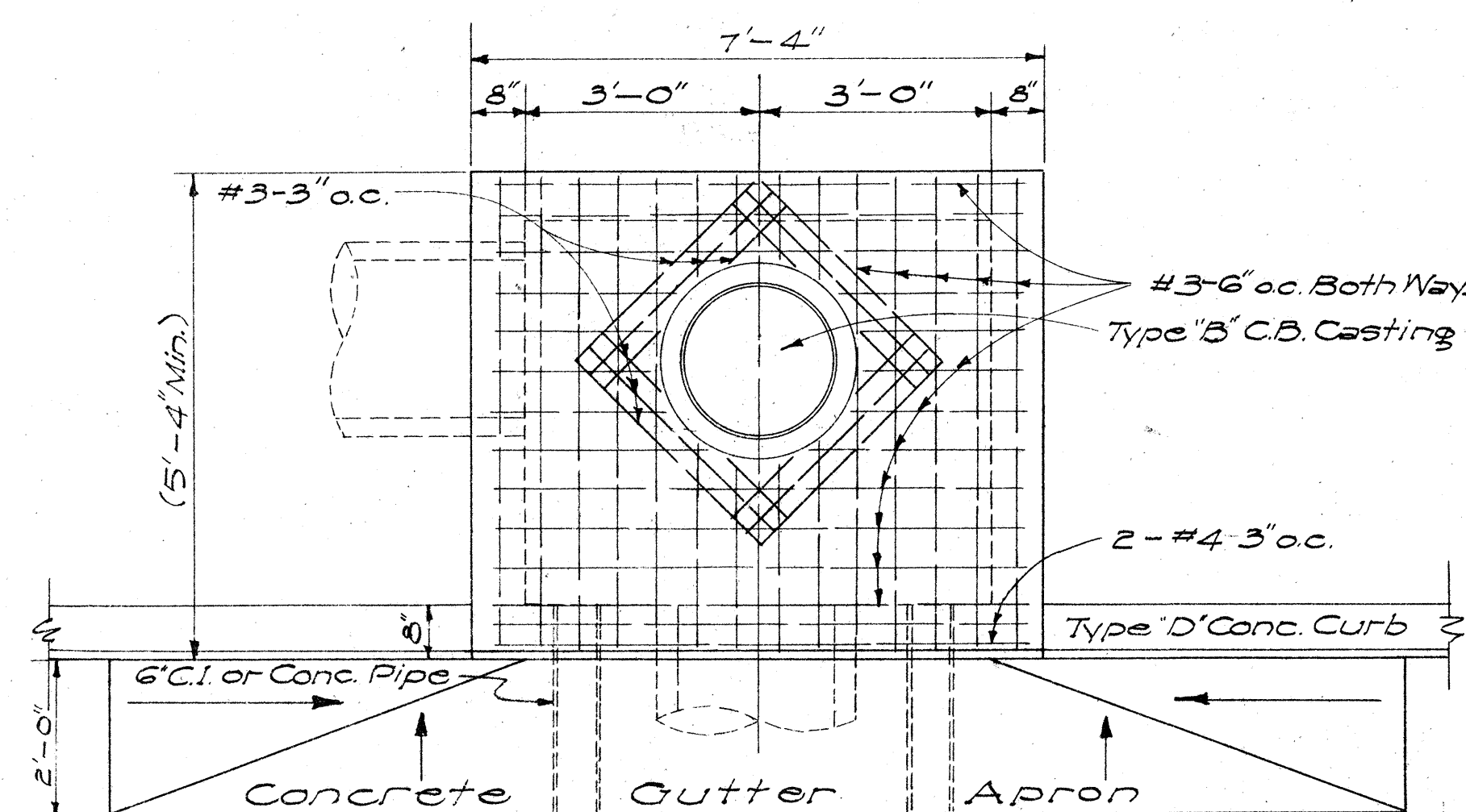


DETAIL OF TYPE "A" CATCH BASIN
SCALE: 1/2" = 1'-0"



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"

APPROVED:  DATE Aug 26, 1957
STATE HIGHWAY ENGINEER

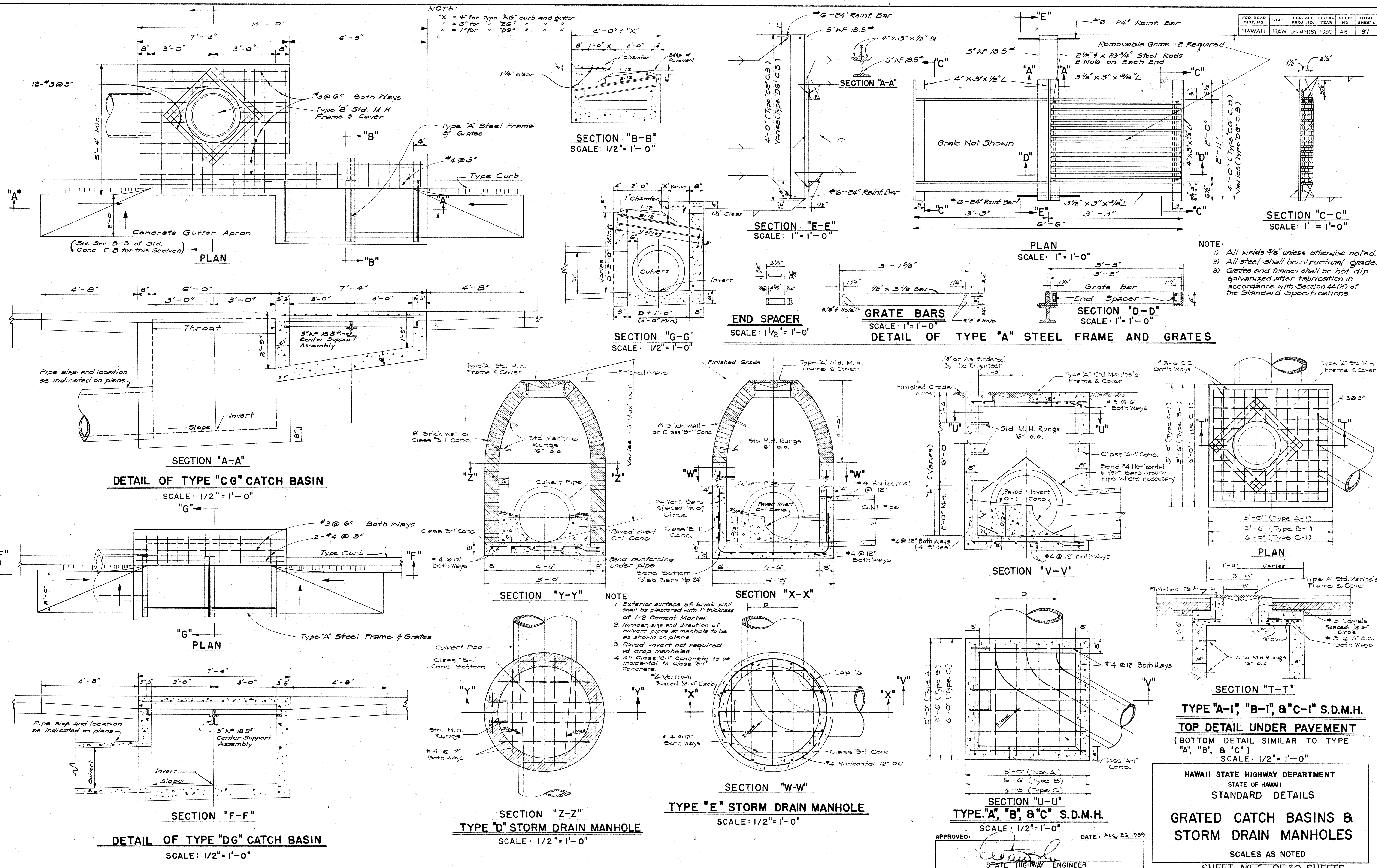
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
CONCRETE CATCH BASINS

SCALES AS NOTED

SHEET N° 5 OF 20 SHEETS

\$183.47

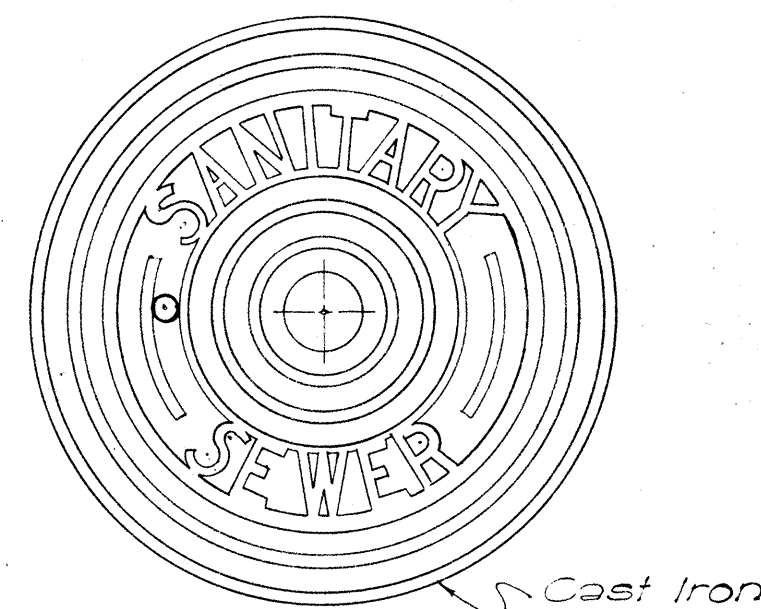
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW	U-072-1(8)	1959	48	87



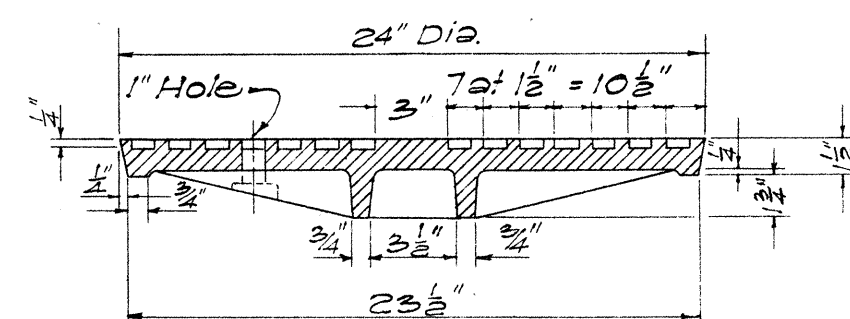
\$ 1 \$ 3 . 4 \$

2/17/57
8/17/50

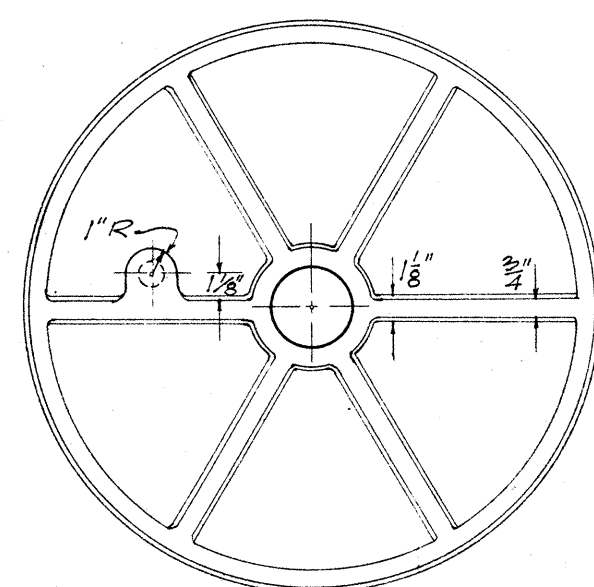
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	U-07E-1(8)	1957	47	87
August 1957					



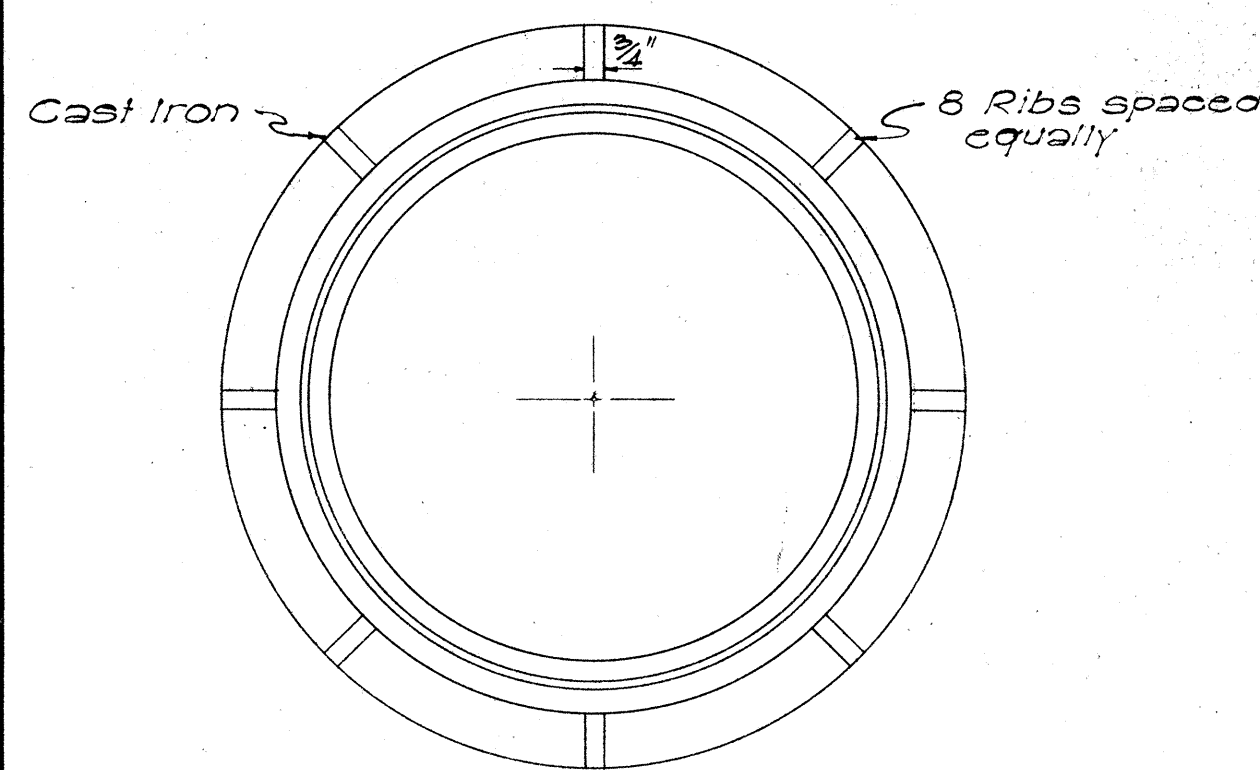
TOP VIEW OF COVER



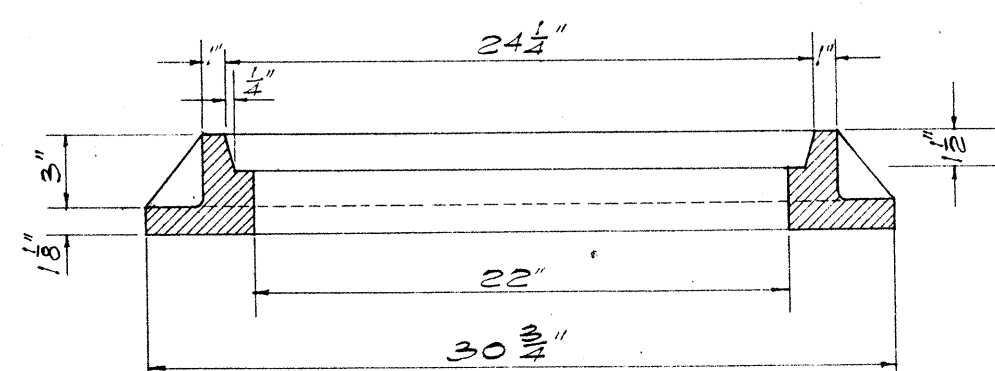
SECTION



BOTTOM VIEW OF COVER

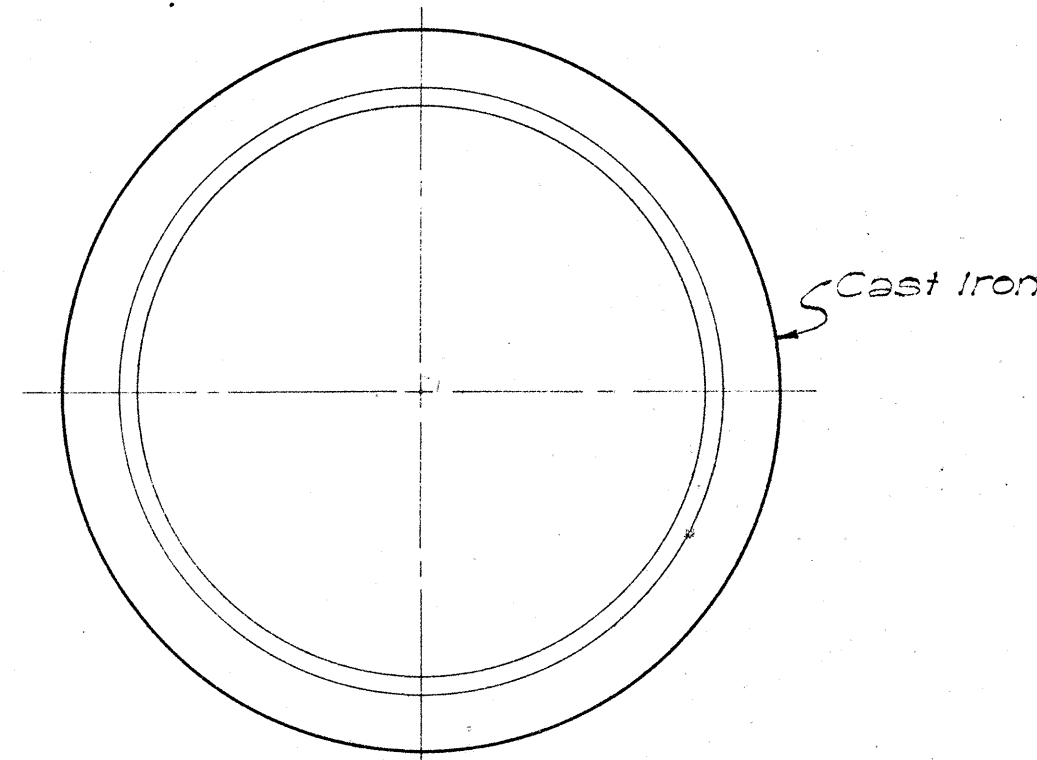


PLAN OF RIM

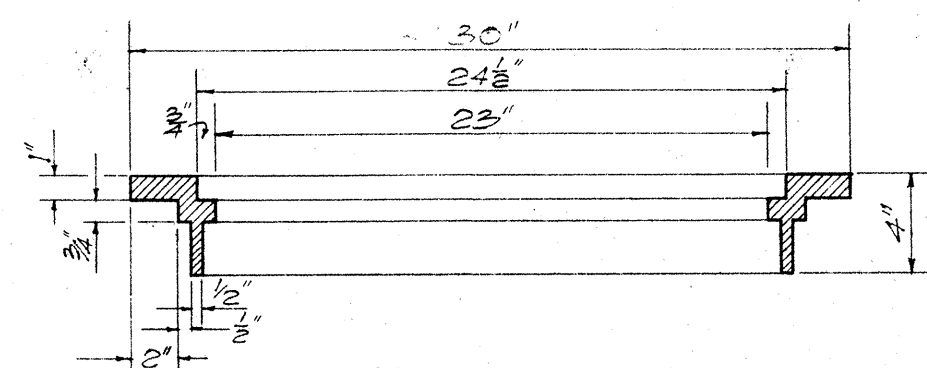


SECTION OF RIM
DETAILS OF TYPE "C"
MANHOLE CASTINGS

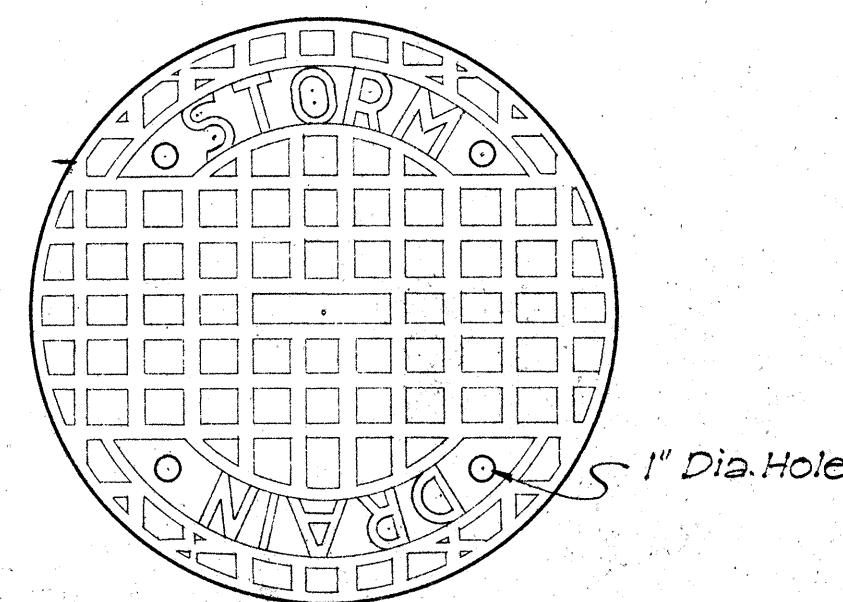
SCALE: 1-1/2" = 1'-0"



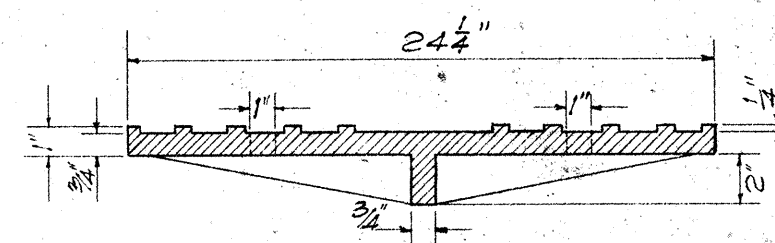
PLAN OF RIM



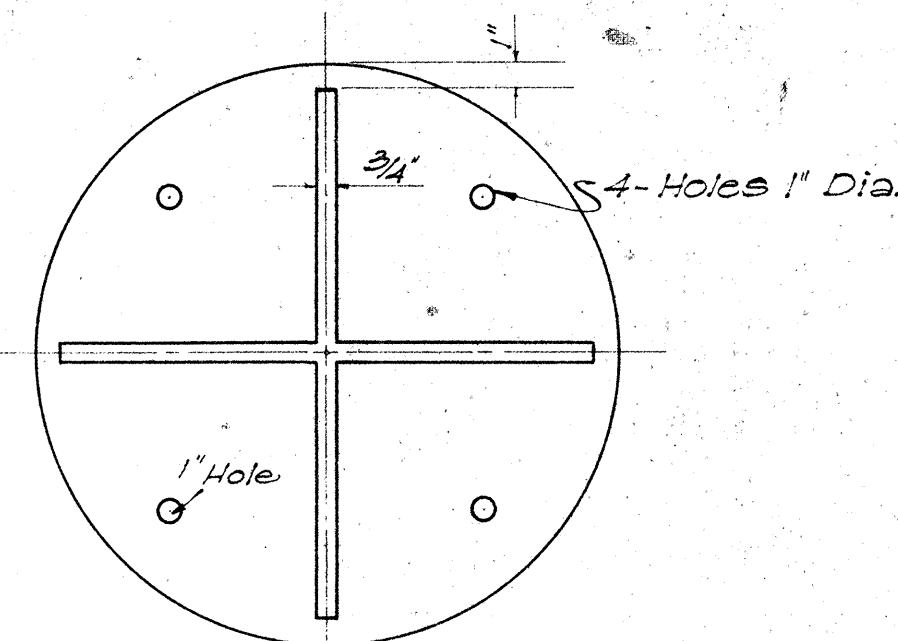
SECTION OF RIM



TOP VIEW OF COVER



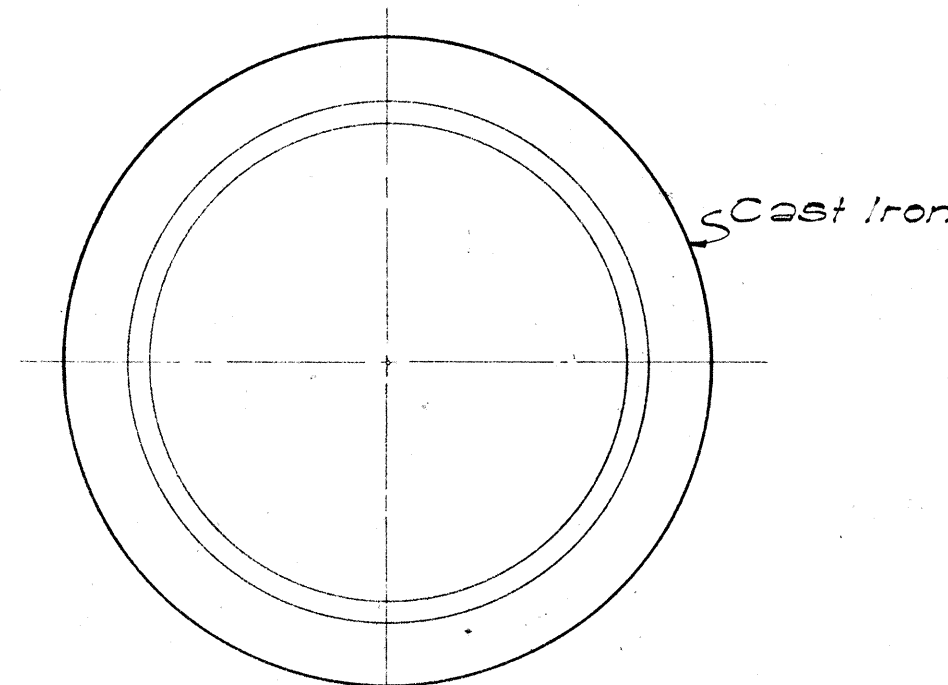
SECTION



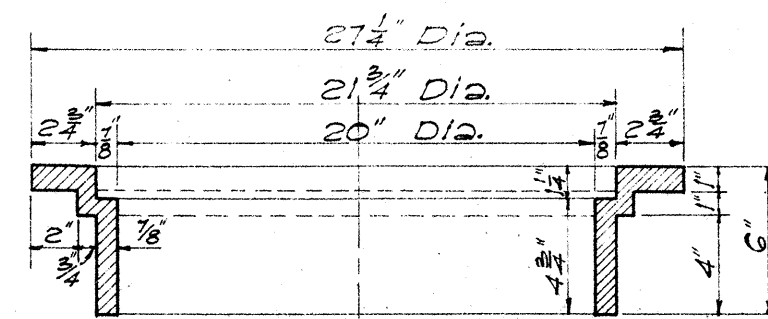
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B"
CATCH BASIN CASTINGS

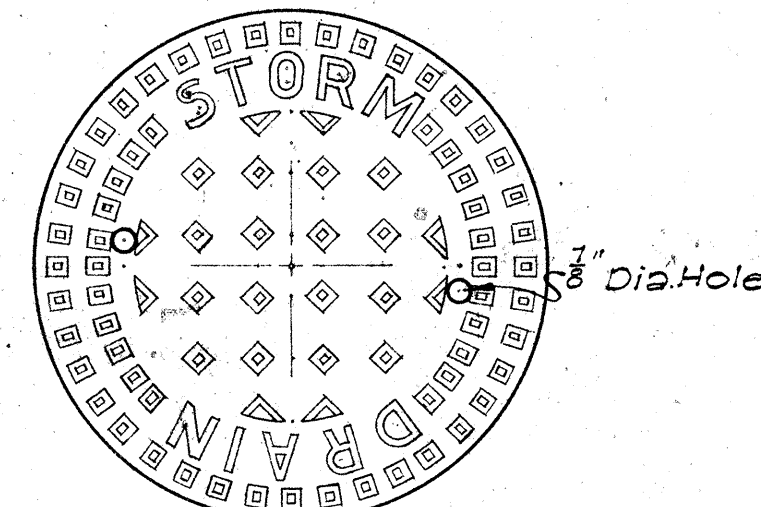
SCALE: 1-1/2" = 1'-0"



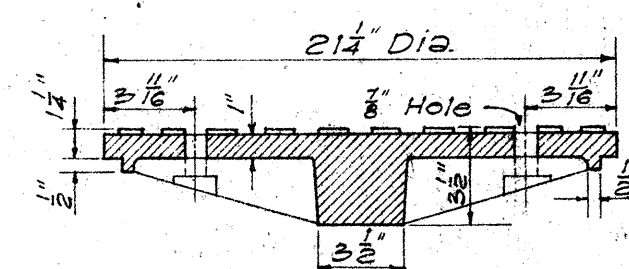
PLAN OF RIM



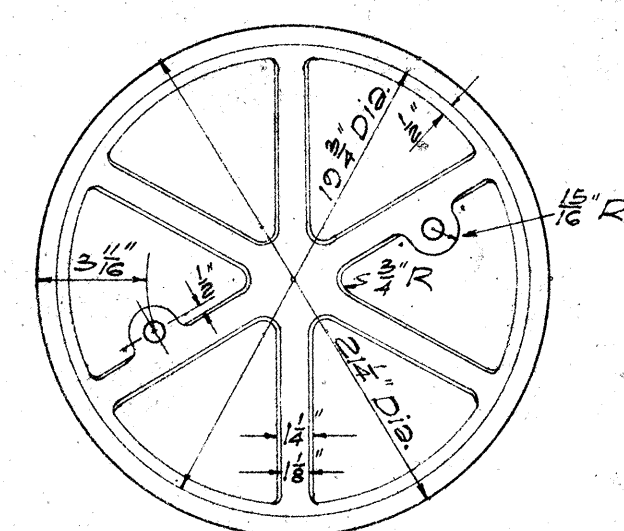
SECTION OF RIM



TOP VIEW OF COVER



SECTION

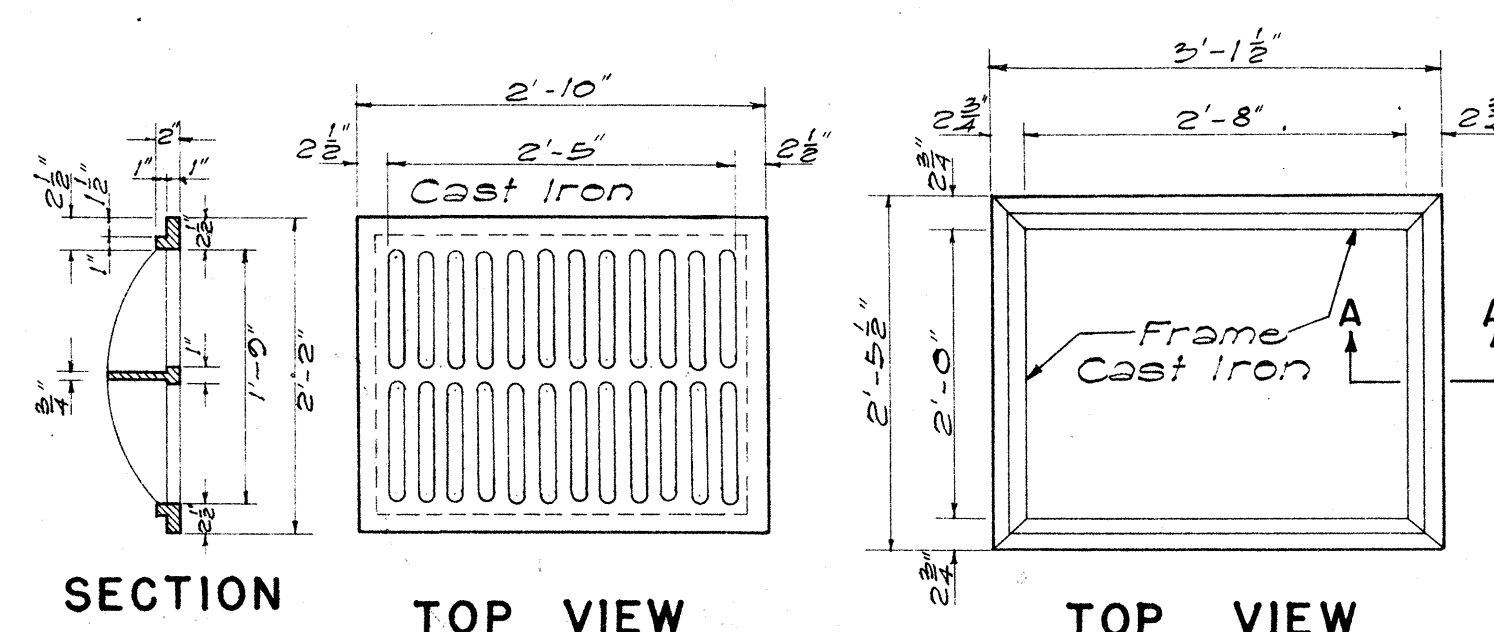


BOTTOM VIEW OF COVER

DETAILS OF TYPE "A"
MANHOLE CASTINGS

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

NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



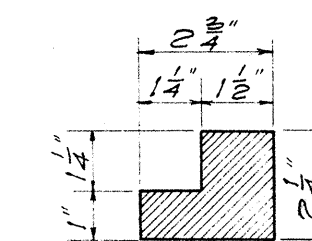
SECTION

TOP VIEW

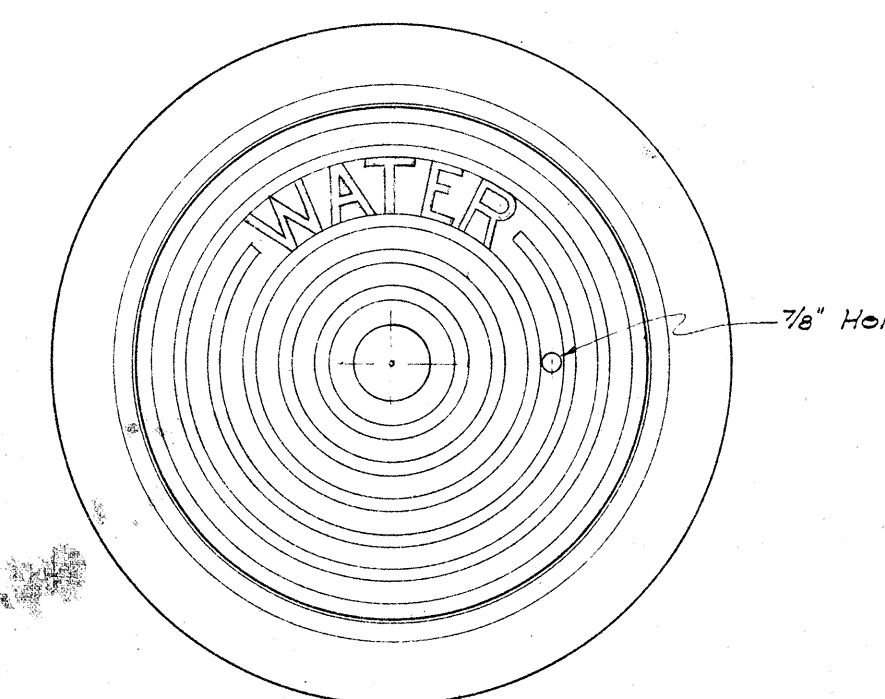
TOP VIEW

TYPE C C.I. FRAME AND GRATING

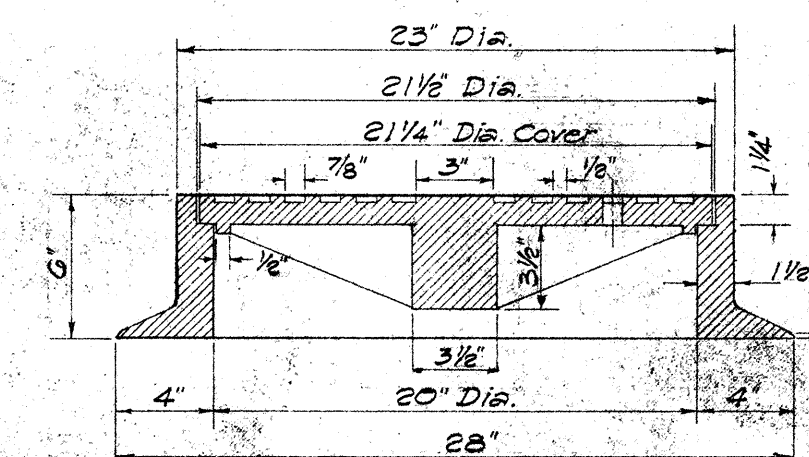
SCALE: 3/4" = 1'-0"



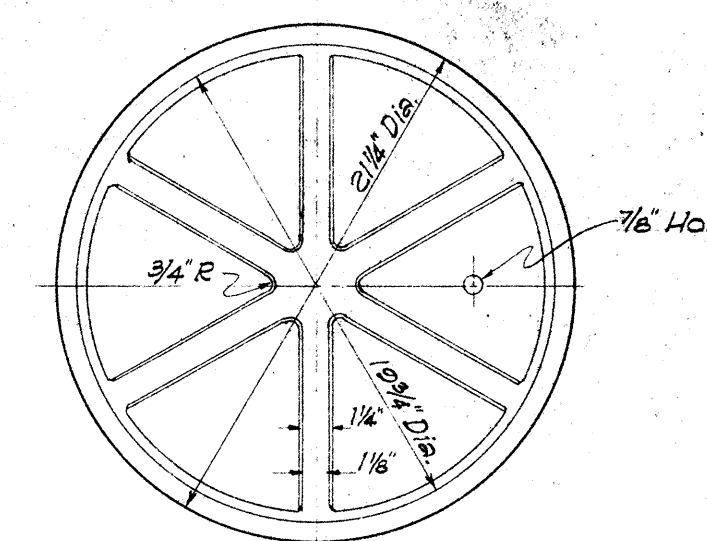
SECTION "A-A"
SCALE 3" = 1'-0"



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

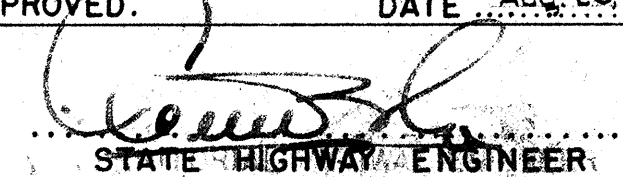
SCALE: 1 1/2" = 1'-0"

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS
CATCH BASIN AND
MANHOLE CASTINGS

SCALES AS NOTED

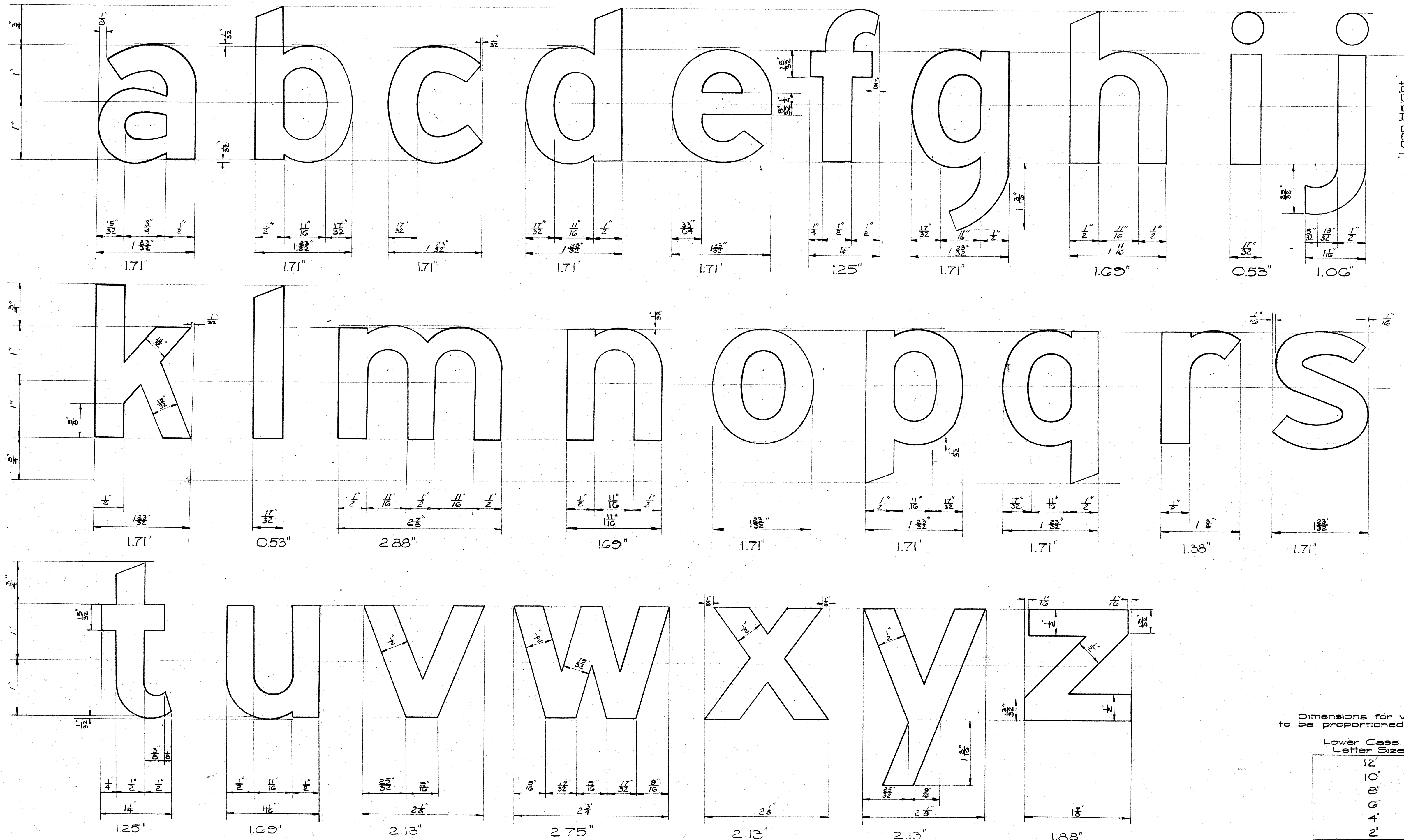
SHEET NO 7 OF 20 SHEETS

APPROVED:  DATE: Aug. 29, 1957
STATE HIGHWAY ENGINEER

\$183.49

2/17/59
4/6/59
4/28/59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	13-072-168	1959	51	87



Dimensions for various size letters are to be proportioned as follows.

Lower Case Letter Size	Multiply By Factor
12"	6
10"	5
8"	4
6"	3
4"	2
2"	1

NOTES: Spacing of letters on this drawing is not to scale and not intended to be followed. For spacing, use dimensions given in table I widths of letters and digits for Expressway Signs, Territorial Highway Department Standard. Letters of shorter words on signs are to have larger spacing for better proportioning of copy as shown on typical signs. Capital letters shall conform to Series 'E' of standard alphabets for Highway Signs of The Public Roads Administration 1952.

1. Capital letters used with lower case letters shall be 1.5 times height of lower case letters.

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

APPROVED
DATE AUG 20 1959
STATE HIGHWAY ENGINEER

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
LOWER CASE LETTERS
SCALE AS NOTED

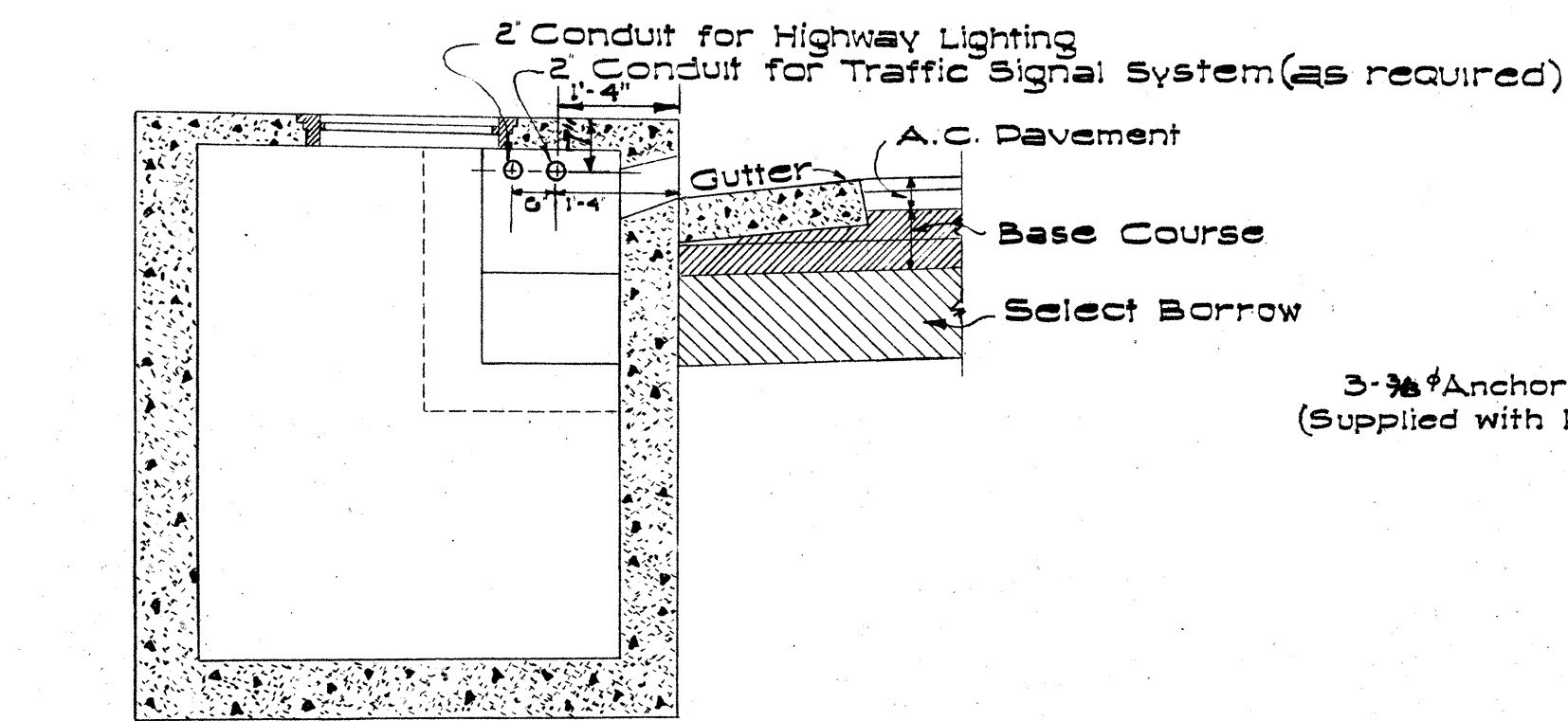
SHEET No 51 OF 87 SHEETS

8183.51

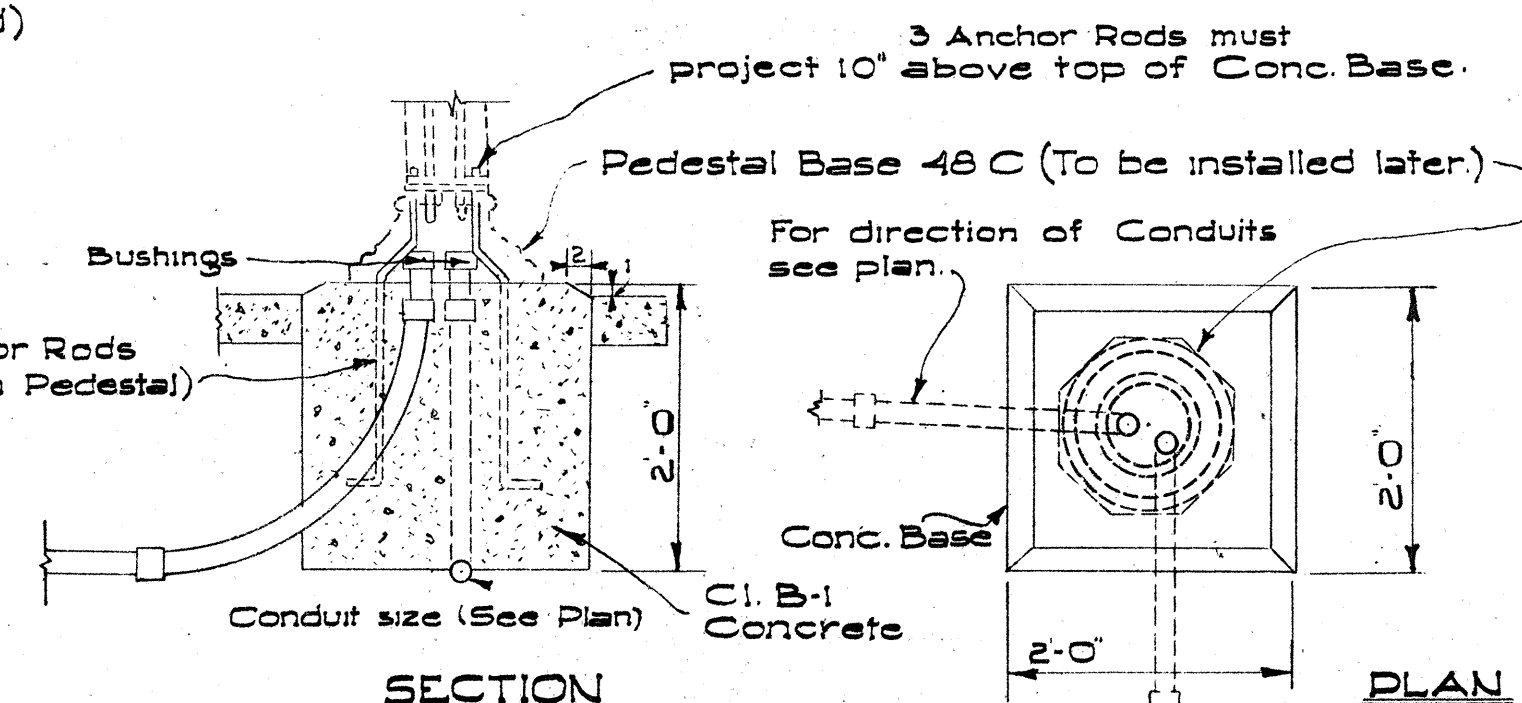
2/17/57

NOTE: Galv. 2" Conduits shall be supported by Band Hangers bolted to the top slab of Catch Basins. Band Hangers shall be No. 2G9-G Crane Catalogue No. 43 or equal. Pipe Hangers and bolts shall be incidental to item No. 4G(1) Class A-1 Concrete other than in Bridges.

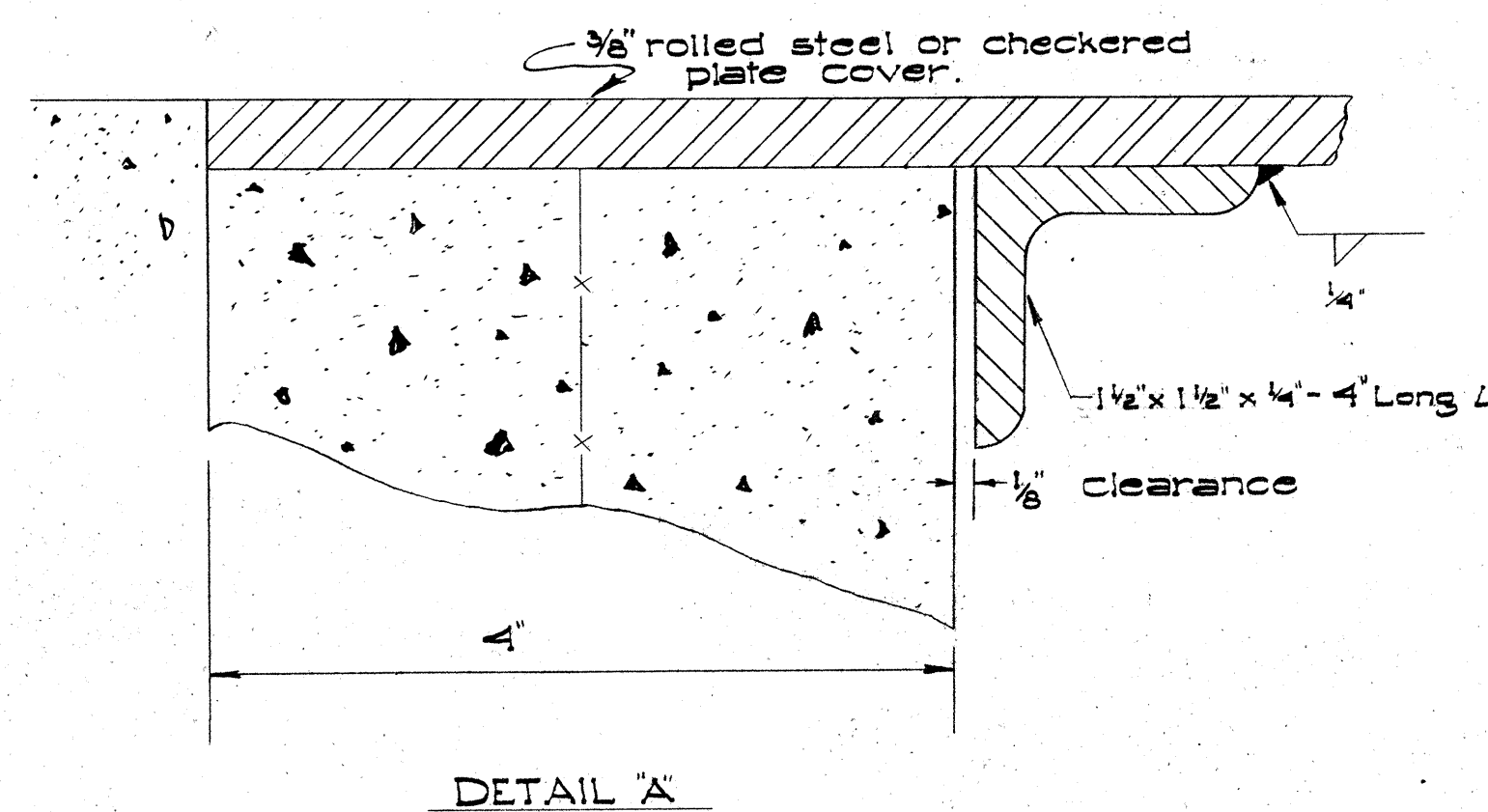
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	U072-1(8)	1957	52	87



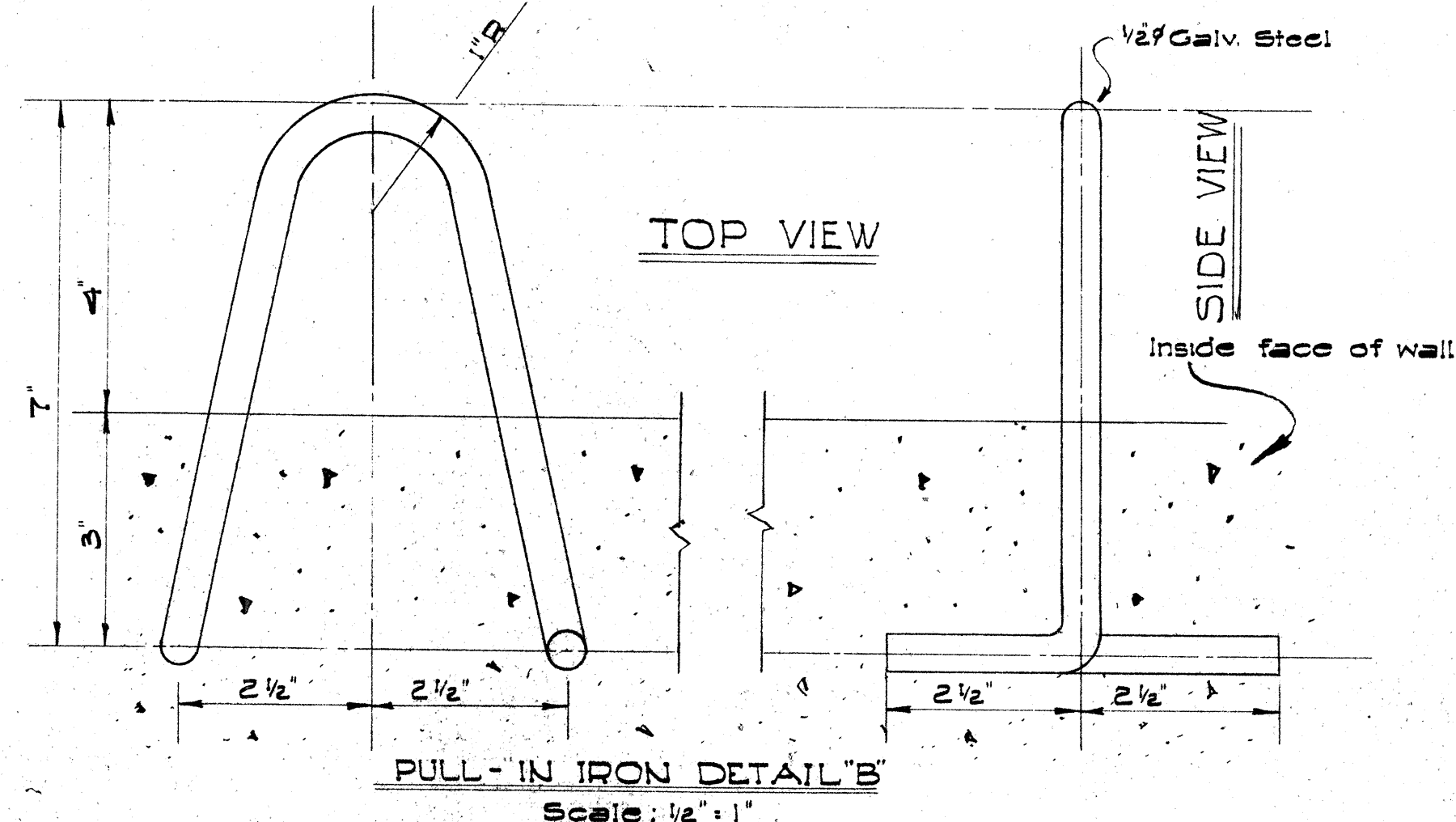
TYPICAL SECTION SHOWING CONDUITS PASSING THROUGH CATCH BASINS
Scale: 1/2" = 1'-0"



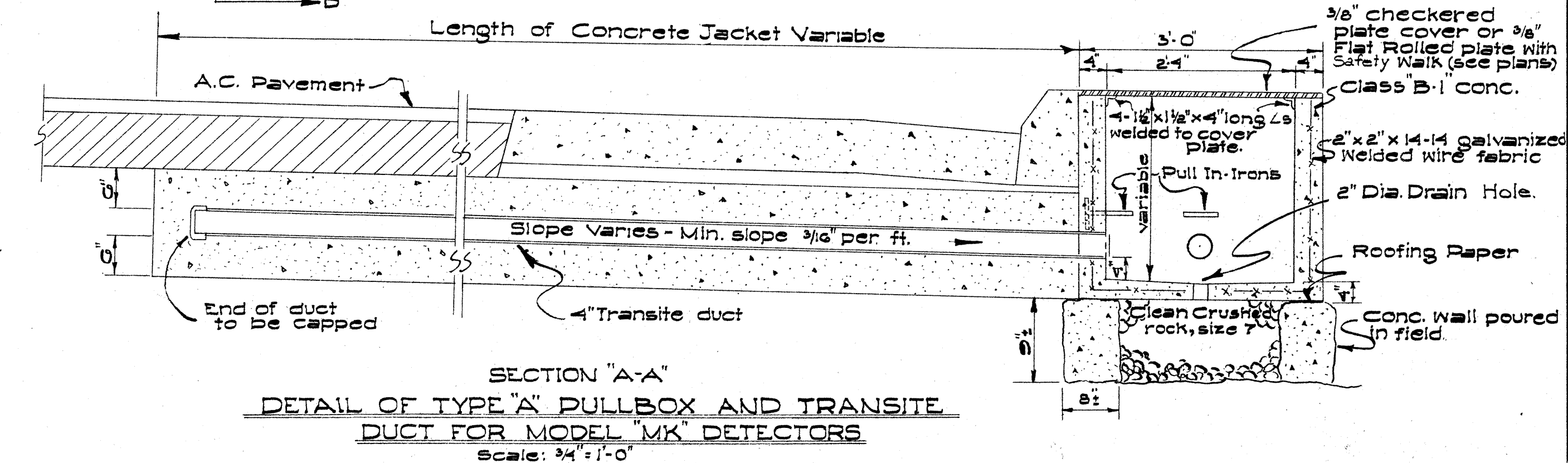
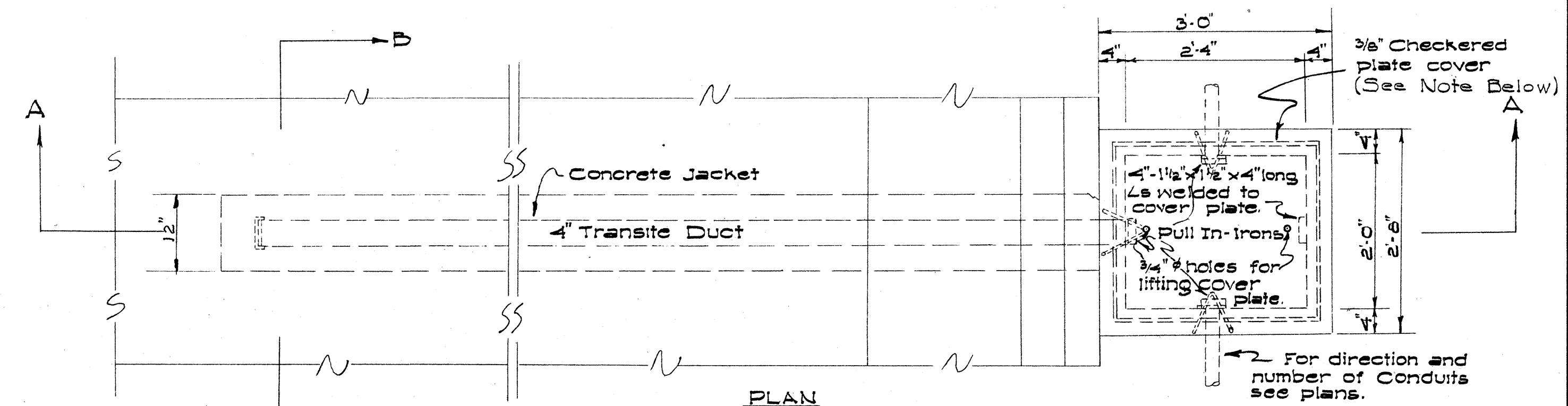
BASE FOR TRAFFIC SIGNAL POLES
Scale: 3/4" = 1'-0"



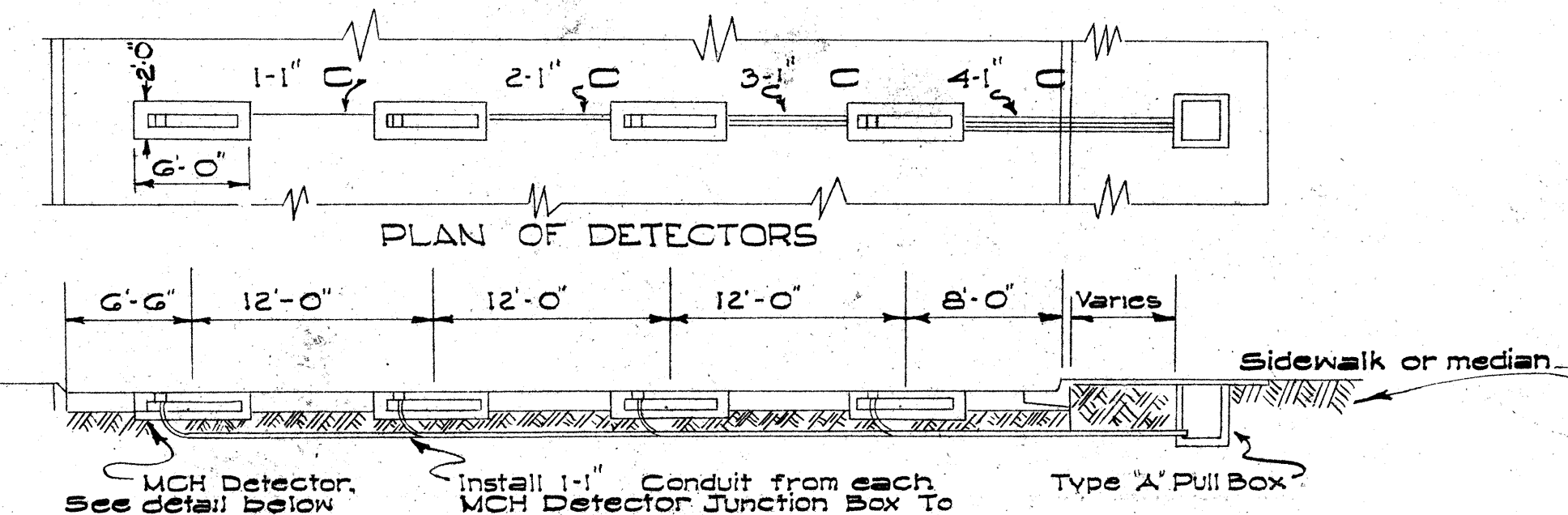
DETAIL 'A'



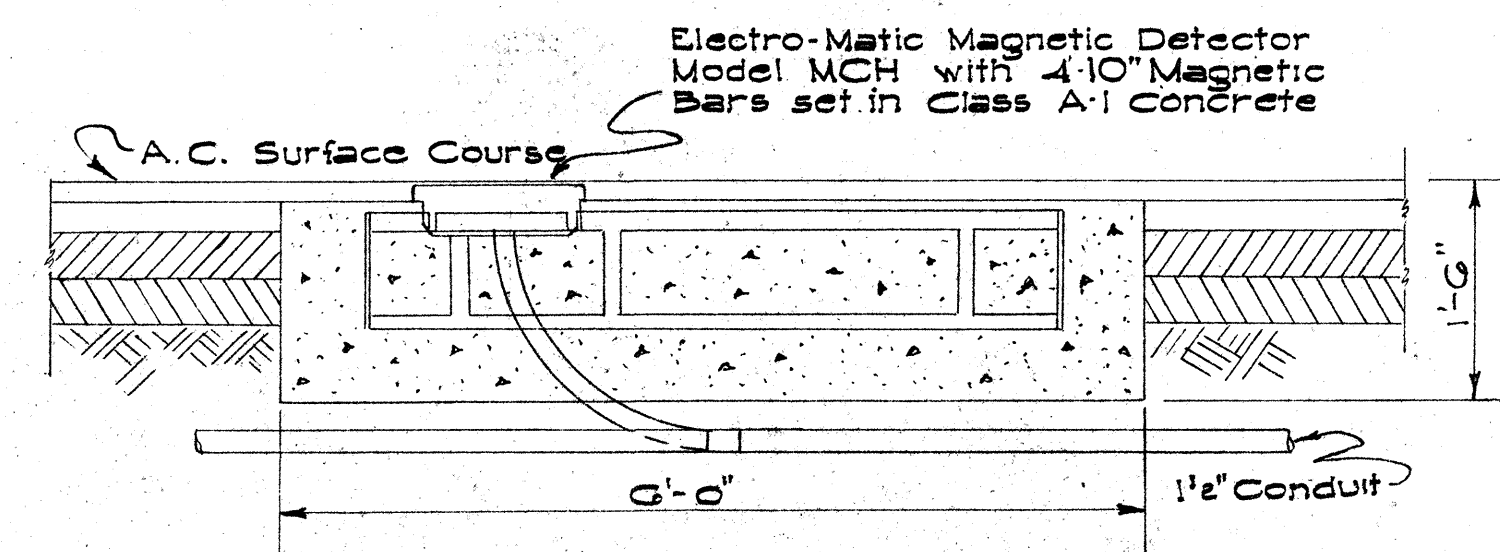
PULL-IN IRON DETAIL 'B'
Scale: 1/2" = 1'-0"



SECTION 'A-A'
DETAIL OF TYPE 'A' PULLBOX AND TRANSITE DUCT FOR MODEL 'MK' DETECTORS
Scale: 3/4" = 1'-0"



TYPICAL LAYOUT OF MCH DETECTORS IN CONCRETE JACKET
Scale: 1/8" = 1'-0"



DETAIL OF MCH DETECTOR IN CONCRETE JACKET
Scale: 3/4" = 1'-0"

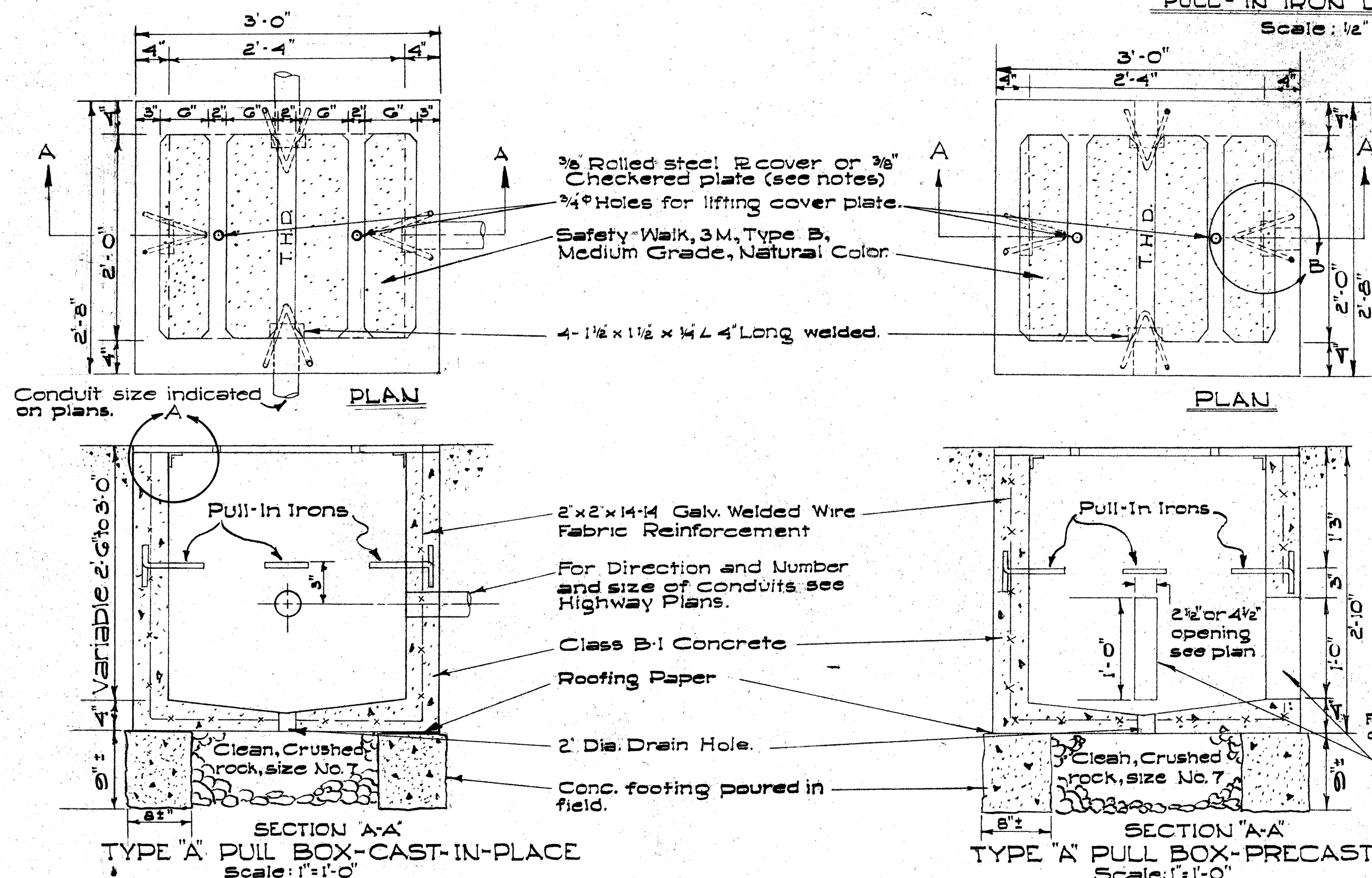
Note: Class A-1 Concrete shall be used for Concrete Jacket.

APPROVED: DATE: 8/1/57
STATE HIGHWAY ENGINEER

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
TRAFFIC SIGNAL SYSTEM
BASE, PULLBOX,
MAGNETIC DETECTORS

SHEET NO 10 OF 20 SHEETS

8183.52

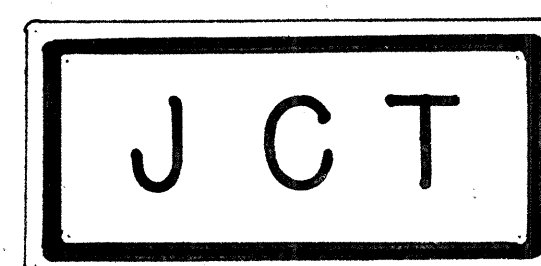


SECTION 'A-A'
TYPE 'A' PULL BOX-CAST-IN-PLACE
Scale: 1" = 1'-0"

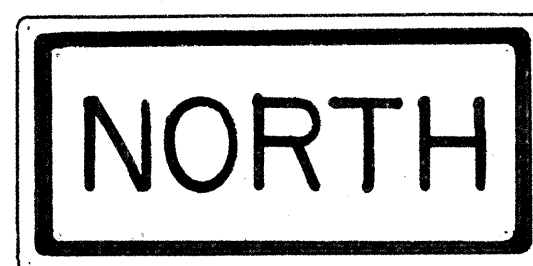
SECTION 'A-A'
TYPE 'A' PULL BOX-PRECAST
Scale: 1" = 1'-0"

Note:
1. 3/8" Rolled steel Plate Cover with safety Walk 3M, Type B, Medium Grade, Natural Color shall be used on all Pull Boxes located on sidewalk areas where pedestrians are walking.
2. 3/8" Checkered Plate Cover shall be used on all Pull Boxes located in median areas and other locations where there are no pedestrians walking.
3. Pull Irons shall be placed opposite each conduit slot.
4. Covers on all pull boxes located in sidewalk areas shall be set flush with the concrete sidewalk.
5. Each Pull Box shall have a pair of pull irons opposite each other for lifting purposes.
For direction and number and size of slots for conduits (see plan)
Grout Conduit Slot with 1:3 Cement Mortar after Conduit is placed.

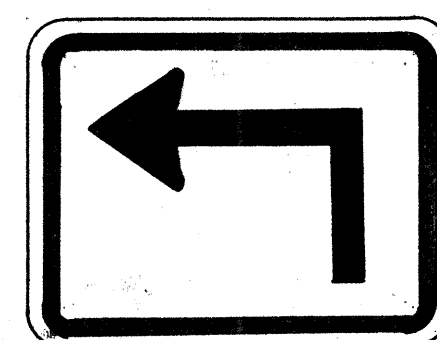
ORIGINAL PLAN	DESIGNED BY	DATE
NOTE BOOK	J. A. Nardel	7/1/57
QUANTITIES BY		
CHECKED BY		



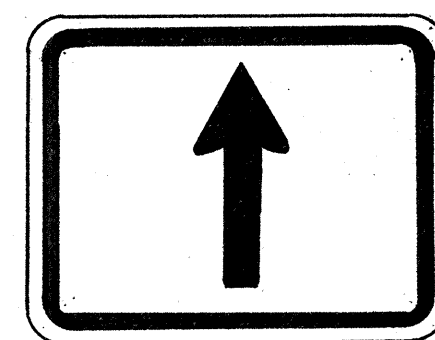
M-3
16 1/2" x 8"



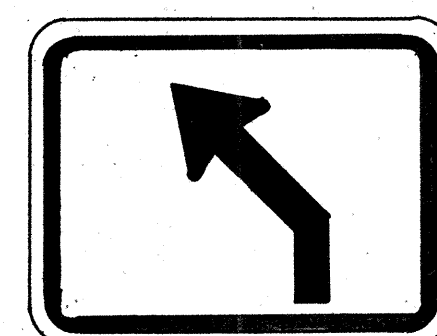
M-21-N
16 1/2" x 8"



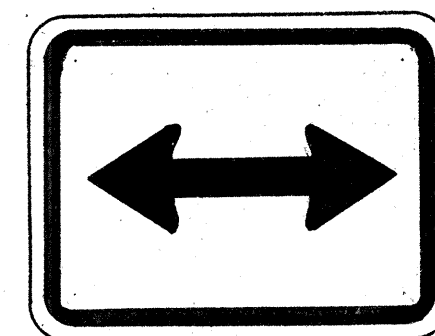
M-7-L
* M-7-R (←→)
13" x 10"



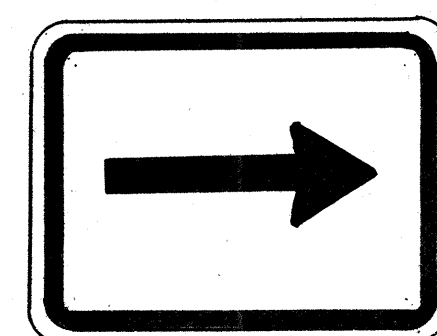
M-11
13" x 10"



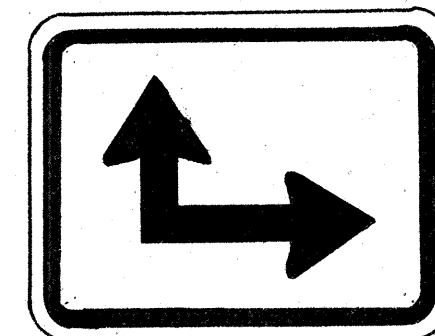
M-8-L
* M-8-R (←→)
13" x 10"



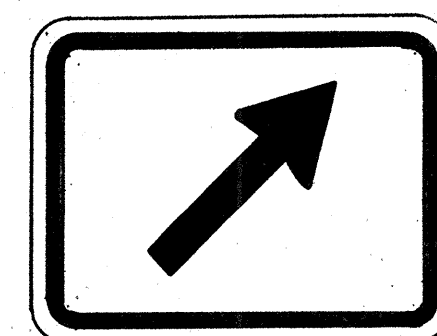
M-12
13" x 10"



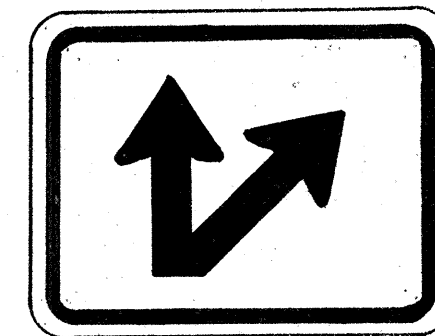
M-9
13" x 10"



M-13-R
* M-13-L (←→)
13" x 10"



M-10-R
* M-10-L (←→)
13" x 10"



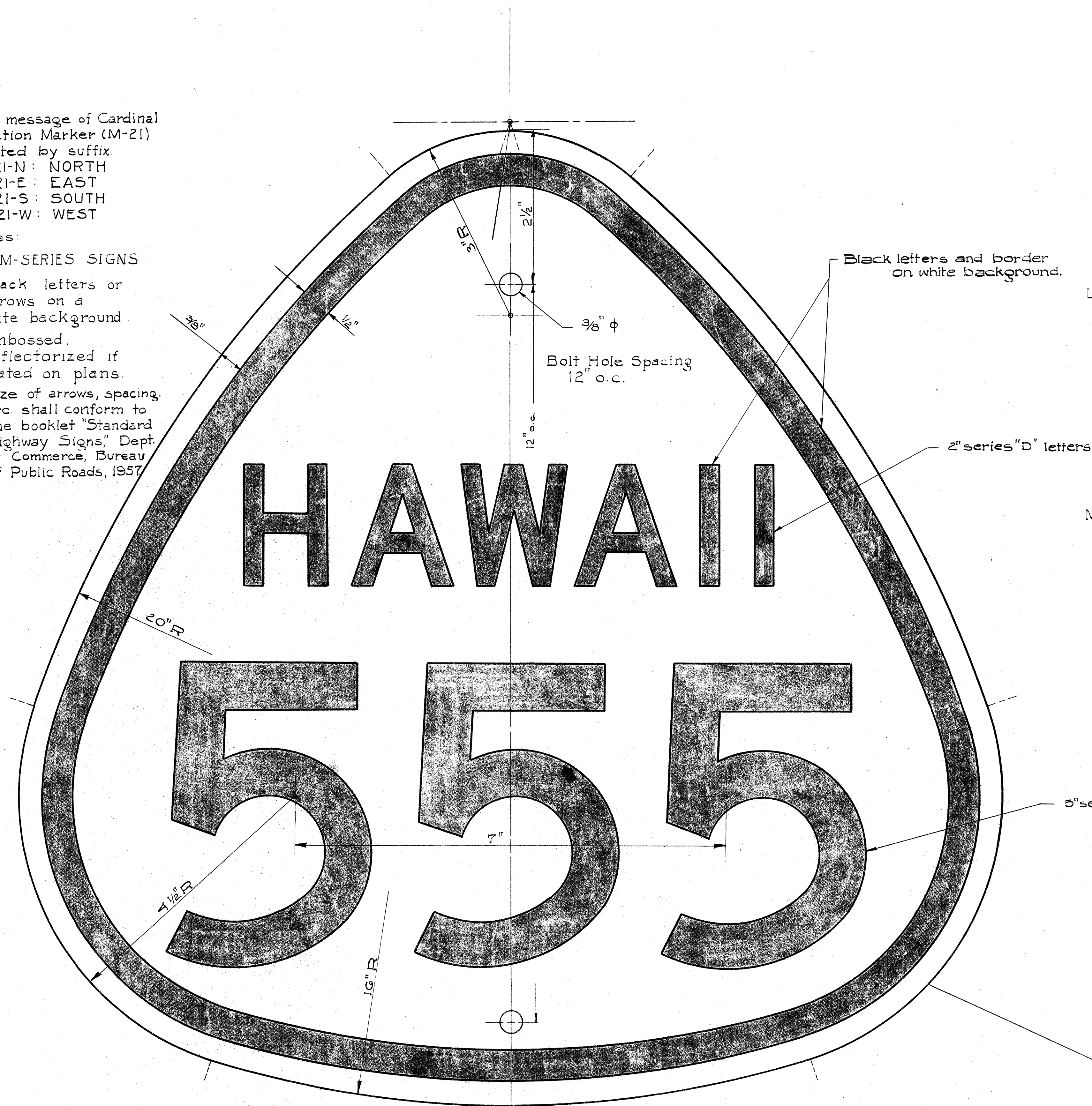
M-14-R
* M-14-L (←→)
13" x 10"

Note:
Sign message of Cardinal
Direction Marker (M-21)
denoted by suffix.
M-21-N: NORTH
M-21-E: EAST
M-21-S: SOUTH
M-21-W: WEST

Notes:

M-SERIES SIGNS

1. Black letters or arrows on a white background.
2. Embossed, reflectorized if stated on plans.
3. Size of arrows, spacing, etc. shall conform to the booklet "Standard Highway Signs," Dept. of Commerce, Bureau of Public Roads, 1957.



Black letters and border
on white background.

Location:

Use the M-2 sign at important rural and urban intersections and intermediate locations as specified in sections 93-111, Manual of Uniform Traffic Control Devices, to guide traffic over State numbered highways.

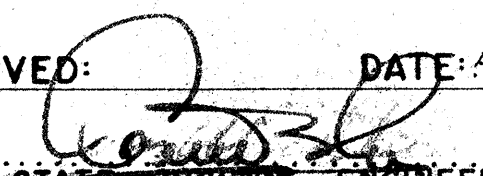
Note:

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 "D" letters and series "E" numerals shall be used.

Embossed
Black on White
16 x 16"
2" series "D" letters
5" series "E" numerals
Reflectorized if
stated on plans.

5" series "E" letters

STATE ROUTE MARKER
M-2
Scale: Full Size

APPROVED:  DATE: AUG. 26, 1950
STATE HIGHWAY ENGINEER

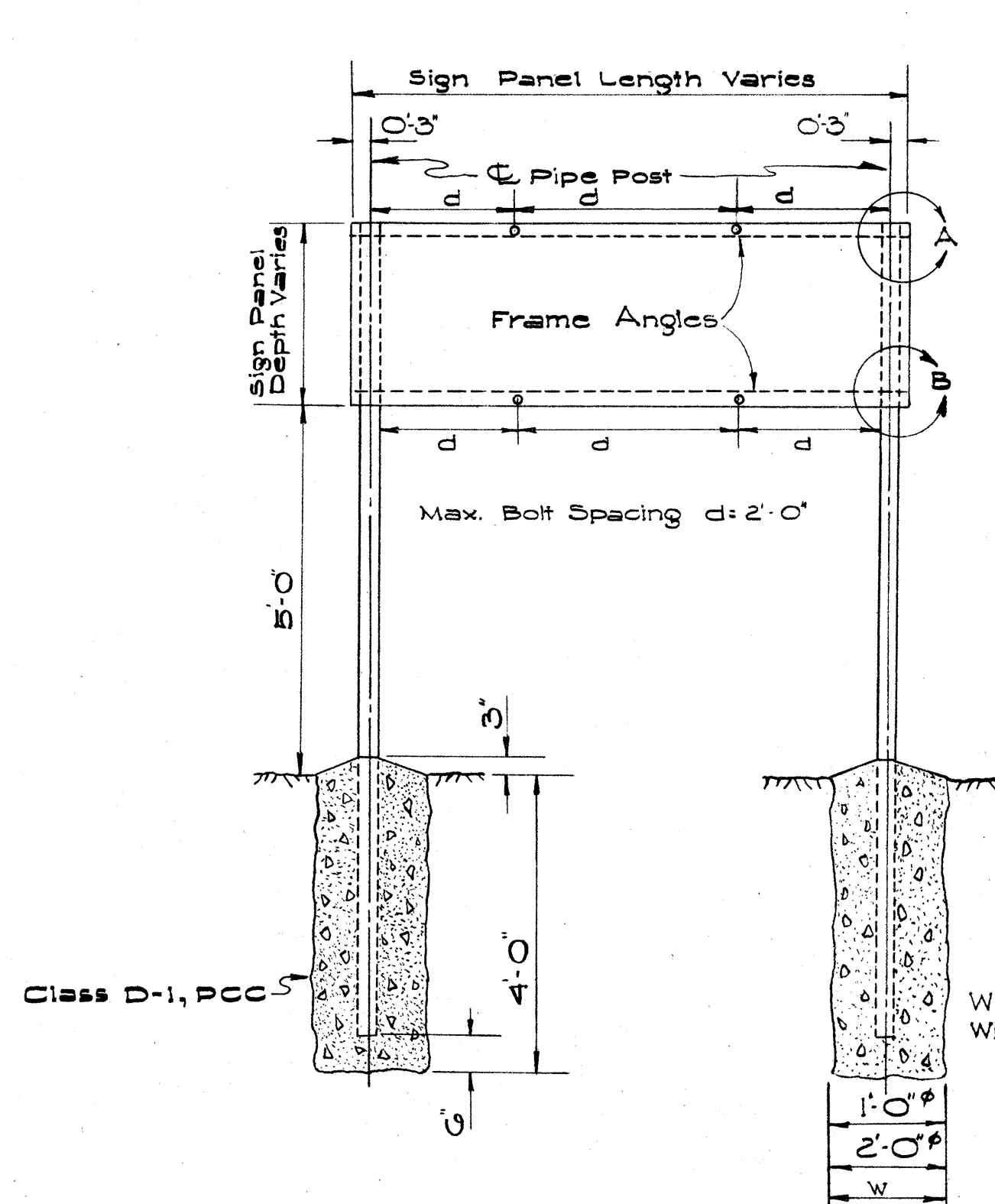
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
STATE
ROUTE NUMBER
AND DIRECTIONAL
MARKER SIGNS
SCALE: AS NOTED
SHEET No. 11 OF 20 SHEETS

NOT TO SCALE

* Signs shall be similar
but opposite in direction.

8183.53

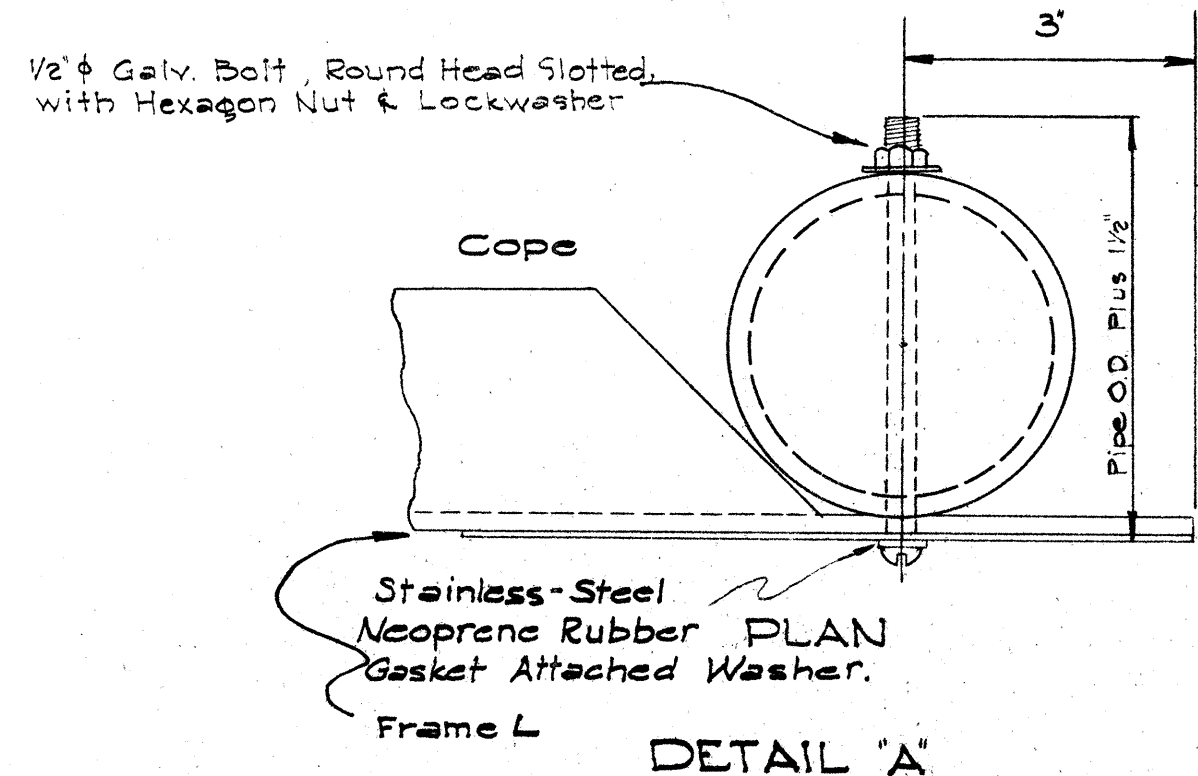
2/17/59
4/6/59
4/28/59



DESTINATION SIGNS
ELEVATION
Not to Scale

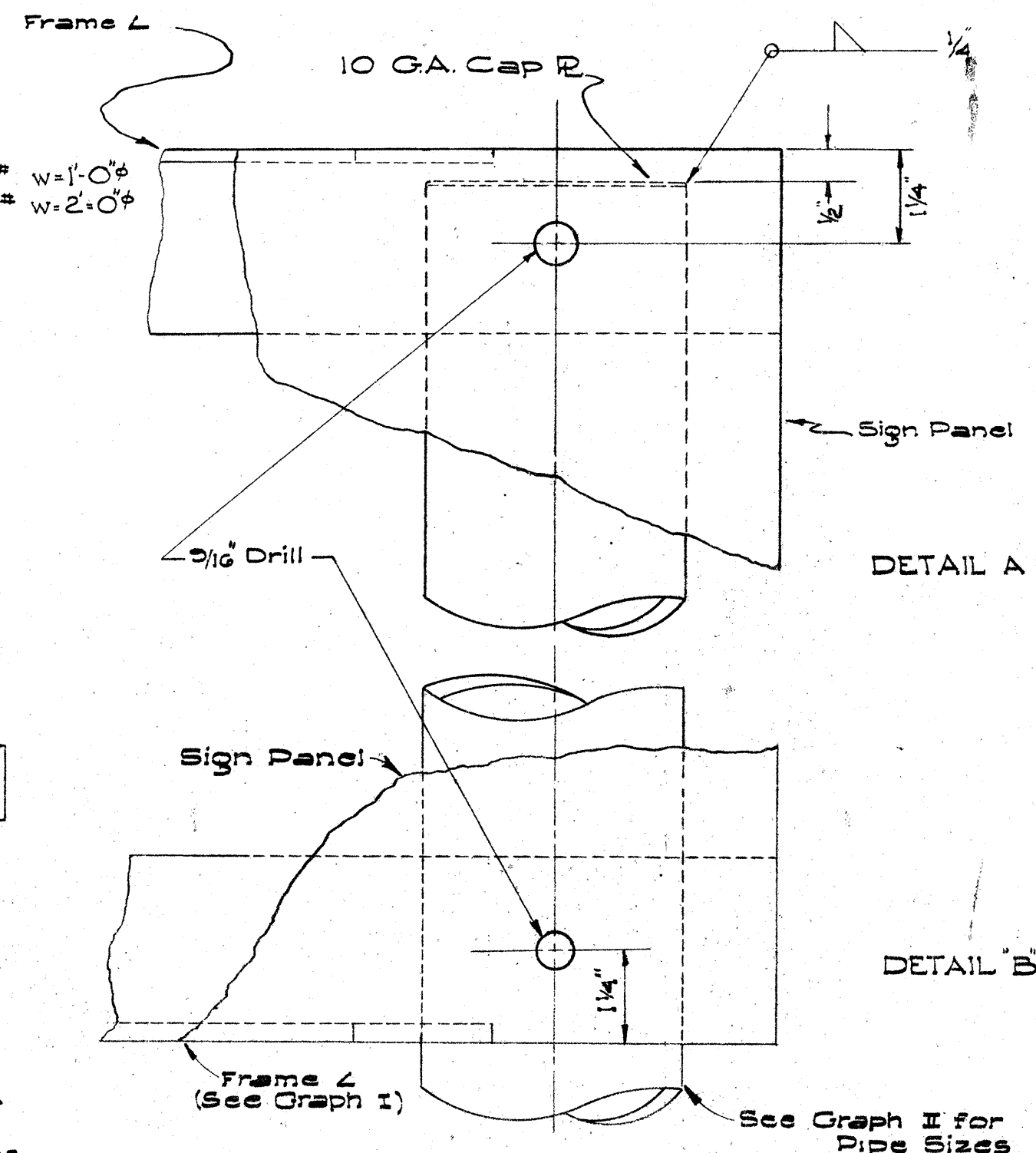
TYPICAL TABLE

SIGN NO.	STATION	SIGN PANEL	FRAME L	PIPE POST	BOLT HOLE SPACING
----------	---------	------------	---------	-----------	-------------------



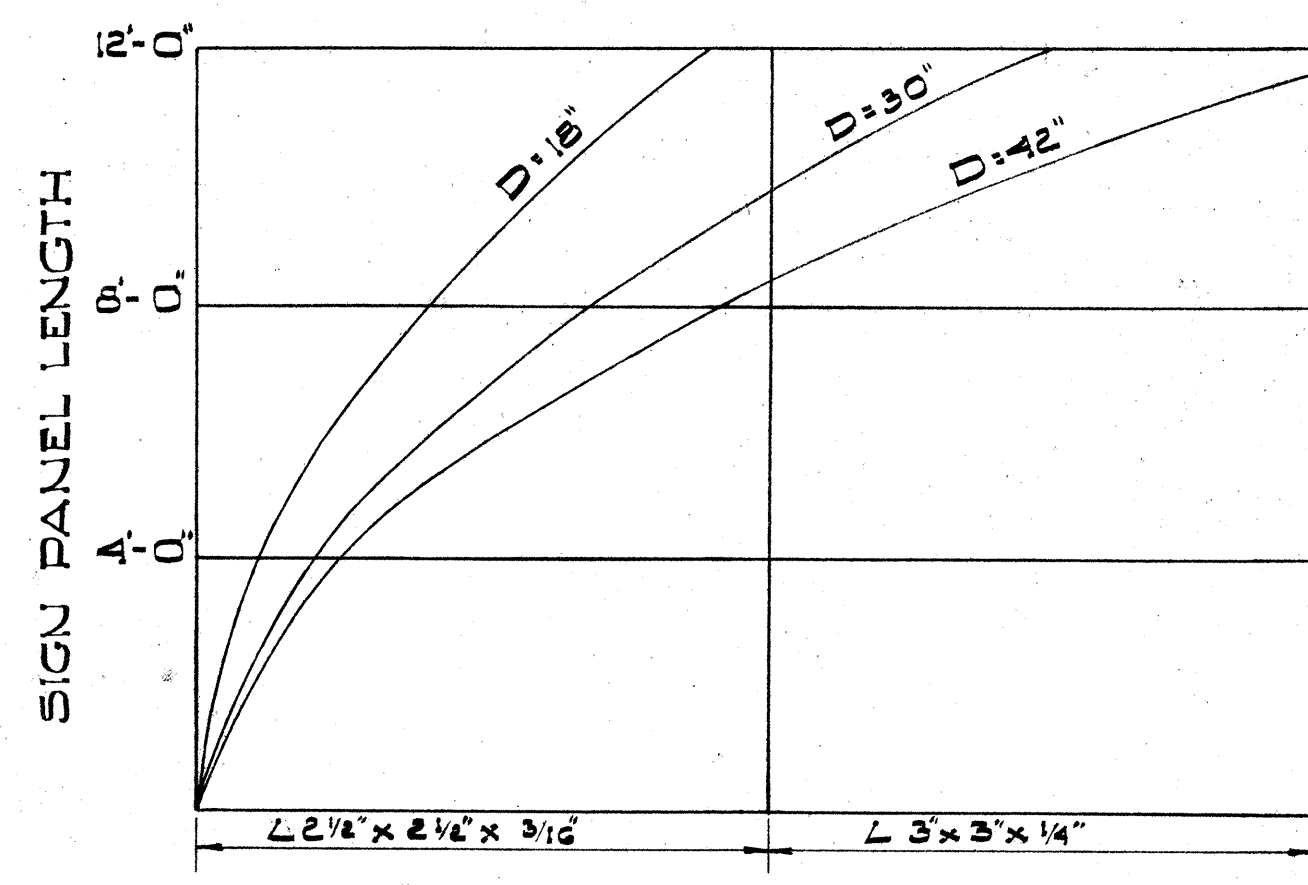
ATTACHMENT OF SIGN
PANEL TO FRAME

With 3" Std. Pipe 7.68" w=1'0"
With 3 1/2" ES Pipe 12.51" w=2'0"

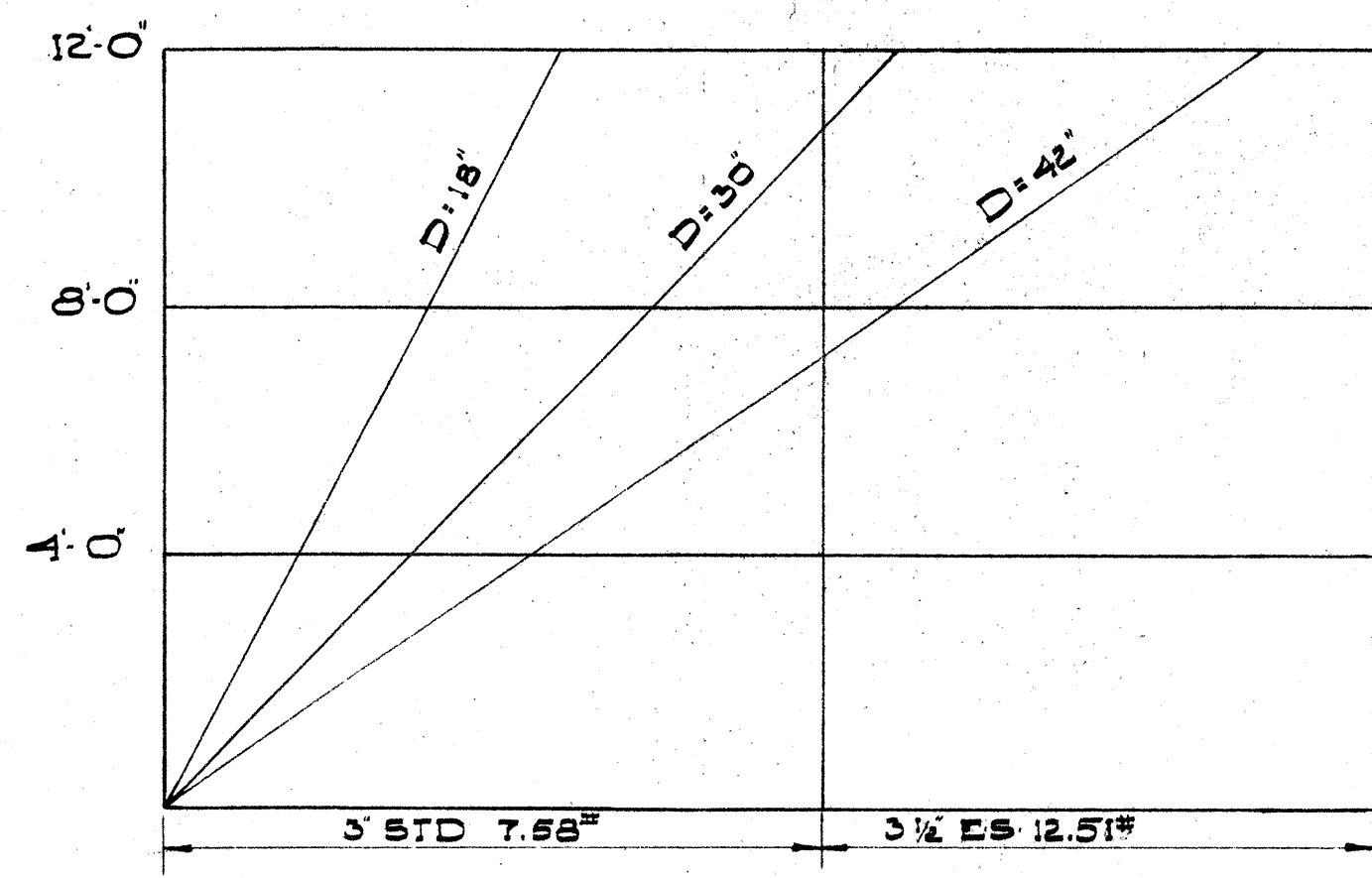


DESIGN DATA
1. Wind Load : 30 psi
2. Allowable Stresses
a. Concrete : $f_c = 1500$ psi
b. Pipe : $f_s = 16000$ psi

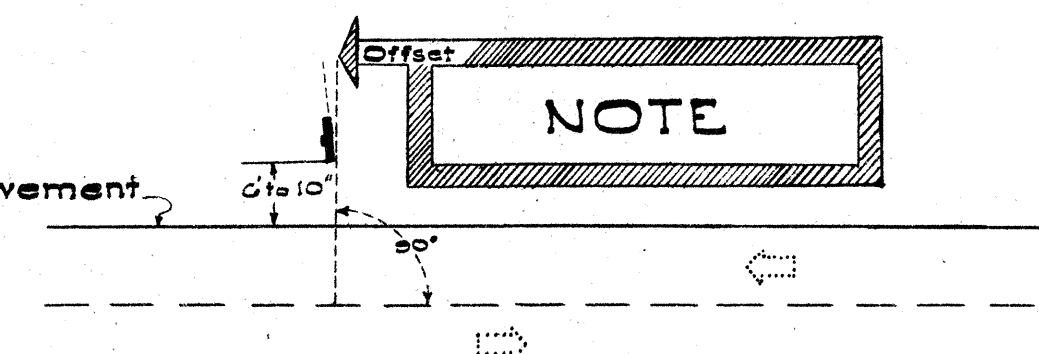
GRAPH I
REQUIRED FRAME ANGLE



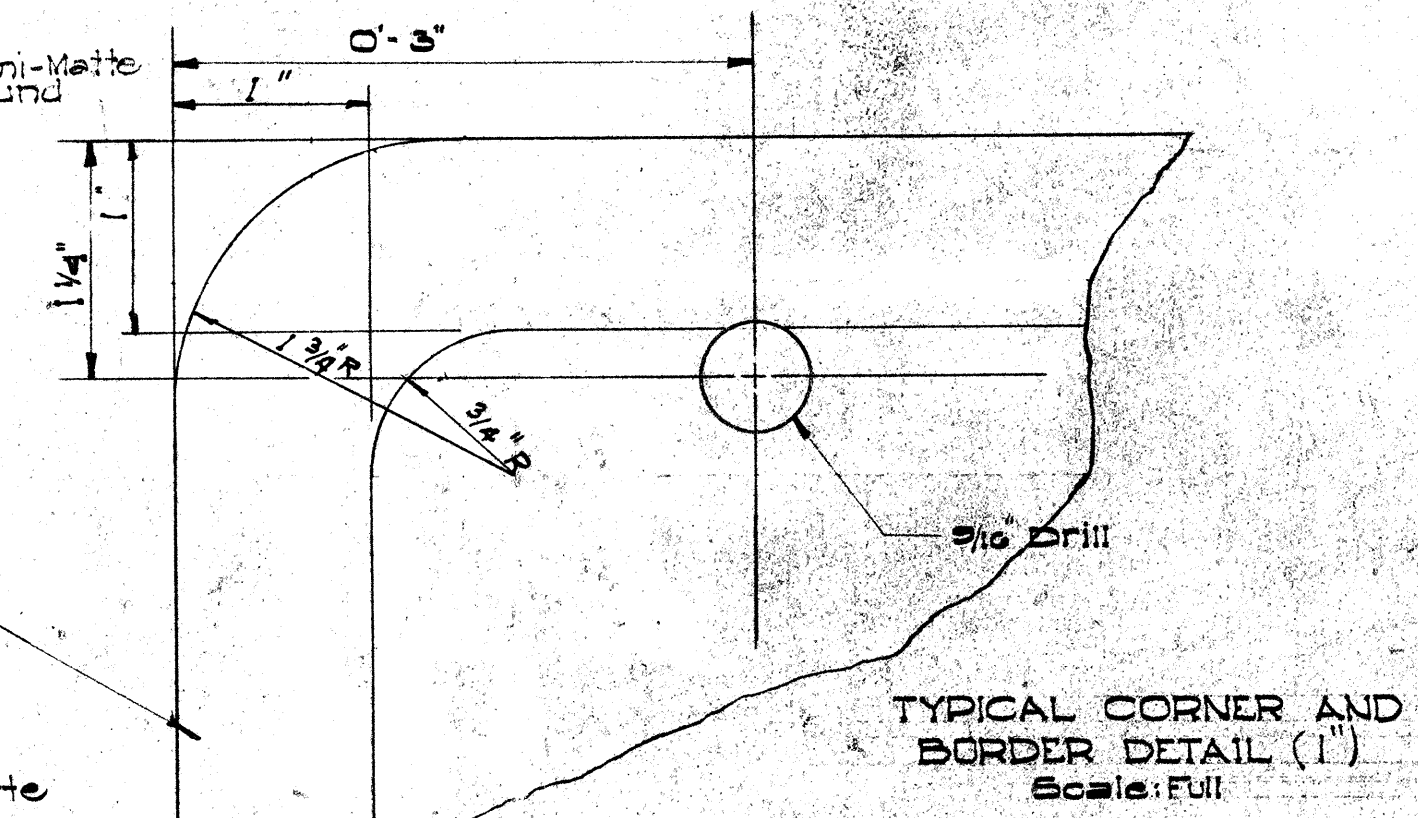
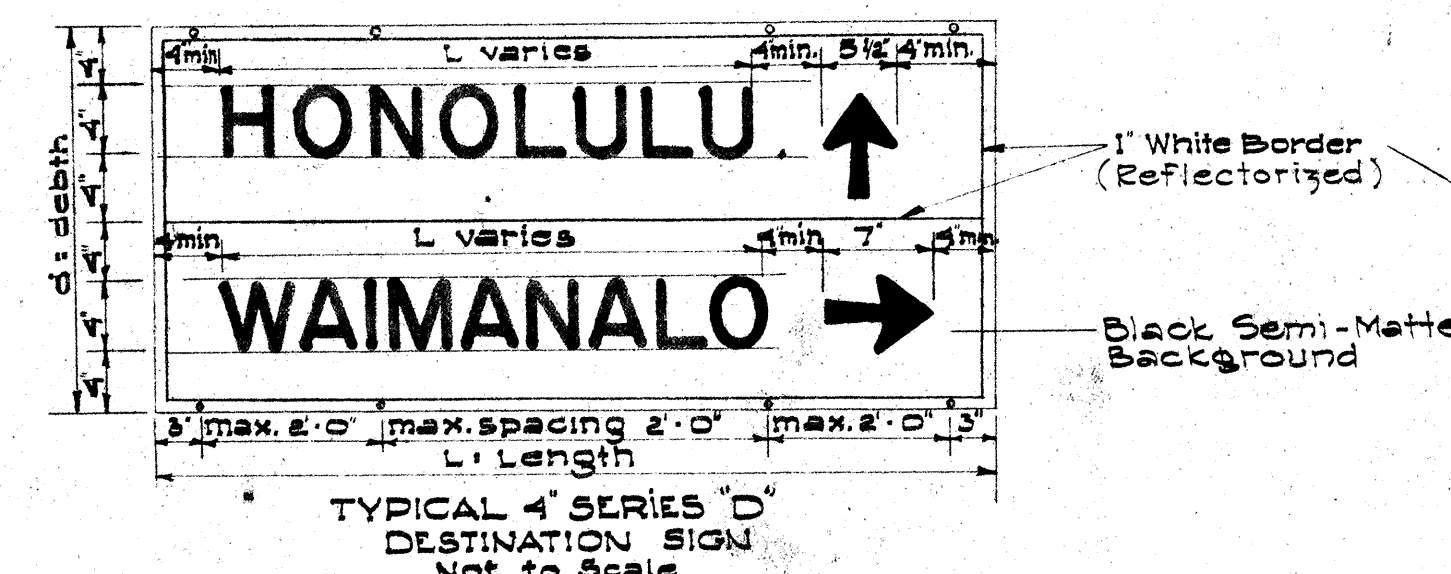
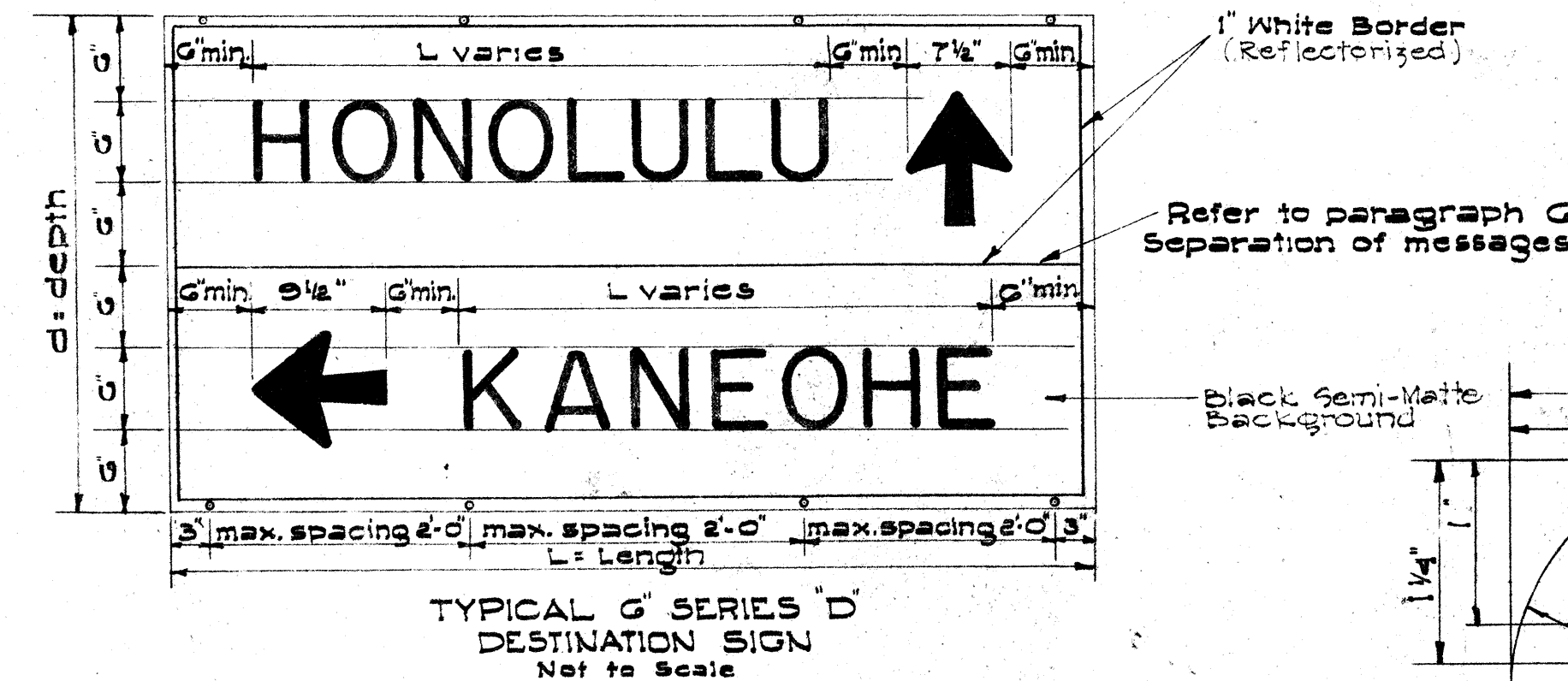
GRAPH II
REQUIRED PIPE POST



SIGN POSITION WITH RELATION
TO DIRECTION OF TRAFFIC



Note: For enamel signs face slightly more than 90° from direction of traffic. Offset approximately 5% of horizontal dimension.



GENERAL NOTES

- Sign message shall be lettered according to "Standard Alphabets for Highway Signs" Public Roads Administration, Federal Works Agency, 1952 and from Table III, Width of Capital Letters and Digits, Series "D", Table II, Spacing of Letters and Digits. Use Series "D" Letters unless otherwise noted.
- Arrows shall conform with "Standard Arrows for Directional Signs".
- Thickness of sign plate shall be No. 16 U.S. standard gauge.
- Signs shall be bolted with 1/2" round head Galv. Bolts and hex. nuts with stainless-steel washer with neoprene rubber gasket attached on face of signs. For number and exact location of 5/16" holes, see plans.
- Sign finish shall be porcelain enamel as specified in the latest Department specifications.
- Signs shall have white letters on a black background, non-embossed, and letters reflectorized with reflective sheeting.
- All sign frame members shall be painted with one prime coat and two field coats. Finish coat shall be aluminum or approved green (see plans).
- Class D-1 concrete for footing will not be paid for separately but shall be considered incidental to the item of destination signs.
- Pipe shall be galvanized conforming to A.S.T.M. Designation "A120" and shall be painted in accordance with paragraph 7. (General Notes).
- All welding shall conform to the latest specifications for welded Highway and Railway Bridges, of the American Welding Society.
- Reflective sheeting material shall be applied by heat and vacuum applicator over the white porcelain enamel letters and arrow.
- Borders shall be white porcelain enamel finish and reflectorized.

Note: This Standard Detail Sheet applies to G-25 Series Expressway signs with G Series "E" and "L" letters.

APPROVED: DATE: Aug. 25, 1959
STATE HIGHWAY ENGINEER

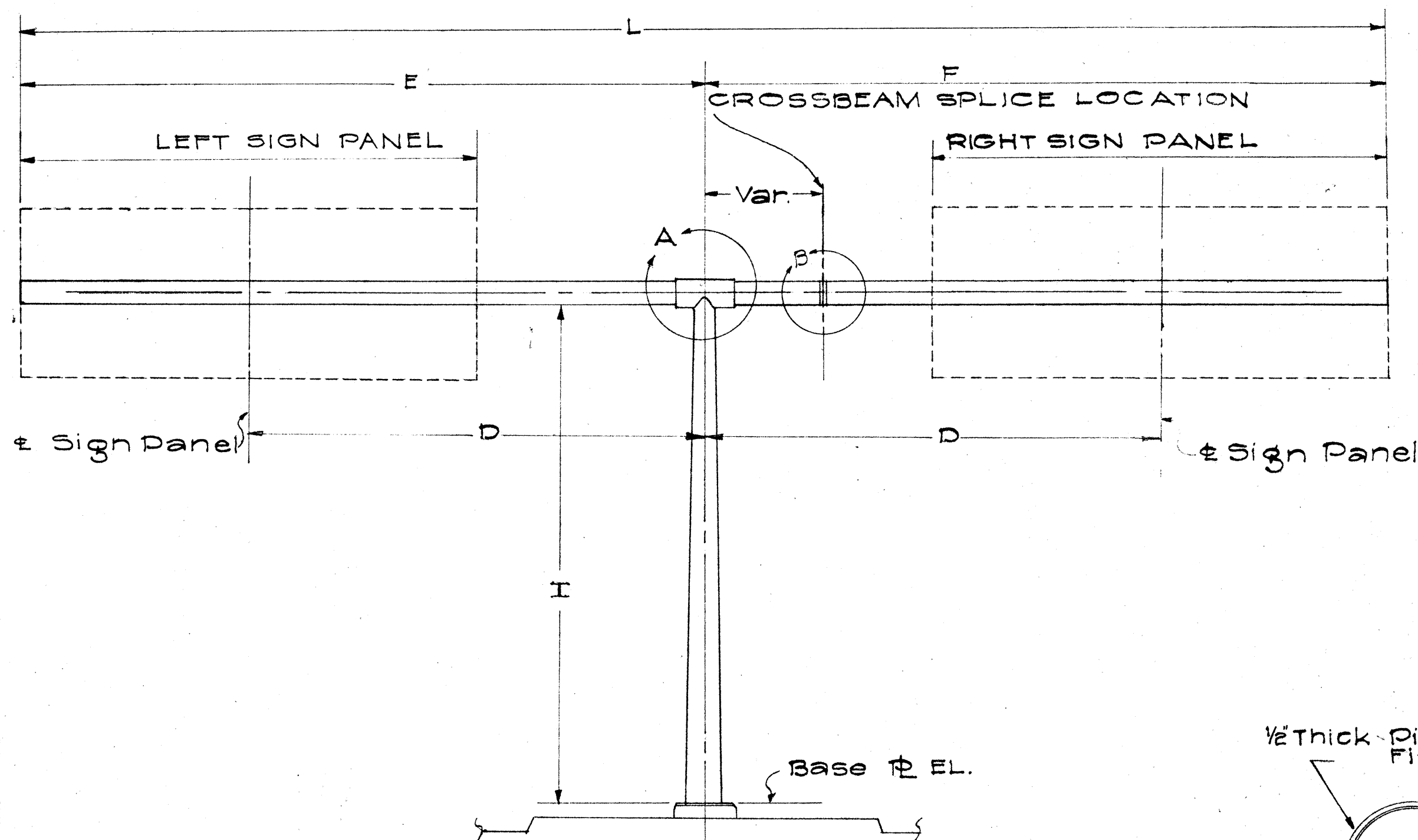
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
DESTINATION SIGNS
POST AND FRAMES
TYPICAL SIGN PANELS
SCALE AS NOTED
SHEET NO 12 OF 20 SHEETS

8183.54

SURVEY PLOTTED BY: DATE: _____
DESIGNED BY: _____
NOTED BY: J. A. MARDIA
CHECKED BY: _____
ORIGINAL PLAN: _____
NOTE BOOK: _____
QUANTITIES BY: _____
CHECKED BY: _____

2/17/59
4/6/59
4/28/59

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-072-18	1959	55	81



GENERAL NOTES

DESIGN DATA

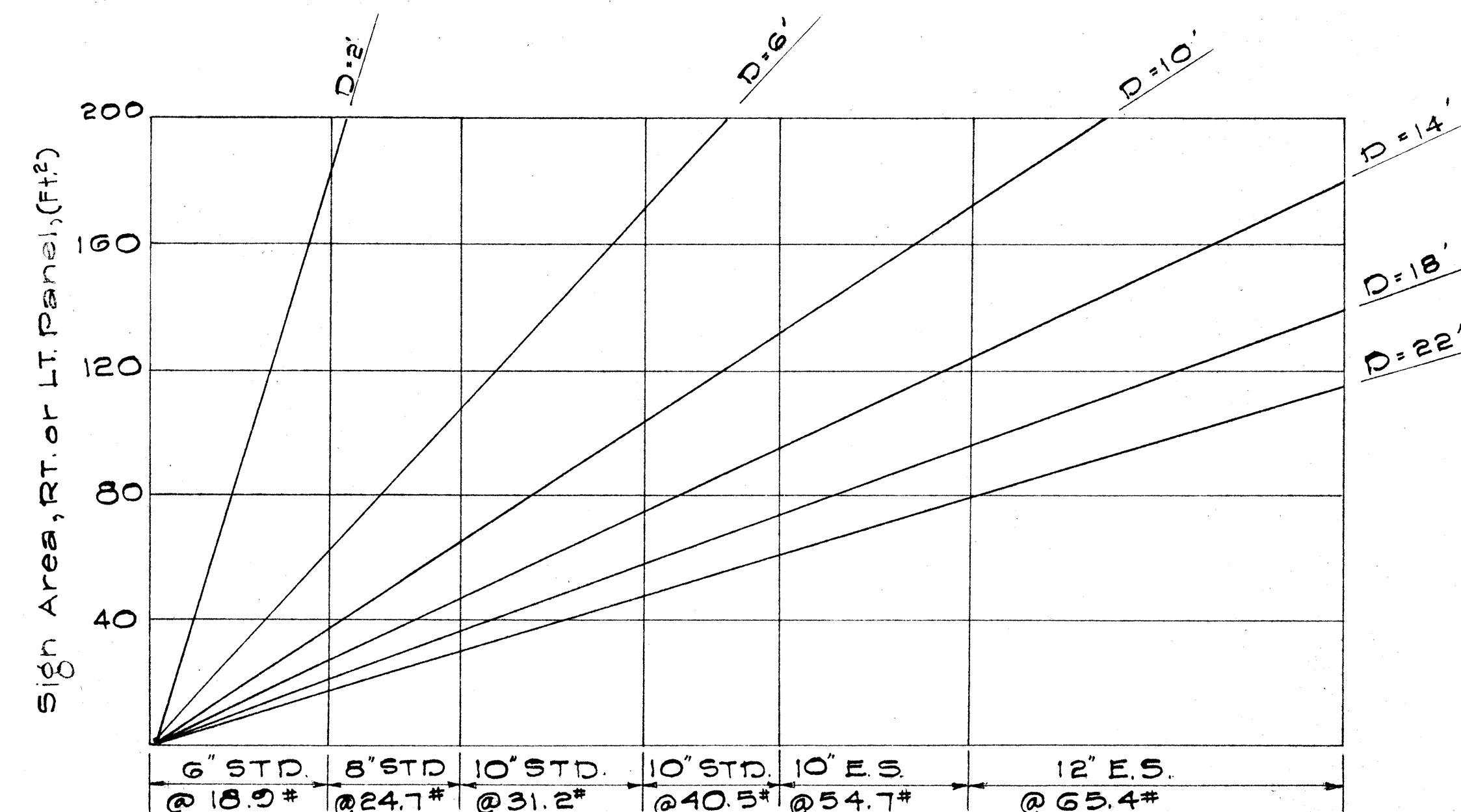
1. Wind Load: 30 psf
2. Allowable stresses:
Concrete: $f_c = 1200$ psi $n=10$
Reinforcement: $f_s = 20,000$ psi
Structural Steel: $f_s = 18,000$ psi

MATERIALS

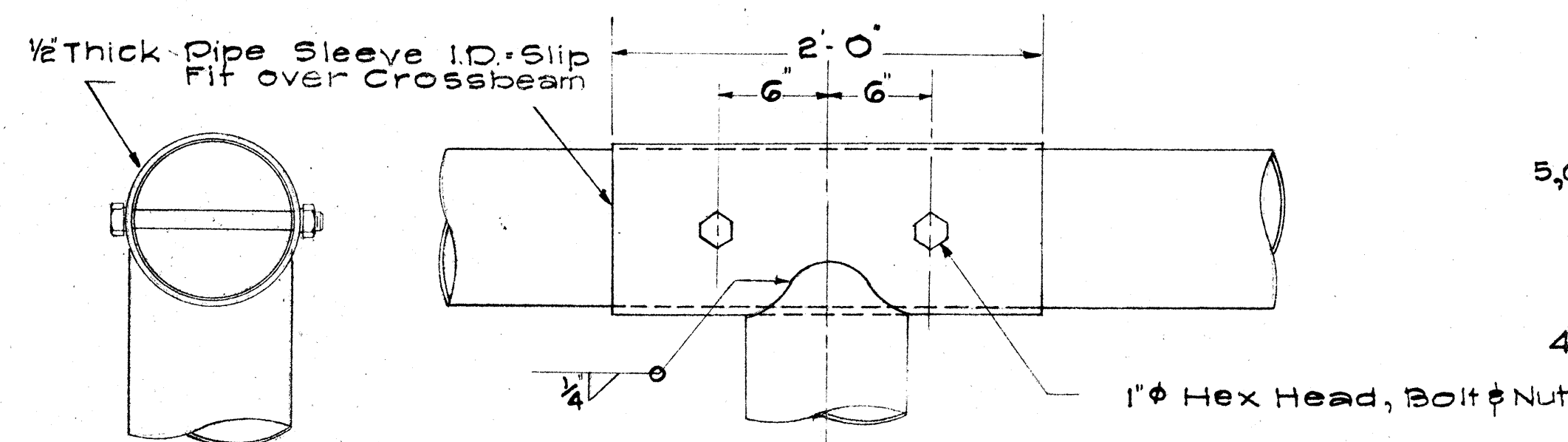
Concrete: All Concrete Class A-1
Reinforcing Steel: See Standard Specs.
Structural Steel: Structural Steel shall be structural carbon steel: ASTM, Designation A-7
Pipe: Pipe shall be Black Steel Pipe conforming to Requirements of A.S.T.M. Specification A-120
Fastenings: Bolts, Nuts, Screws, Washers, shall be hot-dipped galvanized

CONSTRUCTION METHOD

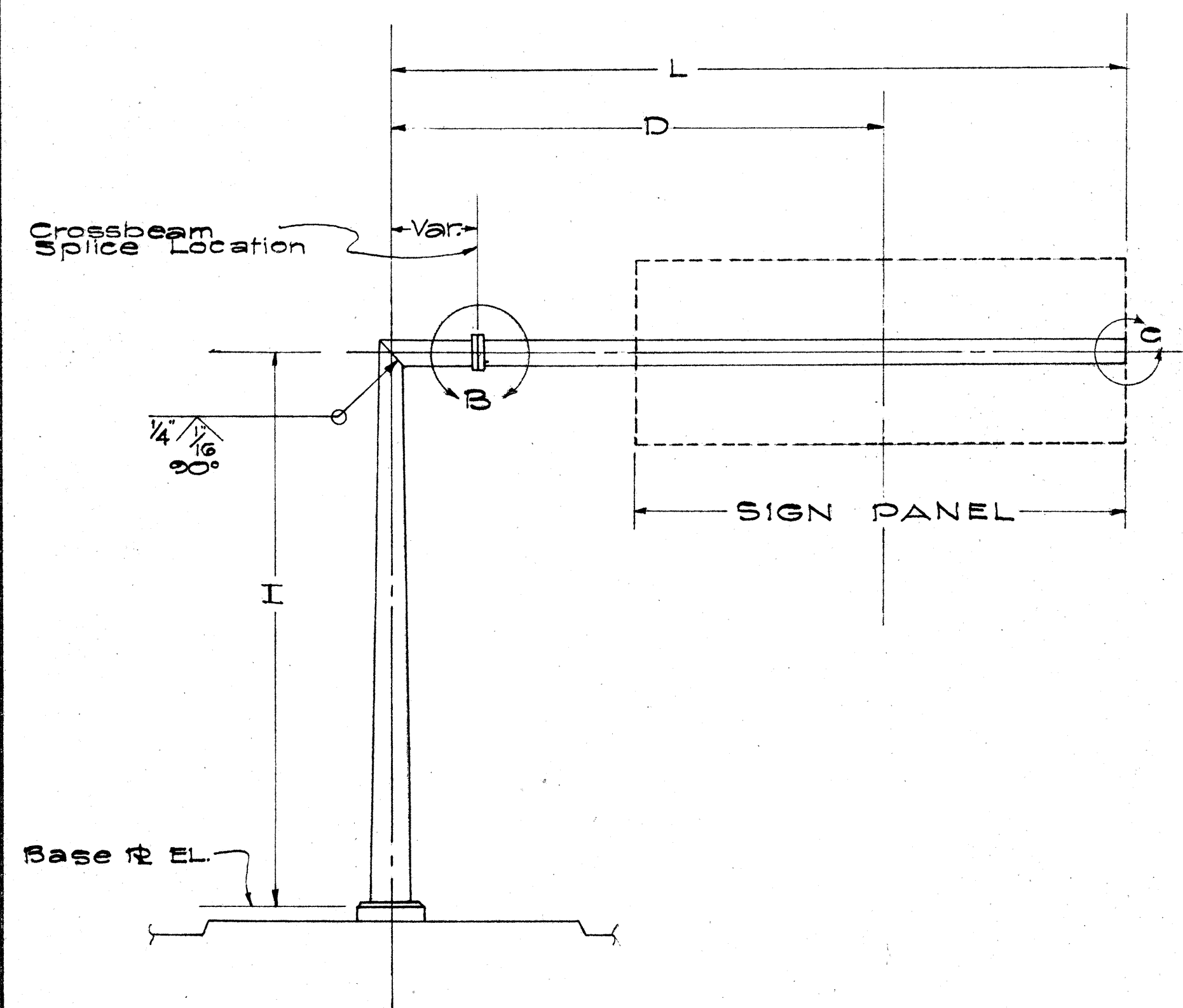
Welding: All Welding shall Conform to the Latest Specifications for welded Highway & Railway Bridges, Design, Construction, and Repair of the American Welding Society
Painting: Post and crossarms shall be painted with one prime coat and two field coats. The second field or finish coat shall be an approved green paint as specified under section 43 of the Standard Specifications, 1957.



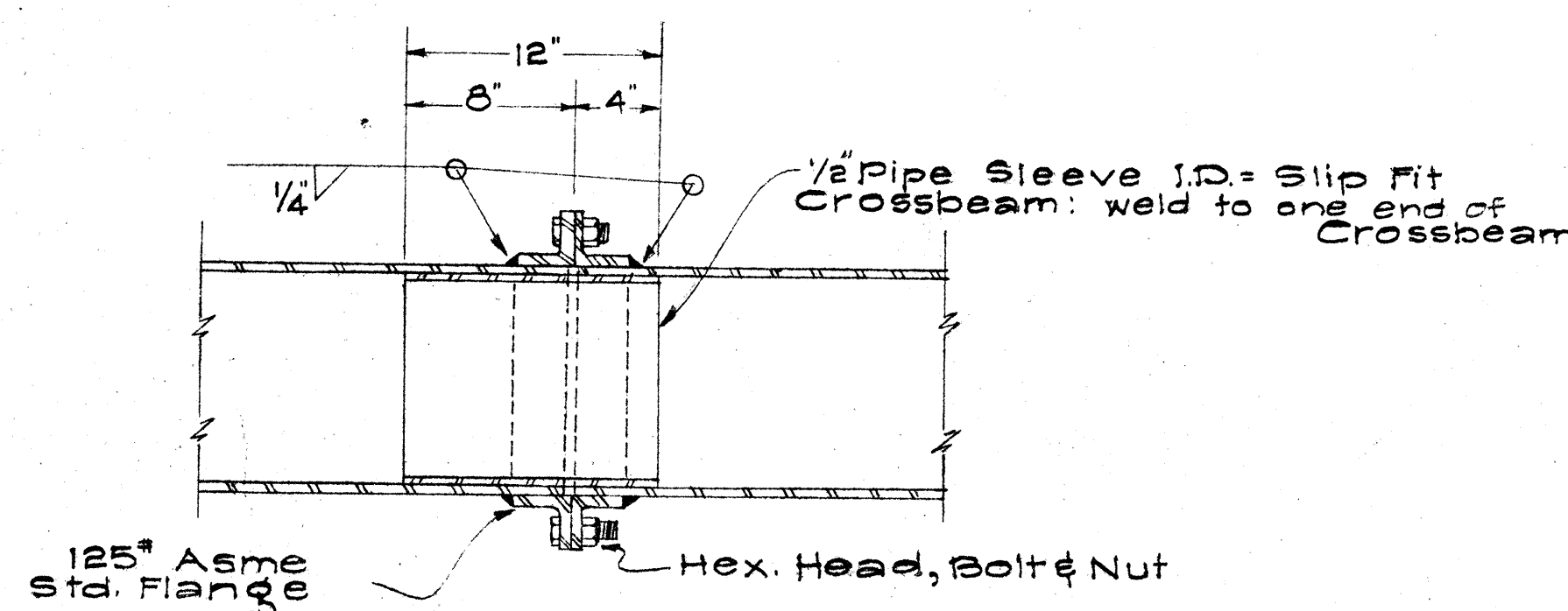
ELEVATION
CENTER MOUNTED SIGN
Not to scale



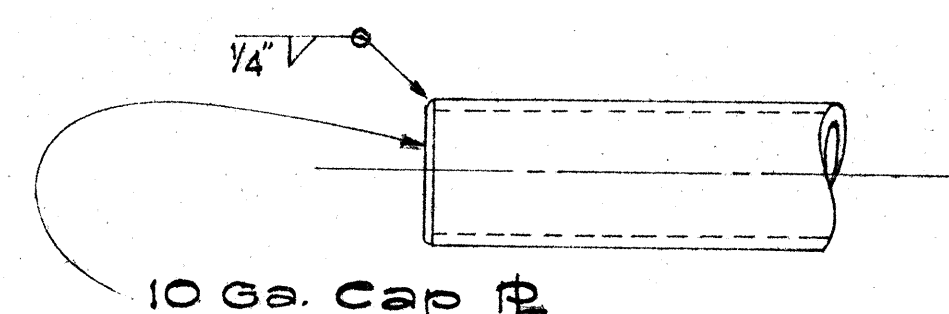
DETAIL 'A'



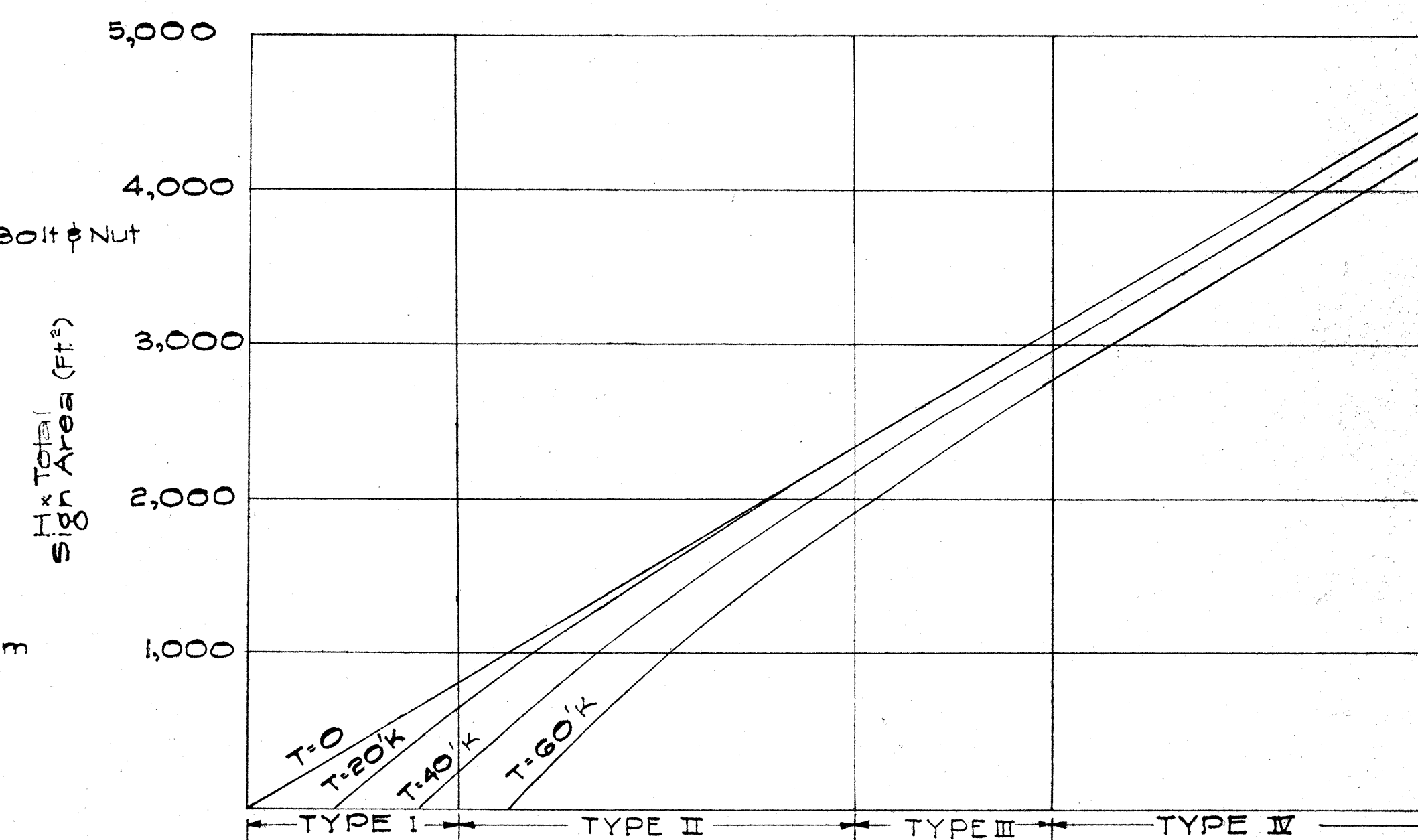
CANTILEVER SIGN
Not to scale



DETAIL 'B'
CROSSBEAM SPLICE



DETAIL 'C'



POST TYPE REQUIRED
 $T = \frac{RT \text{ Sign Panel Area} \times D \times 30}{LT \text{ Sign Panel Area} \times D \times 30}$

L	Camber/Ft
0'-5'	0.0
5'-10'	0.020
10'-15'	0.030
15'-20'	0.040
20'-25'	0.050"

Camber = Camber/Ft x L

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

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
EXPRESSWAY SIGNS
SINGLE SIGN POST—CROSSBEAMS
FOR CANTILEVER AND CENTER MOUNT
TYPES
G-23 AND G-24 L AND S SERIES

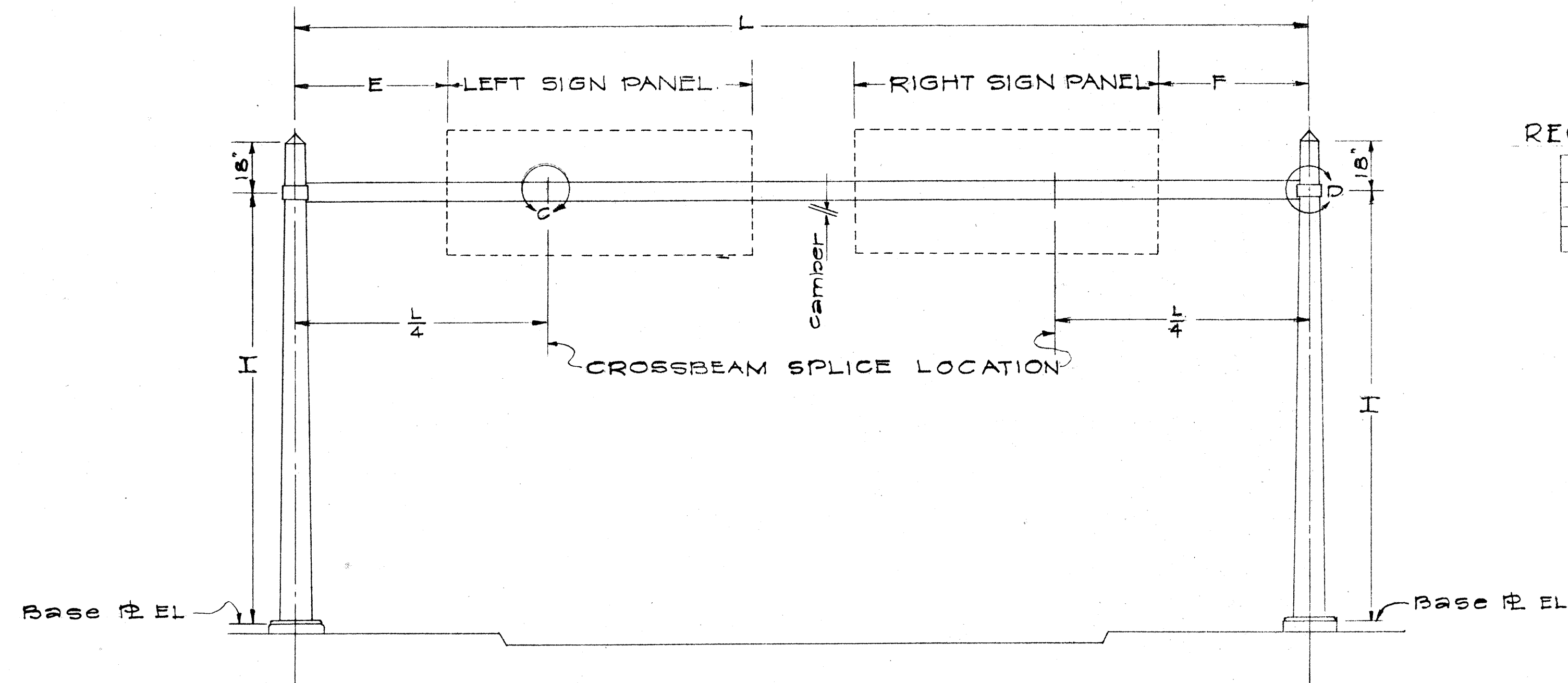
SHEET No. 13 OF 20 SHEETS

\$183.55

ORIGINAL PLAN	DESIGNED BY	DATE
NOTE BOOK	DRAWN BY	
NO.	QUANTITIES CHECKED BY	
	CHECKED BY	

2/17/59
4/6/59
4/28/59

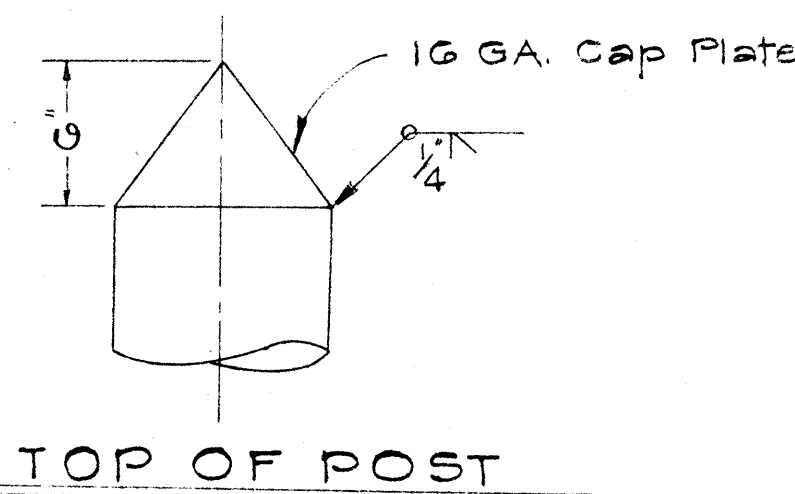
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-103	1959	56	57



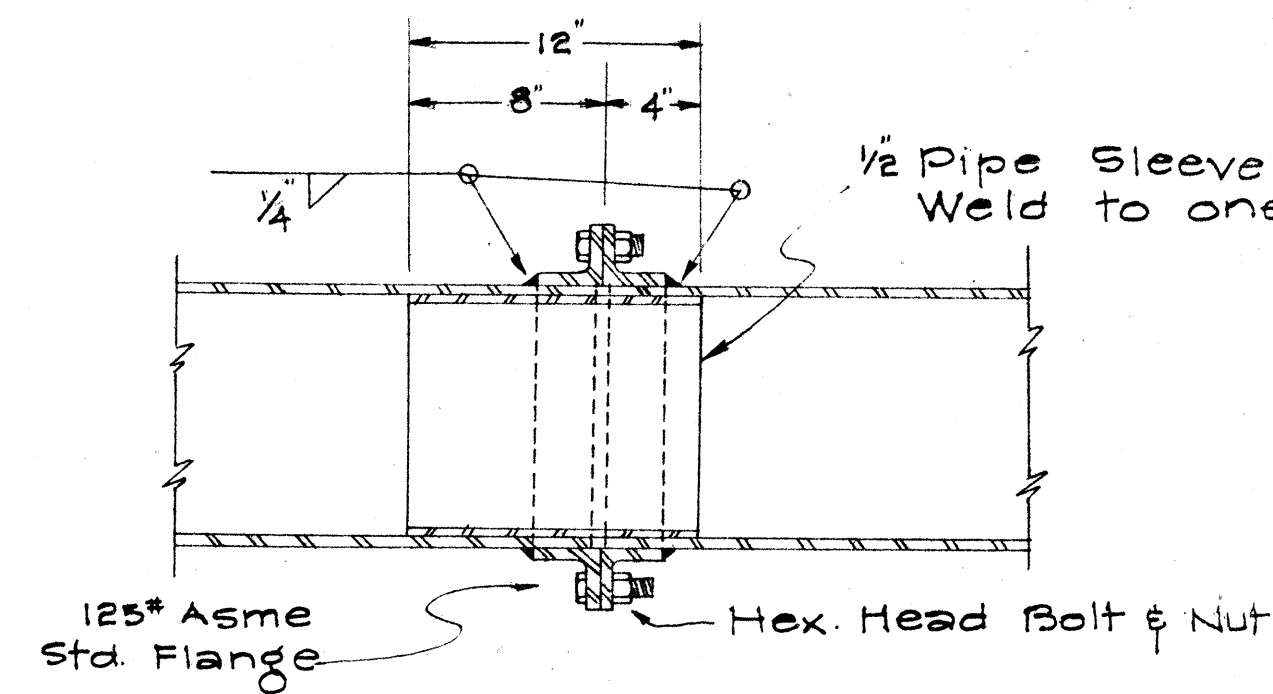
ELEVATION

REQUIRED CAMBER

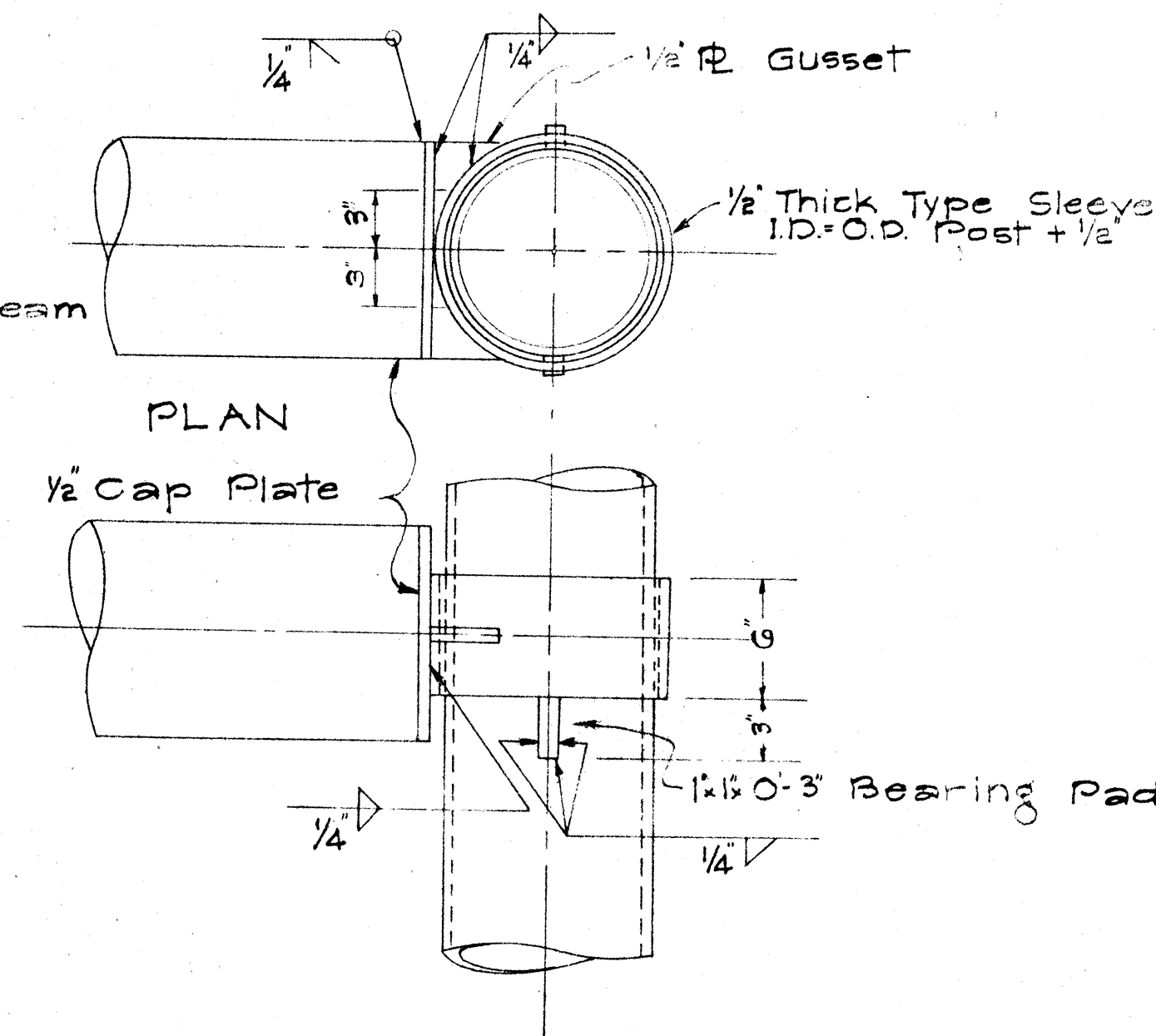
L	CAMBER
30'0" 40'0"	1 1/2"
40'0" 50'0"	2 1/2"
50'0" 60'0"	3 1/2"



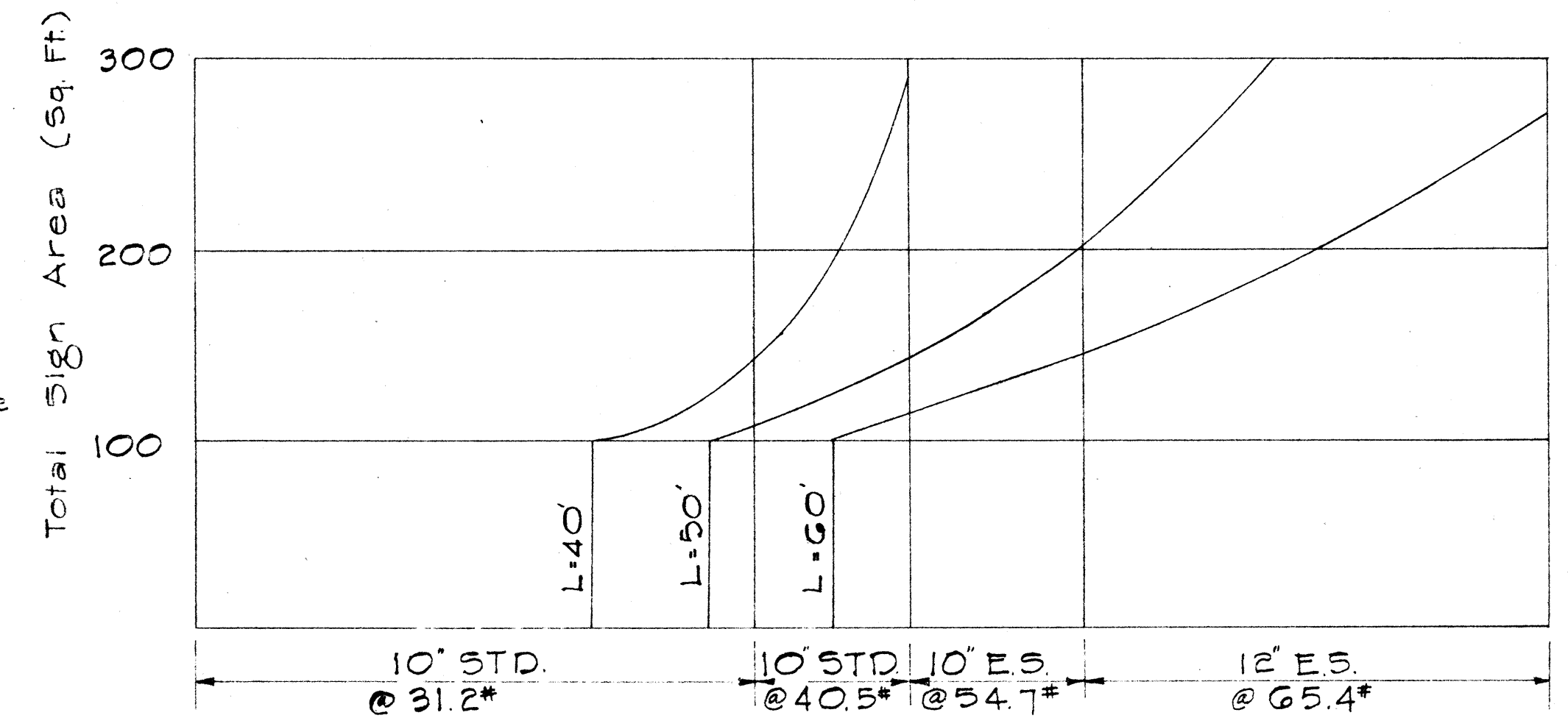
TOP OF POST



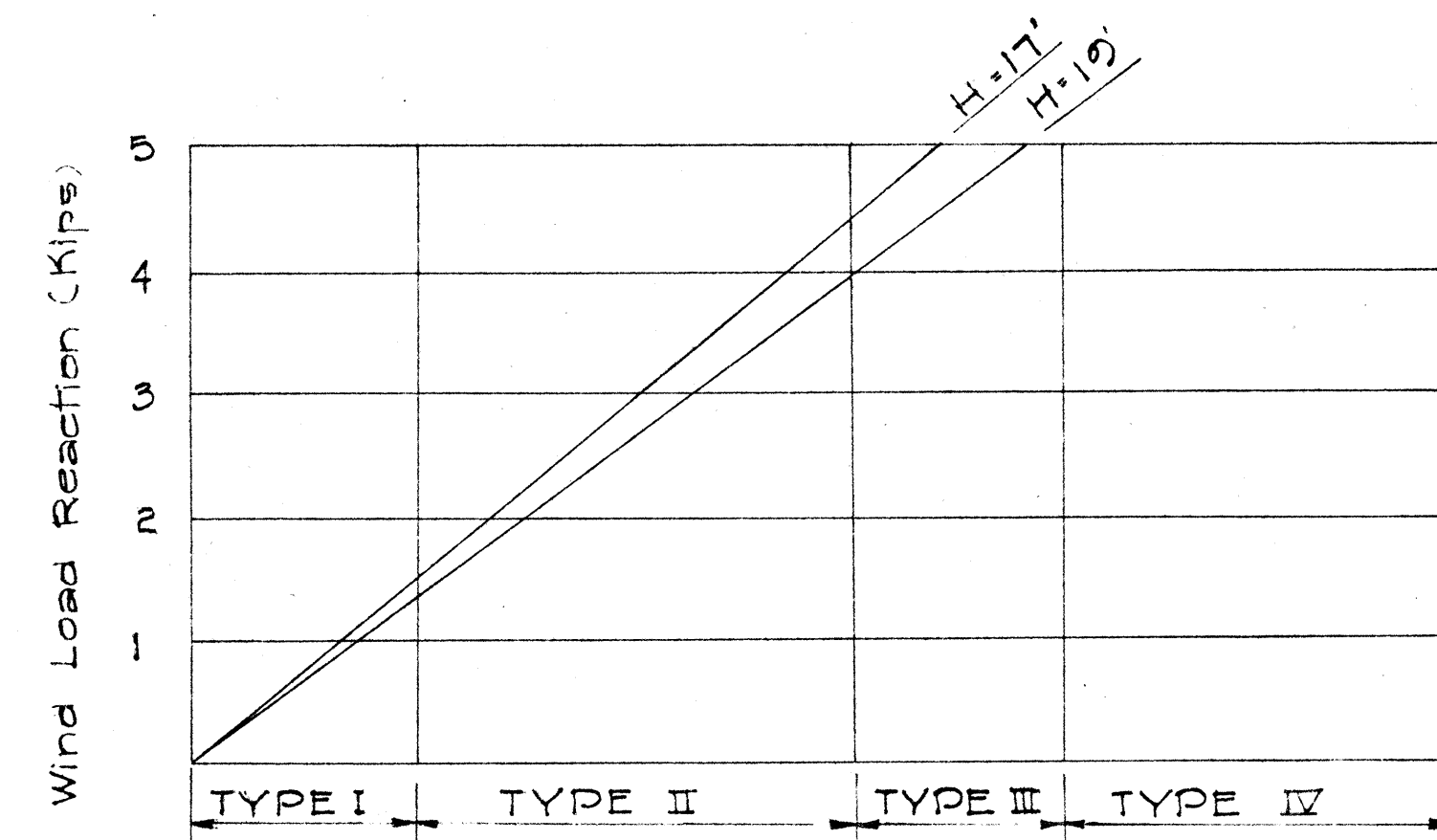
DETAIL "C"
CROSSBEAM SPLICE



ELEVATION
DETAIL "D"



CROSSBEAM SIZE REQUIRED



POST TYPE REQUIRED

NOTE: For "General Notes" refer to sheet, Expressway Signs, Single Sign Post-Crossbeams For Cantilever And Center Mounted Types

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

APPROVED: DATE: 4-28-59
STATE HIGHWAY ENGINEER

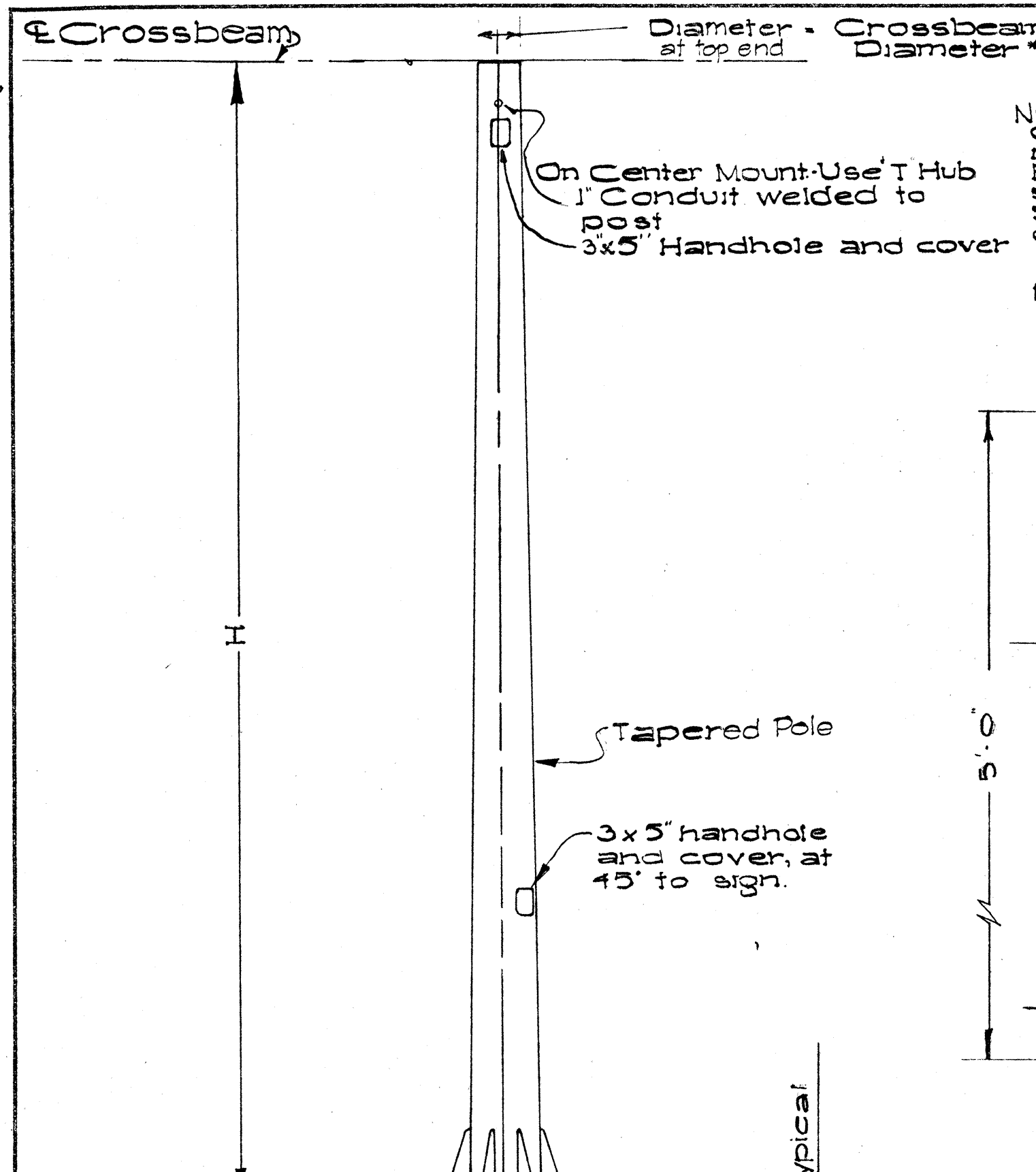
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS,
EXPRESSWAY SIGNS,
DOUBLE SIGN POSTS-CROSSBEAMS
SPAN TYPE
G-23 AND G-24 L AND S SERIES
SCALE AS NOTED

SHEET No. 14 OF 20 SHEETS

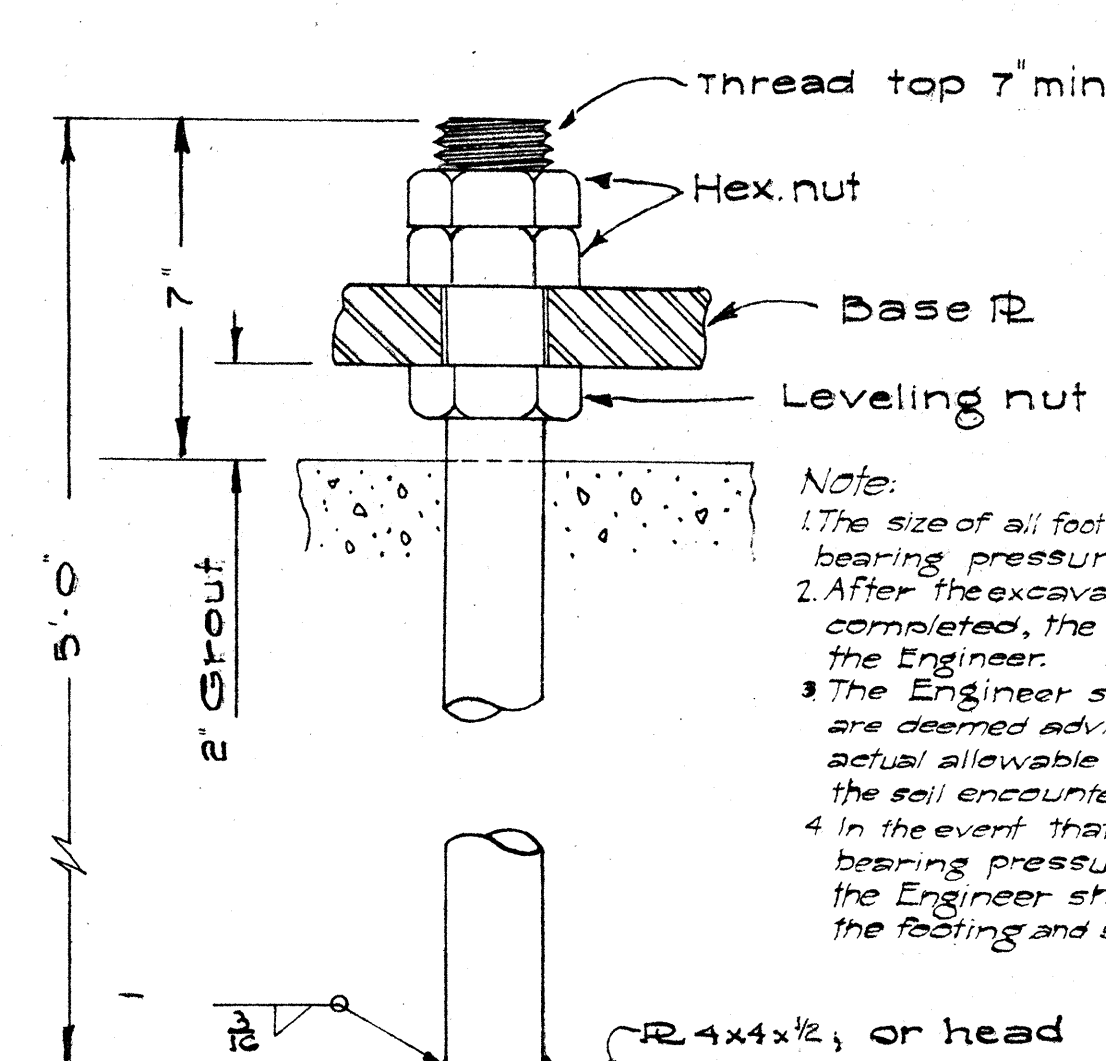
8183.56

2/17/59
4/6/59
4/28/59

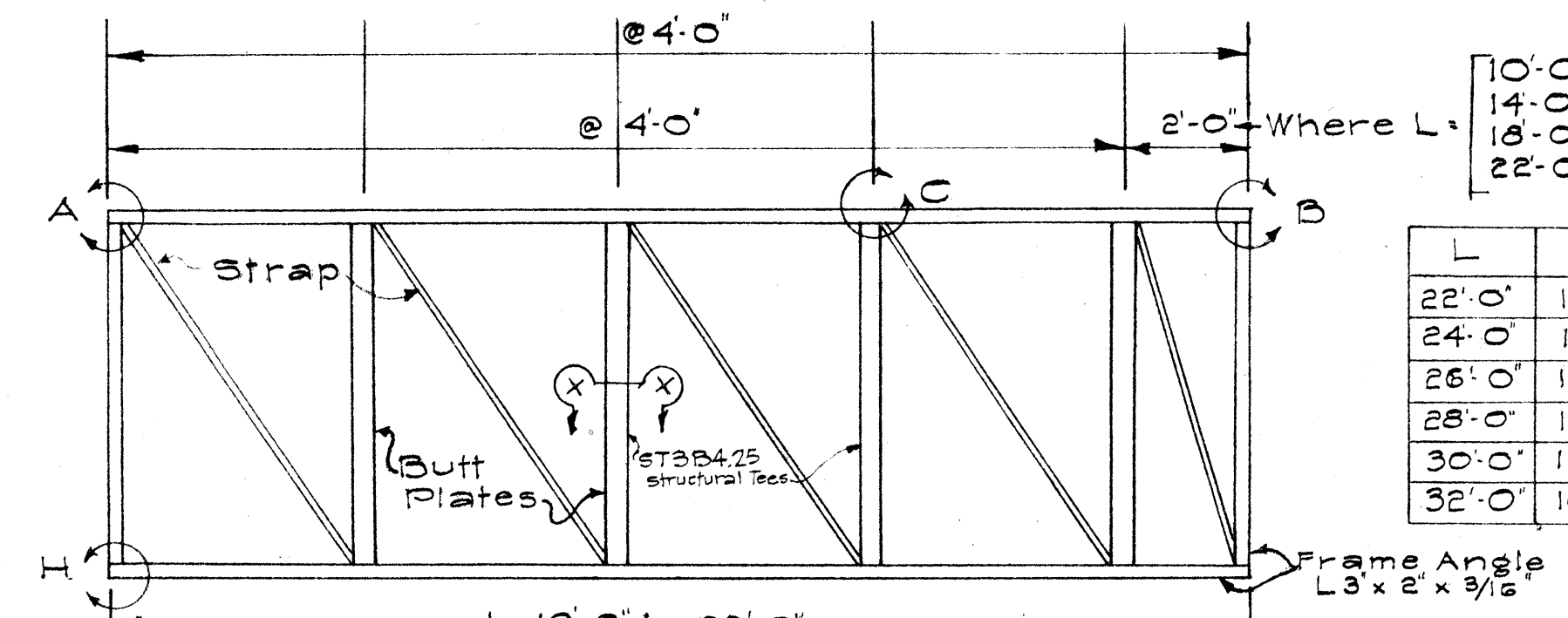
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	U-072-16	1959	57	81



NOTE:
Grout to be placed after sign is in place and leveled. For details at top of post, see "SIGN BRIDGE, CENTER MOUNT, SIGNS" and "CANTILEVER SIGNS" details.
Handholes shall be furnished only on post supporting ballast boxes.



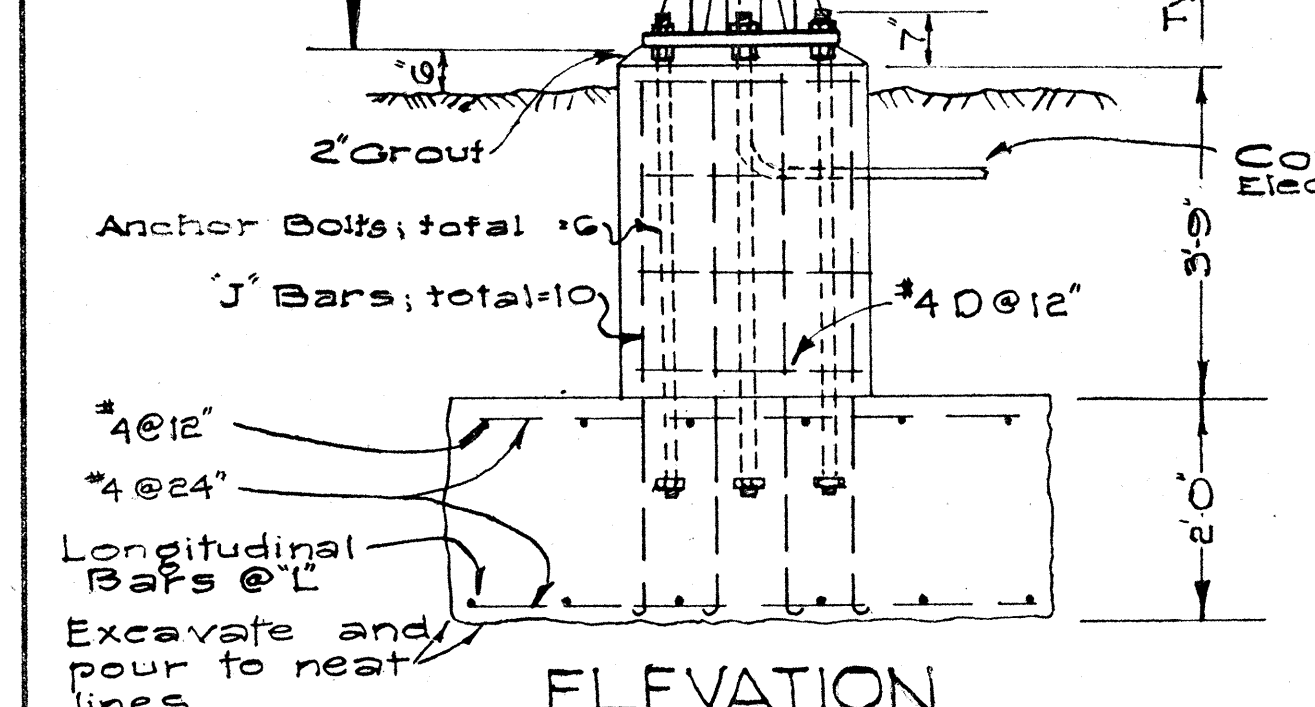
ANCHOR BOLT



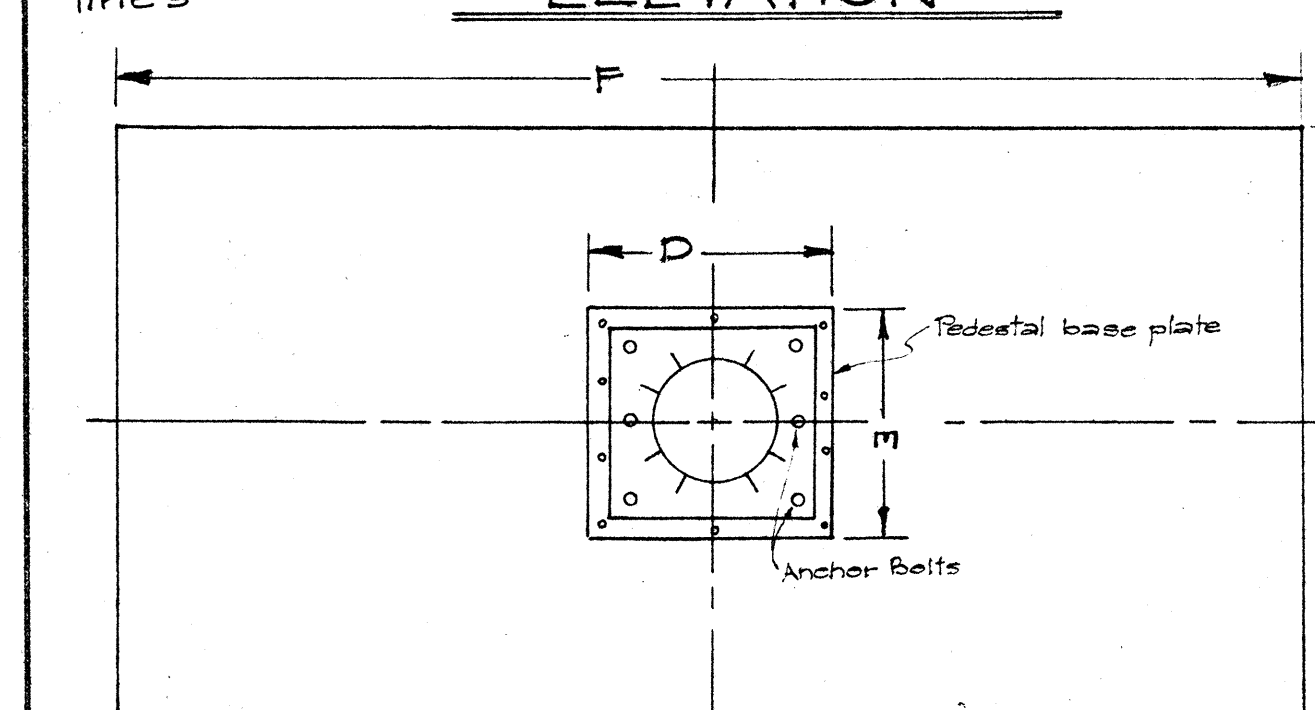
SIGN PANEL FRAME

Note: Sign panel frames L: 22'-0" to 32'-0" may be fabricated as two short frames and field spliced.

NOTE: For General Notes refer to sheet, Expressway Signs, Single Sign Post-Crossbeams For Cantilever And Center Mounted Types.

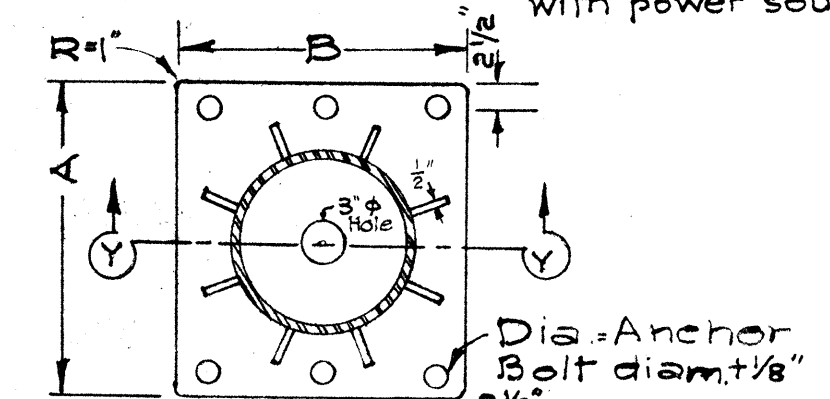


ELEVATION

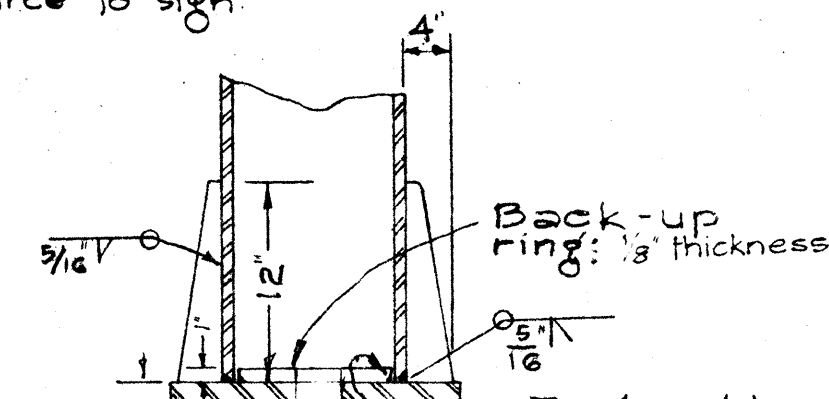


FOOTING PLAN

Note: Dimension F normal to sign.
1. Class A Concrete to be used in footing.
2. Handholes required only on post with power source to sign.

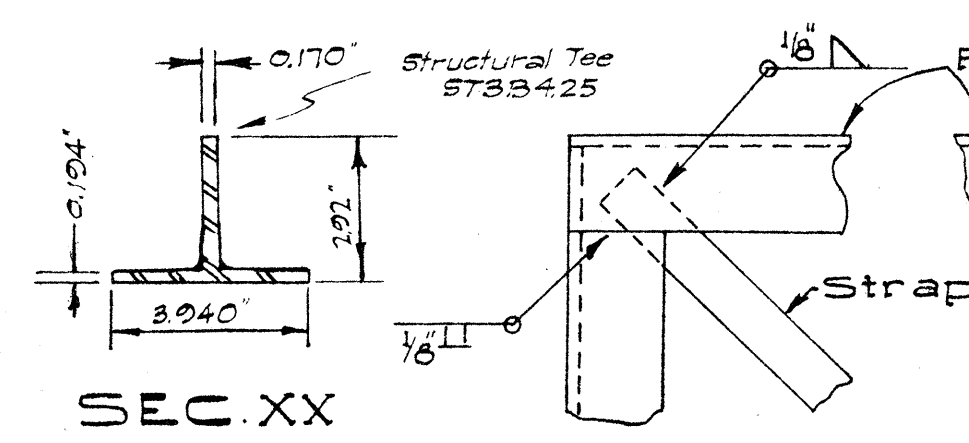


BASE PLATE

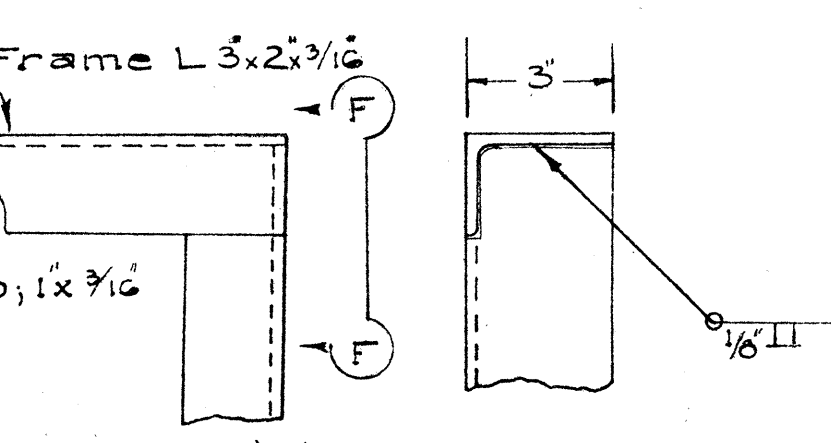


SEC. Y-Y

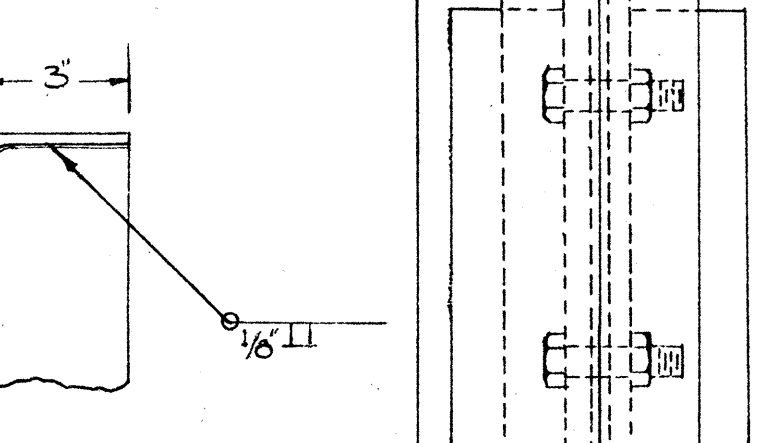
HANDHOLE AND COVER DETAILS



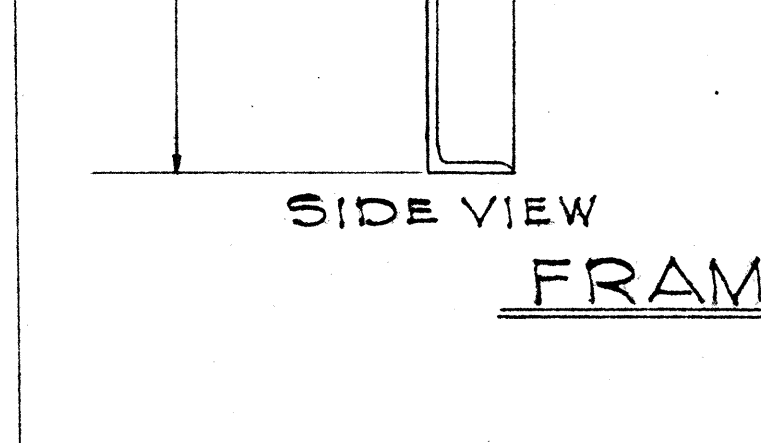
DETAIL A



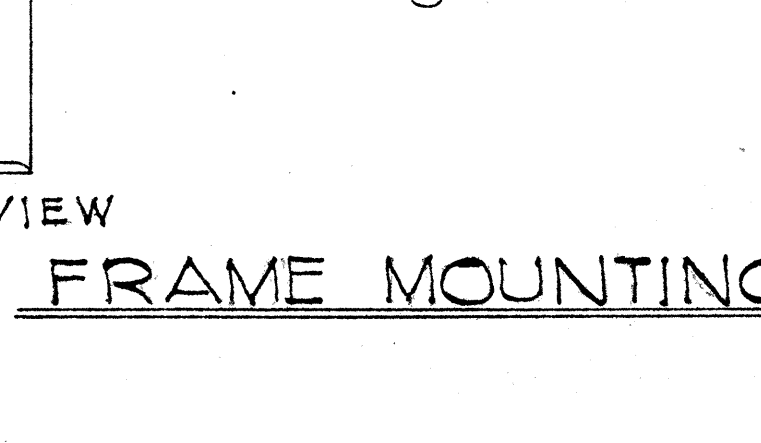
DETAIL B



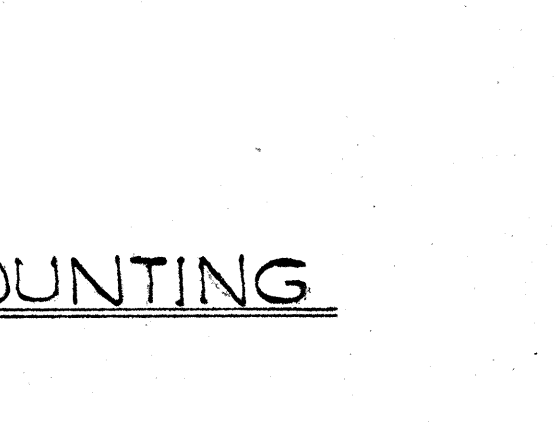
DETAIL C



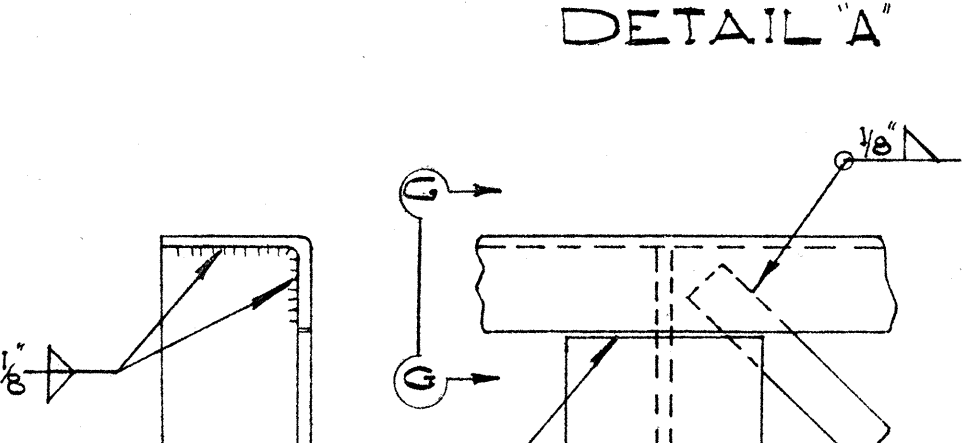
DETAIL D



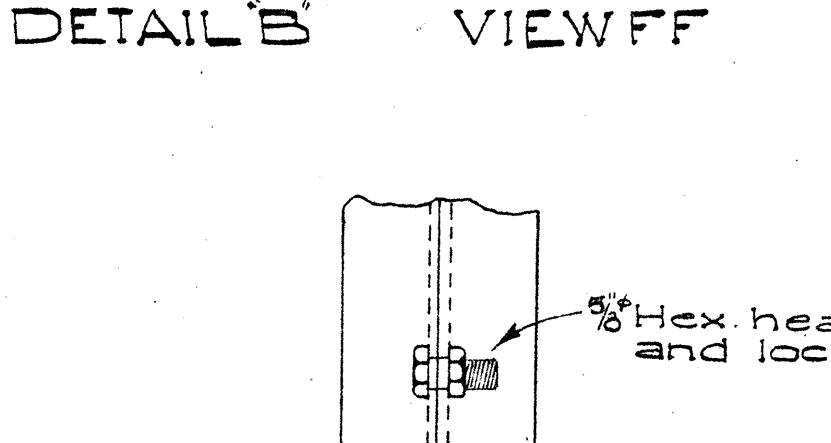
DETAIL E



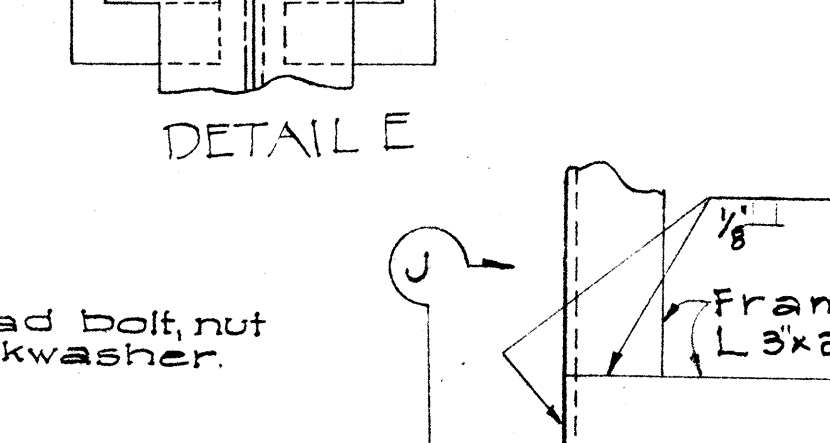
DETAIL F



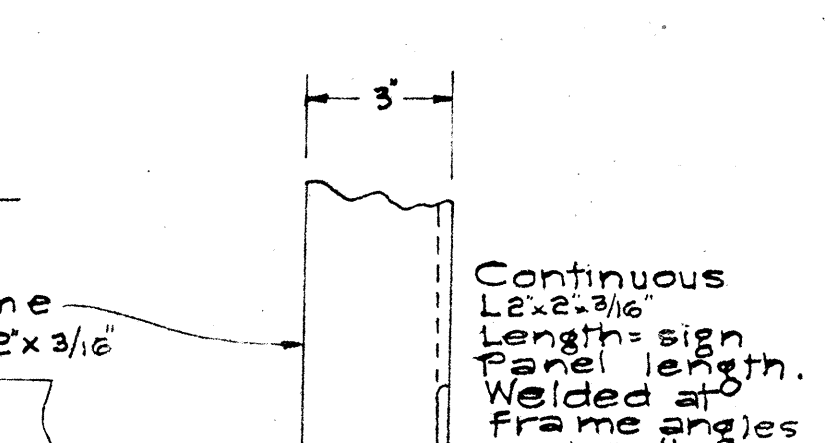
DETAIL G



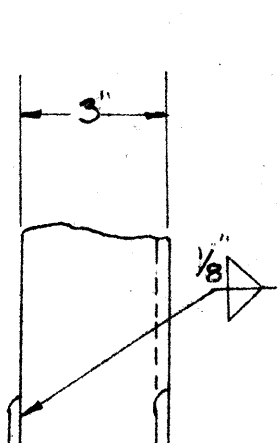
DETAIL H



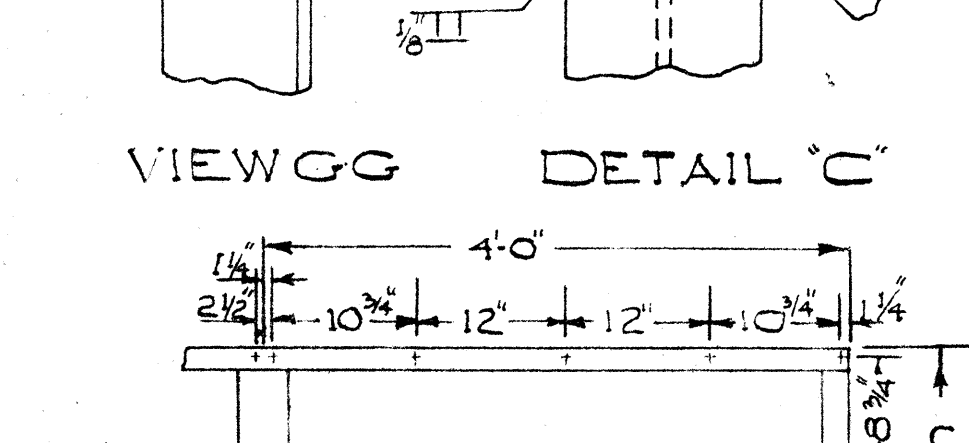
DETAIL I



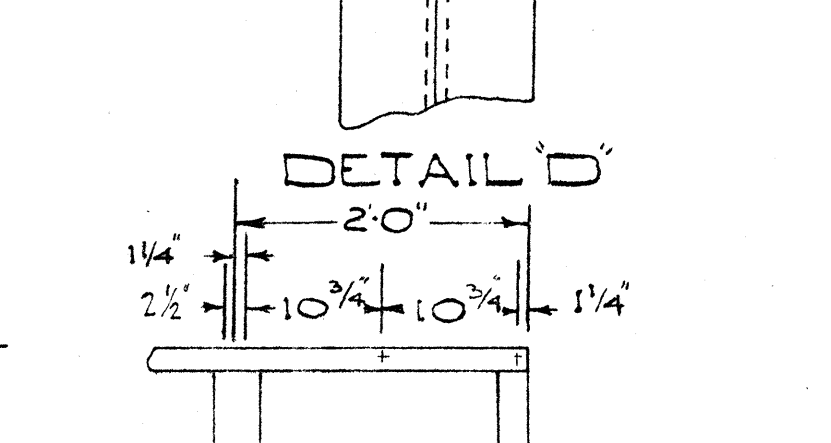
DETAIL J



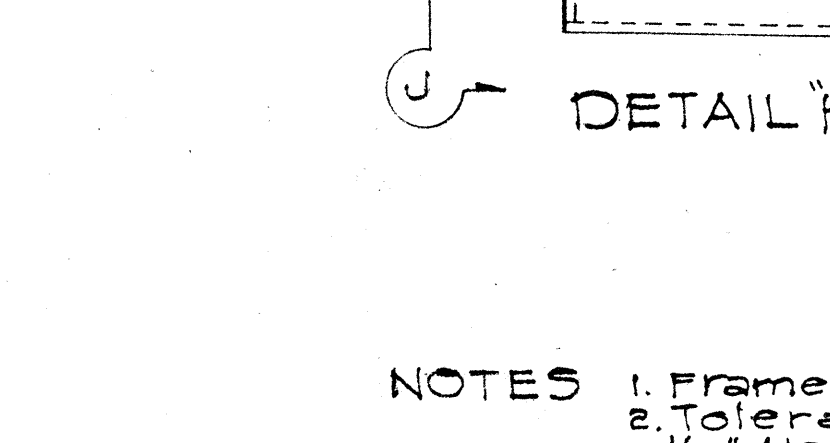
DETAIL K



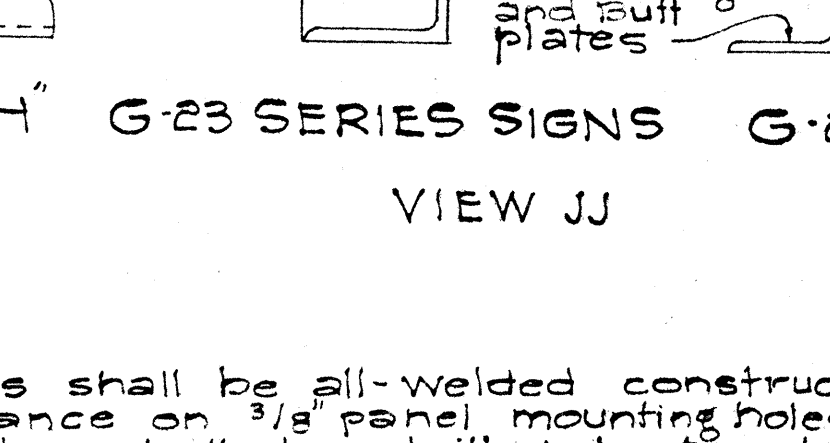
DETAIL L



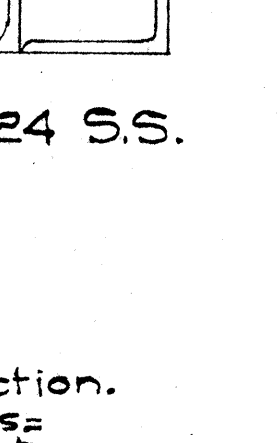
DETAIL M



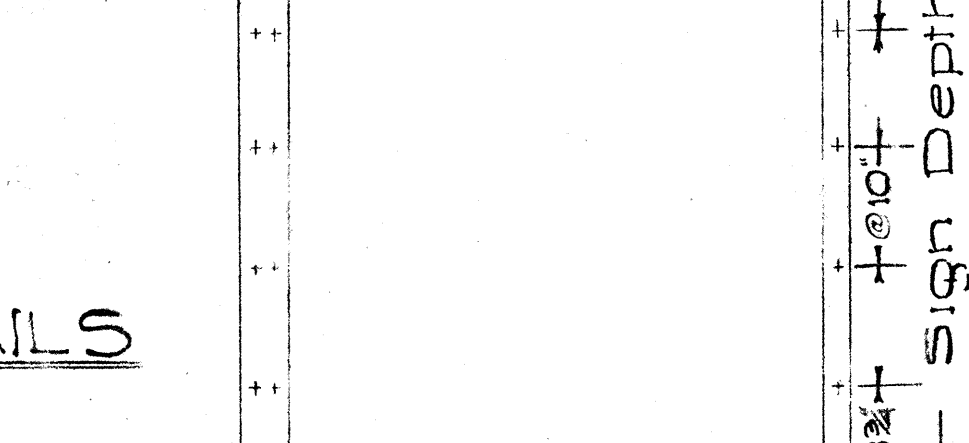
DETAIL N



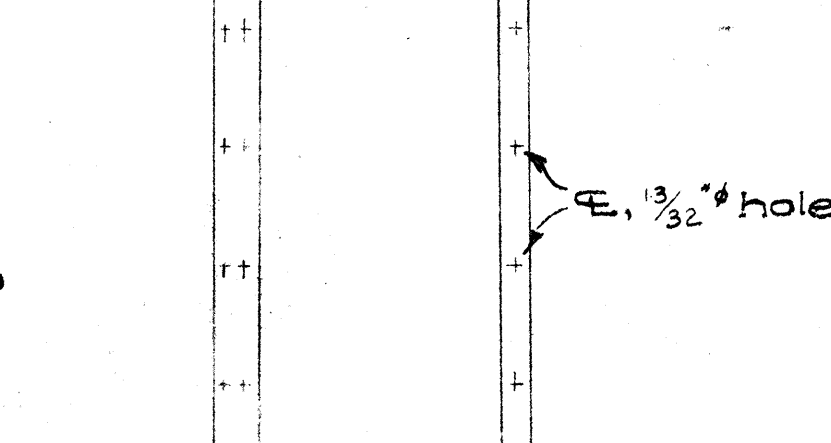
DETAIL O



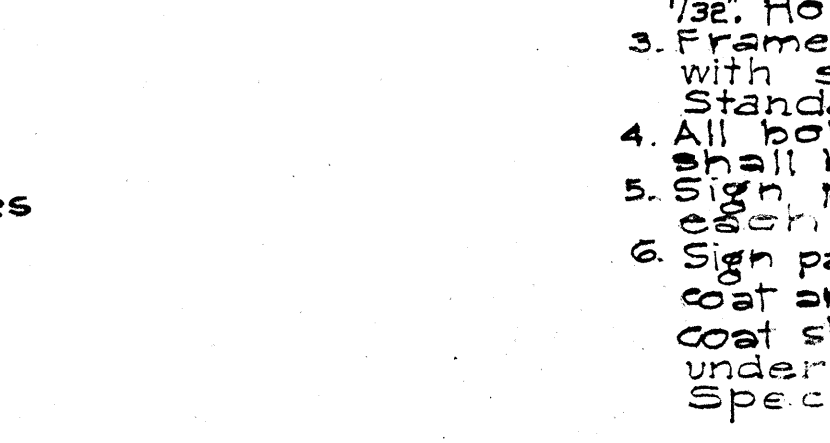
DETAIL P



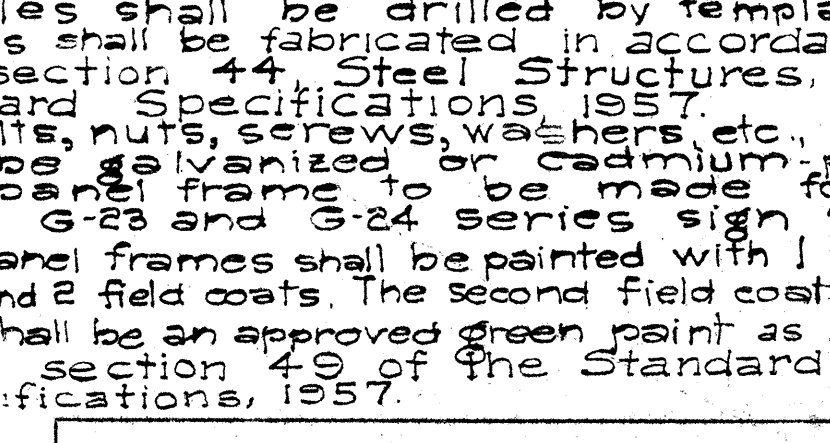
DETAIL Q



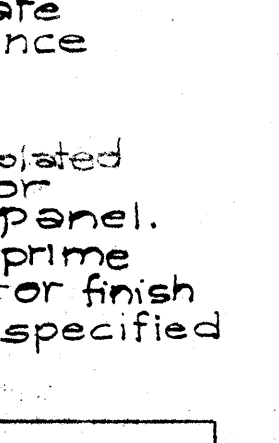
DETAIL R



DETAIL S



DETAIL T



DETAIL U

PANEL MOUNTING HOLE SPACING

Post Type	POLE			BASE PLATE			PEDESTAL			FOOTING		
	Dia. @ Base	Wall Thickness	Anchor Bolts	A	B	C	D	E	J Bars	F	G	L Long Bars
I	10"	1/4"	1 1/8"	1'-7"	1'-7"	1'-7"	1'-11"	1'-11"	*5	7'-0"	3'-0"	*4 total = 3
II	12"	3/8"	1 3/8"	2'-2"	2'-0"	1'-7"	2'-6"	2'-4"	*7	9'-0"	4'-6"	*6 total = 5
III	14"	1/2"	1 5/8"	2'-2"	2'-0"	1'-7"	2'-6"	2'-4"	*8	10'-0"	5'-0"	*7 total = 5
IV	18"	7/8"	2"	2'-5"	2'-4"	1'-7"	2'-9"	2'-8"	*10	12'-0"	6'-0"	*9 total = 6

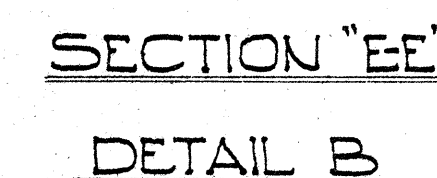
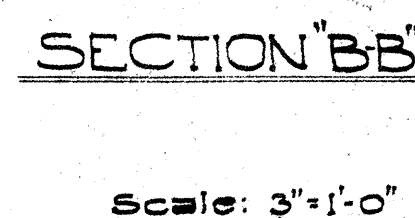
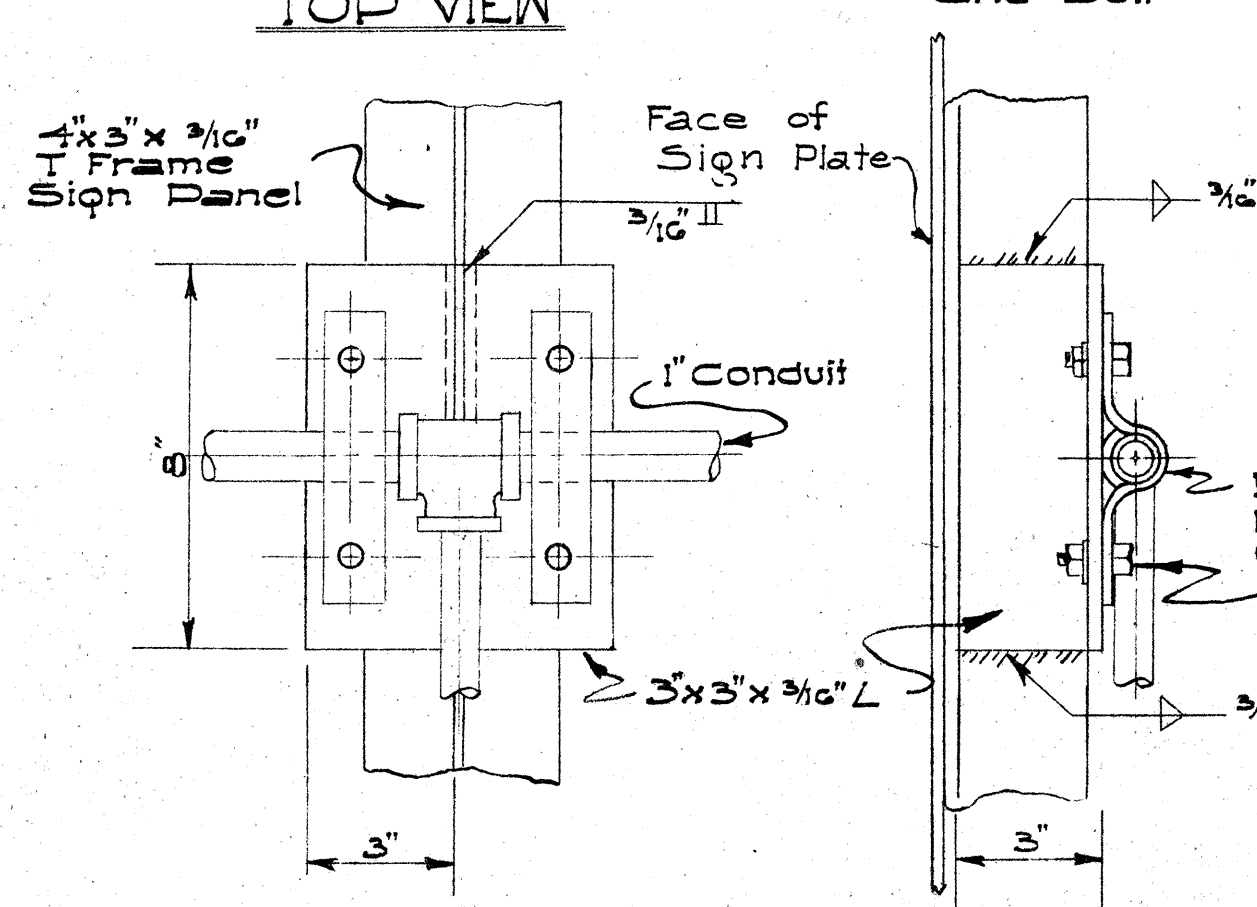
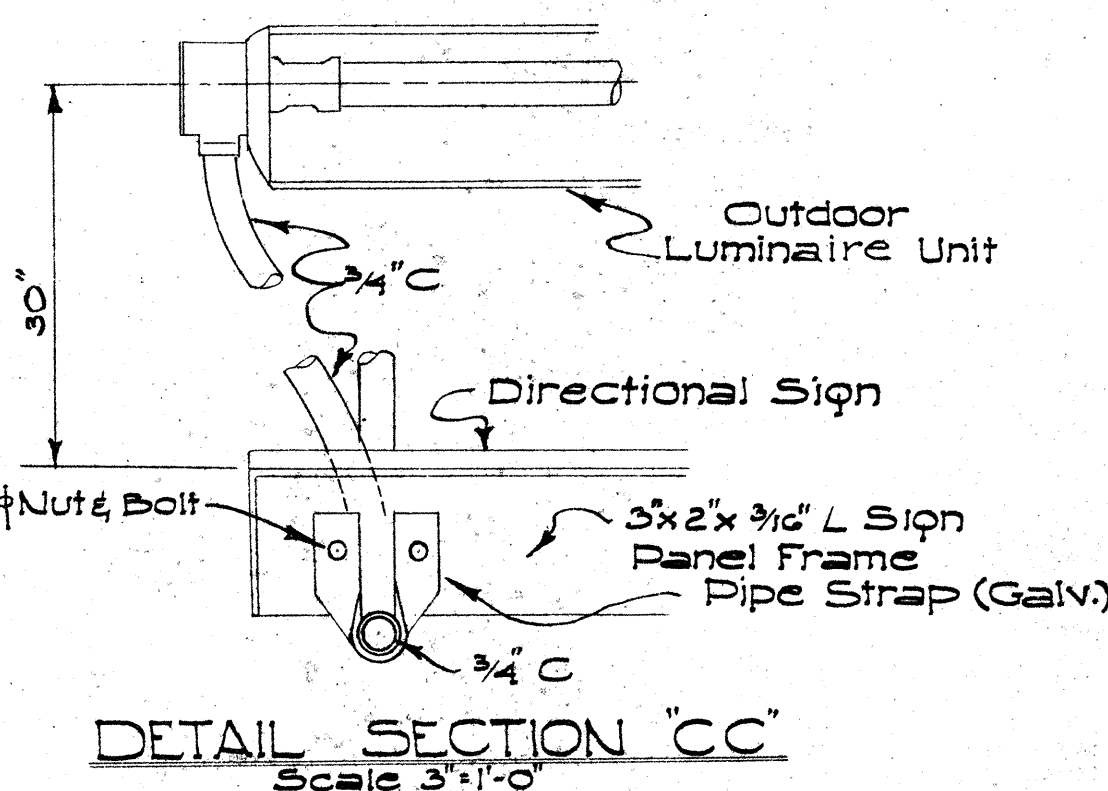
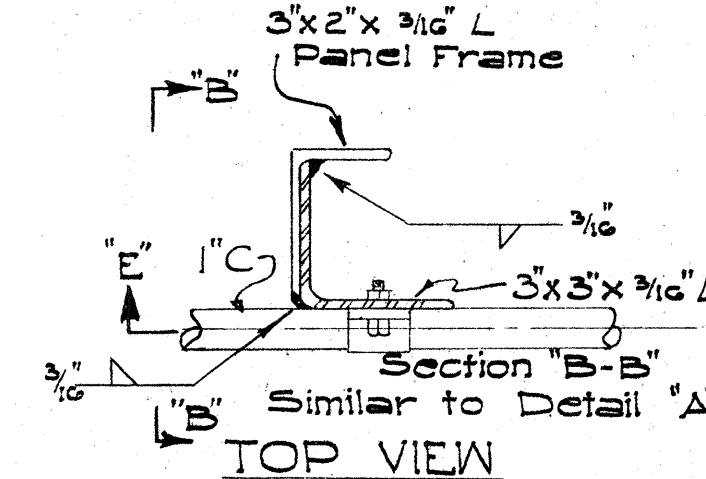
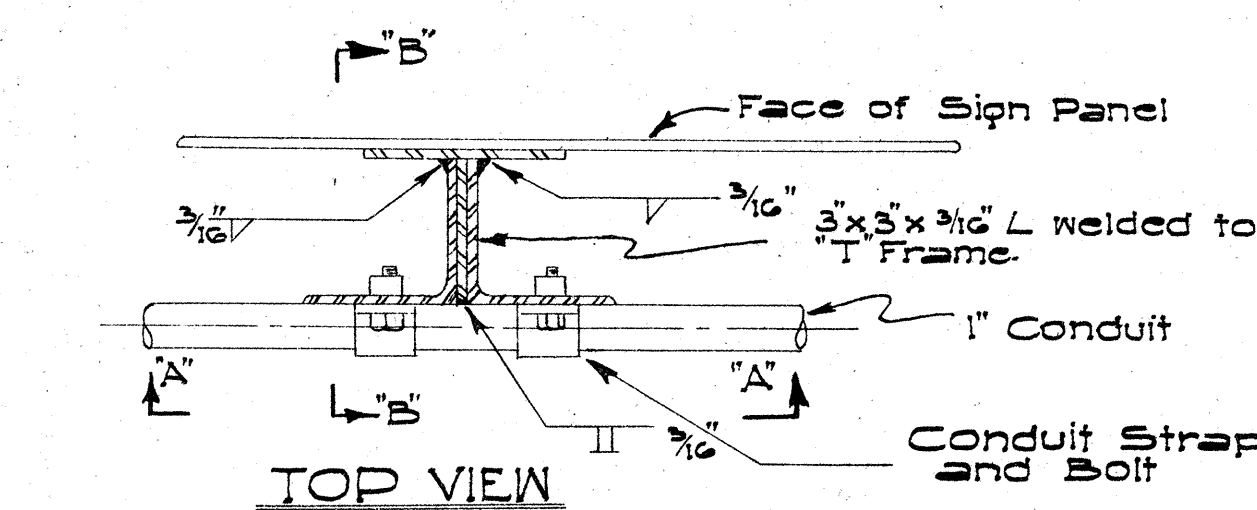
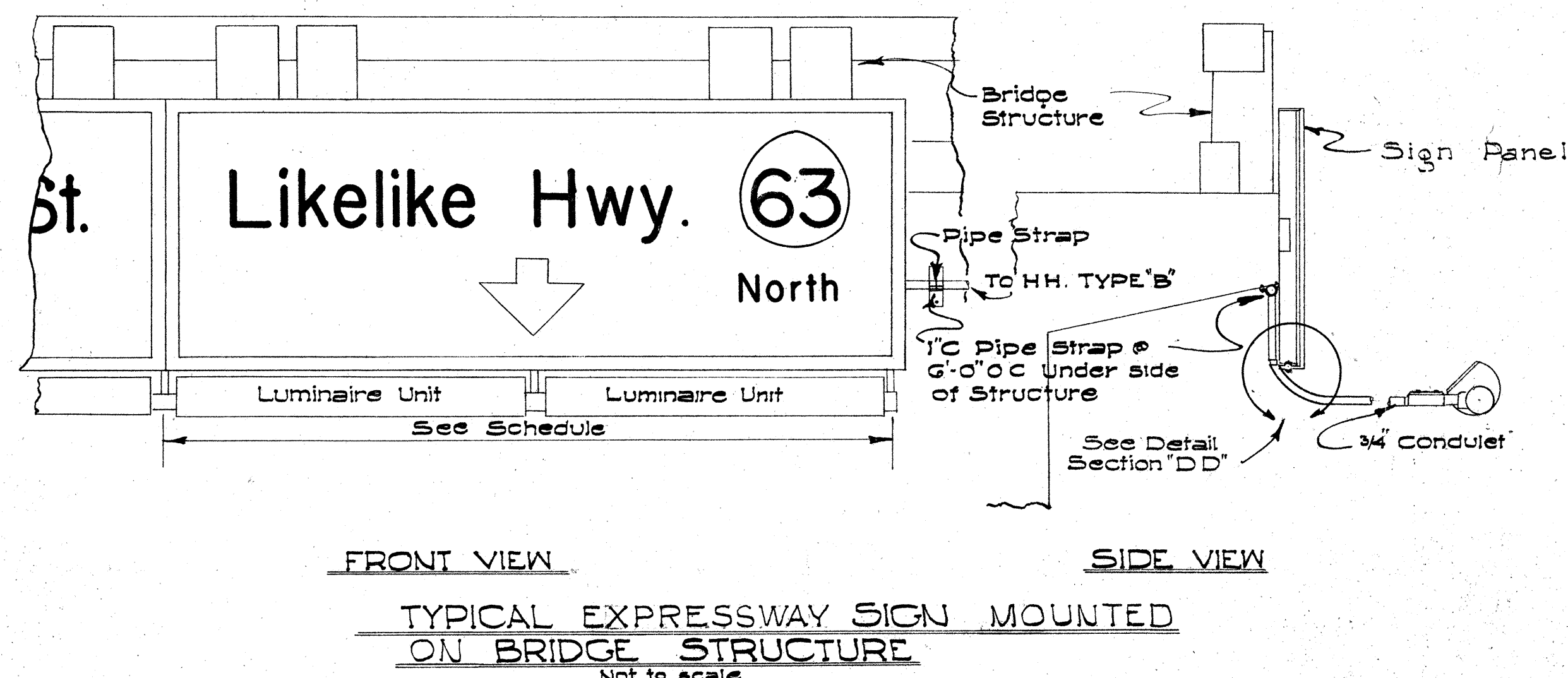
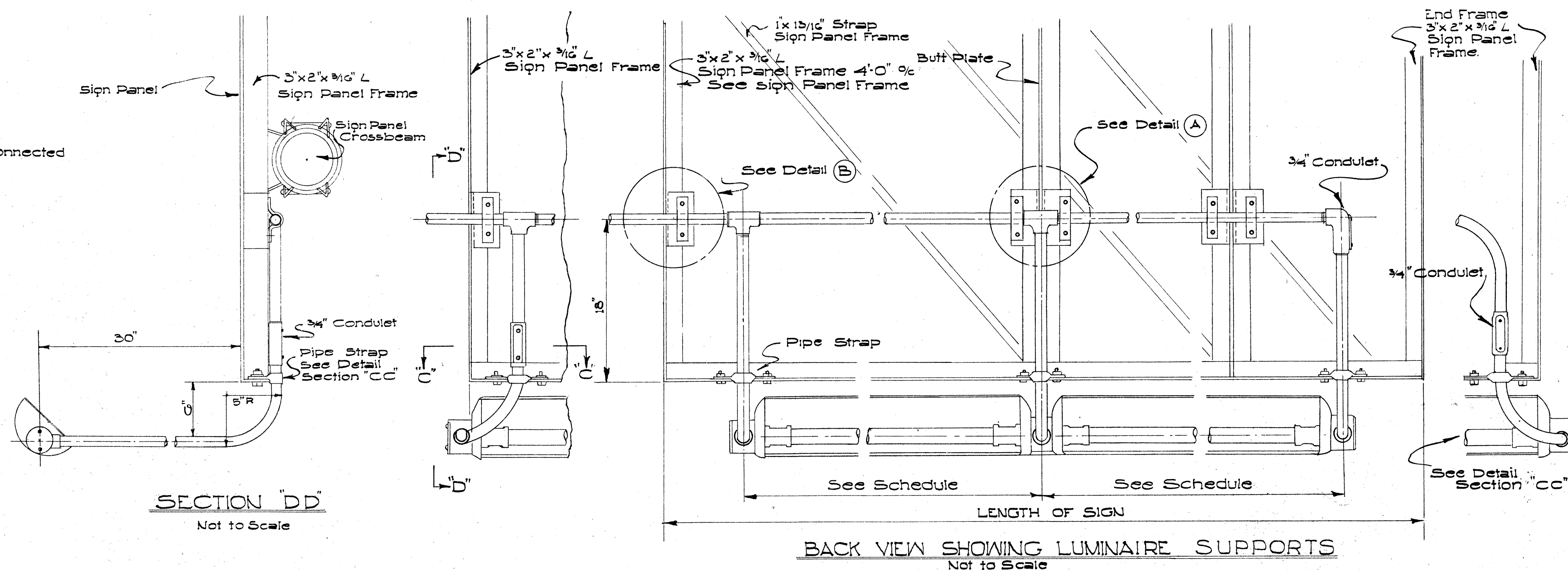
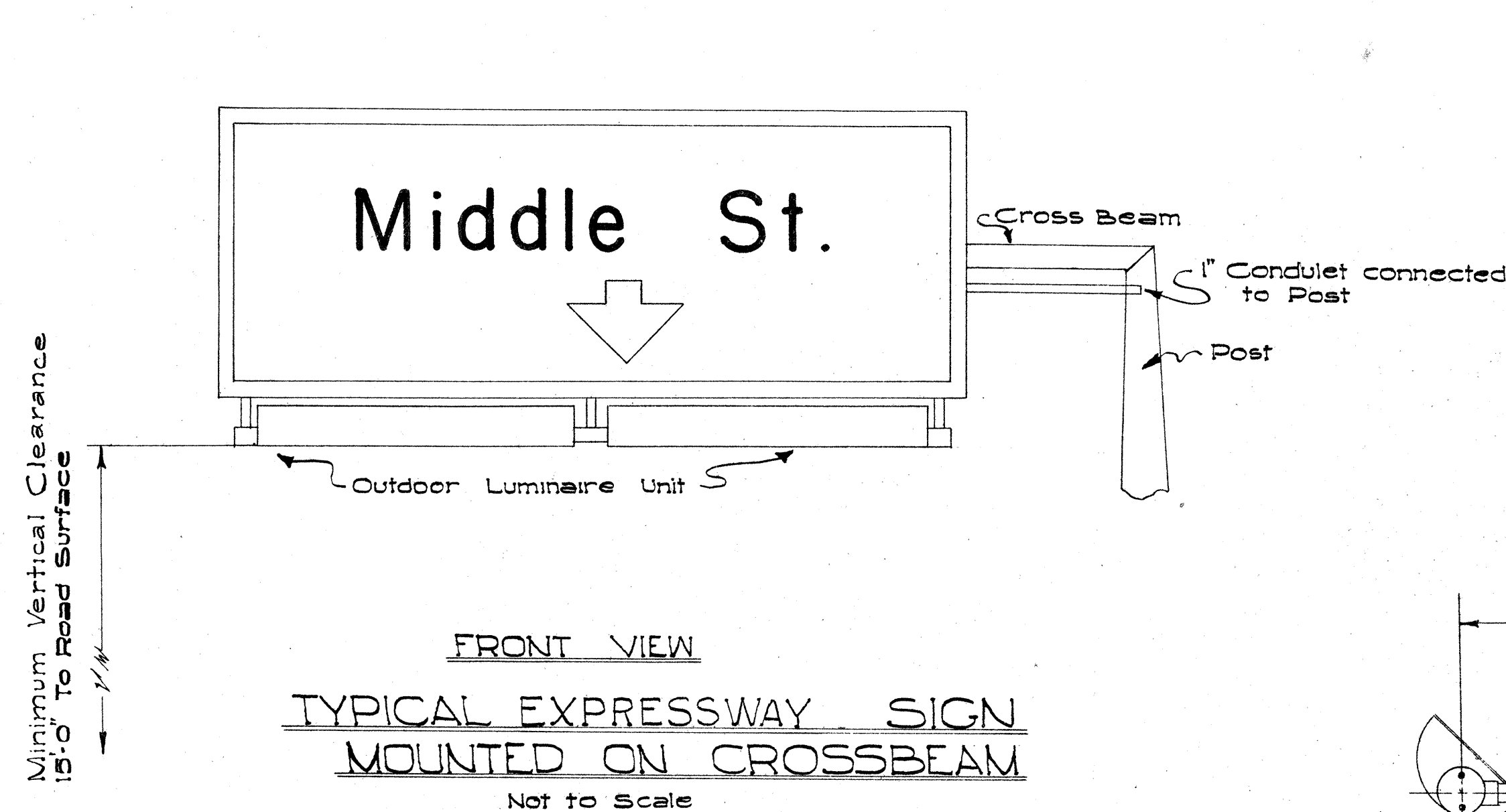
NOTES
1. Frames shall be all-welded construction.
2. Tolerance on 3/8" panel mounting holes: 1/32".
3. Frames shall be fabricated in accordance with section 4.4 Steel Structures, Standard Specifications, 1957.
4. All bolts, nuts, screws, washers, etc. shall be galvanized or cadmium plated.
5. Sign panel frames to be made for each G-23 and G-24 series sign panel.
6. Sign panel frames shall be painted with 1 prime coat and 2 field coats. The second field coat or finish coat shall be an approved green paint as specified under section 4.9 of the Standard Specifications, 1957.

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
EXPRESSWAY SIGNS
POST AND FRAMES
G-23 AND G-24 L AND S SERIES
SCALE AS NOTED

APPROVED: _____ DATE: Aug. 25, 1959
STATE HIGHWAY ENGINEER

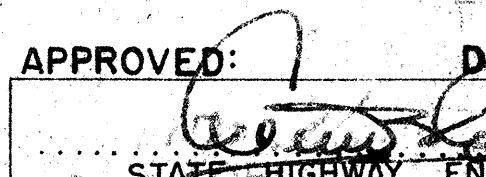
2/17/57

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-10	1957	55	57



EXPRESSWAY SIGN LUMINAIRE SCHEDULE	
SIGN LENGTH	NUMBER AND SIZE OF LUMINAIRE
10	2 - 4'-0"
12	2 - 6'-0"
14	2 - 6'-0"
16	2 - 6'-0"
18	2 - 6'-0"
20	2 - 4'-0"
22	2 - 4'-0"
24	2 - 6'-0"
26	2 - 6'-0"
28	2 - 6'-0"
30	2 - 6'-0"
32	2 - 4'-0"

NOTE: 1. Fluorescent Floodlight Fixtures shall be installed as recommended by the manufacturers.

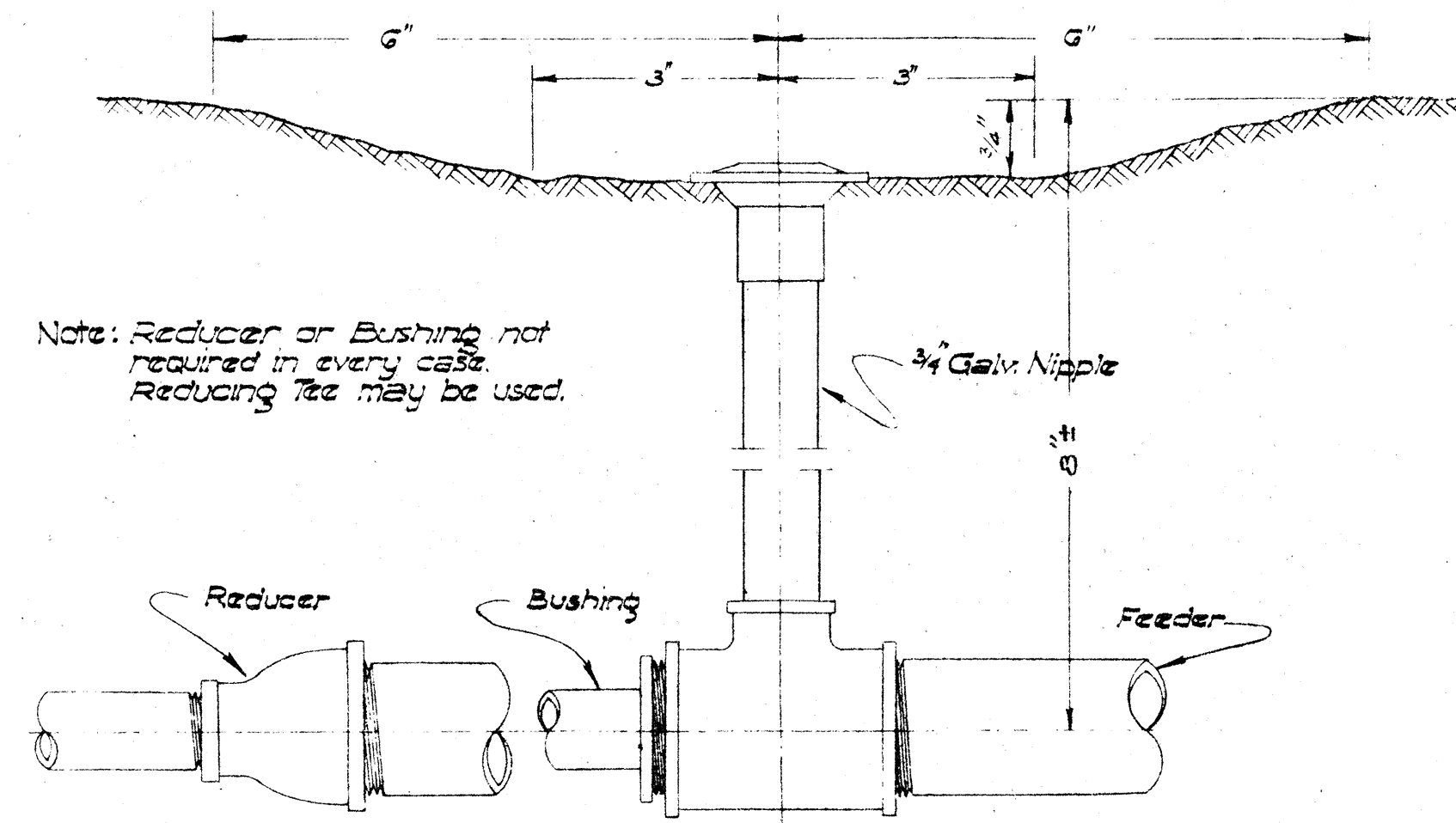
APPROVED:  DATE: Aug. 26, 1957
STATE HIGHWAY ENGINEER

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
STANDARD DETAILS
EXPRESSWAY SIGNS
FLUORESCENT LUMINAIRE
SUPPORTS

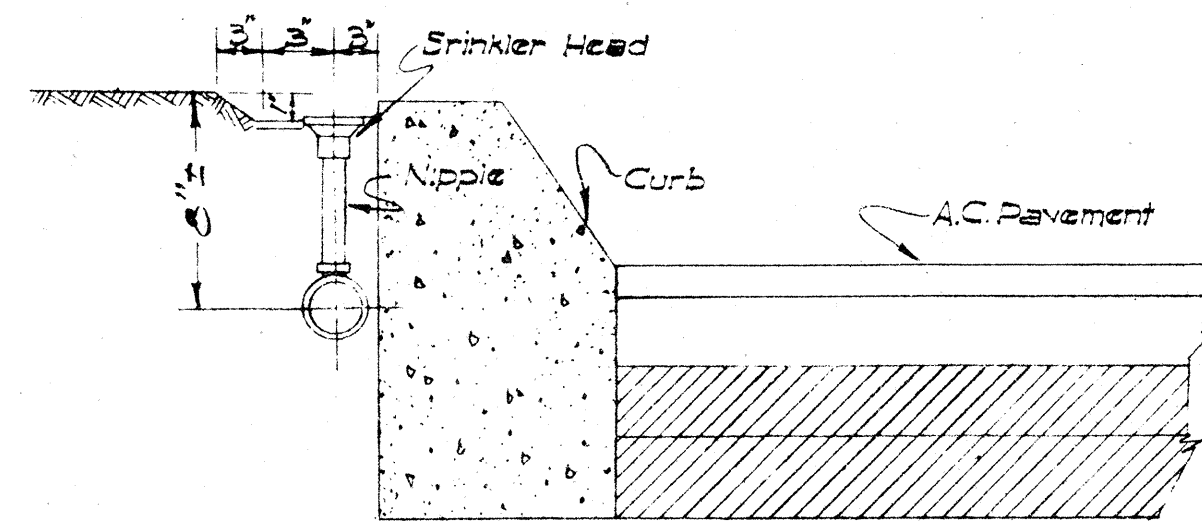
SHEET NO. 16 OF 20 SHEETS

\$183.58

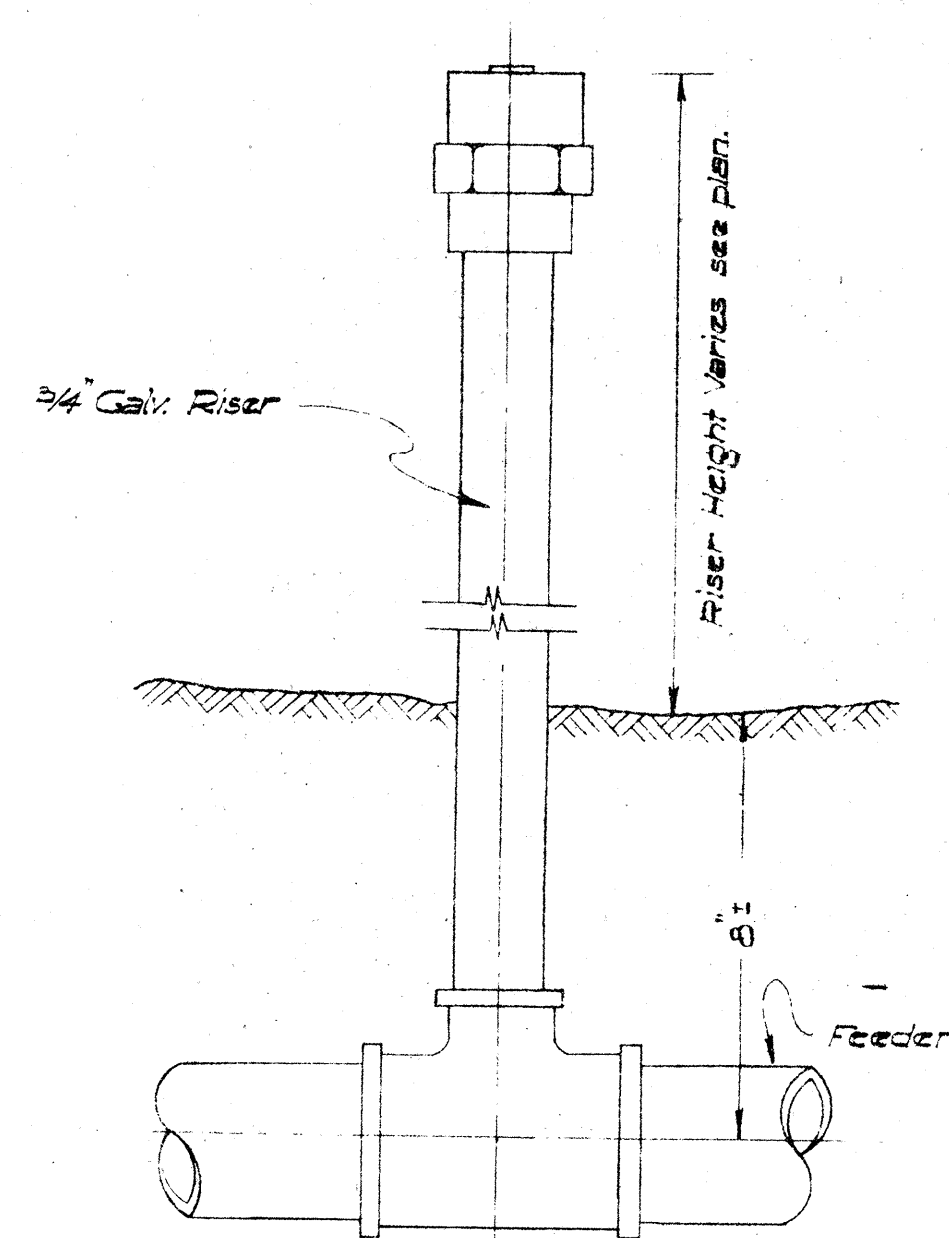
DATE: 2/17/57
DESIGNED BY: J. A. Nardiel
DRAWN BY: J. A. Nardiel
CHECKED BY: J. A. Nardiel
ORIGINAL PLAN
NOTE BOOK
No.



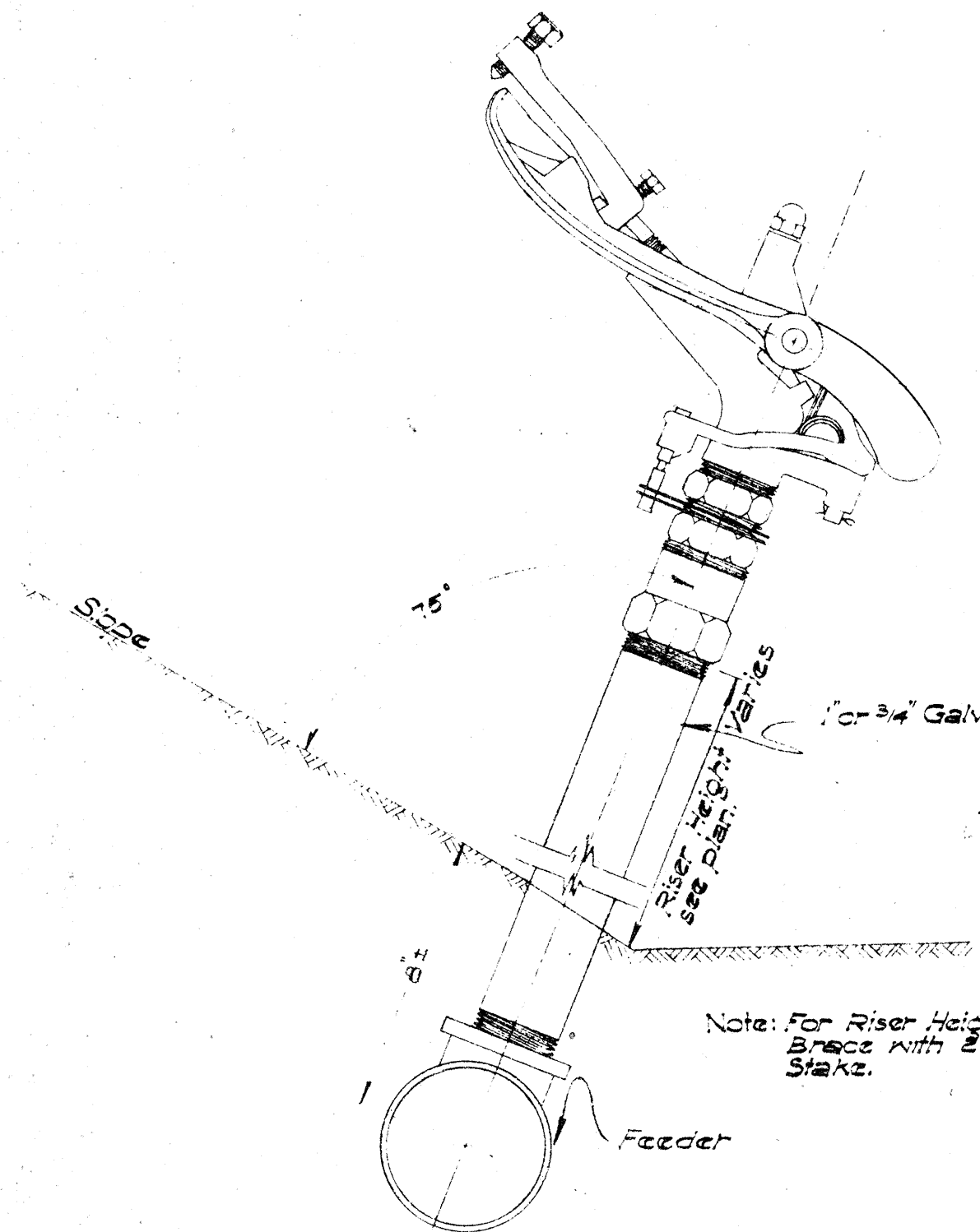
CONNECTION OF SPRINKLER HEAD TO FEEDER PIPE
Not to Scale



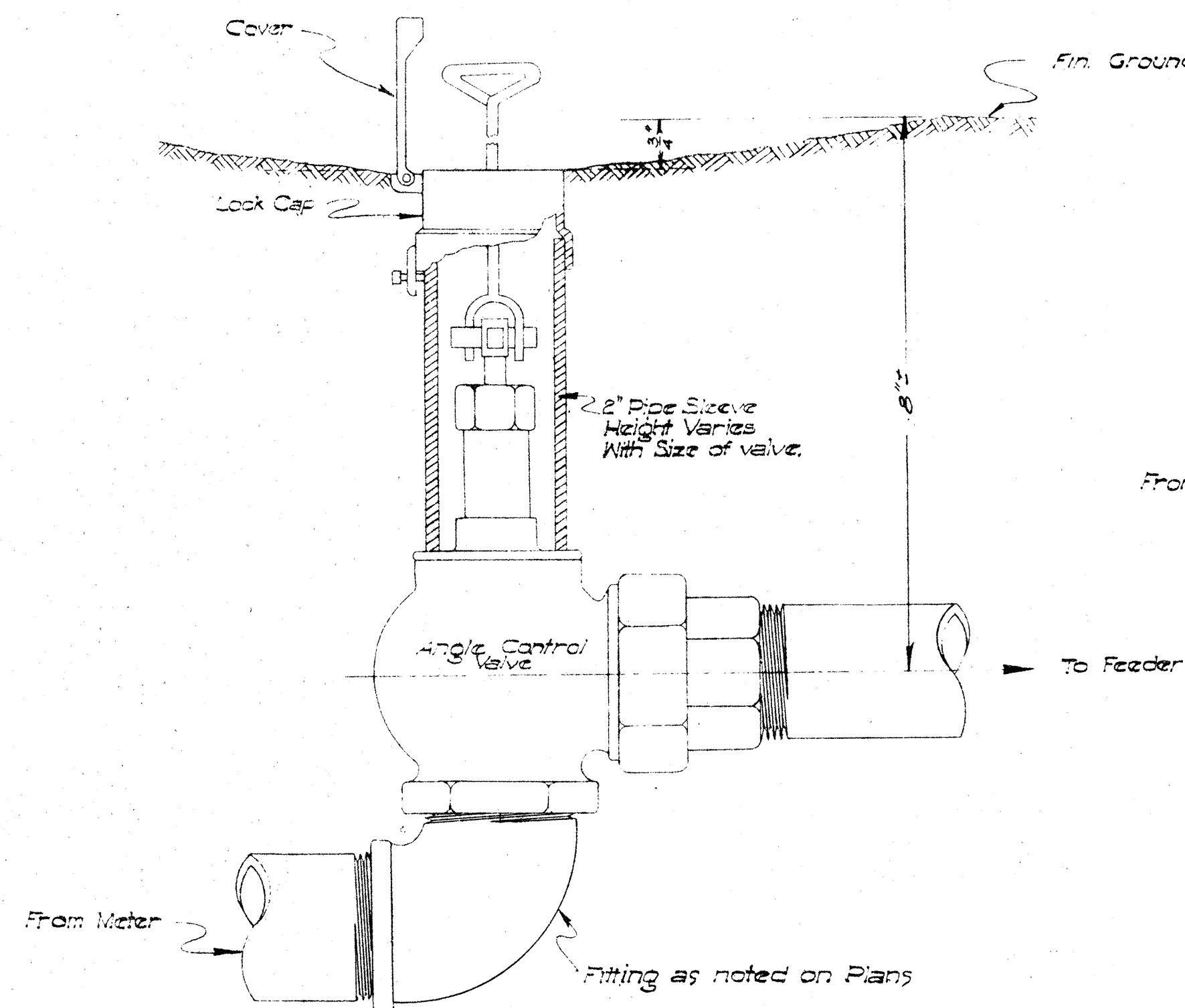
TYPICAL DETAIL OF SPRINKLER AT CONC. CURB
Not to Scale



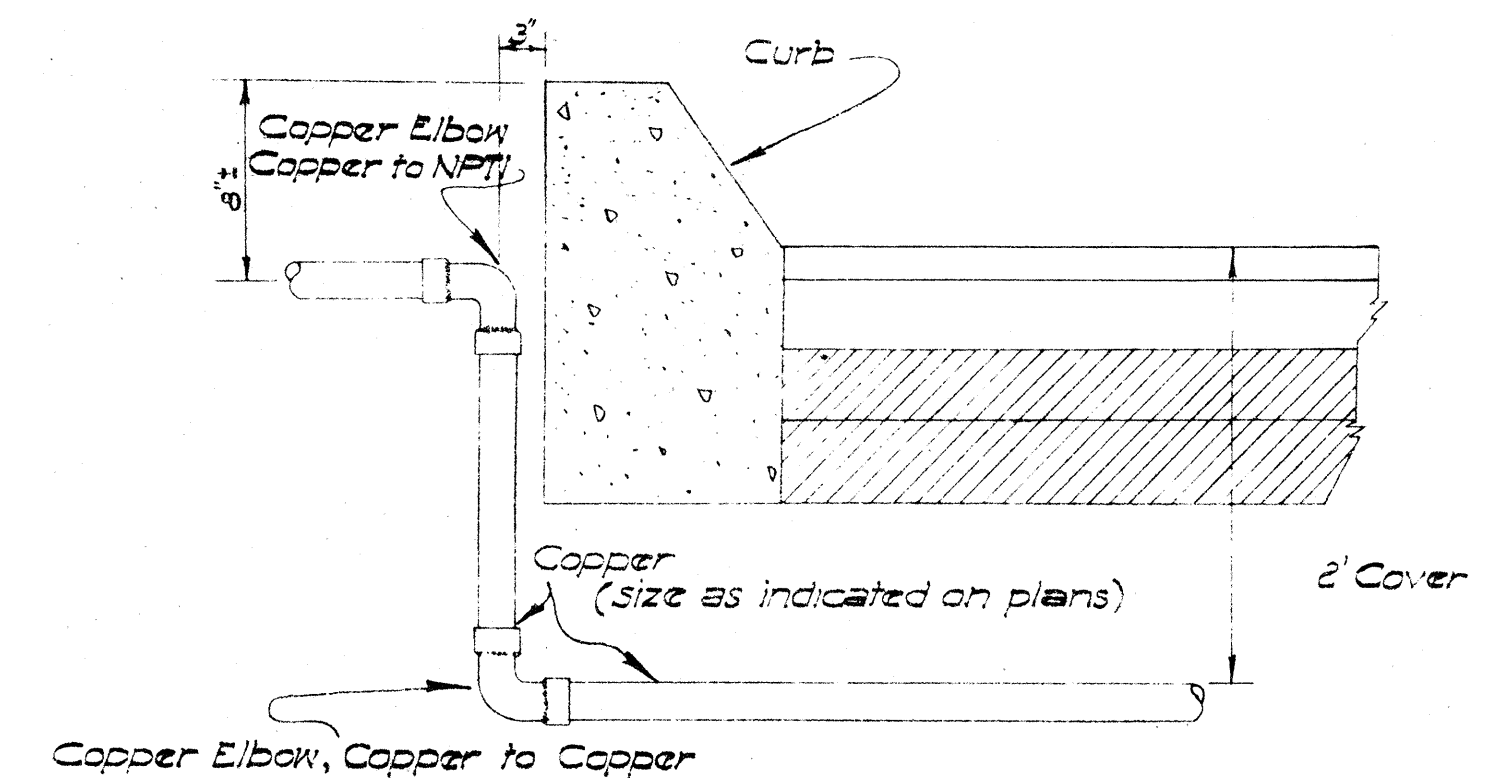
DETAIL OF SHRUBBERY HEAD
Not to Scale



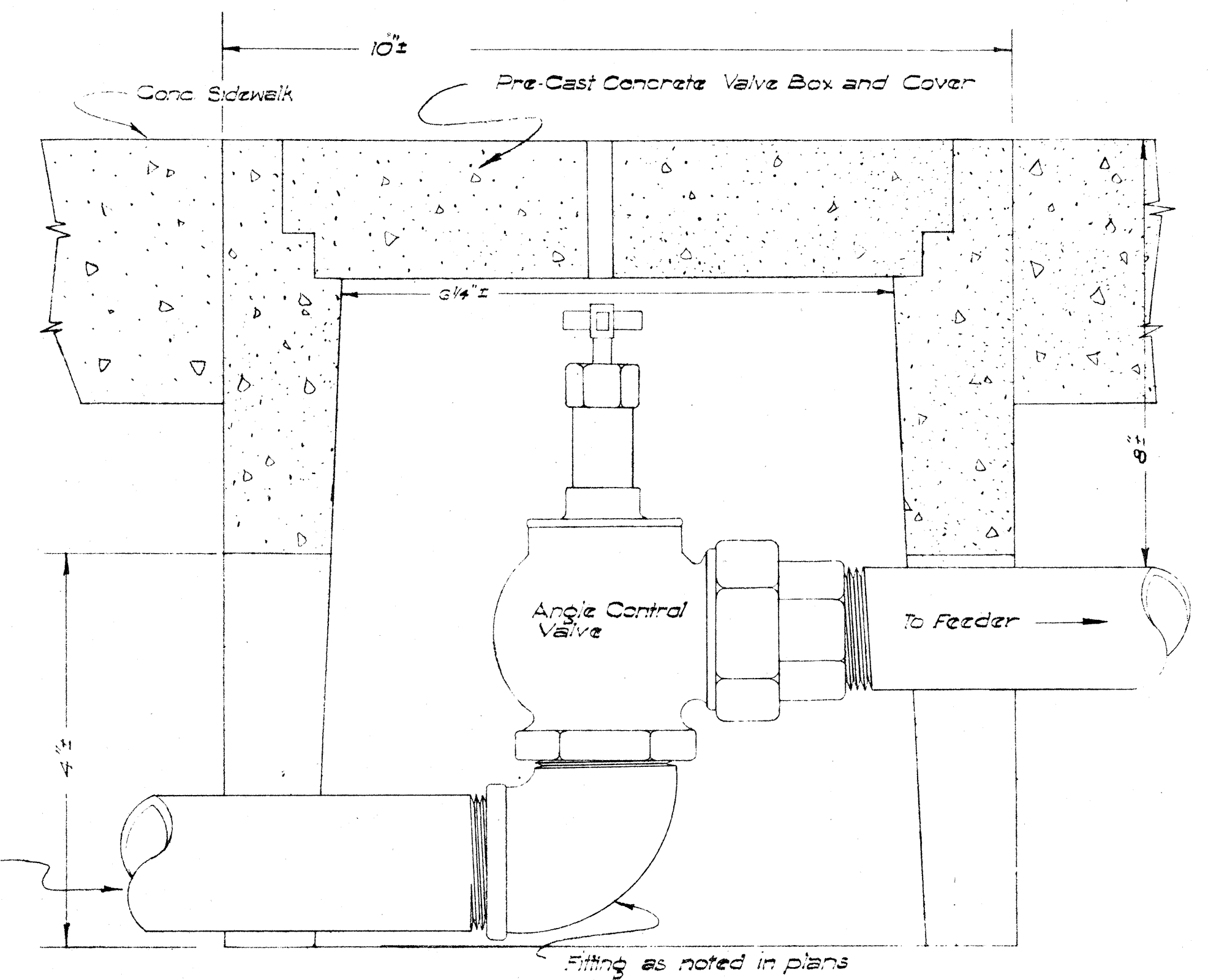
INSTALLATION OF JET SPRINKLER ON SLOPE
Not to Scale



ANGLE CONTROL VALVE HOUSING & CAP
Not to Scale



TYPICAL DETAIL OF ROADWAY CROSSING
Not to Scale



ANGLE CONTROL VALVE IN SIDEWALK AREA
Not to Scale

GENERAL NOTES

1. All copper pipes shall be connected with solder type fittings of bronze castings or wrought copper. Solder type fittings and copper pipes shall be "Streamline" or approved equal.
2. Pipes not noted "Copper" are to be Galvanized Iron Screw Pipes, and fittings not noted "Copper" are to be Galvanized Malleable Iron Fittings.
3. After complete installation of the sprinkler system, each sprinkler head shall be adjusted to the satisfaction of the Engineer.

APPROVED..... DATE Aug. 25, 1950

STATE HIGHWAY ENGINEER

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

STANDARD DETAILS
SPRINKLER SYSTEM

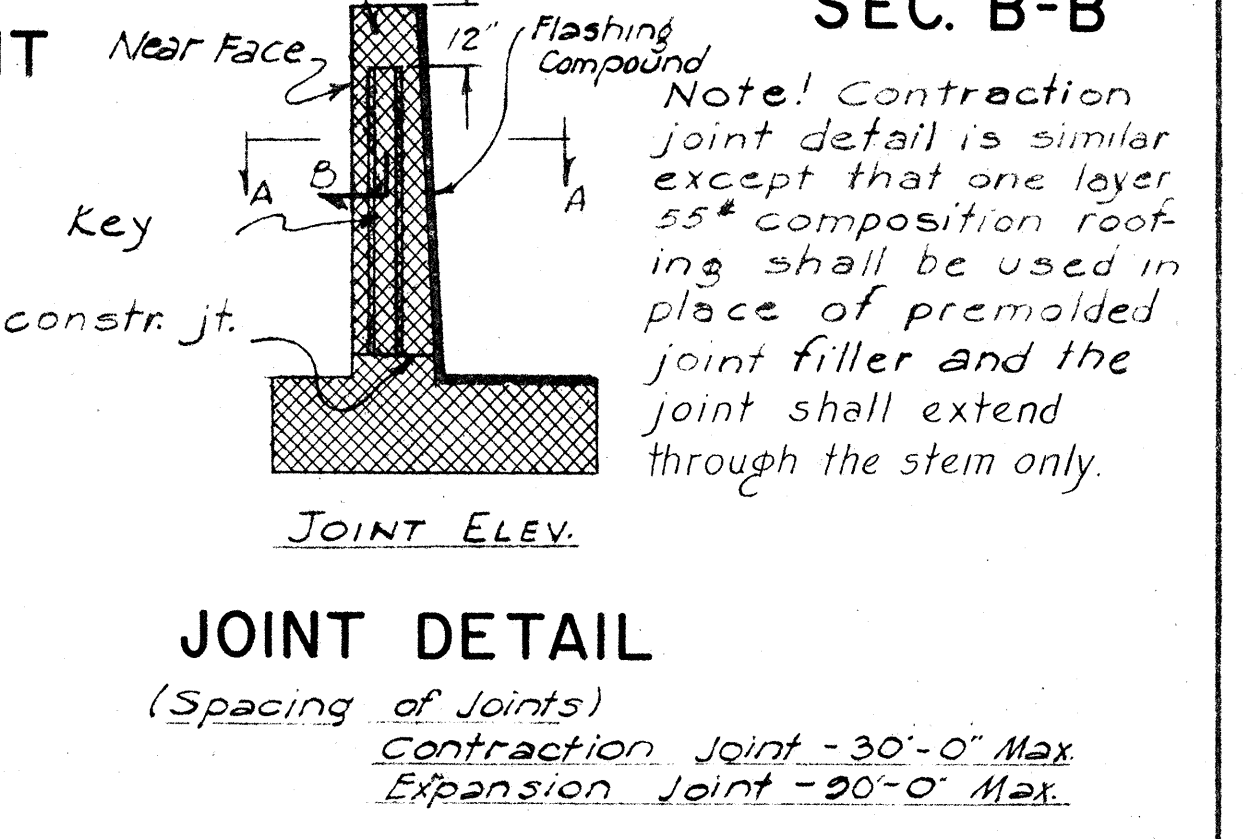
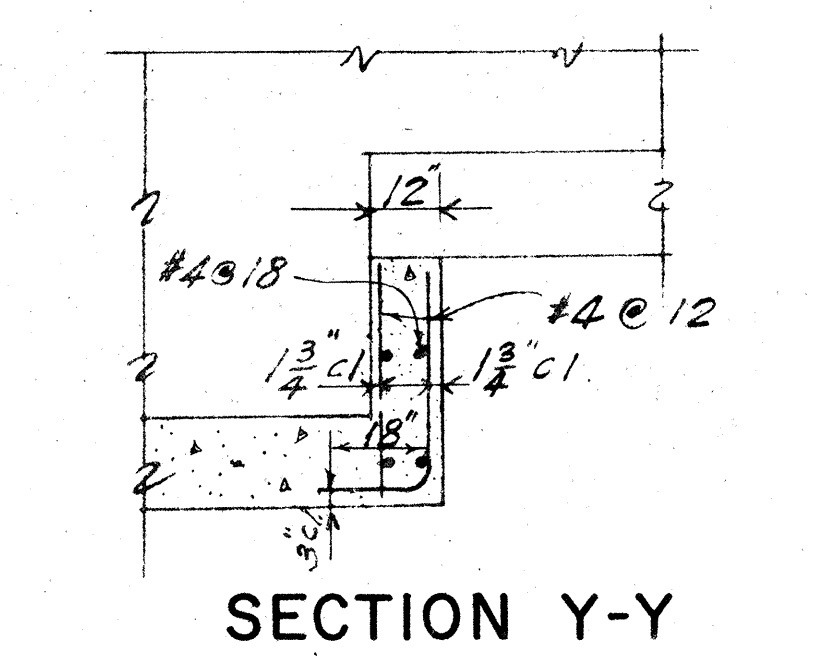
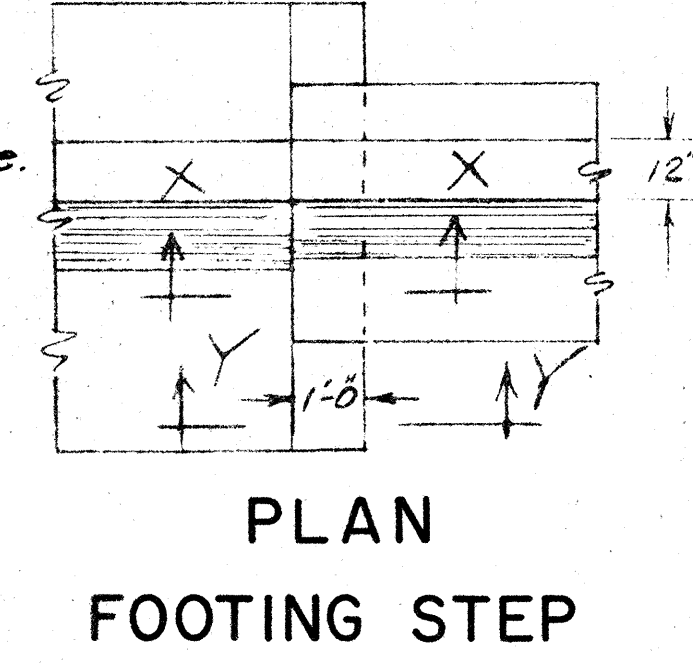
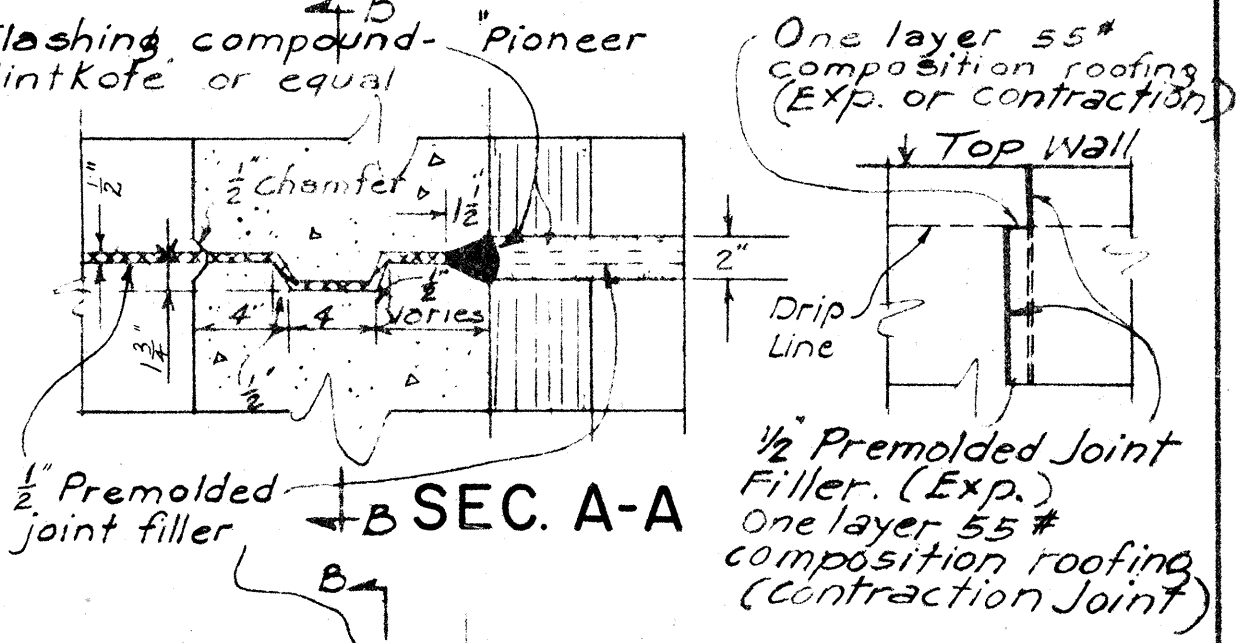
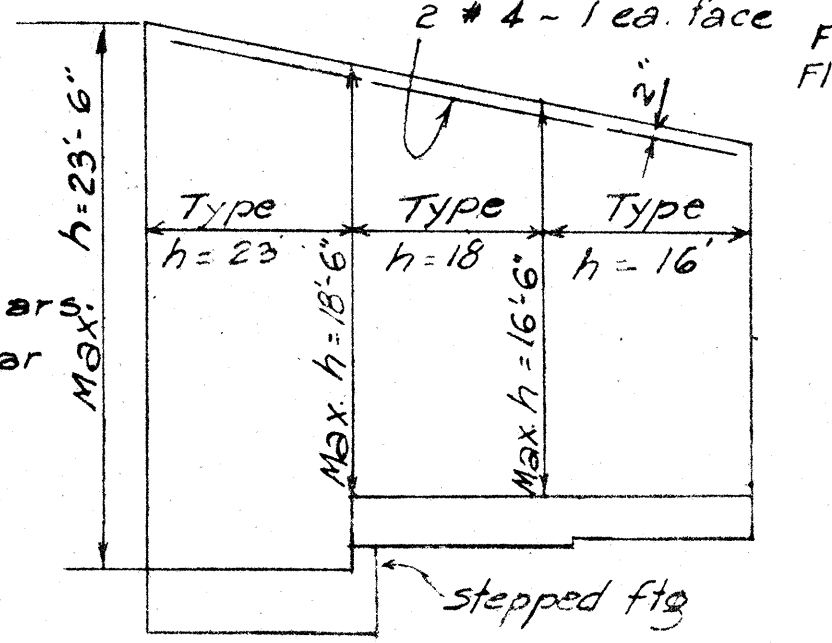
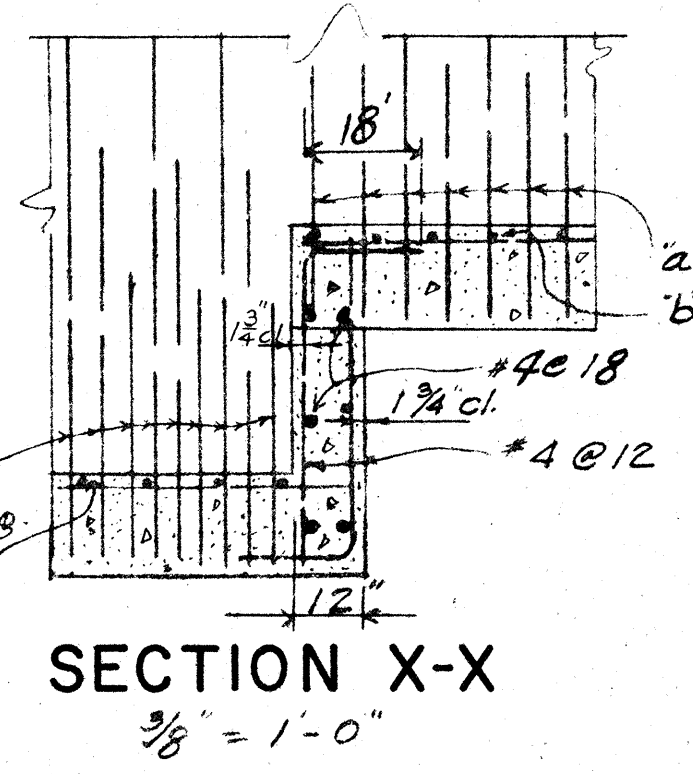
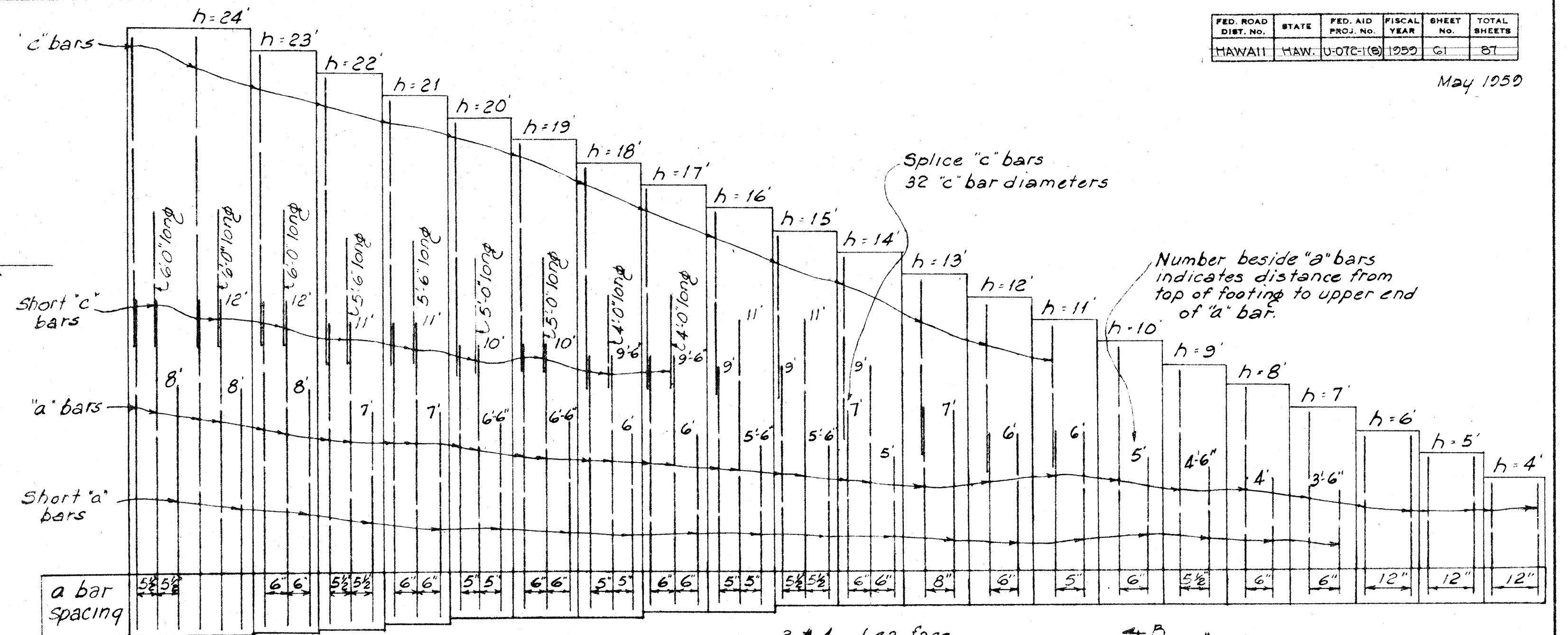
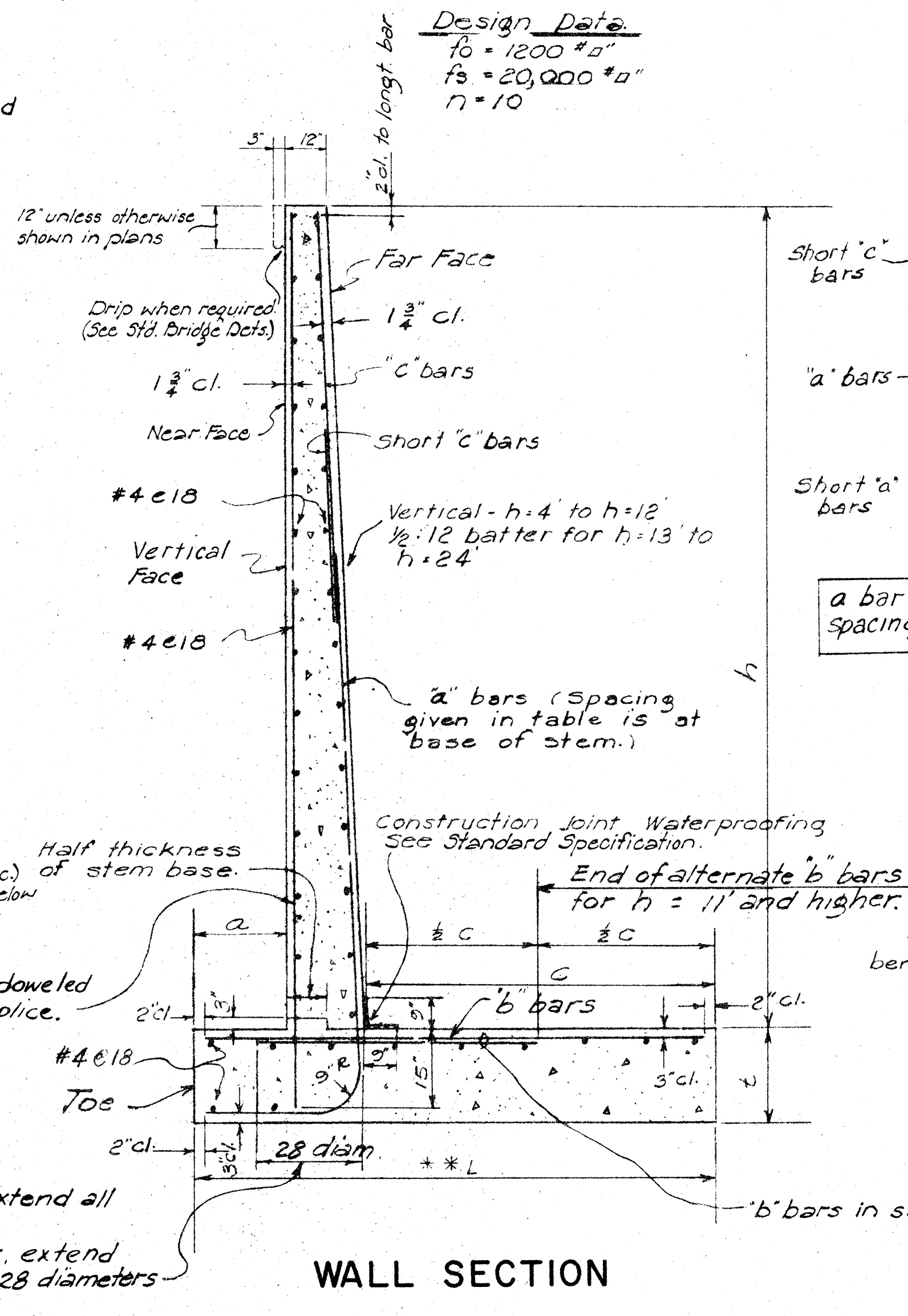
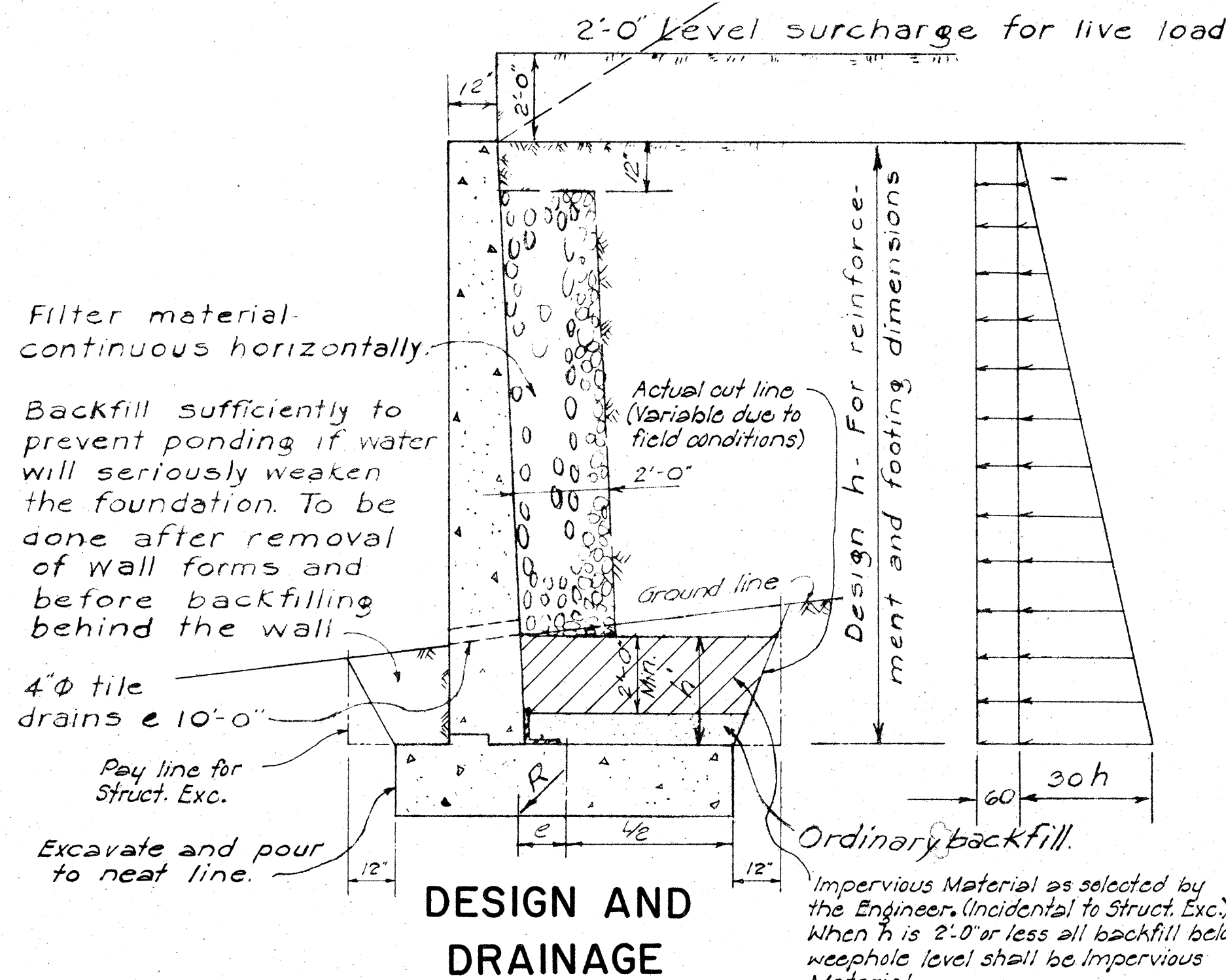
Not to Scale

SHEET No. 17 OF 20 SHEETS

\$183.59

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
QUANTITIES CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

May 1950



- SPECIAL CASES:**
- Retaining walls shown are also applicable for the following conditions of loading:
- For h=4' to 7'
 1.5:1 or less sloping surcharge unlimited
 1.5:1 sloping surcharge limited to $\frac{2}{3}H = 2.3$
 - For h of 8 and 9'
 1.6:1 or less sloping surcharge unlimited
 1.5:1 sloping surcharge limited to $\frac{2}{3}H = 1.8$
 - For h of 10 and 11'
 1.9:1 or less sloping surcharge unlimited
 1.5:1 sloping surcharge limited to $\frac{2}{3}H = 1.4$
 - For h=13', 14', and 15'
 2.2:1 or less sloping surcharge unlimited
 1.5:1 sloping surcharge limited to $\frac{2}{3}H = 1.2$
 - For h=18' to 21'
 2.7:1 or less sloping surcharge unlimited
 - For h=22' to 24'
 3:1 sloping surcharge unlimited

** When footing is on rock, L shall be reduced to $L_p = 0.4(h+t+2')$ to increase footing pressure. L_p shall be measured from the toe. Adjust footing design accordingly.

TABLE OF DIMENSIONS AND REINFORCING STEEL																							
h	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'		
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"		
**L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'		
t	18"	18"	18"	18"	18"	18"	18"	18"	18"	18"	18"	18"	21"	21"	24"	24"	24"	27"	30"	31"	33"		
"a" bars	#3@12	#3@12	#4@12	#3@6	#4@6	#4@5½	#5@6	#5@5	#6@6	#6@8	#6@6	#6@5½	#6@5	#7@6	#7@5	#8@6	#8@5	#9@6	#9@5½	#10@6	#10@5½		
"b" bars	#3@12	#3@12	#3@12	#3@12	#3@12	#4@11	#5@12	#5@10	#5@6	#6@8	#6@6	#6@5½	#6@5	#7@6	#7@5	#8@6	#8@5	#10@6	#10@5½	#11@6	#11@5½		
"c" bars	—	—	—	—	—	—	—	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#6	#6	#7	#7	
F.S. Sliding *	1.30	1.29	1.28	1.16	1.17	1.18	1.17	1.17	1.20	1.23	1.25	1.21	1.25	1.26	1.33	1.39	1.42	1.48	1.53	1.53	1.54		
F.S. Overturning	1.38	1.45	1.50	1.54	1.61	1.64	1.63	1.71	1.76	1.81	1.96	1.97	2.05	2.19	2.47	2.49	2.70	2.85	3.02	3.06	3.11		
Concr. C.Y./ft	0.29	0.35	0.42	0.48	0.55	0.61	0.68	0.74	0.81	1.00	1.10	1.19	1.37	1.49	1.69	1.83	1.97	2.26	2.53	2.72	2.97		
Steel lbs./ft.	11.1	13.8	18.3	20.5	27.8	33.4	44.7	51.0	67.7	59.6	76.2	87.8	103.7	125.8	145.4	178.3	222.7	249.2	273.4	339.0	376.6		
Eccentricity e	0.88'	1.01'	1.14	1.21	1.20	1.42	1.63	1.63	1.74	1.83	1.83	1.89	1.93	1.89	1.98	1.94	1.86	2.00	1.75	1.82	1.82		
Toe Pressure	2800	2600	3200	2800	2900	3200	3700	3600	3800	4100	3800	3900	3900	3800	3800	4000	3900	4100	3900	4100	4100		

* Special cases are not applicable if traffic can come within a distance from the top of the stem equal to one-half its height.

* F.S. Against Sliding based on friction factor of 0.40

GENERAL NOTE

Except where detailed otherwise in the plans, all details on this sheet govern.

APPROVED: _____ DATE: Aug. 25, 1950
 STATE HIGHWAY ENGINEER

HAWAII STATE HIGHWAY DEPARTMENT
 STATE OF HAWAII

RETAINING WALL STANDARDS

SCALES AS NOTED MAY 1956

SHEET NO. 19 OF 20 SHEETS

\$183.61

Depressed "V" letters 3" deep

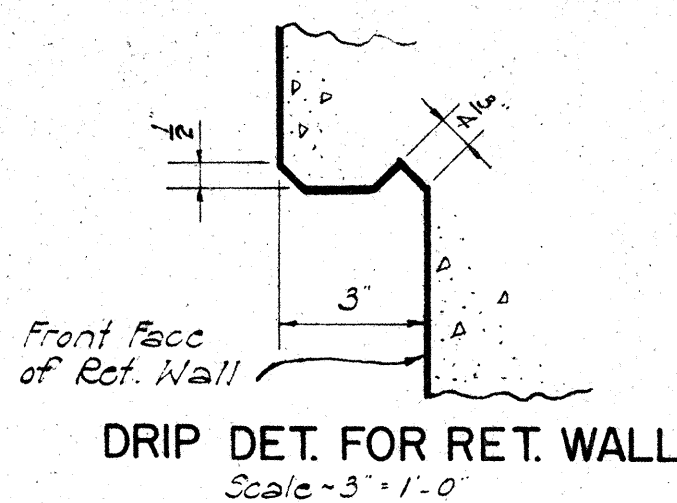
NAME **DATE**

Use correct name of bridge
LEFT HAND SIDE

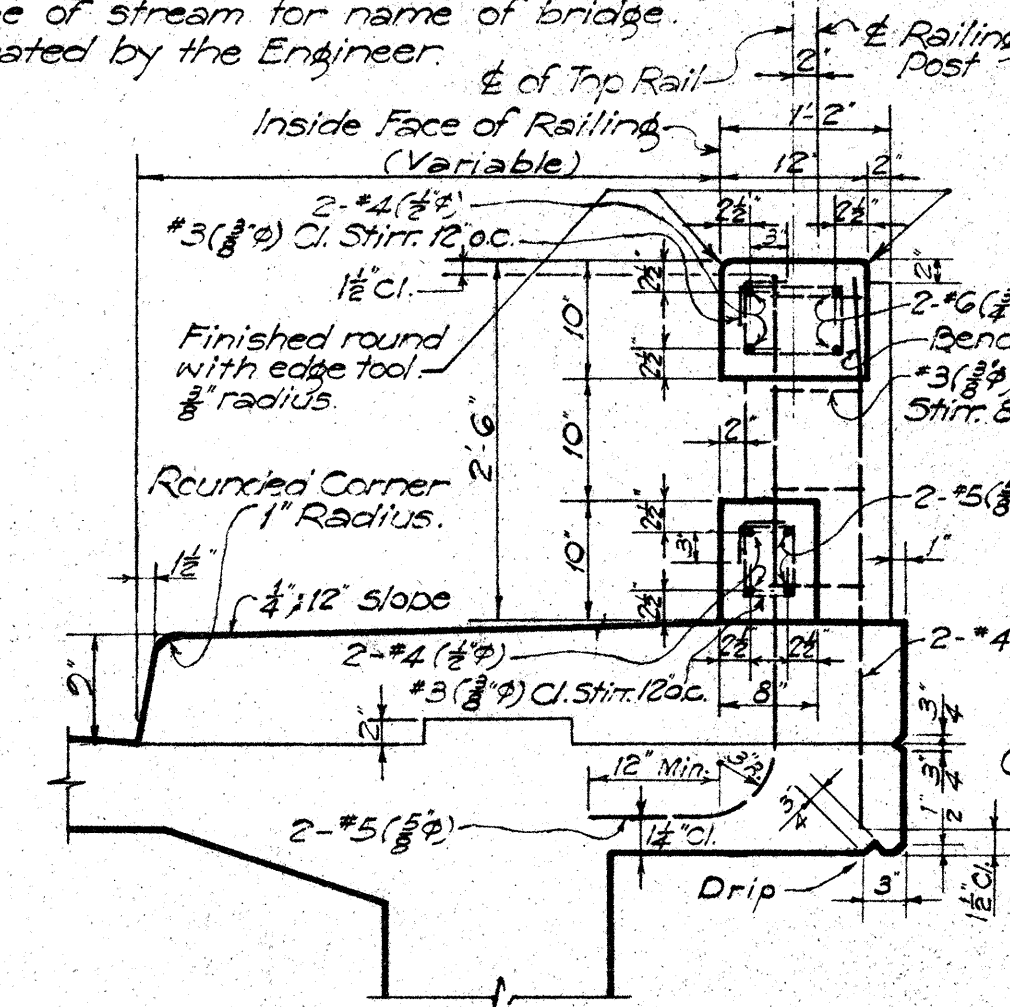
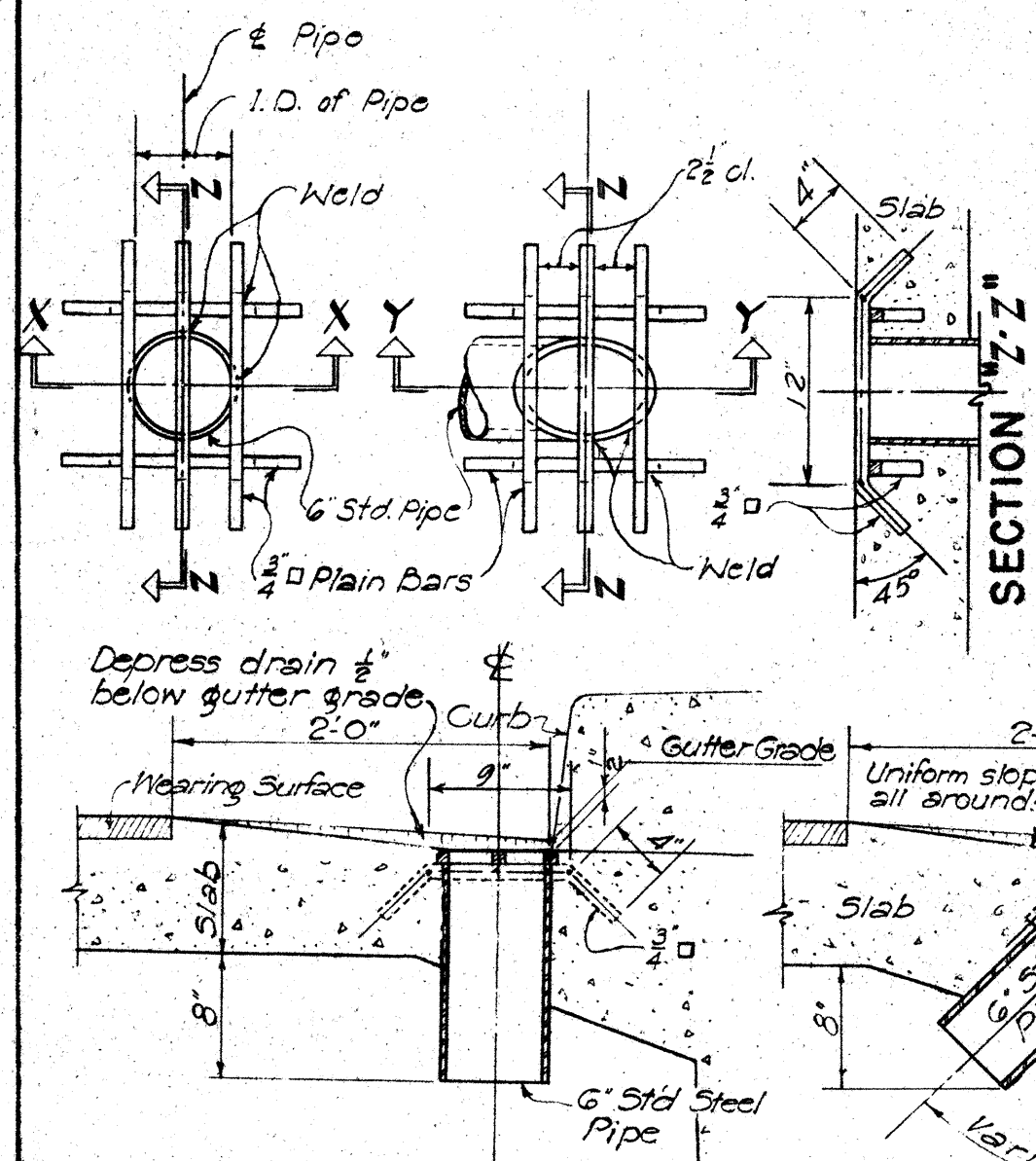
Date of year built
RIGHT HAND SIDE

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.



END POST GROOVE DET.
Scale: 5/8" = 1'-0"



NOTE! Sidewalk, curb and railing to be poured after release of falsework. Forms for railing and endpost to be made of 2x4's.

SURFACE FINISH: The surface of the concrete railings shall be given a Class 2 Rubbed Finish as specified under Sub-article 46.3 (1) (3) of Section 46 Concrete of the Standard Specifications.

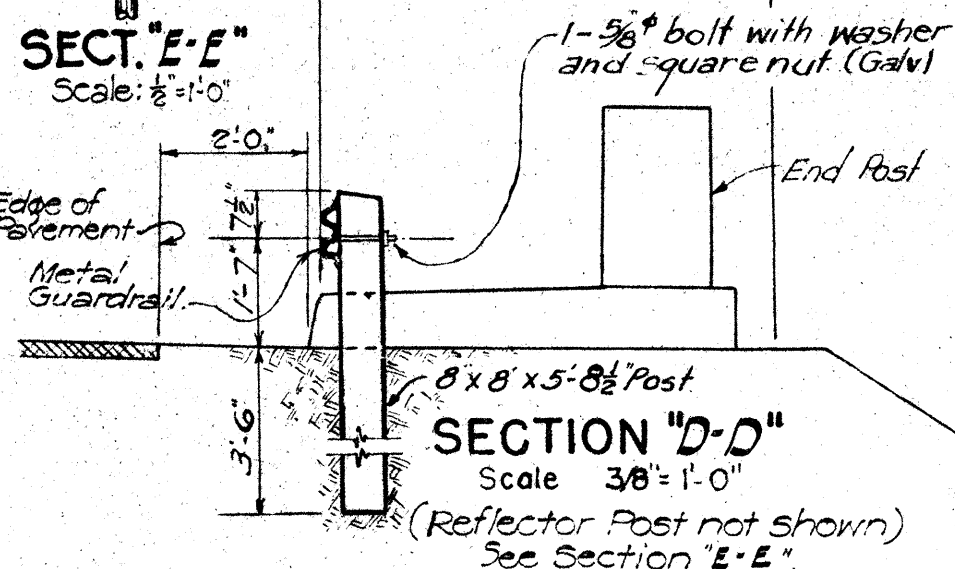
NOTE! Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately.

Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.

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

SECTION "X-X" DRAINAGE DETAIL

Scale: 1" = 1'-0"



NOTE!! See REGULATORY & WARNING Signs Sheet for details of W-42, W-43, and railing posts. See 5th Detail Sheet for reinforcement of conc. posts.

SECTION "F-F"

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

8x8x5-8 1/2 Post
See Proposal Schedule for material.

Shoulder Line

End Post
W-42 Reflector Post

Top Curb
3/4"

End of Bridge

12'-6" Spacing for Stakeout of Guardrail Flare (Not for location of posts)

PLAN - METAL GUARDRAIL FLARE
Scale: 1/8" = 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. A-15 Intermediate grade.

Steel shall be made by the open-hearth process. Deformations shall conform to A.S.T.M. A-305.

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 electrically 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.

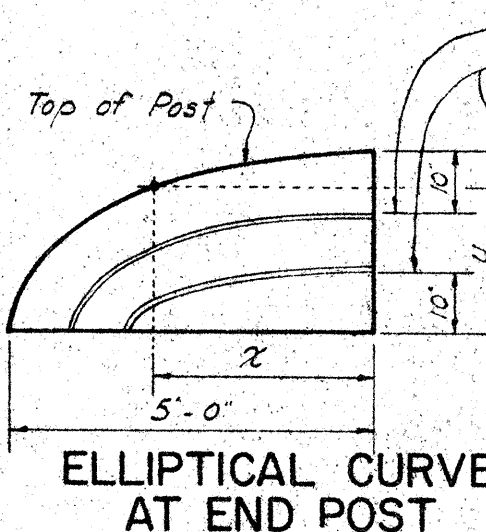
Minimum covering, measured from the surface of the concrete to the face of any reinforcing bar, shall be not less than 2 inches except in slabs where the minimum covering shall be 1 1/2 inch. In the footings of abutments and retaining walls and in piers the minimum covering shall be 3 inches. In work 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. 46.3F(3) of the "Standard Specifications".

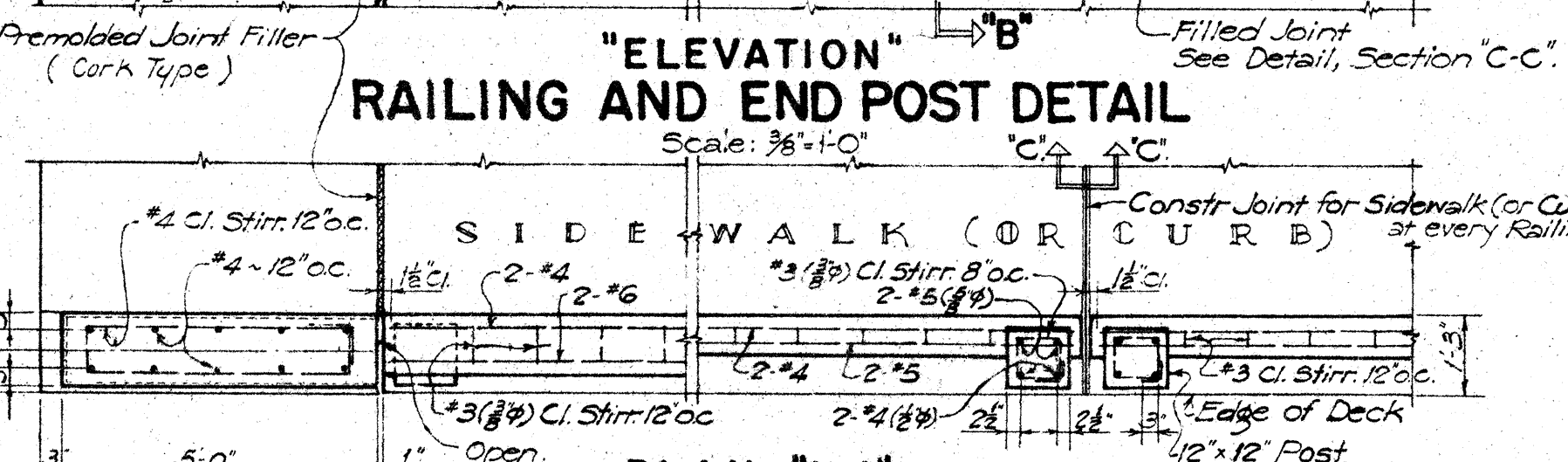
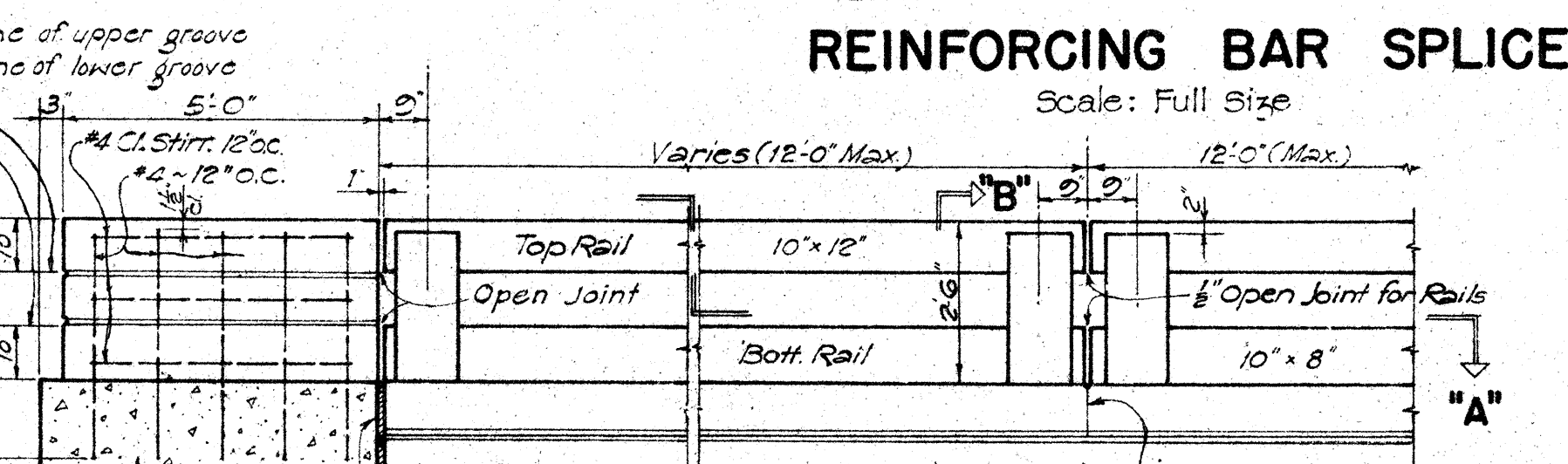
ELLIPSE COORDINATES

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



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	0.25	0.24	0.23	0.22	0.20	0.18
37.5	1.69	1.44	1.23	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					5.93	5.12
112.5					7.00	6.48
125.0						8.00



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

Widen for pedestrian walkway when required.

Edge of Pavement

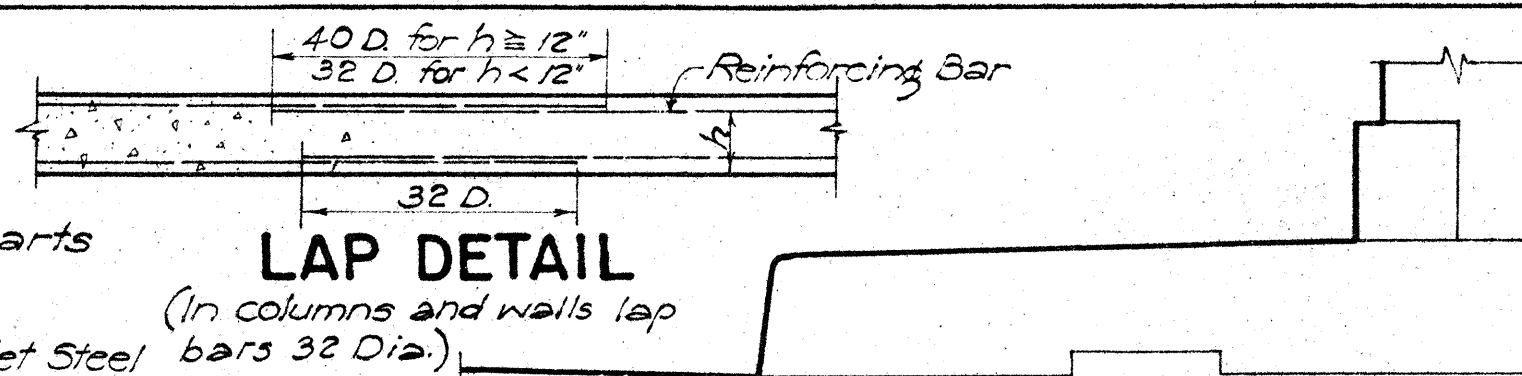
Edge of Pavement

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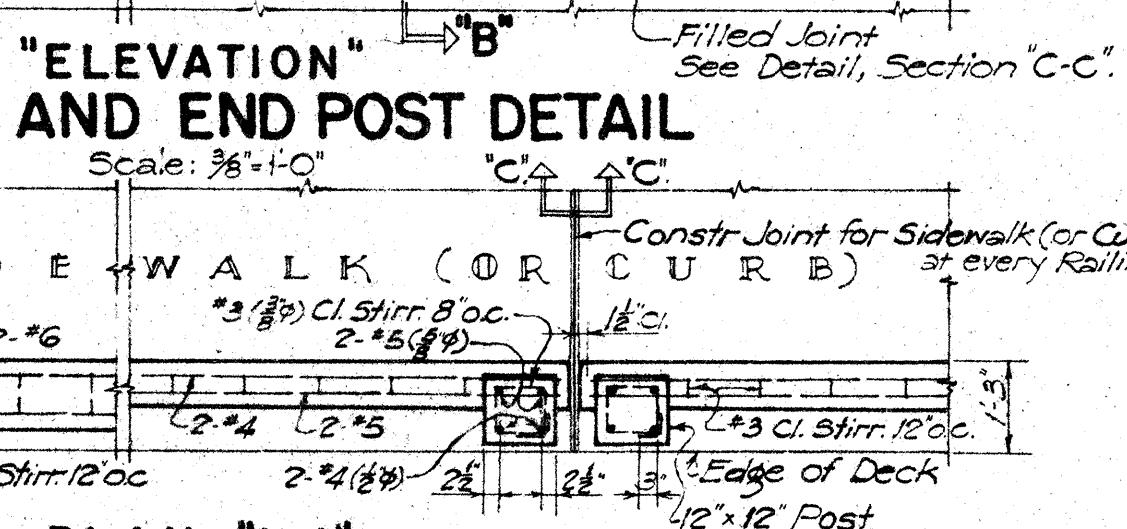
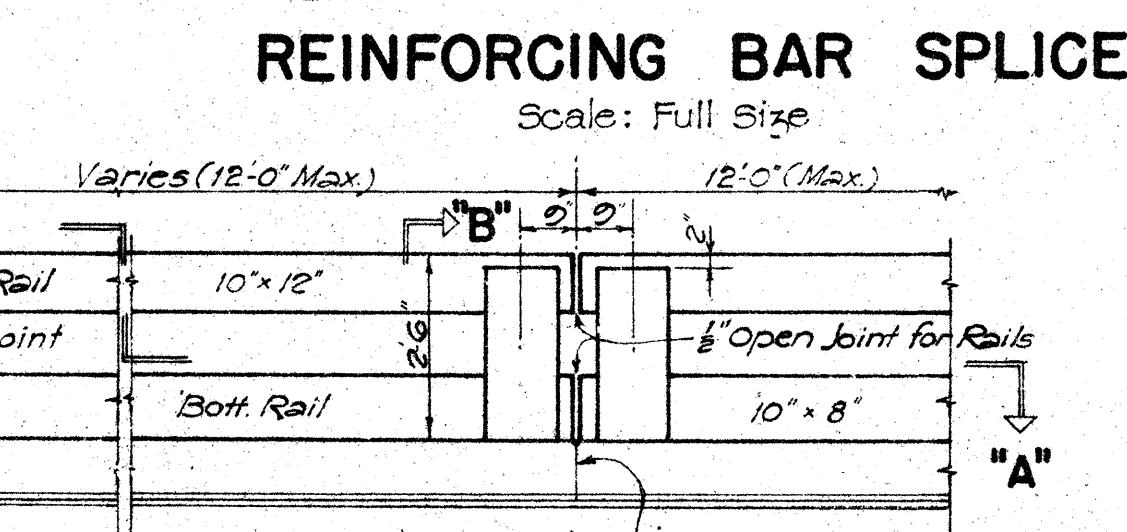
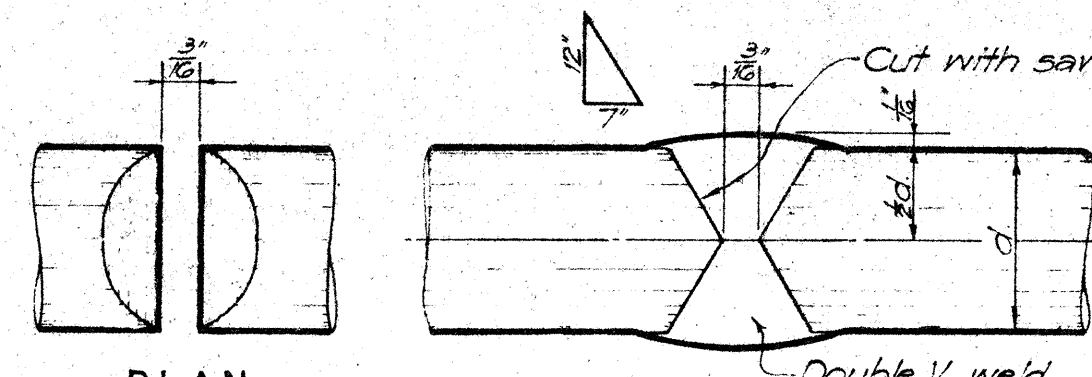
Provide opening of sufficient size to insert head of bolt.

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.



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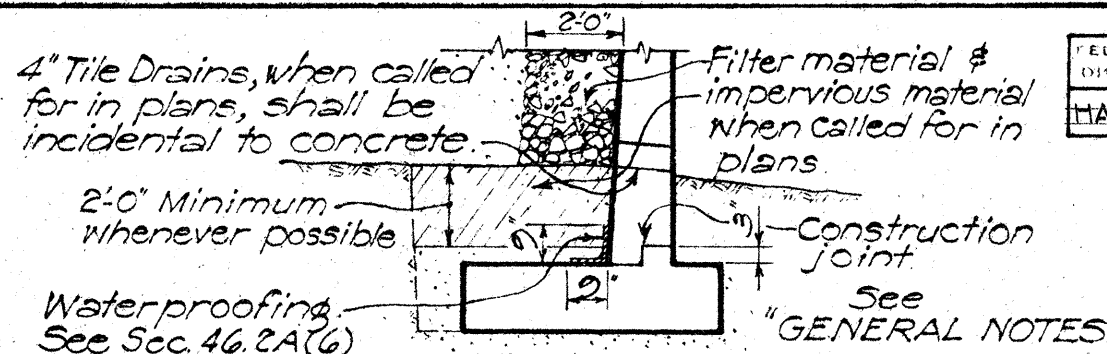
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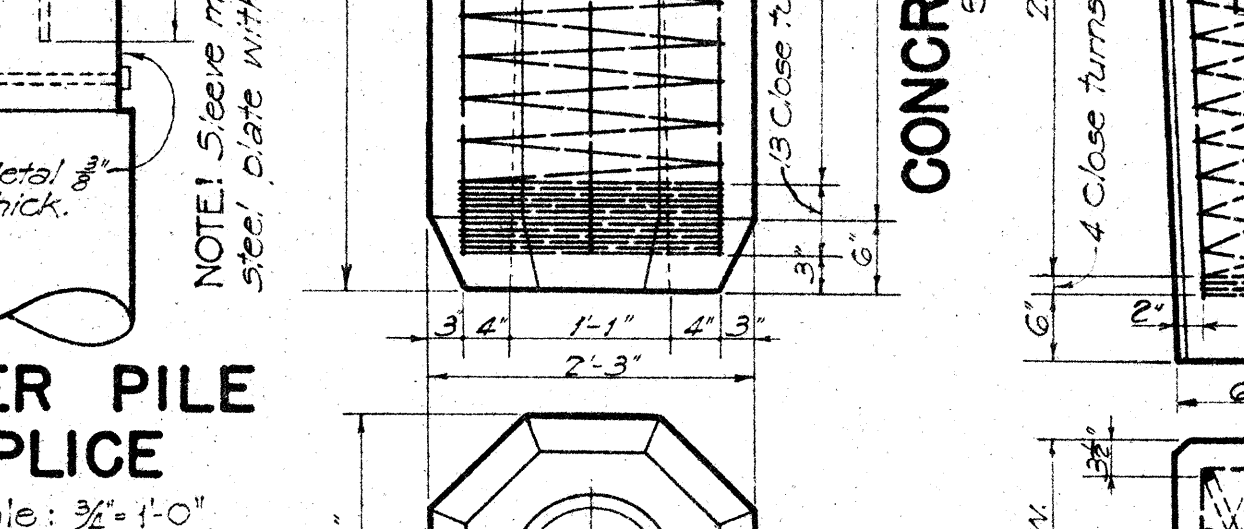
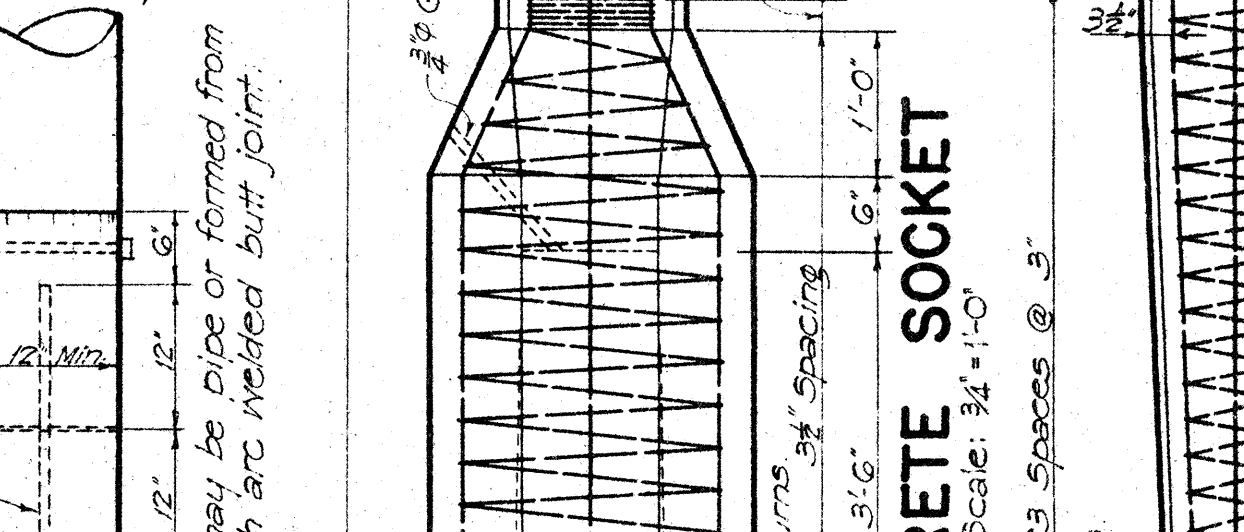
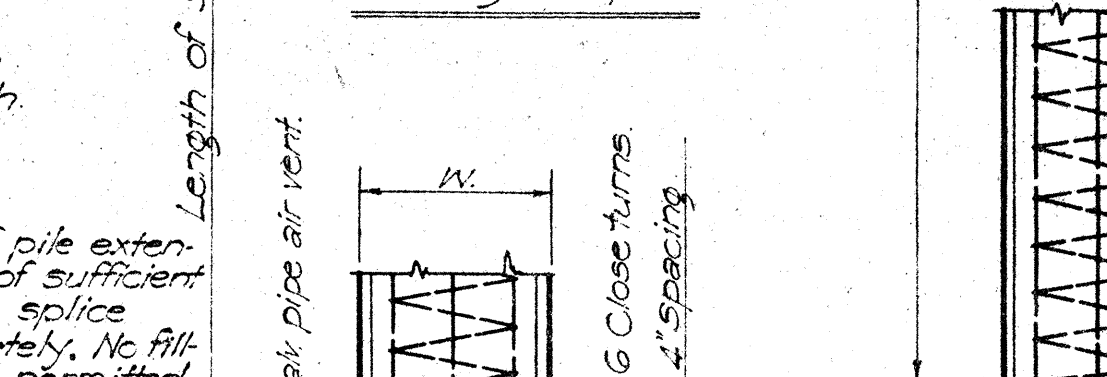
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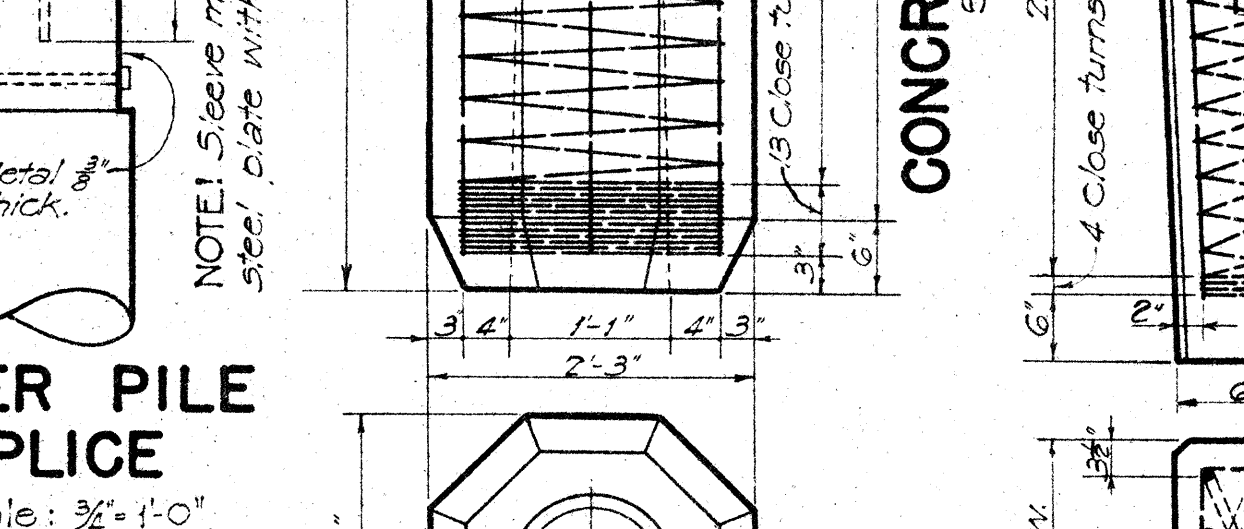
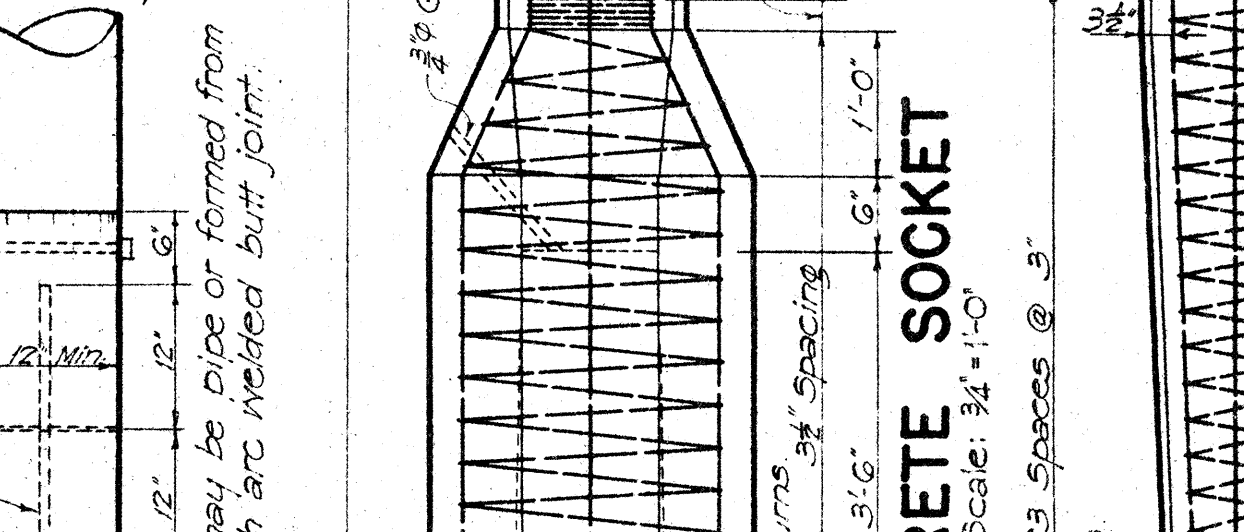
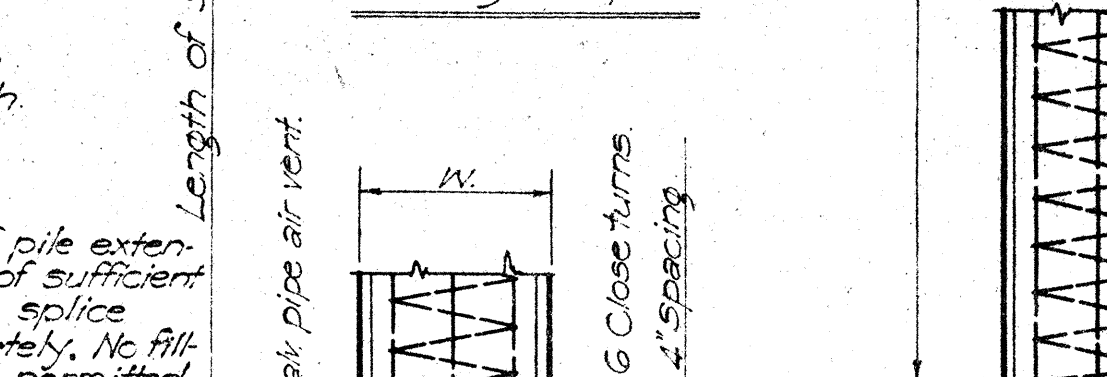
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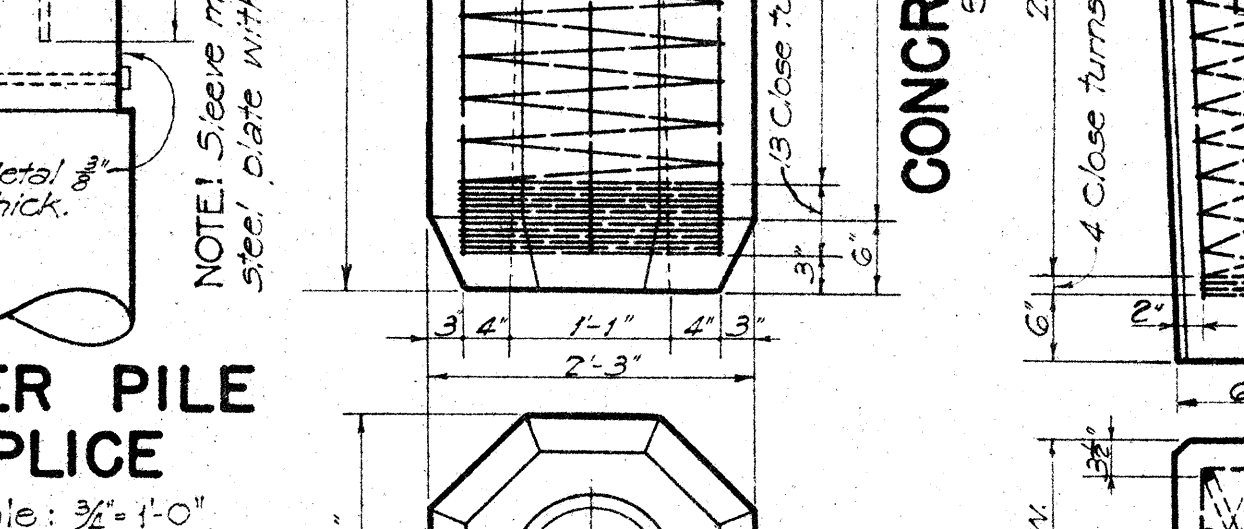
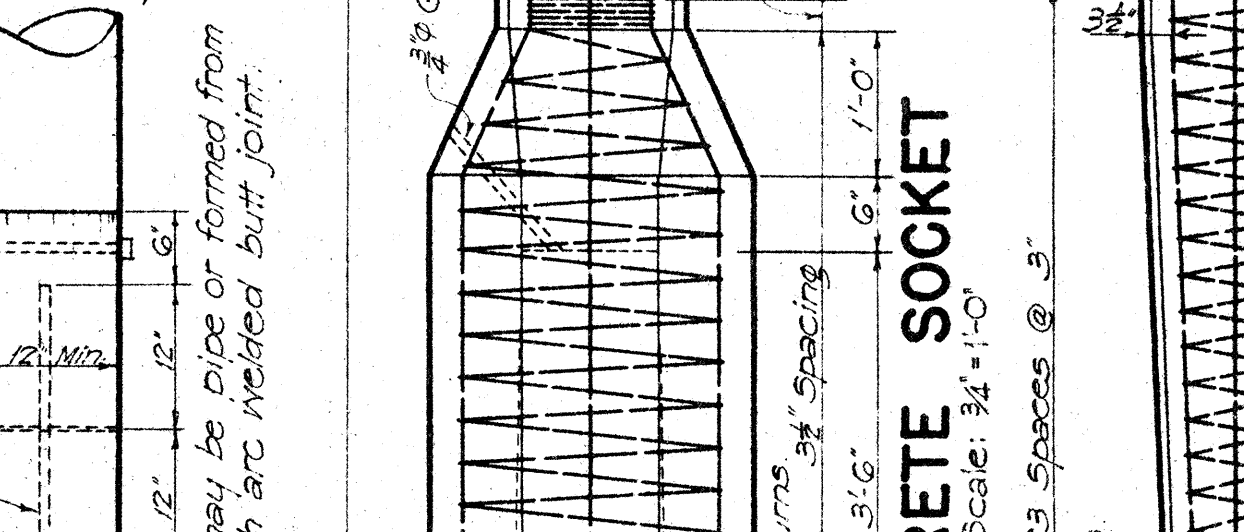
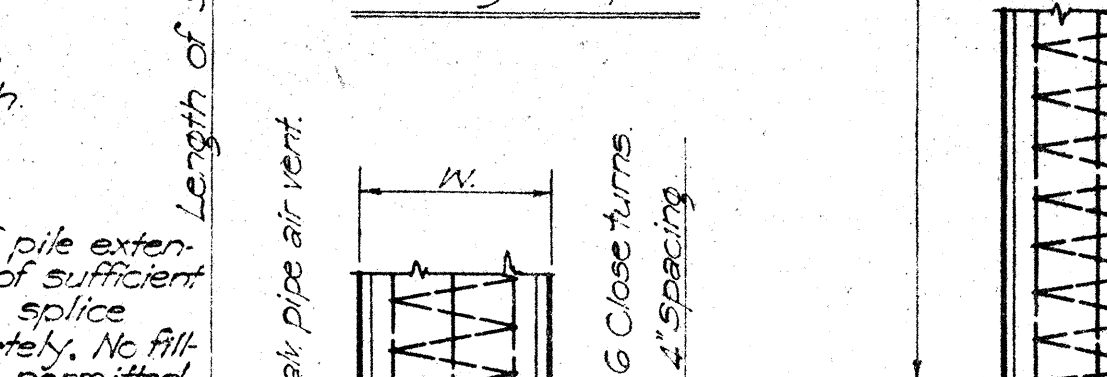
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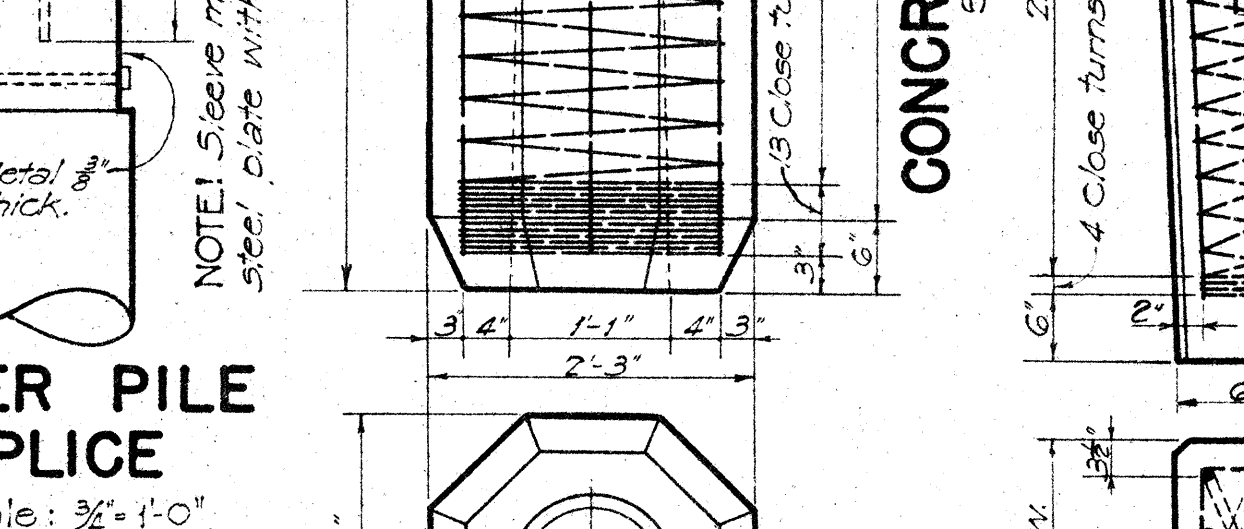
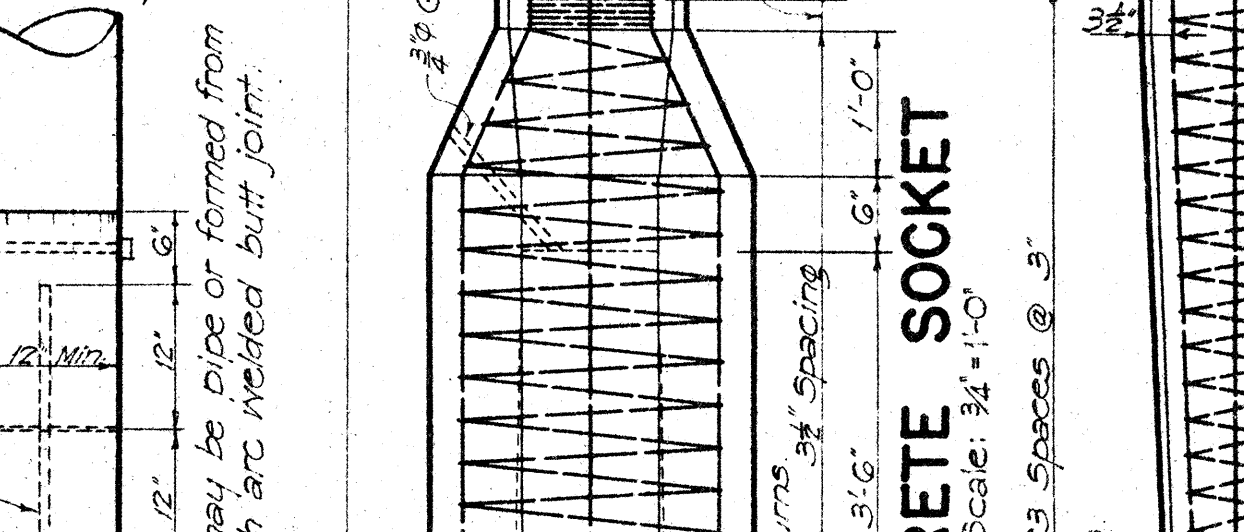
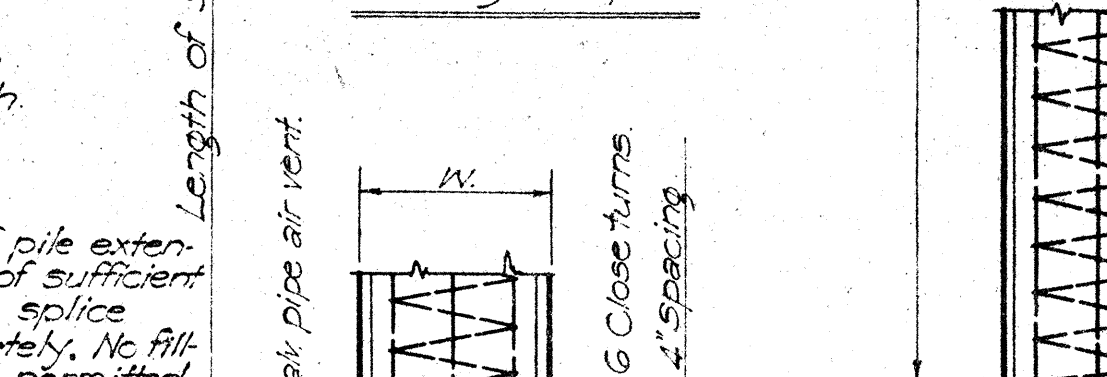
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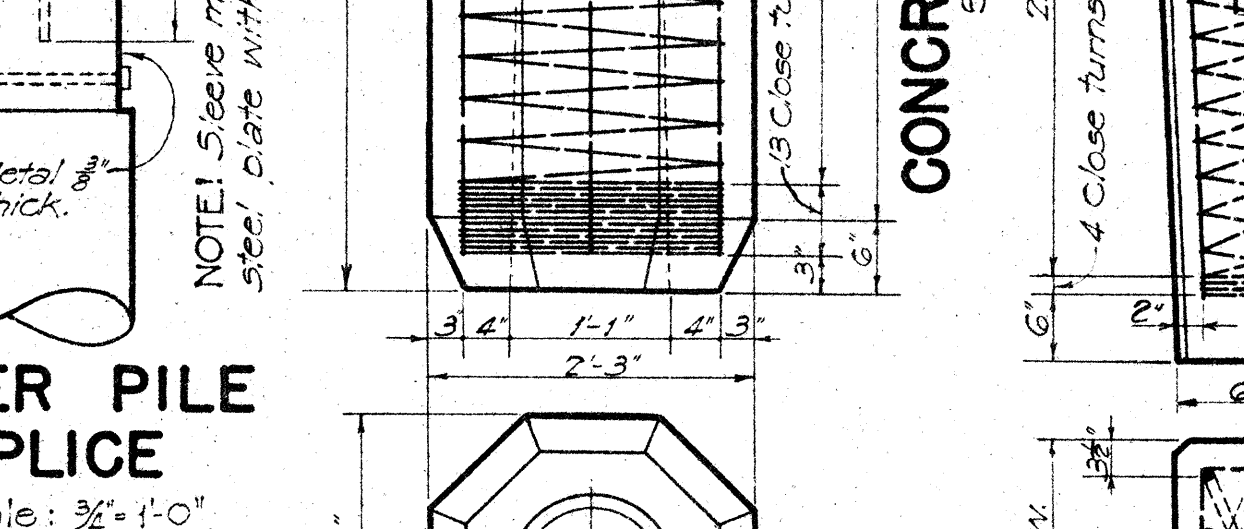
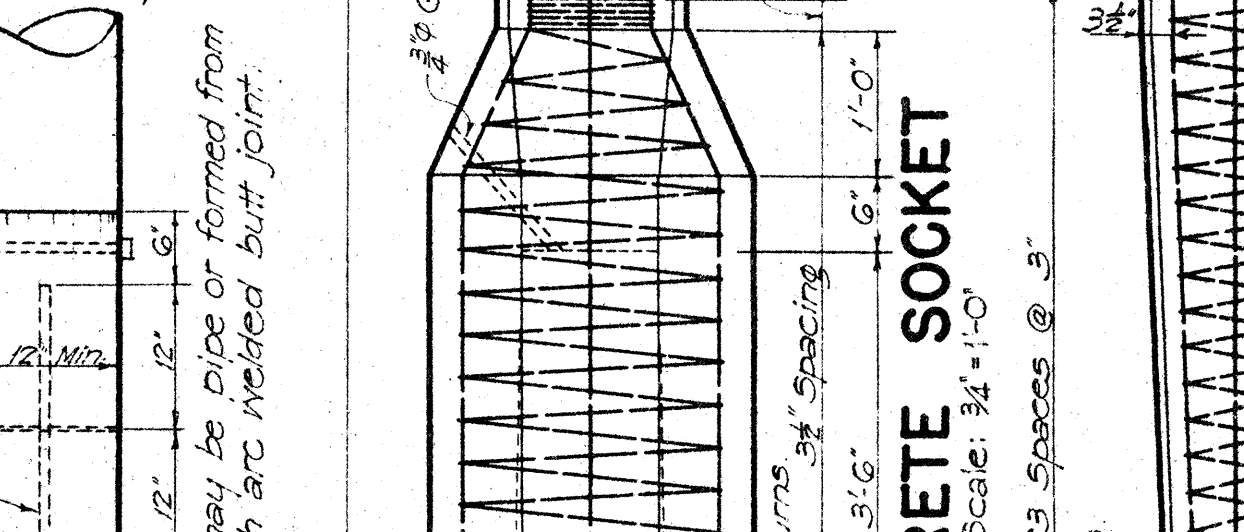
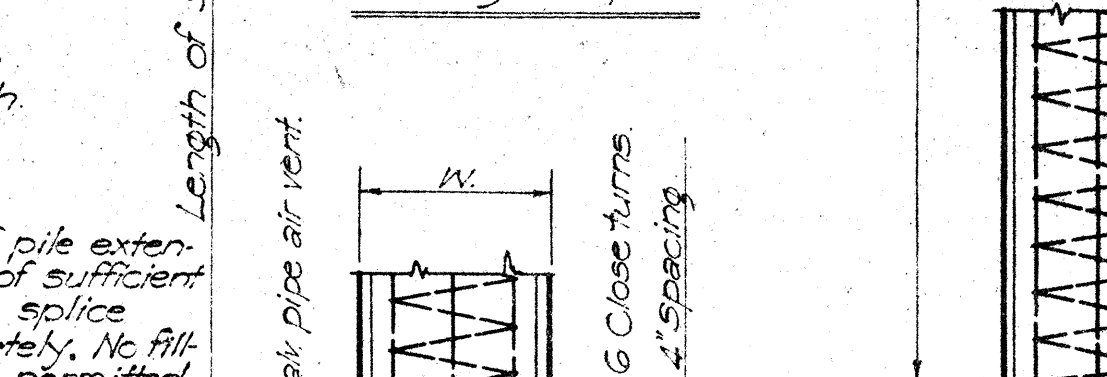
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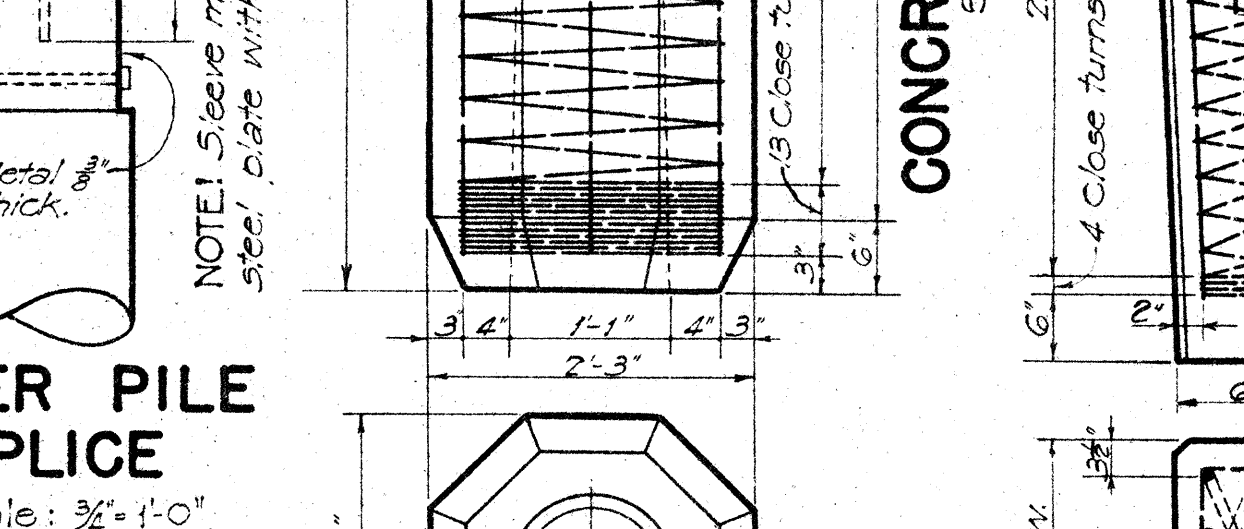
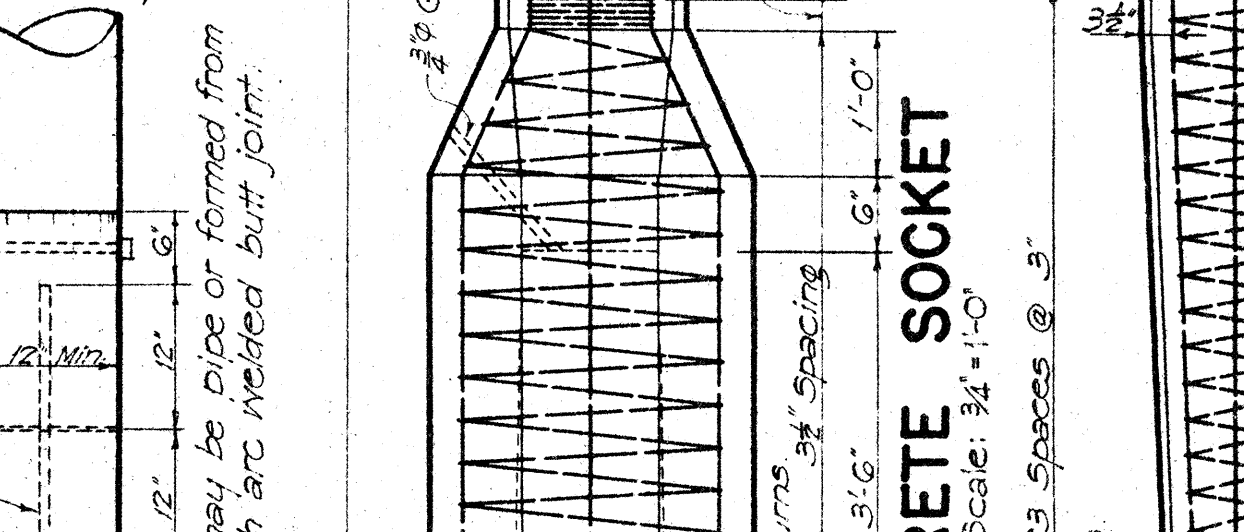
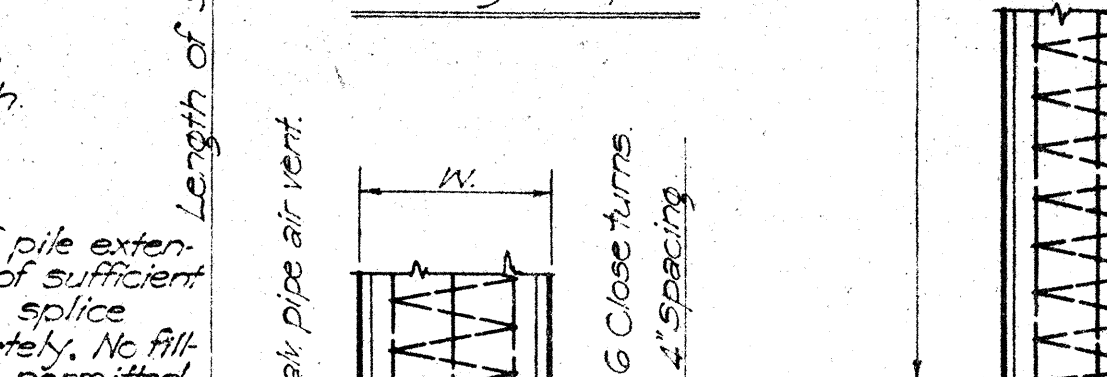
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