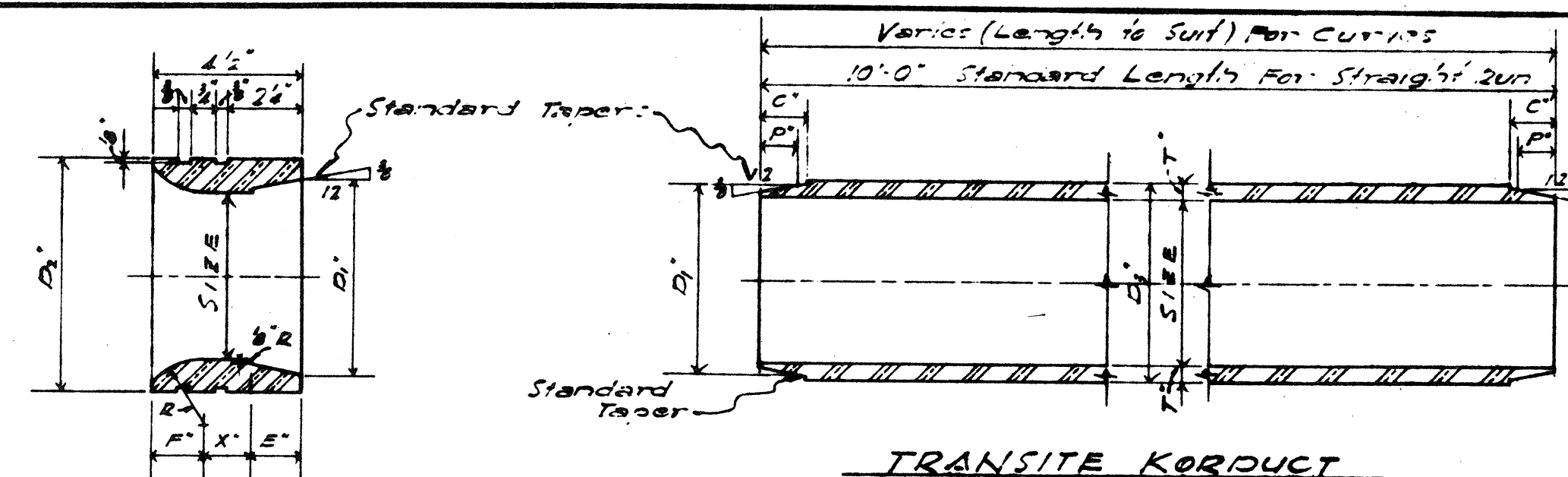
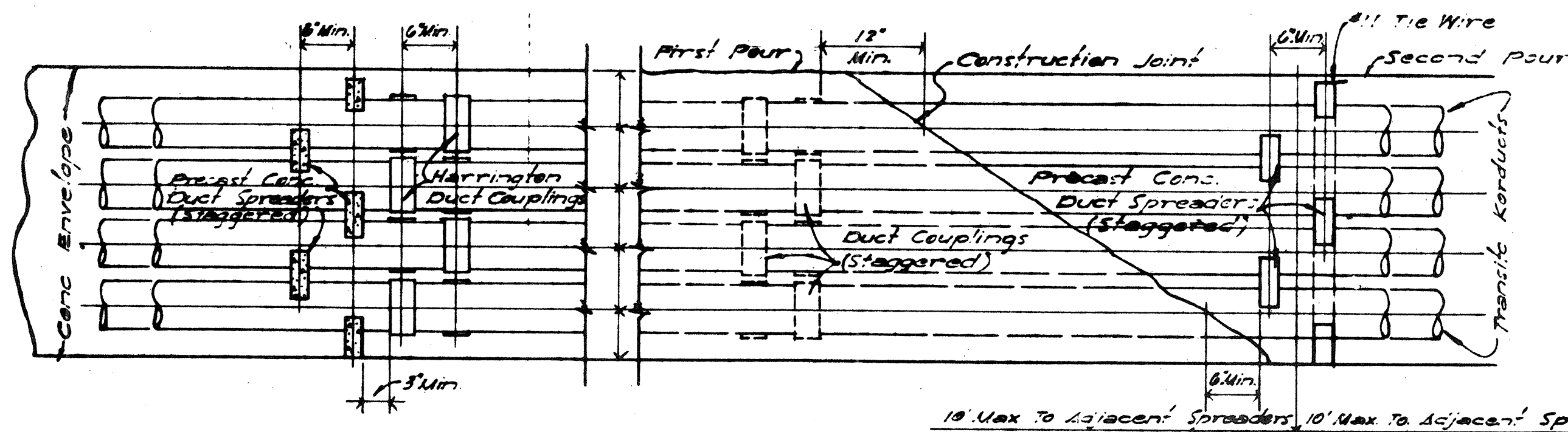


FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
nd (a) 1040 (1)	MASS	US-0780-(3) UNIT 3	1960	34	79
1040 (2)		BU-005-(1) UNIT 3	1960	53	115
		BU-078-(2) UNIT 4	1960	55	118

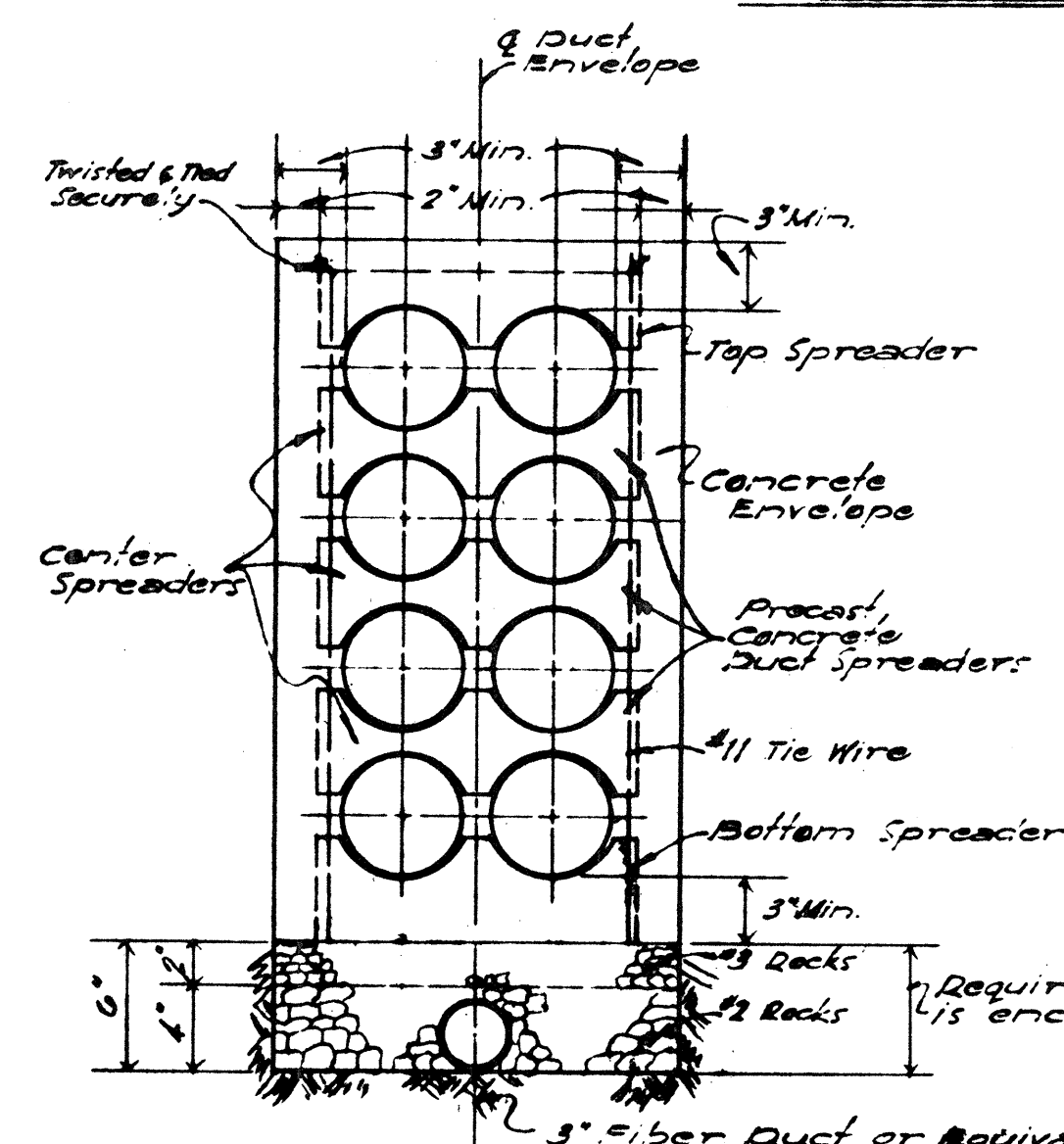


<u>3'-10"</u>						
<u>SIZE</u>	<u>D₁"</u>	<u>D₂"</u>	<u>F"</u>	<u>X"</u>	<u>E"</u>	<u>R</u>
3"	3 $\frac{11}{16}$	4 $\frac{1}{2}$	1 $\frac{11}{16}$	1 $\frac{11}{16}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
4"	4 $\frac{11}{16}$	5 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2
4 $\frac{1}{2}$ "	4 $\frac{15}{16}$	6 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2
5"	5 $\frac{15}{16}$	7	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2

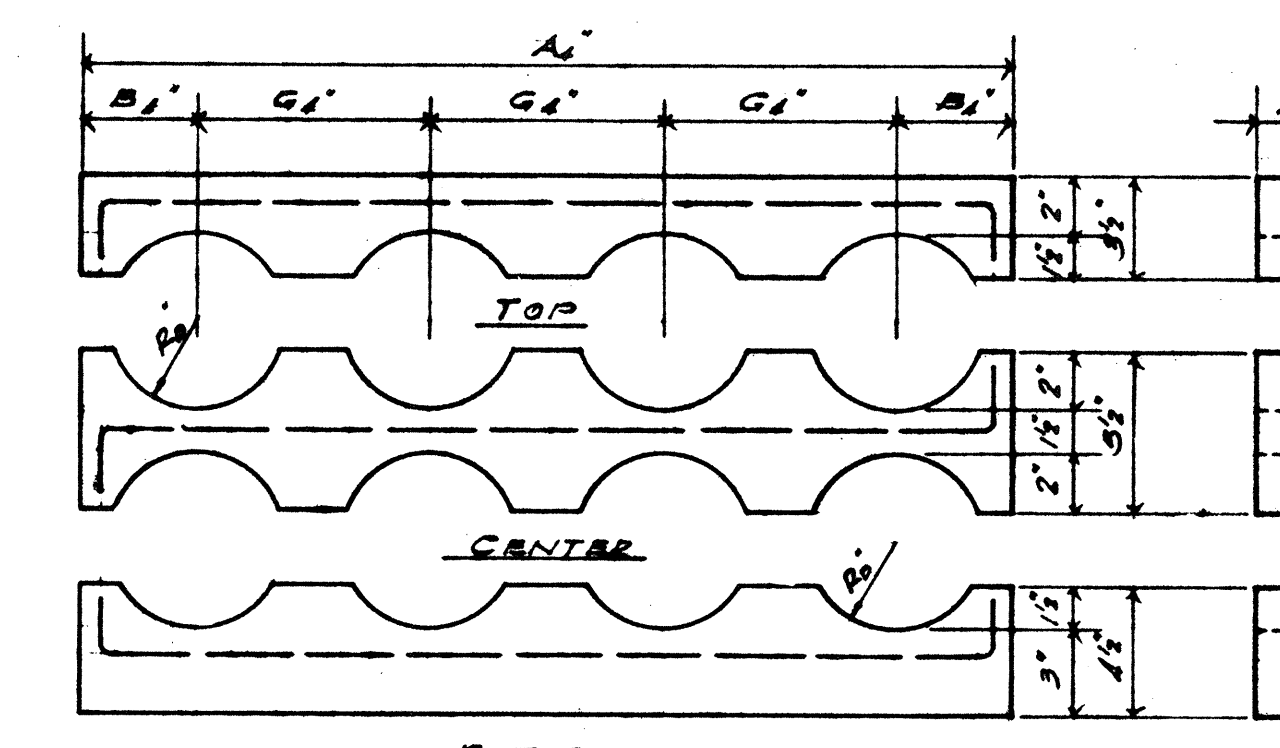
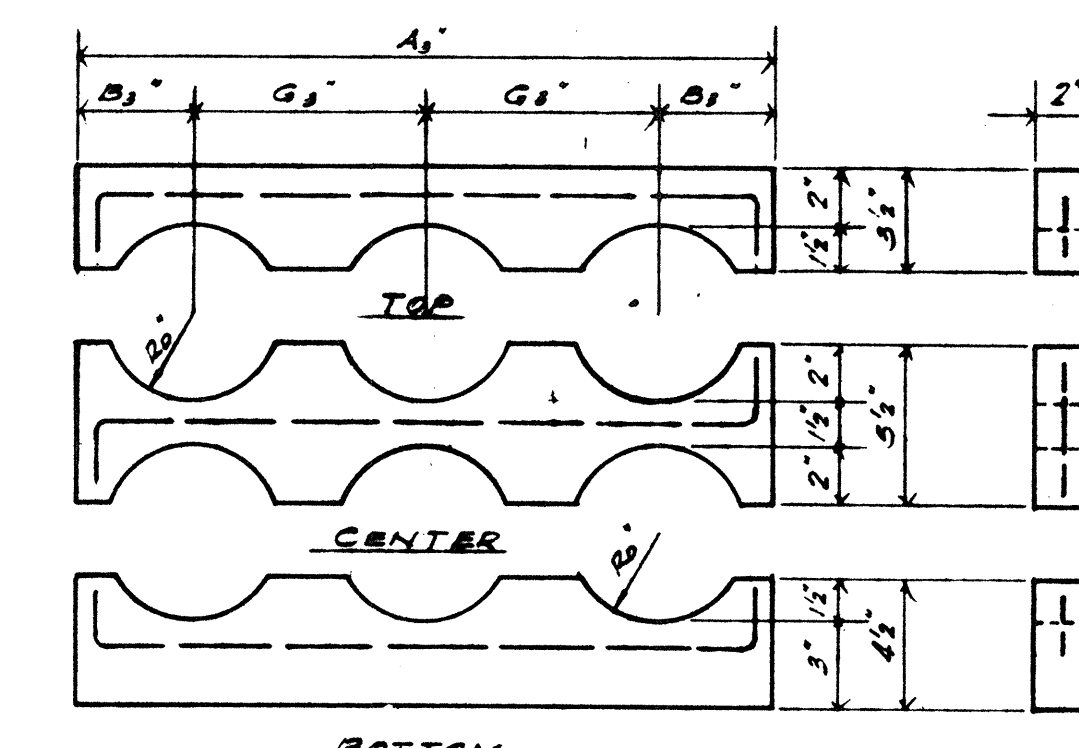
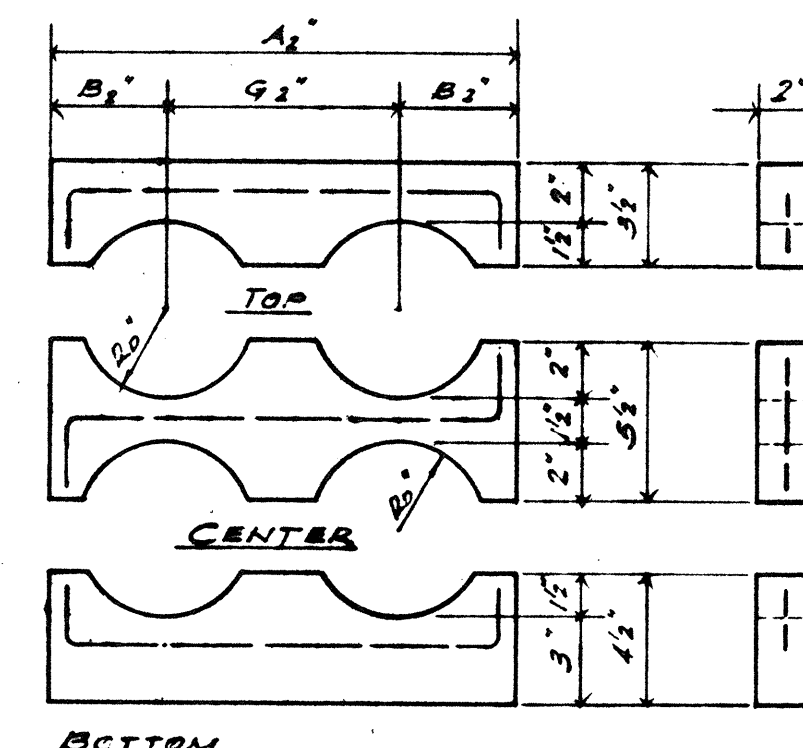
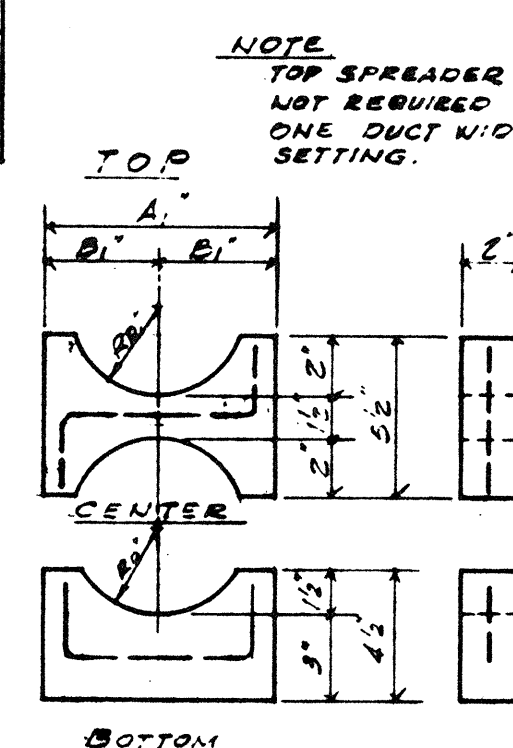
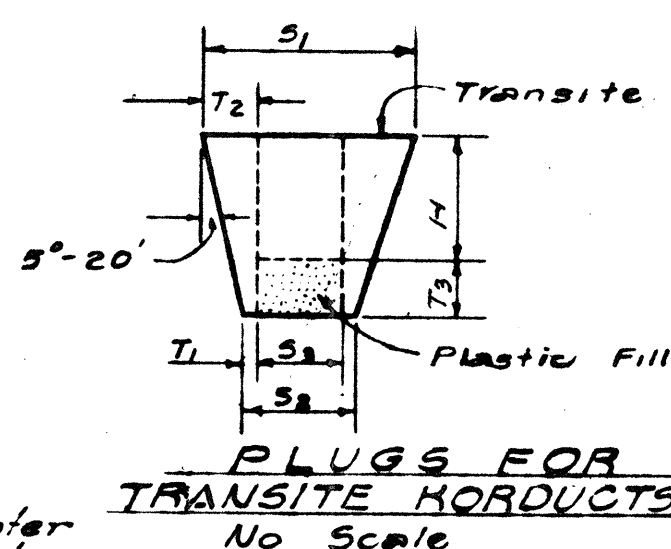
SIZE	D ₁ "	D ₂ "	C"	P"	L"
3"	3 $\frac{55}{64}$	3 $\frac{31}{64}$	1 $\frac{1}{8}$	7	1 $\frac{1}{2}$
4"	4 $\frac{11}{16}$	4 $\frac{1}{8}$	1 $\frac{1}{2}$	1	1 $\frac{1}{2}$
4 $\frac{1}{2}$ "	4 $\frac{1}{2}$	5 $\frac{1}{8}$	1 $\frac{1}{2}$	1	1 $\frac{1}{2}$
5"	5 $\frac{55}{64}$	5 $\frac{31}{64}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{2}$

HARRINGTON
COUPLINGS
3" - 1'-8"

SIZE	D ₁ "	D ₂ "	L"
3"	3 ⁵ / ₈	4 ¹ / ₄	2 ¹ / ₄
4	4 ¹ / ₂	5 ¹ / ₈	2 ¹ / ₂
4 1/2	4 ⁵ / ₈	5 ³ / ₈	2 ¹ / ₂
5"	5 ¹ / ₂	6 ³ / ₈	2 ³ / ₄

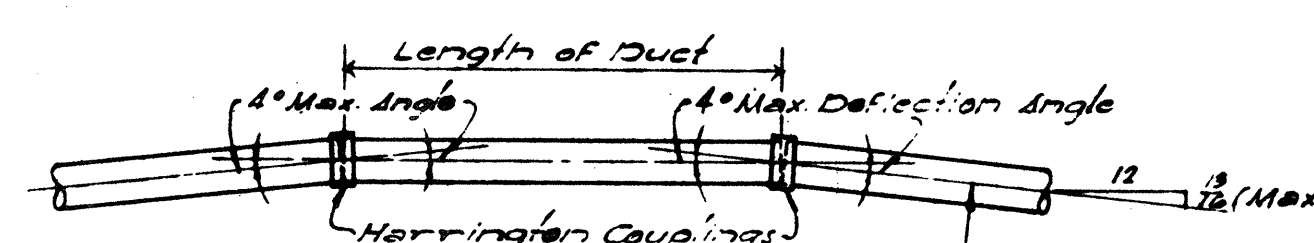
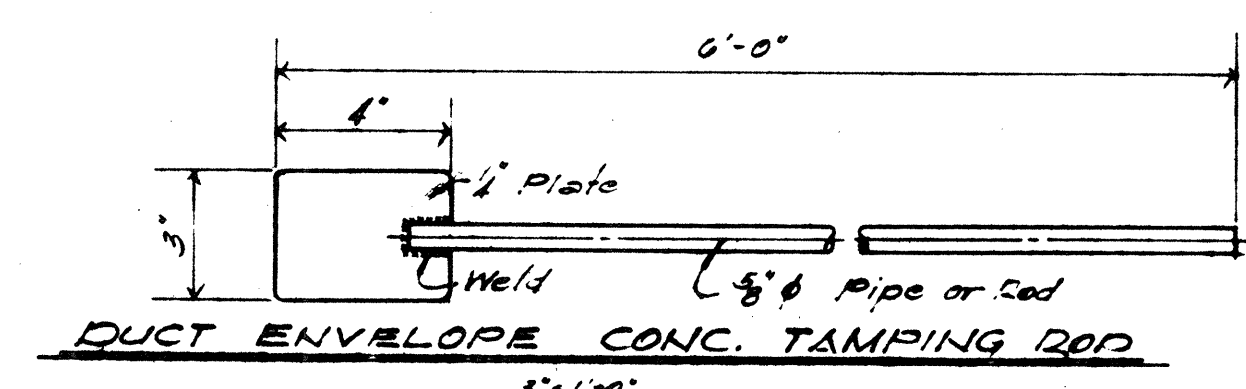


SIZE	H	S ₁	S ₂	S ₃	T ₁	T ₂	T ₃
3"	4	3 $\frac{3}{8}$	2 $\frac{5}{8}$	2	$\frac{5}{16}$	$\frac{11}{16}$	$\frac{3}{4}$
4"	4 $\frac{1}{2}$	4 $\frac{21}{32}$	3 $\frac{27}{32}$	2 $\frac{3}{4}$	$\frac{13}{32}$	$\frac{21}{32}$	$\frac{3}{4}$
4 $\frac{1}{2}$ "	4 $\frac{1}{2}$	4 $\frac{23}{32}$	4 $\frac{25}{32}$	3	$\frac{25}{64}$	$\frac{31}{32}$	$\frac{3}{4}$
5"	4 $\frac{1}{2}$	5 $\frac{27}{32}$	4 $\frac{37}{32}$	3 $\frac{1}{2}$	$\frac{15}{32}$	$\frac{31}{32}$	$\frac{3}{4}$

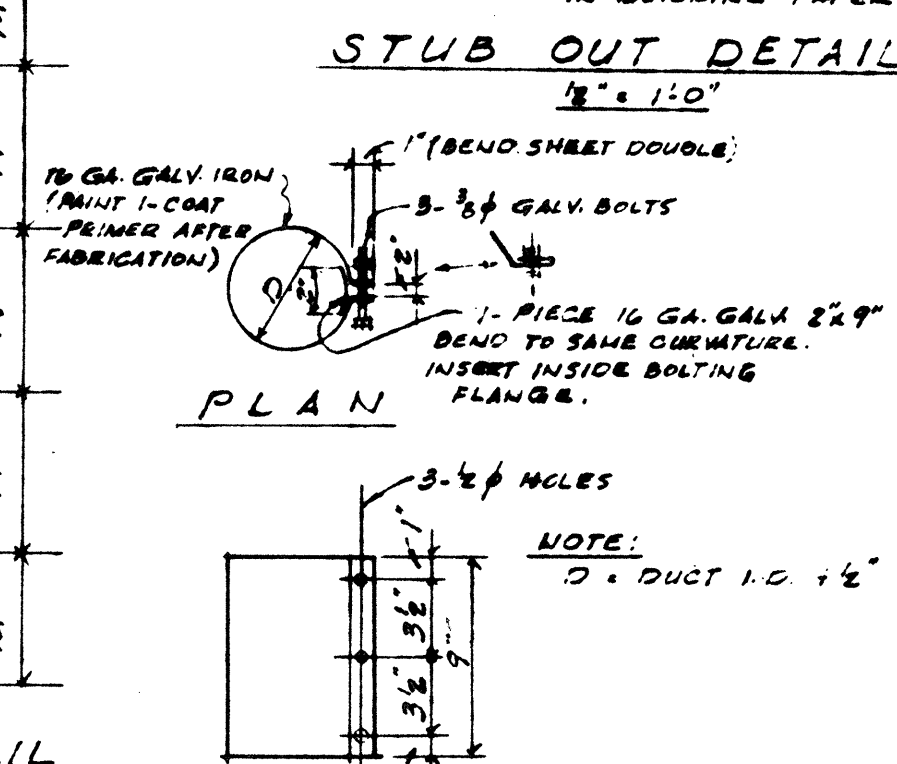
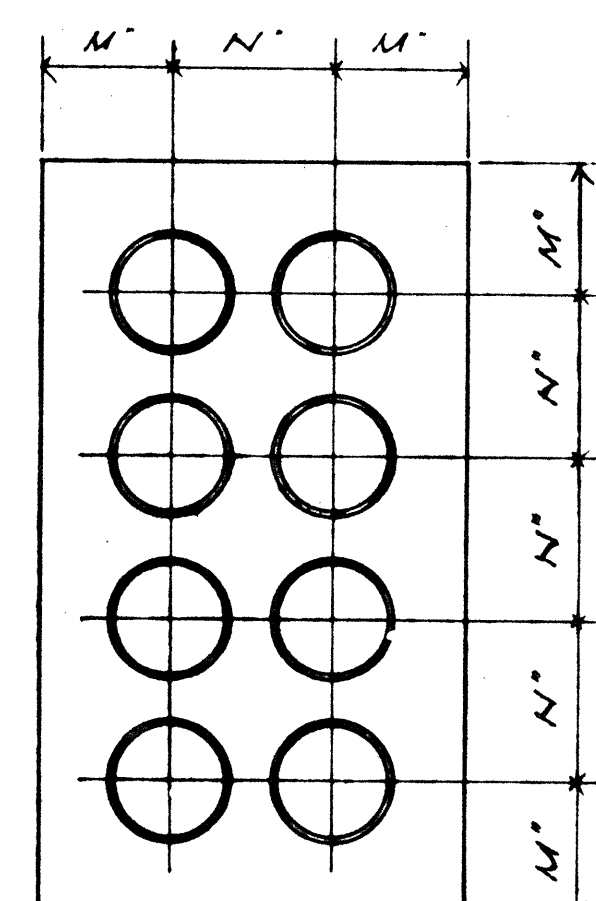
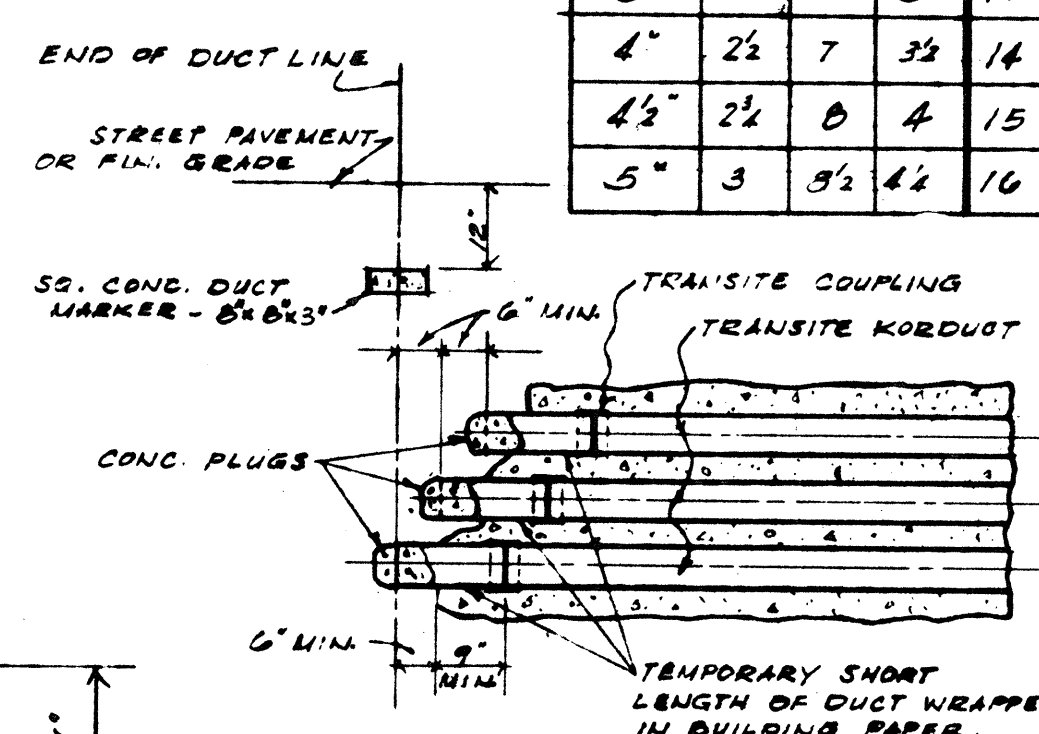
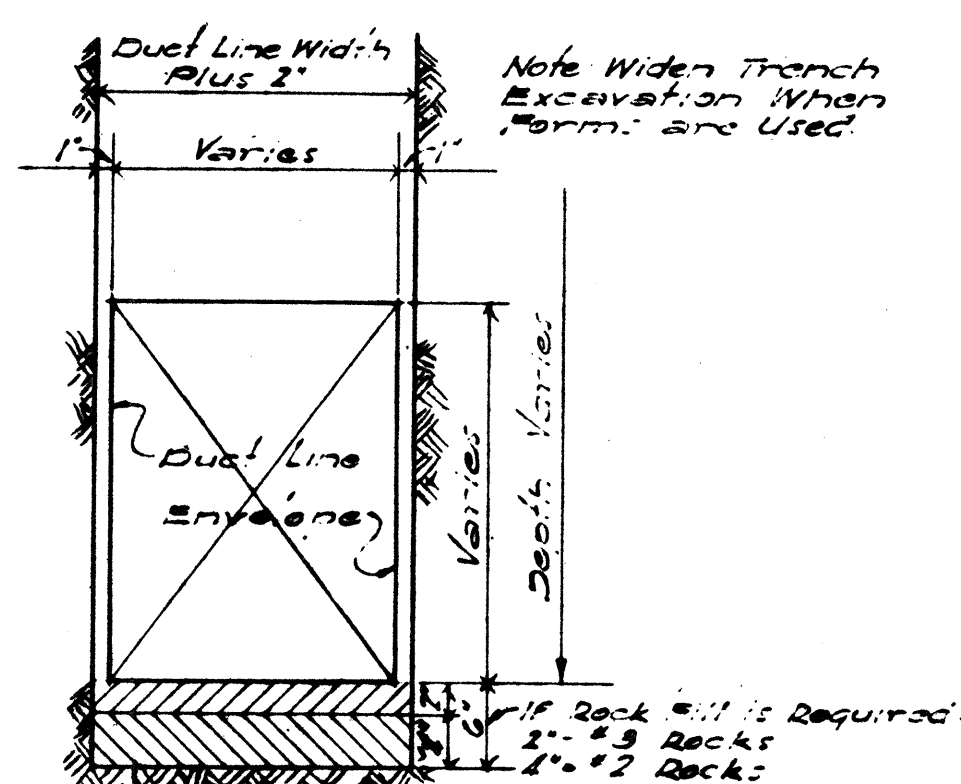


PRECAST CONCRETE DUCT SPREADER DETAILS														
2'-1'-0"														
		1 DUCT WIDE		2 DUCTS WIDE			3 DUCTS WIDE			4 DUCTS WIDE				
SIZE	R ₀	A ₁ '	B ₁ '	A ₂ '	B ₂ '	G ₂ '	A ₃ '	B ₃ '	G ₃ '	A ₄ '	B ₄ '	G ₄ '		
3"	2	6	3	12	3½	5½	17½	3½	5½	23	3½	5½		
4"	2½	7	3½	14	3¾	6½	20½	3¾	6½	27	3¾	6½		
4½"	2¾	8	4	15	4	7	22	4	7	29	4	7		
5"	3	9½	4½	16	4½	7½	23½	4½	7½	31	4½	7½		

NOTES: DUCT SPREADERS
Reinforcing
1- $\frac{1}{4}$ " ϕ Bar each spreader
Concrete Mix
One Part Cement.
Two Parts Beach Sand.
Two Parts Gravel $\frac{3}{4}$ " (Fine).
Measurements by Weight.



MIN. RAD.	MIN. RAD.
1°-0'	14'-4"
1°-0'	21'-0"
2°-0'	28'-8"
2°-0'	35'-10"
3°-0'	42'-11"
3°-0'	50'-1"
4°-0'	57'-3"
4°-0'	64'-5"
5°-0'	71'-7"
5°-0'	78'-9"
6°-0'	85'-11"
6°-0'	93'-1"
7°-0'	100'-3"
7°-0'	107'-5"
8°-0'	114'-7"
8°-0'	121'-9"
9°-0'	128'-10"
9°-0'	136°-0'
10°-0'	143°-2'



3-BOLT CLAMP-DETAIL
1 1/2" = 1'-0"

**REDUCED PLANS
SCALES REDUCED
ACCORDINGLY**

No	Date	Revision	Ints	Scale: 1" = 400' / Date: 2-20
1	5-2-56	Added 5' DUCT TO CENTRAL SPREADER	R	Drawn: J.P. / Checked: L.M.
2	1-9-57	RE-USED DEFLATION INSULA 5' TO 40'	R.Y.	Approved: J.K. / J.C. Miller
				Time: 2:00 P.M. / J.C. Miller

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
HAWAIIAN ELECTRIC CO.
STANDARD DETAILS
MOANALUA ROAD U5-5-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1 (2) UNIT 4
MIDDLE STREET BU-065-1 (1) UNIT 3
Scale: As Noted Feb. 28, 1978

SHEET No. 1 OF 6 SHEETS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCTLINES

Engineering Department
The Hawaiian Electric Company, Ltd. U-18
Honolulu, H.

\$161.53

§ 526.34

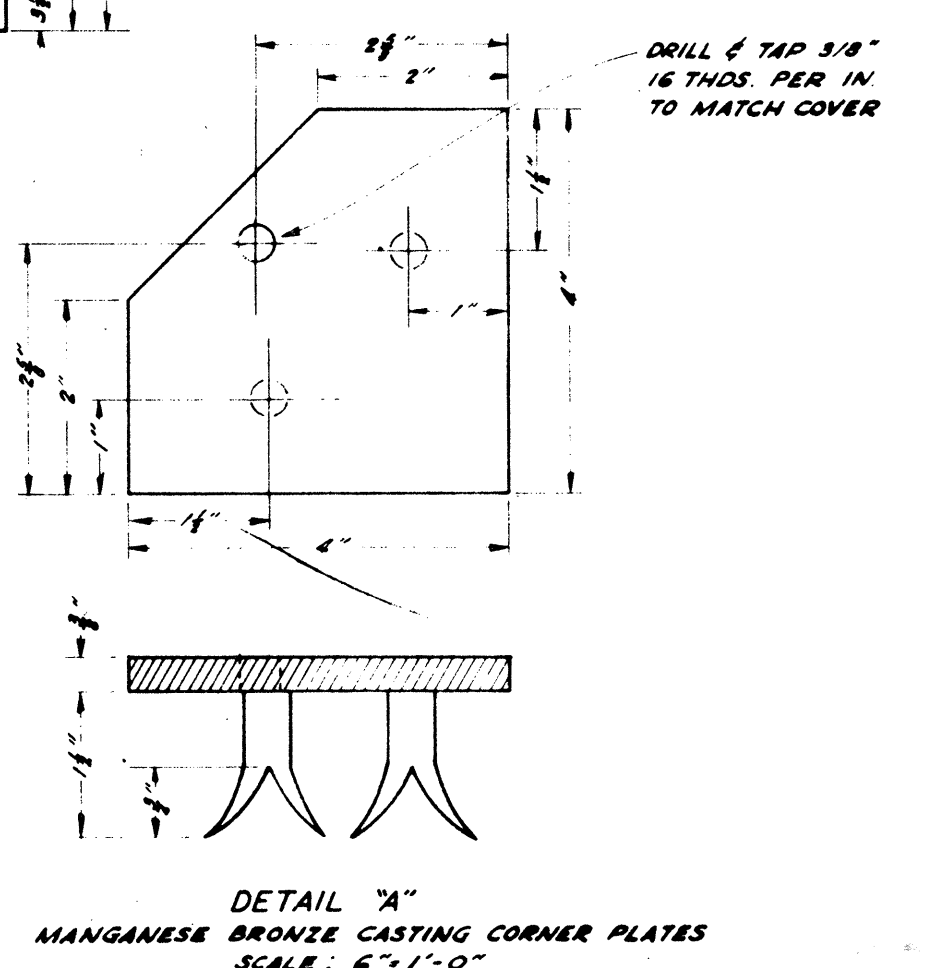
Fin. 1234567890

The Hawaiian Electric Company, Ltd.
Honolulu, T.H.

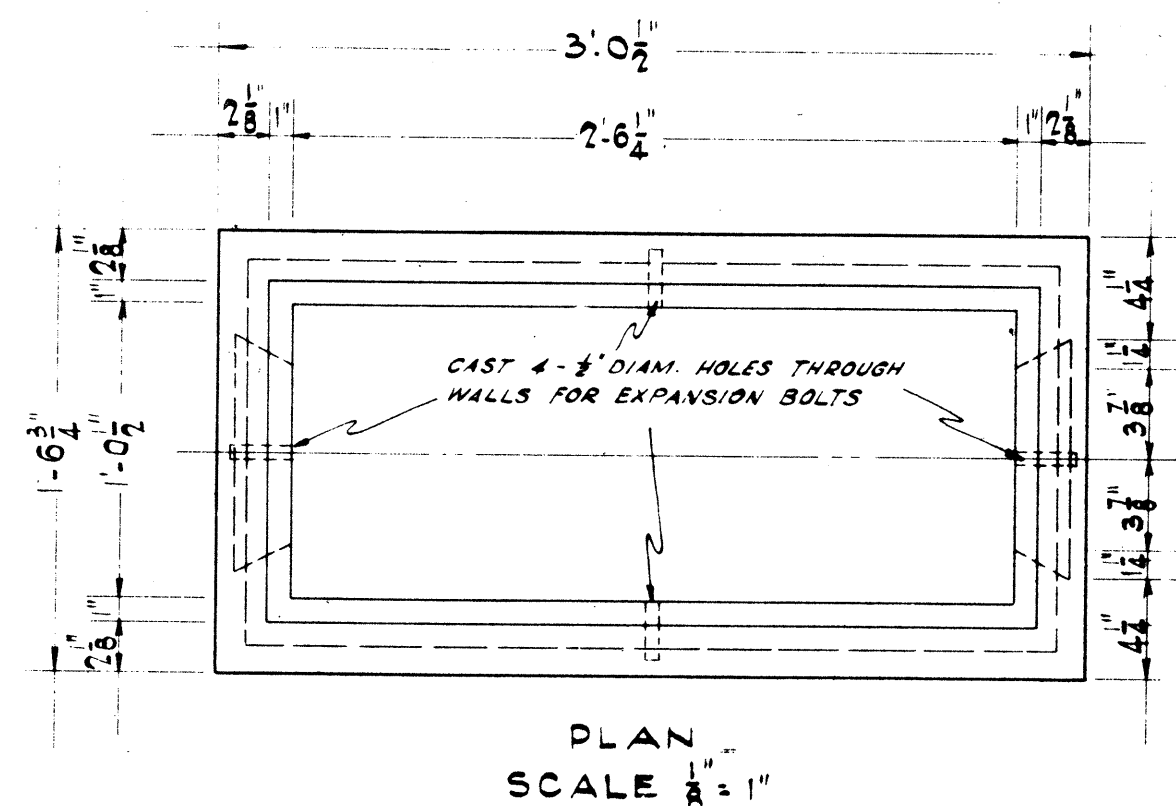
86

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	US-0720(3)	1960	55	79
		UNIT 3			
		BU-072-1(2)	1960	57	115
		UNIT 4			
		BU-072-1(2)	1960	57	118

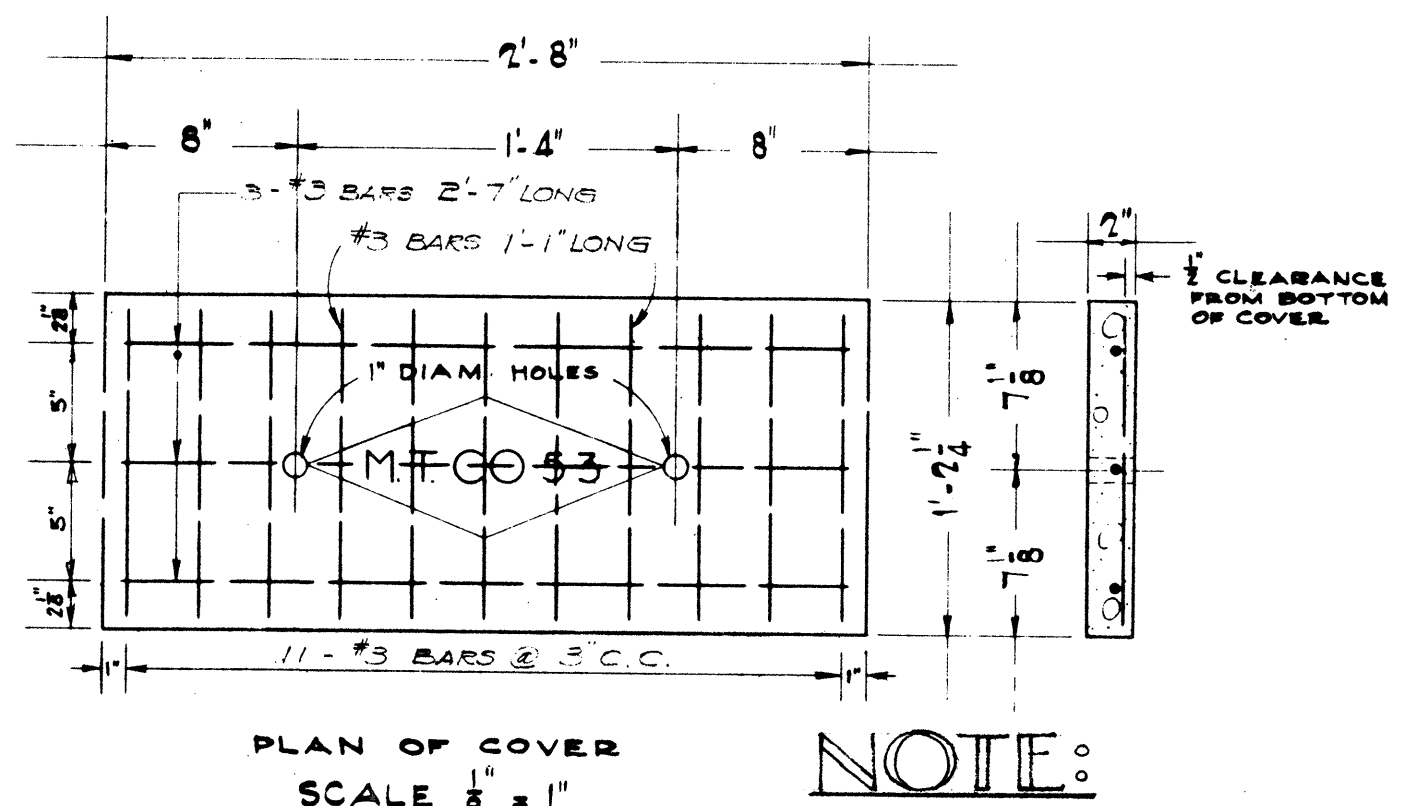
NOTE:
CHECKERED PLATE COVER SHALL BE 1/4" THICK AT SIDEWALK AREAS AND 3/8" THICK AT DRIVEWAYS.



DETAIL "A"
BRONZE CASTING CORNER PLATES
SCALE: 6"=1'-0"

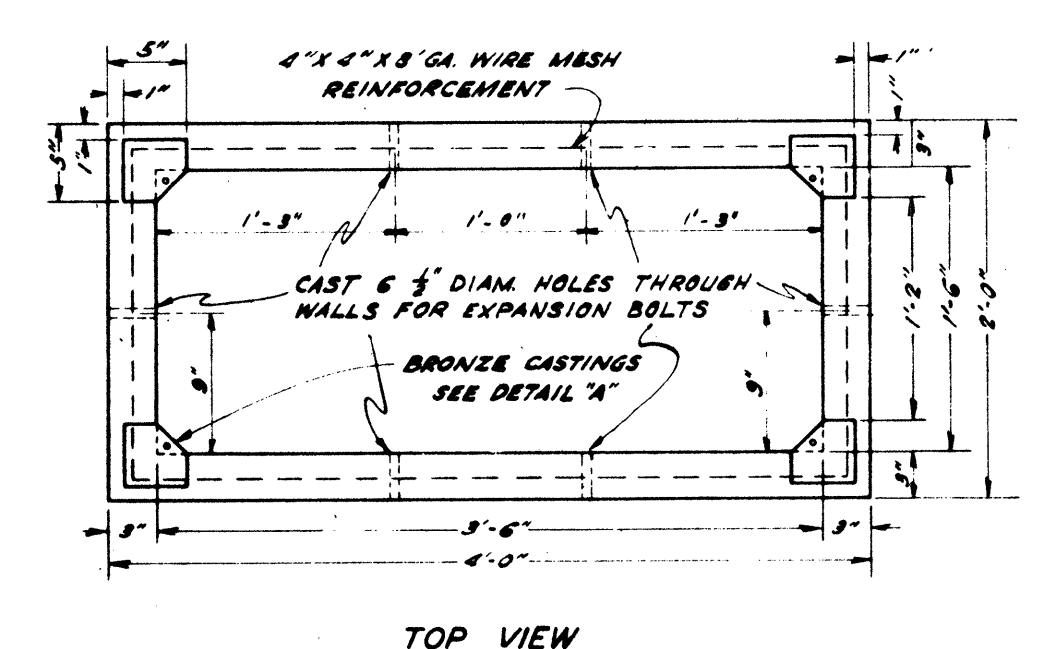


PLAN
SCALE 1/8"=1'

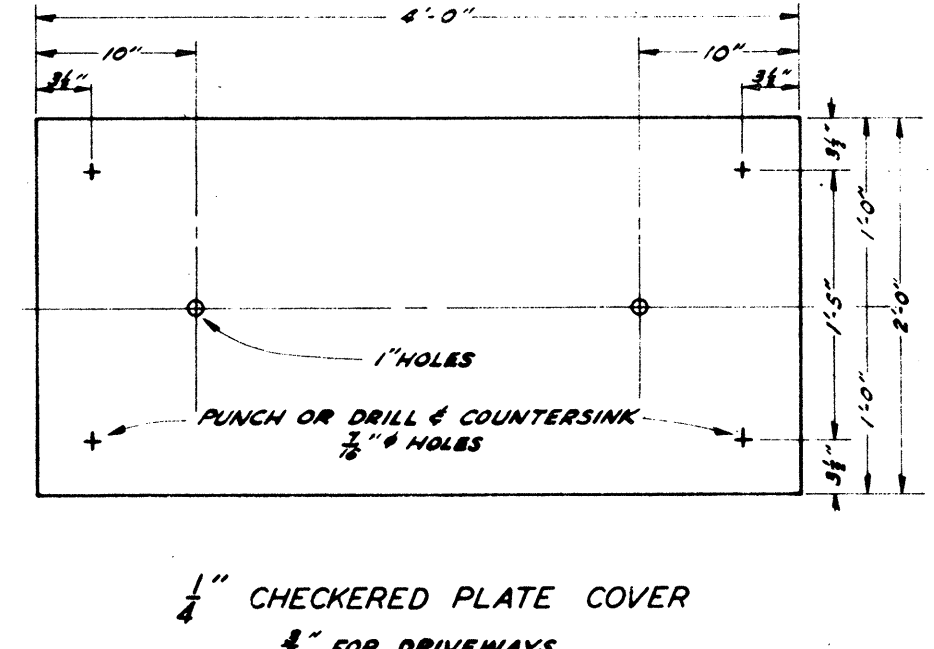


PLAN OF COVER
SCALE 1/8"=1'

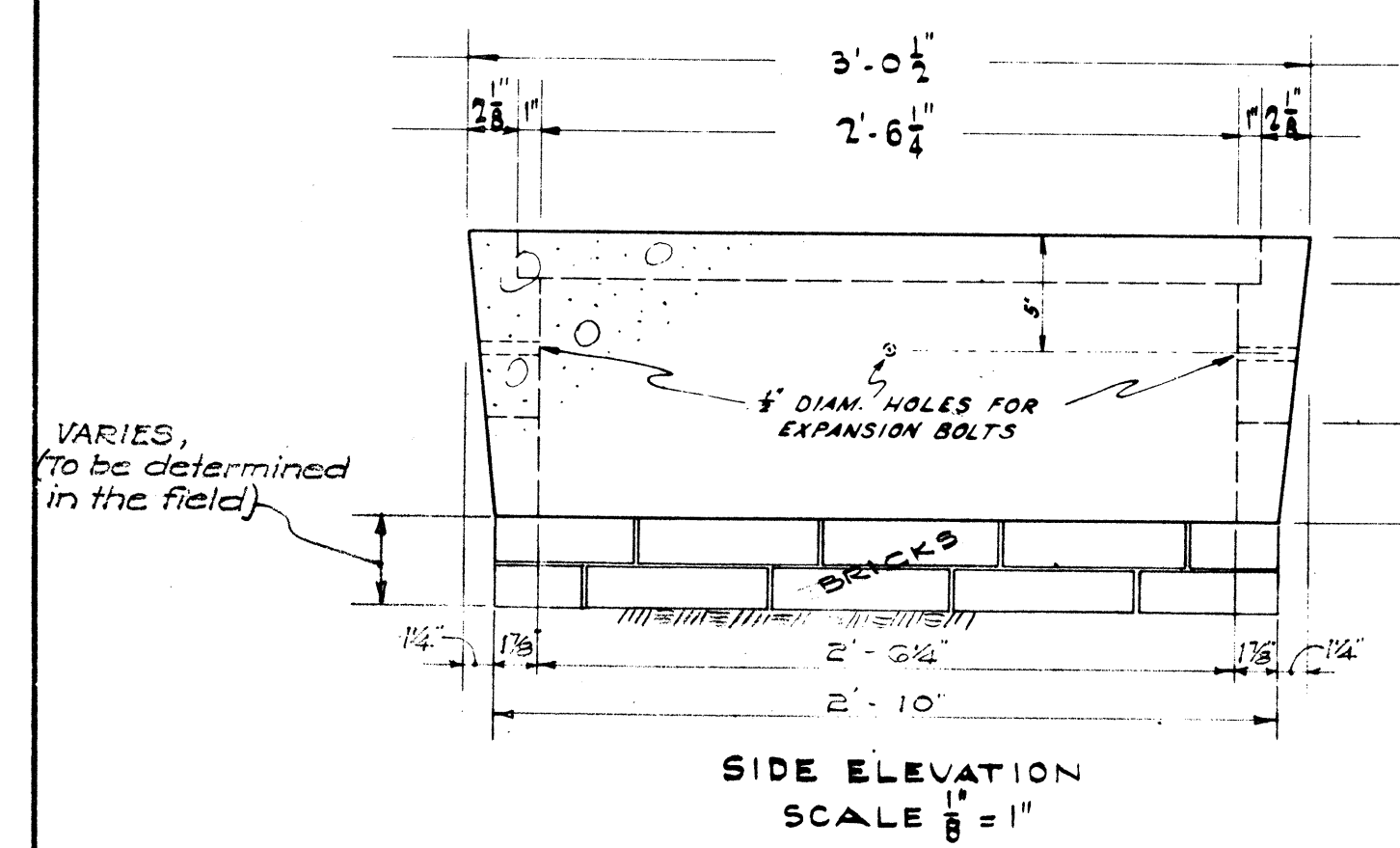
NOTE:
1. THE PULL BOXES SHOWN ON THIS SHEET ARE TO BE USED BY BOTH THE HAWAIIAN TELEPHONE CO. AND THE HAWAIIAN ELECTRIC CO.
2. PULL BOXES TO BE FURNISHED BY THE UTILITY COMPANIES.
3. CONTRACTOR TO FURNISH BRICKS AND CONSTRUCT WALLS (INCIDENTAL TO ITEM OF "INSTALLING PRECAST CONCRETE PULL BOXES").
4. BRICKS TO BE PLACED UNDER BOX TO BRING TOP OF BOX TO GRADE.



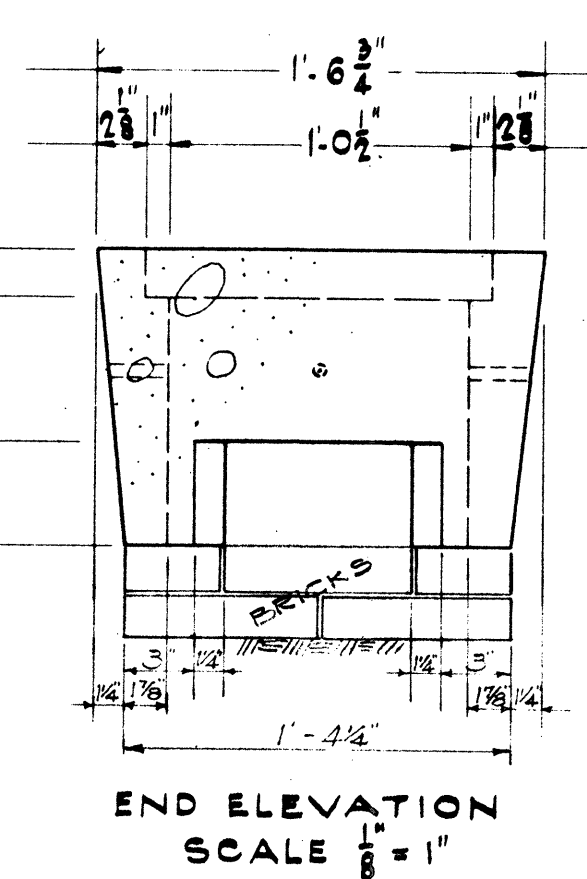
TOP VIEW



1/2" CHECKERED PLATE COVER
3/8" FOR DRIVEWAYS

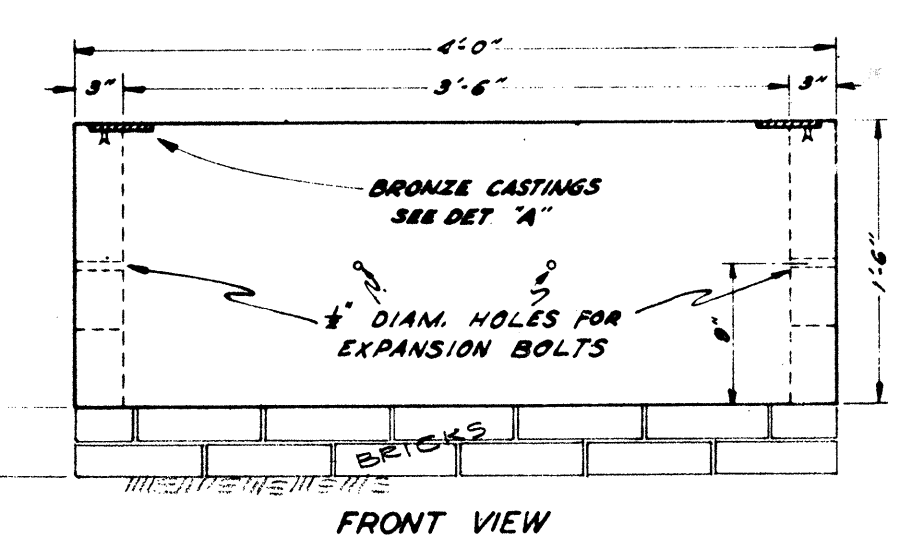


SIDE ELEVATION
SCALE 1/8"=1'

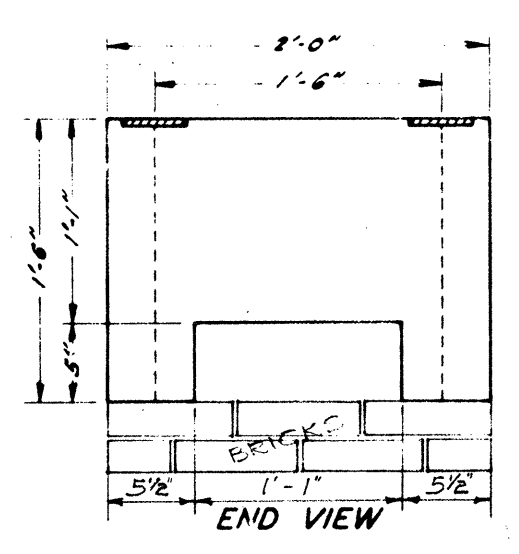


END ELEVATION
SCALE 1/8"=1'

NOTE:
REINFORCING BARS TO BE OF INTERMEDIATE GRADE & FREE OF SCALE AND OIL



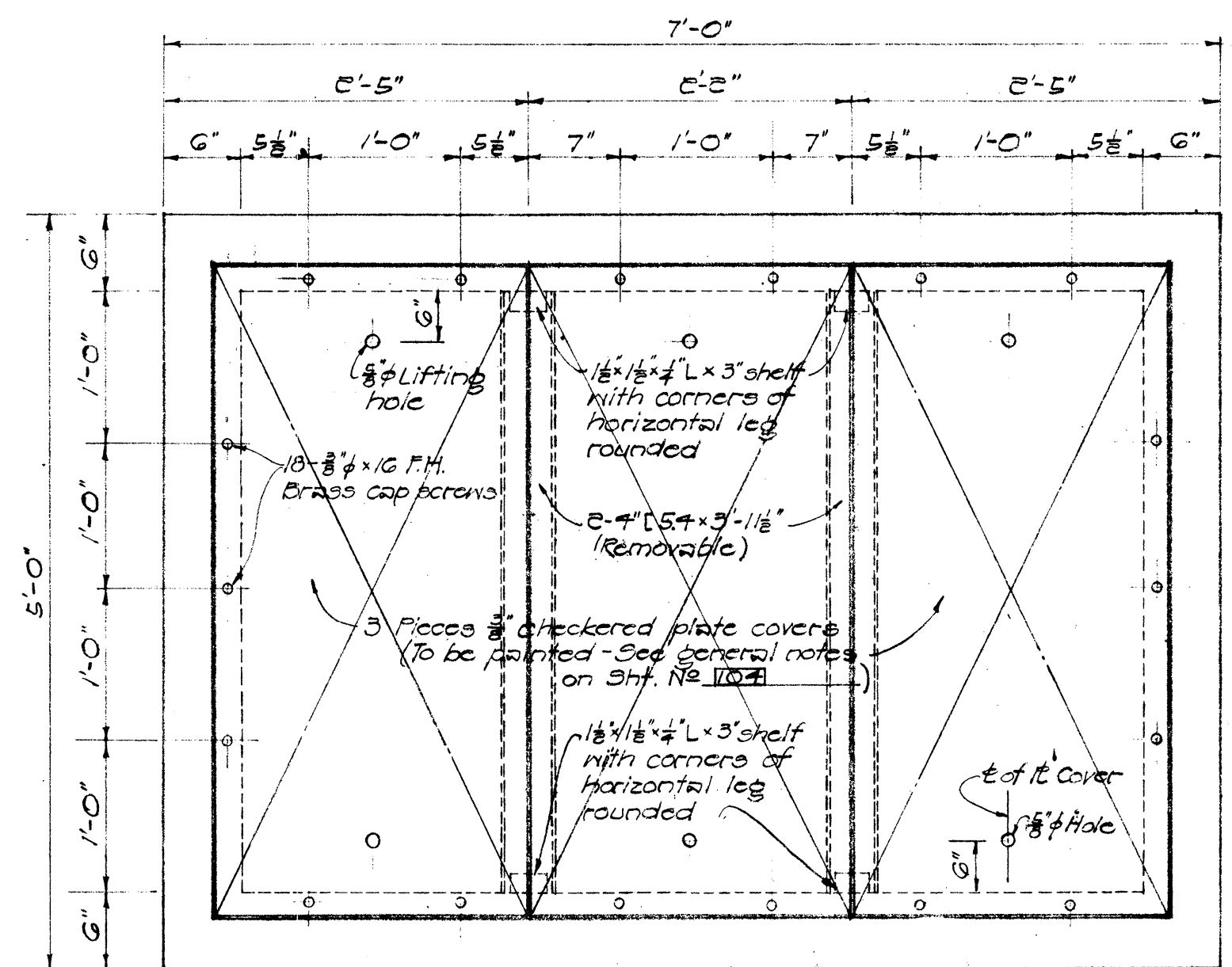
FRONT VIEW



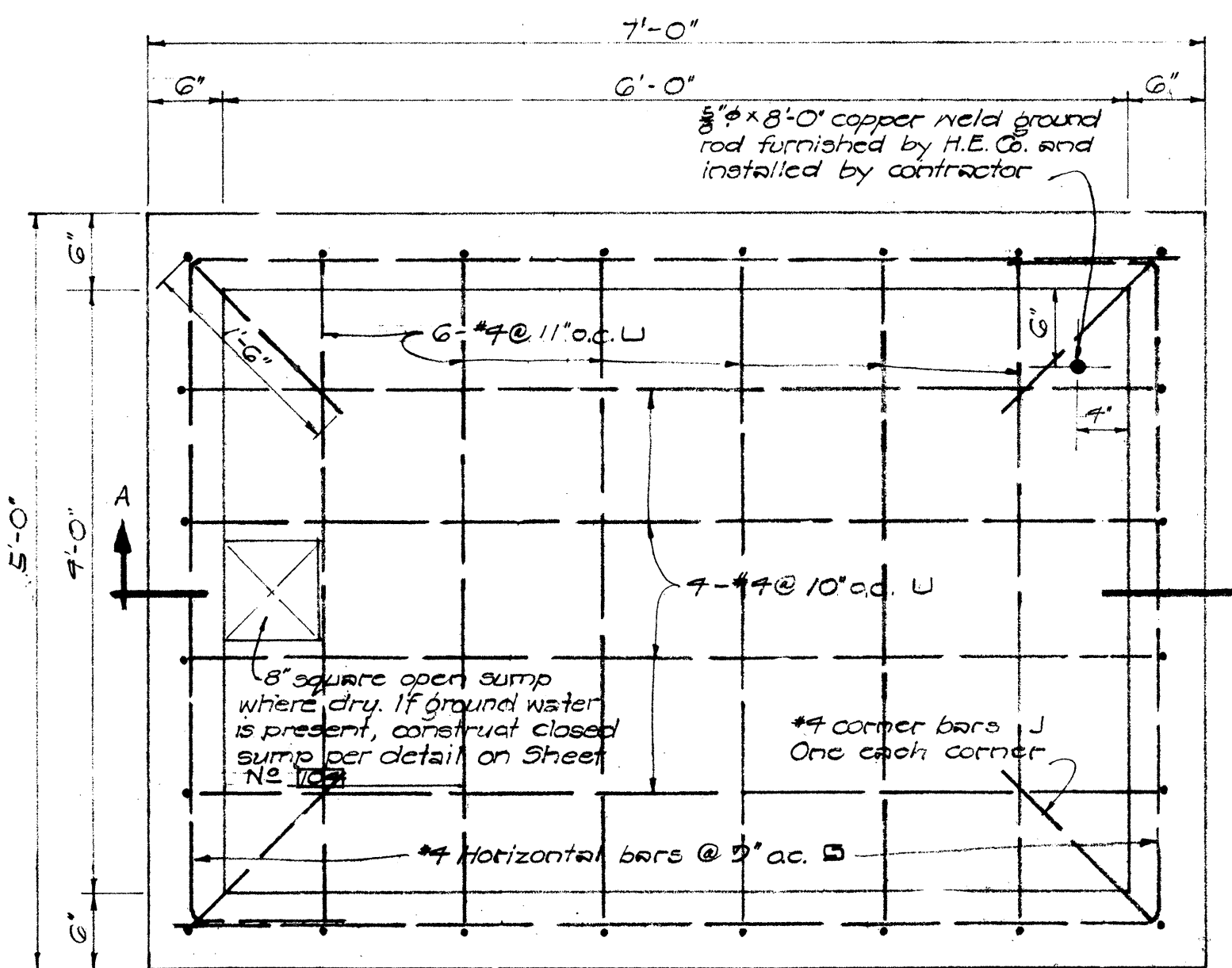
END VIEW

H.E. CO. PULLBOX No UI-103-L
H.T. CO. PULLBOX No 516

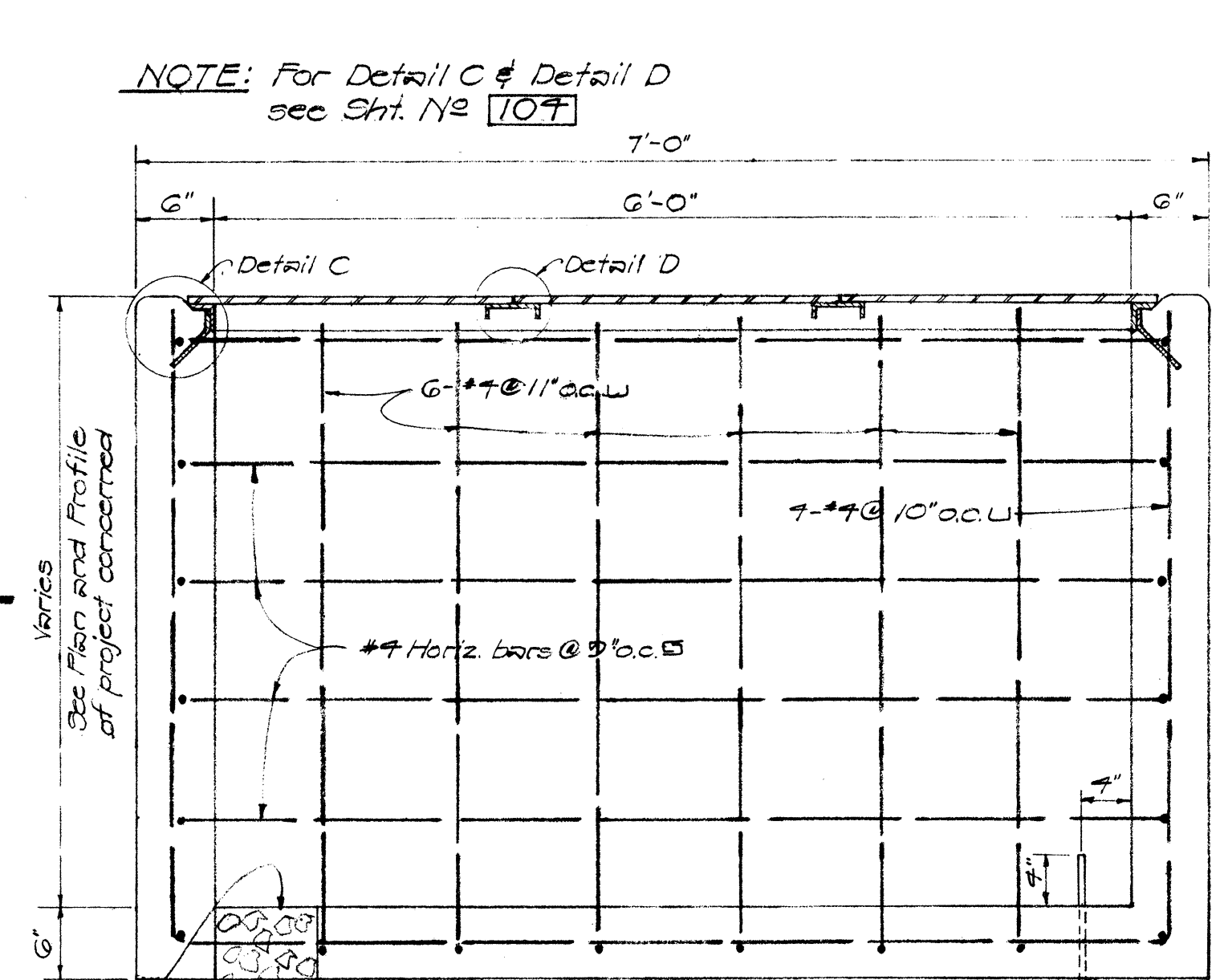
SCALE: 1"=1'-0"



PLAN



SECTIONAL PLAN



SECTION A-A

H. E. CO. HANDHOLE TYPE #3
(7'-0" X 7'-0" INSIDE)
Scale: 1"=1'-0"

APPROVED:
Principal Elec. Engr. H. E. CO., LTD. DATE 1/13/59
Dist. Engr. H. E. CO., LTD. DATE 1/13/59
Plant Eng'g. Supv. H. T. CO., LTD. DATE 1-13-59

HAWAII STATE HIGHWAY DEPARTMENT
- STATE OF HAWAII -
DETAIL OF HAWAIIAN ELEC. CO.
HANDHOLE, & HAWAIIAN ELEC. CO.
& HAWAIIAN TEL. CO. PULLBOXES.
MOANALUA ROAD US-S-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3
SCALE: AS SHOWN SEPT. 1957

SHEET No. 3 OF 6 SHEETS

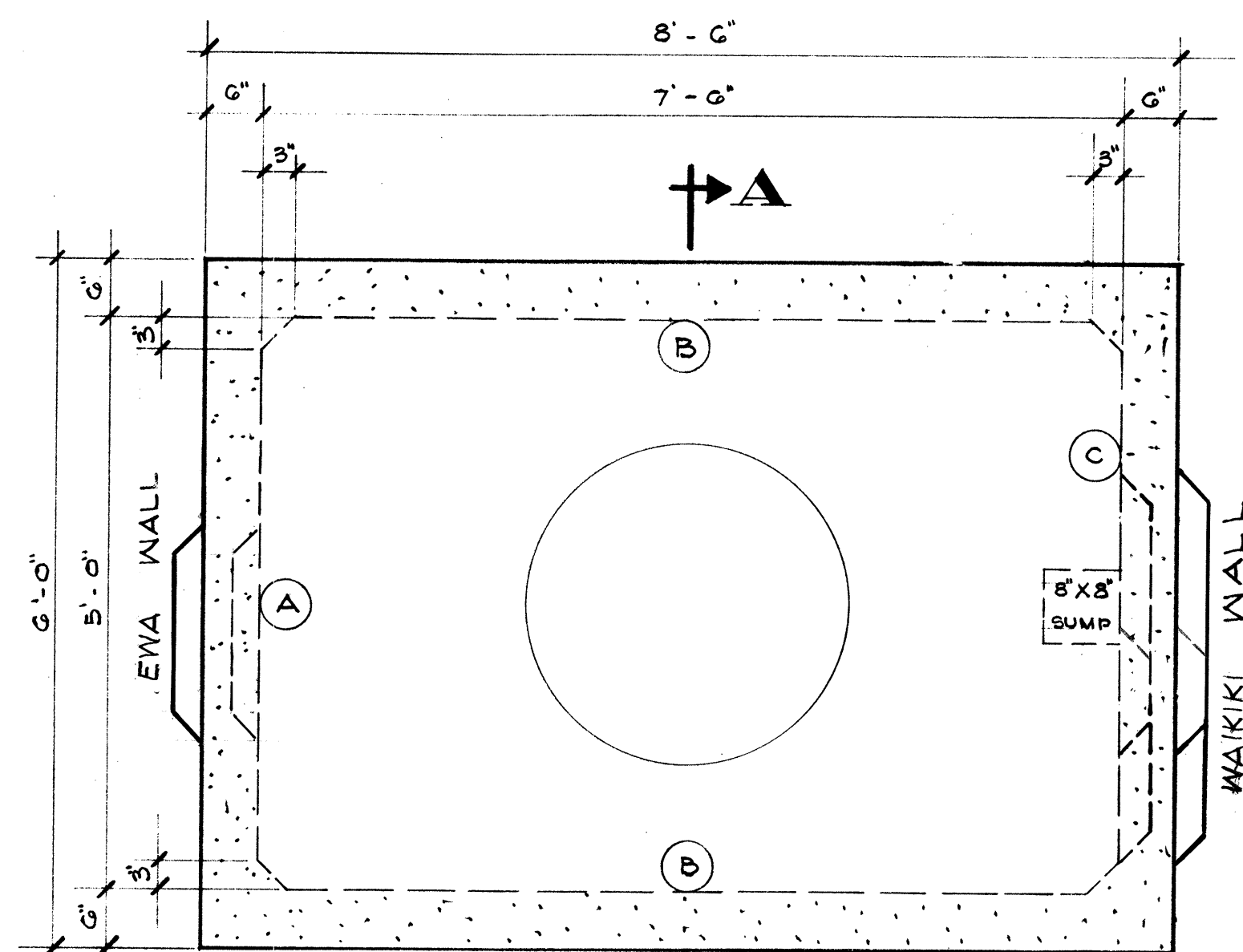
\$526.35

\$174.57

\$161.54

88

DATE
DESIGNED BY
CHECKED BY
QUANTITIES BY
NOTE BOOK
No.

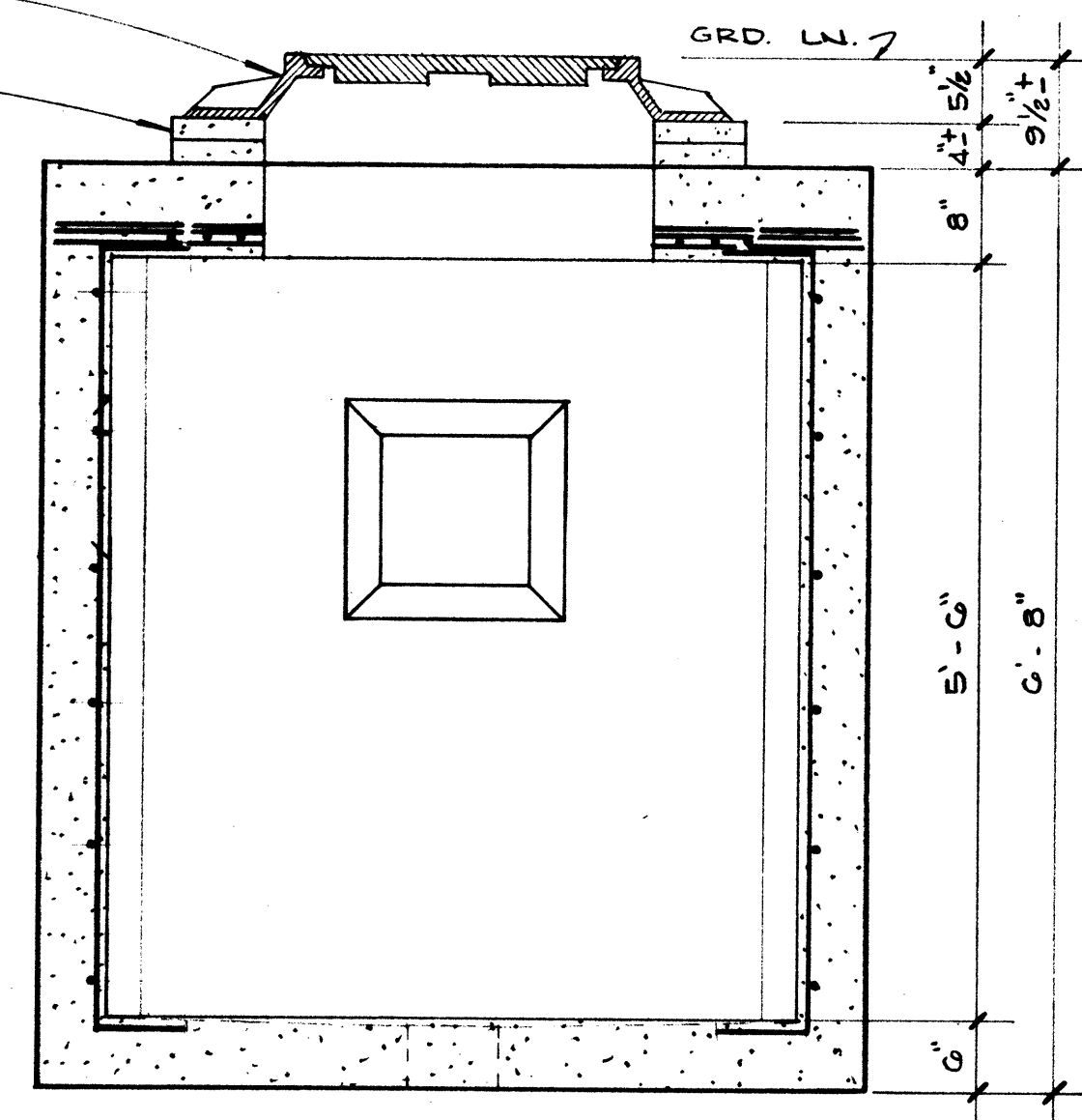


TOP VIEW
SCALE: $\frac{3}{4}$ " = 1'-0"

NOTES:

1. ALL WALL REINFORCING TO BE OF $\frac{1}{2}$ " ROUND DEFORMED BARS 12" O.C. BOTH WAYS.
2. BEND END OF BARS 90° AND OVERLAP 5".
3. UPON COMPLETION OF EXCAVATION NOTIFY THE PLANT ENGINEER IF GROUND IS FOUND TO BE OF A FLUID NATURE. IF SO REINFORCING BARS WILL BE ADDED IN FLOOR SLAB.
4. SLOPE FLOOR $\frac{1}{4}$ " TOWARDS DRAINAGE SUMP. SEE TOP VIEW FOR LOCATION.
5. AT EACH DUCT ENTRANCE, PLACE 3- $\frac{3}{8}$ " HORIZ. REINFORCING BARS BOTH ABOVE & BELOW THE DUCT ENTRANCE. BARS TO BE SPACED 8" ON CENTER & EXTENDED 18" BEYOND BOTH SIDES OF THE DUCT ENTRANCE.
6. SEE DEVELOPED VIEW FOR DUCTS, CABLE RACKS & PULLING IRON PLACEMENT.

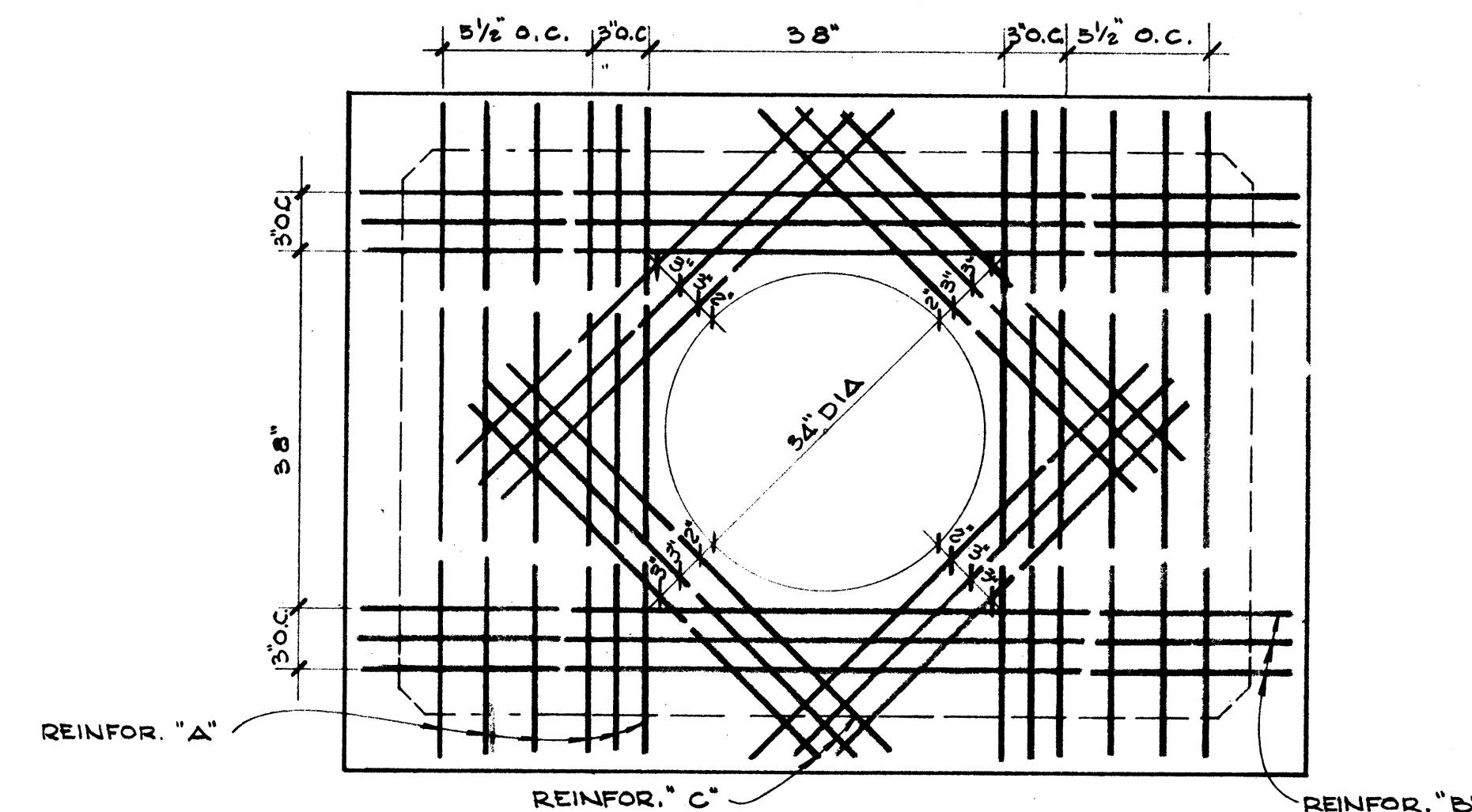
TYPE "65" MANHOLE
FRAME AND COVER
BRICK COLLAR
+ OR -



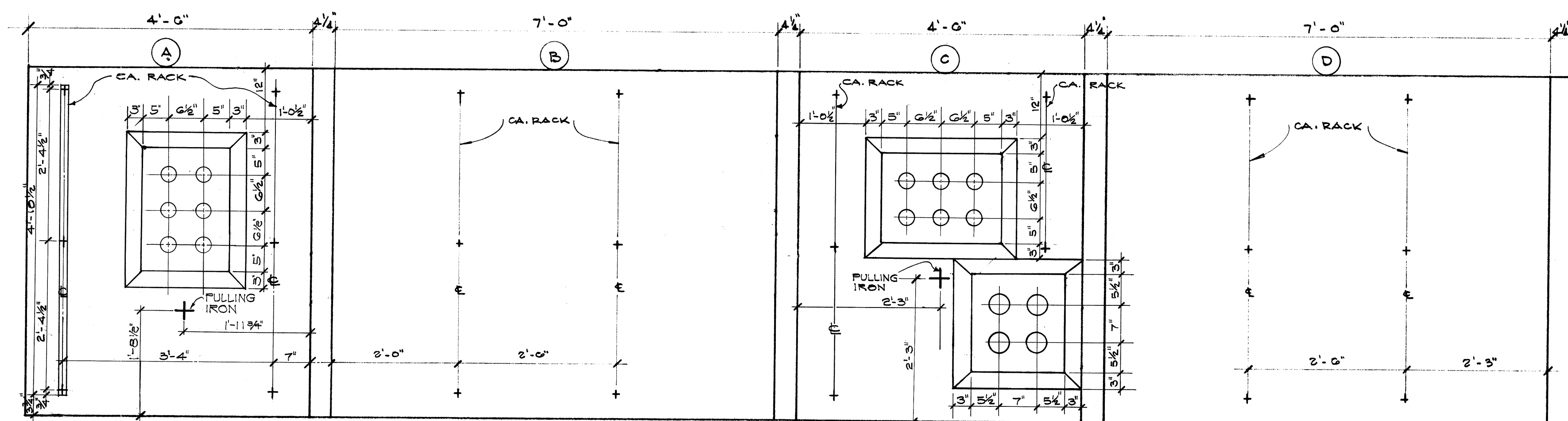
SECTION "A-A"
SCALE: $\frac{3}{4}$ " = 1'-0"

NOTES:

1. ALL BARS TO BE $\frac{7}{8}$ " ROUND DEFORMED BARS.
2. PLACE "A" BARS 1" FROM INNER SURFACE OF ROOF.
3. PLACE "B" BARS ON TOP OF "A" BARS.
4. PLACE "C" BARS ON TOP OF "A" AND "B" BARS.



ROOF REINFORCEMENT
SCALE: $\frac{3}{4}$ " = 1'-0"



DEVELOPED VIEW OF WALLS
SCALE: $\frac{3}{4}$ " = 1'-0"

NOTES:

1. PLACE 30" CABLE RACKS ON ALL WALLS. REFER TO WALL "A" FOR BOLT SPACING.
2. PLACE STANDARD PULLING IRON # 9119.

APPROVED: _____

PLANT ENG'G. SUP'V., H. T. CO., LTD. DATE _____

HAWAII STATE HIGHWAY DEPARTMENT
HAWAIIAN TELEPHONE CO.
MANHOLE TYPE B-1
MIDDLE STREET BU-065-1(1) UNIT 3
SCALE: AS NOTED NOV. 1958

SHEET No. 4 OF 6 SHEETS

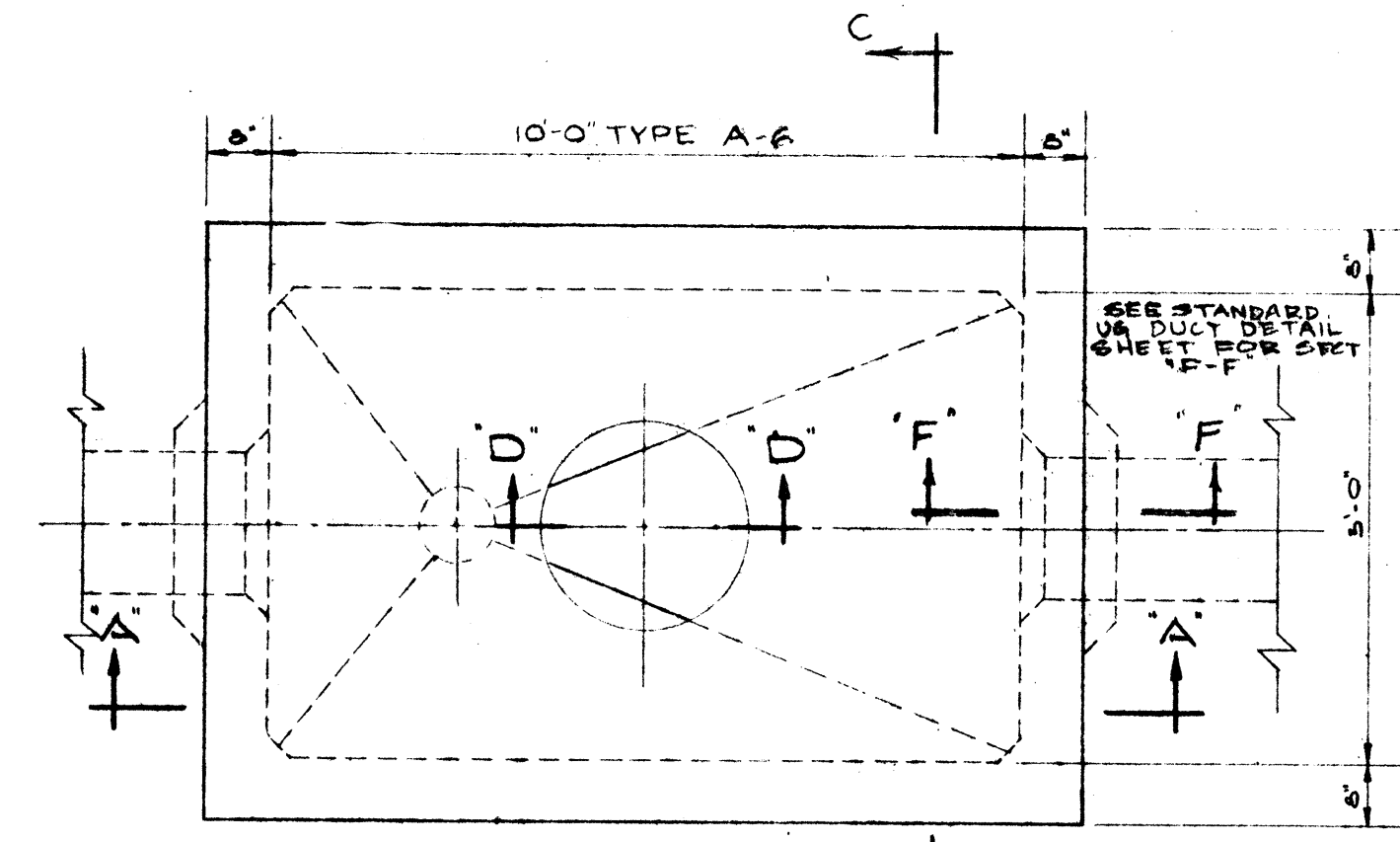
\$161.55

87

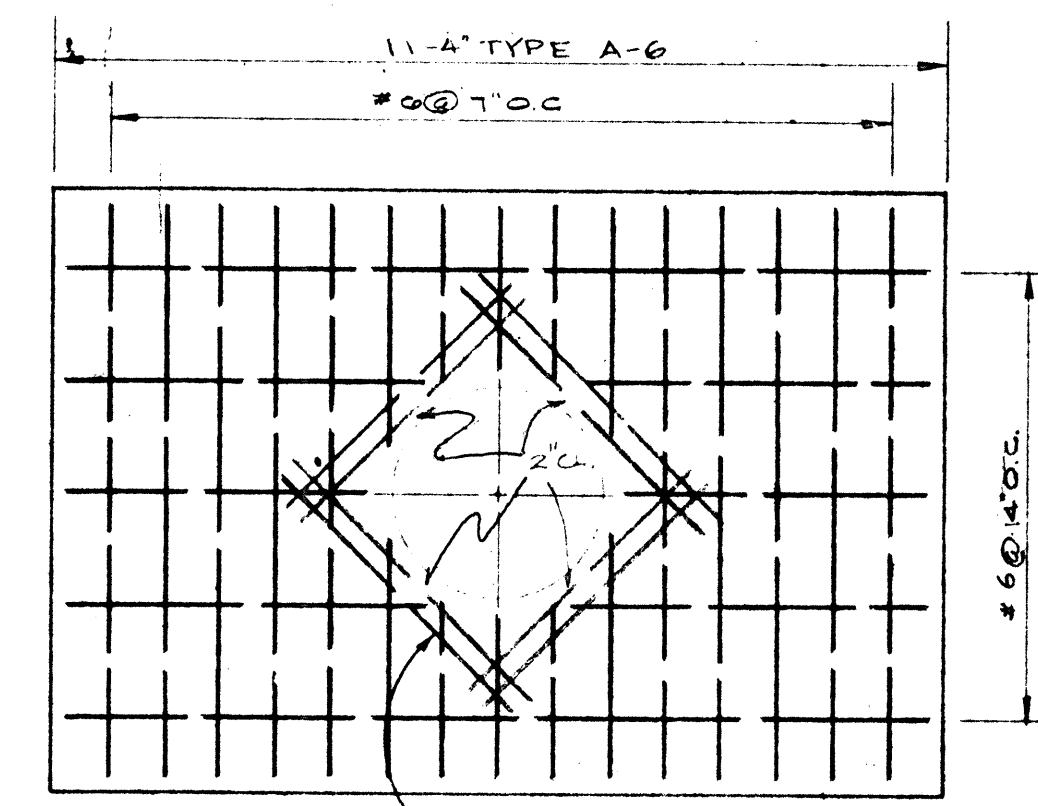
PROJ. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	US-5-0780(3) Unit 3	1960	35A	73
		BU-065-10 Unit 3	1960	35A	118

GENERAL NOTES:

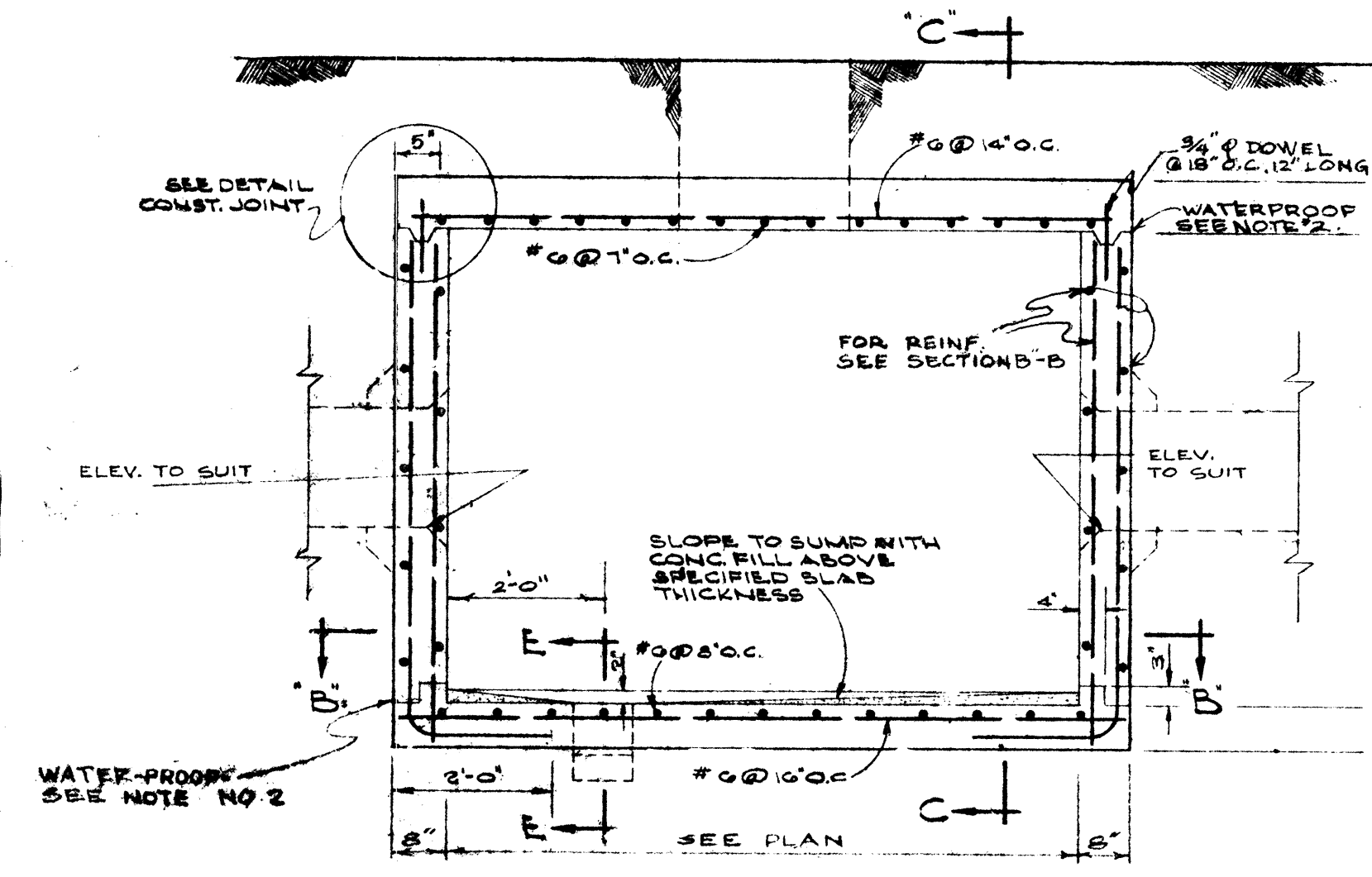
- DESIGN DATA
 $f'_s = 20,000$ PSI
 $f'_c = 3,000$ PSI; $f'_c = 1,200$ PSI
 $n = 10$
 $W =$ EQUIV. FLUID PRESS. 30#/FT²
- ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO SEAL OR EQUAL.
- FOR DUCT WINDOW DETAILS SEE SECTION "F-F," STANDARD UNDERGROUND DETAIL SHEET.



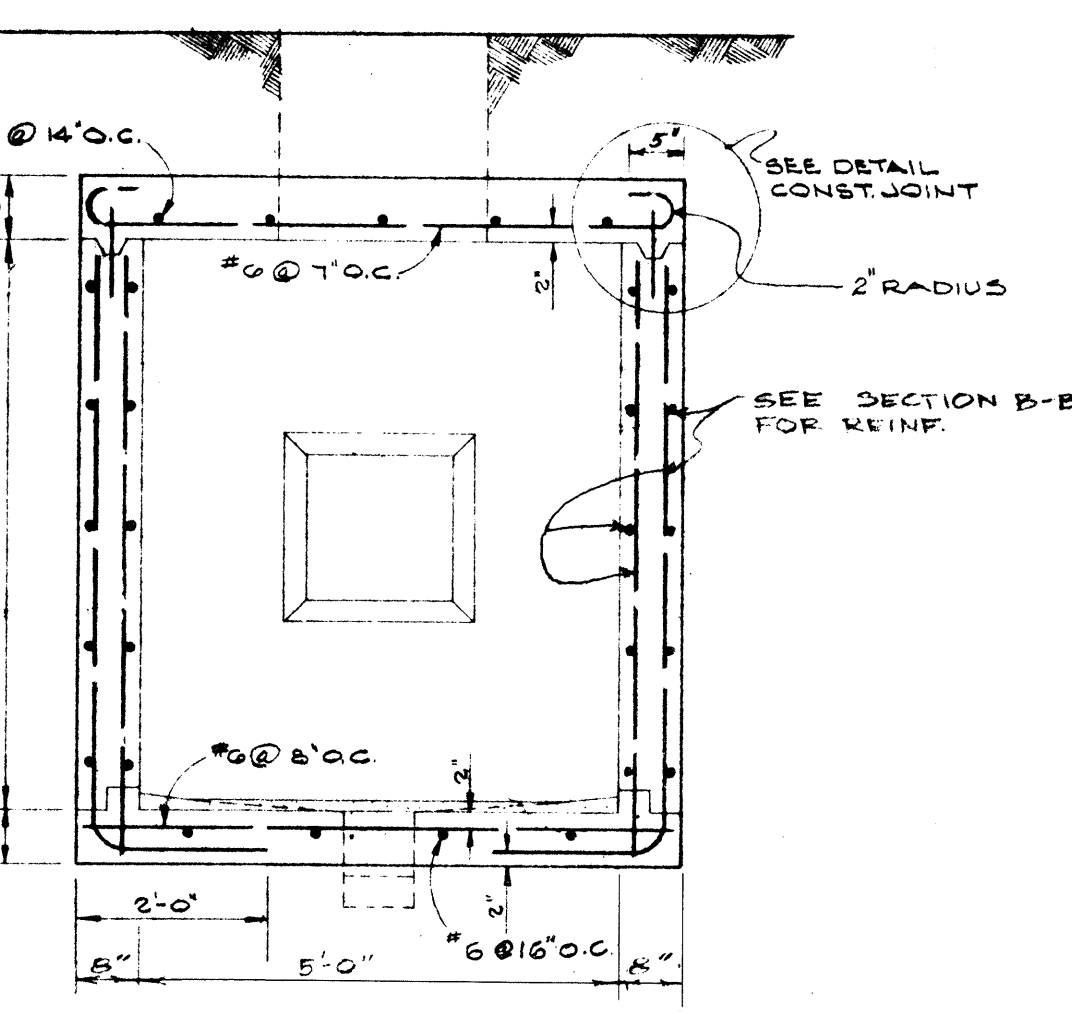
PLAN - M.H. TYPE 'A' FOR ROADWAY AREAS
SCALE: 1/2" = 1'-0"



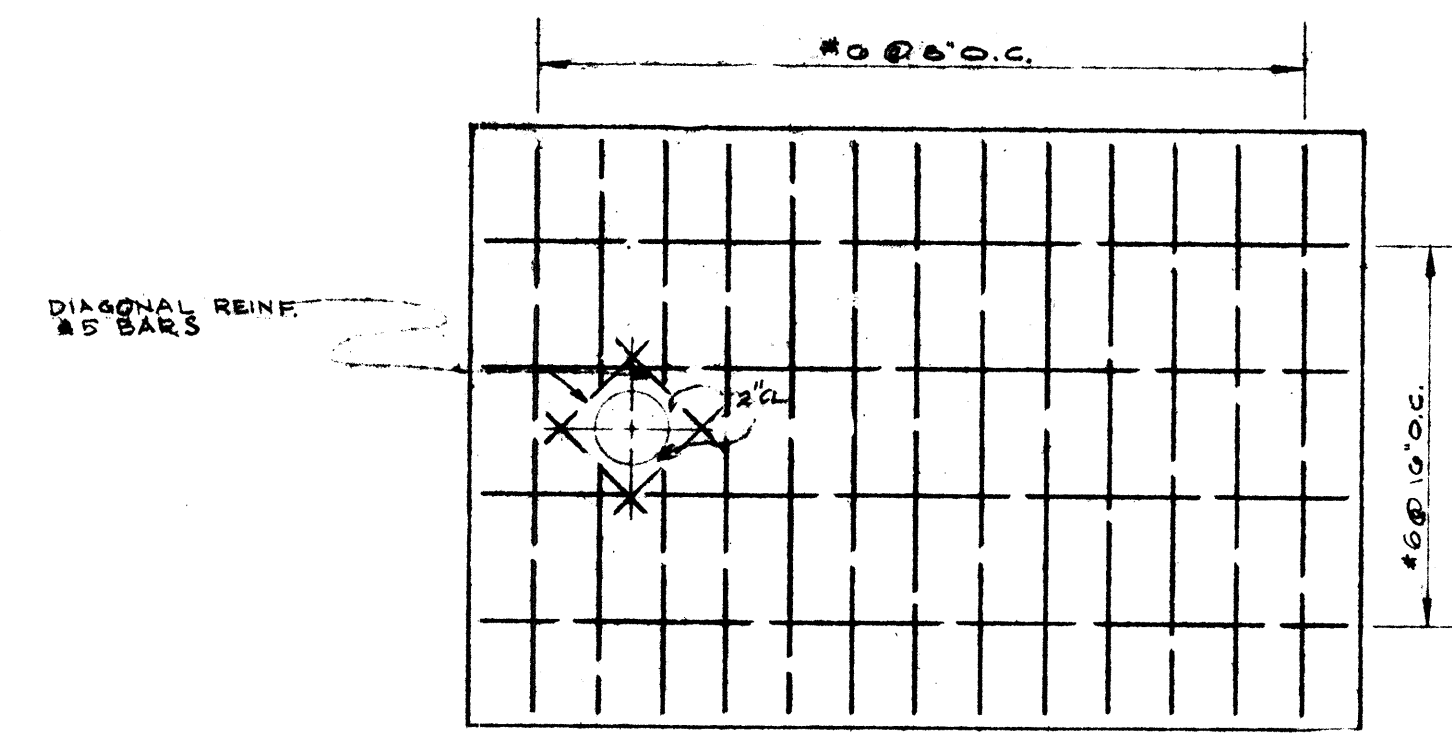
ROOF SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"



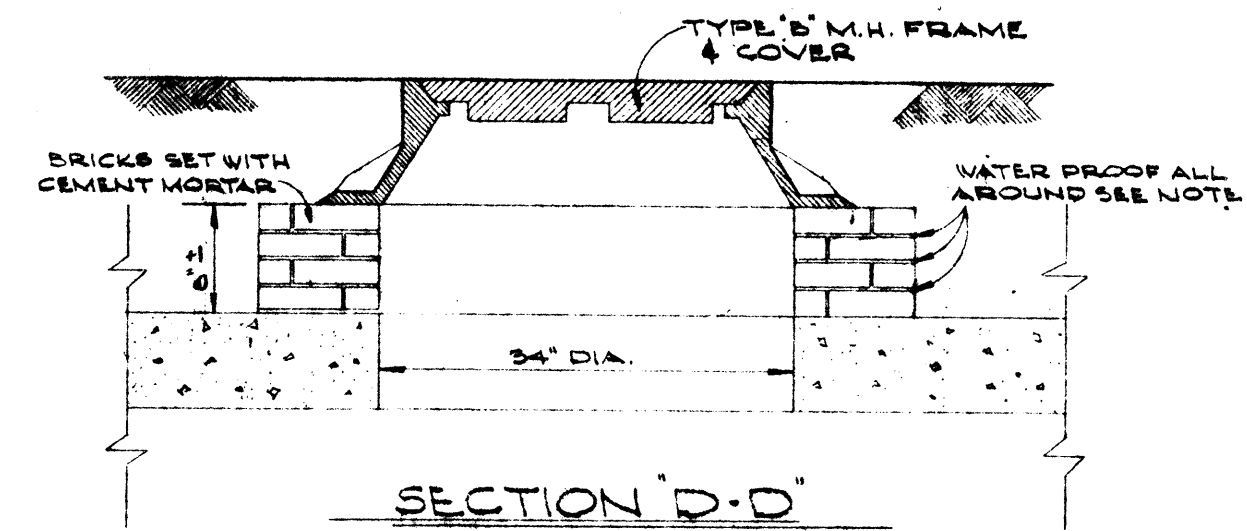
SECTION A-A
SCALE: 1/2" = 1'-0"



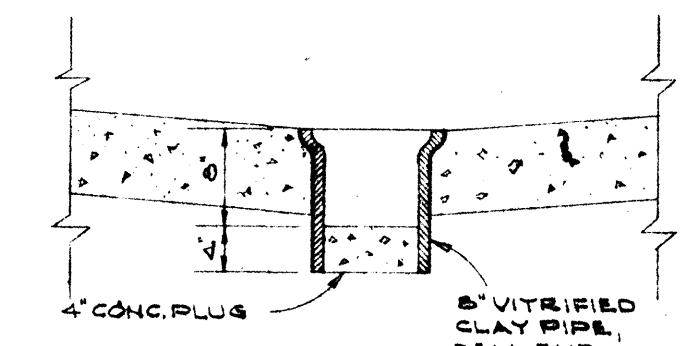
SECTION C-C
SCALE: 1/2" = 1'-0"



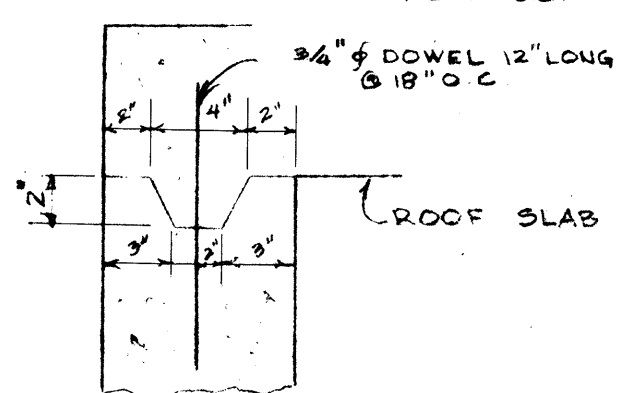
FLOOR SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"



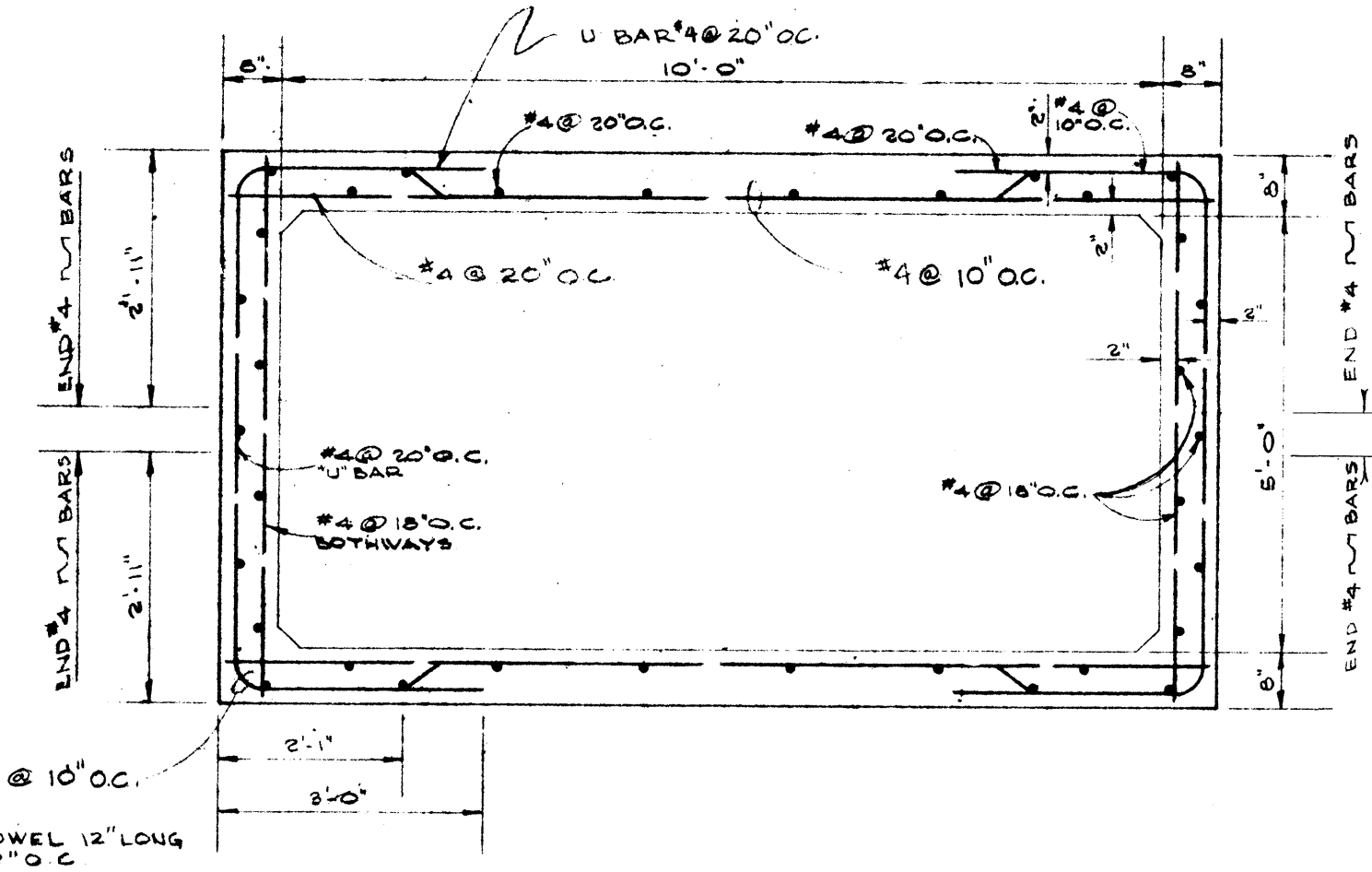
SECTION D-D
M.H. COVER DETAIL
SCALE: 1/2" = 1'-0"



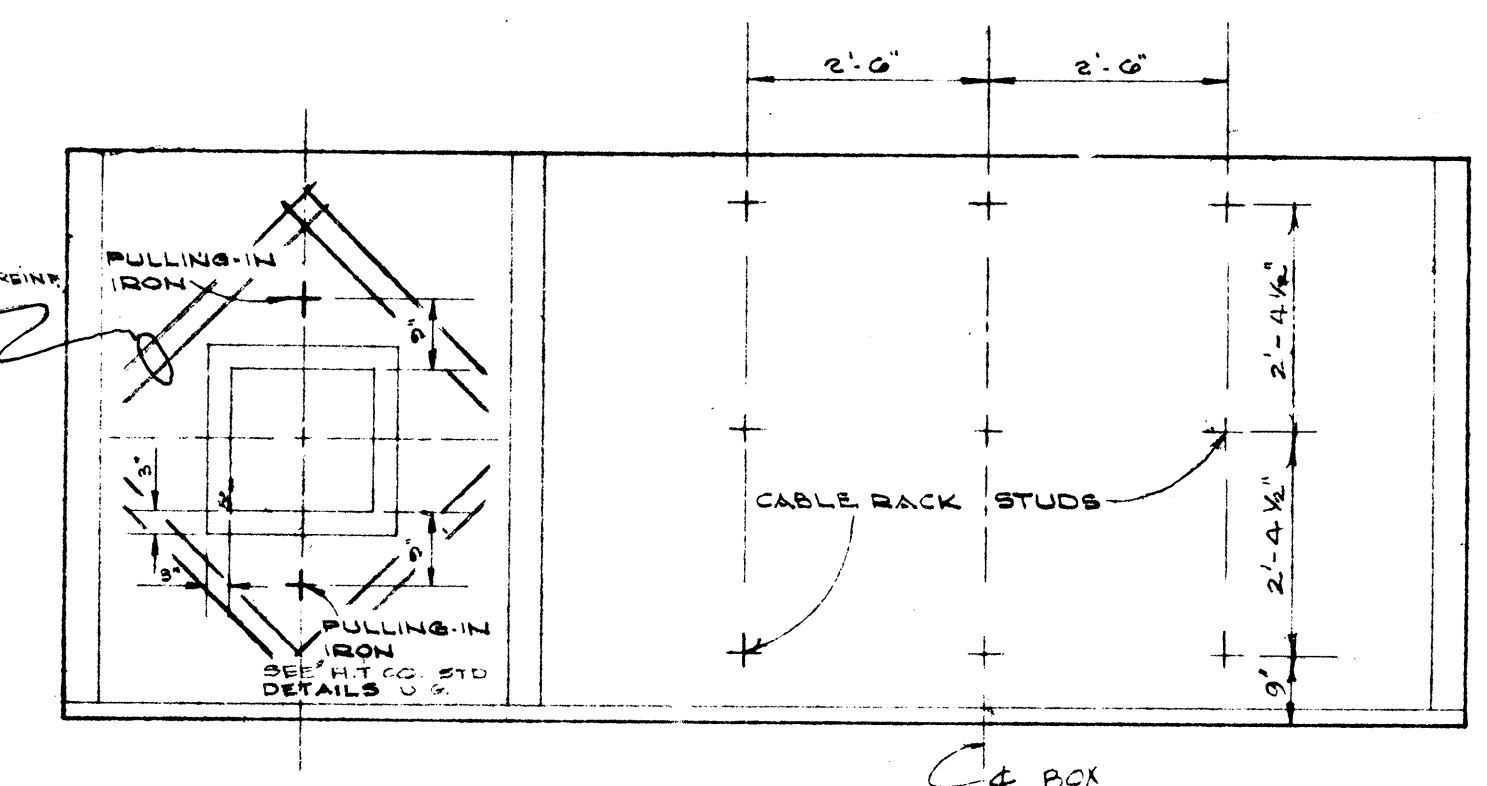
SECTION E-E
SCALE: 1/2" = 1'-0"



CONSTR. JOINT DETAIL
SCALE: 1 1/2" = 1'-0"



SECTION B-B TYPE A-G
SCALE: 1/2" = 1'-0"



ELEVATION OF INSIDE WALLS TYPES A-B, A-G
SCALE: 1/2" = 1'-0"

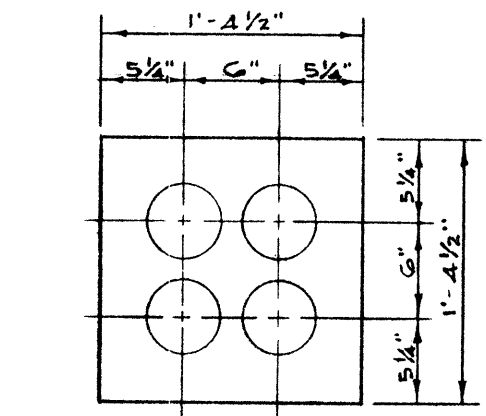
THIS SHEET SUPERCEDES SHY. 39

HAWAII STATE HIGHWAY DEPARTMENT STATE OF HAWAII Moanalua Road Middle Street		US-5-0780(3) Unit 3 BU-065-10 Unit 3		TYPE 'A' MANHOLES FOR ROADWAY AREAS	
FILE	DR. R. J. TAKAMASHI	CHK. J. TAKAMASHI	APP'D. J. TAKAMASHI	DATE 5-31-60	977-400-1 D
CONSTRUCTION	INDEX	REVISIONS	ENGINEER	SHEET 3 OF 4	3400 80A
ACC'TO	HAWAIIAN TELEPHONE COMPANY	HAWAII			

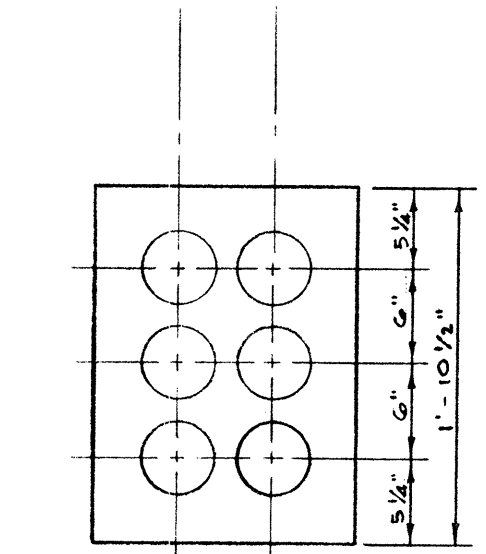
8526.35A

8161.55A

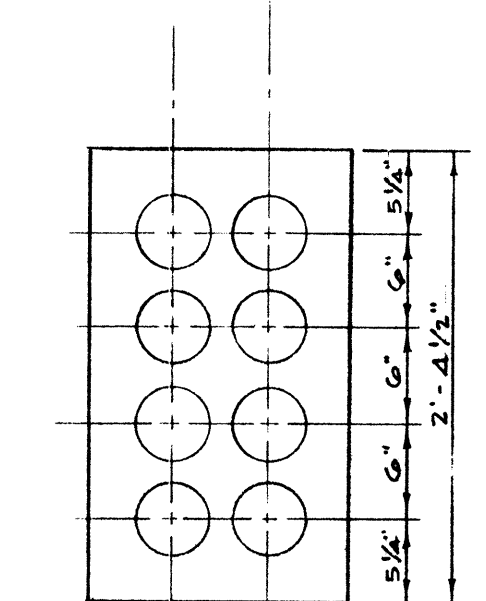
PRO. ROAD DIST. No.	STATE	PRO. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	US-5-0720(3) Unit 3	1960	35B	79
		BU-072-(2) Unit 4	1960	57A	115
		BU-065-(1) Unit 3	1960	55B	118



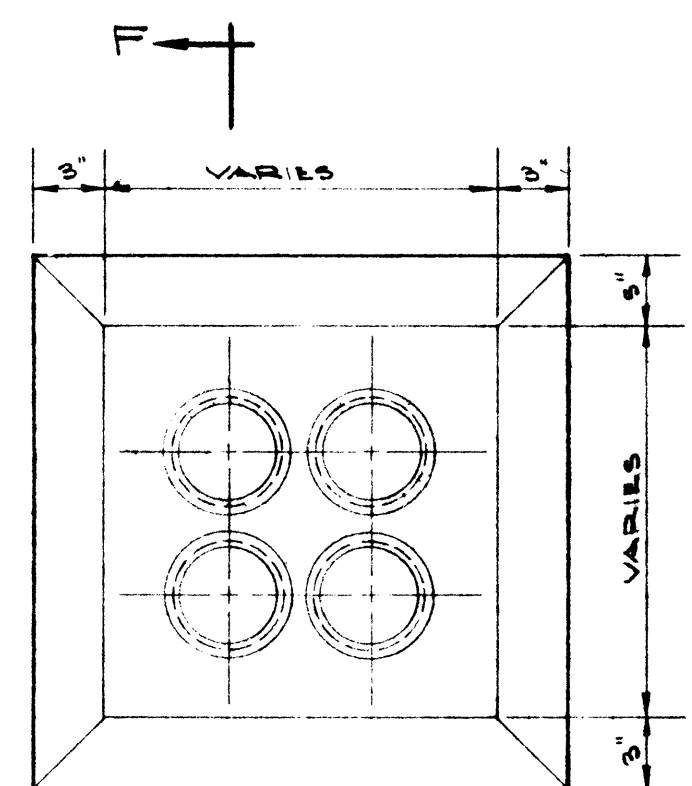
2 WIDE X 2 HIGH
4 DUCTS



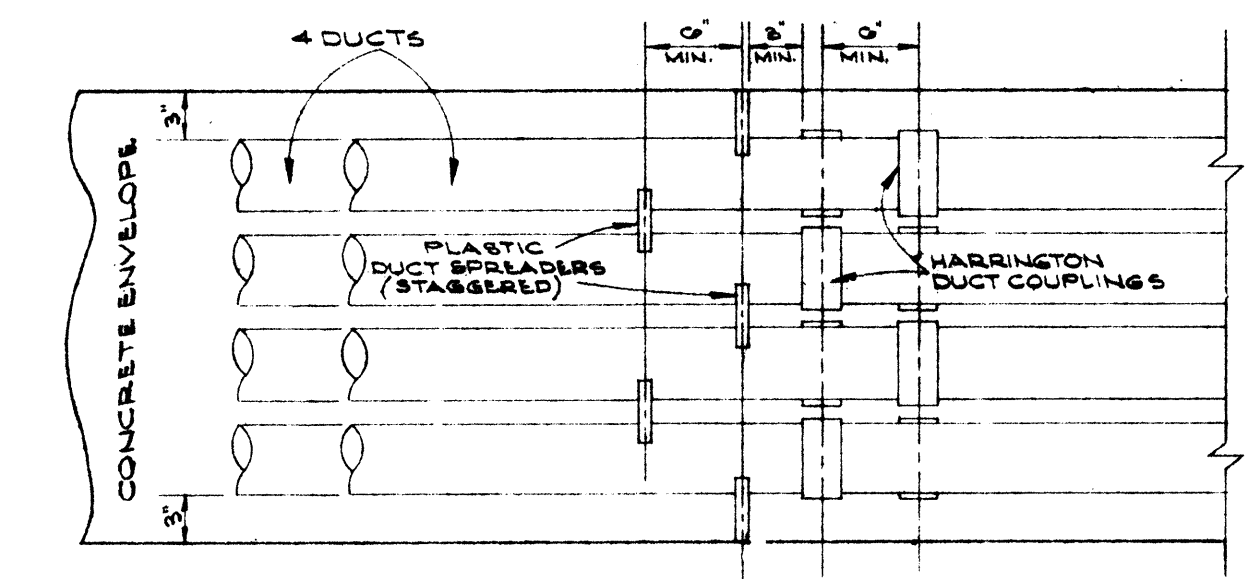
2 HIGH X 3 WIDE
6 DUCTS



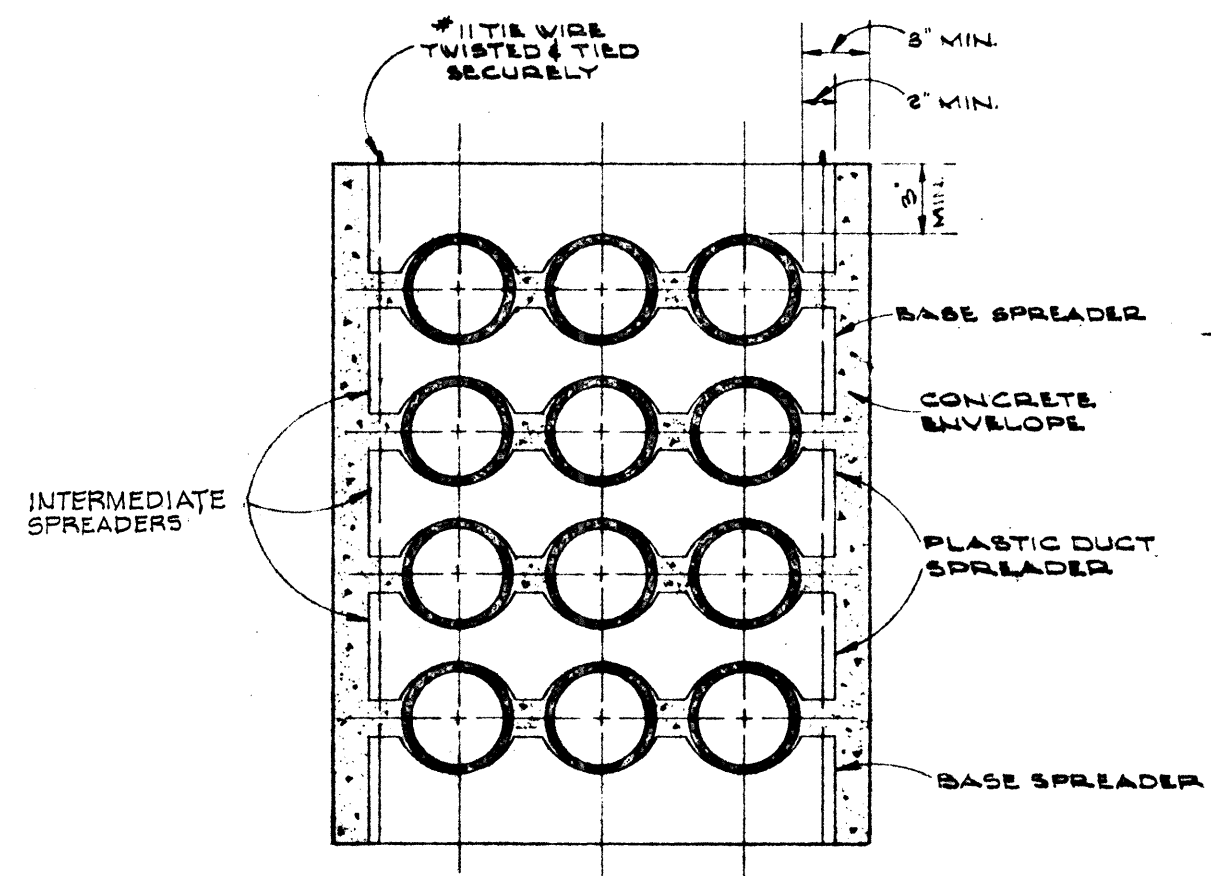
2 HIGH X 4 WIDE
8 DUCTS



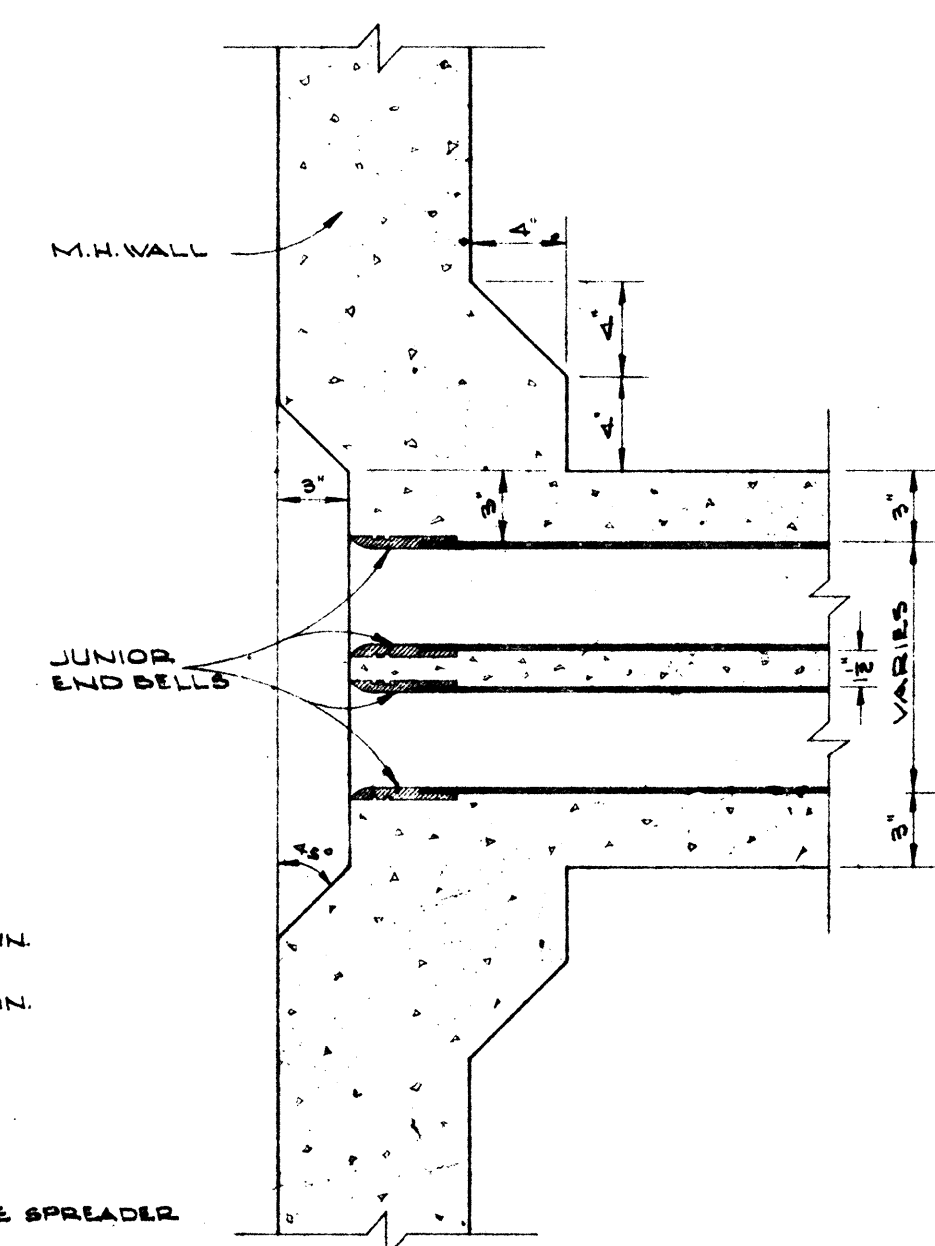
TYPICAL MANHOLE
DUCT WINDOW
SCALE 1/2" = 1'-0"



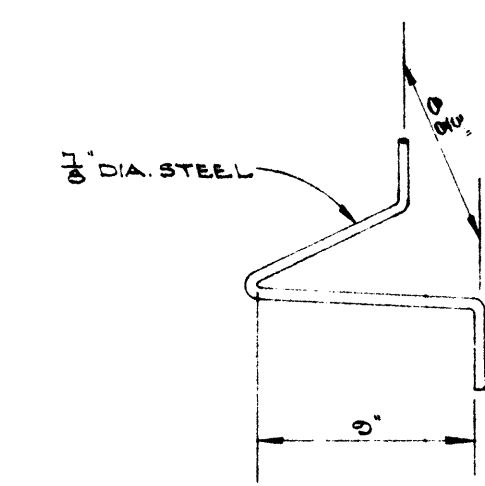
TYPICAL DUCT ENVELOPE ELEVATION
ARRANGEMENT OF COUPLING & PLASTIC SPACERS
SCALE 1" = 1'-0"



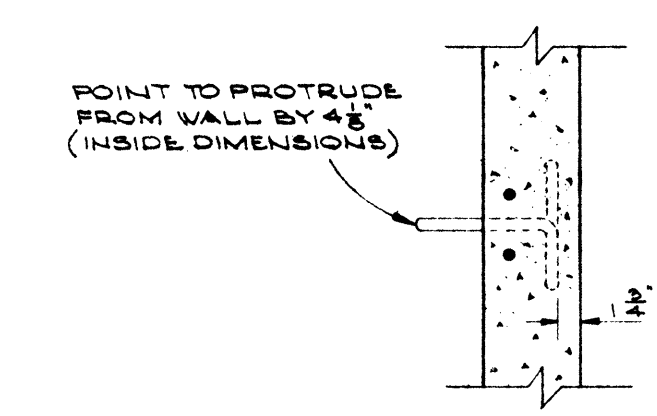
SECTION SHOWING SPACERS



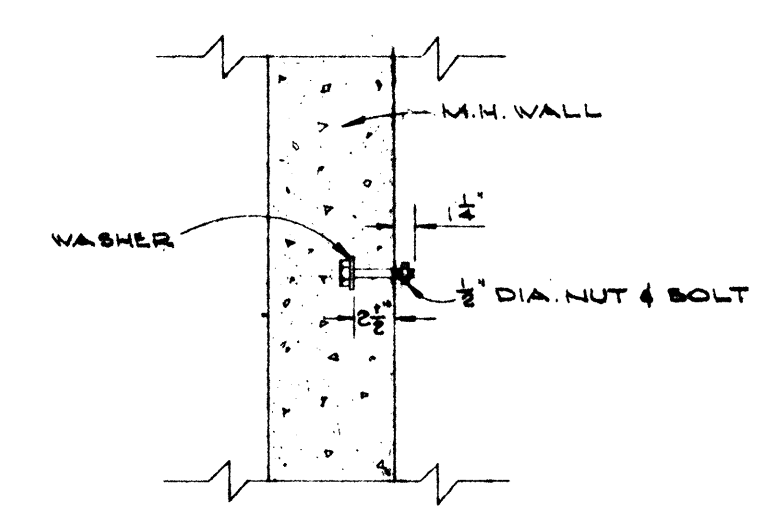
SECTION F-F
TYPICAL STUB OUT DETAIL
& JUNIOR END BELL
SCALE 1/2" = 1'-0"



PULLING-IN IRON



SECTIONAL VIEW
OF PULLING-IN IRON
SCALE 3/4" = 1'-0"



CABLE RACK STUD
BOLT DETAIL
SCALE 1/2" = 1'-0"

STANDARD DUCT FORMATIONS

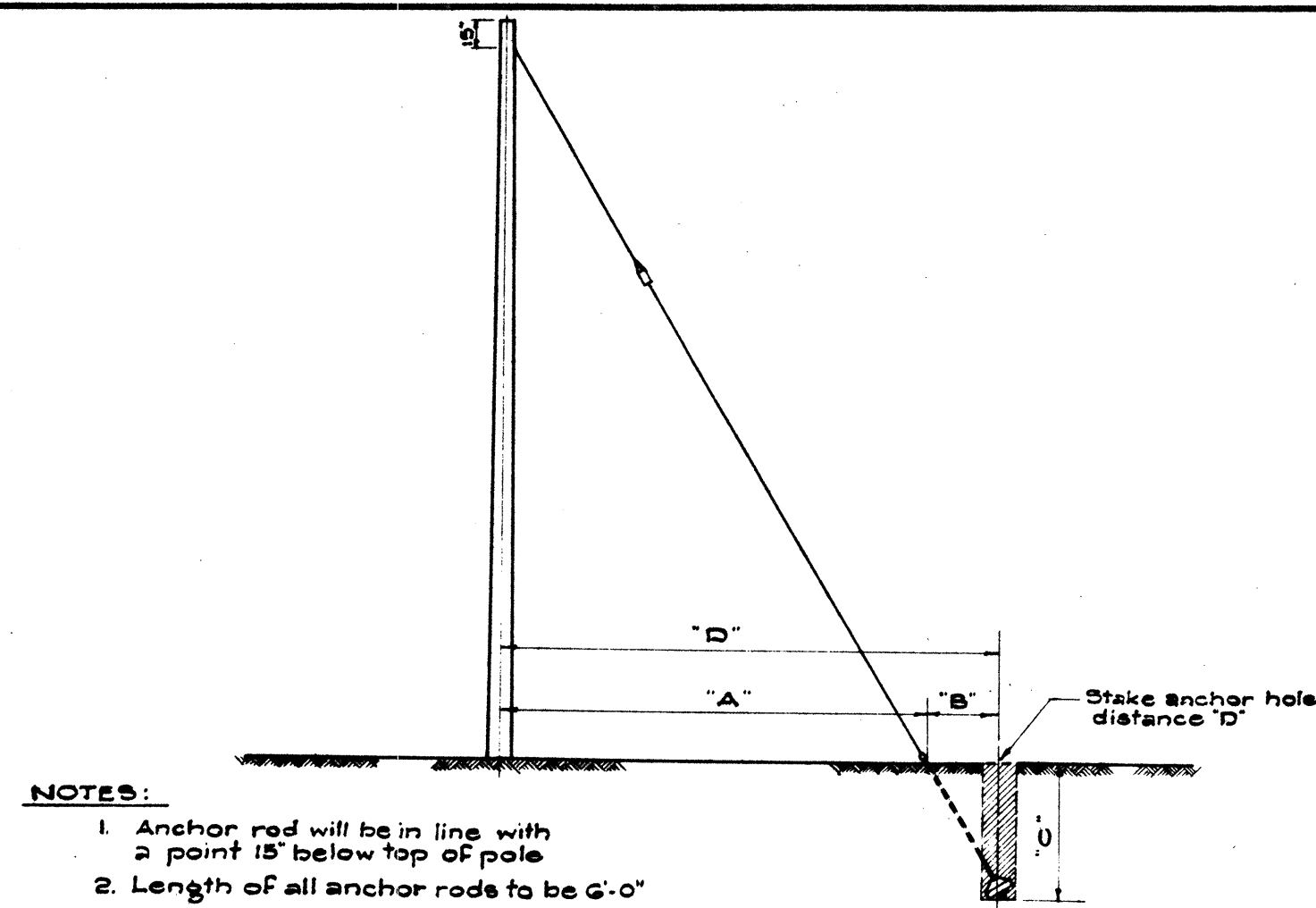
HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
Moanalua Road
Lunalilo Freeway
Middle Street

US-5-0720(3) Unit 3
BU-072-(2) Unit 4
BU-065-(1) Unit 3

FILE	DR. S. S.	ENG. J. TAKAHASHI	STANDARD DUCT FORMATIONS AND MANHOLE DETAILS
ASSIGNMENT	CONSTRUCTION	TEL. 1-55	DATE 5-31-60
MAINTENANCE	INDEX	APPD. [Signature]	977-400-1 D
ACCTG		HAWAIIAN TELEPHONE COMPANY	
ENGR.		HAWAII	
TOTAL PRINTS	21		

THIS SHEET IS ADDITIONAL TO SHT. 57A
2/1/61

S 5 2 6 . 3 5 B S 1 7 4 . 5 7 A S 1 6 1 . 5 5 B



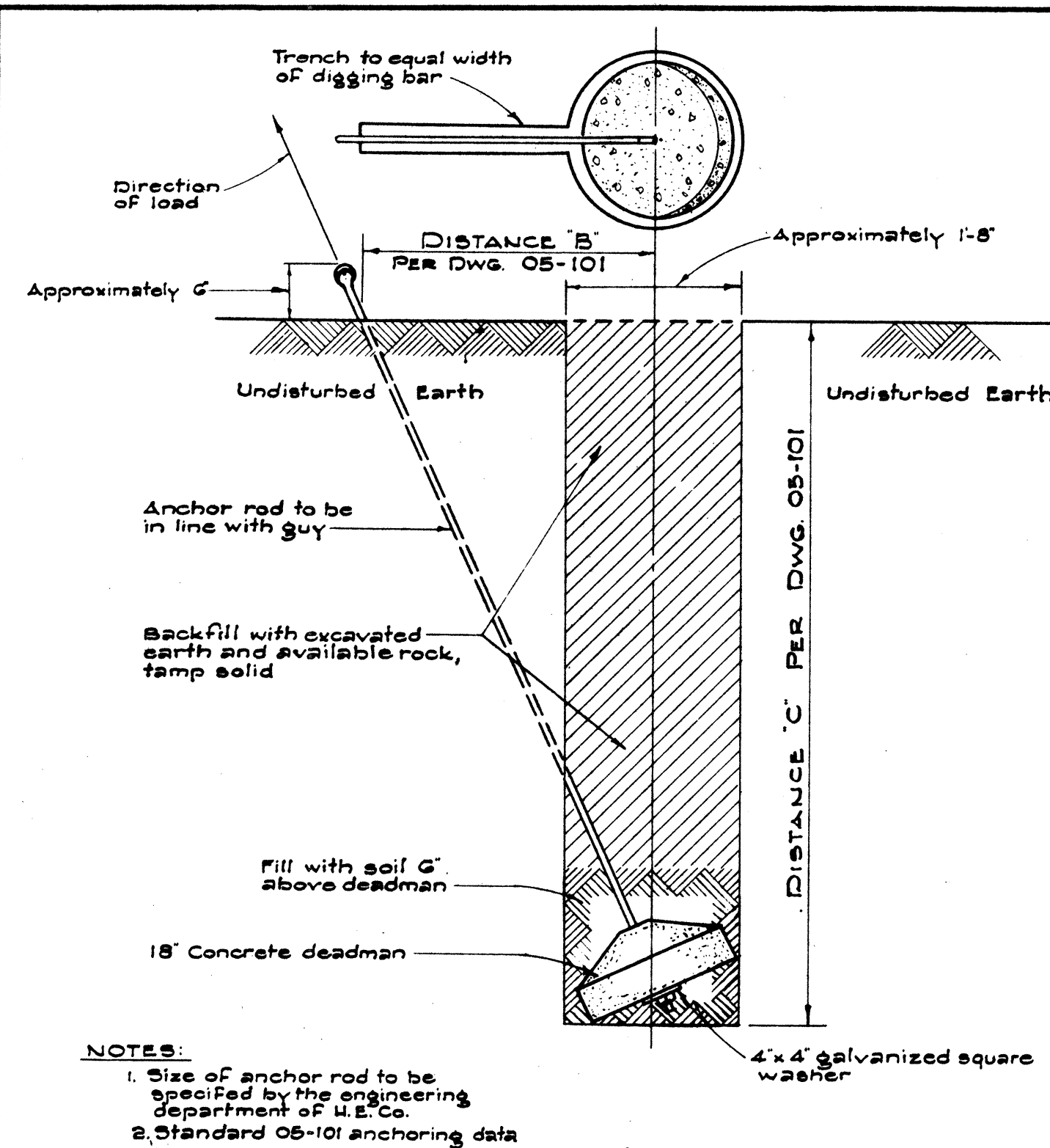
FOR 35', 40', 45', 50' & 55' POLES				
LEAD ANCHOR ROD TO & OF POLE	ANCHOR ROD TO & OF HOLE	VERTICAL DEPTH 18" D.M. 24" D.M.	TOTAL DISTANCE POLE TO HOLE	
"A"	"B"	"C"	"D" (A+B)	
5'-0"	1'-0"	7'-3"	7'-4"	6'-0"
10'-0"	1'-11"	7'-1"	7'-3"	11'-11"
15'-0"	2'-8"	6'-5"	7'-1"	17'-5"
20'-0"	3'-3"	6'-6"	6'-10"	23'-3"
25'-0"	3'-10"	6'-2"	6'-7"	28'-10"

FOR 25' & 30' POLES				
LEAD ANCHOR ROD TO & OF POLE	ANCHOR ROD TO & OF HOLE	VERTICAL DEPTH 18" D.M. 24" D.M.	TOTAL DISTANCE POLE TO HOLE	
"A"	"B"	"C"	"D" (A+B)	
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	15'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"

D.M. = DEADMAN
Lead (Dimension A) For H.T.Co. anchors (H.T.Co. ONLY) shown on plan.

ANCHORING DATA
Not to Scale

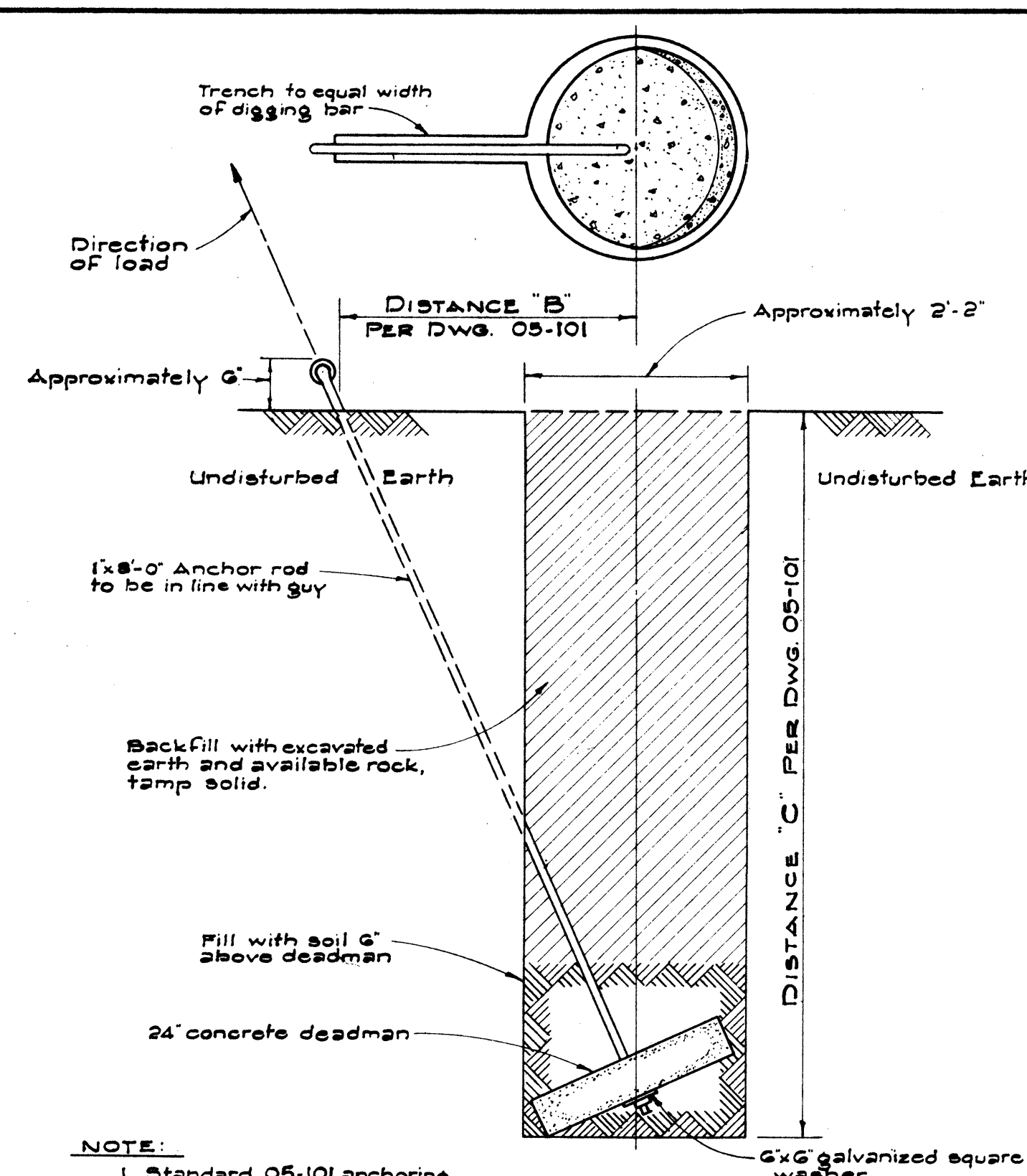
05-101



ALLOWABLE LOAD (1/2 OF ULTIMATE)	
3/4" Anchor rod	8,000 lbs.
1" Anchor rod	12,500 lbs.
1 1/2" Copperweld anchor rod	2,250 lbs.

GUY ANCHOR, 18" DEADMAN
Scale: 3/4" = 1'-0"

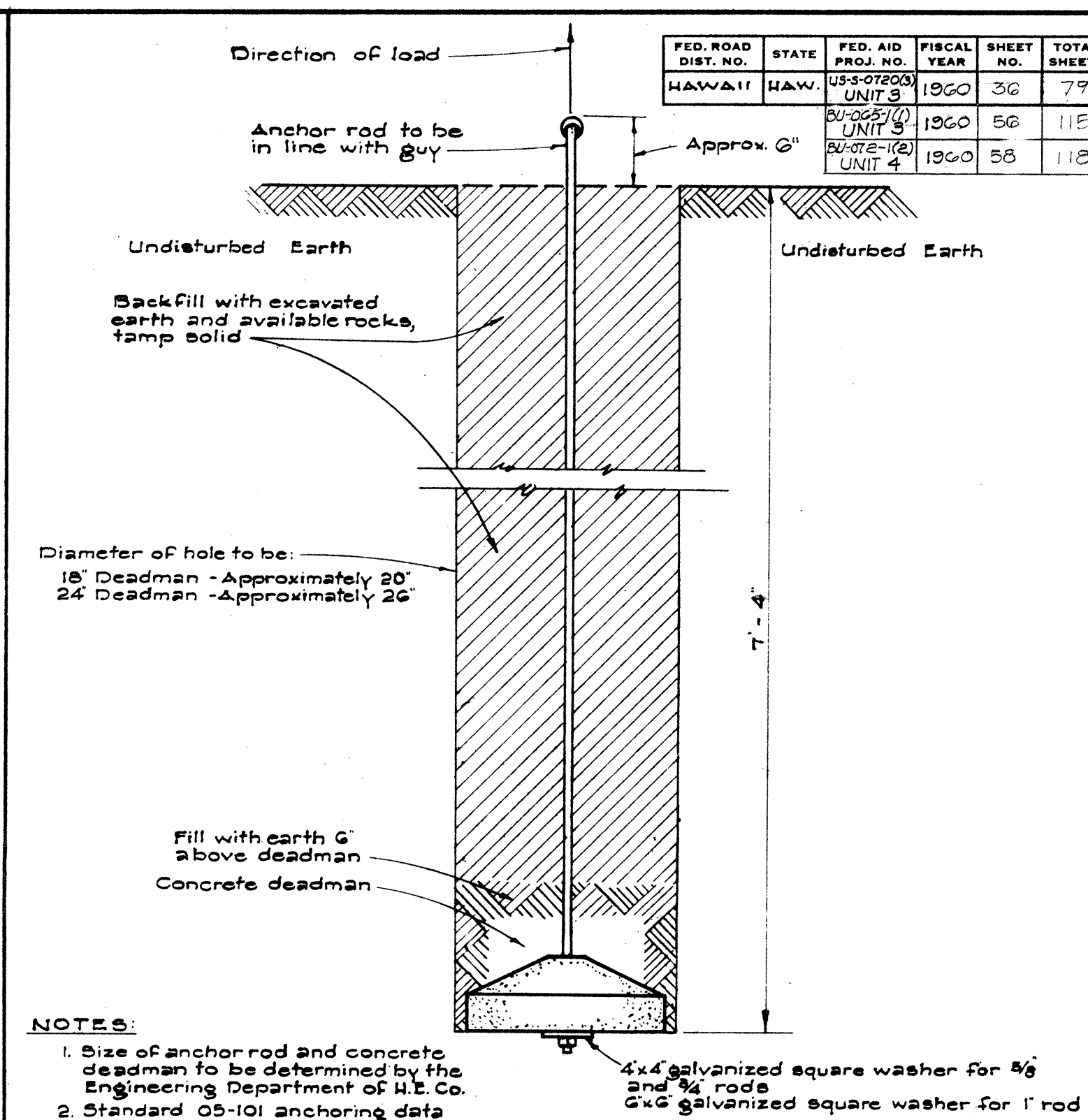
05-102



ALLOWABLE LOAD (1/2 OF ULTIMATE)	
1" Anchor rod	20,000 lbs.
1 1/2" Copperweld anchor rod	2,250 lbs.

GUY ANCHOR, 24" DEADMAN
Scale: 3/4" = 1'-0"

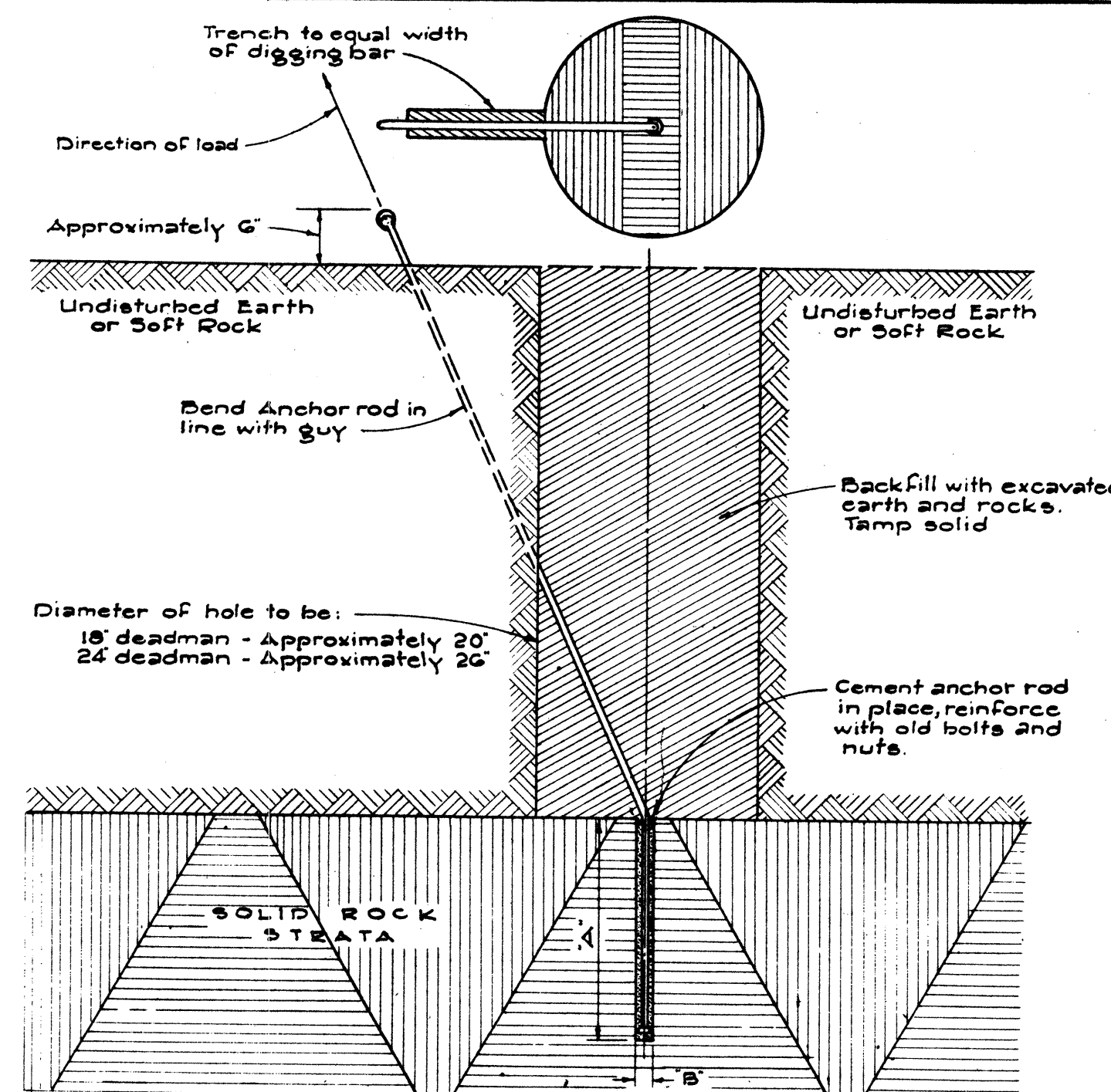
05-103



ALLOWABLE LOAD (1/2 OF ULTIMATE)	
3/4" Anchor rod	8,000 lbs.
1" Anchor rod	12,500 lbs.
1 1/2" Copperweld anchor rod	2,250 lbs.

SIDE-WALK ANCHOR
Scale: 1" = 1'-0"

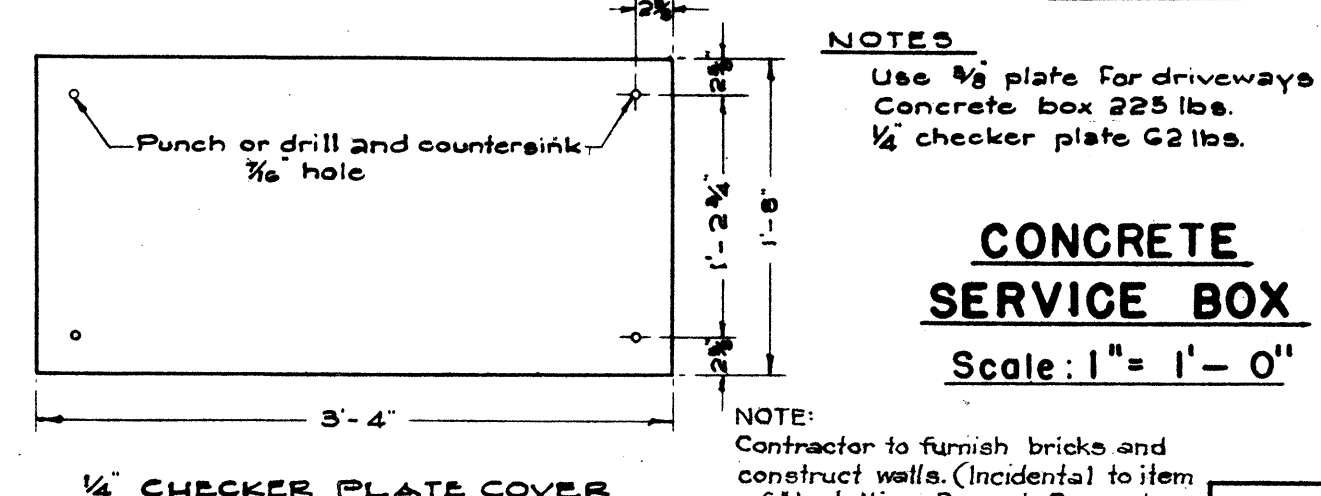
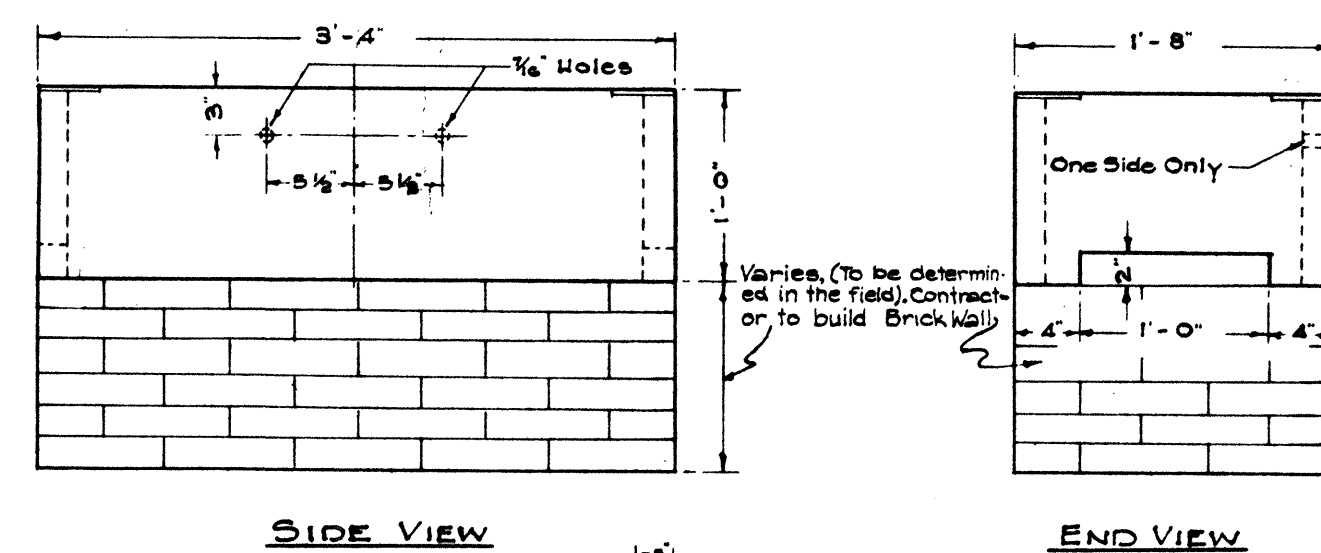
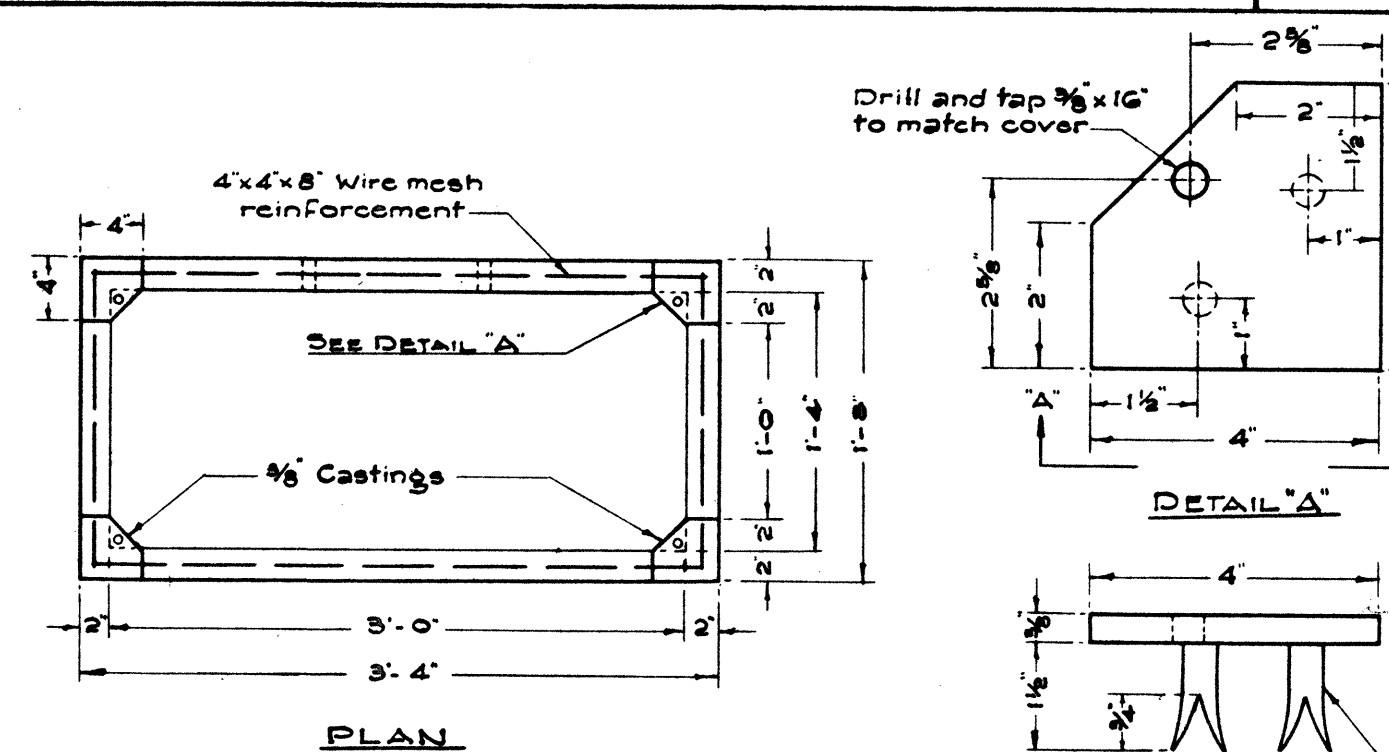
05-104



ALLOWABLE LOAD (1/2 OF ULTIMATE)	
3/4" anchor rod	8,000 lbs.
1" anchor rod	12,500 lbs.
1 1/2" anchor rod	20,000 lbs.

ROCK ANCHOR
Scale: 3/4" = 1'-0"

05-105



CONCRETE SERVICE BOX
Scale: 1" = 1'-0"

UI-103

SOUTHERN PINE & DOUGLAS FIR 8lb. CREOSOTED TREATMENT										
LENGTH IN FEET	CLASS	APPROXIMATE MINIMUM DIMENSIONS — INCHES				AVERAGE WEIGHT IN POUNDS		POLE SETTING DEPTH		BREAKING LOAD 2'-0" BELOW TOP
		AT TOP		6'0" FROM BUTT		S. P. D. F.		DEPTH IN SOIL	DEPTH IN ROCK	
		DIA.	CIR.	DIA.	CIR.					
JOINT POLES (J.P. POLES)										
25	5	6.05	19	8.28	26.0	491	525	4'-6"	3'-0"	1,900
30	5	6.05	19	8.92	28.0	660	600	5'-0"	3'-0"	1,900
35	5	6.05	19	9.55	30.0	862	770	5'-0"	3'-6"	1,900
40	3	7.32	23	11.79	37.0	1403	1320	5'-6"	3'-6"	3,000
45	3	7.32	23	12.26	38.5	1664	1575	6'-0"	4'-0"	3,000
50	3	7.32	23	12.73	40.0	1925	1850	6'-6"	4'-0"	3,000
55	3	7.32	23	13.23	41.5	2200	2145	7'-0"	4'-6"	3,000
TRANSMISSION POLES (T. POLES)										
45	2	7.96	25	13.23	41.5	1911	1845	6'-0"	4'-0"	3,700
50	2	7.96	25	13.69	43.0	2214	2150	6'-6"	4'-0"	3,700
60	1	8.59	27	15.77	49.5	3451	3360	7'-0"	4'-6"	4,500

S. P. — SOUTHERN YELLOW PINE
D. F. — DOUGLAS FIR

NOTE:

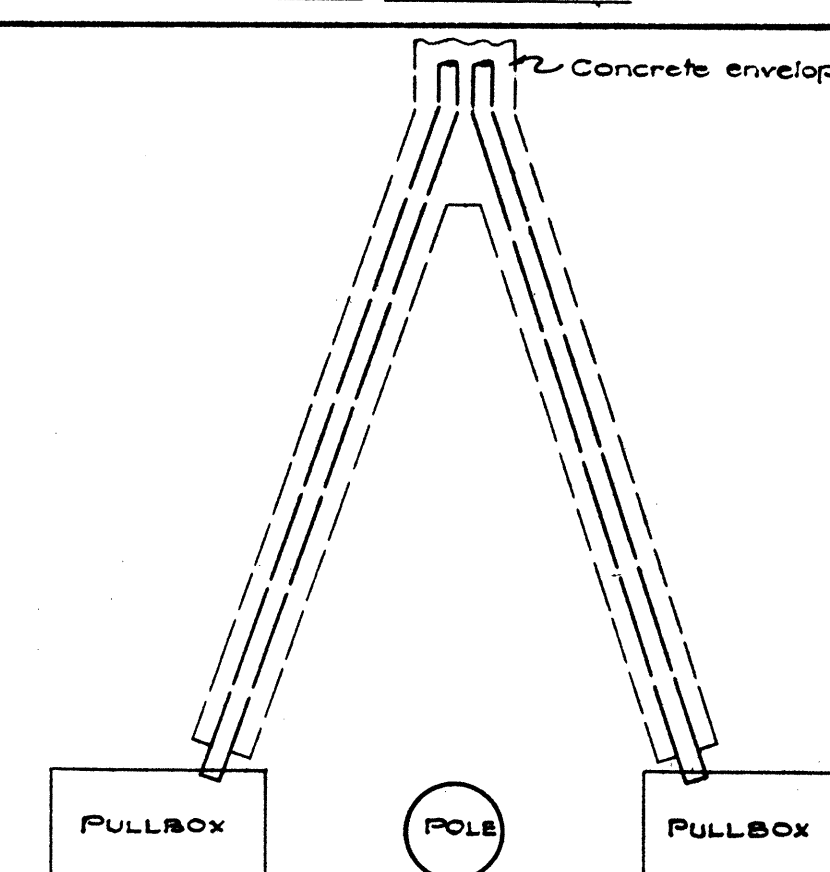
THE ULTIMATE FIBER STRESS FOR CREOSOTED SOUTHERN YELLOW PINE & DOUGLAS FIR IS 7,400 lbs. PER SQUARE INCH.

REFERENCES:

AMERICAN STANDARDS ASSOCIATION 05.4-1941, 05.6-1945
STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS, EIGHTH EDITION
H.E.CO. SPECIFICATIONS FOR POLES.

WOOD POLE DATA

05-501



TYPICAL BOX AND DUCT DETAIL
Scale: 1/8" = 1'-0"

NOTE:
Exact location of pullboxes to be determined in the field

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

HAWAIIAN ELECTRIC &
HAWAIIAN TELEPHONE

STANDARD DETAILS

MOANALUA ROAD, US-S-0720(3) UNIT 3
LUNALILO FREEWAY BU-072-1(2) UNIT 4
MIDDLE STREET BU-065-1(1) UNIT 3
Scale: As Noted Oct. 17, 1957

SHEET No 5 OF 6 SHEETS

\$526.36

\$174.58

\$161.56

20

