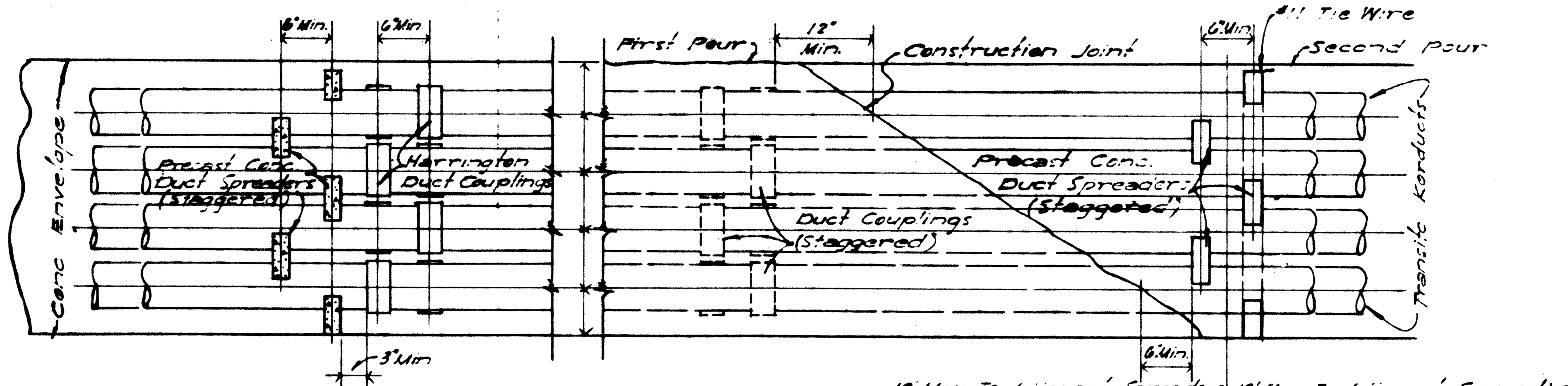
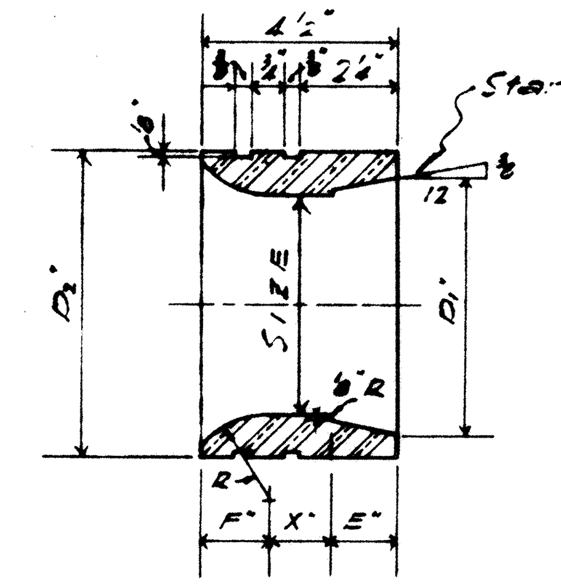
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(6)	1961	18	71

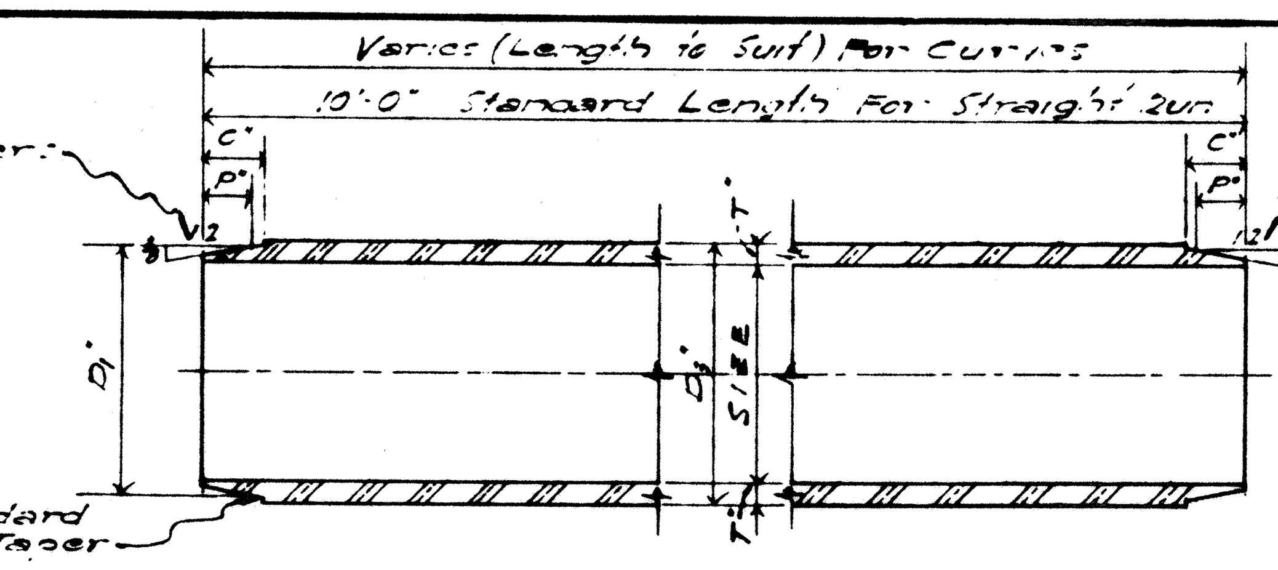


TYPICAL DUCT ENVELOPE ELEVATION
(8 WAY DUCT SHOWN)
1" = 1'-0"



JUNIOR END BELLS
3" = 1'-0"

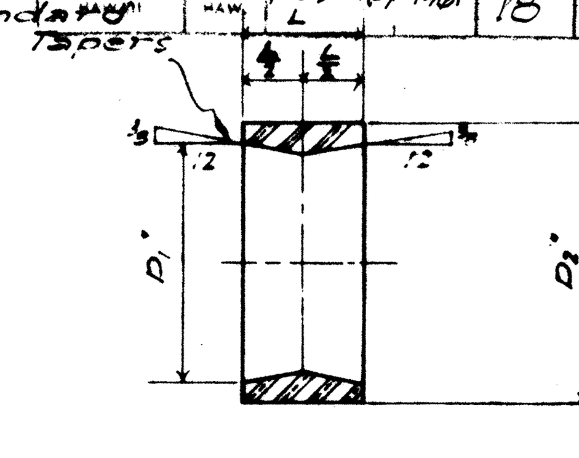
SIZE	D1"	D2"	F"	X"	E"	R"
3"	3 23/64	4 1/2	1 11/32	1 29/32	1 1/4	1 3/4
4"	4 23/64	5 3/4	1 9/16	1 9/16	1 3/8	2
4½"	4 57/64	6 1/4	1 9/16	1 9/16	1 3/8	2
5"	5 29/64	7	1 9/16	1 7/16	1 1/2	2



TRANSITE KORDUCT
3" = 1'-0"

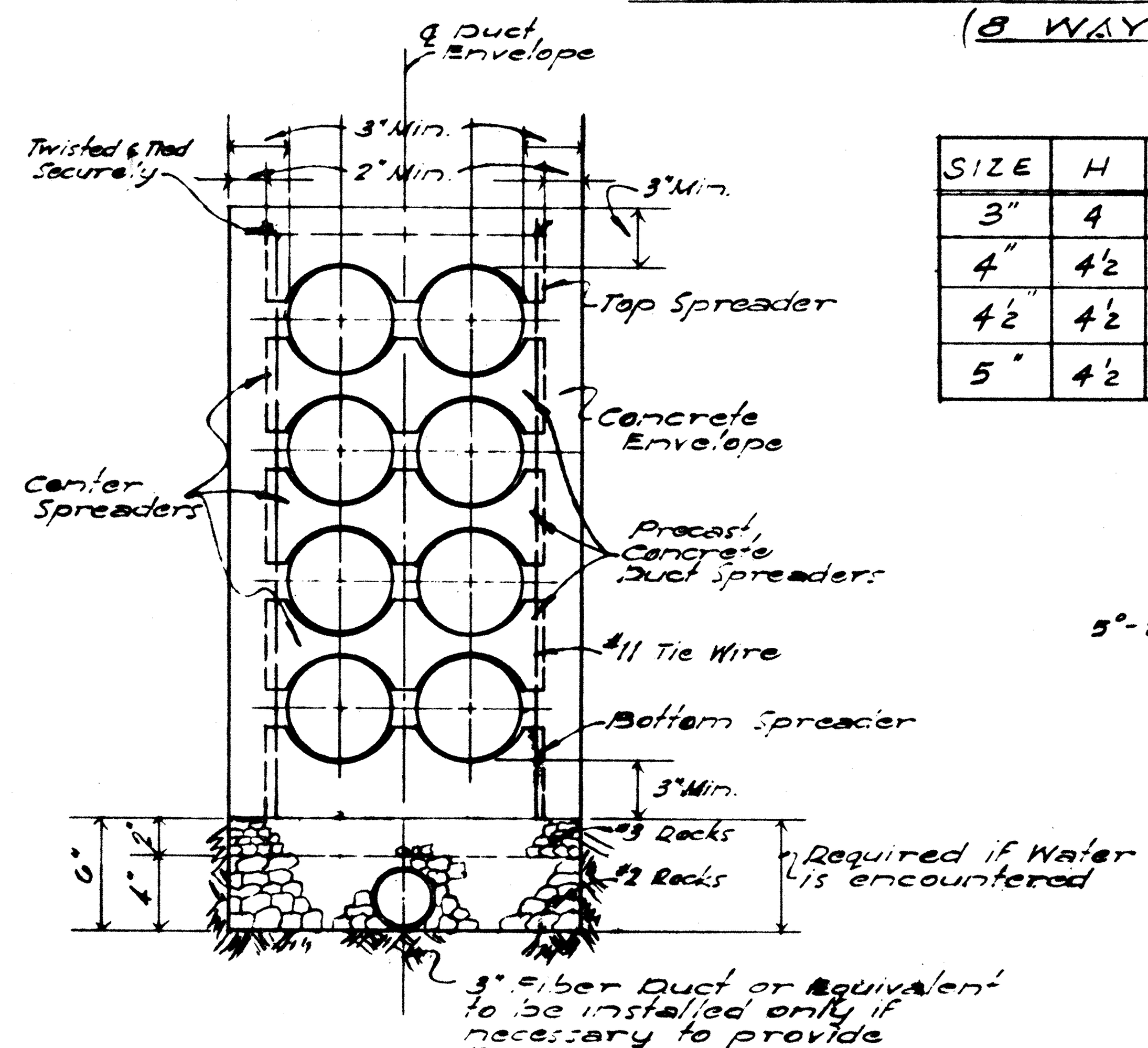
STANDARD TAPERS

SIZE	D1"	D3"	C"	P"	T"
3"	3 23/64	3 23/64	1 1/8	7/8	17/64
4"	4 25/64	4 25/64	1 1/4	1	17/64
4½"	4 57/64	5 3/64	1 1/4	1	17/64
5"	5 27/64	5 27/64	1 25/64	1 1/8	19/64



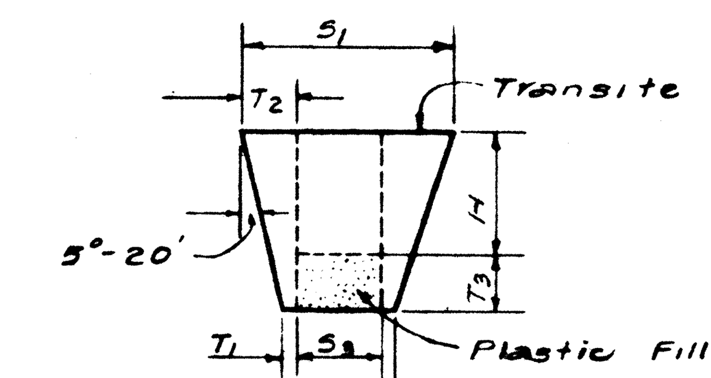
HARRINGTON COUPLINGS
3" = 1'-3"

SIZE	D1	D2"	L"
3"	3 23/32	4 11/64	2 1/4
4	4 25/64	5 3/16	2 1/2
4½"	4 57/64	5 43/64	2 1/2
5"	5 29/64	6 21/64	2 3/4



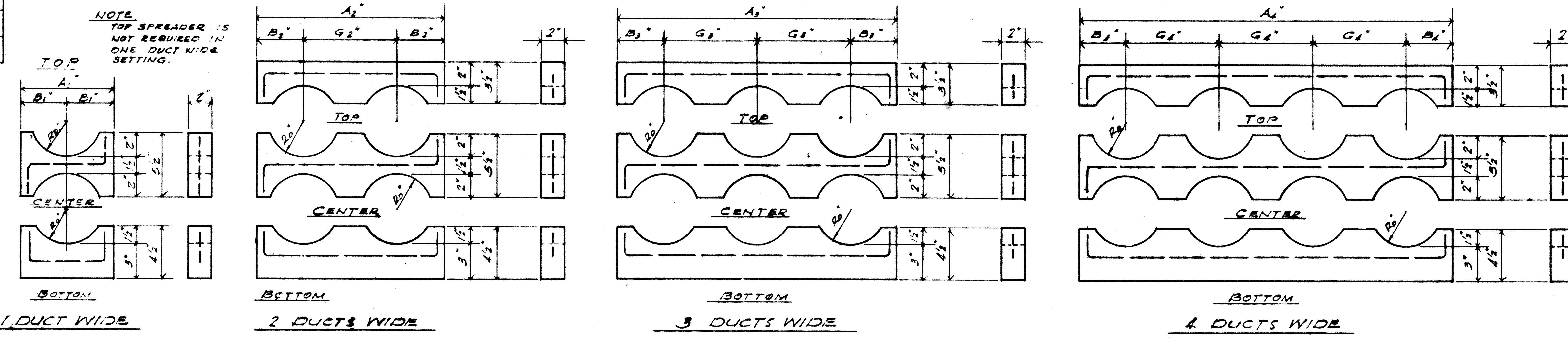
TYPICAL DUCT SPREADERS & DRAINAGE SECTION
(8 WAY DUCT SHOWN)
1½" = 1'-0"

SIZE	H	S1	S2	S3	T1	T2	T3
3"	4	3 3/8	2 5/8	2	5/16	11/16	3/4
4"	4½	4 27/64	3 37/64	2 3/4	13/32	27/32	3/4
4½"	4½	4 59/64	4 5/64	3	35/64	31/32	3/4
5"	4½	5 27/64	4 37/64	3½	35/64	31/32	3/4



PLUGS FOR TRANSITE KORDUCTS
No Scale

NOTE: TOP SPREADER IS NOT REQUIRED IN ONE DUCT WIDE SETTING.



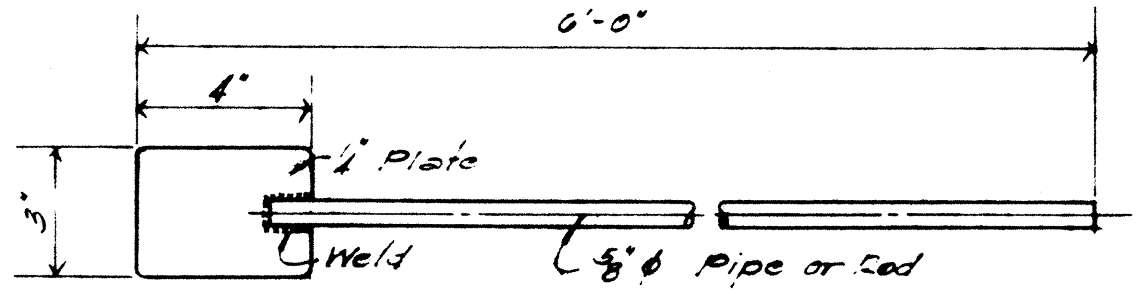
PRECAST CONCRETE DUCT SPREADER DETAILS
2" = 1'-0"

SIZE	Ro"	1 DUCT WIDE A1"	1 DUCT WIDE B1"	2 DUCTS WIDE A2"	2 DUCTS WIDE B2"	2 DUCTS WIDE G2"	3 DUCTS WIDE A3"	3 DUCTS WIDE B3"	3 DUCTS WIDE G3"	4 DUCTS WIDE A4"	4 DUCTS WIDE B4"	4 DUCTS WIDE G4"					
3"	2	6	3	12	3¼	5½	17½	3¼	5½	23	3¼	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	8½	4¼	16	4¼	7½	23½	4¼	7½	31	4¼	7½					

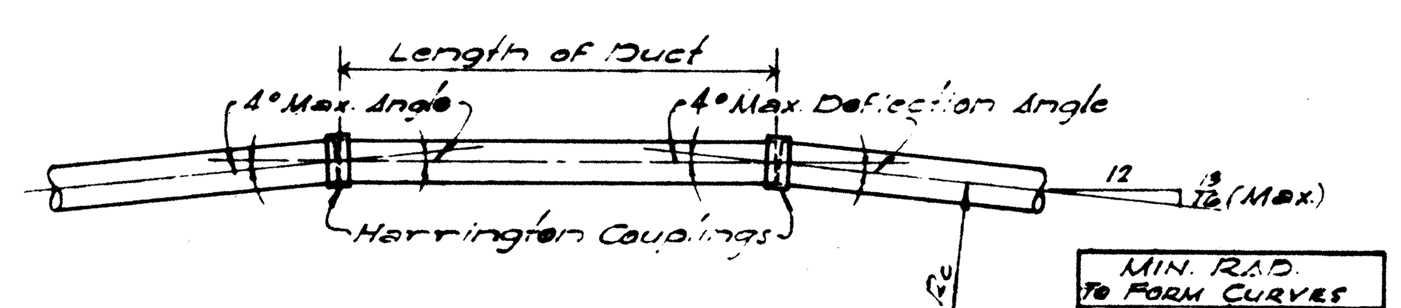
NOTES: DUCT SPREADERS

Reinforcing
1 - ¼" ϕ Bar each Spreader

Concrete Mix
One Part Cement
Two Parts Beach Sand
Two Parts Gravel #4 (Fine)
Measurements by Weight

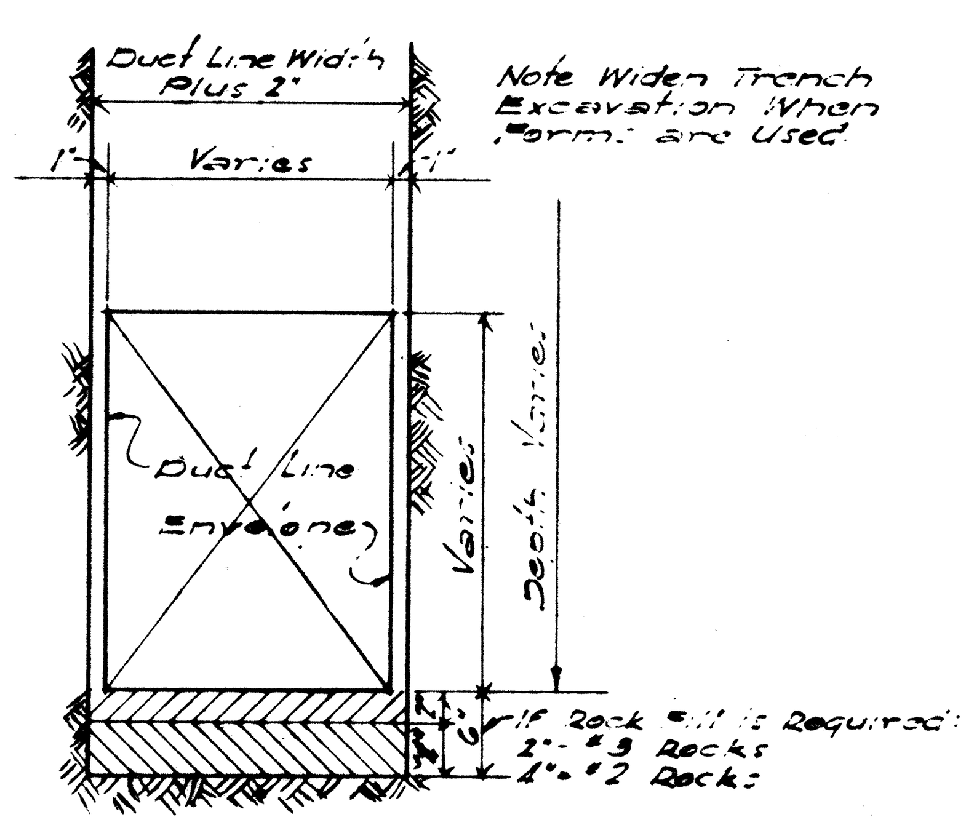


DUCT ENVELOPE CONC. TAMPING ROD
3" = 1'-0"



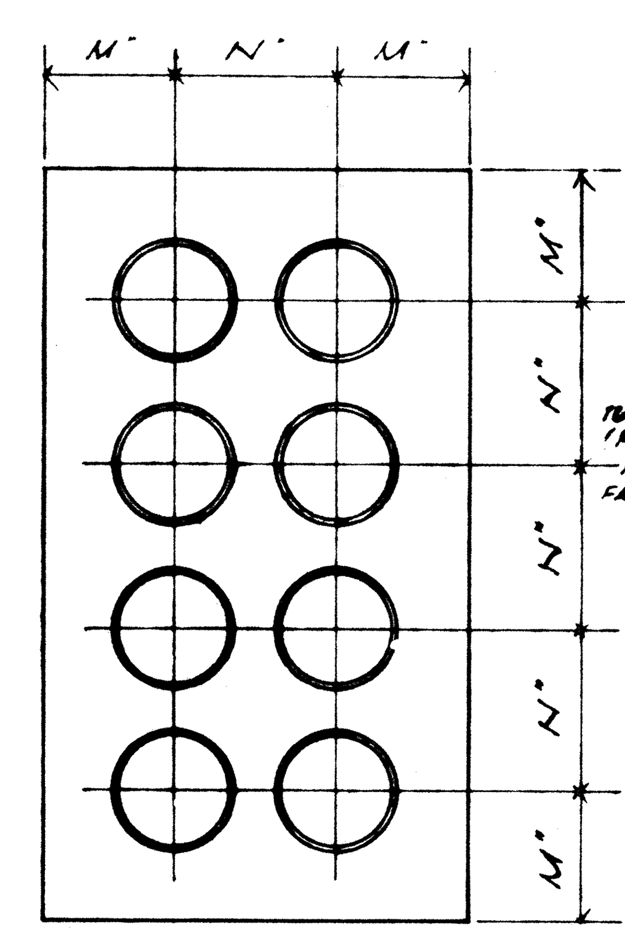
METHOD OF FORMING CURVES
½" = 1'-0"

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

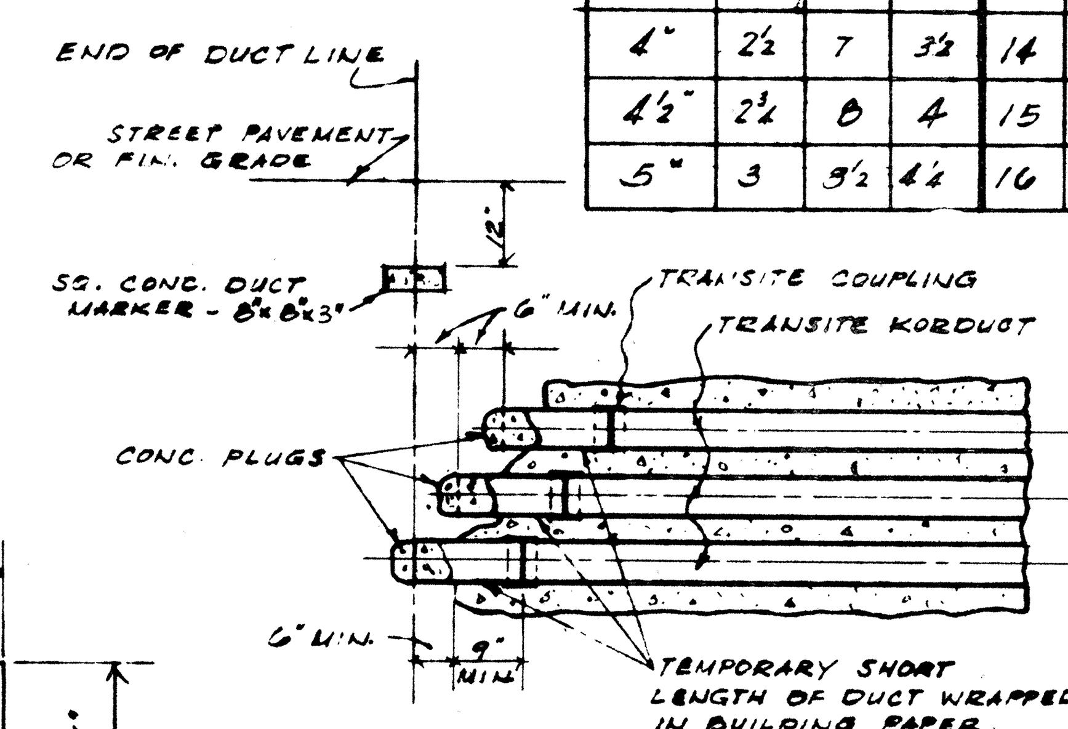


TYPICAL EXCAVATION DETAIL
N.T.S.

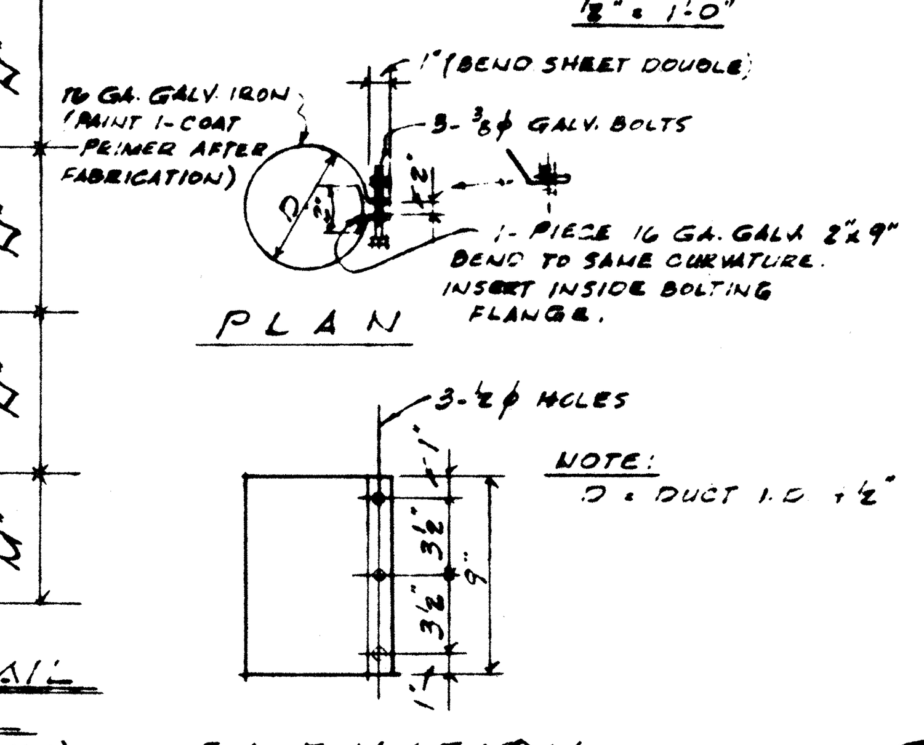
SIZE	M"	N"
3"	5	6
4"	5½	7
4½"	5½	7½
5"	6	8



TYPICAL DUCT DETAIL AT MANHOLE WALL
(8 WAY DUCT SHOWN)
1½" = 1'-0"



STUB OUT DETAIL
⅛" = 1'-0"



3-BOLT CLAMP - DETAIL
1½" = 1'-0"

DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII
HAWAIIAN ELECTRIC CO.
STANDARD DETAILS

PROJ. NO. F-090-1(6)
Scale: As Noted
Feb. 28, 1958

REDUCED PLANS
SCALES REDUCED
ACCORDINGLY

SHEET No. OF SHEETS

No	Date	Revision	Init's
1	5-2-56	ADDED 3" DUCT, CENTER SPREADER FOR 1 DUCT WIDE, 3 FOL. CHART	R.
2	1-9-57	REVISED DEFLECTION ANGLE 5° TO 4°	R.Y.

Scale: As Shown
Date 2-23-56
Drawn: JP
Checked: W.M.H.
Approved:
Final Approval:

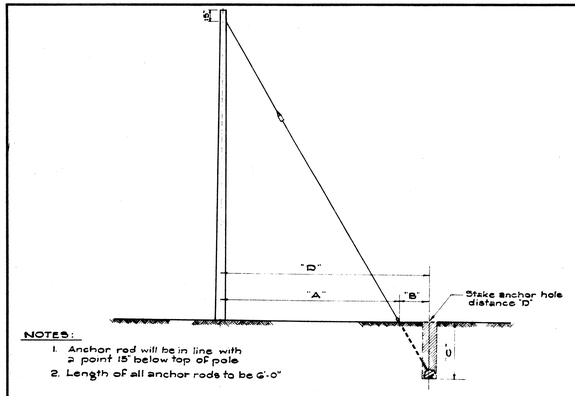
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCTLINES

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

U-18744

18

1 S



NOTES:
1. Anchor rod will be in line with a point 15" below top of pole
2. Length of all anchor rods to be 6'-0"

FOR 35', 40', 45', 50' & 55' POLES				
LEAD ANCHOR ROD TO ℄ OF POLE "A"	ANCHOR ROD TO ℄ OF HOLE "B"	VERTICAL DEPTH "C" 18" D.M.	VERTICAL DEPTH "C" 24" D.M.	TOTAL DISTANCE POLE TO HOLE "D" (A+B)
5'-0"	1'-0"	7'-5"	7'-4"	6'-0"
10'-0"	1'-11"	7'-1"	7'-3"	11'-11"
15'-0"	2'-8"	6'-5"	7'-1"	17'-8"
20'-0"	3'-3"	6'-6"	6'-10"	23'-3"
25'-0"	3'-10"	6'-2"	6'-7"	28'-10"
FOR 25' & 30' POLES				
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"	19'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"

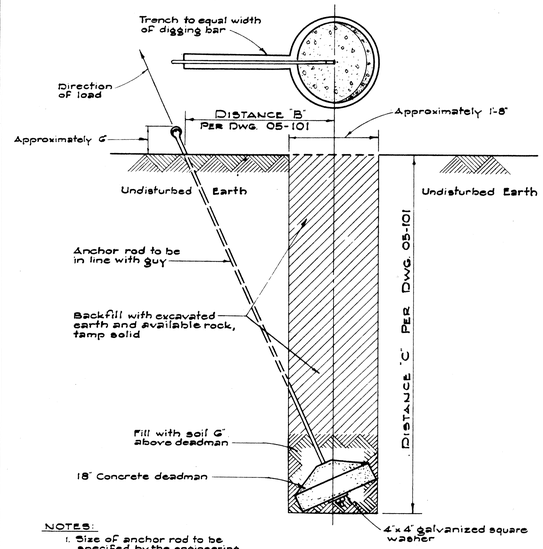
D.M. = DEADMAN

Lead (Dimension "A") for H.T.Co. anchors (H.T.Co. ONLY) shown on plan.

ANCHORING DATA

Not to Scale

05-101



NOTES:
1. Size of anchor rod to be specified by the engineering department of H.E.Co.
2. Standard 05-101 anchoring data

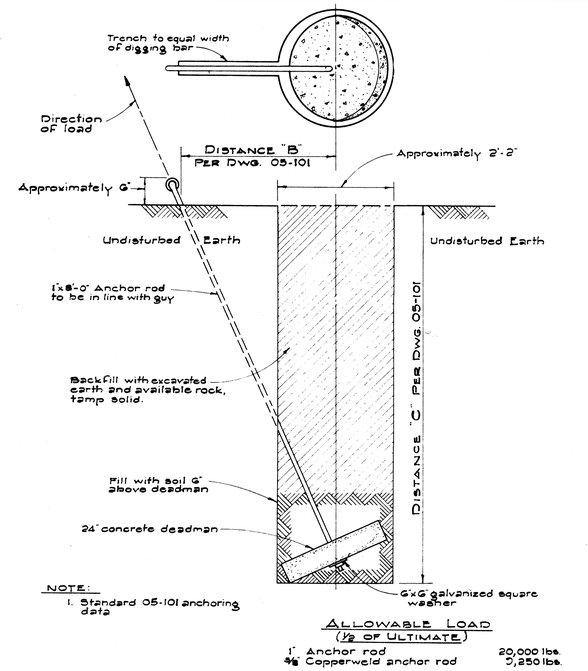
ALLOWABLE LOAD
(½ OF ULTIMATE)

⅝" Anchor rod	8,000 lbs.
¾" Anchor rod	12,500 lbs.
⅝" Copperweld anchor rod	5,200 lbs.

GUY ANCHOR, 18" DEADMAN

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

05-102



NOTE:
1. Standard 05-101 anchoring data

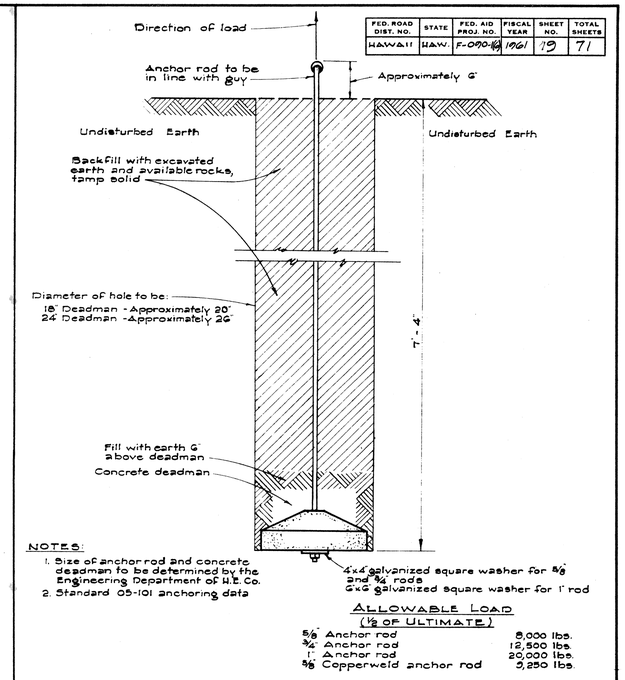
ALLOWABLE LOAD
(½ OF ULTIMATE)

1" Anchor rod	20,000 lbs.
⅝" Copperweld anchor rod	5,250 lbs.

GUY ANCHOR, 24" DEADMAN

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

05-103



NOTES:
1. Size of anchor rod and concrete deadman to be determined by the Engineering Department of H.E.Co.
2. Standard 05-101 anchoring data

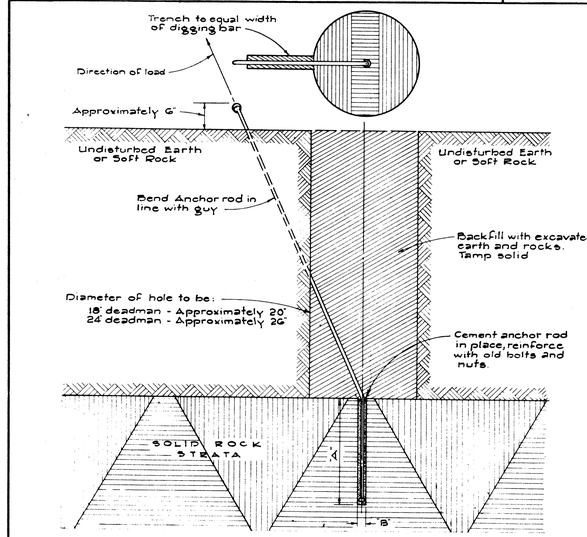
ALLOWABLE LOAD
(½ OF ULTIMATE)

⅝" Anchor rod	8,000 lbs.
¾" Anchor rod	12,500 lbs.
1" Anchor rod	20,000 lbs.
⅝" Copperweld anchor rod	5,250 lbs.

SIDE-WALK ANCHOR

Scale: 1" = 1'-0"

05-104



NOTES:
1. Size of anchor rod to be specified by the Engineering Department of H.E.Co.
2. "A" should not be less than 24". If "A" is less than 24, complete hole and install anchor per O.H. Standard 05-102, 103, or 104.
3. "B" ⅝" anchor rod drill 2" hole.
   ¾" anchor rod drill 2" hole.
   1" anchor rod drill 2½" hole
4. Standard 05-101 anchoring data.

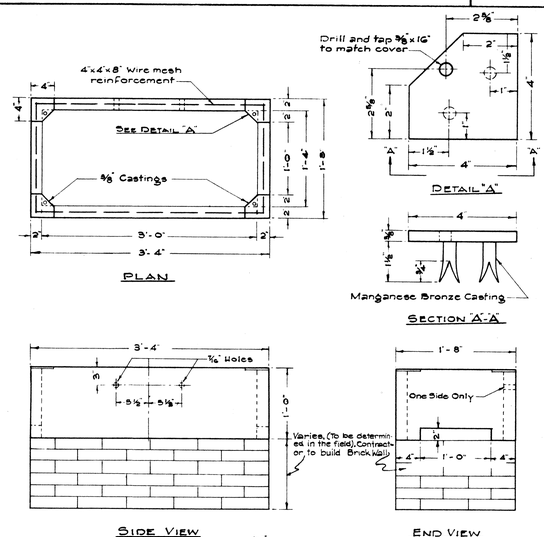
ALLOWABLE LOAD
(½ OF ULTIMATE)

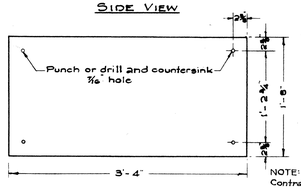
⅝" anchor rod	8,000 lbs.
¾" anchor rod	12,500 lbs.
1" anchor rod	20,000 lbs.

ROCK ANCHOR

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

05-105





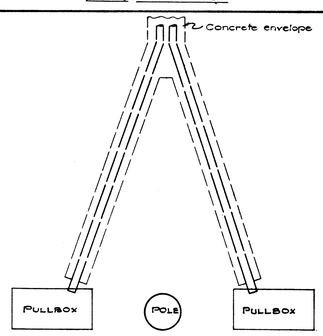
NOTES
Use ⅜ plate for driveways
Concrete box 225 lbs.
¼" checker plate 62 lbs.

CONCRETE SERVICE BOX

Scale: 1" = 1'-0"

NOTE:
Contractor to furnish bricks and construct walls. (Incidental to item of "Installing Precast Concrete Pull Boxes")

UI-103



TYPICAL BOX AND DUCT DETAIL

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

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

SOUTHERN PINE & DOUGLAS FIR 8lb. CREOSOTED TREATMENT										
LENGTH IN FEET	CLASS	APPROXIMATE MINIMUM DIMENSIONS — INCHES AT TOP DIA.	AT TOP CIR.	6'0" FROM BUTT DIA.	6'0" FROM BUTT CIR.	AVERAGE WEIGHT IN POUNDS S.P.	AVERAGE WEIGHT IN POUNDS D.F.	POLE SETTING DEPTH DEPTH IN SOIL	POLE SETTING DEPTH DEPTH IN ROCK	BREAKING LOAD 2'-0" BELOW TOP OF POLE (LBS.)
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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(6)	1961	19	71

DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

HAWAIIAN ELECTRIC & HAWAIIAN TELEPHONE

STANDARD DETAILS

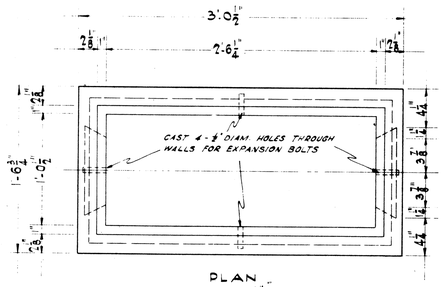
PROJ. NO. F-090-1(6)
Scale: As Noted
Oct. 17, 1957

SHEET Nº 19 OF 71 SHEETS

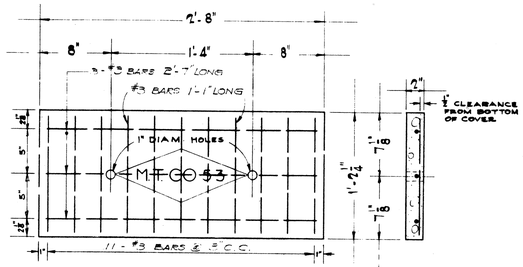
ORIGINAL PLAN | SURVEY PLOTTED BY | DESIGNED BY | DRAWN BY | TRACED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

WRIGHT 18406

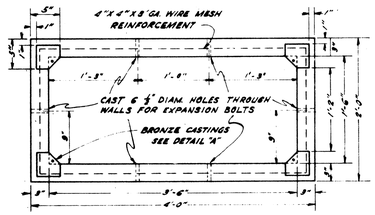
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(6)	1961	20	71



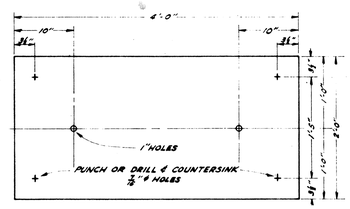
PLAN
SCALE 1" = 1"



PLAN OF COVER
SCALE 1" = 1"



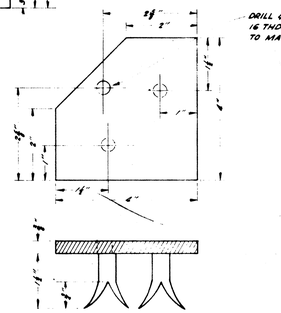
TOP VIEW



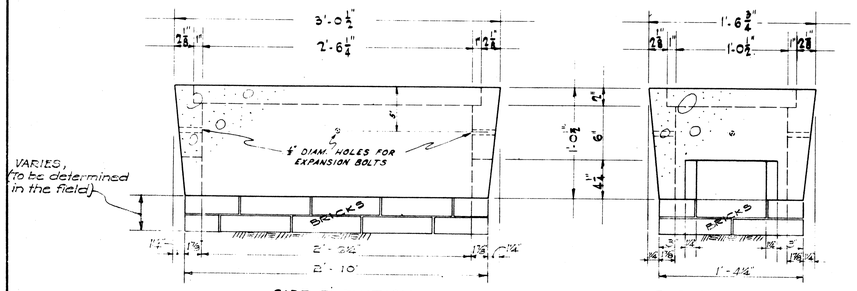
¼" CHECKERED PLATE COVER
⅜" FOR DRIVEWAYS

NOTE:

CHECKERED PLATE COVER SHALL BE ¼" THICK AT SIDEWALK AREAS AND ⅜" THICK AT DRIVEWAYS.



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



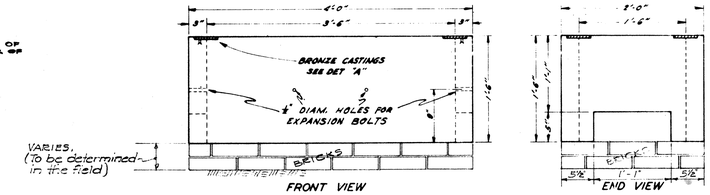
SIDE ELEVATION
SCALE 1" = 1"

END ELEVATION
SCALE 1" = 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.

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



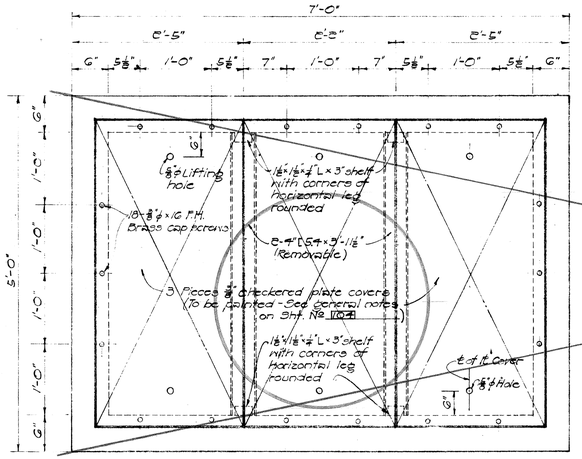
FRONT VIEW

END VIEW

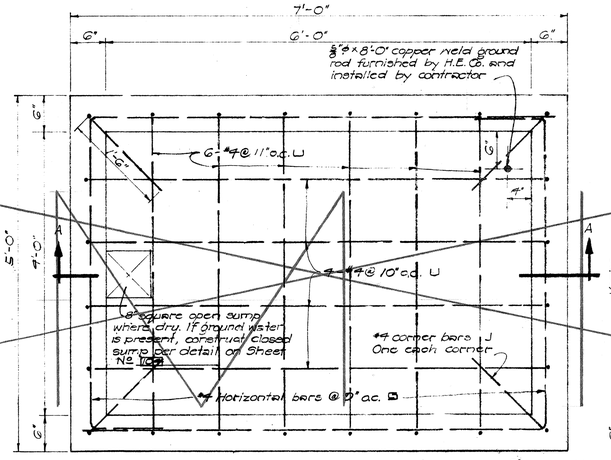
H. E. CO. PULLBOX № U1-103-L
H. T. CO. PULLBOX № 516

H. E. CO. PULLBOX № U1-103-S
H. T. CO. PULLBOX № 513

SCALE: 1" = 1'-0"

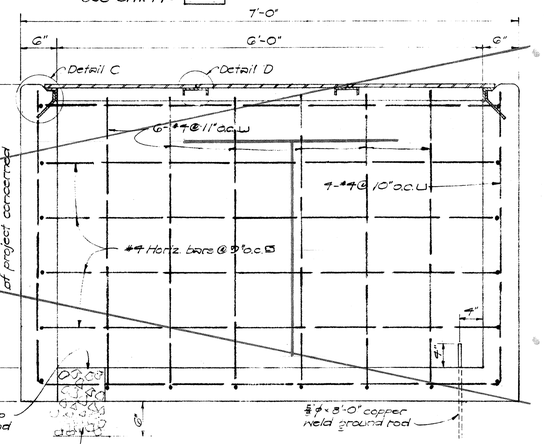


PLAN



SECTIONAL PLAN

NOTE: For Detail C & Detail D see Sht. № [ ]



SECTION A-A

H. E. CO. HANDHOLE TYPE #3
(9'-0" x 6'-0" INSIDE)
Scale: 1" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DESIGNED BY	
	DRAWN BY	
	TRACED BY	
NOTE BOOK	QUANTITIES BY	
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JAMES B. WILSON — REGISTERED PROFESSIONAL ENGINEER — No. 379 — HAWAII, U.S.A.

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DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

DETAIL OF HAW'N. ELEC. CO. HANDHOLE, & HAW'N ELEC. CO. & HAWN TEL. CO. PULLBOXES.

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