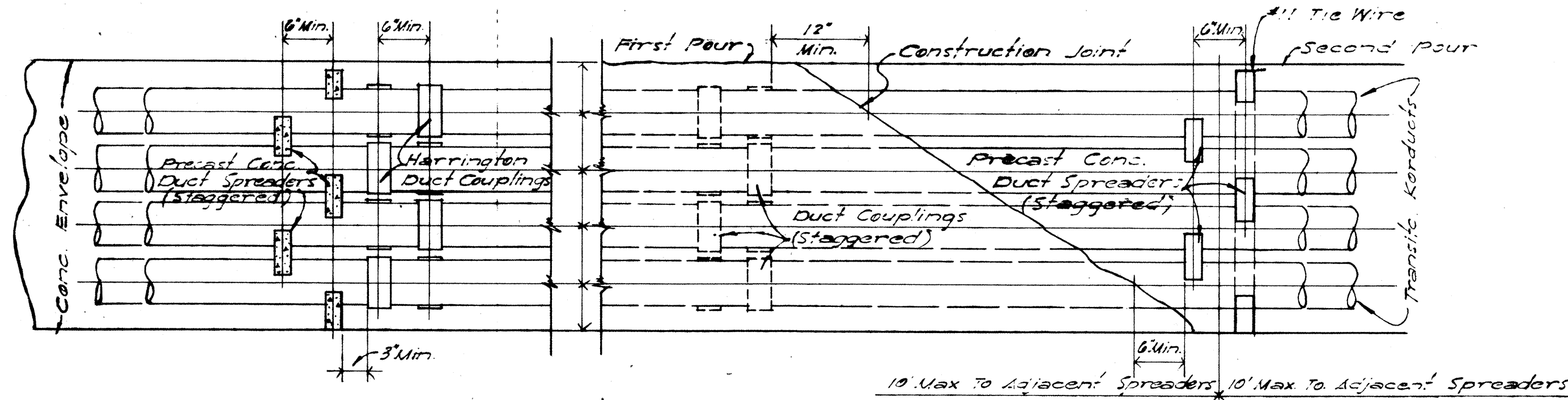
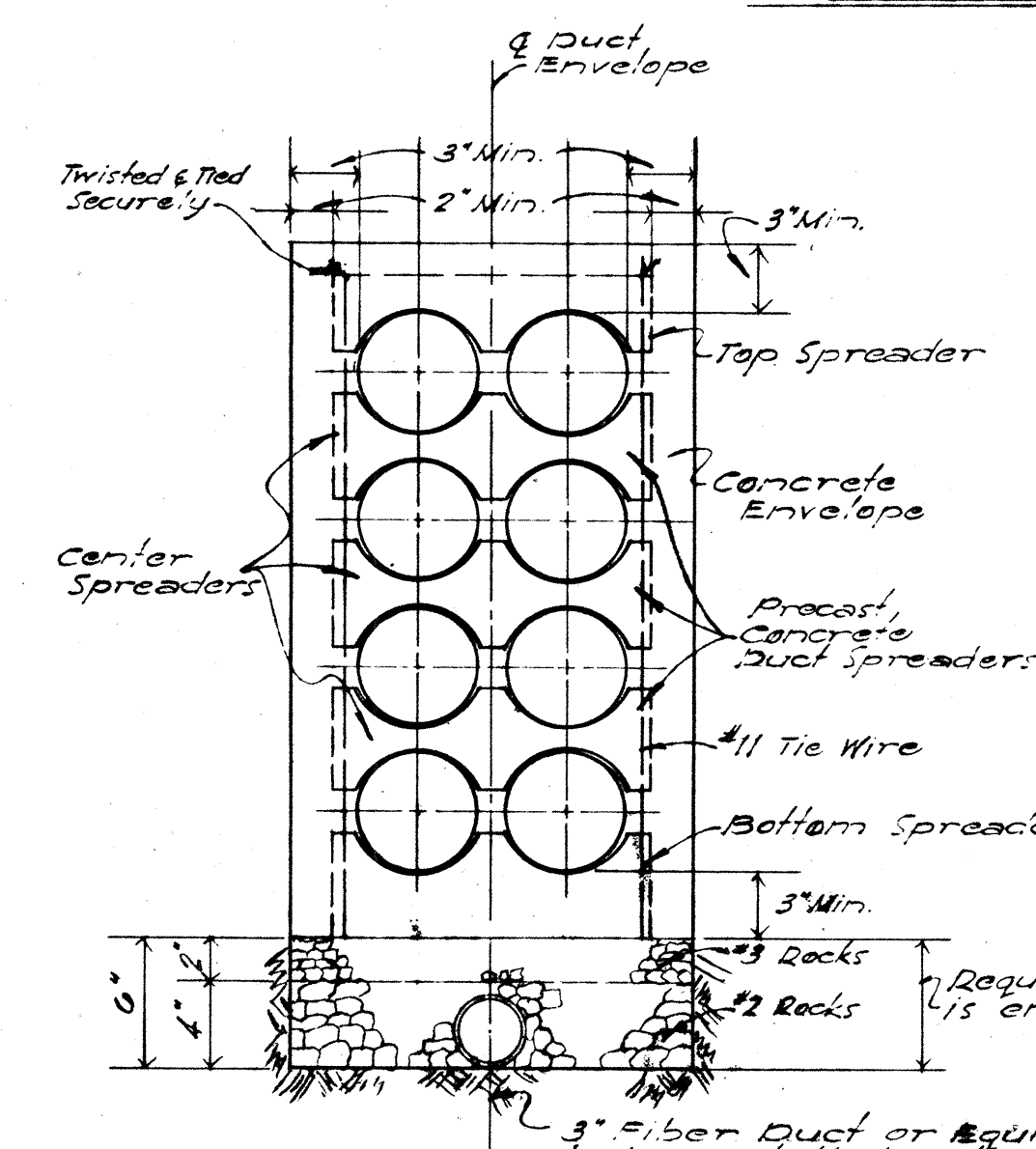


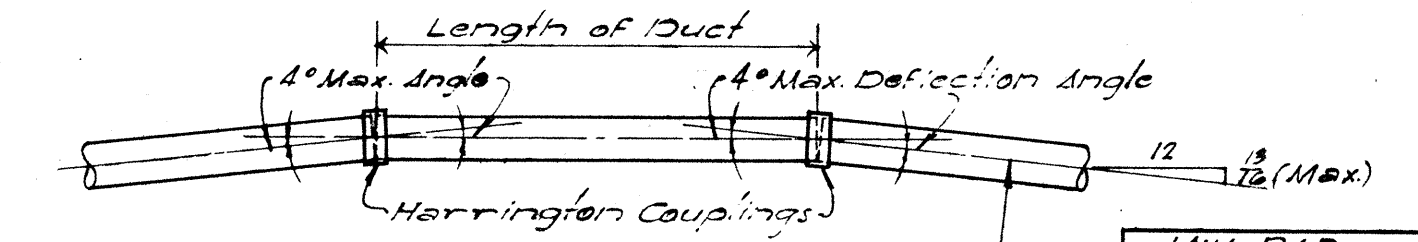
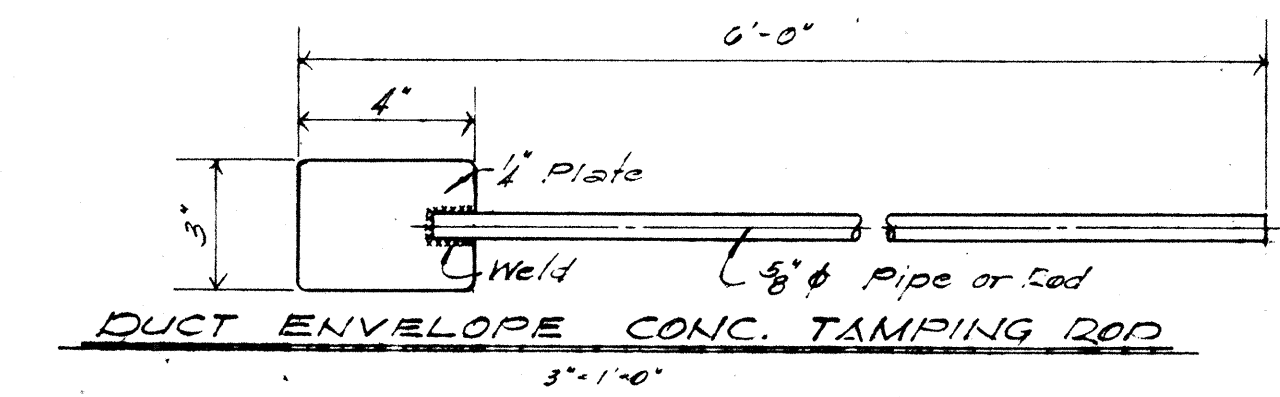


TYPICAL DUCT ENVELOPE ELEVATION
(8 WAY DUCT SHOWN)
1" = 1'-0"

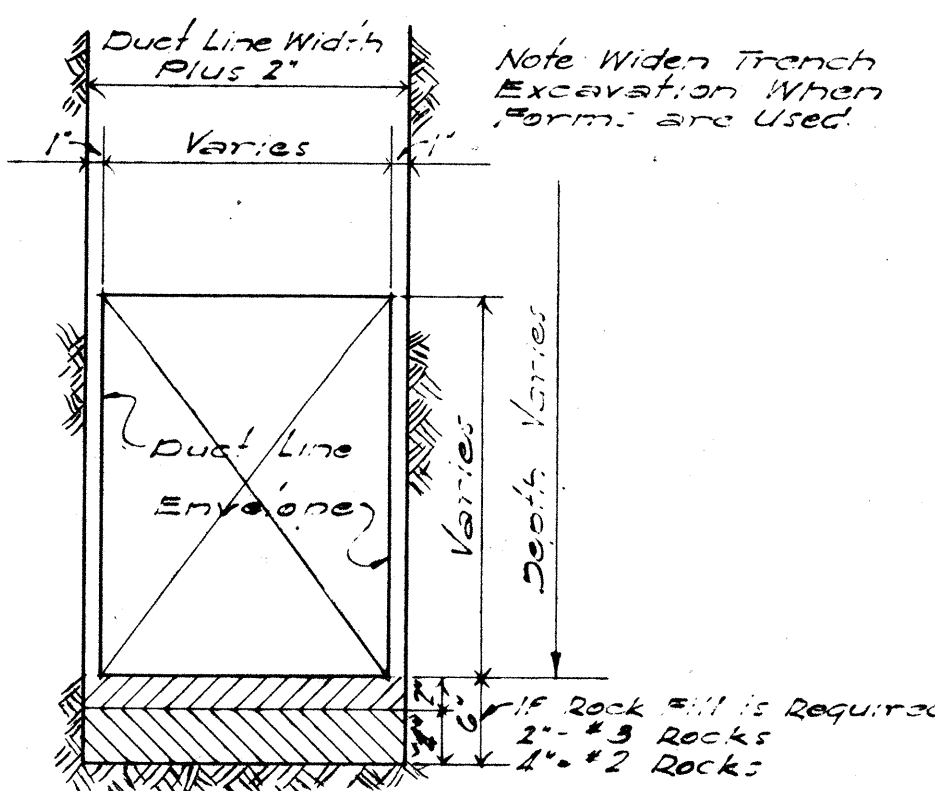
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4	3 3/8	2 5/8	2	5 1/16	11 1/16	3 1/4
4"	4 1/2	4 27/32	3 37/64	2 3/4	13 3/32	27 3/32	3 3/4
4 1/2"	4 1/2	4 27/64	4 5/64	3	3 5/8	31 3/8	3 3/4
5"	4 1/2	5 27/64	4 37/64	3 1/2	2 5/8	31 3/8	3 3/4



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



METHOD OF FORMING CURVES
2" = 1'-0"



TYPICAL EXCAVATION DETAIL
1" = 1'-0"

MIN. RAD. TO FORM CURVES	MIN. RAD. TO FORM CURVES
1'-0"	14'-4"
1'-6"	21'-0"
2'-0"	28'-0"
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'-9"
9'-0"	128'-11"
9'-6"	136'-0"
10'-0"	143'-2"

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

JUNIOR END BELLS
3'-1'-0"

SIZE	D1	D2	F	X	E	R
3"	3 3/8	4 1/2	1 1/2	1 3/8	1 1/2	1 3/4
4"	4 27/32	5 1/2	1 7/8	1 7/8	1 3/4	2
4 1/2"	4 27/32	6 1/2	1 7/8	1 7/8	1 3/4	2
5"	5 27/32	7	1 7/8	1 7/8	1 3/4	2

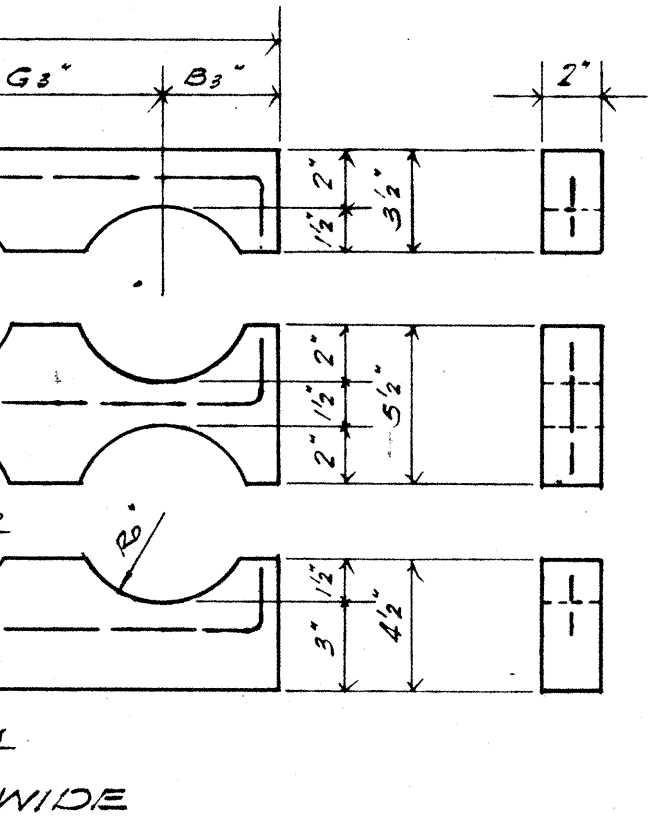
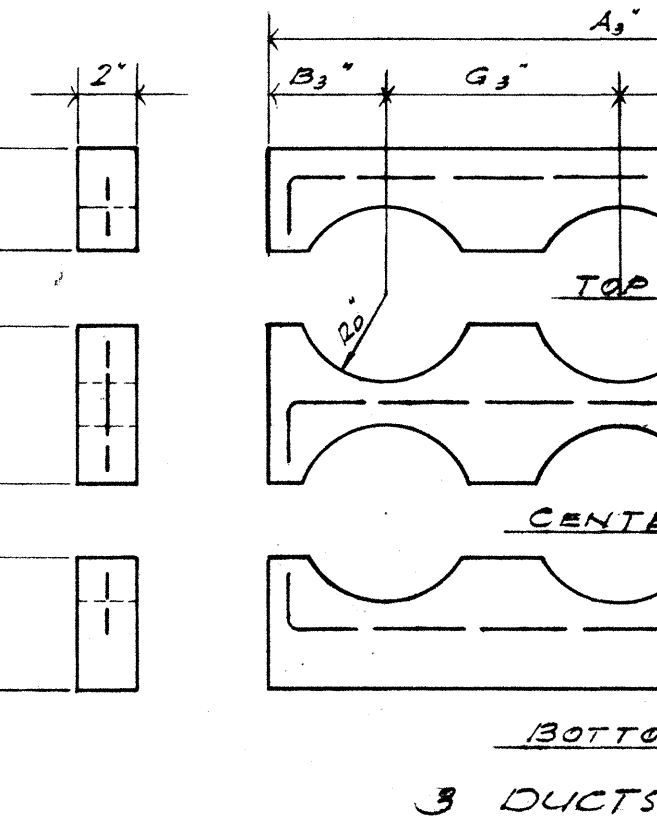
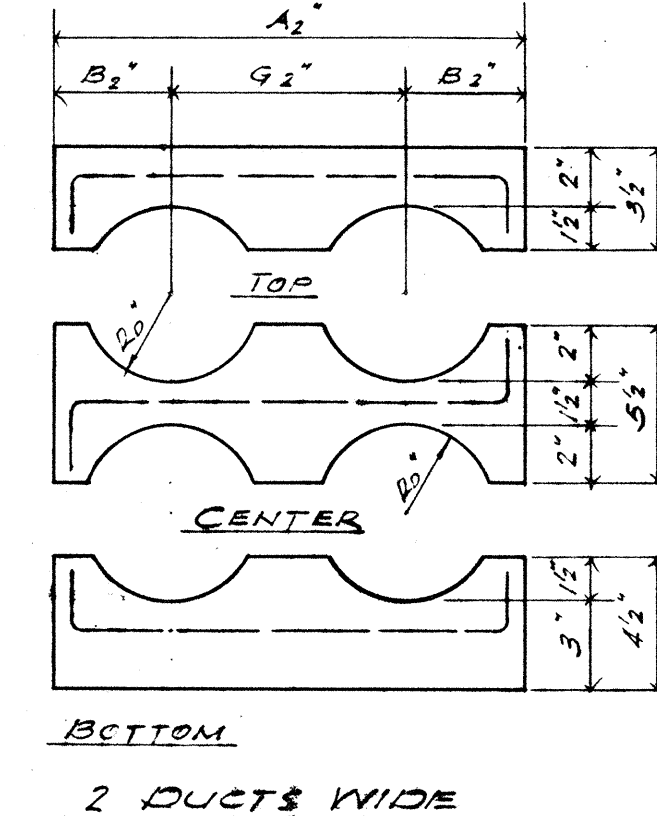
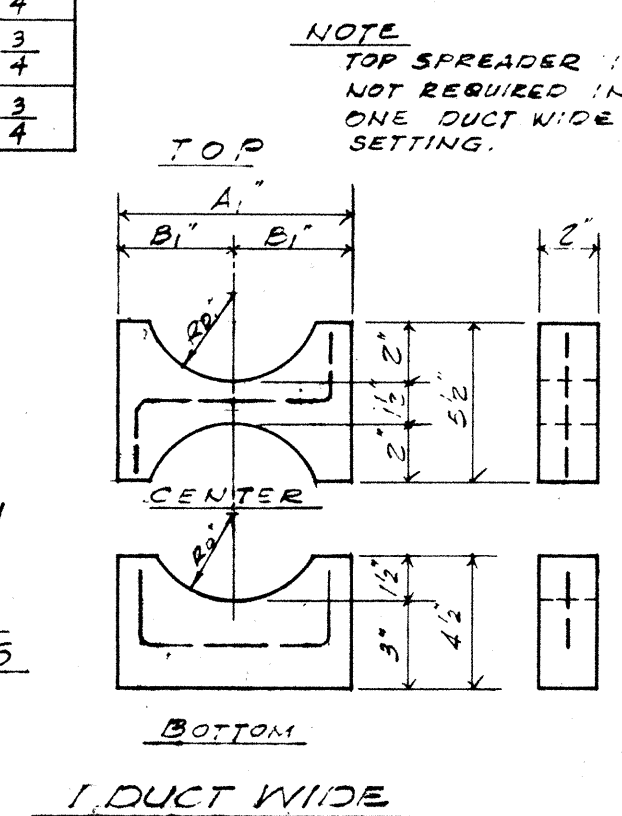
TRANSITE KORDUCT
3'-1'-0"

STANDARD TAPERS

SIZE	D1	D2	C	P	T
3"	3 3/8	3 3/8	1 1/2	1 1/2	1 1/4
4"	4 27/32	4 27/32	1 1/2	1	1 1/4
4 1/2"	4 27/32	5 1/2	1 1/2	1	1 1/4
5"	5 27/32	5 27/32	1 1/2	1 1/2	1 1/4

HARRINGTON COUPLINGS
3'-1'-0"

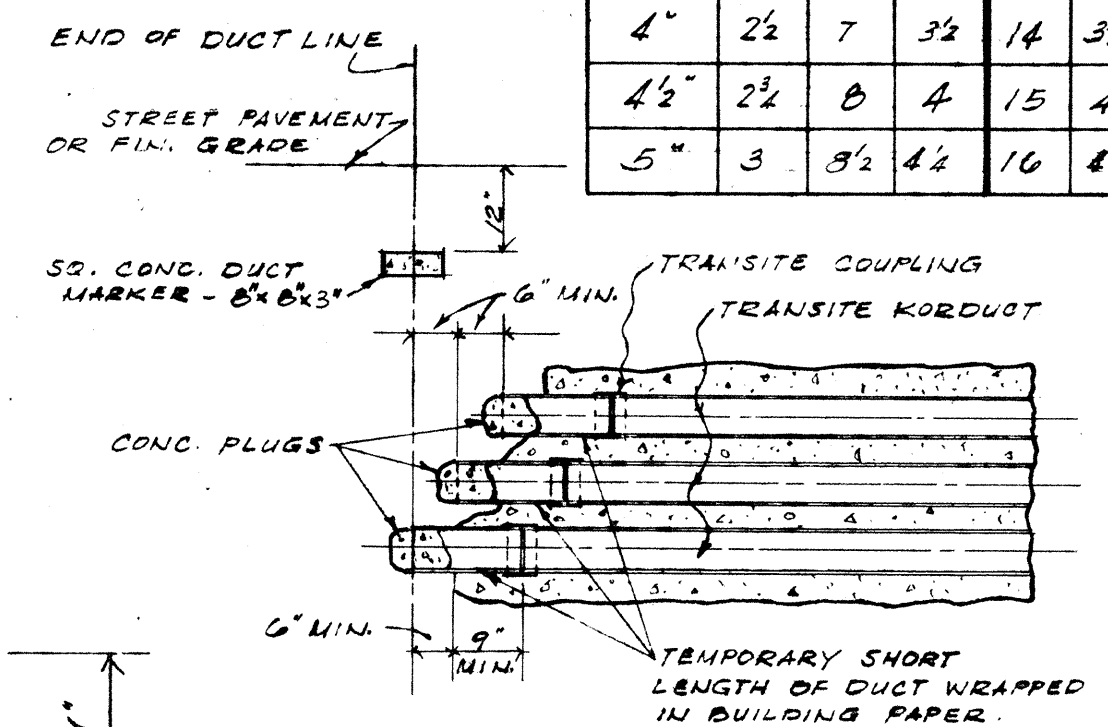
SIZE	D1	D2	L
3"	3 3/8	4 1/2	2 1/4
4"	4 27/32	5 1/2	2 1/4
4 1/2"	4 27/32	5 27/32	2 1/4
5"	5 27/32	6 1/2	2 1/4



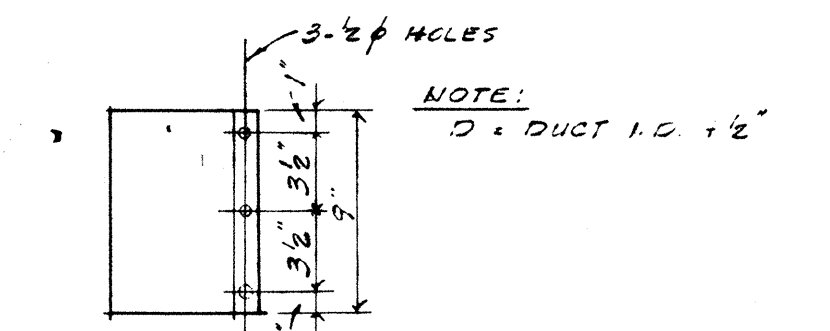
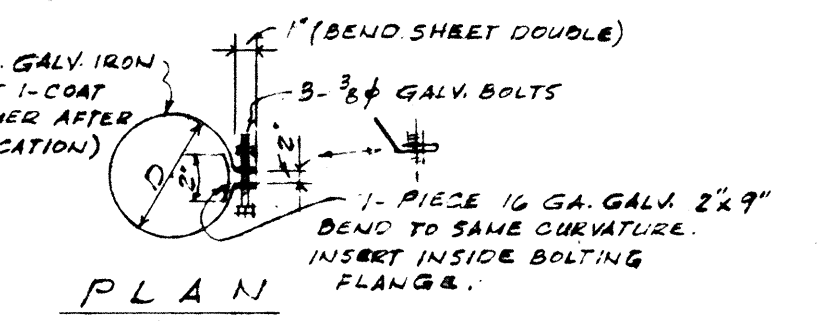
PRECAST CONCRETE DUCT SPREADER DETAILS
2" = 1'-0"

SIZE	Rd	A1	B1	A2	B2	G2	A3	B3	G3	A4	B4	G4
3"	2	6	3	12	3 1/2	5 1/2	17 1/2	3 1/2	5 1/2	23	3 1/2	5 1/2
4"	2 1/2	7	3 1/2	14	3 3/4	6 1/2	20 1/2	3 3/4	6 1/2	27	3 3/4	6 1/2
4 1/2"	2 1/2	8	4	15	4	7	22	4	7	29	4	7
5"	3	8 1/2	4 1/2	16	4 1/4	7 1/2	23 1/2	4 1/4	7 1/2	31	4 1/4	7 1/2

NOTES: DUCT SPREADERS
Reinforcing
1-1/4" Bar each Spreader
Concrete Mix
One Part Cement
Two Parts Beach Sand
Two Parts Gravel #4 (Fine)
Measurements by Weight



STUB OUT DETAIL
1" = 1'-0"



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

REDUCED PLANS
SCALES REDUCED
ACCORDINGLY

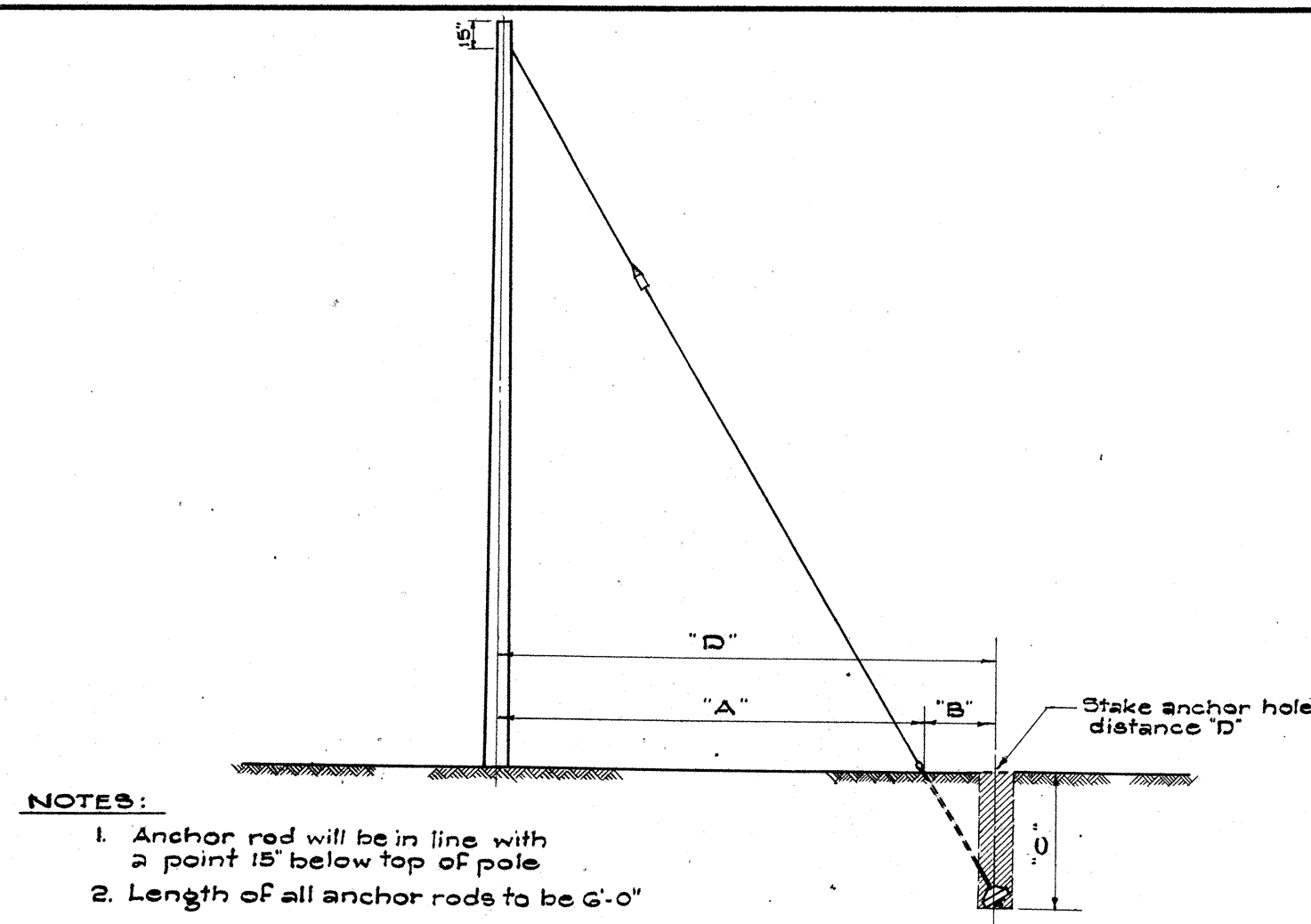
No.	Date	REVISION	Notes	Scale	As Shown	Date
1	5-2-56	ADDED 3" DUCT SPREADER	R.Y.	Drawn by	Checked by	5-2-56
2	1-9-57	REvised DEFLECTION ANGLE 5" TO 4"	R.Y.	Approved	in the presence of	
				Signature		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
HAWAIIAN ELECTRIC & HAWAIIAN TELEPHONE
STANDARD DETAILS
LUNALILO FREEWAY U-072-1(7) UNIT 3
KALIHI STREET US-0630(2)
SCALE: AS NOTED MAR. 1958

SHEET No. 1 OF 3 SHEETS

CONSTRUCTION STANDARD
TRANSITE KORDUCTS
UNDERGROUND DUCTLINES

Engineering Department
The Hawaiian Electric Company, Ltd.
1552 KALANILU'U AVE.
HONOLULU, HAWAII
U-1844



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

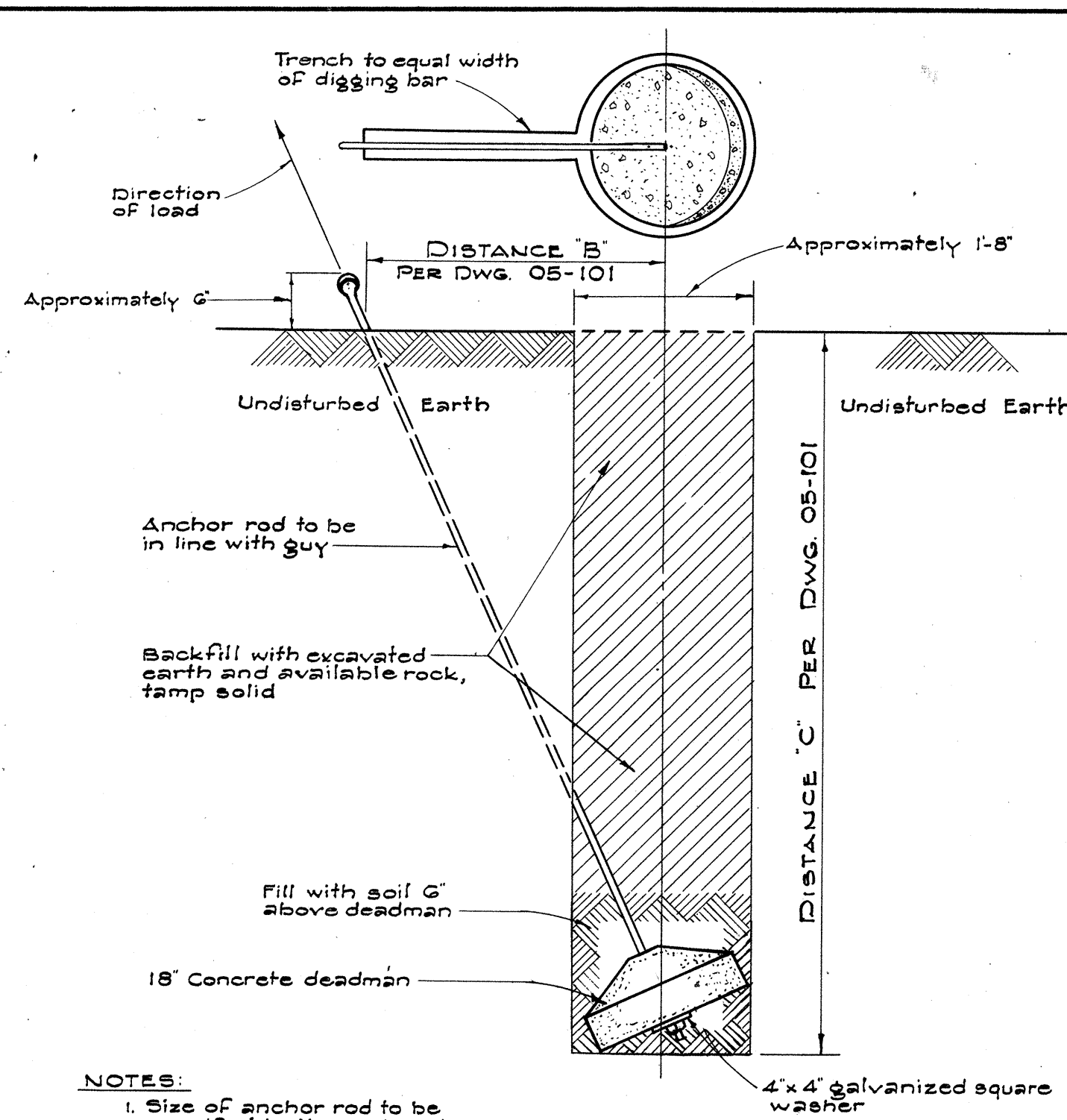
FOR 25' & 30' POLES				
LEAD ANCHOR ROD TO E. OF POLE TO E. OF HOLE "A"	ANCHOR ROD TO E. OF HOLE "B"	VERTICAL DEPTH 15' D.M. "C"	VERTICAL DEPTH 24' D.M. "D"	TOTAL DISTANCE POLE TO HOLE "D" (A+B)
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	15'-0"
20'-0"	4'-8"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



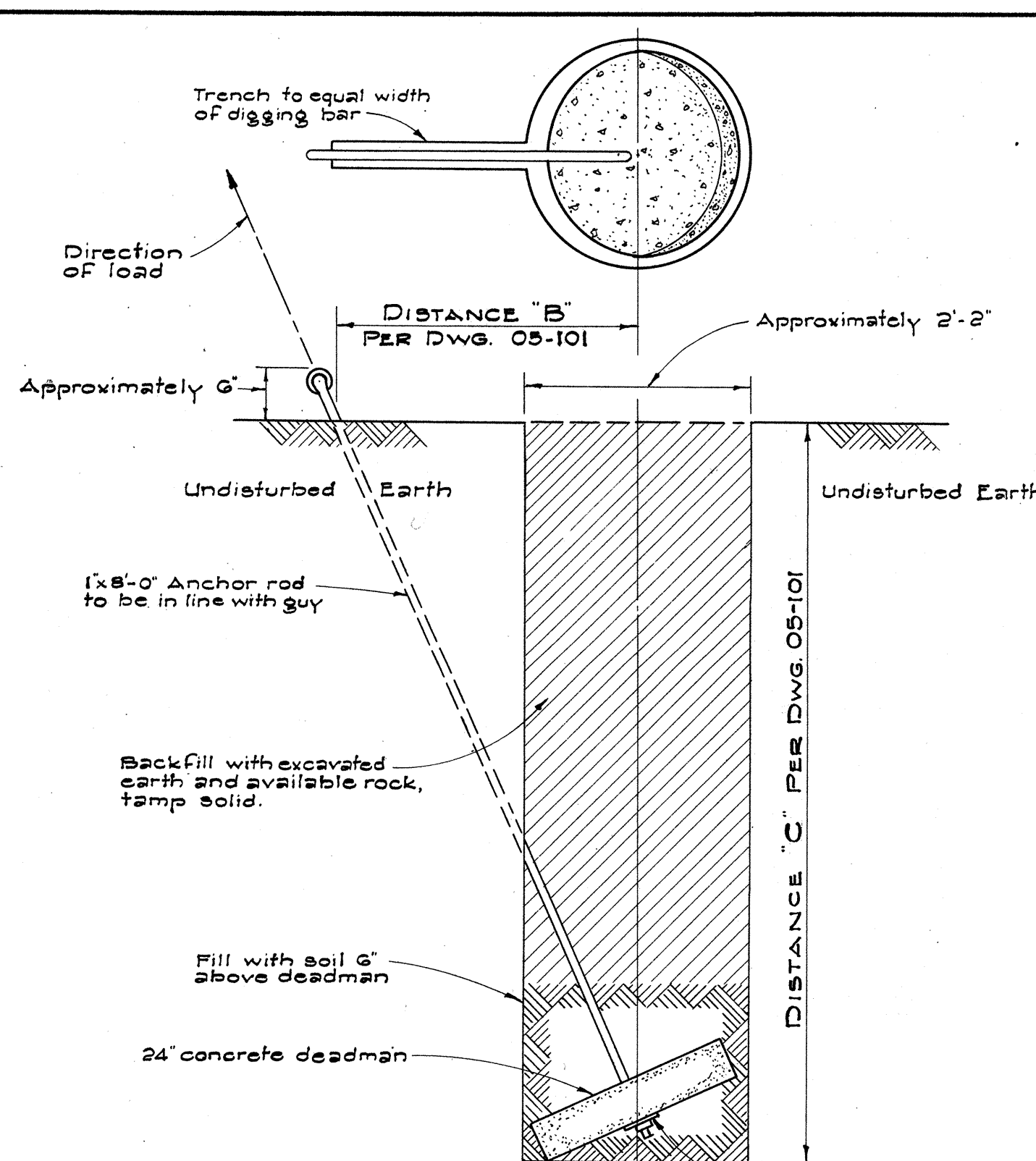
ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" Anchor rod	8,000 lbs.
3/4" Anchor rod	12,500 lbs.
5/8" Copperweld anchor rod	20,000 lbs.

GUY ANCHOR, 18" DEADMAN

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

05-102



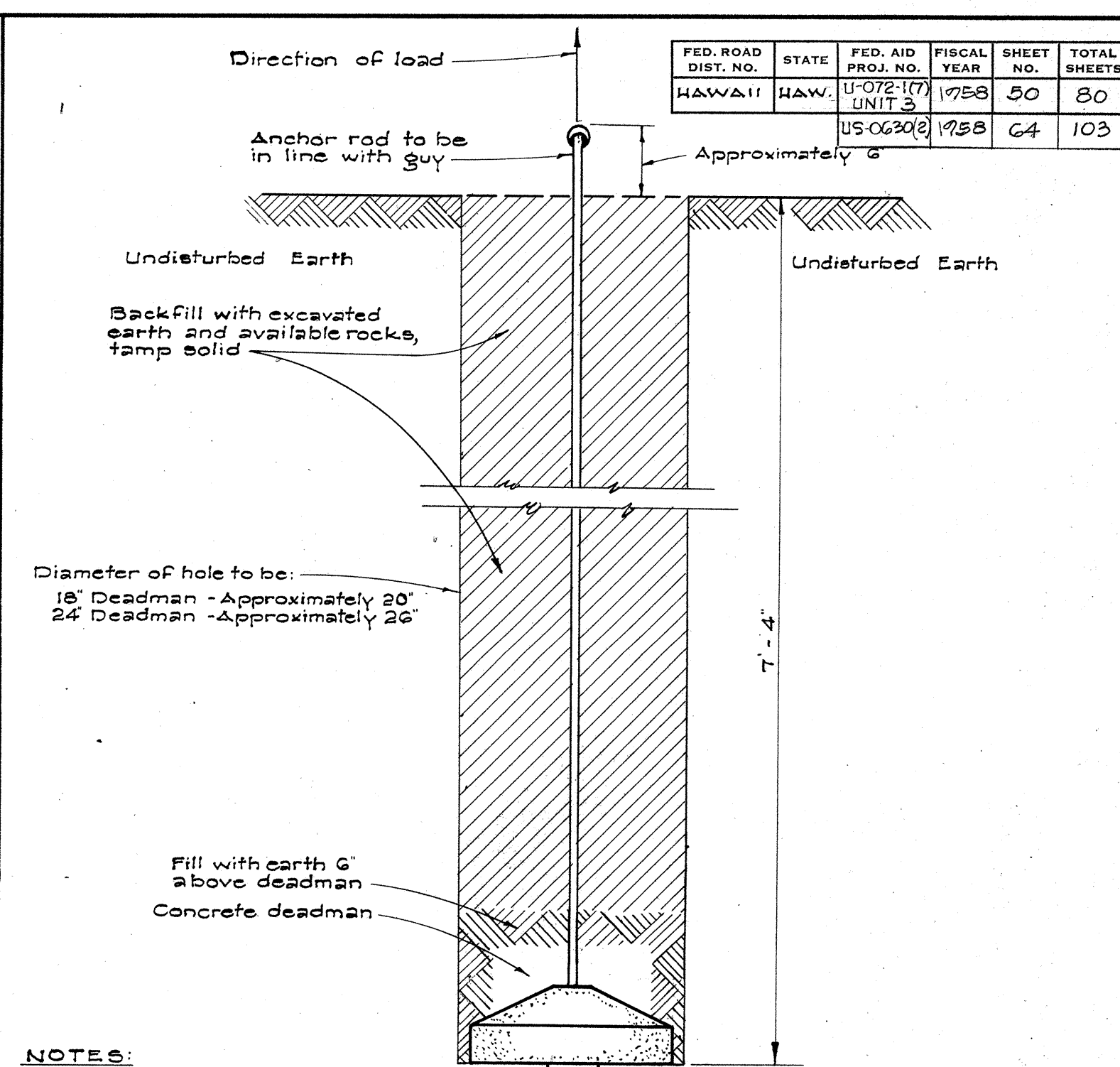
ALLOWABLE LOAD (1/2 OF ULTIMATE)

1" Anchor rod	20,000 lbs.
5/8" Copperweld anchor rod	20,250 lbs.

GUY ANCHOR, 24" DEADMAN

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

05-103



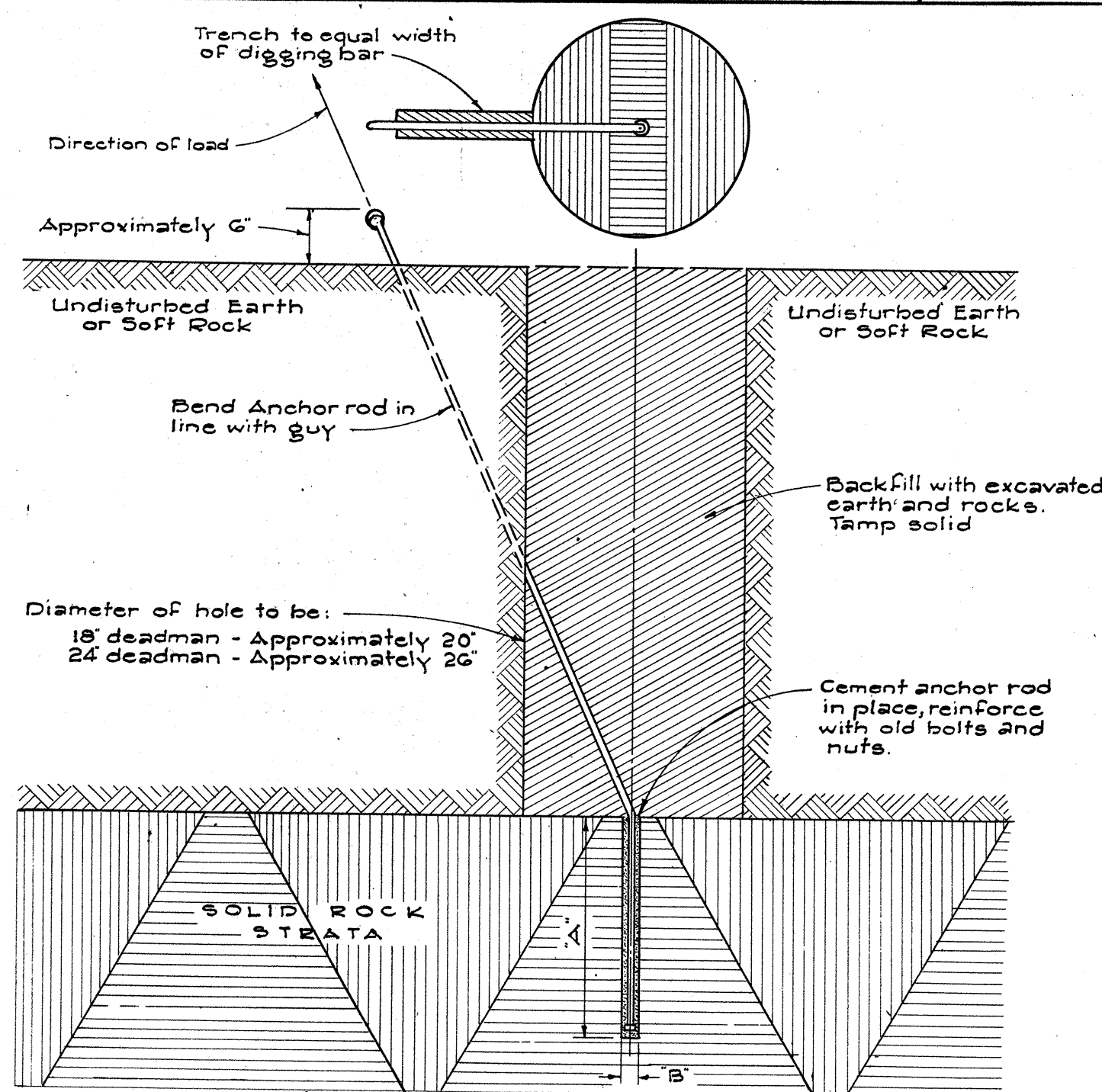
ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" Anchor rod	8,000 lbs.
3/4" Anchor rod	12,500 lbs.
1" Anchor rod	20,000 lbs.
5/8" Copperweld anchor rod	20,250 lbs.

SIDE-WALK ANCHOR

Scale: 1" = 1'-0"

05-104



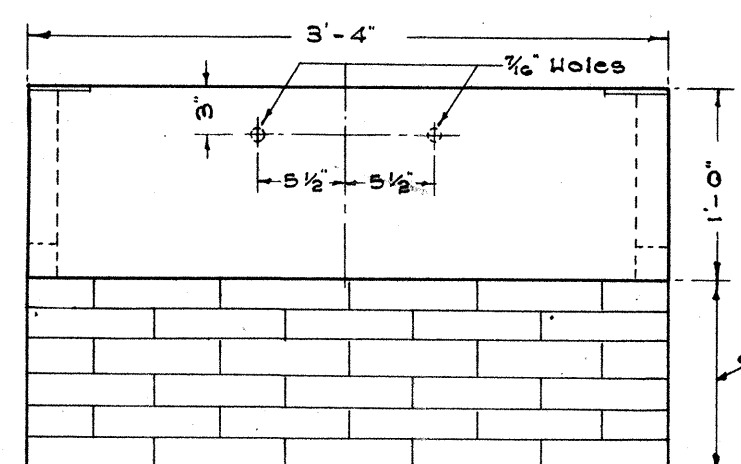
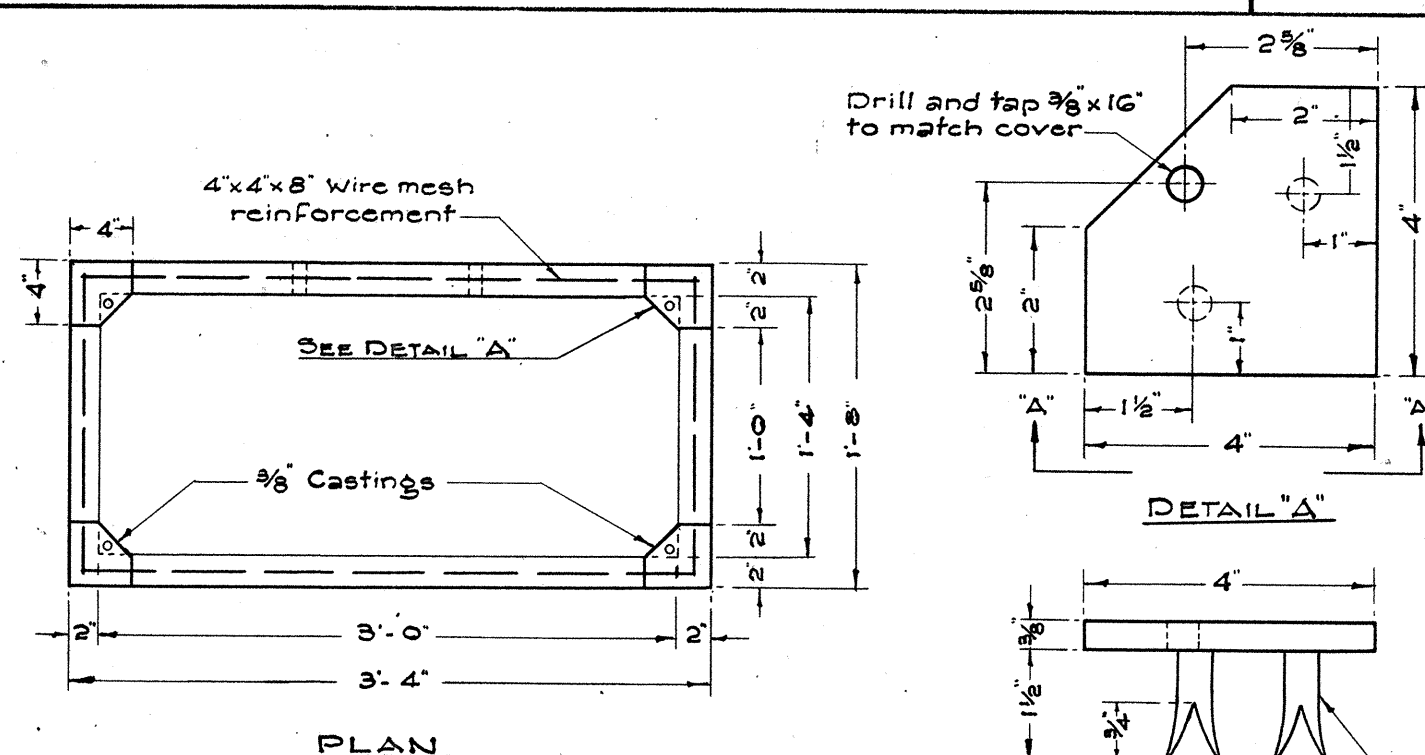
ALLOWABLE LOAD (1/2 OF ULTIMATE)

5/8" anchor rod	8,000 lbs.
3/4" anchor rod	12,500 lbs.
1" anchor rod	20,000 lbs.

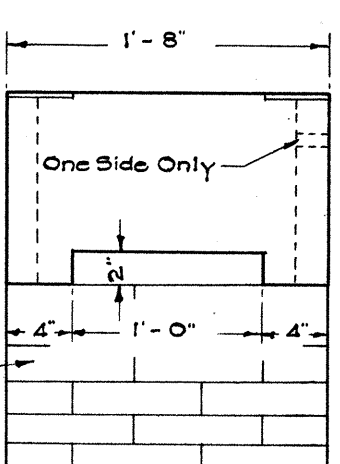
ROCK ANCHOR

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

05-105



SECTION "A-A"



CONCRETE SERVICE BOX

Scale: 1" = 1'-0"

U1-103

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' BELOW TOP
		AT TOP		6' 0" FROM BUTT				DEPTH IN SOIL	DEPTH IN ROCK	
		DIA.	CIR.	DIA.	CIR.	S. P.	D. F.			

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:

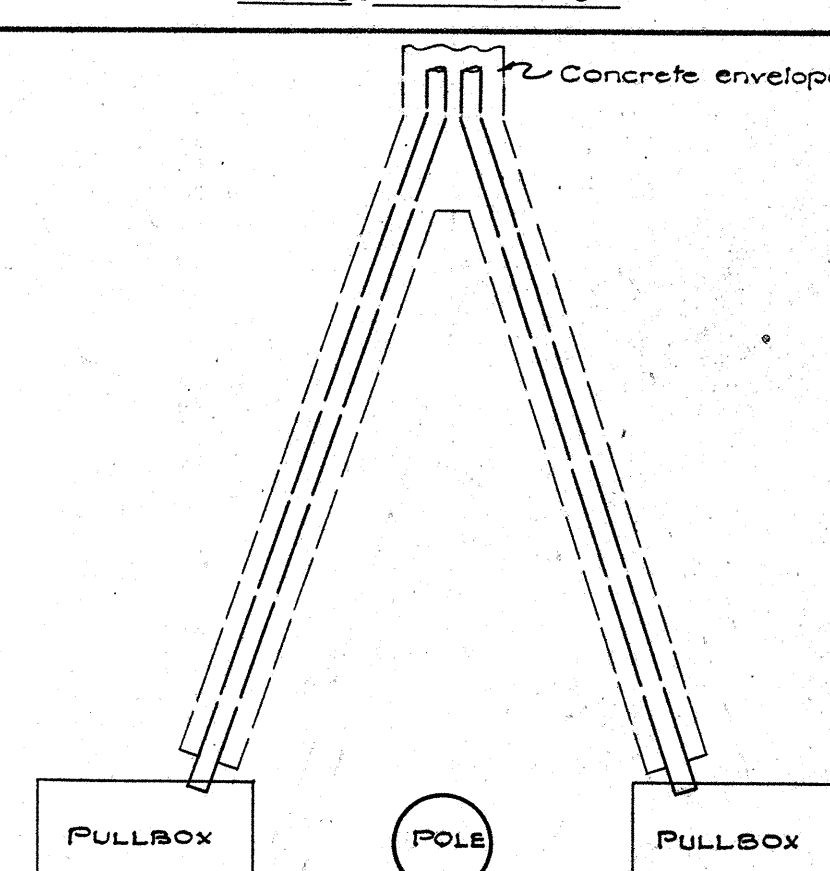
THE ULTIMATE FIBER STRESS FOR CREOSOTED SOUTHERN YELLOW PINE & DOUGLAS FIR IS 7,400 lbs. PER SQUARE INCH.

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: 3/8" = 1'-0"

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

TERRITORIAL HIGHWAY DEPARTMENT

TERRITORY OF HAWAII

HAWAIIAN ELECTRIC &
HAWAIIAN TELEPHONE

STANDARD DETAILS

LUNALILO FREEWAY U-072-1(7) UNIT 3
KALIHI STREET US-0630(2)

Scale: As Noted FEB. 1958

SHEET No 2 OF 3 SHEETS

5983.50 5984.64