FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(18)	1965	25	124

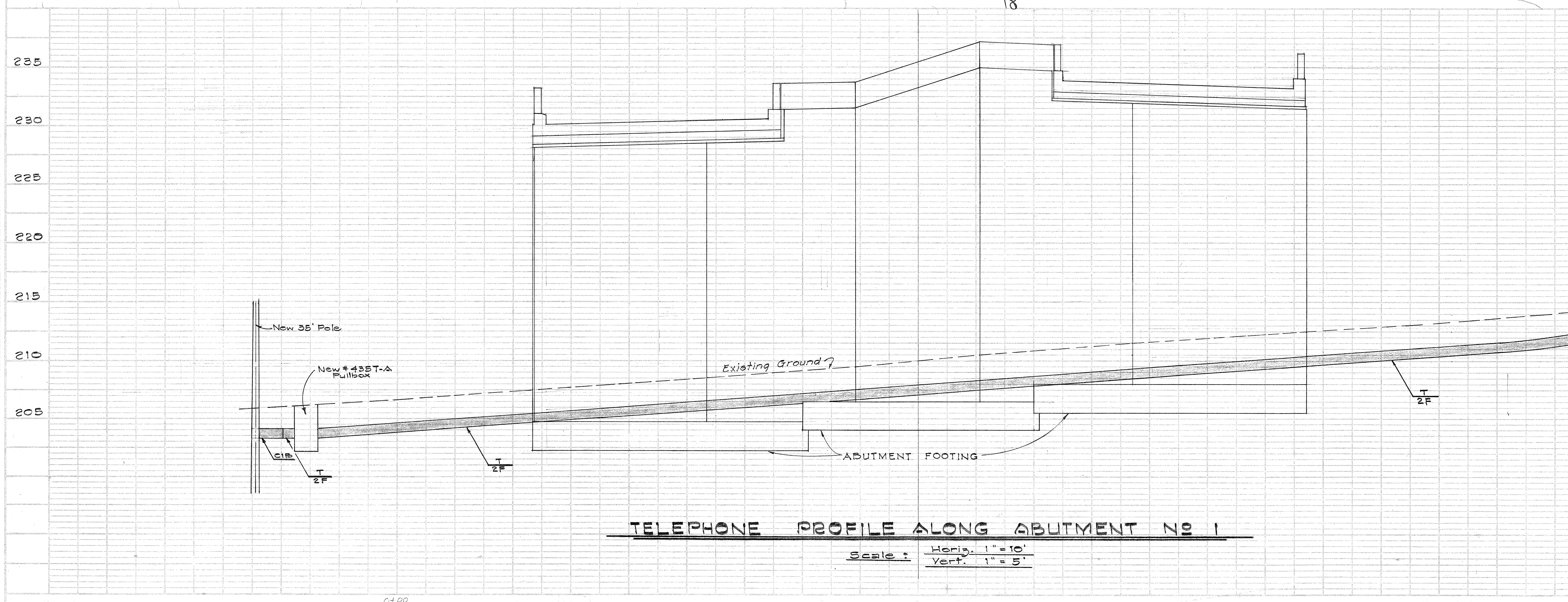
APPROVED:

1-6-65

OUTSIDE PLANT ENGINEER, H.T. Co. Ltd. DATE

ESTIMATED QUANTITIES

Exc. for Poles	5 Lin. Ft.
Install Precast Concrete Pullboxes	2 Each
Install Pole Anchors	2 Each
Install Two Transite Ducts Encased in Plain Concrete Jacket	250 Lin. Ft.



TELEPHONE PROFILE ALONG ABUTMENT No 1

Scale: Horiz. 1" = 10'
Vert. 1" = 5'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

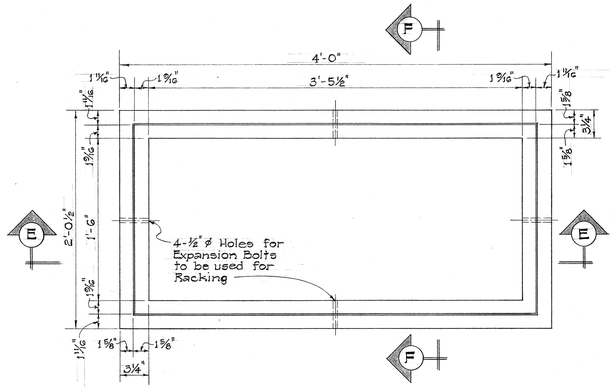
UTILITY PLAN & PROFILE
TELEPHONE
PALEHUA ROAD
F.A.I. Proj. No. I-H1-1(18)

Scale: Horiz. = 1" = 10'
Vert. = 1" = 5'

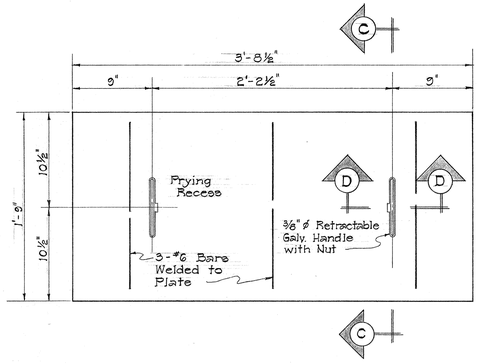
Date: 12/29/64

SHEET NO. 1 OF 6 SHEETS

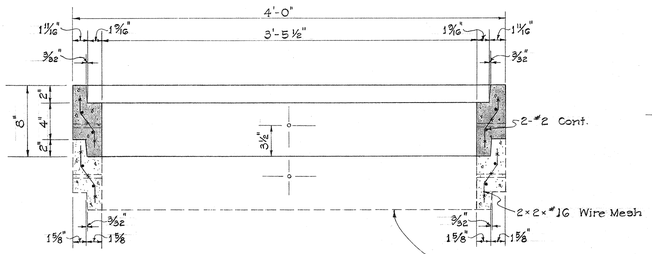
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(18)	1965	26	124



PLAN

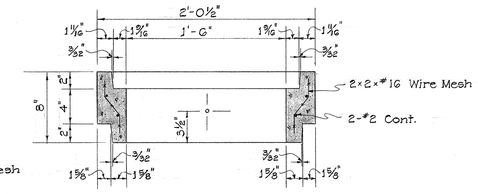


PLAN OF COVER

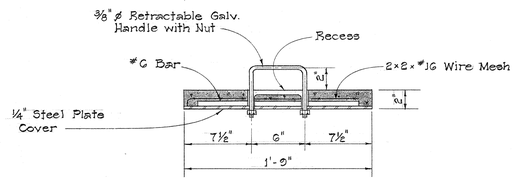


SECTION "E-E"

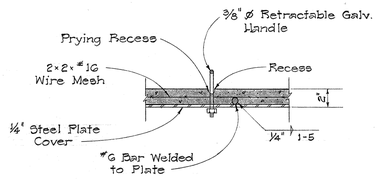
Additional Sections Added as Required



SECTION "F-F"



SECTION "C-C"



SECTION "D-D"

DETAIL OF TELEPHONE PULL BOX NO. 435 T-A

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

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co. Ltd. — DATE: 1-6-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY DETAIL
TELEPHONE
DETAIL OF PULL BOX No. 435 T-A
F.A.I. Proj. No. I-HI-1(18)

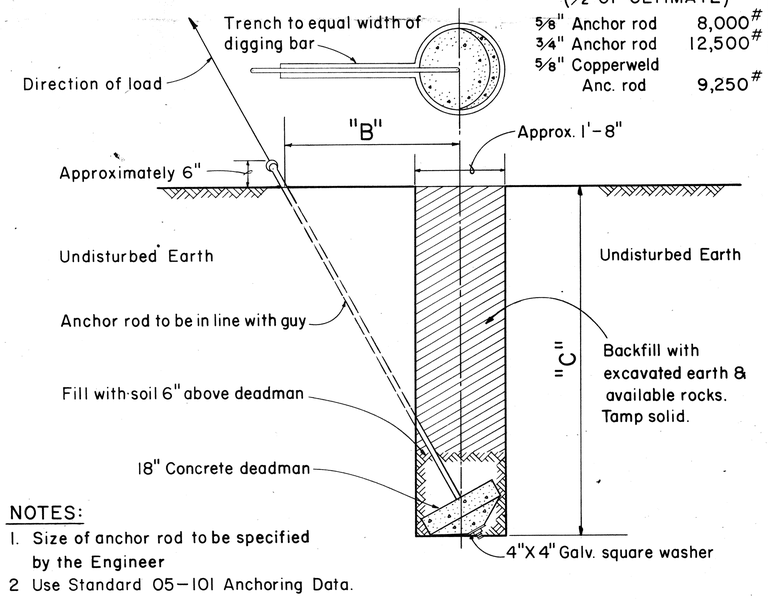
Scale: 1 1/2" = 1'-0" Date:

SHEET No. 2 OF 6 SHEETS

26

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

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(18)	1965	27	124



ALLOWABLE LOAD
(½ OF ULTIMATE)

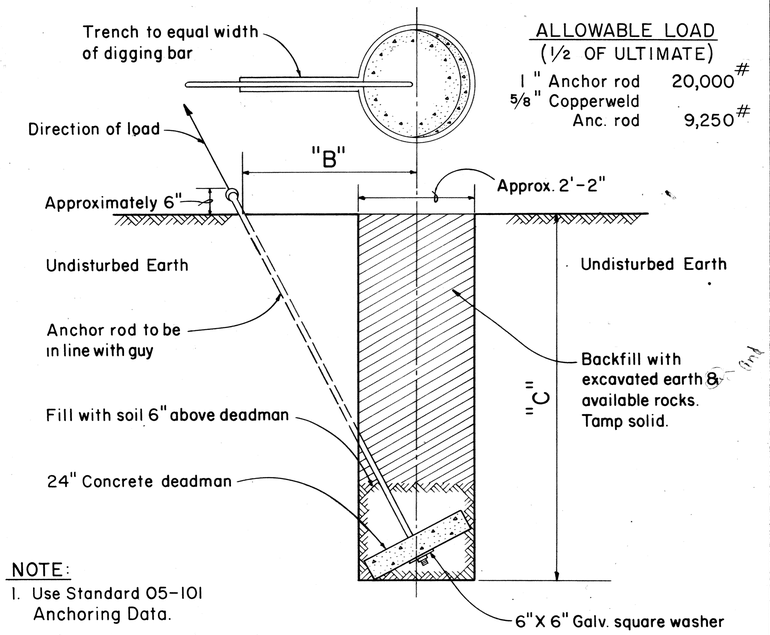
⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
⅝" Copperweld Anc. rod	9,250#

NOTES:
1. Size of anchor rod to be specified by the Engineer
2 Use Standard 05-101 Anchoring Data.

GUY ANCHOR 18" DEADMAN

Scale: ¾" = 1' - 0"

05-102



ALLOWABLE LOAD
(½ OF ULTIMATE)

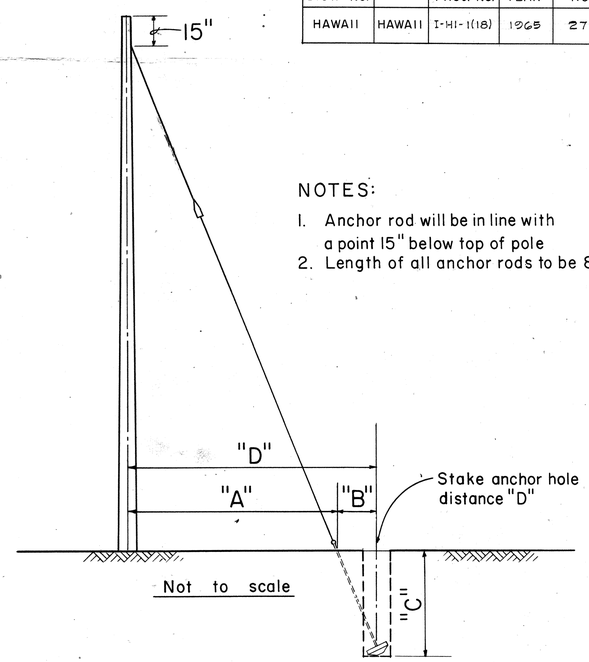
1" Anchor rod	20,000#
⅝" Copperweld Anc. rod	9,250#

NOTE:
1. Use Standard 05-101 Anchoring Data.

GUY ANCHOR 24" DEADMAN

Scale: ¾" = 1' - 0"

05-103



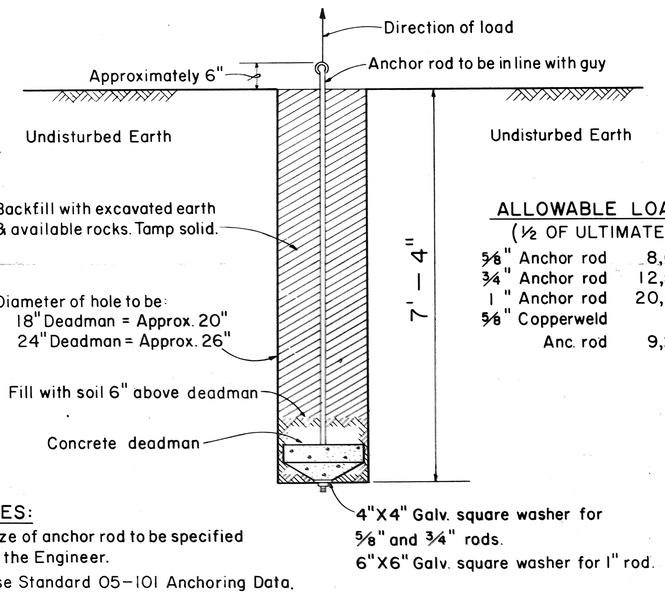
NOTES:
1. Anchor rod will be in line with a point 15" below top of pole
2. Length of all anchor rods to be 8'-0"

FOR 35', 40', 45', 50', 55', & 60' POLES			
LEAD-ANCHOR ROD TO ℄ OF POLE "A"	ANCHOR ROD TO ℄ OF HOLE "B"	VERTICAL DEPTH 18" D.M. "C"	24" D.M. "C"	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'-9"	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

ANCHORING DATA

05-101



ALLOWABLE LOAD
(½ OF ULTIMATE)

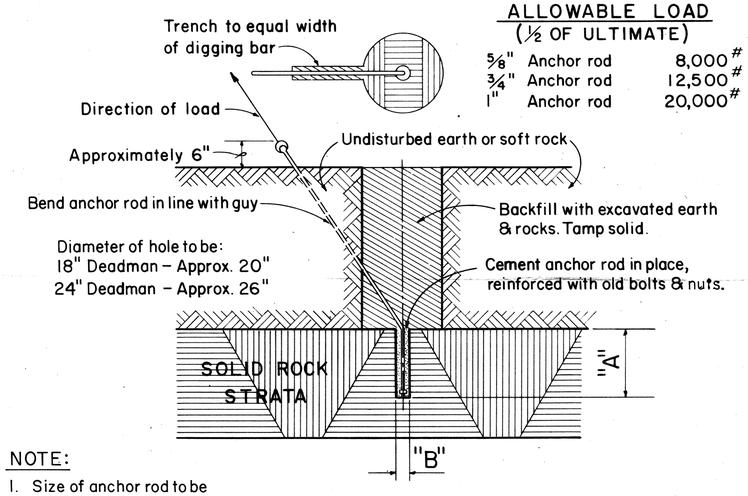
⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
1" Anchor rod	20,000#
⅝" Copperweld Anc. rod	9,250#

NOTES:
1. Size of anchor rod to be specified by the Engineer.
2. Use Standard 05-101 Anchoring Data.

SIDE - WALK ANCHOR

Scale: ¾"= 1'-0"

05-104



ALLOWABLE LOAD
(½ OF ULTIMATE)

⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
1" Anchor rod	20,000#

NOTE:
1. Size of anchor rod to be specified by the Engineer.
2. "A" Should not be less than 24" If "A" is less than 24" complete hole & install anchor per O.H. Standard 05-102,103,or104.
3. "B" ⅝" Anchor rod drill 2" hole
   ¾" Anchor rod drill 2" hole
   1" Anchor rod drill 2½" hole
4. Use Standard 05-101 Anchoring Data.

ROCK ANCHOR

Not to Scale

05-105

APPROVED:

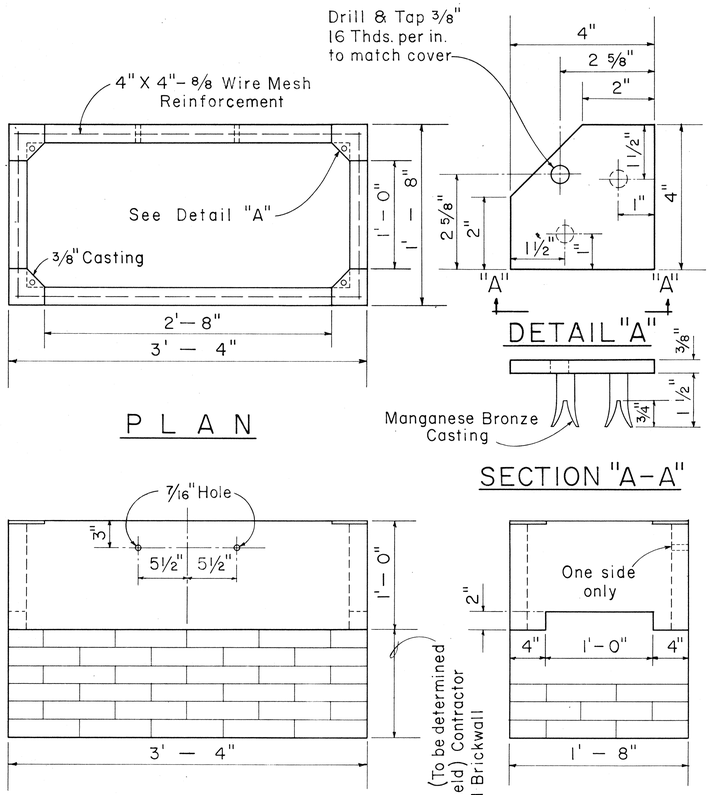
DIRECTOR OF TRANSPORTATION	DATE 1-6-65
OUTSIDE PLANT ENGR. H.T. CO., LTD.	DATE
PRINCPL. ELEC. ENGR. H.E. CO., LTD.	DATE
PRINCPL. DISTR. ENGR. H.E. CO., LTD.	DATE

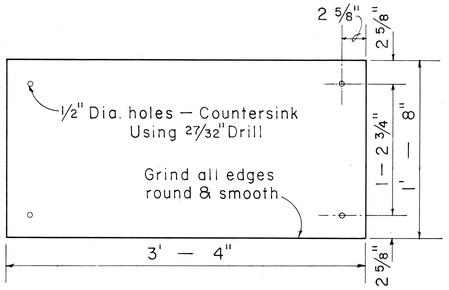
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
H.E.Co. AND H.T. Co.
ANCHOR DETAILS AND ANCHORING DATA

Scales: As Noted Date

SHEET No. 3 OF 6 SHEETS





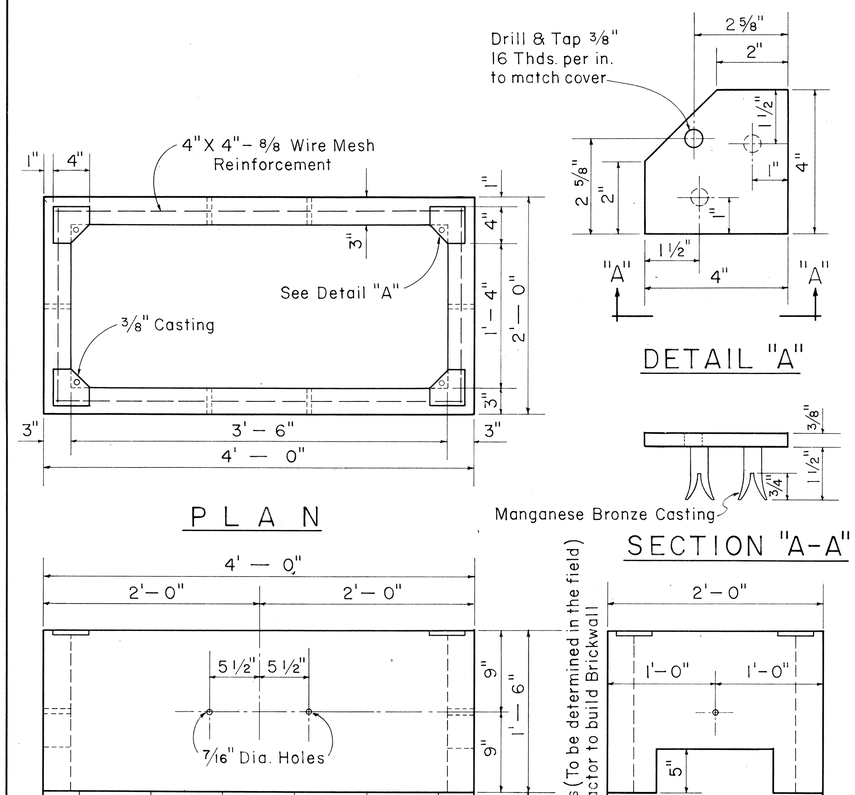
NOTES:
Use 3/8" Plate for driveways.
Concrete Box 225 Lbs.
1/4" Checker Plate 62 Lbs.

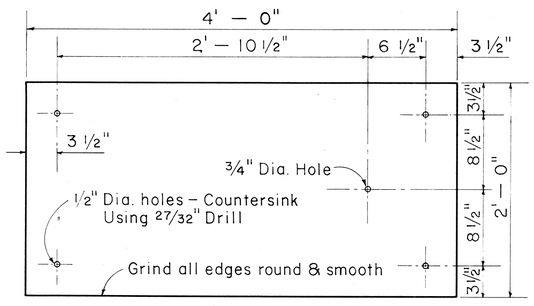
1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

1'-4" X 3'-0" CONCRETE SERVICE BOX

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

UI-103





NOTES:
Use 3/8" Plate for driveway.
Concrete Box 575 Lbs.
1/4" Checker Plate 130 Lbs.

1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

1'-6" X 3'-6" CONCRETE SERVICE BOX

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

UI-103

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(18)	1965	28	124

SOUTHERN PINE & DOUGLAS FIR — 8 LB. CREOSOTED TREATMENT

LENGTH IN FEET	CLASS	APPROXIMATE MINIMUM DIMENSIONS — INCHES				AVERAGE WEIGHT IN POUNDS		POLE SETTING DEPTH		BREAKING LOAD 2'-0" BELOW TOP OF POLES (LBS.)
		AT TOP		6'-0" FROM BUTT						
		DIA.	CIR.	DIA.	CIR.	S. P.	D. F.	DEPTH IN SOIL	DEPTH IN ROCK	
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	1,403	1,320	5'-6"	3'-6"	3,000
45	3	7.32	23	12.26	38.5	1,664	1,575	6'-0"	4'-0"	3,000
50	3	7.32	23	12.73	40.0	1,925	1,850	6'-6"	4'-0"	3,000
55	3	7.32	23	13.23	41.5	2,200	2,145	7'-0"	4'-6"	3,000
TRANSMISSION POLES (T. POLES)										
45	2	7.96	25	13.23	41.5	1,911	1,845	6'-0"	4'-0"	3,700
50	2	7.96	25	13.69	43.0	2,214	2,150	6'-6"	4'-0"	3,700
60	1	8.59	27	15.77	49.5	3,451	3,360	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 Standard Association 05.4 - 1,941, 05.6 - 1,945
Standard Handbook for Electrical Engineers. Eighth Edition
H. E. Co. Specifications for poles.

WOOD POLE DATA

05-501

APPROVED:

DIRECTOR OF TRANSPORTATION — DATE
F. A. Judd — 1-6-65
OUTSIDE PLANT ENG'R., H.T. CO. LTD. — DATE
PRINCPL. ELEC. ENGR. H. E. CO., LTD. — DATE
PRINCPL. DISTR. ENGR. H.E.CO., LTD. — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
H.E.Co. AND H.T.Co.
SERVICE BOX DETAILS AND WOOD POLE DATA
Scales: As Noted — Date

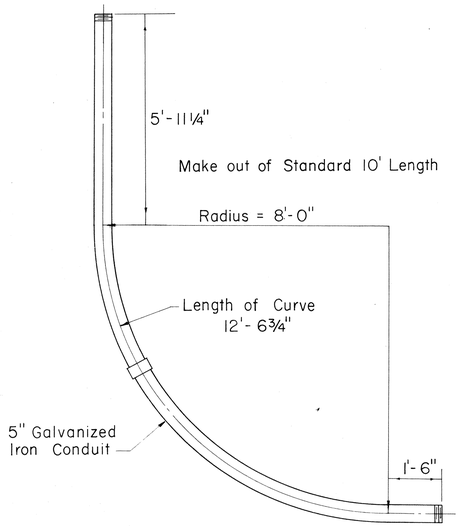
SHEET NO. 4 OF 6 SHEETS

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

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

28

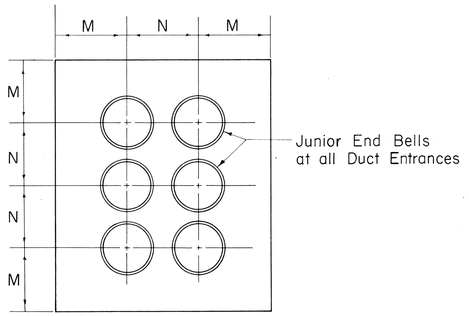
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(18)	1965	29	124



46 KV RISER CONDUIT BEND

(8'-0" RADIUS)

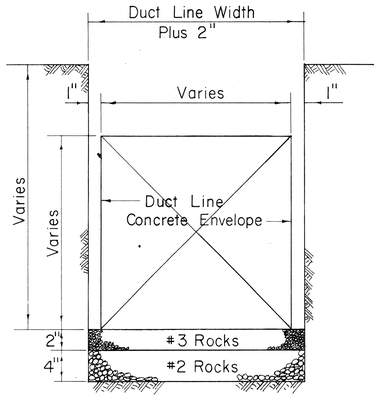
Not to Scale



TYPICAL DUCT DETAIL AT MANHOLE WALL

Not to Scale

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

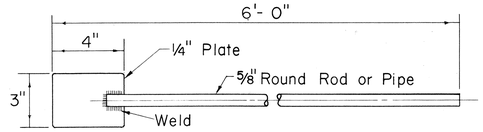


TYPICAL EXCAVATION DETAIL

Not to Scale

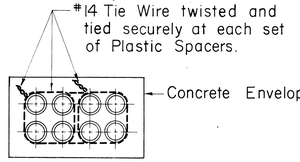
NOTES

1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



CONCRETE DUCT ENVELOPE TAMPING ROD

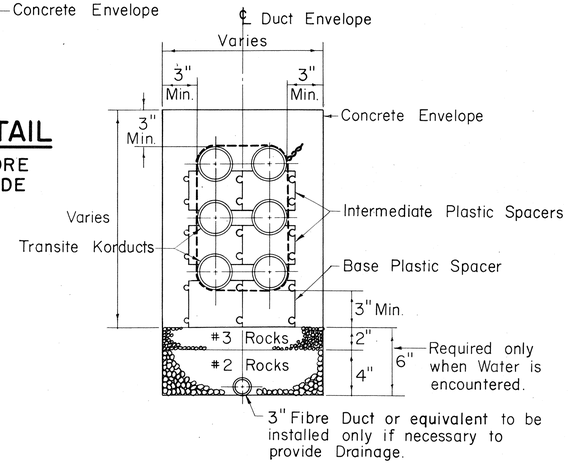
Scale: 3" = 1'-0"



TIE WIRE DETAIL

FOR DUCT LINE MORE THAN 4 DUCTS WIDE

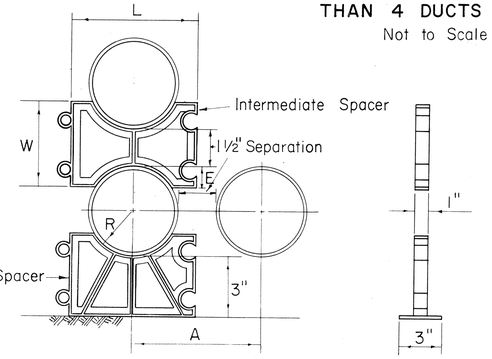
Not to Scale



TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION

(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)

Not to Scale



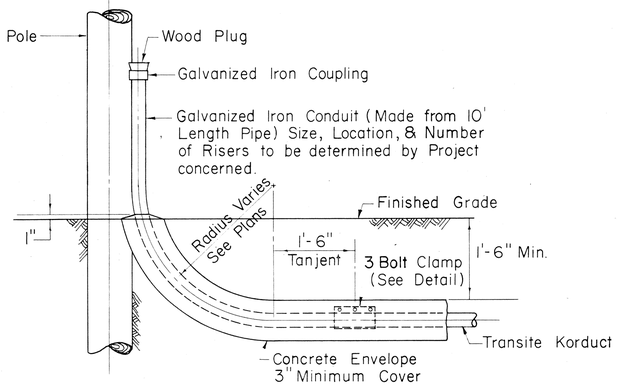
TYPICAL PLASTIC SPACERS

Not to Scale

SIZE	R	E	W	A	L
3"	1 27/32"	7/8"	3 1/4"	5 1/8"	5"
4"	2 13/32"	1 1/8"	3 3/4"	6 1/4"	6 1/8"
4½"	2 23/32"	1 1/4"	4"	6 7/8"	6 3/4"
5"	3 1/16"	1 3/8"	4 1/4"	7 5/8"	7 1/2"

For 1½" Separation

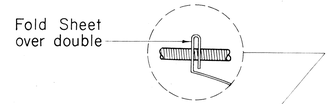
PLAN



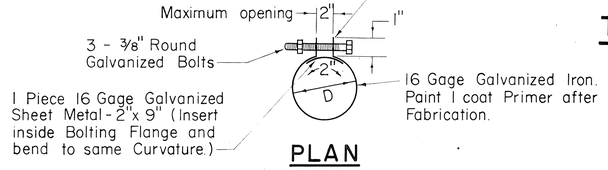
ELEVATION

TYPICAL POLE RISER DETAIL

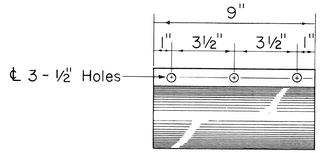
Scale: ¾" = 1'-0"



DETAIL



PLAN



ELEVATION

3 BOLT CLAMP DETAIL

Scale: 3" = 1'-0"

APPROVED:

F.F. Judd 1-6-65

OUTSIDE PLANT ENG'R., H.T. CO., LTD. DATE

HAWAIIAN ELECTRIC CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

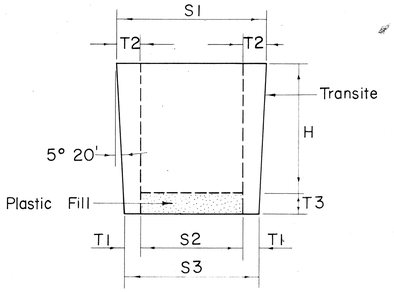
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

Scales: As Noted Date

SHEET NO. 5 OF 6 SHEETS

29

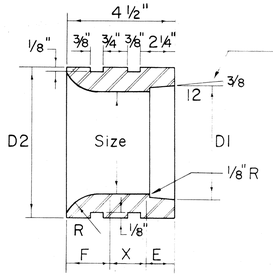
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(18)	1965	30	124



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

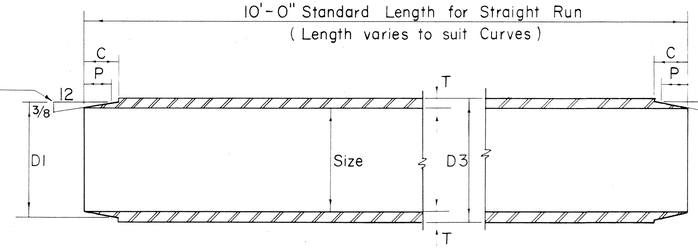
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



JUNIOR END BELLS

Not to Scale

SIZE	D1	D2	F	X	E	R
3"	3 25/64"	4 1/2"	1 11/32"	1 29/32"	1 1/4"	1 3/4"
4"	4 25/64"	5 3/4"	1 9/16"	1 9/16"	1 3/8"	2"
4 1/2"	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"



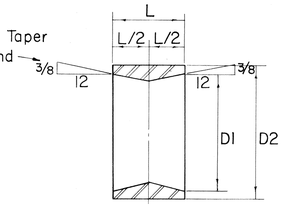
TRANSITE KORDUCTS

Not to Scale

SIZE	D1	D3	C	P	T
3"	3 25/64"	3 35/64"	1 1/8"	7/8"	17/64"
4"	4 25/64"	4 35/64"	1 1/4"	1"	17/64"
4 1/2"	4 57/64"	5 3/64"	1 1/4"	1"	17/64"
5"	5 29/64"	5 39/64"	1 25/64"	1 1/8"	19/64"

Note "X"

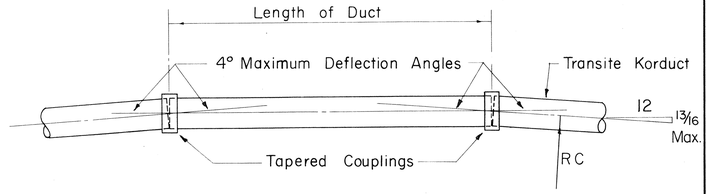
Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



SIZE	D1	D2	L
3"	3 25/32"	4 11/64"	2 1/4"
4"	4 25/64"	5 3/16"	2 1/2"
4 1/2"	4 57/64"	5 49/64"	2 1/2"
5"	5 29/64"	6 21/64"	2 3/4"

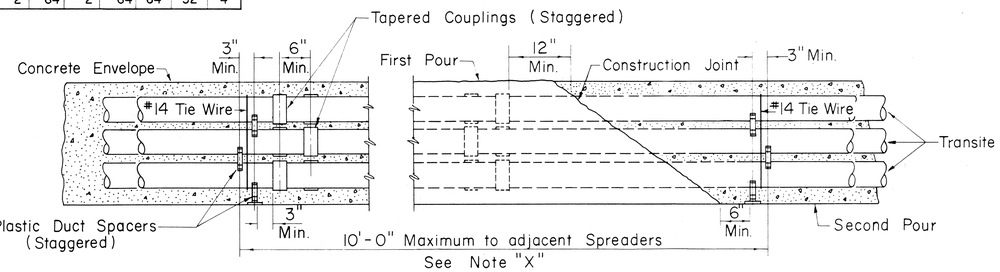
TAPERED COUPLINGS

Not to Scale



METHOD OF FORMING CURVES

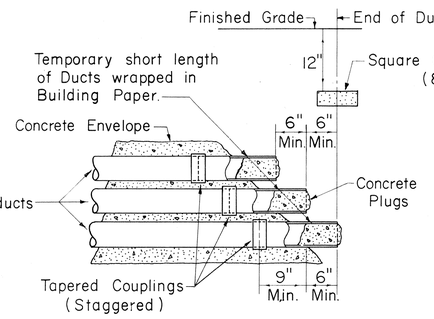
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

(6 WAY DUCT LINE SHOWN)

Not to Scale

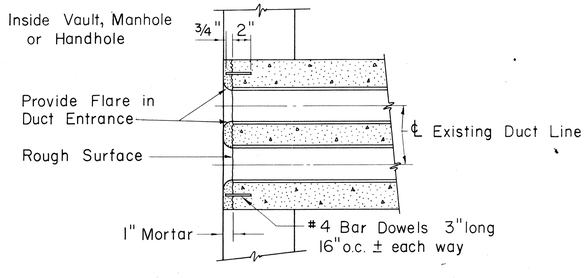


TYPICAL STUB OUT DETAIL

Not to Scale

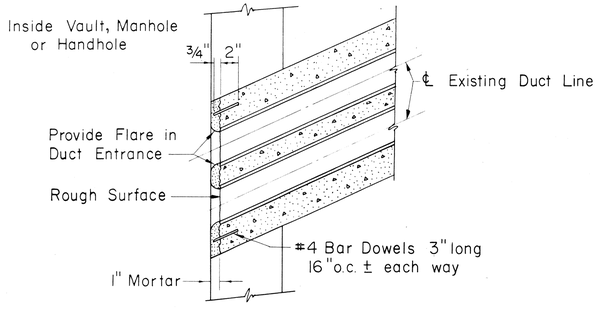
MINIMUM RADIUS TO FORM CURVES

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



DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

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

APPROVED:

T. Dodd 1-6-65
OUTSIDE PLANT ENGR. H.T. CO., LTD. DATE

HAWAIIAN ELECTRIC CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

Scales: As Noted Date

SHEET NO. 6 OF 6 SHEETS

33 (1)