

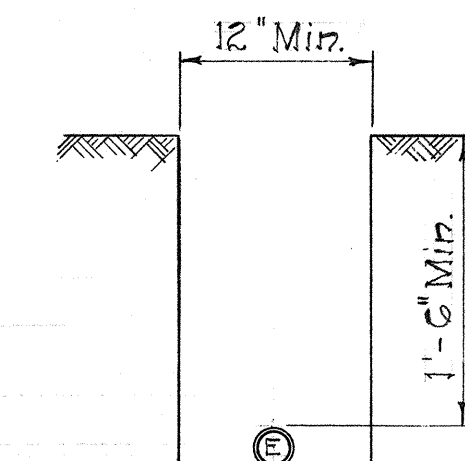
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 3	1967	52	152

GAS - GENERAL NOTES

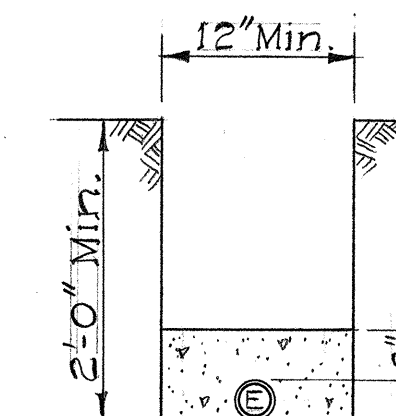
- On this project the relocation of the gas system will be done by the utility company's forces or its Contractor. The State's Contractor and the utility company shall mutually coordinate the work to minimize conflicts and delays to either party.
- The existing gas lines shown on the plans are approximate only. The State Contractor shall use precaution when working in the vicinity of the gas lines.
- Cutting, plugging and reconnecting of live gas lines will be done by the Honolulu Gas Company, Ltd.
- There shall be at least 6" Clearance between any gas line and any underground structure not used in conjunction with the gas line. If this clearance cannot be attained, the gas line shall be protected with a Honolulu Gas Co., Ltd., approved insulating material.

ELECTRIC & TELEPHONE ~ GENERAL NOTES

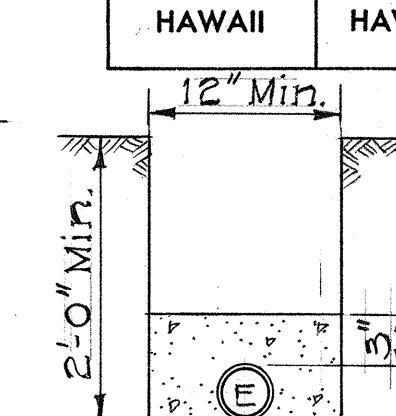
- The Contractor shall notify each utility in writing 10 working days prior to commencing work on their respective utility system.
- Existing electric and telephone facilities shown on these plans are approximate only. The Contractor shall verify their actual locations and shall make adjustments to any new or existing facility as directed by the Engineer.
- The Contractor shall notify the affected property owners at least one week in advance as to the time and duration the trenching and installing of underground electric and telephone service will be performed in their property.
- Where galvanized iron conduits, direct burial, are to be installed through retaining walls, standard weight galvanized iron pipe sleeves of appropriate diameter shall be installed through the wall extending at least 1'-0" beyond the wall faces.
- Unless otherwise shown on the plans, the minimum depth of duct lines from finished grade to:
 - Top of concrete jacket where ducts are concrete encased = 2'-0".
 - Top of ducts not encased in concrete (direct-burial) - In property 1'-6" - In sidewalk 2'-0".
 - Top of steel conduits (direct burial) = 1'-6".
- Final depth of all pull boxes, service boxes, handholes and manholes shall be determined in the field by the Engineer.
- Anchor holes shall be backfilled by the Contractor.
- For ducts encased in concrete jackets a 3" minimum clearance between H.E.Co. and H.T.Co. ducts shall be maintained.
- Existing utility cables which are to remain in place during construction shall be handled by the utility company's men only. The Contractor shall exercise caution to avoid disturbances to the cables or temporary guards erected by the utility company.
- Contractor to stake out proposed ductline, pole and anchor locations and H.E.Co. and H.T.Co. to check locations before contractor undertakes excavation.
- All ducts and conduits called for installation in concrete jacket shall be inspected and approved by the respective Engineer of H.E.Co. or H.T.Co. before concrete placing. 24 hours (minimum) notice to respective Utility shall be given before pouring concrete.
- Whenever direct burial secondary cables are to be installed, the trenches shall be opened in such lengths as to permit the H.E.Co. to install its cable in one length.



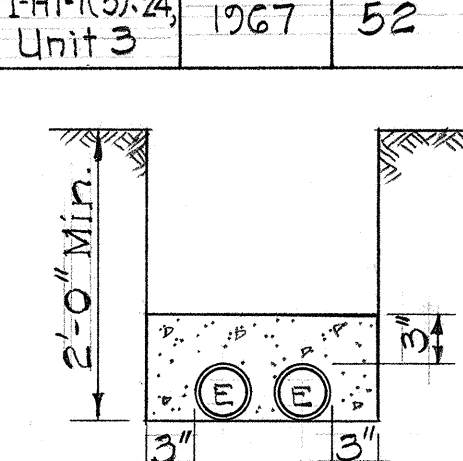
E
1C (DB)
1-2" PVC Conduit
(Direct Burial)



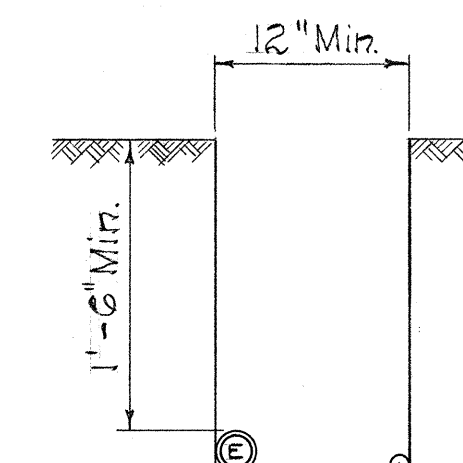
E
1C (CAP)
1-2" PVC Conduit (CAP)



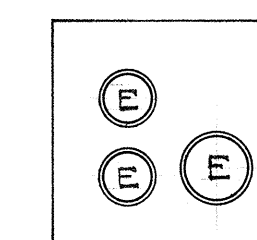
E
1D (CAP)
1-3" Transite
Conduit (CAP)



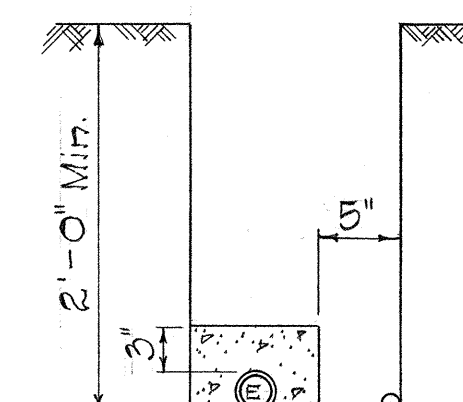
E
2D (CAP)
2-3" Transite
Conduits (CAP)



E
2F
2-4" Transite Ducts



E
2D, 1F
2-3" Transite
Conduits (H.E.Co.)
1-4" Transite
Duct (H.E.Co.)

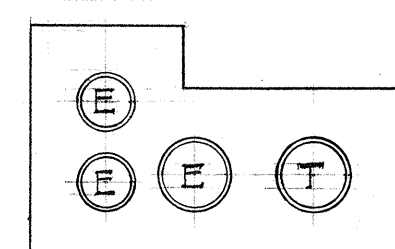


E-T
1C (DB)-1B (DB)
1-2" PVC Conduit
(Direct Burial)
(H.E.Co.)
1-1" GIP Conduit
(Direct Burial)
(H.T.Co.)

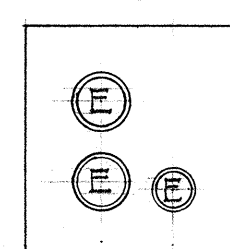
E-T
1C (CAP)-1B (DB)
1-2" PVC Conduit
(CAP) (H.E.Co.)
1-1" GIP Conduit
(Direct Burial)
(H.T.Co.)

GAS ~ ELECTRIC ~ TELEPHONE LEGEND

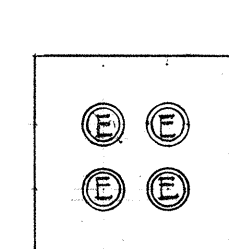
- G—4— Existing Gas Line
- G—4— New Gas Line
- //— Cut/Plug or Plug existing utility line
- ◇— Anode
- ≡≡≡ Insulate
- ⊗ Existing C & C Pole to be removed
- EP Existing Electric or Telephone pole
- ⊗TP Existing Electric or Telephone pole to be removed
- EP New Electric or Telephone pole
- Existing pole with existing anchor
- Existing pole with new anchor
- Existing pole with new anchor
- Existing Pull Box or Service Box
- New Pull Box or Service Box (Type as noted on plans)
- Existing Manhole or Handhole
- New Manhole or Handhole (Type as noted on plans)
- ⊗ New Transformer Vault
- Existing Duct line
- New Duct line
- Direct Burial Duct (Type and size as noted on plans)
- Anc. Anchor
- Bett. Betterment
- CIB Cast Iron Bend
- LRB Long Radius Bend
- SRB Standard Radius Bend
- ⊗ New Submersible Transformer
- (P31) Parenthesis Indicates Proposed Pole No.
- PVC Polyvinyl Chloride
- DB Direct Burial



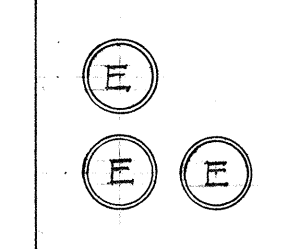
E-T
2D, 1F-1F
2-3" Transite Conduits (H.E.Co.)
1-4" Transite Ducts (H.E.Co.)
1-4" Plastic Duct (H.T.Co.)



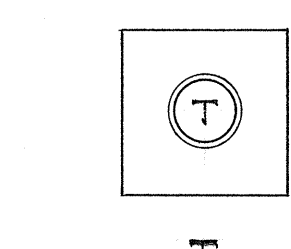
E
2D, 1C
2-3" Transite
Conduits
1-2" PVC Conduit



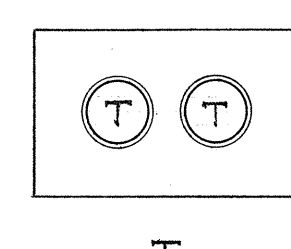
E
2C, 2D
2-2" Transite Conduits
2-3" Transite Conduits



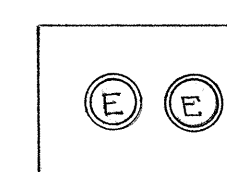
E
3F
3-4" Transite Conduits



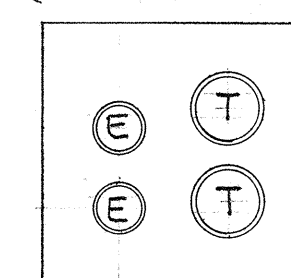
T
1F
1-4" Plastic
Duct



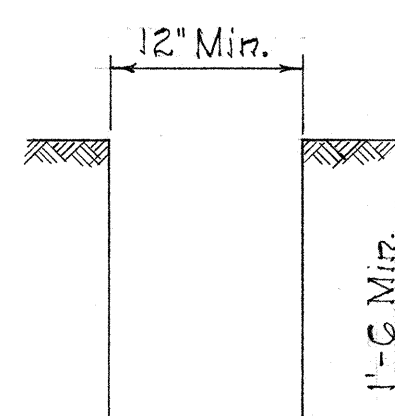
T
2F
2-4" Plastic
Ducts



E
2D
2-3" Transite
Conduits



E-T
2D-2F
2-3" Transite Conduits (H.E.Co.)
2-4" Plastic Ducts (H.T.Co.)



T
1B (DB)
1-1" GIP Conduit
(Direct Burial)

APPROVED:

Thomas K. K.
HAWAIIAN ELECTRIC CO., INC.

7/7/67
DATE

W. H. K.
HAWAIIAN TELEPHONE CO.

7-3-67
DATE

P. C. Joy
HONOLULU GAS CO., LTD.

6/14/67
DATE

LEGEND FOR CONDUIT

SYMBOL	CONDUIT SIZE	SYMBOL	CONDUIT SIZE
A	3/4"	E	3 1/2"
B	1"	F	4"
C	2"	G	4 1/2"
D	3"	H	5"

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

GENERAL NOTES ~ LEGEND AND DUCT SECTIONS

GAS ~ ELECTRIC & TELEPHONE

INTERSTATE HIGHWAY (LUNALILO FRWY.)
F.A.I. Proj. No. I-HI-1(5)24, Unit 3

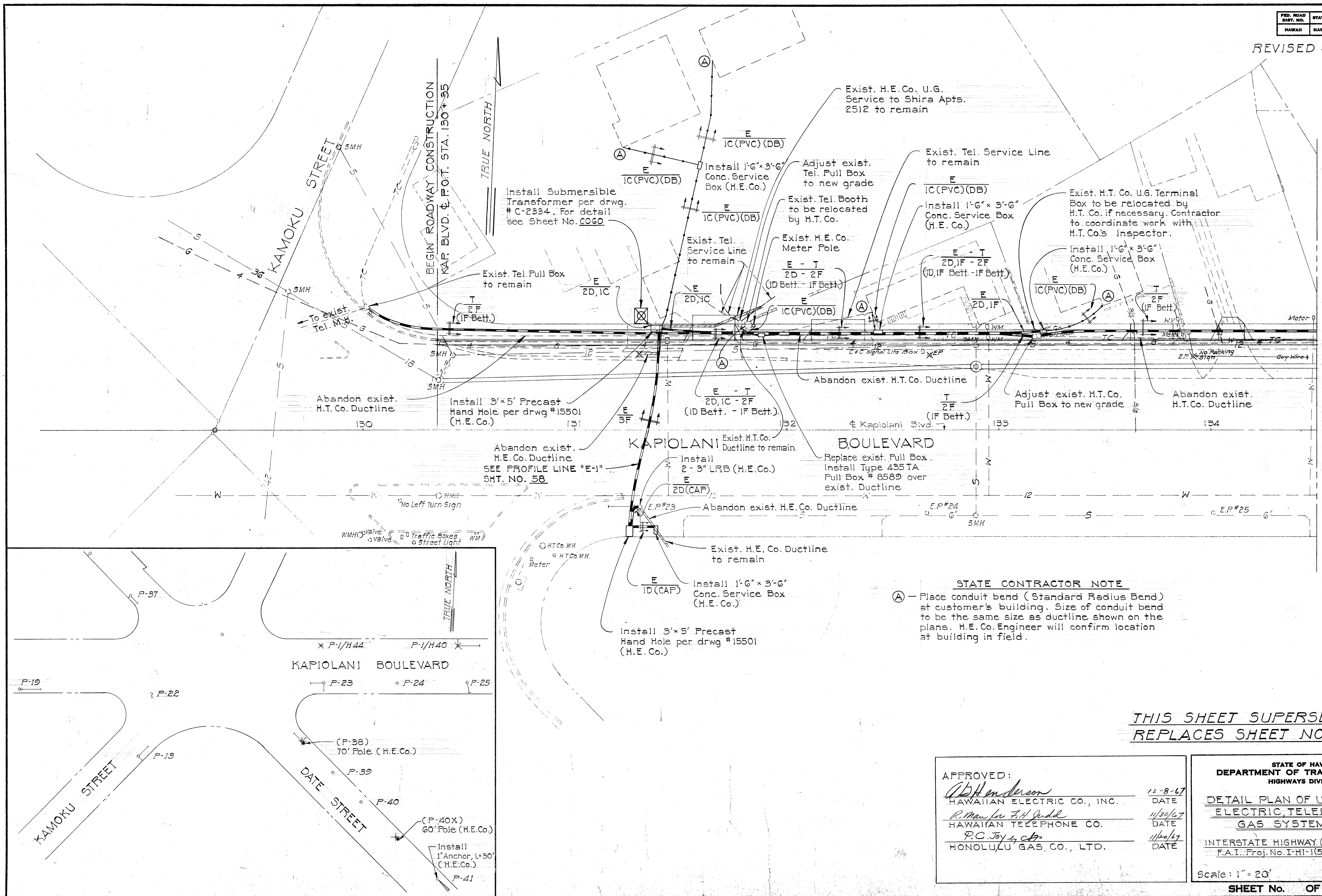
Date: May, 1967

SHEET No. 1 OF 10 SHEETS

52

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1(5) 24 Unit 3	1967	53	152

REVISED: Nov. 21, 1967



THIS SHEET SUPERSEDES & REPLACES SHEET NO. 53

APPROVED:

[Signature]
HAWAIIAN ELECTRIC CO., INC.
[Signature]
HAWAIIAN TELEPHONE CO.
[Signature]
HONOLULU GAS CO., LTD.

12-8-67
DATE
11/30/67
DATE
11/20/67
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

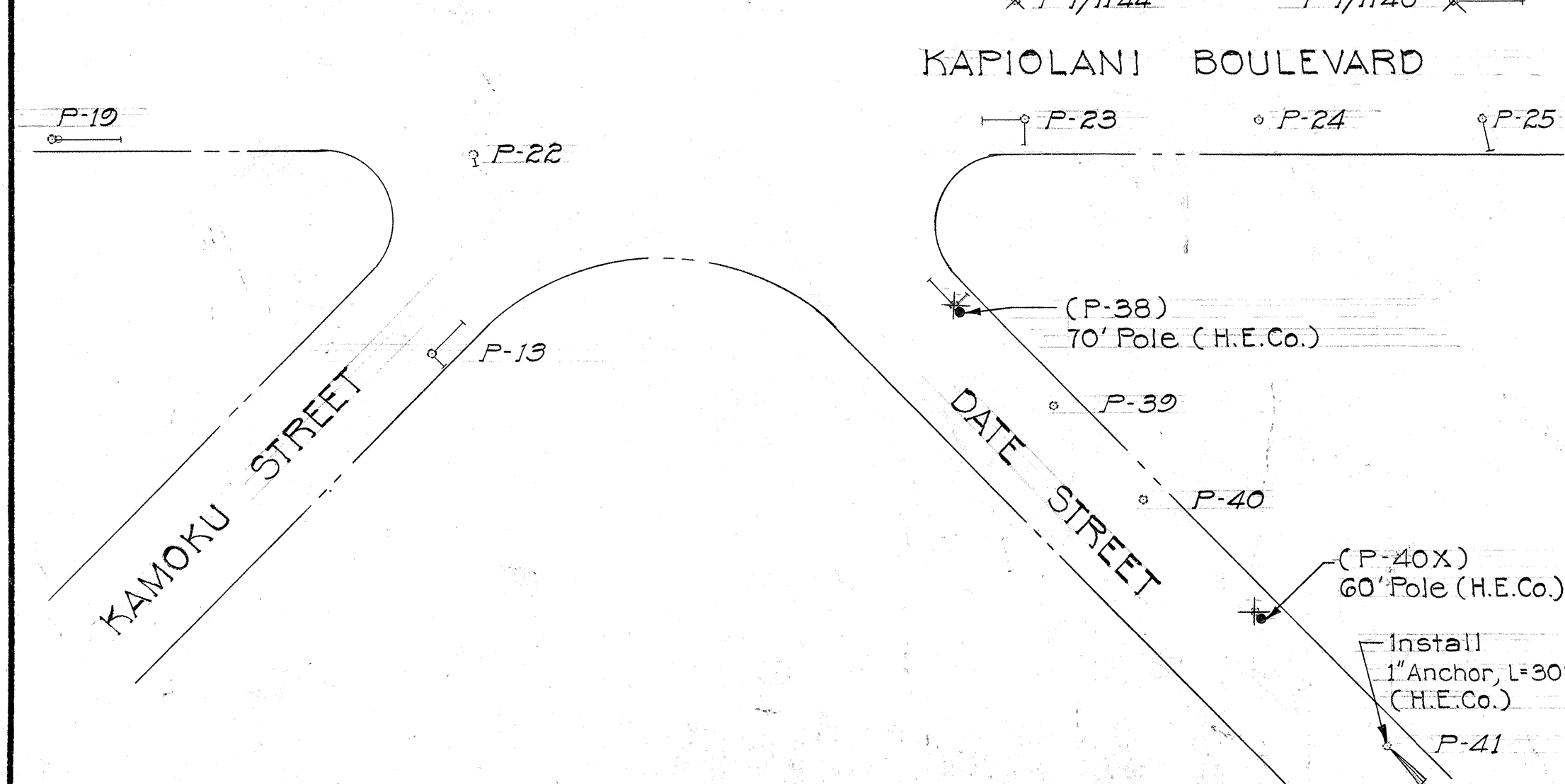
DETAIL PLAN OF UTILITIES
ELECTRIC, TELEPHONE &
GAS SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. Proj. No. I-HI-1(5) 24 Unit 3

Scale: 1" = 20' Date:

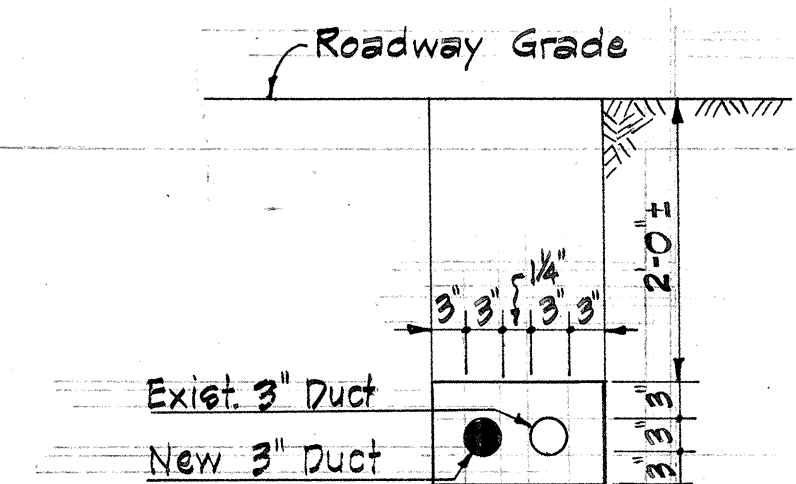
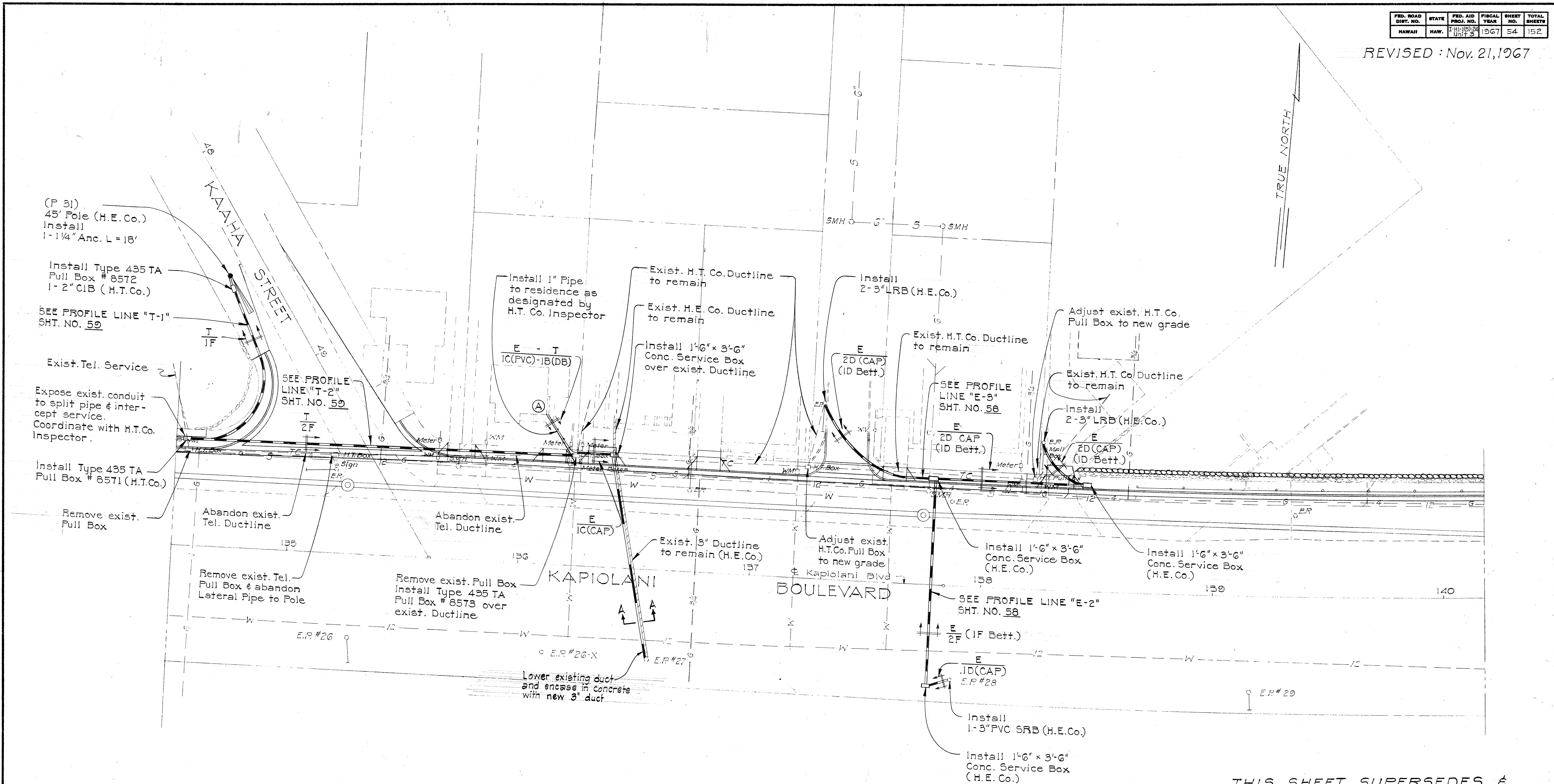
SHEET No. OF SHEETS

C053



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-115-24	1967	54	152

REVISED : Nov. 21, 1967



THIS SHEET SUPERSEDES &
REPLACES SHEET NO. 54

APPROVED:
Robert H. Anderson
 HAWAIIAN ELECTRIC CO., INC. DATE 12-8-67
R. Man for F. H. Judd
 HAWAIIAN TELEPHONE CO. DATE 11/30/67
P. C. Joy
 HONOLULU GAS CO., LTD. DATE 11/29/67

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DETAIL PLAN OF UTILITIES
 ELECTRIC, TELEPHONE &
 GAS SYSTEMS
 INTERSTATE HIGHWAY (LUNALILO FRWY)
 F.A.I. Proj. No. I-HI-1(5):24, Unit 3
 Scale: 1" = 20' Date:

SHEET No. OF SHEETS

54 OF 152

THIS SHEET SUPERSEDES &
REPLACES SHEET NO. 55

APPROVED:	
<i>Thomas K. Kan</i>	7/7/67
HAWAIIAN ELECTRIC CO., INC.	DATE
<i>P. A. Quill</i>	7-3-67
HAWAIIAN TELEPHONE CO.	DATE
<i>PC Joy by C. J. Tracy</i>	6/15/67
HONOLULU GAS CO., LTD.	DATE

SHEET No. 4 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	11967	56	152	

REVISED: Nov. 21, 1967

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
CHECKED BY	
NOTE BOOK	
NO.	

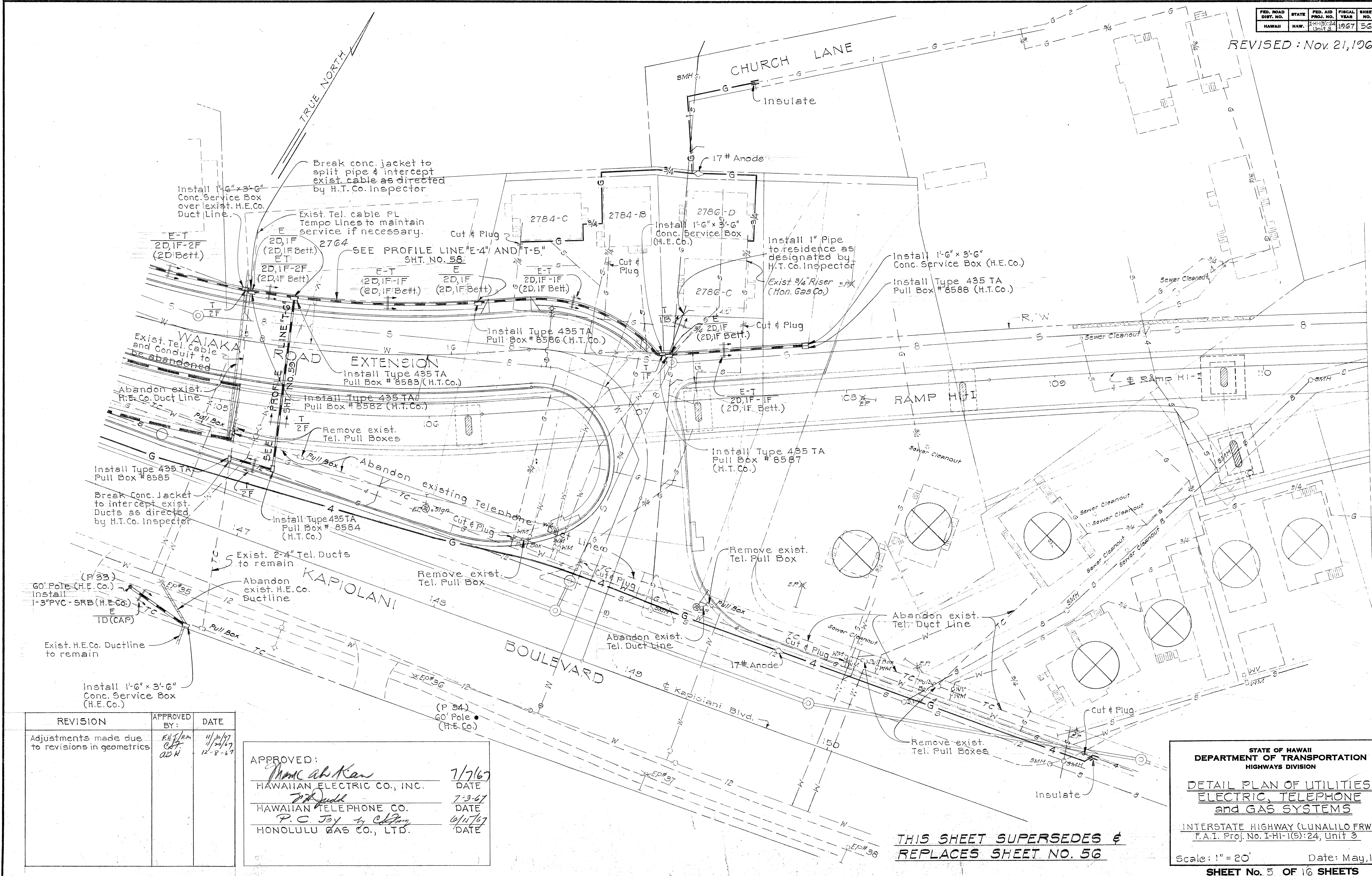
REVISION	APPROVED BY:	DATE
Adjustments made due to revisions in geometrics	<i>R.H. Lam</i> <i>Q.D.H.</i>	11/20/67 12-8-67

APPROVED:
Thomas A. Kan
 HAWAIIAN ELECTRIC CO., INC.
P.C. Jay
 HAWAIIAN TELEPHONE CO.
 HONOLULU GAS CO., LTD.

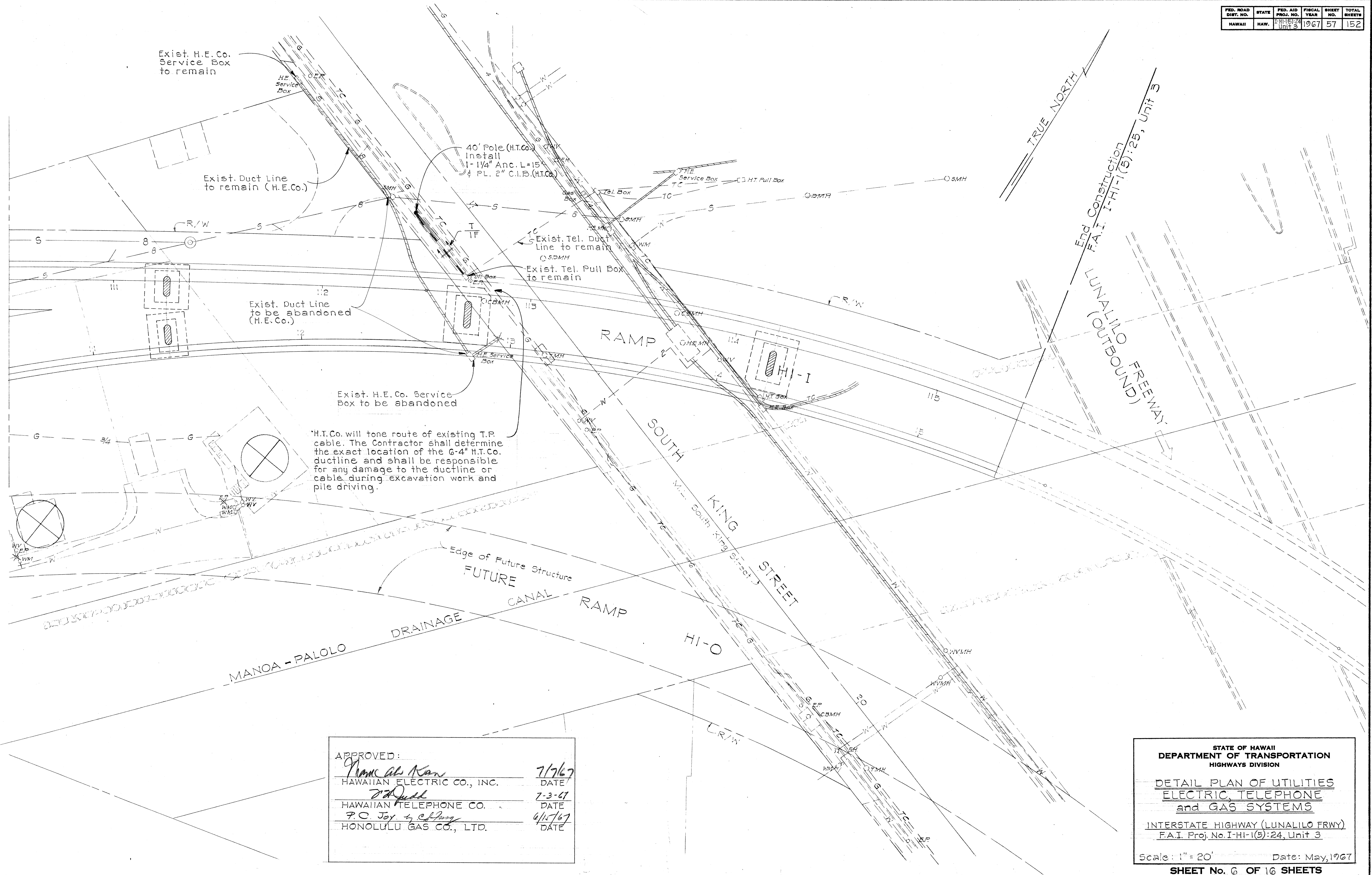
1/7/67
DATE
7-3-67
DATE
6/15/67
DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DETAIL PLAN OF UTILITIES
 ELECTRIC, TELEPHONE
 and GAS SYSTEMS
 INTERSTATE HIGHWAY (LUNALILO FRWY)
 F.A.I. Proj. No. I-HI-1(5):24, Unit 3
 Scale: 1" = 20' Date: May, 1967
 SHEET No. 5 OF 16 SHEETS

THIS SHEET SUPERSEDES &
 REPLACES SHEET NO. 56



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1967	57	152	



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

APPROVED:

James A. Kan
HAWAIIAN ELECTRIC CO., INC. 7/7/67
DATE

W. J. Hall
HAWAIIAN TELEPHONE CO. 7-3-67
DATE

P. C. Joy & Company
HONOLULU GAS CO., LTD. 6/1/67
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES
ELECTRIC, TELEPHONE
and GAS SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. Proj. No. I-HI-1(5):24, Unit 3

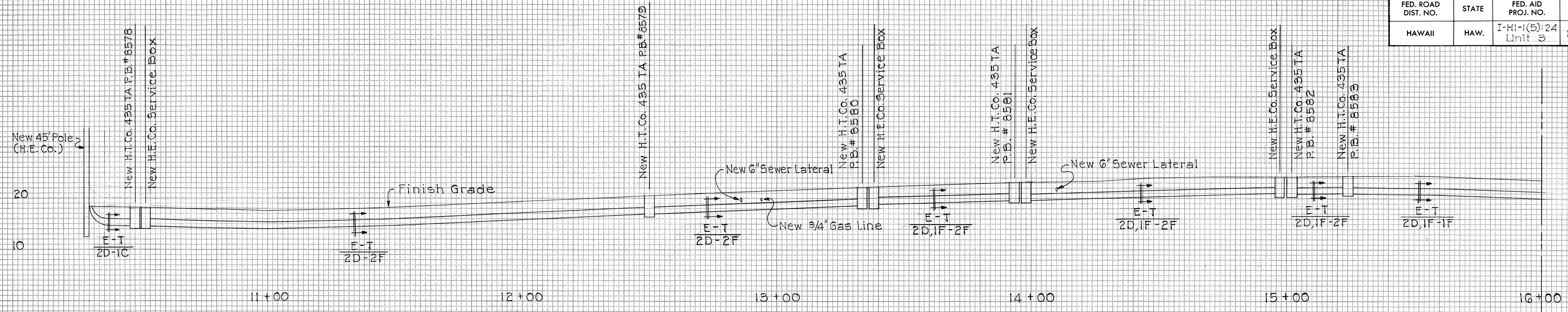
Scale: 1" = 20' Date: May, 1967

SHEET No. 6 OF 16 SHEETS

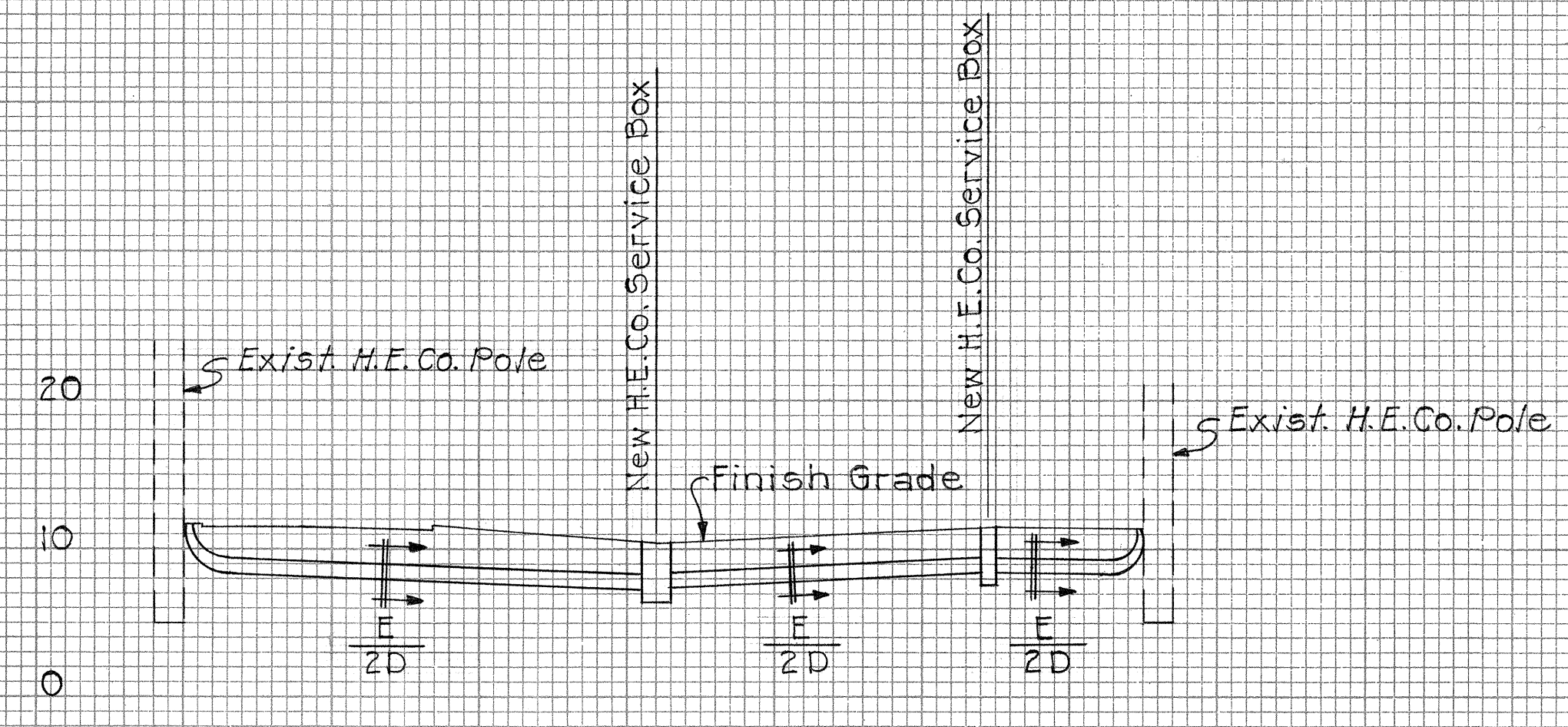
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 3	1967	58	152

FINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK		
NO.		

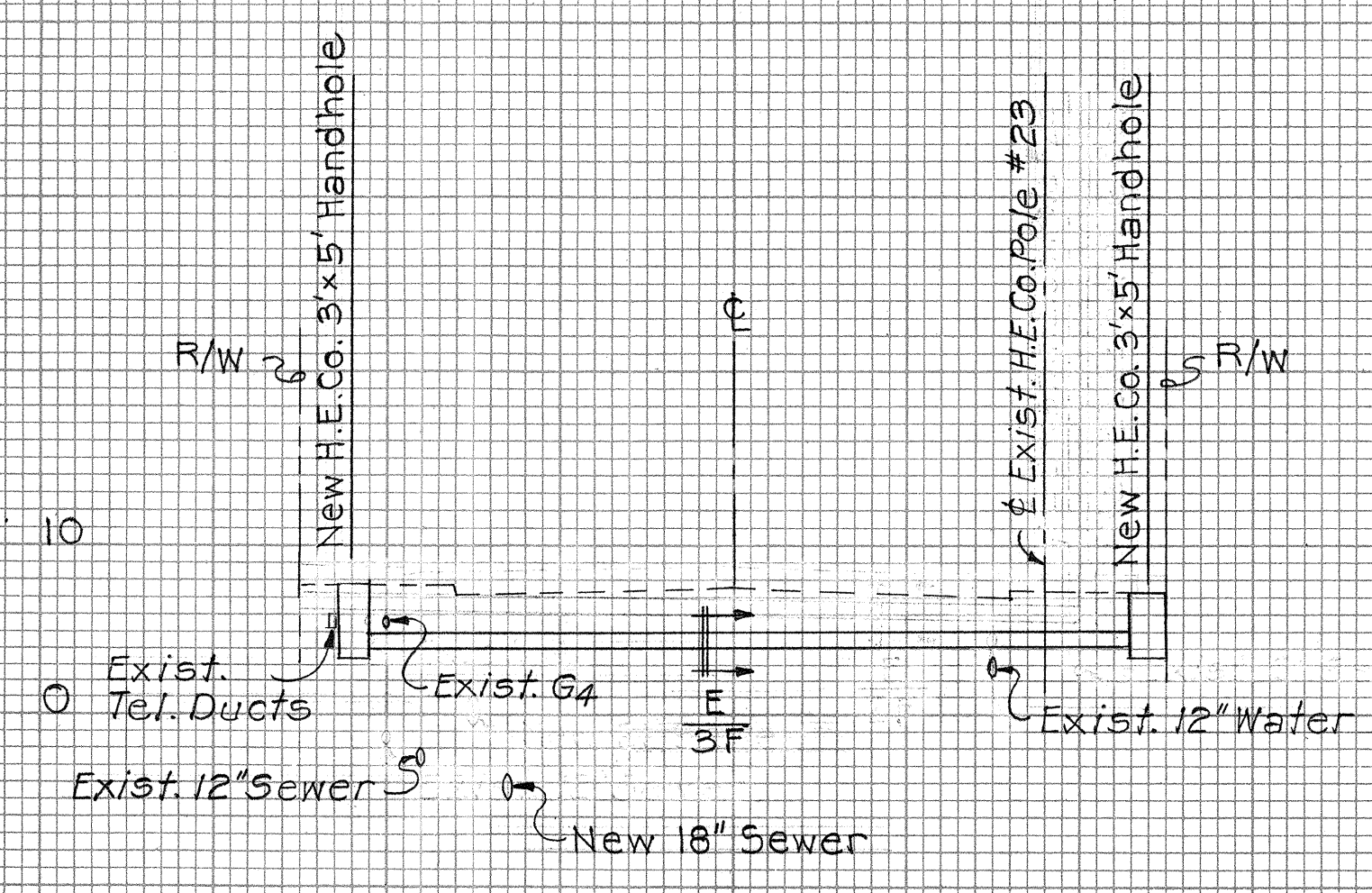
ORIGINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK		
NO.		



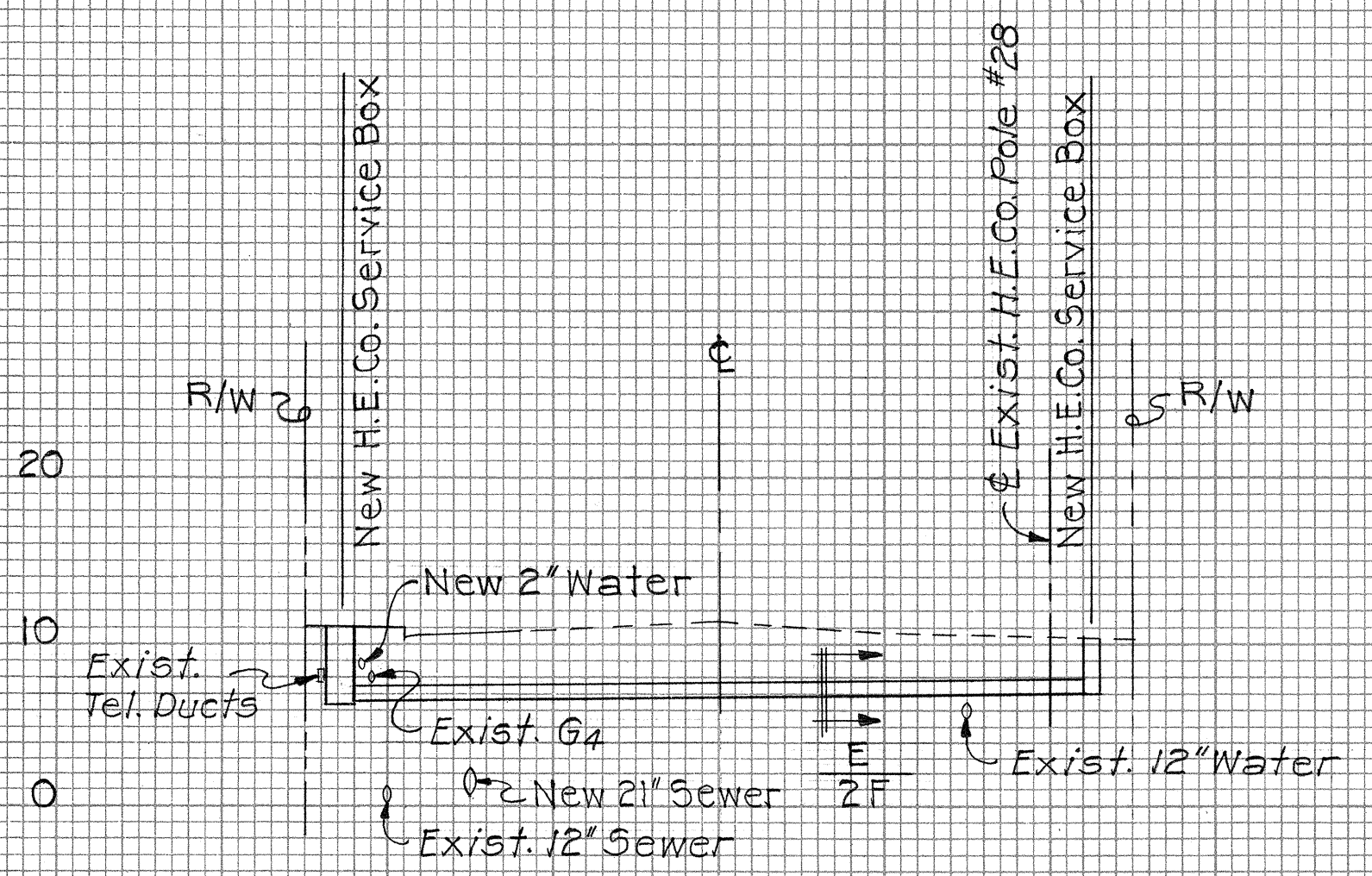
PROFILE LINE "E-4" AND "T-5"
 Scale: Horiz. 1" = 20'
 Vert. 1" = 10'



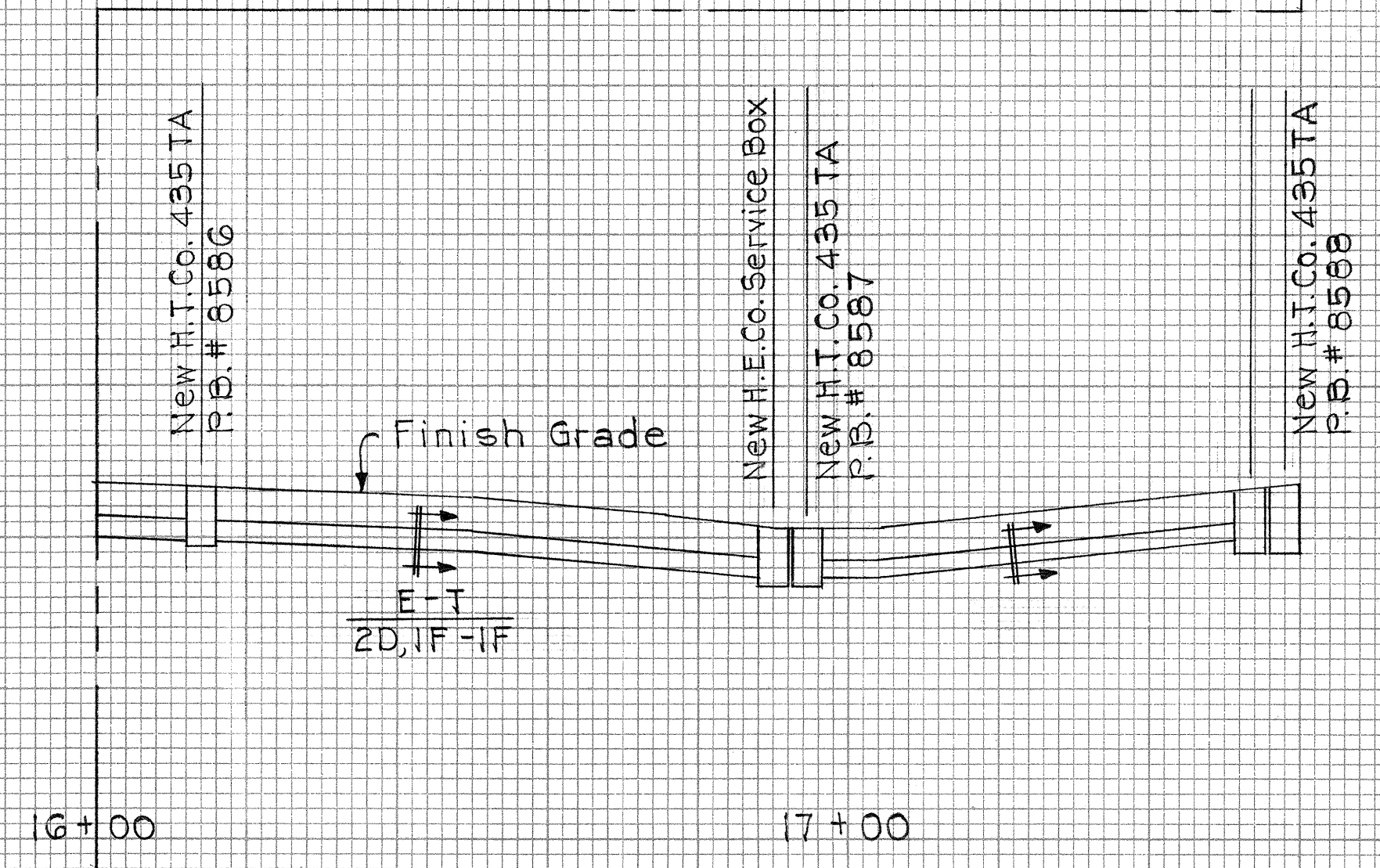
PROFILE LINE "E-3"
 Scale: Horiz. 1" = 20'
 Vert. 1" = 10'



PROFILE LINE "E-1"
 Scale: Horiz. 1" = 20'
 Vert. 1" = 10'



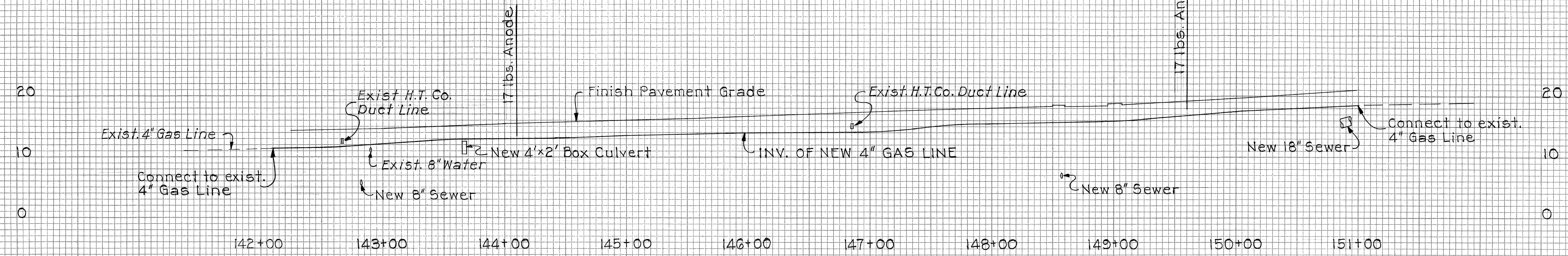
PROFILE LINE "E-2"
 Scale: Horiz. 1" = 20'
 Vert. 1" = 10'



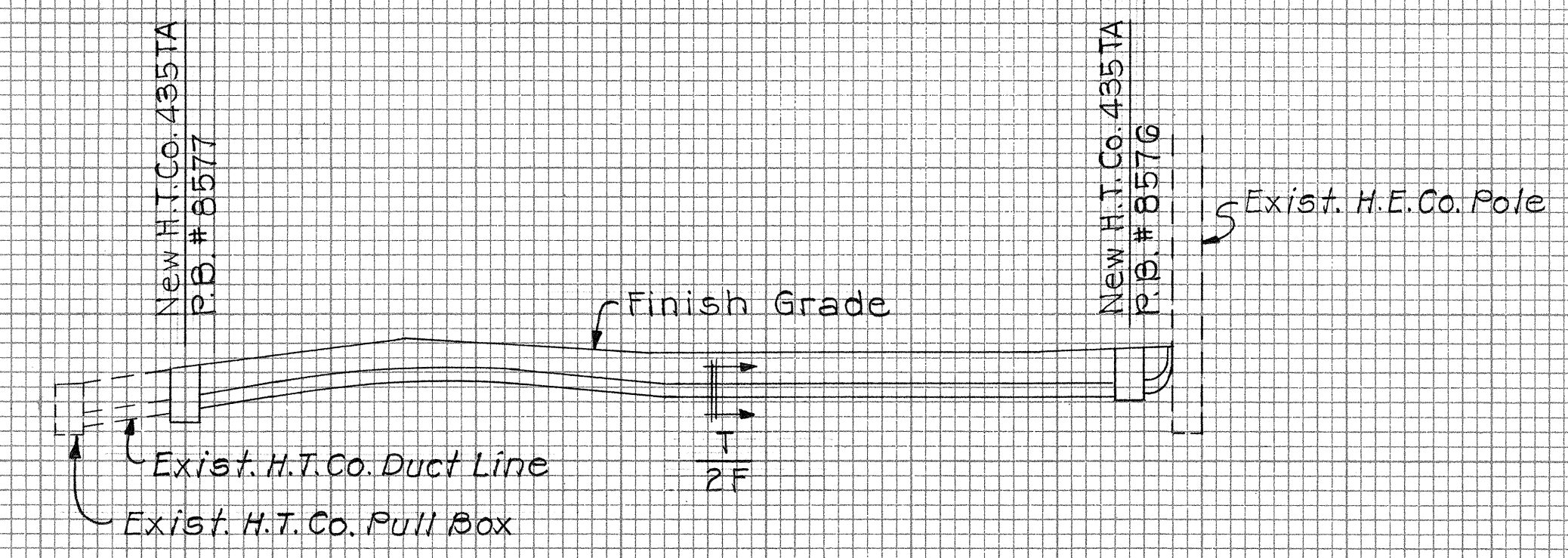
APPROVED:
Tham (oh) Kan
 HAWAIIAN ELECTRIC CO., INC.
M. Quail
 HAWAIIAN TELEPHONE CO., LTD.
 DATE 7-1-67
 DATE 7-3-67

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
UTILITY PROFILES
ELECTRIC-TELEPHONE
 INTERSTATE HIGHWAY (LUNALILO FREEWAY)
 F.A.I. Proj. No. I-HI-1(5):24, Unit 3
 Scale: As Noted Date: May, 1967
SHEET No. 7 OF 16 SHEETS

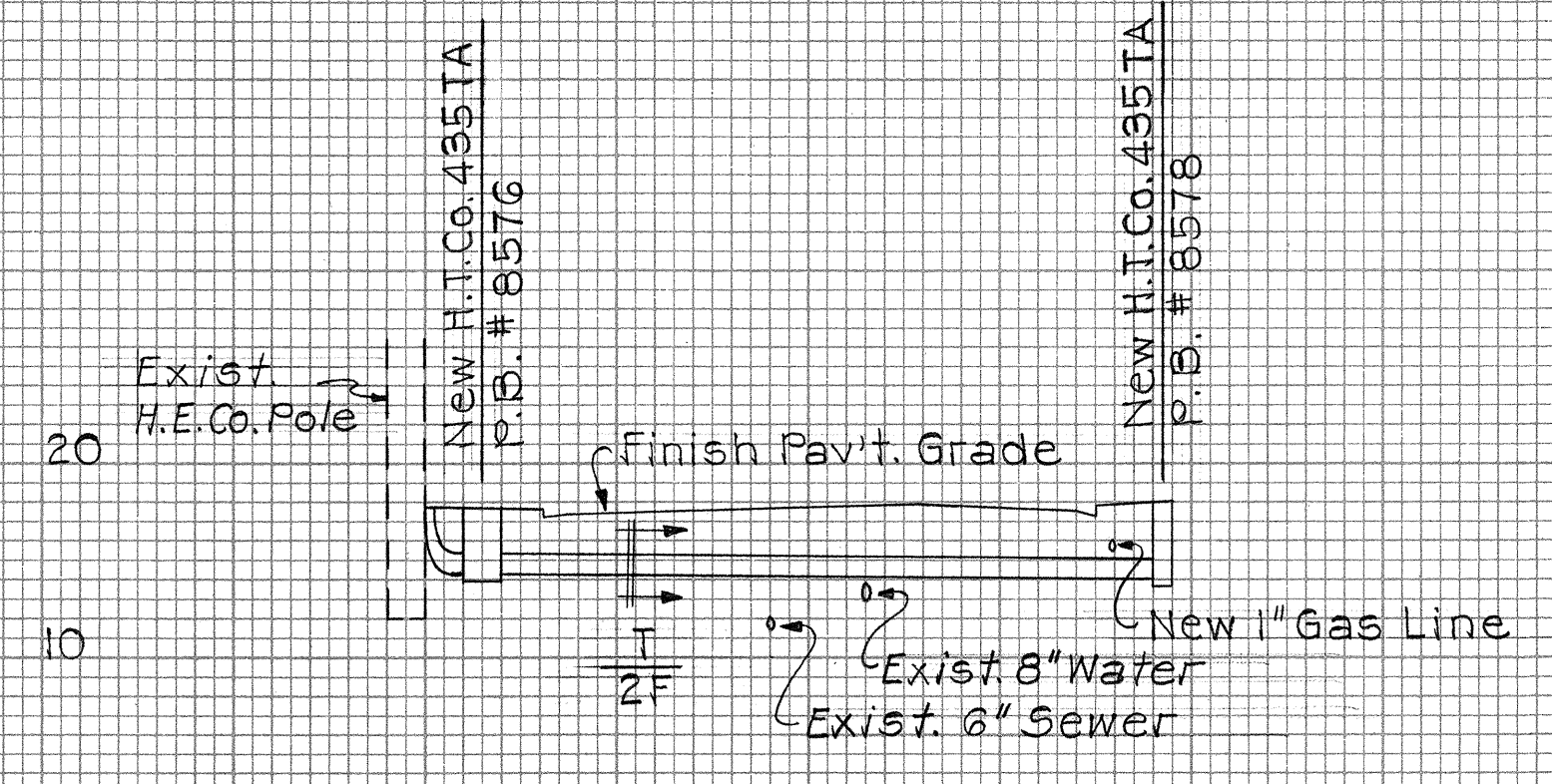
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 3	1967	59	152



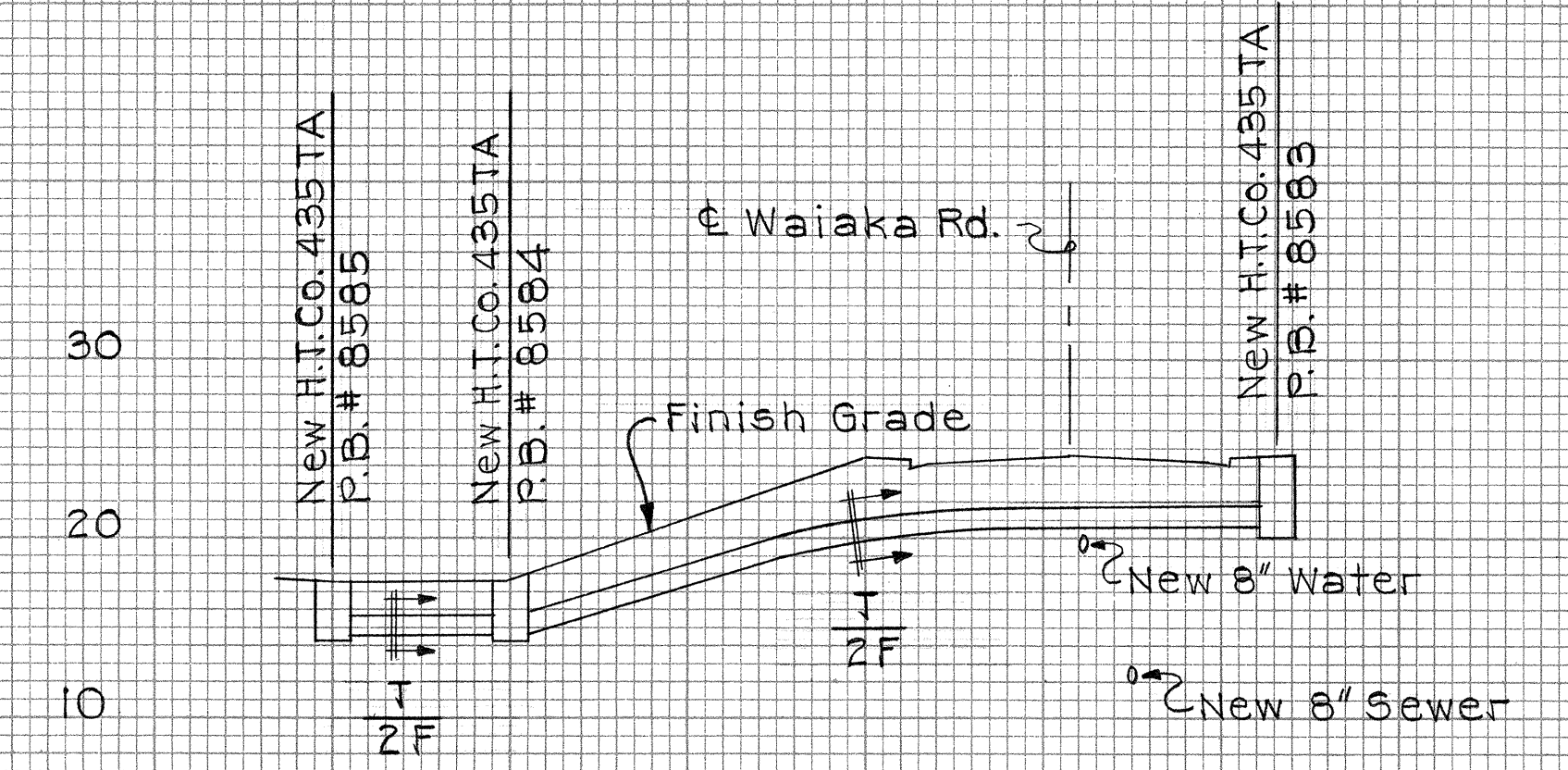
PROFILE OF NEW 4" GAS LINE
 Scale : Horiz. 1" = 50'
 Vert. 1" = 10'



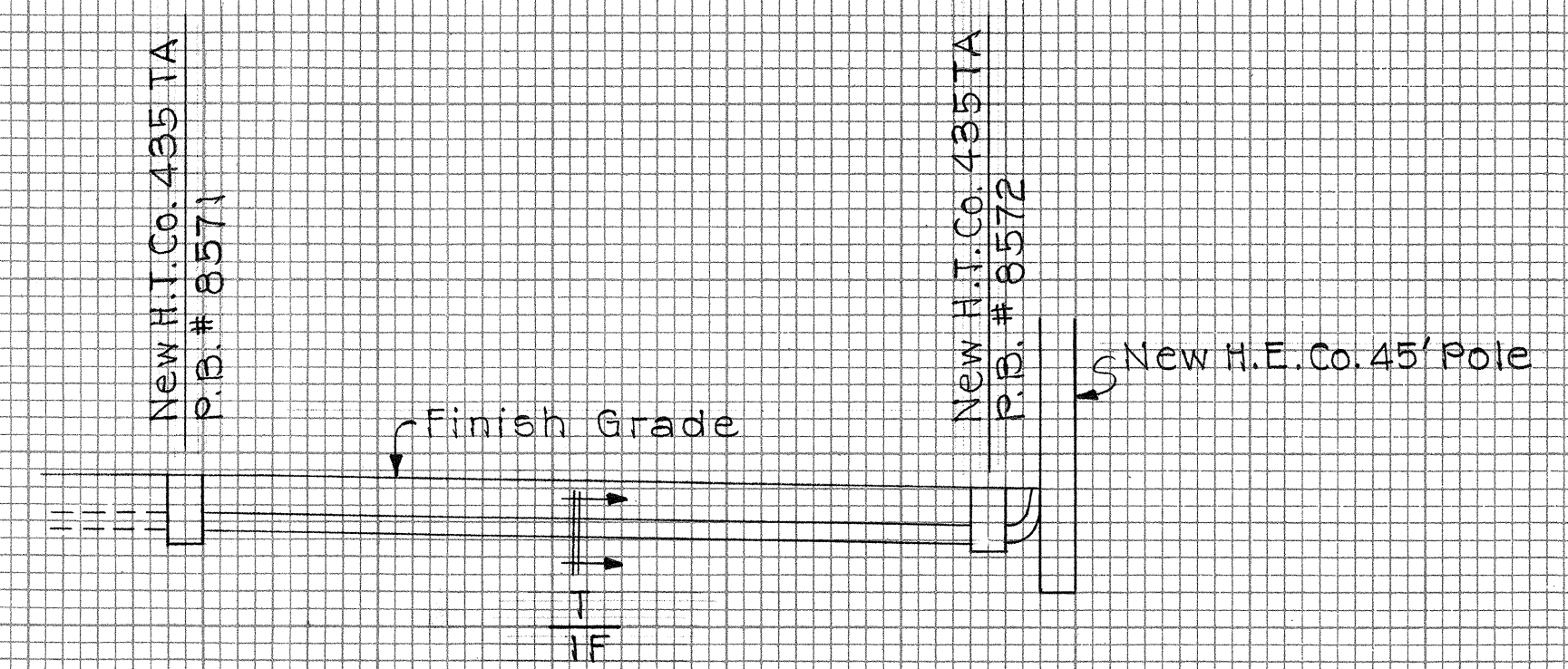
PROFILE LINE "T-3"
 Scale : Horiz. 1" = 20'
 Vert. 1" = 10'



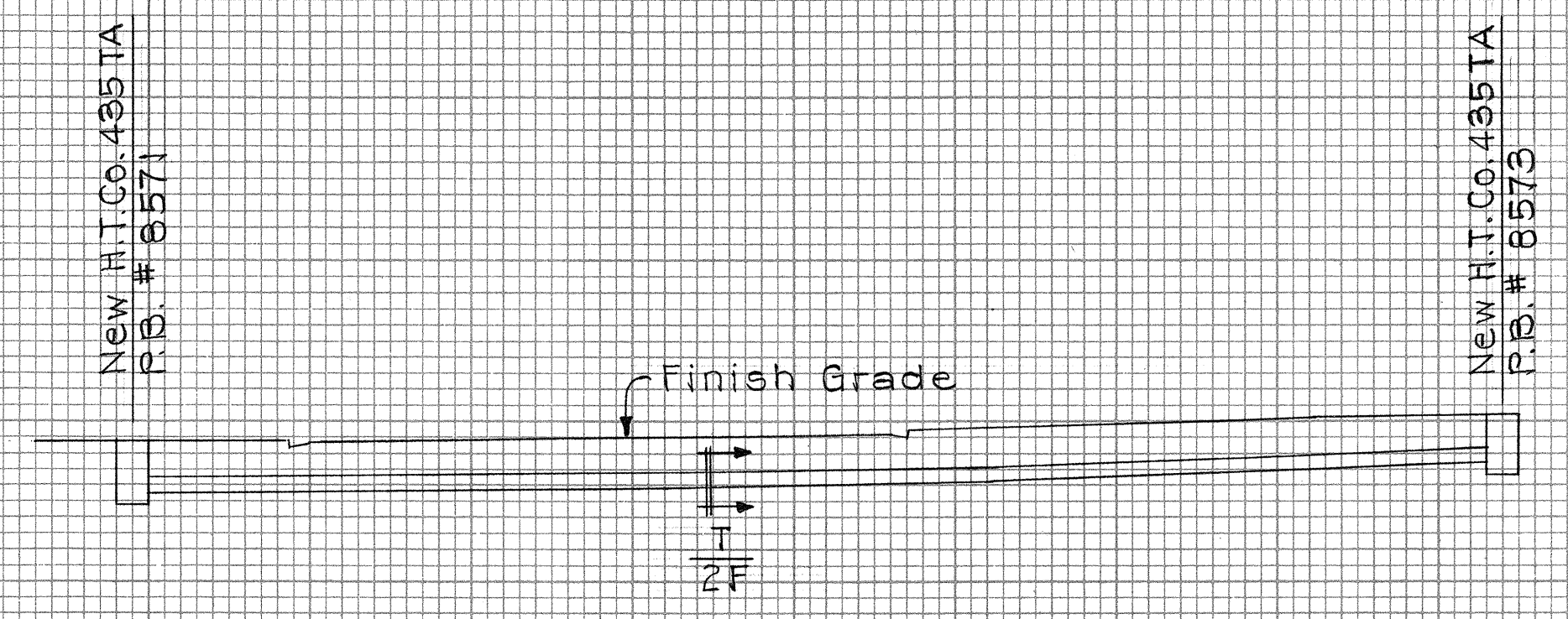
PROFILE LINE "T-4"
 Scale : Horiz. 1" = 20'
 Vert. 1" = 10'



PROFILE LINE "T-6"
 Scale : Horiz. 1" = 20'
 Vert. 1" = 10'



PROFILE LINE "T-1"
 Scale : Horiz. 1" = 20'
 Vert. 1" = 10'



PROFILE LINE "T-2"
 Scale : Horiz. 1" = 20'
 Vert. 1" = 10'

APPROVED:
P. C. Joy
 HAWAIIAN TELEPHONE CO., INC.
 P.C. Joy
 HONOLULU GAS CO., LTD.
 DATE 7-3-67
 DATE 6/15/67

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
UTILITY PROFILES
TELEPHONE - GAS
 INTERSTATE HIGHWAY (LUNALILO FREEWAY)
 F.A.I. Proj. No. I-HI-1(5):24, Unit 3
 Scale: As Noted Date: May, 1967
SHEET No. 8 OF 16 SHEETS

FINAL SURVEY
 SURVEYED
 PLOTTED
 NOTE BOOK
 AREAS CHECKED
 NO.

ORIGINAL SURVEY
 SURVEYED
 PLOTTED
 NOTE BOOK
 AREAS CHECKED
 NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-1(5)24 Unit 3	1967	61	152

NOTE "X" - IMPORTANT

Maximum clearances between removable concrete cover slabs and concrete opening at the supports must be kept. Concrete Contractor shall measure cover slab steel frame after fabrication to obtain proper clearances. Any variation in clearances shall be corrected to the satisfaction of the Engineer at Contractor's expense.

GENERAL NOTES

HANDHOLE FABRICATION

- CONCRETE STRENGTH:**
Concrete to develop compressive cylinder strength of 3000 p.s.i. in 28 days.
- CONCRETE FINISH:**
Top of handhole wood floated (sidewalk finish) according to Division of Highways, State of Hawaii or Division of Engineering City & County of Honolulu specification whichever governs unless otherwise directed.
Round all exposed edges to $\frac{3}{8}$ " radius.
- REINFORCING**
Round deformed bars, new billet stock, intermediate grade ASTM A15.
- FINISH STEEL WORK:**
Angle iron frames, lifting devices for removable concrete slabs and pulling eye attachments shall be Hot-Dip Galvanized After Fabrication.
- All material shall be new and manufactured in the United States of America.

HANDHOLE INSTALLATION

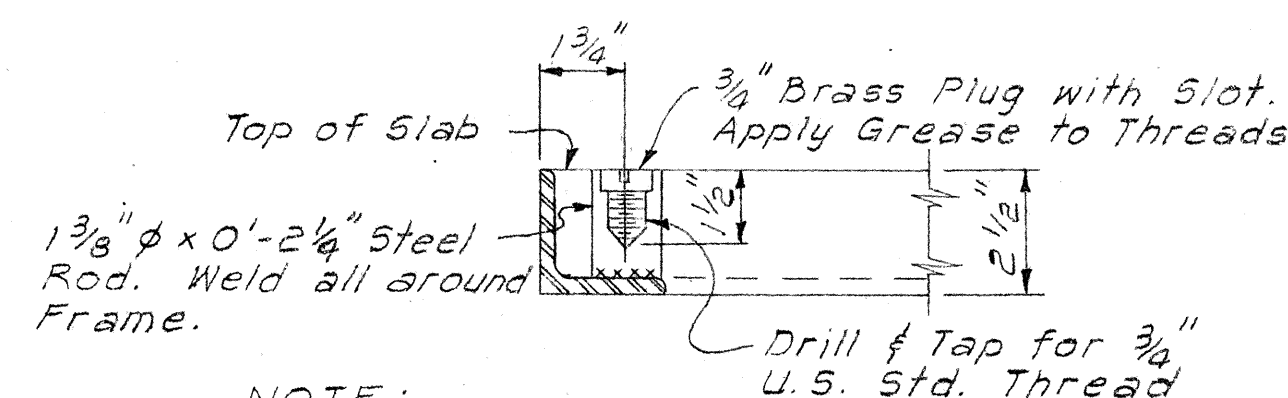
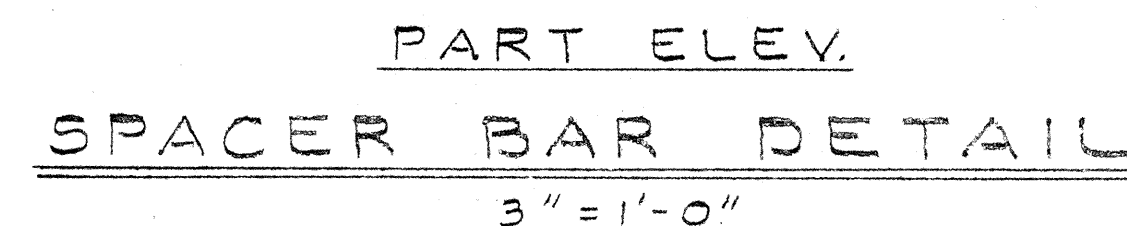
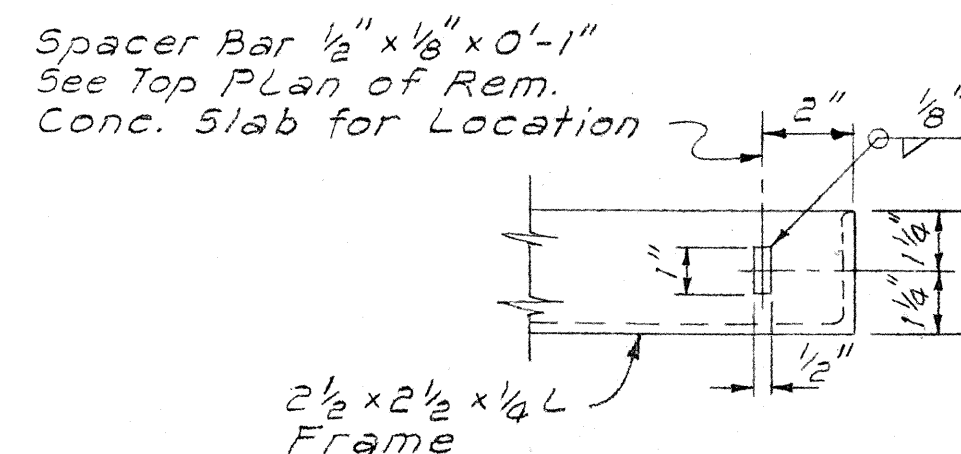
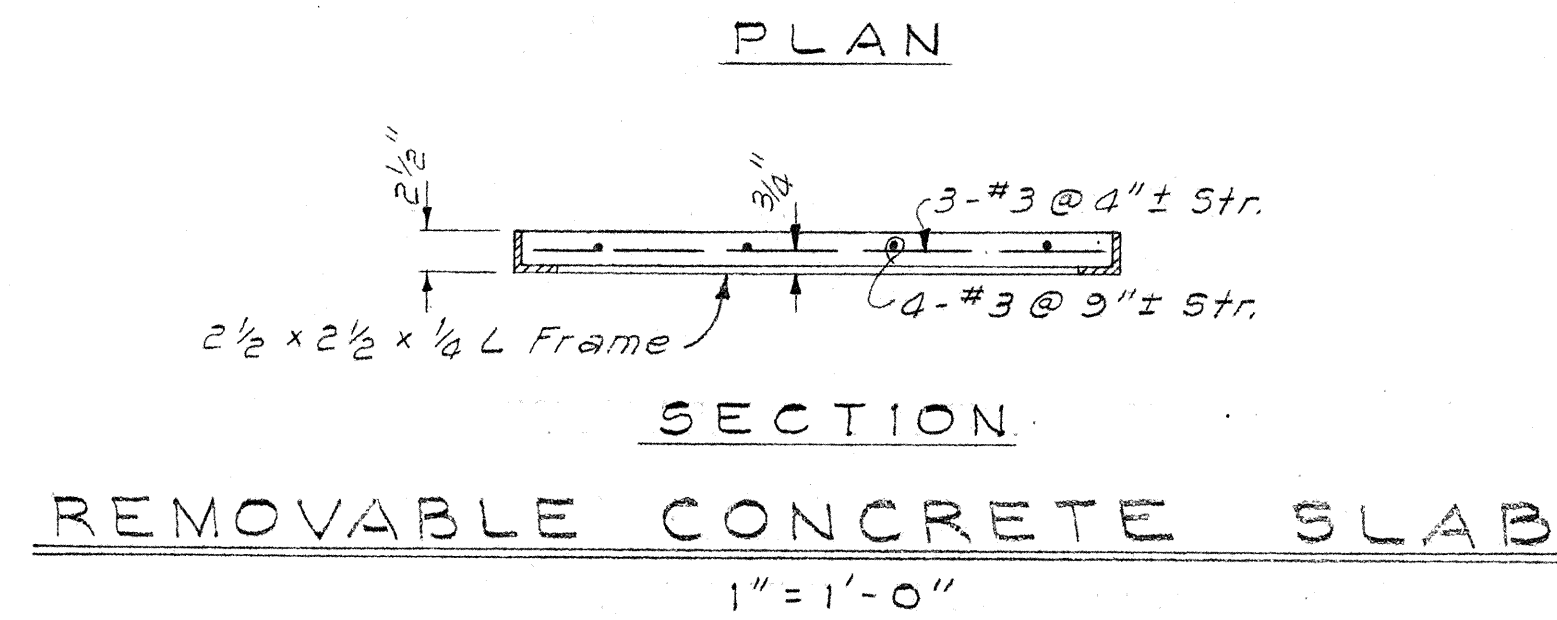
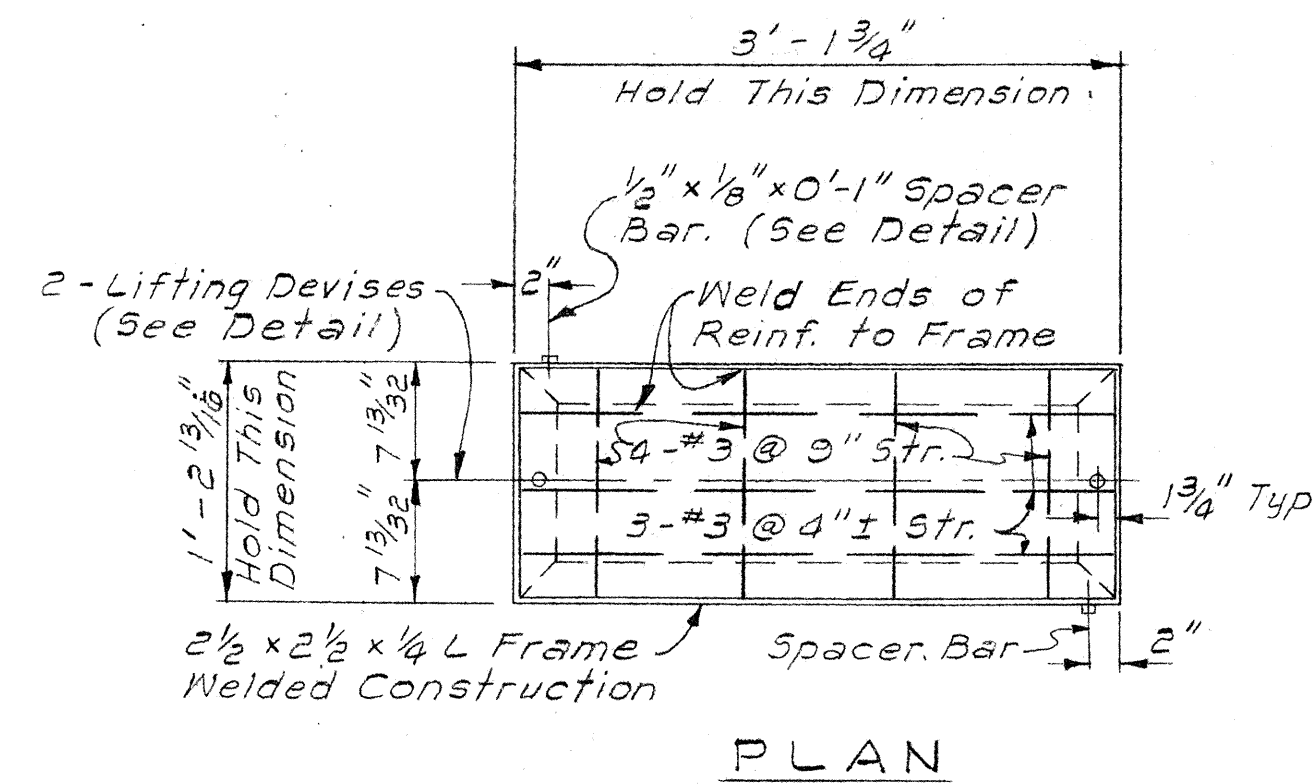
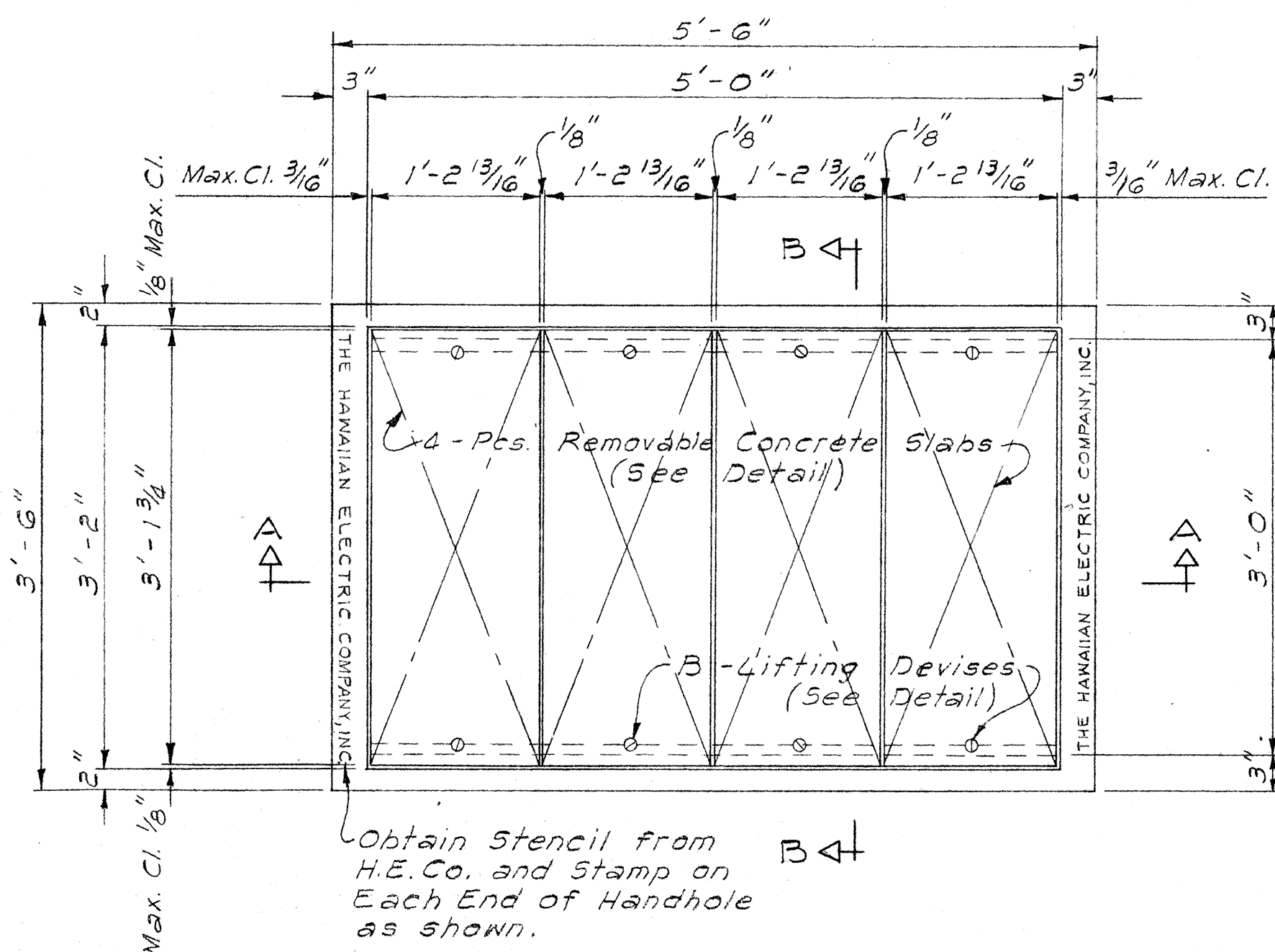
- EXCAVATION:**
Excavate for handhole to accurate alignment, grades and dimensions as shown on drawings. All excavation must be approved by the Engineering Dept., Hawaiian Electric Co. Inc. before installing precast handhole.
- INSTALLATION:**
Place handhole on 3" thick #3 fine lava rock. Top of handhole to be level and 1" above finish grade except in sidewalk areas where top is to match top of sidewalk.
- BACKFILL:**
Remove all debris before backfilling. Backfill in accordance with latest specifications of and subject to approval of Div. of Highways, State of Hawaii or Div. of Eng., C & C of Honolulu whichever governs unless otherwise directed.

WEIGHT PER REMOVABLE COVER

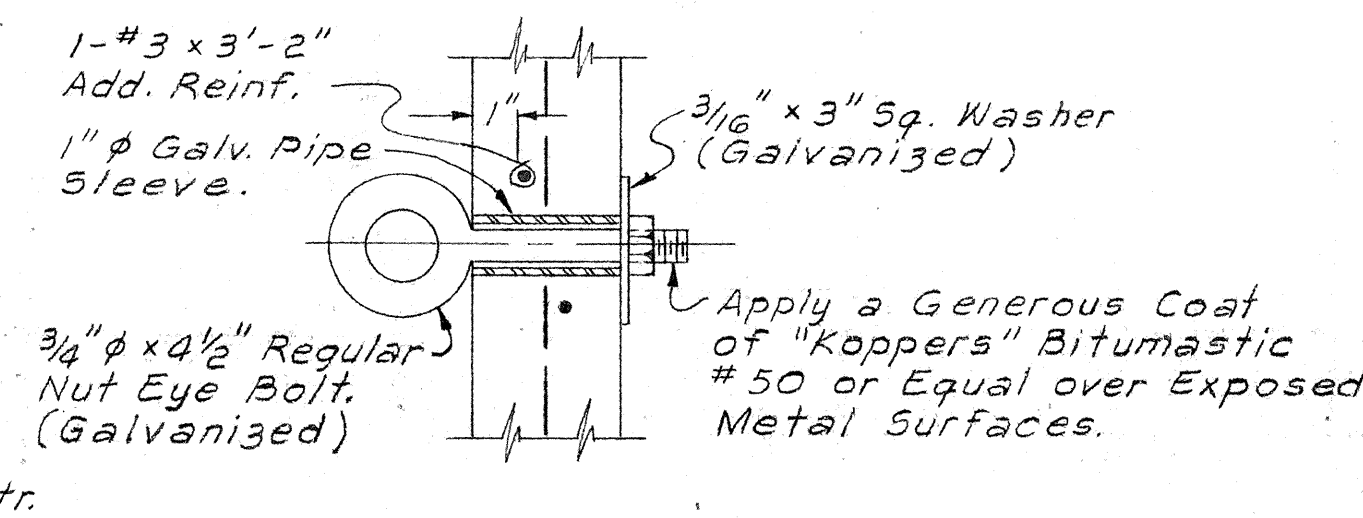
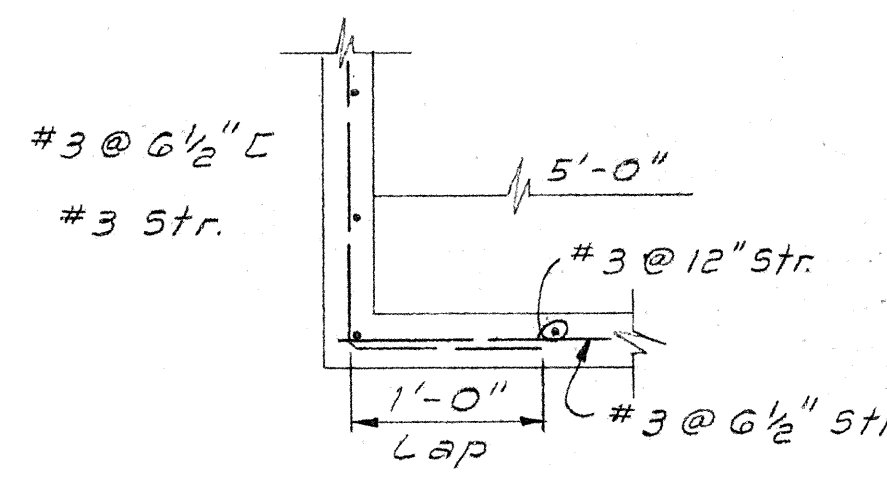
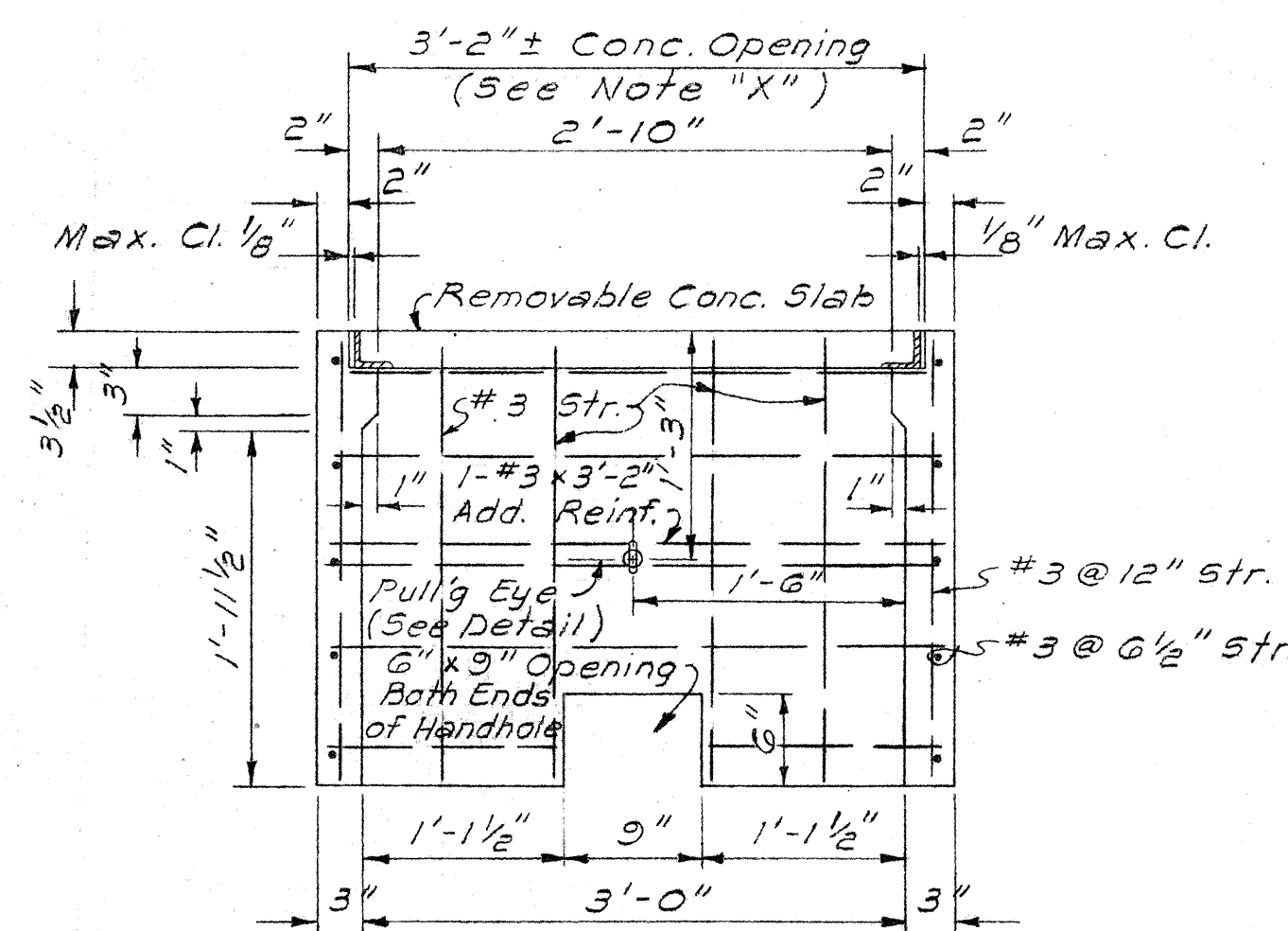
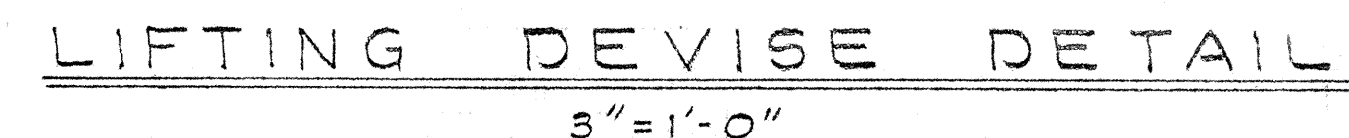
Reinf. & Angle Frames = 38.0 Lb.
Concrete = 115.0 Lb.
Total = 153.0 Lb.

WEIGHT OF MATERIAL PER UNIT (EXCLUDING COVERS)

Concrete = 1,675 Lb. (.42 cu. yd.)
Reinf. Steel = 52 Lb. (157 L.F. of #3)
Total = 1,734 Lb.



NOTE:
Hot-Dip Galvanize L Frame after Fabrication

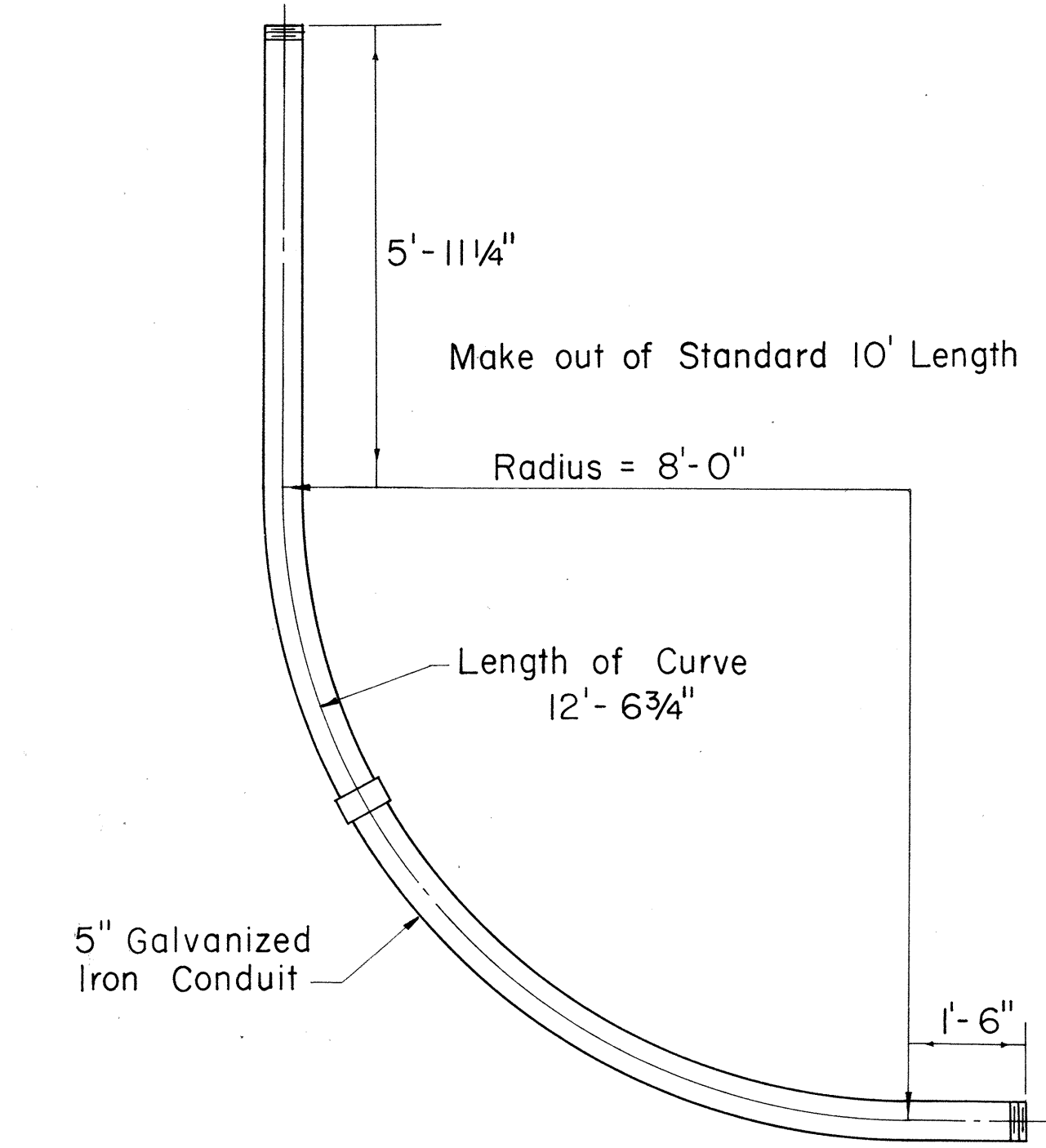


FOR USE IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC.

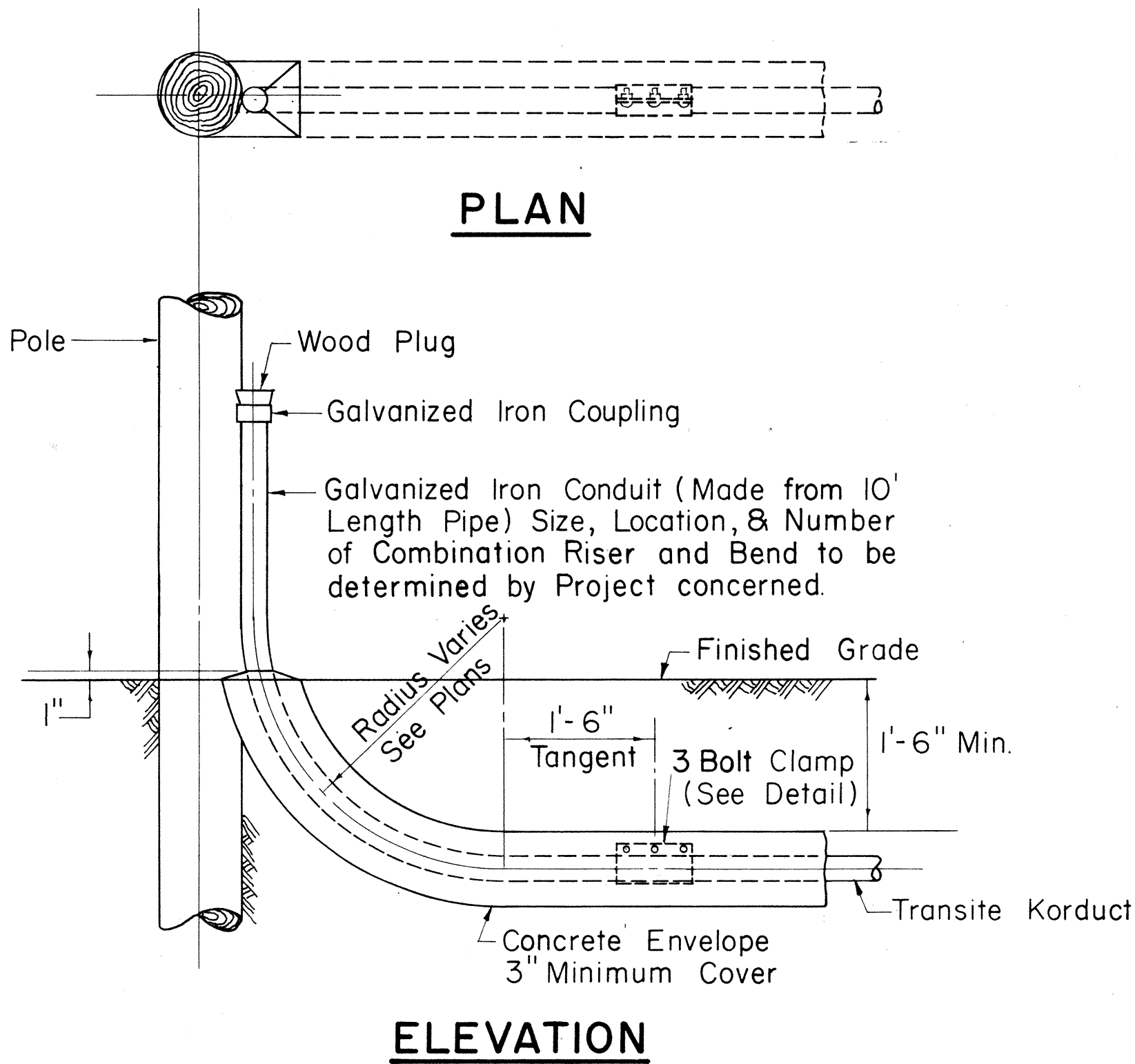
APPROVED:
HAWAIIAN ELECTRIC Co., Inc. DATE 7/7/67

HECo., Inc. Drawing Number
15501
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
STANDARD DETAILS PRECAST HANDHOLE (3'-0" x 5'-0") UNDERGROUND STANDARDS
Scales: As Noted Date:
SHEET No. 10 OF 16 SHEETS

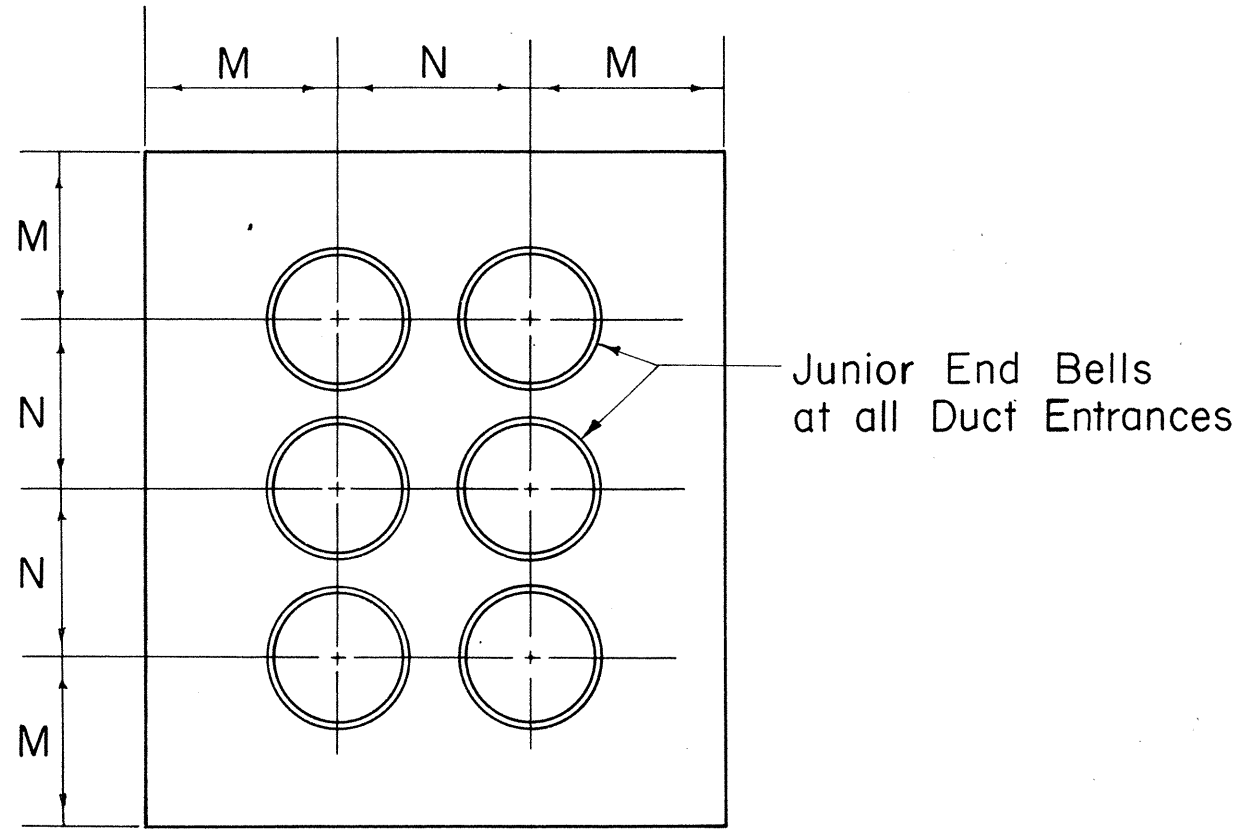
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	T-H-1(5)24 Unit 3	1967	62	152



46 KV COMBINATION RISER AND BEND
(8'-0" RADIUS)
Not to Scale

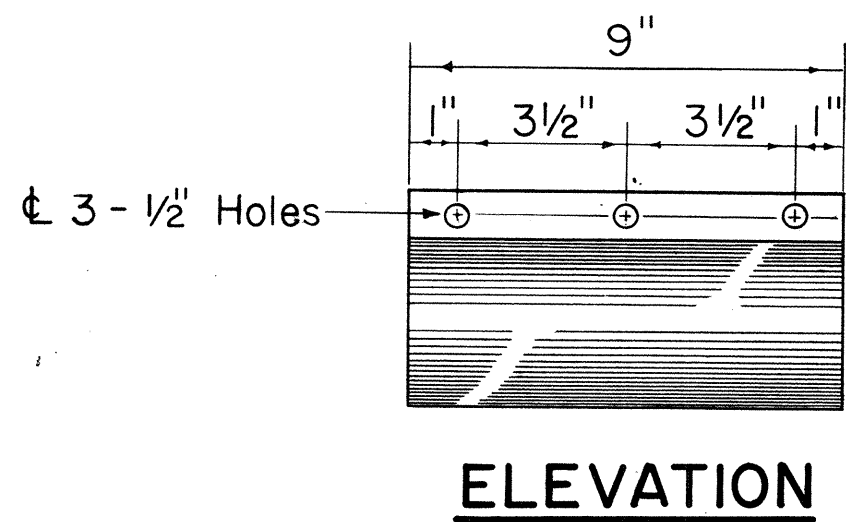
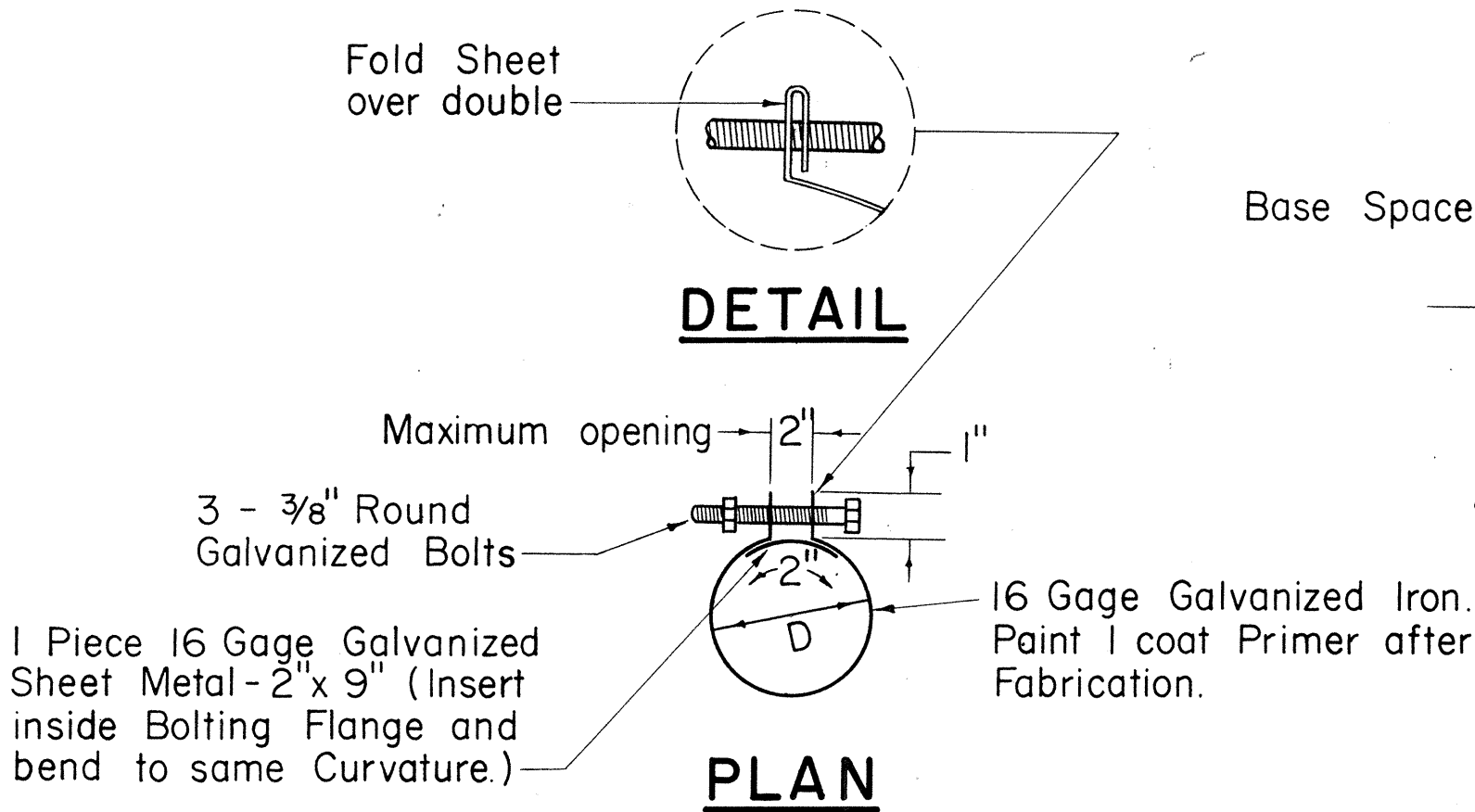


TYPICAL DETAIL COMBINATION RISER AND BEND
Scale: 3/4" = 1'-0"

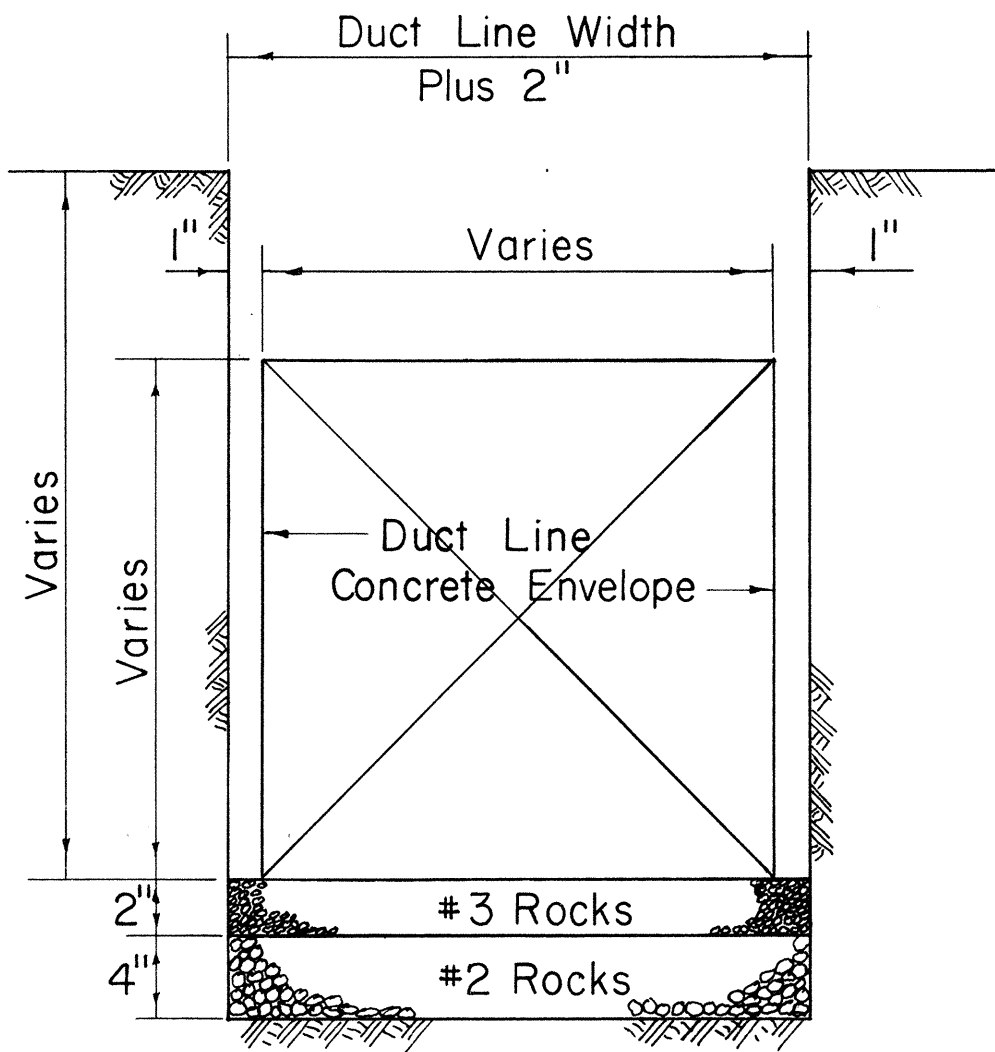


TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

SIZE	M	N
3"	5"	6"
4"	5 1/2"	7"
4 1/2"	5 1/2"	7 1/2"
5"	6"	8"

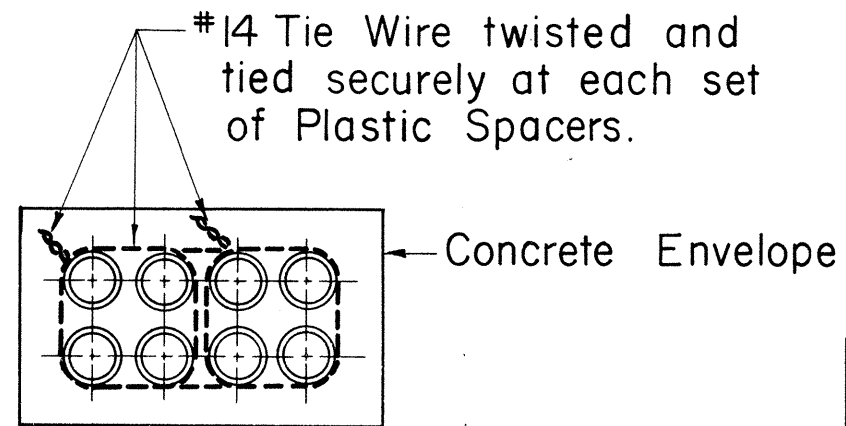


3 BOLT CLAMP DETAIL
Scale: 3" = 1'-0"

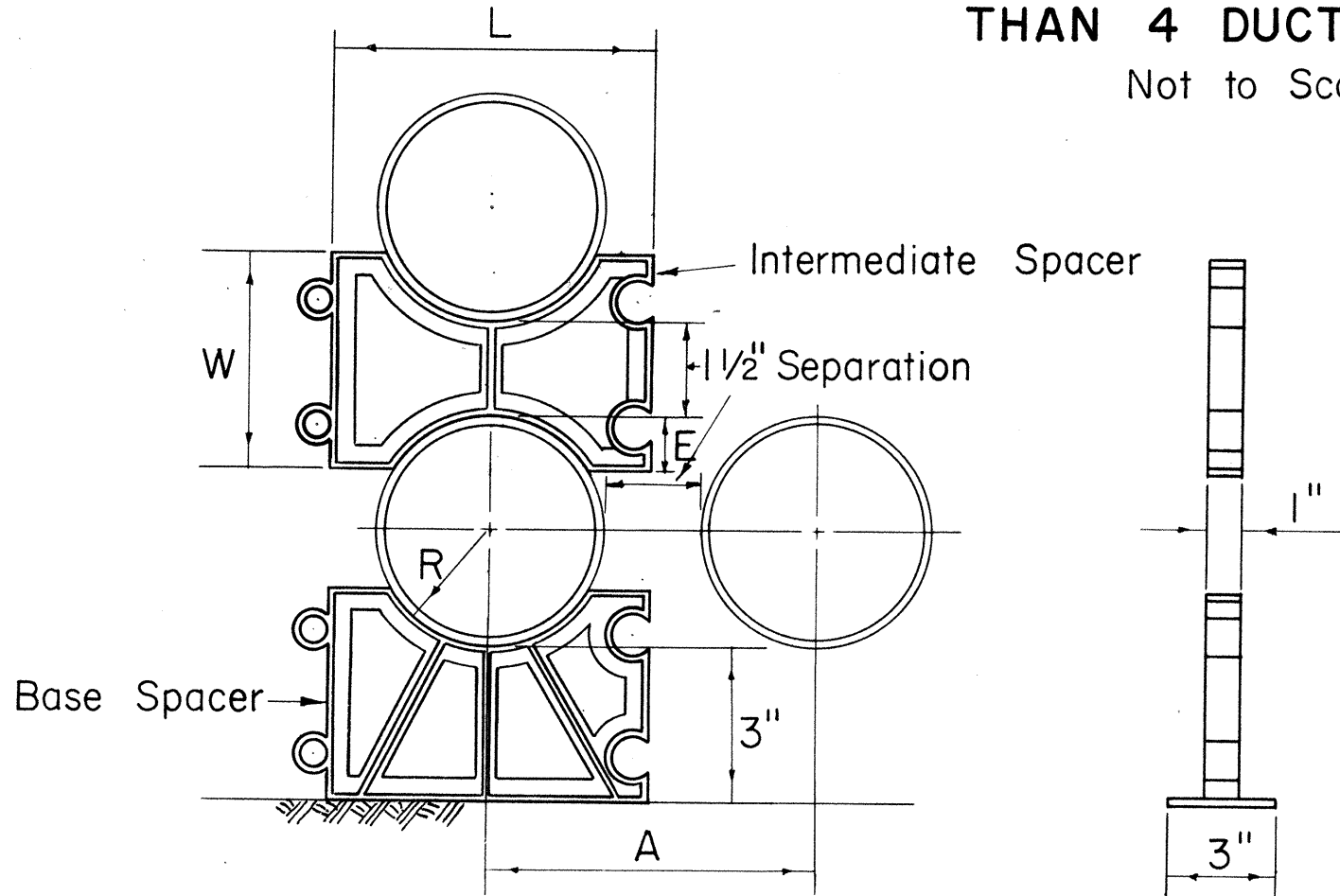


TYPICAL EXCAVATION DETAIL
Not to Scale

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



TIE WIRE DETAIL
FOR DUCT LINE MORE THAN 4 DUCTS WIDE
Not to Scale

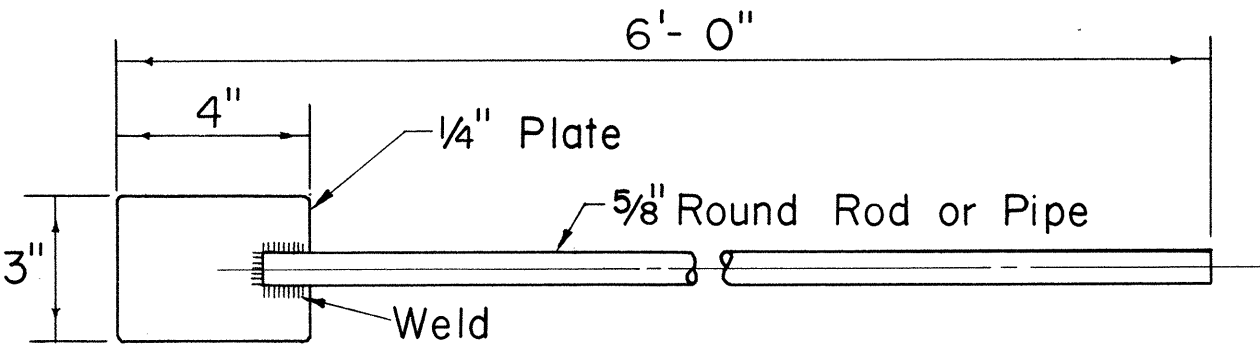


TYPICAL PLASTIC SPACERS
Not to Scale

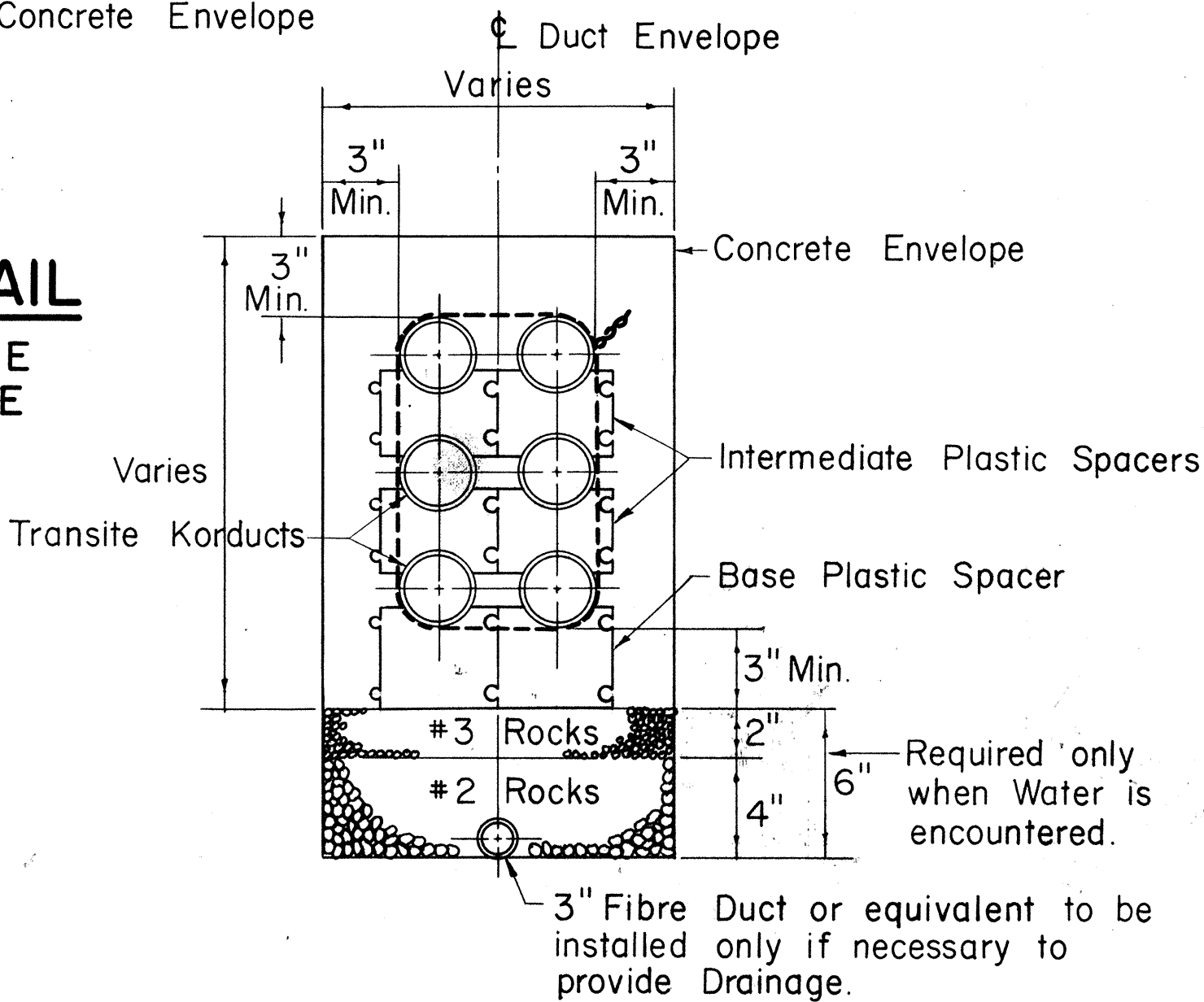
SIZE	R	E	W	A	L
3"	1 27/32"	7/8"	3 1/4"	5 1/8"	5"
4"	2 13/32"	1 1/8"	3 3/4"	6 1/4"	6 1/8"
4 1/2"	2 23/32"	1 1/4"	4"	6 7/8"	6 3/4"
5"	3 1/16"	1 3/8"	4 1/4"	7 5/8"	7 1/2"

For 1 1/2" Separation

APPROVED:
Thomas A. Kama
HAWAIIAN ELECTRIC CO., INC. DATE 7/17/67



CONCRETE DUCT ENVELOPE TAMPING ROD
Scale: 3" = 1'-0"



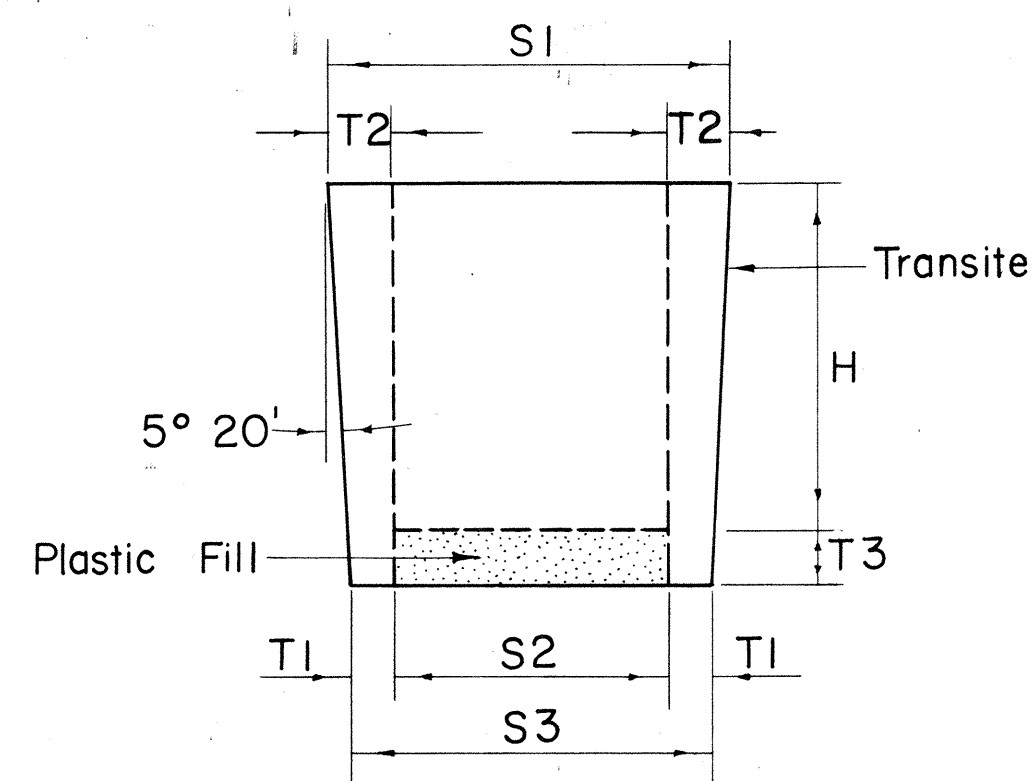
TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale

HECo., Inc. Drawing Number
18585

SHEET No. 1
OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES
Scales: As Noted Date:

SHEET NO. 11 OF 16 SHEETS



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 1/16"	11 1/16"	3 3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13 3/32"	27 3/32"	3 3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35 3/64"	31 3/32"	3 3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35 3/64"	31 3/32"	3 3/4"

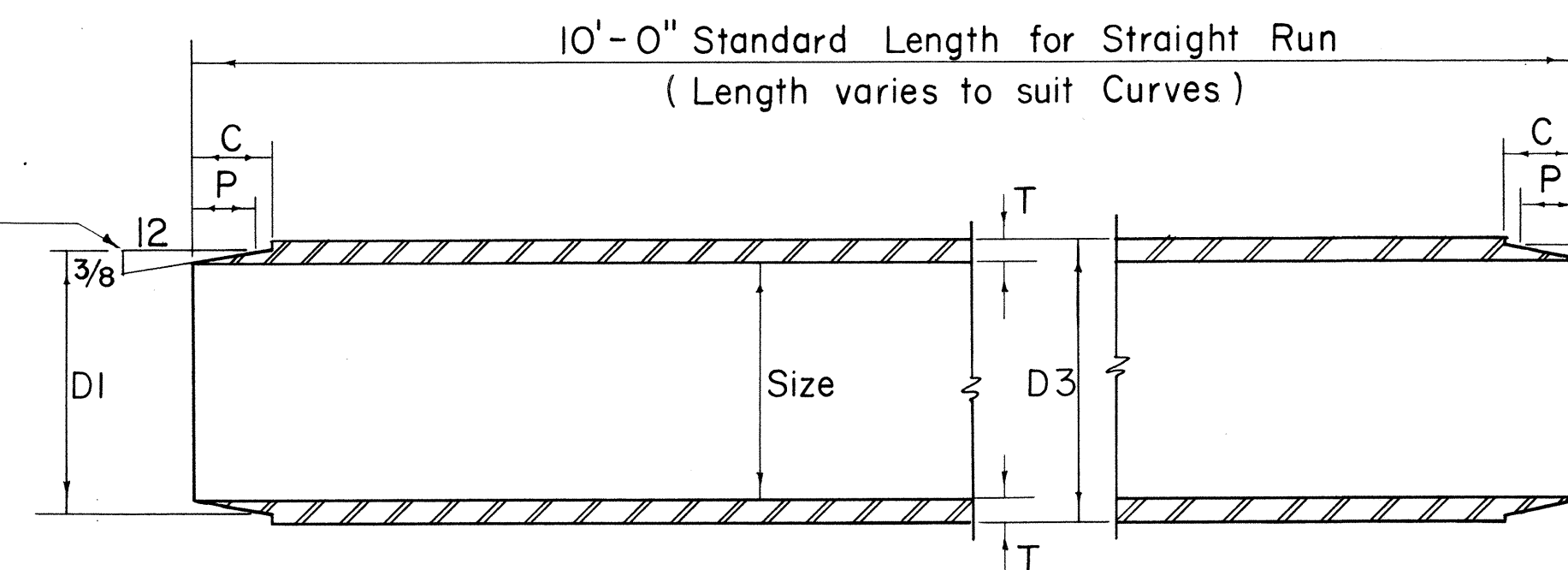
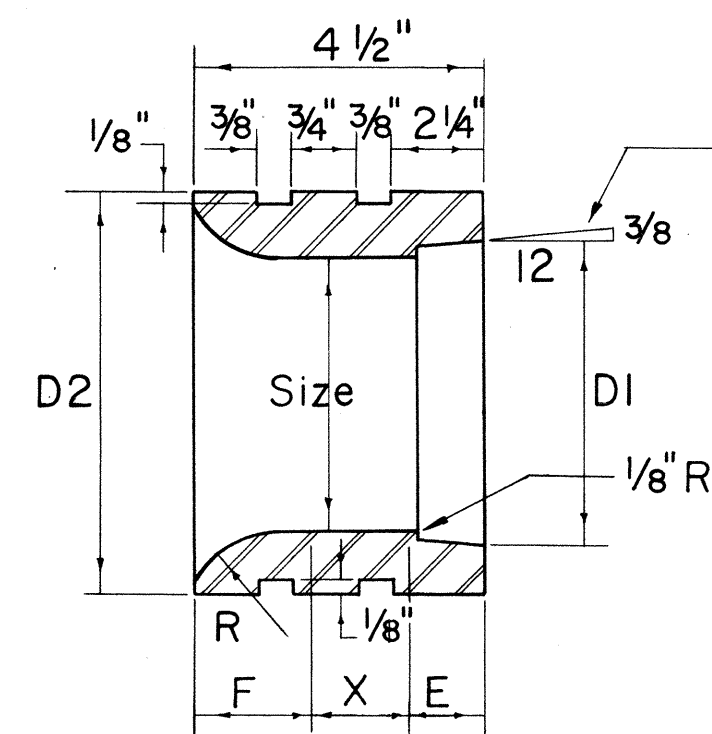
JUNIOR END BELLS

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"	3 3/8"	2"
4 1/2"	4 57/64"	6 1/4"	1 9/16"	1 9/16"	3 3/8"	2"
5"	5 29/64"	7"	1 9/16"	1 7/16"	1 1/2"	2"

Note "X"

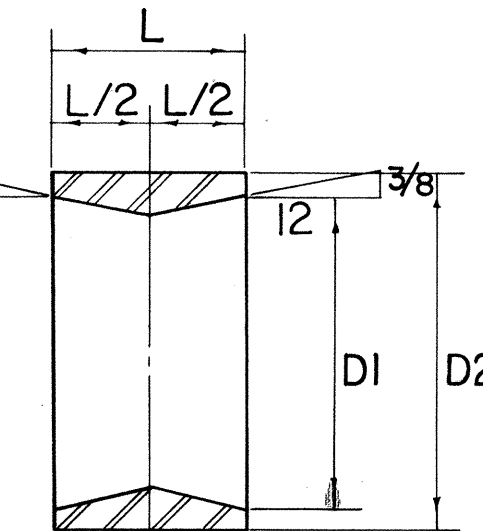
- Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



TRANSITE KORDUCTS

Not to Scale

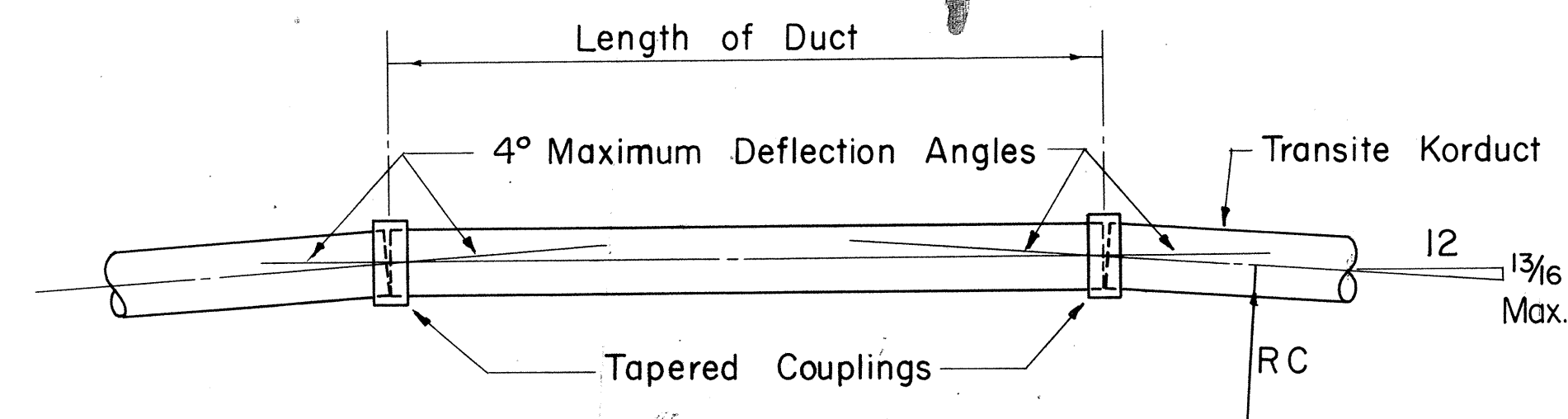
SIZE	D1	D3	C	P	T
3"	3 25/64"	3 35/64"	1 1/8"	7 7/8"	17 1/64"
4"	4 25/64"	4 35/64"	1 1/4"	1"	17 1/64"
4 1/2"	4 57/64"	5 3/64"	1 1/4"	1"	17 1/64"
5"	5 29/64"	5 39/64"	1 1/8"	1 1/8"	19 1/64"



TAPERED COUPLINGS

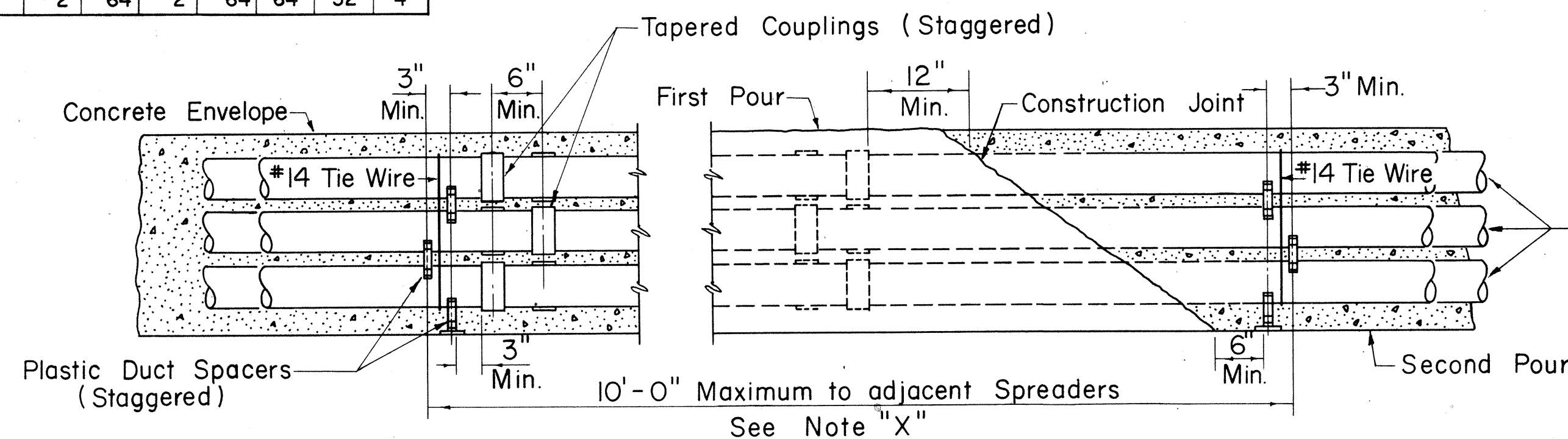
Not to Scale

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"



METHOD OF FORMING CURVES

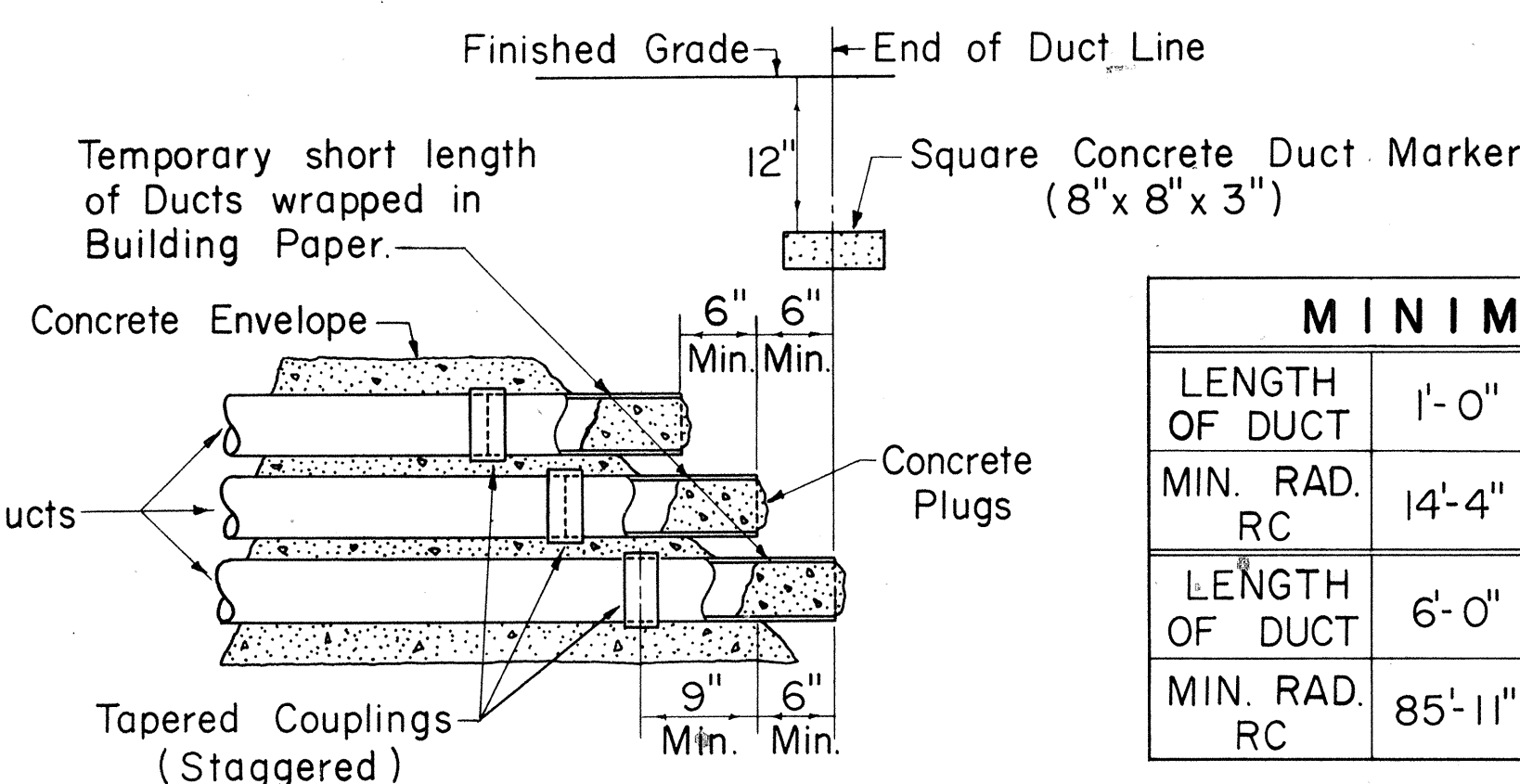
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

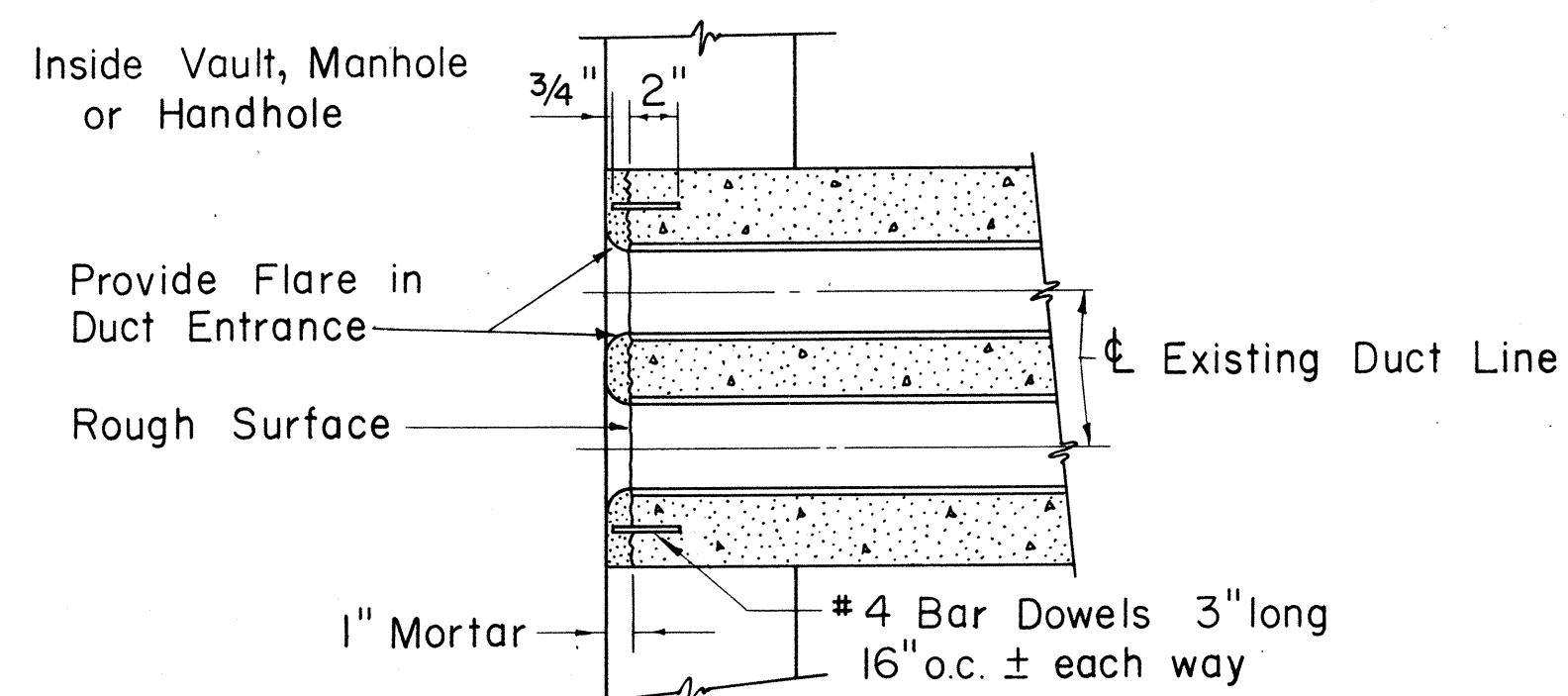
(6 WAY DUCT LINE SHOWN)

Not to Scale



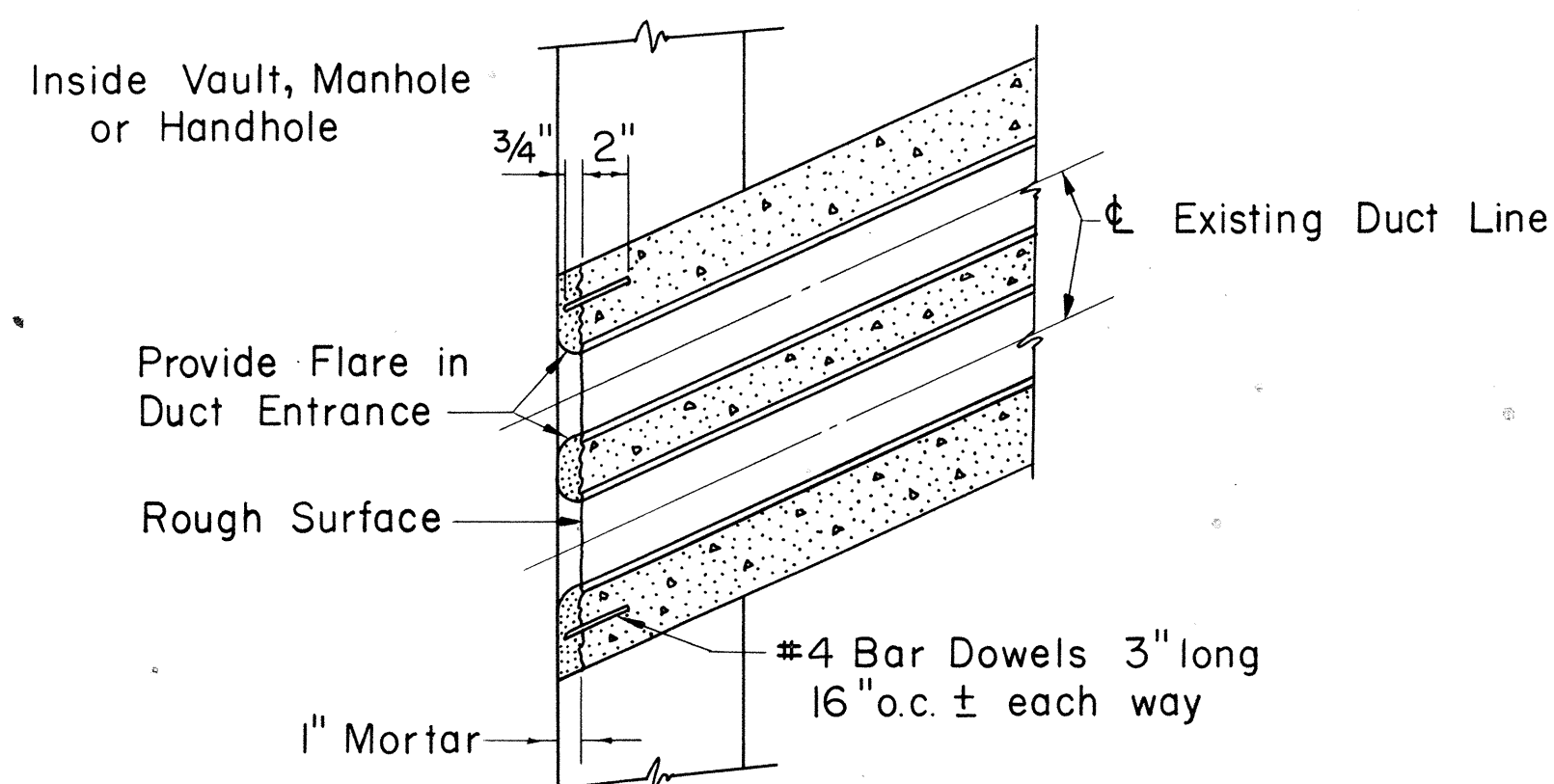
TYPICAL STUB OUT DETAIL

Not to Scale



DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

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

APPROVED:

Manuel A. Kama
HAWAIIAN ELECTRIC CO., INC.

7/7/67
DATE

HECo., Inc. Drawing Number
18585 SHEET No. 2 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

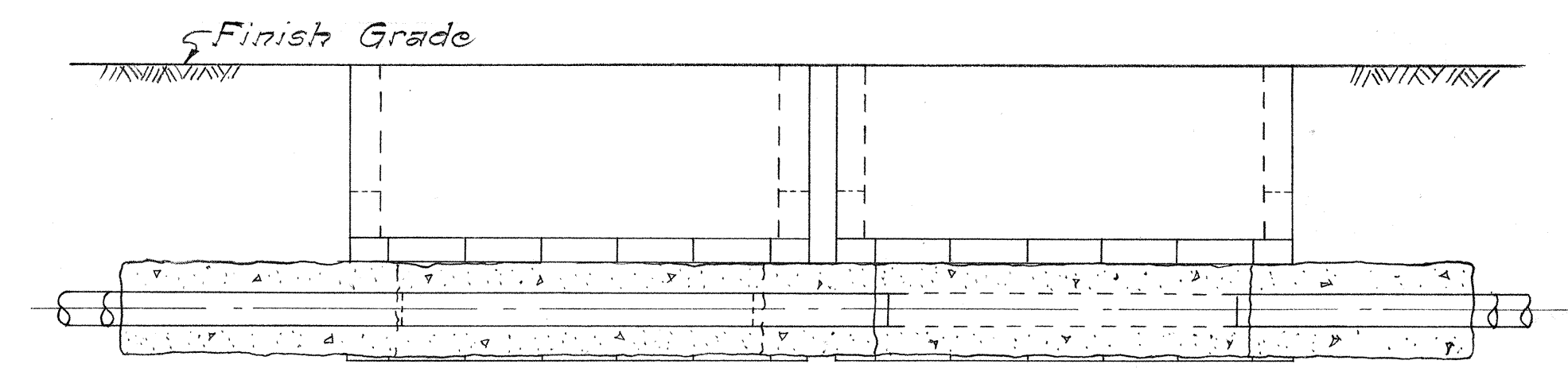
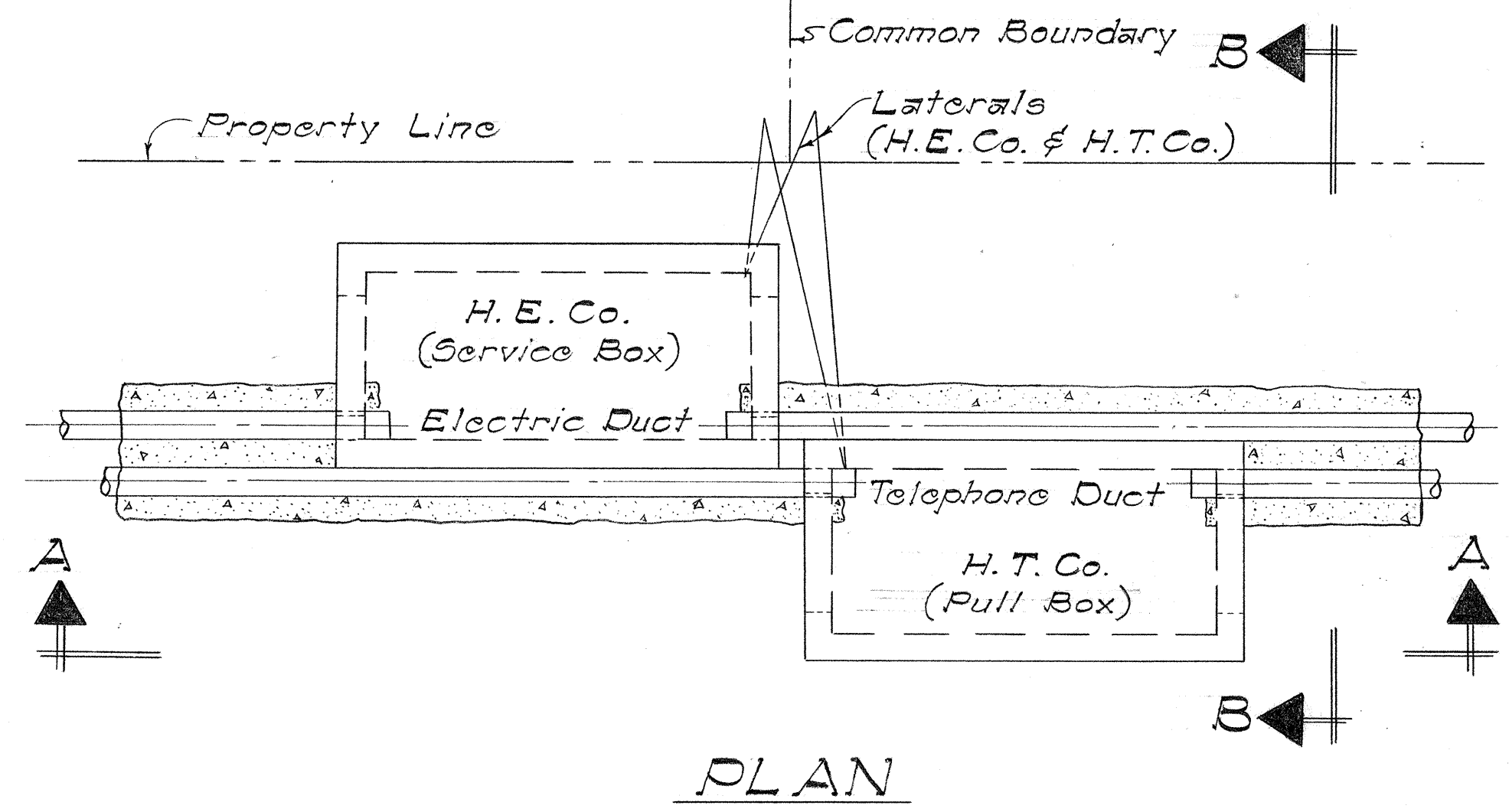
STANDARD DETAILS
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

Scales: As Noted Date

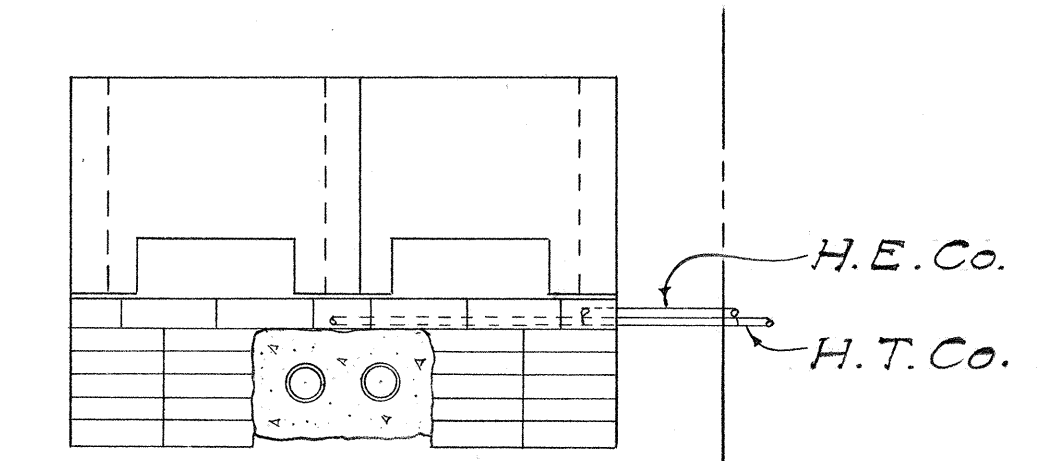
SHEET NO. 12 OF 16 SHEETS

(63)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 3	1967	64	152

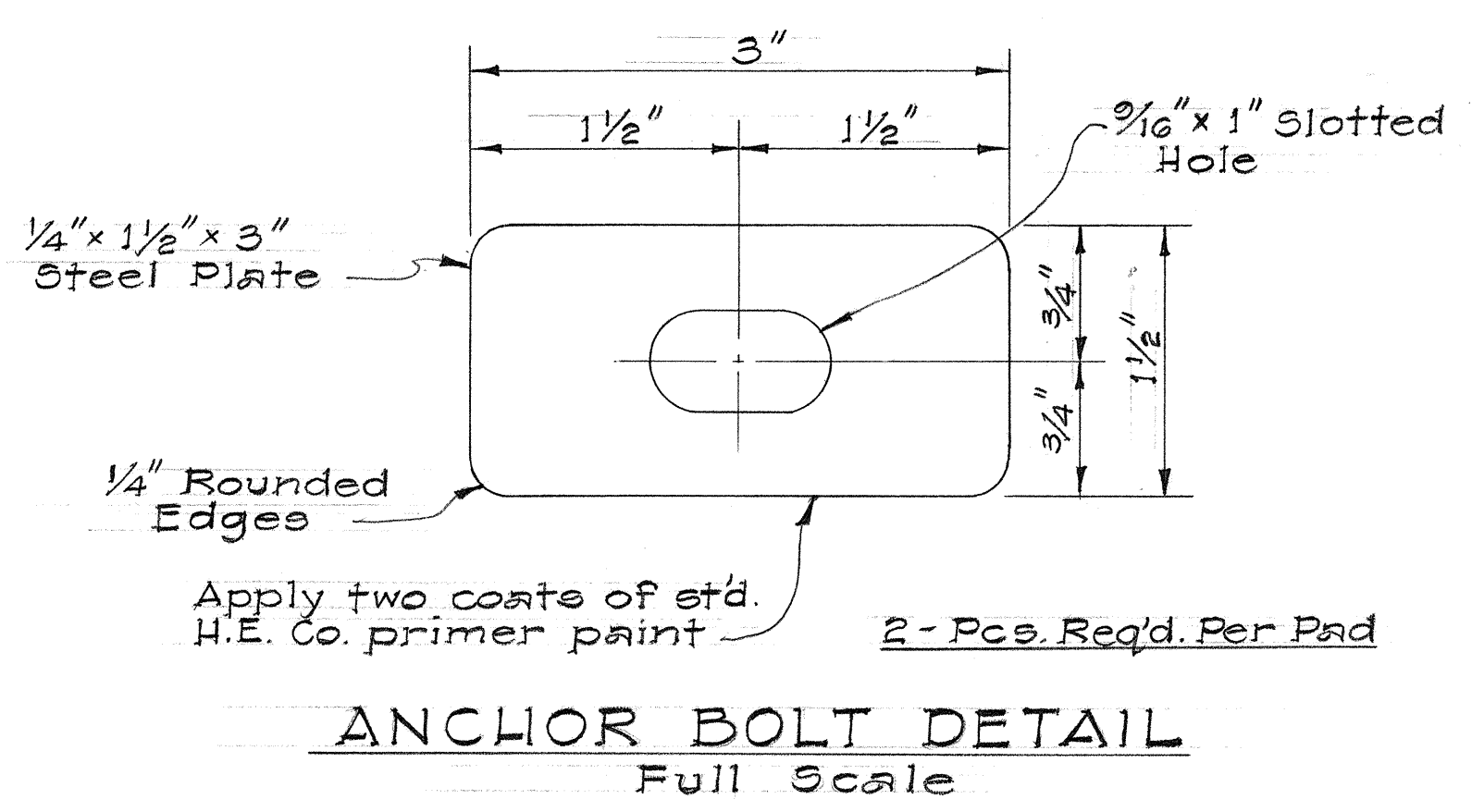


SECTION "A-A"

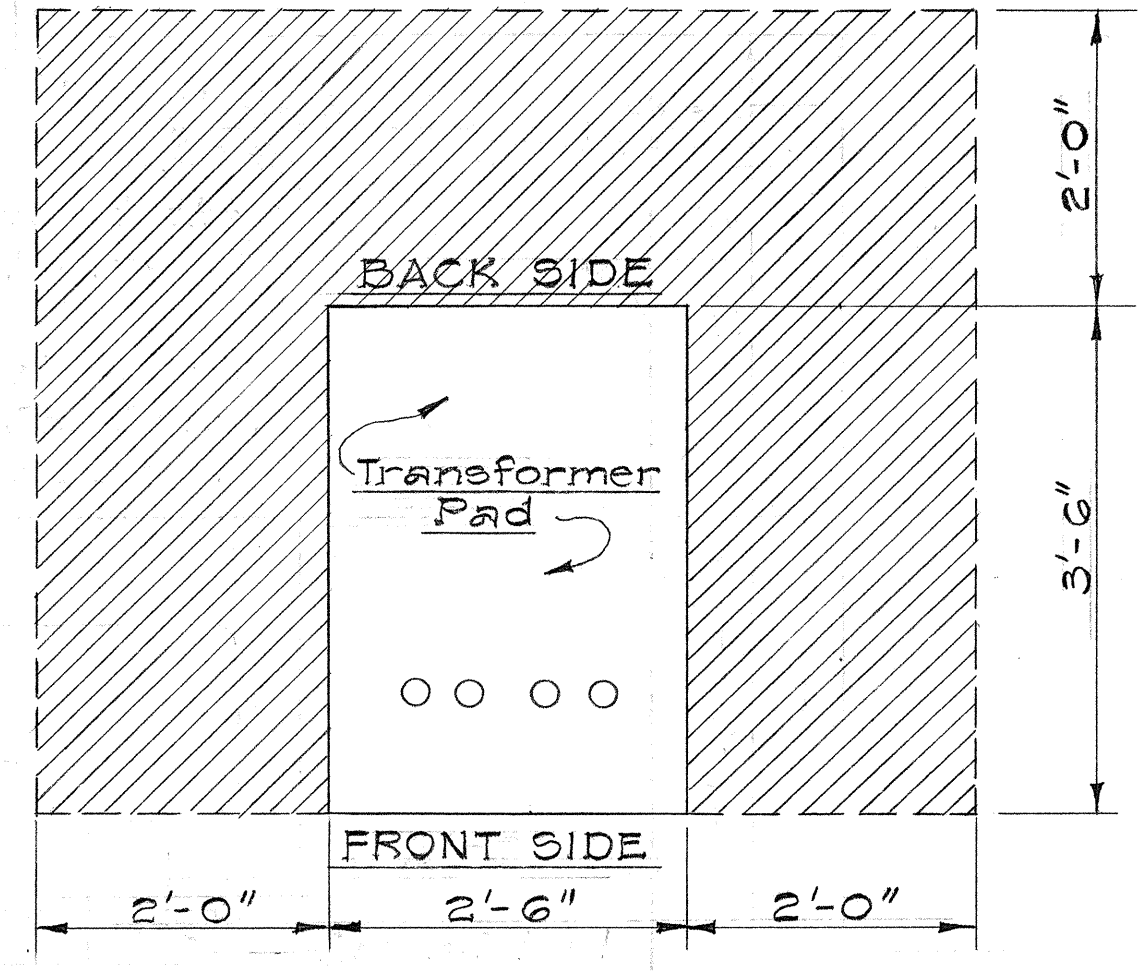


SECTION "B-B"

TYPICAL DETAIL LAYOUT
OF SERVICE & PULL BOX
Scale: 3/4" = 1'-0"



- H.E. CO. NOTES
1. This pad will accommodate the 1Ø, line material pad mounted transformer up to 167 KVA.
 2. The transformer size and voltage are to be specified for each job.

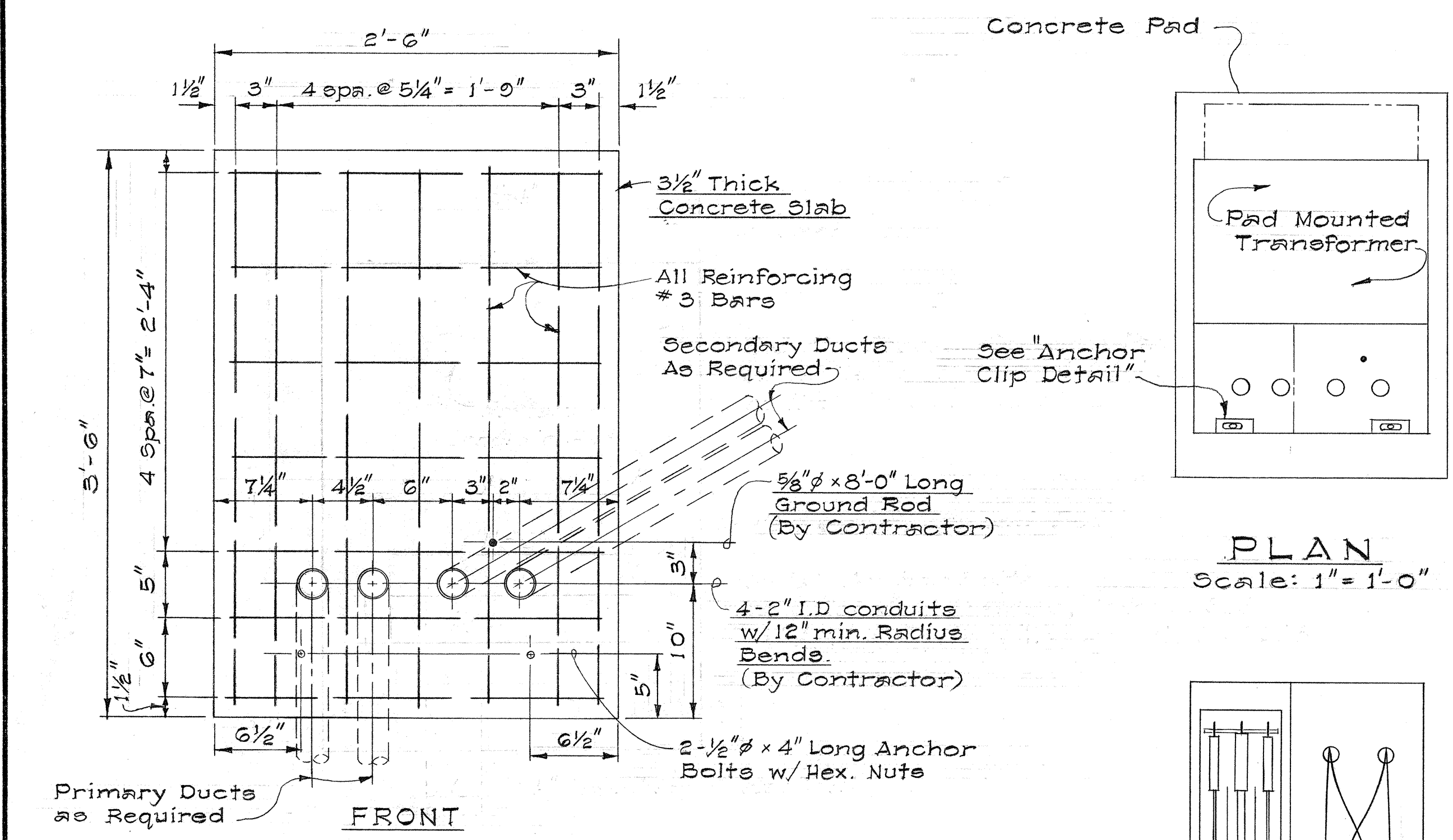


SPACE DETAILS
Scale: 3/4" = 1'-0"

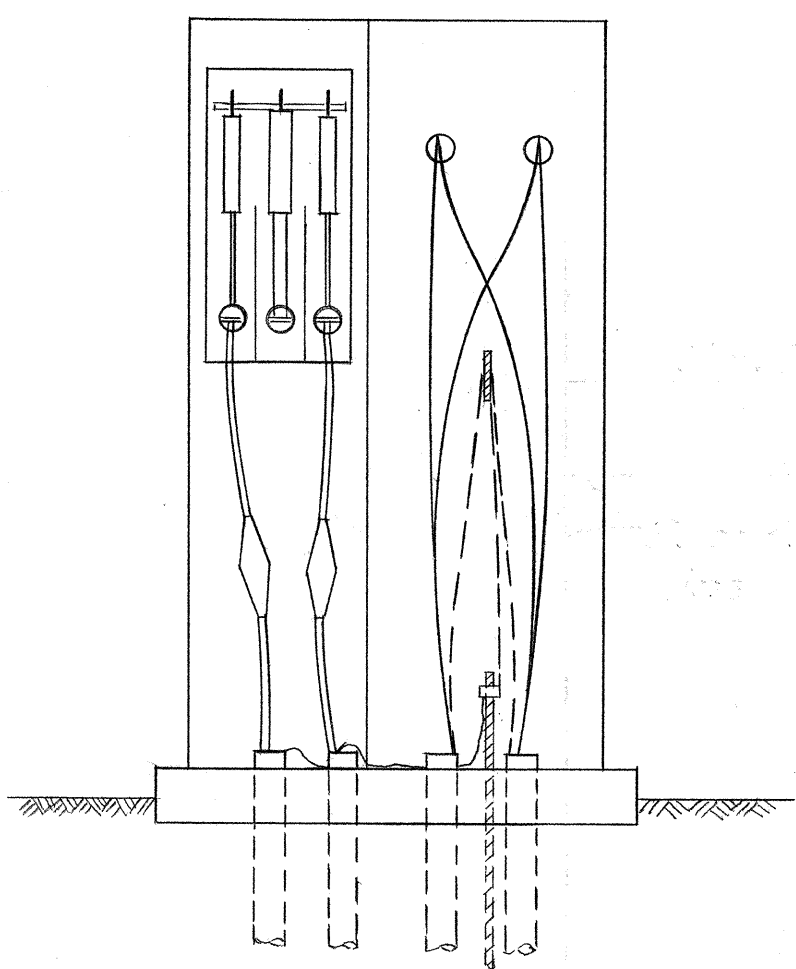
GENERAL NOTES

1. The Contractor is to furnish materials and construct the facilities for the pad mounted transformer including the concrete pad, primary and secondary ducts and anchor bolts. Concrete curb and rock fill around the pad, when required, shall also be furnished and installed by the Contractor.
2. One copperweld ground rod 5/8" Ø x 8'-0" long is supplied and installed by the Contractor. The rod is to extend 6" above the finished pad. Tie the rod to a water pipe with #10 copper wire. This tie may be eliminated where the water pipe is more than 25' away.
3. The front side of the concrete pad shall always be located to face the vehicular access and shall be free and clear of any obstruction at all times.

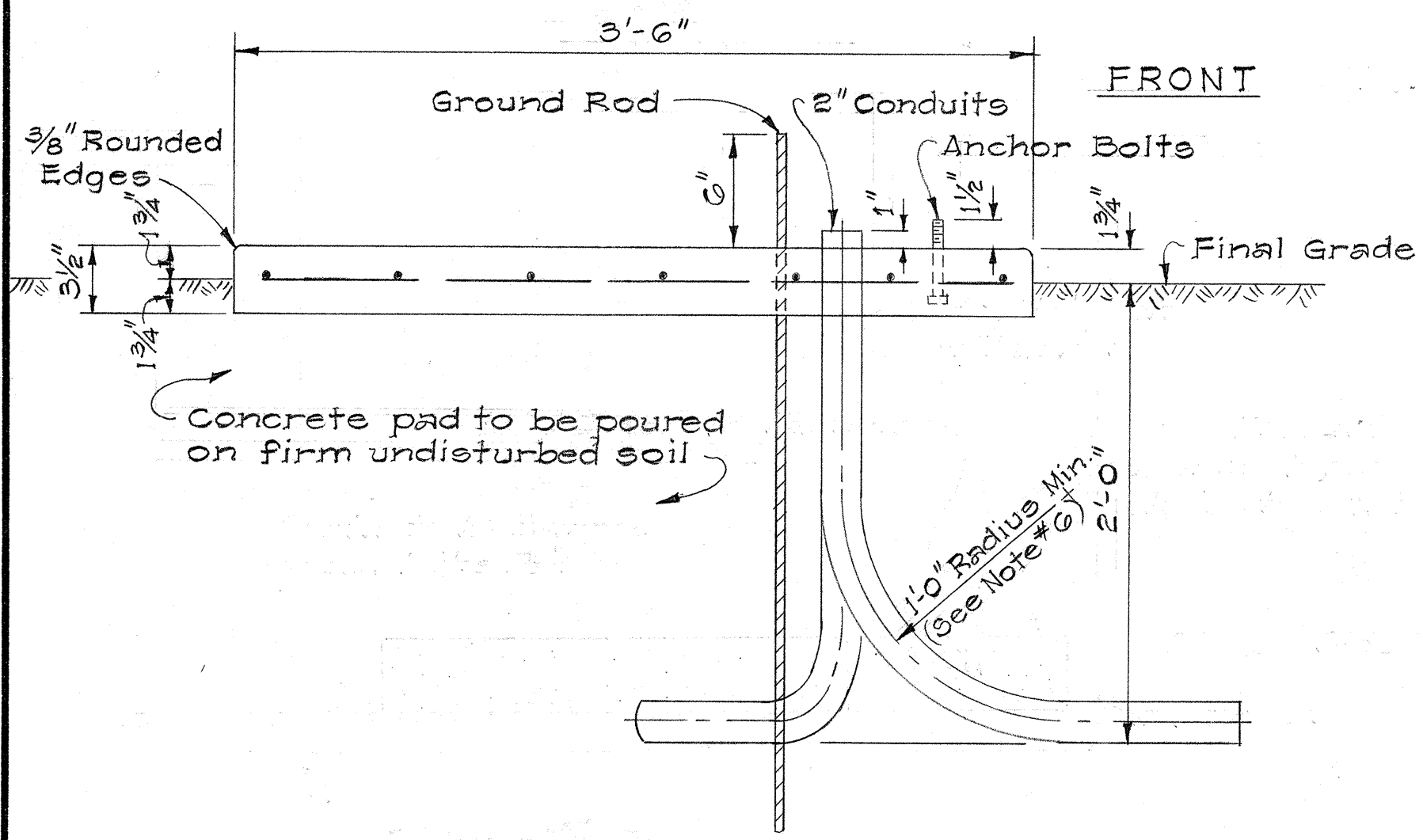
DETAIL OF REINFORCED CONCRETE TRANSFORMER PAD
H.E. CO.'S DRAWING NO. 15561



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



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



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

CONCRETE PAD DETAILS

CONCRETE PAD NOTES

1. Concrete pad to be poured on firm undisturbed soil.
2. Compression strength: 3000 p.s.i. in 28 days.
3. Top of concrete pad to be smooth, true and level. Other exposed surfaces to be smooth and free from defects.
4. Reinforcing: Clean and new round deformed bars (ASTM A15).
5. Contractor to supply and install concrete pad, ground rod, conduits w/12" min. radius bends and anchor bolts w/hex. nuts.
6. The 2" conduit bends that are to be supplied and installed by the Contractor may be transite, fiber or plastic conduit bends.

APPROVED:
HAWAIIAN ELECTRIC CO., INC.
HAWAIIAN TELEPHONE CO.

7/7/67
DATE
7-3-67
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITY DETAILS
ELECTRIC - TELEPHONE
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. Proj. No. I-HI-1(5):24, Unit 3
Scale: As Shown Date: May, 1967
SHEET No. 13 OF 16 SHEETS

FOR 25', & 30' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"		"D" = ("A" + "B")
LEAD-ANCHOR ROD TO C OF POLE	ANCHOR ROD TO C OF HOLE	VERTICAL DEPTH 18" D.M.	24" D.M.	TOTAL DISTANCE POLE TO HOLE
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"
FOR 35' THRU 70' POLES WITH 8'-0" ANCHOR RODS				
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 40' THRU 70' POLES WITH 1 1/4" x 10'-0" ANCHOR RODS				
5'-0"	1'-7"		9'-4"	6'-7"
10'-0"	3'-0"		9'-0"	13'-0"
15'-0"	4'-2"		8'-6"	19'-2"
20'-0"	5'-3"		7'-11"	25'-3"
25'-0"	6'-2"		7'-3"	31'-2"

D. M. = Deadman

TABLE 2 ANCHOR ROD - ANCHOR SLUG - SQUARE WASHER COMBINATION

H.E. CODE NO.	ANCHOR ROD	WORKING TENSION 1/2 ULT (LBS.)	H.E. CONC. NO.	CONC. (IN.)	H.E. CODE NO.	WASHER SIZE	QTY.
617	5/8" x 8'-0" Steel	8,000	518	18	2320	4" x 4" x 3/16"	2
615	5/8" x 8'-0" Cu Cov Stl	9,250	518	18	**	3" x 3" x 1/8"	2
618	3/4" x 8'-0" Steel	11,500	518	18	2330	6" x 6" x 3/8"	1
619	1" x 8'-0" Steel	18,000	524	24	2331	6" x 6" x 1/2"	1
616	1" x 8'-0" Cu Cov Stl	22,500	524	24	**	4" x 4" x 3/16"	2
613	1 1/4" x 10'-0" Steel	29,000	524	24	2330	6" x 6" x 3/8"	2

** Use bronze square washers included in anchor rod assembly on copper covered steel (Cu Cov Stl) anchor rods.

ANCHORING DATA

APPROVED:

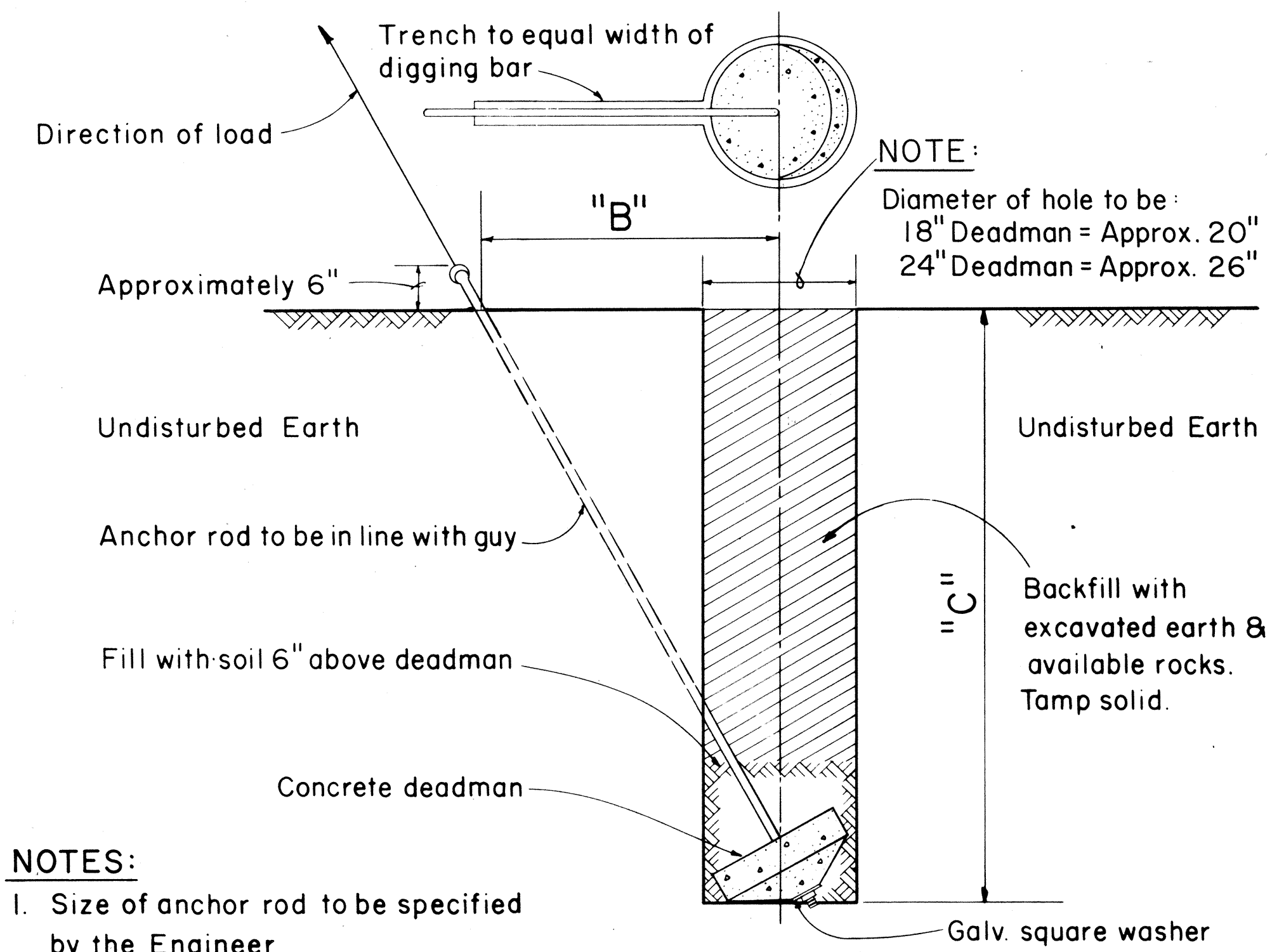
Thamchar Kan 7/2/67
HAWAIIAN ELECTRIC Co., Inc. DATE

F.R. Judd 7-3-67
HAWAIIAN TELEPHONE Co. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

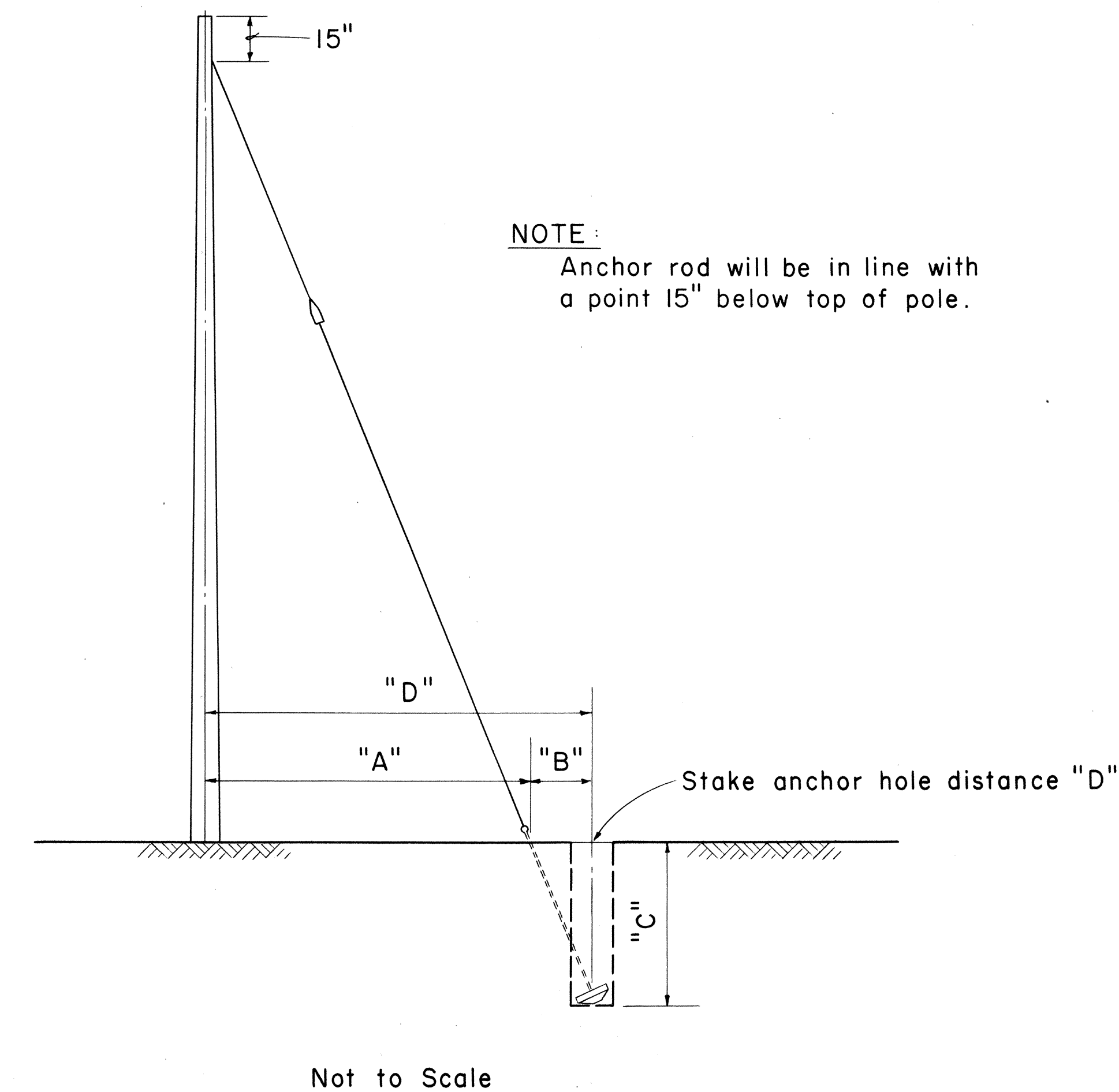
STANDARD DETAILS
H.E. Co. AND H.T. Co.
ANCHOR DETAILS AND
ANCHORING DATA

Scales: As Noted Date



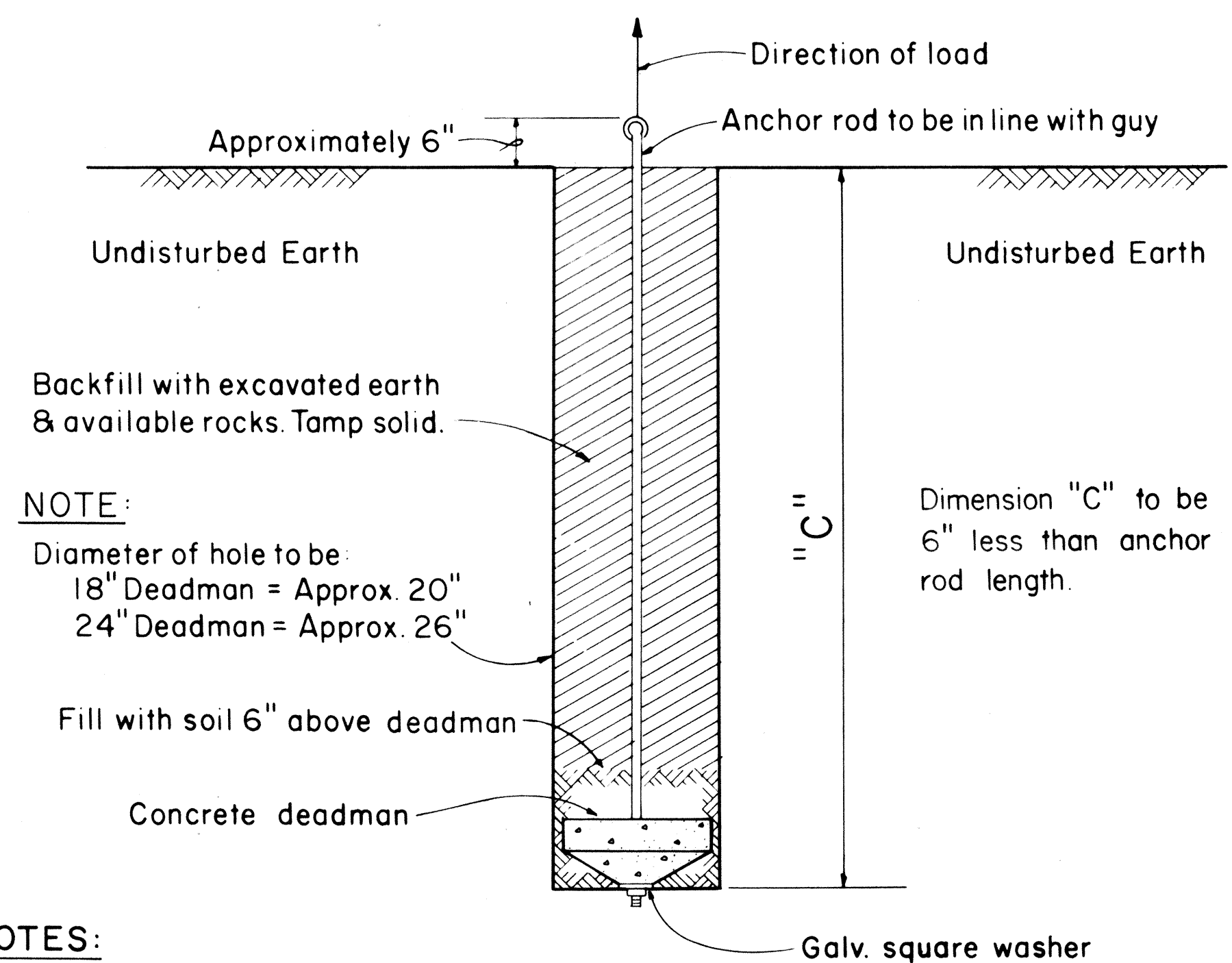
GUY ANCHOR DEADMAN
Scale: 3/4" = 1' - 0"

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



ROCK ANCHOR
Not to Scale

- NOTE:
1. Size of anchor rod to be specified by the Engineer.
 2. "X" Should not be less than 24". If "X" is less than 24" complete hole & install anchor.
 3. "Y" 5/8" Anchor rod drill 2" hole
3/4" Anchor rod drill 2" hole
1" Anchor rod drill 2 1/2" hole
1 1/4" Anchor rod drill 3" hole
 4. Use Anchoring Data.



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

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

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	HI-1(5)-24 Unit 3	1967	66	152

CREOSOTED DOUGLAS FIR & YELLOW PINE POLE DATA									
LENGTH IN FEET	CLASS	APPROX. MINIMUM DIMENSIONS (INCHES)				AVERAGE WEIGHT (LBS.)	POLE SETTING DEPTH (FT.)		BREAKING LOAD 2'-0" BELOW TOP OF POLE (LBS.)
		AT TOP		6' FROM BUTT		DOUGLAS FIR	IN SOIL	IN ROCK	
		DIA.	CIR.	DIA.	CIR.				
25	5	6.04	19	8.26	26	525	4.5	3	1900
30	3	7.32	23	10.32	32.5	810	5	3.5	3000
	5	6.04	19	8.90	28	600	5	3.5	1900
35	2	7.96	25	12.23	37.5	1260	5	3.5	3700
	5	6.04	19	9.55	30	770	5	3.5	1900
40	3	7.32	23	11.77	37	1320	5.5	3.5	3000
45	2	7.96	25	13.20	41.5	1845	6	4	3700
	3	7.32	23	12.25	38.5	1575	6	4	3000
50	2	7.96	25	13.70	43	2150	6.5	4	3700
	3	7.32	23	12.70	40	1850	6.5	4	3000
55	1	8.59	27	15.11	47.5	2860	7	4.5	4500
	2	7.96	25	14.15	44.5	2475	7	4.5	3700
	3	7.32	23	13.20	41.5	2145	7	4.5	3000
60	1	8.59	27	15.75	49.5	3360	7	4.5	4500
	2	7.96	25	14.62	46	2820	7	4.5	3700
65	1	8.59	27	16.20	51	3835	7.5	5	4500
	2	7.96	25	15.11	47.5	3250	7.5	5	3700
70	1	8.59	27	16.70	52.5	4340	7.5	5	4500
	2	7.96	25	15.60	49	3640	7.5	5	3700
75	1	8.59	27	17.20	54	4800	8	5.5	4500
	2	7.96	25	16.05	50.5	4050	8	5.5	3700
80	1	8.59	27	17.50	55	5240	8	6	4500
	2	7.96	25	16.40	51.5	4400	8	6	3700
85	1	8.59	27	18.00	56.5	5780	8.5	6.5	4500
	2	7.96	25	16.88	53	4930	8.5	6.5	3700
90	1	8.59	27	18.30	57.5	6300	8.5	6.5	4500
	2	7.96	25	17.20	54	5400	8.5	6.5	3700

NOTE:
The ultimate fiber stress for creosoted Southern Yellow Pine & Douglas Fir is 7,400 Lbs. per square inch.

Weights are for untreated poles. Add 5% as estimate of added weight of creosote treatment.

REFERENCES:
American Standards Association O5.4-1941, O5.6-1945.
Standard Handbook for Electrical Engineers, Eighth Edition
H. E. Co. Specification for Poles.

WOOD POLE DATA

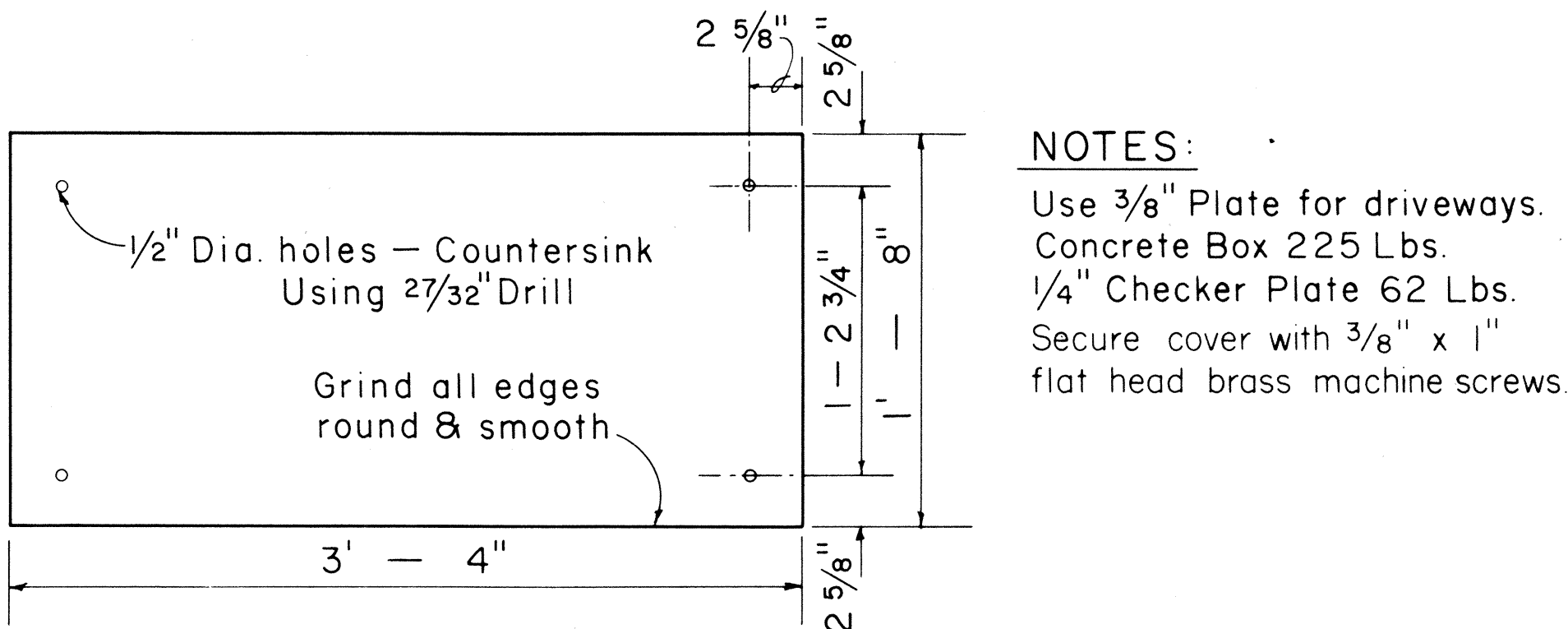
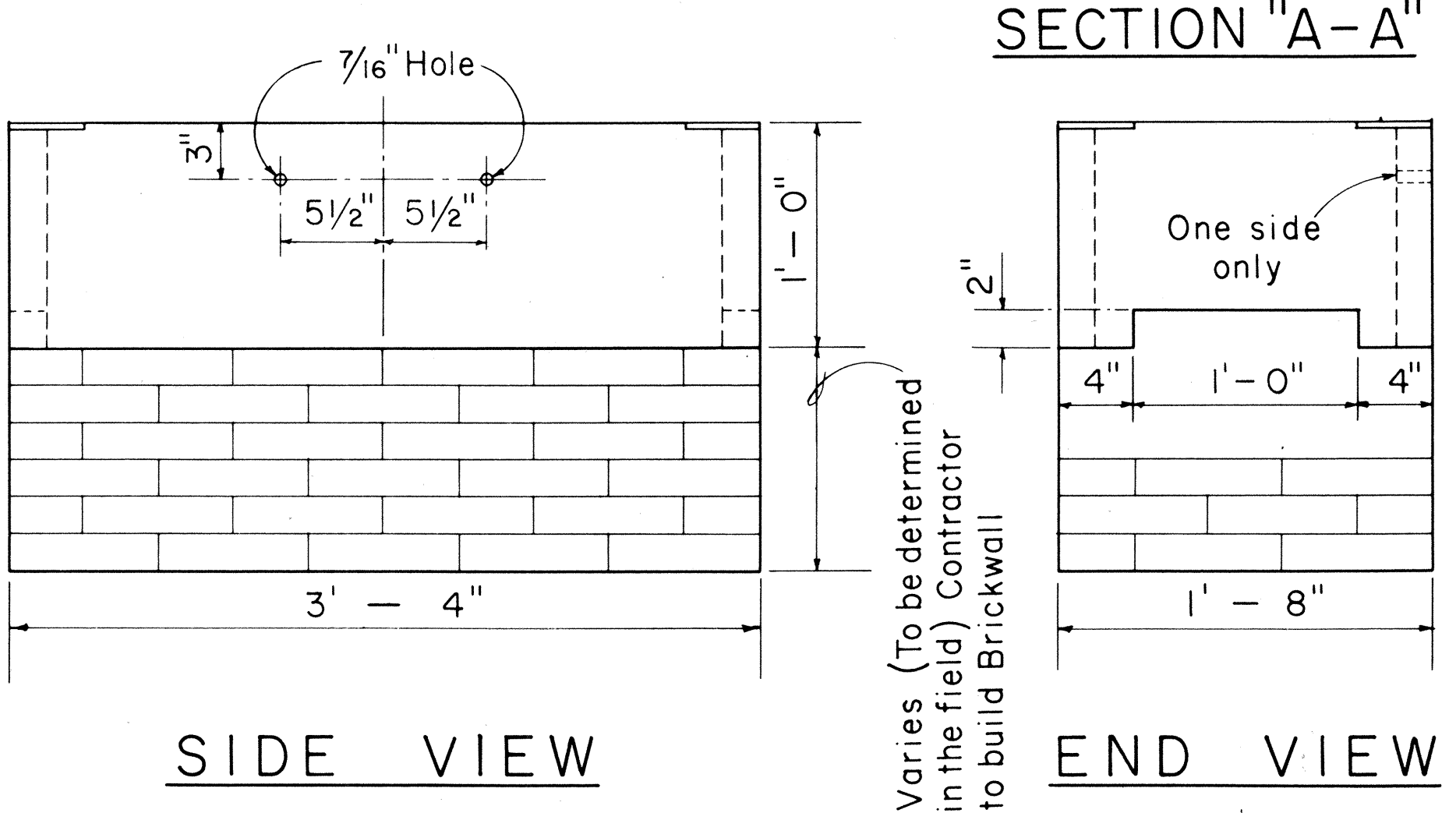
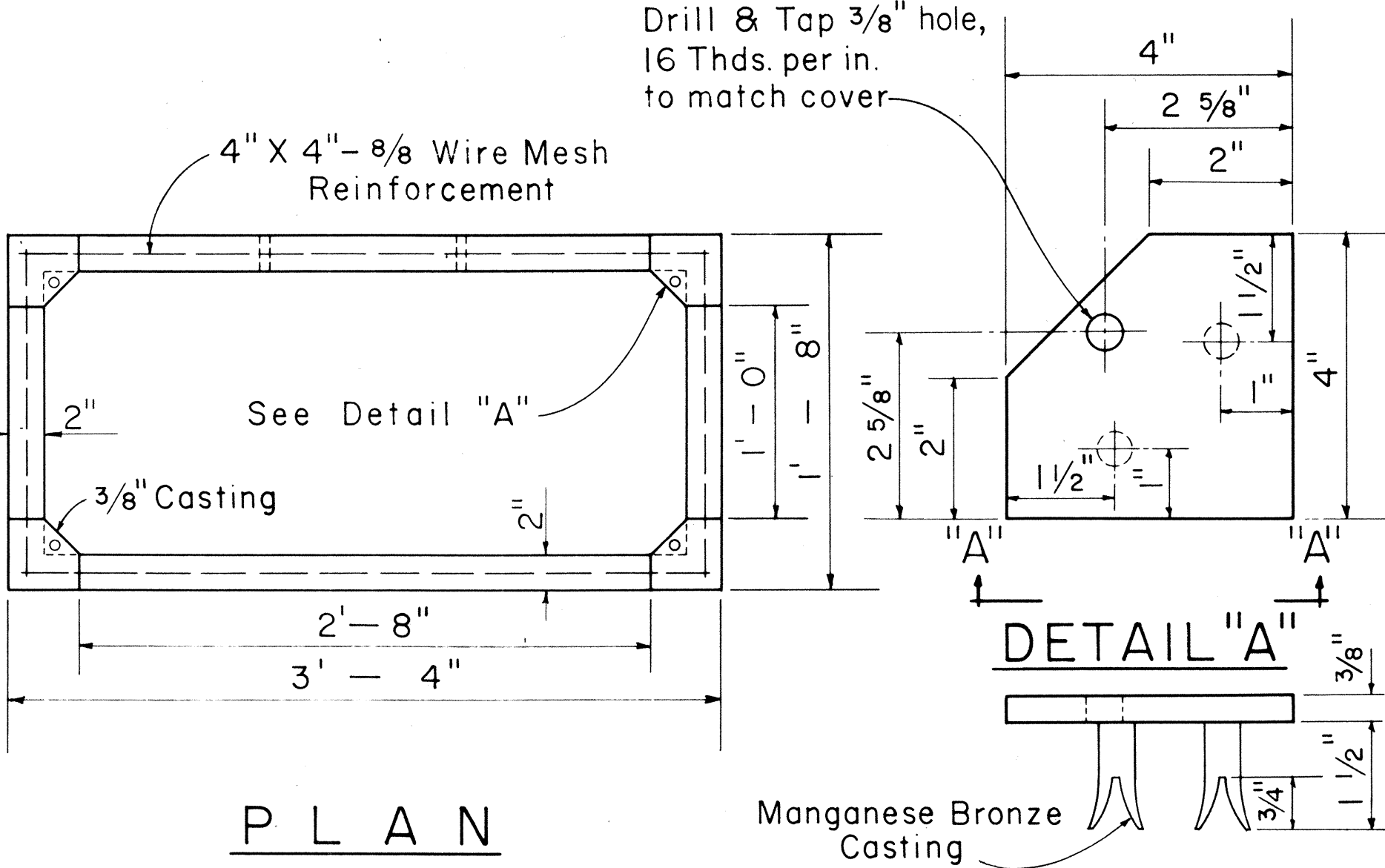
APPROVED:
[Signature] 7/2/67
HAWAIIAN ELECTRIC Co., Inc. DATE

[Signature] 7-3-67
HAWAIIAN TELEPHONE Co. 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

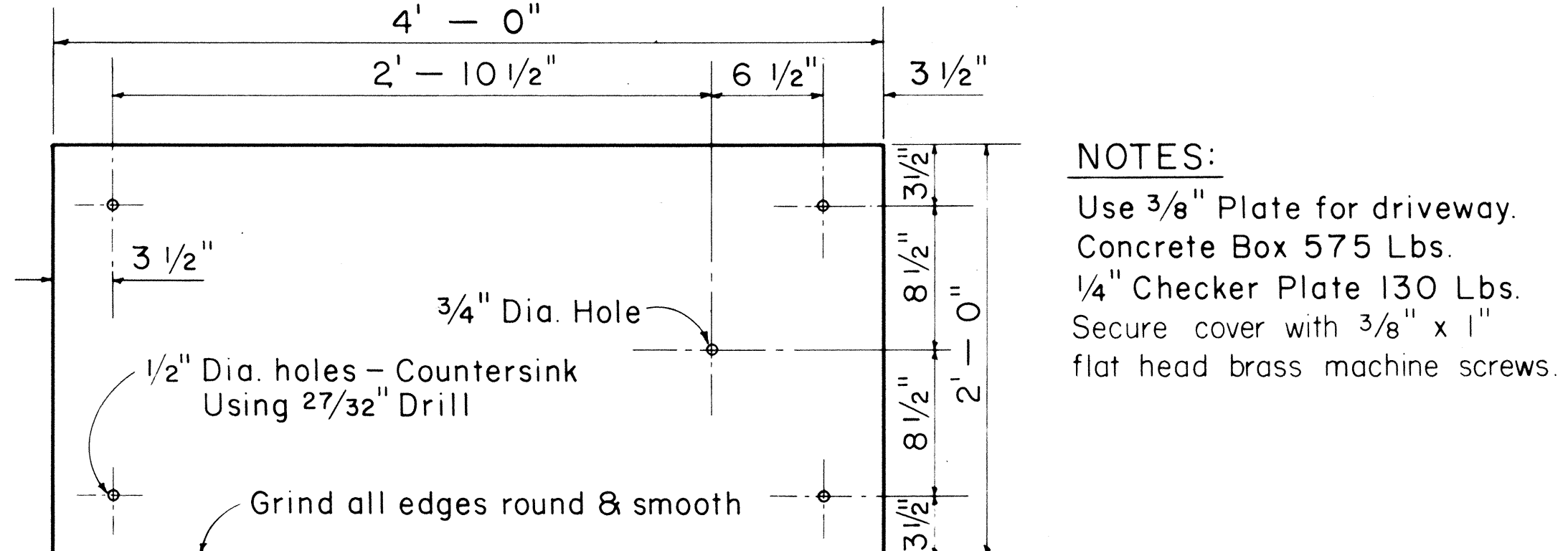
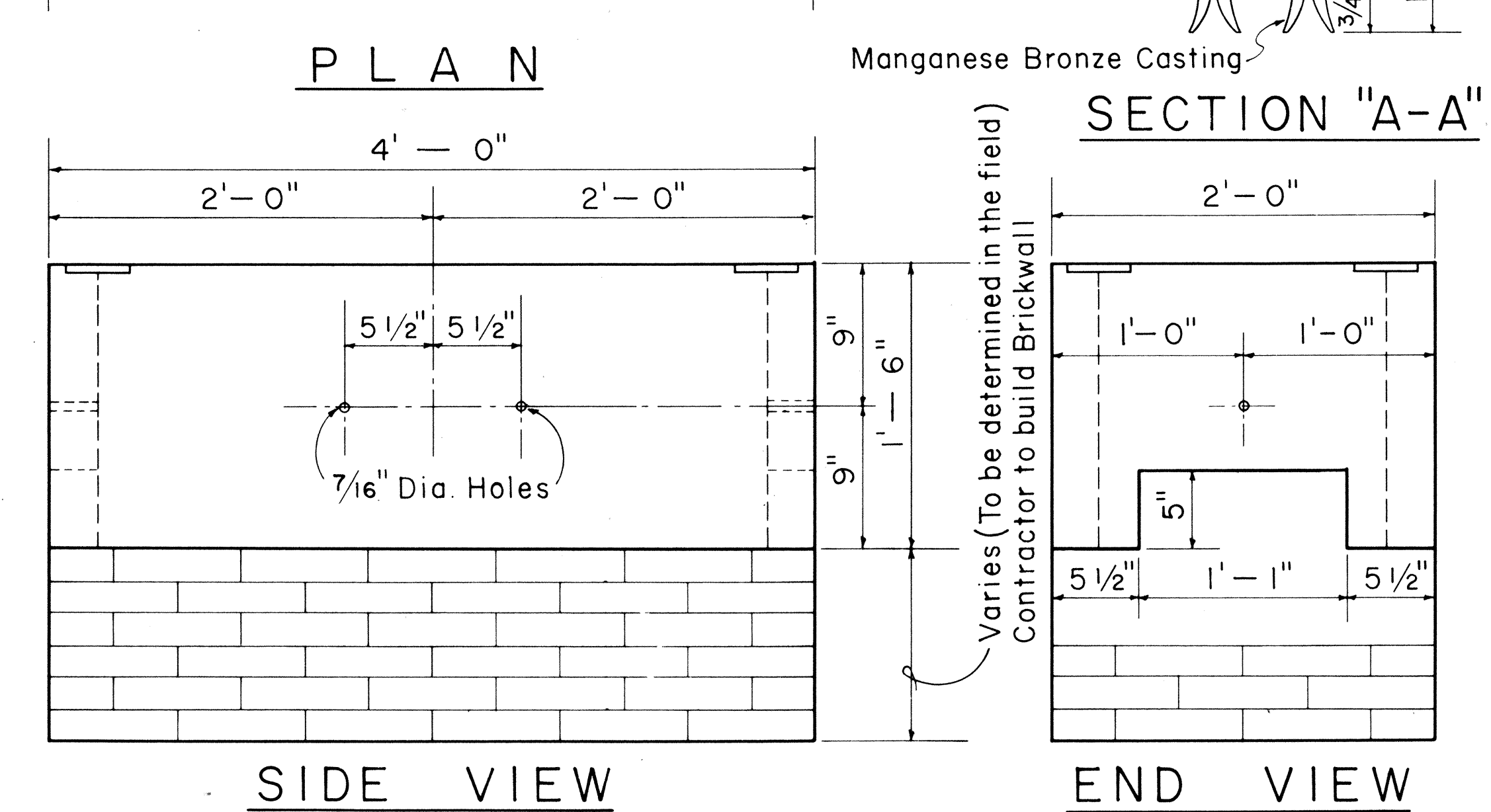
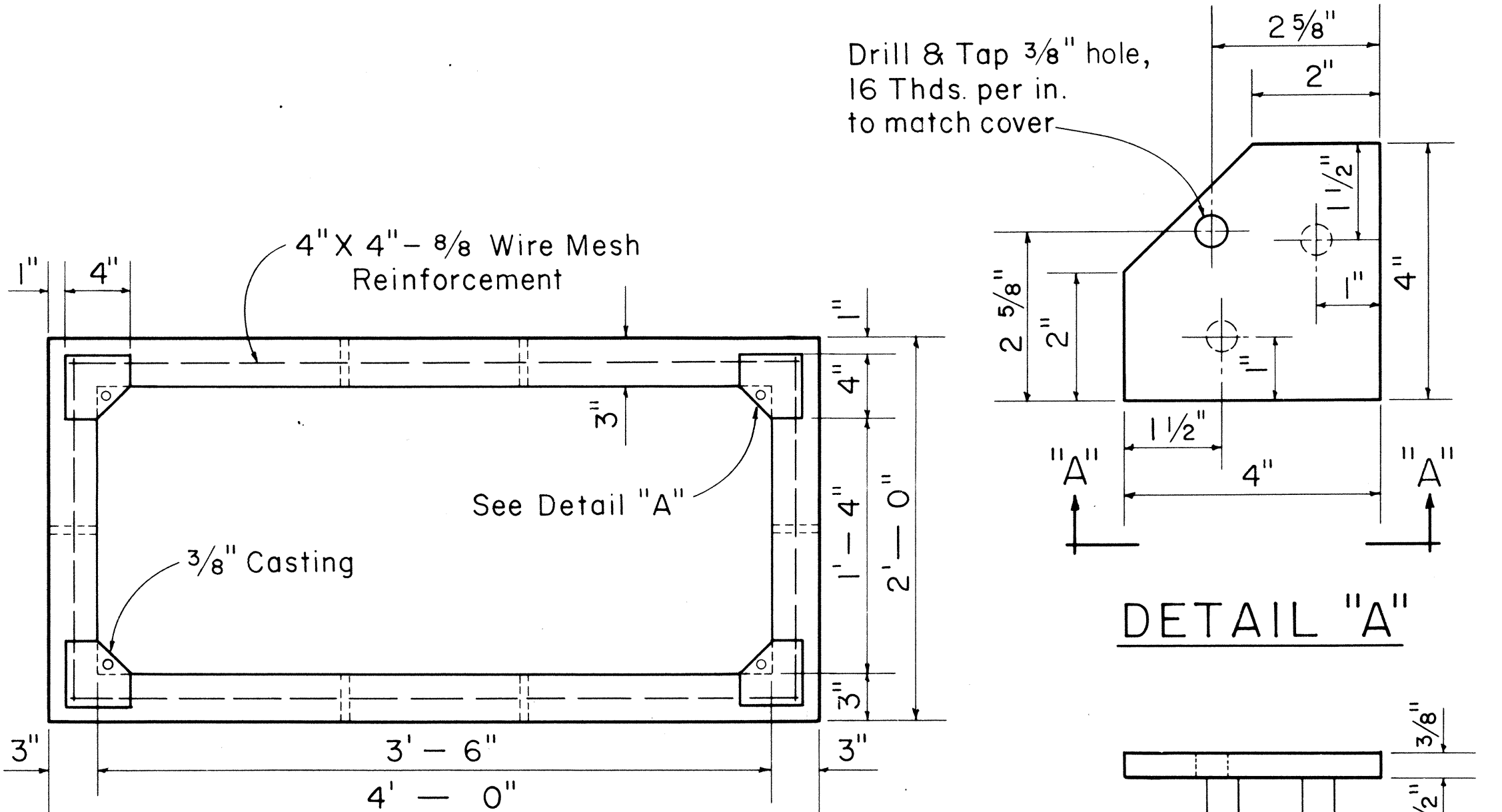
SHEET NO. 15 OF 16 SHEETS



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"

OII250



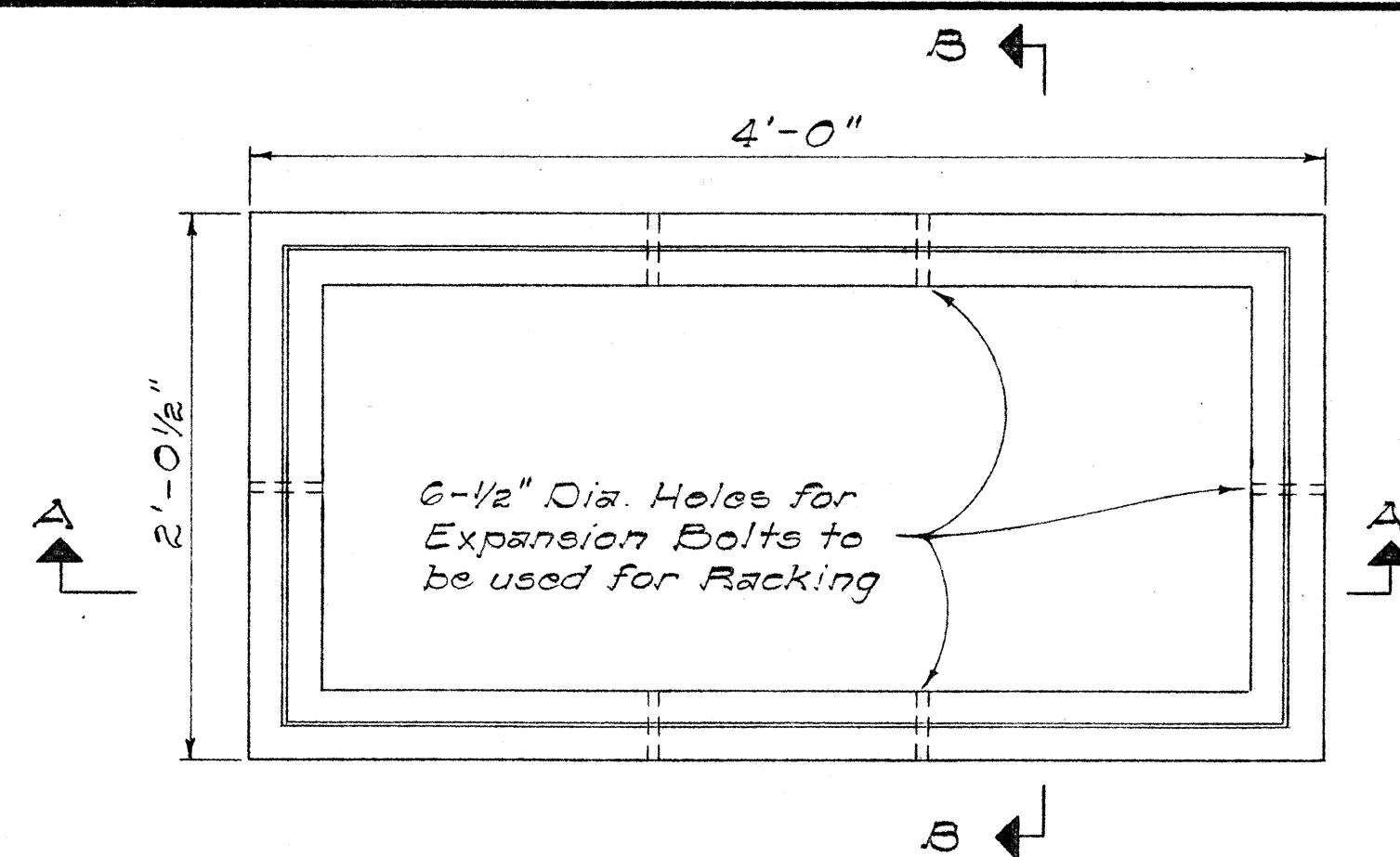
1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

1'-6" X 3'-6" CONCRETE
SERVICE BOX
Scale: 1 1/2" = 1'-0"

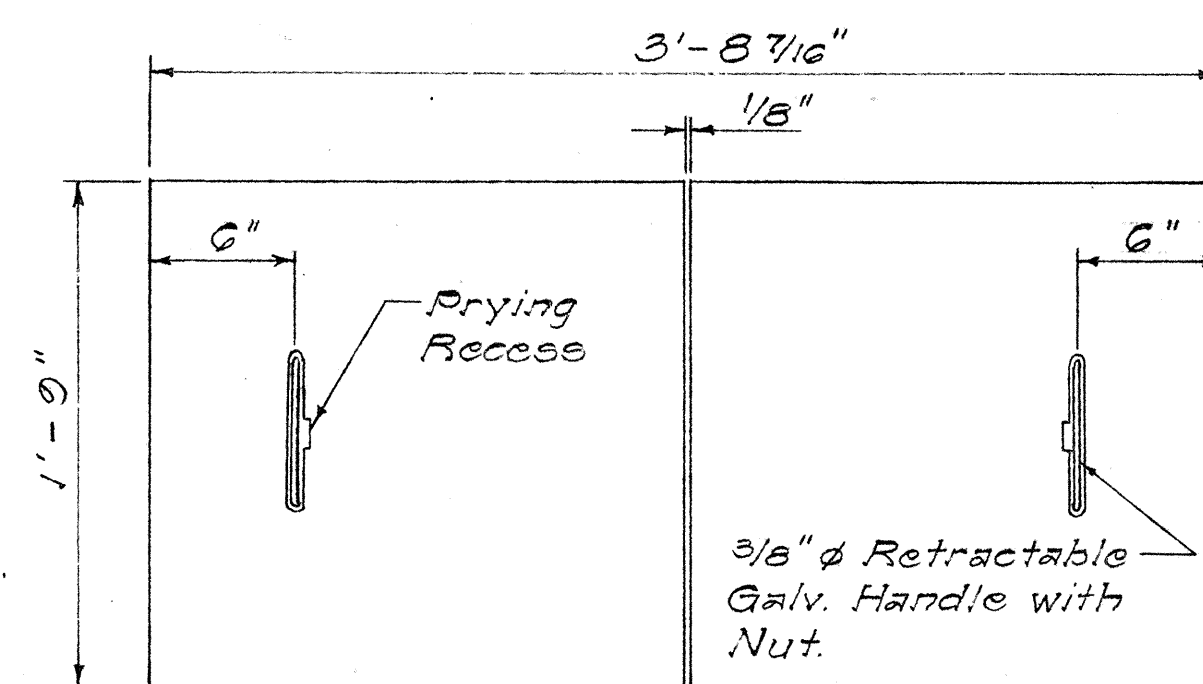
OII255

SURVEY PLOTTED BY: _____ DATE: _____
DRAWN BY: _____
DESIGNED BY: _____
CHECKED BY: _____
NOTE BOOK
No. _____

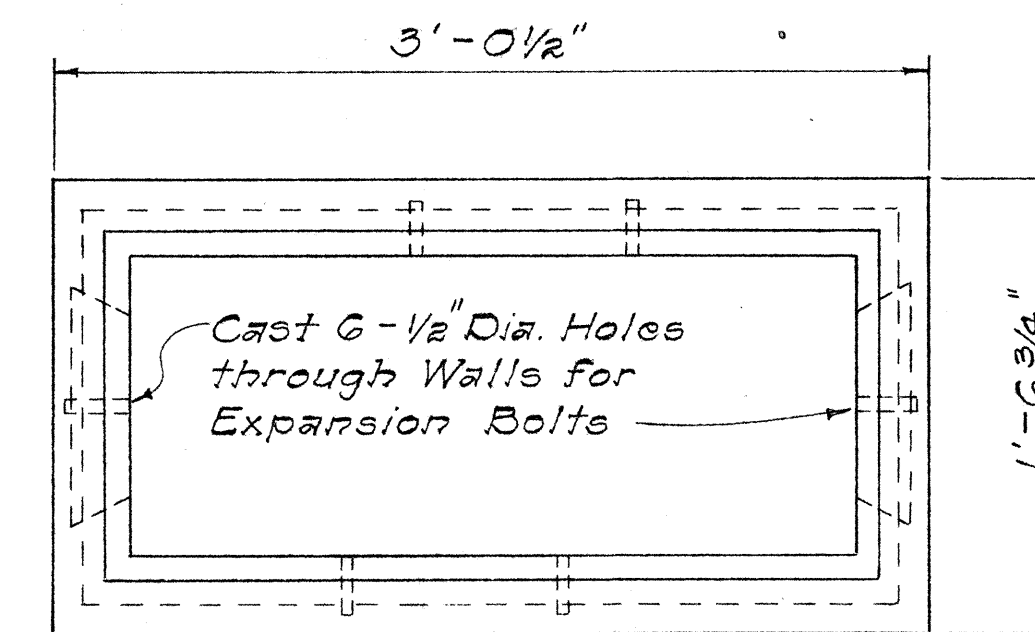
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(6)24 Unit 3	1967	67	152



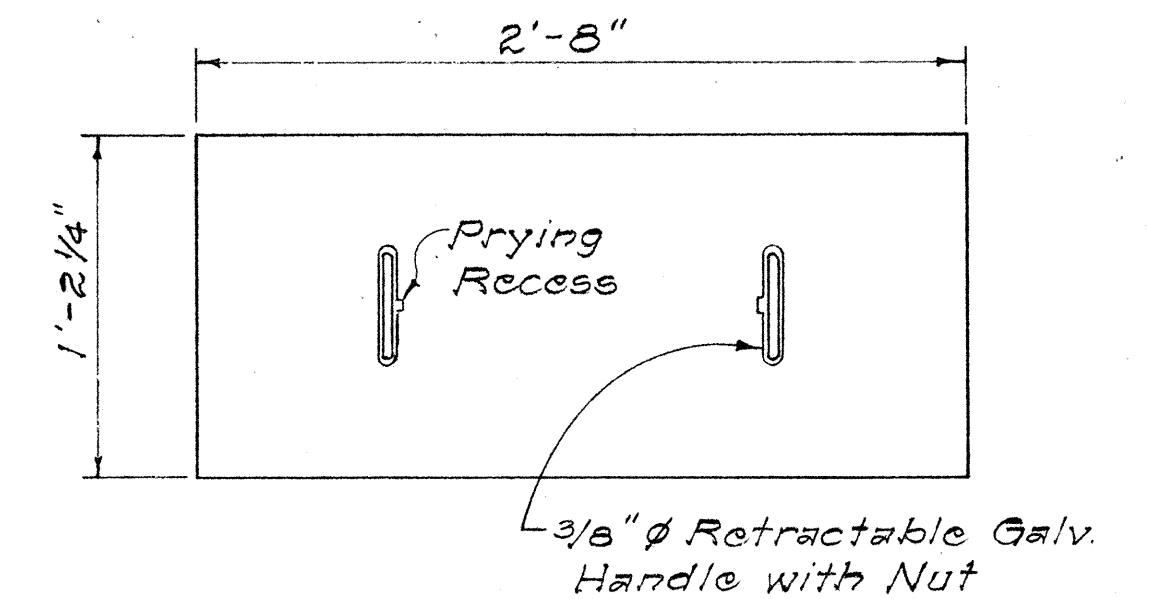
PLAN



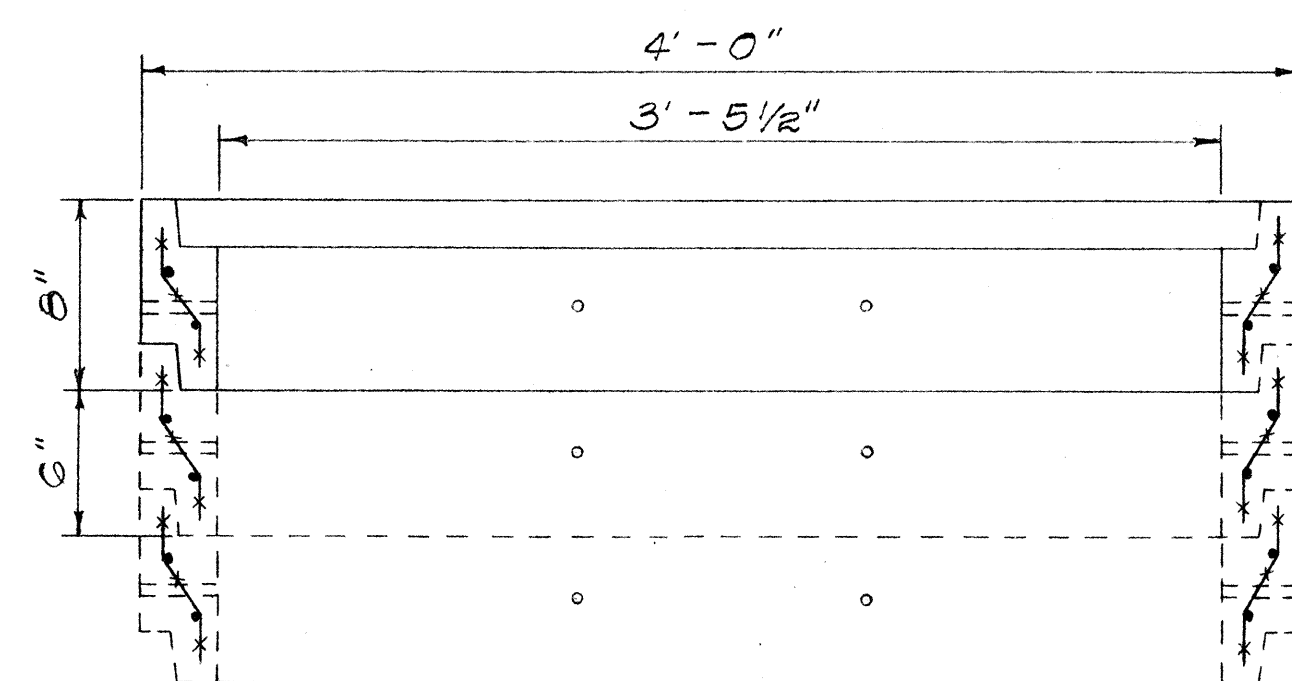
PLAN OF COVER



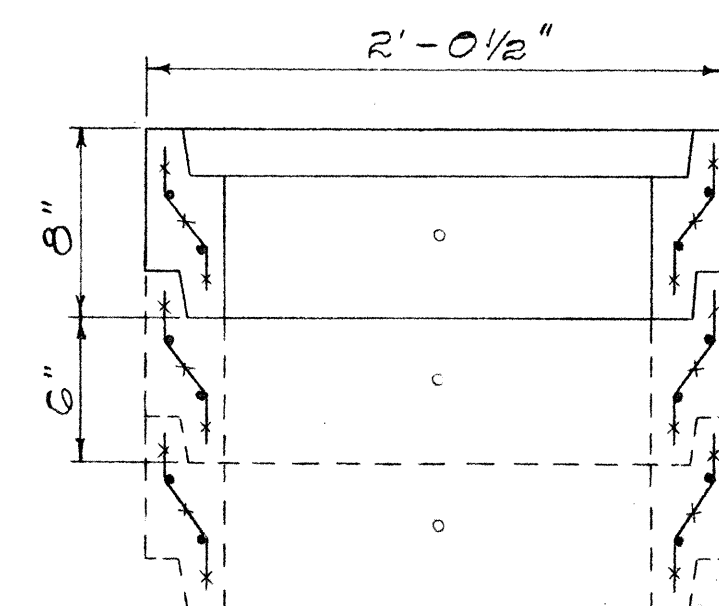
PLAN



PLAN OF COVER



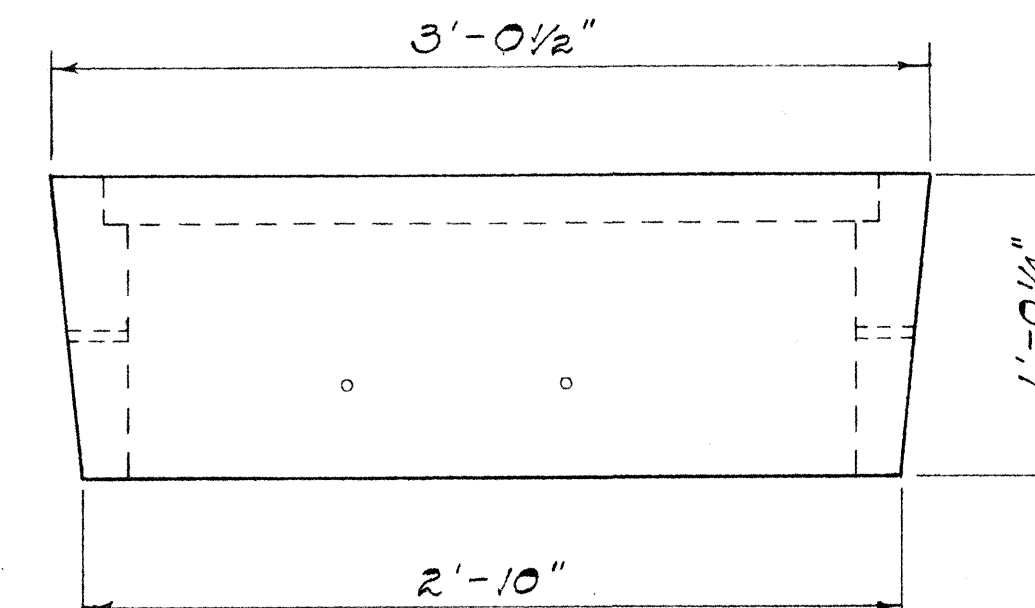
SECTION "A-A"



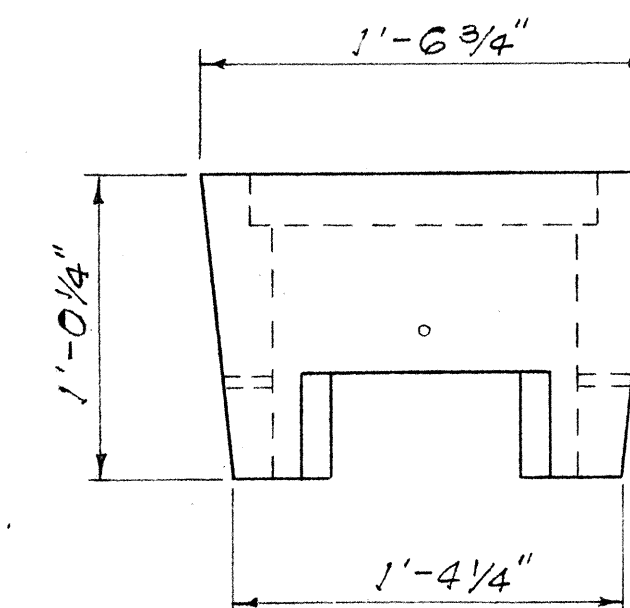
SECTION "B-B"

DETAIL OF LARGE PULL BOX No. 435T-A

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



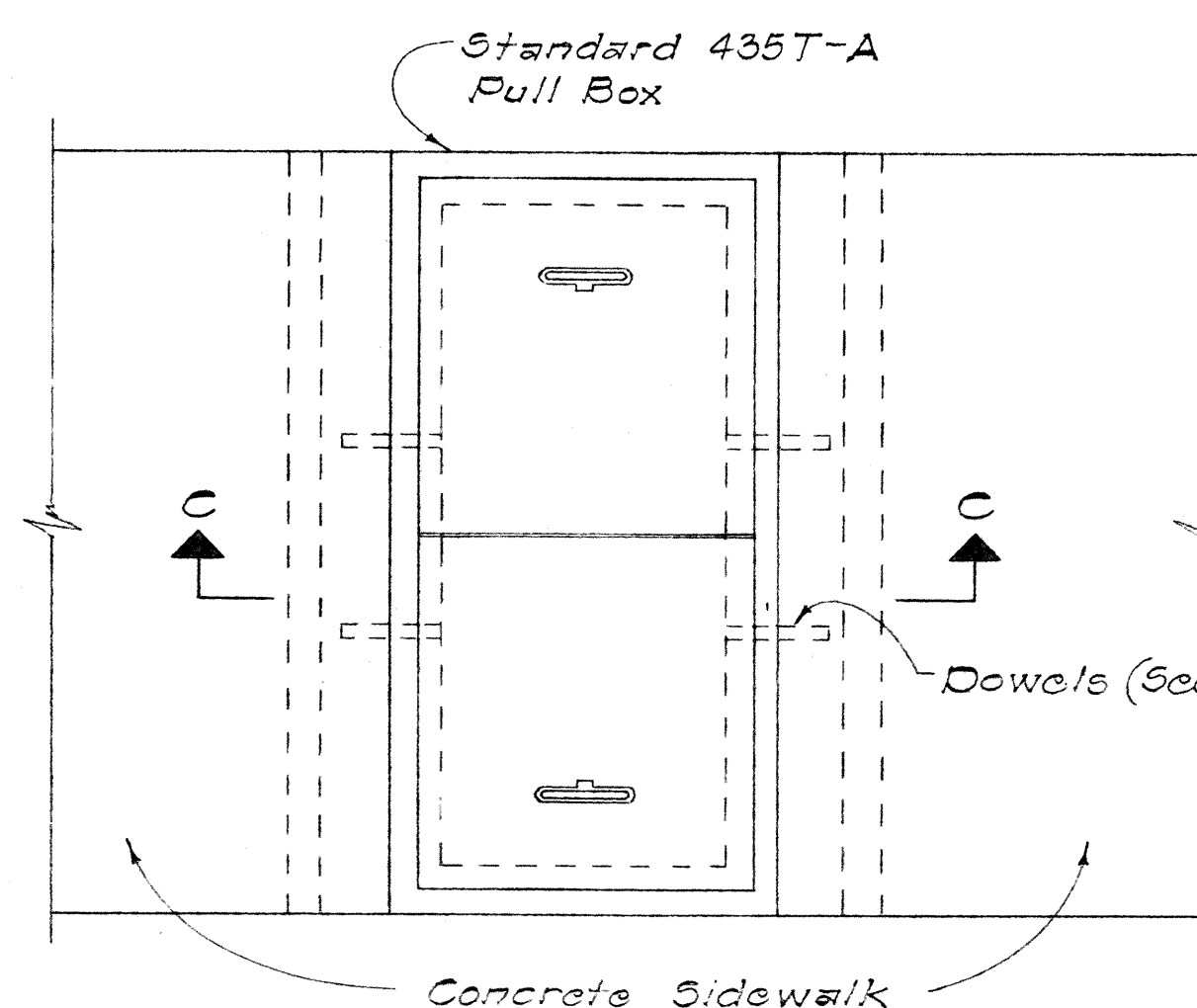
SIDE ELEVATION



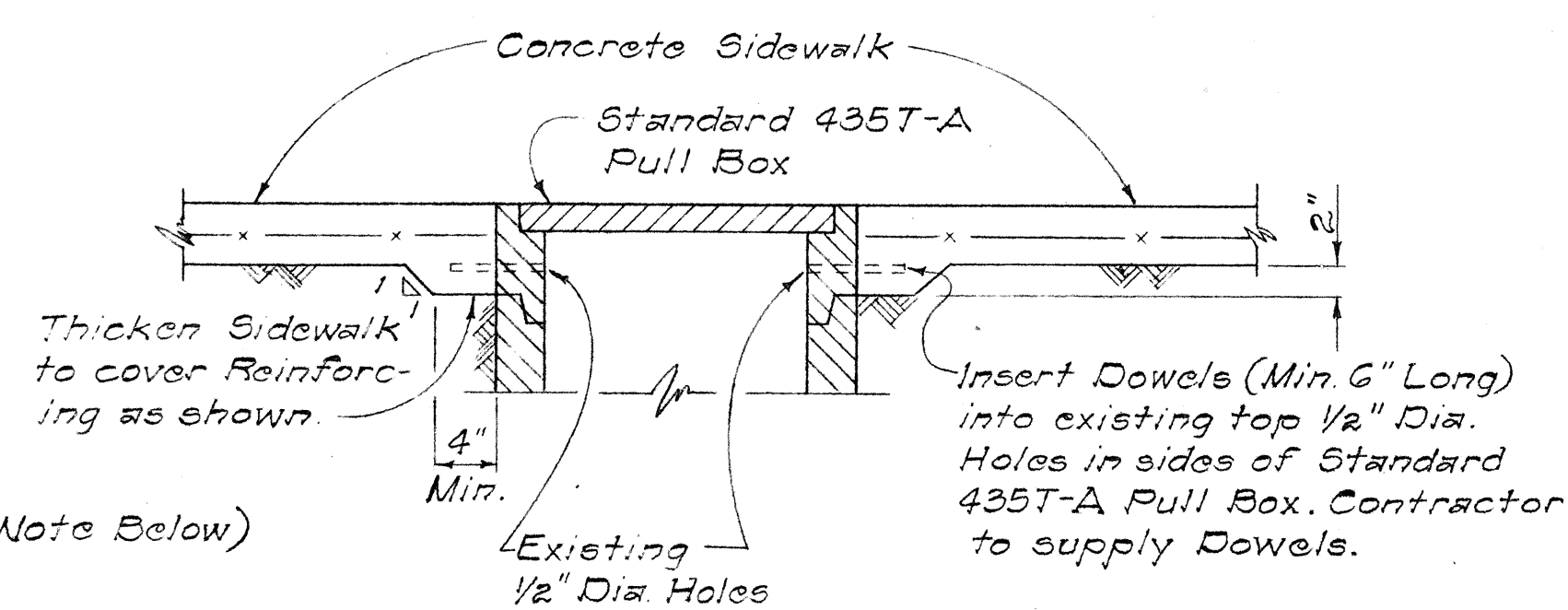
END ELEVATION

DETAIL OF SMALL PULL BOX No. 434T

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



PLAN

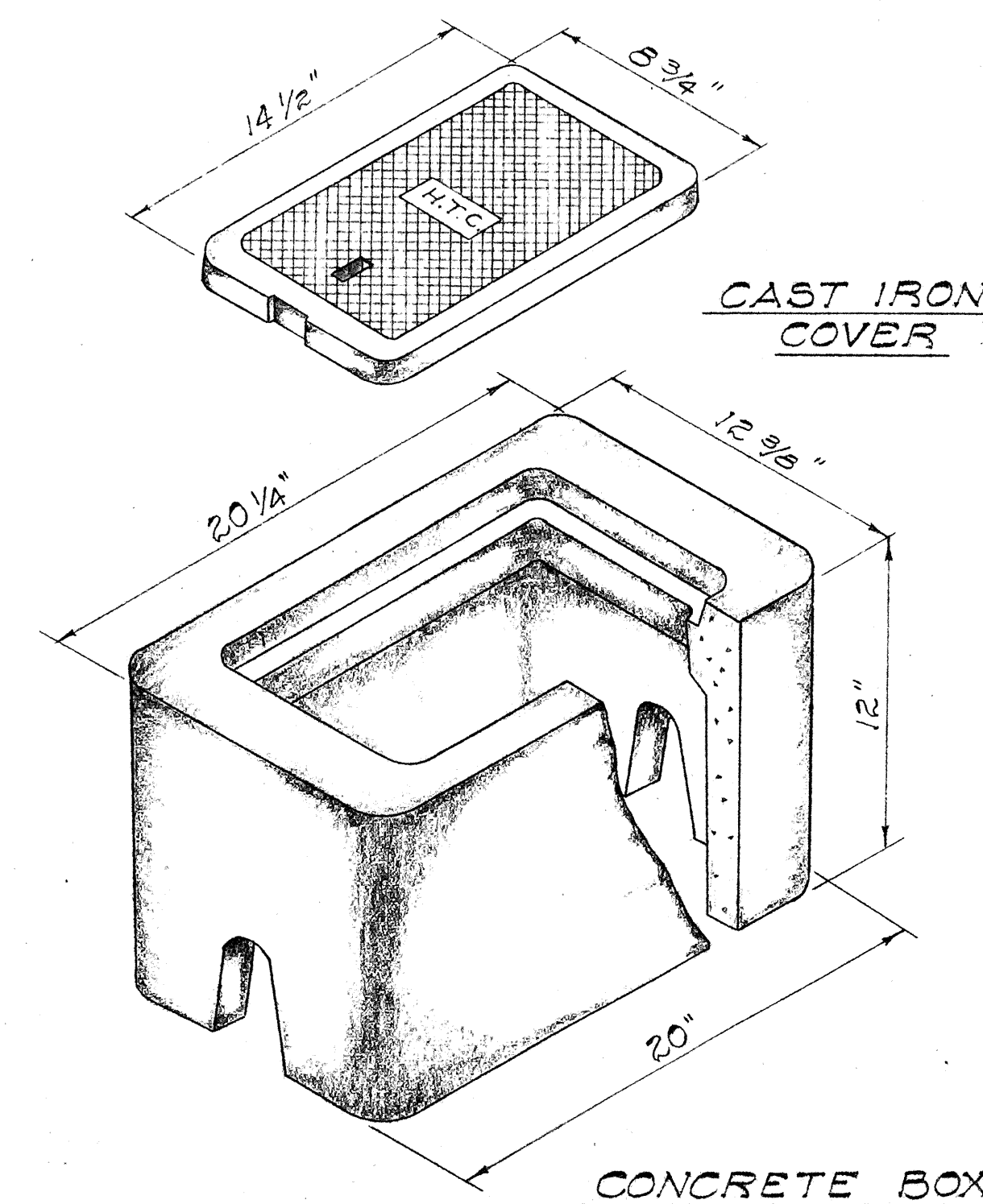


SECTION "C-C"

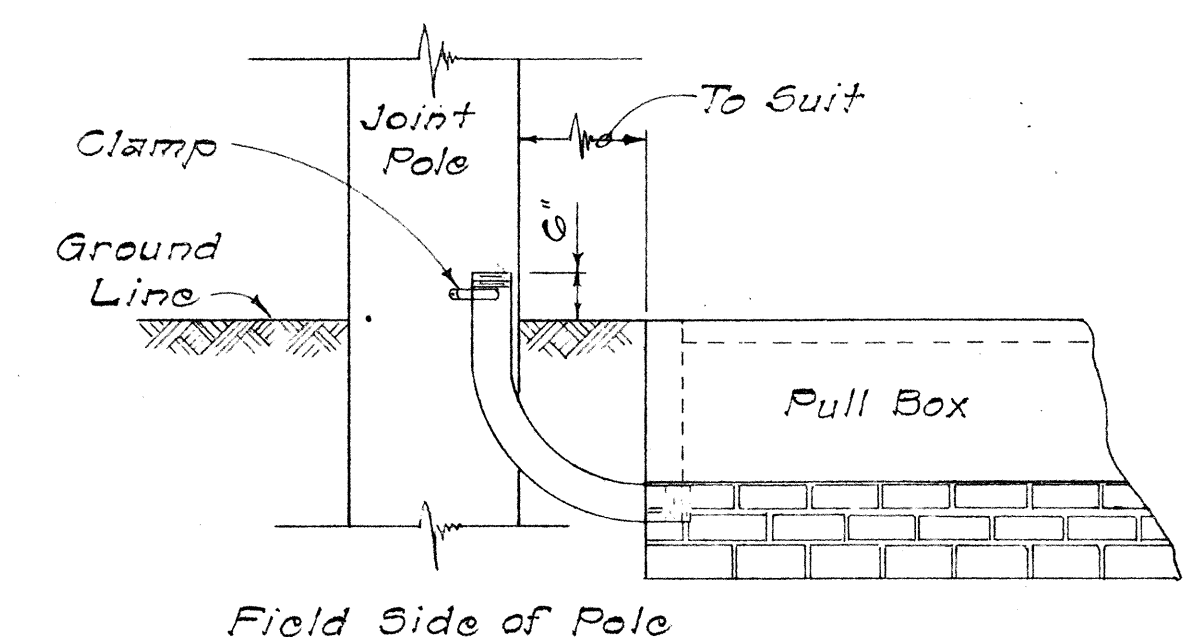
NOTE: Dowels shall be used only where the Sidewalk is as Wide or Narrower than the Pull Box.

INSTALLATION DETAIL OF PULL BOX No. 435T-A IN SIDEWALK AREAS

Scale: 1" = 1'-0"



TYPE "B" METER BOX
TYPE 436T



TYPICAL 90° CONDUIT
BEND TO POLE
Not To Scale

APPROVED: *[Signature]* 7-3-67
HAWAIIAN TELEPHONE CO. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TELEPHONE PULL BOXES
Nos. 435T-A, 434T AND 436T

Scale: As Shown Date:

SHEET No. 16 OF 16 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
No.	_____