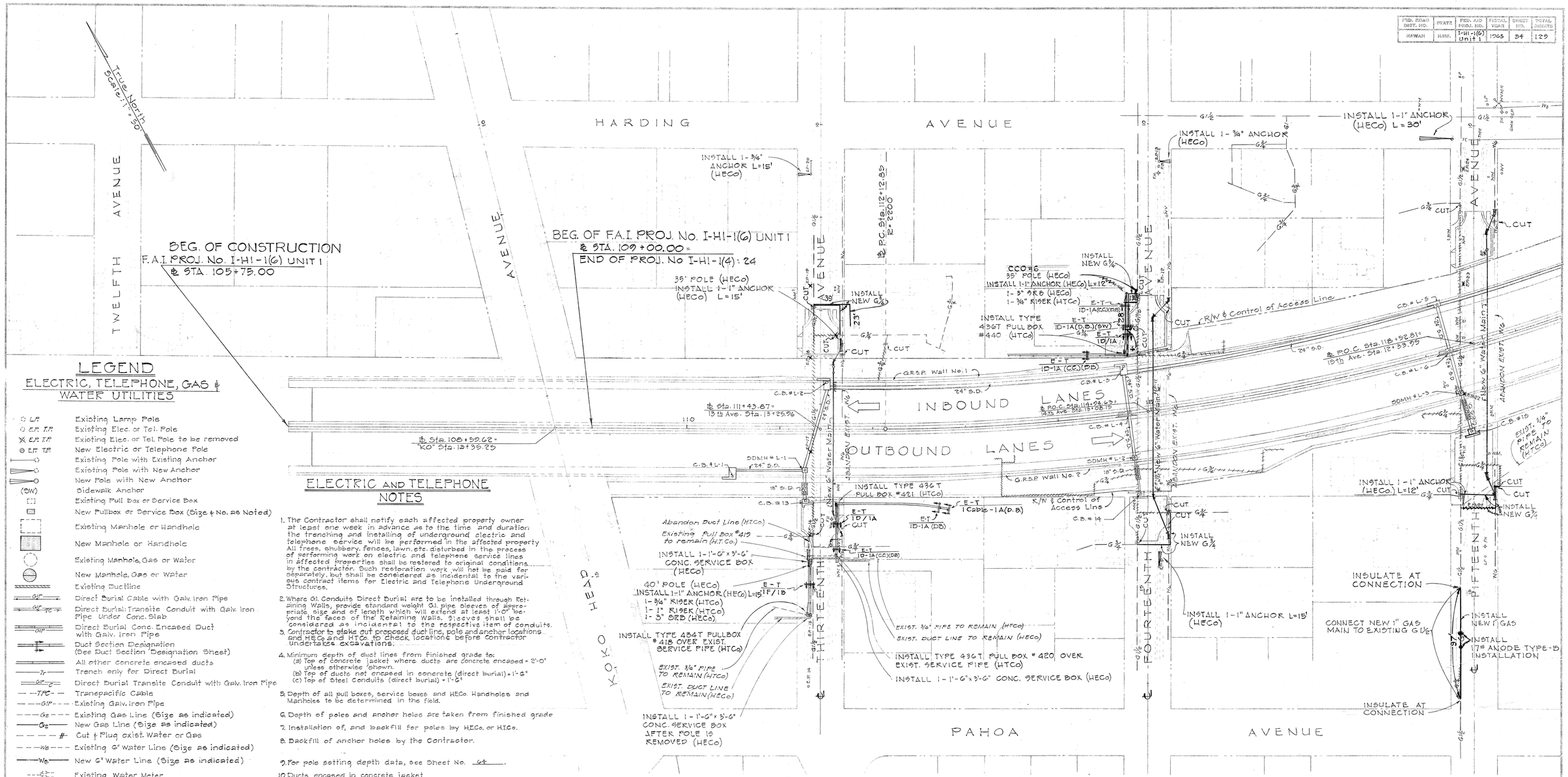
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(6) Unit 1	1965	54	129



LEGEND

ELECTRIC, TELEPHONE, GAS & WATER UTILITIES

L.P.	Existing Lamp Pole
E.P. T.P.	Existing Elec. or Tel. Pole
E.P. T.P.	Existing Elec. or Tel. Pole to be removed
E.P. T.P.	New Electric or Telephone Pole
	Existing Pole with Existing Anchor
	Existing Pole with New Anchor
	New Pole with New Anchor
(SW)	Sidewalk Anchor
	Existing Pull Box or Service Box
	New Pullbox or Service Box (Size & No. as Noted)
	Existing Manhole or Handhole
	New Manhole or Handhole
	Existing Manhole, Gas or Water
	New Manhole, Gas or Water
	Existing Ductline
G1"	Direct Burial Cable with Galv. Iron Pipe
G1" TC	Direct Burial Transite Conduit with Galv. Iron Pipe Under Conc. Slab
G1"	Direct Burial Conc. Encased Duct with Galv. Iron Pipe
	Duct Section Designation (See Duct Section Designation Sheet)
	All other concrete encased ducts
Tr	Trench only for Direct Burial
G1" C	Direct Burial Transite Conduit with Galv. Iron Pipe
TPC	Transpacific Cable
G1"	Existing Galv. Iron Pipe
Ge	Existing Gas Line (Size as indicated)
Ge	New Gas Line (Size as indicated)
#	Cut & Plug exist. Water or Gas
We	Existing 6" Water Line (Size as indicated)
We	New 6" Water Line (Size as indicated)
	Existing Water Meter
	New Water Meter
	Existing Fire Hydrant
	New Fire Hydrant
G1 1/2	Abandon Existing Gas Line (Size as indicated)
	Fire Alarm System and Traffic Signal System Conduit
SRD	Standard Radius Bend
LRB	Long Radius Bend
Anc.	Anchor
P.B.	Pull Box
C.I.B.	Cast Iron Bend

ELECTRIC AND TELEPHONE NOTES

1. The Contractor shall notify each affected property owner 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 the affected property. All trees, shubbery, fences, lawn, etc. disturbed in the process of performing work on electric and telephone service lines in affected properties shall be restored to original conditions by the contractor. Such restoration work will not be paid for separately, but shall be considered as incidental to the various contract items for Electric and Telephone Underground Structures.
2. Where G1. Conduits Direct Burial are to be installed through Retaining Walls, provide standard weight G1. pipe sleeves of appropriate size and of length which will extend at least 1'-0" beyond the faces of the Retaining Walls. Sleeves shall be considered as incidental to the respective item of conduits.
3. Contractor to stake out proposed duct line, pole and anchor locations and HECo and HTCo to check locations before contractor undertakes excavations.
4. Minimum depth of duct lines from finished grade to:
   (a) Top of concrete jacket where ducts are concrete encased = 2'-0" unless otherwise shown.
   (b) Top of ducts not encased in concrete (direct burial) = 1'-6"
   (c) Top of Steel Conduits (direct burial) = 1'-6"
5. Depth of all pull boxes, service boxes and HECo. Handholes and Manholes to be determined in the field.
6. Depth of poles and anchor holes are taken from finished grade
7. Installation of, and backfill for poles by HECo. or HTCo.
8. Backfill of anchor holes by the Contractor.
9. For pole setting depth data, see Sheet No. 64.
10. Ducts encased in concrete jacket
    (a) Normal distance from face of conc. jacket to all ducts to be 3" Minimum
    (b) Clear distance of 1 1/2" minimum between ducts of same utility Co.
    (c) Clear distance of 3" minimum between HECo Ducts and HTCo Ducts
11. Existing electric and telephone systems shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
12. Adjust existing telephone manholes and manhole frame & Covers within proposed roadway to fit New Roadway finished grades.
13. Adjusting of HECo manholes to be done by HECo.
14. All ducts and conduits called for installation in concrete jacket shall be inspected and approved by the respective Engineer of HECo or HTCo before concrete placing. 24 hour (Min.) notice shall be given to respective utility company before placing Concrete.
15. C&C conduits and pull boxes sharing trenches with HECo &/or HTCo will be installed by C&C Street Lighting Division.
16. All HECo's Direct Burial Cables to be installed by HECo.
17. Concrete for floating slab over ducts shall be Class "B-1" Concrete.
18. Whenever direct buried secondary cables are to be installed, the trenches shall be opened in such lengths as to permit the Hawaiian Electric Co. to install its cables in one length.

GAS NOTES

1. The gas lines shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
2. Cutting, plugging and reconnecting of live gas lines will be done by the Honolulu Gas Co Ltd.
3. There should be at least 2" clearance wherever possible between any gas pipeline or main and any underground structure not used in conjuction with the pipeline or main. When this clearance cannot be attained, the pipe shall be protected with Gas Co. approved insulating material.

GENERAL NOTES

1. Utility lines other than electric, telephone & gas are shown for the Contractors convenience only. For layout of other utilities, see respective utility plans.

APPROVED

L. Nakafuji — PRINCIPAL ELECTRICAL ENGINEER HECo, INC.	4/28/65 DATE
Thomas A. Kan — PRINCIPAL DISTRIBUTION ENGINEER, HECo. INC.	4/28/65 DATE
J. H. Judd — OUTSIDE PLANT ENGINEER, HTCo LTD	4-30-65 DATE
Paul C. Jory — DIRECTOR OF DEVELOPMENT, HON. GAS Co LTD	4/28/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

RELOCATION OF ELECTRIC, TELEPHONE AND GAS SYSTEMS

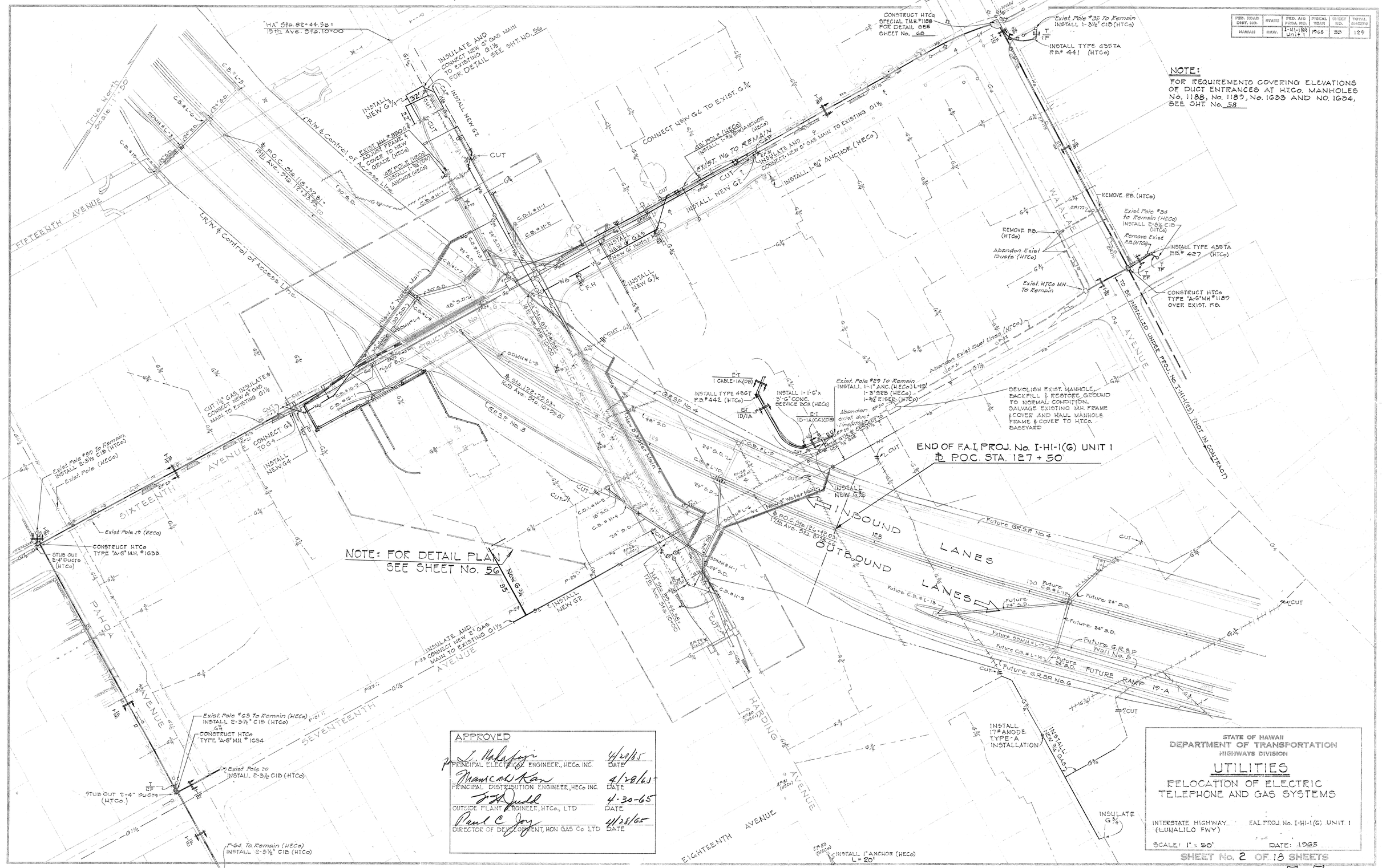
INTERSTATE HIGHWAY (LUNALILO FWY) — F.A.I. PROJ. No. I-H1-1(6) UNIT 1
SCALE: 1" = 50' — DATE: 1965

SHEET No. 1 OF 18 SHEETS

54

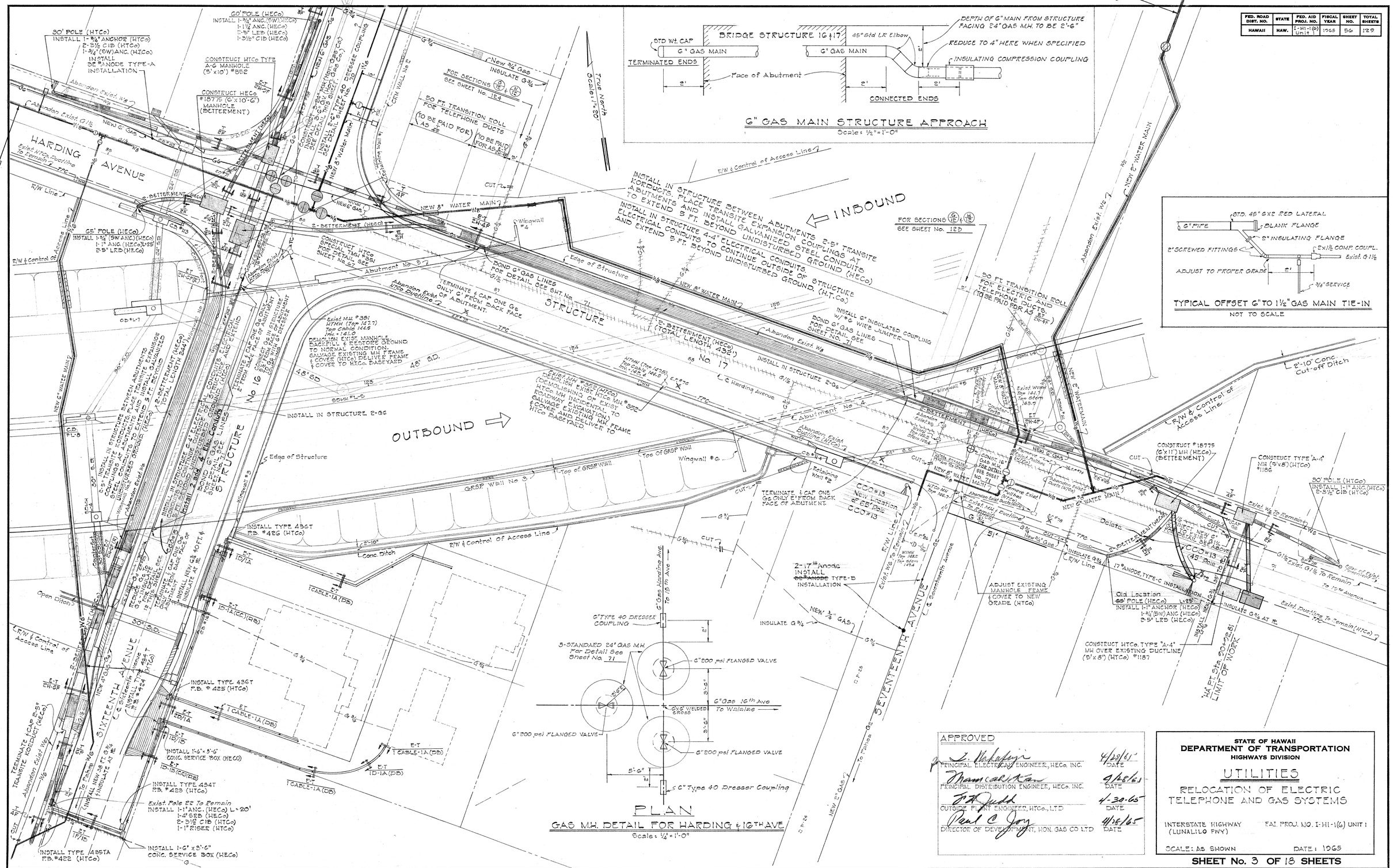
50

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(G) Unit 1	1965	55	129



55

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(6) Unit 1	1965	56	129

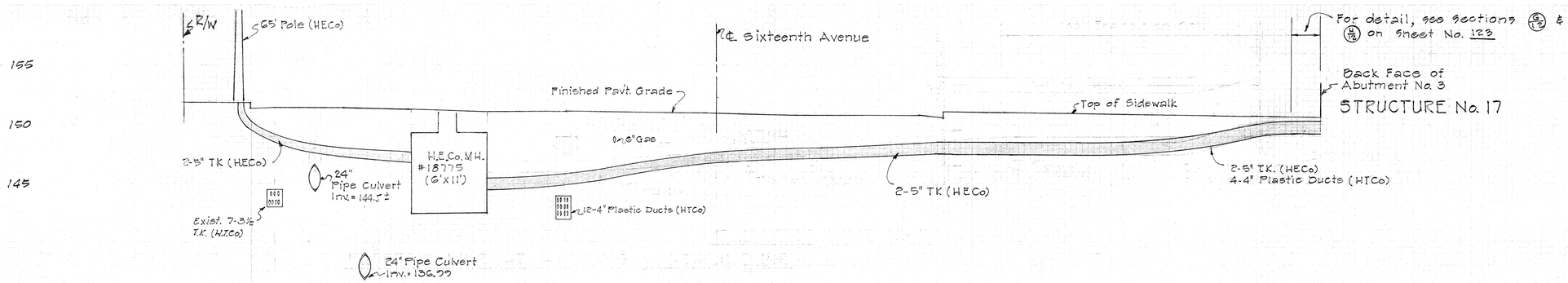


ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	
	DRAWN BY	" " "
	TRACED BY	" " "
	DESIGNED BY	" " "
NOTE BOOK	QUANTITIES BY	
No.	CHECKED BY	

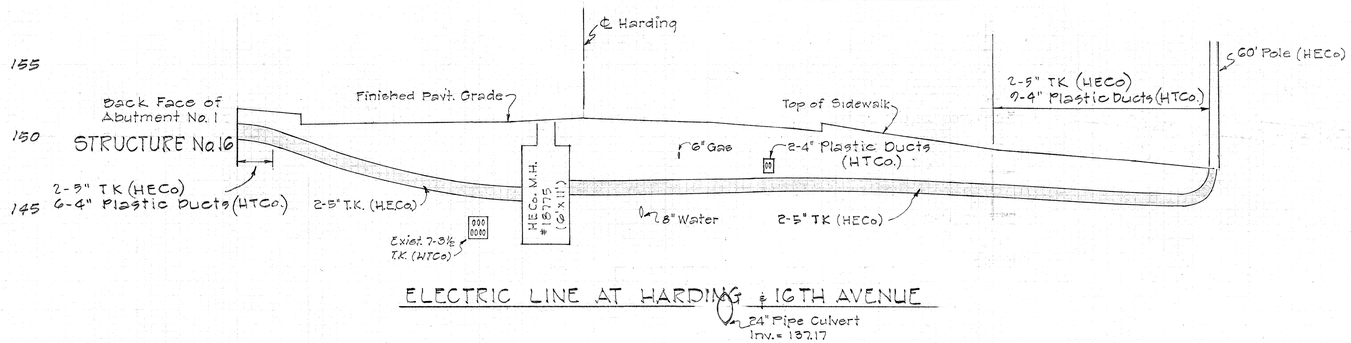
PRINTED ON NO. 1000H CLEARPRINT

56

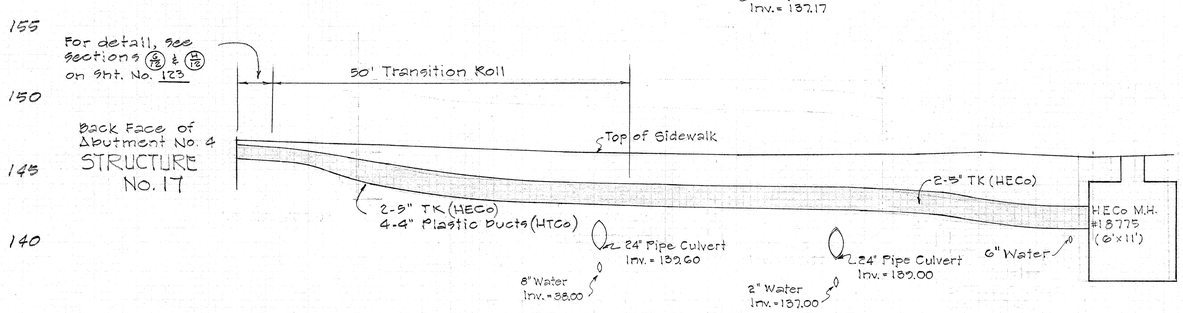
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(G) Unit 1	1965	57	129



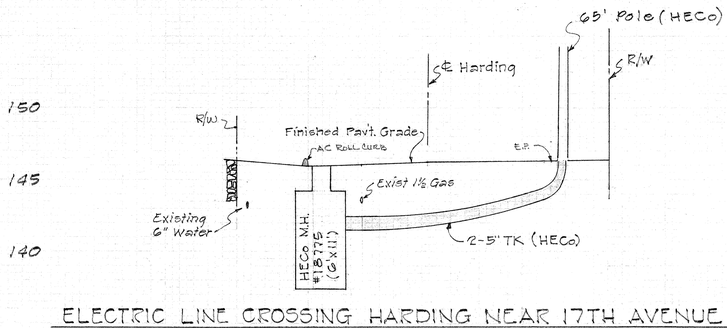
ELECTRIC LINE AT HARDING & 16TH AVENUE



ELECTRIC LINE AT HARDING & 16TH AVENUE



ELECTRIC LINE ON HARDING NEAR 17TH AVENUE



ELECTRIC LINE CROSSING HARDING NEAR 17TH AVENUE

PROFILE

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

APPROVED

L. Nakapani PRINCIPAL ELECTRICAL ENGINEER, HECo. INC.	4/27/65 DATE
Maurice W. Kan PRINCIPAL DISTRIBUTION ENGINEER, HECo. INC.	4/28/65 DATE
T. R. Judd OUTSIDE PLANT ENGINEER, HTCo., LTD	4-30-65 DATE
Paul C. Jory DIRECTOR OF DEVELOPMENT, HON. GAS Co. LTD.	4/28/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

PROFILE OF UNDERGROUND UTILITY DUCTS

INTERSTATE HIGHWAY (LUNALILO FWY.)
SCALE: HOR. 1" = 10' VERT. 1" = 5'

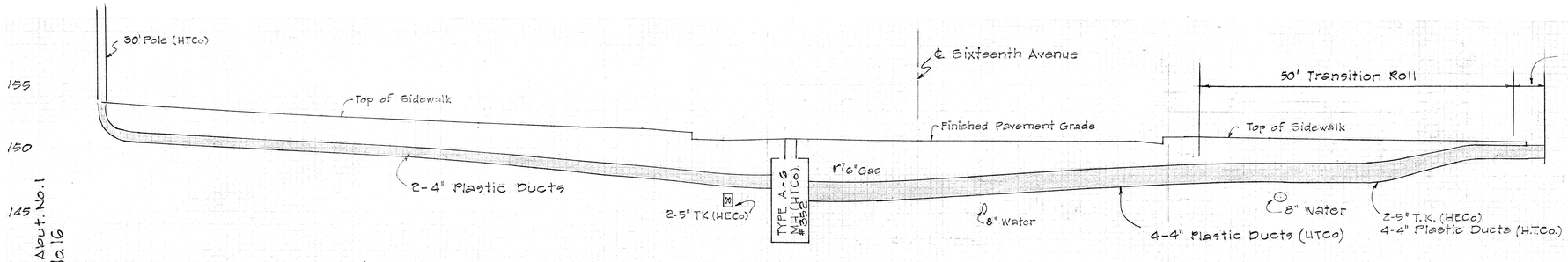
F.A.I. PROJ. I-HI-1(G) UNIT 1

DATE: 1965

SHEET No. 4 OF 18 SHEETS

57

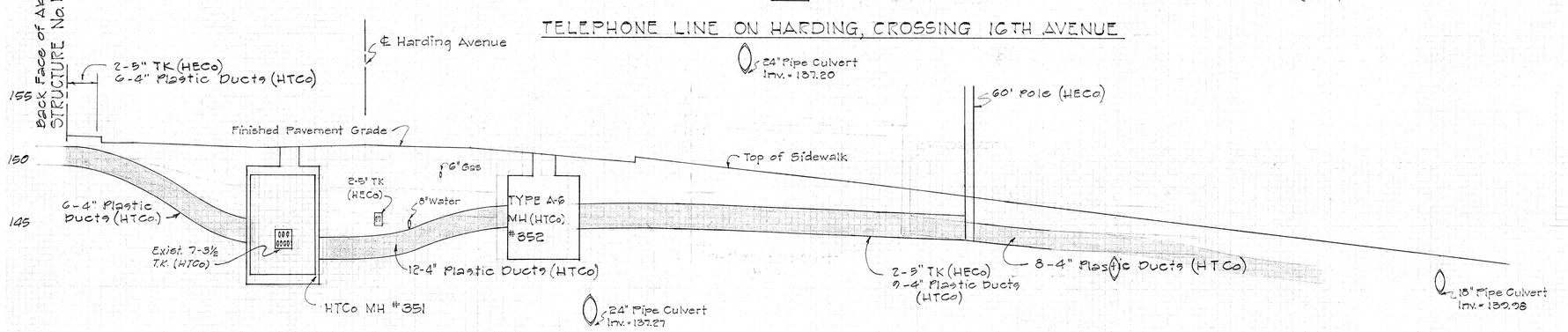
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(6) Unit 1	1969	58	129



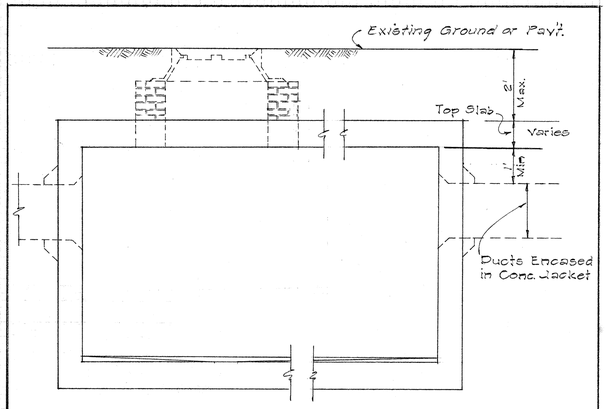
For detail, see sections (G/12) & (H/12) on Sht. No. 123

Back face of Abutment No. 3.
STRUCTURE No. 17

TELEPHONE LINE ON HARDING, CROSSING 16TH AVENUE



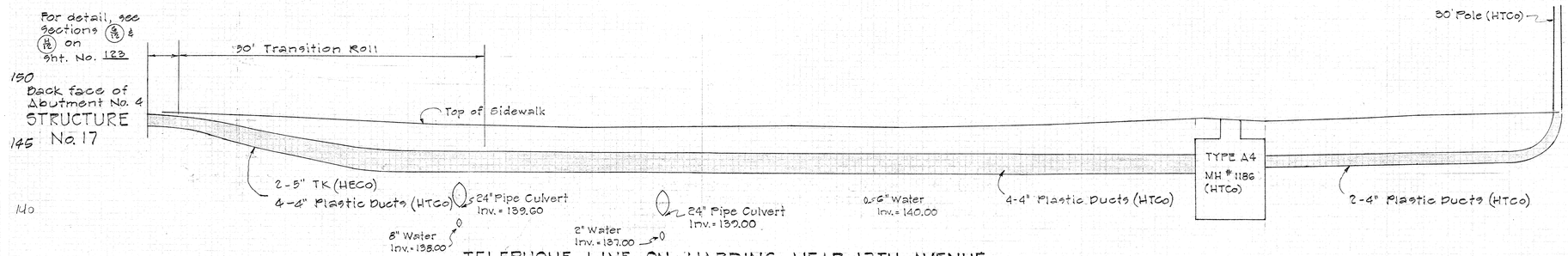
TELEPHONE LINE ON 16TH AVENUE CROSSING HARDING



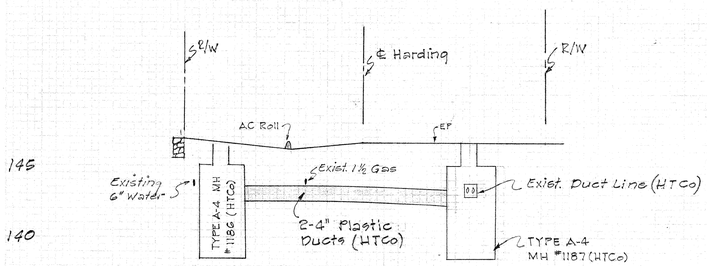
SECTION
Scale: ½"=1'-0"
TYPICAL H.T.Co. MANHOLE

NOTE: SEE HTCo MANHOLE DETAILS FOR MANHOLE DIMENSIONS AND FRAME & COVER LOCATIONS.

DETAIL SHOWING ELEVATION OF DUCT ENTRANCES AT H.T.Co. MANHOLES No. 1188, No. 1189, No. 1633 AND No. 1634.



TELEPHONE LINE ON HARDING NEAR 17TH AVENUE



TELEPHONE LINE CROSSING HARDING AVE STA. 90+81±

PROFILE

SCALE: HORIZ. 1"=10'
VERT. 1"= 5'

APPROVED

J. Nakafuji PRINCIPAL ELECTRICAL ENGINEER, HECo. INC.	4/28/65 DATE
Thomas A. Kau PRINCIPAL DISTRIBUTION ENGINEER, HECo. INC.	4/28/65 DATE
F. H. Judd OUTSIDE PLANT ENGINEER, HTCo. LTD.	4-30-65 DATE
Paul C. Joy DIRECTOR OF DEVELOPMENT, HON. GAS Co LTD	4/28/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

PROFILE OF UNDERGROUND UTILITY DUCTS

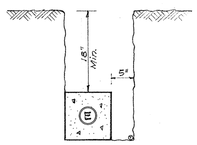
INTERSTATE HIGHWAY (LUNALILO FWY)
F.A.I. PROJ. I-H1-1 (6) UNIT 1
SCALE: HOR. 1" = 10' VERT. 1" = 5'
DATE: 1965

SHEET No. 5 OF 18 SHEETS

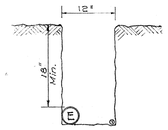
58

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) Unit 1	1968	59	129

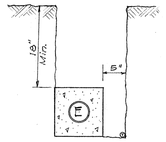
SHEET No. 54



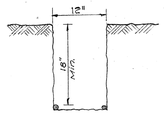
E-T / 1D/1A
1-3" Transite Conduit (C.J.)(H.E.Co)
1-3/4" GIP Direct Burial (HTCo)



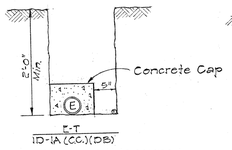
E-T / 1D-1A (DB)
1-3" Transite Conduit (HECo)
1-3/4" GIP Direct Burial (HTCo)



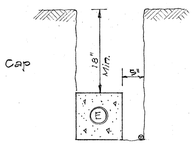
E-T / 1F/1B
1-4" Transite Korduct (C.J.)(H.E.Co)
1-1" GIP Direct Burial (HTCo)



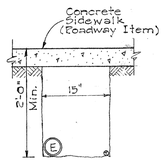
E-T / 1 Cable-1A (DB)
1 Cable Direct Burial (HECo)
1-3/4" GIP Direct Burial (HTCo)
(HECo's Direct Burial Cable to be installed by HECo)



E-T / 1D-1A (CC.)(DB)
1-3" Transite Conduit (C.C.)HECo)
1-3/4" GIP Direct Burial (HTCo)



E-T / 1D/1A
1-3" Transite Conduit (C.J.)(H.E.Co)
1-3/4" GIP Direct Burial (HTCo)



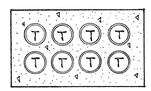
E-T / 1D-1A (DB)(SW)
1-3" Transite Conduit Direct Burial (HECo)
1-3/4" GIP Direct Burial (HTCo)

SHEET No. 55

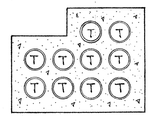
T / 2F
2-4" Plastic Ducts (H.T.Co)

T / 4F
4-4" Plastic Ducts (H.T.Co)

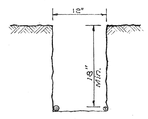
T / 1F
1-4" Plastic Duct (H.T.Co)



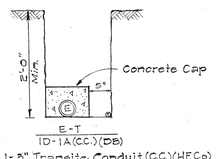
T / 8F
8-4" Plastic Ducts (H.T.Co)



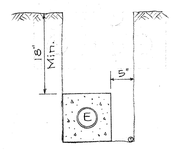
T / 10F
10-4" Plastic Ducts (H.T.Co)



E-T / 1Cable-1A (DB)
1 Cable Direct Burial (HECo)
1-3/4" GIP Direct Burial (HTCo)
(HECo's Direct Burial Cable to be installed by HECo)

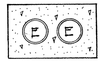


E-T / 1D-1A (CC.)(DB)
1-3" Transite Conduit (C.C.)(HECo)
1-3/4" GIP Direct Burial (HTCo)

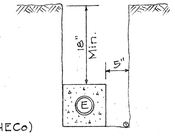


E-T / 1D/1A
1-3" Transite Conduit (C.J.)(HECo)
1-3/4" GIP Direct Burial (HTCo)

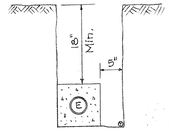
SHEET No. 56



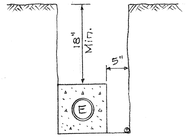
E / 2H
2-5" Transite Korduct (HECo)



E-T / 1D/1A
1-3" Transite Conduit (C.J.)(HECo)
1-3/4" GIP Direct Burial (HTCo)



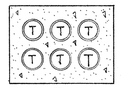
E-T / 1D/1B
1-3" Transite Conduit (C.J.)(H.E.Co)
1-1" GIP Direct Burial (HTCo)



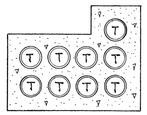
E-T / 1F/1B
1-4" Transite Korduct (C.J.)(H.E.Co)
1-1" GIP Direct Burial (HTCo)

T / 2F
2-4" Plastic Ducts (HTCo)

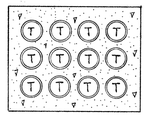
T / 4F
4-4" Plastic Ducts (HTCo)



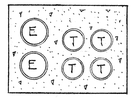
T / 6F
6-4" Plastic Ducts (HTCo)



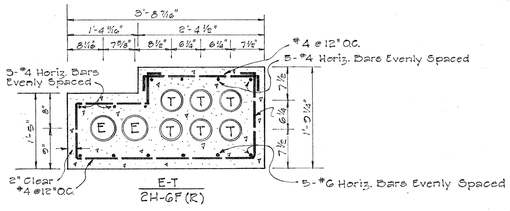
T / 9F
9-4" Plastic Ducts (HTCo)



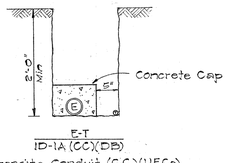
T / 12F
12-4" Plastic Ducts (HTCo)



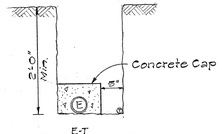
E-T / 2H-4F
2-5" Transite Korduct (HECo)
4-4" Plastic Ducts (HTCo)



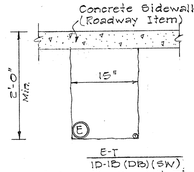
E-T / 2H-6F (R)
2-5" Galv. Steel Conduit (HECO)
6-4" Electrical Conduit (HTCO)
(Reinforced Conc. Jacket)



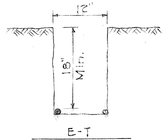
E-T / 1D-1A (CC)(DB)
1-3" Transite Conduit (C.C.)(HECo)
1-3/4" GIP Direct Burial (HTCo)



E-T / 1D-1B (CC)(DB)
1-3" Transite Conduit (C.C.)H.E.Co)
1-1" G.I.P. Direct Burial (H.T.Co)

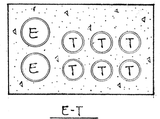


E-T / 1D-1B (DB)(SW)
1-3" Transite Conduit Direct Burial (HECo)
1-1" GIP Direct Burial (HTCo)

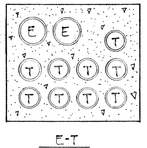


E-T / 1Cable-1A (DB)
1 Cable Direct Burial (HECo)
1-3/4" GIP Direct Burial (HTCo)
(HECo's Direct Burial Cable to be installed by HECo)

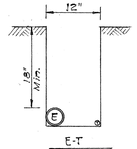
SHEET No. 56



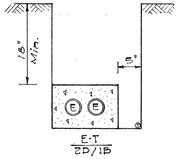
E-T / 2H-6F
2-5" Transite Korduct (HECo)
6-4" Plastic Ducts (HTCo)



E-T / 2H-6F
2-5" Transite Korduct (HECo)
9-4" Plastic Ducts (HTCo)



E-T / 1D-1A (DB)
1-3" Transite Conduit (HECo)
1-3/4" GIP Direct Burial (HTCo)



E-T / 2D/1B
2-3" Transite Conduit (C.J.)(HECo)
1-1" GIP Direct Burial (HTCo)

LEGEND	
C.C.	Concrete Cap
C.J.	Concrete Jacket
D.B.	Direct Burial
R	Reinforced
S.W.	Sidewalk

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

APPROVED:

PRINCIPAL ELECTRICAL ENGINEER, HECo. INC.	DATE 4/28/61
PRINCIPAL DISTRIBUTION ENGINEER HECo. INC.	DATE 4/28/61
OUTSIDE PLANT ENGINEER, HTCo., LTD	DATE 4-30-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

DUCT SECTIONS OF ELECTRIC AND TELEPHONE SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FWY) — F.A.I. PROJ. I-HI-1(6) UNIT 1

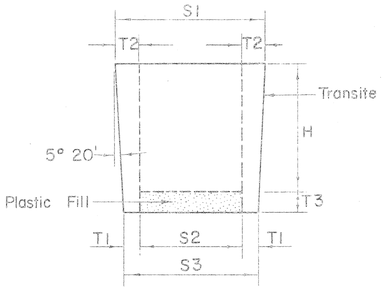
SCALE: NOT TO SCALE — DATE: 1965

SHEET No. 6 OF 18 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

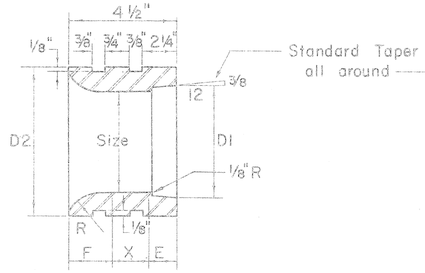
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) Unit 1	1965	60	129



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

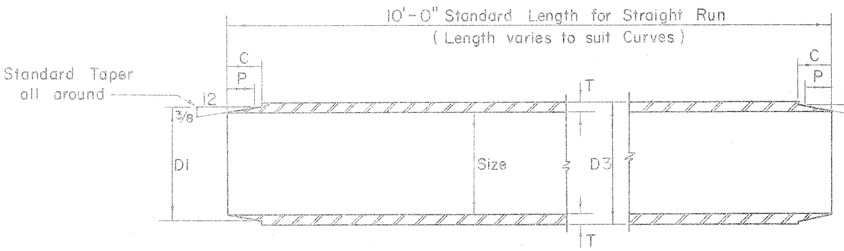
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	12/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



JUNIOR END BELLS

Not to Scale

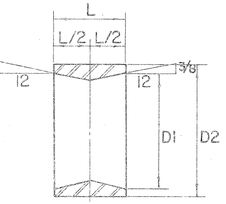
SIZE	D1	D2	F	X	E	R
3"	3 25/64"	4 1/2"	1 11/32"	1 29/32"	1 1/4"	1 3/4"
4"	4 25/64"	5 3/4"	1 9/16"	1 9/16"	1 3/8"	2"
4 1/2"	4 57/64"	6 1/4"	1 9/16"	1 9/16"	1 3/8"	2"
5"	5 29/64"	7"	1 9/16"	1 7/16"	1 1/2"	2"



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"



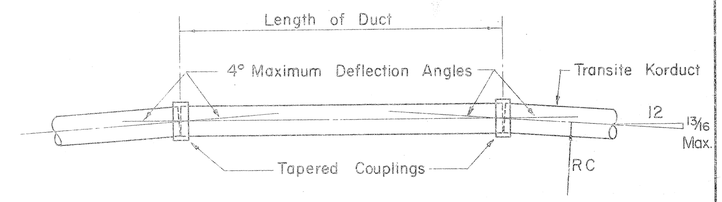
SIZE	D1	D2	L
3"	3 25/32"	4 11/64"	2 1/4"
4"	4 25/64"	5 3/16"	2 1/2"
4 1/2"	4 57/64"	5 49/64"	2 1/2"
5"	5 29/64"	6 21/64"	2 3/4"

TAPERED COUPLINGS

Not to Scale

Note "X"

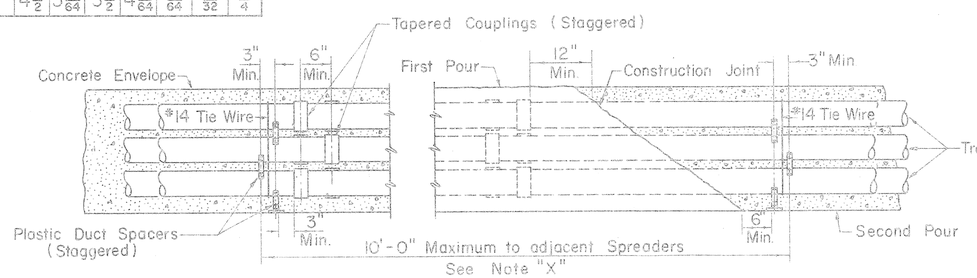
Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



METHOD OF FORMING CURVES

Not to Scale

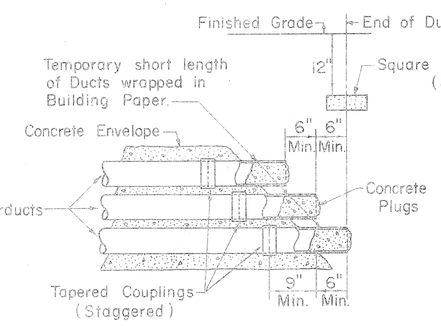
MINIMUM RADIUS TO FORM CURVES										
LENGTH OF DUCT	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"
MIN. RAD. RC	14'-4"	21'-6"	28'-8"	35'-10"	42'-11"	50'-1"	57'-3"	64'-5"	71'-7"	78'-9"
LENGTH OF DUCT	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
MIN. RAD. RC	85'-11"	93'-1"	100'-3"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



TYPICAL DUCT ENVELOPE ELEVATION

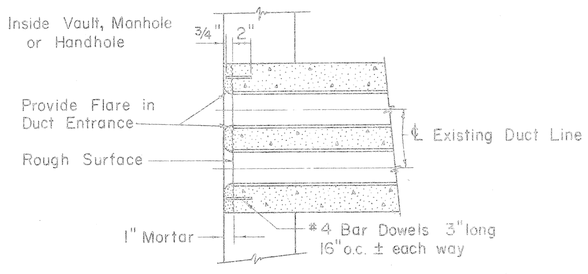
(6 WAY DUCT LINE SHOWN)

Not to Scale



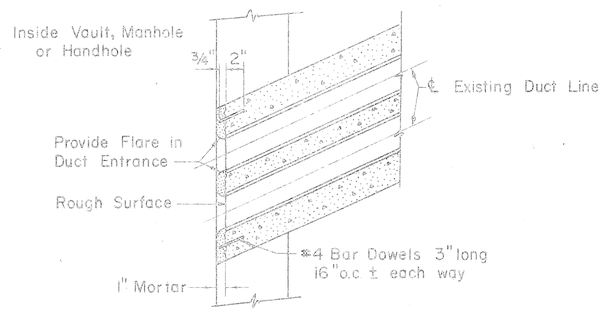
TYPICAL STUB OUT DETAIL

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:

for L. Nakafuji 4/28/65
PRINCPL. ELEC. ENGR. H. E. CO., INC. DATE

M. Cabrera 4/28/65
PRINCPL. DISTR. ENGR. H. E. CO., INC. DATE

DRAWING NUMBER U-18585

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

INTERSTATE HIGHWAY (LUALALILO FWY.) F. A. I. PROJ. NO. I-HI-1(6) UNIT 1
Scales: As Noted Date 1965

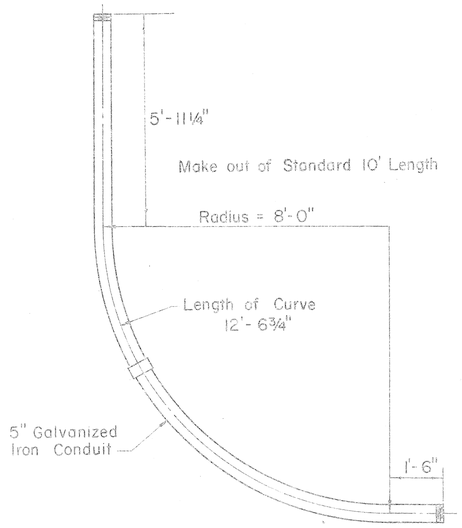
SHEET NO. 7 OF 18 SHEETS

60

E-1-B U-18585

LIETZ 1103 ARKWRIGHT TRACING CLOTH 1040 20DP

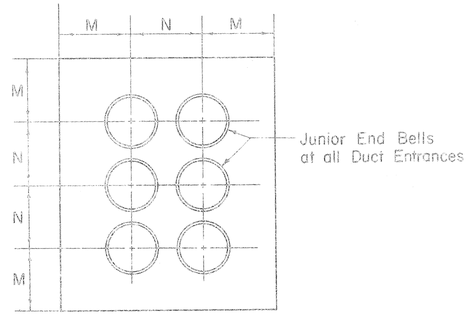
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) Unit 1	1965	61	129



46 KV RISER CONDUIT BEND

(8'-0" RADIUS)

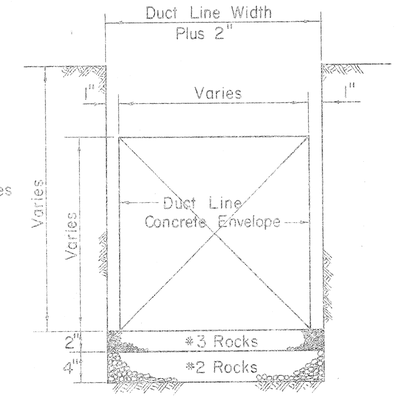
Not to Scale



TYPICAL DUCT DETAIL AT MANHOLE WALL

Not to Scale

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

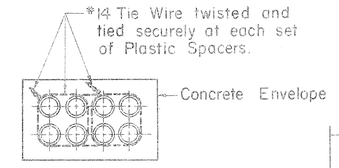


TYPICAL EXCAVATION DETAIL

Not to Scale

NOTES

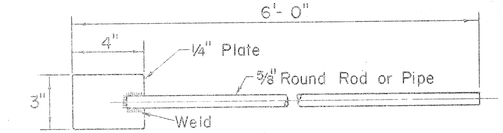
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



TIE WIRE DETAIL

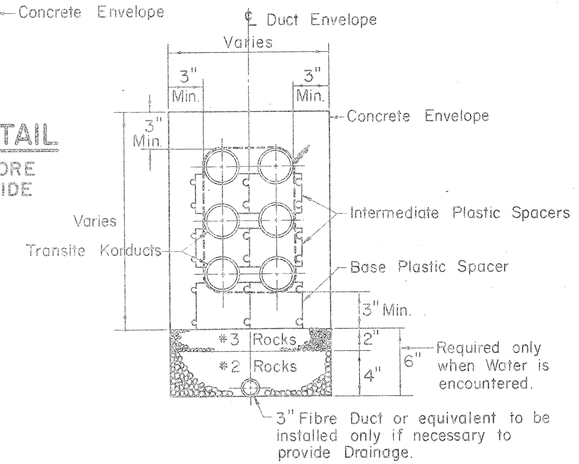
FOR DUCT LINE MORE THAN 4 DUCTS WIDE

Not to Scale



CONCRETE DUCT ENVELOPE TAMPING ROD

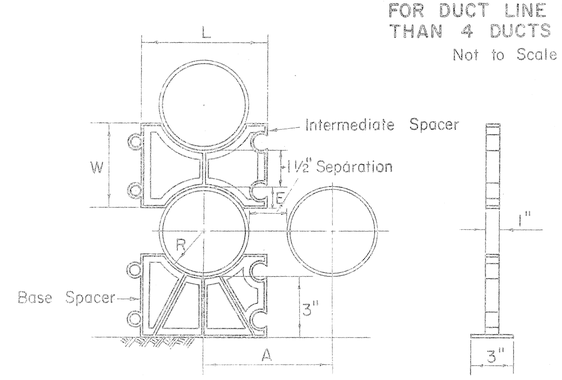
Scale: 3" = 1'-0"



TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION

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

Not to Scale



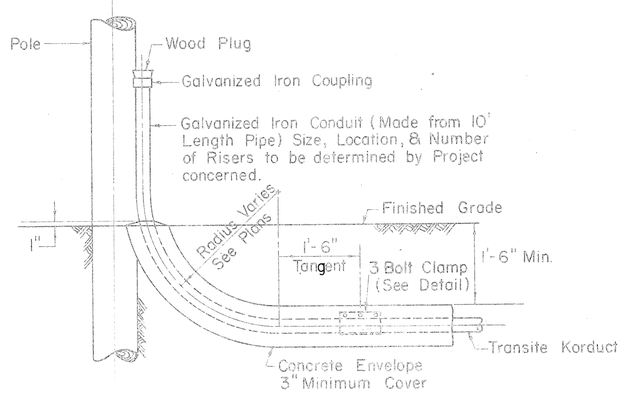
TYPICAL PLASTIC SPACERS

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

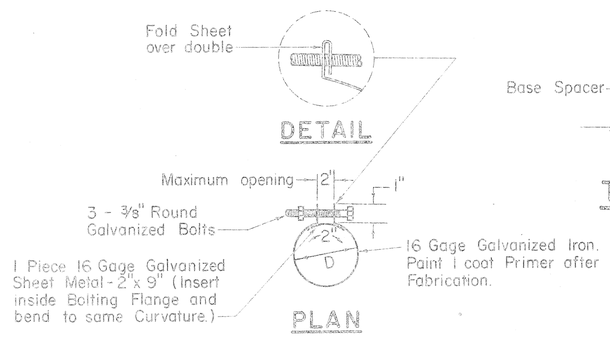
PLAN

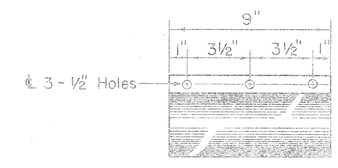


ELEVATION

TYPICAL POLE RISER DETAIL

Scale: ¾" = 1'-0"





ELEVATION

3 BOLT CLAMP DETAIL

Scale: 3" = 1'-0"

APPROVED:

for I. Nakafuji 4/22/65
PRINCPL. ELEC. ENGR. H. E. CO., INC. DATE

Morris A. Kam 4/28/65
PRINCPL. DISTR. ENGR. H. E. CO., INC. DATE

DRAWING NUMBER U-18585

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

INTERSTATE HIGHWAY
(LUNALILO FWY)
Scales: As Noted

F. A. I. PROJ. NO. I-HI-1(6) UNIT 1

Date 1965

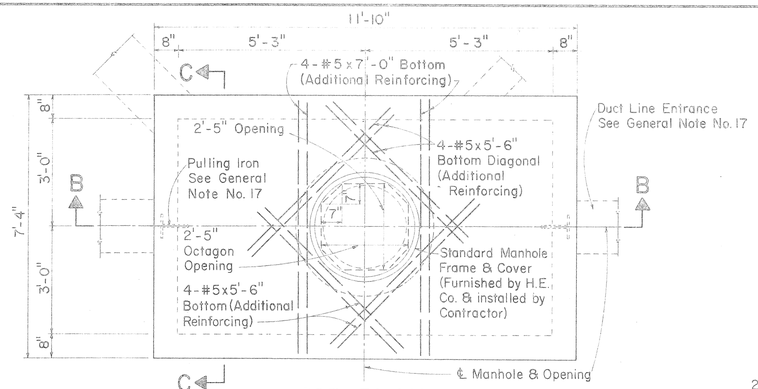
SHEET NO. 8 OF 18 SHEETS

61

E-1-A U-18585

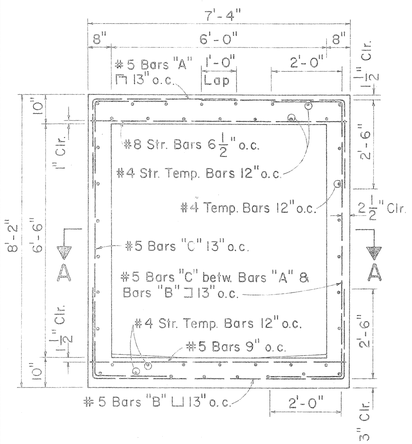
LIETZ 1309 AIRWRIGHT TRACING CLOTH 10-60 250P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT I	1965	62	120



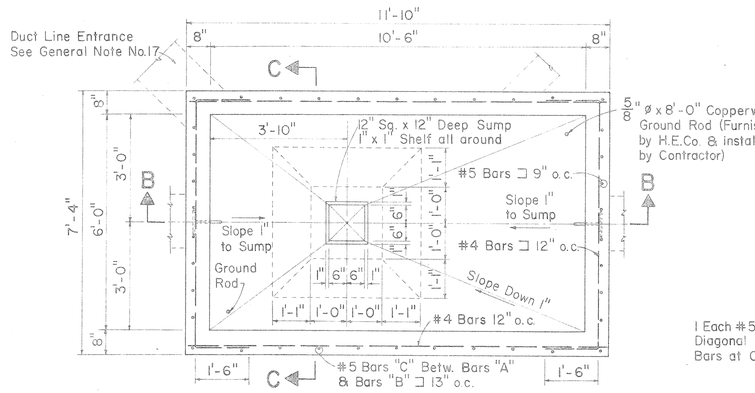
TOP PLAN

Scale : $\frac{1}{2}$" = 1'-0"



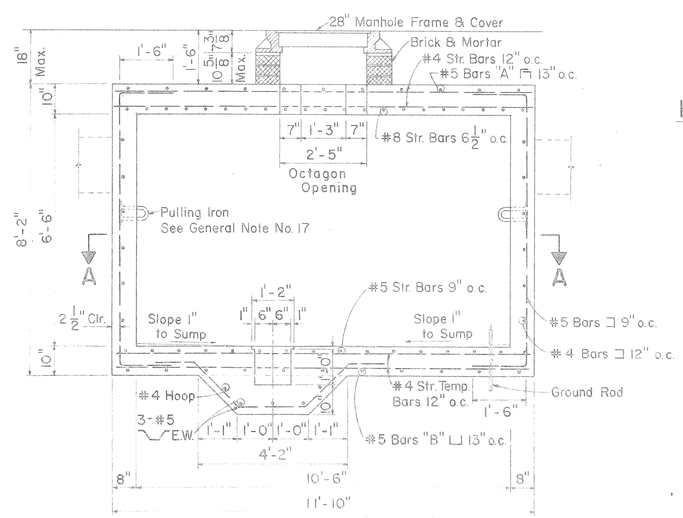
SECTION C-C

Scale : $\frac{1}{2}$" = 1'-0"



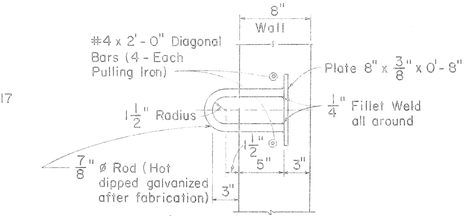
SECTIONAL PLAN A-A

Scale : $\frac{1}{2}$" = 1'-0"



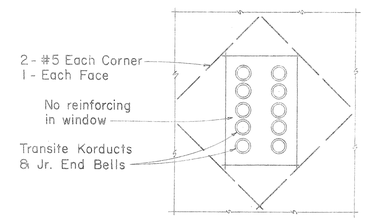
SECTION B-B

Scale : $\frac{1}{2}$" = 1'-0"



PULLING IRON DETAIL

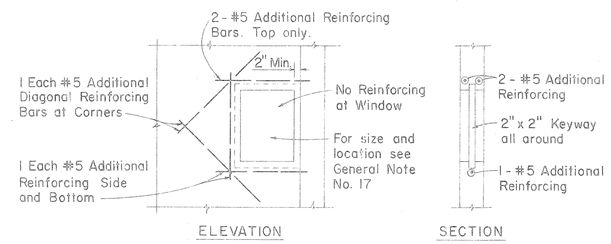
Scale : 1½" = 1'-0"



ELEVATION

REINFORCING AT DUCT WINDOW

Scale : $\frac{1}{2}$" = 1'-0"



ELEVATION SECTION

NOTE :

Provide opening for future duct line. Fill opening with bricks and mortar joints as required. (See project concerned).

KNOCKOUT FOR FUTURE DUCT LINE

Scale : $\frac{1}{2}$" = 1'-0"

GENERAL NOTES

1. EXCAVATION : Excavate for manhole to accurate alignment grades and dimensions as shown on drawings.
   All excavation must be approved by Engineering Dept. H.E.Co. before any concrete is poured.
   All excess cut shall be backfilled with concrete or rocks.
2. BACKFILL : Remove all debris before backfilling. Backfill in accordance with latest specifications of Division of Highways, State of Hawaii.
3. All work to be done in dry.
4. Concrete shall be Class A-1 conforming to the requirements of Section 47 of the Special Provisions.
5. MIXING : Ready-Mixed A.S.T.M. C-94-47.
6. REINFORCING : Round deformed bars (clean and new).
7. SPLICE : Lap 30 bar diameters unless otherwise shown.
8. CURING : Keep concrete moist at least 7 days after pouring. (By approved method).
9. FINISH : All surfaces smooth and free from defects.
   Top of manhole - wood floated.
   Manhole floor - steel troweled.
10. Install all inserts, including pulling irons, ground rods, etc., before pouring concrete.
11. POURING : Notify the Hawaiian Electric Co. Engineering Dept. 24 hours before pouring concrete.
12. FORMS : Make of good sound lumber, of sufficient strength, water tight and conforming to shape and dimensions indicated on drawings.
13. The Hawaiian Electric Co. to furnish and Contractor to install :

    A - 2-⅝" ø x 8'-0" copperweld ground rods.

    B - Standard 28" manhole frame and cover. (H.E. Standard)
14. Slope down manhole floor 1" toward sump.
15. All work shall be subject to inspection by the Hawaiian Electric Co. Inc.; and/or Division of Highways, State of Hawaii; and/or Division of Engineering, City & County of Honolulu.
16. All materials shall be new and shall be manufactured in the United States.
17. For number, size, and exact location of ducts and pulling irons, refer to plan of project concerned.

REFERENCE DRAWINGS

U-10082 - Standard H.E.Co. 28" Manhole Frame and Cover.
U-18585 - Underground Ductline Construction Standards - Details.
U-18585A - Underground Ductline Construction Standards - Specifications.

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

FOR USE IN AREAS SUBJECT TO VEHICULAR TRAFFIC

APPROVED :

for L. Nakafuji — PRINCPL. ELEC. ENGR. H.E.CO., INC. — DATE 4/29/65

Thomas A. Kim — PRINCPL. DISTR. ENGR. H.E.CO., INC. — DATE 4/28/65

DRAWING NUMBER 18775

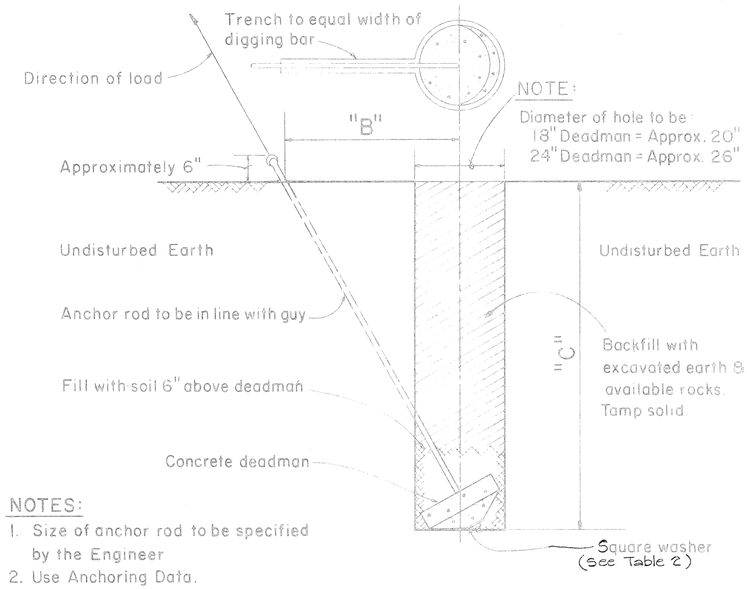
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MANHOLE TYPE #1 (6'-0" x 10'-6") STRUCTURAL PLAN, SECT., & DETAILS UNDERGROUND STANDARDS

INTERSTATE HIGHWAY (LUNALILO FWY) — F.A.I. PROJ. NO. I-HI-1(6) UNIT I

SCALE : AS NOTED — DATE : 1965

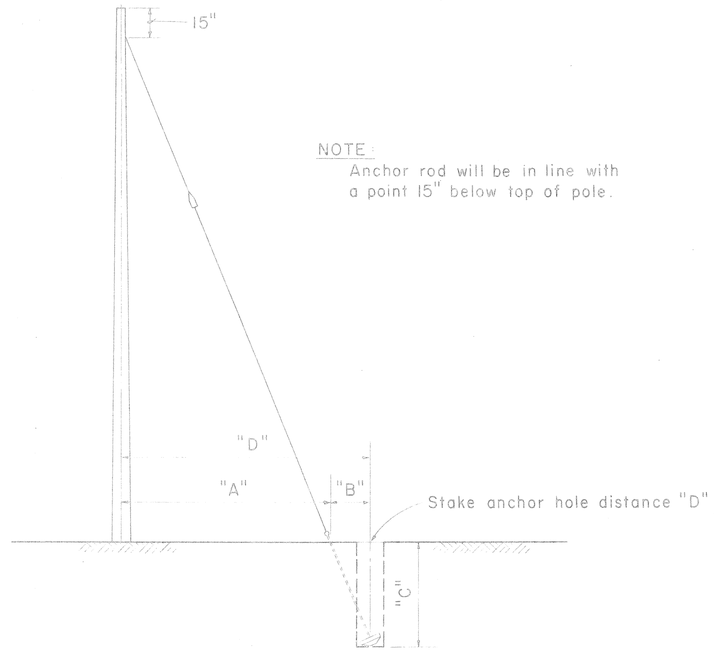
FED AID DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-H1-1(6) Unit 1	1965	63	129



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

GUY ANCHOR DEADMAN

Scale: 3/4" = 1' – 0"



Not to Scale

FOR 25', & 30' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"		"D" = ("A" + "B")
LEAD-ANCHOR ROD TO ℄ OF POLE	ANCHOR ROD TO ℄ OF HOLE	VERTICAL DEPTH 18" D.M.	VERTICAL DEPTH 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"

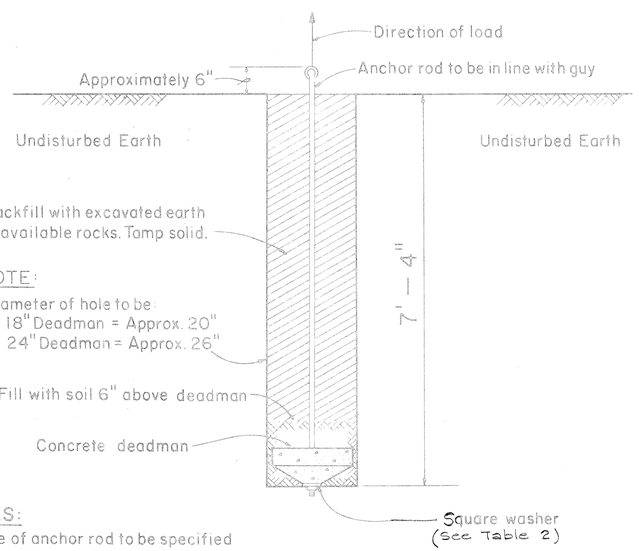
D.M. = Deadman

TABLE 2 ANCHOR ROD - ANCHOR SLUG - SQUARE WASHER COMBINATION

H.E. CODE NO.	ANCHOR ROD	WORKING TENSION 1/2 ULT (LBS.)	H.E. CODE NO.	CONC. ANC. (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.

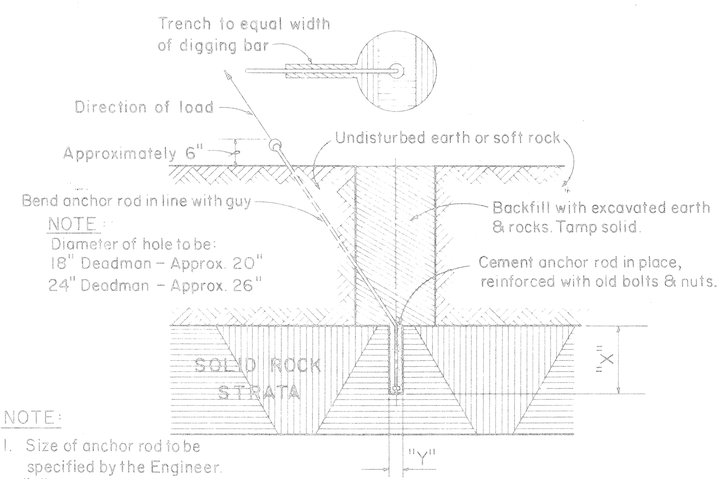
ANCHORING DATA



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

SIDE – WALK ANCHOR

Scale: 3/4" = 1' – 0"



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.

ROCK ANCHOR

Not to Scale

APPROVED:

OUTSIDE PLANT ENGR. H.T.CO., LTD.	DATE 4-30-65
PRINCPL. ELEC. ENGR. H.E.CO., INC.	DATE 4/20/65
PRINCPL. DISTR. ENGR. H.E.CO., INC.	DATE 4/28/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

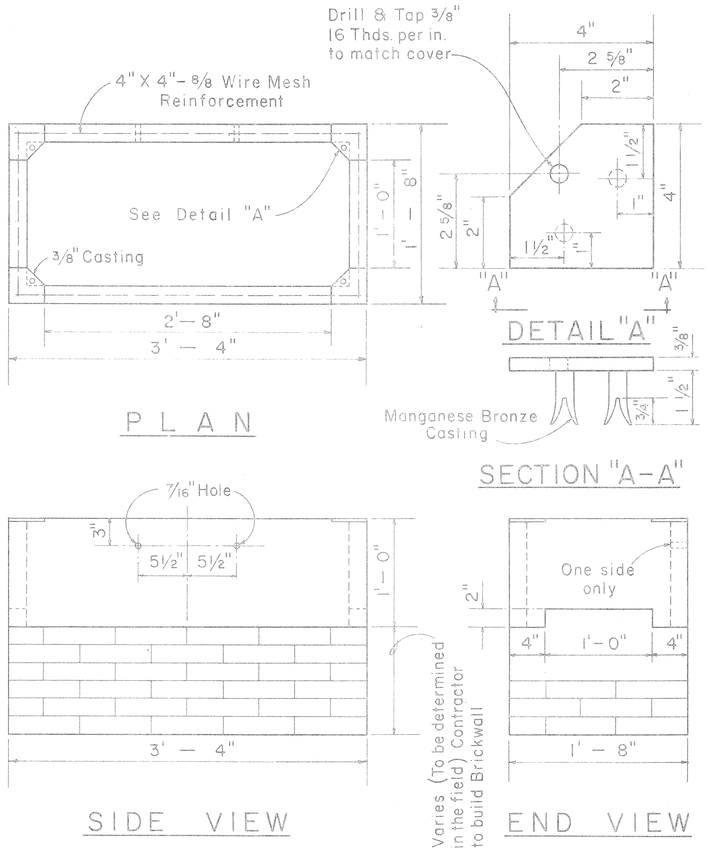
INTERSTATE HIGHWAY (LUNALILO FWY)
Scales As Noted

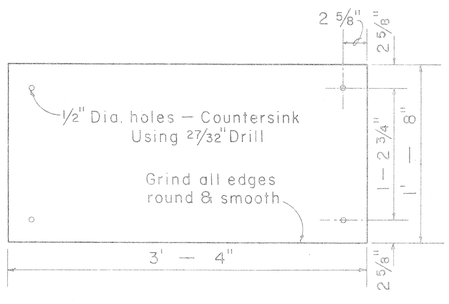
F.A.I. PROJ. NO. I-H1-1(6) UNIT 1
Date 1965

SHEET No. 10 OF 18 SHEETS

63

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-H1-1(6) Unit 1	1965	64	129





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

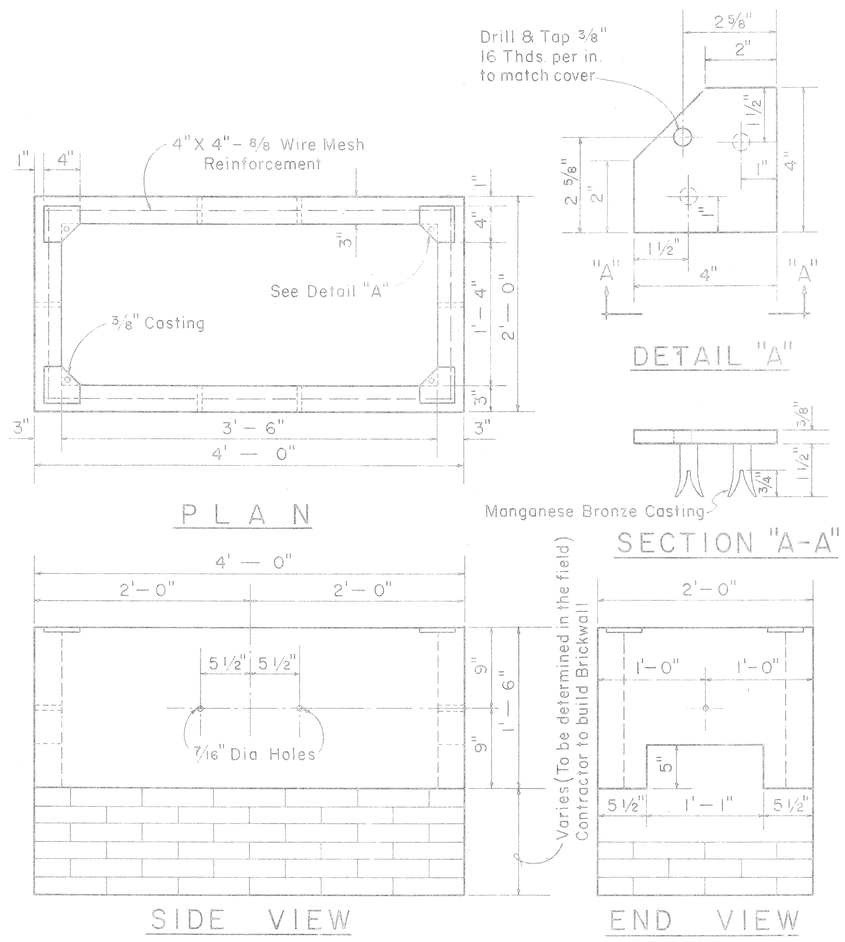
1/4" CHECKER PLATE COVER

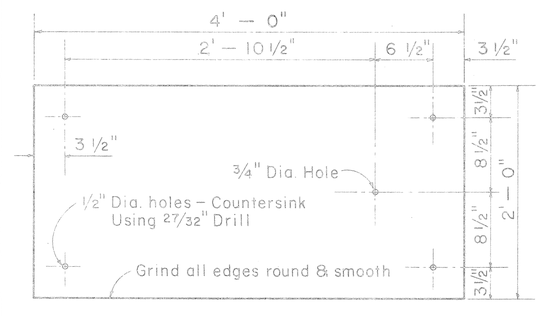
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

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

CREOSOTED DOUGLAS FIR & YELLOW PINE POLE DATA

LENGTH IN FEET	CLASS	APPROX. MINIMUM DIMENSIONS (INCHES) AT TOP DIA.	AT TOP CIR.	6' FROM BUTT DIA.	6' FROM BUTT CIR.	AVERAGE WEIGHT (LBS.)	POLE SETTING DEPTH (FT.) IN SOIL	IN ROCK	BREAKING LOAD 2'-0" BELOW TOP OF POLE (LBS.)
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.

REFERENCES:
American Standards Association 05.4-1941, 05.6-1945.
Standard Handbook for Electrical Engineers, Eighth Edition
H. E. Co. Specification for Poles.

WOOD POLE DATA

APPROVED:

OUTSIDE PLANT ENGR. H.T. CO., LTD.	4-30-65 DATE
PRINCPL. ELEC. ENGR. H. E. CO., INC.	4/23/65 DATE
PRINCPL. DISTR. ENGR. H.E.CO., INC.	4/28/65 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

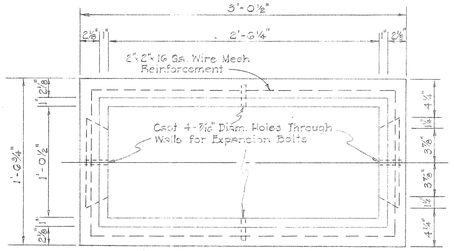
INTERSTATE HIGHWAY (LUNALILO FWY) | F.A.I. PROJ. NO. I-H1-1(6) UNIT 1
Scales: As Noted | Date 1965

SHEET NO. 11 OF 18 SHEETS

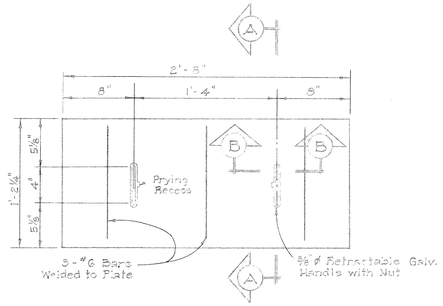
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

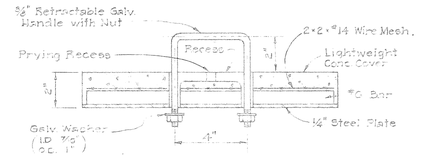
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(9) Unit 1	1965	65	129



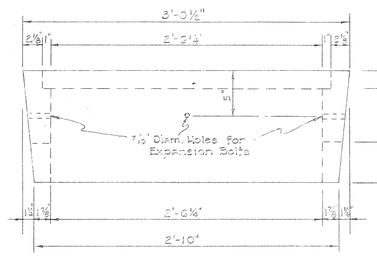
PLAN
Scale: 1½" = 1'-0"



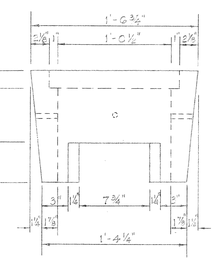
PLAN OF COVER
Scale: 1½" = 1'-0"



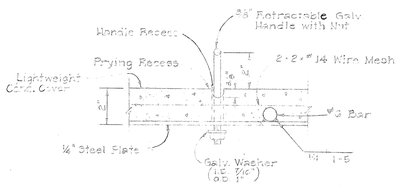
SECTION "A-A"
Scale: 3" = 1'-0"



SIDE ELEVATION
Scale: 1½" = 1'-0"

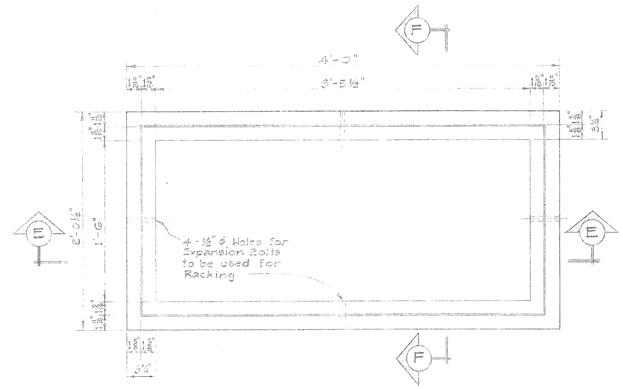


END ELEVATION
Scale: 1½" = 1'-0"

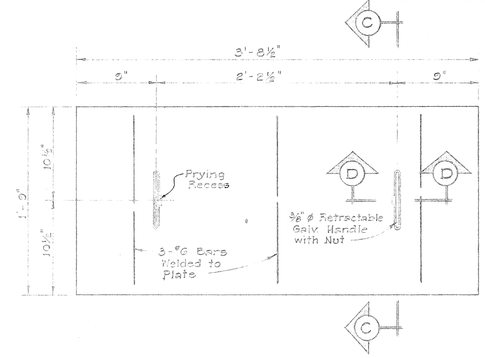


SECTION "B-B"
Scale: 3" = 1'-0"

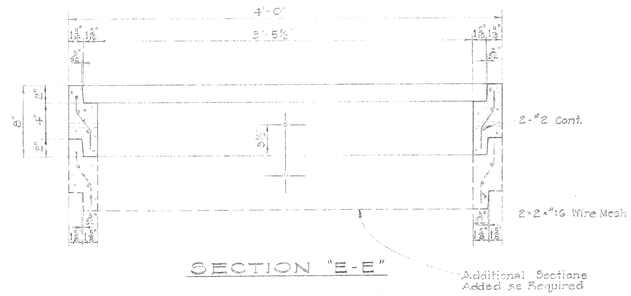
DETAIL OF TELEPHONE PULL BOX NO. 434T
Scale: As Shown



PLAN

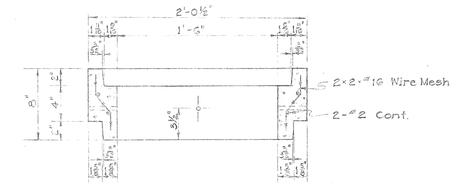


PLAN OF COVER

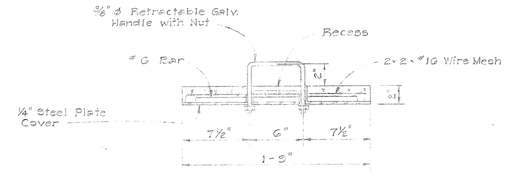


SECTION "E-E"

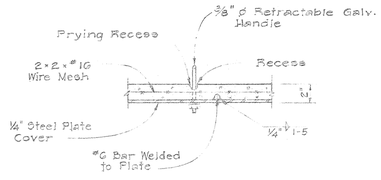
Additional Sections Added as Required



SECTION "F-F"



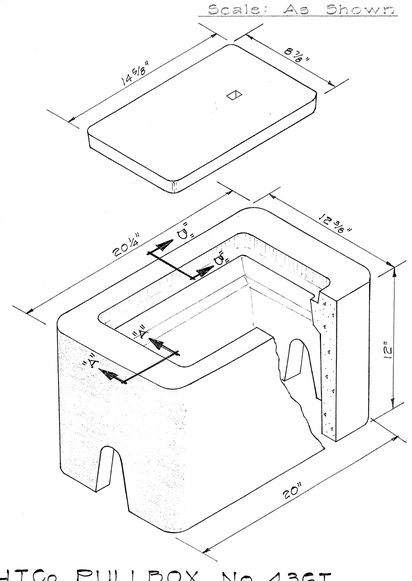
SECTION "C-C"

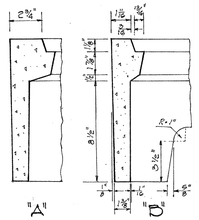


SECTION "D-D"

DETAIL OF TELEPHONE PULL BOX NO. 435T-A
Scale: 1½" = 1'-0"

SECT. OF COVER





H.T.Co. PULLBOX No. 436T
SCALE: 2" = 1'-0"

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

APPROVED:

M. H. Judd 4-30-65

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE PULLBOXES 434T, 435TA, 436T

INTERSTATE HIGHWAY (LUNALILO FWY) F.A.I. PROJ. No. I-HI-1 (G) UNIT 1

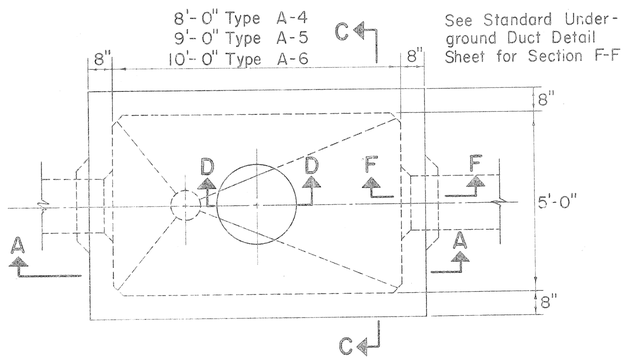
Scale: As Shown Date: 1965

SHEET No. 12 OF 18 SHEETS

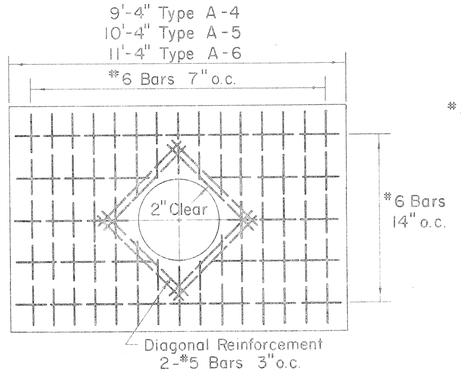
65

PRINTED ON NO. 1000H CLEARPRINT

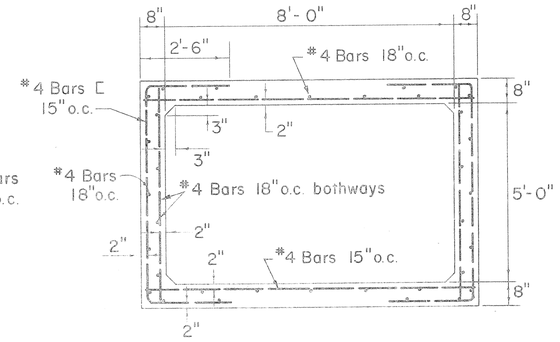
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) Unit 1	1965	66	129



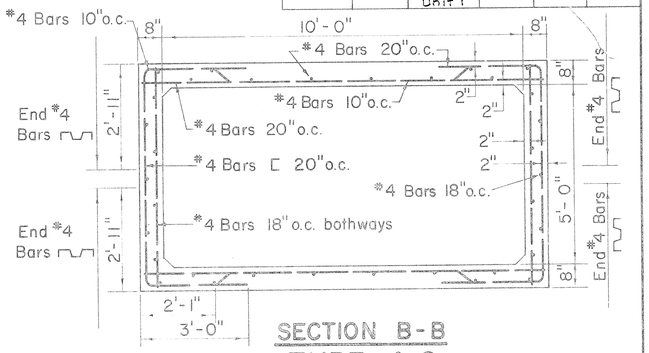
PLAN
TYPE "A" MANHOLE FOR ROADWAY AREAS
Scale: 1/2" = 1'-0"



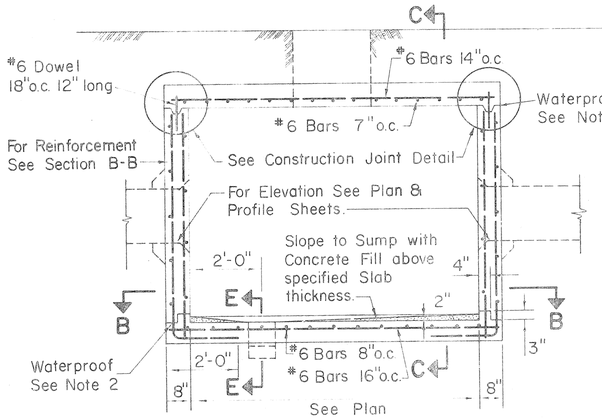
ROOF SLAB REINF. PLAN
Scale: 1/2" = 1'-0"



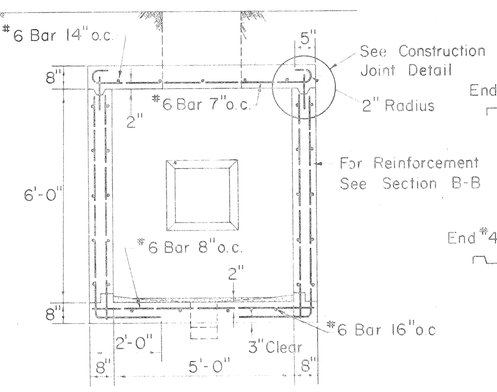
SECTION B-B
TYPE A-4
Scale: 1/2" = 1'-0"



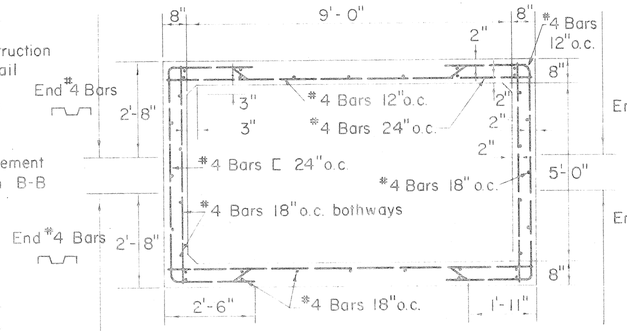
SECTION B-B
TYPE A-6
Scale: 1/2" = 1'-0"



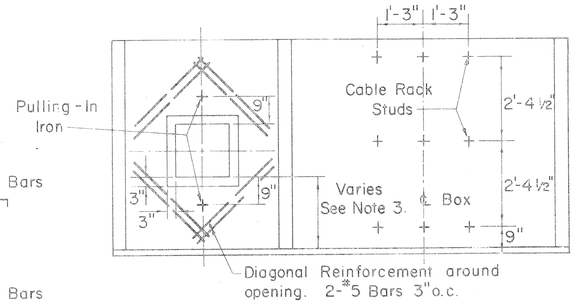
SECTION A-A
Scale: 1/2" = 1'-0"



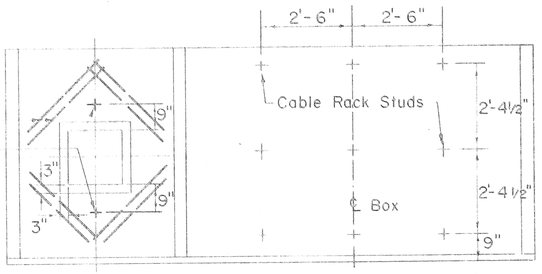
SECTION C-C
Scale: 1/2" = 1'-0"



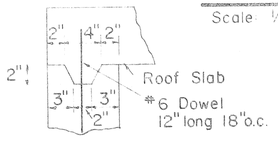
SECTION B-B
TYPE A-5
Scale: 1/2" = 1'-0"



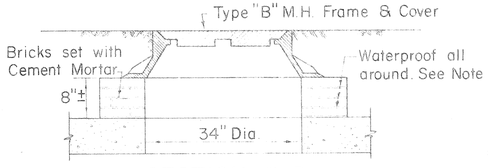
ELEVATION OF INSIDE WALLS
TYPE A-4
Scale: 1/2" = 1'-0"



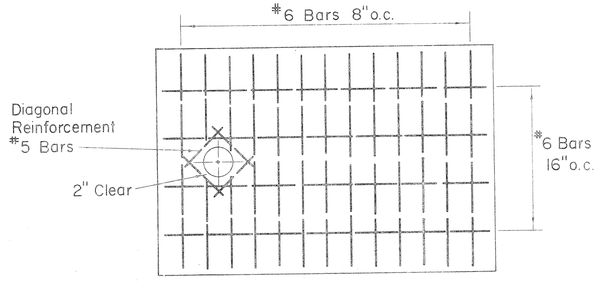
ELEVATION OF INSIDE WALLS
TYPES A-5, A-6
Scale: 1/2" = 1'-0"



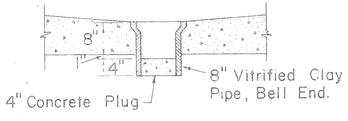
CONSTRUCTION JOINT DETAIL
Scale: 1/2" = 1'-0"



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



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



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

GENERAL NOTES

1. DESIGN DATA
   f_s = 20,000 psi ; f'_c = 3000 psi ; f_c = 1200 psi .
   n = 10 ; w = Equivalent Fluid Pressure = 30 psf.
2. All Construction Joints shall be Waterproofed with 2 applications of Thoro Seal or equal.
3. For Duct Window Location see Plan & Profile Shts.
4. Duct Window to suit. See Plan & Profile & Standard Detail Sheets for Location and Details.
5. For Duct Window Details see Section F-F, Standard Underground Detail Sheet.

APPROVED:

F. H. Judd 4-30-65
OUTSIDE PLANT ENGR. H.T. CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE "A" MANHOLE FOR ROADWAY AREAS

INTERSTATE HIGHWAY (LUNALILO FWY) — F. A. I. PROJ. NO. I-HI-1(6) UNIT 1
Scales: As Noted Date 1965

SHEET NO 13 OF 18 SHEETS

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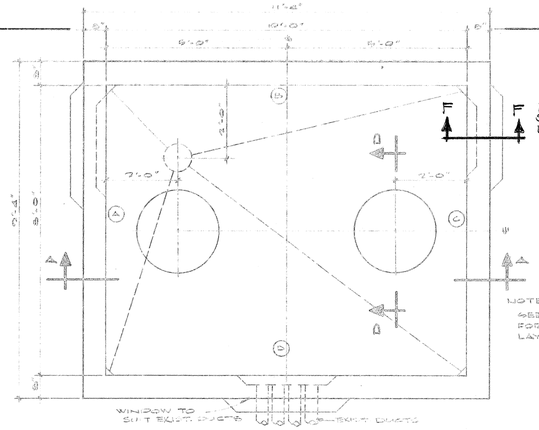
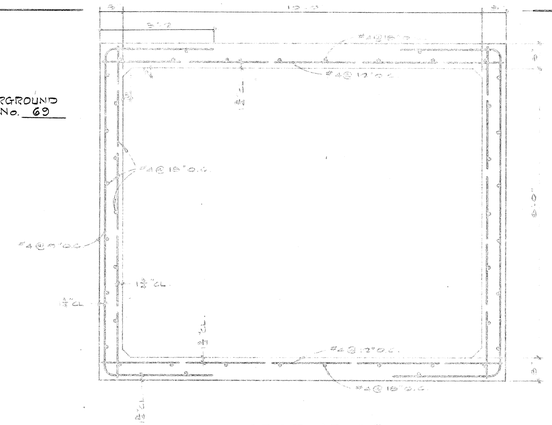
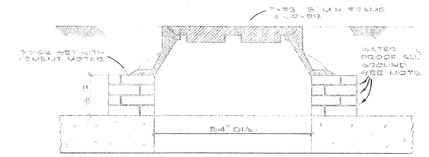
FED. AID DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(6) Unit 1	1965	67	129



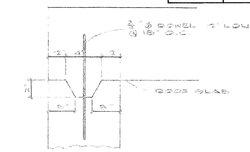
PLAN - ROADWAY AREAS
SCALE : 1/4"=1'-0"



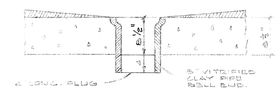
SECT. "B-B"
SCALE: 1/4"=1'-0"



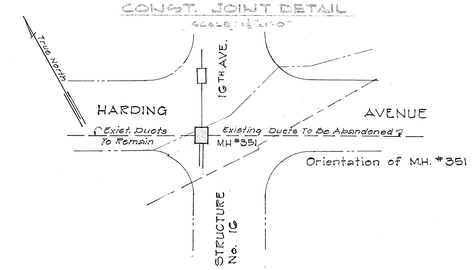
SECT. "D-D"
M.H. COVER DETAIL
SCALE: 1/2"=1'-0"



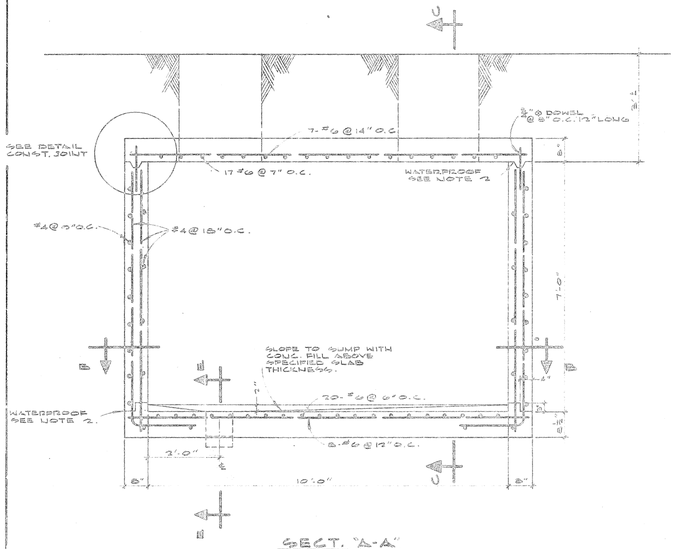
CONST. JOINT DETAIL
SCALE: 1 1/2"=1'-0"



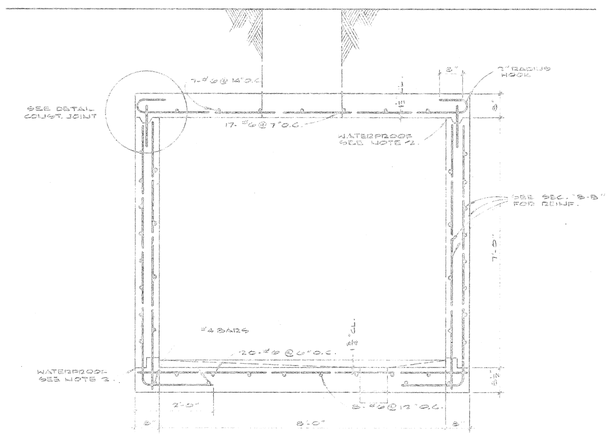
SECT. "E-E"
SCALE: 1/2"=1'-0"



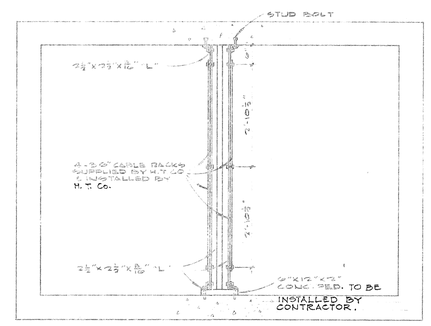
LOCATION MAP
Not to Scale



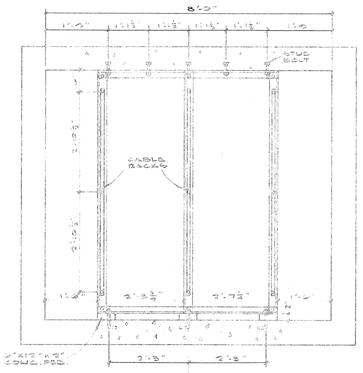
SECT. "A-A"
SCALE: 1/4"=1'-0"



SECT. "C-C"
SCALE: 1/4"=1'-0"

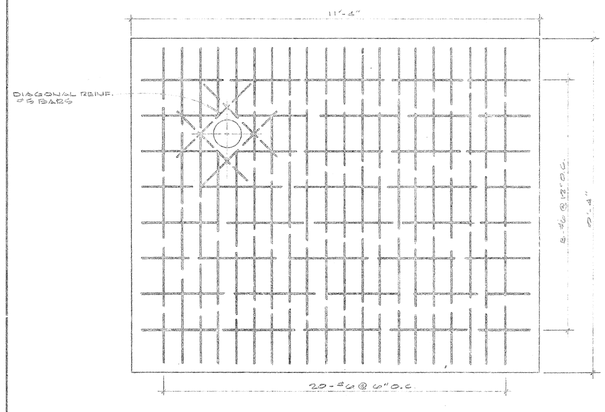


SECT. "G-G"
CENTER RACK
SCALE: 1/2"=1'-0"

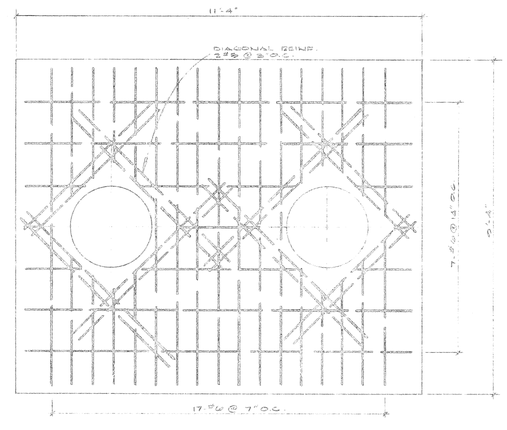


SECT. "H-H"
CENTER RACK
SCALE: 1/2"=1'-0"

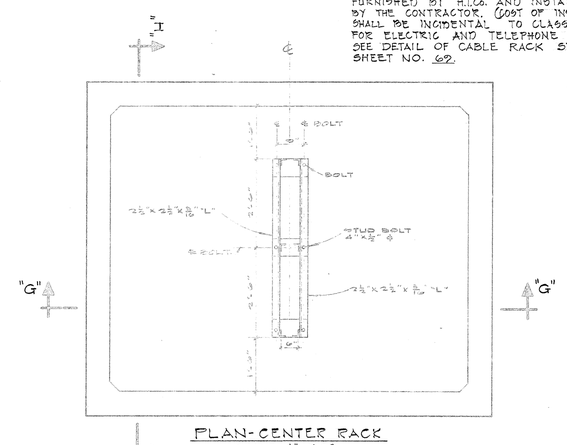
NOTE: ALL STUD BOLTS (4" x 1/2" ϕ) SHALL BE FURNISHED BY H.T.CO. AND INSTALLED IN PLACE BY THE CONTRACTOR. COST OF INSTALLING BOLTS SHALL BE INCIDENTAL TO CLASS "A-1" CONCRETE FOR ELECTRIC AND TELEPHONE STRUCTURES. SEE DETAIL OF CABLE RACK STUD BOLT ON SHEET NO. 69.



FLOOR SLAB REINF. PLAN
SCALE: 1/4"=1'-0"



ROOF SLAB REINF. PLAN
SCALE: 1/4"=1'-0"



PLAN-CENTER RACK
SCALE: 1/2"=1'-0"

GENERAL NOTES:

1. DESIGN DATA:
   fs = 20,000 PSI
   fc = 3,000 PSI, fc = 1,200 PSI
   n = 10
   W = EQUIV. FLUID PRESS = 30#/FT³
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO SEAL OR EQUAL.
3. FOR DUCT WINDOW LOCATION SEE PLAN PROFILE SHEETS FOR ELEVATIONS.
4. DUCT WINDOW TO SUIT. SEE PLAN & PROFILE & STANDARD DETAIL SHEETS FOR LOCATION & DETAIL.
5. FOR DUCT WINDOW DETAILS SEE SECTION "E-E" STANDARD UNDERGROUND DETAIL SHEET.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION.
HIGHWAYS DIVISION

MANHOLE No 351

INTERSTATE HIGHWAY (LUNALILO FWY) F.A.I. PROJ. No. I-H1-1(G) UNIT 1

Scale: As Shown Date: 1965

SHEET NO 14 OF 18 SHEETS

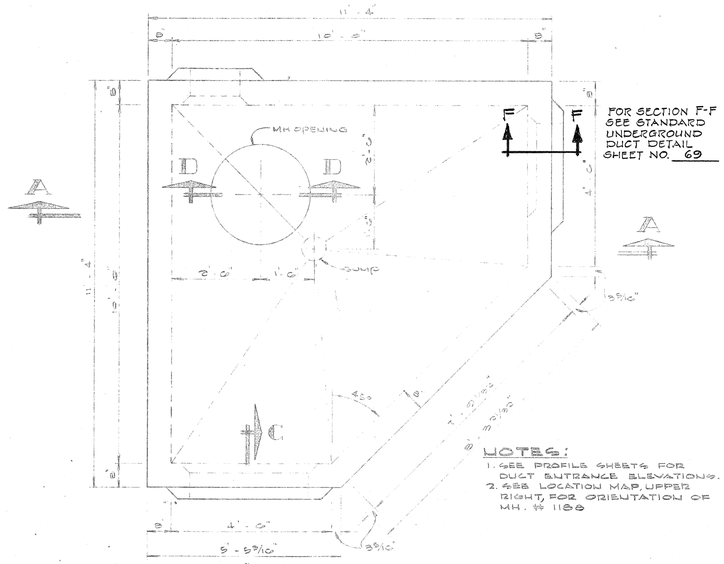
APPROVED:
OUTSIDE PLANT ENGINEER, HTCo., Ltd
4-30-65
DATE

TITLE	DR. R.Y.A.	ENG. P.A.W.	MANHOLE 351 HARDING AVE., CONC. 16TH
ASSIGNMENT	CHK.	TEL. 577-1788	
CONSTRUCTION			
MAINTENANCE	INDEX	APP'D.	
TOTAL POLE MILES	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 11-22-1964 SHEET OF	577-0002-1 D

SPEED GRADE

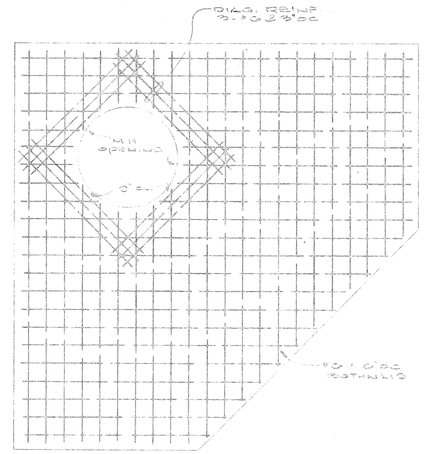
67

FED AID DIST. No.	STATE	FED AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(6) Unit 1	1965	68	129

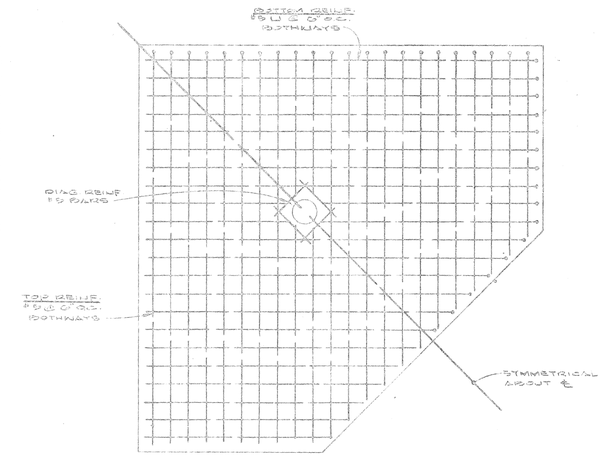


NOTES:
1. SEE PROFILE SHEETS FOR DUCT ENTRANCE ELEVATIONS.
2. SEE LOCATION MAP, UPPER RIGHT, FOR ORIENTATION OF MH. # 1188

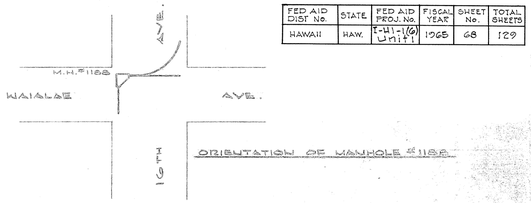
PLAN
SCALE: 1/2" = 1'-0"



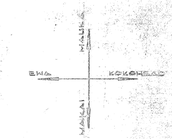
ROOF SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"

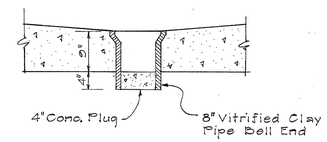


FLOOR SLAB REINF. PLAN
(SHOWING TOP & BOTTOM REINF.)
SCALE: 1/2" = 1'-0"

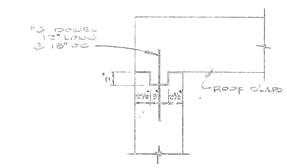


LOCATION MAP
Not To Scale

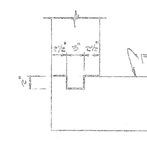




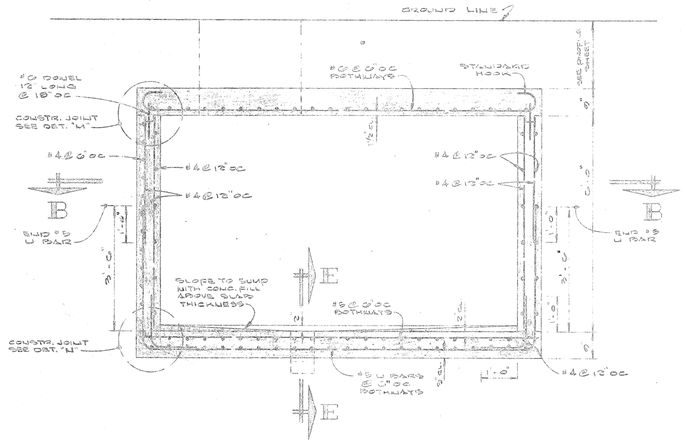
SECTION "E-E"
Scale: 3/4" = 1'-0"



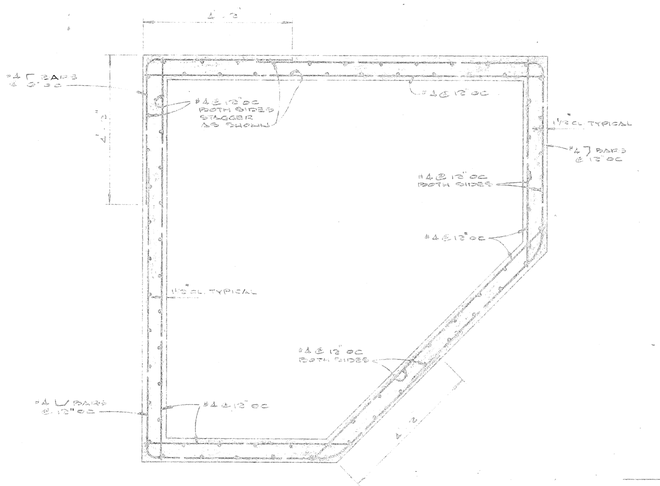
DETAIL "M"
(TOP CONSTR. JOINT DETAIL)
SCALE: 1" = 1'-0"



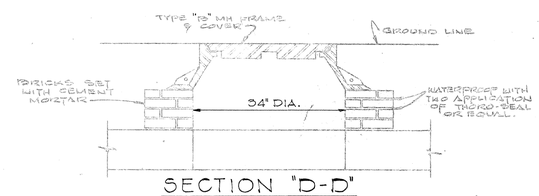
DETAIL "N"
(BOTTOM CONSTR. JOINT DETAIL)
SCALE: 1" = 1'-0"



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



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



SECTION "D-D"
SCALE: 3/4" = 1'-0"

GENERAL NOTES:

1. DESIGN DATA
   f_s = 20,000 PSI
   f'_c = 3,000 PSI
   f_c = 1200 PSI
   n = 15
   w = EQUIV. FLUID PRESSURE 30#/ft³
2. MINIMUM OVERLAP FOR A LAPPED SPLICE SHALL BE 30 BAR DIA. BUT NOT LESS THAN 12". LAP REINFORCEMENT BARS SHALL NOT BE IN SAME LOCATION.
3. UNLESS OTHERWISE INDICATED, FOR VERTICAL LOCATION OF DUCT WINDOWS SEE PROFILE SHT.
4. MANHOLE WALLS SHALL BE DOUBLE COURSE.
5. ALL CONCRETE SHALL BE CURED BY ALL IN ONE COAT LIQUID MEMBRANE COMPOUND.
6. CONCRETE SHALL NOT BE LOADED, EXCEPT AT ITS OWN WEIGHT, UNTIL 28 DAYS HAVE PASSED SINCE PLACEMENT.
7. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH THE APPLICATIONS OF THORO-SEAL OR EQUAL.
8. CAP ALL DUCTS & STUBOUTS.
9. CONCRETE SHALL BE CLASS A-1 & SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI IN 28 DAYS WITH A SLUMP OF 3".
10. CONCRETE ADMIXTURE SHALL BE, 2½ LBS. "TRIDOSEL NORMAL" PER CUBIC YARD.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MANHOLE No 1188

INTERSTATE HIGHWAY F.A.I. PROJ. No. I-H1-1(6) UNIT 1
(LUNALILO FWY)

Scale: As Shown Date: 1965

SHEET NO 15 OF 18 SHEETS

APPROVED:
4-30-65
OUTSIDE PLANT ENGINEER, H.T.Co., Ltd DATE

FILE
ASSISTANT
CONSTRUCTION
MAINTENANCE
TOTAL PERIODS

DR. RIA
CK. EPN 577-7821
INDEX APPD.

HAWAIIAN TELEPHONE COMPANY
HAWAII

MANHOLE 1188

DATE 2-17-64
SHEET OF

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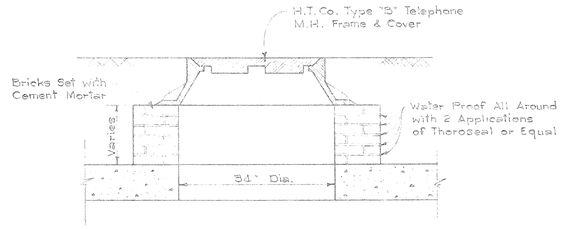
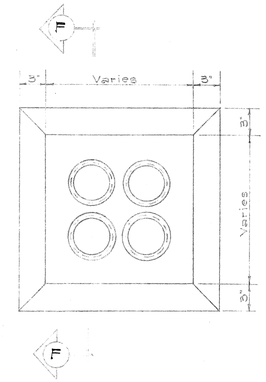
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) Unit 1	1965	60	120

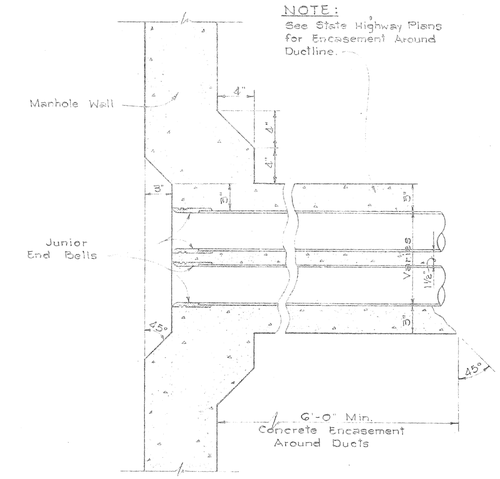


SECTION "D-D"
Scale: 3/4" = 1'-0"

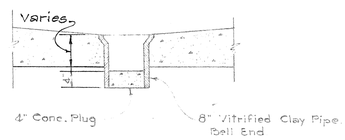
TELEPHONE M.H. COVER DETAIL



TYPICAL MANHOLE DUCT WINDOW
Scale: 1½" = 1'-0"

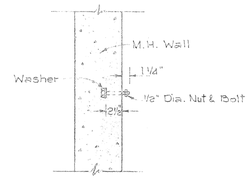


SECTION "F-F"
TYPICAL STUBOUT DETAIL & JUNIOR END BELL
Scale: 1½" = 1'-0"

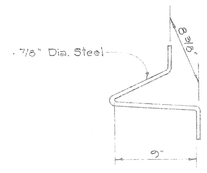


SECTION "E-E"
Scale: 3/4" = 1'-0"

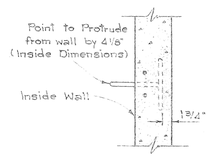
STANDARD SUMP DETAIL



CABLE RACK STUD BOLT DETAIL
Scale: 3/4" = 1'-0"

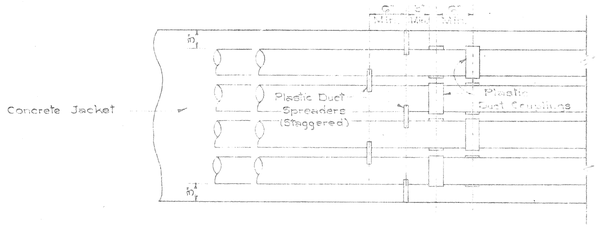


DETAIL PULLING-IN-IRON

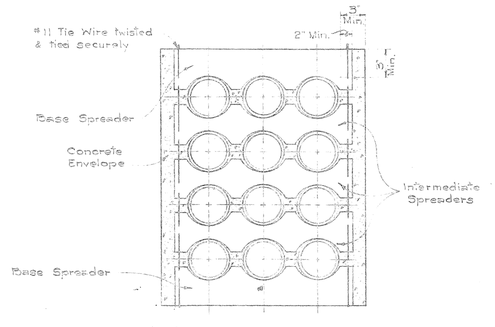


ELEV. DETAIL OF PULLING-IN-IRON

DETAIL OF PULLING-IN-IRON
Scale: 3/4" = 1'-0"



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



SECTION SHOWING SPACERS

APPROVED:
F. H. Rudd 4-30-65
OUTSIDE PLANT ENGINEER, H.T.Co., Ltd. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE

INTERSTATE HIGHWAY (LUNALILO FWY) F.A.I. PROJ. No. I-HI-1(6) UNIT 1
Scale: As Noted Date: 1965

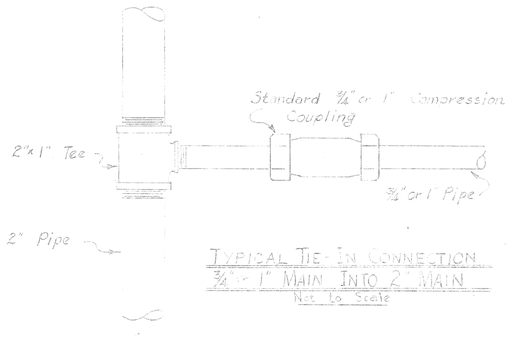
SHEET No. 16 OF 18 SHEETS

(60)

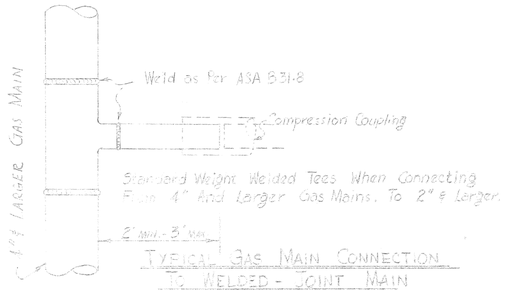
ORIGINAL PLAN		
	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

PRINTED ON NO. 1000N CLEARPRINT

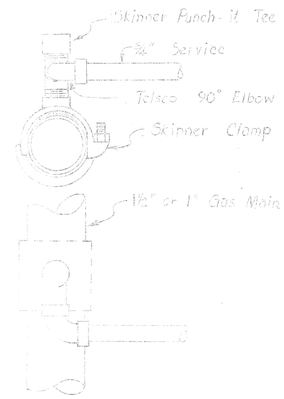
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) Unit 1	1965	70	120



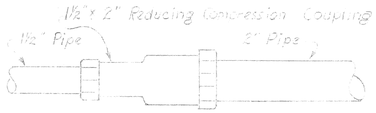
TYPICAL TIE-IN CONNECTION
¾"- 1" MAIN INTO 2" MAIN
Not to Scale



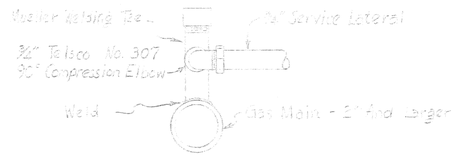
TYPICAL GAS MAIN CONNECTION
½" WELDED - JOINT MAIN
Not to Scale

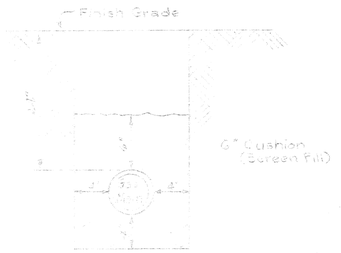


TYPICAL MAIN - SERVICE CONNECTION
½" or 1" MAIN
Not to Scale

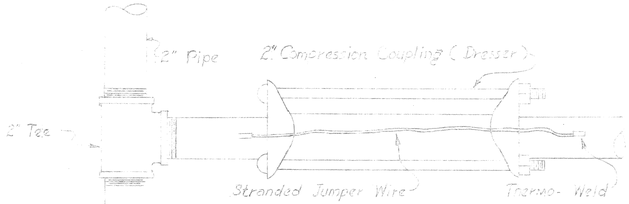


TYPICAL IN-LINE TIE-IN
1½" MAIN TO 2" MAIN
Not to Scale

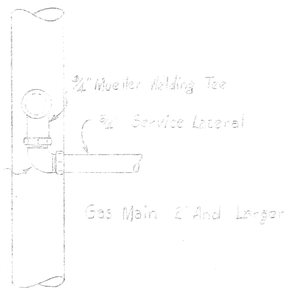




TYPICAL TRENCHING DETAIL
Not to Scale

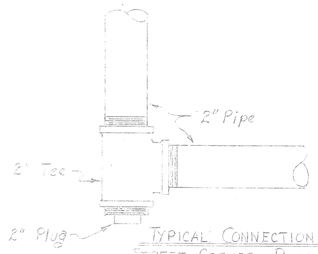


TYPICAL TIE-IN CONNECTION
2" MAIN INTO 2" MAIN
Not to Scale

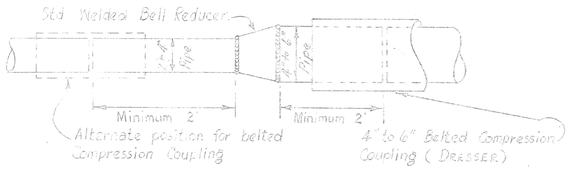


TYPICAL MAIN - SERVICE CONNECTION
Not to Scale

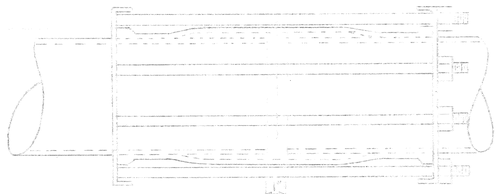
All gas service connections will consist of:
1. ¾" Mueller Welding Tee Welded to Main as shown.
2. ¾" Telsco No. 307 90° Compression Elbow. This is for services connections to Mains only.



TYPICAL CONNECTION, 2" MAIN AT STREET CORNER, PLUGGED TEE FOR PURGING
Not to Scale



TYPICAL IN-LINE TIE-IN
2" MAIN AND LARGER
Not to Scale



TYPICAL 6'-0" STYLE 40 DRESSER FOR EXPANSION JOINT
Not to Scale

TYPICAL CONNECTIONS OF GAS MAINS
Not to Scale

1. Compression couplings may be of insulating or non-insulating type. All such fittings to be primed & wrapped with Gasco approved materials
2. #12 stranded jumper wire will installed across all non-insulating compression couplings for 2" pipe & smaller. #6 stranded wire for larger pipes.
3. Unless specified install non-insulating type of compression coupling.

APPROVED:

Paul C. Jory 4/28/65
DIRECTOR OF DEVELOPMENT, HON. GAS Co. LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GAS DETAILS

INTERSTATE HIGHWAY F.A.I. PROJ. No. I-HI-1(G) UNIT 1
(LUNALILO FWY)

SCALE: AS SHOWN DATE: 1965

SHEET No. 17 OF 18 SHEETS

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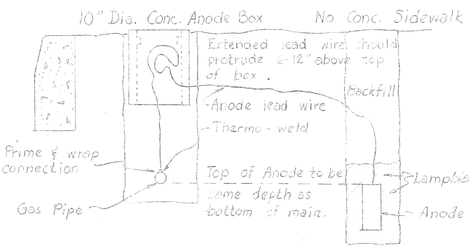
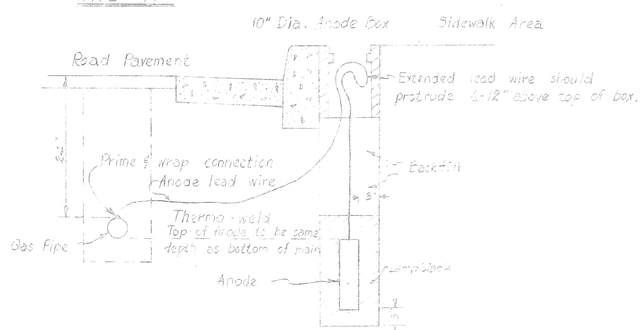
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL No.	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(6) Unit 1	1965	71	129

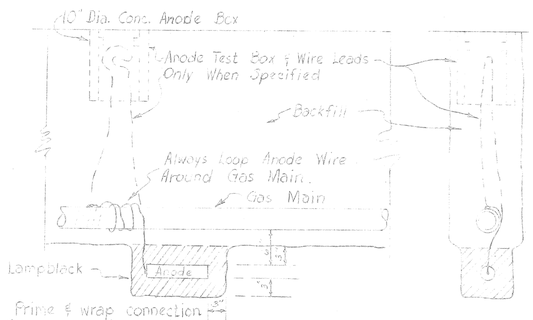
Note :
Offset word Gasco 1½" high ⅛" deep.



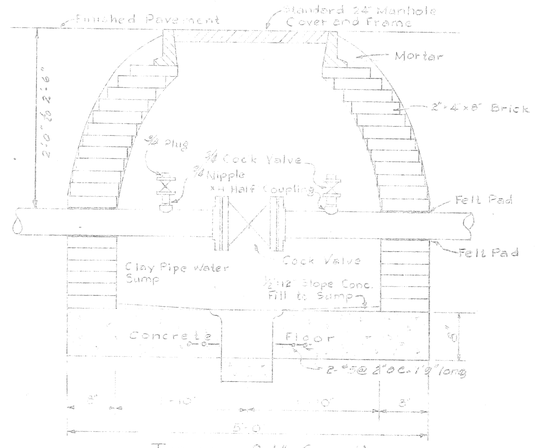
ANODE INSTALLATION
TYPE "A"
Not to Scale



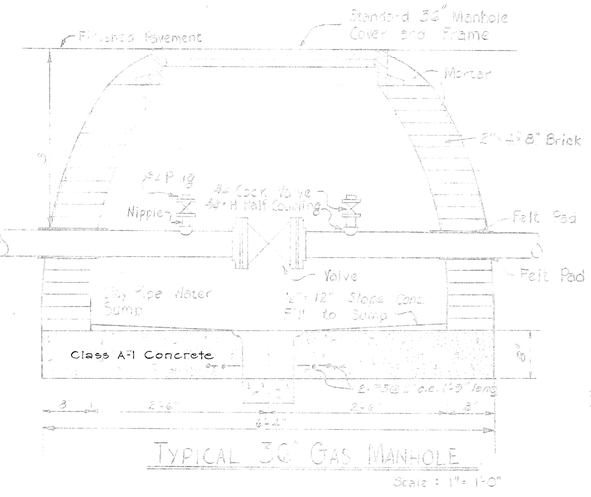
ANODE INSTALLATION
TYPE E
Not to Scale



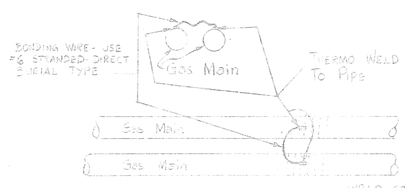
ANODE INSTALLATION
TYPE "C"
Not to Scale



TYPICAL 24" GAS MANHOLE
Scale : 1" = 1'-0"

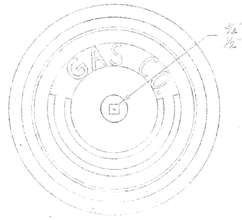


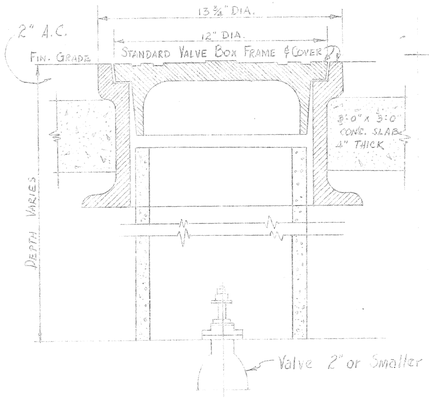
TYPICAL 36" GAS MANHOLE
Scale : 1" = 1'-0"



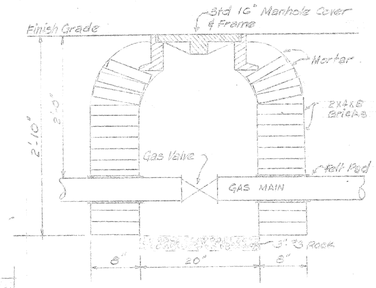
WRAP COMPLETED CONNECTION WITH GASCO APPROVED PRIMER AND TAPE

TYPICAL BOND CONNECTION
Not to Scale

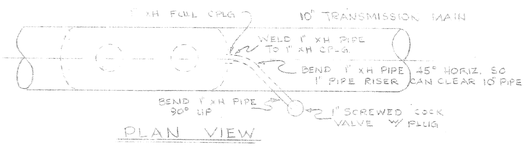




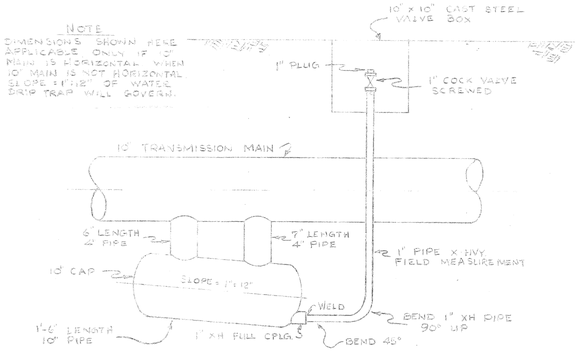
TYPICAL DETAIL OF VALVE BOX FOR 2" GAS VALVE AND SMALLER



TYPICAL 16" GAS MANHOLE
Scale: 1" = 1'-0"



PLAN VIEW



ELEV. VIEW

TYPICAL WATER DRIP
Scale : 1" = 1'-0"

APPROVED:
Paul C Jay
DIRECTOR OF DEVELOPMENT, HON. GAS Co. LTD.
4/28/65
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GAS DETAILS

INTERSTATE HIGHWAY (LUNALILO FWY)
F.A.I. PROJ. No. I-H1-1(G) UNIT 1

SCALE: AS SHOWN
DATE: 1965

SHEET No. 18 OF 18 SHEETS

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