FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	41	202

LEGEND

ELECTRIC & TELEPHONE UTILITIES

- E.P. — Existing Elec. or Tel. pole
- T.P. — Existing Elec. or Tel. pole to be removed
- E.P. — New Electric or Telephone pole
- Existing pole with existing anchor
- Existing pole with new anchor
- New pole with new anchor
- Existing Pull box or Service box
- New Pull box or Service box
- Existing Manhole or Handhole
- New Manhole or Handhole
- —Tr——Tr— Trench only for Direct Burial
- —TrC——GIP— Direct Burial; Transite conduit or Galv. Iron Pipe
- —TrC—GIP—TrC— Direct Burial; Transite conduit with Galv. Iron Pipe
- —TrC——GIP— Concrete encased or capped duct with Direct Burial Transite Conduit or Galv. Iron Pipe
- All other concrete encased or capped ducts
- N. I. C. Not in contract

SEWER, WATER, & GAS UTILITIES

- ---S-----G-- Existing Sewer Line to remain
- —S——G— New Sewer Line
- ---W-----G-- Existing Water Line to remain
- —W——G— New Water Line
- ---G-----E-- Existing Gas Line to remain
- —G——E— New Gas Line
- ----------// Cut/Plug or Plug Existing Utility Line
- /--/--/--/-- Existing Abandoned Utility Line
- (S) SMH — Existing (Sewer, Water, Gas) Manhole
- (S) SMH — Existing (Sewer, Water, Gas) Manhole to be adjusted
- (S) SMH — New (Sewer, Water, Gas) Manhole
- WM — Existing Water Meter
- WM — New Water Meter
- FH — Existing Fire Hydrant
- FH — New Fire Hydrant
- A.I.P. — Cut and Abandon in Place Existing Utility Line
- Remove — Existing Utility Line to be removed
- C.L. — New Conduit For Board of Water Supply Control Line.
- New Pullbox For Board of Water Supply Control Line.

GENERAL UTILITY NOTES

WATER

1. The Contractor shall notify the Board of Water Supply in writing 10 working days prior to commencing work on the water system.
2. Existing Water Lines shown on the 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.
3. The Contractor shall arrange with the Board of Water Supply to cut off existing unused service laterals and remove meter boxes and appurtenances prior to commencement of clearing and grading operations.
4. Asterisk (*) indicates work will be performed by BWS. Materials shall be furnished by the Contractor unless specified as "relocated."
5. The Contractor shall plug the ends of abandoned water mains with class "B-1" concrete. Costs of cutting and plugging shall be incidental to the various contract items for the water system.
6. Water lines and other parallel utility lines shall have a minimum 3.0 feet horizontal clearance. Where water lines and other utility lines cross, there shall be a minimum 6" vertical clearance.
7. The minimum clearance between fire hydrants and utility poles or light standards shall be 3.0 feet.
8. Prior to trenching for new or relocated mains, the Contractor shall expose existing water mains at crossings and connections to new or relocated mains to verify their locations and depths. Hand excavating shall be utilized wherever excavation around an existing live water main is required.
9. The Contractor shall notify the Board of Water Supply in writing at least 5 working days prior to the date work is required on the control cable.

SEWER

1. The Contractor shall notify the Division of Sewers in writing 2 working days prior to commencing work on the sewer system.
2. Existing Sewer Lines shown on the plans are approximate only. The Contractor shall verify their actual locations and shall make adjustments to any new or existing sewer facility as directed by the Engineer.
3. If existing laterals other than those shown on the plans are exposed during construction, they shall be cut and plugged or extended and reconnected as directed by the Engineer.
4. All services from existing sewer mains which are to be abandoned or removed shall be connected to new sewer mains if services are required.
5. Location of laterals and wyes on new sewer lines shall be as designated by the Engineer.
6. Concrete jackets shall be constructed a minimum of one foot beyond the edges of footings, piers, box culverts, etc., or as directed by the Engineer.
7. Existing sewer manhole frames and covers designated as "Relocate" shall be removed, cleaned and reinstalled at new manholes shown on the plans. All 24" frames and covers shall be used before 21" frames and covers are used. Excess frames and covers not required for relocation shall be disposed of by the Contractor at his expense.

ELECTRIC AND TELEPHONE

1. The Contractor shall notify each utility in writing 10 working days prior to commencing work on their respective utility system.
2. 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.
3. 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.
4. 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.
5. Unless otherwise shown on the plans, the minimum depth of duct lines from finished grade to:
   (a) Top of concrete jacket where ducts are concrete encased = 2'-0."
   (b) Top of ducts not encased in concrete (direct burial) = 1'-6."
   (c) Top of steel conduits (direct burial) = 1'-6."
6. Final depth of all pull boxes, service boxes, handholes and manholes shall be determined in the field by the Engineer.
7. Anchor holes shall be backfilled by the Contractor.
8. For ducts encased in concrete jackets a 3" minimum clearance between H.E. Co. and H.T. Co. ducts shall be maintained.
9. 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.

GAS

1. The Contractor shall notify the Honolulu Gas Company Ltd., in writing 5 working days prior to commencing work on the gas system.
2. On this project a major portion of the relocation of the gas system will be done by the utility company's forces. The Contractor and the utility company shall mutually coordinate the work to minimize conflicts and delays to either party.
3. The existing gas lines shown on the plans are approximate only. The Contractor shall verify their actual locations and shall make adjustments to any new or existing gas facility as directed by the Engineer.
4. Cutting, plugging and reconnecting of live gas lines will be done by the Honolulu Gas Company, Ltd.
5. There shall be at least 2" 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 Company Ltd., approved insulating material.

SIGNAL CORPS

1. On this project a major portion of the relocation of the U.S. Army Signal Corps' facilities will be done by their own forces or by their own contractor. The State's Contractor and the Signal Corps shall mutually coordinate the work to minimize conflicts and delays to either party.

APPROVED:

W Henderson for F.A.K. HAWAIIAN ELECTRIC Co., Inc.	6-15-66 DATE
R. Mau for F. H. Judd OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6/14/66 DATE
D. K. Kawakami ASSISTANT CHIEF ENGINEER BWS	6/16/66 DATE
D. Lowe for SEWER SYSTEM DIRECTOR DIV. OF SEWERS	6/21/66 DATE
Howard C. Wilkinson DIRECTOR OF DEVELOPMENT HONOLULU GAS Co., Ltd.	6/14/66 DATE
Lowell K. Nagi for SIGNAL OFFICER U.S. ARMY-HAWAII	15 June 66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LEGEND AND GENERAL UTILITY NOTES

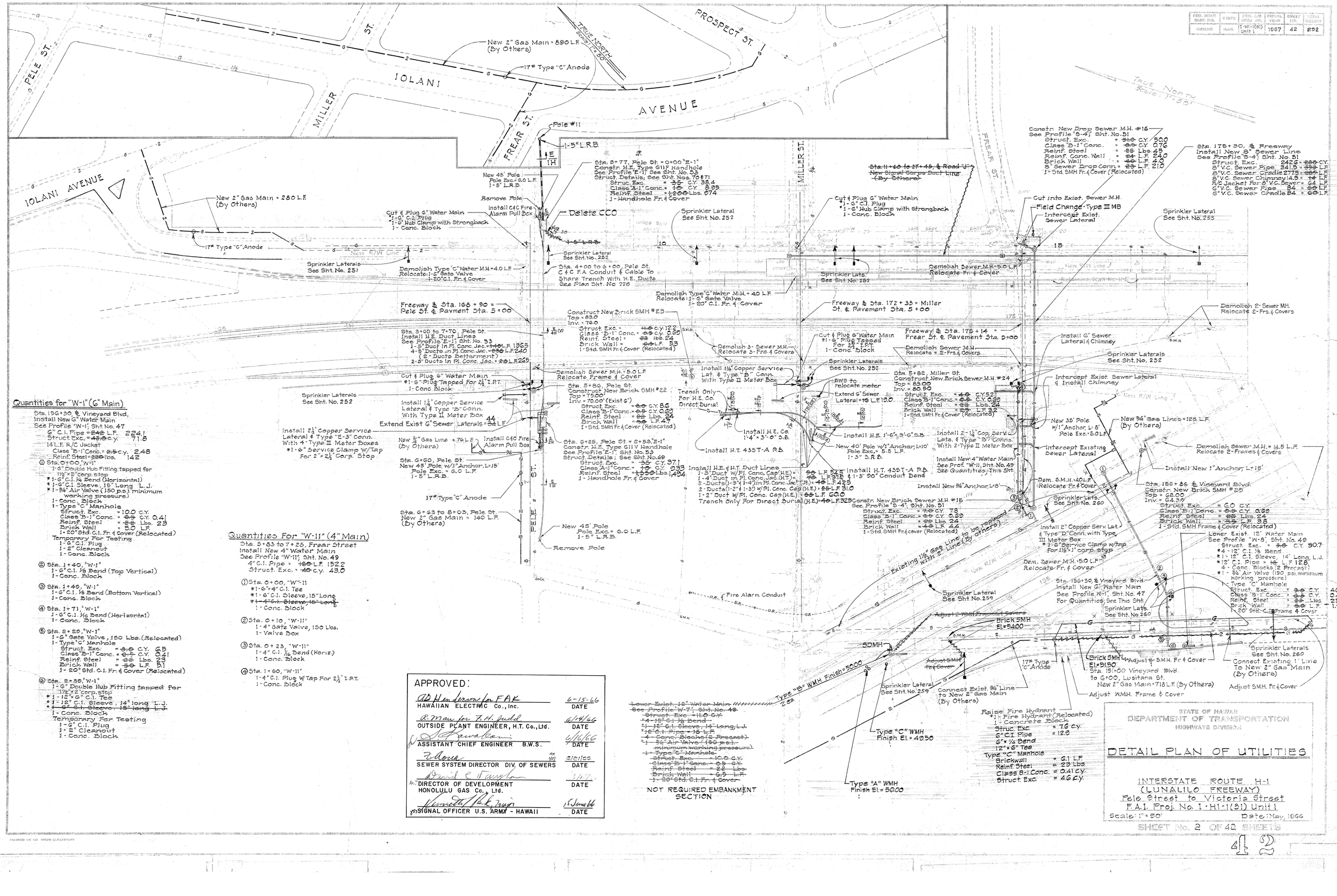
INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31), Unit 1
Date: May, 1966

SHEET No. 1 OF 42 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	H.W.	H-HI-1(36) Unit 1	1967	42	252



Quantities for "W-1" (6" Main)

Sta. 1+90 ℄ Vineyard Blvd.
Install New 6" Water Main
See Profile "W-1", Sht. No. 47
6" C.I. Pipe = 242 L.F. 224.1
Struct. Exc. = 42.0 c.y. 71.8
14 L.F. R/C Jacket
Class "B-1" Conc. = 2.5 c.y. 2.48
Reinf. Steel = 220 lbs. 142

① Sta. 0+00, "W-1"
1-6" Double Hub Fitting Tapped for 1½"×2" Corp. Stop
#1-6" C.I. ¼ Bend (Horizontal)
#1-6" C.I. Sleeve, 15" Long L.J.
#1-3¼" Air Valve (150 p.s.) minimum working pressure)
1-Conc. Block
1-Type "C" Manhole
Struct. Exc. = 10.0 C.Y.
Class "B-1" Conc. = 0.5 C.Y. 0.41
Reinf. Steel = 22 Lbs. 23
Brick Wall = 5.0 L.F.
1-20" Std. C.I. Fr. & Cover (Relocated)
Temporary For Testing
1-6" C.I. Plug
1-2" Cleanout
1-Conc. Block

② Sta. 1+40, "W-1"
1-6" C.I. ⅛ Bend (Top Vertical)
1-Conc. Block

③ Sta. 1+40, "W-1"
1-6" C.I. ⅛ Bend (Bottom Vertical)
1-Conc. Block

④ Sta. 1+71, "W-1"
1-6" C.I. ⅛ Bend (Horizontal)
1-Conc. Block

⑤ Sta. 2+20, "W-1"
1-6" Gate Valve, 150 Lbs. (Relocated)
1-Type "C" Manhole
Struct. Exc. = 3.0 C.Y. 6.5
Class "B-1" Conc. = 0.5 C.Y. 0.41
Reinf. Steel = 22 Lbs. 23
Brick Wall = 5.0 L.F. 5.1
1-20" Std. C.I. Fr. & Cover (Relocated)

⑥ Sta. 2+30, "W-1"
1-6" Double Hub Fitting Tapped for 1½"×2" corp. stop
#1-12"×6" C.I. Tee
#3-12" C.I. Sleeve, 14" long L.J.
#1-6" C.I. Sleeve, 15" long L.J.
1-Conc. Block
Temporary For Testing
1-6" C.I. Plug
1-2" Cleanout
1-Conc. Block

Quantities For "W-11" (4" Main)

Sta. 5+83 to 7+25, Frear Street
Install New 4" Water Main
See Profile "W-11", Sht. No. 49
4" C.I. Pipe = 160 L.F. 152.2
Struct. Exc. = 40 c.y. 43.0

①Sta. 0+00, "W-11
#1-6"×4" C.I. Tee
#1-6" C.I. Sleeve, 15" Long
#1-4" C.I. Sleeve, 15" Long
1-Conc. Block

②Sta. 0+10, "W-11"
1-4" Gate Valve, 150 Lbs.
1-Valve Box

③Sta. 0+23, "W-11"
1-4" C.I. ⅛ Bend (Horiz.)
1-Conc. Block

④Sta. 1+60, "W-11"
1-4" C.I. Plug W/Tap For 2½" I.P.T.
1-Conc. Block

APPROVED:

HAWAIIAN ELECTRIC Co., Inc.	6-15-66 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6/14/66 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	6/16/66 DATE
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	6/21/66 DATE
for DIRECTOR OF DEVELOPMENT HONOLULU GAS Co., Ltd.	6/17/66 DATE
SIGNAL OFFICER U.S. ARMY - HAWAII	15 June 66 DATE

ORIGINAL SURVEY PLOTTED BY
FIELD SURVEY CHECKED BY
NOTE BOOK
DESIGNED BY
QUANTITIES BY
CHECKED BY
No. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-H1-1(31) Unit 1
Scale: 1" = 50' Date: May, 1966
SHEET No. 2 OF 42 SHEETS

PRINTED ON NO. TEECON CLEARPRINTS

42

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	(1)H-1(31) Unit 1	1967	43	202

Sta. 21+97 to 26+05, ℄ Road "J"
Install New 12" Water Main
See Profile "W-2", Sht. No. 47
12" C.I. Pipe = ~~624~~ L.F. 564.5
Struct. Exc. = ~~210~~ C.Y. 267.3

① Sta. 0+00, "W-2"
*1-18"x12" C.I. Tee
*1-18" C.I. Sleeve, 14" long L.J.
*1-12" C.I. Sleeve, 14" long L.J.
1-Conc. Block
Temp. For Testing
1-12" C.I. Plug
1-2" Cleanout
1-Conc. Block

② Sta. 0+08, "W-2"
1-12" C.I. ⅛ Bend
1-Conc. Block

③ Sta. 0+39, "W-2"
1-12" Gate Valve 150 lbs.
1-Type "B" Manhole
Struct. Exc. = ~~4.0~~ C.Y. 7.0
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~68~~ Lbs. 23
Brick Wall = ~~5.5~~ L.F. 4.5
1-20" C.I. Fr. & Cover

④ Sta. 0+38, "W-2"
1-12" C.I. ⅛ Bend
1-Conc. Block

⑤ Sta. to Sta. 1+ "W-2"
2-12" Offsets 24" drop, B.B.
2-Conc. Blocks
1-¾" Air Valve (150 p.s.i. min. working pressure)
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 7.7
Cl "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~68~~ Lbs. 23
Brick Wall = ~~4.5~~ L.F. 4.0
1-20" C.I. Fr. & Cover

⑥ Sta. 6+02, "W-2"
*1-12" C.I. ⅛ Bend
1-Conc. Block

⑦ Sta. 6+12, "W-2"
*1-~~12~~ 6" Offset, 18" Drop 12" Sleeve
1-Conc. Block

⑧ Sta. 6+20, "W-2" CCO "54
*1-12" Sleeve, 14" long L.J.
*1-¾" Air Valve (150 p.s.i. min. working pressure)
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 5.6
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~22~~ Lbs. 23
Brick Wall = ~~4.5~~ L.F. 4.0
1-20" C.I. Fr. & Cover
Temporary For Testing
1-12" C.I. Plug
1-2" Cleanout
1-Conc. Block

1½" Copper Pipe 261 L.F.

17" Type "C" Anode

New 2" Gas Main = 550 L.F. (By Others)

Construct Type "C" W.M.H. & Install Fire Hydrant #180
Struct. Exc. = ~~6.0~~ C.Y. 44.2
*1-6" C.I. Pipe = ~~19~~ L.F. 15.0
*1-20" C.I. Sleeve, 14" Long L.J.
*1-20"x6" B.O. C.I. Tee
*1-6" Gate Valve (Relocated)
*1-Fire Hydrant #180 (Relocated)
*1-6" C.I. ¾ Bend
5-Conc. Blocks
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 8.5
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~68~~ Lbs. 23
Brick Wall = ~~4.5~~ L.F. 5.0
1-20" C.I. Fr. & Cover (Relocated)

Demolish Type "C" W.M.H. = 60 L.F.
Remove & Relocate:
1-6" Gate Valve
1-Fire Hydrant #180
1-6" C.I. Pipe
1-20" C.I. Fr. & Cover

~~Install 1½" Copper Serv. Lat. & Type "B" Conn. with Type II Meter Box~~

Adjust W.M.H. Fr. & Cover

Sprinkler Lateral See Sht. No. 254

Cut & Plug 6" Water Main
*1-6" C.I. Plug
*1-6" Hub Clamp w/Strongback
1-Conc. Block

Demolish Type "C" W.M.H.
Remove & Relocate:
1-Fire Hydrant #180
1-6" Gate Valve
1-20" C.I. Fr. & Cover

Demolish Sewer M.H.
Relocate Fr. & Cover

~~CCO #36 2nd See Sheet 46B~~
~~Construct New Brick Sewer M.H. #14~~
~~See Profile "S-2", Sht. No. 50~~
~~Struct. Exc. = 9.0 C.Y.~~
~~Class "B-1" Conc. = 0.5 C.Y.~~
~~Reinf. Steel = 22 Lbs.~~
~~Brick Wall = 6.0 L.F.~~
~~1-Std. S.M.H. Fr. & Cover (Relocated)~~

Construct New Brick SMH # 26
Top = 70.50
Inv. = 66.86
Struct. Exc. = ~~6.0~~ C.Y. 6.7
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ lbs. 24
Brick Wall = ~~3.0~~ L.F. 3.9
1-Std. SMH Fr. & Cover (Relocated)

New 1½" BWS Control Line See Detail Plan Sht. No. 46

New 18" & 20" Water Mains See Detail Plan Sht. No. 46

Sprinkler Lats. See Sht. No. 261

Demolish 2-Sewer M.H. Relocate 2-Frs. & Covers

Dem. Type "C" W.M.H. = 5.0 L.F.
Remove & Relocate:
1-Fire Hydrant #181
1-6" Gate Valve
1-20" C.I. Fr. & Cover

Install 1-4" C.I. Plug With 2½" I.P.T. & 1-Conc. Block

Install H.E. 1'-4"x3'-0" S.B.
Install H.T. 435 T-A P.B.

New 2" & 1" Gas Line 40 L.F. 2" Pipe, 40 L.F. 1" Pipe (By Others)

Extend 5.0 L.F. 6" Sewer Lateral

Install New 1" Anchor, L=15'

Install New 4" Water Main
See Profile "W-12", Sht. No. 49
4" C.I. Pipe = ~~225~~ L.F. 219.1
Struct. Exc. = ~~56~~ C.Y. 48.1

Two 1½" Copper Service Laterals & Type "B" Conn. With Two Type II Meter Boxes (By BWS, N-1-69)

Install New 1" Anchor, L=50'

LAUHALA ST.

LUSITANA ST.

Install 1-4" Gate Valve, 150# & 1-Valve Box

Install 1-4" C.I. ⅛ Bend (Horiz.) & 1-Conc. Block

Install:
*1-12"x4" C.I. Tee
*1-12" C.I. Sleeve, 14" Long
~~*1-4" C.I. Sleeve, 12" Long~~
1-Conc. Block

Install H.E. & H.T. Duct Lines
1-3" Duct W/Pl. Cond. Csp (H.E.) = ~~150~~ 155 L.F.
1-1" G.I. Pipe, Direct Burial (H.T.) = 35 L.F.
1-3" Duct W/Pl. Conc. Cap & 1-1" G.I.P., Direct Burial (J-t) = ~~110~~ L.F. 40.0
~~185.0~~

Install 1½" Copper Serv. Lat. & Type "C" Conn. With Type II Meter Box

Install H.E. 1'-6"x3'-6" S.B.
& 1-3" S.R.B.

Install New 1" Anchor, L=10'

Install H.T. 435 T-A P.B.

Install 2" Copper Service Lateral & Type "D" Conn. With Type III Meter Box

Construct Type "C" W.M.H. & Install Fire Hydrant #181
Struct. Exc. = ~~2.0~~ C.Y. 19.2
*1-6" C.I. Pipe = ~~14~~ L.F. 17.1
*1-18" C.I. Sleeve, 15" Long L.J.
*1-18"x6" C.I. Tee
*1-6" Gate Valve (Relocated)
*1-Fire Hydrant #181 (Relocated)
2-Conc. Blocks
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 5.9
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~68~~ Lbs. 23
Brick Wall = ~~6.0~~ L.F. 4.5
1-20" C.I. Fr. & Cover (Relocated)

Construct New Brick SMH #28
Top = 55.90
Inv. = 47.64
Struct. Exc. = ~~3.0~~ C.Y. 14.9
Class B-1 Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = ~~7.5~~ L.F. 8.7
1-Std. S.M.H. Fr. & Cover (Reloc.)

Exist. H.T.M.H. #563

Install 2-4" H.T. 90° Bends

Install 2-4" H.T. Ducts in Pl. Conc. Jacket = 85 L.F.

To Kimau St.

M.L.B.

Demolish 3-Type "A" W.M.H. = 16 L.F.
Remove & Relocate:
3-60' Gate Valves
3-20' C.I. Fr. & Cover

Demolish Sewer M.H.
Relocate Fr. & Cover

Construct New Brick SMH #27
Top = 68.50
Inv. = ~~62.23~~ 65.00
Struct. Exc. = ~~8.0~~ C.Y. 6.2
Class B-1 Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = 22 Lb. 24
Brick Wall = ~~5.0~~ L.F. 3.0
1-Std. S.M.H. Fr. & Cover (Relocated)

Install 6" Sewer Lats. @ 1.00% Slope

Construct New Brick Sewer M.H. #21
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~4.0~~ C.Y. 3.7
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = 3.0 L.F.
1-Std. SMH Fr. & Cover (Relocated)

Sprinkler Lat. & MH. See Sht. No. 254

Install 1½" Copper Serv. Lateral & Type "C" Conn. With Type II Meter Box

Demolish Sewer M.H. Relocate Fr. & Cover = 5.0 L.F.

Install H.E. 1'-6"x3'-6" S.B. & 1-3" S.R.B.

Install New 1" Anchor, L=10'

Install H.T. 435 T-A P.B.

Install 2" Copper Service Lateral & Type "D" Conn. With Type III Meter Box

Construct Type "C" W.M.H. & Install Fire Hydrant #180
Struct. Exc. = ~~6.0~~ C.Y. 8.9
6" C.I. Pipe = ~~19~~ L.F. 21.6
*1-6" C.I. ¾ Bend
1-Fire Hydrant (Relocated)
1-6" Gate Valve (Relocated)
5-Conc. Blocks
1-Type "C" Manhole
Struct. Exc. = ~~7.0~~ C.Y. 6.2
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~22~~ Lbs. 23
Brick Wall = ~~6.0~~ L.F. 4.6
1-20" C.I. Fr. & Cover (Relocated)

Construct New Brick Sewer M.H. #12
See Profile "S-2", Sht. No. 50
Struct. Exc. = ~~12.0~~ C.Y. 7.2
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = 6.0 L.F.
1-Std. SMH Fr. & Cover (Relocated)

Cut & Plug 12" W.
*1-12" C.I. Plug (Relocated)
1-Conc. Block

New Fire Alarm Conduit See Plan Sht. No. 229

Sprinkler Laterals See Sht. No. 255

Sprinkler Lateral See Sht. No. 254

Cut Into Exist. Sewer M.H.

Sta. 11+60 to 27+45, ℄ Road "J"
New Signal Corps Duct Line (By Others)

See Sheet 46B for Realignment

Sta. 20+36 to 35+25, ℄ Road "J"
Install 8" & 10" Sewer Line
See Profile "S-2", Sht. No. 50

(CCO "36 2nd)
Struct. Exc. = ~~7.0~~ C.Y. 105.6
10" V.C. Sewer Pipe = ~~8.46~~ L.F. 760.5
10" V.C. Sewer Cradle = ~~6.16~~ L.F. 79.0
R/C Jacket For 10" V.C. Sewer = 28 L.F.

(CCO "36 2nd)
8" V.C. Sewer Pipe = ~~6.50~~ L.F. 685.0
8" V.C. Sewer Cradle = ~~4.96~~ L.F. 53.0

(CCO "36 2nd)
R/C Jacket For 8" V.C. Sewer = ~~14~~ L.F. 49.0

Constr. H.T. Type T-1 Handhole
See Detail Sht. No. 77
Struct. Exc. = ~~1.0~~ C.Y. 8.0
Class "A-1" Conc. = ~~0.5~~ C.Y. 1.85
Reinf. Steel = ~~2.70~~ Lbs. 265
1-Type 1 H.H. Fr. & Cover
2-5" 90° Conduit Bends

Constr. New Shallow Drop S.M.H. #11
See Profile "S-2", Sht. No. 50
Struct. Exc. = ~~1.0~~ C.Y. 2.8
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~2.2~~ Lbs. 24
Brick Wall = ~~4.0~~ L.F. 5.1
9' Sewer Drop Conn. = ~~4.0~~ L.F. 9.0
Reinf. Conc. Wall = ~~3.0~~ L.F. 2.0
1-Std. SMH Fr. & Cover (Relocated)

Install New 8" Sewer Line
See Profile "S-2", Sht. No. 50
Struct. Exc. = 60.5 C.Y.
8" V.C. Sewer Pipe = ~~75~~ L.F. 70
8" V.C. Sewer Cradle = ~~75~~ L.F. 70

Install 2-4" H.T. Ducts in Pl. Conc. Jacket = ~~85~~ L.F. 83

Sprinkler Lateral see Sht. No. 255

Install H.T. Type 1457-A Pull Box & 2-3" 90° Bends

New 50' Pole w/⅝" S.W. Anchor
Pole Exc. = 6.5 L.F.

New 45' Pole
Pole Exc. = 6.0 L.F.

New 50' Pole
Pole Exc. = 6.5 L.F.

New 45' Pole w/1" Anchor, L=15'
Pole Exc. = 6.0 L.F.

Construct Type "C" W.M.H. & Install Fire Hydrant #183
Struct. Exc. = ~~6.0~~ C.Y. 7.1
*1-12" C.I. Sleeve, 14" Long L.J.
*6" C.I. Pipe = ~~14~~ L.F. 13.6
*1-12"x6" C.I. Tee
*1-18"x6" C.I. Tee
*1-6" Gate Valve (Relocated)
*1-Fire Hydrant (Relocated)
3-Conc. Blocks
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 5.2
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~68~~ Lbs. 23
Brick Wall = ~~4.5~~ L.F. 3.8
1-20" Std. C.I. Fr. & Cover (Relocated)

Install 1½" Copper Serv. Lat. & Type "B" Conn. with Type II Meter Box

Fire Alarm System See Sht. Nos. 151 & 229

Intercept Exist Sewer Lats.

Construct New R/C Sewer M.H. #10
See Profile "S-2", Sht. No. 50
See Detail Sht. No. 66
Struct. Exc. = ~~16.0~~ C.Y. 15.8
Class "A-1" Conc. = ~~4.5~~ C.Y. 4.3
Reinf. Steel = ~~390~~ lbs. 343
1-Type "SA" SMH Fr. & Cover

Construct New Plain Sewer M.H. #18
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~16.0~~ C.Y. 15.8
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = ~~4.0~~ L.F. 5.5
Reinf. Conc. Wall = ~~4.0~~ L.F. 6.6
1-Std. SMH Fr. & Cover (Relocated)

Construct New Brick Sewer M.H. # 17
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~14.0~~ C.Y. 8.6
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = ~~6.0~~ L.F. 7.8
1-Std. SMH Fr. & Cover (Relocated)

Install Two 1½" Copper Serv. Lateral & Type "C" Conn. W/2 Type II Meter Boxes

Extend Existing 6" Sewer Laterals = ~~55~~ L.F. 66

Demolish Type "C" W.M.H.
Relocate 2-Frs. & Covers

Demolish Type "C" W.M.H.
Remove & Relocate:
1-Fire Hydrant #180
1-6" Gate Valve
1-20" C.I. Fr. & Cover

Sta. 1+53 "W-6"
New Fire Hydrant
1-8"x6" Tee
1-6" G.V. 150 Lbs.
1-F.H. 4.5' ht.
20.3 ~~18~~ L.F. 6" C.I. Pipe
1-Valve Box
2-Conc. Blocks
Struct. Exc. = ~~6.0~~ C.Y. 5.8

Sta. 0+20, "Road K" to G+02 "Ward Ave."
Install 8" Sewer Main
See Profile "W-6", Sht. No. 49
8" C.I. Pipe = ~~6.0~~ 6.0 L.F. 631.6
Struct. Exc. = ~~16.0~~ C.Y. 17.4.4

Sta. 0+30, "W-6"
1-8" Gate Valve 150 Lbs.
1-Type "C" Manhole
Struct. Exc. = ~~6.0~~ C.Y. 4.7
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~22~~ Lbs. 23
Brick Wall = ~~4.0~~ L.F. 5.4
1-20" C.I. Fr. & Cover

Sta. 0+10, Road K" to G+60, "Ward Ave."
Install 8" Sewer Line
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~14.0~~ C.Y. 402.7
8" V.C. Sewer Pipe = ~~7.19~~ L.F. 680.0
8" V.C. Sewer Cradle = ~~7.13~~ L.F. 466.5
6" V.C. Sewer Pipe = ~~1.10~~ L.F. 116.0
6" V.C. Sewer Cradle = ~~1.10~~ L.F. 116.0
8" V.C. Sewer Pipe Reinf. Conc. Jacket 220 L.F.

Install 2" Cop. Serv. Lat. & Type "D" Conn. W/Type III Meter Box

Install 2" Cop. Serv. Lat. & Type "E-1" Conn. W/2 Type III Meter Box

Install 1-8" Dble. Hub Fitting w/Tap For 2" Corp. Stop

Install 6" Sewer Lateral @ 1.00% Slope

Sprinkler Lat. See Sht. No. 255

Sprinkler Lateral See Sht. No. 255

Sta. 5+05 "W-6"
New Fire Hydrant
1-6"x6" Tee
1-6" G.V. 150 Lbs. (Reloc.)
1-F.H. 4.5' ht.
137 ~~16~~ L.F. 6" C.I. Pipe
1-Valve Box
2-Conc. Blocks
Struct. Exc. = 6.0 C.Y.

Sta. 6+17 "W-6"
1-6" C.I. ½ Bend
1-Conc. Block

Sta. 6+67, "W-6"
Connect to Existing 12" Water Main
*1-12" Sleeve, 14" Long, L.J.
*1-12"x6" Reducer (S.B.)
*1-6" C.I. ½ Bend
*1-¾" Air Valve (150 p.s.i. minimum working pressure)
1-Type "C" Manhole, 6.5' deep
Struct. Exc. = ~~6.0~~ C.Y. 9.8
Class B-1 Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = 22 Lb. 23
Brick Wall = ~~6.0~~ L.F. 2.8
1-20" C.I. Fr. & Cover
1-Conc. Block
Temporary For Testing:
1-8" C.I. Plug
1-2" Cleanout
1-Conc. Block

Construct New Brick Sewer M.H. #19
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~6.0~~ C.Y. 9.5
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ Lbs. 24
Brick Wall = ~~6.0~~ L.F. 8.8
1-Std. SMH Fr. & Cover (Relocated)

Construct New Brick Sewer M.H. #20
See Profile "S-5", Sht. No. 51
Struct. Exc. = ~~4.0~~ C.Y. 6.6
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~22~~ lbs. 24
Brick Wall = 3.0 L.F.
1-Std. SMH Fr. & Cover (Relocated)

New 35' Pole w/1" Anchor, L=10'
1-3" S.R.B.
Pole Exc. = 5.0 L.F.

Install H.E. & H.T. Duct Lines
1-3" Duct W/Pl. Conc. Cap & 1-2" G.I.P. Direct Burial (J-t) = ~~100~~ L.F. 54
1-2" PVC Conduit & 1-2" G.I.P. Direct Burial (J-t) = ~~58~~ L.F. 58
1-H.E. 1'-4"x3'-0" S.B.
1-H.E. 1'-6"x3'-6" S.B.
2-H.T. 435 T-A P.B.

New 2" Gas Main = 202 L.F. (By Others)

Install New ¾" S.W. Anchor, L=6.5'

New 35' Pole w/1" Anchor, L=10' & ¾" S.W. Anchor, L=6' Pole Exc. = ~~5.0~~ 6.0 L.F.

New 2" Gas Main = 174 L.F. (By Others)

17" Type "C" Anode

New ¾" Gas Line = 42 L.F. (By Others)

Note: See Plan Sht. No. 45 For Additional Utility Notes Along Ward Avenue

APPROVED:

W. Henderson for F.A.K. HAWAIIAN ELECTRIC Co., Inc.	6-15-66 DATE
R. Maui for F. H. Judd OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6/14/66 DATE
A. Kawakami ASSISTANT CHIEF ENGINEER B.W.S.	6/16/66 DATE
R. Nova for SEWER SYSTEM DIRECTOR DIV. OF SEWERS	6/21/66 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS Co., Ltd.	DATE
Kenneth Mack Major SIGNAL OFFICER U.S. ARMY - HAWAII	15 June 66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pole Street to Victoria Street
F.A.I. Proj. No. I-H1-1(31) Unit 1

Scale: 1" = 50' Date: May, 1966

SHEET No. 3 OF 42 SHEETS

41 63

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

PRINTED ON NO. 1000M ULTRAPHANT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	44	892

TRUE NORTH SCALE 1"=50'

Brick Wall SMH
Sta. 32+45, Road "J" 3+00, "B-2"
Constr. New R/C Sewer M.H. # 9
See Profile "B-2", Sht. No. 50
See Detail Sht. No. 65
Struct. Exc. = ~~10.0~~ C.Y. 8.7
Class "A-1" Conc. = ~~1.0~~ C.Y. 0.09
Reinf. Steel = ~~34.0~~ C.Y. 2.4 Lbs.
1-Type "A" S.M.H. Fr. & Cover
Brick Wall = 7.1 L.F.

Install H.E. & H.T. Duct Line
2 Ducts (1-3" & 1-4") in Pl. Conc. Jacket (Joint) = 10 L.F.
1-3" Duct W/Pl. Conc. Cap (H.E.) ~~10.0~~ L.F. 1055
1-H.E. 1'-4" x 3'-0" S.B.
1-H.T. 435T-A P.B.

Install 1" Anchor, L=15' & 1-3" S.R.B.

Sta. 35+09, Road "J" = 0+36, "B-2"
Constr. New Brick SMH #8
See Profile "B-2", Sht. No. 50
Struct. Exc. = ~~13.0~~ C.Y. 7.2
Class "B-1" Conc. = ~~0.9~~ C.Y. 0.60
Reinf. Steel = ~~26~~ Lbs. 24
Brick Wall = ~~1.5~~ L.F. 7.3
Shallow Drop Connection = ~~1~~ L.F. Ea.
1-Std. SMH Fr. & Cover (Relocated)

Sta. 38+57, Road "J" = 2+83, "B-1"
Constr. New Brick Sewer M.H. #3
See Profile "B-1", Sht. No. 50
Struct. Exc. = ~~1.0~~ C.Y. 12.8
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~1.5~~ L.F. 3.3
1-Std. SMH Fr. & Cover (Relocated)

Sta. 40+97, Road "J" = 0+40, "B-1"
Constr. New Brick Sewer M.H. # 2
See Profile "B-1", Sht. No. 50
Struct. Exc. = ~~1.0~~ C.Y. 6.5
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~1.5~~ L.F. 6.8
1-Std. SMH Fr. & Cover (Relocated)

Sta. 41+34, Road "J" = 0+00, "B-1"
Constr. New Brick Sewer M.H. # 1
See Profile "B-1", Sht. No. 50
Struct. Exc. = ~~1.0~~ C.Y. 11.9
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~0.0~~ L.F. 6.5
1-Std. SMH Fr. & Cover (Relocated)

Sta. 36+40, Road "J" = 5+00 "B-1"
Constr. New Brick Sewer M.H. #4
See Profile "B-1" Sht. No. 50
Struct. Exc. = ~~1.0~~ C.Y. 10.6
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~1.5~~ L.F. 7.5
1-Std. SMH Fr. & Cover (Relocated)

Sta. 38+68, Road "J"
New 45' Pole w/1" Anchor, L=15
Pole Exc. = 6.0 L.F.

Sta. 37+42 to 41+34, Road "J"
Install New 8" Sewer Line
See Profile "B-1", Sht. No. 50
Struct. Exc. = ~~858.0~~ C.Y. 270.3
8" V.C. Sewer Pipe = ~~500~~ L.F. 488
8" V.C. Sewer Cradle = ~~500~~ L.F. 488
(2" Dia. Betterment)

Sta. 40+73, Road "J"
New 45' Pole
Pole Exc. = 6.0 L.F.
Sprinkler Lats. See Sht. No. 258

Sta. 203+50, ℄ Freeway
Constr. Special R/C Sewer M.H. # 5
See Detail Sht. No. 63
Top = 54.00
Inv. = 18.10 (4'x5' Tunnel)
Struct. Exc. = ~~136.0~~ C.Y. 116.6
Class "A-1" Conc. = ~~84.0~~ C.Y. 264
Reinf. Steel = ~~10.0~~ Lbs. 3439
1-Type "SB" Std. SMH Fr. & Cover

Sta. 43+92, Road "J"
New 45' Pole w/1" Anchor, L=15'
Pole Exc. = 6.0 L.F.

New 45' Pole
Pole Exc. = 6.0 L.F.

Sprinkler Lateral See Sht. No. 256

Conn. Lats. to New Sewer Line

New H.T. P.B.

New H.E. S.B.

New 30' Pole (H.T. Co)
1-3" 90° Conduit Bend
Pole Exc. = 3.0 L.F.

Adjust W.M.H. Fr. & Cover

Adjust W.M.H Fr. & Cover

Sta. 35+62 & 37+15, Road "J"
2-New 25' Poles (H.T. Co)
Pole Exc. = 10 L.F.

Connect Lateral to New Sewer Line

Adjust W.M.H Fr. & Cover

Connect Lateral to New Sewer Line

Adjust 4-W.M.H. Frs. & Covers

Adjust W.M.H. Fr. & Cover

Adjust W.M.H. Fr. & Cover

New 45' Pole w/1" Anchor, L=15' Pole Exc. = 6.0 L.F.

Adjust Signal Corps M.H. (By Others)

Demolish Sewer M.H. = 8.0 L.F. Relocate Fr. & Cover

Demolish Sewer M.H. = 5.0 L.F. Relocate Fr. & Cover

Demolish Type "D" M.H. = 4.0 L.F. Relocate Frame & Cover

Fire Alarm System See Sht. No. 230

Demolish Sewer M.H. = 7.0 L.F. Relocate Fr. & Cover

Seal Existing Sewer M.H. See Detail Sht. No. 65 Relocate Fr. & Cover

Seal Existing Sewer M.H. Relocate Fr. & Cover See Detail Sht. No. 65

Demolish Sewer M.H. = 8.0 L.F. Relocate Fr. & Cover

Adjust S.M.H. Fr. & Cover

Install New 1" Anchor L=15' (Remove under Unit # 2)

Construct New Brick SMH # 29
Top = 54.50
Inv. = 47.20
Struct. Exc. = ~~11.0~~ C.Y. 13.8
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.69
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~7.0~~ L.F. 7.8
1-Std. Fr. & Cover (Relocated)

Sta. 106+80 ℄ Freeway = 0+10, "B-2"
Constr. Special R/C Drop S.M.H. # 7
See Detail Sht. No. 167
Top = 67.30
Inv. = 17.50 (4'x5' Tunnel)
Inv. = 58.28 (New 10" V.C.)
Struct. Exc. = ~~180.0~~ C.Y. 178.8
Class "A-1" Conc. = ~~43.0~~ C.Y. 40.6
Reinf. Steel = ~~2.100~~ Lbs. 4462
1-Type "SB" Std. SMH Fr. & Cover

Sta. 108+75, ℄ Freeway
Constr. Special R/C Sewer M.H. # 6
See Detail Sht. No. 166
Top = 63.75
Inv. = 17.70 (4'x5' Tunnel)
Struct. Exc. = ~~155.0~~ C.Y. 134.2
Class "A-1" Conc. = ~~83.0~~ C.Y. 93.8
Reinf. Steel = ~~2.100~~ Lbs. 4115
1-Type "SB" S.M.H. Fr. & Cover

New R/W Line

New 45' Pole w/1" Anchor, L=15' Pole Exc. = 6.0 L.F.
1-3" S.R.B.

Install 1½" Copper Service Lateral And Type "C" Conn. With Type II Meter Box

Install 1½" Copper Serv. Lat. & Type "B" Conn. with ~~Type II~~ Type III Meter Box

Install 1-3" H.T. 90° Bend

Install H.T. 435T-A P.B.

Install H.E. 1'-6" x 3'-6" S.B.

Install 4" Water Main & Service Lateral For Sprinkler System See Sht. No. 257

Install H.T. Duct Line 251.0
1-4" Duct in Pl. Conc. Jac. = ~~244~~ L.F.
4-H.T. 435T-A P.B.

Install 2½" Copper Serv. Line = ~~212~~ L.F. 202.0
(Install 2½" x 2½" x 1" Tee At Each Existing Metered Service, Except At The End.

Install 2½" Copper Serv. Lat. & Type "E" Conn. With Type II Meter Box

Connect To Existing 6" Water Main * 1-6" Service Clamp w/ Tap For 2" x 2½" Corporation Stop

Install 1-3" H.T. 90° Conduit Bend

New 2" Gas Main = 260 L.F. (By Others)

17# Type "C" Anode

Constr. New Brick SMH # 30
Top = 41.50
Inv. = 37.66
Struct. Exc. = ~~6.0~~ C.Y. 7.5
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.60
Reinf. Steel = ~~25~~ Lbs. 24
Brick Wall = ~~3.5~~ L.F. 5.8
1-Std. S.M.H. Fr. & Cover Relocated

Demolish Sewer M.H. = 4.5 L.F. Relocate Fr. & Cover

Install 2½" x 1¼" Cross W/ 2½" Adapter Fitting To M.I.P. And 2½" Cap, F.I.P.

Install 2½" Copper Serv. Line = 287 L.F.
(Install 2½" x 2½" x 1½" Tee At Each Existing Metered Service, Except At The End.

Install 2½" Copper Service Lateral And Type "E" Conn. With Type II Meter Box

Connect To Existing 6" Water Main * 1-6" Service Clamp W/ Tap For 2" x 2½" Corporation Stop

KINAU STREET

VICTORIA STREET

PENSACOLA STREET

APPROVED:

A.H. Vandervoort for F.A.K. HAWAIIAN ELECTRIC Co., Inc.	6-15-66 DATE
A. Maw for F.H. Judd OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6/14/66 DATE
for ASSISTANT CHIEF ENGINEER B.W.S.	6/14/66 DATE
M. Mora SEWER SYSTEM DIRECTOR DIV. OF SEWERS	6/15/66 DATE
David C. Vaughan DIRECTOR OF DEVELOPMENT HONOLULU GAS Co., Ltd.	6/17/66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pole Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1
Scale: 1" = 50' Date: May, 1966

SHEET No. 4 OF 42 SHEETS

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

PRINTED ON NO. 1053H CLEARPRINT

PROJ. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	45	292

True North
Scale: 1" = 50'

Sta. 2+60 to 8+30, Ward Ave.
Install H.T. Duct Line
See Profile "T-1" Sht. No. 52
See Detail Sht. No. 151
9-4" Ducts in Plain Conc. Jacket. = ~~152~~ L.F. 211.8
9-4" Ducts Reinf. Conc. Jacket = ~~80~~ L.F. 71.0
9-4" E.9. Conduits in Structure = ~~156~~ L.F. 150.0
2-4" Ducts in Plain Conc. Jacket = ~~118~~ L.F. 85.5

Construct H.T. Type A-G M.H.
See Profile "T-1" Sht. No. 52
See Detail Sht. No. 76
Struct. Exc. = ~~35~~ C.Y. 32.5
Class "A-1" Conc. = ~~9.5~~ C.Y. 8.16
Reinf. Steel = ~~1,065~~ Lbs. 1098
1-Type "B" M.H. Fr. & Cover

CCO #25
~~Lower Existing 6" Water Main~~
~~See Profile "W-9, Sht. No. 49~~
~~Struct. Exc. = 6.0 cy.~~
~~* 4-6" C.I. 1/8 Bends~~
~~* 1-6" C.I. Sleeve, 15" Long~~
~~* 6" C.I. Pipe = 28 L.F.~~
~~* 1-¾" Air Valve (150 p.s.i. minimum working pressure)~~
~~12 L.F. R/C Jacket~~
~~Class "B-1" Conc. = 2.0 cy.~~
~~Reinf. Steel = 190 lbs.~~
~~4 Conc. Blocks (2 Precast)~~
~~1 Type "C" Manhole, 4.0' deep~~
~~Struct. Exc. = 6.0 cy.~~
~~Class "B-1" Conc. = 0.5 cy.~~
~~Reinf. Steel = 22 lbs.~~
~~Brick Wall = 3.5 L.F.~~
~~1-20" C.I. Fr. & Cover~~
CCO #25 - Encased in top slab of box culvert (Reinforced Conc. Jacket)
Lower Existing 8" Gas Main To Clear New Box Culvert (By Others)

Sta. 8+30 to 12+00, Ward Ave.
Install H.T. Duct Line
See Profile "T-3" Sht. No. 52
9-4" Ducts in Pl. Conc. Jac. = ~~378~~ 370 L.F.

Existing 8-inch Water Main raised to rest on culvert cover. Encased in reinforced concrete jacket by CCO #10

Install 4-4" H.T. Ducts in Pl. Conc. Jacket: ~~46~~ 29.6 L.F.

Install H.T. 435T-A P.B. & 2-3" 90° Conduit Bends

Demolish 2-Sewer M.H. = 140 L.F.
Relocate 2-Frame & Cover

Construct H.T. Type V-1 Manhole
See Profile T-1" Sht. No. 52
See Detail Sht. No. 76
Struct. Exc. = ~~32~~ C.Y. 42.6
Class A-1 Conc. = ~~10~~ C.Y. 9.04
Reinf. Steel = ~~1,100~~ 1165 Lbs.
1-Type "B" M.H. Frame & Cover

Adjust W.M.H. Frame & Cover

Install 3-4" H.T. Ducts in Plain Conc. Jacket. = ~~46~~ L.F. 44.8

New Signal Corps M.H. & Ducts Line (by others)

Install H.T. 435T-A P.B. & 2-3" 90° Conduit Bends

Install new 50' Pole
Pole Exc. = 6.5 L.F.
1-5" L.R.B.

Construct H.E. Type G11V Handhole
See Profile "E-2" Sht. No. 53
See Detail Sht. No. 69
Struct. Exc. = ~~35~~ C.Y. 18.8
Class A-1 Conc. = ~~10~~ C.Y. 10.6
Reinf. Steel = ~~1,550~~ Lbs. 1728
1-Conc. H.H. Frame & Cover

Cut & Plug 6" Water Main
*1-6" C.I. Plug
*1-6" C.I. Cap
2-Conc. Blocks

Dem. 2-Type "C" W.M.H.
Remove & Relocate:
1-F.H. # 603
2-6" Gate Valves
2-20" C.I. Fr. & Cover

Type C-1
1½" Copper Service Lateral, Type II M.B. 2ea. (CCO #47)

Sprinkler Lateral See Sht. No. 256

Type C
1½" Copper Service Lateral w/ Type II MB

New Fire Alarm System See Sht. Nos. 151 & 229

Location of Utilities See Sht #5X in Structure

17# Type "C" Anodes

New 50' Pole
Pole Exc. = 6.5 L.F.
1-5" L.R.B.

New 50' Pole w/1" Anchor Str., L = 20'
Pole Exc. = 6.5 L.F.
1-5" L.R.B.

Pole to remain for Temp. Overhead Suspension

Install H.T. 435T-A Pull Box & 2-3" 90° Conduit Bends

Pole to remain for Temporary Overhead Suspension

Construct H.T. Type A-G M.H.
See Profile "T-2" Sht. No. 52
See Detail Sht. No. 76
Struct. Exc. = ~~35~~ C.Y. 32.5
Class A-1 Conc. = ~~9~~ C.Y. 8.16
Reinf. Steel = ~~1,065~~ lbs. 1098
1-Type "B" M.H. Frame & Cover

Install H.T. Duct Line
See Profile "T-2" Sht. No. 52
See Detail Sht. No. 97
3-4" Ducts in Plain Conc. Jacket = 60 L.F.

Support Existing H.T. Co. Ducts Over Culvert Excavation

Dem. Type "C" W.M.H. = 5.0 L.F.
Remove & Relocate:
1-Fire Hydrant # 795
1-6" Gate Valve
1-20" C.I. Fr. & Cover

Support Existing Sewer Const. R/C Jacket = 5 L.F.

Construct H.T. Type A-G Manhole
See Profile "T-2" Sht. No. 52
See Detail Sht. No. 76
Struct. Exc. = ~~35~~ C.Y. 32.5
Class A-1 Conc. = ~~9~~ C.Y. 8.16
Reinf. Steel = ~~1,065~~ lbs. 1098
1-Type "B" M.H. Frame & Cover

Construct Type "C" W.M.H. and Install Fire Hydrant # 795
Struct. Exc. = ~~16.0~~ C.Y. 13.3
*1-6"x6" C.I. Tee (Rotate)
*1-6" Gate Valve (Relocated)
*1-Fire Hydrant # 795 (Relocated)
*1-6" C.I. ⅛ Bend
*6" C.I. Pipe = ~~35~~ L.F. 51.7
3-Conc. Blocks
1-Type "C" Manhole
Struct. Exc. = 8.0 C.Y.
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~22~~ lbs. 23
Brick Wall = ~~5.0~~ L.F. 5.0
1-20" C.I. Fr. & Cover (Relocated)

Work Not Done; Water Line Clears RCCP

Cut & Plug 6" Water Line & Remove "C" Water M.H.
*1-6" C.I. Plug
*1-6" Hub Clamp w/ Strongback
1-Conc. Block
Remove & Relocate:
1-Fire Hydrant # 791
1-6" Gate Valve
1-20" C.I. Fr. & Cover

Lower Existing 20" Water Main
See Profile W-10, Sht. No. 49
Struct. Exc. = ~~26.0~~ 6 C.Y. 121.7
2 * ~~4~~ - 20" C.I. ⅛ Bend (DAKWA, lg. pat't)
1 * ~~2~~ - 20" C.I. Sleeve, 14" long
* 20" C.I. Pipe, Class 150 = ~~44~~ L.F. 38.2
2-20" C.I. ⅛ Bend
4-Conc. Blocks (2 Precast)
*1-2" Air Valve (100 p.s.i. minimum working pressure)
1-Type "B" Manhole
Struct. Exc. = ~~13.0~~ C.Y. 12.0
Class B-1 Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~22~~ Lbs. 23
Brick Wall = ~~9.0~~ L.F. 6.8
1-20" Std. C.I. Fr. & Cover
10 L.F. Reinf. Conc. Jacket = 7.77
Class "B-1" Conc. 0.6 C.Y. ~~0.60~~
Reinf. Steel = ~~380~~ lbs. 4082

Support Existing H.T. Co. Ducts, 4" Gas Main, 12" Water Main and H.E. Co. Ducts over Culvert Excavation.

Connect Lateral To 84" Culvert See Detail Sht. No. 96

Cut & Plug

Construct Type "C" W.M.H. and Install Fire Hydrant # 791
Struct. Exc. = ~~12.0~~ C.Y.
*6" C.I. Pipe = 30 L.F.
*1-6"x6" C.I. Tee
*1-6" Gate Valve (Relocated)
*1-Fire Hydrant # 791 (Relocated)
*1-6" C.I. ⅛ Bend
*1-6" C.I. Sleeve, 15" long
1-Type "C" Manhole
Struct. Exc. = 8.0 C.Y.
Class "B-1" Conc. = 0.5 C.Y.
Reinf. Steel = 22 lbs.
Brick Wall = 5.0 L.F.
1-20" C.I. Fr. & Cover (Relocated)
2-Conc. Blocks

Work Not Done - Due to Ward Ave Shift (Westerly Direction)

Support Exist. 6" Water Main over Culvert Excavation

4" Water Line To Be Lowered By B.W.S. Contractor Shall Excavate & Backfill And Construct R/C Jacket
Struct. Exc. = 2.0 C.Y.
12 L.F. R/C Jacket
Class "B-1" Conc. = 1.5 C.Y.
Reinf. Steel = 190 Lbs.

Work Not Done; 4" Water Line Clears Drain

Construct H.E. Type G11V Handhole
See Profile "E-2" Sht. No. 53
See Detail Sht. No. 69
Struct. Exc. = ~~35~~ C.Y. 18.8
Class A-1 Conc. = ~~10.0~~ C.Y. 10.6
Reinf. Steel = ~~1,550~~ Lbs. 1728
1-Conc. H.H. Frame & Cover

Sta. 3+90 to 6+40, Ward Ave
Install New 6" Water Main
See Profile W-3" Sht. No. 47
See Struct. Detail Sht. No. 151
Struct. Exc. = ~~170~~ C.Y. 30.8
6" C.I. Pipe, P & S = ~~115~~ L.F. 103.4
6" C.I. Pipe, M.J. = ~~152~~ L.F. 165.4
1-6" Gate Valve (Relocated)
*2-6" C.I. Sleeve, 15" Long
1-6" C.I. Sleeve (M.J.), 12" Long
2-6" C.I. ⅛ Bend (Horiz.)
1 *2-6" C.I. ⅛ Bend (Vert.)
1 *2-6" C.I. ⅛ Bend (Vert.)
~~1-6"x6"x6" D.H. Tee~~ 12x6 Tee & 1-12"x15" Sleeve
8-Conc. Blocks
1 *2-Type "C" Manholes
Struct. Exc. = ~~16.0~~ C.Y. 4.9
Class "B-1 Conc. = ~~1.0~~ C.Y. 0.41
Reinf. Steel = ~~44~~ lbs. 23
Brick Wall = ~~9.0~~ L.F. 5.0
2-20" C.I. Frame & Cover (Relocated)
Temporary for Testing
2-6" C.I. Plugs; 2-Conc. Blks.
2-2" Cleanouts
1-¾" Air Valve (150 p.s.i. minimum working pressure)
*2-6" C.I. ⅛ Bends (Horiz.)
2-6" Double Hub Fittings W/Tap For 1½" x 2" Corp. Stop

Sta. 4+80 to 5+20, Ward Ave
Install Signal Corps Duct Line
See Profile "S.C.-2" Sht. No. 55
See Struct. Detail Sht. No. 151
2-3" Ducts in Structure = ~~186~~ L.F. 151.3
Note: Duct Line beyond limits of Abutments, by others.

Sta. 3+30 to 8+15, Ward Ave.
Install H.E. Duct Lines
See Profile "E-2" Sht. No. 53
See Struct. Detail Sht. No. 151
4-5" T.K. Ducts in Structure = ~~156~~ L.F. 150.4
4-5" G.S. Ducts in Structure = ~~6~~ L.F. 6.3
4-5" T.K. Ducts in Plain Conc. Jacket = ~~54~~ L.F. 70.0
4-5" T.K. Ducts in Reinf. Conc. Jacket = ~~60~~ L.F. 60.7
4-5" G.S. Ducts in Reinf. Conc. Jacket = 24 L.F.
1-5" T.K. Duct In Plain Conc. Jacket = ~~208~~ L.F. 167.4
2-5" T.K. Ducts In Plain Conc. Jacket = ~~16~~ L.F. 29.6
5-5" T.K. Ducts In Plain Conc. Jacket = ~~16~~ L.F. 29.7

Sta. 3+90 to 11+95, Ward Ave.
Install 4" Gas Main
See Profile "G-2" Sht. No. 54
See Detail Sht. No. 97
4" Gas Main Through Structure = ~~336~~ 308 L.F.
4" Gas Main = ~~550~~ L.F.
662.6

APPROVED:

A.D. Henderson for F.A.K. HAWAIIAN ELECTRIC CO., Inc.	6-15-66 DATE
R. Maw for F.H. Judd OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6/14/66 DATE
for D. Lewa Kamii ASSISTANT CHIEF ENGINEER B.W.S.	6/16/66 DATE
E. Mona SEWER SYSTEM DIRECTOR DIV. OF SEWERS	6/21/66 DATE
David C. Crosby DIRECTOR OF DEVELOPMENT HONOLULU GAS Co., Ltd.	6/24/66 DATE
Lewis A. Hatch, Major SIGNAL OFFICER U.S. ARMY - HAWAII	15 June 66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scale: 1" = 50' Date: May, 1966

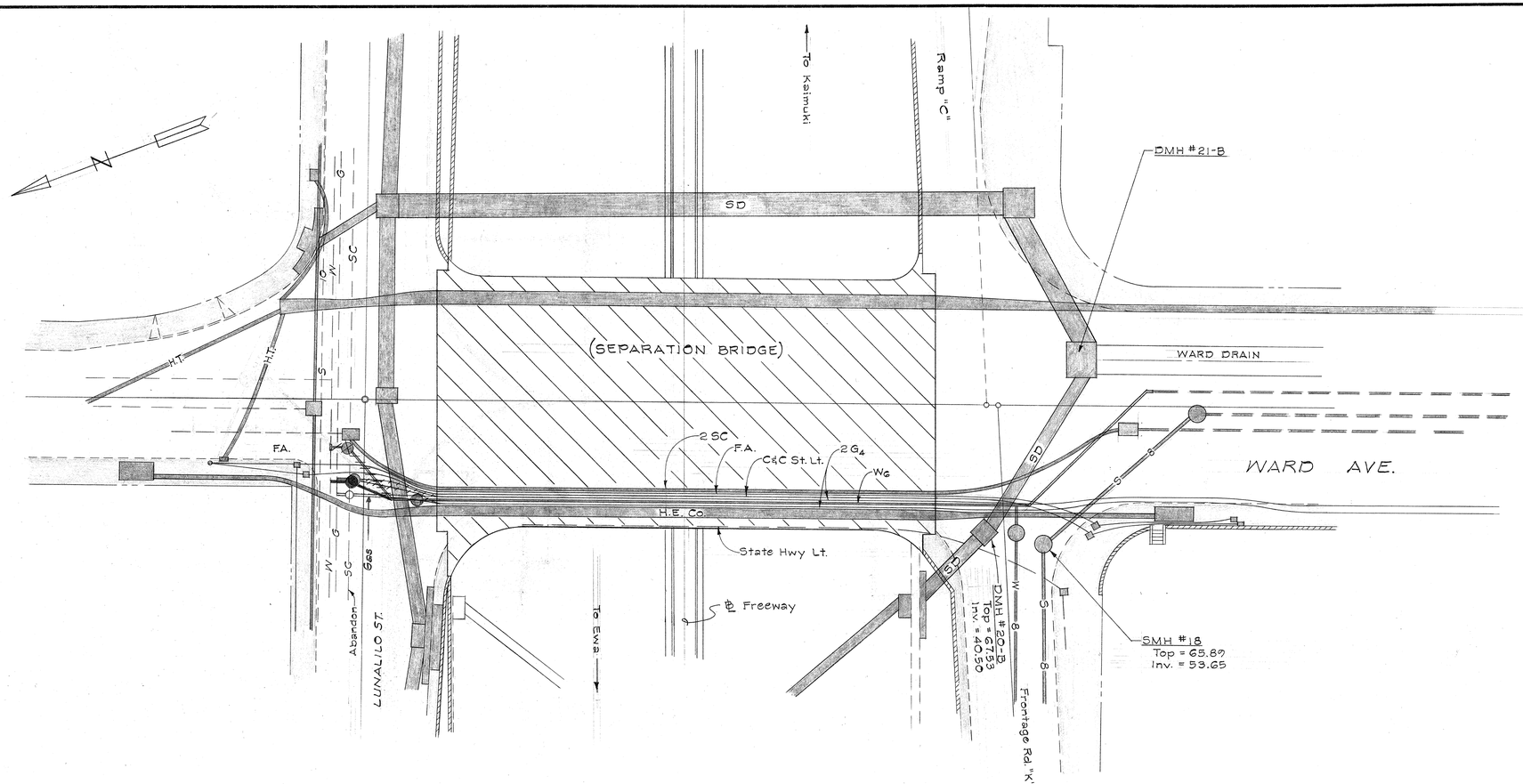
SHEET No. 5 OF 42 SHEETS

45

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

PRINTED ON NO. 8900H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	45X	292



ORIGINAL PLAN

NOTE BOOK
No.

SURVEY PLOTTED BY DATE
DRAWN BY "
TRACED BY "
DESIGNED BY "
QUANTITIES BY "
CHECKED BY "

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY LINES ON WARD AVENUE IN THE VICINITY OF THE SEPARATION BRIDGE

I-HI-1(31), Unit 1

Scale: 1"=20' Date: Jan. 16, 1968

SHEET No. OF SHEETS

45X

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(31) Unit 1	1967	46	202

Sta. 0+00, "W-5"
Connect to Existing 20" Main (H.P.)
*1 - 20" C.I. Sleeve, 15" Long, L.J.
*1 - 20" C.I. ⅛ Bend (Horiz.)
1 - Precast Conc. Block With Structural Strut
Temp. For Testing
1 - 20" C.I. Plug
1 - 2" Cleanout
1 - Conc. Block

Demolish 3 - Type "C" W.M.H. = 18.0 L.F.
Remove & Relocate:
3 - 6" Gate Valves
3 - 20" C.I. Frs. & Covers
1 - Fire Hydrant # 4282

~~Cut & Plug 6" Water Lateral~~
~~*1 - 6" C.I. Plug~~
~~*1 - 6" Hub Clamp W/Strongback~~
~~1 - Conc. Block~~

B.W.S. Will Relocate Meter. Contractor Shall Excavate And Backfill
Struct. Exc. = ~~4.0~~ C.Y. 5.6

Install Fire Hydrant # 4282 & Construct ~~2~~ Type "C" W.M.H.
*1 - 20" x 6" B.O. Tee
*1 - ~~20" C.I. Sleeve, 15" Long, L.J.~~
*3 - 6" Gate Valves (Relocated)
*1 - Fire Hydrant # 4282 (Relocated)
*1 - 6" x 6" C.I. Tee
*1 - 6" C.I. ⅛ Bend
*6" C.I. Pipe = 32 L.F. 41.9
*2 - 6" Hub Clamps (Including Rods, Nuts, & Washers)
1 - Conc. Blocks
Struct. Exc. = 14.0 c.y.
2 - Type "C" Manholes
Struct. Exc. = ~~24.0~~ c.y. 8.2
Class "B-1" Conc. = ~~1.5~~ c.y.
Reinf. Steel = ~~28~~ lbs. ~~46~~
Brick Wall = ~~15.0~~ L.F. 11.6
2 - 20" C.I. Fr. & Cover (Reloc.)

Sta. 0+11, "W-5"
1 - 20" x 20" C.I. Tee
1 - Conc. Block

1 - 20" C.I. ⅛ Bend (Inv. = 86.5')
1 - Conc. Block

1 - 20" C.I. ⅛ Bend (Inv. = 87.5')
1 - Conc. Block

Install 20" S.G. Gate Valve & Construct Type "A" Manhole
1 - 20" S.G.G.V., 250# (Relocated)
1 - Type "A" Manhole
Struct. Exc. = ~~23.0~~ c.y. 25.7
Class "B-1" Conc. = ~~2.5~~ c.y. 3.04
Reinf. Steel = ~~245~~ lbs. 327
Brick Wall = ~~5.0~~ L.F. 8.2
1 - 20" C.I. Fr. & Cover (Relocated)
2 - G" C.I. Fr. & Cover

Connect To Exist. 20" Main (H.P.)
*1 - 20" C.I. Sleeve, 15" Long, L.J.
*1 - ~~20" C.I. ⅛ Bend~~ (Hor.) 20x6 Tee
1 - Precast Conc. Block With Structural Strut
Temp. For Testing
1 - 20" C.I. Plug
1 - 2" Cleanout
1 - Conc. Block
*1 - 20" x 6" B.O. Tee (Tilt-up)

Interconnect 6" & 20" Water Mains
*6" C.I. Pipe = ~~16~~ L.F. 28.5
*1 - 6" C.I. ¼ Bend
*1 - ~~6" C.I. ⅛ Bend (Top Vert.)~~
*1 - 6" Gate Valve (Relocated)
3 - Conc. Blocks
1 - Type "C" Manhole
Struct. Exc. = ~~4.0~~ c.y. 24.2
Class "B-1" Conc. = ~~0.5~~ c.y. 0.41
Reinf. Steel = 22 lbs. 23
Brick Wall = ~~4.0~~ L.F. 4.2
1 - 20" C.I. Fr. & Cover (Relocated)

Sta. 0+06, "W-5"
Install 20" S.G. Gate Valve & Construct Type "A" Manhole
1 - 20" S.G.G.V., 250# (Relocated) Done by BWS CCO #21 1st
1 - Type "A" Manhole
Struct. Exc. = ~~23.0~~ c.y. 23.4
Class "B-1" Conc. = ~~2.5~~ c.y. 3.04
Reinf. Steel = ~~245~~ Lbs. 327
Brick Wall = ~~5.0~~ L.F. 8.2
1 - 20" C.I. Fr. & Cover (Relocated)
2 - G" C.I. Fr. & Cover

Sta. 0+15, "W-5"
Install 20" S.G. Gate Valve & Construct Type "A" Manhole
1 - 20" S.G.G.V., 250# (Relocated)
1 - Type "A" Manhole
Struct. Exc. = ~~23.0~~ c.y. 18.0
Class "B-1" Conc. = ~~2.5~~ c.y. 2.21
Reinf. Steel = ~~245~~ Lb. 241
Brick Wall = ~~10.0~~ L.F. 7.1
1 - 20" C.I. Fr. & Cover (Reloc)
2 - 6" C.I. Frs. & Covers

Sta. 0+00, "W-4"
Connect To Existing 18" Main
*1 - ~~18" C.I. Sleeve, 15" Long, L.J.~~
*1 - 18" C.I. ⅛ Bend (Horiz.)
1 - Precast Conc. Block With Structural Strut
Temp. For Testing
1 - 18" C.I. Plug
1 - 2" Cleanout
1 - Conc. Block

Sta. 0+05, "W-4"
1 - 18" C.I. ⅛ Bend (Top Vert.)
1 - Conc. Block

Sta. 0+46, "W-4"
1 - 18 C.I. ⅛ Bend (Bott. Vert)

Sta. 0+53, "W-4"
1 - 18" C.I. ⅛ Bend (Horiz.)

Sta. 0+00 to 3+30, "W-A"
Install New 18" Water Main
See Profile W-4, Sht. No. 48
18" C.I. Pipe, Class 150 = ~~360~~ L.F. 351.6
Struct. Exc. = ~~580.0~~ c.y. 778.7
~~340~~ L.F. R/C Jacket
Class "B-1" Conc. = ~~165.0~~ c.y. 110.27
Reinf. Steel = ~~7,700~~ lbs. 7133

Sta. 0+65, "W-5"
1 - 20" C.I. ⅛ Bend (Hor.)

Sta. 0+55, "W-5"
1 - 20" C.I. ⅛ Bend (Bott. Vert.)

Sta. 0+19, "W-5"
1 - 20" C.I. ⅛ Bend (Top Vert.)
1 - Conc. Block

Sta. 0+00 to 3+45, "W-5"
Install New 20" Water Main (H.P.)
See Profile W-5, Sht. No. 48 = 385.4
20" C.I. Pipe, Class 250 = ~~345~~ L.F.
Struct. Exc. = ~~524.0~~ c.y. 756.6
~~328~~ L.F. R/C Jacket
Class "B-1" Conc. = ~~120.0~~ c.y. 168.35
Reinf. Steel = ~~7,600~~ lbs. 7118

Install new B.W.S. Control Line See profile "W-5" Sht. #48
1 - 1½" Galv. Steel conduit and cable, direct burial with protective coating as required by C&C of Honolulu Bldg. Dept ordinance for protection of galvanized ferrous piping = ~~500~~ L.F. 500.5
4 - Type "B" Pull boxes

Sta. 2+26, "W-5"
1 - 20" C.I. ⅛ Bend (Hor.)

Sta. 2+68, "W-5"
1 - 20" C.I. ⅛ Bend (Bott. Vert.)

Sta. 2+25, "W-4"
1 - 18" C.I. ⅛ Bend (Hor.)

Sta. 3+18, "W-4"
Install 2" Air Valve & Construct Type "B" Manhole
1 - 18" C.I. ⅛ Bend (Top Vert.)
1 - 2" Air Valve (100 p.s.i. minimum working pressure)
1 - Type "B" Manhole
Struct. Exc. = ~~11.0~~ c.y. 12.0
Class "B-1" Conc. = ~~0.5~~ C.Y. 0.41
Reinf. Steel = ~~26~~ Lbs. 23
Brick Wall = ~~5.5~~ L.F. 4.4
1 - 20" C.I. Fr. & Cover
1 - Conc. Block

Sta. 3+30, "W-4"
Connect to Exist. 18" Main
*1 - 18" C.I. Sleeve, 15" Long, L.J.
*1 - 18" C.I. ⅛ Bend (Horiz.)
1 - Precast Conc. Block With Structural Strut
Temp. For Testing
1 - 18" C.I. Plug
1 - 2" Cleanout
1 - Conc. Block

Type "B" Pullbox

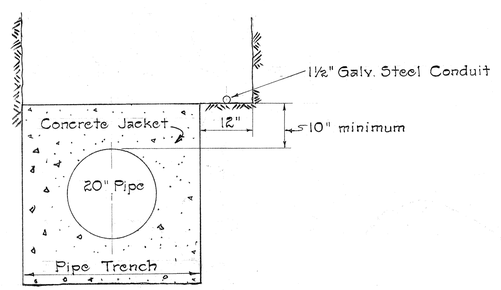
Sta. 3+45, "W-5"
Connect to Exist. 20" H.P. Main
*1 - 20" C.I. Sleeve, 15" Long, L.J.
*1 - 20" C.I. ⅛ Bend (Hor.)
1 - Precast Conc. Block With Structural Strut
Temp. For Testing
1 - 20" C.I. Plug
1 - 2" Cleanout
1 - Conc. Block

Sta. 3+19, "W-5"
Install 2" Air Valve & Construct Type "B" Manhole
1 - 20" C.I. ⅛ Bend (Top Vert.)
1 - 2" Air Valve (105 p.s.i. minimum working pressure)
1 - Type "B" Manhole
Struct. Exc. = ~~12.0~~ c.y. 4.1
Class "B-1" Conc. = ~~0.5~~ c.y. 0.41
Reinf. Steel = ~~36~~ Lbs. 27
Brick Wall = ~~6.0~~ L.F. 5.5
1 - 20" C.I. Fr. & Cover
1 - Conc. Block

Type "B" Pullbox

VALVE BOX

See sheet #46 for Relocation CCO #36 2nd



TYPICAL SECTION SHOWING CONTROL LINE AND 20" INCH WATER MAIN

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

REVISED: Control Line Location
APPROVED:
ASSISTANT CHIEF ENGINEER B.W.S. — DATE 2-9-67

APPROVED:
ASSISTANT CHIEF ENGINEER B.W.S. — DATE 6/16/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Fele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1
Scale: 1" = 80' — Date: May, 1966

SHEET No. 6 OF 42 SHEETS

46

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

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(51) Unit 1	1967	~~15~~ C.O.4GS-1	202

Revised: Feb. 16, 1968
Jun. 17, 1968

LEGEND

- W12 — Existing Water Lines
- W20 — Existing Water Lines
- S6 — Existing Sewer Line
- G2 — Existing Gas Line
- S6 — New Sewer Line
- W6 — New Water Line
- New Manhole
- Existing Manhole
- New Gas Line

CURVE DATA

	L-2	L.W.B-1		F-1 & F-2	
Δ	52°48'00"	22°52'06"		90°00'00"	
R	1200.00'	1300.00'		23.00'	
T	594.38'	262.93'		23.00'	
Ch	1066.25'	515.45'		32.53'	
Lc	1103.75'	518.87'		36.15'	

FREAR ST.

CB #2-B Type A
Fr. Rd. Sta. 14+21
Top = 62.82
Inv. = 57.22

Existing lava rock curb to remain

MAGELLAN AVE.

Demolish exist. Drwy. and reconstruct exist. lava rock curb to exist. curb level

DMH #2-B Type E
Fr. Rd Sta. 13+87
Top = 87.55
Inv = 80.00

Edge of Shoulder

New 72" Chain Link Fence

24" CGMP 14 Ga
See Profile Sht. No. 68

24" RCCP, Cl III or 24" CGMP, 14 Ga. S = 0.009

Abandon Existing 18" RCP & Invert Cut & Plug

CB #2-B Type A
Fr. Rd Sta. 15+07
Top = 85.5
Inv. = 77.5

Demolish exist. MH

24" RCCP, Cl III or 24" CGMP, 14 Ga. S = 0.018

W20 W20 W20

Relocated 2" Gas Main

Existing lava rock curb to remain G2

FRONTAGE ROAD "J"

W6 W6 W6

℄ Frontage Road "J" 343°-08'-30" 10

G2 G2

Excavation Line

Footing Line

10'

Reconstructed Lava Rock Curb

Frontage Rd. Sta. 15+00
6' high x 4' wide gate

New 72" Chain Link Fence

Control of Access Line

Observation Platform # 2

Observation Platform # 3

New R.C. Retaining Wall No N-II
See Detail Sheet No 158

Paved Shoulder

Type "DG" Curb & Gutter

WESTBOUND LANES

C.B. #6-B Type "G"
B.P. Sta. 174+50
Top 73.71
Inv. 69.79
See Detail Sht. No. 100

24" RCCP, Cl III or 24" CGMP, 14 Ga. S = 0.014

LUNALILO FREEWAY

Double Metal Guard Rail
Continuous from Beg. of Proj. to Sta. 178+26±

℄ Sta. 175+14.15 = Frear St. E 7+00

Modified Master C.B.#1
℄ Sta. 177+00
Inv. = 68.00
(See Sht. No. 5A 1328(2))

C.B. #11-B Type "G"
B.P. Sta. 178+25
Top = 82.80
Inv. = 68.80
See Detail Sht. No. 100

℄ Sta. 178+14.25 = P.C. Westbound E.P. 178+14.25 R = 1300'

℄ P.C. Sta. 178+50.78 R = 1200'

℄ Monument at P.C. Sta. 178+50.78

LWB-1

L-2

175 174 175 ℄ Lunalilo Freeway 343°-08'-30" 176 177 178 179

24" RCCP, Cl III or 30" CGMP, 14 Ga S = 0.0075

18" CGMP Median Drain (GGa) w/slot

Metal Guard Rail Cont. from Sta. 178+85 to Sta. 189+50

EASTBOUND LANES

LUNALILO FREEWAY

DMH #4-E Type "D"
℄ Sta. 174+80
Top = 74.50±
Inv = 62.10

24" RCCP, Cl III or 24" CGMP, 14 Ga S = 0.014

C.B. #6-B Type "G"
℄ Sta. 174+80
B.P. Sta. 174+80
Top = 73.91
Inv. = 69.75
See Detail Sht. No. 22

Type "DG" Curb & Gutter

Paved Shoulder

Terminate at nearest transverse joint

6' Min.

RAMP "B-1"

℄ Ramp B-1" 347°-08'-30"

Paved Shoulder

Longitudinal Joint See Sht. No 3 for detail 4

Control of Access Line

New R/W and Control of Access Line

ITEM No. 123
Building to be relocated
See Sheet No. 110

Frear St. E 7+82

Cut off exist drain & Plug with conc

New A.C. Pav't

Construct 10' Reinf. conc. Drop Driveway

72" Chain Link Fence

Metal Guard Rail (Omit Spacer Blocks)

New R/W Line

R=10' R=23'

Conform to existing at R/W Line

Begin Reconstructed lava rock curb; Connect to existing lava rock curb

End Reconstructed lava rock curb; Connect to existing lava rock curb

Construct smooth riding connection to exist pavement

Exist. curb to remain

Exist. drain to remain

FREAR ST.

Exist. R/W Line

CAPTAIN COOK AVENUE

VINEYARD BOULEVARD

315°-08'-30"

APPROVED:

R. K. Nagata — 6/18/68
for ASSISTANT CHIEF ENGINEER BWS — DATE

Folland — 6/20/68
SEWER SYSTEM DIRECTOR DIV. OF SEWERS — DATE

for DIRECTOR OF DEVELOPMENT
HONOLULU GAS Co. Ltd. — 6/18/68 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31), Unit 1

Scale 1" = 20' Date: June 1968

SHEET No. C.O.4GS-1 OF SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(31) Unit 1	1967	~~17~~	292

C.O.46S-2

Revised: Feb. 16, 1968
Jun. 17, 1968

CURVE DATA

	L-2	L.W.B.-1	L.W.B.-2	J-2	A-1	A-2	Lau-1	Lau-2
Δ	52°-42'-00"	22°-56'-06"	29°-48'-54"	32°-35'-30"	101°-25'-47"	89°-37'-00"	21°-55'-55"	16°-15'-37"
R	1200.00'	1300.00'	1200.00'	300.00'	30.00'	30.00'	50.00'	50.00'
T	594.39'	262.95'	319.65'	88.70'	36.65'	29.80'	0.52'	7.14'
Ch.	1065.25'	515.49	617.76'	168.36	46.49'	42.22'		
Lc	1103.75'	518.87'	624.81'	170.65'	53.00'	46.92'	16.82'	13.10'

REVISION	DESCRIPTION	DATE	APPROVED
No. 1	6 ft. of Conc. Jacket to C.I. Pipe Cl. 250	6/21/68	[signature]

APPROVED:

for [signature] ASSISTANT CHIEF ENGINEER BWS — 6/18/68 DATE

[signature] SEWER SYSTEM DIRECTOR DIV. OF SEWERS — 6/20/68 DATE

for [signature] DIRECTOR OF DEVELOPMENT HONOLULU GAS Co. Ltd. — 6/18/68 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-H1-1(31) Unit 1

Scale: 1"=20' Date: June 1968

SHEET No. OF SHEETS

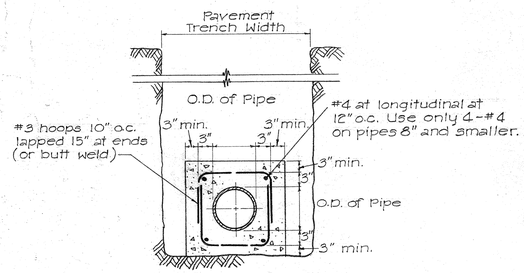
C.O. 46S-2

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

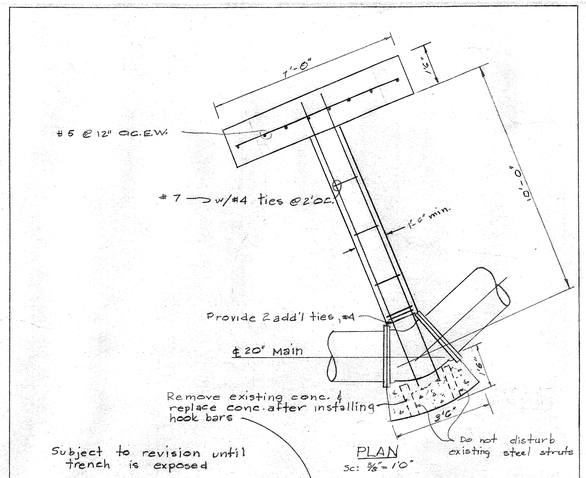
PRINTED ON NO. 1000H CLEARPRINT

Revised: Jun. 17, 1968

REVISION	DESCRIPTION	DATE	APPROVED
No. 1	6 ft. of conc. lacket to C.I. pipe CI.250	6/21/68	



DETAIL OF
CONCRETE JACKET
Scale: 3/4" = 1' 0"



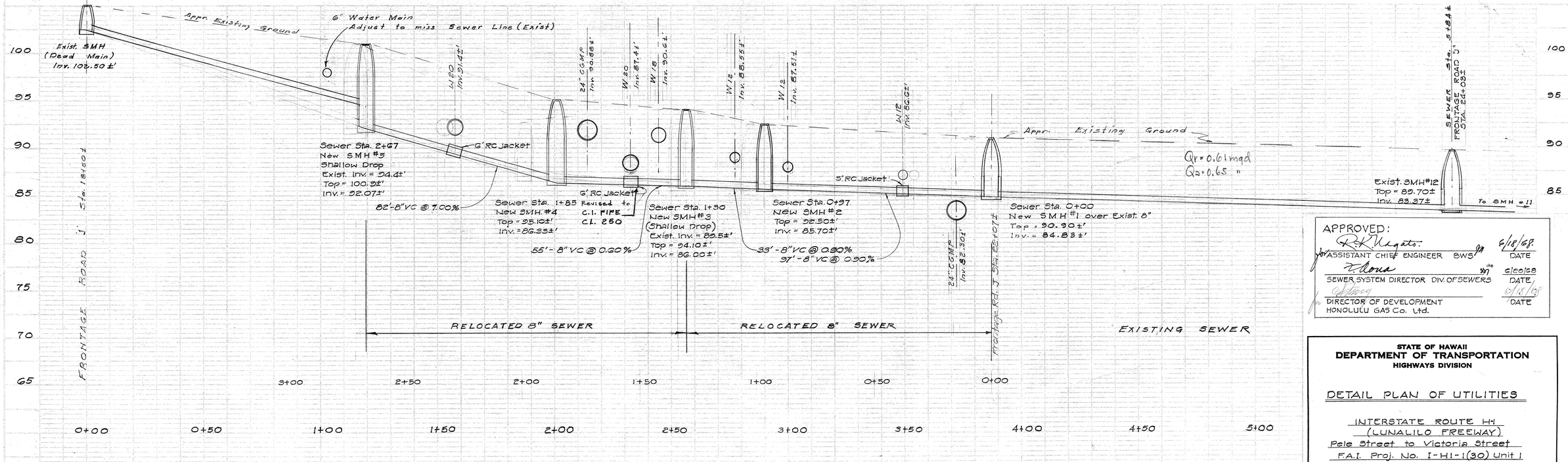
NOTES

1. Class "B" Conc.
2. Design pressure: 125 psi
3. Min. cover for reinf.: 3"
4. Min. lap reinf.: 24"
5. Backfill & Tamp around block @ 3 reqd.

CONCRETE BLOCK
& TIE BEAM
20" 1/8 HORIZ. BEND

FRONTAGE ROAD: "J" Sta. 20+35±
I-HI-1(31) Unit #1

BOARD OF WATER SUPPLY
Location of bend: Alapai & Magellan St.



APPROVED:

R K Nugata for ASSISTANT CHIEF ENGINEER BWS — 6/18/68 DATE

F. Nona for SEWER SYSTEM DIRECTOR DIV. OF SEWERS — 6/20/68 DATE

DIRECTOR OF DEVELOPMENT HONOLULU GAS Co. Ltd. — 6/18/68 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

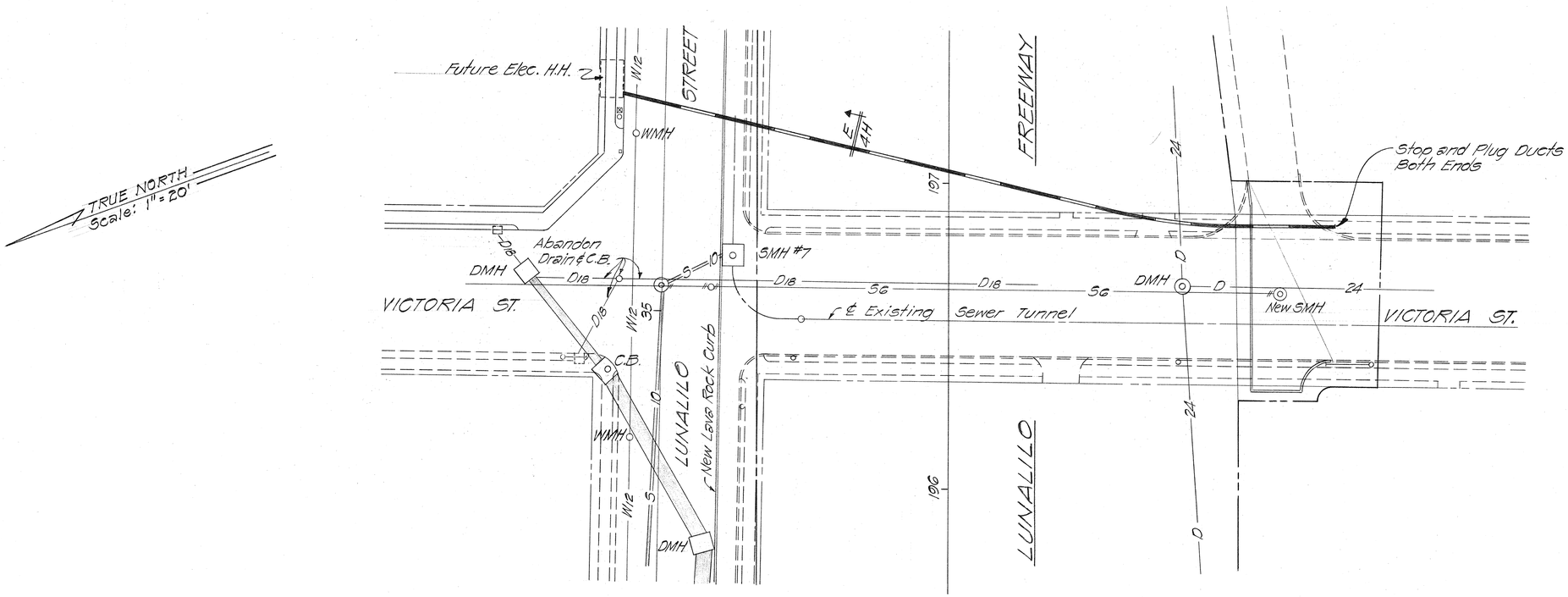
INTERSTATE ROUTE HH
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(30) Unit 1

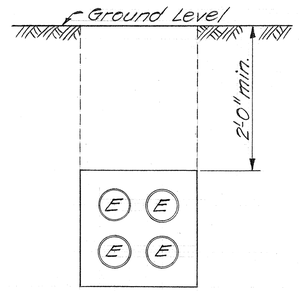
Scale: 1" = 20' Date: June 1968

SHEET No. C.D. 4 OF 65 SHEETS

C.D. 4 65-3

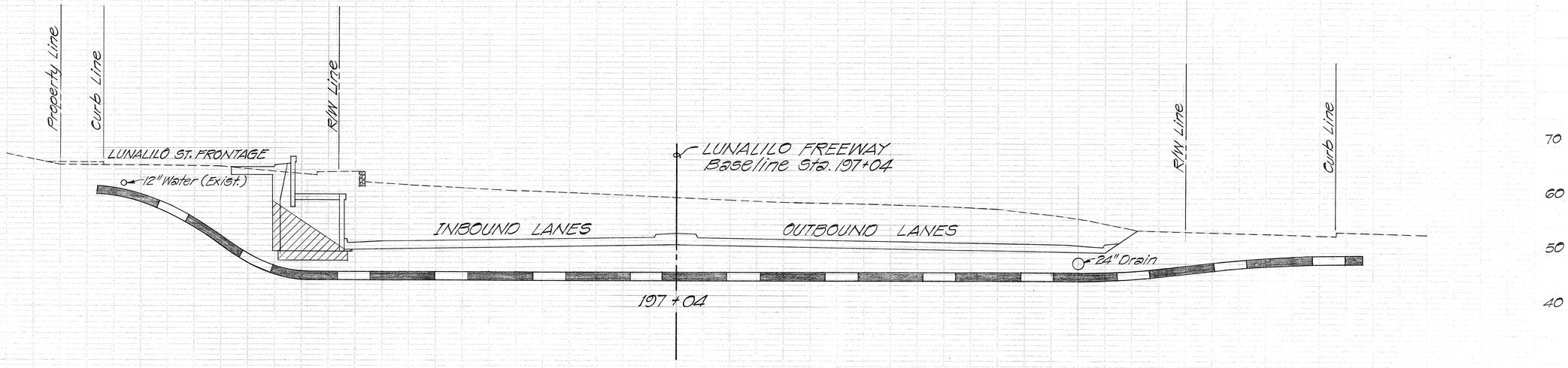
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	C046S4	202





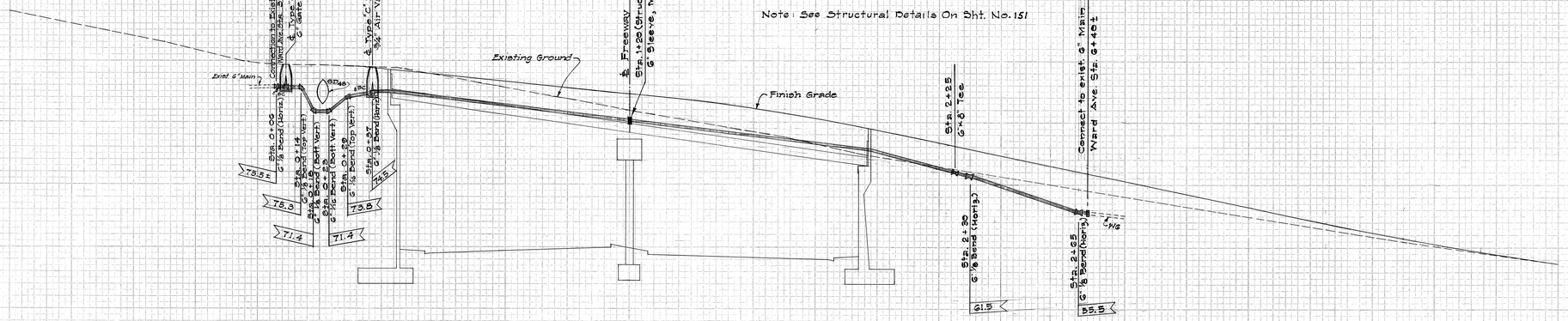
E
4H

4-5" TRANSITE KORDUCT
Scale: 1" = 1'-0"



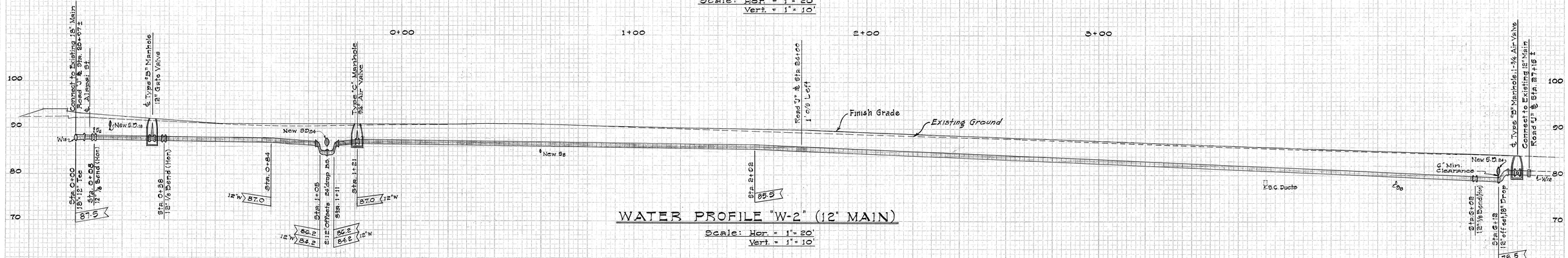
C046S4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	47	252



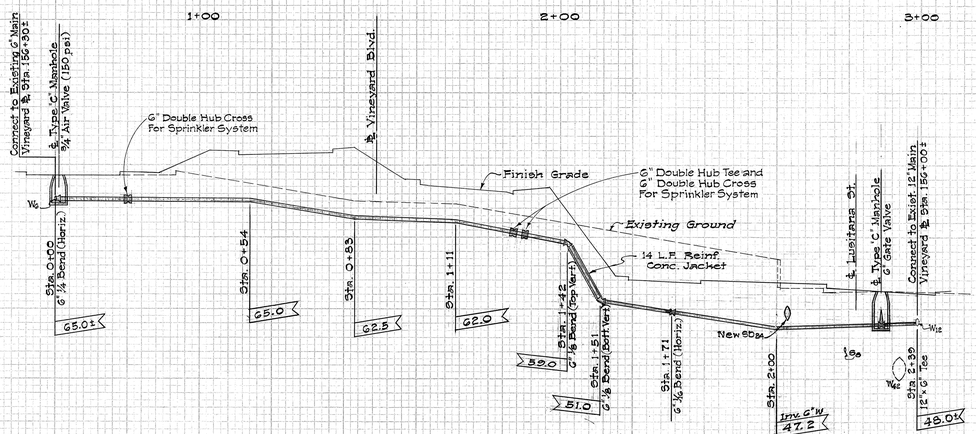
WATER PROFILE "W-3" (6" MAIN)

Scale: Hor. = 1"= 20'
Vert. = 1"= 10'



WATER PROFILE "W-2" (12" MAIN)

Scale: Hor. = 1"= 20'
Vert. = 1"= 10'



WATER PROFILE "W-1" (6" MAIN)

Scale: Hor. = 1"= 20'
Vert. = 1"= 10'

APPROVED:

ASSISTANT CHIEF ENGINEER B.W.S. — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F. A. I. Proj. No. I-HI-1(31) Unit 1

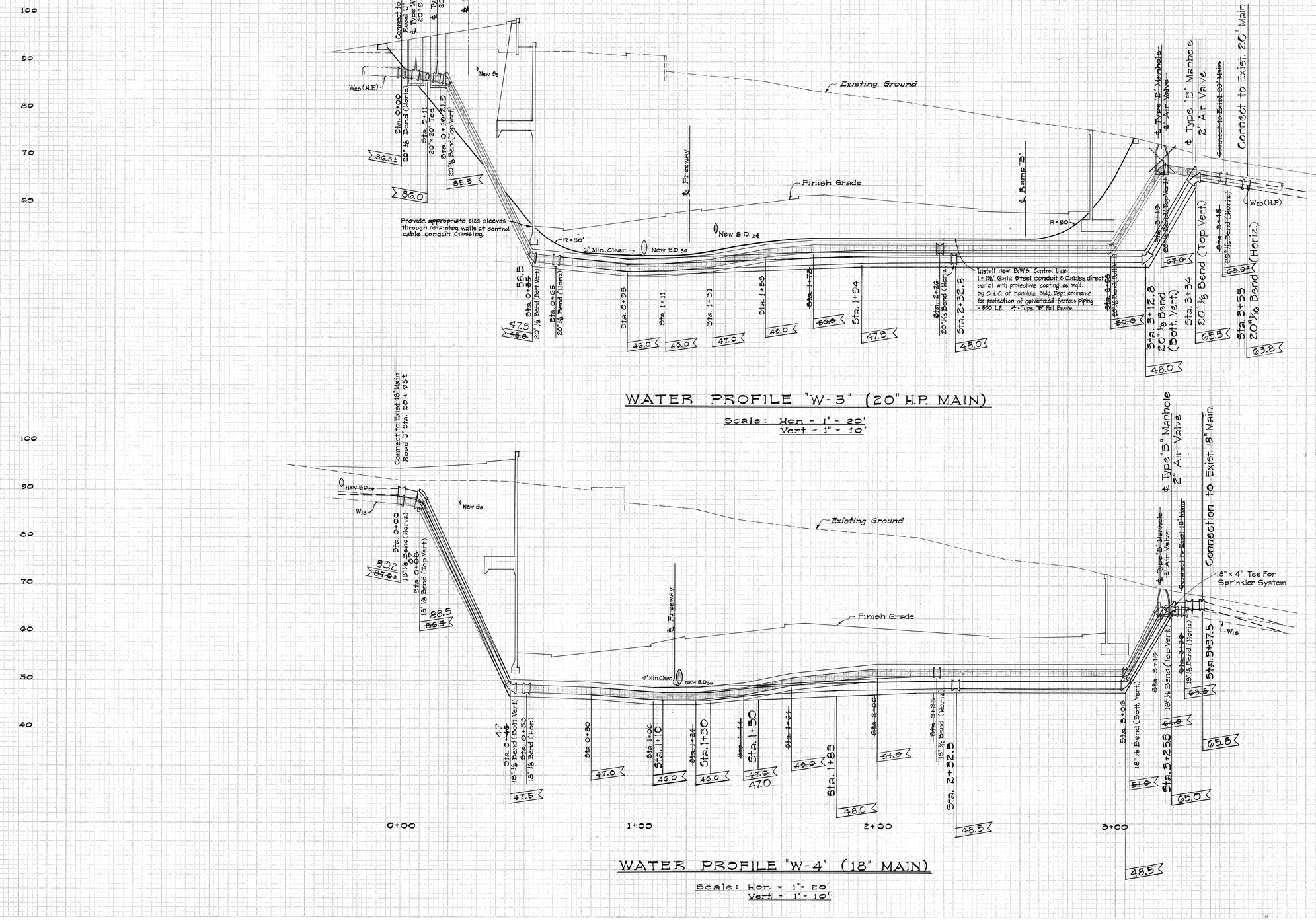
Scale: As Noted — Date: May, 1966

SHEET No. 7 OF 48 SHEETS

47

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, PAGE NO.
ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, PAGE NO.
DATE, BY, CALC.
K&E PLATE 3, CROSS SECTION KEUFFEL & ESSER CO.
46 7000 IMPERIAL™ TRACING CLOTH

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(30) Unit1	1967	48	292



WATER PROFILE "W-5" (20" H.P. MAIN)

Scale: Hor. = 1" = 20'
Vert. = 1" = 10'

WATER PROFILE "W-4" (18" MAIN)

Scale: Hor. = 1" = 20'
Vert. = 1" = 10'

REVISED: Control Line Location
APPROVED:
ASSISTANT CHIEF ENGINEER B.W.S. — DATE: 2-9-67

APPROVED:
ASSISTANT CHIEF ENGINEER B.W.S. — DATE: 6/1/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31)Unit 1

Scale: As Noted — Date: May, 1966

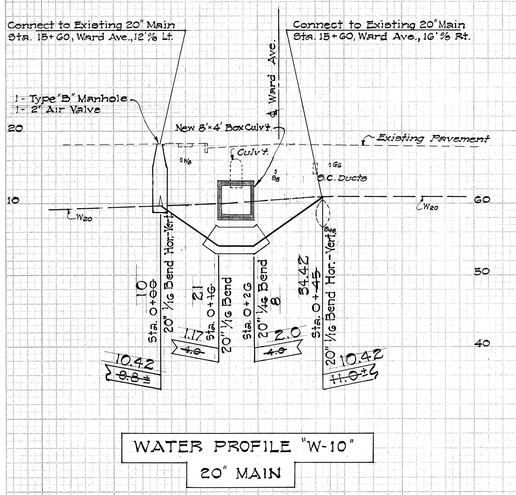
SHEET No. 8 OF 48 SHEETS

48

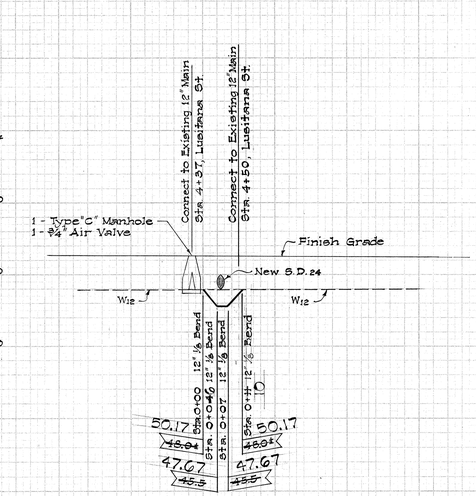
FINAL SURVEY — ORIGINAL SURVEY — DRAWN, PLOTTED, TRACED, NOTE BOOK, NO., CHECKED, DATE, BY

K&E PLATE 3, CROSS SECTION KEUFFEL & ESSER CO. 46 7060 IMPERIAL

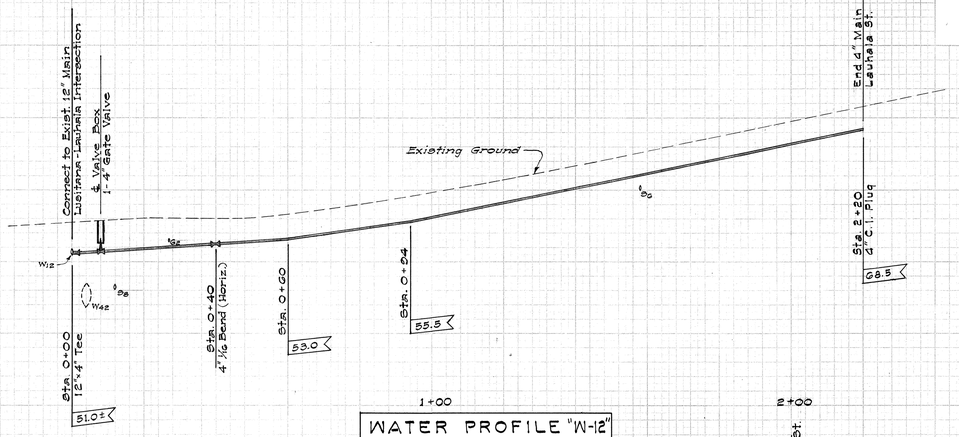
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1 (31) Unit 1	1967	49	252



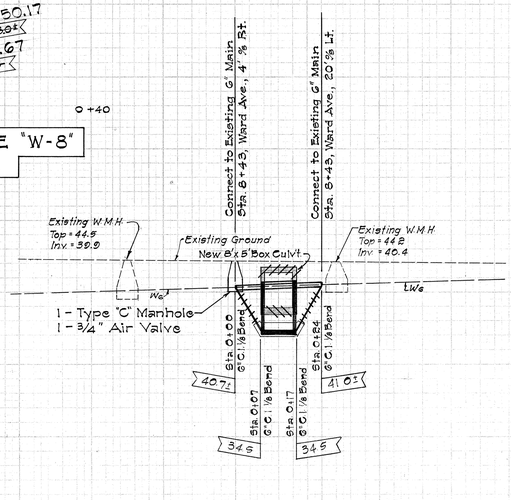
WATER PROFILE "W-10"
20" MAIN



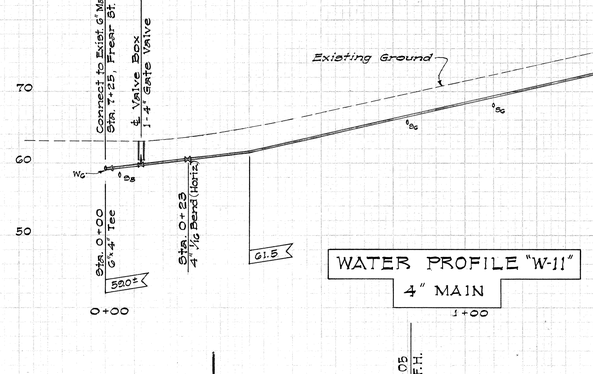
WATER PROFILE "W-8"
12" MAIN



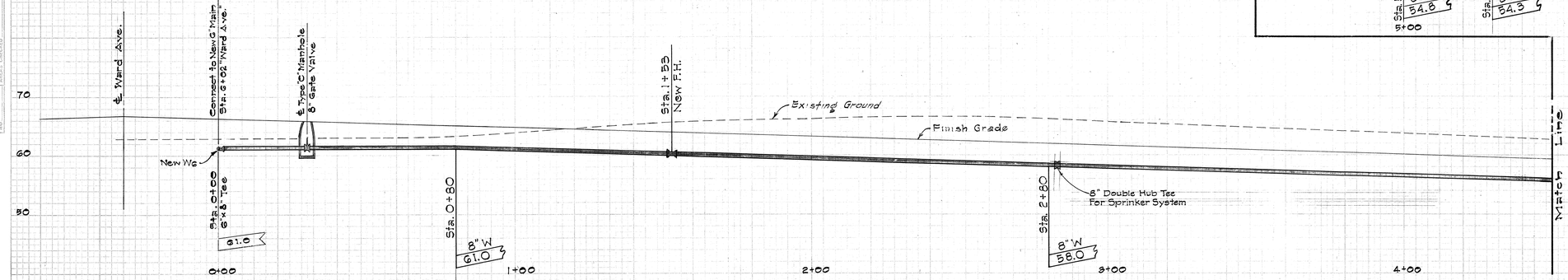
WATER PROFILE "W-12"
4" MAIN



WATER PROFILE "W-9"
6" MAIN

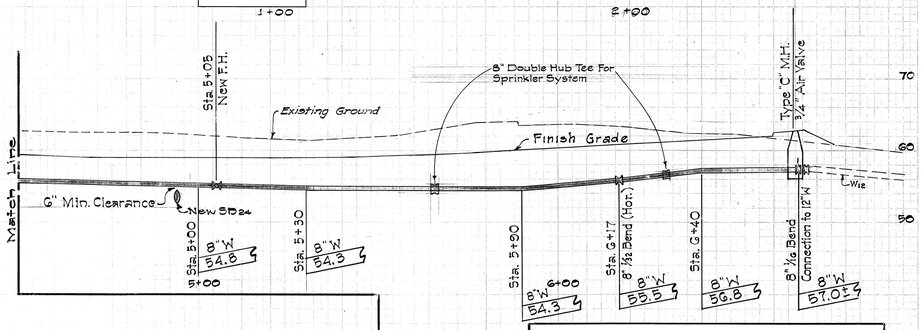


WATER PROFILE "W-11"
4" MAIN



WATER PROFILE "W-7"
12" MAIN

WATER PROFILE "W-6" (8" MAIN)



APPROVED:

ASSISTANT CHIEF ENGINEER B.W.S. — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pole Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scale: Vert.: 1" = 10
Horz.: 1" = 80'

Date: May 1966

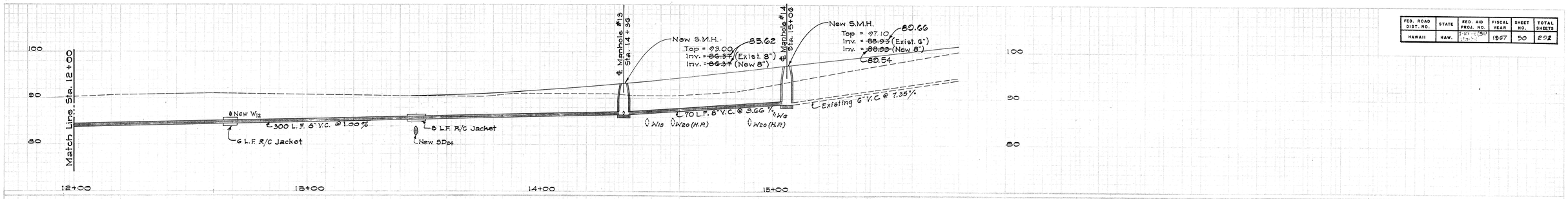
SHEET No. 9 OF 42 SHEETS

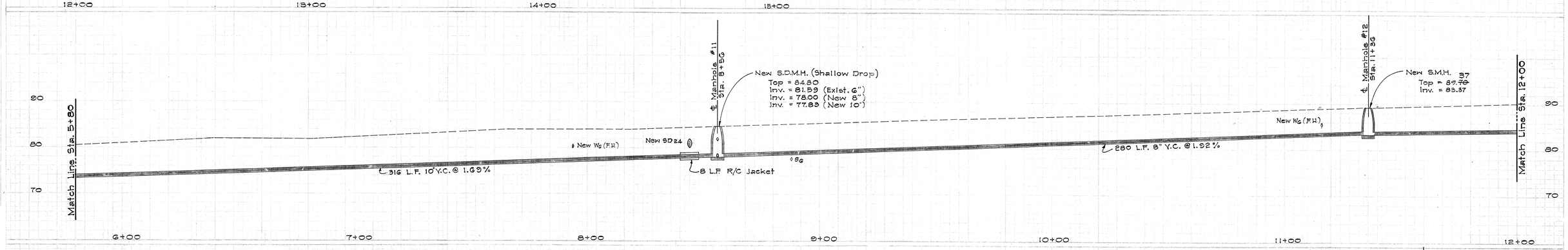
49

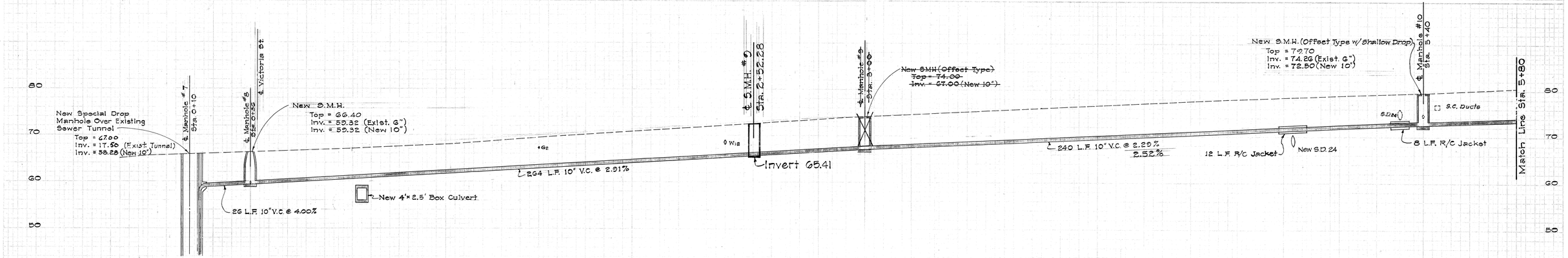
ORIGINAL SURVEY — FINAL SURVEY
SURVEYED / PLOTTED / TEMPLATE / AREAS / AREAS CHECKED / NOTE BOOK / LEO / BY / DATE

PLATE 3—CROSS SECTION G. P. N. & R. E. STANDARD
J. W. VICK CO., PHILADELPHIA

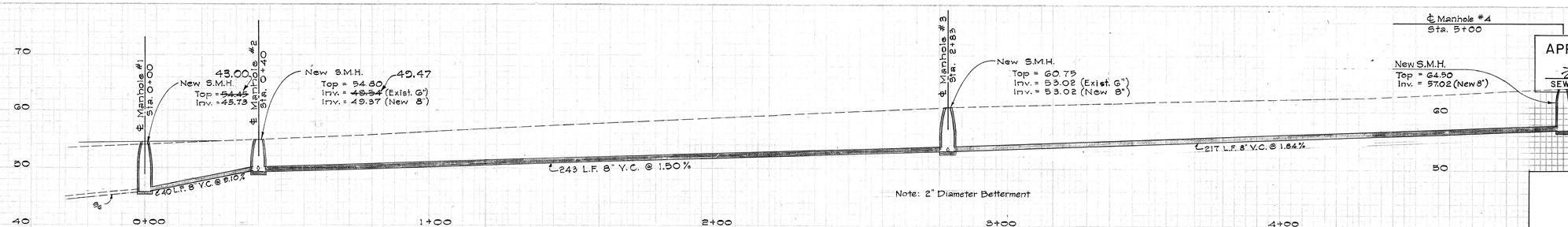
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31)	1967	50	252







SEWER PROFILE "S-2"



SEWER PROFILE "S-1"

APPROVED:

SEWER SYSTEM DIRECTOR — DIV. OF SEWERS — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
SEWER

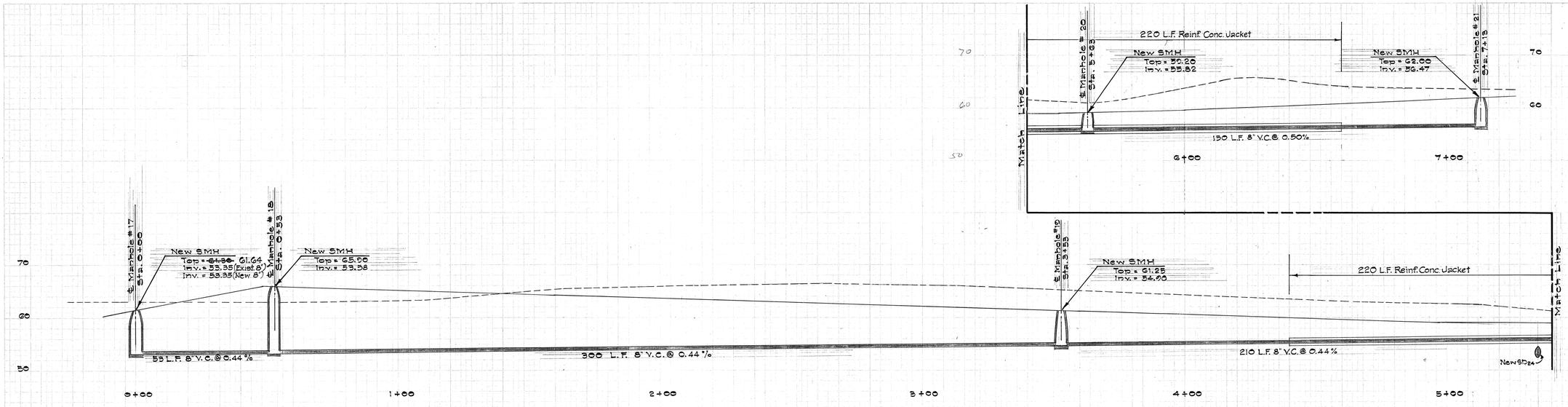
INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit I

Scale: Vert. 1" = 10'
Horz. 1" = 80'
Date: May, 1966

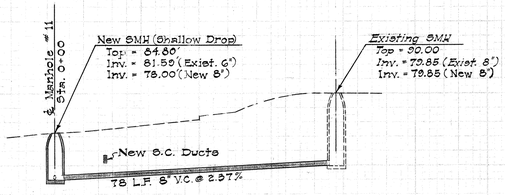
SHEET No. 10 OF 42 SHEETS

50

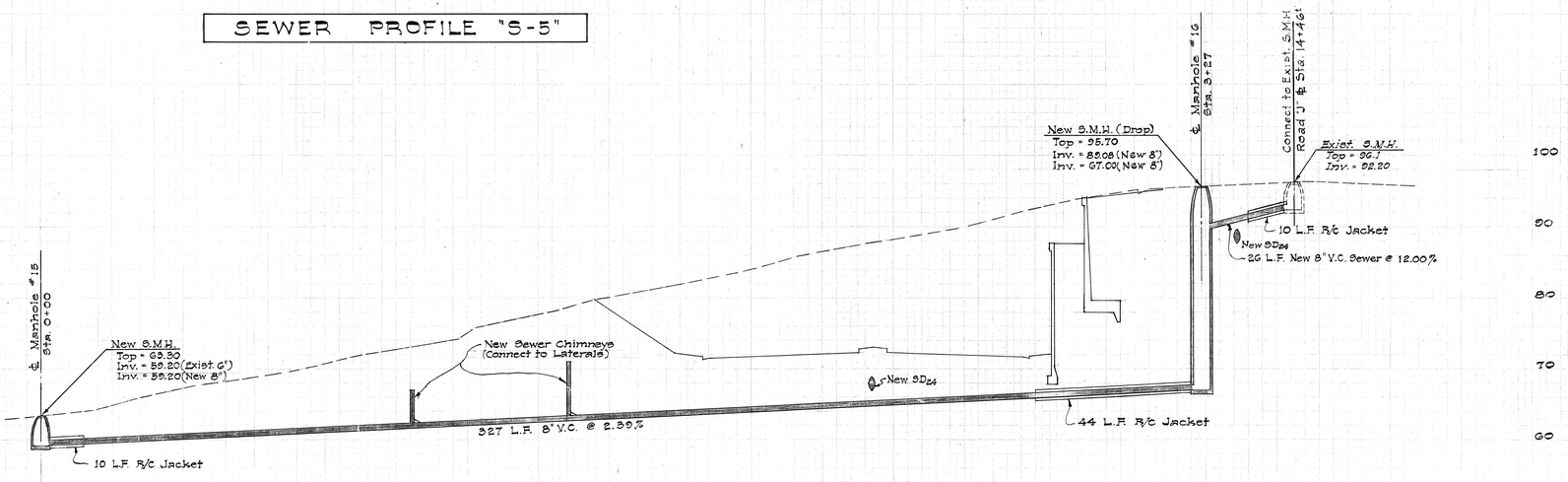
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit1	1967	51	292



SEWER PROFILE "S-5"



SEWER PROFILE "S-3"



SEWER PROFILE "S-4"

APPROVED :

SEWER SYSTEM DIRECTOR — DIV. OF SEWERS — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
SEWER

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Fele Street to Victoria Street
F.A.I Proj. No I-HI-1(31)Unit1

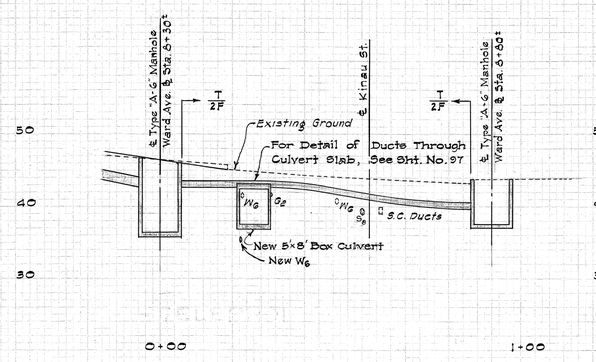
Scale: Vert.: 1" = 10
Horz.: 1" = 20'

Date: May 1966

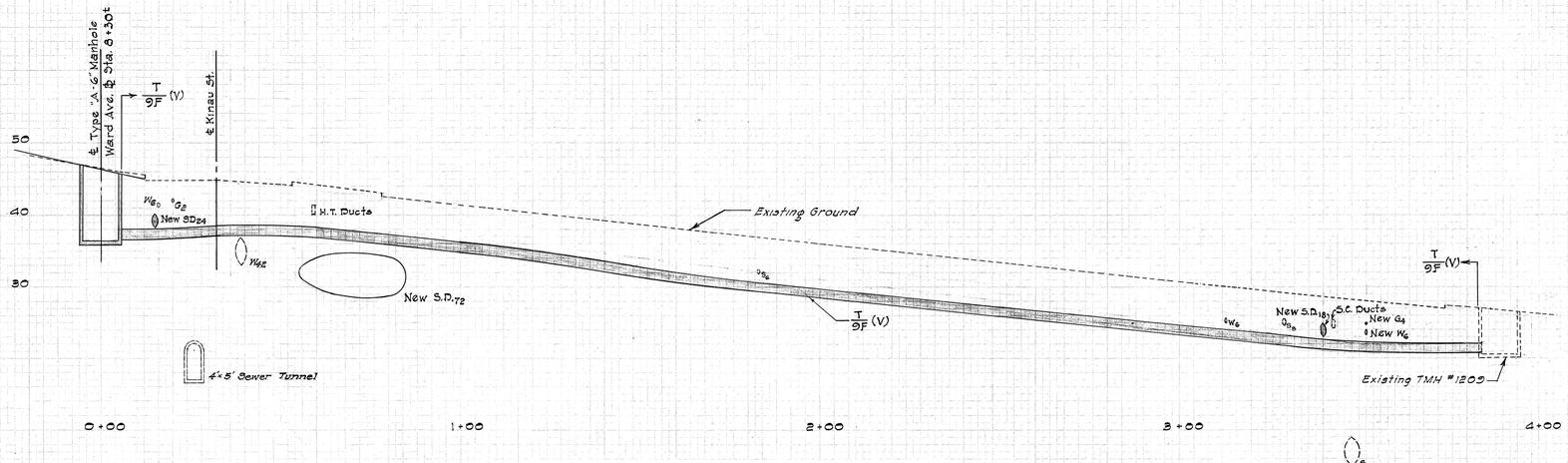
SHEET No. 11 OF 42 SHEETS

51

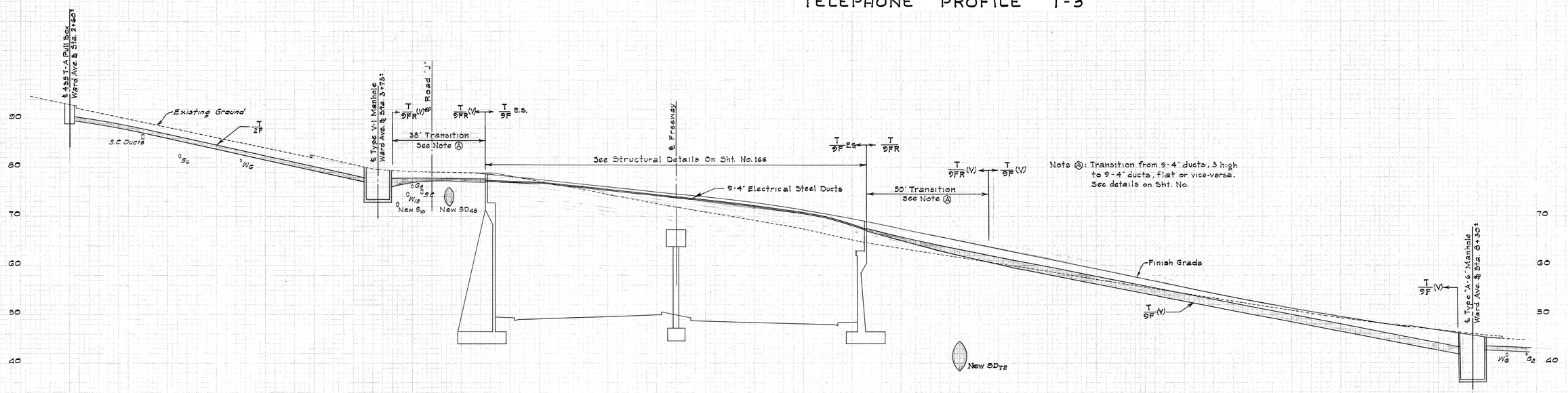
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(50) Unit1	1967	52	292



TELEPHONE PROFILE "T-2"



TELEPHONE PROFILE "T-3"



TELEPHONE PROFILE "T-1"

APPROVED:

R. Mau for F.H. Judd — 6/14/66

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
TELEPHONE

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(51) Unit 1

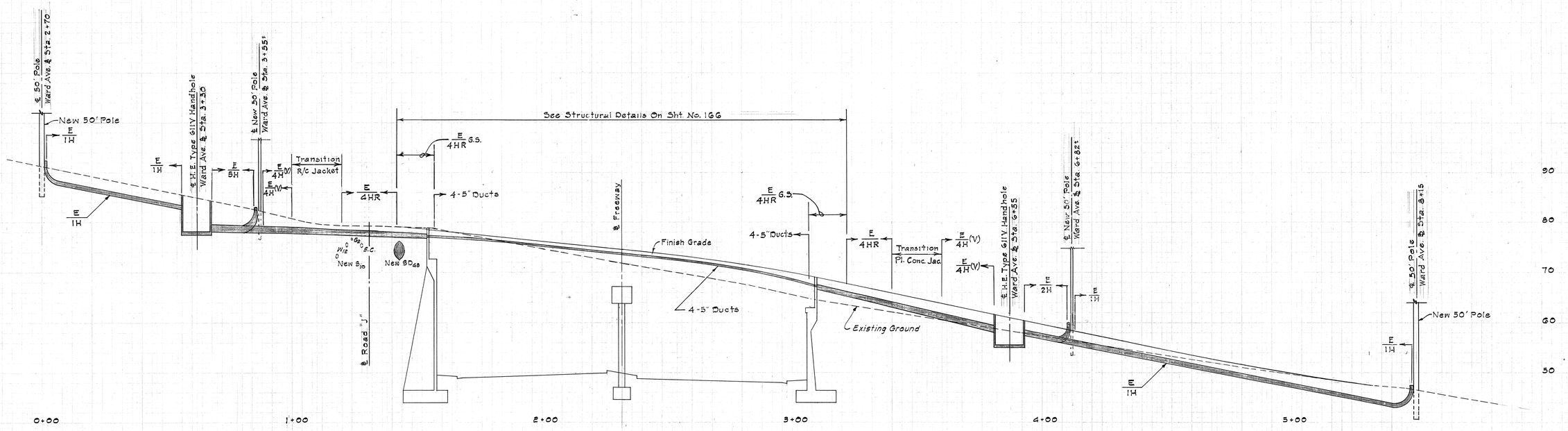
Scale: Vert.: 1"=10'
Horz.: 1"=20'

Date: May, 1966

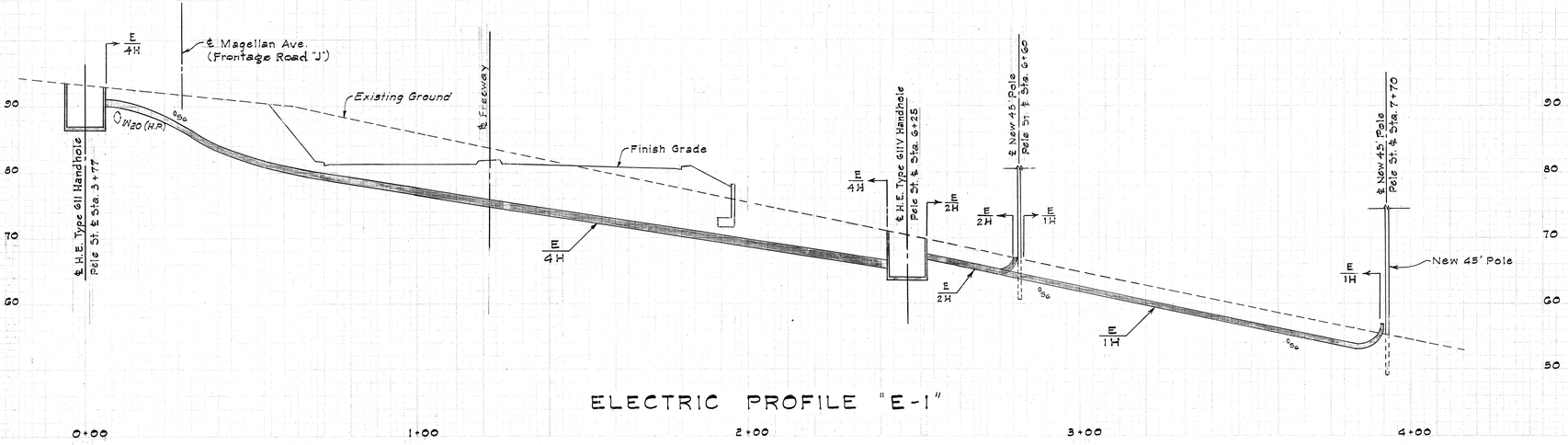
SHEET No. 12 OF 42 SHEETS

52

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	58	292



ELECTRIC PROFILE "E-2"



ELECTRIC PROFILE "E-1"

APPROVED:

R.B. Henderson for FAK — 6-15-66

HAWAIIAN ELECTRIC Co., Inc. — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
ELECTRIC

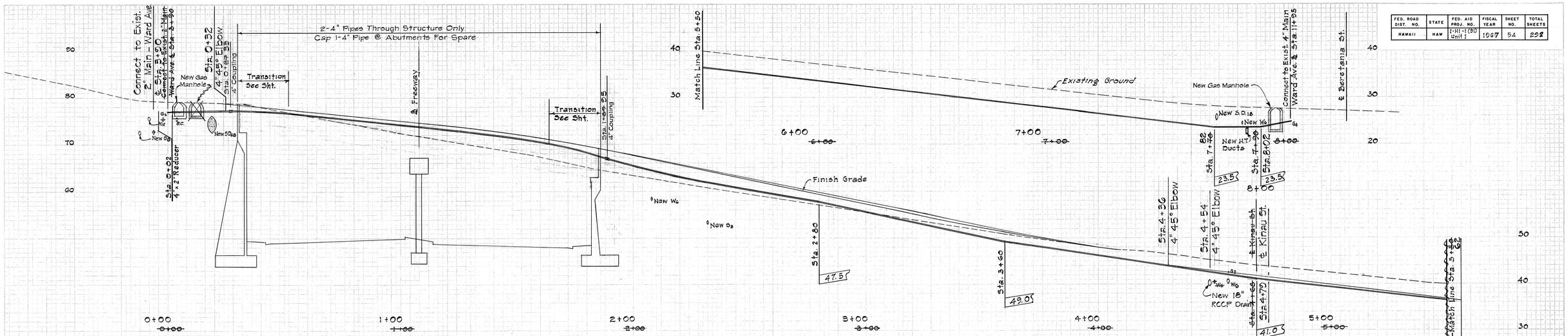
INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31)Unit 1

Scale: Vert. 1"=10'
Horz. 1"=20'

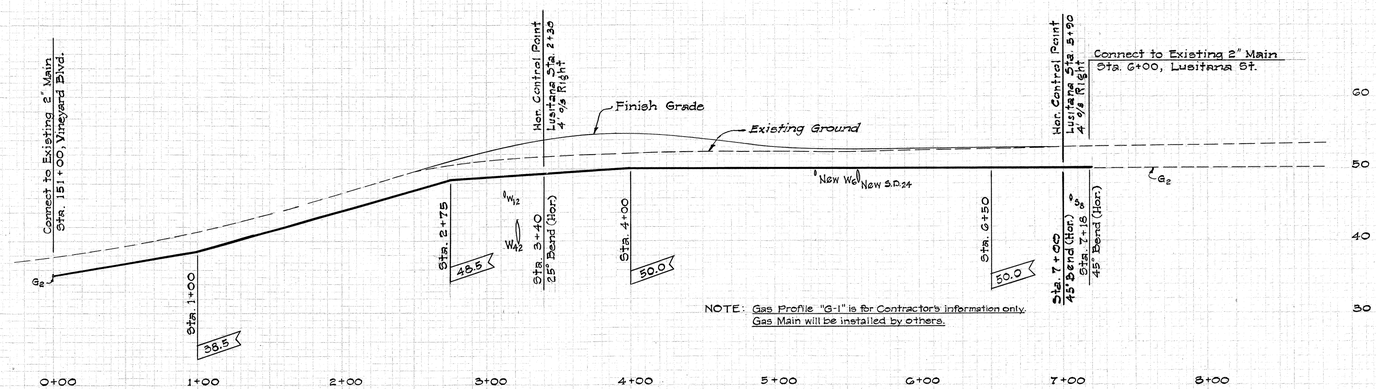
Date: May, 1966

SHEET No. 13 OF 42 SHEETS

53



GAS PROFILE "G-2" (4" MAIN)
Scale: Hor. : 1" = 20'
Vert. : 1" = 10'



NOTE: Gas Profile "G-1" is for Contractor's information only. Gas Main will be installed by others.

GAS PROFILE "G-1" (2" MAIN)
Scale: Hor. : 1" = 50'
Vert. : 1" = 10'

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(31) Unit 1	1967	54	202

APPROVED:

[signature] 4/27/66
DIRECTOR OF DEVELOPMENT, HON. GAS CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
GAS

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

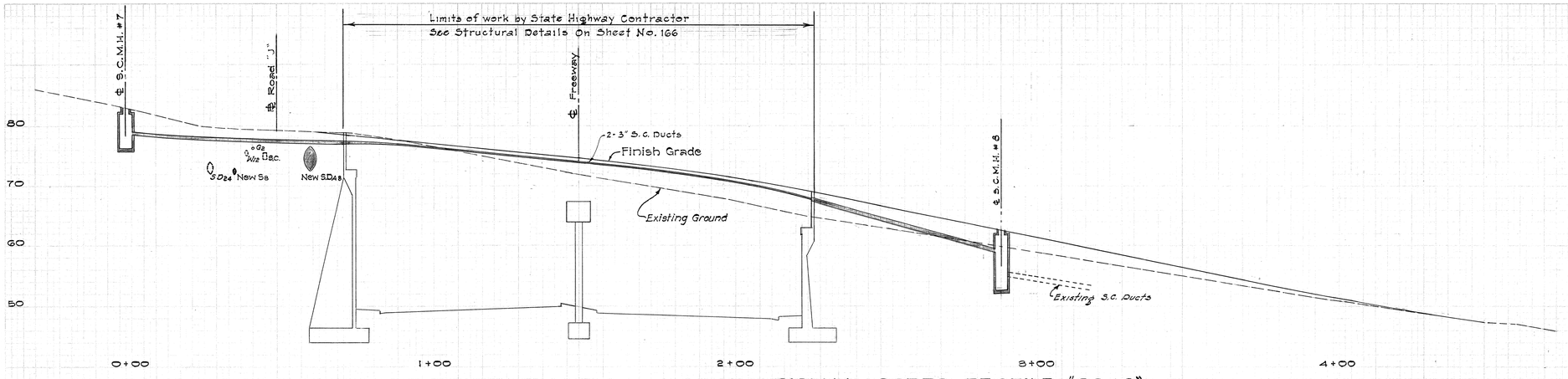
Scale: As Noted Date: May, 1966

SHEET No. 14 OF 42 SHEETS

54

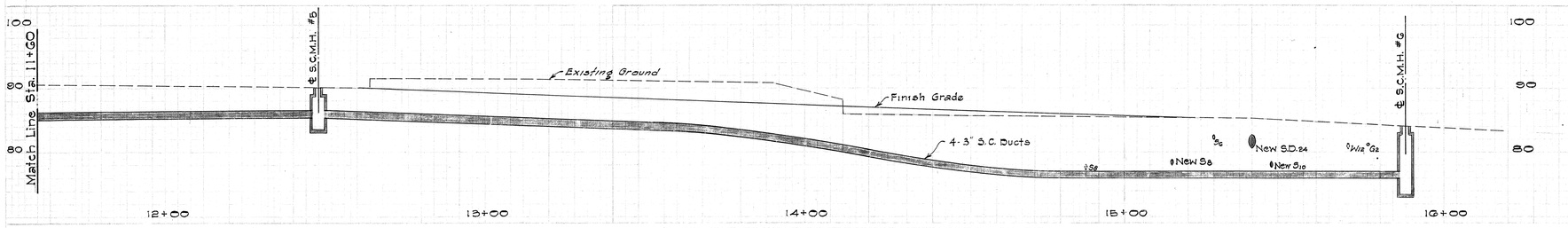
ORIGINAL SURVEY
FINAL SURVEY
PLOTTED
PLOTTED
PROFILE
CROSS SECTIONS
FIELD BOOK
PAGE
DRAWN
TRACED
CHECKED
QUANTITIES
CHECKED
FINAL SURVEY
PLOTTED
PROFILE
CROSS SECTIONS
FIELD BOOK
PAGE
DRAWN
TRACED
CHECKED
QUANTITIES
CHECKED
PLATE 5. CROSS SECTION
KEUFFEL & ESSER CO.
46 7000 IMPERIAL

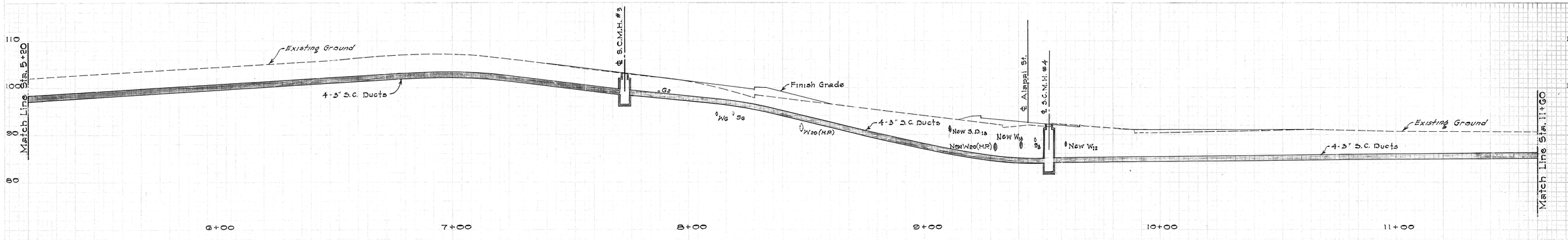
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	55	872

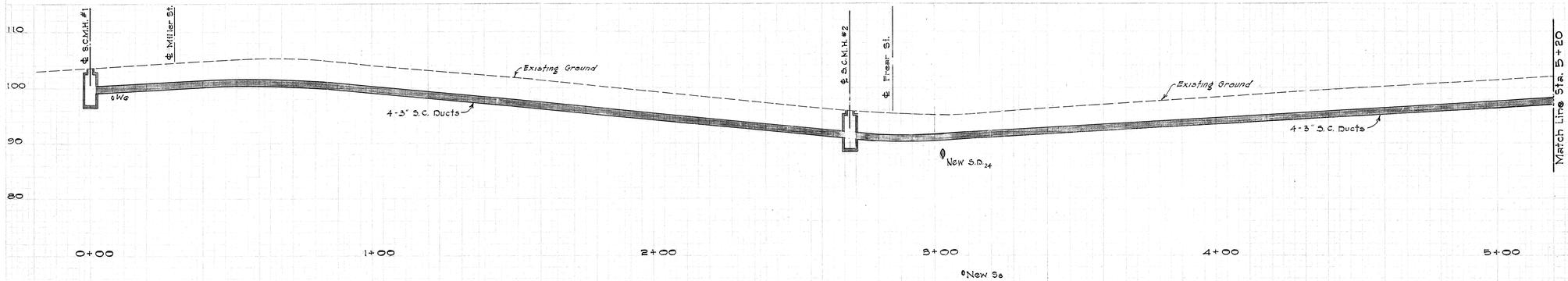


SIGNAL CORPS PROFILE "SC-2"

Note: The State's highway contractor shall install Signal Corps ducts through the Ward Avenue Separation only. All other work will be done by others.







SIGNAL CORPS PROFILE "SC-1"

APPROVED:
Lieutenant Colonel, Signal
SIGNAL OFFICER U.S. ARMY - HAWAII
15 June 66
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
SIGNAL CORPS

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

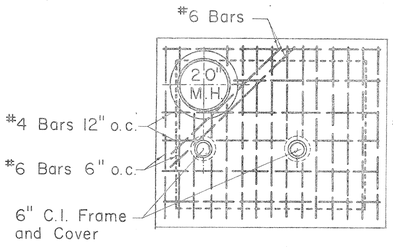
Scale: Vert. 1" = 10'
Horz. 1" = 80'
Date: May 1966

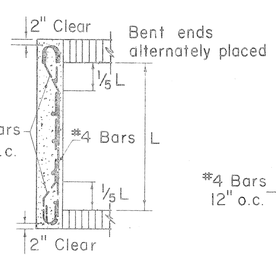
SHEET No. 15 OF 42 SHEETS

55

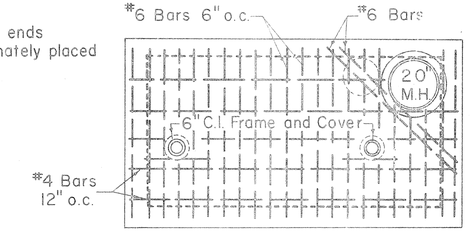
PLATE 3-CROSS SECTION O.F.R. & R.E. STANDARD
L.H. WELCH, STATE ENGINEER

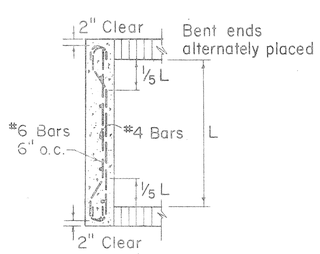
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	56	212



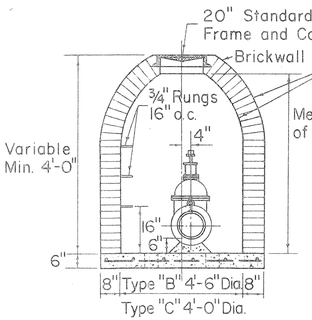


PLAN OF TOP SLAB

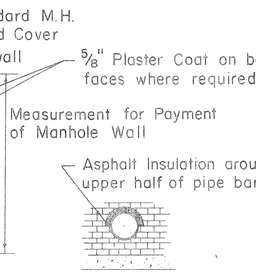




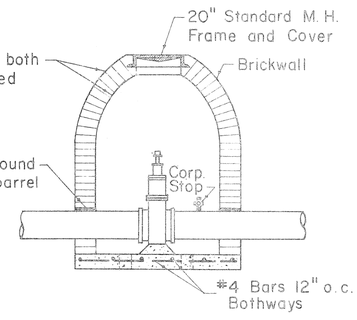
PLAN OF TOP SLAB

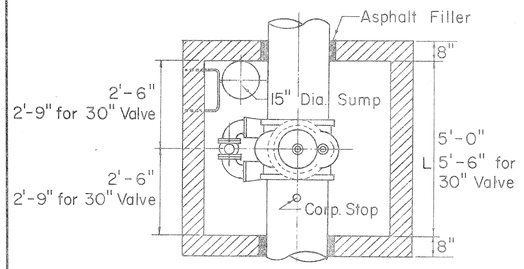


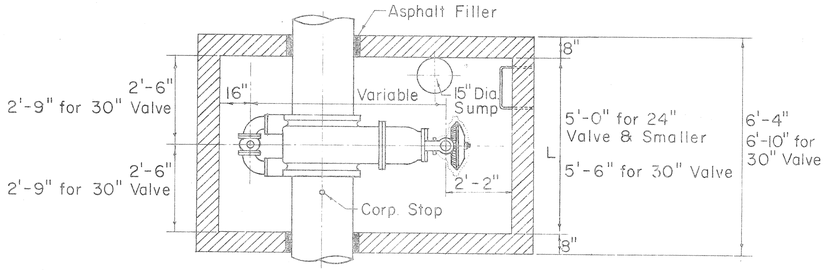
SECTION A-A

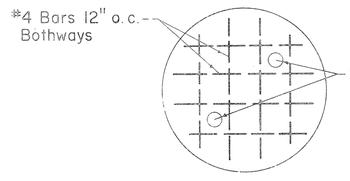


DETAIL OF ASPHALT FILLER







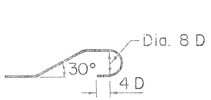


STEEL DETAIL IN BOTTOM SLAB

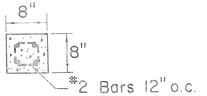
TABLE "A"

REQUIRED CORPORATION STOP SIZES AT GATE VALVE

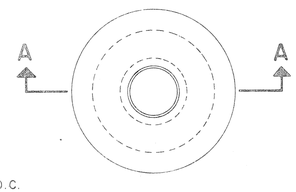
DIA. OF MAIN INCHES	SIZE OF CORP. STOP
4	1" x 1¼"
6	1" x 1¼"
8	1" x 1¼"
12	1" x 1¼"
16	1" x 1¼"
20	1" x 1¼"
24	1½" x 2"
36	1½" x 2"
42	1½" x 2"



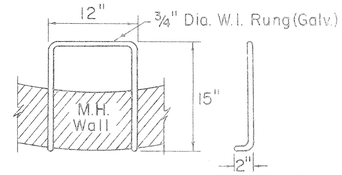
BAR BENDING DETAIL



SECTION THRU LINTEL



PLAN

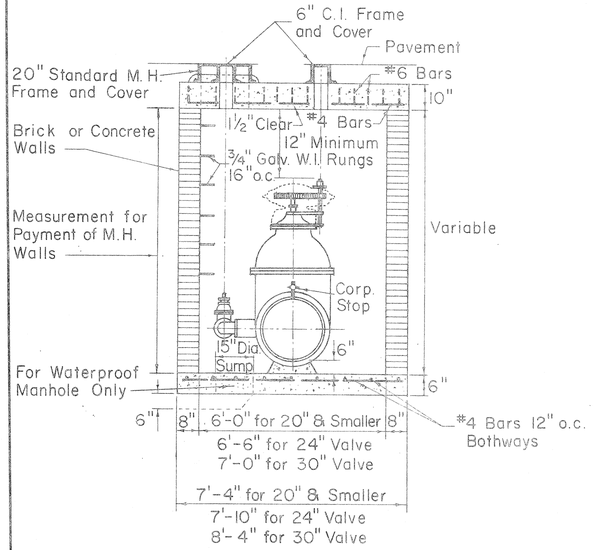


DETAIL OF RUNG

TYPE "B" AND "C" MANHOLES

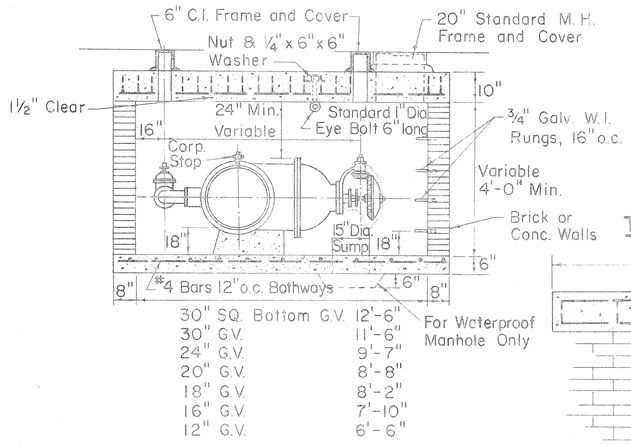
TYPE "B" 4'-6" DIA. (FOR 12" G.V.)

TYPE "C" 4'-0" DIA. (FOR 6" & 8" G.V.)



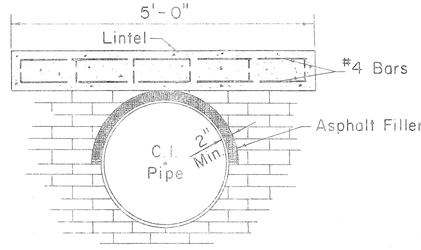
SECTION

TYPE "A" MANHOLE FOR SPUR GEARED GATE VALVES



SECTION

TYPE "A" MANHOLE FOR BEVEL GEARED GATE VALVES



DETAIL OF LINTEL AND ASPHALT FILLER

APPROVED:

L. Kawakami 6/16/66

ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

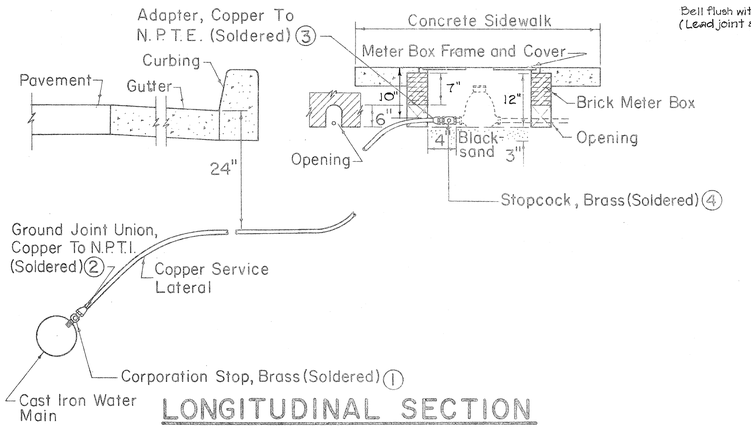
Not to Scale Date May 1966

SHEET NO. 16 OF 42 SHEETS

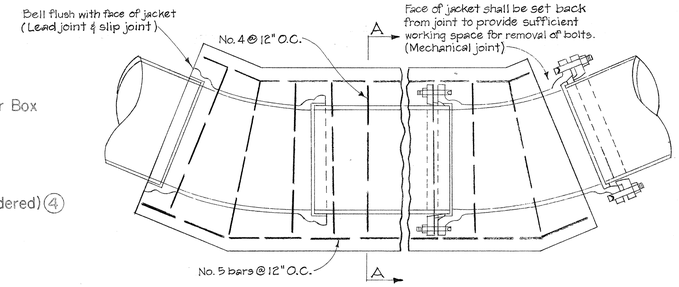
56

LIETZ 1103 ARAWRIGHT TRACING CLOTH 10-66 2GP

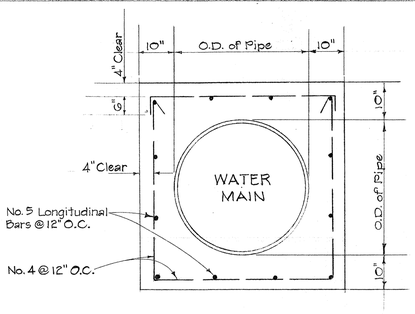
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	57	282



LONGITUDINAL SECTION



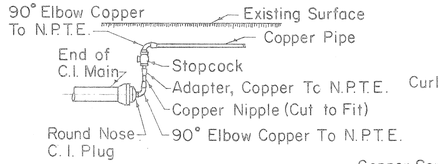
REINFORCED CONCRETE JACKET



SECTION "A-A"

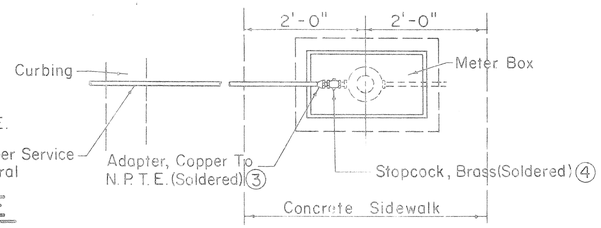
NOTE:

2½" depth of lead for lead joint pipe required at all embedded joints. Wherever construction joints are required, 6" rubber or neoprene waterstops shall be installed. Waterstop shall be of the type specified and manufactured by the Servicized Products Corp., Gate Rubber Co. or approved equal.

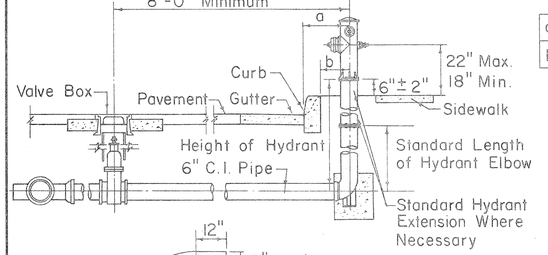


SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE



SINGLE SERVICE CONNECTION



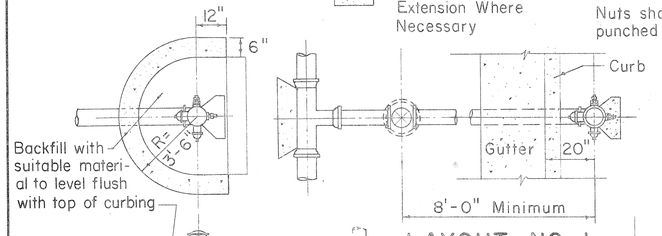
a	20" Min. (Standard Curb)
b	20" Min. (Roll Curb)

NOTE:

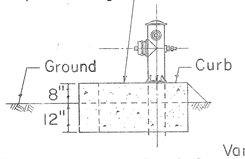
Gaskets for flanged joints shall be 1/16 inch duck-inserted rubber packing Garlock No. 19.

Bolts shall be 5/8" diameter x 2¾" long steel machine bolts with cut threads, American Standard heavy hexagon heads, galvanized.

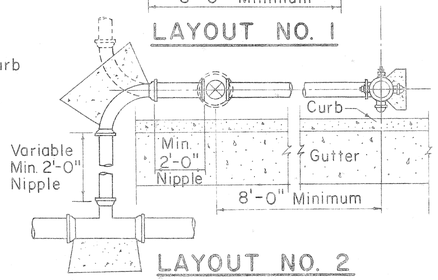
Nuts shall be American Standard heavy cold punched hexagon nuts, galvanized.



LAYOUT NO. 1



DETAIL OF CURBING AT HYDRANT WHERE REQUIRED



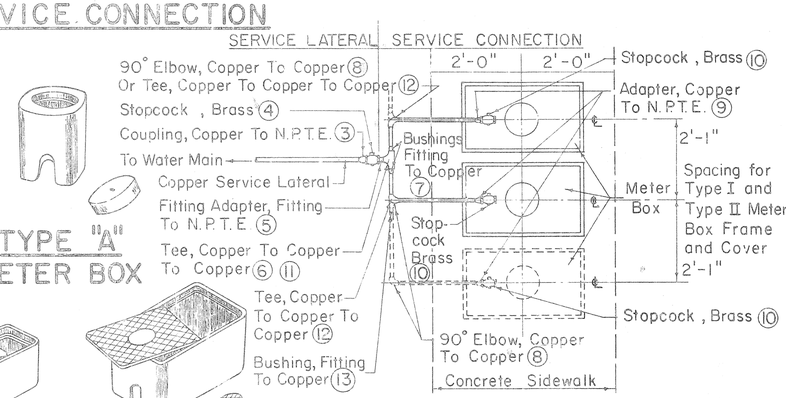
LAYOUT NO. 2

STANDARD FIRE HYDRANT LAYOUT

STANDARD LENGTHS FOR HYDRANT ELBOWS
30"
36"
42"
48"

Standard Hydrant Extensions are available in the following Lengths:

6 to 30 inches long in in increments of 6 inches



TYPE "A" METER BOX

TYPE "B" METER BOX

TYPE "X" METER BOX

MULTIPLE SERVICE CONNECTION SOLDERED JOINTS

METER BOX DATA

TYPE METER BOX	METER SIZES	OVERALL DIMENSIONS AT BOTTOM	OVERALL DIMENSIONS AT TOP	COMPLETE WEIGHT	OVERALL DIMENSIONS OF LID
A	5/8" or ¾" Without Valve	7¼" x 7¼"	10" x 10"	45 lbs.	7⅜" Dia.
B	5/8" or ¾"	9½" x 16"	12¼" x 18⅜"	82 lbs.	8¾" x 14½"
X		14½" x 23½"	16" x 25"	143 lbs.	13⅛" x 22⅛"

SCHEDULE OF COPPER FITTINGS (SOLDERED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN. TWO SERVICES	MULTIPLE SERV. CONN. THREE SERVICES
1	Corporation Stop Brass (H-10003)	1	1	1
2	Ground Joint Union (Style Copper To N.P.T.E. No. C-109)	1	1	1
3	Adapter, Copper To N.P.T.E. (Style No. C-101)	2	1	1
4	Stopcock Brass (B.W.S Standard)	1	1	1
5	Fitting Adapter, (Style Fitting To N.P.T.E. No. C-104)	—	1	1
6	Tee, Copper To Copper To Copper (Style No. T-300)	—	1	1
7	Bushings, Fitting To Copper (Style No. C-103)	—	2	2
8	90° Elbow, Copper To Copper (Style No. C-200)	—	2	2
9	Adapter, Copper To N.P.T.E. (Style No. C-101)	1	2	3
10	Stopcock Brass (B.W.S. Standard)	1	2	3
11	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 6 and 7). (Style No. T-300)	—	1	1
12	Tee, Copper To Copper To Copper (Style No. T-300)	—	—	1
13	Bushing, Fitting To Copper (Style No. C-103)	—	—	1
14	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 12 and 13 (Style No. T-300)	—	—	1

NOTE:

Reference Numbers shown thus (H-10003) are from Mueller Co. Catalog "H" and (Style No. T-300) are from Mueller Brass Co. "Streamline" Catalog S-354. Approved Equal may be used.

APPROVED:

L. Kawakami 6/16/66

ASSISTANT CHIEF ENGINEER BOARD OF WATER SUPPLY — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

Not to Scale — Date May 1966

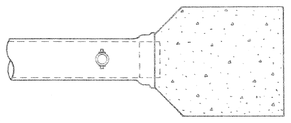
SHEET NO. 17 OF 48 SHEETS

57

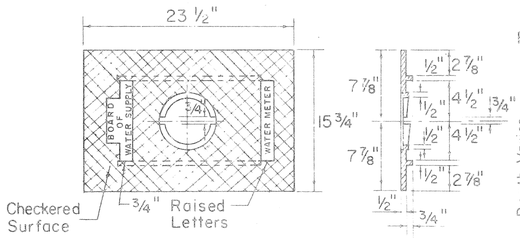
LIETZ NO. ARKWRIGHT TRACING CLOTH 1040 20%

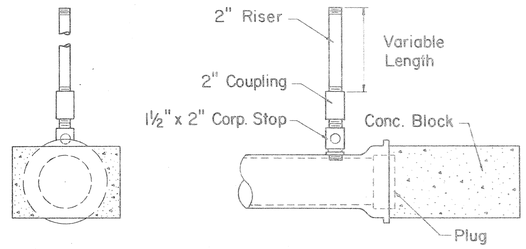
FED. AID DIST. NO.	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	98	202

NOTE:
Contractor to furnish 1½" brass plug (Tapered thread) to replace corporation stop upon completion of chlorination.



TOP VIEW

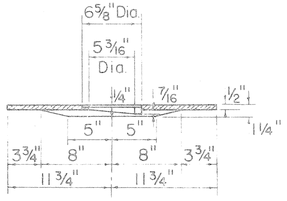




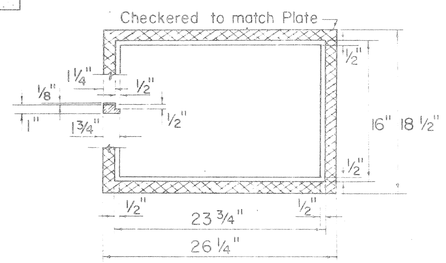
END VIEW

SIDE VIEW

DETAIL OF TEMPORARY 2" CLEANOUT
Not to Scale

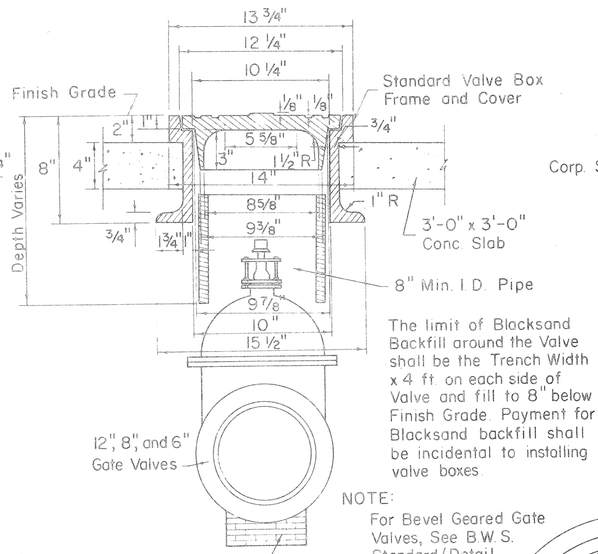


COVER PLATE



FRAME

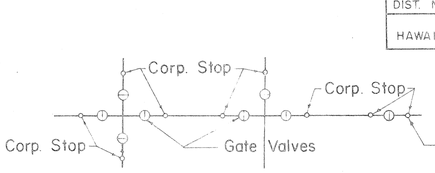
CAST IRON FRAME AND PLATE
TYPE II
Scale: 1½" = 1'-0"



The limit of Blacksand Backfill around the Valve shall be the Trench Width x 4 ft. on each side of Valve and fill to 8" below Finish Grade. Payment for Blacksand backfill shall be incidental to installing valve boxes.

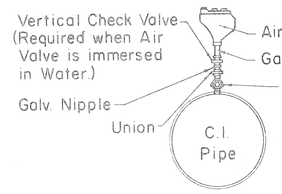
NOTE:
For Bevel Geared Gate Valves, See B.W.S. Standard (Detail Sheet filed in B.W.S. Engr. Division)

INSTALLATION OF VALVE BOX FOR GATE VALVES
Not to Scale



Size of one Corp. Stop given in Table "A". Extra Corp. Stop required at valves located on the "run" shall be 1" x 1¼" for all sizes of pipes and shall be installed as directed by the Engineer.

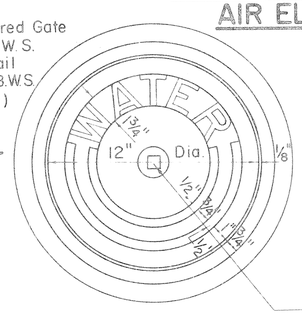
CORP. STOP LAYOUT
Not to Scale



For ¾" Air Valve - ¾" x 1" Corp. Stop w/Bushing
For 2" Air Valve - 1½" x 2" Corporation Stop

For Vertical Check Valve Fig 490 from Kennedy Valve Mfg. Co., Cat. No. 78, or Fig. 24, from Crane Co., Cat. No. 53 or approved equal.

DETAIL OF CONNECTION FOR AIR ELIMINATING TRAP
Not to Scale

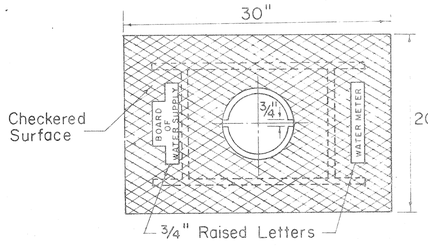


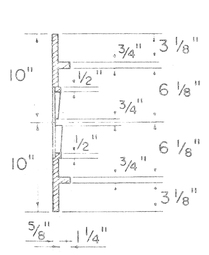
Offset word "WATER" 1¾" high, ⅛" deep

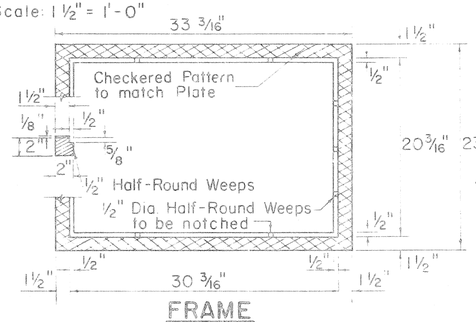
NOTE:
All castings shall be made accurately to the dimensions shown. Seat and Cover shall be ground where necessary to secure flat and true surfaces. The Cover shall not rattle in any position.

Minor changes in dimensions may be made to suit foundry conditions provided such changes are approved by the Board of Water Supply.

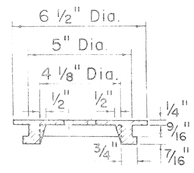
CAST IRON FRAME AND COVER
Scale: 3" = 1'-0"

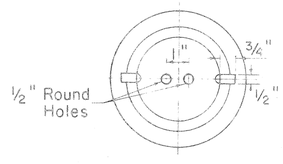




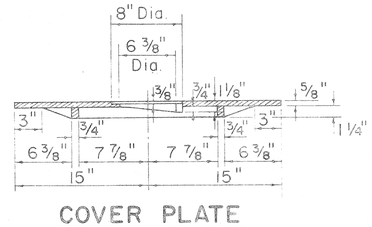


FRAME

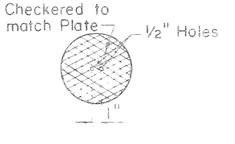


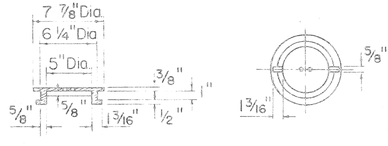


READING COVER



COVER PLATE



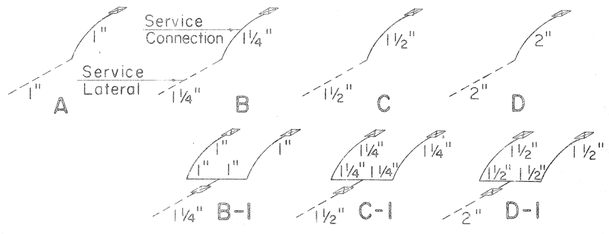


READING COVER

CAST IRON FRAME, PLATE AND COVER
TYPE III
Scale: 1½" = 1'-0"

CHECKERED PATTERN

CAST IRON COVER FOR TYPE II FRAME
Not to Scale



TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS
Not to Scale

APPROVED:

ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

6/16/66
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

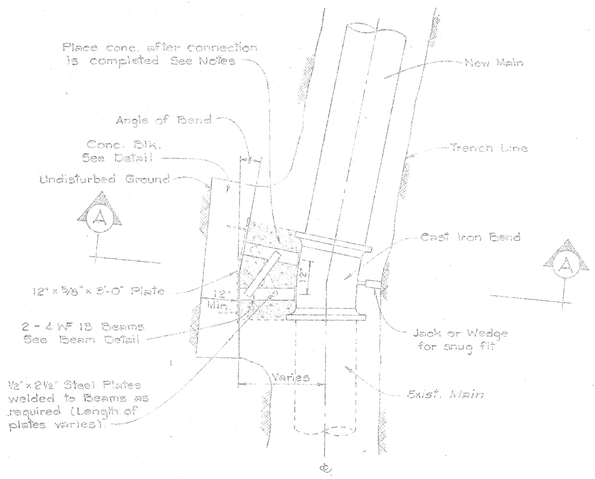
Scale As Noted

Date: May 1966

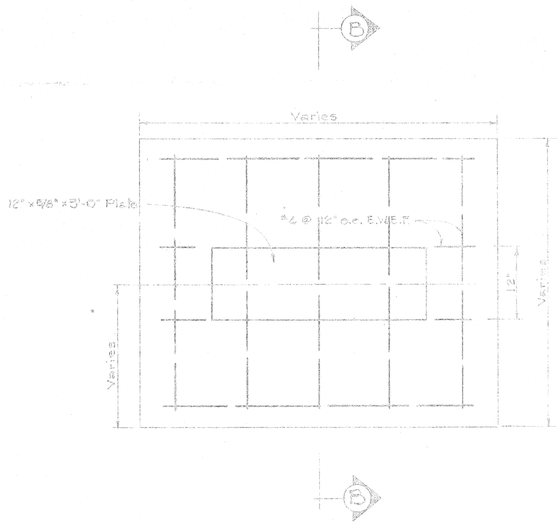
SHEET NO. 18 OF 42 SHEETS

55

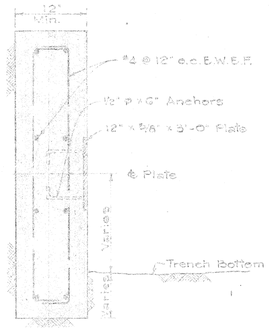
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	39	202



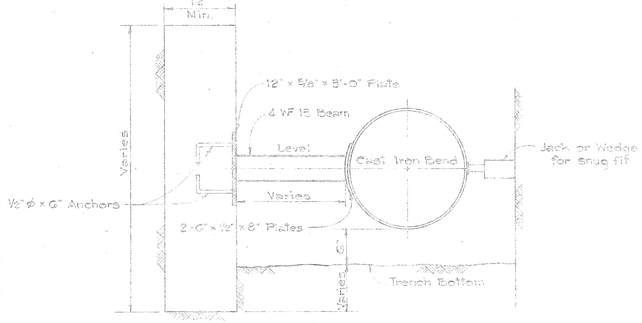
PLAN
Scale: ½" = 1'-0"



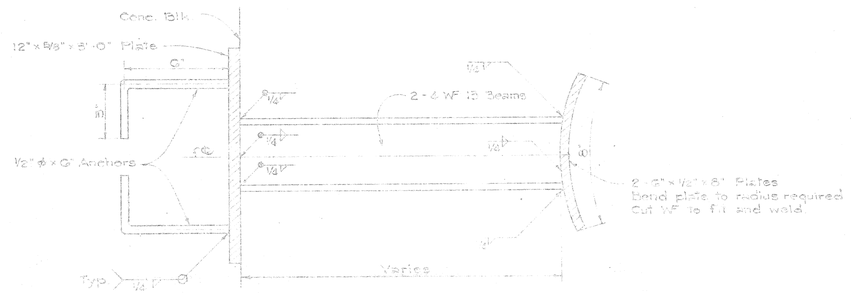
ELEVATION
Scale: 1" = 1'-0"



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



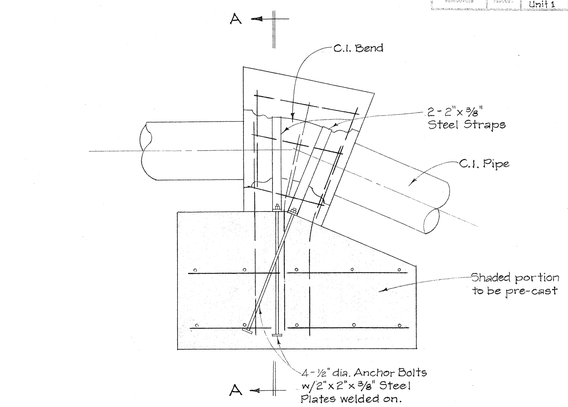
SECTION "A-A"
Scale: 1" = 1'-0"



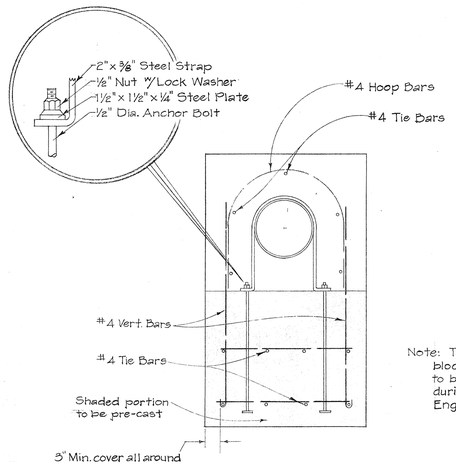
BEAM DETAIL
Scale: 3" = 1'-0"

NOTES:
1. All dimensions marked "Varies" shall be determined in the field by the Engineer.
2. Min. cover over Reinf. shall be 3".
3. Conc. shall be Class "B-1".
4. Dotted area to be filled with conc. after connection is completed.

DETAIL OF
CONC. BLOCK W/STRUCTURAL STRUT
Scale: As Shown



PROFILE



Note: Typical pre-cast concrete block shown. Actual design to be used shall be furnished during construction by the Engineer.

SECTION "A-A"

TYPICAL PRE-CAST CONCRETE
REACTION BLOCK DETAILS
Not to Scale

APPROVED:

ASSISTANT CHIEF ENGINEER — B.W.S. — 6/6/66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

WATER DETAILS
CONCRETE REACTION BLOCKS

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scale: As Shown — Date: May, 1966

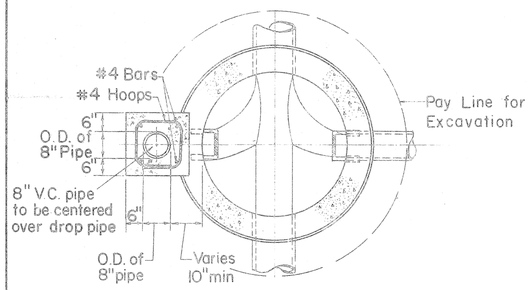
SHEET NO. 10 OF 42 SHEETS

ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
NO.	CHECKED BY	

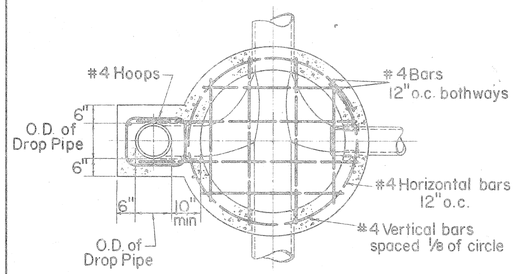
PRINTED ON NO. 1000N CLEARPRINT

5 9

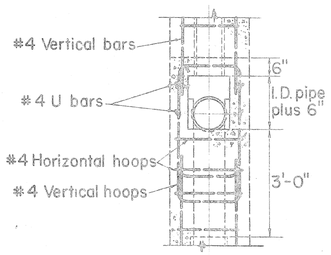
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	60	292



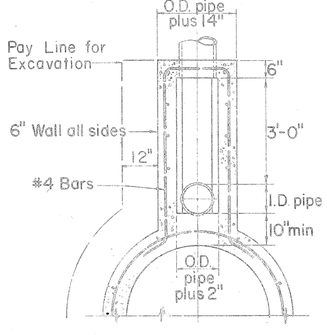
SECTION A-A
Scale: ½"=1'-0"



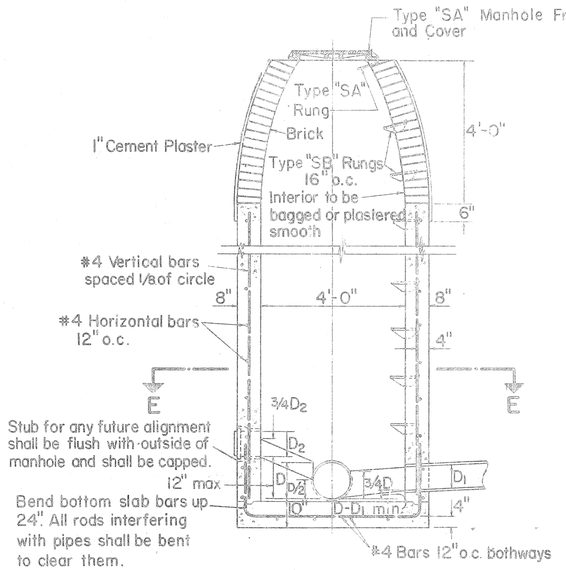
SECTION B-B
Scale: ½"=1'-0"



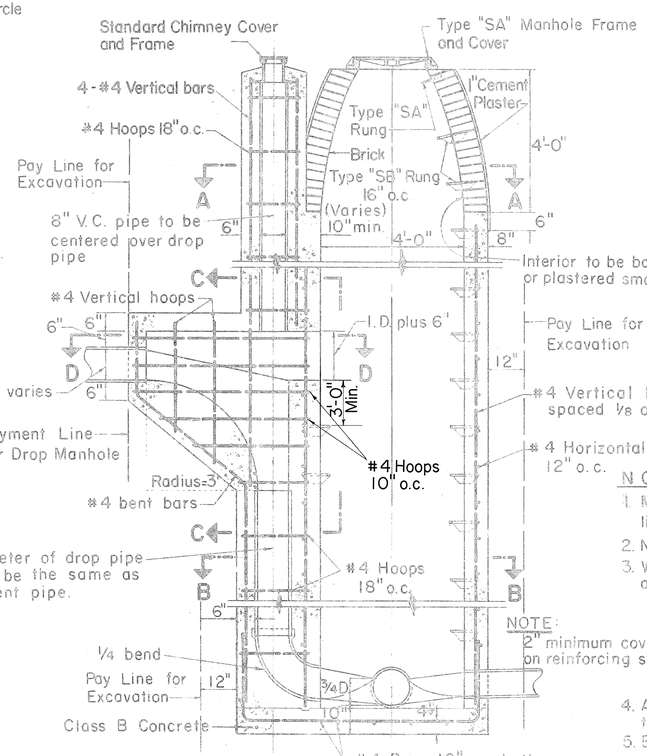
SECTION C-C
Scale: ½"=1'-0"



SECTION D-D
Scale: ½"=1'-0"

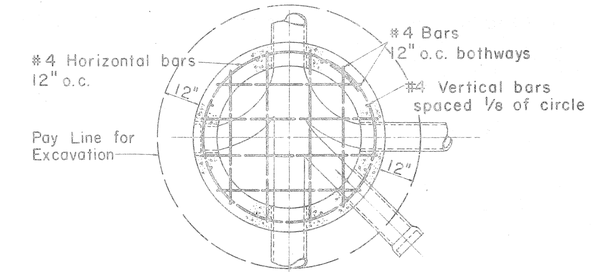


PLAIN MANHOLE
Scale: ½"=1'-0"

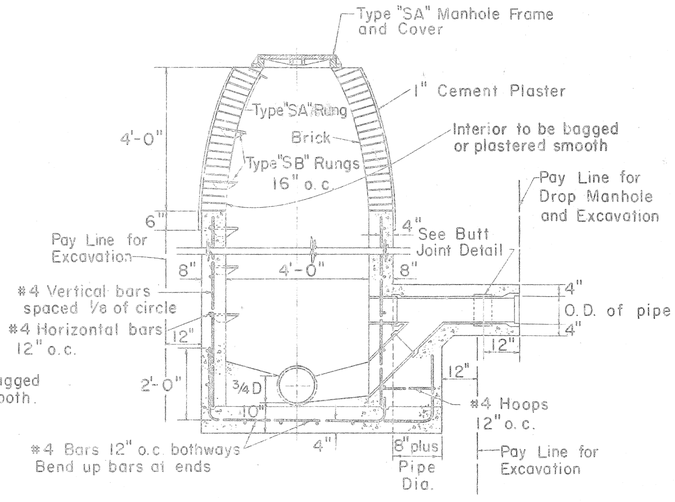


(FOR DROPS OVER 5.0 FEET)

DROP MANHOLE
Scale: ½"=1'-0"



SECTION E-E
Scale: ½"=1'-0"



(FOR DROPS UNDER 5.0 FEET)

SHALLOW DROP MANHOLE
Scale: ½"=1'-0"

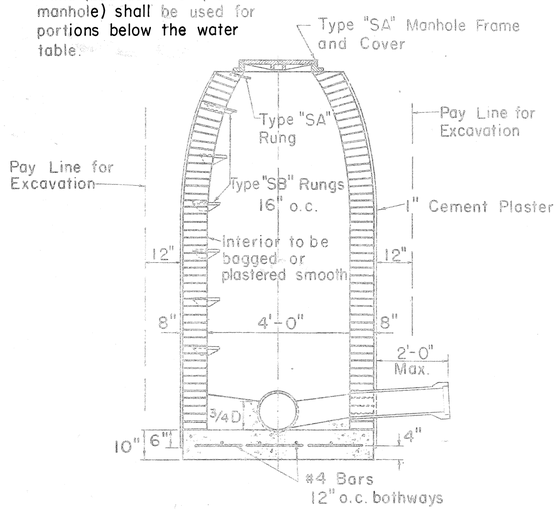
NOTE:

1. Manhole rungs shall not be aligned above any flow line except in drop manhole.
2. No rungs shall be installed in manholes less than 3' high.
3. When not otherwise noted, manhole stubs shall be sloped as follows:

Pipe Size	Rise Per Foot
6"	⅛"
8"	3/32"
10"	1/16"
12"	1/16"

4. All reinforcing rods interfering with pipes shall be bent to clear them.
5. Bar lap to be 40 diameters in length.
6. Data for special manholes not shown shall be similar to that for plain manholes.
7. Size of drop pipe in all Drop Manholes shall be same as influent line.
8. Manhole wall to be of reinforced concrete to height 1' above normal ground water table.
9. **All pipes entering or leaving manholes shall have a joint within 2'-0" of the manhole wall.**

NOTE:
Reinforced concrete manhole walls (See detail of plain manhole) shall be used for portions below the water table.



(MAXIMUM HEIGHT-10.0 FEET)

BRICK MANHOLE
Scale: ½"=1'-0"

Payment for excavation for manholes shall be made under unit price for trench excavation and shall be measured to one foot outside of walls from original ground elevation to authorized bottom elevation.

Payment for manhole walls (brick, or cast-in-place concrete) shall include brick, motar, concrete, reinforcing steel, cast-iron steps, galvanized wrought iron rungs, and plastering.

APPROVED:

Z. Lona — 6/21/66
SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

SEWERS - DROP MANHOLE AND BRICK MANHOLE DETAILS

Scales: As Noted — Date: May 1966

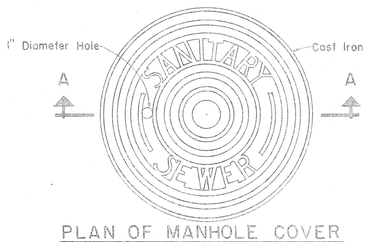
SHEET NO. 20 OF 42 SHEETS

Revised Oct 1965

IMPERIAL 700 K & E CO., N.Y. ®
TRADE MARK

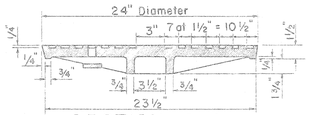
60

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(51) Unit 1	1967	61	202



PLAN OF MANHOLE COVER

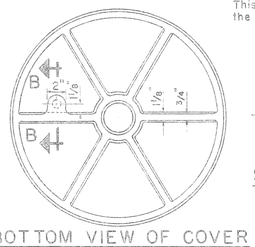
Scale: 1 1/2" = 1'-0"



SECTION A-A

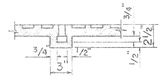
Scale: 1 1/2" = 1'-0"

NOTE:
This cover is used with the "SA" or "SD" frame

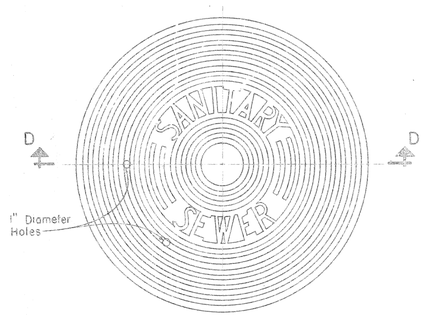


BOTTOM VIEW OF COVER

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



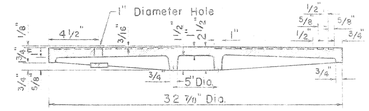
SECTION B-B



PLAN

SPECIAL MANHOLE COVER

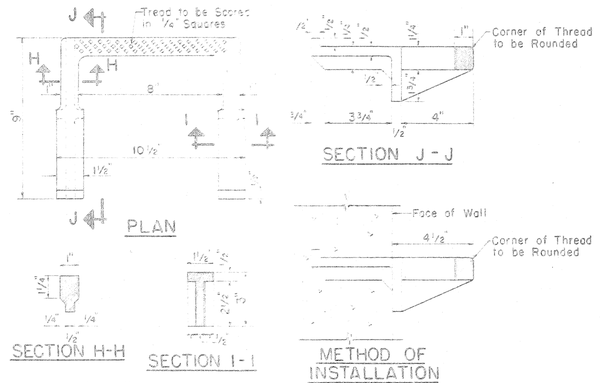
Scale: 1 1/2" = 1'-0"



SECTION D-D

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

Approx. Weight 260 Pounds



PLAN

SECTION J-J

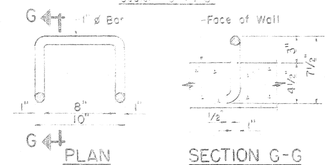
SECTION H-H

SECTION I-I

METHOD OF INSTALLATION

TYPE "SB" MANHOLE RUNGS (CAST IRON)

Scale: 3" = 1'-0"



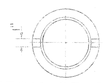
PLAN

SECTION G-G

TYPE "SA" MANHOLE RUNGS (WROUGHT IRON)

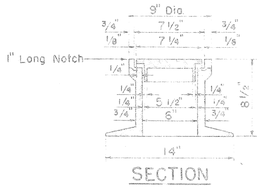
Scale 1 1/2" = 1'-0"

PLAN OF COVER



BOTTOM OF COVER

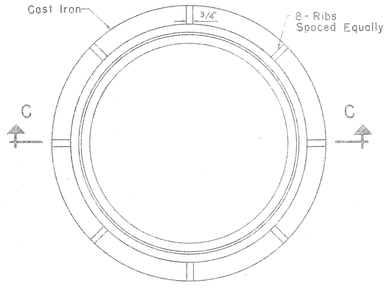
ELEVATION



SECTION

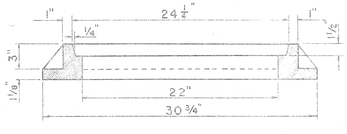
DROP MANHOLE CHIMNEY CASTINGS

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



PLAN OF MANHOLE FRAME

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

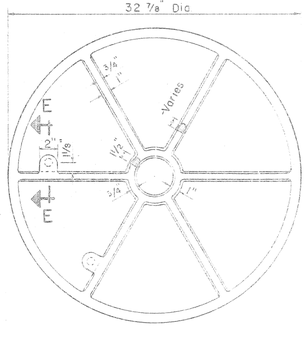


SECTION C-C

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

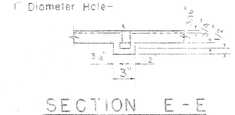
TYPE "SA" SEWER MANHOLE FRAME AND COVER

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



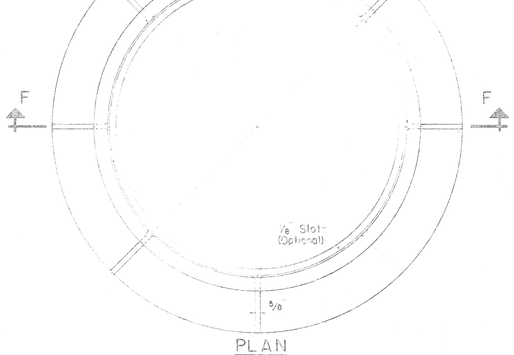
BOTTOM VIEW OF COVER

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



SECTION E-E

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

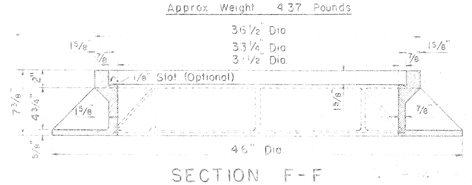


PLAN

SPECIAL MANHOLE FRAME

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

Approx. Weight 437 Pounds



SECTION F-F

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

TYPE "SB" SEWER MANHOLE FRAME AND COVER

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

APPROVED:

SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

SEWERS - MANHOLE RUNGS, CHIMNEY CASTINGS AND FRAME AND COVER DETAILS

Scales: As Noted — Date: May 1966

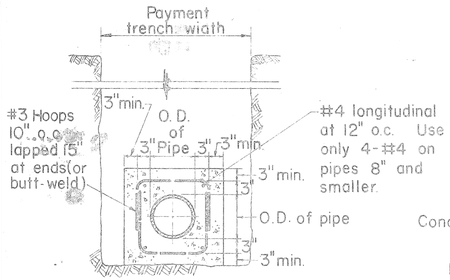
SHEET NO. 21 OF 42 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 11-9-65
	DRAWN BY	11-9-65
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

61

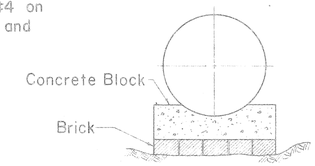
DIETZGEN IMPERIAL TRACING CLOTH

FED AID DIST. NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	G2	292



DETAIL OF CONCRETE JACKET

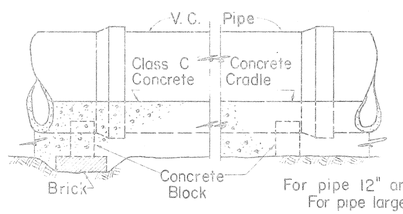
Scale: 3/4" = 1'-0"



METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

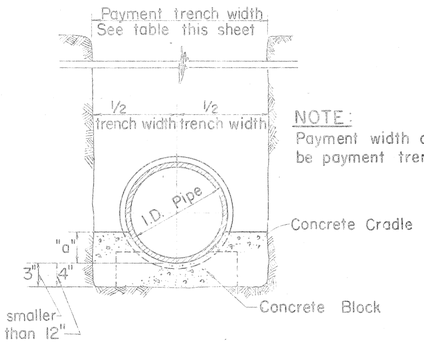
Not To Scale

Contractor shall set Concrete Blocks on undisturbed ground. Where ground is too low, the contractor shall not heap up dirt under the Concrete Block but use Concrete Bricks to take up the deficiency, scraping away beneath Concrete Block to give sufficient room for Brick.



ELEVATION SHOWING METHOD OF LAYING PIPE

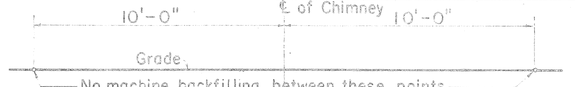
Not To Scale

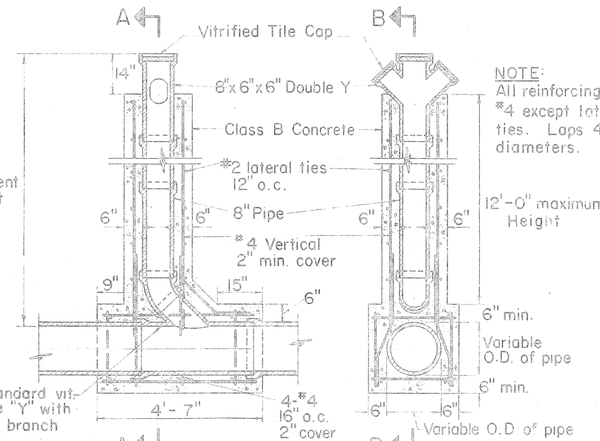


NOTE:
Payment width of cradle shall be payment trench width.

CONCRETE CRADLE FOR VITRIFIED CLAY PIPE

Not To Scale



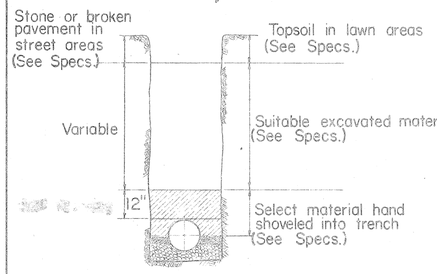


SECTION B-B SECTION A-A

DETAILS OF CHIMNEY

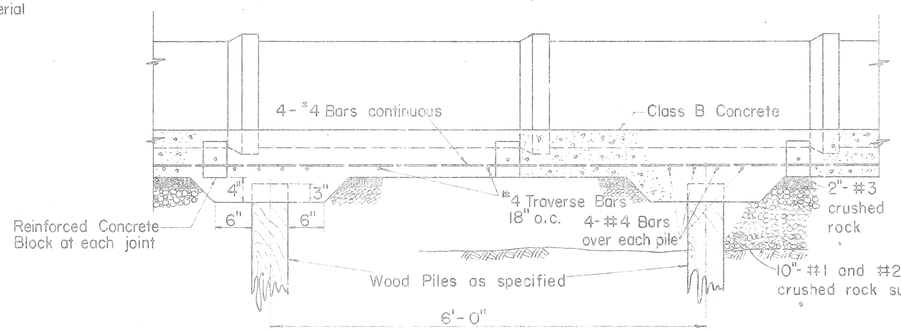
Scale: 1/2" = 1'-0"

Payment quantities for trench excavation, crushed rock fill, crushed rock cradle, and crushed rock sub-base shall be computed using payment trench widths as shown in the table of "Trench Widths". No payment shall be made for excess quantities resulting from trench widths greater than the payment trench widths shown.



METHOD OF BACKFILL

Not To Scale

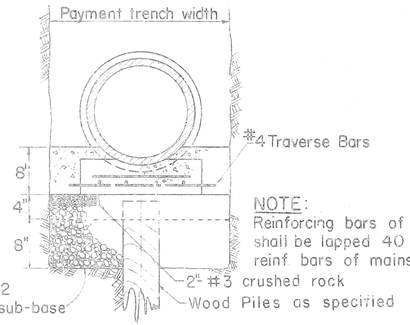


Scale: 1" = 1'-0"

DETAIL OF REINFORCED CONCRETE CRADLE ON WOOD PILES

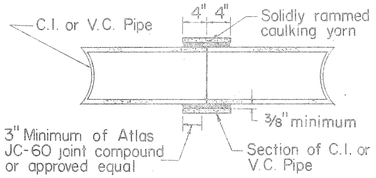
(FOR 6, 8, 10 & 12 IN. V.C. PIPE)

DETAIL OF REINFORCED CONCRETE CRADLE WITHOUT PILES SIMILAR EXCEPT FOR WOOD PILES AND PILE CAPS



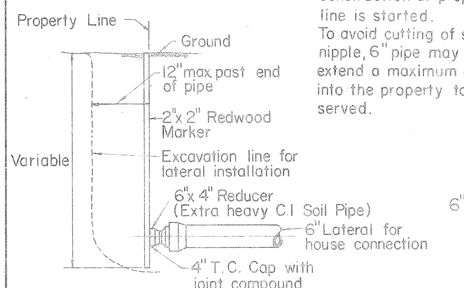
SECTION

NOTE:
Reinforcing bars of laterals shall be lapped 40 dia. to reinf. bars of mains.



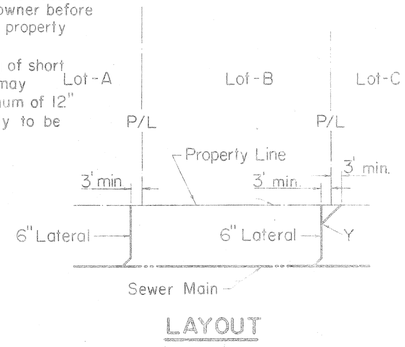
BUTT JOINT DETAIL

Scale: 1" = 1'-0"



NOTE: Permission is to be secured from property owner before construction at property line is started. To avoid cutting of short nipple, 6" pipe may extend a maximum of 12" into the property to be served.

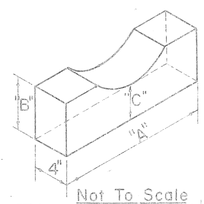
DETAIL AT PROPERTY LINE



LAYOUT

CONSTRUCTION OF LATERALS

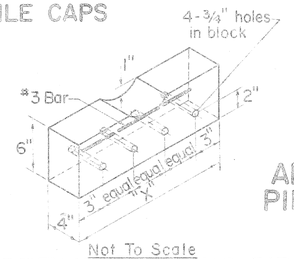
Not To Scale



Not To Scale

DETAIL OF PRECAST CONC. PIPE BLOCK

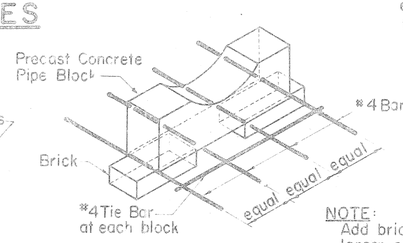
CONCRETE BLOCK DIMENSIONS			
PIPE SIZE	"A"	"B"	"C"
6"	1'-2"	6"	3"
8"	1'-5"	6"	3"
10"	1'-7"	6"	3"
12"	1'-7"	6"	3"
15"	1'-8"	6"	4"
18"	1'-9"	6"	4"
21"	1'-10"	6"	4"
24"	1'-11"	6"	4"
27"	2'-0"	6"	4"
30"	2'-3"	6"	4"



Not To Scale

DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

DIM. OF REINF. CONC. BLOCK	
PIPE SIZE	"X"
6"	1'-6"
8"	1'-6"
10"	1'-8"
12"	1'-8"
15"	1'-10"
18"	1'-10"
21"	1'-10"
24"	2'-0"
27"	2'-0"
30"	2'-0"



NOTE:
Add brick for larger size pipe

Not To Scale

ALTERNATE DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

VITRIFIED CLAY PIPE TABLE

TRENCH WIDTHS		DIM. OF CONC. CRADLE		
PIPE SIZE	PAY. WIDTH	PIPE SIZE	"a"	WIDTH
6"	24"	6"	3"	24"
8"	24"	8"	3"	24"
10"	24"	10"	3"	24"
12"	30"	12"	3"	30"
15"	38"	15"	4"	38"
18"	41"	18"	5"	41"
21"	45"	21"	5"	45"
24"	50"	24"	6"	50"
27"	53"	27"	7"	53"
30"	57"	30"	7"	57"

APPROVED:

SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

SEWERS - CONCRETE JACKET & MISCELLANEOUS DETAILS

Scales: As Noted — Date: May 1966

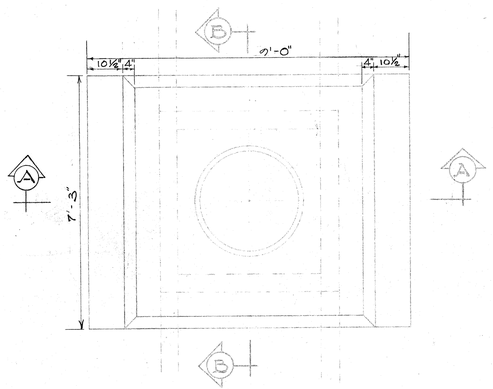
SHEET NO. 22 OF 42 SHEETS

G2

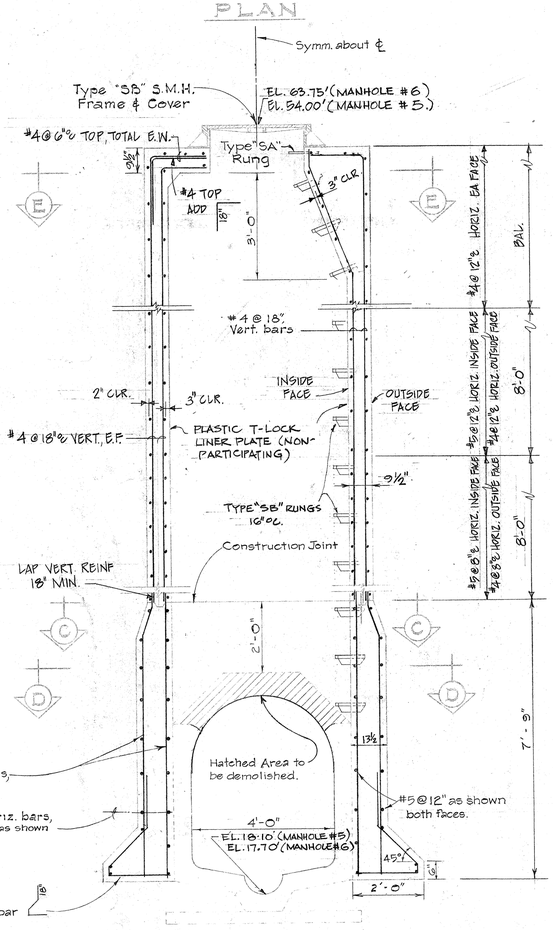
Revised Oct. 1965

IMPERIAL 138 K & E CO., N.Y. ©
TRADE MARK

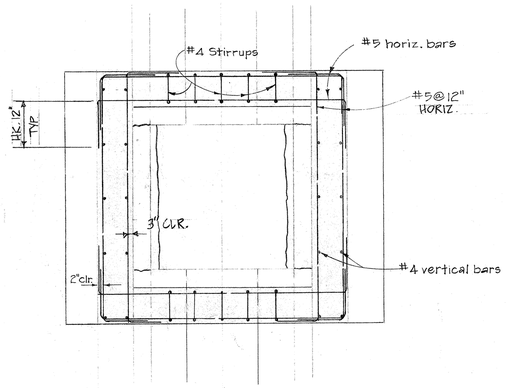
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	CONSEC. NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(51) Unit 1	1967	63A	192



PLAN



SECTION "A-A"



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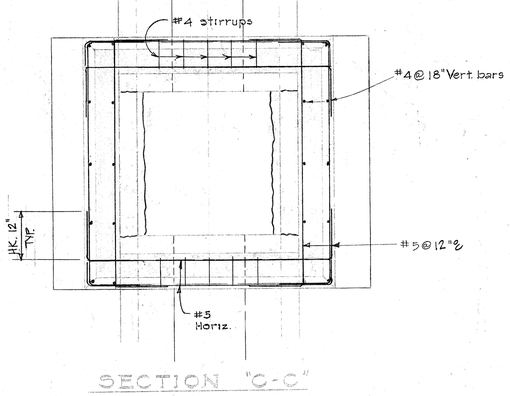
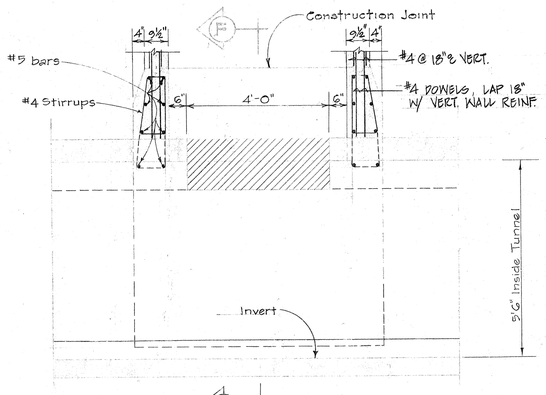
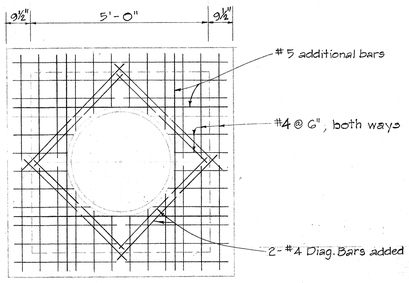


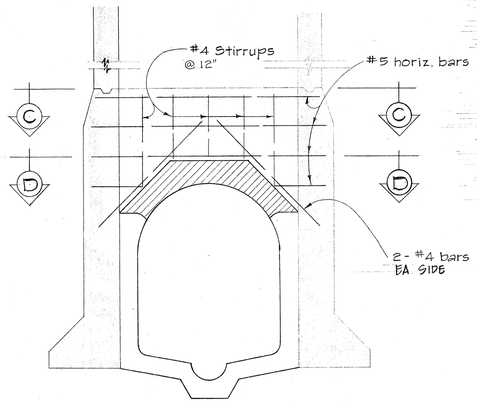
SECTION "C-C"



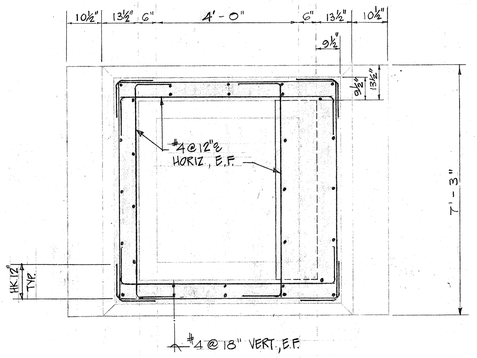
SECTION "B-B"



TOP SLAB REINFORCING PLAN



SECTION "E-E"



SECTION "F-F"

GENERAL NOTES

1. The Contractor shall arrange in advance with the Engineer so that all work shall be performed in the presence of a representative of the Division of Sewers.
2. The Contractor shall use extreme care and precaution to prevent any damage to any portion of the existing trunk sewer.
3. All excavation shall be carefully done by hand methods. Ground under the trunk sewer shall not be disturbed. Any voids formed shall be filled with concrete at the Contractor's expense.
4. Timbering shall be carefully removed or cut back when encountered.
5. Vibrators shall be kept away from contact with the existing trunk sewer at all times.
6. Concrete shall be Class "A-1" conforming to the requirements of Section 47 of the Special Provisions.
7. Reinforcing bars shall be lapped 40 diameters in length.
8. Unless otherwise noted, minimum cover for reinforcing bars shall be 3 inches.
9. Manhole frame & cover shall be centered over existing tunnel, and the side with runge shall be beveled as shown.
10. All demolished material falling into sewer shall be removed.

REVISION (TO CONTRACT PLANS)

THIS SHEET REVISED 4/11/67 TO INCORPORATE MANHOLE DETAILS #6 WITH MANHOLE DETAILS #5 & TO MAKE BOTH MANHOLES #5 & #6 INDEPENDENT OF THE RETAINING WALLS.

REVISION	DATE	BRIEF	BY	APPROVED
1	5/8/67	MANHOLE WALL THICKENED, REINFORCING STEEL INCREASED, LINER PLATE ADDED.	Y.N.	5-8-67

APPROVED:

SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 6/21/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

SPECIAL DETAILS

SEWER MANHOLE NOS. 5 & 6.

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pole Street to Victoria Street
F.A.I. Proj. No. I-HI-1(51) Unit 1

Scales: ½"=1'-0" Date: 4/11/67.

SHEET No. 23 OF 42 SHEETS

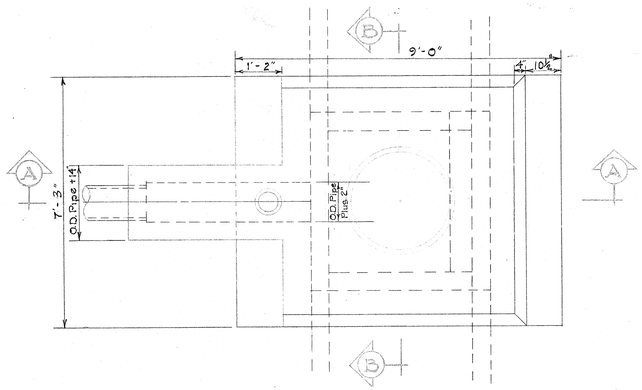
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	" "
	TRACED BY	" "
NOTE BOOK	DESIGNED BY	" "
	QUANTITIES BY	" "
No.	CHECKED BY	" "

PRINTED ON NO. 1900H CLEARPRINT

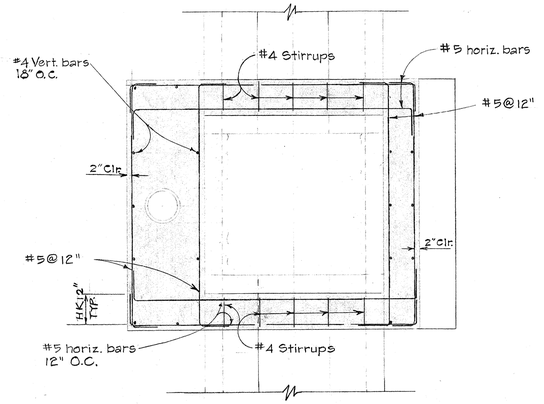
THIS SHEET SUPERSEDES SHEET 63

63A

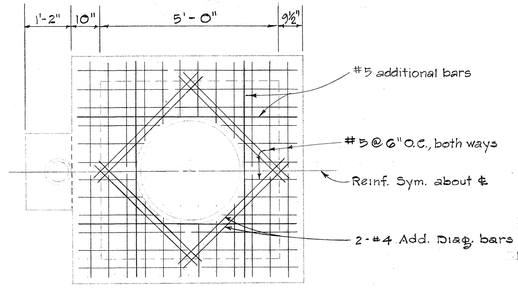
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	G4A	292



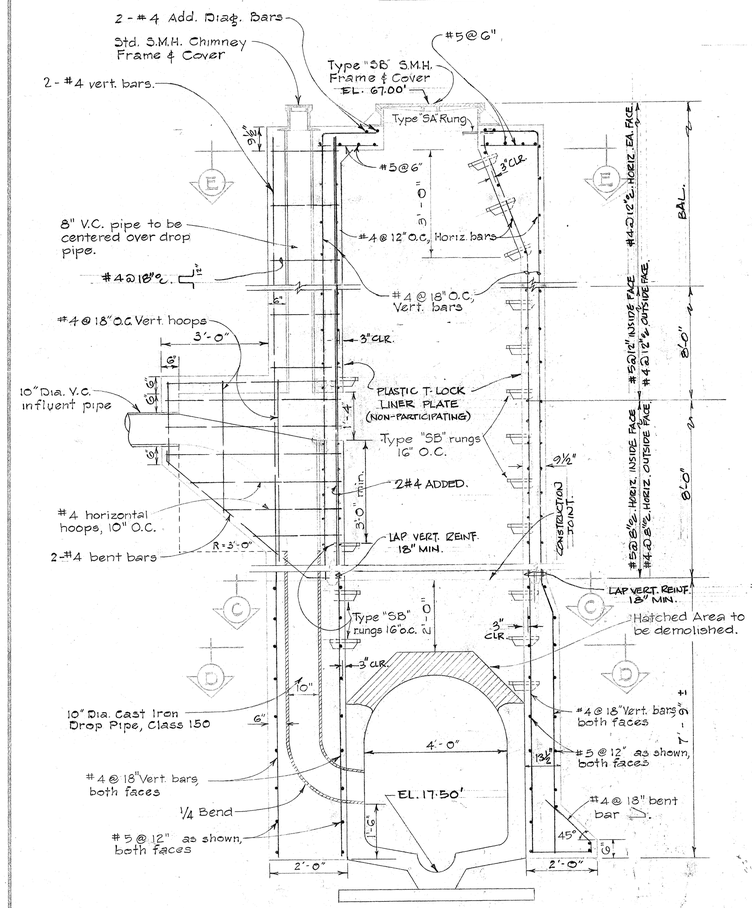
PLAN



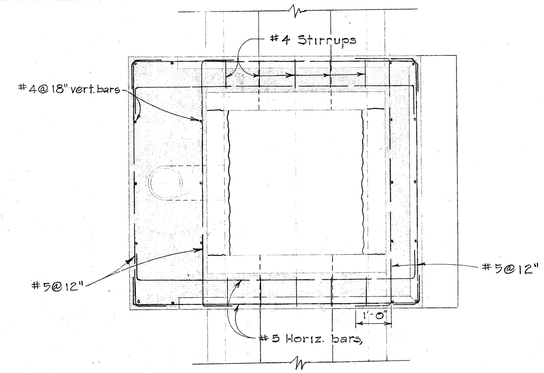
SECTION "D-D"



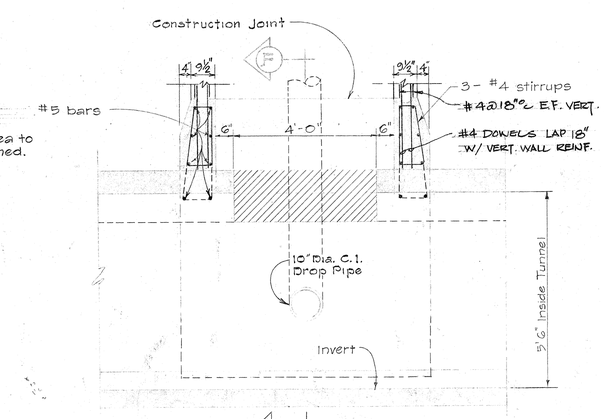
TOP SLAB REINFORCING PLAN



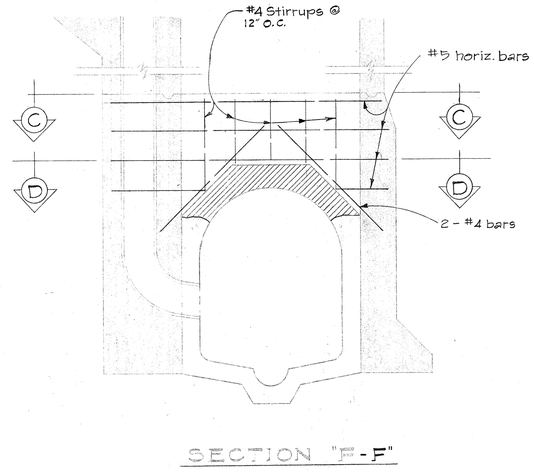
SECTION "A-A"



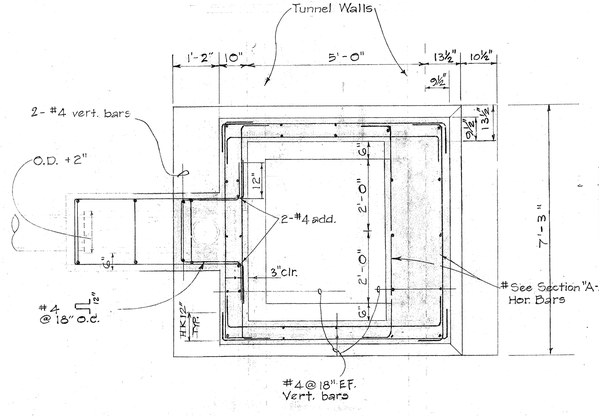
SECTION "C-C"



SECTION "B-B"



SECTION "E-E"



SECTION "F-F"

GENERAL NOTES

1. The Contractor shall arrange in advance with the Engineer so that all work shall be performed in the presence of a representative of the Division of Sewers.
2. The Contractor shall use extreme care and precaution to prevent any damage to any portion of the existing trunk sewer.
3. Ground under the trunk sewer shall not be disturbed. Any voids formed shall be filled with concrete at the Contractor's expense.
4. Timbering shall be carefully removed or cut back when encountered.
5. Vibrators shall be kept away from contact with the existing trunk sewer at all times.
6. Concrete shall be Class "A-1" conforming to the requirements of Section 47 of the Special Provisions.
7. Reinforcing bars shall be lapped 40 diameters in length.
8. Unless otherwise noted, minimum cover for reinforcing bars shall be 3 inches.
9. Manhole frame & cover shall be centered over existing tunnel, and the side with rungs shall be beveled as shown.
10. All demolished material falling into sewer shall be removed.

REVISION (TO CONTRACT PLANS)

THIS SHT. REVISED 4/11/67 TO MAKE MANHOLE # 7 INDEPENDENT OF THE RETAINING WALLS.

REVISION	DATE	BRIEF	BY	APPROVED
1	5/5/67	MANHOLE WALL THICKENED, REINFORCING STEEL INCREASED, LINER PLATE ADDED	Y.N.	5-8-67

APPROVED:

Tilona — 5/21/67

SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

SPECIAL DETAILS

SEWER MANHOLE NO. 7

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scales: ½"=1'-0" Date: 4/11/67.

SHEET No. 64 OF 42 SHEETS

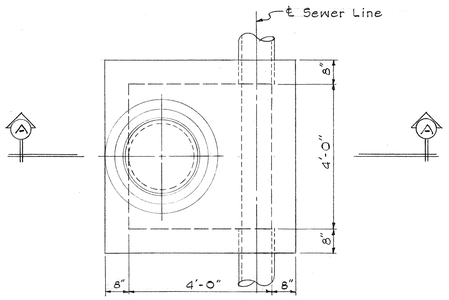
ORIGINAL PLAN	SURVEY PLOTTED BY: DRAWN BY: TRACED BY: DESIGNED BY: NOTE BOOK:	DATE: QUANTITIES BY: CHECKED BY: No.

PRINTED ON NO. 10050R CLEARPRINT

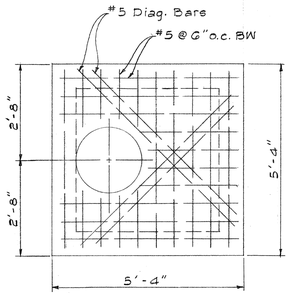
THIS SHEET SUPERSEDES SHEET 64

64A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(51) Unit 1	1967	65	92

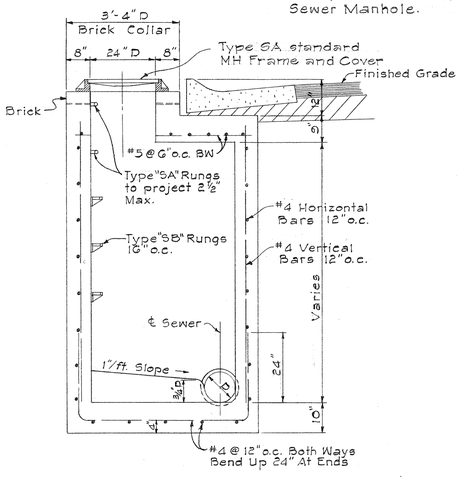


PLAN



TOP SLAB

NOTE:
Use Class A-1 Conc. for Special Off-Set Sewer Manhole.

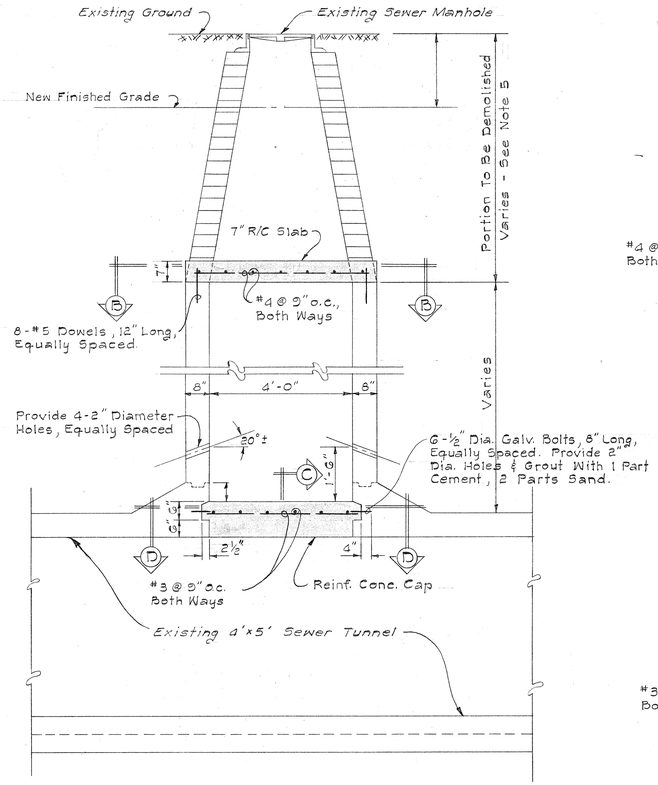


SECTION "A-A"

DETAIL OF SPECIAL OFF-SET SEWER MANHOLE #0

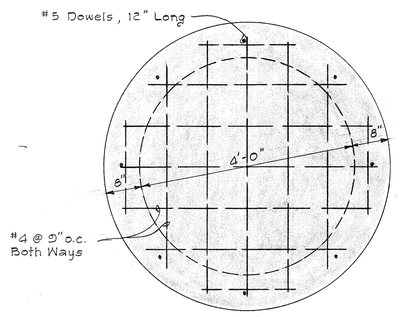
FREEWAY ℄ STA. 58+45 ±

Scale: ½" = 1'-0"



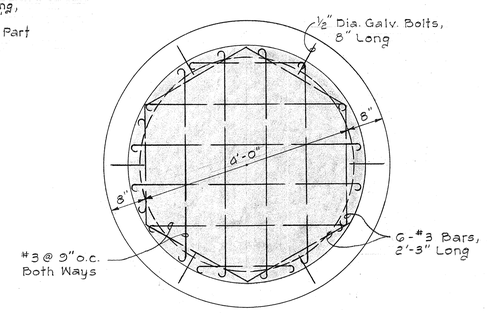
ELEVATION

Scale: ½" = 1'-0"



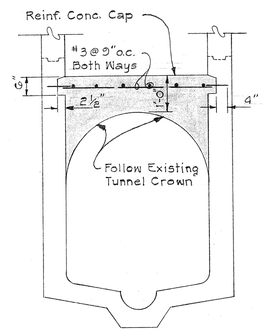
SECTION B-B

Scale: ¾" = 1'-0"



SECTION D-D

Scale: ¾" = 1'-0"



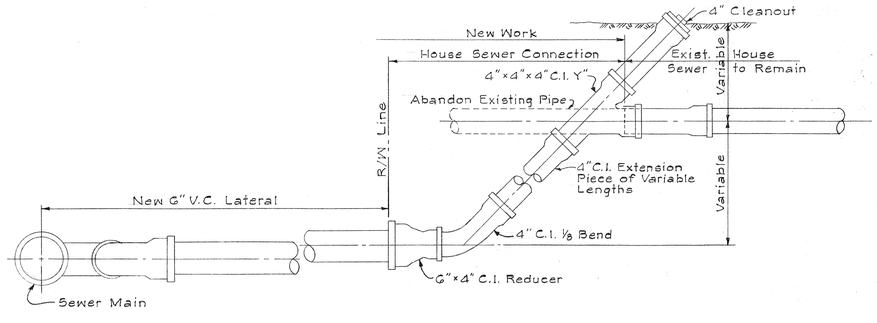
SECTION C-C

Scale: ½" = 1'-0"

DETAILS OF SEALING EXISTING SEWER MANHOLES

FREEWAY ℄ STA. 195+55 AND 202+10

Scale: As Shown



TYPICAL DETAIL OF HOUSE SEWER CONNECTION

Scale: ¾" = 1'-0"

GENERAL NOTES

1. The Contractor shall notify the Engineer in advance so that all work shall be performed in the presence of a representative of the Division of Sewers.
2. The Contractor shall use extreme care and precaution to prevent any damage to any portion of the existing tunnel.
3. Concrete shall be Class "A-1" conforming to the requirements of Section 47 of the Special Provisions.
4. Reinforcing bars shall be lapped 40 diameters in length, and minimum cover for reinforcing bars shall be 3 inches.
5. Portion of existing sewer manhole to be demolished shall be the entire brick section or to a depth of 4.0 ft. below the new finished grade, whichever is greater.
6. All form work for the lower seal shall be removed. Forms for the upper seal may be left in place.

APPROVED:

F. Rosa — 6/21/66

SEWER SYSTEM DIRECTOR — DIV. OF SEWERS — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL SEWER DETAILS OFF-SET MANHOLE, EXISTING MANHOLE SEALS AND HOUSE SEWER CONNECTION

INTERSTATE ROUTE H-1 (LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(51) Unit 1

Scale: As Noted — Date: May 1966

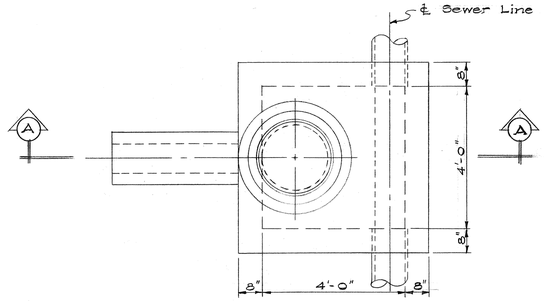
SHEET No. 65 OF 92 SHEETS

65

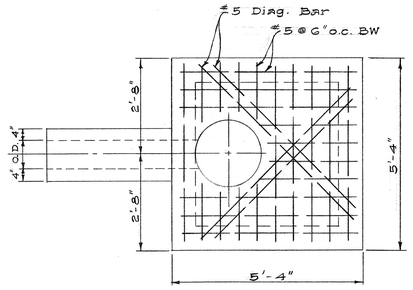
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	66	122

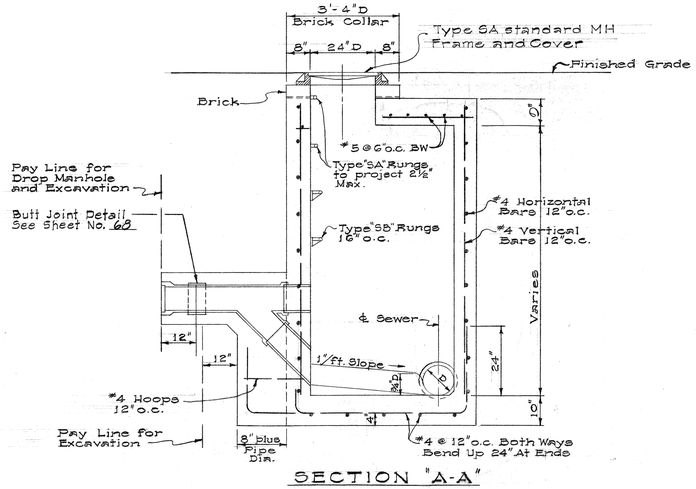


PLAN



TOP SLAB

NOTE:
Use Class A-1 Conc. for Special Off-Set Sewer Manhole



SECTION "A-A"

DETAIL OF SPECIAL OFF-SET SEWER MANHOLE #10

FRONTAGE ROAD "J" ℄ STA. 30+06 ±

Scale: ½" = 1'-0"

APPROVED:

R. Nowa — 4/27/66

SEWER SYSTEM DIRECTOR — DIV. OF SEWERS — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL OF SPECIAL OFF-SET SEWER MANHOLE (SHALLOW DROP)

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scale: ½" = 1'-0" Date: May 1966

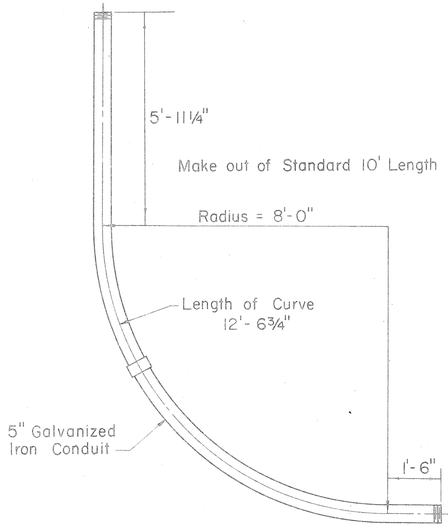
SHEET No. 66 OF 122 SHEETS

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

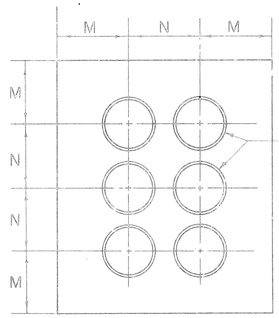
PRINTED ON NO. 1000H CLEARPRINT

66

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(81) Unit 1	1967	67	292

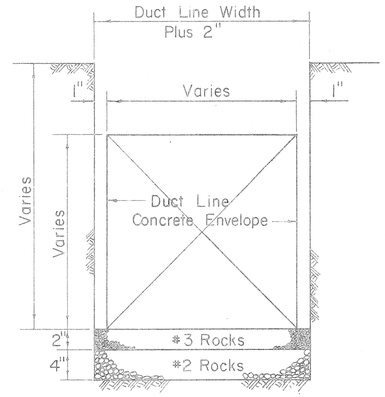


46 KV COMBINATION RISER AND BEND
(8'-0" RADIUS)
Not to Scale



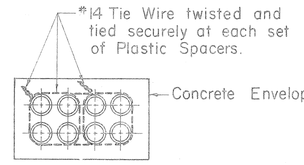
TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

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

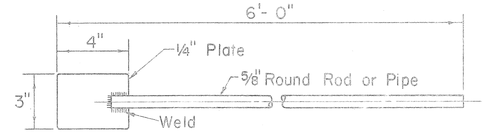


TYPICAL EXCAVATION DETAIL
Not to Scale

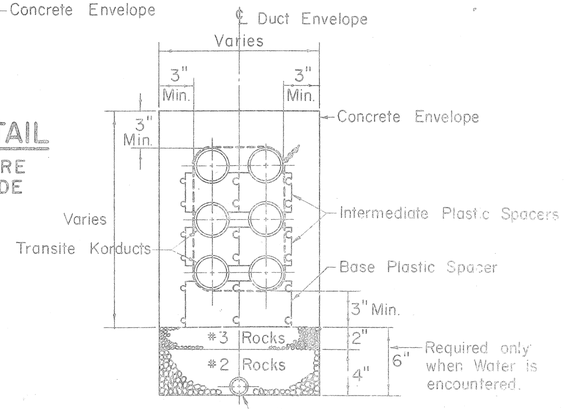
NOTES
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



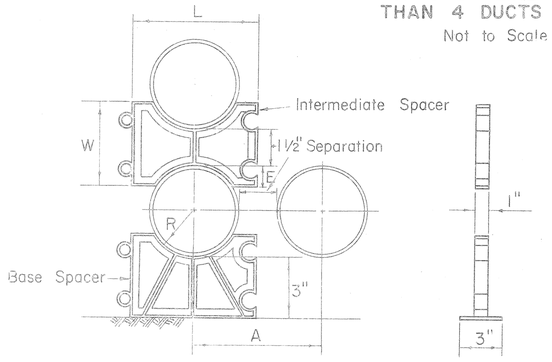
TIE WIRE DETAIL
FOR DUCT LINE MORE THAN 4 DUCTS WIDE
Not to Scale



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



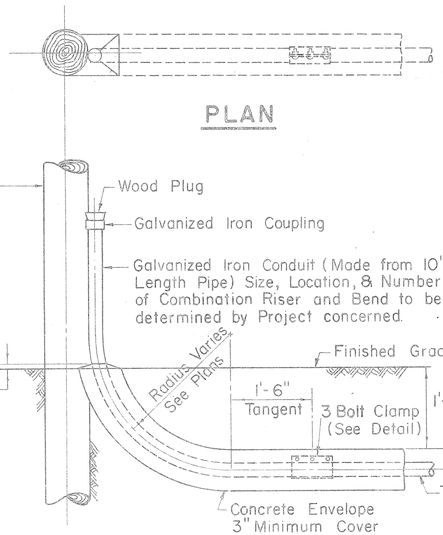
TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale



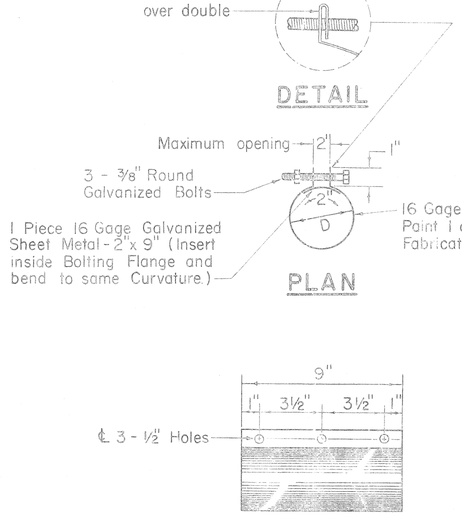
TYPICAL PLASTIC SPACERS
Not to Scale

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"
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 1½" Separation



TYPICAL DETAIL COMBINATION RISER AND BEND
Scale: ¾" = 1'-0"



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

APPROVED:
A D Henderson for FAK 6-15-66
HAWAIIAN ELECTRIC CO., INC. DATE

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

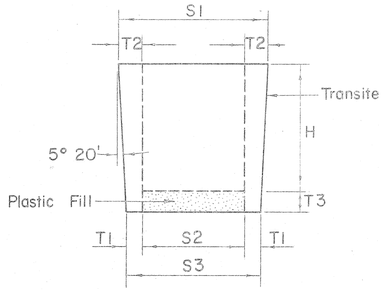
Scales: As Noted Date May 1966

SHEET NO. 27 OF 42 SHEETS

67

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-40 200P

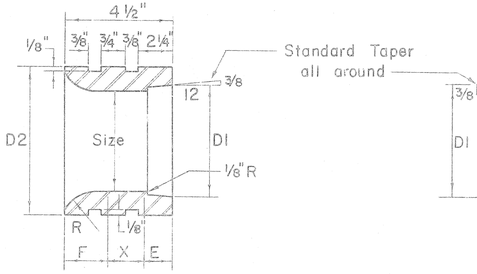
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	68	292



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

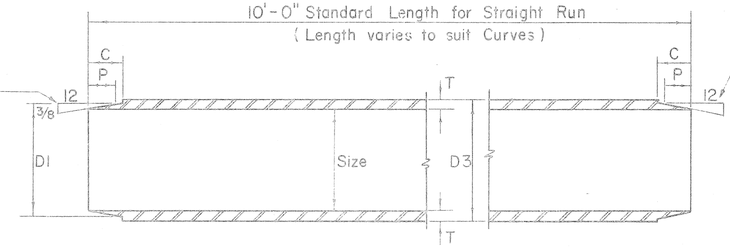
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



JUNIOR END BELLS

Not to Scale

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



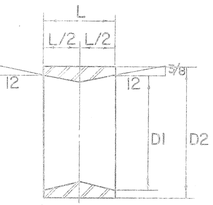
TRANSITE KORDUCTS

Not to Scale

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

Note "X"

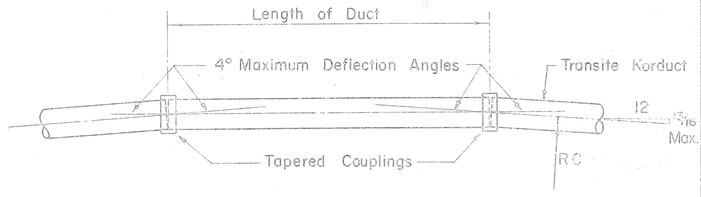
Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



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

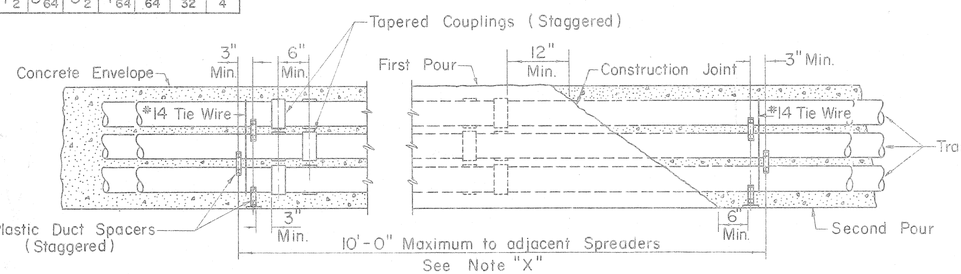
TAPERED COUPLINGS

Not to Scale



METHOD OF FORMING CURVES

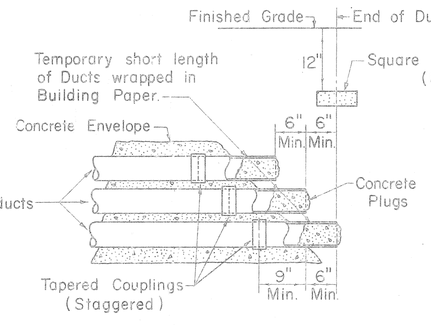
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

(6 WAY DUCT LINE SHOWN)

Not to Scale

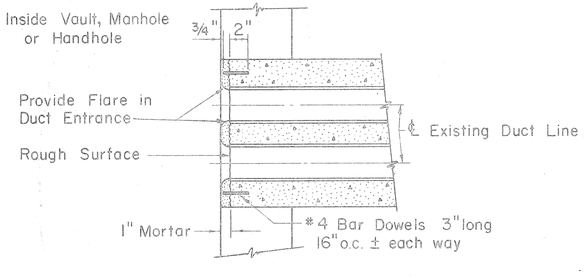


TYPICAL STUB OUT DETAIL

Not to Scale

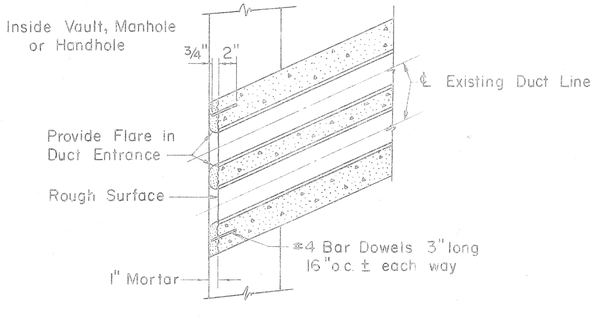
MINIMUM RADIUS TO FORM CURVES

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



DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

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

APPROVED:

A D Henderson for F A K 6-15-66

HAWAIIAN ELECTRIC CO., INC. 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

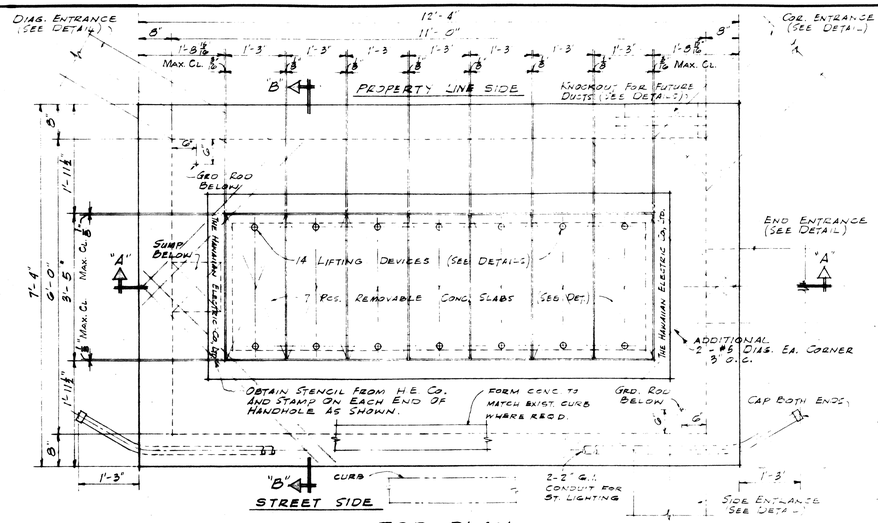
Scales: As Noted Date: May 1966

SHEET NO. 28 OF 42 SHEETS

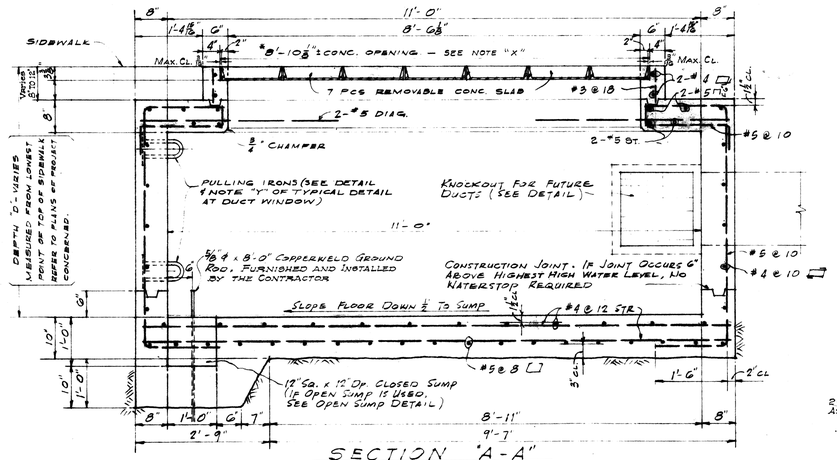
GS

LIETZ 3102 ARKWRIGHT TRACING CLOTH 10-68 2109

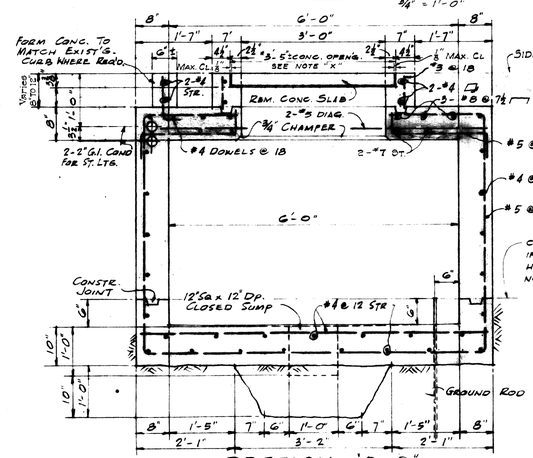
FED ROAD DIST NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(31) Unit 1	1967	69	82



TOP PLAN
3/16" = 1'-0"



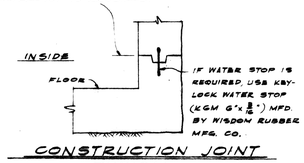
SECTION "A-A"
3/4" = 1'-0"



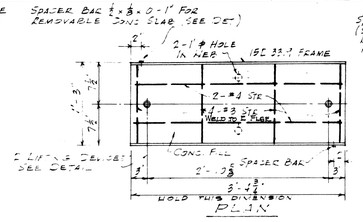
SECTION "B-B"
3/4" = 1'-0"

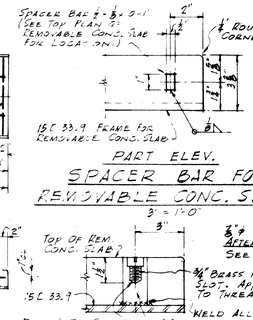
*NOTE "X" IMPORTANT

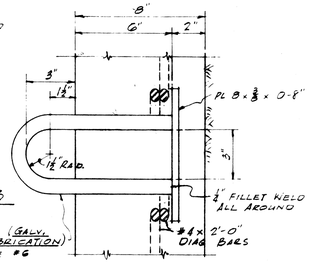
MAXIMUM CLEARANCES BETWEEN REMOVABLE CONCRETE COVER SLABS AND CONCRETE OPENING AT THE SUPPORTS MUST BE KEPT. CONCRETE CONTRACTOR SHALL MEASURE COVER SLAB STEEL FRAME AFTER FABRICATION TO OBTAIN PROPER CLEARANCES. ANY VARIATION IN CLEARANCES SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT CONTRACTOR'S EXPENSE.

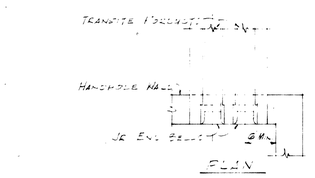


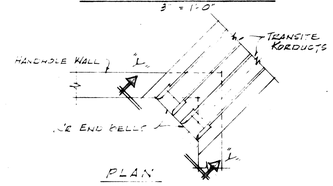
CONSTRUCTION JOINT
TYPICAL
1" = 1'-0"

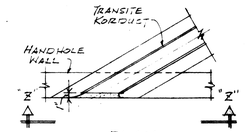


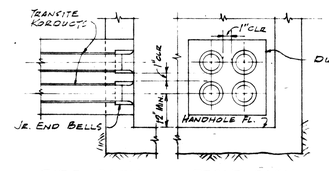


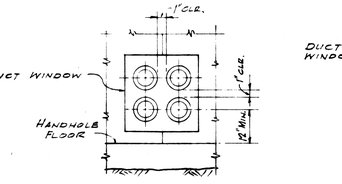


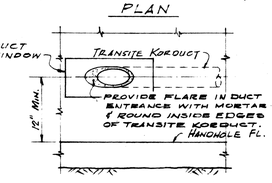




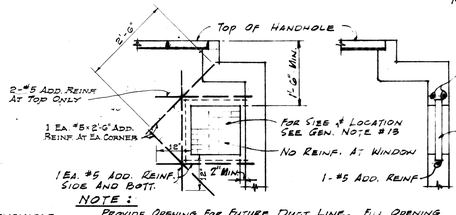


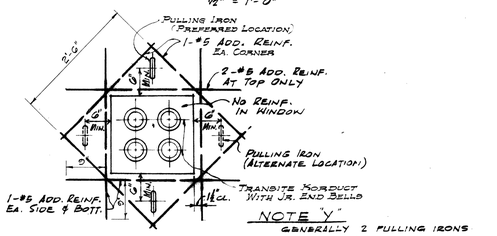


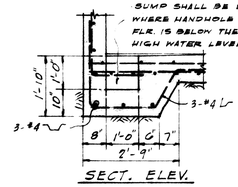


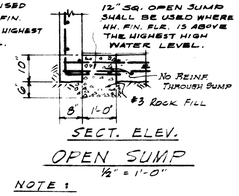


TYPICAL DUCT LINE ENTRANCE DETAILS
N.T.S.









GENERAL NOTES

1. CONCRETE SHALL BE CLASS A-1 CONFORMING TO THE REQUIREMENTS OF SECTION 47 OF THE SPECIAL PROVISIONS.
2. CONCRETE FINISH :
   Top Of Handhole - Wood Floated, Sidewalk Finish) According To Highways Division Stds., State Of Hawaii.

   Floor - Smooth Metal Trowelled.

   Exposed Wall Surfaces, And Edges - Smooth And Free From Defects.
3. CONCRETE POURING :
   NOTIFY THE HAWAIIAN ELECTRIC CO. CONTRACTING & INSPECTION DIV. 24 HOURS BEFORE POURING ANY CONCRETE.
   ALL CONCRETE SHALL BE POURED IN THE PRESENCE OF H.E.CO. ENGINEER OR INSPECTOR.
4. REINFORCING :
   ROUND DEFORMED BARS, NEW BILLET STOCK INTERMEDIATE GRADE ASTM A15. ALL HOOKED BARS SHALL HAVE A C.I. STD. HOOK UNLESS OTHERWISE SHOWN.
5. FORMS :
   FORM HANDHOLE TO SIZE & SHAPE AS SHOWN. EXTERIOR FACE OF HANDHOLE WALLS SHALL BE FORMED EXCEPT :
   A) EXCAVATION IN SOLID MATERIAL SUCH AS CORAL OR ROCK - NEAT CUT - NO FORMS REQUIRED.
   B) EXCAVATION IN SOLID MATERIALS OTHER THAN CORAL & ROCK - LINING SUCH AS SALVAGED CORRUGATED IRON, CANVAS, ETC. SHALL BE USED.
6. PULLING IRON :
   LOCATION & NUMBER REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
7. DRAINAGE :
   SLOPE FLOOR DOWN 1/2" TO SUMP.
8. SLOPE TOP OF HANDHOLE TO MATCH FINISHED GRADE.
9. FINISH STEEL WORK :
   CHANNEL FRAMES FOR REMOVABLE CONCRETE SLABS, LIFTING DEVICE & PULLING IRONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
10. EXCAVATION :
    EXCAVATE FOR HANDHOLE TO ACCURATE ALIGNMENT, GRADES & DIMENSIONS AS SHOWN ON DRAWING. ALL EXCAVATION MUST BE APPROVED BY CONTRACTING & INSPECTION DIVISION, THE HAWAIIAN ELECTRIC CO., LTD., BEFORE ANY CONCRETE IS POURED. ALL EXCESS CUT SHALL BE BACKFILLED WITH CONCRETE OR ROCK.
11. BACKFILL :
    REMOVE ALL DEBRIS BEFORE BACKFILLING. BACKFILL IN ACCORDANCE WITH LATEST SPECIFICATIONS OF AND SUBJECT TO APPROVAL OF H.W.Y.S. DIV., STATE OF HAWAII.
12. FOR DUCT LINE CONSTRUCTION SEE STANDARD DETAIL SHEETS.
13. DUCTS :
    FOR SIZE, LOCATION & NUMBER REQUIRED SEE PLAN & PROFILE SHEETS.
14. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
15. THIS HANDHOLE IS DESIGNED FOR LIGHT VEHICULAR LOADING - MAXIMUM LOAD 5000 LBS CONCENTRATED.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" = 5'-0"

CONCRETE	= 9.2 CU. YDS.
REINF. STEEL	= 2000 LBS.

WEIGHT PER REMOVABLE CONC. SLAB

CONCRETE	= 137 LBS.
15C 33.9	= 115 "
REINF & MISC. STEEL	= 10 "
TOTAL	262 LBS.

MATERIALS FOR 6' DEPTH OF 8" THICK WALL

CONCRETE	= 0.5 CU. YD.
REINF. STEEL	= 53 LBS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC UTILITIES

INTERSTATE HIGHWAY — PROJ. NO. I-HI-1(31), Unit 1
SCALE: AS SHOWN — DATE: May 1966

REDUCED PLANS
SCALES REDUCED ACCORDINGLY

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

HANDHOLE TYPE G11V (6'-0" x 11'-0") UNDERGROUND STANDARDS

DESIGNED	[illegible]	DRAWN RY	DATE 8-18-61
CHECKED	ELEC. MECH.	LINE & STRUC.	SCALE AS SHOWN
APPROVAL	Jm Wilder, H K Stewart Jr.		ENGINEERING DEPARTMENT THE HAWAIIAN ELECTRIC CO., LTD. HONOLULU, HAWAII
			DRAWING NUMBER 18849

SHEET No. 29 OF 42 SHEETS

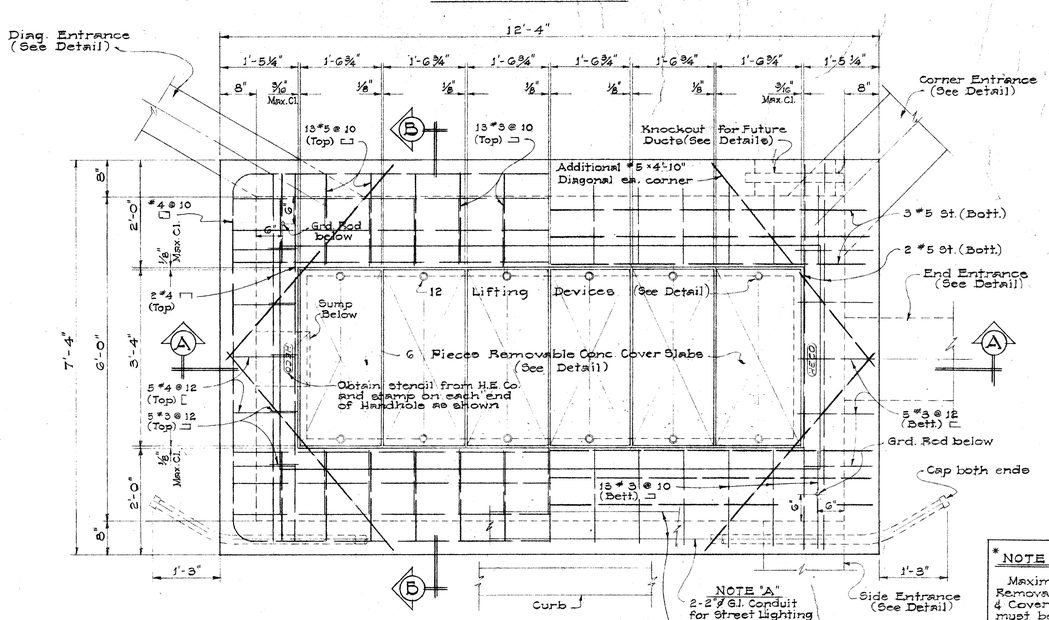
(69)

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

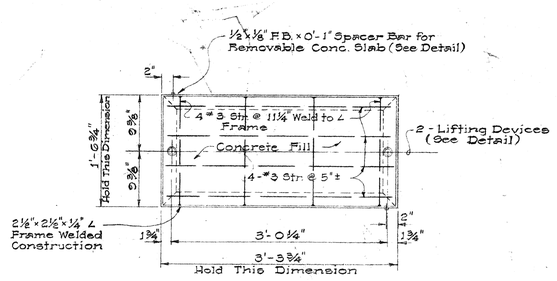
PRINTED ON DIETZO NO. 1000W CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S-HH-(BH) Unit 1	1967	70	223

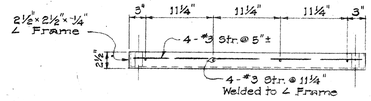
PROPERTY LINE SIDE



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

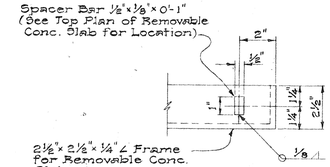


TOP PLAN



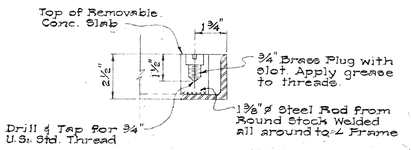
SECTION

REMOVABLE CONC. SLAB
Scale: 1" = 1'-0"

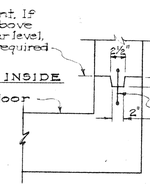


PART ELEV.

SPACER BAR FOR REMOVABLE CONC. SLAB
Scale: 3" = 1'-0"



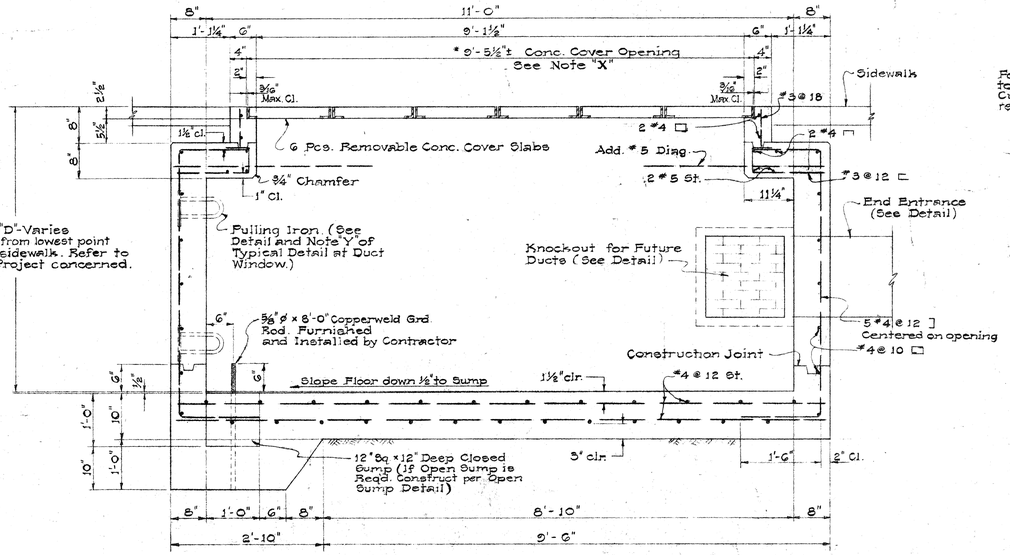
REM. CONCRETE SLAB LIFTING DEVICE
Scale: 3" = 1'-0"



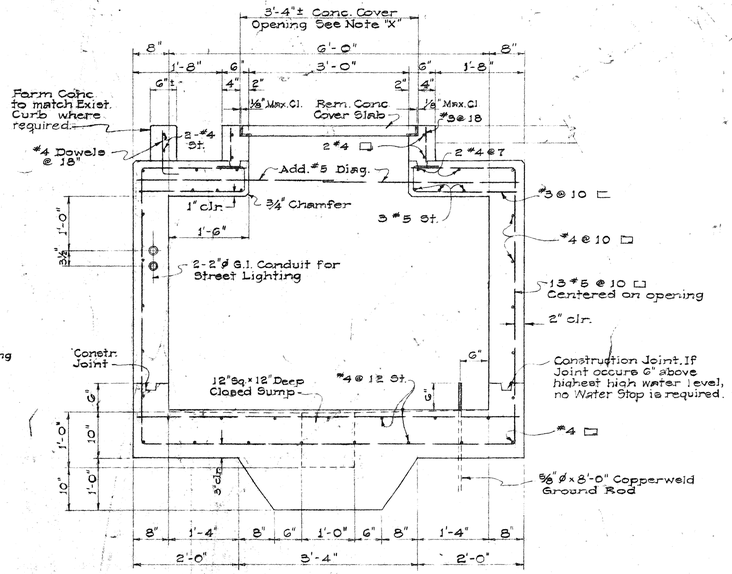
CONSTRUCTION JOINT TYPICAL
Scale: 1" = 1'-0"

*NOTE "X" IMPORTANT

Maximum clearance between Removable Concrete Cover Slabs & Cover 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 the Contractor's expense.



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



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

APPROVED:

A.B. Henderson for FAK 6-15-66
HAWAIIAN ELECTRIC Co., Inc. DATE

FOR USE IN AREAS NOT SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC.

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

HECo., Inc. Drawing Number
18851
SHEET No. 1 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

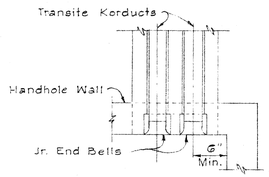
HANDHOLE TYPE 611 F (6'-0" x 11'-0") UNDERGROUND STANDARDS

Scales As Noted Date May 1966

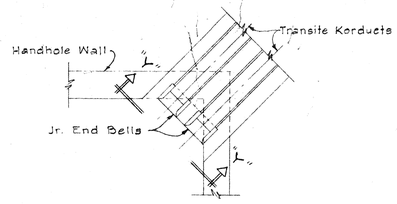
SHEET No. 30 OF 48 SHEETS

PRINTED ON NO. 100RN CLEARPRINT

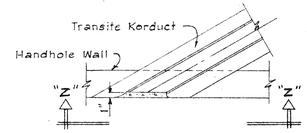
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-HI-F(31) Unit 1	1967	71	202



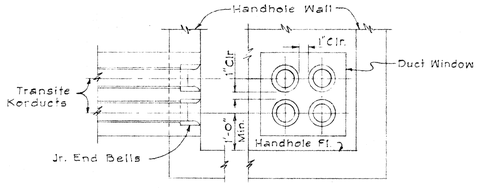
PLAN



PLAN



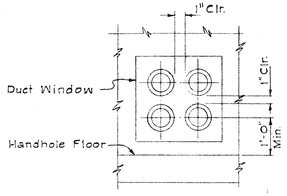
PLAN



SIDE ELEV. FRONT ELEV.

END OR SIDE ENTRANCE

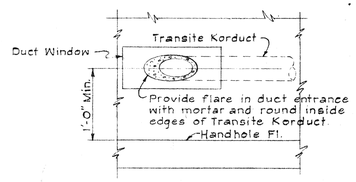
(FOUR WAY DUCT)



ELEVATION "Y-Y"

CORNER ENTRANCE

(FOUR WAY DUCT)



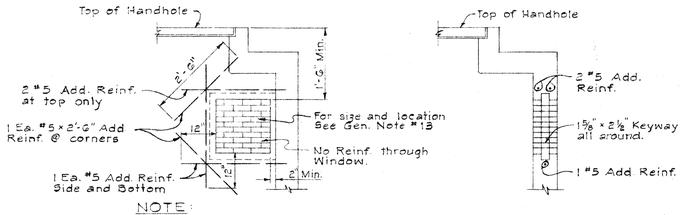
ELEVATION "Z-Z"

DIAGONAL ENTRANCE

(ONE WAY DUCT)

TYPICAL DUCT LINE ENTRANCE DETAILS

NOT TO SCALE

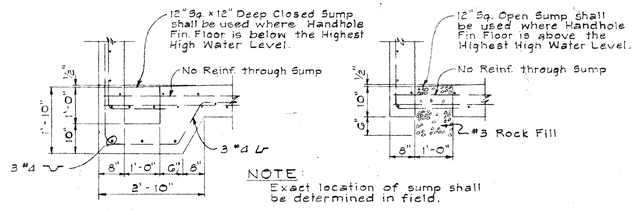


NOTE:
Provide opening for future duct line. Fill opening with bricks and motar joints as required.

ELEVATION SECTION

KNOCKOUT FOR FUTURE DUCT LINE

1/2" = 1'-0"



NOTE:
Exact location of sump shall be determined in field.

SECT. ELEV.

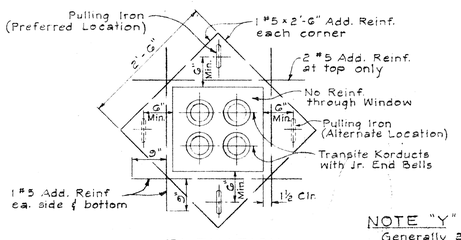
CLOSED SUMP

1/2" = 1'-0"

SECT. ELEV.

OPEN SUMP

1/2" = 1'-0"



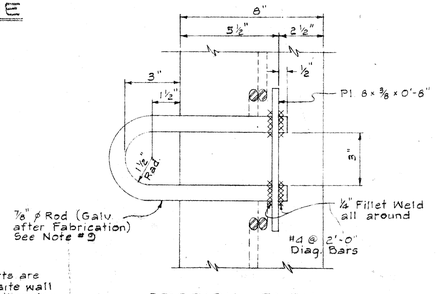
ELEVATION

TYPICAL DETAIL AT DUCT WINDOW

3/4" = 1'-0"

NOTE "Y"

Generally 2 pulling eye inserts are required and located on opposite wall of each duct window unless otherwise shown or noted. H.E. Co Engineer shall determine number required.



SECTION ELEV.

PULLING IRON

3" = 1'-0"

GENERAL NOTES

1. Concrete shall be class A-1 conforming to the requirements of Section 47 of the Special Provisions.
2. Concrete Finish:
   Top of handhole - wood floated (sidewalk finish) according to Highways Division Standards, State of Hawaii.
   Floor - smooth metal trowelled.
   Exposed wall surfaces and edges - smooth and free from defects.
3. Concrete Pouring:
   Notify H.E. Co. Contracting & Inspection Division 24 hours before pouring any concrete. All concrete shall be poured in the presence of an H.E. Co. Engineer or Inspector.
4. Reinforcing:
   Round deformed bars, new billet stock intermediate grade ASTM A15. All hooked bars shall have A.C.I. std. hook unless otherwise shown.
5. Forms:
   Form handhole to size and shape as shown. Exterior face of handhole walls shall be formed except:
   A) Excavation in solid material such as coral or rock - neat cut, no forms required.
   B) Excavation in solid materials other than coral & rock - lining such as salvaged corrugated iron, cans, etc. shall be used.
6. Pulling Iron:
   Location and number required, shall be determined by the Engr.
7. Drainage:
   Slope floor down 1/2" to sump.
8. Slope top of handhole to matched finished grade.
9. Finish Steel Work:
   Angle iron frames, lifting devise for removable concrete slabs and pulling irons shall be Hot Dip Galvanized After Fabrication.
10. Excavation:
    Excavate for handhole to accurate alignment, grades and dimensions as shown on drawing. All excavation must be approved by the Contracting & Inspection Div., The Hawaiian Electric Co., Inc., before any concrete is poured. All excess cut shall be backfilled with concrete or rock.
11. Backfill:
    Remove all debris before backfilling. Backfill in accordance with latest specifications of and subject to approval of Highways Division, State of Hawaii.
12. For duct line construction, see Standard Detail Sheets.
13. Ducts:
    For size, location and number required see Plan & Profile Sheets.
14. All Materials Shall Be New And Shall Be Manufactured In The United States of America.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPT "D" = 5'-0"

CONCRETE	= 9.2 CU. YDS.
REINF. STEEL	= 1161 LBS.

WEIGHT PER REMOVABLE CONC. SLAB

CONCRETE	= 150 LBS.
ANGLE FRAME	= 40 LBS.
REINF. & MISC. STEEL	= 10 LBS.
TOTAL	200 LBS

MATERIALS FOR 6" DEPTH OF 8" THICK WALL

CONCRETE	= 0.5 CU. YDS
REINF. STEEL	= 53 LBS.

APPROVED:

HAWAIIAN ELECTRIC Co., Inc. — DATE 6-15-66

FOR USE IN AREAS NOT SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC.

HECo., Inc. Drawing Number

18851

SHEET No. 2 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

HANDHOLE TYPE 611 F
.(6'-0" x 11'-0")
UNDERGROUND STANDARDS

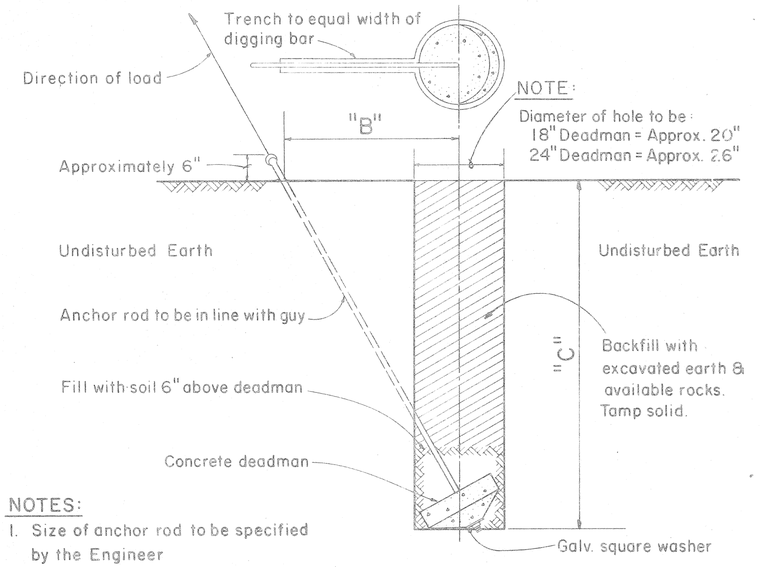
Scales As Noted — Date May 1966

SHEET No. 31 OF 42 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

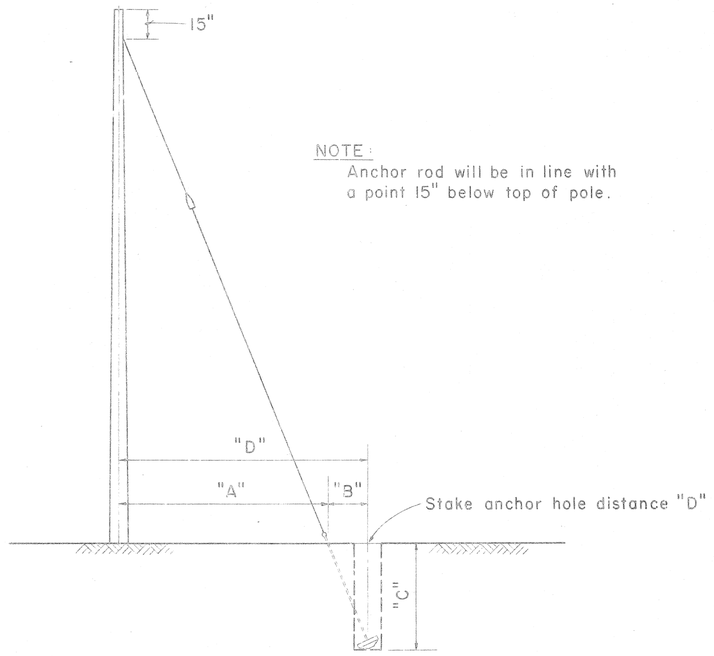
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	72	202



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'-5"	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"

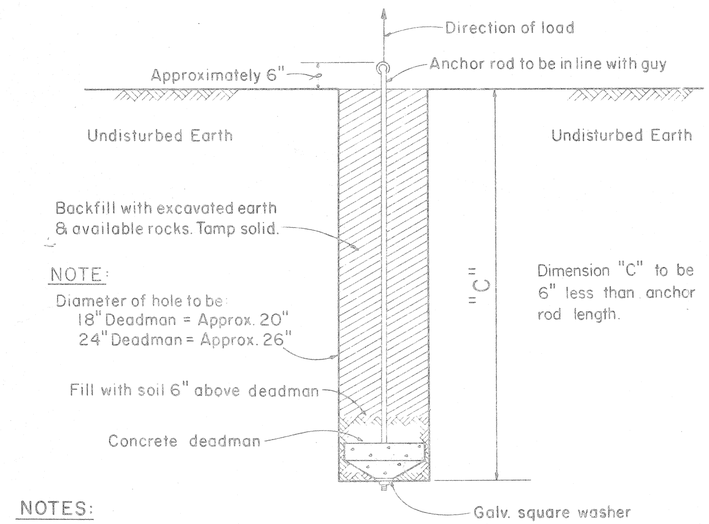
D.M. = Deadman

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"x4"x3/16"	2
615	5/8" x 8'-0" Cu Cov Stl	9,250	518	18	**	3"x3"x1/8"	2
618	3/4" x 8'-0" Steel	11,500	518	18	2330	6"x6"x3/8"	1
619	1" x 8'-0" Steel	18,000	524	24	2331	6"x6"x1/2"	1
616	1" x 8'-0" Cu Cov Stl	22,500	524	24	**	4"x4"x3/16"	2
613	1 1/4" x 10'-0" Steel	29,000	524	24	2330	6"x6"x3/8"	2

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

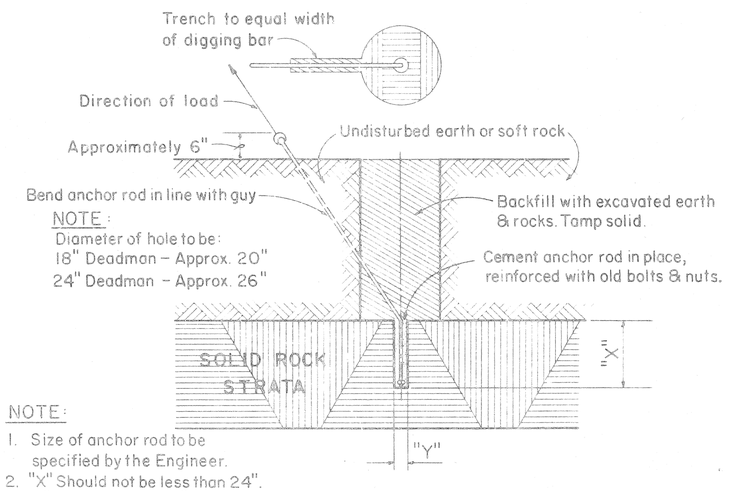
ANCHORING DATA



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:

QD Henderson for FAK 6-15-66
HAWAIIAN ELECTRIC Co., Inc. DATE

R. Maw for F.H. Judd 6/14/66
OUTSIDE PLANT ENGINEER, H.T.Co.,Ltd. DATE

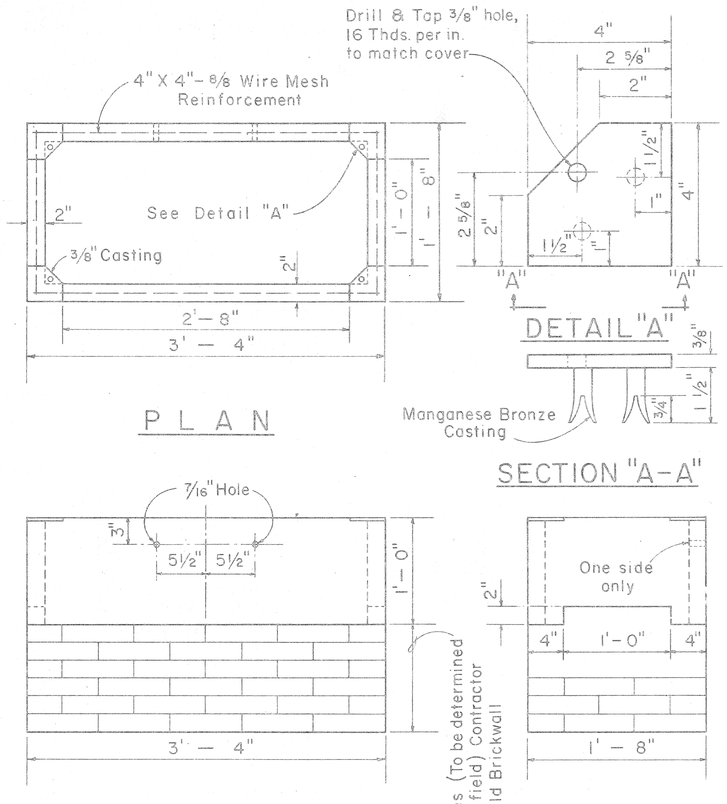
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

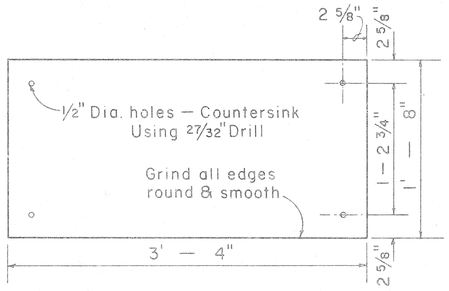
Scales As Noted Date May 1966

SHEET No. 32 OF 42 SHEETS

72



Varies (To be determined in the field) Contractor to build Brickwall



NOTES:
Use 3/8" Plate for driveways.
Concrete Box 225 Lbs.
1/4" Checker Plate 62 Lbs.
Secure cover with 3/8" x 1" flat head brass machine screws.

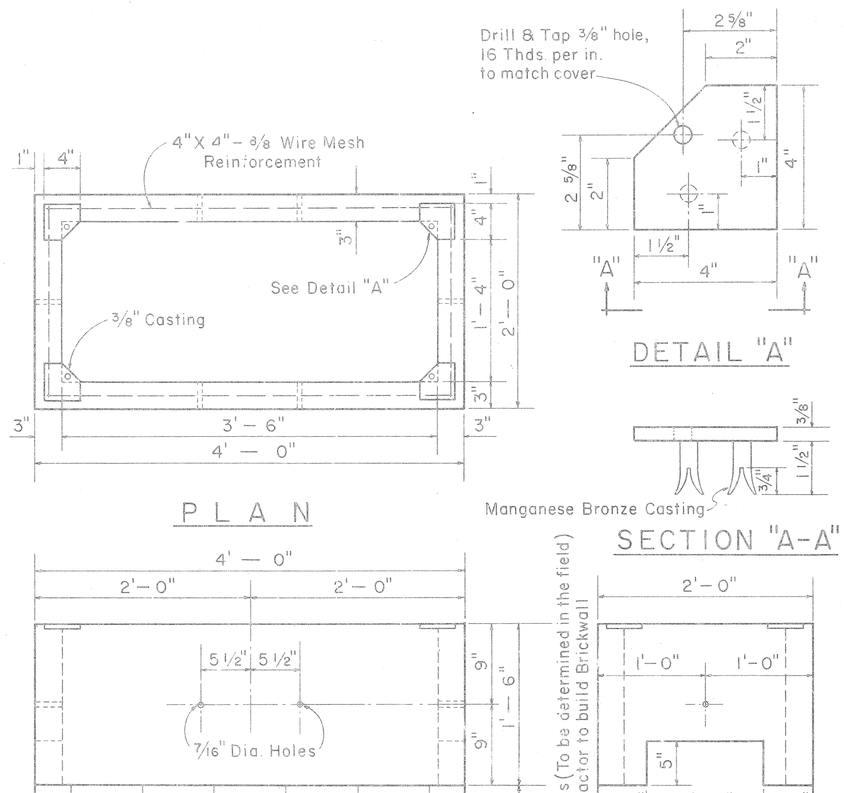
1/4" CHECKER PLATE COVER

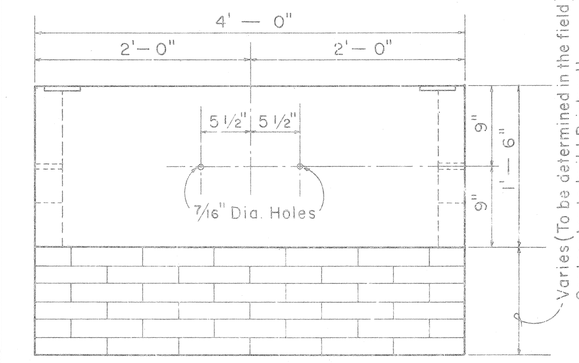
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

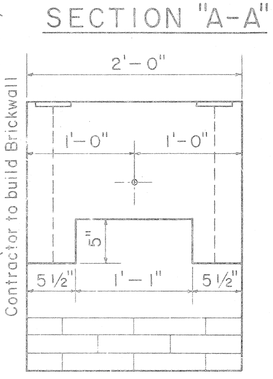
1'-4" X 3'-0" CONCRETE SERVICE BOX

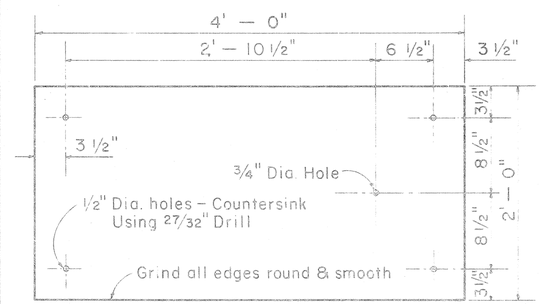
Scale: 1 1/2" = 1'-0"

011250









NOTES:
Use 3/8" Plate for driveway.
Concrete Box 575 Lbs.
1/4" Checker Plate 130 Lbs.
Secure cover with 3/8" x 1" flat head brass machine screws.

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"

011255

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(31) Unit 1	1967	73	202

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.) DOUGLAS FIR	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.

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

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:

A B Henderson for FAK 6-15-66
HAWAIIAN ELECTRIC Co., Inc. DATE

A. Mau for F.H. Judd 6/14/66
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
H.E. Co. AND H.T. Co.
SERVICE BOX DETAILS
AND WOOD POLE DATA

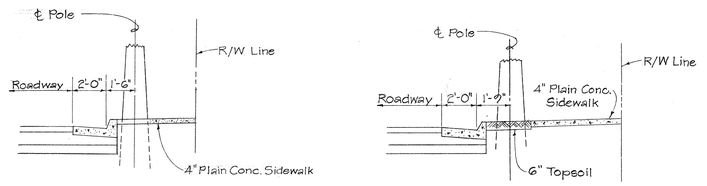
Scales: As Noted Date May 1966

SHEET NO. 33 OF 42 SHEETS

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

LIETZ 1103 ARKWRIGHT TRACING CLOTH 1949 20SP

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(81) Unit 1	1967	74	232



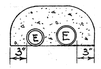
TYPICAL DETAIL OF POLE OFFSETS
Scale: 1/4" = 1'-0"

E / 1C(CC)

1-2" Transite Duct

E / 1D(CC)

1-3" Transite Duct

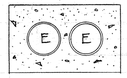


E / 1C - 1D (CC)

1-2" & 1-3" Transite Ducts

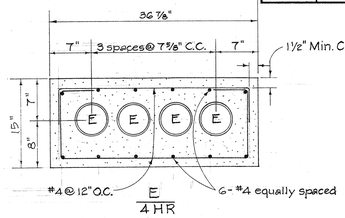
E / 1H

1-5" Transite Duct



E / 2H

2-5" Transite Ducts

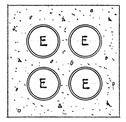


E / 4HR

4-5" Transite or E.S. Ducts
In Reinforced Concrete Jacket

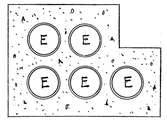
LEGEND FOR CONDUIT

Conduit Size	Symbol
3/4"	A
1"	B
2"	C
3"	D
3½"	E
4"	F
4½"	G
5"	H



E / 4H (V)

4-5" Transite Ducts



E / 5H

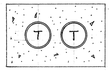
5-5" Transite Ducts

T / 2D

2-3" Plastic Ducts

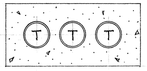
T / 1F

1-4" Plastic Duct



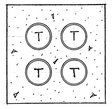
T / 2F

2-4" Plastic Ducts



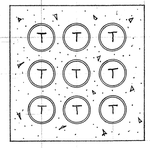
T / 3F

3-4" Plastic Ducts



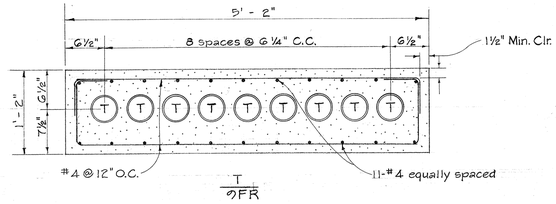
T / 4F

4-4" Plastic Ducts



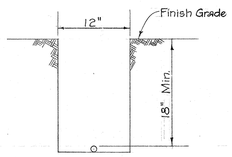
T / 9F (V)

9-4" Plastic Ducts



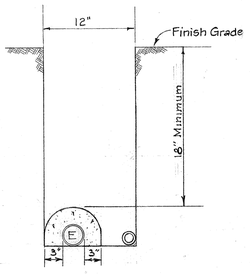
T / 9FR

9-4" Plastic Ducts
In Reinforced Concrete Jacket



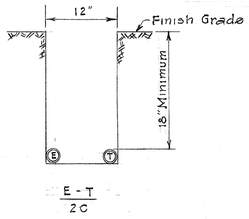
T / 1B G.I.

1-1" G.I. Pipe, Direct Burial



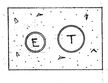
E - T / 1D(CC) - 1B or E - T / 1D(CC) - 1C

1-3" Transite Duct
1-1" or 1-2" G.I. Conduit,
Direct Burial



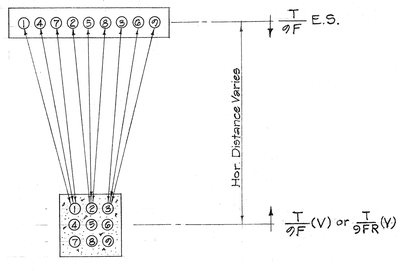
E - T / 2C

1-2" G.I. Pipe, Direct Burial
1-2" PVC Conduit, Dir. Burial

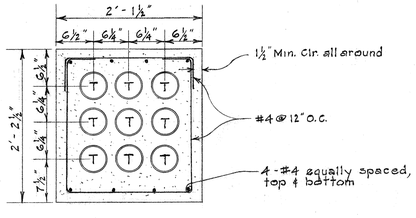


E - T / 1D - 1F

1-3" Transite Duct
1-4" Plastic Duct



H.T. Co. Duct Transitions @ Ward Ave.
Scale: 1/2" = 1'-0"



T / 9FR (V)

9-4" Plastic Ducts In
Reinforced Conc. Jacket

APPROVED:

G.H. Henderson for F.A.K. — Hawaiian Electric Co., Inc. — 6-15-66 Date

E. Mau for F.H. Judd — Outside Plant Engineer, H.T. Co., Ltd. — 6/14/66 Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS
H.E. Co. & H.T. Co DUCT SECTIONS & POLE OFFSET

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pole Street to Victoria Street
F.A.I. Proj. No. I-HI-1(81) Unit 1

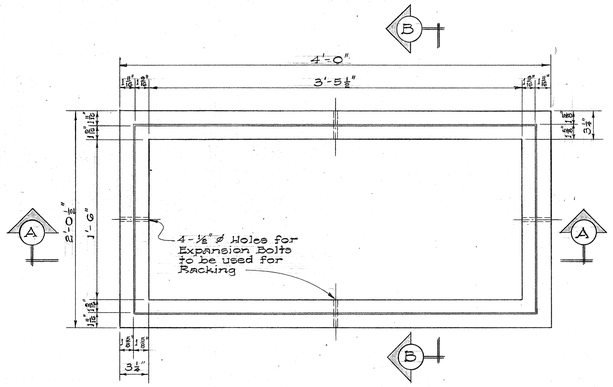
Scale: As Noted — Date: May, 1966

SHEET No. 34 OF 42 SHEETS

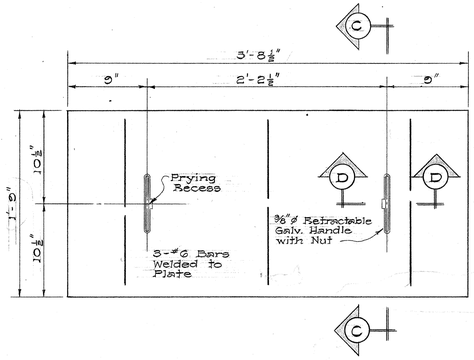
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

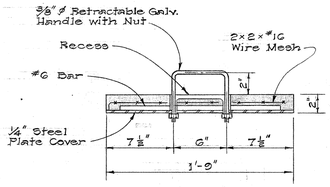
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	T-M-1131 Unit I	1962	75	102



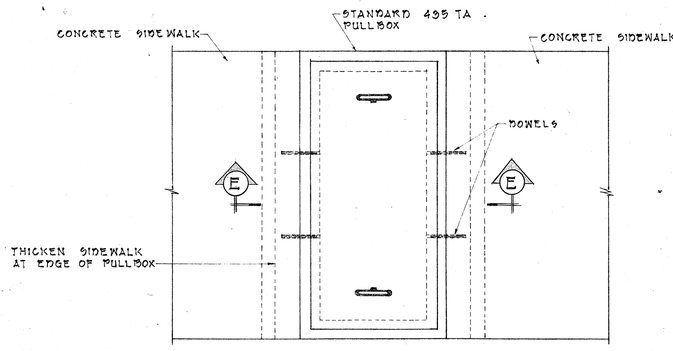
PLAN



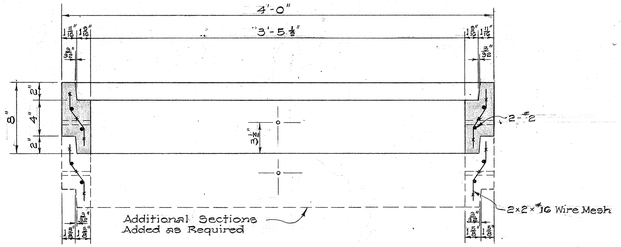
PLAN OF COVER



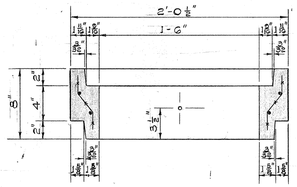
SECTION "C-C"



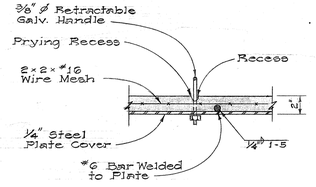
PLAN



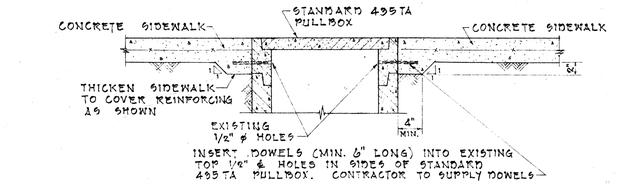
SECTION "A-A"



SECTION "B-B"



SECTION "D-D"



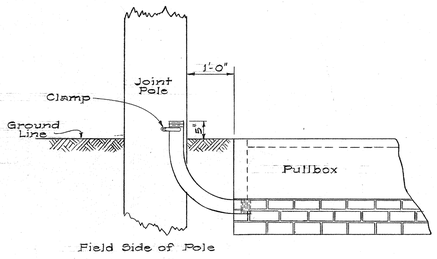
SECTION "E-E"

435 TA PULLBOX IN SIDEWALK

SCALE: 1" = 1'-0"

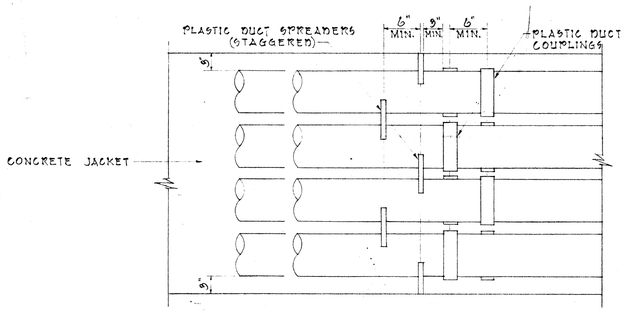
DETAIL OF TELEPHONE PULLBOX TYPE 435 T-A

Scale: 1½" = 1'-0"



TYPICAL 90° CONDUIT BEND TO POLE

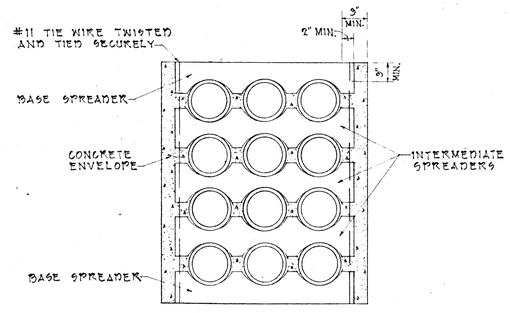
Not To Scale



TYPICAL DUCT ENVELOPE ELEVATION

ARRANGEMENT OF COUPLING AND PLASTIC SPACERS

SCALE: 1" = 1'-0"



SECTION SHOWING SPACERS

SCALE: 1" = 1'-0"

ORIGINAL PLAN

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

NOTE BOOK
No.

APPROVED:

R. Mau for F. H. Judd — 6/14/66
OUTSIDE PLANT ENGINEER, HTCo., LTD. — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

H.T. CO. 435 T-A PULLBOX, TYPICAL DUCT ENVELOPE AND CONDUIT BEND DETAILS

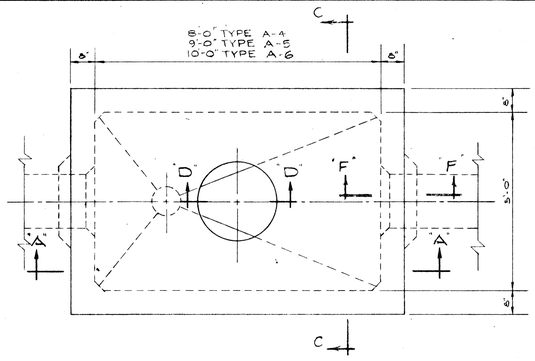
SCALE: As Shown — DATE: May 1966

SHEET No. 35 OF 42 SHEETS

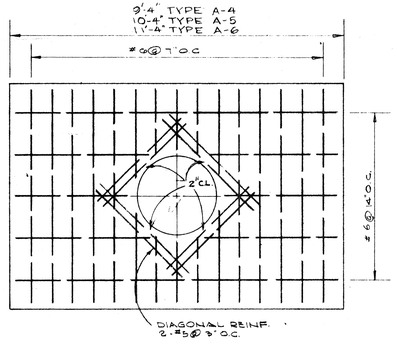
PRINTED ON NO. 1000H CLEARPRINT

75

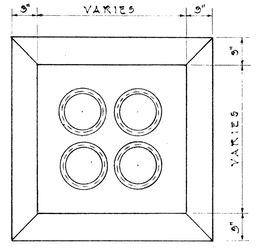
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(91) Unit 1	1967	76	242



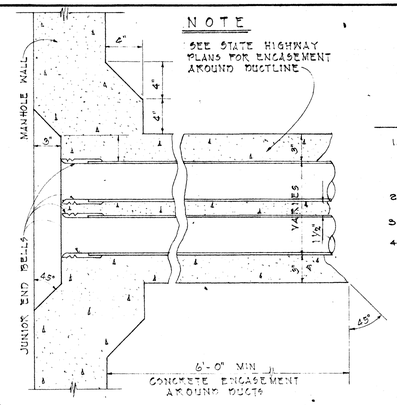
PLAN - M.H. TYPE "A"
FOR ROADWAY & SIDEWALK AREAS
SCALE: 1/2" = 1'-0"



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



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

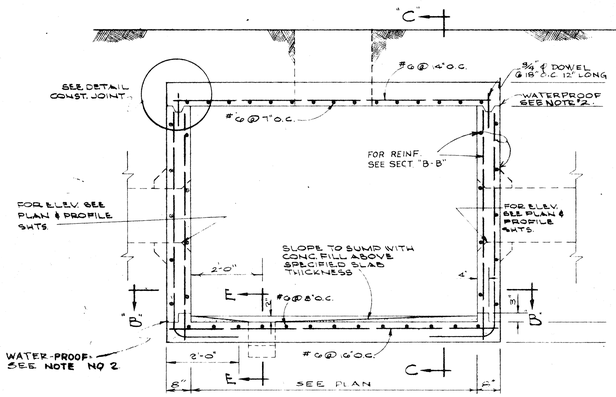


SECTION F-F

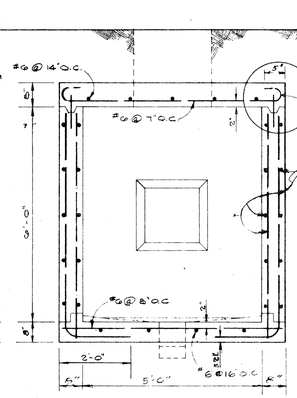
TYPICAL STUBOUT DETAIL AND JUNIOR END BELL
SCALE: 1½" = 1'-0"

GENERAL NOTES:

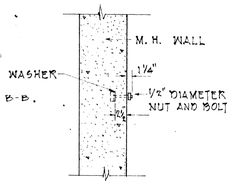
1. DESIGN DATA
   f_s : 20,000 PSI
   f_c : 3,000 PSI ; f_c = 1200 PSI
   n : 10
   W : EQUIV. FLUID PRESS: 30#/FT²
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO SEAL OR EQUAL
3. FOR DUCT WINDOW LOCATION SEE PLAN PROFILE SHEETS FOR ELEVATIONS.
4. DUCT WINDOW TO SUIT. SEE PLAN & PROFILE & STANDARD DETAIL SHEETS FOR LOCATION & DETAILS



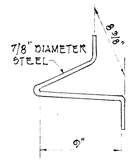
SECTION "A-A"
SCALE: 1/2" = 1'-0"



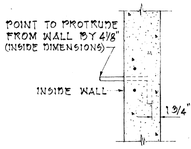
SECTION "C-C"
SCALE: 1/2" = 1'-0"



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

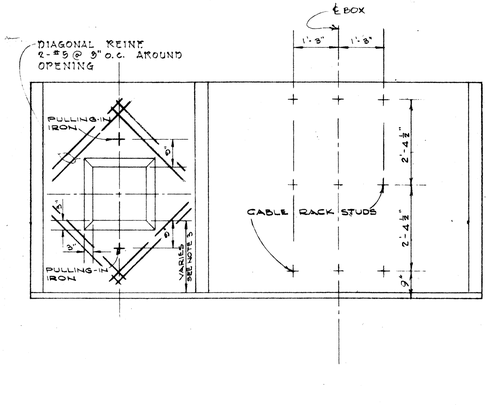


DETAIL PULLING-IN-IRON

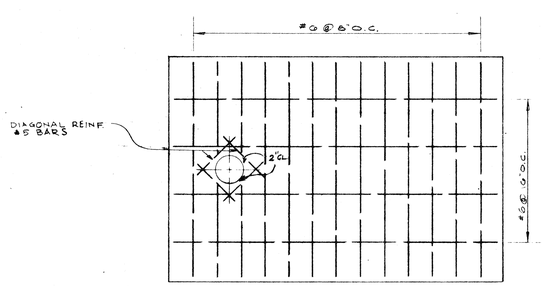


ELEV. DETAIL OF PULLING-IN-IRON

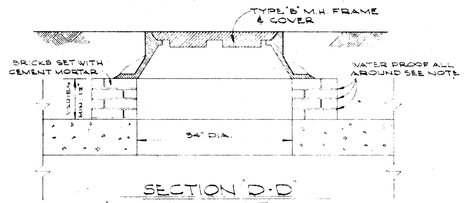
DETAIL OF PULLING-IN-IRON
SCALE: NOT TO SCALE



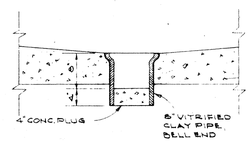
ELEV OF INSIDE WALLS - TYPE A-4
(OPPOSITE FACES SIMILAR)
SCALE: 1/2" = 1'-0"



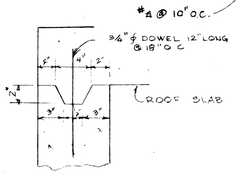
FLOOR SLAB REINF PLAN
SCALE: 1/2" = 1'-0"



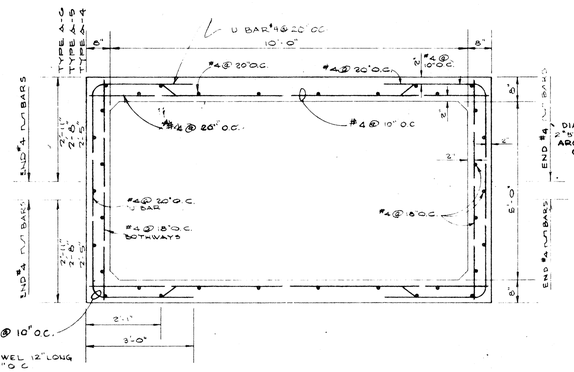
SECTION "D-D"
M.H. COVER DETAIL
SCALE: 3/4" = 1'-0"



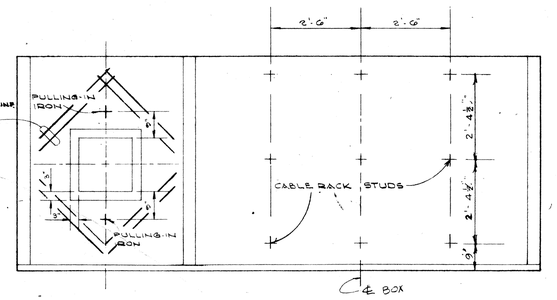
SECTION "E-E"
SCALE: 1/2" = 1'-0"



CONSTR JOINT DETAIL
SCALE 1½" = 1'



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



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

APPROVED:

R Mau for F.H. Judd 6/14/66
OUTSIDE PLANT ENGINEER, HTCo., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

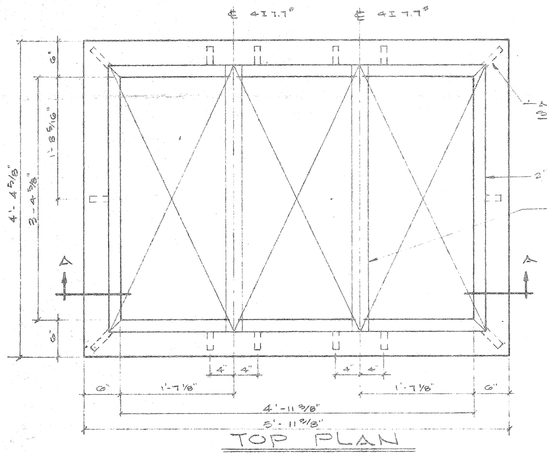
Scale: As Noted Date: May 1966

FILE ASSIGNMENT / CONSTRUCTION / MAINTENANCE / TOTAL PRINTS	DR. CMA ENG. I WU-WAKE CHK. J.F. TEL. INDEX APP'D. FHJ	TYPE "A" MANHOLES FOR ROADWAY AND SIDEWALK AREAS	
	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE SHEET 1 OF 1	34003 D

SHEET NO. 36 OF 42 SHEETS

76

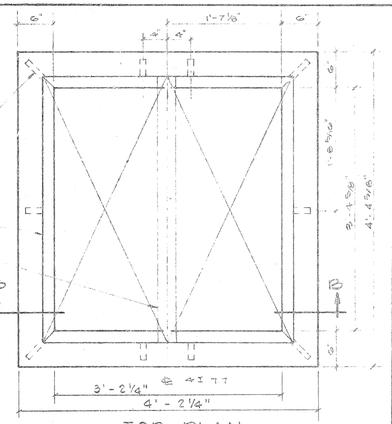
FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F-HH-1(25) Unit I	1967	77	282



TOP PLAN

COVERS NOT SHOWN

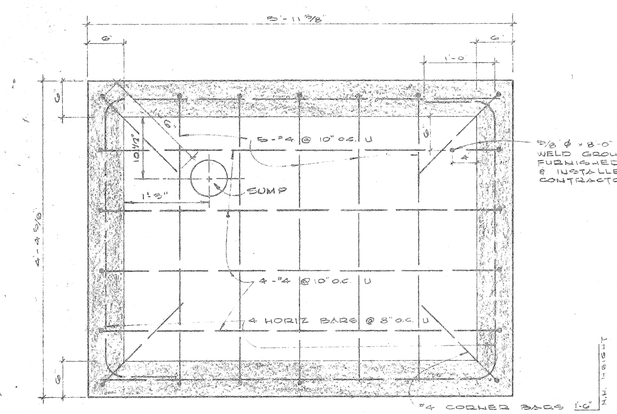
SCALE 1"=1'-0"



TOP PLAN

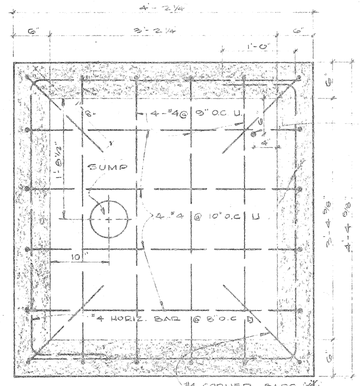
COVER NOT SHOWN

SCALE: 1" = 1'-0"



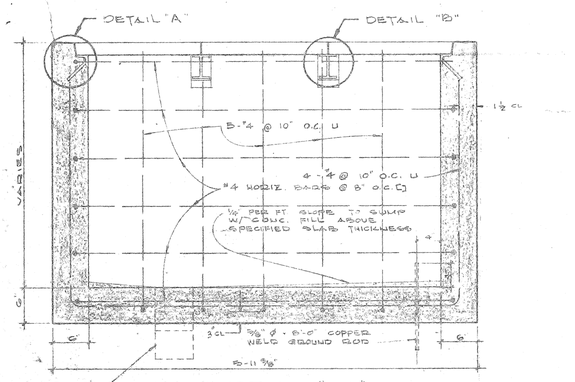
FLOOR PLAN

SCALE 1"=1'-0"



FLOOR PLAN

SCALE 1"=1'-0"

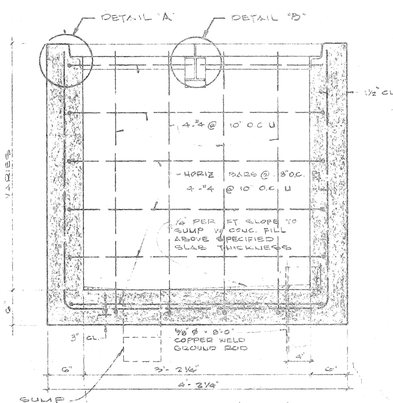


SECTION 'A-A'

SCALE 1"=1'-0"

HANDHOLE TYPE #1

(2'-4 5/8" x 4'-11 5/8" INSIDE)

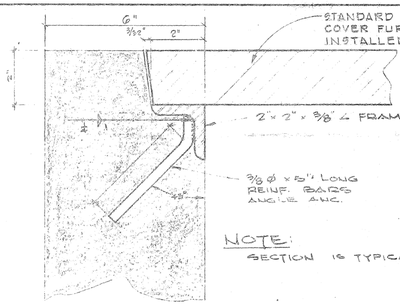


SECTION 'B-B'

SCALE 1"=1'-0"

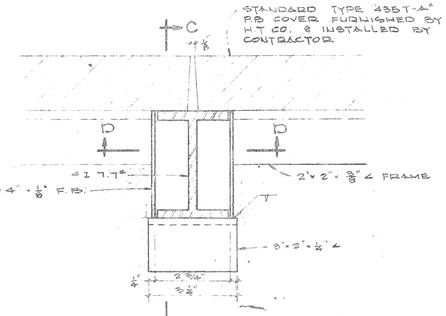
HANDHOLE TYPE #2

(3'-4 5/8" x 3'-2 1/4" INSIDE)



DETAIL "A"

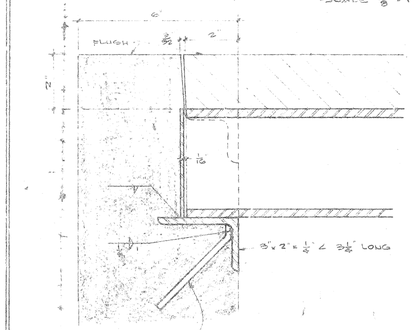
SCALE 3/8" = 1"



DETAIL "B"

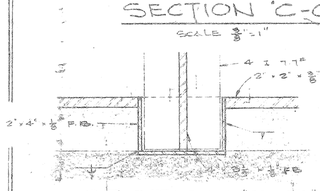
SCALE 3/8" = 1"

5/8 ϕ - 8'-0" COPPER WELD GROUND ROD FURNISHED BY H.T. CO. & INSTALLED BY CONTRACTOR.



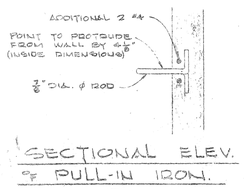
SECTION 'C-C'

SCALE 3/8" = 1"



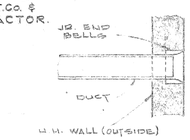
SECTION 'D-D'

SCALE 3/8" = 1"

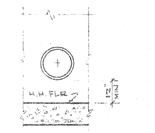


SECTIONAL ELEV. OF PULL-IN IRON.

NTS



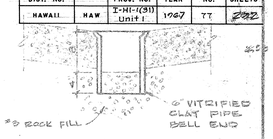
TOP PLAN



FRONT VIEW

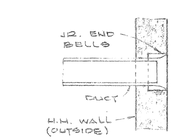
1-DUCT

NTS

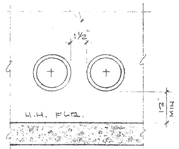


DETAIL of SUMP

NTS



SIDE VIEW

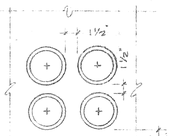


FRONT VIEW

2-DUCTS

NTS

SIDE VIEW



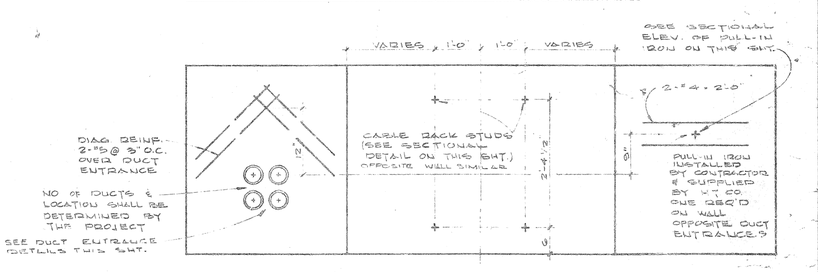
TOP PLAN FRONT VIEW

4-DUCTS

DUCT ENTRANCE DETAILS

CABLE RACK STUD BOLT DETAIL

NTS



ELEV. of INSIDE WALLS-H.H. TYPE 1 & 2

SCALE 3/8"=1'-0"

APPROVED:

R. Maw for F.H. Judd — 6/14/66

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN TELEPHONE CO.
STANDARD DETAILS

Scale: As Noted — Date: May 1966

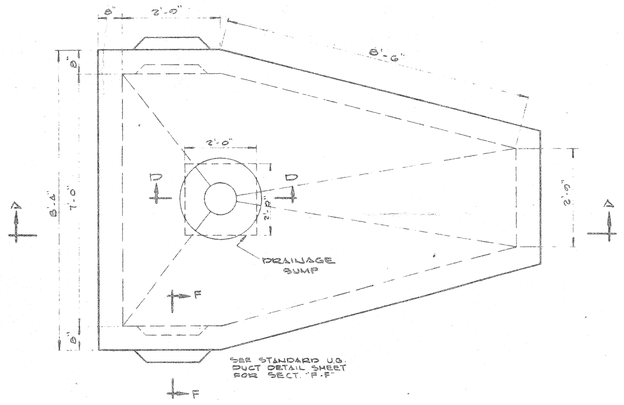
GENERAL NOTES:

1. CONC. FINISH: FLOORS - SMOOTH METAL TROWELLED - EXPOSED WALL SURFACES AND EDGES - SMOOTH AND FREE FROM DEFECTS.
2. CONC. TO DEVELOP COMPRESSIVE STRENGTH - 3000 P.S.I. IN 28 DAYS
3. STEEL WORK: ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION
4. FOR DUCT LINE CONSTRUCTION STANDARDS, SEE SHEET NO. ___
5. THESE HANDHOLES ARE DESIGNED FOR INSTALLATION IN AREAS OTHER THAN ROADWAYS.

SHEET NO. 37 OF 42 SHEETS

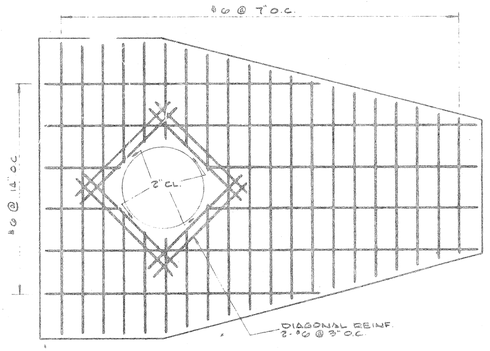
FILE	DR. MJK	ENG'R	STANDARD HANDHOLE TYPE #1 & #2 USING MANHOLE TYPE A-ST-2 PULLBOX COVERS
ASSIGNMENT	CHK. RM	TEL. 621	
CONSTRUCTION	INDEX	APP'D.	
MAINTENANCE			
	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 5-27-66	340291 D
TOTAL PRINTS		SHEET 1 OF 1	

FED ROAD DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAW	I-HI-1(31) Unit 1	1967	78	42



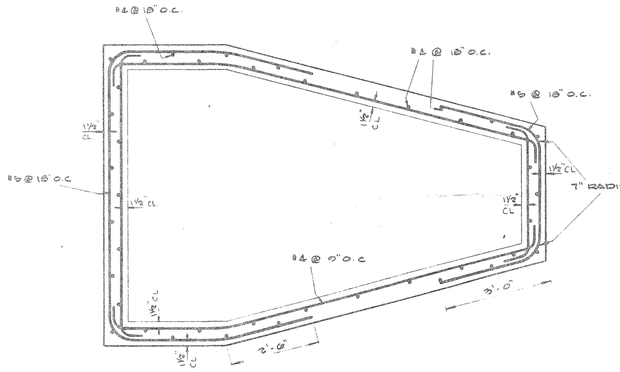
PLAN

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



ROOF SLAB REINF. PLAN

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

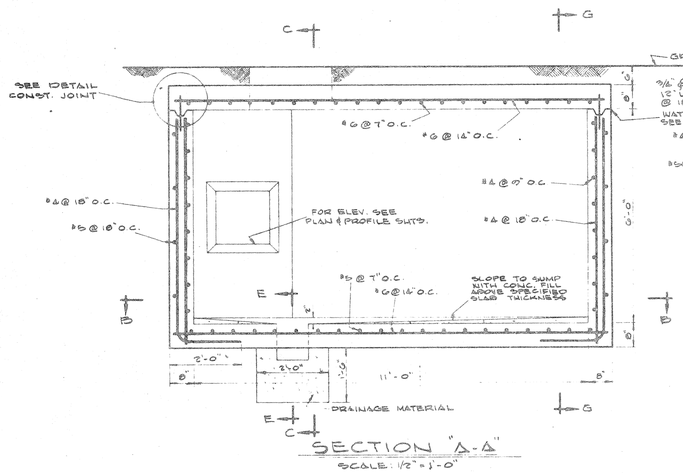


SECTION "B-B"

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

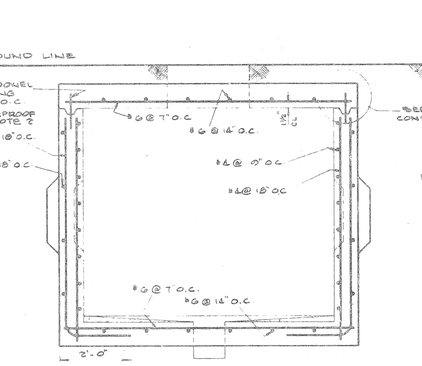
GENERAL NOTES:

1. DESIGN DATA
   fs = 20000 PSI
   fc = 1300 PSI, f'c 3000 PSI
   n = 10
   W = EQUIV. FLUID PRESS. = 30 PSF
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO-SEAL OR EQUAL.
3. DUCT WINDOW TO SUIT. SEE PLAN & PROFILE & STANDARD DETAIL SHEETS FOR LOCATION & DETAILS.



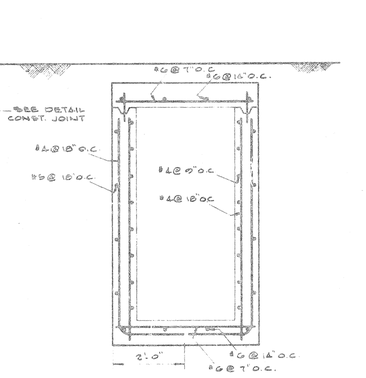
SECTION "A-A"

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



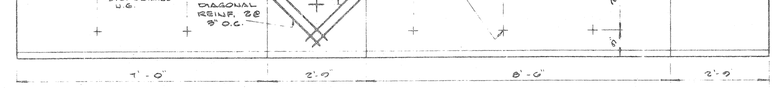
SECTION "C-C"

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



SECTION "G-G"

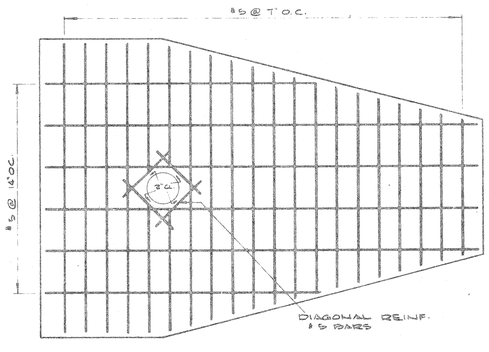
SCALE: 1/2" = 1'-0"



ELEVATION OF INSIDE WALLS

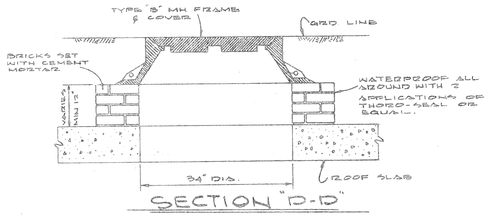
(OPPOSITE FACES SIMILAR)

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



FLOOR SLAB REINF. PLAN.

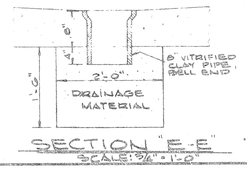
SCALE: 1/2" = 1'-0"



SECTION "D-D"

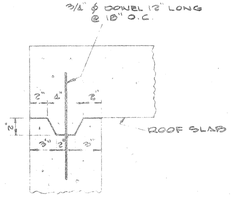
M.H. COVER DETAIL

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



SECTION "E-E"

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



CONST. JOINT DETAIL

SCALE: 1½" = 1'-0"

APPROVED:

R. Mau for F.H. Judd — 6/14/66

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN TELEPHONE CO. STANDARD DETAILS

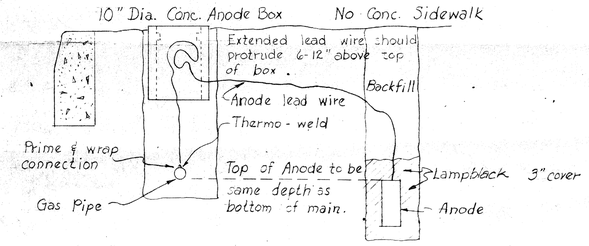
Scale: As Noted — Date: May 1966

FILE	DR. WKH	ENG. N. KOO	MODIFIED TYPE V-1 MANHOLE FOR ROADWAY & SIDEWALK AREAS
ASBUILT/ECOY	CHK. W.S.	YR. 1966-1981	
CONSTRUCTION	INDEX	APP'D.	
MAINTENANCE	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 5-27-66	34031 D
TOTAL PRINTS		SHEET 1 OF 1	

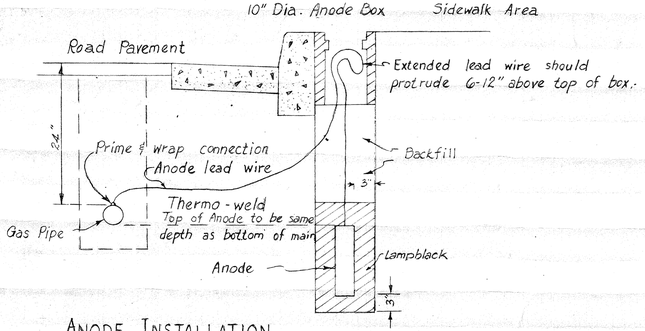
SHEET NO. 38 OF 42 SHEETS

78

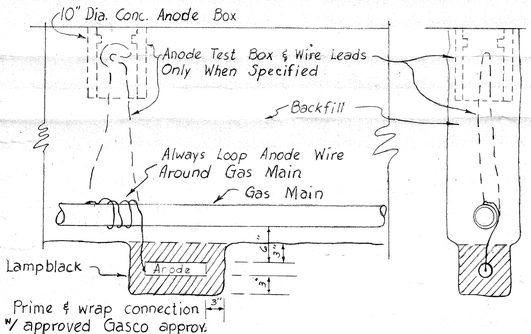
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit 1	1967	79	282



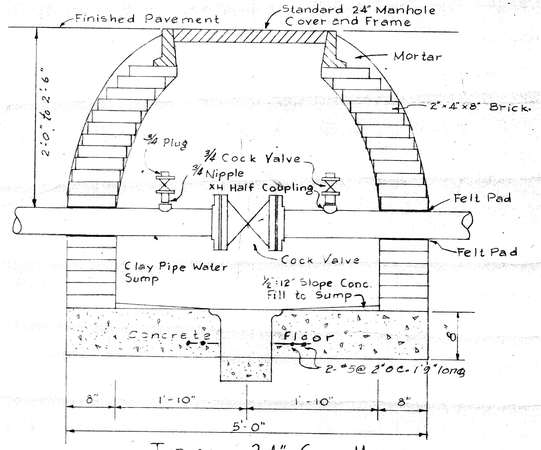
ANODE INSTALLATION
TYPE "A"
Not to Scale



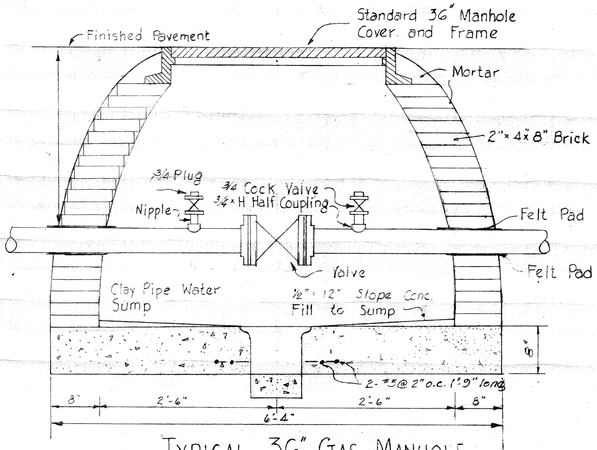
ANODE INSTALLATION
TYPE B
Not to Scale



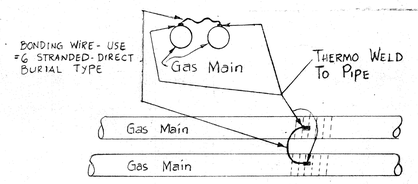
ANODE INSTALLATION
TYPE "C"
Not to Scale



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



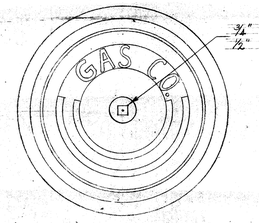
TYPICAL 36" GAS MANHOLE
Scale : 1"= 1'-0"

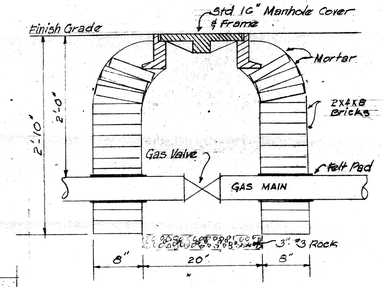


WRAP COMPLETED CONNECTION WITH GASCO APPROVED PRIMER AND TAPE

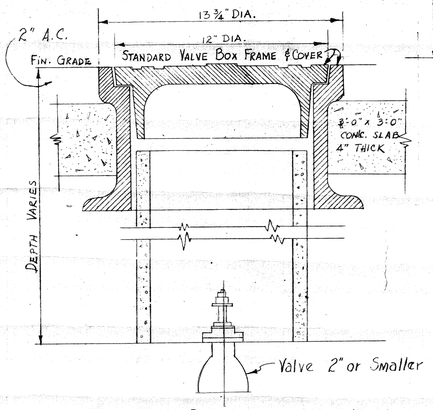
TYPICAL BOND CONNECTION
Not to Scale

Note :
Offset word Gasco 1¾" high ⅛" deep.

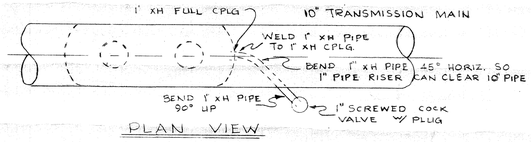




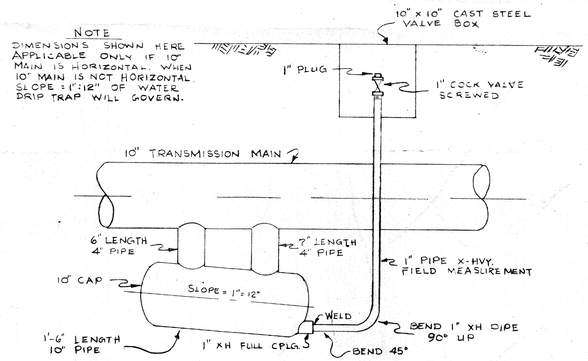
TYPICAL 16" GAS MANHOLE
Scale : 1"=1'-0"



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



PLAN VIEW



ELEV. VIEW

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

APPROVED:
David E Taylor
DIRECTOR OF DEVELOPMENT
HONOLULU GAS CO., LTD.
6/15/66
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

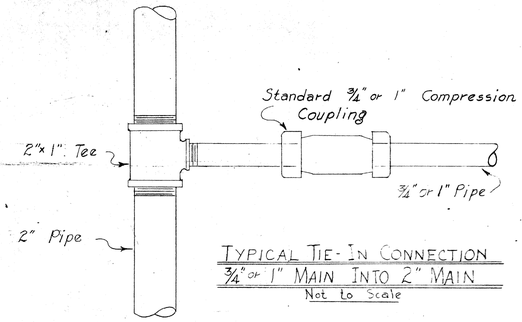
HONOLULU GAS CO.
STANDARD DETAILS

Scales: As Noted
Date: May, 1966

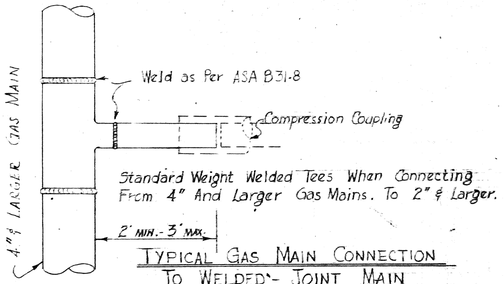
SHEET No. 39 OF 42 SHEETS

79

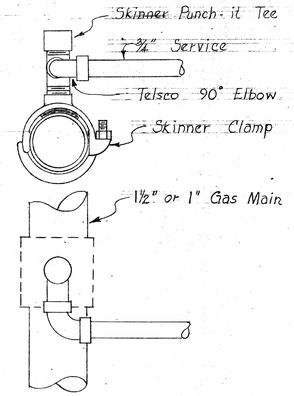
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(61) Unit 1	1967	80	202



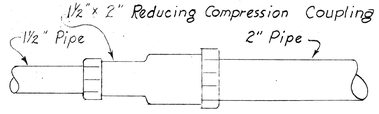
TYPICAL TIE-IN CONNECTION
¾" or 1" MAIN INTO 2" MAIN
Not to Scale



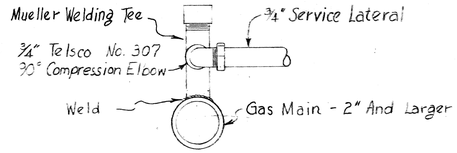
TYPICAL GAS MAIN CONNECTION
TO WELDED-JOINT MAIN
Not to Scale

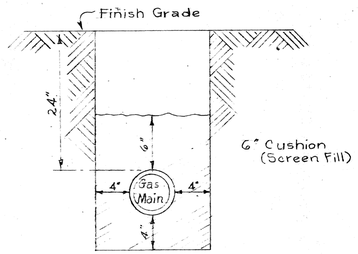


TYPICAL MAIN - SERVICE CONNECTION
1½" OR 1" MAIN
Not to Scale

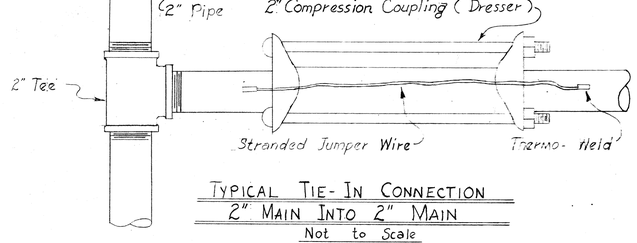


TYPICAL IN-LINE TIE-IN
1½" MAIN TO 2" MAIN
Not to Scale

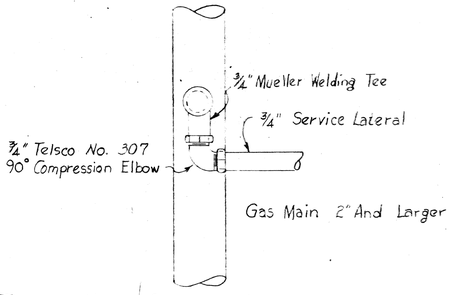




TYPICAL TRENCHING DETAIL
Not to Scale

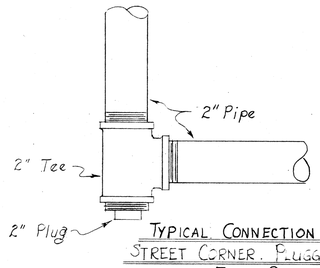


TYPICAL TIE-IN CONNECTION
2" MAIN INTO 2" MAIN
Not to Scale

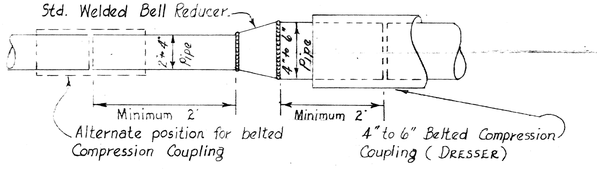


TYPICAL MAIN - SERVICE CONNECTION
Not to Scale

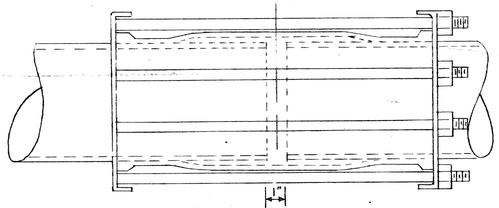
All gas service connections will consist of:
1. ¾" Mueller Welding Tee Welded to Main as shown.
2. ¾" Telsco No. 307, 90° Compression Elbow. This is for services connections at Mains only.



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"-10" 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. #4 stranded wire for larger pipes.
3. Unless specified install non-insulating type of compression coupling.

APPROVED:
David E Vaughan
DIRECTOR OF DEVELOPMENT (Acting)
HONOLULU GAS CO., LTD.
6/15/66
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HONOLULU GAS CO. STANDARD DETAILS

Scales: As Noted
Date: May, 1966

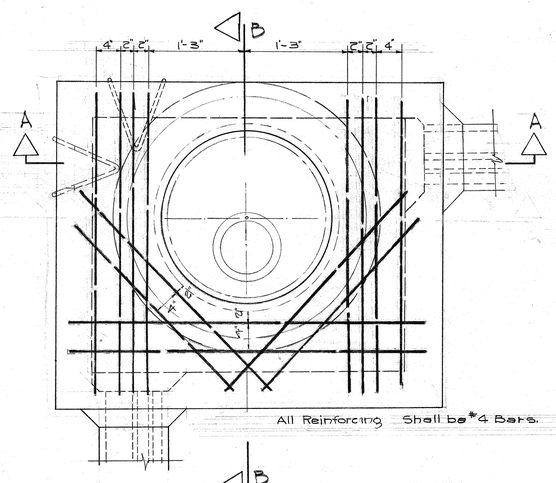
SHEET No. 40 OF 42 SHEETS

077

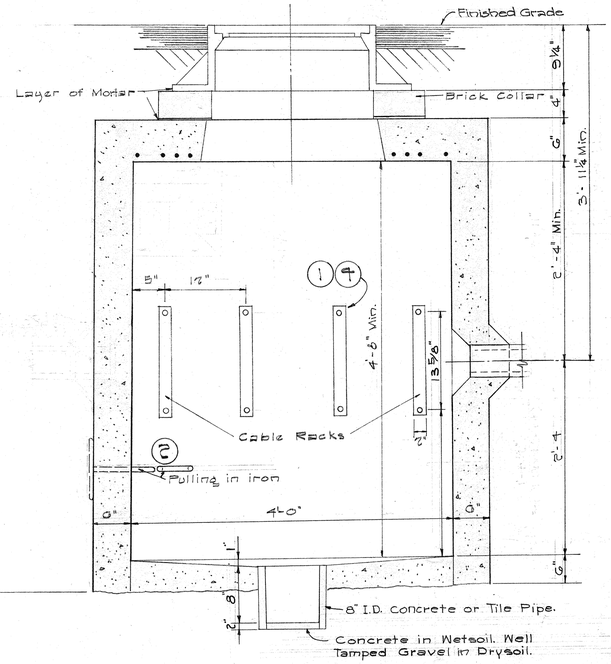
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HANA 11	HAW	I-HI-1(31) Unit 1	1967	81	292

NOTE:
The following items of hardware shall be furnished by the Contractor.

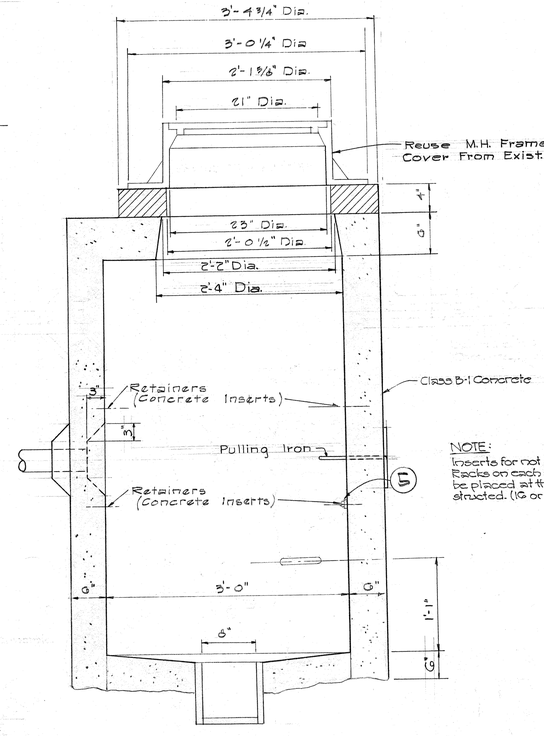
ITEM Nº	MATERIAL	STOCK Nº	QUANT
1	Hook, Cable Rack	5B5131	16
2	Iron, Pulling-in	5B5580	2
4	Rack, Cable, 15" 8 holes	5B5029	6
5	Retainer, Cable Rack (Inserts & Bolts)	5B9100	16



PLAN

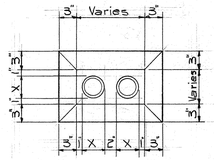


SECTION A-A



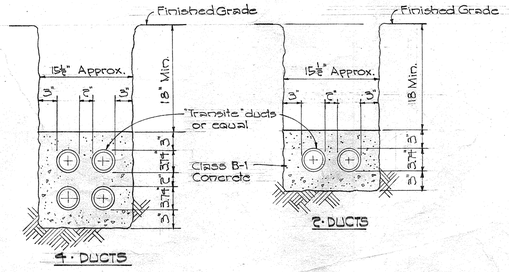
SECTION B-B

NOTE:
Inserts for not less than four Cable Racks on each side wall of MH should be placed at the time the MH is constructed. (12 or more inserts req'd.)



X= O.D. of Duct

INVERT DETAIL
Scale: 1"= 1'-0"



TYPICAL DETAIL of TRENCHES
Scale: 1" = 1'-0"

DETAIL OF STANDARD 4'-0" SIGNAL CORPS MANHOLE
Scale: 1" = 1'-0"

NOT IN CONTRACT
For Information Only

APPROVED:
Kenneth Hebert Jr.
SIGNAL OFFICER U.S. ARMY - HAWAII
15 June 66
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGNAL CORPS DETAILS

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit 1

Scale: As Noted
Date: May, 1966

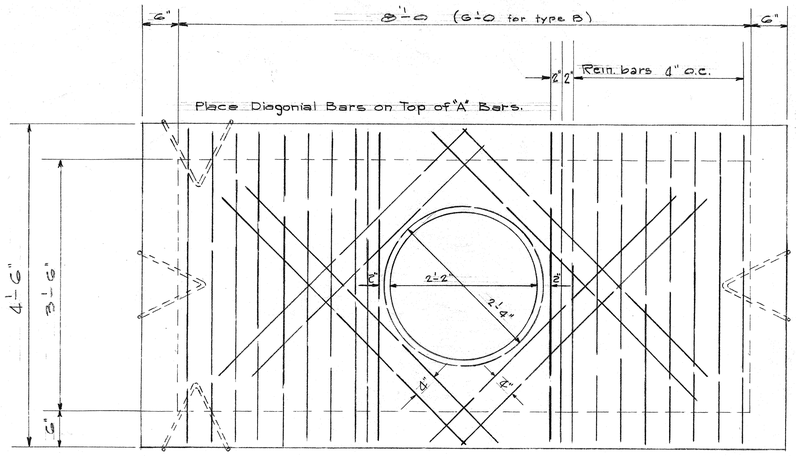
SHEET No. 41 OF 42 SHEETS

S1

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

PRINTED ON DIEPO 1000H CLEARPRINT

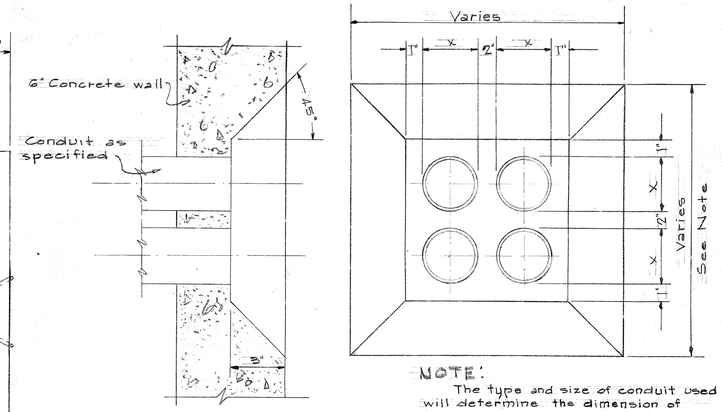
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(31) Unit I	1967	82	202



Reinforcement to consist of #4 deformed bars.
Placement to be modified as required for opening at end of manhole.

TOP VIEW AND ROOF REINFORCING DETAIL

Scale: 1" = 1'-0



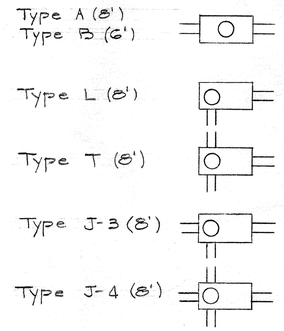
NOTE:
The type and size of conduit used will determine the dimension of Invert.

INVERT DETAIL

Not to scale

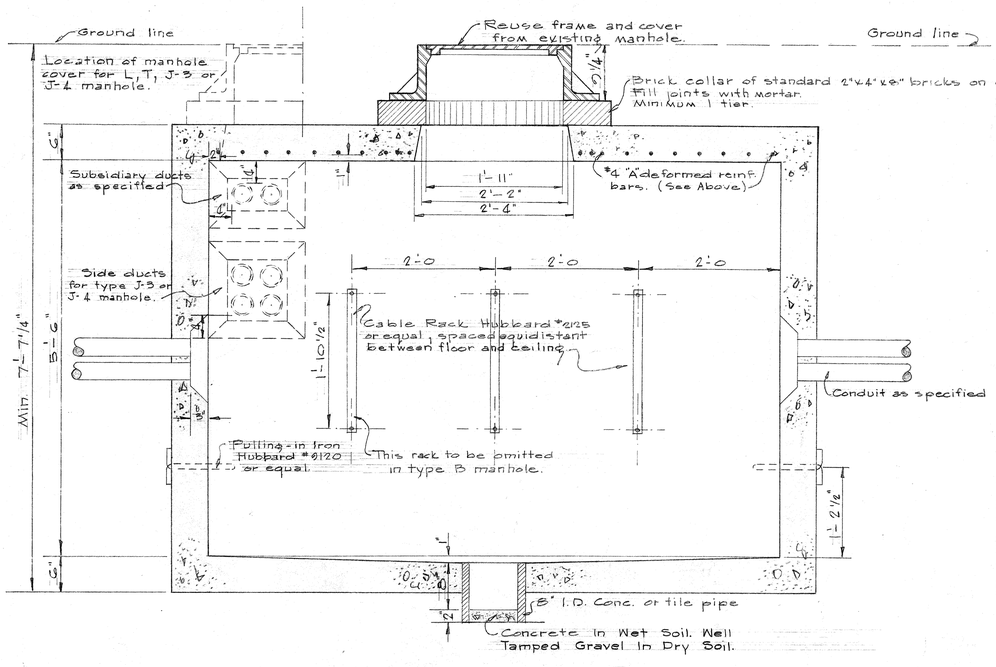
MANHOLE TYPE

(Subsidiary ducts not shown)



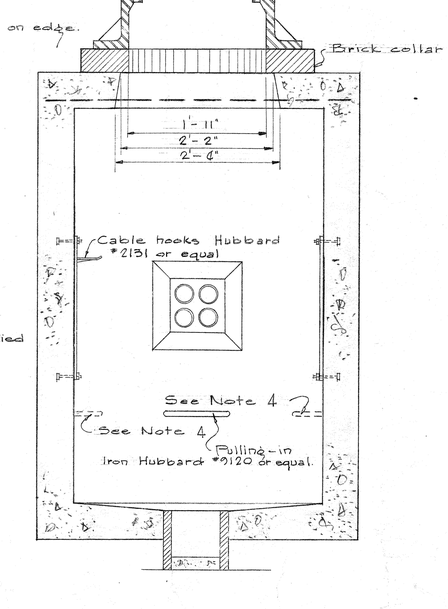
NOTES: (The following notes are applicable to shts. 81 & 82)

1. Concrete to be Class B-1.
2. No reinforcement required in walls or floor.
3. Side walls to be poured direct between the manhole forms and the side of the excavation where soil conditions permit.
4. Pulling-in iron to be installed opposite each main duct formation. (Not required opposite subsidiary ducts.)
5. All duct formations to be spaced equidistant between the floor and ceiling except where otherwise specified.
6. Standard end bells may be substituted for recesses at conduit entrances to manholes provided that manhole dimensions shall be increased three (3) inches for each wall in which end bells instead of recesses are provided.



SECTION "A-A"

Scale: 1" = 1'-0 *



SECTION "B-B"

Scale: 1" = 1'-0

DETAIL OF LARGE SIGNAL CORPS MANHOLE

* Scale applies to 8' manholes.

NOT IN CONTRACT
For Information Only

APPROVED:

SIGNAL OFFICER U.S ARMY - HAWAII — DATE: 15 Jun 66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGNAL CORPS MH DETAIL

INTERSTATE ROUTE H-1
(LUNALILO FREEWAY)
Pele Street to Victoria Street
F.A.I. Proj. No. I-HI-1(31) Unit I

Scale: As Noted — Date: May, 1966

SHEET No. 42 OF 42 SHEETS

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

PRINTED ON DIEPO 1000H CLEARPRINT

DETAIL OF LARGE SIGNAL CORPS MANHOLE