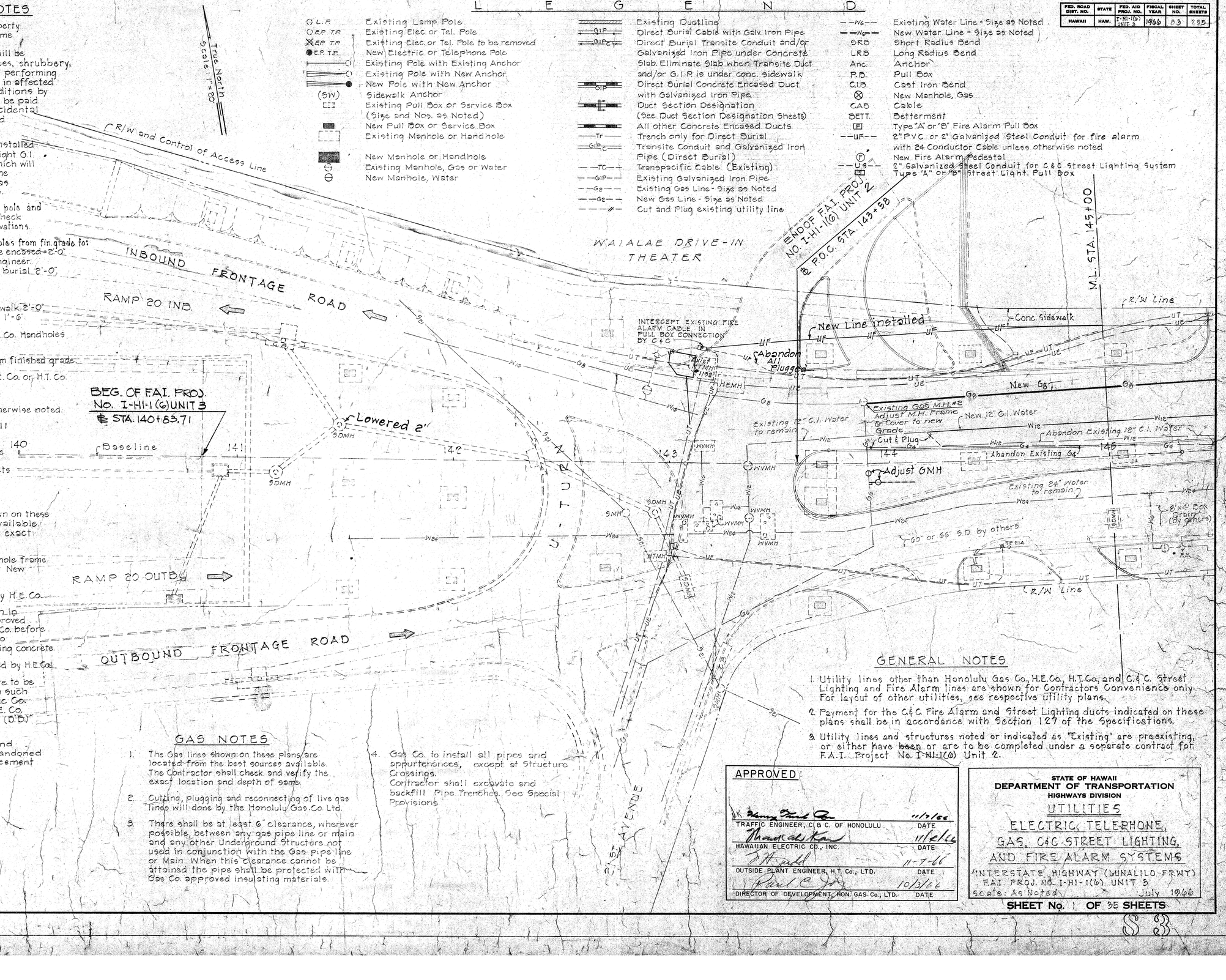
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	83	235

ELECTRIC AND TELEPHONE NOTES

1. The Contractor shall notify each affected property owner at least one week in advance as to the time and duration the trenching and installing of underground electric and telephone service will be performed in the affected property. All trees, shrubbery, fences, lawn, etc. disturbed in the process of performing work on electric and telephone service lines in affected properties shall be restored to original conditions by the Contractor. Such restoration work will not be paid for separately but shall be considered as incidental to the various contract items for Electric and Telephone Underground Structures.
2. Where G.I. Conduits Direct Burial are to be installed through Retaining Walls, provide Standard weight G.I. pipe sleeve of appropriate size and length which will extend at least 1'-0" beyond the faces of the Retaining Walls. Sleeves shall be considered as incidental to the respective items of conduits.
3. Contractor to stake out proposed duct line, pole and anchor locations and H. E. Co. and H.T. Co. to check locations before Contractor undertakes excavations.
4. Minimum depth of cover over duct lines or cables from fin. grade to:
   (a) Top of concrete jacket where ducts are concrete encased-2'-0" unless otherwise noted or ordered by the Engineer.
   (b) Top of ducts not encased in concrete (direct burial 2'-0" in private property 1'-6"
   (c) Top of steel conduits (direct burial) 2'-0" in private property 1'-6"
   (d) Top of cable (direct burial) under concrete sidewalk 2'-0"
   (e) Top of cable (direct burial) in private property 1'-6"
5. Depth of all pull boxes, service boxes and H.E. Co. Handholes and Manholes to be determined in the field.
6. Depth of poles and anchor holes are taken from finished grade.
7. Installation of, and backfill for poles by H. E. Co. or, H.T. Co.
8. Backfill of anchor holes by the Contractor.
9. Poles and Anchors are for H. E. Co. unless otherwise noted.
10. For pole setting depth data, see Sheet No. 111
11. Ducts encased in concrete jacket.
   (a) Normal distance from face of plain concrete jacket to all ducts to be 3" minimum.
   (b) Clear distance of 1½" minimum between ducts of same utility Co.
   (c) Clear distance of 3" minimum between H. E. Co. Ducts and H. T. Co. Ducts.
12. Existing Electric and telephone systems shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
13. Adjust existing telephone manholes and manhole frame and covers within proposed roadway to fit New Roadway finished grades.
14. Adjusting of H. E. Co. manholes to be done by H. E. Co.
15. All ducts and conduits called for installation in concrete jacket shall be inspected and approved by the respective Engineer of H.E. Co. or H.T. Co. before concrete placing. 24 hours (Minimum) notice to respective utility shall be given before pouring concrete.
16. All H.E. Co. direct burial cable will be installed by H.E. Co.
17. Whenever direct burial secondary cables are to be installed, the Trenches shall be opened in such lengths as to permit The Hawaiian Electric Co. to install its cables in one length. All H. E. Co. Direct Burial Cables designated "C A B (D.B)" to be installed by H.E. Co.
18. Existing utilities to be replaced by new, and indicated to be abandoned, shall be abandoned only after the completion of the replacement facilities.

L E G E N D

O L.P	Existing Lamp Pole
O E.P. T.P.	Existing Elec. or Tel. Pole
⊗ E.P. T.P.	Existing Elec. or Tel. Pole to be removed
● E.P. T.P.	New Electric or Telephone Pole
—O	Existing Pole with Existing Anchor
—O	Existing Pole with New Anchor
—●	New Pole with New Anchor
(SW)	Sidewalk Anchor
	Existing Pull Box or Service Box (Size and Nos. as Noted)
	New Pull Box or Service Box
	Existing Manhole or Handhole
	New Manhole or Handhole
	Existing Manhole, Gas or Water
	New Manhole, Water
	Existing Dustline
G I P	Direct Burial Cable with Galv. Iron Pipe
G I P T	Direct Burial Transite Conduit and/or Galvanized Iron Pipe under Concrete Slab. Eliminate Slab when Transite Duct and/or G.I.P. is under conc. Sidewalk
G I P	Direct Burial Concrete Encased Duct with Galvanized Iron Pipe
	Duct Section Designation (See Duct Section Designation Sheets)
	All other Concrete Encased Ducts
Tr	Trench only for Direct Burial
G I P T	Transite Conduit and Galvanized Iron Pipe (Direct Burial)
TC	Transpacific Cable (Existing)
G I P	Existing Galvanized Iron Pipe
Ge	Existing Gas Line - Size as Noted
Gs	New Gas Line - Size as Noted
	Cut and Plug existing utility line
We	Existing Water Line - Size as Noted
We	New Water Line - Size as Noted
SRB	Short Radius Bend
LRB	Long Radius Bend
Anc.	Anchor
P.B.	Pull Box
C.I.B.	Cast Iron Bend
⊗	New Manhole, Gas
CAB	Cable
BETT.	Betterment
F	Type "A" or "B" Fire Alarm Pull Box
UF	2" PVC or 2" Galvanized Steel Conduit for fire alarm with 24 Conductor Cable unless otherwise noted
F	New Fire Alarm Pedestal
US	2" Galvanized Steel Conduit for C & C Street Lighting System
S	Type "A" or "B" Street Light Pull Box



GAS NOTES

1. The Gas lines shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
2. Cutting, plugging and reconnecting of live gas lines will done by the Honolulu Gas Co Ltd.
3. There shall be at least 6" clearance, wherever possible, between any gas pipe line or main and any other Underground Structure not used in conjunction with the Gas pipe line or Main. When this clearance cannot be attained the pipe shall be protected with Gas Co approved insulating materials.
4. Gas Co. to install all pipes and appurtenances, except at Structure Crossings. Contractor shall excavate and backfill Pipe Trenches. See Special Provisions

GENERAL NOTES

1. Utility lines other than Honolulu Gas Co., H.E.Co., H.T.Co. and C. & C. Street Lighting and Fire Alarm lines are shown for Contractors Convenience only. For layout of other utilities, see respective utility plans.
2. Payment for the C & C Fire Alarm and Street Lighting ducts indicated on these plans shall be in accordance with Section 127 of the Specifications.
3. Utility lines and structures noted or indicated as "Existing" are preexisting, or either have been or are to be completed under a separate contract for F.A.I. Project No. I-HI-1(6) Unit 2.

APPROVED:

TRAFFIC ENGINEER, C. & C. OF HONOLULU	DATE 11/7/66
HAWAIIAN ELECTRIC CO., INC.	DATE 11/8/66
OUTSIDE PLANT ENGINEER, H.T. Co., LTD.	DATE 11-7-66
DIRECTOR OF DEVELOPMENT, HON. GAS Co., LTD.	DATE 10/31/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES
ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (HONOLULU-PEARL HARBOR)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted July 1966

SHEET No. 1 OF 35 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

PROJECT NUMBER						
FED. AID PROJ. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
I-HI-1(6) UNIT 3	HAWAII	F-1-1(6)	1967	78	235

Revised May 5, 1967

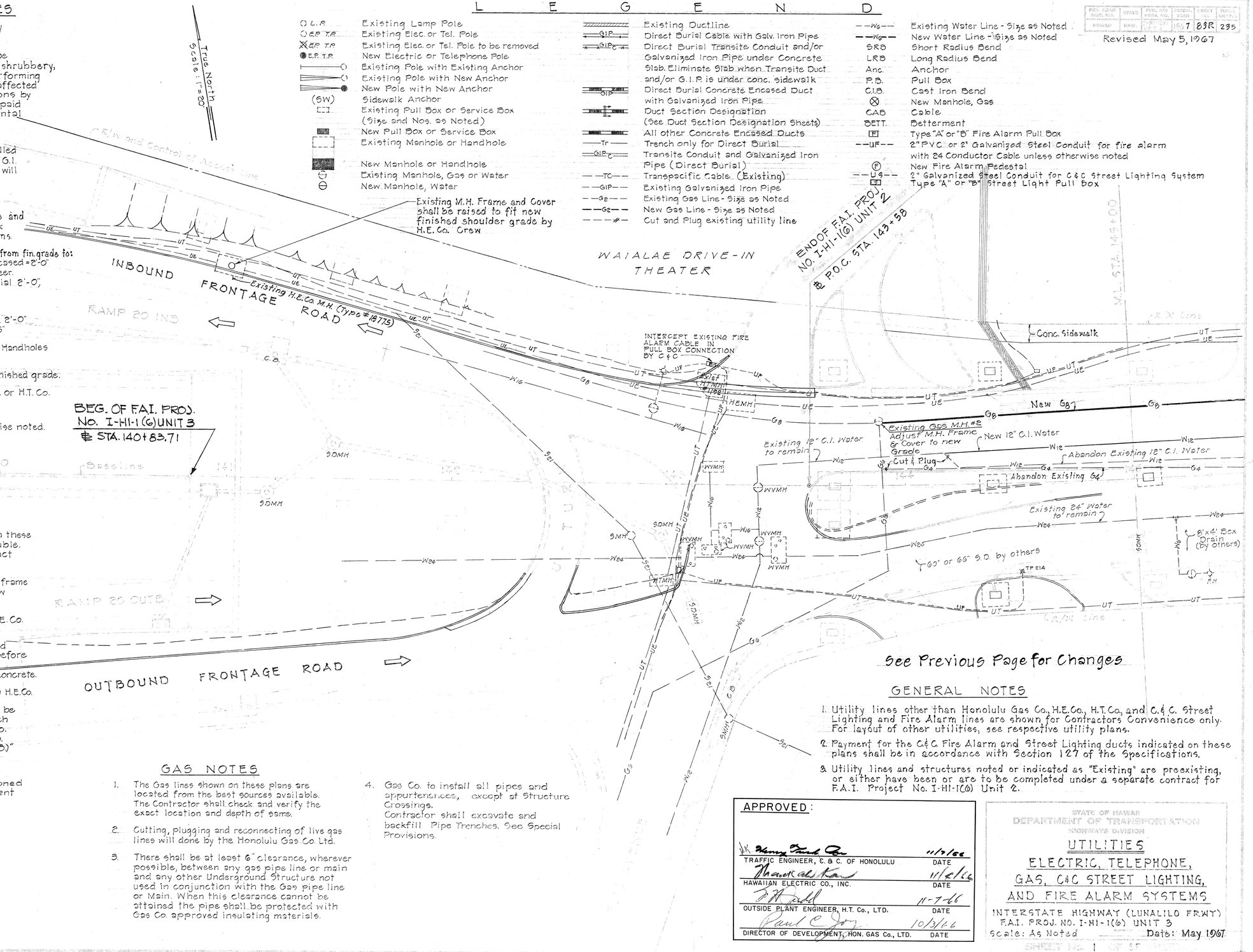
ELECTRIC AND TELEPHONE NOTES

1. The Contractor shall notify each affected property owner at least one week in advance as to the time and duration the trenching and installing of underground electric and telephone service will be performed in the affected property. All trees, shrubbery, fences, lawn, etc. disturbed in the process of performing work on electric and telephone service lines in affected properties shall be restored to original conditions by the Contractor. Such restoration work will not be paid for separately but shall be considered as incidental to the various contract items for Electric and Telephone Underground Structures.
2. Where G.I. Conduits Direct Burial are to be installed through Retaining Walls, provide standard weight G.I. pipe sleeve of appropriate size and length which will extend at least 1'-0" beyond the faces of the Retaining Walls, Sleeves shall be considered as incidental to the respective items of conduits.
3. Contractor to stake out proposed duct line, pole and anchor locations and H. E. Co. and H.T. Co. to check locations before Contractor undertakes excavations.
4. Minimum depth of cover over duct lines or cables from fin.grade to:
   (a) Top of concrete jacket where ducts are concrete encased = 2'-0" unless otherwise noted or ordered by the Engineer.
   (b) Top of ducts not encased in concrete (direct burial 2'-0", in private property 1'-6".
   (c) Top of steel conduits (direct burial) 2'-0", in private property 1'-6"
   (d) Top of cable (direct burial) under concrete sidewalk 2'-0"
   (e) Top of cable (direct burial) in private property 1'-6"
5. Depth of all pull boxes, service boxes and H. E. Co. Handholes and Manholes to be determined in the field.
6. Depth of poles and anchor holes are taken from finished grade.
7. Installation of, and backfill for poles by H. E. Co. or H.T. Co.
8. Backfill of anchor holes by the Contractor.
9. Poles and Anchors are for H. E. Co. unless otherwise noted.
10. For pole setting depth data, see Sheet No. 111
11. Ducts encased in concrete jacket.
   (a) Normal distance from face of plain concrete jacket to all ducts to be 3" minimum.
   (b) Clear distance of 1½" minimum between ducts of same utility Co.
   (c) Clear distance of 3" minimum between H. E. Co. Ducts and H. T. Co. Ducts.
12. Existing Electric and telephone systems shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
13. Adjust existing telephone manholes and manhole frame and covers within proposed roadway to fit New Roadway finished grades.
14. Adjusting of H. E. Co. manholes to be done by H. E. Co.
15. All ducts and conduits called for installation in concrete jacket shall be inspected and approved by the respective Engineer of H.E. Co. or H.T. Co. before concrete placing. 24 hours (Minimum) notice to respective utility shall be given before pouring concrete.
16. All H.E. Co. direct burial cable will be installed by H.E. Co.
17. Whenever direct burial secondary cables are to be installed, the Trenches shall be opened in such lengths as to permit The Hawaiian Electric Co. to install its cables in one length. All H. E. Co. Direct Burial Cables designated "C A B (D.B)" to be installed by H. E. Co.
18. Existing utilities to be replaced by new, and indicated to be abandoned, shall be abandoned only after the completion of the replacement facilities.

L E G E N D

○ L.P	Existing Lamp Pole	Existing Ductline	—We— Existing Water Line - Size as Noted
○ E.P. T.P.	Existing Elec. or Tel. Pole	G.I.P. Direct Burial Cable with Galv. Iron Pipe	—We— New Water Line - Size as Noted
⊗ E.P. T.P.	Existing Elec. or Tel. Pole to be removed	G.I.P.C. Direct Burial Transite Conduit and/or Galvanized Iron Pipe under Concrete Slab. Eliminate Slab when Transite Duct and/or G.I.P. is under conc. sidewalk	SRB Short Radius Bend
● E.P. T.P.	New Electric or Telephone Pole		LRB Long Radius Bend
—○	Existing Pole with Existing Anchor		P.B. Pull Box
—○	Existing Pole with New Anchor	G.I.P. Direct Burial Concrete Encased Duct with Galvanized Iron Pipe	C.I.B. Cast Iron Bend
—● (SW)	New Pole with New Anchor Sidewalk Anchor	Duct Section Designation (See Duct Section Designation Sheets)	⊗ New Manhole, Gas
	Existing Pull Box or Service Box (Size and Nos. as Noted)	All other Concrete Encased Ducts	CAB Cable
	New Pull Box or Service Box	—Tr— Trench only for Direct Burial	BETT. Betterment
	Existing Manhole or Handhole	G.I.P.C. Transite Conduit and Galvanized Iron Pipe (Direct Burial)	F Type "A" or "B" Fire Alarm Pull Box
	New Manhole or Handhole	—TC— Transpacific Cable (Existing)	—UF— 2" PVC or 2" Galvanized Steel Conduit for fire alarm with 24 Conductor Cable unless otherwise noted
	Existing Manhole, Gas or Water	—G.I.P.— Existing Galvanized Iron Pipe	(F) New Fire Alarm Pedestal
⊖	New Manhole, Water	—Ge— Existing Gas Line - Size as Noted	—US— 2" Galvanized Steel Conduit for C & C Street Lighting System
		—Ge— New Gas Line - Size as Noted	Type "A" or "B" Street Light Pull Box
		—//— Cut and Plug existing utility line	

Existing M.H. Frame and Cover shall be raised to fit new finished shoulder grade by H.E. Co. Crew



See Previous Page for Changes

GENERAL NOTES

1. Utility lines other than Honolulu Gas Co., H.E.Co., H.T.Co, and C. & C. Street Lighting and Fire Alarm lines are shown for Contractors Convenience only. For layout of other utilities, see respective utility plans.
2. Payment for the C & C Fire Alarm and Street Lighting ducts indicated on these plans shall be in accordance with Section 127 of the Specifications.
3. Utility lines and structures noted or indicated as "Existing" are preexisting, or either have been or are to be completed under a separate contract for F.A.I. Project No. I-HI-1(6) Unit 2.

GAS NOTES

1. The Gas lines shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.
2. Cutting, plugging and reconnecting of live gas lines will done by the Honolulu Gas Co. Ltd.
3. There shall be at least 6" clearance, wherever possible, between any gas pipe line or main and any other Underground Structure not used in conjunction with the Gas pipe line or Main. When this clearance cannot be attained the pipe shall be protected with Gas Co. approved insulating materiale.
4. Gas Co. to install all pipes and appurtenances, except at Structure Crossings. Contractor shall excavate and backfill Pipe Trenches. See Special Provisions.

APPROVED:

TRAFFIC ENGINEER, C. & C. OF HONOLULU	DATE 11/7/66
HAWAIIAN ELECTRIC CO., INC.	DATE 11/4/66
OUTSIDE PLANT ENGINEER, H.T. Co., LTD.	DATE 11-7-66
DIRECTOR OF DEVELOPMENT, HON. GAS Co., LTD.	DATE 10/31/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES
ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted Date: May 1967

SHEET NO. 1 OF 9 SHEETS

S 3 R

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	84	235

OCEAN VIEW CEMETERY

EQUISTION STATION
INB. FRONT. RD. STA. 124+26.84
INB. FRONT. RD. STA. 145+33.43

TRUE NORTH
SCALE: 1" = 20'

Existing 80' Pole (HECo)

JOLLY ROGER

Existing Conc. Box Drain

Type "A" Fire Alarm Pull Box

Exist. HTCo P.B. # 3404

10' Wide Utility Easement

Exist. HECo. Duct Line

Existing 1'-6" x 3'-6" CONC. SERVICE BOX (HECO)

Existing T.P. #1 (HTCO)

Existing Type 434T P.B. # 433 (HTCO)

Existing 2" PVC Fire Alarm Conduit

SEE SHEET 84 FOR DETAIL OF DUCT CROSSING OVER EXIST. 18'x5' RC BOX DRAIN

TYPE "B" FIRE FIRE ALARM PULL BOX

Connect New 2" PVC Fire Alarm Conduit

STOP & PLUG 2-5" DUCTS (HECO)

H.T.CO. Pay Station to Remain

Conc. Sidewalk

Existing Type "B" Fire Alarm P.B.

R/W Line

LINE E-1 & T-1

PROPOSED FOOTING ON PILES (TYPICAL)

LINE G-1

NEW G8 Existing (6'x11' H.H.) (HECO) ELEC. M.H. # 5

#18849

New 12" Water

EXISTING LINE E-6

ABANDON EXISTING 12" WATER

DEMOLISH EXISTING GAS M.H.

EXISTING 24" WATER TO REMAIN

OUTB.

8'x4' BOX DRAIN (EXIST.)

INB. FRONTAGE ROAD

92" Type B Anode installation

8" GAS LINE, CAP BOTH ENDS 5' BEYOND CULVERT SEE SHEET 94

Exist. 18'x5' RC Culvert (Waialae Major Storm Drain)

Adjust Existing H.T.M.H. # 937 Frame and Cover to New Grade.

Adjust Existing 1'-6" x 3'-6" Conc. Service Box (HE.Co.) to New Grade.

2" G.S. Fire Alarm Conduit & 2 Conductor Cable

Remove Exist. HECo. Service Box

Type "A" Fire Alarm Pull Box

New Fire Alarm Pedestal

Exist. Fire Alarm Pull Station to be relocated to new Pedestal by C & C.

Exist. HTCo. M.H. # 1006 Adjust M.H. Frame & Cover to new grade (HTCo.)

4" Insulating Dresser Coupling

Exist. 30 KVA Regulators & Control Equipment to be relocated to Kealaolu Ave. by Contractor. See Sht. No. 114

Abandon Exist. C & C Street Light Pull Box

Abandon Exist. Street Light Cables.

This portion of HECo. duct to be abandoned.

Install 1'-6" x 3'-6" Conc. Service Box (HECo.) over existing duct.

Exist. Type 434 T Pull Box # 434.

Exist. 1'-6" x 3'-6" Conc. Service Box (HECo.)

Existing 80' Pole (HECo.)

Exist. HTCo. and HE Co. Ductlines

4" Transite Korduct in Structure (HE Co.) See Structural Detail Sheet No. 53

SAM SPOONE'S

BARRY'S UNION SERVICE

WAIALAE MAJOR STORM DRAIN

M.L. @ STA. 145+00

Intercept Existing Series Circuit with new Type "A" Pull Box.

Existing Street Light Cable to remain

2" G.S. Street Light Conduit with 2-#8 TKV Cable.

Cut & Plug

HUNAKAI ST. EXTENSION

Existing S.D.

Close Series Loop in Existing Lamp Post

Abandon Exist Street Light Cable

Exist. HTCo. P.B. # 3405

Exist. Duct to Remain (H.T.Co.)

Insulate G3/4

2" PVC Fire Alarm Conduit with 2 conductor cable E&C to make Final Connection

Exist. H.T.CO. M.H. #1268 (HTCO) Adjust M.H. Frame & Cover to New Grade

WAIALAE SHELL SERVICE

INSTALL 1'-6" x 3'-6" CONC. SERVICE BOX (HECO)

STA 138+88 CONSTRUCT # 18775 (6'x11' MH) (HECO) ELEC. M.H. # 6

Exist 2'-4" Ducts to remain

Existing Sewer Easement

Cut & connect new G3/4

Existing 8" S.D. to Remain

Existing G8 to Remain

EXIST. H.T. CO. DUCT SYSTEM TO REMAIN

Existing 36" S.D. to Remain

2" G.G. Fire Alarm Conduit in same trench with Electric

Type "B" Fire Alarm Pull Box

Abandon existing F.H.

New G8

LINE G-1

"A"

THIS PORTION OF HECO DUCT TO BE ABANDONED

Construct 16" GAS M.H. # 3

CONNECT NEW 2-3" ELECTRICAL DUCTS TO EXISTING DUCTS SEE "NOTE 1" ON SHEET # 85

New 12" Water

ABANDON EXISTING 12" WATER

DEMOLISH EXISTING GAS M.H.

Exist. HECO Ductline to Remain (HECO) (2-3" Ducts)

H.T. DUCTLINE TO REMAIN (HTCO)

ABANDON EXISTING G4

NEW G4

NEW 24" WATER

ABANDON EXISTING 24" WATER

EXIST. H.T. CO. DUCT LINE TO REMAIN

Existing H.T. Co. M.H. # 938 Adjust M.H. Frame and Cover to new grade.

Existing H.E. Co. Service Box to remain.

Existing 30 KVA Regulators and Control Equipment to be relocated to Kealaolu Avenue by Contractor. See Sheet No. 114.

Relocate Existing C & C Lamp Pole by Contractor.

Relocated Lamp Pole

EXISTING 12" WATER TO REMAIN

EXISTING G4 TO REMAIN

LINE G-3 See Sheet # 81

HUNAKAI ST.

REUBEN'S

M.L. @ STA. 150+50

KENEKE BLDG.

TRENCH WIDTH

24" MIN.

SECTION "A"

APPROVED:

TRAFFIC ENGINEER, C & C OF HONOLULU — DATE 11/7/66

HAWAIIAN ELECTRIC CO, INC. — DATE 11/16/66

OUTSIDE PLANT ENGINEER, HTCO LTD. — DATE 11/17/66

DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD. — DATE 10/3/66

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted — Date: July 1966

SHEET No. 2 OF 35 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

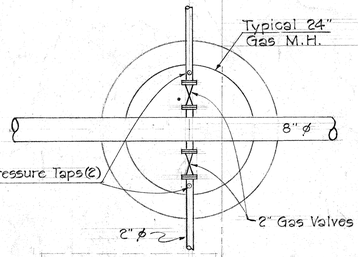
S 1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1967	85R	235

Revised May 5, 1967

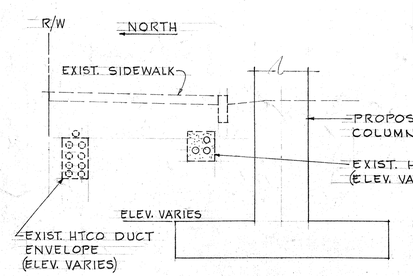
NOTE 1

For connections of new and existing 2-3" electrical ducts at Manhole #6 (℄ Sta. 148+65), Handholes #8 (℄ Sta. 152+31±), and Handhole #9 (℄ Sta. 153+96±), see Subarticle 120.3G of Special Provisions.



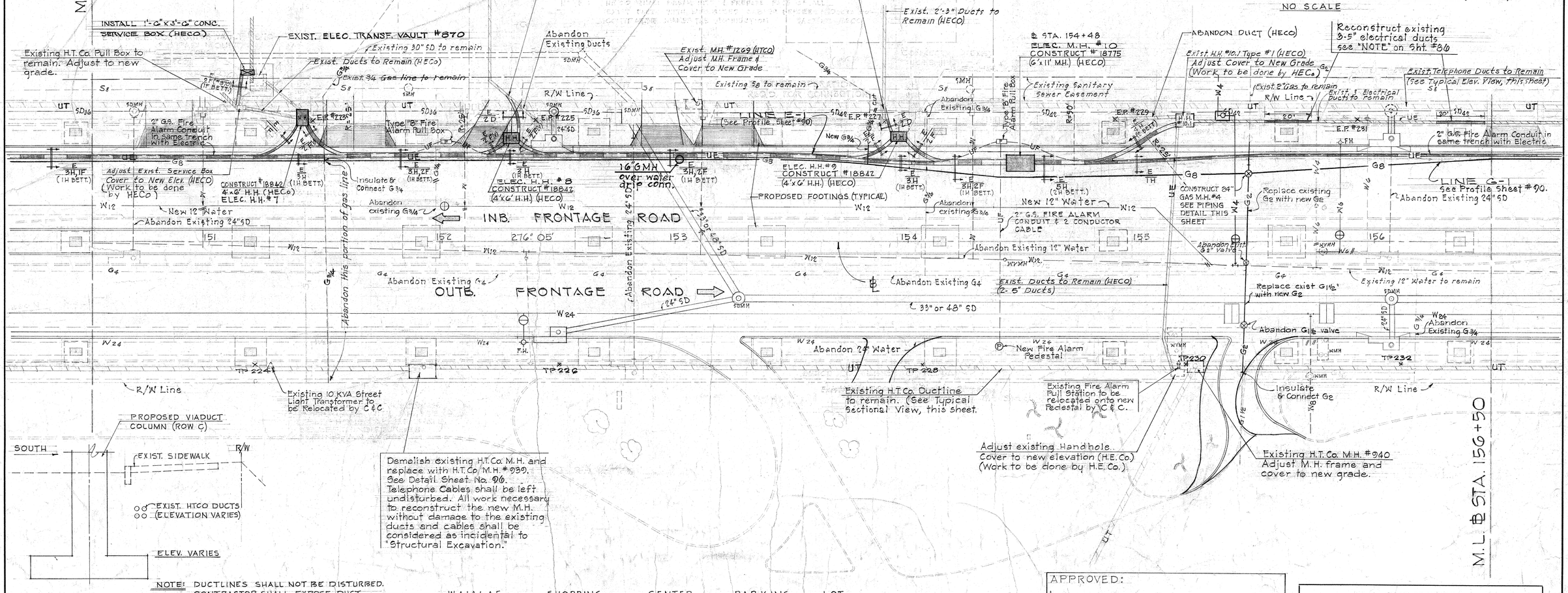
GAS M.H. #4 PIPING DETAIL
NO SCALE

TRUE NORTH
SCALE: 1" = 20'



NOTE: DUCTLINES SHALL NOT BE DISTURBED. CONTRACTOR SHALL EXPOSE DUCT ENVELOPE AND VERIFY EXACT LOCATION PRIOR TO FOOTING EXCAVATION AND CONSTRUCTION.

TYPICAL SECTIONAL VIEW
EXIST. HECO & HTCO DUCTS
& PROPOSED VIADUCT COLUMNS (NORTH)
NO SCALE



NOTE: DUCTLINES SHALL NOT BE DISTURBED. CONTRACTOR SHALL EXPOSE DUCT ENVELOPE AND VERIFY EXACT LOCATION PRIOR TO FOOTING EXCAVATION AND CONSTRUCTION.

TYPICAL SECTIONAL VIEW
EXISTING H.T.CO. DUCTS &
PROPOSED VIADUCT COLUMNS (SOUTH)
NO SCALE

WAIALAE SHOPPING CENTER PARKING LOT

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

APPROVED:

TRAFFIC ENGINEER, C & C OF HONOLULU	11/7/66 DATE
HAWAIIAN ELECTRIC CO., INC.	11/9/66 DATE
OUTSIDE PLANT ENGINEER, HTCO LTD.	11-7-66 DATE
DIRECTOR OF DEVELOPMENT, HGN. GAS CO. LTD.	10/1/66 DATE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted Date: May 1967

SHEET No. 3 OF 35 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	86	235

NOTE:

For reconstructing of Existing 3-5" H.E.Co. underground ducts at Structure No. 21 Footings #20-A (℄ Sta. 155+62.93) #21-A (℄ Sta. 156+36.50) and #29-A (℄ Sta. 157+85.01) see Subarticle 120.3 (F) of Special Provisions.

TRUE NORTH
SCALE: 1" = 80'

M.L. ℄ STA. 156+50

M.L. ℄ STA. 162+00

WAIALAE SKATELAND

CHEVRON 4346

KAHALA SUPER SERVICE 4339

WAIALAE SHOPPING CENTER PARKING LOT

FRONTAGE ROAD

KILAUEA AVE.

KEALAOLU AVE.

Type "A" Fire Alarm Pull Box

2"G.S. Street Light Conduit with 2-#8 7KV Cable

Type "A" Street Light Pull Box

Contractor to intercept existing pipe into base (from Existing Pole 239) and bring series cables into base.

Exist. 3 H.E.Co. Ducts to Remain

Reconstruct existing electrical ducts-see "NOTE" this sheet

2" G.S. Fire Alarm Conduit with 2 Conductor Cable. C&C to make Connection

Existing HTCo MH to remain Adjust M.H. Frame & Cover to new grade

ABANDON EXIST. STREET LIGHT CABLE

Exist. 3 Electrical Ducts to remain

Existing HTCO Ducts to Remain (See Typical Sectional View, North Sheet #85)

Existing Sewer Easement

Existing Sg to remain

R/W Line

E.P. #235

E.P. #223

New G8

2" G.S. Fire Alarm Conduit in same trench with Electric

LINE G-1

54" or 66" SD

Existing 12" water to remain

33" or 48" SD

Abandon Existing G4

Abandon existing G8

New 24" Water

Abandon Existing 24" Water

TP 234

TP 230

R/W Line

Existing H.T.Co. Ducts to remain. (See Typical Sectional View, South Sheet #85)

Existing M.H. #767 (H.T.Co.) Adjust M.H. frame and cover to new grade.

Existing Street Light Cable to remain

Existing 6'x3' Box Culvert to be Abandoned

LINE E-1 (See Profile, Sheet #90)

Type "B" Fire Alarm Pull Box

INB. & OUTB. FRONT. RD. STA. 150+05.05 (BACK) = INB. & OUTB. FRONT. RD. STA. 200+00 (FRONT)

OUTB. FRONT. RD. ℄

℄ New 60" or 72" S.D.

10 L.F. CONC. JACKET OVER DRAIN (See Detail Below)

Abandon Existing S.D.

Abandon S.D.

Existing HTCo's Ductline to Remain

2" PVC Fire Alarm Conduit with 2 Conductor Cable. C&C to make Connection

New Fire Alarm Pedestal

LINE E-11 (See Profile, Sheet #91)

Abandon Exist. C&C Street Light Pull Box

Relocate Existing C&C Lamp Pole

Abandon Existing Street Light Cable

Relocated Existing Lamp Post

Type "A" Street Light Pull Box to intercept Existing Cable.

STOP & PLUG

Install 2 New Cables in New 2" G.S. Conduit to Close Existing Cable with 2-#8 7KV

Type "A" Fire Alarm Pull Box

Blank Flange

Existing Fire Alarm Pull Station to be relocated to new pedestal by C&C.

Construct Type A-6 M.H. #1193 over existing ductline (H.T.Co.)

Demolish Existing H.T.M.H. #387. Remove & Salvage M.H. Frame & Cover. Deliver to H.T.Co. Base Yard.

Existing 10 KVA Street Light Transformer Relocate to Kealaolu Ave. by Contractor See Sht No. 114

LINE T-3 (See Sheet #90)

Exist. G8S MH

Insulate G8

New G2

R/W Line

Abandon Existing H.T.Co's Duct Line

Type "B" Street Light Pull Box

INSTALL 1'-6"x3'-6" CONC. SERVICE BOX (HECO) DO NOT BREAK 5" DUCT IN SERVICE BOX.

EXISTING HECo H.H. # 11.3 TO REMAIN

NEW TRANSFORMER (HECO) CONC. PAD MOUNT DWG. #V-41333 (For Detail, see Sht. #103) 2-3" SRB 2-2" SRB

2"PVC Street Light Conduit with 2-#8 7KV Cable in same trench with Electric

Exist. HECo Ducts to Remain

Exist. HTCO Ducts to Remain

Existing Sewer Easement

Existing Sg to Remain

Type "B" Fire Alarm Pull Box

Type "B" Street Light Pull Box FH

New

LINE E-1 (See Profile, Sheet #90)

CONNECT 2-5" TO EXIST. DUCTS

2" G.S. FIRE ALARM CONDUIT IN SAME TRENCH WITH ELECTRIC

(Abandon existing G4)

℄ STA. 160+30

CONSTRUCT #18775 (6'x11' M.H.) (HECO)

ELEC. M.H. # 11

CONSTRUCT 24" GAS M.H. #5 See Detail Sheet No. 117

INB'D.

FRONTAGE ROAD

2" G.S. Street Conduits with #8 7KV Cable in same trench with Electric

2" G.S. Fire Alarm Conduit in same trench with Electric

Abandon Exist. G4

LINE E-7 See Sheet #91

2" G.S. FIRE ALARM CONDUIT & 2 CONDUCTOR CABLES

Existing Sewer to Remain

Existing 12" Water to Remain

New 24" Water

Abandon Exist. 24" Water

OUTB'D

INSTALL TYPE 435TA, P.B. #435 OVER EXIST. PIPE. (HTCO) HTCO TO CUT PIPE & EXPOSE CABLE IN PULL BOX.

INSTALL TYPE 434T, P.B. #436 OVER EXIST. PIPE. (HTCO) HTCO TO CUT PIPE & EXPOSE CABLE IN P.B.

LINE T-2 (See Profile Sht. #90)

R/W Line

New G8

Exist. 8" V.C. Sewer to Remain

Abandon Ducts (HTCO)

Demolish Exist. P.B. (HTCO)

E.P. #1x

EXIST. H.T.Co. DUCT LINE TO BE ABANDONED (HTCO)

Exist. H.T.M.H. #1271 (HTCO) Adjust M.H. Frame & Cover to New Grade

New 12" Water

Abandon Existing G4

Abandon Existing 12" Water

LINE T-8 (SEE SHEET #91)

Demolish Existing H.T.Co. Pull Box

CONSTRUCT NEW SPECIAL M.H. #1194 (HTCO) (FOR DETAILS, SEE SHEET #97)

Type "B" Fire Alarm Pull Box

LINE T-3

R/W Line

INSTALL TYPE 434T, P.B. #1281 (HTCO) 2-4" C.I.B. (H.T.Co.)

Type "B" Fire Alarm Pull Box.

Install 2-2" Galv. Steel Risers 8' high, terminate with 30' slack cable for Fire Alarm and 40' slack cable for Street Light.

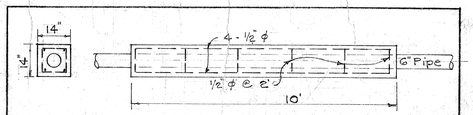
50' POLE (HECO) INSTALL 1-5" LRB

2" PVC FIRE ALARM CONDUIT with 4 Conductor Cable

ELEC. H.H. #17 CONSTRUCT #18849 (6'x11' H.H.) (HECO)

Type "B" Street Light Pull Box

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS



10' CONC. JACKET FOR 6" GAS MAIN

APPROVED:

TRAFFIC ENGINEER, C & C. OF HONOLULU — 11/1/66 DATE

HAWAIIAN ELECTRIC CO., INC. — 11/1/66 DATE

OUTSIDE PLANT ENGINEER, HTCO LTD. — 11-7-66 DATE

DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD. — 10/31/66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scale: As Noted — Date: July 1966

SHEET No. 4 OF 95 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

S 6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	87	235

M.L. ℄ STA. 162+00

M.L. ℄ STA. 168+00

TRUE NORTH SCALE: 1"=20'

WAIALAE SKATELAND

PARKING

NEW HECO POWER LINE EASEMENT

WAIALAE NUI STREAM

MATCH LINE BELOW SEE INSET

Existing Sewer to Remain

C.O.#1-1st Suppl.

LINE E-2 (See Profile, Sheet #91)

45'6" POLE (HECO)

INSTALL 1¼" ANCHOR L=30'
1-5" (8' RAD.) LRB
1-3" LRB
1-2" LRB

LINE E-1 & T-2 (See Profile, Sheet #90)

INSTALL TYPE 435TA P.B.#7779 (H.T.Co.)

NEW S.M.H.

NEW 8" V.C. SEWER

INSTALL IN STRUCTURE 1-4" ELECTRICAL CONDUIT, ELECTRICAL CONDUIT ENCASED IN REINFORCED CONCRETE JACKET TO EXTEND 10 FT. BEYOND BOTH ABUTMENTS (H.T.Co) SEE SHEET NO. 222

INSTALL 1'-6" x 3'-6" CONC. SERVICE BOX (H.E.Co.)

NEW TRANSFORMER (HECO) CONC. PAD MOUNT DRWG. # 15231
2-3" SRB
2-3" SRB
See Sheet No. 103

Existing S.M.H. Cut & Plug

Existing G¾ to Remain

EXISTING 3" CONDUIT TO STAR OF THE SEA RECTORY

STAR OF THE SEA CHURCH AND SCHOOL

Exist. 2" HT Duct (HTCO) To Remain

INSTALL 1'-6" x 3'-6" CONC. SERVICE BOX (HECO)

INSTALL TYPE 435TA P.B.#437 (HTCO)

INSTALL TYPE 434 T. P.B.#438 (HTCO) OVER EXIST. 2" PIPE. H.T.CO. TO CUT PIPE AND EXPOSE CABLE IN P.B.

LINE E-1 & T-2 (See Profile, Sheet #90)

R/W & Control Of Access Line

Inbound Front. Rd. — Conc. Service Box — Retaining Wall #14

2-3" Galv. Steel Conduit in Plain Conc. Jacket

Transformer Conc. Pad — Gutter — Exist. Ground

2-3" S.R.B.

3 Layers 45# Smooth Roofing Paper

SECTION "A-A"
Not to Scale

2' Gutter

Reinf. Conc. Ret. Wall #14

INSULATE & CONNECT G¾

DRIP SEE

Installed at ℄ Sta. 153+00 Lt.

Abandon Existing HECO Ducts

Abandon Existing HTCO Ducts

INB'D. FRONTAGE ROAD

INBOUND FRONT. RD. ℄

NEW 12" WATER

Abandon Exist. 8" Sewer

Exist. 8" Sewer to Remain

Existing S.M.H.

INB. FRONT. RD. ℄

CONSTRUCT # 18755 (HECO) ELEC. M.H. #12

INSTALL IN STRUCTURE BETWEEN ABUTMENTS 4-5" AND 2-3" GALV. STEEL CONDUITS AND INSTALL GALV. STEEL CONDUITS ENCASED IN REINFORCED CONC. JACKET 10 FT. BEYOND EAST SIDE ABUTMENT AND 20 FT. BEYOND WEST SIDE ABUT. SEE SHT. NO. 222

#8 COMP. COUPLINGS 3' FROM ABUT. FACE

INSTALL IN STRUCTURE 2-8" G2 LINE. SEE SHEET NO. 222

TERMINATE AND CAP ONE #8 ONLY, 5FT BEYOND FACE OF ABUTMENT

DEMOLISH EXIST. H.T.CO. M.H. REMOVE AND SALVAGE M.H. FRAME AND COVER. DELIVER TO H.T.CO. BASEYARD.

Abandon Existing HTCO Ducts

Demolish Exist. HTCO MH #1272
Remove & Salvage MH Frame & Cover.
Deliver to HTCO Base Yard

ABUTMENT #2 STRUCTURE #21

Abandon existing G1

(ABANDON EXISTING DUCTS (HTCO))

WAIALAE NUI STREAM BRIDGE (STRUCTURE No. 22)

Abandon Existing G¾

Reinf. Conc. Ret. Wall #15

INBOUND LANES

Abandon Existing Gᴳ

Abandon Existing 12" Water

Abandon Existing 24" Water

NEW SEWER TUNNEL FOR EXISTING S18

Exist. 18" Sewer Force Main to Remain

INBOUND FRONT. RD. ℄ SHIFT FROM STA. 204+00 TO STA. 206+00 LT. TO LT. PAVT. EDGE

EXISTING 30 KVA REGULATOR & CONTROL EQUIPMENT TO BE RELOCATED BY CONTRACTOR TO T.P. 16 KALANIANAOLE HWY.

Existing HTCO Ductline to be Abandoned

OUTBOUND LANES

NEW 60" OR 72" S.D.

NEW 24" WATER

OUTB. FRONTAGE ROAD

OUTB. FRONT. RD. ℄

Demolish Existing HTCo M.H. #1285 (HTCo) Remove and Salvage M.H. Frame & Cover. Deliver to HTCo. Base Yard.

Reinf. Conc. Ret. Wall #16

R/W & Control of Access Line

2" PVC Fire Alarm Conduit in same trench with Telephone

LINE T-3 (See Profiles Sht #90)

Type "B" Fire Alarm Pull Box

CONSTRUCT TYPE A-6 M.H. #1668 (H.T.Co.)

50' TRANSITION — 25' — 12-4" ELECTRICAL CONDUITS — 25' — 50' TRANSITION

INSTALL IN STRUCTURE 12-4" ELECTRICAL CONDUITS. ELECTRICAL CONDUITS ENCASED IN REINFORCED CONC. JACKET TO EXTEND 10 FT. BEYOND BOTH ABUTMENTS (H.T.Co.) SEE SHEET NO. 222

INSTALL IN STRUCTURE 1-2" PVC FIRE ALARM CONDUIT (2 @ C) SEE SHEET NO. ~~222~~ 282

WAIALAE GOLF COURSE

INSET

60' POLE (HECO)
1-1" ANCHOR L=30'
1-5" LRB
1-1" ANCHOR L=18'

NEW H.E.CO. POWER LINE EASEMENT

WAIALAE-NUI STREAM

CONSTRUCT #18848 (5'x7' H.H.) (HECO) ELEC. H.H. #18

LINE E-2 See Sheet #91

MATCH LINE

ORIGINAL PLAN

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

APPROVED:

TRAFFIC ENGINEER, C & C. OF HONOLULU — DATE 11/1/66

HAWAIIAN ELECTRIC CO., INC. — DATE 11/4/66

OUTSIDE PLANT ENGINEER, HTCO LTD. — DATE 11-7-66

DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD. — DATE 10/31/66

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES
ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted — July 1966

SHEET No. 5 OF 95 SHEETS

S 5

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(6) UNIT 3	1966	88	235

TRUE NORTH
SCALE: 1" = 20'

M.L. ℄ STA. 168+00

M.L. ℄ STA. 173+50

KAPAKAHI STREAM

EXIST. HTCo & HECo DUCTS TO STAR OF THE SEA SCHOOL

INB. FRONT. RD. STA. 210 + ~~75~~ 69
ELEC. M.H. #~~18775~~ 18713
CONSTRUCT #~~15585~~ 15585 (HECO)
OVER EXIST. HECo DUCT TO STAR OF THE SEA SCHOOL

INSTALL TYPE 434 T P.B. # 439
OVER EXIST. SERVICE PIPE
HTCo TO CUT PIPE & EXPOSE CABLE IN PULL P.B.X

DUCT LINES TO REMAIN

INSTALL TYPE 434T P.B. #440 (HTCo)

FOR H.E.Co. DUCTS IN WALL See Sheet No. 87

E-T LINE E-1 & T-2 (See Profile, Sheet #90)

4H-1F (2H BETT.)

Reinf. Conc. Ret. Wall #14

Reinf. Conc. Ret. Wall #15

Reinf. Conc. Ret. Wall #16

INB. FRONT. RD. ℄

LINE C-1

⇦ INB'D. FRONTAGE ROAD

WYMH

New 12" Water

ABANDON

ABANDON EXIST. DUCTS (HECO)

ABANDON EXIST. HANDHOLE (HECO)

E.P. # 6X

E.P. # 7X

LINE E-1 (See Profile, Sheet #90)

2' Gutter

R/W & Control of Access Line

New G8

2½

4H-1F (2H BETT.)

4H-1F(R)(G8) (2H BETT.)

HECo.'s 1-4" & 4-5" GALV. STEEL CONDUITS SUSPENDED FROM STRUCTURE. EXTEND 10 FT BEYOND BOTH ABUTMENTS IN REINFORCED CONC. JACKET. SEE SHEET NOS. 95 AND 220 FOR DETAILS.

Install 1'-6" x 3'-6" Conc. Service Box (H.E.Co.)

R/W Line

4H-1F (2H BETT.) EP#8X

32# TYPE "B" ANODE INSTALLATION

2-8" COMP. COUPLING 3' FROM ABUTMENT FACE

NEW G8 SUSPENDED FROM STRUCTURE. PROVIDE ADDITIONAL HANGER INSERTS FOR FUTURE G8. SEE SHEET NOS. 95 AND 220 FOR DETAILS.

NEW SIGN "E-5"

NEW 24" S.D.

New G2

LINE C-1

New 12" Water

⇦ INBOUND LANES

OUTBOUND LANES ⇨

KAPAKAHI STREAM BRIDGE (STRUCTURE No. 23)
℄ Sta. 171+56

ABUTMENT NO 1

ABUTMENT NO 2.

Replace existing G1 with new G2

SDMH

New 24" S.D.

Abandon Existing G4

Abandon Existing 12" Water

Abandon Existing 24" Water

Abandon Existing H.T. Co. Duct Line

Abandon existing G4

Existing 12" Water to remain

Existing 24" Water to remain

Abandon H.T. Co.'s Duct Line

New 24" Water

OUTB. FRONT. RD. ℄

OUTB'D. FRONTAGE ROAD ⇨

New WYMH

New 24" Water

R/W & Control of Access Line

Type "B" Fire Alarm Pull Box

2" PVC Fire Alarm Conduit in same trench with telephone.

DEMOLISH EXIST. H.T.Co MH # 1357 (HTCo)
REMOVE & SALVAGE MH FRAME & COVER
DELIVER TO H.T. Co. BASEYARD

CONSTRUCT NEW M.H. #1669 (HTCO)
FOR DETAIL, SEE SHT. #90

LINE T-3 See Profile Sheet #90.

INSTALL IN STRUCTURE 1-2" PVC FIRE ALARM CONDUIT (C&C) SEE SHEET NO. 95 FOR DETAILS.

HTCo. 12-4" ELECTRICAL CONDUIT SUSPENDED FROM STRUCTURE. EXTEND 10 FT. BEYOND BOTH ABUTMENTS IN REINFORCED CONCRETE JACKET. SEE SHEET NOS. 95 AND 220 FOR DETAILS.

Type "B" Fire Alarm Pull Box

INSULATE G¾"

2" PVC Fire Alarm Conduit in same trench with Telephone

OUTB. FRONT. 212+04.10 TO STA. 173+27.25

SHEET TO RIGHT

WAIALAE GOLF COURSE

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

APPROVED:

W. Harry Funk Jr. 11/9/66
TRAFFIC ENGINEER, C&C OF HONOLULU — DATE

AG Henderson for FAK P-18-65
HAWAIIAN ELECTRIC CO., INC. — DATE

DA Hydell 11-7-66
OUTSIDE PLANT ENGINEER, HTCO LTD. — DATE

Paul C Jog 11/3/66
DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD. — DATE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

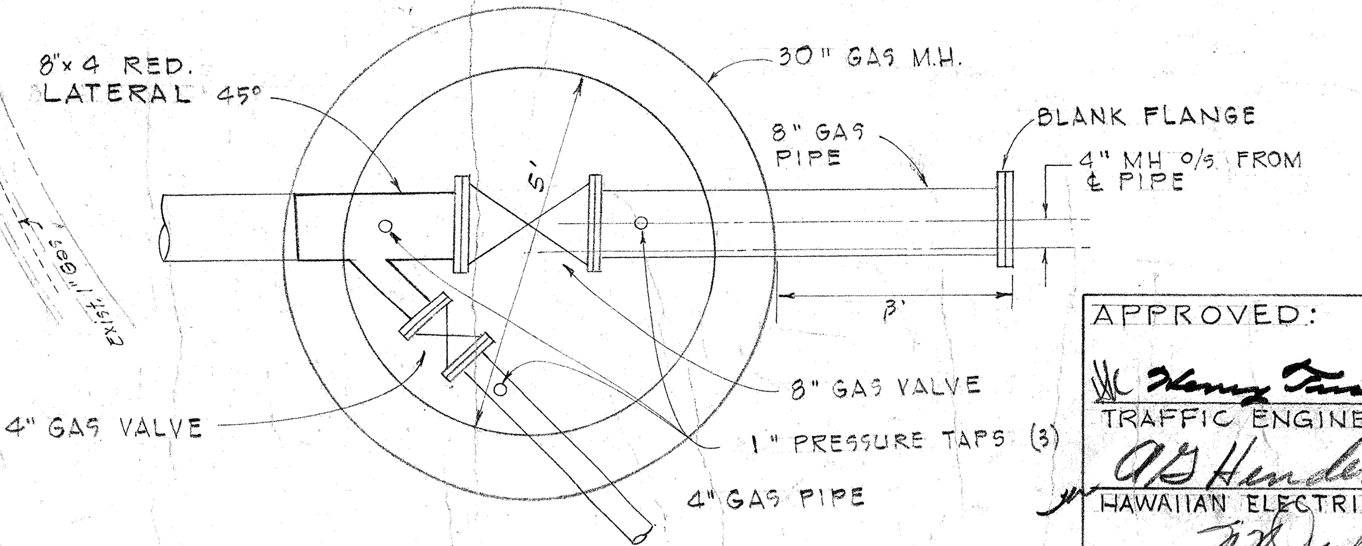
ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted — July 1966

SHEET No. 6 OF 95 SHEETS

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(6) UNIT 3	1966	89	235



GAS MH # 7 PIPING DETAIL

8" TO 4" GAS LINE

NOT TO SCALE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

APPROVED:

[signature] TRAFFIC ENGINEER, C&C OF HONOLULU	11/7/66 DATE
A.G. Henderson for FAK HAWAIIAN ELECTRIC CO., INC.	8-18-65 DATE
[signature] OUTSIDE PLANT ENGINEER, HTCO LTD.	11-7-66 DATE
Paul C. [signature] DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD.	10/3/66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-H1-1(6) UNIT 3
Scale: As Noted Date: July, 1966

SHEET No. 7 OF 35 SHEETS

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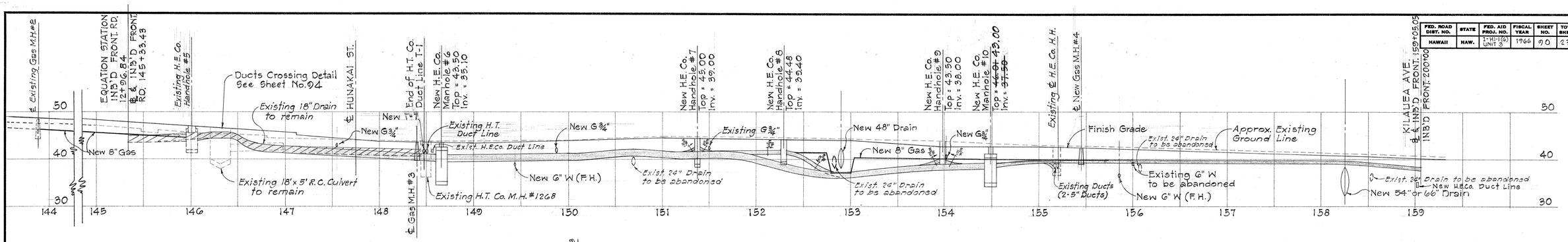
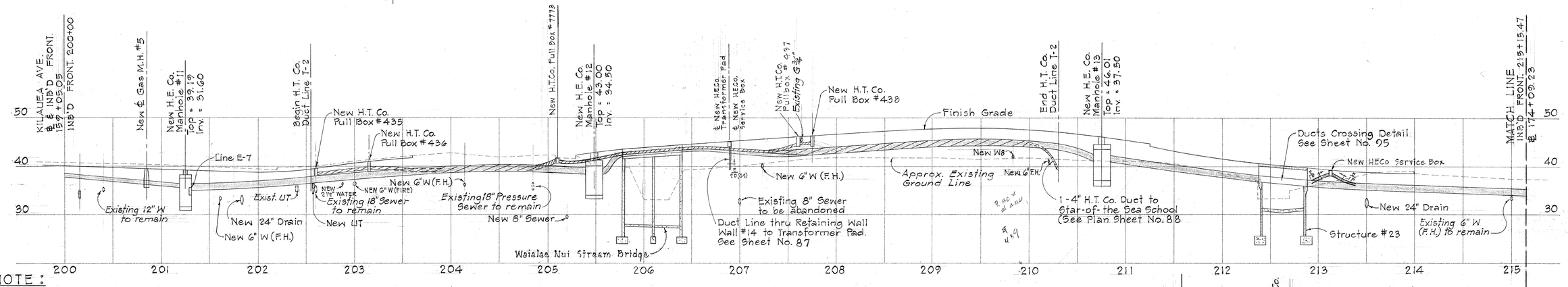
ORIGINAL PLAN	SURVEY PLOTTED BY ____ DATE
	DRAWN BY ____ "
	TRACED BY ____ "
NOTE BOOK ____	DESIGNED BY ____ "
	QUANTITIES BY ____ "
No. ____	CHECKED BY ____ "

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(6) UNIT 3	1966	70	235





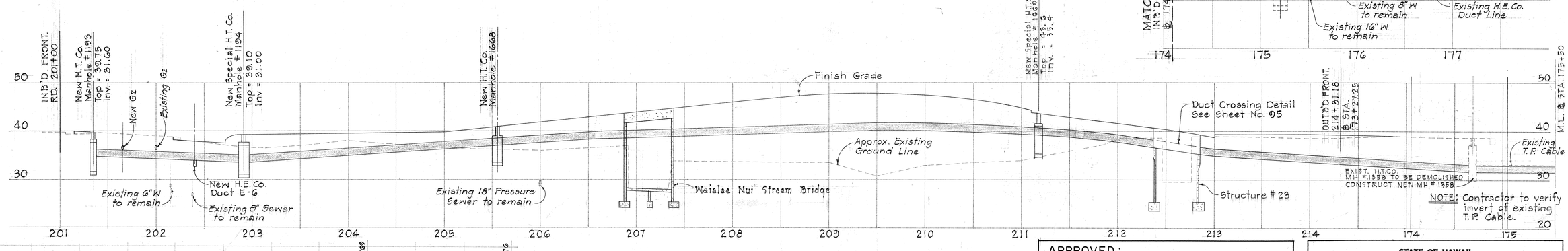
NOTE:

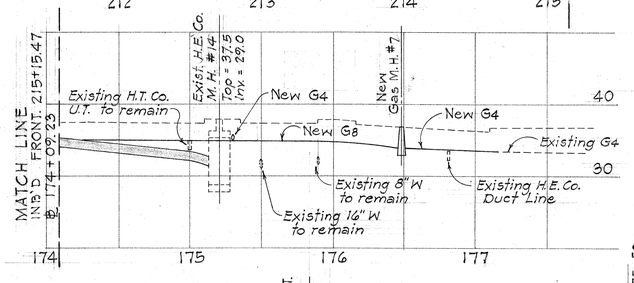
1. Where Gas Line profile is on approximately same elevation as the Electric and Telephone profile, it is not shown here.
2. Fire Alarm System placed in Electric and Telephone Trench. Profile not shown.

Electric Duct Line E-1
Telephone Duct Lines T-1 & T-2

GAS LINE G-1, ELECTRICAL DUCT LINE E-1 AND TELEPHONE DUCT LINES T-1 AND T-2

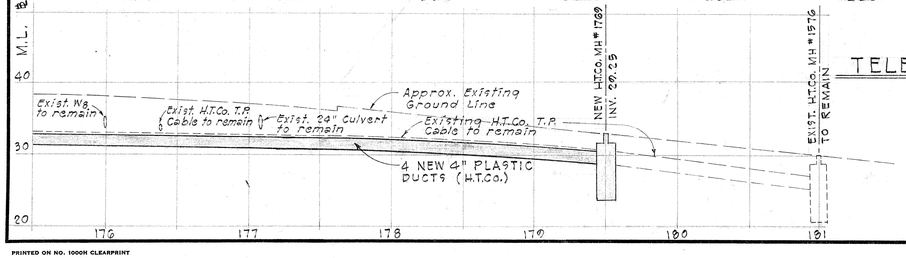
Scale: Horiz. 1" = 50'
Vert. 1" = 10'





TELEPHONE DUCT LINE T-3

Scale: Horiz. 1" = 50'
Vert. 1" = 10'



APPROVED:

TRAFFIC ENGINEER, C & C OF HONOLULU	DATE 11/21/66
HAWAIIAN ELECTRIC CO., INC.	DATE 11/21/66
OUTSIDE PLANT ENGINEER, H.T. Co., LTD.	DATE 11-7-66
DIRECTOR OF DEVELOPMENT, HON. GAS Co., LTD.	DATE 10/13/66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY.)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted July 1966

SHEET No. 8 OF 35 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

8 D 11

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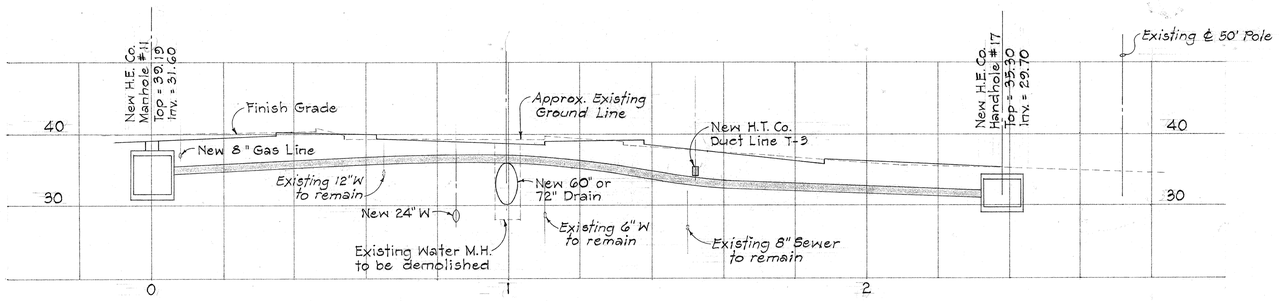
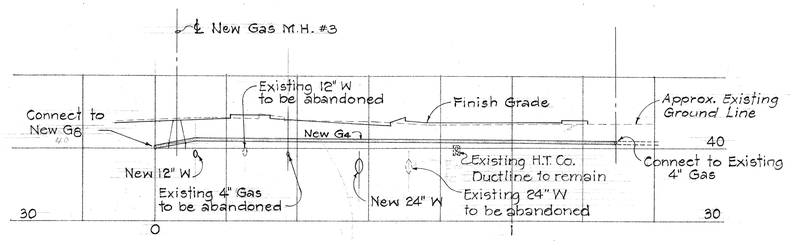
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	91	235



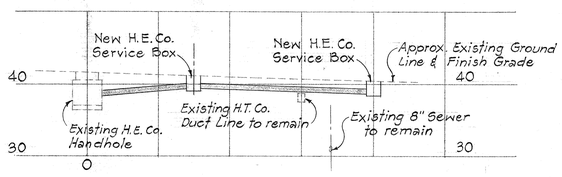
ELECTRICAL DUCT LINE E-7

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



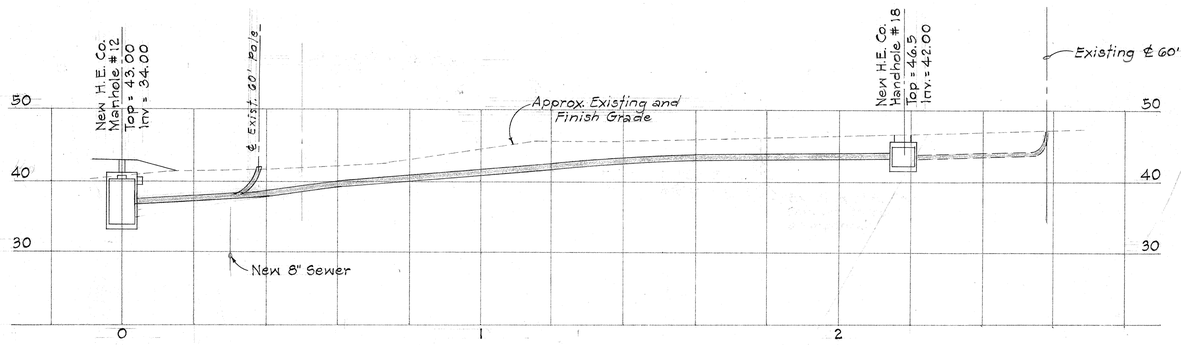
GAS LINE G-3 (NEAR HUNAKAI ST.)

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



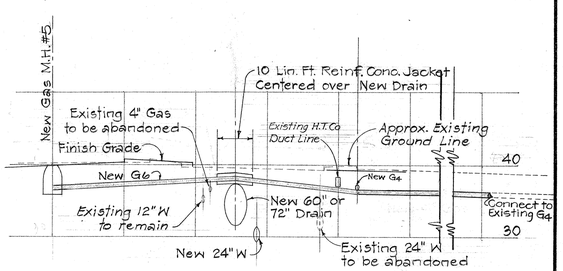
ELECTRICAL DUCT LINE E-8

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



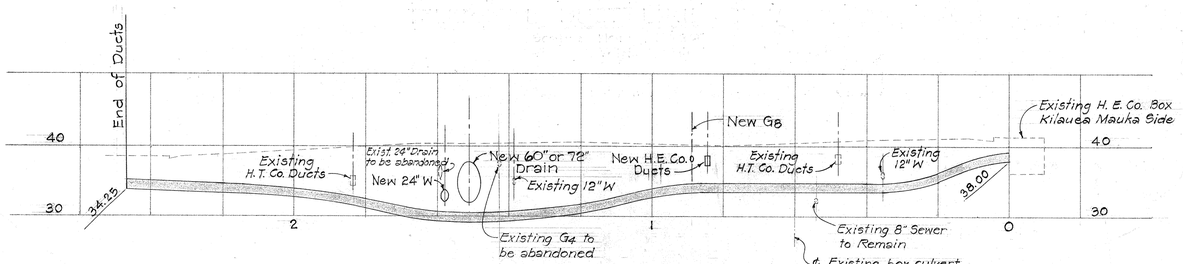
ELECTRICAL DUCT LINE E-9

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



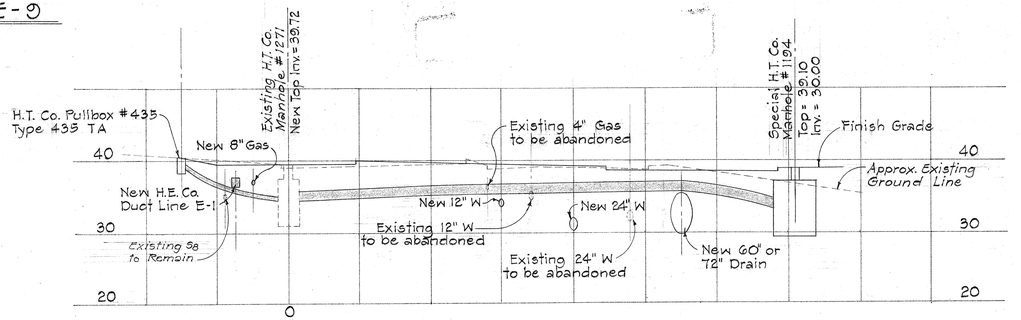
GAS LINE G-4 (NEAR KILAUEA AVE.)

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



ELECTRICAL DUCT LINE E-11

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



TELEPHONE DUCT LINE T-8

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

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

APPROVED:

TRAFFIC ENGINEER, C & C OF HONOLULU	11/3/66 DATE
HAWAIIAN ELECTRIC CO., INC.	11/16/66 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., LTD.	11-7-66 DATE
DIRECTOR OF DEVELOPMENT, HON. GAS Co., LTD.	10/5/66 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

ELECTRIC, TELEPHONE, GAS, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY.)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted July 1966

SHEET No. 9 OF 35 SHEETS

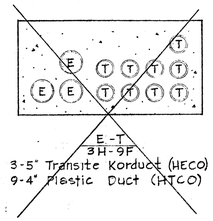
9 1

PRINTED ON NO. 1000H CLEARPRINT

82

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	92	235

DUCT SECTIONS FOR SHEET NO. 84

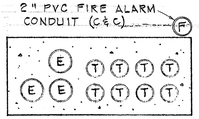


$\frac{E-T}{3H-9F}$

3-5" Transite Korduct (HECO)
9-4" Plastic Duct (HTCO)

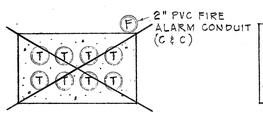
$\frac{T}{1C}$

1-2" Plastic Duct (HTCO)



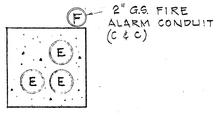
$\frac{E-T}{3H-8F}$

3-5" Transite Korduct (HECO)
8-4" Plastic Duct (HTCO)



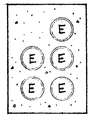
$\frac{T}{8F}$

8-4" Plastic Duct (HTCO)



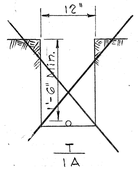
$\frac{E}{3H}$

3-5" Transite Korduct (HECO)



$\frac{E}{5H}$

5-5" Transite Korduct (HECO)



$\frac{T}{1A}$

1-¾" GIP Direct Burial (HTCo.)

$\frac{E}{2H}$

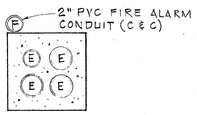
2-5" Transite Korduct (HECO)

$\frac{E}{2F}$

2-4" Transite Korduct (HECO)

$\frac{E}{2D}$

2-3" Transite Conduit (HECO)

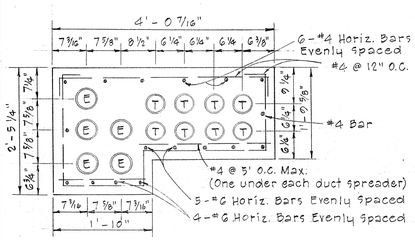


$\frac{E}{3H,1F}$

3-5" Transite Korduct (HECO)
1-4" Transite Korduct (HECO)

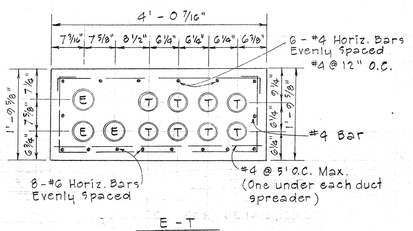
$\frac{E}{1F(GS)}$

1-4" Galvanized Steel Conduit (HECo)



$\frac{E-T}{5H-8F(R)}$

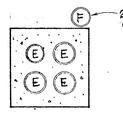
5-5" Transite Korduct Reinforced (HECo)
0-4" Electrical Conduits Reinforced (H.T.Co.)



$\frac{E-T}{3H-8F(R)}$

3-5" Transite Korduct Reinforced (HECo)
0-4" Electrical Conduits Reinforced (H.T.Co.)

DUCT SECTIONS FOR SHEET NO. 85



$\frac{E}{3H,1F}$

3-5" Transite Korduct (HECO)
1-4" Transite Korduct (HECO)

$\frac{E}{1F}$

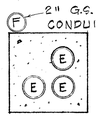
1-4" Transite Korduct (HECO)

$\frac{E}{2F(870)}$

2-4" Transite Korduct to Exist. H.E.CO. Transf. Vault # 870 (HECO)

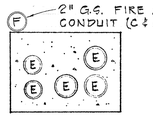
$\frac{E}{2F}$

2-4" Transite Korduct (HECO)



$\frac{E}{3H}$

3-5" Transite Korduct (HECO)



$\frac{E}{3H,2F}$

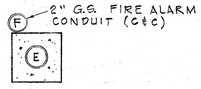
3-5" Transite Korduct (HECO)
2-4" Transite Korduct (HECO)

$\frac{E}{2D}$

2-3" Transite Conduit (HECO)

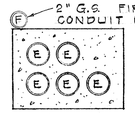
$\frac{E}{4H}$

4-5" Transite Korduct (HECO)



$\frac{E}{1H}$

1-5" Transite Korduct (HECO)



$\frac{E}{5H}$

5-5" Transite Korduct (HECO)

LEGEND FOR CONDUIT	
CONDUIT SIZE	SYMBOL
¾"	A
1"	B
2"	C
3"	D
3½"	E
4"	F
4½"	G
5"	H

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

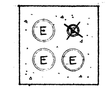
DUCT SECTIONS FOR SHEET NO. 86

$\frac{E}{1H}$

1-5" Transite Korduct (HECO)

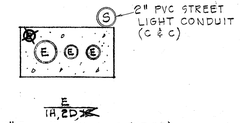
$\frac{E}{3H,\cancel{3H}}$ (H)

3-5" Transite Korduct (HECO)
1-2" Transite Conduit (HECO) (Horizontal)
Occurs at Northeast curb return on Kilauea Ave. Intersection



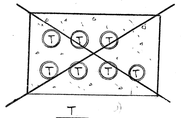
$\frac{E}{3H,\cancel{3H}}$

3-5" Transite Korduct (HECO)
1-2" Transite Conduit (HECO)



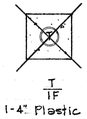
$\frac{E}{1H,\cancel{2D}}$

1-5" Transite Korduct (HECO)
2-3" Transite Conduit (HECO)
1-2" Transite Conduit (HECO)



$\frac{T}{6F,1C}$

6-4" Plastic Duct (H.T.Co.)
1-2" Plastic Duct (H.T.Co.)

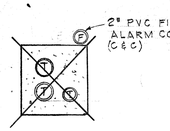


$\frac{T}{1F}$

1-4" Plastic Duct (HTCO)

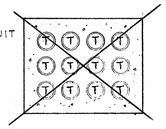
$\frac{E}{1H,\cancel{1H}}$

1-5" Transite Korduct (HECO)
1-2" Transite Conduit (HECO)



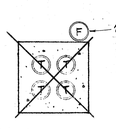
$\frac{T}{2F,1C}$

2-4" Plastic Duct (HTCO)
1-2" Plastic Duct (H.T.Co.)



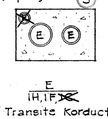
$\frac{T}{12F}$

12-4" Plastic Duct (HTCO)



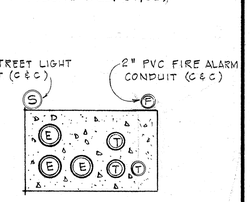
$\frac{T}{4F}$

4-4" Plastic Duct (HTCO)



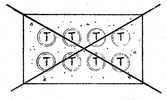
$\frac{E}{1H,\cancel{1F}}$

1-5" Transite Korduct (HECO)
1-4" Transite Korduct (HECO)
1-2" Transite Conduit (HECO)



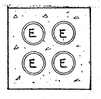
$\frac{E-T}{3H-4F,1C}$

3-5" Transite Korduct (HECO)
2-4" Plastic Duct (H.T.Co.)
1-2" Plastic Duct (H.T.Co.)



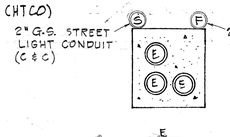
$\frac{T}{8F}$

8-4" Plastic Duct (HTCO)



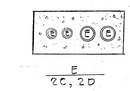
$\frac{E}{4H}$

4-5" Transite Korduct (HECO)



$\frac{E}{3H}$

3-5" Transite Korduct (HECo)



$\frac{E}{2C,2D}$

2-2" Transite Conduit (HECo)
2-3" Transite Conduit (HECo)

APPROVED

TRAFFIC ENGINEER, C&C OF HONOLULU — DATE 10/19/66

HAWAIIAN ELECTRIC CO., INC. — DATE 8-18-65

OUTSIDE PLANT ENGINEER, HTCO LTD. — DATE 11-7-66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

DUCT SECTIONS OF ELECTRIC, TELEPHONE, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Not to Scale — July 1966

SHEET No. 10 OF 35 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

REINFORCED Jacket.

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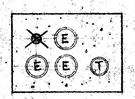
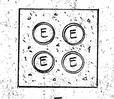
DUCT SECTIONS FOR SHEET NO. 87

T / 1F
1-4" Plastic Duct (HTCo)

E / 3H,1C
3-5" Transite Korduct (HECO)
1-2" Transite Conduit (HECO)

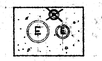


E-T / 3H,1C-1F
3-5" Transite Korduct (HECO)
1-4" Plastic Duct (HTCo)
1-2" Transite Conduit (HECO)



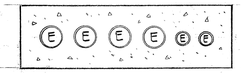
E / 4H
4-5" Transite Korduct (HECO)

E / 1H
1-5" Transite Korduct (HECO)

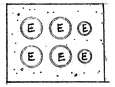


E / 1H,1D,1C
1-5" Transite Korduct (HECO)
1-3" Transite Conduit (HECO)
1-2" Transite Conduit (HECO)

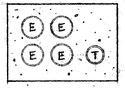
E / 1H,2H,1D,1C
2-5" Transite Korduct (HECO)
1-3" Transite Conduit (HECO)
1-2" Transite Conduit (HECO)



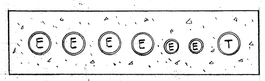
E / 4H,2D
4-5" Transite Korduct (HECO)
2-3" Transite Conduit (HECO)



E / 4H,2D
4-5" Transite Korduct (HECO)
2-3" Transite Conduit (HECO)



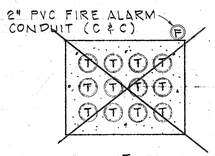
E-T / 4H-1F
4-5" Transite Korduct (HECO)
1-4" Plastic Duct (HTCo)



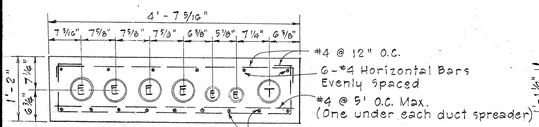
E-T / 4H,2D-1F
4-5" Transite Conduit (HECo)
2-3" Transite Conduit (HECo)
1-4" Plastic Duct (HTCo)

E / 2D(GS)
2-3" Galvanize Steel Conduit (HECO)

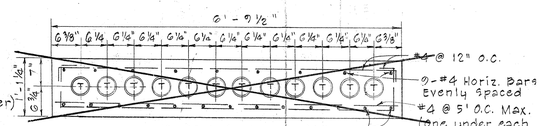
E / 1D
1-3" Transite Conduit (HECO)



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

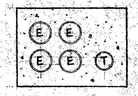


E-T / 4H,2D-1F(R)(3,5)
4-5" Galvanized Steel Conduits Reinforced (HECo.)
2-3" Galvanized Steel Conduits Reinforced (HECo.)
1-4" Electrical Conduit Reinforced (H.T.Co.)

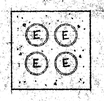


T / 12F(R)
12-4" Electrical Conduits Reinforced (H.T.Co.)

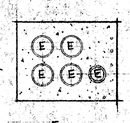
DUCT SECTIONS FOR SHEET NO. 88



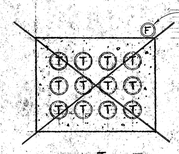
E-T / 4H-1F
4-5" Transite Korduct (HECO)
1-4" Plastic Duct (HTCo)



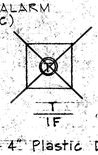
E / 4H
4-5" Transite Korduct (HECO)



E / 4H,1F
4-5" Transite Korduct (HECO)
1-4" Transite Korduct (HECO)

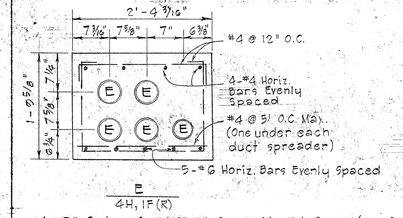


T / 12F
12-4" Plastic Duct (HTCo)

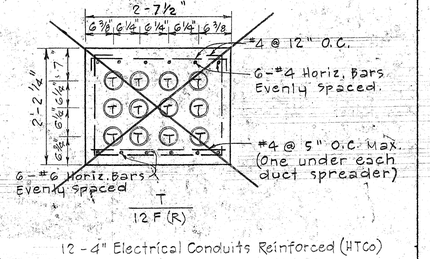


T / 1F
1-4" Plastic Duct (HTCo)

E / 1F
1-4" Transite Korduct (HECo)

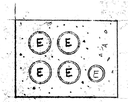


E / 4H,1F(R)
4-5" Galvanized Steel Conduits Reinforced (HECo)
1-4" Galvanized Steel Conduits Reinforced (HECo)

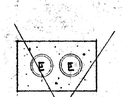


T / 12F(R)
12-4" Electrical Conduits Reinforced (HTCo)

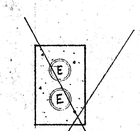
DUCT SECTIONS FOR SHEET NO. 89



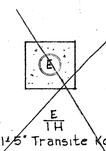
E / 4H,1F
4-5" Transite Korduct (HECO)
1-4" Transite Korduct (HECO)



E / 2H(H)
2-5" Transite Korduct (HECO)
From H.E.M.H. #U-18629
(Horizontal)

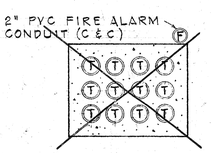


E / 2H(V)
2-5" Transite Korduct (HECO)
From H.E.H.H. #18849
(Vertical)

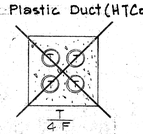


E / 1H
1-5" Transite Korduct (HECO)

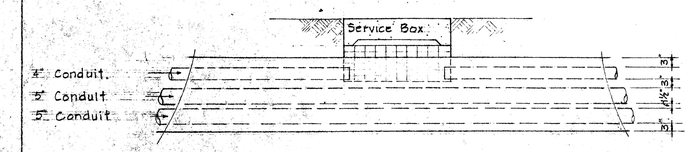
T / 1F
1-4" Plastic Duct (HTCo)



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



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



TYPICAL SECTION OF SERVICE BOX OVER DUCT LINE

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	93	235

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

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

APPROVED

TRAFFIC ENGINEER, C&C OF HONOLULU — DATE 11/9/66

HAWAIIAN ELECTRIC CO., INC. — DATE 8-18-65

OUTSIDE PLANT ENGINEER, HTCO LTD. — DATE 11-7-66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

DUCT SECTIONS OF ELECTRIC, TELEPHONE, C&C STREET LIGHTING, AND FIRE ALARM SYSTEMS

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Not to Scale — July 1966

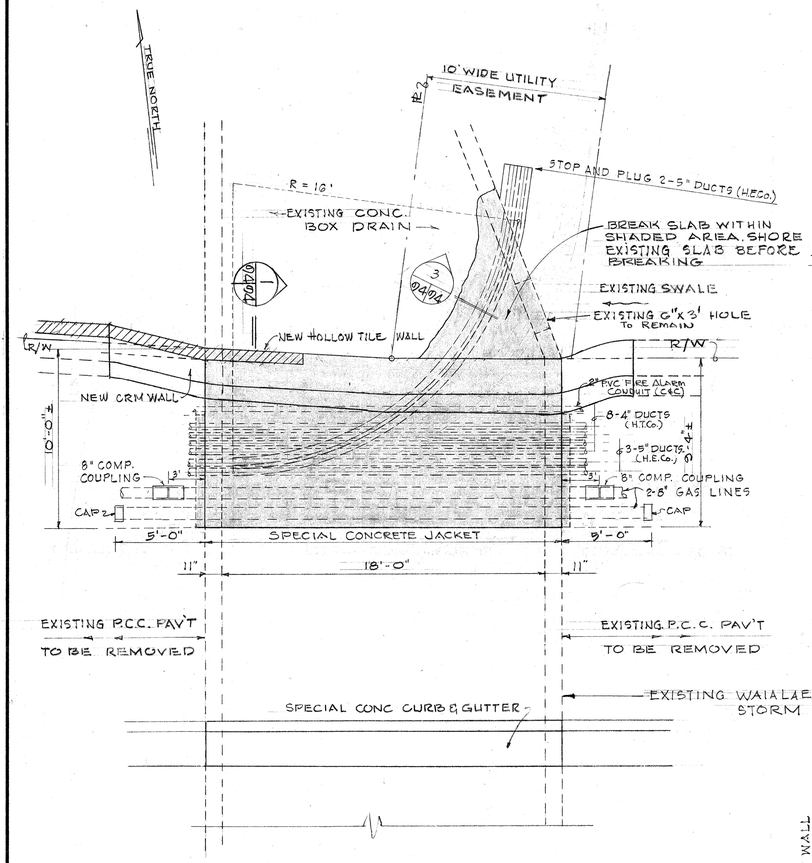
SHEET No. 11 OF 35 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

83

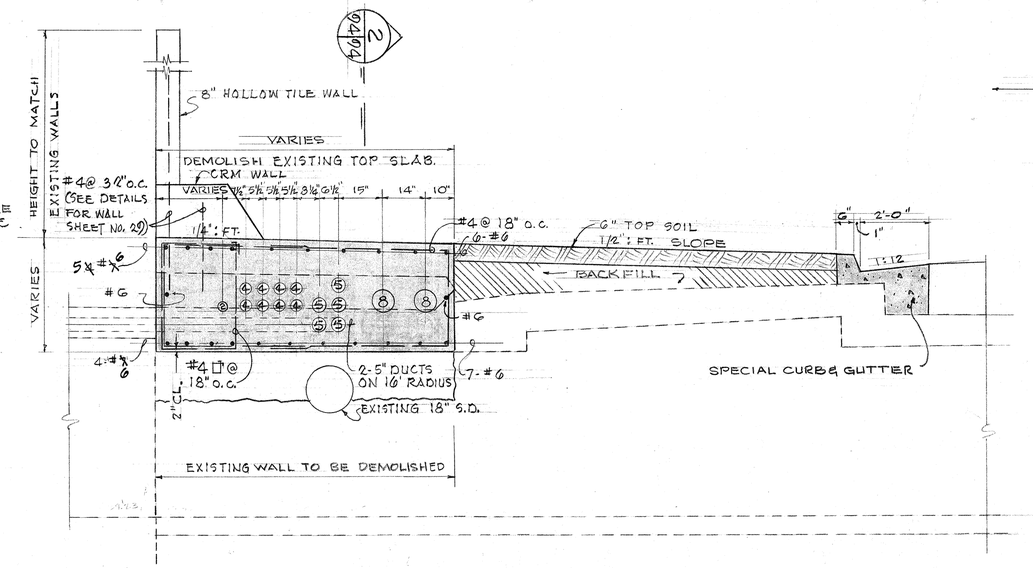
79

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	12	235

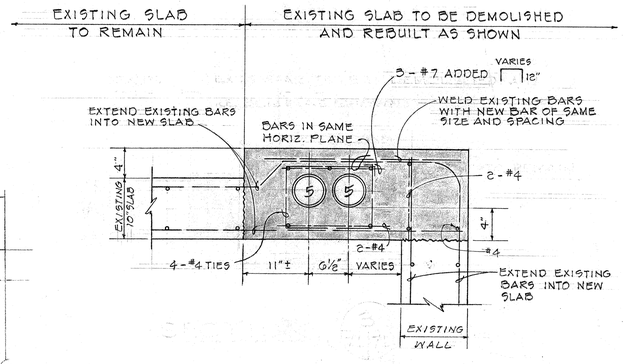


PLAN OF CONCRETE JACKET
FOR UTILITY DUCTS AT ℄ STA. 146+35

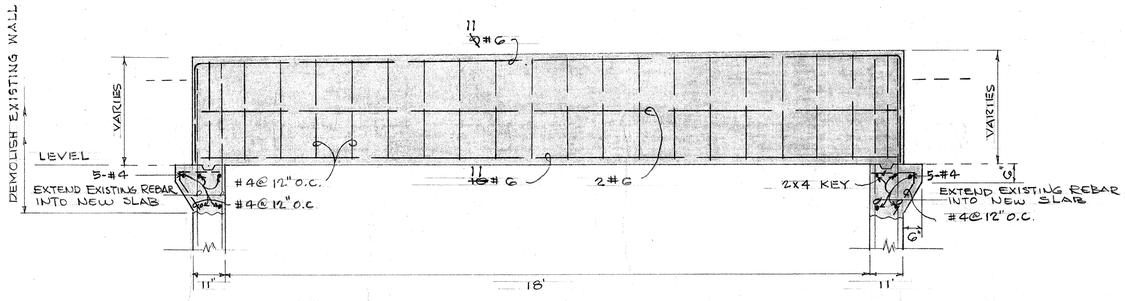
SCALE: 1/4"=1'-0"



SECTION (1 / 9404)
SCALE: 1/2"=1'-0"



SECTION (3 / 9404)
SCALE: 1"=1'-0"



SECTION (2 / 9404)
SCALE: 1/2"=1'-0"

APPROVED:

TRAFFIC ENGINEER, C&C OF HONOLULU	11/7/66 DATE
HAWAIIAN ELECTRIC CO., INC.	8-18-65 DATE
OUTSIDE PLANT ENGINEER, HTCO LTD.	11-7-66 DATE
DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD.	10/3/66 DATE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES
UNDERGROUND UTILITIES ACROSS WAIALAE MAJOR STORM DRAIN AT ℄ STA. 146+35

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
scale: As Noted July 1966

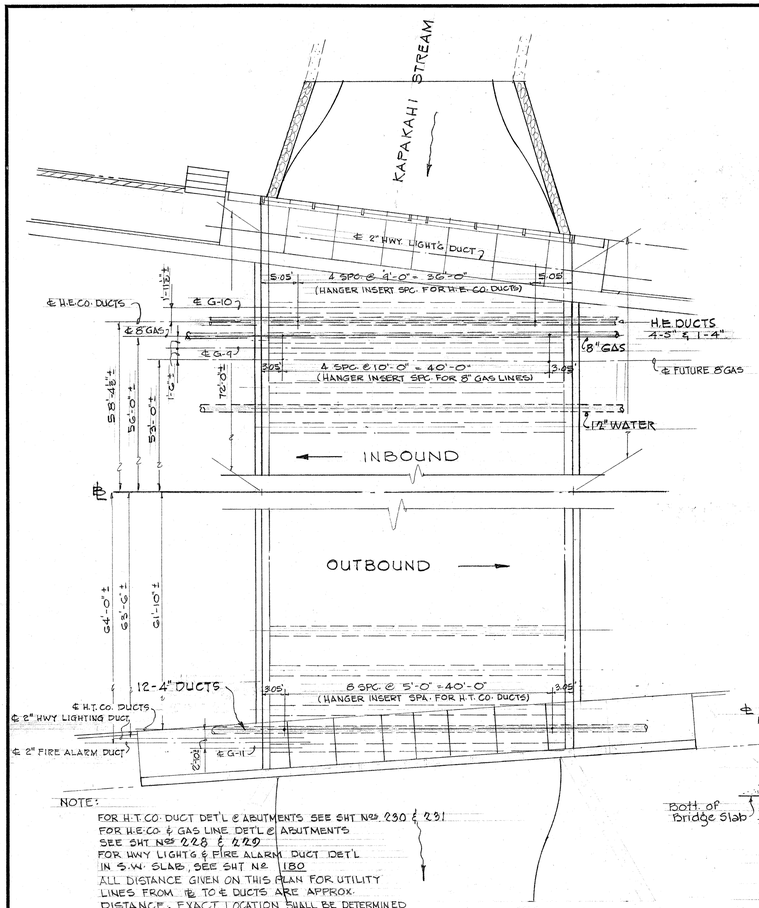
SHEET No. 12 OF 35 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

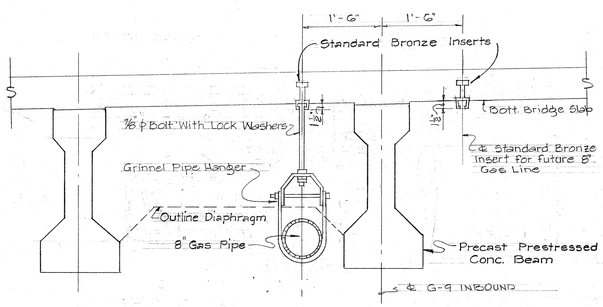
94

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	95	235

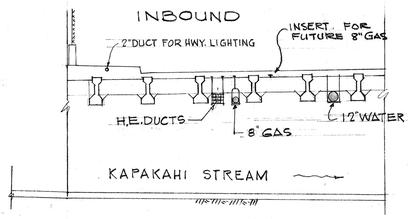


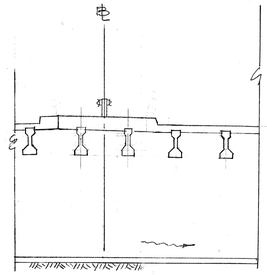
NOTE:
FOR H.T.CO. DUCT DET'L & ABUTMENTS SEE SHT No. 230 & 231
FOR H.E.CO. & GAS LINE DET'L & ABUTMENTS SEE SHT. No. 228 & 229
FOR HWY LIGHTS & FIRE ALARM DUCT DET'L IN S.W. SLAB, SEE SHT No. 180
ALL DISTANCE GIVEN ON THIS PLAN FOR UTILITY LINES FROM ℄ TO ℄ DUCTS ARE APPROX. DISTANCE. EXACT LOCATION SHALL BE DETERMINED IN THE FIELD BY THE PROJ. ENG'R.

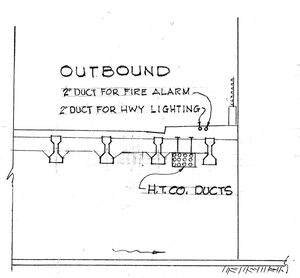
PLAN
SCALE: 3/32" = 1'-0"



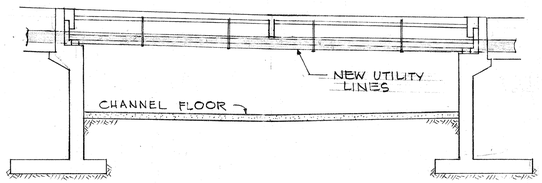
8" GAS PIPE HANGER DETAIL
SCALE: ¾" = 1'-0"
HANGERS TO BE SPACED 10 FT. O.C. FOR GAS LINE



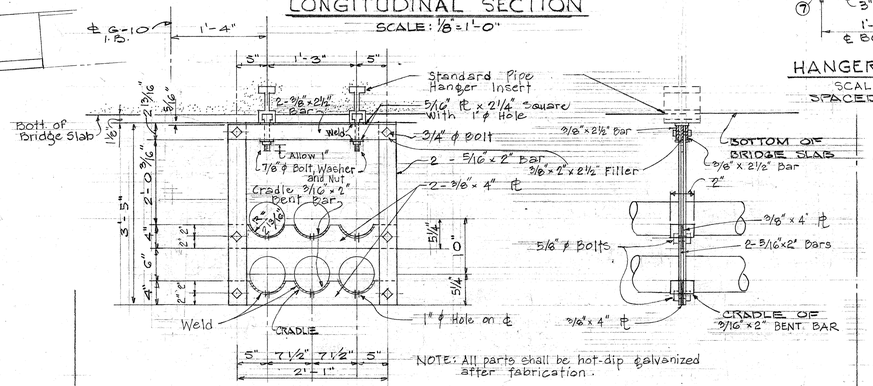




TRANSVERSE SECTION

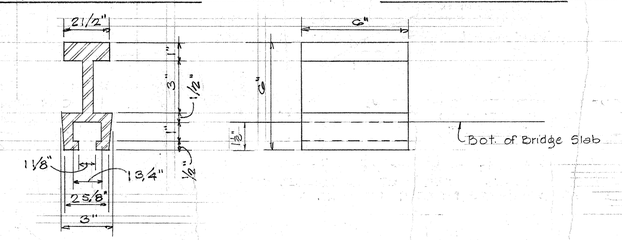


LONGITUDINAL SECTION
SCALE: ⅛" = 1'-0"



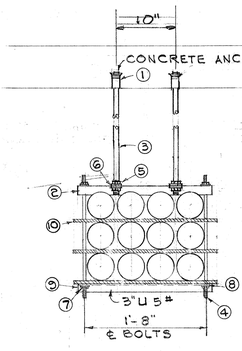
NOTE: All parts shall be hot-dip galvanized after fabrication.

FRONT VIEW SCALE: 1" = 1'-0" SIDE VIEW



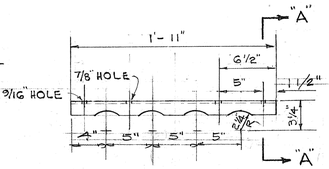
STANDARD INSERT DETAIL SCALE: 3" = 1'-0"

HANGER DETAIL FOR ELEC. GALV. STEEL CONDUITS
(SEE HANGER NOTE THIS SHEET)

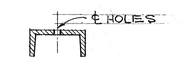


HANGER ASSEMBLY
SCALE: 1" = 1'-0"
SPACED 5 FT. O.C.

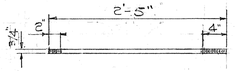
STOCKLIST PER ASSEMBLY		
DET.	DESCRIPTION	AMT.
1	¾" PHILIPS REDHEAD ROD HANGER ANC.	2
2	SADDLE HANGER	1
3	HANGER SUSPENSION ROD	2
4	HANGER ROD	2
5	¾" JAM NUT (GALV.)	4
6	¾" BRASS LOCKWASHERS	4
7	½" HEX. NUT (GALV.)	4
8	½" GALV. LOCKWASHERS	4
9	5" U 5# X 1'-11" LONG	1
10	½" PREMOLDED JOINT FILLER	3



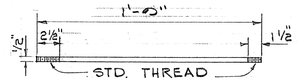
DETAIL 2
SCALE: 1½" = 1'-0"
SADDLE HANGER, 3" CHANNEL 5.0#
HOT DIP GALVANIZE AFTER MACHINING



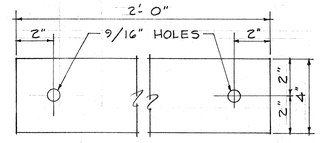
SECTION "A-A"
SCALE: 3" = 1'-0"



DETAIL 3
SCALE: 1" = 1'-0"
¾" HANGER SUSPENSION ROD



DETAIL 4
SCALE: 1½" = 1'-0"
HANGER ROD
½" DIA. STEEL ROD



DETAIL 10
SCALE: 3" = 1'-0"
½" PREMOLDED JOINT FILLER

HANGER DETAIL FOR TELEPHONE DUCT LINES

NOTES:
1 HANGER SPACING 5'-0" MAXIMUM.
2 PEEN ALL THREADS AFTER INSTALLATION COMPLETED.
3 ELECTRIC CONDUIT WRAPPING CONSISTS OF:
A BRUSH OR HAND APPLIED COAT CONFORMING TO MILITARY SPEC. MIL C-18167 (SHIP) TYPE B.
B FABRIC - ACETATE - MEMBRANE PAPER CONFORMING TO MILITARY SPEC. MIL-B-121 B, GRADE C, TYPE 1.
C HEAVY, PIGMENTED, WAX BASE, SOLVENT CUT BACK MATERIAL, DRYING TO A FIRM TOUGH COAT RESISTANT TO MOISTURE PENETRATION.
D ONE LAYER KRAFT PAPER - 60 LB. WT. HEAVY DUTY CONFORMING TO MILITARY SPEC. MIL-P-3420.
4 EXCEPT FOR THE CONDUITS, ALL ITEMS REQUIRED FOR THE HANGER ASSEMBLY, COMPLETE, SHALL BE FURNISHED BY THE CONTRACTOR.

APPROVED:

Henry Test Q for 11/9/66
TRAFFIC ENGINEER, C&C OF HONOLULU DATE

Q2H anderson for FAK 8-18-65
HAWAIIAN ELECTRIC CO., INC. DATE

11-7-66
OUTSIDE PLANT ENGINEER, HTCO LTD. DATE

10/18/66
DIRECTOR OF DEVELOPMENT, HON. GAS CO. LTD. DATE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

MISCELLANEOUS DETAILS AT ℄ STA. 171+56

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted July 1966

SHEET No. 13 OF 35 SHEETS

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

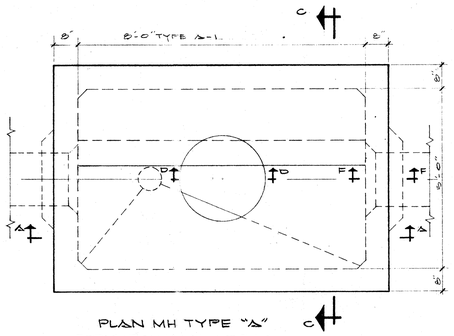
PRINTED ON NO. 5000H CLEARPRINT

5) 5

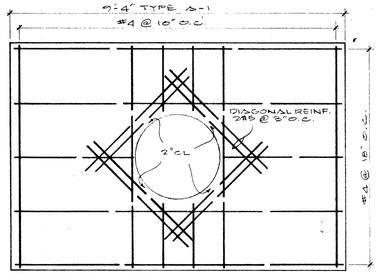
76

81

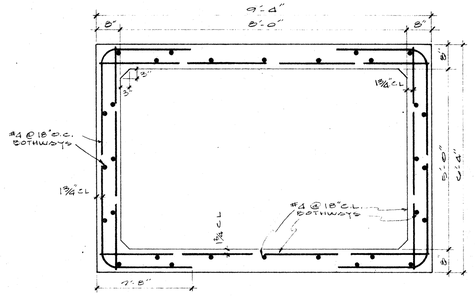
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	96	235



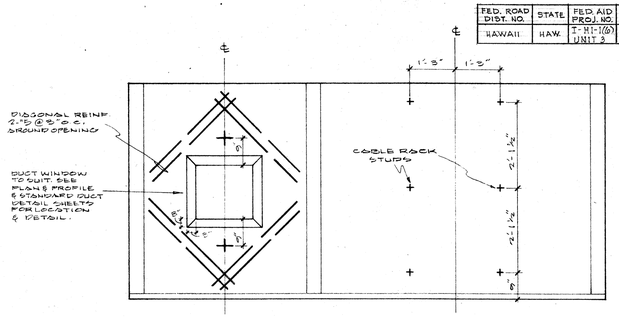
PLAN MH TYPE "A"
FOR SIDEWALK AREAS
SCALE: 2"=1'-0"



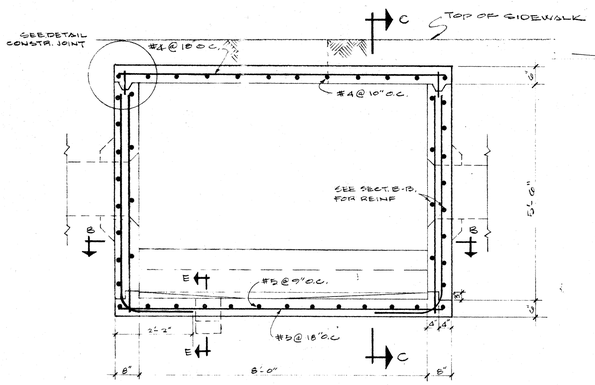
ROOF SLAB REINF. PLAN
SCALE: 1/2"=1'-0"



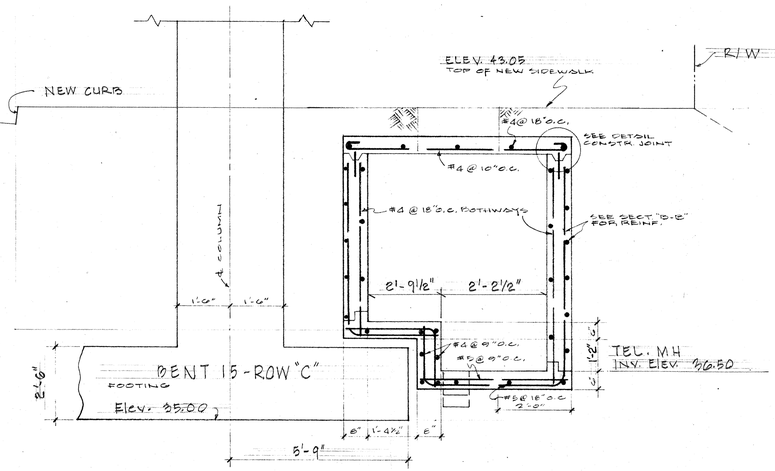
SECT. "B-B" TYPE A-1
SCALE: 1/2"=1'-0"



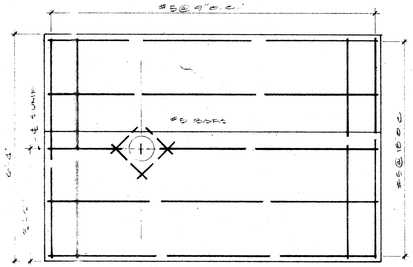
½ ELEV. OF INSIDE WALLS-TYPE A-1
(OPPOSITE FACES SIMILAR)
SCALE: 1/2"=1'-0"



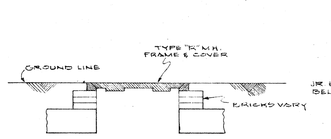
SECTION "A-A"
SCALE: ½"=1'-0"



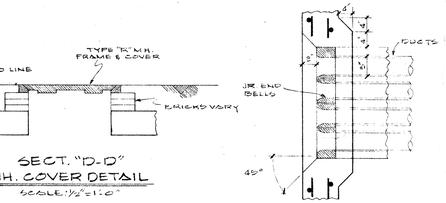
SECTION "C-C"
SCALE: NO SCALE



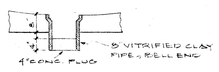
FLOOR SLAB REINF. PLAN
SCALE: ½"=1'-0"



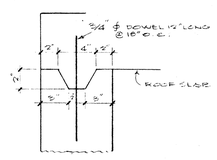
SECT. "D-D"
MH. COVER DETAIL
SCALE: ½"=1'-0"



SECT. "F-F"
TYPICAL DUCT
ENTRANCE RISER
NO SCALE



SECT. "E-E"
SCALE: ½"=1'-0"



DETAIL-
CONSTR. JOINT
SCALE: 1"=1'-0"

GENERAL NOTES:

1. DESIGN DATA
   f_s = 20,000 PSI
   f_s = 11,200 PSI; f_c = 3,000 PSI
   n = 10
   W = EQUIV. FLUID PRESS = 50 PCF
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO-SEAL OR EQUAL.
3. FOR DUCT WINDOW LOCATION SEE PLAN PROFILE SHTS. FOR ELEVATIONS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITIES
SPECIAL DETAILS
HTCO. MH#939 AT ℄ STA. 151+91.20
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted July 1966

SHEET No. 14 OF 95 SHEETS

APPROVED:
OUTSIDE PLANT ENGINEER, H.T. Co. Ltd.
11-7-66
DATE

FILE	
ARRGNMENT	
CONSTRUCTION	
MAINTENANCE	
INDEX	
TOTAL PRINTS	
SPEED	SHADE

HAWAIIAN TELEPHONE COMPANY
HAWAII

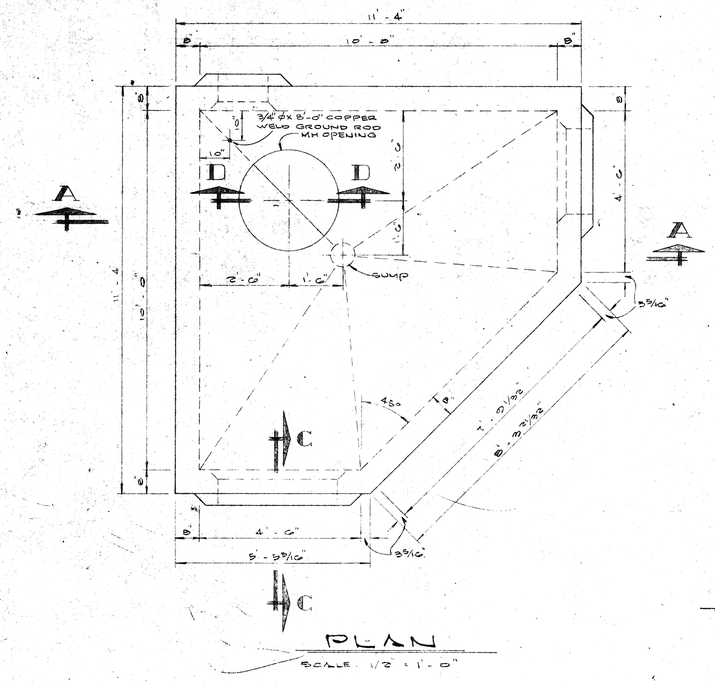
DR. RK ENG. C. SOUZA
CHK. [illegible] TEL. 577-786
APP'D.
DATE 11-10-66
SHEET OF

LUNALILO FREEWAY, M.H.#939
WAIALAE AVE., OPPOSITE
WAIALAE SHOPPING CENTER

577-050-1 D

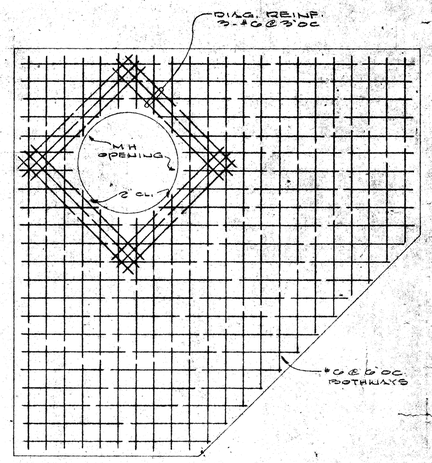
9) 6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	07	235



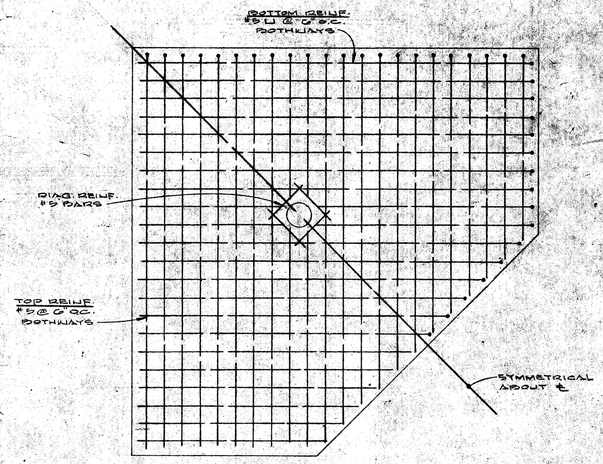
PLAN

SCALE: 1/2 : 1'-0"



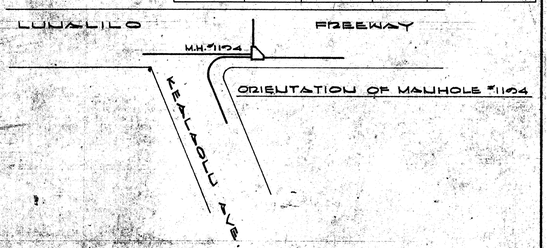
ROOF SLAB REINF. PLAN

SCALE: 1/2 : 1'-0"



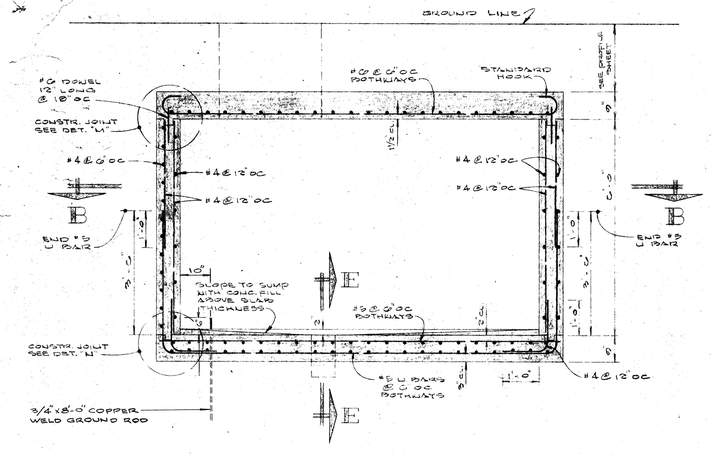
FLOOR SLAB REINF. PLAN

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



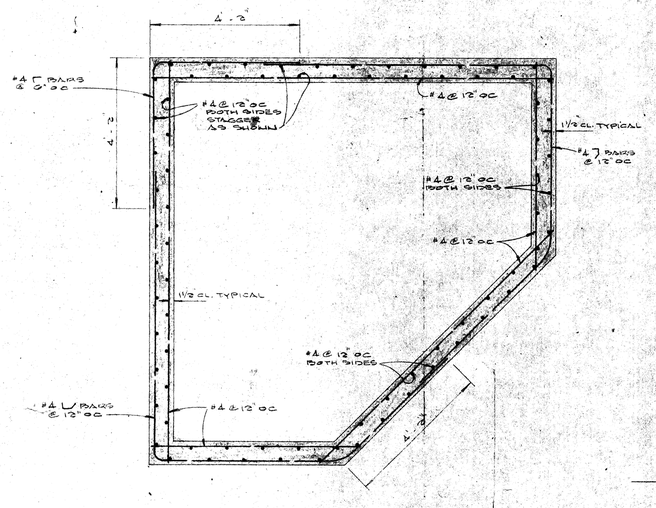
LOCATION MAP

NTS



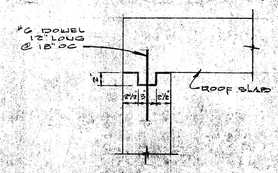
SECTION "A-A"

SCALE: 1/2 : 1'-0"



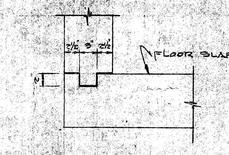
SECTION "B-B"

SCALE: 1/2 : 1'-0"



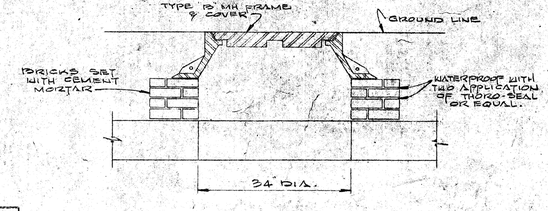
DETAIL "M"

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



DETAIL "N"

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



SECTION "D-D"

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

GENERAL NOTES:

1. DESIGN DATA
   - fs = 20,000 PSI
   - fc = 3,000 PSI
   - fc = 1200 PSI
   - n = 10
   - w = EQUIV. FLUID PRESSURE 30#/FT²
2. MINIMUM OVERLAP FOR A LAPPED SPLICE SHALL BE 24 BAR DIA. BUT NOT LESS THAN 12". LAP OF ADJACENT BARS SHALL NOT BE IN SAME LOCATION.
3. UNLESS OTHERWISE INDICATED, FOR VERTICAL LOCATION OF DUCT WILL DOWS SEE PROFILE SHT.
4. MANHOLE WALLS SHALL BE DOUBLED FORMED.
5. ALL CONCRETE SHALL BE CURED BY AN IMPERVIOUS LIQUID MEMBRANE COMPOUND.
6. CONCRETE SHALL NOT BE LOADED, EXCEPT BY ITS OWN WEIGHT, UNTIL 28 DAYS HAVE PASSED SINCE PLACEMENT.
7. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO-SEAL OR EQUAL.
8. CAP ALL DUCTS & STUBOUTS.
9. CONCRETE SHALL BE CLASS A-1 & SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI IN 28 DAYS WITH A SLUMP OF 3".
10. CONCRETE ADMIXTURE SHALL BE 3½ LBS. "TRICOSOL NORMAL" PER CUBIC YARD.

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

UTILITIES

MANHOLE #1194

INTERSTATE HIGHWAY (LUNALILO FWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scale: As Noted — July 1966

SHEET NO. 15 OF 35 SHEETS

APPROVED:
OUTSIDE PLANT ENGINEER, HTCO, LTD. — DATE 11-7-66

FILE	DR RJM	ENG C. SOUZA	MANHOLE #1194
ASSIGNMENT	CHK	TEL 577-7860	
CONSTRUCTION	INDEX	APP'D	
MAINTENANCE			
TOTAL PRINTS	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 10-3-66 SHEET 1 OF 1	577-050-1 D

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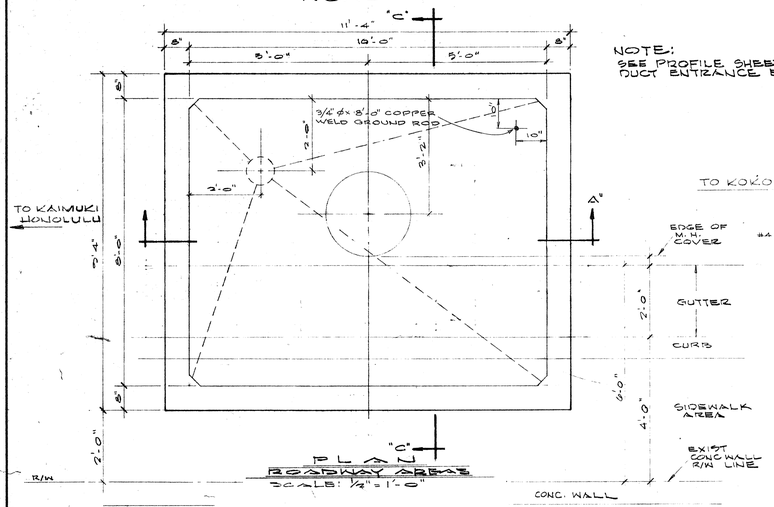
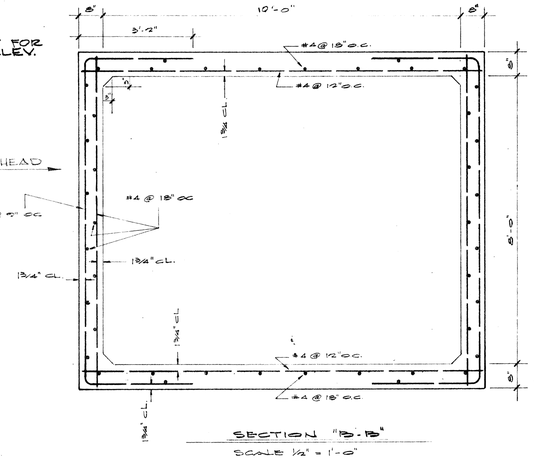
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	98	235

ROAD

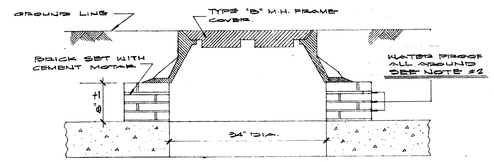


PLAN
ROADWAY AREAS
SCALE: ½" = 1'-0"

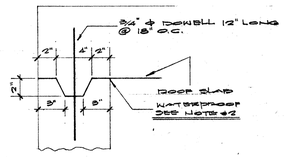
NOTE:
SEE PROFILE SHEET FOR DUCT ENTRANCE ELEV.



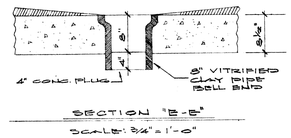
SECTION "D-D"
SCALE ½" = 1'-0"



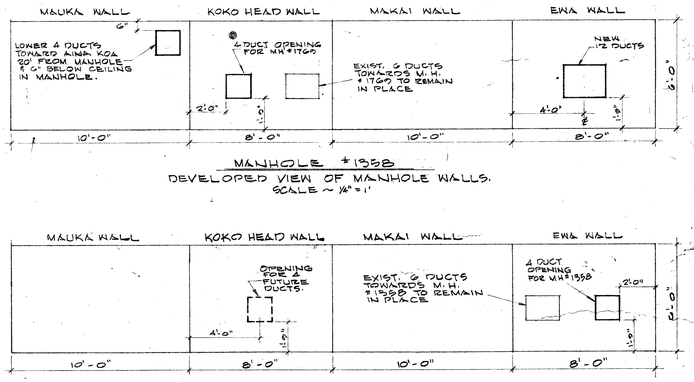
SECTION "D-D"
M.H. COVER DETAIL
SCALE: 3/4" = 1'-0"



CONST. JOINT DETAIL
SCALE: 1½" = 1'-0"

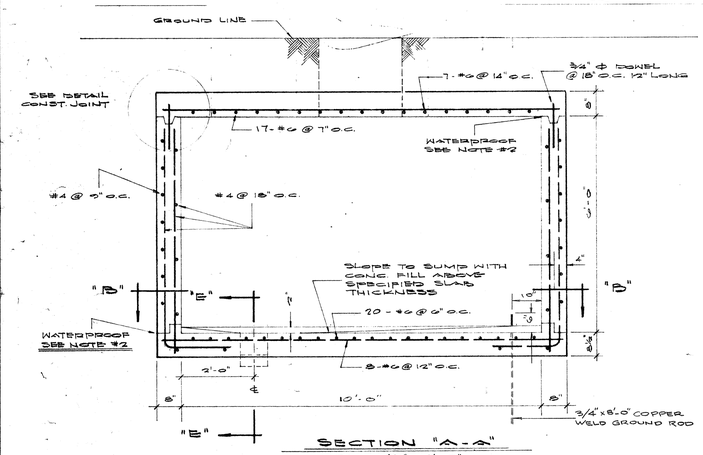


SECTION "E-E"
SCALE: 3/4" = 1'-0"

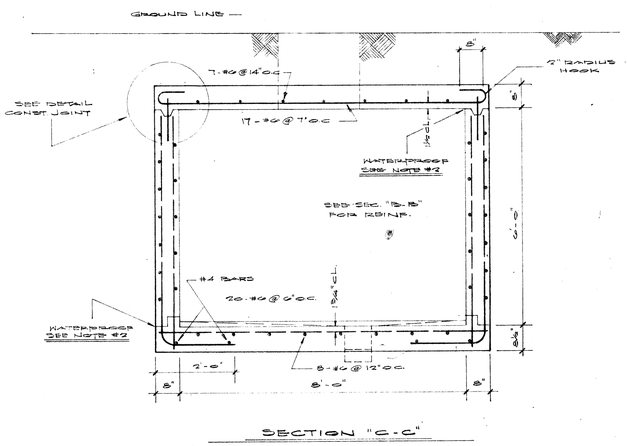


MANHOLE #1358
DEVELOPED VIEW OF MANHOLE WALLS.
SCALE ~ ½" = 1'

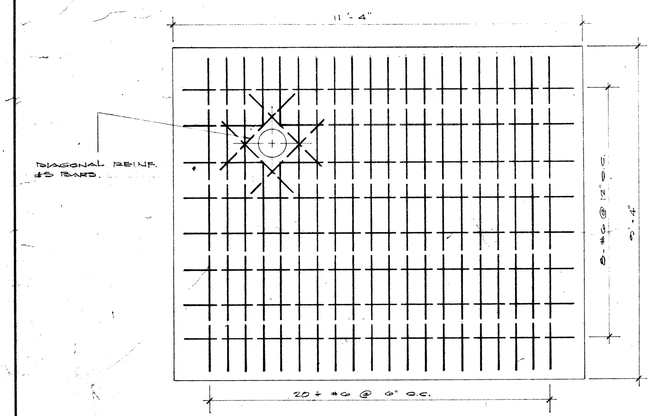
MANHOLE #1769
DEVELOPED VIEW OF MANHOLE WALLS
SCALE ~ ½" = 1'-0"



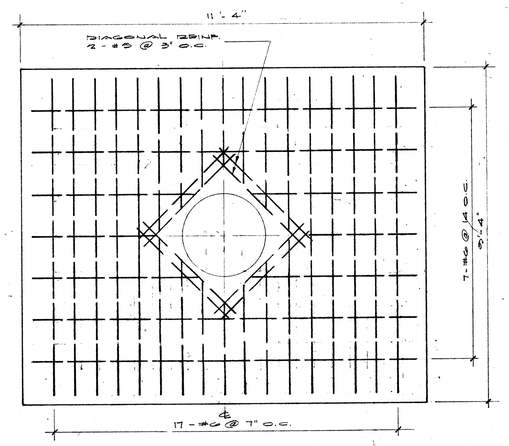
SECTION "A-A"
SCALE: ½" = 1'-0"



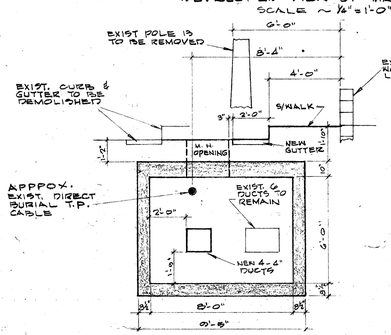
SECTION "C-C"
SCALE: ½" = 1'-0"



FLOOR SLAB REINF. PLAN.
SCALE: ½" = 1'-0"



ROOF SLAB REINF PLAN
SCALE: ½" = 1'-0"



MANHOLE #1358
LOOKING TOWARDS KOKO HEAD

SECTION SHOWIN LOCATION OF EXISTING & PROPOSED
SCALE ~ ½" = 1'-0"

GENERAL NOTES

1. DESIGN DATA
   fs = 20,000 PSI fc = 3,000 PSI fc = 1,200 PSI
   n = 12
   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
4. PROFILE SHEETS FOR ELEVATIONS
5. DUCT WINDOW TO SUIT SEE PLAN & PROFILE & STANDARD DETAIL SHEETS FOR LOCATION & DETAIL
6. FOR DUCT WINDOW DETAILS SEE SECTION "B-B" STANDARD UNDERGROUND DETAIL SHEET, DRG. 34028

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII

UTILITIES

MANHOLE #1358 & #1769

INTERSTATE HIGHWAY (LUNALILO FWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scale: As Noted July 1966

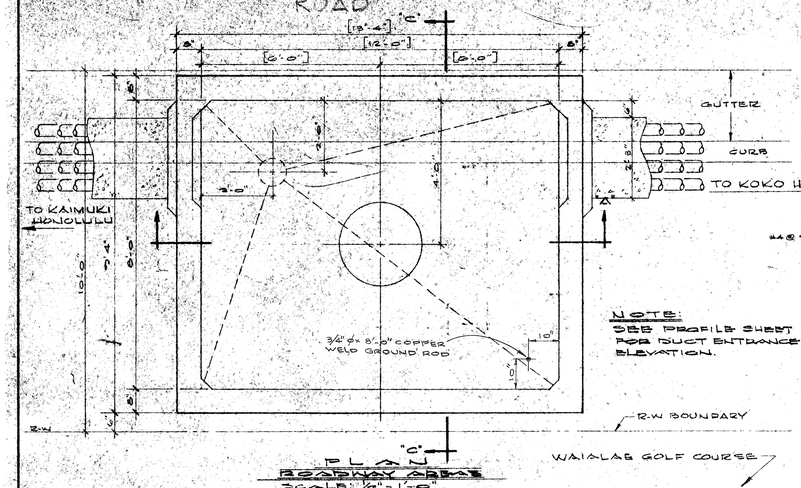
APPROVED!
OUTSIDE PLANT ENGINEER, HTCO, LTD. 11-7-66 DATE

SHEET NO. 16 OF 35 SHEETS

FILE	DR. T.S	ENG. C.SOUZA	M.H. 1358 - 1769. LUNALILO FREEWAY
ASSIGNMENT	CHK. 11-7-66	TEL. 577-7824	
CONSTRUCTION	INDEX	APP'D	
MAINTENANCE	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 12-29-66	577-0501 D
TOTAL PRINTS		SHEET 1 OF	

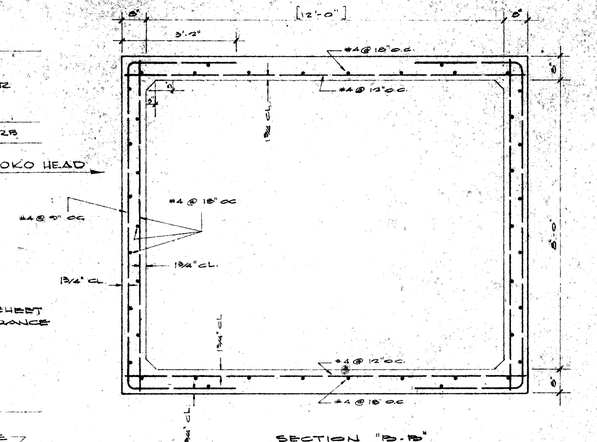
DS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	90	235

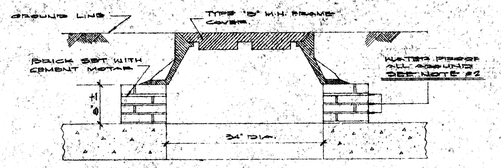


PLAN
ROADWAY AREAS
SCALE: 1/8" = 1'-0"

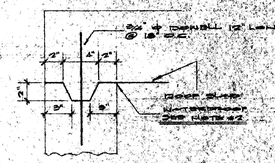
NOTE:
SEE PROFILE SHEET FOR DUCT ENTRANCE ELEVATION.



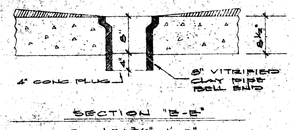
SECTION "B-B"
SCALE 1/2" = 1'-0"



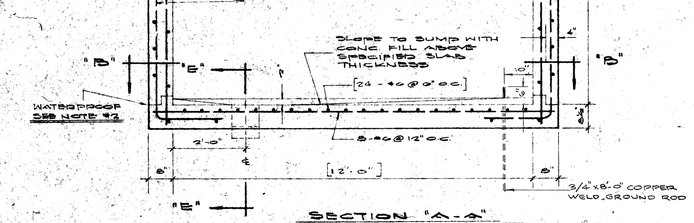
SECTION "D-D"
M.H. COVER DETAIL
SCALE: 3/4" = 1'-0"



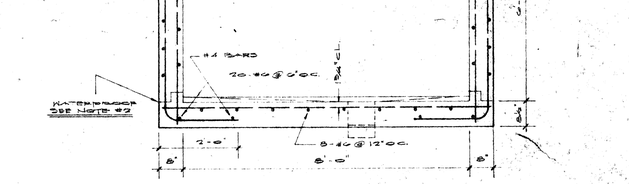
CONST. JOINT DETAIL
SCALE: 1½" = 1'-0"



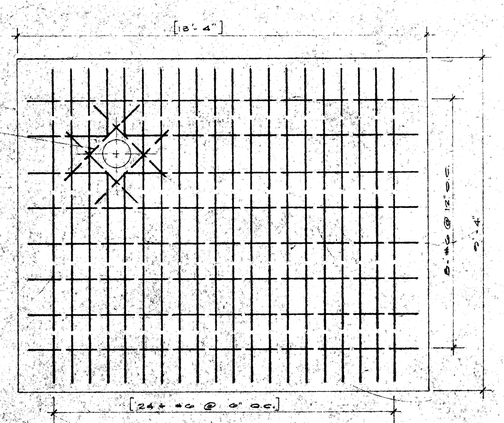
SECTION "E-E"
SCALE: 3/4" = 1'-0"



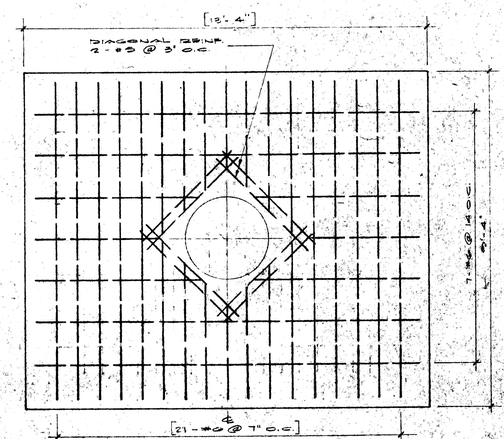
SECTION "A-A"
SCALE: 1/2" = 1'-0"



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



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



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

GENERAL NOTES

1. DESIGN DATA
   f'_c = 20,000 PSI
   f_c = 9,000 PSI f_s = 1,260 PSI
   n = 10
   W = EQUIV FLUID PRESS = 300 PCF
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THOROSEAL OR EQUAL.
3. FOR DUCT WINDOW LOCATION SEE PLAN.
4. FOR MANHOLE SHEETS FOR ELEVATIONS.
5. DUCT WINDOW TO SUIT SEE PLAN & PROFILE SHEETS FOR DUCT LOCATION
6. ‡ STANDARD DETAIL SHEETS FOR LOCATION
7. ‡ DETAILS
8. FOR DUCT WINDOW DETAILS SEE SECTION "A-A" STANDARD UNDERGROUND DETAIL SHEET.

NOTE: DIMENSIONS AND CALLOUTS IN BRACKETS [ ] ARE TRUE. DRAWING HAS NOT BEEN CHANGED TO CONFORM WITH CHANGES. DO NOT SCALE DRAWING.

APPROVED:
F. R. Judd
OUTSIDE PLANT ENGINEER, HTCO, LTD
11-7-66
DATE

HAWAII STATE HIGHWAY DEPARTMENT
STATE OF HAWAII
UTILITIES
MANHOLE #1667
INTERSTATE HIGHWAY (LUNALILO FWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scale: As Noted
JULY 1966
SHEET NO. 17 OF 35 SHEETS

FILE	DR. T.T.	ENG. P. SOUZA	MANHOLE #1667 LUNALILO FREEWAY	
ABBIGNMENT	CHK. [illegible]	TEL. 377-7841		
CONSTRUCTION	INDEX	APP'D.		
MAINTENANCE	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE 11-66	STL 6571	D
TOTAL PRINTS		SHEET OF		

99

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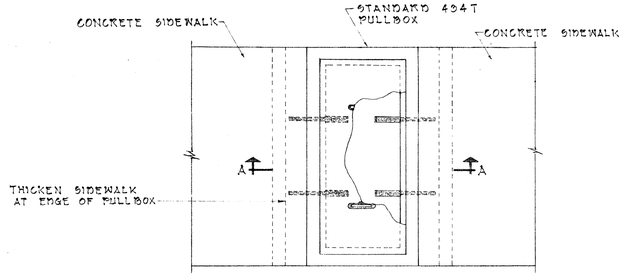
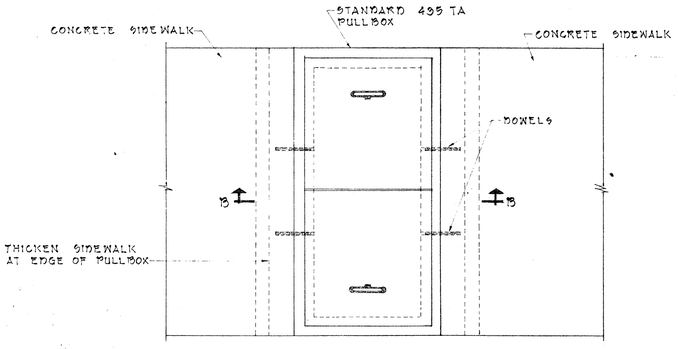
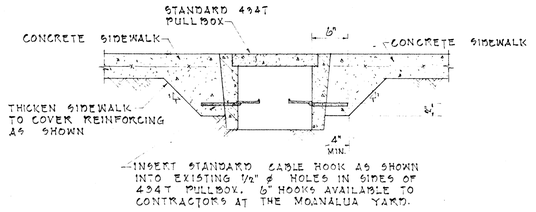
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	100	235



PLAN



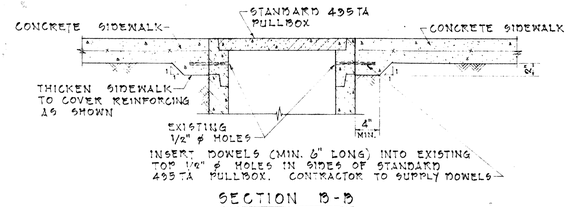
PLAN



SECTION A-A

434T PULLBOX IN SIDEWALK

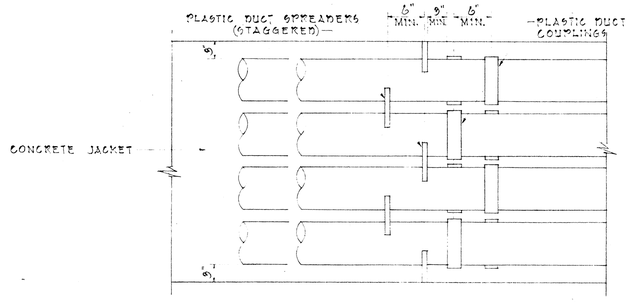
SCALE: 1" = 1'-0"



SECTION B-B

435TA PULLBOX IN SIDEWALK

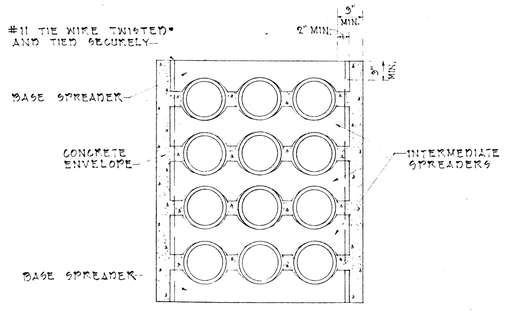
SCALE: 1" = 1'-0"



TYPICAL DUCT ENVELOPE ELEVATION

ARRANGEMENT OF COUPLING AND PLASTIC SPACERS

SCALE: 1" = 1'-0"



SECTION SHOWING SPACERS

SCALE: 1" = 1'-0"

APPROVED:

OUTSIDE PLANT ENGINEER, HTCo., LTD. — DATE 11-7-66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

H.T.Co. 434T AND 435TA PULLBOX IN SIDEWALK AND TYPICAL DUCT ENVELOPE

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

SCALE: 1" = 1'-0" DATE: July 1966

SHEET No. 18 OF 35 SHEETS

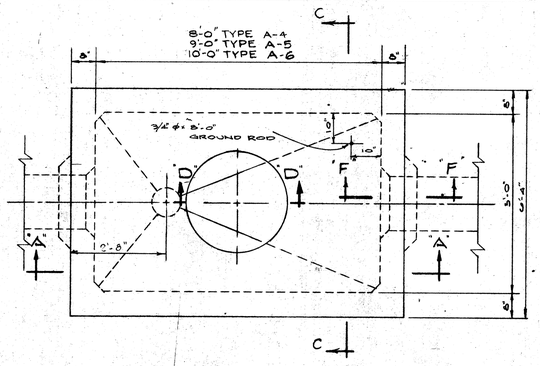
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Nov. 1962
	DRAWN BY " " "	Nov. 1962
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

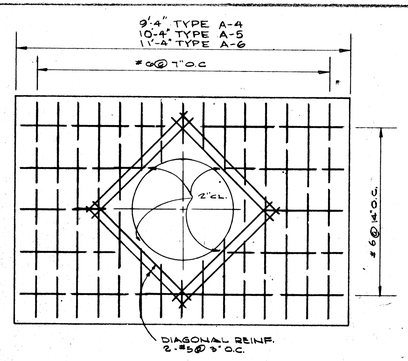
100

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET	TOTAL SHEETS
HAWAII	HAW.	F-HI-I(9) UNIT 3	1966	101	235

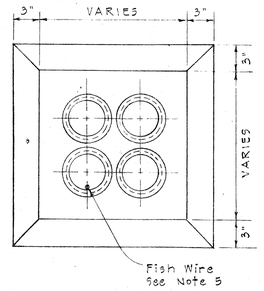
DECEMBER, 1966



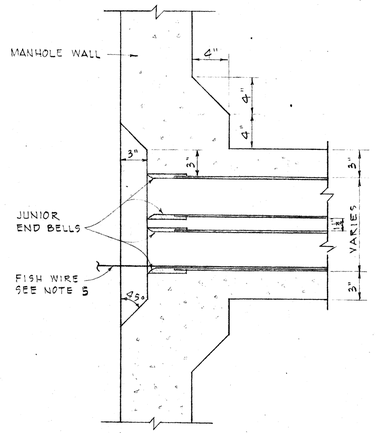
PLAN - M.H. TYPE "A"
FOR ROADWAY & SIDEWALK AREAS
SCALE : 1/2" = 1'-0"



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



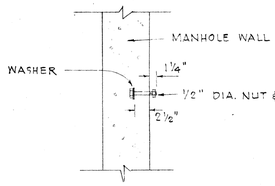
TYPICAL MANHOLE
DUCT WINDOW
Scale : 1 1/2" = 1'-0"



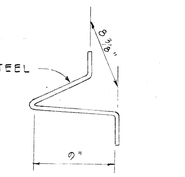
SECTION F-F
TYPICAL WINDOW DETAIL AND
JUNIOR END BELL
Scale : 1 1/2" = 1'-0"

GENERAL NOTES:

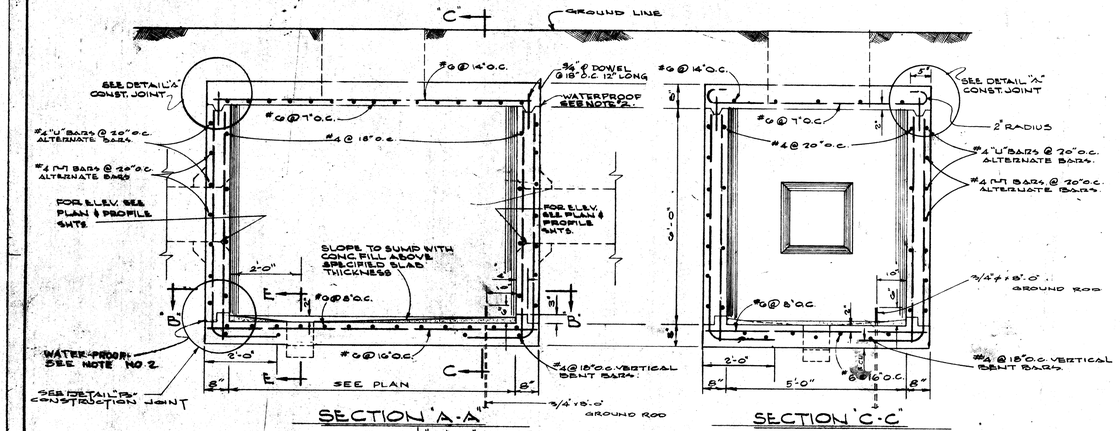
1. DESIGN DATA
   f_s : 20,000 PSI
   f_c : 3,000 PSI, f_c - 1200 PSI
   n : 10
   w : EQUIV. FLUID PRESS : 30#/FT²
2. ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO SEAL OR EQUAL.
3. FOR DUCT WINDOW LOCATION SEE PLAN PROFILE SHEETS FOR ELLEVATIONS.
4. DUCT WINDOW TO SUIT. SEE PLAN & PROFILE & STANDARD DETAIL SHEETS FOR LOCATION & DETAILS
5. THE CONTRACTOR SHALL PLACE #12 FISH WIRE IN DESIGNATED DUCT THROUGHOUT ITS ENTIRE LENGTH WITH PROTRUSIONS OF 2 FEET IN MANHOLES AND HANDHOLES AT EACH END AND 1 FOOT IN PULLBOXES.



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

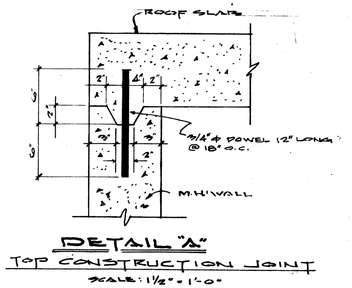


PULLING-IN IRON

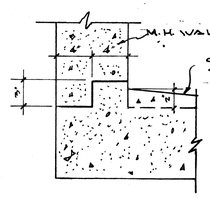


SECTION 'A-A'
SCALE: 1/2" = 1'-0"

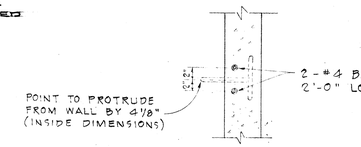
SECTION 'C-C'
SCALE: 1/2" = 1'-0"



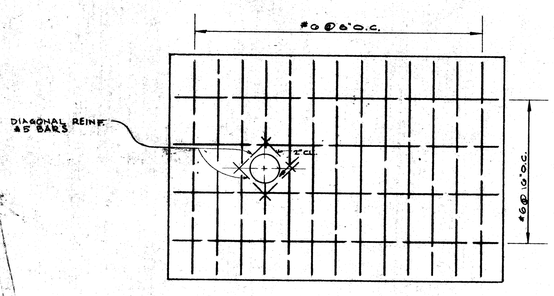
DETAIL "A"
TOP CONSTRUCTION JOINT
SCALE: 1 1/2" = 1'-0"



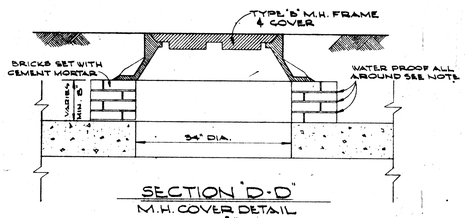
DETAIL "B"
BOTTOM CONSTRUCTION JOINT
SCALE: 1 1/2" = 1'-0"



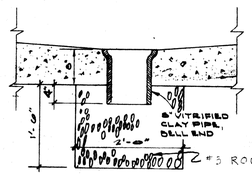
SECTIONAL VIEW
OF PULLING-IN IRON
Scale : 3/4" = 1'-0"



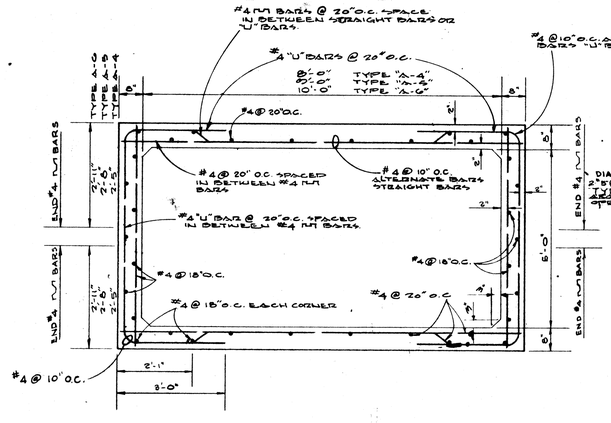
FLOOR SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"



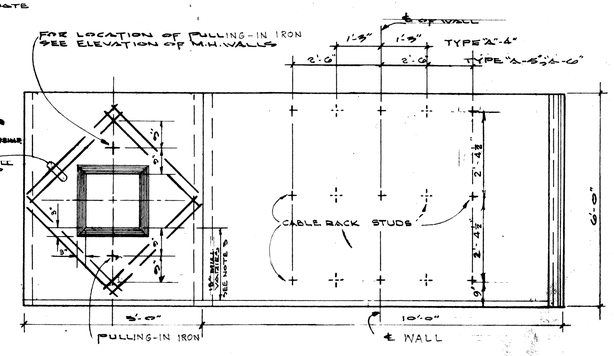
SECTION 'D-D'
M.H. COVER DETAIL
SCALE: 1/2" = 1'-0"



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



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



ELEVATION OF INSIDE WALLS TYPES A-4, A-5 & A-6
(OPPOSITE FACES SIMILAR)
SCALE: 1/2" = 1'-0"

SHEET 19 OF 35 SHEETS

FILE	DR. S	ENG. SY-CO	TYPE "A" MANHOLES FOR ROADWAY AND SIDEWALK AREAS
ABSTRACT	CHK.	TEL. BELL-DCC	
CONSTRUCTION	INDEX	APP'D.	
MAINTENANCE			
TOTAL PRINTS	HAWAIIAN TELEPHONE COMPANY HAWAII	DATE	34003 D
		SHEET OF	

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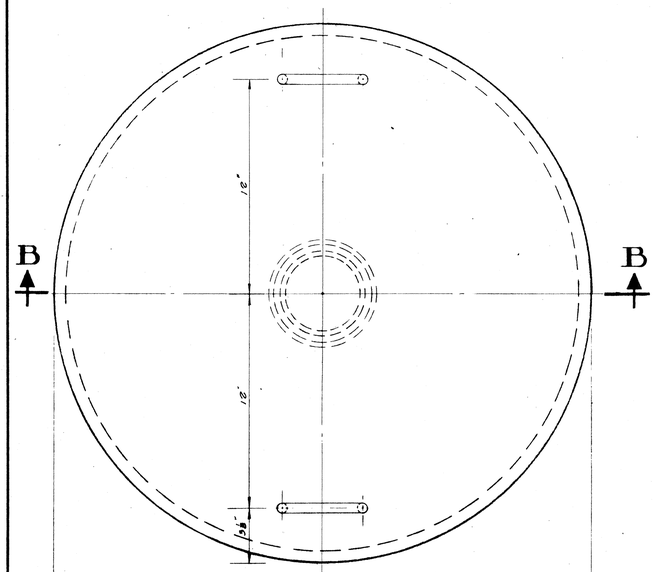
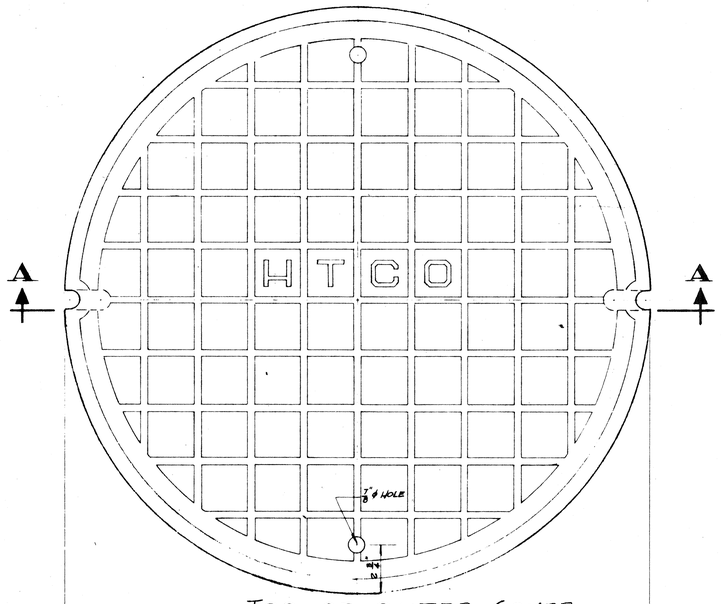
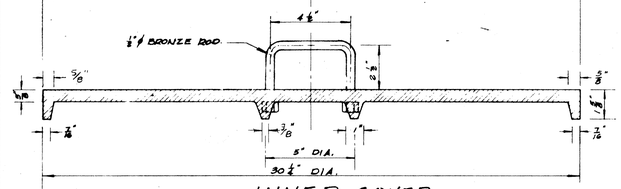
FED. RDAD DIST. No.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CHT-T(6) UNIT 3	1966	102	235

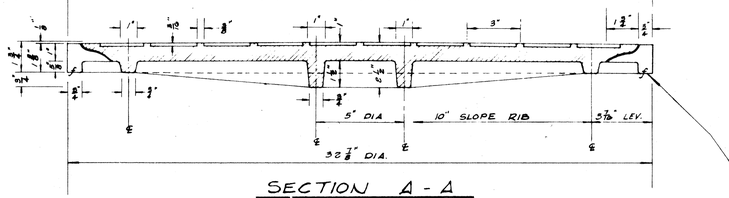




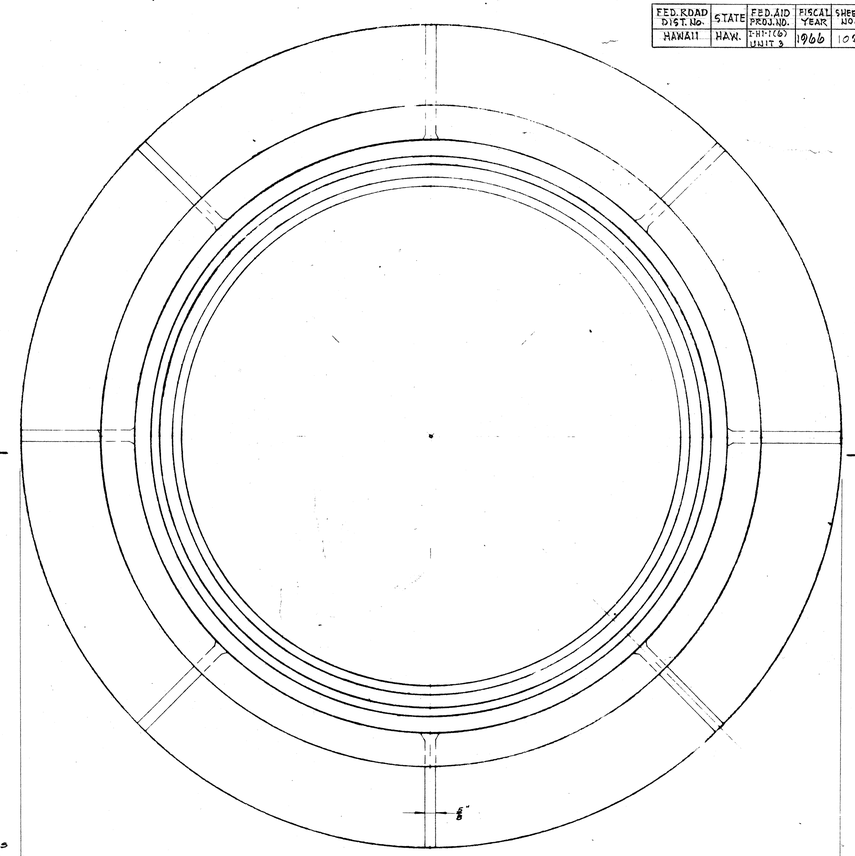
TOP OF OUTER COVER



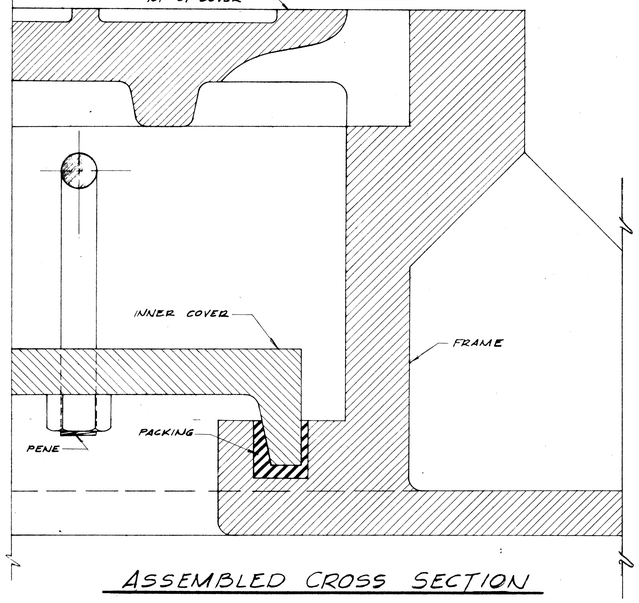
INNER COVER
SECTION B-B
CAST IRON



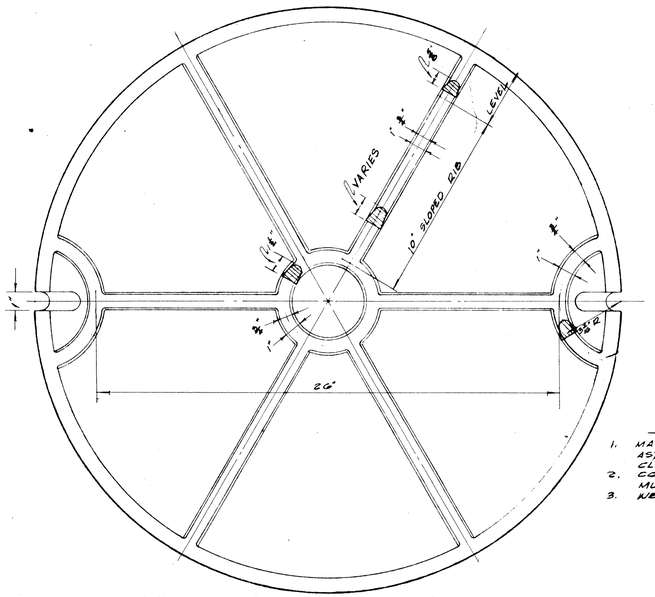
SECTION A - A
CAST IRON



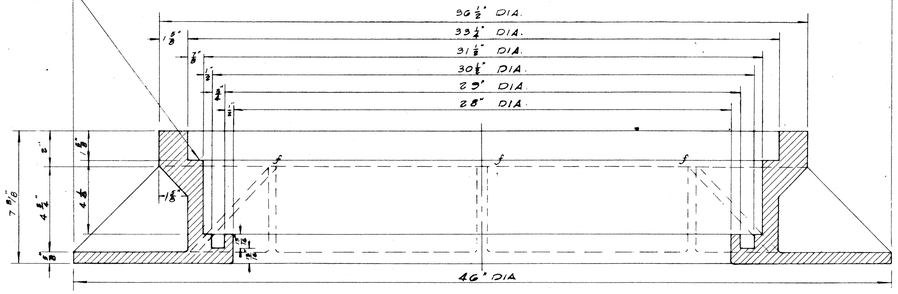
NOTE:
THESE SURFACES TO BE MACHINED



ASSEMBLED CROSS SECTION
FULL SIZE

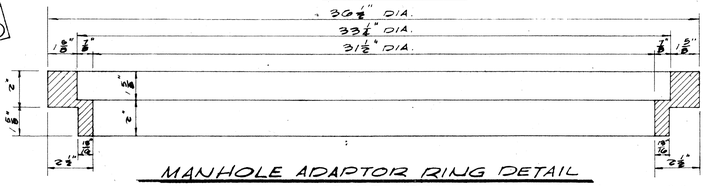


BOTTOM OF OUTER COVER
CAST IRON



MANHOLE FRAME
SECTION C-C
CAST IRON

REVISION 1



MANHOLE ADAPTOR RING DETAIL
CAST IRON

NOTES:
1. MATERIAL: GRAY CAST IRON ASTM. DESIGNATION: A-48, CLASS 30.
2. COVER REMOVEABLE AND MUST SEAT FREELY.
3. WEIGHTS:

FRAME	490 #
OUTSIDE COVER	252 #
INSIDE COVER	151 #
MH ADAPTOR RING	137 #

SCALE: 3" = 1'-0"

SHEET No. 20 OF 35 SHEETS

NO.	REVISION	DATE	APPROVED
1	ADDED MH RING ADAPTOR	9-10-67	J.T.

FILE
ENDORSEMENT
CONSTRUCTION
MAINTENANCE
TOTAL PRINTS
SHEETS

DR. N.C. ENG.
CHK. HU TEL. 2324412
INDEX APP'D

HAWAIIAN TELEPHONE COMPANY
HAWAII

STANDARD TYPE 'A' 577-050-1
MANHOLE FRAME & COVER

DATE 6-1-66
SHEET 1 OF 1

34002 D

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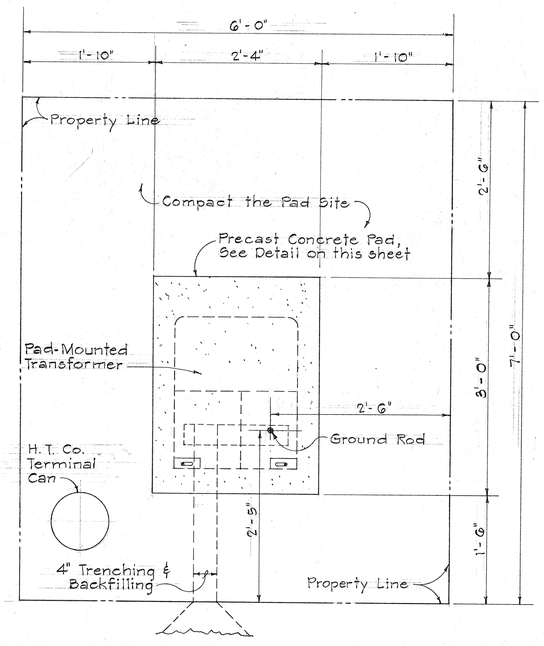
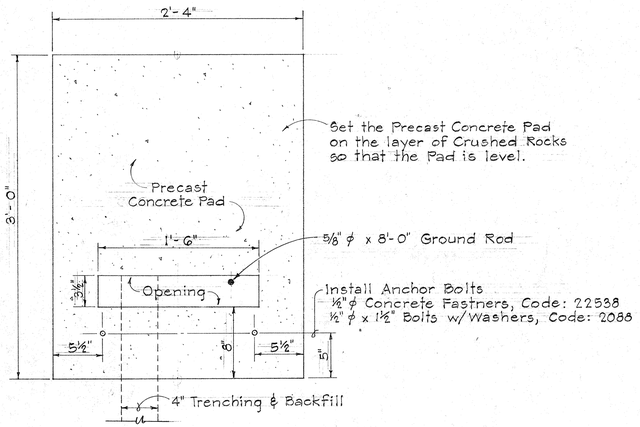
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	109	235



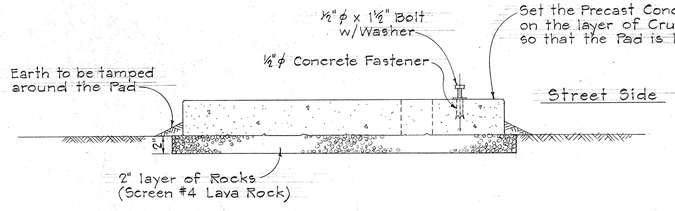
PLAN

LAYOUT OF PAD WITHIN PROPERTY LINE

Scale: 1" = 1'-0"



PLAN

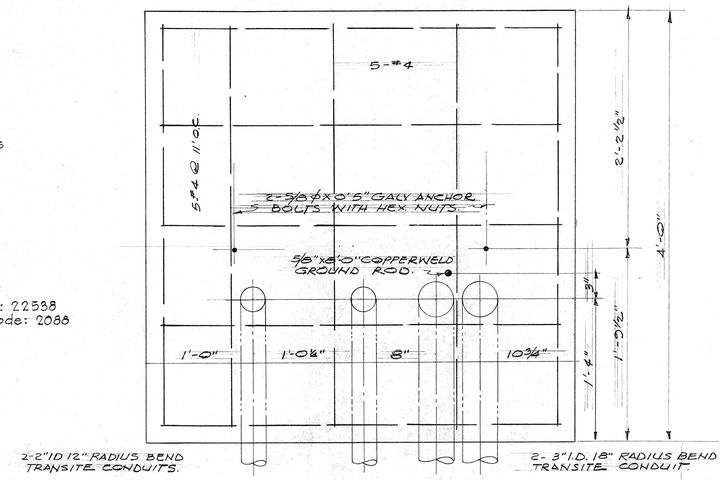


SIDE ELEVATION

DETAIL OF PRECAST TRANSFORMER PAD

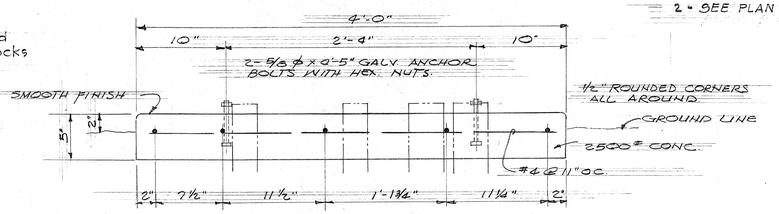
(H.E. Co. DRAWING NO. Y-15231)

Scale: 1½" = 1'-0"



(SIDEWALK AREA)

PLAN



FRONT ELEVATION

DETAIL OF TRANSFORMER PAD

(H.E. Co. DRAWING NO. Y-41333)

Scale: ½" = 1'-0"

NOTES

1- THIS PAD IS ADEQUATE FOR 1 THRU 167 KVA TRANSFORMER.

2 - SEE PLAN SHT. # 86 FOR LOCATION.

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

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

APPROVED

A B Henderson for FAR 8-18-65

HAWAIIAN ELECTRIC CO., INC. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

TRANSFORMER PAD

WESTINGHOUSE TRANSFORMER

(H. E. Co. DRAWING NOS. Y-15231 & Y-41333)

INTERSTATE HIGHWAY (LUNALILO FRWY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

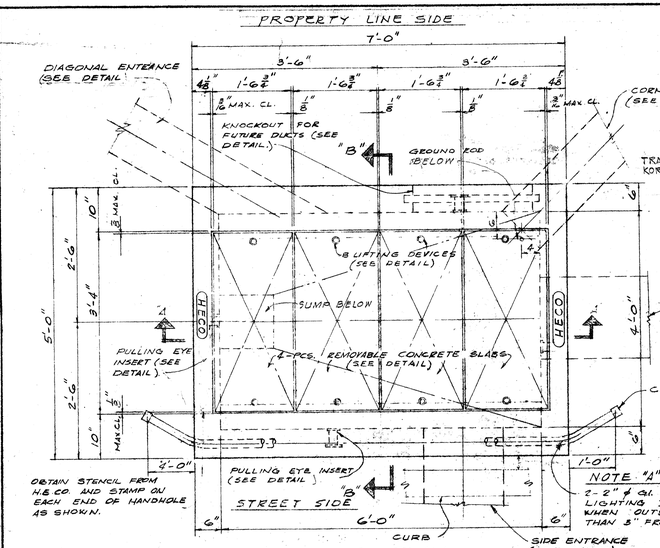
Scale: As Noted July 1966

SHEET No. 21 OF 95 SHEETS

109

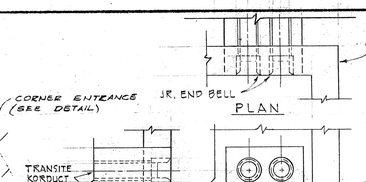
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	104	235

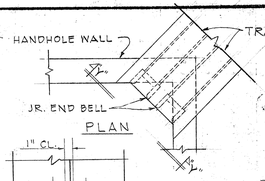


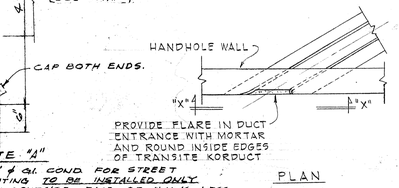
TOP PLAN

1/4"=1'-0"



END & SIDE ENTRANCES
(FOUR WAY DUCT)



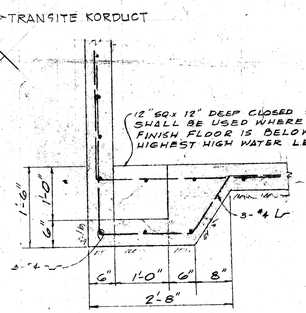


NOTE "A"

2-2" # GI. COND. FOR STREET LIGHTING TO BE INSTALLED ONLY WHEN OUTSIDE FACE OF H.H. IS LESS THAN 3" FROM CURBING.

TYPICAL DUCT ENTRANCE DETAIL

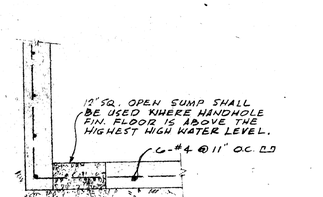
NOT TO SCALE



SECT. ELEV.

CLOSED SUMP

3/4"=1'-0"

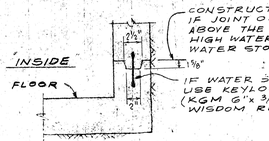


SECT ELEV.

OPEN SUMP

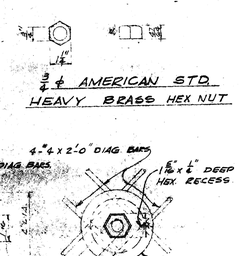
3/4"=1'-0"

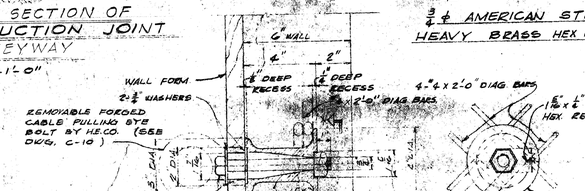
NOTE:
EXACT LOCATION OF SUMP TO BE DETERMINED IN THE FIELD.



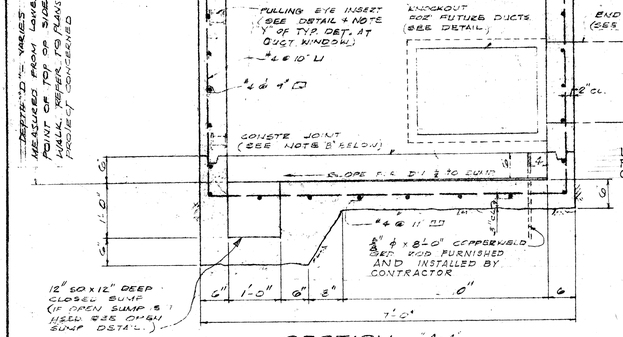
TYPICAL SECTION OF CONSTRUCTION JOINT AND KEYWAY

1"=1'-0"



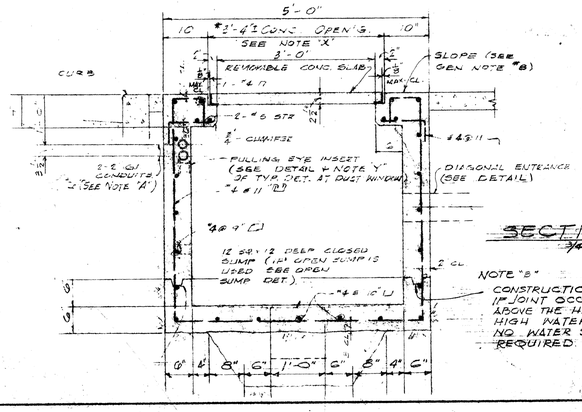


NOTE:
CONTRACTOR SHALL PLACE ADVANCE ORDERS FOR CAST BRASS PULLING EYE INSERTS. ORDERS MAY BE PLACED AT NOVELTY FOUNDRY, 656 KAMANI STREET PHONE 526316



SECTION "A-A"

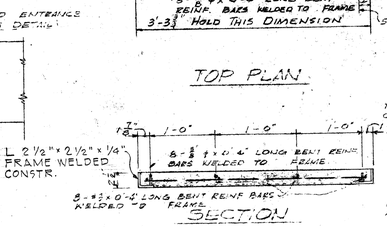
3/4"=1'-0"



SECTION "B-B"

3/4"=1'-0"

NOTE "B"
CONSTRUCTION JOINT IF JOINT OCCURS 6" ABOVE THE HIGHEST HIGH WATER LEVEL, NO WATER STOP IS REQUIRED.

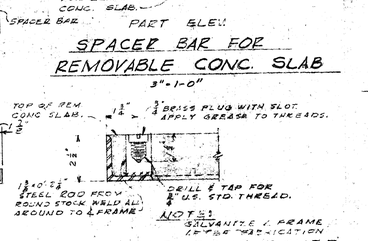


REMOVABLE CONC. SLAB

1"=1'-0"

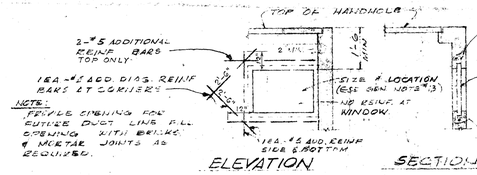
SPACER BAR FOR REMOVABLE CONC. SLAB

3"=1'-0"



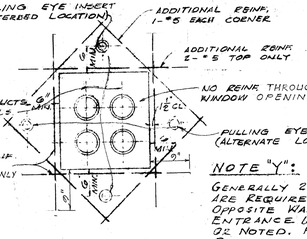
REMOVABLE CONC COVER SLAB LIFTING DEVICE

3"=1'-0"



KNOCKOUT FOR FUTURE DUCT LINE

3/8"=1'-0"



NOTE "Y":
GENERALLY 2 PULLING EYE INSERTS ARE REQUIRED AND LOCATED ON OPPOSITE WALL OF EACH DUCT ENTRANCE. UNLESS OTHERWISE SHOWN OR NOTED, HECO ENGINEERS SHALL DETERMINE NUMBER REQUIRED.

ELEVATION
TYP. DET. AT DUCT WINDOW

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 THE CONTRACTOR'S EXPENSE.

APPROVED

R.D. Henderson for FAK 8-18-65

HAWAIIAN ELECTRIC CO., INC. DATE

WILSON, OKAMOTO, OKA, INC.
PARK ASSOCIATES, INC.
ARCHITECTS & ENGINEERS

GENERAL NOTES

1.

2. CONCRETE TO DEVELOP COMPRESSIVE CYLINDER STRENGTH OF 3000 PSI IN 28 DAYS.

3. CONCRETE FINISH: TOP OF H.H. - WOOD FLOATED (SIDEWALK FINISH) ACCORDING TO THE STATE HIGHWAYS DIVISION OR CITY AND COUNTY OF HONOLULU SPECS., WHICHEVER THE CASE MAYBE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
FLOOR - SMOOTH METAL TROWELLED, EXPOSED WALL SURFACES & EDGES SMOOTH & FREE FROM DEFECTS.
CONCRETE POURING: NOTIFY H.E.CO. CONTRACTING & INSPECTION DIV. 24 HRS. BEFORE POURING ANY CONC. ALL CONC. SHALL BE POURED IN THE PRESENCE OF H.E. CO. ENG'S. OR ITS INSPECTOR.

4. REINFORCING:
ROUND DEFORMED BARS, NEW BILLET STOCK INTERMEDIATE GRADE ASTM A15. ALL HOOKED BARS SHALL HAVE ACI STD. HOOK UNLESS OTHERWISE SHOWN.

5. FORMS:
FORM HANDHOLE TO SIZE & SHAPE AS SHOWN. EXTERIOR FACE OF HANDHOLE WALL SHALL BE FORMED EXCEPT;
A) EXCAVATION IN SOLID MATERIAL SUCH AS CORAL OR ROCK - NEAT CUT, NO FORMS REQUIRED.
B) EXCAVATION IN SOLID MATERIAL OTHER THAN CORAL OR ROCK - LINING SUCH AS SALVAGED CORRUGATED IRON, CANEC, ETC. SHALL BE USED.

6. PULLING EYE INSERTS:
FOR LOCATION AND NUMBER REQUIRED SEE DUCT ENTRANCE PLAN OF PROJECT CONCERNED.

7. DRAINAGE:
SLOPE FLOOR DOWN 1/4" TO SUMP.

8. SLOPE TOP OF HANDHOLE TO MATCH EXISTING GRADE.

9. FINISH STEEL WORK:
CHANNEL FRAMES, LIFTING DEVICES FOR REMOVABLE CONCRETE SLABS SHALL BE HOT 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 ENGINEERING DEPARTMENT, 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 HWYS. DIV., STATE OF HAWAII OR C. & C. OF HON. WHICHEVER THE CASE MAY BE UNLESS OTHERWISE DIRECTED.

12. FOR DUCT LINE CONSTRUCTION STANDARDS, SEE H.E. CO. DWG. U-18588, AND SPECIFICATION SHEET U-18588A.

13. DUCTS:
FOR SIZE, LOCATION AND NUMBER REQUIRED, SEE DUCT ENTRANCE PLAN OF PROJECT CONCERNED.

14. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" = 5'-0",
TOTAL CONCRETE = 3.5 CU. YDS.
TOTAL REINF. STEEL = 450 LBS.
TOTAL MISC. STEEL = 160 LBS.

WEIGHT PER REMOVABLE CONC. SLAB,
CONCRETE = 150 LBS.
REINF. STEEL = 7 "
MISC. STEEL = 40 "
TOTAL = 197 "

MATERIALS FOR 6" DEPTH OF 6" THICK WALL,
CONCRETE = 0.2 CU. YDS.
REINF. STEEL = 18 LBS.

FOR USE IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

HANDHOLE TYPE 46 (4'-0" x 6'-0")
HECo DRAWING NO. 18842

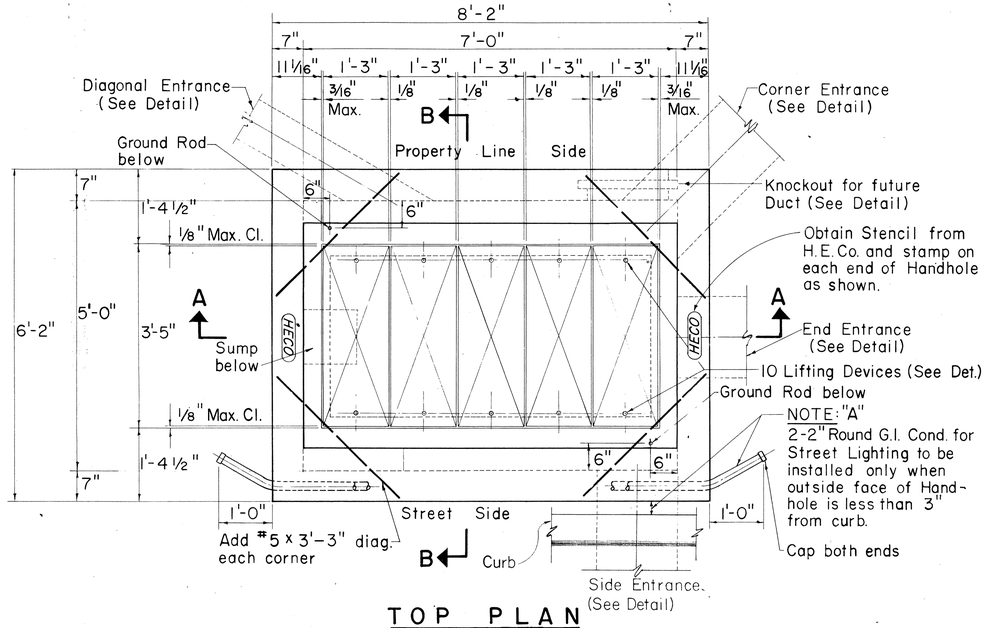
INTERSTATE HWY. (LUNALILO FWY.)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

SCALE: AS SHOWN DATE: July 1966

SHEET No. 104 OF 235 SHEETS

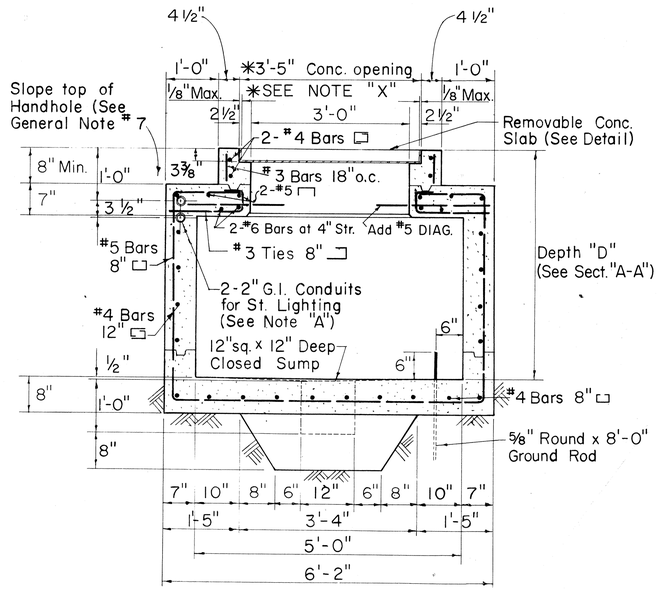
104

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	105	235



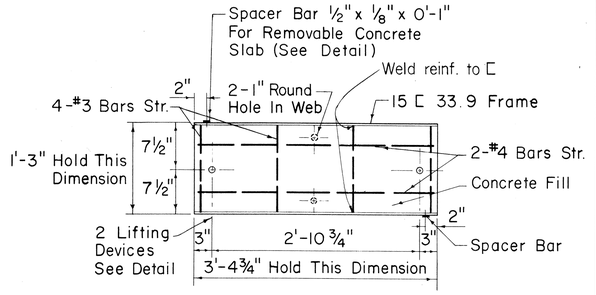
TOP PLAN

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



SECTION "B-B"

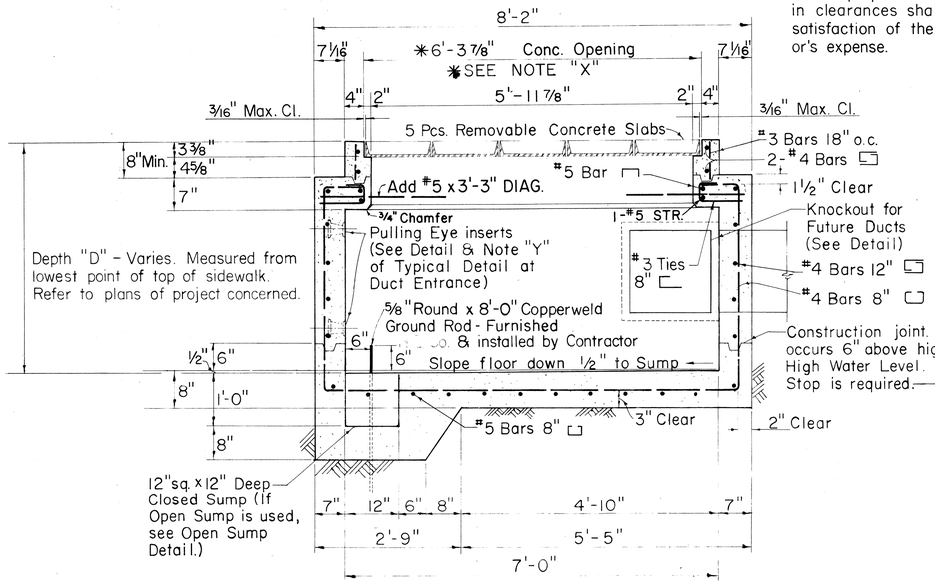
Scale: 3/4" = 1'-0"



PLAN

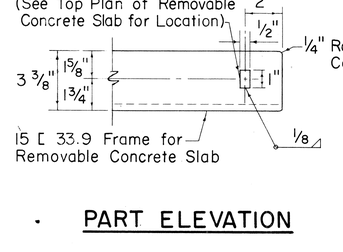
*NOTE: "X"

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.



SECTION "A-A"

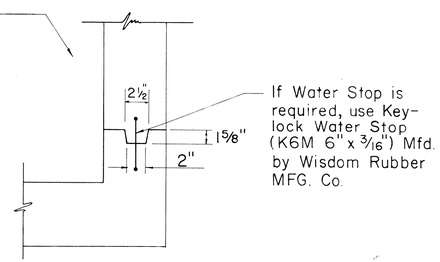
Scale: 3/4" = 1'-0"



PART ELEVATION

SPACER BAR FOR REMOVABLE CONC. SLAB

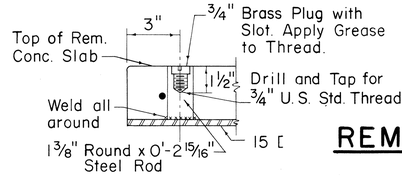
Scale: 3" = 1'-0"



TYPICAL DETAIL OF CONSTRUCTION JOINT AND KEYWAY

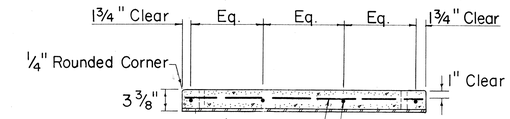
Scale: 1 1/2" = 1'-0"

NOTE: Galvanize 15 C and Steel Rod.



REMOVABLE CONCRETE COVER SLAB LIFTING DEVICE

Scale: 3" = 1'-0"



SECTION

REMOVABLE CONCRETE SLAB

Scale: 1" = 1'-0"

REINFORCED CONCRETE QUANTITIES

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

Total Concrete	= 4.5 Cu. Yds.
Total Reinf. Steel	= 690 Lbs.
Total Misc. Steel	= 588 Lbs.

WEIGHT PER REMOVABLE CONCRETE SLAB

Concrete	= 149 Lbs.
Reinf. Steel	= 6 Lbs.
Misc. Steel	= 118 Lbs.
TOTAL	= 273 Lbs.

MATERIALS FOR 6" DEPTH OF 7" THICK WALL

Concrete	= 0.3 Cu. Yds.
Reinf. Steel	= 32 Lbs.

APPROVED:

HAWAIIAN ELECTRIC Co., Inc. — Date 11/9/66

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

HECo., Inc. Drawing Number

18848 SHEET No. 1 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

HANDHOLE TYPE 57V (5'-0 x 7'-0) UNDERGROUND STANDARDS

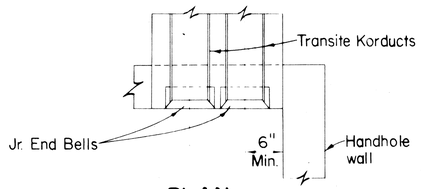
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scales: As Noted

SHEET NO. 23 OF 35 SHEETS

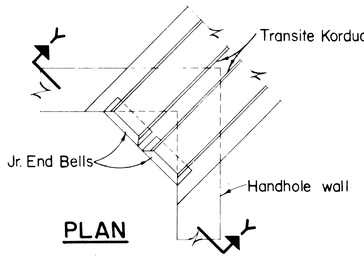
105

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

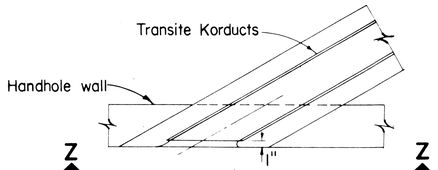
FED. AID DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	106	235



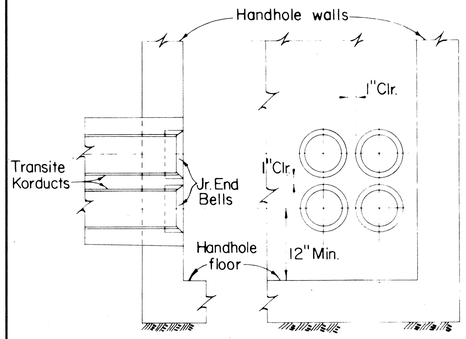
PLAN



PLAN



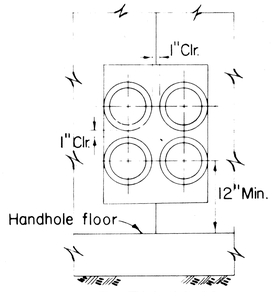
PLAN



SIDE ELEV. FRONT ELEV.

END & SIDE ENTRANCES

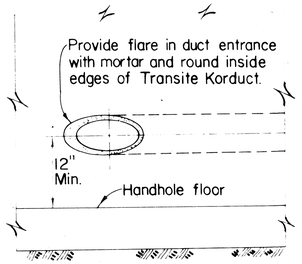
(FOUR WAY DUCT)



ELEV. Y-Y

CORNER ENTRANCE

(FOUR WAY DUCT)



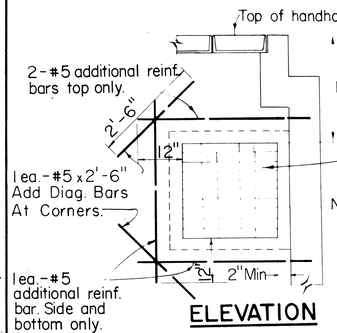
ELEV. Z-Z

DIAGONAL ENTRANCE

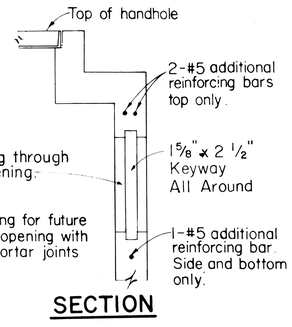
(ONE WAY DUCT)

TYPICAL DUCT LINE ENTRANCE DETAIL

NOT TO SCALE



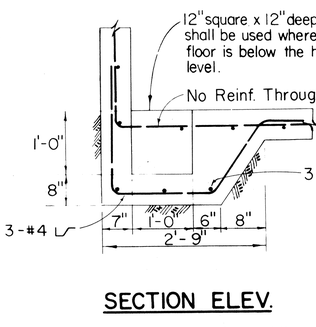
ELEVATION



SECTION

KNOCKOUT FOR FUTURE DUCT LINE

NOT TO SCALE

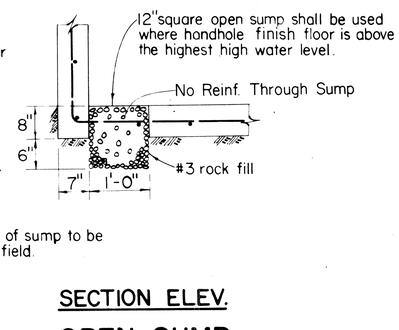


NOTE: Exact location of sump to be determined in field.

SECTION ELEV.

CLOSED SUMP

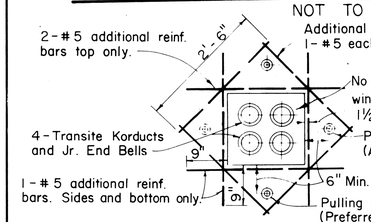
NOT TO SCALE



SECTION ELEV.

OPEN SUMP

NOT TO SCALE

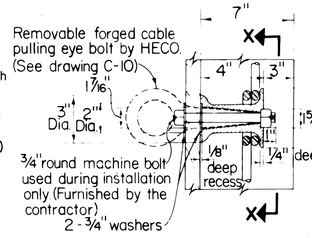


ELEVATION

TYPICAL DETAIL AT DUCT WINDOW

NOT TO SCALE

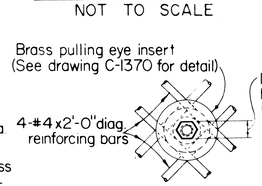
NOTE "Y": Generally 2 pulling eye inserts are required and located on opposite wall of each duct entrance unless otherwise shown or noted. HECO engineer shall determine number required.



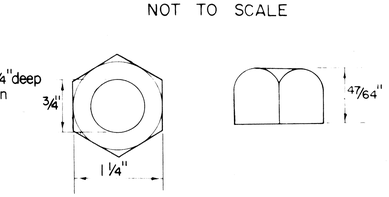
SECTION ELEV. ELEV. X-X

BRASS PULLING EYE INSERT

NOT TO SCALE



NOTE: Contractor shall place advance orders for cast brass pulling eye inserts. Orders may be placed at NOVELTY FOUNDRY, 556 Kamani Street phone 502314.



¾" AMERICAN STANDARD HEAVY BRASS HEXAGON NUT

NOT TO SCALE

GENERAL NOTES

1. Concrete to develop compressive cylinder strength of 3000 PSI in 28 days.
2. CONCRETE FINISH:
   Top of Handhole - Woodfloated (sidewalk finish) according to State Highway or City and County of Honolulu specifications whichever the case maybe unless otherwise directed by the Engineer.
   Floor - Smooth metal trowelled.
   Exposed Wall Surfaces, and Edges - Smooth and free from defects.
   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.
3. REINFORCING round deformed bars, new billet stock intermediate grade ASTM A15. All hooked bars shall have ACI std. hook unless otherwise shown.
4. FORMS form handhole to size and shape as shown. Exterior face of handhole wall shall be formed except
   A) Excavation in solid material such as coral or rock-neat cut, no forms required.
   B) Excavation in solid material other than coral or rock-lining such as salvaged corrugated iron, canec etc. may be used.
5. PULLING EYE INSERTS:
   For location and number required, see duct entrance plan of project concerned.
6. DRAINAGE: Slope floor down ½" to sump.
7. Slope top of handhole to match existing grade.
8. FINISH STEEL WORK:
   Channel frames, lifting devices for removable concrete slabs shall be HOT DIP GALVANIZED AFTER FABRICATION.
9. EXCAVATION:
   Excavate for handhole to accurate alignment grades and dimensions as shown on drawing. All excavation must be approved by the Engineering Department, the Hawaiian Electric Co., Inc., before any concrete is poured. All excess cut shall be backfilled with concrete or rock.
10. BACKFILL:
    Remove all debris before backfilling. Backfill in accordance with latest specifications of and subject to approval of State Highway or City and County of Honolulu whichever the case may be unless otherwise directed.
11. For duct line construction standards see H.E.CO. Dwg. 18585, and specs sheet 18585A.
12. DUCTS: For size, location and number required see duct entrance plan of project concerned.
13. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA
14. This handhole is designed for light vehicular loading - maximum load 5000 lbs. concentrated.

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

APPROVED:

HAWAIIAN ELECTRIC Co., Inc. DATE 11/6/66

HECo., Inc. Drawing Number	
18848	SHEET No. 2 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

HANDHOLE TYPE 57V (5'-0 x 7'-0) UNDERGROUND STANDARDS

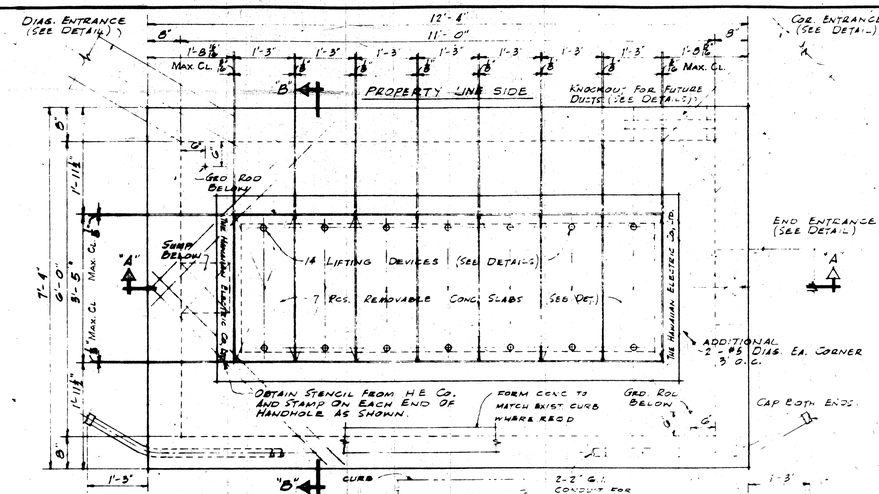
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scales: As Noted Date

SHEET NO. 24 OF 35 SHEETS

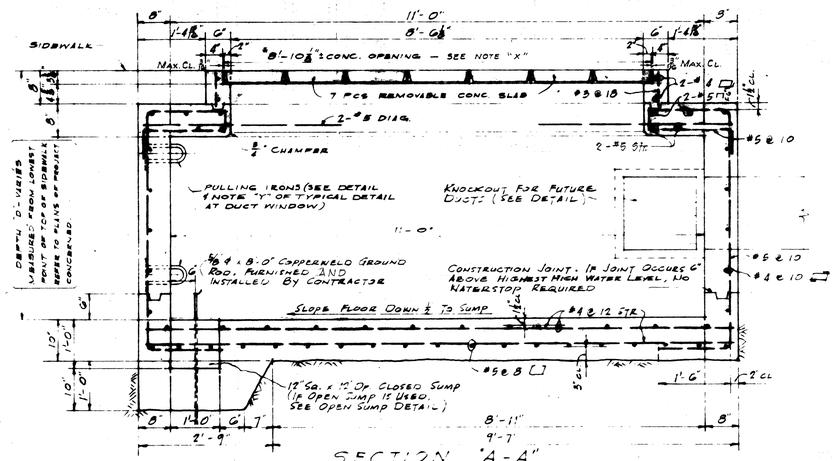
106

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

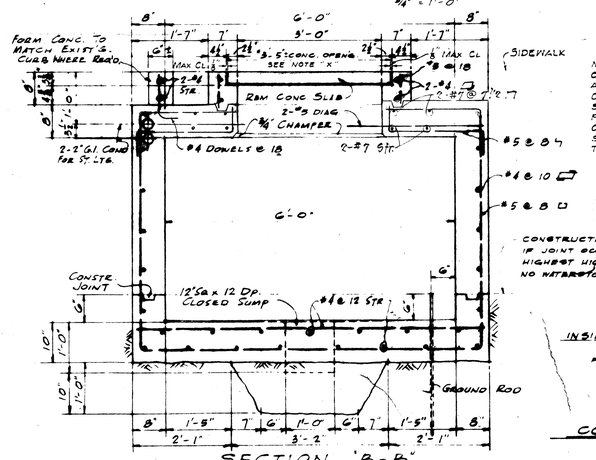
FED ROAD DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAW	I-HI-1(6) UNIT 3	1966	107	235



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



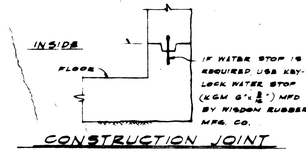
SECTION "A-A"
¼" = 1'-0"



SECTION "B-B"
¼" = 1'-0"

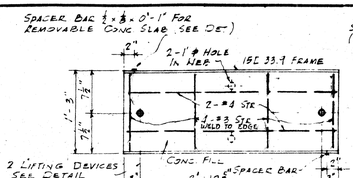
* NOTE "X" IMPORTANT

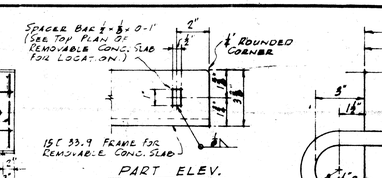
MAXIMUM CLEARANCES BETWEEN REMOVABLE CONCRETE COVER SLABS AND CONCRETE OPENING AT THE SUPPORTS MUST BE KEPT. CONCRETE CONTRACTOR SHALL MEASURE COVER SLAB STEEL FRAME AFTER FABRICATION TO OBTAIN PROPER CLEARANCES. ANY VARIATION IN CLEARANCES SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT CONTRACTOR'S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

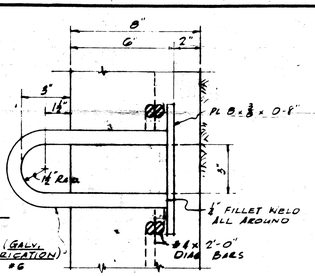


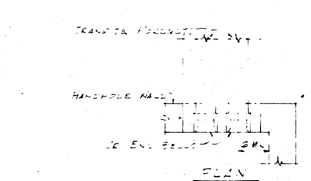
IF WATER STOP IS REQUIRED, USE KEY-LOCK WATER STOP (KLW 6"x⅜") MFD BY WISCON RUBBER MFG. CO.

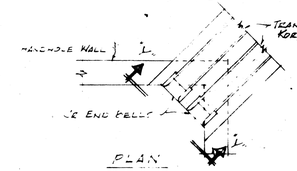
CONSTRUCTION JOINT TYPICAL
1" = 1'-0"

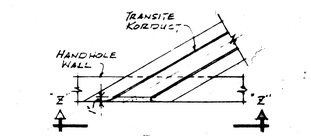


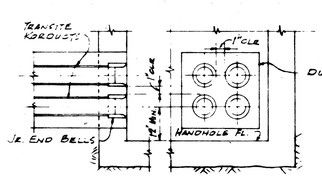


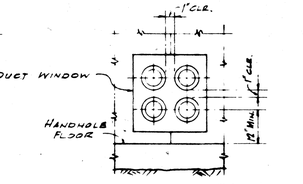


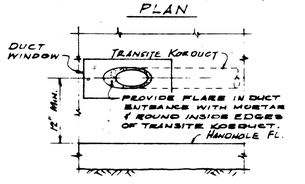




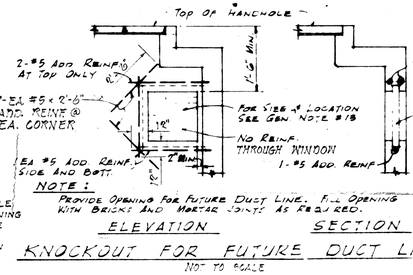


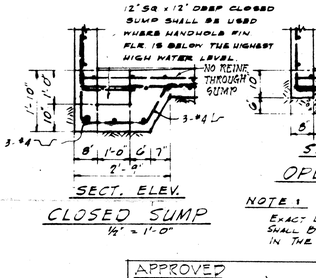






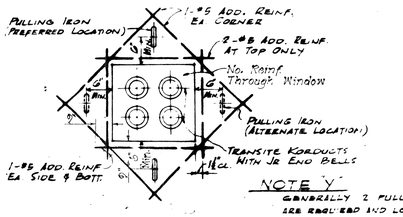
TYPICAL DUCT LINE ENTRANCE DETAILS
N.T.S.





NOTE 1

EXACT LOCATION OF SUMP SHALL BE DETERMINED IN THE FIELD.



NOTE "Y"

GENERALLY 2 PULLING IRONS ARE REQUIRED AND LOCATED ON OPPOSITE WALL OF EACH DUCT WINDOW UNLESS OTHERWISE SHOWN OR NOTED. H.E.CO. ENGINEER SHALL DETERMINE NUMBER REQUIRED.

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 DIVISION OF HIGHWAYS, 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 615). 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 WHAT CUT TO FORMS IS REQUIRED.
   b) EXCAVATION IN SOLID MATERIALS OTHER THAN CORAL & ROCK, LINING SUCH AS PLYWOOD CORRUGATED IRON, CANEC, ETC. SHALL BE USED.
6. PULLING IRON:
   LOCATION & NUMBER REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
7. DRAINAGE:
   SLOPE FLOOR DOWN ½" TO SUMP.
8. SLOPE TOP OF HANDHOLE TO MATCH FINISHED GRADE.

   FINISH STEEL WORK:
   CHANNEL FRAMES FOR REMOVABLE CONCRETE SLABS, LIFTING DEVICE & PULLING IRONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
9. EXCAVATION:
   EXCAVATE FOR HANDHOLE TO ACCURATE ALIGNMENT GRADES & DIMENSIONS AS SHOWN ON DRAWING. ALL EXCAVATION MUST BE APPROVED BY THE ENGINEERING DEPT. THE HAWAIIAN ELECTRIC CO., LTD. BEFORE ANY CONCRETE IS POURED. ALL EXCESS CUT SHALL BE BACKFILLED WITH CONCRETE OR ROCK.
10. BACKFILL:
    REMOVE ALL DEBRIS BEFORE BACKFILLING. BACKFILL IN ACCORDANCE WITH LATEST SPECIFICATIONS OF AND SUBJECT TO APPROVAL OF DIV. OF HWYS., STATE OF HAWAII.
11. FOR DUCT LINE CONSTRUCTION SEE STANDARD DETAIL SHEETS.
12. DUCTS:
    FOR SIZE, LOCATION & NUMBER REQUIRED SEE PLAN & PROFILE SHEETS.
13. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
14. THIS HANDHOLE IS DESIGNED FOR LIGHT VEHICULAR LOADING - MAXIMUM LOAD 5000 LBS. CONCENTRATED.

REINFORCED CONC. QUANTITIES

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

TOTAL CONCRETE	= 5.5 CU. YDS.
TOTAL REINF. STEEL	= 1,034 LBS.
TOTAL MISC. STEEL	= 845 LBS.
WEIGHT PER REMOVABLE CONC. SLAB	
CONCRETE	= 149 LBS.
REINF STEEL	= 6 LBS.
MISC. STEEL	= 118 LBS.
TOTAL	273 LBS.

MATERIALS FOR 6" DEPTH OF 8 THICK WALL

CONCRETE	= 0.45 CU. YD.
REINF. STEEL	= 56 LBS.

APPROVED

HAWAIIAN ELECTRIC CO. INC. — DATE

REDUCED PLANS
SCALES REDUCED ACCORDINGLY

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC UTILITIES

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
SCALE: AS SHOWN — DATE: July 1966

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

DESIGNED	DRAWN RY	DATE 8-18-61	SCALE As Shown
CHECKED			
APPROVAL			

ENGINEERING DEPARTMENT
THE HAWAIIAN ELECTRIC CO., LTD.
HONOLULU, HAWAII

DRAWING NUMBER
18849

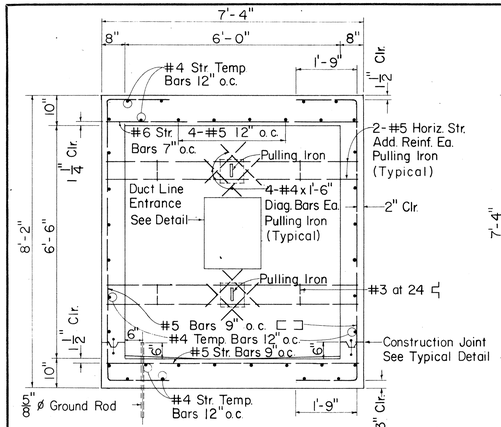
SHEET No. 25 OF 35 SHEETS

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

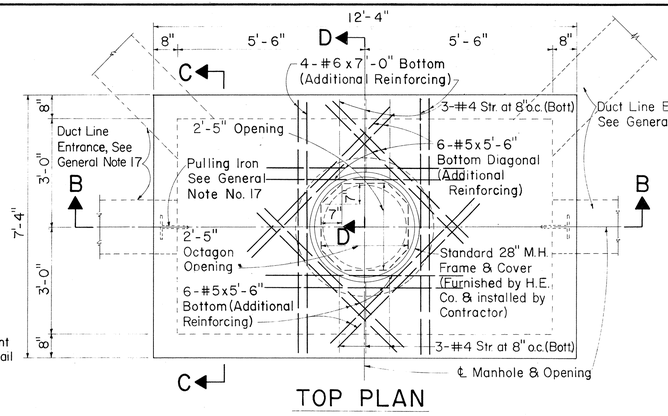
PRINTED ON SEPIA NO. 10000 CLEARPRINT

107

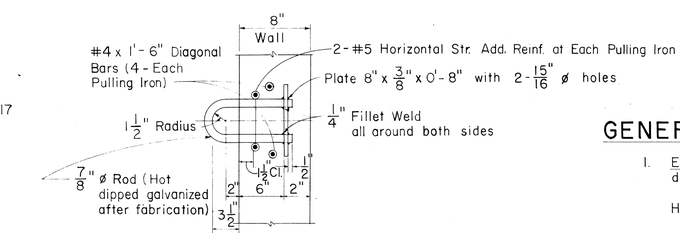
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	108	235



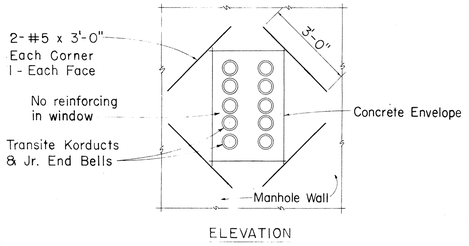
SECTION C-C



TOP PLAN



PULLING IRON DETAIL

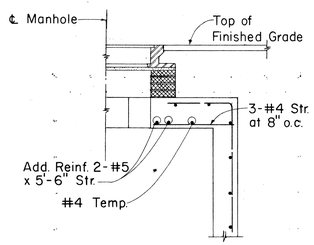


ELEVATION

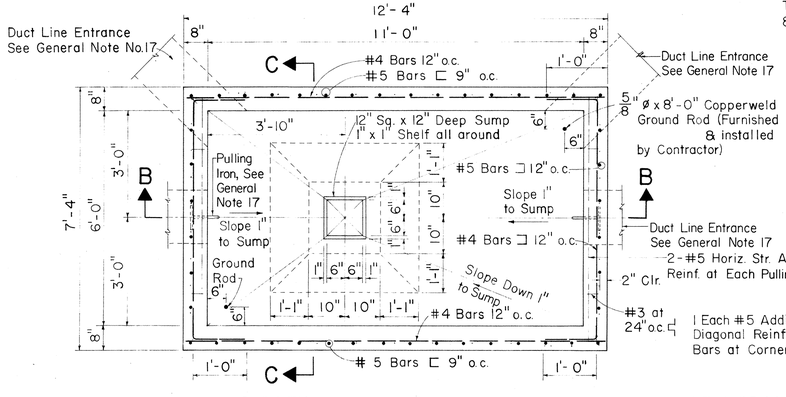
REINFORCING AT DUCT WINDOW

GENERAL NOTES

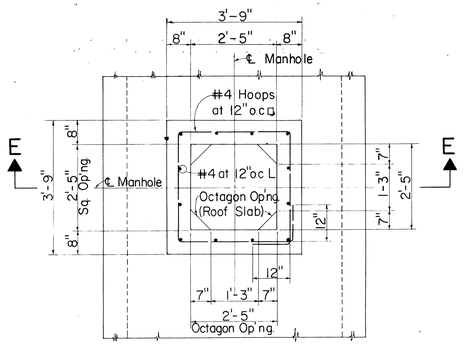
1. EXCAVATION : Excavate for manhole to accurate alignment, grades and dimensions as shown on drawings.
   All excavation must be approved by Engineering Dept. H.E.Co. before any concrete is poured.
   All excess cut shall be backfilled with concrete or rocks.
2. BACKFILL : Remove all debris before backfilling. Backfill in accordance with latest specifications of Division of Highways, State of Hawaii.
3. All work to be done in dry.
4. Concrete shall be Class A-1 conforming to the requirements of Section 47 of the Special Provisions.
5. MIXING : Ready-Mixed A.S.T.M. C-94-47.
6. REINFORCING : Round deformed bars (clean and new).
7. SPLICE : Lap 30 bar diameters unless otherwise shown.
8. CURING : Keep concrete moist at least 7 days after pouring. (By approved method).
9. FINISH : All surfaces smooth and free from defects.
   Top of manhole - wood floated. Manhole floor - steel troweled.
   Inside walls and ceiling - cement washed.
10. Install all inserts, including pulling irons, ground rods, etc, before pouring concrete.
11. POURING: Notify the H.E.Co. Contracting and Inspection Division, 24 hours before pouring any concrete. All concrete pouring shall be done in the presence of an H.E.Co. Engineer or Inspector.
12. FORMS : Make of good sound lumber, of sufficient strength, water tight and conforming to shape and dimensions indicated on drawings.
13. The Hawaiian Electric Co. Inc. to furnish and Contractor to install, for each manhole:
    A. Standard 28" manhole frame and cover. (H.E. Standard)
14. Slope manhole floor down 1" toward sump.
15. All work shall be subject to inspection by the Hawaiian Electric Co. Inc.; and/or Division of Highways, State of Hawaii; and/or Division of Engineering, City & County of Honolulu.
16. All materials shall be new and shall be manufactured in the United States.
17. For number, size, and exact location of ducts entrances and pulling irons, refer to project drawings.



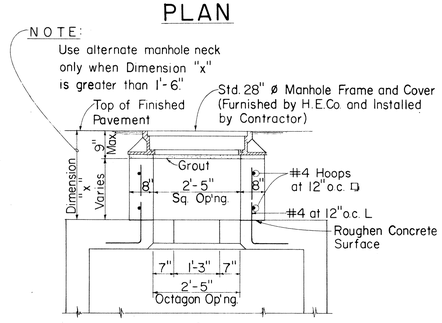
SECTION D-D



SECTIONAL PLAN A-A

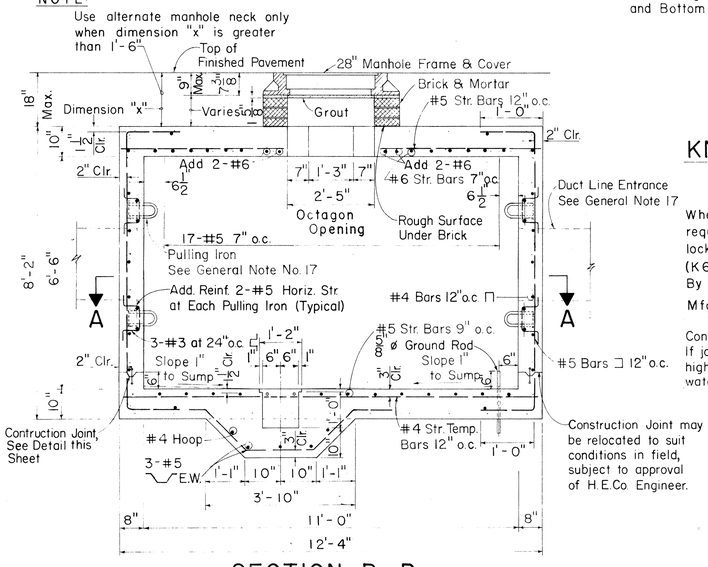


PLAN

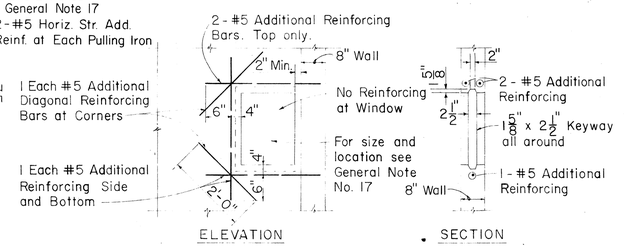


SECTION E-E

ALTERNATE MANHOLE NECK



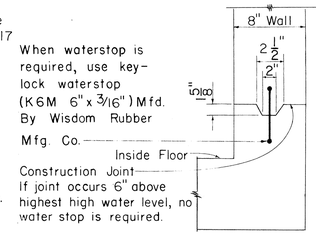
SECTION B-B



ELEVATION SECTION

NOTE:
Provide opening for future duct line. Fill opening with bricks with mortar joints as required. (See project drawing).

KNOCKOUT FOR FUTURE DUCT LINE



TYPICAL DETAIL OF CONSTRUCTION JOINT AND KEYWAY

REFERENCE DRAWINGS

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

REINFORCED CONCRETE QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH AS SHOWN
Total Concrete = 11.8 Cu. Yds.
Total Reinf. Steel = 1,363 Lbs.
QUANTITY OF MATERIALS FOR ALTERNATE NECK "D"= 1'-0"
Concrete = 0.29 Cu. Yds.
Reinf. Steel = 39 Lbs.
MATERIALS FOR 6" DEPTH OF 8" THICK WALL
Concrete = 0.45 Cu. Yds.
Reinf. Steel = 37 Lbs.

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

APPROVED:
HAWAIIAN ELECTRIC Co., Inc. — DATE 11/8/66

HECo., Inc. Drawing Number
18775

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

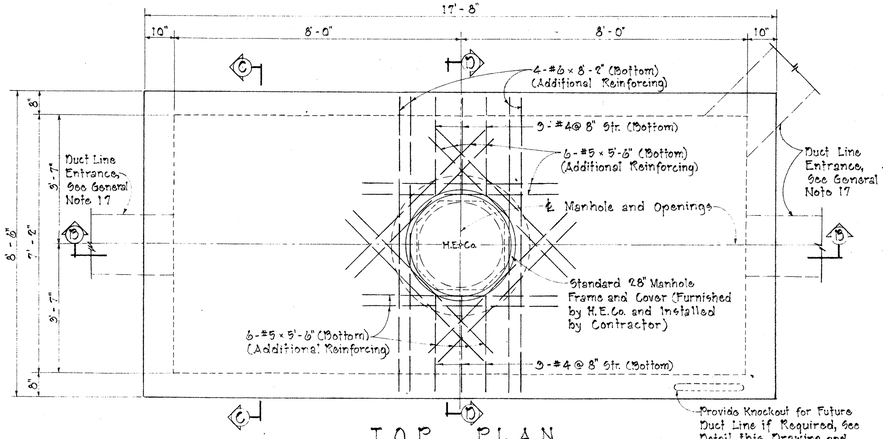
STANDARD DETAILS
MANHOLE TYPE No. 1 (6'-0" x 11'-0")
UNDERGROUND STANDARDS
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scales: Not to Scale

SHEET NO. 26 OF 35 SHEETS

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

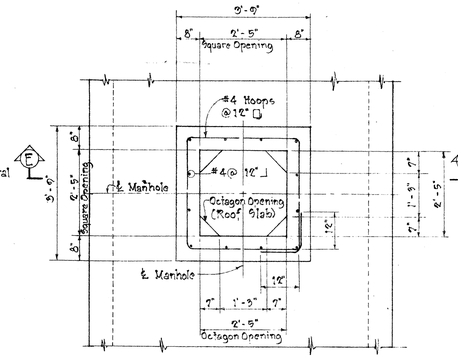
105

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	108	235



TOP PLAN

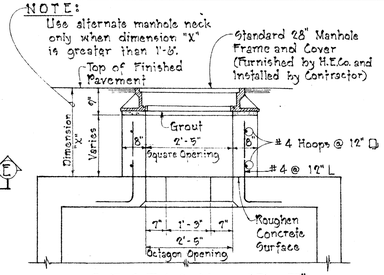
Scales: 1/2" = 1'-0"



PLAN

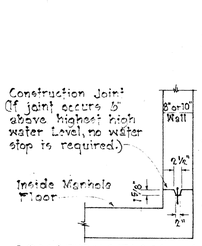
ALTERNATE MANHOLE NECK

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



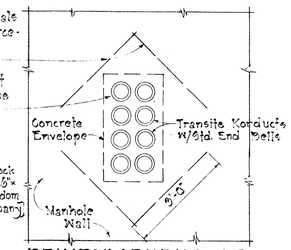
SECTION "E-E"

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



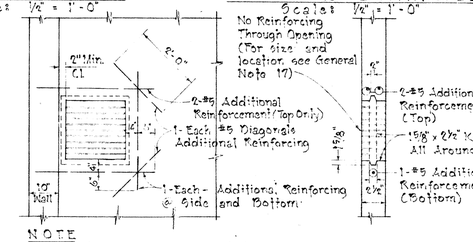
CONSTRUCTION JOINT TYPICAL DETAIL

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



REINFORCEMENT AT DUCT LINE ENTRANCES

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



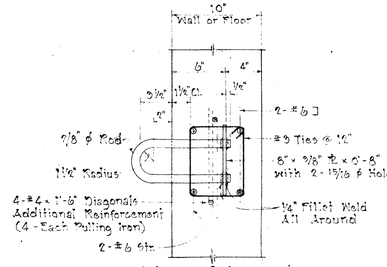
NOTE

Provide opening for future duct line. Fill opening with bricks with mortar joints as required. (See Project Drawing)

PART ELEVATION SECTION

KNOCKOUT FOR FUTURE DUCT LINE

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



PULLING IRON DETAIL

Scales: 1½" = 1'-0"

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

APPROVED:

Thomas K. Kau — 11/6/66

HAWAIIAN ELECTRIC Co., Inc. — DATE

GENERAL NOTES

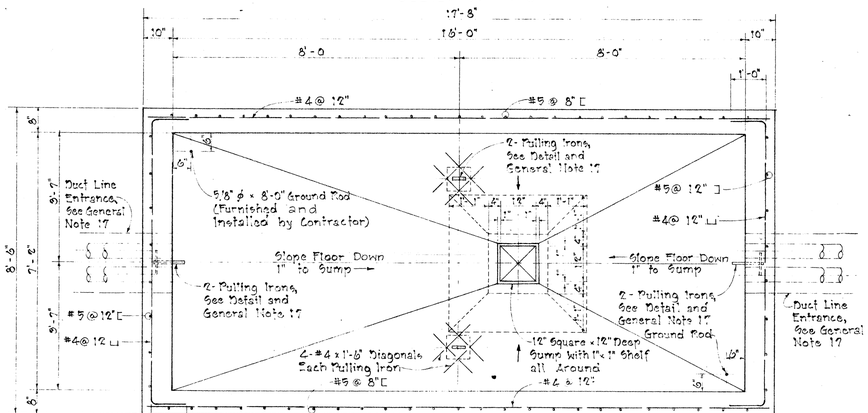
1. Excavations: Excavate for manhole to accurate alignment, grades and dimensions as shown on drawings. All excavation must be approved by the Engineering Dept. H.E.Co., before any concrete is poured. All excess cut shall be backfilled with concrete or rocks.
2. Backfill: Remove all debris before backfilling. Backfill in accordance with latest specifications of Division of Highways, State of Hawaii.
3. All work to be done in dry.
4. Concrete compressive strength: 3,000 p.s.i. in 28 days.
5. Mixing: Ready-Mixed A.S.T.M. C-94.
6. Reinforcing: Round deformed bars. (Clean and New)
7. Splices: Lap 30 bar diameters unless otherwise shown.
8. Curing: Keep concrete moist at least 7 days after pouring. (By Approved Method)
9. Finish: All surfaces smooth and free from defects.
   Top of manhole - wood floated
   Manhole floor - steel trowelled
   Inside wall and ceiling - cement washed
10. Install all inserts, including pulling irons, ground rods, and etc., before pouring concrete.
11. Pouring: Notify the H.E.Co. Contracting and Inspection Division 24 hours before pouring any concrete. All concrete pouring shall be done in the presence of an H.E.Co. Engineer or Inspector.
12. Forms: Make of good sound lumber of sufficient strength, water tight and conforming to shape and dimensions indicated on drawings.
13. The H.E.Co Inc. to furnish and Contractor to install for each manhole:
    A. Standard (H.E.Co) 28" manhole frame and cover.
14. Slope manhole floor down 1" toward sump.
15. All work shall be subject to inspection by the H.E.Co Inc. and/or Division of Highways, State of Hawaii, or Division of Engineering, City and County of Honolulu.
16. All materials shall be new and manufactured in the United States of America.
17. For Number, size and exact location of duct entrances and pulling irons, refer to project drawings.

REFERENCE DRAWINGS

U-10082 Standard H.E.Co. 28" Manhole Frame and Cover
18585 U.G. Duct Line Construction Std's. (Transite Koroducts)
18585A U.G. Duct Line Construction Std's. Specifications Sheet

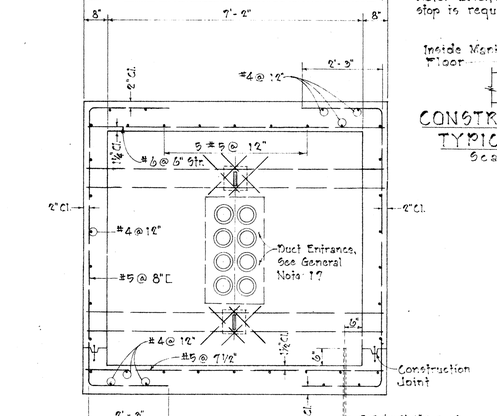
REINFORCED CONCRETE QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" =
Total Concrete = 18 Cu. Yds.
Total Reinforcing Steel = 2,570 Lbs.
QUANTITY OF MATERIALS FOR ALTERNATE NECK "D" = 1'-0"
Concrete = 0.29 Cu. Yds.
Reinforcing Steel = 39 Lbs.
MATERIALS FOR 6" DEPTH OF 8" AND 10" THICK WALL
Concrete = 0.66 Cu. Yds.
Reinforcing Steel = 52.5 Lbs.



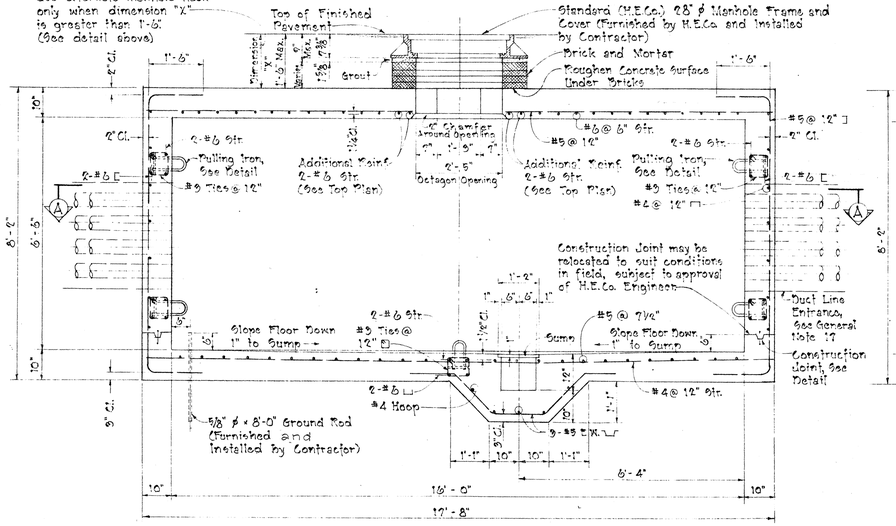
SECTIONAL PLAN "A-A"

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



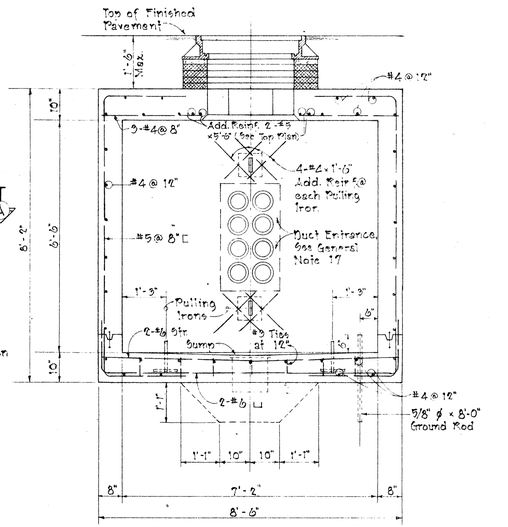
SECTION "C-C"

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



SECTION "B-B"

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



SECTION "D-D"

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

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

ORIGINAL PLAN
NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

MANHOLE TYPE No. 4 (7'-2" x 16'-0") UNDERGROUND STANDARDS

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scales: As Noted

HECo., Inc. Drawing Number

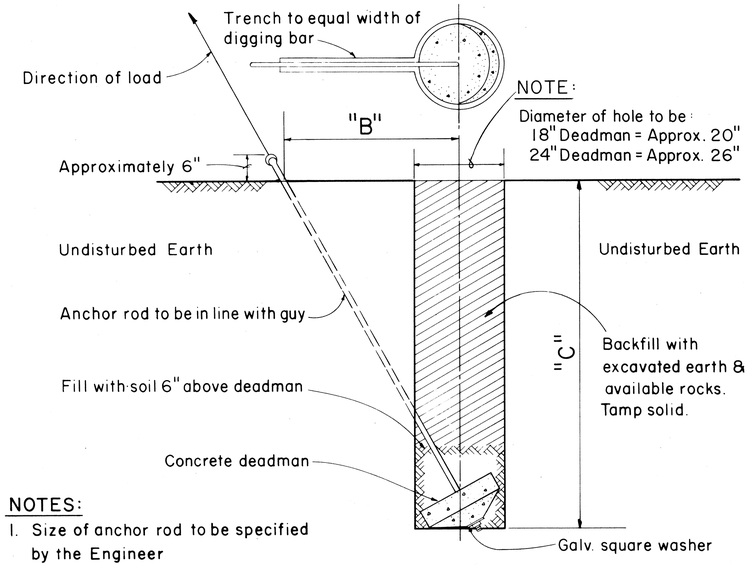
15588

SHEET No. 27 OF 95 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

108

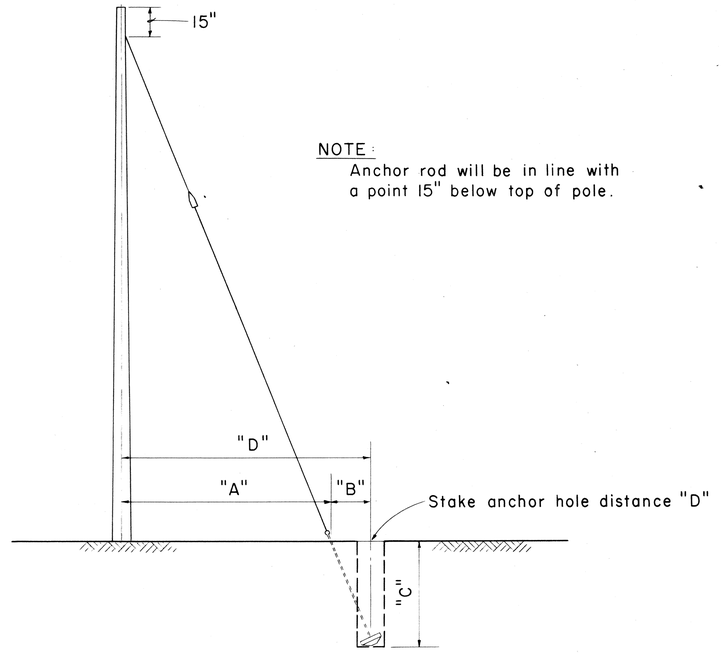
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	110	235



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

GUY ANCHOR DEADMAN

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



Not to Scale

FOR 25', & 30' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"		"D" = ("A" + "B")
LEAD-ANCHOR ROD TO ℄ OF POLE	ANCHOR ROD TO ℄ OF HOLE	VERTICAL DEPTH 18" D.M.	VERTICAL DEPTH 24" D.M.	TOTAL DISTANCE POLE TO HOLE
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	19'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"
FOR 35' THRU 70' POLES WITH 8'-0" ANCHOR RODS				
5'-0"	1'-0"	7'-3"	7'-4"	6'-0"
10'-0"	1'-11"	7'-1"	7'-3"	11'-11"
15'-0"	2'-8"	6'-9"	7'-1"	17'-8"
20'-0"	3'-3"	6'-6"	6'-10"	23'-3"
25'-0	3'-10"	6'-2"	6'-7"	28'-10"
FOR 40' THRU 70' POLES WITH 1 1/4" x 10'-0" ANCHOR RODS				
5'-0"	1'-7"		9'-4"	6'-7"
10'-0"	3'-0"		9'-0"	13'-0"
15'-0"	4'-2"		8'-6"	19'-2"
20'-0"	5'-3"		7'-11"	25'-3"
25'-0"	6'-2"		7'-3"	31'-2"

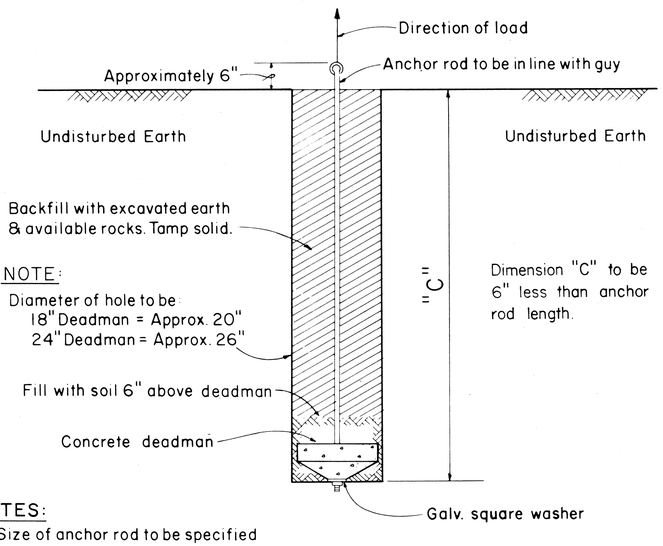
D. M. = Deadman

TABLE 2 ANCHOR ROD - ANCHOR SLUG - SQUARE WASHER COMBINATION

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

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

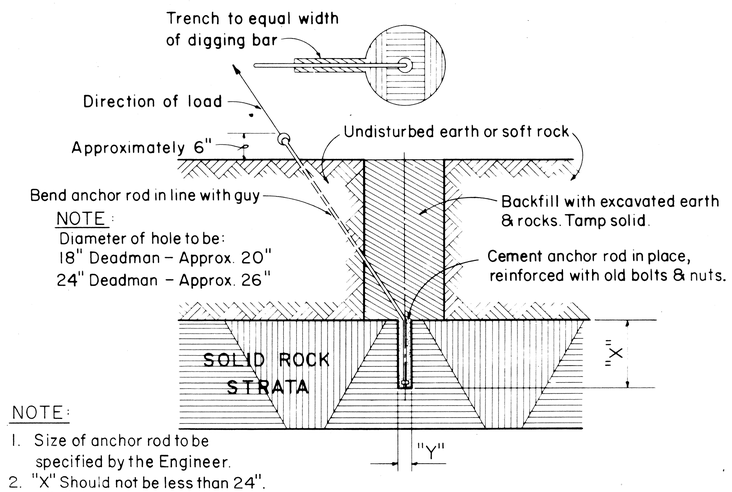
ANCHORING DATA



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

SIDE - WALK ANCHOR

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



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

ROCK ANCHOR

Not to Scale

APPROVED:

Mank Ashikawa 11/4/66
HAWAIIAN ELECTRIC Co., Inc. DATE

F. F. Rudd 11-7-66
OUTSIDE PLANT ENGR. H.T. Co., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

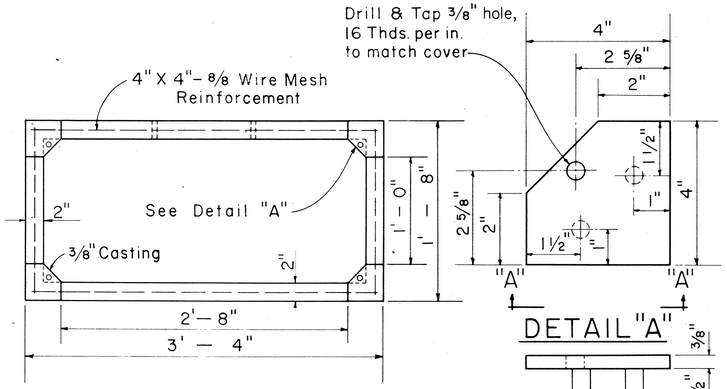
STANDARD DETAILS
H.E. Co. AND H.T. Co.
ANCHOR DETAILS AND ANCHORING DATA

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scales: As Noted Date

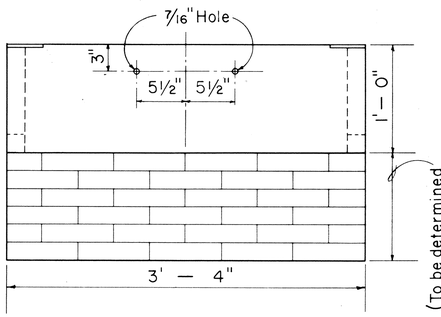
SHEET No. 28 OF 95 SHEETS

110

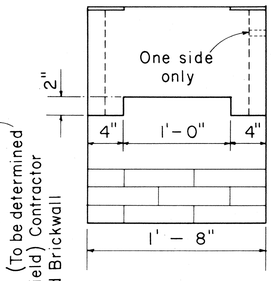


PLAN

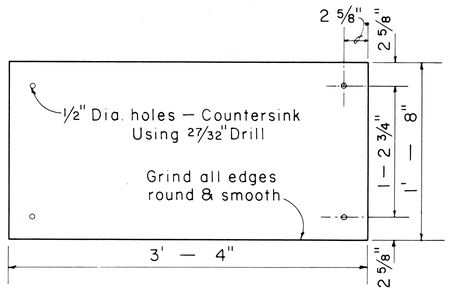
SECTION "A-A"



SIDE VIEW



END VIEW



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.

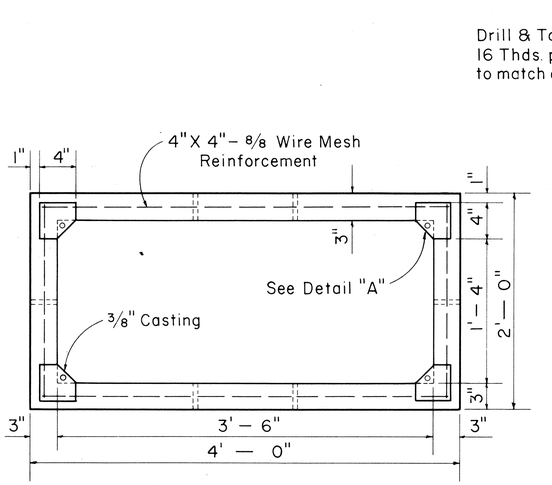
1/4" CHECKER PLATE COVER

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

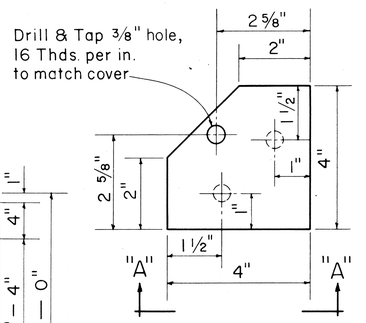
1'-4" X 3'-0" CONCRETE SERVICE BOX

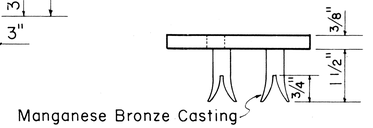
Scale: 1 1/2" = 1'-0"

011250

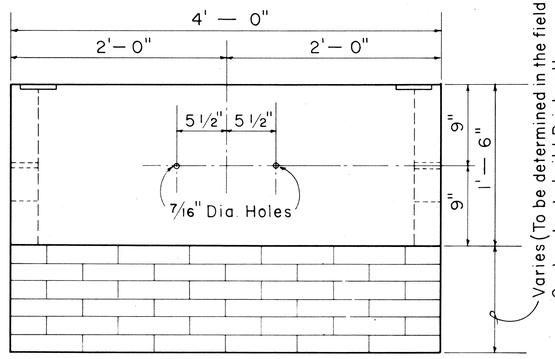


PLAN

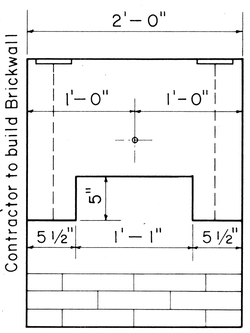




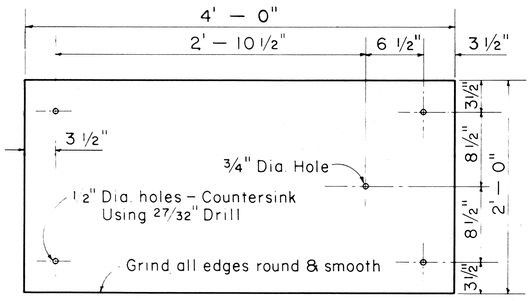
SECTION "A-A"



SIDE VIEW



END VIEW



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

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

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	111	235

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:

HAWAIIAN ELECTRIC Co., Inc. — DATE 11/28/66

OUTSIDE PLANT ENGR. H.T. Co., LTD. — DATE 11-7-66

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
H.E. Co. AND H.T. Co.
SERVICE BOX DETAILS
AND WOOD POLE DATA

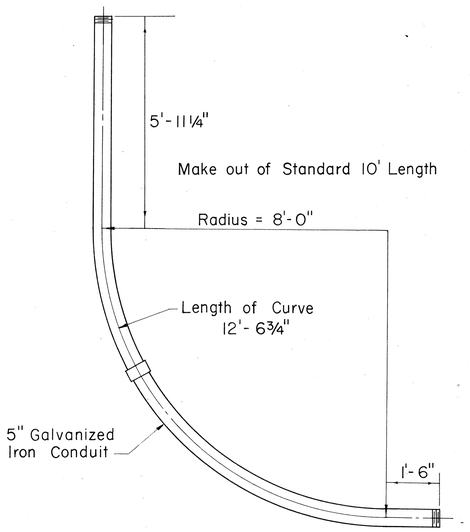
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

Scales: As Noted — Date

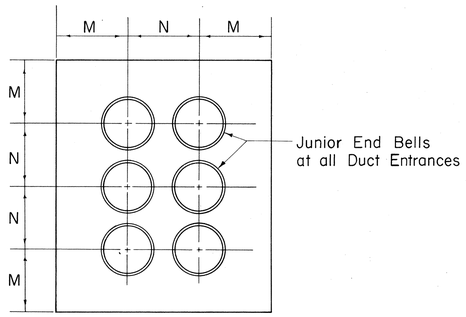
SHEET NO. 29 OF 35 SHEETS

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	112	235

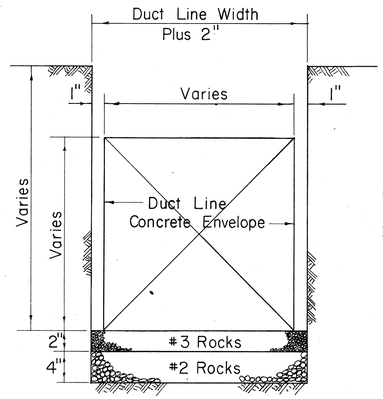


46 KV COMBINATION RISER AND BEND
(8'-0" RADIUS)
Not to Scale



TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

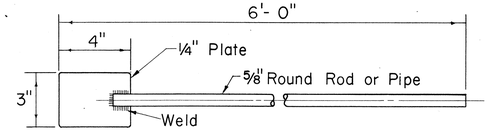
SIZE	M	N
3"	5"	6"
4"	5½"	7"
4½"	5½"	7½"
5"	6"	8"



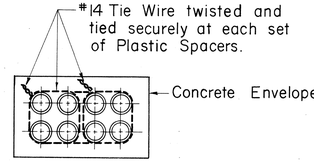
TYPICAL EXCAVATION DETAIL
Not to Scale

NOTES

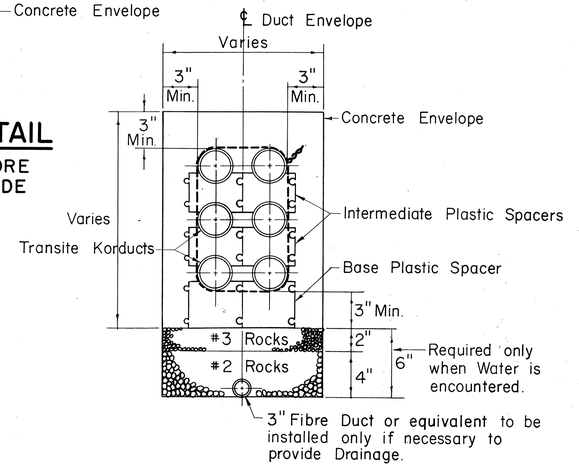
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



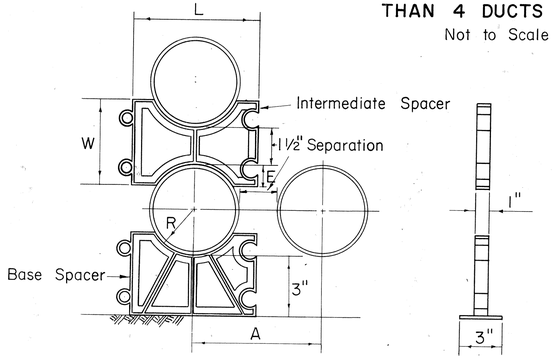
CONCRETE DUCT ENVELOPE TAMPING ROD
Scale: 3" = 1'-0"



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



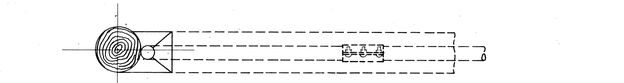
TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale



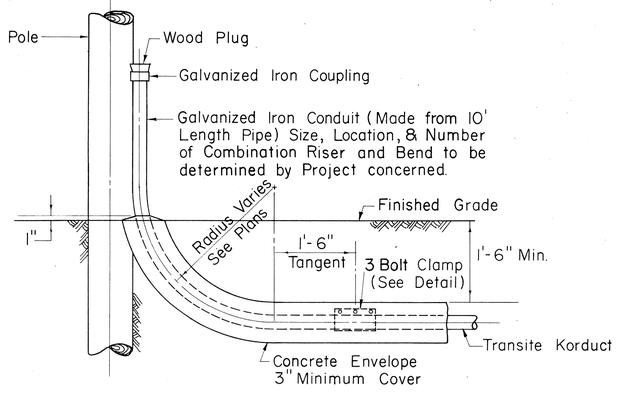
TYPICAL PLASTIC SPACERS
Not to Scale

SIZE	R	E	W	A	L
3"	$1\frac{27}{32}$"	⅞"	$3\frac{1}{4}$"	$5\frac{1}{8}$"	5"
4"	$2\frac{13}{32}$"	$1\frac{1}{8}$"	$3\frac{3}{4}$"	$6\frac{1}{4}$"	$6\frac{1}{8}$"
$4\frac{1}{2}$"	$2\frac{23}{32}$"	$1\frac{1}{4}$"	4"	$6\frac{7}{8}$"	$6\frac{3}{4}$"
5"	$3\frac{1}{16}$"	$1\frac{3}{8}$"	$4\frac{1}{4}$"	$7\frac{5}{8}$"	$7\frac{1}{2}$"

For 1½" Separation

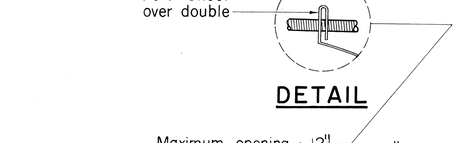


PLAN

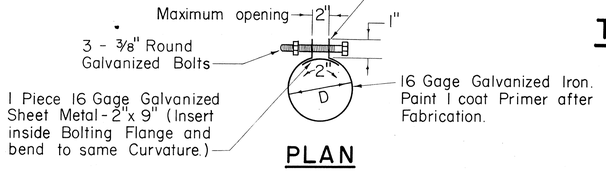


ELEVATION

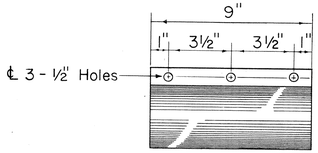
TYPICAL DETAIL COMBINATION RISER AND BEND
Scale: ¾" = 1'-0"



DETAIL



PLAN



ELEVATION

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

APPROVED:

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

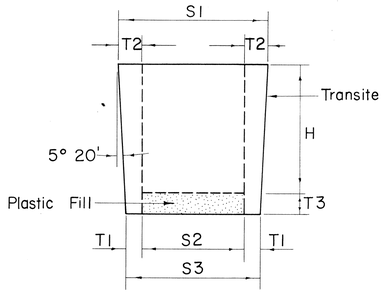
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES
INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3
Scales: As Noted Date

SHEET NO. 90 OF 95 SHEETS

112

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

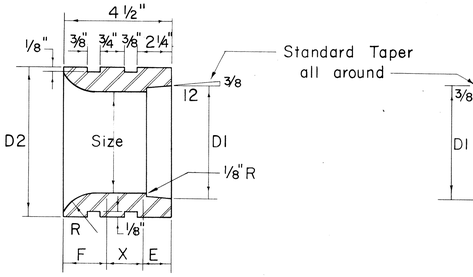
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(6) UNIT 3	1966	113	235



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

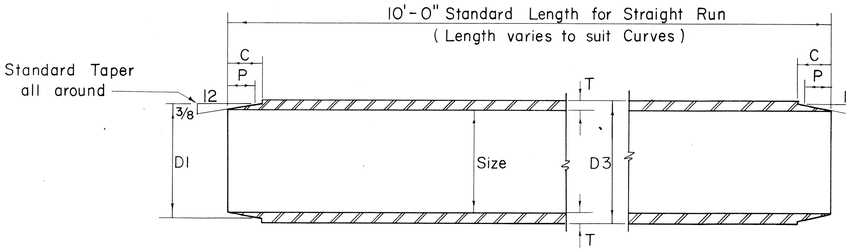
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



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"



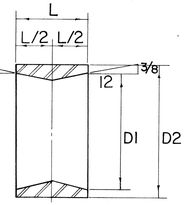
TRANSITE KORDUCTS

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"	25/64"	1 1/8"	19/64"

Note "X"

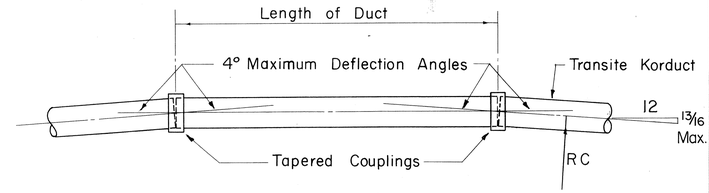
Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



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"

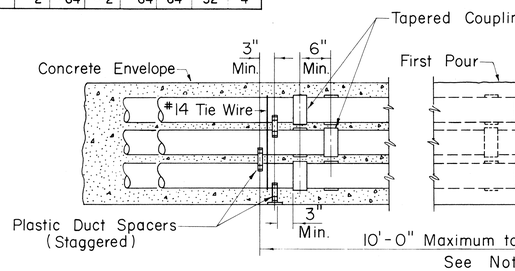
TAPERED COUPLINGS

Not to Scale



METHOD OF FORMING CURVES

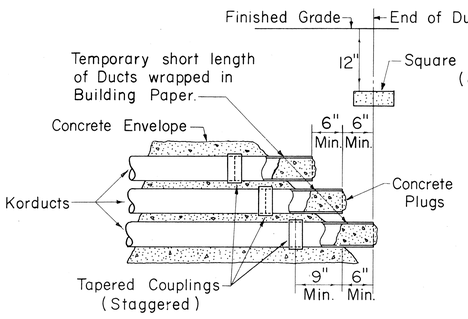
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

(6 WAY DUCT LINE SHOWN)

Not to Scale

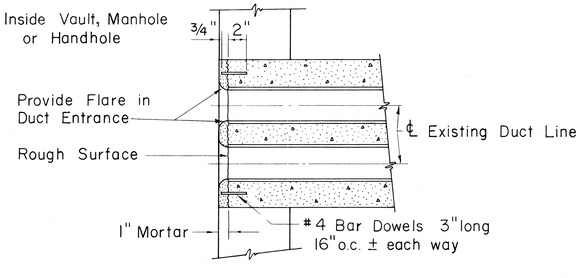


TYPICAL STUB OUT DETAIL

Not to Scale

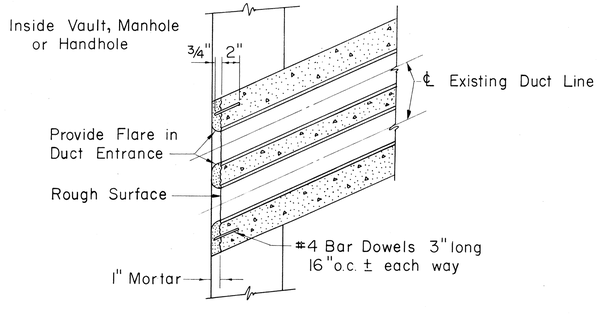
MINIMUM RADIUS TO FORM CURVES

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: 1½" = 1'-0"



DUCT LINE DIAGONAL ENTRANCE

Scale: 1½" = 1'-0"

APPROVED:

HAWAIIAN ELECTRIC CO., INC. — DATE 11/9/66

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

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

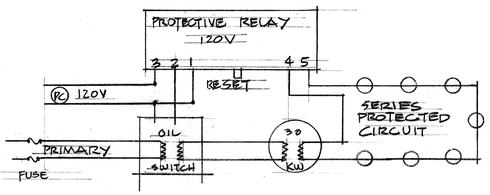
Scales: As Noted — Date

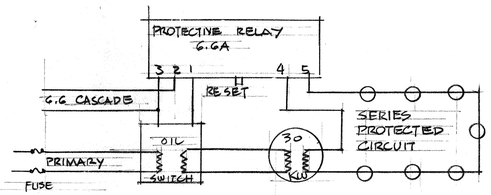
SHEET NO. 31 OF 35 SHEETS

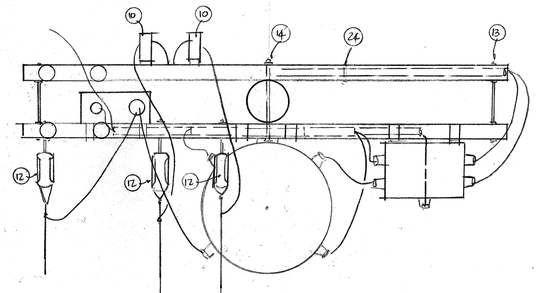
113

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

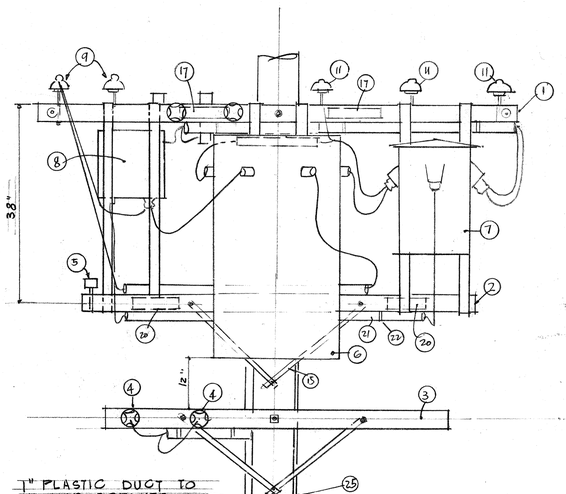
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	114	235



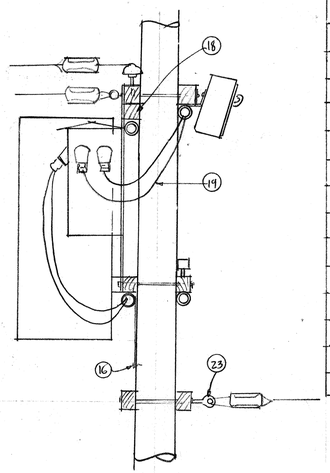




TOP VIEW

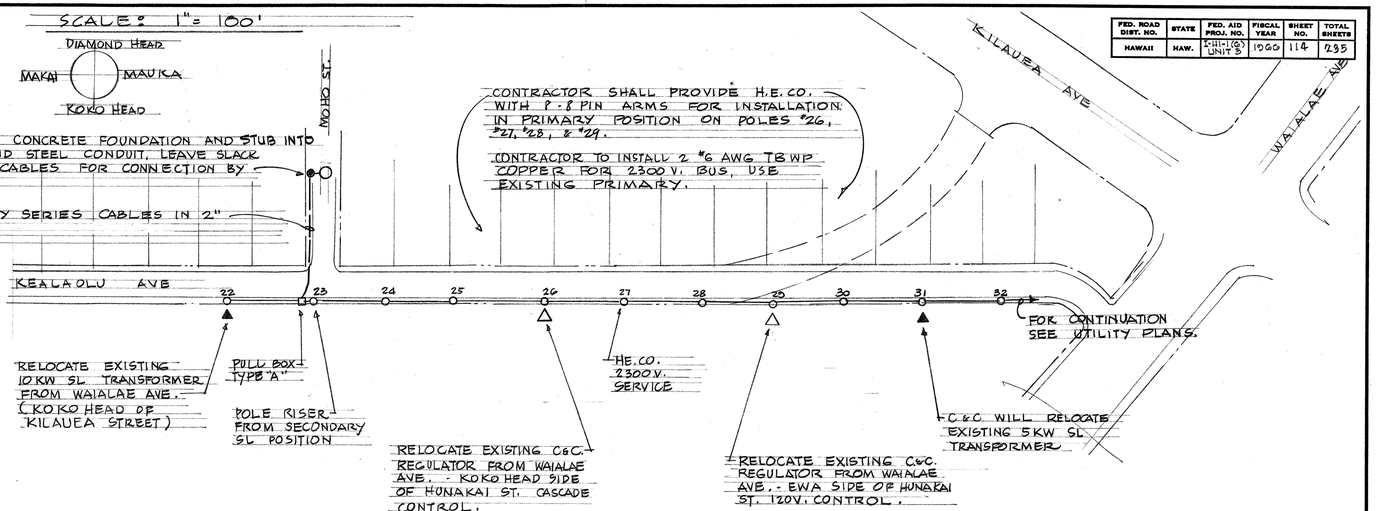


FRONT ELEVATION



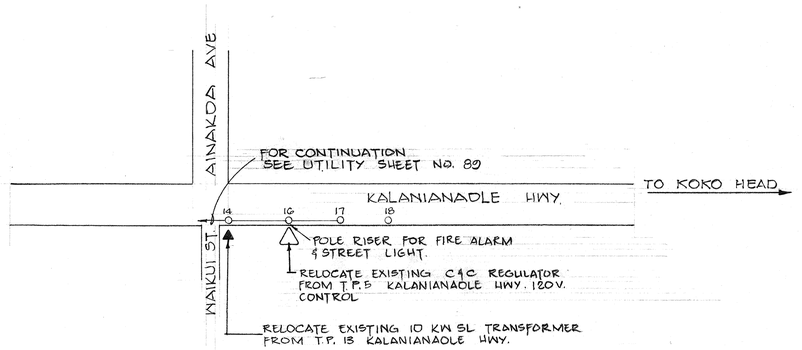
SIDE ELEVATION

SCALE: 1" = 100'



MATERIALS & GENERAL EQUIPMENT

NO.	DESCRIPTION
1	CROSS ARM - 8 PIN 3½"X4½"X9'-2" H.E. PRIMARY ARM.
2	" " - 6 PIN 3½"X4½" X 8'-0" HEEL ARM.
3	" " - 4 PIN 3½"X4½"X 5'-6½" H.E. SECONDARY ARM.
4	H.E. 120V SERVICE
5	PHOTO-CELL CONTROL - 120V
6	30 KW REGULATOR
7	R.C.O.C. OIL SWITCH 120V. OR 6.6 CASCADE
8	R.C.O.C. PROTECTIVE RELAY 120V. OR 6.6
9	C&C. PRIMARY POSITION - IRON PIN & INSULATOR 6.6 KV.
10	ENCLOSED FUSE CUTOUTS, 5,000 V. 100 AMPS. SINGLE POLE, WITH CROSS ARM BRACKET. 30 AMP FUSE.
11	H.E. PRIMARY 2300 V POSITION.
12	STRAIN INSULATOR, 6.6 KV MECHANICAL STRENGTH 20,000 LBS.-CLEVIS
13	DOUBLE ARMING BOLT 5/8" WITH SQ. WASHERS 5/8"X2½"X 2½" AND 5/8" SQ. NUT. LENGTH OF BOLT, VARIES WITH THICKNESS OF POLE.
14	MACHINE BOLT WITH 5/8" WASHERS. LENGTH OF BOLT VARIES - POLE THICKNESS.
15	CROSS ARM BRACE 1½"X ¼"X 28" STRUCTURAL GRADE STEEL. BREAK STRENGTH 10000 LBS.
16	LAG SCREW ½"X 4" FETTER DRIVE.
17	"HIGH VOLTAGE" SIGN. YELLOW PLASTIC WITH LETTERS CUT OUT (4)
18	SUPPORT ARM 3½"X4½"X 24"
19	NON-SHIELDED 5000V. #8 - 1 CONDUCTOR (SOLID) CABLE.
20	"HIGH VOLTAGE" SIGN. (2) STAGGARED ONE ON EACH SIDE OF HEEL ARM.
21	PLASTIC CONDUIT 1½" (HEAVY WALL)
22	GALV. STRAPS, 1¾" 2 NAIL HOLES.
23	½"X 5" GALV. EYE BOLT WITH ½" GALV. ROUND WASHER.
24	5/8"X4½" CROSS ARM BOLT WITH 3/8" GALV. ROUND WASHER.
25	#6 BARE COPPER GROUND WIRE COVERED WITH WOOD MOULDING.



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

APPROVED:

Henry Ford Jr. 11/1/66

TRAFFIC ENGINEER, C&C OF HONOLULU — DATE

This work was prepared by me or under my supervision.

J. Oberhousen

Junius J. Oberhousen

JAMES J. OBERHAUSEN — REGISTERED PROFESSIONAL ENGINEER — No. 664 — HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES
C&C TRANSFORMER DETAILS

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

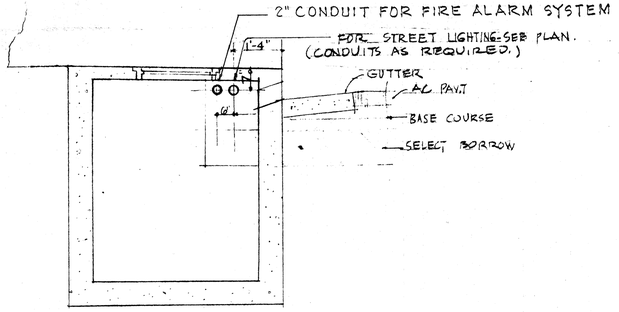
NOT TO SCALE — Date: AUG. 1966

SHEET No. 92 OF 235 SHEETS

114

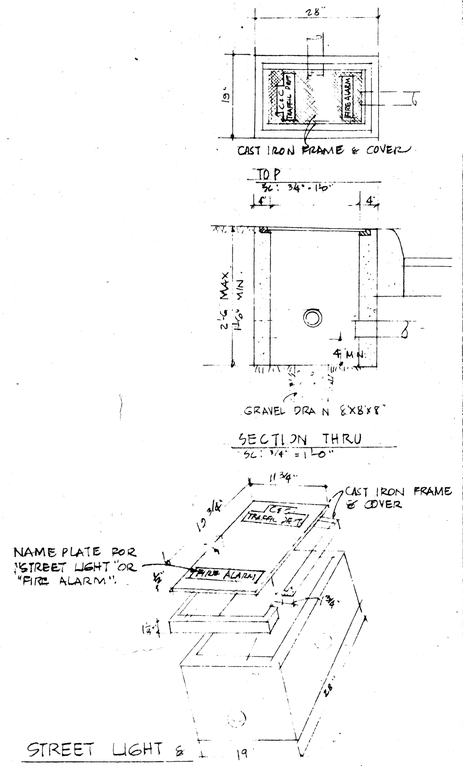
PRINTED ON NO. 1000H CLEARPRINT

NOTE: GALV. CONDUITS SHALL BE SUPPORTED BY BAND HANGERS BOLTED TO THE TOP SLAB OF CATCH BASINS. PIPE HANGERS AND BOLTS SHALL BE INCIDENTAL TO ITEM NO. 46.101 CLASS A-1 CONCRETE OTHER THAN IN BRIDGES.



TYPICAL SECTION SHOWING CONDUITS PASSING THROUGH CATCH BASINS

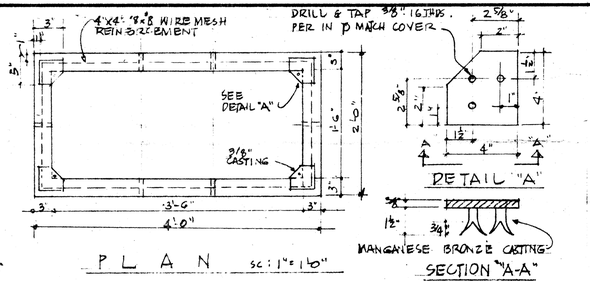
SCALE: 1/2" = 1'-0"



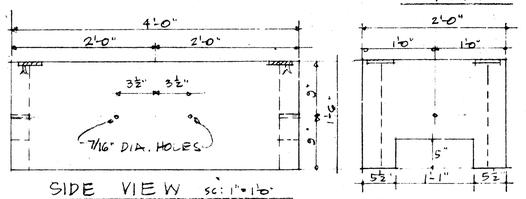
SECTION THRU

SC: 1/4" = 1'-0"

STREET LIGHT & FIRE ALARM PULL-BOX - TYPE "A"



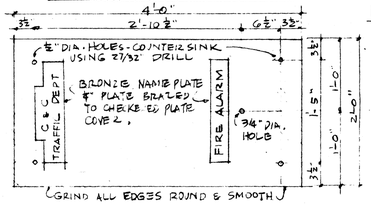
PLAN SC: 1"=1'-0"



SIDE VIEW SC: 1"=1'-0"

END VIEW

SC: 1"=1'-0"



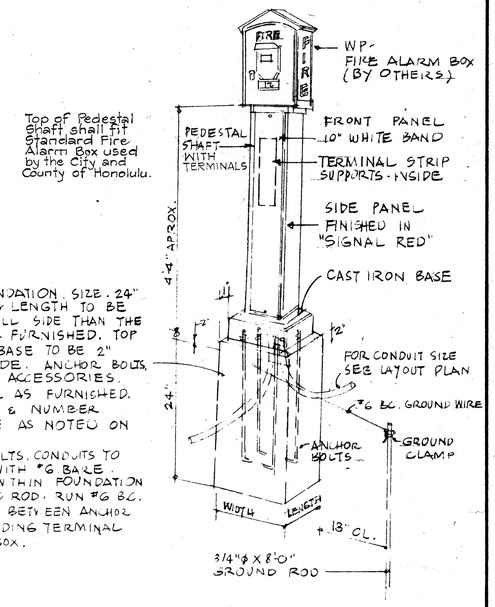
NOTES:

1. USE ⅜" PLATE FOR DRIVEWAYS.
2. CONC. BOX 575 LBS.
3. ¼" CH.PL. 150 LBS.
4. HOT DIP GALVANIZE CHECKERED PLATE COVER AFTER FABRICATION.
5. SECURE COVER WITH ⅜"X 1" FLAT HEAD BRASS MACHINE SCREW.
6. NAME PLATE - FOR "STREET LIGHT" OR "FIRE ALARM"

¼" CHECKERED PLATE COVER (GALVANIZED) SC: 1"=1'-0"

1'-6" x 3'-6" CONCRETE SERVICE BOX FOR STREET LIGHT & FIRE ALARM PULL BOX TYPE "B"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1960	115	235



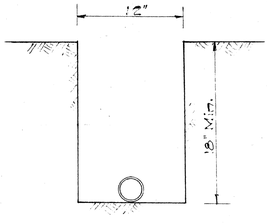
Top of Pedestal Shaft shall fit Standard Fire Alarm Box used by the City and County of Honolulu.

CONCRETE FOUNDATION. SIZE - 24" DEPTH, WIDTH & LENGTH TO BE 1" WIDER ON ALL SIDE THAN THE CAST IRON BASE FURNISHED. TOP OF CONCRETE BASE TO BE 2" ABOVE FIN. GRADE. ANCHOR BOLTS, NUTS, AND THE ACCESSORIES. SIZE & NUMBER AS FURNISHED. CONDUIT SIZE & NUMBER ENTERING BASE AS NOTED ON PLAN.

ALL ANCHOR BOLTS, CONDUITS TO BE WRAPPED WITH #6 BARE COPPER WIRE WITHIN FOUNDATION AND TO GROUND ROD. RUN #6 BC. GROUND WIRE BETWEEN ANCHOR BOLT AND GROUNDING TERMINAL IN FIRE ALARM BOX.

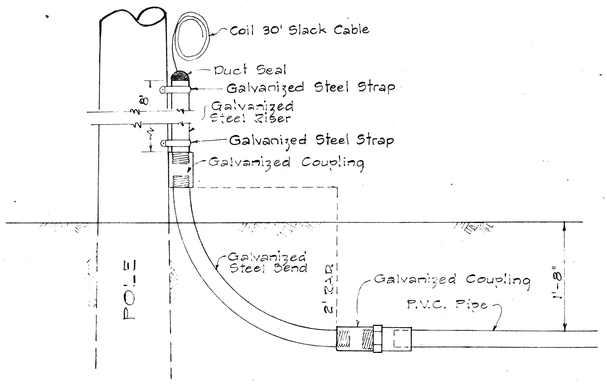
MANUAL FIRE ALARM STATION

FIRE ALARM BOX. NOT TO SCALE.



TYPICAL TRENCH DETAIL FOR FIRE ALARM AND STREET LIGHTING SYSTEM

Scale: 1½" = 1'-0"



TYPICAL DETAIL COMBINATION RISER AND BEND

Scale: 1" = 1'-0"

APPROVED

Harry Saunders Jr. 11/1/60

TRAFFIC ENGINEER, C. & C. of Honolulu DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS FOR C & C FIRE ALARM AND STREET LIGHTING SYSTEM

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. No. I-HI-1 (6) UNIT 3

SCALE: AS NOTED DATE: July 1960

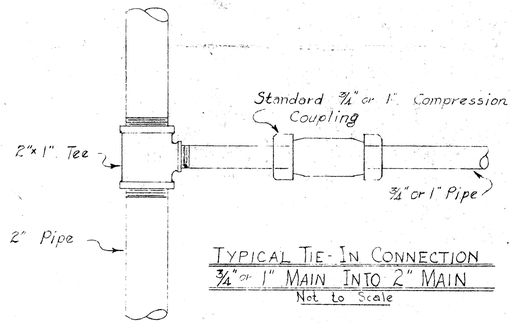
SHEET No. 33 OF 35 SHEETS

115

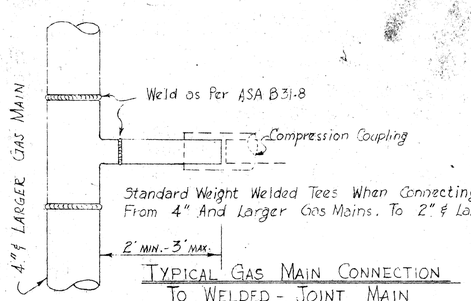
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

PRINTED ON NO. 1000H CLEARPRINT

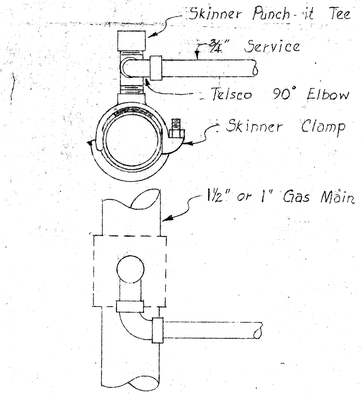
U.S. ROUTE DIST. NO.	STATE	F.A.I. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(6) UNIT 3	1966	116	235



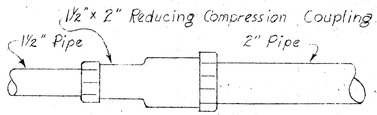
TYPICAL TIE-IN CONNECTION
¾" or 1" MAIN INTO 2" MAIN
Not to Scale



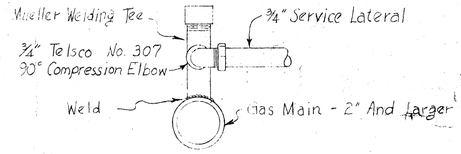
TYPICAL GAS MAIN CONNECTION
TO WELDED-JOINT MAIN
Not to Scale

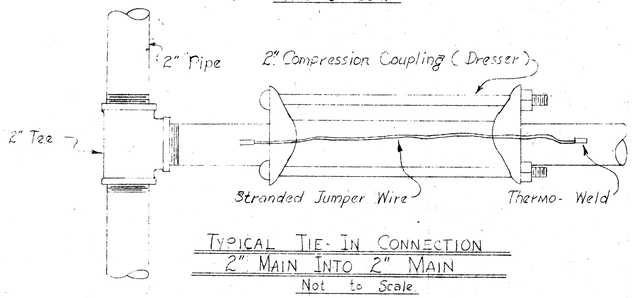


TYPICAL MAIN-SERVICE CONNECTION
1½" OR 1" MAIN
Not to Scale

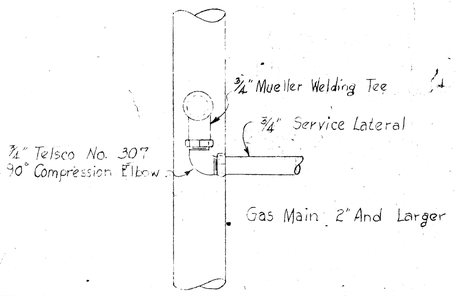


TYPICAL IN-LINE TIE-IN
1½" MAIN TO 2" MAIN
Not to Scale



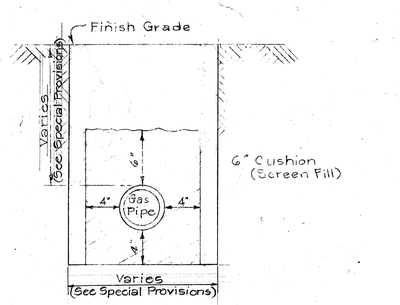


TYPICAL TIE-IN CONNECTION
2" MAIN INTO 2" MAIN
Not to Scale

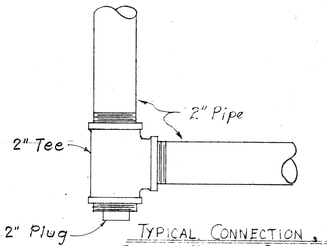


TYPICAL MAIN-SERVICE CONNECTION
Not to Scale

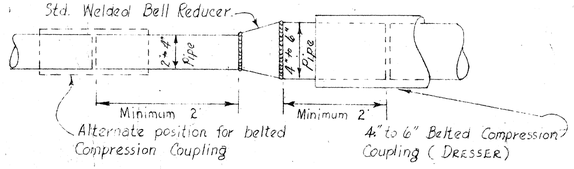
All gas service connections will consist of:
1. ¾" Mueller Welding Tee Welded to Main as shown
2. ¾" Telsco No. 307 90° Compression Elbow. This is for services connections at Mains only.



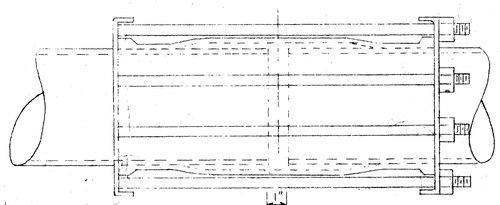
TYPICAL TRENCHING DETAIL
Not to Scale



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 Telsco 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
Paul C Jost 10/3/66
DIRECTOR OF DEVELOPMENT, HON GAS CO. LTD DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

GAS CONNECTION DETAILS

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I. PROJ. NO. I-HI-1(6) UNIT 3

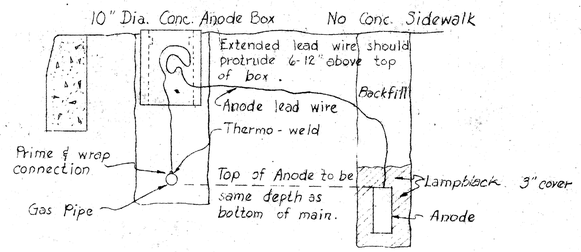
SCALE: AS SHOWN DATE: July 1966

SHEET No. 34 OF 35 SHEETS

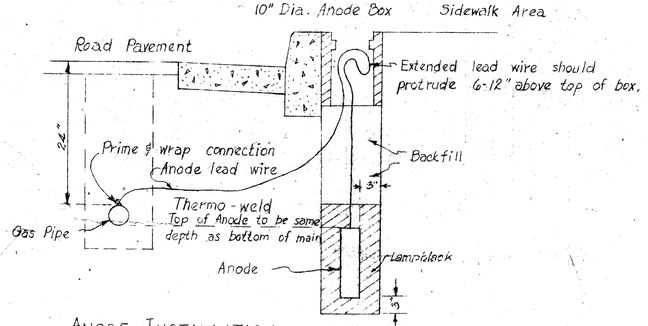
11-6

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

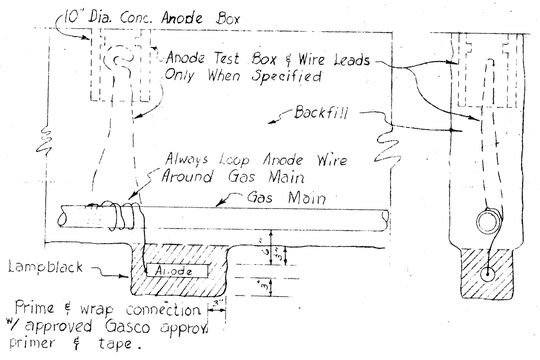
FED.ROAD DIST.No.	STATE	FED. AID PROJ.No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6) UNIT 3	1966	117	235



ANODE INSTALLATION
TYPE "A" Not to Scale



ANODE INSTALLATION
TYPE E Not to Scale



ANODE INSTALLATION
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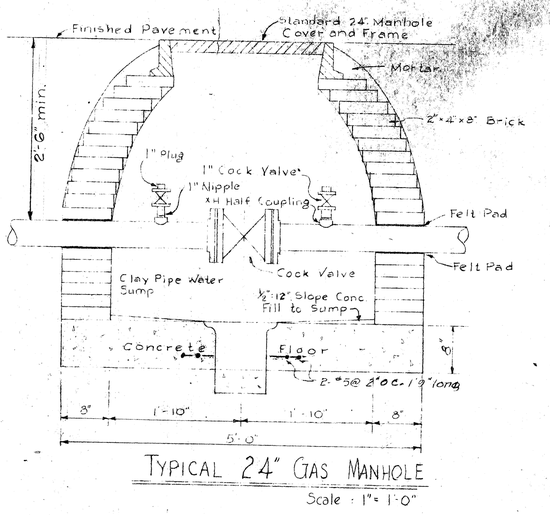
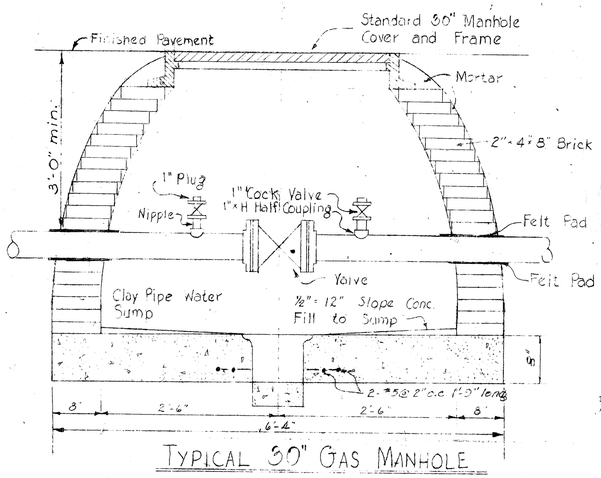
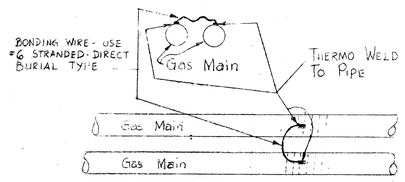


TYPICAL 24" GAS MANHOLE
Scale : 1"= 1'-0"



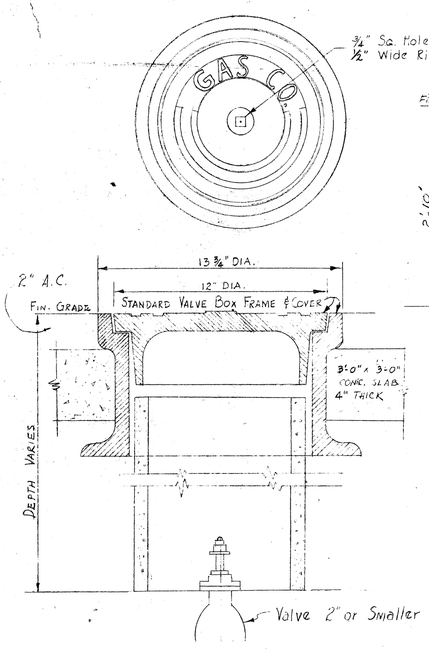
TYPICAL 30" GAS MANHOLE
Scale : 1"= 1'-0"



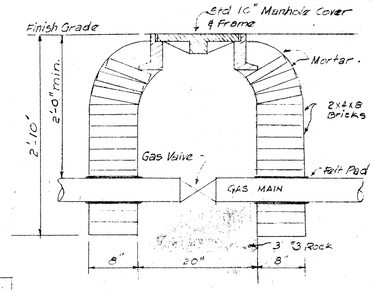
WRAP COMPLETED CONNECTION WITH GASCO APPROVED PRIMER AND TAPE

TYPICAL BOND CONNECTION
Not to Scale

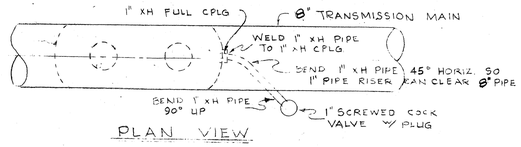
Note : Offset word Gasco 1¾" high ⅛" deep.



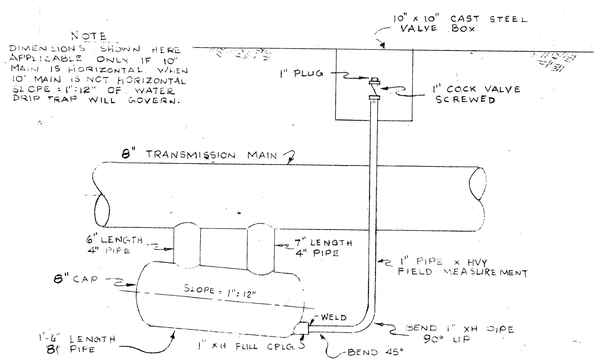
TYPICAL DETAIL OF VALVE BOX FOR 2" GAS VALVE AND SMALLER



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



PLAN VIEW



ELEV. VIEW

TYPICAL WATER DRIP
Not to Scale

NOTE:
1. All concrete work shall be done in accordance with Section 46 "Concrete Structures" of the Standard Specifications
2. Installation of cast iron M.H. frame and cover and sump pipe shall be considered as included in the cost for concrete work.

APPROVED
Paul C. Jay 10/3/66
DIRECTOR OF DEVELOPMENT, GASCO LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES

MISCELLANEOUS GAS DETAILS

INTERSTATE HIGHWAY (LUNALILO FREEWAY)
F.A.I PROJ. NO. I-HI-1(6) UNIT 3
SCALE: AS SHOWN DATE: July 1966

SHEET No. 35 OF 35 SHEETS

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