FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)13	1971	138	362

GENERAL WATER NOTES

(BOARD OF WATER SUPPLY)

1. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
2. PRIOR TO EXCAVATING FOR NEW DRAIN, SEWER AND OTHER UTILITY LINES, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.
3. ASTERISK (*) INDICATES WORK TO BE PERFORMED BY B.W.S. MATERIALS TO BE FURNISHED BY THE CONTRACTOR UNLESS SPECIFIED AS "RELOCATE."
4. APPROVAL BY THE BOARD OF WATER SUPPLY IS ONLY TO ASSURE THAT ADJUSTMENTS TO THE WATER SYSTEM ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE B.W.S. STANDARDS. DISCREPANCIES IF ANY, OF ALIGNMENTS, GRADES, FITTINGS, ETC., SHALL BE THE RESPONSIBILITY OF THE ENGINEER WHO PREPARES THE PLAN.
5. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DATED 1969, AS AMENDED, OF THE HAWAII HIGHWAYS DIVISION, DEPARTMENT OF TRANSPORTATION.
6. WHERE THE INSTALLATION OF NEW DRAIN, SEWER OR OTHER UTILITY LINES ARE TO CROSS OVER OR UNDER EXISTING WATER MAINS, THE CONTRACTOR SHALL EXPOSE THE EXISTING WATER MAINS PRIOR TO TRENCHING. EXCAVATION AROUND WATER MAINS SHALL BE DONE BY HAND.
7. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT ARE NOT GUARANTEED AS TO THE ACCURACY OR THAT OTHER OBSTACLES MAY NOT BE ENCOUNTERED IN THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ANY DAMAGES TO THE EXISTING MAIN.
8. ANY ADJUSTMENT TO THE WATER MAINS AND APPURTENANCES, WHETHER SHOWN ON THE CONSTRUCTION PLANS OR NOT SHALL BE MADE A PART OF THE PROJECT.
9. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN DOING WORK OVER THE EXISTING 42" MAIN.

GENERAL TELEPHONE NOTES (H.T. CO.)

A. H.T. CO. CABLES:

1. EXCAVATION OF POLES AND ANCHORS AND INSTALLATION OF ANCHORS BY THE CONTRACTOR.
2. ALL MANHOLES, HANDHOLES, PULLBOXES, CONDUITS AND C-BENDS TO BE INSTALLED BY THE CONTRACTOR.
3. ALL MATERIALS TO BE FURNISHED BY H.T. CO. UNLESS NOTED OTHERWISE.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH H.T. CO., STANDARD DRAWINGS.
5. H.T. CO., TO REMOVE POLES AND CABLES.

(CONTINUED)

B. TRANSPACIFIC LAND CABLES:

1. EXISTING TRANSPACIFIC LAND CABLES TO REMAIN IN PLACE UNTIL RELOCATED SECTION IS CUT-OVER.
2. ALL TRENCHING, BACKFILLING, DIGGING OF SPLICE PITS AND INSTALLATION OF THE 4" GALVANIZED STEEL PIPE BY THE CONTRACTOR. H.T. CO., TO FURNISH MATERIALS.
3. H. T. CO., TO FURNISH, INSTALL AND SPLICE TRANSPACIFIC LAND CABLES.
4. CONTRACTOR TO TRENCH AND BACKFILL THE LENGTH OF THE UTILITY CORRIDOR FOR PERMANENT RELOCATION OF THE TRANSPACIFIC LAND CABLES.
5. SPLICE PIT LOCATIONS ARE APPROXIMATE. H.T. CO. INSPECTOR TO VERIFY LOCATIONS IN THE FIELD.

C. JOINT TRUNKING SYSTEM CABLES:

1. EXISTING JOINT TRUNKING SYSTEM CABLES TO REMAIN IN PLACE UNTIL RELOCATED SECTION IS CUT-OVER.
2. ALL TRENCHING, BACKFILLING AND DIGGING OF SPLICE PITS BY THE CONTRACTOR.
3. H. T. CO., TO FURNISH, INSTALL AND SPLICE JOINT TRUNKING SYSTEM CABLES.
4. SPLICE PIT LOCATIONS ARE APPROXIMATE. H.T. CO. INSPECTOR TO VERIFY LOCATIONS IN THE FIELD.

A. H.T. CO. CABLES (CONTINUED):

6. POLES AND ANCHORS ARE FOR H.E. CO. UNLESS OTHERWISE INDICATED.
7. DEPTH OF POLES AND ANCHOR HOLES ARE TAKEN FROM FINISH GRADE.
8. FOR POLE SETTING DEPTH DATA, SEE SHEET NO. 24U.
9. ALL DUCTS AND CONDUITS CALLED FOR INSTALLATION IN CONCRETE JACKET SHALL BE INSPECTED AND APPROVED BY THE ENGINEER OF H.T. CO., OR H.T.CO. REPRESENTATIVE BEFORE CONCRETE PLACING. 24 HR.(MIN.) NOTICE SHALL BE GIVEN BEFORE PLACING CONCRETE.
10. MINIMUM DEPTH OF DUCT LINES FROM FINISH GRADE TO TOP OF CONCRETE JACKET WHERE DUCTS ARE CONCRETE ENCASED = 2'-0" UNLESS OTHERWISE SHOWN. WITHIN INTERSTATE ROUTE H-3 R/W, MINIMUM DEPTH SHALL BE 3'-0".
11. DUCTS ENCASED IN CONCRETE JACKETS:
    a. NORMAL DISTANCE FACE OF JACKET TO ALL DUCTS TO BE 3" MINIMUM.
    b. CLEAR DISTANCE OF 1 1/2" MINIMUM BETWEEN DUCTS OF SAME UTILITY COMPANY.
    c. CLEAR DISTANCE OF 3" MINIMUM BETWEEN H.E. CO. DUCTS AND H.T. CO. DUCTS.
12. LOCATION AND DEPTH OF ALL PULLBOXES, SERVICE BOXES, HANDHOLES, MANHOLES, DUCT LINES, POLES AND ANCHORS TO BE VERIFIED AND APPROVED IN THE FIELD BY H.T. CO. PRIOR TO EXCAVATION, CONSTRUCTION AND INSTALLATION.
13. THE CONTRACTOR SHALL NOTIFY H.T. CO. IN WRITING 20 WORKING DAYS PRIOR TO COMMENCING WORK ON H.T. CO. UTILITY SYSTEM.
14. EXISTING TELEPHONE FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THEIR ACTUAL LOCATION AND SHALL MAKE ADJUSTMENTS TO ANY NEW OR EXISTING FACILITY AS DIRECTED BY THE ENGINEER.

GENERAL AVGAS NOTES (NAVY)

1. THE CONTRACTOR SHALL COORDINATE ALL WORK ON THE AVGAS LINE WITH THE NAVY SUPPLY CENTER (PHONE 43-57128, MR. MILLER)
2. THE CONTRACTOR SHALL NOTIFY THE NAVY IN WRITING FIFTEEN (15) DAYS PRIOR TO COMMENCING WORK ON THE AVGAS LINE.

GENERAL NOTES

(NAVY-ELECTRIC SYSTEM) ALSO SEE NOTES 8 THRU 10 OF H.E. CO.

1. THE CONTRACTOR SHALL COORDINATE ALL WORK ON NAVY UTILITIES WITH THE NAVY PUBLIC WORKS CENTER (PHONE EXTENSION 29102). ALL SALVAGED MATERIAL IS TO BE STOCKPILED, AND THE NAVY PUBLIC WORK CENTER NOTIFIED WHEN AVAILABLE FOR PICKUP.
2. EXISTING ELECTRIC SYSTEMS SHOWN ON THESE PLANS ARE LOCATED FROM THE BEST SOURCES AVAILABLE. THE CONTRACTOR SHALL CHECK AND VERIFY THE EXACT LOCATION OF SAME PRIOR TO START OF CONSTRUCTION OPERATIONS.
3. CONTRACTOR TO STAKE OUT NAVY DUCT LINES, POLE AND ANCHOR LOCATIONS; NAVY TO CHECK LOCATIONS BEFORE CONTRACTOR UNDERTAKES EXCAVATION, INSTALLATION AND BACKFILL.
4. FOR POLE SETTING DEPTH AND ANCHOR DATA, SEE SHEET NOS. 24U & 25U.
5. ALL DUCTS AND CONDUITS CALLED FOR INSTALLATION IN CONCRETE JACKET SHALL BE INSPECTED AND APPROVED BY THE NAVY BEFORE CONCRETE PLACING. 72 HOURS (MINIMUM) NOTICE SHALL BE GIVEN BEFORE PLACING CONCRETE.

GENERAL NOTES (NAVY-SEWER)

1. THE CONTRACTOR SHALL COORDINATE ALL WORK ON NAVY UTILITIES WITH THE NAVY PUBLIC WORKS CENTER (PHONE EXTENSION 29102). ALL SALVAGED MATERIAL IS TO BE STOCKPILED, AND THE NAVY PUBLIC WORKS CENTER IS TO BE NOTIFIED WHEN AVAILABLE FOR PICKUP.
2. ALL EXCAVATION AND BACKFILL SHALL BE DONE BY THE CONTRACTOR, INCLUDING EXCAVATION FOR THE RELOCATION OF EXISTING LINES.
3. THE LOCATION OF EXISTING SEWER LINE AND APPURTENANCES SHOWN ON THE PLANS ARE APPROXIMATE ONLY AND THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION.
4. UNLESS OTHERWISE NOTED, DETAILS OF PROPOSED SANITARY SEWER FACILITIES FOR THE U.S. NAVY SHALL CONFORM TO THE STANDARD DETAILS OF THE CITY AND COUNTY OF HONOLULU. MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF SECTION 625 OF THE STATE OF HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1969.

GENERAL GAS NOTES (H.G. CO.)

1. ALL WORK REQUIRED FOR THE INSTALLATION OF THE RELOCATED GAS MAIN AND FACILITIES SHALL BE DONE BY THE CONTRACTOR. CONTRACTOR SHALL FURNISH LABOR AND EQUIPMENT FOR EXCAVATION, CUSHIONING, BACKFILLING, HANDLING AND STRINGING GAS PIPING, FABRICATING AND WELDING THE GAS PIPING AND TESTING AFTER RELOCATION.
2. THE CONTRACTOR SHALL NOTIFY THE HONOLULU GAS COMPANY, LTD. AT LEAST 10 CALENDAR DAYS IN ADVANCE OF RELOCATION OPERATIONS AND SHALL COORDINATE HIS WORK WITH THE GAS COMPANY.
3. THE CONTRACTOR SHALL CHECK AND VERIFY THE EXACT LOCATION AND DEPTH OF EXISTING GAS LINE PRIOR TO START OF CONSTRUCTION OPERATIONS.

GENERAL ELECTRIC NOTES (H.E. CO.)

1. WOOD AND STEEL POLES AND ANCHOR LOCATIONS TO BE STAKED OUT BY THE CONTRACTOR AND VERIFIED BY H.E. CO.
2. H.E. CO. TO FURNISH STEEL POLES AND H.E. CO'S. CONTRACTOR TO CONSTRUCT FOUNDATIONS AND INSTALL STEEL POLES.
3. EXCAVATION OF POLE HOLES AND ANCHORS, INSTALLATION OF POLES AND ANCHORS, AND BACKFILL OF POLES AND ANCHORS BY OTHERS.
4. POLES AND ANCHORS AS INDICATED H.E. CO. WILL BE INSTALLED BY H.E. CO'S. CONTRACTOR.
5. DEPTH OF POLES AND ANCHOR HOLES ARE TAKEN FROM FINISH GRADE.
6. FOR POLE SETTING DEPTH DATA, SEE SHEET NO. 24U.
7. ALL DUCTS AND CONDUITS CALLED FOR INSTALLATION IN CONCRETE JACKET SHALL BE INSPECTED AND APPROVED BY THE ENGINEER OF H.E. CO., OR H.E. CO. REPRESENTATIVE BEFORE CONCRETE PLACING. 24 HR. (MIN.) NOTICE SHALL BE GIVEN BEFORE PLACING CONCRETE.
8. MINIMUM DEPTH OF DUCT LINES FROM FINISH GRADE TO TOP OF CONCRETE JACKET WHERE DUCTS ARE CONCRETE ENCASED = 3'-0" UNLESS OTHERWISE SHOWN. OUTSIDE INTERSTATE ROUTE H-3 R/W, MINIMUM DEPTH SHALL BE 2'-0".
9. DUCTS ENCASED IN CONCRETE JACKETS:
    a. NORMAL DISTANCE FACE OF JACKET TO ALL DUCTS TO BE 3" MINIMUM.
    b. CLEAR DISTANCE OF 1½" MINIMUM BETWEEN DUCTS.
    c. CLEAR DISTANCE OF 3" MINIMUM BETWEEN H.E. CO. DUCTS AND H.T. CO. DUCTS
10. LOCATION AND DEPTH OF ALL PULLBOXES, SERVICE BOXES, HANDHOLES AND MANHOLES TO BE VERIFIED AND APPROVED IN THE FIELD BY H.E. CO. PRIOR TO EXCAVATION, CONSTRUCTION OR INSTALLATION.
11. THE CONTRACTOR SHALL NOTIFY H.E. COMPANY IN WRITING 20 WORKING DAYS PRIOR TO COMMENCING WORK ON THEIR RESPECTIVE UTILITY SYSTEM.
12. EXISTING ELECTRIC FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THEIR ACTUAL LOCATIONS AND SHALL MAKE ADJUSTMENTS TO ANY NEW OR EXISTING FACILITY AS DIRECTED BY THE ENGINEER.
13. CONSTRUCT ALL MANHOLE NECKS PER DETAIL "C-C" DRAWING 16688.
14. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS TO COMPLETE CONSTRUCTION OF UNDERGROUND DUCTLINE SYSTEM INCLUDING RISER CONDUITS.
15. H.E. CO. IS TO COORDINATE ITS WORK WITH THE STATE'S CONTRACTOR IN SUCH A MANNER AS NOT TO IMPEDE CONSTRUCTION.
16. ALL EXISTING H.E. CO. FACILITIES SHALL REMAIN IN PLACE UNTIL THE PROPOSED FACILITIES ARE PROVIDED. ANY COST FOR TEMPORARY RELOCATIONS ARISING DURING CONSTRUCTION SHALL BE BORNE BY THE STATE'S CONTRACTOR.
17. H.E. CO. TO MANDREL TEST ALL ITS DUCTLINES.
18. MANHOLE FRAMES AND COVERS TO BE 31".

APPROVED

A. Kawakami — 3/1/71
ASSIST. CHIEF ENGINEER, B.W.S. — DATE

T. Mona — 3/8/71
CHIEF, DIV. OF SEWERS — DATE

[illegible] — 5/20/71
HAWAIIAN ELECTRIC CO., INC. — DATE

F.H. Judd — 2-8-71
HAWAIIAN TELEPHONE CO., LTD. — DATE

Paul C. Jay, Vice Pres — 1-20-71
HONOLULU GAS CO. — DATE

Edwards Watts — 3/16/71
DIRECTOR & BLDG. SUPERINTENDENT — DATE

GENERAL SEWER NOTES (CITY)

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, NOVEMBER 1968; THE DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS, JULY, 1965; AND THE REVISED ORDINANCES OF HONOLULU, SEPTEMBER 28, 1961.
2. THE CONTRACTOR SHALL NOTIFY THE DIVISION OF SEWERS 10 DAYS PRIOR TO COMMENCEMENT OF SEWER WORK.
3. TOP OF SEWER MANHOLES IN EASEMENTS SHALL BE FOUR (4) INCHES ABOVE GROUND UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. CRUSHED ROCK CRADLE WILL BE PERMITTED WHERE THE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL THE ENGINEER AND THE SEWER ENGINEER (C&C) WILL DETERMINE THE PIPE SUPPORT REQUIRED.
5. ALL FRAMES AND COVERS ON EXISTING SEWER MANHOLES TO BE DEMOLISHED SHALL BE CLEANED AND REUSED ON NEW SEWER MANHOLES OR RETURNED TO THE CITY AND COUNTY AS DIRECTED BY THE SEWER ENGINEER (C&C).
6. LOCATIONS OF PROPOSED LINES, UNLESS OTHERWISE NOTED, ARE TO BE CONSIDERED DIAGRAMMATIC. UPON VERIFICATION IN THE FIELD OF THE LOCATION OF EXISTING LINES, THE FINAL LOCATION OF THE PROPOSED LINES SHALL BE DETERMINED SUBJECT TO THE APPROVAL OF THE ENGINEER AND CITY AND COUNTY OF HONOLULU.
7. CUTTING AND PLUGGING OF EXISTING SEWERS AND SEWER LATERALS IS TO BE CONSIDERED INCIDENTAL EXCEPT FOR CHANNELING IN EXISTING MANHOLES, WHICH WORK IS TO BE DONE BY THE DIVISION OF SEWERS (C&C).
8. RESTORATION OF EXISTING STREETS AND OTHER IMPROVEMENTS TO BE INCIDENTAL.

J. ANDREW SCHUCHARDT — REGISTERED PROFESSIONAL ENGINEER — No. 2229 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL UTILITY NOTES

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89):13

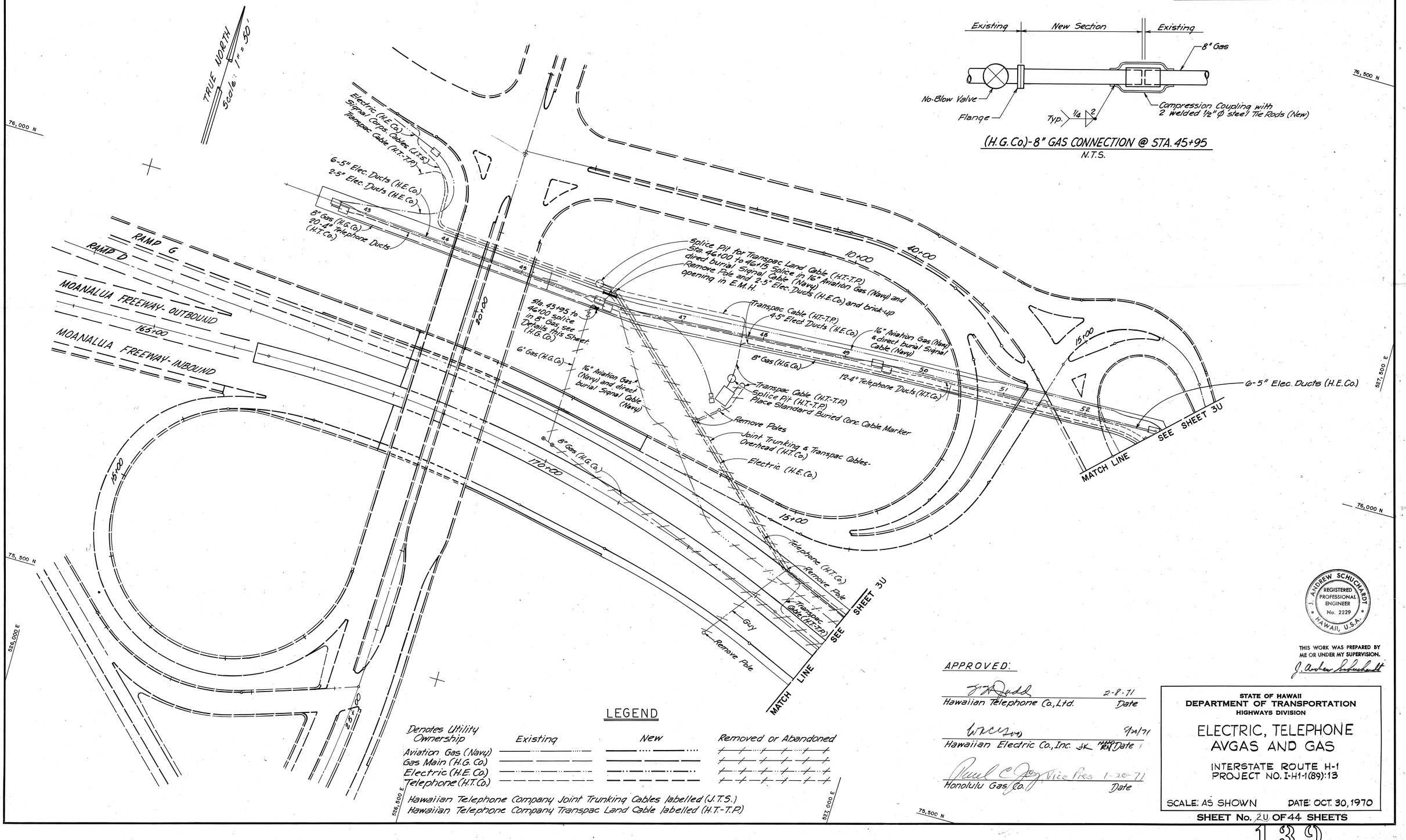
NO SCALE — DATE: OCT. 30, 1970

SHEET No. 14 OF 44 SHEETS

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

PRINTED ON NO. 1000N CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	130	362



(H.G.Co.)-8" GAS CONNECTION @ STA. 45+95
N.T.S.

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

J. ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

APPROVED:

F. H. Judd 2-8-71
Hawaiian Telephone Co., Ltd. Date

W. K. Lee 3/10/71
Hawaiian Electric Co., Inc. Date

Paul C. Jay Vice Pres 1-20-71
Honolulu Gas Co. Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC, TELEPHONE AVGAS AND GAS

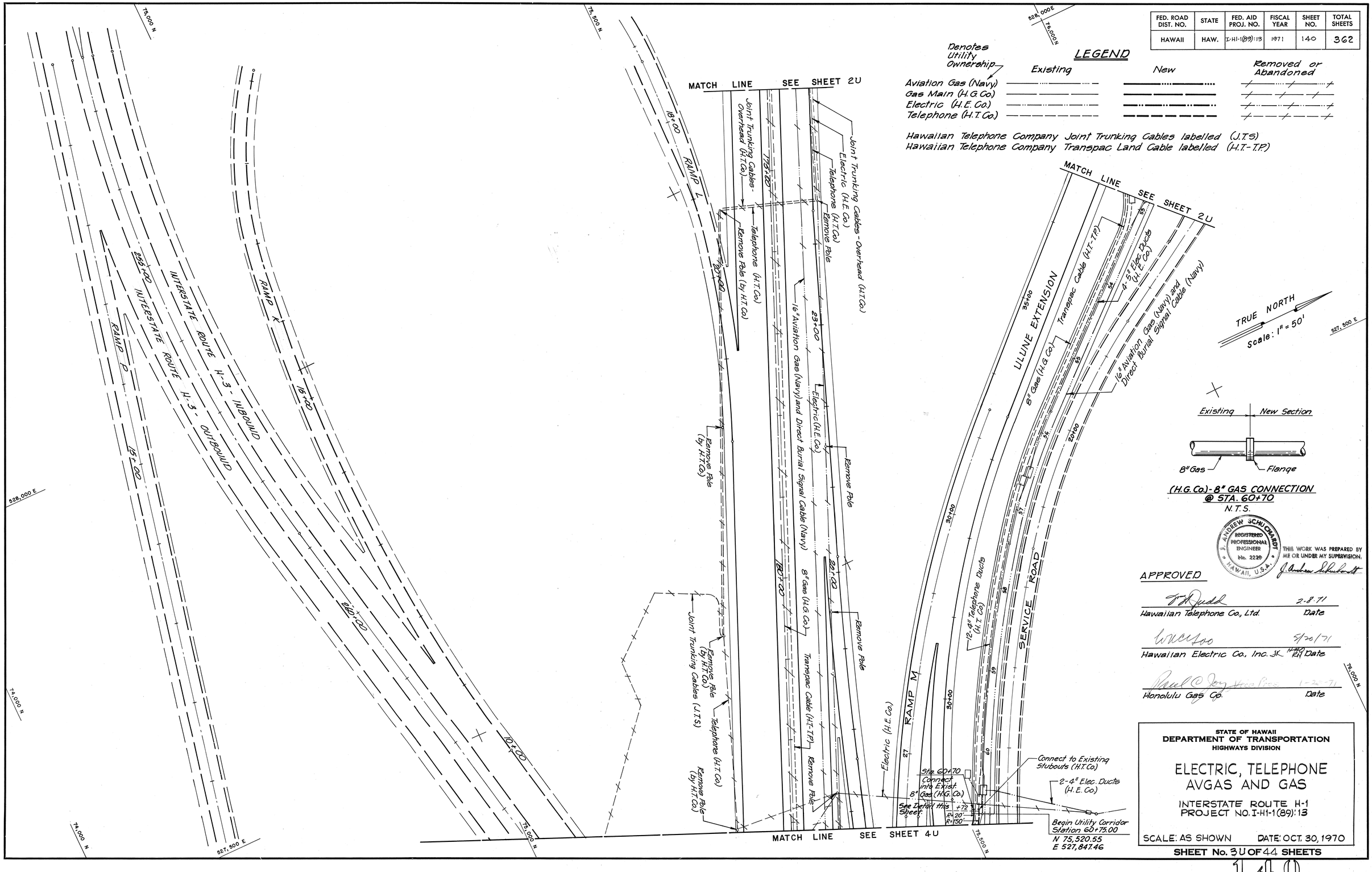
INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89):13

SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 2U OF 44 SHEETS

139

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	140	362



ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2239 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

APPROVED

F.F. Judd — 2-8-71
Hawaiian Telephone Co., Ltd. — Date

5/20/71
Hawaiian Electric Co., Inc. JK HHD RH Date

Paul C. Jay Vice Pres. — 1-31-71
Honolulu Gas Co. — Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC, TELEPHONE AVGAS AND GAS

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89):13

SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 3U OF 44 SHEETS

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

140

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	141	362

74,500 N | 527,500 E | 75,000 N | 75,500 N | 528,000 E | 528,500 N | 527,500 E | 528,000 E

TRUE NORTH
Scale: 1"= 50'

MATCH LINE SEE SHEET 3U

MATCH LINE SEE SHEET 5U

INTERSTATE ROUTE H-3 OUTBOUND N.I.C.

INTERSTATE ROUTE H-3 INBOUND N.I.C.

RAMP O

RAMP P

RAMP N

Drainage Ditch

Telephone (H.T.Co.)
Construct bricked up opening for future 18" R.C.P.

Electric (H.E.Co.)

Ext. 18" R.C.P. San. Sewer

Az. 204°58'

Az. 217°53'03"

New S.M.H. M.F. Sta. 183+82.81, 139.35' Rt., Inv. 54.64 (City). Walls to be cast-in-place reinforced concrete. Frame & Cover Relocated.

Remove Pole

Remove Pole (by H.T.Co.)

Electric (H.E.Co.)

183.00

380 Lin. Ft. 18" R.C.P. Cl. II San. Sewer encased in Concrete Jacket (City)

Sta. 62+20 32° (A) (H.G.Co.)

Sta. 62+05.93 = UE Sta. 27+35

Remove bricked up opening and connect new 18" R.C.P. San. Sewer

12-4" Telephone Ducts (H.T.Co.)

Exist. S.M.H. (City) Inv. 55.40

2-4" Telephone Ducts, Connect to Exist. (H.T.Co.) 18" R.C.P. San. Sewer in Conc. Jacket (City)

Exist. S.M.H. (City)

1-1"x8' Anchor Inv. 55.63
@ 20' Lead (H.T.Co.)

Service Rd. Sta. 26+99, 19'0/S

T.H.H. #21 (Existing) (H.T.Co.)

To Sta. 63+00± T.M.H. #22 Type A-385 (H.T.Co.)

For Details see "Plan @ T.M.H. #22" Sheet 16U.

Sta. 63+74± Compression Coupling (H.G.Co.)

8-4" Telephone Ducts (H.T.Co.)
6-4" Telephone Ducts (H.T.Co.)
6-4" Telephone Ducts (H.T.Co.)
1-8" Gas, Schedule 40 Pipe, To be 100% X Rayed (H.G.Co.)
Within Structure #16, see Bridge Plans

Serv. Rd. Sta. 28+35 (23.05 E.M.H. #20, (H.E.Co.) Existing

Elec. Sta. 64+10± Conn. into Exist. M.H. (H.E.Co.)

Sta. 64+51.30
Connect into Existing 16" Av. Gas (Navy) & Direct Burial Signal Cable (Navy)
(N 75,444.99
E 528,209.71)

Az. 282°49'04" 33.00'

Splice Pit (H.T.Co.)

30' Class 5 Pole (H.T.Co.)

6-5" Elec. Ducts (H.E.Co.)

Drainage Ditch

Remove Pole
1-1¼"x10' Anchor & 30' Lead (H.E.Co.)
1-1¼"x10' Anchor & 75' Lead (H.E.Co.)
New 80' Wood Pole w/ 2-5" Riser Conduits (H.E.Co.)

Concrete Knock Out Slab

MH 21A (6'x11') - BETT.

MH 21B (6'x11') - BETT.

MH #2637 - Type "A-1-6", CCO #30

Telephone (H.T.Co.)
Electric (H.E.Co.) 12 KV, 4G KV, Neut.

2-5" Elec. Ducts (2W x 1H) (H.E.Co.)

Az. 292°59'30" 878.21'

20" Pipe Sleeve Casing

E.M.H. #21 Type 1, 6'x11' (H.E.Co.)

New 50' Pole w/ 2-5" Riser Conduits, 1-1"x8' Anchor & 25' Lead (H.E.Co.)

2-5" Elec. Ducts (2W x 1H) (H.E.Co.)

16" Aviation Gas (Navy) & Direct Burial Signal Cable (Navy) See Sht. 10 U for profile

Transpac Cable (H.T.-T.P.)

6-5" Elec. Ducts (H.E.Co.)

Remove Exist. Av. Gas Cathodic Protection Anode Bed and Marker Post

Sta. 70+10 - Provide Valve Pit w/ M.O. Valve See Detail 1 Sht. 19 U

Sta. 69+72± Compression Coupling (H.G.Co.)

P.I. Sta. 70+17.13 Bk.
Elec. Sta. 70+30
E.M.H. #22, Type 1, 6'x11' (H.E.Co.)

Structure #16, Pier 2 Footing

Structure #16, Pier 1 Footing

Remove Exist. Av. Gas Cathodic Protection Equipment Installation

3' Min.

46 KV Overhead Line (H.E.Co.)

Joint Trunking Cables (J.T.S.)

Electric (H.E.Co.)

Remove Existing Valve Pit and M.O. Valve. M.O. Valve to be Relocated To Temporary Location As Necessary and Ultimately to AV.GAS Sta. 70+10.

Remove Pole (by H.T.Co.)

16" Aviation Gas (Navy) & Direct Burial Signal Cable (Navy)

Remove Pole (by H.T.Co.)

Telephone (H.T.Co.)

Remove Pole (by H.T.Co.)

Transpac Cable (H.T.-T.P.)

8" Gas (H.G.Co.)

New Steel Pole (H.E.Co.) U.E. Sta. 70+18, 47' %

For Details see "Plan @ E.M.H. #22 & T.M.H. #23" Sht. 16 U

Ft. Relocated North Halawa Stream

Ft. Relocated South Halawa Stream

Az. 285°28'05.8" 431.41'

Az. 305°48'30.9" 380.91'

R=20'

R=300'

R=100'

Tele Ducts crossing existing T.P. Cable

Cond. Drip Valve (H.G.Co.)

16" Aviation Gas (Navy) & Direct Burial Signal Cable (Navy)

6-5" Elec. Ducts (H.E.Co.)

Transpac Cable (H.T.-T.P.)

45° Elbow

8" Gas (H.G.Co.)

LEGEND

Denotes Utility Ownership	Existing	New	Removed or Abandoned
Aviation Gas (Navy)			
Gas Main (H.G.Co.)			
Electric (H.E.Co.)			
Telephone (H.T.Co.)			
San. Sewer (City)			

Hawaiian Telephone Company Joint Trunking Cables labelled (J.T.S.)
Hawaiian Telephone Company Transpac Land Cable labelled (H.T.-T.P.)

APPROVED

J. T. Judd — 2-8-71
Hawaiian Telephone Co., Ltd. — Date

5/20/71
Hawaiian Electric Co., Inc. — Date

Paul C. Jog, Vice Pres. — 1-20-71
Honolulu Gas Co. — Date

R. Arona — 3/8/71
Chief, Division of Sewers — Date

J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC, TELEPHONE, AV. GAS, GAS AND CITY SEWER

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(89):13

SCALE: 1"=50' DATE: OCT 30, 1970

SHEET No. 4U OF 44 SHEETS

141

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	142	362

SANITARY SEWER OUTFALL

Scale: 1" = 1'-0"

END ELEVATION — LONGITUDINAL SECTION

Existing Pole and Existing Air Interruptor Switch to Remain. Connect 3W Primary into Existing Line, new 3/4"x8' Anchor 15' Lead (Navy)

APPROVED

Director & Bldg. Superintendent — 3/16/71 Date

Hawaiian Telephone Co, Ltd. — 2-2-71 Date

Hawaiian Electric Co., Inc. — 3/20/71 Date

Honolulu Gas Co. — 2-20-71 Date

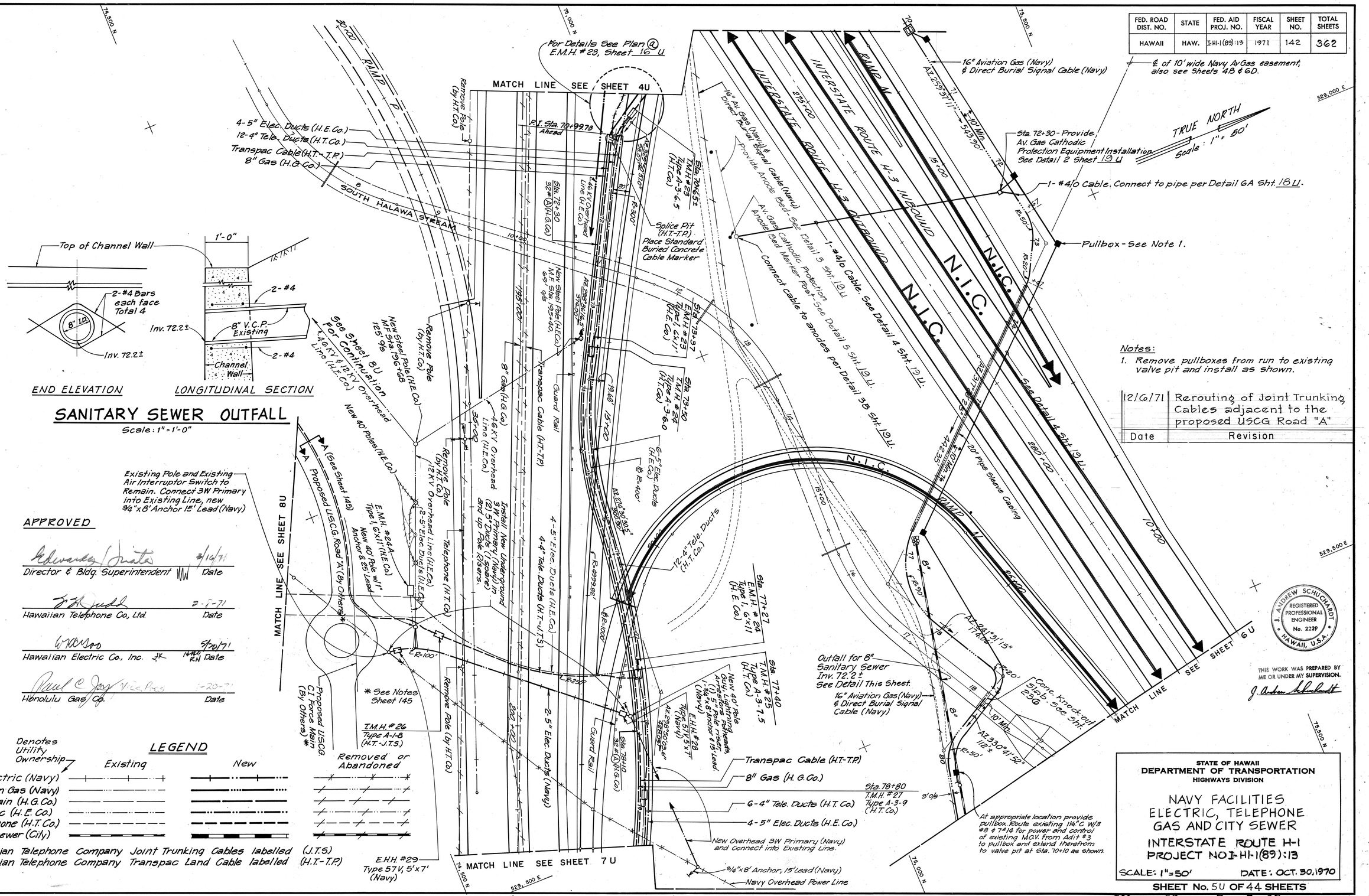
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
	DESIGNED BY	
NOTE BOOK	QUANTITIES BY	
No.	CHECKED BY	

LEGEND

Denotes Utility Ownership

	Existing	New	Removed or Abandoned
Electric (Navy)			
Aviation Gas (Navy)			
Gas Main (H.G.Co)			
Electric (H.E.Co)			
Telephone (H.T.Co.)			
San. Sewer (City)			

Hawaiian Telephone Company Joint Trunking Cables labelled (J.T.S)
Hawaiian Telephone Company Transpac Land Cable labelled (H.T.-T.P.)


MATCH LINE SEE SHEET 4U
MATCH LINE SEE SHEET 8U
MATCH LINE SEE SHEET 7U
MATCH LINE SEE SHEET 6U
RAMP D
RAMP M
INTERSTATE ROUTE H-3 INBOUND
INTERSTATE ROUTE H-3 OUTBOUND
N.I.C.
SOUTH HALAWA STREAM
For Details See Plan @ E.M.H. #23, Sheet 16 U
4-5" Elec. Ducts (H.E.Co.)
12-4" Tele. Ducts (H.T.Co.)
Transpac Cable (H.T.-T.P.)
8" Gas (H.G.Co.)
Sta. 70+99.79 P.I. Ahead
Sta. 72+30 32"@ (H.G.Co.)
Sta. 72+65± TMH #28 Type A-3-9.5 (H.T.Co.)
Splice Pit (H.T.-T.P.) Place Standard Buried Concrete Cable Marker
Sta. 73+37 EMH #23 Type 1, 6'x11' (H.E.Co.)
Sta. 73+50 TMH #24 Type A-3-6.0 (H.T.Co.)
Remove Pole (by H.T.Co.)
New Steel Pole (H.E.Co.) M.F. Sta. 195+40 6.9 g/s
See Sheet 8U For Continuation 12 KV & 12 KV Overhead Line (H.E.Co.)
New 40' Poles (H.E.Co.)
Remove Pole (by H.E.Co.)
Remove Pole (by H.T.Co.)
E.M.H. #24A Type 1, 6'x11' (H.E.Co.) New 40' Pole w/1" Anchor & 25' Lead
Install New Underground 3W Primary (Navy) in (2) 5" Ducts (H.E.Co.) and up Pole Risers.
Telephone (H.T.Co.)
Proposed USCG Road "A" (By Others)*
* See Notes Sheet 145
T.M.H. #26 Type A-1-8 (H.T.-J.T.S.)
E.H.H. #29 Type 57V, 5'x7' (Navy)
Proposed USCG. CI Force Main (By Others)*
2.5" Elec. Ducts (Navy)
4-5" Elec. Ducts (H.E.Co.)
4-4" Tele. Ducts (H.T.-J.T.S.)
Guard Rail
Sta. 77+27 E.M.H. #24 Type 1, 6'x11' (H.E.Co.)
Sta. 77+40 T.M.H. #25 Type A-3-7.5 (H.T.Co.)
New 40' Pole w/Anchoring Guy & Guy Pothead, (1) 5" Pole Riser #1/0 Lead (Navy)
E.H.H. #28 Type 57V, 5'x7' (Navy)
Sta. 78+10 32"@ (H.G.Co.)
Transpac Cable (H.T.-T.P.)
8" Gas (H. G.Co.)
G-4" Tele. Ducts (H.T.Co.)
4-5" Elec. Ducts (H.E.Co.)
New Overhead 3W Primary (Navy) and Connect into Existing Line.
3/4"x8' Anchor, 15' Lead (Navy)
Navy Overhead Power Line
Sta. 78+80 T.M.H. #27 Type A-3-9 (H.T.Co.)
3'0/s
16" Aviation Gas (Navy) & Direct Burial Signal Cable (Navy)
16" Av. Gas (Navy) & Signal Cable (Navy) Direct Burial
Provide Anode Bed - See Detail 3 Sht. 19 U.
Av. Gas Cathodic Protection Anodes
Cathodic Protection Bond Marker Post - See Detail 5 Sht. 19 U.
Connect Cable to Anodes per Detail 3B Sht. 19 U.
1-#4/0 Cable. See Detail 4 Sht. 19 U.
Outfall for 8" Sanitary Sewer Inv. 72.2± See Detail This Sheet.
16" Aviation Gas (Navy) & Direct Burial Signal Cable (Navy)
Conc. knock-out Slab - See Sht. 23G
At appropriate location provide pullbox. Route existing 1¼" C W/3 #8 & 7#1/4 for power and control of existing M.O.V. from Jalt #3 to pullbox and extend therefrom to valve pit at Sta. 70+10 as shown.
20" Pipe Sleeve Casing
8" Gas (Navy)
Az 259°57'11" 543.90'
10' Min.
Sta. 72+30 - Provide Av. Gas Cathodic Protection Equipment Installation See Detail 2 Sheet 19 U.
1-#4/0 Cable. Connect to pipe per Detail 6A Sht. 18 U.
Pullbox - See Note 1.
TRUE NORTH
Scale: 1" = 50'
Az 244°31'15" 174.00'
Az 330°41'52" 112.2±
Az 238°35'03" 228.39'
Az 68°24'36" 300.35'
Az 244°31'15" 174.00'
R=1000'
R=2250'
R=100'
R=50'
R=20'
R=25'
R=10'
R=4000'
R=2000'
R=1999.82'
R=1999.82'
R=1000

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	143	362

APPROVED

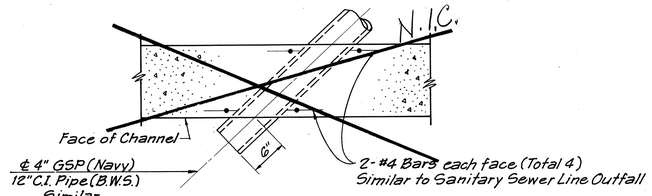
Director & Bldg. Superintendent Date

Assistant Chief Engineer, B.W.S. Date

LEGEND

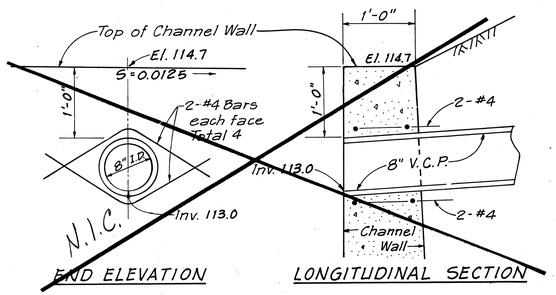
Denotes Utility Ownership

	Existing	New	Removed or Abandoned
Water (B.W.S)	—W—	—W—	—W—
Aviation Gas (Navy)			
San. Sewer (City)			
Force Main (Navy)			



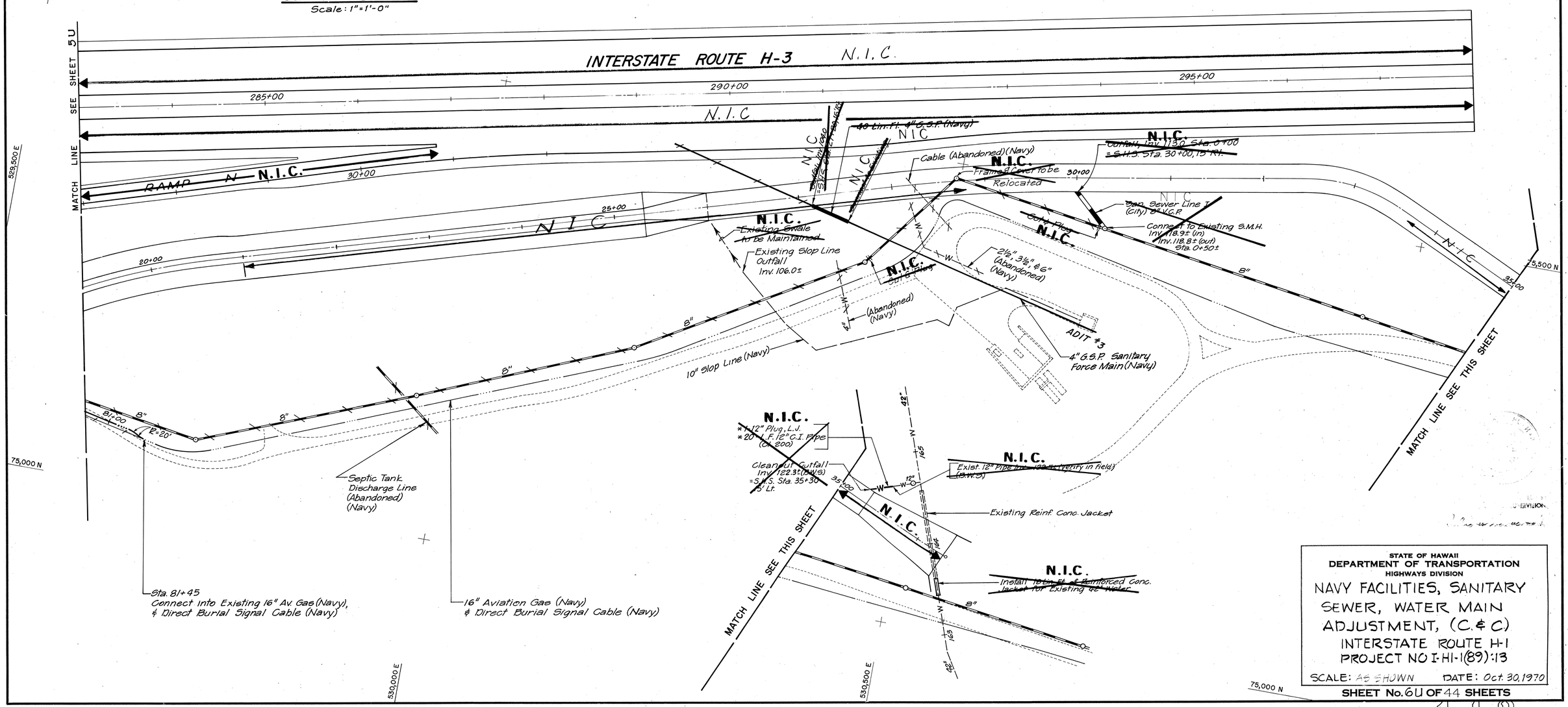
OUTFALL DETAIL

Scale: 1"=1'-0"



SANITARY SEWER LINE I OUTFALL

Scale: 1"=1'-0"



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

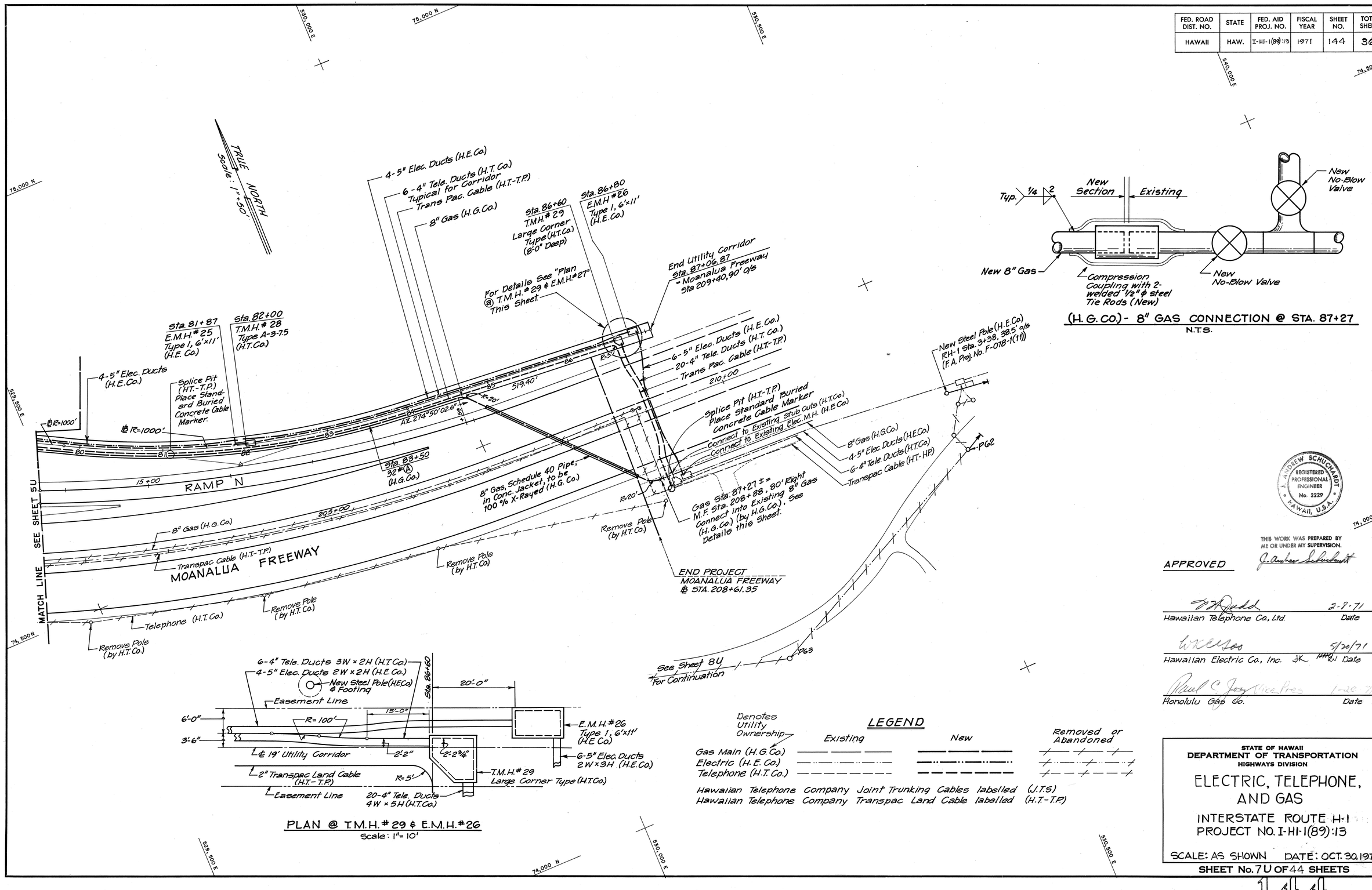
NAVY FACILITIES, SANITARY SEWER, WATER MAIN ADJUSTMENT, (C. & C.)
INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(89):13

SCALE: AS SHOWN DATE: Oct. 30, 1970

SHEET No. 6U OF 44 SHEETS

143

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	144	362



(H. G. CO.) - 8" GAS CONNECTION @ STA. 87+27
N.T.S.

PLAN @ T.M.H. # 29 & E.M.H. # 26
Scale: 1" = 10'

Denotes Utility Ownership

LEGEND

	Existing	New	Removed or Abandoned
Gas Main (H.G.Co.)	———	———	———
Electric (H.E.Co.)	——·——·——	——·——·——	——·——·——
Telephone (H.T.Co.)	– – – – –	– – – – –	– – – – –

Hawaiian Telephone Company Joint Trunking Cables labelled (J.T.S.)
Hawaiian Telephone Company Transpac Land Cable labelled (H.T.-T.P.)

ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
J. Andrew Schuchardt

APPROVED

Hawaiian Telephone Co., Ltd. — Date 2-9-71

Hawaiian Electric Co., Inc. — Date 5/20/71

Honolulu Gas Co. — Date 1-26-71

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC, TELEPHONE, AND GAS

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(89):13

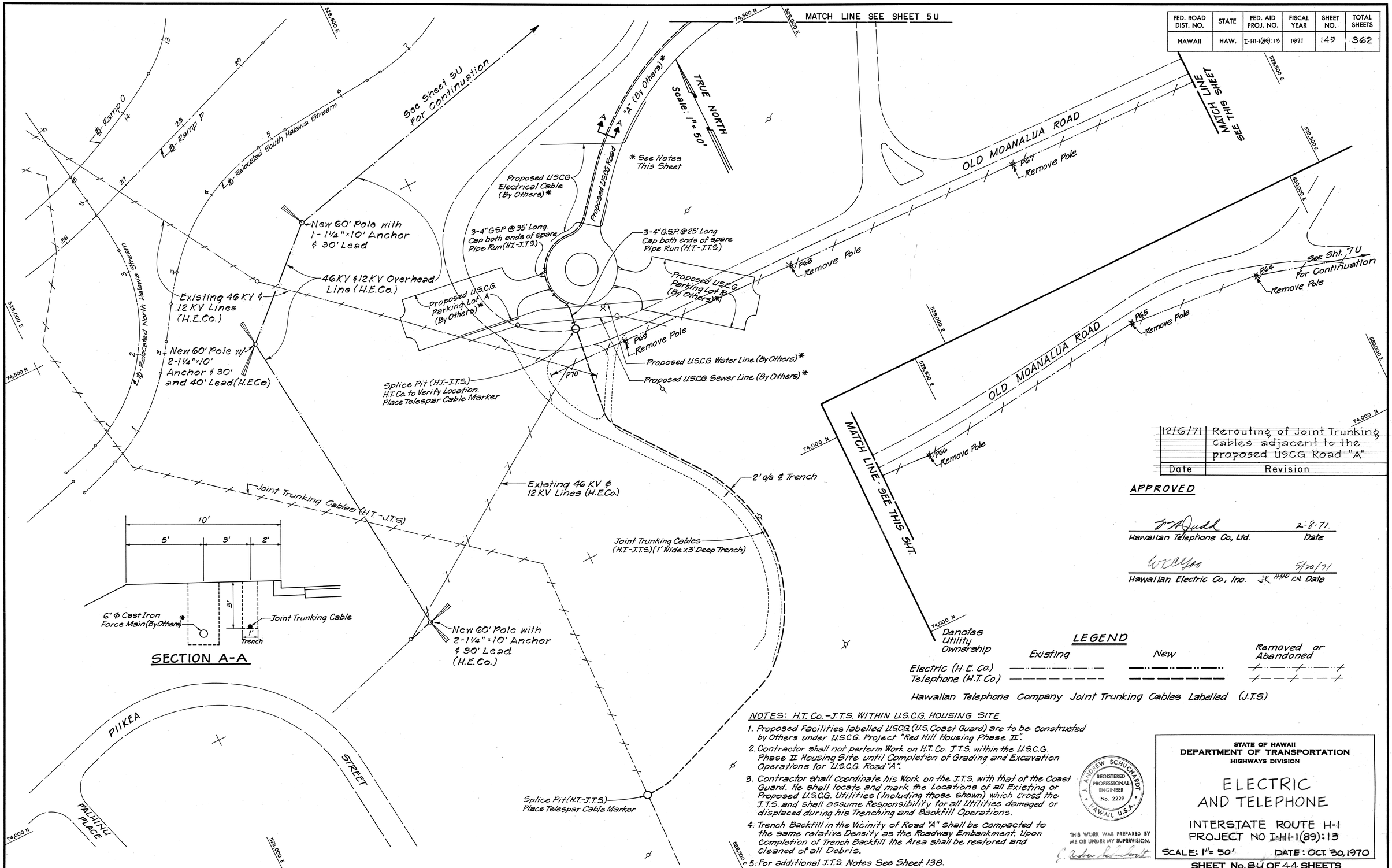
SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 7U OF 44 SHEETS

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

1 4 4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	145	362



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

Date	Revision
12/6/71	Rerouting of Joint Trunking Cables adjacent to the proposed USCG Road "A"

APPROVED

F. T. Judd — 2-8-71
Hawaiian Telephone Co, Ltd. — Date

W. K. Glass — 5/20/71
Hawaiian Electric Co., Inc. JK HAD RN — Date

LEGEND

	Existing	New	Removed or Abandoned
Electric (H.E. Co.)	——·——·——	—·—·—·—·—	+——+——+
Telephone (H.T. Co.)	—— —— ——	— — — — —	+—+—+—+

Denotes Utility Ownership

Hawaiian Telephone Company Joint Trunking Cables Labelled (J.T.S.)

NOTES: H.T. Co. - J.T.S. WITHIN U.S.C.G. HOUSING SITE

1. Proposed Facilities labelled U.S.C.G. (U.S. Coast Guard) are to be constructed by Others under U.S.C.G. Project "Red Hill Housing Phase II".
2. Contractor shall not perform Work on H.T. Co. J.T.S. within the U.S.C.G. Phase II Housing Site until Completion of Grading and Excavation Operations for U.S.C.G. Road "A".
3. Contractor shall coordinate his Work on the J.T.S. with that of the Coast Guard. He shall locate and mark the Locations of all Existing or Proposed U.S.C.G. Utilities (Including those shown) which cross the J.T.S. and shall assume Responsibility for all Utilities damaged or displaced during his Trenching and Backfill Operations.
4. Trench Backfill in the Vicinity of Road "A" shall be compacted to the same relative Density as the Roadway Embankment. Upon Completion of Trench Backfill the Area shall be restored and cleaned of all Debris.
5. For additional J.T.S. Notes See Sheet 138.

J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC AND TELEPHONE

INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(89):13

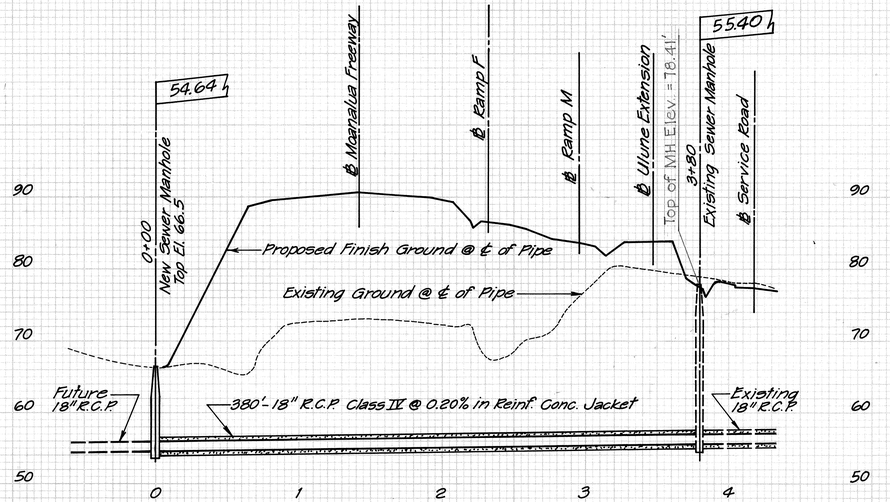
SCALE: 1"= 50' DATE: OCT. 30, 1970

SHEET No. 8U OF 44 SHEETS

C.O. 145

145

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)-13	1971	146	362

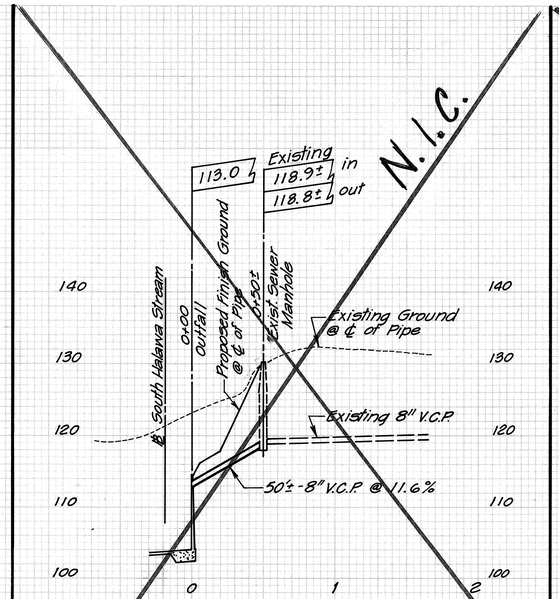


PROFILE - PROPOSED SANITARY SEWER UNDER MOANALUA FREEWAY (STA. 184+20±) (CITY)

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

APPROVED

Chief, Division of Sewers — Date 3/8/71

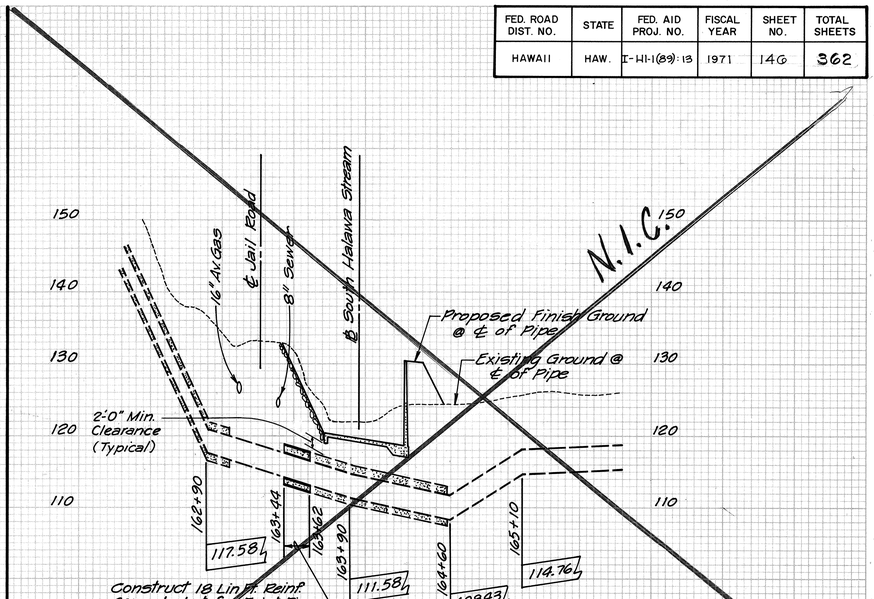


PROFILE - SANITARY SEWER LINE I (CITY)

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

APPROVED

Director & Bldg. Superintendent — Date 3/1/71

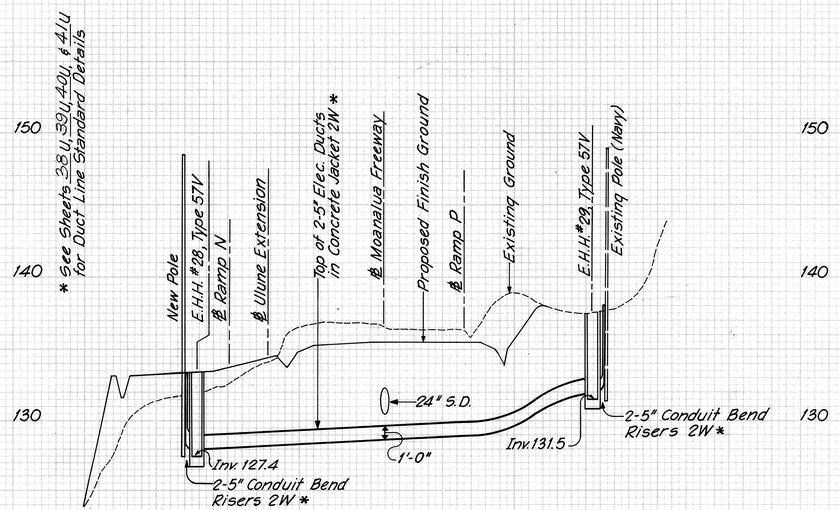


PROFILE - EXISTING 42" WATER MAIN UNDER SOUTH HALAWA STREAM (STA. 36+20±) (B.W.S.)

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

APPROVED

A. Kawakami — Assistant Chief Engineer, B.W.S. — Date 3/1/71



PROFILE - ELECTRIC DUCTS UNDER MOANALUA FREEWAY (STA. 199+44±) (NAVY)

Scale: Horiz - 1" = 50'
Vert - 1" = 5'

J. ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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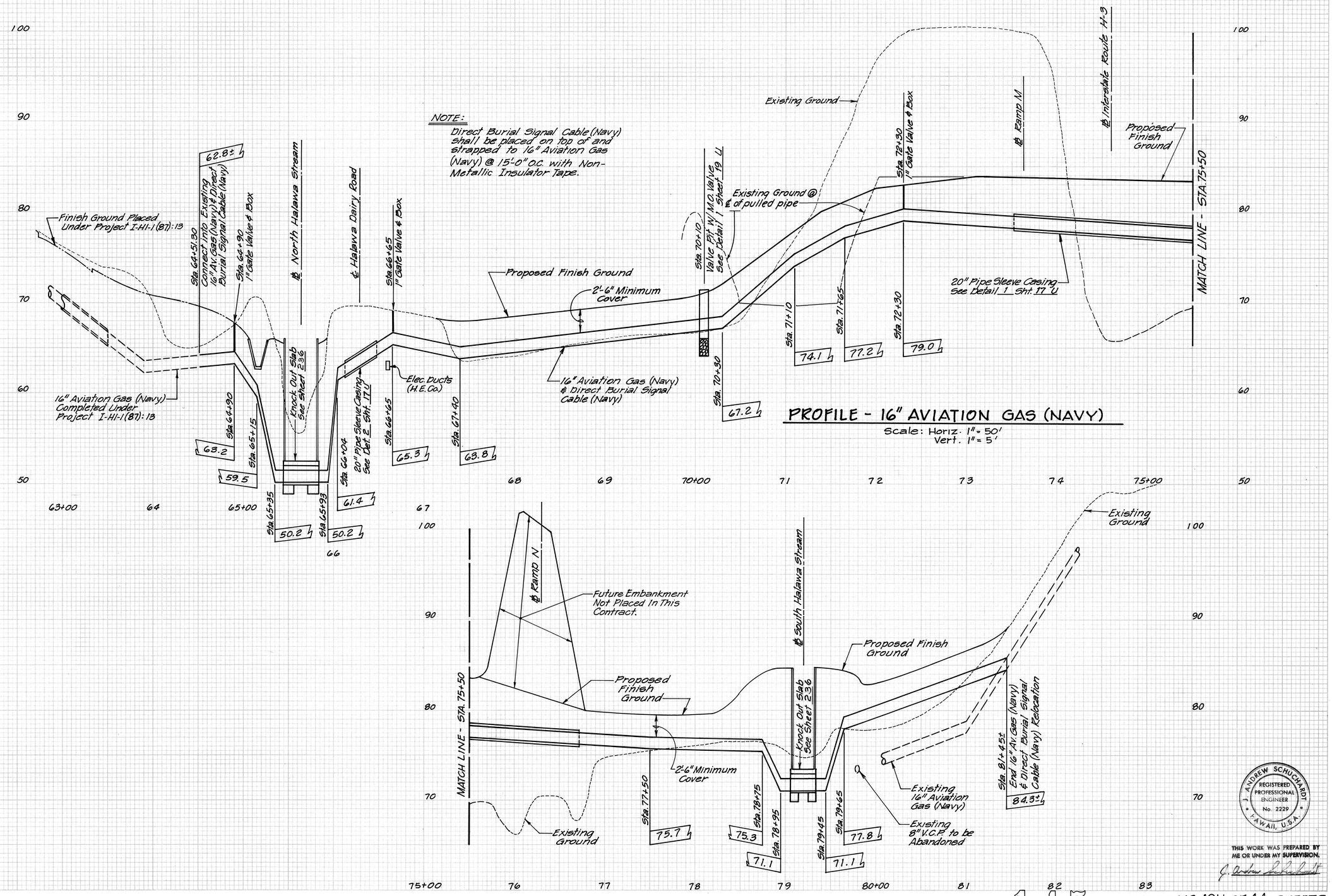
146

SHEET NO. 90 OF 44 SHEETS

PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	147	362



ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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147

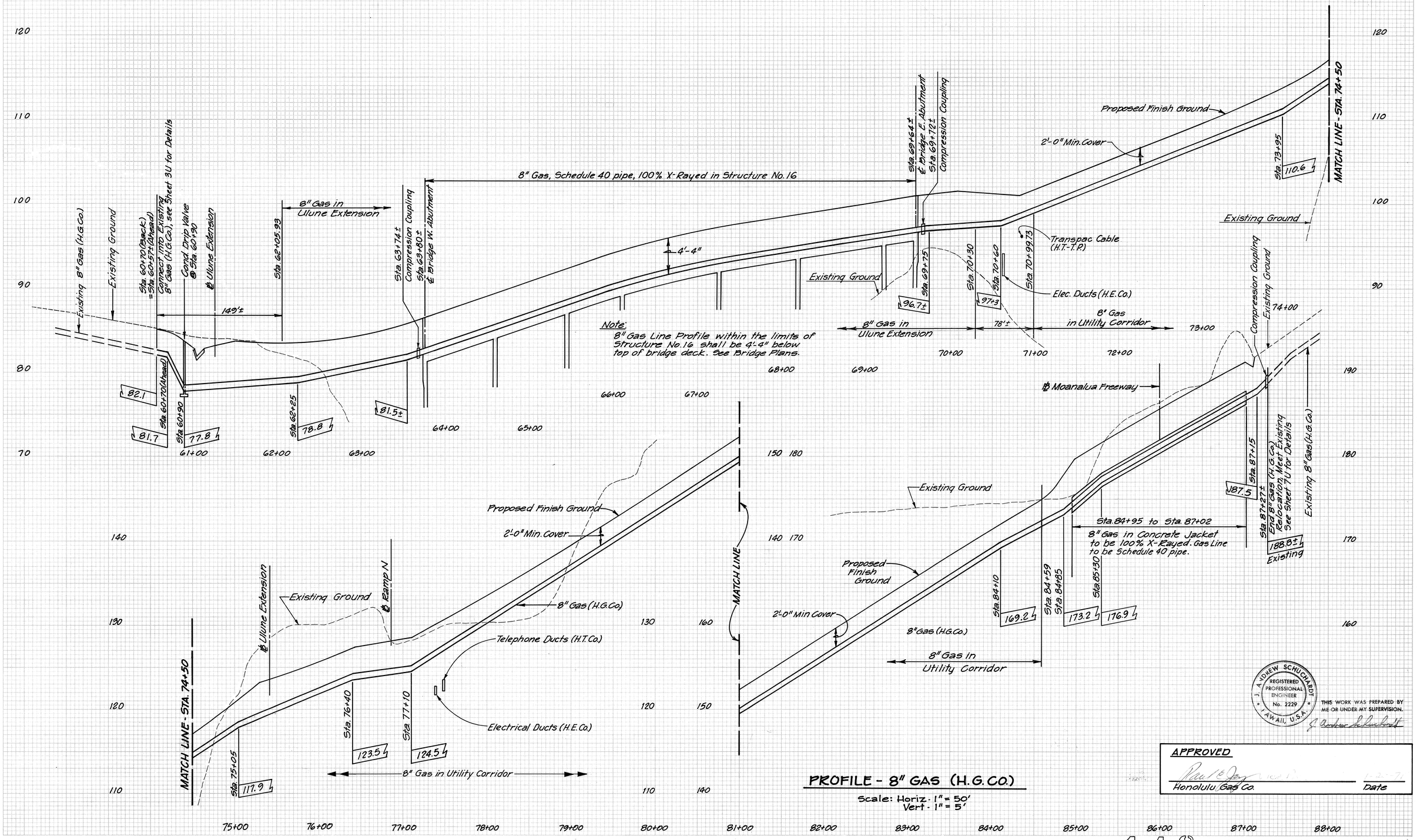
SHEET NO. 10U OF 44 SHEETS

PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	148	362

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, NOTE BOOK, AREAS CHECKED, NO., DATE, BY

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, NOTE BOOK, AREAS CHECKED, NO., DATE, BY



PROFILE - 8" GAS (H.G.CO.)

Scale: Horiz.: 1" = 50'
Vert.: 1" = 5'

J. ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchardt

APPROVED

Honolulu Gas Co. — Date

148

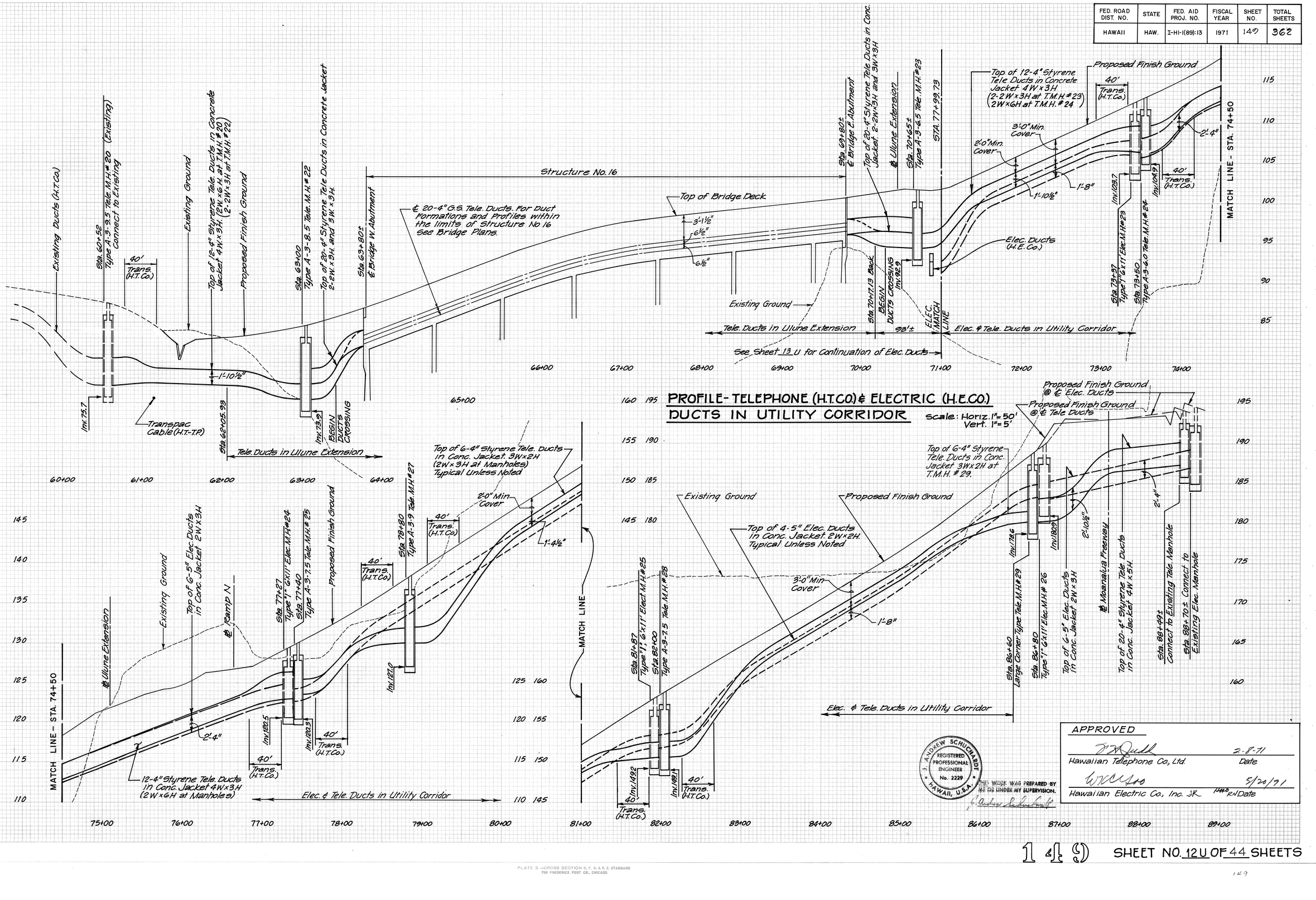
SHEET NO. 11U OF 44 SHEETS

PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	140	362

PROFILE - TELEPHONE (H.T.CO.) & ELECTRIC (H.E.CO.) DUCTS IN UTILITY CORRIDOR

Scale: Horiz. 1" = 50'
Vert. 1" = 5'



J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

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J. Andrew Schuchardt

APPROVED

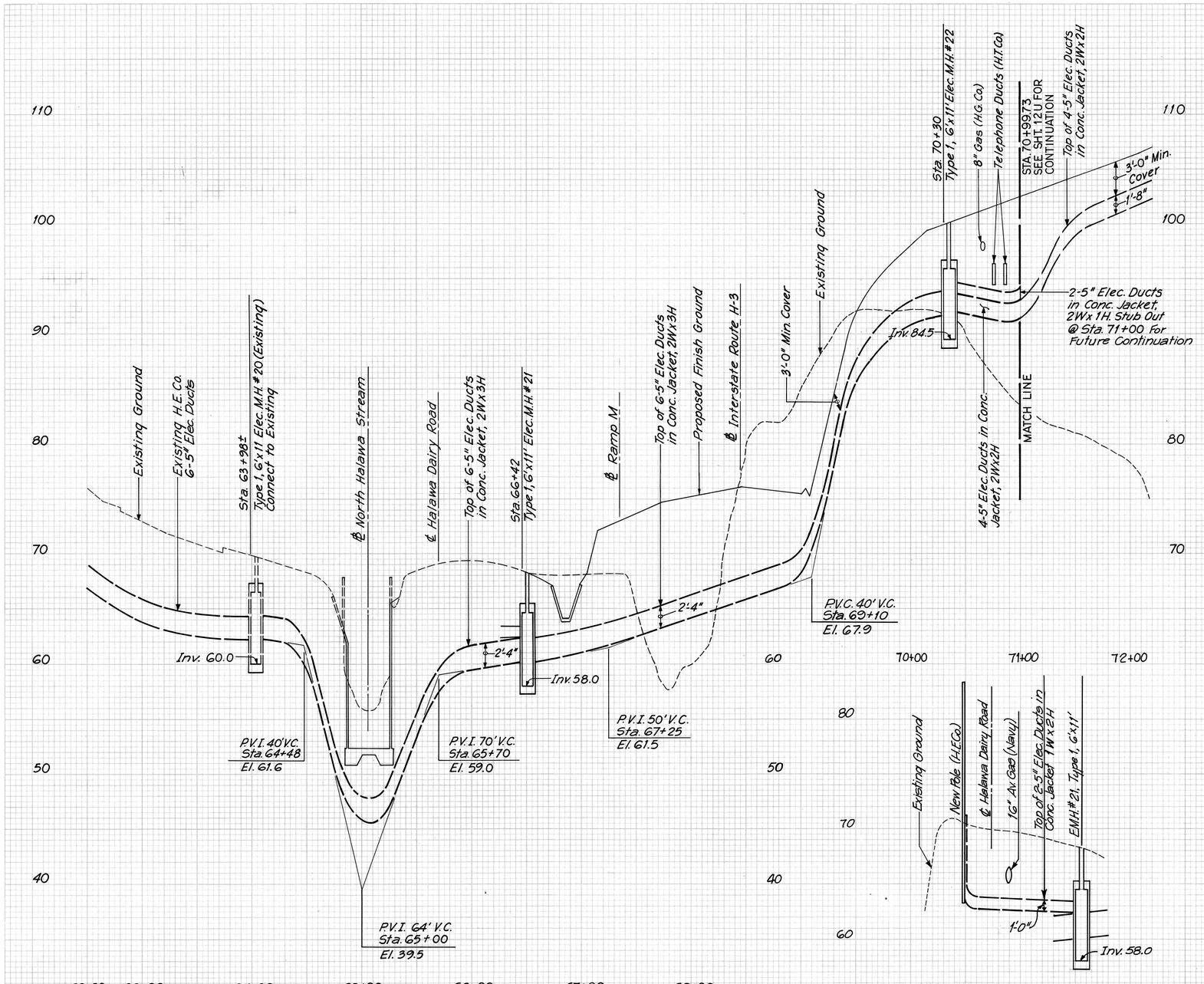
Hawaiian Telephone Co, Ltd. — 2-8-71 Date

Hawaiian Electric Co, Inc. JK — 5/20/71 Date

1 4 9 SHEET NO. 12U OF 44 SHEETS

PLATE 3 — CROSS SECTION O. F. R. & R. E. STANDARD THE FREDERICK POST CO., CHICAGO

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(89).13	1971	150	362

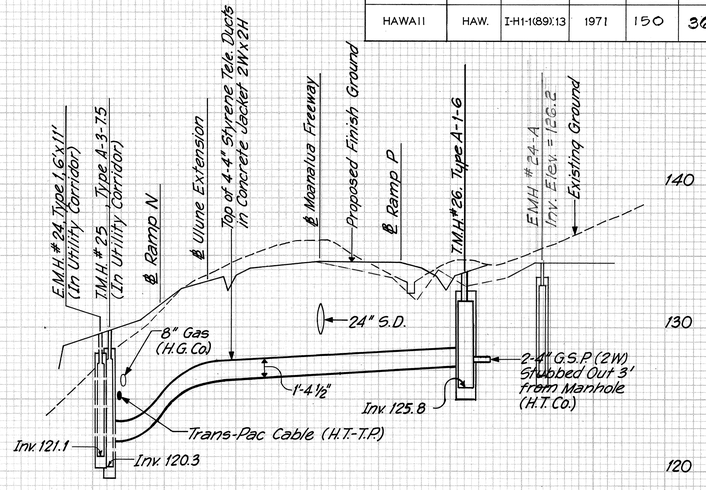


PROFILE - ELECTRIC DUCTS (H.E.CO.)

Scale: Horiz. 1"=50'
Vert. 1"=5'

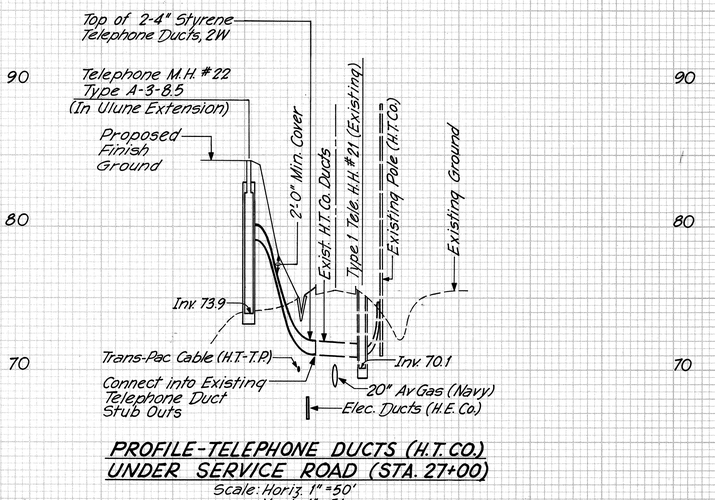
PROFILE - ELECTRIC DUCTS (H.E.Co) UNDER HALAWA DAIRY ROAD

Scale: Horiz. 1"= 50'
Vert. 1"= 5'



PROFILE - TELEPHONE (H.T.CO.) DUCTS UNDER MOANALUA FREEWAY (STA. 199+29±)

Scale: Horiz. 1"=50'
Vert. 1"=5'



PROFILE-TELEPHONE DUCTS (H.T.CO.) UNDER SERVICE ROAD (STA. 27+00)

Scale: Horiz. 1"=50'
Vert. 1"=5'

J. ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchardt

APPROVED:

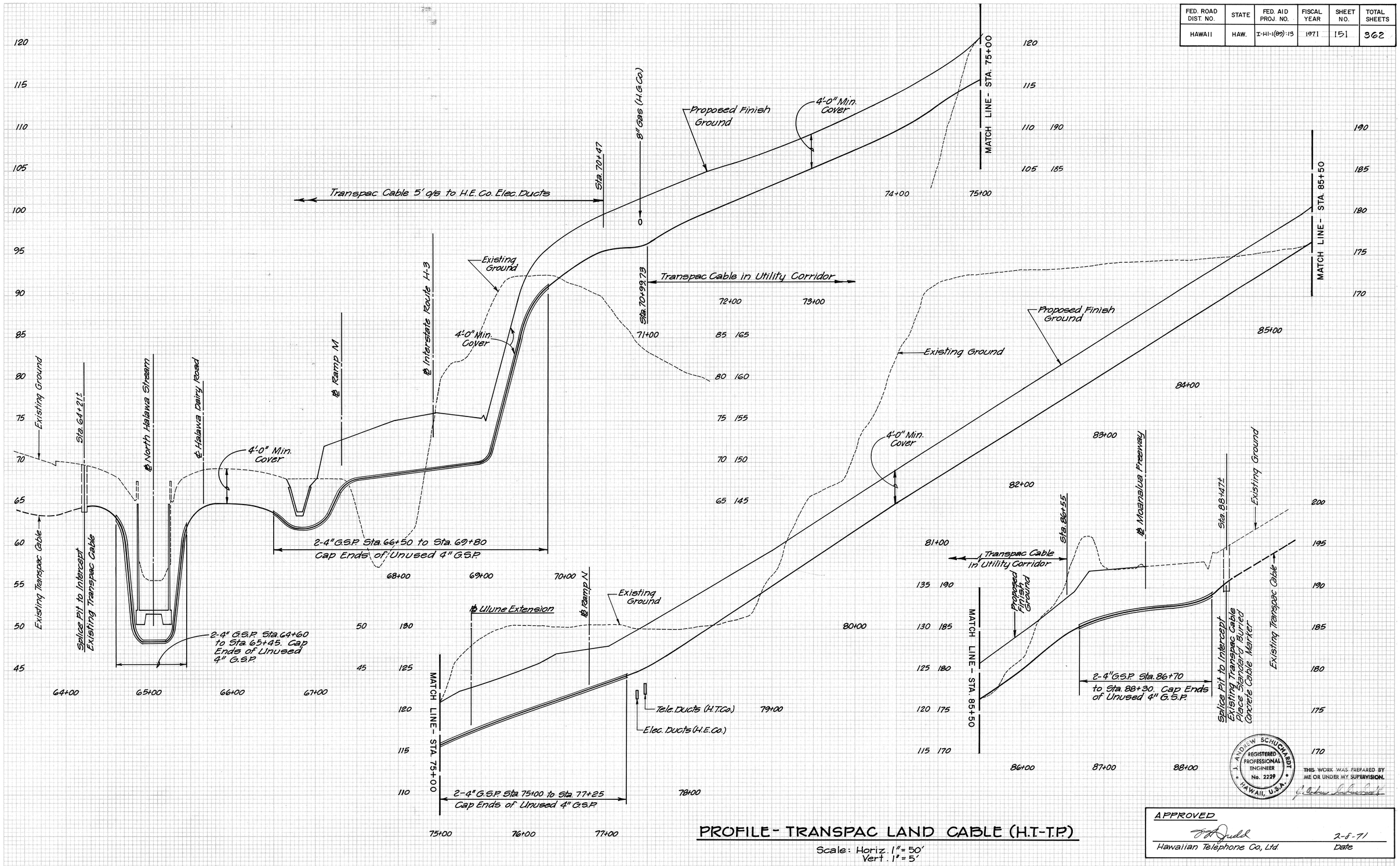
F. F. Judd — 2-8-71
Hawaiian Telephone Co., Ltd. — Date

W. W. Lee — 5/20/71
Hawaiian Electric Co., Inc. — Date

SUBMITTED
PLOTTED
TRACED
AREAS
NOTE BOOK
AREAS CHECKED
FINAL SURVEY
ORIGINAL SURVEY
DATE
BY
NO.

PLATE 3 —CROSS SECTION D. F. R. & R. E. STANDARD

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)-13	1971	151	362



PROFILE - TRANSPAC LAND CABLE (H.T-T.P.)

Scale: Horiz. 1" = 50'
Vert. 1" = 5'

J. ANDREW SCHUCHART
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchart

APPROVED

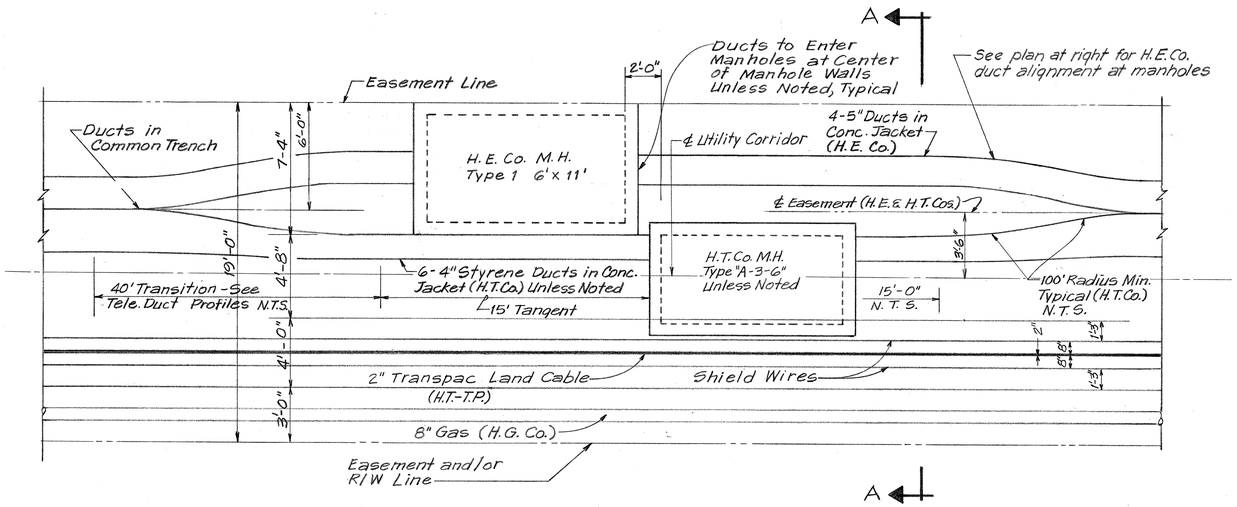
Hawaiian Telephone Co, Ltd. — 2-8-71 Date

151

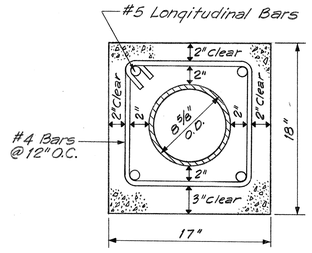
SHEET NO. 14 U OF 44 SHEETS

PLATE 3 —CROSS SECTION O. P. R. & R. E. STANDARD
THE FREDERICK POST CO., CHICAGO

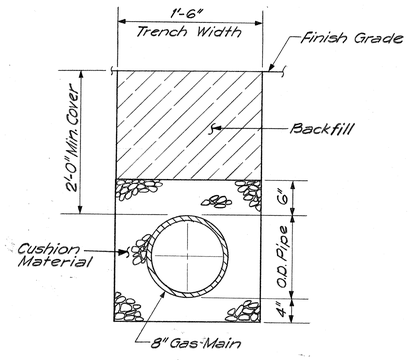
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	152	362



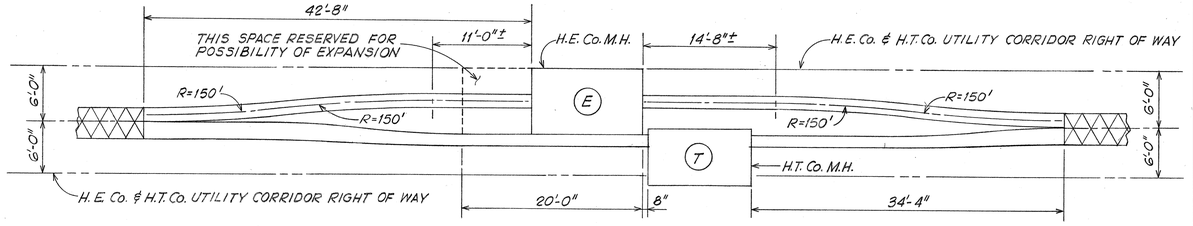
19' UTILITY CORRIDOR TYPICAL PLAN
Scale 1/4" = 1'-0"



8" GAS LINE IN CONCRETE JACKET
N.T.S.

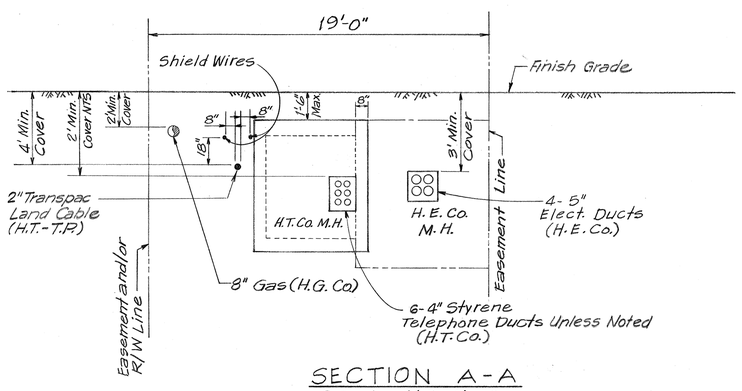


TYPICAL GAS MAIN SECTION
N.T.S.

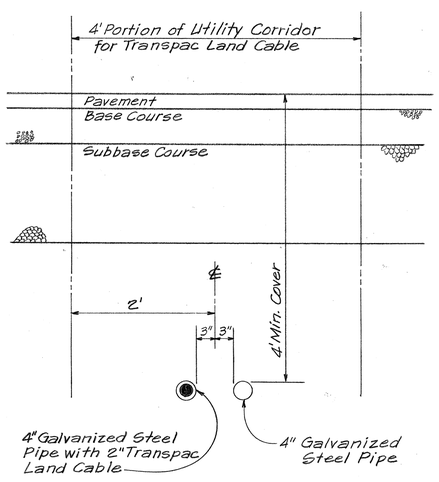


NOTE: OPPOSITE HAND CONFIGURATION APPLIES ALSO. DIMENSIONS FOR H.E. CO.

TYPICAL INSTALLATION OF MANHOLES IN 19' UTILITY CORRIDOR
SCALE: 1/8" = 1'-0"



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



TYPICAL SECTION
TRANSPAC LAND CABLE UNDER PAVEMENT
Scale: 1" = 1'-0"

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

APPROVED

F. H. Judd — 2-8-71
Hawaiian Telephone Co. Ltd. — Date

W K Sumo — 5/20/71
Hawaiian Electric Co. Inc. — Date

Paul C Jay Vice-Pres. — 1-20-71
Honolulu Gas Co. — Date

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J. Andrew Schuchardt

J. ANDREW SCHUCHARDT · REGISTERED PROFESSIONAL ENGINEER No. 2229 · HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC, TELEPHONE AND GAS UTILITY CORRIDOR TYPICAL LAYOUT AND H.G.CO. GAS MAIN SECTIONS

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89):13

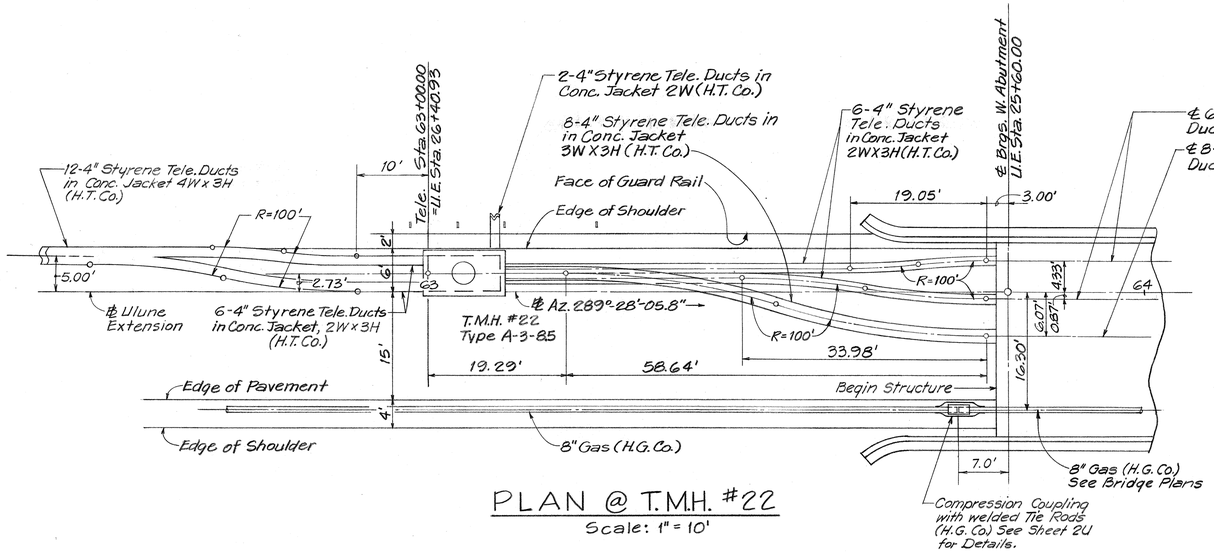
SCALE: AS SHOWN — DATE: OCT. 30, 1970

SHEET No. 150 OF 44 SHEETS

152

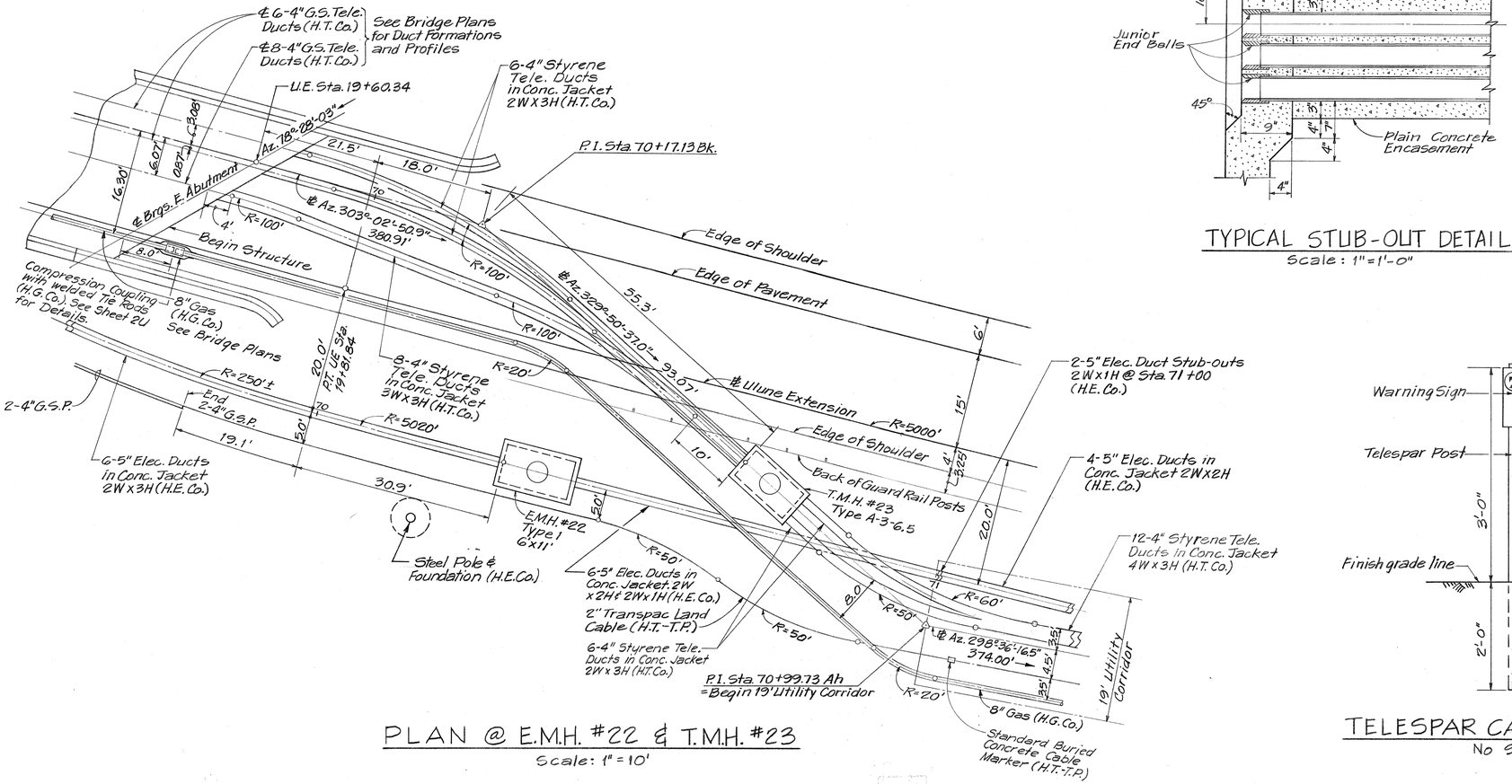
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	153	362



PLAN @ T.M.H. #22

Scale: 1" = 10'



PLAN @ E.M.H. #22 & T.M.H. #23

Scale: 1" = 10'

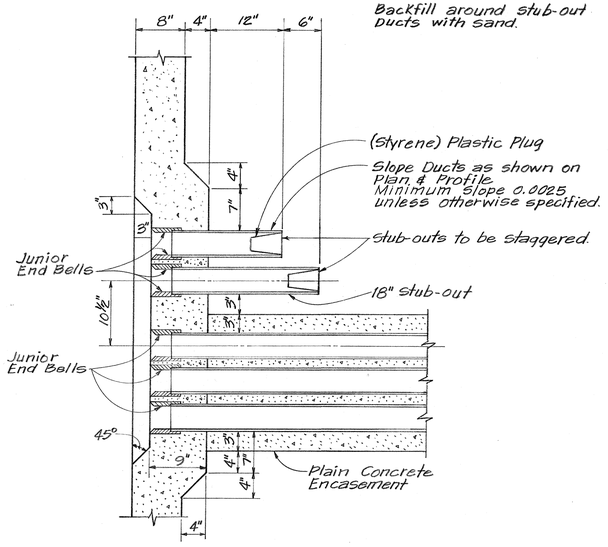
H.T. CO. MISCELLANEOUS DETAILS

SCALE: AS SHOWN

NOTES:

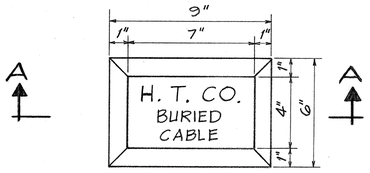
Stub-outs to be incidental to manhole.

Backfill around stub-out Ducts with sand.

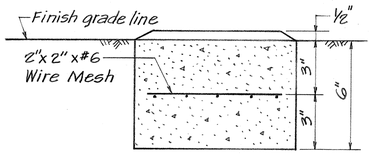


TYPICAL STUB-OUT DETAIL

Scale: 1" = 1'-0"



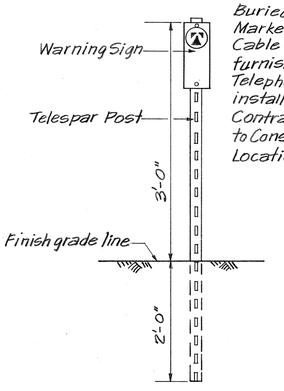
PLAN VIEW



SECTION A-A

BURIED CONCRETE CABLE MARKER

Scale: 3" = 1'-0"



NOTE:

Buried Concrete Cable Marker & Telespar Cable Marker shall be furnished by Hawaiian Telephone Company and installed by the Contractor. (Incidental to Construction) For Locations See Sheet 8 U.

TELESPAR CABLE MARKER

No Scale

APPROVED

F. H. Judd — 2-8-71
Hawaiian Telephone Co, Ltd. — Date

W. K. Hoo — 5/20/71
Hawaiian Electric Co, Inc. Ltd. — Date

Paul C. Jay, Vice Pres. — 1-20-71
Honolulu Gas Co. — Date

J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY CORRIDOR PLAN DETAILS AND H.T. CO. MISCELLANEOUS DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89):13

SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 16U OF 44 SHEETS

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

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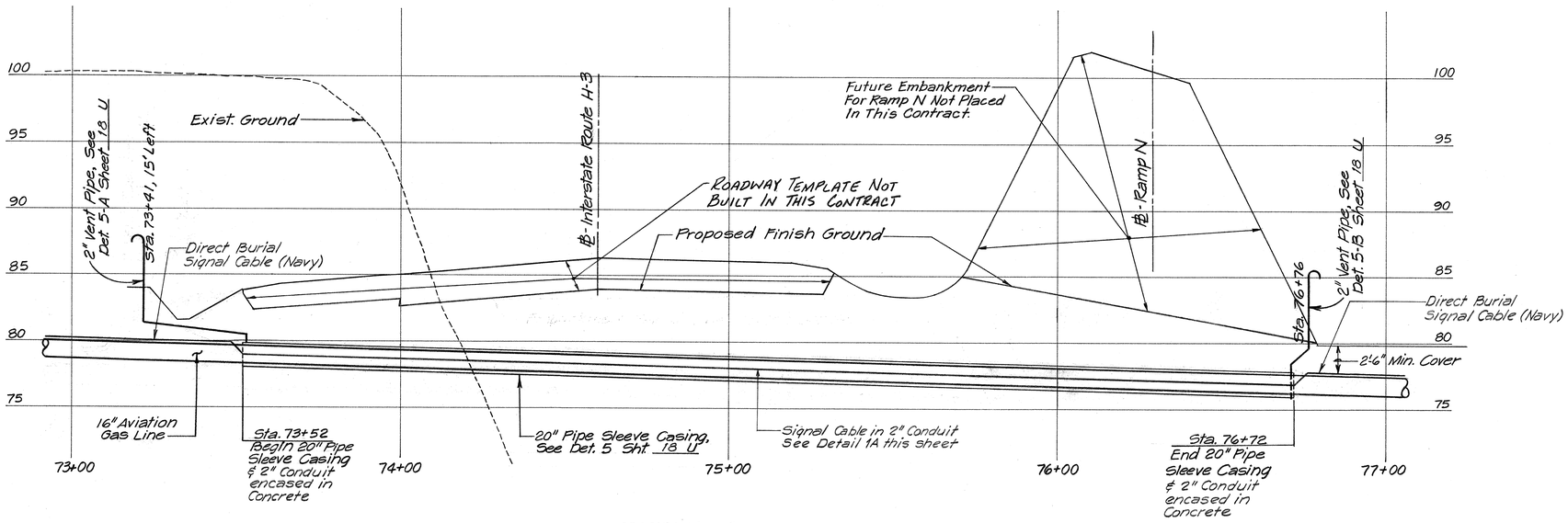
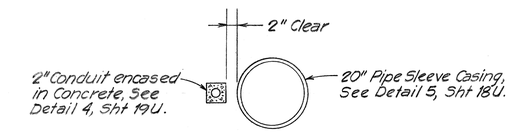
1583

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	154	362



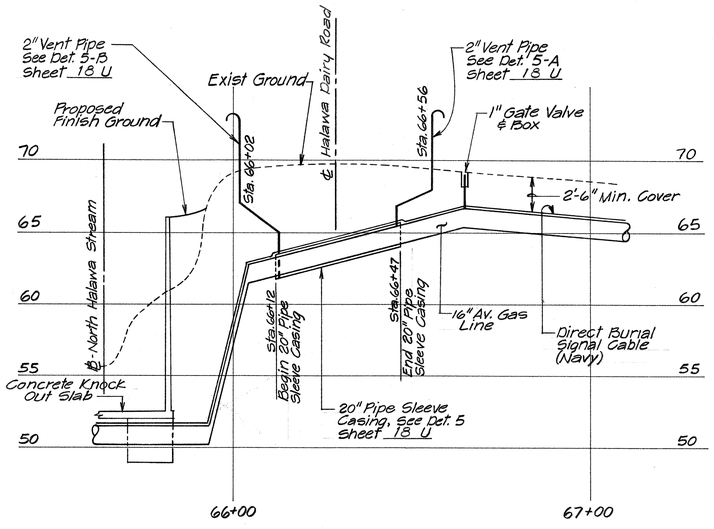
DETAIL 1

Scale: Horiz. 1"= 20'
Vert. 1"= 5'



DETAIL 1A

Not to Scale



DETAIL 2

Scale: Horiz. 1"= 20'
Vert. 1"= 5'

ORIGINAL PLAN

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

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REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NAVY AVGAS LINE
PIPE SLEEVE CASING DETAILS

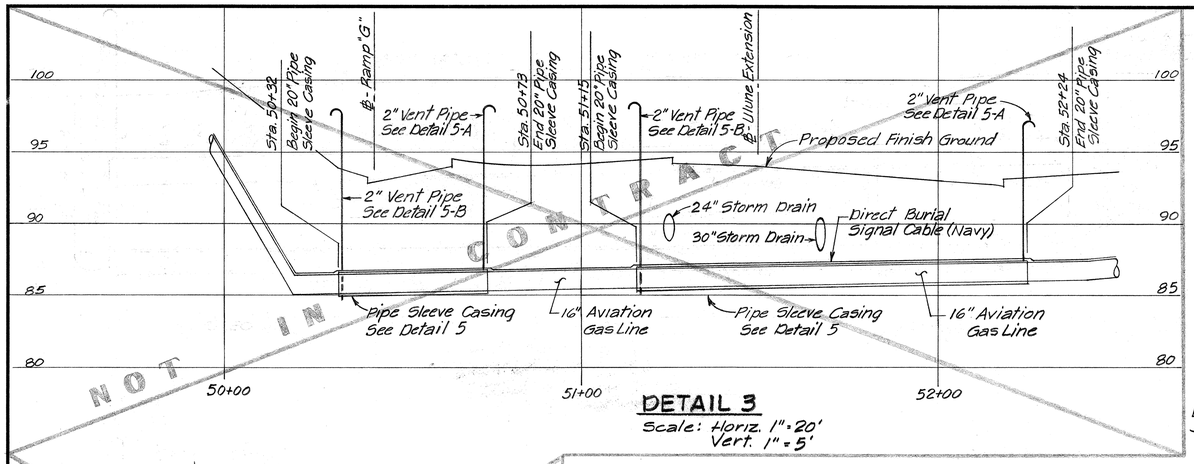
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(89):13

SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 17U OF 44 SHEETS

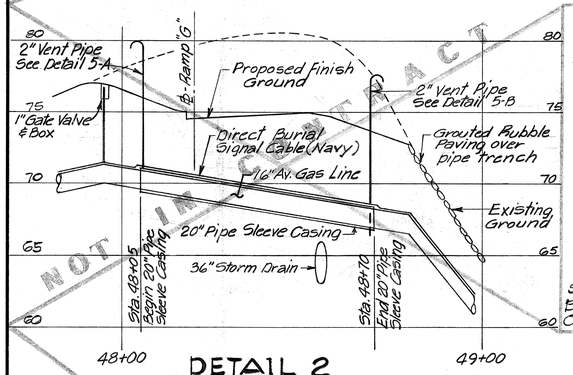
154

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	155	362



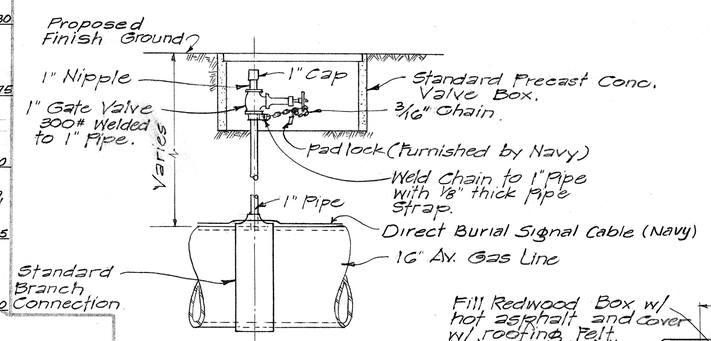
DETAIL 3

Scale: Horiz. 1"=20'
Vert. 1"=5'



DETAIL 2

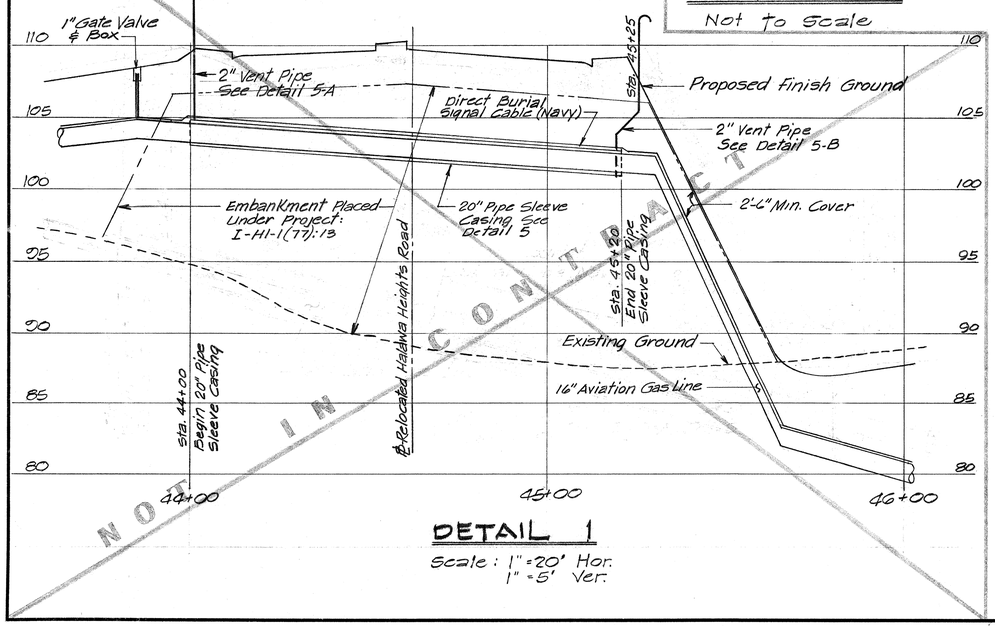
Scale: Horiz. 1"=20'
Vert. 1"=5'



DETAIL 4

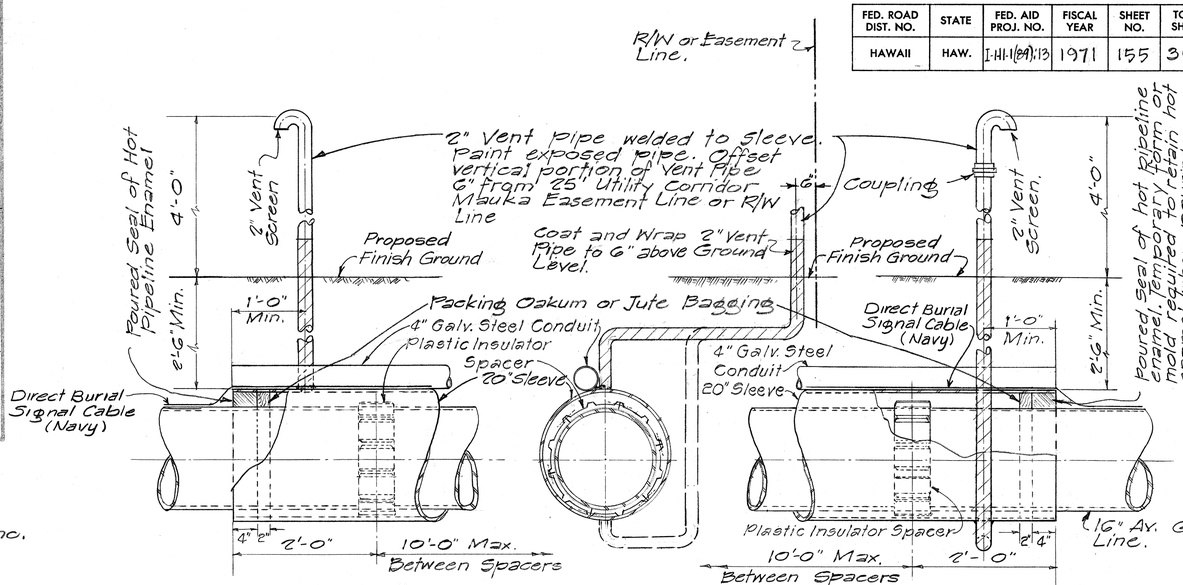
1" GATE VALVE

Not to Scale



DETAIL 1

Scale: 1"=20' Hor.
1"=5' Ver.



HIGH END
DETAIL 5-A

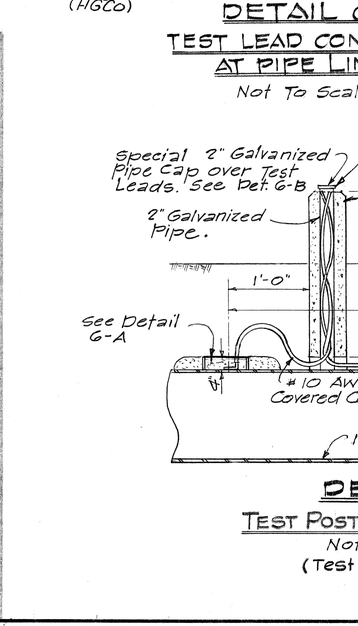
SECTION

DETAIL 5

20" PIPE SLEEVE CASING

Scale 1"=1'-0"

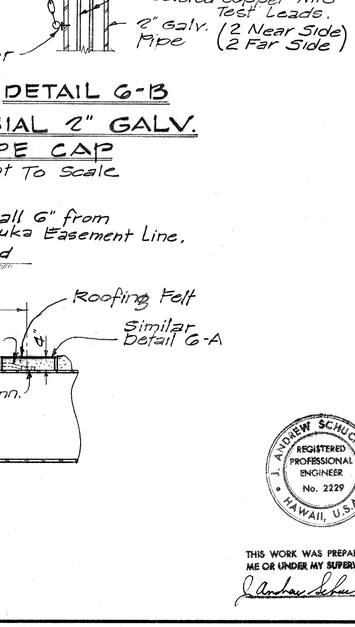
LOW END
DETAIL 5-B



DETAIL 6-A

TEST LEAD CONNECTION AT PIPE LINE

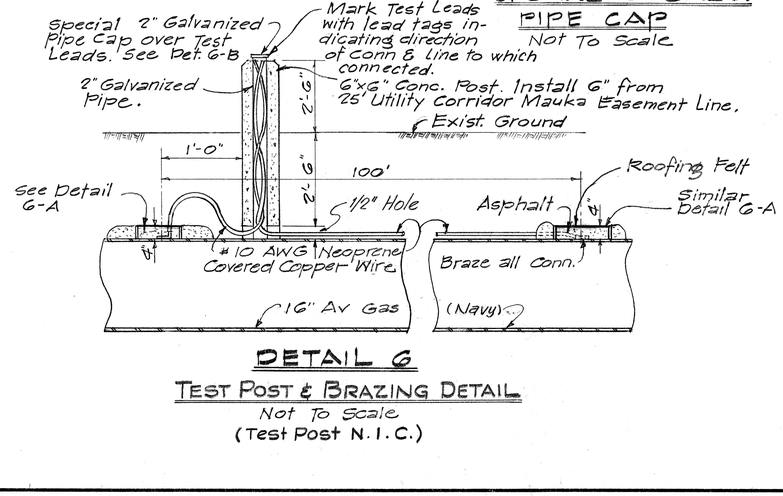
Not To Scale



DETAIL 6-B

SPECIAL 2" GALV. PIPE CAP

Not To Scale



DETAIL 6

TEST POST & BRAZING DETAIL

Not To Scale

(Test Post N.I.C.)

Notes

1. Direct Burial Signal Cable (Navy) shall be installed along top of relocated 16" Av. Gas Line and Connected to existing cable at beginning and end of project.
2. Direct Burial Signal Cable (Navy) shall be strapped to 16" Av. Gas Line with Non-Metallic Insulator Tape at 15'-0" O.C.

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

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REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NAVY AVGAS LINE DETAILS & SECTIONS

HALAWA INTERCHANGE
PROJECT NO I-HI-1(89):13

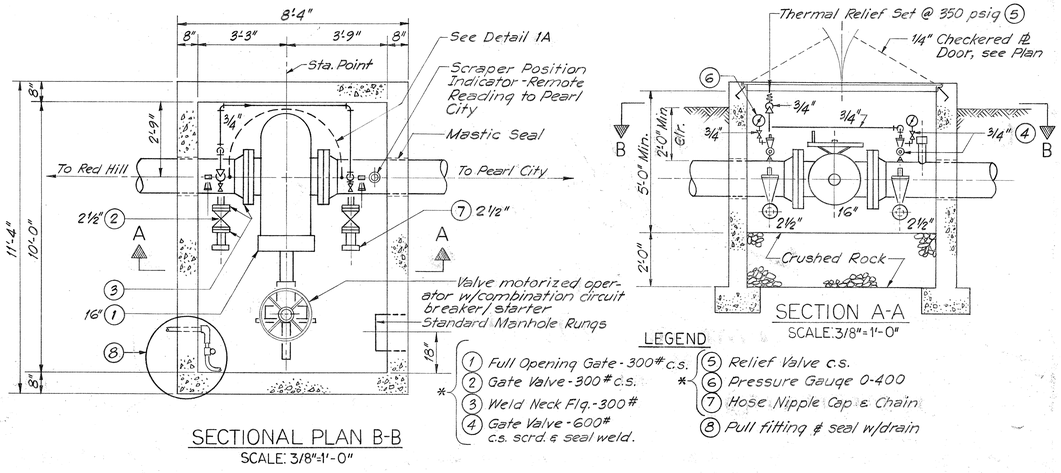
SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 18U OF 44 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

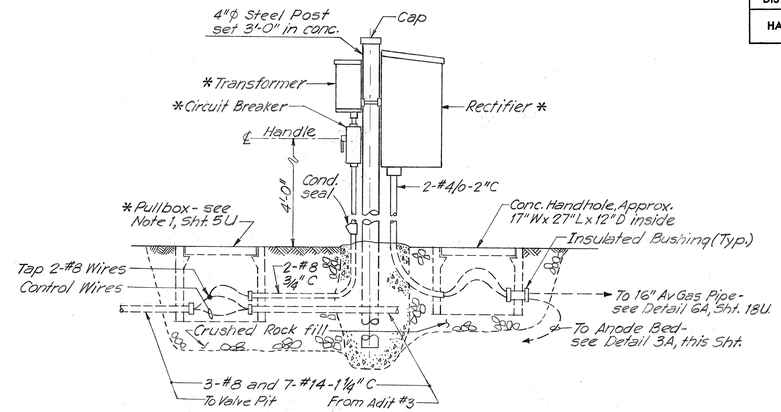
155

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)-13	1971	156	362



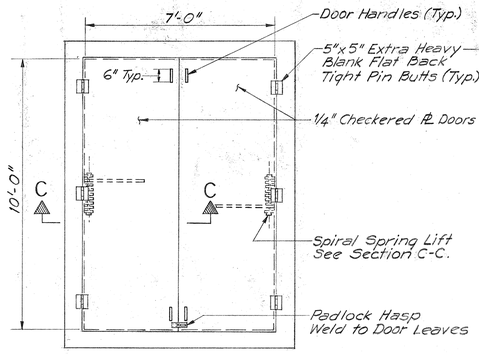
SECTIONAL PLAN B-B
SCALE: 3/8"=1'-0"

SECTION A-A
SCALE: 3/8"=1'-0"

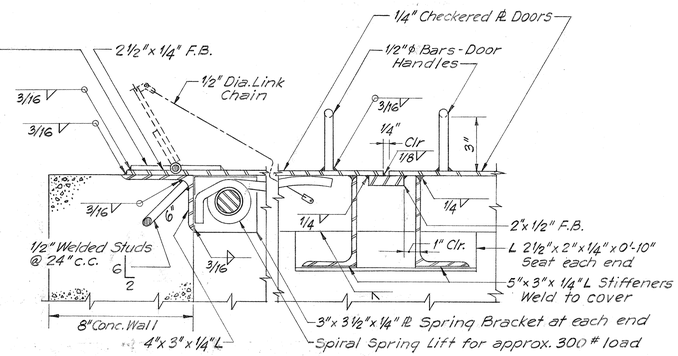


* Remove from existing installation and reinstall as shown items so referenced. Furnish and install all other items.

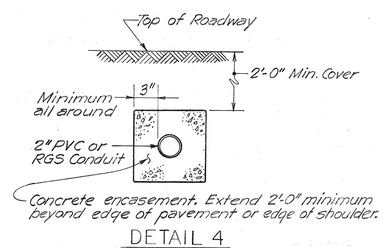
D E T A I L 2
CATHODIC PROTECTION EQUIPMENT INSTALLATION
NO SCALE



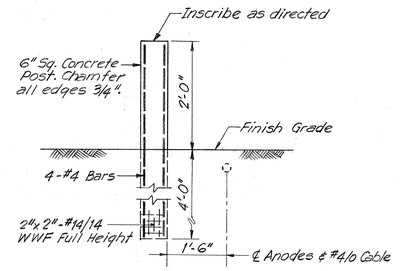
PLAN
SCALE: 3/8"=1'-0"



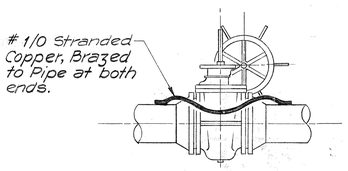
SECTION C-C
SCALE: 3" = 1'-0"



DETAIL 4
INSTALLATION OF CABLE UNDER ROADWAY
NO SCALE

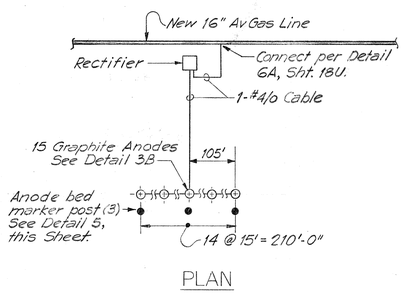


DETAIL 5
ANODE BED MARKER POST
NO SCALE



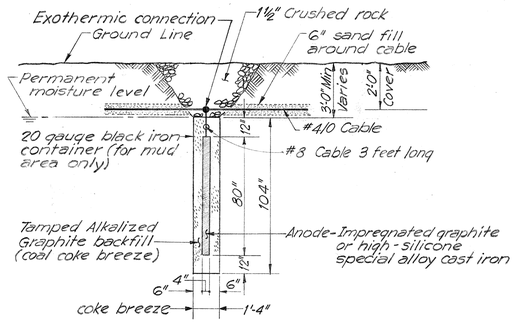
DETAIL 1A
BONDING AT VALVE
SCALE: 3/8"=1'-0"

D E T A I L 1
PIPELINE VALVE BOX AT STA. 70 + 10
* Remove from existing installation and reinstall as shown items so referenced. Furnish and install all other items.



PLAN

DETAIL 3A
ARRANGEMENT OF ANODES
NO SCALE



DETAIL 3B
TYPICAL ANODE
SCALE: 1/4" = 1'-0"

D E T A I L 3
CATHODIC PROTECTION ANODE BED

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REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

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J. Andrew Schuchardt

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NAVY AVGAS LINE PIPELINE VALVE BOX & CATHODIC PROTECTION DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-1(89)-13

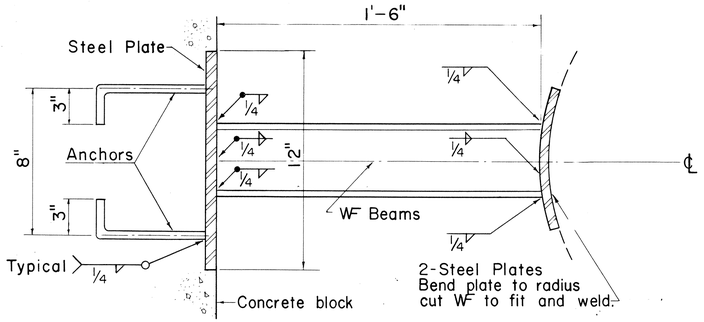
SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 19U OF 44 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

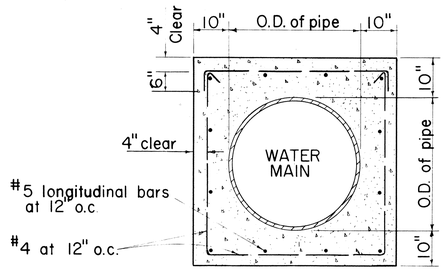
156

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HH-1(89)13	1971	157	362

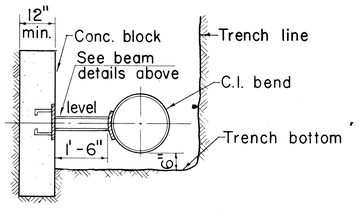


BEAM DETAIL

Scale: 3" = 1'-0"

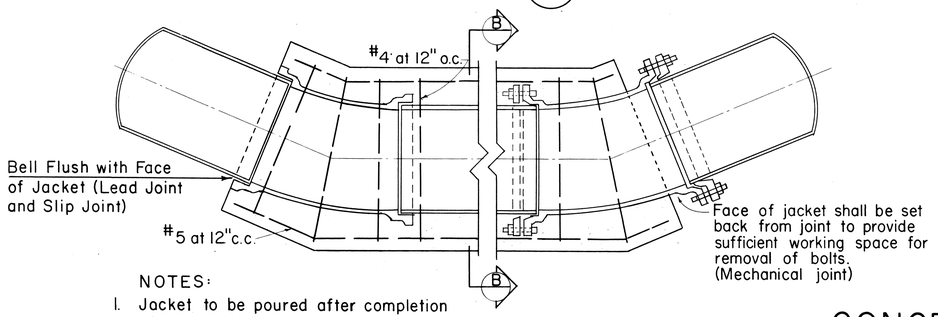


SECTION B



SECTION C

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

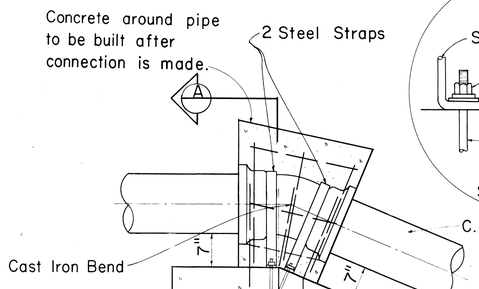


NOTES:

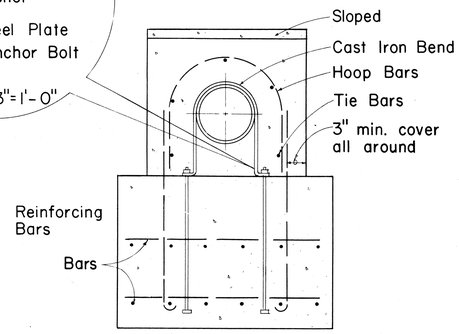
1. Jacket to be poured after completion of test unless otherwise approved by the Engineer.
2. 2 1/2" depth of lead for lead joint pipe required at all embedded joints.
3. Wherever construction joints are required, 6" rubber or neoprene waterstops shall be installed. Waterstops shall be of the type specified and manufactured by the Servicized Products Corporation, Gate Rubber Company or approved equal.

REINFORCED CONCRETE JACKET

Scale: Not to Scale



ELEVATION



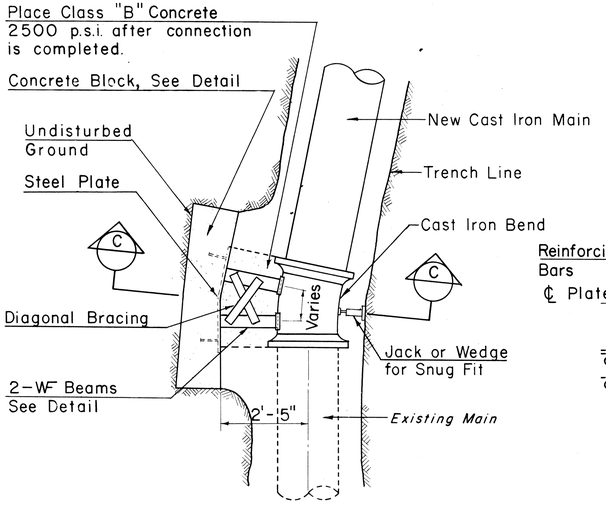
SECTION A

TYPICAL DETAIL OF CONCRETE REACTION BLOCK WITH STRAPS

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

GENERAL NOTES:

1. Detail drawings of actual blocks to be used, shall be furnished during construction by B.W.S. and or State.
2. Steel straps, anchor bolts, nuts, washers, etc., furnished and installed by the Contractor will not be paid for directly, but shall be considered incidental to the various contract items for the water system.
3. Minimum cover over all reinforcing steel shall be 3 inches.

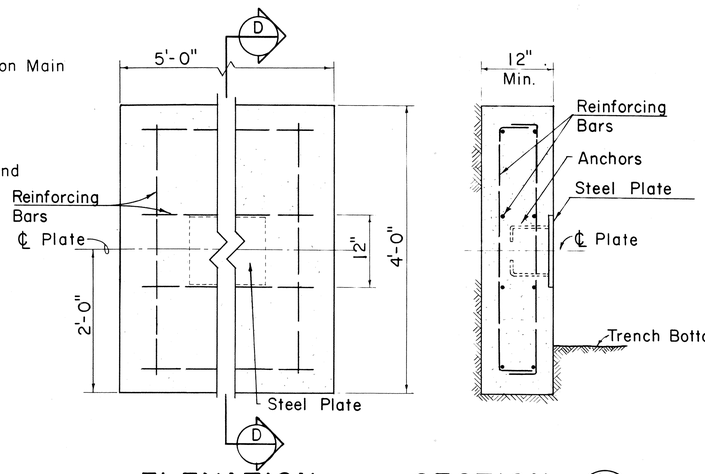


PLAN

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

NOTE:

Concrete Block with structural strut shall be used for bends at connections or for tee connections.

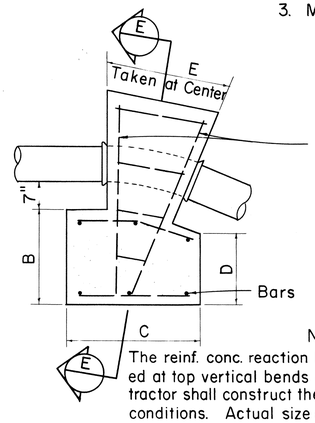


ELEVATION SECTION D

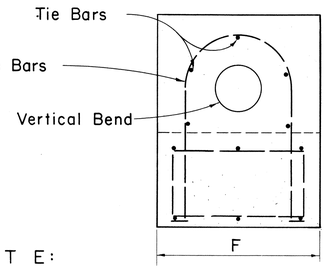
DETAILS OF CONCRETE BLOCK

Scale: 1" = 1'-0"

TYPICAL DETAIL OF CONCRETE BLOCK WITH STRUCTURAL STRUT



ELEVATION



SECTION E

NOTE:

The reinf. conc. reaction block as shown in this typical detail shall be constructed at top vertical bends only. After trench is dug at block location, the Contractor shall construct the block as directed by the Engineer to meet ground conditions. Actual size of Reaction Block shall also be determined by the Engineer.

TYPICAL DETAIL OF REINFORCED CONCRETE REACTION BLOCK FOR TOP VERTICAL BENDS

Scale: Not to Scale

APPROVED:

ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

3/1/71
DATE

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

Scale: As Shown

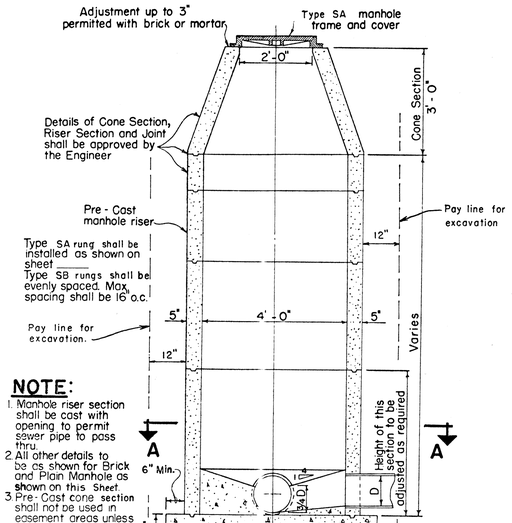
DATE: 10/30/70

SHEET No. 20U OF 44 SHEETS

157

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGN 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	HAWAII	I-HI-1(89) 13	1971	158	362



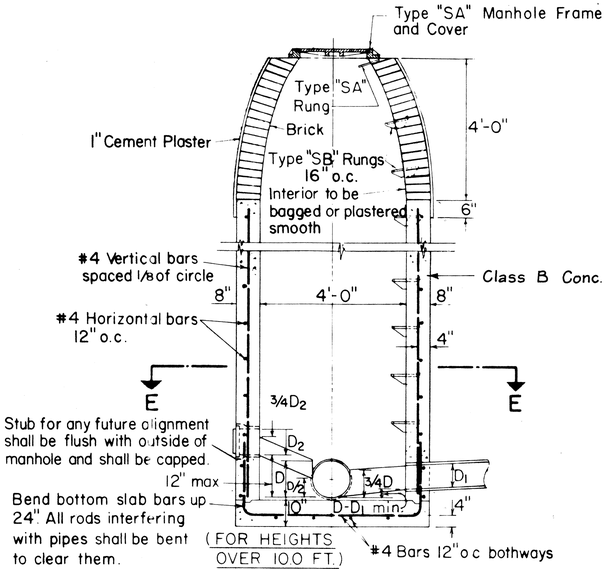
NOTE:

1. Manhole riser section shall be cast with opening to permit sewer pipe to pass thru.
2. All other details to be as shown for Brick and Plain Manhole as shown on this Sheet.
3. Pre-Cast cone section shall not be used in easement areas unless when approved by the Engineer. Cone section shall be of bricks where pre-cast not permitted.
4. All pipes entering or leaving manholes shall have a joint within 2'-0" of the manhole wall.

PLAIN MANHOLE (PRE-CAST CONCRETE)

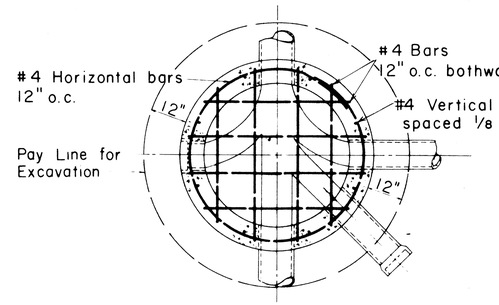
Scale: 1/2" = 1'-0"

Where sewer runs straight thru the manhole, the Contractor may lay pipe thru manhole with the manhole invert and base poured together. After concrete has hardened, the upper portion of pipe within the manhole shall be carefully broken out. All unevenness shall be patched with mortar.



PLAIN MANHOLE

Scale 1/2" = 1'-0"

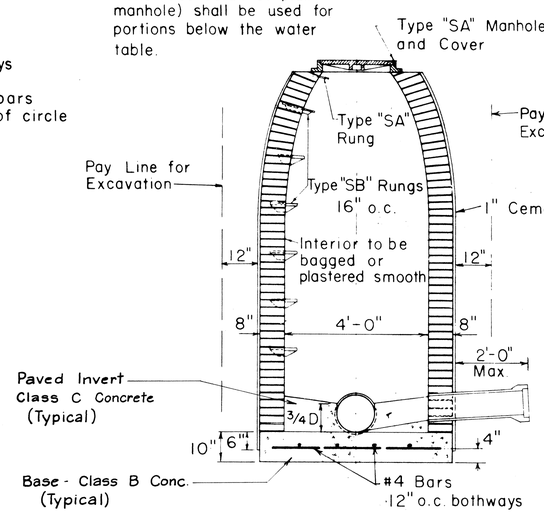


SECTION E-E

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

NOTE:

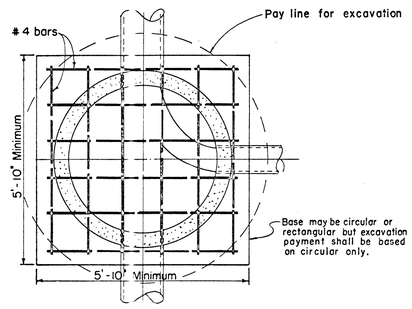
Reinforced concrete manhole walls (See detail of plain manhole) shall be used for portions below the water table.



(MAXIMUM HEIGHT - 10.0 FEET)

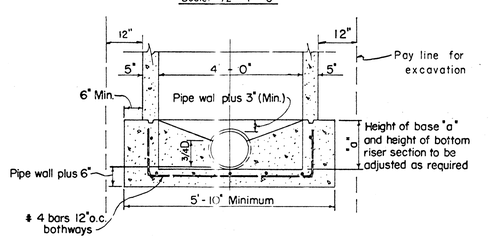
BRICK MANHOLE

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



SECTION A-A

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



ALTERNATE BASE (PRE-CAST CONCRETE M.H.)

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

Payment for excavation for manholes shall be made under the item "Structure Excavation other than at Bridges" and shall be measured to one foot outside of walls from original ground elevation to authorized bottom elevation.
Payment for manhole walls (brick, concrete, or cast-in-place concrete) shall include brick, mortar, concrete, reinforcing steel, cast-iron steps, galvanized wrought iron rungs, and plastering, and be paid for under the item "Walls for Sewer Manhole."
Payment for manhole bases shall be made under the items "Class B Concrete other than in Bridges" and "Reinforcing Steel other than in Bridges."

NOTE

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

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

4. All reinforcing rods interfering with pipes shall be bent to clear them.
5. Bar lap to be 40 diameters in length.
6. All Class C Concrete to be incidental to Class B Conc.
7. Manhole wall to be of reinforced concrete to height 1' above normal ground water table.
8. All pipes entering or leaving manholes shall have a joint within 2'-0" of the manhole wall.

APPROVED:

Edona 3/8/71

CHIEF, DIVISION OF SEWERS — DATE

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

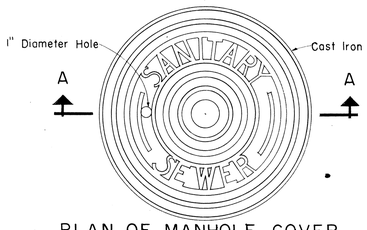
SEWERS: PRE-CAST AND BRICK MANHOLE DETAILS

Scales As Noted — Date: 10/30/70

SHEET NO. 21 OF 44 SHEETS

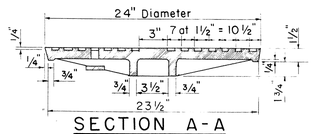
ILLIN KREG. CO., N.Y. MADE

FED. ROAD DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89):13	1971	159	362



PLAN OF MANHOLE COVER

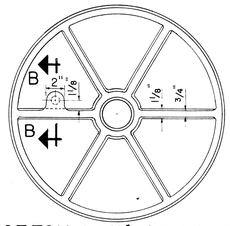
Scale: 1 1/2" = 1'-0"



SECTION A-A

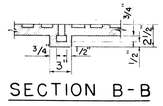
Scale: 1 1/2" = 1'-0"

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

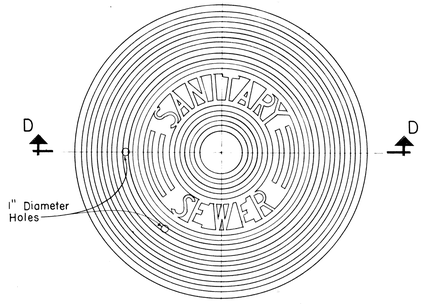


BOTTOM VIEW OF COVER

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



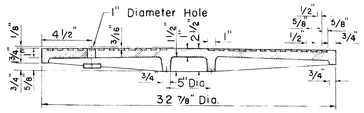
SECTION B-B



PLAN

SPECIAL MANHOLE COVER

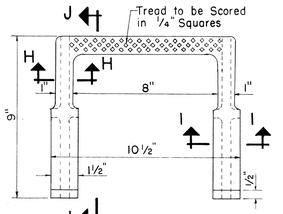
Scale 1 1/2" = 1'-0"



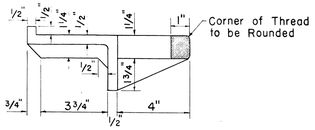
SECTION D-D

Scale 1 1/2" = 1' 0"

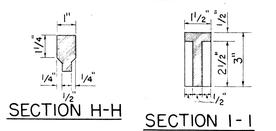
Approx Weight 260 Pounds



PLAN

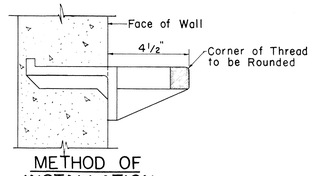


SECTION J-J



SECTION H-H

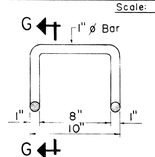
SECTION I-I



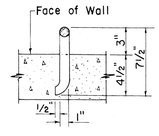
METHOD OF INSTALLATION

TYPE "SB" MANHOLE RUNGS (CAST IRON)

Scale: 3" = 1'-0"



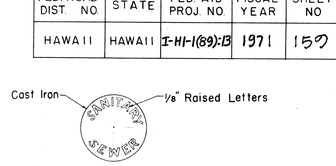
PLAN



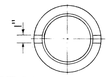
SECTION G-G

TYPE "SA" MANHOLE RUNGS (WROUGHT IRON)

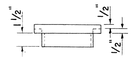
Scale: 1 1/2" = 1'-0"



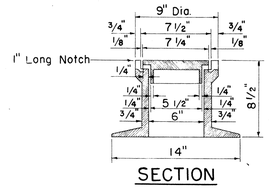
PLAN OF COVER



BOTTOM OF COVER



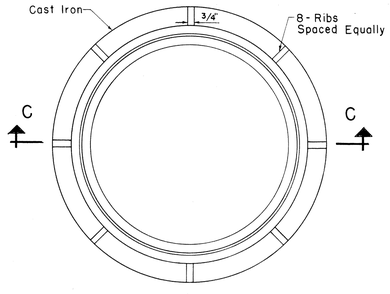
ELEVATION



SECTION

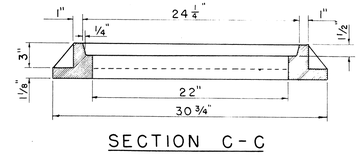
DROP MANHOLE CHIMNEY CASTINGS

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



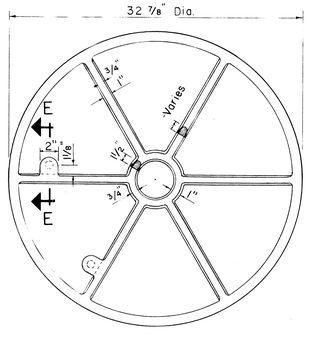
PLAN OF MANHOLE FRAME

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



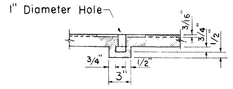
SECTION C-C

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



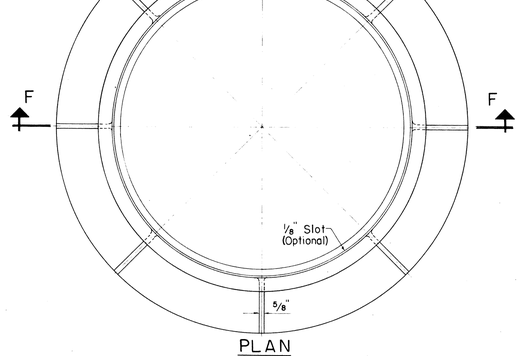
BOTTOM VIEW OF COVER

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



SECTION E-E

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

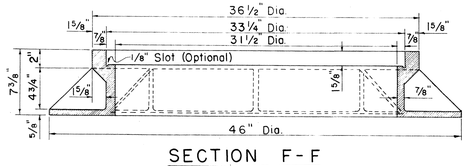


PLAN

SPECIAL MANHOLE FRAME

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

Approx Weight 437 Pounds



SECTION F-F

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

TYPE "SA" SEWER MANHOLE FRAME AND COVER

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

TYPE "SB" SEWER MANHOLE FRAME AND COVER

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

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

APPROVED:

Zdona 3/8/71

CHIEF, DIVISION OF SEWERS DATE

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

STANDARD DETAILS

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

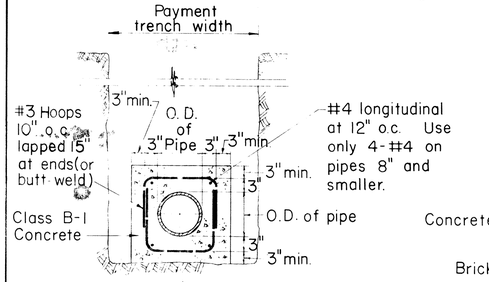
Scales: As Noted Date: 10/30/70

SHEET NO. 22 OF 44 SHEETS

159

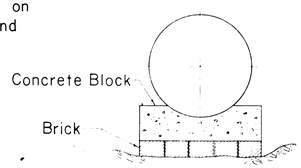
PD 125 IMPERIAL TRACING CLOTH 10-62

FED. ROAD DIST. NO	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(69):13	1971	160	362



DETAIL OF CONCRETE JACKET

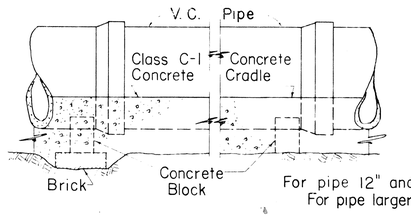
Scale: 3/4" = 1'-0"



METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

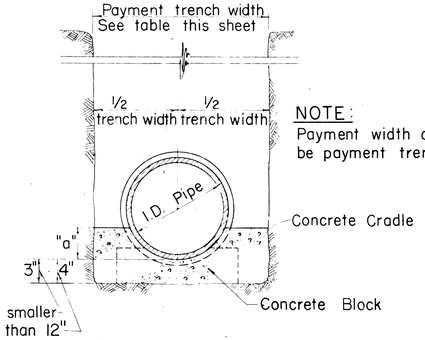
Not To Scale

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



ELEVATION SHOWING METHOD OF LAYING PIPE

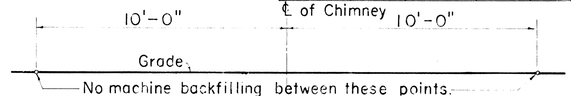
Not To Scale

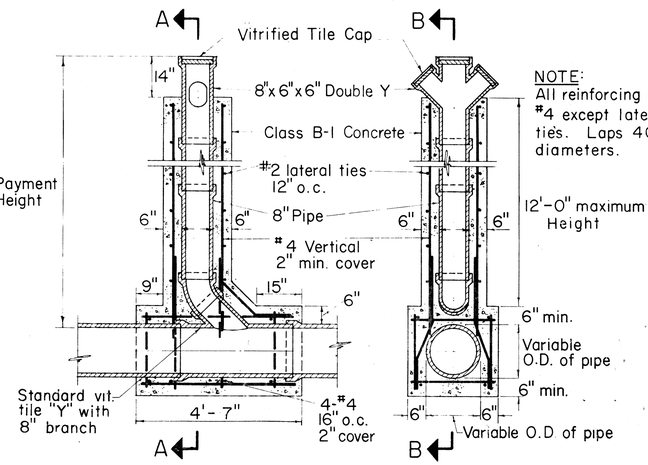


NOTE:
Payment width of cradle shall be payment trench width.

CONCRETE CRADLE FOR VITRIFIED CLAY PIPE

Not To Scale



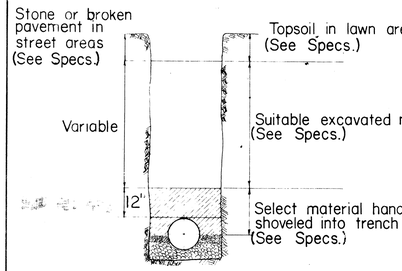


NOTE:
All reinforcing rods #4 except lateral ties. Laps 40 diameters.

12'-0" maximum Height

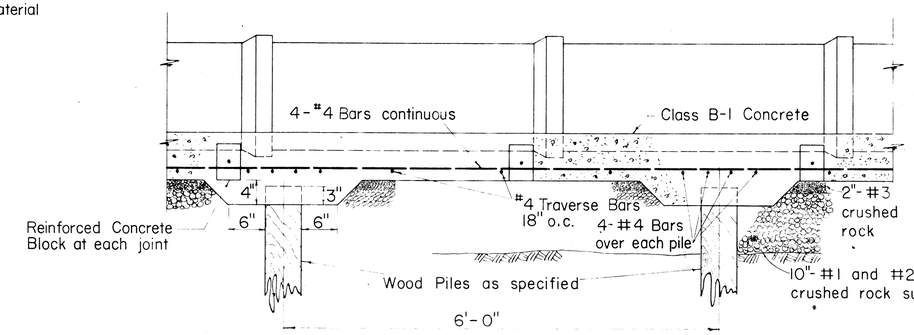
DETAILS OF CHIMNEY

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

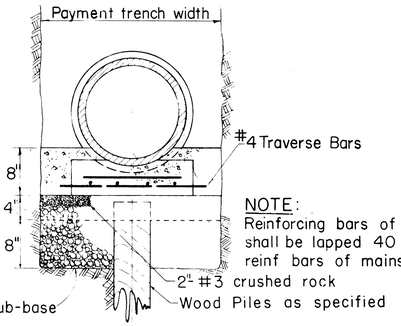


METHOD OF BACKFILL

Not To Scale



Scale: 1" = 1'-0"

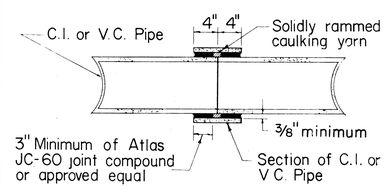


SECTION

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

DETAIL OF REINFORCED CONCRETE CRADLE ON WOOD PILES (FOR 6, 8, 10 & 12 IN. V.C. PIPE)

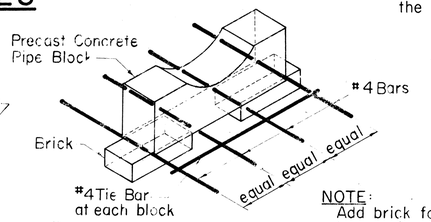
DETAIL OF REINFORCED CONCRETE CRADLE WITHOUT PILES SIMILAR EXCEPT FOR WOOD PILES AND PILE CAPS



BUTT JOINT DETAIL

Scale: 1" = 1'-0"

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

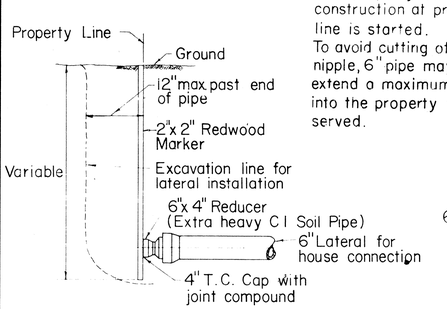


NOTE:
Add brick for larger size pipe

Not To Scale

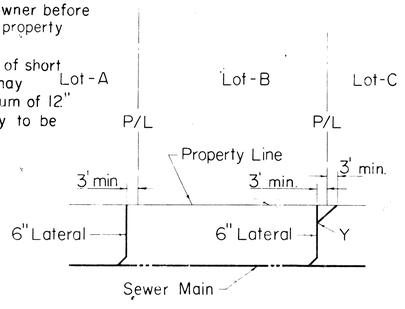
ALTERNATE DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

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



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

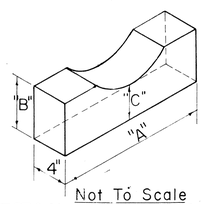
DETAIL AT PROPERTY LINE



LAYOUT

CONSTRUCTION OF LATERALS

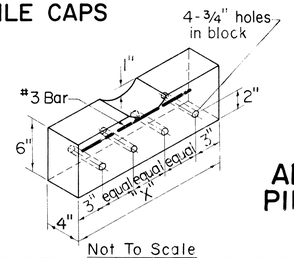
Not To Scale



Not To Scale

DETAIL OF PRECAST CONC. PIPE BLOCK

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



Not To Scale

DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

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

APPROVED:

R Lowe
CHIEF, DIVISION OF SEWERS

3/8/71
DATE

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

STANDARD DETAILS

SEWERS - CONCRETE JACKET & MISCELLANEOUS DETAILS

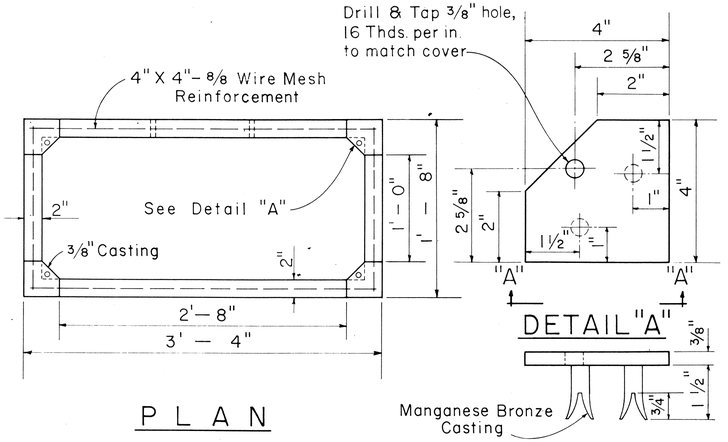
Scales: As Noted Date: 10/30/70

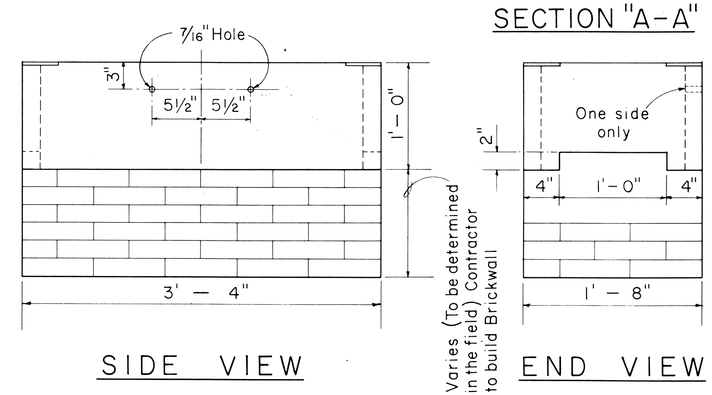
SHEET NO. 23 OF 44 SHEETS

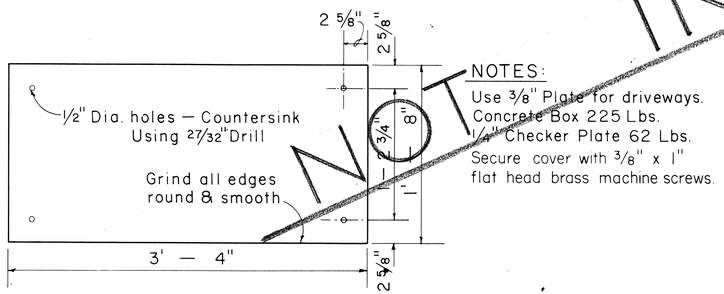
160

IMPERIAL TYPE K & E CO., N.Y. TRADE MARK

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89):13	1971	161	362







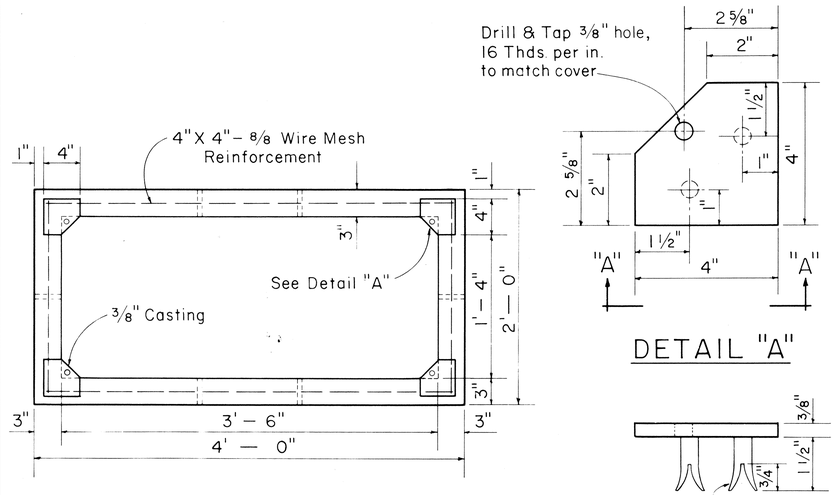
1/4" CHECKER PLATE COVER

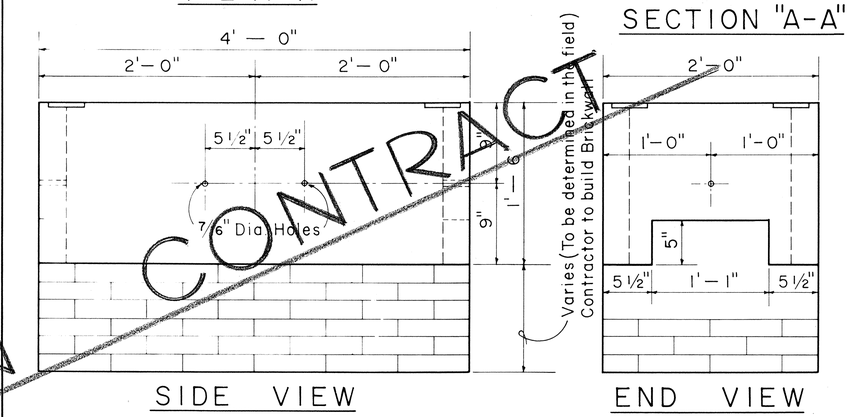
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

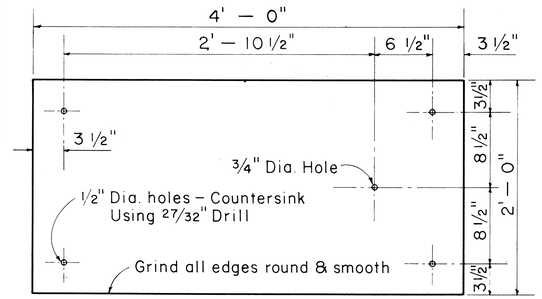
1'-4" X 3'-0" CONCRETE SERVICE BOX

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

011250







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

1/4" CHECKER PLATE COVER

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

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

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

011255

CONTRACT NOT IN

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. JK — HARRN — 5/20/71 DATE

HAWAIIAN TELEPHONE Co. — 2-8-71 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

Scales: As Noted — Date: OCT. 30, 1970

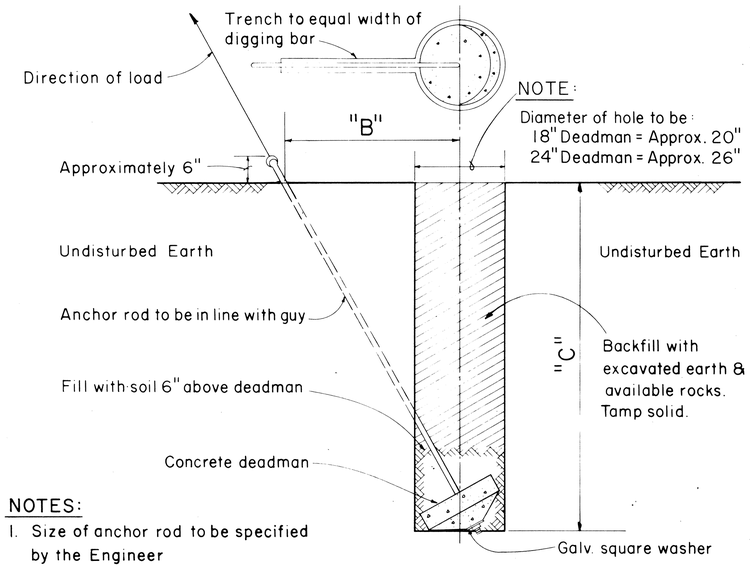
SHEET NO. 24 OF 44 SHEETS

161

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

LIETZ 1104 ARKWRIGHT TRACING CLOTH 10-60 200P

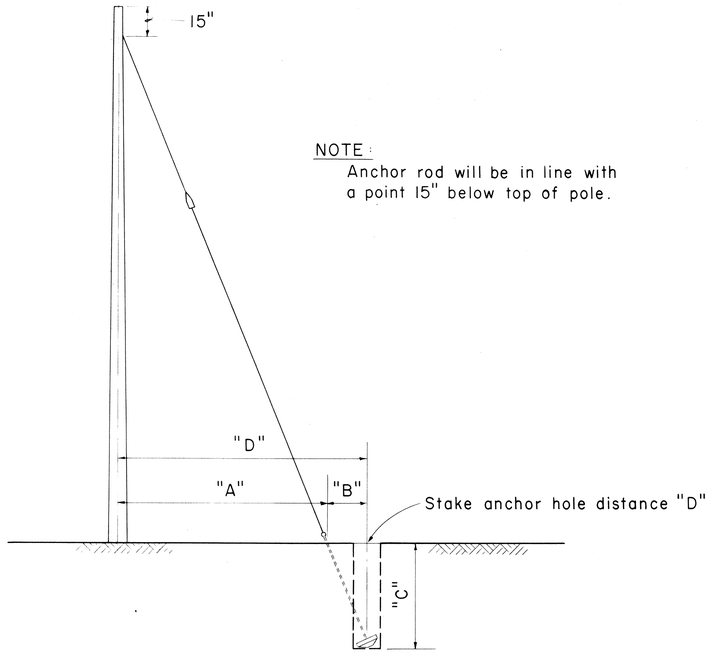
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89):13	1971	102	362



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"

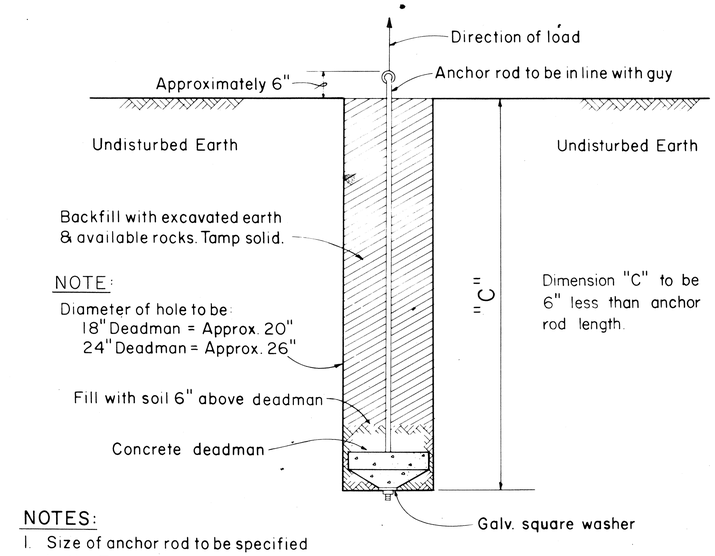
D. M. = Deadman

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

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

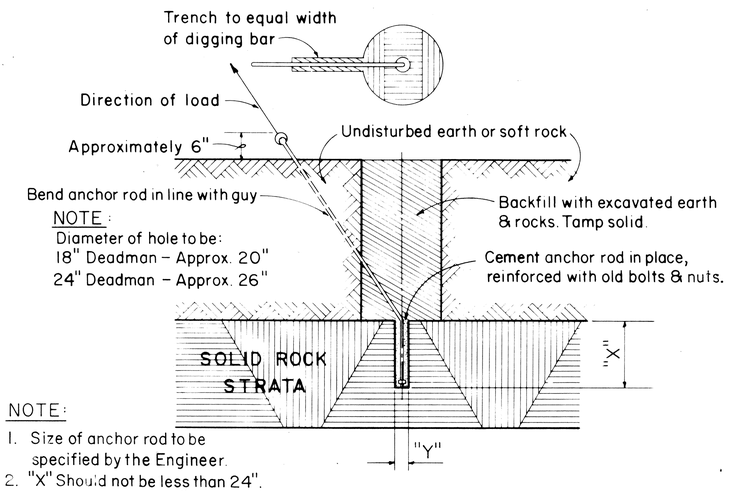
ANCHORING DATA



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

SIDE – WALK ANCHOR

Scale: 3/4"= 1' – 0"



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

ROCK ANCHOR

Not to Scale

APPROVED:

HAWAIIAN ELECTRIC Co., Inc. — 5/20/71 DATE

HAWAIIAN TELEPHONE Co. — 5-8-71 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

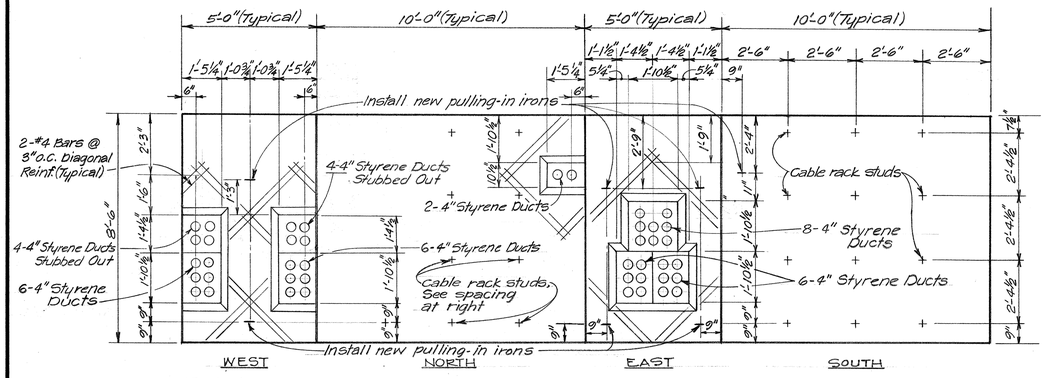
STANDARD DETAILS
H.E.Co. AND H.T. Co.
ANCHOR DETAILS AND ANCHORING DATA

Scales: As Noted — Date: OCT. 30, 1970

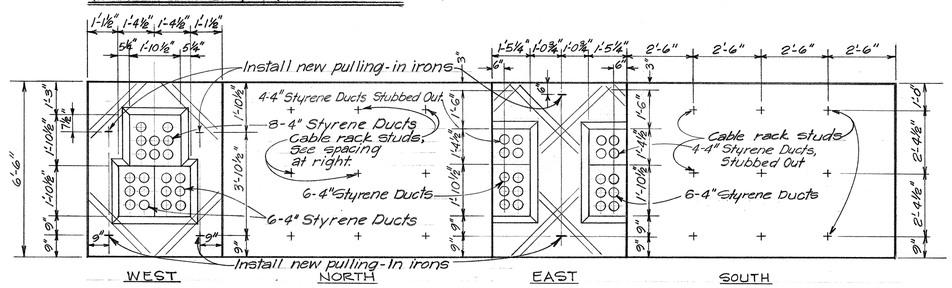
SHEET No. 25U OF 44 SHEETS

102

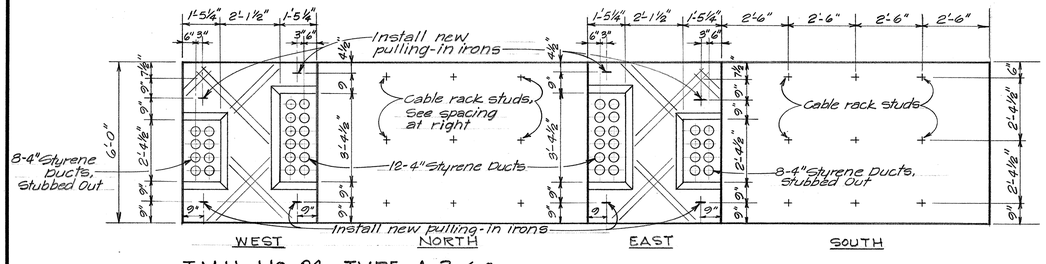
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)-13	1971	163	362



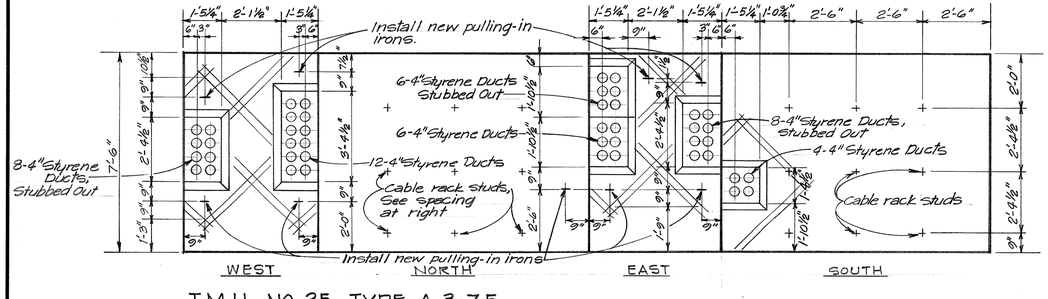
T.M.H. NO.22, TYPE A-3-8.5



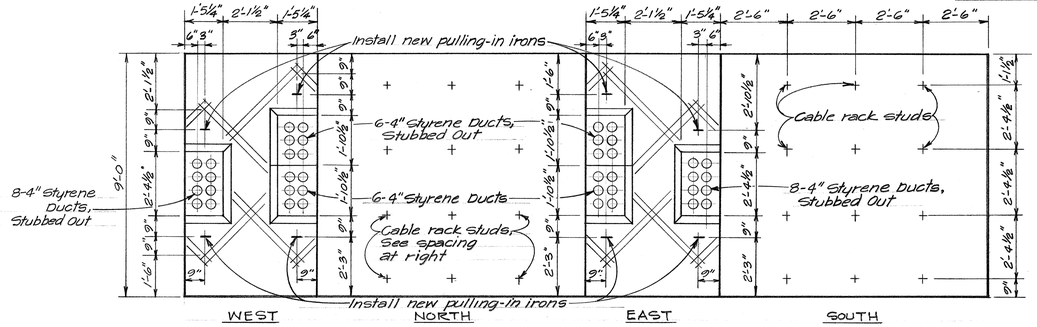
T.M.H. NO. 23, TYPE A-3-6.5



T.M.H. NO. 24, TYPE A-3-6.0



T.M.H. NO. 25, TYPE A-3-7.5



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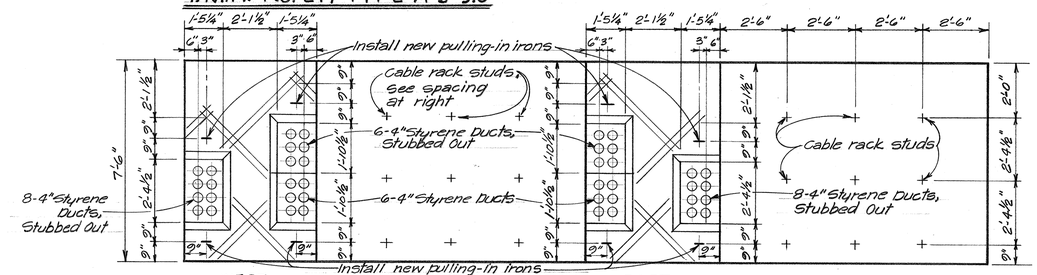
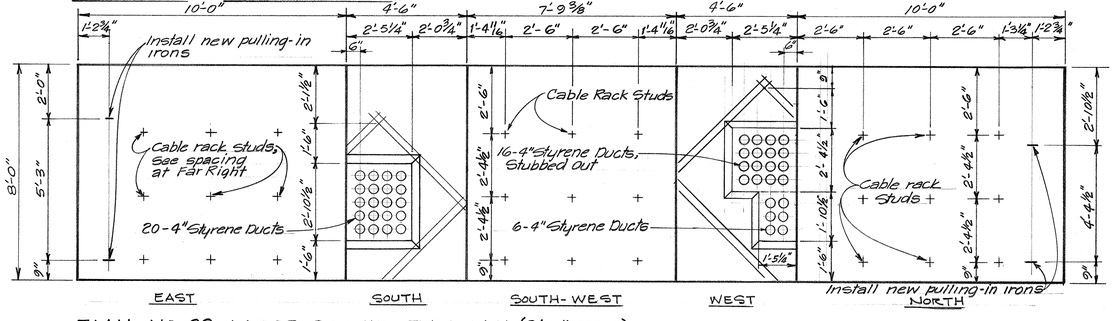
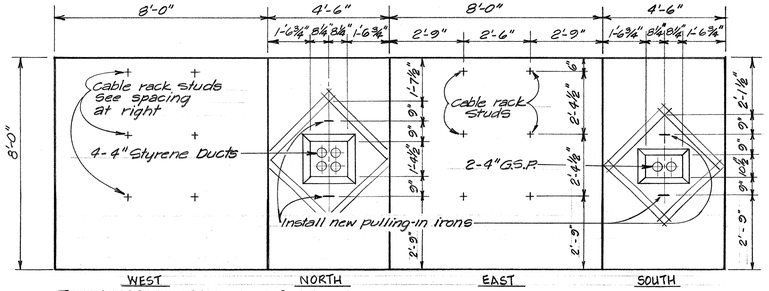


T.M.H. NO. 28, TYPE A-3-7.5



T.M.H. NO. 29, LARGE CORNER TYPE M.H. (8'-0" DEEP)



T.M.H. NO. 26, TYPE A-1-8

NOTE

See Sht. 16 U for Typical Stub-Out Detail.

APPROVED

Hawaiian Telephone Co, Ltd. — 5-8-71 Date

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

J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H.T.CO. MANHOLE WALL ELEVATIONS

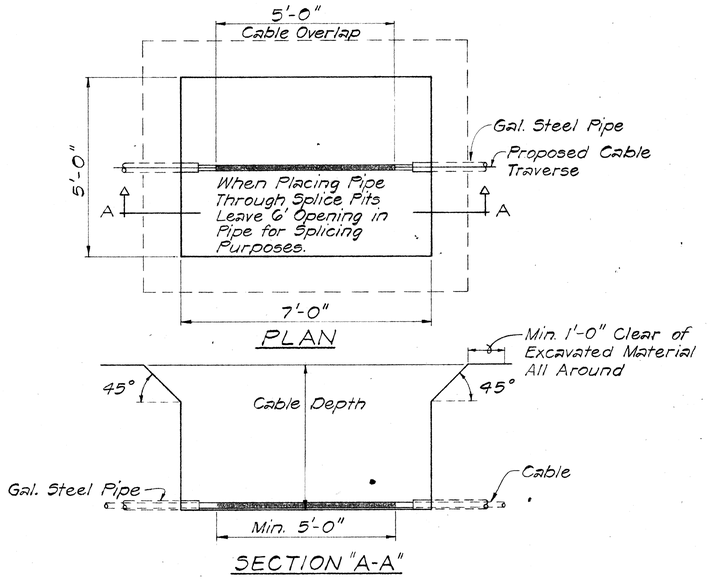
INTERSTATE ROUTE H-1
PROJECT NO I-HI-1(89):13

SCALE: 3/8"=1'-0" DATE: OCT. 30, 1970

SHEET No. 26 U OF 44 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

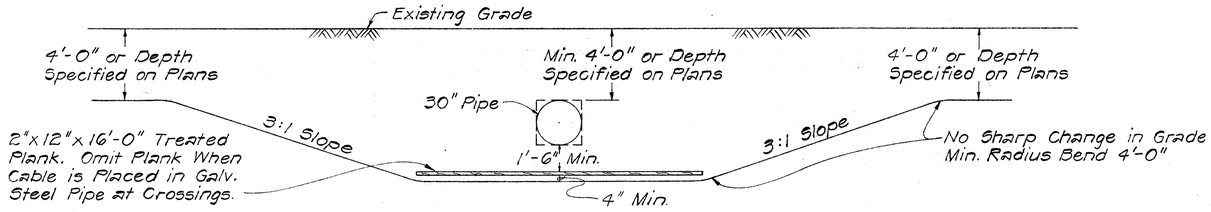
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)13	1971	164	362



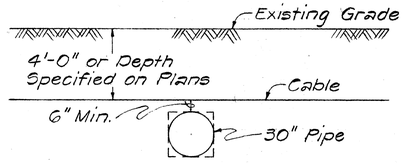
TYPICAL SPLICING PITS FOR BURIED CABLE

NOTES:

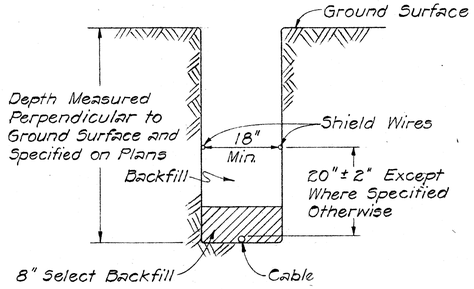
1. The Contractor shall dig pits at specified locations.
2. One face of pit shall be kept free of excavated material.
3. Where pits are located on sloping or irregular ground. The excavated material shall be placed in such a manner as to prevent surface water from draining into the pit.
4. Provide a fence around the pit at any location where stock have access to the route, and pits near farm homes to keep out small animals and pets.



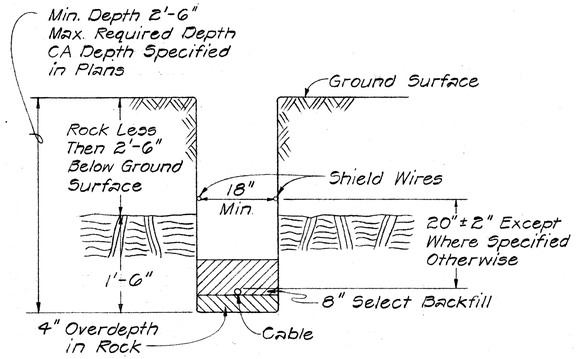
DETAIL OF CABLE CROSSINGS UNDER STORM CULVERTS - IRRIGATION PIPES, OTHER UTILITIES, OR FOREIGN PIPES



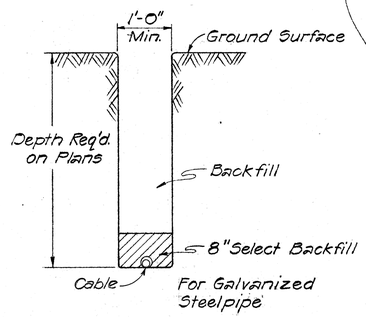
DETAIL OF CABLE CROSSINGS OVER STORM CULVERTS - IRRIGATION PIPES, OTHER UTILITIES, OR FOREIGN PIPES



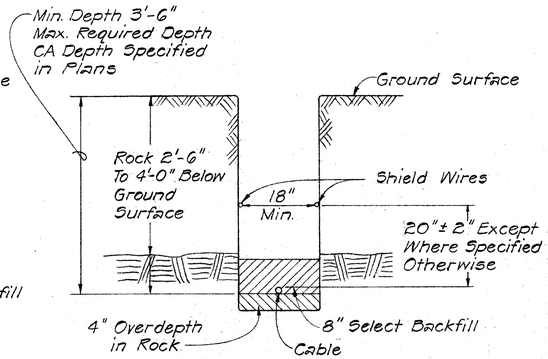
TYPICAL SECTION THROUGH NORMAL TRENCH



TYPICAL SECTION THROUGH TRENCH WITH ROCK LESS THAN 2'-6" BELOW SURFACE



TYPICAL SECTION FOR TRENCH WHERE NO SHIELD WIRE IS REQUIRED



TYPICAL SECTION THROUGH TRENCH WITH ROCK 2'-6" TO 4'-0" BELOW SURFACE

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

APPROVED:

F. K. Judd — 2-8-71

Hawaiian Telephone Co., Ltd. — Date

H. T. Co., Ltd. — Drawing Nos. 34047, 34048

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS SPLICING PITS AND STANDARD TRENCHING DETAILS FOR BURIED COAXIAL CABLE

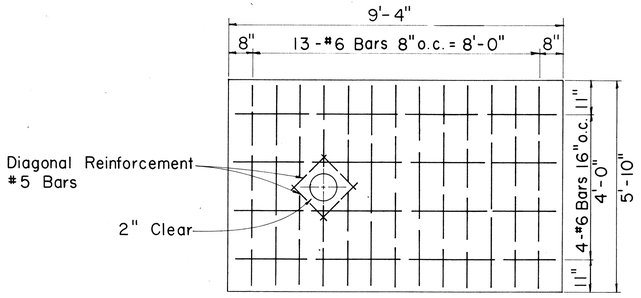
Scale: Not to Scale Date: OCT. 30, 1970

SHEET No. 27U OF 44 SHEETS

164

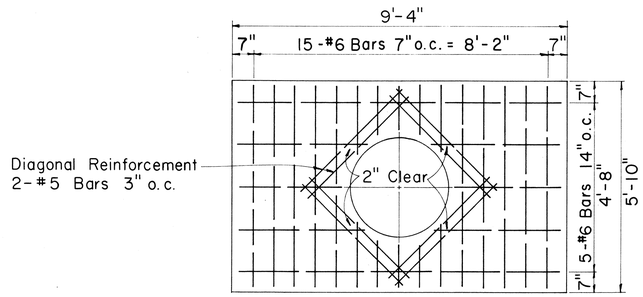
K+E CRYSTALENE® LA 2920 TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-III-1(18)18	1971	165	362



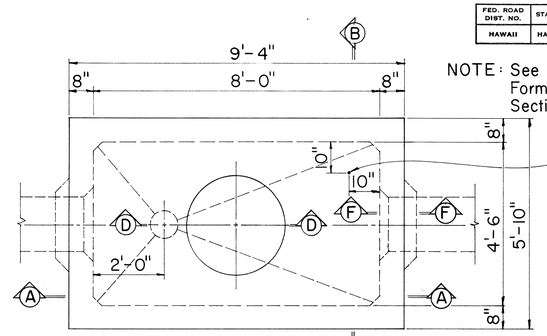
FLOOR SLAB REINF PLAN

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



ROOF SLAB REINF PLAN

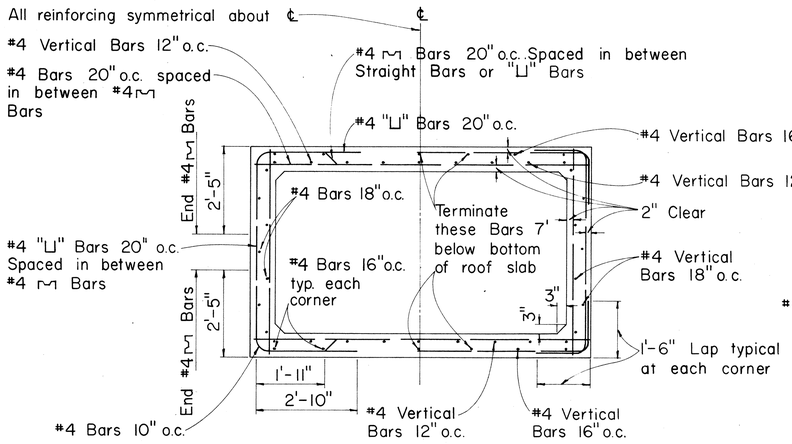
Scale: 1/2" = 1'-0"



NOTE: See Standard Duct Formation Sheet for Section "F-F"

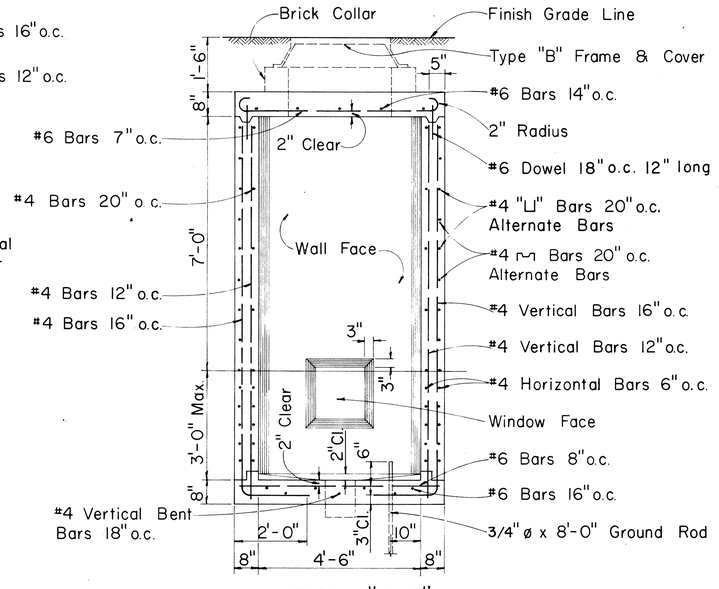
PLAN M.H. TYPE "A-1"
FOR ROADWAY & SIDEWALK AREAS

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



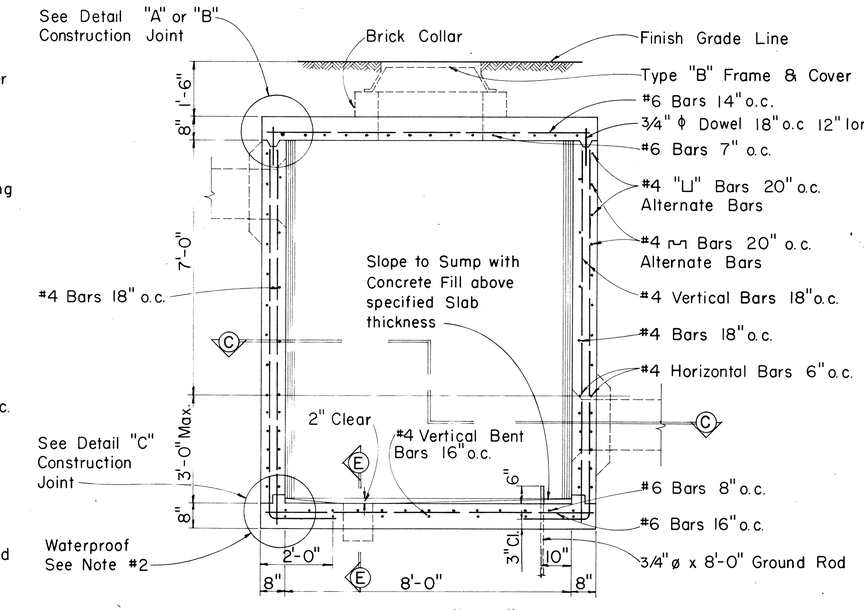
SECTION "C-C"

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



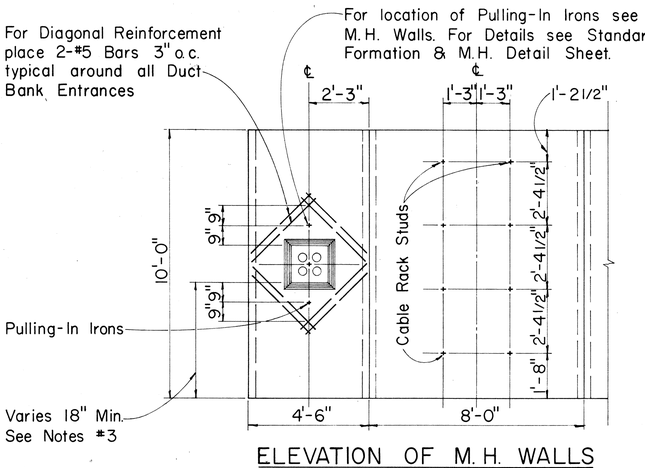
SECTION "B-B"

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



SECTION "A-A"

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

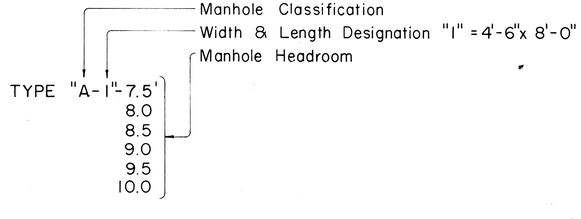


ELEVATION OF M.H. WALLS
(OPPOSITE FACES SIMILAR)

Scale: 3/8" = 1'-0"

GENERAL NOTES

1. Design Data:
   f_s = 20,000 psi; f'_c = 3,000 psi; f_c = 1,350 psi; n = 10
   w = Equivalent Fluid Pressure: 30#/FT²
2. All Construction Joints shall be water proofed with two applications of Thoro Seal or equal.
3. For Duct Window location see Plan Profile Sheets for Elevations.
4. Duct Window to suit-See Plan & Profile & Standard Detail Sheets for Location & Details.
5. For Details "A", "B", "C", Sections "D-D", "E-E", "F-F" and other miscellaneous Manhole Construction Details see Supplement Sheet to Type A-1, A-2, and A-3 Telephone Manholes.
6. Step and Ladder required only in Manholes with Headroom of 9.0' or more. Step and Ladder to be furnished by H.T.CO.



APPROVED:

D. H. Judd 2-9-71

Hawaiian Telephone Co., Ltd. Date

H. T. Co., Ltd. Drawing No. 34061

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A-1" MANHOLES FOR 7.5' TO 10.0' HEADROOM

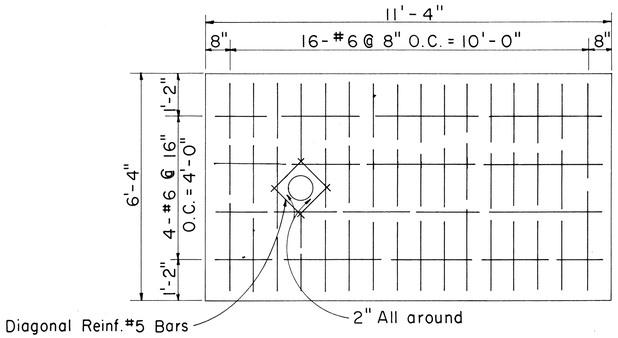
Scale: As Noted Date:

SHEET No. 280 OF 44 SHEETS

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

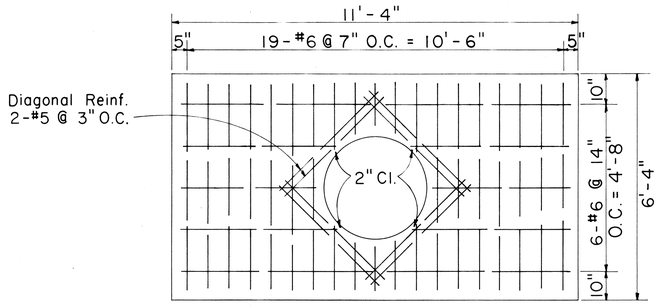
1 65

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(89)-13	1971	166	362



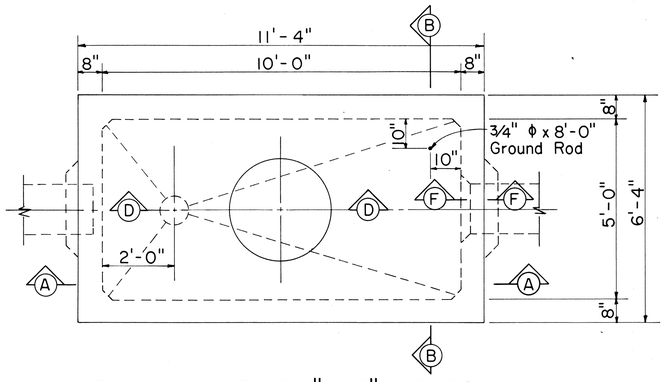
FLOOR SLAB REINF. PLAN

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



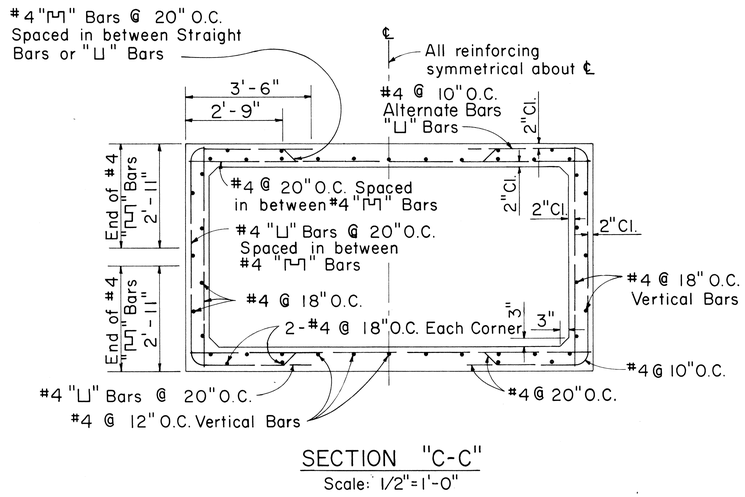
ROOF SLAB REINF. PLAN

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



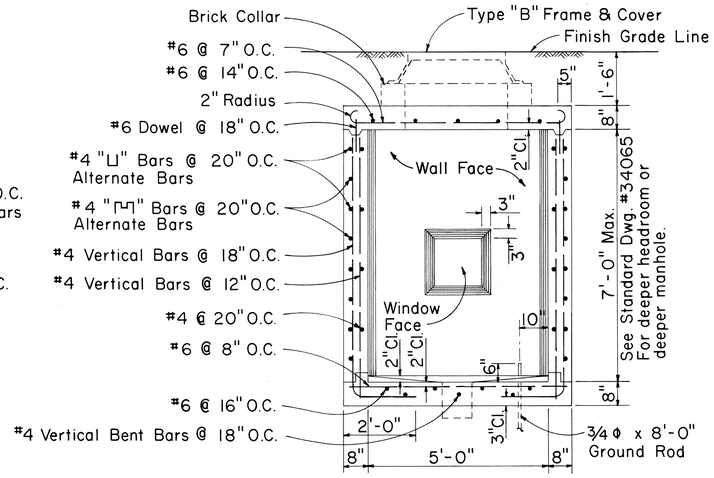
PLAN - M.H. TYPE "A-3" SERIES
FOR ROADWAY & SIDEWALK AREAS

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



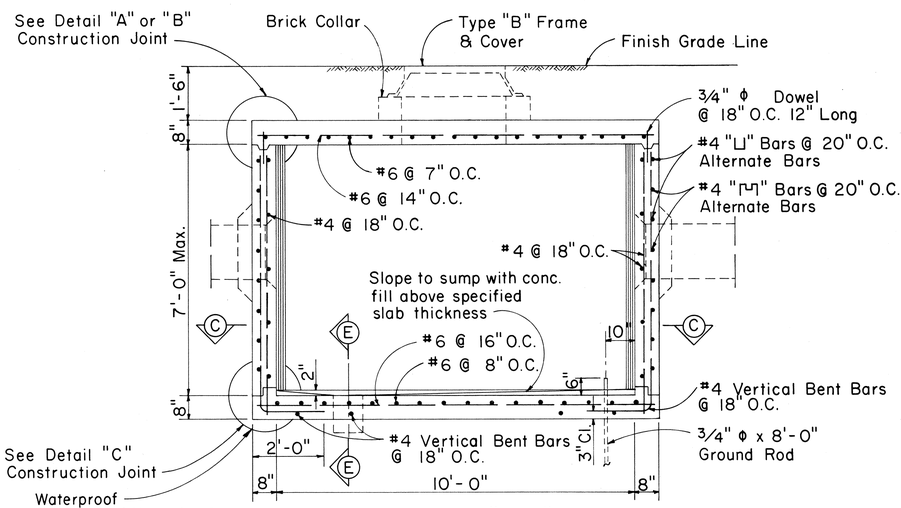
SECTION "C-C"

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



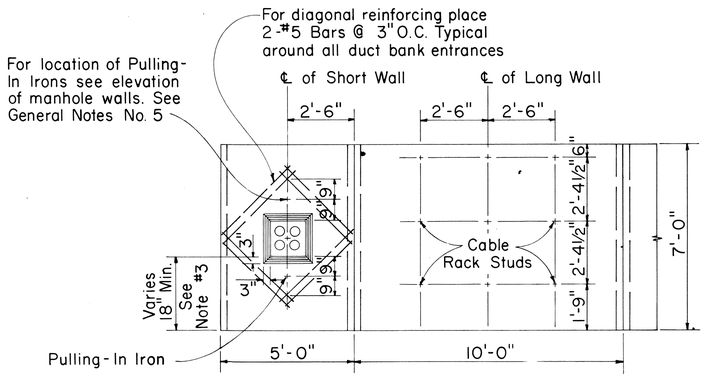
SECTION "B-B"

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



SECTION "A-A"

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



ELEVATION OF M.H. WALLS - TYPE "A-3" SERIES

(OPPOSITE FACES SIMILAR)

Scale: 3/8"=1'-0"

GENERAL NOTES:

1. Design Data:
   fs= 20,000 psi; f'c= 3,000 psi; fc= 1,350 psi; n=10
   w= Equivalent Fluid Pressure: 30#/ft²
2. All Construction Joints shall be waterproofed with two applications of Thoro Seal or equal.
3. For Duct Window location see Plan Profile Sheets for Elevations.
4. Duct Window to suit - See Plan & Profile & Standard Detail Sheets for Location & Details.
5. For Details "A", "B", "C," Sections "D-D," "E-E," "F-F" and other miscellaneous Manhole Construction Details see Supplement Sheet to Type "A-1," "A-2" and "A-3" Telephone Manholes.

TYPE "A-3"-6.0'
6.5'
7.0'

Manhole Classification
Width & Length Designation "3" = 5.0' x 10.0'
Manhole Headroom

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

APPROVED:

T.K. Dudd 2-8-71

Hawaiian Telephone Co., Ltd. Date

H.T. Co., Ltd. Drawing No. 34064

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

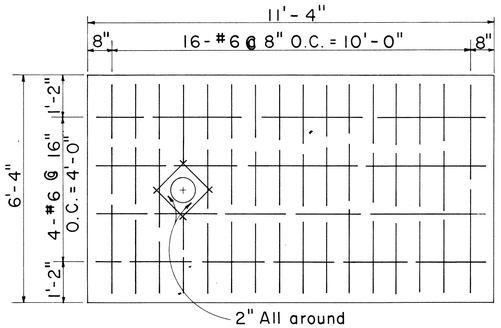
TYPE "A-3" MANHOLES FOR 6.0' TO 7.0' HEADROOM

Scale: As Noted Date: OCT. 30, 1970

SHEET No. 294 OF 444 SHEETS

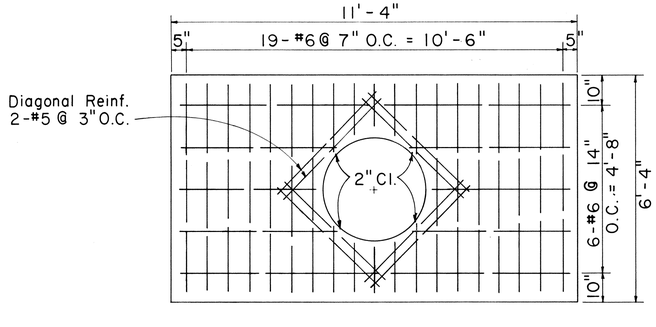
166

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(20)-13	1971	167	362



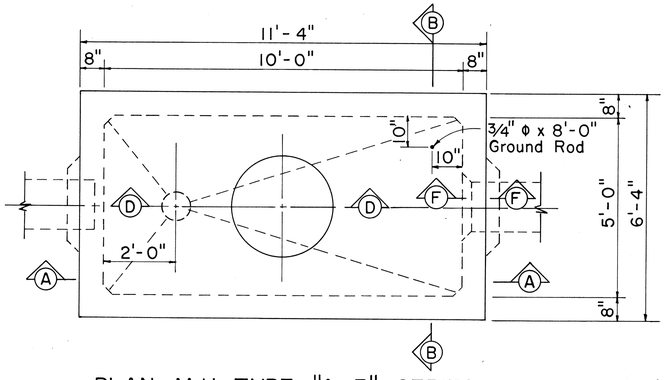
FLOOR SLAB REINF. PLAN

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



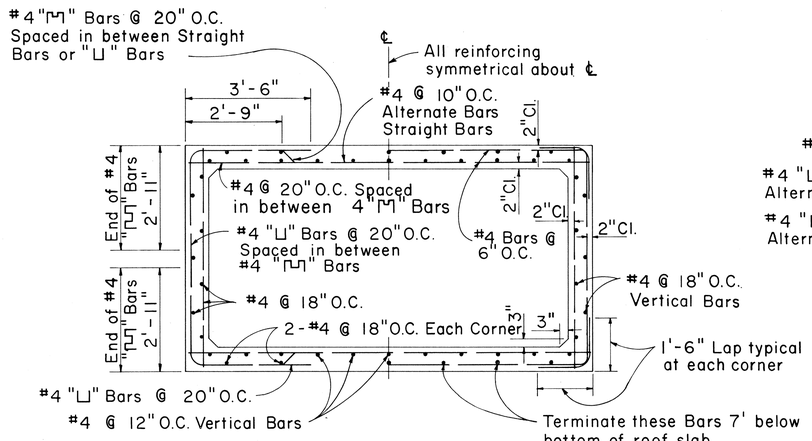
ROOF SLAB REINF. PLAN

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



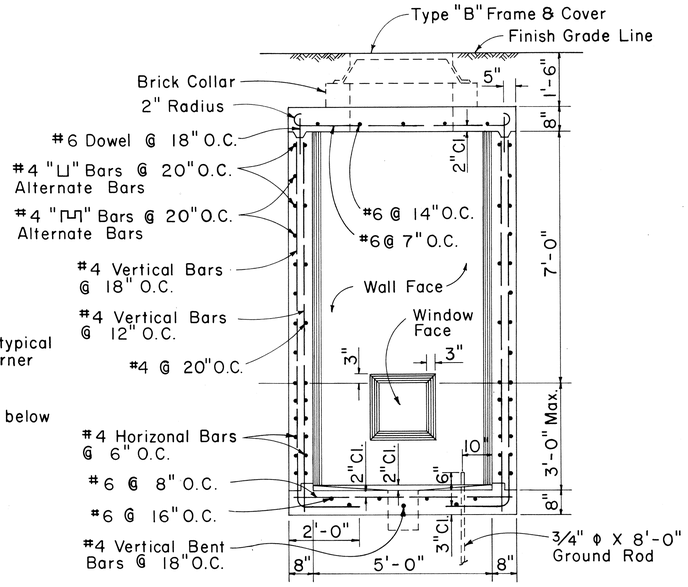
PLAN - M.H. TYPE "A-3" SERIES
FOR ROADWAY & SIDEWALK AREAS

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



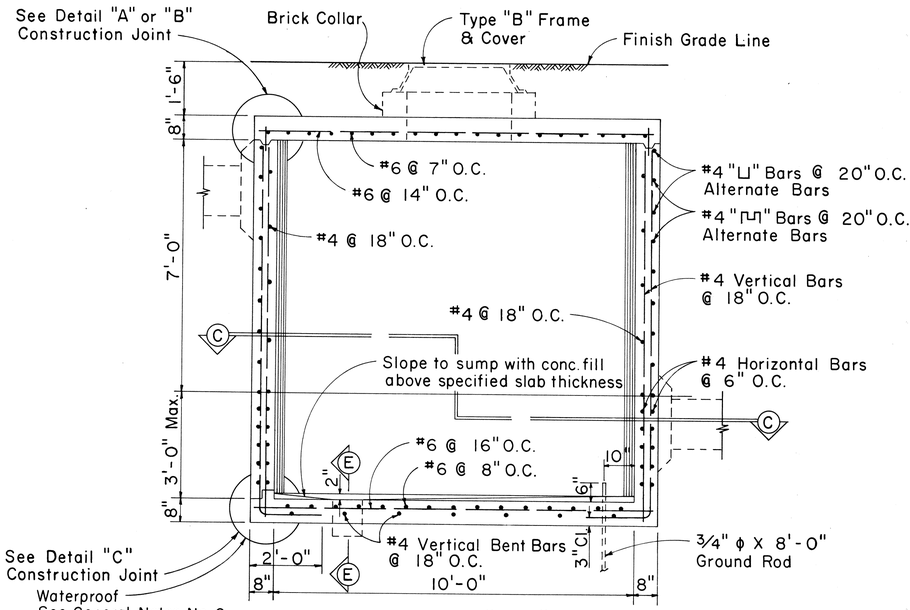
SECTION "C-C"

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



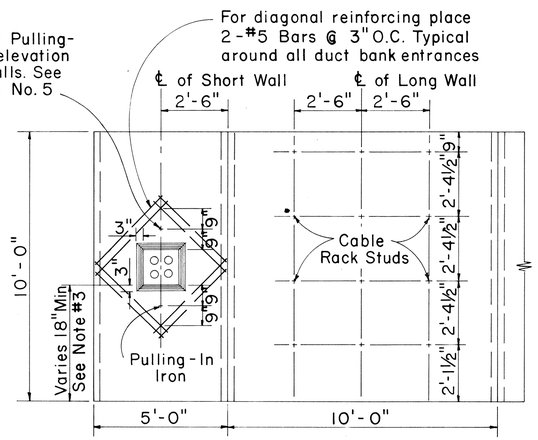
SECTION "B-B"

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



SECTION "A-A"

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



ELEVATION OF M.H. WALLS - TYPE "A-3" SERIES

(OPPOSITE FACES SIMILAR)

Scale: 3/8"=1'-0"

GENERAL NOTES:

1. Design Data:
   fs= 20,000 psi; fc'= 3,000 psi; fc= 1,350 psi; n=10
   w= Equivalent Fluid Pressure: 30#/ft²
2. All Construction Joints shall be waterproofed with two applications of Thoro Seal or equal.
3. For Duct Window location see Plan Profile Sheets for Elevations.
4. Duct Window to suit - See Plan & Profile & Standard Detail Sheets for Location & Details.
5. For Details "A", "B", "C", Sections "D-D", "E-E", "F-F" and other miscellaneous Manhole Construction Details see Supplement Sheet to Type "A-1", "A-2" and "A-3" Telephone Manholes.
6. Step and Ladder required only in Manholes with Headroom of 9.0' or more. Step and Ladder to be furnished by H.T.CO.

TYPE "A-3"-7.5'
8.0
8.5
9.0
9.5
10.0

Manhole Classification
Width & Length Designation "3" = 5.0' x 10.0'
Manhole Headroom

APPROVED:

F. H. Judd 2-8-71

Hawaiian Telephone Co., Ltd. Date

H.T. Co., Ltd. Drawing No. 34065

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A-3" MANHOLES FOR 7.5' TO 10.0' HEADROOM

Scale: As Noted Date: OCT. 30, 1970

SHEET No. 30U OF 44 SHEETS

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

167

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69):13	1971	168	362

GENERAL NOTES:

1 Design Data
- fs = 20,000 psi
- f'c = 3,000 psi
- fc = 12,000 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 Windows see Profile Sheet.

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

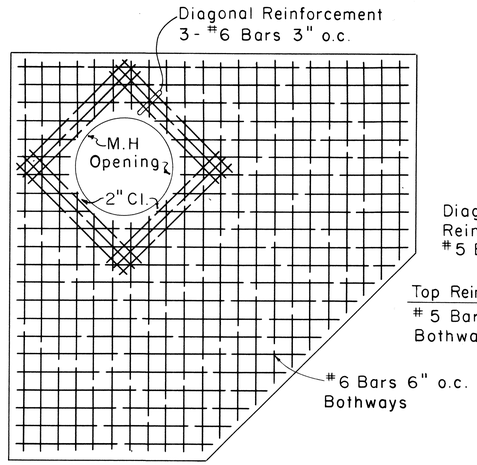
7 All Construction Joints shall be Waterproofed with Two Applications of Thoro-Seal or equal.

8 Cap all Ducts and Stubouts.

9 Concrete shall be Class A and shall have a Compressive Strength of 3000 psi in 28 Days with a Slump of 3".

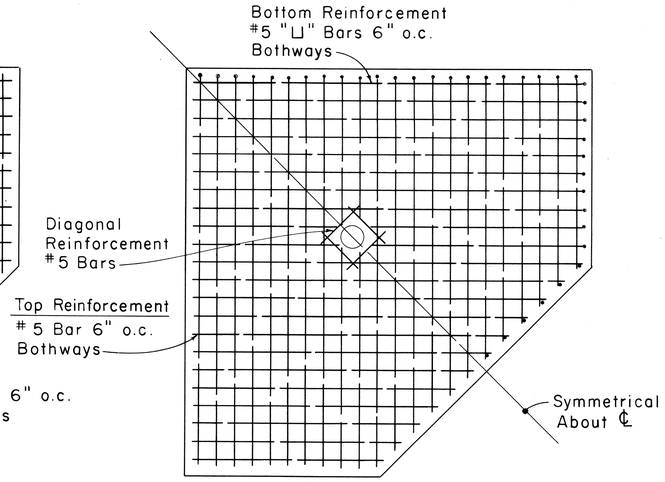
10 Concrete Admixture shall be 2½ Lbs. "Tricosol Normal" per Cubic Yard.

11 For Details "A", "B", "C", Sections "D-D", "E-E", "F-F" and other Miscellaneous Manhole Construction Details see Supplement Sheet to A-1, A-2, and A-3 Telephone Manholes.



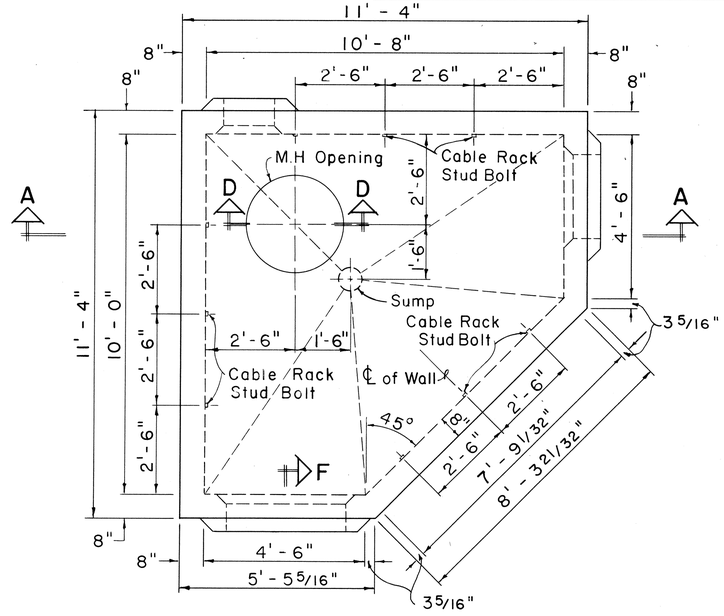
ROOF SLAB REINF. PLAN

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



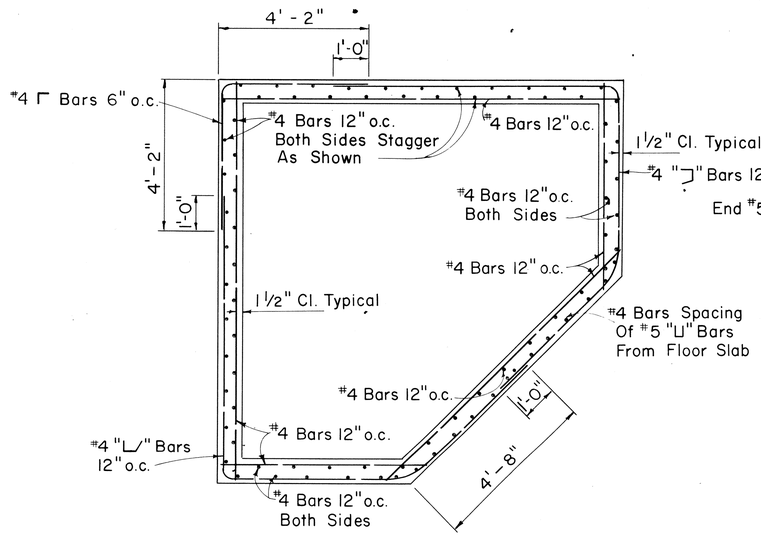
FLOOR SLAB REINF. PLAN

(Showing Top & Bottom Reinf.)
Scale: 1/2" = 1'-0"



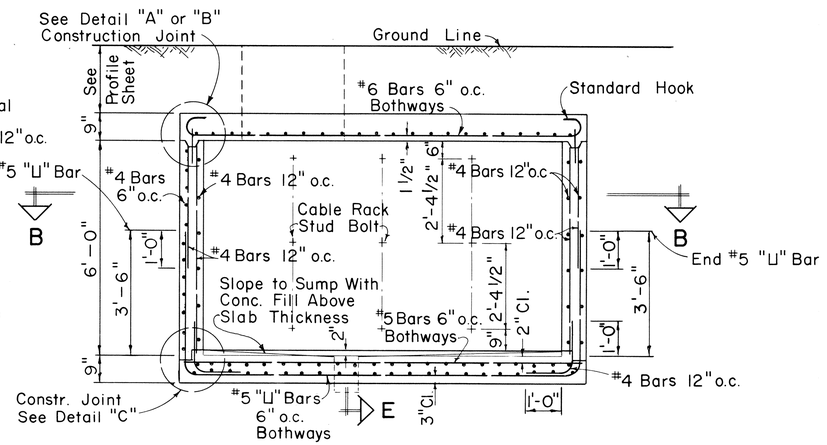
PLAN

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



SECTION "B-B"

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



SECTION "A-A"

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

APPROVED:

T. D. Judd 2-8-71

Hawaiian Telephone Co., Ltd. Date

H. T. Co., Ltd. Drawing No. 34034

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD CORNER LARGE TYPE MANHOLE

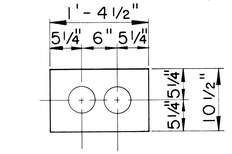
Scale: As Noted Date: OCT. 30, 1970

SHEET No. 31U OF 44 SHEETS

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

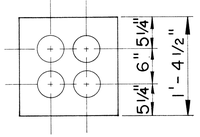
168

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-I(89):13	1971	169	362



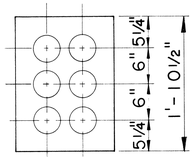
2 DUCTS

$\left(\frac{T}{2F-2}\right)$



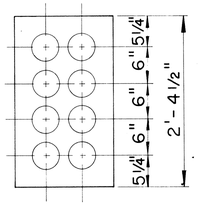
2 WIDE X 2 HIGH

$\left(\frac{T}{4F-2}\right)$



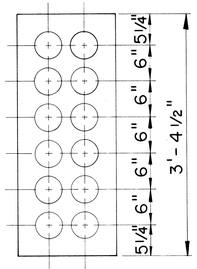
2 WIDE X 3 HIGH

$\left(\frac{T}{6F-2}\right)$



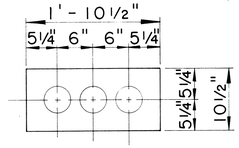
2 WIDE X 4 HIGH

$\left(\frac{T}{8F-2}\right)$



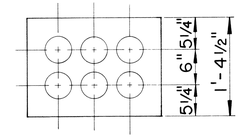
2 WIDE X 6 HIGH

$\left(\frac{T}{12F-2}\right)$



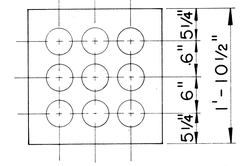
3 DUCTS

$\left(\frac{T}{3F-3}\right)$



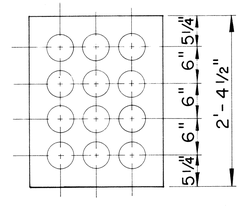
3 WIDE X 2 HIGH

$\left(\frac{T}{6F-3}\right)$



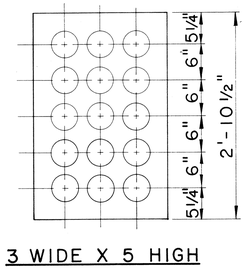
3 WIDE X 3 HIGH

$\left(\frac{T}{9F-3}\right)$



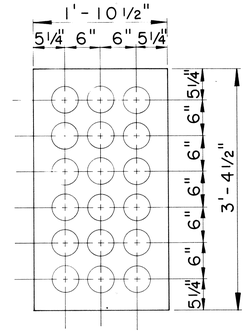
3 WIDE X 4 HIGH

$\left(\frac{T}{12F-3}\right)$



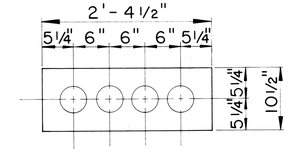
3 WIDE X 5 HIGH

$\left(\frac{T}{15F-3}\right)$



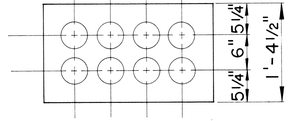
3 WIDE X 6 HIGH

$\left(\frac{T}{18F-3}\right)$



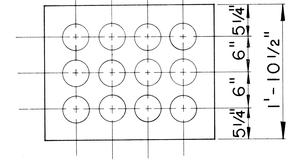
4 DUCTS

$\left(\frac{T}{4F-4}\right)$



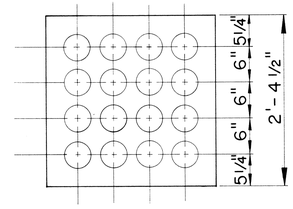
4 WIDE X 2 HIGH

$\left(\frac{T}{8F-4}\right)$



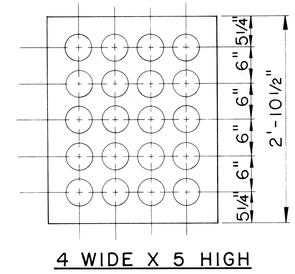
4 WIDE X 3 HIGH

$\left(\frac{T}{12F-4}\right)$



4 WIDE X 4 HIGH

$\left(\frac{T}{16F-4}\right)$

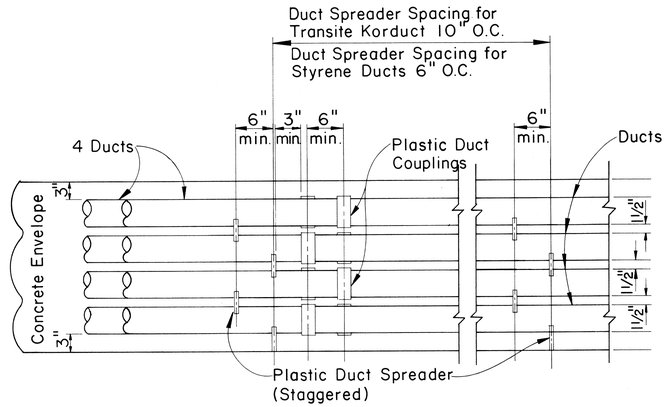


4 WIDE X 5 HIGH

$\left(\frac{T}{20F-4}\right)$

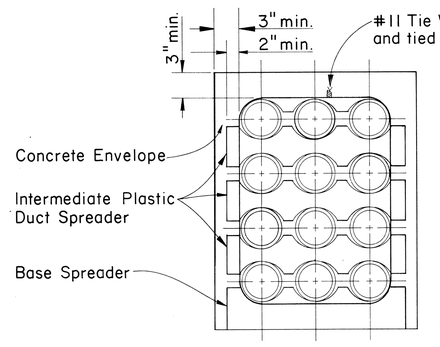
STANDARD DUCT FORMATIONS

Scale: 1" = 1'-0"



TYPICAL DUCT ENVELOPE ELEVATION ARRANGEMENT OF COUPLING & PLASTIC SPACERS

Scale: 1" = 1'-0"

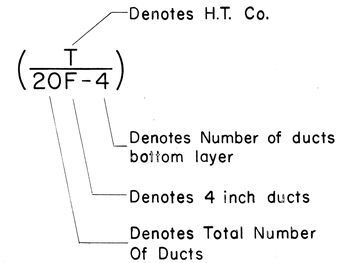


NOTE:

1. The Contractor shall place #12 Fish Wire in designated duct throughout its entire length with protrusions of 2 feet in manholes & handholes at each end and 1 foot in pullboxes.

SECTION SHOWING SPACERS

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



SYMBOL IDENTIFICATION

ORIGINAL PLAN	DRAWN (LAYOUT) BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE FROM	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

APPROVED:

Hawaiian Telephone Co., Ltd. — 2-8-71 Date

H.T. Co., Ltd. — Drawing No. 34028

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

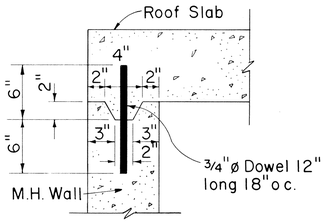
STANDARD DUCT FORMATIONS

Scale: As Shown — Date: OCT. 30, 1970

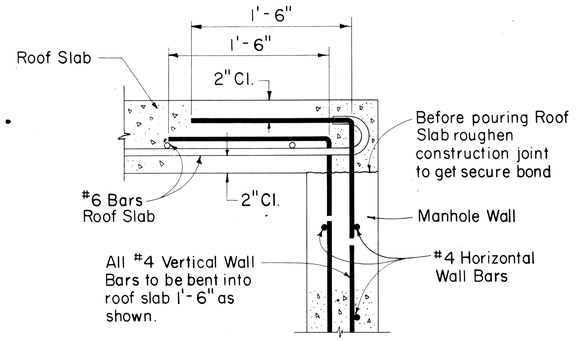
SHEET No. 32 OF 44 SHEETS

169

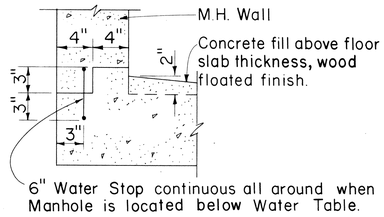
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(69):13	1971	170	362



DETAIL "A"
TOP CONSTRUCTION JOINT
Scale: 1 1/2" = 1'-0"
(Optional for cast-in-place construction
Required for precast construction)

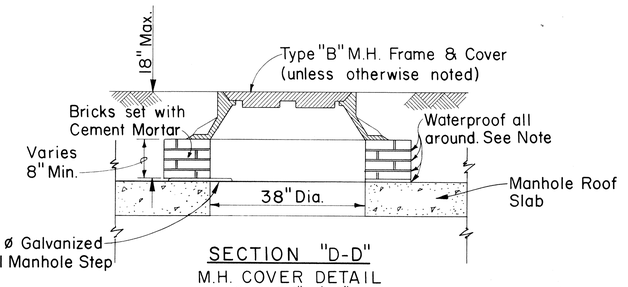


DETAIL "B"
(USED FOR CAST-IN-PLACE CONSTRUCTION)
Scale: 1 1/2" = 1'-0"

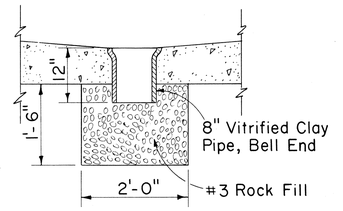


DETAIL "C"
BOTTOM CONSTRUCTION JOINT
Scale: 1 1/2" = 1'-0"

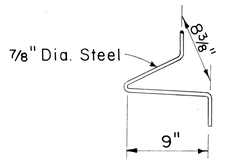
NOTE:
Corbel Bricks to suit Type A Frame & Cover.



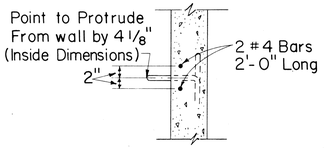
SECTION "D-D"
M.H. COVER DETAIL
Scale: 3/4" = 1'-0"



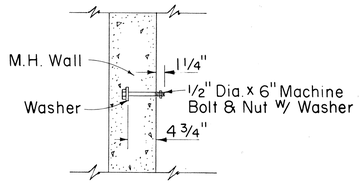
SECTION "E-E"
M.H. SUMP DETAIL
Scale: 3/4" = 1'-0"
Note:
See Section "E1-E1" Below



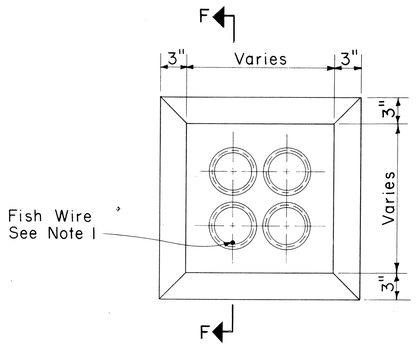
PULLING-IN IRON



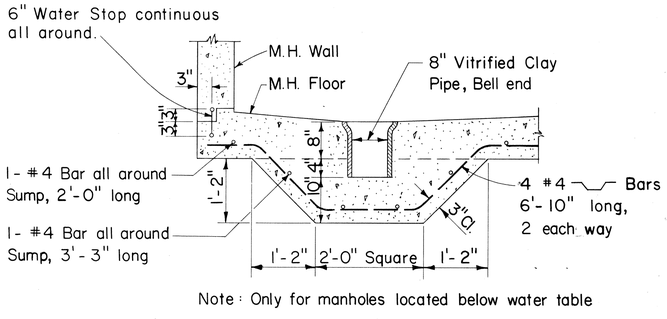
SECTIONAL VIEW OF PULLING-IN IRON
Scale: 3/4" = 1'-0"



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



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

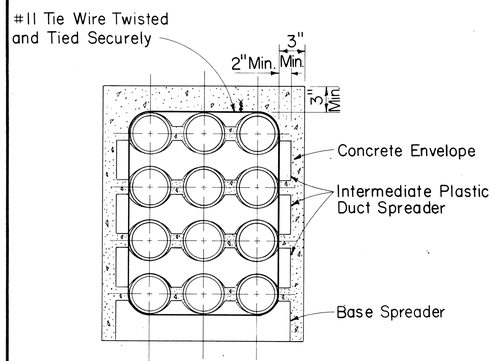


Note: Only for manholes located below water table

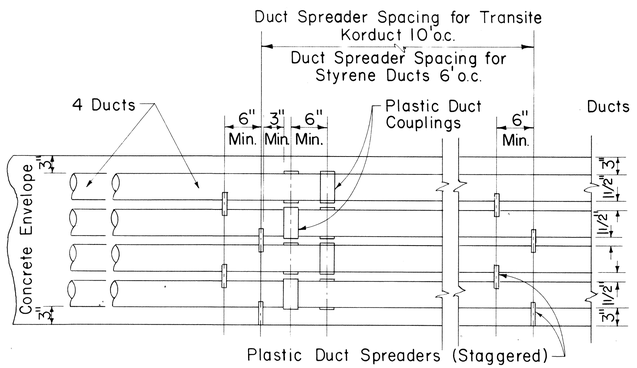
SECTION "E1-E1"
MANHOLE SUMP DETAIL
Scale: 3/4" = 1'-0"

NOTE

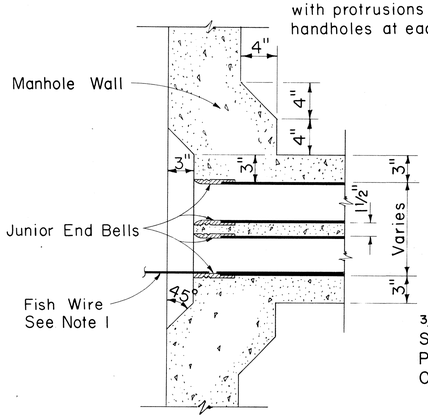
1. The Contractor shall place #12 Fish Wire in designated duct throughout its entire length with protrusions of 2 feet in manholes & handholes at each end and 1 foot in pullboxes.



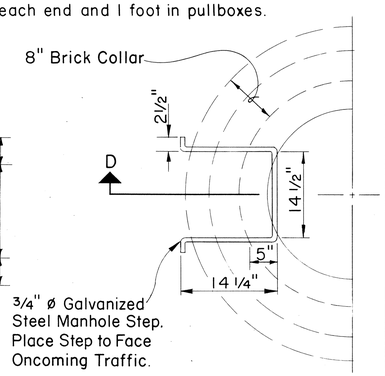
SECTION SHOWING SPACERS



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



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



PART-PLAN MANHOLE STEP
Scale: 1" = 1'-0"

Supplement Sheet to Type "A-1" (Drawing Nos. 34060 & 34061), Type "A-2" (Drwg. Nos. 34062 & 34063) and Type "A-3" (Drwg. Nos. 34064 & 34065) Telephone M.H.

APPROVED:

Hawaiian Telephone Co., Ltd. — Date 2-8-71

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE "A" MANHOLE AND MISCELLANEOUS TELEPHONE DETAILS

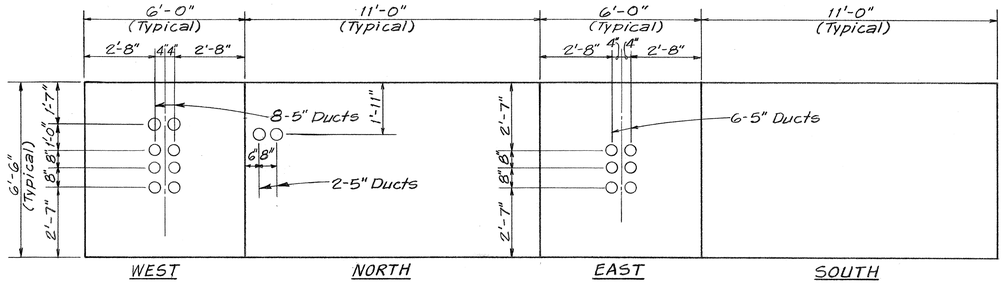
Scale: As Noted — Date: OCT. 30, 1970

SHEET No. 330 OF 44 SHEETS

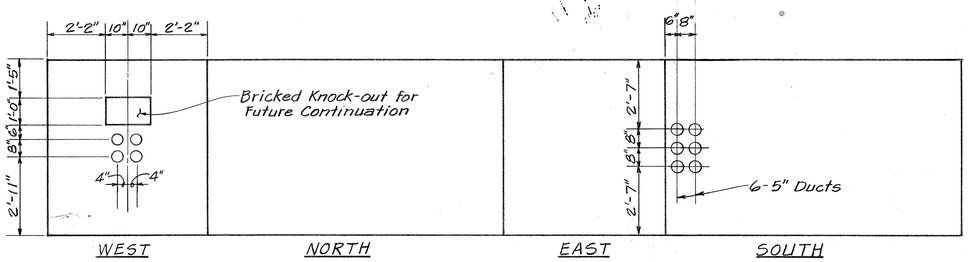
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

170

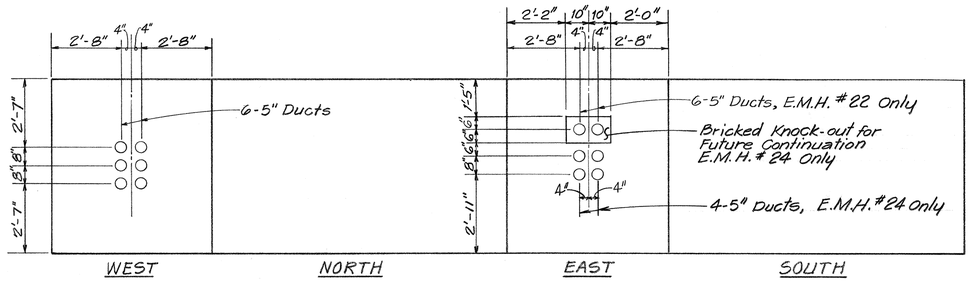
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89):13	1971	171	362



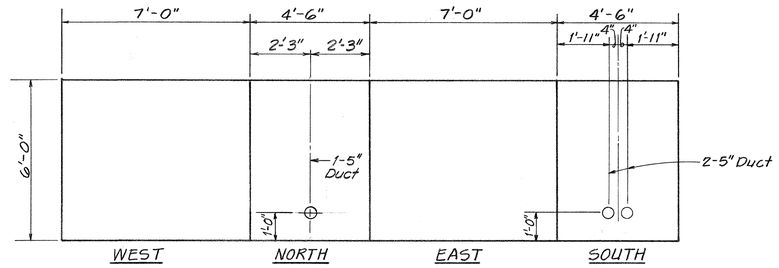
EMH NO. 21



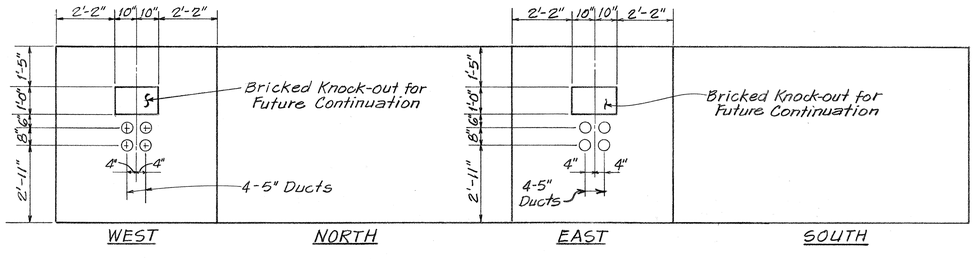
EMH NO. 26



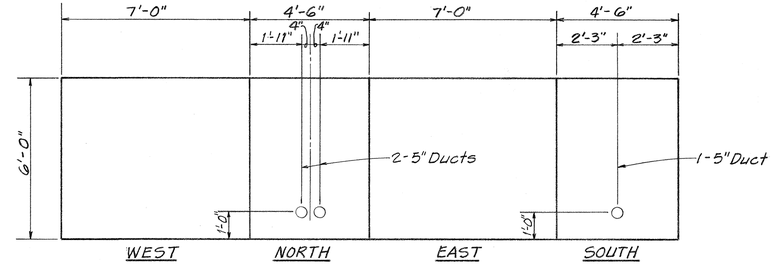
EMH NOS. 22 & 24



EMH NO. 28

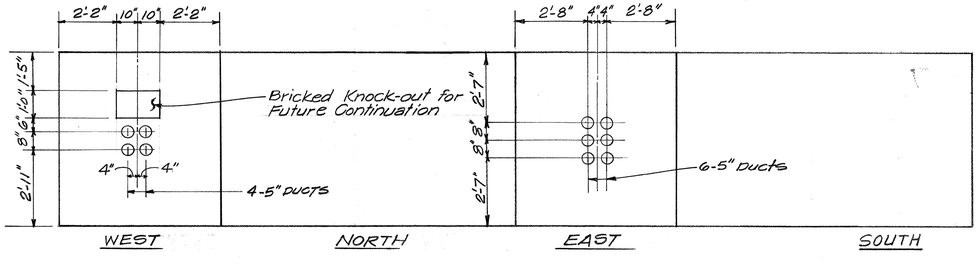


EMH NO. 25



EMH NO. 29

NAVY TYPE 57V (5'-0" X 7'-0") HANDHOLES



EMH NO. 23

H.E. CO. TYPE 1 (6'-0" X 11'-0") MANHOLES

APPROVED:

5/20/71

Hawaiian Electric Co., Inc. Date

ANDREW SCHUCHARDT
REGISTERED PROFESSIONAL ENGINEER
No. 2229
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H. E. CO. & NAVY MANHOLE WALL ELEVATIONS

INTERSTATE ROUTE H-1
PROJECT NO. I-H1-(89): 13

SCALE: 3/8" = 1'-0" DATE: Oct. 30, 1970

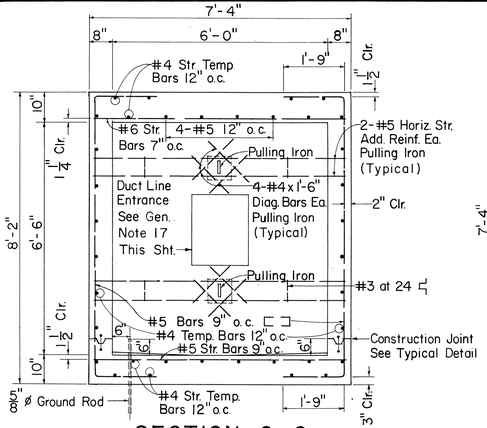
SHEET No. 34 OF 44 SHEETS

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

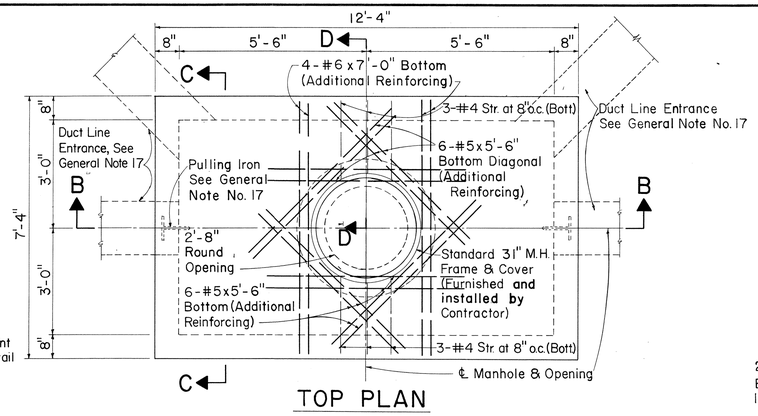
PRINTED ON NO. 1000H CLEARPRINT

171

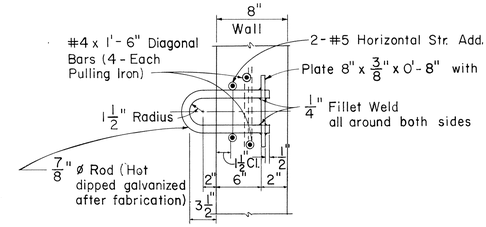
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89)15	1971	172	362



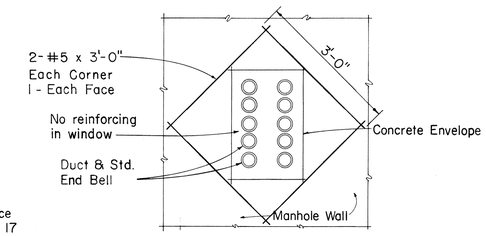
SECTION C-C



TOP PLAN



PULLING IRON DETAIL

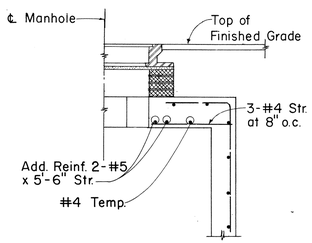


ELEVATION

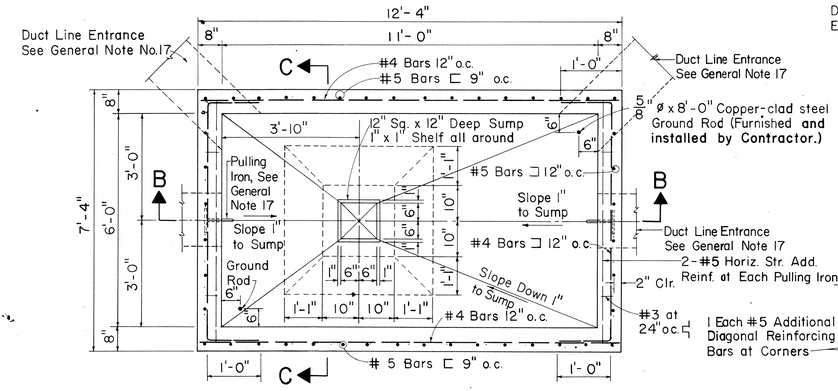
REINFORCING AT DUCT WINDOW

GENERAL NOTES

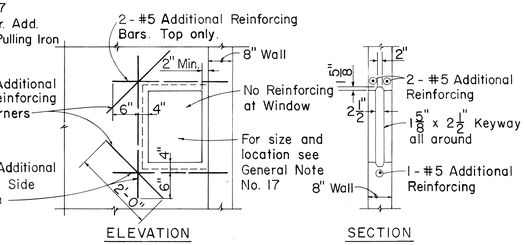
1. EXCAVATION : Excavate for manhole to accurate alignment, grades and dimensions as shown on drawings. **All excavation must be approved by Engineering Dept. H.E. Co. before any concrete is poured. All excess cut shall be backfilled with concrete or approved aggregate.**
2. BACKFILL : Remove all debris 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 **conforming to the requirements of Section 601 of the State Standard Specification.**
5. MIXING : Ready-Mixed A.S.T.M. C-94-47.
6. REINFORCING : Round deformed bars (clean and new). **Grade 40 Billet Steel per ASTM A615.**
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 Contractor to furnish and install for each manhole:
    a. **2-5/8" ø x 8'-0" copper-clad steel ground rods.**
    b. Standard **31"** 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 of America
17. For number, size, and exact location of ducts entrances and pulling irons, refer to project drawings.
18. **Waterstop shall conform to the requirements of Section 705.07 of the State Standard Specifications for Road & Bridge Construction.**



SECTION D-D



SECTIONAL PLAN A-A



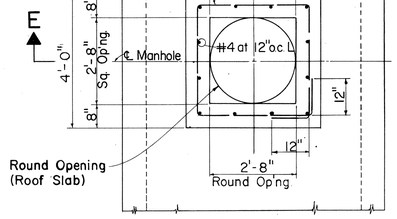
ELEVATION

SECTION

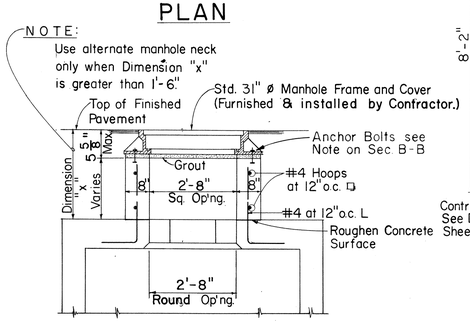
NOTE:
Provide opening for future duct line: Fill opening with bricks with mortar joints as required. (See project drawing).

REFERENCE DRAWINGS AND SPECIF.

011327 & 011328 - Standard H. E. Co. 31" Manhole Frame and Cover.
20191 & 18585 - Underground Ductline Construction Standards - Details.
CS 7001-0 - Construction of Underground Facilities - Specification

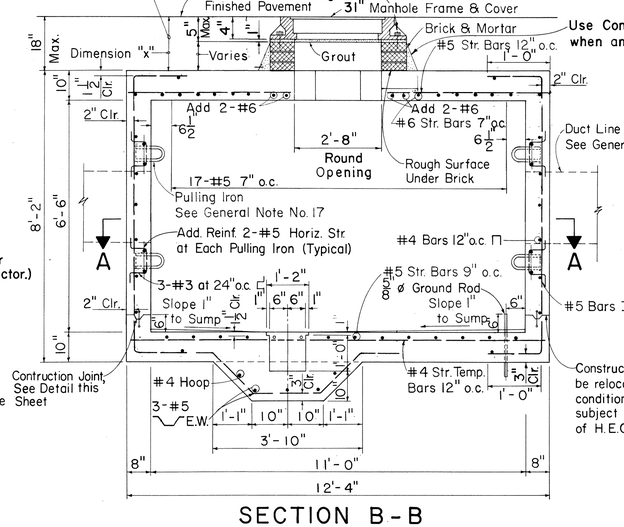


PLAN



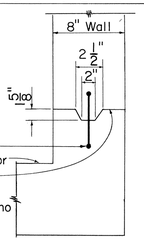
SECTION E-E

ALTERNATE MANHOLE NECK



SECTION B-B

KNOCKOUT FOR FUTURE DUCT LINE



TYPICAL DETAIL OF CONSTRUCTION JOINT AND KEYWAY

QUANTITY OF MATERIALS, (M.H. ONLY)

* Concrete	= 11.52 Cu. Yds.
Reinf. Steel	= 1444.61 lbs.
Misc. Steel (Pulling Irons, ea.	= 10.90 lbs.

ADDITIONAL QUANTITY OF MATERIALS FOR ALTERNATE NECK (Dim. "X" = 2'-0")

Concrete	= 0.50 Cu. Yds.
Reinf. Steel	= 40.0 lbs.

* NOTE: Conc. for M.H. necks when used in lieu of bricks (for dim "X" < 1'-6") for anchor bolt installation is not included in above totals.

APPROVED:
HAWAIIAN ELECTRIC Co., Inc. JK
5/20/71 DATE

FOR USE IN AREAS SUBJECT TO VEHICULAR TRAFFIC

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

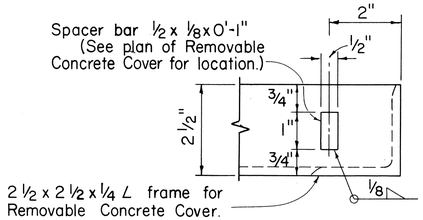
Scales: Not to Scale Date: OCT 30, 1970

SHEET NO 35 OF 44 SHEETS

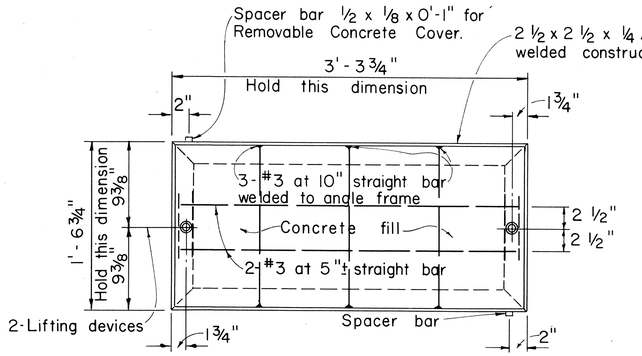
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

172

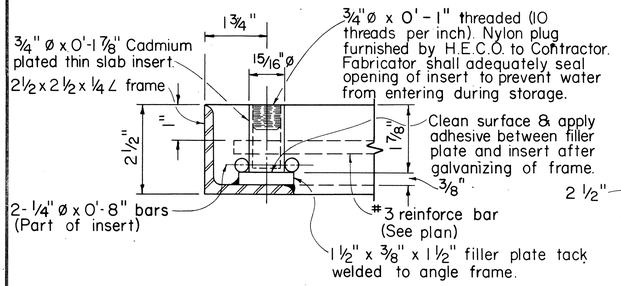
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)113	1971	173	362



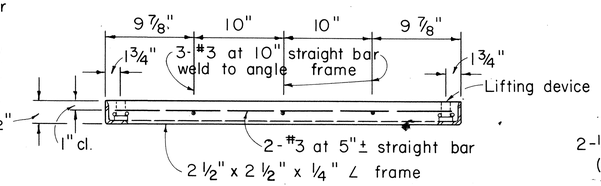
PART ELEVATION
SPACER BAR
Scale: ½ full size



PLAN
Scale: 1½" = 1'-0"

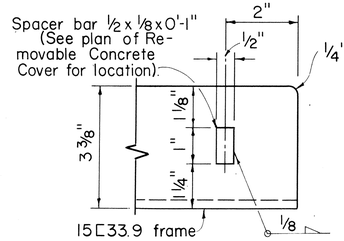


PART SECTION
LIFTING DEVICE
Scale: ½ full size

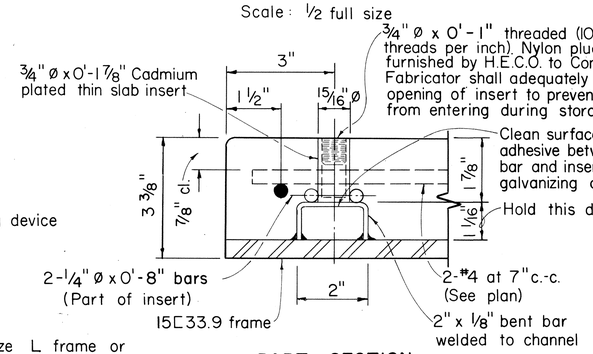


SECTION
Scale: 1½" = 1'-0"

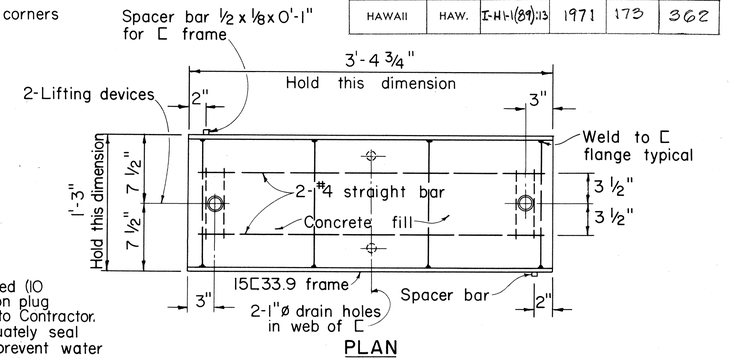
NOTE: Galvanize ∟ frame or ⊏ frame, steel rods, and spacer bars after fabrication.



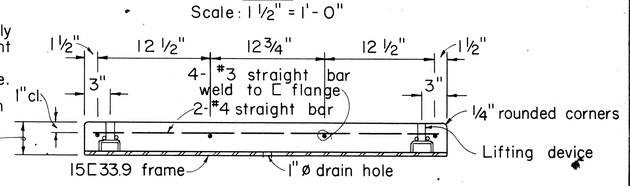
PART ELEVATION
SPACER BAR
Scale: ½ full size



PART SECTION
LIFTING DEVICE
Scale: ½ full size

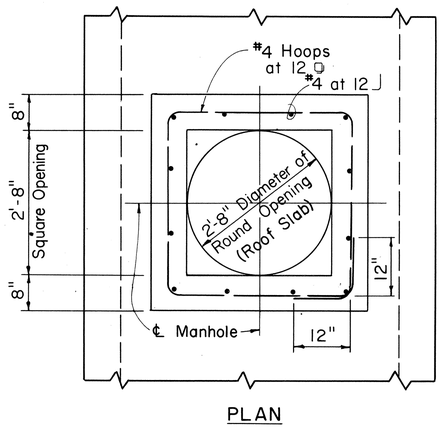


PLAN
Scale: 1½" = 1'-0"

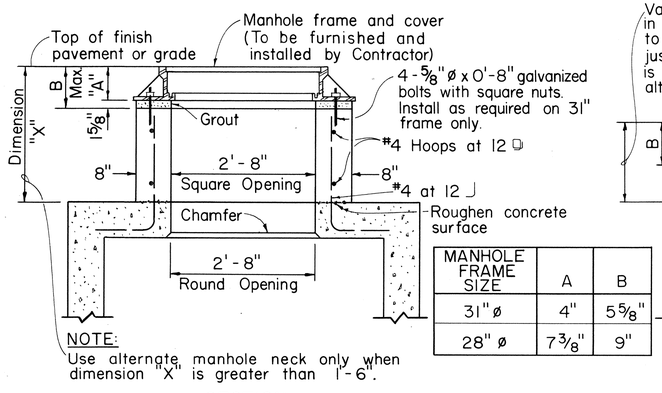


SECTION
Scale: 1½" = 1'-0"

TYPE "SW" REMOVABLE CONCRETE COVER



PLAN



MANHOLE FRAME SIZE	A	B
31" ø	4"	5⅝"
28" ø	7⅜"	9"

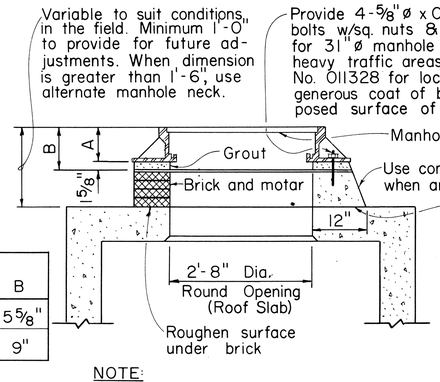
NOTE:
Use alternate manhole neck only when dimension "X" is greater than 1'-6".

SECTION

ALTERNATE MANHOLE NECK

Scale: ¾" = 1'-0"

TYPE "TR" REMOVABLE CONCRETE COVER



NOTE:
See table alternate manhole neck detail for dimension A and B.

31" ø & 28" ø MANHOLE FRAME NECK DETAIL

Scale: ¾" = 1'-0"

GENERAL NOTES

1. On handhole covers, maximum clearances must be kept between removable concrete cover slabs and concrete openings at the supports. Contractor shall measure cover slabs steel frame after fabrication to obtain proper clearances. All covers after being installed shall be seated firmly and evenly and be free from rocking. Any variation in clearances and unevenness shall be corrected to the satisfaction of the Engineer at the Contractor's expense.
2. Concrete Pouring: Notify the Hawaiian Electric Co., Inc. Contracting & Inspection Division, 24 hours before pouring concrete. All concrete pouring shall be done in the presence of an Hawaiian Electric Co., Inc. Engineer or Inspector.
3. All materials shall be new and manufactured in the United States of America.

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

APPROVED:
Hawaiian Electric Co., Inc. By Date 5/20/71

HECo., Inc. Drawing Number
16688
SHEET NO. 1 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

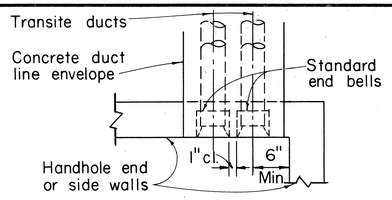
MISCELLANEOUS DETAILS HANDHOLES & MANHOLES UNDERGROUND STANDARDS

Scale as noted DATE: OCT. 30, 1970

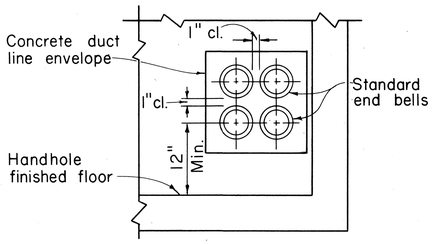
SHEET No. 36 OF 44 SHEETS

173

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)13	1971	174	362



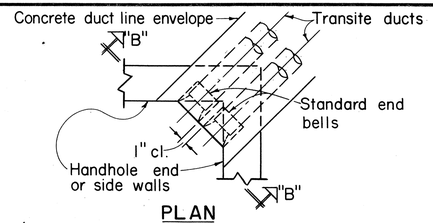
PLAN



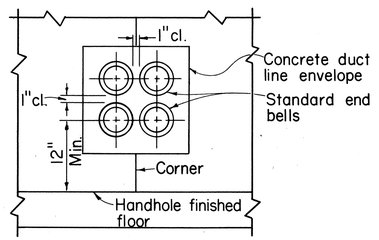
ELEVATION

END OR SIDE ENTRANCE

Scale: 1" = 1'-0"



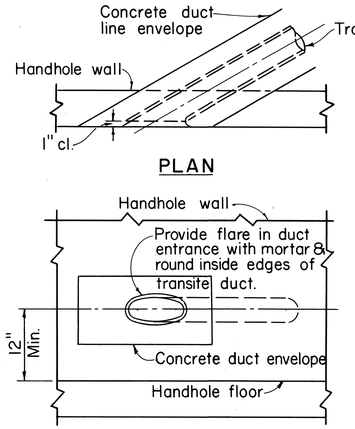
PLAN



ELEVATION "B-B"

CORNER ENTRANCE

Scale: 1" = 1'-0"

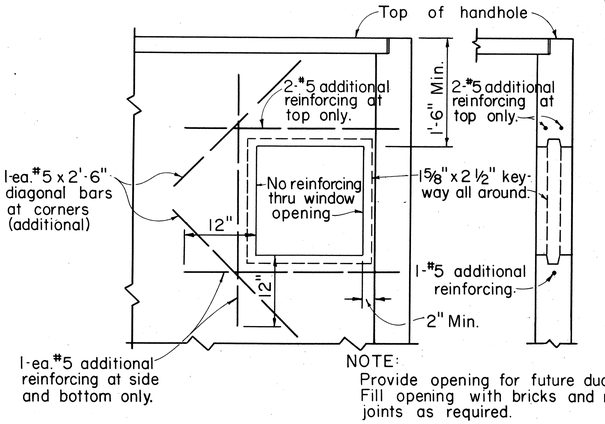


PLAN

ELEVATION

DIAGONAL ENTRANCE

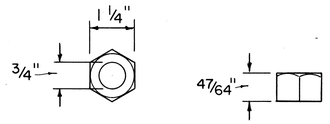
Scale: 1" = 1'-0"



ELEVATION SECTION

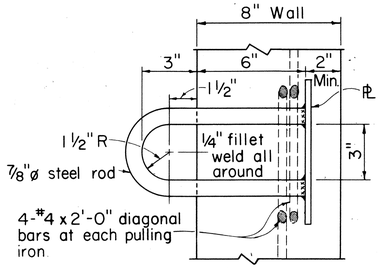
KNOCKOUT FOR FUTURE DUCT LINE

Scale: 1" = 1'-0"



3/4" ø AMERICAN STANDARD HEAVY BRASS HEXAGON NUT

Scale: 1/2 full size

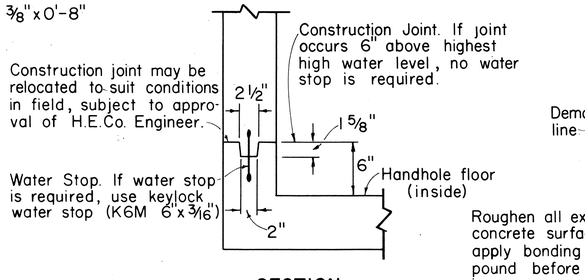


NOTE:
Hot-dip galvanized after fabrication.

SECTION

PULLING IRON

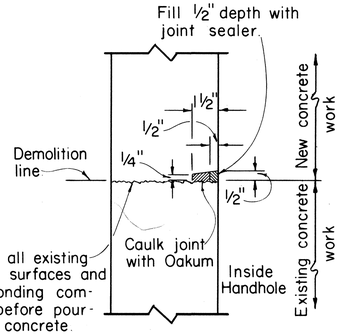
Scale: 3" = 1'-0"



SECTION

TYPICAL CONSTRUCTION JOINT

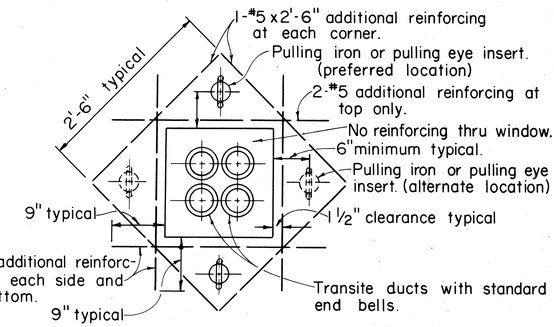
Scale: 1 1/2" = 1'-0"



SECTION

TYPICAL COLD JOINT

Scale: 3" = 1'-0"

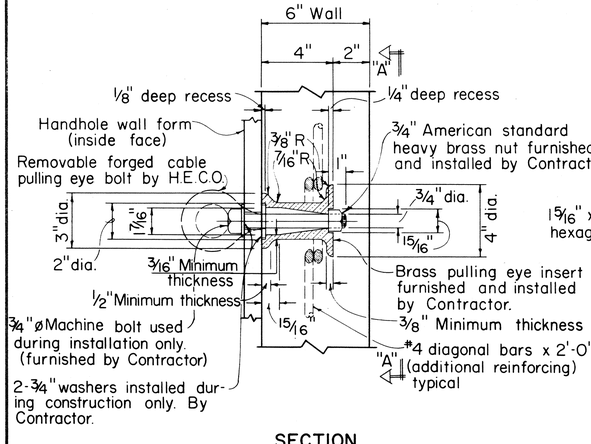


NOTE:
Generally 2 pulling irons or pulling eye inserts are required and located on opposite wall of each duct window unless otherwise shown or noted. H.E.Co. Engineer shall determine number required.

ELEVATION

TYPICAL DUCT WINDOW

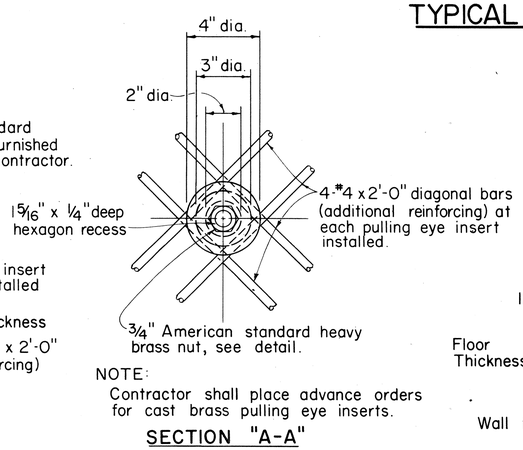
Scale: 1" = 1'-0"



SECTION

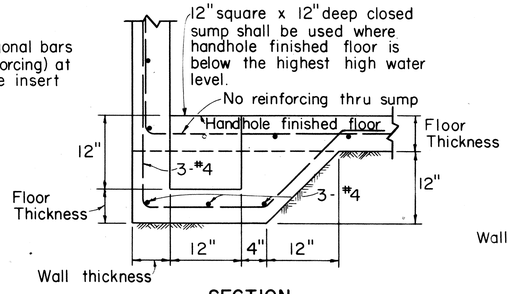
BRASS PULLING EYE INSERT

Scale: 3" = 1'-0"



NOTE:
Contractor shall place advance orders for cast brass pulling eye inserts.

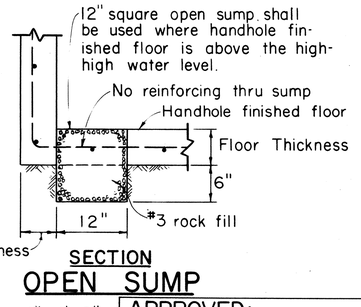
SECTION "A-A"



SECTION

CLOSED SUMP

Scale: 1" = 1'-0"



SECTION

OPEN SUMP

Scale: 1" = 1'-0"

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

APPROVED:

Hawaiian Electric Co., Inc. 5/20/71 Date

HECo., Inc. Drawing Number

16688

SHEET NO. 2 OF 2 SHEETS

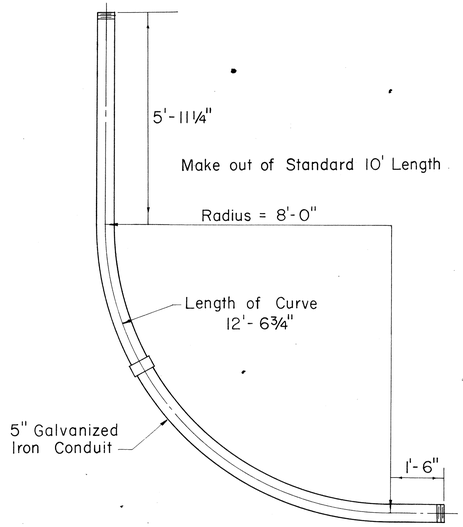
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS HANDHOLES & MANHOLES UNDERGROUND STANDARDS

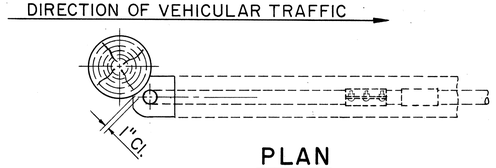
Scale as noted Date: OCT. 30, 1970

SHEET No. 370 OF 44 SHEETS

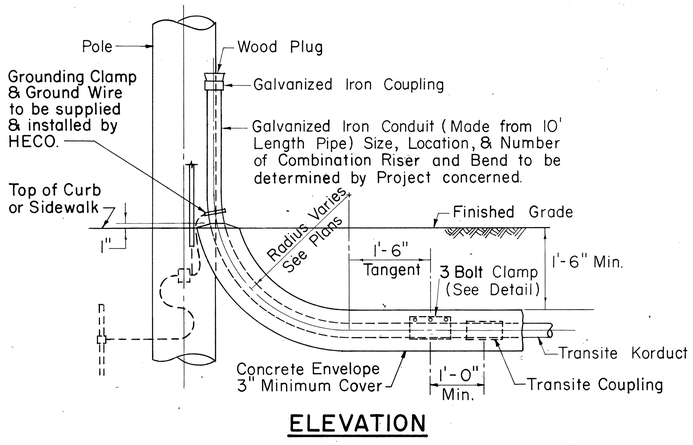
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89)13	1971	175	362



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

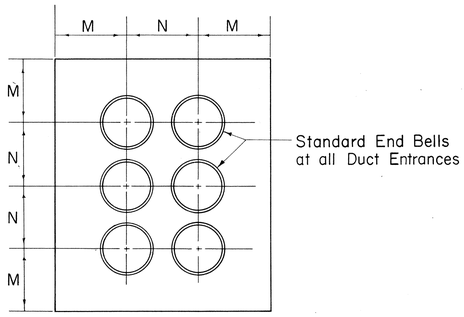


PLAN



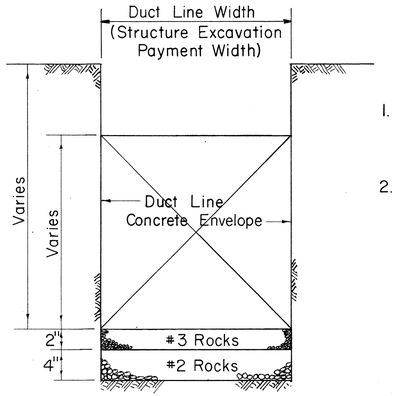
ELEVATION

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



TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

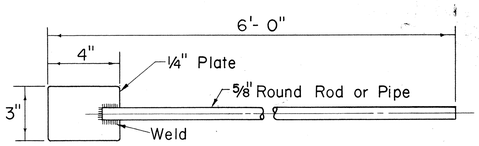
SIZE	M	N
3"	5"	6"
4"	5½"	7"
4½"	5½"	7½"
5"	6"	8"



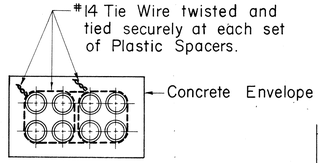
TYPICAL EXCAVATION DETAIL
Not to Scale

NOTES

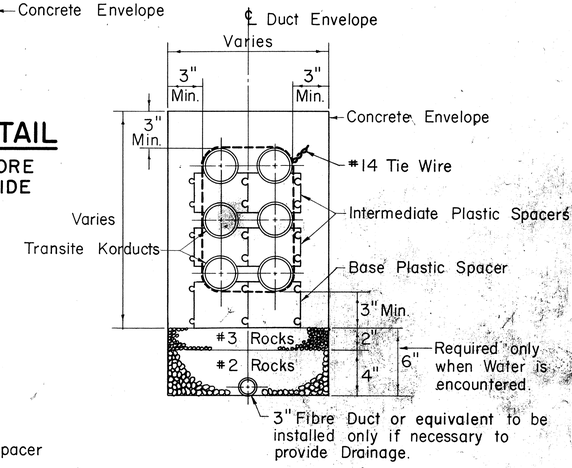
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Rock Foundation required only when Water is encountered



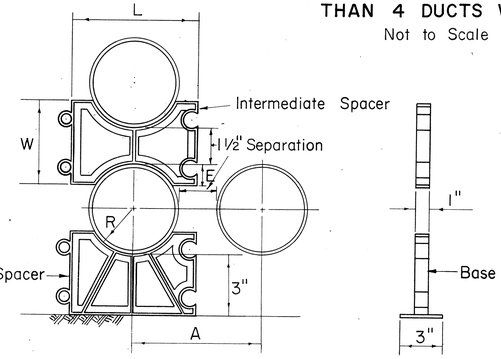
CONCRETE DUCT ENVELOPE TAMPING ROD
Scale: 3" = 1'-0"



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



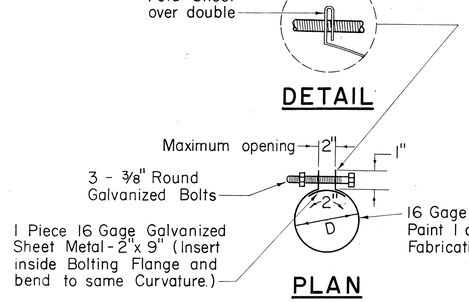
TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale

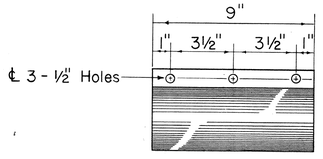


TYPICAL PLASTIC SPACERS
Not to Scale

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





ELEVATION

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

APPROVED:

HAWAIIAN ELECTRIC CO., INC. JK 5/20/71 DATE

HECo., Inc. Drawing Number	
18585	SHEET No. 1 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

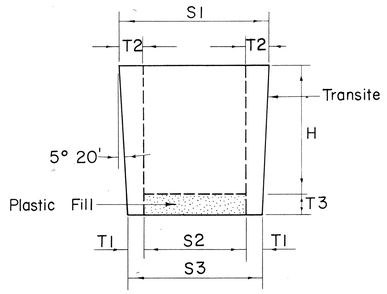
Scales: As Noted Date: OCT. 30, 1970

SHEET NO. 38 OF 44 SHEETS

175

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

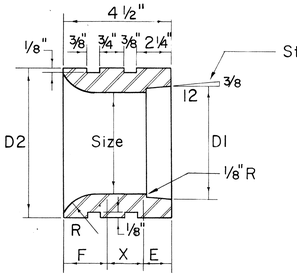
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(23)13	1971	176	362



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

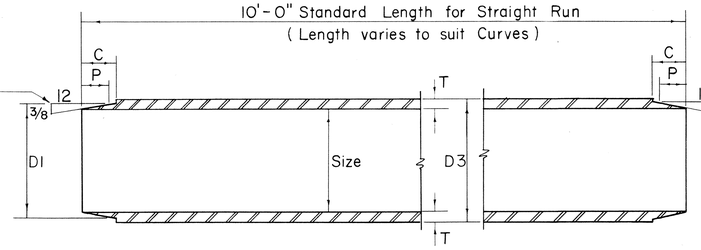
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



STANDARD END BELLS

Not to Scale

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



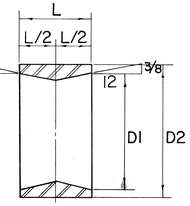
TRANSITE KORDUCTS

Not to Scale

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

Note "X"

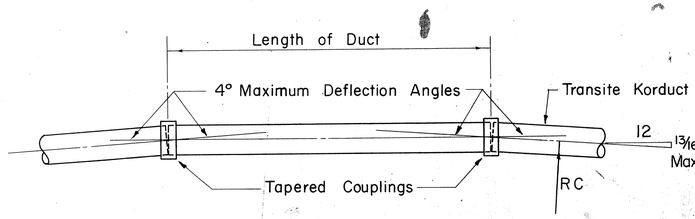
Provide one set of Spacers
(a) 10 Ft. straight run for 4 Ducts high or less.
(b) 5 Ft. straight run for 5 Ducts high or more.



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

TAPERED COUPLINGS

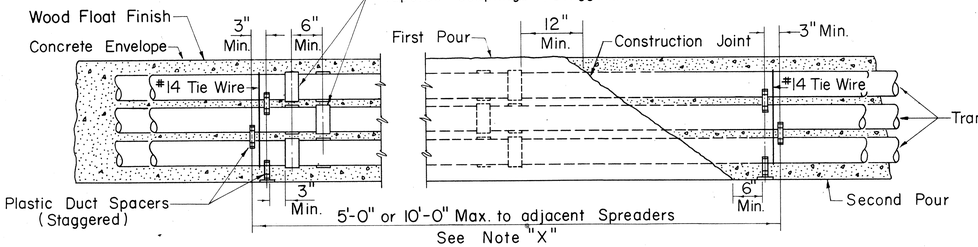
Not to Scale



METHOD OF FORMING CURVES

Not to Scale

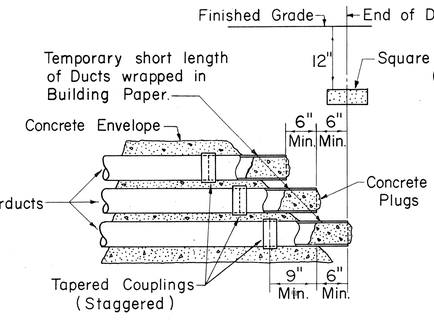
MINIMUM RADIUS TO FORM CURVES										
LENGTH OF DUCT	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"
MIN. RAD. RC	14'-4"	21'-6"	28'-8"	35'-10"	42'-11"	50'-1"	57'-3"	64'-5"	71'-7"	78'-9"
LENGTH OF DUCT	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
MIN. RAD. RC	85'-11"	93'-1"	100'-3"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



TYPICAL DUCT ENVELOPE ELEVATION

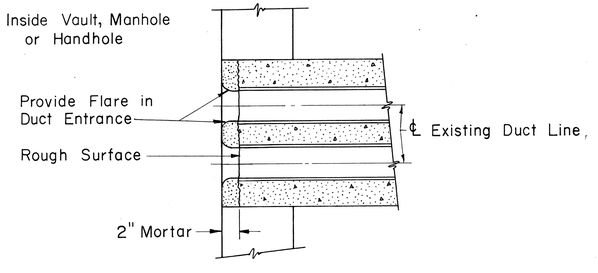
(6 WAY DUCT LINE SHOWN)

Not to Scale



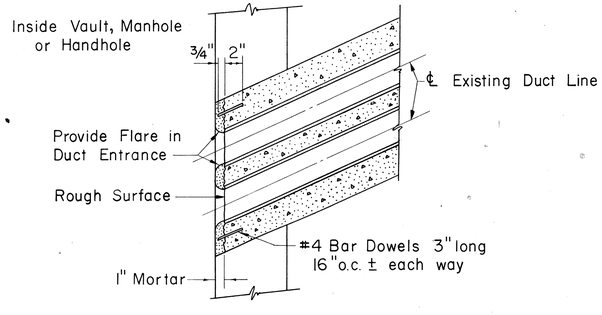
TYPICAL STUB OUT DETAIL

Not to Scale



DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

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

APPROVED:

HAWAIIAN ELECTRIC CO., INC. BY DATE 5/20/71

HECo., Inc. Drawing Number

18585 SHEET No. 2 OF 2 SHEETS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

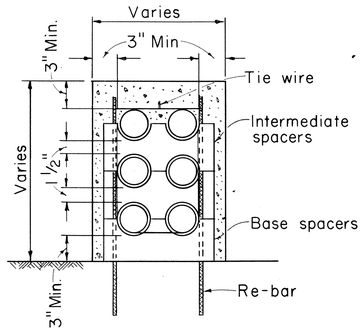
Scales: As Noted Date: OCT. 30, 1970

SHEET NO. 39 OF 44 SHEETS

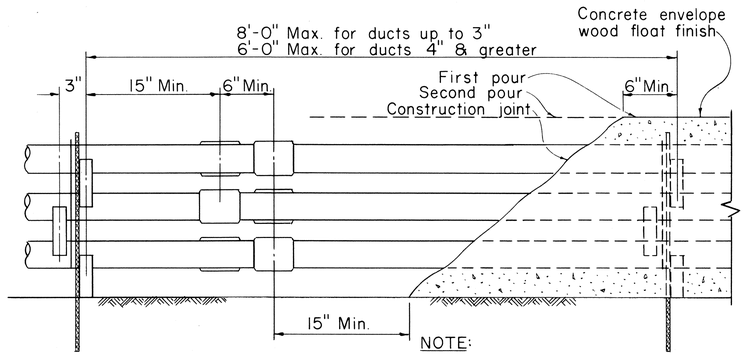
176

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(39)-13	1971	177	362



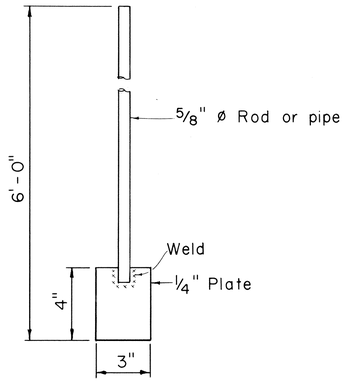
SECTION



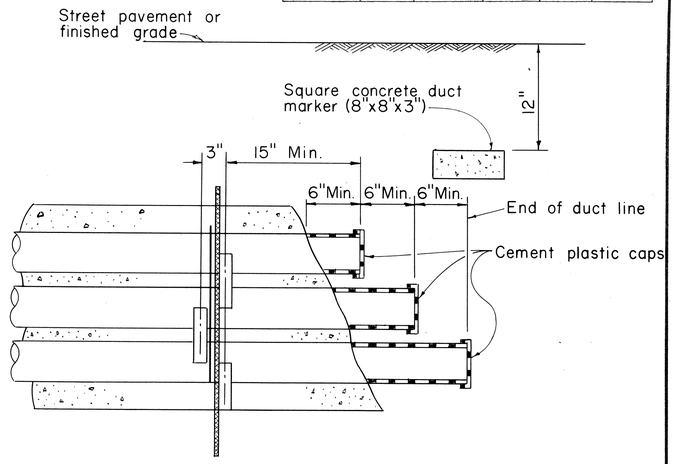
ELEVATION

NOTE:
1. Stagger couplings (or belled ends).
2. Anchor conduit with #14 steel tie wire & #4 reinforcing bars.
3. Cement all joints.
4. Avoid standing on conduit.

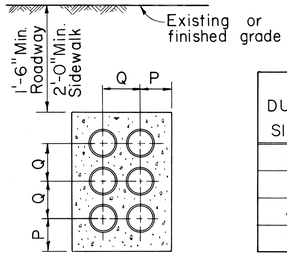
TYPICAL DUCT LINE
(6-WAY DUCT SHOWN)
Scale: 1½" = 1'-0"



HAND SPADE
Scale: 3" = 1'-0"



TYPICAL STUB OUT DETAIL
(6-WAY DUCT SHOWN)
Scale: 1½" = 1'-0"

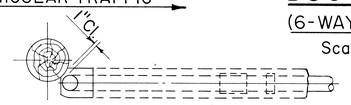


DUCT SIZE	DIMENSIONS (INCHES) P	Q
2	4 1/4	4 1/8
3	4 3/4	5 1/8
4	5 1/4	6 1/4
5	5 7/8	7 5/8

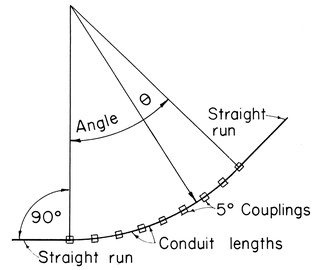
NOTE:
1. Maintain 1½" minimum spacing between conduit; 3" minimum concrete envelope around top, bottom & sides.
2. Dimensions are minimum dimensions.

ENCASED BURIAL TYPICAL DUCT SECTION
(6-WAY DUCT SHOWN)
Scale: 1" = 1'-0"

DIRECTION OF VEHICULAR TRAFFIC



PLAN



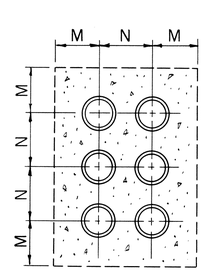
EXAMPLE:
Radius of bend (R) = 60'
Angle of bend (θ) = 45°
From Table A, the nearest value to 60' radius is 57'-6". Length of conduit = 5'.
From Table B, for 45° angle.
Number of couplings required = 9
Number of conduit lengths required = 8

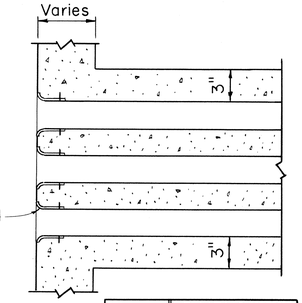
TABLE "A"	
APPROX. RADIUS OF BEND, R	LENGTH OF EA. CONDUIT-FT USING 5° BEND AT COUPL.
11'-6"	1
17'-3"	1.5
23'-0"	2
28'-9"	2.5
34'-6"	3
40'-3"	3.5
46'-0"	4
51'-9"	4.5
57'-6"	5
69'-0"	6
80'-6"	7
92'-0"	8

TABLE "B"		
ANGLE OF BEND θ	NO. OF COUPLINGS	LENGTH OF CONDUIT
15°	3	2
30°	6	5
45°	9	8
60°	12	11
75°	15	14
90°	18	17

METHOD OF FORMING CURVES:
There are 4 methods of forming curves with plastic conduit.
1. "Cold" bending: Limit trench formed radius sweeps to 25' minimum radius.
2. "Heat" bending: Do not heat bend conduit.
3. 5° angle couplings may be used as shown.
4. Factory made elbows and sweeps may be used only when specified by Engineer.

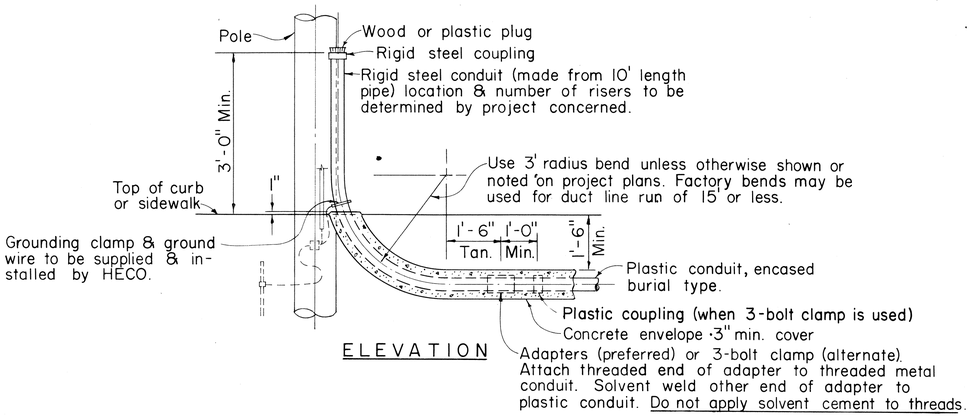
APPLICATION OF 5° COUPLING FOR LONG RADIUS BENDS





TYPICAL CONDUIT ENTRANCE INTO HANDHOLE, MANHOLE & VAULT WALLS
(6-WAY DUCT SHOWN)
Scale: 1½" = 1'-0"

DUCT SIZE	DIMENSIONS (INCHES) M	N
2	4	5
3	5	6
4	5 1/2	7
5	6	8



ELEVATION

TYPICAL RISER DETAIL
(POLE RISER SHOWN)
Scale: ½" = 1'-0"

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

HECo., Inc. Drawing Number
20191

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONSTRUCTION STANDARDS
PLASTIC CONDUIT
UNDERGROUND DUCT LINES

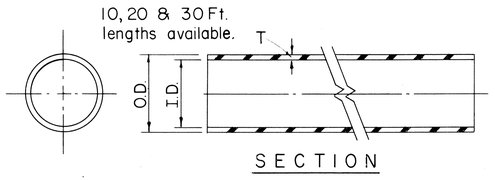
Scale as noted Date: OCT. 30, 1970

APPROVED:
Hawaiian Electric Co., Inc. 5/20/71 Date

SHEET No. 40 OF 44 SHEETS

177

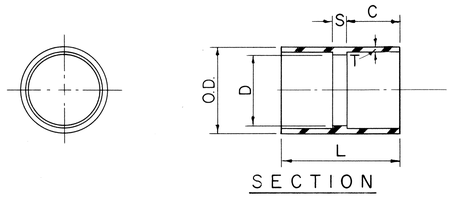
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)-13	1971	178	362



CONDUIT

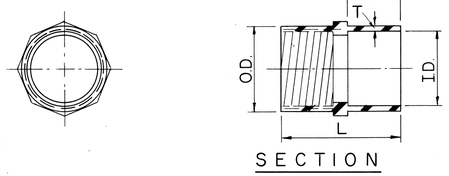
CONDUIT SIZE	EB (ENCASED BURIAL) HECO CODE	O.D.	I.D.	T (MIN.)	WEIGHT #/10² FT.	DB (DIRECT BURIAL) HECO CODE	O.D.	I.D.	T (MIN.)	WEIGHT #/10² FT.
2	29002	2.375	2.25	.060	21	29010	2.375	2.15	.110	38
3	29004	3.500	3.35	.075	39	29012	3.500	3.25	.125	64
4	29006	4.500	4.31	.095	63	29014	4.500	4.18	.160	104
5	29008	5.563	5.36	.100	82	29016	5.563	5.20	.180	146

NOTE:
Type EB & DB Conduits have same O.D. for a given size.
All fittings which go over Conduits are DB type & fit both types of Conduits.



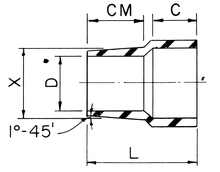
COUPLING

SIZE	HECO CODE	O.D.	D	L	C	S	T
2	29018	2.620	2.255	2 7/16	1.16	.110	.110
3	29020	3.780	3.350	3 3/8	1.63	.120	.125
4	29022	4.855	4.310	3 11/16	1.78	.120	.160
5	29024	5.965	5.363	4 3/32	1.97	.160	.180



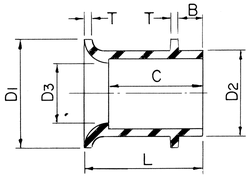
ADAPTER - PLASTIC TO STEEL

SIZE	HECO CODE	O.D.	I.D.	L	T	C
2	29026			2 15/16	1 1/16	1.16
3	29028			3 7/16	1 5/8	1.63
4	29030			3 11/16	1 23/32	1.78
5	29032			4 1/16	1 27/32	1.97



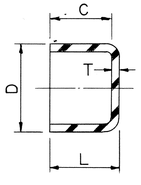
ADAPTER - PLASTIC TO TRANSITE (ASBESTOS-CEMENT)

SIZE	HECO CODE	L	X	C.M.	D	C
2	29034	3 1/16	2.580	1 3/4	2.18	1.16
3	29036	3 19/32	3.620	1 3/4	3.09	1.63
4	29038	4 1/32	4.620	2	4.03	1.78
5	29040					



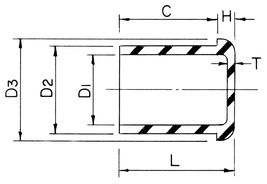
END BELL

SIZE	HECO CODE	D1	D2	D3	B	C	L	T
2	29042	3.01	2.520	2.255	.50	1.16	1.54	.060
3	29044	4.10	3.680	3.350	.75	1.63	2.00	.075
4	29046	5.31	4.725	4.310	.75	1.78	2.28	.095
5	29048	6.36	5.805	5.363	1.00	1.97	2.47	.100



CAP (RIGID) - FOR SEMI-PERMANENT USE

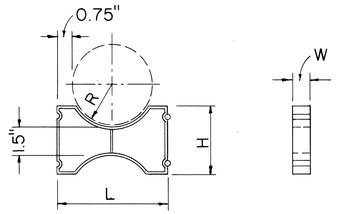
SIZE	HECO CODE	D	C	L	T
2	29050	2.52	.59	.65	.060
3	29052	3.68	.81	.89	.075
4	29054	4.725	.91	1.01	.095
5	29056	5.805	1.00	1.10	.100



CAP (TEMPORARY)

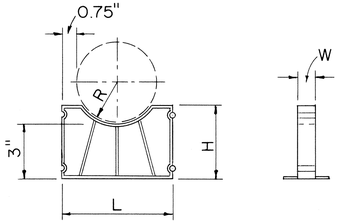
SIZE	HECO CODE	D1	D2	D3	C	H	L	T
2	29058	2.260	2.375	2.500	.593	.125	.718	.060
3	29060	3.360	3.500	3.656	.812	.156	.968	.075
4	29062	4.320	4.500	4.687	.906	.187	1.092	.095
5	29064	5.375	5.638	5.760	1.000	.218	1.218	.100

NOTE:
Cap will go over conduit or "plug" the coupling.



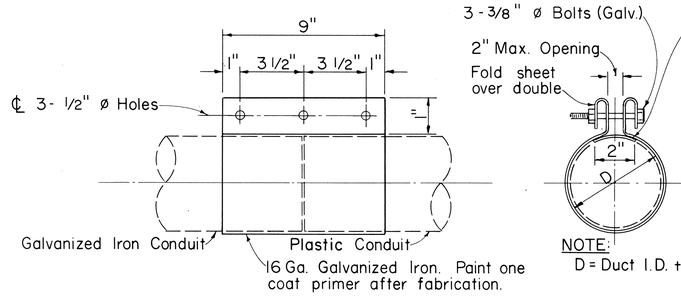
INTERMEDIATE SPACER

SIZE	HECO CODE	L	W	H	R
2	29066	4.00	1	2.75	1.188
3	29068	5.00	1	3.25	1.750
4	29070	6.13	1	3.75	2.250
5	29072	7.50	1	4.25	2.782



BASE SPACER

SIZE	HECO CODE	L	W	H	R
2	29074	4.00	1	3.63	1.188
3	29076	5.00	1	3.88	1.750
4	29078	6.13	1	4.13	2.250
5	29080	7.50	1	4.38	2.782



3 - BOLT CLAMP

SIZE	HECO CODE
2	13126
3	13128
4	13130
5	13132

NOTES:
1. All dimensions in inches.
2. Spacers shown are different than that used for transite.
3. These accessories are to be used with ABS (Acrylonitrile-Butadiene-Styrene), or PVC (Poly-Vinyl Chloride) Plastic Conduit, per HECO purchase specification M7001-O.

APPROVED:
Hawaiian Electric Co., Inc. JK WKL 5/20/71 Date

HECo., Inc. Drawing Number
42276

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

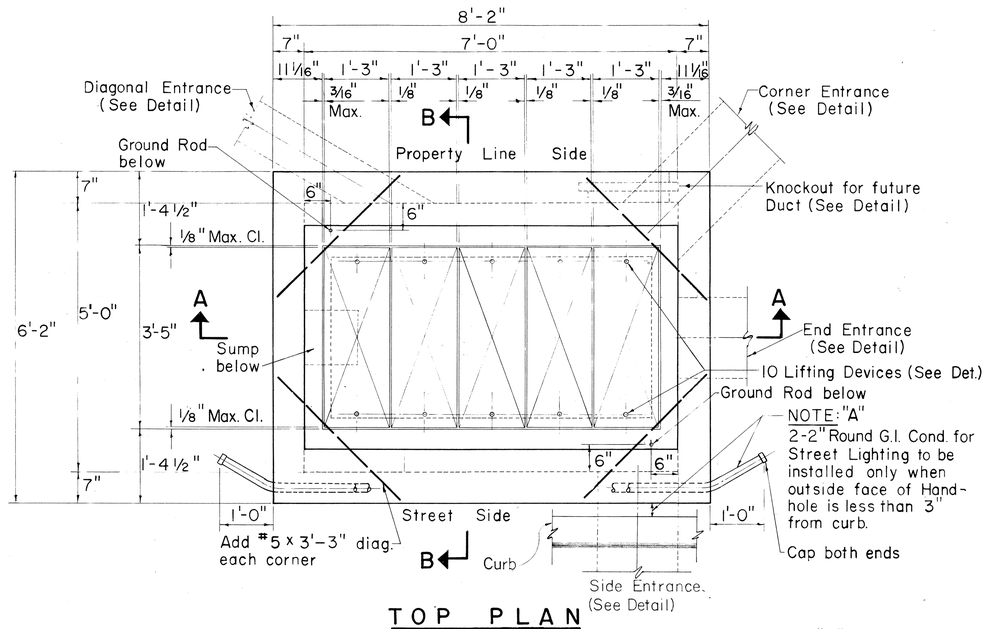
STANDARD DETAILS
ACCESSORY DETAILS FOR PLASTIC CONDUIT UNDERGROUND DUCT LINES

Scales: Not to Scale Date: OCT. 30, 1970

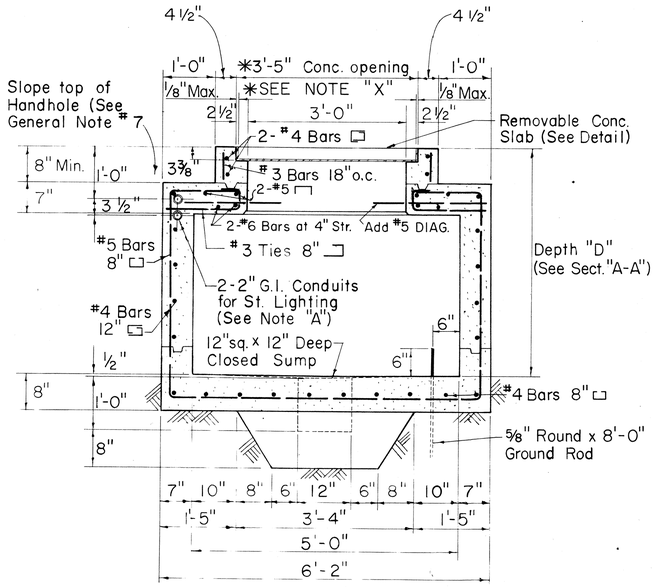
SHEET No. 41 OF 44 SHEETS

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

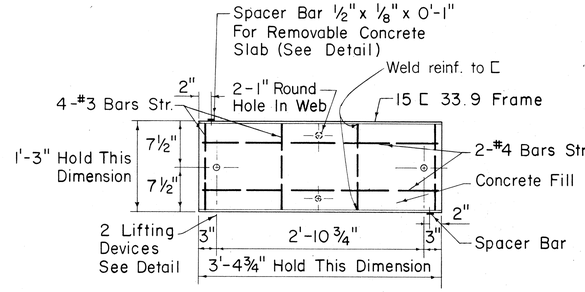
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89):13	1971	179	362



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



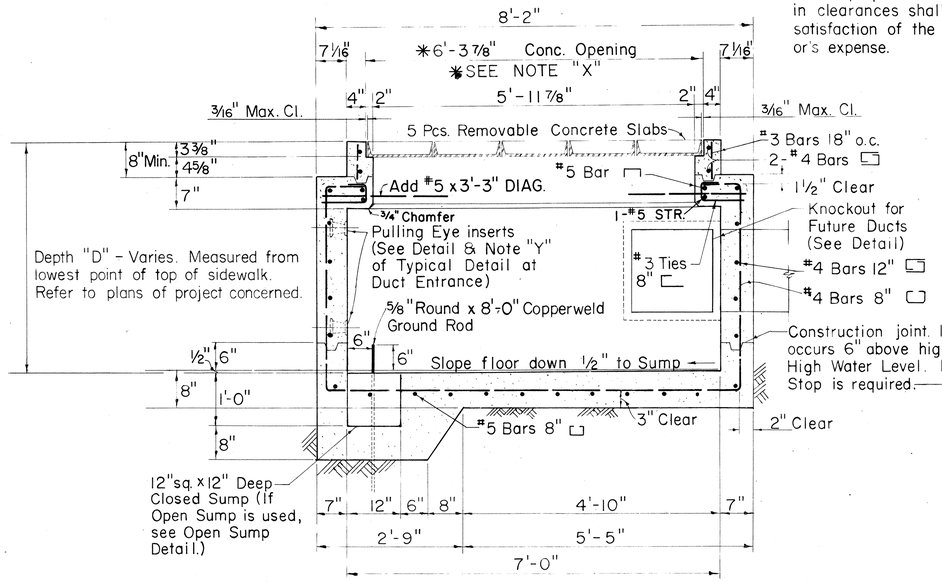
SECTION "B-B"
Scale: 3/4" = 1'-0"



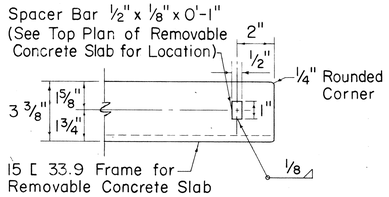
PLAN

*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.

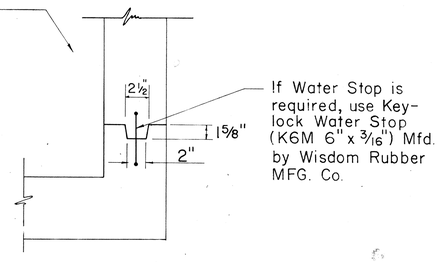


SECTION "A-A"
Scale: 3/4" = 1'-0"



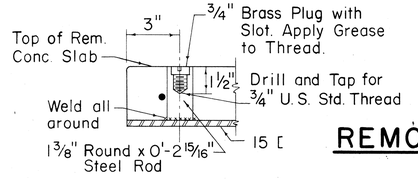
PART ELEVATION

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

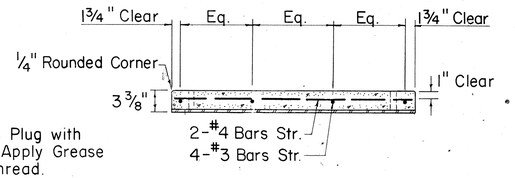


TYPICAL DETAIL OF CONSTRUCTION JOINT AND KEYWAY
Scale: 1 1/2"=1'-0"

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.

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

SHEET No. 1 OF 2 SHEETS

U.S. NAVY

STANDARD DETAILS

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

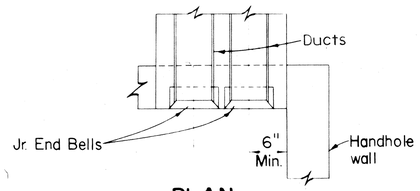
Scales: As Noted Date: OCT. 30, 1970

SHEET NO. 42 OF 44 SHEETS

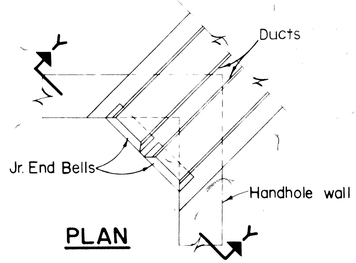
179

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

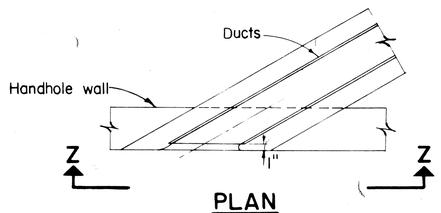
FED. AID DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(89)13	1971	180	362



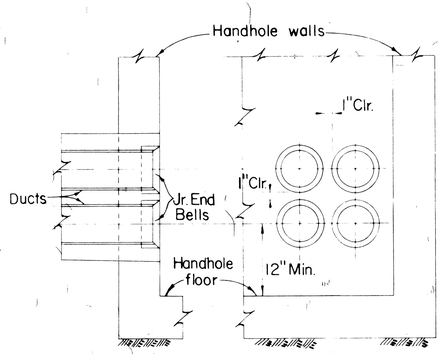
PLAN



PLAN



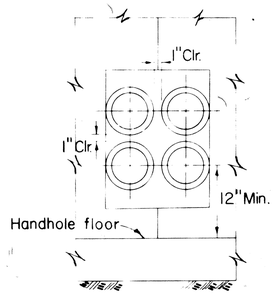
PLAN



SIDE ELEV. FRONT ELEV.

END & SIDE ENTRANCES

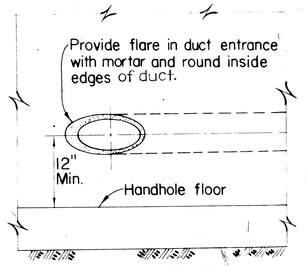
(FOUR WAY DUCT)



ELEV. Y-Y

CORNER ENTRANCE

(FOUR WAY DUCT)



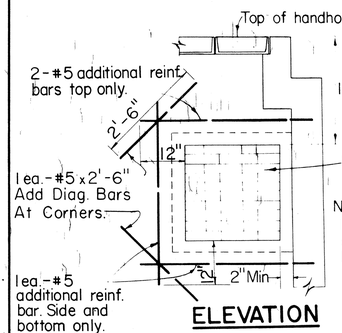
ELEV. Z-Z

DIAGONAL ENTRANCE

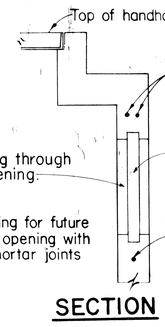
(ONE WAY DUCT)

TYPICAL DUCT LINE ENTRANCE DETAIL

NOT TO SCALE



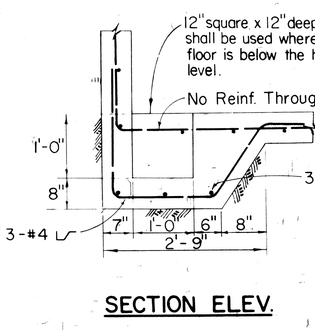
ELEVATION



SECTION

KNOCKOUT FOR FUTURE DUCT LINE

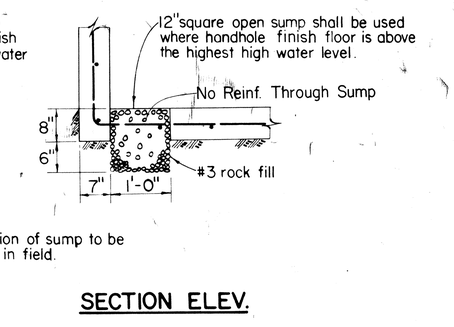
NOT TO SCALE



SECTION ELEV.

CLOSED SUMP

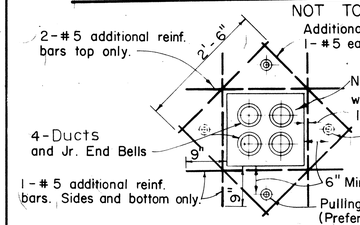
NOT TO SCALE



SECTION ELEV.

OPEN SUMP

NOT TO SCALE

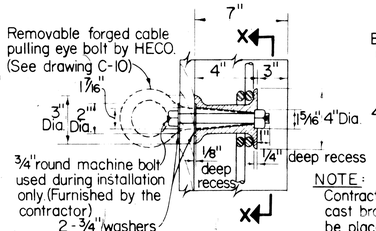


ELEVATION

TYPICAL DETAIL AT DUCT WINDOW

NOT TO SCALE

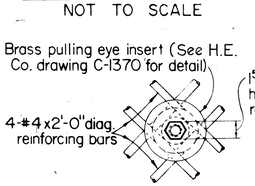
NOTE "Y":
Generally 2 pulling eye inserts are required and located on opposite wall of each duct entrance unless otherwise shown or noted. Navy engineer shall determine number required.



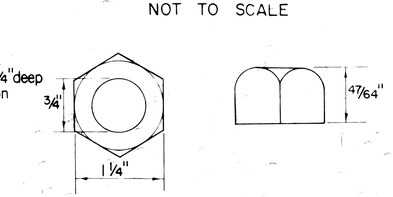
SECTION ELEV. ELEV. X-X

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 Navy Public Works Center (Telephone Ext. 29102), 24 hours before pouring any concrete. All concrete shall be poured in the presence of Navy 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 Navy engineer 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

SHEET No. 2 OF 2 SHEETS

U. S. NAVY

STANDARD DETAILS

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

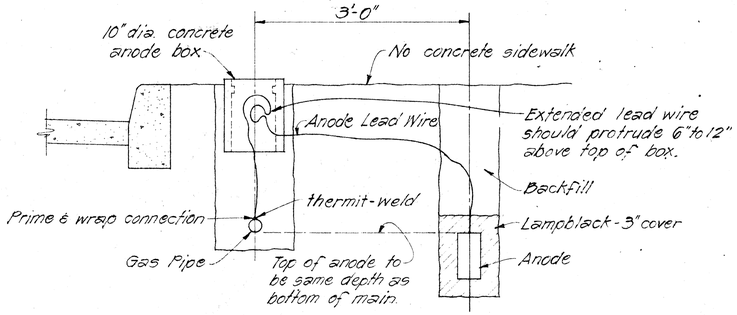
Scales: As Noted Date: Oct. 30, 1970

SHEET NO. 43 OF 44 SHEETS

180

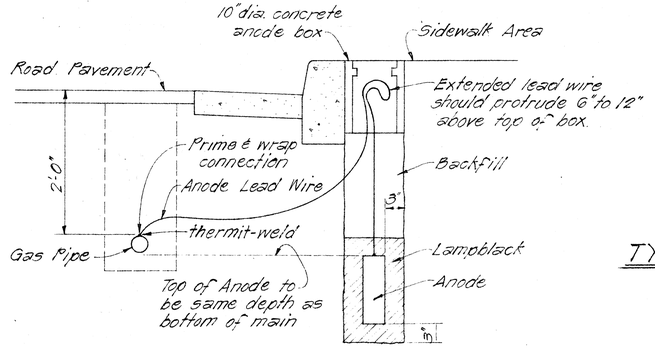
LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(89)13	1971	181	862



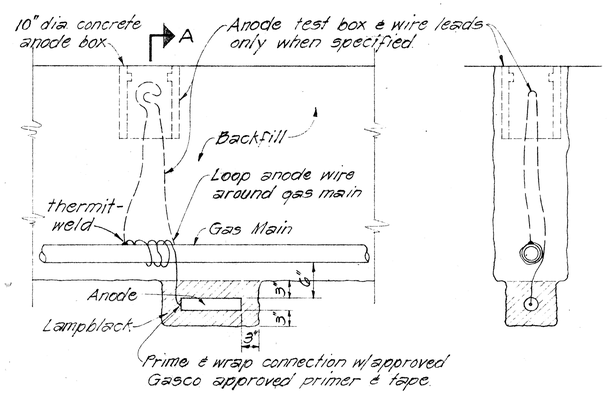
ANODE INSTALLATION ~ TYPE "A"

Not to Scale



ANODE INSTALLATION ~ TYPE "B"

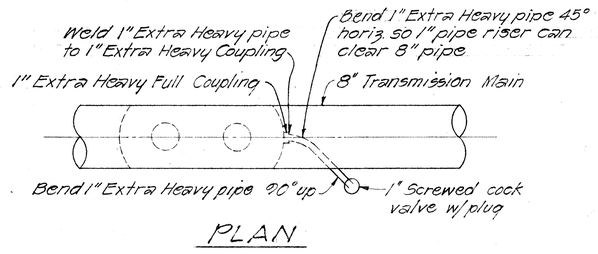
Not to Scale



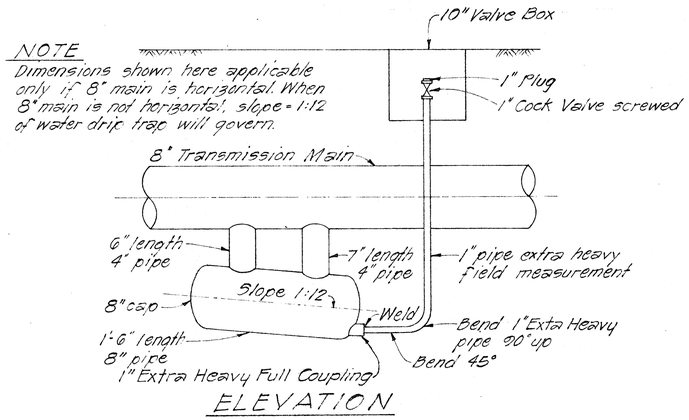
ELEVATION SECTION A

ANODE INSTALLATION ~ TYPE "C"

Not to Scale



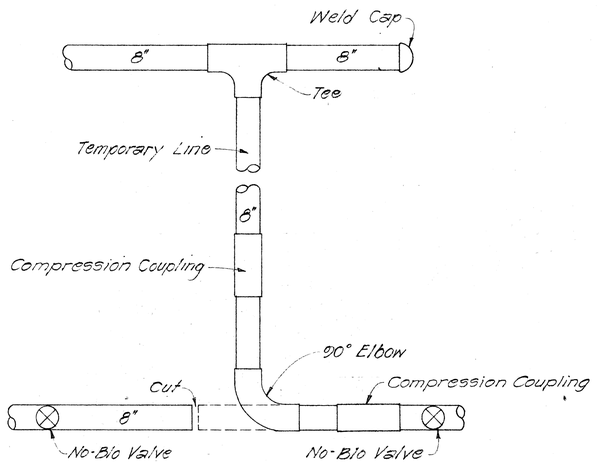
PLAN



ELEVATION

TYPICAL CONDENSATE DRIP POT ASSEMBLY

Not to Scale



TYPICAL TEMPORARY CONNECTION OF GAS MAIN AT ENDS OF PROJECT

Not to Scale

APPROVED:

Paul C. Jog Vice Pres 1-20-71

HONOLULU GAS CO. DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

J. Andrew Schuchardt

J. ANDREW SCHUCHARDT REGISTERED PROFESSIONAL ENGINEER No. 2229 HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

H.G. Co.

MISCELLANEOUS DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(89):13

SCALE: AS SHOWN DATE: OCT. 30, 1970

SHEET No. 44U OF 44 SHEETS

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

K+E CRYSTALENE® LA 2020 TRACING PAPER

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