FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	122	234

GENERAL NOTES

1. ELEVATION DATUM BASED ON MEAN SEA LEVEL DATUM.
2. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF UTILITIES FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DATED 1976 AS AMENDED, OF THE HAWAII HIGHWAYS DIVISION, DEPARTMENT OF TRANSPORTATION.
3. SERVICES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. ALTERATIONS TO SERVICE LINES SHALL BE DONE WITH THE LEAST AMOUNT OF DISTURBANCE TO THE EXISTING SERVICES.
4. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES, AND STRUCTURES SHOWN ARE BASED ON AVAILABLE RECORDS VERIFIED WHENEVER POSSIBLE BY FIELD SURVEYS. THE CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF EXISTING LINES AND SHALL BE REQUIRED TO MAKE ADJUSTMENTS TO ANY NEW OR EXISTING SYSTEMS, AS NECESSARY, WITH THE APPROVAL OF THE ENGINEER OR WHENEVER DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL NOT ASSUME THAT, WHERE NO EXISTING UTILITIES ARE SHOWN, NONE EXIST.
5. CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL DAMAGES TO EXISTING UTILITIES.
6. WHERE REQUIRED, RESTORATION OF EXISTING PAVEMENTS AND IMPROVEMENTS DEMOLISHED BY UTILITY RELOCATION WORK SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT ITEMS. RESTORATION SHALL BE TO ORIGINAL OR BETTER CONDITION.
7. WHERE PUMPING IS REQUIRED, CONTRACTOR SHALL POST A CUSTODIAN DURING ENTIRE PUMPING OPERATION. CUSTODIAN MUST BE KNOWLEDGEABLE IN THE OPERATION OF THE TYPE OF PUMP BEING USED IN ORDER TO PREVENT PROLONGED DELAY DURING ANY BREAKDOWN THAT MIGHT OCCUR.

ARMY WATER MAIN & BOARD OF WATER SUPPLY - GENERAL NOTES

1. PRIOR TO EXCAVATING FOR NEW WATER, DRAIN, SEWER, AND OTHER UTILITY LINES, THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES.

   WHERE THE INSTALLATIONS 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.
2. EXISTING FIRE HYDRANTS, VALVES, METERS, OR MANHOLE FRAMES AND COVERS THAT ARE REMOVED SHALL BE REMOVED AND STOCKPILE FOR PICK UP BY B.W.S.
3. MINIMUM CLEARANCES BETWEEN FIRE HYDRANTS AND UTILITY POLES OR LIGHT STANDARDS SHALL BE 3.0 FEET.
4. APPROVAL BY THE BOARD OF WATER SUPPLY IS BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY. DISCREPANCIES, IF ANY, OF ALIGNMENTS, GRADES, FITTINGS, ETC., SHALL BE THE RESPONSIBILITY OF THE ENGINEER WHO PREPARED THE PLANS.
5. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE MAIN.
6. THE NEW MAINS SHALL BE INSTALLED, TESTED, AND PLACED IN SERVICE PRIOR TO PLACING ANY FILL OR PERFORMING ANY WORK OVER OR NEAR THE EXISTING MAINS.
7. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, ARE FROM THE LATEST AVAILABLE DATA BUT ARE NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES.
8. DEGREE OF ALL BENDS OR LENGTH OF ADJACENT PIPES REQUIRED AT POINTS OF CONNECTION TO THE EXISTING MAIN SHALL BE VERIFIED AFTER EXPOSURE OF THE EXISTING MAIN PRIOR TO THE START OF CONSTRUCTION WORK.
9. THERE SHALL BE A MINIMUM HORIZONTAL CLEARANCE OF 3 FEET AND A MINIMUM VERTICAL CLEARANCE OF 6 INCHES BETWEEN WATER MAINS AND OTHER UTILITIES. HECO, HTCO, AND OTHER UTILITY POLES, HANDHOLES, MANHOLES, SEWER MAINS, AND APPURTENANCES ALSO HAVE A MINIMUM OF 3 FEET CLEARANCE FROM WATER MAINS AND OTHER WATER SYSTEM APPURTENANCES.
10. WATER LINES SHALL BE DUCTILE IRON, CAST IRON OR CONCRETE CYLINDER PIPE, CLASS AS INDICATED IN THE PROPOSAL.
11. PIPE TEST PRESSURE SHALL BE 150 LBS.
12. UNLESS OTHERWISE SPECIFIED, CONNECTIONS TO EXISTING WATER MAINS AND CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH THE BWS INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT BWS ENGINEERING DIVISION, CONSTRUCTION SECTION.
13. REAPPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF ONE YEAR. (SEE RULES AND REGULATIONS OF THE BOARD OF WATER SUPPLY.)
14. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE BOARD OF WATER SUPPLY STANDARD SPECIFICATION AND DETAILS.
15. VALVE I.D. TAGS SHALL BE AFFIXED ON THE UNDERSIDE OF ALL NEW MANHOLE AND VALVE BOX COVERS. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO MANHOLE AND VALVE BOX COVERS. FOR DETAIL SEE SHEET U-10
18. CONNECTIONS TO EXISTING WATER MAINS SHALL NOT BE MADE DURING NORMAL WORKING HOURS.

ARMY SEWER - GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY FACILITIES ENGINEER UTILITIES DIVISION AT FORT SHAFTER AT LEAST TWO WEEKS IN ADVANCE.
2. EXISTING SEWERS SHOWN ARE FROM THE BEST SOURCE AVAILABLE. THE CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF EXISTING LINES AND SHALL BE REQUIRED TO MAKE ADJUSTMENTS TO ANY NEW OR EXISTING SEWER SYSTEM WHEREVER DIRECTED BY THE ENGINEER.
3. ALL SEWER WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY AND COUNTY STANDARD SPECIFICATIONS, MAY 1975, THE LATEST DIVISION OF SEWERS DETAIL, AUGUST 1976, AS REVISED, AND THE REVISED ORDINANCES OF HONOLULU, 1969.
4. SERVICE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. ALTERATIONS TO SERVICE LINES SHALL BE DONE WITH THE LEAST AMOUNT OF DISTURBANCE TO THE EXISTING SERVICES.
5. IF LATERALS OTHER THAN THOSE SHOWN ON PLANS ARE EXPOSED DURING CONSTRUCTION, THE SAME SHALL BE CUT AND PLUGGED, LOWERED OR EXTENDED, AND RECONNECTED TO NEW MAIN, AS REQUIRED.
6. ALL FRAMES AND COVERS ON EXISTING SEWER MANHOLES TO BE DEMOLISHED SHALL BE CLEANED AND REUSED ON NEW SEWER MANHOLE
7. EXISTING SEWER MANHOLES TO BE DEMOLISHED AS NOTED ON PLAN SHALL BE DEMOLISHED 3 FEET BELOW FINISH GRADE AND FILLED WITH SAND.
8. REINF. CONCRETE CRADLE FOR 8-INCH SEWER WILL BE CLASS B

GAS NOTES (GASCO, INC.)

1. THE CONTRACTOR SHALL GIVE GASCO, INC., IN WRITING AT LEAST 14 CALENDAR DAYS ADVANCE NOTICE OF INTENT TO COMMENCE WORK ON THE GAS SYSTEM.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS AND DEPTHS OF EXISTING GAS LINES PRIOR TO START OF CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL CALL GASCO, INC. A MINIMUM OF 48 HOURS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING GAS PIPE LINES. THE TELEPHONE NUMBER IS 548-2126 DURING BUSINESS HOURS, AND 548-2123 AFTER HOURS.

   THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPE LINES IN THE PRESENCE OF A GASCO, INC. REPRESENTATIVE. ALL BACKFILL WITHIN SIX INCHES OF GAS LINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY GASCO, INC.
3. FOR RELOCATION OF ANY GAS PIPE LINE, THE CONTRACTOR SHALL NOTIFY GASCO, INC. 5 WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, ARRANGE FOR TRAFFIC PERMITS AND RESTORE SIDEWALK PAVEMENT OR OTHER IMPROVEMENTS. THE CONTRACTOR SHALL PERFORM ALL NECESSARY EXCAVATION FOR NEW GAS LINES UNTIL THE NEW LINES ARE IN SERVICE.
4. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR AND EQUIPMENT FOR PERFORMING ALL NECESSARY EXCAVATION, BACKFILL, AND CONCRETE WORK NECESSARY FOR THE INSTALLATION OF NEW GAS PIPES IN TRENCH AND ADJUSTMENTS TO EXISTING GAS PIPES AND APPURTENANCES. GASCO WILL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT FOR THE INSTALLATION OF THE GAS LINE IN TRENCHES, INCLUDING FABRICATION, WELDING, AND TESTING.
5. ALL EXISTING GAS FACILITIES SHALL REMAIN IN PLACE UNTIL ALL NEW FACILITIES ARE INSTALLED AND PRESSURIZED INTO SERVICE. ALL COSTS FOR TEMPORARY RELOCATION REQUIRED DURING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR GAS PIPE LINES.
7. THE CONTRACTOR SHALL NOTIFY GASCO, INC. IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPE LINES, THEIR COATINGS OR THEIR CATHODIC PROTECTION DEVICES. REPAIR WORK ON THIS DAMAGE WILL BE DONE BY GASCO, INC. WITH PAYMENT FOR THIS WORK TO BE BORNE BY THE CONTRACTOR.
8. MINIMUM VERTICAL OR HORIZONTAL CLEARANCE BETWEEN GAS PIPE LINES AND OTHER PIPE LINES, CONDUITS, OR DUCTLINES SHALL BE 12 INCHES. ADEQUATE SUPPORT AND PROTECTION FOR GAS PIPE LINES EXPOSED IN THE TRENCH SHALL BE PROVIDED. SUCH SUPPORT AND PROTECTION WILL BE APPROVED BY GASCO, INC. IF THIS CLEARANCE CANNOT BE ATTAINED, THE GAS LINE SHALL BE PROTECTED WITH A GASCO, INC. - APPROVED INSULATION MATERIAL FURNISHED AND INSTALLED BY THE CONTRACTOR, AND THE WORK MUST BE APPROVED BY GASCO, INC.
9. THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER TO KEEP UNCOVERED GAS PIPE LINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.

LEGEND

S_8	EXISTING SEWER
S_8	NEW SEWER
W_{42}	EXISTING WATER LINE
W_{42}	NEW WATER LINE
G_3	EXISTING GAS LINE
G_4	NEW GAS LINE
D_{30}	EXISTING DRAIN LINE
JTS	EXISTING JOINT TRUNKING SYSTEM
DATS	EXISTING DEFENSE ADMINISTRATIVE TELEPHONE SYSTEM
DATS	NEW DEFENSE ADMINISTRATIVE TELEPHONE SYSTEM
E	NEW ELECTRIC LINE
T	NEW TELEPHONE LINE
FA	NEW FIRE ALARM LINE
WMH	EXISTING WATER MANHOLE
SMH	EXISTING SEWER MANHOLE
	NEW SEWER MANHOLE
JTS	NEW JTS LINE (DIRECT BURIED)
DMH	EXISTING DRAIN MANHOLE
	NEW FIRE ALARM PULLBOX
	EXISTING FIRE HYDRANT
	NEW MANHOLE, TYPE AS INDICATED
	NEW SPLICE PIT
	EXISTING UTILITY POLES TO BE REMOVED
	EXISTING UTILITY LINES TO BE ABANDONED
E	TYPE OF UTILITY
12-4"-4	NUMBER OF DUCTS ON BOTTOM / SIZE OF DUCTS / AMOUNT OF DUCTS
O.H.	EXISTING OVERHEAD LINES TO BE REMOVED
	NEW UTILITY POLE WITH ANCHOR

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

REAPPROVED:
CHIEF, PLANNING AND ENGINEERING, B.W.S. — DATE 7/6/81

APPROVED:
GASCO — DATE 6-5-78

APPROVED:
HAWAIIAN ELECTRIC CO. INC. — DATE 5-24-78
HAWAIIAN TELEPHONE CO. LTD. — DATE 7-12-79, 11-13-78
DIVISION OF WASTEWATER MGT. CITY & COUNTY OF HONOLULU — DATE 6/14/78
DEPT. OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU, MUNICIPAL FIRE ALARM — DATE 6/8/78
CHIEF, PLANNING AND ENGINEERING, BWS — DATE 7/10/78

E. CLARENCE W. Y. CHING — REGISTERED PROFESSIONAL ENGINEER No. 1003 — HAWAII, U.S.A.
GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER No. 2997 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY GENERAL NOTES

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. U-1 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	123	234

HAWAIIAN TELEPHONE COMPANY - GENERAL NOTES

1. ALL EXISTING FACILITIES (HTCO, TPC, AUTOVON, DATS & JTS) SHALL REMAIN IN OPERATION UNTIL THE PROPOSED PERMANENT FACILITIES ARE PROVIDED.
2. HTCO TO REMOVE ALL EXISTING CABLE FACILITIES (HTCO, TPC, AUTOVON, DATS AND JTS) EXCEPT AS NOTED ON PLANS.
3. HTCO TO FURNISH THE CONTRACTOR FOR PROPER INSTALLATION THE FOLLOWING MATERIALS:
   A. ALL MANHOLE FRAMES AND COVERS
   B. ALL PULL BOXES AND COVERS
   C. ALL PULLING IRONS, CABLE RACKS, BOLTS, NUTS, WASHERS AND GROUND RODS FOR INSTALLATION IN MANHOLES AND HANDHOLES.
   D. ALL PVC DUCTS, FITTINGS, SPREADERS AND CEMENT.
   E. ALL STEEL CONDUITS, BENDS AND FITTINGS
4. STAKE OUT OF HTCO MANHOLES, HANDHOLES, PULL BOXES AND DUCTS SHALL BE BY THE STATE'S CONTRACTOR, VERIFIED BY HTCO.
5. ALL HTCO MANHOLES, HANDHOLES, PULL BOXES PVC DUCTS, CONDUITS AND CONDUIT BENDS ARE TO BE INSTALLED BY THE CONTRACTOR. ALL WORK TO BE DONE IN ACCORDANCE WITH HTCO STANDARD DRAWINGS.
6. LOCATION AND DEPTH OF ALL HTCO MANHOLES, HANDHOLES, PULL BOXES, DUCTS AND CONDUITS TO BE VERIFIED AND APPROVED IN THE FIELD BY HTCO PRIOR TO CONSTRUCTION OR INSTALLATION.
7. MANHOLES DEPTHS SHOWN ON PLANS REFER TO INSIDE DEPTH OF MANHOLES.
8. ALL DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR.
9. HTCO SHALL COORDINATE ITS WORK WITH THE STATE'S CONTRACTOR IN SUCH A MANNER AS NOT TO IMPEDE CONSTRUCTION.
10. CONTRACTOR SHALL INSTALL 1/8" POLYOLEFIN PULL LINE IN ALL NEWLY CONSTRUCTED DUCT LINES.
11. CONTRACTOR TO FURNISH HIS CONSTRUCTION SCHEDULE TWENTY (20) WORKING DAYS PRIOR TO STARTING ANY WORK ON HTCO FACILITIES.
12. THE CONTRACTOR SHALL GIVE HTCO TEN (10) WORKING DAYS NOTICE TO PROCEED WITH ITS PORTION OF THE WORK.

HAWAIIAN ELECTRIC GENERAL NOTES

1. EXCAVATION OF POLE HOLES AND ANCHORS, INSTALLATION OF POLE AND ANCHORS, AND BACKFILL OF POLE HOLES AND ANCHORS ARE TO BE DONE BY HECO AND OR IT'S CONTRACTOR.
2. HECO SHALL FURNISH AND INSTALL ALL MATERIALS TO COMPLETE CONSTRUCTION OF HECO'S UNDERGROUND DUCT LINE SYSTEM.
3. STATE'S CONTRACTOR TO STAKEOUT MANHOLES, HANDHOLES AND SERVICE BOXES.
4. LOCATION AND DEPTH OF MANHOLES AND SERVICE BOXES TO BE VERIFIED AND APPROVED IN THE FIELD BY HECO PRIOR TO CONSTRUCTION OR INSTALLATION.
5. ALL DUCTS AND CONDUITS TO BE INSTALLED IN CONCRETE JACKET SHALL BE INSPECTED AND APPROVED BY HECO BEFORE PLACING CONCRETE.
6. HECO TO MANDREL TEST ALL DUCT LINES INSTALLED BY HECO.
7. UNLESS SHOWN OTHERWISE, THE MINIMUM DEPTH OF DUCT LINES FROM FINISH GRADE TO:
   a. TOP OF CONCRETE DUCT ENCASEMENT IN STATE'S RIGHT OF WAY 3'-0"
   b. TOP OF CONCRETE DUCT ENCASEMENT IN PRIVATE PROPERTY 2'-0"
8. BREAKING INTO EXISTING HECO UNDERGROUND FACILITIES SHALL BE DONE BY HECO.
9. HECO TO REPAIR ALL TEMPORARY OPENINGS IN MANHOLES, HANDHOLES AND SERVICE BOXES AFTER COMPLETION OF TEMPORARY CONSTRUCTION.
10. EXISTING FACILITIES SHOWN ARE APPROXIMATE ONLY. THE HECO TO VERIFY THEIR LOCATIONS AND SHALL MAKE ADJUSTMENTS TO ANY NEW OR EXISTING FACILITIES.
11. ALL EXISTING HECO FACILITIES SHALL REMAIN IN PLACE UNTIL PROPOSED PERMANENT FACILITIES ARE PROVIDED.
12. HECO IS TO COORDINATE IT'S WORK WITH THE STATE'S CONTRACTOR IN SUCH A MANNER AS NOT TO IMPEDE CONSTRUCTION.
13. STATE'S "SPECIAL PROVISIONS, PROPOSAL, CONTRACT AND BOND" - SECTION 630 SHALL APPLY TO THE PROJECT.
14. HECO TO REMOVE ALL EXISTING HECO POLES AND CABLES FACILITIES EXCEPT AS NOTED ON PLANS.
15. THE STATE SHALL GIVE THE COMPANY 15 WORKING DAYS NOTICE TO PROCEED WITH ITS PORTION OF THE WORK.

ABBREVIATIONS

AE	ARMY ELECTRIC
AS_{24}	ARMY SEWER, 24" DIA
AV	AUTOVON
CATV	COMMUNITY ANTENNA TELEVISION
DATS	DEFENSE ADMINISTRATIVE TELEPHONE SYSTEM
DMH	DRAINAGE MANHOLE
E	ELECTRIC
EMH	ELECTRIC MANHOLE
FH	FIRE HYDRANT
FA	FIRE ALARM
HH	HANDHOLE
JTS	JOINT TRUNKING SYSTEM
K.S. STA	KAUA STREET STATIONING
OH	OVERHEAD
PB	PULL BOX
SMH	SEWER MANHOLE
SL	STREET LIGHT
T	TELEPHONE
TMH	TELEPHONE MANHOLE
TPC	TRANSPACIFIC CABLE

FIRE ALARM GENERAL NOTES

1. EXISTING FIRE ALARM CIRCUIT SHALL NOT BE INTERRUPTED AT ANY TIME.
2. FINAL CONNECTION OF CABLES TO EXISTING FIRE ALARM CIRCUITS SHALL BE DONE BY CITY.
3. CABLE SPLICES, IF REQUIRED, SHALL BE LOCATED IN FA PULLBOXES. SPLICING OF CABLES TO BE DONE BY THE CONTRACTOR UNDER THE SUPERVISION OF THE CITY. SPLICES SHALL BE KEPT TO A MINIMUM.
4. FA CONDUIT SHALL BE 2" GALVANIZED RIGID STEEL. NUMBER OF CONDUITS SHALL BE ONE UNLESS OTHERWISE INDICATED.
5. EXISTING OVERHEAD OPEN WIRES AND CABLES SHALL BE REMOVED AND DISPOSED OF AFTER THE NEW CIRCUIT IS IN OPERATION AND ACCEPTED BY THE CITY.
6. SPARE CONDUITS SHALL BE INSTALLED WITH 1/8" POLYOLEFIN PULL LINE AND SHALL BE CAPPED AT BOTH ENDS.
7. AFTER CABLES ARE INSTALLED, SEAL CONDUITS WITH DUCT SEAL IN ALL PULL BOXES.
8. NOTIFY AND COORDINATE WORK WITH ELECTRICAL AND MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU (PHONE 523-4905), THREE (3) WORKING DAYS PRIOR TO START OF CONSTRUCTION.
9. FIRE ALARM PULL BOXES SHALL NOT BE BUILT ON ROADWAYS OR DRIVEWAYS.
10. NATIONAL ELECTRIC CODE, NATIONAL FIRE CODE AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION MAY 1975 SHALL BE COMPLIED WITH.
11. DIRECT BURIED CONDUITS SHALL BE PAINTED WITH TWO (2) COATS OF ANTI-CORROSION ASPHALT BASE COMPOUND.
12. LEAVE FOUR (4) FEET MINIMUM CABLE SLACK IN EACH PULL BOX.
13. FA CONDUITS SHALL BE 24" UNDER ROADWAYS AND 18" UNDER SIDEWALKS.
14. FA CONDUITS SHALL BE CONCRETE ENCASED UNDER ROADWAYS.

ARMY ELECTRIC GENERAL NOTES

1. CONTRACTOR SHALL SCHEDULE WORK TO MINIMIZE THE NUMBER AND DURATION OF POWER OUTAGES. OUTAGES SHALL BE COORDINATED WITH FACILITIES ENGINEER UTILITIES DIVISION AT FORT SHAFTER AT LEAST TWO WEEKS IN ADVANCE.
2. CONTRACTOR SHALL TURN IN SALVAGEABLE MATERIAL SUCH AS POLES, WIRES, CABLES AND OTHER ELECTRICAL HARDWARE AS DIRECTED BY THE FACILITIES ENGINEER UTILITIES DIVISION.
3. ALL DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR.
4. CONTRACTOR SHALL INSTALL 1/8" POLYOLEFIN PULL LINE IN ALL NEWLY CONSTRUCTED DUCT LINES.
5. REFER TO HECO AND HTCO STANDARD DRAWINGS FOR ANCHORING DATA AND DETAILS.
6. EXISTING ELECTRICAL EQUIPMENT REQUIRED TO COMPLETE THE ELECTRICAL RELOCATION THAT ARE UNSERVICEABLE SHALL BE REPLACED BY THE CONTRACTOR.
7. CONTRACTOR SHALL INSTALL AT NO ADDITIONAL COST TO THE STATE TEMPORARY OVERHEAD FEEDER SERVING LOWER FT. SHAFTER INDUSTRIAL AND RESIDENTIAL AREA. MAXIMUM OUTAGE TIME DURING INSTALLATION OF PERMANANT 350 MCM SYSTEM SHALL BE 4 HOURS PROPOSED TEMPORARY WORK REQUIRES STATE AND USA APPROVAL.

APPROVED:

I. Kanuma — 5-24-78
HAWAIIAN ELECTRIC CO. INC. — DATE

H. Yamada — 7-12-79 / 11-14-78
HAWAIIAN TELEPHONE CO. LTD. — DATE

for By Kenneth T. Young — 6/18/79
DEPT. OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU, MUNICIPAL FIRE ALARM — DATE

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

CLARENCE W. Y. CHING — REGISTERED PROFESSIONAL ENGINEER No. 1002 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY GENERAL NOTES

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. U-2 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	124	234

537,000 E

537,250 E

537,500 E

65,250 N

65,000 N

TRUE NORTH

B.W.S. WATER

1. CUT AND PLUG
   1 - 6" PLUG, LEAD JOINT
   1 - 6" HUB CLAMP W/STRONG BACK
   1 - CONC. BLOCK
2. REMOVE EXIST. FIRE HYDRANT AND DEMOLISH EXISTING M.H. SEE B.W.S. NOTE 2 SHEET U-1
3. RECONSTRUCT OVER EXISTING 30"BGGV TYPE A MANHOLE TO FINISH GRADE. REUSE MH. FRAME AND COVER.
4. ADJUST MH FRAME & COVERS TO FINISH GRADE.

UNITED STATES MILITARY RESERVATION
(FORT SHAFTER)

EXIST. FA PB #8

* TMH #2874
TYPE A-3-7
K.S. ℄ STA. 39+30
℄ O/S = 18' (LT.)

PROVIDE TRENCH & BACKFILL - 24" MIN. HTCO TO PLACE DIRECT BURIED JTS CABLES

E 4-5"-2 | T 12-4"-4 | FA 1-2" W/ CABLES

FA PB #9
K.S. ℄ STA. 38+85
℄ O/S = 16' (LT.)

PARKING LOT

K.S. ℄ STA. 37+71.38
℄ O/S = 20' (LT.)

CONC. SIDEWALK

EXIST. DATS MH #21

BUILDING P.I.
K.S. ℄ STA. 24+10
℄ O/S = 6' LT.

EXIST: E 4-5"-2 | T 12-4"-4 | FA 2-2"
(INSTALLED IN UNIT 1)

EXIST. 4-4" JTS DUCTS (2-SPARE) EXPOSE AT DUCT ENDS

SMH

AS

WALL

TEMP E

5'x7' SPLICE PIT (JTS)

TEMP P 312/1

EXIST. STUB OUTS

TEMP E

JTS CABLES (BY OTHERS)

FA PB #7
K.S. ℄ STA. 33+00
℄ O/S = 8' (LT.)
(BY OTHERS)

(BY OTHERS) 5'x7' SPLICE PIT (AV)

T(AV) 2-4"GSP (BY OTHERS) AV

EXIST. STUB OUTS

TEMP FA SEE NOTE 2 THIS SHT.

FH 2210

40' SPLAYING

40' SPLAYING

40' SPLAYING

R=1020'

R=4020'

R=200

KAUA STREET

E,T,FA & CATV-O.H.

TEMP JTS OH

TEMP OH FA

TEMP T 4-4"-2

E-O.H.

FH 2211

HTCO

EXIST. 8" IRRIGATION LINE

(BY OTHERS)
EMH 950 E
TYPE 611 (6'x11')
K.S. ℄ STA. 36+70
℄ O/S = 20' (LT.)

(BY OTHERS)
TMH #2873
TYPE A-3-7
K.S. ℄ STA. 34+60
℄ O/S = 6' (LT.)

EXIST. TRANSF. VAULT TO BE DEMOLISHED & REMOVED (BY OTHERS)

FORT SHAFTER OVERPASS

PLAN
SCALE: 1"=20'

NOTES:
1. * INDICATES UTILITY RELOCATION WORK TO BE DONE BY HTCO CONTRACTOR (HECO)
2. FINAL CONNECTION OR CABLE TO FA CIRCUIT BY CITY & COUNTY. SEE FA GENERAL NOTES SHT. U-2.
3. CONCRETE REACTION BLOCK SHALL BE CLASS B CONCRETE.
4. TESTING AND MATERIAL FOR TESTING OF WATERLINE SHALL BE INCIDENTAL WORK.

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

REAPPROVED:
CHIEF, PLANNING AND ENGINEERING, B.W.S. — DATE 6/6/81

APPROVED:
HAWAIIAN ELECTRIC CO., INC. — DATE 5-24-78
HAWAIIAN TELEPHONE CO., LTD. — DATE 7/12/79
CHIEF, PLANNING AND ENGINEERING, B.W.S. — DATE 6/5/81

APPROVED:
DEPT. OF TRANSPORTATION SERVICES CITY & COUNTY OF HONOLULU MUNICIPAL FIRE ALARM CIRCUIT RELOCATION CLEARANCE — 6/13/79

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2998 — HAWAII, U.S.A.

CLARENCE W.Y. CHING — REGISTERED PROFESSIONAL ENGINEER — No. 1002 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PLAN
WATER, DATS, TELEPHONE & ELECTRIC
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST - UNIT 3B
F.A. PROJ. NO. F-078-1(21)
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-3 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-070-1(21)	1980	125	234

DATS MH #104
TYPE A-1-7
K.S. ℄ STA. 39+90
℄ 9/s = 9'(RT.)

597,800 E

DATS

EMH 959 F
TYPE G11 (6'X11')
K.S. ℄ STA. 39+58
℄ 9/s = 16'(LT.)

P.I.
K.S. ℄ STA. 40+35
℄ 9/s = 8'(LT.)

65,000 N

* TMH #2875
TYPE A-3-7
K.S. ℄ STA. 42+65
℄ 0/s = 5'(LT.)

FA PB #10
K.S. ℄ STA. 41+20
℄ 0/s = 4'(LT.)

E * T FA
4-5"-2 12-4"-4 1-2"W/ CABLES

DATS MH #78
TYPE A-1-7
K.S. ℄ STA. 42+34
℄ 9/s = 4'(RT.)

DATS
2-4" DUCTS

5'X7' SPLICE PIT (JTS)

JTS
2-4" GSP W/ 2-4"C BENDS

DATS
1¼" x 10' ANCHOR
L = 12' MIN.

*5'X7' SPLICE PIT (A.V.)

REMOVE AE OH
-AP#212

DEAD END AP W/ ANCHOR LEAD, 6' MIN.

REMOVE AP #211
RELOCATE EXIST. AIR SWITCH & AE OH LINES AS REQUIRED TO AP SEE DETAIL A/U-15

RELOCATE AE OH & TERMINATE ON DEAD END POLE

RELOCATE AE OH

C.A.V. BURIED

AS

TRUE NORTH

EXIST. DATS
4-4"

40' SPLAYING

5'X7' SPLICE PIT (JTS)

JTS
2-4" GSP

K.S. STA. 40+67
℄ 9/s = 8'(LT.)

PROVIDE TRENCH & BACKFILL 24" HTCO TO PLACE DIRECT BURIED JTS CABLES.

P308

E, T, FA & CATV-OH

KAUA ST
12-4"-4

EXIST. 42" WATER MAIN

R=140'

P.I.
K.S. ℄ STA. 40+18
℄ 9/s = 1'(RT.)

P308

JTS

D36

S

W

STREET

E, T, FA & CATV-OH

DATS
4-4"-2

R=4008'

DATS
P-BOX-435TB(2'4")

*T
13-4"-7
*AV
2-465P

43

42

P304

P302

*T
2-4" PVC W/ 2-4"C BENDS

EXIST. SEWER W/ CONC. CRADLE

EDGE OF WALL FOOTING

RAMP "I"

"DATS"

WATER LINE "A"

12" BLOW-OFF LINE

GAS LINE "A"

W42

G4

G2

JTS

AS6

AV12

T, DATS & JTS OH

AE
9-4"-3
*5'X7' PIT (JTS) SPLICE

JTS
4-4"-2

WATER LINE "B"
RELOCATE AV12 CAPACITOR BANK, SEE SHT. U-9 FOR LOCATION

E & T OH
DATS OH
AE OH
DATS
4-4"-4

"L" GAS LINE IN TOP DECKING OF KAHAUIKI BRIDGE CULVERT W/ 6" STEEL SLEEVE

E *T FA
4-5"-2 13-4"-7 1-2"W CABLES

*JTS
4-4"-2

T
13-4"-4

-4"

Existing Type A MH with 16" BGV

E & T OH
CATV-OH

AE & CATV OH

T OH

AV BURIED

AS6

EXIST. DATS MH TO BE DEMOLISHED 45+00

EDGE OF WALL FOOTING

E, T & FA-O.H

EXIST. DATS MH #78 DATS

EXIST. AE
9-4"
REMOVE EXIST 3-350 MCM & 2/0
INSTALL 3-350 MCM, 4/0, 15 KV & 2/0 FROM EXIST. AEMH TO AEMH #1

OUTBOUND LANES

INBOUND LANES

AV16

WMH

W12

KAHAUIKI STREAM (& CONC. CHANNEL)

E & T-OH

UP

NEW SPLICE PIT, 5'X7'

AEHH, #1, 3'X5'
K.S. STA. 44+12
℄ OS. = 60'(LT.)

4" RISER CONDUIT UP AP, SEE DETAIL B/U-15

ANCHOR LEAD 15' MINIMUM

*T
1-4"-1 W/ 1-4"C BEND

AE
4-4"-2
(2 W/ 4#2/0, 2-SPARES)

E
2-3"-2

E
4-5"-2

EMH #959 G
TYPE NO.1 (6'X11')
K.S. ℄ STA. 44+15.25
℄ 0/s = 5'(LT.)

*TPB (2 X 4' 435 TB)

T
12-4"-4

FA
1-2" W/ CABLES

45+00

G4 750 N

DEMOLISH EXIST. 4-WAY DUCT BANK. EXPOSE LOWER CABLES AND PLACE SPLIT DUCT ON 3 CABLES. RECONNECT ONE REMAINING DUCT AND ENCASE.

EXIST. DATS MH #104 TO BE DEMOLISHED

B.W.S. WATER LINE

(1) BEGIN WATER LINE "A" STA. 0+00 = K.S. ℄ STA. 40+00 ℄ 9/s = 1' LT.
CONNECT TO EXIST. 42" WATER LINE
1-42" 45° HORIZ. BEND
1-42" BUTT STRAP
1-CONC. BLOCK W/ STRUCTURAL STRUT
1-TEMP. CLEANOUT W/CAP FOR TESTING
1-ADAPTER C.C. TO C.I. (LEAD JOINT) O.D. 44.5"
12 L.F. 42" C.C. PIPE CLASS 150

(2) WATER LINE "A" STA. 0+49 = K.S. ℄ STA. 40+32 ℄ 0/s = 37.5' RT.
1-42" 45° HORIZ. BEND
1-CONC. BLOCK

(3) WATER LINE "A" STA. 1+25
1-42" BUTTERFLY VALVE F.E. CLASS 150
1-TYPE "A" MANHOLE
1-42" ADAPTER (F & B)
1-42" ADAPTER (F & S)

(4) REMOVE EXIST. FIRE HYDRANT AND DEMOLISH EXIST. MANHOLE SEE B.W.S. NOTE 2 SHT. U-1

(5) DEMOLISH EXIST. MANHOLE. SEE B.W.S. NOTE 2 SHT. U-1

(6) 12" BLOW OFF LINE
1-42" X 12" BLOW OFF TEE (OUTLET TO FIT 12" PIPE)
1-12" GATE VALVE CLASS 150
70 L.F. 12" PIPE
1-12" ¼ BEND
1-12" FLAP VALVE, F.E.
8 L.F. 12" PIPE, F.E., P.E.
1-VALVE BOX
2-CONC. BLOCK

(7) WATER LINE "A" STA. 3+80
RAMP I ℄ STA. 43+80 ℄ 9/s = 9.5' RT.
1-42" 11¼° HORIZ. BEND
1-CONC. BLOCK

ARMY WATER LINE & SEWER

* BEGIN WATER LINE "B" STA. 0+00 = K.S. ℄ STA. 42+38 ℄ 0/s = 22' ±
1-12" 22½° BEND
1-CONC. BLOCK W/ STRUCTURAL STRUT
1-12" x 8" REDUCER

* WATER LINE "B" STA. 0+13
1-12" TEE
2-12" GATE VALVE W/ VALVE BOX
1-12" 90° HORIZ. BEND
2-CONC. BLOCK

* WATER LINE "B" STA. 1+00
K.S. ℄ STA. 44+07
℄ 9/s = 20' LT.
1-12" 90° HORIZ. BEND
1-16" x 12" REDUCER
1-CONC. BLOCK

* WATER LINE "B" STA. 1+28
1-¾" AIR RELIEF VALVE
1-AIR RELIEF VALVE BOX

* WATER LINE "B" STA. 1+32 = K.S. ℄ STA. 44+07
℄ 9/s = 13' LT.
1-16" 22½° HORIZ. BEND
1-CONC. BLOCK

* END WATER LINE "B" STA. 1+87 ± CONNECT TO EXISTING 16" WATER LINE RAMP I ℄ STA. 43+85 ℄ 9/s = 13' ± LT.
1-16" 22½° BEND
1-CONC. BLOCK W/ STRUCTURAL STRUT

(7A) CONSTRUCT REINF. CONC. JACKET (60 FT. ±)

(7) CONNECT TO EXIST. 12" WATER LINE
1-12" 45° HORIZ. BEND
1-CONC. BLOCK W/ STRUCTURAL STRUT

(8) REMOVE 4' OF EXIST. SMH AND RECONSTRUCT TO FINISH GRADE

(9) DEMOLISH EXISTING SMH

(10) EXPOSE PIPE AT BOTH ENDS NEAR MANHOLES AND MONITOR FOR SETTLEMENT (INCIDENTAL WORK).

(11) DEMOLISH EXIST. AEMH

* NOTE: SEE REVISED ARMY WATER LINE B" PROFILE & PLAN ON PLAN SHEET C.O. 1313-1 FOR DATA ON STATIONS.

GASCO GAS LINE

(1) BEGIN GAS LINE "A" STA. 0+00 = K.S. ℄ STA. 39+07 ℄ 9/s = 29' ± RT.

(2) GAS LINE A STA. 0+05 K.S. ℄ STA. 39+11 ℄ 9/s = 26' RT.

(3) GAS LINE "A" STA. 0+08 = BEGIN GAS LINE "B" STA. 0+00

(4) GAS LINE "A" STA. 4+75 K.S. ℄ STA. 43+86 ℄ 9/s = 26' RT.

(5) END GAS LINE "B" STA. 2+67 EC. STA. 38+08 ℄ 9/s = 106' ± CONNECT TO EXIST. 2" GAS LINE (BY GASCO)

(6) INSTALL 2" VALVE W/ VALVE BOX

(7) INSTALL 1" VALVE W/ VALVE BOX. INSTALL 32# ANODE, PUT TEST LEADS IN VALVE BOX AT FINISH GRADE

(8) CONNECT TO EXIST. 1" GAS LINE (BY GASCO)

(9) INSULATE AT TIE IN INSTALL 32# ANODE ON EXISTING GAS LINE WITH TEST BOX AT FINISH GRADE

(10) BEGIN 6-INCH STEEL SLEEVE, STA. 3+70 ±, 20 FT. FROM CULVERT WALL.

(11) BEGIN 5-FT. REINF. CONCRETE JACKET FOR 6-IN. STEEL SLEEVE.

(12) END KAHAUIKI BOX CULV. WALL. BEGIN 5-FT. REINF. CONC. JACKET FOR 6-IN. STEEL SLEEVE GAS LINE "A," STA. 4+55 ± to 4+60 ±.

(13) END 6-IN. STEEL SLEEVE FOR GAS LINE "A," 25 FT. FROM CULV. WALL.

GAS LINE "B"

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

REAPPROVED:
Robert Nimmakayu 9/16/81
CHIEF, PLANNING AND ENGINEERING, B.W.S. DATE

APPROVED:
J. Kaunis 5-24-78
HAWAIIAN ELECTRIC CO., INC. DATE
Y. Yamada 7-12-79
HAWAIIAN TELEPHONE CO., LTD. DATE
M. Mukai 7/26/79
CHIEF, PLANNING & ENGINEERING, BWS DATE

PLAN
SCALE: 1" = 20'

APPROVED:
R. Yoshimoto 6-5-78
GASCO DATE
E. Kimura for Young 6/8/78
DEPT. OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU, MUNICIPAL FIRE ALARM CIRCUIT RELOCATION CLEARANCE DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1003 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PLAN
WATER, GAS, DATS
TELEPHONE & ELECTRIC

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-070-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-4 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	126	234

UNITED STATES MILITARY RESERVATION (FORT SHAFTER)

538,000 E — 64,750 N — TRUE NORTH

FA PB #12
K.S. ℄ STA. 45+75
℄ O/S = 4' (LT.)

AE HH #2
3'X5'
K.S. ℄ STA. 47+93
℄ 9/S = 36' (RT.)

DATS MH #78A
TYPE A-1-7 (HTCO)
K.S. ℄ STA. 48+33
℄ O/S = 4' (RT.)

(STATE CONTRACTOR) T FA
12-4"-4 1-2" W/ CABLES

AE
4-4"-2
(2 W/ 4#2/0, 2 SPARE)

HTCO WORK STATE CONTRACTOR

SEWER - LINE "D"

KAUA STREET

RAMP "J"

GAS LINE "A"

AE T & CATV OH

AV BURIED

EXIST. TILE WALL

E, T & FA-OH

RAMP "I"

EXIST. TILE WALL

EDGE OF WALL FOOTING

WATER LINE "A"

537,750 E

ABANDONED AS 12

64,500 N

FA PB #13
K.S. ℄ STA. 48+40
℄ O/S = 4' (LT.)

CRM WALL

CUT & PLUG

2- 4" RISER CONDUITS UP AP. SEE DETAIL C/U-15

ANCHOR LEAD, 6' MIN.

TMH #2876 (STATE CONTRACTOR)
STD. CORNER LARGE TYPE
K.S. ℄ STA. 48+44.50
℄ 9/S = 9.5' (LT.)

AE OH
8-#2/0

AP SEE DETAIL D/U-15

CRM WALL

64,250 N

AP

50+00

AE & CATV OH

T
16-4"-4
AP (STATE CONTRACTOR)

SMH

EXIST. DRAINAGE CHANNEL

EDGE OF WALL FOOTING

CB

EXIST. HTCO MH #1257 TO BE DEMOLISHED

EXIST DATS MH 78A TO BE DEMOLISHED

EXIST. SIGN

OUTBOUND LANES

INBOUND LANES

COLLECTOR

EASTBOUND

EXIST. DATS MH TO BE DEMOLISHED

EXIST. DATS 4-4"

RAMP G EXIST FA 2-2"

EXIST. T 16-4"-4

EXIST. DATS MH #79B

EXIST. DATS MH #79A

TPC

EXIST TMH #1256

EXIST FA PB FINAL CONNECTION OR CABLES TO FA CIRCUITS BY CITY & COUNTY. SEE FA GENERAL NOTES SHT. U-2

T FA
16-4"-4 2-2"-2
(STATE CONTRACTOR) (1-2" W/ CABLES, 1-2" SPARE)
DATS
4-4"-2

EXIST. DATS MH #73 TO BE DEMOLISHED

~~6" D.I. NIPPLE (LENGTH TO SUIT).~~
~~2-6" COUPLING ADAPTERS~~

~~42" D.I. PIPE (LENGTH TO SUIT)~~
~~2-42" COUPLING ADAPTERS.~~

CUT & PLUG

CUT & PLUG

B.W.S. WATER LINE

① WATER LINE "A" STA. 4+85
RAMP "I" ℄ STA. 44+49
℄ 9/S = 19' RT.
1- 42" 45° HORIZ. BEND
1- CONC. BLOCK

② WATER LINE "A" STA. 5+58
1- 2" AIR RELIEF VALVE
WORKING PRESSURE 150 PSI
1- TYPE "B" MANHOLE OFFSET 16'

③ END WATER LINE "A" STA. 4+60± =
RAMP "I" ℄ STA. 44+56.5
℄ 9/S = 12.5'± RT.
1- 42" 45° HORIZ. BEND
1- 42" BUTT STRAP
1- CONC. BLOCK W/ STRUCTURAL STRUT
1- TEMP. CLEANOUT W/ CAP FOR TESTING
1- ADAPTER C.C. TO C.I. (LEAD JOINT) O.D. 44.5"
12 L.F. 42" C.C. PIPE CLASS 150

④ REMOVE 2 EXIST. 2" SPRINKLER WATER METERS RETURN TO BWS.

⑤ REMOVE EXIST. FIRE HYDRANT
1- 6"X3" REDUCER
1- 3" 90° HORIZ. BEND
1- CONC. BLOCK

⑥ REMOVE EXIST. MH AND VALVES; ~~CONNECT LINE.~~

⑦ 2½" WATER CONNECTION W/ TYPE III W.M. BOX
NEW 2" WATER METER; 1- BACKFLOW PREVENTER FOR SPRINKLER. FOR DETAILS SEE SHEET U-6

GASCO GAS LINE

① GAS LINE "A"
STA. 5+71
RAMP J ℄ P.C.C.
STA. 44+29.81
℄ O/S = 14' (RT.)

② END GAS LINE "A"
STA. 9+14±
RAMP J ℄ STA. 47+78
℄ O/S = 14±
CONNECT TO EXIST. 4" GAS LINE (BY GASCO)

③ INSULATE AT TIE-IN
INSTALL 32# ANODE ON EXIST. GAS LINE WITH TEST BOX AT FINISH GRADE

ARMY SEWER

① SMH "D-1" 9+07.47
S.L. "D" STA. ~~10+00~~ =
K.S. ℄ STA. 44+35 ℄ 9/S = 38'±
CONSTRUCT SMH OVER EXIST. 16" SEWER
TOP = 14.0
INV. = 2.00 (8")
INV. = 8.6± (EXIST. 16")

② SMH "D-2"
SL. "D" STA. 11+20
K.S. ℄ STA. 45+50
℄ 9/S = 18' LT.
TOP = 15.0
INV. = 10.0

③ DROP SMH "D-3"
S.L. "D" STA. 14+00
K.S. ℄ STA. 48+26
℄ 9/S = 31' LT.
TOP = 23.0
INV. = 13.26 (6")
INV. = 12.24 (8")

✱ INDICATES UTILITY RELOCATION WORK TO BE DONE BY HTCO CONTRACTOR (HECO)

PLAN

SCALE: 1" = 20'

REAPPROVED: Richard K. Minamikawa — CHIEF, PLANNING AND ENGINEERING, B.W.S. — 6/6/81 DATE

APPROVED: J. Kaumeyer — HAWAIIAN ELECTRIC CO., INC. — 5-24-78 DATE

APPROVED: P. Yoshimoto — GASCO — 6-5-78 DATE

APPROVED: J.E. Yamada — HAWAIIAN TELEPHONE CO., LTD. — 7-12-78 DATE

APPROVED: Richard K. Minamikawa — CHIEF, PLANNING & ENGINEERING, BWS — 7/6/78 DATE

APPROVED: by Kenneth Z. Young — DEPT. OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU, MUNICIPAL FIRE ALARM CIRCUIT RELOCATION CLEARANCE — 6/18/78 DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1005 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE	REVISION
4/8/81	REVISED SEWER INVERTS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PLAN
WATER, SEWER, GAS, DATS, TELEPHONE & ELECTRIC

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. U-5 OF 30 SHEETS

ADD 126

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	HAW.	F-078-1(21)	1980	127	234

538,250 E

64,250 N

TRUE NORTH

DROP SMH D-4
SL-"D" STA. 16+~~28~~ 13
K.S. & STA. 50+~~48~~ 30
℄ O/S = ~~25~~ (LT.) 35' (LT.)
CONSTRUCT SMH OVER EXIST. 6" SEWER
TOP = ~~50.0~~ MATCH EXIST.
INV. = ~~46.0~~ ± (EXIST. 6") 47.3±
INV. = 38.8 (6")

SMH D-5
SL-"D" STA. 16+~~67~~ 70
K.S. & STA. ~~50+00~~ 51+01
℄ O/S = ~~25~~ (LT.) 40'
CONSTRUCT SMH OVER EXIST. 6" SEWER
TOP = ~~52.5~~ MATCH EXIST.
INV. = ~~41.6~~ ± (EXIST. 6") 42.7±
INV. = 41.46 (6")

18+03±
SL-"D" STA. ~~17+96~~ ±
INTERCEPT EXIST. 6" SEWER LATERAL
1-6" WYE
1-6" ADAPTER

SMH D-6
END SL-"D" STA. 18+~~14~~ 48±
K.S. & STA. 52+~~97~~ 71±
℄ O/S = ~~25~~ (LT.) 41'
CONSTRUCT SMH ~~OVER EXIST. 6" SEWER~~
TOP = ~~54.5~~ MATCH EXIST.
INV. = ~~46.7~~ ± 82

538,500 E

64,000 N

EXIST. SMH 300-21
END SL-"D" STA. 18+03
TIE-INTO EXIST. SMH
TOP = 53.78±
INV. = 48.25±

B. W. S. WATER

① CUT AND PLUG
1- PLUG

② CUT AND PLUG
1- PLUG
1- CONC. BLOCK

③ 4" WATER CONNECTION INCLUDING 4-INCH TAPPING VALVE W/ VALVE BOX
1- 4" 1/16 BEND
2- CONC. BLOCK

④ 1-4" 1/16 BEND
1- CONC. BLOCK

⑤ INSTALL 3" WATER METER FOR SPRINKLER, FOR DETAIL SEE THIS SHEET.

⑥ REFER TO PLAN SHT. 131 FOR METER INSTALLATION DETAILS.

AP
CRM WALL
CONNECT TO EXIST.
SMH
AS6
CRM WALL
D36
50
D48
AP
AS6
SMH
AE OH
B-#2/0
RELOCATE EXIST. CAPACITOR BANK ON AP, SEE DETAIL E/U-15
AE & CATV OH
ANCHOR LEAD, 6' MIN.
AS6
AE & CATV OH
AP
AE & CATV OH
AP
AE & CATV OH
SMH
AS6
CATV OH
SMH
AP
KAUA STREET
RAMP "I"
BIKEWAY AND WALKWAY
EXIST. DRAINAGE CHANNEL
50+00
51
52
53
54
55+00
D24
D48
D12

PLAN
SCALE: 1"=20'

538,750 E

63,300 N

TRUE NORTH

D30
D36
39
60
G
G
D90
KAUA STREET
MIDDLE STREET
S8
W12
D30
W12
S8
G
G
4" COPPER
TO BE ABANDONED
REMOVE EXISTING 2" WATER METER
① ② ③ ④ ⑤

PLAN
SCALE: 1"=20'

FROM BWS WATER MAIN
3" GATE VALVE W/ VALVE BOX
WATER METER W/ METER BOX SIZE INDICATED ON PLANS
3" DOUBLE CHECK, BWS APPROVED BACKFLOW PREVENTOR W/ 2 GATE VALVES
12" MIN
CONCRETE BLOCK
CONNECT TO METER LATERAL. INSTALL REDUCER AS REQUIRED
3"1/4 BEND
CONCRETE BLOCKS
FINISH GRADE
REDUCER AS REQUIRED
TO SPRINKLER SYSTEM

TYPICAL CONNECTION DETAIL FOR SPRINKLER SYSTEM

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

REAPPROVED:
Richard H. Murakami 4/6/81
CHIEF, PLANNING AND ENGINEERING, B.W.S. DATE

APPROVED:
Richard H. Murakami 7/6/81
CHIEF, PLANNING AND ENGINEERING, BWS DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1003 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE	REVISION
4/8/81	REVISED SEWER INVERT.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PLAN
SEWER & ELECTRIC

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. U-6 OF 30 SHEETS

ADD 127

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	128	234

OUTBOUND LANES
KAUA ST.
DEMOLISH EXT'G S.M.H.
R"K"
FINISH GRADE
EXISTING GROUND
NEW ELEC. & F.A.
EXT'G 24" SEWER @ 0.1% ±
24" SEWER 92 LF @ 0.26% ±
24" SEWER 138 LF ± @ 0.26% ±
EXT'G 24" SEWER @ 0.62% ±
STA. 0+00 CONNECT TO EXT'G SEWER
EXT'G SEWER INVERT (-)3.01
STA. 0+92
SMH A-1 (+)2.76
STA. 2+30± CONNECT TO EXT'G S.M.H.
(-)2.43
N. I. C.

ARMY SEWER LINE "A"
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

FOR PLAN SEE SHT. U-4
EXISTING GROUND
FINISH GRD.
STA. 0+00 BEGIN GAS LINE "A" CONNECT TO EXT'G GAS LINE (BY GASCO) SEE GASCO NOTE 1, THIS SHEET
DATS TO BE ABANDONED
JTS TO BE ABANDONED
REINF. CONC. JACKET. SEE PLAN SHT. 190, 193 FOR DETAIL
AS8
STA. 1+00
STA. 1+50
24.00
21.50
28.5±
STA. 3+00
W12 TO BE ABANDONED
18.00
STA. 3+70
16.00
NEW BOX CULVERT (10') 6" STEEL PIPE SLEEVE 10" 15" 12"
PIPE 6" STEEL
STA. 3+85
W42 TO BE DEMOLISHED
0.00
STA. 4+55
0.00
STA. 4+70
15.50
SEE GASCO NOTES 1 & 2 THIS SHEET
G1 TO BE ABANDONED
NEW AW16
TEL. TO BE ABANDONED
AS16 TO BE ABANDONED
NEW AS16
AW16 TO BE ABANDONED
REINF. CONC. JACKET 110 L.F.
INVERT OF 4" GAS LINE "A"
STA. 7+50
11.50
STA. 8+00
11.00
NEW W42
TEL. TO BE ABANDONED
AS8 TO BE ABANDONED
STA. 8+50
10.50
STA. 9+14± END GAS LINE "A" CONNECT TO EXT'G 4" GAS LINE (BY GASCO) SEE GASCO NOTE 1, THIS SHEET
8.5±

GAS LINE "A"
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

W3 TO BE ABANDONED
FINISH GRADE
EXISTING GROUND
NEW D24
8" VC SEWER, 243 LF @ 6.0 %
8" VC SEWER 85 LF ± @ 1.52%
EXT'G 8" VC SEWER @ 1.35 %
N. I. C.
STA. 7+03
SMH B-4 38.71
STA. 7+88±
SMH B-5 40.0±
REINF. CONC. JACKET 5 L.F.
REINF. CONC. JACKET 20 L.F.
W3 TO BE ABANDONED
NEW D24
OUTBOUND LANES
R"K"
NEW F.A.
8" SEWER 56 LF @ 1.36%
8" VC SEWER 196 LF @ 1.5%
210 LF @ 4.6 %
REINF. CONC. JACKET 5 LF
EXT'G 8" VC SEWER @ 1.36% ±
D48 TO BE ABANDONED
NEW TEL.
NEW ELEC.
NEW ELEC. & F.A.
NEW D48
DEMOLISH EXT'G S.M.H.
STA. 0+00 CONNECT TO EXT'G SEWER
EXT'G SEWER INV. 10.8±
STA. 0+56
SMH B-1 11.56
STA. 2+50
SMH B-2 14.47
SMH B-3 24.13

DIVISION OF WASTEWATER MANAGEMENT
SEWER LINE "B"
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

FOR PLAN SEE SHT. U-2
KAUA ST.
JTS TO BE ABANDONED
℄ FWY.
℄ E.B. COLLECTOR
FINISH GRADE
EXISTING GROUND
REINF. CONC. JACKET 160 LF.
INVERT OF 2" GAS
STA. 0+30
STA. 1+00
STA. 1+50
STA. 2+00
STA. 2+67± END GAS LINE "B" CONNECT TO EXT'G 2" GAS LINE (BY GASCO) SEE GASCO NOTE 1, THIS SHEET
STA. 0+00 BEGIN GAS LINE "B"
STA. 0+08 GAS LINE "A"

GAS LINE "B"
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

FOR PLAN SEE SHT. U-6
6" SEWER 45 LF ± @ 3.17%
6" SEWER 44 LF ± @ 3.56% ±
STA. 16+67
SMH D-5 41.62 ± EXT'G 6"
41.46 6"
STA. 16+86
SHALLOW SMH D-4 40.62 ± EXT'G 6" 38.80 6"
SHALLOW SMH D-3 41.22 ± EXT'G 6" 38.30
STA. 17+03 ± INTERCEPT EXT'G 6" SEWER LATERAL
STA. 17+96 ± STA. 18+14.
SMH D-6 40.72 ± 6"
STA. 18+03 EXT'G SMH 300-21 42.25R EXT'G 6"
STA. 18+48
SMH D-6 40.06 ± 6"
FOR PLAN SEE SHT. U-4
G1 TO BE ABANDONED
S8 TO BE ABANDONED
AV TO BE ABANDONED
NEW DATS
NEW TEL
NEW EMH
NEW G4
FINISH GRADE
EXISTING GROUND
EXT'G CRM WALL
D24
6" SEWER, 246 LF @ 11.8 %
8" SEWER, 280 LF @ 0.80%
8" SEWER 120 L.F. @ 0.80%
16" SEWER 133 L.F. @ 11.60 %
ABANDONED AS12
NEW D42
NEW BOX CULVERT
STA. 10+30
SMH #1 0.00 8" 5.85± 16" EXIST. 8.43 16
STA. 11+20
SMH D-2 10.00 8"
STA. 14+00
SMH D-3 13.26
CONNECT TO EXIST. S.M.H. 6.93±
4'x5' DRAIN BOX TO BE DEMOLISH TO BE ABANDONED
STA. 8+67
133 L.F. REINF. CONC. JACKET
CONCRETE CRADLE ON WOOD PILES

NOTE:
ESTIMATED PILE TIP ELEV.=(-)45' AND WOOD PILES CAPACITY= 15 TONS. (PILE DIAMETER-12 INCHES MINIMUM)

ARMY SEWER LINE "D"
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

GASCO NOTES

1. INSULATE AT TIE-IN INSTALL 32# ANODE ON EXISTING GAS LINE WITH TEST BOX AT FINISH GRADE.
2. INSTALL 32# ANODE PLACE TEST LEADS IN VALVE BOX.
3. FOR "DETAIL OF CONC. JACKET" SEE SHT. U-12

DATE	REVISION
4/8/81	REVISED SEWER LINE SLOPE & SEWER INVERTS.

APPROVED:
GASCO — DATE 6-5-78
~~DIVISION OF WASTEWATER MGT. CITY & COUNTY OF HONOLULU~~ — ~~DATE~~

CLYDE Y. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1002 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PROFILES
SEWER & GAS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-7 OF 30 SHEETS

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

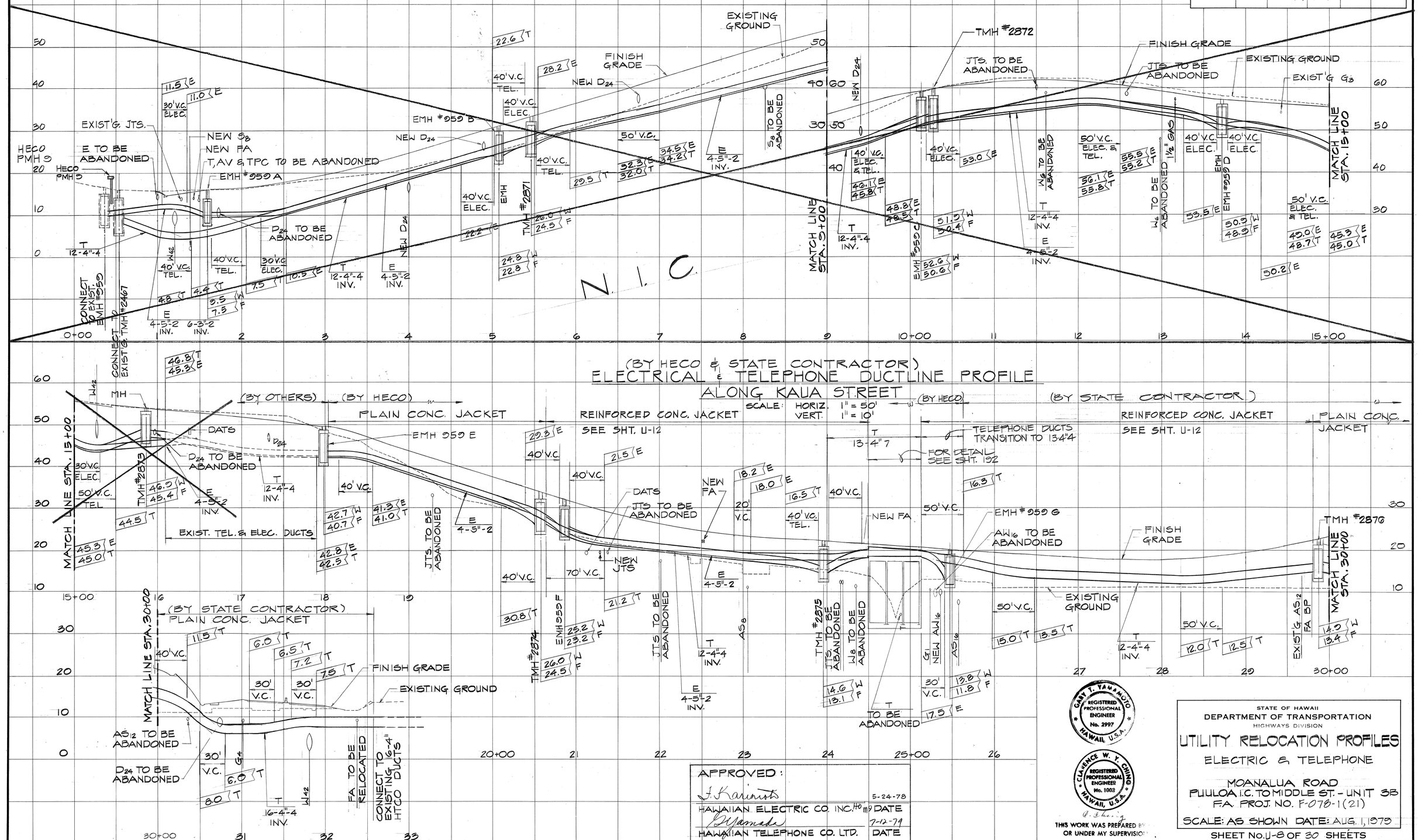
ADD 128

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	129	234

(BY HECO & STATE CONTRACTOR)

ELECTRICAL & TELEPHONE DUCTLINE PROFILE ALONG KAUA ST.REET

SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'



APPROVED:

J. Karimoto — 5-24-78
HAWAIIAN ELECTRIC CO. INC. — DATE

P. Yamada — 7-12-79
HAWAIIAN TELEPHONE CO. LTD. — DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 3003 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PROFILES
ELECTRIC & TELEPHONE

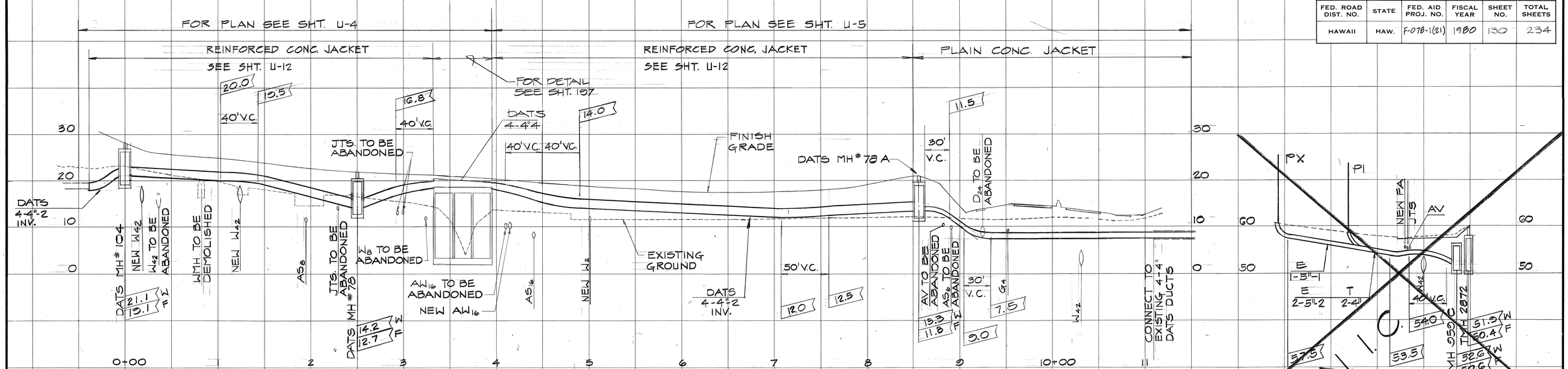
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1978

SHEET NO. U-8 OF 30 SHEETS

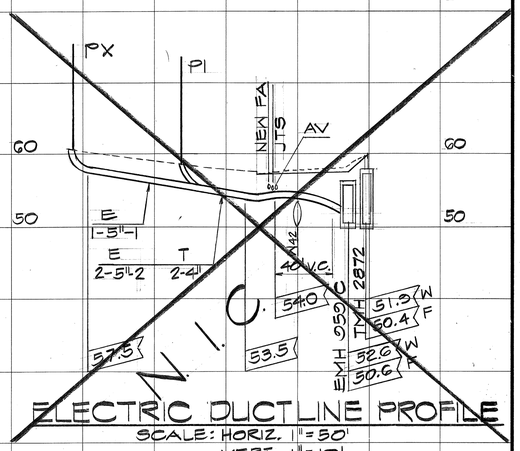
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	130	234



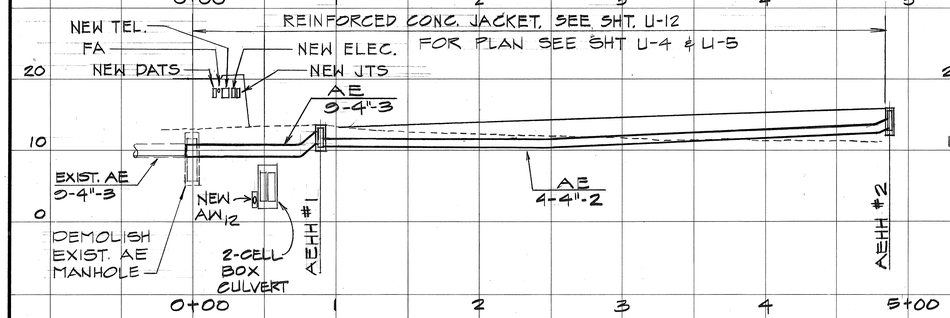
DATS DUCTLINE PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'



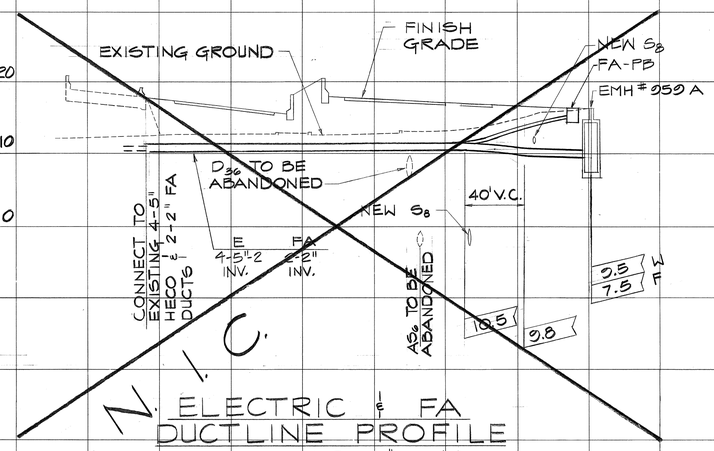
ELECTRIC DUCTLINE PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'



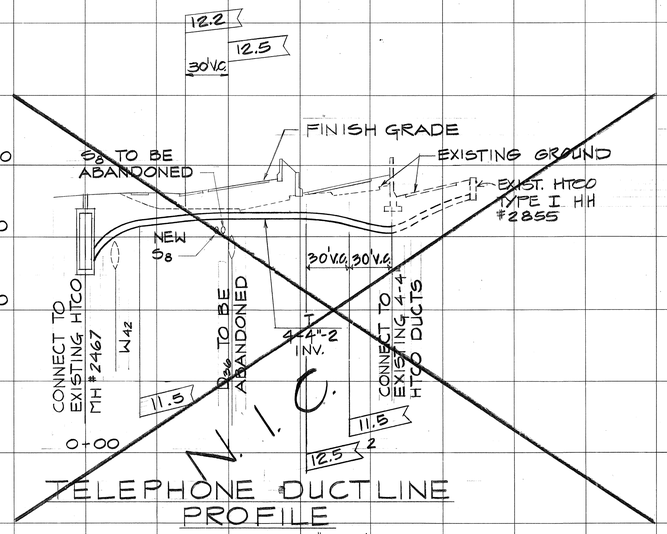
ARMY ELECTRICAL DUCTLINE PROFILE

SCALES: HORIZ. 1" = 50'
VERT. 1" = 10'



ELECTRIC ℄ FA DUCTLINE PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'



TELEPHONE DUCTLINE PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'

APPROVED:

J. Kaunis	5-24-78
HAWAIIAN ELECTRIC CO. INC.	DATE
P. Yamada	7-12-79
HAWAIIAN TELEPHONE CO. LTD.	DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. T. CHING REGISTERED PROFESSIONAL ENGINEER No. 1002 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY RELOCATION PROFILES
DATS, ELECTRIC & TELEPHONE

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

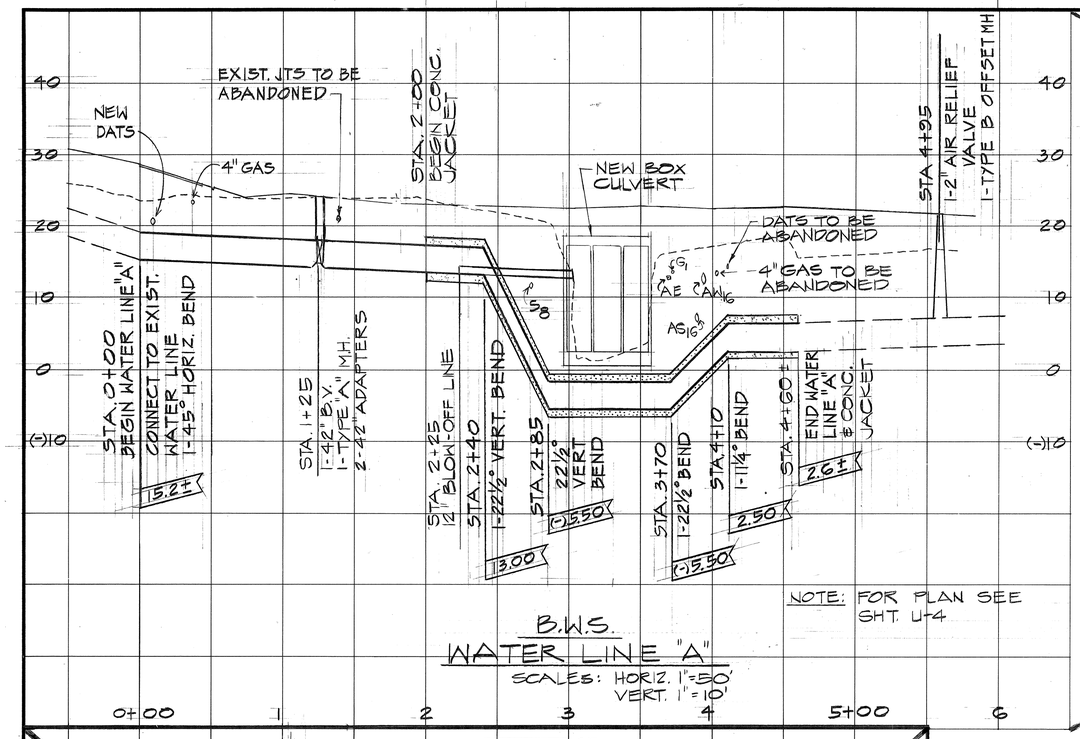
SCALE: AS SHOWN DATE: AUG. 1, 1979

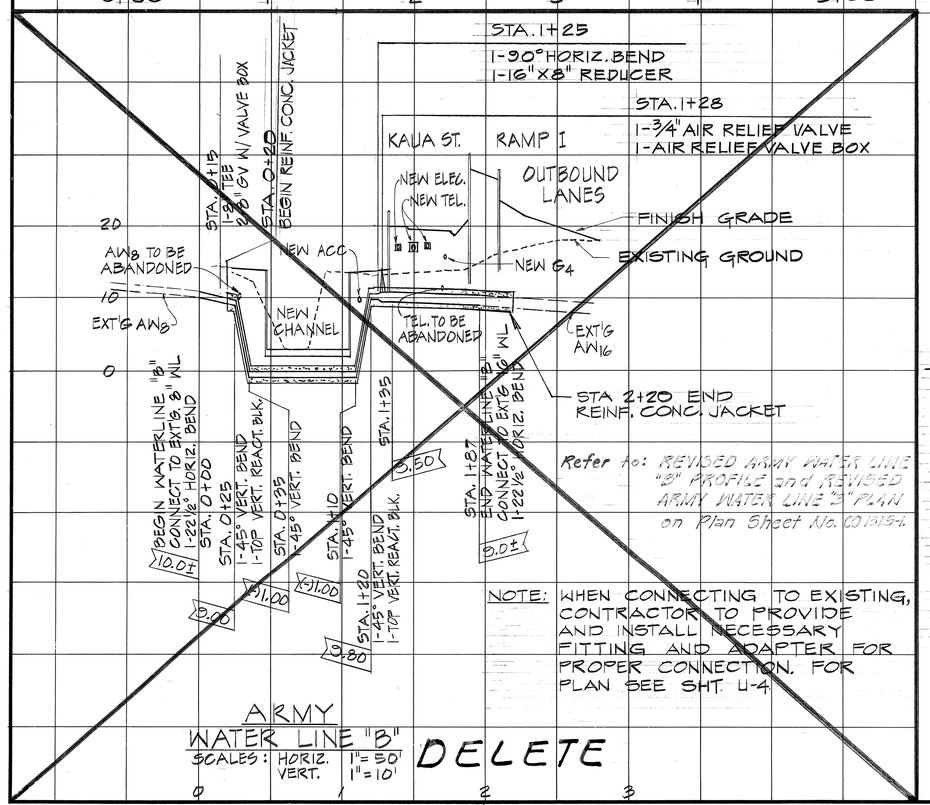
SHEET NO. U-9 OF 30 SHEETS

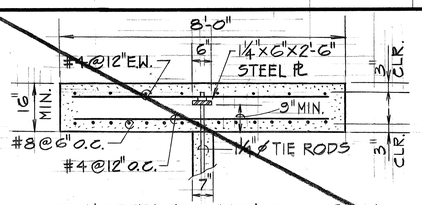
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

130

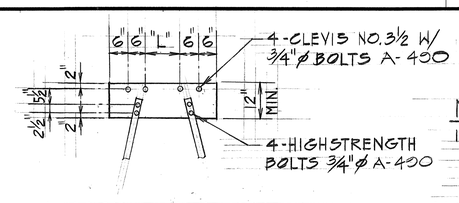
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	131	234







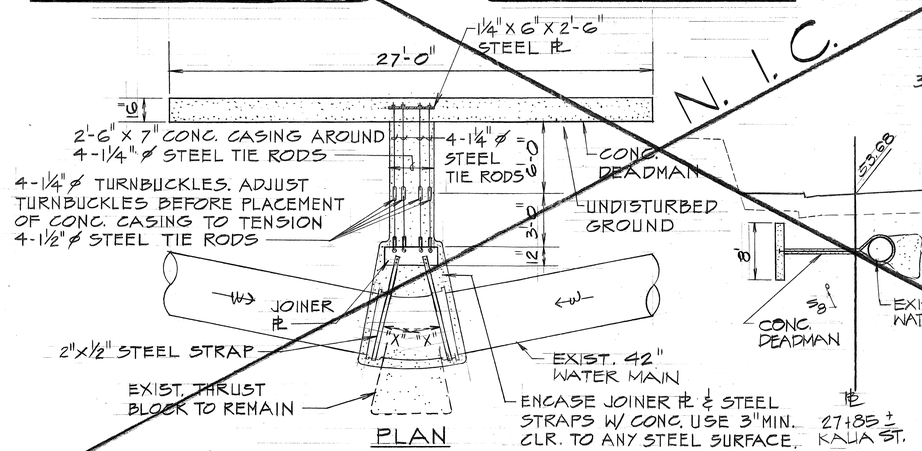
CONC. DEADMAN SECTION



JOINER PLATE DETAIL

NOTES:

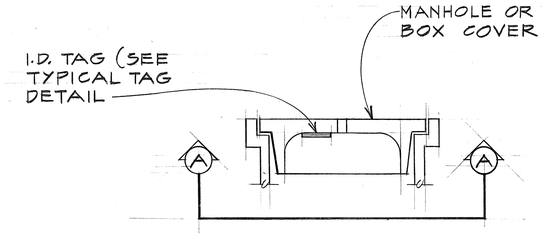
1. STEEL STRAP WILL BE INSTALLED ADJACENT TO EXIST. THRUST BLOCK AND COVERED WITH CONC. AFTER INSTALLATION.
2. DEADMAN TO BE CONSTRUCTED AND CONNECTED TO EXIST. 42" WATER LINE PRIOR TO RETAINING WALL NO. 6 EARTHWORK OPERATIONS.
3. CONC. FOR DEADMAN SHALL BE CLASS A. BOLTS, STEEL PL'S, TIE RODS ETC. WILL NOT BE PAID FOR DIRECTLY BUT CONSIDERED INCIDENTAL TO CLASS A CONC.



PLAN

SECTION
SCALE: 1"=10'

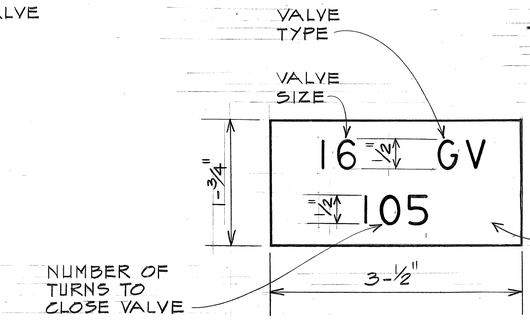
42"Ø WATER MAIN DEADMAN DETAIL
NOT TO SCALE



SECTION

VALVE TYPE ABBREVIATIONS

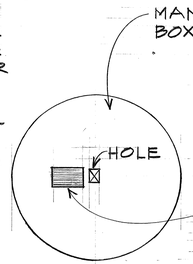
GATE VALVE	GV
BEVEL GEAR GATE VALVE	BGGV
BUTTERFLY VALVE	BV



TYPICAL TAG

NOTE:

THE CONTRACTOR SHALL VERIFY VALVE DATA WITH THE VALVE MANUFACTURER PRIOR TO STAMPING I.D. TAG.
I.D. TAG SHALL BE INSTALLED ON UNDERSIDE OF ALL NEW MANHOLE OR VALVE BOX COVER.
PAYMENT SHALL BE INCIDENTAL TO GATE VALVES.



IDENTIFICATION TAG FOR MANHOLE OR VALVE BOX COVER
NOT TO SCALE

SECTION (A)

REAPPROVED:
CHIEF, PLANNING AND ENGINEERING, BWS. DATE 2/6/81

APPROVED:
CHIEF, PLANNING AND ENGINEERING, BWS DATE 2/6/81

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1003 HAWAII, U.S.A.

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITY RELOCATION PROFILES
WATER

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

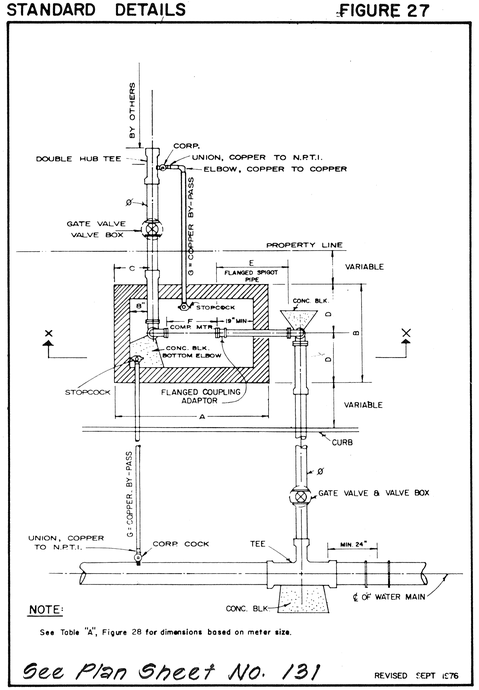
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-100F 30 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	CO 1315-1	234

STANDARD DETAILS FIGURE 27

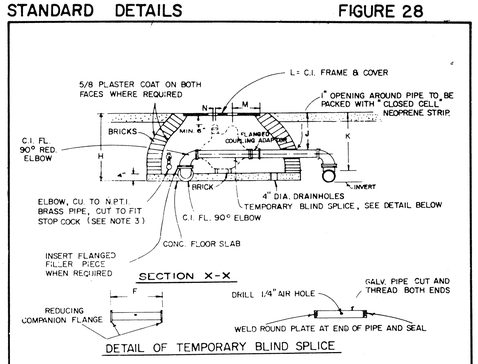


See Plan Sheet No. 131 REVISED SEPT 1976

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

SINGLE COMPOUND METER INSTALLATION-PLAN

STANDARD DETAILS FIGURE 28



DETAIL OF TEMPORARY BLIND SPLICE

TABLE A

	COMPOUND METERS			
	3"	4"	6"	8"
A	7'-2"	7'-5"	7'-11"	8'-7"
B	4'-0"	4'-6"	4'-6"	4'-6"
C	1'-8 1/2"	1'-9 1/2"	1'-10 3/4"	1'-11"
D	2'-0"	2'-3"	2'-3"	2'-3"
E	3'-0"	3'-0"	3'-0"	3'-0"
F	2'-9 1/4"	2'-9 1/4"	3'-5 1/8"	3'-6"
G	2"	2 1/2"	2 1/2"	2 1/2"
H	2'-9 1/4"	3'-1"	3'-6"	3'-7"
J	1'-6 1/4"	1'-8 1/2"	1'-11 1/2"	1'-3"
X	2'-6 3/4"	2'-11 1/2"	3'-4 1/2"	2'-10 1/2"
L	24"x 42"	24"x42"	36"x52"	36"x52"
M	15 1/4"	15 1/4"	15"	15"
N	1"	7/8"	1/2"	1/2"
Ø	4"	4" or 6"	6" or 9"	8" or 12"

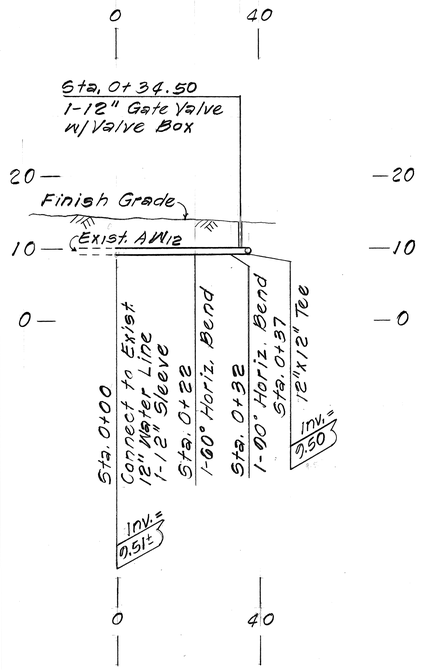
NOTES
1. SEE FIGURES 23, 24, 25 & 26 FOR METER BOX FRAME AND COVER DETAILS.
2. BWS TO INSTALL COMPOUND METER.
3. LOCATE BY-PASS STOP COCKS IN METER BOX BELOW FRAME AND COVER WITH ENOUGH SPACE BETWEEN METER AND WALL FOR TEMPORARY BY-PASS STANDPIPE TO BE HOOKED UP.

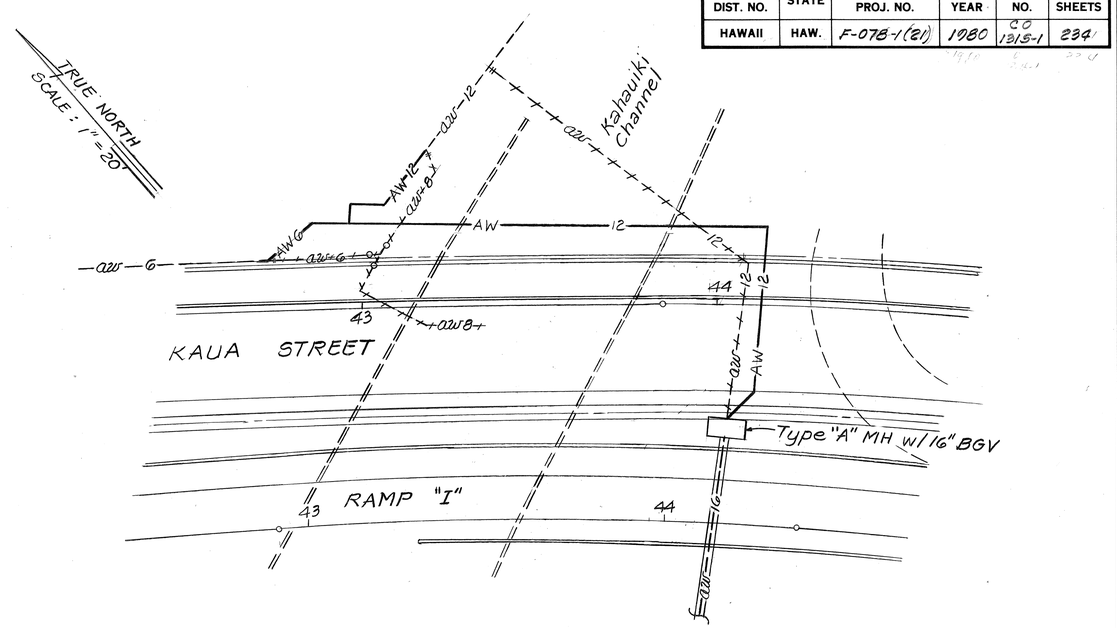
See Plan Sheet No. 131 REVISED SEPT 1976

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

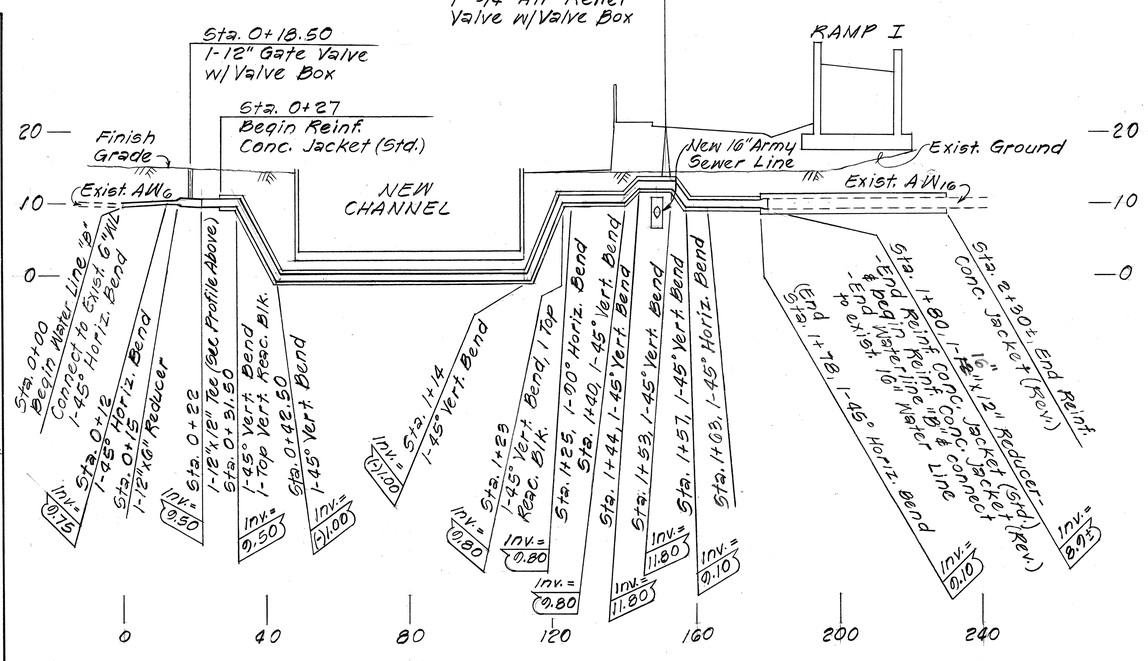
SINGLE COMPOUND METER INSTALLATION — SECTION

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





REVISED ARMY WATER LINE "B" PLAN
Scale: 1" = 20'



REVISED ARMY WATER LINE "B" PROFILE
Scale: Horiz. = 1" = 20'
Vert. = 1" = 10'

Note: All Bends have Reaction Block

THIS TRACING PREPARED DURING "AS-BUILT" POSTINGS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATER PROFILES AND DETAILS

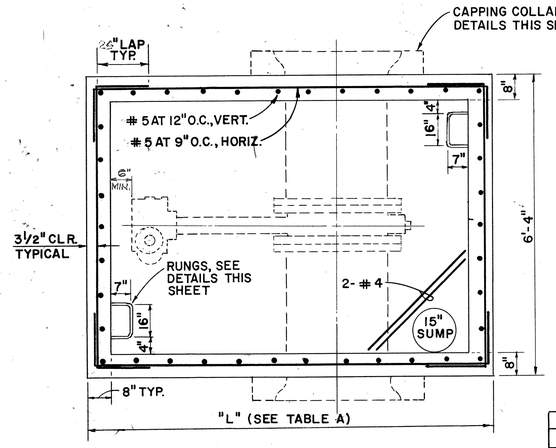
MOANALUA ROAD
Puuloa I.C. to Middle St.-Unit 3B
F.A. Proj. No. F-078-1(21)

Scale: As Shown Date: Aug 1986

SHEET No. U-10A OF 30 SHEETS

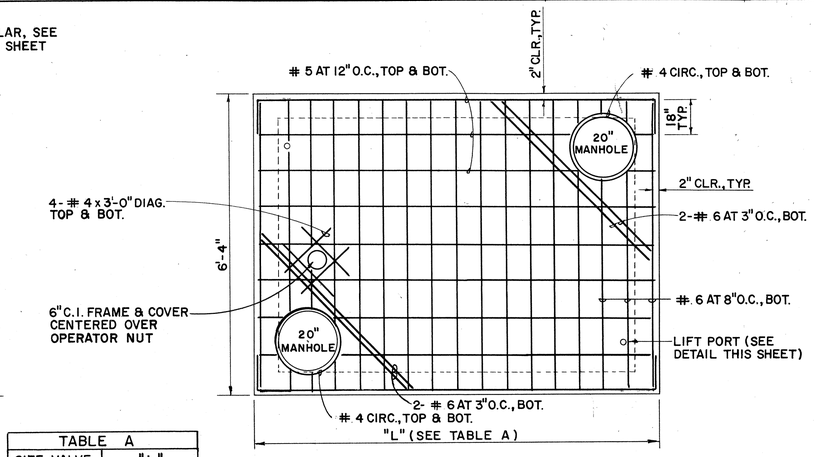
CO 1315-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	132	234



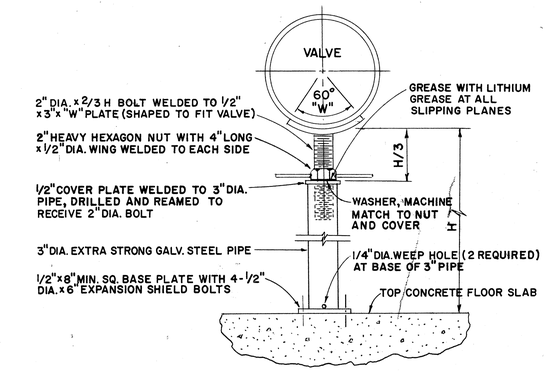
FLOOR PLAN

TABLE A	
SIZE VALVE	"L"
16"	6'-10"
20"	7'-2"
24"	8'-1"
30"	8'-9"
36"	9'-6"
42"	10'-1"



ROOF SLAB PLAN

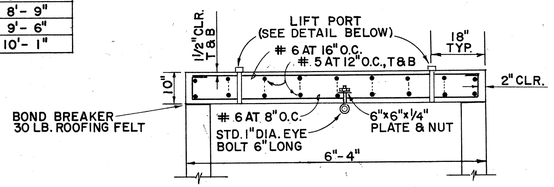
NOTE: HEIGHT (H) TO BE DETERMINED IN FIELD PRIOR TO FABRICATION.



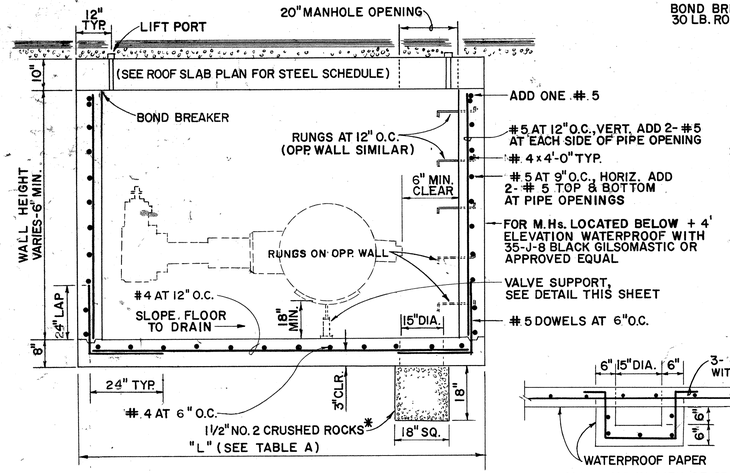
VALVE SUPPORT DETAIL

NOTES:

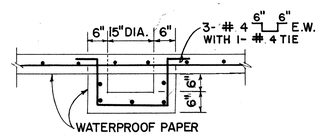
1. ALL CONCRETE FOR MANHOLE SHALL BE B.W.S. CLASS "D."
2. PAYMENT FOR LIN. FT. OF CONCRETE WALL SHALL BE FROM TOP OF FLOOR SLAB TO BOTTOM OF ROOF SLAB.
3. PAYMENT FOR FLOOR AND ROOF SLABS SHALL BE CUBIC YARDS CLASS "D" CONCRETE.
4. PAINT ALL METAL ITEMS:
   A. MANHOLE FRAME & COVER, AND VALVE WITH ASPHALTUM.
   B. VALVE SUPPORT AND RUNGS.
      a. SURFACE PREP (COULTER MP-7 OR APPROVED EQUAL).
      b. KEELER LONG 8250 POLYSILICONE STAINLESS STEEL PRIMER (4 MIL DFT) OR APPROVED EQUAL.
      c. KEELER LONG POLYSILICONE ENAMEL (2 MIL DFT) OR APPROVED EQUAL.
5. VALVE SUPPORT SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.



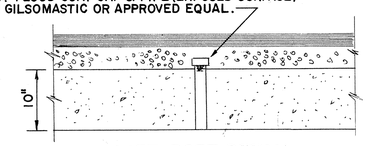
ROOF SLAB SECTION



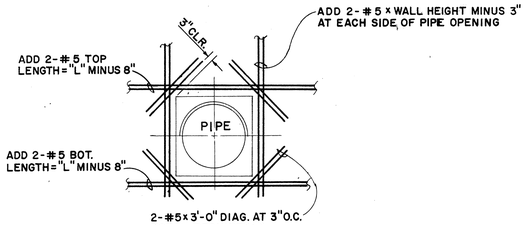
FLOOR & WALL SECTION



* INSTALL SUMP IN LIEU OF CRUSHED ROCK FOR MANHOLE LOCATED BELOW +4' ELEVATION.

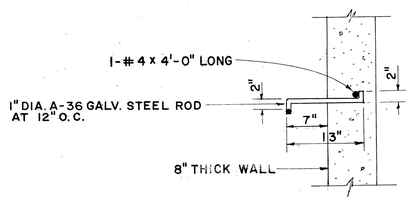


LIFT PORT DETAIL

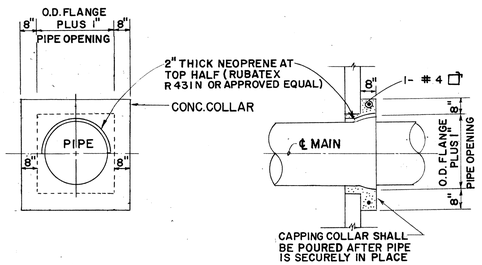


ELEVATION

WALL PIPE OPENING ADDED REBARS DETAIL

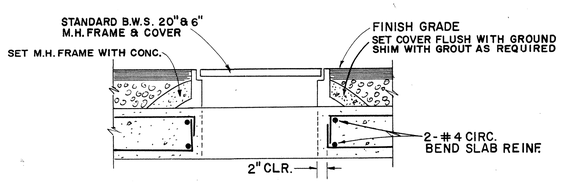


RUNG DETAIL



ELEVATION SECTION

CAPPING COLLAR DETAILS



20" & 6" MANHOLE SETTING DETAIL

APPROVED R. Nagata 2-12-81
for CHIEF, PLANNING AND ENGINEERING, B.W.S. DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Gary T. Yamamoto 2/11/81

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A" BUTTERFLY VALVE MANHOLE STANDARD DETAILS

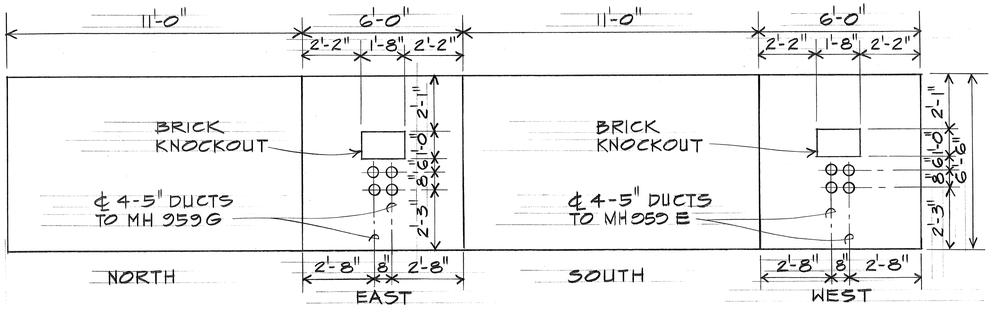
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

NOT TO SCALE

SHEET No. U-11 OF 30 SHEETS

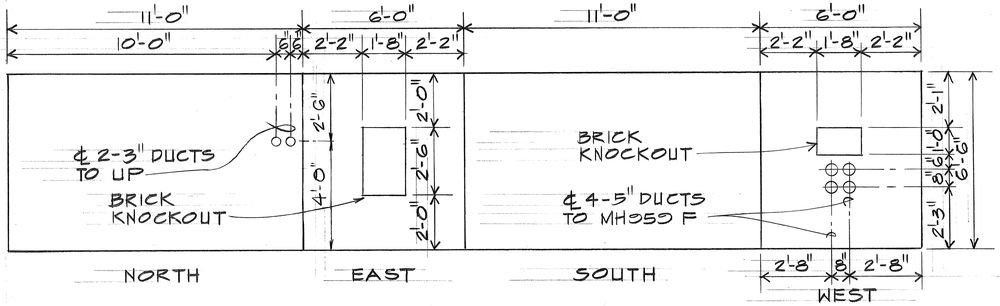
132

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	133	234



MANHOLE 959 F

KAUA STREET ℄ STA. 39+58
NO SCALE



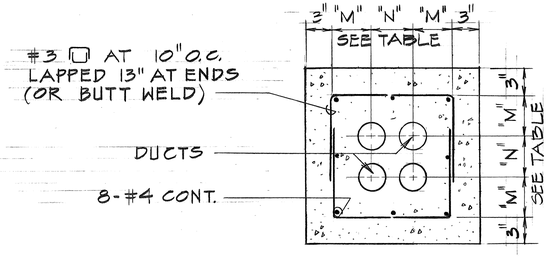
MANHOLE 959 G

KAUA STREET ℄ STA. 44+15
NO SCALE

HECO MANHOLE DETAILS

NOTE:
HECO MANHOLES BY HECO

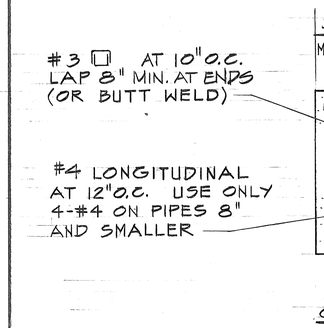
DUCT SIZE	DIMENSION (INCHES) "M"	"N"
2"	4	5
3"	5	6
4"	5½	7
5"	6	8
6"	6⅝	9



HECO & ARMY ELECTRIC

TYPICAL DETAIL OF CONCRETE JACKET

NO SCALE

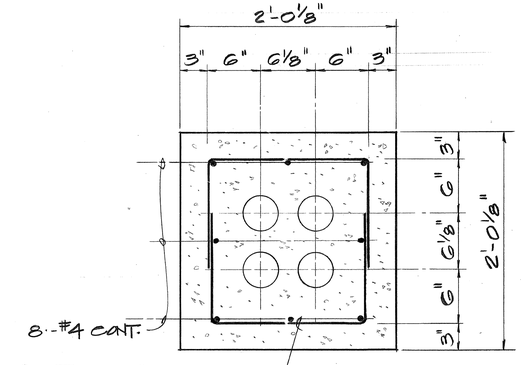


GAS

DETAIL OF CONCRETE JACKET

NO SCALE

APPROVED:
R. Yoshimoto
GASCO
6-5-78
DATE



HTCO & DATS

TYPICAL DETAIL OF CONCRETE JACKET

NO SCALE

APPROVED:
G. Yamamoto 7-12-79
HAWAIIAN TELEPHONE CO. LTD. DATE
T. Kawamoto 5-24-78
HAWAIIAN ELECTRIC CO. INC. DATE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2993 HAWAII, U.S.A.

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1002 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MANHOLE & MISCELLANEOUS DETAILS
GAS, TELEPHONE & ELECTRIC

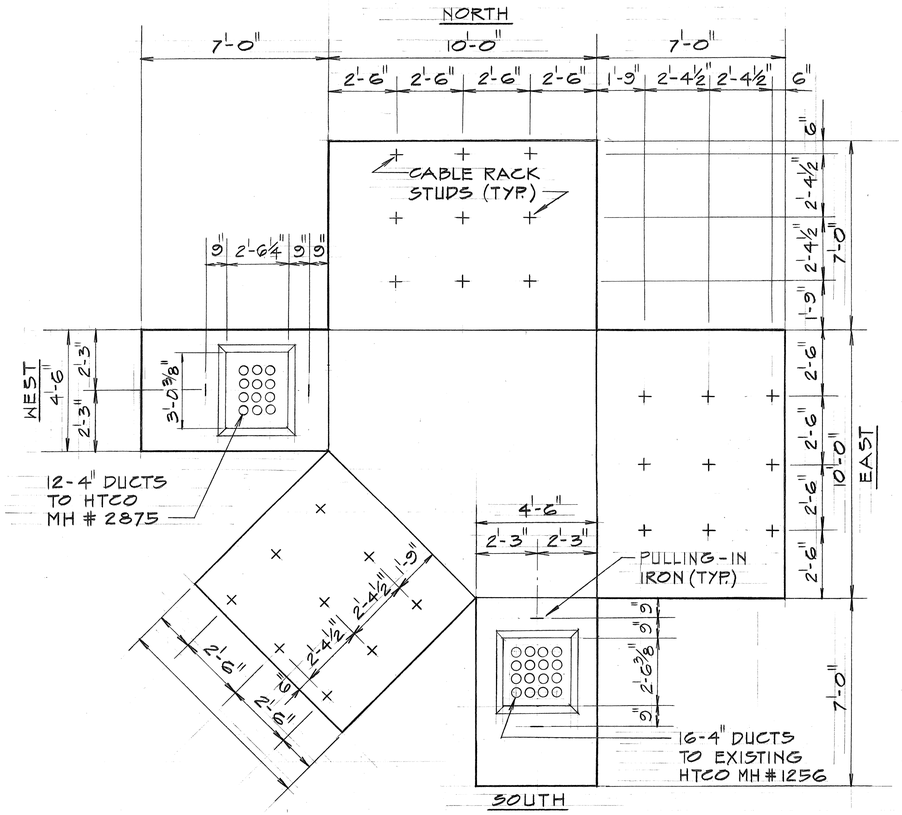
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-12 OF 30 SHEETS

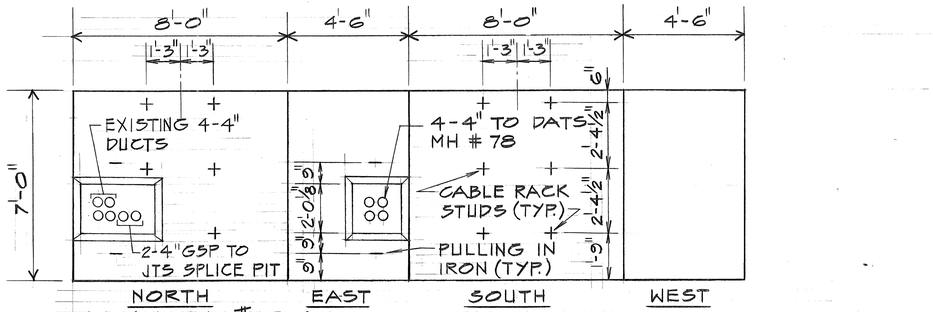
ORIGINAL PLAN
SURVEY PLOTTED BY: DATE
DRAWN BY:
TRACED BY:
DESIGNED BY:
QUANTITIES BY:
CHECKED BY:
NOTE BOOK
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	134	234

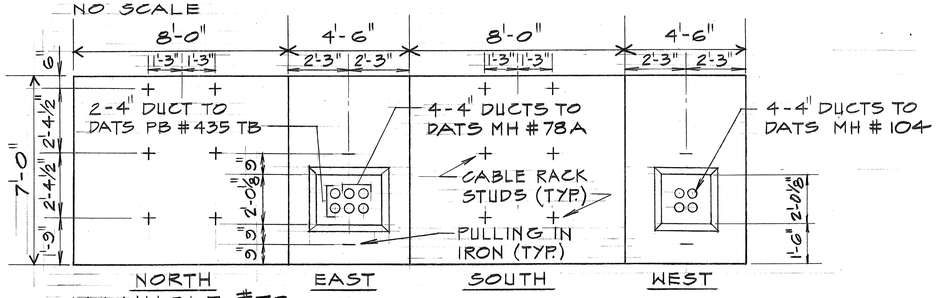


MANHOLE #2876 STD. CORNER LARGE TYPE
KAUA STREET ℄ STA. 48+44
NO SCALE

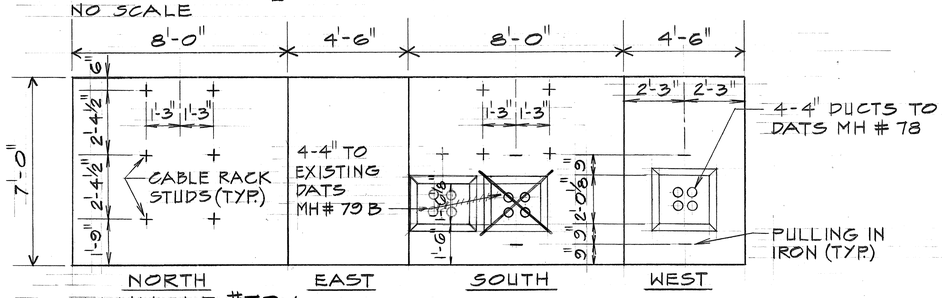
HTCO MANHOLE DETAIL



MANHOLE #104
KAUA STREET ℄ STA. 39+30
NO SCALE

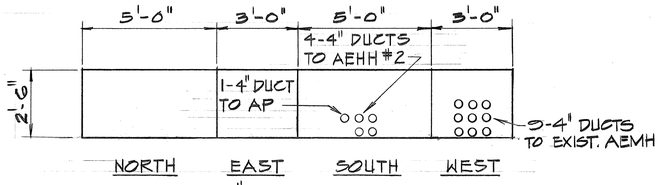


MANHOLE #78
KAUA STREET ℄ STA. 42+34
NO SCALE

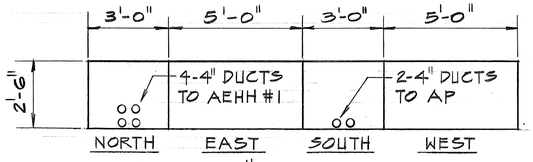


MANHOLE #78A
KAUA STREET ℄ STA. 48+33
NO SCALE

DATS MANHOLE DETAILS



HANDHOLE #1
KAUA STREET ℄ STA. 44+12
NO SCALE



HANDHOLE #2
KAUA STREET ℄ STA. 47+93
NO SCALE

AE HANDHOLE DETAILS

NOTE: FOR HANDHOLE DETAIL SEE SHEET U-22

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

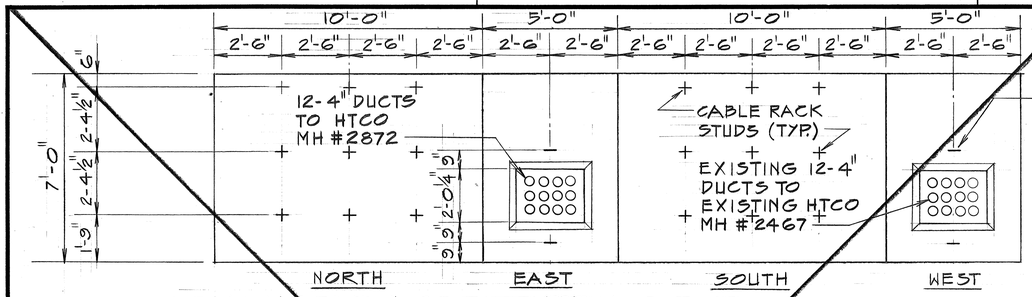
APPROVED :
J. Yamada 7-17-79
HAWAIIAN TELEPHONE CO. LTD. DATE

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1002 HAWAII, U.S.A.
C Ching
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

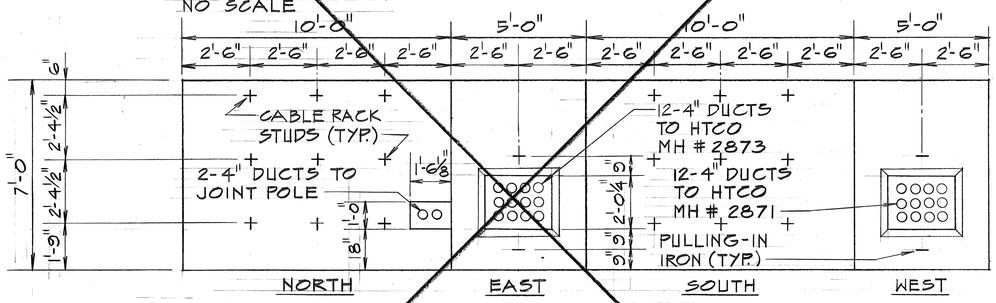
HTCO, DATS & AE
MANHOLE & HANDHOLE DETAILS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)
SCALE: AS SHOWN DATE: AUG. 1, 1979
SHEET NO. U-13 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-070-1(21)	1980	135	234



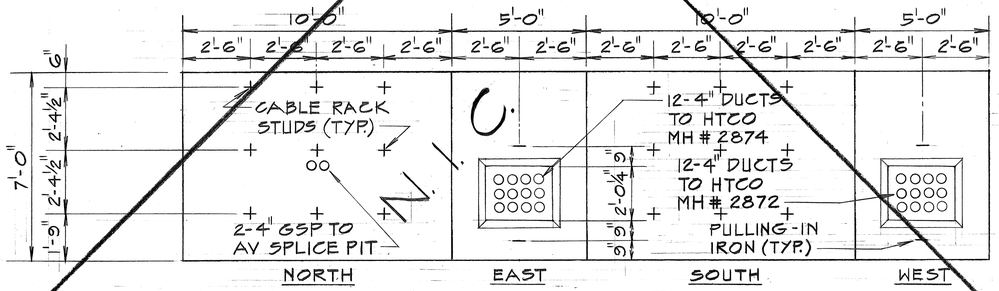
MANHOLE # 2871 TYPE A-3-7

KAUA STREET ℄ STA. 24+30
NO SCALE



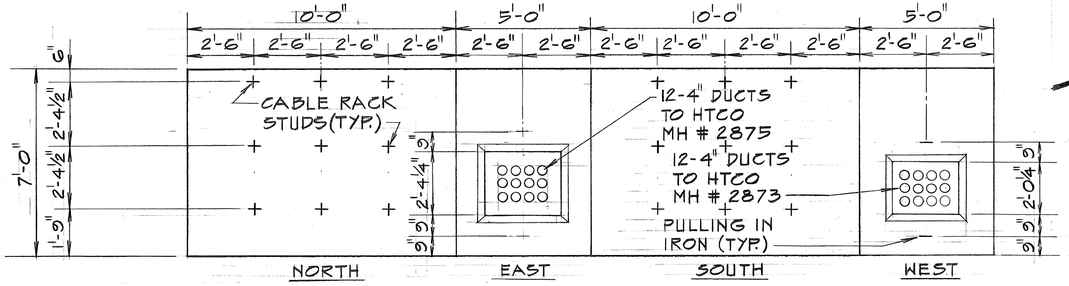
MANHOLE # 2872 TYPE A-3-7

KAUA STREET ℄ STA. 29+00
NO SCALE



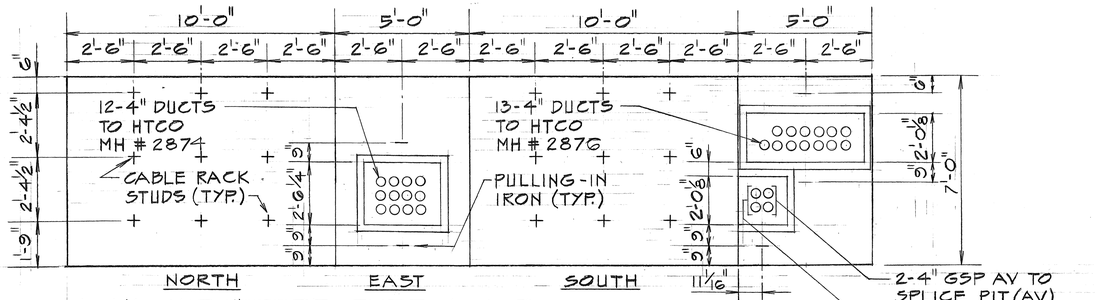
MANHOLE # 2873 TYPE A-3-7

KAUA STREET ℄ STA. 34+60
NO SCALE



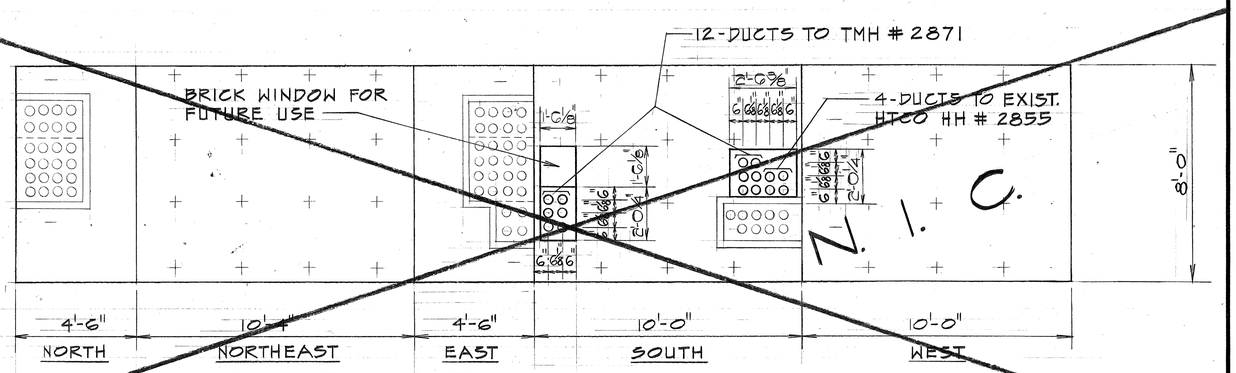
MANHOLE # 2874 TYPE A-3-7

KAUA STREET ℄ STA. 39+30
NO SCALE



MANHOLE # 2875 TYPE A-3-7

KAUA STREET ℄ STA. 42+65
NO SCALE



EXISTING MANHOLE # 2467

PINEAPPLE LANE
NO SCALE

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

APPROVED:

J. Yamada 7-12-79
HAWAIIAN TELEPHONE CO. LTD. DATE

CLARENCE W. Y. CHING — REGISTERED PROFESSIONAL ENGINEER No. 1093 — HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DETAILS

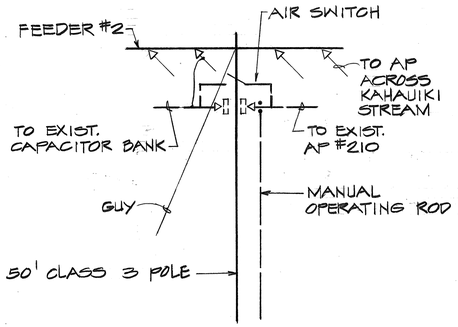
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-070-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. 11-14 OF 30 SHEETS

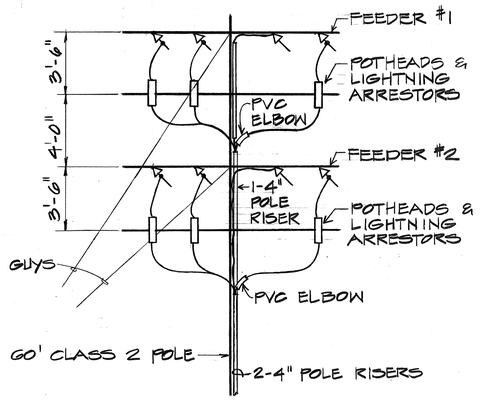
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	136	234

NOTE: RELOCATE EXIST. AIR SWITCH AND ASSOCIATED EQUIPMENT COMPLETE AND IN-PLACE FROM EXIST. AP #211. FOR LOCATION SEE SHT. U-4



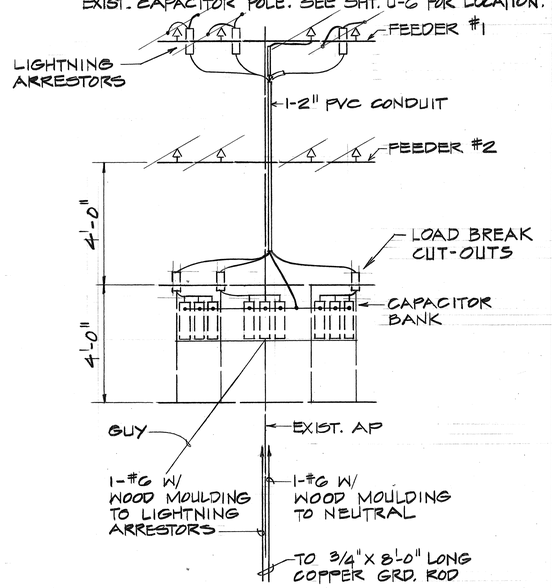
POLE DETAIL (A) U-15
NO SCALE

NOTE: FOR LOCATION SEE SHT. U-5

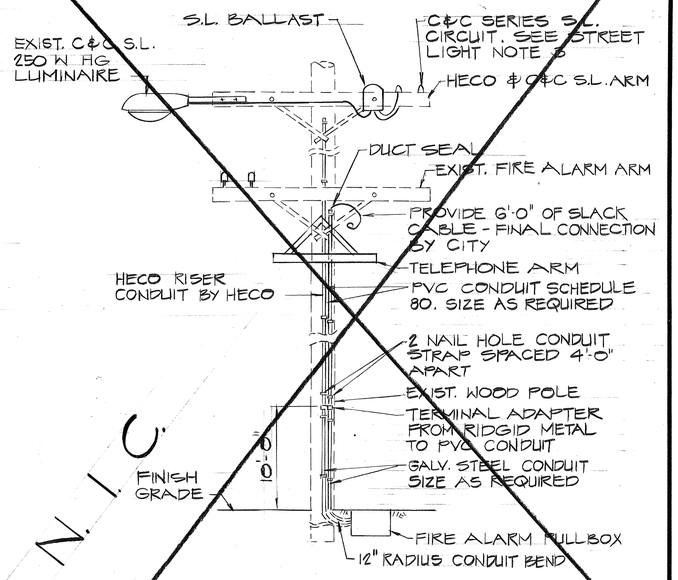


POLE DETAIL (C) U-15
NO SCALE

NOTE: RELOCATE EXIST. LIGHTNING ARRESTORS, LOAD BREAK CUT-OUTS, CAPACITOR BANK & ASSOCIATED EQUIPMENT AS REQ'D. FROM EXIST. CAPACITOR POLE. SEE SHT. U-6 FOR LOCATION.



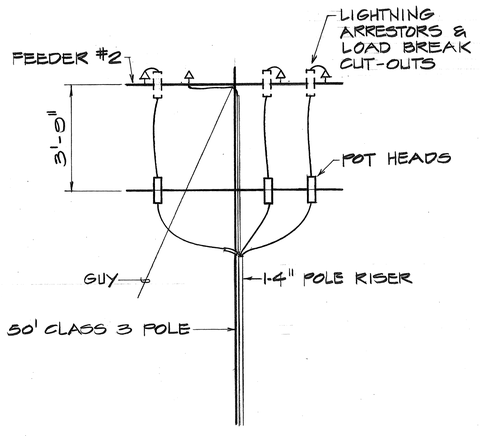
POLE DETAIL (E) U-15
NO SCALE



FIRE ALARM CONDUIT RISER DETAIL
NO SCALE
EXIST. POLE 1X ON ALA MAHAMOE STREET

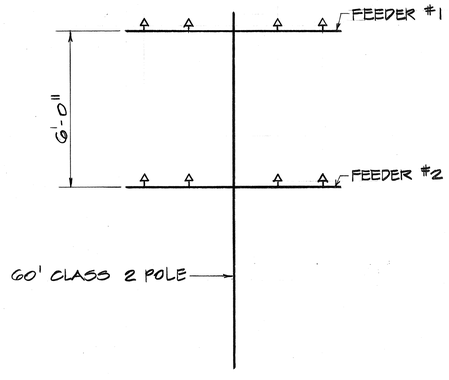
APPROVED
/s/ G. Kamura for Thomas 6/8/79
DEPT. OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU, MUNICIPAL FIRE ALARM — DATE

NOTE: RELOCATE EXIST. LIGHTING ARRESTORS, LOAD BREAK CUT-OUTS AND ASSOCIATED EQUIPMENT COMPLETE AND IN-PLACE FROM EXIST. AP #302. FOR LOCATION SEE SHT. U-4

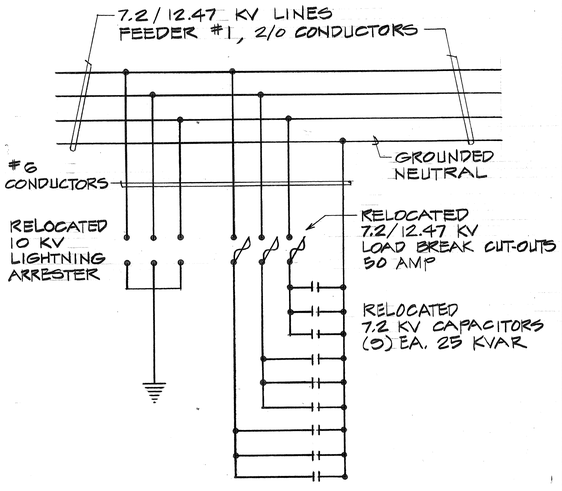


POLE DETAIL (B) U-15
NO SCALE

NOTE: FOR LOCATION SEE SHT. U-5



POLE DETAIL (D) U-16
NO SCALE



SCHEMATIC DIAGRAM
NO SCALE

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

CLARENCE W. T. CHUNG REGISTERED PROFESSIONAL ENGINEER No. 1628 HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

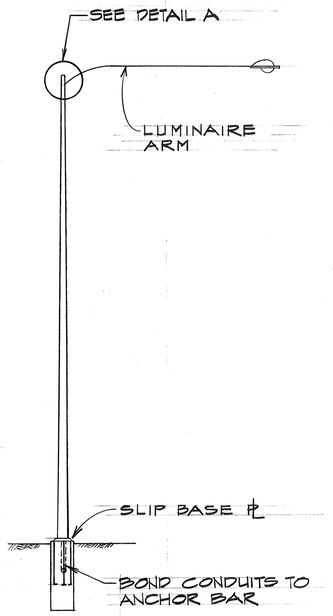
POLE DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

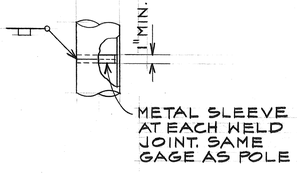
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-15 OF 30 SHEETS

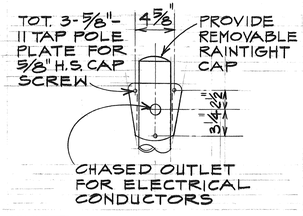
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	137	234

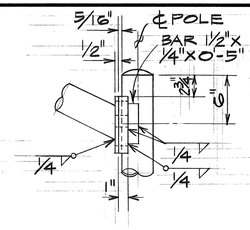


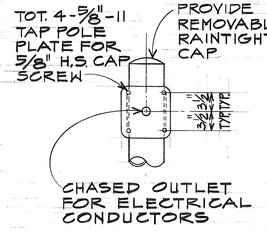
ELEVATION

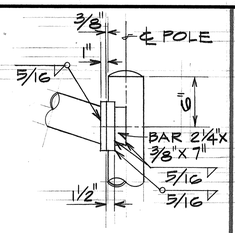


POLE SPLICE

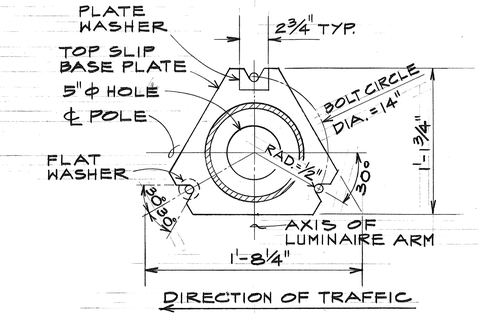








DETAIL A



PLAN-TOP PLATE

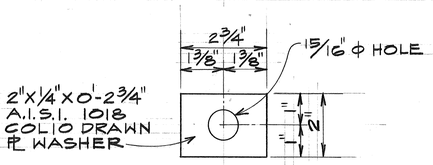
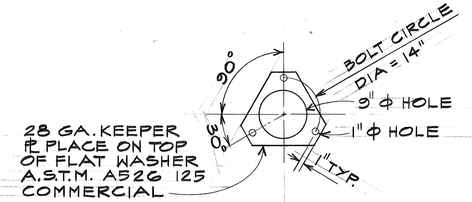
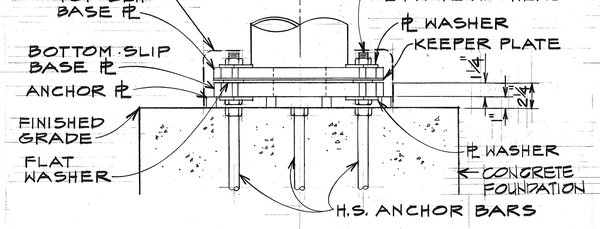


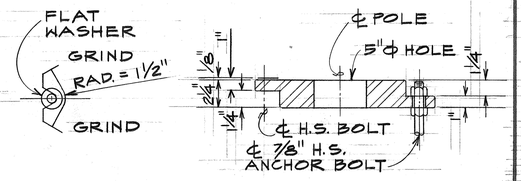
PLATE WASHER



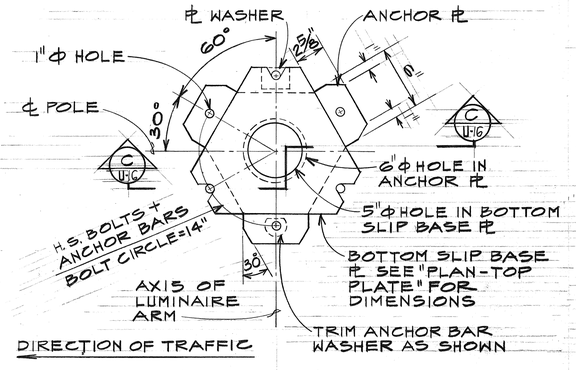
KEEPER PLATE



ELEVATION



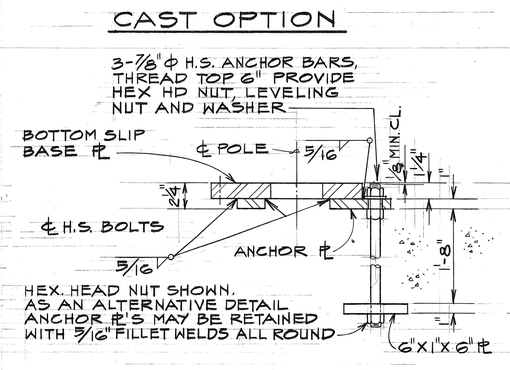
CAST OPTION



PLAN-BOTTOM PLATES

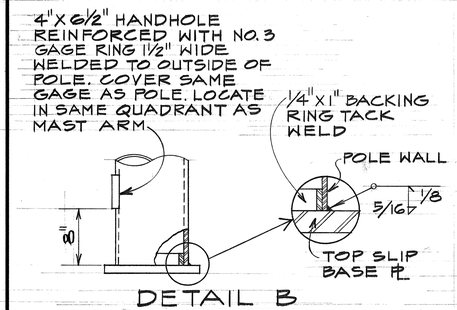
TYPICAL SLIP BASE INSERT DETAIL FOR HIGHWAY LIGHTING STANDARDS (A U-16)

N.T.S.

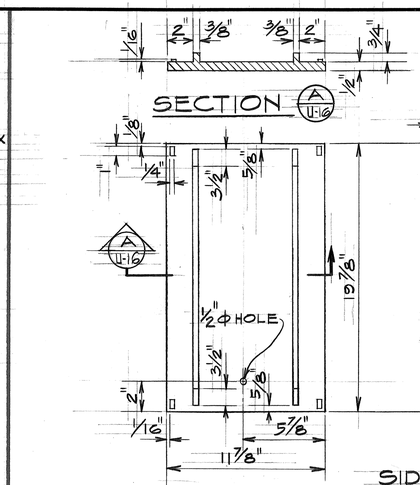


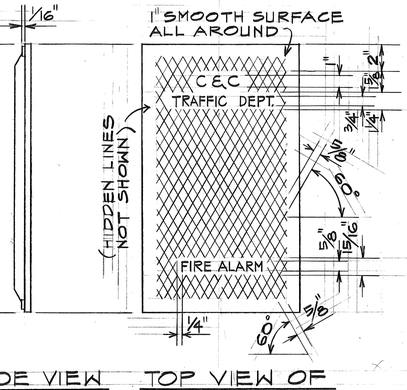
WELDED OPTION

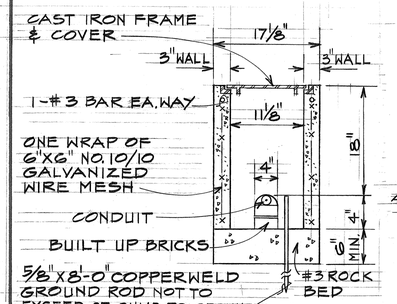
SECTION (C U-16)

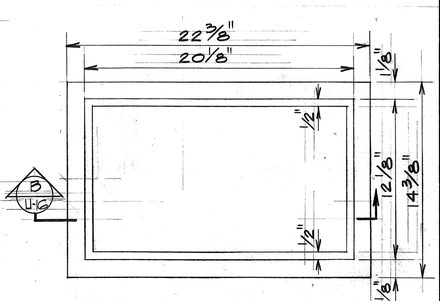


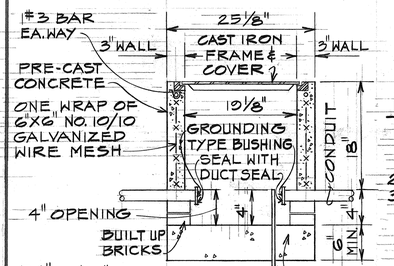
DETAIL B

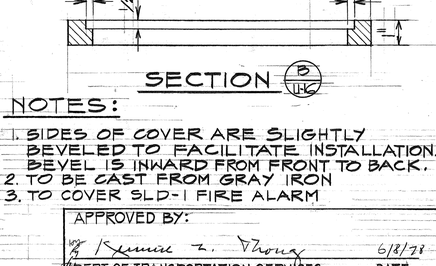












NOTES:

1. SIDES OF COVER ARE SLIGHTLY BEVELED TO FACILITATE INSTALLATION. BEVEL IS INWARD FROM FRONT TO BACK.
2. TO BE CAST FROM GRAY IRON
3. TO COVER SLD-1 FIRE ALARM

APPROVED BY:

/s/ Clarence W. Y. Ching 6/8/78

DEPT. OF TRANSPORTATION SERVICES — DATE
CITY & COUNTY OF HONOLULU
MUNICIPAL FIRE ALARM CIRCUIT RELOCATION CLEARANCE

PRECAST PULLBOX SLD-1 FIRE ALARM PULLBOX & COVER (B U-16)

N.T.S.

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

CLARENCE W. Y. CHING REGISTERED PROFESSIONAL ENGINEER No. 1002 HAWAII, U.S.A.

/s/ C. Ching

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

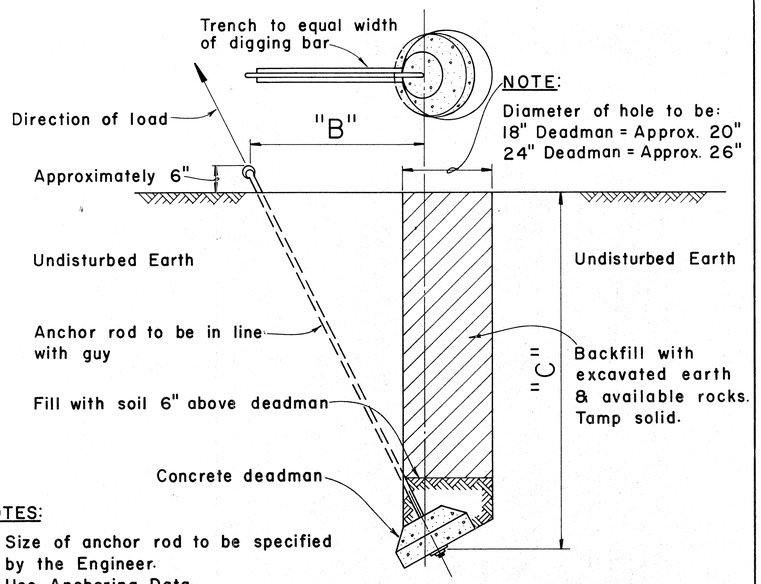
SLIP BASE AND FIRE ALARM PULLBOX DETAIL

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. PROJ. NO. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. U-16 OF 30 SHEETS

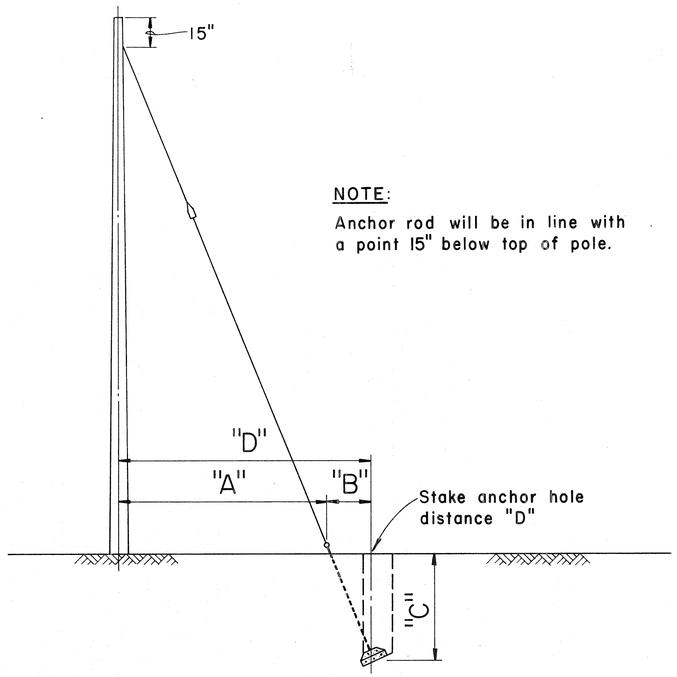
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	138	234



NOTE:
Diameter of hole to be:
18" Deadman = Approx. 20"
24" Deadman = Approx. 26"

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

STANDARD ANCHOR DETAIL
Scale: 3/4" = 1'-0"



NOTE:
Anchor rod will be in line with a point 15" below top of pole.

Not to Scale

FOR 25', & 30' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"		"D" = ("A" + "B")
ANCHOR ROD EYE TO ℄ OF POLE	ANCHOR ROD EYE TO ℄ OF HOLE	VERTICAL DEPTH 18" D.M.	24" D.M.	TOTAL DISTANCE POLE TO HOLE
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	19'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"
FOR 35' THRU 60' 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 60' 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"

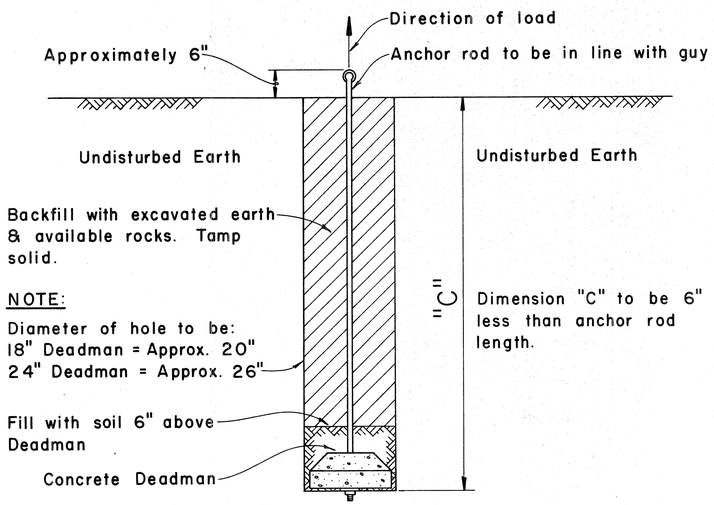
D.M. = Deadman

TABLE 2 ANCHOR ROD - ANCHOR SLUG - SQUARE WASHER COMBINATION

CODE NO.	ANCHOR ROD	WORKING TENSION 1/2 ULT (LBS.)	CODE NO.	CONC. ANC. (IN.)	CODE NO.	WASHER SIZE	QTY.
617	5/8" x 8'-0" Steel	8,000	518	18	2320	4" x 4" x 3/16"	2
614	3/4" x 8'-0" Cu Clad	13,250	518	18	**	4" x 4" x 3/16"	1
618	3/4" x 8'-0" Steel	11,500	518	18	2330	6" x 6" x 3/8"	1
619	1" x 8'-0" Steel	18,000	524	24	2331	6" x 6" x 1/2"	1
616	1" x 8'-0" Cu Cov Stl	22,500	524	24	**	4" x 4" x 3/16"	2
613	1 1/4" x 10'-0" Steel	29,000	524	24	2331	6" x 6" x 1/2"	2

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

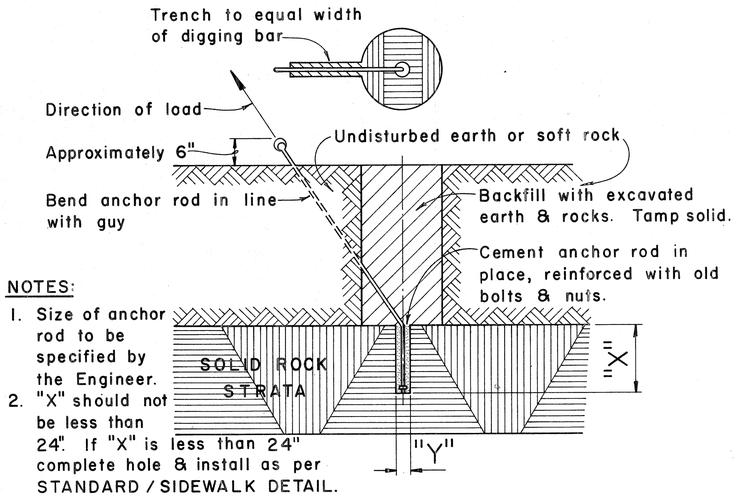
ANCHORING DATA



NOTE:
Diameter of hole to be:
18" Deadman = Approx. 20"
24" Deadman = Approx. 26"

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

SIDEWALK ANCHOR DETAIL
Scale: 3/4" = 1'-0"



NOTES:
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 as per STANDARD / SIDEWALK DETAIL.
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 DETAIL
Not to Scale

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

STANLEY L. PERRY REGISTERED PROFESSIONAL ENGINEER No. 4680 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

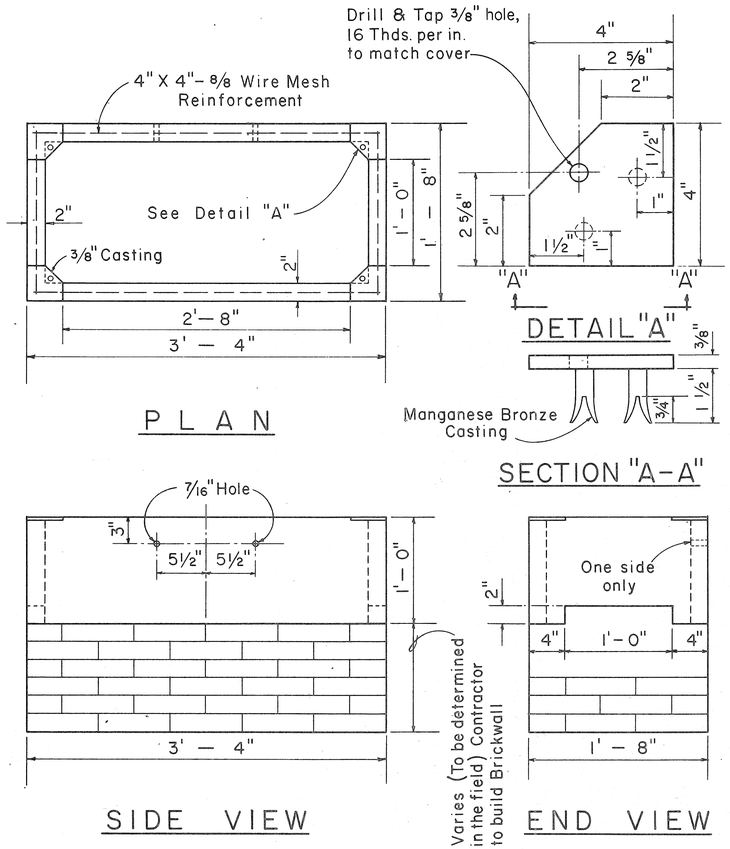
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

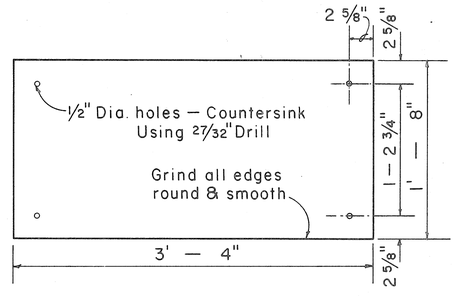
STANDARD DETAILS

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

Scales: As Noted Date: Mar., 1979

DD-630.001 SHEET No. U-17 OF 30 SHEETS





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

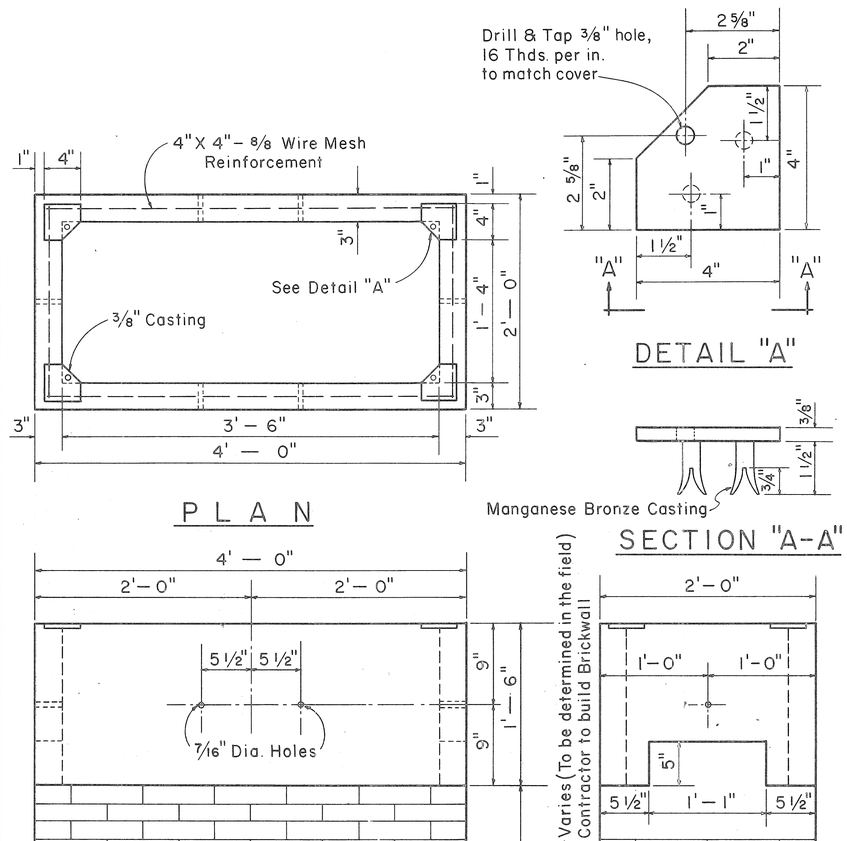
1/4" CHECKER PLATE COVER

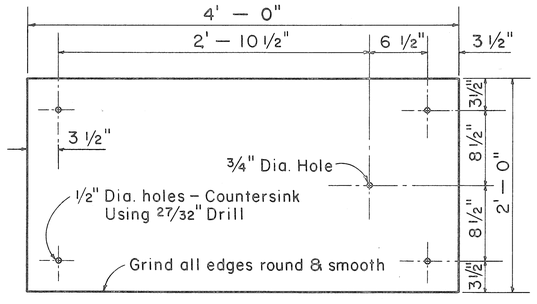
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

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

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

011250





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

1/4" CHECKER PLATE COVER

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

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

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

011255

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-078-1(21)	1980	139	339

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

STANLEY L. PIBBY
REGISTERED PROFESSIONAL ENGINEER
No. 4580
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

Scales: As Noted Date

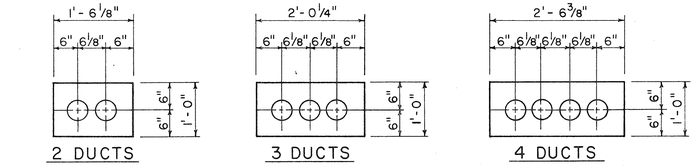
SHEET NO. 139 OF 339 SHEETS

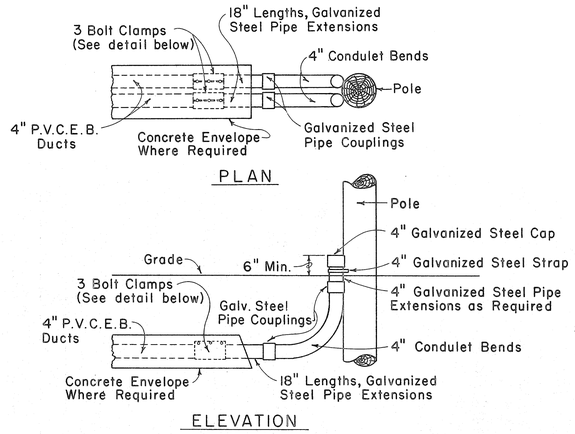
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

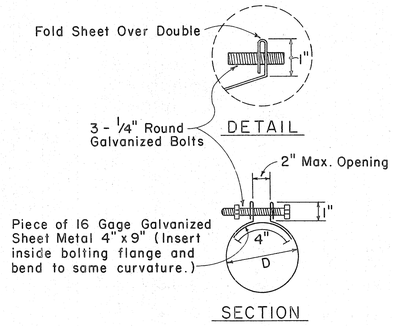
HE-HT-2

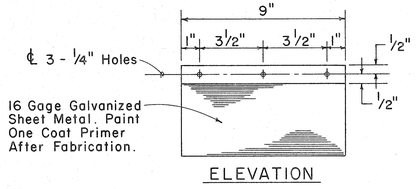
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(61)	1980	140	234



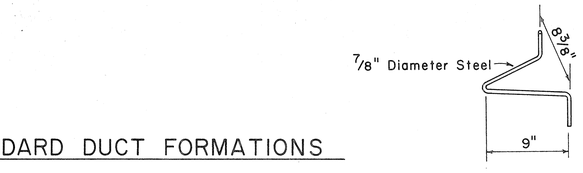


TYPICAL INSTALLATION DETAILS

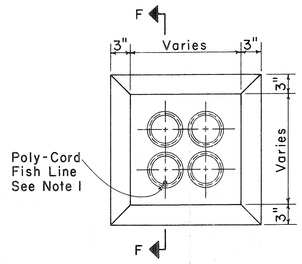


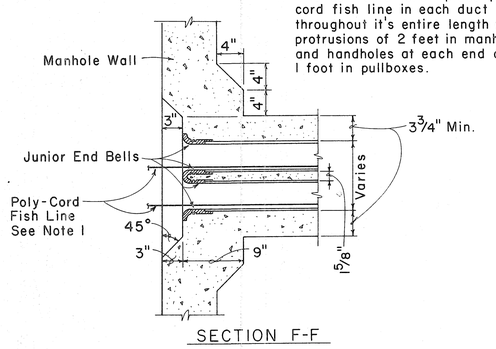


3-BOLT CLAMP ADAPTOR DETAIL



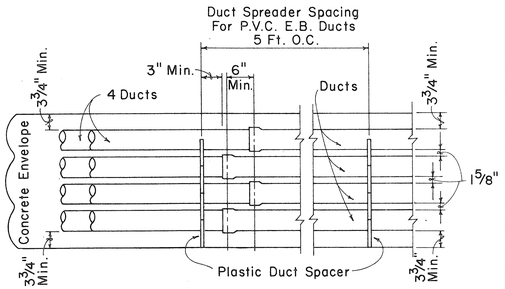
STANDARD DUCT FORMATIONS



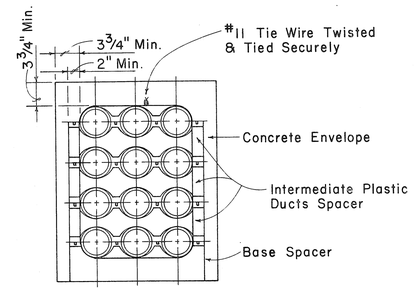


NOTE:
1. The contractor shall place poly-cord fish line in each duct throughout it's entire length with protrusions of 2 feet in manholes and handholes at each end and 1 foot in pullboxes.

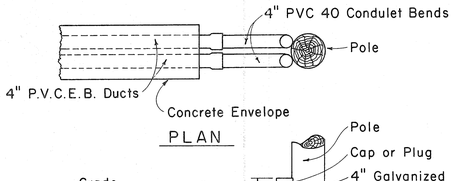
TYPICAL DUCT WINDOW DETAIL & JUNIOR END BELL



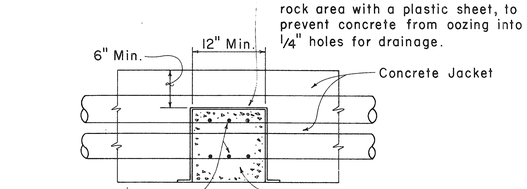
TYPICAL DUCT ENVELOPE ELEVATION ARRANGEMENT OF PLASTIC SPACERS



SECTION SHOWING INTER-LOCKING SPACERS



TYPICAL CONDULET BEND INSTALLATION DETAILS



ELEVATION VIEW OF DUCT DRAIN DETAIL

NOTE:
Before placement of concrete contractor shall seal off the crushed rock area with a plastic sheet, to prevent concrete from oozing into 1/4" holes for drainage.

APPROVED:
Hawaiian Telephone Co., Ltd. — Date 7-14-71

H.T. Co., Ltd. — Drawing No. 34028

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

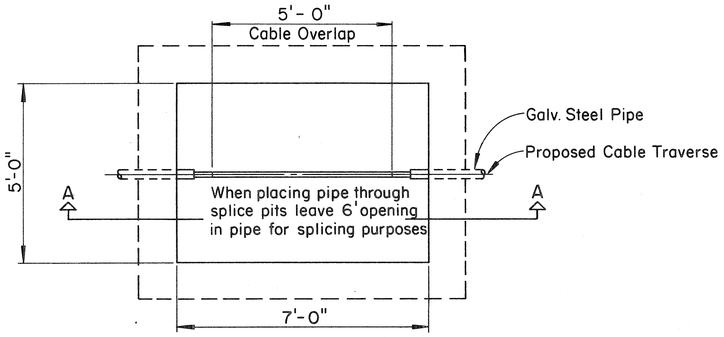
STANDARD DUCT FORMATIONS

Not to Scale

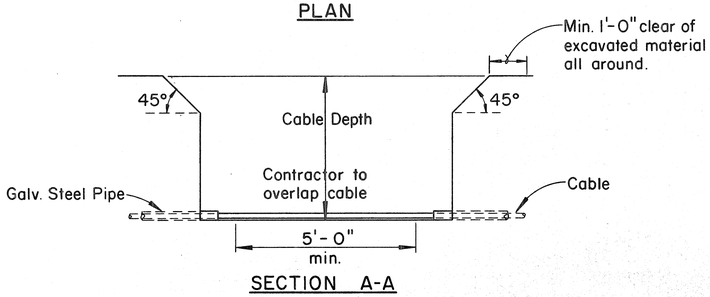
SHEET NO. 140 OF 234 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-070-1(21)	1980	141	234



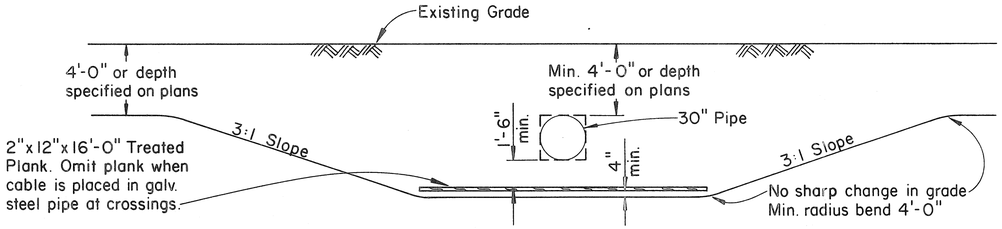
PLAN



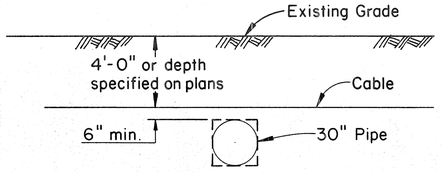
SECTION A-A

TYPICAL SPLICING PITS FOR BURIED CABLE

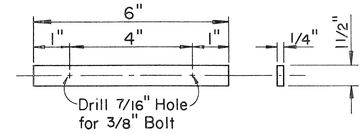
NOTES:
1. The Contractor shall dig pits at specified locations.
2. One face of pit shall be kept free of excavated material.
3. Where pits are located on sloping or irregular ground, the excavated material shall be placed in such a manner as to prevent surface water from draining into the pit.
4. Provide 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.



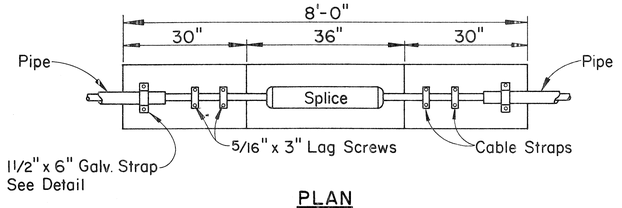
DETAIL OF CABLE CROSSING UNDER STORM CULVERTS-IRRIGATION PIPES, OTHER UTILITIES, OR FOREIGN PIPES



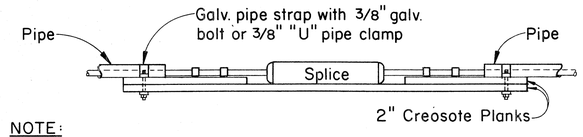
DETAIL OF CABLE CROSSING OVER STORM CULVERTS-IRRIGATION PIPES, OTHER UTILITIES, OR FOREIGN PIPES



GALVANIZED STRAP DETAIL



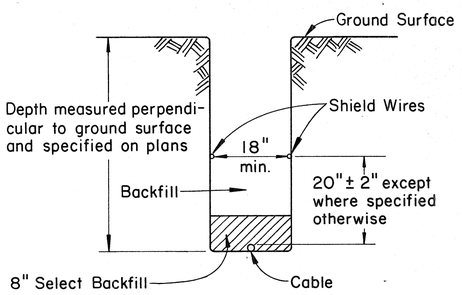
PLAN



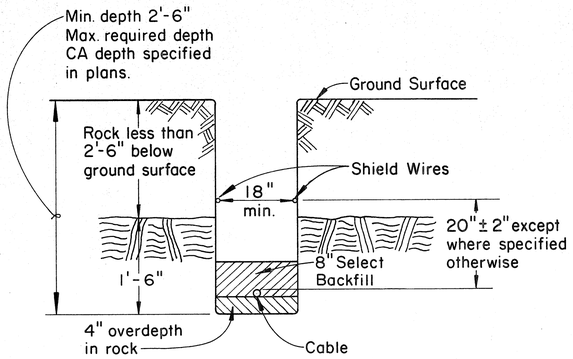
NOTE:
Galv. Strap may be substituted with pipe clamp.

ELEVATION

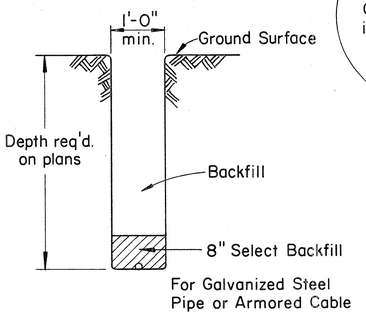
DETAIL OF SPLICE SUPPORT BETWEEN PIPE SECTIONS



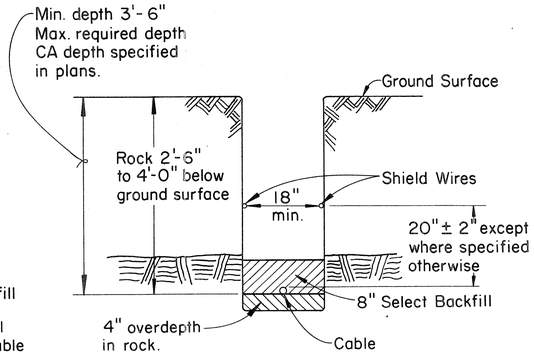
TYPICAL SECTION THROUGH NORMAL TRENCH



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

APPROVED:
Hawaiian Telephone Co., Ltd. — Date 7-14-79

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

SHEET No. 11-20 OF 30 SHEETS

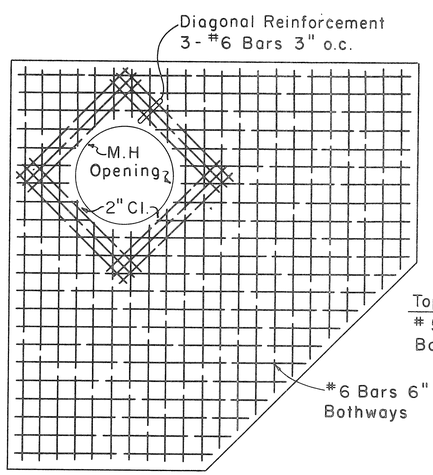
ORIGINAL PLAN	NOTE BOOK	No.	DATE
SURVEY PLOTTED BY			
DRAWN BY			
TRACED BY			
DESIGNED BY			
QUANTITIES BY			
CHECKED BY			

K&E IMPERIAL™ LA 3207

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	142	234

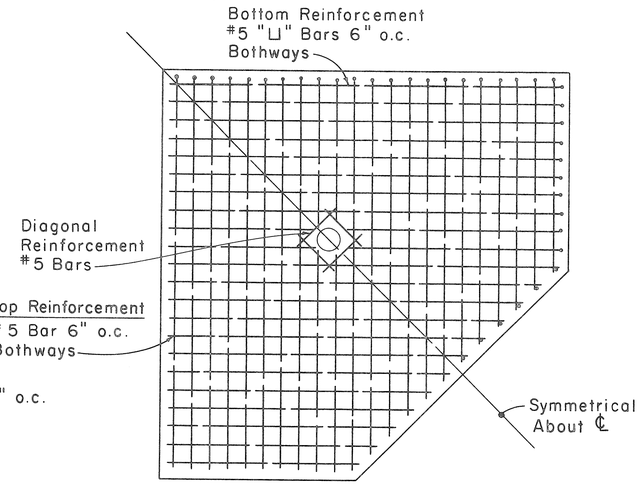
GENERAL NOTES:

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.



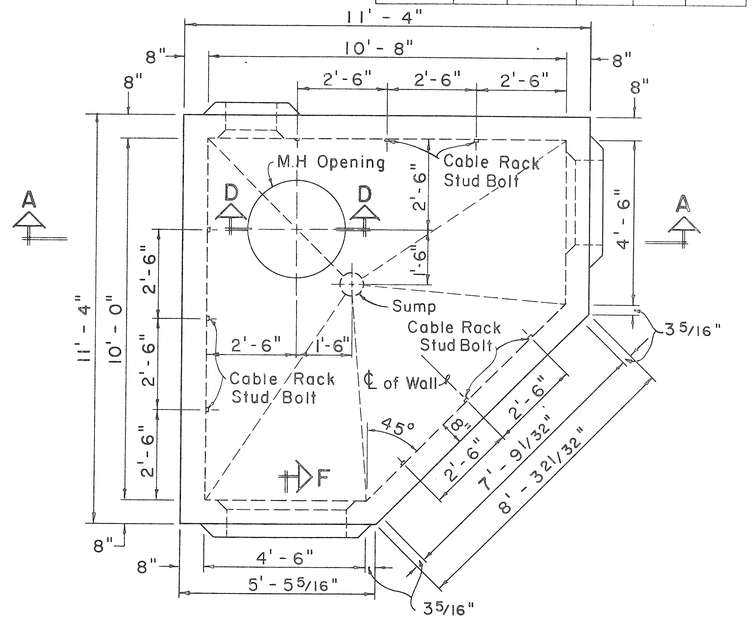
ROOF SLAB REINF. PLAN

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



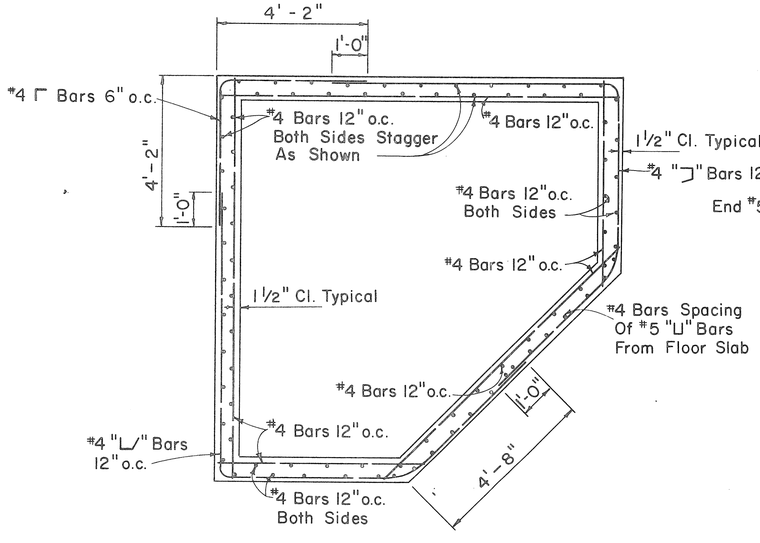
FLOOR SLAB REINF. PLAN

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



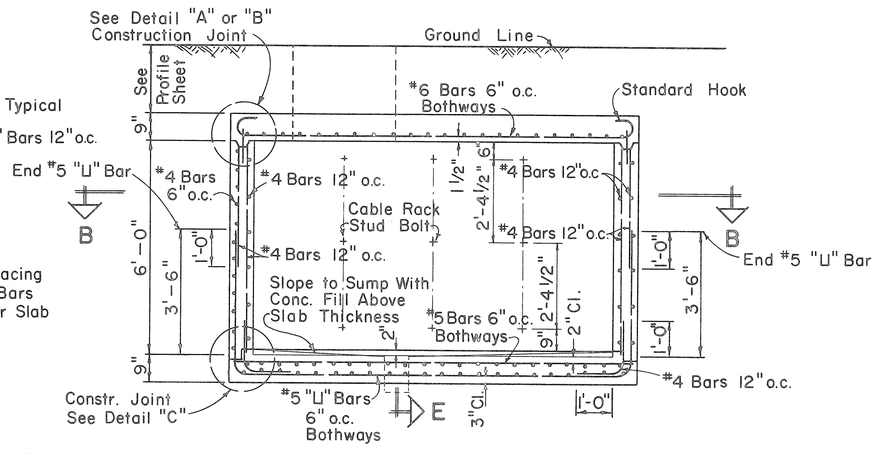
PLAN

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



SECTION "B-B"

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



SECTION "A-A"

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

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

APPROVED:

7-23-79

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

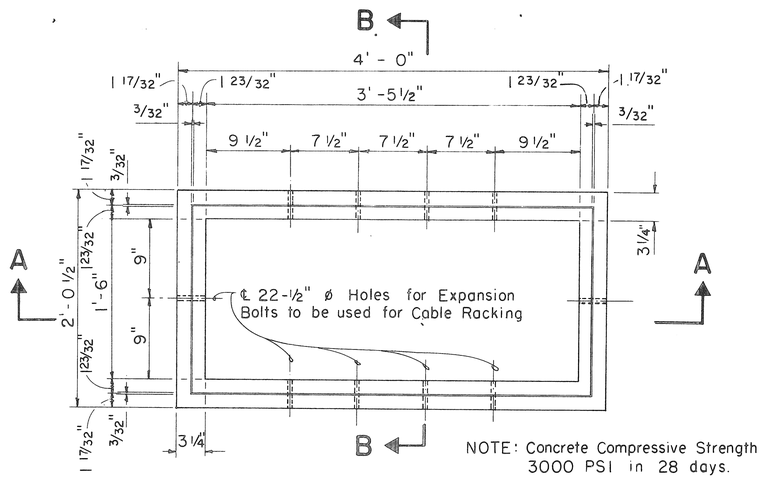
Scale: As Noted Date:

SHEET No. 11 21 OF 30 SHEETS

142

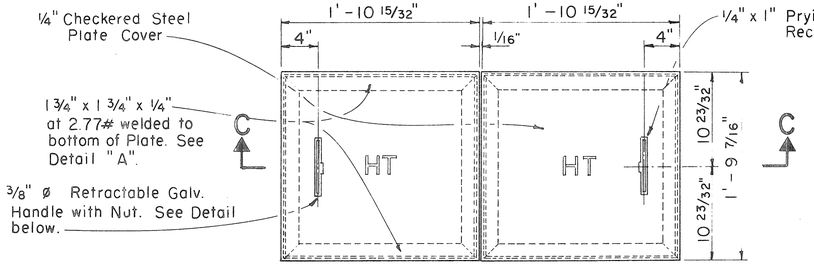
HT-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	143	234

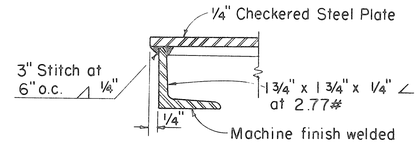


NOTE: Concrete Compressive Strength 3000 PSI in 28 days.

PLAN

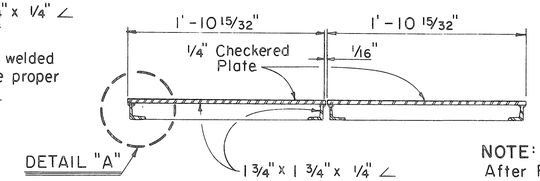


PLAN



DETAIL A

SCALE: 6" = 1'-0"



SECTION A-A

NOTE:
After Fabrication of Cover, apply 2 coats of ZRC (Zinc Rich Coating) to both sides.

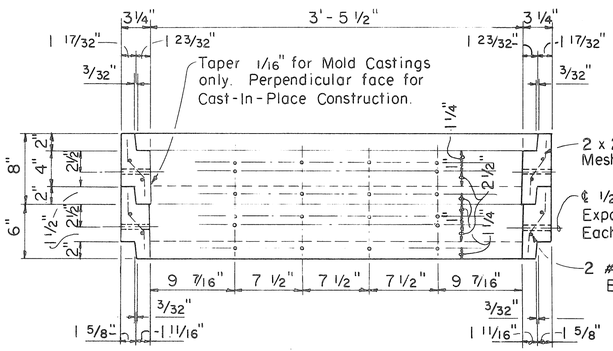
CHECKERED STEEL PLATE COVERS

FOR LIGHT LOADING AREAS - APPROX. WT. 55 LBS.

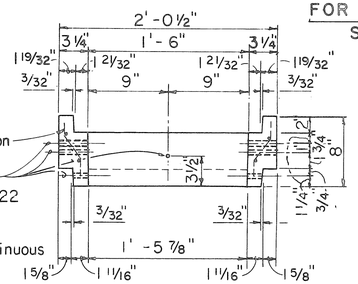
SCALE: 1 1/2" = 1'-0" (EXCEPT AS NOTED)

INSTALLATION NOTES:

1. A minimum of Two(2) Precast Sections must be used on all installations.
2. The minimum layers of Bricks to be used shall always be at least One (1) layer lower than the lowest Duct entering the Pullbox. At no time, however, shall there be less than Two (2) layers of Bricks on each installation.
3. At no time shall Cement Mortar, Wood or any other material be used between Precast Sections. Leveling or raising of Boxes to grade must be done at Brickwork Section using Cement Mortar. The permanent installation of Wooden Wedges to accomplish this purpose will not be accepted.
4. For 3-Cover P.B. join 435TB P.B. Half Section to Full Section using Strap and Bolts as shown in 3-Cover P.B. Section Plan.



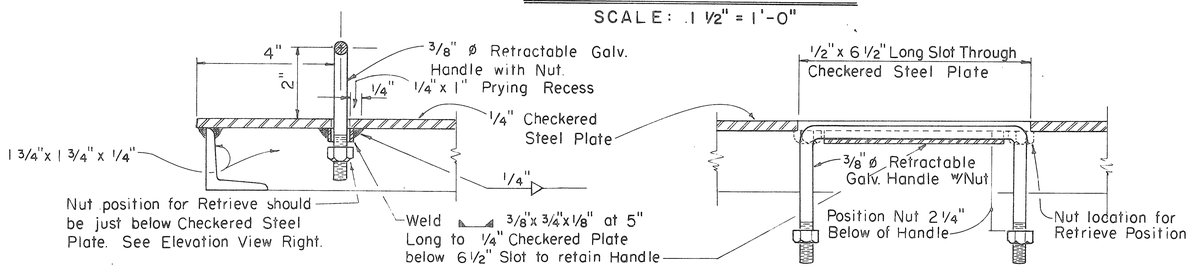
SECTION A-A



SECTION B-B

PULLBOX #435 T-B

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

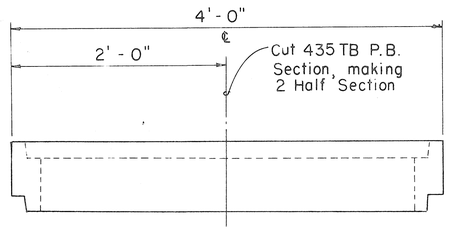


SECTION - RETRIEVE POSITION

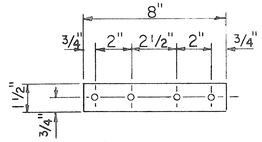
ELEVATION - AT REST POSITION

RETRACTABLE HANDLE

SCALE: 6" = 1'-0"



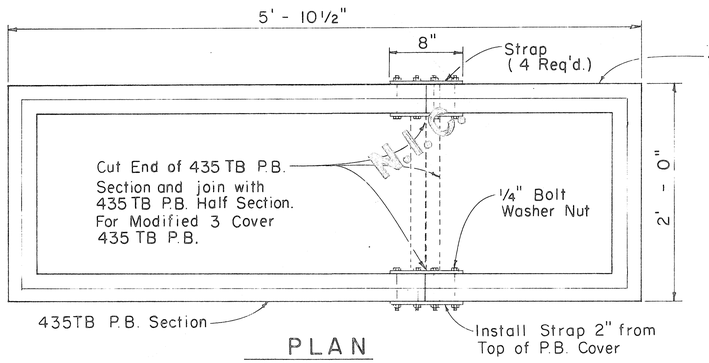
435TB P. B. SECTION



STRAP DETAIL

1/4" BAR

SCALE: 3" = 1'- 0"



PLAN

MODIFIED 3-COVER P.B. SECTION

APPROVED:

Hawaiian Telephone Co., Ltd. — Date 7-15-79

H.T. Co., Ltd. — Drawing No. 34056

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LARGE PULLBOX NO. 435 T-B

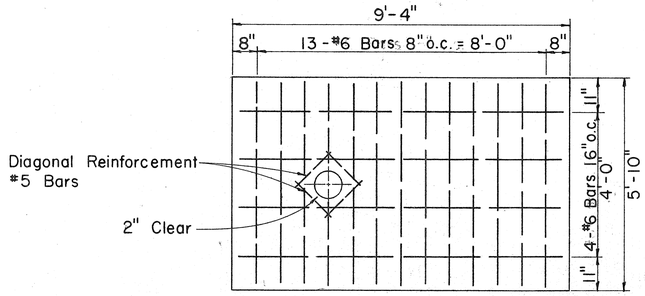
SHEET No. 11 OF 20 SHEETS

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

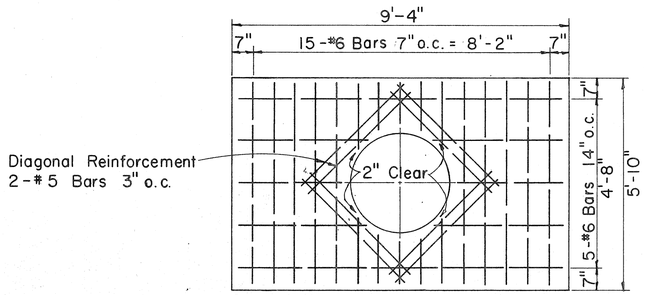
143

HT-5

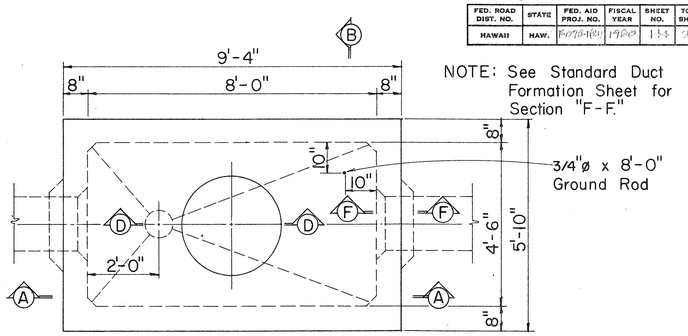
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	[illegible]	19[illegible]	144	203



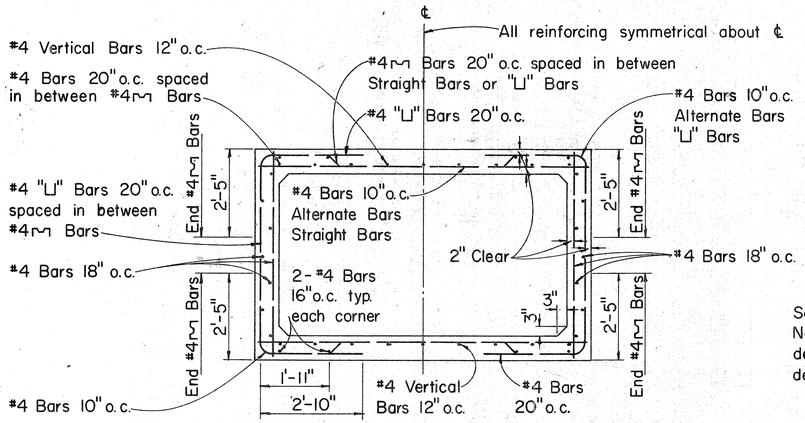
FLOOR SLAB REINF PLAN
Scale: 1/2" = 1'-0"



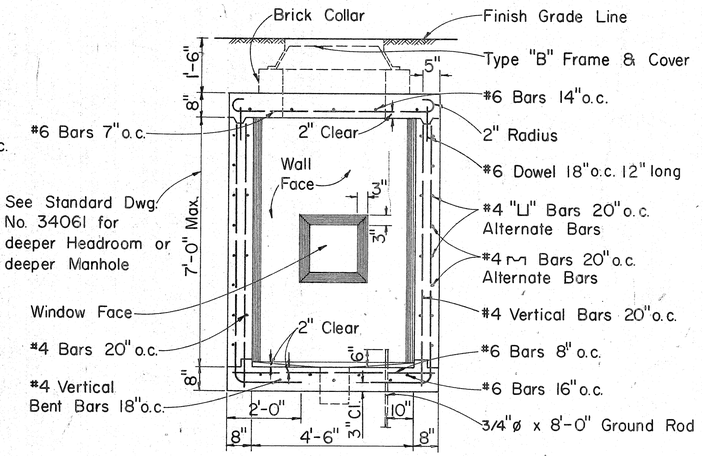
ROOF SLAB REINF PLAN
Scale: 1/2" = 1'-0"



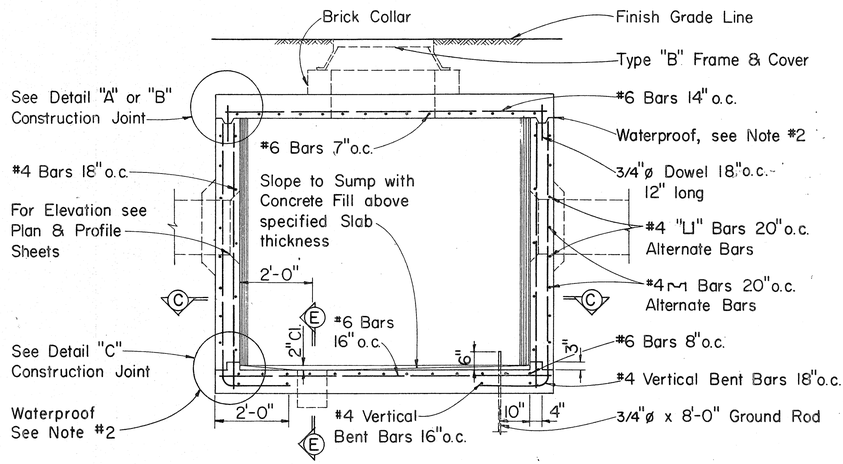
PLAN M.H. TYPE "A-1"
FOR ROADWAY & SIDEWALK AREAS
Scale: 1/2" = 1'-0"



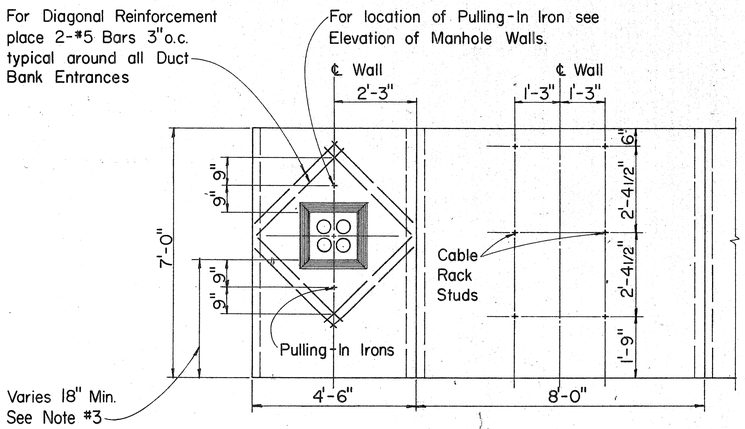
SECTION "C-C"
Scale: 1/2" = 1'-0"



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



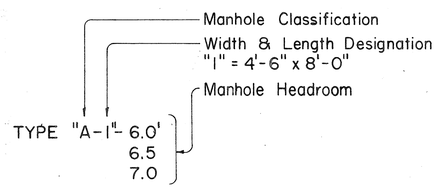
SECTION "A-A"
Scale: 1/2" = 1'-0"



ELEVATION OF M. H. WALLS
(OPPOSITE FACES SIMILAR)
Scale: 1/2" = 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 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.



APPROVED:

Hawaiian Telephone Co., Ltd. Date

H. T. Co., Ltd. Drawing No. 34060

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A-1" MANHOLES FOR 6.0' TO 7.0' HEADROOM

Scale: As Noted Date:

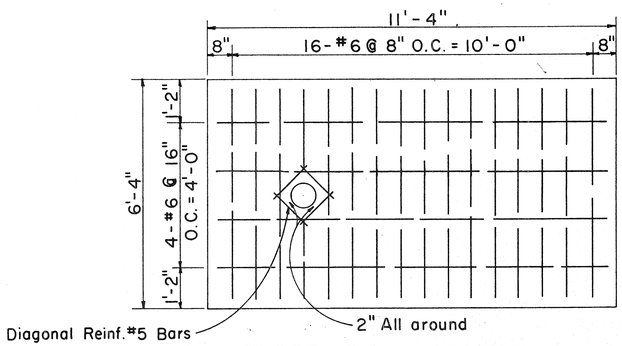
SHEET No. [illegible] OF [illegible] SHEETS

144

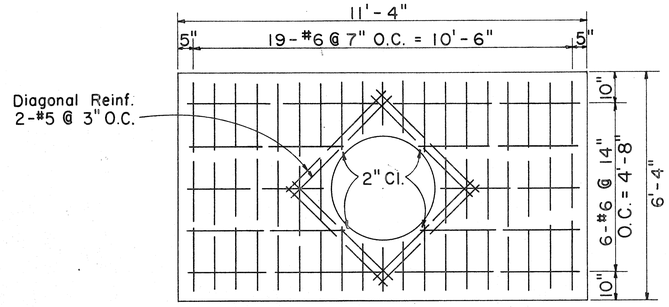
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
NOTE BOOK
No.
DATE

HT-7

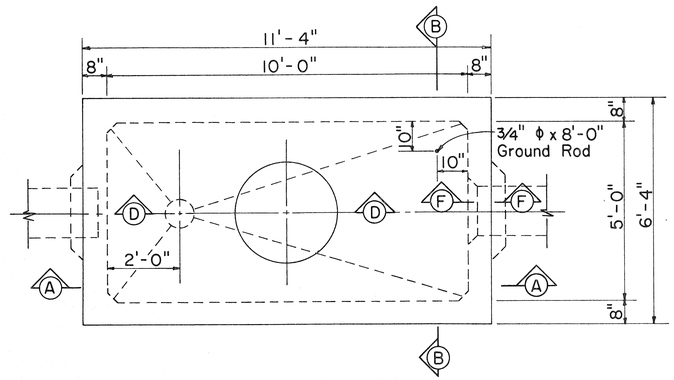
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-070-1(61)	1980	145	254



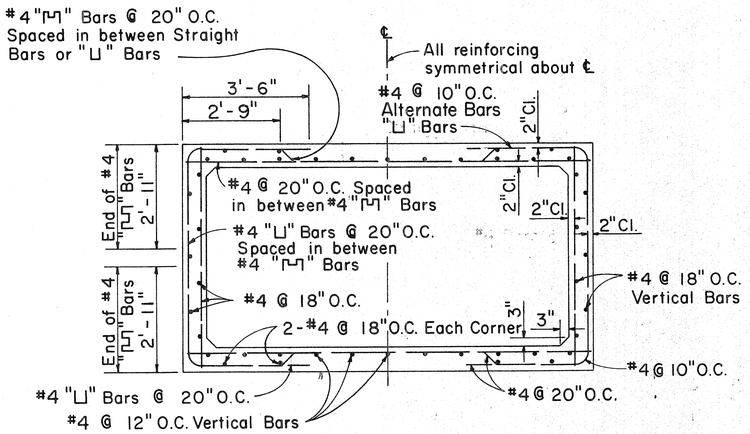
FLOOR SLAB REINF. PLAN
Scale: 1/2"=1'-0"



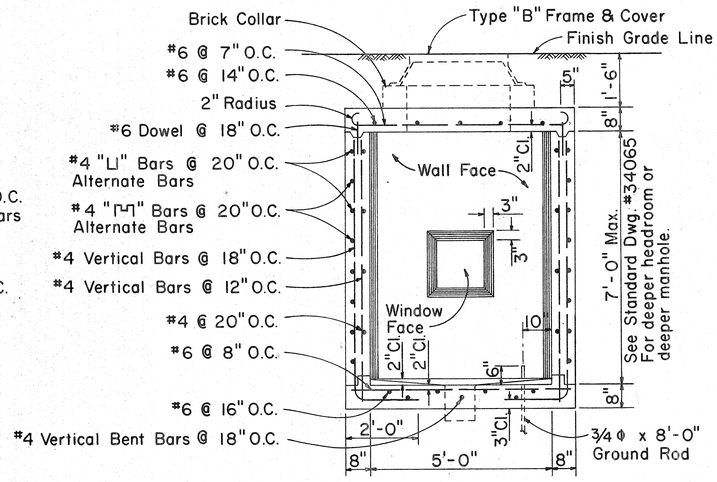
ROOF SLAB REINF. PLAN
Scale: 1/2"=1'-0"



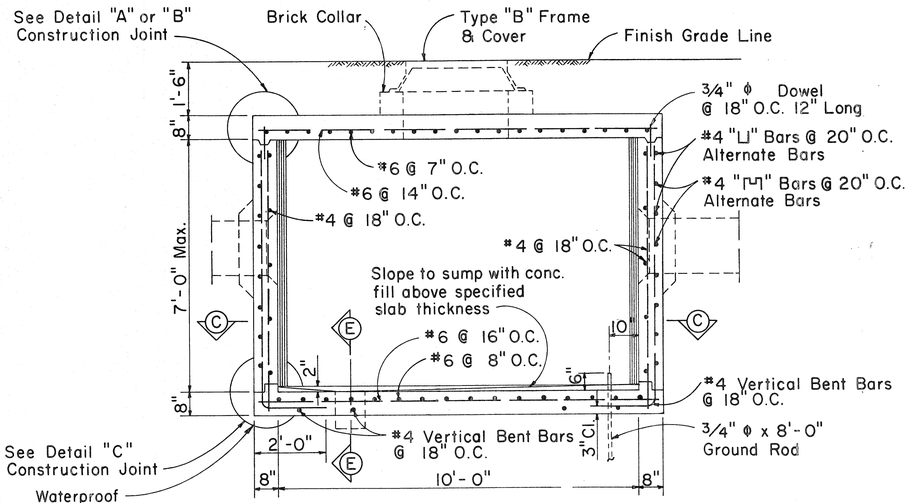
PLAN - M.H. TYPE "A-3" SERIES
FOR ROADWAY & SIDEWALK AREAS
Scale: 1/2"=1'-0"



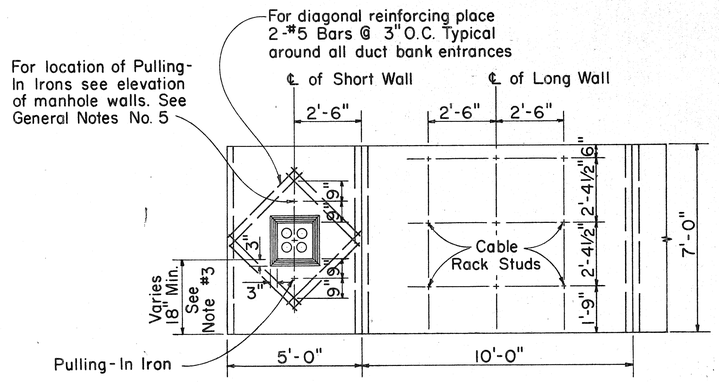
SECTION "C-C"
Scale: 1/2"=1'-0"



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.

TYPE "A-3"-6.0'
6.5'
7.0'
Manhole Classification
Width & Length Designation "3" = 5.0' x 10.0'
Manhole Headroom

APPROVED:

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:

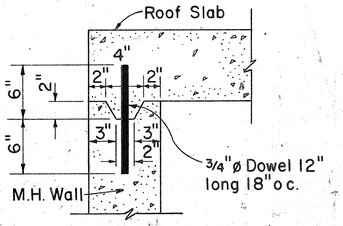
SHEET No. 11 24 OF 30 SHEETS

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

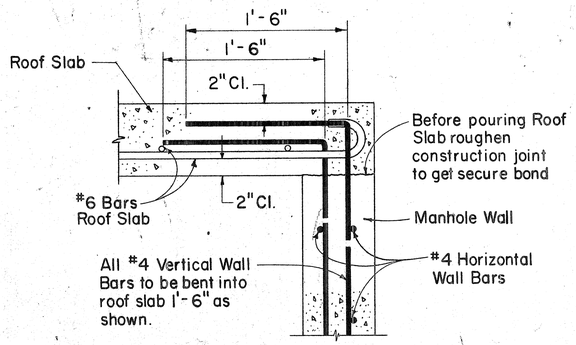
145

HT-11

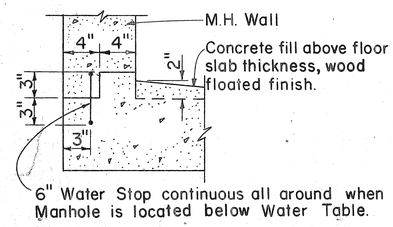
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-079-1(61)	1980	140	154



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

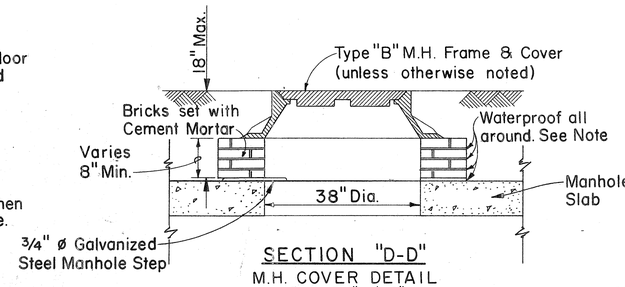


DETAIL "B"
(USED FOR CAST-IN-PLACE CONSTRUCTION)
Scale: 1 1/2" = 1'-0"

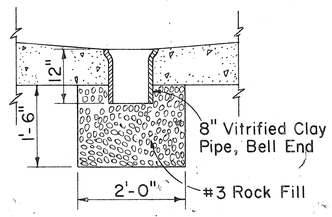


DETAIL "C"
BOTTOM CONSTRUCTION JOINT
Scale: 1 1/2" = 1'-0"

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

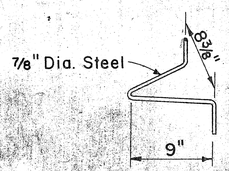


SECTION "D-D"
M.H. COVER DETAIL
Scale: 3/4" = 1'-0"

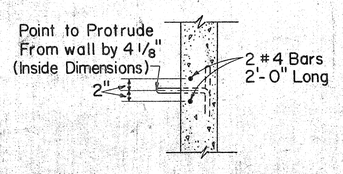


SECTION "E-E"
M.H. SUMP DETAIL
Scale: 3/4" = 1'-0"

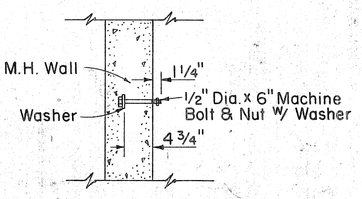
Note:
See Section "E1-E1" Below



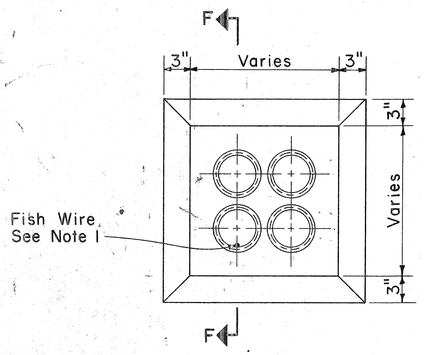
PULLING-IN IRON



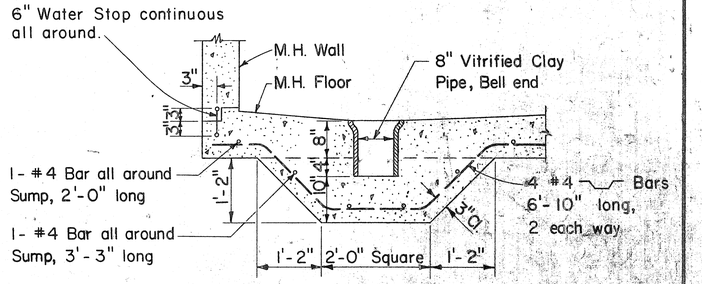
SECTIONAL VIEW OF PULLING-IN IRON
Scale: 3/4" = 1'-0"



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

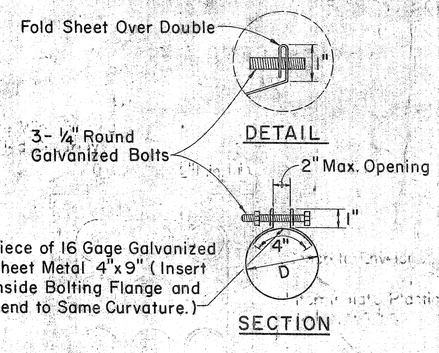


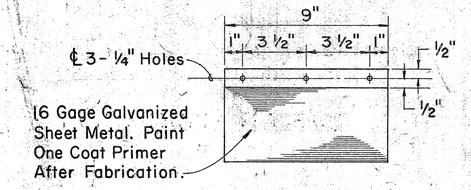
TYPICAL MANHOLE DUCT WINDOW
Scale: 1 1/2" = 1'-0"



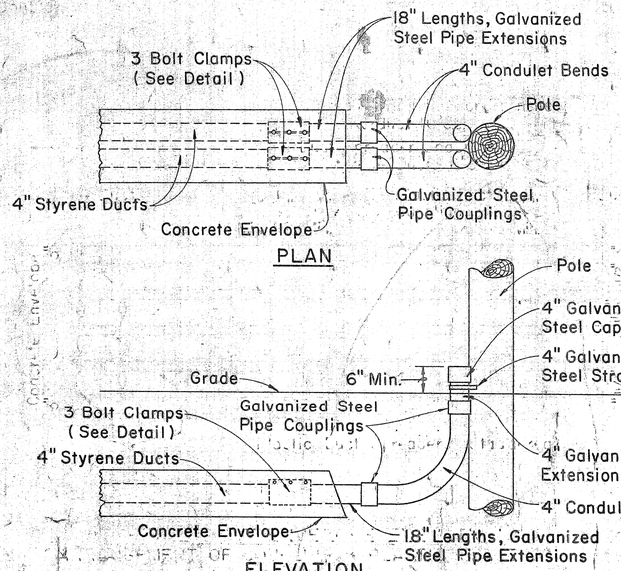
Note: Only for manholes located below water table

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



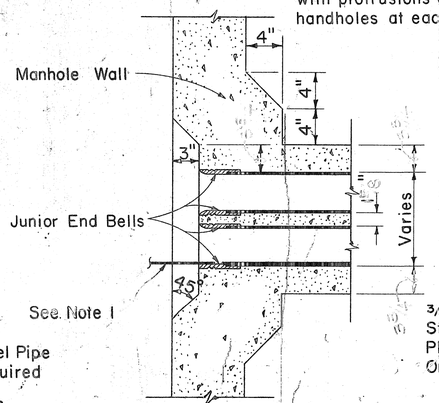


3-BOLT CLAMP ADAPTOR DETAIL
Scale: 3" = 1'-0"

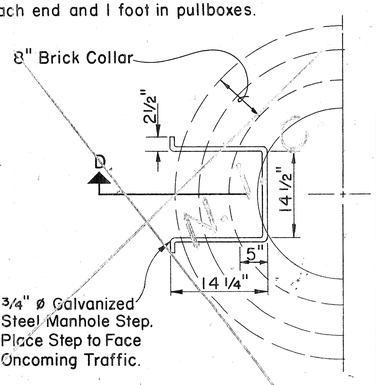


TYPICAL INSTALLATION DETAILS
Scale: 3/4" = 1'-0"

NOTE
1. The Contractor shall place fully cured in designated duct throughout its entire length with protrusions of 2 feet in manholes & handholes at each end and 1 foot in pullboxes.



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

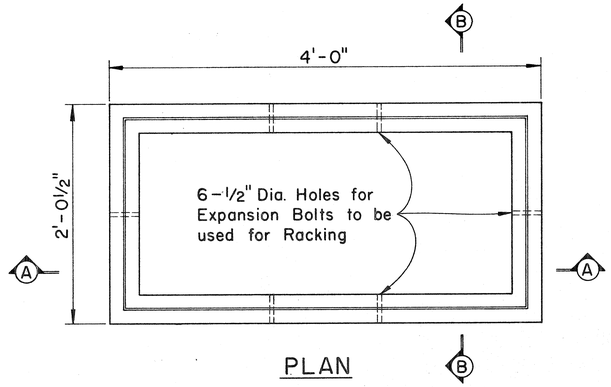
TYPE "A" MANHOLE AND MISCELLANEOUS TELEPHONE DETAILS

Scale: As Noted Date:

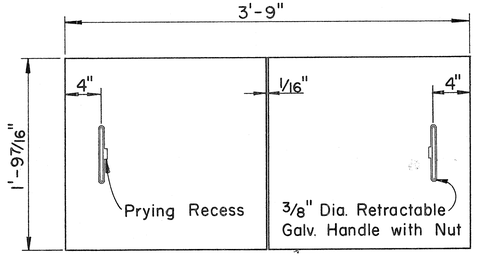
SHEET No. 1 OF SHEETS

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

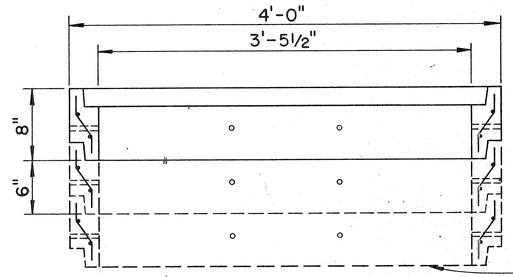
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	147	284



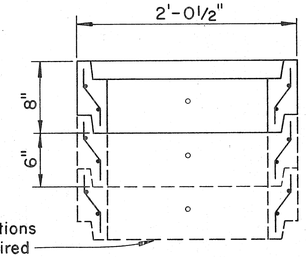
PLAN



COVER



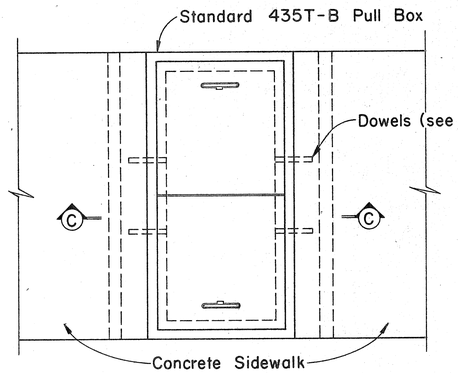
SECTION "A-A"



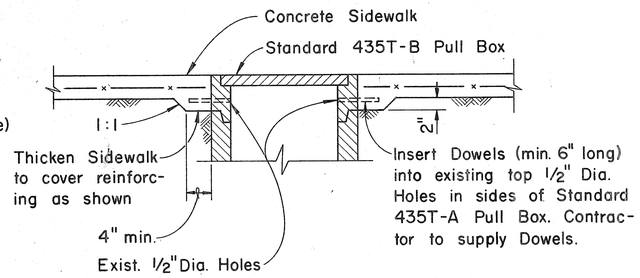
SECTION "B-B"

DETAIL OF LARGE PULL BOX NO. 435T-B

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



PLAN

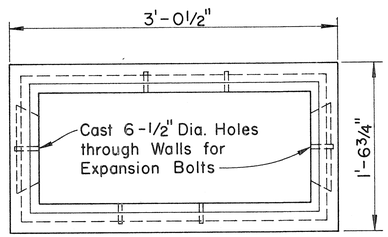


NOTE: Dowels shall be used only where the Sidewalk is as wide or narrower than the Pull Box.

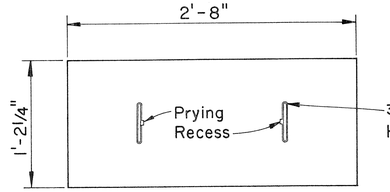
SECTION "C-C"

INSTALLATION DETAIL OF PULL BOX NO. 435T-B IN SIDEWALK AREAS

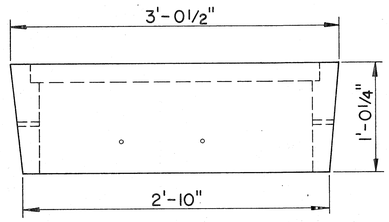
Scale: 1" = 1'-0"



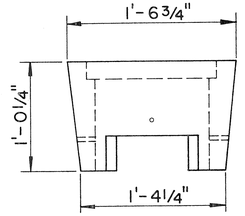
PLAN



COVER



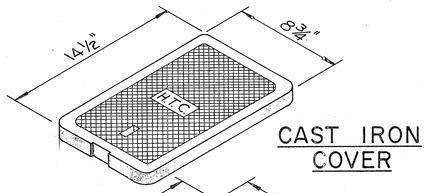
SIDE ELEVATION



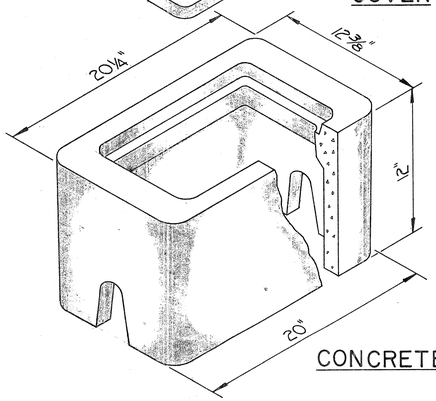
END ELEVATION

DETAIL OF SMALL PULL BOX NO. 434T

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



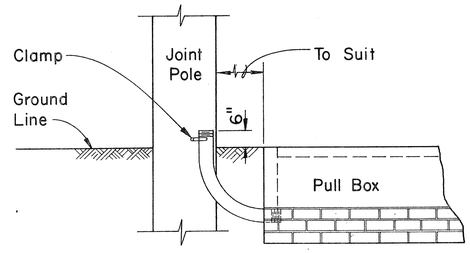
CAST IRON COVER



CONCRETE BOX

TYPE "B" METER BOX, NO. 436T

Not to Scale



TYPICAL 90° CONDUIT BEND TO POLE

Not to Scale

APPROVED:

Hawaiian Telephone Co., Ltd. Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TELEPHONE PULL BOXES NOS. 435T-B, 434T, & 436T

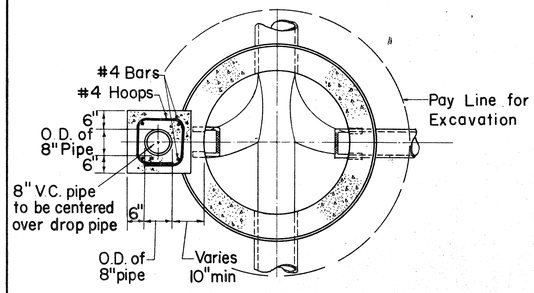
Scale: As Shown Date:

SHEET No. U-26 OF 32 SHEETS

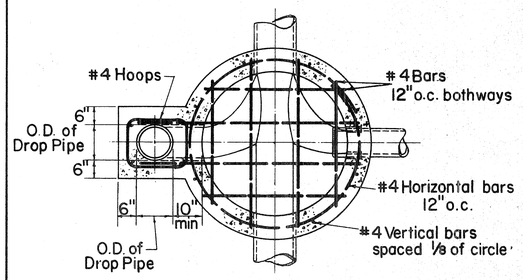
147

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

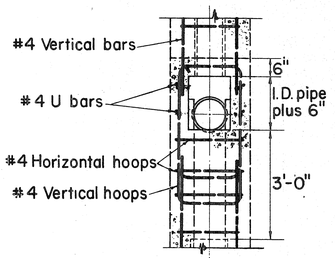
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-078-1(21)	1980	148	234



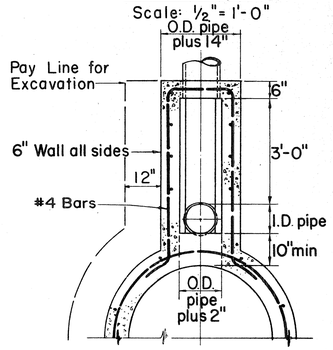
SECTION A-A
Scale: ½"=1'-0"



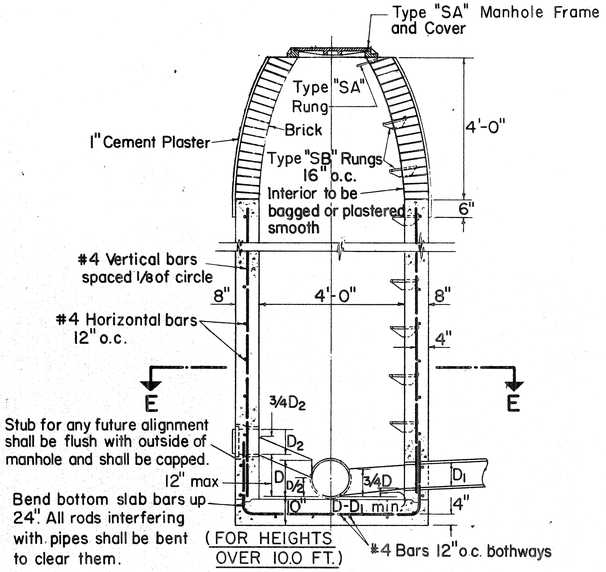
SECTION B-B
Scale: ½"=1'-0"



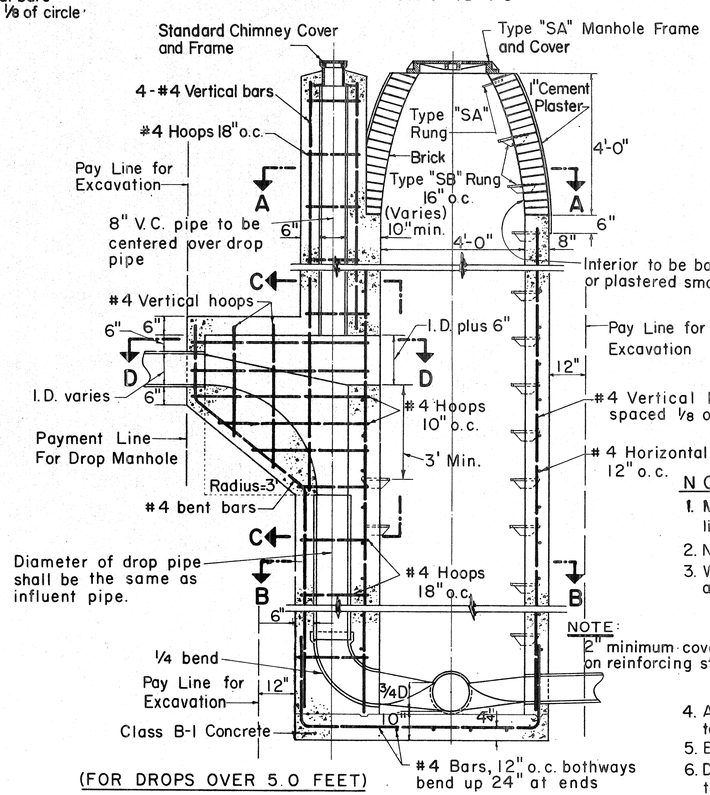
SECTION C-C
Scale: ½"= 1'-0"



SECTION D-D
Scale: ½"= 1'-0"

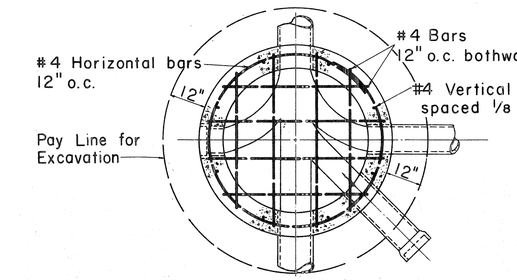


PLAIN MANHOLE
Scale: ½"=1'-0"

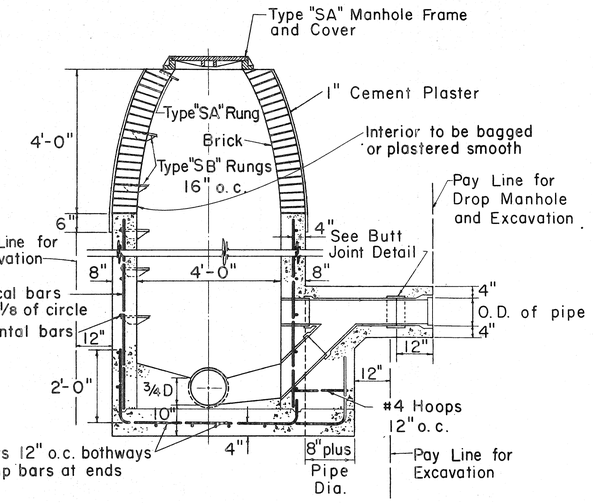


(FOR DROPS OVER 5.0 FEET)

DROP MANHOLE
Scale: ½"=1'-0"



SECTION E-E
Scale: ½" = 1'-0"



(FOR DROPS UNDER 5.0 FEET)

SHALLOW DROP MANHOLE
Scale: ½"=1'-0"

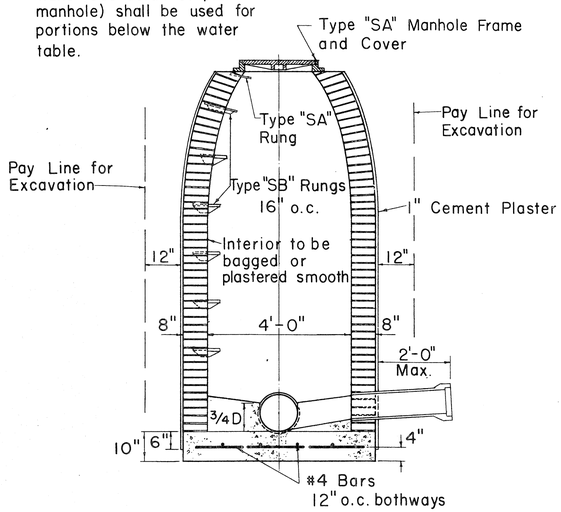
NOTE:

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

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

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

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



(MAXIMUM HEIGHT - 10.0 FEET)

BRICK MANHOLE
Scale: ½"=1'-0"

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

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

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2992 Hawaii, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

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

STANDARD DETAILS

SEWERS - DROP MANHOLE AND BRICK MANHOLE DETAILS

Scales: As Noted Date:

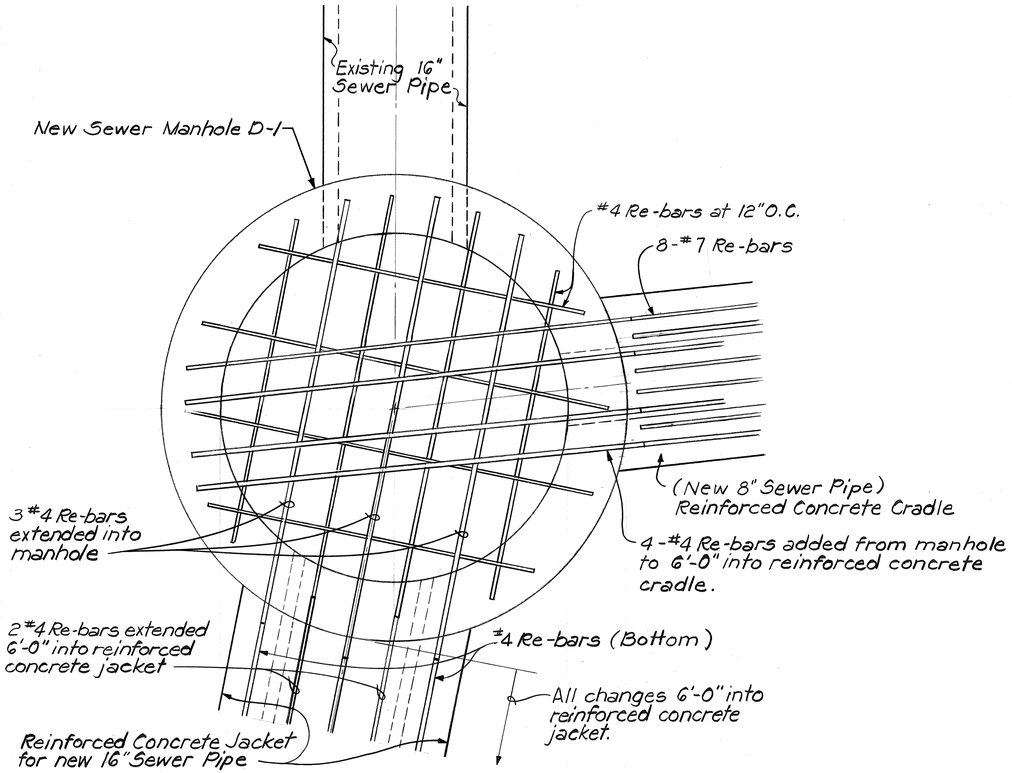
SHEET NO. U-27 OF 50 SHEETS

148

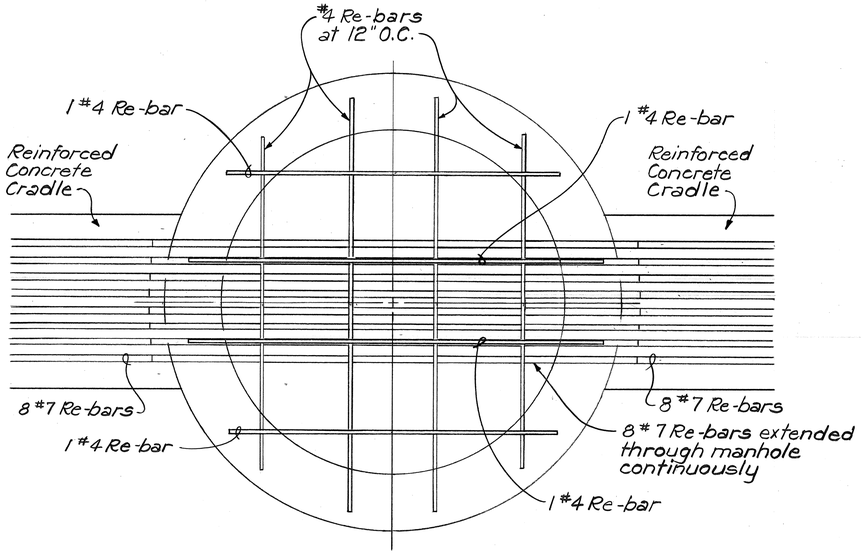
S1

IMPERIAL 150 K & E CO., N.Y. ®
TRADE MARK

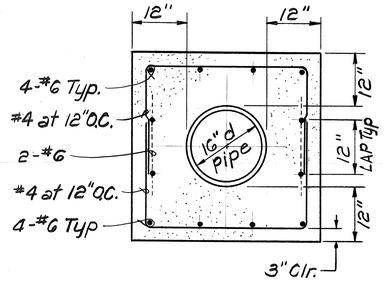
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	C.O.148 S-1	234



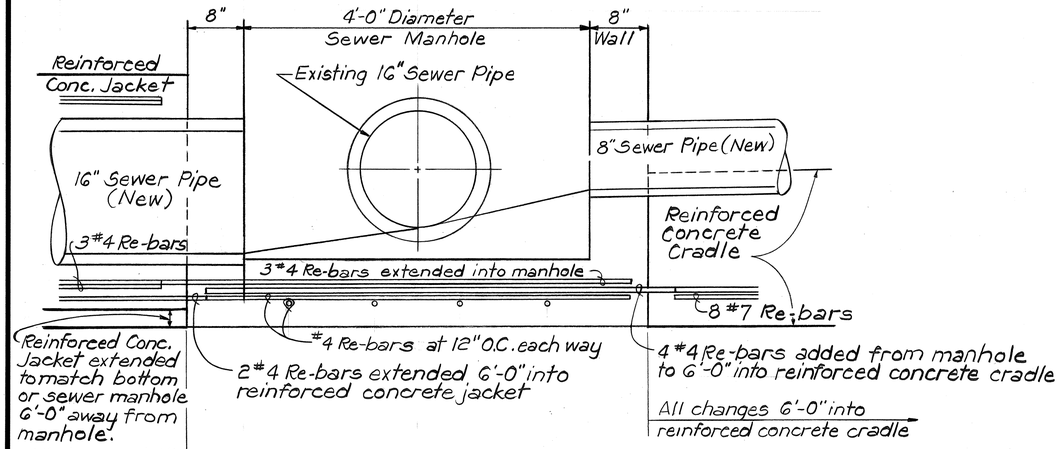
PLAN VIEW
SEWER MANHOLE D-1
Scale: 1" = 10"



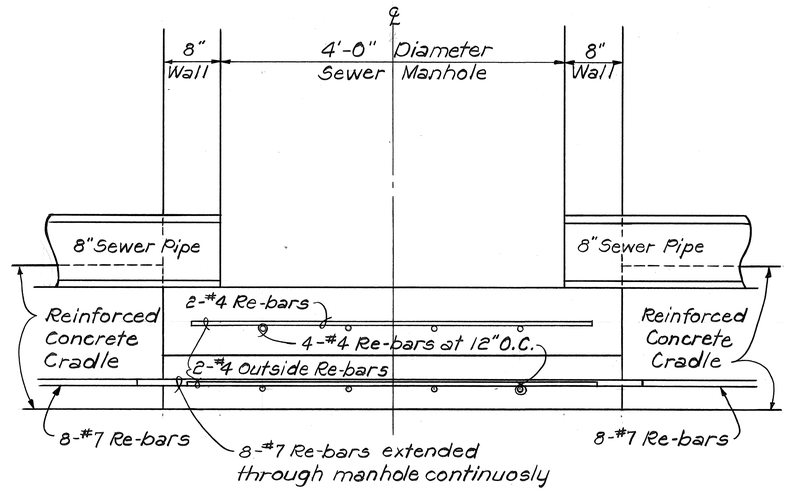
PLAN VIEW
SEWER MANHOLE D-2
Scale : 1" = 10"



CONCRETE JACKET DETAIL
Scale: 3/4" = 1'-0"
(FOR 16" SEWER AND 16" WATER LINE)



ELEVATION VIEW
SEWER MANHOLE D-1
Scale: 1" = 10"



ELEVATION VIEW
SEWER MANHOLE D-2
Scale: 1" = 10"

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

THIS TRACING PREPARED DURING AS-BUILT POSTINGS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SEWER & WATER DETAILS

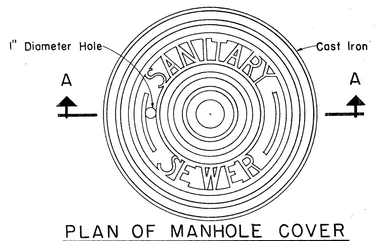
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST-UNIT 3B
F. A. Proj. No. F-078-1(21)

Scale: As Noted Date: Aug. 1986

SHEET NO. U-27A OF 30 SHEETS

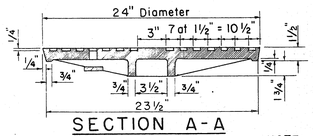
C.O.148 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAWAII	F-078-1(21)	1980	149	254



PLAN OF MANHOLE COVER

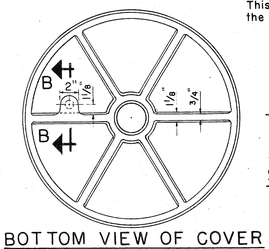
Scale: 1 1/2" = 1'-0"



SECTION A-A

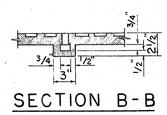
Scale: 1 1/2" = 1'-0"

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

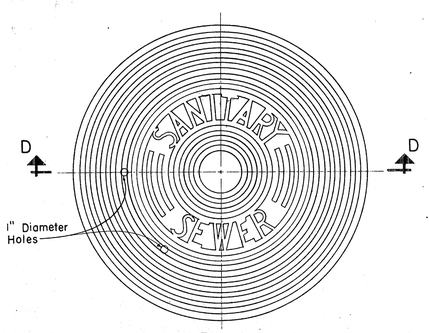


BOTTOM VIEW OF COVER

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



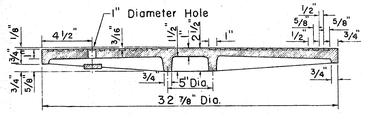
SECTION B-B



PLAN

SPECIAL MANHOLE COVER

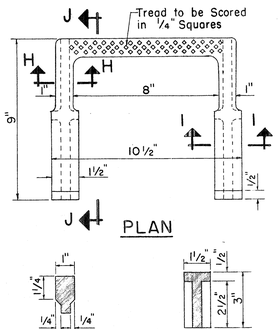
Scale: 1 1/2" = 1'-0"



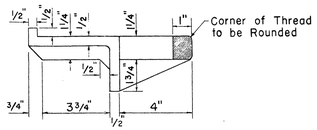
SECTION D-D

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

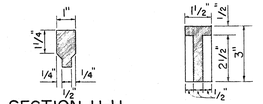
Approx. Weight 260 Pounds



PLAN

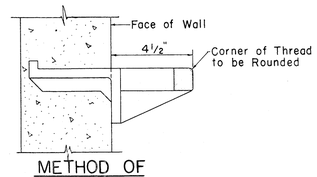


SECTION J - J



SECTION H-H

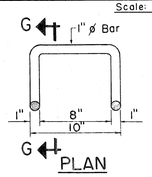
SECTION I-I



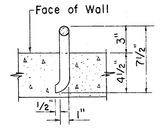
METHOD OF INSTALLATION

TYPE "SB" MANHOLE RUNGS (CAST IRON)

Scale: 3" = 1'-0"



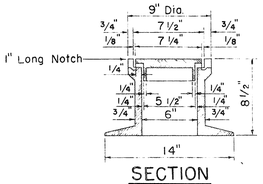
PLAN



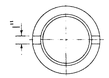
SECTION G-G

TYPE "SA" MANHOLE RUNGS (WROUGHT IRON)

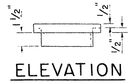
Scale: 1 1/2" = 1'-0"



PLAN OF COVER



BOTTOM OF COVER

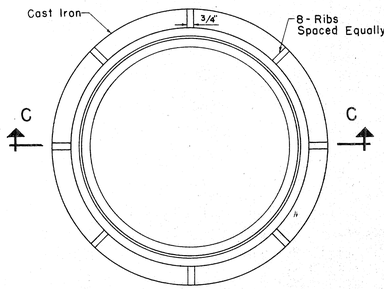


ELEVATION

SECTION

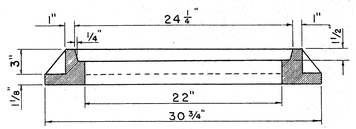
DROP MANHOLE CHIMNEY CASTINGS

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



PLAN OF MANHOLE FRAME

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

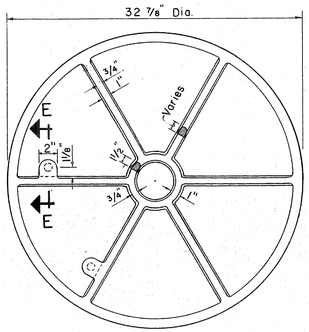


SECTION C-C

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

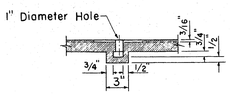
TYPE "SA" SEWER MANHOLE FRAME AND COVER

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



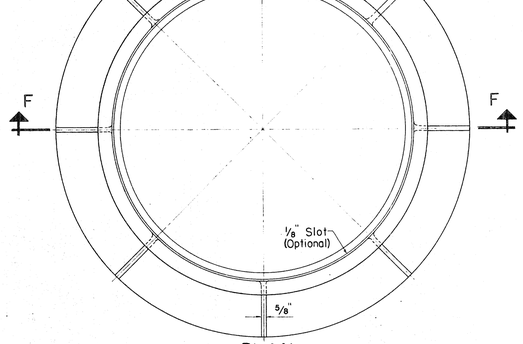
BOTTOM VIEW OF COVER

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



SECTION E-E

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

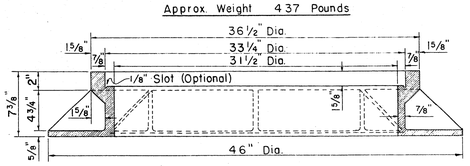


PLAN

SPECIAL MANHOLE FRAME

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

Approx. Weight 437 Pounds



SECTION F-F

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

TYPE "SB" SEWER MANHOLE FRAME AND COVER

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

GARY I. YAMAMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2957
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

ARMY SEWER

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:

SHEET NO. U-28 OF 30 SHEETS

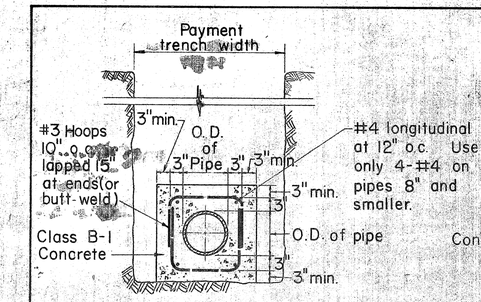
149

ORIGINAL TRACE	SURVEY PLOTTED BY	DATE 11-5-65
	DRAWN BY	" " "
	TRACED BY	11-5-65
NOTE BOOK	DESIGNED BY	" " "
No.	QUANTITIES BY	" " "
	CHECKED BY	" " "

IMPERIAL TRACING CLOTH 10-62

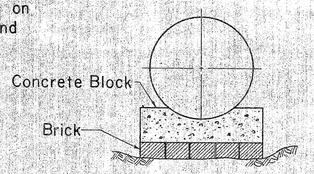
S2

FED. ROAD DIST. NO.	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-078-1(21)	1980	150	234



DETAIL OF CONCRETE JACKET

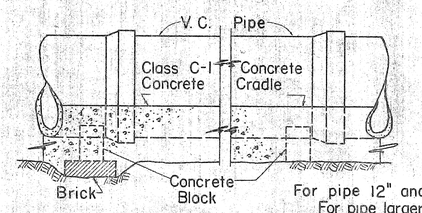
Scale: 3/4" = 1'-0"



METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

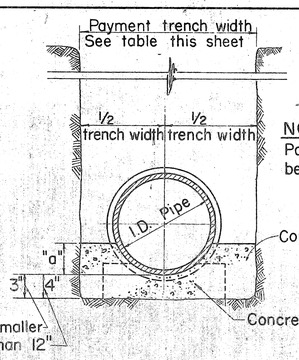
Not To Scale

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



ELEVATION SHOWING METHOD OF LAYING PIPE

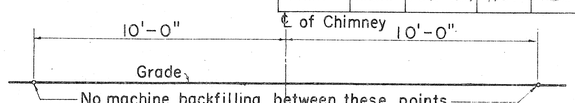
Not To Scale

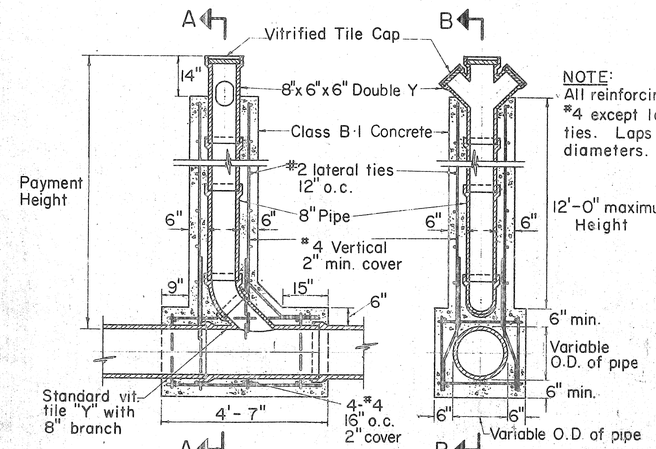


NOTE:
Payment width of cradle shall be payment trench width.

CONCRETE CRADLE FOR VITRIFIED CLAY PIPE

Not To Scale



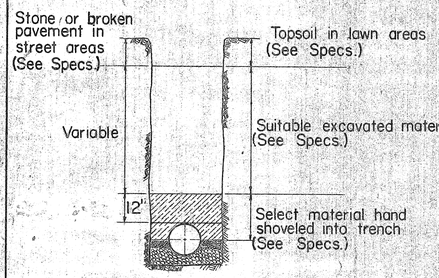


SECTION B-B SECTION A-A

DETAILS OF CHIMNEY

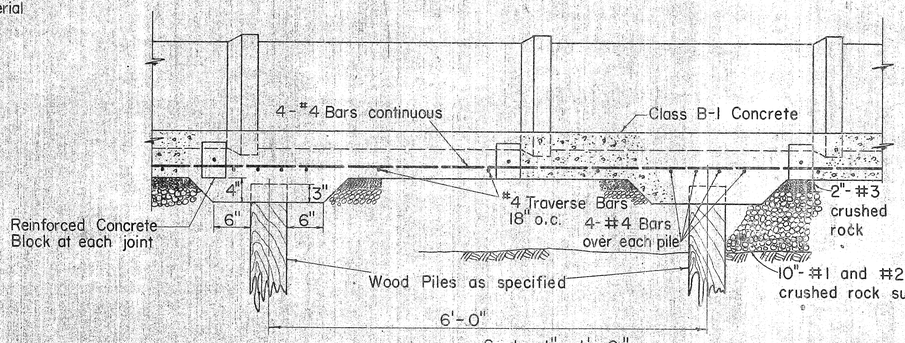
Scale: 1/2" = 1'-0"

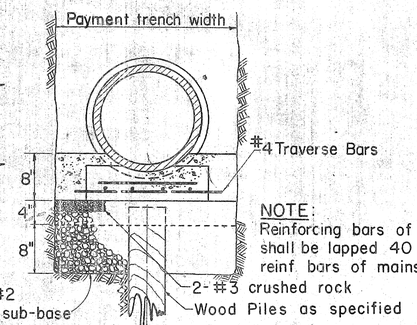
Payment quantities for trench excavation, crushed rock fill, crushed rock cradle, and crushed rock sub-base shall be computed using payment trench widths as shown in the table of "Trench Widths". No payment shall be made for excess quantities resulting from trench widths greater than the payment trench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



METHOD OF BACKFILL

Not To Scale





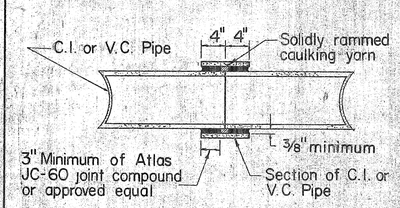
SECTION

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

Scale: 1" = 1'-0"

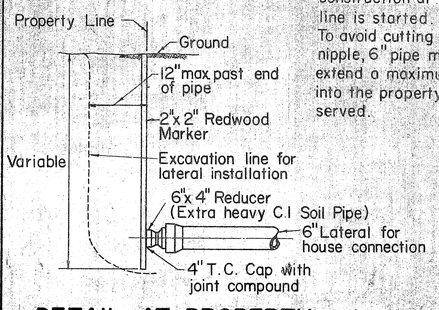
DETAIL OF REINFORCED CONCRETE CRADLE ON WOOD PILES (FOR 6, 8, 10 & 12 IN. V.C. PIPE)

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



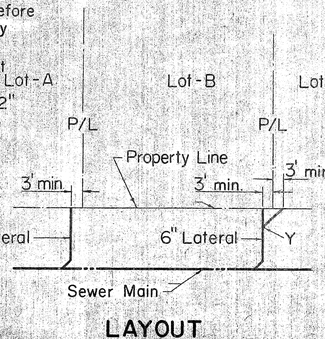
BUTT JOINT DETAIL

Scale: 1" = 1'-0"



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

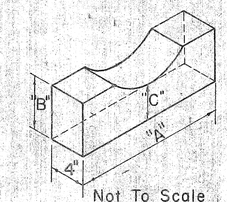
DETAIL AT PROPERTY LINE



LAYOUT

CONSTRUCTION OF LATERALS

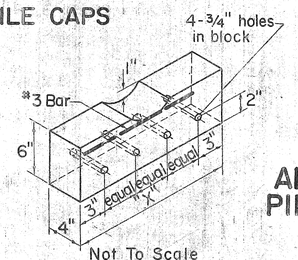
Not To Scale



Not To Scale

DETAIL OF PRECAST CONC. PIPE BLOCK

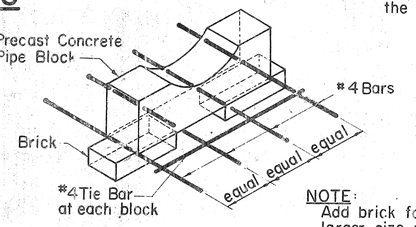
CONCRETE BLOCK DIMENSIONS			
PIPE SIZE	"A"	"B"	"C"
6"	1'-2"	6"	3"
8"	1'-5"	6"	3"
10"	1'-7"	6"	3"
12"	1'-7"	6"	3"
15"	1'-8"	6"	4"
18"	1'-9"	6"	4"
21"	1'-10"	6"	4"
24"	1'-11"	6"	4"
27"	2'-0"	6"	4"
30"	2'-3"	6"	4"



Not To Scale

DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

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



NOTE:
Add brick for larger size pipe

Not To Scale

ALTERNATE DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

VITRIFIED CLAY PIPE TABLE

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

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

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:

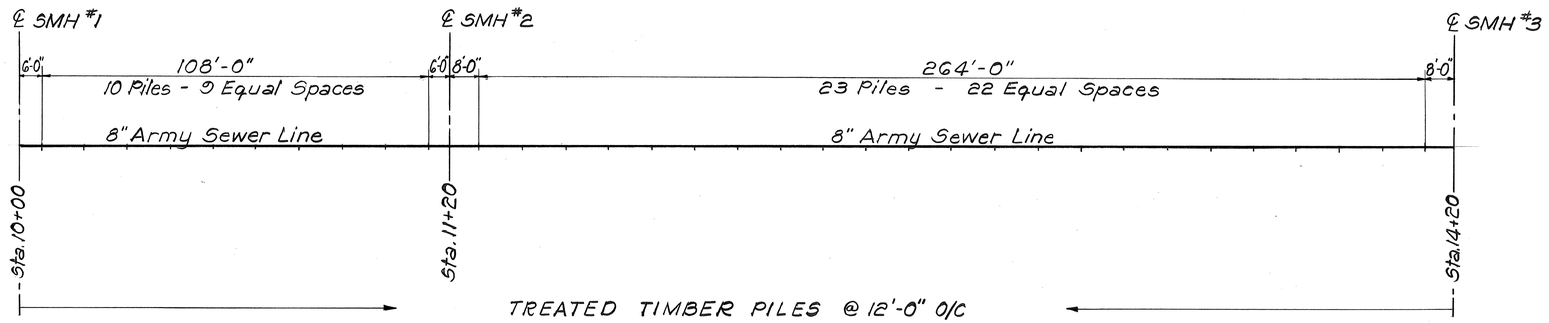
SHEET NO. 150 OF 234 SHEETS

150

S3

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

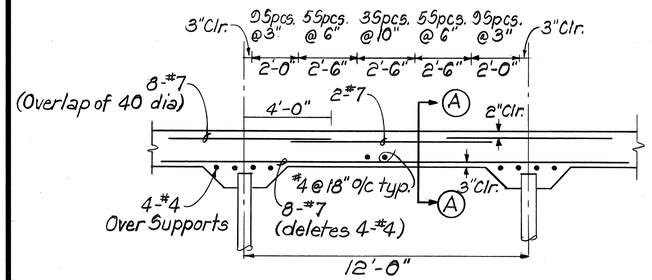
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	C.O.150 S-1	234



PLAN

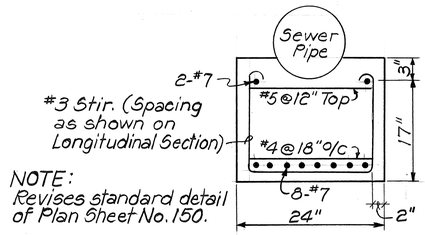
PILE LOCATION FOR CONCRETE CRADLE

Scale: 1" = 20'



LONGITUDINAL SECTION

Not To Scale



NOTE:
Revises standard detail of Plan Sheet No. 150.

SECTION Ⓐ-Ⓐ

Not To Scale

REVISED DETAIL OF

REINFORCED CONCRETE CRADLE ON WOOD PILES

THIS TRACING PREPARED DURING "AS-BUILT" POSTINGS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SEWER DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)

Scale: As Noted Date: Aug. 1986

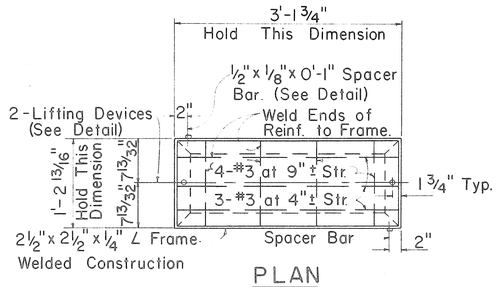
SHEET No. U-29A OF 30 SHEETS

ORIGINAL PLAN | NOTE BOOK | No. ____

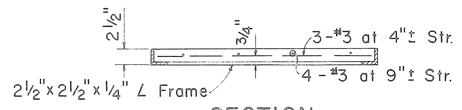
SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGN DATA BY ____
QUANTITIES BY ____
CHECKED BY ____

C.O. 150 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F 078-1(21)	1980	151	234



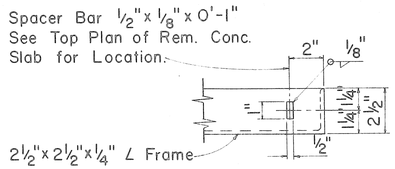
PLAN



SECTION

REMOVABLE CONCRETE SLAB

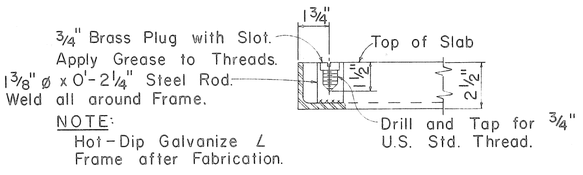
1" = 1'-0"



PART ELEVATION

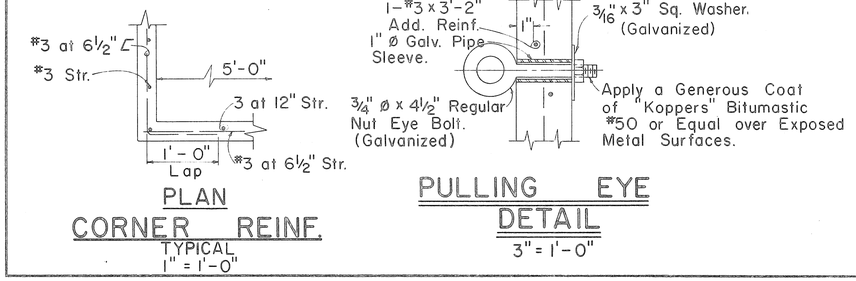
SPACER BAR DETAIL

3" = 1'-0"



LIFTING DEVICE DETAIL

3" = 1'-0"



PLAN

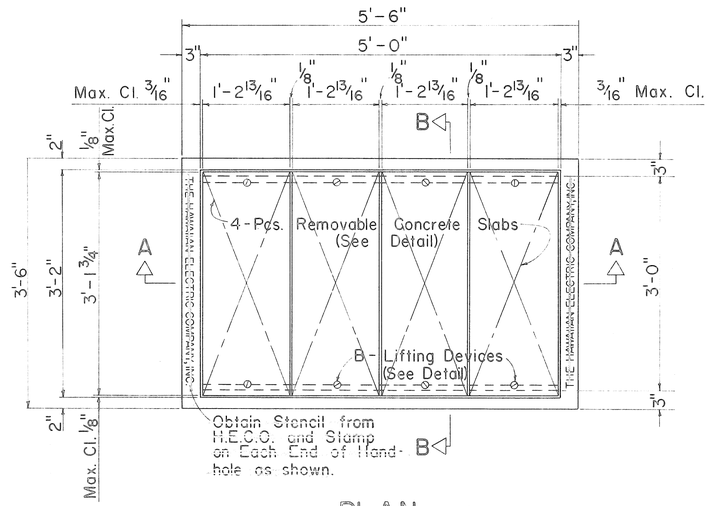
CORNER REINF.

TYPICAL

1" = 1'-0"

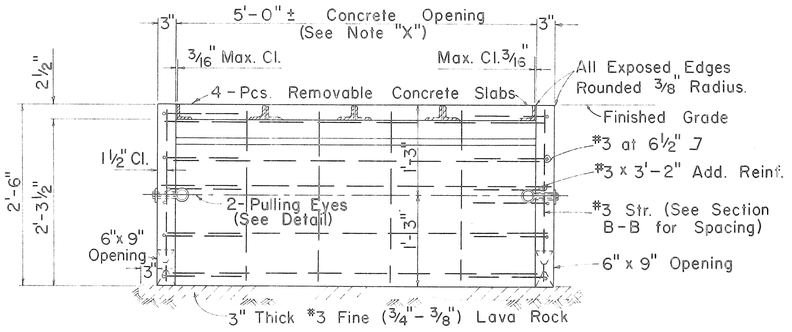
PULLING EYE DETAIL

3" = 1'-0"



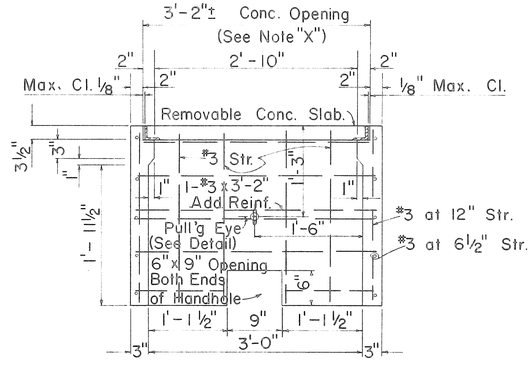
PLAN

1" = 1'-0"



SECTION A-A

1" = 1'-0"



SECTION B-B

1" = 1'-0"

GENERAL NOTES

HANDHOLE FABRICATION

1. CONCRETE STRENGTH:
   Concrete to develop compressive cylinder strength of 3,000 psi. in 28 days.
2. CONCRETE FINISH:
   Top of handhole wood floated (sidewalk finish) according to Division of Highways, State of Hawaii or Division of Engineering, City & County of Honolulu specification whichever governs unless otherwise directed. Round all exposed edges to 3/8" radius.
3. REINFORCING:
   Round deformed bars, new billet stock, intermediate grade ASTM A15.
4. FINISH STEEL WORK:
   Angle iron frames, lifting devices for removable concrete slabs and pulling eye attachments shall be Hot-Dip Galvanized After Fabrication.
5. All materials shall be new and manufactured in the United States of America.

HANDHOLD INSTALLATION

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

WEIGHT PER REMOVABLE COVER

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

WEIGHT OF MATERIAL PER UNIT (EXCLUDING COVERS)

Concrete	=	1,675 Lb. (.42 cu. yd.)
Reinf. Steel	=	59 Lb. (157 L.F. of #3)
Total	=	1,734 Lb.

NOTE "X" — IMPORTANT

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

NOTE:
FOR A.B. HANDHOLE

STANLEY L. PERRY
REGISTERED PROFESSIONAL ENGINEER
No. 4680
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

HECo., Inc. Drawing Number
15501

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

PRECAST HANDHOLE (3'-0" x 5'-0")
UNDERGROUND STANDARDS

Scales: As Noted Date:

SHEET No. 20 OF 30 SHEETS

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

151