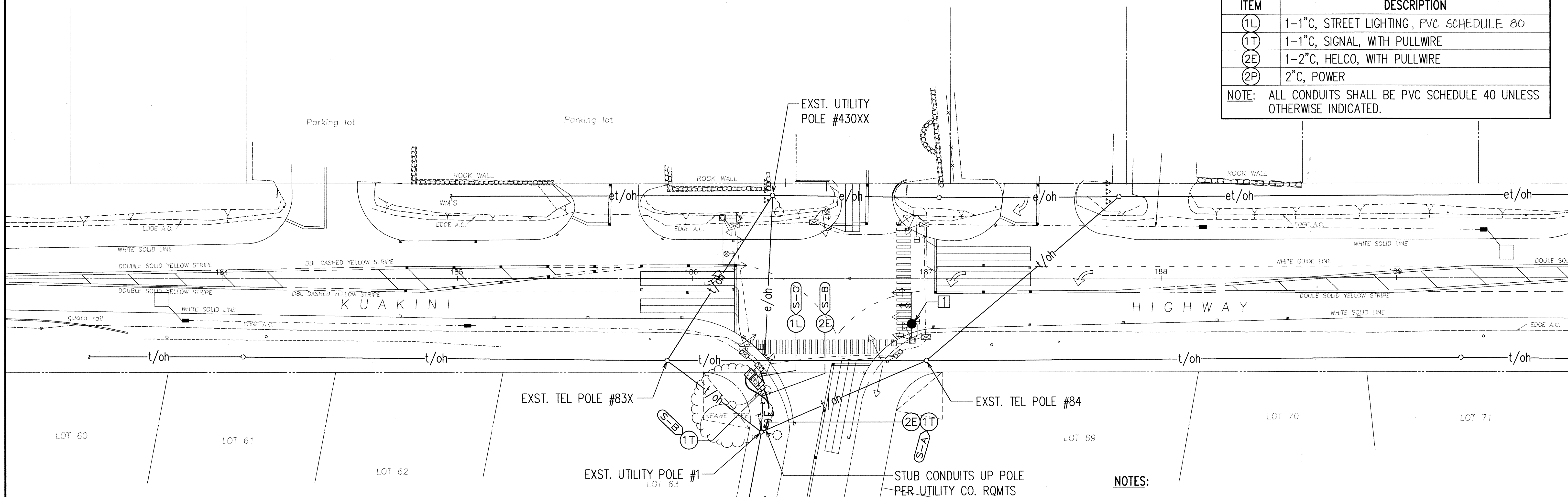


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-011-1(22)	1999	11	14

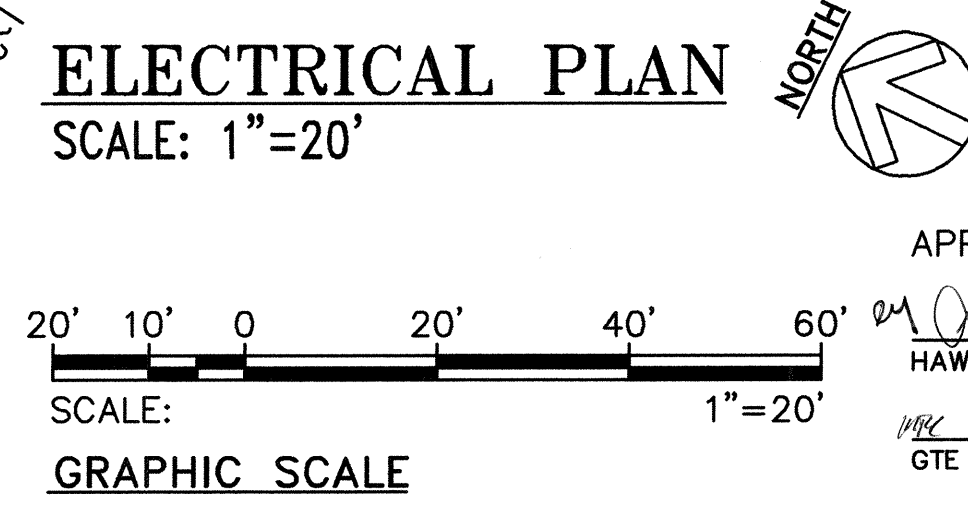
CONDUIT SCHEDULE	
ITEM	DESCRIPTION
(1L)	1-1" C, STREET LIGHTING, PVC SCHEDULE 80
(1T)	1-1" C, SIGNAL, WITH PULLWIRE
(2E)	1-2" C, HELCO, WITH PULLWIRE
(2P)	2" C, POWER

NOTE: ALL CONDUITS SHALL BE PVC SCHEDULE 40 UNLESS OTHERWISE INDICATED.

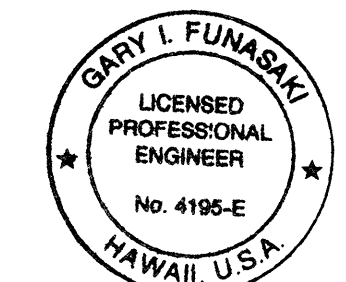


NOTES:
 [1] SEE TRAFFIC SIGNAL PLANS FOR STREET LIGHT CONDUIT ROUTING TO TYPE III TRAFFIC SIGNAL STANDARDS. WIRING PER ONE-LINE DIAGRAM, SEE B/E-3.

ELECTRICAL SYMBOLS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
●	STREET LIGHT, 180 WATT LPS SINGLE LUMINAIRE AND BRACKET ARM, MOUNT ON TYPE III T.S. STANDARD, SEE C/E-4.	(S-B)(1L)	DUCT SECTION DESIGNATOR, TYPE "S-B" DUCTLINE WITH TYPE "1L" DUCT INDICATED, SEE SHEET E-2 FOR DUCT SECTIONS AND THIS SHEET FOR CONDUIT SCHEDULE
○	EXISTING STREET LIGHT MTD ON EXISTING UTILITY JOINT POLE	—E—	ELECTRIC DUCTLINE
○	EXISTING UTILITY POLE	—SL—	STREET LIGHT DUCTLINE AND WIRING
△	EXISTING POLE MOUNTED TRANSFORMER	—e/oh—	EXISTING OVERHEAD ELECTRIC LINES
→	EXISTING ANCHOR GUY	—t/oh—	EXISTING OVERHEAD SIGNAL LINES
→	ANCHOR GUY PROVIDED BY UTILITY COMPANY		
←*→	EXISTING ANCHOR GUY TO BE REMOVED BY RESPECTIVE UTILITY COMPANY		
□	METERING EQUIPMENT, SEE DETAIL A/E-3		



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 [Signature] DATE 5/1/98
 HAWAII ELECTRIC LIGHT COMPANY, INC.
 [Signature] DATE 5/13/98
 GTE HAWAIIAN TEL

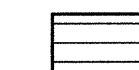





STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 ELECTRICAL PLAN,
 ELECTRICAL SYMBOLS
 KUAKINI HIGHWAY
 INSTALLATION OF TRAFFIC SIGNALS AT
 SEA VIEW CIRCLE
 FAP NO. STP-011-1(22)
 SCALE: AS NOTED DATE: MARCH 1998
 SHEET No. E-1 OF 4 SHEETS

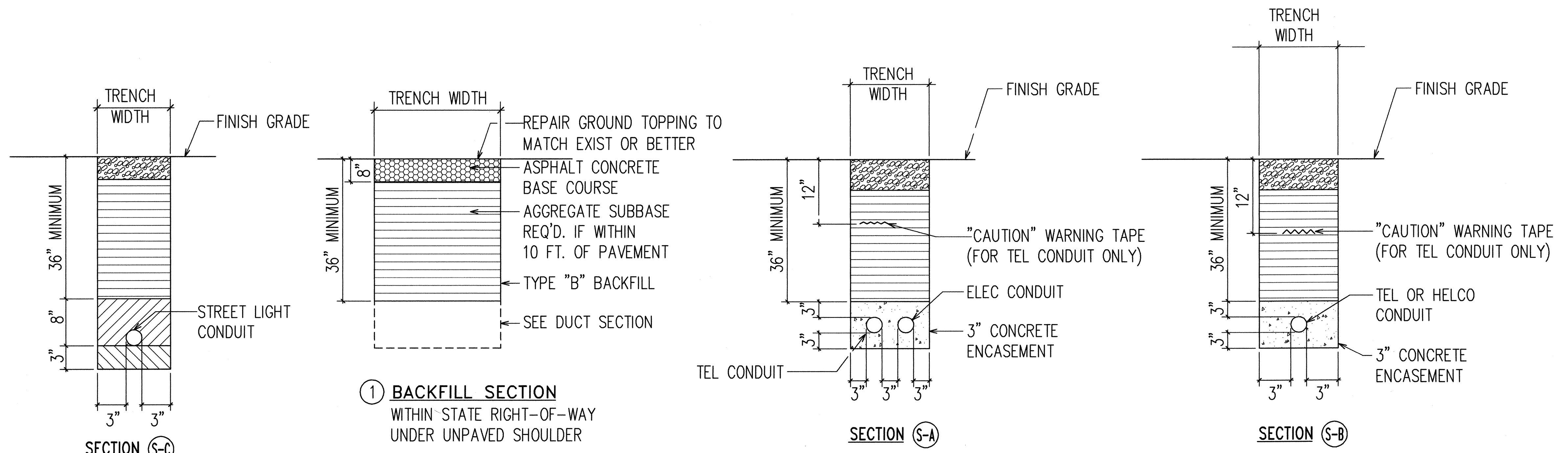
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-011-1(22)	1999	12	14

STATE RIGHT-OF-WAY BACKFILL NOTES

-  TRENCH BACKFILL MATERIAL "B"
1. SAND EQUIVALENT \geq 2
2. 8" MAX. LIFT LOOSE
3. 95% COMPACTION
-  TRENCH BACKFILL MATERIAL "A"
1. SAND EQUIVALENT \geq 20
2. 8" MAX. LIFT LOOSE
3. 95% COMPACTION
-  IF MATERIAL BELOW DUCT IS NOT EQUIVALENT TO BACKFILL "A". SEE ABOVE MATERIAL "A", EXCAVATE MATERIAL & PROVIDE 3" BACKFILL MATERIAL
-  CONCRETE - 3" ENCASEMENT, 3000 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

NOTE: BASE COURSE & SUB-BASE COURSE PER 1994 STATE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.



TYPICAL DUCT SECTIONS (STATE)
A
E-2
NOT TO SCALE

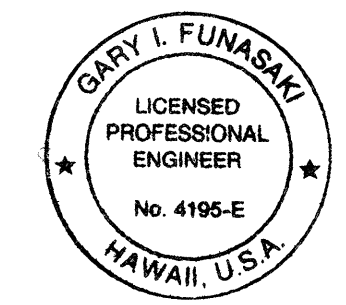
GENERAL NOTES


1. THE LOCATION OF OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT WITHIN OR UNDER ANY OVERHEAD LINES.
2. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HELCO TWO WEEKS PRIOR TO STARTING CONSTRUCTIONS.
3. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGES TO HELCO FACILITIES AND SHALL IMMEDIATELY REPORT SUCH DAMAGES TO HELCO'S TROUBLE DISPATCHER.
4. THE CONTRACTOR IS TO COMPLY WITH THE DIRECTIONS OF THE STATE OF HAWAII OCCUPATIONAL SAFETY AND HEALTH LAW (DOSHS).
5. FOR VERIFYING THE LOCATION OF UNDERGROUND DUCT LINES AND FOR ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF THE UNDERGROUND DUCT LINES, THE CONTRACTOR IS TO CONTACT HELCO A MINIMUM OF 72 HOURS IN ADVANCE.
6. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN THE EXCAVATION AND CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND TELEPHONE AND SIGNAL CABLE FACILITIES AND SHALL MAINTAIN ADEQUATE CLEARANCE FOR HIS EQUIPMENT WHILE WORKING CLOSE TO AND/OR UNDER OVERHEAD FACILITIES. ANY DAMAGES TO THE EXISTING UNDERGROUND FACILITIES SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.
7. FOR FIELD LOCATION OF HTCO FACILITIES, CONTACT HTCO OUTSIDE PLANT ENGINEERING SECTION, A MINIMUM OF 72 HOURS IN ADVANCE PRIOR TO START OF EXCAVATION.
8. SHOULD FIELD CONDITIONS AND CONSTRUCTION PROCEDURES REQUIRE THAT UTILITY POLES BE BRACED, THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY CO. FOR POLE BRACING INSTRUCTIONS A MINIMUM OF 72 HOURS IN ADVANCE OF ACTUAL REQUIRED BRACING.
9. WHEN TRENCH EXCAVATION IS ADJACENT TO EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS, OR UNDERPINNING TO FULLY PROTECT IT FROM DAMAGE.
10. A 4" WIDE WARNING TAPE, ORANGE IN COLOR WITH A BLACK IMPRINTED MESSAGE "WARNING-STOP DIGGING-CALL GTE COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION" SHALL BE PLACED 12" BELOW THE SURFACE, OVER THE DUCT OR CONCRETE JACKET FOR THE ENTIRE LENGTH OF DUCT INSTALLATIONS. SEE HTCO STD. DWG. NO. 34028. RECOMMENDED TAPE IS MANUFACTURED BY THOR ENTERPRISES, DTGTE-41 OR DTGTE-46, EQUIVALENT TAPES ARE ACCEPTABLE.
11. PROVIDE NEPTCO MULETAPE (WP1800) IN ALL NEW DUCTS AND CAP ALL DUCTS AFTER TESTING. NEPTCO MULETAPE IS AVAILABLE FROM WESTINGHOUSE SUPPLY CO. (WESCO). THE NEPTCO MULETAPE IS PRELUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS.

USING THE NEPTCO MULETAPE, THE CONTRACTOR SHALL MEASURE AT LEAST ONE DUCT OF A COMMON DUCT RUN. THE DISTANCE SHALL BE MARKED ON THE RECORD PRINTS AND SUBMITTED TO THE HTCO INSPECTOR FOR RECORD KEEPING.
12. ALL ELECTRICAL/COMMUNICATION CONDUITS SHALL CROSS BELOW ALL WATERLINES. MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINE AND ELECTRICAL/COMMUNICATION DUCTLINE CROSSING SHALL BE 1'-6".

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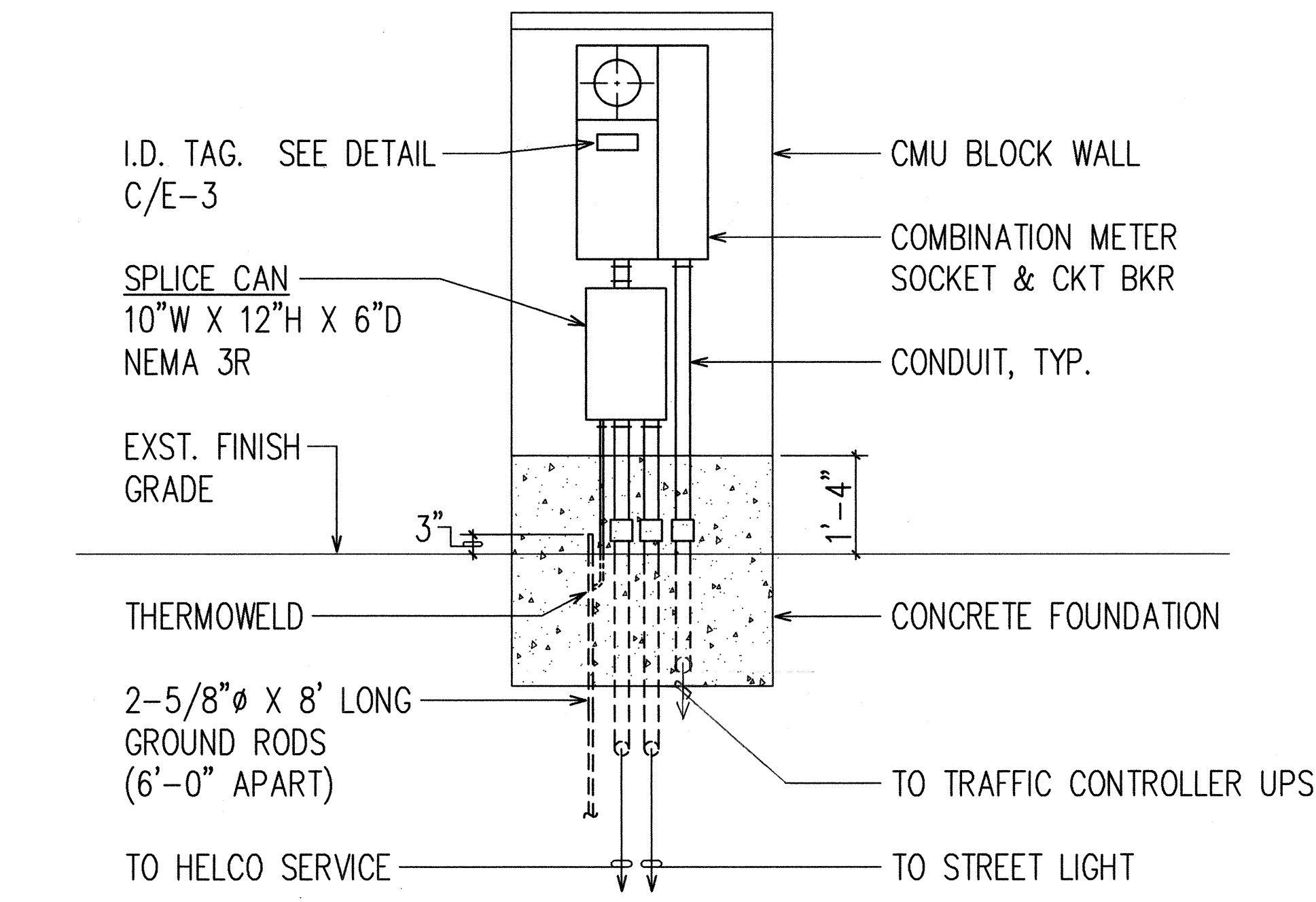
APPROVED BY:
 5/13/98
HAWAII ELECTRIC LIGHT COMPANY, INC. DATE
 5/13/98 DATE
GTE HAWAIIAN TEL



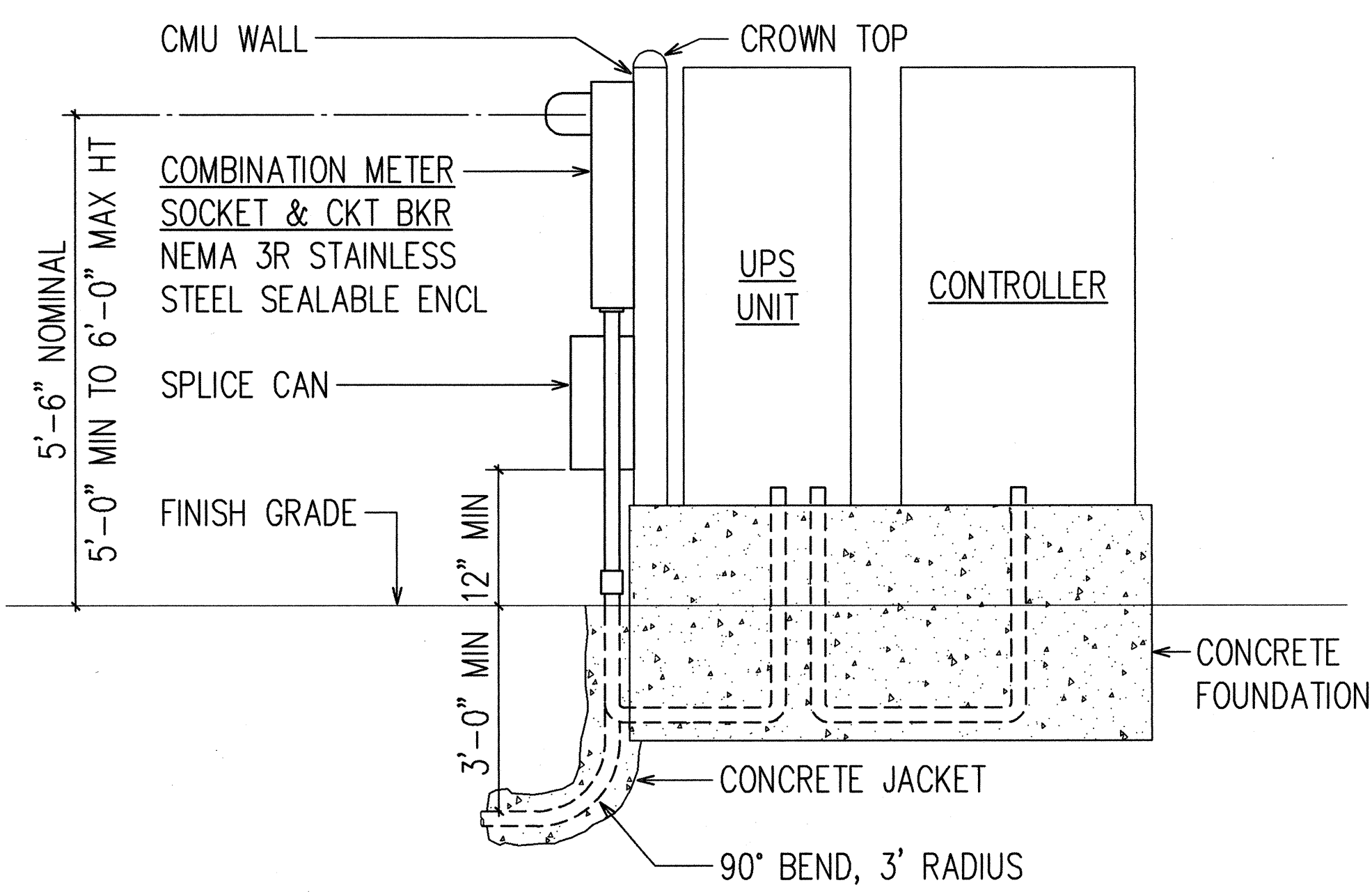
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION:

Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL DUCT SECTIONS,
GENERAL NOTES
KUAKINI HIGHWAY
INSTALLATION OF TRAFFIC SIGNALS AT
SEA VIEW CIRCLE
FAP NO. STP-011-1(22)
SCALE: AS NOTED DATE: MARCH 1998

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-011-1(22)	1999	13	14



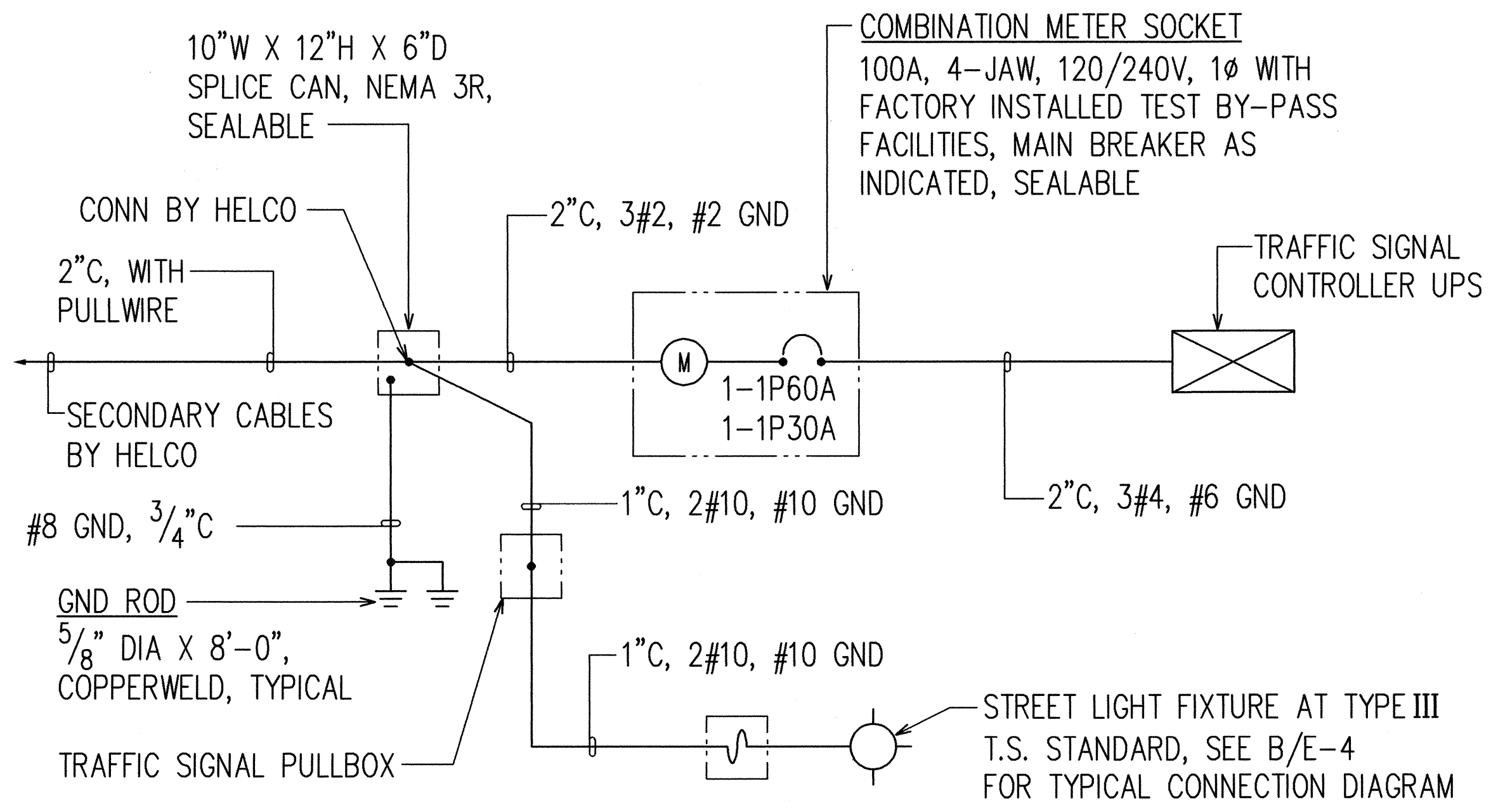
FRONT ELEVATION



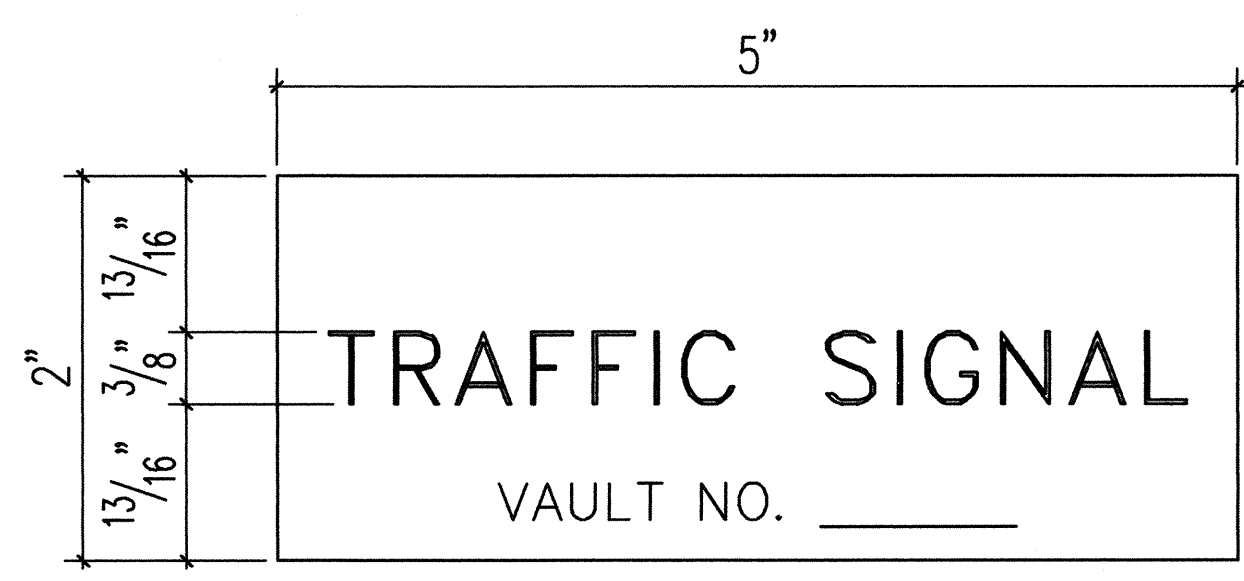
SIDE ELEVATION

- NOTES:**
1. CONTRACTOR SHALL MAKE ALL ELECTRICAL CONNECTION TO CONTROLLER, PROVIDE 2-1P50A BREAKER, GROUND AND 2" CONDUIT.
 2. ALL CONDUITS TO CONTAIN A POLYOLEFIN PULL LINE. (JET LINE CAT #232 OR EQUIV)
 3. SEE TRAFFIC SIGNAL PLANS FOR UPS & CONTROLLER CABINET FOUNDATION AND CMU WALL DETAIL.
 4. ALL FASTENING BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL. PROVIDE ONE COAT SHOP PRIMER & TWO COATS OF ACRYLIC ENAMEL FINISH, COLOR TO MATCH CONTROLLER CABINET.
 5. PROVIDE 4 FT CLEARANCE IN FRONT OF METER.

A
E-3
ELECTRICAL SERVICE DETAIL
NOT TO SCALE

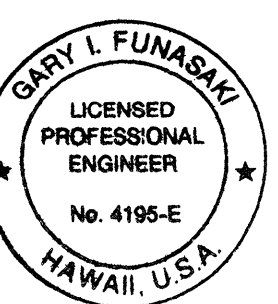


B
E-3
ONE-LINE DIAGRAM



C
E-3
METER I.D. TAG DETAIL
NOT TO SCALE

- NOTES:**
1. USE 3 PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK. THICKNESS: BLACK CAP & BASE SHEET - 0.010", WHITE MIDDLE SHEET - 0.052".
 2. LETTERS AND NUMBERS SHALL BE ENGRAVED 3/8" HIGH, 1/16" STROKE, WHITE IN COLOR.
 3. ATTACH TO METER SOCKET USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.
 4. LETTERS AND NUMBERS SHALL BE ENGRAVED THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE" LETTERS.



APPROVED BY:

[Signature] DATE 5/11/99

HAWAII ELECTRIC LIGHT COMPANY, INC.

[Signature] DATE 5/13/98

GTE HAWAIIAN TEL

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[Signature]

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SERVICE DETAIL, T.S.
CONTROLLER ONE-LINE DIAGRAM

KUAKINI HIGHWAY
INSTALLATION OF TRAFFIC SIGNALS AT
SEA VIEW CIRCLE
FAP NO. STP-011-1(22)

SCALE: AS NOTED DATE: MARCH 1998

SHEET No. E-3 OF 4 SHEETS

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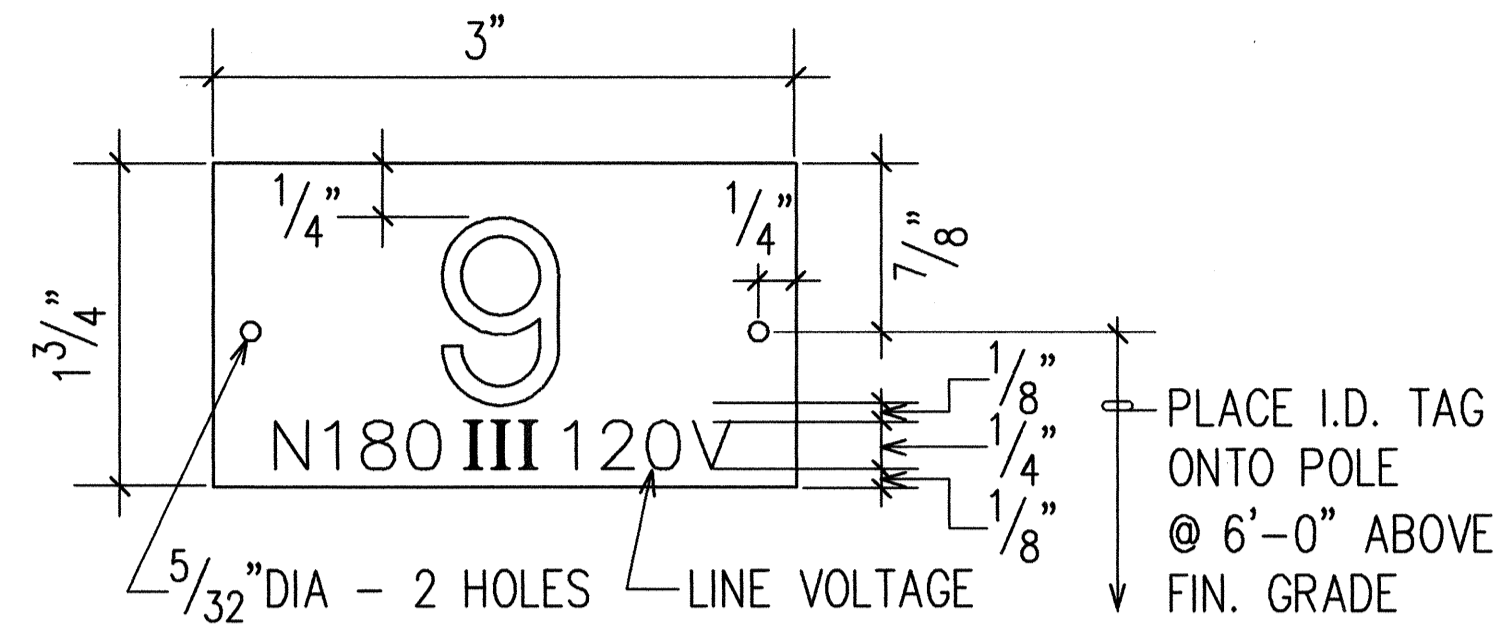
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-011-1(22)	1999	14	14

STREET LIGHT NOTES:

- NO CHANGES WILL BE ALLOWED WITHOUT PRIOR APPROVAL FROM TRAFFIC DIVISION.
- ALL STREET LIGHT IDENTIFICATION TAG NUMBERING FOR METAL POLES SHALL START WITH "1" AND CONTINUE NUMERICALLY FOR EACH STREET IN THE SUBDIVISION. ALL STREET LIGHT I.D. TAG NUMBERING FOR WOODEN POLES SHALL BE IN ACCORDANCE WITH HELCO'S NUMBERING SYSTEM.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SECONDARY CIRCUIT EXTENSIONS TO THE NEAREST HELCO SECONDARY.
- IF THE STREET LIGHTS ARE INSTALLED BEFORE HELCO INSTALLS THEIR SECONDARY, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND INFORMING HELCO OF STREET LIGHT LOCATIONS AND POLE CONTACTS.
- THE CONTRACTOR SHALL ARRANGE AND ASSUME COSTS TO ENERGIZE STREET LIGHTS A MINIMUM OF 6 HOURS FOR FINAL INSPECTION.
- THE CONTRACTOR SHALL INSCRIBE THE MONTH AND YEAR OF INSTALLATION OF PHOTOCELLS AND LAMPS. ALL P.E.'S SHALL HAVE THE NORTH INDEX FACING NORTH.
- ALL LABOR AND MATERIALS SHALL BE WARRANTED FOR A MINIMUM OF ONE YEAR FROM DATE OF DEDICATION TO THE COUNTY.
- FOR STREET LIGHTS CONNECTED TO UNDERGROUND WIRING, CONTRACTOR SHALL REMOVE ALL FUSES AFTER TESTING, AND GIVE THE FUSES TO THE TRAFFIC DIVISION.
- ACCEPTABLE STREET LIGHT MATERIALS:

LUMINAIRES: SHALL BE COMPLETE WITH P.E. RECEPTACLE AND 120-240 VOLT HPF BALLAST. AMERICAN ELECTRIC SRX 55, SP2 90, SP2 135, & SP2 180 WITH POLYCARBONATE SEMI-CUTOFF LENS.

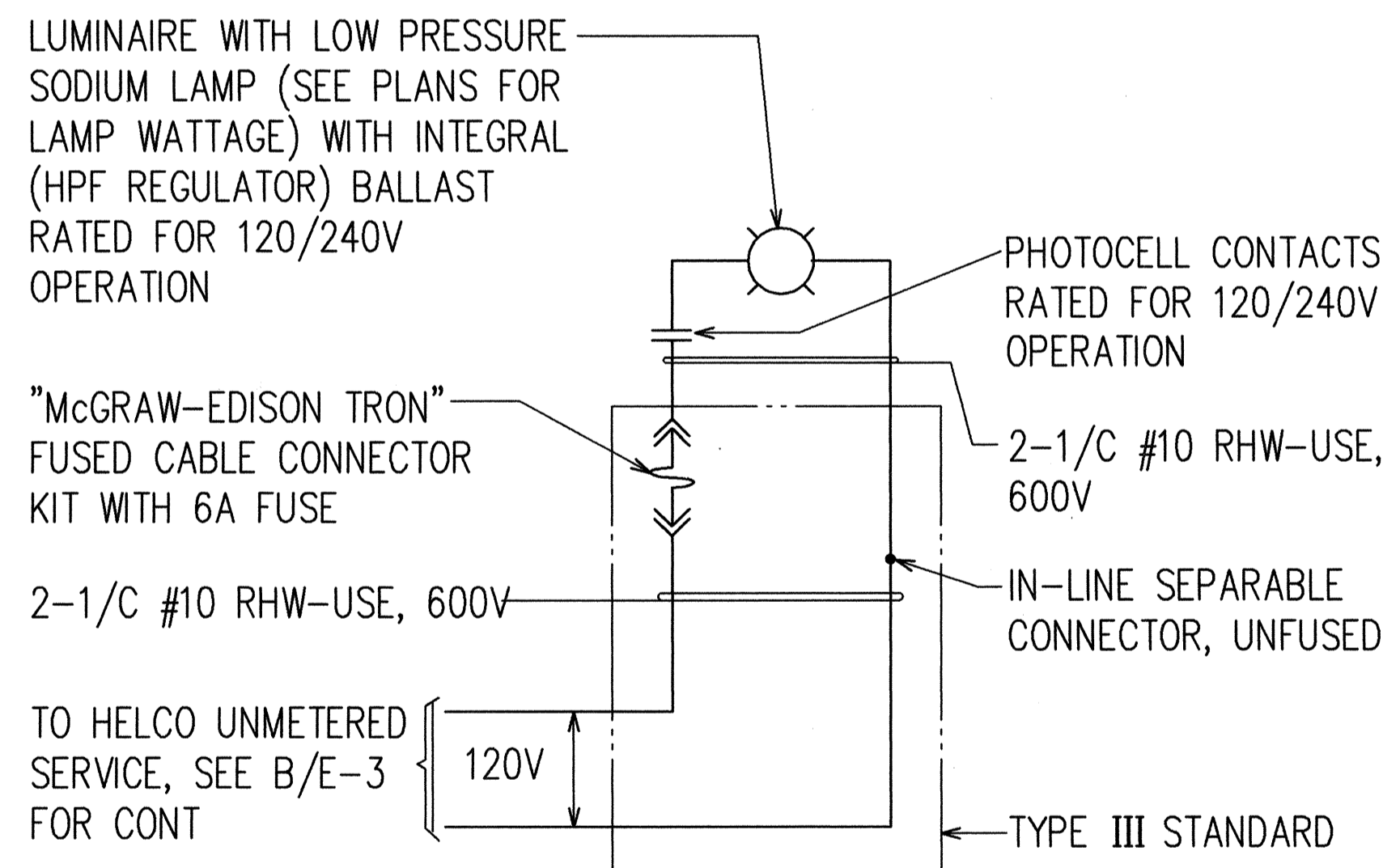
PHOTOCELLS: SHALL BE COMPLETELY SOLID STATE. PHOTOCELLS SHALL FAIL IN "ON" POSITION AND SHALL BE SILICON JUNCTION TYPE; NO CADMIUM SULFIDE CELLS WILL BE ACCEPTED. ALR SST PV.
- A SCALED DRAWING OF STREET LIGHT LOCATIONS (PREFER ON ONE SHEET) AND DETAILS OF FIXTURE MOUNTING, LUMINAIRE TYPE, ARM LENGTH, IDENTIFICATION TAGS, AND IF CONNECTED TO UNDERGROUND WIRING, CIRCUITS, FOUNDATION, BASE AND POLE, SHALL BE SUBMITTED TO THE TRAFFIC DIVISION AFTER PLAN APPROVAL AND BEFORE CONSTRUCTION BEGINS.
- SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BY THE TRAFFIC DIVISION.
- ALL STREET LIGHT(S) REQUIRED ON EXISTING POLE(S) SHALL BE INSTALLED BY THE TRAFFIC DIVISION AT A COST OF \$1,500 PER LIGHT. DEVELOPER WILL SUBMIT A CHECK PAYABLE TO THE FINANCE DIRECTOR TO THE TRAFFIC DIVISION ALONG WITH THE SUBDIVISION NUMBER, DPW FOLDER NUMBER, TAX MAP KEY, AND POLE NUMBER(S).
- WHEN STREET LIGHTS ARE INSTALLED ON ROADWAYS UNDER STATE JURISDICTION, SHOP DRAWINGS SHALL ALSO BE SUBMITTED TO THE STATE D.O.T FOR APPROVAL. TRAFFIC DIVISION WILL INSTALL STREET LIGHT ON EXISTING POLE(S), WITH COST DEPENDENT ON HEIGHT OF POLE.
- ALL STREET LIGHTS CONNECTED TO UNDERGROUND WIRING SHALL BE GROUNDED TO PROVIDE A MINIMUM 25 OHMS TO GROUND. THE CONTRACTOR SHALL MEASURE AND RECORD GROUND RESISTANCE AT EACH STANDARD AND SUBMIT A LIST TO THE COUNTY (UNDERGROUND CIRCUITS ONLY).
- ALL WORK SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE.



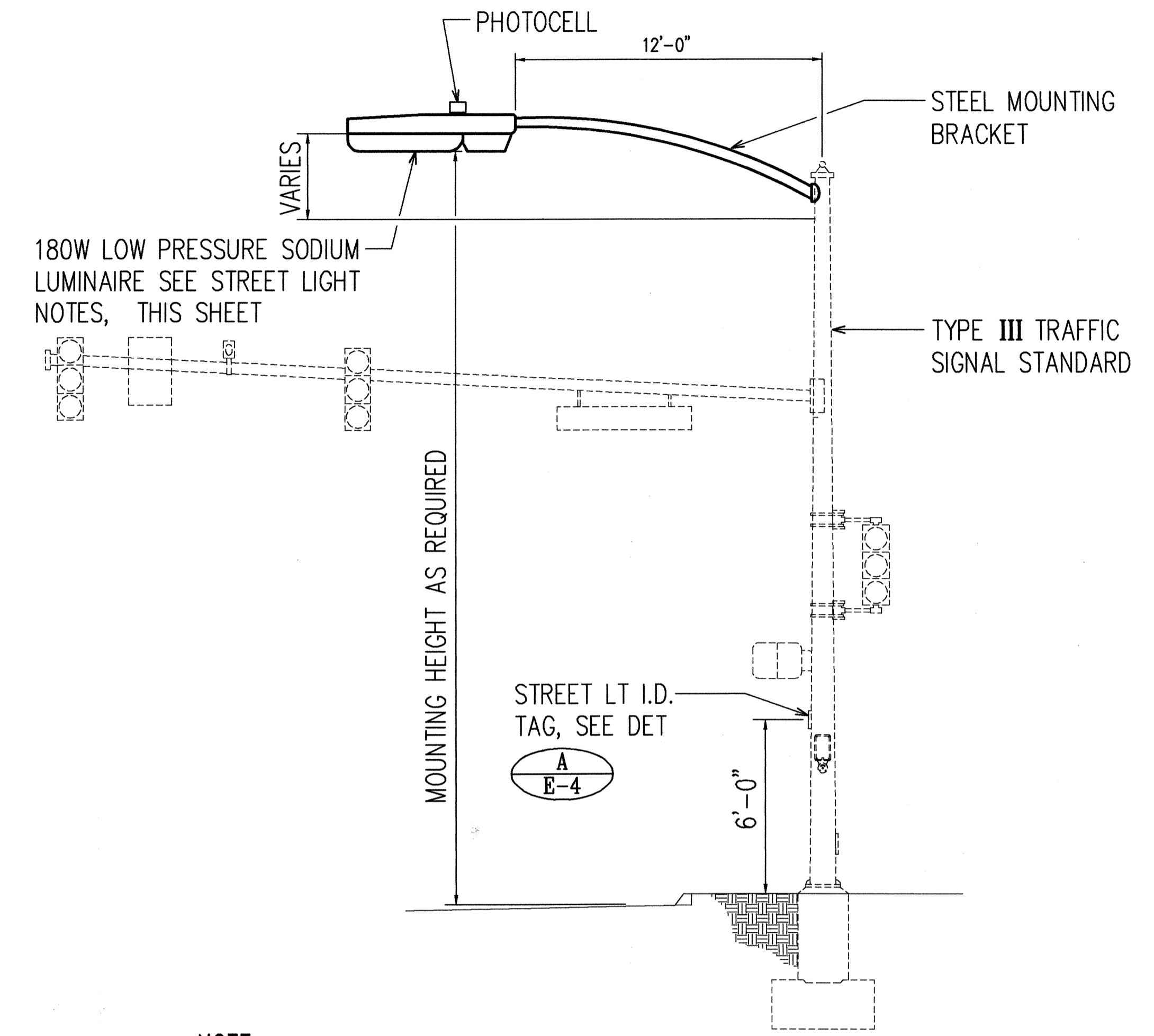
NOTES: (FOR METAL POLES ONLY)

- USE 2 PLY PLASTIC - BLACK, WHITE.
- NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED 1/8" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
- NOMENCLATURE SIZE SHALL BE 1/4" HIGH AND ENGRAVED 1/32" WIDE, WHITE IN COLOR (WATTAGE IES DISTRIBUTION AND VOLTAGE AS REQUIRED).
- ATTACH TO STEEL POLES WITH NO. 7 CADMIUM PLATE DRIVE SCREWS. (a) ATTACH TO ALUMINUM POLE WITH NO. 7 ALUMINUM DRIVE SCREWS.
- USE "N" FOR SODIUM LAMPS

A STREET LIGHT I.D. TAG DETAIL
E-4 NOT TO SCALE

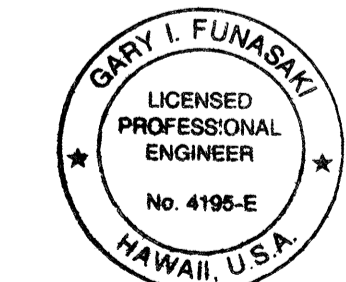


B TYPICAL SINGLE STREET LIGHT LUMINAIRE CONNECTION DIAGRAM
E-4



NOTE:
SEE TRAFFIC SIGNAL PLANS FOR TRAFFIC SIGNAL EQUIPMENT REQUIREMENTS.

C STREET LIGHT ELEVATION AT TYPE III TRAFFIC SIGNAL STANDARD
E-4 NOT TO SCALE



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 HAWAII ELECTRIC LIGHT COMPANY, INC.
 [Signature] 5/13/98 DATE
 GTE HAWAIIAN/TEL

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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STREET LIGHT NOTES; I.D. TAG DETAIL;
 CONNECTION DIAGRAM; ELEVATION
 KUAKINI HIGHWAY
 INSTALLATION OF TRAFFIC SIGNALS AT
 SEA VIEW CIRCLE
 FAP NO. STP-011-1(22)
 SCALE: AS NOTED DATE: MARCH 1998

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