

GENERAL NOTES:

1. PROVIDE 5' MINIMUM CLEAR BETWEEN STREET LIGHT POLES & SEWER LATERALS.
2. PROVIDE 3' MINIMUM CLEAR BETWEEN PULLBOXES & SEWER LATERALS.
3. PROVIDE 6' MINIMUM CLEAR BETWEEN TRANSFORMER PADS & SEWER LATERALS (DO NOT STRADDLE).
4. PROVIDE 3' MINIMUM CLEAR BETWEEN DUCTLINES & SEWER LINES.
5. CONTRACTOR SHALL VERIFY SEWER LATERAL LOCATIONS WITH CIVIL SHEETS.
6. PROVIDE 8' MINIMUM HORIZONTAL CLEAR & 18" VERTICAL CLEAR BETWEEN WATER LINES & ALL ELECTRICAL SYSTEMS.
7. CONTRACTOR SHALL BE RESPONSIBLE TO ARRANGE WITH THE GENERAL CONTRACTOR TO IDENTIFY THE LOCATIONS OF CIVIL SITE UTILITIES, DRIVEWAYS, ETC. PRIOR TO ELECTRICAL CONTRACTORS LAYOUT OF ELECTRIC, TELEPHONE, STREET LIGHT, TRAFFIC SIGNAL, AND CATV SYSTEMS.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	STREET LIGHT, 55W LOW PRESSURE SODIUM LUMINAIRE, GALVANIZED STEEL POLE & BRACKET ARM, SEE DETAIL A/E-19		HELCO 17' X 30' PULLBOX
	STREET LIGHT, 180W LOW PRESSURE SODIUM LUMINAIRE, GALVANIZED STEEL POLE & BRACKET ARM, SEE DETAIL A/E-19		HELCO 2' X 3' PULLBOX
	STREET LIGHT, 180W LOW PRESSURE SODIUM LUMINAIRE, GALVANIZED STEEL POLE & BRACKET ARM, SEE DETAIL A/E-23		HELCO 2' X 4' PULLBOX
	EXISTING STATE STREET LIGHT		HELCO 3' X 5' PULLBOX
	EXISTING COUNTY STREET LIGHT		HELCO 4' X 6' PULLBOX
	REMOVE & RELOCATE EXISTING STREET LIGHT & BRACKET ARM, DEMOLISH EXST. CONC. BASE 2 FT. BELOW FINISH GRADE		EXST HELCO 5' X 7' HANDHOLE
			EXST HELCO 6' X 11' MANHOLE
			SIC COM 30' X 48' HANDHOLE
			SIC COM 3' X 5' MANHOLE
			SIC COM 4' X 6' MANHOLE
			3/8' X 8' GROUND ROD
			EXST HAWAIIAN TELCOM HANDHOLE
			EXST HAWAIIAN TELCOM MANHOLE
			EXST SANDWICH ISLES MANHOLE
	GROUND ROD, 5/8" DIA. X 8'-0" (BMZ)		STREET LIGHT PULLBOX, SEE DETAIL A/E-18
	BREAKLINE TO BEGIN & END DUCT SECTION TYPE		2' X 4' STREET LIGHT PULLBOX
	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; INDICATES TYPE "A" DUCT SECTION WITH "2-2E" DUCTS. SEE SHEET E-15 & E-16 FOR DUCT SECTIONS AND CONDUIT SCHEDULES		
	STUB, CAP, & MARK CONDUIT(S) WITH CONCRETE MARKER, SEE DETAIL F/E-17		
	SAWCUT EXST. A.C. PAVEMENT, CONC. SIDEWALK, CURB & GUTTER PRIOR TO TRENCH EXCAVATION. RESTORE SUBBASE, BASECOURSE, PAVEMENT, CONC. SIDEWALK, CURB & GUTTER PER CITY REQUIREMENTS, THICKNESS SHALL MATCH EXST ROAD DESIGN		
	STREET LIGHT DUCTS & WIRING		
	TRAFFIC SIGNAL DUCT & PULLWIRE		HELCO TRANSFORMER PAD LOT, 6' X 7' EASEMENT & CONCRETE PAD, SEE DETAIL E/E-17
	EXST. UNDERGROUND DUCTLINE & WIRING		EXST. HELCO SWITCHING EASEMENT PAD LOT
	EXST. UNDERGROUND TEL. CABLES		
	EXST. UNDERGROUND STREET LIGHT CABLES & CONDUITS		
	EXST. UNDERGROUND TRAFFIC SIGNAL CONDUITS		
	NON METERED COUNTY STREET LIGHT I.D. TAG, 1 = LIGHT NO., SEE DETAIL C/E-19		CONCRETE STUB OUT MARKER, SEE DETAIL F/E-17
	NON METERED STATE STREET LIGHT I.D. TAG, 1 = LIGHT NO., SEE DETAIL C/E-23		

NOTES FOR CONSTRUCTION

- a. 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 PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT UNDER ANY OVERHEAD LINES.
- b. THE CONTRACTOR IS TO COMPLY WITH THE DIRECTIONS OF THE STATE OF HAWAII OCCUPATIONAL SAFETY AND HEALTH LAW (DOSH).
- c. 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.
- d. AS REQUIRED BY THE CITY AND COUNTY OF HONOLULU, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
- e. WHERE PEDESTRIAN WALKWAYS EXIST, SUCH WALKWAYS SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
- f. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHT-OF-WAYS ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
- g. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN BY THE ENGINEER TO EXIST FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

SANDWICH ISLES COMMUNICATIONS, INC

DATE

DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII ELECTRICAL SYMBOLS, LOCATION MAP, SITE PLAN Approved: COUNTY ENGINEER, DPW, COUNTY OF HAWAII AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

SHEET E-1 OF SHEETS

AS-BUILT

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9 MAY 2011  
ELECTRICAL SYMBOLS



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HAWAII ELECTRIC LIGHT COMPANY (HELCO) NOTES

1. LOCATION OF HELCO FACILITIES

THE LOCATION OF HELCO'S 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 VERIFY IN THE FIELD THE LOCATIONS OF THE FACILITIES AND SHALL EXERCISE PROPER CARE IN EXCAVATING AND WORKING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES AND UTILITY CROSSINGS ARE SHOWN, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS AND CROSSINGS TO VERIFY THE DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HELCO'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.

2. COMPLIANCE WITH HAWAII OCCUPATIONAL SAFETY AND HEALTH LAWS

THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, THOSE RELATED TO WORKING ON OR NEAR EXPOSED OR ENERGIZED ELECTRICAL LINES AND EQUIPMENT.

3. EXCAVATION PERMIT

THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HELCO'S TECHNICAL DIVISION, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. PLEASE REFER TO OUR REQUEST NUMBER AT THAT TIME.

4. CAUTION!!! ELECTRICAL HAZARD!!!

EXISTING HELCO OVERHEAD AND UNDERGROUND LINES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION UNLESS PRIOR SPECIAL ARRANGEMENTS HAVE BEEN MADE WITH HELCO. ONLY HELCO PERSONNEL ARE TO HANDLE THESE ENERGIZED LINES AND ERECT TEMPORARY GUARDS TO PROTECT THESE LINES FROM DAMAGE. THE CONTRACTOR SHALL WORK CAUTIOUSLY AT ALL TIMES TO AVOID ACCIDENTS AND DAMAGE TO EXISTING HELCO FACILITIES, WHICH CAN RESULT IN ELECTROCUTION.

5. OVERHEAD LINES

STATE LAW REQUIRES THAT A WORKER AND THE LONGEST OBJECT HE OR SHE MAY CONTACT CANNOT COME CLOSER THAN A MINIMUM RADIAL CLEARANCE OF 10 FEET WHEN WORKING CLOSE TO OR UNDER ANY OVERHEAD LINES RATED 50KV AND BELOW. FOR EACH ADDITIONAL 1KV ABOVE 50KV, AN ADDITIONAL 0.4 INCH SHALL BE ADDED TO THE 10- FOOT CLEARANCE REQUIREMENT. THE PRECEDING INFORMATION ON LINE CLEARANCE REQUIREMENTS IS PROVIDED AS A CONVENIENCE AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE INFORMED OF AND COMPLY WITH ANY REVISIONS OR AMENDMENTS TO THE LAW.

SHOULD THE CONTRACTOR ANTICIPATE THAT HIS WORK WILL RESULT IN THE NEED TO ENCR OACH WITHIN THE MINIMUM REQUIRED CLEARANCE AT ANY TIME, THE CONTRACTOR SHALL NOTIFY HELCO AT LEAST FOUR (4) WEEKS PRIOR TO THE PLANNED ENCR OACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE, DE- ENERGIZE, OR BLANKET HELCO LINES) CAN BE PUT IN PLACE. HELCO'S COST OF SAFEGUARDING ITS LINES WILL BE CHARGED TO THE CONTRACTOR.

CONTACT HELCO'S CUSTOMER INSTALLATIONS DEPARTMENT AT 543-7846 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

REFER TO SECTION X OF HELCO'S ELECTRIC SERVICE INSTALLATION MANUAL FOR ADDITIONAL GUIDELINES WHEN WORKING AROUND HELCO'S FACILITIES. A COPY MAY BE OBTAINED FROM HELCO'S CUSTOMER INSTALLATIONS DEPARTMENT.

6. POLE BRACING

A MINIMUM CLEARANCE OF 10 FEET MUST BE MAINTAINED WHEN EXCAVATING AROUND UTILITY POLES AND/OR THEIR ANCHOR SYSTEM TO PREVENT WEAKENING OR POLE SUPPORT FAILURE. SHOULD WORK REQUIRE EXCAVATING WITHIN 10 FEET OF A POLE AND/OR ITS ANCHOR SYSTEM, THE CONTRACTOR SHALL PROTECT, SUPPORT, SECURE, AND TAKE ALL OTHER PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF THESE POLES. THE CONTRACTOR IS RESPONSIBLE FOR ALL ASSOCIATED COSTS TO BRACE, REPAIR, OR STRAIGHTEN POLES. ALL MEANS OF STRUCTURAL SUPPORT FOR THE POLE PROPOSED BY THE CONTRACTOR SHALL FIRST BE REVIEWED BY HELCO BEFORE IMPLEMENTATION. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HELCO CONSTRUCTION AND MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT A MINIMUM OF TWO (2) WEEKS IN ADVANCE.

7. UNDERGROUND LINES

THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES. HELCO'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HELCO PERSONNEL ARE TO BREAK INTO EXISTING HELCO FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HELCO'S ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF ITS UNDERGROUND LINES WILL BE CHARGED TO THE CONTRACTOR. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HELCO'S 138KV UNDERGROUND LINES (SEE HELCO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HELCO'S UNDERGROUND 138KV LINES" FOR DETAILED REQUIREMENTS).

FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL HELCO'S UNDERGROUND DIVISION A MINIMUM OF 72 HOURS IN ADVANCE.

FOR ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE LINES, THE CONTRACTOR SHALL CALL HELCO'S CONSTRUCTION & MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT, A MINIMUM OF TWO (2) WEEKS IN ADVANCE.

8. UNDERGROUND FUEL PIPELINES

THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HELCO'S UNDERGROUND FUEL OIL PIPELINES. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HELCO'S UNDERGROUND FUEL OIL PIPELINES (SEE HELCO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HELCO'S UNDERGROUND FUEL PIPELINES" FOR DETAILED REQUIREMENTS).

9. EXCAVATIONS

WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HELCO'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR:

- a) SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE AND TO PREVENT POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENTS.
- b) PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNINGS TO FULLY PROTECT IT FROM DAMAGE.
- c) BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DEPARTMENT FOR THERMAL BACKFILL SPECIFICATIONS).

10. RELOCATION OF HELCO FACILITIES

ANY WORK REQUIRED TO RELOCATE OR MODIFY HELCO FACILITIES SHALL BE DONE BY HELCO, OR BY THE CONTRACTOR UNDER HELCO'S SUPERVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HELCO'S WORK, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, EXCAVATION AND BACKFILL, PERMITS AND TRAFFIC CONTROL, BARRICADING, AND RESTORATION OF PAVEMENT, SIDEWALKS, AND OTHER FACILITIES.

ALL COSTS ASSOCIATED WITH ANY RELOCATION OR MODIFICATION (EITHER TEMPORARY OR PERMANENT) FOR THE CONVENIENCE OF THE CONTRACTOR, OR TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS SHALL BE BORNE BY THE CONTRACTOR.

11. CONFLICTS

ANY REDESIGN OR RELOCATION OF HELCO'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HELCO IS NOT RESPONSIBLE FOR ANY DELAY OR DAMAGE THAT MAY ARISE AS A RESULT OF ANY CONFLICTS DISCOVERED OR IDENTIFIED WITH RESPECT TO THE LOCATION OR CONSTRUCTION OF HELCO'S ELECTRICAL FACILITIES IN THE FIELD, REGARDLESS OF WHETHER THE CONTRACTOR HAS MET THE REQUESTED MINIMUM ADVANCE NOTICES. IN ORDER TO MINIMIZE ANY DELAY OR IMPACT ARISING FROM SUCH CONFLICTS, HELCO SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.

12. DAMAGE TO HELCO FACILITIES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HELCO SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HELCO'S FACILITIES AS A RESULT OF HIS OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES TO HELCO'S TROUBLE DISPATCHER. REPAIR WORK SHALL BE DONE BY HELCO OR BY THE CONTRACTOR UNDER HELCO'S SUPERVISION COSTS FOR DAMAGES TO HELCO'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HELCO'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HELCO'S HONOLULU POWER PLANT SHIFT SUPERVISOR (A 24-HOUR NUMBER) SO HELCO PERSONNEL CAN SECURE THE DAMAGED SECTION AND REPORT ANY OIL SPILLS TO THE PROPER AUTHORITIES. ALL COSTS ASSOCIATED WITH THE DAMAGE, REPAIR, AND OIL SPILL CLEANUP SHALL BE BORNE BY THE CONTRACTOR.

13. HELCO STAND-BY PERSONNEL

THE CONTRACTOR MAY REQUEST HELCO TO PROVIDE AN INSPECTOR TO STAND-BY DURING CONSTRUCTION NEAR HELCO'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR.

THE CONTRACTOR SHALL CALL THE HELCO CONSTRUCTION AND MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT A MINIMUM OF 5 WORKING DAYS IN ADVANCE TO ARRANGE FOR HELCO STAND-BY PERSONNEL.

14. CLEARANCES

THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HELCO'S DUCTLINE AND ALL ADJACENT STRUCTURES (CHARTED AND UNCHARTED) IN THE TRENCH:

STRUCTURE TYPE	MINIMUM CLEARANCE(INCHES)
WATER LINES, PARALLEL	36 (A)
WATER LINES, CROSSING	12 (B)
SEWER LINES, PARALLEL	36 (C)
SEWER LINES, CROSSING	24 (D)
DRAIN LINES, PARALLEL	12
DRAIN LINES, CROSSING	6 (E)
ELECTRICAL AND GAS LINES, PARALLEL	12
ELECTRICAL AND GAS LINES, CROSSING	12
TELEPHONE LINES, PARALLEL	6 (E)
TELEPHONE LINES, CROSSING	6 (E)
CHEVRON OIL LINES, PARALLEL	36
CHEVRON OIL LINES, CROSSING	48 BELOW OIL LINE (F)

- A. THE MINIMUM HORIZONTAL CLEARANCES TO WATER LINES PARALLEL TO ELECTRICAL DUCTLINES MUST BE INCREASED TO 60 INCHES IF THE WATER LINE IS GREATER THAN 16 INCHES IN DIAMETER
- B. THE MINIMUM VERTICAL CLEARANCES TO WATER LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 6 INCHES IF THE ELECTRICAL DUCTLINE STRUCTURE IS CONCRETE ENCASED AND IS BELOW THE WATER LINE AND THE WATER LINE IS LESS THAN 16 INCHES IN DIAMETER.
- C. A MINIMUM HORIZONTAL CLERANCE OF 36 INCHES IS REQUIRED BETWEEN NEW HANDHOLES AND EXISTING SEWER LATERALS.
- D. THE MINIMUM VERTICAL CLEARANCES TO SEWER PIPES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 12 INCHES IF THE SEWER PIPE IS JACKETED IN CONCRETE.
- E. THE MINIMUM CLEARANCES SHALL BE INCREASED TO 12 INCHES IF THE ELECTRICAL DUCTLINE IS DIRECT BURIED.
- F. THE MINIMUM VERTICAL CLEARANCES TO OIL LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 24 INCHES BELOW OIL LINES IF THE CROSSINGS ARE ENCASED IN 6 INCHES OF CONCRETE.
- G. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER & HELCO OF ANY HEAT SOURCES (POWER CABLE DUCT BANK, STEAMLINE, ETC.) ENCOUNTERED THAT ARE NOT PROPERLY IDENTIFIED ON THE DRAWING.

THE FOLLOWING CLEARANCE SHALL BE MAINTAINED BETWEEN HELCO'S FUEL OIL PIPELINES AND ALL ADJACENT STRUCTURES: 24-INCHES, PARALLEL OR CROSSING. THE MINIMUM CLEARANCE CAN BE REDUCED TO 12 INCHEL (PARALLEL AND BELOW ONLY) IF THE STRUCTURE IS JACKETED IN CONCRETE.

15. INDEMNITY

THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HELCO FROM AND AGAINST ALL LOSSES, DAMAGES, CLAIMS, AND ACTIONS, INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEY'S FEES AND COSTS BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTION OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY BASED UPON THE SOLE NEGLIGENCE OF HELCO.

16. SCHEDULE

CONTRACTOR SHALL FURNISH HIS CONSTRUCTION SCHEDULE \_\_\_ WORKING DAYS PRIOR TO STARTING WORK ON HELCO FACILITIES. CONTRACTOR SHALL GIVE HELCO, IN WRITING \_\_\_ WORKING DAYS NOTICE TO PROCEED WITH HELCO'S PORTION OF WORK.

17. AUTHORITY

ALL CONSTRUCTION, RESTORATION WORK, AND INSPECTION SHALL BE SUBJECT TO WHICHEVER GOVERNMENTAL AGENCY HAS AUTHORITY OVER THE WORK.

18. SPECIFICATIONS

CONSTRUCTION OF HELCO'S UNDERGROUND FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISIONS OF HELCO SPECIFICATIONS CS7001, CS7003, CS7202, CS9301, AND CS9401 AND APPLICABLE HELCO STANDARDS.

19. CONSTRUCTION

CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES TO PROPERLY PERFORM AND FULLY COMPLETE ALL WORK SHOWN ON THE CONTRACT, DRAWINGS, AND SPECIFICATIONS. ALL MATERIALS SHALL BE NEW AND MANUFACTURED IN THE UNITED STATES OF AMERICA. ALL MANHOLE, HANDHOLE, AND DUCTLINE INSTALLATIONS SHALL BE INSPECTED AND APPROVED BY HELCO PRIOR TO EXCAVATION AND PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL NOTIFY HELCO'S INSPECTION DIVISION AT 543-4356 AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE.

CONTRACTOR TO COORDINATE WORK TO BREAK INTO HELCO'S EXISTING ELECTRICAL FACILITIES WITH HELCO'S UNDERGROUND DIVISION AT 543-7871 AT LEAST 10 WORKING DAYS IN ADVANCE.

20. STAKEOUT

THE CONTRACTOR SHALL ARRANGE FOR TONEOUTS OF ALL UNDERGROUND FACILITIES AND SHALL STAKEOUT ALL PROPOSED HELCO FACILITIES WITHIN THE PROJECT AREA SO AS TO NOT CONFLICT WITH ANY UTILITY (EXISTING OR PROPOSED) AND ANY PROPOSED CONSTRUCTION OR IMPROVEMENT WORK FOR VERIFICATION BY HELCO BEFORE PROCEEDING WITH HELCO WORK.

21. DUCTLINES

ALL DUCTLINE INSTALLATIONS SHALL BE PVC SCHEDULE 40 ENCASED IN CONCRETE, UNLESS OTHERWISE NOTED. ALL COMPLETED DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR IN THE PRESENCE OF HELCO'S INSPECTOR USING HELCO'S STANDARD PRACTICE. THE CONTRACTOR SHALL INSTALL A 1/8" POLYOLEFIN PULL LINE IN ALL COMPLETED DUCTLINES AFTER MANDREL TESTING IS COMPLETE.

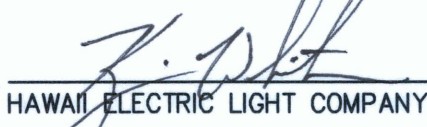
22. JOINT POLE REMOVAL

THE LAST JOINT POLE OCCUPANT OFF THE POLES SHALL REMOVE THE POLES.

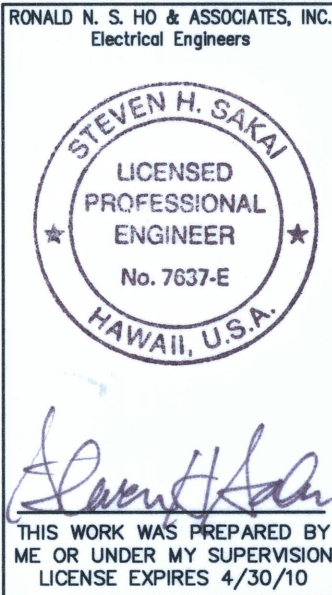
23. AS-BUILT PLANS

THE CONTRACTOR SHALL PROVIDE HELCO WITH TWO SETS OF AS-BUILT REPRODUCIBLE TRACINGS SHOWING THE OFFSETS, STATIONING, AND VERTICAL ELEVATION OF THE DUCT LINE(S) CONSTRUCTED.

APPROVED BY:

  
HAWAII ELECTRIC LIGHT COMPANY

5-28-09  
DATE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
HELCO NOTES			
Approved: COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

AS-BUILT



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HAWAIIAN TELCOM (HTCO) NOTES

1. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
2. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT AND TONING REQUEST FROM HAWAIIAN TELCOM'S EXCAVATION PERMIT SECTION LOCATED AT 3239 UALENA ST., 3RD FLR., TWO WEEKS PRIOR TO THE START OF CONSTRUCTION. HOURS OF BUSINESS ARE: 8:00 AM TO 11:00 AM AND 12:00 PM TO 3:30 PM MONDAY THRU FRIDAY, EXCEPT HOLIDAYS.
3. PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST HAWAIIAN TELCOM TO LOCATE EXISTING DUCTLINE WHEREVER REQUIRED. FOR UNDERGROUND CABLE LOCATING AND MARKING, FIVE (5) WORKING DAYS ADVANCE NOTICE IS REQUIRED. THREE (3) WORKING DAYS ADVANCE NOTICE IS REQUIRED FOR ANY INSPECTION BY A DESIGNATED REPRESENTATIVE.
4. THE LOCATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION AND SHALL MAINTAIN PROPER CLEARANCES WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HAWAIIAN TELCOM FACILITIES. THE CONTRACTOR SHALL VERIFY THEIR LOCATION AND SHALL BE LIABLE FOR ANY DAMAGES TO HAWAIIAN TELCOM FACILITIES. ANY DAMAGES SHALL BE REPORTED IMMEDIATELY TO HAWAIIAN TELCOM'S REPAIR SECTION AT #611 (24 HOURS) OR TO THE EXCAVATION PERMIT SECTION AT 840-1444 (NORMAL WORKING HOURS, MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS). AS A RESULT OF HIS OPERATIONS, ADJUSTMENTS TO THE NEW DUCTLINE ALIGNMENT, IF REQUIRED, SHALL BE MADE TO PROVIDE REQUIRED CLEARANCES.
5. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. A HAWAIIAN TELCOM INSPECTOR OR DESIGNATED REPRESENTATIVE IS REQUIRED TO BE AT ANY JOB SITE WHENEVER THERE WILL BE BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAIN HAWAIIAN TELCOM FACILITIES. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHENEVER NECESSARY.
6. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM'S INSPECTOR OR DESIGNATED REPRESENTATIVE A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION, BRACING OR BACKFILLING OF HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
7. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "HAWAIIAN TELCOM STANDARD SPECIFICATIONS FOR PLACING UNDERGROUND TELEPHONE SYSTEMS" DATED MARCH 1999. ALL SUBSEQUENT AMENDMENTS AND ADDITION, AND ALL OTHER PERTINENT STANDARD FOR TELEPHONE CONSTRUCTION. CONTRACTOR SHALL FAMILIARIZE HIS PERSONNEL BY OBTAINING APPLICABLE SPECIFICATIONS.
8. WHEN EXCAVATION IS ADJACENT TO OR BENEATH HAWAIIAN TELCOM'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL:

A) SHEET AND/OR BRACE THE EXCAVATION TO PREVENT SLIDES, CAVE-INS OR SETTLEMENT ENSURING NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.

B) PROTECT EXISTING STRUCTURES AND/OR FACILITIES WITH BEAMS, STRUTS OR UNDERPINNINGS WHILE EXCAVATING BENEATH THEM TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
9. THE CONTRACOTR SHALL BRACE ALL POLES OR LIGHT STANDARD NEAR THE NEW DUCTLINE, MANHOLE, OR HANDHOLE DURING HIS OPERATIONS.
10. THE CONTRACTOR SHALL SAW-CUT A.C. PAVEMENT AND CONCRETE GUTTER WHEREVER NEW MANHOLES, HANDHOLES, OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.
11. THE CONTRACTOR SHALL COMPLY WITH THE POLICY ADOPTED BY THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, CONCERNING THE REPLACEMENT OF CONCRETE SIDEWALKS AFTER EXCAVATION WORK.
12. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINE AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATONS AND DEPTH PRIOR TO EXCAVATION FOR THE NEW LINES.
13. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATIONS AND DEPTHS.
14. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE COST FOR SUPPLEMENTARY MEASURES, WHICH WILL BE REQUIRED BY THE CITY AND COUNTY, SHALL BE BORNE BY THE CONTRACTOR.
15. THE CONTRACTOR SHALL PUMP ALL MANHOLES DRY DURING FINAL INSPECTION.
16. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM INSPECTOR 24 HOURS PRIOR TO POURING OF CONCRETE OR BACKFILLING.
17. WHEN CONNECTING TO MANHOLE WALLS, ALL EXISTING REINFORCING BARS SHALL BE LEFT INTACT. DUCTS SHALL BE ADJUSTED IN THE FIELD IN ORDER TO CLEAR REINFORCING.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT ALL REQUIRED LINES AND GRADES AND SHALL PRESERVE ALL BENCH MARKS AND WORKING POINTS NECESSARY TO LAY OUT THE WORK CORRECTLY. THE NEW DUCTLINE SHALL BE ADJUSTED BY THE CONTRACTOR TO SUIT THE EXISTING CONDITONS AND THE DETAILS AS DESCRIBED IN THE PLANS.

19. MINIMUM CONCRETE STRENGTH SHALL BE:

FOR DUCTLINE 2500 PSI AT 28 DAYS

FOR MANHOLE 3000 PSI AT 28 DAYS OR AS SPECIFIED IN DESIGN NOTES
20. BENDS IN THE DUCT ALIGNMENT, DUE TO CHANGES IN GRADE SHALL HAVE A MINIMUM RADIUS OF 25 FEET. ALL 90 DEGREE C-BENDS AT A POLE OR AT THE BULDING FLOOR SLAB PENETRATION, SHALL HAVE A BEND RADIUS OF TEN TIMES THE DIAMETER OF THE DUCT OR GREATER.
21. AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL WITH A SQUARE FRONT NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF 1/4" LESS THAN THE INSIDE DIAMETER OF THE DUCT, SHALL BE PULLED THROUGH EACH DUCT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND OR GRAVEL HAVE BEEN LEFT INSIDE. DUCTS SHALL BE COMPLETELY DRY AND CLEAN.
22. ALL DUCTS AND CONDUITS SHALL HAVE AN 1800# POLYESTER MULE-TAPE (NEPTCO, WP1800P, HAWAIIAN TELCOM MATERIAL CODE NO. 571154) INSTALLED THROUGHOUT ITS ENTIRE LENGTH. ALL DUCTS SHALL BE CAPPED TO PREVENT ENTRY OF FOREIGN MATERIAL DURING CONSTRUCTION AND AT THE COMPLETION OF INSTALLATION.

OCEANIC TIME WARNER CABLE (CATV) NOTES

1. THE LOCATION OF CATV FACILITIES ARE BASICALLY WITHIN EXISTING CATV CONDUITS. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN CLOSE PROXIMITY OF CATV FACILITIES.
2. THE CONTRACTOR SHALL OBTAIN EXCAVATION PERMIT CLEARANCE FROM OCEANIC TIME WARNER CABLE'S ENGINEERING SECTION LOCATED AT 200 AKAMAINUI ST., MILILANI TECH. PARK. PHONE 625-8443.
3. ANY WORK REQUIRED TO RELOCATE CATV FACILITIES SHALL BE DONE BY OCEANIC TIME WARNER CABLE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION REQUIREMENTS AND ASSOCIATED APPLICABLE COSTS.
4. ANY DAMAGE TO CATV FACILITIES SHALL BE REPORTED IMMEDIATELY TO OCEANIC TIME WARNER CABLE'S REPAIR DISPATCH DEPARTMENT AT 625-8437.
5. CONTACT OCEANIC TIME WARNER CABLE INSPECTOR 72 HOURS PRIOR TO STARTING WORK ON CATV INFRASTRUCTURE. CALL MOKI PLACE AT 625-8378.
6. ALL CONDUITS SHALL ENTER THROUGH THE END OF THE PULLBOX AT 90 DEGREES TO THE WALL OF PULLBOX.
7. ALL ENTRANCES INTO THE PULLBOX SHALL BE GROUTED AROUND THE CONDUITS AND THE INSIDE SURFACES SHALL BE SMOOTH AND FLUSH WITH THE EXISTING WALL.
8. ALL 4" CONDUITS SHALL HAVE MULETAPE AND ALL OTHER SIZE CONDUITS SHALL HAVE PULLSTRING.
9. END BELS ARE REQUIRED ON ALL 4" AND 2" CONDUITS.
10. AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF 1/4" LESS THAN THE INSIDE DIAMETER OF DUCT SHALL BE PULLED THROUGH EACH DUCT.

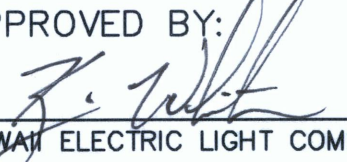
SANDWICH ISLES COMMUNICATIONS INC. (SIC) NOTES

1. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF SANDWICH ISLES COMMUNICATIONS INC. FOR THE FACILITIES WITHIN THEIR JURISDICTION.
2. THE CONTRACTOR SHALL CLOSELY COORDINATE ALL WORK WITH SIC. ALL TRENCHES MUST BE INSPECTED PRIOR TO BACKFILLING WITH CONCRETE OR BACKFILL MATERIAL.

THE CONTRACTOR SHALL NOTIFY THE SIC INSPECTOR AT LEAST 72 HOURS PRIOR TO POURING OF CONCRETE OR BACKFILLING.

3. ALL MATERIALS USED ON SIC PORTION OF THE PROJECT MUST BE ON THE RURAL UTILITIES SERVICE (RUS), UNITED STATES DEPARTMENT OF AGRICULTURE, LIST OF APPROVED MATERIALS.
4. STUBOUT CONDUITS FROM HANDHOLES TO INDIVIDUAL RESIDENTIAL LOTS SHALL BE 1" SCHEDULE 40 PVC, AND EXTENDED 5' BEYOND PROPERTY LINE. CAP AND SEAL ENDS AND MARK LOCATION WITH ABOVE GROUND MARKER.
5. SEE SHEET E-21 FOR ADDITIONAL NOTES.

APPROVED BY:



HAWAII ELECTRIC LIGHT COMPANY

DATE 5-28-09

OCEANIC TIME WARNER CABLE

DATE

HAWAIIAN TELCOM

DATE 5-6-09

SANDWICH ISLES COMMUNICATIONS, INC.

DATE

EQUIPMENT SCHEDULE

THE HAWAII ELECTRIC LIGHT Co., SANDWICH ISLES COMMUNICATIONS, INC., COMMUNITY ANTENNA TELEVISION & STREET LIGHTING PULLBOXES, HANDHOLE, TRANS-FORMER PAD LOTS & SWITCHING EQUIPMENT PAD LOTS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS SHOWN IN THESE DRAWINGS & IN ACCORDANCE WITH THE FOLLOWING STANDARD DRAWINGS:

TYPE	DESCRIPTION	TYPE	DESCRIPTION
13" X 24" HELCO PULLBOX	13" X 24" NON-CONCRETE PULLBOX, COVER WITH LOCKING DEVICE, PROVIDED IN ACCORD-ANCE WITH HECO STANDARD DRAWING NO. 30-2006.	4' X 6' COMMUNICATION MANHOLE	4'-0" X 6'-0" X 6'-1/4" REINFORCED CONCRETE MANHOLE WITH TRAFFIC RATED FRAME AND COVER PROVIDED IN ACCORDANCE WITH SANDWICH ISLES COMMUNICATIONS REQUIREMENTS, TYPE UM-4 X 6. VERIFY DEPTH OF MANHOLE.
17" X 30" HELCO PULLBOX	17" X 30" NON-CONCRETE PULLBOX, EXTENSION, EXTENSION, COVER WITH LOCKING DEVICE, PROVIDED IN ACCORDANCE WITH HECO STANDARD DRAWINGS NO. 30-2006 & 011314.	2' X 6' CATV PULLBOX	2'-0" X 6'-0" PRECAST CONCRETE PULLBOX WITH THREE PIECE POLYMER CONCRETE "SLIP-NOT" COVERS SIMILAR TO HTCO 2' X 6' PULLBOX, HTCO DRAWING NO. 34078, EXCEPT WITH "CATV" INSCRIBED ON COVER. 3 PRECAST CONCRETE PULLBOX SECTIONS SHALL BE REQUIRED AT EACH PULLBOX. PROVIDE ADDITIONAL BASE IF MORE THAN 2-4" CONDUITS ENTER THE "SHORT" END.
2' X 4' HELCO PULLBOX	2' X 4' PRECAST CONCRETE PULLBOX WITH PRECAST CONCRETE COVER, PROVIDED IN ACCORDANCE WITH HECO STANDARD DRAWING NO. 30-2005.	19" X 28" ST. LT. PULLBOX (CITY & COUNTY)	19" X 28" TYPE "SLD-1" PRECAST CONCRETE PULLBOX WITH CAST IRON FRAME AND COVER, PROVIDED IN ACCORDANCE WITH C&C OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES STANDARD DRAWINGS.
3' X 5' HELCO HANDHOLE	3' X 5' PRECAST CONCRETE HANDHOLE WITH PRECAST CONCRETE COVER, PROVIDED IN ACCORDANCE WITH HECO STANDARD DRAWING NO. 15501.	2' X 4' ST. LT. PULLBOX (CITY & COUNTY)	2' X 4' TYPE 435TB PRECAST CONCRETE PULLBOX WITH POLYMER CONCRETE COVERS, PROVIDED IN ACCORDANCE WITH HTCO. STANDARD DRAWING NO. 34056, EXCEPT WITH "C&C ST. LT." INSCRIBED ON COVERS. A MINIMUM OF 2 PRE-CAST CONCRETE PULLBOX SECTIONS SHALL BE REQUIRED AT EACH PULLBOX.
4' X 6' HELCO HANDHOLE	4' X 6' PRECAST CONCRETE HANDHOLE WITH PRECAST CONCRETE COVER, PROVIDED IN ACCORDANCE WITH HECO STANDARD DRAWING NO. 18842.	6' X 7' HELCO TRANSFORMER PAD LOT	6' X 7' TRANSFORMER PAD LOT WITH REIN-FORCED CONCRETE TRANSFORMER PAD AND GROUND ROD PER HECO STANDARD DRAWING NOS. 30-5001 & 011249.
6' X 11' HELCO MANHOLE	6' X 11' REINFORCED CONCRETE MANHOLE WITH TRAFFIC RATED FRAME AND COVER. PROVI-DED IN ACCORDANCE WITH HECO STANDARD DRAWING NO. 18775.	2' X 4' SECONDARY POWER PULLBOX	2' X 4' PRECAST CONCRETE PULLBOX WITH PRECAST CONCRETE COVER. SIMILAR TO HELCO TYPE WITH "ELECTRIC" INSCRIBED ON COVER.
30" X 48" COMMUNICATION HANDHOLE	2'-6" X 4'-0" X 3'-0" FIBRE REINFORCED PLASTIC HANDHOLE WITH NON-SKID SURFACE POLYMER CONCRETE 20K "TRAFFIC" RATED COVERS, "SIC" INSCRIBED ON COVERS. PROVIDED IN ACCORDANCE WITH SANDWICH ISLES COMMUNICATIONS REQUIREMENTS, TYPE UHC 30x48. VERIFY DEPTH OF HANDHOLE.		
3' X 5' COMMUNICATION MANHOLE	3'-9" X 5'-9" X 3'-7" REINFORCED CON-CRETE MANHOLE WITH TRAFFIC RATED FRAME AND COVERS, PROVIDED IN ACCORDANCE WITH SANDWICH ISLES COMMUNICATIONS REQUIREMENTS, TYPE UM-35. VERIFY DEPTH OF HANDHOLE.		

CONDUIT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
(2E)	HAWAII ELECTRIC LIGHT CO. 1-2"C	(4V)	CABLE TV 1-4"C
(2-2E)	HAWAII ELECTRIC LIGHT CO. 2-2"C		
(3-2E)	HAWAII ELECTRIC LIGHT CO. 3-2"C	(6-4I)	HAWAIIAN TELCOM 6-4"C
(6-2E)	HAWAII ELECTRIC LIGHT CO. 6-2"C		
(3E)	HAWAII ELECTRIC LIGHT CO. 1-3"C	(1/4)	STREET LIGHT 1-1 1/4"C
(2-3E)	HAWAII ELECTRIC LIGHT CO. 2-3"C	(1/2)	STREET LIGHT 1-1 1/2"C
(2-5E)	HAWAII ELECTRIC LIGHT CO. 2-5"C	(2L)	STREET LIGHT 1-2"C
		(3L)	STREET LIGHT 1-3"C
(4-1S)	SANDWICH ISLES COMM UD(2x2-1")		
(2-1S)	SANDWICH ISLES COMM UD(1x2-1")		
(2-4S)	SANDWICH ISLES COMM UD(1x2-4")		
(4-4S)	SANDWICH ISLES COMM UD(2x2-4")		

RONALD N. S. HO & ASSOCIATES, INC.  
Electrical Engineers

STEVEN H. SAKAI  
LICENSED PROFESSIONAL ENGINEER  
No. 7637-E  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
NOTES & SCHEDULES			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



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KEANALEHU DISTRIBUTION PLAN II  
SEE SHEET E-13

ELECTRICAL DISTRIBUTION PLAN I  
SEE SHEETS E-5

KEANALEHU DISTRIBUTION PLAN I  
SEE SHEET E-12

ELECTRICAL DISTRIBUTION PLAN III  
SEE SHEET E-7

KEANALEHU DISTRIBUTION PLAN III  
SEE SHEET E-14  
KEANALEHU DRIVE

ELECTRICAL DISTRIBUTION PLAN II  
SEE SHEET E-6

ELECTRICAL DISTRIBUTION PLAN IV  
SEE SHEET E-8

KEALAKEHE LIGHTING PLAN  
SEE SHEET E-22

KEALAKEHE PARKWAY  
PROJECT NO. DEV-12-93

ELECTRICAL DISTRIBUTION PLAN V  
SEE SHEET E-9

ELECTRICAL DISTRIBUTION PLAN VI  
SEE SHEET E-10

ELECTRICAL DISTRIBUTION PLAN VII  
SEE SHEET E-11

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

SANDWICH ISLES COMMUNICATIONS, INC

5-28-09

DATE

5-6-09

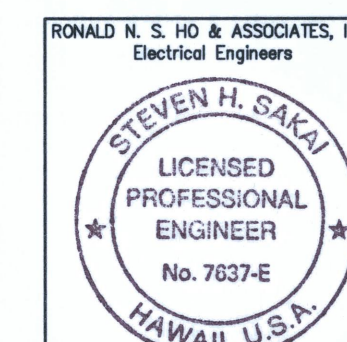
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XFMR FEEDING  
ST. LT. 52



SITE PLAN  
SCALE: 1"=80'

80' 40' 0 80' 160' 240'  
SCALE: 1"=80'  
GRAPHIC SCALE



THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

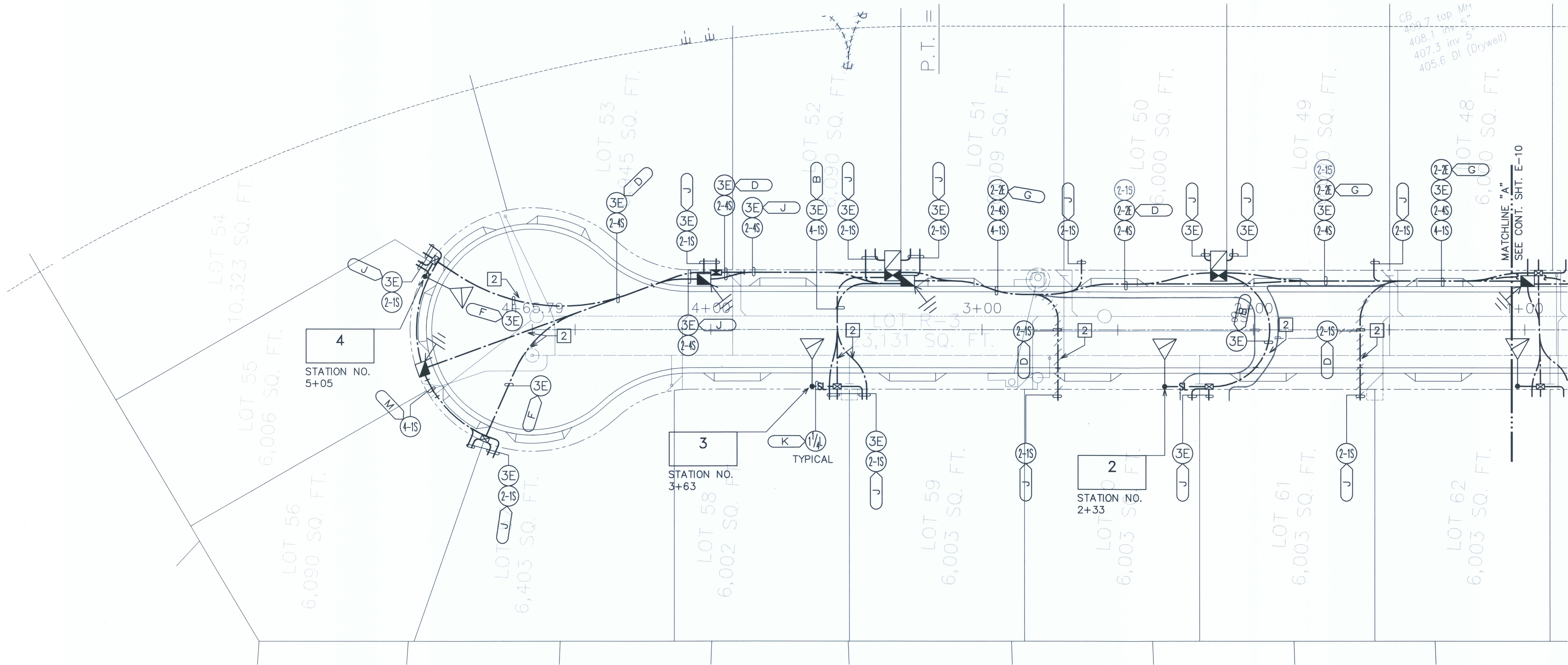
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Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII			
DATE			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

AS-BUILT

SHEET E-4 OF SHEETS



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# ELECTRICAL DISTRIBUTION PLAN I

SCALE: 1"=20'

## NOTE(S):

- 2-2" HELCO CONDUIT TO BYPASS HELCO HANDHOLE.
- REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

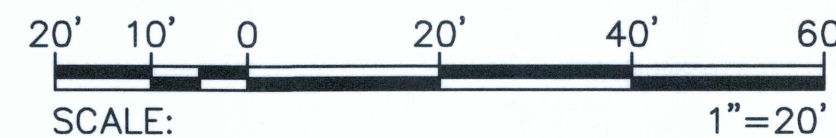
SANDWICH ISLES COMMUNICATIONS, INC

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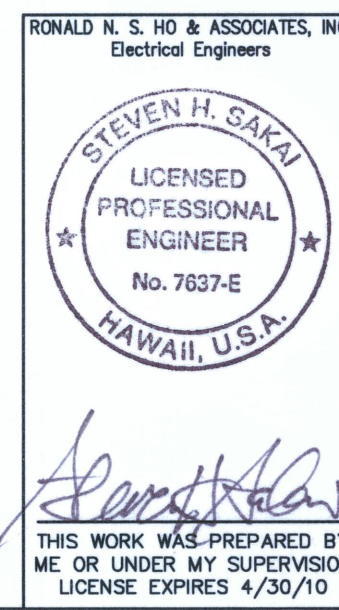
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GRAPHIC SCALE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII ELECTRICAL DISTRIBUTION PLAN I			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
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SHEET E-5 OF SHEETS



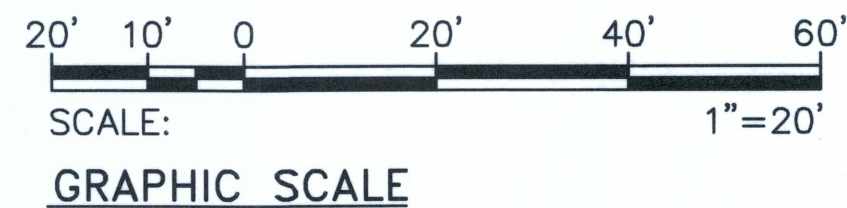
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NOTE(S):

- 1 2-2" HELCO CONDUIT TO BYPASS HELCO HANDHOLE.
- 2 REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.
- 3 SAWCUT EXISTING ROADWAY & DEMOLISH AS REQUIRED TO INSTALL NEW CONDUITS. REPAIR TO MATCH EXISTING PER COUNTY OF HAWAII STANDARDS.



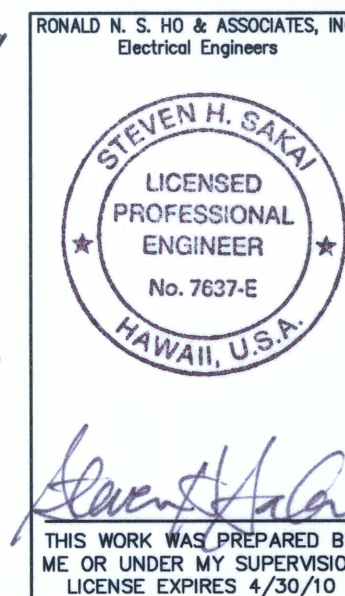
**ELECTRICAL DISTRIBUTION PLAN II**  
SCALE: 1"=20'



APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY  
SANDWICH ISLES COMMUNICATIONS, INC

DATE  
5-28-09  
DATE  
5-6-09



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I OPIA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
ELECTRICAL DISTRIBUTION PLAN II			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

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91. ACAD\PROJECTS\24189\LOT 24189\_Plan3.dwg  
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99. ACAD\PROJECTS\24189\LOT 24189\_Plan3.dwg  
100. ACAD\PROJECTS\24189\LOT 24189\_Plan3.dwg

NOTE(S):

- 1 2-2" HELCO CONDUIT TO BYPASS HELCO HANDHOLE.
- 2 REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.



ELECTRICAL DISTRIBUTION PLAN III  
SCALE: 1"=20'

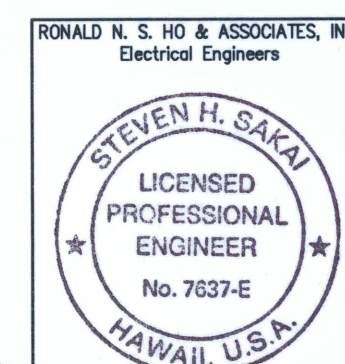
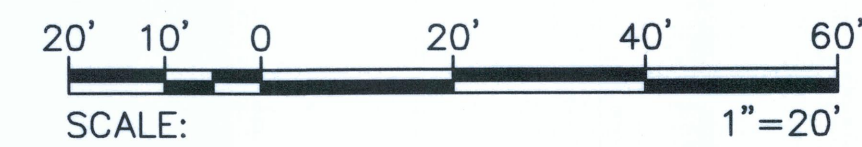
APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

SANDWICH ISLES COMMUNICATIONS, INC

5-28-09  
DATE

5-6-09  
DATE



THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII ELECTRICAL DISTRIBUTION PLAN III			
Approved: COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

AS-BUILT

SHEET E-7 OF SHEETS



LAST SAVE: 05/05/09 @ 07:53:12 BY: GDT PLOT SIZE: 11x17  
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NOTE(S):

- 2-2" HELCO CONDUIT TO BYPASS HELCO HANDHOLE.
- REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.
- SAWCUT EXISTING ROADWAY & DEMOLISH AS REQUIRED TO INSTALL NEW CONDUITS. REPAIR TO MATCH EXISTING PER COUNTY OF HAWAII STANDARDS.



**ELECTRICAL DISTRIBUTION PLAN IV**  
SCALE: 1"=20'

APPROVED BY:

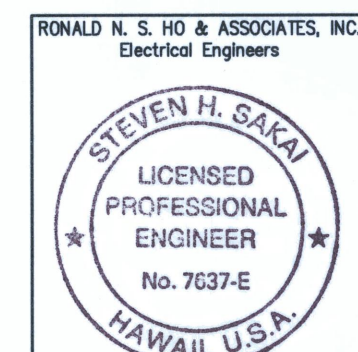
HAWAII ELECTRIC LIGHT COMPANY

SANDWICH ISLES COMMUNICATIONS, INC

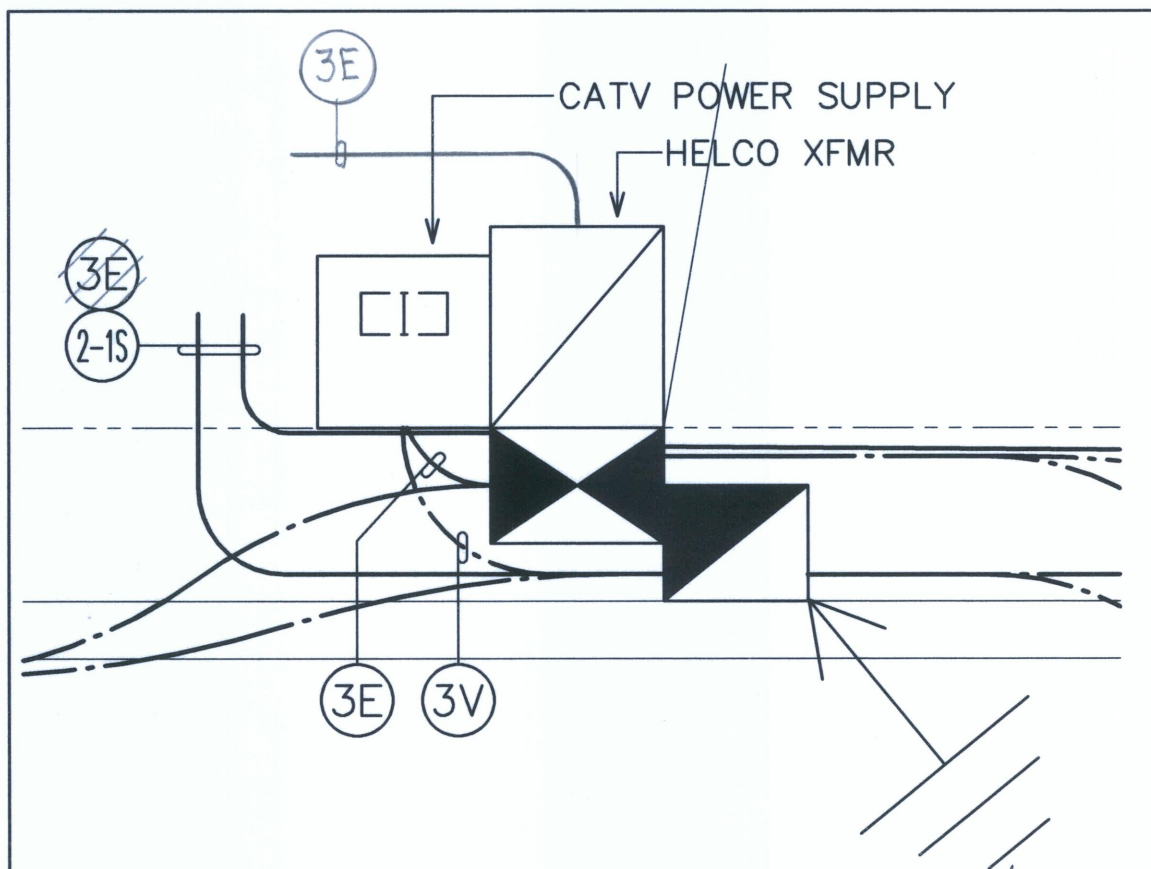
5-28-09  
DATE

5-6-09  
DATE

20' 10' 0 20' 40' 60'  
SCALE: 1"=20'  
GRAPHIC SCALE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10



**CATV SUPPLY DETAIL**  
SCALE: 1"=60'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'IOPIA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII ELECTRICAL DISTRIBUTION PLAN IV			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE _____ AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

SHEET E-8 OF SHEETS

AS-BUILT







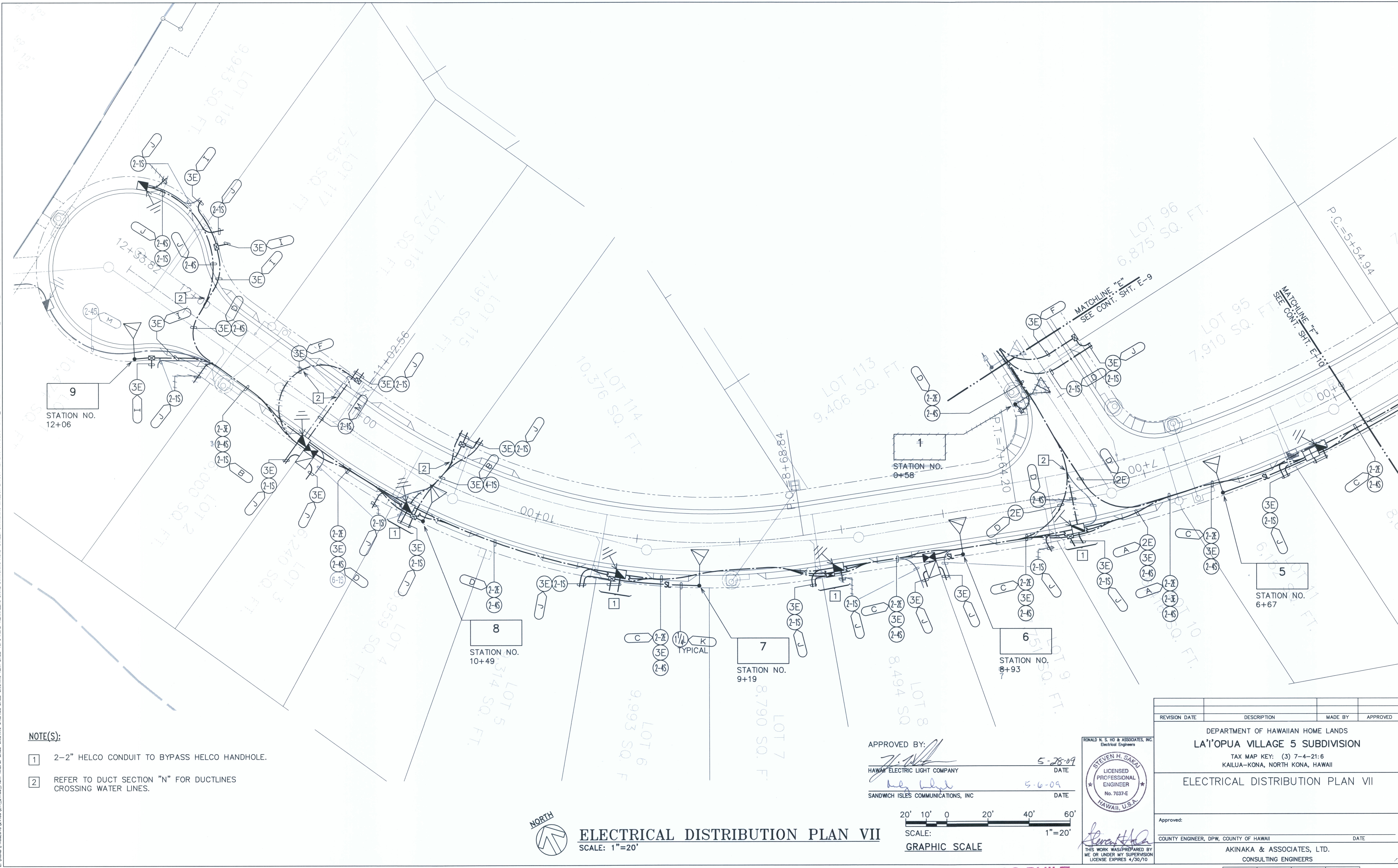
NORTH

A circular compass rose with four main directions labeled: North (N) at the top, South (S) at the bottom, East (E) on the right, and West (W) on the left. The lines are thin and black.

SHEET E-10 OF \_\_\_\_\_ SHEETS



LAST SAVE: 05/05/09 @ 07:53:38 BY: GDT PLOT SZ: 11x20  
Z:\ACAD\PROJECTS\24189\24189-01.dwg XREFS: BASE-EXISTING UTILITIES BASE-EXISTING TEXT BASE-TOPG ACAD-HEMALEHU DRIVE STATIONING ACAD-STREET STATIONING MALEHU SCREEN ELEMENT HEALAKHE-CL LAOPUA-TOPG UTILITIES \_XREF-24189-BACKGND \_XREF-24189-ELEC-ALL



NOTE(S):

- 1 2-2" HELCO CONDUIT TO BYPASS HELCO HANDHOLE.
- 2 REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.



ELECTRICAL DISTRIBUTION PLAN VII  
SCALE: 1"=20'

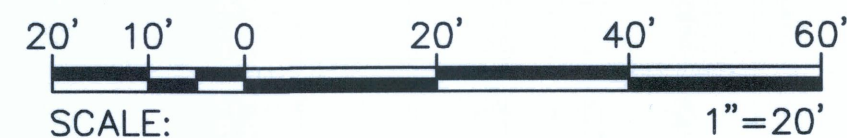
APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

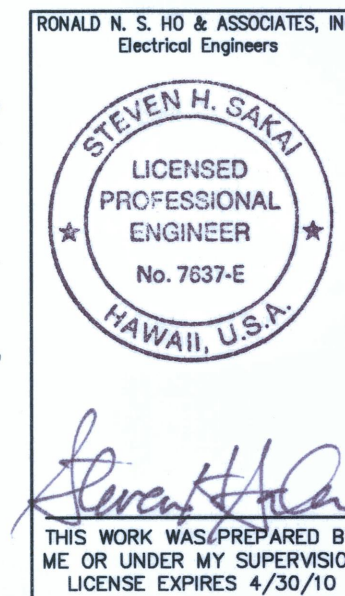
SANDWICH ISLES COMMUNICATIONS, INC

5-28-09  
DATE

5-6-09  
DATE



GRAPHIC SCALE



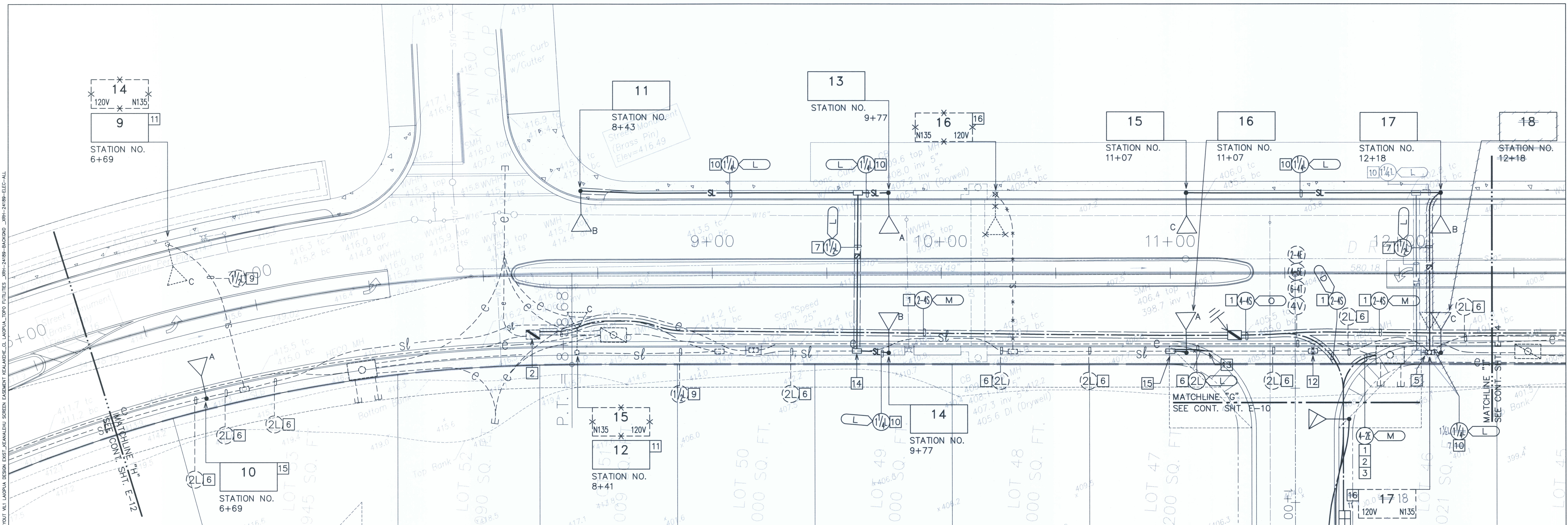
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
ELECTRICAL DISTRIBUTION PLAN VII			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

AS-BUILT









NOTE(S):



## KEANALEHU DISTRIBUTION PLAN II

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

SANDWICH ISLES COMMUNICATIONS, INC.

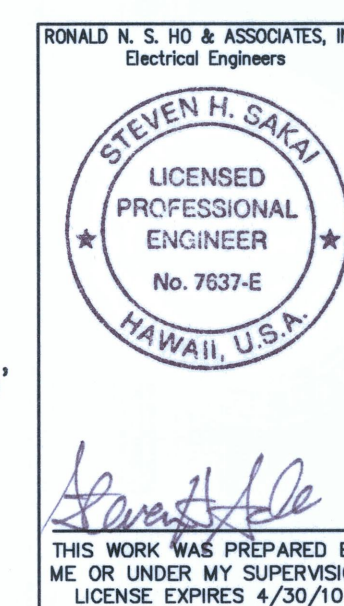
5-29-09

5-8-09

20' 10' 0      20'      40'      60

SCALE: 1"=20'

GRAPHIC SCALE



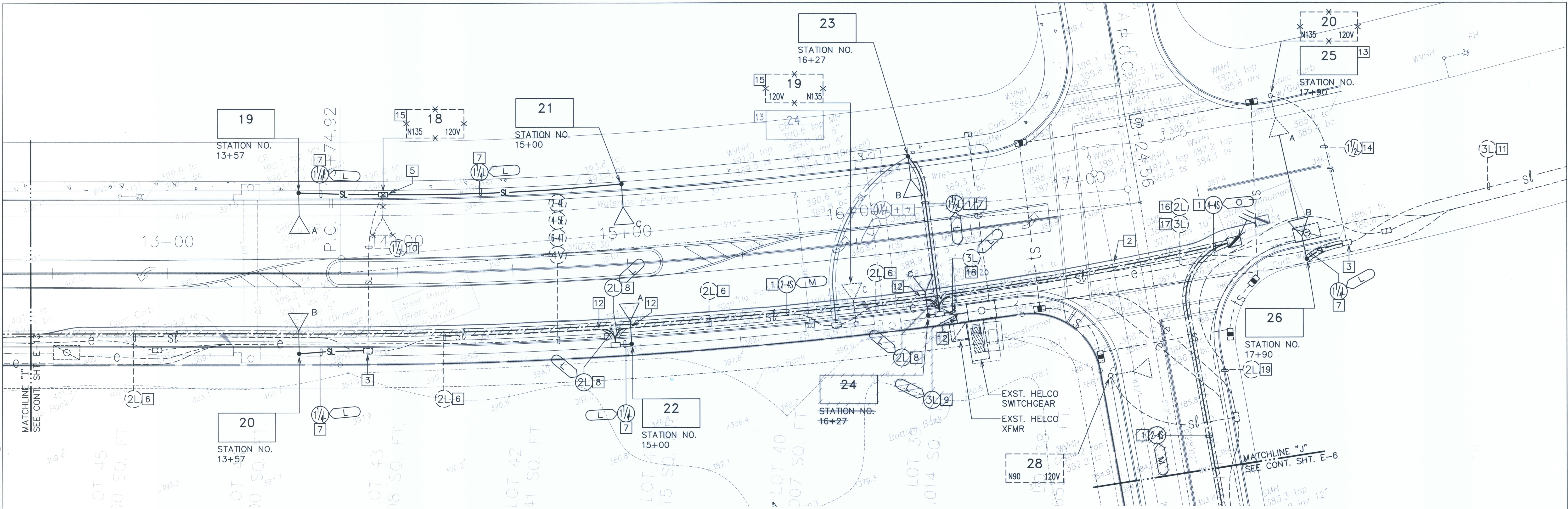
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>INC.</p> <p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p>LA'I'OPUA VILLAGE 5 SUBDIVISION</p> <p>TAX MAP KEY: (3) 7-4-21:6</p> <p>KAILUA-KONA, NORTH KONA, HAWAII</p>			
<p>KEANALEHU DISTRIBUTION PLAN II</p>			
<p>Approved: _____</p>			
<p>COUNTY ENGINEER, DPW, COUNTY OF HAWAII</p>			<p>DATE _____</p>
BY SIGN 9	<p>AKINAKA &amp; ASSOCIATES, LTD.</p> <p>CONSULTING ENGINEERS</p>		

SHEET E-13 OF \_\_\_\_\_ SHEETS

## AS-BUILT



LAST SAVE: 05/05/09 @ 07:54:10 BY: GDT PLOT: 1000000-20.00000  
Z:\ACAD\PROJECTS\24189\14\_24189\_Keanalehu\3\_XREFS: BASE-EXISTING UTILITIES BASE-EXISTING UTILITIES DRIVE STATIONING ACAD-KANALEHU DRIVE STATIONING ACAD-STREET STATIONING MAILBOX LAYOUT M1 LAUPAIA DESIGN EXIST\_KANALEHU SCREEN EASTERN KEANALEHU TOP UTILITIES JRN-24189-BACKGND\_JRN-24189-ELEC-ALL



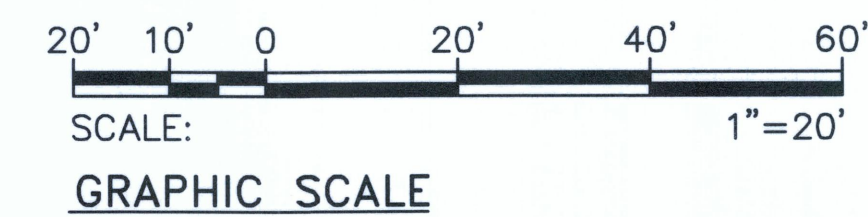
**KEANALEHU DISTRIBUTION PLAN III**  
SCALE: 1"=20'

**NOTE(S):**

- 1 SAWCUT EXISTING ROADWAY & DEMOLISH AS REQUIRED TO INSTALL NEW CONDUITS. REPAIR TO MATCH EXISTING PER COUNTY OF HAWAII STANDARDS.
- 2 REFER TO DUCT SECTION "N" FOR DUCTLINES CROSSING WATER LINES.
- 3 PENETRATE EXISTING HANDHOLE TO ACCOMMODATE NEW CONDUIT INSTALLATION.
- 4 REMOVE AND REPLACE EXST. CURB AND GUTTER PER PUBLIC WORKS STANDARD DETAIL R4.
- 5 REMOVE EXST. STREET LIGHT, DEMOLISH BASE AND SALVAGE CONDUIT. INSTALL NEW HANDHOLE AND INTERCEPT EXST. STREET LIGHT CONDUITS AND CONDUCTORS.
- 6 REMOVE EXST. 3#2 RHW-USE, 1#2 THW GND AND RE-PULL 5#2 RHW-USE, 1#2 THW GND
- 7 2#8 RHW-USE, 1#8 THW GND
- 8 5#2 RHW-USE, 1#2 THW GND
- 9 8#2 RHW-USE, 1#2 THW GND
- 10 3#8 RHW-USE, 1#8 THW GND
- 11 REMOVE EXST. CONDUCTORS AND LEAVE AS SPARE
- 12 INTERCEPT EXST. STREET LIGHT DUCTLINE WITH NEW DUCTLINE.
- 13 REPLACE EXST. STREET LIGHT TAG WITH NEW STREET LIGHT TAG. REPLACE EXST. STREET LIGHT HEAD TO CUT-OFF TYPE, SEE STREET LIGHT NOTES ON SHEET E-19.
- 14 EXST. 2#8 RHW-USE, 1#8 THW GND
- 15 RELOCATE EXISTING STREET LIGHT TO NEW LOCATION. REPLACE EXST. STREET LIGHT HEAD TO CUT-OFF TYPE, SEE STREET LIGHT NOTES ON SHEET E-19.
- 16 REMOVE EXST. 3#2 RHW-USE, 1#2 THW GND
- 17 EXST. 6#2 RHW-USE, 1#2 THW GND
- 18 INTERCEPT EXST. 3" STREET LIGHT DUCTLINE WITH NEW DUCTLINE. PULL 6#2 RHW-USE, 1#2 THW GND TO HANDHOLE.
- 19 EXST. 3#2 RHW-USE, 1#2 THW GND
- 20 REMOVE EXST. 6#2 RHW-USE, 1#2 THW GND AND RE-PULL 8#2 RHW-USE, 1#2 THW GND

APPROVED BY:

*[Signature]* 5-6-09  
SANDWICH ISLES COMMUNICATIONS, INC DATE



RONALD N. S. HO & ASSOCIATES, INC.  
Electrical Engineers  
**STEVEN H. SAKAI**  
LICENSED PROFESSIONAL ENGINEER  
No. 7637-E  
HAWAII, U.S.A.  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS <b>LA'I'OPUA VILLAGE 5 SUBDIVISION</b> TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII <b>KEANALEHU DISTRIBUTION PLAN III</b>			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE _____ AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

AS-BUILT