

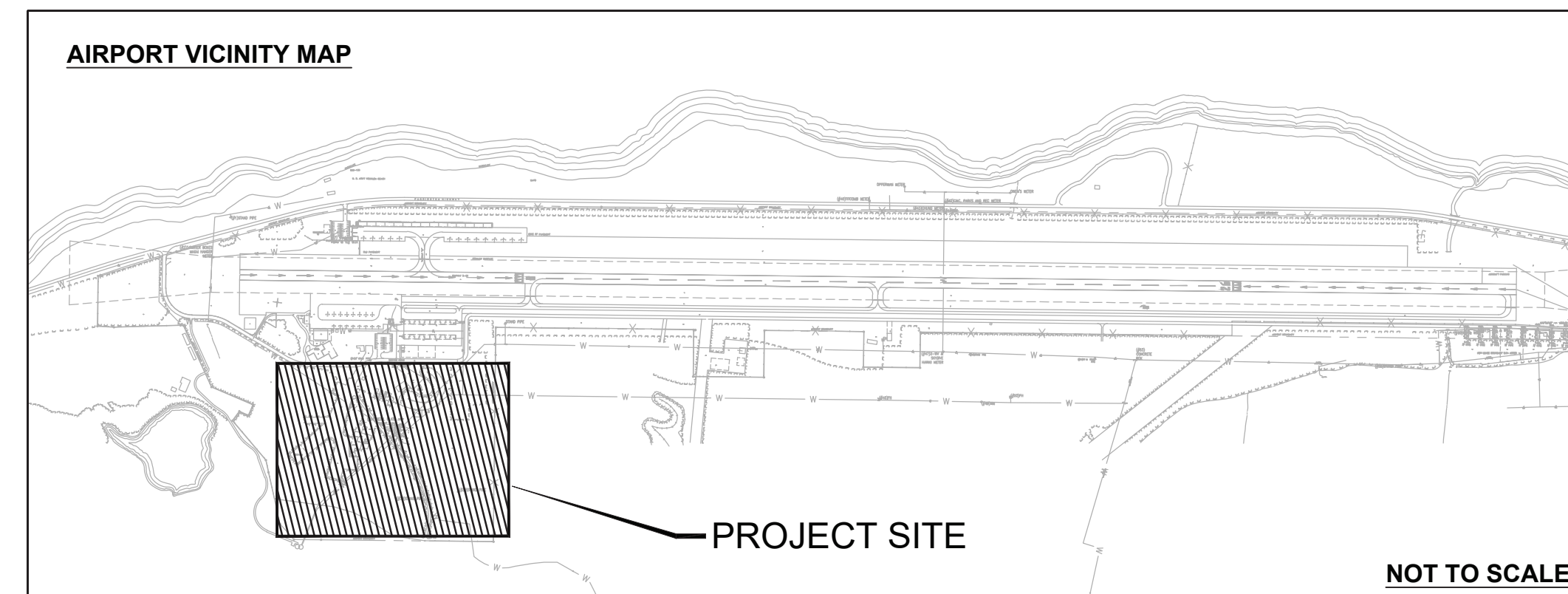
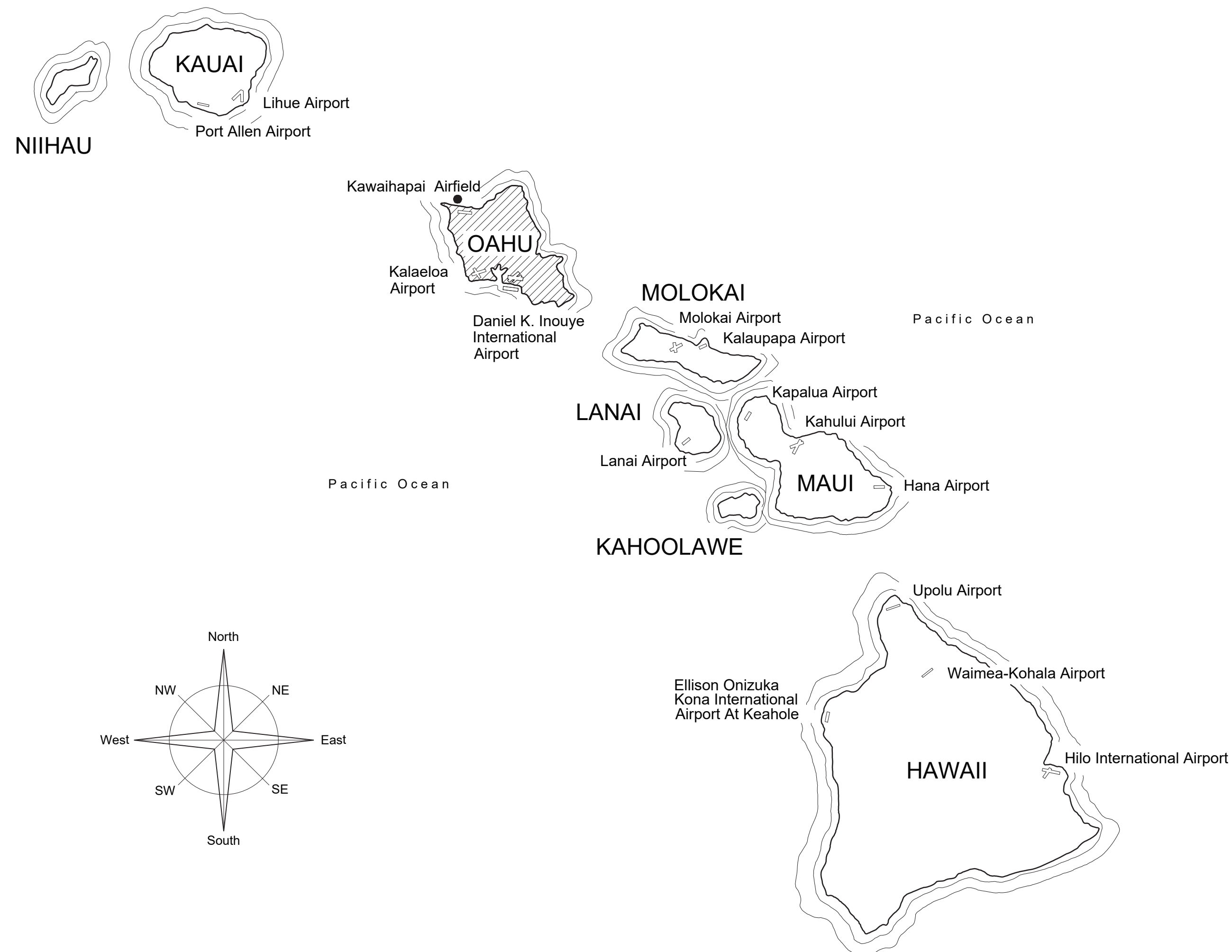
# STATE OF HAWAII DEPARTMENT OF TRANSPORTATION AIRPORTS

PLANS FOR

## ELECTRICAL IMPROVEMENTS

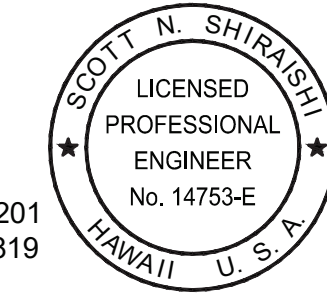
AT

### KAWAIHAPAI AIRFIELD MOKULEIA, OAHU, HAWAII PROJECT NO. CO2544-53

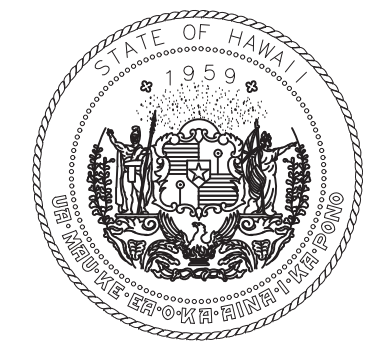


**PROJECT TEAM**

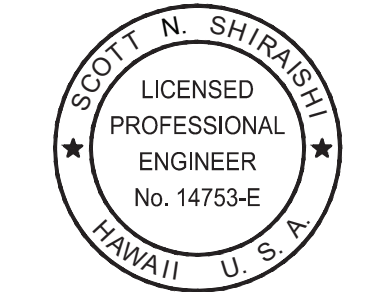
ELECTRICAL:  
RONALD N.S. HO &  
ASSOCIATES, INC.  
2153 N. KING ST., STE. 201  
HONOLULU, HAWAII 96819  
(808) 941-0577



SCOTT N. SHIRASHI  
ELECTRICAL ENGINEER



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS



*Scott Shirashi*

04/30/2026  
Licensed Expiration Date

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DSGN.	DRWN.	CHKD.	APPD.
SS	CAD	SS	SS

NO.	DATE	REVISIONS

**100%  
DESIGN**  
MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**TITLE SHEET**

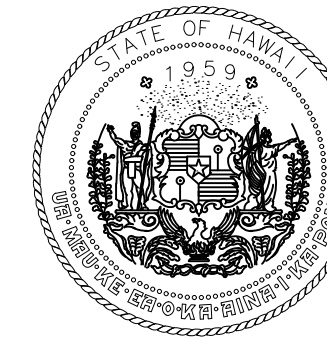
DEPARTMENT OF TRANSPORTATION STATE OF HAWAII	
APPROVED: <i>[Signature]</i>	04/24/2026
FOR DIRECTOR OF TRANSPORTATION	DATE

DATE : 03/24/2026	DWG. NO. G-001
SHEET : 1 OF 21 SHEETS	

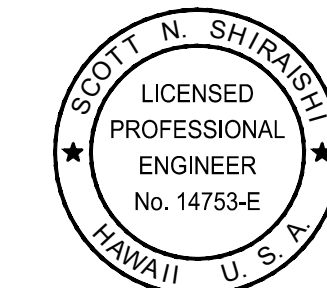
**AIRFIELD LIGHTING CIRCUIT VERIFICATION DRAWING SHEET INDEX**

SHEET NO.	SHEET TITLE	SHEET DESCRIPTION
G-001	TITLE SHEET	ELECTRICAL IMPROVEMENTS TITLE SHEET
G-002	DRAWING SHEET INDEX - 1	DRAWING SHEET INDEX: G-001 THRU G-002, AND E-001 THRU E-019
E-001	SYMBOL LIST, NOTES, POLE LOCATIONS, DUCT SECTIONS	SYMBOL LIST, NOTES, POLE LOCATIONS, DUCT SECTIONS
E-002	NOTES I	HECO NOTES
E-003	NOTES II	HTCO NOTES
E-004	SITE PLAN	ELECTRICAL SITE PLAN
E-005	ELECTRICAL PARTIAL PLAN I	ELECTRICAL PARTIAL PLAN I
E-006	ELECTRICAL PARTIAL PLAN II	ELECTRICAL PARTIAL PLAN II
E-007	ELECTRICAL PARTIAL PLAN III	ELECTRICAL PARTIAL PLAN III
E-008	ELECTRICAL PARTIAL PLAN IV	ELECTRICAL PARTIAL PLAN IV
E-009	PRIMARY 11.5KV DIAGRAM	HECO PRIMARY 11.5KV DIAGRAM
E-010	PRIMARY METERING DETAILS	HECO PRIMARY METERING DETAILS
E-011	HECO PRIMARY METER DETAIL	HECO PRIMARY METER DETAIL
E-012	POLE LINE LIST OF MATERIALS	POLE LINE LIST OF MATERIALS
E-013	POLE TOP TRANSFORMER DETAIL	POLE TOP TRANSFORMER DETAIL FOR P. 7 AND P. 10
E-014	PRIMARY POLE, TOP DETAILS, TERMITE BARRIER DETAILS	PRIMARY SINGLE AND DOUBLE CROSSARM, 3 WIRE PRIMARY AND DOUBLE PRIMARY, GROUND WIRE, AND TERMI-MESH TERMITE BARRIER DETAILS
E-015	MISCELLANEOUS DETAILS	CROSSARM, FLAT CROSSARM BRACE, INSULATOR PIN, AND STRAIN CLAMP DETAIL
E-016	GUY AND ANCHOR DETAIL	TYPICAL GUY AND ANCHOR, SQUARE M-F LOCKNUT, THIMBLEYE, CONCRETE ANCHOR, AND AIR SWITCH OPERATING HANDLE GROUNDING DETAILS
E-017	UTILITY POLE DETAILS	UTILITY POLE DETAILS FOR P. 1/143, 3, 4, 6, 8, 9 AND P. 5, 7, 9X, 10
E-018	AIR BREAK SWITCH DETAILS	AIR BREAK SWITCH DETAILS
E-019	POLE GUYING DETAILS	POLE GUYING DETAILS FOR P. 3, 4, 7, 9, AND 9X

DRAWING SHEET INDEX - 1



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS



*Scott Shirishi*

04/30/2026  
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NO.	DATE	REVISIONS

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DESIGN**  
MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**  
  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**DRAWING SHEET  
INDEX - 1**

DATE :	DWG. NO.
<b>03/24/2026</b>	<b>G-002</b>
SHEET :	
2 OF 21 SHEETS	

ELECTRICAL SYMBOLS	
SYMBOL	DESCRIPTION
⊗	EXST UTILITY POLE TO BE REMOVED
○	EXST UTILITY POLE
●	NEW UTILITY POLE
	EXST POLE MOUNTED TRANSFORMER
	NEW POLE MOUNTED TRANSFORMER
---W8---	EXST UNDERGROUND WATERLINE, 8" DIAMETER INDICATED
---e---	EXST ELECTRICAL UNDERGROUND LINES
---E---	ELECTRICAL UNDERGROUND LINES
---he-oh---	EXST HAWAIIAN ELECTRIC OVERHEAD LINES
---e-oh---	EXST ELECTRICAL OVERHEAD LINES
---mt-oh---	EXST MILITARY TELECOM OVERHEAD LINES
---ht-oh---	EXST HAWAIIAN TELCOM OVERHEAD LINES
---g-oh---	EXST GUY OVERHEAD LINES
---E-OH---	ELECTRICAL (PRIMARY) OVERHEAD LINES
---SEC-OH---	ELECTRICAL (SECONDARY) OVERHEAD LINES
---MT-OH---	MILITARY TELECOM OVERHEAD LINES
---HT-OH---	HAWAIIAN TELCOM OVERHEAD LINES
---E/HT-OH---	ELECTRICAL/HAWAIIAN TELCOM OVERHEAD LINES
---G-OH---	GUY OVERHEAD LINES
*-e-oh*	EXST ELECTRICAL OVERHEAD LINES TO BE REMOVED
*-mt-oh*	EXST MILITARY TELECOM OVERHEAD LINES TO BE REMOVED
*-ht-oh*	EXST HAWAIIAN TELCOM OVERHEAD LINES TO BE REMOVED BY UTILITY
*-g-oh*	EXST GUY OVERHEAD LINES TO BE REMOVED
--- -->	EXST GUYING AND ANCHOR
--- -->	NEW GUYING AND ANCHOR
	EXST HECO METER
	NEW HECO METER
	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; INDICATES TYPE "A" DUCT SECTION WITH "2-4E" DUCTS. SEE RESPECTIVE SHEETS FOR DUCT SECTIONS, CONDUITS, & CABLE COMPLEMENTS

**NOTES:**

- SOLID ITEM DENOTES "NEW"; DASHED ITEM DENOTES "EXISTING".
- "X" THRU SYMBOL DENOTES ITEM TO BE REMOVED.

**GENERAL ELECTRICAL NOTES:**

- ALL WORK SHALL BE NEW UNLESS INDICATED OTHERWISE.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON PLANS ARE FROM EXISTING RECORDS AND ARE APPROXIMATIONS ONLY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY TO EXISTING UNDERGROUND UTILITIES. DAMAGES TO UTILITY COMPANIES' EXISTING FACILITIES SHALL BE REPAIRED BY THE RESPECTIVE UTILITY COMPANY AND REPAIR COSTS SHALL BE PAID BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL VERIFY ALL EXST CONDITIONS. CONTRACTOR SHALL VERIFY EXST CIRCUIT WIRING PRIOR TO ANY DEMOLITION WORK.
- ELECTRICAL OUTAGES SHALL BE SCHEDULED AT THE OWNER'S CONVENIENCE. CONTRACTOR SHALL OBTAIN THE OWNER'S APPROVAL FOR ALL ELECTRICAL OUTAGES A MINIMUM OF 3 WEEKS PRIOR TO WORK. ELECTRICAL OUTAGES SHALL BE RESTRICTED TO 48 HOURS MAXIMUM.
- FURNISH ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO PERFORM ALL DEMOLITION AND REMOVAL WORK INDICATED ON THE DRAWINGS OR REQUIRED FOR THE RECEPTION OF THE NEW CONSTRUCTION SPECIFIED. THIS INCLUDES, BUT IS NOT LIMITED TO, TREES, SHRUBS, AND BUSHES REQUIRED FOR INSTALLATION OF NEW ELECTRICAL POLE LINE. MATERIALS RESULTING FROM REMOVAL WORK, EXCEPT AS INDICATED OR SPECIFIED OTHERWISE, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE LIMITS OF THE PROJECT SITE. REMOVE RUBBISH AND DEBRIS FROM THE JOBSITE DAILY, UNLESS OTHERWISE DIRECTED; DO NOT ALLOW ACCUMULATIONS INSIDE OR OUTSIDE ANY BUILDINGS OR ROADWAYS. TRANSPORT AND LEGALLY DISPOSE OF MATERIALS OFF SITE. REMOVE AND TRANSPORT DEBRIS AND RUBBISH IN A MANNER THAT WILL PREVENT SPILLAGE ON STREETS OR ADJACENT AREAS. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE GOVERNMENT REGULATIONS IN DISPOSING OF SAID WASTE MATERIAL. BURNING OF REMOVED MATERIALS IS NOT PERMITTED ON PROJECT SITE.

POLE LOCATION			
POLE #	BENCH MARK REFERENCE	DISTANCE	DIRECTION
POLE "1"	STA CP-9 TO POLE "1"	154.33'	357 DEG 51' 24"
POLE "2"	STA CP-9 TO POLE "2"	29.14'	101 DEG 07' 25"
POLE P1/143	STA CP-9 TO POLE P1/143	41.34'	127 DEG 30' 47"
POLE "3"	STA CP-7 TO POLE "3"	48'	166 DEG 30' 11"
POLE "4"	STA CP-6 TO POLE "4"	58.08'	166 DEG 57' 07"
POLE "5"	STA CP-5B TO POLE "5"	32.97'	217 DEG 42' 27"
POLE "6"	STA CP-5A TO POLE "6"	47.15'	254 DEG 54' 11"
POLE "7"	STA CP-5 TO POLE "7"	112.41'	293 DEG 29' 33"
POLE "8"	STA CP-5 TO POLE "8"	109.74'	177 DEG 22' 22"
POLE "9"	STA CP-2 TO POLE "9"	272.15'	331 DEG 14' 44"
POLE "9X"	STA CP-2 TO POLE "9X"	138.07'	334 DEG 10' 44"
POLE "10"	STA CP-2 TO POLE "10"	54.19'	339 DEG 04' 38"

**BACKFILL NOTES:**

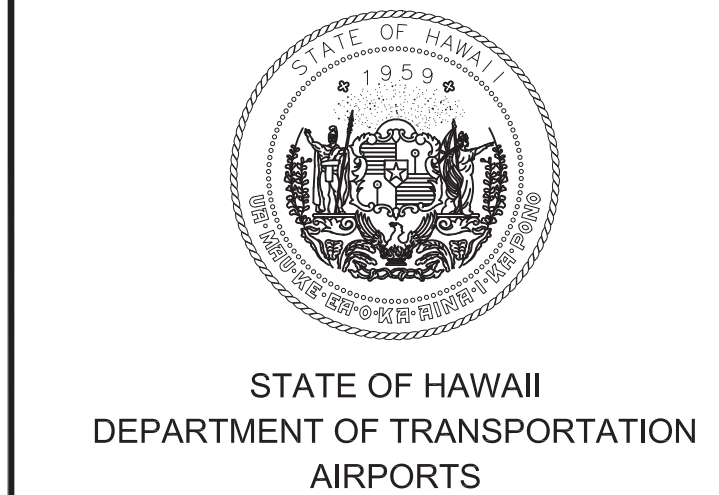
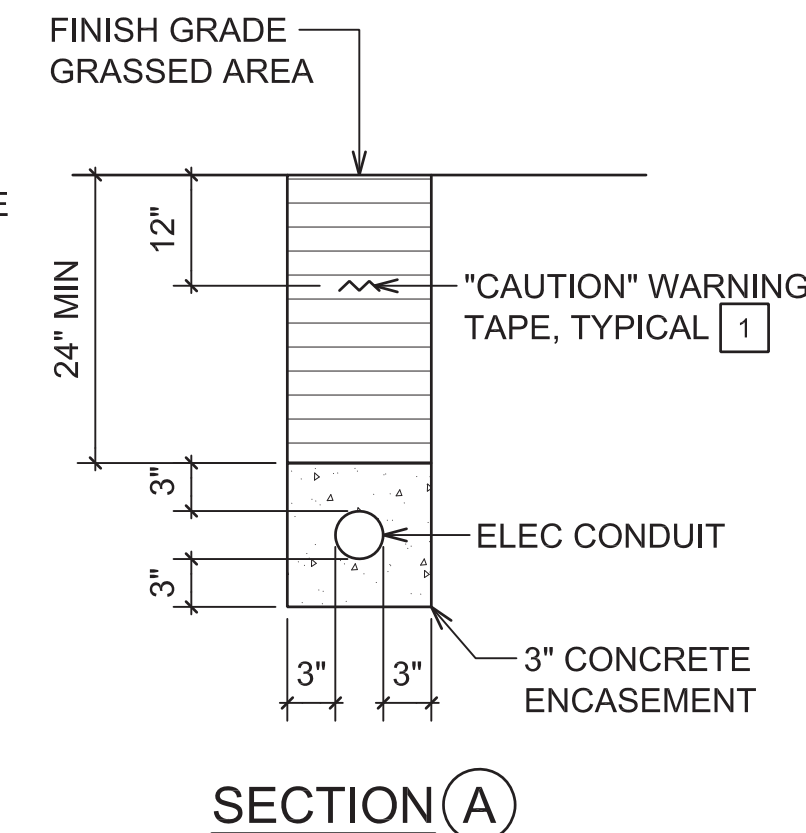
- TYPE "A" BACKFILL - EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX. & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
- TYPE "B" BACKFILL - EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
- NOTE - IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.
- CONCRETE - 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.

**NOTES:**

- METAL DETECTABLE RED WARNING TAPE SHALL BE A MINIMUM OF 5 MILS THICK AND 4" WIDE WITH A CONTINUOUS METALLIC BACKING AND CORROSION RESISTANT +/-1 MIL THICK FOIL CORE. MESSAGE ON TAPE SHALL READ, "CAUTION - ELECTRIC LINES BURIED BELOW" UTILIZING 2 INCH SERIES "C" BLACK LETTERING. MESSAGE SHALL BE REPEATED WITH A 36 INCH SPACING.

CONDUIT SCHEDULE	
ITEM	DESCRIPTION
(4E)	ELEC 4" C

**DUCT SECTIONS NOT TO SCALE**



Ronald N.S. Ho & Associates, Inc.

04/30/2026  
Licensed Expiration Date

This work was prepared by me or under my supervision.

DSGN.	DRWN.	CHKD.	APPD.
SS	CAD	SS	SS

NO.	DATE	REVISIONS
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**100% DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL IMPROVEMENTS**  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

**PROJECT NO.:**  
**CO2544-53**

**SHEET TITLE:**

**SYMBOL LIST, NOTES  
POLE LOCATIONS,  
DUCT SECTIONS**

DATE :	DWG. NO.
03/24/2026	<b>E-001</b>
SHEET :	
3 OF 21 SHEETS	

1. LOCATION OF HAWAIIAN ELECTRIC FACILITIES

THE LOCATION OF HAWAIIAN ELECTRIC'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 HAWAIIAN ELECTRIC'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.

2. COMPLIANCE WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH LAWS

THE CONTRACTOR SHALL COMPLY WITH THE ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, THOSE RELATED TO WORKING ON OR NEAR EXPOSED OR ENERGIZED POWERLINES AND EQUIPMENT.

3. EXCAVATION CLEARANCE

THE CONTRACTOR SHALL OBTAIN AN EXCAVATION CLEARANCE FROM HAWAIIAN ELECTRIC'S PLANNING AND DESIGN SECTION OF THE CUSTOMER ENGINEERING DEPARTMENT (808-543-7086) A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO STARTING CONSTRUCTION. REQUESTS SHOULD BE EMAILED TO CLEARANCETOEXCAVATE@HAWAIIANELECTRIC.COM.

4. CAUTION!!! ELECTRICAL HAZARD!!!

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

5. OVERHEAD POWER LINES

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIRES THAT A WORKER AND THE LONGEST OBJECT HE OR SHE MAY CONTACT CANNOT COME CLOSER THAN A SPECIFIED MINIMUM RADIAL CLEARANCE WHEN WORKING CLOSE TO OR UNDER ANY OVERHEAD POWER LINES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE INFORMED OF AND COMPLY WITH ALL APPLICABLE LAWS.

AT ANY TIME SHOULD THE CONTRACTOR ANTICIPATE THAT HIS OR HER WORK WILL RESULT IN THE NEED TO ENCROACH WITHIN THE MINIMUM REQUIRED CLEARANCE AS STATED IN THE LAW, THE CONTRACTOR SHALL NOTIFY HAWAIIAN ELECTRIC AT LEAST THREE (3) MONTHS PRIOR TO THE PLANNED ENCROACHMENT BY SUBMITTING AN APPLICATION THROUGH HAWAIIANELECTRIC.COM SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE OR DE-ENERGIZE HAWAIIAN ELECTRIC'S POWER LINES) CAN BE INVESTIGATED. HAWAIIAN ELECTRIC MAY ALSO BE ABLE TO BLANKET ITS DISTRIBUTION (12KV AND BELOW) POWER LINES TO PROVIDE A VISUAL AID IN PREVENTING ACCIDENTAL CONTACT. HAWAIIAN ELECTRIC'S COST OF SAFEGUARDING OR IDENTIFYING ITS POWER LINES WILL BE CHARGED TO THE CONTRACTOR. FOR ASSISTANCE IN IDENTIFYING OVERHEAD POWER LINES, EMAIL CI@HAWAIIANELECTRIC.COM.

6. POLE BRACING

a) CONTRACTOR SHALL NOT EXCAVATE WITHIN 10 FEET OF HAWAIIAN ELECTRIC'S UTILITY POLES OR ANY ANCHOR SYSTEM SUPPORTING THE UTILITY POLE. IF CONTRACTOR MUST EXCAVATE AN AREA MORE THAN 12 INCHES DEEP BY 12 INCHES WIDE, AND CLOSER THAN 10 FEET FROM A UTILITY POLE OR ITS ANCHOR SYSTEM, EXCEPT WHEN EXCAVATING FOR RISERS IN A SINGLE TRENCH NOT WIDER THAN 12 INCHES AND NOT DEEPER THAN 3 FEET, CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING, SUPPORTING, SECURING AND TAKING ALL PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF EXISTING POLES. BEFORE COMMENCING SUCH EXCAVATION, CONTRACTOR MUST NOTIFY HAWAIIAN ELECTRIC WHICH MAY LEAD TO IMPLEMENTING POLE BRACING REQUIREMENTS. HAWAIIAN ELECTRIC REQUIRES A MINIMUM OF TEN (10) WORKING DAYS TO CONDUCT A REVIEW THE OF CONTRACTOR'S SUBMITTAL. CONTRACTOR SHALL SUBMIT AN APPLICATION THROUGH HAWAIIANELECTRIC.COM AND INCLUDE BRACING CALCULATIONS AND DRAWINGS, PREPARED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF HAWAII, FOR REVIEW. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF THE TEMPORARY POLE BRACING SYSTEM, AS WELL AS ALL COSTS INCURRED BY HAWAIIAN ELECTRIC TO REVIEW CONTRACTOR'S DRAWINGS AND TO REPAIR OR STRAIGHTEN POLES IMPACTED BY CONTRACTOR'S ACTIVITIES. INCLUDING RESPONSE AND RESTORATION COSTS INCURRED BY HAWAIIAN ELECTRIC ARISING OUT OF OR RELATED TO OUTAGES CAUSED BY CONTRACTOR'S FAILURE TO MEET THE FOREGOING REQUIREMENTS. HAWAIIAN ELECTRIC'S RECEIPT OF POLE BRACING CALCULATION OR DRAWING SUBMITTALS OF ANY CONTRACTOR, INCLUDING WORK PROCEDURE, SHALL NOT RELIEVE CONTRACTOR FROM ANY LIABILITY RESULTING FROM CONTRACTOR'S EXCAVATION NEAR OR AROUND HAWAIIAN ELECTRIC'S UTILITY POLES.

b) HAWAIIAN ELECTRIC MAY PROVIDE TO THE CUSTOMER INFORMATION RELATED TO POLE BRACING, INCLUDING CALCULATIONS AND OTHER BASIC ENGINEERING. HOWEVER, HAWAIIAN ELECTRIC PROVIDES THIS INFORMATION FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT WARRANT ANY OF THE INFORMATION PROVIDED TO CUSTOMER. HAWAIIAN ELECTRIC HEREBY DISCLAIMS ANY LIABILITY ASSOCIATED WITH THE CUSTOMER'S USE OF INFORMATION PROVIDED TO THE CUSTOMER FROM HAWAIIAN ELECTRIC. IT IS THE CUSTOMER'S DUTY TO OBTAIN ENGINEERING FROM ITS OWN ENGINEER OR CONTRACTOR IN ORDER TO BRACE POLES AND THE USE OF HAWAIIAN ELECTRIC'S INFORMATION DOES NOT EXCUSE THE CUSTOMER FROM PERFORMING ITS OWN EVALUATION OF THE BRACING NEEDS. SHOULD THE CUSTOMER INSTALL BRACING AT ANY POLE LOCATION, CUSTOMER SHALL DEFEND, INDEMNIFY, AND HOLD HARMLESS HAWAIIAN ELECTRIC FROM ANY THIRD PARTY CLAIMS ASSOCIATED WITH THE CUSTOMER'S BRACING OF A POLE. SHOULD THE WORK CUSTOMER PERFORM AT OR NEAR THE POLE LOCATION COMPROMISE THE POLE OR ITS SURROUNDINGS IN ANY WAY, CUSTOMER SHALL RESTORE OR REPLACE THE POLE SO THAT IT IS NO LONGER COMPROMISED.

7. UNDERGROUND POWER LINES

THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND POWER LINES. HAWAIIAN ELECTRIC'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HAWAIIAN ELECTRIC PERSONNEL ARE TO BREAK INTO EXISTING HAWAIIAN ELECTRIC FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HAWAIIAN ELECTRIC'S ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF ITS UNDERGROUND POWER LINES WILL BE CHARGED TO THE CONTRACTOR. FOR ASSISTANCE/COORDINATION IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE POWER LINES, THE CONTRACTOR SHALL SUBMIT AN APPLICATION THROUGH HAWAIIANELECTRIC.COM A MINIMUM OF TEN (10) WORKING DAYS IN ADVANCE.

SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HAWAIIAN ELECTRIC'S 138KV OR 46KV UNDERGROUND POWER LINES (SEE HAWAIIAN ELECTRIC INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HAWAIIAN ELECTRIC'S UNDERGROUND 138KV AND/OR 46KV LINES" FOR DETAILED REQUIREMENTS).

FOR VERIFICATION OF UNDERGROUND POWER LINES, THE CONTRACTOR SHALL CALL THE HAWAII ONE CALL CENTER AT 866-423-7287 A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE.

8. UNDERGROUND FUEL PIPELINES

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

9. EXCAVATIONS

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

- a) ARRANGING FOR HAWAIIAN ELECTRIC STANDBY PERSONNEL TO OBSERVE WORK AT CONTRACTOR'S COST.
- b) SHEETING, BRACING, OR OTHERWISE SUPPORTING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE AND TO PREVENT POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENTS.
- c) PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, UNDER-PINNINGS, OR OTHER NECESSARY METHODS TO FULLY PROTECT IT FROM DAMAGE.
- d) BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DIVISION FOR THERMAL BACKFILL SPECIFICATIONS).

10. RELOCATION OF HAWAIIAN ELECTRIC FACILITIES

ANY WORK REQUIRED TO RELOCATE OR MODIFY HAWAIIAN ELECTRIC FACILITIES SHALL BE DONE BY HAWAIIAN ELECTRIC, OR BY THE CONTRACTOR UNDER HAWAIIAN ELECTRIC'S SUPERVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HAWAIIAN ELECTRIC'S WORK, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, STAKING OF POLE/ANCHOR LOCATIONS, IDENTIFYING RIGHT-OF-WAY AND PROPERTY LINES, 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 HAWAIIAN ELECTRIC'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HAWAIIAN ELECTRIC 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 HAWAIIAN ELECTRIC'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, HAWAIIAN ELECTRIC SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.

12. DAMAGE TO HAWAIIAN ELECTRIC FACILITIES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HAWAIIAN ELECTRIC SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HAWAIIAN ELECTRIC'S FACILITIES AS A RESULT OF HIS OR HER OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES OR ANY HAZARDOUS CONDITIONS RELATED TO HAWAIIAN ELECTRIC'S LINES TO HAWAIIAN ELECTRIC AT 855-304-1212 AND PRESS 1. REPAIR WORK SHALL BE DONE BY HAWAIIAN ELECTRIC OR BY THE CONTRACTOR UNDER HAWAIIAN ELECTRIC'S SUPERVISION. COSTS FOR DAMAGES TO HAWAIIAN ELECTRIC'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HAWAIIAN ELECTRIC'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HAWAIIAN ELECTRIC'S SECURITY COMMAND CENTER AT 808-543-7685 (A 24-HOUR NUMBER) SO HAWAIIAN ELECTRIC 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. HAWAIIAN ELECTRIC STANDBY PERSONNEL

THE CONTRACTOR MAY REQUEST HAWAIIAN ELECTRIC TO PROVIDE AN INSPECTOR TO STANDBY DURING CONSTRUCTION NEAR HAWAIIAN ELECTRIC'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR.

THE CONTRACTOR SHALL SUBMIT AN APPLICATION THROUGH HAWAIIANELECTRIC.COM A

MINIMUM OF THREE (3) MONTHS IN ADVANCE TO ARRANGE FOR HAWAIIAN ELECTRIC STANDBY PERSONNEL.

14. CLEARANCE BETWEEN UNDERGROUND FACILITIES

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

THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER AND HAWAIIAN ELECTRIC OF ANY HEAT SOURCES (POWER CABLE DUCT BANK, STEAMLINE, ETC.) ENCOUNTERED THAT ARE NOT PROPERLY IDENTIFIED ON THE DRAWING.

15. INDEMNITY

THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HAWAIIAN ELECTRIC 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 HAWAIIAN ELECTRIC.

ADDITIONAL NOTES WHEN WORK INVOLVES CONSTRUCTION OF HAWAIIAN ELECTRIC FACILITIES

16. SCHEDULE

CONTRACTOR SHALL FURNISH HIS OR HER CONSTRUCTION SCHEDULE SIX (6) MONTHS PRIOR TO STARTING WORK ON HAWAIIAN ELECTRIC FACILITIES. CONTRACTOR SHALL GIVE HAWAIIAN ELECTRIC, IN WRITING, THREE (3) MONTHS NOTICE TO PROCEED WITH HAWAIIAN ELECTRIC'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 HAWAIIAN ELECTRIC'S UNDERGROUND FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISIONS OF HAWAIIAN ELECTRIC SPECIFICATIONS CS7001, CS7003, CS7202, CS9301, AND CS9401 AND APPLICABLE HAWAIIAN ELECTRIC STANDARDS. HECO SPECIFICATION M0302-1, WARNING TAPE FOR UNDERGROUND CONUIT SYSTEMS.

- A. WIDTH - 6". MINIMUM THICKNESS - 0.004"
- B. THICK DETECTABLE WARNING TAPE. TAPE SHALL BE RED IN COLOR TO INDICATE ELECTRICAL LINE.
- C. CONTINUOUS PRINTED INSCRIPTION INDICATING PRESENCE OF HIGH VOLTAGE ELECTRICAL UNDERGROUND CABLE OR BURIED ELECTRICAL LINE.

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 HAWAIIAN ELECTRIC PRIOR TO EXCAVATION AND PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL NOTIFY HAWAIIAN ELECTRIC'S INSPECTION GROUP AT 808-543-2567 AT LEAST FIVE (5) WORKING DAYS PRIOR TO INSTALLING FACILITIES OR PLACING CONCRETE.

CONTRACTOR TO COORDINATE WORK TO BREAK INTO HAWAIIAN ELECTRIC'S EXISTING ELECTRICAL FACILITIES WITH HAWAIIAN ELECTRIC'S INSPECTION GROUP AT 808-543-2567 AT LEAST TEN (10) WORKING DAYS IN ADVANCE.

20. STAKEOUT

THE CONTRACTOR SHALL ARRANGE FOR TONEOUTS OF ALL UNDERGROUND FACILITIES AND SHALL STAKEOUT ALL PROPOSED HAWAIIAN ELECTRIC 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 HAWAIIAN ELECTRIC BEFORE PROCEEDING WITH HAWAIIAN ELECTRIC WORK.

21. DUCTLINES

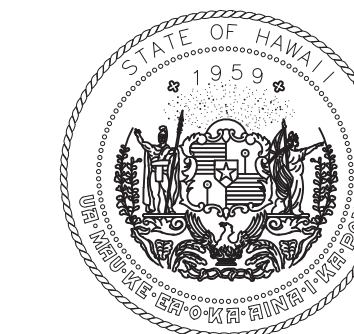
ALL DUCTLINE INSTALLATIONS SHALL BE PVC SCHEDULE 40 ENCASED IN CONCRETE, UNLESS OTHERWISE NOTED. ALL COMPLETED DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR IN THE PRESENCE OF HAWAIIAN ELECTRIC'S INSPECTOR USING HAWAIIAN ELECTRIC'S STANDARD PRACTICE. THE CONTRACTOR SHALL INSTALL 1800# TENSILE STRENGTH MULETAPE PULL LINE IN ALL COMPLETED DUCTLINES AFTER MANDREL TESTING IS COMPLETE. PLUG BOTH ENDS OF EACH DUCT WITH PLASTIC PLUGS.

22. JOINT POLE REMOVAL

POLES SHALL BE REMOVED IN ACCORDANCE WITH THE APPLICABLE JOINT POLE AGREEMENT OR OPERATING AGREEMENT.

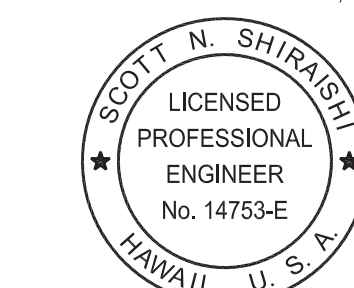
23. AS-BUILT PLANS

THE CONTRACTOR SHALL PROVIDE HAWAIIAN ELECTRIC WITH A SET OF ELECTRONIC AND HARD COPY PLANS OF EACH SHEET SHOWING THE OFFSETS, STATIONING, AND VERTICAL ELEVATION OF THE DUCTLINE(S) CONSTRUCTED.



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS

Ronald N.S. Ho & Associates, Inc.



Scott Shirashi

04/30/2026  
Licensed Expiration Date

This work was prepared by me or under my supervision.

DSGN.	DRWN.	CHKD.	APPD.
SS	CAD	SS	SS

NO.	DATE	REVISIONS
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**100%  
DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL  
IMPROVEMENTS**  
  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

**PROJECT NO.:**

**CO2544-53**

**SHEET TITLE:**

**NOTES I**

DATE :	DWG. NO.
<b>03/24/2026</b>	<b>E-002</b>
SHEET :	
4 OF 21 SHEETS	

HAWAIIAN TELCOM (HTCO) NOTES:

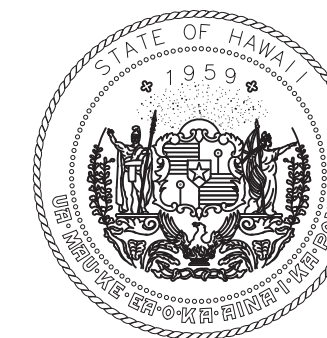
- THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
- THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT AND TONING REQUEST FROM HAWAIIAN TELCOM'S EXCAVATION PERMIT SECTION, LOCATED AT 1177 BISHOP STREET, TWO WEEKS PRIOR TO THE START OF CONSTRUCTION. HOURS OF BUSINESS ARE 8:00 A.M. TO 11:00 A.M. AND 12:00 P.M. TO 3:00 P.M. MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS.
- 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.
- THE LOCATIONS 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 LOCATIONS 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 546-7746 (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 THE REQUIRED CLEARANCES.
- 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 A BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAIN HAWAIIAN TELCOM FACILITIES. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHEREVER NECESSARY.
- 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.
- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "HAWAIIAN TELCOM STANDARD SPECIFICATIONS FOR PLACING TELEPHONE SYSTEMS" DATED JANUARY 2007, ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, AND ALL OTHER PERTINENT STANDARDS FOR TELEPHONE CONSTRUCTION. CONTRACTOR SHALL FAMILIARIZE HIS PERSONNEL BY OBTAINING APPLICABLE SPECIFICATIONS.
- WHEN EXCAVATION IS ADJACENT TO OR BENEATH HAWAIIAN TELCOM'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL:
  - SHEET AND/OR BRACE THE EXCAVATION TO PREVENT SLIDES, CAVE-INS, OR SETTLEMENTS TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
  - PROTECT EXISTING STRUCTURES AND/OR FACILITIES WITH BEAMS, STRUTS, OR UNDERPINNING WHILE EXCAVATING BENEATH THEM TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
- THE CONTRACTOR SHALL BRACE ALL POLES OR LIGHT STANDARDS NEAR THE NEW DUCTLINE, MANHOLE, OR HANDHOLE DURING HIS OPERATIONS.
- THE CONTRACTOR SHALL SAW-CUT AC. PAVEMENT AND CONCRETE GUTTER WHEREVER NEW MANHOLES, HANDHOLES, OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.
- THE CONTRACTOR SHALL COMPLY WITH THE POLICY ADOPTED BY THE DEPARTMENT OF PLANNING AND PERMITTING, CITY AND COUNTY OF HONOLULU, CONCERNING THE REPLACEMENT OF CONCRETE SIDEWALKS AFTER EXCAVATION WORK.
- 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 DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN 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.
- 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.
- 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.
- THE CONTRACTOR SHALL PUMP ALL MANHOLES DRY DURING FINAL INSPECTION.
- THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM INSPECTOR 24 HOURS PRIOR TO THE POURING OF CONCRETE OR BACKFILLING.
- 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
- 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 CONDITIONS AND THE DETAILS AS DESCRIBED IN THE PLANS.
- 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

- 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 BUILDING FLOOR SLAB PENETRATION, SHALL HAVE A BEND RADIUS OF TEN TIMES THE DIAMETER OF THE DUCT OR GREATER.
- 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.
- 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.

GUIDELINES FOR MINIMUM HORIZONTAL (PARALLEL) CLEARANCES BETWEEN HAWAIIAN ELECTRIC AND OTHER UNDERGROUND UTILITIES					GUIDELINES FOR MINIMUM VERTICAL (CROSSING) CLEARANCES HAWAIIAN ELECTRIC AND OTHER UNDERGROUND UTILITIES				
UNDERGROUND UTILITY	HAWAIIAN ELECTRIC DIRECT BURIED CABLE	HAWAIIAN ELECTRIC DIRECT BURIED IN CONDUIT (NO CONCRETE ENCASEMENT)	HAWAIIAN ELECTRIC 3" (MINIMUM) CONCRETE ENCASEMENT	APPLICABLE NOTES:	UNDERGROUND UTILITY	HAWAIIAN ELECTRIC DIRECT BURIED CABLE	HAWAIIAN ELECTRIC DIRECT BURIED IN CONDUIT (NO CONCRETE ENCASEMENT)	HAWAIIAN ELECTRIC 3" (MINIMUM) CONCRETE ENCASEMENT	APPLICABLE NOTES:
HAWAIIAN ELECTRIC DB CONDUITS	12"	3"	0"		HAWAIIAN ELECTRIC DB CONDUITS	6"	3"	0"	
HAWAIIAN ELECTRIC 3" ENCASEMENT	0"	0"	0"		HAWAIIAN ELECTRIC 3" ENCASEMENT	0"	0"	0"	
TELEPHONE/CATV DB	12"	12"	6"		TELEPHONE/CATV DB	12"	12"	6"	
TELEPHONE/CATV DB DUCTS	12"	12"	6"		TELEPHONE/CATV DB DUCTS	12"	12"	6"	
TELEPHONE/CATV 3" ENCASEMENT	0"	0"	0"	5	TELEPHONE/CATV 3" ENCASEMENT	0"	0"	0"	3
TRAFFIC SIGNAL	12"	12"	12"		TRAFFIC SIGNAL	12"	12"	6"	
WATER DB (BWS OWNED)	36"	36"	36"	1, 4	WATER DB (BWS OWNED)	12"	12"	12"	5
CUSTOMER OWNED WATER SERVICE LATERALS	12"	12"	12"		CUSTOMER OWNED WATER SERVICE LATERALS	6"	6"	6"	
WATER (CONCRETE JACKETED) (BWS OWNED)	36"	36"	36"	1, 4	WATER (CONCRETE JACKETED) (BWS OWNED)	12"	12"	12"	5
GAS DB GAS	12"	12"	12"	1	GAS DB	12"	12"	12"	
(CONCRETE JACKETED)	12"	12"	12"	1	GAS (CONCRETE JACKETED)	12"	12"	12"	
SEWER DB	36"	36"	36"	1, 2	SEWER DB	24"	24"	24"	1
SEWER (CONCRETE JACKETED)	36"	36"	36"	1, 2	SEWER (CONCRETE JACKETED)	24"	24"	24"	1
DRAIN FUEL	12"	12"	12"	1	DRAIN	12"	12"	6"	
PIPELINES				3	FUEL PIPELINES				2

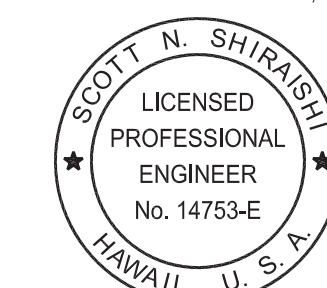
  

NOTES:	NOTES:
1. WHERE SPACE IS AVAILABLE, PARALLEL CLEARANCE TO OTHER UTILITIES, OR FOREIGN STRUCTURES OTHER THAN COMMUNICATION OR TRAFFIC SIGNAL SHALL BE 36" 2. IF 36" CLEARANCE CANNOT BE MET: - IF CLEARANCE IS LESS THAN 12", JACKET SEWER LINE WITH REINFORCED CONCRETE (PER HECO'S STD. 30-1030) FOR A DISTANCE OF 5' PLUS PIPE DIAMETER. - IF CLEARANCE IS BETWEEN 12" AND 36", JACKET SEWER LINE WITH PLAIN CONCRETE. 3. ALL FUEL PIPELINE CROSSINGS SHALL BE REVIEWED AND APPROVED BY THE COMPANY THAT OWNS AND MAINTAINS IT. 4. 5 FEET CLEAR TO WATER MAINS 16" OR LARGER. 5. FOR SITUATIONS WITH 0" MINIMUM SEPARATION, A 6" SEPARATION IS RECOMMENDED. 6. CLEARANCES MEASURED FROM OUTER EDGES OR DIAMETERS OF UTILITIES. WHENEVER CONCRETE JACKETS ARE INVOLVED, CLEARANCES SHALL BE TOTAL CLEAR DISTANCE BETWEEN THE CONCRETE JACKET AND UTILITY CONCERNED.	1. IF CLEARANCE CANNOT BE MET: - IF CLEARANCE IS LESS THAN 12", JACKET SEWER LINE WITH REINFORCED CONCRETE (PER HECO'S STD. 30-1030) FOR A DISTANCE OF 5' PLUS PIPE DIAMETER. - IF CLEARANCE IS BETWEEN 12" AND 24", JACKET SEWER LINE WITH PLAIN CONCRETE. 2. ALL FUEL PIPELINE CROSSINGS SHALL BE REVIEWED AND APPROVED BY THE COMPANY THAT OWNS AND MAINTAINS IT. 3. FOR SITUATIONS WITH 0" MINIMUM SEPARATION, A 6" SEPARATION IS RECOMMENDED. 4. CLEARANCES MEASURED FROM OUTER EDGES OR DIAMETERS OF UTILITIES. WHENEVER CONCRETE JACKETS ARE INVOLVED, CLEARANCES SHALL BE TOTAL CLEAR DISTANCE BETWEEN THE CONCRETE JACKET AND UTILITY CONCERNED. 5. 36" CLEARANCE IS REQUIRED FOR TRENCHLESS INSTALLATION WORK.



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS

Ronald N. Ho & Associates, Inc.



Scott Shirashi

04/30/2026  
Licensed Expiration Date

This work was prepared by me or under my supervision.

DSGN.	DRWN.	CHKD.	APPD.
SS	CAD	SS	SS

NO.	DATE	REVISIONS
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**100%  
DESIGN**  
MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

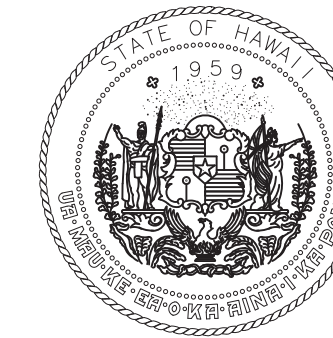
PROJECT NO.:

**CO2544-53**

SHEET TITLE:

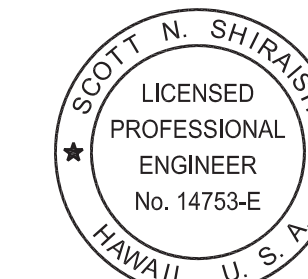
**NOTES II**

DATE :	DWG. NO.
<b>03/24/2026</b>	<b>E-003</b>
SHEET :	
5 OF 21 SHEETS	



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS

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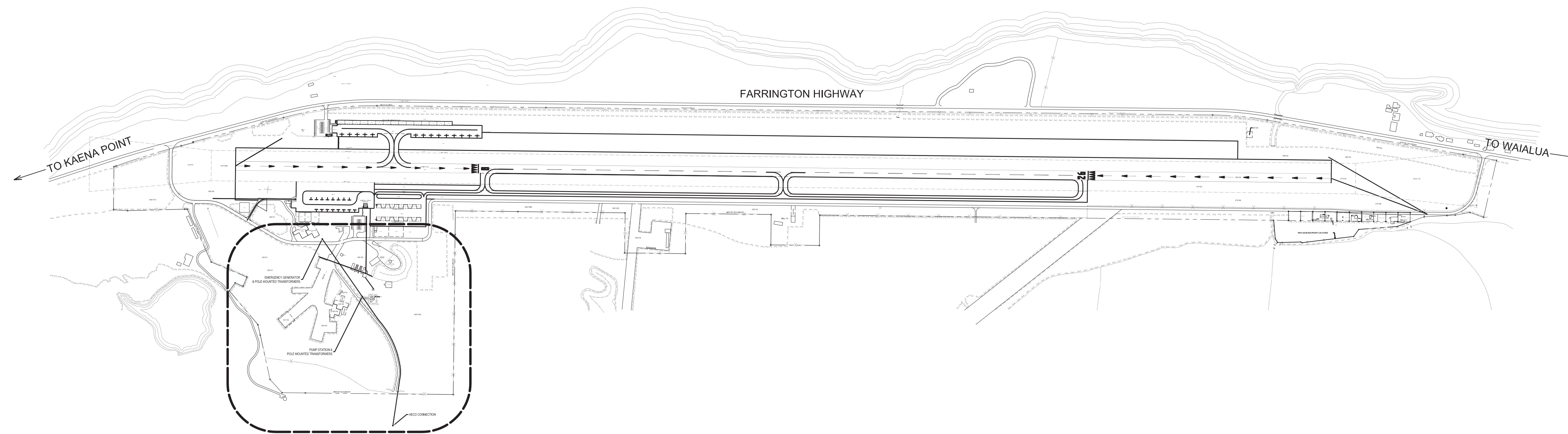


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04/30/2026  
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SS	CAD	SS	SS



PROJECT SITE  
SHEETS E-005, E-006, E-007, & E-008



DILLINGHAM AIRFIELD  
**ELECTRICAL SITE PLAN**  
NOT TO SCALE

NO.	DATE	REVISIONS
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**100%  
DESIGN**  
MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**SITE PLAN**

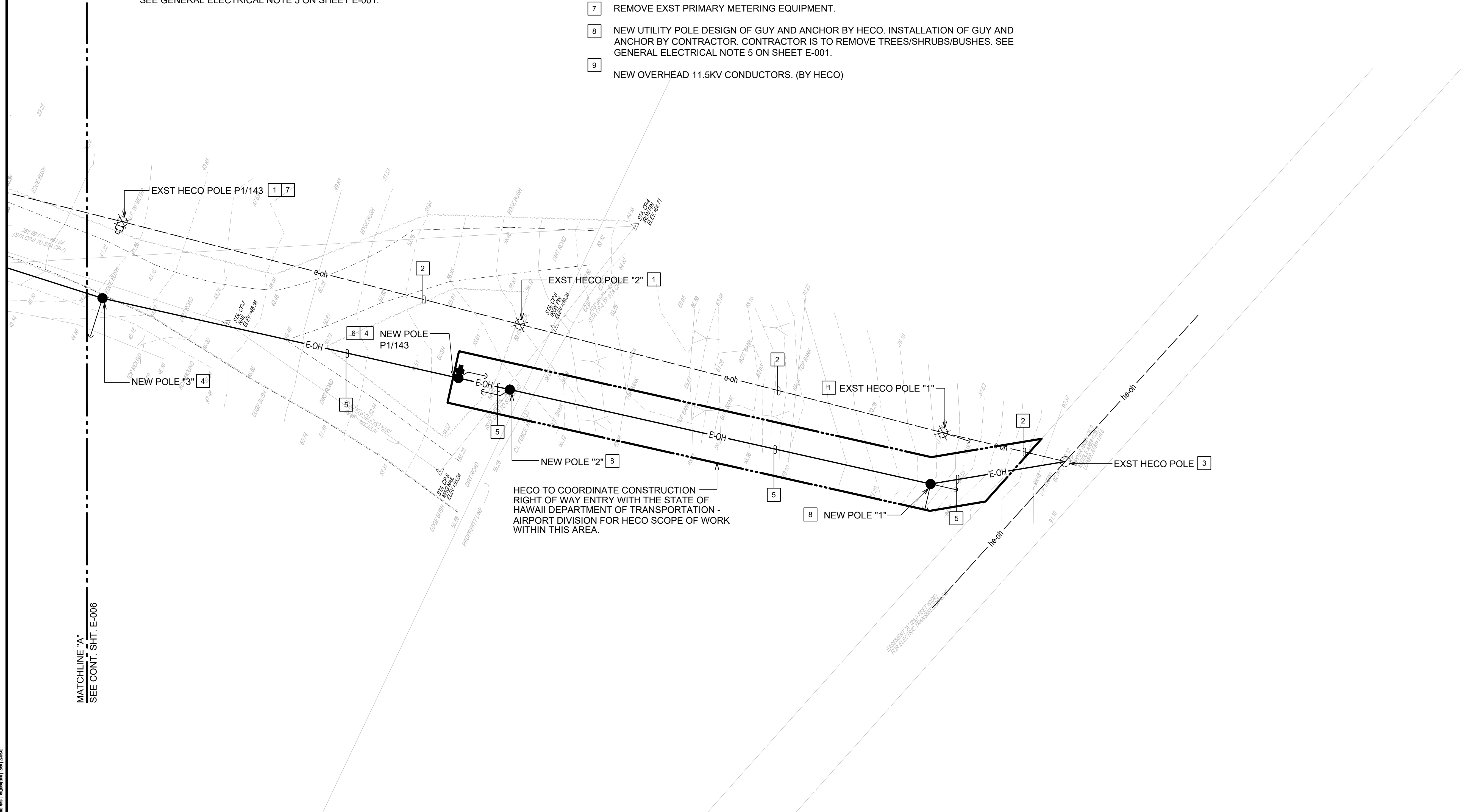
DATE :	DWG. NO.
03/24/2026	<b>E-004</b>
SHEET :	
6 OF 21 SHEETS	

**GENERAL NOTES:**

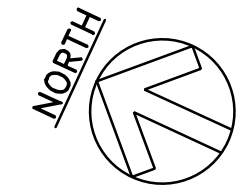
1. CONTRACTOR IS TO CONSTRUCT NEW POLE LINE BEFORE DEMOLISHING EXST POLE LINE.
2. CONTRACTOR IS TO COORDINATE WITH THE STATE TO SCHEDULE AN ELECTRICAL OUTAGE. ELECTRICAL OUTAGES SHALL BE RESTRICTED TO 48 HOURS MAXIMUM.
3. AFTER NEW POLE LINE IS OPERATIONAL, CONTRACTOR IS TO DEMOLISH EXST POLE LINE.
4. CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN ELECTRIC.
5. CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN TELCOM.
6. CONTRACTOR IS TO REMOVE TREES/SHRUBS/BUSHES FOR POLE LINE INSTALLATION. SEE GENERAL ELECTRICAL NOTE 5 ON SHEET E-001.

**NOTES:**

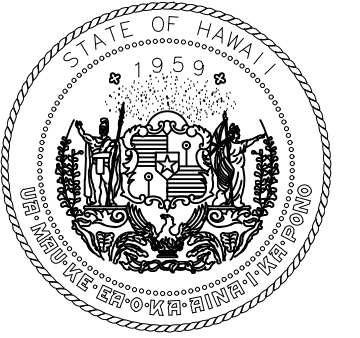
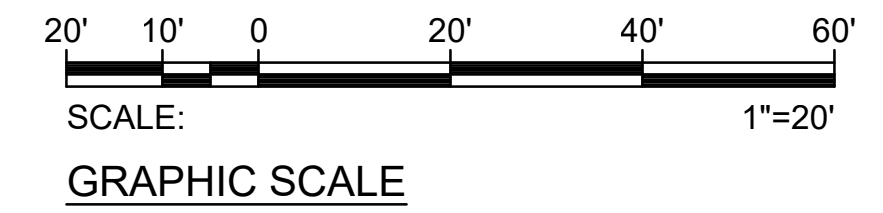
1. EXST UTILITY POLE TO BE REMOVED. REMOVE EXST GUY & ANCHOR IF APPLICABLE.
2. EXST OVERHEAD 11.5KV CONDUCTORS TO BE REMOVED. (BY HECO)
3. EXST HECO POLE. HECO TO MAKE FINAL TAP CONNECTIONS. COORDINATE WORK WITH HECO.
4. NEW UTILITY POLE. PROVIDE TERMI-MESH TERMITE BARRIER.
5. NEW OVERHEAD 11.5KV CONDUCTORS.
6. NEW HECO METER. CONTRACTOR TO INSTALL NEW METER ENCLOSURE, HECO TO INSTALL METER & ENERGIZE SERVICE. COORDINATE WORK WITH HECO.
7. REMOVE EXST PRIMARY METERING EQUIPMENT.
8. NEW UTILITY POLE DESIGN OF GUY AND ANCHOR BY HECO. INSTALLATION OF GUY AND ANCHOR BY CONTRACTOR. CONTRACTOR IS TO REMOVE TREES/SHRUBS/BUSHES. SEE GENERAL ELECTRICAL NOTE 5 ON SHEET E-001.
9. NEW OVERHEAD 11.5KV CONDUCTORS. (BY HECO)



MATCHLINE "A"  
SEE CONT. SHT. E-006

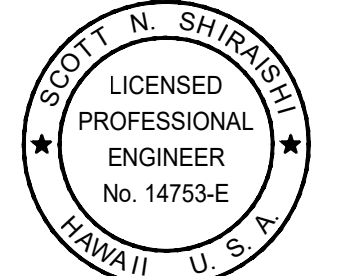


**ELECTRICAL PARTIAL PLAN I**  
SCALE: 1"=20'



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS

Ronald N.S. Ho & Associates, Inc.



*Scott Shirahishi*

04/30/2026  
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SS	CAD	SS	SS

NO.	DATE	REVISIONS

**100%  
DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

**PROJECT NO.:**

**CO2544-53**

**SHEET TITLE:**

**ELECTRICAL PARTIAL  
PLAN I**

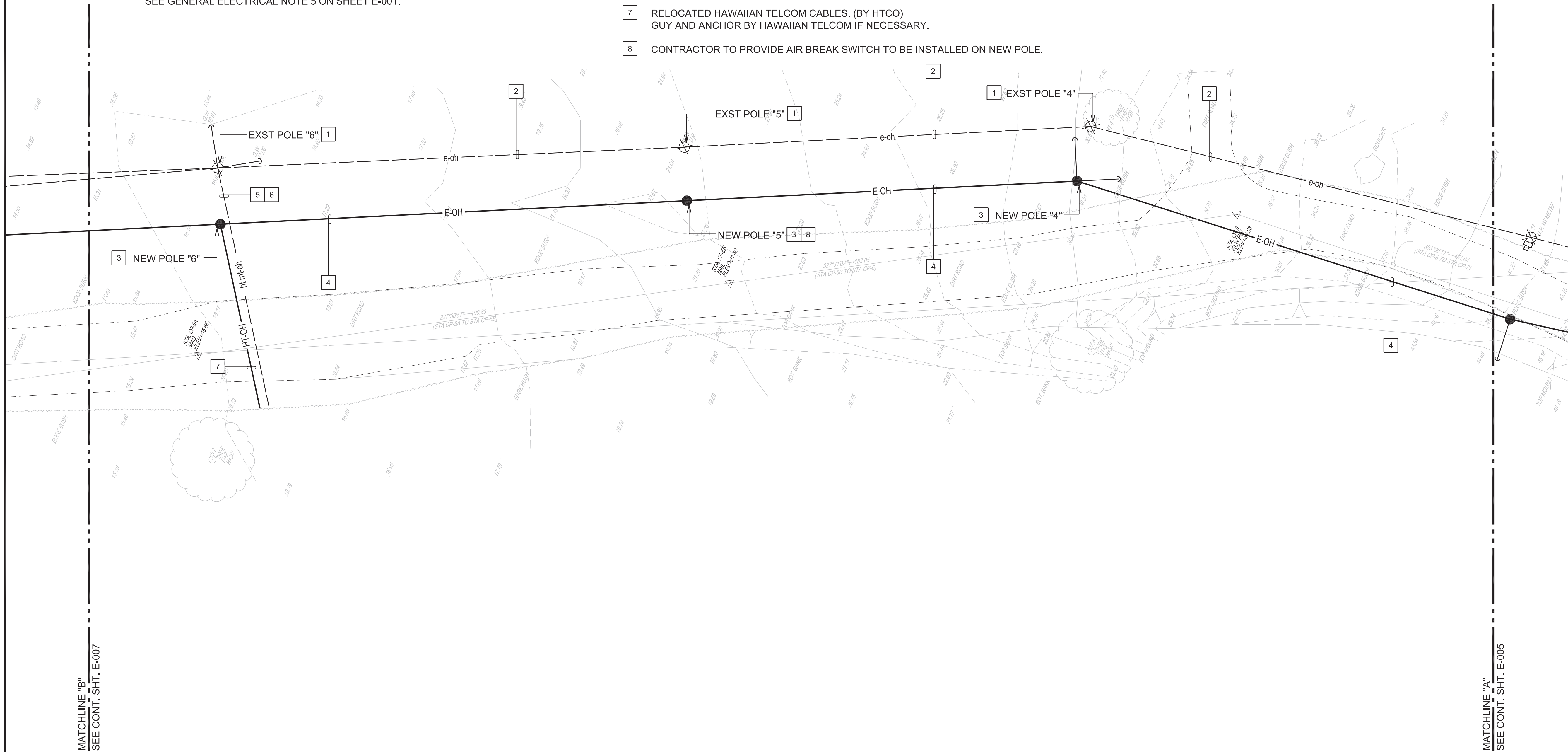
DATE :	DWG. NO.
03/24/2026	<b>E-005</b>
SHEET :	
7 OF 21 SHEETS	

**GENERAL NOTES:**

- CONTRACTOR IS TO CONSTRUCT NEW POLE LINE BEFORE DEMOLISHING EXST POLE LINE.
- CONTRACTOR IS TO COORDINATE WITH THE STATE TO SCHEDULE AN ELECTRICAL OUTAGE. ELECTRICAL OUTAGES SHALL BE RESTRICTED TO 48 HOURS MAXIMUM.
- AFTER NEW POLE LINE IS OPERATIONAL, CONTRACTOR IS TO DEMOLISH EXST POLE LINE.
- CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN ELECTRIC.
- CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN TELCOM.
- CONTRACTOR IS TO REMOVE TREES/SHRUBS/BUSHES FOR POLE LINE INSTALLATION. SEE GENERAL ELECTRICAL NOTE 5 ON SHEET E-001.

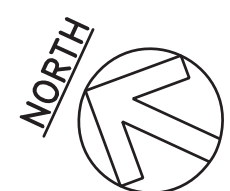
**NOTES:**

- EXST UTILITY POLE TO BE REMOVED. REMOVE EXST GUY & ANCHOR IF APPLICABLE.
- EXST OVERHEAD 11.5KV CONDUCTORS TO BE REMOVED.
- NEW UTILITY POLE. PROVIDE TERMI-MESH TERMITE BARRIER.
- NEW OVERHEAD 11.5KV CONDUCTORS.
- REMOVE EXST MILITARY TELECOM CABLE.
- EXST HTCO CABLES. HAWAIIAN TELCOM TO RELOCATE EXST HTCO CABLES TO NEW POLE LINE.
- RELOCATED HAWAIIAN TELCOM CABLES. (BY HTCO) GUY AND ANCHOR BY HAWAIIAN TELCOM IF NECESSARY.
- CONTRACTOR TO PROVIDE AIR BREAK SWITCH TO BE INSTALLED ON NEW POLE.

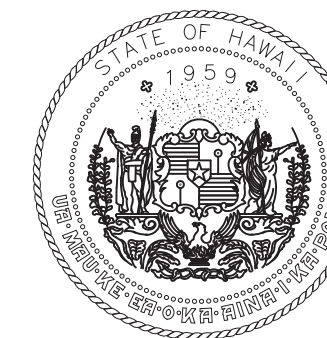
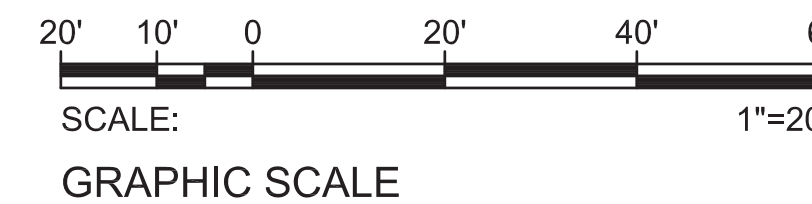


MATCHLINE "B"  
SEE CONT. SHT. E-007

MATCHLINE "A"  
SEE CONT. SHT. E-005

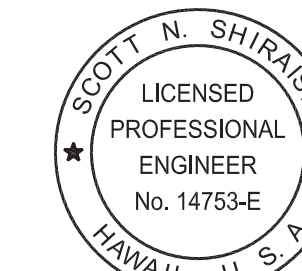


**ELECTRICAL PARTIAL PLAN II**  
SCALE: 1"=20'



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SS	CAD	SS	SS

NO.	DATE	REVISIONS

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DESIGN**

MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**ELECTRICAL PARTIAL  
PLAN II**

DATE :

03/24/2026

SHEET :

8 OF 21 SHEETS

DWG. NO.

**E-006**

**GENERAL NOTES:**

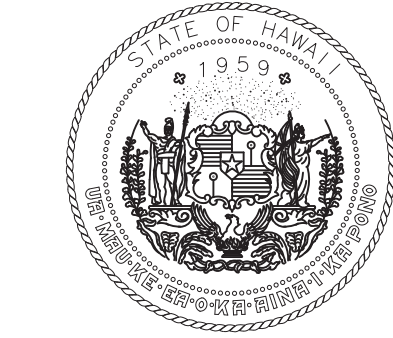
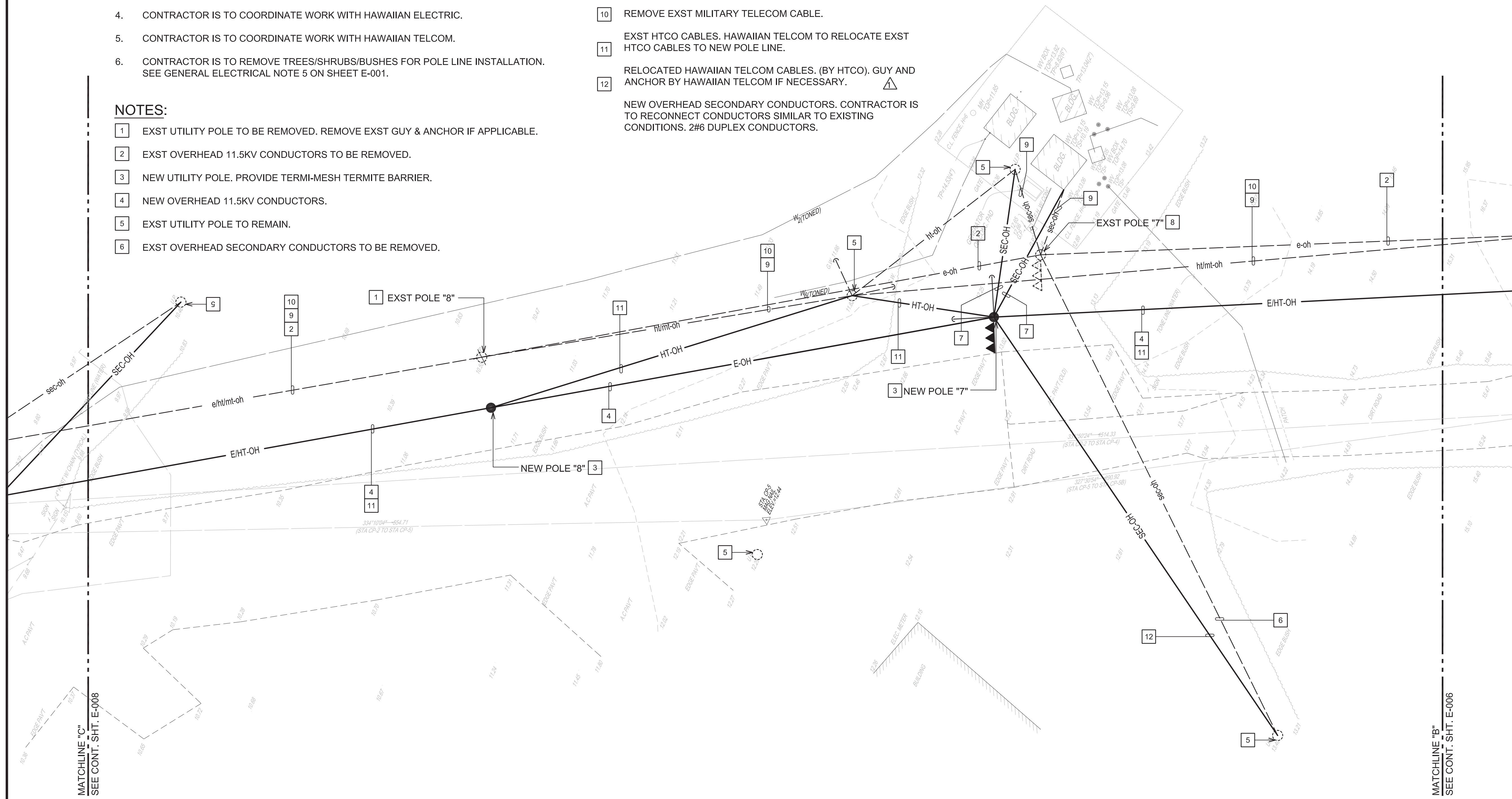
1. CONTRACTOR IS TO CONSTRUCT NEW POLE LINE BEFORE DEMOLISHING EXST POLE LINE.
2. CONTRACTOR IS TO COORDINATE WITH THE STATE TO SCHEDULE AN ELECTRICAL OUTAGE. ELECTRICAL OUTAGES SHALL BE RESTRICTED TO 48 HOURS MAXIMUM.
3. AFTER NEW POLE LINE IS OPERATIONAL, CONTRACTOR IS TO DEMOLISH EXST POLE LINE.
4. CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN ELECTRIC.
5. CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN TELCOM.
6. CONTRACTOR IS TO REMOVE TREES/SHRUBS/BUSHES FOR POLE LINE INSTALLATION. SEE GENERAL ELECTRICAL NOTE 5 ON SHEET E-001.

**NOTES:**

- 1 EXST UTILITY POLE TO BE REMOVED. REMOVE EXST GUY & ANCHOR IF APPLICABLE.
- 2 EXST OVERHEAD 11.5KV CONDUCTORS TO BE REMOVED.
- 3 NEW UTILITY POLE. PROVIDE TERMI-MESH TERMITE BARRIER.
- 4 NEW OVERHEAD 11.5KV CONDUCTORS.
- 5 EXST UTILITY POLE TO REMAIN.
- 6 EXST OVERHEAD SECONDARY CONDUCTORS TO BE REMOVED.

**NOTES:**

- 7 NEW OVERHEAD SECONDARY CONDUCTORS. CONTRACTOR IS TO RECONNECT CONDUCTORS SIMILAR TO EXISTING CONDITIONS. 4#6 QUADRUPLIX CONDUCTORS. COORDINATE OUTAGES WITH RESPECTIVE FACILITY OWNERS.
- 8 EXST UTILITY POLE & XFMRs TO REMAIN.
- 9 REMOVE EXST MILITARY TELECOM CABLE.
- 10 EXST HTCO CABLES. HAWAIIAN TELCOM TO RELOCATE EXST HTCO CABLES TO NEW POLE LINE.
- 11 RELOCATED HAWAIIAN TELCOM CABLES. (BY HTCO). GUY AND ANCHOR BY HAWAIIAN TELCOM IF NECESSARY.
- 12 NEW OVERHEAD SECONDARY CONDUCTORS. CONTRACTOR IS TO RECONNECT CONDUCTORS SIMILAR TO EXISTING CONDITIONS. 2#6 DUPLEX CONDUCTORS.



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NO.	DATE	REVISIONS

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DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL  
IMPROVEMENTS**  
  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

**PROJECT NO.:**

**CO2544-53**

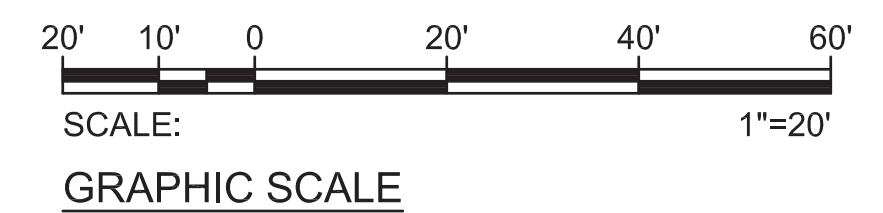
**SHEET TITLE:**

**ELECTRICAL PARTIAL  
PLAN III**

DATE :	DWG. NO.
03/24/2026	<b>E-007</b>
SHEET :	
9 OF 21 SHEETS	



**ELECTRICAL PARTIAL PLAN III**  
SCALE: 1"=20'



11/23/2025 10:00 AM C:\Users\jshirashi\OneDrive\Documents\Projects\CO2544-53\Drawings\E-007.dwg

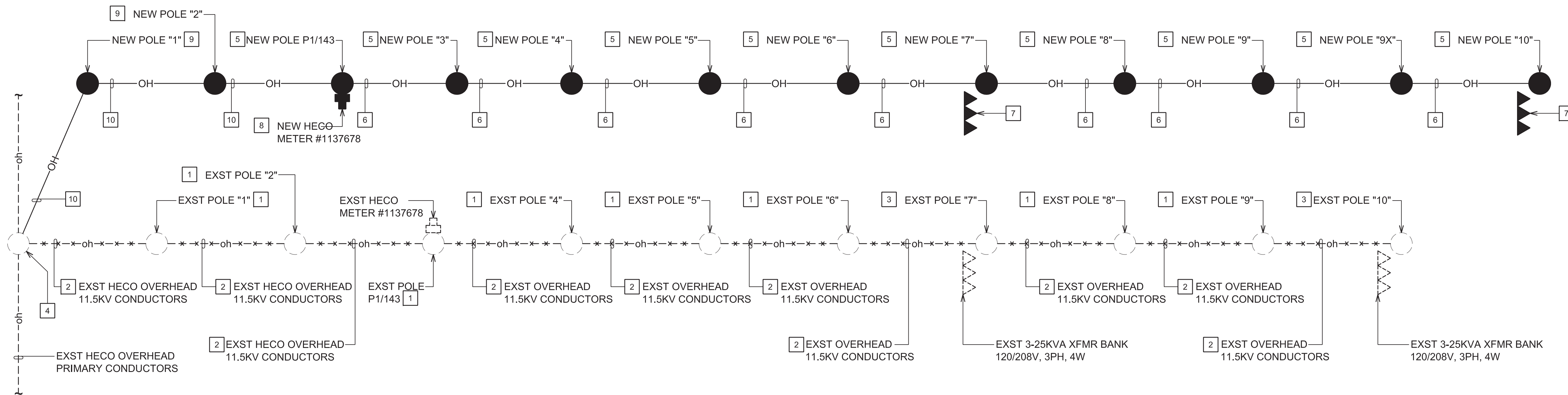


**GENERAL NOTES:**

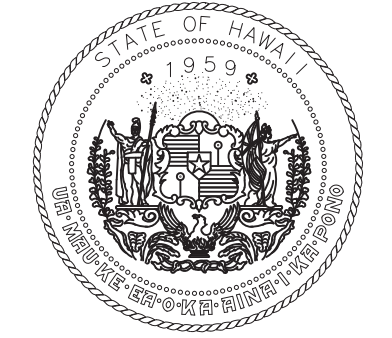
- CONTRACTOR IS TO CONSTRUCT NEW POLE LINE BEFORE DEMOLISHING EXST POLE LINE.
- CONTRACTOR IS TO COORDINATE WITH THE STATE TO SCHEDULE AN ELECTRICAL OUTAGE. ELECTRICAL OUTAGES SHALL BE RESTRICTED TO 48 HOURS MAXIMUM.
- AFTER NEW POLE LINE IS OPERATIONAL, CONTRACTOR IS TO DEMOLISH EXST POLE LINE.
- CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN ELECTRIC.
- CONTRACTOR IS TO COORDINATE WORK WITH HAWAIIAN TELCOM.
- CONTRACTOR IS TO REMOVE TREES/SHRUBS/BUSHES FOR POLE LINE INSTALLATION. SEE GENERAL ELECTRICAL NOTE 5 ON SHEET E-001.

**NOTES:**

- EXST UTILITY POLE TO BE REMOVED.
- EXST 11.5KV CONDUCTORS TO BE REMOVED.
- EXST UTILITY POLE & XFMRs TO REMAIN.
- EXST HECO POLE. HECO TO MAKE FINAL CONNECTIONS.
- NEW UTILITY POLE.
- NEW 11.5KV 4-1/C #2 MHD CONDUCTORS.
- NEW 3-25KVA POLE TOP XFMR BANK, 11.5KV-120/208, 3PH, 4W.
- PROVIDE NEW 13-JAW METER SOCKET, NEMA 3R, STAINLESS STEEL PER HECO REQUIREMENTS.
- NEW HECO UTILITY POLE.
- NEW 11.5KV CONDUCTORS BY HECO.

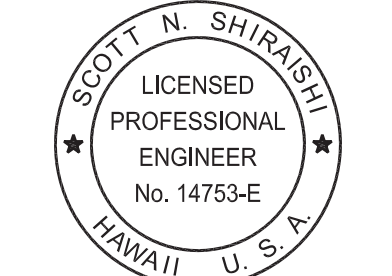


**PRIMARY 11.5KV  
DIAGRAM**



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MARCH 24, 2026  
DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

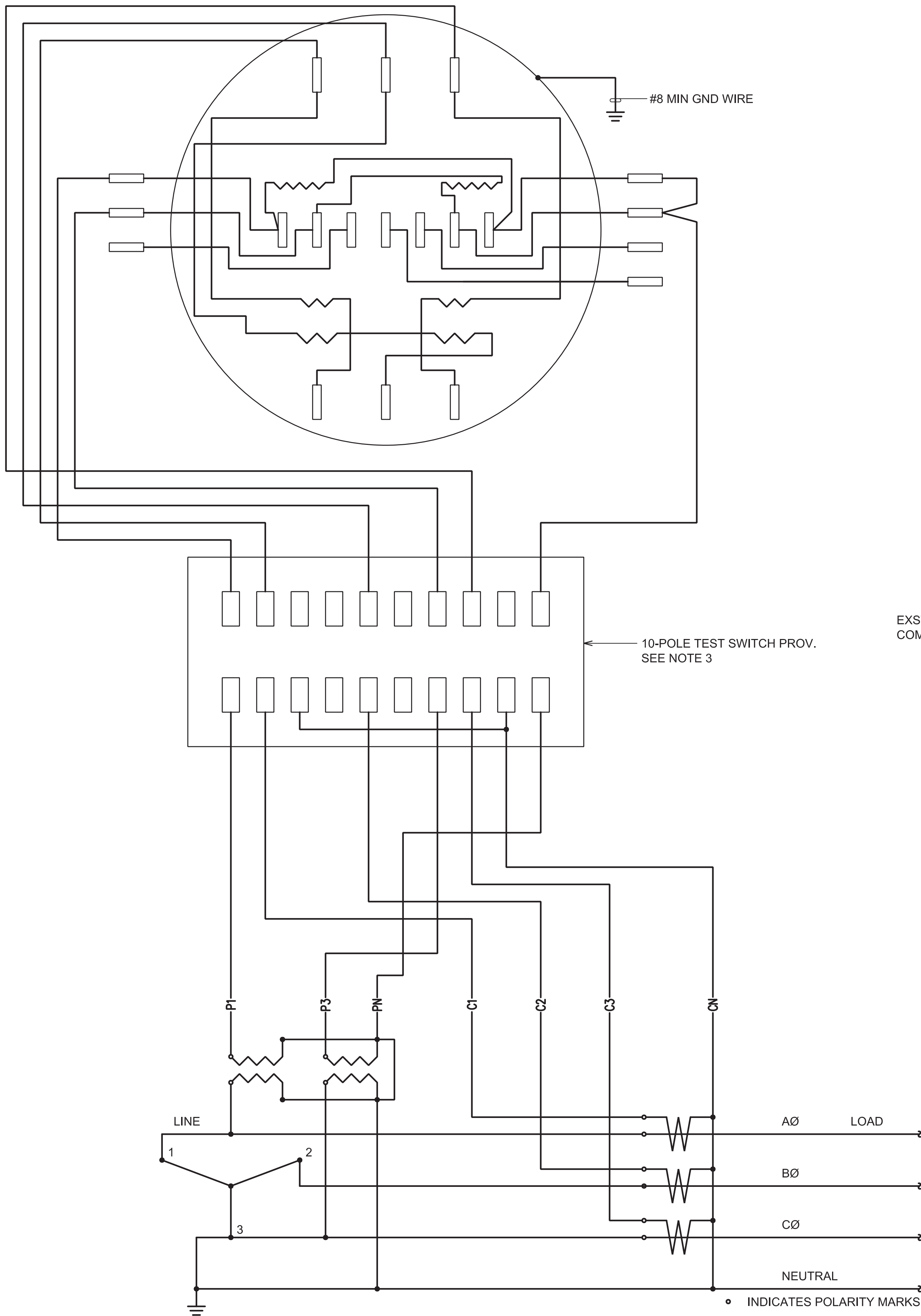
**CO2544-53**

SHEET TITLE:

**PRIMARY 11.5KV  
DIAGRAM**

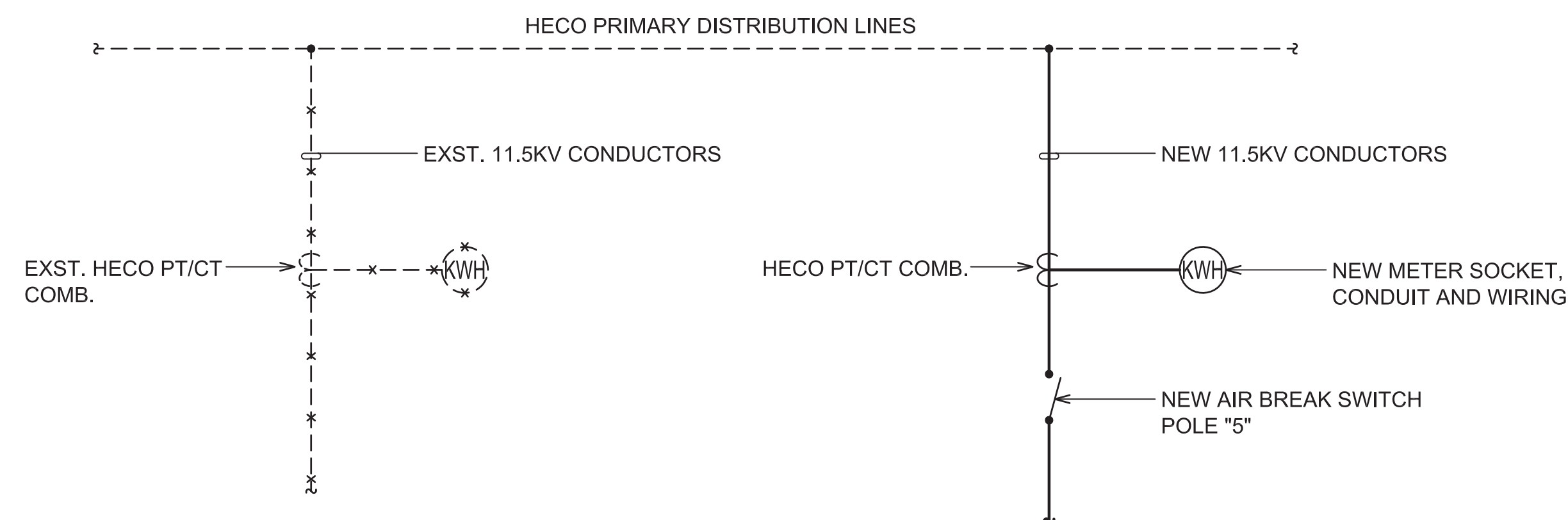
DATE :	03/24/2026	DWG. NO.	<b>E-009</b>
SHEET :	11 OF 21 SHEETS		





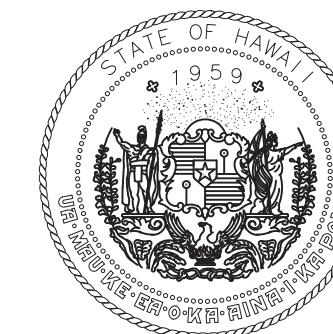
**NOTES:**

1. METER INSTALLATION SHALL CONFORM TO HECO ELEC SERVICE INSTALLATION MANUAL 7TH ED.
2. CONFIRM ALL WIRING CONNECTION POINTS WITH HECO METER SUPERVISOR. LABEL WIRES AND COLOR CODE PER HECO METER PERSONNEL DIRECTION.
3. HECO TO WIRE WITHIN METER SOCKET AND PROVIDE TEST SWITCHES.
4. COORDINATE WITH HECO TO REMOVE EXISTING METERING EQUIPMENT AND TO INSTALL NEW METERING EQUIPMENT.



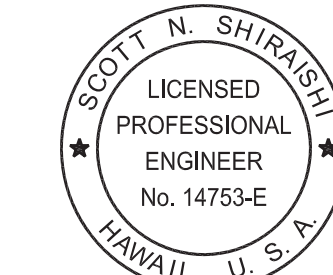
**PARTIAL 11.5 KV ONE LINE DIAGRAM**  
NOT TO SCALE

**3 PHASE, 4 WIRE, 2.4 KV-12.47 KV METERING DETAIL**  
NOT TO SCALE



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PROJECT TITLE :

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IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**HECO PRIMARY  
METERING DETAIL**

DATE :

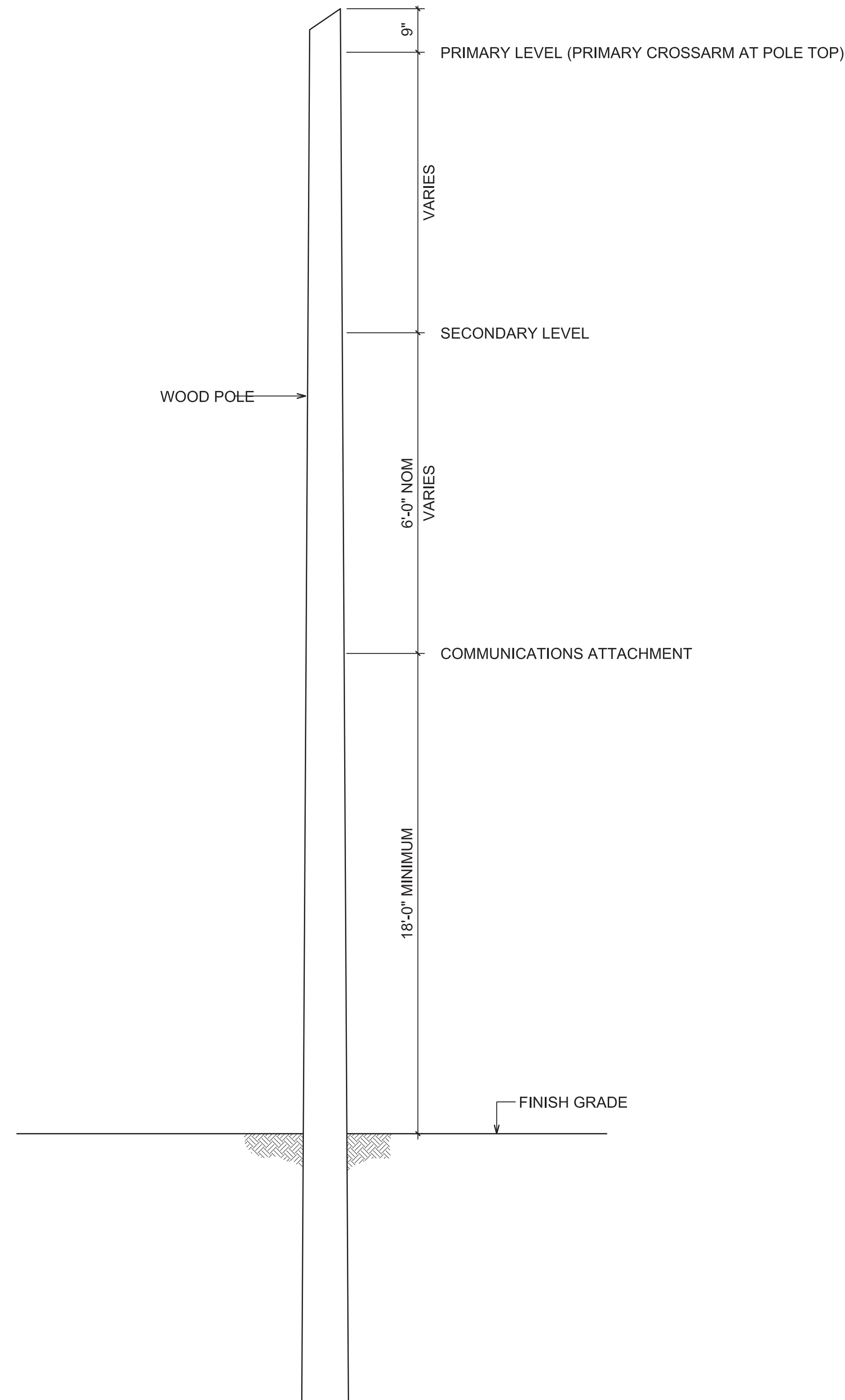
03/24/2026

SHEET :

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DWG. NO.

**E-011**



**TYPICAL ATTACHMENT ASSIGNMENTS**  
NOT TO SCALE

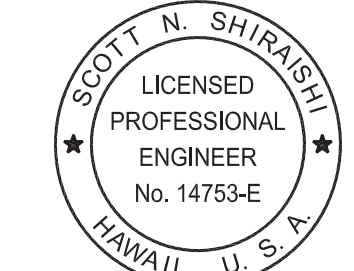
**LIST OF MATERIALS**

PART NO.	DESCRIPTION
1	WOOD POLE, CLASS AS SPECIFIED, HEIGHT AS SPECIFIED
1A	WOOD POLE, CLASS AS SPECIFIED, HEIGHT AS SPECIFIED
1B	WOOD POLE, CLASS AS SPECIFIED, HEIGHT AS SPECIFIED
2	CROSSARM, DOUGLAS FIR, 3 1/2" X 4 1/2" X 10'-0"
2A	CROSSARM, DOUGLAS FIR, 3-3/4" X 5-3/4" X 8'-0"
3	BRACE, FLAT CROSSARM, 1 1/4" X 1/4 " X 34" STRUCTURAL GRADE STEEL, 10,000 LBS. BREAKING STRENGTH
4	CARRIAGE BOLT, 3/8" X 4 1/2". EEI SPEC TD-1.
5	#8 MHD BARE COPPER, BOND TO INSULATOR PINS OR BOLTS & WOOD MOLDING
6	CLAMP, HOT LINE TAP ASSEMBLY
7	INSULATOR PIN, FORGED STL HIGH TENSION. 1 3/8" LEAD THDS, EEI SPEC TDJ-17.
8	#4 SOFT DRAWN BARE COPPER GROUND WIRE.
10	MACHINE BOLT, 5/8" X 14"
12	MACHINE BOLT, 5/8" X 18"
13	STRAIN CLAMP, ENVELOPE TYPE, ULTIMATE STRENGTH 8,000 LBS.
14	LAG SCREW, 1/2" X 4", FETTER DRIVE
15	DOUBLE ARMING BOLT 5/8" X 18" WITH 4 NUTS
15A	DOUBLE ARMING BOLT 5/8" X 14" WITH 4 NUTS
16	SUSPENSION INSULATOR, 10" DIA. CLEVIS TYPE, EEI-NEMA CLASS 52-2
17	PIN TYPE INSULATOR, 1 3/8" DIA. PINHOLE, EEI-NEMA CLASS 55-5
17A	INSULATED CLEVIS (SECONDARY RACK)
17B	3-GANG INSULATED CLEVIS (SECONDARY RACK)
17C	PRIMARY INSULATED CLEVIS
18	SQUARE WASHER, FLAT, 2 1/4" X 2 1/4" X 3/16", 11/16" DIA. HOLE
19	SQUARE WASHER, CURVED, 2 1/4" X 2 1/4" X 3/16", 13/16" DIA. HOLE
20	ROUND WASHER, 1" DIA. 7/16" DIA. HOLE
21	ROUND WASHER, 1 1/4" DIA., 9/16" DIA. HOLE, USE UNDER HEAD OF CARRIAGE BOLT.
22	THIMBLE DEADEND ASSEMBLY, ALUMINUM, WITH GALVANIZED COTTER BOLT AND STAINLESS STEEL PIN
23	EYENUT, 5/8" BOLT SIZE
29	M-F LOCKNUT, SQUARE 5/8" BOLT SIZE
30	M-F LOCKNUT, SQUARE 3/4" BOLT SIZE
32	FUSE CUTOUT, 100 AMP, OPEN TYPE, LOAD BREAK, 15KV, HOOK STICK OPERATED
33	POST INSULATOR & POST
34	SURGE ARRESTER, ZINC OXIDE, 15KV
35	MACHINE BOLT, 3/4" X 10"
36	SHACKLE, ULTIMATE STRENGTH - 18,000 LBS.
37	EXTENSION LINK, 1 3/4" X 3/8" X 24"
43	THIMBLEYE BOLT, 5/8" X 10"
45	SQUARE WASHERS, CURVED, 2 1/4" X 2 1/4" X 3/16", 11/16" DIA. HOLE
46	CONCRETE ANCHOR, 18" DEADMAN
47	GALVANIZED GUY WIRE, 7 STRAND UTILITIES GRADE, 7/16" SIZE.
49	ANCHOR ROD, THREADED THIMBLEYE 5/8" X 8'-0"
52	#1/0 CU 15KV CABLE, 3-1/C
53	GUY PROTECTOR, 8 FEET, 16 GAGE STEEL
55	LIFT PLATE, 3-HOLE, 1/4" STEEL PLATE
56	GUY STRAIN INSULATOR
58	GUY CLAMP, 6" 3-BOLT, 5/8" BOLT
61	#4/0 CU 15KV CABLE, 3-1/C
62	CONNECTOR, SPLIT BOLT, COPPER ALLOY
62A	CRIMP CONNECTOR
63	TERMINATOR, SINGLE CONDUCTOR, SLIP-ON TYPE, 15KV.
64	TRANSFORMER, OIL FILLED, NON-PCB, STAINLESS STEEL TANK, SIZE AS NOTED
65	WOOD MOLDING, HALF ROUND, STAPLE EVERY 12" WITH COPPER CLAD STAPLES
66	300 MCM COPPER CABLE
67A	#6 MHD BARE COPPER WIRE
68	3" PVC CONDUIT RISER, SCHEDULE 80, DUCT SEAL AT TOP
70	3" PVC SCHEDULE 80 SLEEVE
73	GROUND ROD, 5/8" DIA X 10'-0" COPPER CLAD STEEL
74	CLAMP, 5/8" DIA GROUND ROD



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SS	CAD	SS	SS

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DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL  
IMPROVEMENTS**  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

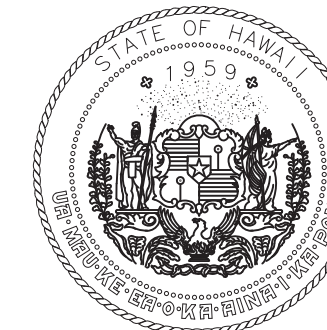
**PROJECT NO.:**

**CO2544-53**

**SHEET TITLE:**

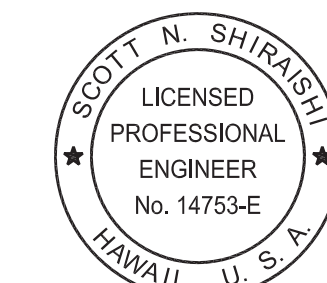
**POLE LINE LIST OF  
MATERIALS**

DATE :	03/24/2026	DWG. NO.	<b>E-012</b>
SHEET :	14 OF 21 SHEETS		



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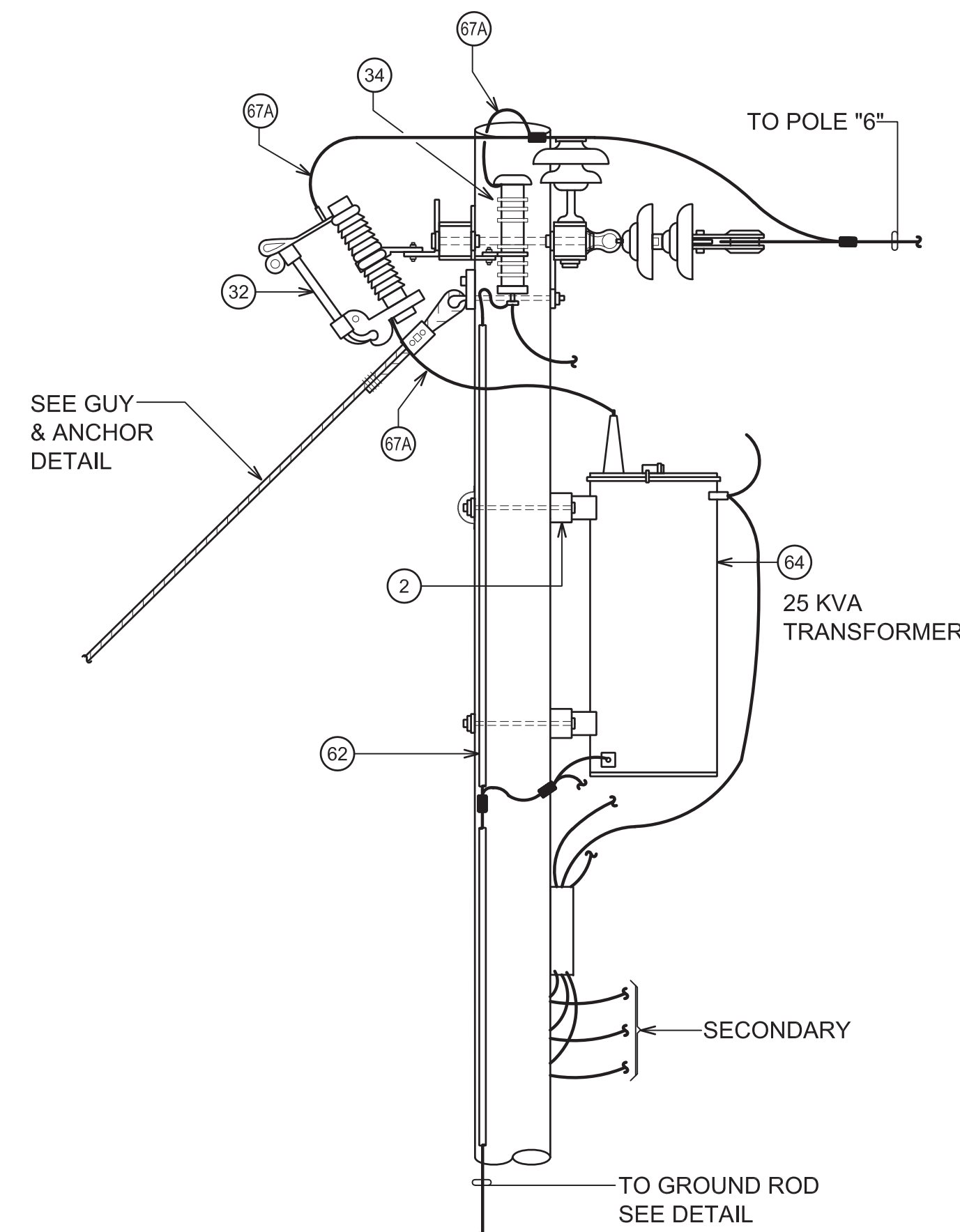


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Licensed Professional Engineer  
No. 14753-E  
HAWAII U.S.A.

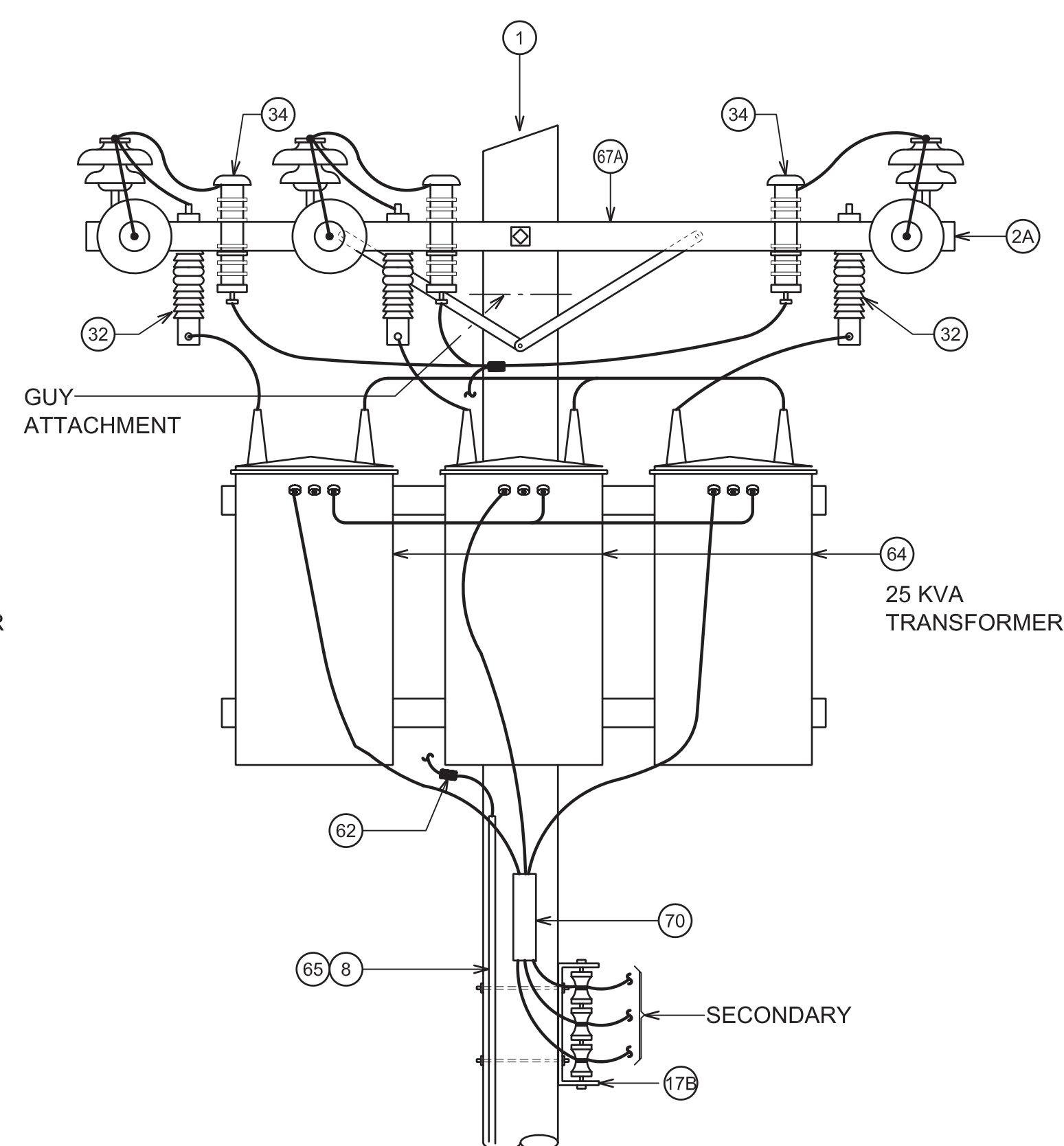
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SIDE VIEW



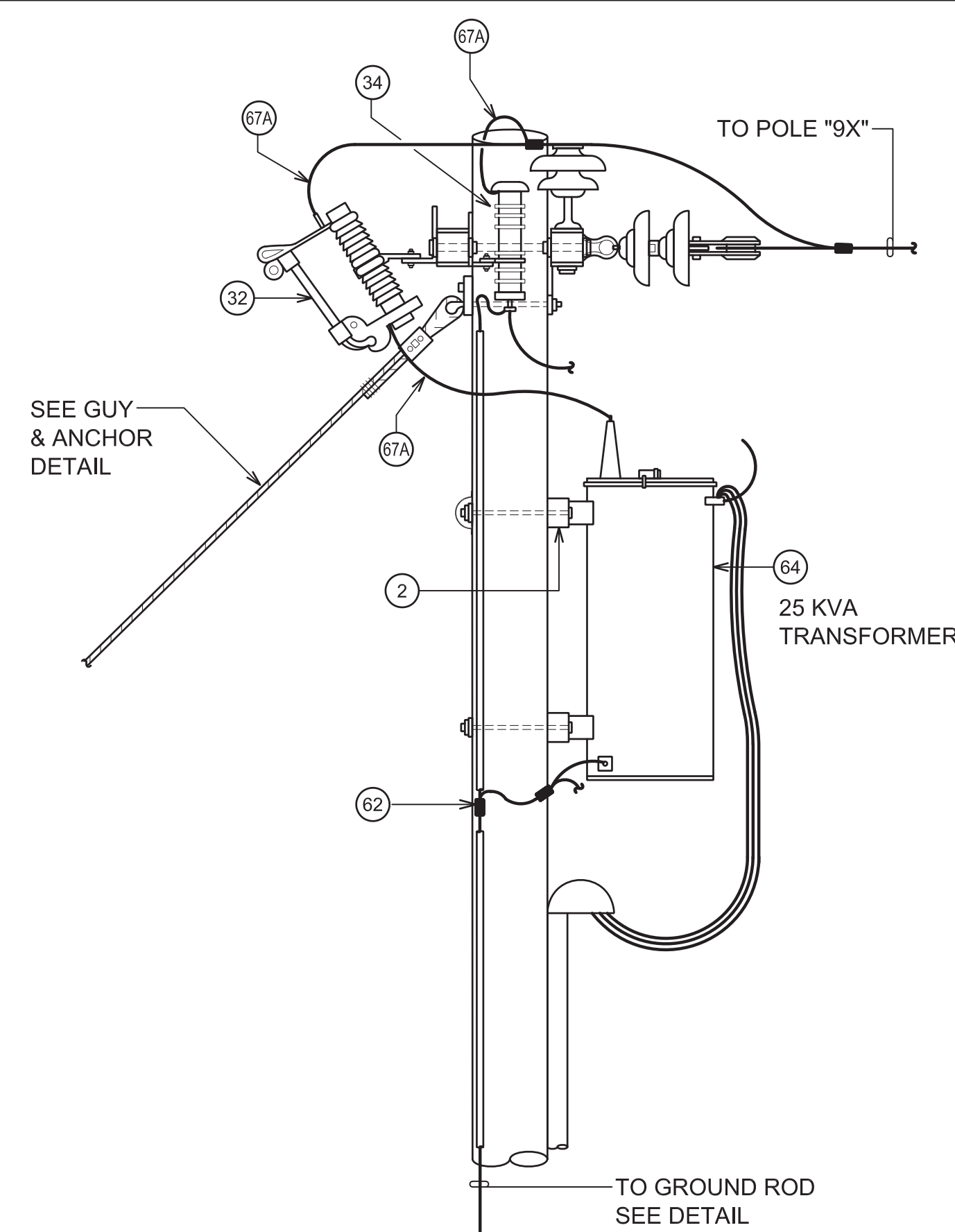
FRONT VIEW

NEW POLE "7"

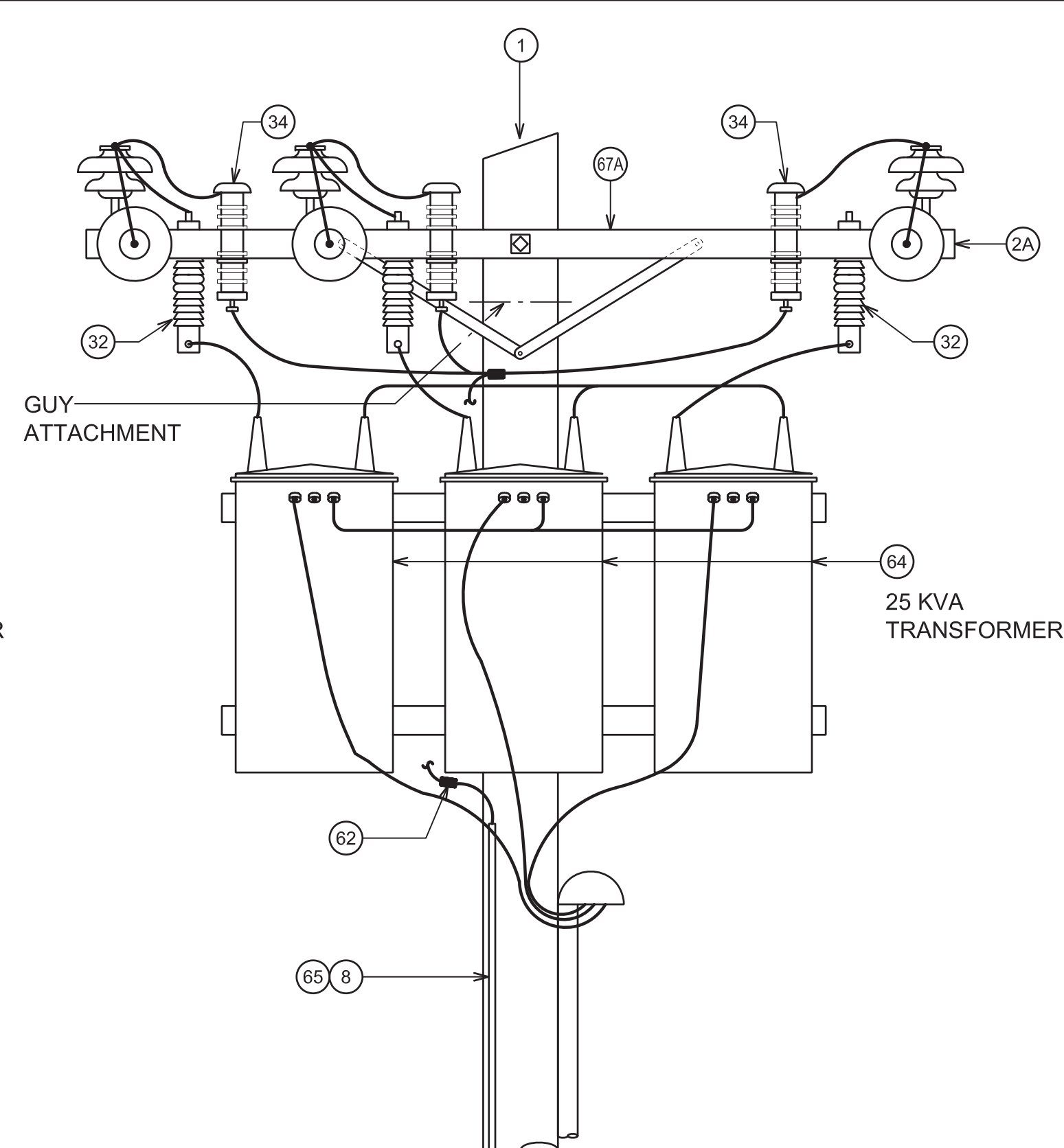
NOT TO SCALE

NOTES FOR DETAILS:

- A. ITEM NUMBERS IN CIRCLE INDICATES MATERIAL PART NUMBER; SEE SHEET E-012 FOR LIST OF MATERIALS.



SIDE VIEW



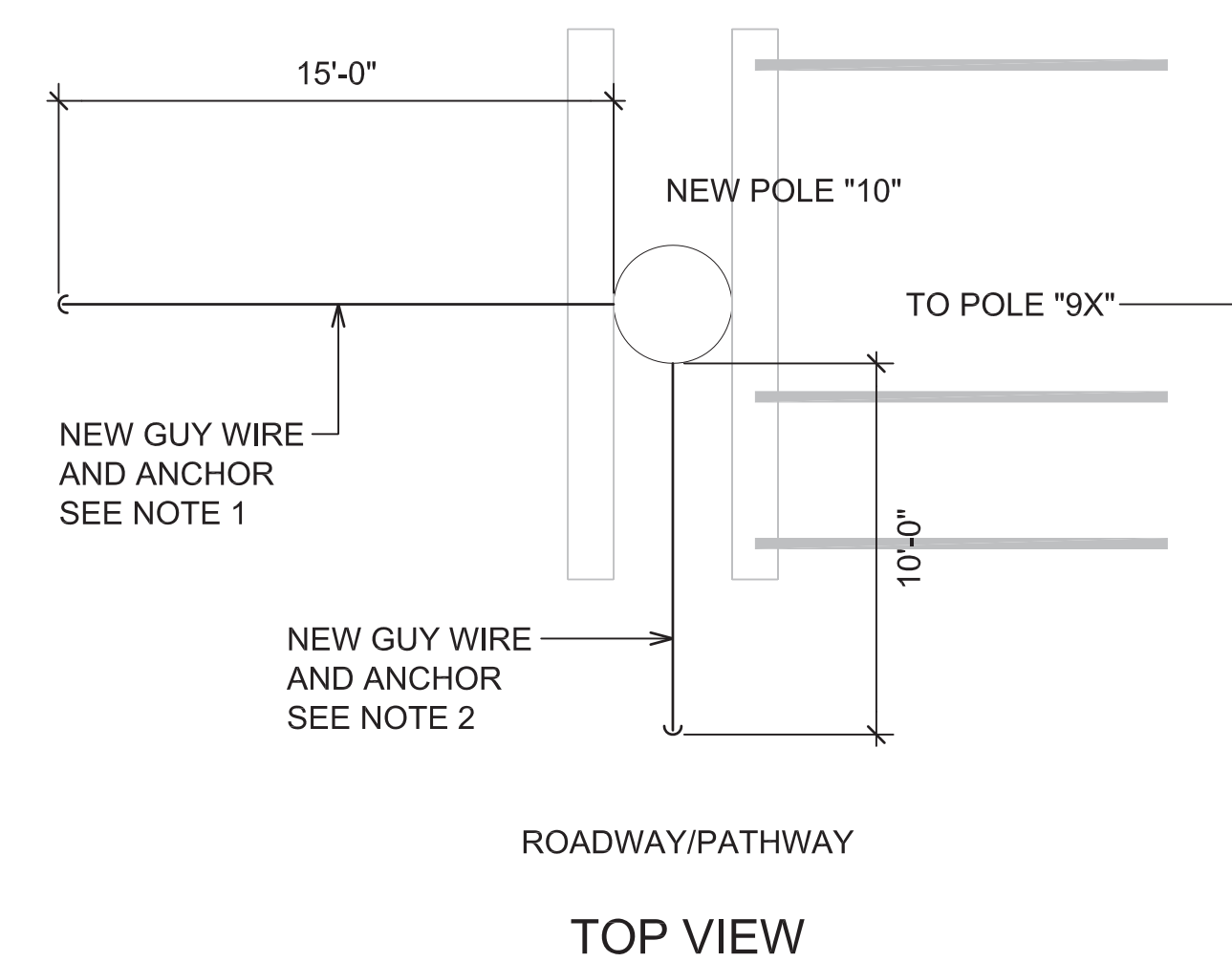
FRONT VIEW

NEW POLE "10"

NOT TO SCALE

NOTES:

1. ATTACH GUY (PRIMARY) TO NEW UTILITY POLE AT SAME HEIGHT (OR AS CLOSE AS POSSIBLE) AS CROSSARM ELEVATION.
2. ATTACH GUY (SECONDARY) TO NEW UTILITY POLE AT SAME HEIGHT AS SECONDARY CONDUCTOR ELEVATION.
3. ATTACH GUYS AT 180° & 270°, SEE ORIENTATION ON SHEET E-019.



TOP VIEW

NEW POLE "10" GUY DETAIL

NOT TO SCALE

NO.	DATE	REVISIONS

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DESIGN

MARCH 24, 2026  
DATE

PROJECT TITLE :

ELECTRICAL  
IMPROVEMENTS

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

CO2544-53

SHEET TITLE:

POLE TOP  
TRANSFORMER DETAIL

DATE :

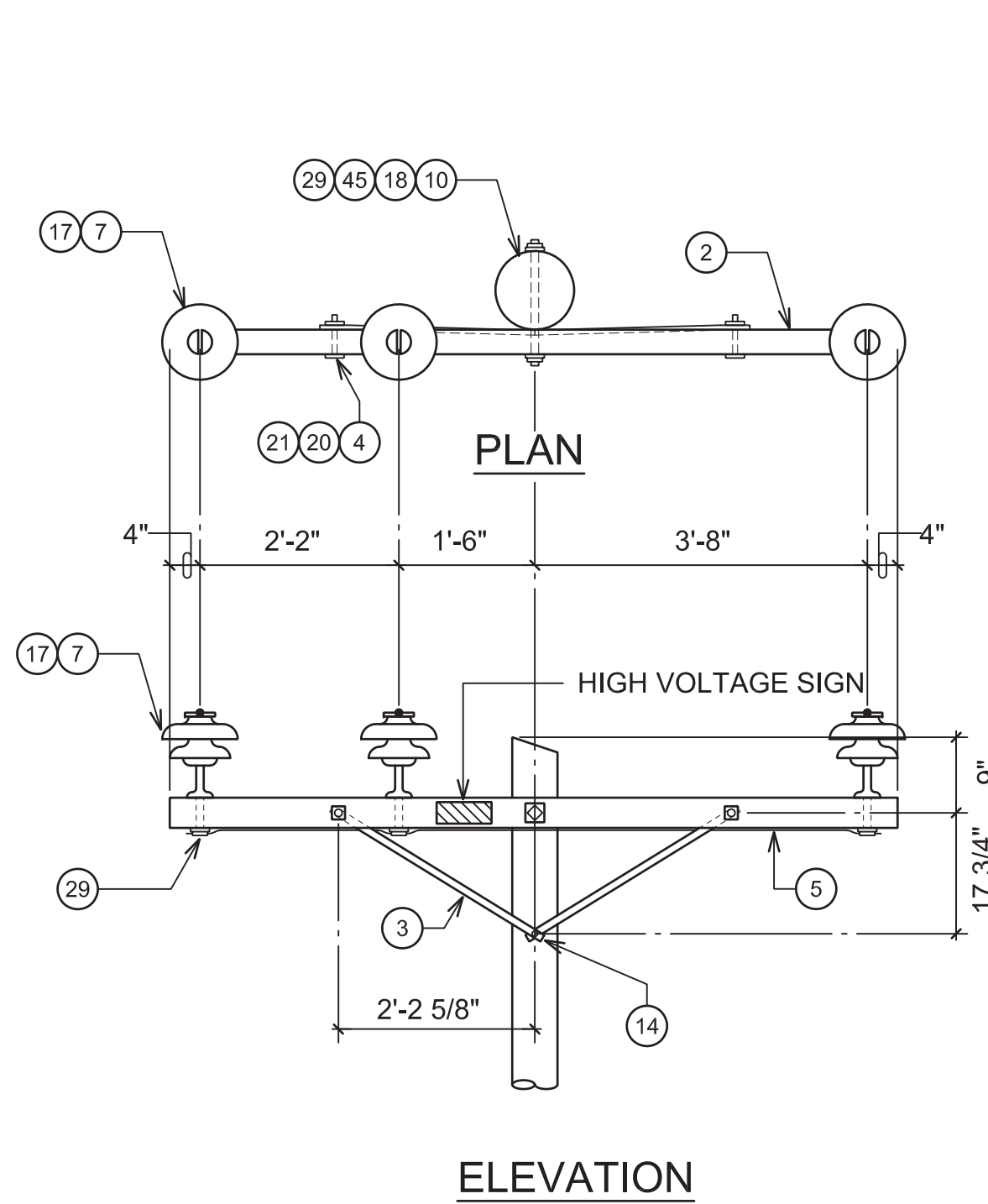
03/24/2026

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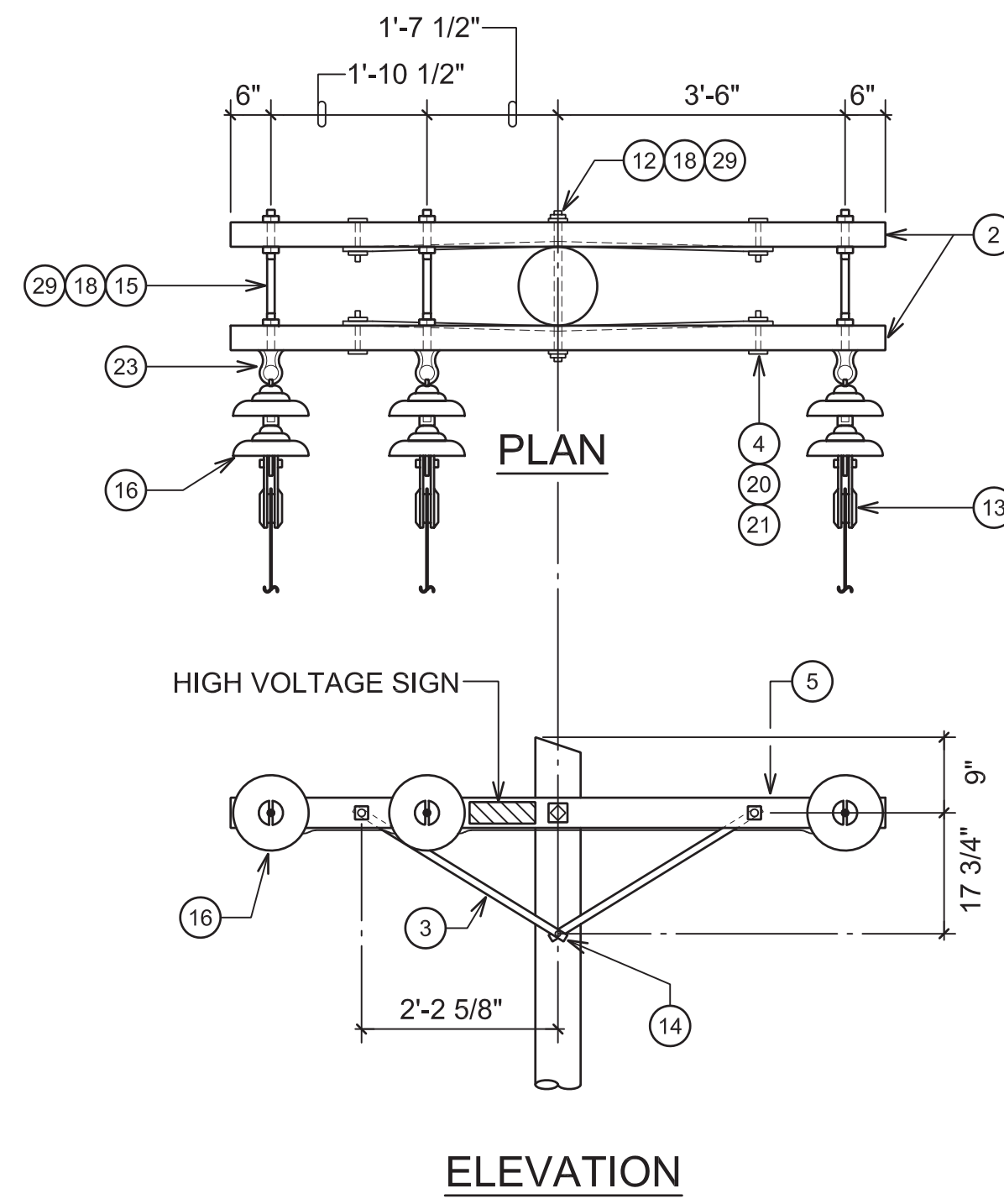
15 OF 21 SHEETS

DWG. NO.

E-013



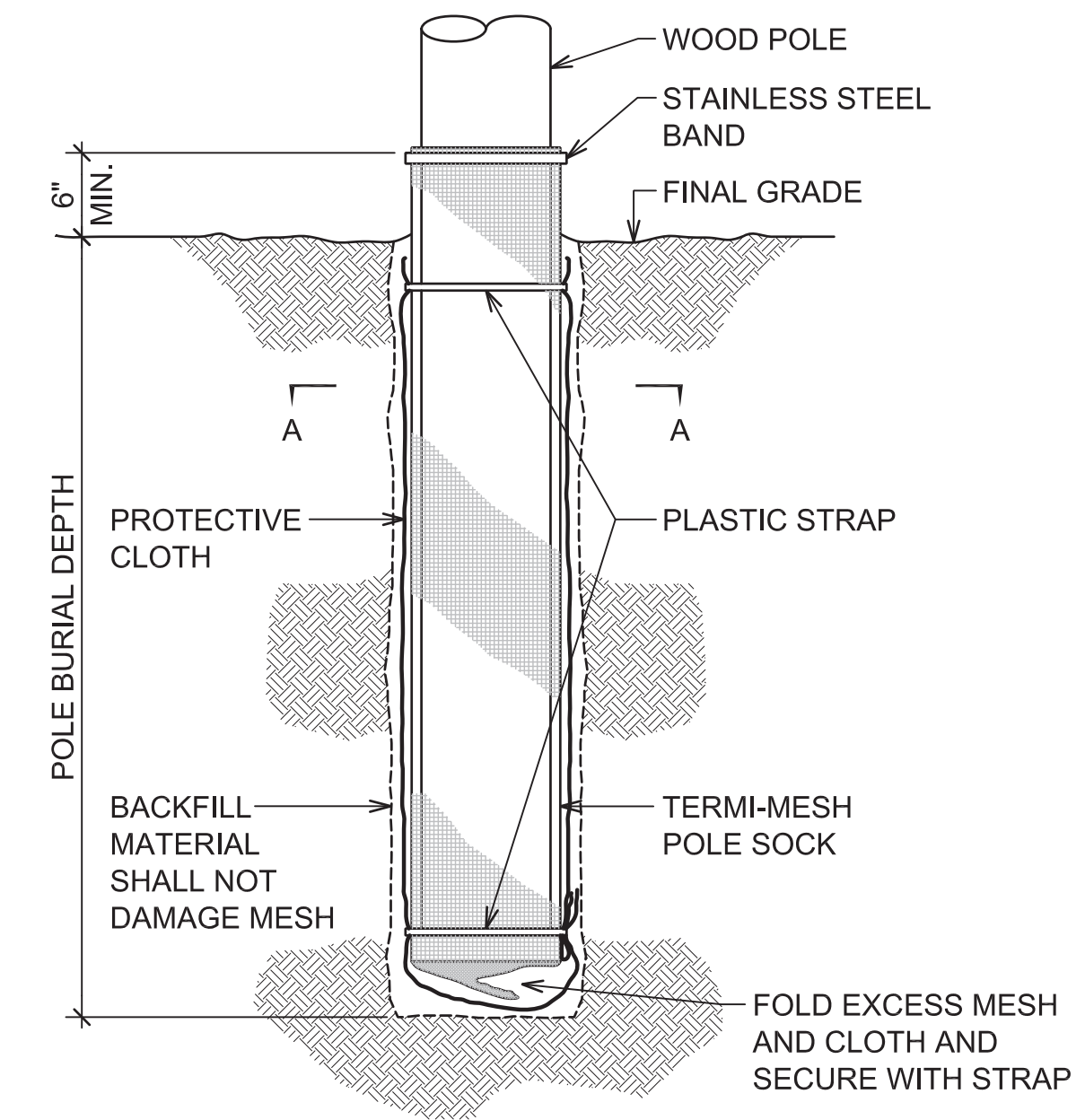
**PRIMARY - TANGENT  
SINGLE CROSSARM DETAIL**  
NOT TO SCALE FOR POLES "5", "6", "8"



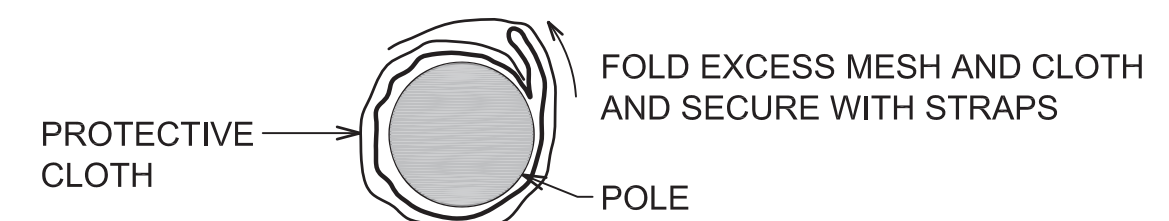
**3 WIRE - PRIMARY  
DEADEND DETAIL**  
NOT TO SCALE

**NOTES FOR DETAILS:**

A. ITEM NUMBERS IN CIRCLE INDICATES MATERIAL PART NUMBER; SEE SHEET E-012 FOR LIST OF MATERIALS.



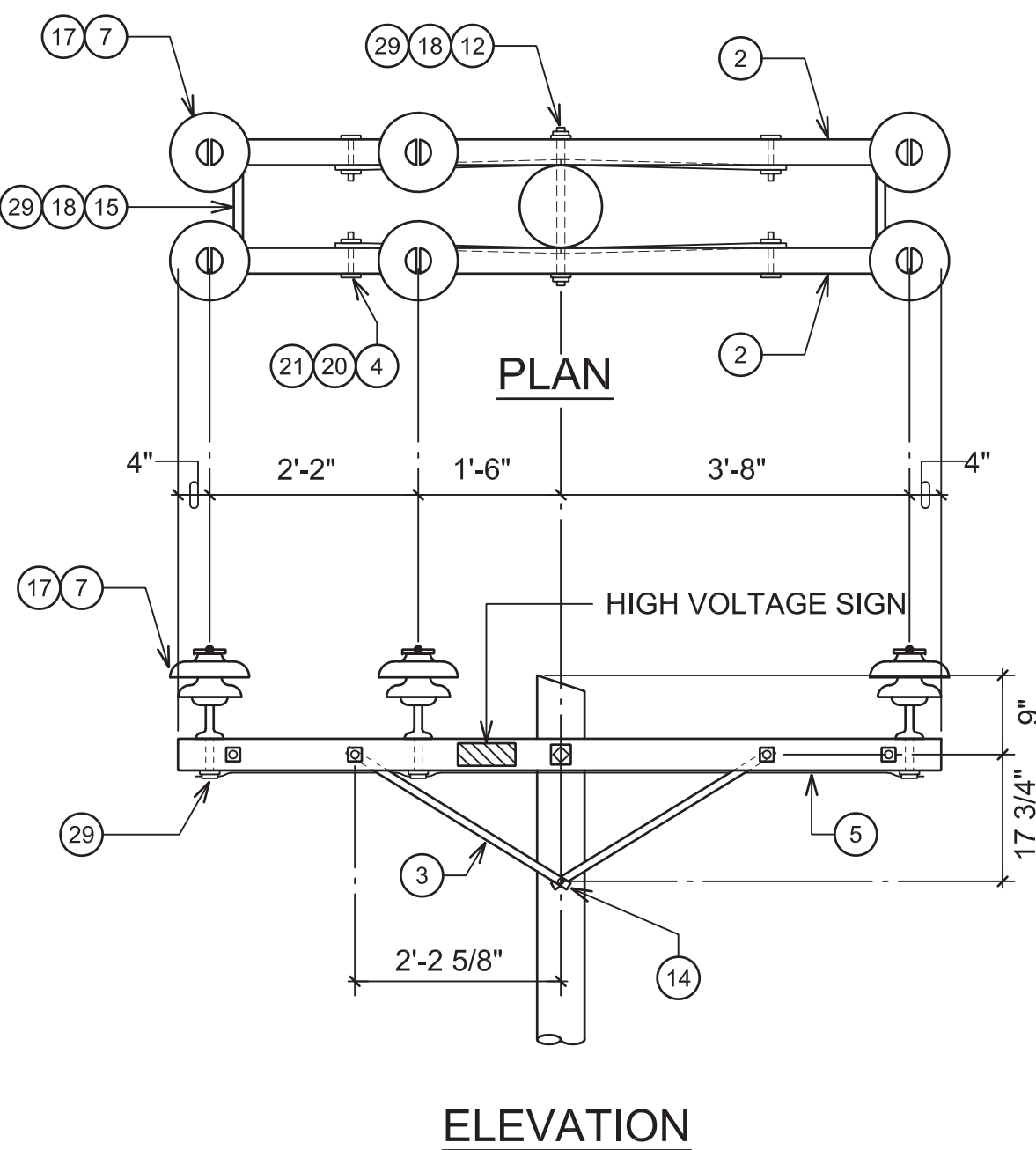
**TYPICAL BARRIER INSTALLATION**



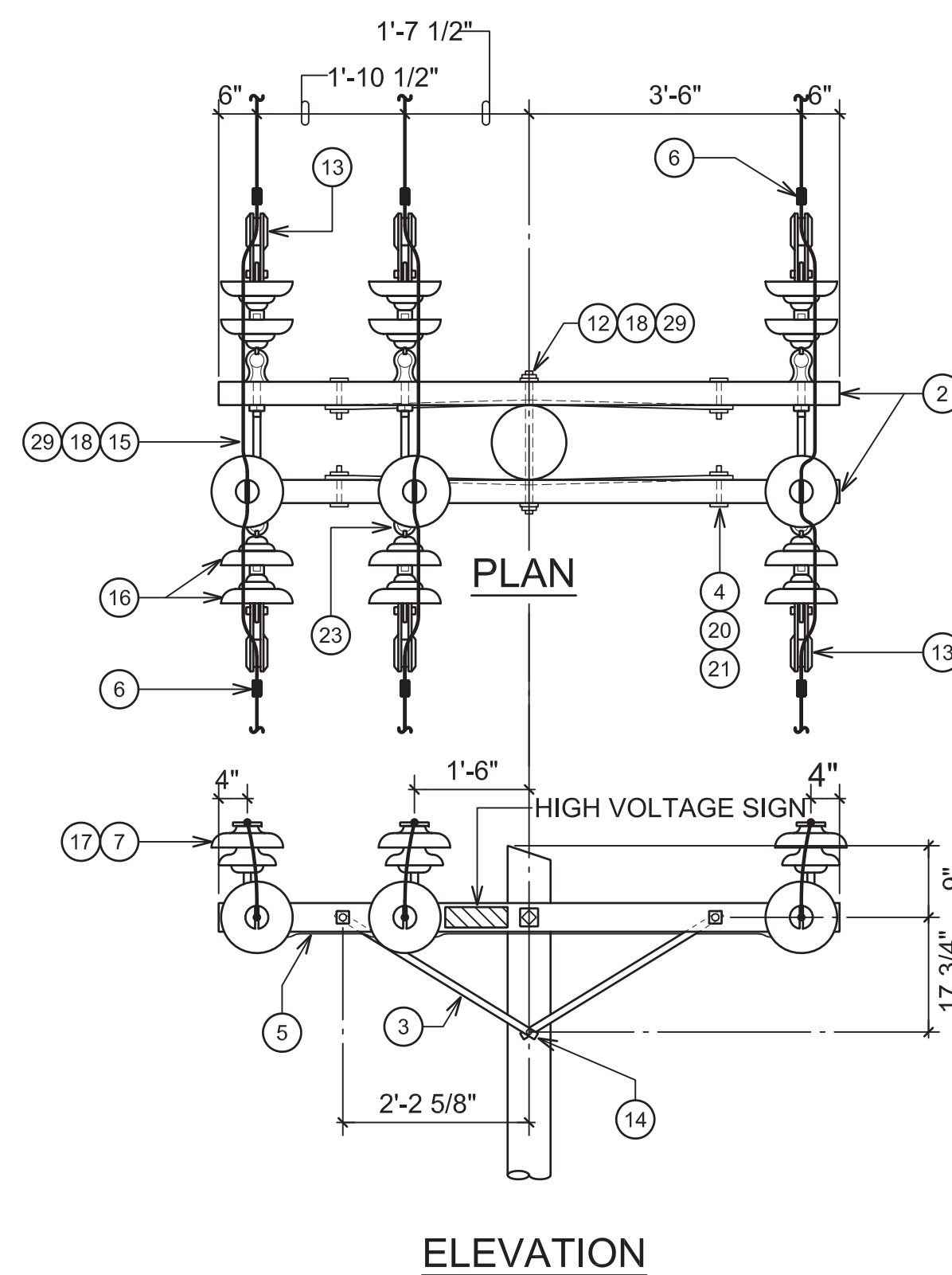
**SECTION A-A**

SEE GROUND WIRE/RISER DETAIL AND NOTES.

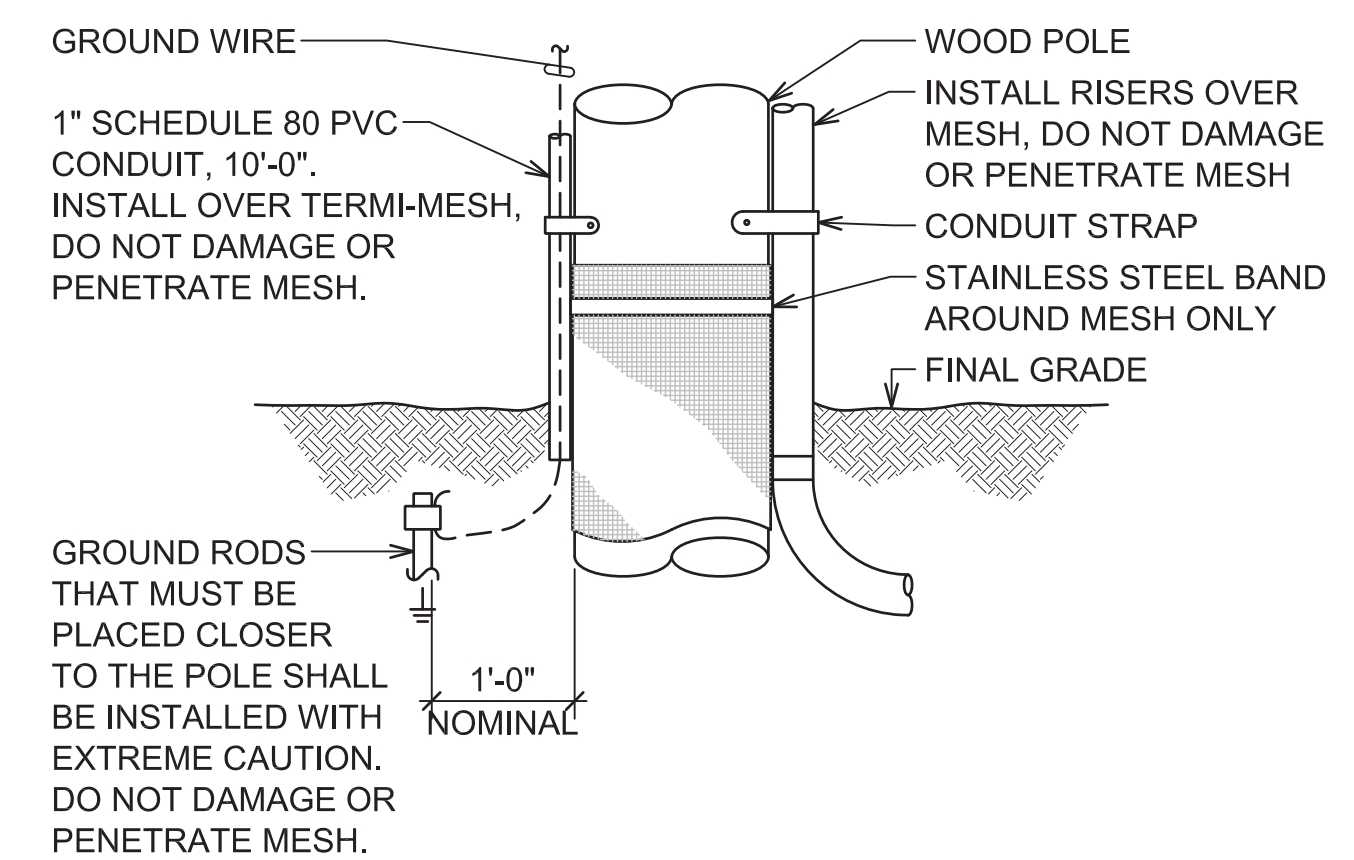
**TERMI-MESH TERMITE BARRIER  
FOR WOOD POLES DETAIL**  
NOT TO SCALE



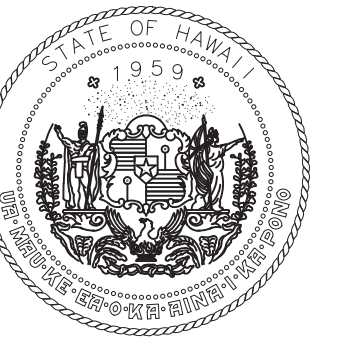
**PRIMARY - TANGENT  
DOUBLE CROSSARM DETAIL**  
NOT TO SCALE FOR POLES "3", "4", "9", "9X"



**3 WIRE - PRIMARY DOUBLE  
DEADEND DETAIL**  
NOT TO SCALE

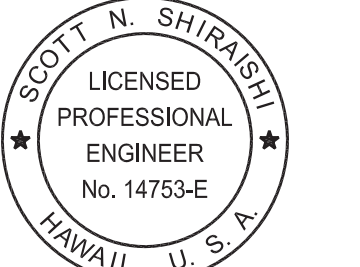


**GROUND WIRE/RISER DETAIL**  
NOT TO SCALE



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS

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Scott Shirashi

04/30/2026  
Licensed Expiration Date

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NO.	DATE	REVISIONS

**100%  
DESIGN**  
MARCH 24, 2026  
DATE

**PROJECT TITLE :**

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

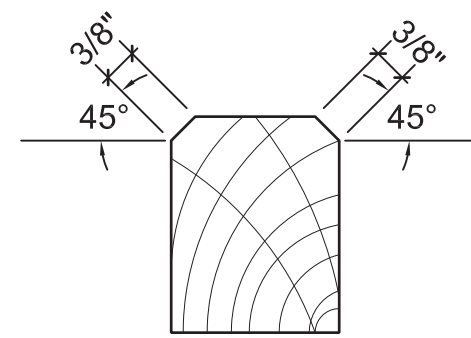
**PROJECT NO.:**

**CO2544-53**

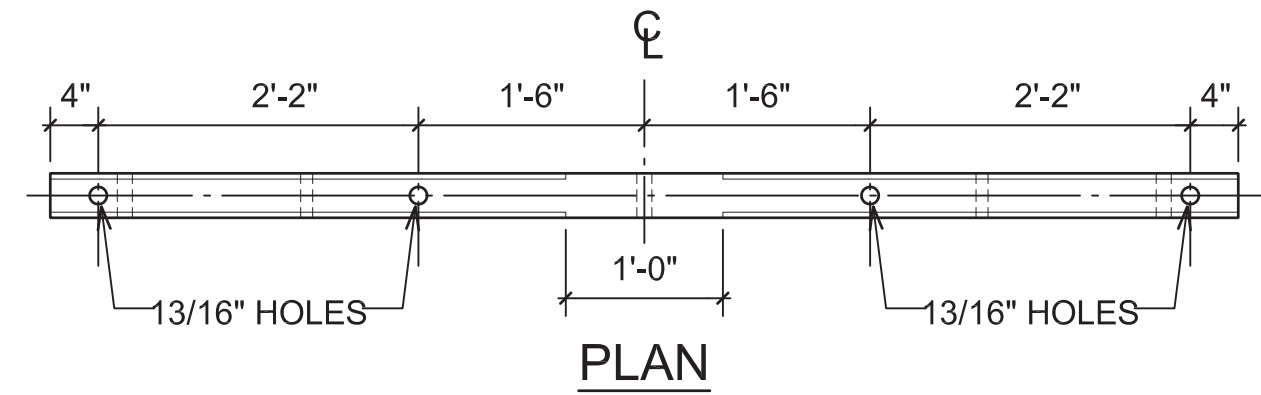
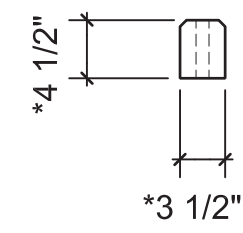
**SHEET TITLE:**

**PRIMARY POLE TOP  
DETAILS, TERMITE  
BARRIER DETAILS**

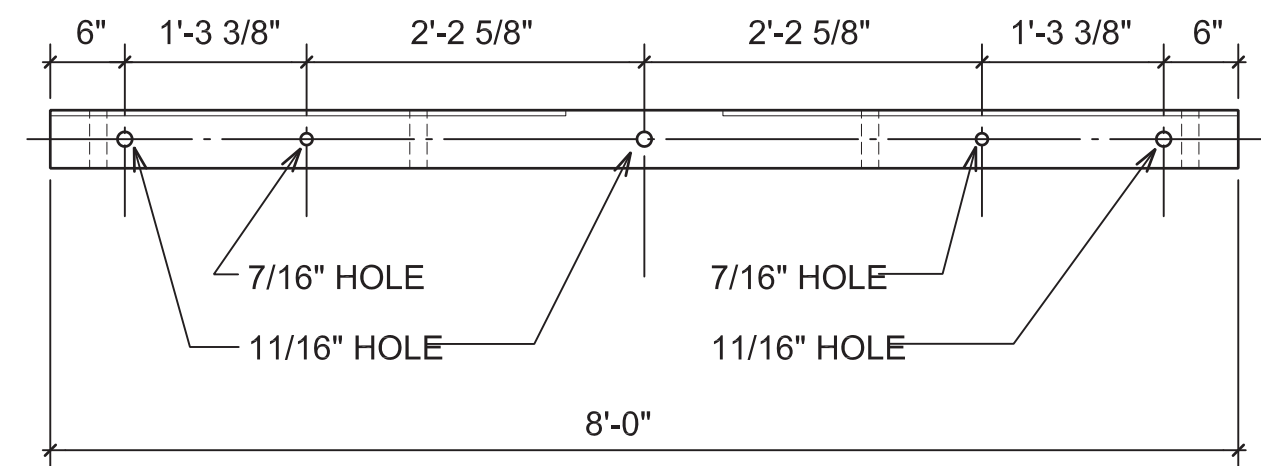
DATE :	DWG. NO.
03/24/2026	E-014
SHEET :	
16 OF 21 SHEETS	



TYPICAL ENLARGED SECTION OF CROSSARM



PLAN



ELEVATION

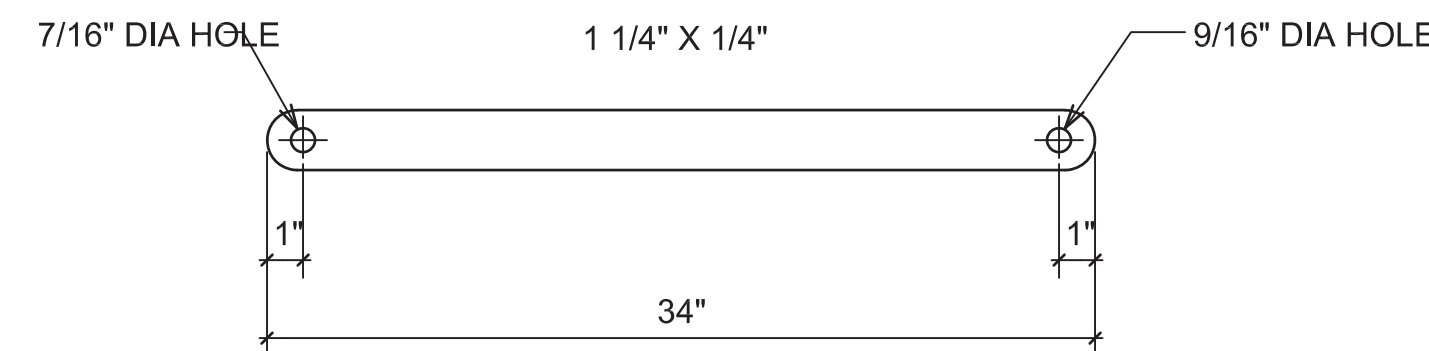
\* MINIMUM DIMENSIONS AFTER SURFACING, IN ACCORDANCE WITH "CONSTRUCTION GRADES" OF WEST COAST LUMBERMAN'S ASSOCIATION STANDARD GRADING AND DRESSING RULES, LATEST ISSUE.

PART NO. 2

NOTES:

- CROSSARMS SHALL BE PRESSURE TREATED WITH A 5% SOLUTION OF PENTACHLOROPHENOL IN A PETROLEUM CARRIER TO A FINAL RETENTION OF 6 LBS. PER CUBIC FOOT.
- CROSSARMS SHALL BE PAINTED BRIGHT YELLOW.
- ALL HARDWARE SHALL BE GALVANIZED IN CONFORMANCE WITH ASTM DESIGNATION A-153.
- INSULATOR PINS SHALL BE BONDED TOGETHER WITH #8 MHD COPPER CONDUCTOR.
- CONDUCTORS SHALL BE CLEANED AND TINNED BEFORE INSTALLING CONNECTORS.
- REQUIRED BOLT LENGTHS INDICATED ARE APPROXIMATE. MODIFY TO SUIT POLE DIAMETER.
- PROVIDE DRILLING AS REQUIRED.

CROSSARM DETAIL  
NOT TO SCALE

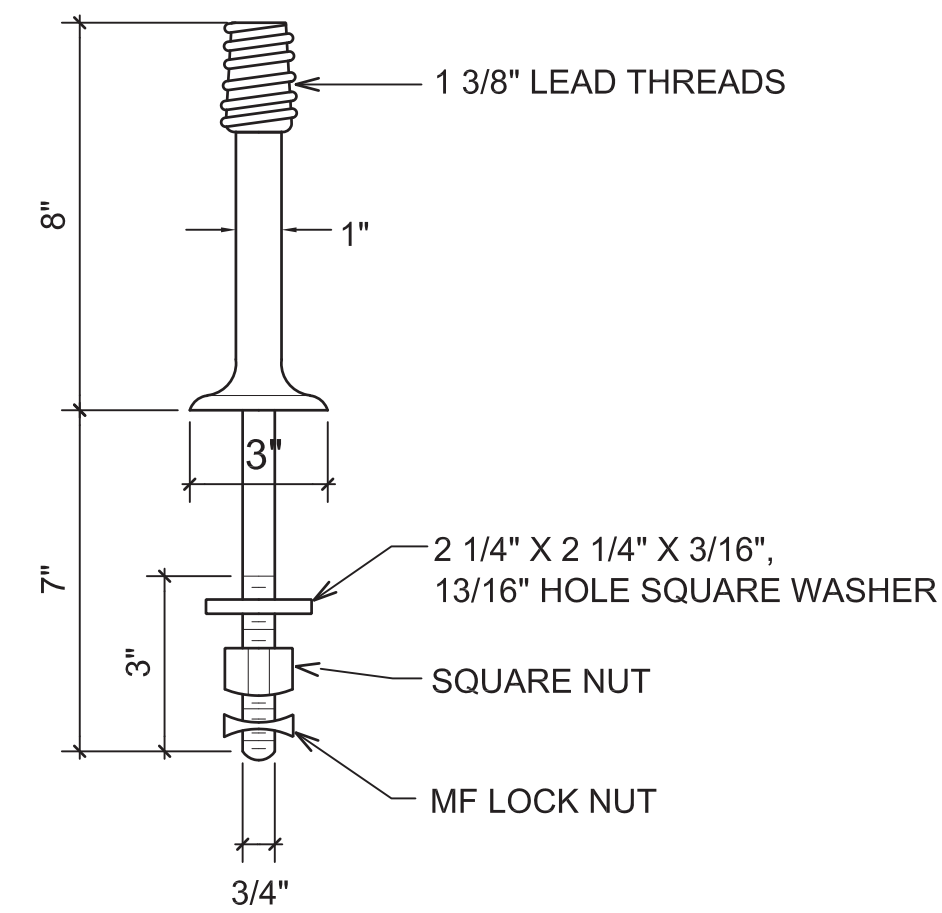


NOTES:

- STRUCTURAL GRADE STEEL, 10,000 LBS. BREAKING STRENGTH.

PART NO. 3

FLAT CROSSARM BRACE DETAIL  
NOT TO SCALE

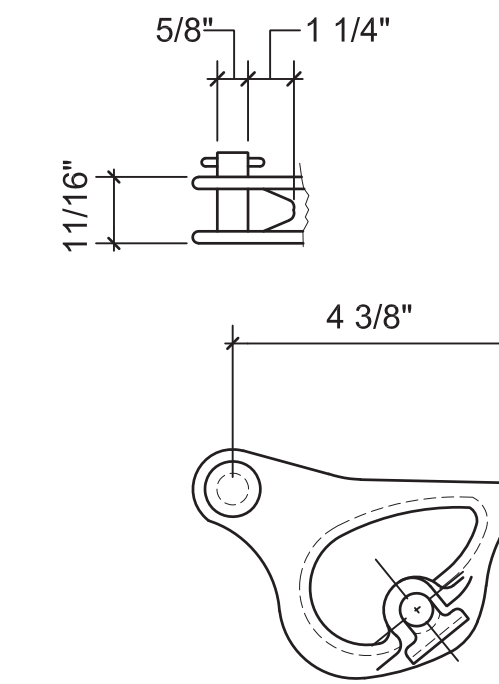


NOTES:

- PINS SHALL BE FORGED STEEL HIGH TENSION.

PART NO. 7

INSULATOR PIN DETAIL  
NOT TO SCALE



NOTES:

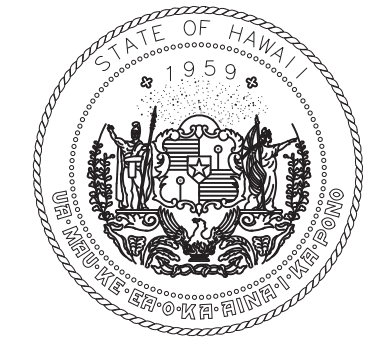
- ENVELOPE TYPE
- ULTIMATE STRENGTH - 8000 POUNDS
- CABLE SEAT DIAMETER 0.16" TO 0.375"

PART NO. 13

STRAIN CLAMP DETAIL  
NOT TO SCALE

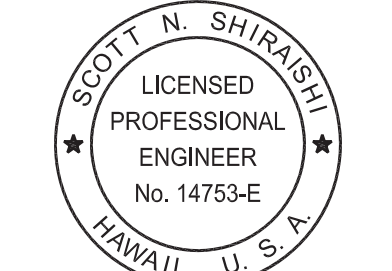
NOTES FOR DETAILS:

- ITEM NUMBERS IN CIRCLE INDICATES MATERIAL PART NUMBER; SEE SHEET E-012 FOR LIST OF MATERIALS.



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DEPARTMENT OF TRANSPORTATION  
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Ronald N.S. Ho & Associates, Inc.



Scott Shirishi

04/30/2026  
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SS	CAD	SS	SS

NO.	DATE	REVISIONS
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DATE

PROJECT TITLE :

**ELECTRICAL  
IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

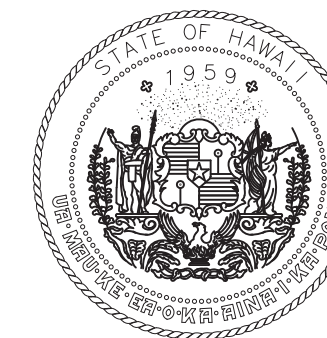
PROJECT NO.:

**CO2544-53**

SHEET TITLE:

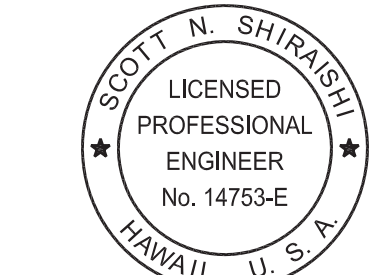
**MISCELLANEOUS  
DETAILS**

DATE :	DWG. NO.
03/24/2026	<b>E-015</b>
SHEET :	
17 OF 21 SHEETS	



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AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

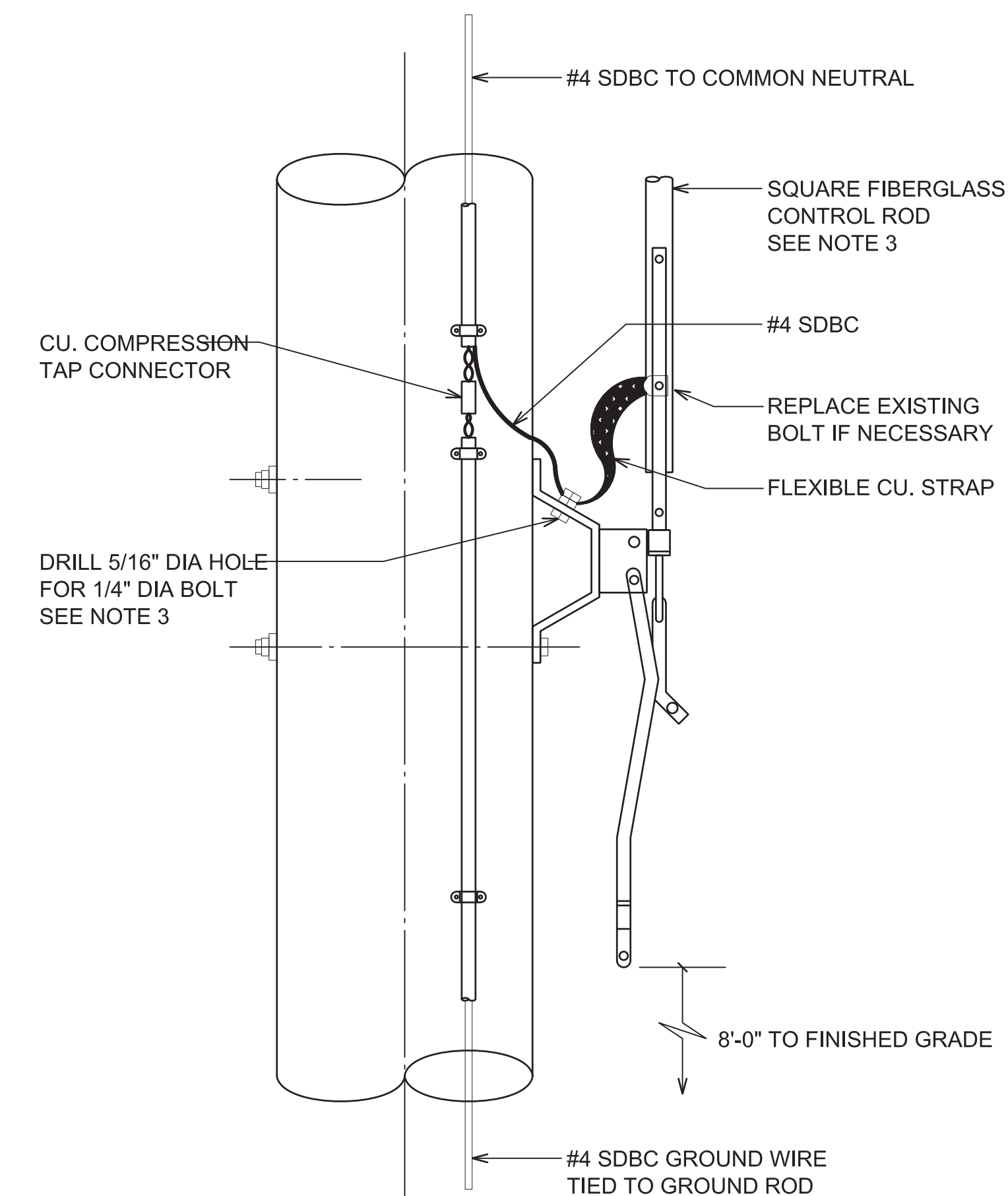
PROJECT NO.:

**CO2544-53**

SHEET TITLE:

**GUY AND ANCHOR  
DETAILS**

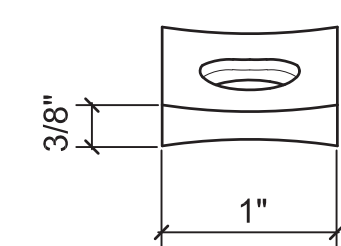
DATE :	03/24/2026	DWG. NO.	<b>E-016</b>
SHEET :			
18 OF 21 SHEETS			



**NOTES:**

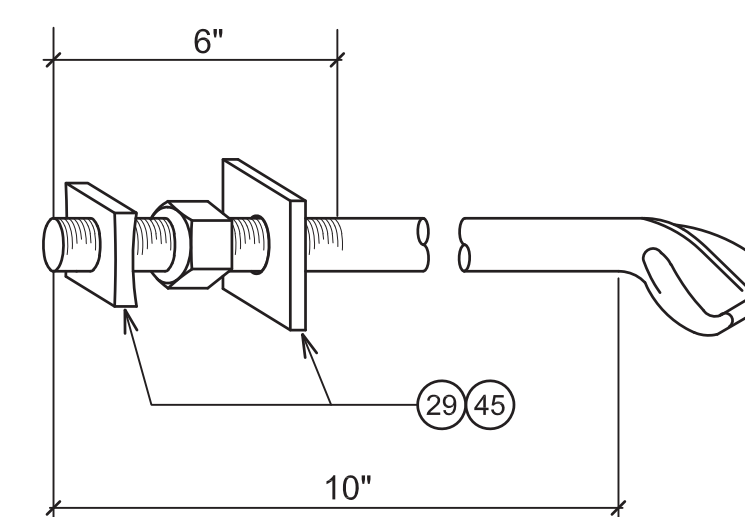
- TIE THE SWITCH HANDLE TO THE #4 SDBC WIRE COMING DOWN THE POLE FROM THE COMMON NEUTRAL TO THE GROUND ROD WITH CU. COMPR TAP CONNECTOR.
- COVER THE ENTIRE LENGTH OF THE #4 SDBC GROUND WIRE WITH WOOD MOULDING
- FOR METAL OPERATING RODS, MAKE GROUNDING CONNECTION BY CONNECTING THE GROUND BRAID TO THE #4 SDBC WIRE WITH A CU. COMPRESSION TERMINAL, A 1/4" X 1 1/2" BRONZE BOLT, AND A BRONZE LOCKWASHER.

**AIR SWITCH OPERATING  
HANDLE GROUNDING**  
NOT TO SCALE



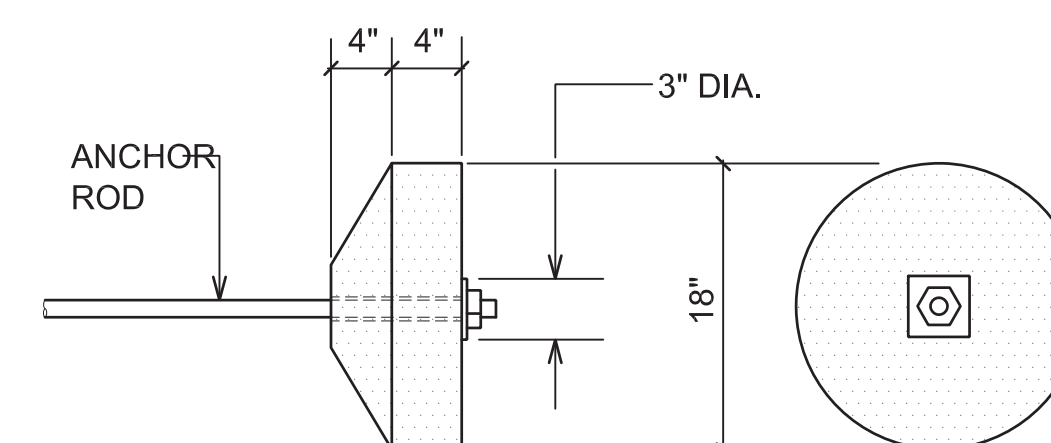
PART NO. 29

**SQUARE M-F LOCKNUT DETAIL**  
NOT TO SCALE



PART NO. 43

**THIMBLEYE BOLT DETAIL**  
NOT TO SCALE

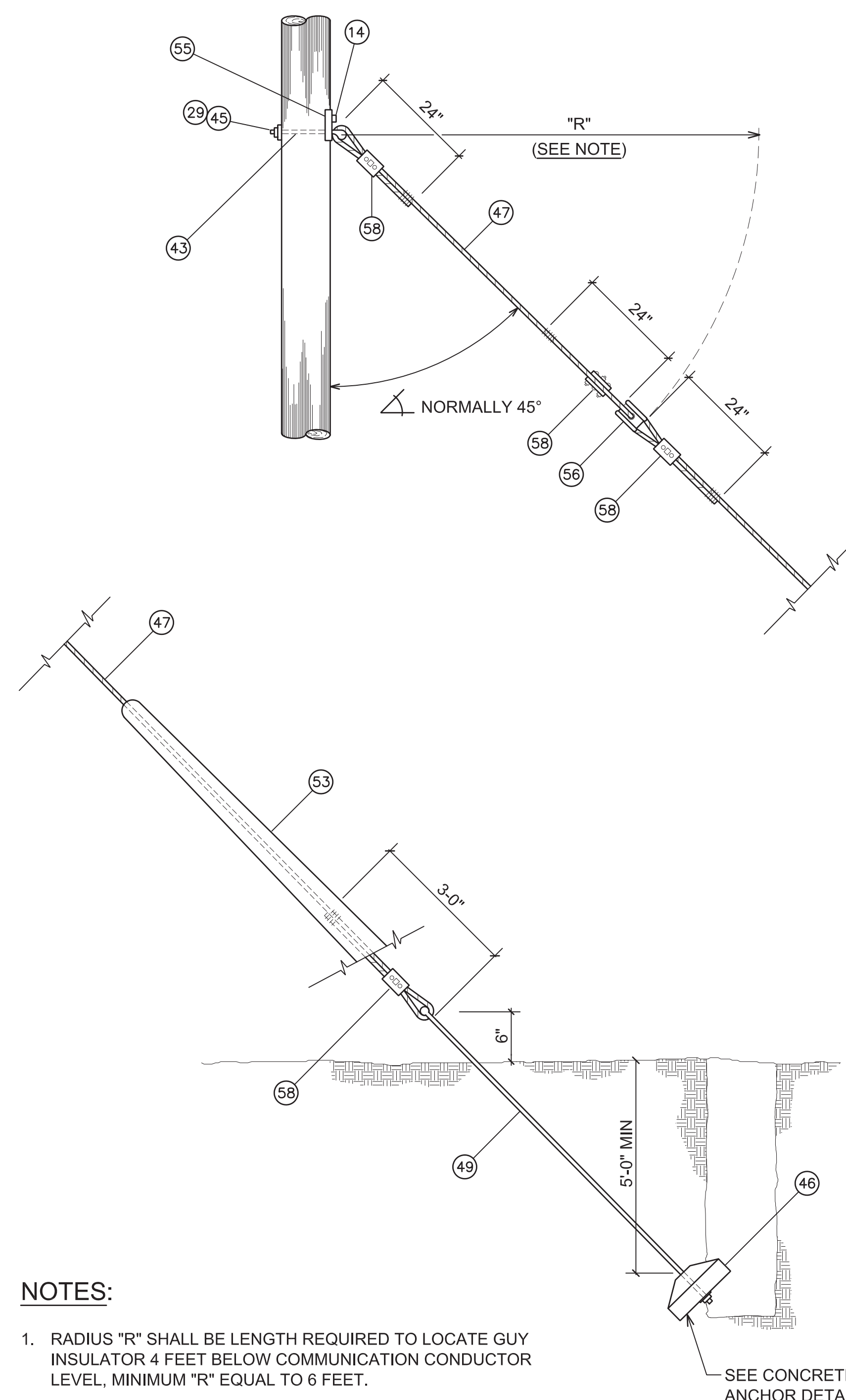


PART NO. 46

**CONCRETE ANCHOR DETAIL**  
NOT TO SCALE

**NOTES FOR DETAILS:**

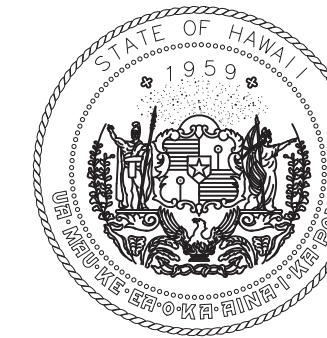
- A. ITEM NUMBERS IN CIRCLE INDICATES MATERIAL PART NUMBER; SEE SHEET E-012 FOR LIST OF MATERIALS.



**NOTES:**

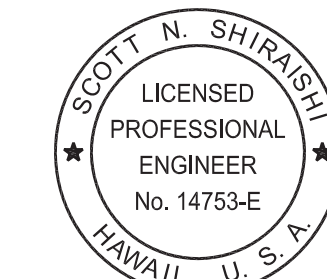
- RADIUS "R" SHALL BE LENGTH REQUIRED TO LOCATE GUY INSULATOR 4 FEET BELOW COMMUNICATION CONDUCTOR LEVEL, MINIMUM "R" EQUAL TO 6 FEET.
- ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM DESIGNATION A-153.
- GRIPS FOR DOWN GUY OF EQUIVALENT STRENGTH MAY BE USED IN LIEU OF THE TYPE AS SHOWN.

**TYPICAL GUY & ANCHOR ASSEMBLY DETAIL**  
NOT TO SCALE



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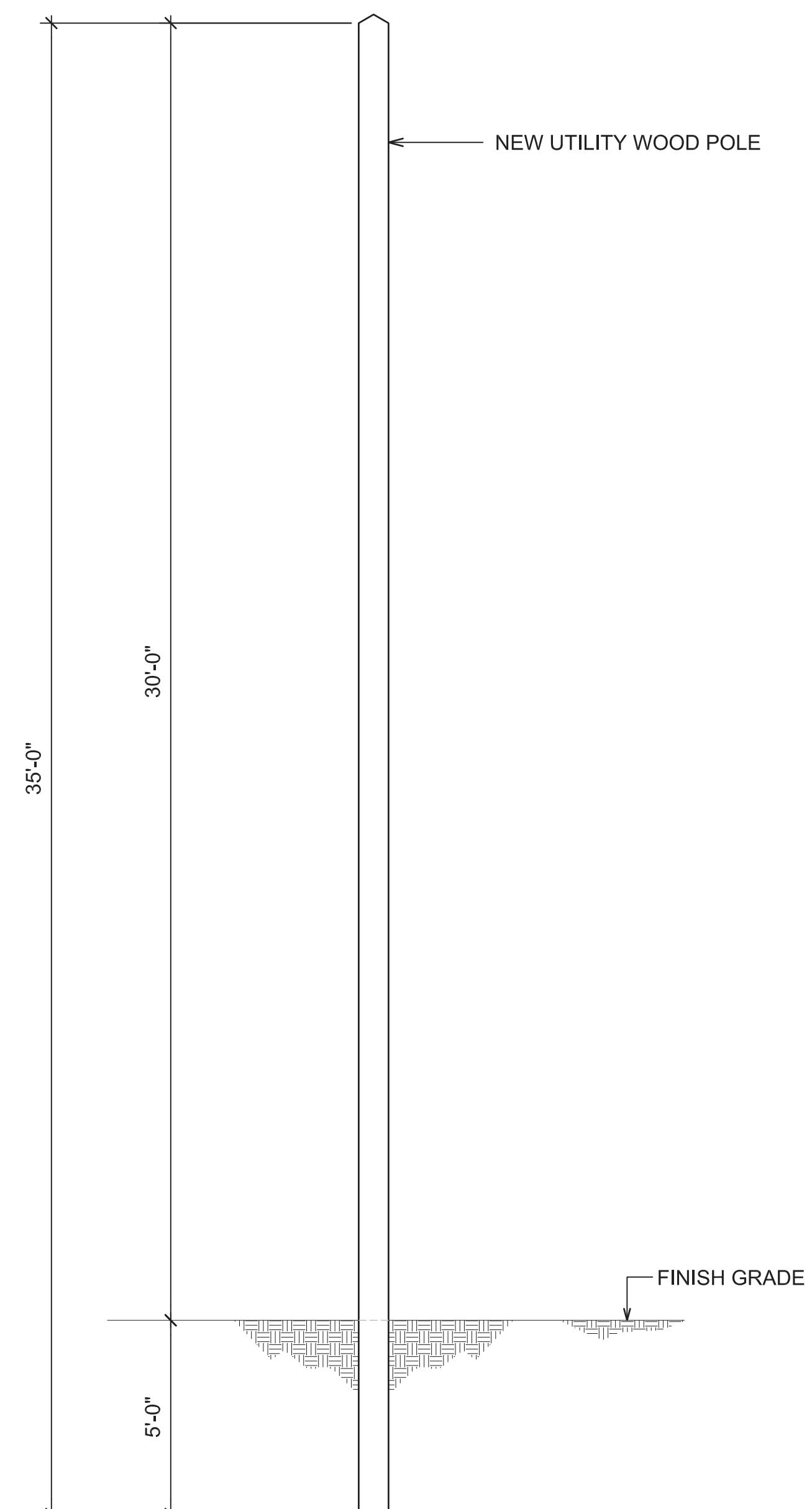


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SS	CAD	SS	SS

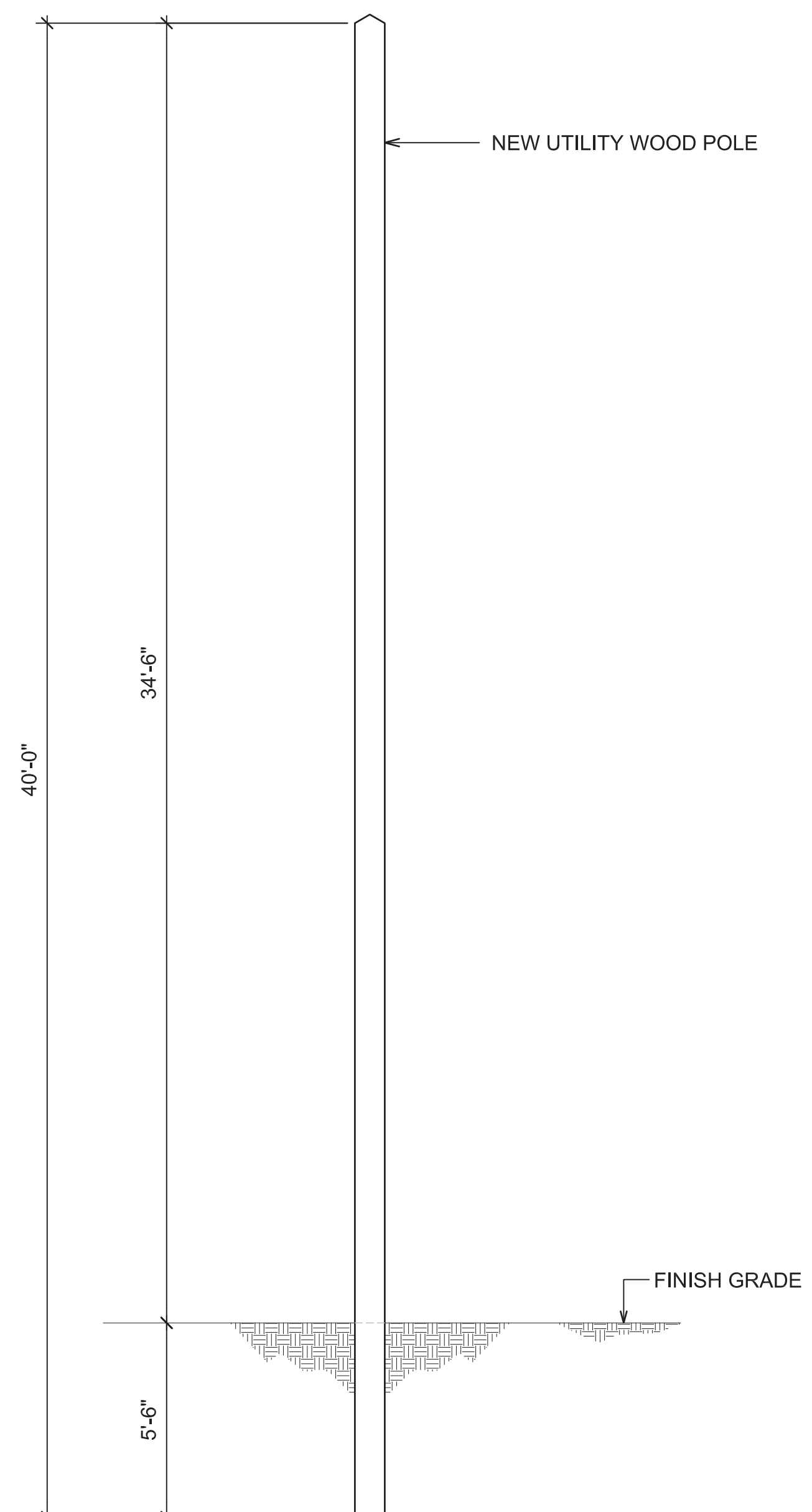


NEW UTILITY WOOD POLE									
GENERAL SPECIFICATIONS		APPROXIMATE MINIMUM DIMENSIONS (INCHES)							
TYPE	TREATED DOUGLAS FIR	AT TOP		6' FROM BUTT		DIAMETER		CIRCUMFERENCE	
LENGTH	35 FT	DIA.	CIR.	DIA.	CIR.	SOIL	ROCK	SOIL	ROCK
CLASS	3	7.3	23	10.8	34	10.9	11.1	34.4	34.9
POLE SETTING DEPTH	5 FT (IN SOIL)								

**NOTES:**

- GENERAL SPECIFICATIONS AND DIMENSIONS ARE REFERENCED FROM HECO STANDARD DRAWING 1-5000, MINIMUM REQUIREMENTS FOR WOOD POLES.

**NEW UTILITY WOOD POLE DETAIL**  
NOT TO SCALE FOR POLES "P1/143", "3", "4", "6", "8", "9"



NEW UTILITY WOOD POLE									
GENERAL SPECIFICATIONS		APPROXIMATE MINIMUM DIMENSIONS (INCHES)							
TYPE	TREATED DOUGLAS FIR	AT TOP		6' FROM BUTT		DIAMETER		CIRCUMFERENCE	
LENGTH	40 FT	DIA.	CIR.	DIA.	CIR.	SOIL	ROCK	SOIL	ROCK
CLASS	1	8.6	27	13.1	41	13.1	13.4	41.2	42
POLE SETTING DEPTH	5.5 FT (IN SOIL)								

**NOTES:**

- GENERAL SPECIFICATIONS AND DIMENSIONS ARE REFERENCED FROM HECO STANDARD DRAWING 1-5000, MINIMUM REQUIREMENTS FOR WOOD POLES.

**NEW UTILITY WOOD POLE DETAIL**  
NOT TO SCALE FOR POLES "5", "7", "9X", "10"

NO.	DATE	REVISIONS
-----	------	-----------

**100% DESIGN**  
MARCH 24, 2026  
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PROJECT TITLE :

**ELECTRICAL IMPROVEMENTS**  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

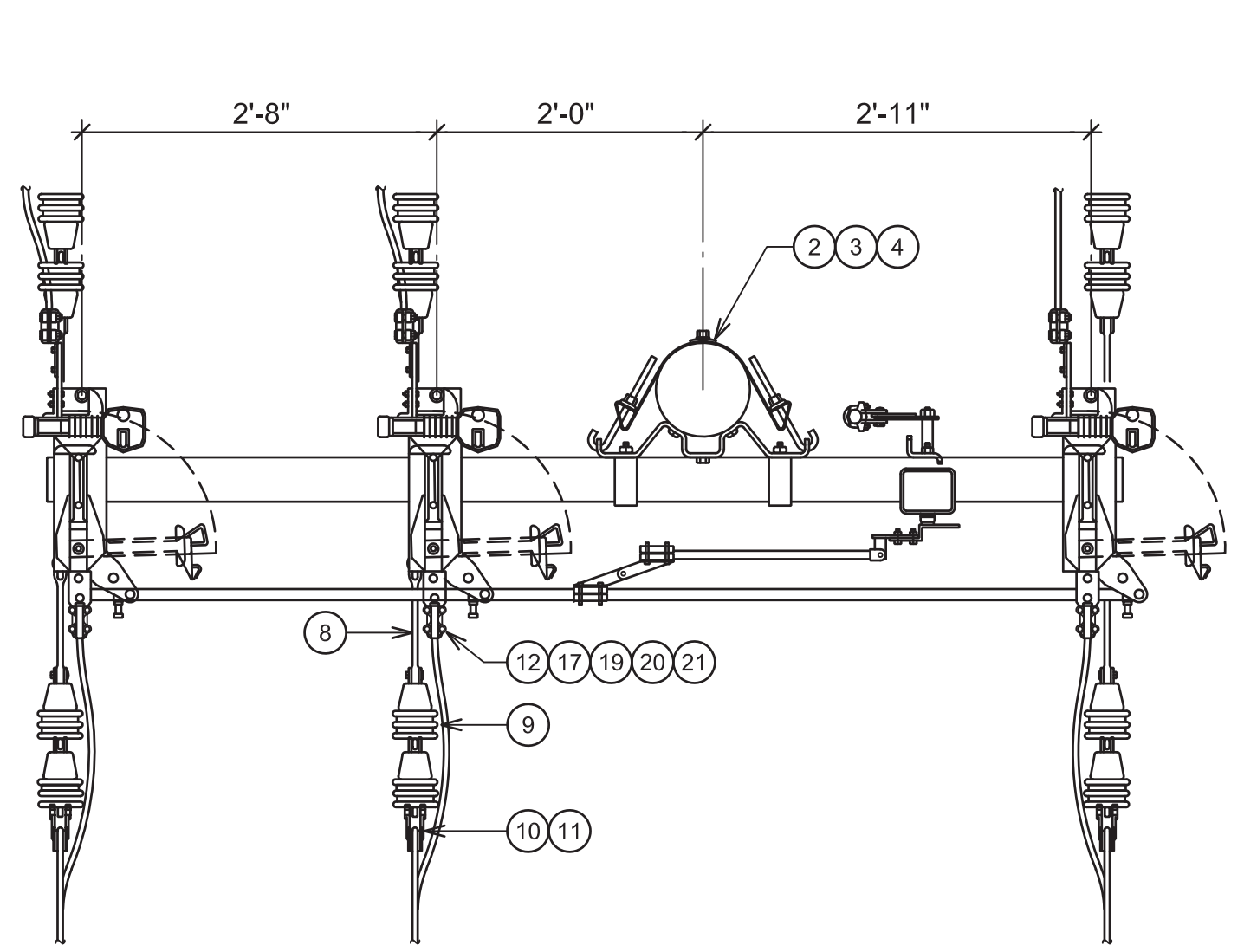
**CO2544-53**

SHEET TITLE:

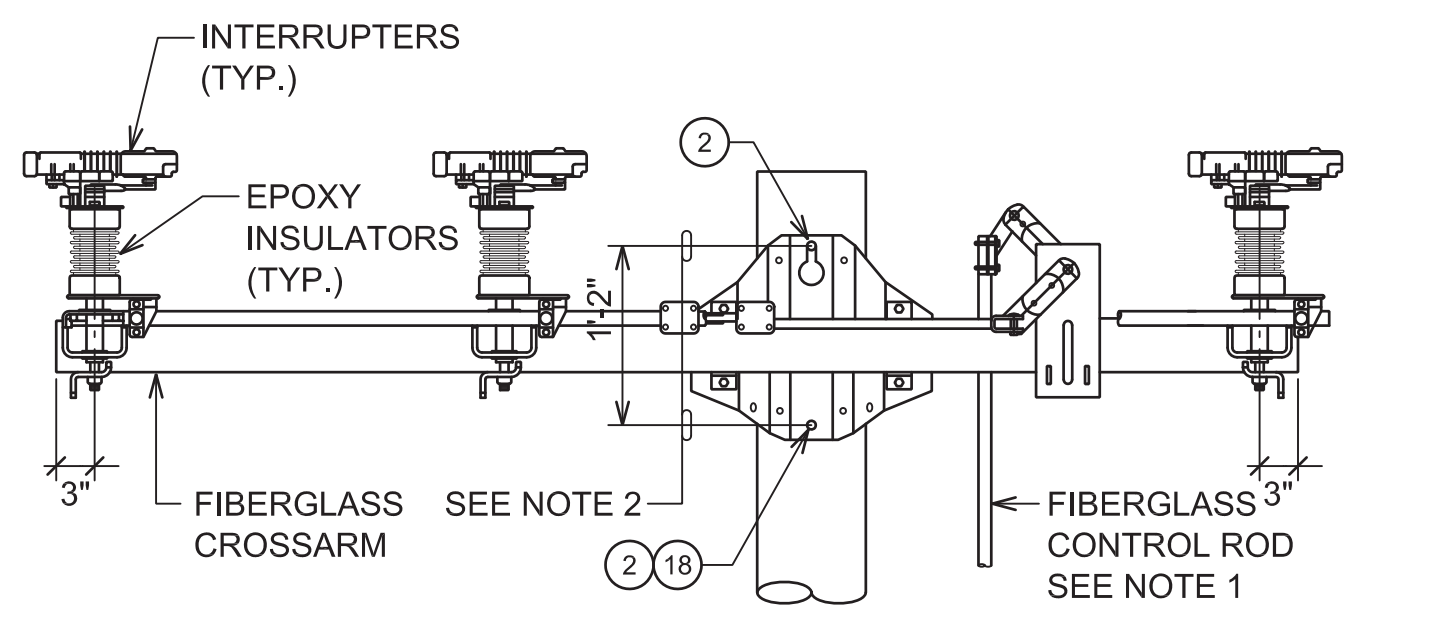
**UTILITY POLE DETAILS**

DATE :	DWG. NO.
03/24/2026	<b>E-017</b>
SHEET :	
19 OF 21 SHEETS	

11/23/2023 10:00 AM C:\Users\scshirishi\OneDrive\Documents\Projects\2024\11-23-2023\_10:00 AM C:\Users\scshirishi\OneDrive\Documents\Projects\2024\11-23-2023\_10:00 AM



PLAN



ELEVATION

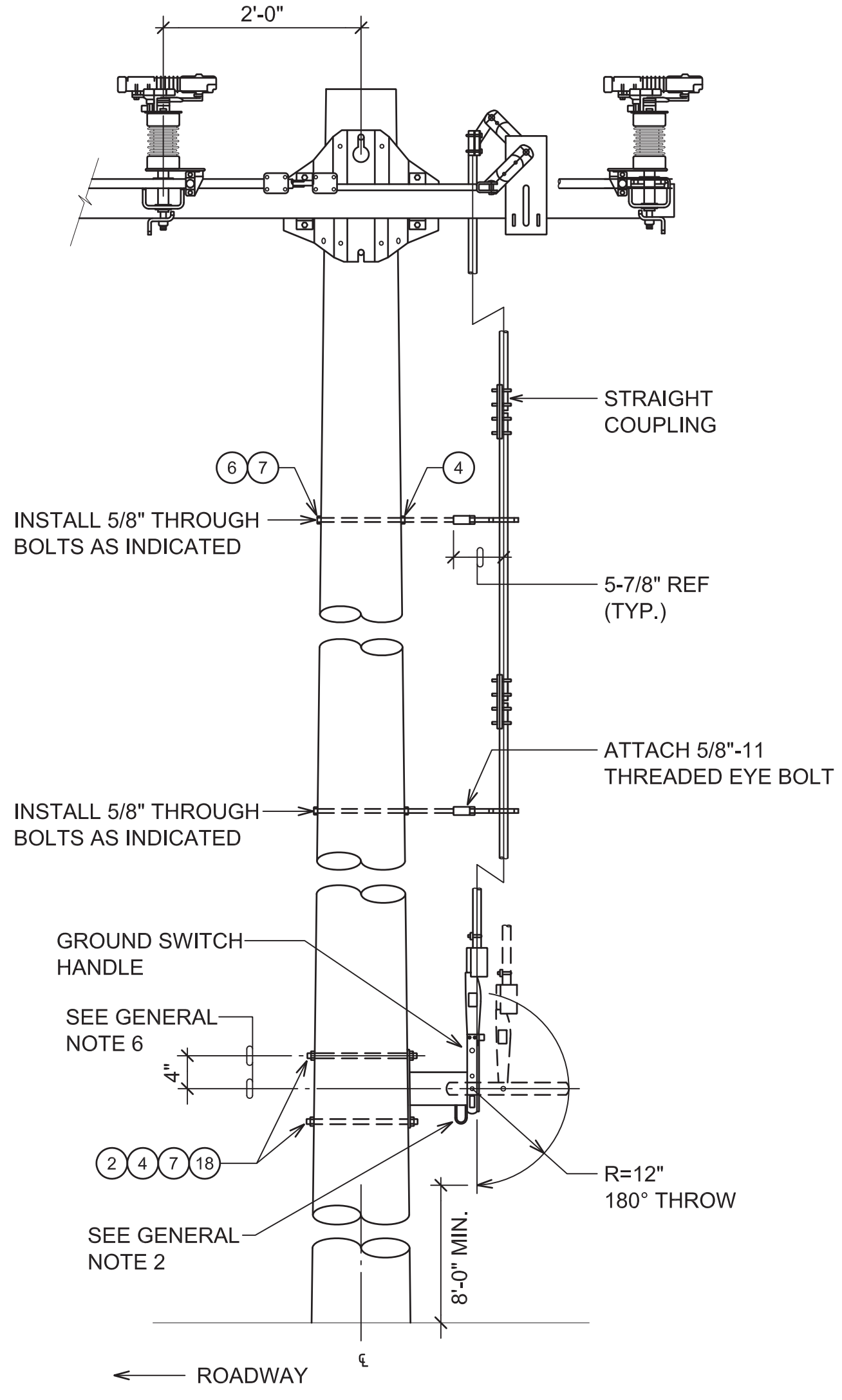
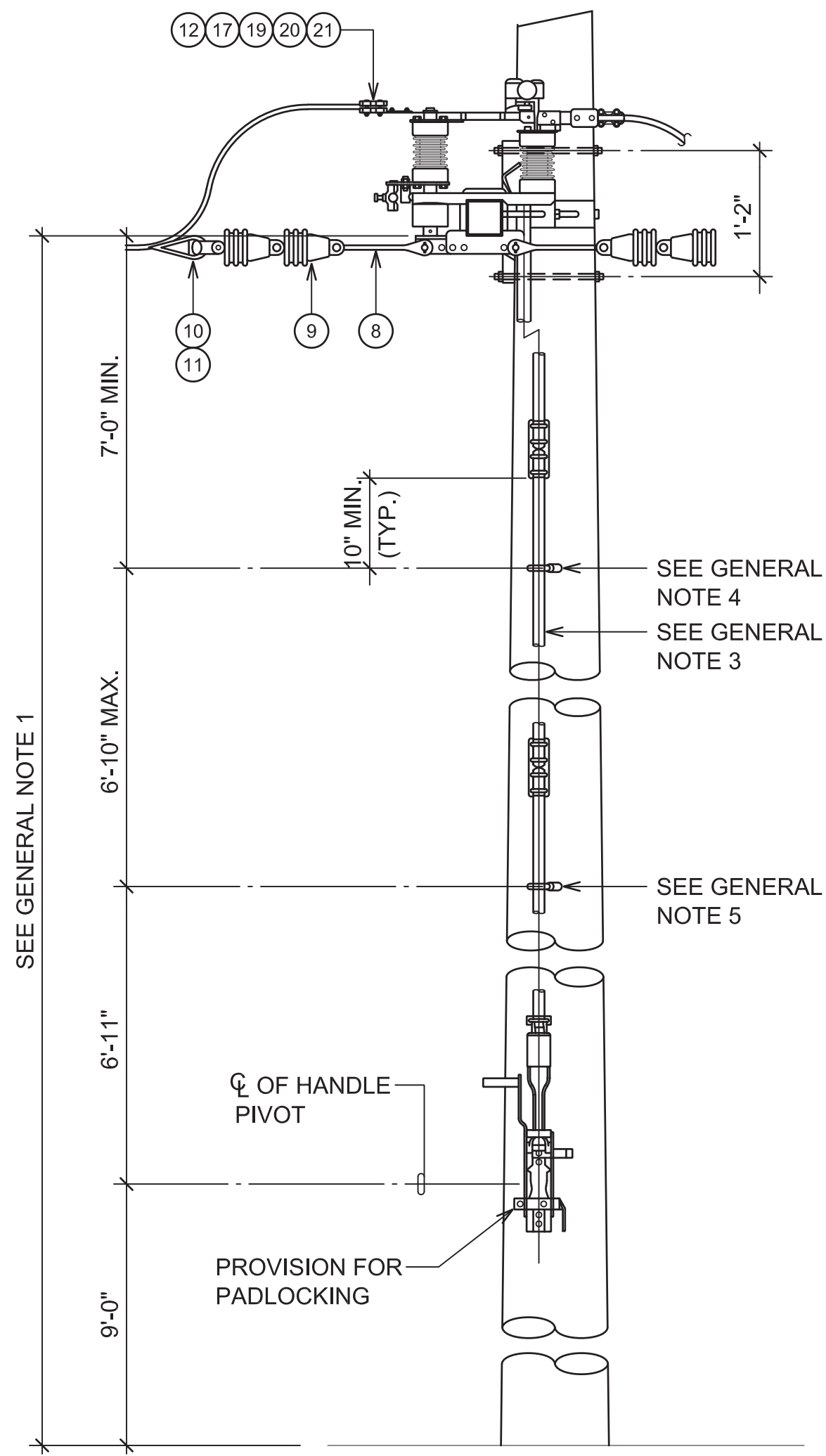
NOTES:

- CONTROL ROD SHALL BE INSTALLED STRAIGHT AND VERTICAL.
- DRILL (2) 11/16" HOLES 14" O.C. TO MOUNT SWITCH.
- MAXIMUM DEADEND LOADING: 700 POUNDS ("SLACK SPAN" DEADEND)  
8000 POUNDS (DOUBLE DEADEND)

**AIR BREAK SWITCH**  
NOT TO SCALE

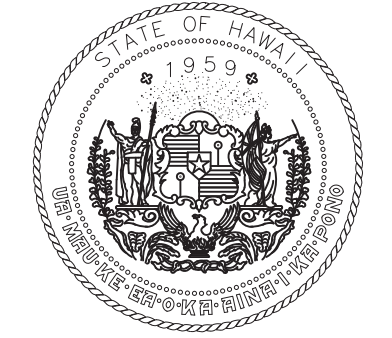
GENERAL NOTES:

- ORDER ADDITIONAL CONTROL ROD SECTIONS AS REQUIRED AND CUT TO FIT.
- LOCATE SWITCH HANDLE ON SIDE OF POLE OPPOSITE VEHICULAR TRAFFIC. IF THIS IS NOT POSSIBLE (OR TO AVOID OBSTACLES), THE LOCATION OF THE SWITCH HANDLE CAN BE ROTATED UP TO MAXIMUM OF 45°. WHEN REQUIRED, THIS SHOULD BE GRADUATED BY UNIFORM ADJUSTMENT OF THE GUIDE BEARINGS (EYE BOLTS).
- LOCATE UPPERMOST GUIDE 7'-0" BELOW CROSSARM.
- LOCATE LOWEST ROD GUIDE 6'-11" ABOVE PIVOT POINT OF OPERATING HANDLE.
- DRILL (2) 1/16" HOLES TO MOUNT SWITCH HANDLE.
- REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ADJUSTMENT DETAILS.



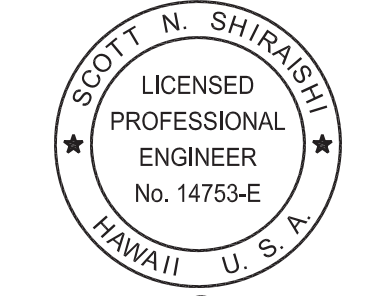
LIST OF MATERIALS (THIS SHEET ONLY)	
ITEM	DESCRIPTION
1	SWITCH, AIR BREAK, GROUP OPERATED, HORIZONTAL, SIDE-BREAK, 15KV, 600A
2	BOLT, 5/8" X 14" GALV. MACHINE, WITH SQUARE NUT
3	WASHER, SQUARE, CURVED, GALV., RIBBED, 4" X 4"
4	WASHER, LOCK, 5/8" SPLIT, GALV.
5	ADDITIONAL CONTROL ROD, 1" ROUND FIBERGLASS, 6'-10" SECTION, WITH HARDWARE
6	BOLT, 5/8" X 12" GALV. MACHINE
7	WASHER, SQUARE, 3/4" HOLE, CURVED, GALV.
8	LINK, EXTENSION, GALV., 10" CENTER TO CENTER
9	INSULATOR, SUSPENSION, PORCELAIN, 4-1/4" GALV. CAP
10	THIMBLE, AL. ALLOY DE
11	GRIP, AL. ALLOY PREFORMED DE (STD. 1-2560)
12	TERMINAL, PAD, STRAIGHT, CLAMP TYPE, 336.5KCM, AL, 2 HOLE
13	COMPOUND JOINT
14	ROD, GROUND CCS 5/8 X 8'
15	CONDUCTOR, BARE CU. SOL. #4 SD
16	MOLDING, GROUND WIRE, CREOSOTE, 1/2" X 7/8" X 8'
17	CAPSCR., SS, 1/2" X 2" 13 THD
18	WASHER, 5/8" GALV. ROUND
19	WASHER, FLAT, SS, 1/2"
20	NUT, HEX HEAD, SS, 1/2"

LIST OF MATERIALS (THIS SHEET ONLY)	
ITEM	DESCRIPTION
21	WASHER, BELLEVILLE, SS, 1/2"
22	STAPLE, GALV. STEEL, 1-1/2"
23	CONNECTOR, TAP COMPR, CU. R #6 SOL-#4 STR T #4 SOL-#4 STR
24	STAPLE, COPPER, 2-1/2" X 1-1/16" X .187 DIAMOND POINT
26	CLAMP, GROUND ROD, CCS, 5/8"
27	LAG & PLT. FOR DETACH. POLE STEP
28	NAIL, WIRE GALV. 6D



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04/30/2026  
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SS	CAD	SS	SS

NO.	DATE	REVISIONS

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PROJECT TITLE :

**ELECTRICAL IMPROVEMENTS**  
AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

PROJECT NO.:

**CO2544-53**

SHEET TITLE:

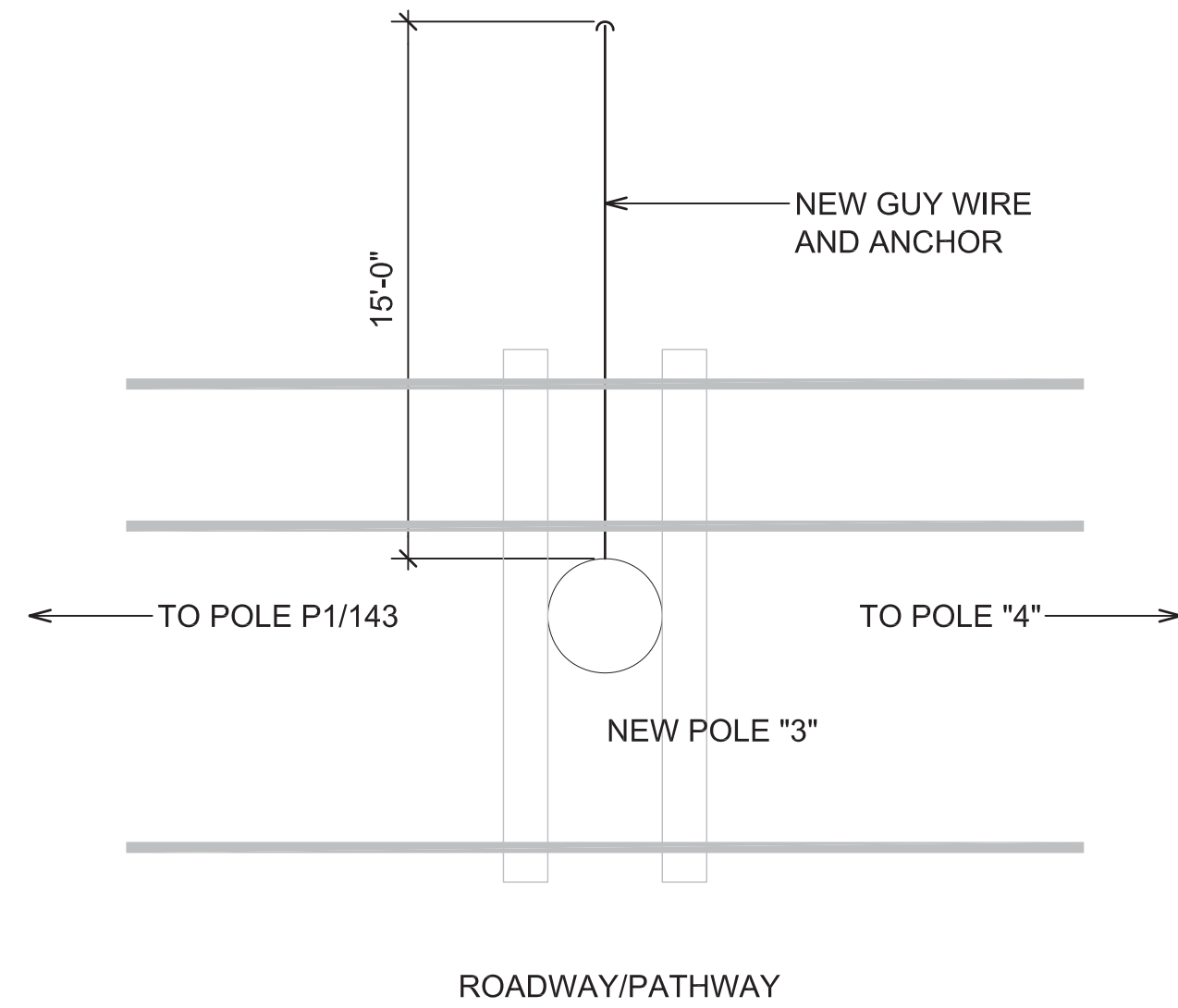
**AIR BREAK SWITCH DETAILS**

DATE :	03/24/2026	DWG. NO.	E-018
SHEET :	20 OF 21 SHEETS		

11/23/2023 10:00 AM C:\Users\scshirashi\OneDrive\Documents\Projects\2023\CO2544-53\Drawings\Sheet\03-24-2026.dwg

**NOTES :**

1. ATTACH GUY TO NEW UTILITY POLE AT SAME HEIGHT AS CROSSARM ELEVATION.
2. ATTACH GUY AT 90°, SEE ORIENTATION ON THIS SHEET.

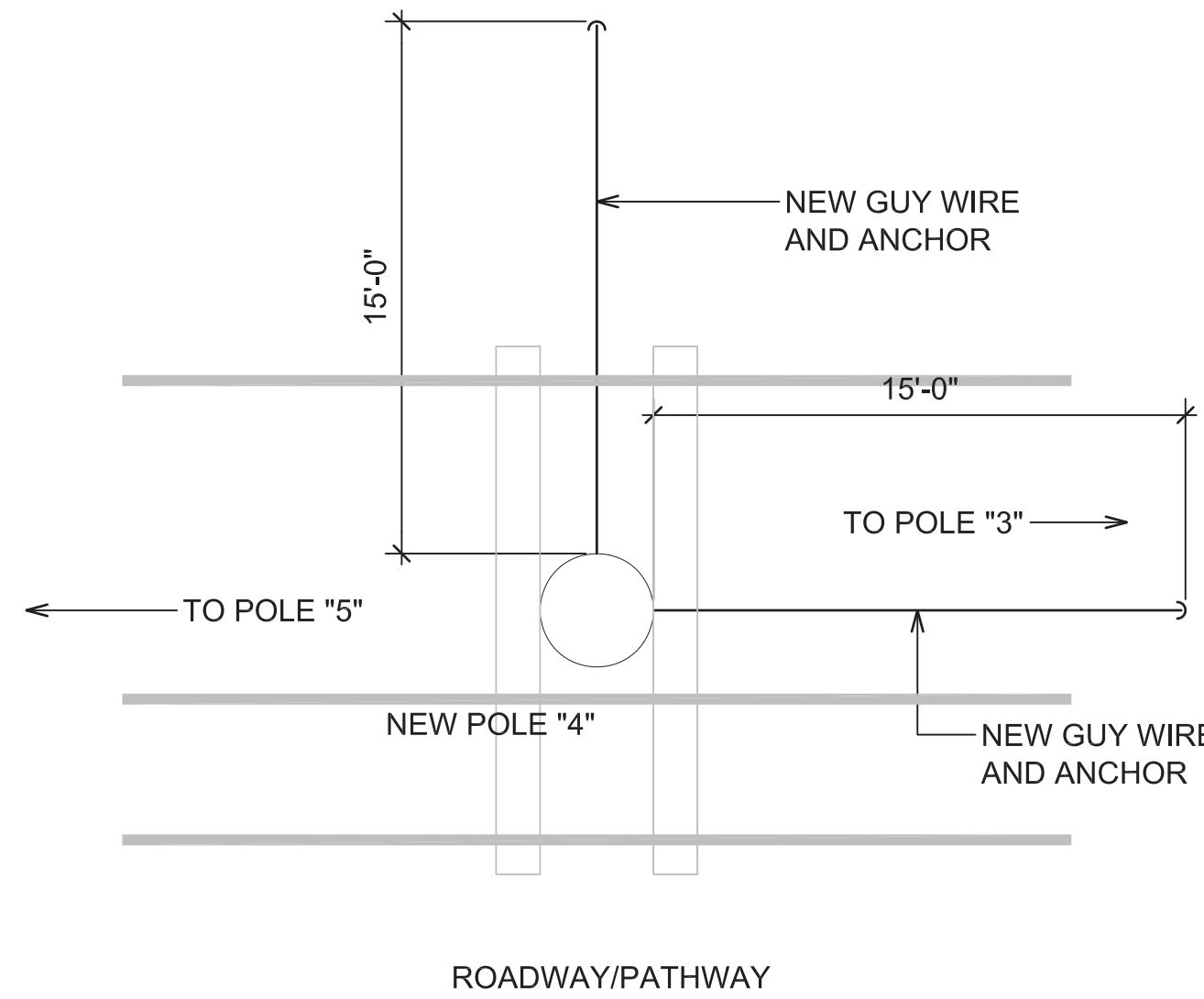


**TOP VIEW**

**NEW POLE "3" GUY DETAIL**  
NOT TO SCALE

**NOTES:**

1. ATTACH GUYS TO NEW UTILITY POLE AT SAME HEIGHT (OR AS CLOSE AS POSSIBLE) AS CROSSARM ELEVATION.
2. ATTACH GUYS AT 0° & 90°, SEE ORIENTATION ON THIS SHEET.

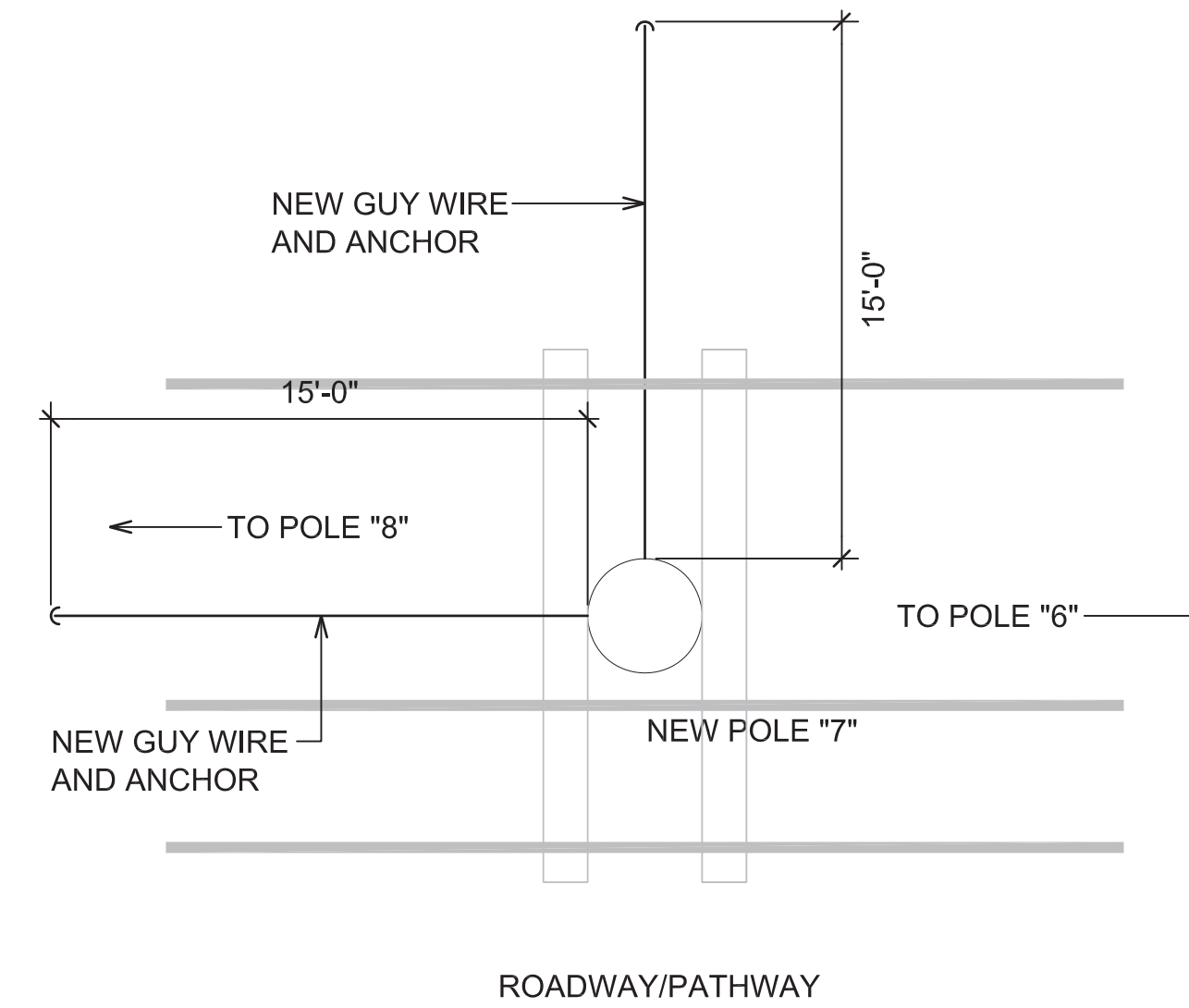


**TOP VIEW**

**NEW POLE "4" GUY DETAIL**  
NOT TO SCALE

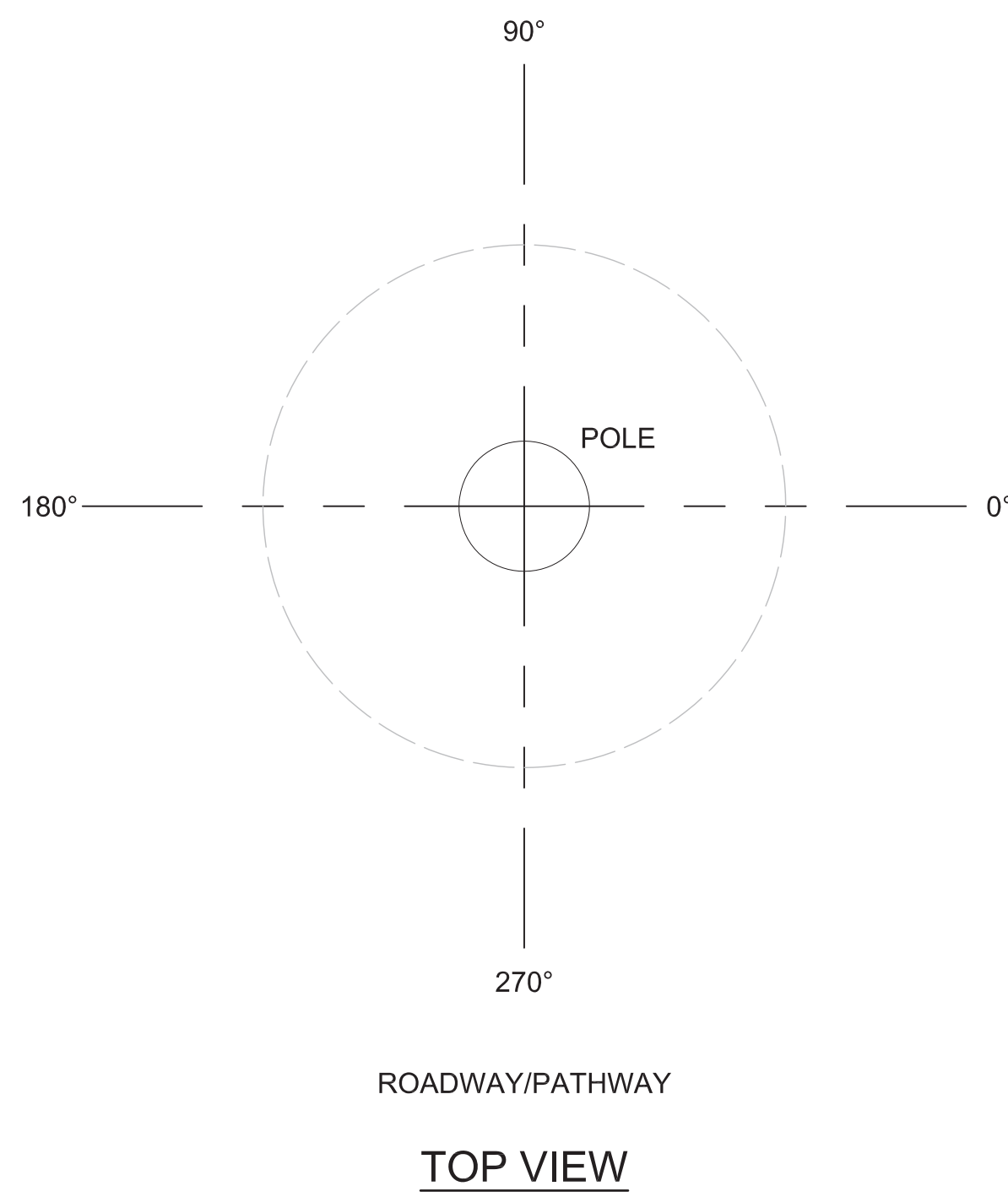
**NOTES:**

1. ATTACH GUYS TO NEW UTILITY POLE AT SAME HEIGHT (OR AS CLOSE AS POSSIBLE) AS CROSSARM ELEVATION.
2. ATTACH GUYS AT 90° & 180°, SEE ORIENTATION ON THIS SHEET.



**TOP VIEW**

**NEW POLE "7" GUY DETAIL**  
NOT TO SCALE

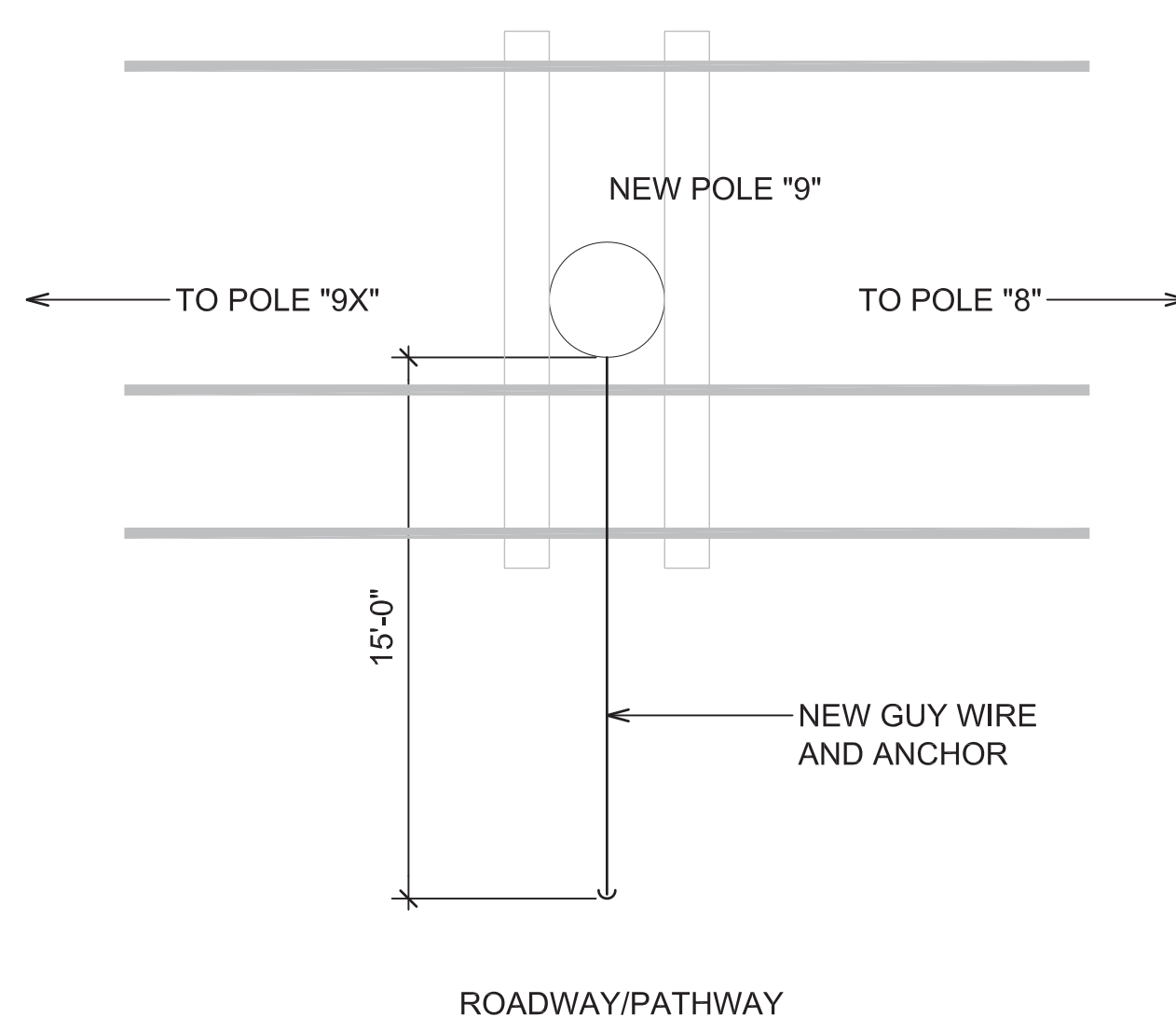


**TOP VIEW**

**TYPICAL GUY & ANCHOR ORIENTATION**  
NOT TO SCALE

**NOTES:**

1. ATTACH GUY TO NEW UTILITY POLE AT SAME HEIGHT AS CROSSARM ELEVATION.
2. ATTACH GUY AT 270°, SEE ORIENTATION ON THIS SHEET.

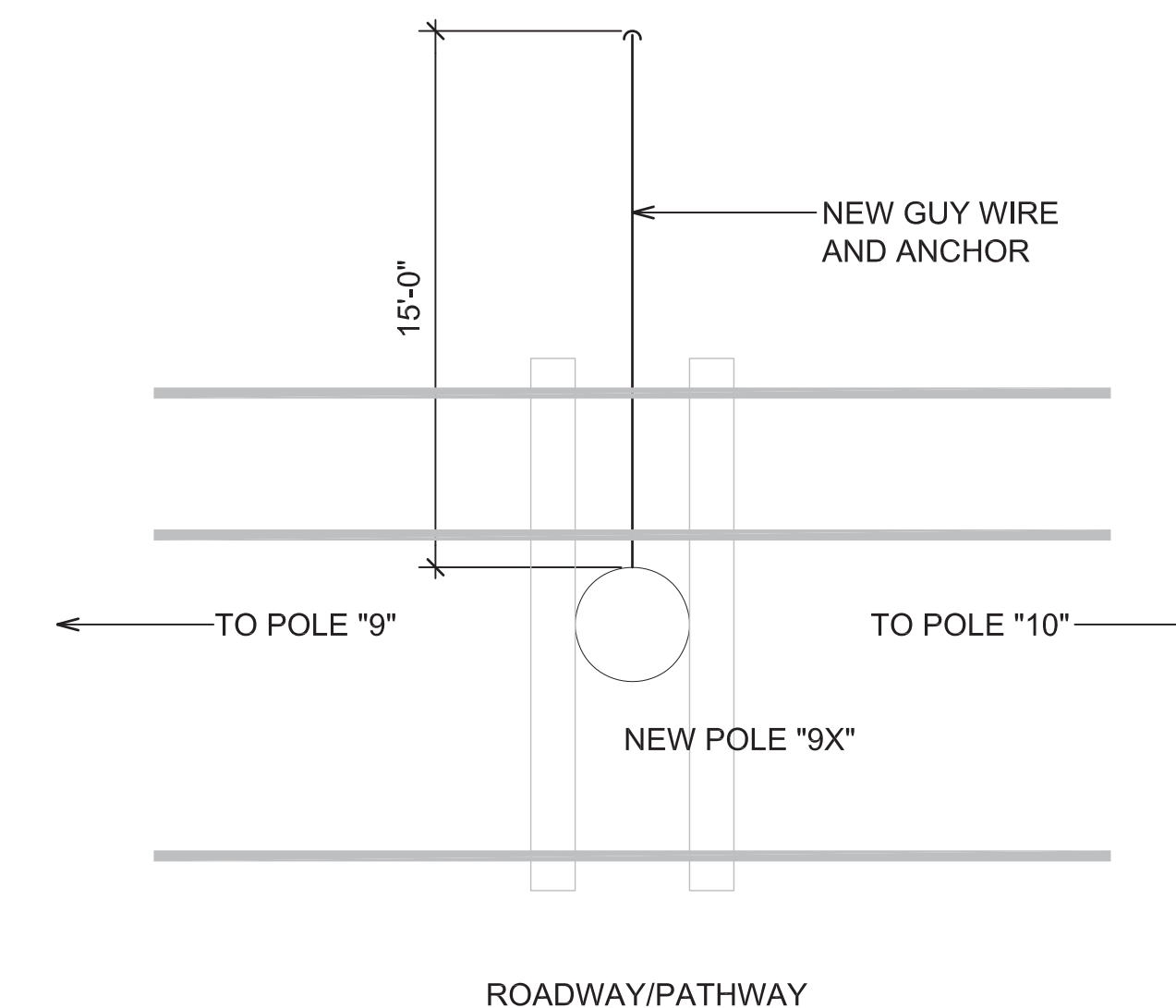


**TOP VIEW**

**NEW POLE "9" GUY DETAIL**  
NOT TO SCALE

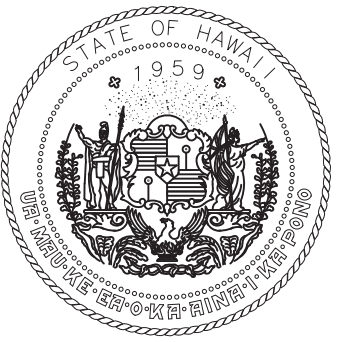
**NOTES:**

1. ATTACH GUY TO NEW UTILITY POLE AT SAME HEIGHT AS CROSSARM ELEVATION.
2. ATTACH GUY AT 90°, SEE ORIENTATION ON THIS SHEET.



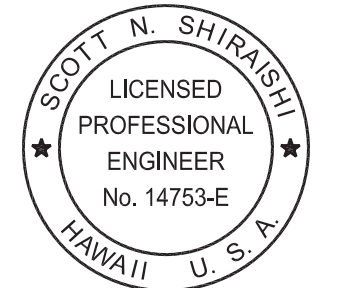
**TOP VIEW**

**NEW POLE "9X" GUY DETAIL**  
NOT TO SCALE



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**ELECTRICAL IMPROVEMENTS**

AT  
KAWAIHAPAI AIRFIELD  
MOKULEIA, OAHU, HAWAII

**PROJECT NO.:**

**CO2544-53**

**SHEET TITLE:**

**POLE GUYING DETAILS**

DATE :	DWG. NO.
03/24/2026	<b>E-019</b>
SHEET :	
21 OF 21 SHEETS	