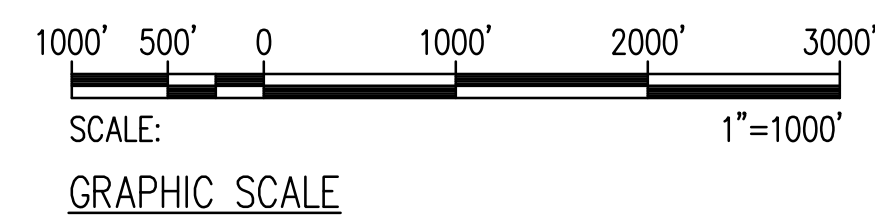


DEPARTMENT OF WATER  
 COUNTY OF KAUAI  
 JOB NO. 21-03

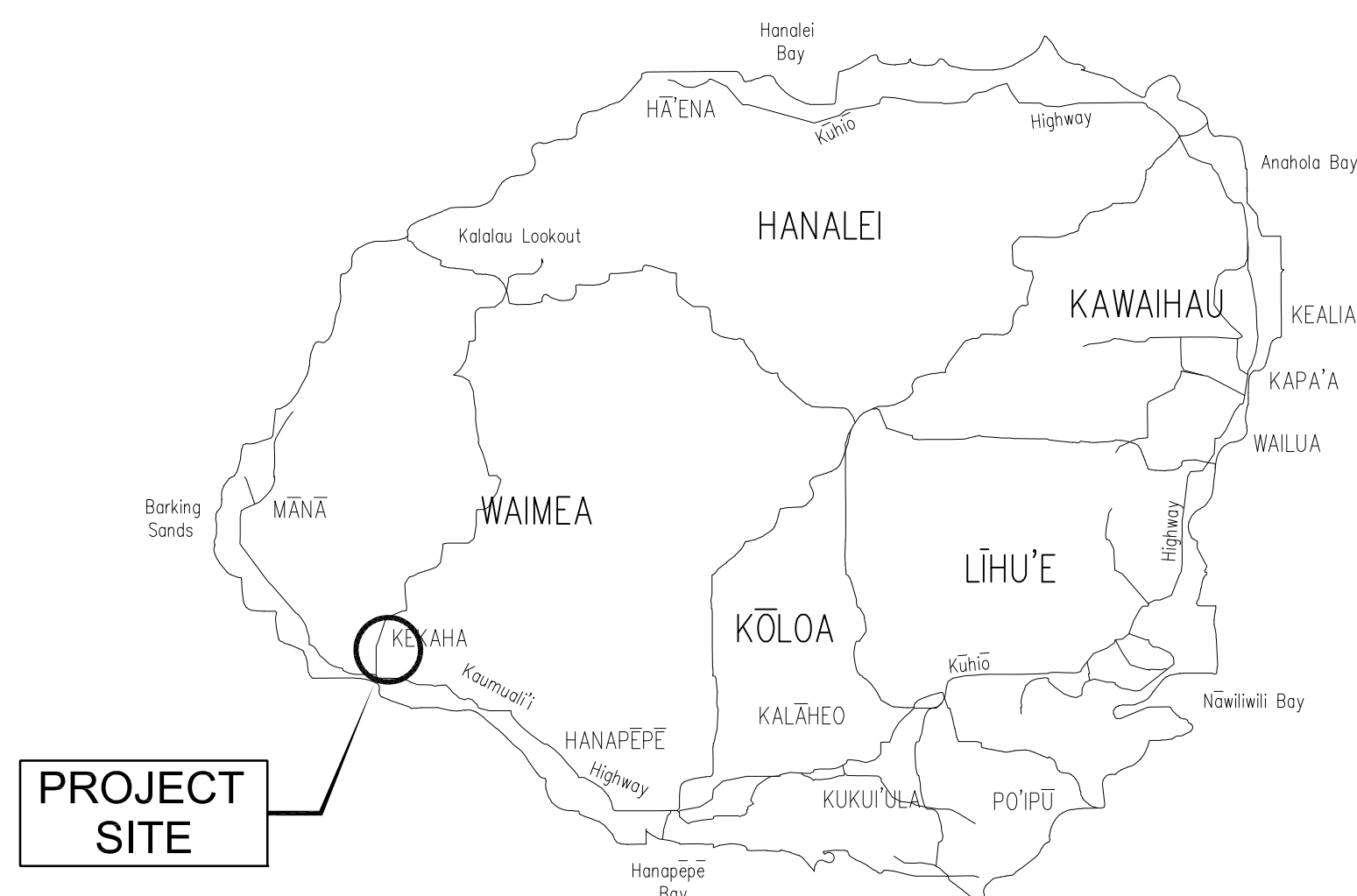
PAUA VALLEY WELL  
 MOTOR CONTROL CENTER  
 REPLACEMENT  
 KEKAHA, KAUAI, HAWAII  
 T.M.K: 4-1-2-002:039

ELECTRICAL ENGINEER:

RONALD N.S. HO AND ASSOCIATES, INC.  
 2153 NORTH KING STREET, SUITE 201  
 HONOLULU, HAWAII, 96819  
 (808) 941-0577



**LOCATION MAP**  
 SCALE: 1"=1000'



**ISLAND OF KAUAI**  
 NOT TO SCALE

INDEX OF DRAWINGS

SHEET NO.	DWG NO.	SHEET TITLE
1	OCS1	COVER SHEET
2	SP1	PLOT PLAN
3	E01	ELECTRICAL LEGENDS AND GENERAL NOTES
4	E02	DUCT SECTION DETAILS
5	E03	MISCELLANEOUS ELECTRICAL DETAILS
6	E11	DEMOLITION ELECTRICAL SITE AND BUILDING PLANS
7	E21	NEW ELECTRICAL SITE AND BUILDING PLANS, PANEL SCHEDULE
8	E31	ONE LINE DIAGRAMS, ELECTRICAL SCHEDULES
9	E41	MOTOR CONTROL CENTER AND ELECTRICAL BUILDING ELEVATIONS
10	E51	MOTOR CONTROL CENTER WELL PUMP CONTROL DIAGRAM
11	E52	MODIFIED EXISTING SCADA DIAGRAM
12	E53	CHLORINATION SYSTEM CONTROL DIAGRAM

BUILDING INFORMATION

NUMBER OF STORIES: ONE  
 OCCUPANCY GROUP: U (UTILITY AND MISCELLANEOUS GROUP)  
 AREA: 175 SF  
 OCCUPANT LOAD FACTOR: 300 GROSS, 1 OCCUPANT TOTAL  
 CONSTRUCTION TYPE: TYPE III-B  
 SPRINKLERED: NO

APPROVED:

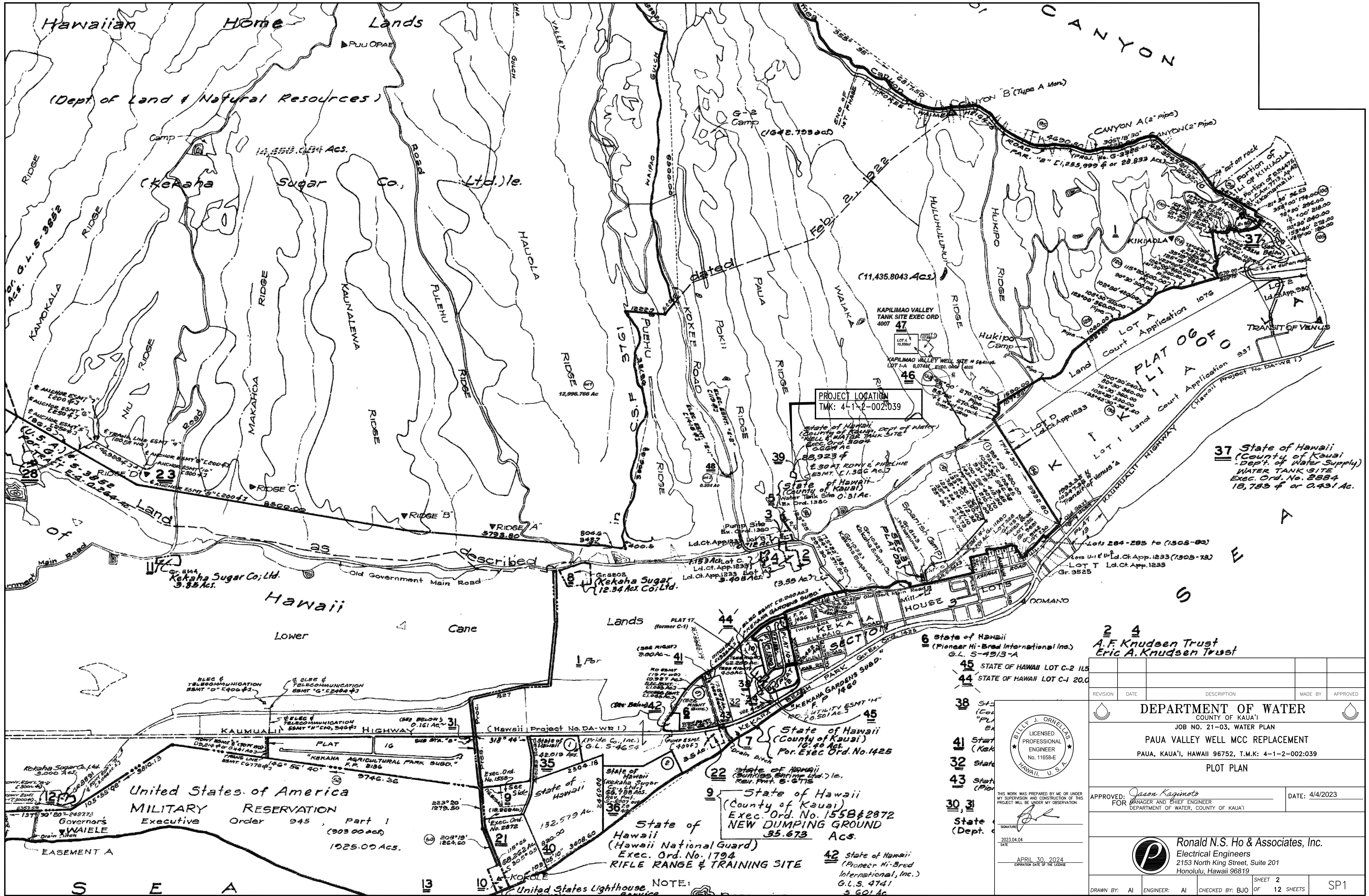
*Jason Kagimoto*

FOR MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER  
 COUNTY OF KAUAI

*Ronald N.S. Ho*

FOR  
 KAUAI ISLAND UTILITY COOPERATIVE  
 COUNTY OF KAUAI

04/05/23



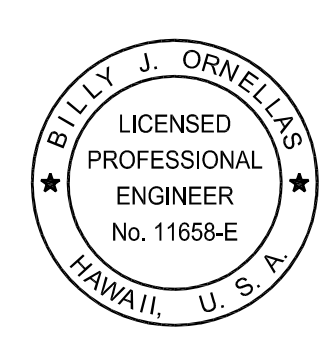
REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

**DEPARTMENT OF WATER**  
 COUNTY OF KAUAI  
 JOB NO. 21-03, WATER PLAN  
**PAUA VALLEY WELL MCC REPLACEMENT**  
 PAUA, KAUAI, HAWAII 96752, T.M.K.: 4-1-2-002:039  
**PLOT PLAN**

APPROVED: *Jason Kagimoto* DATE: 4/4/2023  
 FOR: MANAGER AND CHIEF ENGINEER  
 DEPARTMENT OF WATER, COUNTY OF KAUAI

**Ronald N.S. Ho & Associates, Inc.**  
 Electrical Engineers  
 2153 North King Street, Suite 201  
 Honolulu, Hawaii 96819

ENGINEER: AI CHECKED BY: BJO SHEET 2 OF 12 SHEETS SP1



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

APRIL 30, 2024  
 EXPIRATION DATE OF THE LICENSE

# KIUC CONSTRUCTION NOTES

- A. THESE NOTES ARE NOT INTENDED TO BE USED IN PLACE OF THE SERVICE INSTALLATION MANUAL, PLEASE REFER TO SERVICE INSTALLATION MANUAL FOR ALL SERVICE ISSUES. COORDINATE ALL WORK WITH KAUAI ISLAND UTILITY COOPERATIVE.
- B. CONTRACTOR SHALL CONTACT KAUAI ISLAND UTILITY COOPERATIVE'S ("KIUC") CONSTRUCTION COORDINATOR/INSPECTOR PRIOR TO START OF WORK ON KE FACILITIES AND FOR SCHEDULING SITE INSPECTIONS. [WESTSIDE: 246-2323; EASTSIDE: 246-4343]
- C. CONTRACTOR SHALL CONTACT KIUC'S DISTRIBUTION ENGINEER @ 246-2373 FOR DESIGN APPROVALS, STANDARD DETAIL DRAWINGS, AND ANY ITEMS NOT ADDRESSED IN THESE NOTES OR DRAWINGS.
- D. ALL CONTRACTORS ENTERING KIUC FACILITIES MUST BE APPROVED BY KIUC AND MUST HAVE PROPER LICENSING AND INSURANCE COVERAGE. CONTACT KIUC LEGAL COORDINATOR @ 246-4369 FOR DETAILS.
- E. ALL TRENCHES AND PULLBOXES MUST BE INSPECTED BY KIUC PRIOR TO BACKFILLING AND CONCRETE-ENCASING OPERATIONS. FOR DETAILED TRENCHING AND BACKFILLING REQUIREMENTS REFER TO KIUC'S SERVICE INSTALLATION MANUAL.
- F. THE CONTRACTOR SHALL PROVIDE A POLY-LINE 200 LB. TEST LINE OR EQUIVALENT AS A PULLING WIRE IN ALL 1", 2", 3" & 4" CONDUITS. IN 5" AND 6" CONDUITS, THE CONTRACTOR SHALL INSTALL NEPTCO WP1800 MULETAPE AS A PULLING LINE.
- G. ALL CONDUITS, PULLBOXES, HANDHOLES, & MANHOLES SHALL BE CLEANED AND FREE FROM OBJECTIONABLE MATERIALS. CONDUIT ENDS SHALL BE ADEQUATELY COVERED UNTIL THE CONDUCTOR IS INSTALLED BY THE ELECTRIC COMPANY. (COVER'S SHALL BE CARLON PLUG WITH PULL TAB SERIES P258 EQUIVALENT OR BETTER)
- H. FOR ALL CONDUITS OTHER THAN SERVICES, REFER TO CONDUIT SCHEDULE ON DRAWINGS.
- I. FOR ALL SERVICES WHERE THE CONDUCTOR IS 1/0 OR LESS, THE DISTANCE FROM KIUC'S HANDHOLE AND CUSTOMER'S METER IS LESS THAN 125 FEET, AND NOT CROSSING ANY DRIVEWAYS OR ROADS THE CONDUIT SHALL BE 2 INCH SCHEDULE 40 PVC. FOR SERVICES GREATER THAN 125 FEET, CONTACT KIUC PLANNER FOR FIELD VERIFICATION AND UNDERGROUND SERVICE REQUIREMENTS. ANY DEVIATIONS WILL REQUIRE KIUC WRITTEN APPROVAL.
- J. PRIMARY AND SECONDARY CONDUITS FOR NEW LINE EXTENSIONS SHALL BE SCHEDULE 40 PVC. (CARLON P&C DUCT TYPE DB EQUIVALENT OR BETTER.) UNDER DRIVEWAYS AND ROADWAYS, THE CONDUITS SHALL BE ENCASED IN A MINIMUM OF 3 INCH CONCRETE JACKET EXTENDING 12" OUTSIDE THE EDGE OF PAVEMENT.
- K. SCHEDULE 80 PVC CONDUITS MAY BE SUBSTITUTED FOR THE CONCRETE ENCASED SCHEDULE 40 PVC FOR SERVICE CONDUIT ONLY CROSSING UNDER UNPAVED PRIVATE DRIVEWAYS & ROADWAYS FROM KIUC POLE/HANDHOLE TO CUSTOMER'S METER. IF CONCRETE DRIVEWAY WILL BE BUILT OVER SERVICE CONDUIT IMMEDIATELY AFTER CONDUIT IS INSTALLED, THEN SCHEDULE 40 PVC MAY BE USED PROVIDED THAT IT MEETS WITH RULE NO. 21.
- L. ALL PRIMARY AND SECONDARY CONDUITS WHICH ARE CROSSING STATE OR COUNTY ROADWAYS SHALL BE SCHEDULE 40 PVC ENCASED IN A MINIMUM 3 INCH CONCRETE JACKET, WHICH SHALL EXTEND A MINIMUM OF 12 INCHES OUTSIDE OF THE EDGE OF PAVEMENT.
- M. ELECTRICAL SUPPLY DUCTS, WHEN INSTALLED NEAR COMMUNICATION CABLES, SHALL BE SEPARATED FROM COMMUNICATION DUCT SYSTEMS AND BURIED COMMUNICATION CABLES OR CONDUCTORS BY NOT LESS THAN 3 INCHES OF CONCRETE OR 12 INCHES OF EARTH WHEN PARALLELING OR CROSSING.
- N. CHAIRS SHALL BE INSTALLED AND SPACED AT A MAXIMUM OF 5 FEET SEPARATION WHEN CONCRETE ENCASING CONDUITS.
- O. ALL CONDUITS SHALL ENTER BOXES AT 90 DEGREE ANGLE, PERPENDICULAR AND FLUSH TO THE WALL WITH BELL ENDS TO PREVENT CABLE DAMAGE.
- P. 90 DEGREE CONDUIT BENDS SHALL BE FACTORY MADE WITH A MINIMUM RADIUS OF 3 FEET IN TRENCH RUNS.
- Q. CONDUIT BENDS EXCEEDING 90 DEGREES WILL NOT BE ACCEPTED.
- R. A 36 INCH MINIMUM HORIZONTAL CLEARANCE SHALL BE MAINTAINED WHEN RUNNING KIUC CONDUITS PARALLEL TO WATER & SEWER LINES. IF CLEARANCE IS LESS THAN 36 INCHES, KIUC CONDUIT SHALL BE CONCRETE ENCASED.
- S. NO FOREIGN PULLBOXES, HANDHOLES, MANHOLES, CONCRETE SLABS/BOXES, STRUCTURES, ETC. ARE TO BE INSTALLED OVER KIUC FACILITIES WITH THE EXCEPTION OF HTI, CATV OR WATERLINE CONDUIT CROSSINGS. SUCH CROSSING MUST BE APPROVED BY KIUC'S SERVICE ASSURANCE DEPARTMENT AND KIUC CONDUIT TO BE CONCRETE ENCASED. CONCRETE ENCASEMENT MUST BE A MINIMUM OF 3 INCH ENCASEMENT AND EXTEND A MINIMUM OF 1 FOOT BEYOND CROSSING CONDUIT OR PIPE.
- T. YELLOW MARKER TAPE TO BE PLACED 1 FOOT ABOVE ELECTRICAL CONDUITS IN THE TRENCH DURING BACKFILLING. (E-Z CODE WBT 6 INCH WIDE 4 MILL POLYETHYLENE PROTECT-A-LINE WARNING TAPE NA-0708 "ELECTRIC LINE" IN YELLOW, EQUIVALENT OR BETTER)
- U. UNLESS OTHERWISE NOTED, THE TOP OF ALL CONDUITS SHALL BE AT 24 INCHES DEPTH.
- V. ALL HANDHOLES, PULLBOXES, AND MANHOLES SHALL BE WALKER INDUSTRIES TYPE OR APPROVED EQUAL. CONTACT KIUC PRIOR TO ORDERING UNDERGROUND BOXES FOR VENDOR APPROVAL. CUSTOMER TO SUBMIT MANUFACTURER'S SHOP DRAWINGS IF SUBSTITUTING FROM WALKER INDUSTRIES TYPE.

- W. TYPICALLY, THE TOP OF ALL ELECTRICAL UTILITY BOXES SHALL BE 1 INCH ABOVE FINISH GRADE, SINGLE PHASE TRANSFORMER PADS SHALL BE 2 INCHES ABOVE FINISH GRADE, AND THREE PHASE TRANSFORMER PADS SHALL BE 4 INCHES ABOVE FINISH GRADE UNLESS OTHERWISE NOTED. (SPECIAL CONDITIONS MAY APPLY TO SIDEWALKS, ROADWAYS, ETC. SEE SPECIFIC LOCATION NOTATION)
- X. AT NO TIME SHALL CEMENT MORTAR, WOOD OR ANY OTHER MATERIAL BE USED BETWEEN PRE-CAST SECTIONS OF KIUC PULLBOXES, HANDHOLES, OR MANHOLES. THE PERMANENT INSTALLATION OF WOODEN WEDGES TO LEVEL OR RAISE THE PRE-CAST SECTIONS SHALL NOT BE PERMITTED.
- Y. A MINIMUM OF 6 INCHES OF #3 CRUSHED ROCK BACKFILL SHALL BE PLACED LOOSELY BENEATH THE BOTTOM SECTION OF HANDHOLES AND PULLBOXES. CRUSHED ROCK OR OTHER FOREIGN MATERIALS ARE NOT TO BE PLACED INSIDE HANDHOLES AND PULLBOXES.

# KDOW CONSTRUCTION NOTES

- A. A 8 FEET MINIMUM HORIZONTAL CLEARANCE SHALL BE MAINTAINED WHEN RUNNING KIUC CONDUIT PARALLEL TO WATER AND SEWER LINES. IF CLEARANCE IS LESS THAN 8 FEET, KIUC CONDUIT SHALL BE CONCRETE ENCASED.
- B. NO FOREIGN PULLBOXES, HANDHOLES, MANHOLES, CONCRETE SLABS/BOXES, STRUCTURES, ETC. ARE TO BE INSTALLED OVER KIUC FACILITIES WITH THE EXCEPTION OF HTI, CATV OR WATERLINE CONDUIT CROSSING. SUCH CROSSING MUST BE APPROVED BY KIUC'S SERVICE ASSURANCE DEPARTMENT AND KIUC CONDUIT TO BE CONCRETE ENCASED. CONCRETE ENCASEMENT MUST BE A MINIMUM OF 3 INCH ENCASEMENT AND EXTEND A MINIMUM OF MORE THAN 1 FOOT BEYOND CROSSING CONDUIT OR PIPE.
- C. OIL-LUBE WELL PUMP IS BEING REPLACED WITH SUBMERSIBLE WELL PUMP BY OTHERS. DISRUPTION OF ELECTRICAL AND TELECOMMUNICATIONS SERVICE IS PERMITTED THROUGHOUT PUMP AND SERVICE EQUIPMENT REPLACEMENT.

# GENERAL CONSTRUCTION NOTES

## GENERAL ELECTRICAL NOTES

- A. PERFORM ALL WORK IN ACCORDANCE WITH NFPA 70 2017 (NATIONAL ELECTRICAL CODE), NFPA 70E (STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE), AND ALL LOCAL RULES AND REGULATIONS.
- B. PER NEC 110.12, WORK SHALL BE NEAT AND WORKMANLIKE. PROVIDE LISTED, CORRECTLY-SPACED METHODS OF RACEWAY SUPPORT AND TRANSITIONS. COVER ALL UNUSED BOX OPENINGS; EQUIPMENT SHALL BE FIRMLY SECURED WITH VENTILATION OPENINGS UNOBSOURED.
- C. TONE AND LOCATE ALL BELOW-GRADE UTILITY LINES WITHIN THE PROJECT SITE PRIOR TO THE START OF EXCAVATION. REPAIR OF ALL DAMAGES TO EXISTING UTILITIES TO REMAIN SHALL BE AT NO COST TO KDOW.
- D. PROVIDE PERMANENT LABELING FOR ALL NEW EQUIPMENT BEARING NAMED DESIGNATIONS; MELAMINE NAMEPLATES SHALL BE USED WITH TYPED CIRCUIT SCHEDULES INDICATING ALL FINAL LOADS SERVED AND SPARE CIRCUITS. PROVIDE LAMINATED LABELS FOR RECEPTACLE CIRCUIT DESIGNATIONS.
- E. COORDINATE CONNECTIONS OF ALL EQUIPMENT PROVIDED BY OTHERS WITH THE ASSOCIATED CONTRACTOR PRIOR TO ROUGH-IN. THIS INCLUDES, BUT IS NOT LIMITED TO, MECHANICAL EQUIPMENT, AND LOW VOLTAGE EQUIPMENT. ALL EQUIPMENT SHALL HAVE THE APPROPRIATE DISCONNECTING MEANS PROVIDED, INCLUDING ANY PLUGS AND CORDS WHERE NOT ALREADY INTEGRATED.
- F. NOT ALL PENETRATIONS ARE INDICATED. PENETRATE WALLS, SLABS, BEAMS, AND CEILING FOR INSTALLATION OF NEW ELECTRICAL RACEWAYS AS REQUIRED; FIRE STOP, PATCH AND PAINT TO MATCH EXISTING RATINGS AND ADJACENT FINISHES. EXTERIOR PENETRATIONS SHALL BE FIRE STOPPED AND MADE WEATHERPROOF ON THE SAME DAY OF THE PENETRATION.
- G. EXPOSED BOXES AND RACEWAYS WITHOUT GRADE 316 STAINLESS STEEL SHALL BE PAINTED TO MATCH ADJACENT FINISH; DO NOT PAINT OVER NAMEPLATES AND LABELS.
- H. PROVIDE POLYOLEFIN 200LB TEST PULLCORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.
- I. ALL EQUIPMENT AND DEVICES SHALL BE RATED FOR THE ENVIRONMENT THEY ARE INSTALLED IN. ALL OUTDOOR EQUIPMENT SHALL BE MINIMUM NEMA 4X 316SS; SEE PLANS FOR SUPERCEDING RATINGS. OUTDOOR NEMA 5-15R AND 5-20R RECEPTACLES SHALL BE WEATHER RESISTANT WITH GFCI PROTECTION, AND SHALL HAVE CAST-METAL "WHILE-IN-USE" WEATHERPROOF COVERPLATES.
- J. ELECTRICAL DISTRIBUTION EQUIPMENT SHALL HAVE MINIMUM 75 DEGREE CELSIUS CONDUCTOR TERMINATIONS. 60 DEGREE CELSIUS TERMINATIONS WILL NOT BE APPROVED.

## GENERAL ELECTRICAL NOTES - EXISTING CONDITIONS

- A. EXISTING CONDITIONS INDICATED ON THESE DRAWINGS ARE INTENDED TO SHOW THE GENERAL SCOPE OF WORK, BASED ON LIMITED FIELD VERIFICATION AND INFORMATION PROVIDED BY OTHERS. VISIT THE PROJECT SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PRIOR TO BIDDING AND THE START OF WORK. A SIGNED CONTRACT ACKNOWLEDGES THAT ALL SITE CONDITIONS ARE ACCEPTED.
- B. ANY DRAWING DISCREPANCIES, INCLUDING BUT NOT LIMITED TO THOSE WITH RESPECT TO THE EXISTING CONDITIONS, SHALL BE REPORTED TO THE ENGINEER. DISCREPANCIES SHALL BE RESOLVED PRIOR TO STARTING WORK. NO ADDITIONAL EXPENSES WILL BE ALLOWED FOR WORK MADE NECESSARY BY FAILING TO VERIFY SITE CONDITIONS AND RESOLVE DISCREPANCIES.
- C. DEMOLISH EXISTING EQUIPMENT, DEVICES, SUPPORTS, ETC. AS REQUIRED TO ACCOMPLISH THE NEW WORK INDICATED ON THE PLANS, WHETHER OR NOT THESE ITEMS ARE SPECIFICALLY SHOWN.
- D. ALL DEMOLISHED ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF UNLESS DESIGNATED BY THE KDOW OR AS INDICATED ON THE DRAWINGS.
- E. REMOVED EQUIPMENT OR LUMINAIRES CONTAINING HAZARDOUS MATERIALS, SUCH AS MERCURY OR PCBs, SHALL BE DISPOSED OF PER THE ENVIRONMENTAL PROTECTION AGENCY (EPA) GUIDELINES.
- F. ALL EQUIPMENT AND CIRCUITING LINED WITH 'X' INDICATES WORK THAT SHALL BE COMPLETELY DEMOLISHED, INCLUDING ALL CONDUCTORS, RACEWAYS, AND SUPPORTS, UNLESS SPECIFICALLY STATED OTHERWISE.

# ELECTRICAL SYMBOLS

POWER EQUIPMENT SYMBOLS		
DESCRIPTION		
EXISTING	NEW	ELECTRICAL PANELBOARD, LOAD CENTER, OR POWER DISTRIBUTION BOARD; DIMENSIONS AS SHOWN ON THE PLANS. MOUNTING HEIGHT SHALL COMPLY WITH NEC 240.24(A).
		EQUIPMENT DISCONNECT SWITCH. MOUNTING HEIGHT SHALL COMPLY WITH NEC 240.24(A).
		ELECTRICAL METER SOCKET; METER PROVIDED BY UTILITY.
		SWITCHBOARD, SWITCHGEAR, OR MOTOR CONTROL CENTER SECTIONS AS LABELED; SEE PLANS AND DETAILS FOR MORE INFORMATION
POWER DEVICE SYMBOLS		
DESCRIPTION		
EXISTING	NEW	DUPLEX RECEPTACLE, NEMA 5-20R, TAMPER RESISTANT, WALL MOUNTED +18" OR AS NOTED
		DUPLEX RECEPTACLE, TAMPER RESISTANT, GFCI FACEPLATE TYPE, WALL MOUNTED +18" OR AS NOTED
		ELECTRICAL EQUIPMENT / MOTOR CONNECTION
		JUNCTION BOX, 4"SQ X 1-1/2" MIN., WALL/CEILING MOUNTED RESPECTIVELY
RACEWAY SYMBOLS		
DESCRIPTION		
EXISTING	NEW	(LIQUID-TIGHT) FLEXIBLE CONDUIT
		CONDUIT CONCEALED IN SLAB OR BELOW GRADE
		CONDUIT CONCEALED IN WALL OR ABOVE CEILING. 3 WIRES INDICATED. NO HASHMARKS DENOTES 2 WIRES. EGC IS REQUIRED BUT NOT INDICATED.
		EXPOSED CONDUIT
		ELECTRICAL DUCTLINE WITH DUCT SECTION DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE; DUCT DESIGNATORS IN ADJACENT CIRCLES INDICATES DUCTS INSTALLED IN COMMON TRENCH AND COMBINED CONCRETE ENCASEMENT WITH REQUIRED DUCT SEPARATIONS; DUCT DESIGNATION CUT LINE INDICATES VIEW OF DUCT SECTION; SHOWN WITH DUCT COMPLEMENTS TYPE "EA" DUCT SECTION WITH 2-5"E DUCTS AND TYPE "TA" DUCT SECTION WITH 2-4"T DUCTS IN COMMON TRENCH AND CONCRETE ENCASEMENT (E=ELECTRIC, T=TELEPHONE, I = INSTRUMENTATION, P=SECONDARY POWER); SEE E-02 FOR DUCT SECTION DETAILS
		HOMERUN TO ELECTRICAL PANELBOARD. "A-1" DENOTES CONNECTED TO PANEL "A" CKT #1

# ABBREVIATIONS

AFF	DENOTES "ABOVE FINISH FLOOR"
AHJ	DENOTES "AUTHORITY HAVING JURISDICTION"
AR	DENOTES "AUXILIARY RELAY"
CC	DENOTES "CAPACITOR CONTACTOR"
CKT BKR	DENOTES "CIRCUIT BREAKER"
EGC	DENOTES "EQUIPMENT GROUNDING CONDUCTOR"
ESS	DENOTES "(MANUAL) EMERGENCY STOP SWITCH"
GEC	DENOTES "GROUNDING ELECTRODE CONDUCTOR"
HH	DENOTES "HANDHOLE"
JB	DENOTES "JUNCTION BOX"
KDOW	DENOTES "KAUAI DEPARTMENT OF WATER"
KIUC	DENOTES "KAUAI ISLAND UTILITY COOPERATIVE"
LSC	DENOTES "LIMIT SWITCH CONTROL (VALVE)"
MCC	DENOTES "MOTOR CONTROL CENTER"
MP	DENOTES "MOTOR PROTECTOR"
MPRM	DENOTES "MOTOR PROTECTOR REMOTE MANAGER"
OL	DENOTES "OVERLOAD"
PRL	DENOTES "PHASE REVERSAL / LOSS (RELAY)"
RTM	DENOTES "RUNNING TIME METER"
SCADA	DENOTES "SUPERVISORY CONTROL AND DATA ACQUISITION"
SPD	DENOTES "SURGE PROTECTIVE DEVICE"
ST	DENOTES "SEQUENCE TIMER"
SSS	DENOTES "SOLID STATE STARTER"
TD	DENOTES "TIME DELAY"
TELECOM	DENOTES "TELECOMMUNICATIONS"
TYP	DENOTES "TYPICAL"
WP	DENOTES "WEATHERPROOF"
XFMR	DENOTES "TRANSFORMER"

## BUILDING ENERGY CONSERVATION CODE

EXTERIOR LIGHTING POWER ALLOWANCE   N/A\*   INSTALLED   N/A\*    
INTERIOR LIGHTING POWER ALLOWANCE   N/A\*   INSTALLED   N/A\*  

CALCULATIONS: SEPARATE   X   ON DRAWINGS \_\_\_\_\_  
(CHECK ONE)

\*SCOPE OF WORK INVOLVES NO NEW OR MODIFIED LIGHTING.

NEW/EXISTING LEGEND*	
---	EXISTING WORK OR PRIOR PHASE (THIN)
---	NEW WORK OR CURRENT PHASE (BOLD)
X-X	DEMOLISHED WORK

\* LEGEND APPLIES TO ALL PLAN SHEETS.

# CONTROL WIRING LEGEND



SYMBOL*	DESCRIPTION
(R1)	SOLENOID COIL OF CONTACT, RELAY OR STARTER
	CONTACT NORMALLY OPEN (N.O.) WHEN COIL IS DE-ENERGIZED OR SWITCH IS IN OPEN POSITION
	CONTACT NORMALLY CLOSED (N.C.) WHEN COIL IS DE-ENERGIZED OR SWITCH IS IN OPEN POSITION
Y	TIME DELAY CONTACTS, N.O., DELAY TO CLOSE
Y	TIME DELAY CONTACTS, N.O., DELAY TO OPEN
Y	TIME DELAY CONTACTS, N.C., DELAY TO CLOSE.
Y	TIME DELAY CONTACTS, N.C., DELAY TO OPEN.
(R)	LED INDICATING LIGHT, LETTER DENOTES COLOR. MODIFIERS: R=RED, G=GREEN, A=AMBER, B=BLUE
	EXTERNAL CONTACTS (DASHED)
--(SV)--	EXTERNAL SOLENOID (DASHED)
⏏	FUSE
⏏	EXTERNAL CONTROL VALVE, N.O. FROM ELECTRIC ACTUATOR
⏏	PUSHBUTTON, N.O.
⏏	SWITCH, N.O.
m	CONTROL TRANSFORMER

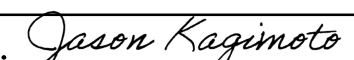
\* ALL DASHED CONTROL SYMBOLS AND BOXES ARE FROM EXTERNAL DEVICES.


# WASTEWATER SYMBOLS

EXISTING	NEW	DESCRIPTION
(M/H)		MOTOR AND HEATER CONNECTION
(PLS)		PRELUBE SOLENOID CONNECTION
(PCV)		PUMP CONTROL VALVE CONNECTION
(FS)		FLOW SWITCH CONNECTION
(FT)		FLOW TRANSMITTER CONNECTION
(PT)		PRESSURE TRANSMITTER CONNECTION
(LT)		LEVEL TRANSMITTER CONNECTION
(HS)		WELL OR TANK HATCH SWITCH
(HH)		HIGH-HIGH LEVEL SWITCH
(HPS)		HIGH PRESSURE DISCHARGE PRESSURE SWITCH

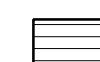



REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

 <b>DEPARTMENT OF WATER</b> COUNTY OF KAUAI 	
JOB NO. 21-03, WATER PLAN	
<b>PAUA VALLEY WELL MCC REPLACEMENT</b>	
PAUA, KAUAI, HAWAII 96752, T.M.K.: 4-1-2-002:039	
<b>ELECTRICAL LEGENDS AND GENERAL NOTES</b>	

APPROVED:  <b>FOR</b> MANAGER AND CHIEF ENGINEER DEPARTMENT OF WATER, COUNTY OF KAUAI	DATE: 4/4/2023
---	----------------

 <b>Ronald N.S. Ho &amp; Associates, Inc.</b> Electrical Engineers 2153 North King Street, Suite 201 Honolulu, Hawaii 96819				
DRAWN BY: AI	ENGINEER: AI	CHECKED BY: BJO	SHEET 3 OF 12 SHEETS	E01

**DUCT SECTION 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, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

**DESIGNATION DESCRIPTIONS**

- ELEC = UTILITY CO. PRIMARY OR SECONDARY ELECTRIC
- TEL = UTILITY CO. TELEPHONE
- PWR = PRIMARY OR SECONDARY ELECTRIC
- CTL = CONTROL
- SIG = INSTRUMENTATION OR ANTENNA CABLE

**MINIMUM "X" DIMENSION**

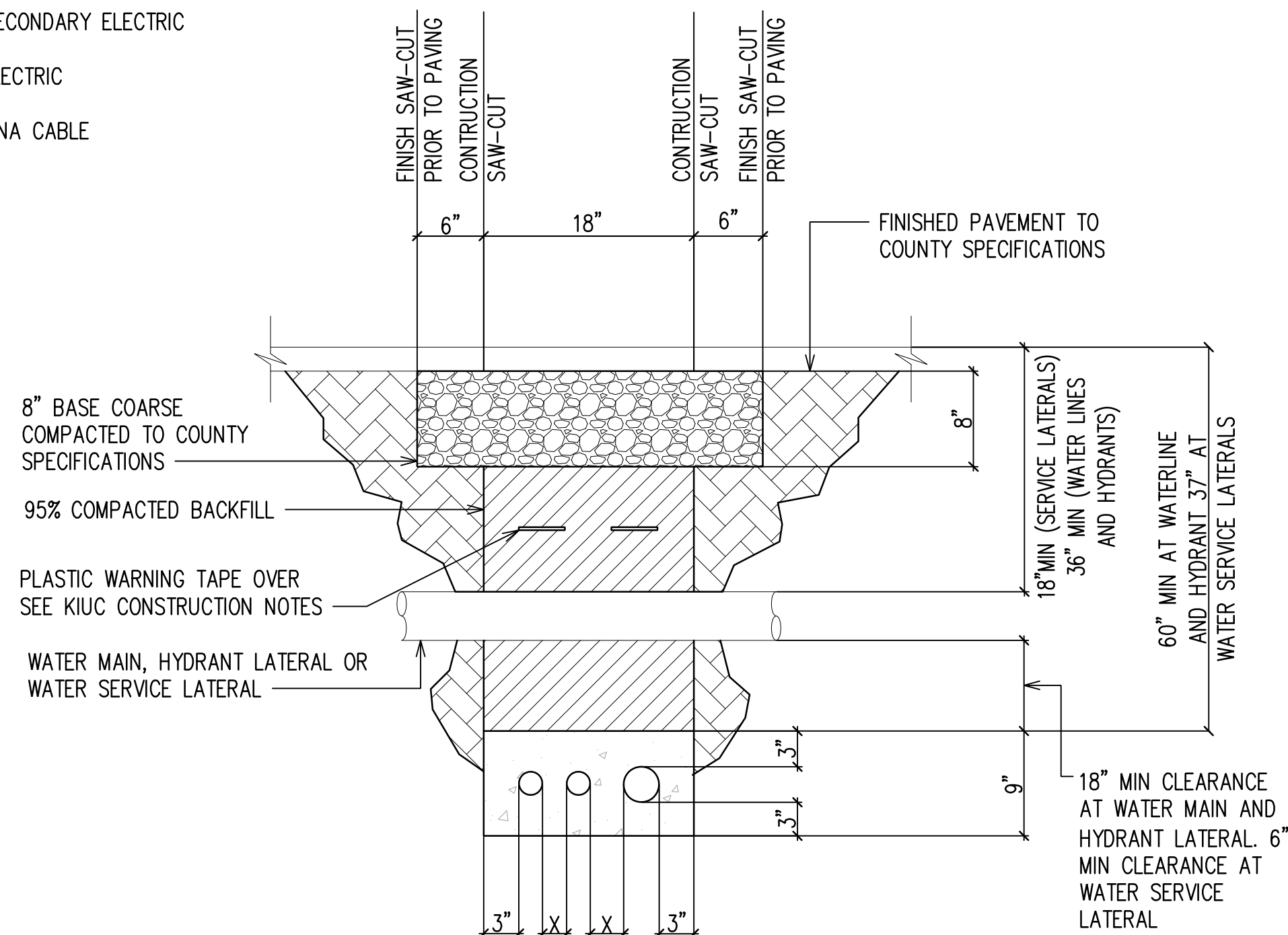
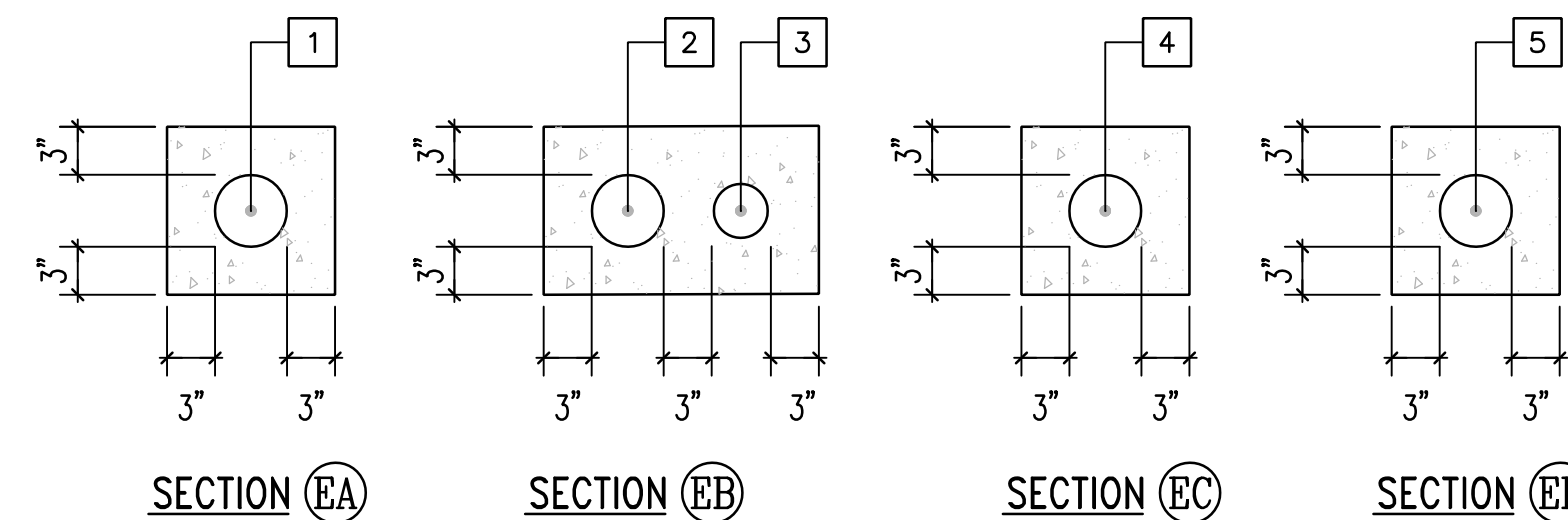
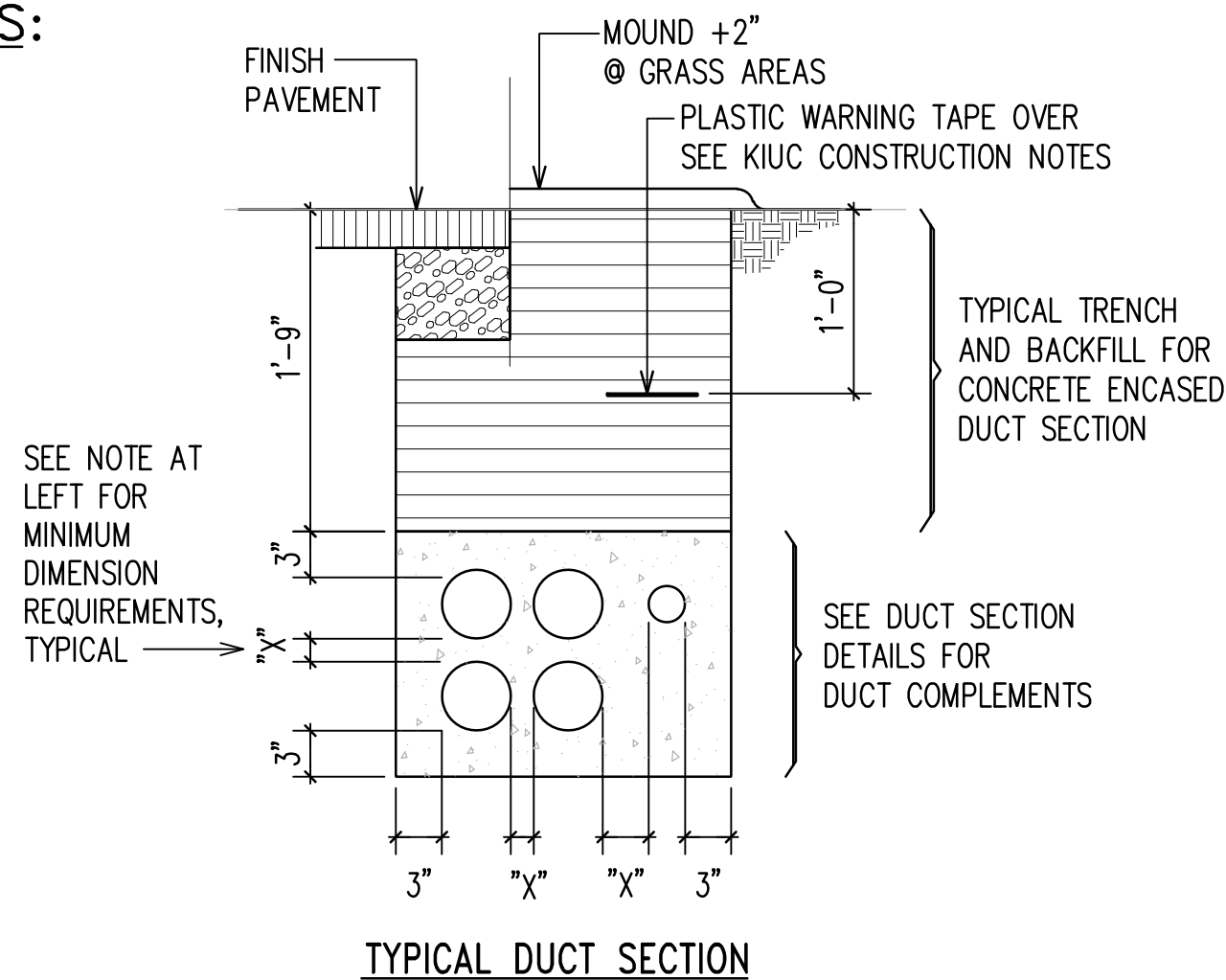
**DUCT SEPARATION REQUIREMENTS**

- ELEC - ELEC = 1 1/2"
- ELEC - TEL = 3"
- TEL - TEL = 1 1/2"
- ELEC - CTL/SIG = 3"
- TEL - CTL/SIG = 1 1/2"
- PWR - CTL/SIG = 3"
- ELEC - PWR = 1 1/2"
- TEL - PWR = 3"
- PWR - PWR = 1 1/2"
- CTL/SIG - CTL/SIG = 1 1/2"

MINIMUM OF 3" CONCRETE ENCASEMENT AROUND DUCTBANK

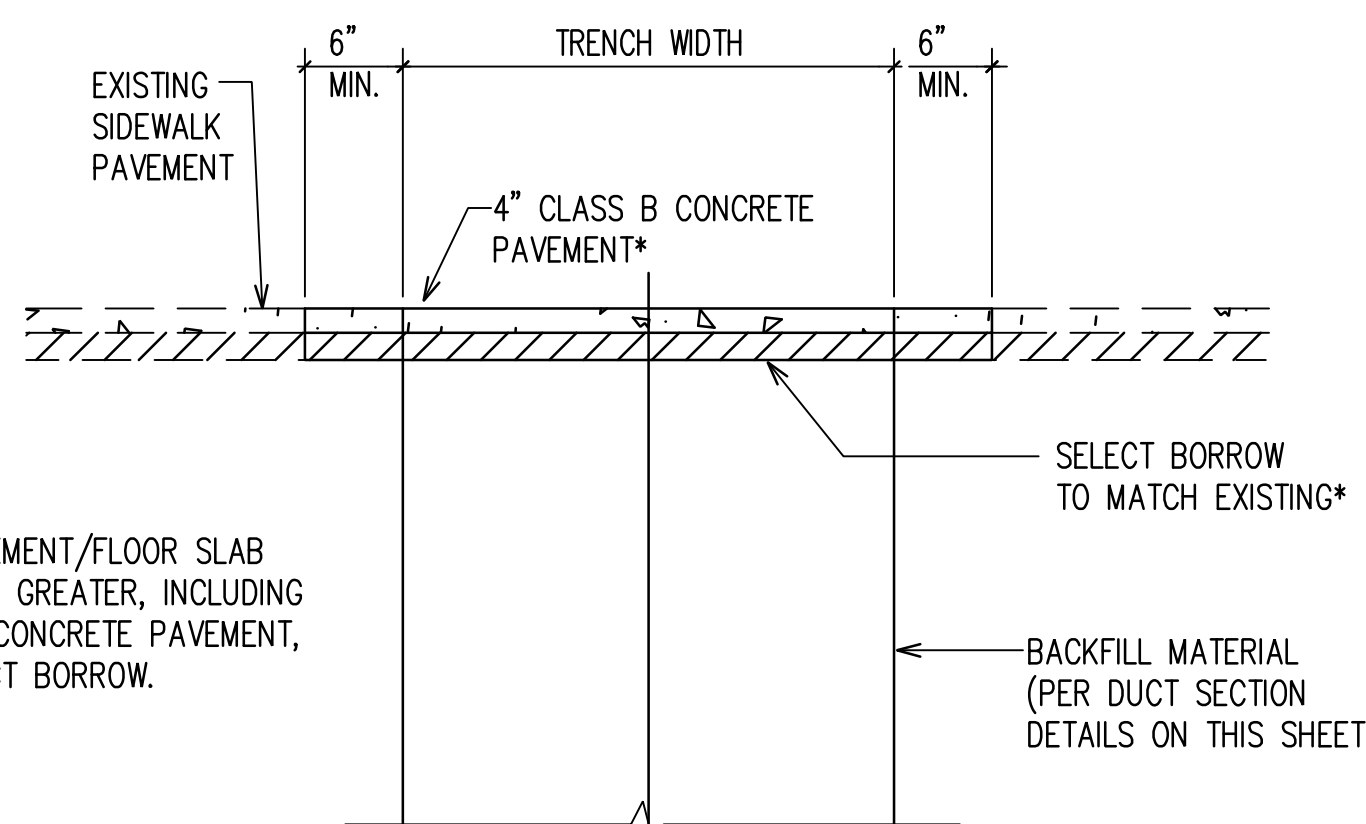
WHERE DUCTLINE CROSSES OVER WATER LINE, PROVIDE THE FOLLOWING:

1. PROVIDE CONCRETE JACKET AROUND DUCTLINES.



TYPICAL DUCT SECTION AT WATER FACILITIES CROSSING

**1 DUCT SECTION DETAILS AND REQUIREMENTS**  
E02 NOT TO SCALE



**2 CONCRETE TRENCH RESTORATION DETAIL**  
E02 NOT TO SCALE

**WATER NOTES:**

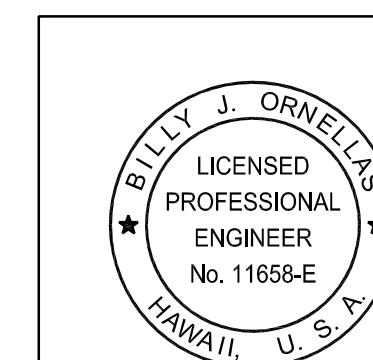
1. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF THE EXISTING WATER FACILITIES PRIOR TO TRENCHING. EXCAVATION AROUND EXISTING WATER FACILITIES SHALL BE DONE BY HAND.
2. MATERIAL USED FOR BACK FILLING AT THE WATER FACILITIES CROSSINGS SHALL NOT CONTAIN VEGETABLE MATTER OR DEBRIS OF ANY KIND. NO "ADOBE" OR SIMILAR MATERIAL SHALL BE USED.
3. PROVIDE CONCRETE ENCASEMENT FOR THE CONDUITS AT ALL WATERLINE, SERVICE LATERAL AND HYDRANT CROSSING. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER AT LEAST 24-HOURS PRIOR TO SCHEDULING BACK FILLING OPERATION AT THE WATER FACILITIES CROSSINGS.

**DUCT AND WIRE SCHEDULE**

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	EXISTING 3"	SEE ONE-LINE DIAGRAM	SECONDARY POWER FROM KIUC POLE TOP TRANSFORMER TO NEW MCC
2	1"	SEE ONE-LINE DIAGRAM	SUBMERSIBLE WELL PUMP NEW CONDUIT
3	3/4"	SEE PANEL SCHEDULE	WEATHERPROOF SERVICE RECEPTACLE AT PUMP
4	3"	SEE ONE-LINE DIAGRAM	STANDBY GENERATOR TAP BOX TO KEY-INTERLOCKED EMERGENCY MCC BREAKER
5	3/4"	SEE ONE-LINE DIAGRAM	GROUNDING ELECTRODE CONDUCTOR FOR INSPECTION HOUSING

**NOTES:**

1. ALL ELECTRICAL AND LOW VOLTAGE DUCTS SHALL BE CONCRETE ENCASED.
2. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
3. ALL DIRECT BURIED DUCTS SHALL BE SCHEDULE 80 PVC.
4. PC INDICATES PROVIDE PULLCORD.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

DATE: 2023.04.04


APRIL 30, 2024  
EXPIRATION DATE OF THE LICENSE

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

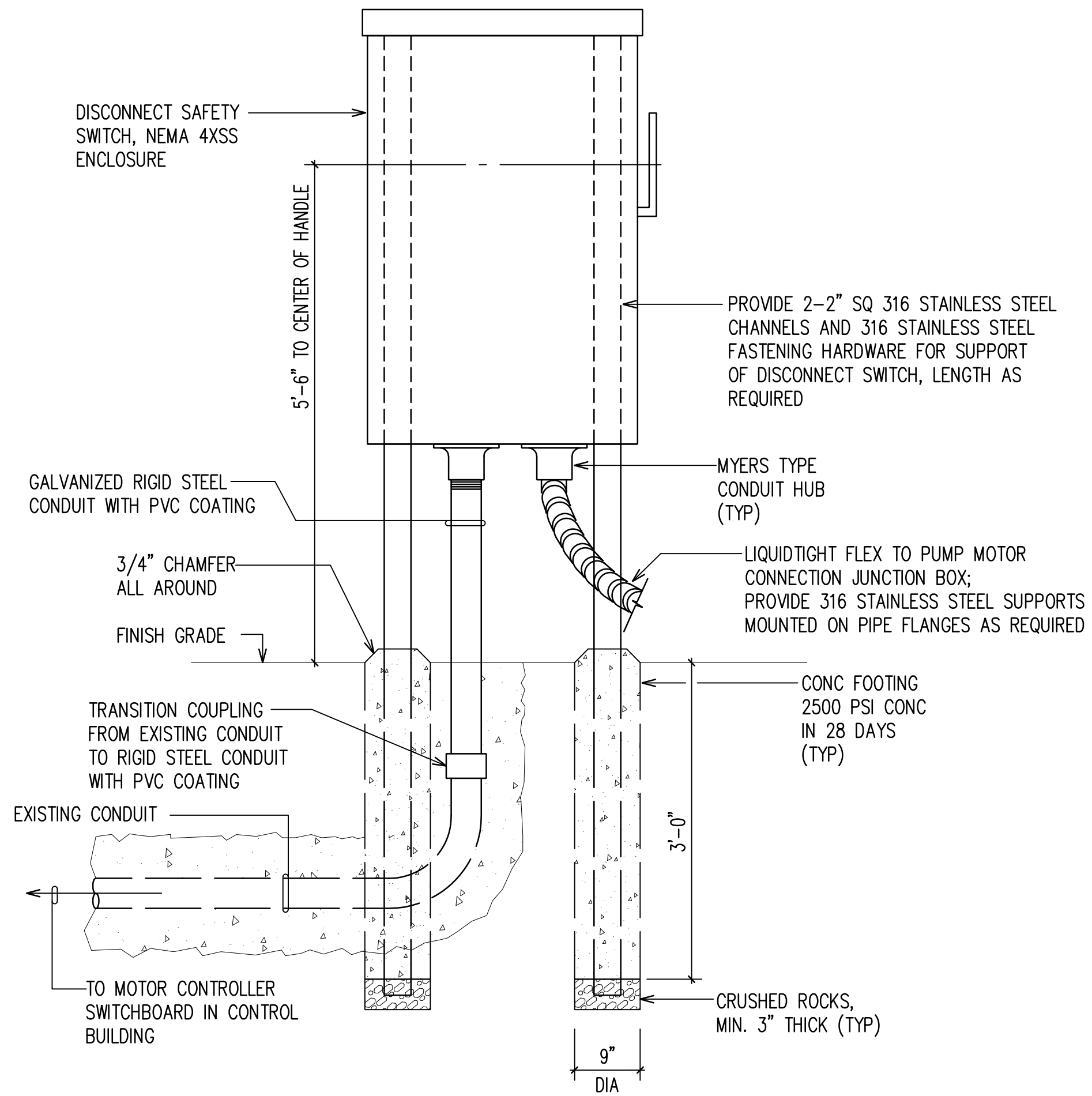
**DEPARTMENT OF WATER**  
COUNTY OF KAUAI  
JOB NO. 21-03, WATER PLAN  
**PAUA VALLEY WELL MCC REPLACEMENT**  
PAUA, KAUAI, HAWAII 96752, T.M.K: 4-1-2-002:039

**DUCT SECTION DETAILS**

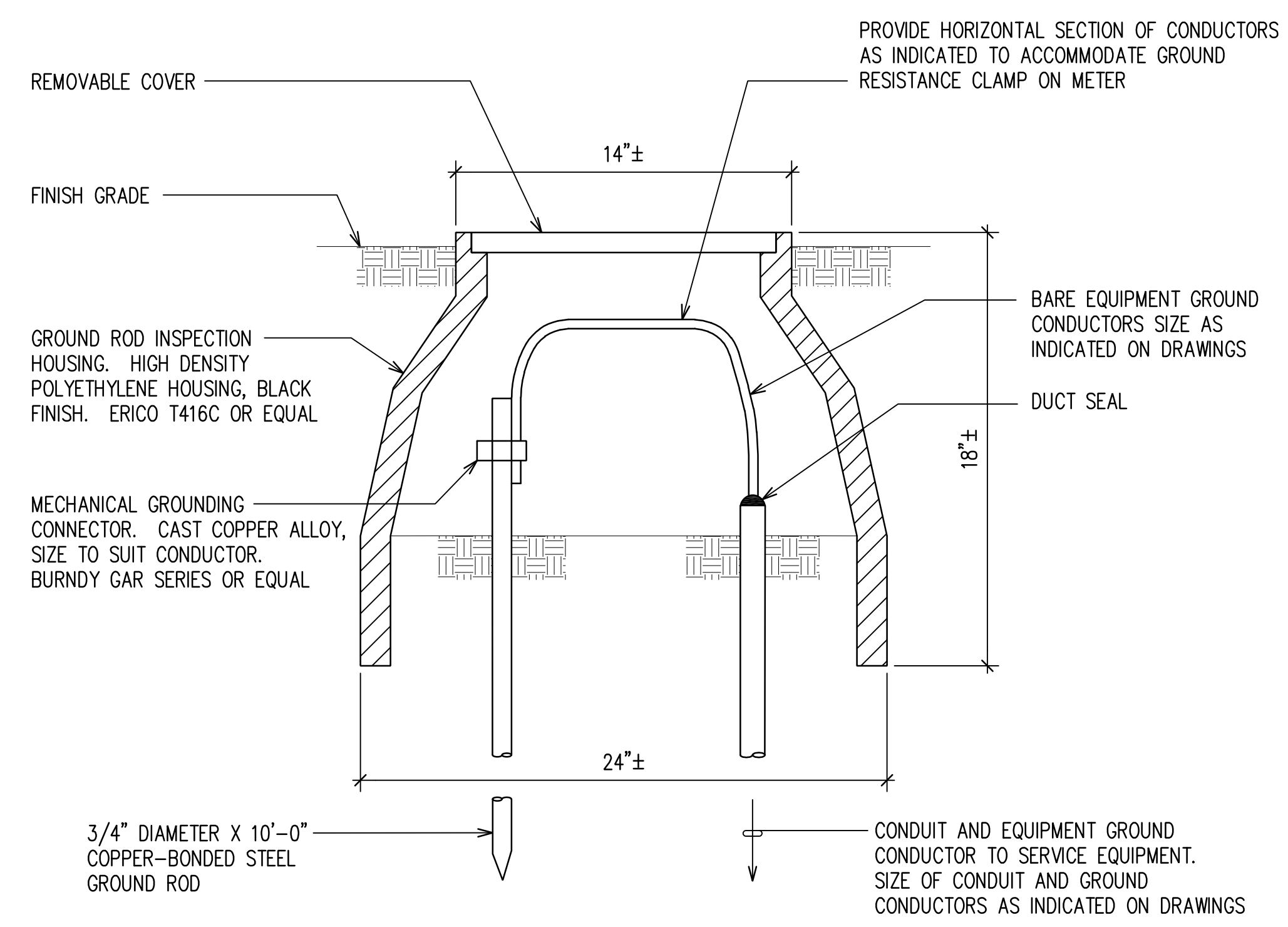
APPROVED: *Jason Kagimoto*  
FOR: MANAGER AND CHIEF ENGINEER  
DEPARTMENT OF WATER, COUNTY OF KAUAI  
DATE: 4/4/2023

 **Ronald N.S. Ho & Associates, Inc.**  
Electrical Engineers  
2153 North King Street, Suite 201  
Honolulu, Hawaii 96819

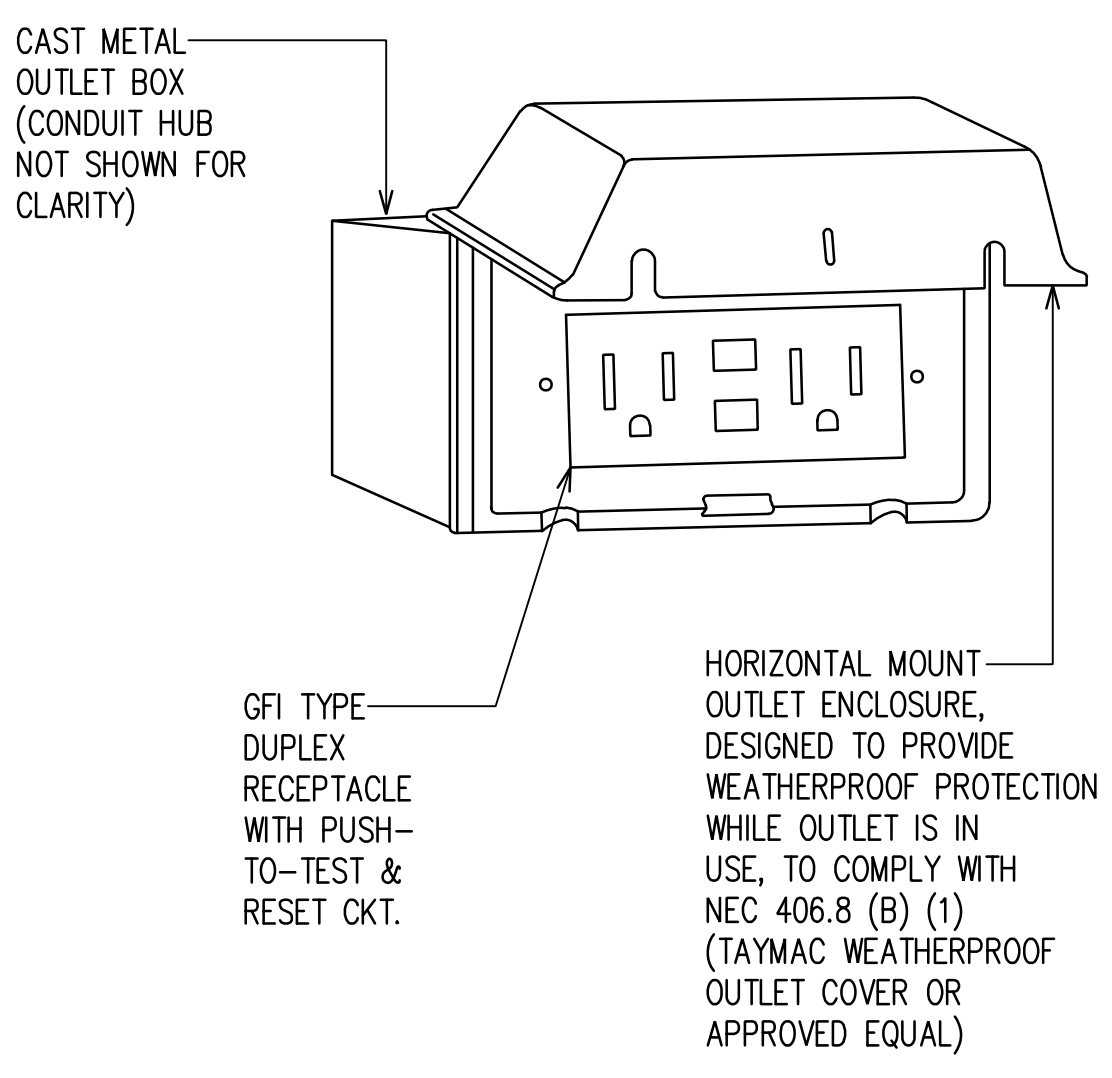
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**2 PUMP MOTOR DISCONNECT SWITCH DETAIL**  
E03 NOT TO SCALE

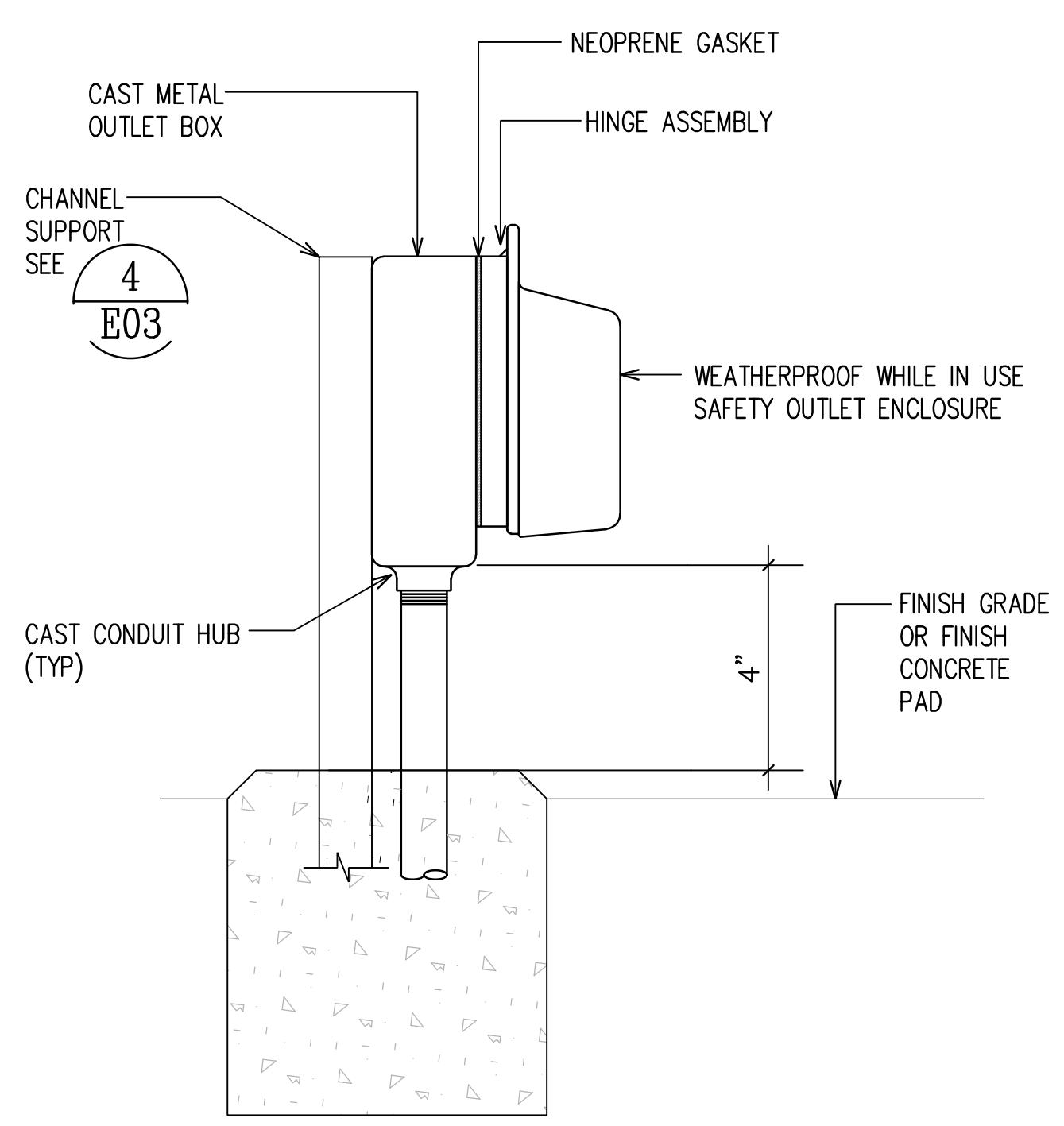


**1 GROUND ROD WITH INSPECTING HOUSING**  
E03 NOT TO SCALE

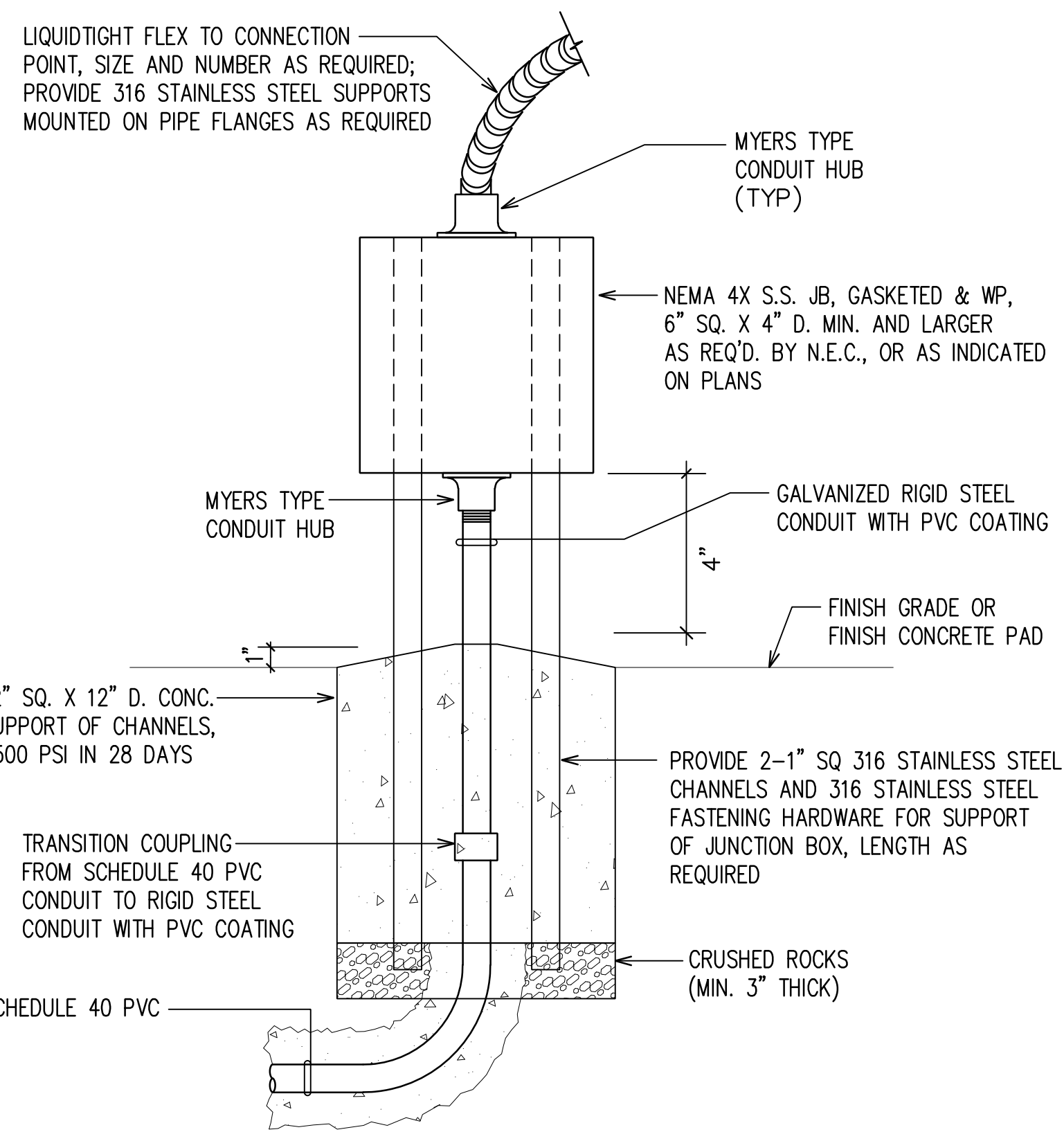


FRONT VIEW

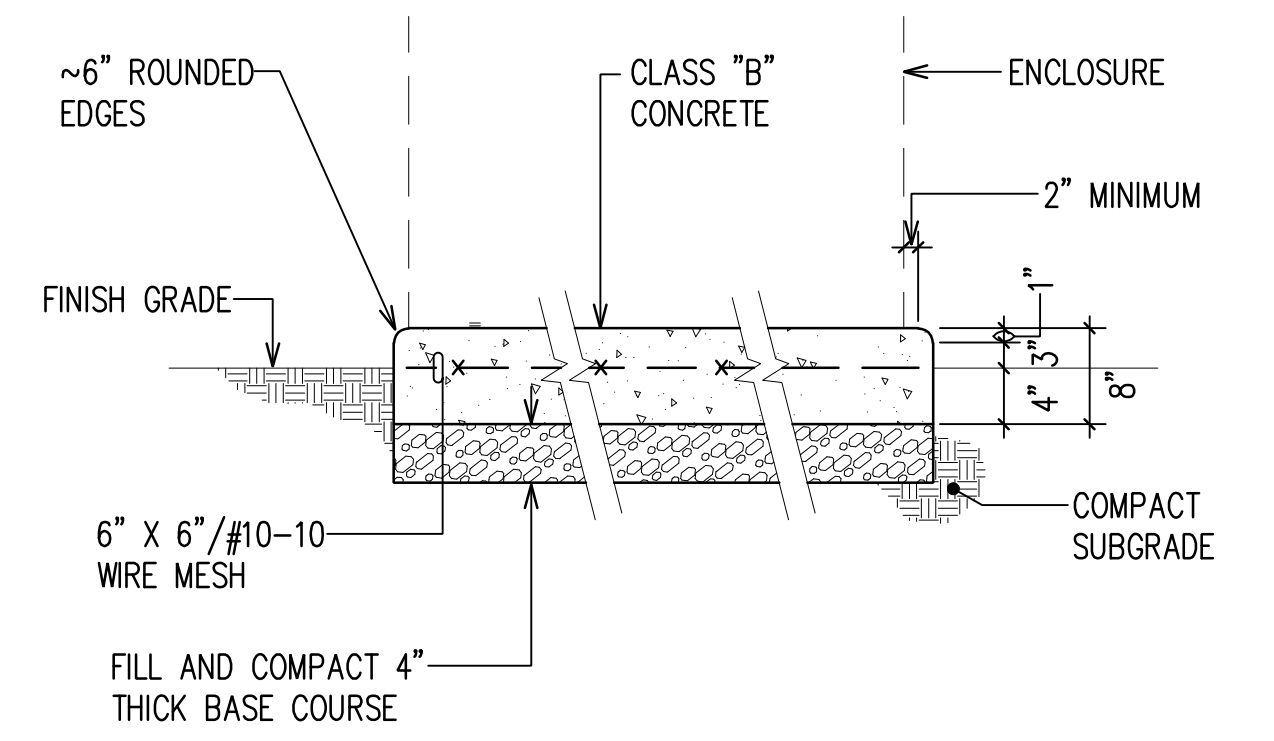
**3 WEATHERPROOF RECEPTACLE DETAIL**  
E03 NOT TO SCALE



SIDE VIEW



**4 CHANNEL SUPPORTED JUNCTION BOX DETAIL**  
E03 NOT TO SCALE



NOTE: CONCRETE PAD SHALL BE ADJUSTED TO FIT MCC AT NO ADDITIONAL CHARGE TO KDOW.

**5 CONCRETE PAD DETAIL**  
E03 NOT TO SCALE

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

**BILLY J. ORNELLAS**  
LICENSED PROFESSIONAL ENGINEER  
No. 11658-E  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

2023.04.04  
DATE

APRIL 30, 2024  
EXPIRATION DATE OF THE LICENSE

**DEPARTMENT OF WATER**  
COUNTY OF KAUAI  
JOB NO. 21-03, WATER PLAN  
**PAUA VALLEY WELL MCC REPLACEMENT**  
PAUA, KAUAI, HAWAII 96752, T.M.K: 4-1-2-002:039  
MISCELLANEOUS ELECTRICAL DETAILS

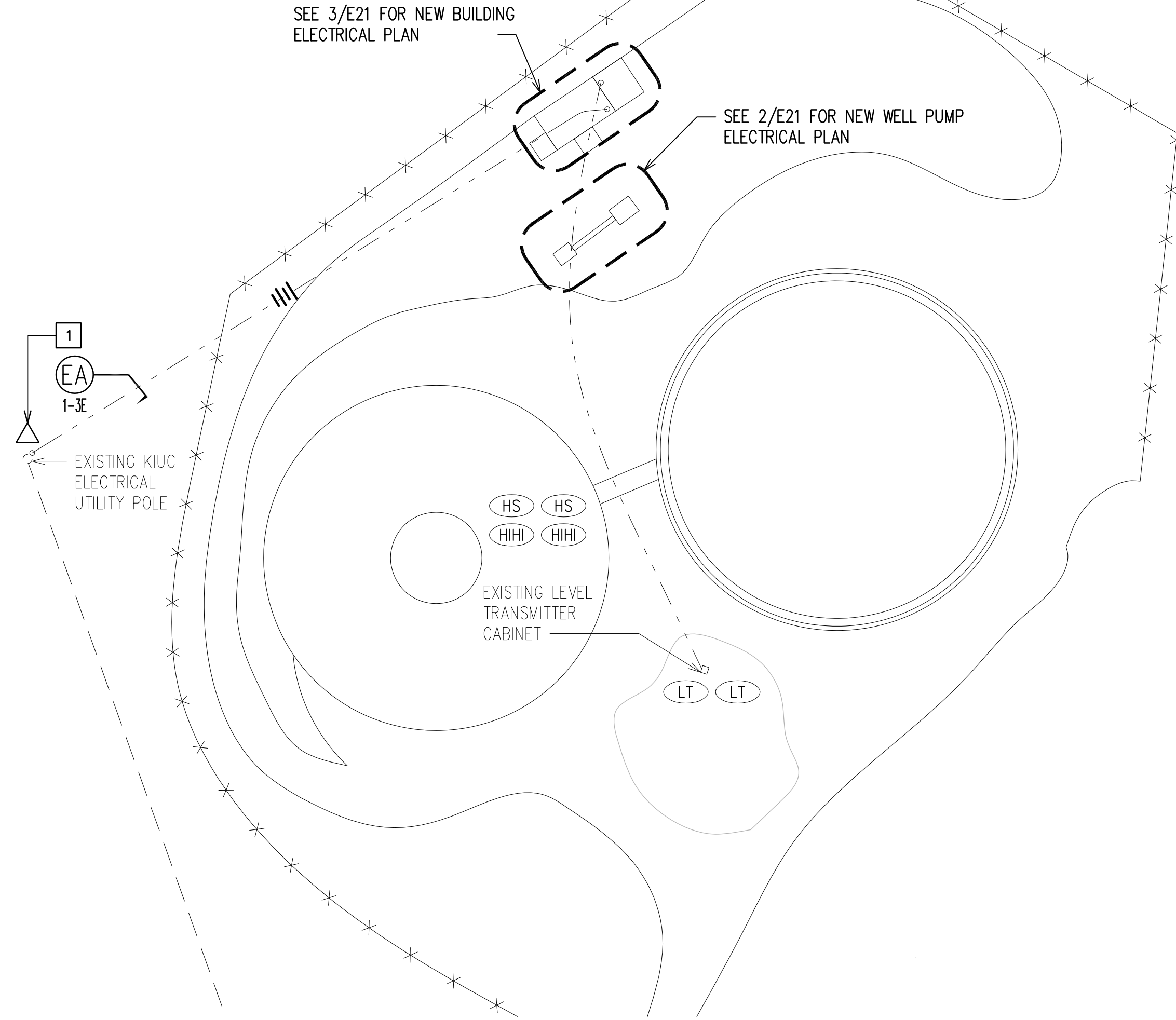
APPROVED: *Jason Kagimoto*  
FOR: MANAGER AND CHIEF ENGINEER  
DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

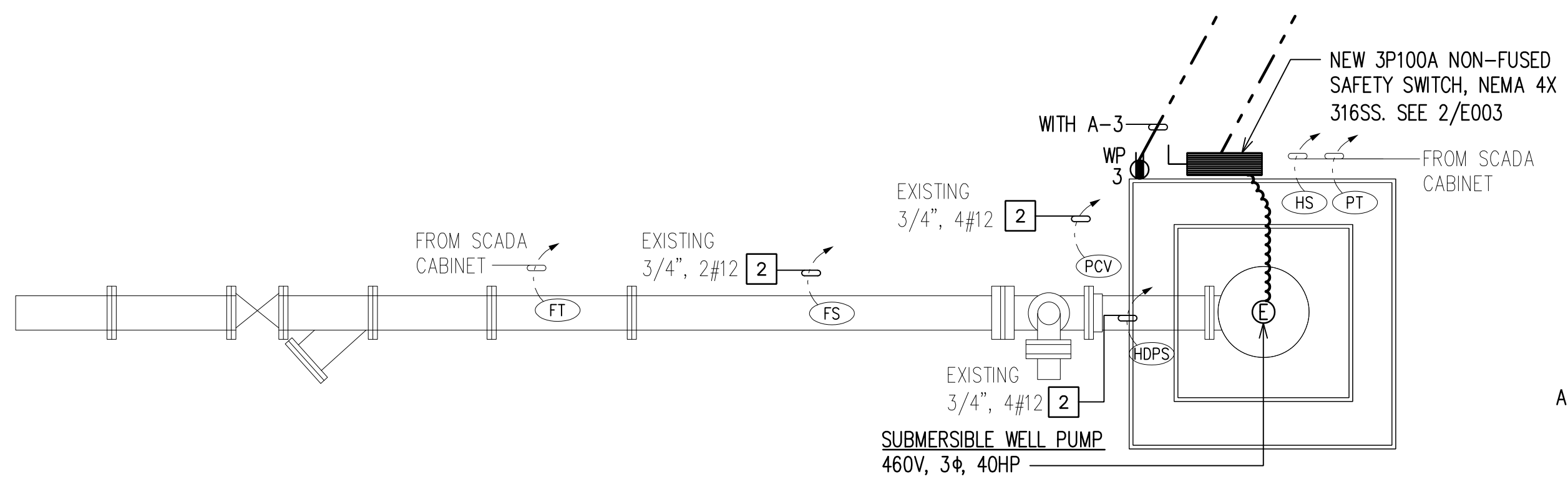
**Ronald N.S. Ho & Associates, Inc.**  
Electrical Engineers  
2153 North King Street, Suite 201  
Honolulu, Hawaii 96819

DRAWN BY: AI	ENGINEER: AI	CHECKED BY: BJO	SHEET 5 OF 12 SHEETS	E03
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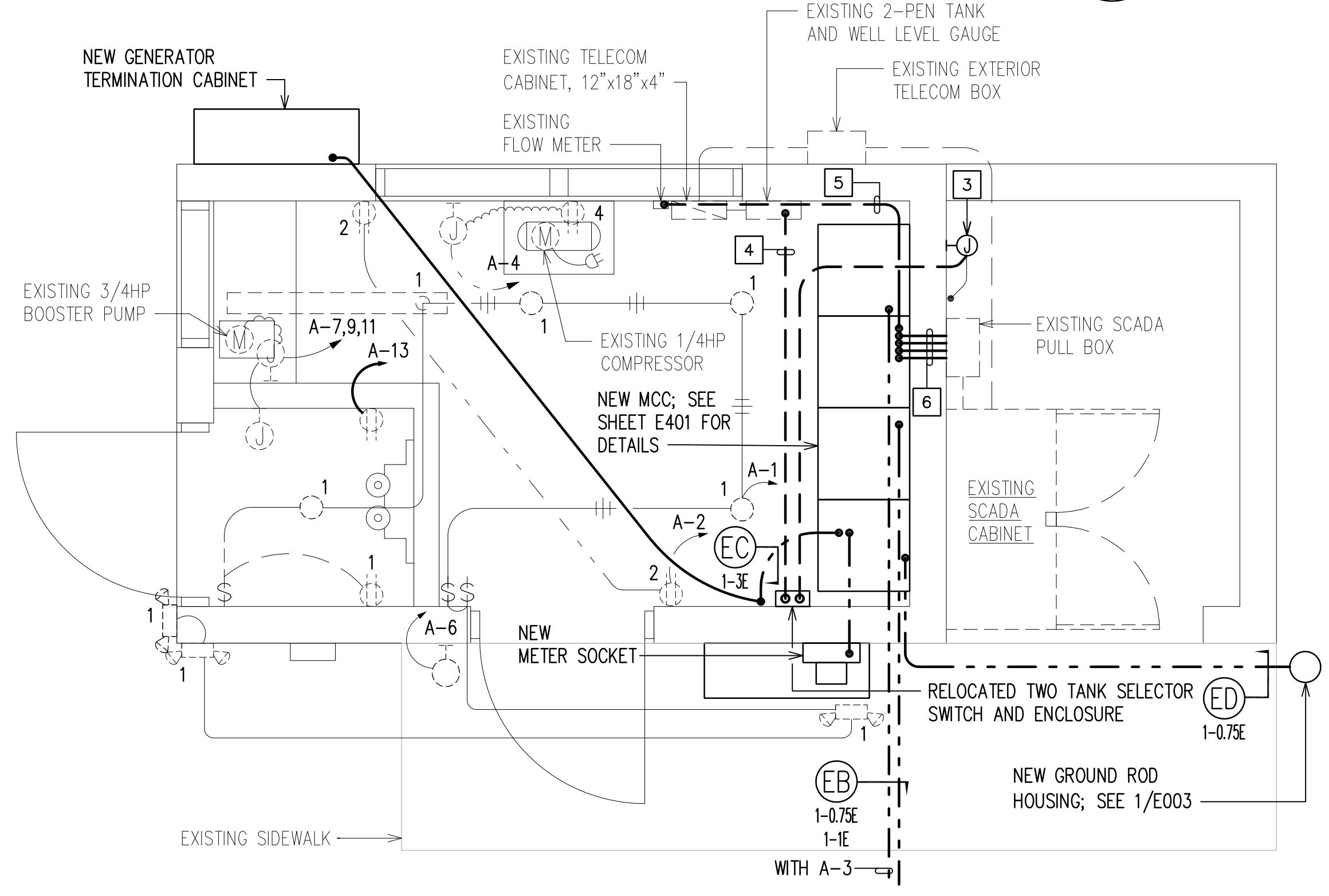




**1 NEW SITE ELECTRICAL PLAN**  
 E21 SCALE: 1"=20'-0"  
 NORTH



**2 NEW WELL PUMP ELECTRICAL PLAN**  
 E21 SCALE: 1/2"=1'-0"  
 NORTH



**3 NEW BUILDING ELECTRICAL PLAN**  
 E21 SCALE: 1/2"=1'-0"  
 NORTH

- GENERAL ELECTRICAL NOTES:**
- A. INTERCEPT AND EXTEND EXISTING BRANCH CIRCUITS AS REQUIRED TO TERMINATE IN NEW MCC DISTRIBUTION PANELBOARD SECTION.
- KEYED ELECTRICAL NOTES:**
- 1 NEW 480V 3φ SECONDARY POLE-MOUNTED XFMR BY KIUC FOR NEW UNDERGROUND SERVICE CONNECTION FROM OVERHEAD SOURCE. MAINTAIN MINIMUM 30 FEET OF CONDUIT (SCHEDULE 80 PVC) UP KIUC POLE FROM BASE FOR FINAL TERMINATIONS BY KIUC.
  - 2 RECONNECT TO NEW WELL PUMP CONTROL SECTION; EXTEND EXISTING CONDUCTORS AS REQUIRED.
  - 3 INTERCEPT EXISTING CONTROL CONDUIT INTO NEW 6"SQ x 6" D 316SS JB AND EXTEND CONTROLS IN 1" C TO RELOCATED TANK SELECTOR SWITCH. SEE ELECTRICAL ELEVATIONS FOR MORE INFORMATION.
  - 4 3/4" C, 4#12, SIGNAL FOR LEVEL GAUGE
  - 5 3/4" C, 2#12 SIGNAL FOR FLOW METER
  - 6 NEW (1) 3/4" C AND (3) 1" C FOR SCADA CABLING

PANEL "A" - NEC DEMAND CALCULATION (NON-DWELLING)										
LOAD TYPE	CODE	DEMAND FACTOR	(A) CONNECT KVA	(A) DEMAND KVA	(B) CONNECT KVA	(B) DEMAND KVA	(C) CONNECT KVA	(C) DEMAND KVA	TOTAL KVA CONNECT	TOTAL KVA DEMAND
LIGHTING	(L)	125%	1.20	1.50	0.00	0.00	0.10	0.13	<b>1.30</b>	<b>1.63</b>
CONTINUOUS	(C)	125%	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	<b>0.00</b>
NON-CONTINUOUS	(NC)	100%	0.00	0.00	0.18	0.18	0.20	0.20	<b>0.38</b>	<b>0.38</b>
MOTOR	(M)	100%	0.72	0.72	1.12	1.12	0.42	0.42	<b>2.26</b>	<b>2.26</b>
RECEPTACLE	(R)	100%	0.98	0.98	0.18	0.18	0.00	0.00	<b>1.16</b>	<b>1.16</b>
KITCHEN	(K)	100%	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	<b>0.00</b>
NON-COINCIDENT	(NO)	0%	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	<b>0.00</b>
SHOW WINDOW		0 FT							<b>0.00</b>	<b>0.00</b>
TRACK LIGHTING		0 FT							<b>0.00</b>	<b>0.00</b>
LARGEST MOTOR		25%							<b>0.06</b>	<b>0.18</b>
<b>PANEL "A" - TOTAL DEMAND LOAD</b>										
KVA			2.90	3.26	1.48	1.54	0.72	0.80	<b>5.10</b>	<b>5.60</b>
AMPS			24.2	27.2	12.3	12.8	6.0	6.7	<b>14.2</b>	<b>15.5</b>
PHASE BALANCE			70.6%	74.5%	-12.9%	-17.6%	-57.6%	-57.0%		
<b>MOTOR CONTROL CENTER "MCC" - TOTAL CONNECTED/DEMAND LOAD SUMMARY</b>										
KVA			16.40	19.69	14.68	17.97	13.95	17.24	<b>45.04</b>	<b>54.90</b>
AMPS			59.2	71.1	53.0	64.9	50.4	62.2	<b>54.2</b>	<b>66.0</b>
PHASE BALANCE			9.3%	7.6%	-2.2%	-1.8%	-7.1%	-5.8%		

(NEW) PANEL A													
100A MAIN CIRCUIT BREAKER, 120/208V 3φ 4W 10000 A.I.C., INDUSTRIAL TYPE, BOLTED BREAKER FLUSH MOUNTED, NEMA 1 COPPER BUS													
CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER POLE	AMPS	WIRE SIZE	KVA ON BUSES			BREAKER POLE	AMPS	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.		
					L1	L2	L3						
1	L-BUILDING	1	20	#12	1.2	0.8		#12	1	20	R-BUILDING	2	
3	R-WELL PUMP	1	20	#12		0.2	0.7	#12	1	20	1/4HP AIR COMP.	4	
5	WATER RECORD.	1	20	#12			0.2	0.1	#12	1	20	L-NIGHT LIGHT	6
7	3/4HP BOOSTER PUMP	3	15	#12	0.4	0.2		#12	1	20	TEST CTRL, TIMECLOCK	8	
9	-	-	-	#12				#12	1	20	RTU 002	10	
11	-	-	-	#12			0.4	0.0	#12	1	20	S	12
13	CHLORINATOR METERING	1	15	#12	0.3	0.0		#12	1	20	S	14	
15	S	1	20	#12		0.0	0.0	#12	1	20	S	16	
17	S	1	20	#12		0.0	0.0	#12	1	20	S	18	
					CONNECTED LOAD PER PHASE								
					2.9			1.5			0.7		
TOTAL CONNECTED LOAD (KVA)										5.1			
DEMAND FACTOR:										110%			
TOTAL DEMAND LOAD (KVA)										5.6			
TOTAL DEMAND LOAD (AMPS)										27.2			

BILLY J. ORNELLAS  
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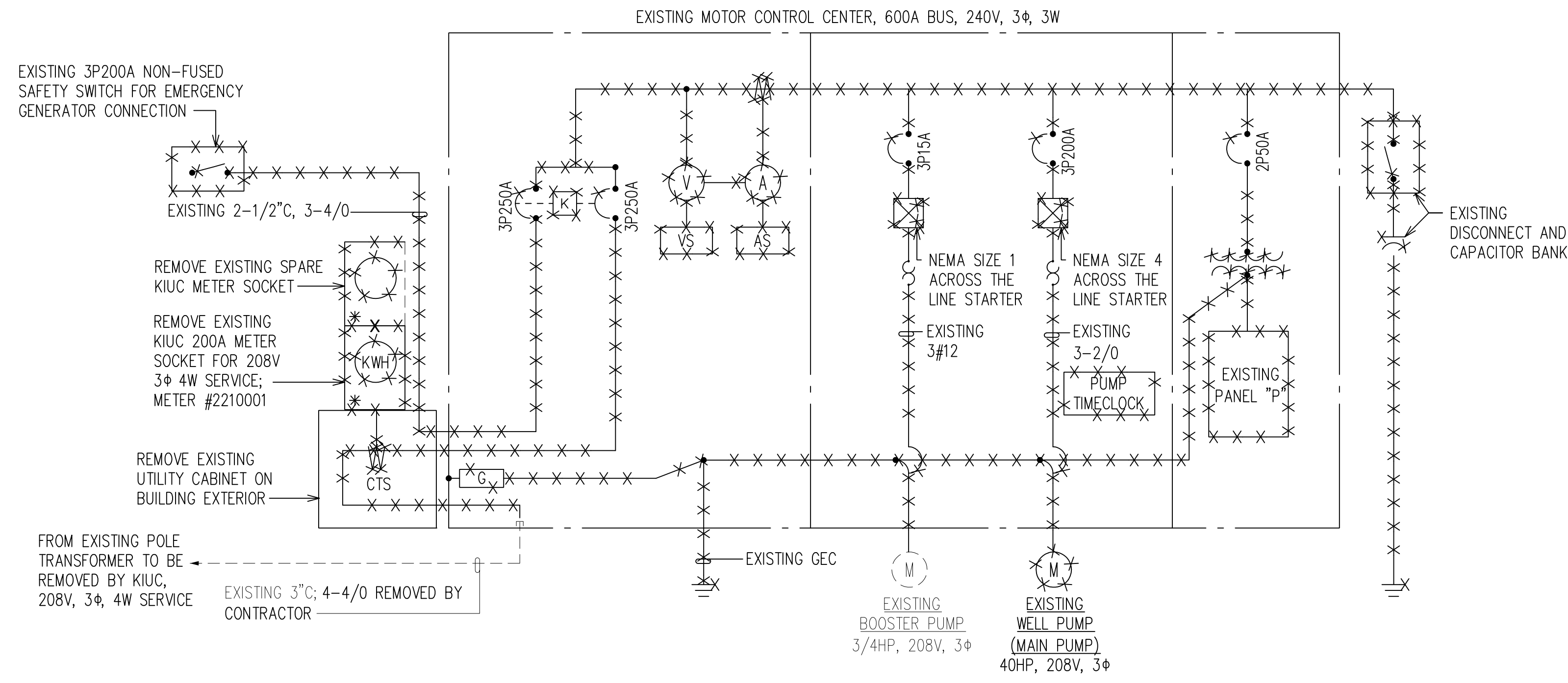
NEW SITE AND BUILDING ELECTRICAL PLANS, PANEL SCHEDULE

APPROVED: Jason Kagimoto  
 FOR: MANAGER AND CHIEF ENGINEER  
 DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

Ronald N.S. Ho & Associates, Inc.  
 Electrical Engineers  
 2153 North King Street, Suite 201  
 Honolulu, Hawaii 96819

DRAWN BY: AI ENGINEER: AI CHECKED BY: BJO OF 12 SHEETS SHEET 7 OF 12 E21



**1 DEMOLITION ELECTRICAL ONE-LINE DIAGRAM**  
E31 NO SCALE

**Initial Fault Current at KIUC XFMR Secondary**

Point Name	I <sub>sc(Primary)</sub> (A)	V <sub>LL(primary)</sub>	V <sub>LL(secondary)</sub>	kVA Rating	Phase	%Z	FLA <sub>(secondary)</sub> (A)	f	m	I <sub>sc(available)</sub> (A)
KIUC XFMR Secondary	Infinite	-	480 V	167 KVA	3	0.750%	201 amps	-	-	26,783 amps

**Point to Point Fault Current Calculations**

From	To	I <sub>sc</sub> at Source (A)	V <sub>LL</sub>	Phase	Length (ft)	# Sets	Conductor Size	Conductor Type	Conduit Type	C	f	m	I <sub>sc(available)</sub> (A)
KIUC XFMR Secondary	NEW MCC	26,783 amps	480 V	3	120'-0"	1	#4/0	Copper	Nonmetallic	16,673	0.6956	0.5898	15,856 amps
MCC XFMR	PANEL A	2,068 amps	208 V	3	5'-0"	1	#3	Copper	Steel	4,774	0.0180	0.9823	2,031 amps

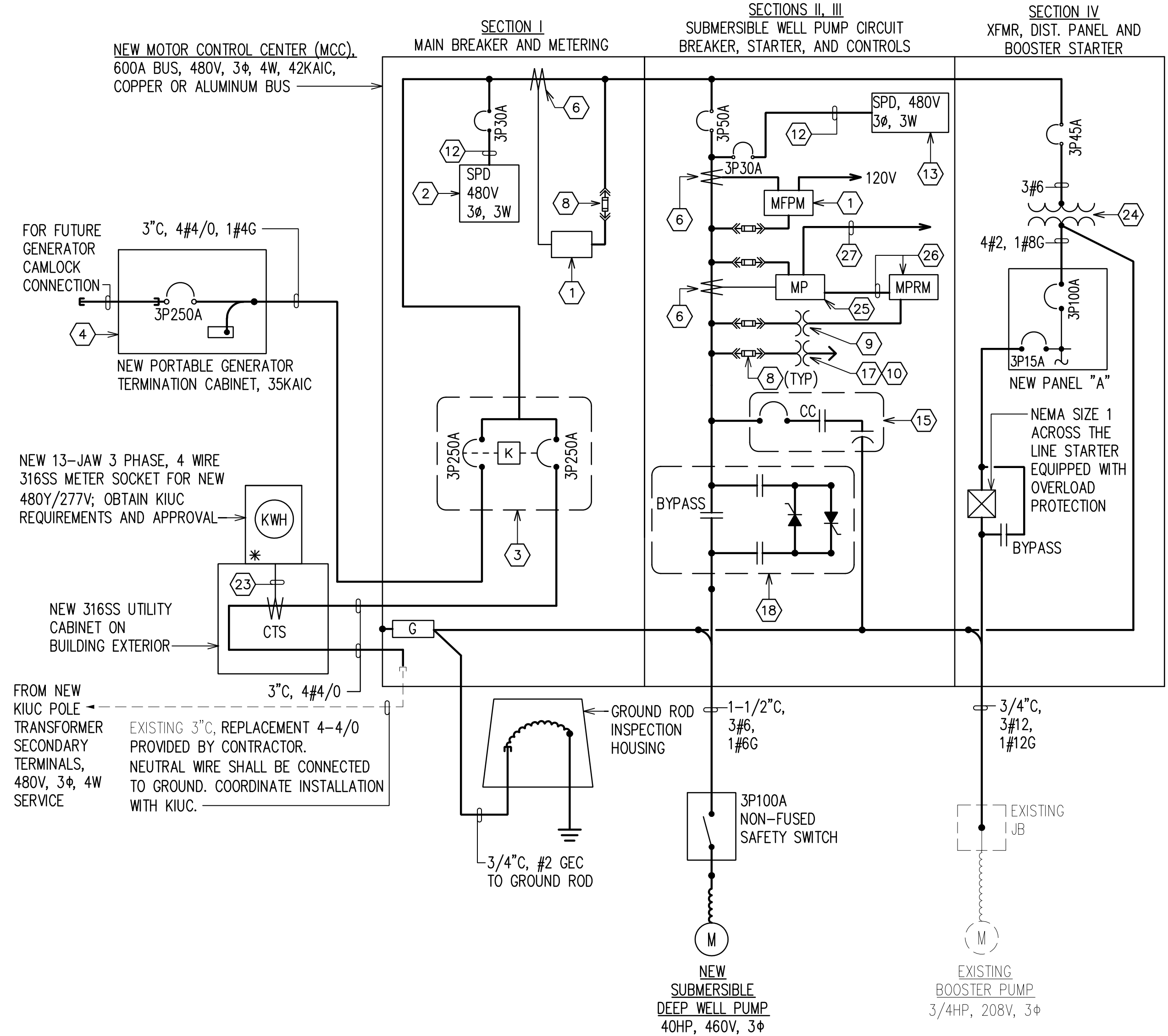
\*\* Calculation includes a total motor contribution of 60 amps added to the most upstream point of the calculation, and is thus carried through each point.

**Transformer Fault Current Calculations**

From	To (XFMR Name)	I <sub>sc(Primary)</sub> (A)	V <sub>Primary</sub>	V <sub>Secondary</sub>	kVA Rating	Phase	%Z	f	m	I <sub>sc(available)</sub> (A)
NEW MCC	MCC XFMR	15,856 amps	480 V	208 V	30 KVA	3	3.80%	16.697	0.057	2,068 amps

**SCHEDULE OF INSTRUMENTS**

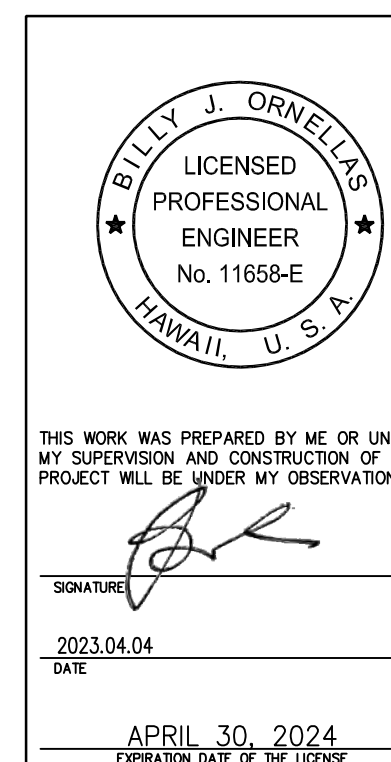
KEY	DESCRIPTION	KEY	DESCRIPTION
1	THREE PHASE DIGITAL MULTI-FUNCTION POWER MONITOR	15	CAPACITOR AND CAPACITOR BREAKER PER PUMP MOTOR MANUFACTURER'S RECOMMENDATIONS, INCLUDING ISOLATION CONTACTOR (CC) TO REMOVE CAPACITORS FROM SYSTEM DURING PUMP MOTOR START UP
2	MAIN ELECTRICAL SERVICE SURGE PROTECTION DEVICE, SEE SPECS	16	
3	MAIN CIRCUIT BREAKER WITH 2-MOLDED CASE CIRCUIT BREAKERS, SIZE AS INDICATED WITH KIRK-KEY INTERLOCK FOR NORMAL OR EMERGENCY OPERATION (MANUAL TRANSFER SWITCH).	17	CONTROL TRANSFORMER, 600V FOR 480-120V, 2 KVA
4	PORTABLE GENERATOR TERMINAL CABINET FOR CONNECTION TO FUTURE BACKUP GENERATOR	18	MOTOR STARTER WITH HP RATING SUFFICIENT FOR THE MOTOR LOAD INDICATED; SOLID-STATE TYPE WITH BYPASS CONTACTOR, AND SILICON-CONTROL RECTIFIER (SCR) ISOLATION CONTACTORS WITH SOLID STATE OVERLOAD HEATERS SELECTED TO MATCH MOTOR NAMEPLATE RATING AT MOTOR LINE VOLTAGE INDICATED
5		19	
6	CURRENT TRANSFORMER (CTS), 600V, 200:5. CT SHALL BE ACCURACY CLASS 0.3% PER C57.13 STANDARD. COORDINATE WITH POWER MONITOR MANUFACTURER.	20	
7		21	
8	FUSE HOLDER WITH FUSE, 600V, SIZE BY MANUFACTURER	22	
9		23	C.T.'S BY KIUC, OBTAIN REQUIREMENTS & APPROVAL FROM KIUC
10	TO CONTROL CIRCUIT	24	DRY TRANSFORMER, 30 KVA, 480-208Y/120V, 3 PHASE, 4 WIRE, 80°C RISE.
11		25	THREE PHASE MOTOR PROTECTOR, SYMCOM, INC. "MOTOR SAVER" MODEL 777KW SERIES WITH MODBUS INTERFACE. DO NOT PROVIDE IF BENSCHAW STARTERS ARE PROVIDED.
12	3#14, FURNISHED AS PART OF SURGE PROTECTION DEVICE AS SHORT AS POSSIBLE (MAX. LENGTH 30")	26	THREE PHASE MOTOR PROTECTOR REMOTE MANAGER, SYMCOM, INC. MODEL RM-2000 SERIES, WITH REQUIRED RS485MS-2W SERIAL INTERFACE FOR CONNECTING TO MODEL 777KW MOTOR PROTECTOR. DO NOT PROVIDE IF BENSCHAW STARTERS ARE PROVIDED.
13	BRANCH FEEDER SURGE PROTECTION DEVICE, SEE SPECIFICATIONS	27	TYPE RS485 NETWORK CABLE FOR INPUT INTO SCADA SYSTEM
14			



**2 NEW ELECTRICAL ONE-LINE DIAGRAM**  
E31 NO SCALE

**NEW ONE-LINE DIAGRAM NOTES:**

- ALL GROUNDING SYSTEMS SHALL BE PROVIDED PER N.E.C. ARTICLE 250.
- SECONDARY SERVICE: 480Y/277V, 3 PHASE, 4 WIRE.
- VERIFY FINAL AVAILABLE FAULT CURRENT WITH KIUC FOR NEW SERVICE TRANSFORMER. ALL EQUIPMENT SHORT CIRCUIT CURRENT RATING (SCCR) AND AMPERE INTERRUPTING CAPACITY (AIC) SHALL EXCEED THE AVAILABLE FAULT CURRENT.
- \* INDICATES PROVISION FOR KIUC SEALS.
- PROVIDE METERING WIRES, #12 THHN STRANDED COPPER:  
PT WIRES: P1-BLACK, P3-ORANGE, PN-WHITE  
CT WIRES: C1-BLUE, C2-YELLOW, C3-BROWN, CN-GREEN  
FINAL CONNECTIONS TO BE MADE BY KIUC. CONTRACTOR TO LEAVE A 6'-0" COIL OF METERING WIRES IN THE METER SOCKET ENCLOSURE. PROVIDE #8 COPPER GROUND CONDUCTOR IN CONDUIT WITH 6'-0" COIL IN CT CABINET AND 2'-0" COIL IN METER SOCKET ENCLOSURE. FINAL CONNECTIONS OF GROUND CONDUCTOR TO BE BY KIUC.
- MANUAL TRANSFER SWITCH SHALL NOT HAVE PARALLELING CAPABILITY; TRANSITION SHALL BE DONE OPEN TRANSITION.



REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

**DEPARTMENT OF WATER**  
COUNTY OF KAUAI

JOB NO. 21-03, WATER PLAN

**PAUA VALLEY WELL MCC REPLACEMENT**

PAUA, KAUAI, HAWAII 96752, T.M.K.: 4-1-2-002:039

**ONE-LINE DIAGRAMS, ELECTRICAL SCHEDULES**

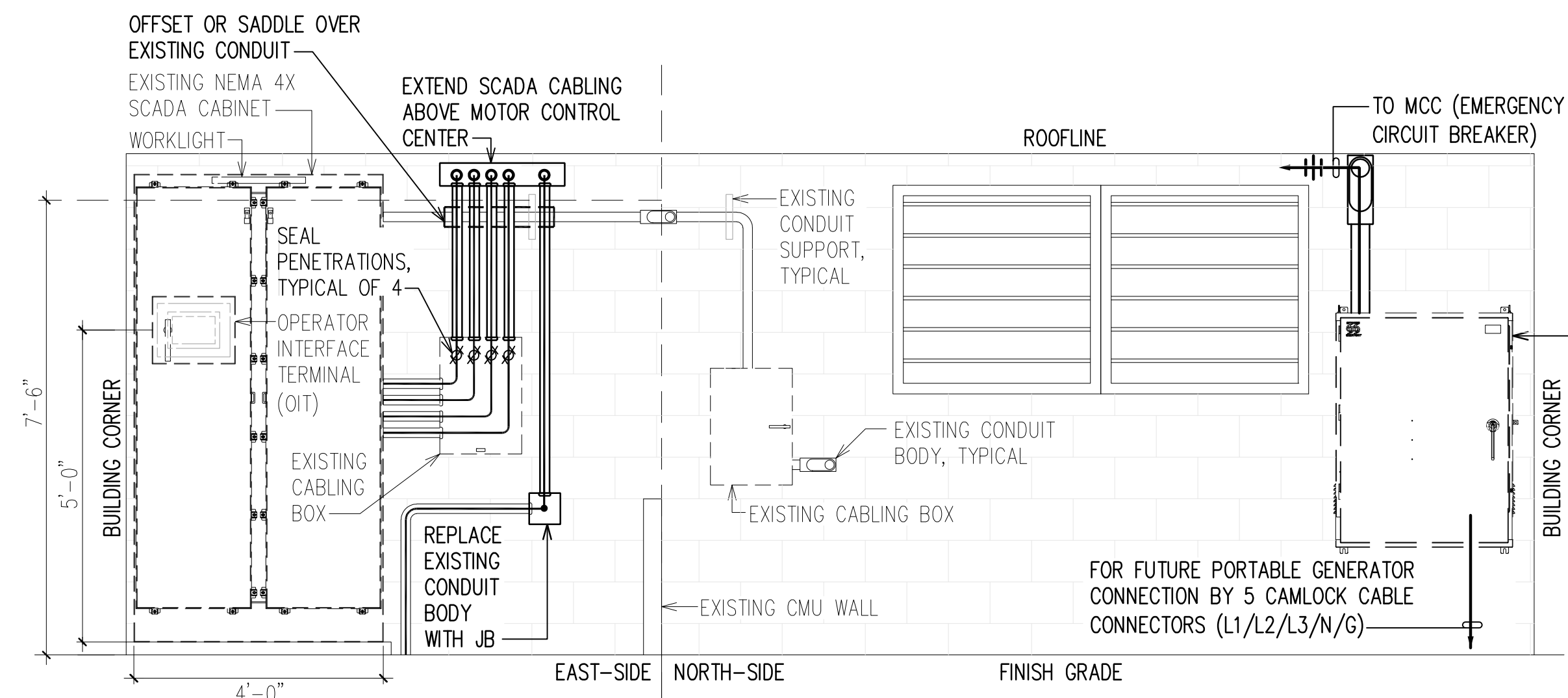
APPROVED: *Jason Kagimoto*  
MANAGER AND CHIEF ENGINEER  
DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

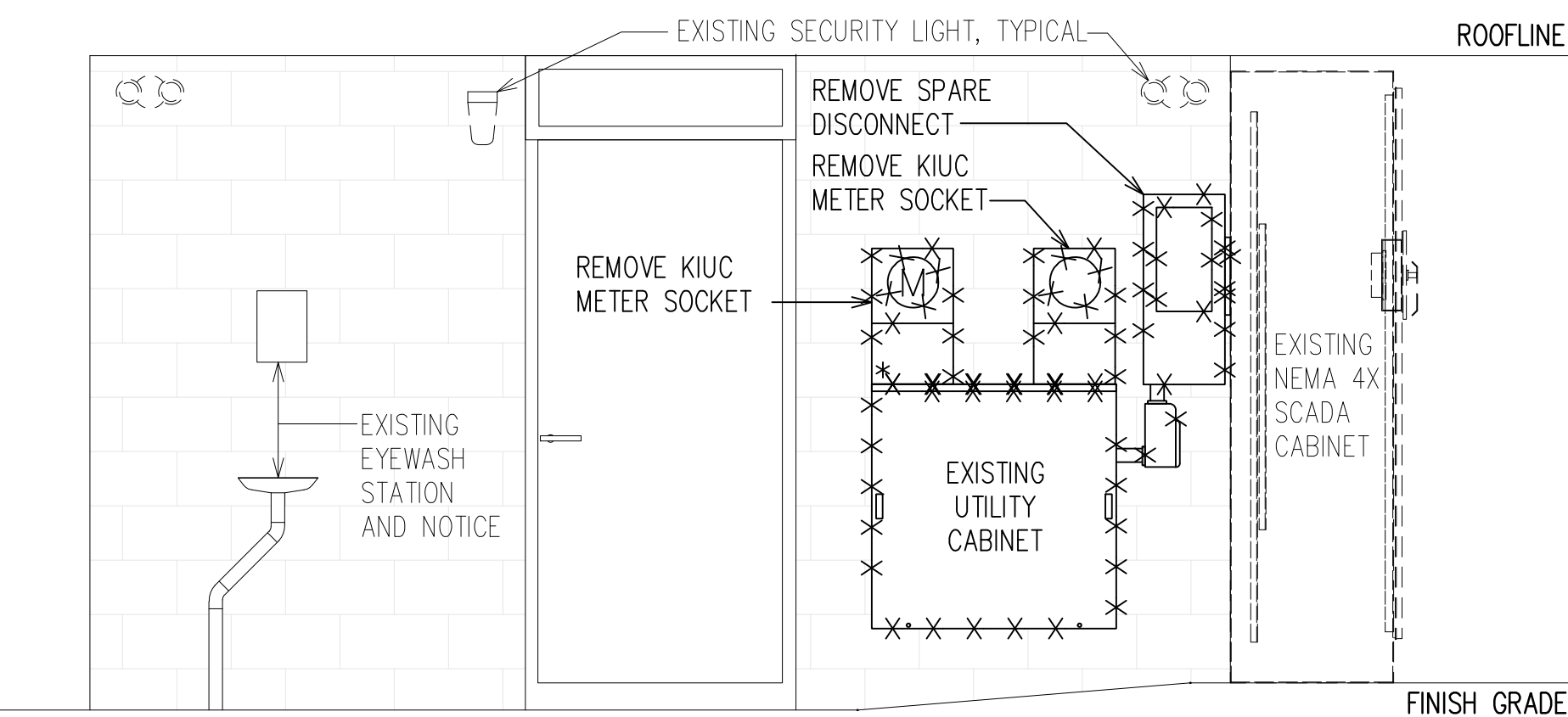
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Electrical Engineers  
2153 North King Street, Suite 201  
Honolulu, Hawaii 96819

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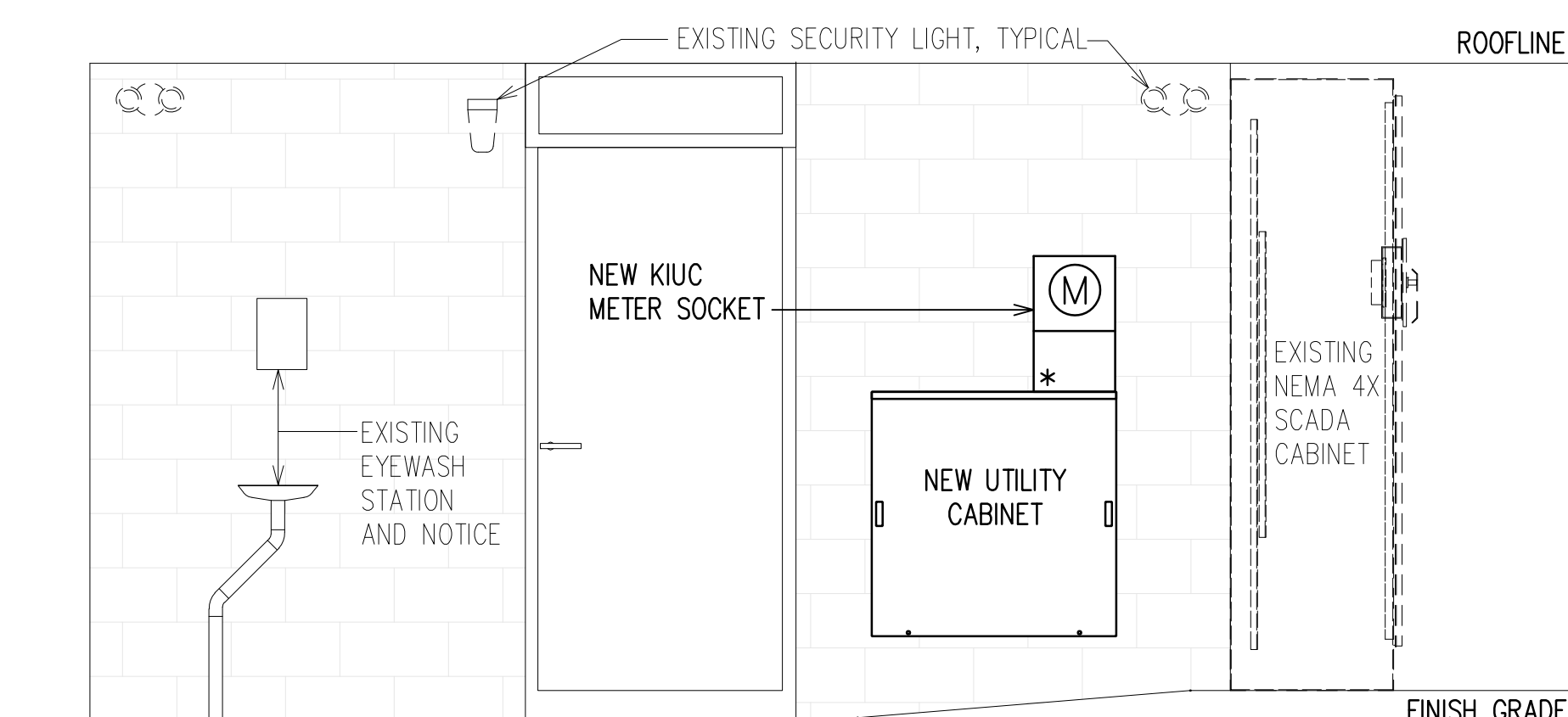




**1 NORTH AND EAST ELECTRICAL BUILDING ELEVATIONS**  
 E41 SCALE: 1/2"=1'-0"

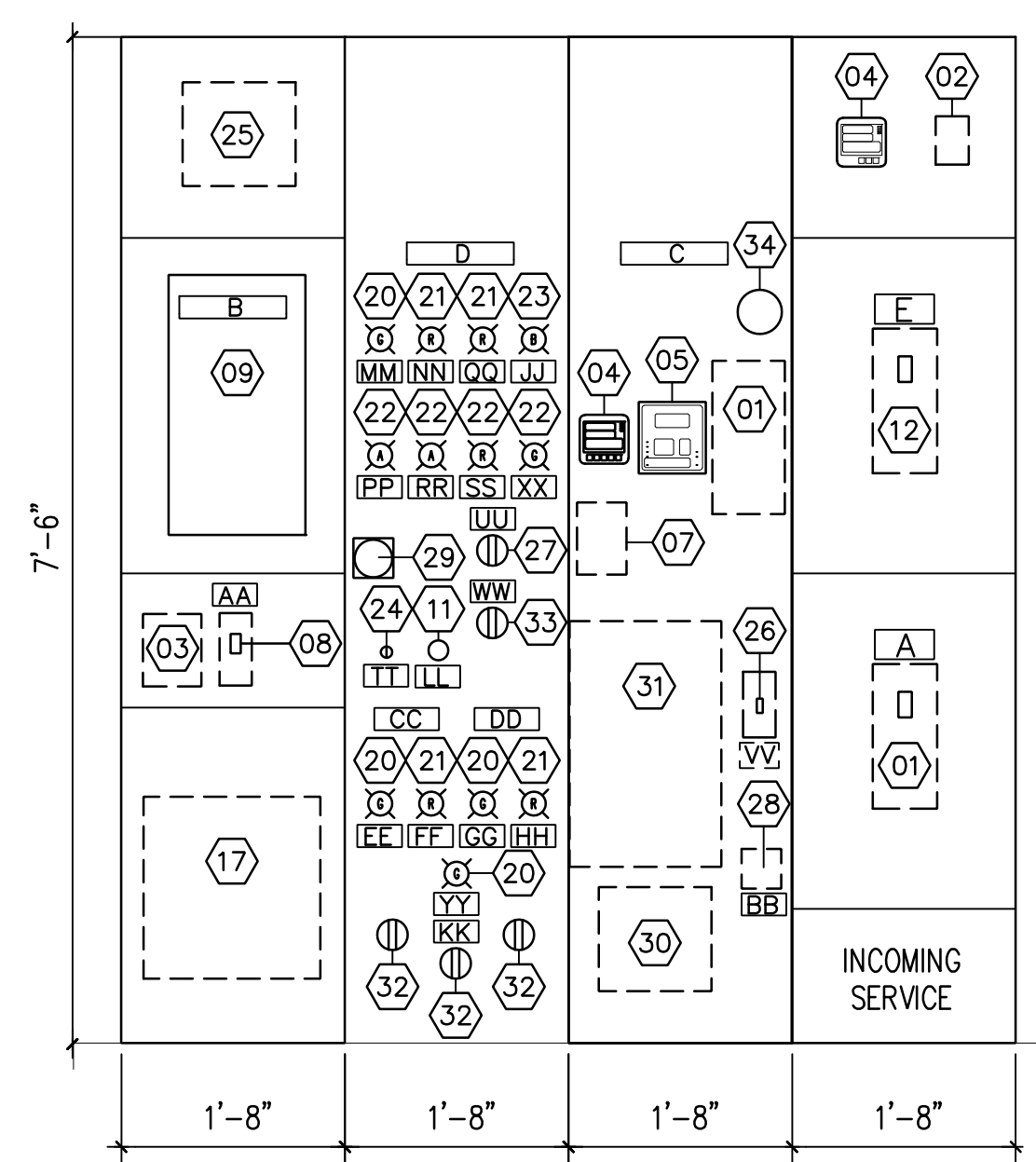


**2 SOUTH EXISTING ELECTRICAL BUILDING ELEV.**  
 E41 SCALE: 1/2" = 1'-0"

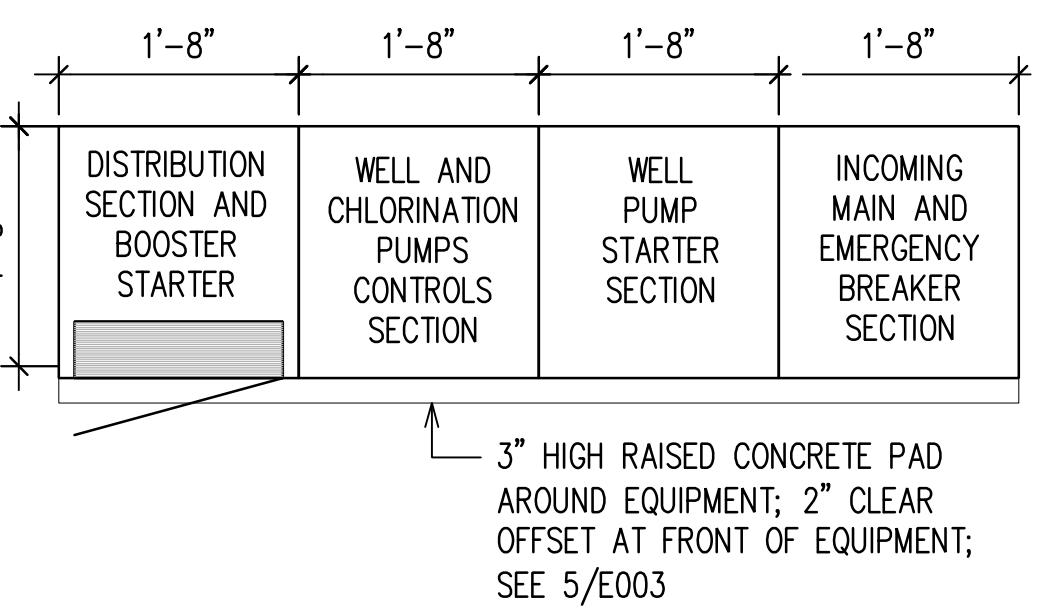


**4 SOUTH NEW ELECTRICAL BUILDING ELEVATION**  
 E41 SCALE: 1/2" = 1'-0"

NEW 34"W X 45"H X 14.6"D WALL-MOUNTED NEMA 3RX 316 STAINLESS STEEL GENERATOR TERMINATION CABINET WITH HINGE ACCESS DOOR TO SECURE CONNECTION OF CAMLOCK CONNECTORS. 3 POLE MOLDED CASE CIRCUIT BREAKER AS INDICATED ON THE ONE-LINE DIAGRAM. ESL POWER SYSTEMS OUTTAP 4800 SERIES DISTRIBUTION UNIT OR APPROVED EQUAL.



**3 MOTOR CONTROL CENTER SECTION ELEVATIONS**  
 E41 NOT TO SCALE



- MCC NOTES:**
- MOTOR CONTROLLERS SHALL HAVE PROVISIONS FOR LOCKING IN THE "OFF" POSITION.
  - ALL SWITCHES MOUNTED ON FRONT PANEL OF MCC SHALL BE MOUNTED NO HIGHER THAN 70" ABOVE FINISH FLOOR. THE EMERGENCY STOP PUSHBUTTON SWITCH SHALL BE MOUNTED NO HIGHER THAN 60" ABOVE FINISH FLOOR.
  - ENTIRE MOTOR CONTROL CENTER SHALL BE CONSTRUCTED ACCORDING TO UL 845. ENCLOSURE SHALL BE RATED NEMA 1.
  - MOTOR CONTROL CENTERS WITH METERING TERMINATIONS SHALL HAVE SHOP DRAWINGS SUBMITTED TO KIUC FOR REVIEW AND APPROVAL PRIOR TO FABRICATION. SUBMISSION TO KIUC SHALL PROCEED SHOP DRAWING APPROVALS FROM THE ENGINEER AND KDOW.

NAMEPLATES		COMPONENTS	
ITEM	DESCRIPTION	ITEM	DESCRIPTION
A	MAIN CIRCUIT BREAKER	01	CIRCUIT BREAKER, 480V
B	PANEL "A"	02	MAIN SERVICE SPD, 480V
C	SUBMERSIBLE WELL PUMP STARTER	03	NIGHT LIGHT TIME SWITCH
D	SUBMERSIBLE WELL PUMP CONTROLS	04	DIGITAL POWER FUNCTION MONITOR
E	PORTABLE GENERATOR CIRCUIT BREAKER	05	MOTOR PROTECTOR REMOTE MANAGER (MOTOR SAVER)
AA	TRANSFORMER MAIN CIRCUIT BREAKER	06	
BB	TEST/NORMAL SWITCH	07	BRANCH FEEDER SPD, 480V
CC	CHLORINATION PUMP 1	08	TRANSFORMER CIRCUIT BREAKER
DD	CHLORINATION PUMP 2	09	PANELBOARD "A"
EE	CHLORINATOR METERING 1 - RUNNING	10	
FF	CHLORINATOR METERING 1 - ALARM	11	TROUBLE RESET PUSHBUTTON
GG	CHLORINATOR METERING 2 - RUNNING	12	EMERGENCY POWER MAIN CIRCUIT BREAKER
HH	CHLORINATOR METERING 2 - ALARM	13	
JJ	ON SUPERVISORY CONTROL	14	
KK	CHLORINATOR SELECTOR SWITCH	15	
LL	TROUBLE RESET	16	
MM	MOTOR STOPPED	17	DRY TYPE TRANSFORMER
NN	MOTOR RUNNING	18	
PP	HIGH DISCHARGE PRESSURE ALARM	19	
QQ	MAIN LINE FLOW	20	GREEN LIGHT
RR	NO MAIN LINE FLOW ALARM	21	RED LIGHT
SS	PUMP CONTROL VALVE FULLY OPEN	22	AMBER LIGHT
TT	EMERGENCY STOP & RESET	23	BLUE LIGHT
UU	HAND-OFF-AUTO-TIMER	24	EMERGENCY STOP-PUSH RESET-PULL BUTTON
VV	CAPACITOR CIRCUIT BREAKER	25	ACROSS THE LINE STARER
WW	TANK #1 / TANK #2 SELECTOR SWITCH	26	CAPACITOR CIRCUIT BREAKER
XX	PUMP CONTROL VALVE FULLY CLOSED	27	SELECTOR SWITCH, HAND-OFF-AUTO-TIMER
YY	BOOSTER PUMP RUNNING	28	TEST/NORMAL SWITCH
	ABOVE NAMEPLATES TO BE 9" X 2 1/4" X 1/8" DILECTO WITH 5/8" WHITE LETTERING & BEVELED EDGES	29	MANUAL TIME CLOCK
		30	CAPACITOR
		31	SOLID STATE STARTER
		32	SELECTOR SWITCH, HAND-OFF-AUTO
		33	SELECTOR SWITCH
		34	INFRARED VIEWING WINDOW; SEE SPECS FOR DETAILS; COORDINATE LOCATION WITH KDOW

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

LICENSED PROFESSIONAL ENGINEER  
 No. 11658-E  
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE: *[Signature]*  
 DATE: 2023.04.04  
 APRIL 30, 2024  
 EXPIRATION DATE OF THE LICENSE

**DEPARTMENT OF WATER**  
 COUNTY OF KAUAI  
 JOB NO. 21-03, WATER PLAN  
**PAUA VALLEY WELL MCC REPLACEMENT**  
 PAUA, KAUAI, HAWAII 96752, T.M.K.: 4-1-2-002:039  
**MOTOR CONTROL CENTER AND ELECTRICAL BUILDING ELEVATIONS**

APPROVED: *Jason Kagimoto*  
 FOR: MANAGER AND CHIEF ENGINEER  
 DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

**Ronald N.S. Ho & Associates, Inc.**  
 Electrical Engineers  
 2153 North King Street, Suite 201  
 Honolulu, Hawaii 96819

DRAWN BY: AI    ENGINEER: AI    CHECKED BY: BJO    SHEET 9 OF 12 SHEETS    E41

POTENTIAL TRANSFORMERS (PTS) SHALL BE ACCURACY CLASS 0.6% PER C57.13 STANDARD. MODEL 460 OR 468 PTS ARE RECOMMENDED. COORDINATE WITH POWER MONITOR MANUFACTURER.

PROVIDE SHORTING BLOCK PER POWER MONITOR MANUFACTURER

EXTERNAL CIRCUIT BREAKER HANDLE, PADLOCKABLE

DO NOT PROVIDE MOTOR PROTECTOR IF BENSCHAW MOTOR STARTERS ARE PROVIDED.

BENSCHAW MX3 MOTOR STARTER OR APPROVED EQUIVALENT.

SOLID STATE STARTER (SSS) CONTROLLER

CAPACITOR

**SUBMERSIBLE WELL PUMP CONTROL SEQUENCE**

ON START-UP, REMOTE LEVEL CONTROL CONTACT "D03" CLOSSES AND ENERGIZES RESPECTIVE RELAY "RE". CONTACT "RE(1)" CLOSSES AND ENERGIZES SEQUENCE TIMER "Q" AND LIGHTS A BLUE LIGHT, PROVIDED THE SOLID STATE STARTER'S "COAST DOWN LOCKOUT TIMER" HAS TIMED OUT FROM THE LAST PUMP CYCLE OR THE SSS "STARTS-PER-HOUR LOCKOUT TIMER" HAS TIMED OUT. WHEN THE HTOA IS IN THE TIMER (T) POSITION, THE PUMP SEQUENCE SHALL INITIATE INDEPENDENT OF THE SCADA DIGITAL COMMAND BASED ON THE TIMECLOCK SETTINGS.

CONTACT "Q(2)" OPENS THE "PUMP CONTROL CLOSE VALVE" CIRCUIT TO ENSURE PUMP CONTROL VALVE IS OPEN PRIOR TO PUMP START UP. AFTER A TIME DELAY, "Q(3)" CLOSSES, ENERGIZING RELAYS "R1" AND "TD2". "R1(2)" CLOSSES, ENERGIZING RELAY "R2". "R2(1)" CLOSSES TO START THE PUMP VIA THE SOLID STATE STARTER CONTROLS. "R1(3)" ALSO CLOSSES, AND AFTER A TIME DELAY, Q(4) CLOSSES AND ENERGIZES THE "PUMP CONTROL VALVE CLOSE" SOLENOID.

AFTER THE PUMP CONTROL VALVE CLOSSES, PUMP CONTROL VALVE MICRO SWITCH "LSC(1)" CLOSSES AND WITH "R2(2)" CLOSED, KEEPS RELAY "R2" ENERGIZED THROUGHOUT THE PUMPING CYCLE. "Q(6)" CLOSSES AND THE CHLORINATION SYSTEM STARTS WHEN THE PUMP CONTROL VALVE IS SIGNALLED TO CLOSE.

AFTER THE PUMP MOTOR IS RUNNING AT FULL SPEED, CONTACT "TB2(17-18)" FROM THE SOLID STATE STARTER CLOSSES AND ENERGIZES CAPACITOR ISOLATION CONTACTOR "CC", WHICH ENERGIZES THE POWER FACTOR CORRECTION CAPACITORS.

AFTER THERE IS MAIN LINE FLOW, (APPROXIMATELY 6 MINUTES AFTER PUMP START, ADJUSTABLE), FLOW SWITCH "FC" CLOSSES AND ENERGIZES RELAY "R3". CONTACT "Q(5)" CLOSSES AND CHECKS FOR MAIN LINE FLOW. IF THERE IS NO WATER FLOW, RELAY "RB" IS ENERGIZED THROUGH "Q(5)" AND "R3(1)". "RB(2)" CLOSSES AND STARTS THE PUMP SHUTDOWN SEQUENCE VIA RELAY "RD". THE PUMP SHUTDOWN SEQUENCE BEGINS AND THE SEQUENCE TIMER WILL BE DE-ENERGIZED AND SHUT DOWN THE CHLORINATION SYSTEM.

ON SHUTDOWN, REMOTE LEVEL CONTROL CONTACT "D03" OPENS AND DE-ENERGIZES RESPECTIVE RELAY "RE" AND "RF". CONTACTS "RE(1)" OR "RF(1)" OPENS AND DE-ENERGIZES SEQUENCE TIMER "Q". "Q(3)" OPENS AND DE-ENERGIZES RELAY "R1". CONTACT "R1(1)" OPENS AND WITH "Q(4)" OPEN, DE-ENERGIZES PUMP CONTROL VALVE SOLENOID "PVSC", WHICH OPENS THE PUMP CONTROL VALVE. MAIN LINE FLOW SWITCH "FC" OPENS AND DE-ENERGIZES RELAY "R3". WHEN THE PUMP CONTROL VALVE IS FULLY OPEN, PUMP CONTROL VALVE MICRO SWITCH "LSC(1)" OPENS AND DE-ENERGIZES RELAY "R2". "R2(1)" OPENS AND STOPS THE PUMP VIA THE SOLID STATE STARTER [TB2(14-15)]. IF LSC(1) DOES NOT OPEN AFTER 5 MINUTES (ADJUSTABLE) OF Q(3) OPENING, TIME DELAY CONTACT "TD2(1)" WILL ALSO OPEN AND STOP THE PUMP.

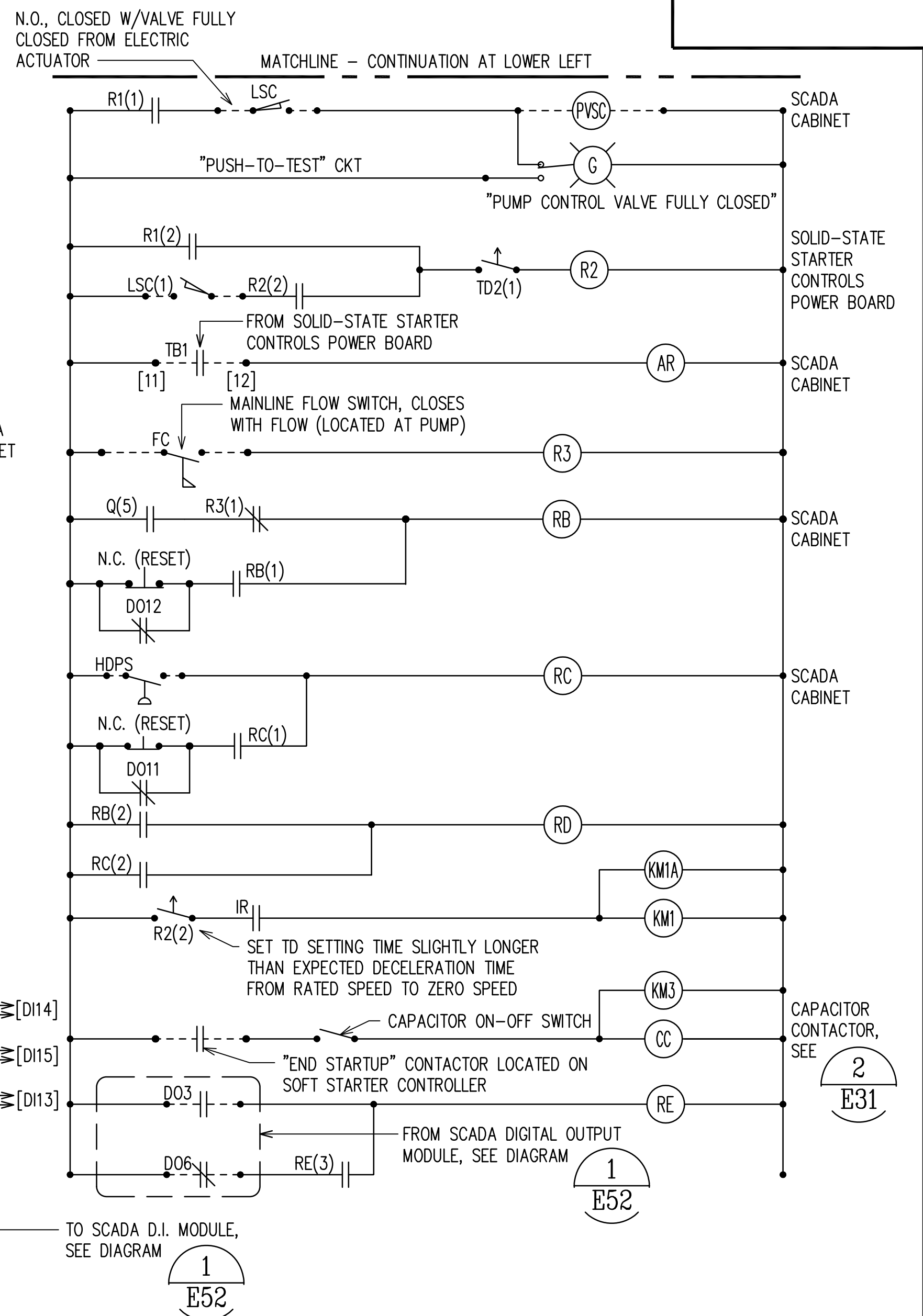
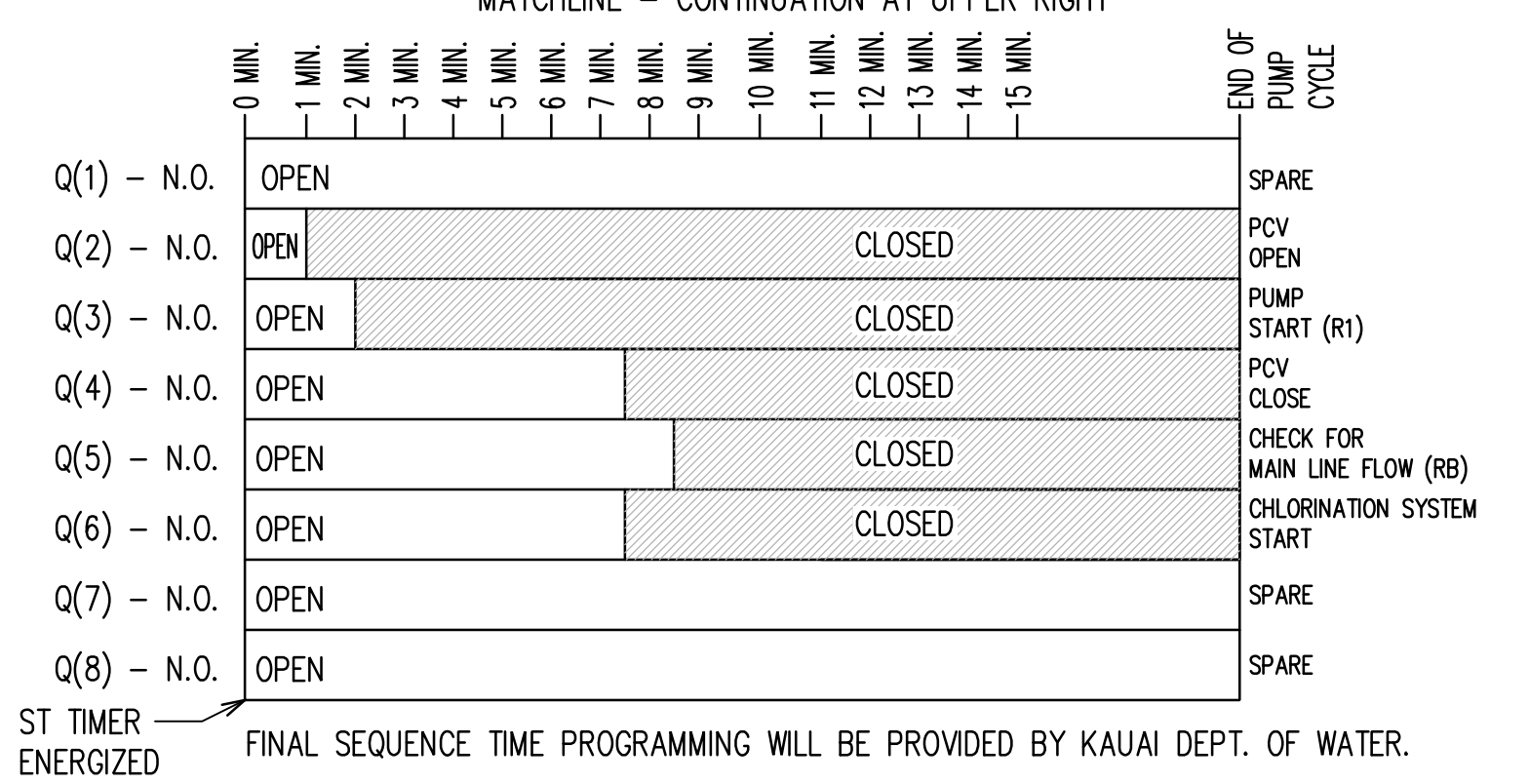
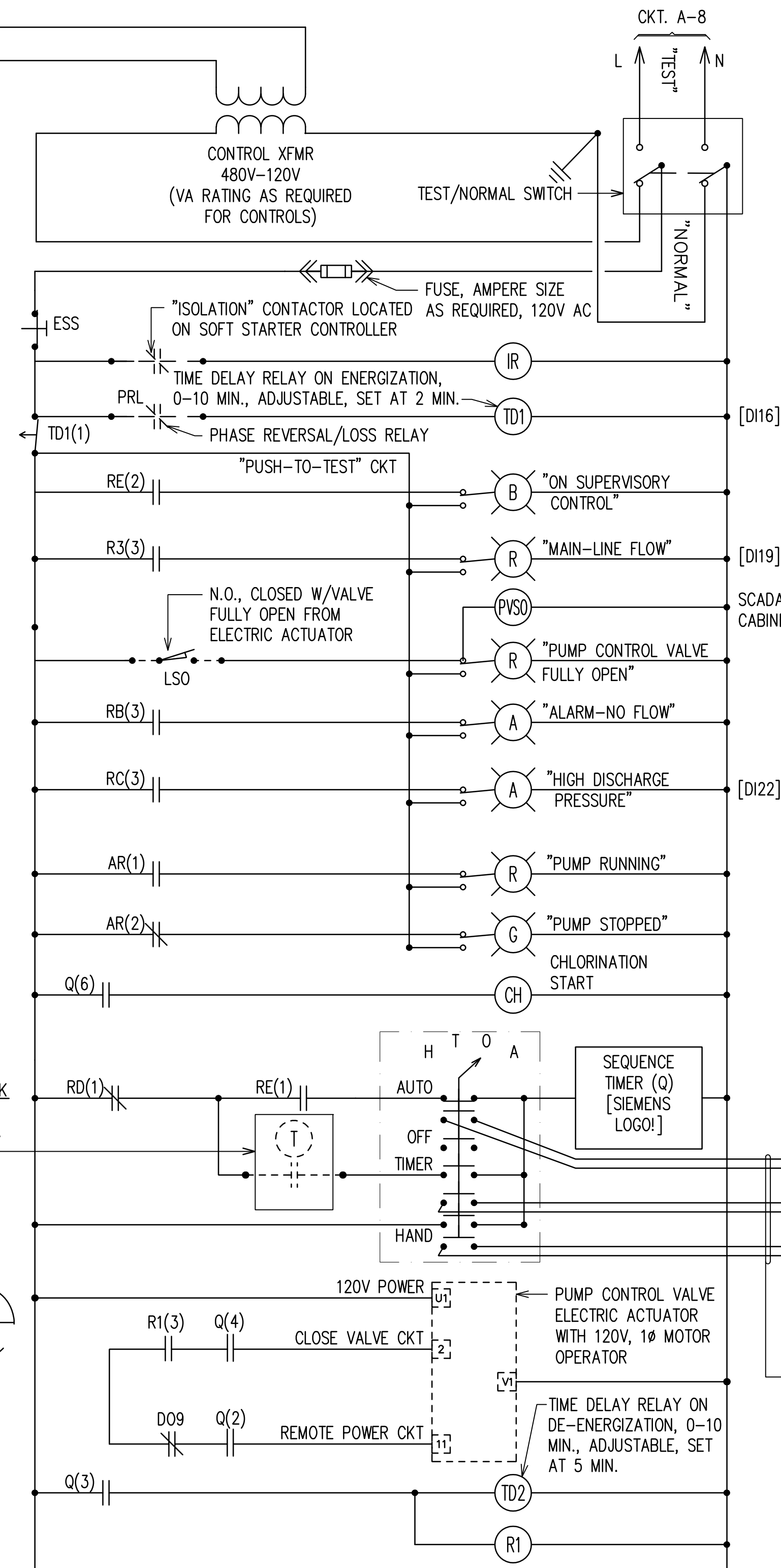
**"HIGH DISCHARGE PRESSURE" ALARM CONDITION:**

IF THERE IS A HIGH DISCHARGE PRESSURE IN THE MAIN LINE, "HDPS" CLOSSES AND ENERGIZES RELAY "RC". "RC(1)" CLOSSES AND HOLDS IN RELAY "RC"; "RC(3)" CLOSSES AND ILLUMINATES AN AMBER LIGHT UNTIL MANUALLY RESET OR THROUGH THE DEDICATED SCADA DIGITAL RESET OUTPUT. "RC(2)" CLOSSES AND STARTS THE PUMP SHUTDOWN SEQUENCE VIA RELAY "RD".

**PHASE REVERSAL/LOSS CONDITION:**

UPON PHASE REVERSAL OR PHASE LOSS, CONTACT "PRL" OPENS AND DE-ENERGIZES "TD1"; "TD1(1)" OPENS THE CONTROL CIRCUIT. WHEN PHASE POWER IS RESTORED, "TD1" WILL RECONNECT THE CONTROL CIRCUIT ONLY AFTER 2 MINUTES (ADJUSTABLE) OF ENERGIZATION TO PREVENT PREMATURE RECONNECTION.

**1 WELL PUMP 1 CONTROL SCHEMATIC DIAGRAM**  
E51



REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

**BILLY J. ORNELLAS**  
LICENSED PROFESSIONAL ENGINEER  
No. 11658-E  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

DATE: 2023.04.04

APRIL 30, 2024  
EXPIRATION DATE OF THE LICENSE

**DEPARTMENT OF WATER**  
COUNTY OF KAUAI

JOB NO. 21-03, WATER PLAN

**PAUA VALLEY WELL MCC REPLACEMENT**  
PAUA, KAUAI, HAWAII 96752, T.M.K.: 4-1-2-002:039

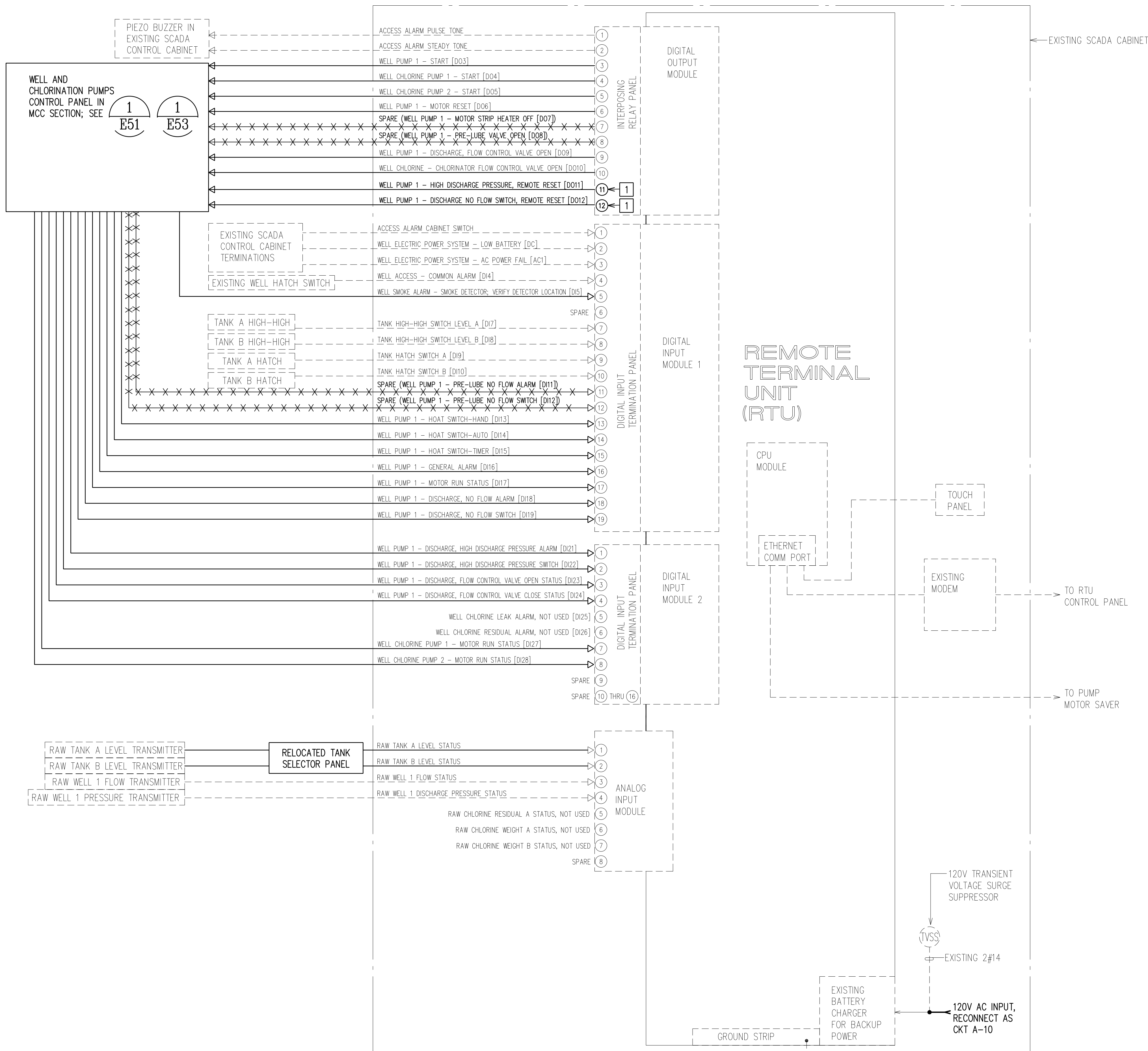
**MOTOR CONTROL CENTER**  
**WELL PUMP CONTROL DIAGRAM**

APPROVED: *Jason Kagimoto*  
FOR: MANAGER AND CHIEF ENGINEER  
DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

**Ronald N.S. Ho & Associates, Inc.**  
Electrical Engineers  
2153 North King Street, Suite 201  
Honolulu, Hawaii 96819

DRAWN BY: AI ENGINEER: AI CHECKED BY: BJO SHEET 10 OF 12 SHEETS E51



- GENERAL SCADA SYSTEM NOTES:**
- CONTRACTOR SHALL PROVIDE REQUIRED MATERIALS AND LABOR TO MODIFY THE EXISTING SCADA SYSTEM AT THE PAUA VALLEY WELL CONTROL BUILDING, INCLUDING PROVIDING THE NECESSARY RE-PROGRAMMING AND UPDATING OF THE EXISTING RTU AND OIT, AS REQUIRED TO SPARE INPUTS AND OUTPUTS RELATED TO RETIRED OIL-LUBE WELL PUMP. RECONNECT AND TEST ALL REMAINING EXISTING INPUTS AND OUTPUTS TO THE NEW MOTOR CONTROL CENTER TO ENSURE FUNCTIONALITY IS MAINTAINED.
  - PROVIDE ALL INTERCONNECTING WIRES, CABLES, CONNECTORS, AND TERMINATIONS REQUIRED FOR THE SUBSYSTEM ELEMENTS, INTERCONNECTIONS, INTERFACES, AND POWER SUPPLIES. ALL INTERCONNECTING WIRES AND CABLES SHALL BE PERMANENTLY LABELED WITH THE DESIGNATIONS AND NUMBERING ON EACH END OF ALL WIRES AND CABLES. ALL WIRING SHALL BE NEATLY LACED OR CLAMPED. AC POWER, DC POWER, AND CONTROL WIRING SIZE SHALL BE MINIMUM 16 AWG; REMAINING ENCLOSURE WIRING SHALL BE MINIMUM 12 AWG.

**NOTE(S):**

1 REUSE EXISTING SPARE OUTPUT.

1 PAUA WELL SITE MODIFIED EXISTING SCADA SCHEMATIC DIAGRAM  
E52

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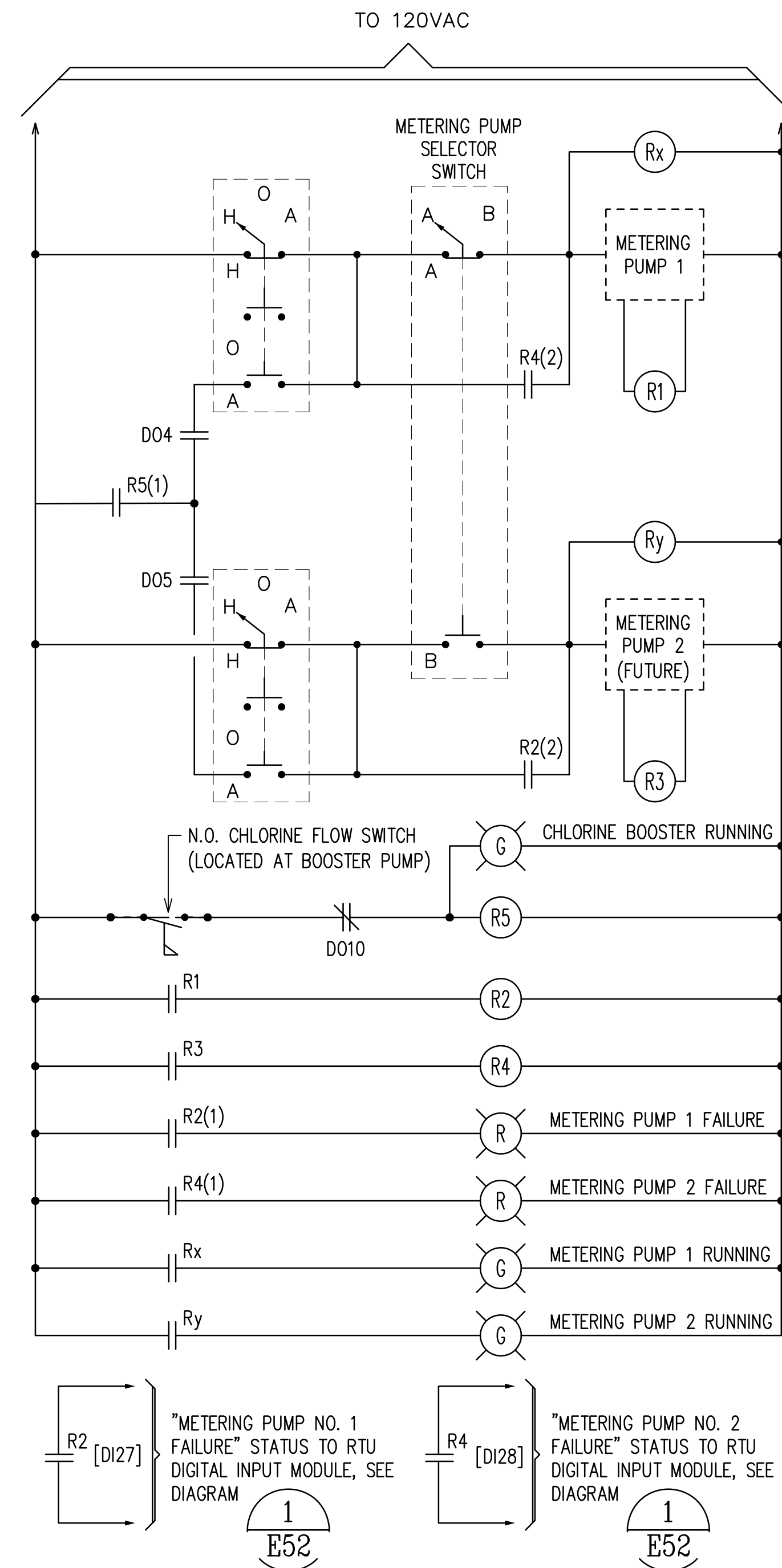
**DEPARTMENT OF WATER**  
 COUNTY OF KAUAI  
 JOB NO. 21-03, WATER PLAN  
**PAUA VALLEY WELL MCC REPLACEMENT**  
 PAUA, KAUAI, HAWAII 96752, T.M.K: 4-1-2-002:039  
**MODIFIED EXISTING SCADA DIAGRAM**

APPROVED: *Jason Kagimoto* DATE: 4/4/2023  
 FOR: MANAGER AND CHIEF ENGINEER DEPARTMENT OF WATER, COUNTY OF KAUAI

SIGNATURE: *[Signature]*  
 DATE: 2023.04.04  
 APRIL 30, 2024 EXPIRATION DATE OF THE LICENSE

**Ronald N.S. Ho & Associates, Inc.**  
 Electrical Engineers  
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 Honolulu, Hawaii 96819

DRAWN BY: AI	ENGINEER: AI	CHECKED BY: BJO	SHEET 11 OF 12 SHEETS	E52
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**GENERAL NOTES:**

- A. ALL WIRING SHALL BE NO. 12 UNLESS OTHERWISE NOTED.
- B. PROVIDE ALL CONTROL PROVISIONS FOR FUTURE CONNECTION AND CONTROL OF BACKUP METERING PUMP 2.

**CHLORINATION SYSTEM SEQUENCE OF OPERATION:**

WHEN CHLORINATION SYSTEM IS ACTIVATED BY THE SEQUENCE TIMER, CHLORINE BOOSTER PUMP SHALL ACTIVATE. METERING PUMPS SHALL NORMALLY RUN IN "AUTO" MODE WHEN:

1. FLOW FROM THE CHLORINATION BOOSTER PUMP IS DETECTED
2. CHLORINATOR CONTROL VALVE CONTACTOR IS UNOPENED [D010]
3. THE METERING PUMP DIGITAL OUTPUT START COMMAND IS PROVIDED [D04] [D05]
4. THE METERING PUMP IS SELECTED WITH THE SELECTOR SWITCH.

NORMAL BOOSTER AND METERING PUMP OPERATION IS INDICATED BY A GREEN LIGHT. IF A METERING PUMP FAILS, RELAY "R1"/"R3" CLOSES, AND ENERGIZES COIL FOR "R2"/"R4". "R2(1)"/"R4(1)" WILL CLOSE AND INDICATE ALARM FOR THE FAILED PUMP WITH A RED LIGHT. "R2(2)"/"R4(2)" SHALL CLOSE AND RUN THE BACKUP METERING PUMP REGARDLESS OF SELECTOR SWITCH POSITION, PROVIDED THE BACKUP METERING PUMP IS NOT SET TO OFF.

WHEN HOA SWITCH IS IN THE "HAND" POSITION, THE METERING PUMP WILL RUN INDEPENDENTLY OF ALL SCADA INPUTS PROVIDED IT IS SELECTED (IE: OMIT FIRST THREE REQUIREMENTS IN AUTO MODE).

**1 E53 CHLORINATION SYSTEM CONTROL DIAGRAM**

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

LICENSED PROFESSIONAL ENGINEER

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**DEPARTMENT OF WATER**  
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**PAUA VALLEY WELL MCC REPLACEMENT**  
 PAUA, KAUAI, HAWAII 96752, T.M.K: 4-1-2-002:039

**CHLORINATION SYSTEM CONTROL DIAGRAM**

APPROVED: *Jason Kagimoto*  
 FOR: MANAGER AND CHIEF ENGINEER  
 DEPARTMENT OF WATER, COUNTY OF KAUAI

DATE: 4/4/2023

**Ronald N.S. Ho & Associates, Inc.**  
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 2153 North King Street, Suite 201  
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DRAWN BY: AI    ENGINEER: AI    CHECKED BY: BJO    SHEET 12 OF 12 SHEETS    E53

# Revised Dwgs - Paua Valley Well 22-05-101BG

Final Audit Report

2023-04-05

Created:	2023-04-05
By:	Ellen Smith (ssmith@kiuc.coop)
Status:	Signed
Transaction ID:	CBJCHBCAABAAha5RHOg7eUfnaz8xh6dLnWuv-UljcvQ-

## "Revised Dwgs - Paua Valley Well 22-05-101BG" History

-  Document created by Ellen Smith (ssmith@kiuc.coop)  
2023-04-05 - 9:01:06 PM GMT- IP address: 76.81.75.196
-  Document emailed to Fred Pascual (fpascual@kiuc.coop) for signature  
2023-04-05 - 9:05:25 PM GMT
-  Email viewed by Fred Pascual (fpascual@kiuc.coop)  
2023-04-05 - 9:47:14 PM GMT- IP address: 104.47.58.126
-  Document e-signed by Fred Pascual (fpascual@kiuc.coop)  
Signature Date: 2023-04-05 - 9:47:55 PM GMT - Time Source: server- IP address: 4.22.97.193
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