

THE CONSTRUCTION OF PUA SEWAGE PUMP STATION MODIFICATION PROJECT

FOR
COUNTY OF HAWAII JOB NO. WW-4059

TMK: 2-1-11-004
SOUTH HILO, HAWAII

PREPARED FOR:
THE COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

PREPARED BY:
ENGINEERING PARTNERS, INC.

APPROVED BY:

MAYOR
COUNTY OF HAWAII

DATE

DIRECTOR
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DATE

DIRECTOR
DEPARTMENT OF PUBLIC WORKS

DATE

WASTEWATER DIVISION CHIEF
COUNTY OF HAWAII

DATE

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STRUCTURAL ENGINEERING
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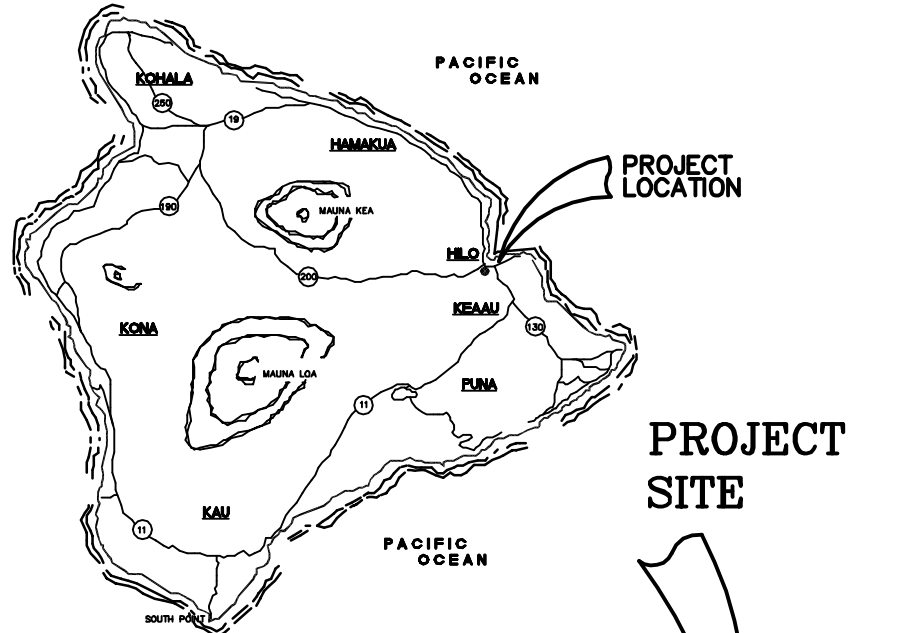
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SUB-CONTRACTOR
ELECTRICAL ENGINEERING

DRAWING INDEX

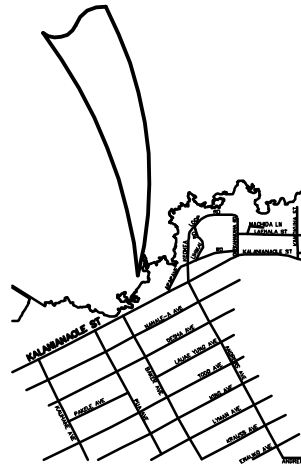
SHT. NO.	DWG. NO.	DESCRIPTION
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2	S-1	STRUCTURAL DETAILS AND GENERAL NOTES
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23	E-15	ELECTRICAL PLANS - NEW WORK
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25	E-17	PHIBD SCHEDULES
26	E-18	EXISTING ALARM PANEL
27	E-19	EXISTING ALARM PANEL - NEW WORK
28	E-20	EXISTING ALARM PANEL - NEW WORK

The Contractor shall be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

IF SHEET IS LESS THAN (22" X 34") IT IS A REDUCED PRINT - SCALE REDUCED ACCORDINGLY



PROJECT SITE



VICINITY MAP
SCALE: 1: 2000

ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED

DESIGNED WPO	DRAWN WPO
CHECKED NYT	APPROVED
APPROVED	APPROVED

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

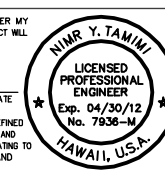
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SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RULES RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.

COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

APPROVED BY: _____ DATE: _____

WASTEWATER DIVISION CHIEF

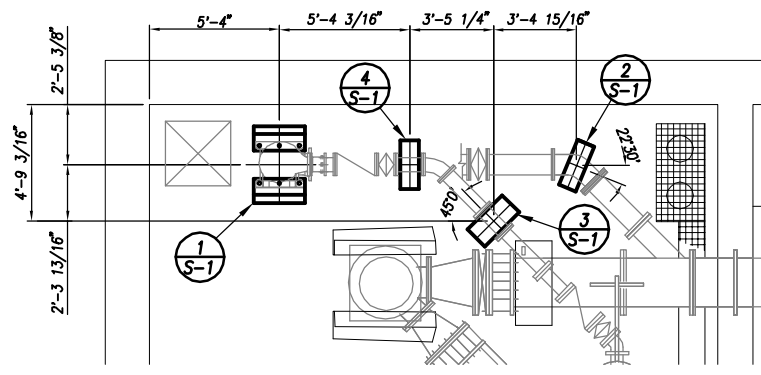


PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

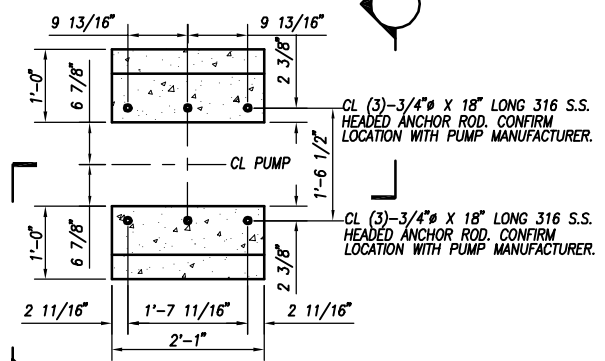
TITLE SHEET
AND DRAWING INDEX

DRAWING NO.
T-1
SHEET
1 OF 28

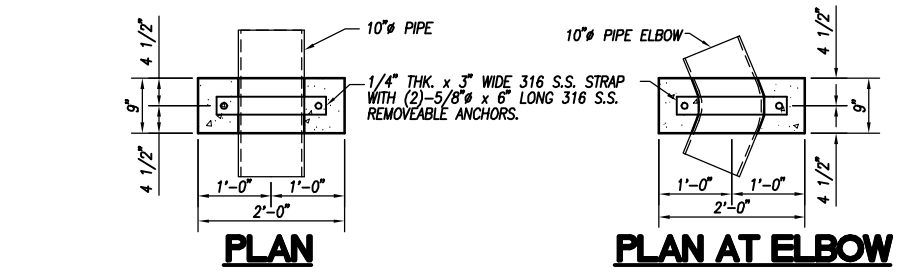
City of Honolulu and State of Hawaii Department of Public Works Engineering Division September 15, 2009 2:00 PM



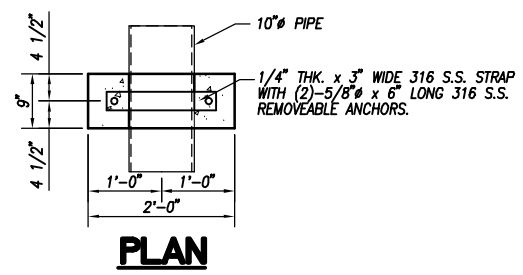
A FOUNDATION PLAN
SCALE: 1/4"=1'-0"



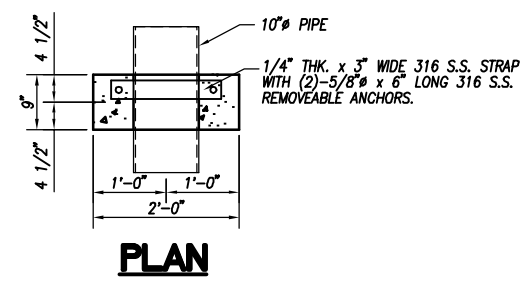
1 PUMP SUPPORT DETAIL
SCALE: 1"=1'-0"



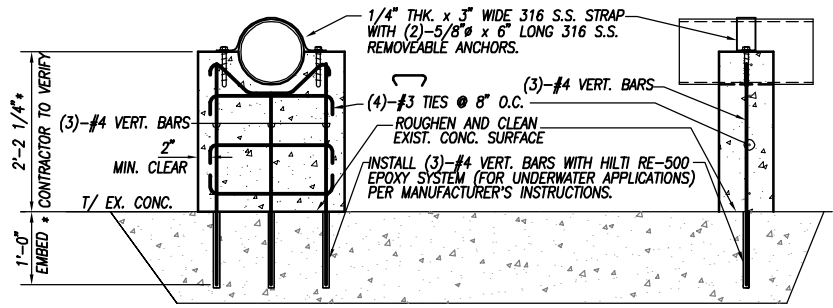
2 PIPE SUPPORT DETAIL
SCALE: 1"=1'-0"



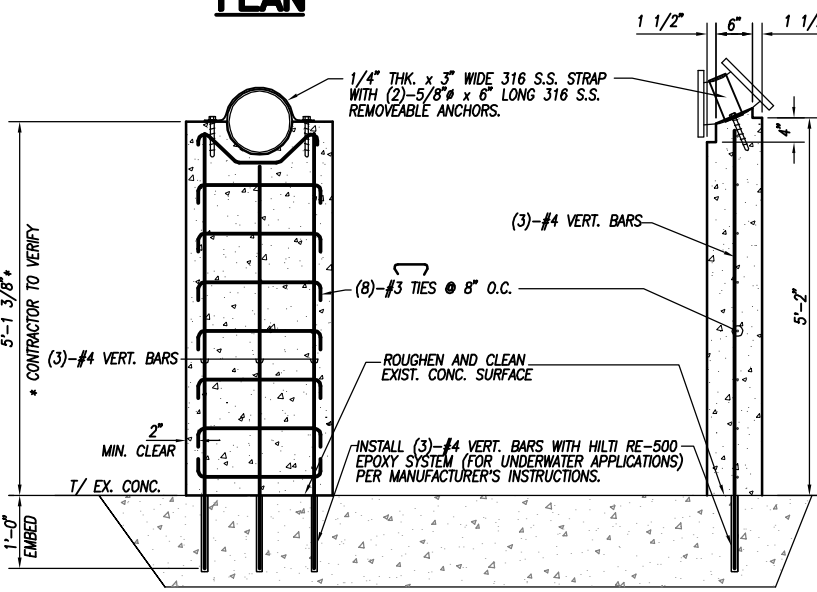
3 PIPE SUPPORT DETAIL
SCALE: 1"=1'-0"



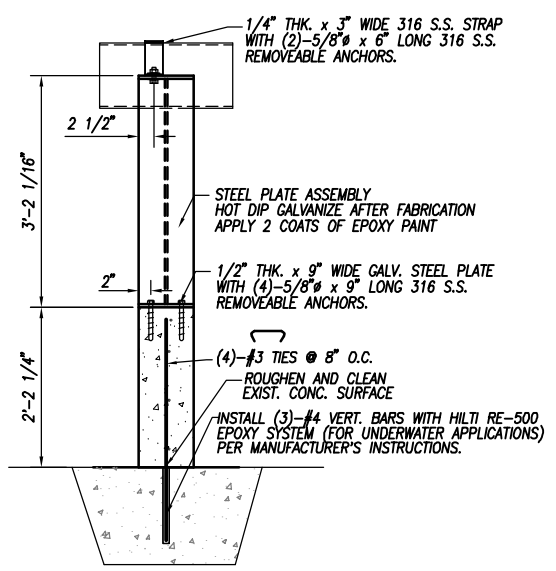
4 PIPE SUPPORT DETAIL
SCALE: 1"=1'-0"



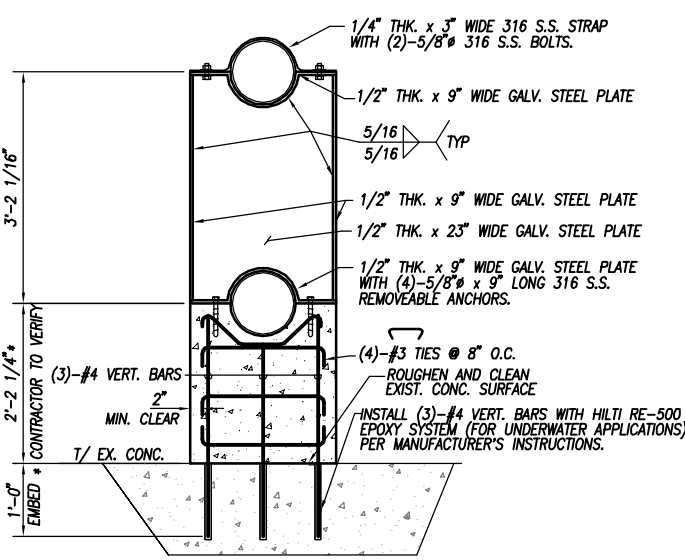
PIER ELEVATION SECTION



PIER ELEVATION SECTION



SECTION



PIER ELEVATION

STRUCTURAL GENERAL NOTES:

- ALL WORK SHALL CONFORM TO THE 1991 UNIFORM BUILDING CODE AND THE COUNTY OF HAWAII AMENDMENTS.
- EXISTING CONDITIONS ARE SHOWN TO THE BEST OF OUR KNOWLEDGE. DISCREPANCIES SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.
- PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES, WHICH MAY BE AFFECTED BY HIS WORK. INTERFERENCES WITH THE STRUCTURE SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

CONCRETE

- ALL CONCRETE UNLESS OTHERWISE NOTED SHALL BE REGULAR WEIGHT HARD ROCK TYPE (150#/CU.FT.).
- ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-95) WITH MODIFICATIONS AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
- STRUCTURAL CONCRETE 28-DAY STRENGTH TO BE 4000 PSI.
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE II.
- AGGREGATE FOR HARDROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF ASTM C-33 AND PROJECT SPECIFICATIONS.
- CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR HIS REVIEW.
- CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C-94.
- PLACEMENT OF CONCRETE SHALL CONFORM TO ACI STANDARD 301 AND PROJECT SPECIFICATIONS.
- UNLESS OTHERWISE NOTED ON THE PLANS, MINIMUM CLEAR COVERAGE OF NEW CONCRETE OVER OUTER REINFORCING BARS SHALL BE AS FOLLOWS:
 - A. CONCRETE POURED DIRECTLY AGAINST EARTH.....3" CLEAR TO REINFORCING
 - B. WALL FACES:
 - EXPOSED TO EARTH WITH FORMED SURFACES OR EXPOSED TO WEATHER.....1-1/2" CLEAR FOR #5 BAR & SMALLER 2" CLEAR FOR #6 BARS & LARGER
 - INTERIOR FACES.....3/4" CLEAR
- ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE.
- PROJECTING CORNERS OF BEAMS, WALLS, COLUMNS, EQUIPMENT PADS, ETC., SHALL BE FORMED WITH 3/4" CHAMFER, UNLESS OTHERWISE NOTED ON ARCHITECTURAL DRAWINGS.
- CONCRETE ADMIXTURES CONTAINING CHLORIDE OR CHLORIDE SALTS SHALL NOT BE USED.

REINFORCING STEEL

- ALL REINFORCING STEEL SHALL BE DETAILED AND PLACED IN CONFORMANCE WITH THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-83), THE CRSI "MANUAL OF STANDARD PRACTICE," AND THE "ACI DETAILING MANUAL - 1988" (SP-66) AS MODIFIED BY THE PROJECT DRAWINGS AND SPECIFICATIONS.
- REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60 REQUIREMENTS. #4 AND SMALLER BARS MAY BE GRADE 40.
- ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS ARE TO BE SECURELY TIED IN PLACE BEFORE CONCRETE IS POURED.
- ALL REINFORCING BAR BENDS SHALL BE MADE COLD.
- WELDING OF REINFORCING STEEL IS NOT PERMITTED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- REINFORCING BARS SHALL BE AS LONG AS PRACTICABLE AND AS DETAILED AND SHALL BE LAPPED AT SPLICES AND CORNERS NOT LESS THAN 32 BAR DIAMETER (24" MINIMUM), UNLESS OTHERWISE SHOWN. STAGGER HORIZONTAL WALL BAR SPLICES. IN GENERAL, BAR SPLICES SHALL BE MADE AT POINTS OF MINIMUM STRESS. IN BEAMS AND SLABS, SPLICE TOP BARS AT MID-SPAN, BOTTOM BARS OVER SUPPORTS, UNLESS OTHERWISE SHOWN.

The Contractor shall be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

IF SHEET IS LESS THAN (22" X 34") IT IS A REDUCED PRINT - SCALE REDUCED ACCORDINGLY

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ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED

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

DESIGNED: _____ DRAWN: _____

CHECKED: _____

APPROVED: _____ APPROVED: _____

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
EXP. 4/30/12
No. 9361-S
HAWAII, U.S.A.

COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

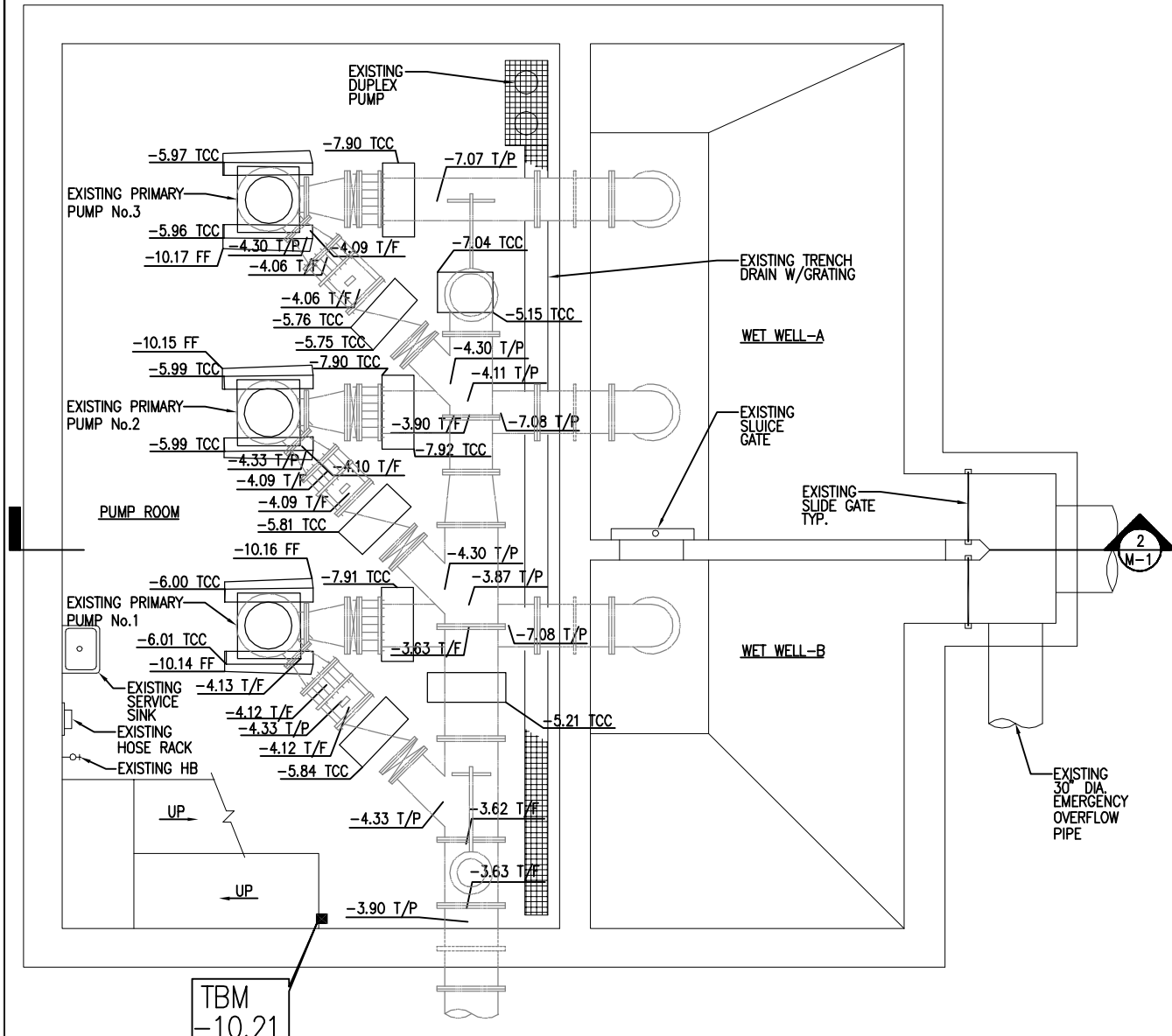
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WASTEWATER DIVISION CHIEF

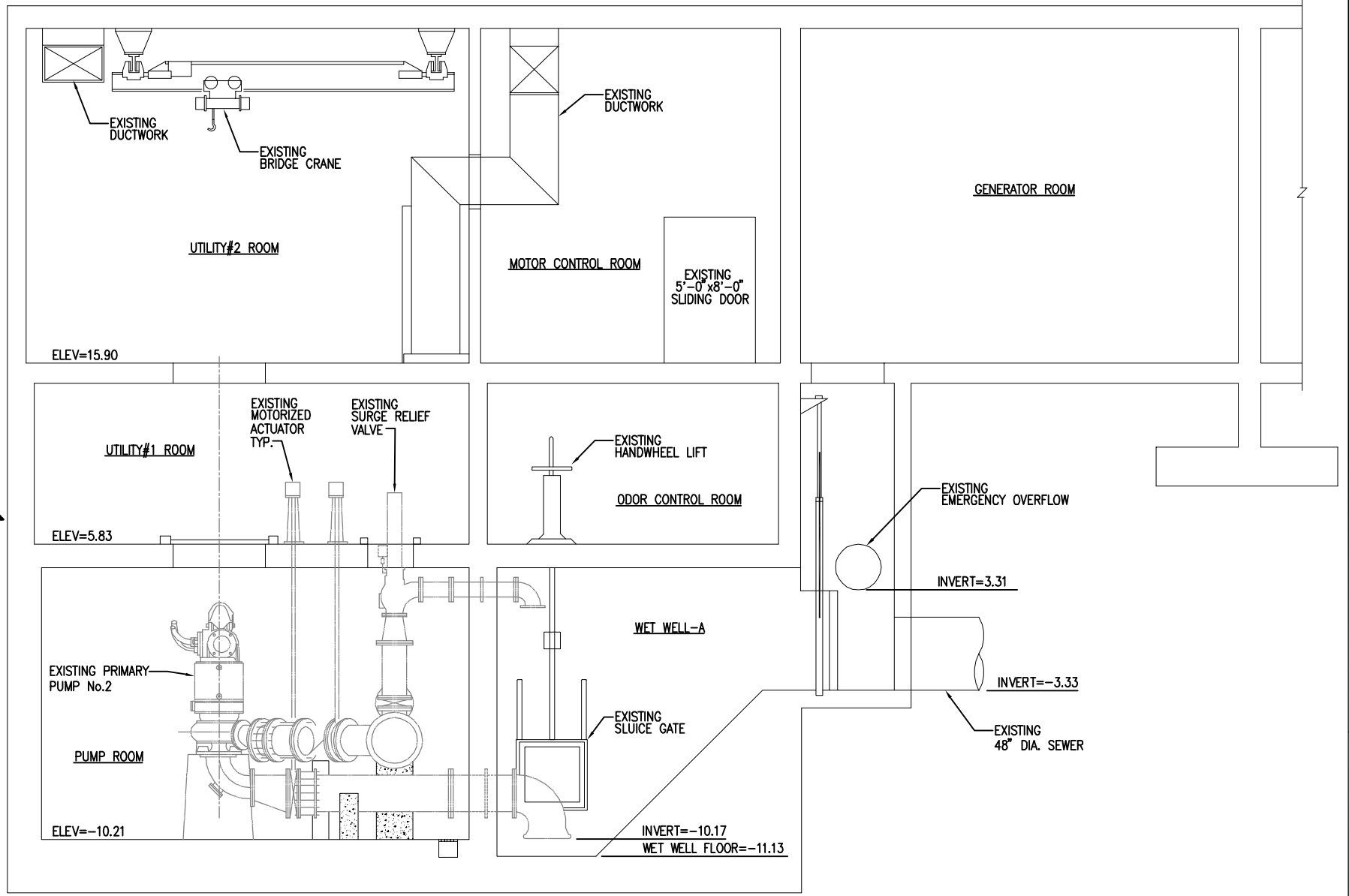
PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

STRUCTURAL DETAILS AND GENERAL NOTES

DRAWING NO. S-1
SHEET 2 OF 28



1 EXISTING BASEMENT PLAN
SCALE: 1/4" = 1'-0"



2 EXISTING SECTION
SCALE: 1/4" = 1'-0"

LEGEND	
ABBR.	DESCRIPTION
T/P	TOP OF PIPE
TCC	TOP OF CONCRETE
T/F	TOP OF FLANGE
FF	FINISHED FLOOR
TBM	TEMPORARY BENCH MARK

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CHECKED NYT	APPROVED

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04/30/12
EXPIRATION DATE

SIGNATURE: **NIMR Y. TAMIMI**
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/12
No. 7936-M
HAWAII, U.S.A.

SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RULES RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.

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WASTEWATER DIVISION

APPROVED BY: _____
WASTEWATER DIVISION CHIEF

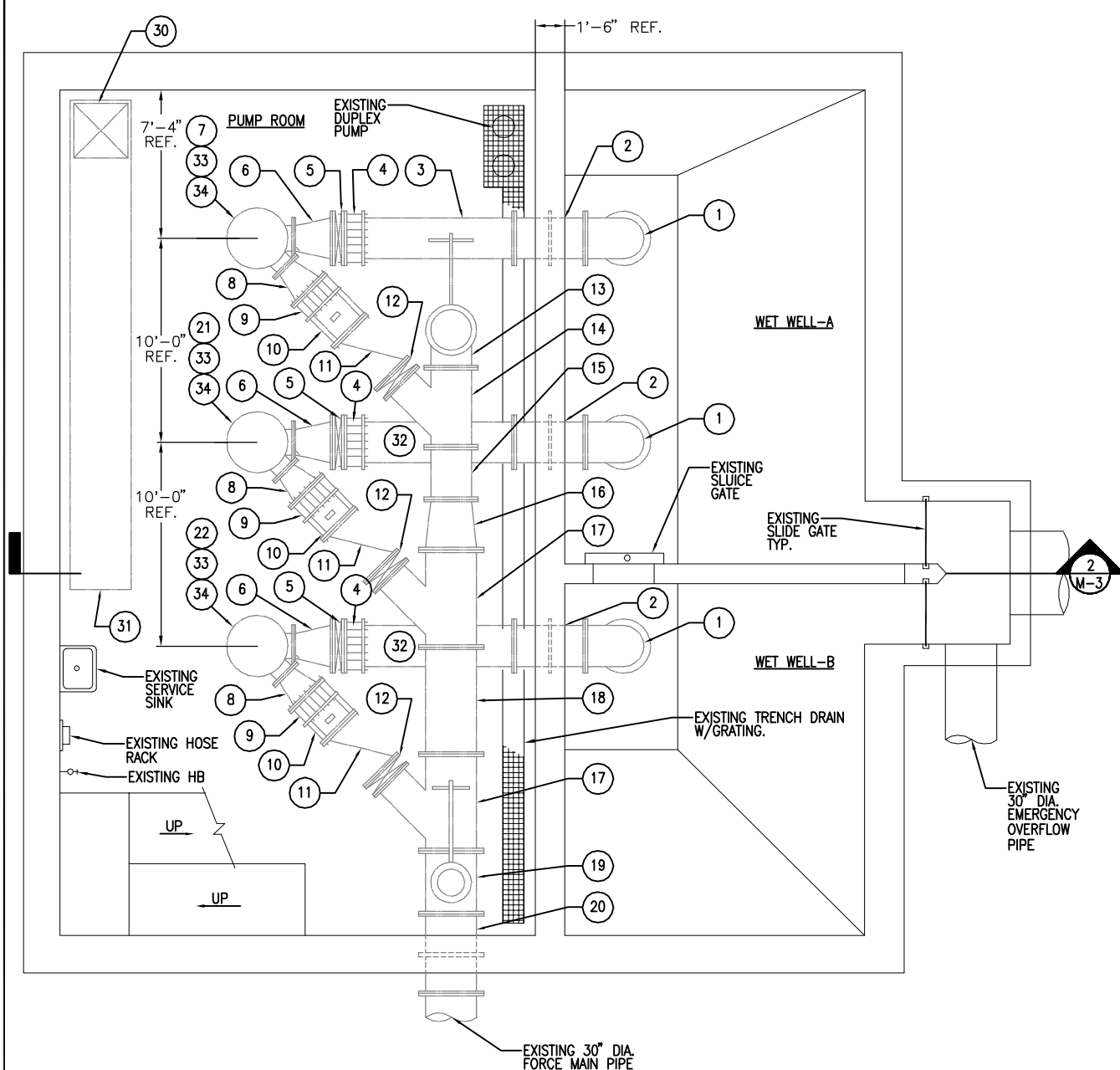
DATE: _____

PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

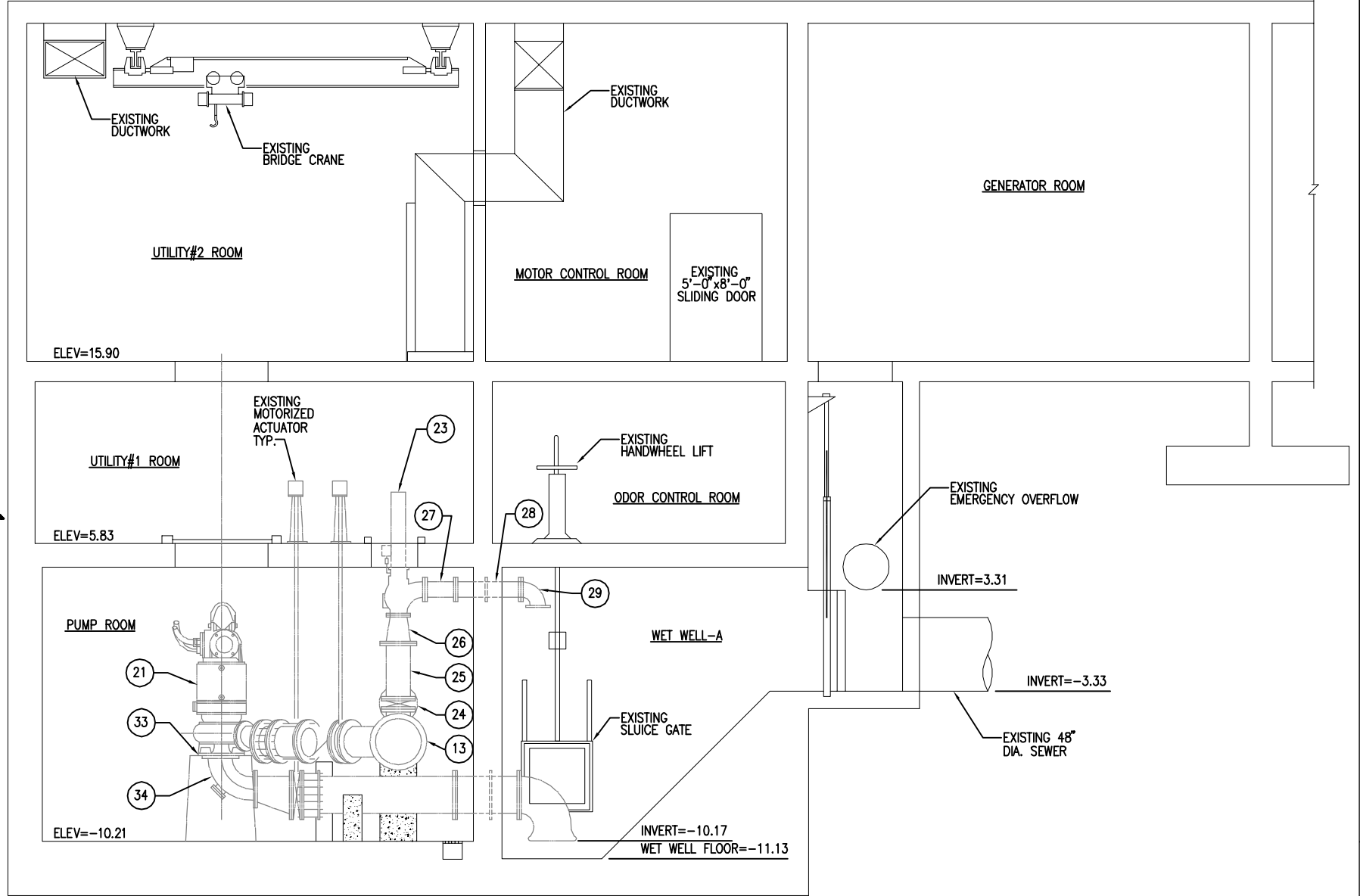
**EXISTING BASEMENT FLOOR PLAN
AND EXISTING SECTION SURVEY**

DRAWING NO.
M-1

SHEET
3 OF 28



1 EXISTING BASEMENT PLAN-DEMOLITION WORK
M-3 SCALE: 1/4"=1'-0"



2 EXISTING SECTION-DEMOLITION WORK
M-3 SCALE: 1/4"=1'-0"

DRAWING NOTES:	DRAWING NOTES:	DRAWING NOTES:	DRAWING NOTES:
1). EXISTING 24" 90° FLARED ELBOW TO REMAIN. 2). EXISTING 24" SPOOL WITH SEEP RING TO REMAIN. 3). EXISTING 24" FLANGED END x PIPE END ADAPTER TO BE REMOVED. 4). EXISTING 24" FLANGED COUPLING ADAPTER TO REMAIN. 5). EXISTING 24" KNIFE GATE VALVE TO REMAIN. 6). EXISTING 24"x16" ECCENTRIC REDUCER TO REMAIN. 7). EXISTING PRIMARY PUMP NUMBER 3 TO BE REMOVED AND ASSOCIATED CONTROLS. 8). EXISTING 20"x12" ECCENTRIC REDUCER TO REMAIN. 9). EXISTING 20" FLANGED COUPLING ADAPTER TO REMAIN. 10). EXISTING 20" FLANGED END x PIPE END ADAPTER TO REMAIN.	11). EXISTING 20" CHECK VALVE TO REMAIN. 12). EXISTING 20" KNIFE GATE VALVE TO REMAIN. 13). EXISTING 24"x18" 90° BASE BEND TO REMAIN. 14). EXISTING 24"x20" WYE TO REMAIN. 15). EXISTING 24" SPOOL TO REMAIN. 16). EXISTING 30"x24" CONCENTRIC REDUCER TO REMAIN. 17). EXISTING 30"x20" WYE WITH TIE RODS TO REMAIN. 18). EXISTING 30" SPOOL TO REMAIN. 19). EXISTING 30"x16" TEE TO REMAIN. 20). EXISTING 30" SPOOL WITH SEEP RING TO REMAIN. 21). EXISTING PRIMARY PUMP NUMBER 2 TO BE REMOVED AND ASSOCIATED CONTROLS.	22). EXISTING PRIMARY PUMP NUMBER 1 TO BE REMOVED AND ASSOCIATED CONTROLS. 23). EXISTING SURGE RELIEF VALVE TO BE REMOVED. 24). EXISTING 16" KNIFE GATE VALVE TO REMAIN. 25). EXISTING 16" SPOOL TO BE REMOVED. 26). EXISTING 16"x10" CONCENTRIC REDUCER TO REMAIN. 27). EXISTING 10" SPOOL TO REMAIN. 28). EXISTING 10" SPOOL WITH SEEP RINGS TO REMAIN. 29). EXISTING 10" 90° BEND TO REMAIN. 30). EXISTING 32"x32" SUPPLY AIR UP TO INTERMEDIATE FLOOR. 31). EXISTING 36"x30" SUPPLY AIR DUCTWORK. 32). EXISTING 24" SPOOL, FLANGED END x PIPE END, 8 FEET LONG TO REMAIN.	33). REMOVE EXISTING PUMP MOUNTING PLATE AND ANCHOR BOLTS. 34). EXISTING INLINE SUCTION ELBOW TO BE REMOVED.

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DESIGNED WPO	DRAWN WPO	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION.
CHECKED NYT	APPROVED	SIGNATURE EXPIRATION DATE 04/30/12
APPROVED	APPROVED	SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RULES RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.

COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

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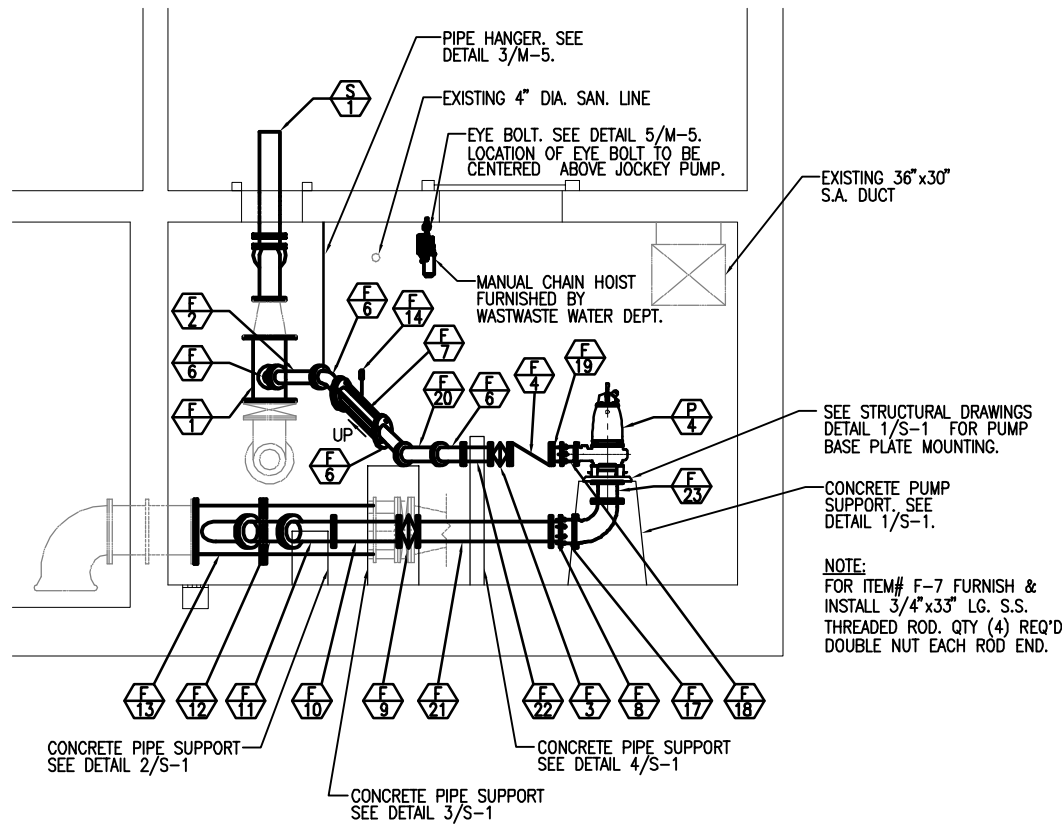
WASTEWATER DIVISION CHIEF

PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

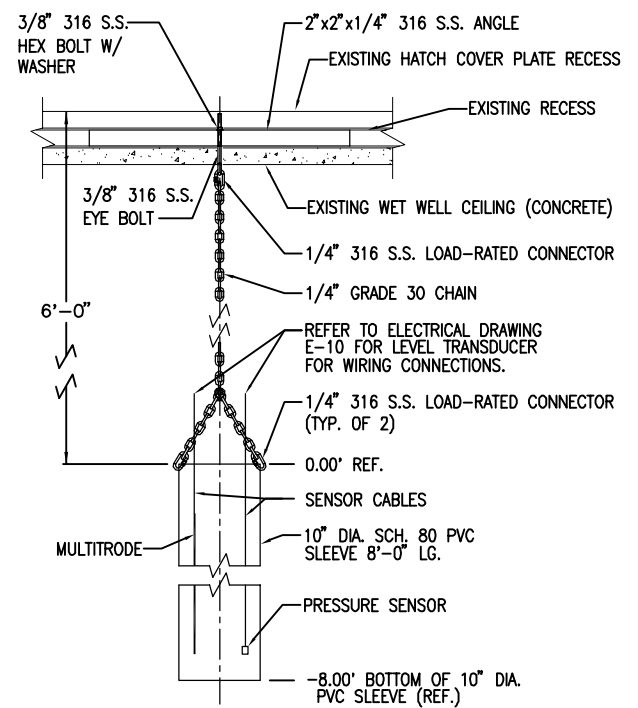
EXISTING BASEMENT FLOOR
PLAN AND EXISTING SECTION

DRAWING NO.
M-3

SHEET
5 OF 28



1 NEW BASEMENT SECTION
SCALE: 1/4" = 1'-0"



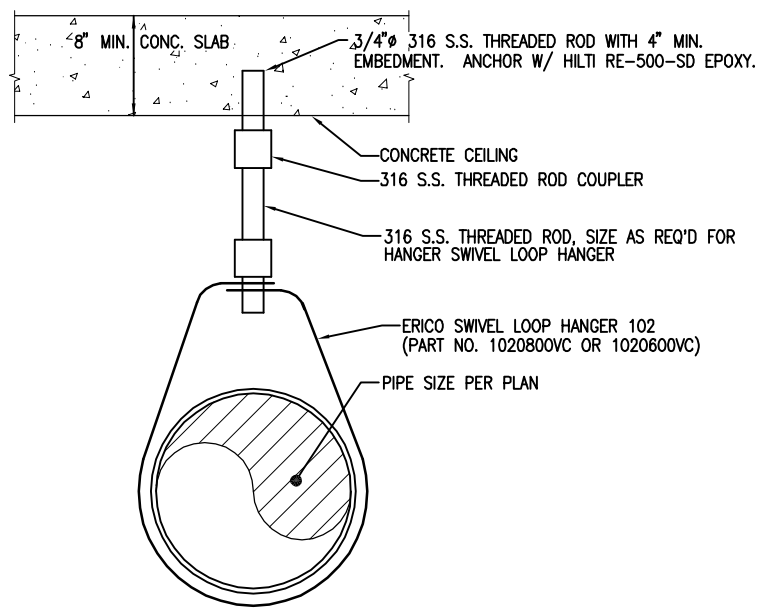
2 LEVEL TRANSDUCER AND PVC SLEEVE ASS'Y
SCALE: N.T.S.

DESCRIPTION	DESCRIPTION	DESCRIPTION
F1 16"x16"x6" REDUCING ON BRANCH TEE CLASS: 125	F9 10" PLUG VALVE, FE CLASS: 125	F17 10" FLANGED COUPLING ADAPTER CLASS: 125
F2 6" SPOOL, FE, 28" LG. CLASS: 125	F10 10" SPOOL, FE, 30-1/4" LG. CLASS: 125	F18 6" FLANGED COUPLING ADAPTER CLASS: 125
F3 6" PLUG VALVE, FE CLASS: 125	F11 10" 45° ELBOW, FE CLASS: 125	F19 6" ADAPTER, FE, CUT TO FIT CLASS: 125
F4 6" CHECK VALVE CLASS: 125	F12 10" SPOOL, FE, 28-3/4" LG. CLASS: 125	F20 6" SPOOL, FE, 23-3/16" LG. CLASS: 125
F5 2" ADAPTER, FE/PE, CUT TO FIT CLASS: 125	F13 2" x 10" WYE, FE CLASS: 125	F21 10" SPOOL, FE, 63-3/4" LG. CLASS: 125
F6 6" 45° ELBOW, FE CLASS: 125	F14 PRESSURE GAUGE	F22 6" SPOOL, FE, 11-7/16" LG. CLASS: 125
F7 6" SPOOL, FE, 25-15/16" LG. CLASS: 125	F15 EXISTING TRANSDUCER AND PVC SLEEVE ASS'Y.	F23 10" SPOOL, FE, 8" LG. CLASS: 125
F8 10" ADAPTER, FE, CUT TO FIT CLASS: 125	F16 NEW TRANSDUCER AND PVC SLEEVE ASS'Y.	

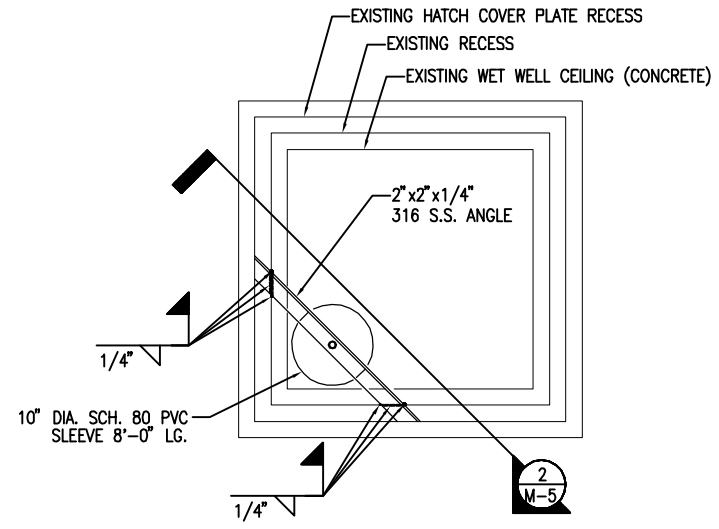
NOTES: 1). FE=FLANGED END, AND PE=PIPE END. 2). CONTRACTOR TO VERIFY ALL SPOOL LENGTHS PRIOR TO ORDERING.

UNIT NO.	LOCATION	TYPE	MANUFACTURE	MODEL#	FLOW GPM	TOTAL HEAD (FT)	NPSH (FT)	MIN% EFF	HP	V	PH	HZ.	RPM	ANCHOR BOLTS
P1	PUMP ROOM	SUBMERSIBLE	FLYGT	N3312/765	5,537	117.0	19.5	73.5	228	460	3	60	1,190	REUSE EXISTING
P2	PUMP ROOM	SUBMERSIBLE	FLYGT	N3312/765	5,537	117.0	19.5	73.5	228	460	3	60	1,190	REUSE EXISTING
P3	PUMP ROOM	SUBMERSIBLE	FLYGT	N3312/765	5,537	117.0	19.5	73.5	228	460	3	60	1,190	REUSE EXISTING
P4	PUMP ROOM	SUBMERSIBLE	FLYGT	NT3171.091	1,391	44.0	23.0	65.6	25	460	3	60	1,755	NEW SEE S-1

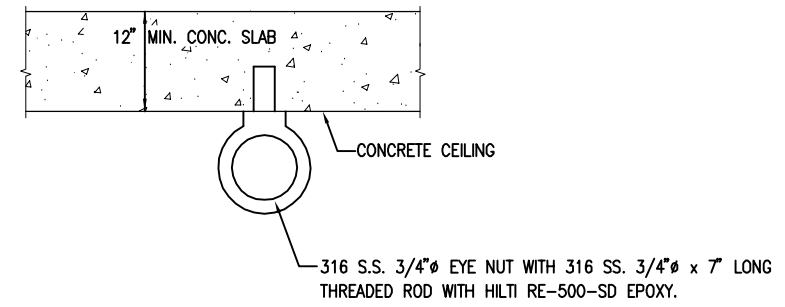
UNIT NO.	LOCATION	MANUFACTURE	MODEL#	FACTORY SET RELIEF PRESSURE	CONNECTIONS FE CLASS
S1	PUMP ROOM	GA INDUSTRIES	624-DS	95 PSI	125



3 PIPE HANGER DETAIL
SCALE: 1/4" = 1'-0"



4 PVC SLEEVE ASS'Y
SCALE: N.T.S.



5 EYE BOLT DETAIL
SCALE: N.T.S.

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DESIGNED WPO DRAWN WPO

CHECKED NYT

APPROVED APPROVED

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SIGNATURE: *NIMR Y. TAMIMI* EXPIRATION DATE: 04/30/12

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NIMR Y. TAMIMI
LICENSED PROFESSIONAL ENGINEER
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No. 7936-M
HAWAII, U.S.A.

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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

APPROVED BY: _____ DATE: _____

WASTEWATER DIVISION CHIEF

PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

SECTIONS, DETAILS AND SCHEDULES

DRAWING NO. M-5
SHEET 7 OF 28

RTU
COMMS PORTS
COMM PROTOCOLS

6 MP MULTISMART CONTROLLER
(OR EQUIVALENT BY)
PUMP 1 PUMP 2 PUMP 3 PUMP 4

WELL LEVEL SENSOR 1
OVERFLOW ALARM
HIGH - HIGH LEVEL ALARM
HIGH LEVEL ALARM
3.31 HIGH WET WELL ALARM 2
-1.50 HIGH WET WELL ALARM 1
-1.83 PRIMARY PUMP 3 ON (70%)
-2.33 PRIMARY PUMP 2 ON (60%)
-3.33 PRIMARY PUMP 1 ON (50%)
-4.25 JOCKEY PUMP ON (40%)
-4.80 ACTIVATE JOCKEY PRIOR PUMP 1 OFF
-5.00 PRIMARY PUMP 1 OFF (30%)
-6.00 JOCKEY PUMP OFF (20%)
-7.08 LOW WATER LEVEL (10%)
LOW WATER ALARM 10% (-10.13')

BACKUP WELL LEVEL SENSOR 2
OVERFLOW ALARM
HIGH - HIGH LEVEL ALARM
HIGH LEVEL ALARM
3.31 HIGH WET WELL ALARM 2
-1.50 HIGH WET WELL ALARM 1
-1.83 PRIMARY PUMP 3 ON (70%)
-2.33 PRIMARY PUMP 2 ON (60%)
-3.33 PRIMARY PUMP 1 ON (50%)
-4.25 JOCKEY PUMP ON (40%)
-4.80 ACTIVATE JOCKEY PRIOR PUMP 1 OFF
-5.00 PRIMARY PUMP 1 OFF (30%)
-6.00 JOCKEY PUMP OFF (20%)
-7.08 LOW WATER LEVEL (10%)
LOW WATER ALARM 10% (-10.13')

PUMP 1
HIGH TEMPERATURE - MOTOR
HIGH TEMPERATURE - MAIN BEARING
HIGH TEMPERATURE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP MOTOR
MOSITURE LEAKAGE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP OIL CHAMBER
VIBRATION SENSOR
PUMP CURRENT - 1 PHASE ONLY

PUMP 2
HIGH TEMPERATURE - MOTOR
HIGH TEMPERATURE - MAIN BEARING
HIGH TEMPERATURE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP MOTOR
MOSITURE LEAKAGE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP OIL CHAMBER
VIBRATION SENSOR
PUMP CURRENT - 1 PHASE ONLY

PUMP 3
HIGH TEMPERATURE - MOTOR
HIGH TEMPERATURE - MAIN BEARING
HIGH TEMPERATURE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP MOTOR
MOSITURE LEAKAGE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP OIL CHAMBER
VIBRATION SENSOR
PUMP CURRENT - 1 PHASE ONLY

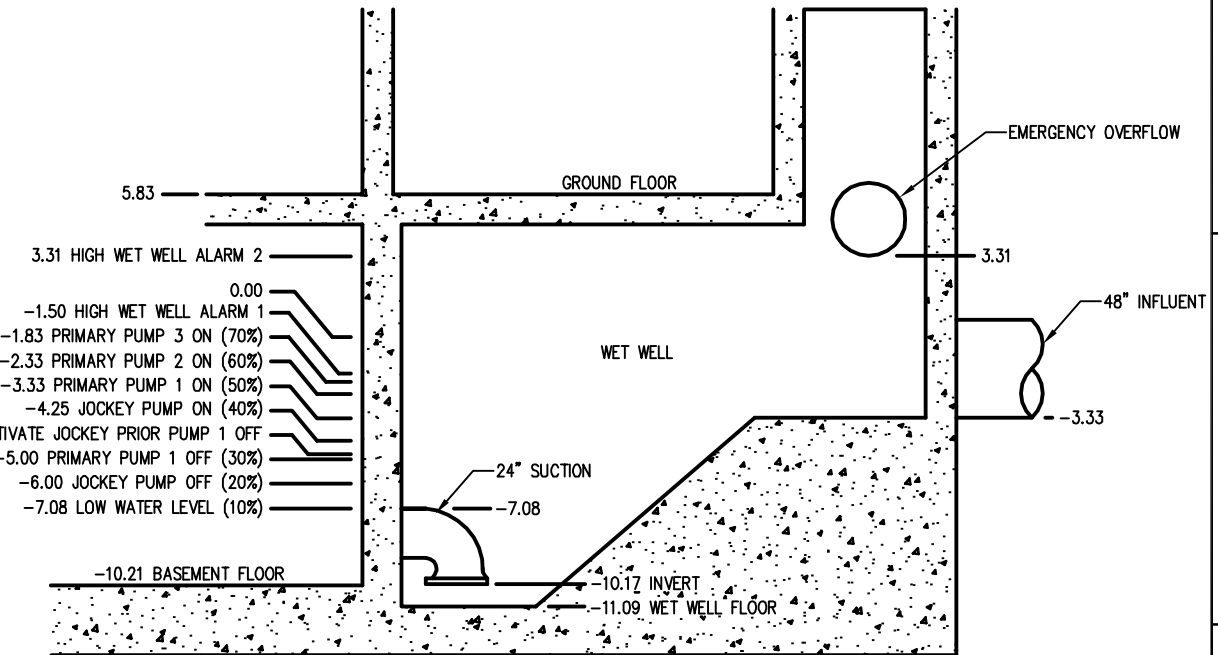
PUMP 4
HIGH TEMPERATURE - MOTOR
HIGH TEMPERATURE - MAIN BEARING
HIGH TEMPERATURE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP MOTOR
MOSITURE LEAKAGE - PUMP CONNECTION
MOSITURE LEAKAGE - PUMP OIL CHAMBER
VIBRATION SENSOR
PUMP CURRENT - 1 PHASE ONLY

PRIMARY ELEMENT SYMBOLS INSTRUMENT DIAGRAM SYMBOLS

- LEVEL
- MULTITRODE PROBE
 - SUBMERSIBLE PUMP (DRY PIT)
 - CHECK VALVE
 - KNIFE GATE VALVE
 - SLUICE GATE
 - P&ID CROSS REFERENCE
- EQUIPMENT
- HAND-OFF-AUTO FOR PUMP
 - CONNECTION TIE-IN
- MISCELLANEOUS
- SLUICE GATE
 - P&ID CROSS REFERENCE

EACH MOTOR CONTROLLER

- SOFT-START WITH BY-PASS CONTRACTOR
- COMBINATION TYPE WITH DISCONNECT
- MOTOR OVERLOAD / TEMPERATURE RISE PROTECTION
- PHASE LOSS, PHASE REVERSAL, UNDER-VOLTS, OVER-VOLTS PROTECTION
- UNDERLOAD, STALL, JAM PROTECTION
- EXCESS START TIME



2 WET WELL CONTROL LEVELS
M-6 N.T.S.

1 SYSTEM CONTROL DIAGRAM
M-6 N.T.S.

The Contractor shall be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

IF SHEET IS LESS THAN (22" X 34") IT IS A REDUCED PRINT - SCALE REDUCED ACCORDINGLY

10/10/2012 10:00 AM C:\Users\james\Documents\Projects\10-10-2012\10-10-2012.dwg

ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED

DESIGNED WPO DRAWN WPO

CHECKED NYT

APPROVED APPROVED

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

SIGNATURE: *NIMR Y. TAMIMI* EXPIRATION DATE: 04/30/12

LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/12
No. 7936-M
HAWAII, U.S.A.

SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RULES RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.

COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

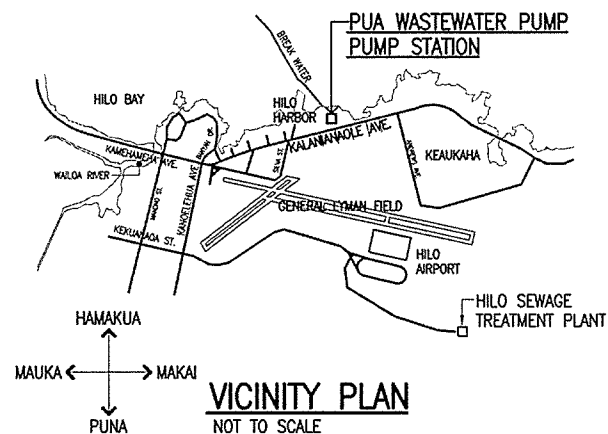
APPROVED BY: _____ DATE: _____

WASTEWATER DIVISION CHIEF

PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

SYSTEM CONTROL DIAGRAM

DRAWING NO. M-6
SHEET 8 OF 28



PROJECT NOTES

1. INSPECT AND VERIFY EXISTING ELECTRICAL SYSTEM AND WORKING CONDITIONS PRIOR TO SUBMITTING BIDS OR PROPOSALS.
2. RESOLVE ALL QUESTIONS AND DISCREPANCIES W/ ENGINEER PRIOR TO START OF ANY ELECTRICAL WORK.
3. ALL ELECTRICAL WORK SHALL COMPLY WITH HAWAII COUNTY ORDINANCES.
4. ALL MATERIALS AND EQUIPMENT SHALL BE "LISTED" OR "LABELLED" AND APPROVED FOR THE PURPOSE AS DEFINED BY THE NATIONAL ELECTRICAL CODE (NEC).
5. WIRING SYSTEM AND EQUIPMENT IN AREAS CLASSIFIED AS HAZARDOUS BY THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII, SHALL BE FURNISHED AND INSTALLED PER APPLICABLE ARTICLES OF THE NEC.

REFER TO MECHANICAL DRAWINGS FOR RECOMMENDED SEQUENCE OF WORK.

GENERAL NOTES:

1. ALL ELECTRICAL ITEMS INDICATED ON THE DRAWINGS ARE NEW AND SHALL BE PROVIDED BY THE CONTRACTOR UNLESS INDICATED AS "EXISTING", OR AS OTHERWISE NOTED.
2. ALL LOCATIONS SHOWN ON THE DRAWING FOR ITEMS OF WORK TO BE FURNISHED AND/OR INSTALLED ARE APPROXIMATE. THE CONTRACTOR SHALL SELECT LOCATIONS TO SUIT FIELD CONDITIONS SUBJECT TO APPROVAL OF THE ENGINEER.
3. CONTRACTOR SHALL INDICATE THE FINAL CONDUIT ROUTINGS AND EQUIPMENT LOCATIONS ON THE "RECORD" DRAWINGS WHERE THEY DIFFER FROM THAT SHOWN ON THE DRAWINGS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK AMONG THE VARIOUS TRADES AS NECESSARY TO AVOID CONFLICTS AND TO INSURE THE INSTALLATION OF ALL WORK WITHIN THE AVAILABLE SPACE.
5. CONTRACTOR SHALL CHECK AND MAINTAIN ORIGINAL PHASE ROTATION AND PHASE RELATIONSHIPS ON ALL CIRCUITS.
6. ALL ELECTRICAL EQUIPMENT SHALL BE NEW AND WARRANTED BY THE MANUFACTURER.
7. ALL SCHEDULED AND AUTHORIZED OUTAGES SHALL BE LIMITED TO 0 HOURS MAXIMUM.
8. THE CONTRACTOR SHALL PROVIDE FOR THE ADDITIONAL COSTS TO PERFORM WORK DURING SCHEDULED AND AUTHORIZED OUTAGES AFTER NORMAL HOURS AND ON WEEKENDS AND HOLIDAYS AS APPLICABLE.
9. EXISTING CONDITIONS, MATERIALS, SIZES, LOCATIONS, AND DIMENSIONS SHOWN ON THESE DRAWINGS REPRESENT THE BEST AVAILABLE INFORMATION OBTAINED FROM FIELD INVESTIGATION. PRIOR TO ORDERING MATERIALS AND EQUIPMENT, THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, MATERIALS, SIZES, LOCATIONS, AND DIMENSIONS THAT AFFECT THE WORK OF THIS PROJECT. NOTIFY THE ENGINEER OF ALL QUESTIONS IN WRITING AND RESOLVE ALL CONTRACTOR'S QUESTIONS AND CONCERNS PRIOR TO PROCUREMENT AND BEFORE START OF CONSTRUCTION.
10. ALL ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE, AND FEDERAL, STATE, AND COUNTY GOVERNMENT STANDARDS, REGULATIONS, AND ORDINANCES.
11. THE EXISTING PUA PUMP STATION SHALL REMAIN OPERATIONAL AT ALL TIMES. POWER OUTAGES WILL BE ALLOWED ONLY AS SCHEDULED AND ONLY FOR THE DURATION AGREED TO.
12. ALL EXPOSED CONDUITS AND FITTINGS, AND METAL PORTIONS OF EQUIPMENT ENCLOSURE SHALL BE FIELD PAINTED FOR CORROSION PROTECTION.
13. ALL EQUIPMENT SHALL BE PROPERLY MOUNTED, ANCHORED, AND SUPPORTED BY APPROVED METHODS FOR RESTRAINT OF SIESMIC ZONE 5.

ABBREVIATIONS

AC	AIR CONDITIONING OR ALTERNATING CURRENT	N	NEUTRAL
ADJ	ADJUSTABLE	(N)	NEW
AF	AMPERE FRAME	N.C.	NORMALLY CLOSED
AFD	ADJUSTABLE FREQUENCY DRIVE	NFSS	NON-FUSED SAFETY SWITCH
AIC	AMPERE INTERRUPTING CAPACITY	NIC	NOT IN CONTRACT
ALM	ALARM	N.O.	NORMALLY OPEN
ANN	ANNUNCIATOR	OV	OVERVOLTAGE
AS	AMMETER SWITCH	OVS	OVERSPEED
AT	AMPERE TRIP	PACRC	PACIFIC AQUACULTURE & COASTAL RESOURCE CENTER
AUTO	AUTOMATIC	PB	PUSHBUTTON
AUX	AUXILIARY	PBS	PUSHBUTTON STATION
AT	AMPERE TRANSDUCER	PBX	PULLBOX
C	CONDUIT	PF	POWER FACTOR
CAB	CABINET	PFB	PROVISIONS FOR FUTURE BREAKER
CB	CIRCUIT BREAKER	PH	PHASE
CMBVSTR	COMBINATION REDUCED - VOLTAGE STARTER	PNLBD	PANELBOARD
CMBSTR	COMBINATION STARTER	PS	PRESSURE SWITCH
CO	CONDUIT ONLY	PT	POTENTIAL TRANSFORMER
CPT	CONTROL POWER TRANSFORMER	R	RECEPTACLE
CS	CONTROL SWITCH	RCDR	RECORDER
CT	CURRENT TRANSFORMER	REM	REMOTE
CV	CONTROL VALVE	RMC	RIGID METAL CONDUIT (STEEL)
D	DEEP	RNMC	RIGID NON-METALLIC CONDUIT (SCH 40 PVC UNLESS OTHERWISE INDICATED)
DC	DIRECT CURRENT	RP/SPR	REVERSE PHASE/SINGLE PHASE RELAY
DIST	DISTRIBUTION	RVSTR	REDUCED-VOLTAGE STARTER
(E)	EXISTING	RTU	REMOTE TERMINAL UNIT
E, ELEC	ELECTRIC, ELECTRICAL	RH	RHEOSTAT
EF	EXHAUST FAN	SF	SUPPLY FAN
EM	EMERGENCY	SPEC	SPECIFICATION
EMT	ELECTRICAL METALLIC TUBING	SS	SELECTOR SWITCH
ENCL	ENCLOSURE	SSS	SELECTOR SWITCH STATION
EO	ELECTRICALLY OPERATED	STR	STARTER
EQPT	EQUIPMENT	SV	SOLENOID VALVE
ESPB	EMERGENCY STOP PUSH BUTTON	T	TRANSFORMER
ETM	ELAPSED TIME METER	T, TEL	TELEPHONE
FBO	FURNISHED BY OWNER OR OTHERS	TACH	TACHOMETER
FLA	FULL LOAD AMPERES	TB	TERMINAL BLOCK
FREQ	FREQUENCY	TCAD	TIME CLOSING AFTER DE-ENERGIZATION
FLS	FLOAT SWITCH	TCAL	TIME CLOSING AFTER ENERGIZATION
G, GND	GROUND	TD	TIME DELAY
GFIC	GROUND FAULT INTERRUPTING CAPABILITY	TOAD	TIME OPENING AFTER DE-ENERGIZATION
H	HORIZONTAL OR HIGH	TOAE	TIME OPENING AFTER ENERGIZATION
HELCO	HAWAII ELECTRIC LIGHT COMPANY	TS	TEMPERATURE SWITCH
HH	HANDHOLE	(TP)	TYPICAL
HTI	HAWAIIAN TELECOM INC	THK	THICK
HZ	HERTZ	UG	UNDERGROUND
HGAF	HOT DIPPED GALVANIZED AFTER FABRICATION	UV	UNDERVOLTAGE
IBC	INSTALLED BY CONTRACTOR	V	VOLTS, VERTICAL
IBO	INSTALLED BY OWNER OR OTHERS	VM	VOLTMETER
IL	INDICATING LIGHT	VMR	VOLTAGE MONITORING RELAY
INTLK	INTERLOCK	VS	VOLTMETER SWITCH
JBX	JUNCTION BOX	W	WIRE(S), WIDE, WATTS
KV	KILO-VOLT	WP	WEATHERPROOF
KVA	KILO-VOLT AMPERE	W, X, H, L	W.=WIDE, H.=HIGH, L.=LONG OR LENGTH
KW	KILO-WATT	XDUCER	TRANSDUCER
L	LIGHTS, LIGHTING, LONG, LENGTH	XFMR	TRANSFORMER
LOC	LOCAL		
LOR	LOCK-OUT RELAY		
LPU	LINE PROTECTION UNIT		
LTFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT		
LTFNMC	LIQUIDTIGHT FLEXIBLE NON-METAL CONDUIT		
LS	LIMIT SWITCH		
MA	MILLIAMPERE		
MAN	MANUAL		
MO	MANUALLY OPERATED		

CONDUCTOR COLOR CODE:

BK	BLACK	Y	YELLOW
W	WHITE	BR	BROWN
R	RED	PK	PINK
G	GREEN	GY	GRAY
O	ORANGE	PU	PURPLE
BL	BLUE	BK1	BLACK-ONE

ELECTRICAL PLAN SYMBOLS

	* - EQUIPMENT AS IDENTIFIED
	PANELBOARD AS IDENTIFIED
	EXPOSED CONDUIT OR RACEWAY AS INDICATED
	EXPOSED CONDUIT, HIDDEN FROM VIEW ON PLAN
	EMBEDDED CONDUIT, BELOW FLOOR SLAB, EXTERIOR FINAL GRADE
	FLEXIBLE METAL CONDUIT, LIQUIDTIGHT WHERE REQUIRED OR INDICATED
	CIRCUIT SCHEDULE INDICATOR, * = CIRCUIT NUMBER
	CIRCUIT SCHEDULE INDICATOR, 2-1/2\"/>
	WIRING TO BE DISCONNECTED/REMOVED AS IDENTIFIED
	EQUIPMENT/DEVICE TO BE DISCONNECTED/REMOVED AS IDENTIFIED
	EQUIPMENT OR OTHER ELECTRICAL CONNECTION AS INDICATED
	MOTOR CONNECTION
	CONTROL DEVICE OR ITEM CONNECTION AS IDENTIFIED
	JUNCTION BOX
	PULLBOX

DEFINITIONS

- PROVIDE - FURNISH AND INSTALL.
 INSTALL - INCLUDES INSTALLATION, WIRING CONNECTIONS, START-UP/ TESTING, AND PLACING INTO OPERATION.
 REPLACE - REMOVE EXISTING AND PROVIDE NEW.
 RESTORE - MATCH EXISTING TYPES, RATING, FUNCTIONS AT NEW LOCATION. RE-USE EXISTING WIRING IF CAN BE RELOCATED WITHOUT SPLICING. PROVIDE ADDITIONAL NEW WIRING AND SPLICE TO EXISTING AND EXTEND TO NEW LOCATION WHERE APPLICABLE. FOR TELEPHONE/DATA/VIDEO WIRING, PROVIDE NEW HR'S IF NOT ABLE TO RELOCATE WITHOUT SPLICING.
 RELOCATE - DISCONNECT, REMOVE, STORE, REINSTALL, RECONNECT AND PLACE INTO CORRECT OPERATION ALL WITHOUT CAUSING ANY DAMAGE TO AFFECTED ITEMS.
 REATTACH - REPLACE MOUNTING ATTACHMENT METHODS. REPLACE ALL MOUNTING HARDWARE, SCREWS, BOLTS, WASHERS, NUTS. MATCH EXISTING TYPES, SIZES, AND QUANTITIES. REPLACE ALL WIRING SPLICES, TERMINATIONS, CONNECTIONS. MATCH EXISTING TYPES, SIZES, AND QUANTITIES.
 WIRING - PROVIDE ALL CONDUITS, RACEWAYS, CONDUCTORS, FITTINGS, PULLBOXES, JUNCTION BOXES, OUTLET BOXES, DEVICES, AND OTHER MATERIALS OR ITEMS AS NECESSARY FOR A COMPLETED AND OPERATIONAL ELECTRICAL CIRCUIT OR SYSTEM; OR THAT WHICH COMPRISES AN ELECTRICAL CIRCUIT OR SYSTEM.
 OUTLET - IN ADDITION TO DEFINITION IN THE NEC, OUTLET SHALL MEAN THE REQUIRED OUTLET BOXES, CONDUCTORS, TERMINATIONS, WIRING DEVICES, AND COVER PLATES, TO PROVIDE FOR THE INTENDED USE, APPLICATION, OR UTILIZATION EQUIPMENT.
 FIELD LOCATE - FINAL LOCATION ADJUSTED TO SUIT EXISTING FIELD CONDITIONS TO ACCOMMODATE CONTRACTOR'S CONSTRUCTION METHODS, WHILE COMPLYING WITH MINIMUM REQUIREMENTS OF NEC AND AS ACCEPTABLE TO ENGINEER. ALLOW FOR MINIMUM 10 FEET HORIZONTAL ADJUSTMENT WITHOUT ADDITIONAL COSTS AND/OR PROVIDE FOR THE ADDITIONAL ADJUSTMENTS NOTED.
 FIELD ROUTE - FINAL CONDUIT ROUTING SELECTED BY CONTRACTOR WITH ACCEPTANCE BY ENGINEER TO SUIT EXISTING SITE CONDITIONS AVOIDING INTERFERENCES WITH OTHER EQUIPMENT, PIPING, STRUCTURAL STEEL, STRUCTURAL WALLS, ETC. AND TO MATCH CONSTRUCTION METHODS DESIRED BY CONTRACTOR.

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2/28/2011	FINAL REVIEW (HS)PDF
2/18/2011	100 PERCENT REVIEW
1/24/2011	60 PERCENT REVIEW
DATE	ISSUE

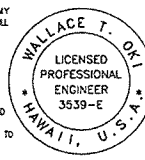
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WALLACE T. OKI, P.E., INC.
 ELECTRICAL ENGINEERING
 P.O. BOX 4070/688 KINOOLE ST., STE. 1158
 HILO, HI. 96720 PH:961-9666/FAX:9352549
 EMAIL: wtopeinc@hilonet.com

WTO REF. NO. 92010217

DESIGNED	DRAWN
WTO	LTK
CHECKED	
LHN	
APPROVED	APPROVED
WTO	WTO

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION.
 04/30/12
 SIGNATURE EXPIRATION DATE
 SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 15-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.

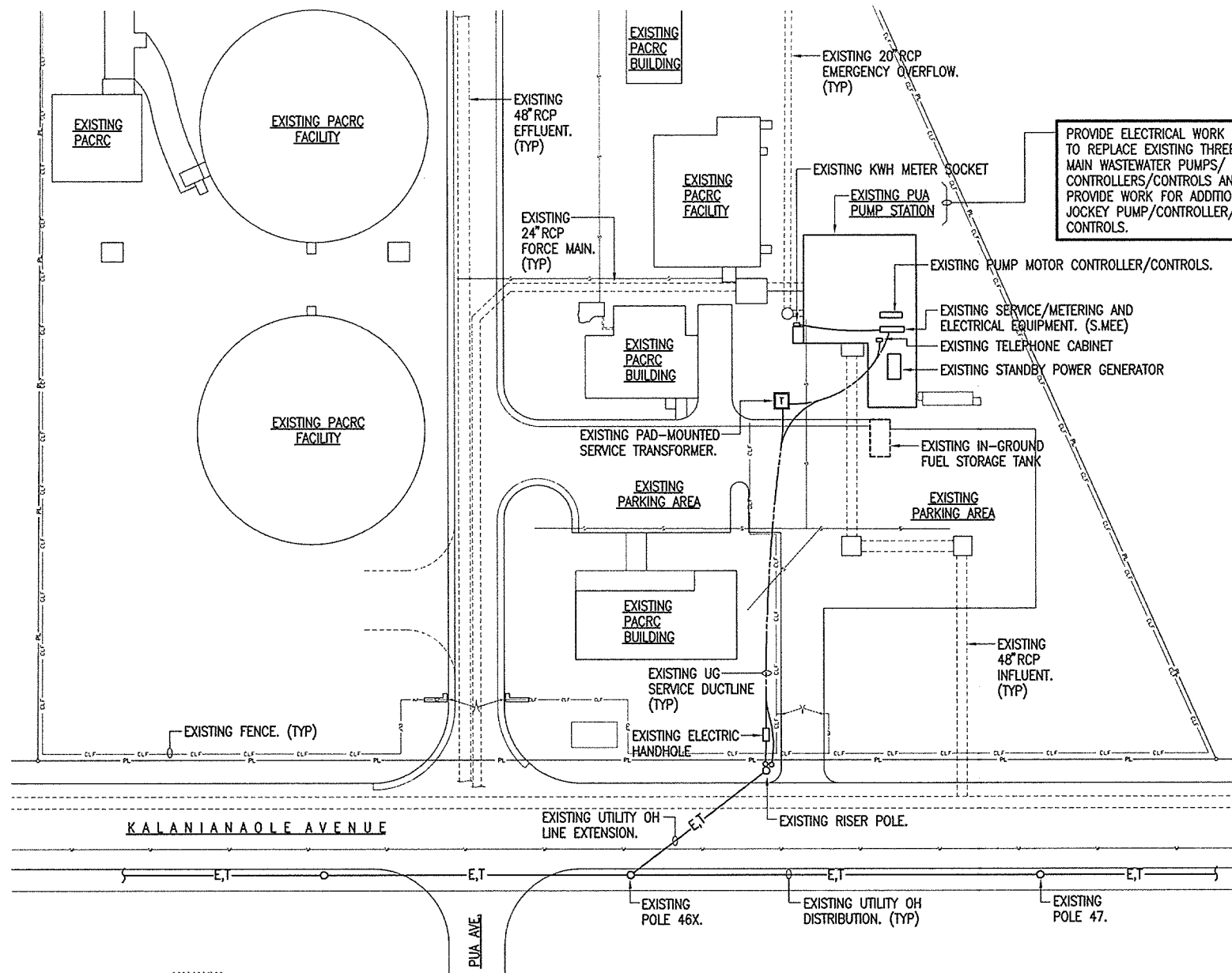


COUNTY OF HAWAII
 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 WASTEWATER DIVISION
 APPROVED BY: _____ DATE _____
 WASTEWATER DIVISION CHIEF

PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

VICINITY PLAN/NOTES

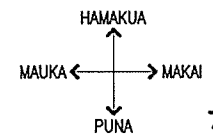
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E-1
 SHEET
 9 OF 28



PROVIDE ELECTRICAL WORK TO REPLACE EXISTING THREE(3) MAIN WASTEWATER PUMPS/ CONTROLLERS/CONTROLS AND TO PROVIDE WORK FOR ADDITIONAL JOCKEY PUMP/CONTROLLER/ CONTROLS.

- DEMOLITION NOTES**
1. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE ENGINEER IN THE FIELD DURING THE ACTUAL DEMOLITION WORK TO RESOLVE ALL QUESTIONS WHERE APPLICABLE.
 2. DISCONNECT AND REMOVE THE EXISTING ELECTRICAL ITEMS AND THEIR ASSOCIATED WIRING AS INDICATED.
 3. EXISTING WIRING NOT RE-USED FOR NEW WORK OR NOT DESIGNATED AS "SPARES" SHALL BE REMOVED IN IT ENTIRETY.
 4. ALL REMOVED ITEMS SHALL REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL CONSULT THE OWNER FOR STORAGE AND/OR DISPOSAL INSTRUCTIONS.
 5. ALL WIRING ASSOCIATED WITH ITEMS TO BE REMOVED SHALL BE DISCONNECTED AND REMOVED BACK TO LAST OVERCURRENT DEVICE, CONTROLLER, OR FIELD TERMINAL POINT.
 6. THE CONTRACTOR SHALL COORDINATE/VERIFY ALL EXISTING BRANCH CIRCUIT WIRING AS APPLICABLE TO THE DEMOLITION WORK AND AS NECESSARY TO PROVIDE TEMPORARY POWER DURING THE VARIOUS PHASES OF CONSTRUCTION.
 7. ALL EMBEDDED CONDUITS SHALL HAVE ALL WIRING REMOVED AND CONDUITS REMOVED OR ABANDONED AS APPLICABLE. ALL ABANDONED CONDUITS SHALL BE CAPPED AND/OR SEALED BY APPROVED METHODS.
 8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS. THE EXISTING CONDITIONS SHOWN ARE INTENDED TO BE AS COMPLETE AND ACCURATE AS POSSIBLE. HOWEVER, ALL ITEMS NOT SHOWN SHALL BE DEMOLISHED WHERE REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

- ELECTRICAL PLAN NOTES**
1. ALL PLANS ARE DIAGRAMMATIC AND INDICATE LOCATIONS AND GENERAL REQUIREMENTS ONLY. ALL FINAL LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR SUBJECT TO ACCEPTANCE BY THE ENGINEER. ALL ROUTINGS FOR WIRING SHALL BE SELECTED AND DETERMINED BY THE CONTRACTOR COMPLYING WITH ALL REQUIREMENTS OF THE NEC.
 2. ALL PLANS ARE DIAGRAMMATIC AND SHOWS CIRCUITING AND HOMERUN REQUIREMENTS ONLY. WHERE A "HR" IS INDICATED, THE CONTRACTOR SHALL INSTALL THE HOMERUN CIRCUIT WIRING AS INDICATED. WHERE NO "HR" IS INDICATED, THE CONTRACTOR SHALL FIELD ARRANGE ALL HOMERUNS. CONDUITS AND CONDUCTORS SHALL BE SIZED PROPERLY PER NEC REQUIREMENTS DEPENDING ON THE HOMERUN GROUPINGS SELECTED BY THE CONTRACTOR.
 3. PROVIDE A NEUTRAL CONDUCTOR FOR EACH SET OF PHASE CONDUCTORS.
 4. PROVIDE A GROUNDING CONDUCTOR FOR ALL CIRCUITS. DO NOT USE CONDUIT OR RACEWAY FOR CIRCUIT GROUNDING. WHERE INDICATED OR REQUIRED, A DEDICATED AND/OR ISOLATED GROUND CONDUCTOR/SYSTEM SHALL BE PROVIDED.
 5. PLANS MAY NOT ALWAYS INDICATE QUANTITY OF CONDUCTORS BY HASH MARKS. PROVIDE CONDUCTORS BASED ON CIRCUITING REQUIREMENTS AND GUIDELINES STATED ABOVE.
 6. ALL REQUIREMENTS FOR MECHANICAL EQUIPMENT ITEMS SHALL BE COORDINATED WITH THE EQUIPMENT SHOP DRAWINGS FOR DETAILS OF INSTALLATION AND WIRING CONNECTIONS. THE CONTRACT DRAWINGS REPRESENT TYPICAL REQUIREMENTS WHICH MAY BE DIFFERENT FROM THE EQUIPMENT TO BE INSTALLED.
 7. DRAWINGS ARE INTENDED TO BE COMPLETE AS TO GENERAL INTENT AND REQUIREMENTS BUT NOT TO ACTUAL DETAILS OF CONSTRUCTION, INSTALLATION, AND LOCATIONS.

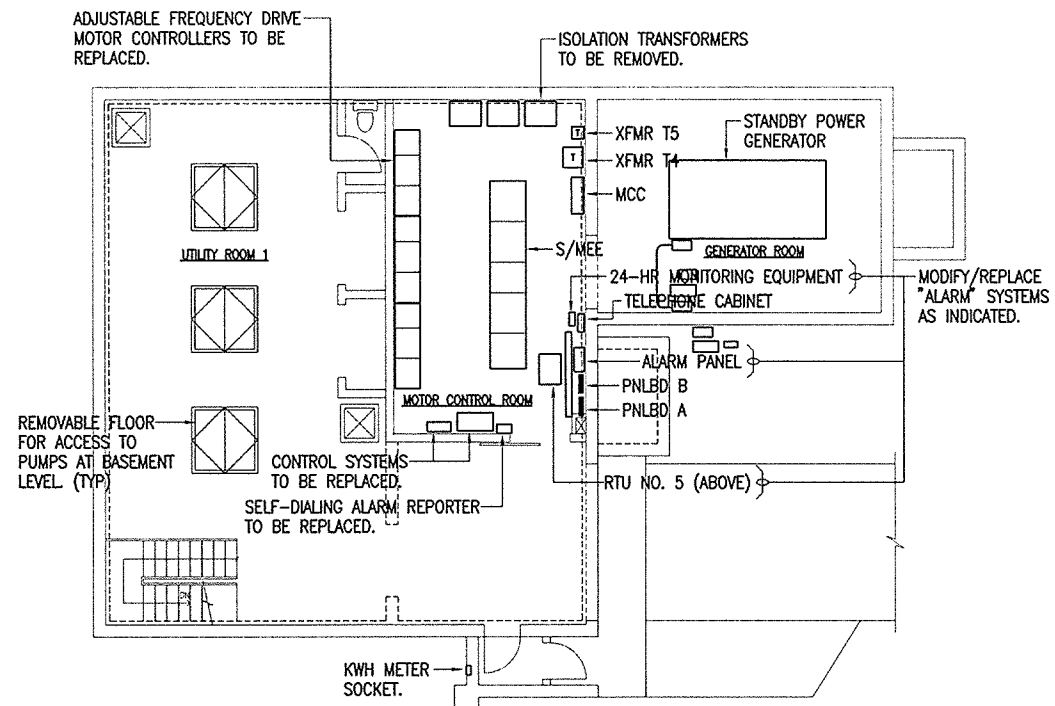


ELECTRICAL PLAN - SITE/LOCATION/GENERAL WORK SCOPE
 ~ 1" = 30'-0" TMK: 2-1-11: 4

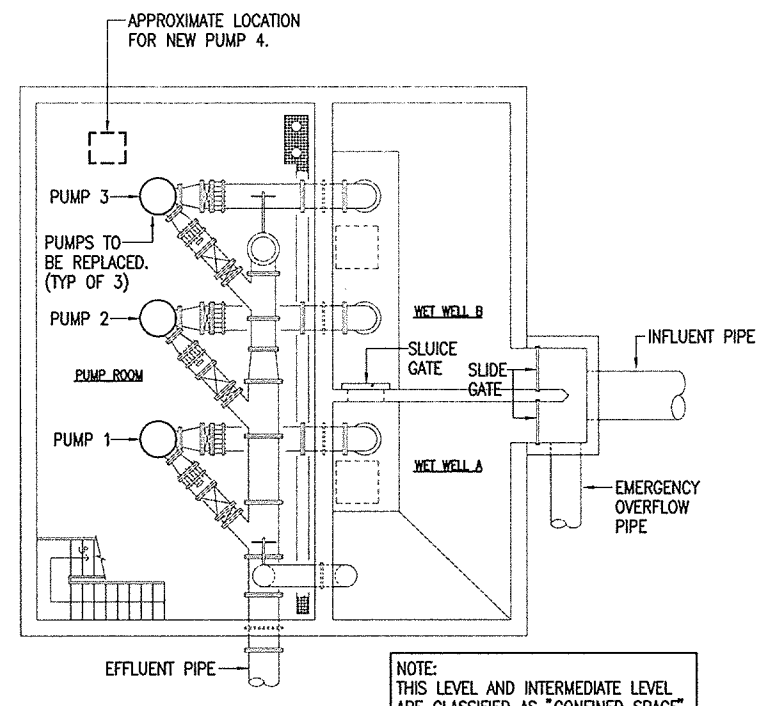
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ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED	WTO	WTO	WTO	WTO	WASTEWATER DIVISION CHIEF	DATE						

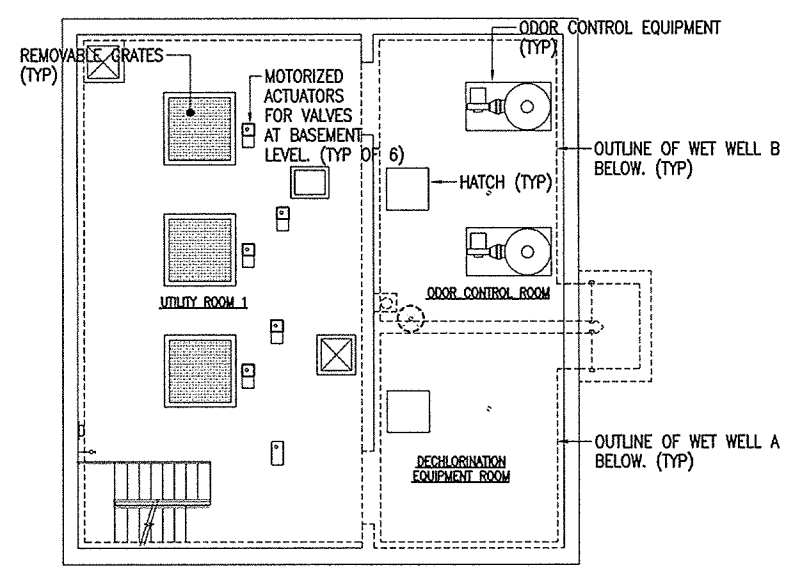


GROUND LEVEL

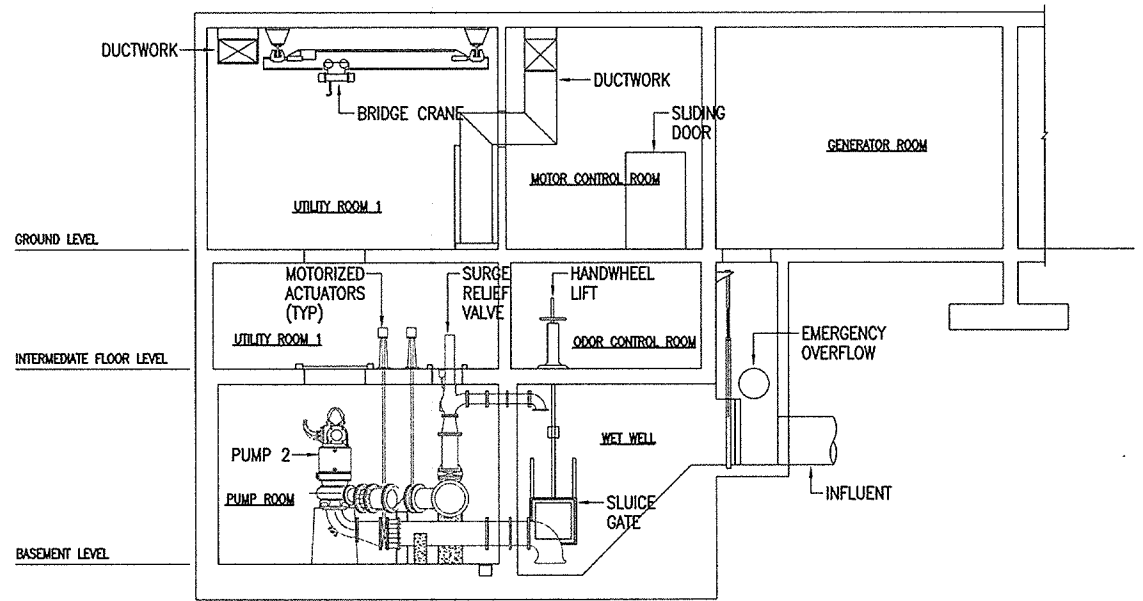


NOTE: THIS LEVEL AND INTERMEDIATE LEVEL ARE CLASSIFIED AS "CONFINED SPACE".

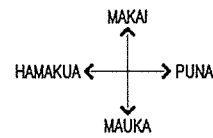
BASEMENT LEVEL



INTERMEDIATE FLOOR LEVEL



SECTION THRU PUMP STATION



ELECTRICAL PLANS - EXISTING - GENERAL

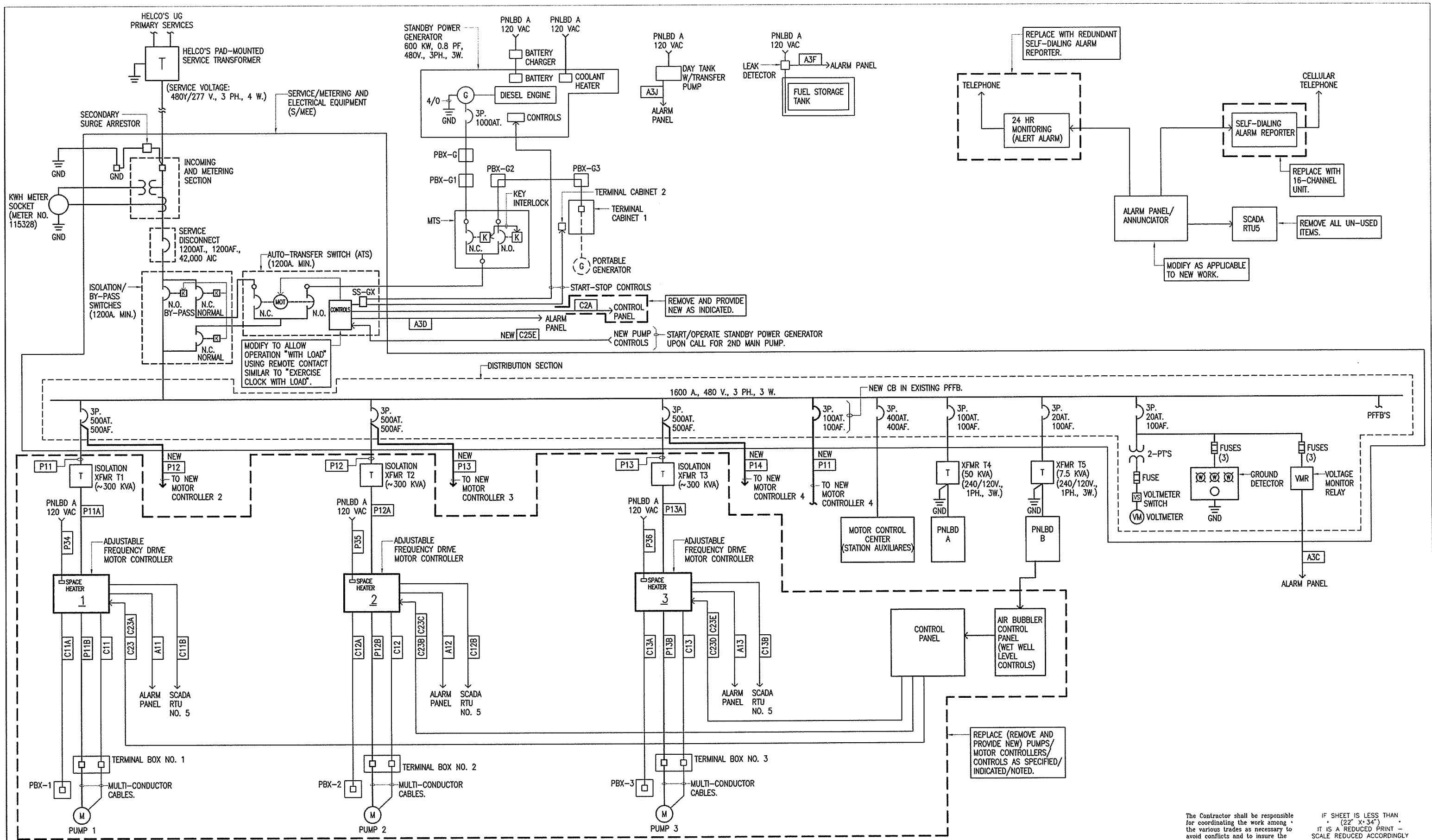
1/8" = 1' - 0"

NOTE: REFER TO MECHANICAL DRAWINGS FOR RECOMMENDED SEQUENCE OF WORK.

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ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED	WTO REF. NO. 92010217		WASTEWATER DIVISION CHIEF		DATE		ELECTRICAL PLANS - EXISTING - GENERAL					



ONE-LINE DIAGRAM - EXISTING SERVICE/DISTRIBUTION/CONTROLS/ALARMS - GENERAL

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 EMAIL: wtopeninc@hilonet.com

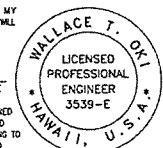
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 DRAWN LTK
 CHECKED LHN
 APPROVED WTO

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04/30/12
 SIGNATURE
 EXPIRATION DATE

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COUNTY OF HAWAII
 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 WASTEWATER DIVISION

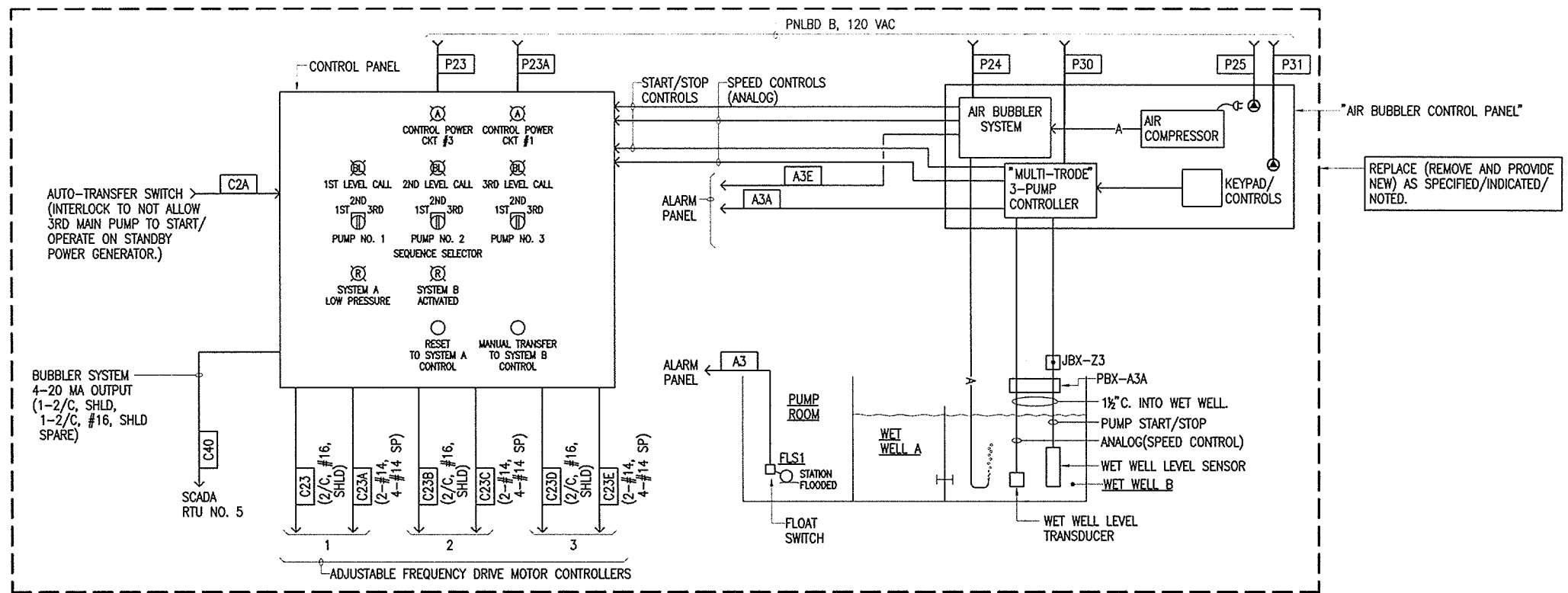
APPROVED BY: _____
 WASTEWATER DIVISION CHIEF

DATE: _____

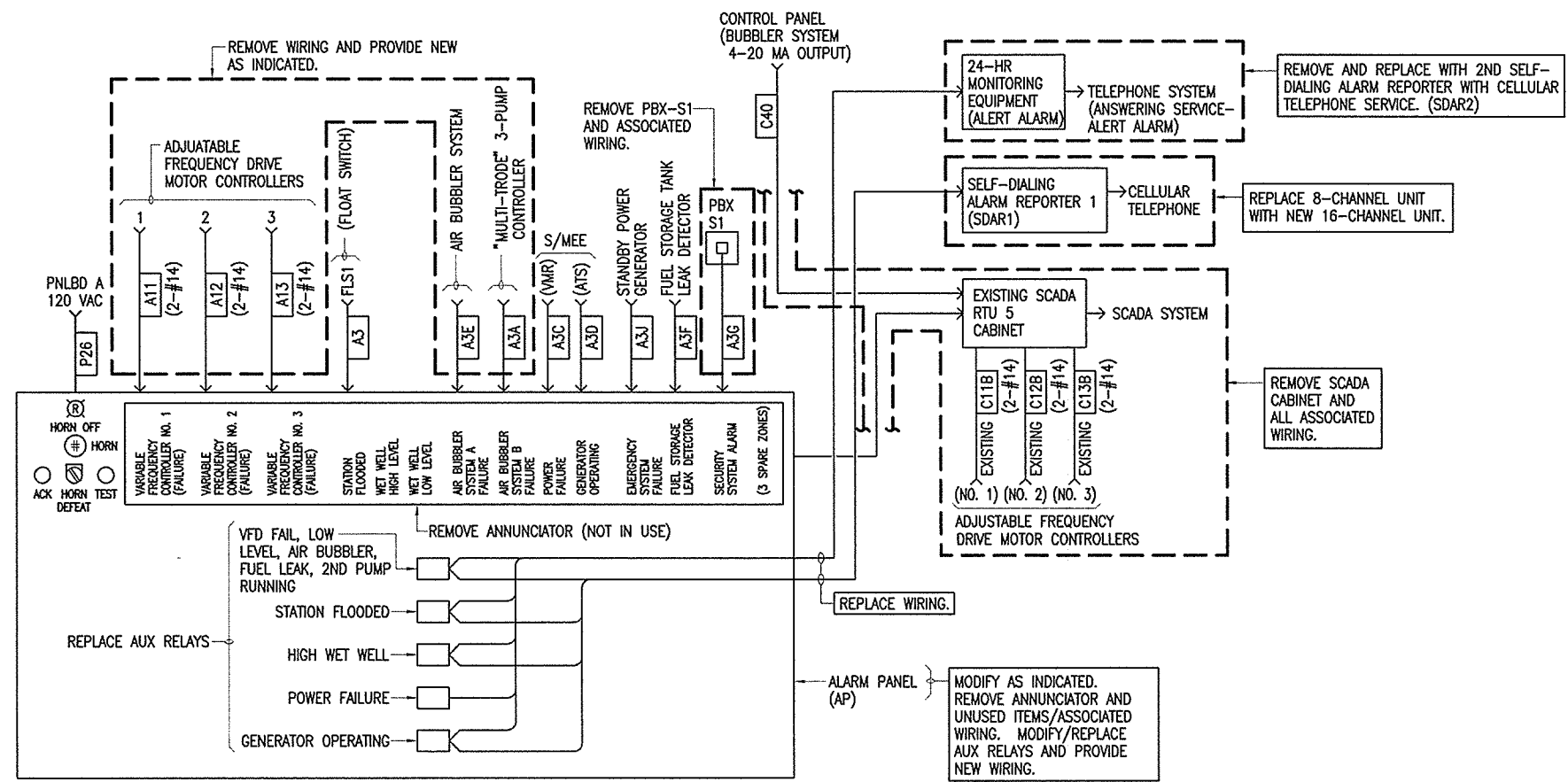
PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - EXISTING SERVICE/DISTRIBUTION

DRAWING NO. E-4
 SHEET 12 OF 28



ONE-LINE DIAGRAM - EXISTING CONTROL PANEL/WET WELL LEVEL CONTROLS



ONE-LINE DIAGRAM - EXISTING ALARM PANEL

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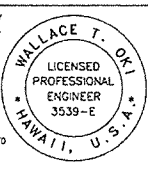
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COUNTY OF HAWAII
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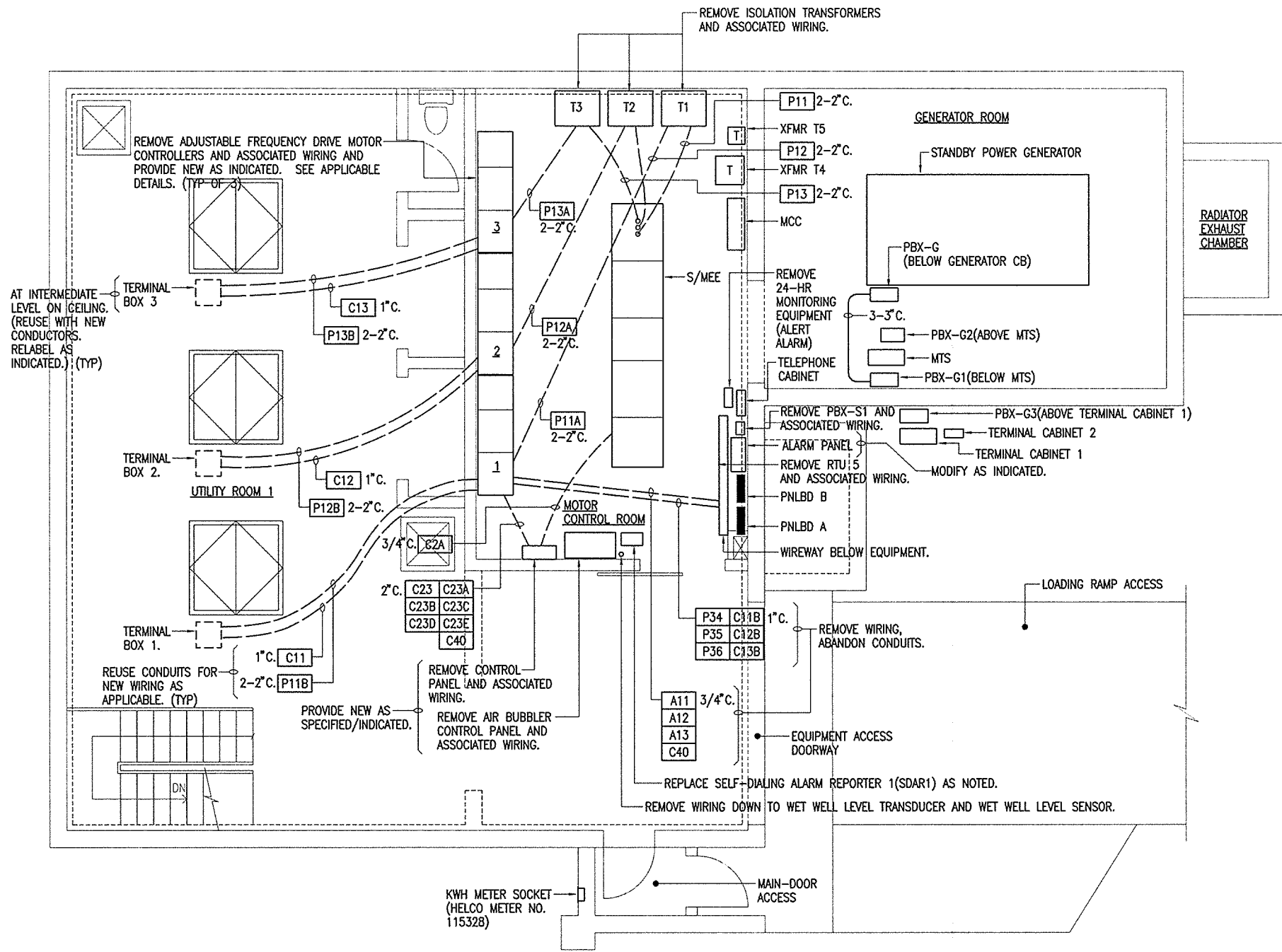
APPROVED BY: _____
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DATE: _____

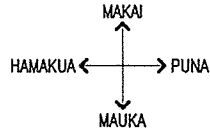
PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - EXISTING ALARM PANEL

DRAWING NO. **E-6**
 SHEET 14 OF 28



GROUND LEVEL



ELECTRICAL PLAN - EXISTING/DEMOLITION WORK

1/4" = 1' - 0"
 NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.

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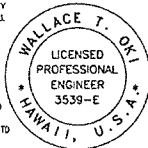
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 WASTEWATER DIVISION

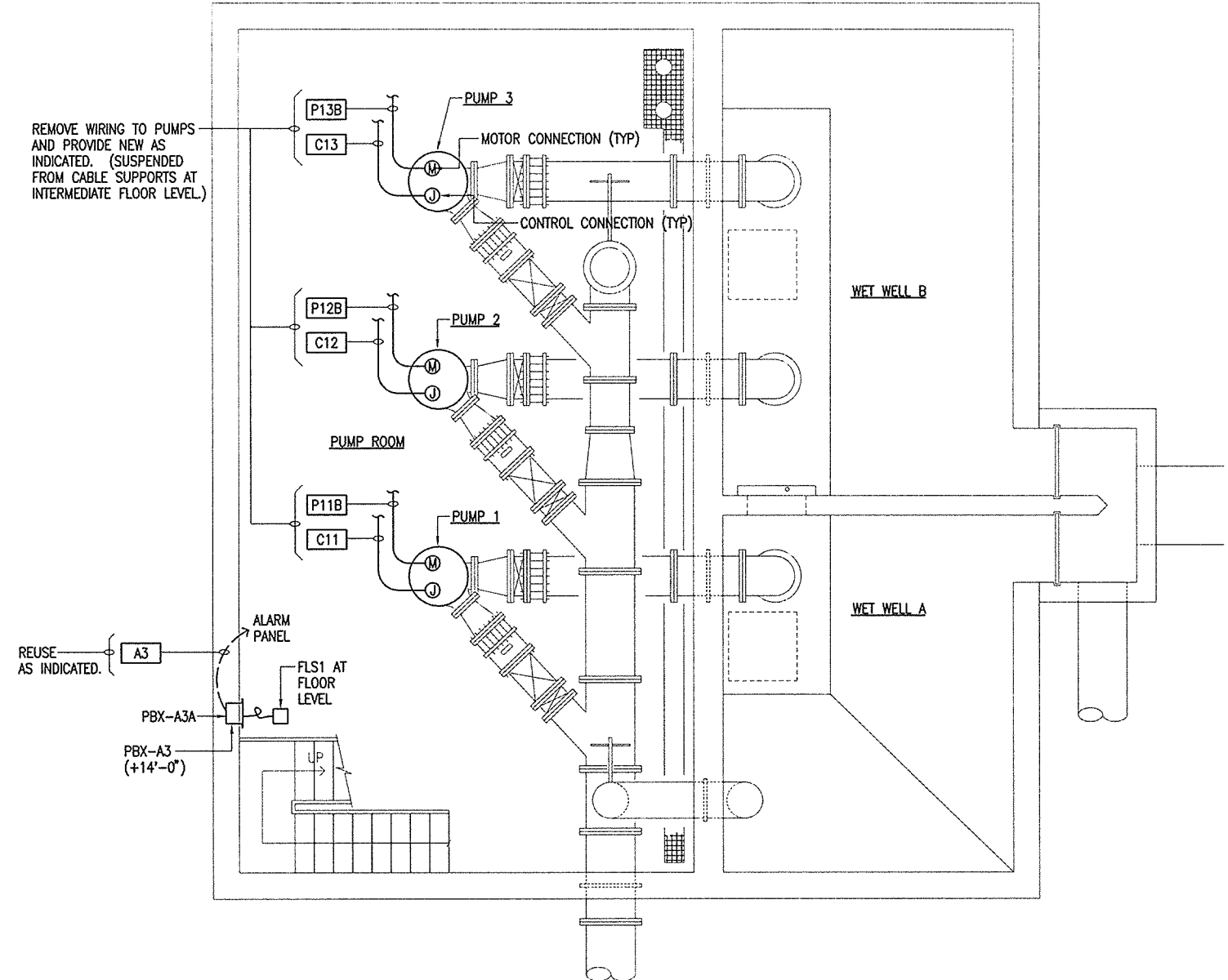
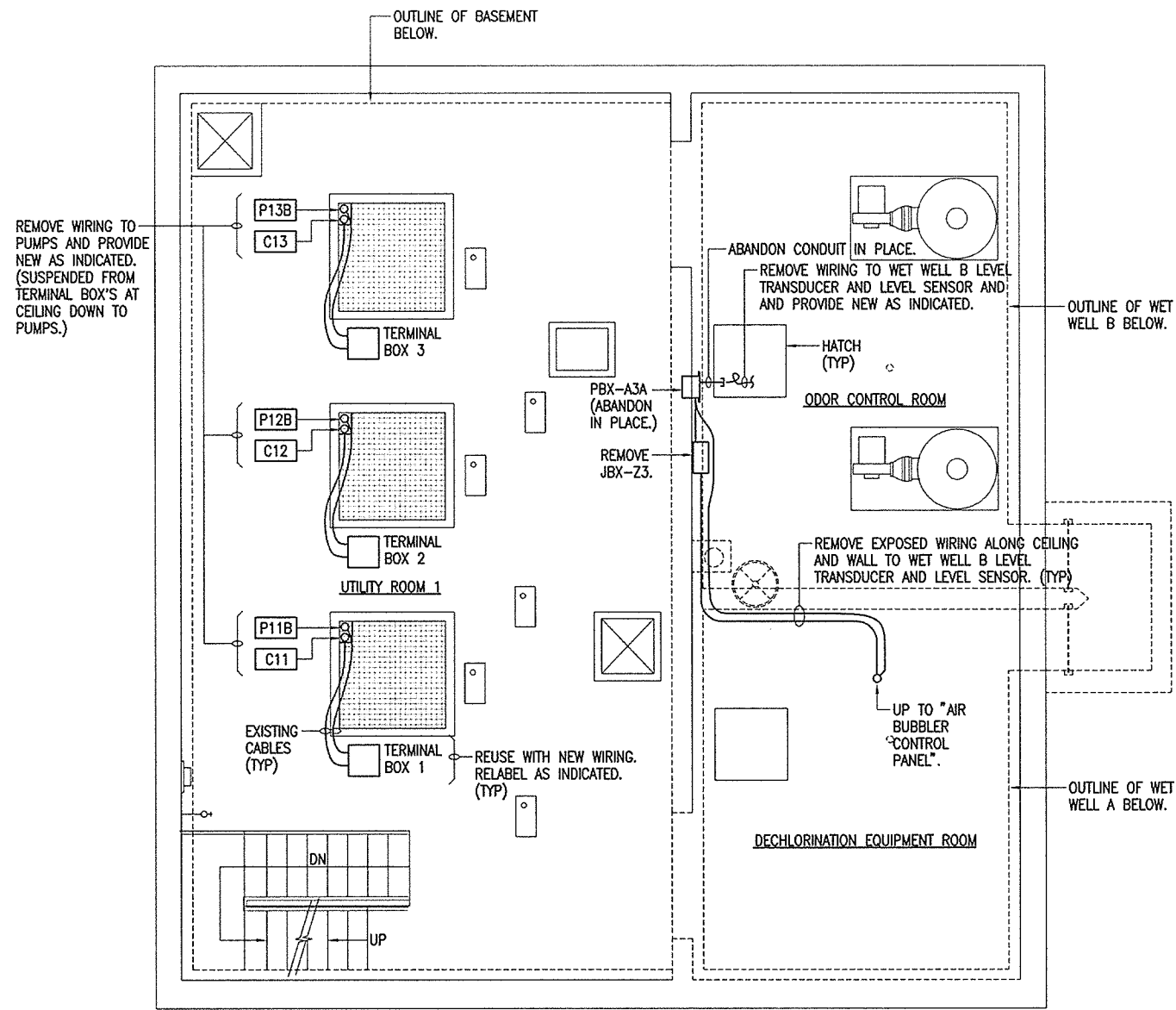
APPROVED BY: _____
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DATE: _____

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 COUNTY JOB NO. WW-4059

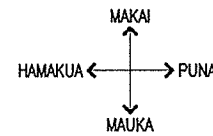
ELECTRICAL PLAN - EXISTING/DEMOLITION WORK

DRAWING NO.
E-7
 SHEET
 15 OF 28



INTERMEDIATE FLOOR LEVEL
 (NOTE: THIS LEVEL IS CLASSIFIED AS "CONFINED SPACE".)

BASEMENT LEVEL
 (NOTE: THIS LEVEL IS CLASSIFIED AS "CONFINED SPACE".)

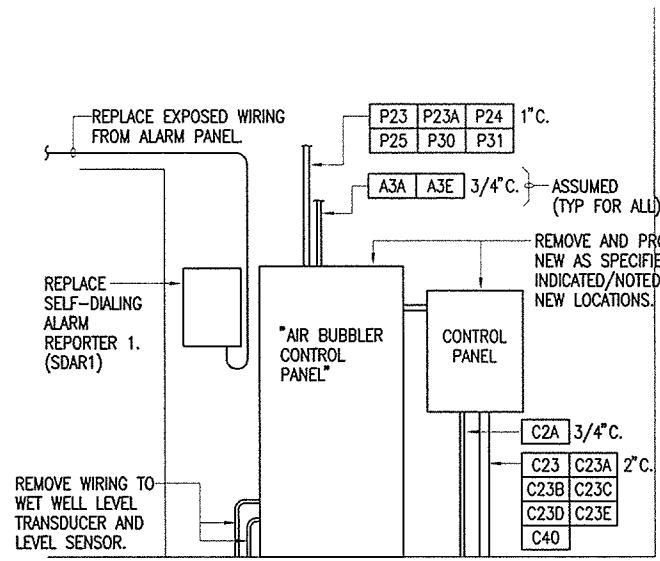


ELECTRICAL PLANS - EXISTING/DEMOLITION WORK

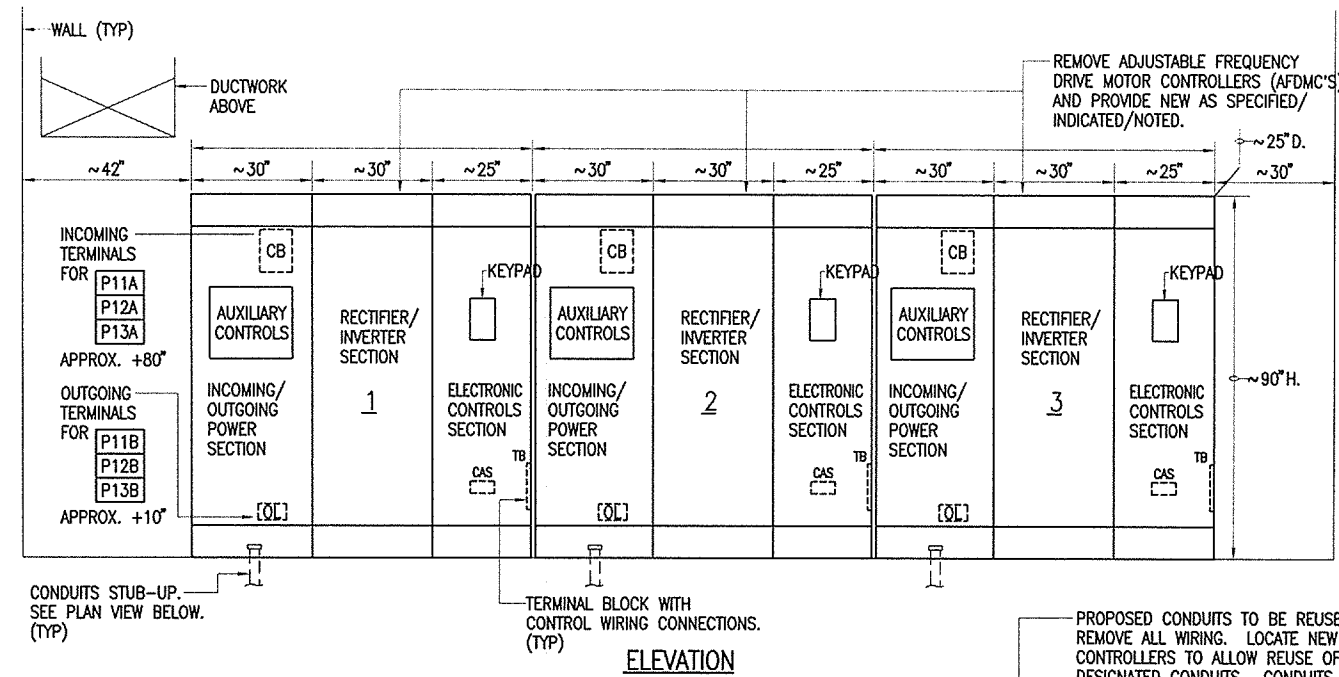
1/4" = 1' - 0"
 NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.

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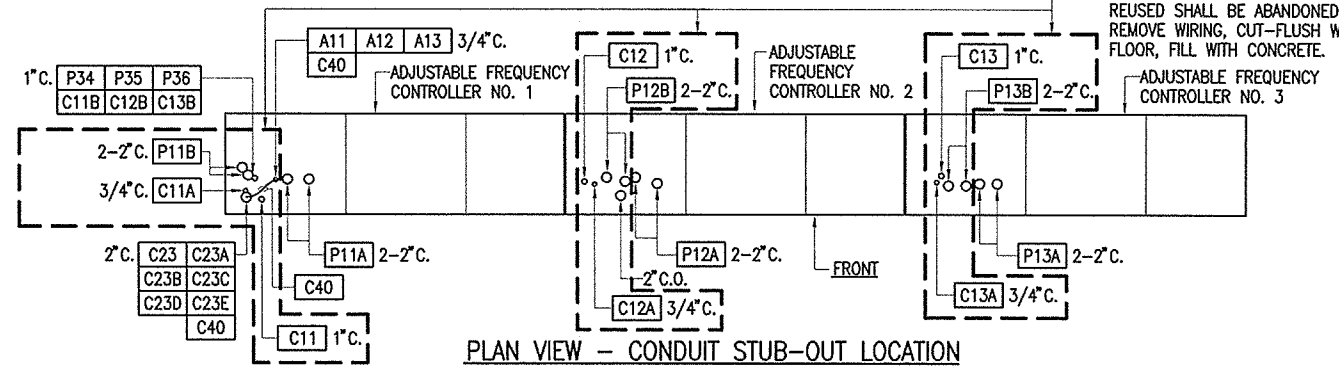
WALLACE T. OKI, P.E., INC. ELECTRICAL ENGINEERING P.O. BOX 4070/688 KINOOLE ST., STE. 1158 HILO, HI. 96720 PH:961-9666/FAX:9352549 EMAIL: wtopeinc@hilonet.com WTO REF. NO. 92010217						DESIGNED WTO	DRAWN LTK	CHECKED LHN	APPROVED WTO	APPROVED WTO	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. SIGNATURE: _____ EXPIRATION DATE: 04/30/12 SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.	COUNTY OF HAWAII DEPARTMENT OF ENVIRONMENTAL MANAGEMENT WASTEWATER DIVISION	PUA PUMP STATION PUMP MODIFICATIONS COUNTY JOB NO. WW-4059	DRAWING NO. E-8
ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED	WTO	WTO	WASTEWATER DIVISION CHIEF	DATE	ELECTRICAL PLANS - EXISTING/DEMOLITION WORK	SHEET 16 OF 28			



GENERAL ARRANGEMENT (TYP) - EXISTING CONTROL PANEL/ "AIR BUBBLER CONTROL PANEL"
NOT TO SCALE



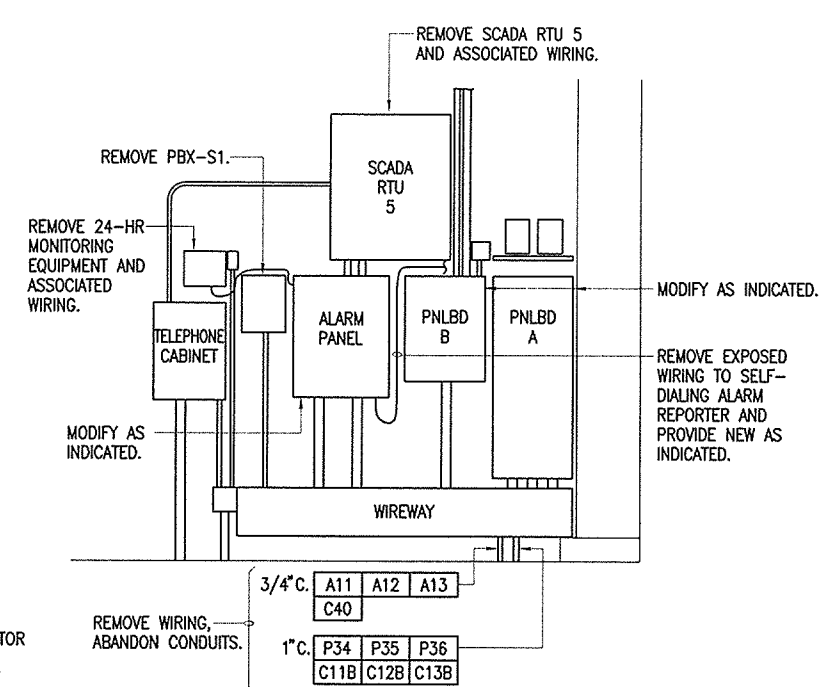
ELEVATION



PLAN VIEW - CONDUIT STUB-OUT LOCATION

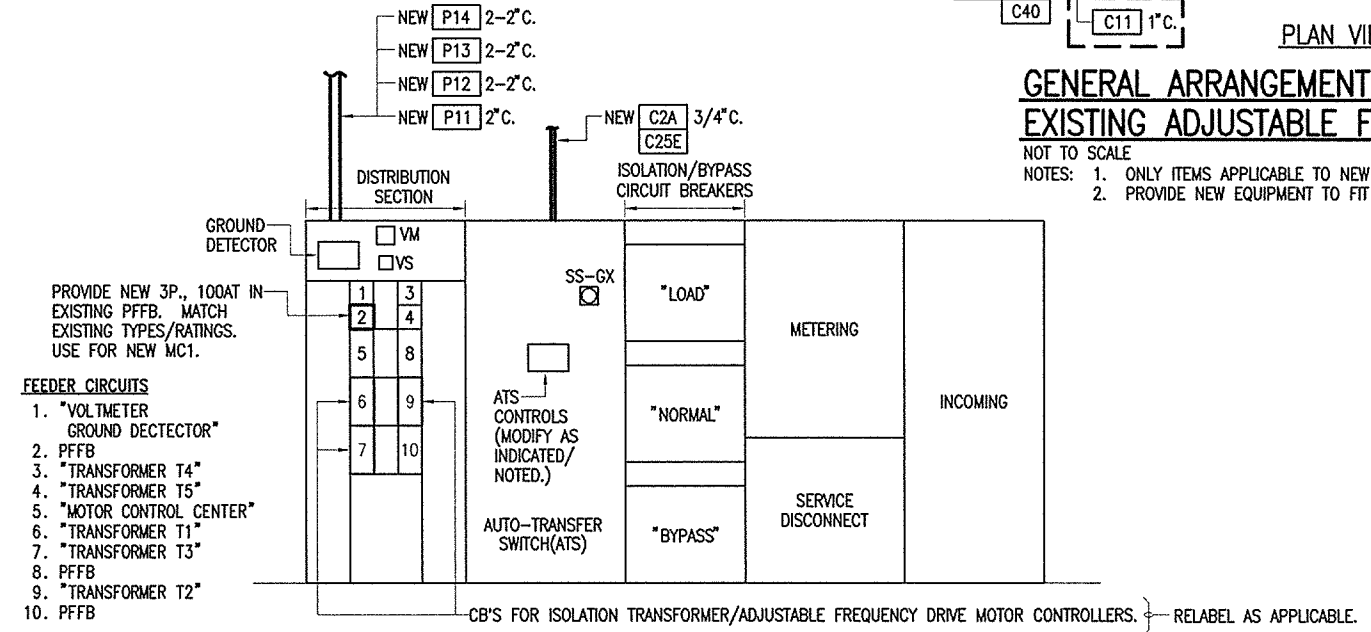
GENERAL ARRANGEMENT (TYP) - EXISTING ADJUSTABLE FREQUENCY DRIVE MOTOR CONTROLLER'S (AFDMC'S)
NOT TO SCALE

NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.
2. PROVIDE NEW EQUIPMENT TO FIT INTO AVAILABLE SPACES AND REUSE CONDUITS IN FLOOR.



GENERAL ARRANGEMENT (TYP) - EXISTING ALARM PANEL, PNLBD'S, SCADA RTU 5
NOT TO SCALE

NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.

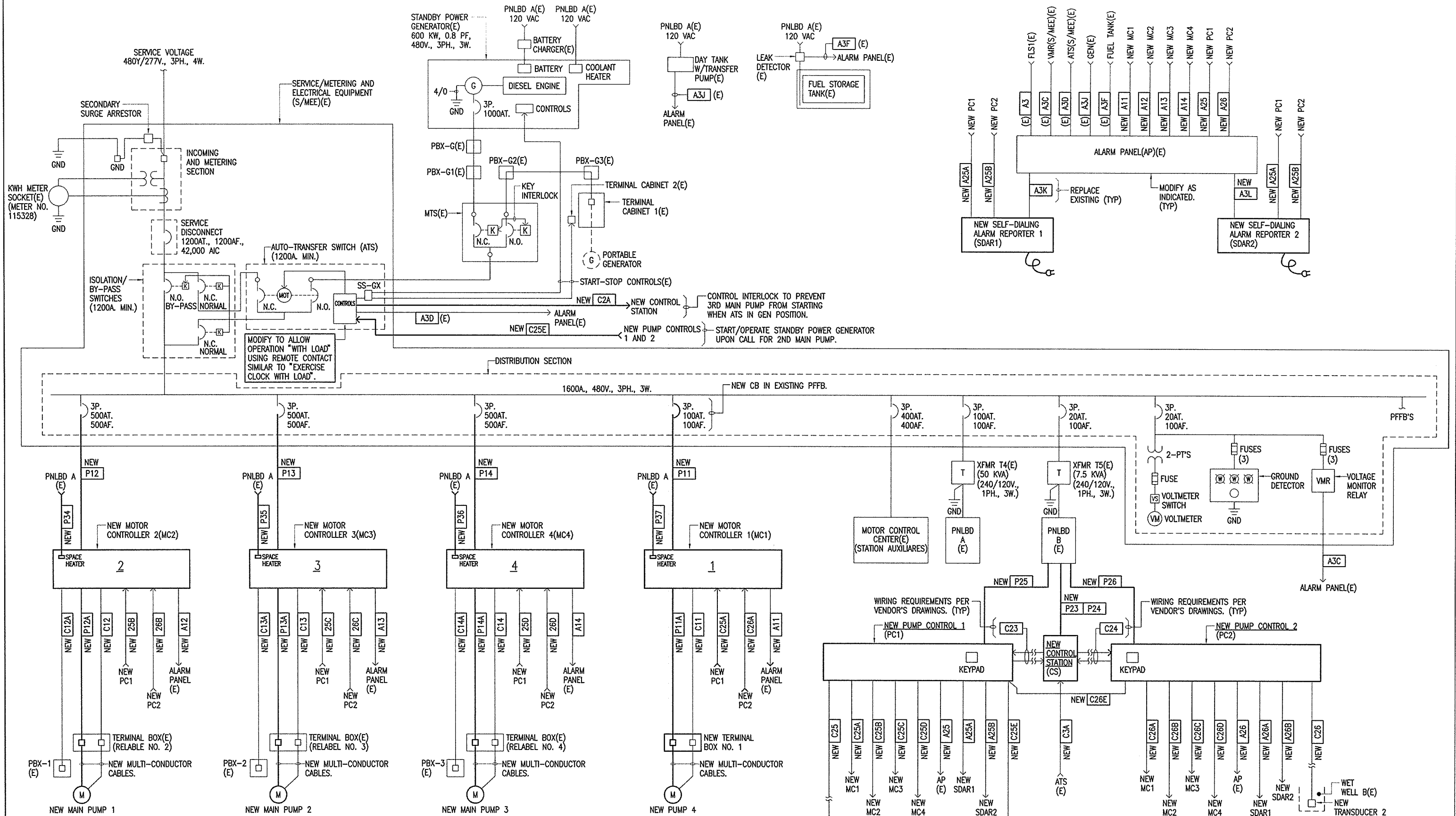


GENERAL ARRANGEMENT (TYP) - EXISTING SERVICE/METERING AND ELECTRICAL EQUIPMENT (S/MEE)
NOT TO SCALE

NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.

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ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED	DATE	DATE	DATE	DATE	DATE	DATE



ONE-LINE DIAGRAM - NEW WORK - GENERAL

NOTES: 1. ALL NEW EXCEPT AS INDICATED.
2. (E) = EXISTING ITEM

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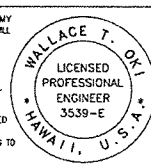
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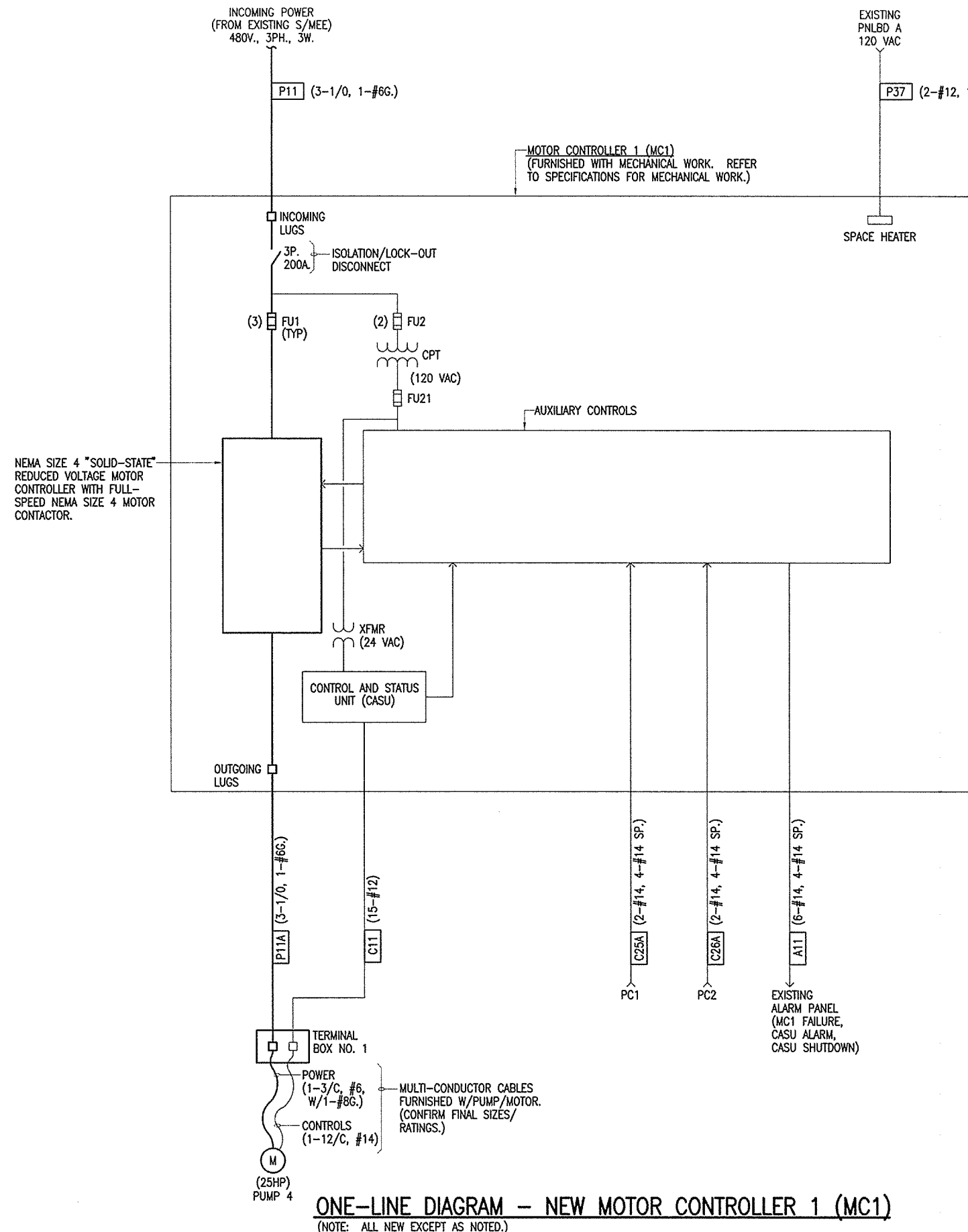


COUNTY OF HAWAII
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WASTEWATER DIVISION
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WASTEWATER DIVISION CHIEF
DATE: _____

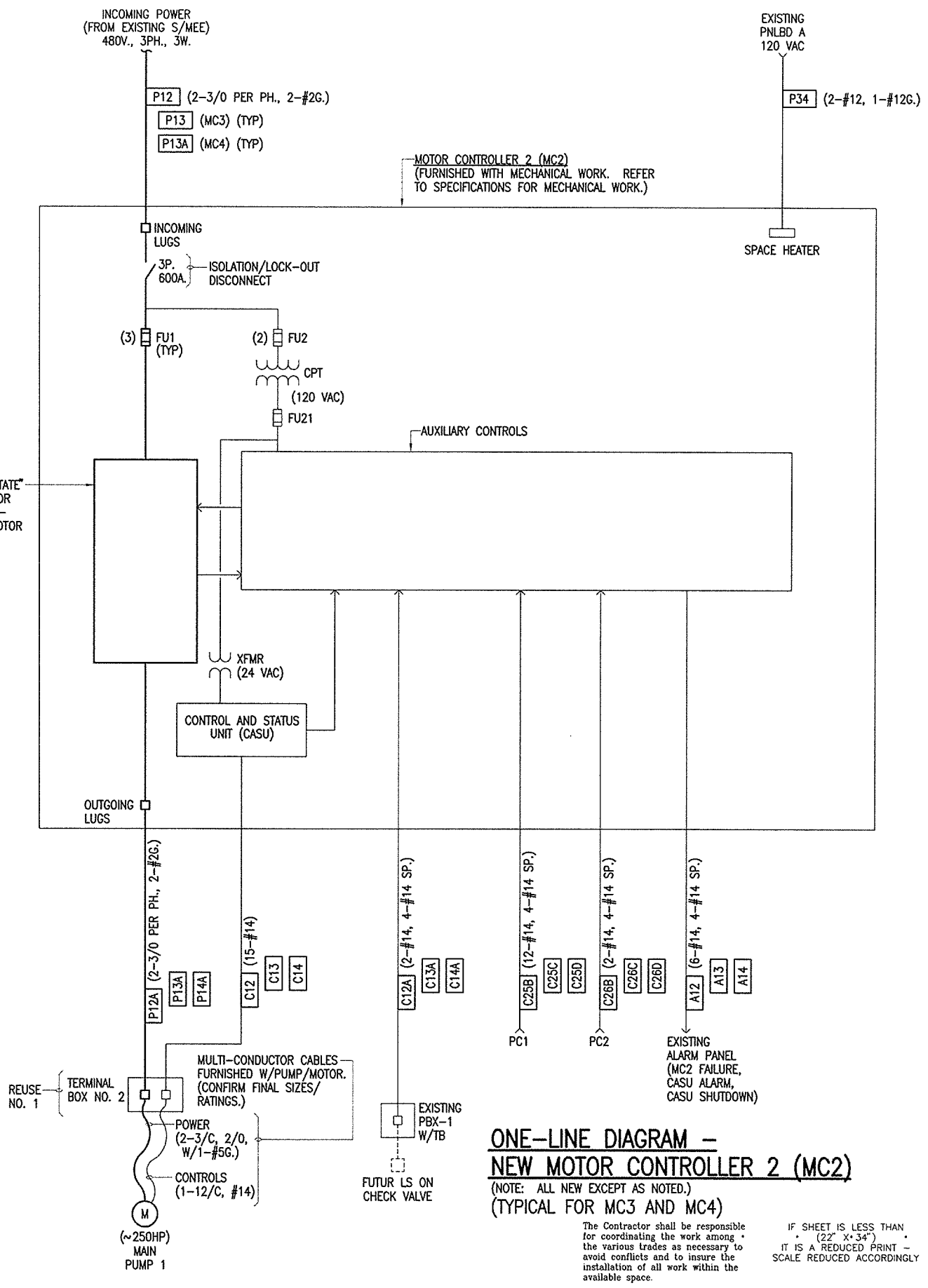
PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - NEW WORK - GENERAL

DRAWING NO.
E-10
SHEET
18 OF 28



ONE-LINE DIAGRAM - NEW MOTOR CONTROLLER 1 (MC1)
 (NOTE: ALL NEW EXCEPT AS NOTED.)



ONE-LINE DIAGRAM - NEW MOTOR CONTROLLER 2 (MC2)
 (NOTE: ALL NEW EXCEPT AS NOTED.)
 (TYPICAL FOR MC3 AND MC4)

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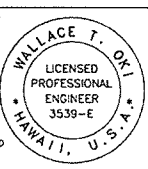
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COUNTY OF HAWAII
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 WASTEWATER DIVISION

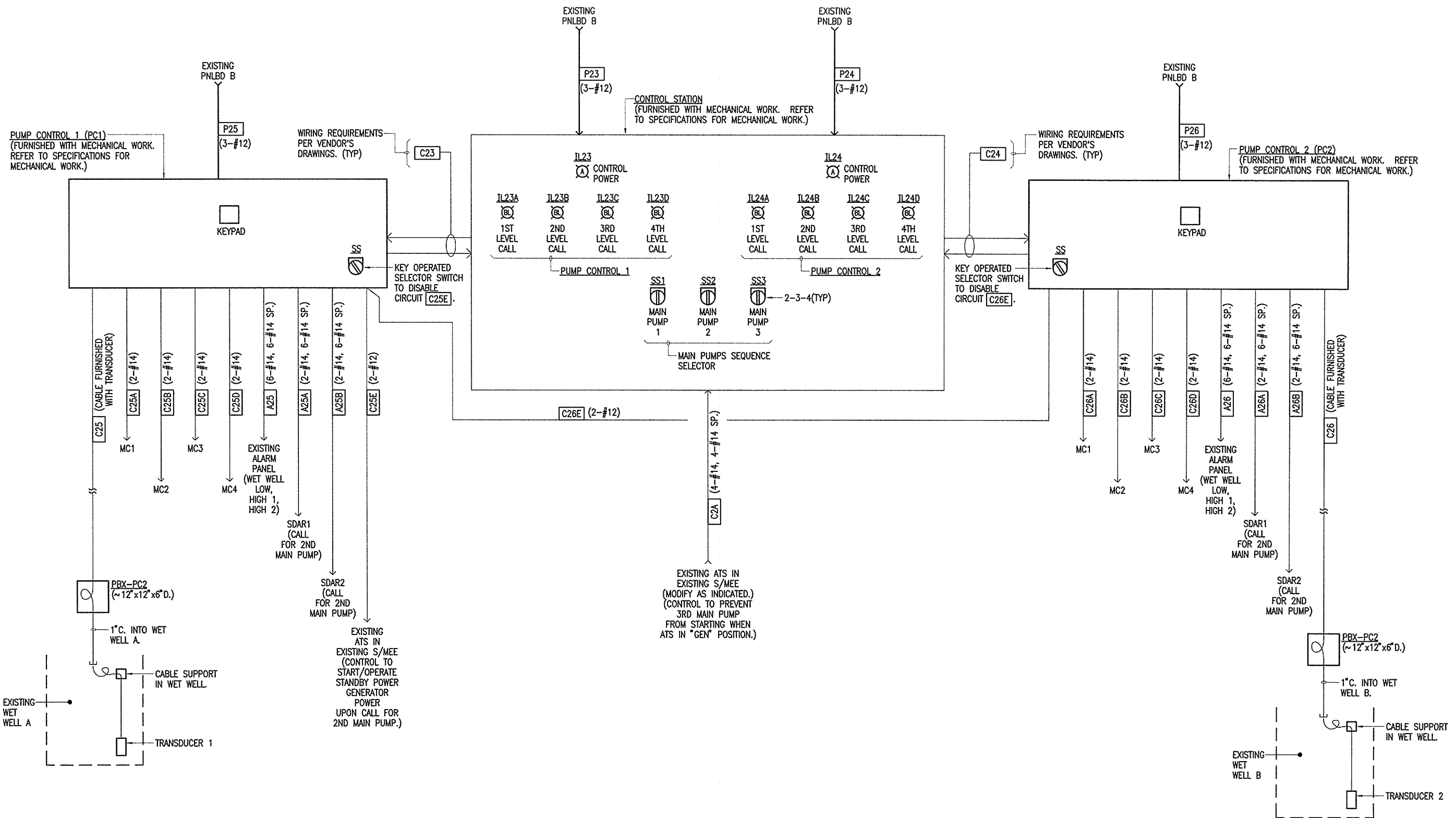
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DATE: _____

PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - NEW MOTOR CONTROLLERS

DRAWING NO. E-11
 SHEET 19 OF 28



ONE-LINE DIAGRAM - NEW CONTROL STATION(CS)/NEW PUMP CONTROL 1(PC1)/NEW PUMP CONTROL 2(PC2)
 (NOTE: ALL NEW EXCEPT AS NOTED.)

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 HAWAII, U.S.A.

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COUNTY OF HAWAII
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 WASTEWATER DIVISION

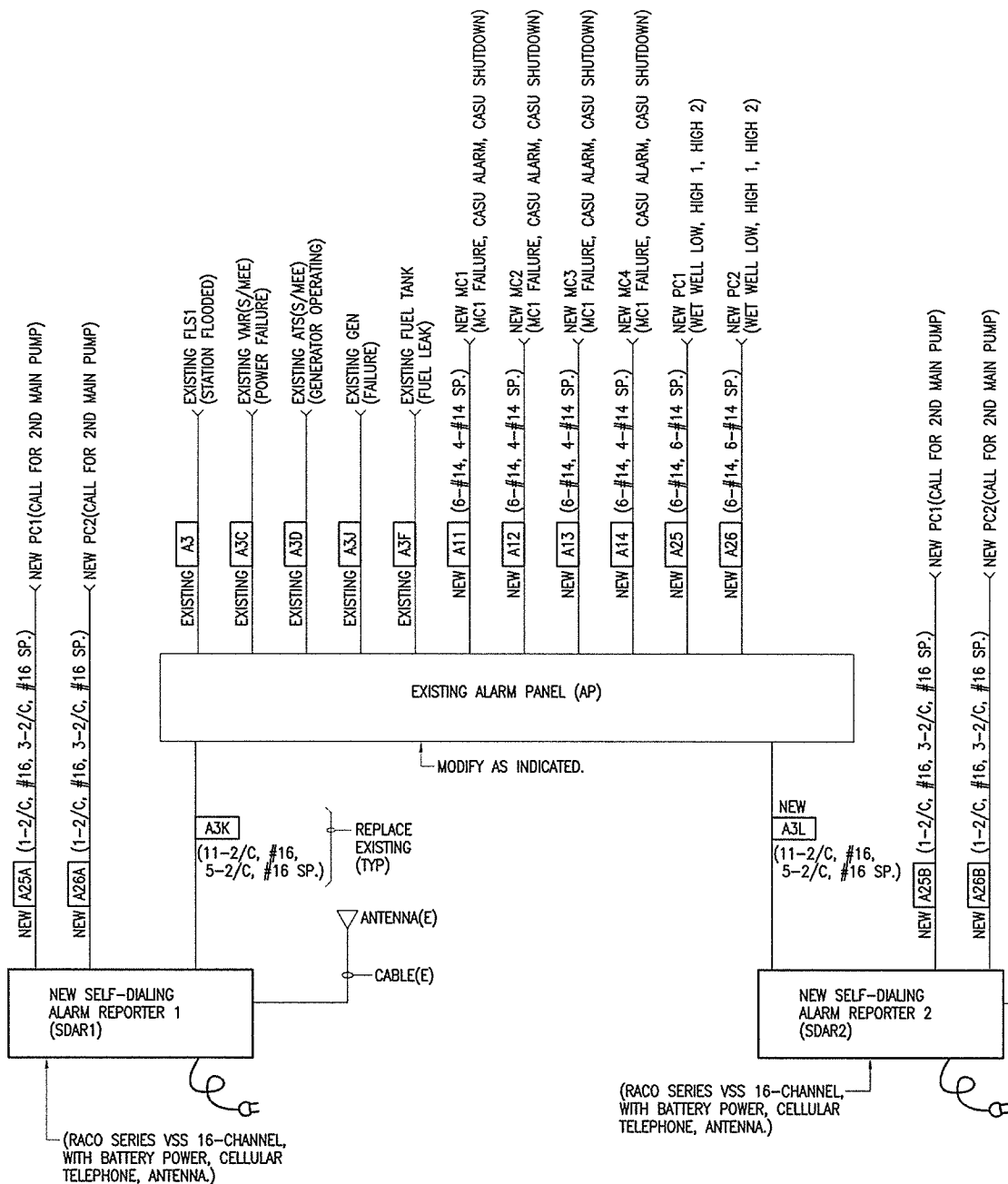
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DATE: _____

PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - NEW CONTROL STATION/
 NEW PUMP CONTROL 1 AND 2

DRAWING NO. E-12
 SHEET 20 OF 28



**ONE-LINE DIAGRAM - EXISTING ALARM PANEL(AP)/
NEW SELF-DIALING ALARM REPORTER 1(SDAR1)/NEW SELF-DIALING ALARM REPORTER 2(SDAR2)**

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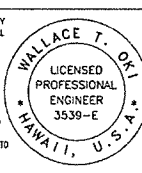
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COUNTY OF HAWAII
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WASTEWATER DIVISION

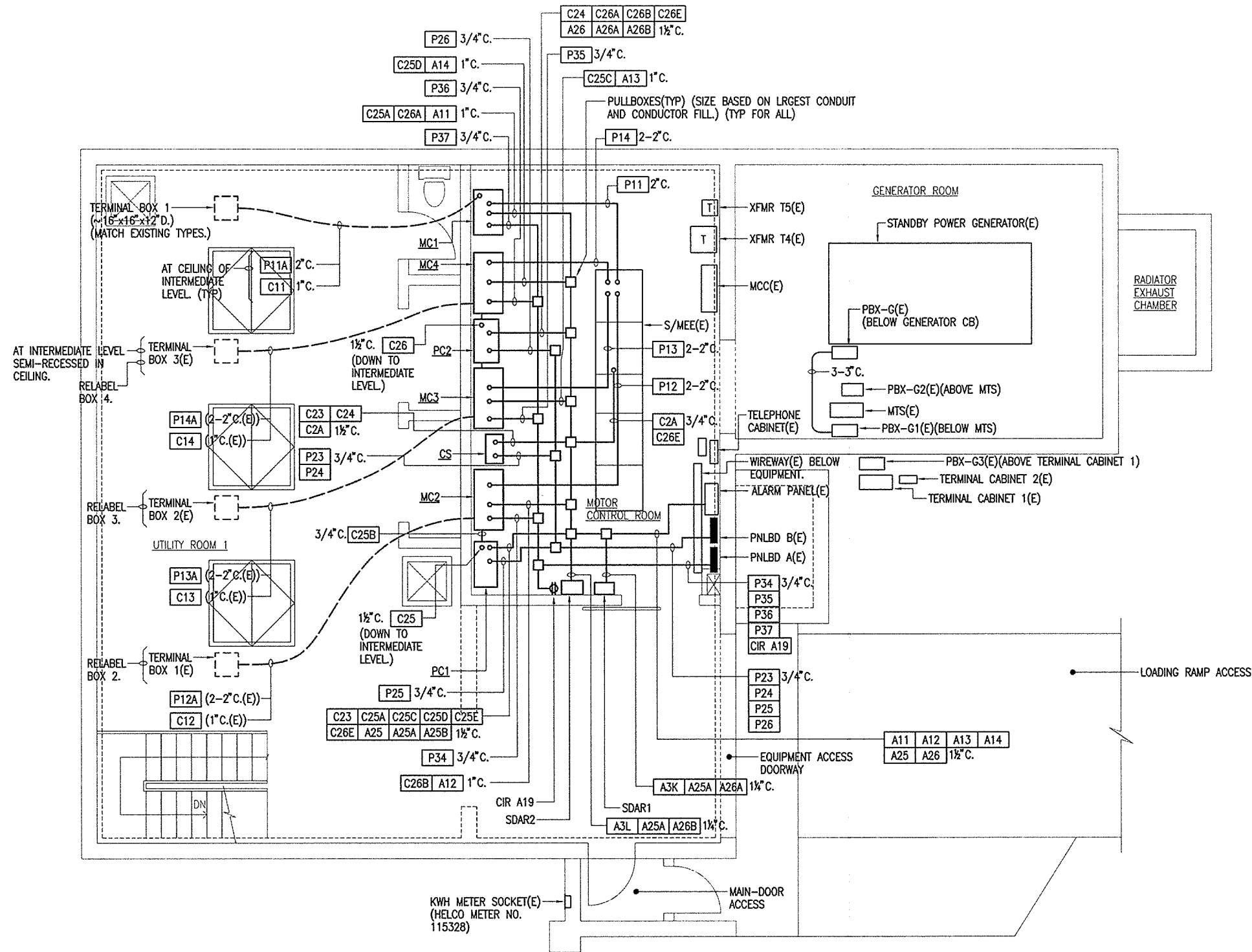
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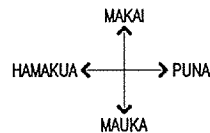
PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

ONE-LINE DIAGRAM - EXISTING ALARM PANEL(AP)/
EXISTING SELF-DIALING ALARM REPORTER 1(SDAR1)/
NEW SELF-DIALING ALARM REPORTER 2(SDAR2)

DRAWING NO. E-13
SHEET 21 of 28



GROUND LEVEL



ELECTRICAL PLAN - NEW WORK

- 1/4" = 1' - 0"
- NOTES:
1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.
 2. ALL NEW EXCEPT AS INDICATED.
 3. (E) = EXISTING ITEM

NOTE: ROUTING FOR NEW CONDUITS AFFECTING EXISTING LIGHTING FIXTURES IN MOTOR CONTROL ROOM. EXISTING LIGHTING FIXTURES ARE NOT INDICATED. NEW CONDUITS, PULLBOXES, FITTINGS, ETC SHALL BE FIELD LOCATED/FIELD ROUTED BELOW EXISTING LIGHTING FIXTURES. PROVIDE SUSPENDED "TRAPEZE" SUPPORTS FOR CONDUITS. PROVIDE \$8000 ALLOWANCE TO RELOCATE AND/OR PROVIDE NEW 10 - 2-LAMP FLUORESCENT FIXTURES TO BELOW NEW CONDUITS. (AT CONTRACTOR'S OPTION, A WIREWAY SYSTEM MAY BE PROVIDED ABOVE PC1, MC2, CS, MC3, PC2, MC4, MC1 TO ROUTE NEW WIRING.)

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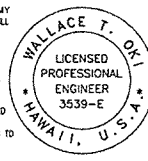
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 ELECTRICAL ENGINEERING
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 HILO, HI. 96720 PH:961-9666/FAX:9352549
 EMAIL: wtopeinc@hiltonet.com

WTO REF. NO. 92010217

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CHECKED LHN	APPROVED WTO
APPROVED WTO	APPROVED WTO

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DATE: 04/30/12
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 EXPIRATION DATE: _____
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COUNTY OF HAWAII
 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 WASTEWATER DIVISION

APPROVED BY: _____
 WASTEWATER DIVISION CHIEF

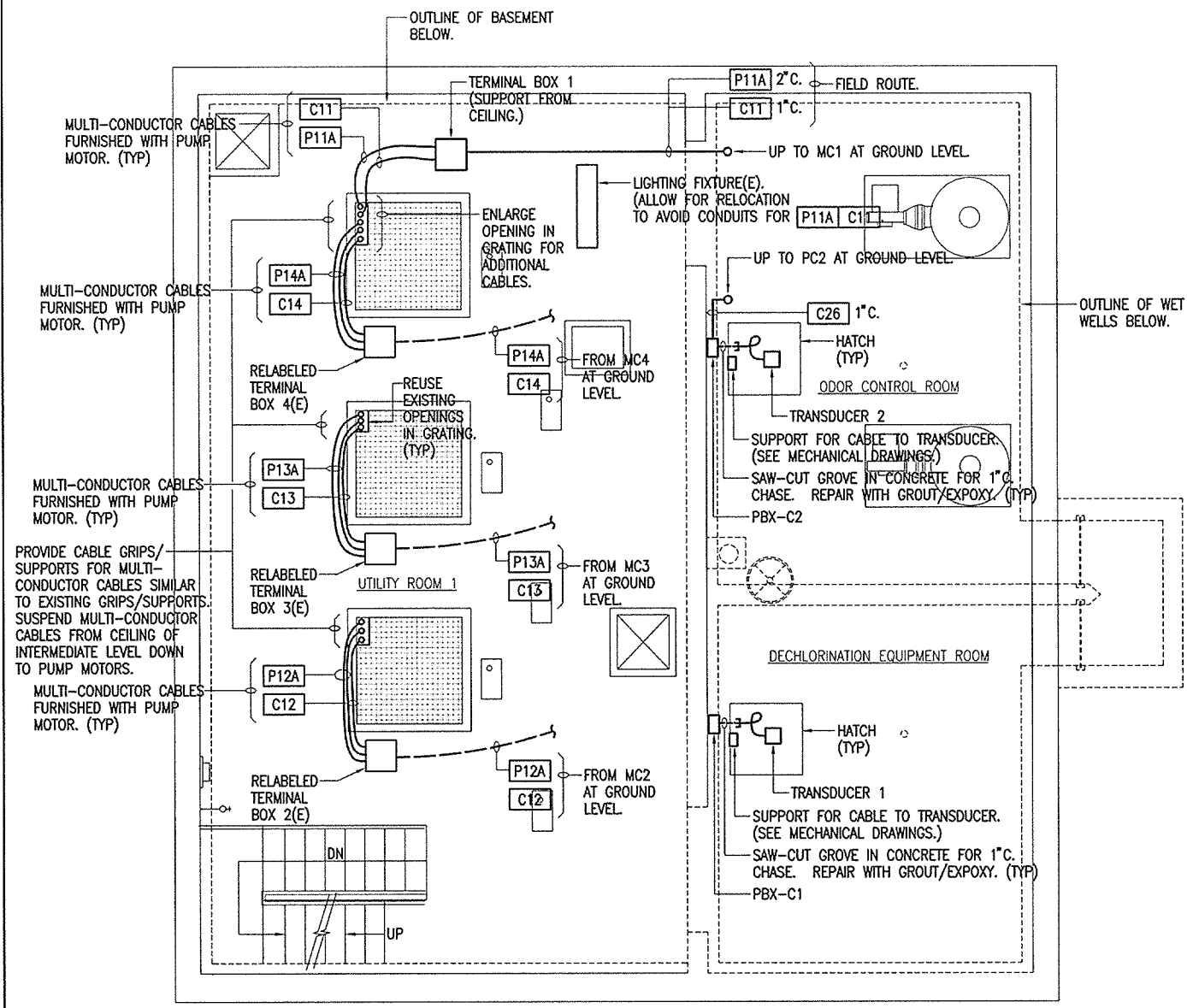
PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

ELECTRICAL PLAN - NEW WORK

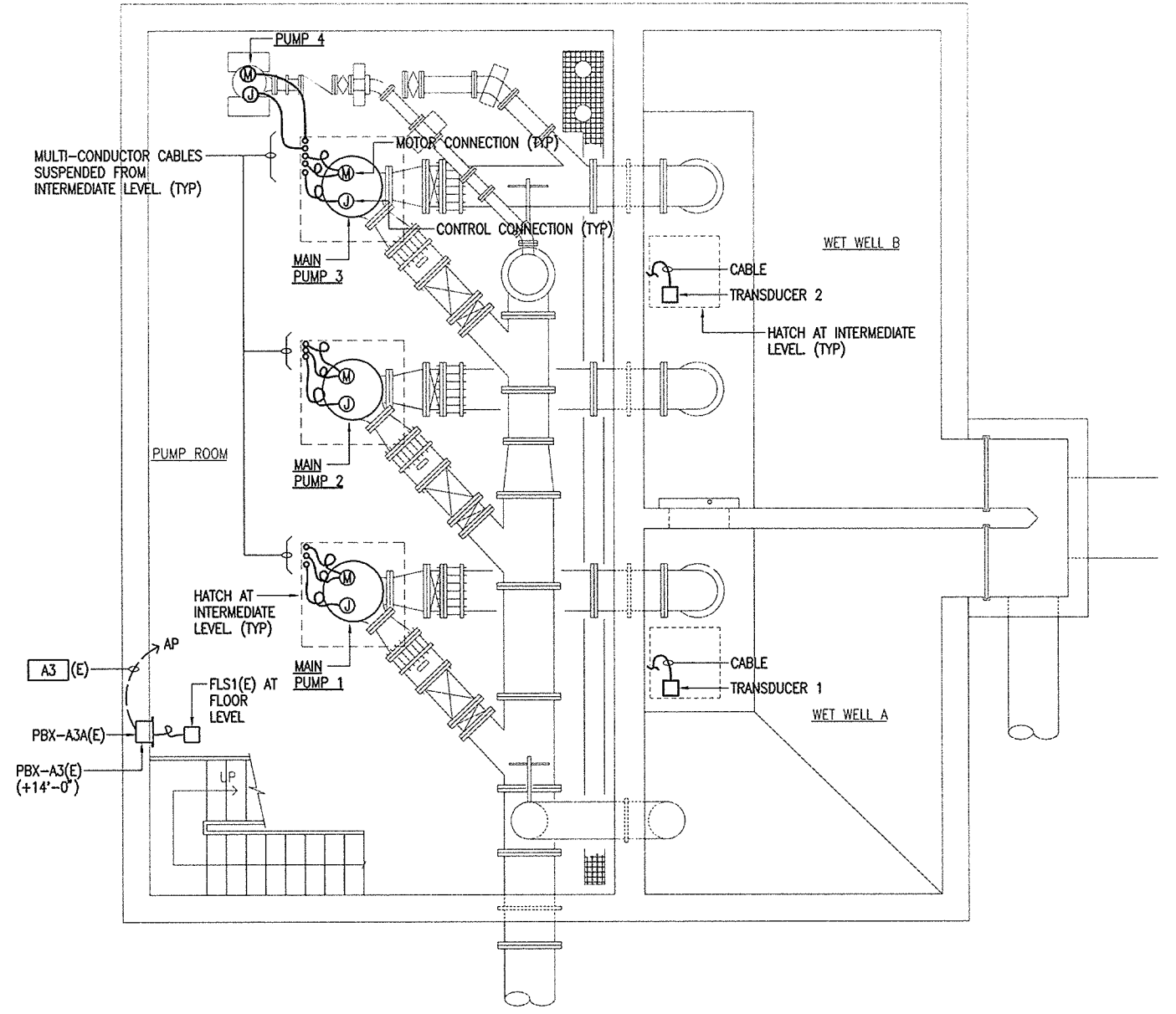
DRAWING NO.
E-14
 SHEET
 22 OF 28

The Contractor shall be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

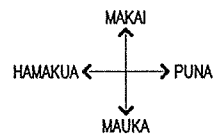
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INTERMEDIATE FLOOR LEVEL
 (NOTE: THIS LEVEL IS CLASSIFIED AS "CONFINED SPACE".)



BASEMENT LEVEL
 (NOTE: THIS LEVEL IS CLASSIFIED AS "CONFINED SPACE".)



ELECTRICAL PLANS - NEW WORK

- 1/4" = 1' - 0"
- NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.
 2. ALL NEW EXCEPT AS INDICATED.
 3. (E) = EXISTING ITEM

ZONE	NUMBER	REVISION DESCRIPTION	MADE BY	DATE	CHECKED

WALLACE T. OKI, P.E., INC.
ELECTRICAL ENGINEERING
 P.O. BOX 4070/688 KINOOLE ST., STE. 1158
 HILO, HI. 96720 PH:961-9666/FAX:9352549
 EMAIL: wtopeinc@hilonet.com

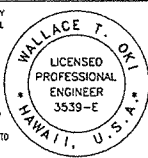
WTO REF. NO. 92010217

DESIGNED WTO	DRAWN LTK
CHECKED LHN	APPROVED WTO

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

04/20/12
 EXPIRATION DATE

SIGNATURE _____
 SUPERVISION OF CONSTRUCTION TO BE AS DEFINED IN SECTION 16-82-2, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII, RELATING TO PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS.



COUNTY OF HAWAII
 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 WASTEWATER DIVISION

APPROVED BY: _____
 WASTEWATER DIVISION CHIEF

DATE _____

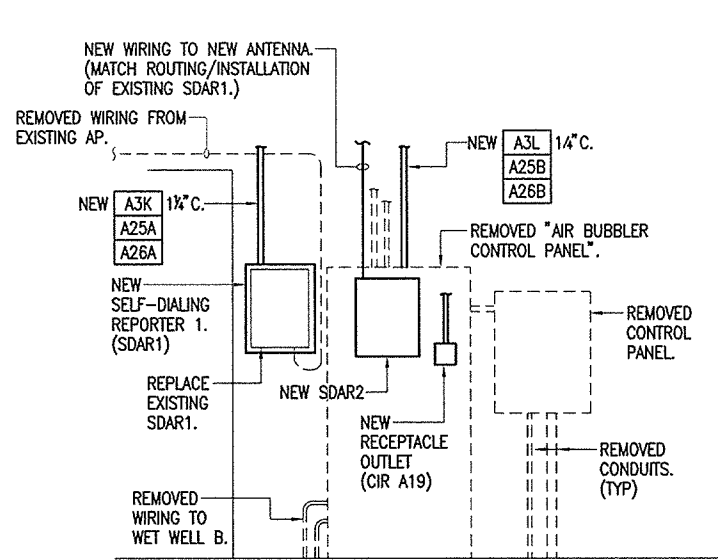
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ELECTRICAL PLANS - NEW WORK

DRAWING NO.
E-15
 SHEET
 23 OF 28

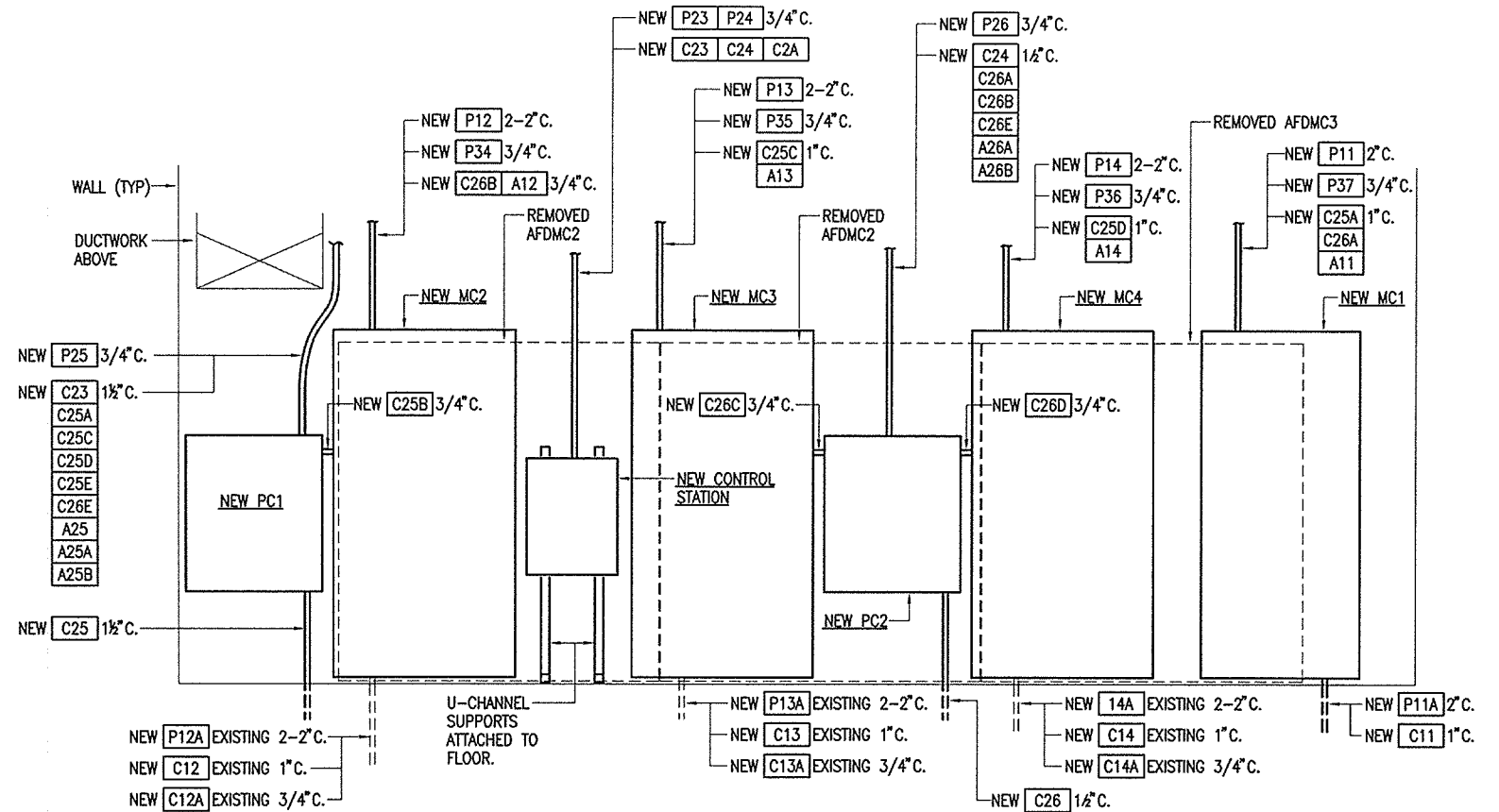
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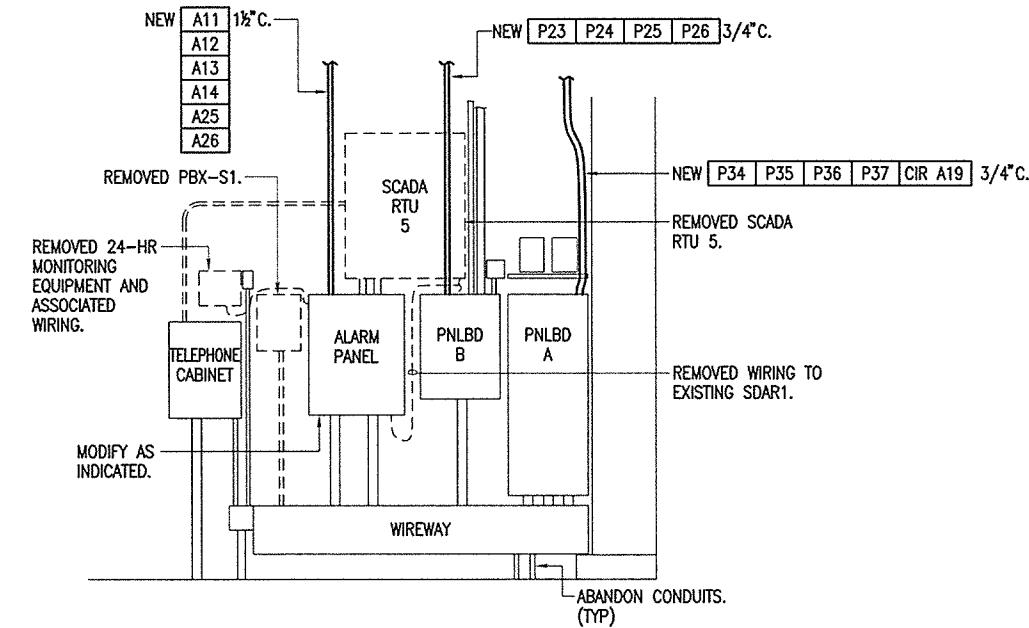


**GENERAL ARRANGEMENT (TYP) - NEW WORK
NEW SDAR1/NEW SADR2**

NOT TO SCALE
NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.

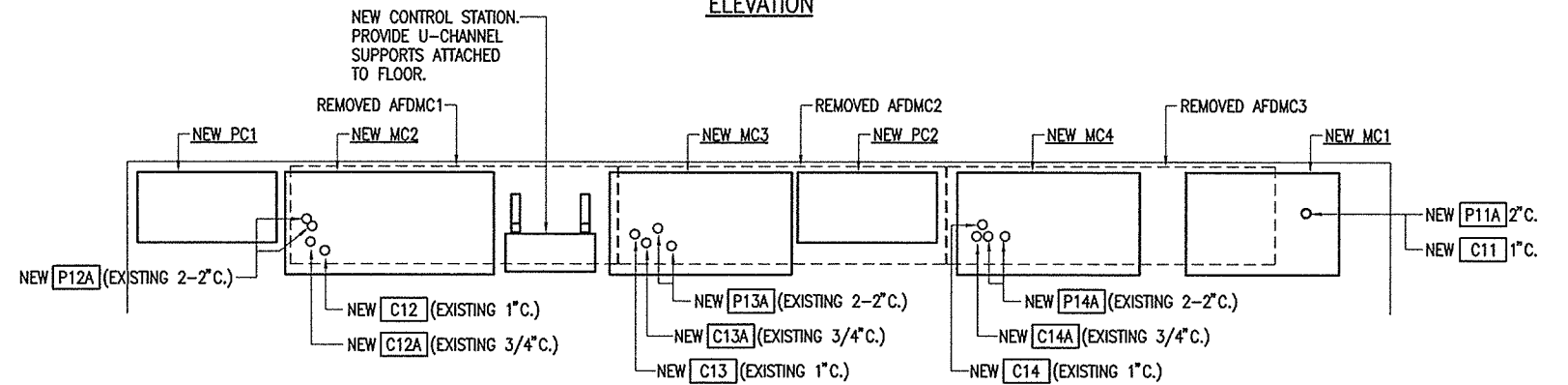


ELEVATION



**GENERAL ARRANGEMENT (TYP) - NEW WORK -
EXISTING ALARM PANEL, PNLBD'S**

NOT TO SCALE
NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.



PLAN

**GENERAL ARRANGEMENT (TYP) - NEW WORK -
NEW MC1, NEW MC2, NEW MC3, NEW MC4, NEW CONTROL STATION, NEW PC1, NEW PC2**

NOT TO SCALE
NOTES: 1. ONLY ITEMS APPLICABLE TO NEW ELECTRICAL WORK ARE INDICATED.
2. PROVIDE NEW EQUIPMENT TO FIT INTO AVAILABLE SPACES AND REUSE CONDUITS WHERE INDICATED.

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COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

APPROVED BY: _____
WASTEWATER DIVISION CHIEF

DATE: _____

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COUNTY JOB NO. WW-4059

GENERAL ARRANGEMENTS - (TYP) - NEW WORK

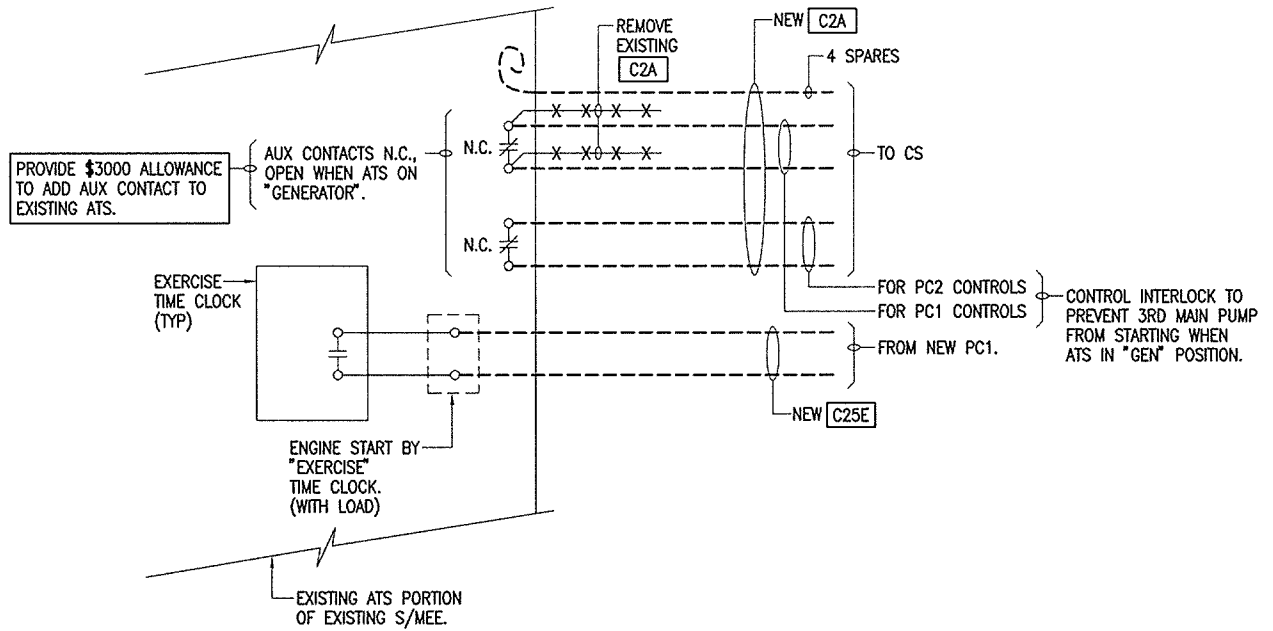
DRAWING NO. **E-16**
SHEET 24 OF 28

EXISTING PNLBD A		240/120V., 1PH., 3W., 225A. MLO (G.E. SERIES A)									
WIRE SIZE	SERVICE	CIR. BKR.		CIR. NO.	CIR. NO.	CIR. BKR.		SERVICE	WIRE SIZE		
		AMP	POLE			AMP	POLE				
3	BATT CHRGR	20	1	L1	2	1	20	R-SUMP PUMP 1		3	
3	ENGINE COOLANT HTR	20	1	L2	4	1	20	R-SUMP PUMP 2		3	
3	BATT CHRGR	20	2	L1	6	1	20	R-BASEMENT		3	
				L2	8	1	20	R-BASEMENT		3	
3	DAY TANK	20	1	L1	10	1	20	R-INT FLR ODOR		3	
3	LEAK DETECTOR	20	1	L2	12	1	20	R-INT FLR DECHLOR		3	
4	ALARM PANEL	20	1	L1	14	1	20	R-INT		3	
4	SPARE	20	1	L2	16	1	20	R-INT		3	
4	SELF-DIALER	20	1	L1	18	1	20	R-GEN RM		3	
4	#12 SECURITY SYSTEM SDAR2	20	1	L2	20	1	20	R-MECH RM		3	
3	SPACE HEATERS	20	1	L1	22	1	20	R-MECH/UTILITY RM		3	
3	BATT CHARGER	30	1	L2	24	1	20	R-UTILITY 2		3	
3	SH MCC	20	1	L1	26	1	20	R-UTILITY 2		3	
5	#12 SH VFD-1 MC2 SPACE HTR	20	1	L2	28	1	20	L-EMERG		3	
5	#12 SH VFD-2 MC3 SPACE HTR	20	1	L1	30	1	20	L-GEN RM		3	
5	#12 SH VFD-3 MC4 SPACE HTR	20	1	L2	32	1	20	L-MCC		3	
3	L-WET WELL	20	1	L1	34	1	20	L-UTILITY 2		3	
3	L-PUMP RM	20	1	L2	36	1	20	L-UTILITY 2		3	
3	L-STAIRS	20	1	L1	38	1	20	L-UTILITY 1		3	
3	PROV FOR FEEDER TO PNLBD B	60	2	L2	40	1	20	L-ODOR/DECHLOR		3	
				L1	42	1	20	PFBB MC1 SPACE HTR	#12	6	

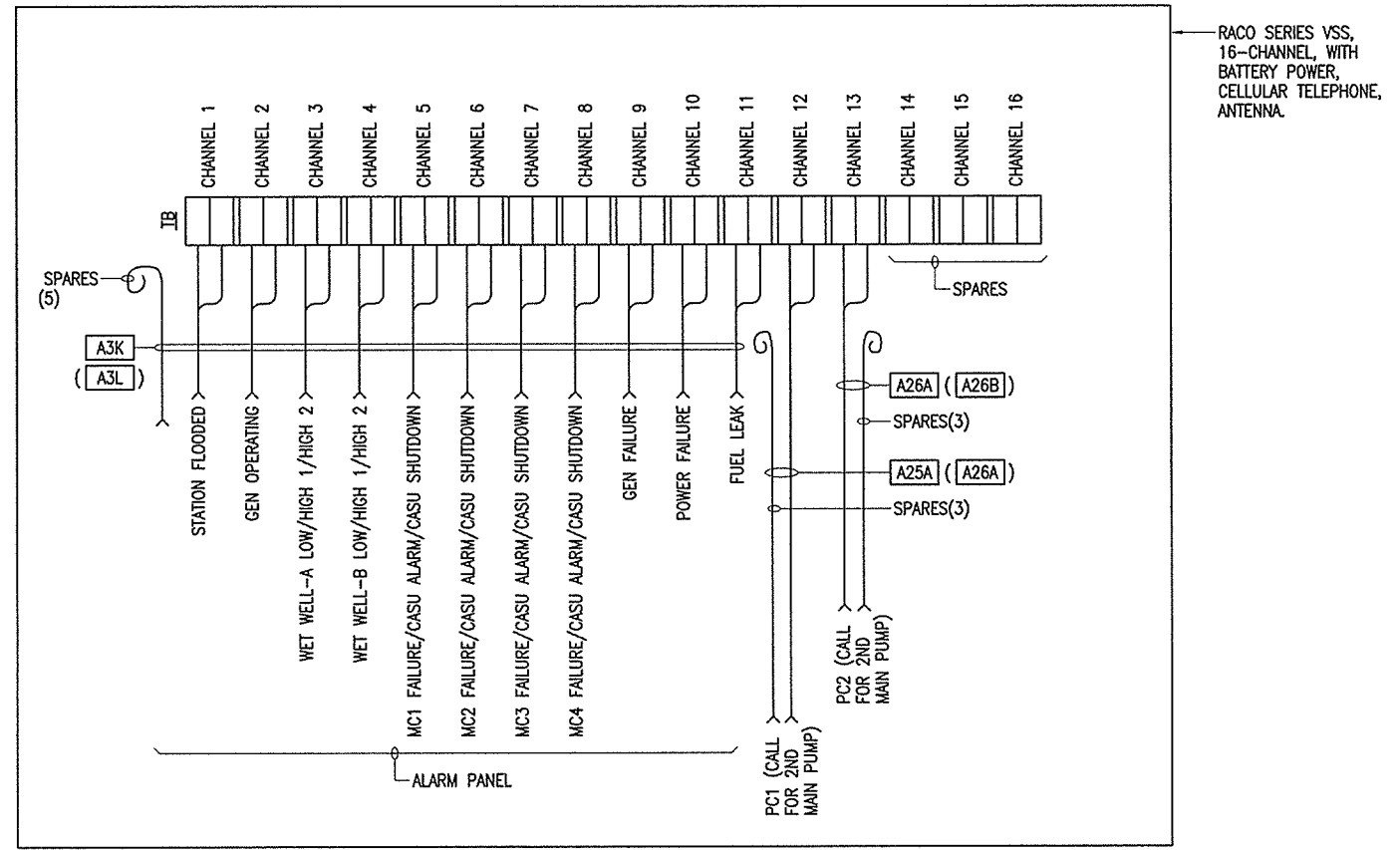
- NOTES: EXISTING PNLBD A
- 1 = CONTRACTOR SHALL PROVIDE THE REQUIRED MAN-HOURS TO FIELD IDENTIFY AND VERIFY EACH BRANCH CIRCUIT.
 - 2 = PROVIDE NEW TYPE WRITTEN PNLBD/LDCTR DIRECTORY IN ACCORDANCE WITH FIELD IDENTIFICATION WORK AND NEW WORK.
 - 3 = EXISTING BRANCH CIRCUIT. NO WORK SHOULD BE REQUIRED.
 - 4 = EXISTING BRANCH CIRCUIT NOT FURTHER LABELLED OR IDENTIFIED. MODIFY BRANCH CIRCUIT AS MAY BE AFFECTED BY DEMOLITION AND/OR NEW WORK. REMOVE PORTION AND/OR MAINTAIN CONTINUITY AND/OR PROVIDE NEW HOMERUNS TO RECONNECT EXISTING ITEMS. RELABEL AS APPLICABLE.
 - 5 = REMOVE EXISTING BRANCH CIRCUIT. REUSE FOR NEW BRANCH CIRCUIT AND RELABEL DIRECTORY AS INDICATED.
 - 6 = NEW BRANCH CIRCUIT. PROVIDE NEW BRANCH CIRCUIT BREAKER IN EXISTING PFFB.

EXISTING PNLBD B		240/120V., 1PH., 3W., 125A. MLO (G.E. SERIES A)									
WIRE SIZE	SERVICE	CIR. BKR.		CIR. NO.	CIR. NO.	CIR. BKR.		SERVICE	WIRE SIZE		
		AMP	POLE			AMP	POLE				
5	#12 CONTROL PANEL-B CS P23	20	1	L1	2	1	20	RTU-5	SPARE	4	
5	#12 (?) CS P24	20	1	L2	4	1	20	BPS SYSTEM	SPARE	4	
5	#12 AIR-BUBBLER-A PC1 P25	20	1	L1	6	2	20	R-240V.		3(6)	
5	#12 AIR-BUBBLER-B PC2 P26	20	1	L2	8	-					
4	AIR COMP-A	20	1	L1	10	1	20	(?)		3(6)	
4	AIR COMP-B	20	1	L2	12			PFBB			

- NOTES: EXISTING PNLBD B
- 1 = CONTRACTOR SHALL PROVIDE THE REQUIRED MAN-HOURS TO FIELD IDENTIFY AND VERIFY EACH BRANCH CIRCUIT.
 - 2 = PROVIDE NEW TYPE WRITTEN PNLBD/LDCTR DIRECTORY IN ACCORDANCE WITH FIELD IDENTIFICATION WORK AND NEW WORK.
 - 3 = EXISTING BRANCH CIRCUIT. NO WORK SHOULD BE REQUIRED.
 - 4 = REMOVE EXISTING BRANCH CIRCUIT. RELABEL DIRECTORY AS "SPARE".
 - 5 = REMOVE EXISTING BRANCH CIRCUIT. REUSE FOR NEW BRANCH CIRCUIT AND RELABEL DIRECTORY AS INDICATED.
 - 6 = PROPOSE USE FOR INTERUM POWER FOR P23, P25, P26 DURING CONSTRUCTION PHASING. PROVIDE TEMPORARY 1P., 20AT. CB'S.



WIRING DIAGRAM - NEW WORK AT EXISTING ATS



CONNECTION DIAGRAM - NEW SDAR1 (TYPICAL FOR SDAR2)

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P.O. BOX 4070/688 KINOOLE ST., STE. 115B
HILO, HI. 96720 PH:961-9666/FAX:9352549
EMAIL: wtopeinc@hiltonet.com

WTO REF. NO. 92010217

DESIGNED WTO	DRAWN LTK
CHECKED LHN	APPROVED WTO

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04/20/72
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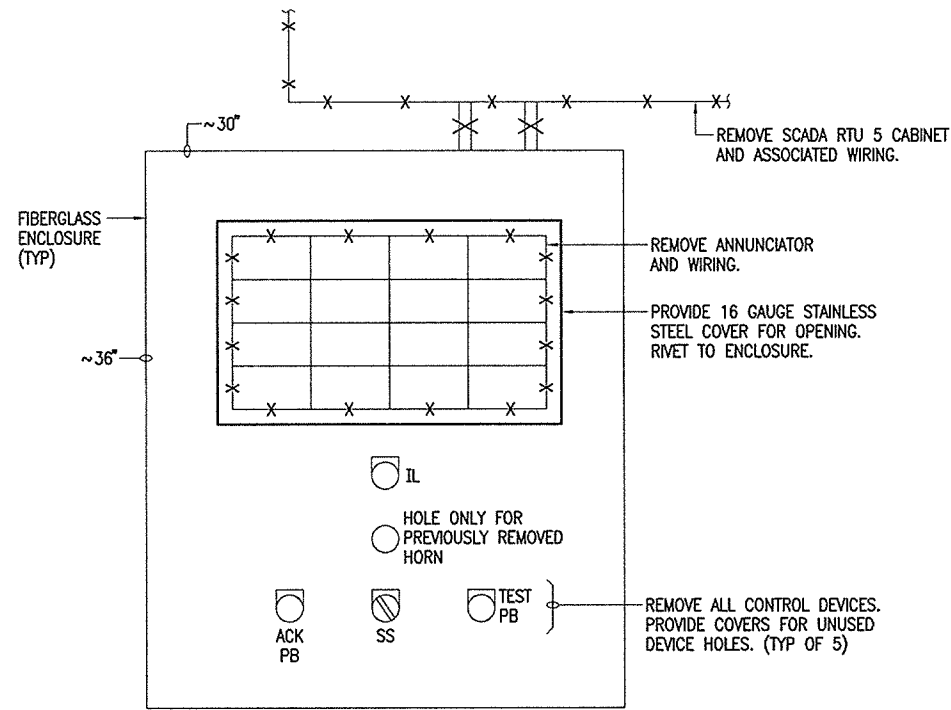
COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

APPROVED BY: _____
WASTEWATER DIVISION CHIEF

DATE _____

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COUNTY JOB NO. WW-4059

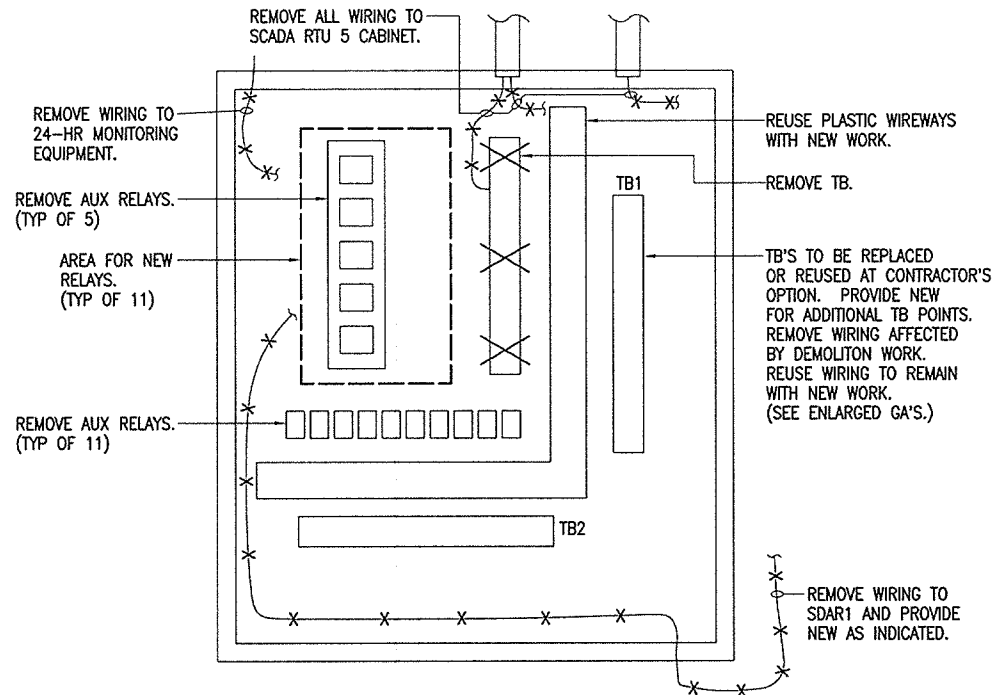
PNLBD SCHEDULES



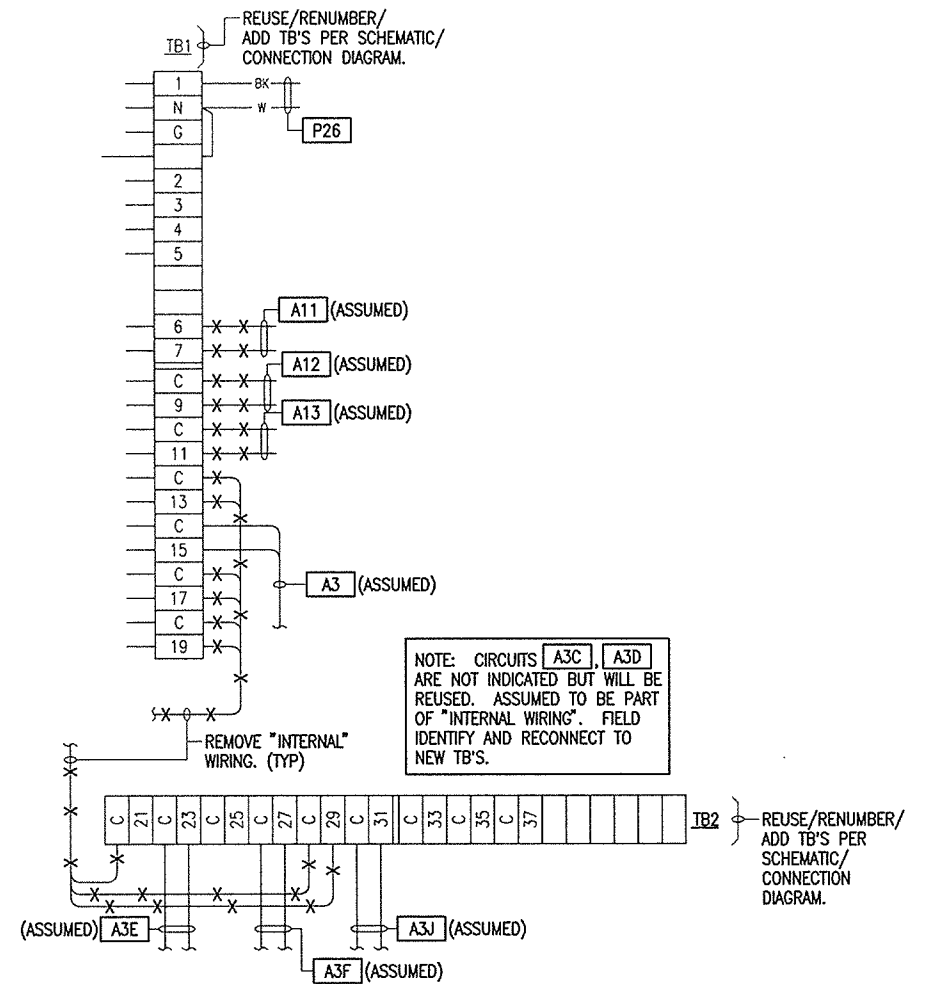
DOOR PANEL

GENERAL ARRANGEMENT (TYP) - EXISTING ALARM PANEL (AP) - MODIFICATIONS/NEW WORK

NOT TO SCALE



INTERIOR PANEL



GENERAL ARRANGEMENT (TYP) - EXISTING TB1 AND TB2 - EXISTING ALARM PANEL

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COUNTY OF HAWAII
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEWATER DIVISION

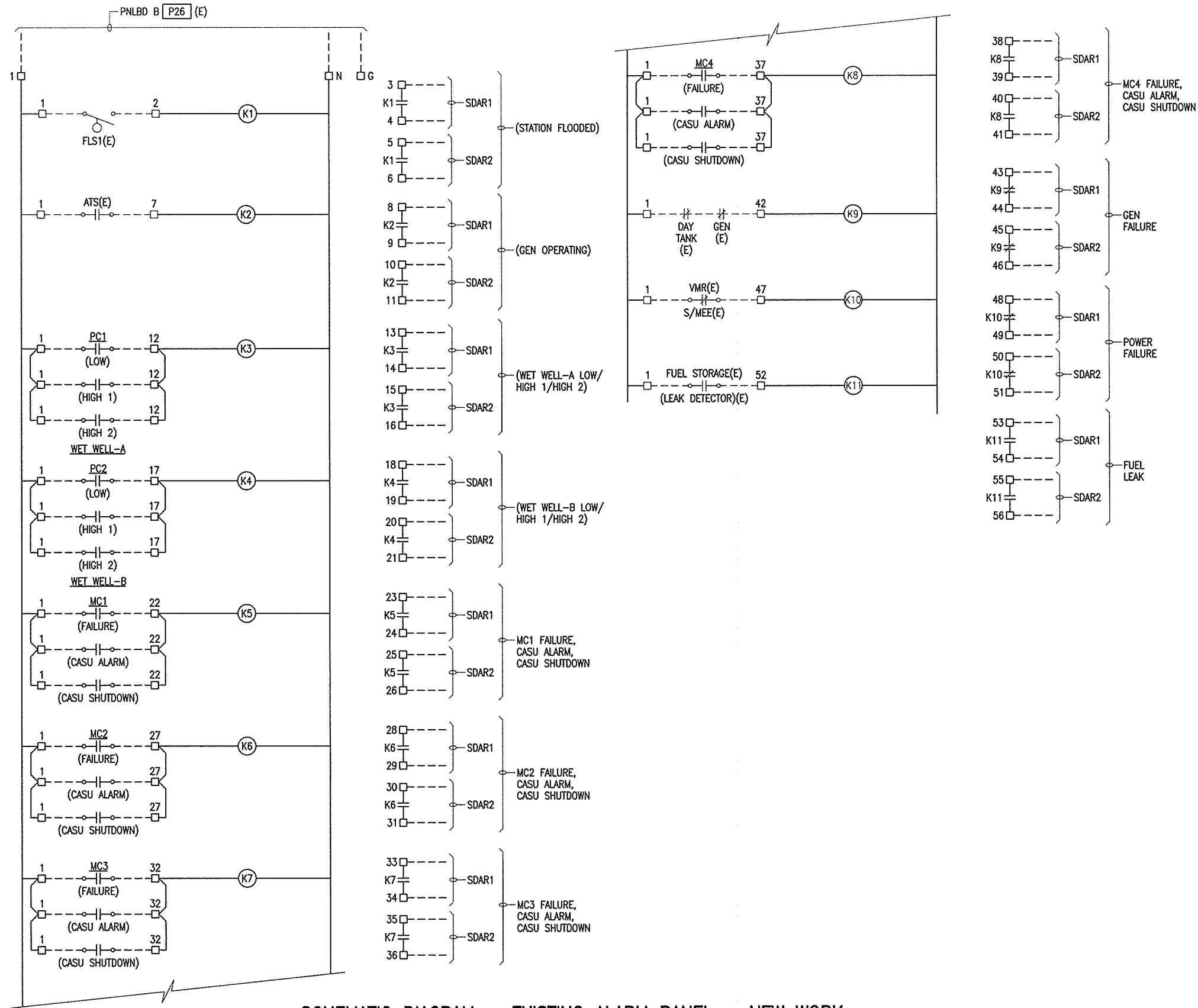
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DATE: _____

PUA PUMP STATION PUMP MODIFICATIONS
COUNTY JOB NO. WW-4059

EXISTING ALARM PANEL

DRAWING NO.
E-18
SHEET
26 OF 28



SCHEMATIC DIAGRAM – EXISTING ALARM PANEL – NEW WORK

- NOTES: 1. ALL NEW EXCEPT AS INDICATED.
 2. (E) = EXISTING ITEM
 3. □ = TB POINT. PROVIDE NEW AS INDICATED.
 4. ---- = FIELD WIRING

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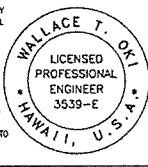
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 WASTEWATER DIVISION

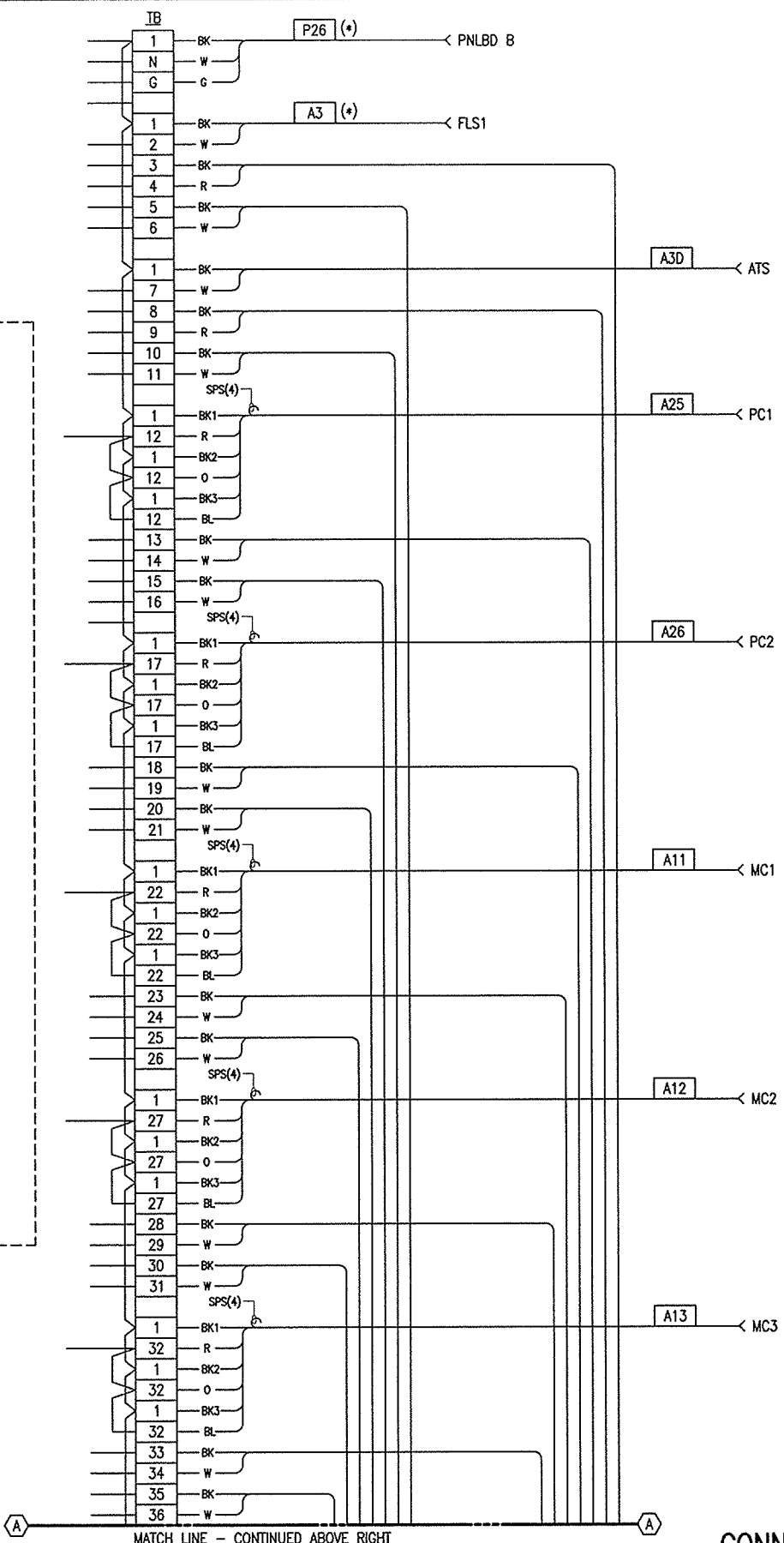
APPROVED BY: _____ DATE _____
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PUA PUMP STATION PUMP MODIFICATIONS
 COUNTY JOB NO. WW-4059

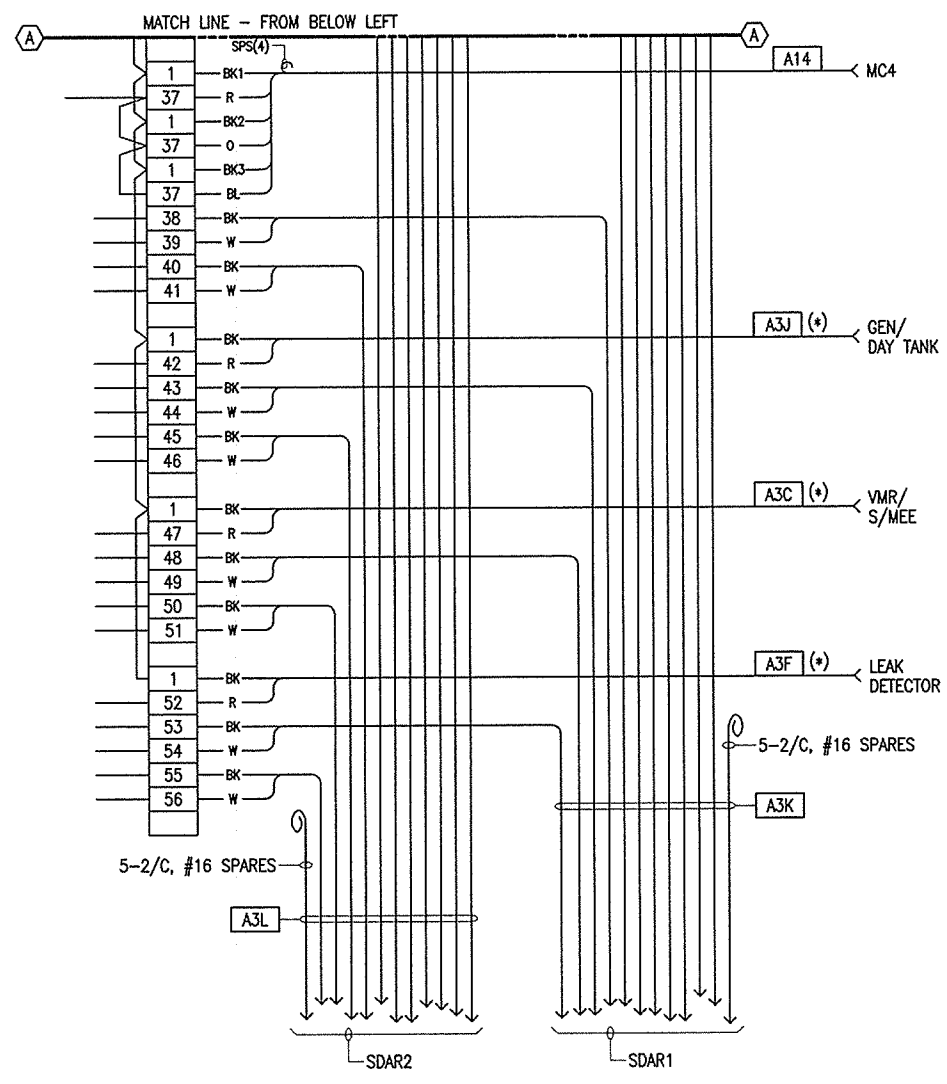
EXISTING ALARM PANEL – NEW WORK

DRAWING NO.
E-19
 SHEET
 27 OF 28

INTERNAL WIRING/LAYOUT FOR RELAYS KI TO K11 BY CONTRACTOR.



(*) = EXISTING CIRCUITS/WIRING TO BE REUSED.



CONNECTION DIAGRAM - EXISTING ALARM PANEL - NEW WORK

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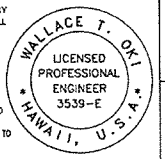
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 WASTEWATER DIVISION CHIEF

DATE _____

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 COUNTY JOB NO. WW-4059

EXISTING ALARM PANEL - NEW WORK

DRAWING NO. E-20
 SHEET 28 OF 28