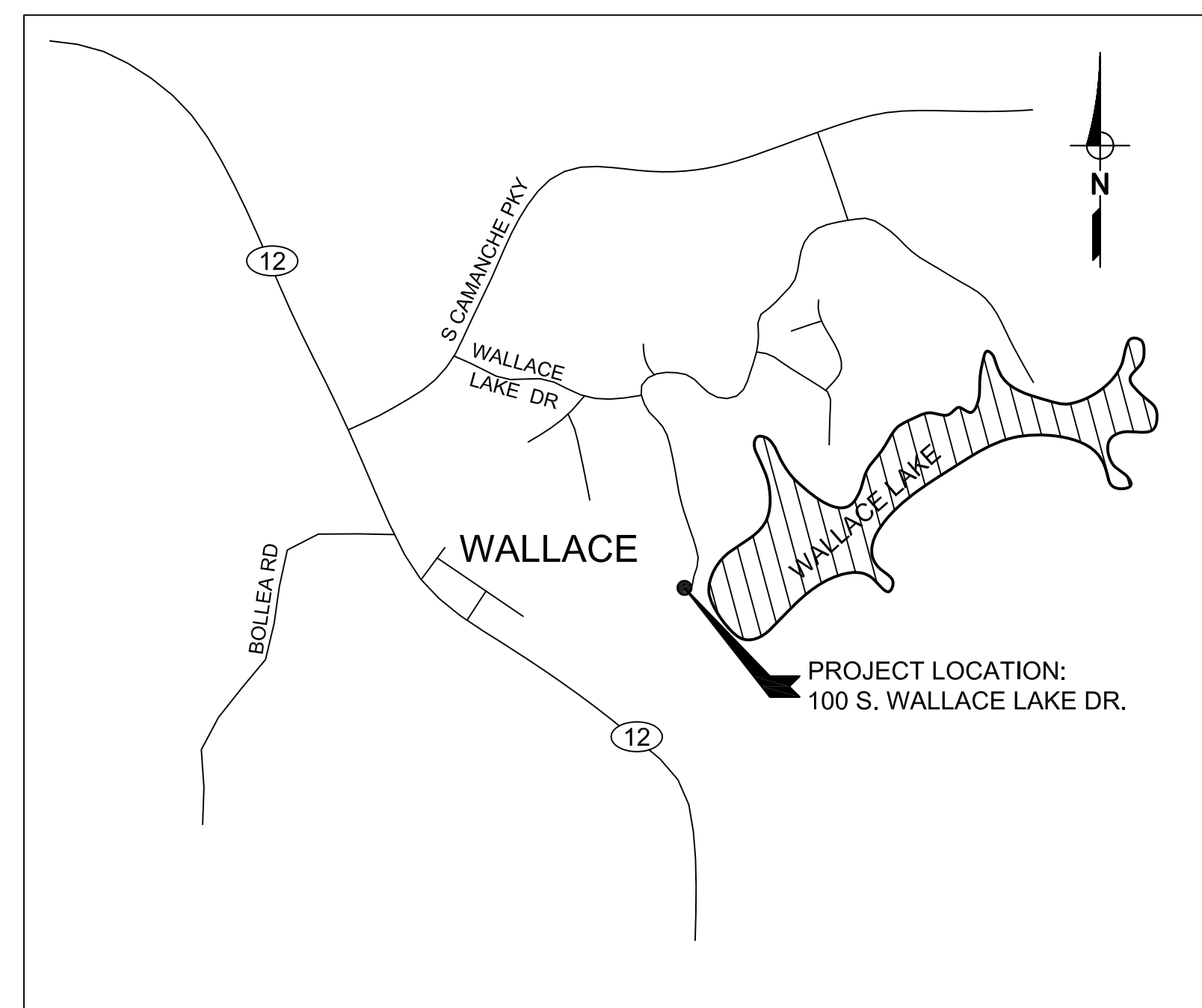


CALAVERAS COUNTY WATER DISTRICT

WALLACE LAKE ESTATES WASTEWATER TREATMENT FACILITY ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT

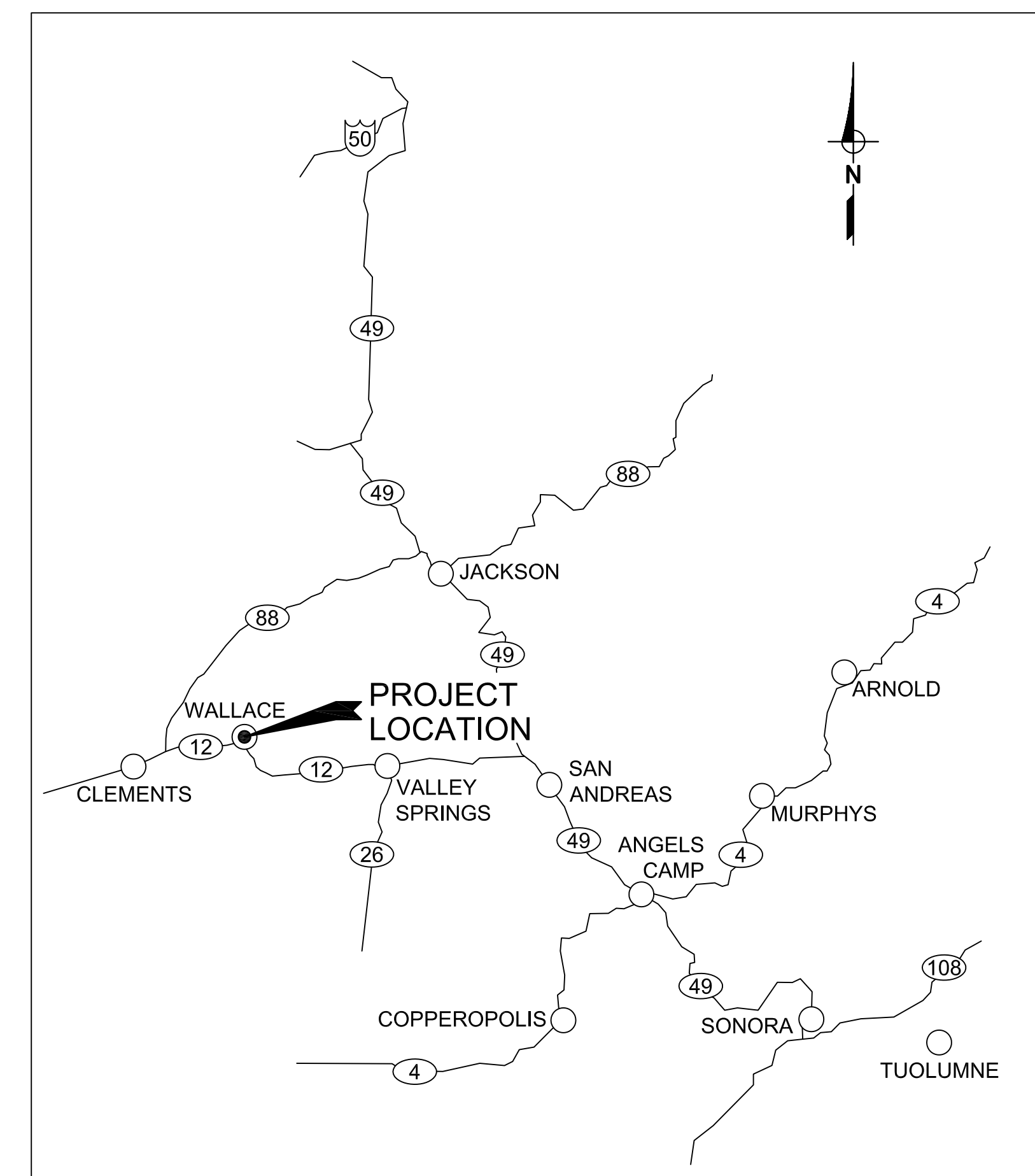
OCTOBER 21, 2020
CIP NO. 15087



LOCATION MAP
NOT TO SCALE

INDEX OF DRAWINGS

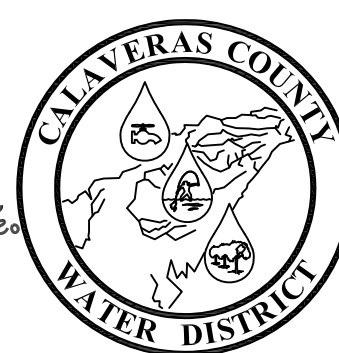
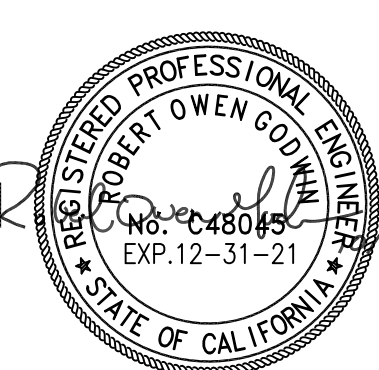
SHEET	DRAWING	TITLE
1	G1	TITLE SHEET
2	G2	SITE PLAN
3	E1	ELECTRICAL SYMBOLS & ABBREVIATIONS
4	E2	EXISTING ONE LINE DIAGRAM
5	E3	REVISED ONE LINE DIAGRAM
6	E4	PANELBOARD SCHEDULE
7	E5	STARTER PANEL (PNL100) ELEVATION AND BACKPAN
8	E6	STARTER PANEL (PNL100) ELEMENTARY DIAGRAM
9	E7	PLANT CONTROL PANEL (CP-1) ELEVATION AND BACKPAN
10	E8	PLANT CONTROL PANEL (CP-1) POWER DISTRIBUTION AND CONTROLS
11	E9	PLANT CONTROL PANEL (CP-1) 24 VDC POWER DISTRIBUTION AND CONTROLS
12	E10	EXAMPLE INTERCONNECT DIAGRAM
13	E11	TYPICAL ELECTRICAL DETAILS
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17	I2	INFLUENT P&ID
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19	I4	AUXILIARY SYSTEMS P&ID
20	I5	MICROLOGIX PLC DIGITAL WIRING DIAGRAM
21	I6	MICROLOGIX PLC DIGITAL OUTPUT WIRING DIAGRAM
22	I7	PLC SLOT 1 DIGITAL INPUT WIRING DIAGRAM
23	I8	PLC SLOT 2 & 3 OUTPUT WIRING DIAGRAM



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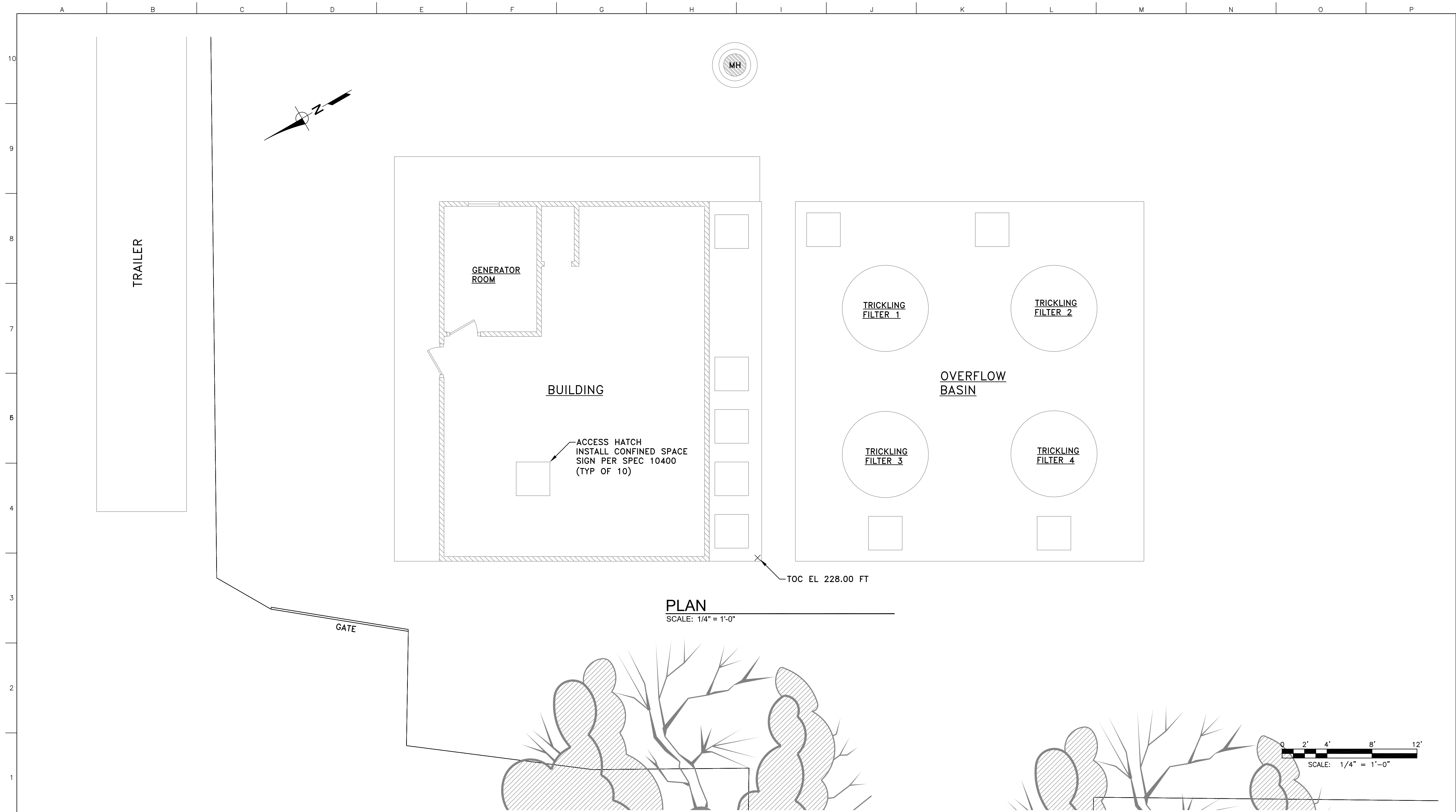


**CALAVERAS COUNTY
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TITLE SHEET
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER
G1
DRAWING NUMBER
1 OF 23
SHEET NUMBER

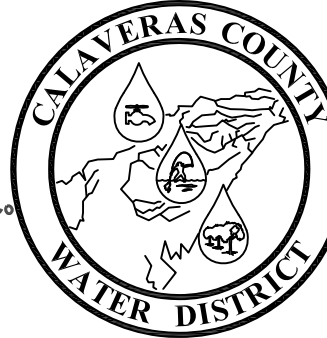
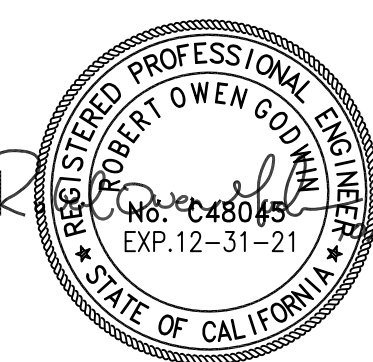


PLAN

SCALE: 1/4" = 1'-0"

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**SITE PLAN
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES**

15087
PROJECT NUMBER
G2
DRAWING NUMBER
2 OF 23
SHEET NUMBER

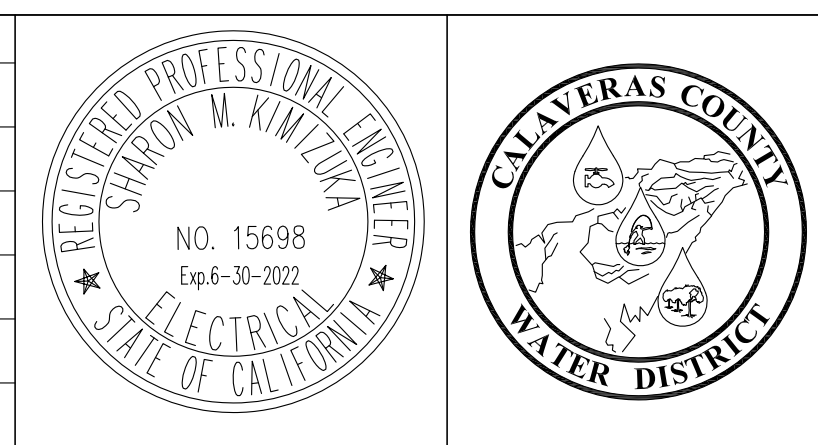
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MISCELLANEOUS ELECTRICAL & INSTRUMENTATION ABBREVIATIONS					
&	AND	HZ	HERTZ (CYCLES PER SECOND)	PT	POTENTIAL TRANSFORMER
@	AT	HZD	HAZARDOUS AREA, EXPLOSION PROOF	PTT	PUSH TO TEST
A	AMBER, AMPERES	I	INTERLOCK	PV	PROCESS VARIABLE
AC	ALTERNATING CURRENT	I/O	INPUT/OUTPUT	PVC	POLY VINYL CHLORIDE
AFF	ABOVE FINISHED FLOOR	ICR	INSTRUMENTATION CONTROL RELAY	PWM	PULSE WIDTH MODULATION
AI	ANALOG INPUT	INCAN	INCANDESCENT	PWR	POWER
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	INST	INSTANTANEOUS	R	RED
ALT	ALTERNATOR	ISC	SHORT CKT INTERRUPTING CURRENT (SYMM)	RCT	REPEAT CYCLE TIMER
AM	AMMETER	ISR	INTRINSICALLY SAFE RELAY	REF	REFERENCE
ATS	AUTOMATIC TRANSFER SWITCH	J	JUNCTION BOX	RIO	REMOTE I/O
AO	ANALOG OUTPUT	K	KILO, PREFIX	RTD	RESISTANCE TEMPERATURE DETECTOR
AWG	AMERICAN WIRE GAUGE	L	LINE	RTM	RUN TIME METER
B	BLUE	LA	LIGHTNING ARRESTOR	RTU	REMOTE TELEMETRY UNIT
BC	BARE COPPER	LC	LIGHTING CONTACTOR	RVNR	REDUCED VOLTAGE NON-REVERSING
BFC	BELOW FINISHED CEILING	LCD	LIQUID CRYSTAL DISPLAY	(R)	REWIRE, RELOCATE, REVISE, REUSE, REPLACE
BOD	BIOCHEMICAL OXYGEN DEMAND	LED	LIGHT EMITTING DIODE	SC	SHORTING CONTACTOR
BLK	BLANK	LEL	LOWER EXPLOSIVE LIMIT	SCH	SCHEDULE
C	CONDUIT	LO	LOW	SEC	SECONDARY
CAP	CAPACITOR	LOR	LOCAL-OFF-REMOTE	SECS	SECONDS
CB	CIRCUIT BREAKER	LOS	LOCK-OUT STOP SWITCH	SEL	SELECTOR
CBL	CABLE	LP	LIGHTING PANELBOARD	SFA	SERVICE FACTOR AMPS
CH	CHANNEL	LPU	LINE PROTECTION UNIT	SP	SETPOINT
CKT	CIRCUIT	LR	LATCHING RELAY	SPD	SURGE PROTECTIVE DEVICE
COAX	COAXIAL CABLE	LS	LEVEL SWITCH	SPEC	SPECIFICATION
COMM	COMMUNICATION PORT	M	MOTOR CONTACTOR	SS	STAINLESS STEEL
CP	CONTROL PANEL	MAX	MAXIMUM	SSS	SOLID STATE SOFT STARTER
CPT	CONTROL POWER TRANSFORMER	MCC	MOTOR CONTROL CENTER	STT	START
CR	CONTROL RELAY	MCM	THOUSAND CIRCULAR MILS	STP	STOP
CT	CURRENT TRANSFORMER	MCP	MOTOR CIRCUIT PROTECTOR	SV	SOLENOID VALVE
CTQ	CONSTANT TORQUE	MH	MANHOLE	SW	SWITCH
CU	COPPER	MHD	METAL HALIDE	SWBD	SWITCHBOARD
DC	DIRECT CURRENT	MIN	MINIMUM	SWGR	SWITCHGEAR
DET	DETAIL	MIN5	MINUTES	SYMM	SYMMETRICAL
DI	DIGITAL INPUT	MISC	MISCELLANEOUS	T	TRIP
DIA	DIAGRAM	MNFR	MANUFACTURER	TB	TERMINAL BLOCK
DISC	DISCONNECT	MODEM	MODULATOR/DEMODULATOR	TC	TIME CLOCK
DIV	DIVISION	MOV	MOTOR OPERATED VALVE	TDOD	TIME DELAY ON DE-ENERGIZATION
DO	DIGITAL OUTPUT	MPS	MOTOR PROTECTION SYSTEM	TDOD	TIME DELAY ON ENERGIZATION
DPDT	DOUBLE POLE DOUBLE THROW	MS	MOISTURE SENSOR/SWITCH	TEL	TELEMETRY
DWG	DRAWING	MTR	MOTOR	TELCO	TELEPHONE COMPANY
ELEV	ELEVATION	MTS	MANUAL TRANSFER SWITCH	TEMP	TEMPERATURE
EMT	ELECTRICAL METALLIC TUBING	MUX	MULTIPLEXER	TM	THERMAL MAGNETIC
ETM	ELAPSED TIME METER	MV	MEDIUM VOLTAGE	TOC	TOTAL ORGANIC CARBON
(E)	EXISTING	N	NEUTRAL	TR	TIME DELAY RELAY
F	FRAME	NC	NORMALLY CLOSED	TRIAD	TWISTED & SHIELDED 3 CONDUCTOR
FC	FAIL CLOSED	NEC	NATIONAL ELECTRICAL CODE	TS	TEMPERATURE SWITCH
FCS	FIELD CONTROL STATION	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION	TSPR	TWISTED & SHIELDED PAIR
FLA	FULL LOAD AMPS	NIC	NOT IN CONTRACT	TYP	TYPICAL
FLP	FAIL LAST POSITION	NO	NORMALLY OPEN	UG	UNDERGROUND
FO	FAIL OPEN	NP	NAMEPLATE	UL	UNDERWRITERS LABORATORIES
FLEX	FLEXIBLE, METAL LIQUID TIGHT CONDUIT	NTS	NOT TO SCALE	UON	UNLESS OTHERWISE NOTED
FS	FLOW SWITCH OR FULL SPEED	(N)	NEW	UPS	UNINTERRUPTIBLE POWER SUPPLIES
FV, FVNR	FULL VOLTAGE NON-REVERSING	OC	ON CENTER	V	VOLTAGE
FVR	FULL VOLTAGE REVERSING	OI	OPERATOR INTERFACE	VA	VOLT AMPS
FWD	FORWARD	OL	OVERLOAD	VAR	VOLT AMP REACTIVE
(F)	FUTURE	ORP	OXIDATION REDUCTION POTENTIAL	VFD	VARIABLE FREQUENCY DRIVE
G	GREEN	P	PHASE, POLE	VLV	VALVE
GALV	GALVANIZED	PB	PULL BOX	VM	VOLTMETER
GEN	GENERATOR	PC	PERSONAL COMPUTER	VTQ	VARIABLE TORQUE
GFI	GROUND FAULT CIRCUIT INTERRUPTER	PE	PHOTOCELL	W	WHITE, WATTS
GND	GROUND	PF	POWER FAIL	WHM	WATT-HOUR METER
GRS	GALVANIZED RIGID STEEL CONDUIT	PFR	POWER (PHASE) FAIL RELAY	WM	WATTMETER
GRS-PVC	PVC COATED GRS CONDUIT	PH	HYDROGEN ION CONCENTRATION	WP	WATERPROOF, WEATHER PROOF
HC	PUSHBUTTON	PLC	PROGRAMMABLE LOGIC CONTROLLER	WS	TORQUE SWITCH
HI	HIGH	PM	POWER MONITOR	XFMR	TRANSFORMER
HID	HIGH INTENSITY DISCHARGE	PMP	PUMP	XS	MISCELLANEOUS SWITCH
HIM	HUMAN INTERFACE MODULE	PNL	PANEL	Y	YELLOW
HOA	HAND-OFF-AUTO	PR	PAIR, TWISTED & SHIELDED CABLE	Z	IMPEDANCE
HOR	HAND-OFF-REMOTE	PRESS	PRESSURE	ZS	LIMIT SWITCH
HP	HORSEPOWER	PRI	PRIMARY		
HPS	HIGH PRESSURE SODIUM	PROVIDE	FURNISH, INSTALL & CONNECT		
HS	HAND SWITCH	PRR	POWER RELAY		
HTR	HEATER	PS	PRESSURE SWITCH, POWER SUPPLY		

SWITCHES - PROCESS		DEVICES - RELAY		COMPONENTS		WIRING - CONNECTIONS	
	FLOW SWITCH - CLOSURES UPON INCREASING FLOW		CONTROL RELAY CR1 WITH NORMALLY OPEN CONTACT ON LINE 28 & NORMALLY CLOSED CONTACT ON LINE 111		RESISTOR		PANEL OR EQUIPMENT WIRING
	FLOW SWITCH - OPENS UPON INCREASING FLOW		TIME DELAY RELAY TR2 - ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN		POTENTIOMETER		FIELD WIRING
	LEVEL SWITCH - CLOSURES UPON INCREASING LEVEL		TIME DELAY ON ENERGIZATION TIME DELAY ON DE-ENERGIZATION		CAPACITOR, FIXED		CONDUCTORS - NOT CONNECTED
	LEVEL SWITCH - OPENS UPON INCREASING LEVEL		CONTACTOR OR STARTER M1		CAPACITOR, ADJUSTABLE		CONDUCTORS - CONNECTED
	PRESSURE SWITCH - CLOSURES UPON INCREASING PRESSURE (INCREASING VACUUM)		SOLENOID		DIODE		GROUND
	PRESSURE SWITCH - OPENS UPON INCREASING PRESSURE (INCREASING VACUUM)		NORMALLY OPEN, RELAY CONTACT - ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105		DIODE, ZENER		CHASSIS OR FRAME GROUND
	TEMPERATURE SWITCH - CLOSURES UPON INCREASING TEMPERATURE		NORMALLY CLOSED, RELAY CONTACT - ACTUATED BY RELAY CR1		VARIATOR TRANSIENT VOLTAGE SUPPRESSOR		PLUG AND RECEPTACLE
	TEMPERATURE SWITCH - OPENS UPON INCREASING TEMPERATURE		LIMIT SWITCH - CLOSURES AT SET LIMIT		VOLTAGE SURGE SUPPRESSOR, AC		INCOMING LINE
	LIMIT SWITCH - OPENS AT SET LIMIT		LIMIT SWITCH - OPENS AT SET LIMIT		RESISTANCE TEMPERATURE DETECTOR (RTD)		TERMINAL BLOCKS
	PROXIMITY SWITCH - CLOSURES UPON DECREASING DISTANCE		NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT CLOSURES AFTER TR2 IS ENERGIZED		THERMOCOUPLE (T/C)		TERMINALS
	PROXIMITY SWITCH - CLOSURES UPON DECREASING DISTANCE		NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS ENERGIZED	DEVICES - MISCELLANEOUS			SHIELDED CABLE
	TORQUE SWITCH - CLOSURES UPON INCREASING TORQUE		NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT CLOSURES AFTER TR2 IS DE-ENERGIZED		AUDIBLE ALARM	PLAN - SYMBOLS	
	TORQUE SWITCH - OPENS UPON INCREASING TORQUE		NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS DE-ENERGIZED		BATTERY		CONDUIT, EXPOSED
	TORQUE SWITCH - OPENS UPON INCREASING TORQUE		CONTACT OPENS AND CLOSURES IN A TIMED REPEAT CYCLE		HEATER		CONDUIT, IN SLAB OR BELOW GRADE
					3 PHASE HEATER		CONDUIT STUBBED OUT & CAPPED
					GENERATOR		CONDUIT BENDS TOWARD OBSERVER
					3 PHASE MOTOR # = MOTOR HP		CONDUIT BENDS AWAY FROM OBSERVER
					SINGLE PHASE MOTOR		CONDUIT ENDS
					TRANSFORMER		CONDUIT CHANGE IN ELEVATION
					LINE REACTOR		BARE COPPER GROUND WIRE
							GROUND CONNECTION BOLTED TYPE
							GROUND CONNECTION EXOTHERMIC WELD TYPE
							PULL BOX
							DISCONNECT SWITCH
							FIELD CONTROL STATION WITH JUNCTION BOX
							FIELD CONTROL STATION WITH #AMP DISCONNECT SWITCH
							SPECIAL RECEPTACLE
							JUNCTION BOX
							THERMOSTAT
							LIGHTING, FANS, HEATERS
							DUPLEX RECEPTACLE
							TOGGLE SWITCH
							EQUIPMENT NUMBER



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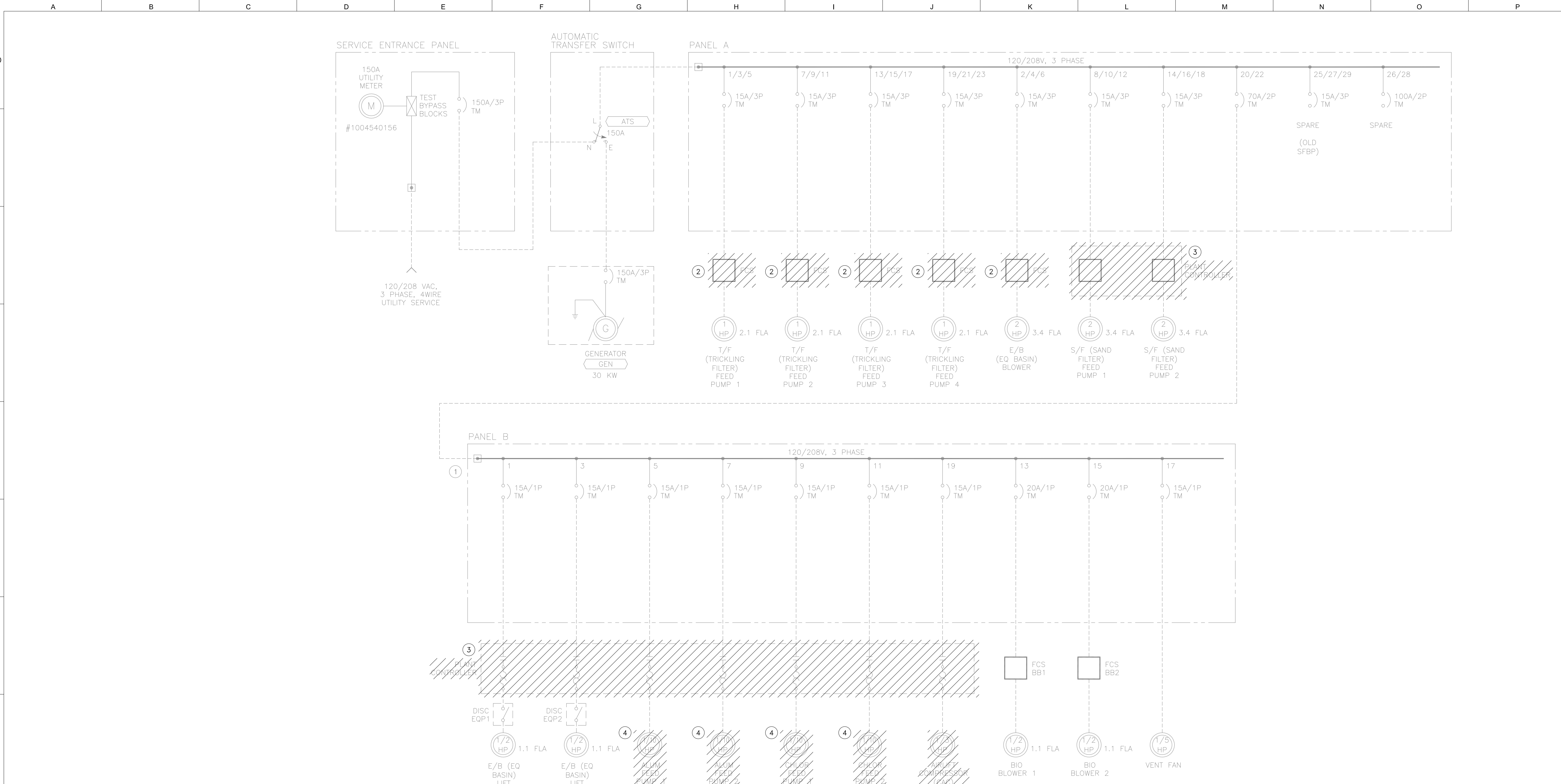
CALAVERAS COUNTY WATER DISTRICT

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ELECTRICAL SYMBOLS & ABBREVIATIONS
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E1
DRAWING NUMBER 3 OF 23
SHEET NUMBER

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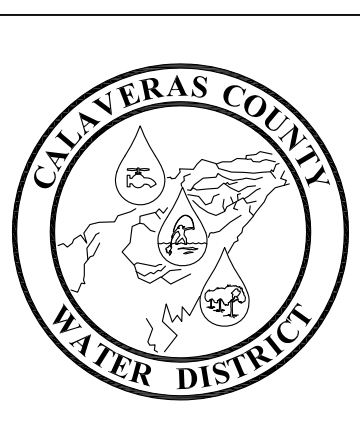
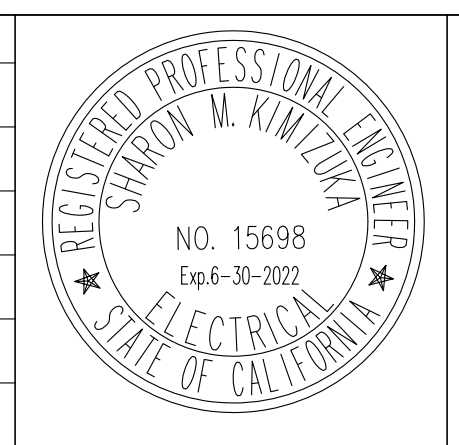


EXISTING ONE LINE DIAGRAM

- NOTES:
- ① MOTOR LOADS SHOWN FOR CLARITY ONLY, SEE PANELBOARD SCHEDULE FOR COMPLETE SCHEDULE.
 - ② DEMO (E) MOTOR STARTER FIELD CONTROL STATIONS (FCS) AND REPLACE WITH STARTER PANEL 100.
 - ③ DEMO (E) PLANT CONTROLLER, REPLACE WITH SEPERATE PLC CONTROL PANEL & STARTER PANEL.
 - ④ REMOVED.



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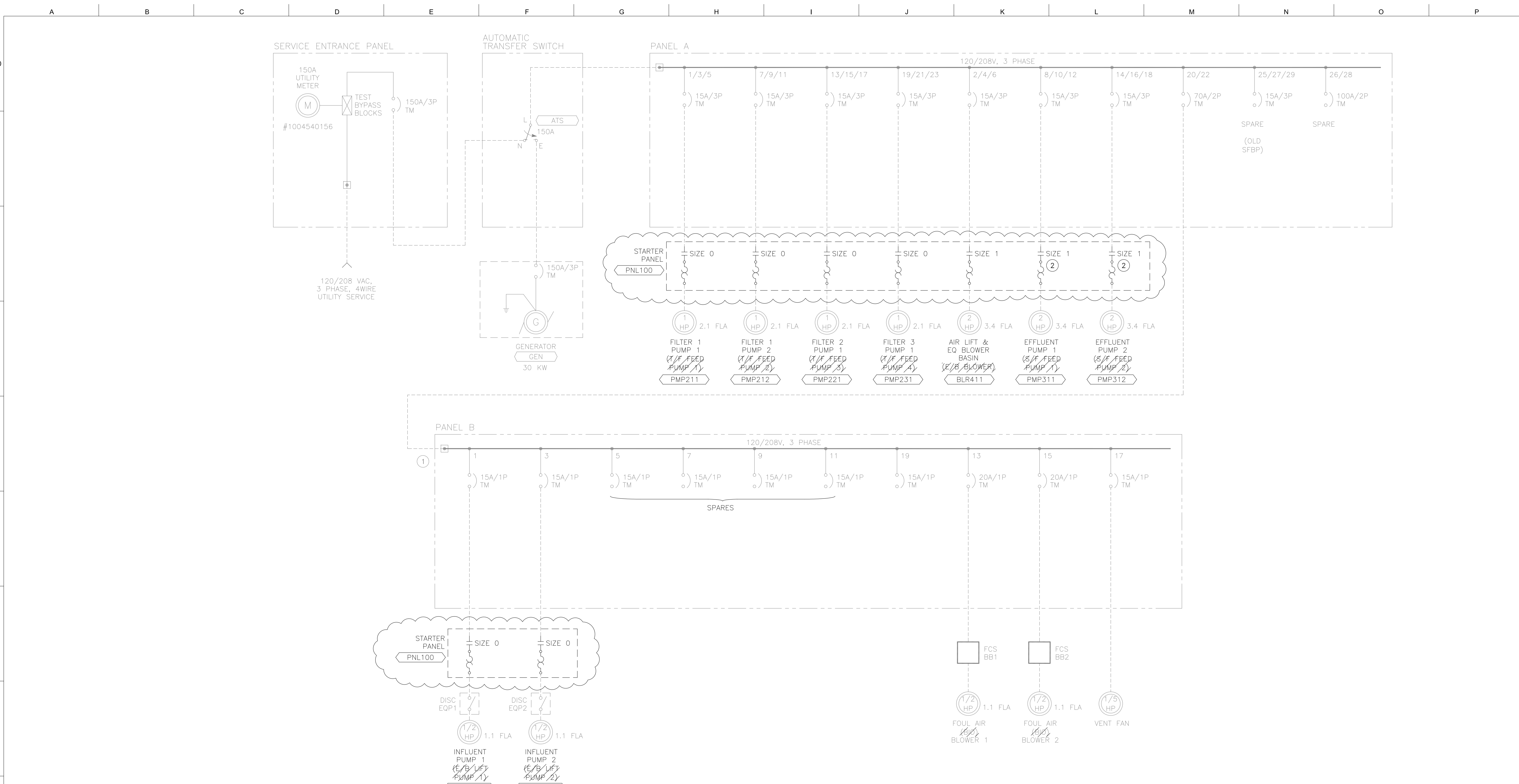
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EXISTING ONE LINE DIAGRAM
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E2
DRAWING NUMBER 4 OF 23
SHEET NUMBER

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REVISED ONE LINE DIAGRAM

- NOTES: ① MOTOR LOADS SHOWN FOR CLARITY ONLY. SEE PANELBOARD SCHEDULE FOR COMPLETE SCHEDULE.
 ② EXTEND CONDUITS & WIRE TO NEW STARTER LOCATION.



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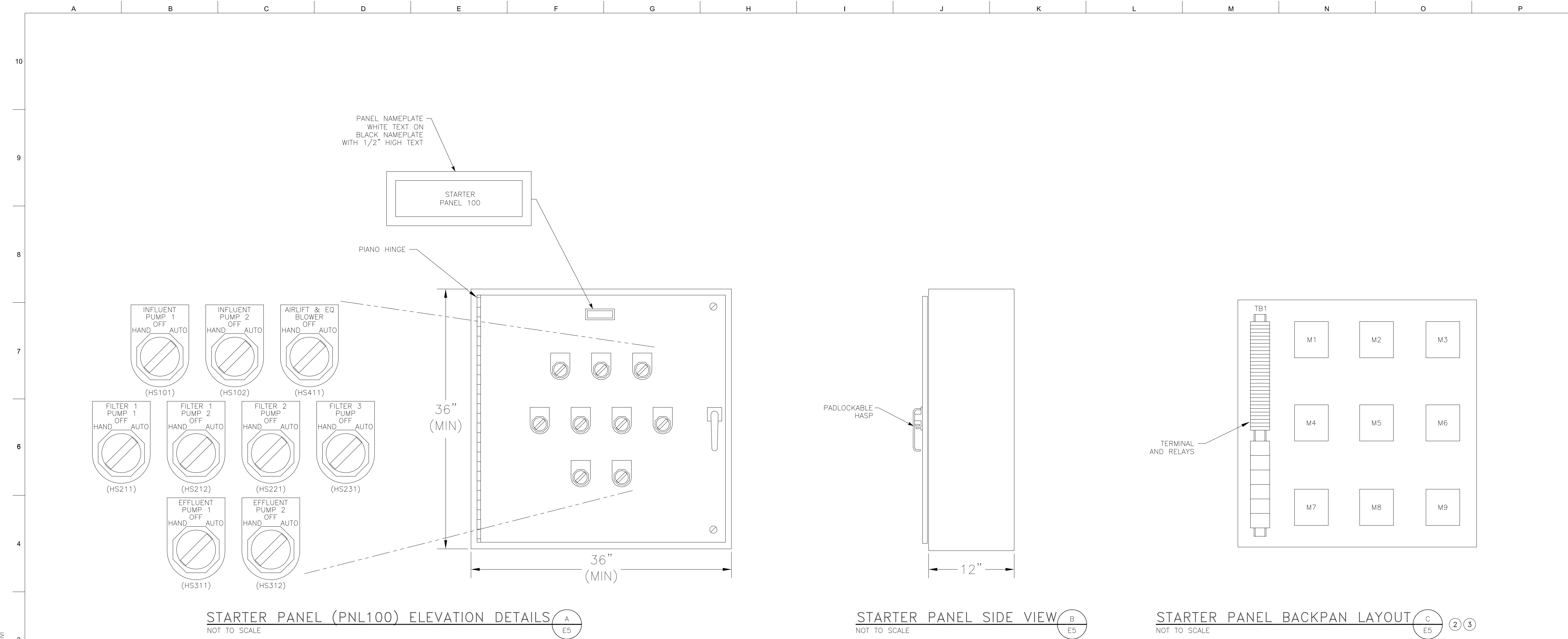


CALAVERAS COUNTY WATER DISTRICT
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REVISED ONE LINE DIAGRAM
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E3
DRAWING NUMBER 5 OF 23
SHEET NUMBER

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STARTER PANEL (PNL100) ELEVATION DETAILS A
NOT TO SCALE E5

STARTER PANEL SIDE VIEW B
NOT TO SCALE E5

STARTER PANEL BACKPAN LAYOUT C
NOT TO SCALE E5 2 3

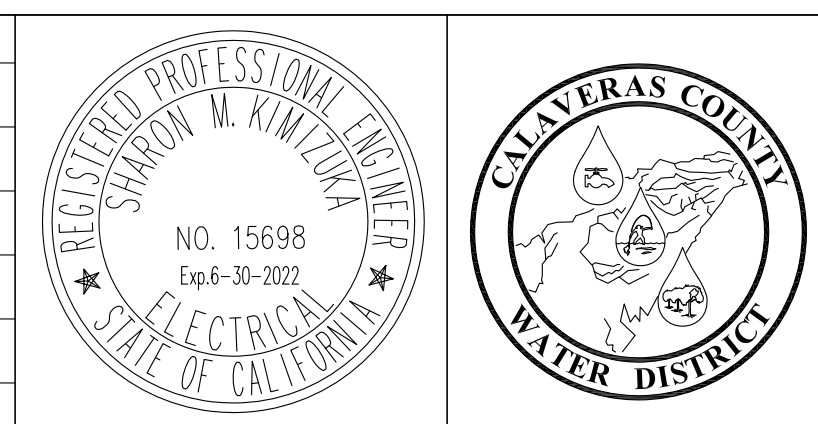
PANEL FABRICATION METHODS

1. NEMA 12 FOR INSIDE INSTALLATION.
2. ALL OUTER DOORS SEALED WITH PERMANENT TYPE GASKETING.
3. EXTERIOR FABRICATED FROM HOT DIPPED GALVANIZED SHEET STEEL.
4. 12 GAUGE CONSTRUCTION.
5. ALL SEAMS CONTINUOUS WELDED.
6. OUTER DOOR TO BE PADLOCKABLE.
7. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
10. EXTERIOR FULL HEIGHT PANEL COLOR: LIGHT GREY.
11. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL DEVICES ON DEADFRONT.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.

- NOTES: ① PROVIDE ADDITIONAL DIN RAIL TO ADD A MINIMUM OF EIGHT TERMINAL BLOCKS TO EACH TERMINAL STRIP.
- ② STARTER PANEL SHALL BE CONSTRUCTED BY AN U.L. APPROVED PANEL SHOP AND BEAR A U.L. LABEL.



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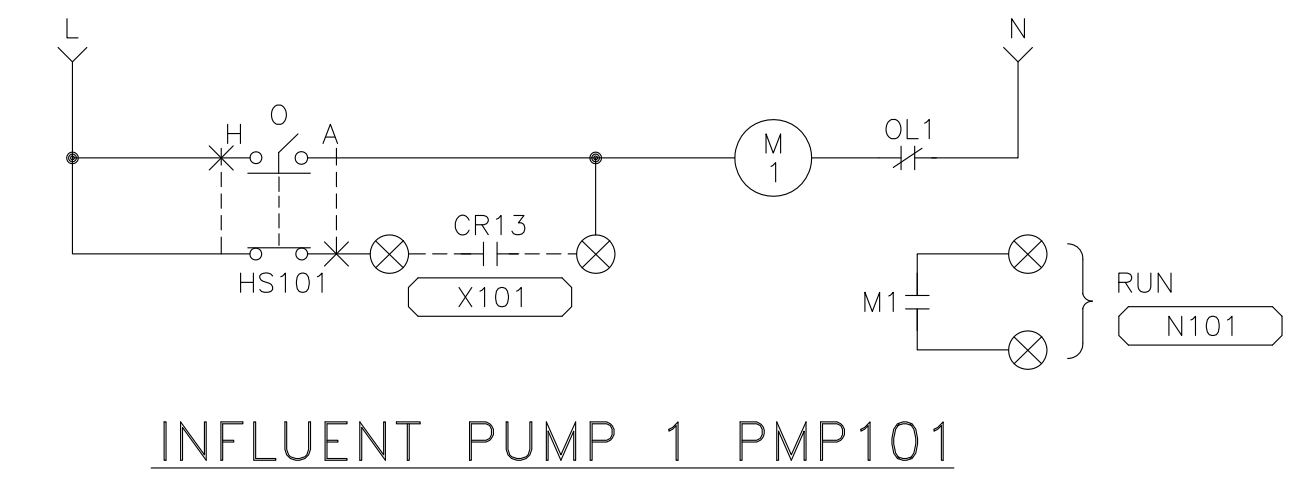
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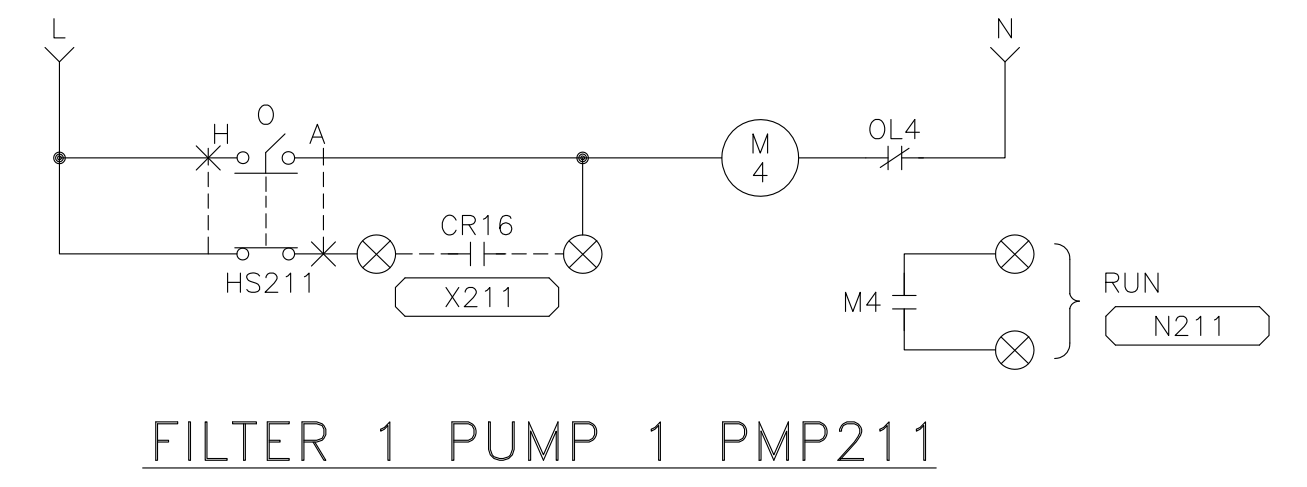
STARTER PANEL (PNL100) ELEVATION & BACKPAN
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER E5
DRAWING NUMBER 7 OF 23
SHEET NUMBER

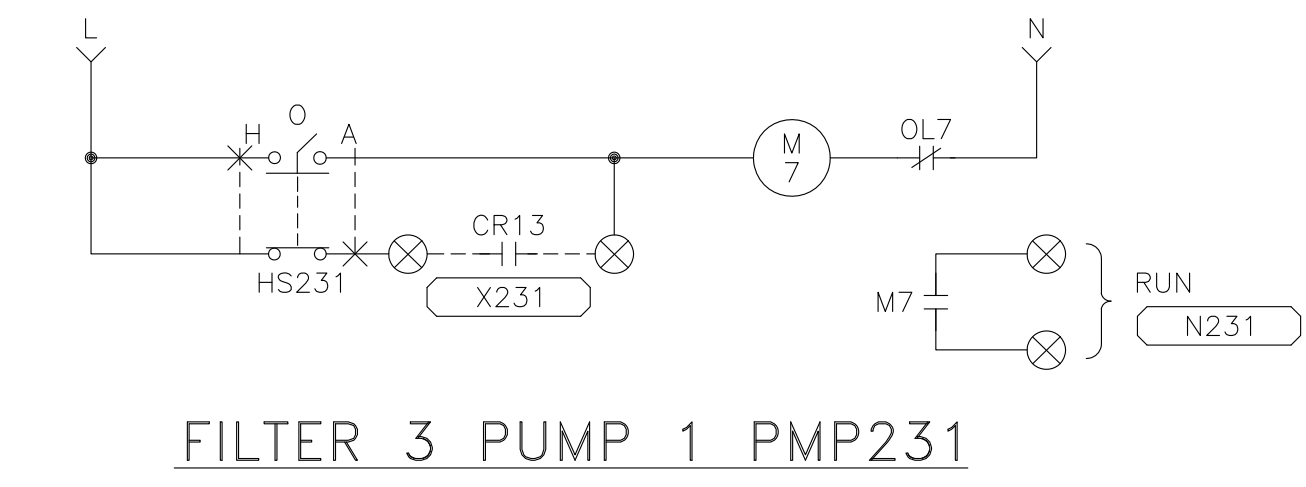
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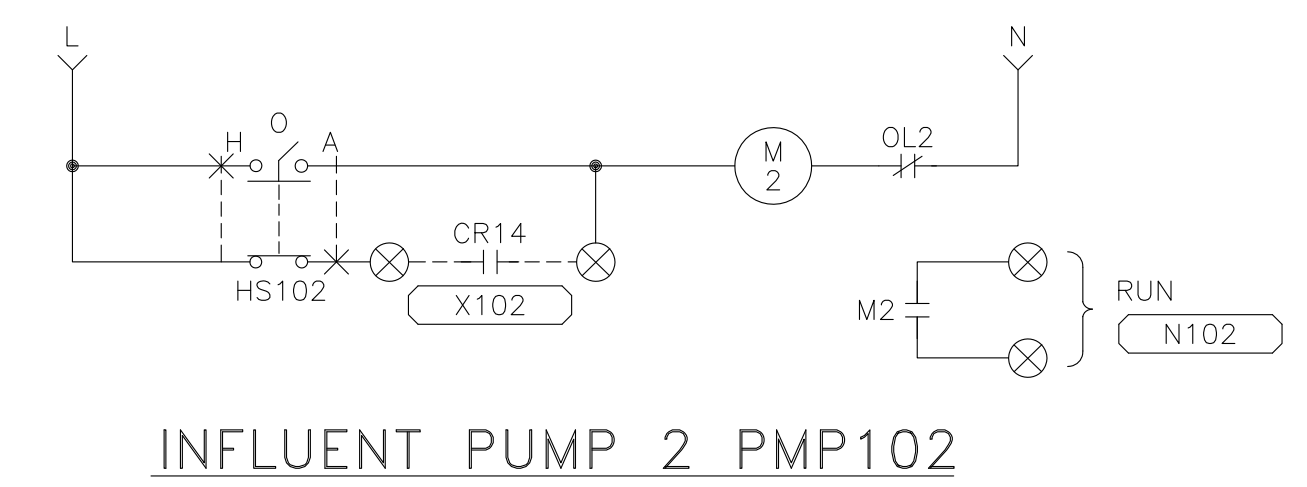
INFLUENT PUMP 1 PMP101



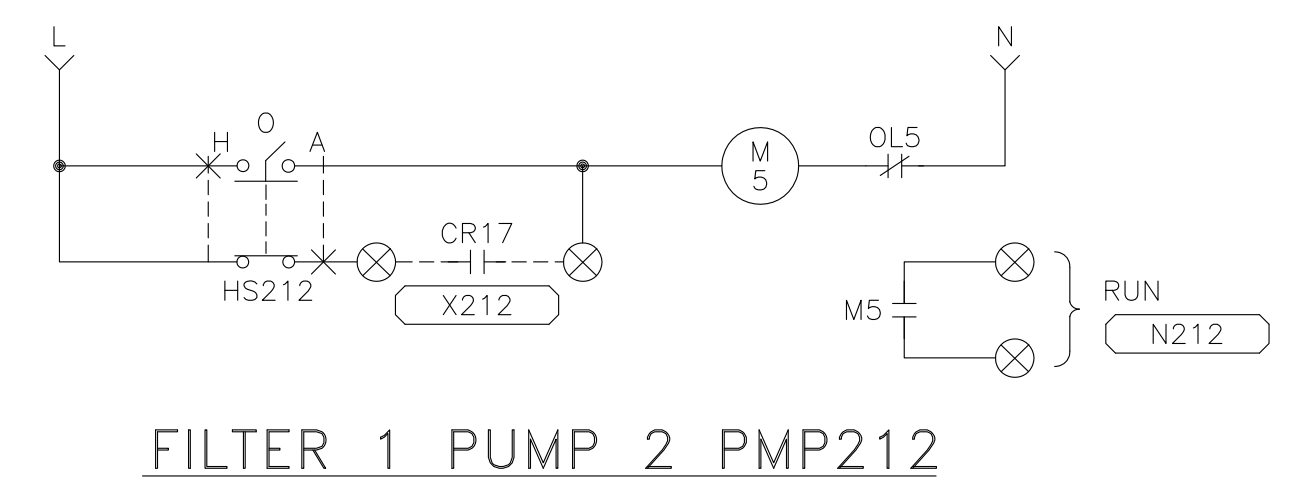
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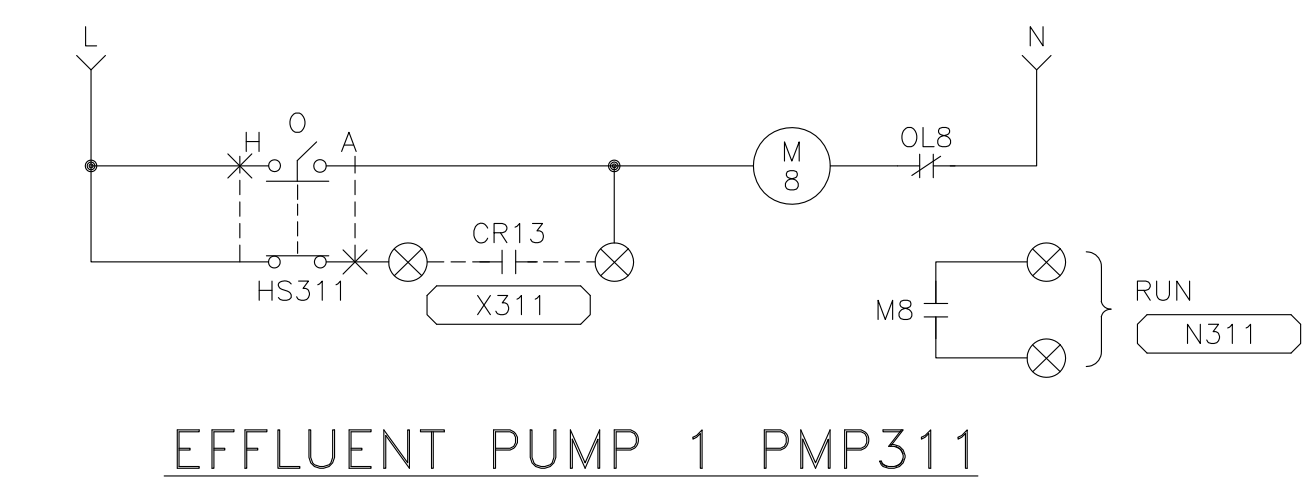
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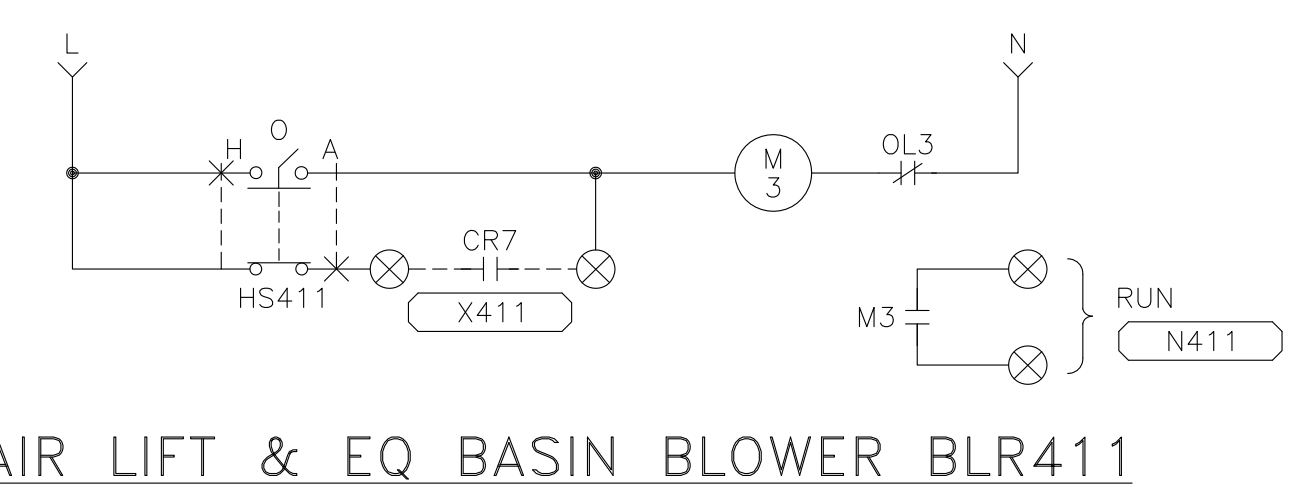
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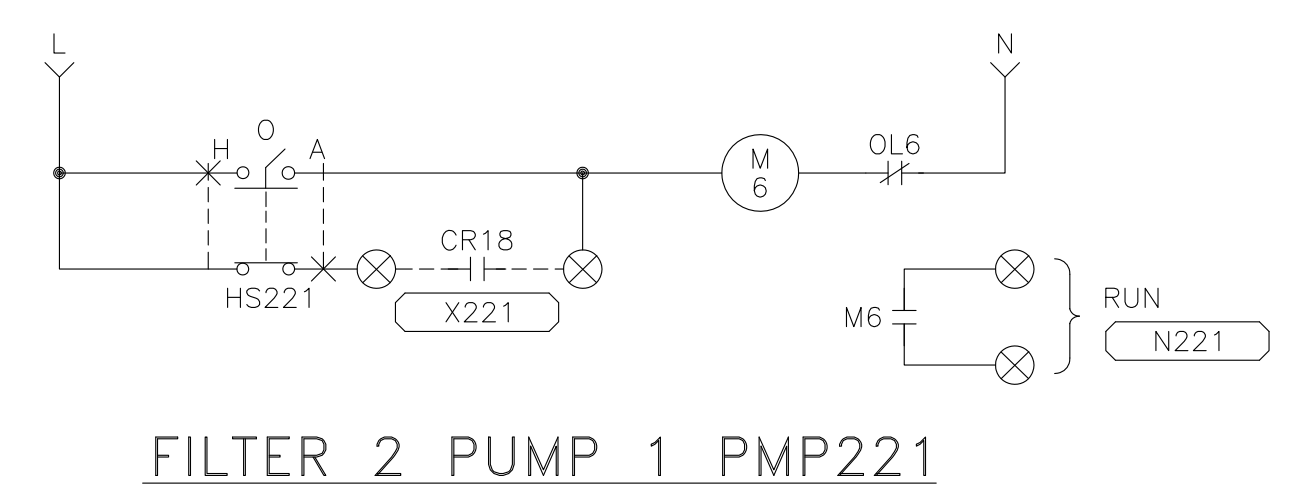
FILTER 1 PUMP 2 PMP212



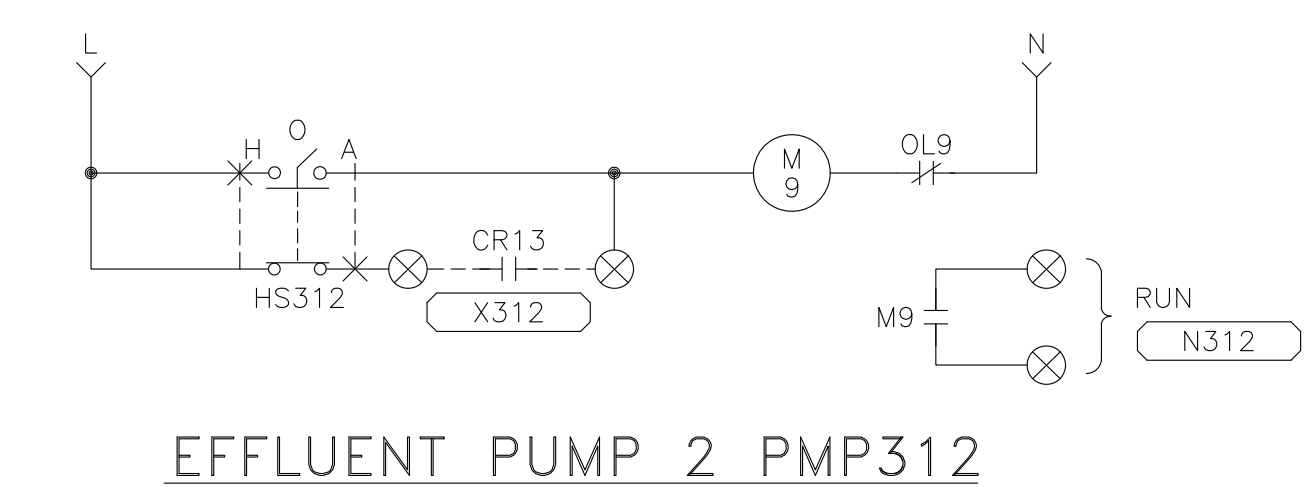
EFFLUENT PUMP 1 PMP311



AIR LIFT & EQ BASIN BLOWER BLR411



FILTER 2 PUMP 1 PMP221

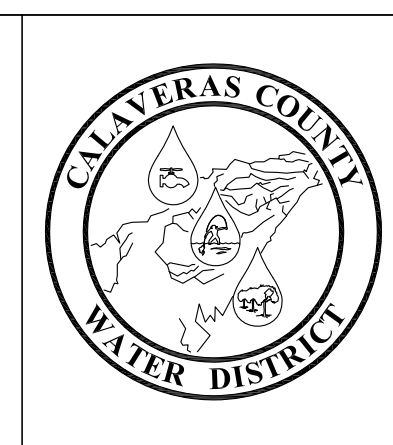
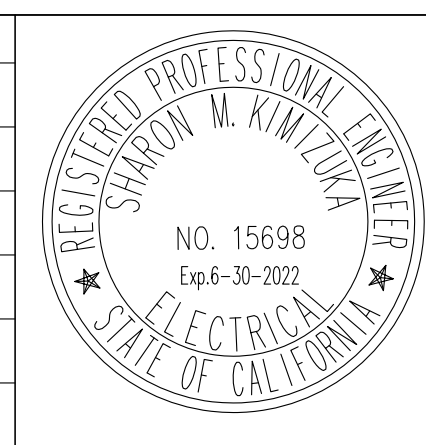


EFFLUENT PUMP 2 PMP312

STARTER PNL100 ELEMENTARY DIAGRAM



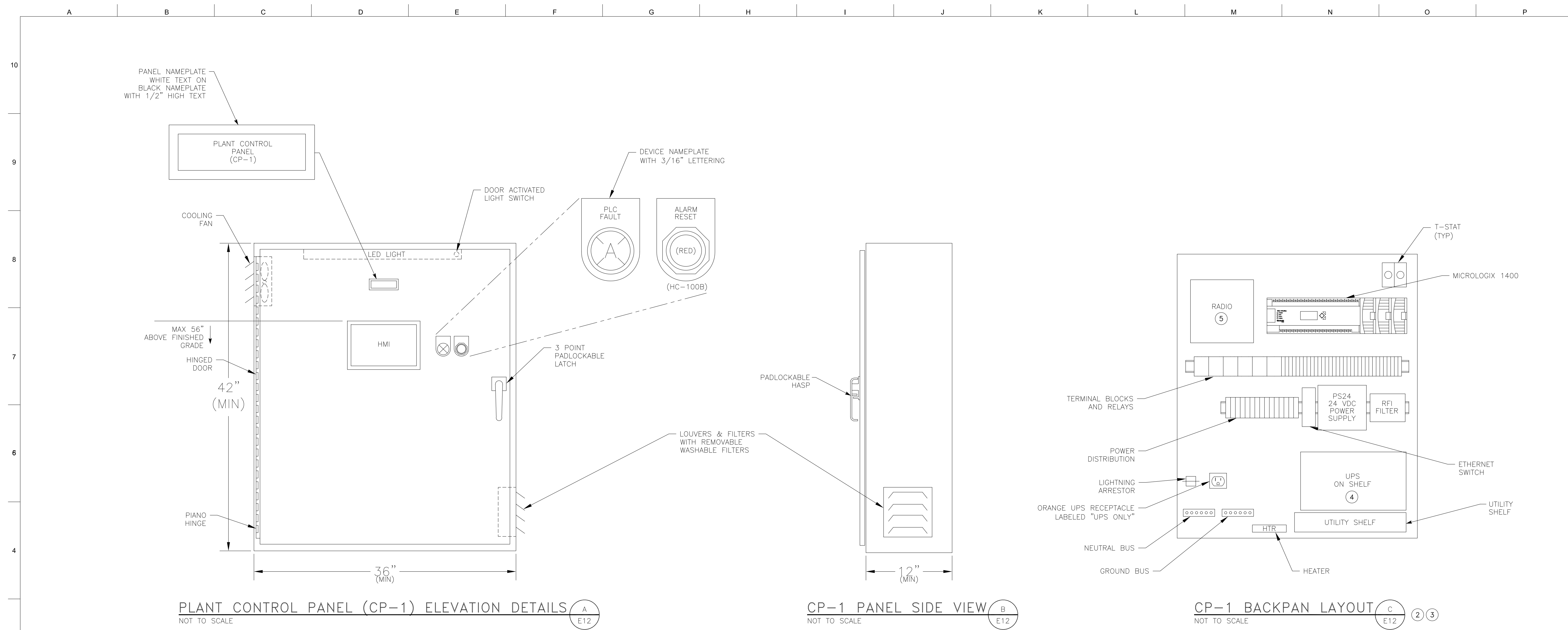
DESIGNED BY:	S. KIMIZUKA	REVISION:	DESCRIPTION:	DATE:	BY:
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DATE:	10/9/2020				
SCALE:	AS INDICATED				
BAR LENGTH ONE INCH ON SCALED DRAWING					



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STARTER PANEL (PNL100) ELEMENTARY DIAGRAM
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E6
DRAWING NUMBER 8 OF 23
SHEET NUMBER



PLANT CONTROL PANEL (CP-1) ELEVATION DETAILS (A) E12
NOT TO SCALE

CP-1 PANEL SIDE VIEW (B) E12
NOT TO SCALE

CP-1 BACKPAN LAYOUT (C) E12 (2) (3)
NOT TO SCALE

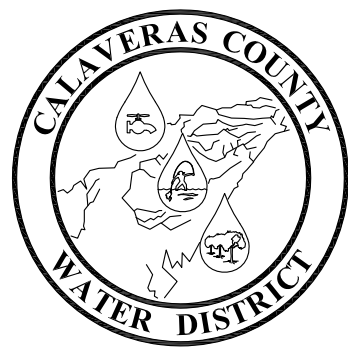
PANEL FABRICATION METHODS

1. NEMA 12 FOR INSIDE INSTALLATION.
2. ALL OUTER DOORS SEALED WITH PERMANENT TYPE GASKETING.
3. EXTERIOR FABRICATED FROM HOT DIPPED GALVANIZED SHEET STEEL.
4. 12 GAUGE CONSTRUCTION.
5. ALL SEAMS CONTINUOUS WELDED.
6. OUTER DOOR TO BE PADLOCKABLE.
7. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
10. EXTERIOR FULL HEIGHT PANEL COLOR: LIGHT GREY.
11. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL DEVICES ON DEADFRONT.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.

- NOTES:
- (1) PROVIDE ADDITIONAL DIN RAIL TO ADD A MINIMUM OF EIGHT TERMINAL BLOCKS TO EACH TERMINAL STRIP.
 - (2) PROVIDE SIDEPANS ON BOTH SIDES OF ENCLOSURE FOR ADDITIONAL MOUNTING SPACE.
 - (3) CONTROL PANEL SHALL BE CONSTRUCTED BY AN U.L. APPROVED PANEL SHOP AND BEAR A U.L. LABEL.
 - (4) SECURE UPS TO SHELF WITH 2 SS STRAPS.
 - (5) RADIO PROVIDED BY OWNER, INSTALLED BY CONTRACTOR.



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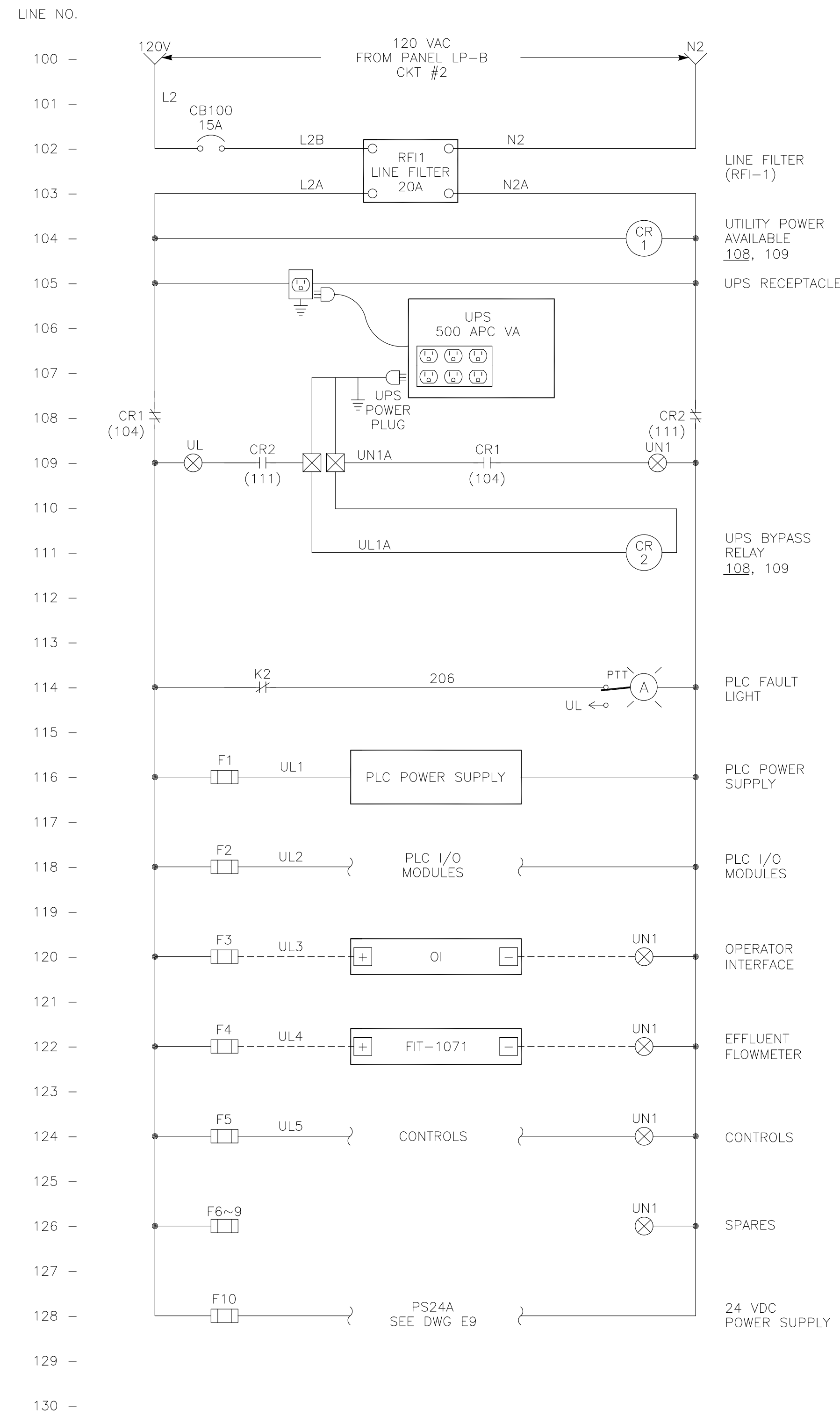
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PLANT CONTROL PANEL (CP-1) ELEVATION AND BACKPAN ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

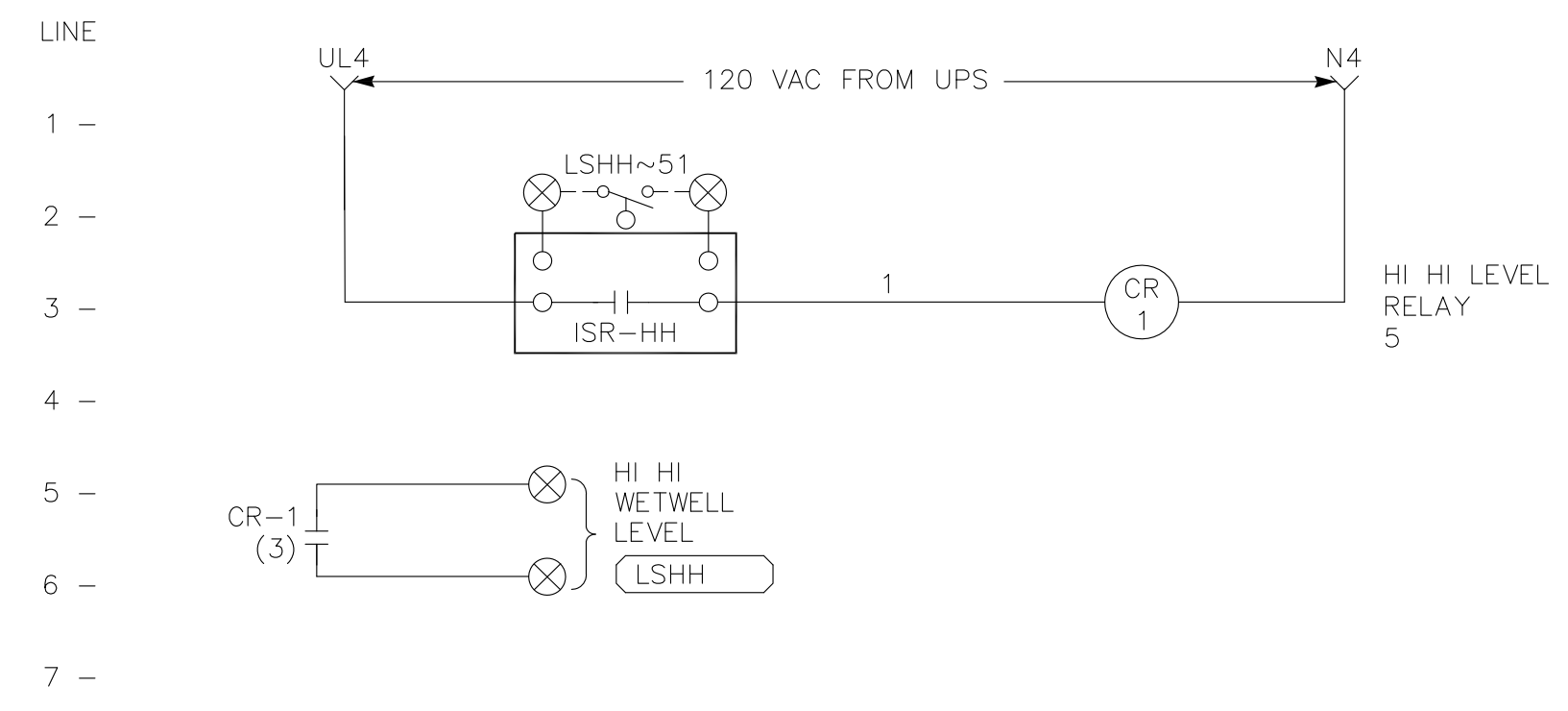
15087
PROJECT NUMBER E7
DRAWING NUMBER 9 OF 23
SHEET NUMBER

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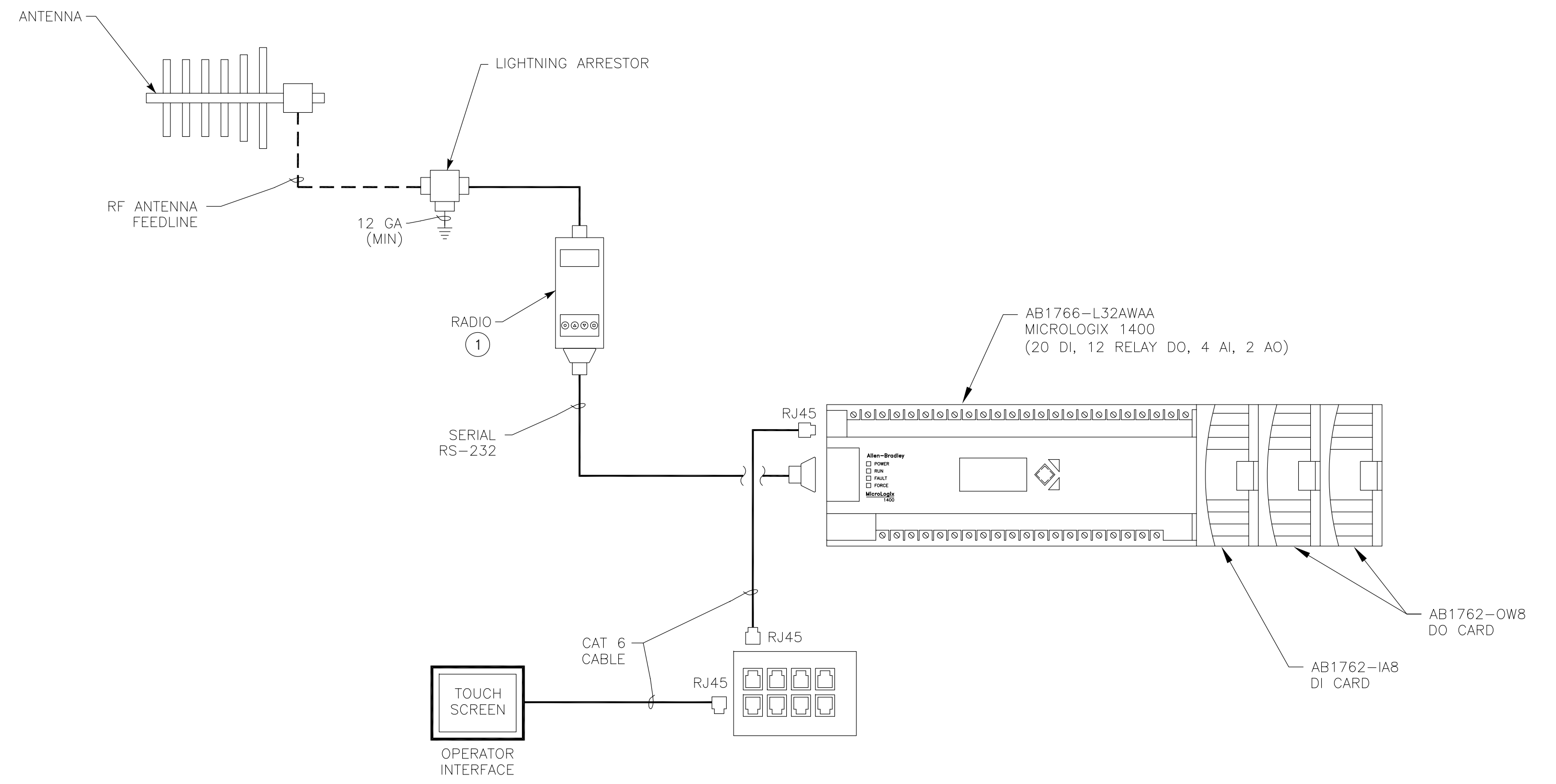


CP-1 120 VAC POWER DISTRIBUTION DIAGRAM (A/E8)

NOTES: ① DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS, AND COMPONENT CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM.



TYPICAL INTRINSIC SAFE RELAY (B/E8)



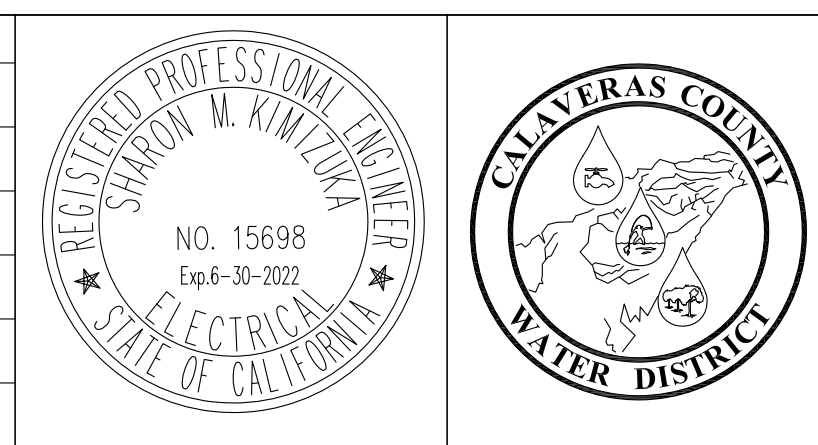
PLC BLOCK DIAGRAM (C/E8)

NOTES: ① RADIO PROVIDED BY OWNER FOR CONTRACTOR INSTALLATION.

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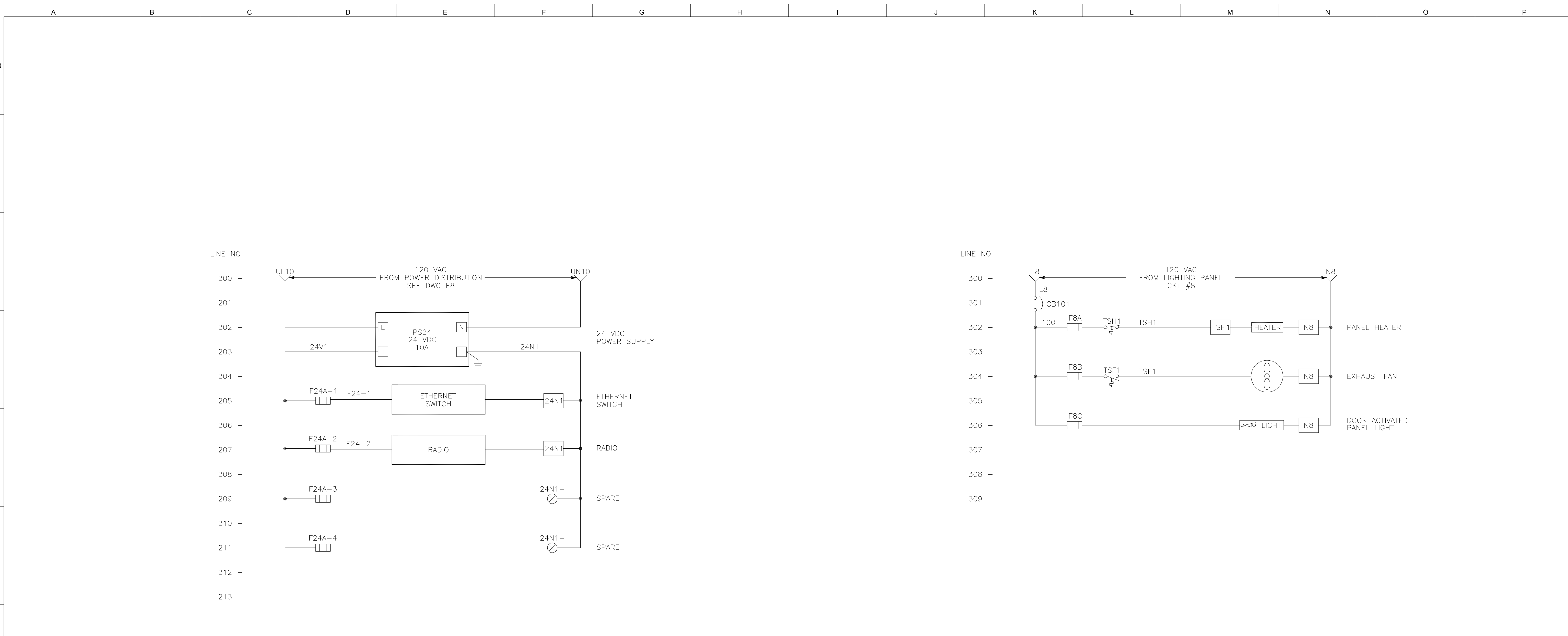
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PLANT CONTROL PANEL (CP-1)
POWER DISTRIBUTION AND CONTROLS
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER E8
DRAWING NUMBER 10 OF 23
SHEET NUMBER

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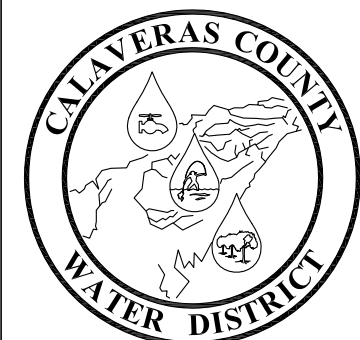
CP-1 24 VDC POWER DISTRIBUTION DIAGRAM

CP-1 CONTROL DIAGRAM



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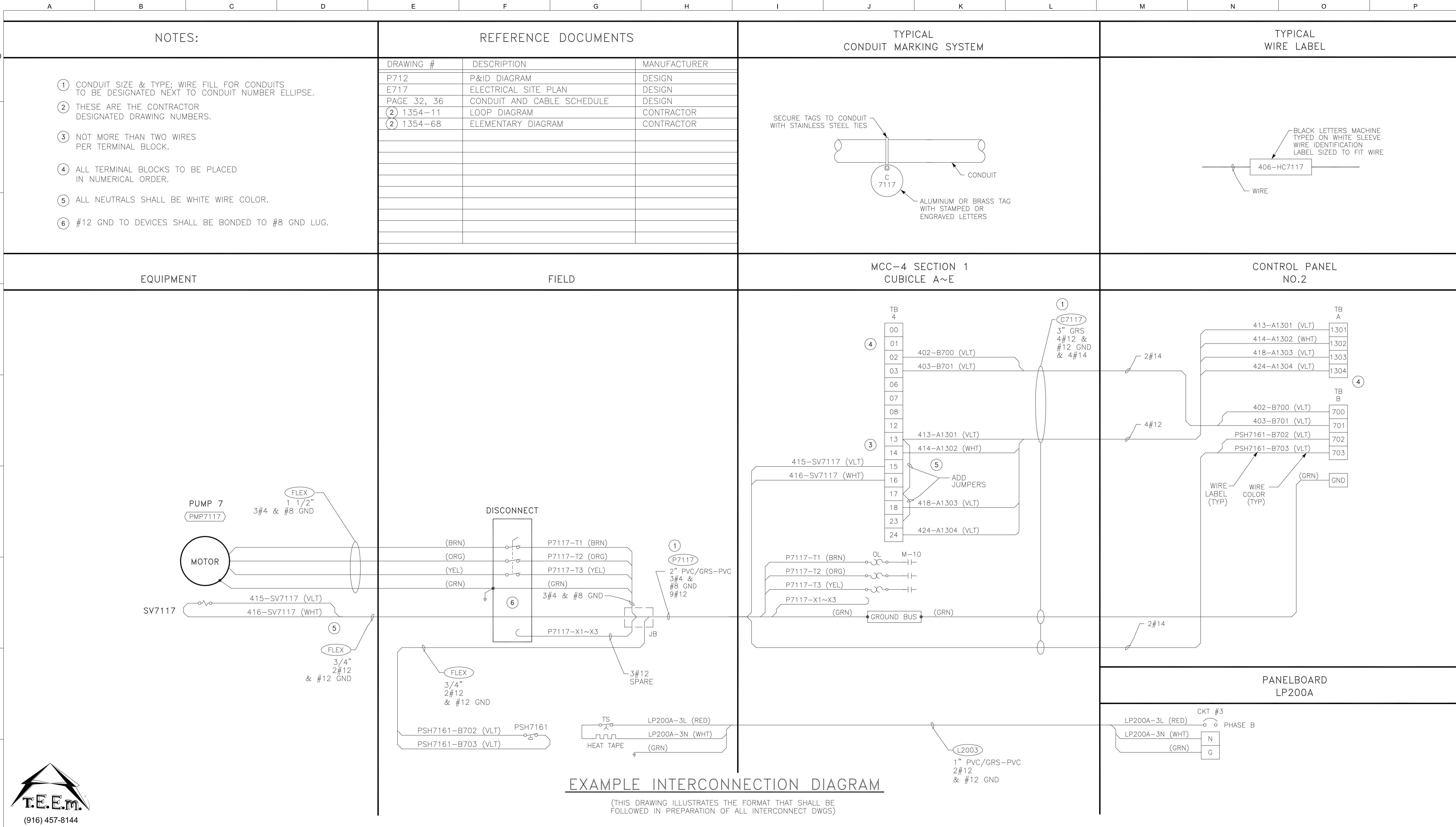
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PLANT CONTROL PANEL (CP-1)
 24 VDC POWER DISTRIBUTION AND CONTROLS
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
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PROJECT NUMBER E9
DRAWING NUMBER 11 OF 23
SHEET NUMBER

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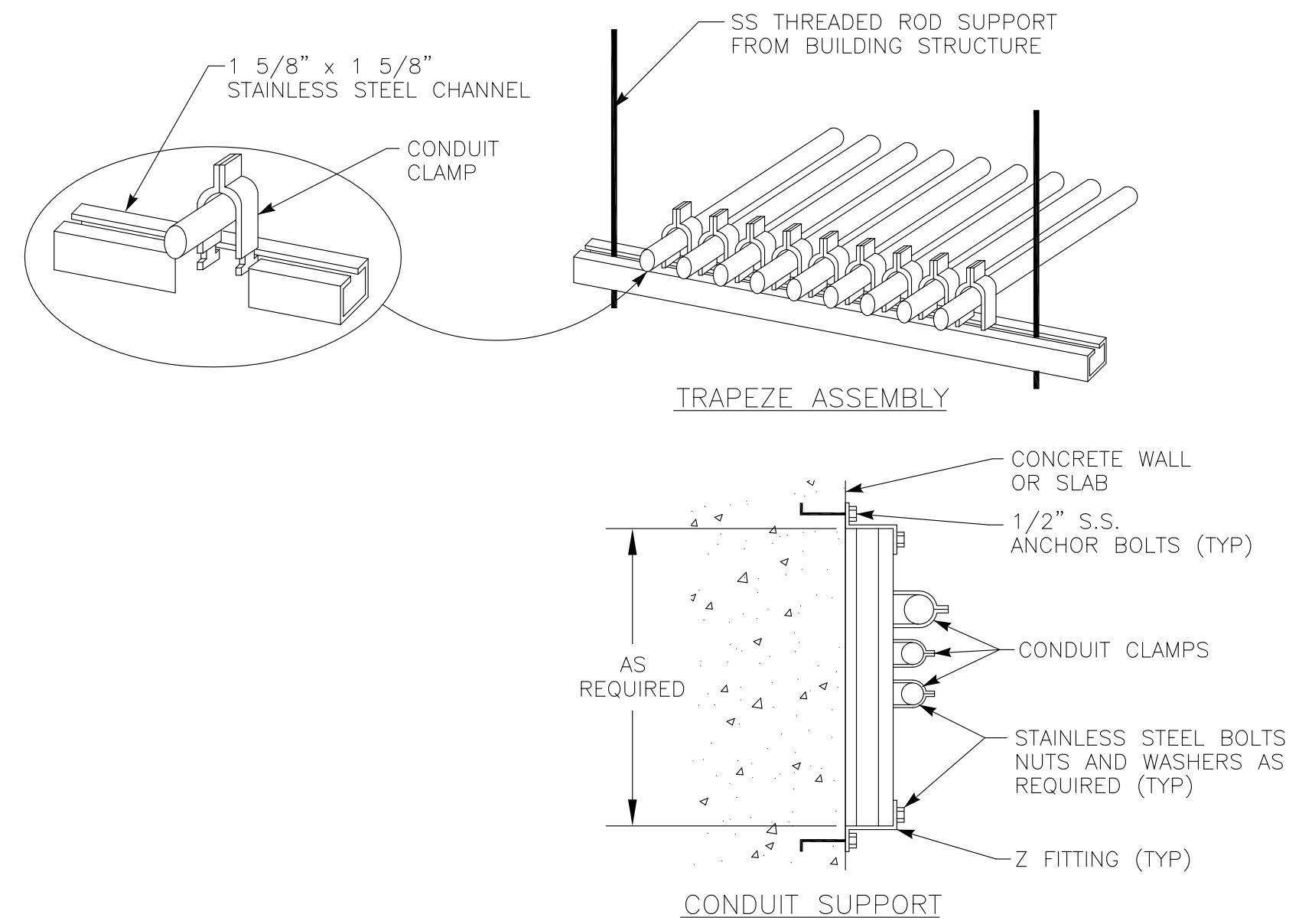


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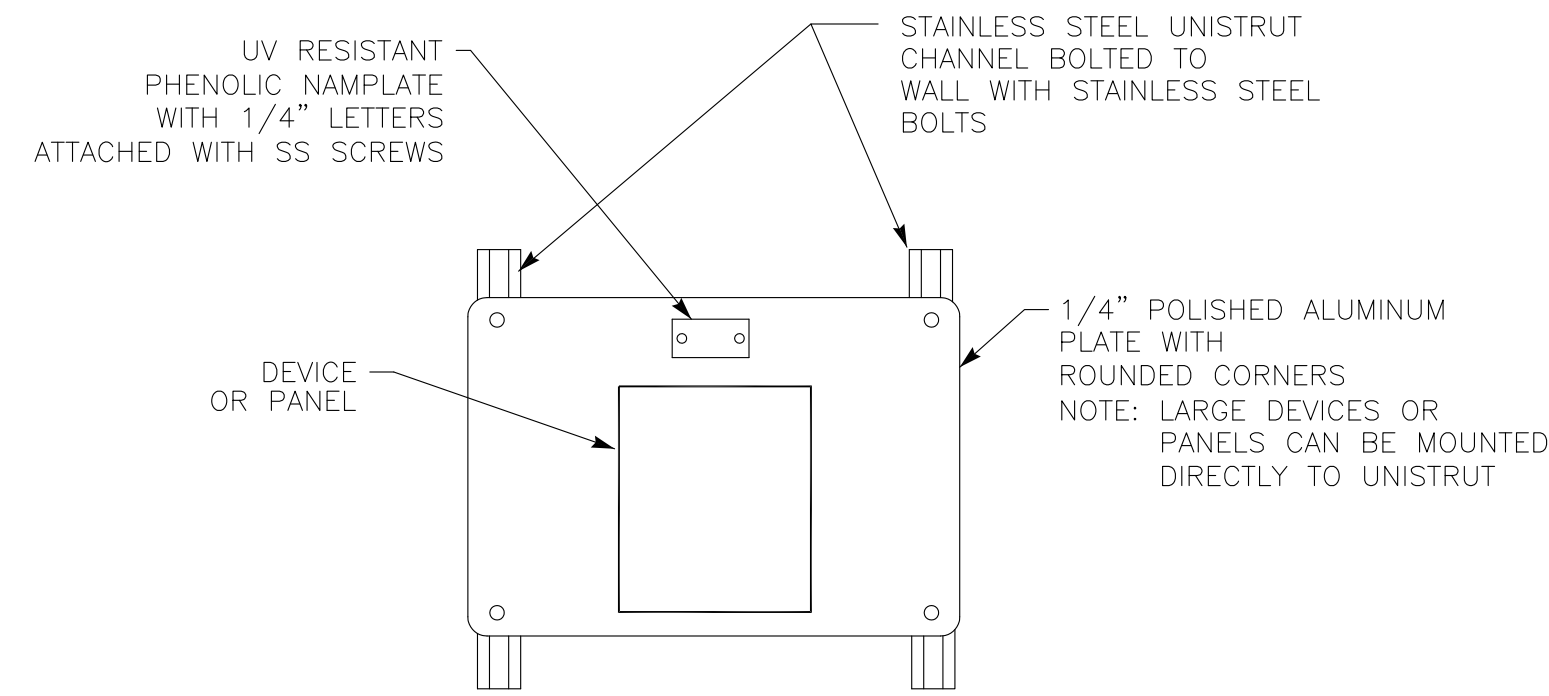
EXAMPLE INTERCONNECT DIAGRAM
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER E10
DRAWING NUMBER 12 OF 23
SHEET NUMBER

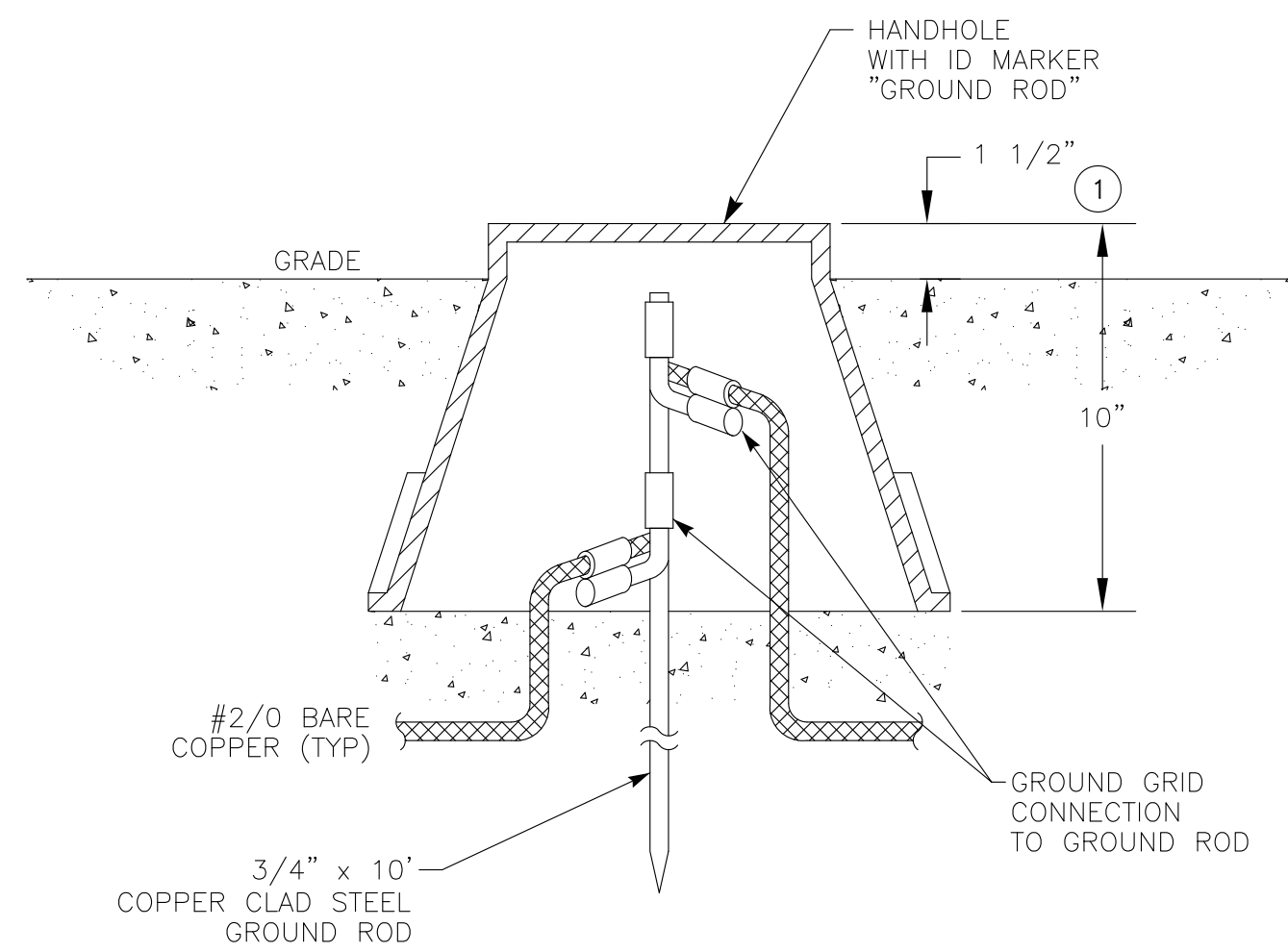


CONDUIT UNISTRUT MOUNTING (A) (E11)
NOT TO SCALE **DETAIL**

- NOTES: ① THIS DETAIL TYPICAL FOR BOTH VERTICAL AND HORIZONTAL MOUNTING.
② CHANNEL AND ALL SUPPORT DEVICES TO BE NEMA RATED PER AREA CLASSIFICATION. FIELD COAT ALL CUTS, ETC. TO MATCH.
③ CHANNELS TO BE SPACED 5' MAXIMUM.

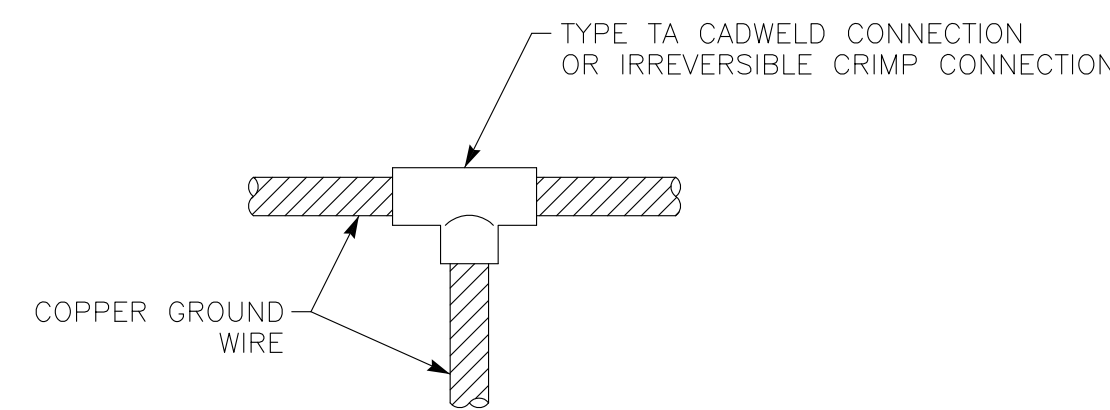


WALL PLATE SUPPORT (B) (E11)
NOT TO SCALE **DETAIL**

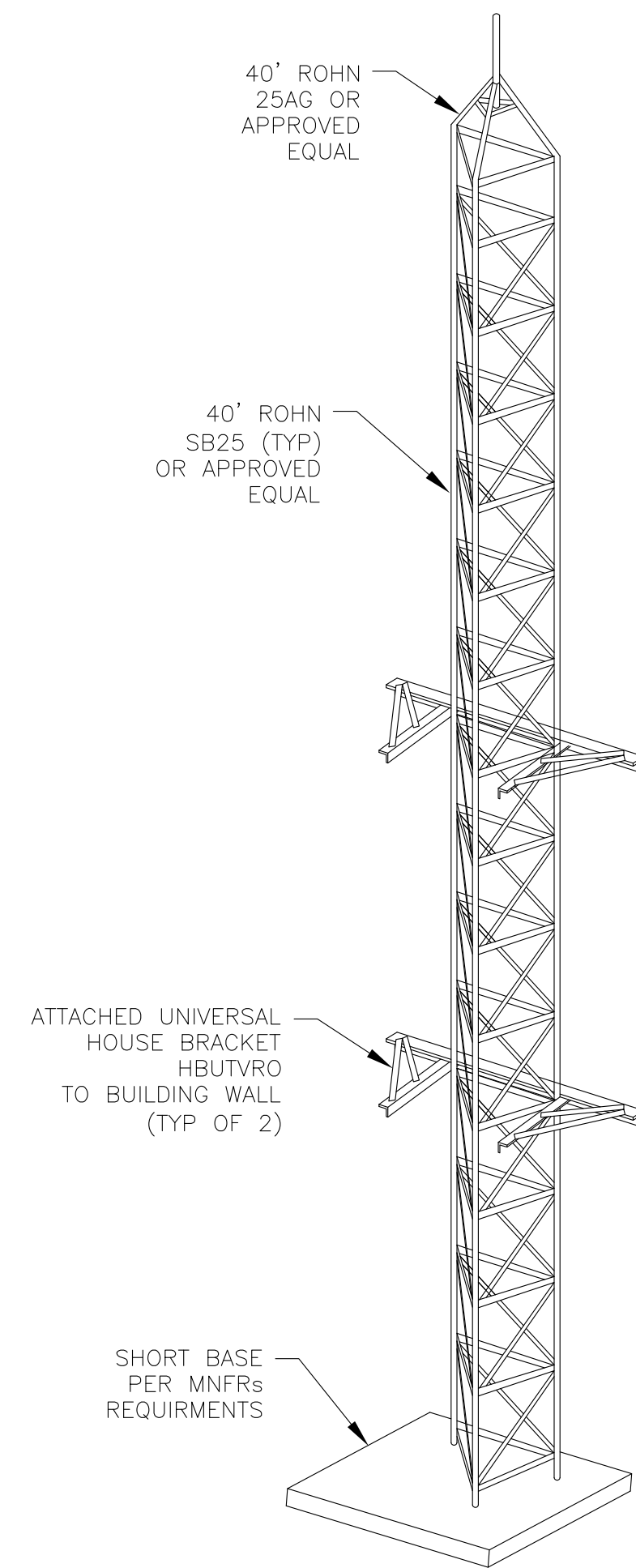


HANDHOLE GROUNDING (C) (E11)
NOT TO SCALE **DETAIL**

- NOTES: ① FLUSH IN PAVED AREAS.



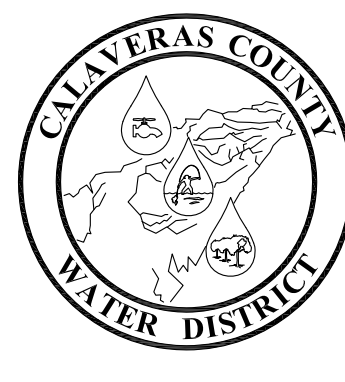
GROUND CABLE CONNECTION (D) (E11)
NOT TO SCALE **DETAIL**



ANTENNA BRACKETED TOWER (E) (E11)
NOT TO SCALE **DETAIL**



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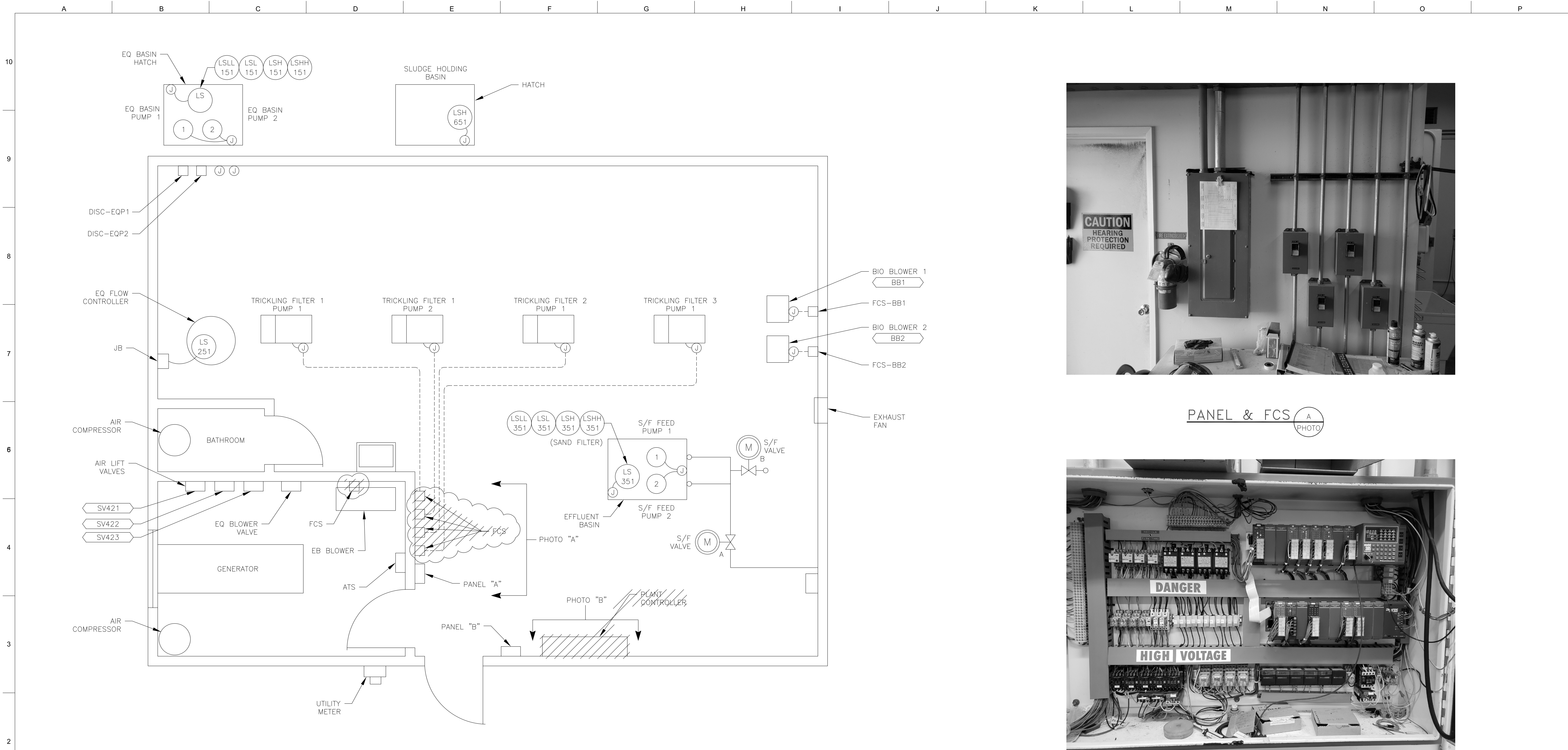


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TYPICAL ELECTRICAL DETAILS
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER E11
DRAWING NUMBER 13 OF 23
SHEET NUMBER

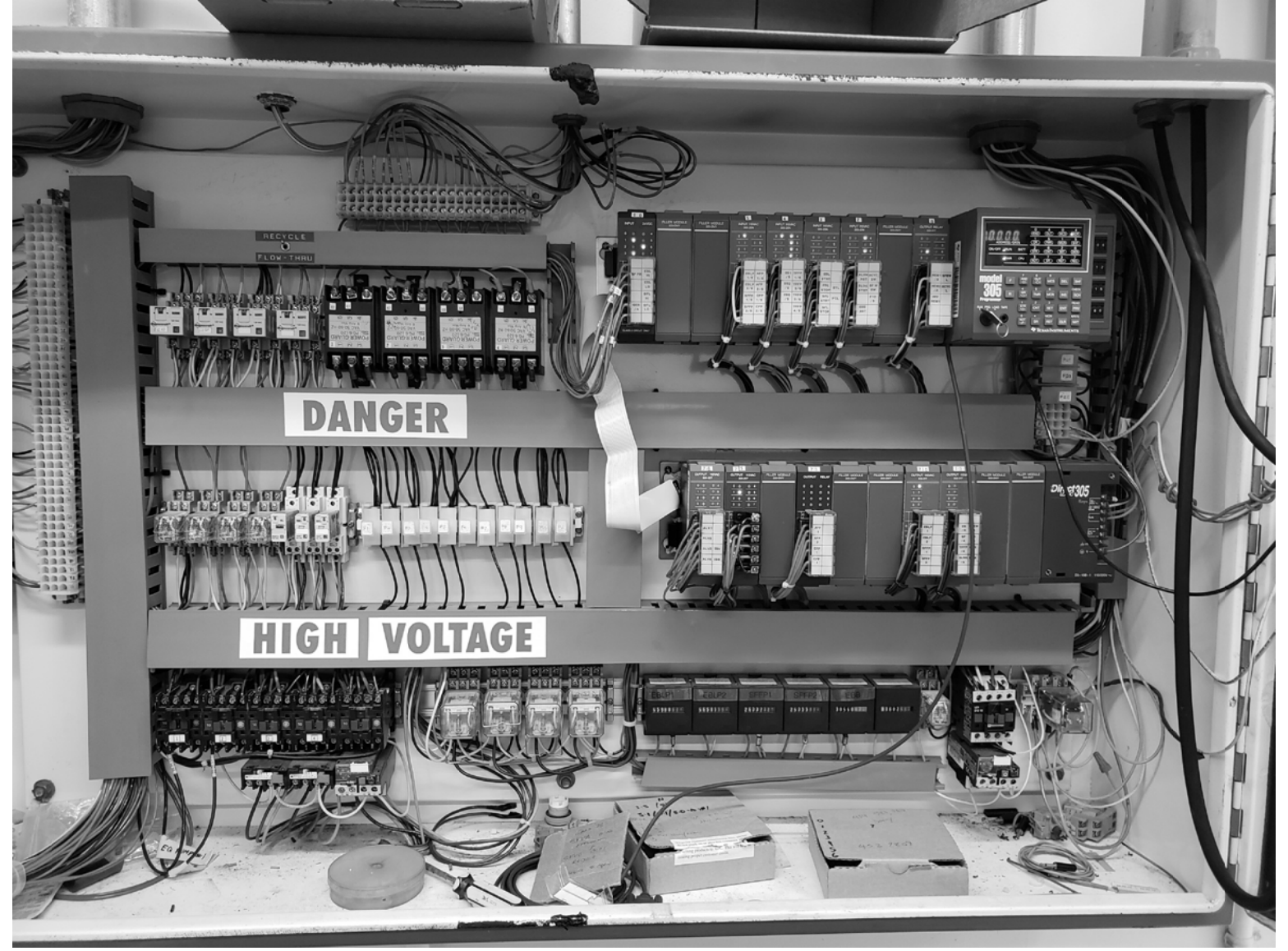


EXISTING BUILDING ELECTRICAL DEMO PLAN ①②

- NOTES: ① NOT ALL EXISTING CONDUITS SHOWN.
 ② DEMO (E) STARTERS AND PANELS WHERE SHOWN. REUSE (E) CONDUIT & WIRE TO RECONNECT (E) EQUIPMENT. EXTEND CONDUIT & WIRE WHERE NECESSARY. CONTRACTOR SHALL USE EXTREME CAUTION TO PREVENT ANY DAMAGE TO THOSE WIRES.



PANEL & FCS PHOTO A

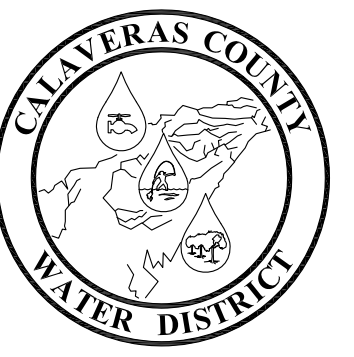


PLANT CONTROLLER PHOTO B

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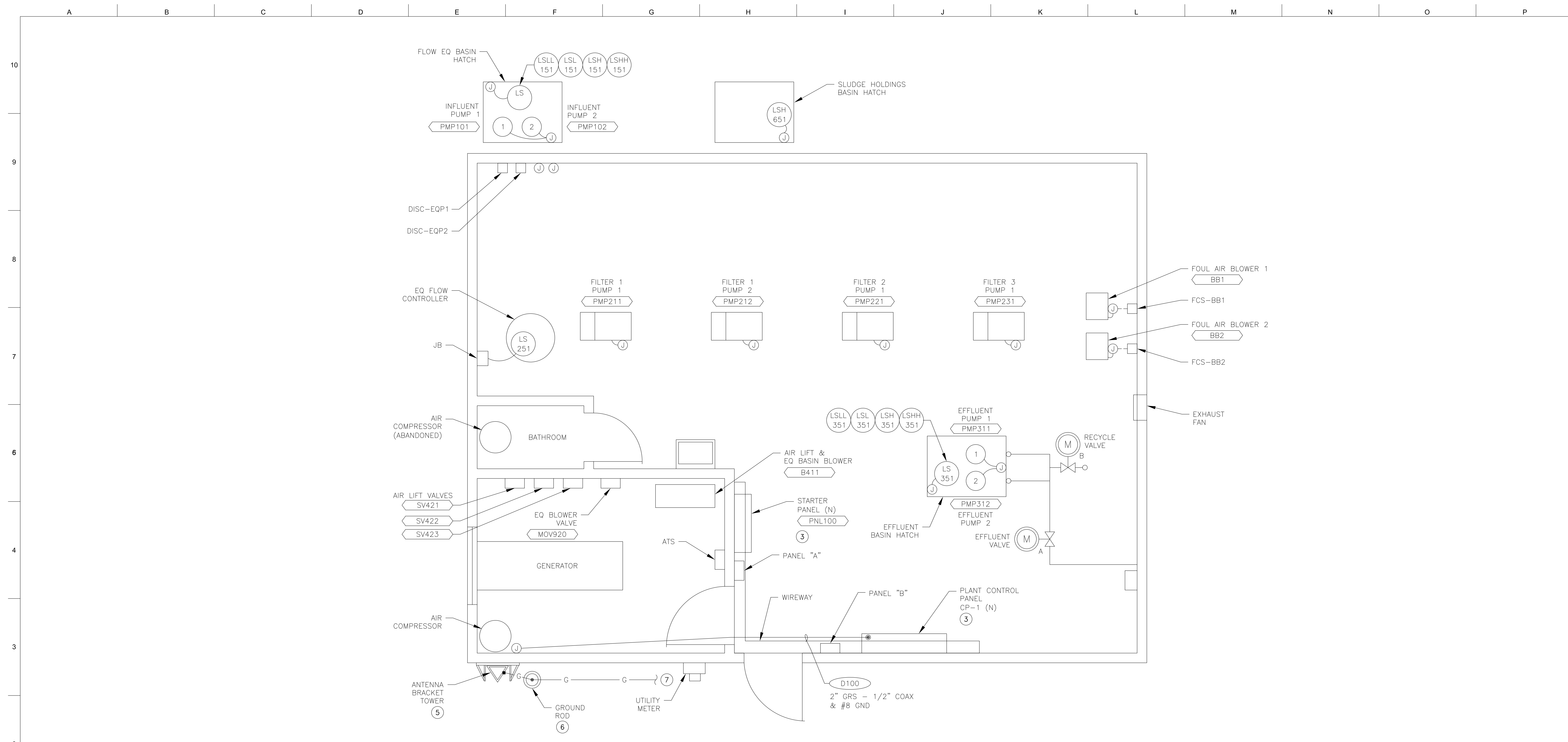


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BUILDING ELECTRICAL DEMO PLAN
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E21
DRAWING NUMBER 14 OF 23
SHEET NUMBER



BUILDING ELECTRICAL REVISED PLAN ①②④

- NOTES:
- ① NOT ALL EXISTING CONDUITS SHOWN, CONDUITS SHOWN ARE THOSE ASSOCIATED WITH NEW WORK.
 - ② EXPOSED CONDUITS PER DWG E11, DETAIL "A".
 - ③ SECURE TO WALL PER DWG E11, DETAIL "B".
 - ④ REUSE EXISTING WIRES TO RECONNECT (E) EQUIPMENT, CONTRACTOR SHALL PERFORM USING EXTREME CAUTION TO PREVENT ANY DAMAGE TO THOSE WIRES.
 - ⑤ INSTALL ANTENNA PER DWG E11, "E". COORDINATE WITH OWNER'S REPRESENTATIVE FOR EXACT LOCATION.
 - ⑥ INSTALL GROUND ROD PER DWG E11, DETAIL "C" & CABLE CONNECTION PER DWG E11, DETAIL "D".
 - ⑦ GROUND BOND TO CONSIST OF #2/0 BARE COPPER WITH 30" MINIMUM COVER. COORDINATE WITH DISTRICT TO LOCATE (E) GROUND ROD.



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BUILDING ELECTRICAL REVISED PLAN
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
 WALLACE LAKE ESTATES

15087
PROJECT NUMBER E22
DRAWING NUMBER 15 OF 23
SHEET NUMBER

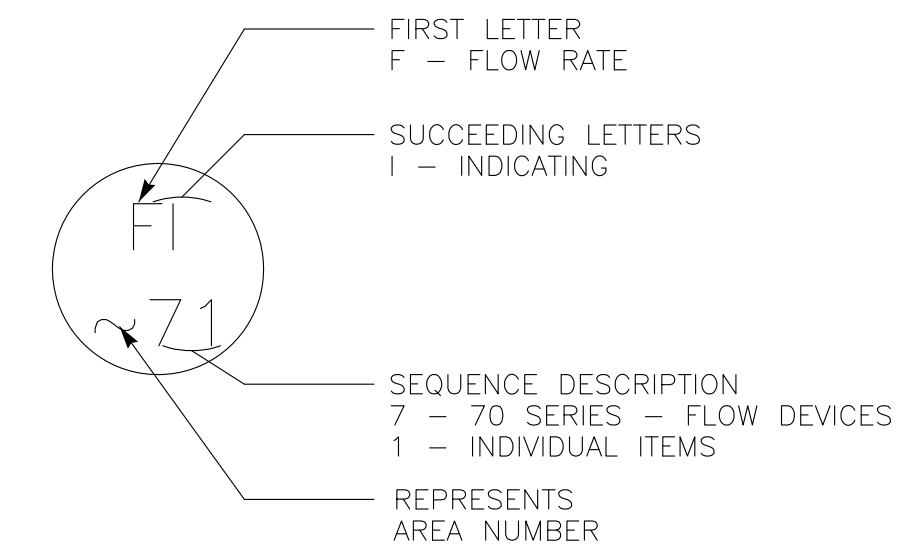
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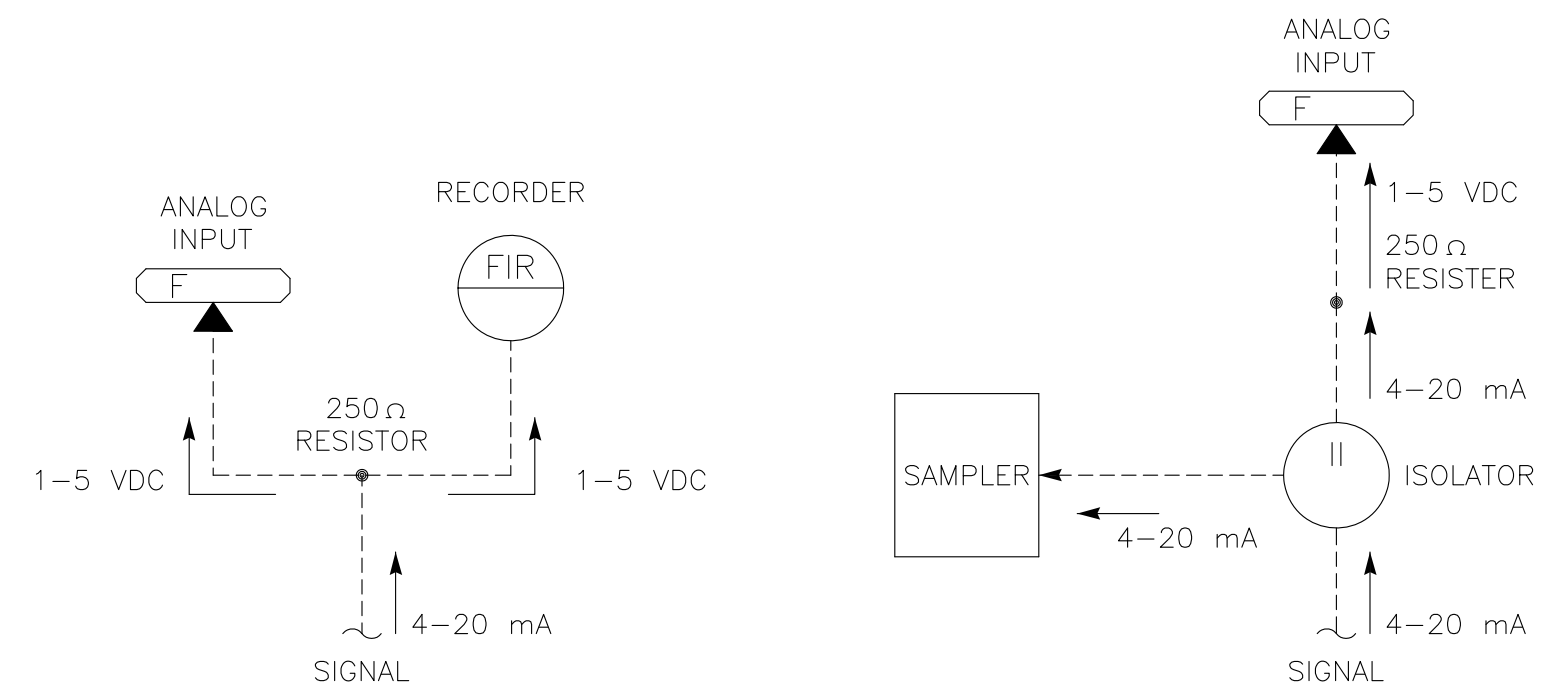
A B C D E F G H I J K L M N O P

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
P & I DIAGRAM SYMBOLS		P & I DIAGRAM SYMBOLS	
	FIELD MOUNTED INSTRUMENT		VALVE (GENERAL)
	FACE MOUNTED INSTRUMENT ON LOCAL PANEL, OPERATOR ACCESSIBLE		VALVE (GENERAL)
	FACE MOUNTED INSTRUMENT ON FIELD PANEL, OPERATOR ACCESSIBLE		GATE (GENERAL)
	INSTRUMENT MOUNTED IN LOCAL PANEL, OPERATOR INACCESSIBLE		GATE (GENERAL)
	INSTRUMENT MOUNTED IN FIELD PANEL, OPERATOR INACCESSIBLE		CHECK VALVE (GENERAL)
	OPERATION PERFORMED WITH LOGIC OR HARDWIRED DEVICES		PUMP (GENERAL)
	DWG # - REFERENCE ELEMENTARY DWG. #		BLOWER (GENERAL)
	PLC OR COMPUTER FUNCTION PERFORMING OPERATION WITH VISUAL INDICATION		VALVE/GATE NUMBER
	PLC OR COMPUTER FUNCTION PERFORMING OPERATION WITH VISUAL ALARM INDICATION		EQUIPMENT NUMBER
	PLC OR COMPUTER PERFORMING INTERNAL OPERATION		ELECTRIC SIGNAL
	PLC OR COMPUTER PERFORMING INTERNAL ALARM OPERATION		LOGIC OR DATA SIGNAL
	PROPORTIONAL, INTEGRAL, AND DIFFERENTIAL PARAMETERS		PNEUMATIC SIGNAL
	RATIO AND BIAS PARAMETERS		CAPILLARY TUBING (FILLED SYSTEM)
	AUDIBLE ALARM (BUZZER OR HORN)		HYDRAULIC SIGNAL
	ANNUNCIATOR WINDOW R - ROW # C - COLUMN #		SONIC OR ELECTROMAGNETIC SIGNAL
	LAMP INDICATION (STATUS OR ALARM)		ELECTRIC SUPPLY FROM PANELBOARD CKT
	DISCRETE INPUT		SERVICE AIR
	DISCRETE OUTPUT		INSTRUMENT AIR
	ANALOG INPUT		
	ANALOG OUTPUT		
	JUMP TAG FROM ONE AREA TO ANOTHER AREA OF DRAWING		
	"g" TAG CONNECT POINT ON EACH DRAWING		
	CONTINUED ON DWG P-X		
	AUTODIALER PRIORITY # PC BASED SOFTWARE		

INSTRUMENT IDENTIFICATION LETTERS				
FIRST - LETTER	SUCCEEDING - LETTER			
MEASURED OF INITIATING VARIABLE	MODIFIER	READOUT PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C CONDUCTIVITY			CONTROLLER	
D DENSITY	DIFFERENTIAL			
E VOLTAGE		SENSOR, PRIMARY ELEMENT		
F FLOW RATE	RATIO (FRACTION)			
G GENERAL		GLASS VIEWING DEVICE		
H HAND				HIGH, OPENED
I CURRENT (ELEC.)		INDICATING, INDICATOR		
J POWER	SCAN			
K TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L LEVEL		LIGHT		LOW, CLOSED
M MOISTURE	MOMENTARY			MIDDLE
N STATUS		STATUS	USER'S CHOICE	USER'S CHOICE
O OPERATOR		ORIFICE, RESTRICTION		
P PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q QUANTITY	INTERGRATE, TOTALIZE			
R RESET		RECORD		
S SPEED, FREQUENCY	SAFETY		SWITCH	
T TEMPERATURE			TRANSMITTER	TEST
U MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V VIBRATION, MECH. ANALYSIS			VALVE, DAMPER LOUVER	
W WEIGHT, FORCE		WELL		
X SWITCH	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTER, CONVERTOR	
Z POSITION DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	



P&ID INSTRUMENT IDENTIFICATION EXAMPLE

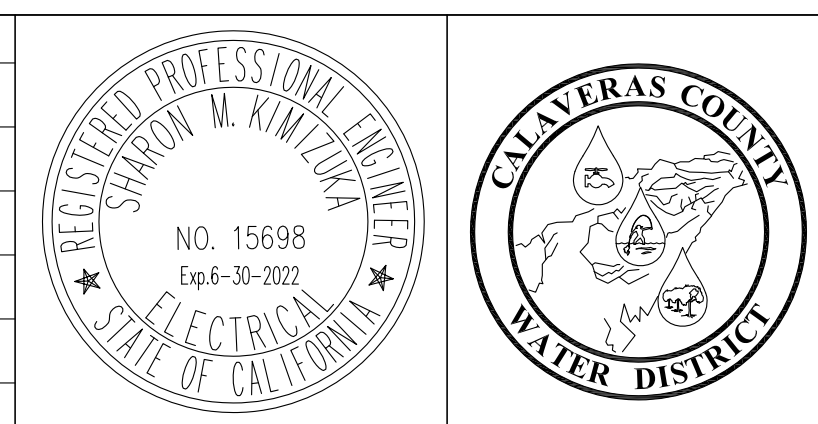


TYPICAL SIGNAL FLOWS

NUMBERING SEQUENCE	
SEQUENCE NUMBER	DESCRIPTION
00	COMMON ALARM
01-09	INDIVIDUAL ITEMS
10	MECHANICAL
20	MECHANICAL
30	MECHANICAL
40	MECHANICAL
50	LEVEL DEVICES
60	PRESSURE DEVICES
70	FLOW DEVICES
80	ANALYTICAL DEVICES
90	SAFETY & SECURITY DEVICES



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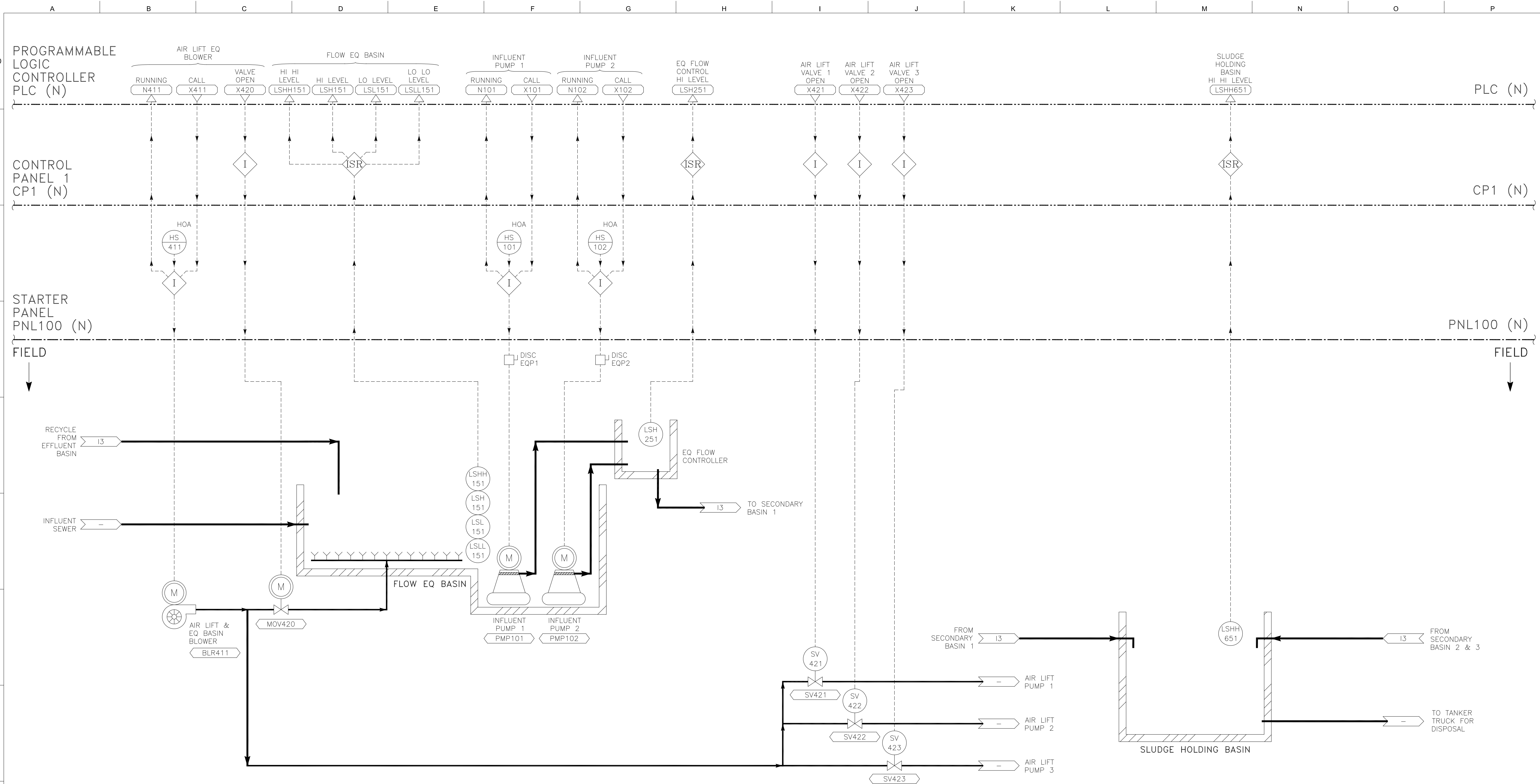


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INSTRUMENTATION SYMBOLS & ABBREVIATIONS
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

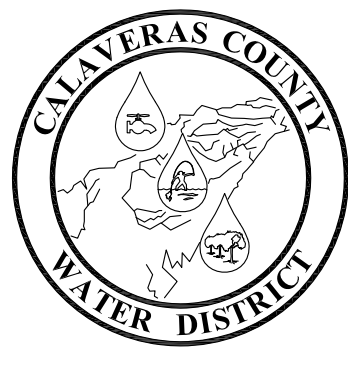
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PROJECT NUMBER 11
DRAWING NUMBER 16 OF 23
SHEET NUMBER



WALLACE WWTP- INFLUENT



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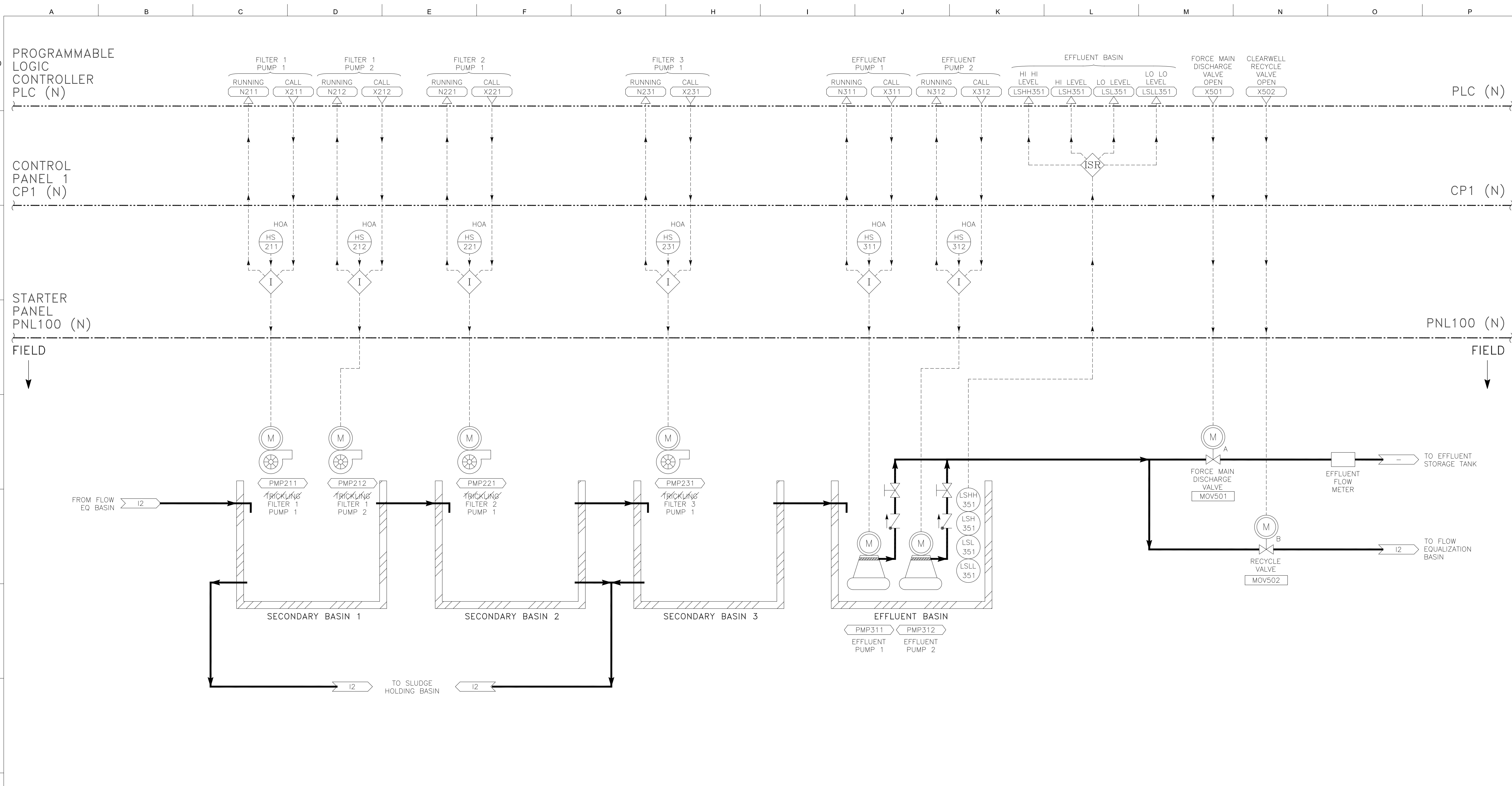
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WALLACE WWTP – INFLUENT P&ID
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
 ARNOLD WASTEWATER TREATMENT FACILITY
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15087
PROJECT NUMBER 12
DRAWING NUMBER 17 OF 23
SHEET NUMBER

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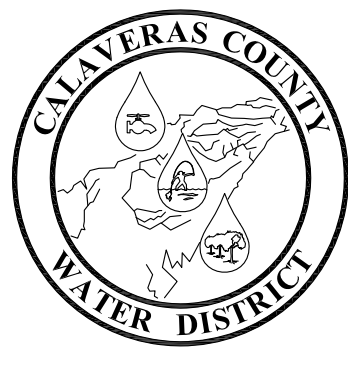
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WALLACE WWTP – EFFLUENT



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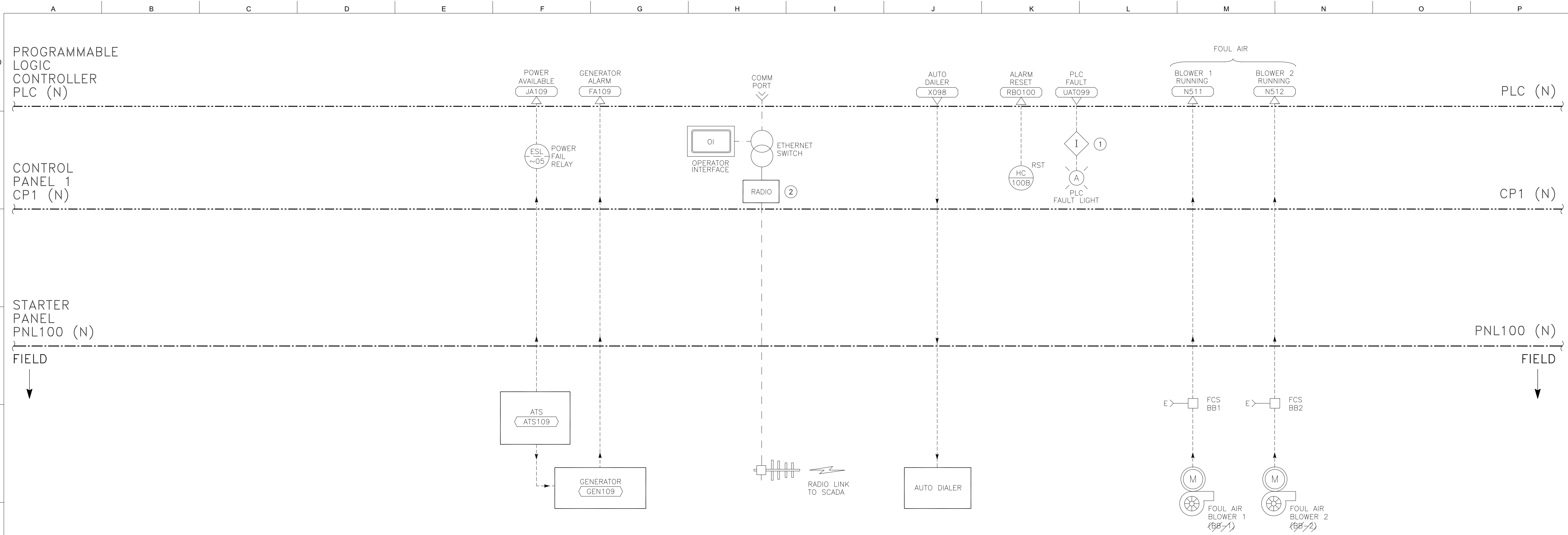


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WALLACE WWTP – EFFLUENT P&ID
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
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WALLACE LAKE ESTATES

15087
PROJECT NUMBER 13
DRAWING NUMBER 18 OF 23
SHEET NUMBER



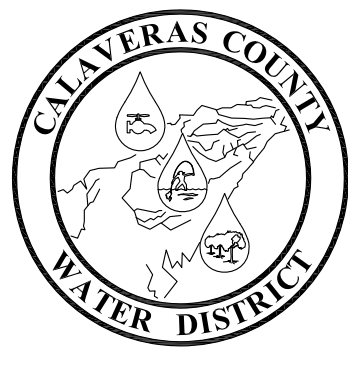
AUXILIARY SYSTEMS

- NOTES: ① WIRE SWITCH WIRING IN SERIES ON TERMINAL BLOCKS AND INSTALL 24VDC ISOLATION RELAY.
 ② OWNER SUPPLIED RADIO INSTALLED BY CONTRACTOR.

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DESIGNED BY:	S. KIMIZUKA	REVISION:	DESCRIPTION:	DATE:	BY:
DRAFTED BY:	Z. VOGLER				
CHECKED BY:	X. LI				
DATE:	10/9/2020				
SCALE:	AS INDICATED				
BAR LENGTH ONE INCH ON SCALED DRAWING					

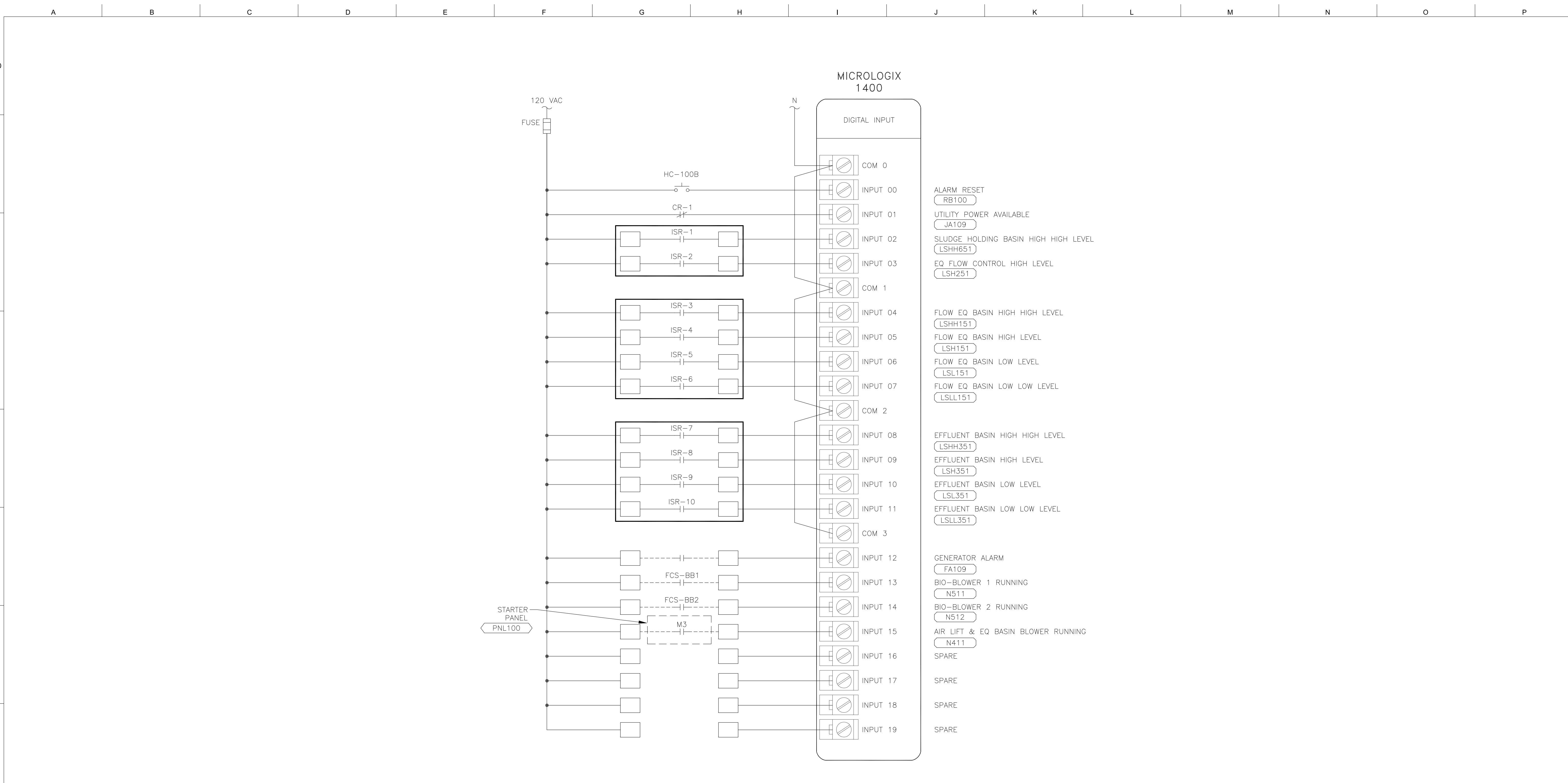


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AUXILIARY SYSTEMS P&ID
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 WALLACE LAKE ESTATES

15087
PROJECT NUMBER 14
DRAWING NUMBER 19 OF 23
SHEET NUMBER

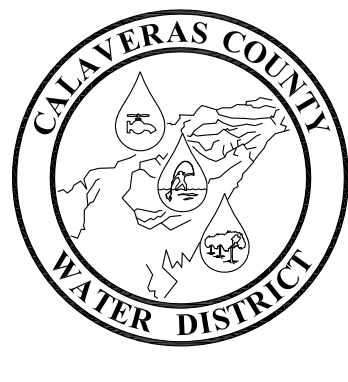
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MICROLOGIX PLC – DIGITAL INPUT WIRING DIAGRAM



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DATE:	10/9/2020								
SCALE:	AS INDICATED								
BAR LENGTH ONE INCH ON SCALED DRAWING									

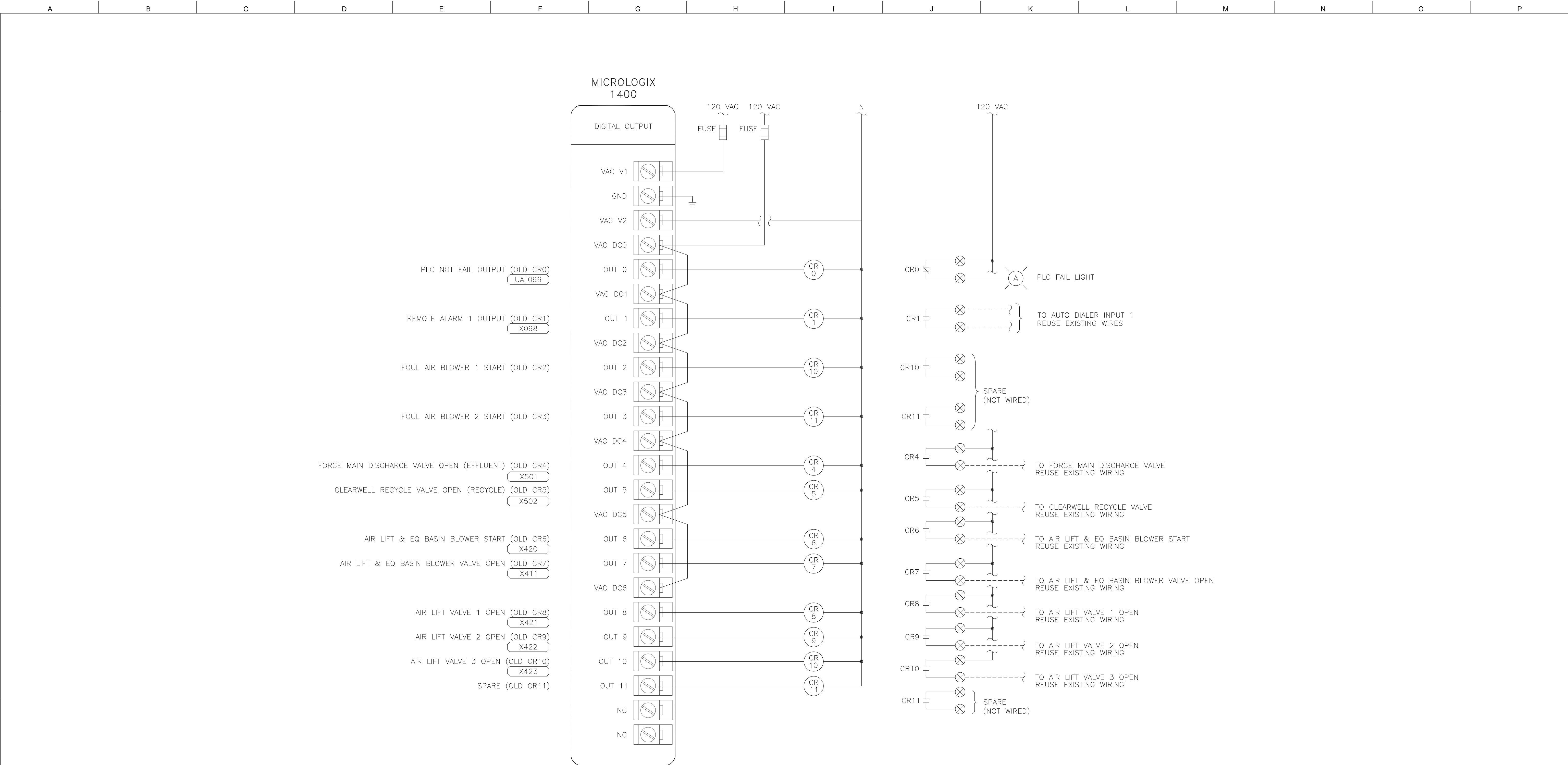


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MICROLOGIX PLC DIGITAL INPUT WIRING DIAGRAM
ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
ARNOLD WASTEWATER TREATMENT FACILITY
WALLACE LAKE ESTATES

15087
PROJECT NUMBER 15
DRAWING NUMBER 20 OF 23
SHEET NUMBER

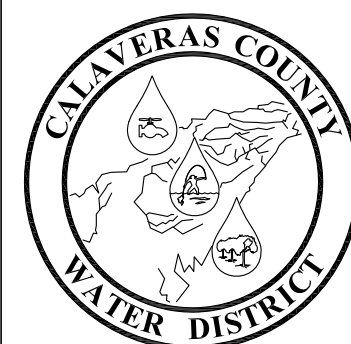


MICROLOGIX PLC – DIGITAL OUTPUT WIRING DIAGRAM



DESIGNED BY: S. KIMIZUKA
 DRAFTED BY: Z. VOGLER
 CHECKED BY: X. LI
 DATE: 10/9/2020
 SCALE: AS INDICATED
 BAR LENGTH ONE INCH ON SCALED DRAWING

REVISION:	DESCRIPTION:	DATE:	BY:



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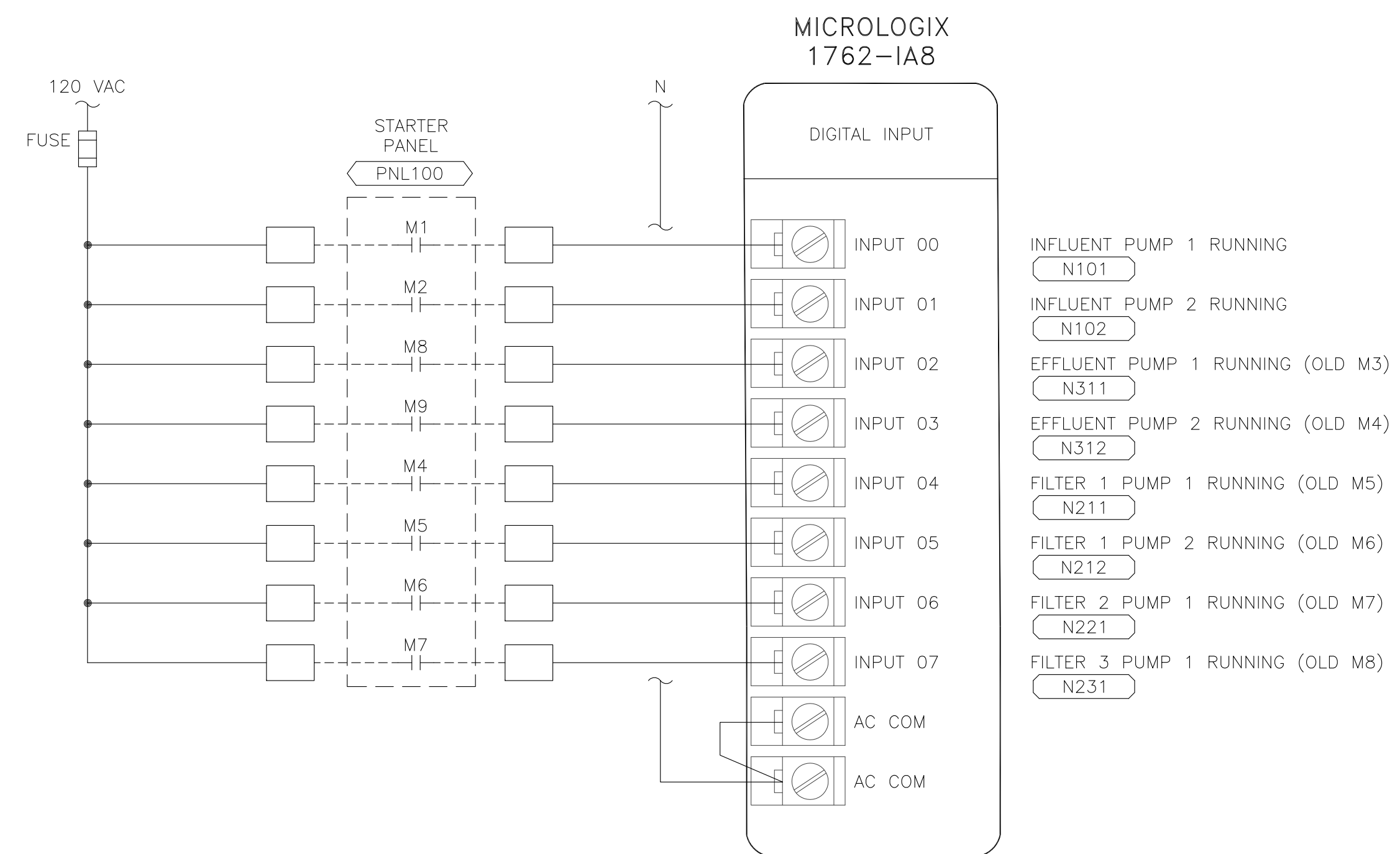
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MICROLOGIX PLC DIGITAL OUTPUT WIRING DIAGRAM
 ELECTRICAL AND INSTRUMENTATION IMPROVEMENT PROJECT
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PROJECT NUMBER 16
DRAWING NUMBER 21 OF 23
SHEET NUMBER

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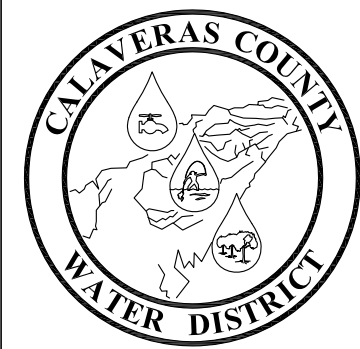


PLC SLOT 1 – DIGITAL INPUT WIRING DIAGRAM



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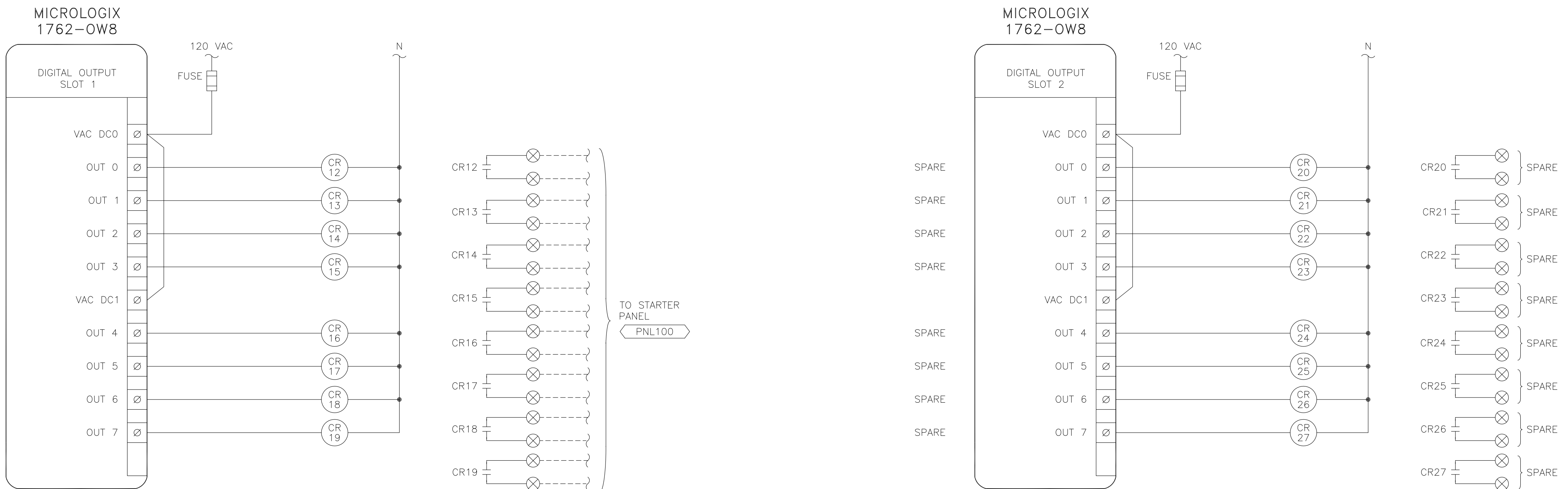
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PLC SLOT 1 DIGITAL INPUT WIRING DIAGRAM
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15087
PROJECT NUMBER 17
DRAWING NUMBER 22 OF 23
SHEET NUMBER

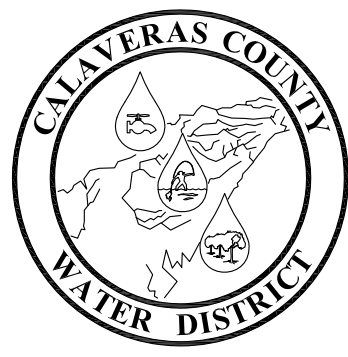
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PLC SLOT 2 & 3 – DIGITAL OUTPUT WIRING DIAGRAM



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PLC SLOT 2 & 3 DIGITAL OUTPUT WIRING DIAGRAM
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PROJECT NUMBER 18
DRAWING NUMBER 23 OF 23
SHEET NUMBER