

PLAN SYMBOLS

	HOME RUN TO PANELBOARD. NO. OF ARROWS INDICATE NO. OF CIRCUITS, HASH MARKS INDICATE NO. OF #12 AWG. CONDUCTORS. NO HASH MARKS INDICATE 2 #12 CONDUCTORS.
	CONDUIT CONCEALED IN WALL, IN SLAB ABOVE, OR ABOVE CEILING
	CONDUIT CONCEALED IN OR BELOW FLOOR OR UNDERGROUND.
	CONDUIT RUN EXPOSED. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.
	FLEXIBLE CONDUIT WITH EQUIPMENT CONNECTION.
	CONCRETE ENCASED DUCTBANK.
	EXTERIOR LED LUMINAIRE AND MOUNTING STANDARD.
	JUNCTION BOX N.E.C. SURFACE MOUNTED UNLESS INDICATED OTHERWISE.
	JUNCTION BOX PER N.E.C., FLUSH MOUNTED UNLESS INDICATED OTHERWISE.
	FLUSH OR SURFACE MOUNTED LIGHTING PANELBOARD.
	FLUSH OR SURFACE MOUNTED POWER PANELBOARD.
	DRY TYPE TRANSFORMER. NO. INDICATES KVA RATING.
	LIQUID FILLED TYPE TRANSFORMER
	SURFACE MOUNTED GROUND FAULT DUPLEX WEATHERPROOF RECEPTACLE 20A, 125V, 3W - MOUNTED 48" ABOVE FINISHED FLOOR.
	DISCONNECT RACK MOUNTED.
	OFF REMOTE/DISCONNECT RACK MOUNTED.
	SINGLE POLE SWITCH WITH PILOT LIGHT IN FLUSH OUTLET BOX, 48" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED (TYPICAL).
	SINGLE POLE SWITCH, WITH PILOT LIGHT SURFACE MOUNTED.
	THREE-WAY SWITCH IN FLUSH OUTLET BOX.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED, WITH REMOTE CONTROL STATION AS REQUIRED BY ELEMENTARY DIAGRAMS OR SPECS.
	ELECTRIC A.C. MOTOR, NO. INDICATES HORSEPOWER.
	FUSED DISCONNECT SWITCH(30/20: 30=SWITCH RATING, 20=FUSE RATING) 3 POLE-UNLESS NOTED OTHERWISE.
	COMBINATION MOTOR STARTER, DISCONNECT SWITCH
	VARIABLE FREQUENCY DRIVE
	THERMOSTAT
	ELECTRIC HEATER
	GROUND TEST WELL
	GROUND ROD
	OFF/REMOTE
	LIQUID LEVEL SWITCH
	TEMPERATURE SWITCH
	SEAL FAIL
	SPACE HEATER

SINGLE LINE DIAGRAM SYMBOLS

	COMBINATION MOTOR STARTER
	SHUNT TRIP
	FUSE
	CAPACITOR
	MOLDED CASE CIRCUIT BREAKER
	TYPICAL SELECTOR SWITCH AND CONTROL. SEE ELEMENTARY DIAGRAMS FOR EXACT TYPE.
	ELECTRIC A.C. MOTOR, NO. INDICATES HORSEPOWER.
	SERVICE OR EQUIPMENT GROUND.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED, WITH REMOTE CONTROL STATION AS REQUIRED BY ELEMENTARY DIAGRAMS OR SPECS.
	120/208V PANELBOARD
	480V PANELBOARD.
	CURRENT TRANSFORMERS
	POTENTIAL TRANSFORMERS.
	PHASE MONITOR.

CONTROL DIAGRAM SYMBOLS

	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	LIMIT SWITCH, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	PRESSURE SWITCH, NORMALLY CLOSED
	FLOAT SWITCH, NORMALLY OPEN
	FLOAT SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	FLOW SWITCH, NORMALLY CLOSED
	TEMPERATURE SWITCH, NORMALLY OPEN
	TEMPERATURE SWITCH, NORMALLY CLOSED
	NORMALLY OPEN, TIMED TO CLOSE CONTACT
	NORMALLY CLOSED, TIMED TO CLOSE CONTACT
	NORMALLY OPEN, TIMED TO OPEN CONTACT
	LOCKOUT RELAY
	ALARM RELAY
	ALARM TIMER
	CONTROL RELAY
	MOTOR STARTER
	MOTOR CALL
	TIMING RELAY
	ALARM INDICATING LIGHT
	RUN INDICATING LIGHT
	MOMENTARY CONTACT PUSHBUTTON
	MOMENTARY BREAK PUSHBUTTON OR RESET
	KEYED SWITCH
	MAINTAINED CONTACT ON-OFF SWITCH
	START/STOP(S/S) CONTROL SWITCH
	MAINTAINED CONTACT
	THREE POSITION MAINTAINED CONTACT SELECTOR SWITCH
	FUSE
	MOLDED CASE CIRCUIT BREAKER
	CONTROL POWER TRANSFORMER
	REMOTE TERMINAL BLOCK POINT

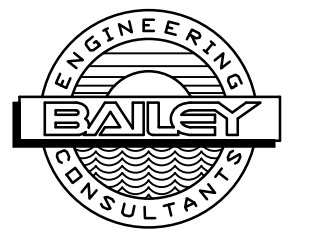
ABBREVIATIONS

A	AMPERES
AIC	AMPS INTERRUPTING CURRENT
ATS	AUTOMATIC TRANSFER SWITCH
BKR	BREAKER
BLDG	BUILDING
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CU	COPPER
CT	CURRENT TRANSFORMER
DH	DATA HIGHWAY
DISC	DISCONNECT
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
EFF	EFFLUENT
ELEC	ELECTRICAL
ENCL	ENCLOSURE
EF	EXHAUST FAN
ETM	ELAPSED TIME METER
EXH	EXHAUST
EXIST	EXISTING
FPL	FLORIDA POWER & LIGHT
FVNR	FULL VOLTAGE NON-REVERSING
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
GFR	GROUND FAULT RECEPTACLE
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
GRS	GALVANIZED RIGID STEEL
HOA	HAND-OFF-AUTOMATIC
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HSP	HIGH SERVICE PUMP
KVA	KILO VOLT-AMPERES
KW	KILOWATT
LP	LOOP
LTG	LIGHTING
MAX	MAXIMUM
MB	MAIN BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MPZ	MINI-POWER ZONE
MSC	MANUFACTURED SUPPLIED CABLE
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
N	NEUTRAL
NTS	NOT TO SCALE
OH	OVERHEAD
P	POLE
PCP	PROCESS CONTROL PANEL
PM	PHASE MONITOR
PMP	PRESSURE MONITORING PANEL
PVC	POLYVINYL CHLORIDE
PLC	PROGRAMMABLE LOGIC CONTROLLER
RTU	REMOTE TERMINAL UNIT
SH	SHIELDED
SLD	SINGLE LINE DIAGRAM
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
SSS	SOLID STATE STARTER
STR	STARTER
SW	SWITCH
TBR	TO BE REMOVED
TYP	TYPICAL
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
w/	WITH
WP	WEATHERPROOF
ø	PHASE

NOTES

- ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL NEW ELECTRICAL WORK INDICATED.
- ELECTRICAL CONTRACTOR SHALL VISIT JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING ELECTRICAL INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. EXISTING CONDITIONS OF ELECTRICAL EQUIPMENT, LIGHT FIXTURES, ETC... THAT ARE PART OF THE FINAL SYSTEM SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO SUBMITTING HIS BID.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2014 EDITION OF THE NATIONAL ELECTRICAL CODE, 2014 EDITION OF THE FLORIDA BUILDING CODE AND SHALL COMPLY WITH ALL LOCAL RULES AND ORDINANCES.
- MINIMUM WIRE SIZE SHALL BE #12 A.W.G. EXCLUDING CONTROL WIRING, UNLESS OTHERWISE NOTED.
- IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS NECESSARY FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
- ELECTRICAL SYSTEM SHALL BE COMPLETE AND EFFECTIVELY GROUNDED AS REQUIRED BY THE N.E.C. 2014 EDITION OR LOCAL CODES. ALL CONDUITS SHALL HAVE A BOND WIRE SIZED PER TABLE 250-122 OF THE 2014 NATIONAL ELECTRICAL CODE.
- ALL MATERIALS SHALL BE NEW AND BEAR UNDERWRITERS' LABELS WHERE APPLICABLE.
- ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND ACCEPTED BY ENGINEER/OWNER.
- CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN TWO YEARS FROM DATE OF ACCEPTANCE. REFER TO SPECIFICATION 16370 AND 16217 FOR ADDITIONAL WARRANTY REQUIREMENTS.
- CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED OF HIS WORK.
- ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS W/ TYPED WRITTEN DIRECTORIES (NEW & EXISTING).
- ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- DO NOT SCALE THE ELECTRICAL DRAWINGS. REFER TO THE MECHANICAL DRAWINGS & THE APPROVED MANUFACTURER'S SHOP DRAWINGS FOR THE EXACT LOCATION OF ALL EQUIPMENT.
- NON-SHADED TEXT DENOTES NEW EQUIPMENT, STRUCTURES AND WORK. SHADED AND SLANTED TEXT DENOTES EXISTING EQUIPMENT OR STRUCTURES.
- ALL CONTROL PANELS SHALL BE UL LISTED AND SHALL COMPLY WITH ARTICLE 409 OF THE NEC.
- ALL EMPTY CONDUITS SHALL BE INSTALLED WITH PULLSTRING.

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Stephen E. Bailey, P.E.
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REBID

NO.	DATE	REVISION	BY

Date: 3/6/18
Designed: SEB
Drawn: DRM
Checked: SEB

APPROVED BY: STEPHEN E. BAILEY, P.E.
DATE: _____
FLORIDA PROFESSIONAL ENGINEER NO. 42461

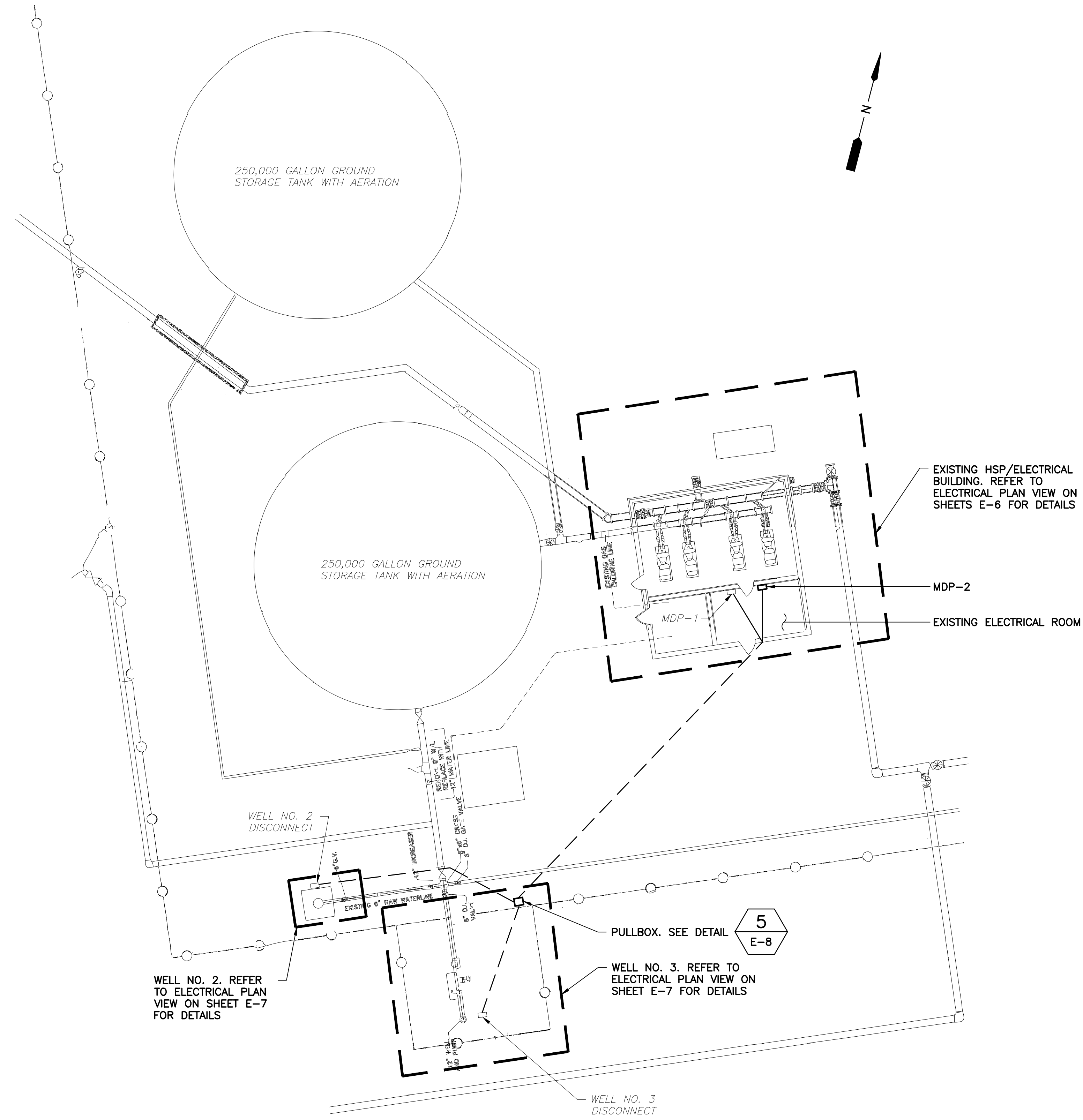
CRAIG A. SMITH & ASSOCIATES
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PREPARED FOR:
SUN 'N' LAKES
SEBRING, FL

SUN 'N' LAKES WTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL NOTES SYMBOLS &
ABBREVIATIONS

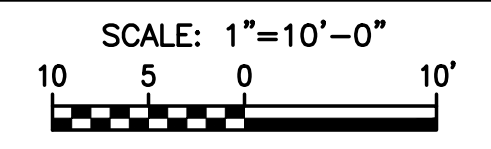
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SHEET
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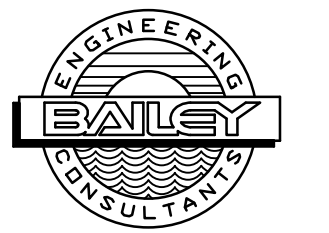


ADDRESS
 4217 COLUMBUS BLVD
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ELECTRICAL SITE PLAN



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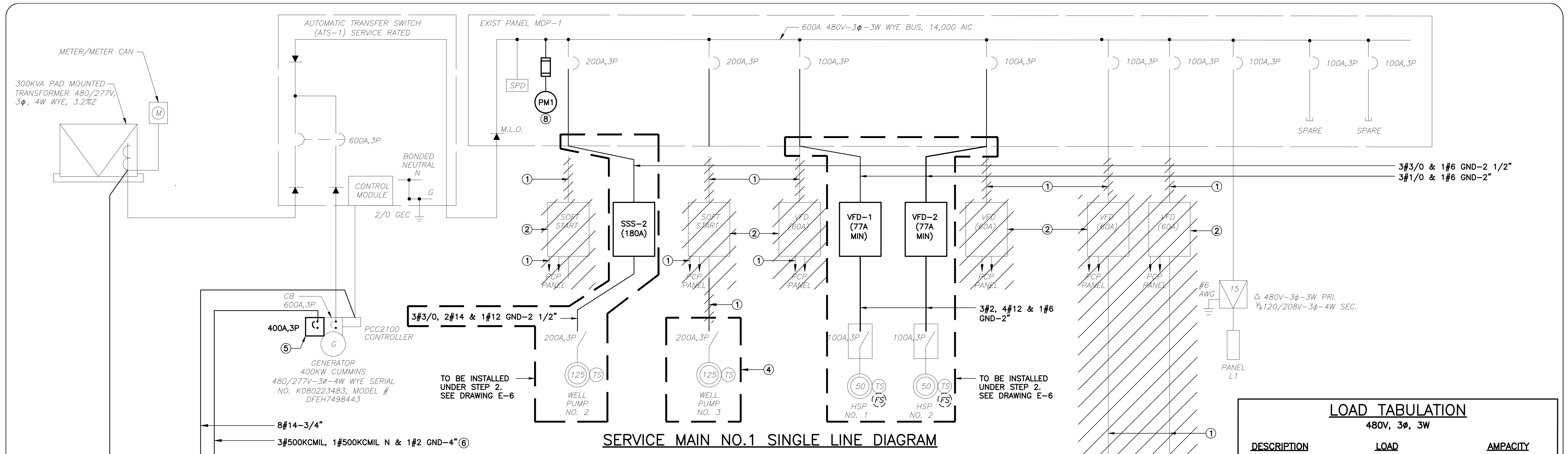
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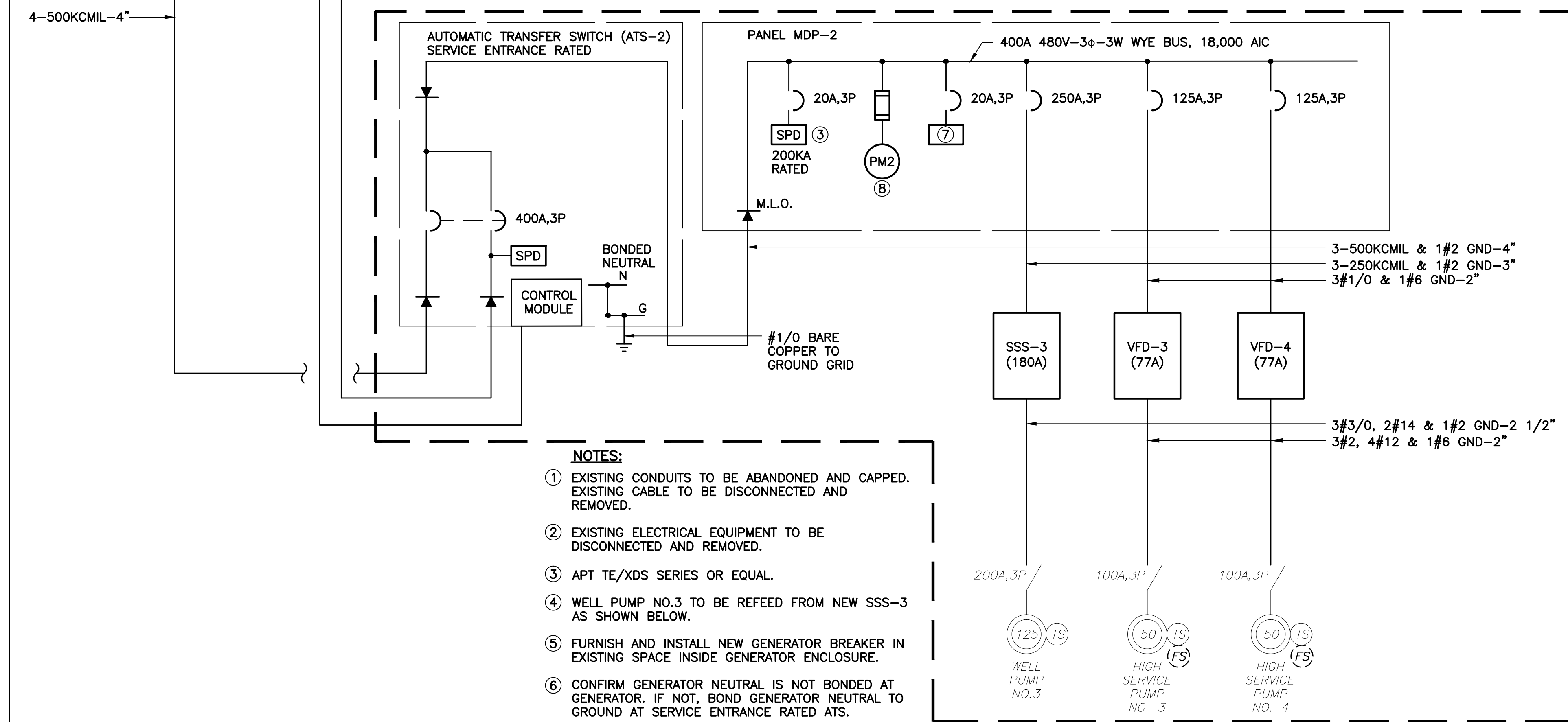
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 ELECTRICAL SITE PLAN

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17-1957

SHEET
E-2



SERVICE MAIN NO.1 SINGLE LINE DIAGRAM



SERVICE MAIN NO.2 SINGLE LINE DIAGRAM

- NOTES:**
- ① EXISTING CONDUITS TO BE ABANDONED AND CAPPED. EXISTING CABLE TO BE DISCONNECTED AND REMOVED.
 - ② EXISTING ELECTRICAL EQUIPMENT TO BE DISCONNECTED AND REMOVED.
 - ③ APT TE/XDS SERIES OR EQUAL.
 - ④ WELL PUMP NO.3 TO BE REFEED FROM NEW SSS-3 AS SHOWN BELOW.
 - ⑤ FURNISH AND INSTALL NEW GENERATOR BREAKER IN EXISTING SPACE INSIDE GENERATOR ENCLOSURE.
 - ⑥ CONFIRM GENERATOR NEUTRAL IS NOT BONDED AT GENERATOR. IF NOT, BOND GENERATOR NEUTRAL TO GROUND AT SERVICE ENTRANCE RATED ATS.
 - ⑦ POWER MONITOR. SQUARE D POWER LOGIC EM3500 SERIES OR EQUAL.
 - ⑧ DIVERSIFIED ELECTRONICS SLA-440-ALE OR EQUAL

LOAD TABULATION		
480V, 3φ, 3W		
DESCRIPTION	LOAD	AMPACITY
XFMR NO.1	1 @ 15.00 KVA	= 18.00 AMPS
① HSP NO.1	1 @ 50.00 HP	= 65.00 AMPS
① HSP NO.2	1 @ 50.00 HP	= 65.00 AMPS
② WELL PUMP NO.2	1 @ 125.00 HP	= 147.00 AMPS
MAIN 1 CONNECTED LOAD		= 295.00 AMPS
③ SERVICE MAIN NO. 1 = 295.00 AMPS + (0.25)(147.00)		= 331.75 AMPS
① HSP NO.1	1 @ 50.00 HP	= 65.00 AMPS
① HSP NO.2	1 @ 50.00 HP	= 65.00 AMPS
② WELL PUMP NO.2	1 @ 125.00 HP	= 147.00 AMPS
MAIN 2 CONNECTED LOAD		= 277.00 AMPS
③ SERVICE MAIN NO. 2 = 277.00 AMPS + (0.25)(147.00)		= 313.75 AMPS

NOTES:

- ① AMPACITIES PER TABLE 430-250 OF THE NATIONAL ELECTRICAL CODE.
- ② AMPACITIES PER EXISTING EQUIPMENT NAMEPLATES.
- ③ SERVICE ENTRANCE MINIMUM SIZE AS PER ARTICLE 430 OF THE NATIONAL ELECTRICAL CODE.
- ④ SERVICE TRANSFORMER AND METERING ARE EXISTING. TOTAL LOAD AND MOTOR LOADS ARE EXISTING AND UNCHANGED.

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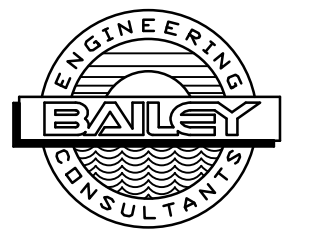
SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 SINGLE LINE DIAGRAM

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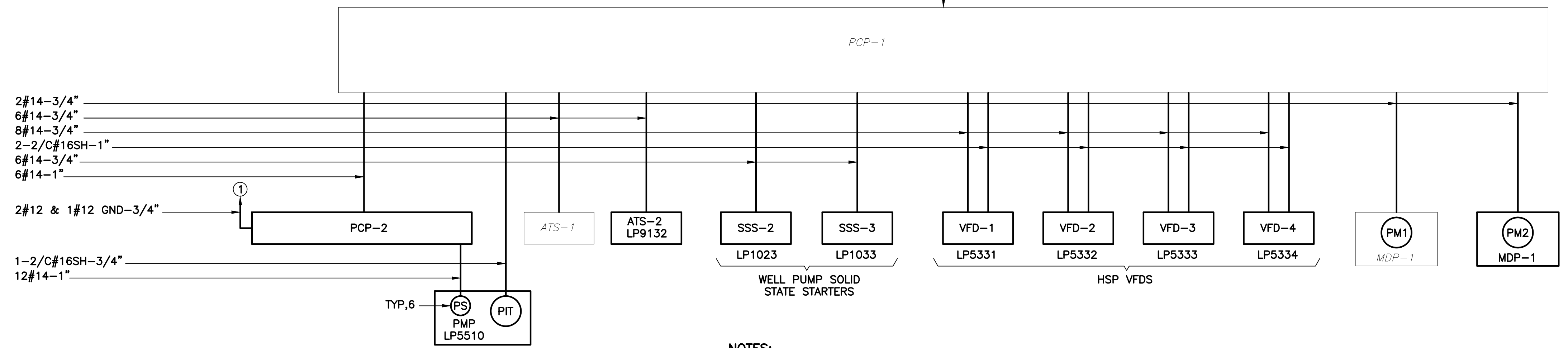
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E-3

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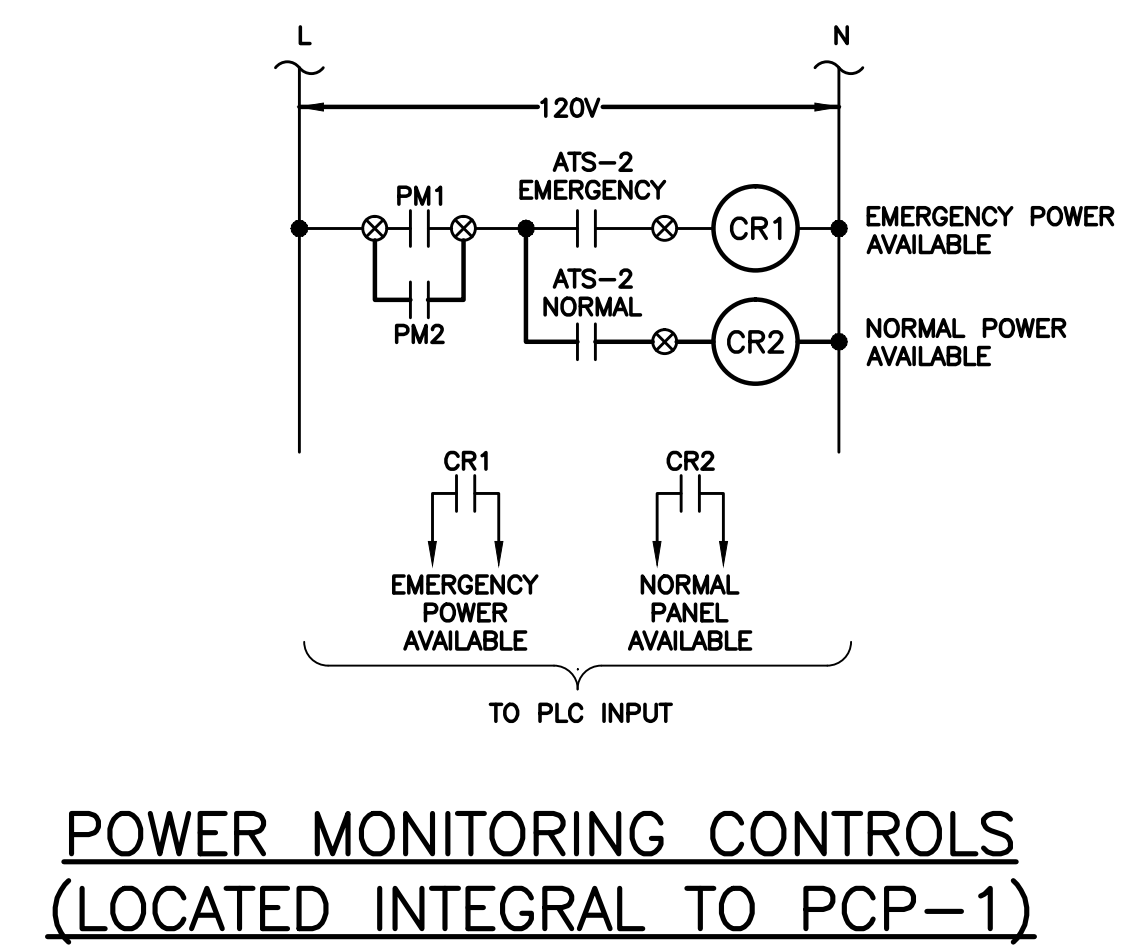


REFER TO DIVISION 13 SPECIFICATIONS FOR MODIFICATIONS

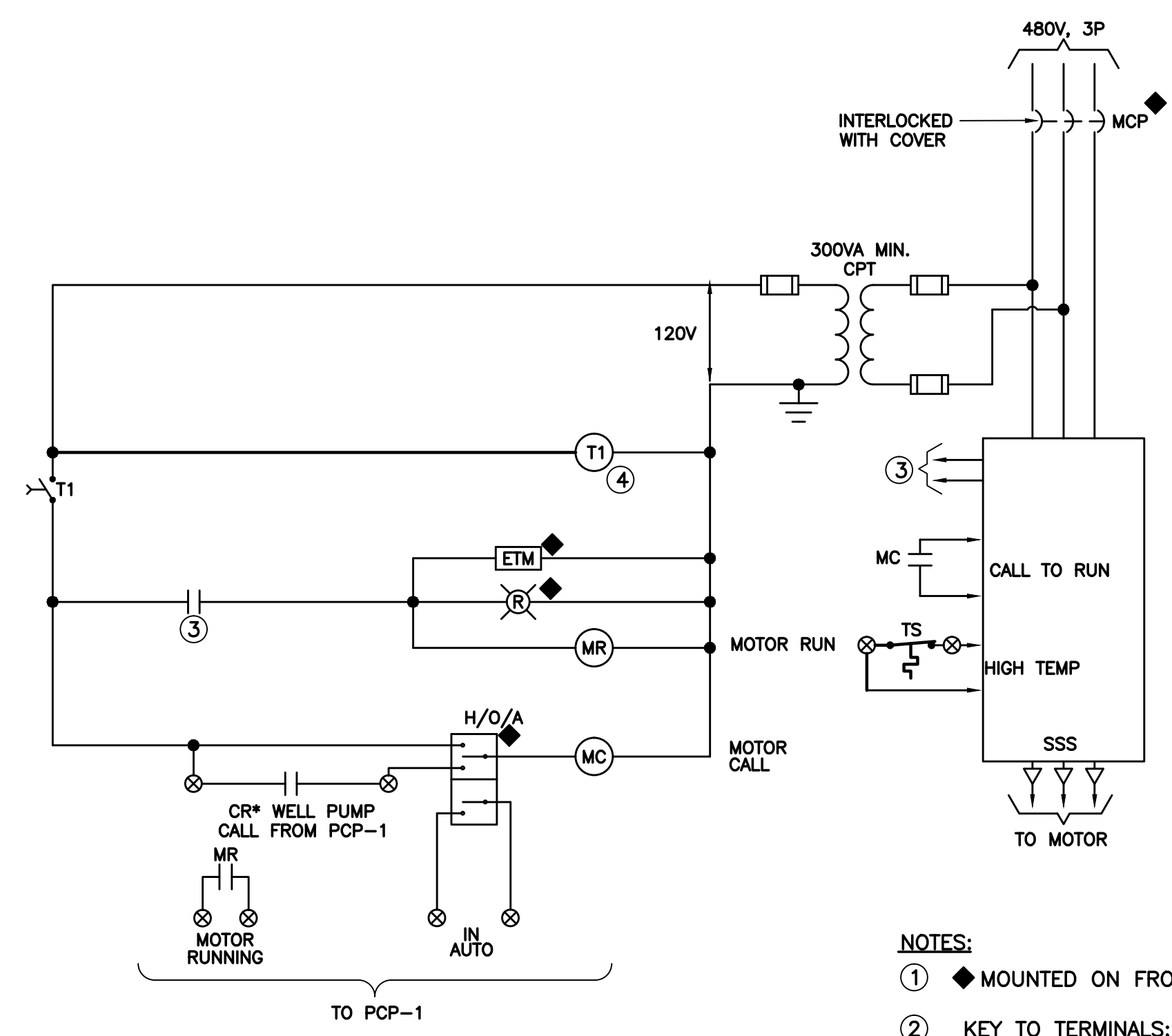


NOTES:
① TO LOCAL 120V PANELBOARD L1.

CONTROL WIRING RISER DIAGRAM

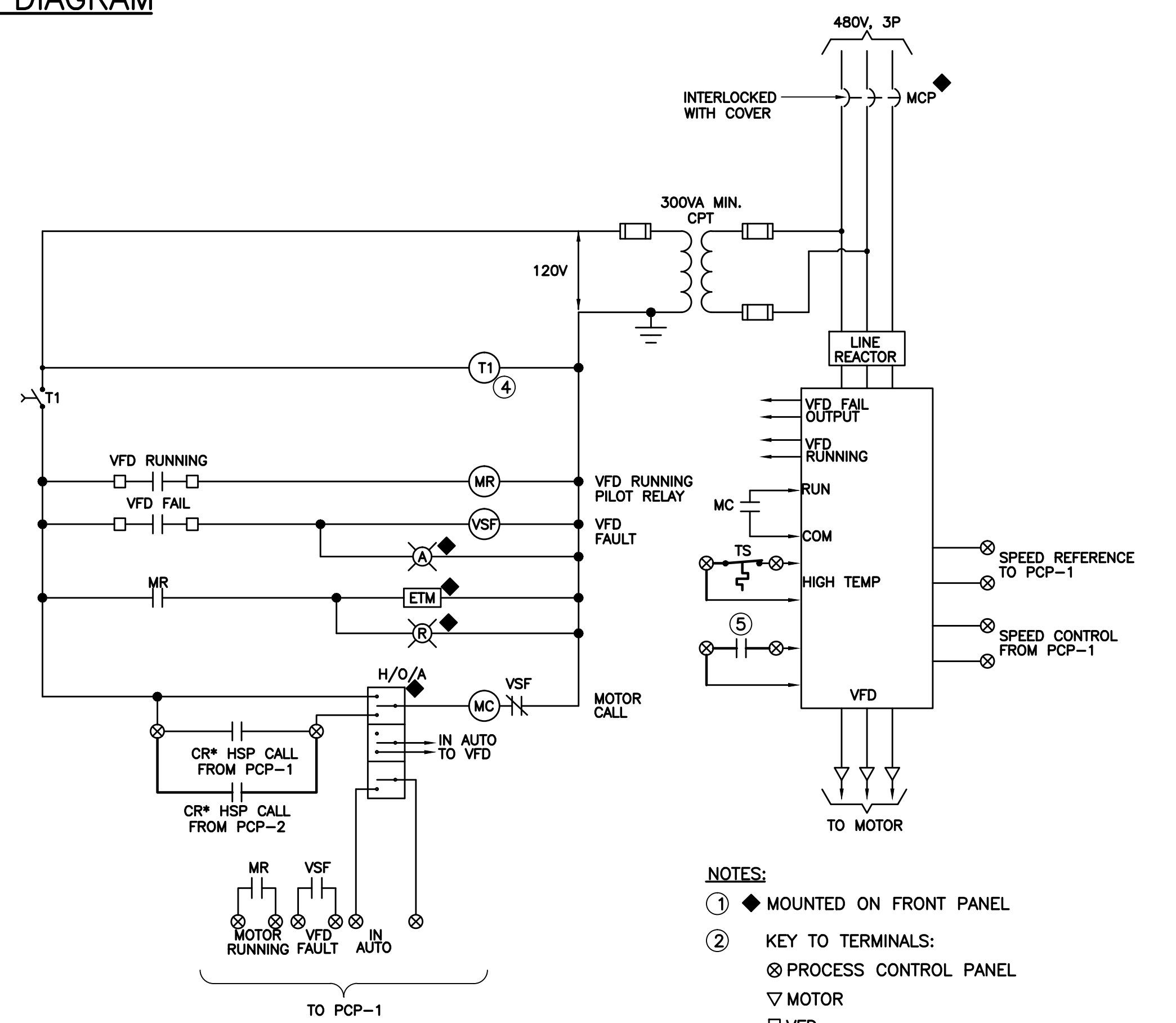


POWER MONITORING CONTROLS (LOCATED INTEGRAL TO PCP-1)



SOLID STATE SOFT START

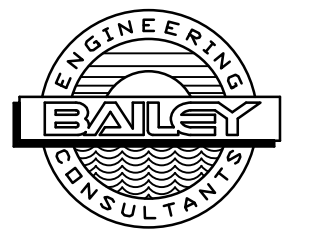
NOTES:
① MOUNTED ON FRONT PANEL
② KEY TO TERMINALS:
⊗ PROCESS CONTROL PANEL
▽ MOTOR
□ VFD
③ MOTOR RUNNING DISCRETE OUTPUT FROM VFD
④ ADJUSTABLE ON DELAY TIMER 0-60 SECONDS



VARIABLE FREQUENCY DRIVE

NOTES:
① MOUNTED ON FRONT PANEL
② KEY TO TERMINALS:
⊗ PROCESS CONTROL PANEL
▽ MOTOR
□ VFD
③ MOTOR RUNNING DISCRETE OUTPUT FROM VFD
④ ADJUSTABLE ON DELAY TIMER 0-60 SECONDS
⑤ SET VFD TO CONSTANT SPEED MODE FROM PCP-2

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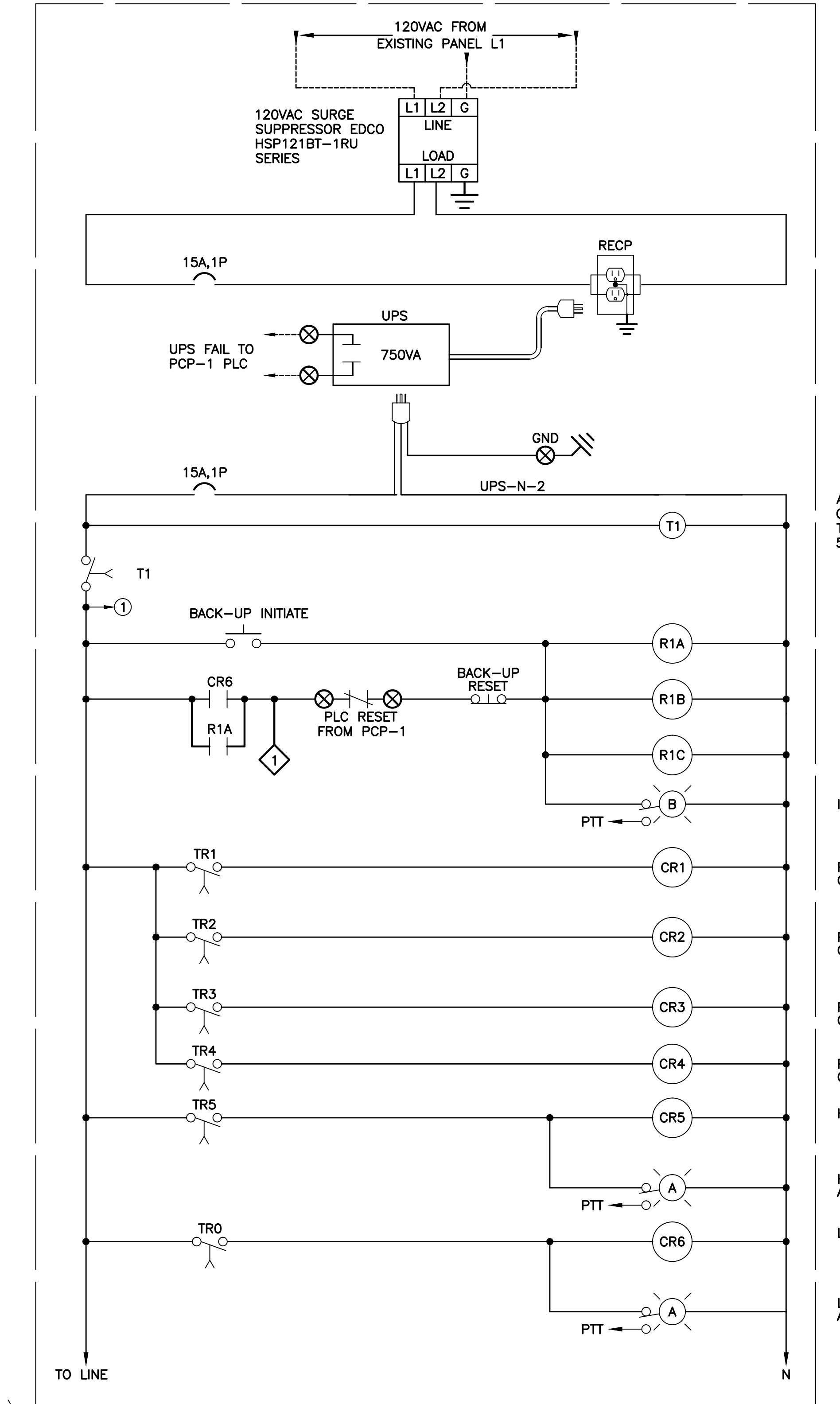
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ELECTRICAL IMPROVEMENTS
CONTROL WIRING RISER DIAGRAM

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CAS PROJECT NUMBER
17-1957

SHEET
E-4

NOTES:
 ① FOR ALL PUSH TO TEST SWITCHES (PTT).

LEGEND
 ⊗ REMOTE TERMINAL BLOCK POINT.



ADJUSTABLE ON DELAY TIMER SET @ 5 SEC.

IN BACK UP MODE

PUMP 1 CALL

PUMP 2 CALL

PUMP 3 CALL

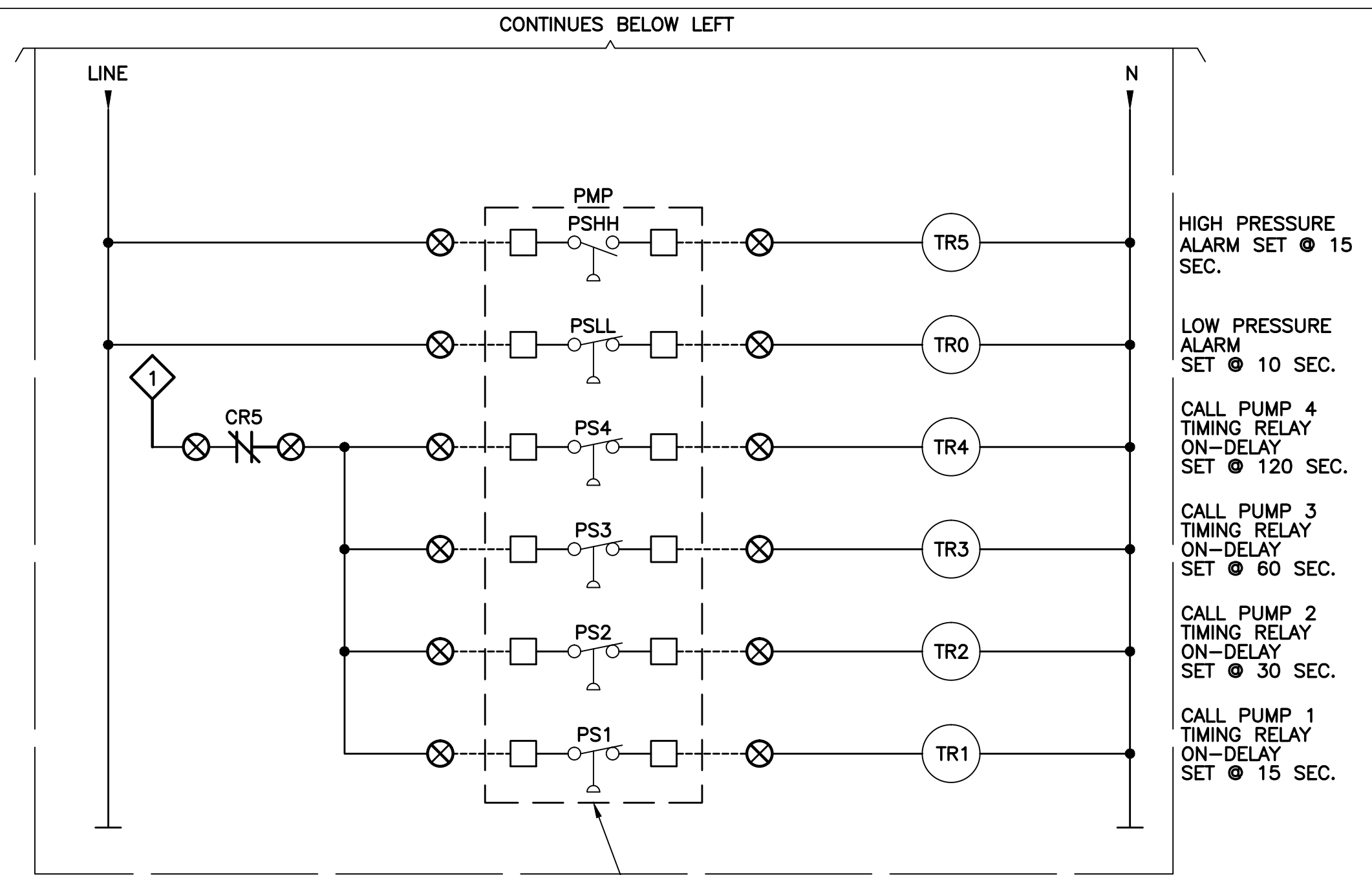
PUMP 4 CALL

HIGH PRESSURE

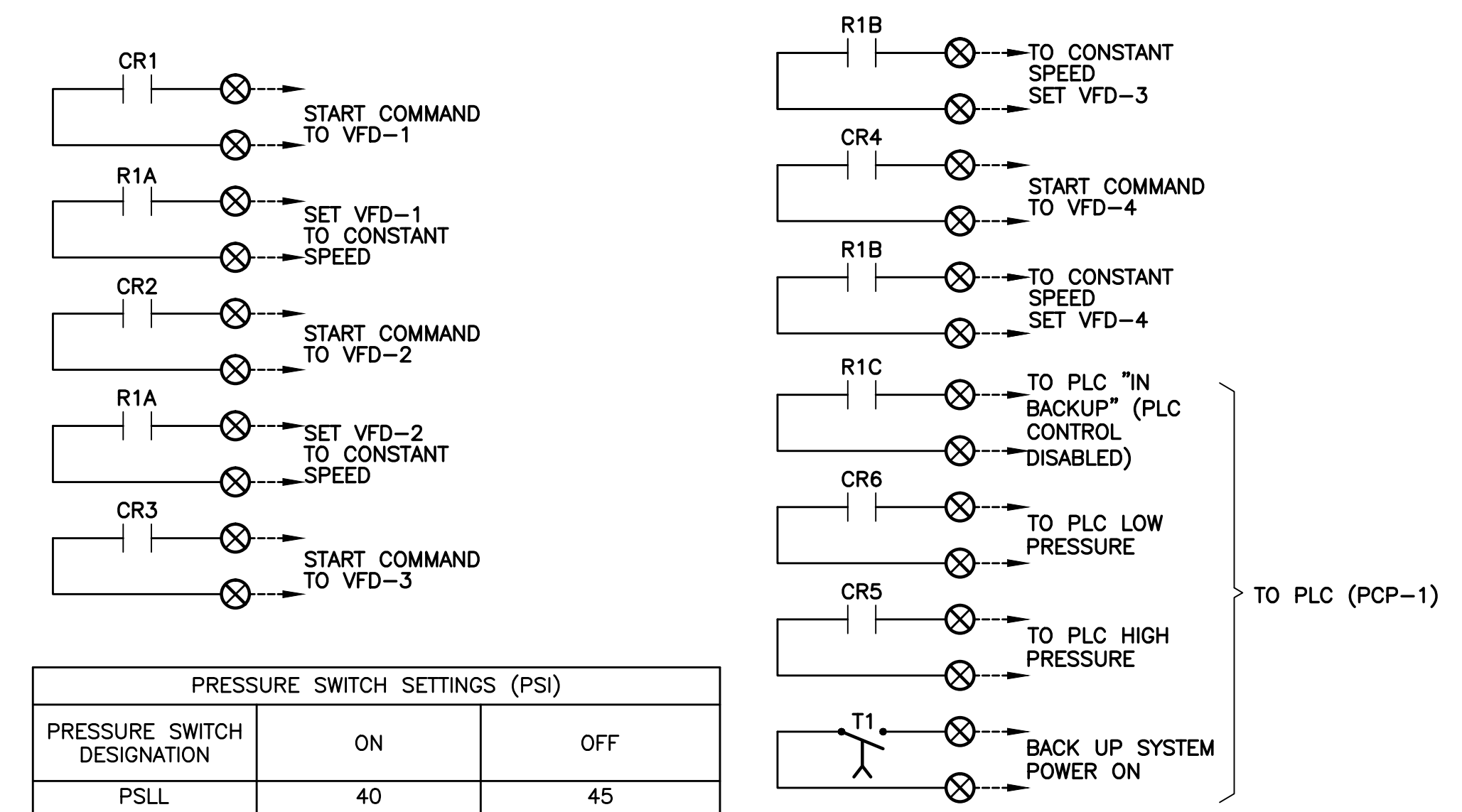
HIGH PRESSURE ALARM INDICATION

LOW PRESSURE

LOW PRESSURE ALARM INDICATION



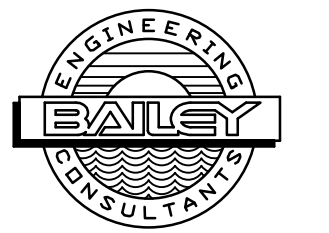
HIGH PRESSURE ALARM SET @ 15 SEC.
 LOW PRESSURE ALARM SET @ 10 SEC.
 CALL PUMP 4 TIMING RELAY ON-DELAY SET @ 120 SEC.
 CALL PUMP 3 TIMING RELAY ON-DELAY SET @ 60 SEC.
 CALL PUMP 2 TIMING RELAY ON-DELAY SET @ 30 SEC.
 CALL PUMP 1 TIMING RELAY ON-DELAY SET @ 15 SEC.



PRESSURE SWITCH SETTINGS (PSI)		
PRESSURE SWITCH DESIGNATION	ON	OFF
PSLL	40	45
PS1	45	55
PS2	40	60
PS3	35	65
PS4	30	70
PSHH	70	80

PUMP CONTROL PANEL (PCP-2) BACK-UP CONTROL ELEMENTARY DIAGRAM

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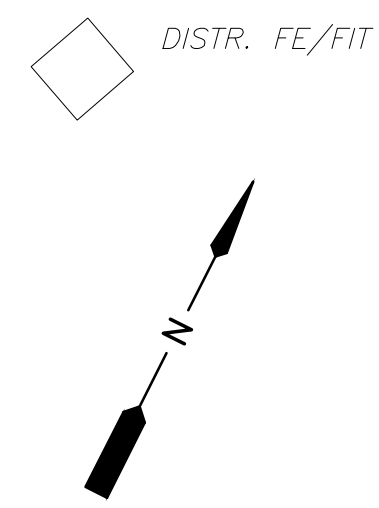
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PREPARED FOR:
SUN 'N' LAKES
 SEBRING, FL

SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 ELEMENTARY DIAGRAM

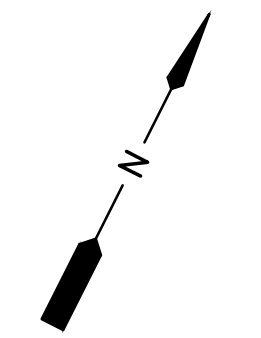
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17-1957

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E-5

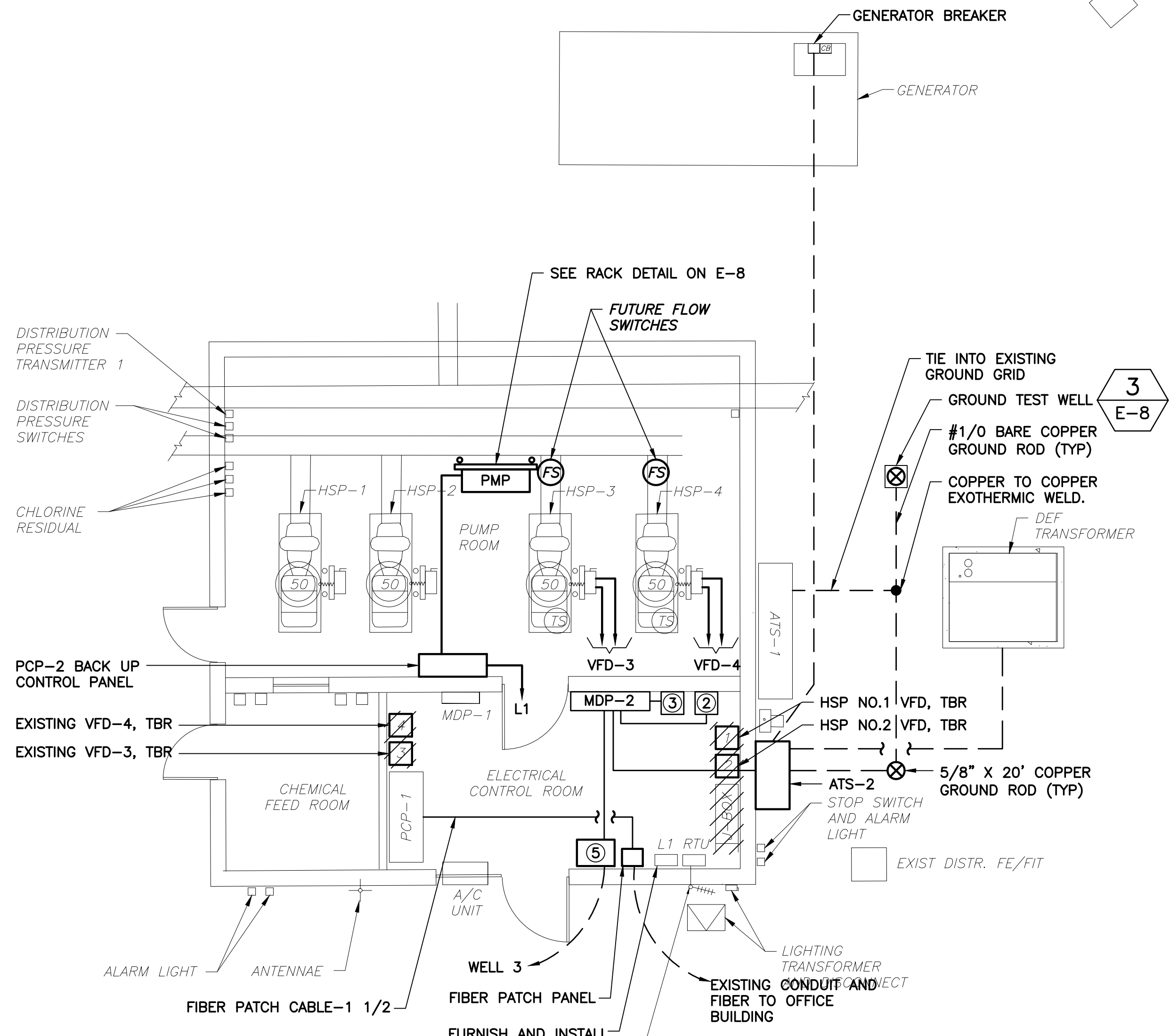


DISTR. FE/FIT

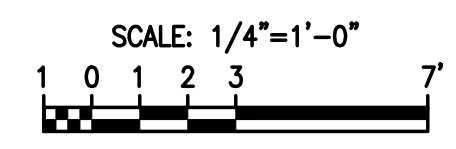
DISTR. FE/FIT



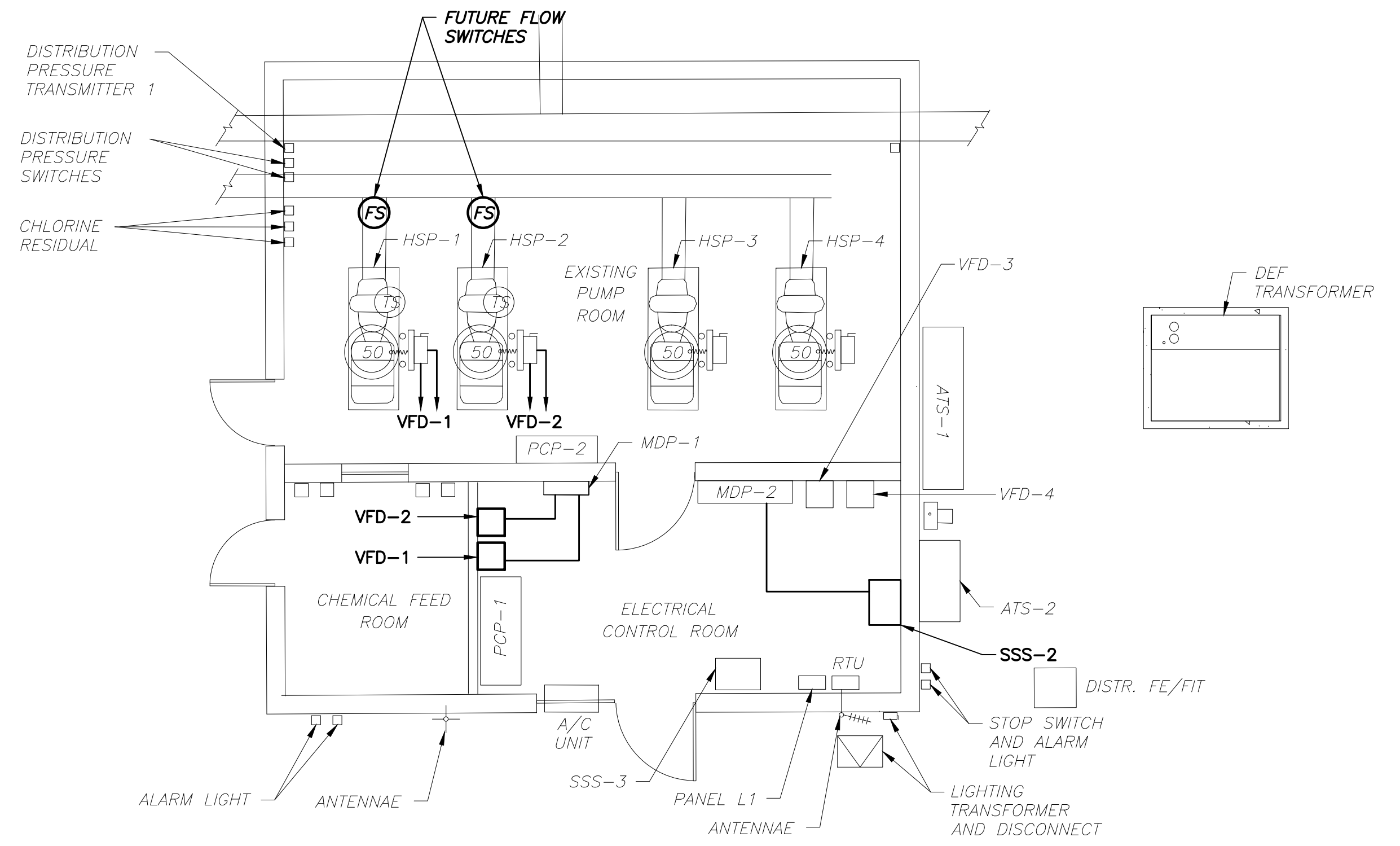
GENERATOR BREAKER



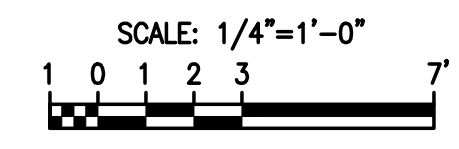
POWER PLAN STEP 1



- NOTES:**
- ① REFER TO SINGLE LINE DIAGRAM FOR CONDUIT AND WIRE REQUIREMENTS.
 - ② HSP NO.4 VFD-4
 - ③ HSP NO.3 VFD-3
 - ④ REMOVE HSP NO.1 & HSP NO.2 VFD'S AFTER HSP NO.3 & 4 VFD'S ARE INSTALLED AND ONLINE
 - ⑤ REMOVE EXISTING SSS-3 AND INSTALL NEW SSS-3 IN THE SAME LOCATION.



POWER PLAN STEP 2



NO.	DATE	REVISION	BY

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CRAIG A. SMITH & ASSOCIATES
 CONSULTING ENGINEERS-PLANNERS-SURVEYORS
 7777 GLADES ROAD, SUITE 410
 BOCA RATON, FLORIDA 33434
 (561) 314-4445
 CERTIFICATE. NO. LB0003110

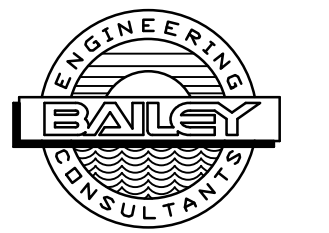
PREPARED FOR:
SUN 'N' LAKES
 SEBRING, FL

SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 POWER PLAN STEP 1

FILE NAME: E-6 DEMO PLAN.dwg
 LAST SAVED: 10/02/17 - 6:39pm
 GAS PROJECT NUMBER
17-1957

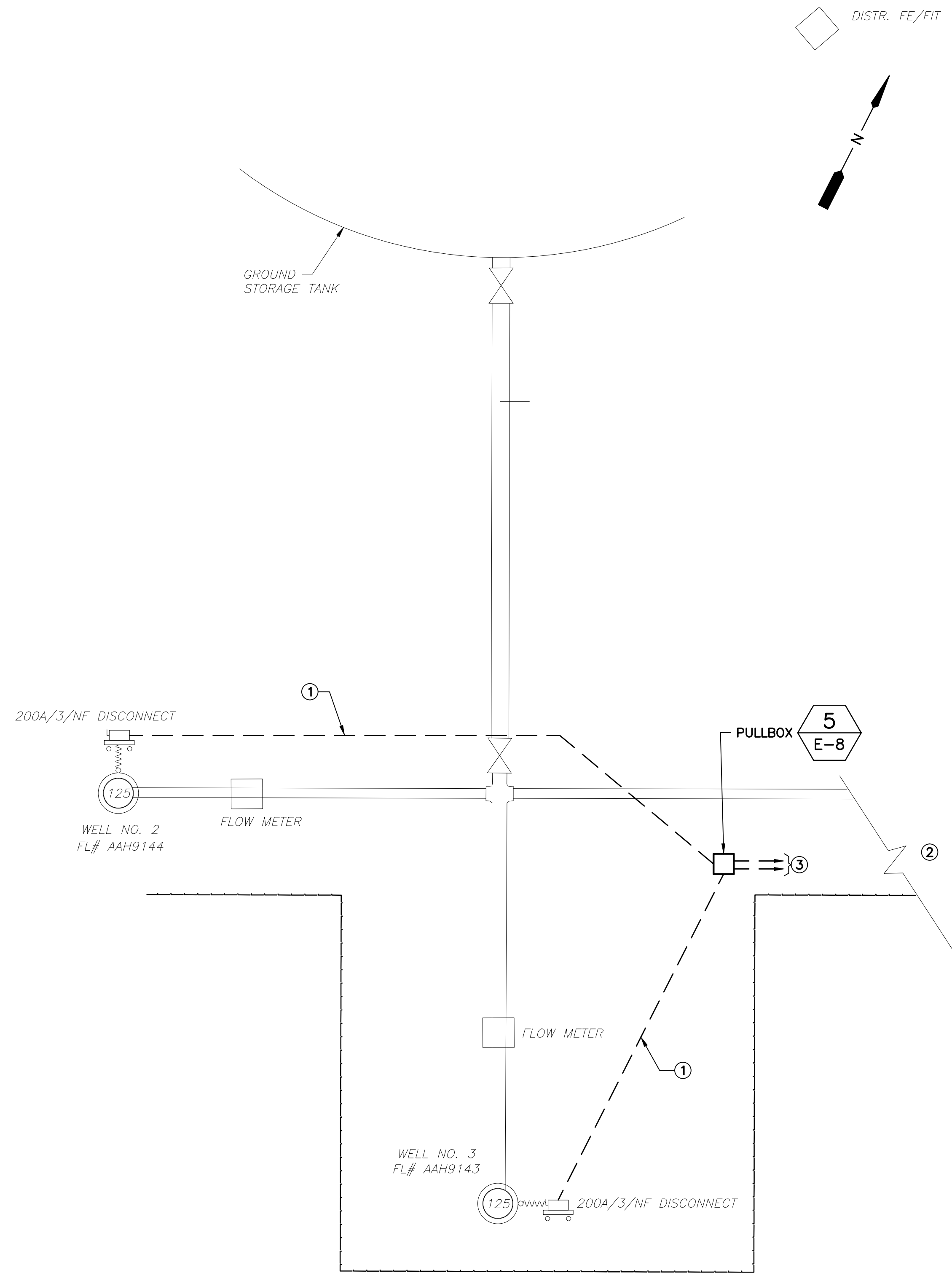
SHEET
E-6

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 Stephen E. Bailey, P.E.
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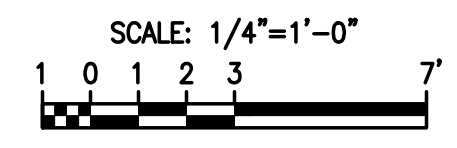
REBID

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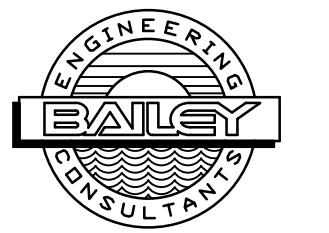


- NOTES:**
- ① EXISTING WELL FEEDER CONDUITS TO BE ABANDONED AND CAPPED. EXISTING CABLES TO BE DISCONNECTED AND REMOVED. FURNISH AND INSTALL CONDUIT AND WIRE AS SHOWN ON SHEET E-3.
 - ② REFER TO ELECTRICAL SITE PLAN FOR CONTINUATION.
 - ③ WELL NO. 2 IS FEED FROM SSS-2. WELL NO. 3 IS FED FROM SSS-3. REFER TO SHEET E-2 FOR CONTINUATION.

WELLS NO. 2 & 3 POWER PLAN



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NO.	DATE	REVISION	BY

Date: 3/6/18
 Designed: SEB
 Drawn: DRM
 Checked: SEB

APPROVED BY: STEPHEN E. BAILEY, P.E.
 DATE _____
 FLORIDA PROFESSIONAL ENGINEER NO. 42461

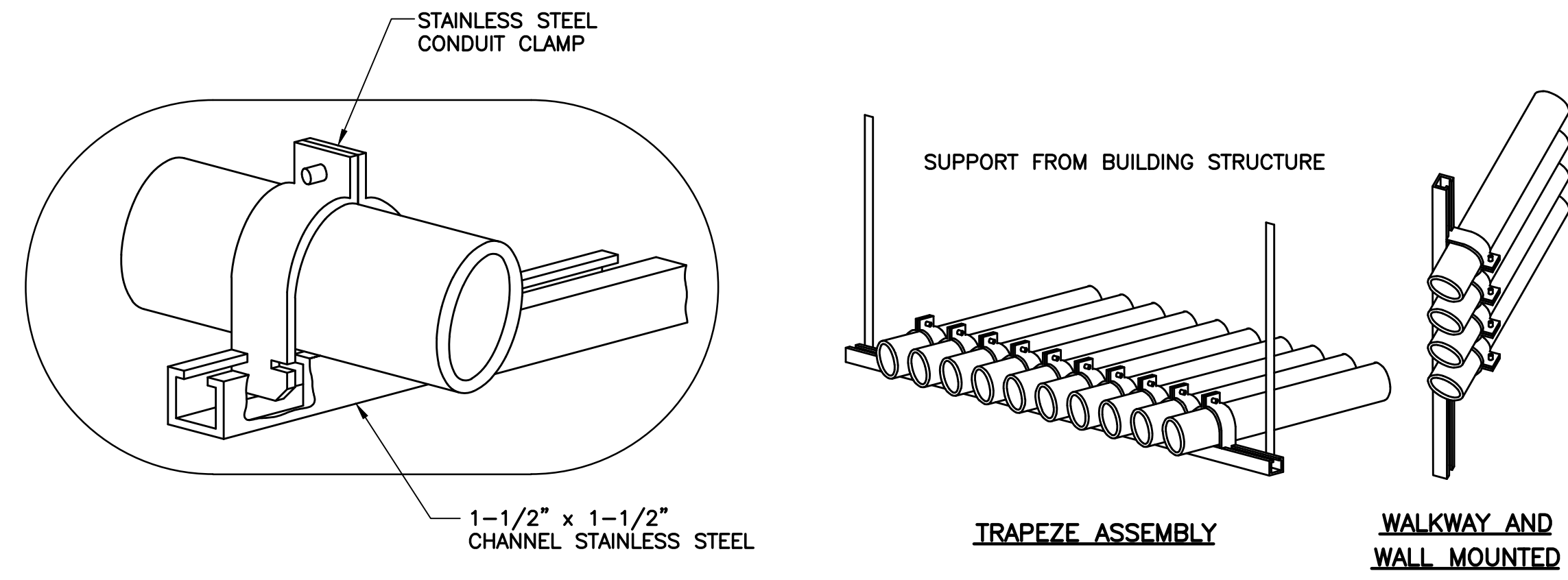
CRAIG A. SMITH & ASSOCIATES
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 BOCA RATON, FLORIDA 33434
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PREPARED FOR:
SUN 'N' LAKES
 SEBRING, FL

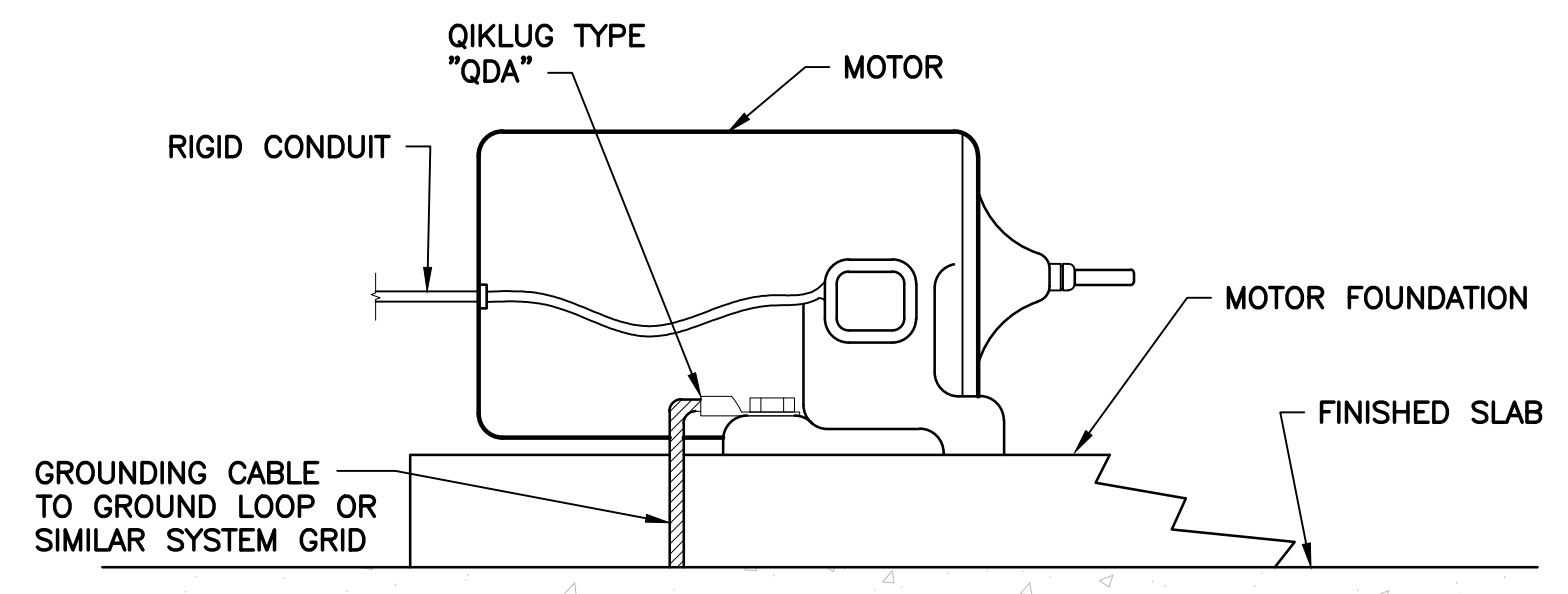
SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 WELLS NO. 2 & 3 POWER PLAN

FILE NAME: E-7 Step 2 plan.dwg
 LAST SAVED: 10/02/17 - 2:45pm
 CAS PROJECT NUMBER
17-1957

SHEET
E-7

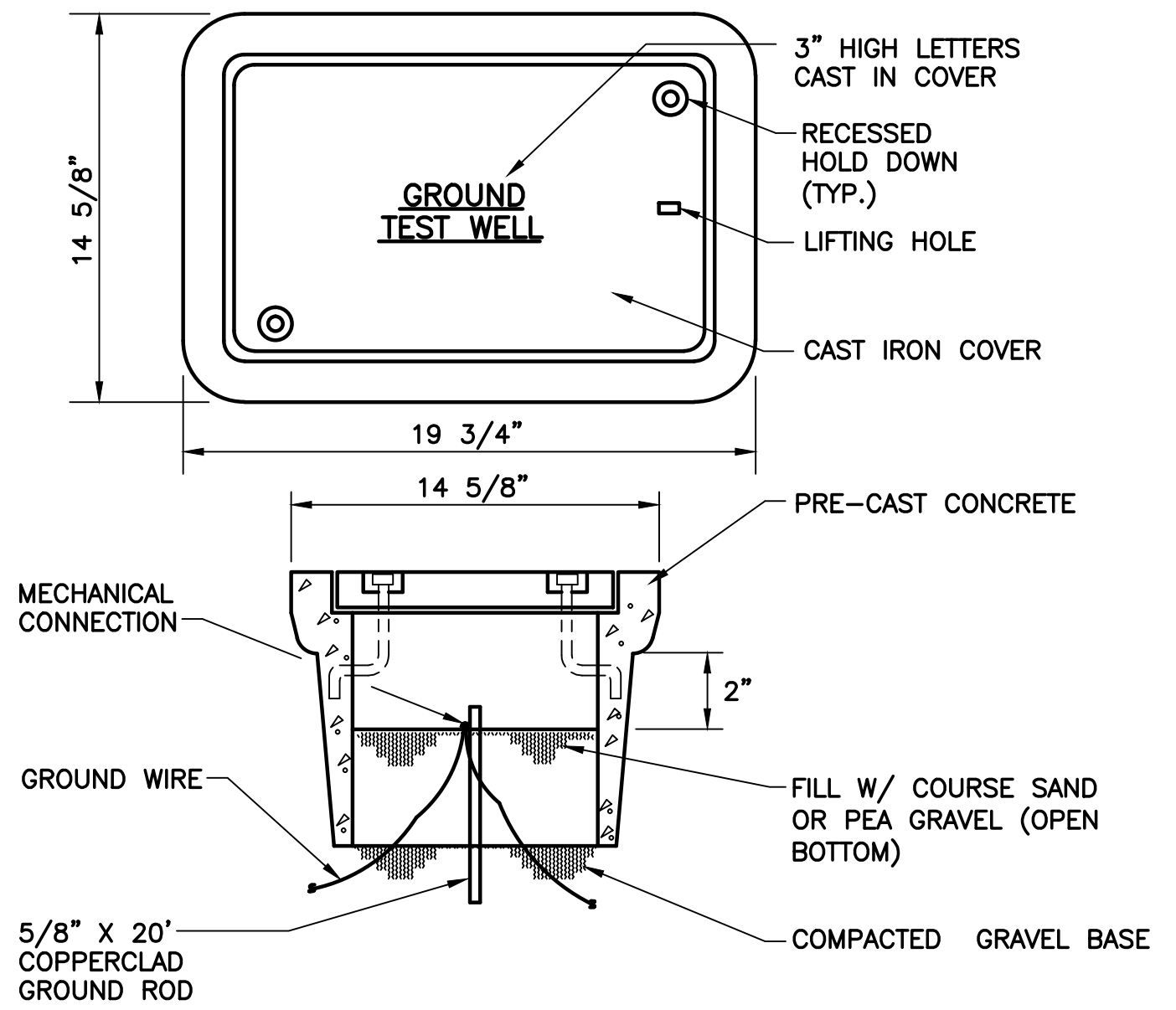


1
E-8
CONDUIT PIPE STRAP MOUNTING DETAILS
N.T.S.

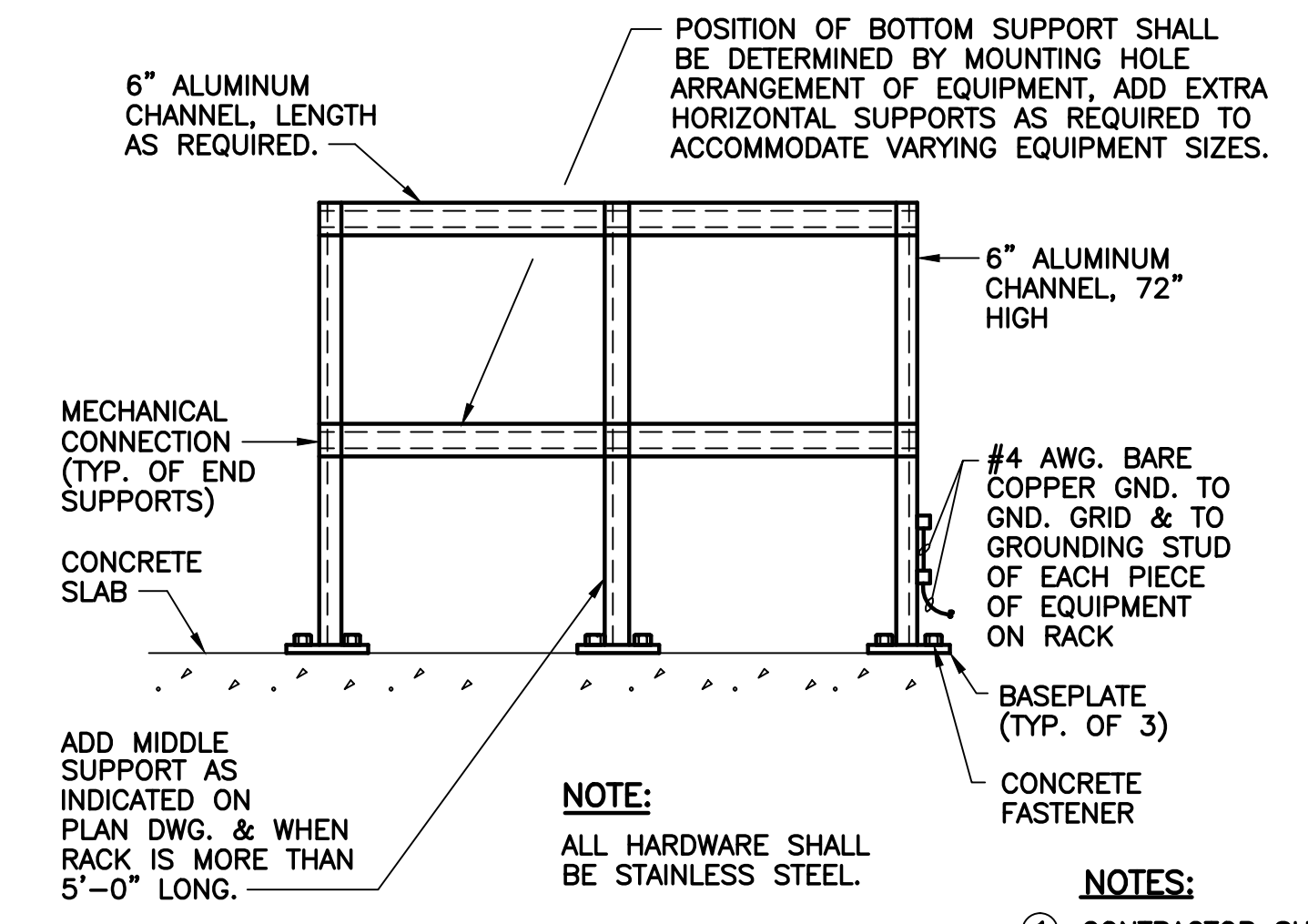


NOTE:
THIS GROUND IS IN ADDITION TO THE GROUND FROM THE MAIN ELECTRICAL SERVICE.

2
E-8
EQUIPMENT GROUNDING DETAIL
N.T.S.

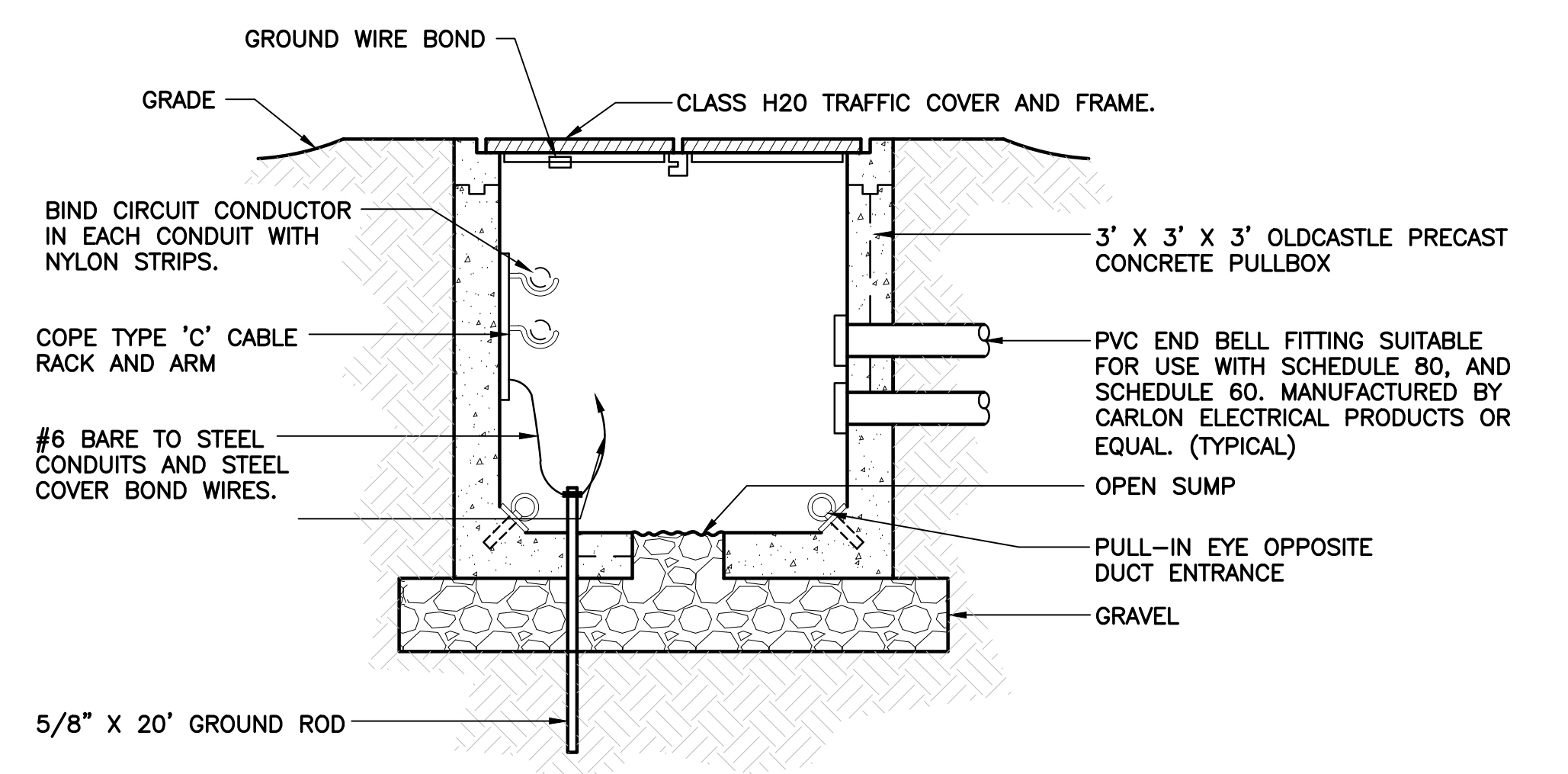


3
E-8
GROUND TEST WELL
N.T.S.



4
E-8
EQUIPMENT RACK DETAIL
N.T.S.

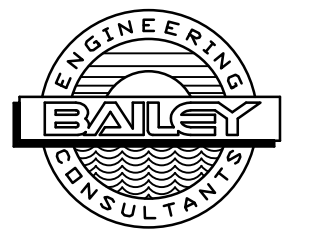
NOTES:
① CONTRACTOR SHALL SUBMIT MOUNTING DETAIL ALONG WITH SIGNED AND SEALED WIND LOAD CALCULATIONS PER THE FLORIDA BUILDING CODE FROM A STRUCTURAL ENGINEER LICENSED IN THE STATE OF FLORIDA.



NOTES:
① ALL WIRES IN PULL BOX TO BE LABELED INDICATING CIRCUIT NUMBERS. SEE SPECIFICATIONS.
② DO NOT SPLICE CABLES IN PULL BOXES UNLESS OTHERWISE NOTED.
③ PATCH CONDUIT ENTRY WINDOW WITH CONCRETE.

5
E-8
PULL BOX DETAIL
N.T.S.

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Date: 3/6/18
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Drawn: DRM
Checked: SEB

APPROVED BY: STEPHEN E. BAILEY, P.E.
DATE: _____
FLORIDA PROFESSIONAL ENGINEER NO. 42461

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PREPARED FOR:
SUN 'N' LAKES
SEBRING, FL

SUN 'N' LAKES WTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL DETAILS

FILE NAME: E-8 ELECTRICAL DETAILS.dwg
LAST SAVED: 10/02/17 - 1:10pm
CAS PROJECT NUMBER
17-1957

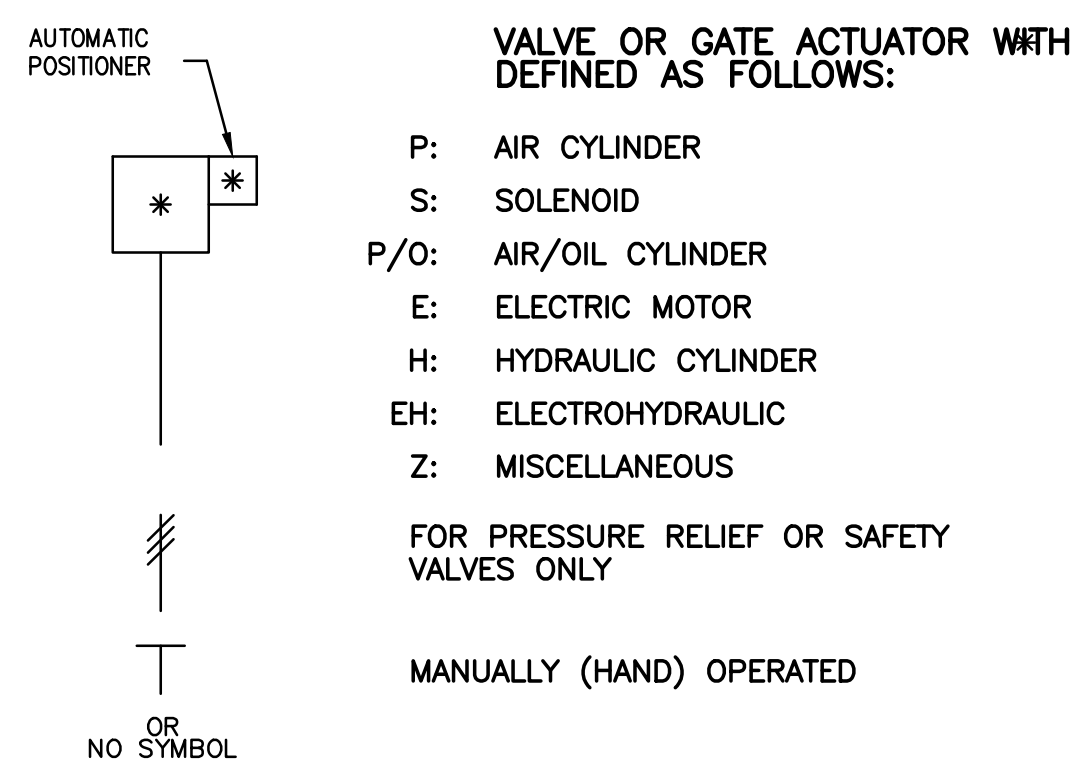
SHEET
E-8

GENERAL INSTRUMENTS AND FUNCTION SYMBOLS		PROCESS DEVICE SYMBOLS		PROCESS DEVICE SYMBOLS (CONTINUED)		FUNCTION SYMBOLS & ABBREVIATIONS			
	FIELD MOUNTED INSTRUMENT		REDUCER OR ENLARGER		VALVE: GLOBE OR OTHER IN-LINE TYPE, UNLESS OTHERWISE INDICATED.	Σ	SUMMING		HAND SWITCH ABBREVIATIONS:
	INSTRUMENT NORMALLY ACCESSIBLE TO THE OPERATOR		PRIMARY ELEMENT VENTURI TUBE		BUTTERFLY VALVE	Σ/n	AVERAGING	A	AUTOMATIC
	INSTRUMENT IN SECONDARY LOCATION		PRIMARY ELEMENT MAGNETIC FLOWMETER		CHECK VALVE WITH FLOW DIRECTION AS INDICATED	Δ	SUBTRACTING	C	COMPUTER OR CLOSE
	INSTRUMENTS SHARING COMMON HOUSING		PRIMARY ELEMENT ULTRASONIC DOPPLER FLOWMETER		PLUG VALVE	$\sqrt{\quad}$	EXACT SQUARE ROOT	H	HAND
	EXISTING EQUIPMENT		PRIMARY ELEMENT PARSCHALL FLUME		BALL VALVE	+	DIVIDE	L	LOCAL
	FUTURE EQUIPMENT		PRIMARY ELEMENT ORIFICE PLATE		PRESSURE REGULATING VALVE - SELF CONTAINED	x	MULTIPLY	M	MODULATE
	INTERLOCK		PRIMARY ELEMENT WEIR FLOWMETER		FLOW CONTROL GATE OR GATE VALVE	S	INTEGRATE	O	OFF OR OPEN
	ANALOG SIGNAL - ARROW DIRECTION DENOTES SIGNAL DIRECTION		PRIMARY ELEMENT TURBINE OR PROPELLER TYPE METER		CENTRIFUGAL BLOWER	+/-	BIAS POSITIVE BIAS NEGATIVE	R	REMOTE
	DIGITAL SIGNAL - ARROW DIRECTION DENOTES SIGNAL DIRECTION		PRIMARY ELEMENT PITOT TUBE		CENTRIFUGAL PUMP	(X)	NONLINEAR OR UNSPECIFIED FUNCTION	S	START OR STOP
	AIR OR GAS LINE		PRIMARY ELEMENT ROTAMETER		SUBMERSIBLE PUMP	>	HIGH SELECT		OTHER ABBREVIATIONS:
	FIBER OPTIC		PRIMARY ELEMENT STRAP ON ULTRASONIC TRANSIT TIME METER		DIAPHRAGM PUMP & MOTOR	<	LOW SELECT	AI	ANALOG INPUT
	DIAPHRAGM SEAL		PRIMARY ELEMENT STRAP ON ULTRASONIC DOPPLER METER		DISC FLOW OR PROGRESSIVE CAVITY PUMP	>	HIGH LIMIT	AO	ANALOG OUTPUT
			PRIMARY ELEMENT ULTRASONIC FLOW OR LEVEL METER		VERTICAL PUMP	<	LOW LIMIT	AS	AIR SUPPLY
			FLOAT SWITCH		MOTOR - MAY BE ELECTRIC, HYDRAULIC, OR PNEUMATIC. ARROW DENOTES VARIABLE SPEED.	**	SIGNAL TRANSDUCER OR CONVERTER (INPUT/OUTPUT) * DEFINED AS FOLLOWS:	COND	CONDUCTIVITY
			DRAIN			E	VOLTAGE	CR	CHLORINE RESIDUAL
			CHEMICAL INJECTION POINT			H	HYDRAULIC	CTU	CENTRAL TELEMETRY UNIT
			MIXER			I	CURRENT	DCU	DISTRIBUTED CONTROL UNIT
						PD	PULSE DURATION	DI	DIGITAL OR DISCRETE INPUT
						O	ELECTROMAGNETIC, SONIC	DO	DISSOLVED OXYGEN OR DIGITAL OUTPUT
						P	PNEUMATIC	ES	ELECTRIC SUPPLY
						PD	PULSE DURATION	FC	FAIL CLOSED
						R	RESISTANCE (ELECTRIC)	FLP	FAIL LAST POSITION
								FO	FAIL OPEN
								MC	MOTOR CONTROLLER
								NC	NORMALLY CLOSED
								pH	HYDROGEN ION CONCENTRATION
								PLC	PROGRAMMABLE LOGIC CONTROLLER
								POLM	POLYMER
								RTU	REMOTE TERMINAL UNIT
								TURB	TURBIDITY
								VIB	VIBRATION
								VSD	VARIABLE SPEED DRIVE

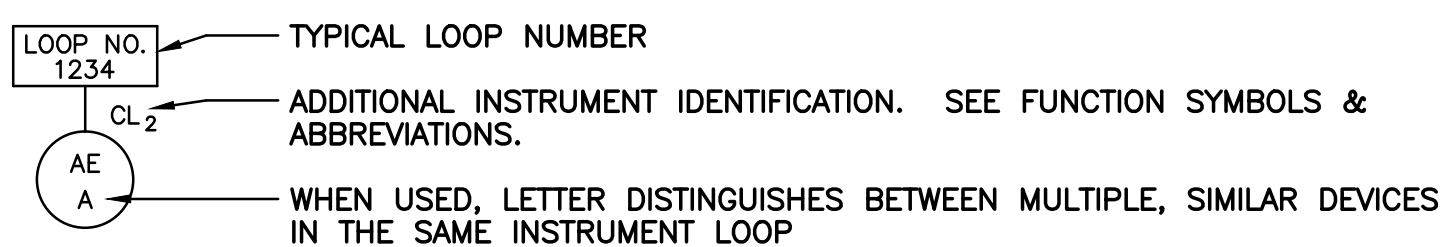
GENERAL NOTES

- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS & ABBREVIATIONS MAY NOT APPLY TO THIS SPECIFIC PROJECT.
- THIS LEGEND APPLIES TO INSTRUMENTATION DIAGRAMS ONLY, & ITS SYMBOLS MAY NOT BE APPLICABLE TO NON-INSTRUMENTATION DRAWINGS.
- THIS LEGEND SHEET & THE INSTRUMENTATION DIAGRAMS & I-DRAWINGS ARE GENERALLY BASED ON THE INSTRUMENT SOCIETY OF AMERICA'S STANDARDS FOR PRACTICES IN INSTRUMENTATION. SOME MODIFICATIONS, ADDITIONS, & ALTERATIONS MAY HAVE BEEN MADE TO ACCOMMODATE INDIVIDUAL PROJECT REQUIREMENTS.
- SOME PROCESS ITEMS (SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC.) WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE INSTRUMENTATION SHEETS.
- SEE ELECTRICAL SHEETS & SPECIFICATIONS FOR ADDITIONAL CONTROL & INTERLOCK REQUIREMENTS FOR EQUIPMENT NOT SHOWN OR NOT PROVIDED BY THE INSTRUMENTATION SUPPLIER.
- SLANTED TEXT DENOTES EXISTING EQUIPMENT OR STRUCTURES. NON-SLANTED TEXT DENOTES NEW EQUIPMENT, STRUCTURES, & WORK. SLANTED TEXT (NOT SHADED) DENOTES FUTURE EQUIPMENT STRUCTURES & WORK.

VALVE ACTUATOR SYMBOLS



TAG NUMBER & DESIGNATION EXAMPLE

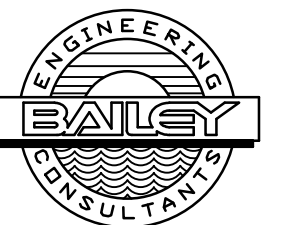


INSTRUMENTATION IDENTIFICATION LETTERS

FIRST LETTER	SUCCEEDING LETTERS	
	MEASURED OR INITIATING VARIABLE	MODIFIER
A	ANALYSIS	
B	BURNER, COMBUSTION	
C	USER'S CHOICE	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL
E	VOLTAGE (EMF)	
F	FLOW RATE	RATIO (FRACTION)
G	GAUGING (DIMENSIONAL)	
H	HAND (MANUALLY INITIATED)	
I	CURRENT (ELECTRICAL)	
J	POWER	SCAN
K	TIME OR TIME SCHEDULE	
L	LEVEL	
M	USER'S CHOICE	MOMENTARY
N	USER'S CHOICE	
O	USER'S CHOICE	
P	PRESSURE OR VACUUM	
Q	QUANTITY	INTEGRATE OR TOTALIZE
R	RUN	
S	SPEED OR FREQUENCY	SAFETY
T	TEMPERATURE	
U	MULTIVARIABLE	
V	VISCOSITY, VIBRATION	
W	WEIGHT OR TORQUE	
X	FAILURE	X AXIS
Y	EVENT, STATE, OR PRESENCE	Y AXIS
Z	POSITION, DIMENSION	Z AXIS

READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
ALARM		
EMERGENCY	USER'S CHOICE	USER'S CHOICE
CLEANER	CONTROL	
PRIMARY ELEMENT		
GLASS		
INDICATE		HIGH OR OPEN
	CONTROL STATION	
LIGHT (PILOT)		LOW OR CLOSED
		MIDDLE OR INTERMEDIATE
USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
ORIFICE (RESTRICTION)		
POINT (TEST CONNECTION)		
RECORD		
	SWITCH	
MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
	VALVE, DAMPER, OR LOUVER	
WELL		
	RELAY, COMPUTE, CONVERT	
	DRIVE, ACTUATE, OR UNCLASSIFIED CONTROL ELEMENT	

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REBID

NO.	DATE	REVISION	BY

Date: 3/6/18
Designed: SEB
Drawn: DRM
Checked: SEB

APPROVED BY: STEPHEN E. BAILEY, P.E.
DATE _____
FLORIDA PROFESSIONAL ENGINEER NO. 42461

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CERTIFICATE. NO. LB0003110

PREPARED FOR:
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SEBRING, FL

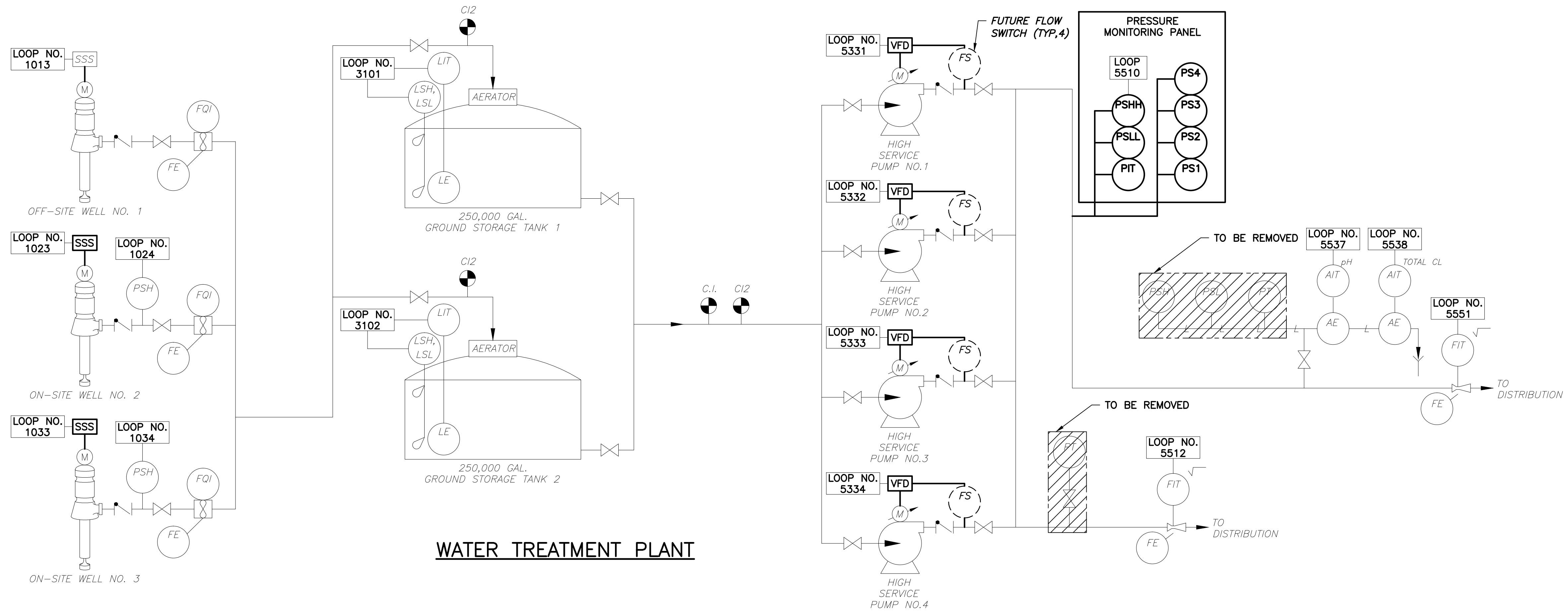
SUN 'N' LAKES WTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION NOTES,
SYMBOLS & ABBREVIATIONS

FILE NAME: I-1 LEGEND.dwg
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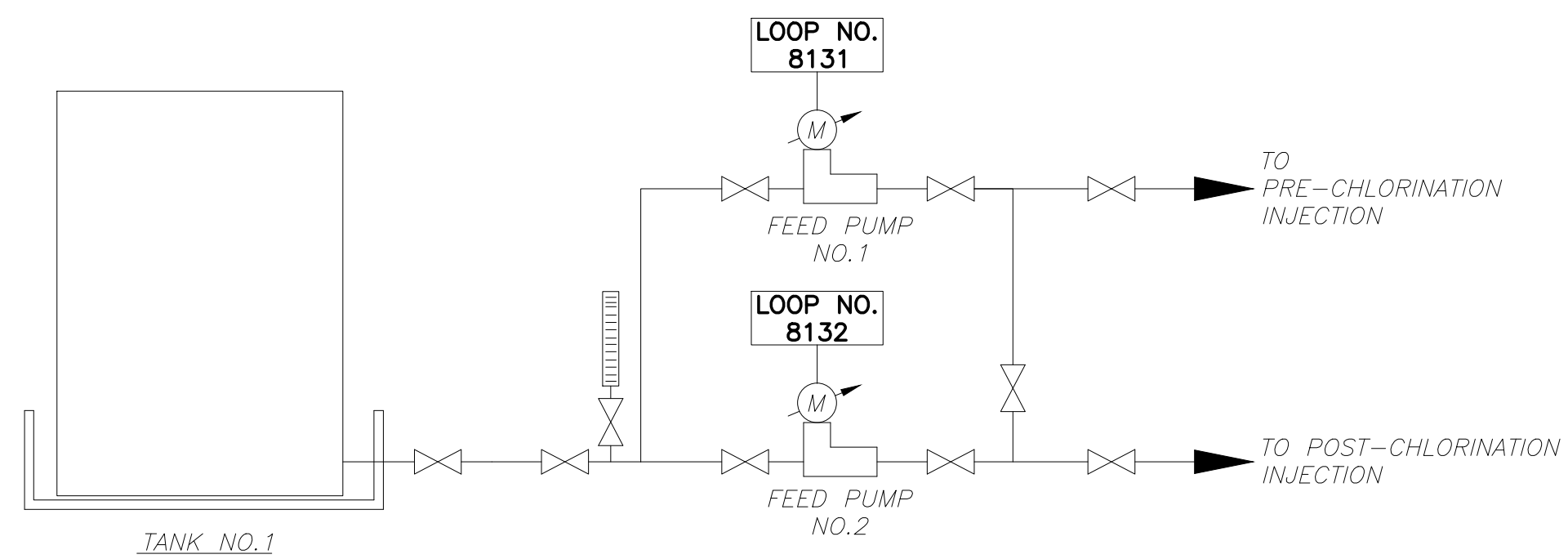
CAS PROJECT NUMBER
17-1957

SHEET

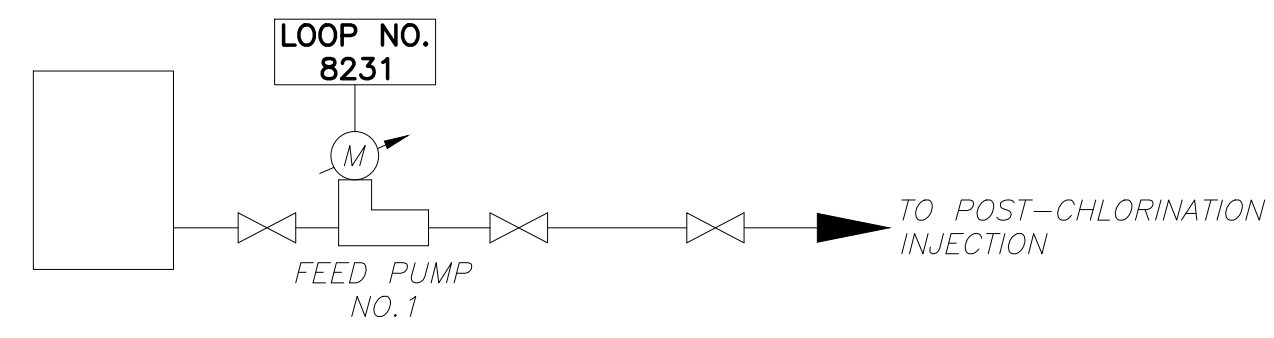
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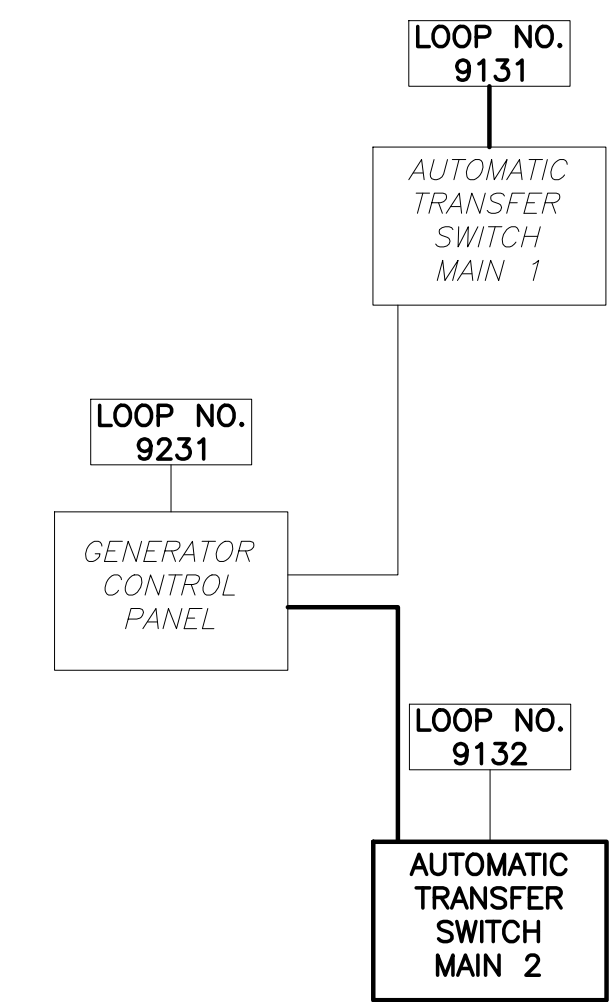
WATER TREATMENT PLANT



SODIUM HYPOCHLORITE SYSTEM

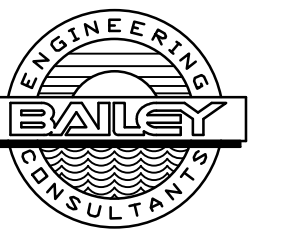


CORROSION INHIBITOR SYSTEM



POWER MONITORING

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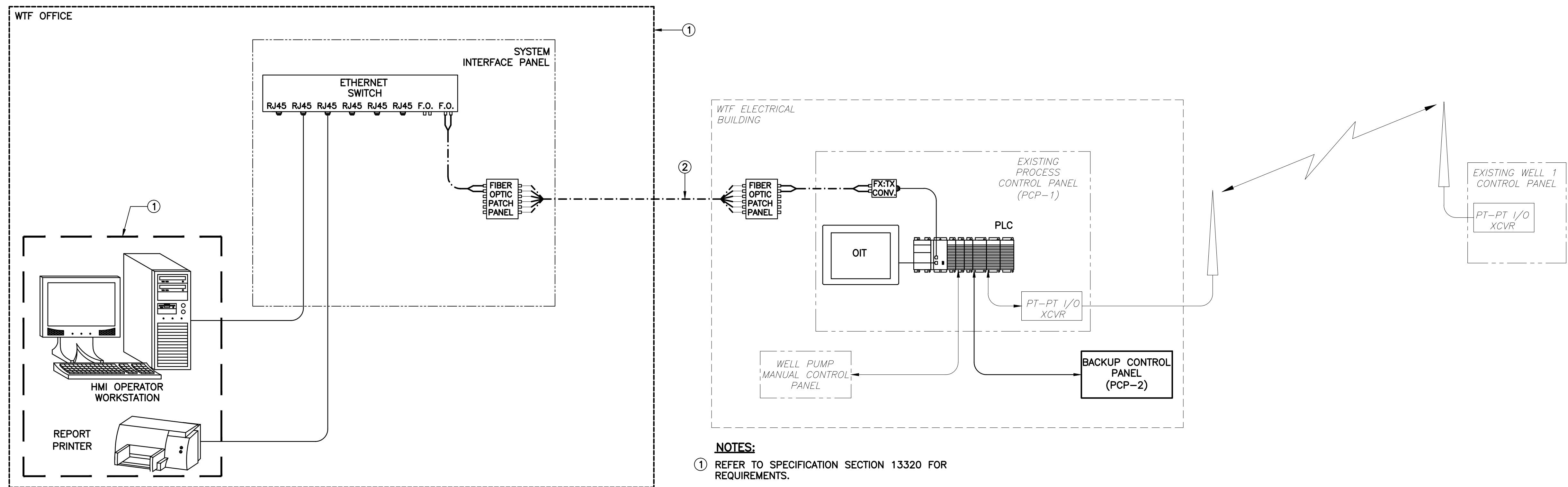
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 7777 GLADES ROAD, SUITE 410
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PREPARED FOR:
SUN 'N' LAKES
 SEBRING, FL

SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 PROCESS & INSTRUMENTATION
 DIAGRAM

FILE NAME: I-2 P&ID.dwg
 LAST SAVED: 10/02/17 - 1:27pm
 CAS PROJECT NUMBER
17-1957

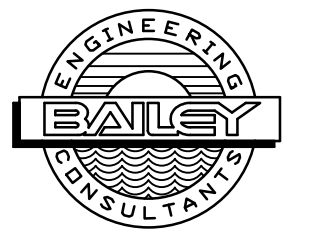
SHEET
1-2



- NOTES:**
- ① REFER TO SPECIFICATION SECTION 13320 FOR REQUIREMENTS.
 - ② FIBER OPTIC CABLE FURNISHED AND INSTALLED BY OWNER. CONTRACTOR TO TERMINATE.

CONTROL SYSTEM BLOCK DIAGRAM

10620 GRIFFIN ROAD, SUITE 202
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PREPARED FOR:
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 SEBRING, FL

SUN 'N' LAKES WTP
 ELECTRICAL IMPROVEMENTS
 CONTROL SYSTEM DIAGRAM

FILE NAME: I-3 SYSTEM.dwg
 LAST SAVED: 10/02/17 - 1:28pm
 CAS PROJECT NUMBER
17-1957

SHEET
1-3

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