

REVISIONS	BY

240-208V 3Ø 1HP - 15HP FULL VOLTAGE
STARTER PANEL DESIGN - ALTERNATE

FOR

EMERALD COAST UTILITIES AUTHORITY
ESCAMBIA COUNTY, FL

SHEET NO.	SHEET DESCRIPTION
1	MAIN POWER DISTRIBUTION SCHEMATIC
2	CONTROL SCHEMATIC
3	DIGITAL INPUTS SCHEMATIC
4	DIGITAL OUTPUTS & ANALOG INPUTS SCHEMATIC
5	ANALOG OUTPUTS & STARTER CONTROL SCHEMATIC
6	TERMINAL BLOCK LAYOUT AND FIELD CONNECTIONS
7A	BACK-TO-BACK EXTERIOR PANEL LAYOUT & FIELD CONDUIT REQUIREMENTS
8	POWER & PUMP 1 INTERNAL PANEL LAYOUTS
9	PUMP 2 & CONTROL PANEL INTERNAL LAYOUTS
10	EQUIPMENT LIST
11	HORSEPOWER RELATED EQUIPMENT & POWER CONDUCTORS
12	PANEL TO PANEL CONDUCTORS & EQUIPMENT
13	PANEL TO PANEL WIRING
14A	BACK-TO-BACK STAINLESS STEEL FRAME LAYOUT
15	TABLES, LEGENDS & TAGS
16	ISR INSTRUCTIONS
17	GENERAL NOTES AND DETAILS
18	GENERAL NOTES AND DETAILS

IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM

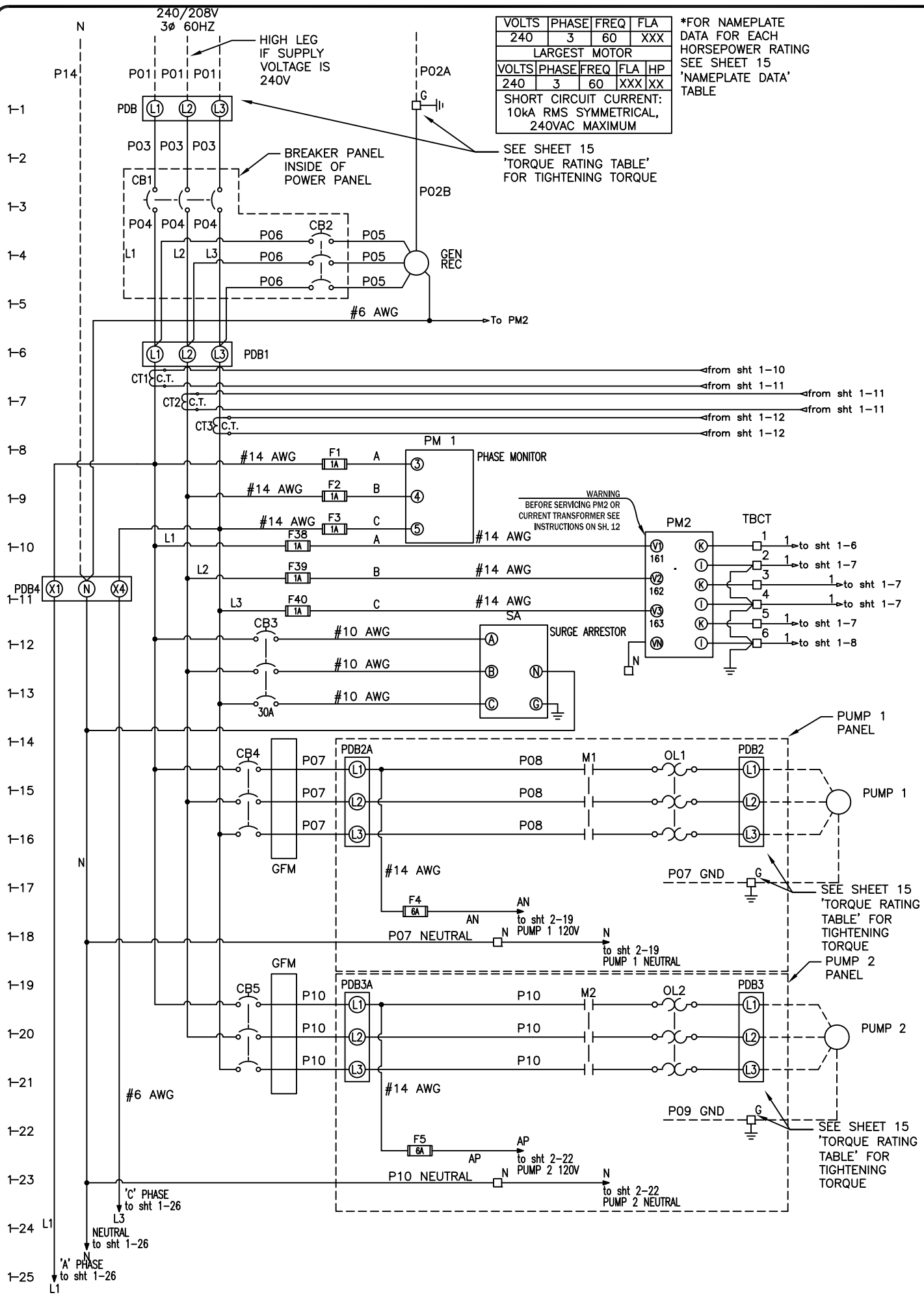
LIFT STATION CONSTRUCTION DETAILS

ELECTRICAL STANDARDS



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Sheet No. 0
Of 18 Sheets



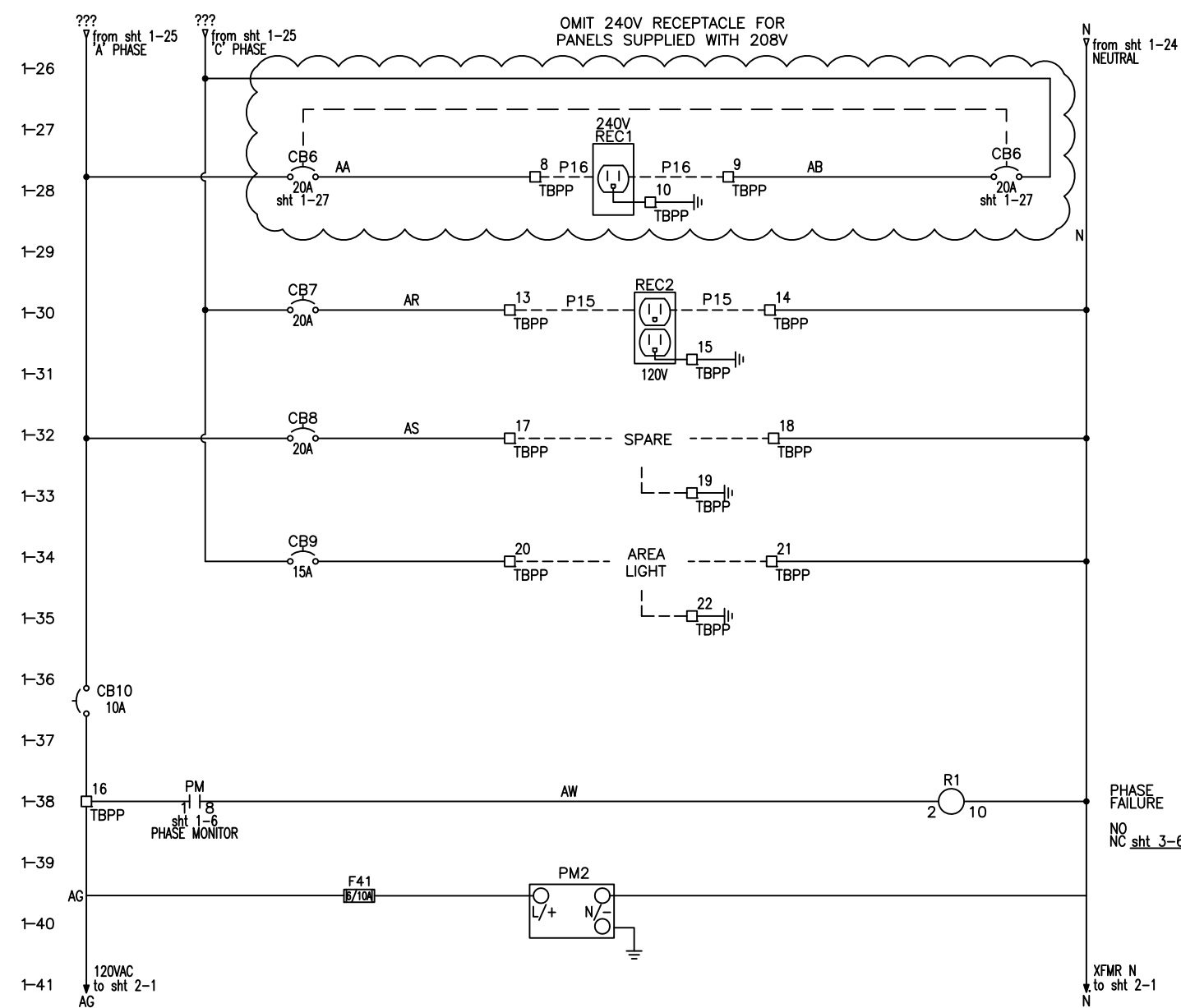
VOLTS	PHASE	FREQ	FLA	
240	3	60	XXX	
LARGEST MOTOR				
VOLTS	PHASE	FREQ	FLA	HP
240	3	60	XXX	XX
SHORT CIRCUIT CURRENT: 10KA RMS SYMMETRICAL, 240VAC MAXIMUM				

*FOR NAMEPLATE DATA FOR EACH HORSEPOWER RATING SEE SHEET 15 'NAMEPLATE DATA' TABLE

NOTES:

- THE COMPLETED CONTROL PANEL SHALL BE LABELED AND MANUFACTURED TO MEET U.L. 508A AND 698A CERTIFICATION.
- CONTROL PANEL WIRING SHALL BE STRANDED COPPER, MINIMUM SIZE #16 AWG WITH 600V 90DEGREE C TYPE THHN INSULATION.
- CONTROL PANEL WIRING SHALL BE NUMBERED AT BOTH ENDS WITH TYPE WRITTEN, HEAT SHRINKABLE WIRE MARKERS.
- ALL WIRING WITHIN THE CONTROL PANEL SHALL BE COLOR CODED OR CODED USING ELECTRICAL TAPE IN SIZES WHERE COLORED INSULATION IS NOT AVAILABLE. THE FOLLOWING CODING SHALL BE USED:
 1. UNGROUNDED AC CONDUCTORS AT SUPPLY VOLTAGE - BLACK
 2. GROUNDED AC CURRENT CARRYING CONDUCTORS - WHITE
 3. UNGROUNDED AC CONDUCTORS BELOW SUPPLY VOLTAGE - RED
 4. UNGROUNDED AC CONTROL CONDUCTORS & CONDUCTORS THAT REMAIN ENERGIZED WHEN THE MAIN DISCONNECT IS OFF - YELLOW
 5. UNGROUNDED DC CONTROL CONDUCTORS - ORANGE
 6. GROUNDED DC CURRENT CARRYING CONDUCTORS - BROWN
 7. INTRINSICALLY SAFE WIRING - BLUE
 8. GROUND CONDUCTORS - GREEN
- SEE SHEETS 11 & 12 FOR DETAILS REGARDING ALL POWER CONDUCTORS LABELED PXX.
- SEE SHEET 11 'HORSEPOWER RELATED COMPONENTS EQUIPMENT LIST' FOR RATINGS OF OVERCURRENT PROTECTION DEVICES.

ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE E.C.U.A. STANDARD SPECIFICATIONS



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IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM

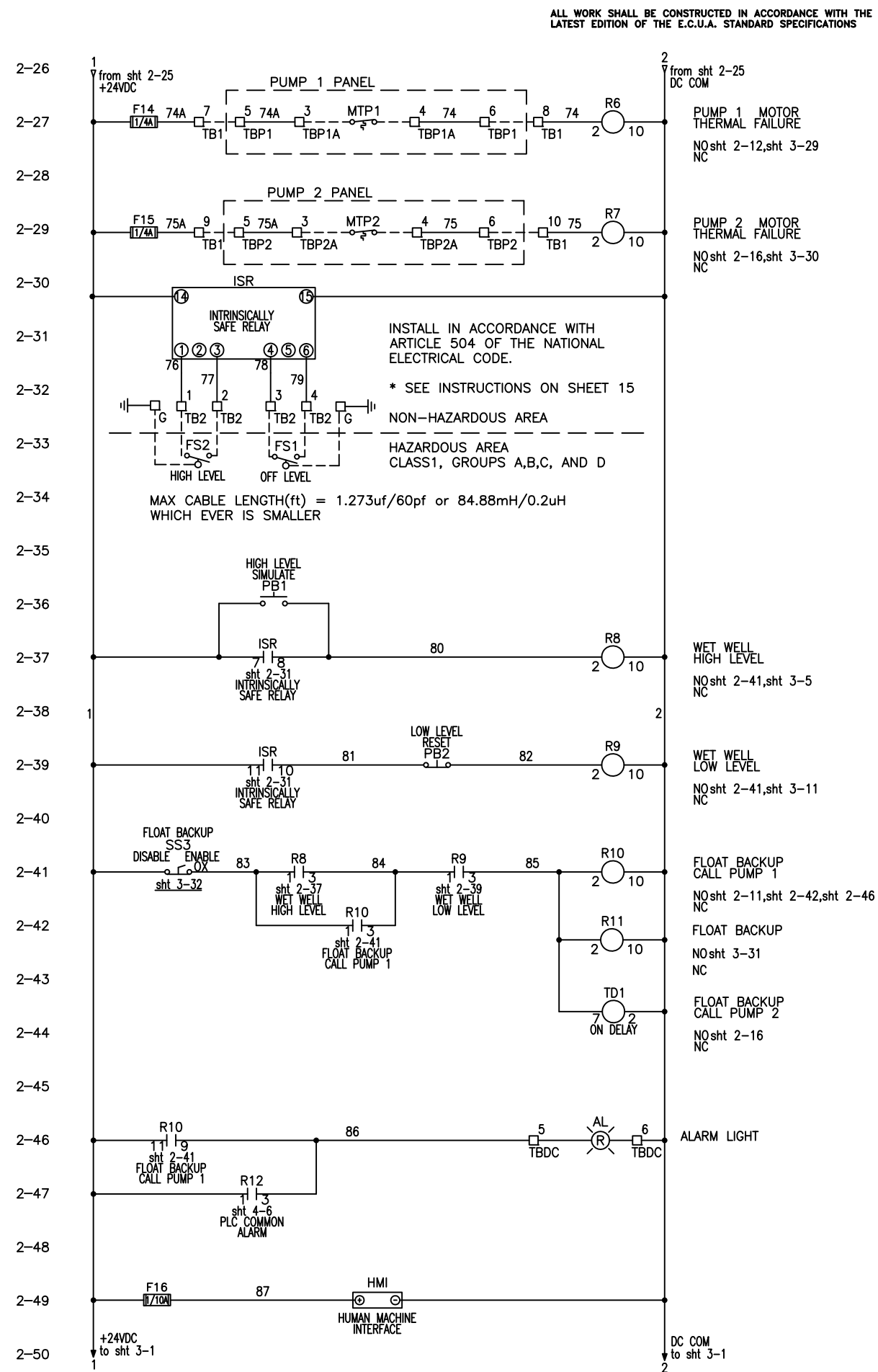
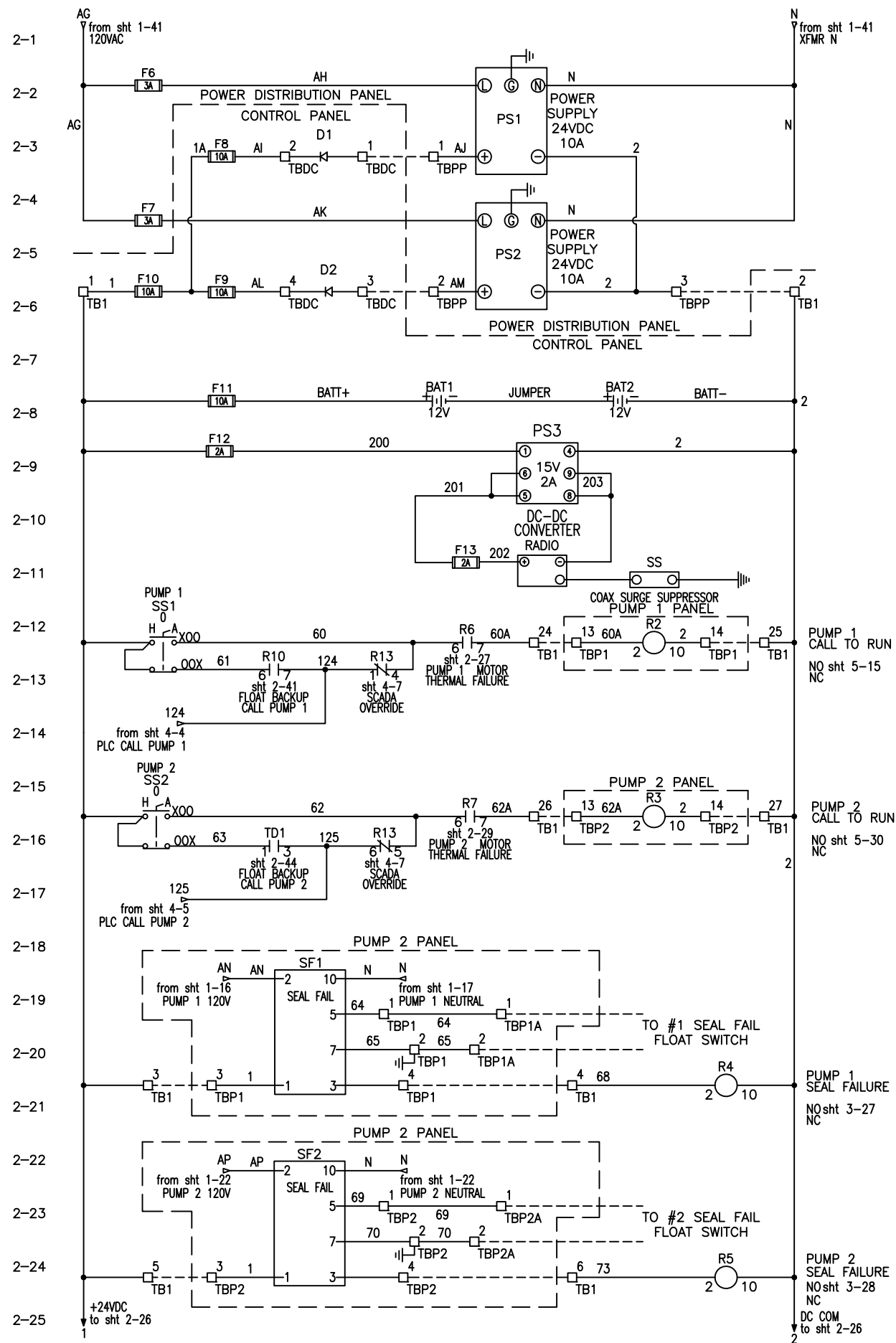
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LIFT STATION CONSTRUCTION DETAILS

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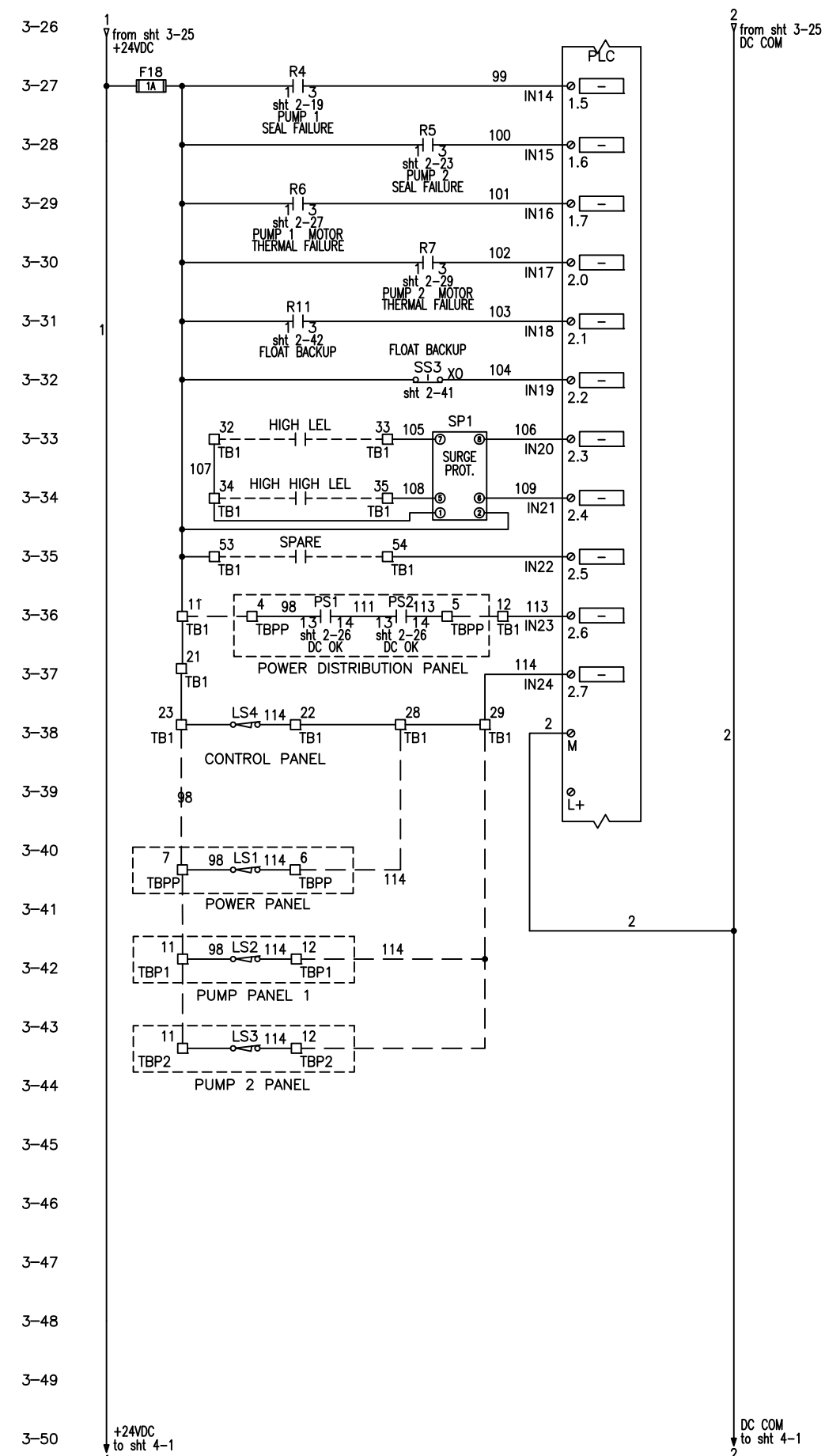


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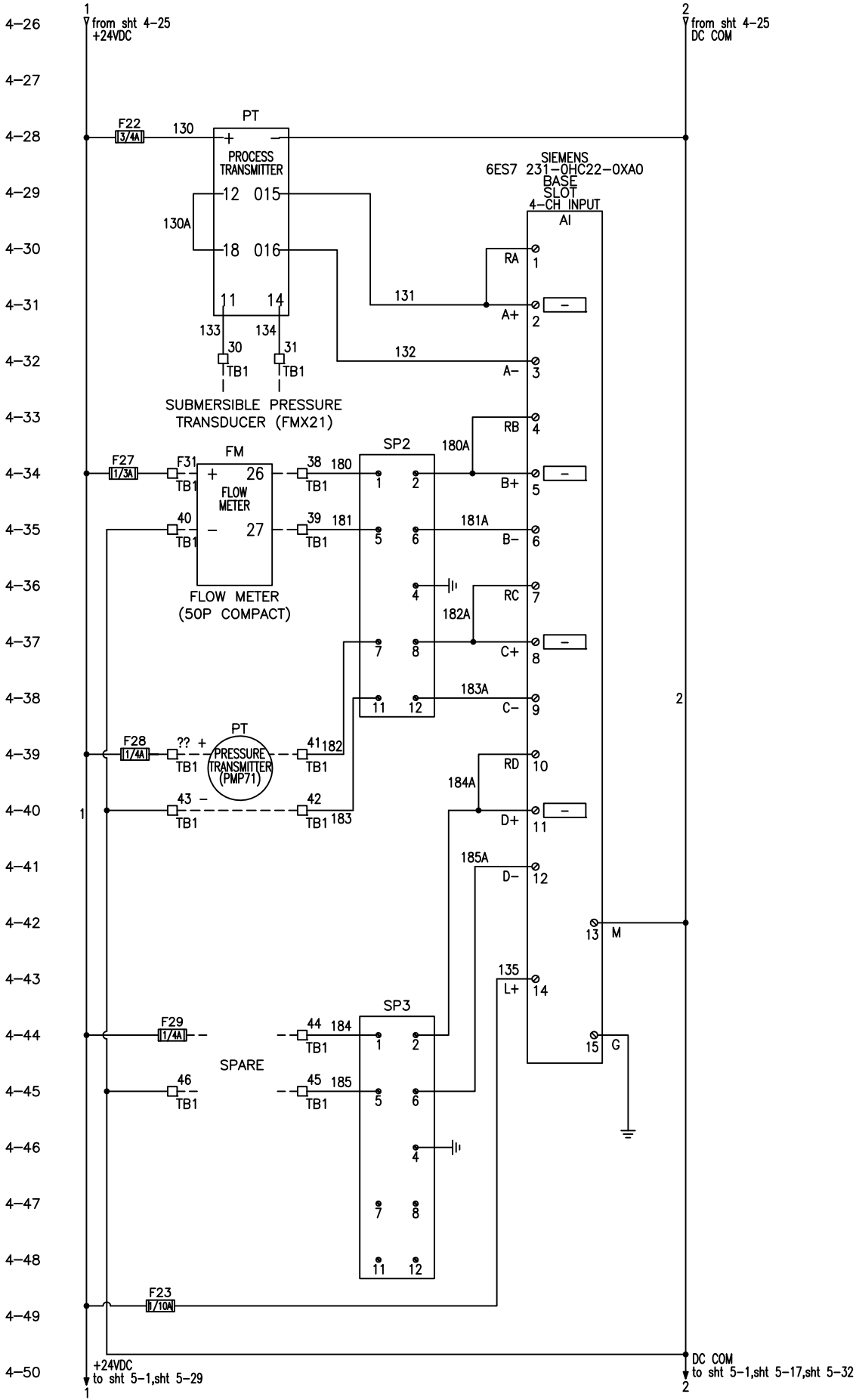
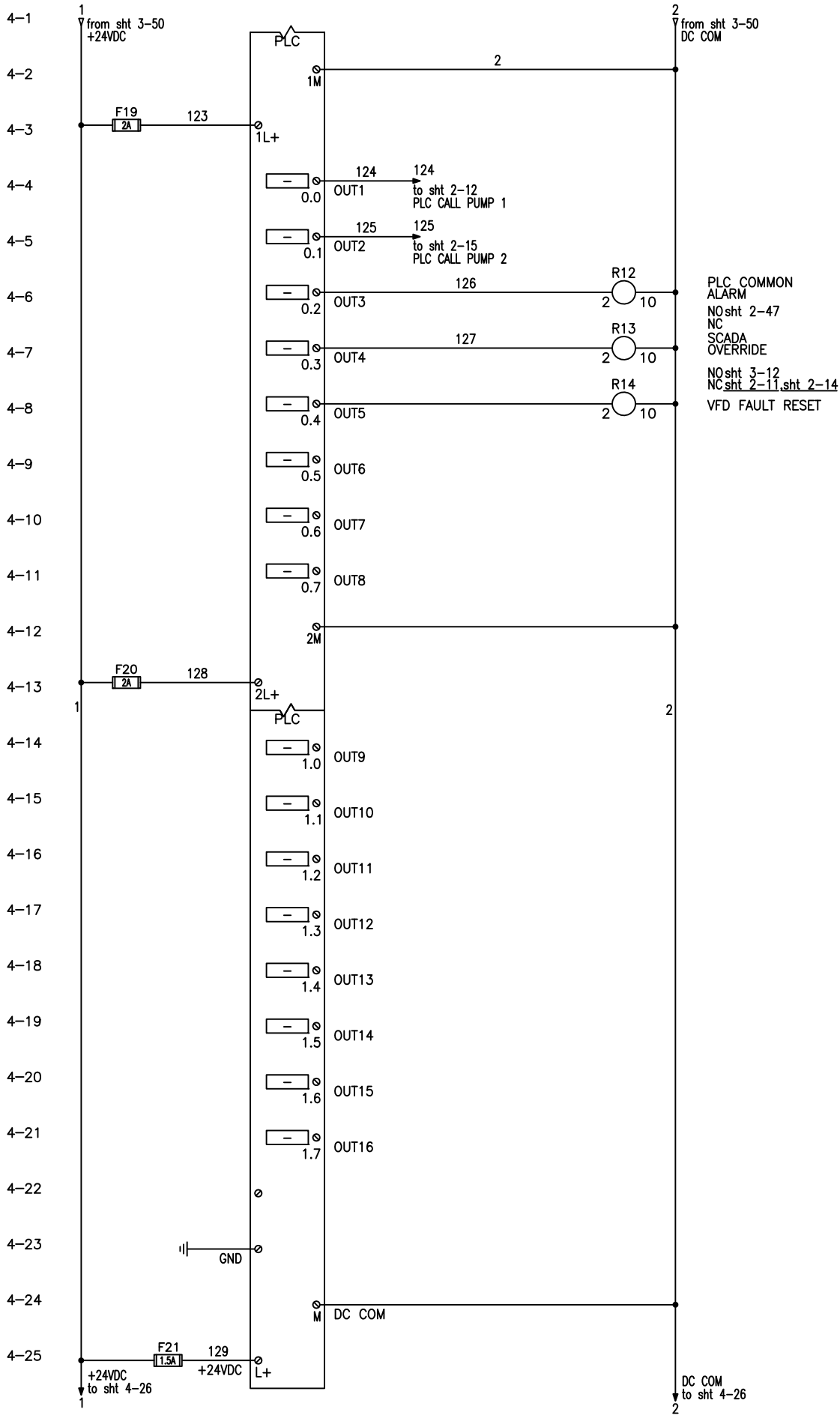
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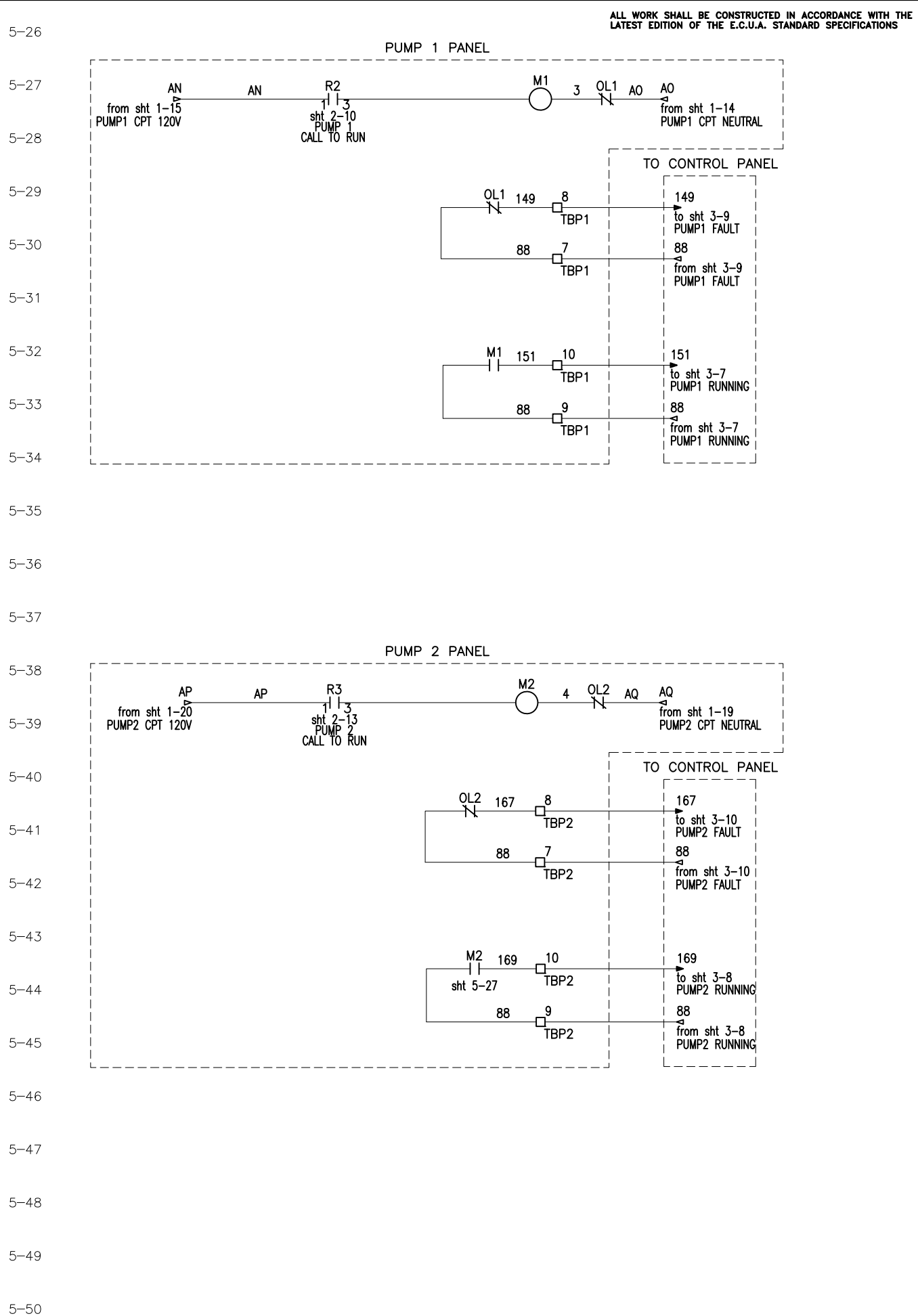
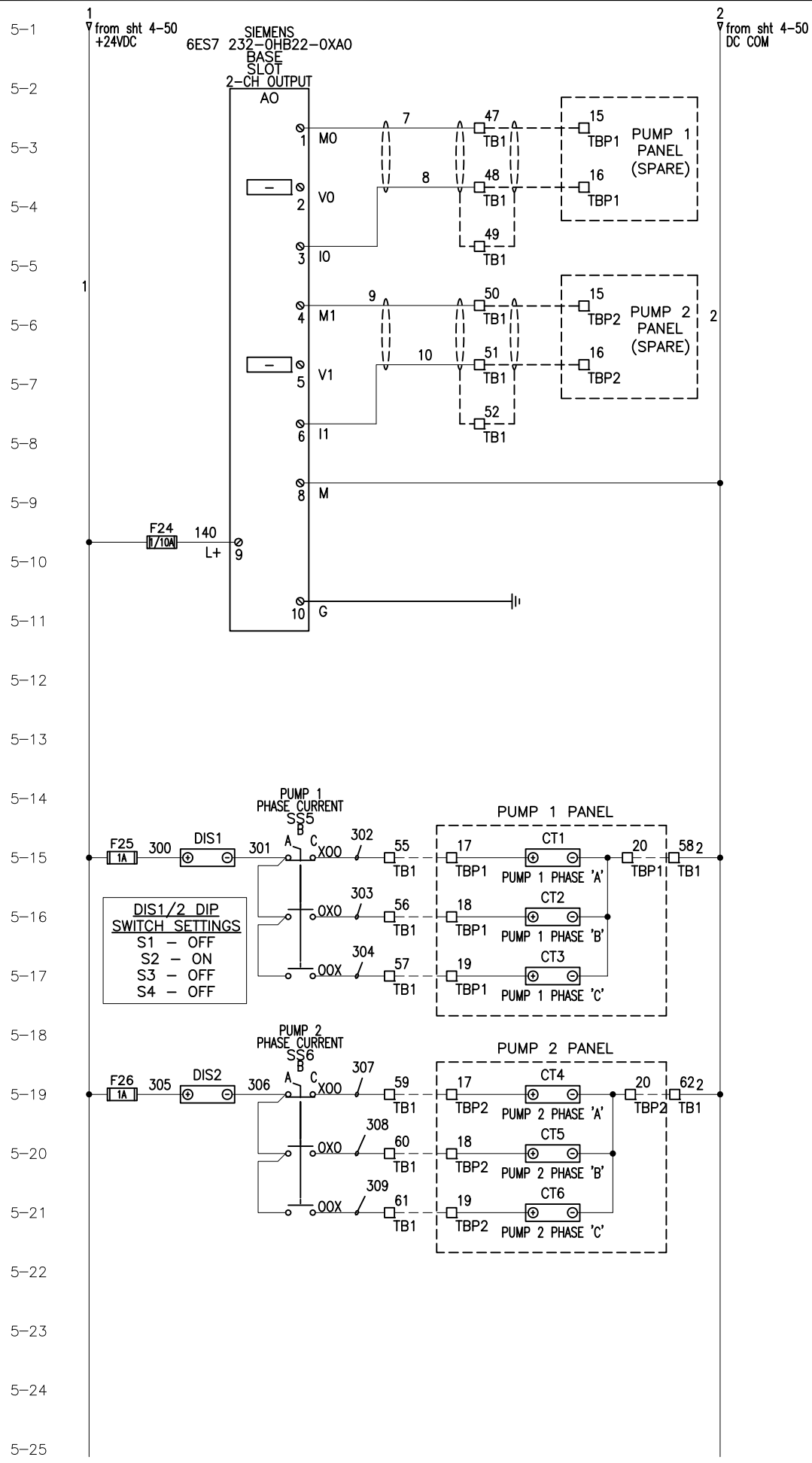


IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM
LIFT STATION CONSTRUCTION DETAILS
ELECTRICAL STANDARDS



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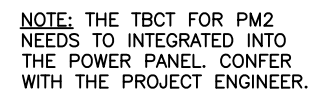
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IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM
LIFT STATION CONSTRUCTION DETAILS
ELECTRICAL STANDARDS

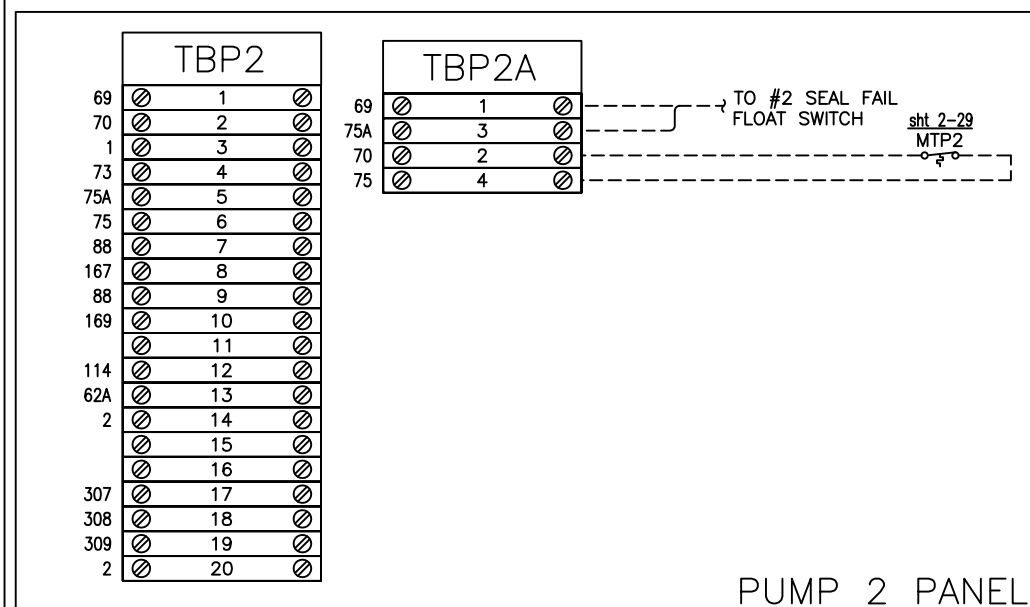
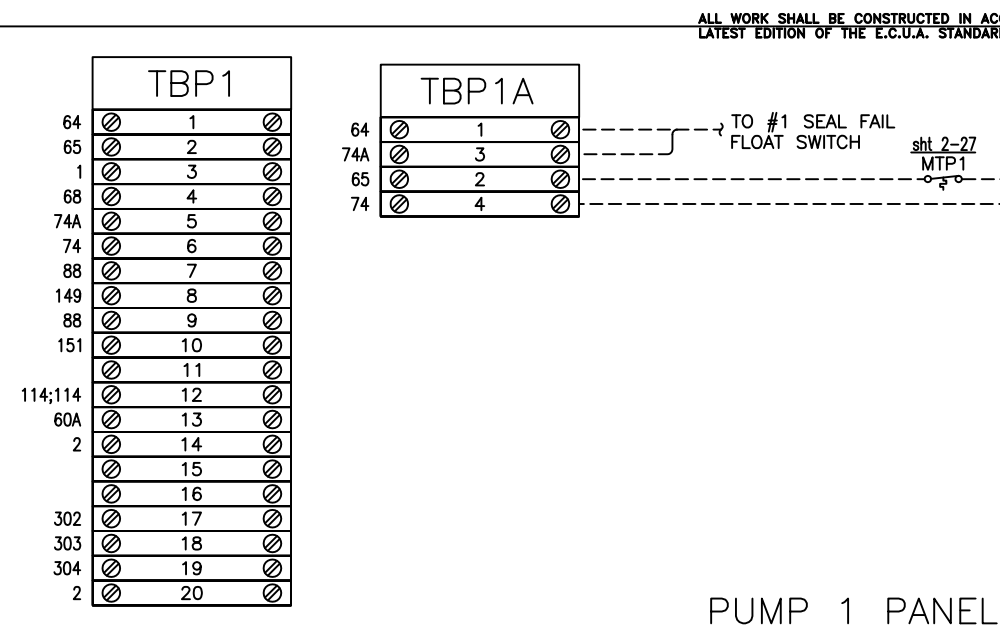
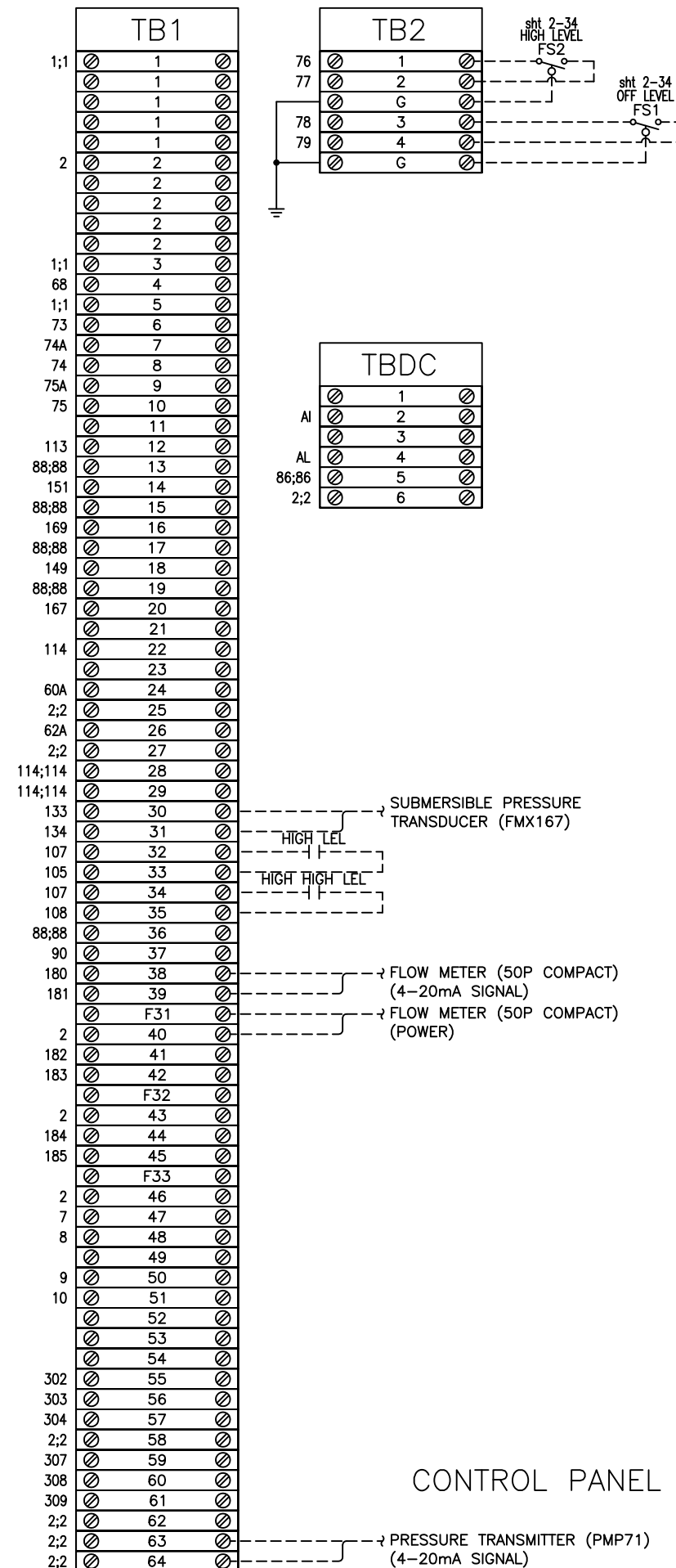


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POWER PANEL



NOTES:

TERMINAL BLOCK DESIGNATIONS:

- TBPP – POWER PANEL TERMINAL BLOCK
- TB1 – CONTROL PANEL TERMINAL BLOCK
- TB2 – INTRINSICALLY SAFE TERMINAL BLOCK
- TBP1 – PUMP 1 TERMINAL BLOCK
- TBP1A – PUMP 1 TERMINAL BLOCK (MOTOR THERMAL AND SEAL FAILURE)
- TBP2 – PUMP 2 TERMINAL BLOCK
- TBP2A – PUMP 2 TERMINAL BLOCK (MOTOR THERMAL AND SEAL FAILURE)

TYPICAL FOR ALL TERMINAL BLOCKS ON THIS DRAWING

USE COPPER CONDUCTORS ONLY
75 DEG C (167 DEG F)
5.3-7.0 LB/IN TIGHTENING TORQUE

REVISIONS		B

IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM LIFT STATION CONSTRUCTION DETAILS ELECTRICAL STANDARDS



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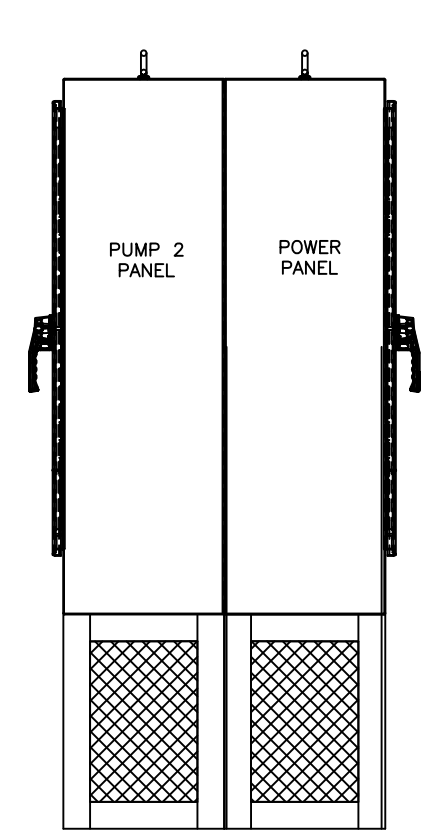
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NOTES

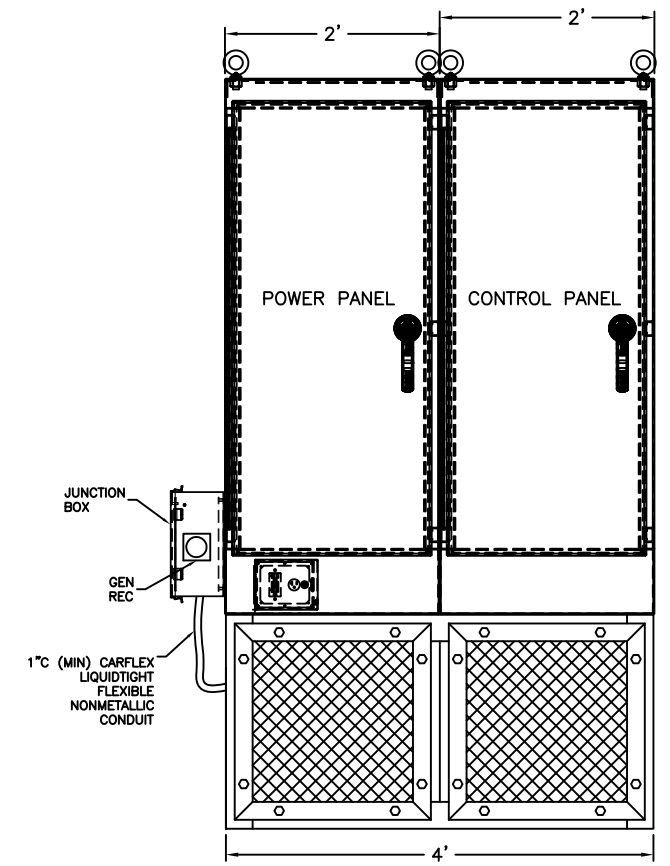
- 1. SEE SHEET 15 FOR SCHEDULES, LEGENDS AND PANEL TAGS.

ATTENTION

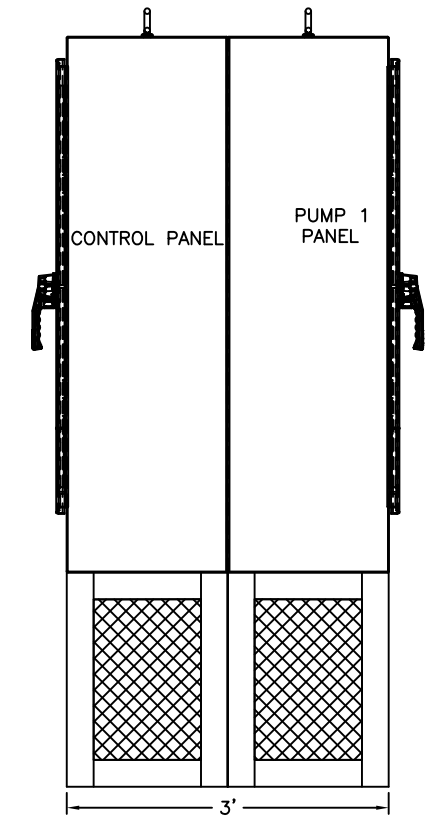
THIS LAYOUT IS ONE OF TWO (2) POSSIBLE CHOICES - SEE SHEET 7 FOR THE OTHER OPTION. IF THIS LAYOUT OPTION IS SELECTED, SEE SHEET 14A FOR ASSOCIATED RACK DETAILS.



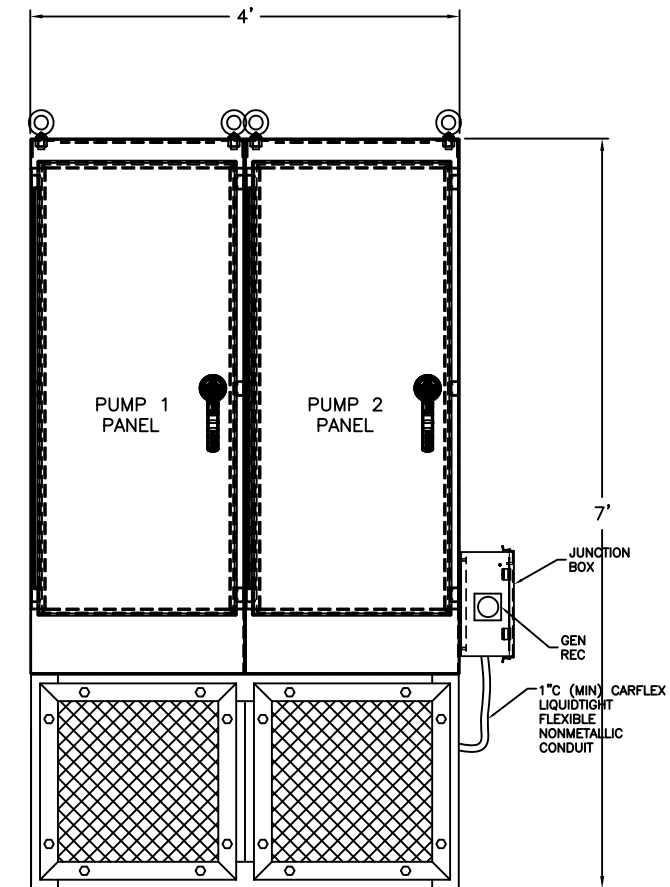
LEFT SIDE



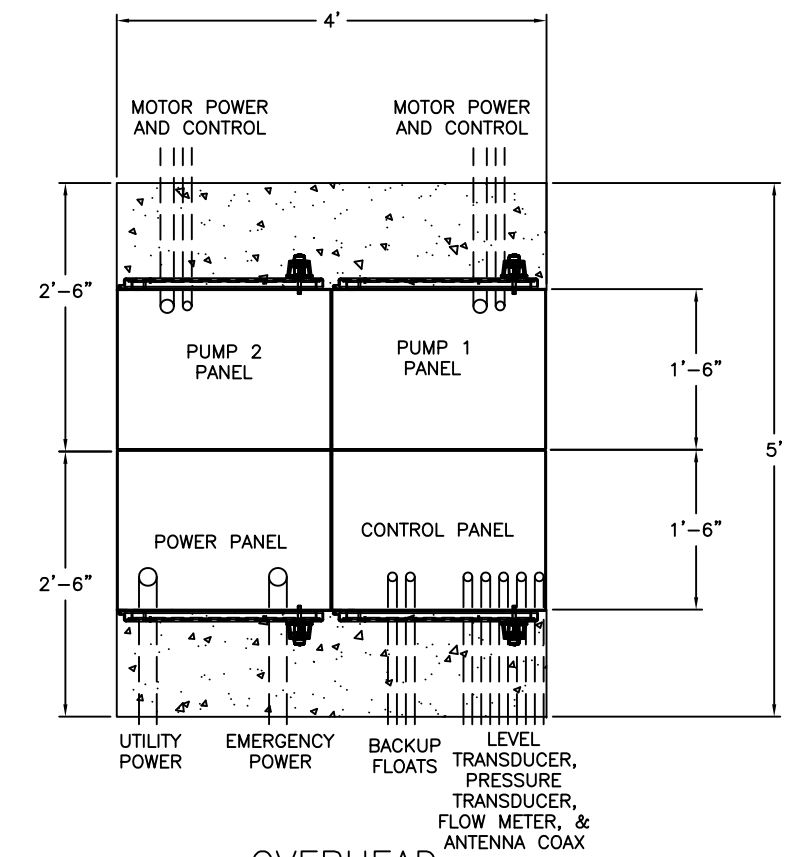
FRONT



RIGHT SIDE



BACK



OVERHEAD

REVISIONS	BY

IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM
LIFT STATION CONSTRUCTION DETAILS
ELECTRICAL STANDARDS



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REVISIONS	BY

NOTES

- 1. SEE SHEET 15 FOR SCHEDULES, LEGENDS AND PANEL TAGS.
- 2. LAYOUT OF THE POWER & STARTER SECTIONS DEPICTS THE LARGEST POSSIBLE HORSEPOWER CONFIGURATION.

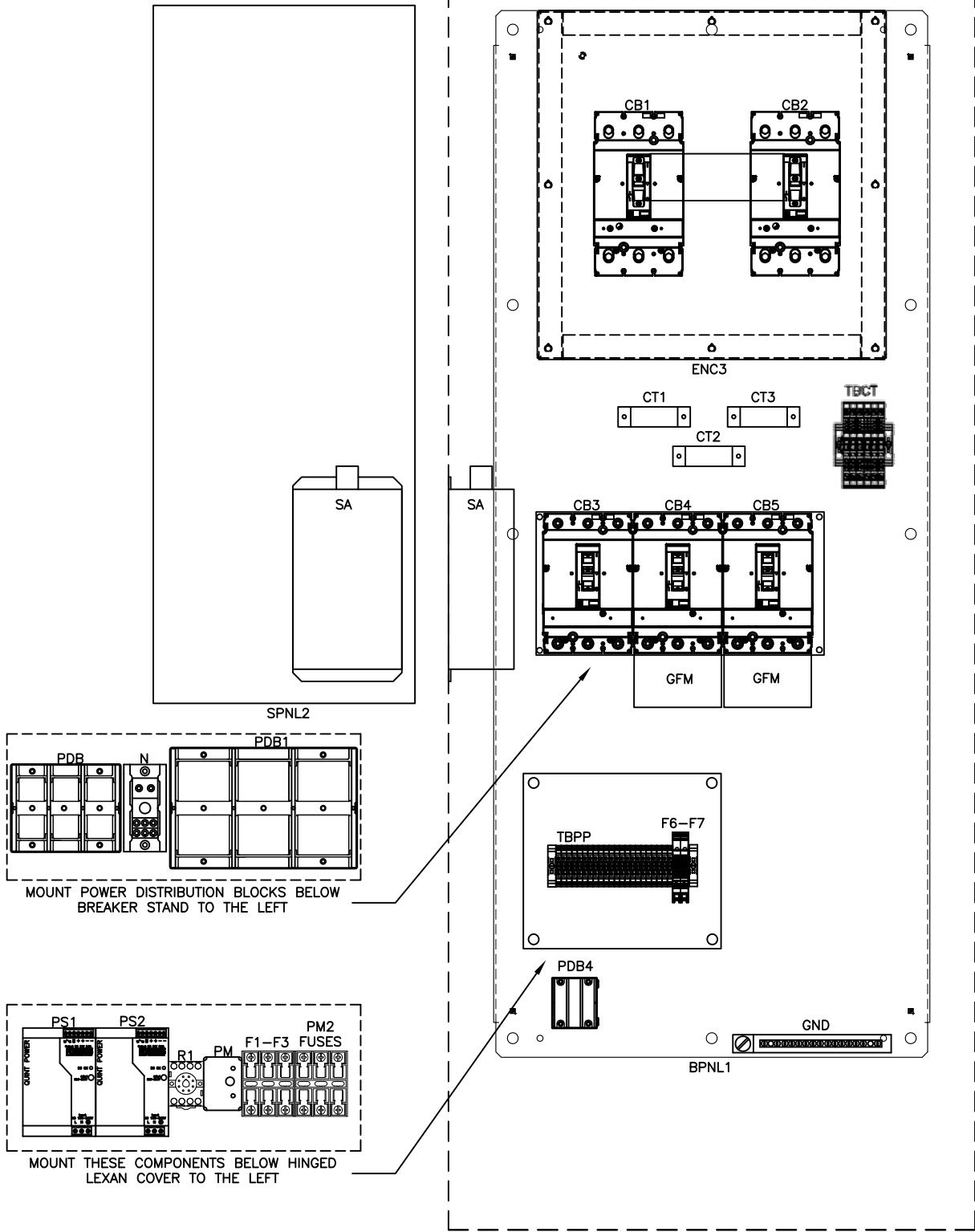
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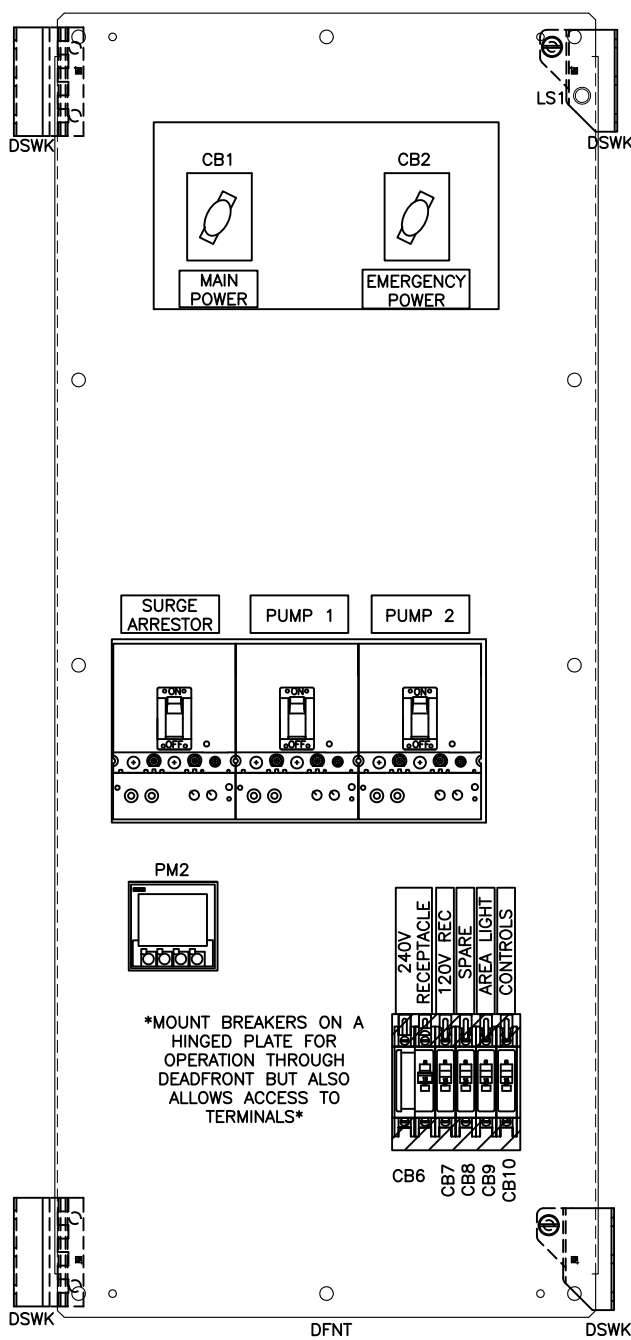
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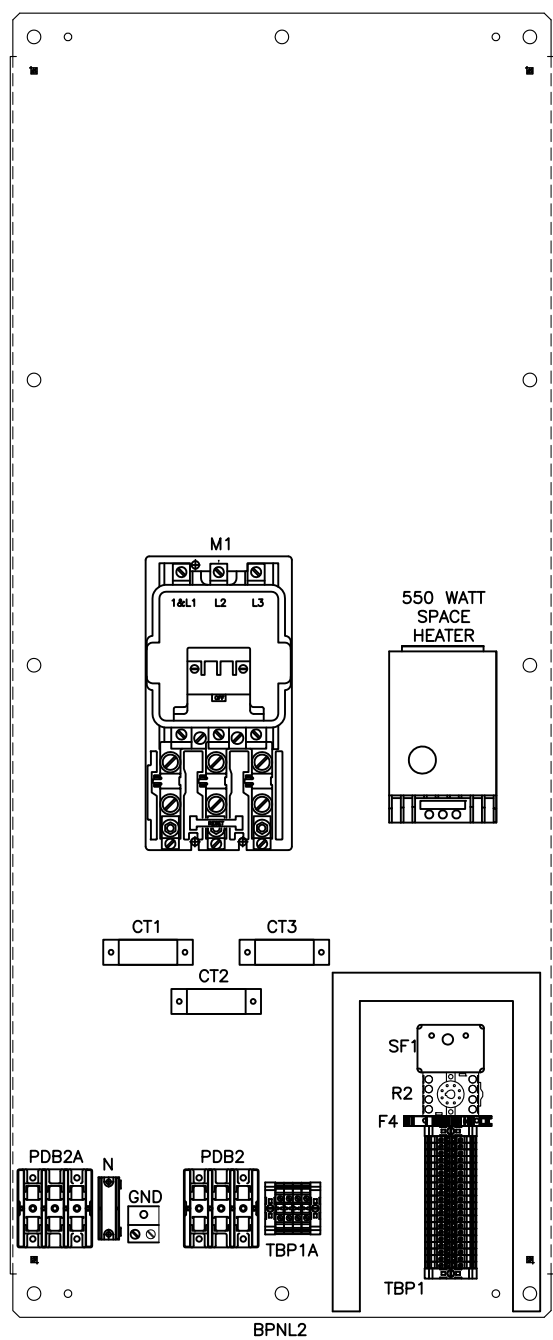
POWER ENCLOSURE
LEFT SIDE PANEL
LAYOUT



POWER ENCLOSURE
BACKPANEL LAYOUT



POWER ENCLOSURE
DEADFRONT LAYOUT



PUMP 1 ENCLOSURE
BACKPANEL LAYOUT

REVISIONS	BY

NOTES

- SEE SHEET 15 FOR SCHEDULES, LEGENDS AND PANEL TAGS.
- LAYOUT OF THE VFD SECTION DEPICTS THE LARGEST POSSIBLE HORSEPOWER CONFIGURATION.

IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM

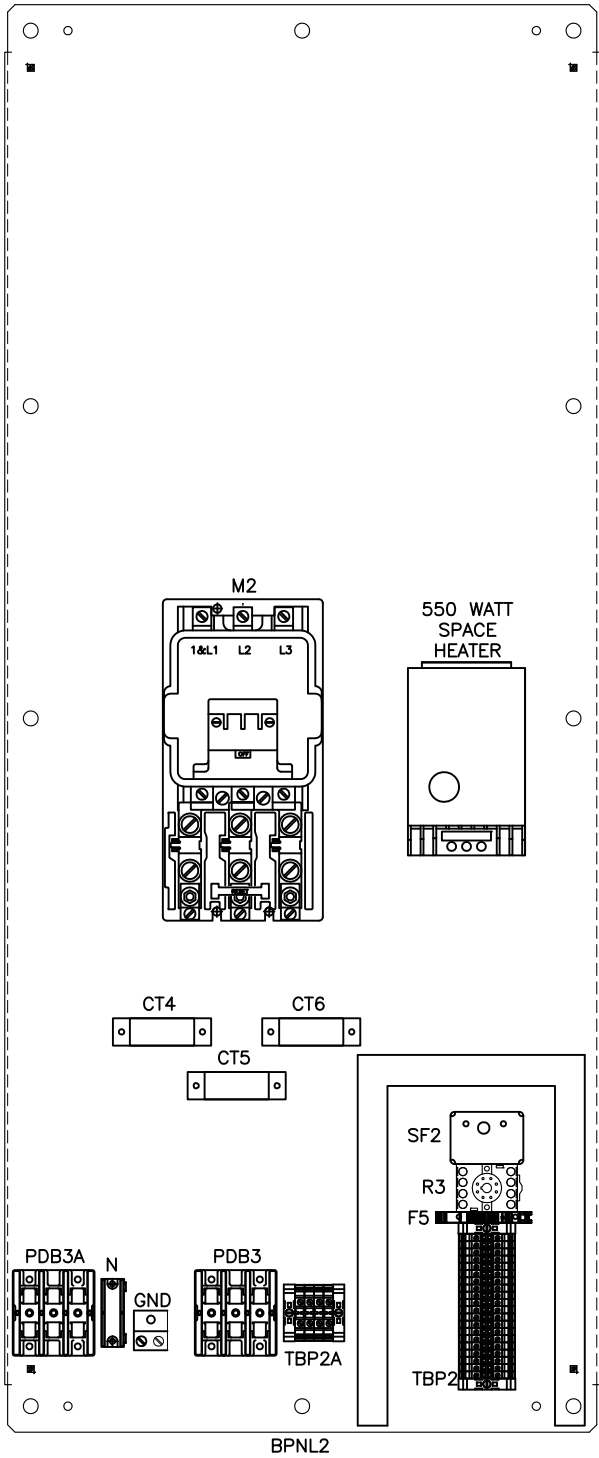
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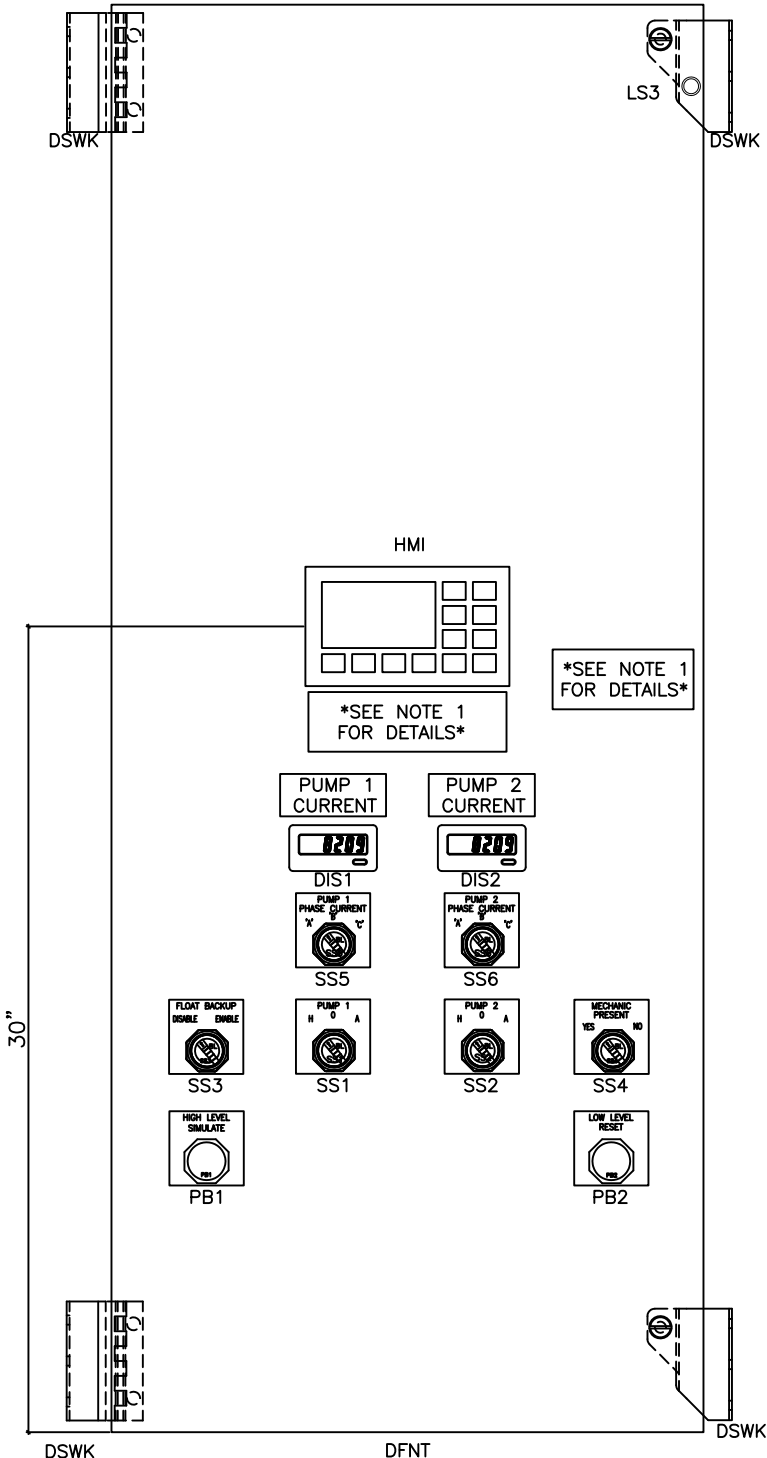


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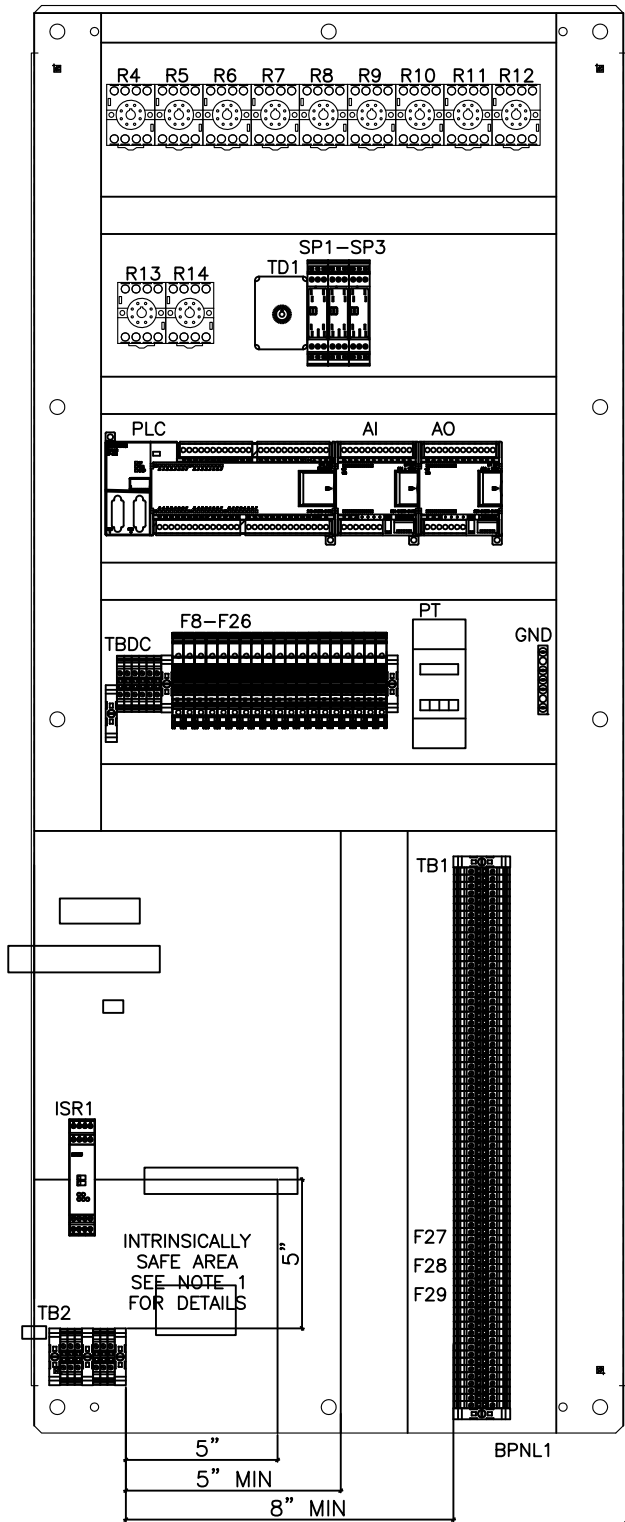
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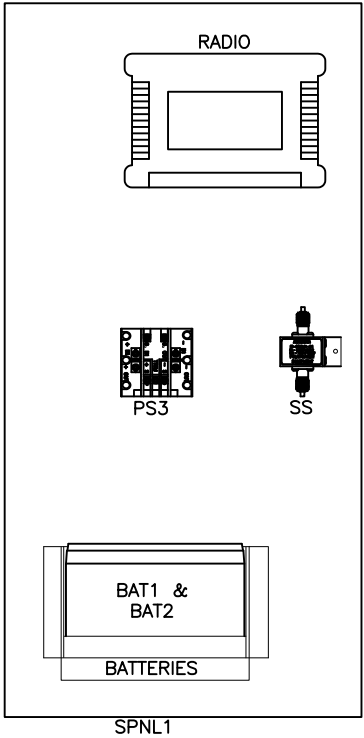
PUMP 2 ENCLOSURE
BACKPANEL LAYOUT



CONTROL ENCLOSURE
DEADFRONT LAYOUT



CONTROL ENCLOSURE
BACKPANEL LAYOUT



CONTROL ENCLOSURE
RIGHT SIDEPANEL LAYOUT

240-208V FVNR Equipment List													
Item	Tag	Panel	Description	Manufacturer	Model	Qty	Item	Tag	Panel	Description	Manufacturer	Model	Qty
1	ENC1	All	60X24X18 NEMA 4X SS Enclosure	Hoffman	A602418SSFSN4	4	71	R2-R13	Control	24VDC 3PDT General Purpose Relay w/ Indicator Lamp	Potter Brumfield	KRPA-14DN-24	12
2	BPNL1	All	60x24 Painted Steel Backpanel	Hoffman	A60P24F1	4	72	SF1, SF2	Control	120V Seal Failure Relay	ATC	SPM-120-AAA-10K	2
3	SPNL1	Control	28"H x 12"W Aluminum Sidepanel	EWS	Custom	1	73	ISR1	Control	Intrinsically Safe Barrier Relay, 24VDC	Phoenix Contact	2685476	1
4	DFNT	Power & Control	60x24 Aluminum Deadfront Panel	EWS	Custom	2	74	TB2	Control	Terminal Block, Blue TB2	Phoenix Contact	3044115	4
5	DSWK	Power & Control	Door Swing Kit	Hoffman	ANADFK	2	75	TB2	Control	Terminal Block, Blue End Barrier, TB2	Phoenix Contact	3047235	1
6	FRM	Power	Expanded Metal Stainless Steel Frame	EWS	SEE DRAWINGS	1	76	TB2	Control	Ground Terminal Blocks, TB2	Phoenix Contact	3044128	2
7	PDB	Power	Incoming Power Distribution Block PDB	Square D	SEE HP TABLE SHEET 11	1	77	PB1, PB2	Control	Push Button, Black 1NO 1NC	Square D	9001SKR1BH13	2
8	PDB	Power	Incoming Power Distribution Block PDB Cover	Square D	SEE HP TABLE SHEET 11	1	78	SS3, SS4	Control	2 Position Selector Switch, 30MM	Square D	9001SKS11BH2	2
9	GND	Power	Power Panel Ground Bar	Square D	PK15GTA-L	1	79	TD1	Control	24VDC 0-180 Second Time Delay Relay	Square D	RE48ATM12MW	1
10	ENC3	Power	16"H x 16"W x 8"D Screw Cover Type 3R Enclosure	Hoffman	A16168GSC	1	80	TD1	Control	8 Pin Relay Base	ABB	NDS-8	1
11	CB1	Power	600V Main Circuit Breaker	Square D	SEE HP TABLE SHEET 11	1	81	F16, F23, F24	Control	1/10A Fuse	Bussmann	AGC-1/10	3
12	CB2	Power	600V Emergency Circuit Breaker	Square D	SEE HP TABLE SHEET 11	1	82	HMI	Control	TD400C Text Display	Siemens	6AV6 640-0AA00-0AX1	1
13	CB1,CB2	Power	Mechanical Interlock for H/J Frame Circuit Breakers	Square D	S29369	1	83	F4, F5, F17, F18	Control	1A Fuse	Bussmann	AGC-1	4
14	CB1,CB2	Power	Door Mounted Rotary Handle for H/J Frame Circuit Breakers	Square D	S29338	2	84	PLC	Control	S7-200 Dual Com Port Processor w/ 24 DI & 16 DO Points	Siemens	6ES7 216-2AD23-0XB0	1
15	GEN REC	Power	NEMA 4X Generator Receptacle	Appleton	SEE HP TABLE SHEET 11	1	85	AI	Control	S7-200 4 Point AI Module	Siemens	6ES7 231-0HC22-0XA0	1
16	PDB1	Power	Main Power Distribution Block PDB1	Square D	SEE HP TABLE SHEET 11	1	86	AO	Control	S7-200 2 Point AO Module	Siemens	6ES7 232-0HB22-0XA0	1
17	PDB1	Power	Main Power Distribution Block PDB1 Cover	Square D	SEE HP TABLE SHEET 11	1	87	PLC	Control	S7-200 Communication cable PC/PP1 RS-232/485	Siemens	6ES7 901-3CB30-0XA0	1
18	F1-F3, F38-F40	Power	3 Pole Rejection type Fuse Block	Bussmann	BC6033PQ	2	88	SP1-SP3	Control	Plug In DI Surge Suppression, PT 4x1...DC	Phoenix Contact	2838322	3
19	F1-F3, F38-F40	Power	1A Rejection Type Fuse, Class CC	Bussmann	KTK-R-1	6	89	SP1-SP3	Control	Terminal Block Base for Plugable Surge Supression, PT 4x1-BE	Phoenix Contact	2839363	3
20	F1-F3, F38-F40	Power	Fuse Cover	Bussmann	SAMI-7N	6	90	LS1-LS4	Control	Panel Intrusion Switches, N.C. Contacts	NSI	76030PS	4
21	PM	Power	240V Phase Monitor	Timemark	257B	1	91	F21	Control	1-1/2A Fuse, PLC Supply	Bussmann	AGC-1-1/2	1
22	PM	Power	600V, 8-Pin Relay Base	ABB	OT08PC	1	92	F22	Control	3/4A Fuse, Process Analyzer	Bussmann	AGC-3/4	1
23	CB3-CB5	Power	Breaker Stand	EWS	Custom	1	93	PT	Control	Process Transmitter	Endress & Hauser	RMA42AAAH2	1
24	CB3	Power	30A 600V 3 Pole Circuit Breaker, Main Surge Arrestor	Square D	HDL36030	1	94	PT	-	Submersible Level Transducer, 33ft Range w/ 60ft Cable & Mounting Clamp (Ship Loose)	Endress & Hauser	FMX21-FE221HGE21A	1
25	SA	Power	Main Surge Arrestor	SSI	SEE HP TABLE SHEET 11	1	95	F25-F27	Control	24VDC Fused Terminal Block With Indication	Phoenix Contact	3046090	3
26	CB4, CB5	Power	600V 3 Pole Circuit Breaker, Starter	Square D	SEE HP TABLE SHEET 11	2	96	F25-F27	Control	1/4A Fuse, Analog Inputs	Bussmann	GMA-250	3
27	CB4, CB5	Power	H & J Frame Circuit Breaker Locking System	Square D	S29371	2	97	TBPP,1,DC,P1, 1A, P2 & 2A	All	Terminal Block, Gray 26-10 AWG Wire	Phoenix Contact	3044102	161
28	PDB2A, PDB3A	Pump 1 & 2	Starter Power Distribution Block	Square D	9080LBA362104	2	98	TBPP,1,DC,P1, 1A, P2 & 2A	All	Terminal Block End Barrier	Phoenix Contact	3047028	8
29	PDB2A, PDB3A	Pump 1 & 2	Starter Power Distribution Block Cover	Square D	9080LB23	2	99	TBPP,1,DC,P1, 1A, P2 & 2A	All	Terminal Block End Anchor	Phoenix Contact	800886	17
30	M1, M2	Pump 1 & 2	NEMA Starter	Square D	SEE HP TABLE SHEET 11	2	100	TBP1A, TBP2A	Pump 1 & 2	Terminal Block, Gray 26-8 AWG Wire, TBVFD1A & TBVFD2A	Phoenix Contact	3044131	8
31	OL1, OL2	Pump 1 & 2	Overload Heaters	Square D	SEE HP TABLE SHEET 11	2	101	GND	Control	Control Panel Ground Bar	Square D	PK5GTA	1
32	OL1, OL2	Pump 1 & 2	Overload Contact, (2) N.C.	Square D	9999-SO5	2	102	-	-	Meter Socket (SHIP LOOSE)	Milbank	UAP9701-RRL	1
33	GND	Pump 1 & 2	Motor Ground Lug	NSI	2-OT	2	103	-	-	Stainless Steel 60' Float (SHIP LOOSE)	Anchor Scientific	P60NO-SST	2
34	PDB2, PDB3	Pump 1 & 2	Motor Power Distribution Block PDB2&3, (1)#14-2/0.....(1)#14-2/0	Square D	9080LBA362101	2	104	-	-	Insulated Ground Neutral (SHIP LOOSE)	Square D	SN400LA	1
35	PDB2, PDB3	Pump 1 & 2	Motor Power Distribution Block PDB2&3 Cover	Square D	9080LB23	2	105	-	-	Ground Bar Kit (SHIP LOOSE)	Square D	PKDGTJ250	1
36	CB7-CB11	Power	Hinged Aluminum Bracked for Mounting 240/120V Circuit Breakers through Deadfront	EWS	Custom	1	106	-	-	NEMA 4A S.S. Disconnect (SHIP LOOSE)	Square D	J250DS	1
37	PDB4	Power	240V/120V Power Distribution Block PDB4, (1) #14-2 ... (4) #18-10	Square D	9080LBA361104	1	107	-	-	Antenna Mast Stabilization Plate (Ship Loose)	EWS	Custom	1
38	CB6	Power	20A, 240V, 2 Pole Circuit Breaker	Square D	QOU220	1	108	-	-	Stainless Steel 'U' Bolt, 2" Pole, 5/16" Diameter Bolt w/ 2-1/2" Threads (SHIP LOOSE)			1
39	REC1	Power	20A, 250V, 6-20R Receptacle	P&S	5872I	1	109	-	-	5/16" Stainless Steel Flat Washer for 'U' Bolt (SHIP LOOSE)			2
40	CB7, CB8	Power	20A, 120V 1 Pole Circuit Breaker	Square D	QOU120	2	110	-	-	5/16" Stainless Steel Lock Washer for 'U' Bolt (SHIP LOOSE)			2
41	REC2	Power	120V 20A GFCI Duplex Receptacle NEMA5-20R	P&S	2094-I	1	111	-	-	5/16" Stainless Steel Nut for 'U' Bolt (SHIP LOOSE)			2
42	REC1, REC2	Power	Custom Receptacle Cover NEMA 4X S.S.	HOFFMAN	HIDRPSS-MOD	1	112	-	-	Stainless Steel 'U' Bolt, 1/4" Diameter (SHIP LOOSE)			2
43	REC1, REC2	Power	3/4 1G AL FD BOX	Appelton	4CS-1/2	2	113	-	-	1/4" Stainless Steel 1/4" Nut for 'U' Bolt (SHIP LOOSE)			4
44	CB9	Power	15A, 120V, 1 Pole Circuit Breaker	Square D	QOU115	1	114	-	-	1-1/4" Reduction Bushing for Antenna Tower, ROHN R-TB50 (SHIP LOOSE)	Tessco	36882	1
45	CB10	Power	10A, 120V, 1 Pole Circuit Breaker	Square D	QOU110	1	115	PLC	Control	S7-200 Memory Module	Siemens	6ES7 2918GF230AX0	1
46	R1	Power	120V 3PDT General Purpose Relay w/ Indicator Lamp	Potter Brumfield	KRPA-14AN-120	1	116	N	Power	Incoming Neutral Block	Square D	9080LBA163206	1
47	R1-R13, SF1, SF2	All	11 Pin Relay Base	ABB	NDS-11	15	117	N	Power	Incoming Neutral Block Cover	Square D	9080LB31	1
48	F4-F7	Pump 1, 2 & Power	Fused Terminal Block w/ 120V Blown Fuse Indication	Allen Bradley	1492-H4	4	118	N	Pump 1 & 2	Neutral Block	Square D	9080LBA161104	2
49	-	Pump 1, 2 & Power	1492-H4 &H5 Fused Terminal Block End Cover	Allen Bradley	1492-N37	4	119	SPNL2	Power	32"X12" Aluminum Sidepanel	EWS	Custom	1
50	F6, F7	Power	3A Fuse	Bussmann	AGC-3	2	120	CT1-CT6	Pump 1 & 2	Current Transducer; 4-20mA; 10, 20 or 50A Range; Loop Powered	NK Technologies	AT1-420-24L-FF	6
51	PS1, PS2	Power	10A 24VDC Power Supply	Phoenix Contact	2938604	2	121	DIS1, DIS2	Control	4 Digit Loop Powered Process Indicator; 4-20mA	Red Lion	CUB4LP40	2
52	D1, D2	Power	10A Diode, P1000A	Newark	51R7094	2	122	SS5, SS6	Control	3 Position Selector Switch, 30MM	Square D	9001SKS46BH2	2
53	-	Power	Custom Stand/Lexan Hinged Cover w/Alum Stand for TBPP & Power Supply Fuses	EWS	Custom	1	123	FM	Control	Flow Meter	Endress & Hauser	50P Compact	1
54	F8-F24	Control	Fused Terminal Block w/ 24VDC Blown Fuse Indication	Allen Bradley	1492-H5	17	124	PR	Control	Pressure Transmitter (0-150 PSI Transmitter)	Endress & Hauser	PMP71-AAC1PG1RAAMA	1
55	F8 - F11	Control	10A Fuse	Bussmann	AGC-10	4	125	PM2	Power	Voltage Monitor, Siemens Sentron PAC3100	Siemens	7KM3133-0BA00-3AA0	1
56	BAT1, BAT2	Control	12VDC Battery	Power Sonic	PS1290	2	126	HTR	Pump 1 & 2	Enclosed Heater w/Fan 120VAC 550W Adj Thermostat	Stego	02700.9-00	2
57	PS3	Control	24VDC-15VDC Converter, 2A	Vicor	V1-J12-EY-B1	1	127	TBCT	Power	Terminal Block, DIN Rail, Test Disconnect	Phoenix Contact	3047400	6
58	RADIO	Control	400MHz Radio	GE MDS	SD04MD	1	128	TBCT	Power	Terminal Block, C-ME 6/2	Phoenix Contact	3034442	3
59	RADIO	Control	USB9 Male/Male Gender Changer	Office Depot	94666U	1	129	IBCI	Power	Switching Jumper POS 2, Gray/Orange	Phoenix Contact	3034468	3
60	RADIO/SS	Control	3 Foot LMR400UF Coaxial Jumper NMale to TNCMale	Tessco	324503	1	130	TBCT	Power	Cover, 2.2M	Phoenix Contact	3047426	1
61	SS	Control	Coaxial Surge Suppressor, 100-512MHz	Polyphaser	VHF50HN	1	131	CT1-CT3	Power	Current Transformer, 200:5 Ratio	Square D	2NR201	3
62	-	-	50FT Coaxial Cable, NMale-Nmale, Wireless Solutions 400-07-07-P50 (Ship Loose)	Tessco	370875	1	132	GFM	Power	Ground Fault Module, Pump 1 & Pump 2	Square D	GFM150HD	2
63	-	-	400MHz Yagi Antenna w/ N Female Connector, MAXRAD MYA4506N (Ship Loose)	Tessci	37634	1	133	F41	Power	1 pole Rejection Type Fuse Block	Bussmann	BC6031PQ	1
64	-	-	Antenna Tower 5' Base Section, ROHN R-SB25G5 (Ship Loose)	Tessco	64559	1	134	F41	Power	0.6A Rejection Type Fuse, Class CC	Bussmann	KTK-R-6/10	1
65	-	-	Antenna Tower 10' Mid Section, ROHN R-25G (Ship Loose)	Tessco	56866	1	135	ENC4	Power	14 X 12 NEMA 4X SS Enclosure	Hoffman	LC353020SS	1
66	-	-	Antenna Tower 9' Top Section, ROHN R-25AG2 (Ship Loose)	Tessco	70080	1	136	ENC4	Power	2" Galv. Rigid Coupling	-	-	1
67	-	-	21' 1-1/4" S.S. Antenna Mast (Ship Loose)	Bell Steel	23008	1	137	ENC4	Power	2" x 1-1/2" Reducing Bushing	Crousehinds	-	1
68	F14, F15	Control	1/4A Fuse	Bussmann	AGC-1/4	2	138	ENC4	Power	2" Ring Seal Rubber Gasket	T&B	5267	1
69	F12, F13, F19, F20	Control	2A Fuse	Bussmann	AGC-2	4	139	ENC4	Power	Cord Grip, 1.28 - 1.53	Appleton	CG-128150	1
70	SS1, SS2	Control	3 Position Selector Switch, 30MM	Square D	9001SKS43BH2	2	140	ENC4	Power	1-1/2" Alum. Hub	Crousehinds	STA-S	1

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IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM

LIFT STATION CONSTRUCTION DETAILS

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Horsepower Related Components Equipment List															
Item	Tag	240V Supply								208V Supply					
		Horsepower								Horsepower					
		1	2	3	5	7.5	10	15	1	2	3	5	7.5	10	15
Incoming Power Distribution Block PDB	PDB	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA363101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA362101	9080LBA363101	9080LBA363101
Incoming Power Distribution Block PDB Cover	PDB	9080LB23	9080LB23	9080LB23	9080LB23	9080LB23	9080LB23	9080LB33	9080LB23	9080LB23	9080LB23	9080LB23	9080LB23	9080LB33	9080LB33
Main Circuit Breaker	CB1	HDL36060	HDL36060	HDL36070	HDL36090	HDL36110	HDL36125	HDL36175	HDL36045	HDL36050	HDL36060	HDL36090	HDL36110	HDL36150	HDL36200
Emergency Circuit Breaker	CB2	HDL36060	HDL36060	HDL36070	HDL36090	HDL36110	HDL36125	HDL36175	HDL36045	HDL36050	HDL36060	HDL36090	HDL36110	HDL36150	HDL36200
Generator Receptacle	GEN REC	ADR1044-RS	ADR1044-RS	ADR1044-RS	ADR1044-RS	AR20044RS	AR20044RS	AR20044RS	ADR1044-RS	ADR1044-RS	ADR1044-RS	ADR1044-RS	AR20044RS	AR20044RS	AR20044RS
Main Power Distribution Block PDB1	PDB1	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA365208	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA363206	9080LBA365208	9080LBA365208
Main Power Distribution Block PDB1 Cover	PDB1	9080LB33	9080LB33	9080LB33	9080LB33	9080LB33	9080LB33	9080LB53	9080LB33	9080LB33	9080LB33	9080LB33	9080LB33	9080LB53	9080LB53
Starter Circuit Breaker	CB4, CB5	HDL36015SA	HDL36015SA	HDL36020SA	HDL36030SA	HDL36045SA	HDL36060SA	HDL36080SA	HDL36015SA	HDL36015SA	HDL36020SA	HDL36035SA	HDL36050SA	HDL36060SA	HDL36090SA
3 Phase FVNR Starter	M1, M2	8536SAO12V02S	8536SBO1V02S	8536SBO1V02S	8536SC03V02S	8536SC03V02S	8536SD01V02S	8536SD01V02S	8536SAO12V02S	8536SBO1V02S	8536SBO1V02S	8536SC03V02S	8536SC03V02S	8536SD01V02S	8536SEO1V02S
Overloads	OL1, OL2	B6.25	B10.2	B14	B25	B36	B45	B79	B6.90	B11.5	B15.5	B28	B45	B56	CC74.6
Surge Arrestor	SA	SDLA3D1	SDLA3D1	SDLA3D1	SDLA3D1	SDLA3D1	SDLA3D1	SDLA3D1	SDLA3Y1	SDLA3Y1	SDLA3Y1	SDLA3Y1	SDLA3Y1	SDLA3Y1	SDLA3Y1
Ground Fault Module	CB4, CB5	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD	GFM150HD

Conductor Tag		240V							208V						
		Horsepower							Horsepower						
		1	2	3	5	7.5	10	15	1	2	3	5	7.5	10	15
P-01, P-03 & P-04	Description	(3)#6	(3)#6	(3)#4	(3)#3	(3)#2	(3)#1	(3)#2/0	(3)#8	(3)#8	(3)#6	(3)#3	(3)#2	(3)#1/0	(3)#2/0
	Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Catalog #	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Length (Ft. Max)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cable Dia (in)	0.254"	0.254"	0.324"	0.352"	0.384"	0.446"	0.532"	0.216"	0.216"	0.254"	0.352"	0.384"	0.486"	0.532"
	Appleton Connector	(3) -CG-1850	(3) -CG-1850	(3) -CG-3150	(3) -CG-3150	(3) -CG-3150	(3) -CG-3775	(3) -CG-5075	(3) -CG-1850	(3) -CG-1850	(3) -CG-1850	(3) -CG-3150	(3) -CG-3150	(3) -CG-3775	(3) -CG-5075
	Connector Range	0.187"-0.312"	0.187"-0.312"	0.312"-0.437"	0.312"-0.437"	0.312"-0.437"	0.375"-0.500"	0.500"-0.625"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.312"-0.437"	0.312"-0.437"	0.375"-0.500"	0.500"-0.625"
P-02A	Meyers Hub	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 3/4" - STA-2	(3) 3/4" - STA-2	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 3/4" - STA-2	(3) 3/4" - STA-2
	Description	(1)#10	(1)#10	(1)#8	(1)#8	(1)#6	(1)#6	(1)#6	(1)#10	(1)#10	(1)#10	(1)#8	(1)#6	(1)#6	(1)#6
	Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Catalog #	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Length (Ft. Max)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cable Dia (in)	0.164"	0.164"	0.216"	0.216"	0.254"	0.254"	0.254"	0.164"	0.164"	0.164"	0.216"	0.254"	0.254"	0.254"
	Appleton Connector	(1)-GC-1250	(1)-GC-1250	(1)-GC-1850	(1)-GC-1850	(1)-GC-1850	(1)-GC-1850	(1)-GC-1850	(1)-GC-1250	(1)-GC-1250	(1)-GC-1250	(1)-GC-1850	(1)-GC-1850	(1)-GC-1850	(1)-GC-1850
P-02B	Connector Range	0.125"-0.187"	0.125"-0.187"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.125"-0.187"	0.125"-0.187"	0.125"-0.187"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"
	Hub	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1	(1) 1/2" - STA-1
	Description	(1)#10	(1)#10	(1)#8	(1)#8	(1)#6	(1)#6	(1)#6	(1)#10	(1)#10	(1)#10	(1)#8	(1)#6	(1)#6	(1)#6
	Manufacturer	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire
	Description	(3)#6	(3)#6	(3)#4	(3)#3	(3)#2	(3)#1	(3)#2/0	(3)#8	(3)#8	(3)#6	(3)#3	(3)#2	(3)#1/0	(3)#2/0
	Manufacturer	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire
	Catalog #	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P-05 & P-06	Length (Ft. Max)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cable Dia (in)	0.254"	0.254"	0.324"	0.352"	0.384"	0.446"	0.532"	0.216"	0.216"	0.254"	0.352"	0.384"	0.486"	0.532"
	Appleton Connector	(3) -CG-1850	(3) -CG-1850	(3) -CG-3150	(3) -CG-3150	(3) -CG-3150	(3) -CG-3775	(3) -CG-5075	(3) -CG-1850	(3) -CG-1850	(3) -CG-1850	(3) -CG-3150	(3) -CG-3150	(3) -CG-3775	(3) -CG-5075
	Connector Range	0.187"-0.312"	0.187"-0.312"	0.312"-0.437"	0.312"-0.437"	0.312"-0.437"	0.375"-0.500"	0.500"-0.625"	0.187"-0.312"	0.187"-0.312"	0.187"-0.312"	0.312"-0.437"	0.312"-0.437"	0.375"-0.500"	0.500"-0.625"
	Hub	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 3/4" - STA-2	(3) 3/4" - STA-2	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 1/2" - STA-1	(3) 3/4" - STA-2	(3) 3/4" - STA-2
	Description	(5)#14 TC	(5)#14 TC	(5)#14 TC	(5)#14 TC	(5)#10 TC	(5)#10 TC	(4)#6 W/G, TC	(5)#14 TC	(5)#14 TC	(5)#14 TC	(5)#12 TC	(5)#10 TC	(4)#8 W/G, TC	(4)#6 W/G, TC
	Manufacturer	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire	Houston Wire
P-07 & P-09	Catalog #	HW151 01405	HW151 01405	HW151 01405	HW151 01405	HW151 01005	HW151 01005	HW 154 00604	HW151 01405	HW151 01405	HW151 01405	HW151 01205	HW151 01005	HW 154 00804	HW 154 00604
	Length (Ft. Max)	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT	19 FT
	Cable Dia (in)	0.41"	0.41"	0.41"	0.41"	0.58"	0.58"	0.76"	0.41"	0.41"	0.41"	0.46"	0.58"	0.61"	0.76"
	Appleton Connector	(2) -CG-3150	(2) -CG-3150	(2) -CG-3150	(2) -CG-3150	(2) -CG-5075	(2) -CG-5075	(2) - CG-7575	(2) -CG-3150	(2) -CG-3150	(2) -CG-3150	(2) -CG-3750	(2) -CG-5075	(2) -CG-5075	(2) - CG-7575
	Connector Range	0.312"-0.437"	0.312"-0.437"	0.312"-0.437"	0.312"-0.437"	0.500"-0.625"	0.500"-0.625"	0.750"-0.875"	0.312"-0.437"	0.312"-0.437"	0.312"-0.437"	0.375"-0.500"	0.500"-0.625"	0.500"-0.625"	0.750"-0.875"
	Hub	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 3/4" - STA-2	(2) 3/4" - STA-2	(2) 3/4" - STA-2	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 1/2" - STA-1	(2) 3/4" - STA-2	(2) 3/4" - STA-2	(2) 3/4" - STA-2
	Description	(3)#14	(3)#14	(3)#14	(3)#14	(3)#10	(3)#10	(3)#6	(3)#14	(3)#14	(3)#14	(3)#12	(3)#10	(3)#8	(3)#6
P-08 & P-10	Manufacturer	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire	Southwire

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Power & Control Conductors, CGB's and Hubs										
Cable Number	Description	Manufacturer	Catalog Numer	Length (Ft. Max)	Cable Diameter	Appleton Liquidtight Cable Connector	Connector Cable Range	Crouse-Hinds Myers Hub	From Panel/Enclosure	To Panel/Enclosure
P-14	(1) #8 AWG	N/A	N/A	AS REQ'D	N/A	N/A	N/A	N/A	Field	Power Panel
P-15	3-1/C #12 AWG	N/A	N/A	AS REQ'D	N/A	N/A	N/A	N/A	Power Panel	Power Panel
P-16	3-1/C #12 AWG	N/A	N/A	AS REQ'D	N/A	N/A	N/A	N/A	Power Panel	Power Panel
C-01	(16) #14 AWG, Tray Cable	Houston Wire & Cable	HW 151 01416	24 FT	0.68"	(2) - CG-6275	0.625"-0.750"	(2) 3/4" - STA-2	Power Panel	Control Panel
C-02	(5) #14 AWG, Tray Cable	Houston Wire & Cable	HW 151 01405	19 FT	0.41"	(2) - CG-3750	0.375"-0.500"	(2) 1/2" - STA-1	Power Panel	Pump 1 Panel
C-03	(16) #14 AWG, Tray Cable	Houston Wire & Cable	HW 151 01416	22 FT	0.68"	(2) - CG-6275	0.625"-0.750"	(2) 3/4" - STA-2	Pump 2 Panel	Control Panel
C-04	1 Pair #16 SH, Tray Cable	Houston Wire & Cable	HW 120 01601	22 FT	0.33"	(2) - CG-2575	0.250"-0.375"	(2) 3/4" - STA-2	Pump 1 Panel	Control Panel
C-05	1 Pair #16 SH, Tray Cable	Houston Wire & Cable	HW 120 01601	22 FT	0.33"	(2) - CG-2575	0.250"-0.375"	(2) 3/4" - STA-2	Pump 2 Panel	Control Panel
PUMP 1-PWR	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 1 Panel
PUMP 1-MTP	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 1 Panel
PUMP 1-SF	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 1 Panel
PUMP 2-PWR	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 2 Panel
PUMP 2-MTP	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 2 Panel
PUMP 2-SF	Per Mfg Specs	N/A	N/A	N/A	N/A	CG Series based on Mfg Specs	N/A	STA Series based on Mfg Specs	Field	Pump 2 Panel
Float Switch 1	Float Switch Cable	BY OTHERS	N/A	N/A	0.56"	(1) - CG-5050	0.500"-0.625"	(1) 1/2" - STA-1	Field	Control Panel
Float Switch 2	Float Switch Cable	BY OTHERS	N/A	N/A	0.56"	(1) - CG-5050	0.500"-0.625"	(1) 1/2" - STA-1	Field	Control Panel
Pressure Xducer	Pressure Transducer Cable	BY OTHERS	N/A	N/A	0.35"	(1) - G-3150	0.312"-0.437"	(1) 1/2" - STA-1	Field	Control Panel
Antenna COAX	Coaxial Cable	BY OTHERS	N/A	N/A	0.408"	(1) - CG-3750	0.375"-0.500"	(1) 1/2" - STA-1	Field	Control Panel

SERVICING CT & TESTING AMMETERS INSTRUCTIONS

WARNING

NEVER LEAVE THE CT CIRCUIT OPEN ALWAYS SHORT THE CIRCUIT. WHEN MAINTENANCE IS REQUIRED ENSURE TO FOLLOW THE INSTRUCTIONS BELOW. FAILURE TO DO SO MAY RESULT IN HIGH VOLTAGE SURGE THAT COULD INJURE PERSONAL AND DAMAGE EQUIPMENT.

THE CALIBRATION & DISCONNECT PROCESS

1. Loosen the screws on the SB-ME 2-8 and move the shorting bar from position A to B to short the outputs of the CT.
2. Secure the shorting bar by tightening the screws. The CT is now neutralized and the circuit is "safe" to open.

2.1. For circuits that include an ME knife-disconnect terminal block, the knife disconnects can now be safely opened.
3. The test signal can now be injected into the transducer/meter side of the circuit by inserting the signal probes into the test adapters or connecting the signal to the disconnected wiring of the measurement circuit.

To return the unit to normal operation, perform the above steps in reverse order:

1. Disconnect the test signal/probes from the transducer wires or remove probes from the test plugs.

1.1. For circuits that include the ME, the knife disconnect must now be CLOSED.
2. Open the switching bridge and return to normal operation.
3. Loosen the screws and move the shorting bar from position B to A and snap into place.
4. Tighten the screws to prevent movement and inadvertent shorting of the CT.

The CT measurement circuit is now functional

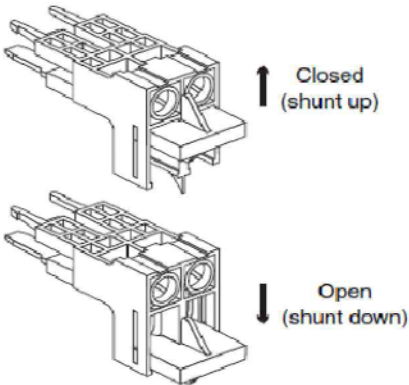


FIGURE 1: SB-ME 2-8 switching bridge

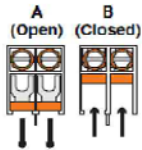


FIGURE 2: SB-ME 2-8 switching bridge

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LIFT STATION CONSTRUCTION DETAILS
ELECTRICAL STANDARDS



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Sheet No. 12
Of 18 Sheets

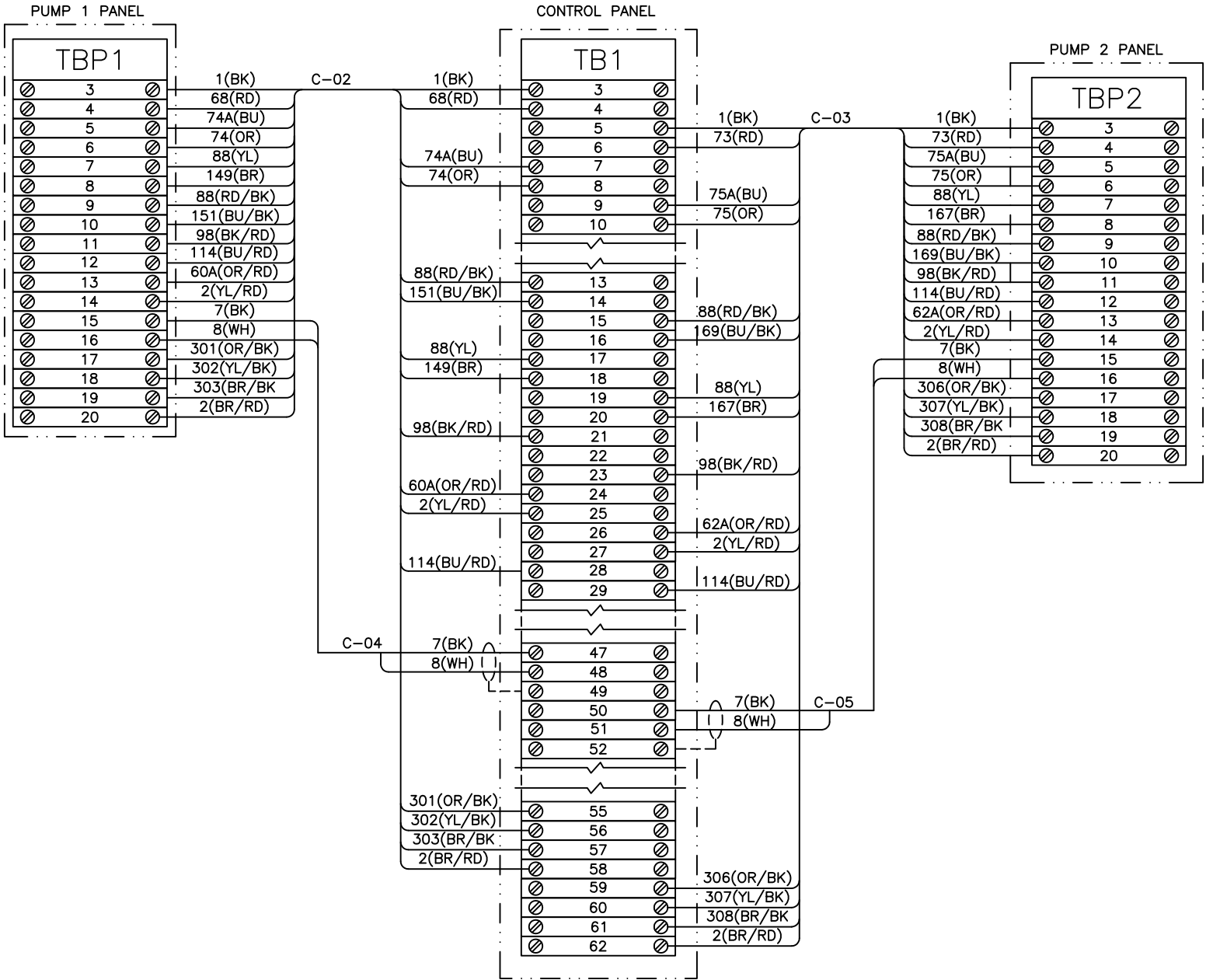
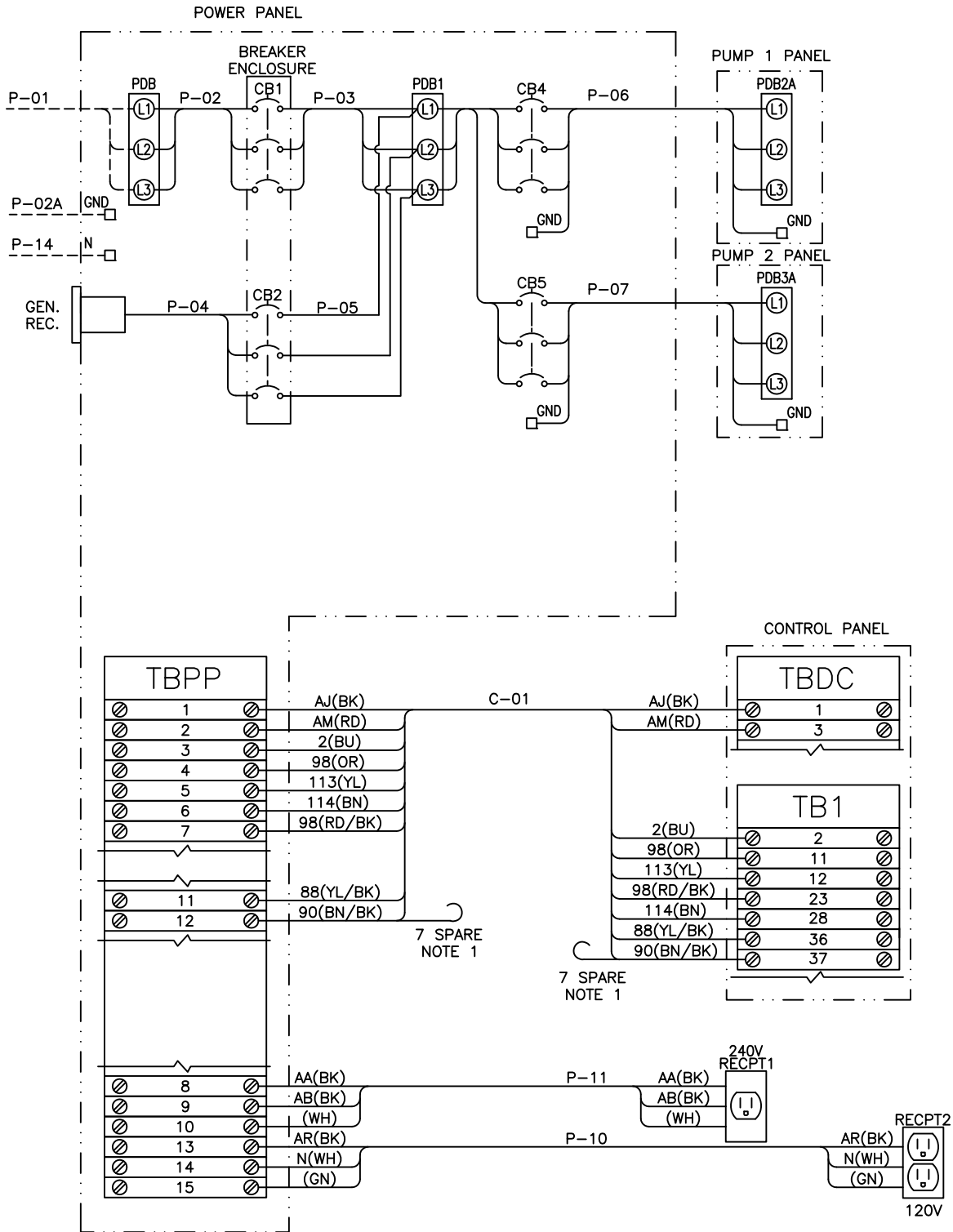
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IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM
LIFT STATION CONSTRUCTION DETAILS
ELECTRICAL STANDARDS



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NOTES:

- 1) ALL SPARE WIRE WILL BE CLEARLY LABELED WITH THE CABLE NUMBER & A SPARE DESIGNATION ON INDIVIDUAL WIRES. THESE SPARES WILL BE LONG ENOUGH TO REACH ANY POINT IN THE PANEL.
- 2) SPARE CONDUCTORS SHOULD BE TRIMMED AND HEAT SHRINK SHOULD BE USED TO SECURE THE SPARE CONDUCTORS IN THE CABLE.
- 3) THE INNER CONNECTING CONDUCTORS BETWEEN THE PANELS ARE CODED AS FOLLOWS: THE FIRST GROUP OF CHARACTER IS THE WIRE NUMBER AND THE SECOND GROUP IS THE COLOR (I.E. 1(BK) SIGNIFIES THAT THE WIRE NUMBER IS 1 AND THE COLOR IS BLACK). WIRE COLOR CODE AS FOLLOWS: BK-BLACK, RD-RED, BU-BLUE, OR-ORANGE, YL-YELLOW, BN-BROWN. FOR COLORS THAT ARE DENOTED AS XX/YY, XX IS THE BASE COLOR AND YY IS THE SPIRAL STRIPE (I.E. RD/BK IS A RED WIRE WITH A BLACK SPIRAL STRIPE).
- 4) SEE SHEETS 11 & 12 FOR PANEL TO PANEL INNER CONNECTING CONDUCTOR AND CABLE DETAILS.

REVISIONS	BY

- NOTES:
1. TOP AND BOTTOM OF BASE TO BE LEFT OPEN.
 2. DRILL TOP OF BASE TO ATTACH ENCLOSURES AS REQUIRED.
 3. DRILL BOTTOM OF BASE TO ATTACH TO SLAB AS REQUIRED.

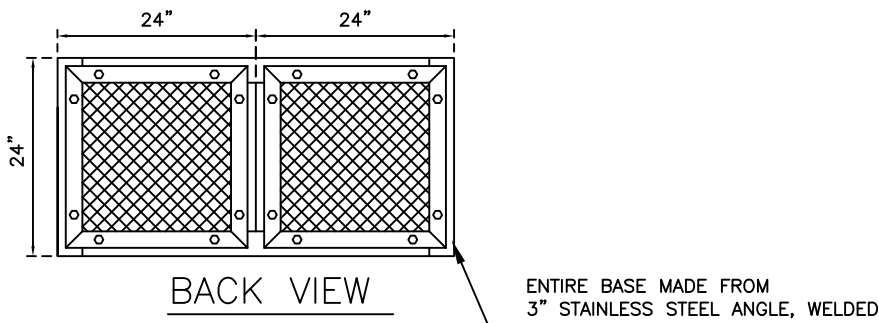
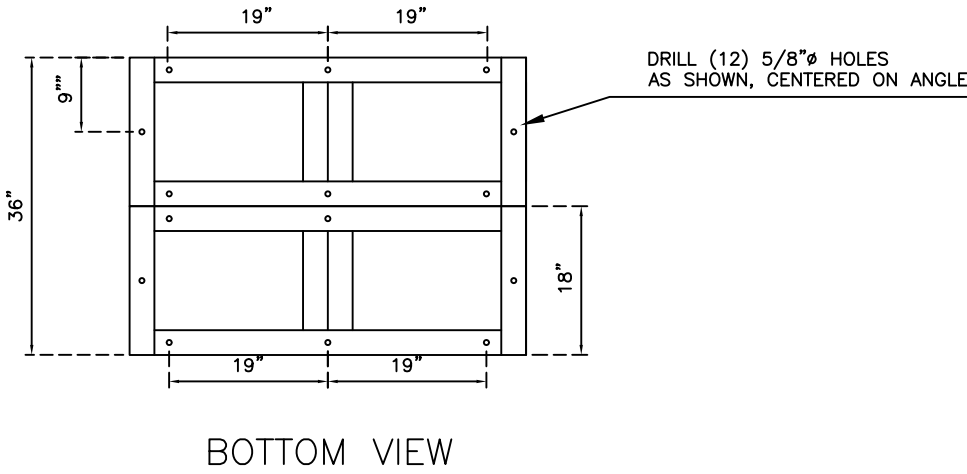
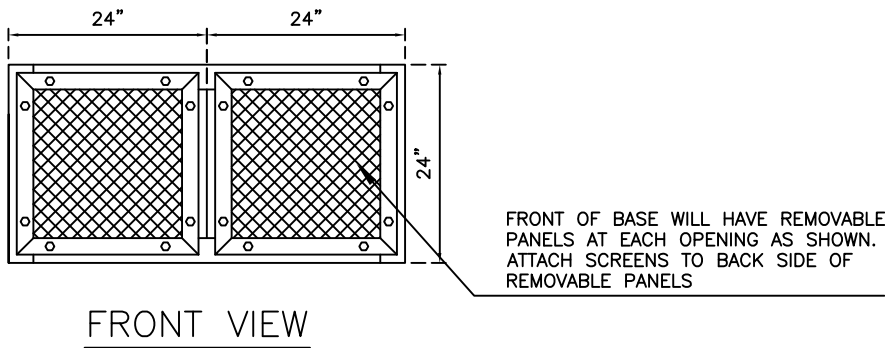
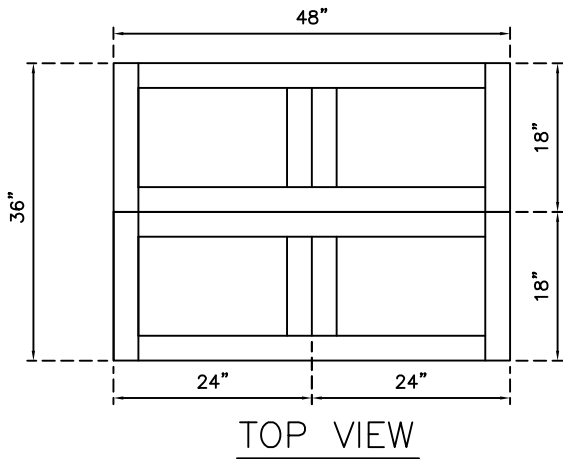
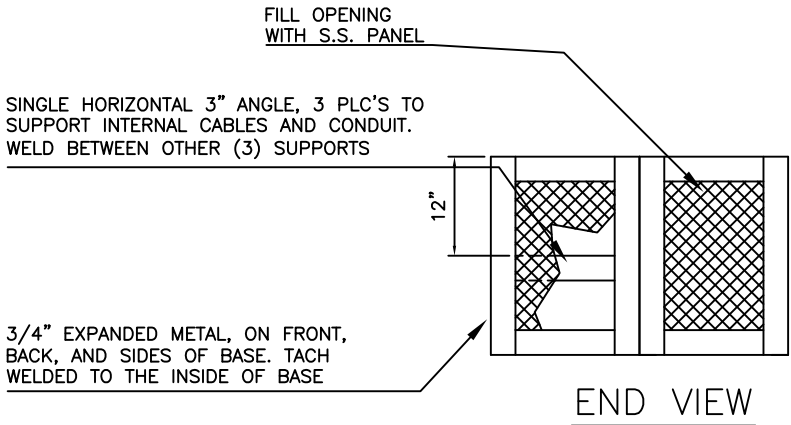
ATTENTION

THIS LAYOUT IS ONE OF TWO (2) POSSIBLE CHOICES – SEE SHEET 14 FOR THE OTHER OPTION. IF THIS LAYOUT OPTION IS SELECTED, SEE SHEET 7A FOR ASSOCIATED PANEL LAYOUT DETAILS.

IMPROVEMENTS TO WASTEWATER COLLECTION SYSTEM
LIFT STATION CONSTRUCTION DETAILS
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Power Panel Fuse Schedule				
Fuse	Type	Voltage	Amps	Description
F1	KTK-R-1	600	1A	PM1 Phase Monitor A Phase
F2	KTK-R-1	600	1A	PM1 Phase Monitor B Phase
F3	KTK-R-1	600	1A	PM1 Phase Monitor C Phase
F6	AGC-3	250	3A	Power Supply 1 Primary
F7	AGC-3	250	3A	Power Supply 2 Primary
F38	KTK-R-1	600	1A	PM2 Power Monitor A Phase
F39	KTK-R-1	600	1A	PM2 Power Monitor B Phase
F40	KTK-R-1	600	1A	PM2 Power Monitor C Phase
F41	KTK-R-6/10	600	.6A	Power Monitor

Pump 1 Panel Fuse Schedule				
Fuse	Type	Voltage	Amps	Description
F4	AGC-1	250	1A	Pump 1 Control Power

Pump 2 Panel Fuse Schedule				
Fuse	Type	Voltage	Amps	Description
F5	AGC-1	250	1A	Pump 2 Control Power

Control Panel Fuse Schedule				
Fuse	Type	Voltage	Amps	Description
F8	AGC-10	250	10A	Power Supply 1 Secondary
F9	AGC-10	250	10A	Power Supply 2 Secondary
F10	AGC-10	250	10A	Control Power
F11	AGC-10	250	10A	Batteries
F12	AGC-2	250	2A	Radio Power Supply Primary
F13	AGC-2	250	2A	Radio Power Supply Secondary
F14	AGC-1/4	250	1/4A	Pump 1 Motor Thermal
F15	AGC-1/4	250	1/4A	Pump 2 Motor Thermal
F16	AGC-1/10	250	1/10A	Operator Interface
F17	AGC-1	250	1A	Digital Inputs 0.0-1.4
F18	AGC-1	250	1A	Digital Inputs 1.5-2.7
F19	AGC-2	250	2A	Digital Outputs 0.0-0.7
F20	AGC-2	250	2A	Digital Outputs 1.0-1.7
F21	AGC-1-1/2	250	1-1/2A	PLC Power
F22	AGC-3/4	250	3/4A	Process Transmitter Supply
F23	AGC-1/10	250	1/10A	Analog Inputs
F24	AGC-1/10	250	1/10A	Analog Outputs
F25	GMA-1/4	250	1/4A	Analog Input 2
F26	GMA-1/4	250	1/4A	Analog Input 3
F27	GMA-1/4	250	1/4A	Analog Input 4

HMI BUTTON LEGEND	
F1	FAULT RESET/ENABLE INTRUSION
SHIFT+F1	DISABLE INTRUSION
F2	ALTERNATE PUMP ASSIGNMENTS
F3	RESET PUMP 1 RUNTIME
SHIFT+F3	RESET PUMP 2 RUNTIME
F4	ALARMS SCREEN
F5	OVERVIEW SCREEN
F6	PUMP 1 SCREEN
F7	PUMP 2 SCREEN
F8	SETPOINTS SCREEN

CONTROL PANEL ISR INFORMATION TAGS

THIS AREA IN BLUE IS FOR INTRINSICALLY SAFE CIRCUITS AND DEVICES ONLY. THIS AREA INCLUDES THE AIR SPACE DIRECTLY IN FRONT OF THE BLUE AREA BETWEEN THE BACKPANEL AND THE ENCLOSURE WALLS AND DOOR INCLUDING THE BOTTOM OF THE ENCLOSURE. ONLY INTRINSICALLY SAFE DEVICES AND WIRING ARE ALLOWED IN THIS AREA. DO NOT ROUTE NON-INTRINSICALLY SAFE WIRING THROUGH THIS AREA OF ENCLOSURE.

WARNING
SUBSTITUTION OF COMPONENTS
MAY IMPAIR INTRINSIC SAFETY

CONTROL PANEL EXTERIOR
TAG INFORMATION

WARNING
TO PREVENT IGNITION OF
FLAMMABLE OR COMBUSTIBLE
ATMOSPHERES DISCONNECT
POWER BEFORE SERVICING

PROVIDES INTRINSICALLY SAFE
CIRCUIT EXTENSIONS FOR USE IN
CLASS 1, GROUPS A, B, C, AND D
WHEN CONNECTED PER REFERENCE
DRAWINGS ON MAIN NAMEPLATE LABEL

CONTROL PANEL DEADFRONT
TAG INFORMATION

SECURELY FASTEN ALL INNER DOOR
LATCHES BEFORE CLOSING OUTER
DOOR. FAILURE TO FOLLOW THESE
INSTRUCTIONS COULD CAUSE THE
OUTER DOOR TO JAM WHEN
RE-OPENED

240V Nameplate Data							
Total Load (FLA)	46	51	57	68	82	94	122
Motor Hp	1	2	9.6	15.2	22	28	42
Motor FLA	4.2	6.8	4.8	7.6	11	14	21

208V Nameplate Data							
Total Load (FLA)	31	37	44	57	72	86	118
Motor Hp	1	2	3	5	7.5	10	15
Motor FLA	4.8	7.8	11	17.5	25.3	32.2	48.3

Torque Rating Table														
Component	240V Supply							208V Supply						
	Horsepower							Horsepower						
	1	2	3	5	7.5	10	15	1	2	3	5	7.5	10	15
Incoming Distribution Block (PDB1)	120lb-in/13.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	275lb-in/31.0N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	120lb-in/13.5N-m	275lb-in/31.0N-m	275lb-in/31.0N-m
Incoming Neutral Block	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m	40lb-in/4.5N-m
Main Ground Block	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	25lb-in/2.8N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	25lb-in/2.8N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m
Motor Distribution Block (PDB2 & 3)	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	120lb-in/13.5N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	35lb-in/4.0N-m	40lb-in/4.5N-m	120lb-in/13.5N-m
Motor Ground Block	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	35lb-in/4.0N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	20lb-in/2.2N-m	35lb-in/4.0N-m	35lb-in/4.0N-m

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CONTROL / INSTALLATION DRAWING
MACX MCR-EX Series

Doc.-No.: 83104549-04

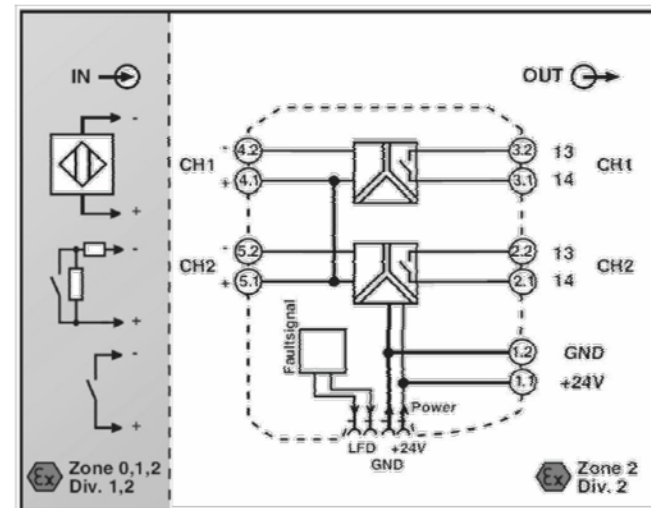
Art.Nr. Model Number

2865476 MACX MCR-EX-SL-2NAM-RO
~~2924087 MACX MCR-EX-SL-2NAM-RO-SP~~

WARNING – EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2.

WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

WARNING – Exposure to some chemicals may degrade the sealing properties of materials used in the sealed relays.



HAZARDOUS AREA

Class I, Division 1, Groups A,B,C,D
Class II, Division 1, Groups E,F,G
Class III, Division 1
Class I, Zone 0,1,2, Groups IIC, IIB, IIA

NON HAZARDOUS AREA

or Class I, Division 2, Groups A,B,C,D
or Class I, Zone 2, Groups IIC, IIB, IIA

- I. The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus not specifically examined in combination as a system. Selected Intrinsically Safe Equipment must be third party listed as intrinsically safe for the application and have intrinsically safe entity parameters conforming with table 1 below:
- Tabelle 1:
- | I.S. Equipment | | Associated Apparatus |
|----------------|---|----------------------|
| V max (or Ui) | ≠ | Voc or Vt (or Uo) |
| I max (or Ii) | ≠ | Isc or It (or Io) |
| P max (or Pi) | ≠ | Pa |
| Ci + Ccable | ≠ | Ca (or Co) |
| Li + Lcable | ≠ | La (or Lo) |
- II. Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown under I. Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF / ft., Lcable = 0.2 µH / ft.
- III. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.
- IV. This associated apparatus has not been evaluated for use in combination with another associated apparatus.
- V. This associated apparatus may also be connected to simple apparatus as defined in Article 504.2 and installed and temperature classified in accordance with Article 504.10(B) of the National Electrical Code (ANSI/NFPA 70), or other local codes applicable.
- VI. Associated apparatus must be installed in an enclosure (which meets the requirements of ANSI/ISA S82) suitable for the application in accordance with the National Electrical Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installation in Canada, or other local codes, as applicable.
- VII. When using as non-incendive device for Class I, Division 2 or Class I, Zone 2 do not snap equipment onto or off the T-connector, or connect and disconnect non-intrinsically safe-lines unless power has been removed or the area is known to be non hazardous.
- VIII. Intrinsically safe circuits must be wired separately in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code Part 1, Appendix F for installation in Canada, or other local codes, as applicable.
- IX. When multiple circuits extend from the same piece of associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP 12.6 for installing intrinsically safe equipment.
- X. When using as non-incendive device for Class I, Division 2 or Class I, Zone 2 with exposure to some chemicals a periodic inspection of the relays for any degradation of properties and a replacement if degradation is found is recommended.

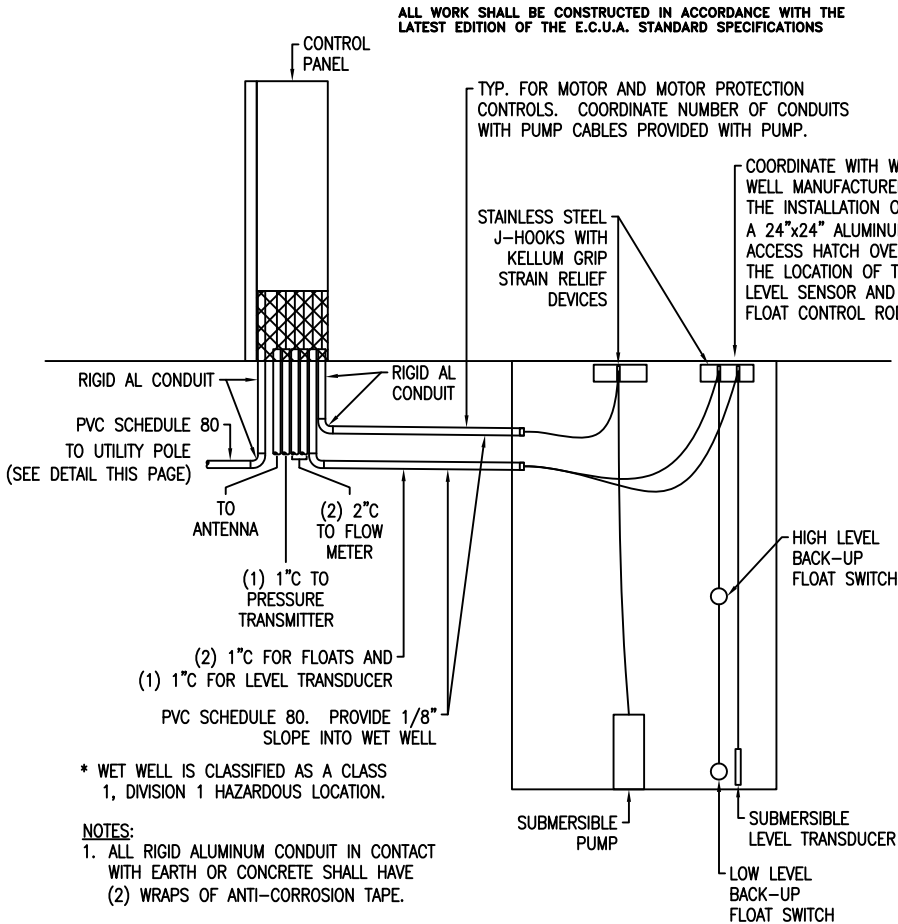
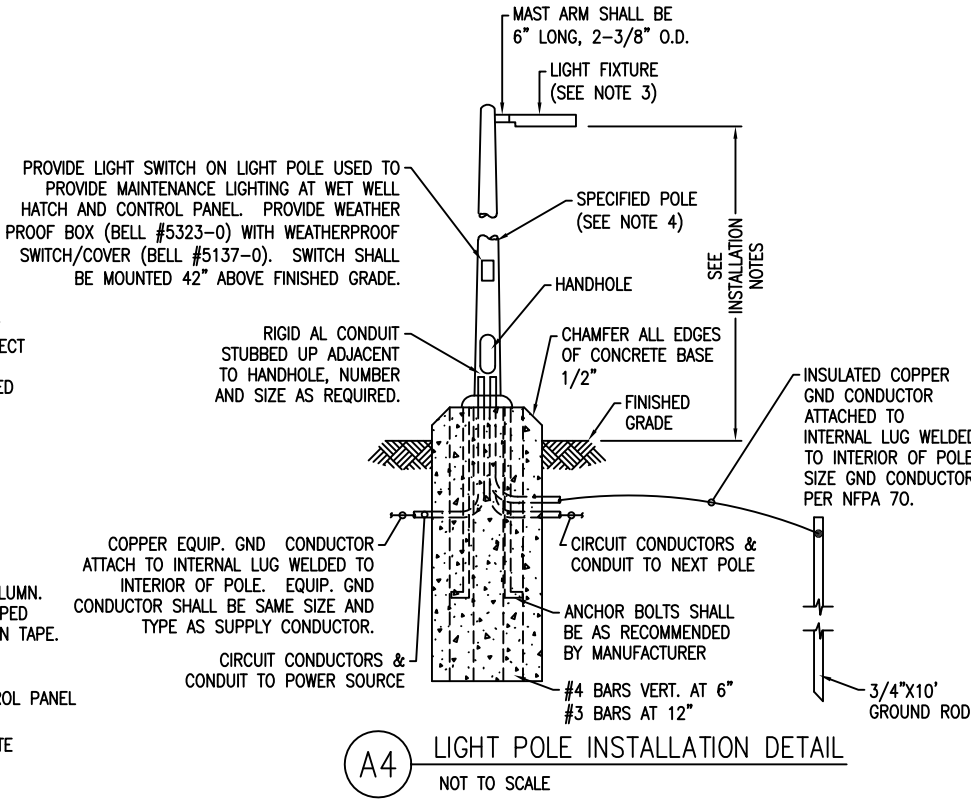
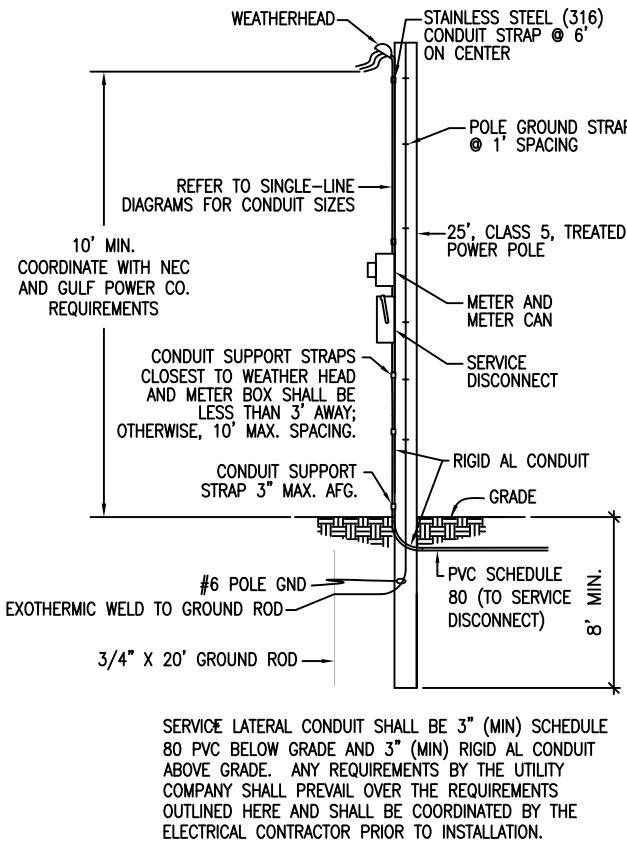
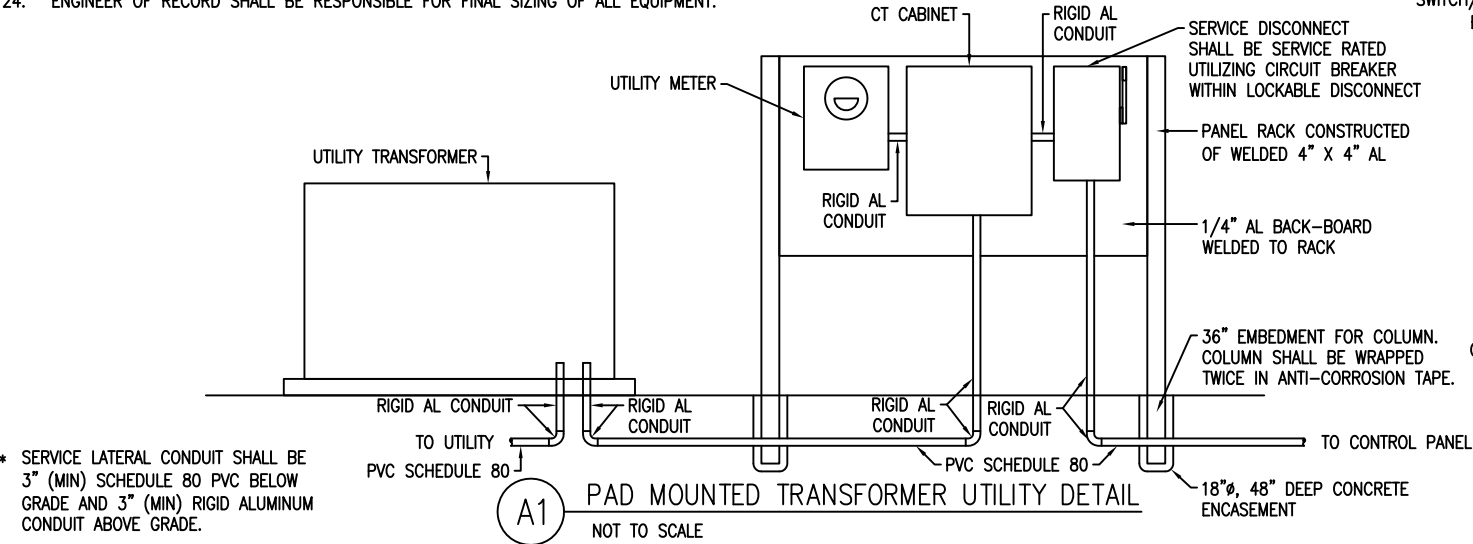
		output circuit - hazardous zone						Group A, B or IIC		Group C or IIB		Group D or IIA		input circuit - hazardous zone				
Art.Nr.	Model Number	Terminal	Voc or Uo / Vdc	Isc or Io / mA	Pa / mW	Ci / nF	Li / mH	Ca or Co / nF	La or Lo / mH	Ca or Co / nF	La or Lo / mH	Ca or Co / nF	La or Lo / mH	Terminal	Vmax or Ui / V	Imax or Ii / mA	Ci / nF	Li / mH
2865476	MACX MCR-EX-SL-2NAM-RO	4.1-4.2 5.1.5.2	9,6	10	25	1,1	negligible	510 840 1200 3600	100 5 1 0,01	2700 4400 6300 26000	100 5 1 0,01	-	-	-	-	-	-	-
2924087	MACX MCR-EX-SL-2NAM-RO-SP	4.1-4.2 5.1.5.2	9,6	10	25	1,1	negligible	510 840 1200 3600	100 5 1 0,01	2700 4400 6300 26000	100 5 1 0,01	-	-	-	-	-	-	-

		power supply circuit				Max. Surrounding Air Temperature Rating: 60°C		signal circuit - safe zone			interface circuit	
Art.Nr.	Model Number	Terminal	T-Connector	Un = 24 V - 20% +25% U range	Um	Ambient Temperature Range: Tamb		Terminal	output	input	socket	
2865476	MACX MCR-EX-SL-2NAM-RO	1.1-1.2	yes	19,2 ... 30 V DC	253 V AC / 125 V DC	-20...+60°C		3.1-3.2 + 2.1-2.2	X	=	=	
2924087	MACX MCR-EX-SL-2NAM-RO-SP	1.1-1.2	yes	19,2 ... 30 V DC	253 V AC / 125 V DC	-20...+60°C		3.1-3.2 + 2.1-2.2	X	=	=	

GENERAL ELECTRICAL NOTES

NEW WORK:

1. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION (UNLESS NOTED OTHERWISE) OF THE FOLLOWING CODES AND STANDARDS:
1.1. NATIONAL ELECTRICAL CODE (NFPA 70).
1.2. STANDARD FOR FIRE PROTECTION IN WASTEWATER TREATMENT AND COLLECTION FACILITIES (NFPA 820).
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING ALL PROJECT SPECIFICATIONS AND WILL BE RESPONSIBLE FOR MEETING ALL REQUIREMENTS OUTLINED IN THE SPECIFICATIONS.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO ROUGH-IN AND INSTALLATION.
4. WORKING SPACE FOR ALL ELECTRICAL AND CONTROL EQUIPMENT OPERATING AT 600V VOLTS OR LESS TO GROUND AND LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE WHILE ENERGIZED SHALL COMPLY WITH NEC, ARTICLE 110.26.
5. THE ELECTRICAL DESIGN PROVIDES A NUMBER OF BRANCH CIRCUITS, AMPACITY AND OVERCURRENT PROTECTION FOR OTHER DIVISIONS DESIGN BASIS EQUIPMENT CONFORMING TO MANUFACTURER'S SPECIFICATIONS AVAILABLE AT TIME OF DESIGN. THE CONTRACTOR SHALL VERIFY ALL EQUIPMENT LOADS PRIOR TO ROUGH-IN. IF REQUIREMENTS OF EQUIPMENT ACTUALLY PROVIDED UNDER CONTRACT FOR CONSTRUCTION ARE DIFFERENT, CONTRACTOR SHALL MAKE ALL CHANGES NECESSARY WITHOUT INCREASE IN THE CONTRACT AMOUNT. SUCH CHANGES SHALL BE BASED UPON REQUIREMENTS, NAMEPLATE VALUES AND CODE REQUIREMENTS, WHICHEVER IS MORE STRINGENT, AND MAY INCLUDE, BUT ARE NOT LIMITED TO: SIZE OF CONDUCTORS, SIZE OF CONDUIT, QUANTITY OF CONDUCTORS AND CONDUITS, TYPE AND SIZE OF CIRCUIT BREAKER OR DISCONNECT, OVERLOADS, FULL-VOLTAGE STARTERS, REDUCED VOLTAGE SOFT STARTERS, VARIABLE FREQUENCY DRIVES, AND FUSE PROTECTION.
6. THE ELECTRICAL CONTRACTOR IS REQUIRED TO COORDINATE, PROVIDE, AND INSTALL A FULLY OPERATIONAL AND CODE COMPLIANT ELECTRICAL SYSTEM. THIS MAY INCLUDE THE ADDITION OF ELECTRICAL ITEMS NOT SHOWN ON THE ELECTRICAL PLANS, BUT REQUIRED FOR SYSTEM OPERATION.
7. CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL SERVICE WITH ELECTRICAL UTILITY COMPANY PROVIDING ELECTRICAL SERVICE TO FACILITY. CONTRACTOR SHALL PAY ALL FEES ASSESSED BY ELECTRICAL UTILITY COMPANY TO PROVIDE ELECTRICAL SERVICE TO FACILITY.
8. CONTRACTOR SHALL EXCAVATE AND CONDUCT DEMOLITION SO AS TO AVOID DAMAGE TO EXISTING UTILITIES AND OTHER UNDERGROUND OR CONCEALED ITEMS. IF EXISTING OR NEW ITEMS ARE DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AT ONCE OF ALL DAMAGE AND SHALL REPAIR (OR REPLACE IF NECESSARY) TO THE ORIGINAL CONDITION TO THE SATISFACTION OF OWNER AND ENGINEER AT NO CHARGE IN THE CONTRACT AMOUNT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DETAILED ELECTRICAL AND CONTROL EQUIPMENT LAYOUT DRAWINGS TO THE ENGINEER AND OWNER FOR APPROVAL PRIOR TO INSTALLATION.
10. ALL CONDUITS NOT LOCATED UNDER SLAB SHALL HAVE A MINIMUM BURIAL DEPTH OF 42", UNLESS NOTED OTHERWISE.
11. CONDUITS SHALL BE BURIED 42" (MINIMUM) BELOW GRADE WITH MARKER TAPE 6" ABOVE TOP OF CONDUIT, UNLESS NOTED OTHERWISE.
12. MINIMUM SIZE CONDUIT SHALL BE 1" (UNLESS NOTED OTHERWISE).
13. CONDUIT ROUTINGS AND DEVICE/EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AND LOCATE AS REQUIRED.
14. CONTRACTOR SHALL PROVIDE PULL BOXES IN POWER CIRCUIT CONDUIT AS REQUIRED TO LIMIT THE NUMBER OF BENDS TO A MAXIMUM OF 270° OR THREE 90° BENDS.
15. ALL WIRE SHALL BE COPPER.
16. ALL ELECTRICAL CIRCUITS SHALL INCLUDE A GREEN GROUNDING CONDUCTOR SIZED PER NEC.
17. CONDUCTORS SHALL BE TERMINATED ON TERMINAL BLOCKS.
18. THE CONTRACTOR SHALL TAG ALL POWER AND CONTROL SYSTEM CABLING AT ALL TERMINATION POINTS.
19. FINAL CONNECTION TO ALL EQUIPMENT IS SHOWN DIAGRAMMATIC. PROVIDE FINAL CONNECTION AS REQUIRED PER MANUFACTURER OF EQUIPMENT.
20. CONTRACTOR SHALL MAINTAIN A SET OF PRINTS AND MARK-UP DURING CONSTRUCTION TO REFLECT "AS-BUILT" CONDITIONS. PRINTS SHALL BE DELIVERED TO THE ENGINEER UPON COMPLETION OF THE PROJECT.
21. ALL HARDWARE SHALL BE STAINLESS STEEL.
22. ALUMINUM CONDUIT SHALL BE COATED WITH (2) WRAPS OF ANTI-CORROSION TAPE OR RUN THROUGH A SCHEDULE 80 PVC SLEEVE TO WHEN IN CONTACT WITH CONCRETE.
23. BARE COPPER SHALL BE COATED WITH (2) WRAPS OF ANTI-CORROSION TAPE OR RUN THROUGH A SCHEDULE 80 PVC SLEEVE TO WHEN IN CONTACT WITH CONCRETE.
24. ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR FINAL SIZING OF ALL EQUIPMENT.



- LIGHTING PERFORMANCE CRITERIA:**
1. LIGHTING FIXTURE LAYOUT SHALL BE BASED UPON ACHIEVING 20 FOOT CANDLES (+/- 20%) AT THE FRONT OF THE CONTROL PANEL (WORK-PLANE OF 24" AFG) AND AT THE WET WELL ACCESS HATCH (WORKPLANE OF 0" AFG).
2. GENERAL SECURITY LIGHTING SHALL ENCOMPASS ACCESS GATE AND ALL PIPING/EQUIPMENT AT A MIN: AVERAGE 1 FOOT-CANDLE (+/- 20%, AT WORKPLANE OF 0" AFG).
3. REFER TO LIGHTING CONTROL DIAGRAM ON SHEET No. 18 FOR ADDITIONAL REQUIREMENTS.
- LIGHT POLE INSTALLATION NOTES:**
1. BURIAL AND DIAMETER DIMENSIONS INDICATED ARE FOR NOMINAL MINIMAL SIZES ONLY. FINAL DIMENSIONS SHALL BE DETERMINED BY A REGISTERED STRUCTURAL ENGINEER IN THE STATE OF FLORIDA. BASED UPON FIXTURES PROVIDED. PROVIDE SIGNED, DATED, AND SEALED PLANS FOR EACH INSTALLATION TYPE AND FIXTURE TYPE AS PART OF LIGHTING SUBMITTAL PACKAGE.
2. THE POLE AND FOUNDATION DESIGN SHALL BE BY A DELEGATED PROFESSIONAL ENGINEER TO MEET THE FOLLOWING CRITERIA:
2.1. DESIGN WIND SPEED 160 MPH WITH A 1.3 GUST FACTOR. EXPOSURE CATEGORY C.
2.2. SIZE EMBEDMENT FOR A MAXIMUM PERMANENT POLE DEFLECTION AFTER DESIGN WIND SPEED EVENT OF 1.00". ALUMINUM, ROUND OR SQUARE, TAPERED.
2.3.
3. FIXTURE SHALL BE AMERICAN ELECTRIC LIGHTING ATB2 FIXTURE, 40 LED, 1000mA DRIVER, 120V, TYPE 4, WITH PHOTOCONTROL.
4. REFER TO SPECIFICATIONS SECTION 16521 "EXTERIOR LIGHTING" FOR ADDITIONAL REQUIREMENTS.
5. LIGHT FIXTURES SHALL BE MOUNTED AT 15'-0" (MAXIMUM) ABOVE FINISHED GRADE.

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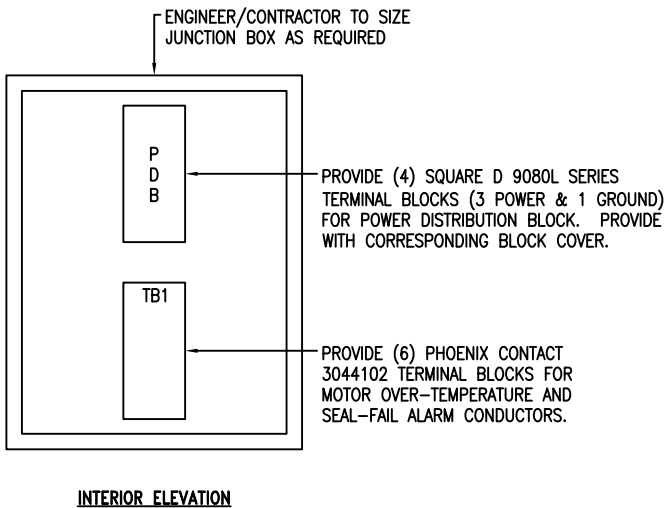
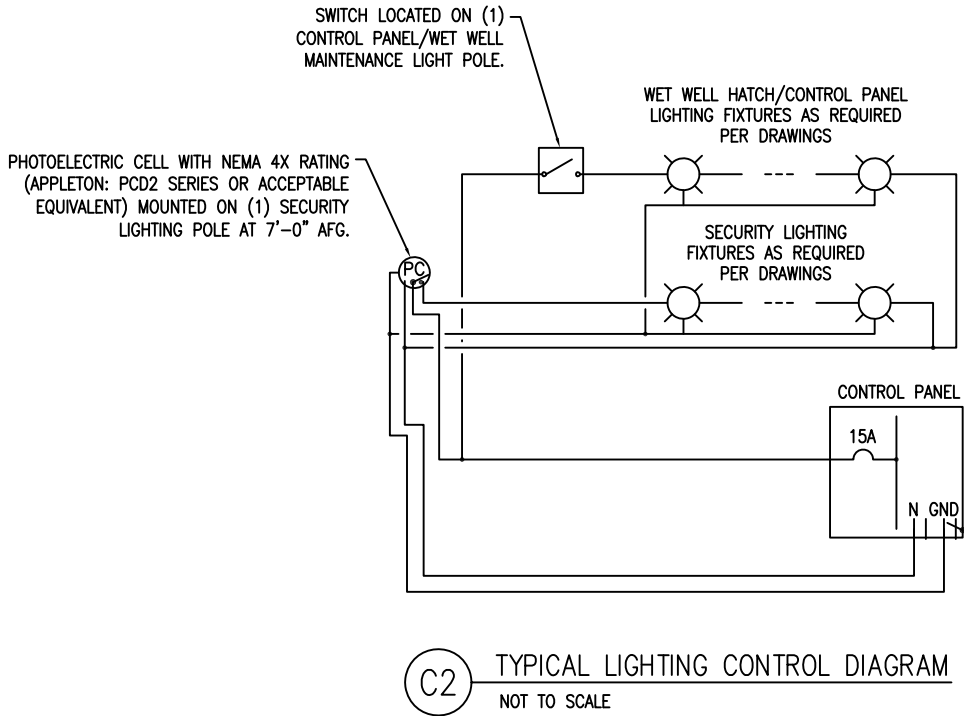
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ELECTRICAL STANDARDS



APPROVED BY:

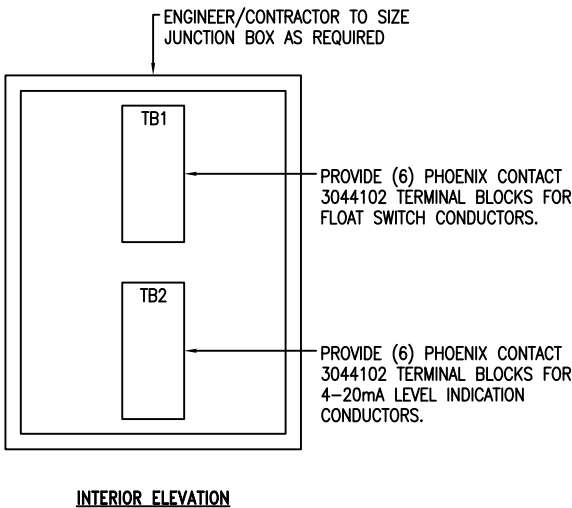
Drawn:
Designed:
Checked:
Date: 12/18/2014
Scale:
Project No:
Sheet No. 18
Of 18 Sheets



DETAIL NOTES:

- ALL TERMINAL BLOCKS SHALL BE PROVIDED WITH CORRESPONDING END BRACKETS AND END COVERS.
- PROVIDE SEPARATE GROUND LUG IN EACH JUNCTION BOX, BONDED TO JUNCTION BOX.

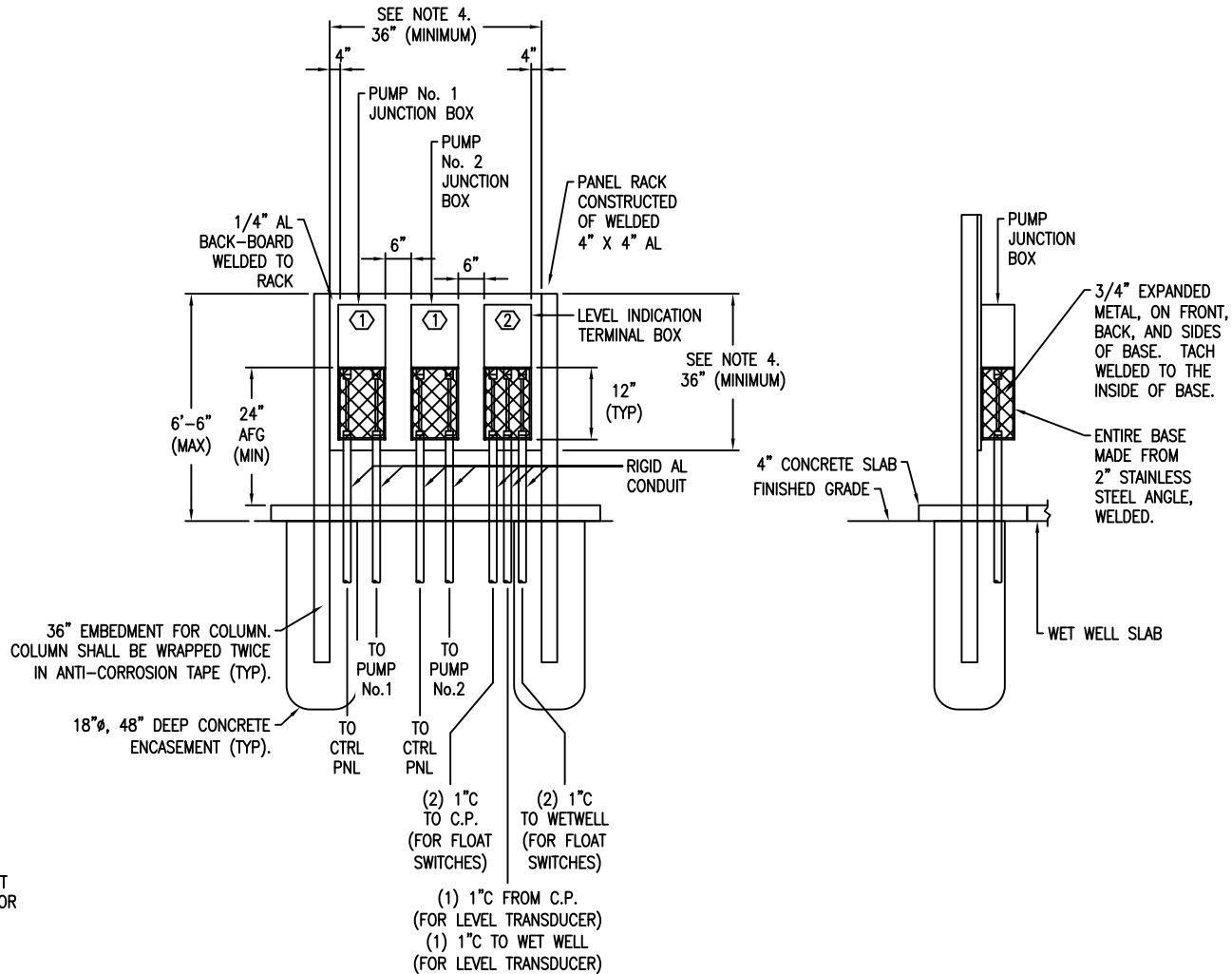
A1 TYPICAL PUMP JUNCTION BOX ELEVATION
NOT TO SCALE



DETAIL NOTES:

- ALL TERMINAL BLOCKS SHALL BE PROVIDED WITH CORRESPONDING END BRACKETS AND END COVERS.
- PROVIDE SEPARATE GROUND LUG IN EACH JUNCTION BOX, BONDED TO JUNCTION BOX.

A3 TYPICAL LEVEL INDICATION JUNCTION BOX ELEVATION
NOT TO SCALE



FRONT ELEVATION

SIDE ELEVATION

DETAIL NOTES:

- THIS DETAIL SHALL ONLY APPLY WHEN THE CONTROL PANEL CANNOT BE PLACED WITHIN 10'-0" OF THE WET WELL TO ALLOW FOR CONNECTION OF STANDARD 50 FOOT PUMP CABLE CONNECTIONS.
- BACKBOARD SHALL BE PLACED AT THE EDGE OF THE WET WELL SLAB BETWEEN THE WET WELL AND CONTROL PANEL.
- JUNCTION BOXES SHALL BE MOUNTED SUCH THAT THEY ARE FACING THE WET WELL.
- ENGINEER/CONTRACTOR SHALL SIZE JUNCTION BOXES AND BACKBOARDS BASED UPON INSTALLATION REQUIREMENTS PROVIDED AT TIME OF DESIGN.

KEY NOTES

- REFER TO "TYPICAL PUMP JUNCTION BOX ELEVATION" (THIS SHEET) FOR ADDITIONAL REQUIREMENTS.
- REFER TO "TYPICAL LEVEL INDICATION JUNCTION BOX ELEVATION" (THIS SHEET) FOR ADDITIONAL REQUIREMENTS.

A4 TYPICAL PUMP JUNCTION BOXES
NOT TO SCALE