

CHARLOTTE COUNTY UTILITIES DESIGN STANDARDS FOR REMOTE STATIONS

POTABLE WATER BOOSTER STATION CONTROL PANEL



POTABLE WATER BOOSTER STATION	
Sheet Number	Sheet Title
E5.0	COVER SHEET AND DRAWING INDEX
E5.1	ELECTRICAL SYMBOLS
E5.2	ENCLOSURE DETAILS
E5.3	BACKPANEL DETAIL AND BILL OF MATERIALS
E5.4	CONTROL POWER WIRING
E5.5	DIGITAL INPUTS CARDS 1 & 2
E5.6	DIGITAL INPUTS CARD 3
E5.7	DIGITAL OUTPUTS CARDS 1 & 2
E5.8	ANALOG INPUTS CARDS 1 & 2
E5.9	ANALOG INPUTS CARD 3
E5.10	ANALOG OUTPUTS CARDS 1 & 2

SHEET INDEX

REV	DESCRIPTION	DATE
2	REVISED	AUG-2024
1	REVISED	OCT-2023
0	STANDARDS	MAR-2023

REVISIONS

CHARLOTTE COUNTY UTILITIES DEPARTMENT

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**CHARLOTTE COUNTY UTILITIES - REMOTE
SITES CONTROL PANEL STANDARDS**

**POTABLE WATER BOOSTER STATION
COVER SHEET AND DRAWING INDEX**

DATE: OCTOBER 2023
MCE PROJ. # 07169-0012
DRAWN: CJA
DESIGNED: CJA
CHECKED: EEB
PROJ. MGR.: EEB

SCALE	E5.0
HORIZONTAL:	
VERTICAL:	1
	REVISION

STATUS:

ELECTRICAL SYMBOLS

ISA-5.3 LOOP SYMBOLS

DISTRIBUTED CONTROL/SHARED DISPLAY SYMBOLS

	NORMALLY ACCESSIBLE TO OPERATOR
	AUXILLIARY OPERATOR'S INTERFACE DEVICE
	NOT NORMALLY ACCESSIBLE TO OPERATOR

COMPUTER SYMBOLS

	NORMALLY ACCESSIBLE TO OPERATOR
	NOT NORMALLY ACCESSIBLE TO OPERATOR

LOGIC AND SEQUENTIAL CONTROL SYMBOLS

	GENERAL LOGIC
	DISTRIBUTED INTERCONNECTING CONTROLLER, NOT NORMALLY ACCESSIBLE TO OPERATOR
	DISTRIBUTED INTERCONNECTING CONTROLLER, NORMALLY ACCESSIBLE TO OPERATOR
	COMPUTATION/SIGNAL CONDITIONING
	SYSTEM/SOFTWARE/NETWORK LINK

DEVICE SYMBOLS

	RELAY COIL
	CONTACT, N.O.
	CONTACT, N.C.
	TIMER RELAY COIL
	TIME-ON DELAY, N.O. CONTACT
	TIME-ON DELAY, N.C. CONTACT
	TIME-OFF DELAY, N.O. CONTACT
	TIME-OFF DELAY, N.C. CONTACT
	PUSH BUTTON, N.O. CONTACT
	PUSH BUTTON, N.C. CONTACT
	MUSHROOM HEAD PUSH BUTTON, N.O. CONTACT
	MUSHROOM HEAD PUSH BUTTON, N.C. CONTACT
	SELECTOR SWITCH, N.O. CONTACT
	SELECTOR SWITCH, N.C. CONTACT
	LIMIT SWITCH, N.O. CONTACT
	LIMIT SWITCH, N.C. CONTACT
	PRESSURE SWITCH, N.O. CONTACT
	PRESSURE SWITCH, N.C. CONTACT

DEVICE SYMBOLS

	TEMPERATURE SWITCH, N.O. CONTACT
	TEMPERATURE SWITCH, N.C. CONTACT
	FLOW SWITCH, N.O. CONTACT
	FLOW SWITCH, N.C. CONTACT
	FLOAT SWITCH, N.O. CONTACT
	FLOAT SWITCH, N.C. CONTACT
	FOOT SWITCH, N.O. CONTACT
	FOOT SWITCH, N.C. CONTACT
	TOGGLE SWITCH, N.O. CONTACT
	TOGGLE SWITCH, N.C. CONTACT
	THERMAL OVERLOAD
	SOLENOID
	HORN
	PILOT LIGHT W - WHITE G - GREEN A - AMBER R - RED B - BLUE
	PILOT LIGHT, PUSH TO TEST
	FUSE
	CIRCUIT BREAKER
	GROUND

DEVICE SYMBOLS

	CONTROL POWER TRANSFORMER
	CURRENT TRANSFORMER
	POTENTIOMETER
	RESISTOR
	CAPACITOR, ELECTROLYTIC
	DIODE
	ZENER DIODE
	BATTERY
	TERMINAL BLOCK, "PTB 120VAC"
	TERMINAL BLOCK, "DIGITAL INPUT"
	TERMINAL BLOCK, "DRY CONTACT"
	TERMINAL BLOCK, "ANALOG SIGNAL"
	TERMINAL BLOCK, OTHER (SPECIFY)
	ELAPSED TIME METER

WIRE SYMBOLS

	CONDUCTORS, WITH JUNCTION
	CONDUCTORS, NOT CONNECTED
	SHIELDED CABLE
	TWISTED-PAIR CABLE
	FIELD WIRING

ABBREVIATIONS

AIT	ANALYSIS INDICATING TRANSMITTER
AFD	ADJUST FREQUENCY DRIVE
BC	BYPASS CONTACTOR
BFI	BLOWN FUSE INDICATOR
C	CONTACTOR
CB	CIRCUIT BREAKER
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRI	CONTROL RELAY, INTRINSIC
CRL	CONTROL RELAY, LATCH
DFR	DRIVE FAIL RELAY
DI	DIGITAL INDICATOR
DUP	DUPLEXOR
DRR	DRIVE RUN RELAY
DSC	DISCONNECT SWITCH
ETM	ELAPSED TIME METER
FIT	FLOW INDICATING TRANSMITTER
FS	FLOAT SWITCH
FSR	FLOAT SWITCH RELAY
FU	FUSE
GRD	GROUND
HS	HAND SWITCH
IC	ISOLATION CONTACTOR
ISO	SIGNAL ISOLATOR/BOOSTER
LT	PILOT LIGHT
LIT	LEVEL INDICATING TRANSMITTER
LS	LIMIT SWITCH
M	MOTOR STARTER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MSP	MAIN SURGE PROTECTOR
OL	OVERLOAD
PB	PUSH BUTTON
PDB	POWER DISTRIBUTION BLOCK
PIT	PRESSURE INDICATING TRANSMITTER
RIO	REMOTE I/O PANEL
POT	POTENTIOMETER
PM	PHASE MONITOR
PS	POWER SUPPLY
RCR	RUN COMMAND RELAY
RES	RESISTOR
S	SWITCH
SP	SURGE PROTECTOR
SS	SELECTOR SWITCH
SSRV	SOLID STATE REDUCED VOLTAGE STARTER
TB	TERMINAL BOARD, TERMINAL BLOCK
TC	TIME CLOCK
TR	TIME DELAY RELAY
TS	TEMPERATURE SWITCH
VFD	VARIABLE FREQUENCY DRIVE
XFMR	TRANSFORMER
ZS	LIMIT SWITCH

NOTES:
ALL SYMBOLS MAY NOT BE UTILIZED FOR THIS PROJECT.
ADDITIONAL SYMBOLS NOT SHOWN ON THIS DRAWING MAY BE SHOWN ELSEWHERE ON THE ELECTRICAL DRAWINGS.

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2	REVISED	AUG-2024
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CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

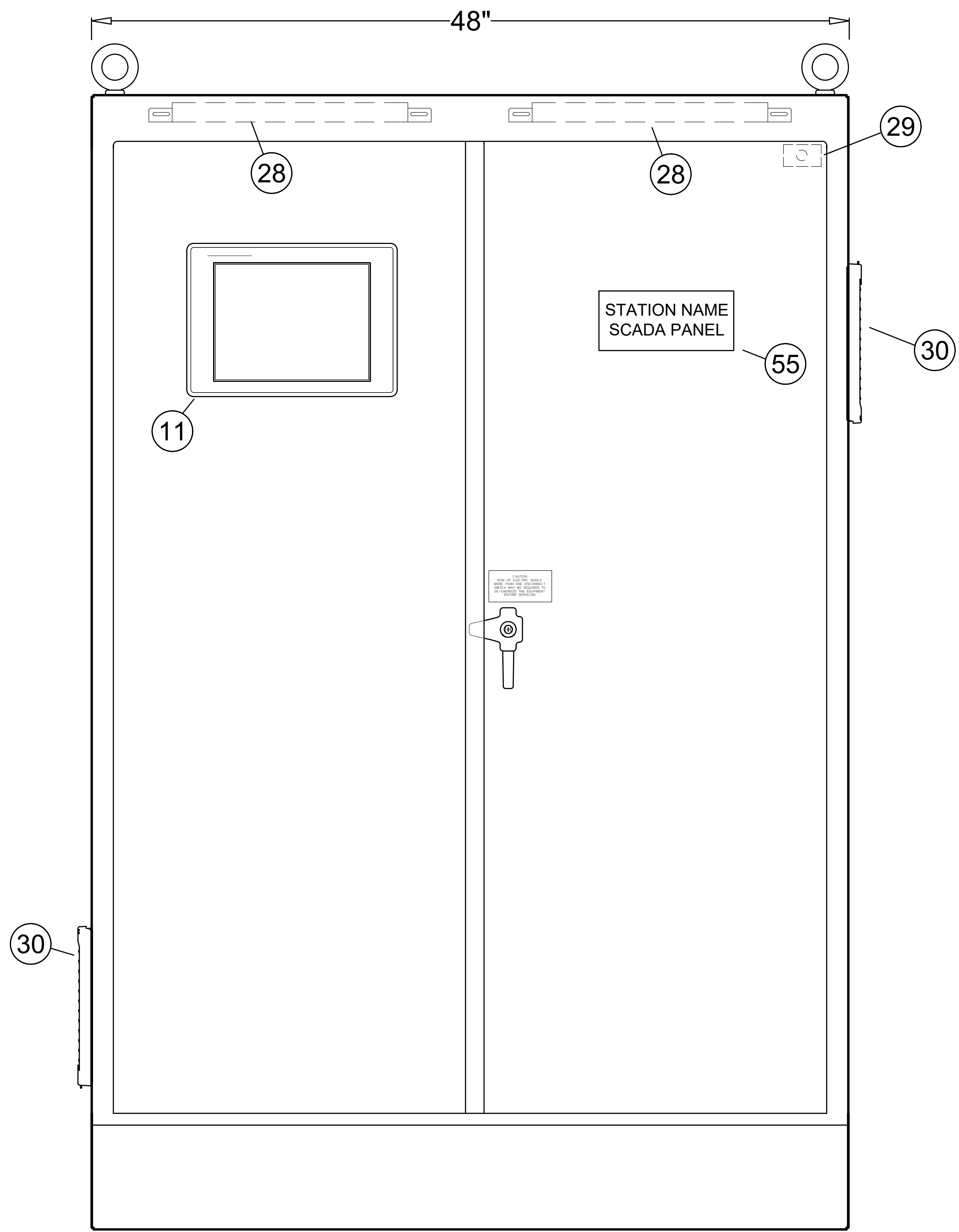
POTABLE WATER BOOSTER STATION ELECTRICAL SYMBOLS

DATE: OCTOBER 2023
MCE PROJ. # 07169-0012
DRAWN: CJA
DESIGNED: CJA
CHECKED: EEB
PROJ. MGR.: EEB

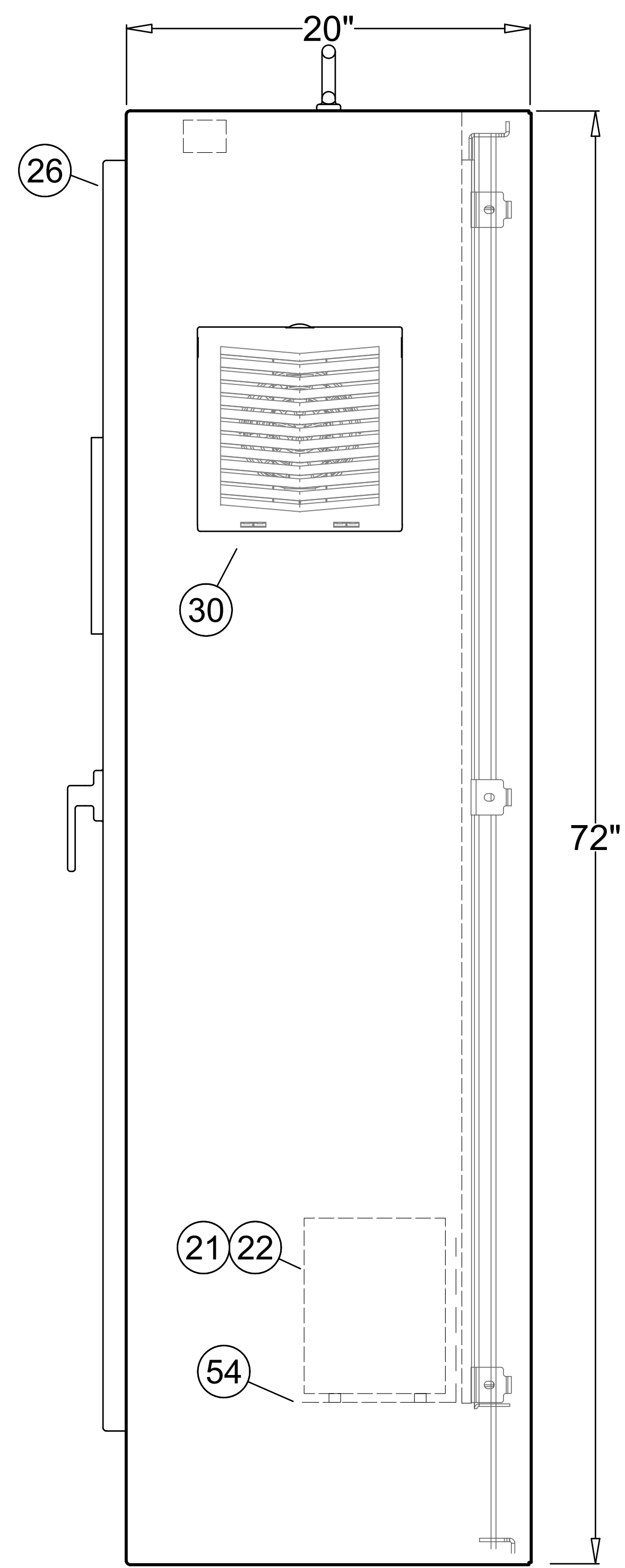
SCALE
HORIZONTAL:
VERTICAL:

E5.1
DRAWING NO.
1
REVISION

STATUS:



FRONT ENCLOSURE VIEW



SIDE ENCLOSURE VIEW

NOTES:
1. ITEM NUMBERS REFER TO BILL OF MATERIALS SHOWN ON SHEET E5.3.

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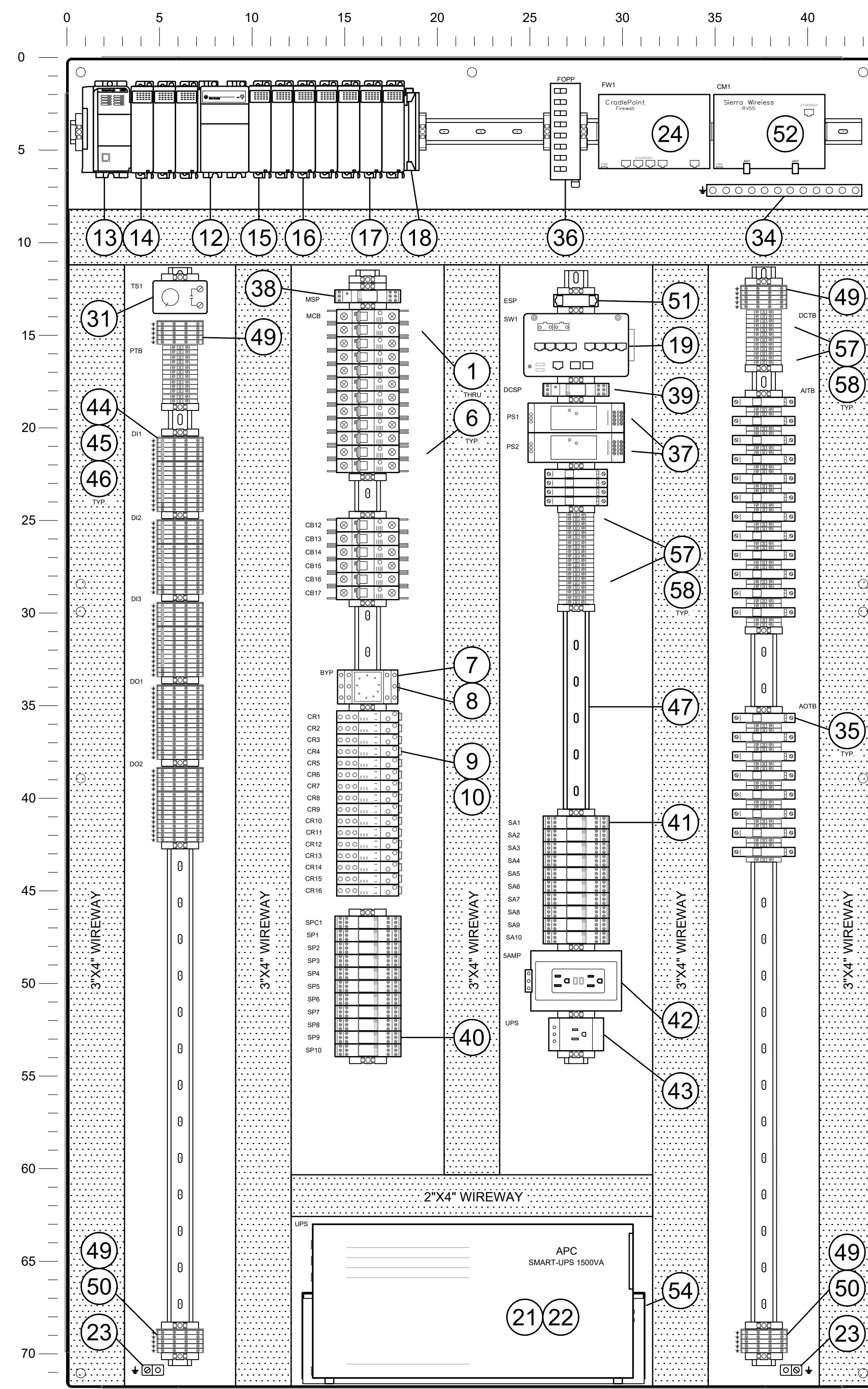
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CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION ENCLOSURE DETAILS

DATE: OCTOBER 2023	SCALE	E5.2 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
DESIGNED: CJA		
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PROJ. MGR.: EEB		
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BACKPANEL VIEW

ID	QTY	MANUFACTURER	CATALOG NUMBER	DESCRIPTION
1	1	ALLEN BRADLEY	1489-M1C200	UL489 CIRCUIT BREAKER, 20 AMP
2	2	ALLEN BRADLEY	1489-M1C150	UL489 CIRCUIT BREAKER, 15 AMP
3	1	ALLEN BRADLEY	1489-M1C100	UL489 CIRCUIT BREAKER, 10 AMP
4	6	ALLEN BRADLEY	1489-M1C050	UL489 CIRCUIT BREAKER, 5 AMP
5	4	ALLEN BRADLEY	1489-M1C030	UL489 CIRCUIT BREAKER, 3 AMP
6	4	ALLEN BRADLEY	1489-M1C020	UL489 CIRCUIT BREAKER, 2 AMP
7	1	ALLEN BRADLEY	700-HA33A1-3-4	3PDT RELAY WITH TEST AND INDICATOR, 10A, 120VAC
8	1	ALLEN BRADLEY	700-HN126	3PDT 11-PIN RELAY BASE, 10A
9	16	ALLEN BRADLEY	700-HK36Z24-3-4	SPDT RELAY WITH TEST AND INDICATOR, SPDT, 24VDC, 16A CONTACT
10	16	ALLEN BRADLEY	700-HN221	SPDT 5-PIN RELAY BASE, 16A
11	1	ALLEN BRADLEY	2711P-T12W21D8S	PANELVIEW PLUS 7 STANDARD TERMINAL, 12-IN COLOR DISPLAY
12	1	ALLEN BRADLEY	1769-PA2	COMPACTLOGIX POWER SUPPLY 120/240V AC POWER SUPPLY (5V @ 2 AMP)
13	1	ALLEN BRADLEY	1769-L33ER	COMPACTLOGIX 5370 L3 CONTROLLER
14	3	ALLEN BRADLEY	1769-IQ16	COMPACTLOGIX DIGITAL INPUT MODULE, 16-PT, 24VDC
15	2	ALLEN BRADLEY	1769-OB8	COMPACTLOGIX RELAY OUTPUT MODULE 8-PT, 24VDC
16	3	ALLEN BRADLEY	1769-IF4I	COMPACTLOGIX 4 CHANNEL ANALOG CURRENT/VOLTAGE ISOLATED INPUT MODULE
17	2	ALLEN BRADLEY	1769-OF4CI	COMPACTLOGIX 4 CHANNEL ANALOG CURRENT ISOLATED OUTPUT MODULE
18	1	ALLEN BRADLEY	1769-ECR	RIGHT END CAP TERMINATOR
19	1	ALLEN BRADLEY	1783-MMS10R	STRATIX 5800 MANAGED ETHERNET SWITCH, 8-RJ45, 2-SFP FIBER
20	2	ALLEN BRADLEY	*1783-SFP1GLX	1000 BASE-LX/LH SINGLE-MODE FIBER TRANSCEIVER
21	1	APC	SMT1500	SMT SERIES SMART-UPS TOWER, 1500VA, LINE INTERACTIVE
22	1	APC	AP9613	SMART-UPS DRY CONTACT I/O CARD
23	2	BURNDY	KA2U	GROUND LUG, #2-14
24	-	CRADLEPOINT	(COORDINATE WITH COUNTY)	NETWORK FIREWALL
26	1	HOFFMAN	A724820FSD	72"H 48"W X 20"D NEMA 12 ENCLOSURE
27	1	HOFFMAN	A72P48F1	BACKPANEL FOR 72"X48" ENCLOSURE
28	2	HOFFMAN	LED24V15	PANELITE LED 15" ENCLOSURE LIGHT
29	1	HOFFMAN	ALF5WD	DOOR SWITCH ASSEMBLY FOR LED LIGHT
30	2	HOFFMAN	TEP10UL12	FILTER VENT
31	1	HOFFMAN	ATEMNO	TEMPERATURE SWITCH
32	7	PANDUIT	F2X4LG6	SLOTTED WIREWAY, GRAY, 2"X4"
33	7	PANDUIT	C2LG6	2" WIREWAY COVER, GRAY
34	1	PANDUIT	UGB2-0-414-12	12-PORT UL LISTED GROUND BAR
35	27	PHOENIX CONTACT	0918603	THERMOMAGNETIC DEVICE CIRCUIT BREAKER, 1/2A
36	1	PHOENIX CONTACT	1019711	FIBER OPTIC PATCH PANEL, 6X LC DUPLEX CONNECTORS
37	2	PHOENIX CONTACT	2866750	24VDC QUINT POWER SUPPLY, 5A
38	1	PHOENIX CONTACT	2907918	120VAC SURGE PROTECTOR WITH STATUS, PLUG AND BASE
39	1	PHOENIX CONTACT	2907916	24VDC POWER SUPPLY SURGE PROTECTOR, PLUG AND BASE
40	11	PHOENIX CONTACT	2800787	24VDC DISCRETE 4-POINT SURGE PROTECTOR, PLUG AND BASE
41	10	PHOENIX CONTACT	2800980	ANALOG SIGNAL SURGE PROTECTOR, 2-CHANNEL, PLUG AND BASE
42	1	PHOENIX CONTACT	5600462	GFCI RECEPTACLE, DIN RAIL MOUNTABLE, 15A
43	1	PHOENIX CONTACT	0804155	SINGLE PLUG RECEPTACLE, DIN RAIL MOUNTABLE, 15A
44	80	PHOENIX CONTACT	3044814	2-TIER ISOLATED TERMINAL BLOCK
45	7	PHOENIX CONTACT	3047293	2-TIER TERMINAL BLOCK END COVER
46	8	PHOENIX CONTACT	3030271	2-TIER TERMINAL BLOCK JUMPER BRIDGE
47	5	PHOENIX CONTACT	0801733	STANDARD DIN RAIL 2M
48	40	PHOENIX CONTACT	0800886	DIN RAIL END BRACKET
49	20	PHOENIX CONTACT	3044597	2-TIER GROUND TERMINAL BLOCK
50	4	PHOENIX CONTACT	3047170	2-TIER TERMINAL BLOCK END COVER
51	1	TUPAVCO	TP309	RJ45 SURGE PROTECTOR DIN RAIL MOUNT
52	1	SIERRA WIRELESS	RV55	LTE CELLULAR TELEMATIC ROUTER
53	4	VERTICAL CABLE	072-600/3GY	3' CAT5E PATCH CABLE
54	1	CUSTOM	PANEL SHOP	BACKPANEL MOUNTED UPS SHELF
55	-	CUSTOM	PANEL SHOP	ENGRAVED PHENOLIC NAMEPLATES, WHITE TEXT WITH BLACK BACKGROUND
57	50	PHOENIX CONTACT	3044102	STANDARD TERMINAL BLOCK, 30A
58	6	PHOENIX CONTACT	3047028	STANDARD TERMINAL BLOCK END BARRIER

BILL OF MATERIALS

NOTES:

1. BILL OF MATERIALS IS PROVIDED FOR EXAMPLE ONLY. PANEL COMPONENTS WILL VARY WITH EACH SPECIFIC BOOSTER STATION. CONTROL PANEL MANUFACTURER TO PROVIDE A COMPLETE LIST OF CONTROL PANEL MATERIALS FOR COUNTY APPROVAL BEFORE FABRICATION.
2. CONTROL PANEL TO BE UL508A LISTED TYPE 12.
3. CONTROL PANEL ENCLOSURE SIZE AND NUMBER OF ITEMS WILL VARY WITH SIZE OF THE SITE SPECIFIC INPUT AND OUTPUT LIST.

REV	DESCRIPTION	DATE
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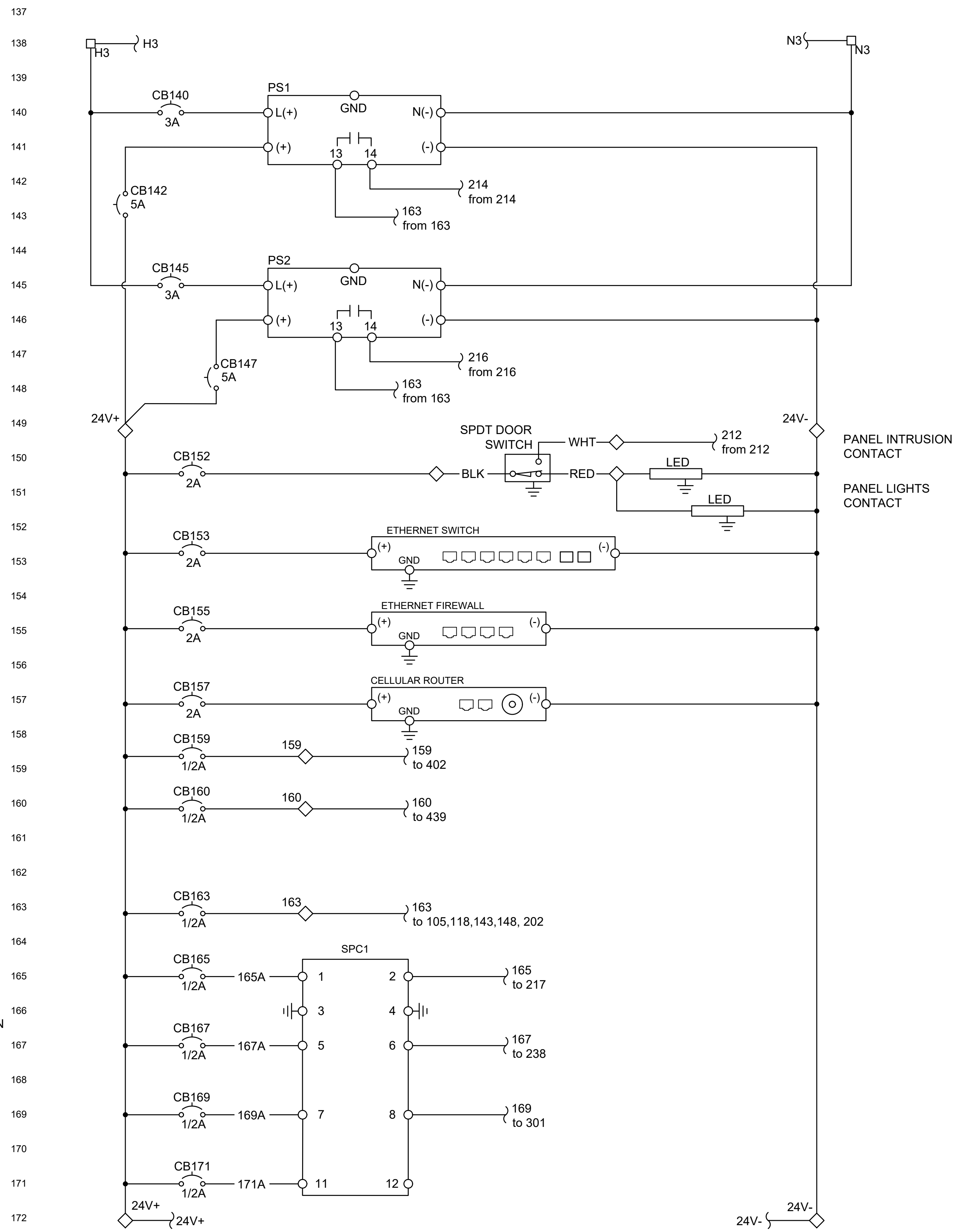
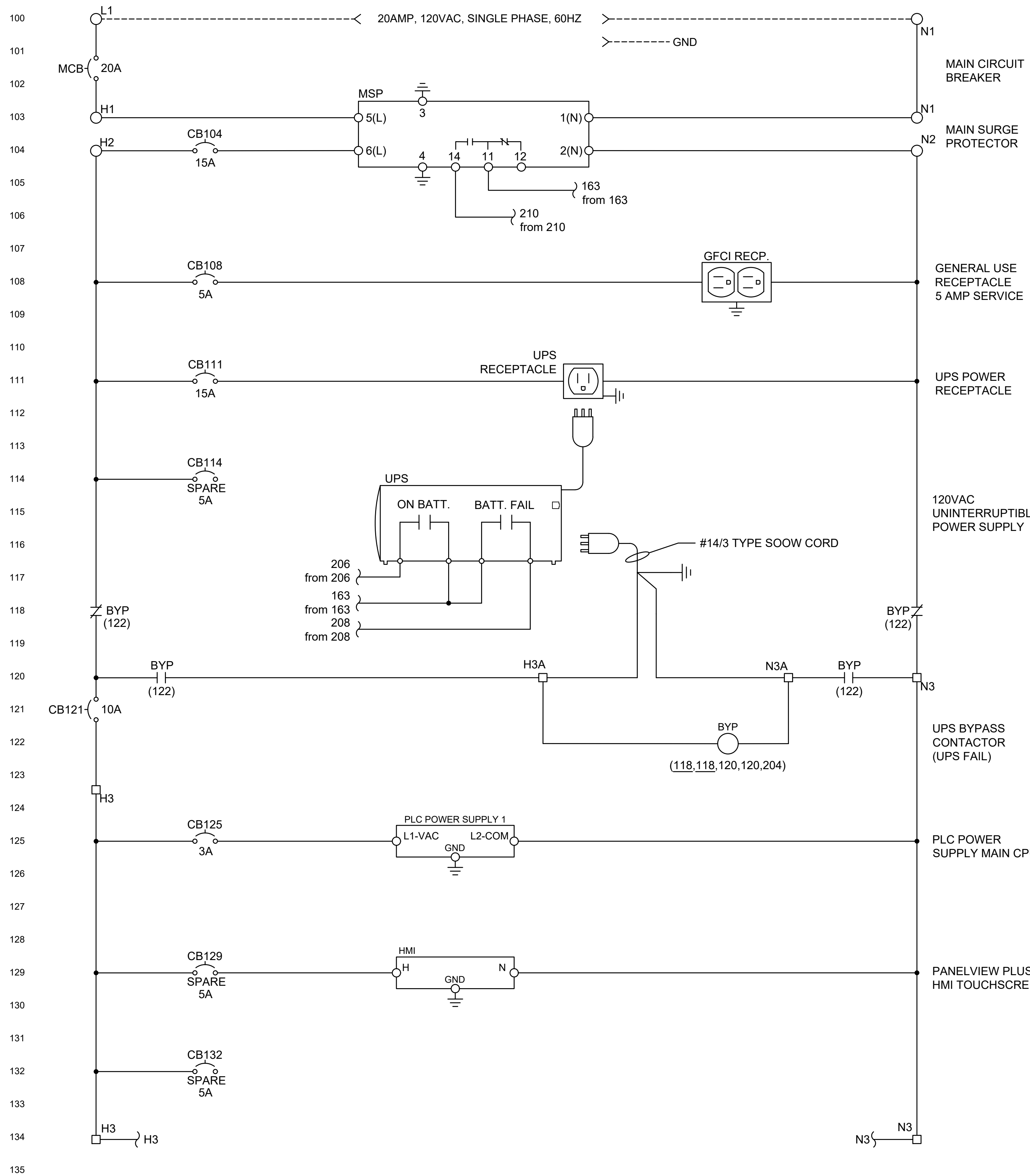
CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION

BACKPANEL DETAIL AND BILL OF MATERIALS

DATE: OCTOBER 2023	SCALE: HORIZONTAL: E5.3
MCE PROJ. # 07169-0012	VERTICAL: 1
DRAWN: CJA	REVISION: 1
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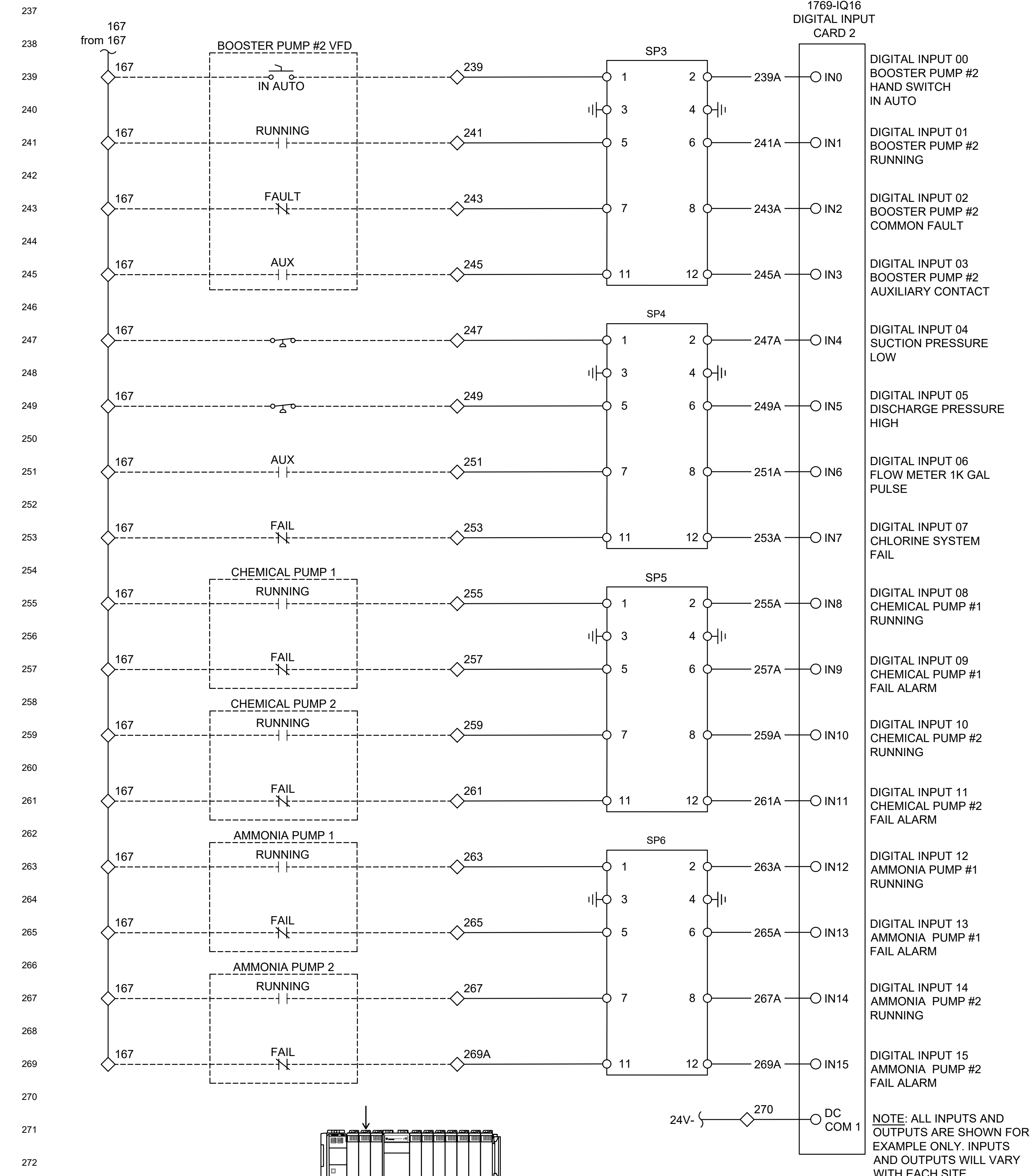
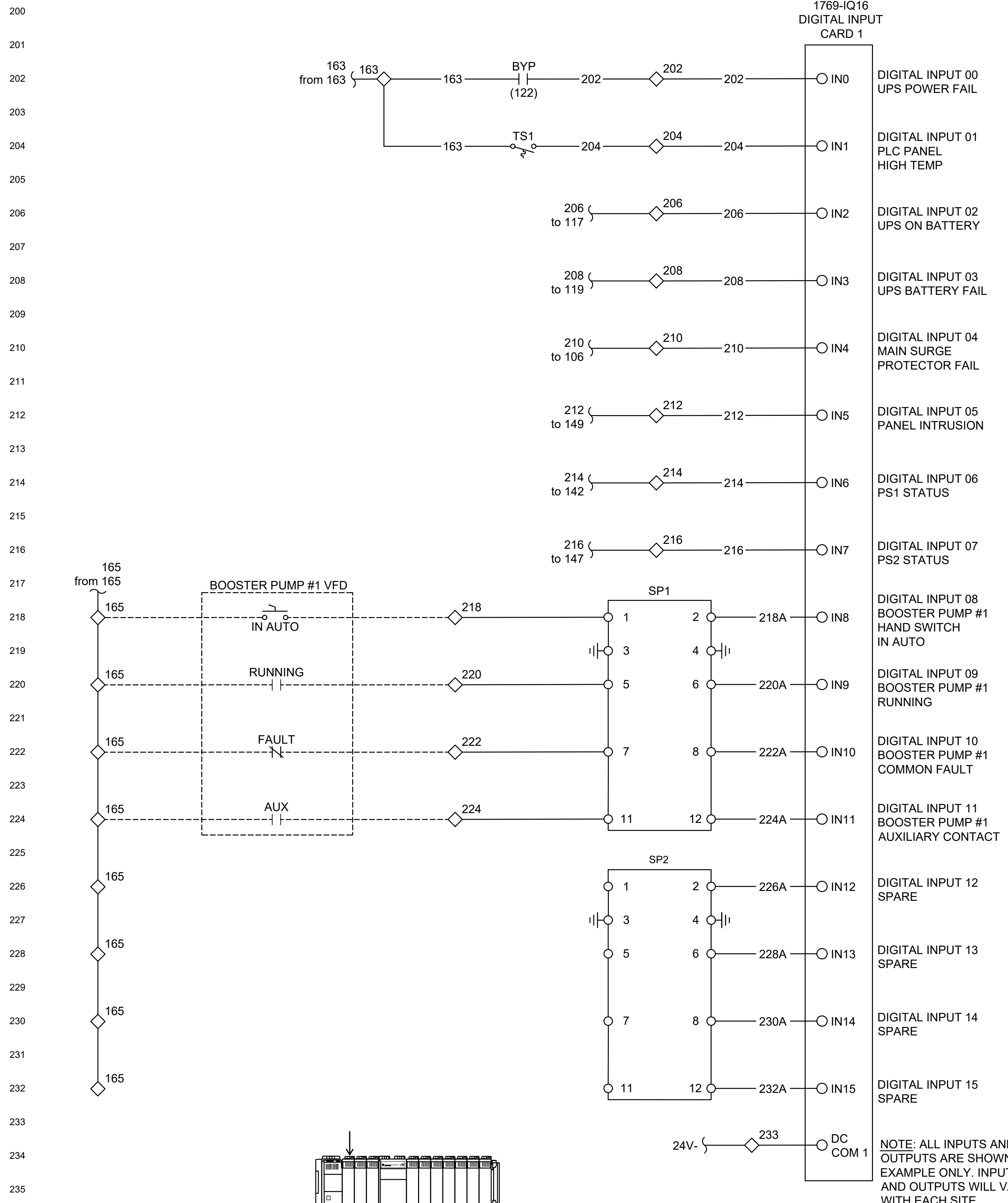


CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION CONTROL POWER WIRING

DATE: OCTOBER 2023	SCALE	E5.4 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
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DESIGNED: CJA		
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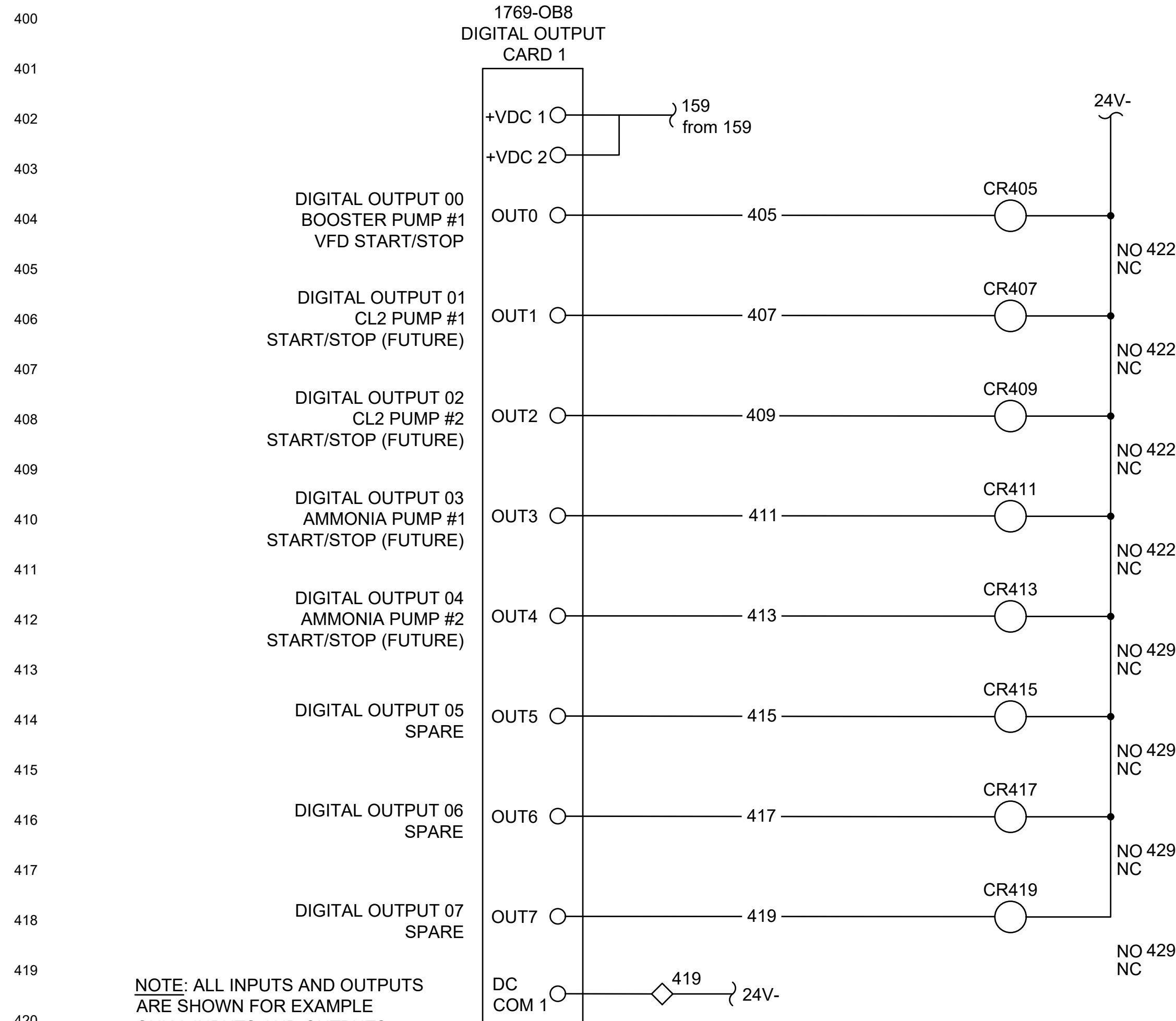
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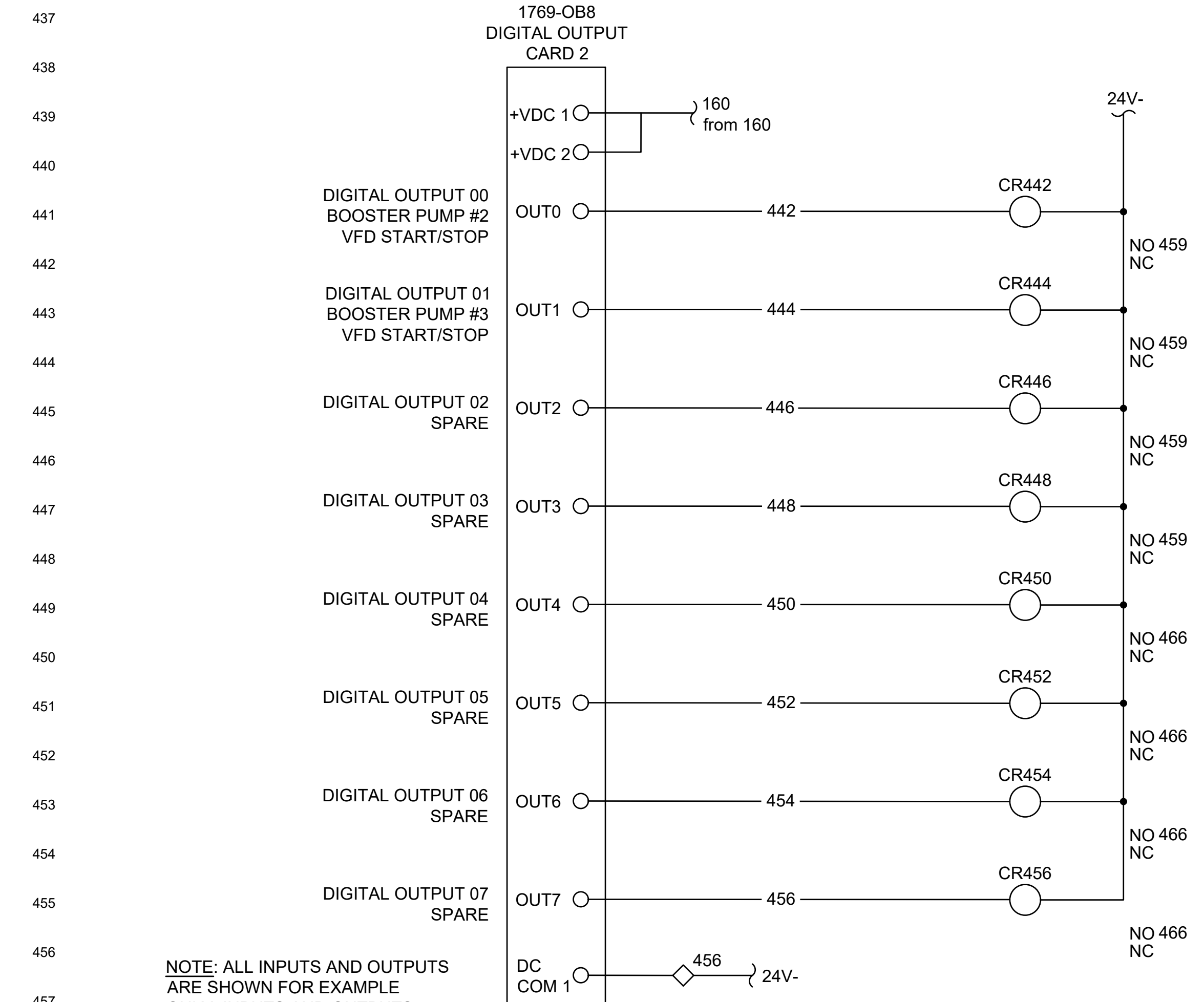
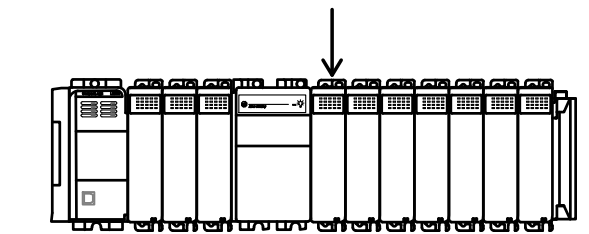
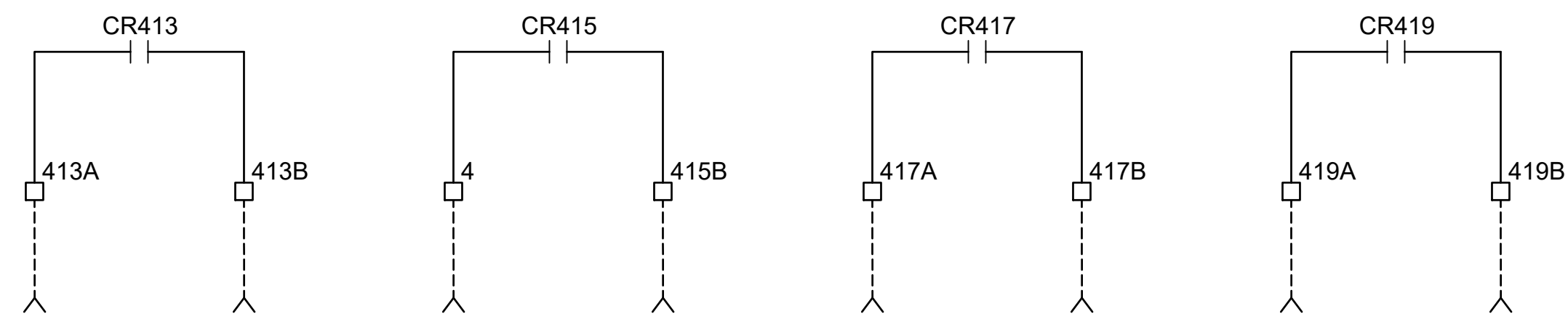
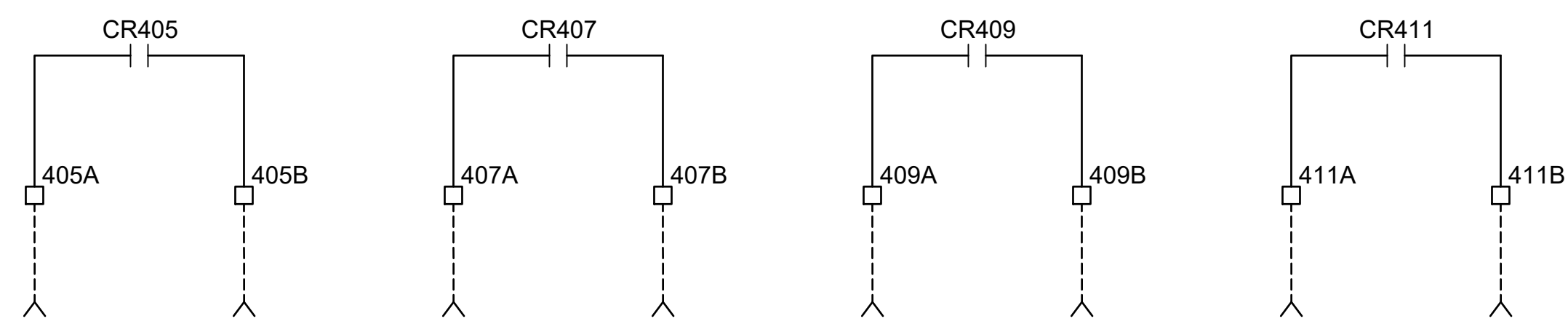
CHARLOTTE COUNTY UTILITIES - REMOTE
SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION
DIGITAL INPUTS CARDS 1 & 2

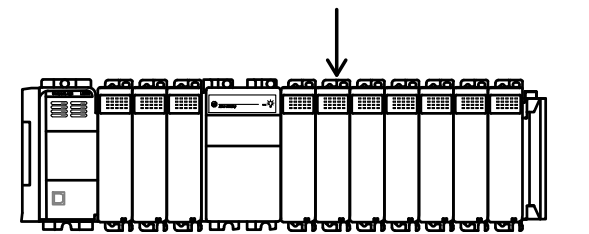
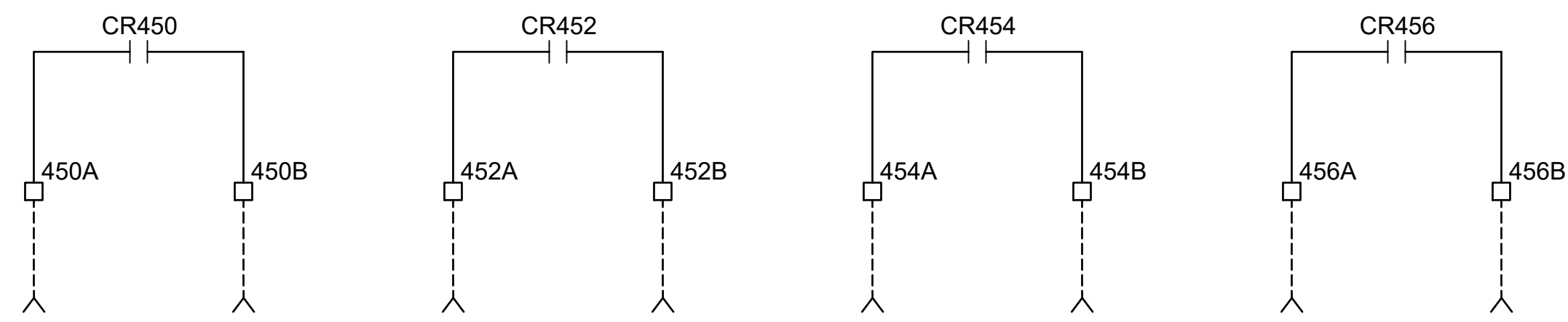
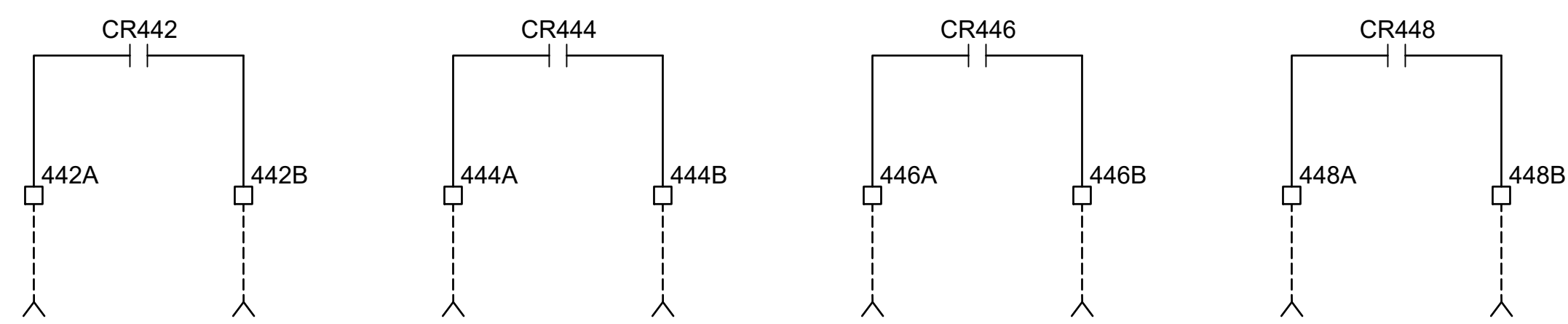
DATE: OCTOBER 2023	SCALE	E5.5 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
DESIGNED: CJA		
CHECKED: EEB		
PROJ. MGR.: EEB		
STATUS:		



NOTE: ALL INPUTS AND OUTPUTS ARE SHOWN FOR EXAMPLE ONLY. INPUTS AND OUTPUTS WILL VARY WITH EACH SITE.



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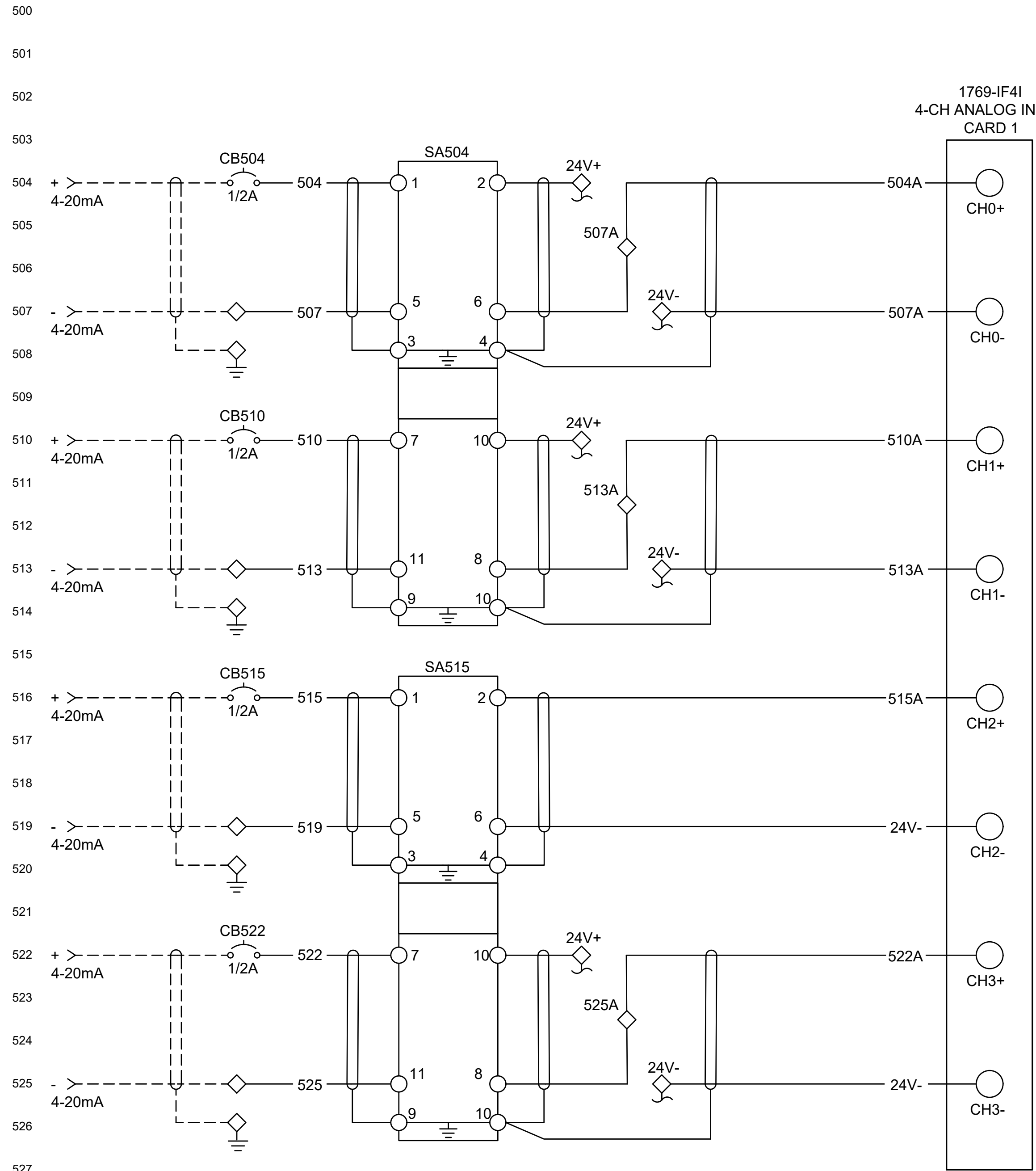
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CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION
DIGITAL OUTPUTS CARDS 1 & 2

DATE: OCTOBER 2023	SCALE	E5.7 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
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PROJ. MGR.: EEB		
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1769-IF41
4-CH ANALOG INPUT
CARD 1

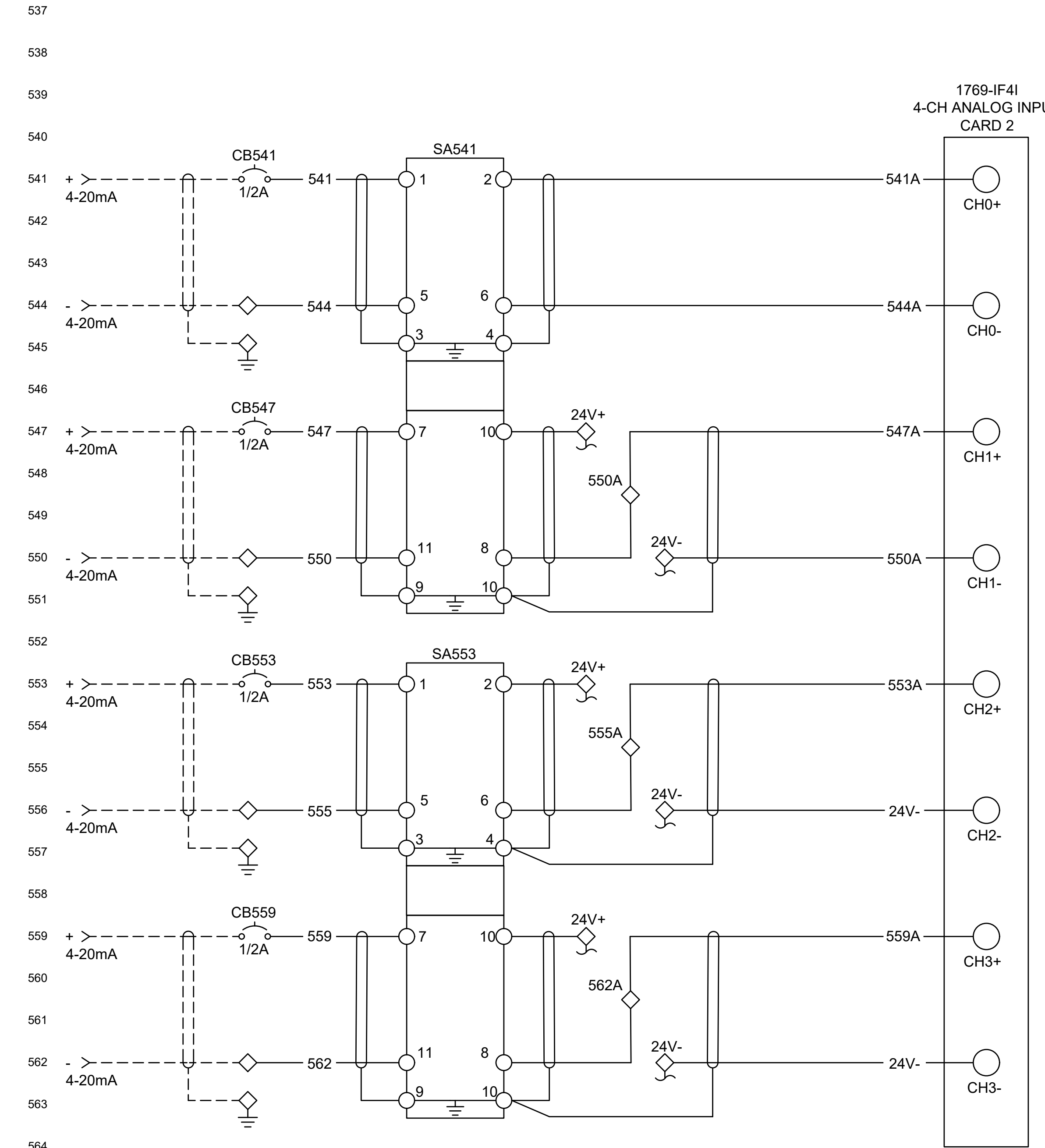
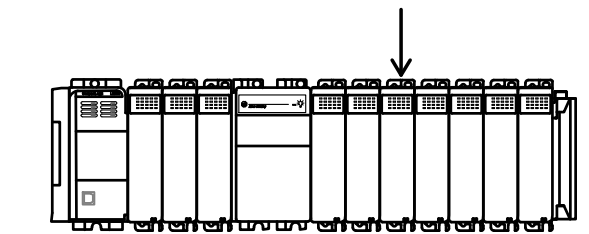
ANALOG INPUT 00
SUCTION PRESSURE
TRANSMITTER 0-160 PSI

ANALOG INPUT 01
DISCHARGE PRESSURE
TRANSMITTER 0-160 PSI

ANALOG INPUT 02
DISCHARGE FLOW METER
0-5000 GPM CONTINUOUS
FLOW

ANALOG INPUT 03
SPARE

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1769-IF41
4-CH ANALOG INPUT
CARD 2

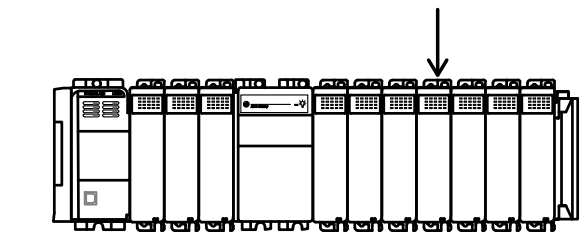
ANALOG INPUT 00
TOTAL CHLORINE
RESIDUAL 0-5 PPM

ANALOG INPUT 01
SODIUM HYPOCHLORITE
TANK LEVEL 0-10 FT

ANALOG INPUT 02
AMMONIUM SULFATE
TANK LEVEL 0-10 FT

ANALOG INPUT 03
SPARE

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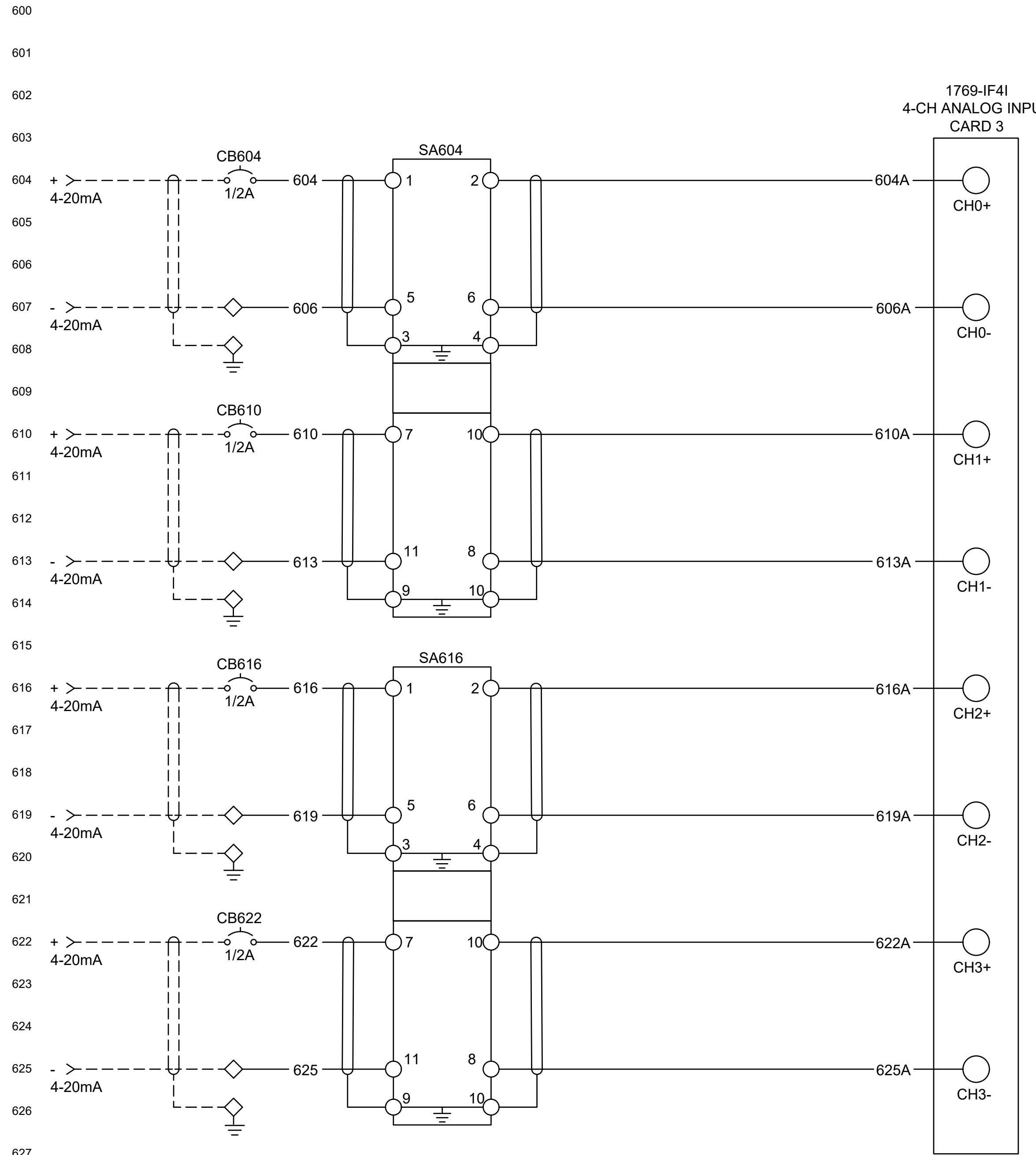
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CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION
ANALOG INPUTS CARDS 1 & 2

DATE: OCTOBER 2023	SCALE	E5.8 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
DESIGNED: CJA		
CHECKED: EEB		
PROJ. MGR.: EEB		
STATUS:		



1769-IF4I
4-CH ANALOG INPUT
CARD 3

604A CH0+
606A CH0-
610A CH1+
613A CH1-
616A CH2+
619A CH2-
622A CH3+
625A CH3-

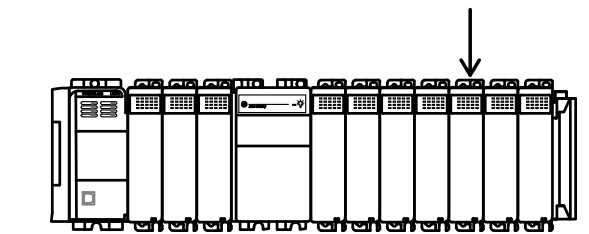
ANALOG INPUT 00
CHEMICAL PUMP 1 SPEED
FEEDBACK 0-100%
(FUTURE)

ANALOG INPUT 01
CHEMICAL PUMP 2 SPEED
FEEDBACK 0-100%
(FUTURE)

ANALOG INPUT 02
AMMONIA PUMP 1 SPEED
FEEDBACK 0-100%

ANALOG INPUT 03
AMMONIA PUMP 2 SPEED
FEEDBACK 0-100%

NOTE: ALL INPUTS AND OUTPUTS ARE SHOWN FOR EXAMPLE ONLY. INPUTS AND OUTPUTS WILL VARY WITH EACH SITE.



REV	DESCRIPTION	DATE
2	REVISED	AUG-2024
1	REVISED	OCT-2023
0	STANDARDS	MAR-2023

REVISIONS

CHARLOTTE COUNTY UTILITIES DEPARTMENT

NOTE: PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN CCU APPROVAL. FOR EACH INSTALLATION A SPECIFIC SET OF CONSTRUCTION DRAWINGS AND SPECIFICATIONS (IF DEEMED NECESSARY BY THE DESIGN ENGINEER) MUST BE PREPARED.



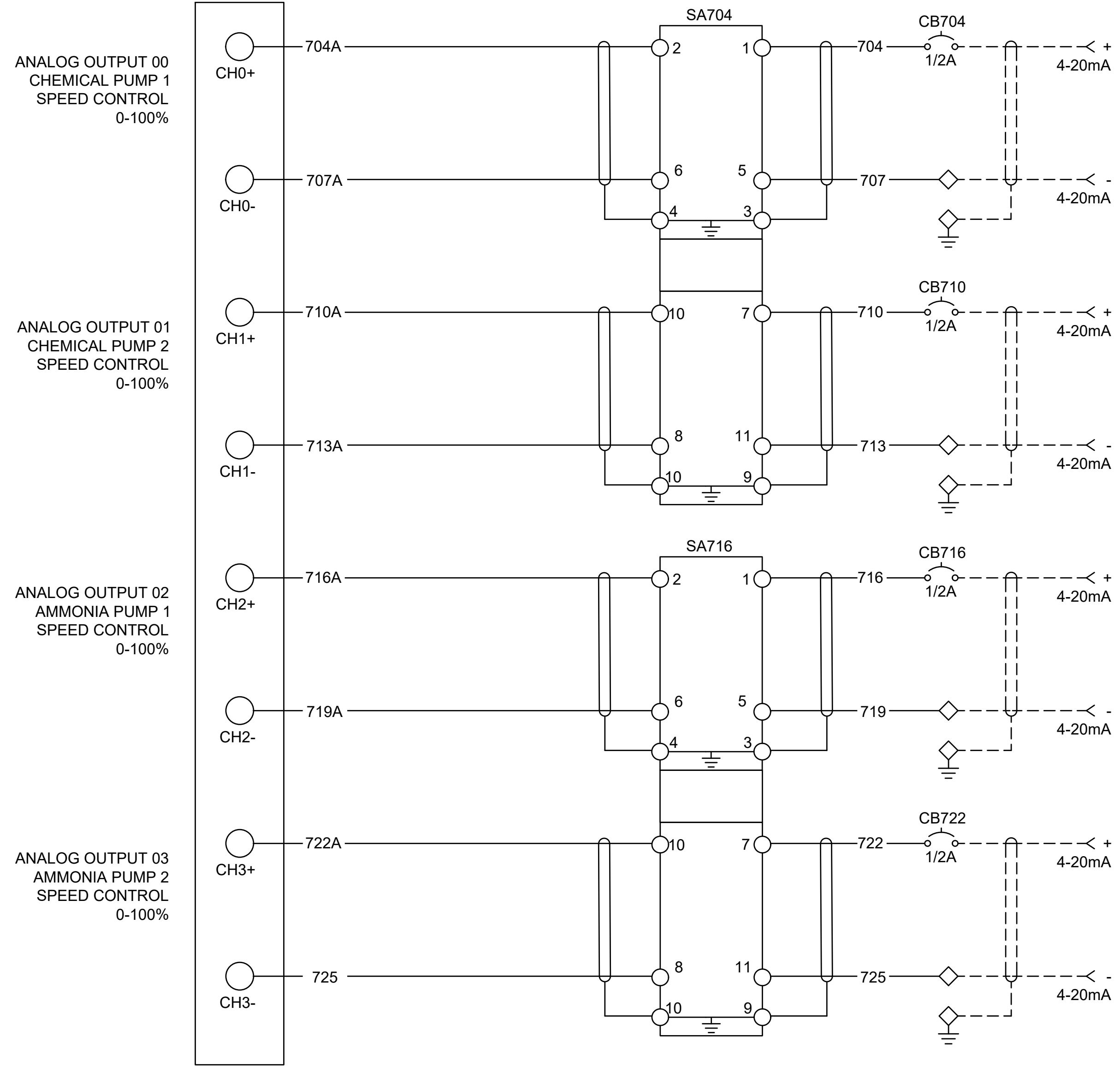
CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION
ANALOG INPUTS CARD 3

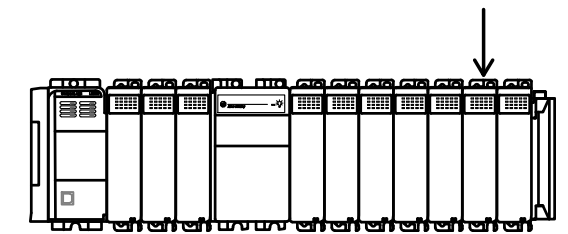
DATE: OCTOBER 2023	SCALE	E5.9 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
DESIGNED: CJA		
CHECKED: EEB		
PROJ. MGR.: EEB		
STATUS:		

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1769-OF4CI
8-CH ANALOG OUTPUT
CARD 1

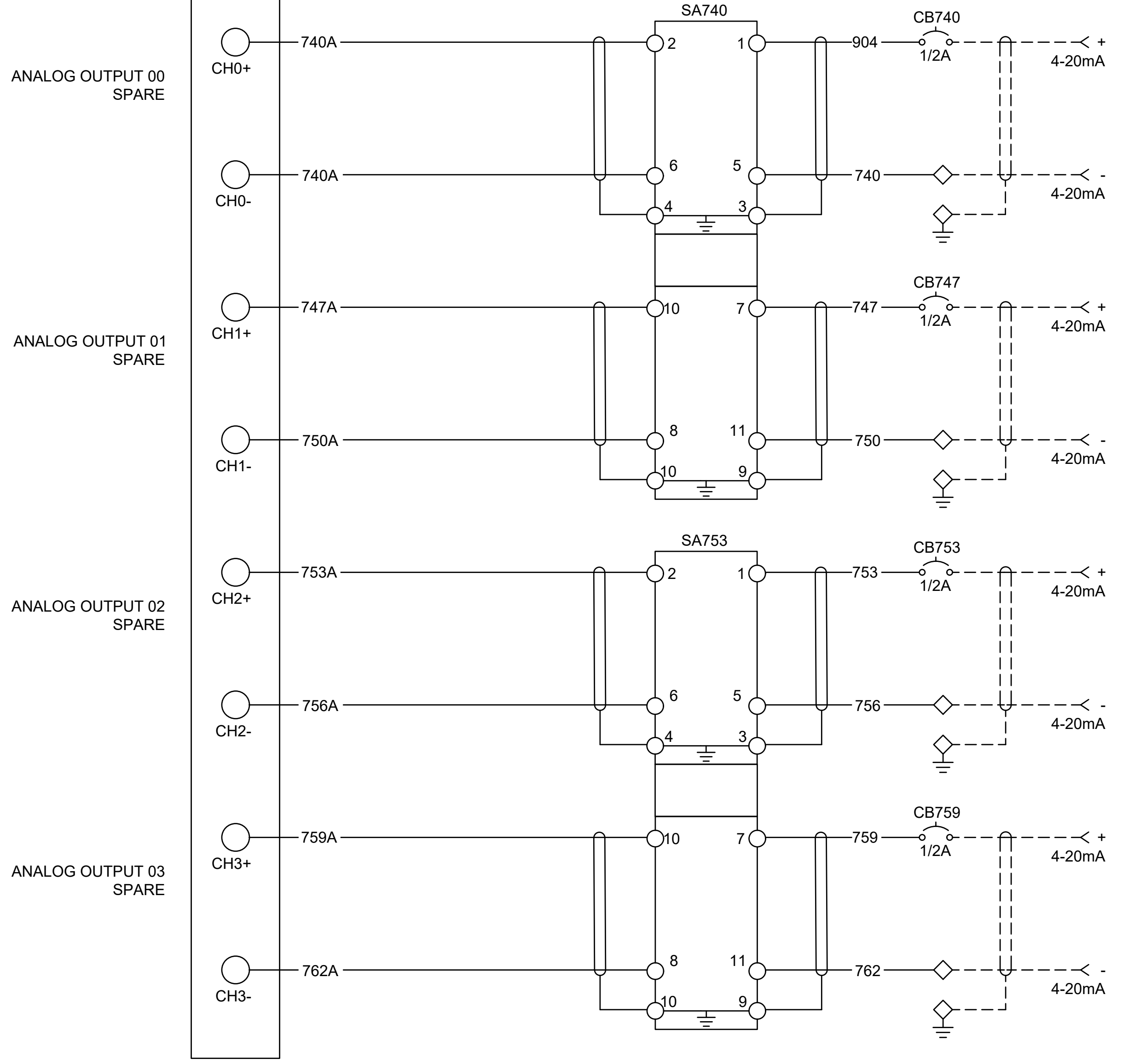


NOTE: ALL INPUTS AND OUTPUTS ARE SHOWN FOR EXAMPLE ONLY. INPUTS AND OUTPUTS WILL VARY WITH EACH SITE.

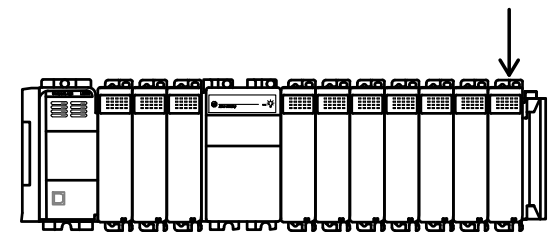


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1769-OF4CI
8-CH ANALOG OUTPUT
CARD 2



NOTE: ALL INPUTS AND OUTPUTS ARE SHOWN FOR EXAMPLE ONLY. INPUTS AND OUTPUTS WILL VARY WITH EACH SITE.



REV	DESCRIPTION	DATE
2	REVISED	AUG-2024
1	REVISED	OCT-2023
0	STANDARDS	MAR-2023

REVISIONS

CHARLOTTE COUNTY UTILITIES DEPARTMENT

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CHARLOTTE COUNTY UTILITIES - REMOTE SITES CONTROL PANEL STANDARDS

POTABLE WATER BOOSTER STATION
ANALOG OUTPUTS CARDS 1 & 2

DATE: OCTOBER 2023	SCALE	E5.10 DRAWING NO. 1 REVISION
MCE PROJ. # 07169-0012	HORIZONTAL:	
DRAWN: CJA	VERTICAL:	
DESIGNED: CJA		
CHECKED: EEB		
PROJ. MGR. EEB		
STATUS:		