

CITY OF PITTSBURG

PITTSBURG, CALIFORNIA



CONTRACT NO. 2022-03

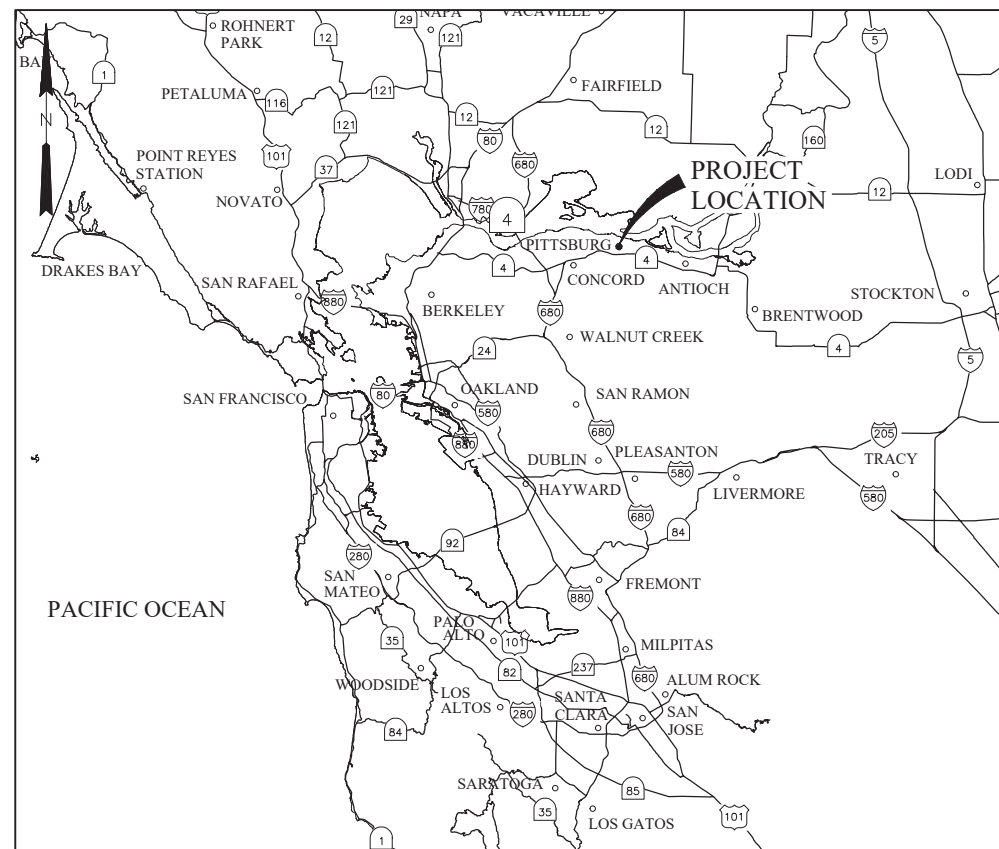
PITTSBURG WATER TREATMENT PLANT

GENIUS BUS REPLACEMENT PROJECT

Project No. 5009

July 2023

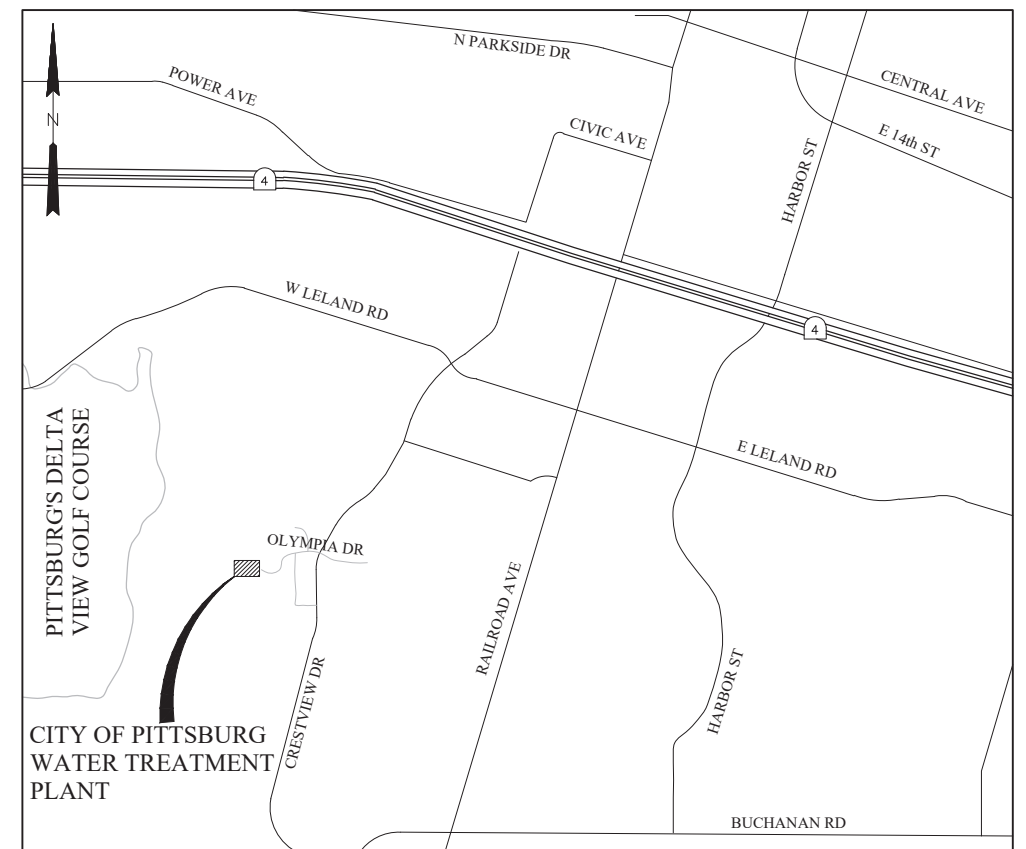
FINAL DESIGN



VICINITY MAP
NOT TO SCALE

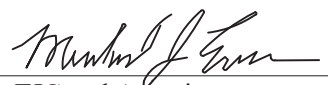
SHEET INDEX

SHT NO.	DWG	TITLE
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LOCATION MAP
NOT TO SCALE

APPROVED BY: 
John Samuelson Public Works Director/City Engineer

PREPARED BY: 
TJC and Associates
Project No. 121096



ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
XXXXXXX	XXXXXXX	EQUIPMENT IDENTIFIER AS DEFINED BY THE PROCESS
ZXXX	ZXXX	CONDUIT ID. Z = CONDUIT TYPE (AS NOTED OR SCHEDULED) XXX = NUMBER PER SCHEDULE (NOTE 3)
MOV	MOV	MOTOR OPERATED VALVE
G	G	GENERATOR, RATINGS AND CONNECTIONS AS NOTED
#	M	MOTOR, NUMERAL INDICATES HORSEPOWER
UTILITY METER	N/A	UTILITY METER
DMM	N/A	DIGITAL MULTIMETER
TRIP FRAME	CB	LOW VOLTAGE AIR OR MOLDED CASE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED; STABS INDICATE DRAWOUT TYPE
*	*	SOLID STATE MOTOR CONTROL * D.C. = D.C. DRIVE CONTROLLER SCR = SILICON CONTROLLED RECTIFIER VFD = VARIABLE FREQUENCY DRIVE RVSS = REDUCED VOLTAGE SOLID STATE
SPD	N/A	SURGE PROTECTION DEVICE
MCP	☒	COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: * FVR FULL VOLTAGE REVERSING 2S2W TWO SPEED, TWO WINDING RVAT REDUCED VOLTAGE, AUTO TRANSFORMER # NUMERAL INDICATES NEMA SIZE
*	☐	NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE * AMPERE RATING NOTED IF OTHER THAN 30A
#	F	FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, AMPERE RATING AND FUSE SIZE AS NOTED * AMPERE RATING NOTED IF OTHER THAN 30A # FUSE RATING EXAMPLE 15
2	P	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD HEATER "P" INDICATES WITH PILOT LIGHT "2" INDICATES TWO POLE
T	T	POWER TRANSFORMER, * RATINGS AND CONNECTIONS AS SHOWN ON THE SINGLE LINE DIAGRAM
T	T	CONTROL TRANSFORMER, * RATINGS AND CONNECTIONS AS SHOWN ON THE SINGLE LINE DIAGRAM
100A AT5-1	N/A	AUTOMATIC TRANSFER SWITCH NO. 1 (ATS-1) "N" INDICATES NORMAL SOURCE "S" INDICATES STANDBY SOURCE 100A INDICATES CONTINUOUS CURRENT RATING
*	N/A	ARRESTOR, TYPE AS INDICATED * LA = LIGHTNING SURGE ARRESTOR SA = SURGE ARRESTOR
⊕	⊕	GROUND OR GROUND ROD
■	■	TERMINAL LUG, TERMINATION POINT, OR GROUNDING BOND POINT
#	N/A	KEY INTERLOCK: # - KEY NUMBER AS INDICATED
E	N/A	ELECTRICAL INTERLOCK

PANEL / CONSOLE ABBREVIATIONS

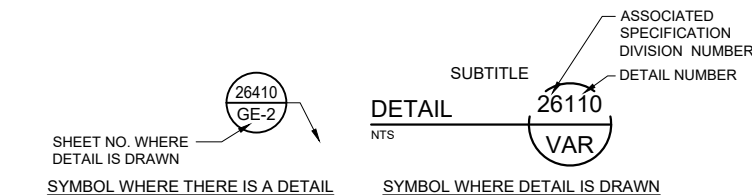
CBPC	CONTROL BUILDING CONTROL PANEL
CECP	CHEMICAL EQUIPMENT CONTROL PANEL
CDTCP	CHLORINE DIOXIDE TANK CONTROL PANEL
FCC	FILTER CONTROL CONSOLE
HLPS1CP	HIGH LEVEL PUMPS STATION 1 CONTROL PANEL
MCP	MAIN CONTROL PANEL
RCP	RESERVOIR CONTROL PANEL (RP-A)
RWPCP	RAW WATER PUMP STATION CONTROL PANEL
STCP	SOLIDS THICKENER CONTROL PANEL

ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION																
☒	N/A	TERMINAL TO EXTERNAL DEVICE (FIELD OR OTHER PANEL)																
☐	N/A	NETWORK CONNECTION TERMINATION																
N/A	*##	CONTROL STATION, TAG NO. AS INDICATED * DEVICE TYPE DEFINED ON P&ID SHEETS OR CONTROL DIAGRAMS ## LOOP NO.																
CS	CS	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED																
CS	CS	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN																
CS	CS	EMERGENCY STOP PUSHBUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)																
A B	CS	SELECTOR SWITCH A ON LOCAL B OFF REMOTE																
CS	CS	3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O-OPEN X-CLOSED <table border="1"> <thead> <tr> <th>POSITION</th> <th>TOP CONTACT</th> <th>MIDDLE CONTACT</th> <th>BOTTOM CONTACT</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>X</td> <td>0</td> <td>0</td> </tr> <tr> <td>B</td> <td>0</td> <td>X</td> <td>0</td> </tr> <tr> <td>C</td> <td>0</td> <td>0</td> <td>X</td> </tr> </tbody> </table> NAMEPLATE (A/B/C) * HOA - HAND/OFF/AUTO HOR - HAND/OFF/REMOTE LOR - LOCAL/OFF/REMOTE OSC - OPEN/STOP/CLOSE	POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT	A	X	0	0	B	0	X	0	C	0	0	X
POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT															
A	X	0	0															
B	0	X	0															
C	0	0	X															
N/A	N/A	PILOT LIGHT AND PILOT LIGHT PUSH-TO-TEST TYPE COLOR AS NOTED * R - RED G - GREEN B - BLUE W - WHITE A - AMBER																
# TD	N/A	TIME DELAY RELAY, NUMBER AS INDICATED RANGE AS NOTED SETPOINT AS NOTED																
N/A	N/A	NOTC-NORMALLY OPEN, TIMED CLOSING WHEN ENERGIZED (ON DELAY)																
N/A	N/A	NCTO-NORMALLY CLOSED, TIMED OPENING WHEN ENERGIZED (ON DELAY)																
N/A	N/A	NOTO-NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED (OFF DELAY)																
N/A	N/A	NCTC-NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED (OFF DELAY)																
N/A	*##	FIELD INSTRUMENT, TAG NO. AS INDICATED * INSTRUMENT TYPE DEFINED ON P&ID SHEETS, CONTROL DIAGRAMS, AND DIVISION 13 LOOP NO.																
HTR	HTR	STRIP HEATER OR HEATING ELEMENT																
SV	SV	SOLENOID VALVE																
30A	N/A	FUSE, AMPERE RATING AS NOTED																
N/A	N/A	CONTACT, NORMALLY OPEN (NO)																
N/A	N/A	CONTACT, NORMALLY CLOSED (NC)																
MS	N/A	MOTOR STARTER COIL, NUMBER AS INDICATED																
CR	N/A	CONTROL RELAY COIL, NUMBER AS INDICATED																

NOTES:

- THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS MAY NOT APPEAR WITHIN THE DRAWING SET FOR THIS PROJECT.
- DETAILS REPRESENT TYPICAL INSTALLATION REQUIREMENTS TO BE USED ON THIS PROJECT FOR THE CONDITION SHOWN. DETAILS ARE NOT SPECIFICALLY CALLED OUT AT EVERY APPLICATION POINT FOR CLARITY AND SIMPLICITY. THE INDICATED DETAIL REQUIREMENTS SHALL APPLY FOR ALL APPLICABLE LOCATIONS.
- PLANS DO NOT SHOW ROUTES OR SIZING OF RACEWAYS AND CONDUCTORS FOR RECEPTACLES, LIGHTING FIXTURES, LIGHTING SWITCHES, OR OTHER LOADS. PROVIDE RACEWAYS AND CONDUCTORS AS REQUIRED PER THE DEVICE LOCATION, SWITCH DESIGNATION, PANEL/CIRCUIT NUMBER, AND PROTECTIVE DEVICE RATING SHOWN ON THE DRAWINGS. HOMERUNS SHOWN CONCEALED OR EXPOSED SHALL BE INDICATIVE OF THE ENTIRE CIRCUIT INSTALLATION.
- IF NOT SHOWN, PROVIDE MINIMUM CONDUIT AND WIRE CIRCUIT RUN CONSISTING OF 3/4" CONDUIT WITH 2#12, 1#12 GROUND.
- WHERE LUMINAIRE MOUNTING HEIGHTS ARE SHOWN ON THE DRAWINGS, HEIGHTS SHALL BE AS MEASURED TO BOTTOM OF THE SOURCE OF ILLUMINATION.
- ITEMS SHOWN THROUGHOUT IN DARK LINWORK ARE NEW WORK AND ITEMS THAT ARE GRAY ARE EXISTING.

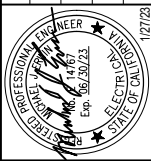
PLAN	DESCRIPTION
NEMA X	NEMA AREA: "X" INDICATES REQUIRED NEMA RATING OF EQUIPMENT IN THE AREA
---	EXPOSED CONDUIT (SEE NOTE 4)
----	CONCEALED CONDUIT (SEE NOTE 4)
o	CAT-6 ETHERNET CABLE
MMF	MULTIMODE FIBER OPTIC CABLE
E-10	UNDERGROUND DUCT BANK, CONCRETE ENCASED UNLESS OTHERWISE NOTED, CONDUIT ARRAY SHOWN IN SECTION 1 ON SHEET E-10.
G 1,3,LP-1	HOMERUN TO PANEL AND CIRCUIT SHOWN WITH TICK MARK INDICATES NUMBER OF CONDUCTORS: SHORT TICK = HOT LONG TICK = NEUTRAL LONG TICK WITH "G" = GROUND EXAMPLE SHOWN: CIRCUITS 1 AND 3 TO PANEL LP-1 (HOT, HOT, NEUTRAL, AND GROUND). (SEE NOTE 3)
---	CONDUIT STUBBED OUT AND CAPPED
~	FLEXIBLE METAL CONDUIT "WHIP" FOR RECESSED LIGHTING FIXTURES AND LIQUID TIGHT MOTOR CONNECTIONS (SEE NOTE 4)
////	CONDUIT, CIRCUIT, OR EQUIPMENT TO BE DEMOLISHED
UPS	LIGHTING PANELBOARD (120, 208, 240V)
UPS	UNINTERRUPTIBLE POWER SUPPLY
A 3 b	CEILING MOUNTED INCANDESCENT, COMPACT FLUORESCENT OR H.I.D. TYPE LIGHTING FIXTURE "A" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "B" - CONTROLLED BY SWITCH "B" "3" - CIRCUIT NUMBER
A 3 b	FLUORESCENT TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3 b	WALL OUTLET AND INCANDESCENT, COMPACT FLUORESCENT OR H.I.D. TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3 b	POLE MOUNTED H.I.D. TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
A 3 b	CROSS HATCH INDICATES LIGHTING FIXTURE FOR EMERGENCY EGRESS LIGHTING
A 3	EMERGENCY LIGHTING FIXTURE. NOTATIONS SAME AS ABOVE (NO SWITCHING REQUIRED)
E	EXIT SIGN. ARROW INDICATES DIRECTION OF EGRESS
# b	MULTIPLE POLE SWITCH # INDICATES NUMBER OF POLES (2, 3 OR 4); BLANK IS SINGLE POLE "a" INDICATES SWITCHLEG SHALL CONTROL LIGHT FIXTURES WITH "a" DESIGNATION
4	DUPEX RECEPTACLE, 20A, 120V, 2P, 3W, NUMBER INDICATES CIRCUIT * GF GROUND FAULT INTERRUPTER TYPE WP WEATHERPROOF T TRANSIENT VOLTAGE SURGE SUPPRESSOR
▽ / ▽	SPECIALTY POWER RECEPTACLE, FUNCTION AS NOTED
TD	SPECIAL SYSTEM JACK, TELEPHONE / DATA
TD	TELEPHONE DEMARCATION (CABINET OR BACKBOARD)
J	JUNCTION BOX
P	PULL BOX
TB	TERMINAL BOX
*-XXX	UNDERGROUND STRUCTURE (MANHOLE OR HANDHOLE) * STRUCTURE TYPE (MH OR HH) XXX ID NUMBER PER PLANS, SCHEDULE, OR AS SPECIFIED
# XX	PHOTO VANTAGE POINT AND DIRECTION # PHOTO NUMBER XX SHEET NO. WHERE PHOTO IS LOCATED



DETAIL SYMBOL (NOTE 2)

ABBREVIATIONS

A, AMP	AMPERE
ac	ALTERNATING CURRENT
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
AIC	AMPERE INTERRUPTING CAPACITY
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BGG	BARE COPPER GROUND
BLDG	BUILDING
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CL	CONTINUOUS LOAD
CMU	CONCRETE MASONRY UNIT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CU	COPPER
CWS	CONDUIT WALL SEAL
dc	DIRECT CURRENT
DIA	DIAMETER
DWG	DRAWING
(E)	EXISTING
EA	EACH
ELEC	ELECTRICAL
EL	ELEVATION
ENCL	ENCLOSURE OR ENCLOSED
EQUIP	EQUIPMENT
ETM	ELAPSED TIME METER
(F)	FUTURE
FO	FIBER OPTIC
FT	FEET
FU	FUSE
G, GRD	GROUND
GALV	GALVANIZED
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
HID	HIGH INTENSITY DISCHARGE
HH	HANDHOLE
hp	HORSEPOWER
HVAC	HEATING VENTILATION AIR CONDITIONING
Hz	HERTZ
kcmil	1000 CIRCULAR MILS
kVA	KILOVOLT AMPERES
kW	KILOWATTS
LES	LOCAL EMERGENCY STOP
LTG	LIGHTING
LP	LIGHTING PANEL
LV	LOW VOLTAGE
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
ML	MOTOR LOAD
MV	MEDIUM VOLTAGE
N	NEUTRAL
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NCL	NON-CONTINUOUS LOAD
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
OL	OVERLOAD
P	POLE
PB	PULL BOX
PC	PHOTOCELL
PH	PHASE
PNL	PANEL OR PANELBOARD
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RECEPT	RECEPTACLE
REQD	REQUIRED
SEC	SECONDS OR SECONDARY
SHT	SHEET
SS	STAINLESS STEEL
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TIME DELAY ON CLOSING
TEL	TELEPHONE
TD	TELEPHONE DEMARCATION POINT
TM	TIME SWITCH
TO	TIME DELAY ON OPENING
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPS
VAR	VOLT AMPS REACTIVE, VARIOUS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE, WATTS, WIDTH
W/	WITH
WP	WEATHERPROOF
XFMR	TRANSFORMER



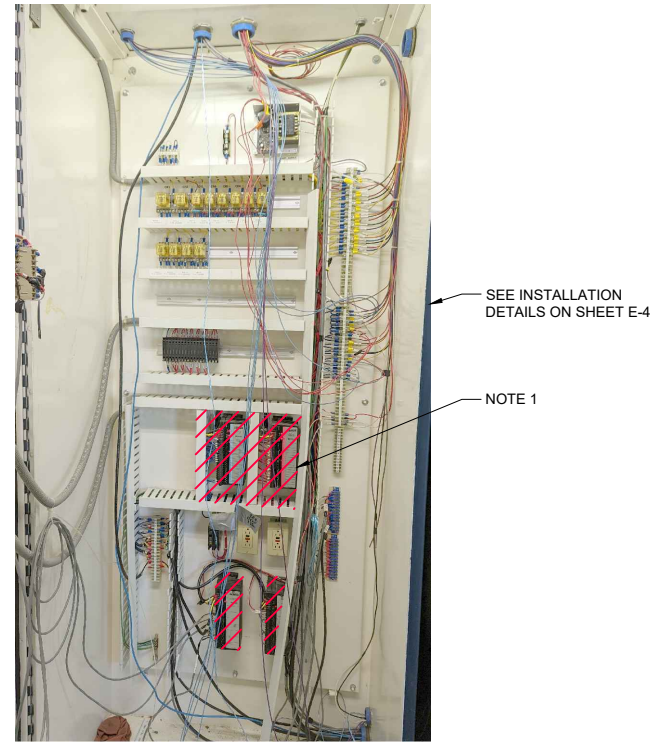
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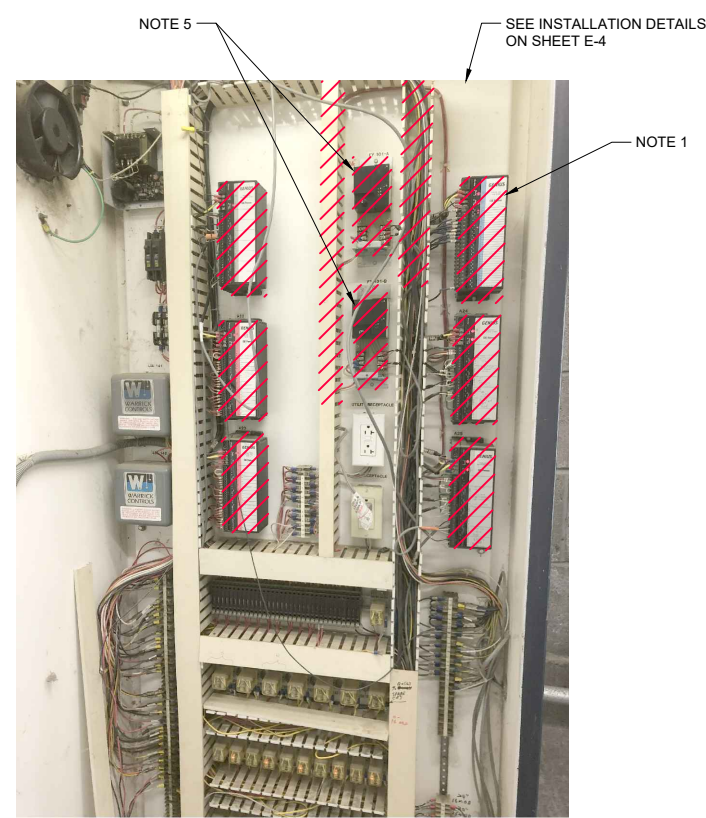
MAIN CONTROL PANEL (MCP) DEMOLITION

PHOTO 1
SCALE: NTS



CONTROL BUILDING CONTROL PANEL (CBCP) DEMOLITION

PHOTO 2
SCALE: NTS



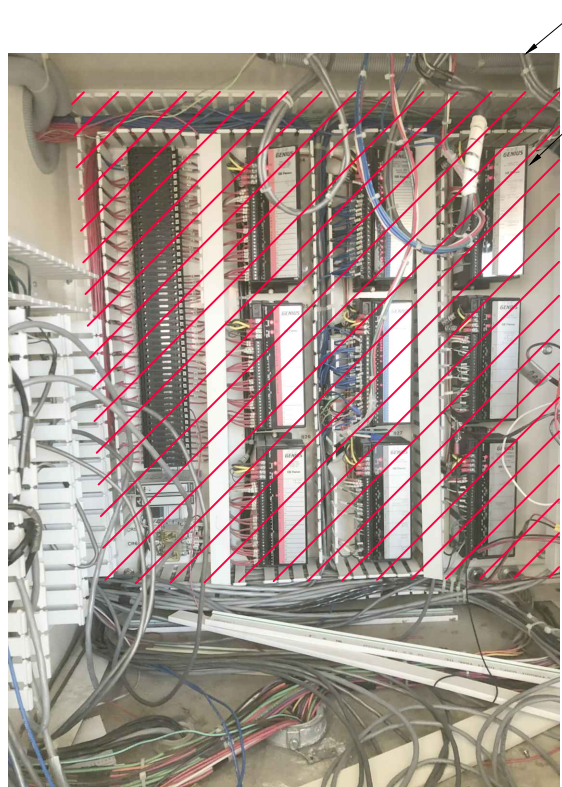
RAW WATER PS CONTROL PANEL (RWPSCP) DEMOLITION

PHOTO 3
SCALE: NTS



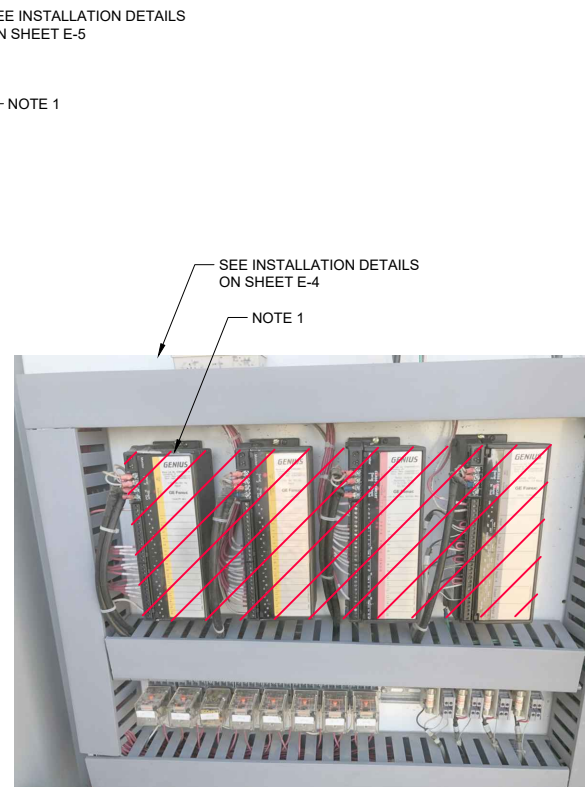
FILTER CONTROL CONSOLE 1/3, 2/4, AND 5/7 CONTROL PANEL (FCC 1/3, 2/4, 5/7) DEMOLITION

PHOTO 4
SCALE: NTS



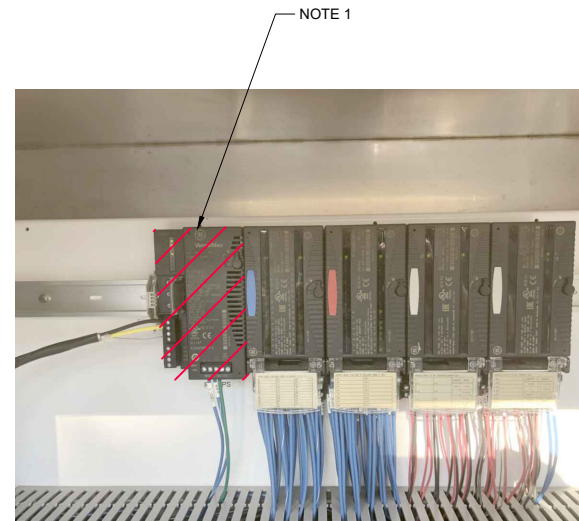
FILTER CONTROL CONSOLE 6/8 CONTROL PANEL (FCC 6/8) DEMOLITION (NOTE 4)

PHOTO 5
SCALE: NTS



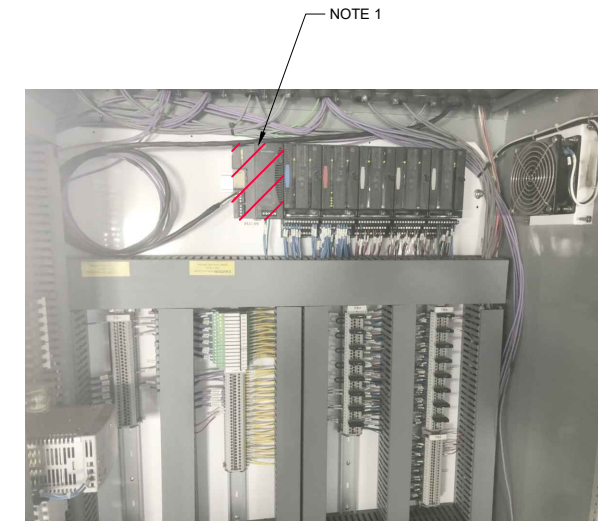
RESERVOIR CONTROL PANEL (RCP) DEMOLITION

PHOTO 6
SCALE: NTS



CHLORINE DIOXIDE TANK CONTROL PANEL (CDTCP) DEMOLITION

PHOTO 7
SCALE: NTS



CHEMICAL EQUIPMENT CONTROL PANEL (CECP) DEMOLITION

PHOTO 8
SCALE: NTS

NOTES:

- SEE SHEET N-1 AND N-2 FOR NEW PAC MODULES AND INSTALLATION DETAILS (TYP).
- DO NOT CUT ANY WIRE BEING REUSED. UTMERINATE ALL REUSED WIRES AND PRESERVE THE EXISTING FIELD WIRE LABELS.
- ALL WIRES SHALL BE ASSIGNED A NUMBER AND LABELED NEAR THE POINT OF TERMINATION.
- DURING DEMOLITION OF FCC 6/8, THE MASTER BACKWASH FLOW CONTROL FUNCTIONS IN FCC 6/8 SHALL BE MAINTAINED TO CONTINUE BACKWASH SERVICE TO THE IN-SERVICE FILTERS. TEMPORARILY WIRING THESE CONTROLS TO ANOTHER FCC MAY BE REQUIRED. CONSULT EXISTING INSTALLATION FOR DETAILS.
- REMOVE AGM SIGNAL CONDITIONERS (2) AND REPLACE WITH TERMINAL BLOCKS CONNECTING SIGNAL WIRING TO BYPASS DEVICE. DEVICE FUNCTION MOVING TO PAC. COORDINATE WITH PROGRAMMER.

SHEET NO. E-2 OF 14

THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE

PITTSBURG WATER TREATMENT PLANT GENIUS BUS REPLACEMENT PROJECT

CONTROL PANEL DEMOLITION DETAILS I

DESIGNED BY:	ADR
DRAWN BY:	BY
CHECKED BY:	MJE
SCALE:	NTS
DATE:	JAN 2023

1/27/23

PROFESSIONAL ENGINEER
ELECTRICAL
STATE OF CALIFORNIA
No. 41073
Exp. 02/28/23
12/27/23

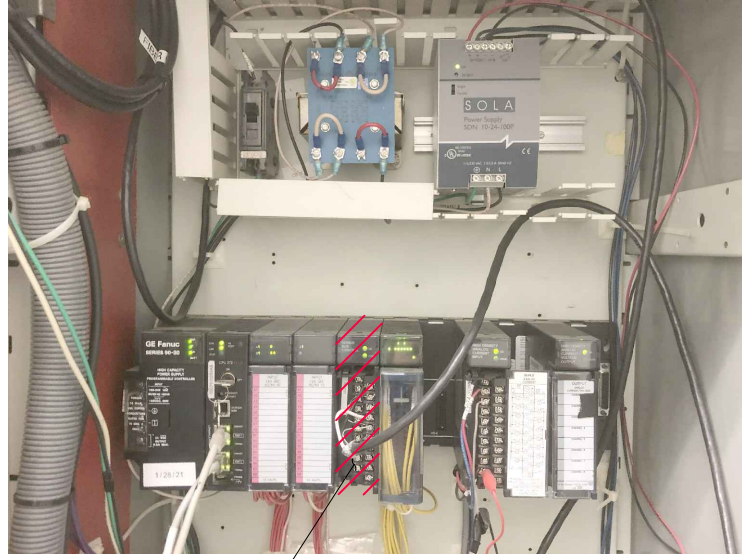
City of Pittsburg

TJC

REV.	DATE	BY	COMMENT

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NOTE 1

HIGH LEVEL PUMP STATION 1
CONTROL PANEL (HLPS1CP) DEMOLITION

PHOTO 9
SCALE: NTS



NOTE 1

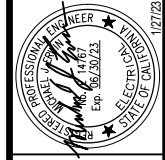
NOTE 1

SOLIDS THICKENER
CONTROL PANEL (STCP) DEMOLITION

PHOTO 10
SCALE: NTS

NOTES:

1. SEE SHEET N-1 AND N-2 FOR NEW PAC MODULES AND INSTALLATION DETAILS (TYP).
2. DO NOT CUT ANY WIRE BEING REUSED. UNDERMINATE ALL REUSED WIRES AND PRESERVE THE EXISTING FIELD WIRE LABELS.
3. ALL WIRES SHALL BE ASSIGNED A NUMBER AND LABELED NEAR THE POINT OF TERMINATION.

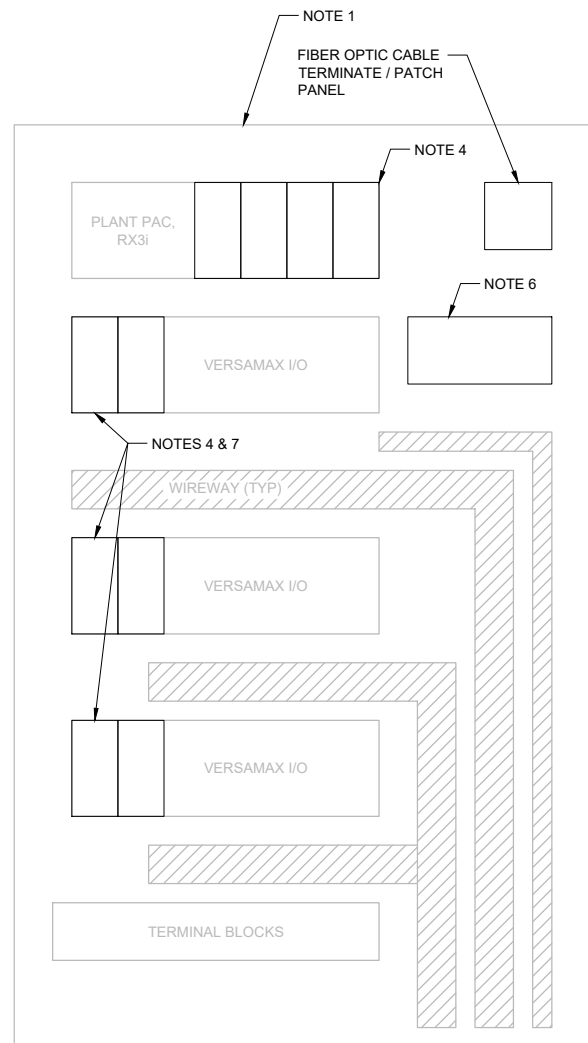


DESIGNED BY:	ADR
DRAWN BY:	BY
CHECKED BY:	MJE
SCALE:	NTS
DATE:	JAN 2023

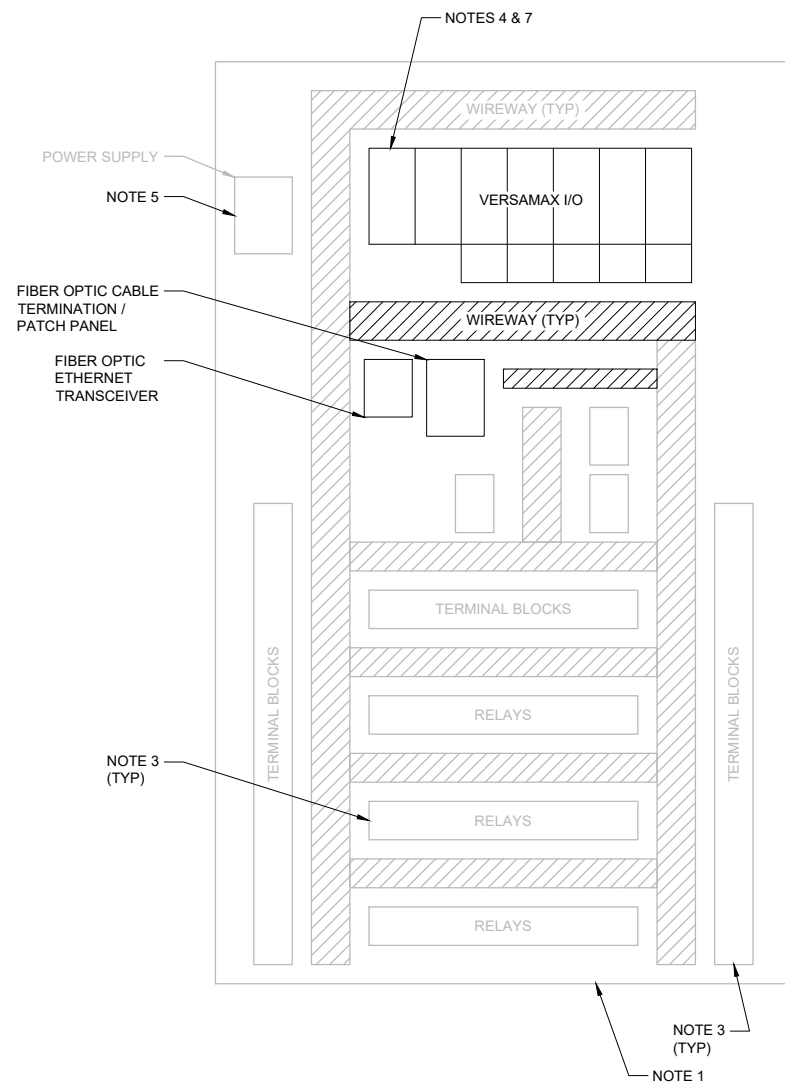
PITTSBURG WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT
**CONTROL PANEL
DEMOLITION DETAILS II**

SHEET NO. **E-3**
THIS BAR
SCALES EXACTLY
ONE INCH AT
FULL SCALE
SHEET 5 OF 14

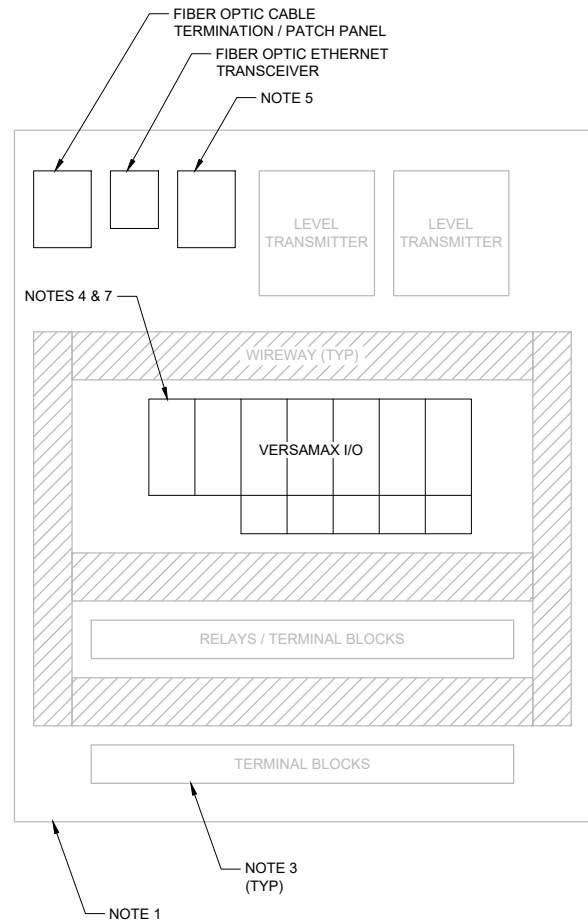
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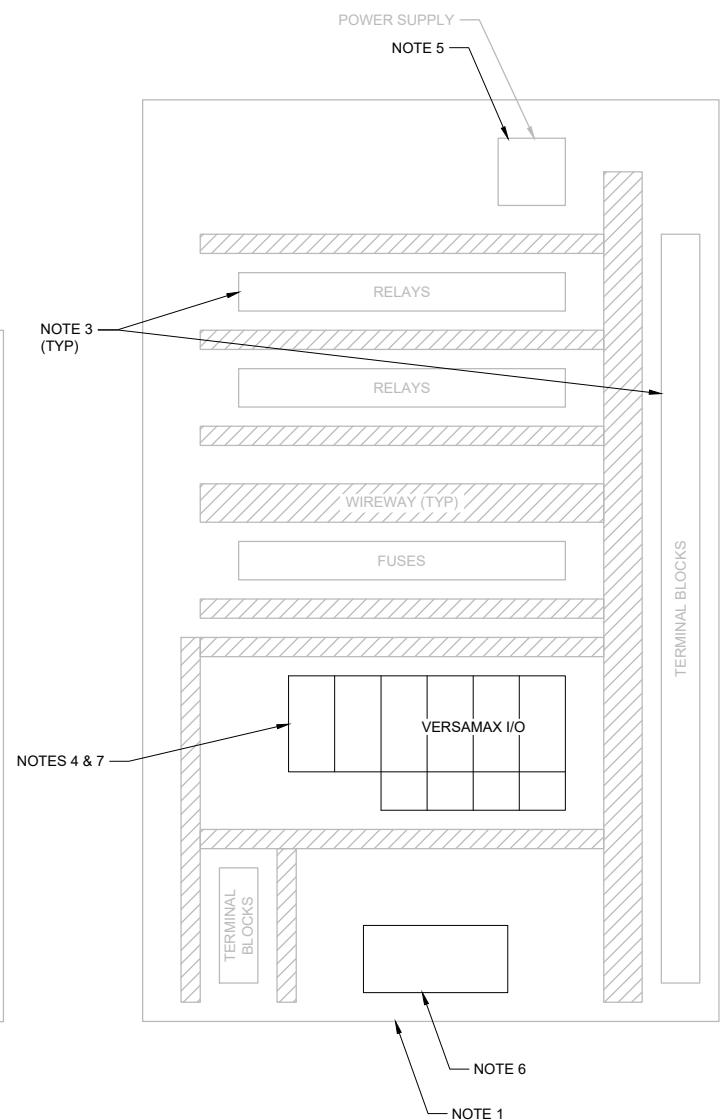
MCP BACK PANEL DETAIL
SCALE: NTS



RWPSCP BACK PANEL DETAIL
SCALE: NTS



RCP BACK PANEL DETAIL
SCALE: NTS



CBCP BACK PANEL DETAIL
SCALE: NTS

NOTES:

1. INTERIOR PANEL LAYOUT IS A GUIDE ONLY. ALL PANEL COMPONENTS ARE NOT SHOWN. CONTRACTOR SHALL FIELD VERIFY THE AVAILABLE SPACE INSIDE THE EXISTING PANEL TO INSTALL THE NEW COMPONENTS.
2. ITEMS SHOWN IN DARK LINEWORK ARE NEW WORK AND THE ITEMS THAT ARE GRAY ARE EXISTING.
3. REPLACE EXISTING WIRING BETWEEN I/O MODULES AND EXISTING TERMINAL BLOCKS/RELAYS WITH NEW. ASSIGN A NUMBER AND LABEL WIRES NEAR THE POINT OF TERMINATION FOR EASE OF TERMINATION AND IDENTIFICATION.
4. SEE SHEET N-1 AND N-2 FOR NEW PAC VERSAMAX MODULE DETAILS (TYP). VERSAMAX MODULES FURNISHED BY OWNER. REFER TO OWNER FURNISHED BOM FOR PROVIDED COMPONENTS.
5. ADD/REPLACE EXISTING 24 VDC POWER SUPPLY AND CONNECTED WIRING. REFER TO E-6 FOR DETAILS.
6. EMC SHIELDING CABLE CLAMPS SHALL BE USED ON ALL SHIELDED CAT-6 CABLES LEAVING THE PANEL TO FACILITATE CONNECTION OF CABLE SHIELD TO COMMON PANEL GROUND. SECURE CABLE ON BOTH SIDES OF CLAMP. CONNECT CLAMP TO PANEL GROUND AS REQUIRED. TYPICAL FOR ALL CONTROL PANELS INTERCONNECTED WITH CAT-6 CABLES.
7. GROUND VERSAMAX PROFINET COMMUNICATION MODULES TO PANEL GROUND PER MANUFACTURER RECOMMENDATIONS. APPLIES TO ALL PANELS EVEN THOSE NOT SHOWN HERE.

SHEET NO. **E-4**
THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE
SHEET 6 OF 14

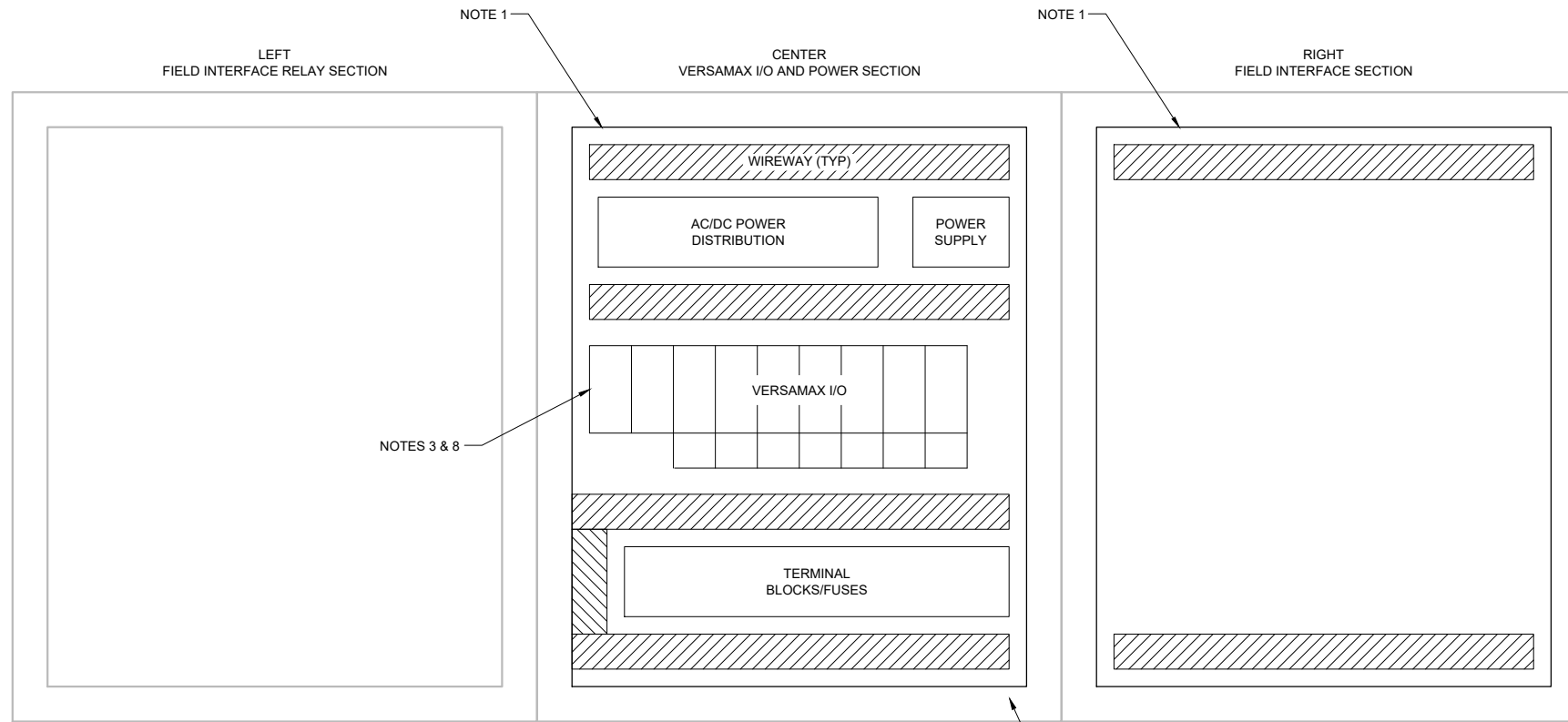
**PITTSBURGH WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT**

**CONTROL PANEL
INSTALL DETAILS 1**

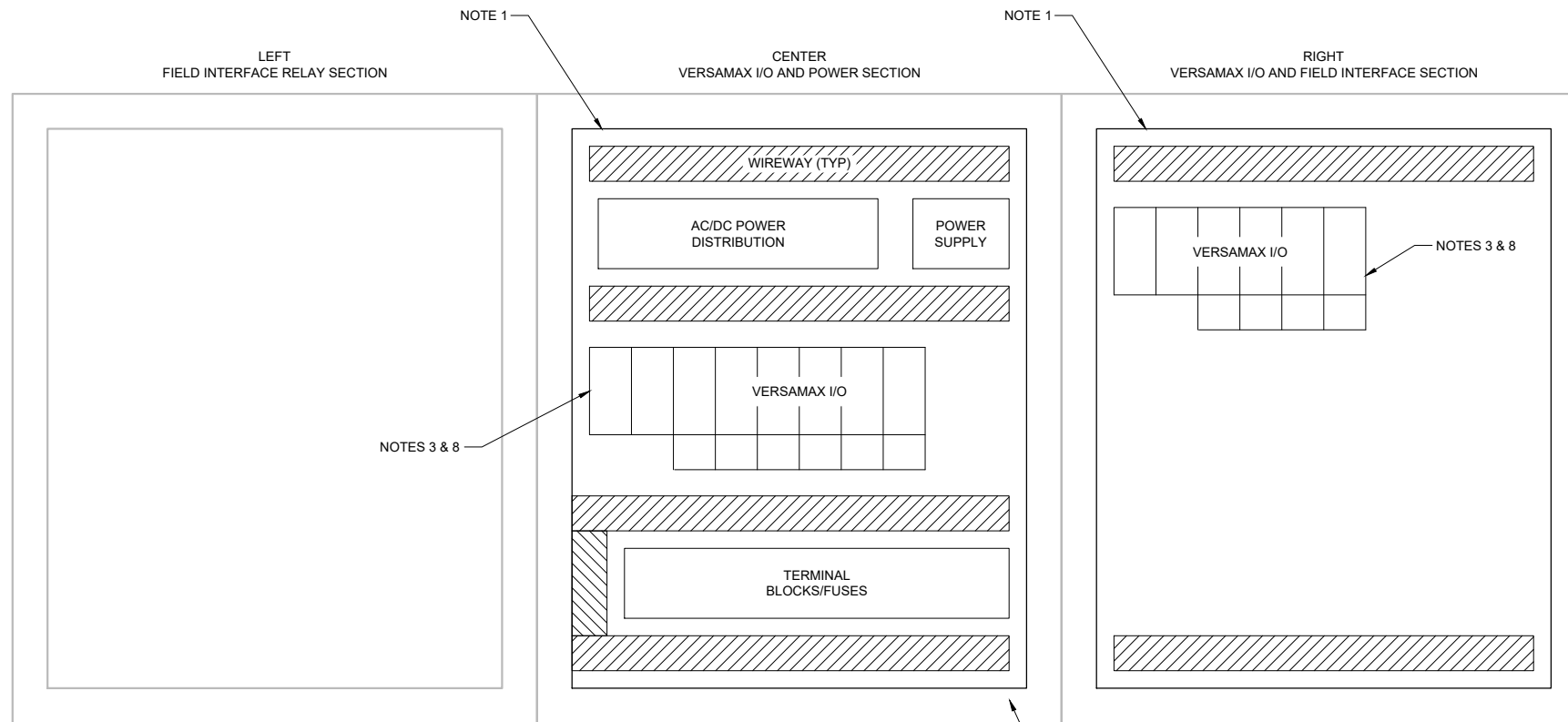
DESIGNED BY:	ADR	BY:	MJE	NTS	DATE:	JAN 2023
DRAWN BY:		CHECKED BY:				
SCALE:						

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XRT\CAAA-bot, MJE California BC Logo 2/line MJE Sig





FCC 1/3, 2/4, 5/7 DETAILS
SCALE: NTS



FCC 6/8 DETAILS
SCALE: NTS

NOTES:

1. REPLACE EXISTING BACK PANEL WITH A NEW BACK PANEL. INTERIOR PANEL LAYOUT IS A GUIDE ONLY. ALL PANELS AND COMPONENTS ARE NOT SHOWN. CONTRACTOR SHALL FIELD VERIFY THE AVAILABLE SPACE INSIDE THE EXISTING PANEL TO INSTALL THE NEW COMPONENTS.
2. ITEMS SHOWN IN DARK LINEWORK ARE NEW WORK AND THE ITEMS THAT ARE GRAY ARE EXISTING.
3. SEE SHEET N-1 AND N-2 FOR NEW PAC VERSAMAX MODULE INSTALLATION DETAILS (TYP). VERSAMAX MODULES FURNISHED BY OWNER. REFER TO OWNER FURNISHED BOM FOR PROVIDED COMPONENTS.
4. REFER TO E-6 FOR POWER SUPPLY AND POWER DISTRIBUTION DETAILS.
5. DO NOT CUT ANY WIRE BEING REUSED. UNTERMATE ALL REUSED WIRES AND PRESERVE THE EXISTING FIELD WIRE LABELS.
6. REPLACE EXISTING WIRING BETWEEN REMAINING EXISTING TERMINAL BLOCKS/RELAYS WITH NEW. ALL WIRES SHALL BE ASSIGNED A NUMBER AND LABELED NEAR THE POINT OF TERMINATION.
7. EMC SHIELDING CABLE CLAMPS SHALL BE USED ON ALL SHIELDED CAT-6 CABLES LEAVING THE PANEL TO FACILITATE CONNECTION OF CABLE SHIELD TO COMMON PANEL GROUND. SECURE CABLE ON BOTH SIDES OF CLAMP. CONNECT CLAMP TO PANEL GROUND AS REQUIRED. TYPICAL FOR ALL CONTROL PANELS INTERCONNECTED WITH CAT-6 CABLES.
8. GROUND VERSAMAX PROFINET COMMUNICATION MODULES TO PANEL GROUND PER MANUFACTURER RECOMMENDATIONS. APPLIES TO ALL PANELS EVEN THOSE NOT SHOWN HERE.

THIS BAR
SCALES EXACTLY
ONE INCH AT
FULL SCALE

PITTSBURG WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT

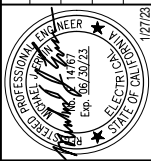
**CONTROL PANEL
INSTALL DETAILS 2**

DESIGNED BY:	ADR	BY	MJE	NTS	JAN 2023
DRAWN BY:		CHECKED BY:		SCALE:	DATE:

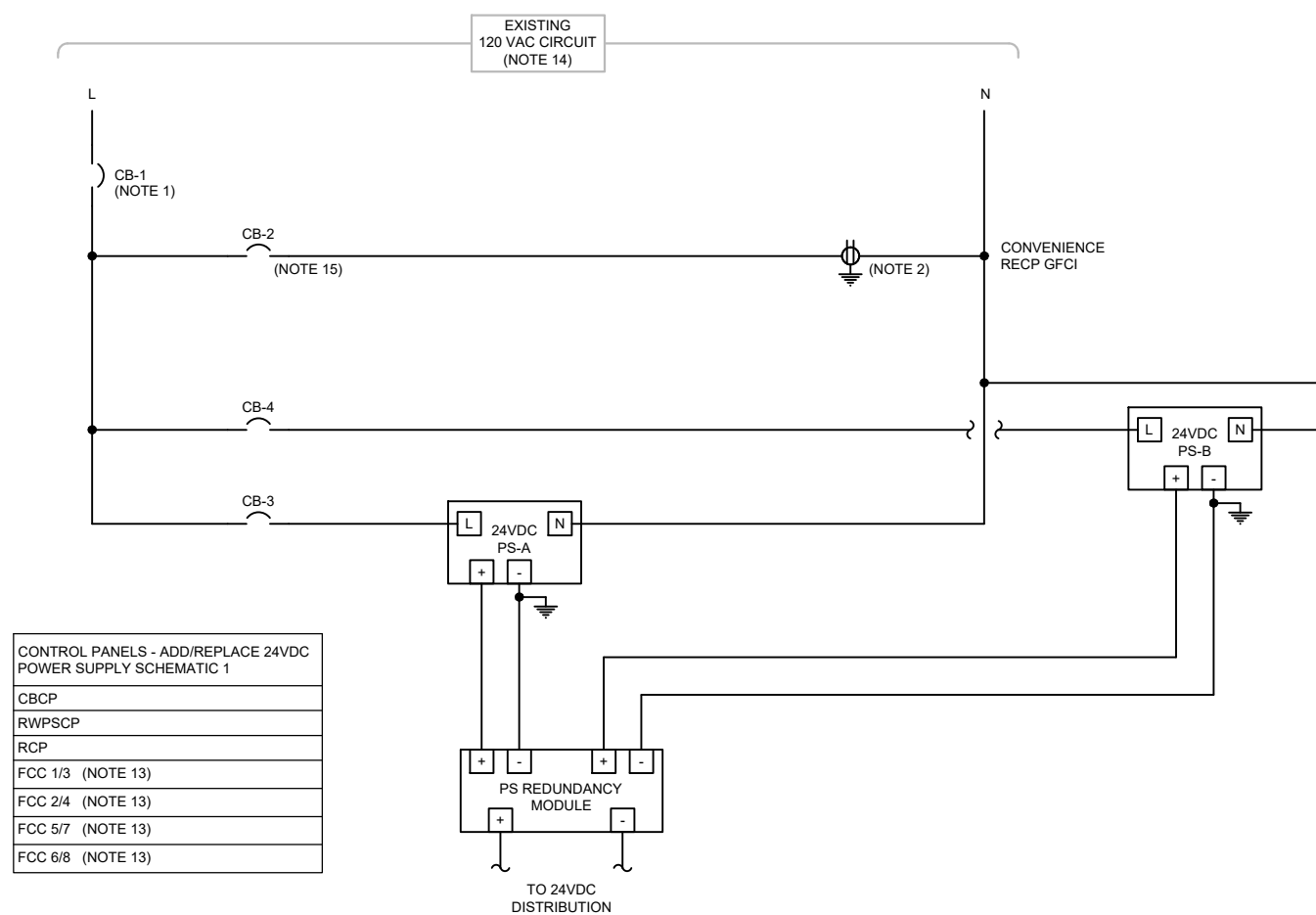


REV.	DATE	BY	COMMENT





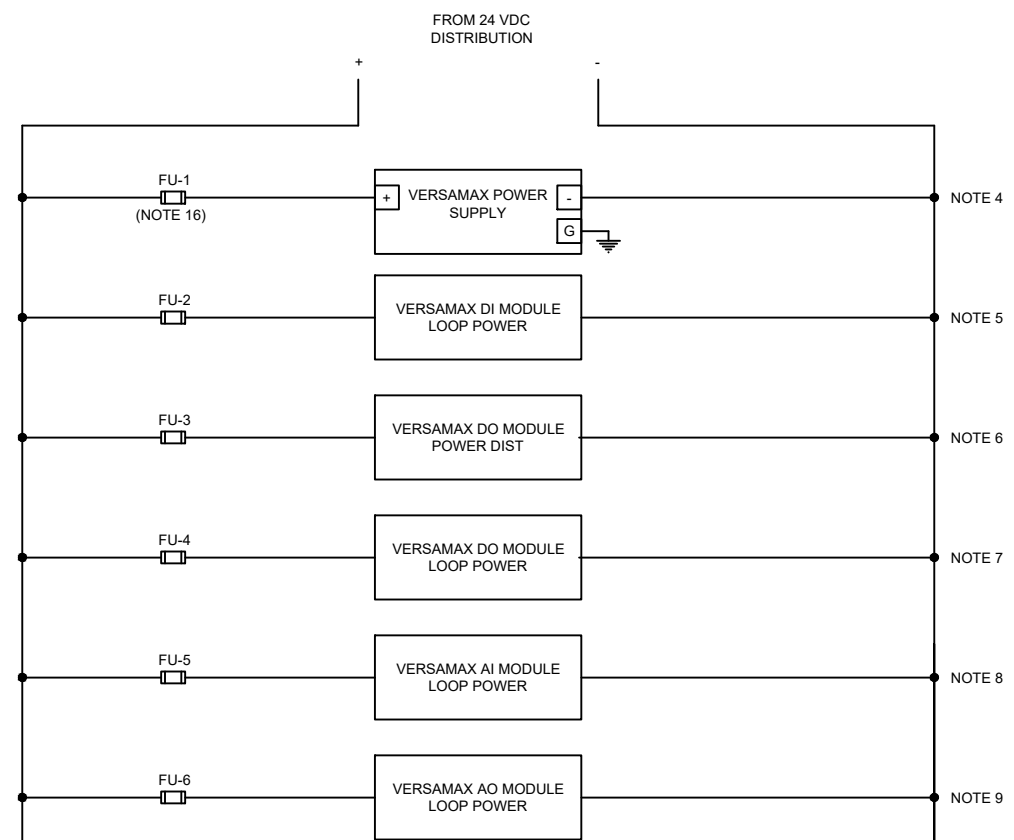
REV.	DATE	BY	COMMENT



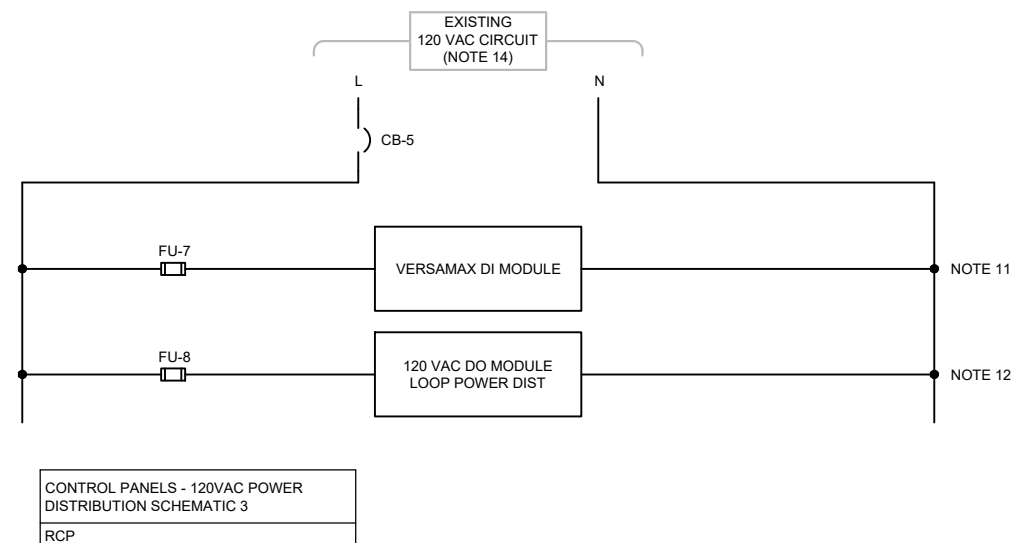
CONTROL POWER DISTRIBUTION SCHEMATIC 1
 SCALE: NTS

NOTES:

- CONTRACTOR SHALL ADD CIRCUIT BREAKER IF NONE EXISTS.
- CONTRACTOR SHALL ADD IF NO CONVENIENCE RECEPTACLE EXISTS.
- APPLIES TO NEWLY ADDED VERSAMAX MODULES REQUIRING 24 VDC.
- TYPICAL FOR EACH VERSAMAX 24 VDC POWER SUPPLY MODULE IN PANEL.
- TYPICAL FOR EACH VERSAMAX DI MODULE (24 VDC).
- TYPICAL FOR EACH VERSAMAX DO RELAY MODULE (24 VDC LOADS).
- TYPICAL FOR EACH VERSAMAX DO MODULE (24 VDC SOURCED).
- TYPICAL FOR EACH VERSAMAX AI MODULE.
- TYPICAL FOR EACH VERSAMAX AO MODULE.
- APPLIES TO NEWLY ADDED VERSAMAX MODULES REQUIRING 120 VAC.
- TYPICAL FOR EACH VERSAMAX DI MODULE (120 VAC).
- TYPICAL FOR EACH VERSAMAX DO MODULE (120 VAC LOADS).
- EXISTING AC POWER DISTRIBUTION ON NEW BACKPANEL SHOULD BE SIMILAR IN FUNCTION TO EXISTING.
- CONTRACTOR SHALL FIELD VERIFY EXISTING PANEL NUMBER AND CIRCUIT.
- CONTRACTOR SHALL SELECT BREAKER SIZE/RATING IN THE CONTROL PANEL AS REQUIRED (TYPICAL).
- CONTRACTOR SHALL SELECT FUSE SIZE/RATING IN THE CONTROL PANEL AS REQUIRED (TYPICAL).



CONTROL POWER DISTRIBUTION SCHEMATIC 2
 SCALE: NTS (NOTE 3)



CONTROL POWER DISTRIBUTION SCHEMATIC 3
 SCALE: NTS (NOTE 10)





NOTE 1 NOTE 2 NOTE 1

FCC 1/3, 2/4 AND 5/7
REPLACE CONTROL STATIONS/DISPLAYS (TYP)

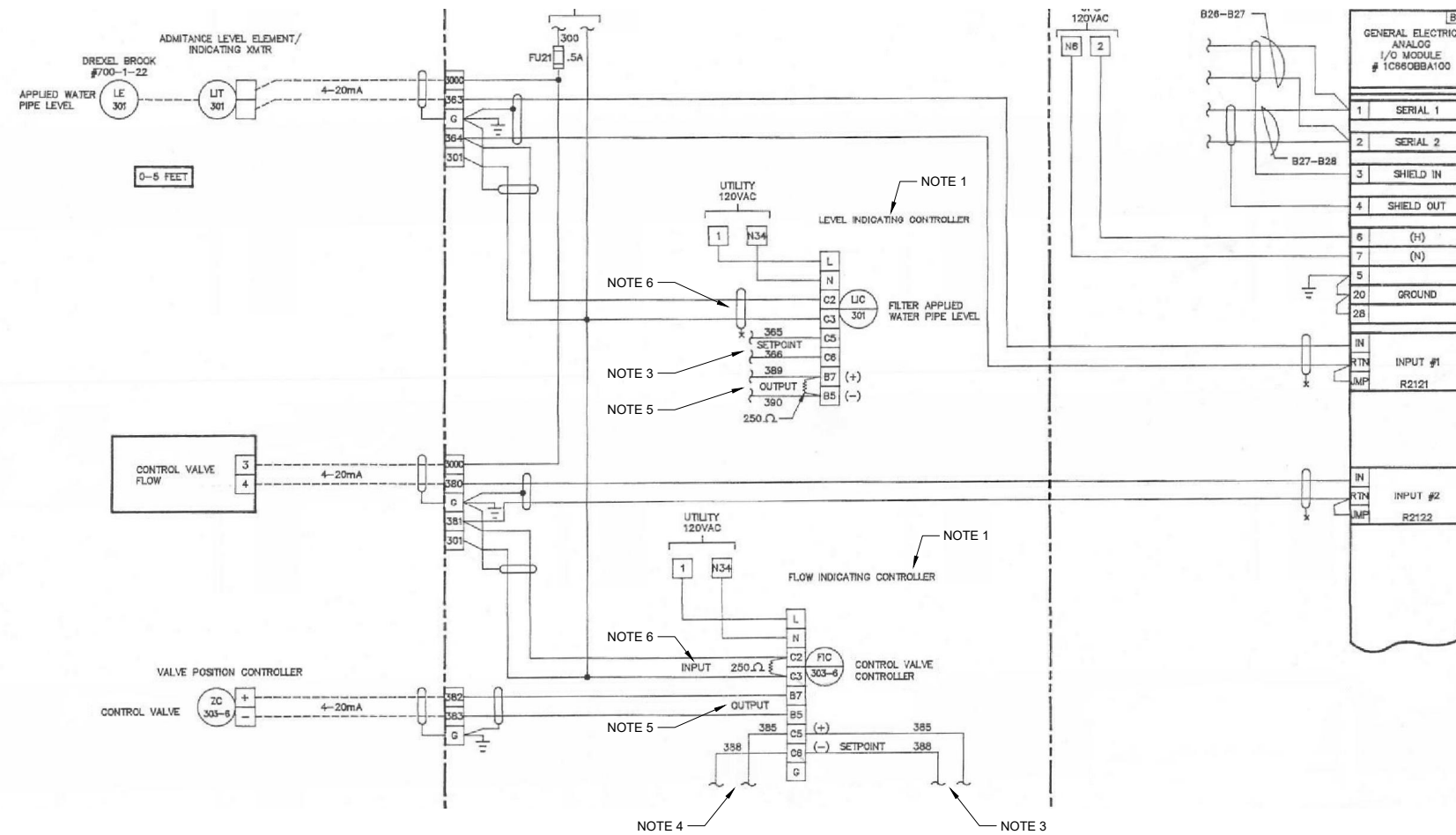
PHOTO 1
SCALE: NTS



NOTE 1 NOTE 2 NOTE 1 NOTE 1

FCC 6/8
REPLACE CONTROL STATIONS/DISPLAYS

PHOTO 2
SCALE: NTS



SAMPLE ELECTRICAL SCHEMATIC FOR
EXISTING CONTROL STATIONS/DISPLAYS
SCALE: NTS

NOTES:

1. INSTALL AND CONFIGURE NEW MANUAL CONTROL STATIONS TO REPLACE EXISTING CONTROLLERS/DISPLAYS. NEW MANUAL CONTROL STATIONS CONFIGURED FOR LOCAL SELECTION OF AUTO/MANUAL CONTROL OF THE ANALOG OUTPUT. AUTO CONTROL PASSES PAC ANALOG SIGNAL TO THE OUTPUT. DISPLAY BOTH SCALED ANALOG INPUTS ON STATION'S NUMERIC/GRAPHIC DISPLAY.
2. REPLACE EACH EXISTING F&P DUAL BAR-GRAPH DISPLAY WITH TWO NEW DIGITAL DISPLAYS. INSTALL AND CONFIGURE. MATCH EXISTING ENGINEERING UNIT SCALE.
3. 4-20 MA. ANALOG OUTPUT FROM CONTROLLER. COORDINATE REPLACEMENT WITH UPDATING CONTROLLER PROGRAMMING. PROGRAMMING PROVIDED BY OTHERS.
4. 4-20 MA. ANALOG SIGNAL LOOP CONTINUATION TO OTHER EQUIPMENT.
5. 4-20 MA. ANALOG OUTPUT FROM THE MANUAL CONTROL STATION TO THE FINAL CONTROL ELEMENT (E.G., VALVE ACTUATOR). DISPLAY OUTPUT VALUE ON MANUAL CONTROL STATION IN SCALED UNITS. COORDINATE UNITS WITH PROGRAMMER.
6. 4-20 MA. ANALOG INPUT FROM FIELD DEVICE. DISPLAY SCALED ENGINEERING UNIT VALUE ON MANUAL CONTROL STATION.
7. PROVIDE 250 OHM RESISTORS FOR CURRENT TO VOLTAGE CONVERSION AS REQUIRED FOR A FUNCTIONAL SYSTEM.

THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE

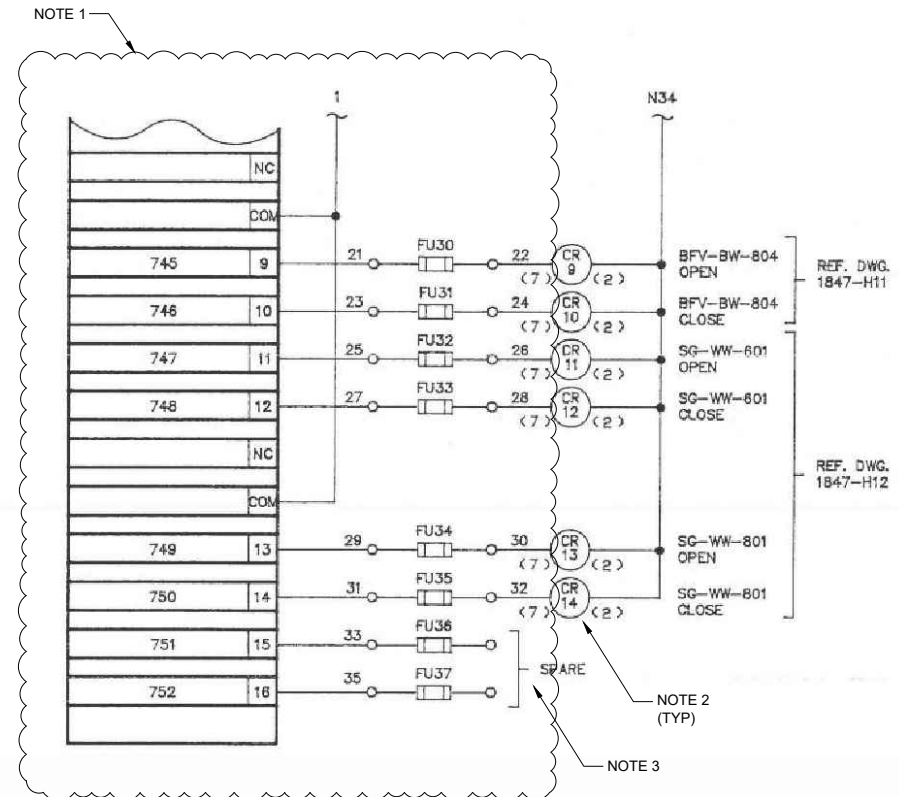
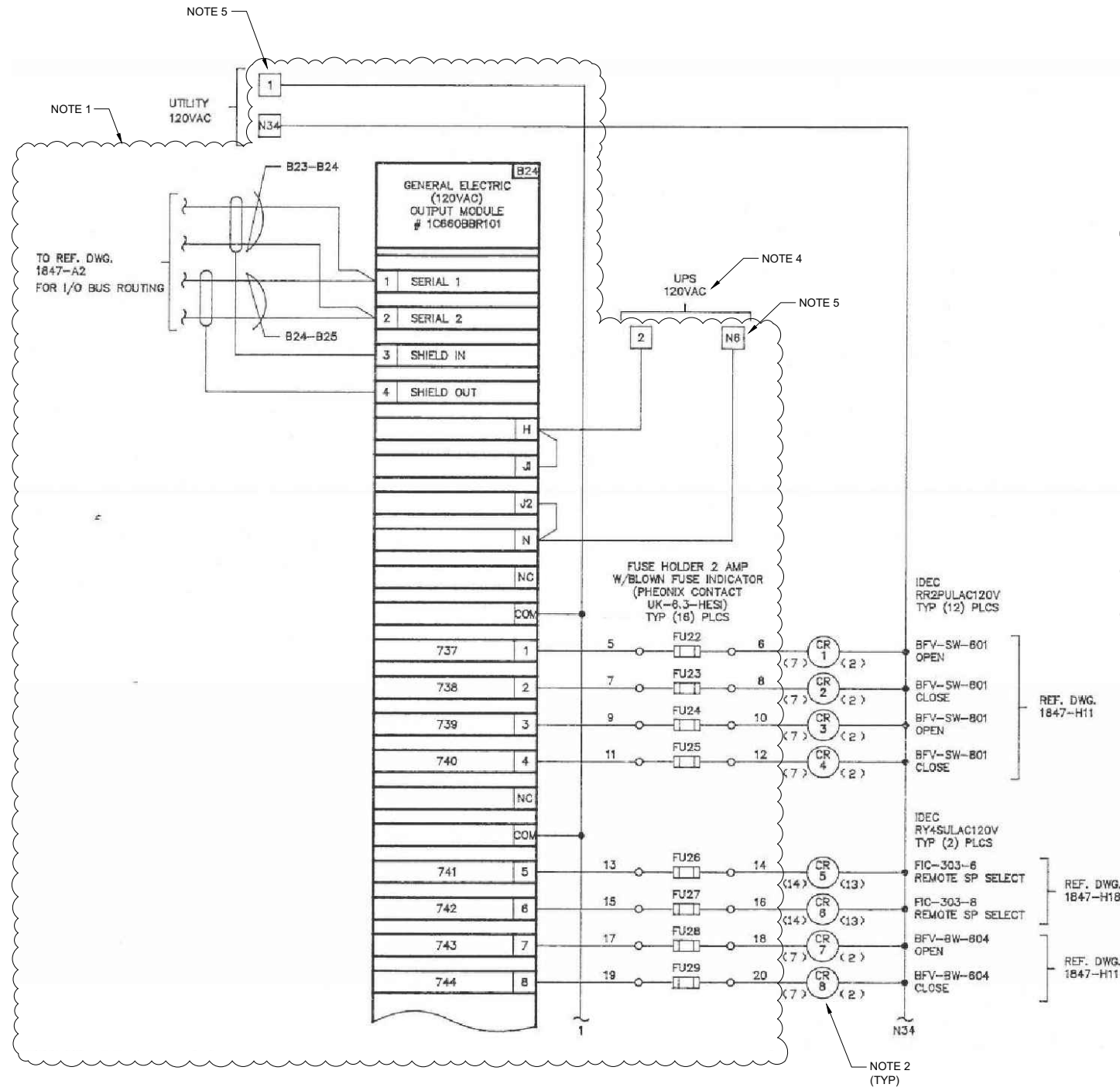
PITTSBURGH WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT
FCC CONTROL STATION/DISPLAY REPLACEMENT

DESIGNED BY: ADR
DRAWN BY: BV
CHECKED BY: MJE
SCALE: NTS
DATE: JAN 2023



REV.	DATE	BY	COMMENT





FCC EXISTING DISCRETE OUTPUT WIRING SAMPLE
SCALE: NTS

NOTES:

1. TYPICAL EXISTING GENIUS MODULE DISCRETE OUTPUT WIRING. REPLACE MODULE AND MODULE WIRING. EXISTING RELAY COILS IN AN ADJACENT CONSOLE SECTION TO BE CONNECTED TO THE NEW VERSAMAX DO MODULES MAINTAINING THE SAME CONNECTION ORDER BETWEEN THE OLD AND NEW OUTPUT MODULES.
2. EXISTING DISCRETE OUTPUT RELAYS IN THE CONSOLE SHALL CONNECT TO NEW VERSAMAX DO MODULE WIRING.
3. WIRE SPARE I/O TO TERMINAL BLOCKS IN KIND FOR THE TYPE OF I/O MODULE.
4. USE EXISTING MODULE POWER SOURCE. IF NOT REQUIRED FOR NEW VERSAMAX I/O THEN REMOVE POWER WIRING BACK TO SOURCE TERMINAL.
5. REPLACE POWER DISTRIBUTION TERMINALS.
6. REFER TO E-9 FOR SAMPLE WIRING DETAILS.



SHEET NO. **E-8**
THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE
SHEET 10 OF 14

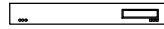
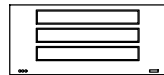

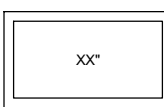
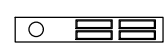
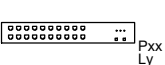

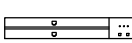
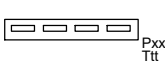










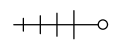

















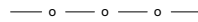





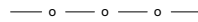





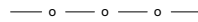





PITTSBURGH WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT

**FCC EXISTING DISCRETE
OUTPUT WIRING SAMPLE**

DESIGNED BY:	ADR	BY:	MJE	DATE:	JAN 2023
DRAWN BY:		CHECKED BY:			
SCALE:		NTS			

C:\Users\Andria\OneDrive\Documents\Projects\121098 - BNC - Pittsburg WTP Genius Bus Replacement\121098 - E-8-E-8.dwg, AndriaPrior, 1/20/23, 12:07pm
XRT\CAAA-bor.MJE California BC Logo 2line.MJE Sg

DRAWING SYMBOLS

NETWORK EQUIPMENT	ANTENNAS	ABBREVIATIONS	FACILITY IDs	DRAWING LIST																																																																																																		
 SERVER COMPUTER  SERVER COMPUTER (VIRTUAL HOST) WITH VM's LISTED  WORKSTATION COMPUTER (XX" = MONITOR SIZE)  HD DISPLAY (XX" = MONITOR SIZE)  NETWORK ATTACHED STORAGE  RACK MOUNT ETHERNET SWITCH (xx= PORTS, y = LAYER)  INDUSTRIAL DIN-RAIL MTD ETHERNET SWITCH  RACK MOUNT FIREWALL  PATCH PANEL (xx = PORTS, tt = TYPE)  PROCESS AUTOMATION CONTROLLER  RADIO  ROUTER  MEDIA CONVERTER TRANSCEIVER  MICROWAVE RADIO INTEGRAL MOUNT DISH  MICROWAVE RADIO INTEGRAL MOUNT PANEL/SECTOR ANTENNA  POWER OVER ETHERNET ADAPTER	 DISH  PANEL / SECTOR  OMNI  YAGI  LIGHTING ARRESTOR  CELLULAR	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>ANT</td><td>ANTENNA</td></tr> <tr><td>AP</td><td>ACCESS POINT</td></tr> <tr><td>CNI</td><td>CELLULAR NETWORK INTERFACE</td></tr> <tr><td>CP</td><td>CONTROL PANEL</td></tr> <tr><td>DMZ</td><td>DEMILITARIZED ZONE</td></tr> <tr><td>EOL</td><td>ELECTRONIC OVERLOAD RELAY</td></tr> <tr><td>ESW</td><td>ETHERNET SWITCH</td></tr> <tr><td>FO</td><td>FIBER OPTIC</td></tr> <tr><td>FOT</td><td>FIBER OPTIC TRANSCEIVER</td></tr> <tr><td>FPP</td><td>FIBER PATCH PANEL</td></tr> <tr><td>GB</td><td>GIGABYTES</td></tr> <tr><td>GHz</td><td>GIGAHERTZ</td></tr> <tr><td>HMI</td><td>HUMAN MACHINE INTERFACE</td></tr> <tr><td>ICS</td><td>INDUSTRIAL CONTROL SYSTEM</td></tr> <tr><td>IP</td><td>INTERNET PROTOCOL</td></tr> <tr><td>IPSEC</td><td>INTERNET PROTOCOL SECURITY</td></tr> <tr><td>LAN</td><td>LOCAL AREA NETWORK</td></tr> <tr><td>MB</td><td>MEGABYTES</td></tr> <tr><td>MHz</td><td>MEGAHERTZ</td></tr> <tr><td>MM</td><td>MULTI-MODE</td></tr> <tr><td>NAS</td><td>NETWORK ATTACHED STORAGE</td></tr> <tr><td>NIC</td><td>NETWORK INTERFACE CARD</td></tr> <tr><td>OIT</td><td>OPERATOR INTERFACE TERMINAL</td></tr> <tr><td>PAC</td><td>PROCESS AUTOMATION CONTROLLER</td></tr> <tr><td>PLC</td><td>PROGRAMMABLE LOGIC CONTROLLER</td></tr> <tr><td>PM</td><td>ELECTRONIC POWER METER</td></tr> <tr><td>PMP</td><td>POINT TO MULTI-POINT</td></tr> <tr><td>PTP</td><td>POINT TO POINT</td></tr> <tr><td>RAD</td><td>RADIO</td></tr> <tr><td>RIO</td><td>REMOTE I/O</td></tr> <tr><td>RM</td><td>RACK MOUNT</td></tr> <tr><td>RPT</td><td>REPEATER</td></tr> <tr><td>NFW</td><td>NETWORK FIREWALL</td></tr> <tr><td>NRT</td><td>NETWORK ROUTER</td></tr> <tr><td>RVSS</td><td>REDUCED VOLTAGE SOFT STARTER</td></tr> <tr><td>SFP</td><td>SMALL FORM-FACTOR PLUGGABLE TRANSCIEVER</td></tr> <tr><td>SM</td><td>SINGLE-MODE</td></tr> <tr><td>SVR</td><td>SERVER</td></tr> <tr><td>TSR</td><td>TIME SERVER</td></tr> <tr><td>VFD</td><td>VARIABLE FREQUENCY DRIVE</td></tr> <tr><td>VLAN</td><td>VIRTUAL LOCAL AREA NETWORK</td></tr> <tr><td>VSVR</td><td>VIRTUAL SERVER</td></tr> <tr><td>WAN</td><td>WIDE AREA NETWORK</td></tr> <tr><td>WS</td><td>WORKSTATION</td></tr> </table>	ANT	ANTENNA	AP	ACCESS POINT	CNI	CELLULAR NETWORK INTERFACE	CP	CONTROL PANEL	DMZ	DEMILITARIZED ZONE	EOL	ELECTRONIC OVERLOAD RELAY	ESW	ETHERNET SWITCH	FO	FIBER OPTIC	FOT	FIBER OPTIC TRANSCEIVER	FPP	FIBER PATCH PANEL	GB	GIGABYTES	GHz	GIGAHERTZ	HMI	HUMAN MACHINE INTERFACE	ICS	INDUSTRIAL CONTROL SYSTEM	IP	INTERNET PROTOCOL	IPSEC	INTERNET PROTOCOL SECURITY	LAN	LOCAL AREA NETWORK	MB	MEGABYTES	MHz	MEGAHERTZ	MM	MULTI-MODE	NAS	NETWORK ATTACHED STORAGE	NIC	NETWORK INTERFACE CARD	OIT	OPERATOR INTERFACE TERMINAL	PAC	PROCESS AUTOMATION CONTROLLER	PLC	PROGRAMMABLE LOGIC CONTROLLER	PM	ELECTRONIC POWER METER	PMP	POINT TO MULTI-POINT	PTP	POINT TO POINT	RAD	RADIO	RIO	REMOTE I/O	RM	RACK MOUNT	RPT	REPEATER	NFW	NETWORK FIREWALL	NRT	NETWORK ROUTER	RVSS	REDUCED VOLTAGE SOFT STARTER	SFP	SMALL FORM-FACTOR PLUGGABLE TRANSCIEVER	SM	SINGLE-MODE	SVR	SERVER	TSR	TIME SERVER	VFD	VARIABLE FREQUENCY DRIVE	VLAN	VIRTUAL LOCAL AREA NETWORK	VSVR	VIRTUAL SERVER	WAN	WIDE AREA NETWORK	WS	WORKSTATION	<p style="text-align: center;">FACILITY TYPE LEGEND</p> <table style="width: 100%;"> <tr><td></td><td>TREATMENT PLANT</td></tr> <tr><td></td><td>REMOTE PROCESS FACILITY</td></tr> <tr><td></td><td>RESERVOIR</td></tr> <tr><td></td><td>TOWER / REPEATER</td></tr> <tr><td></td><td>SUPERVISORY FACILITY</td></tr> </table>		TREATMENT PLANT		REMOTE PROCESS FACILITY		RESERVOIR		TOWER / REPEATER		SUPERVISORY FACILITY	<p style="text-align: center;">DRAWING LIST</p>
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	CELLULAR SIGNAL																																																																																																					


SHEET NO. GN-1
SHEET 12 OF 14


THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE


DESIGNED BY: ADR
 DRAWN BY: BY
 CHECKED BY: MJE
 SCALE: NTS
 DATE: JAN 2023

PITTSBURG WATER TREATMENT PLANT
 GENIUS BUS REPLACEMENT PROJECT


NETWORK
 SYMBOLS AND ABBREVIATIONS







REV.	DATE	BY	COMMENT



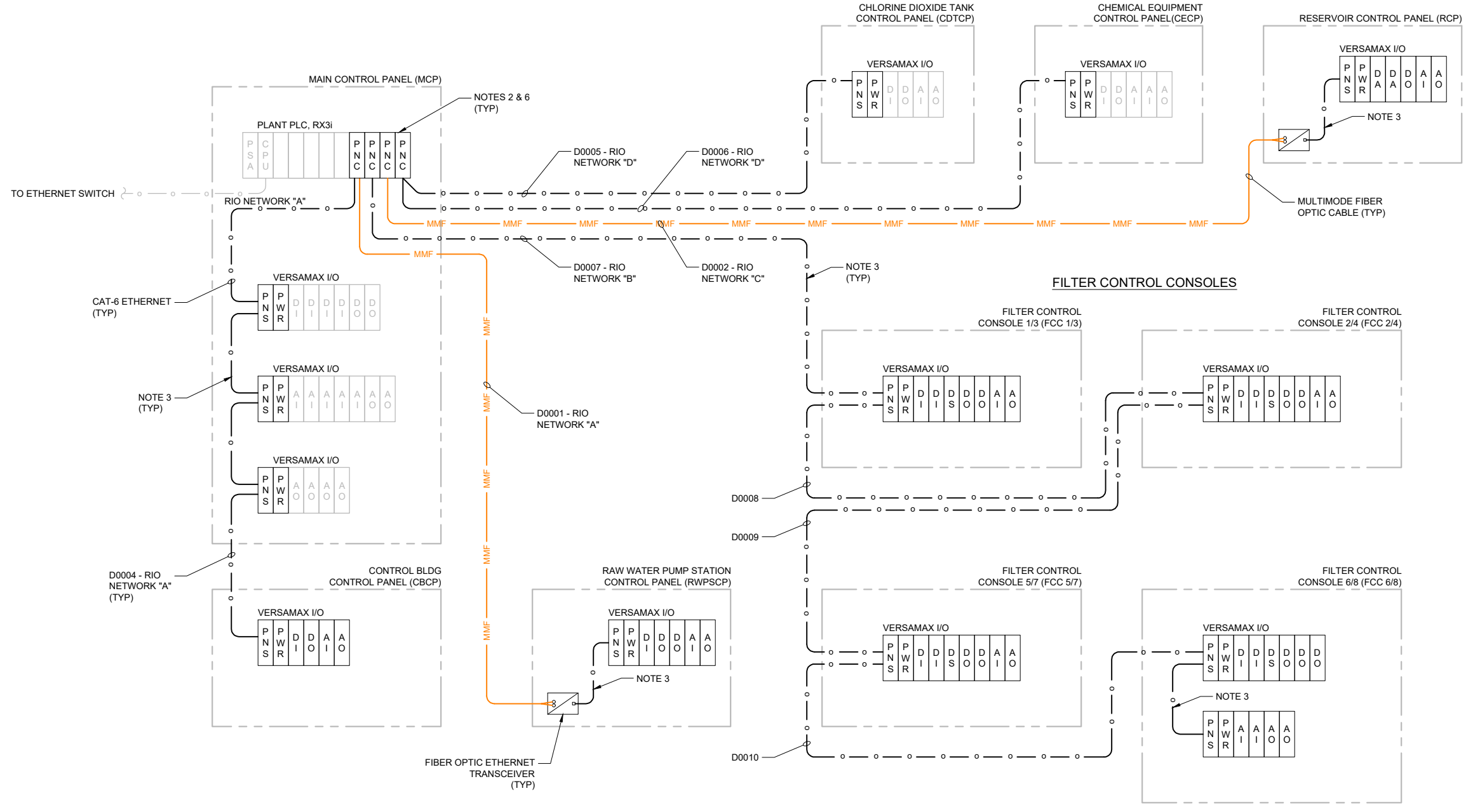
THIS BAR SCALES EXACTLY ONE INCH AT FULL SCALE

PITTSBURG WATER TREATMENT PLANT GENIUS BUS REPLACEMENT PROJECT
WTP ETHERNET REMOTE I/O NETWORK DIAGRAM

DESIGNED BY: ADR
 DRAWN BY: BY
 CHECKED BY: MJE
 SCALE: NTS
 DATE: JAN 2023



REV.	DATE	BY	COMMENT



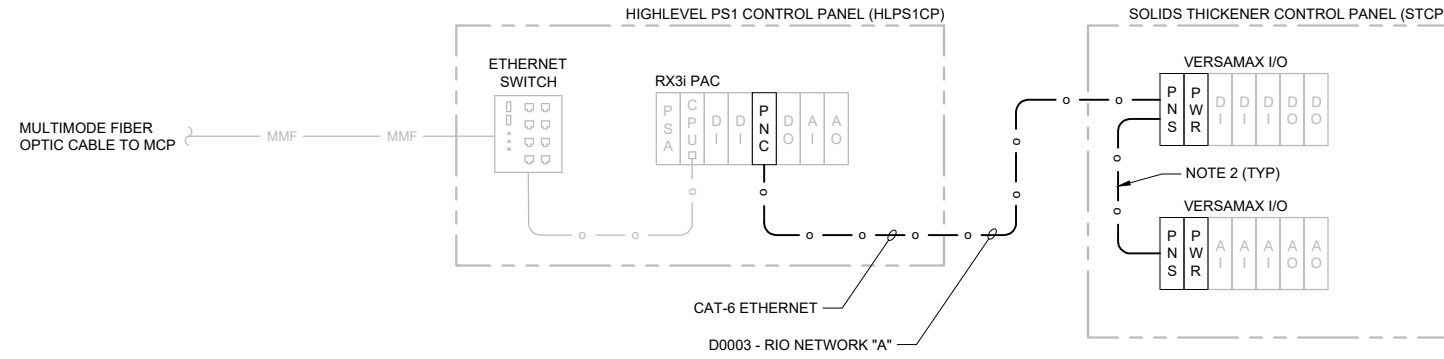
NOTES:

- ITEMS SHOWN IN DARK OR COLOR LINEWORK ARE NEW WORK AND THE ITEMS THAT ARE GRAY ARE EXISTING.
- PROVIDER COMPATIBLE FIBER SFP MODULES FOR PNC MULTI-MODE FIBER CONNECTIONS.
- USE CAT-6A PROFINET S/FTP TYPE A CABLES FOR ALL COPPER DATA CABLES. USE SHIELDED RJ-45 CONNECTORS.
- ALL CABLES SHALL BE TAGGED/LABELED ON BOTH ENDS FOR EASE OF TERMINATION AND IDENTIFICATION.
- ALL INSTALLED ETHERNET AND FIBER OPTIC CABLES SHALL BE TESTED AFTER INSTALLATION END-TO-END BEFORE CONNECTING TO EQUIPMENT.
- MIGRATE ALL PANELS AND PROFINET DROPS FOR ONE NETWORK COMPLETELY BEFORE STARTING THE NEXT.

LEGEND:

ID	DESCRIPTION
PSA	120VAC RX3i Rack Power Supply
CPU	Controller, 1GHz CPU, 64MB RAM
PNC	Profinet Controller
PNS	Profinet Scanner
PWR	120VAC Expansion Base Power Supply
DA	Discrete Input, 120VAC, 16-Point
DI	Discrete Input, 24VDC, 32-Point
DO	Discrete Output, RELAY, 16-Point
DS	Discrete Output, 24VDC Sourced, 16-Point
AI	Analog Input, 16-channel current
AO	Analog Output, 8-channel



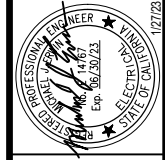


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DESIGNED BY:	ADR
DRAWN BY:	BY
CHECKED BY:	MJE
SCALE:	NTS
DATE:	JAN 2023

PITTSBURG WATER TREATMENT PLANT
GENIUS BUS REPLACEMENT PROJECT

HPLS1 ETHERNET REMOTE
I/O NETWORK DIAGRAM

THIS BAR
SCALES EXACTLY
ONE INCH AT
FULL SCALE