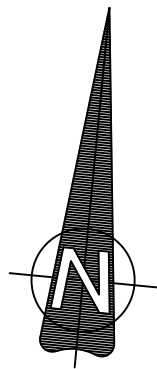
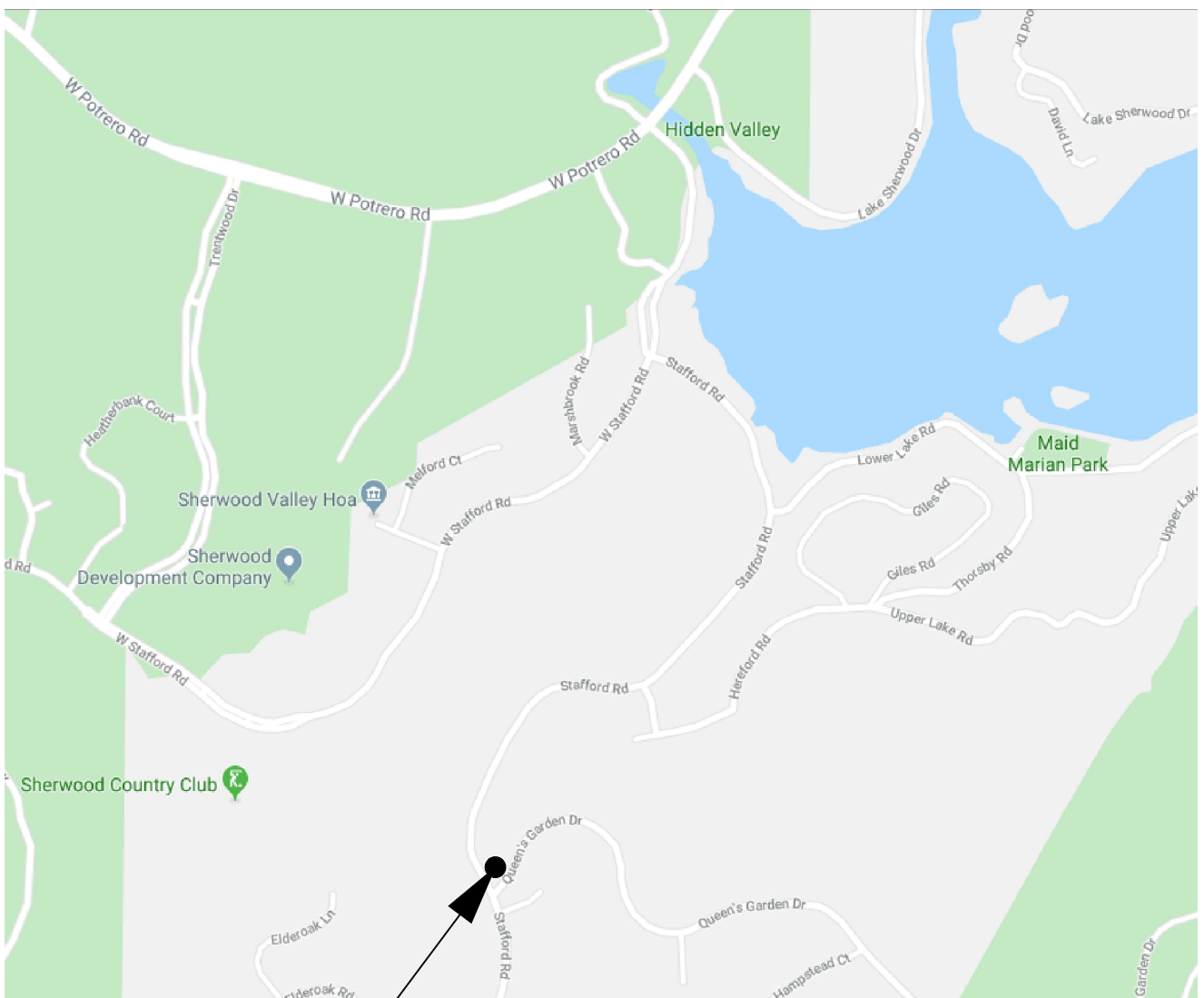


VICINITY MAP

PROJECT
LOCATION

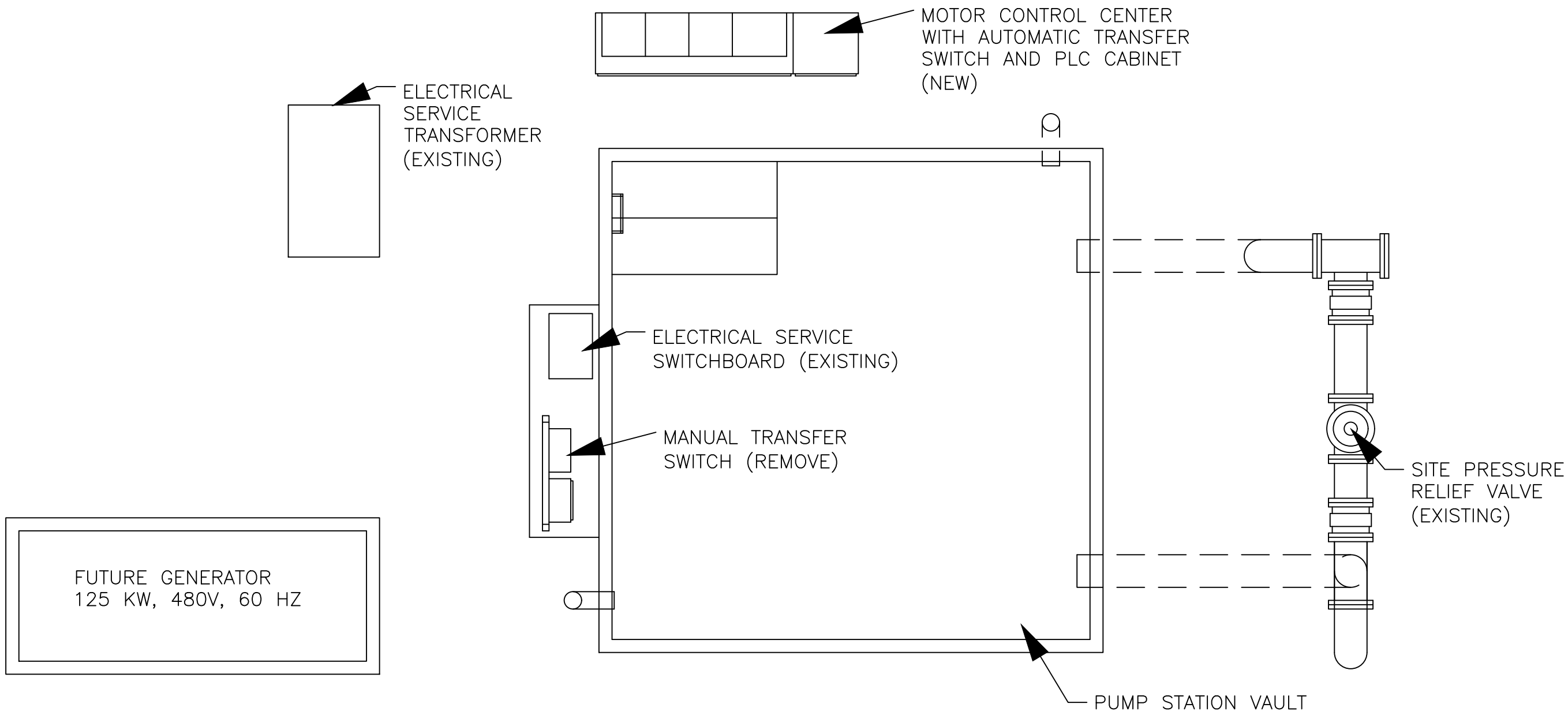


VENTURA COUNTY WATERWORKS DISTRICT NO. 38



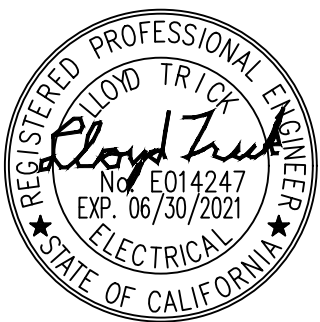
SITE MAP
2624 STAFFORD ROAD,
LAKE SHERWOOD, CA

ZONE II BOOSTER PUMP STATION UPGRADE



BOOSTER PUMP STATION FACILITIES MAP

SHEET	DESCRIPTION
1	TITLE SHEET, SITE LOCATION AND TABLE OF CONTENTS
2	ELECTRICAL AND CONTROLS SYMBOL AND ABBREVIATION LEGENDS
3	SITE LAYOUT, EQUIPMENT LOCATIONS, AND PROJECT SCOPE OF WORK
4	ELECTRICAL SINGLE LINE, GROUNDING, AND PANEL BOARD SCHEDULE
5	MOTOR CONTROL CENTER LAYOUT, HOUSEKEEPING PAD, AND CONDUIT SCHEDULE
6	BOOSTER PUMPS 1 AND 2 CONTROL SCHEMATIC AND INSTALLATION DETAILS
7	MISCELLANEOUS ELECTRICAL SCHEMATICS
8	PROCESS AND INSTRUMENTATION DIAGRAM
9	PLC CONTROL PANEL DETAILS PANEL LAYOUT AND PARTS LIST
10	PLC CONTROL PANEL DETAILS AC POWER DISTRIBUTION WIRING
11	PLC CONTROL PANEL DETAILS DC POWER DISTRIBUTION WIRING
12	PLC CONTROL PANEL DETAILS ANALOG AND DIGITAL INPUT WIRING
13	PLC CONTROL PANEL DETAILS DIGITAL OUTPUT WIRING
14	INSTRUMENTATION INSTALLATION DETAILS



INSTRUMENTATION SOCIETY OF AMERICA
IDENTIFICATION LETTERS

LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED	MODIFIER	READOUT, PASSIVE	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR ELEMENT		
F	FLOW RATE	RATIO			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		TEST POINT		
Q	QUANTITY	INTEGRATE, TOTALIZE		INTEGRATE, TOTALIZE	
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE	Y AXIS		RELAY	
Z	POSITION	Z AXIS		DRIVER, ACTUATOR	

WIRE COLOR LEGEND

480 VAC POWER 3Ø, BROWN, ORANGE, YELLOW, GREEN
208 VAC POWER 3Ø, RED, BLACK, BLUE, WHITE, GREEN
120 VAC POWER 1Ø, BLACK, WHITE GREEN
120 VAC CONTROL, RED
24 VDC, BLUE
0 VDC, WHITE/BLUE
INSTRUMENTATION
WHITE OR RED +
BLACK -

CONDUIT LEGEND

———— CONDUITS ABOVE GRADE,
ROOF OR WALL MOUNTED
— — — CONDUITS BELOW GRADE
OR PUMP STATION FLOOR

COMMON TERMS

NC	NORMALLY CLOSED
NO	NORMALLY OPEN
JS	VOLTAGE SWITCH
LE	LEVEL ELEMENT
LT	LEVEL TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH HIGH
FE	FLOW ELEMENT
FT	FLOW TRANSMITTER
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
PSHL	PRESSURE SWITCH HIGH/LOW
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TT	TEMPERATURE TRANSMITTER
TSH	TEMPERATURE SWITCH HIGH
TSL	TEMPERATURE SWITCH LOW
RSL	RAW SLUDGE LINE
DSL	DIGESTER SLUDGE LINE
DG	DIGESTER GAS
REW	RECLAIMED WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
MOD	MODULATING OPERATION
O/C	OPEN/CLOSE OPERATION
LOR	LOCAL OFF REMOTE
OOC	OPEN OFF CLOSE
HOA	HAND OFF AUTO
OOC	OPEN OFF CLOSE
LOS	LOCK OUT STOP
GF	GROUND FAULT
M	POWER METER

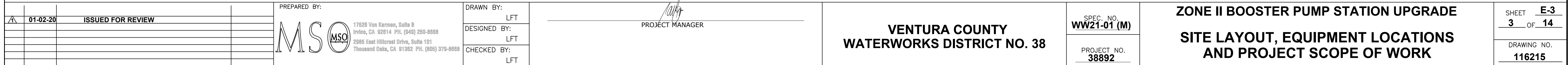
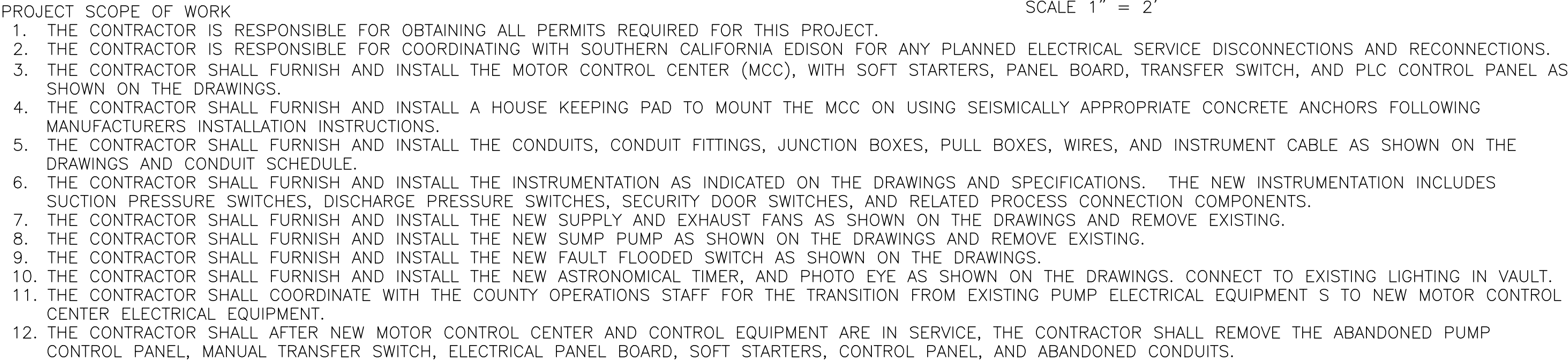
PROCESS SYMBOLS

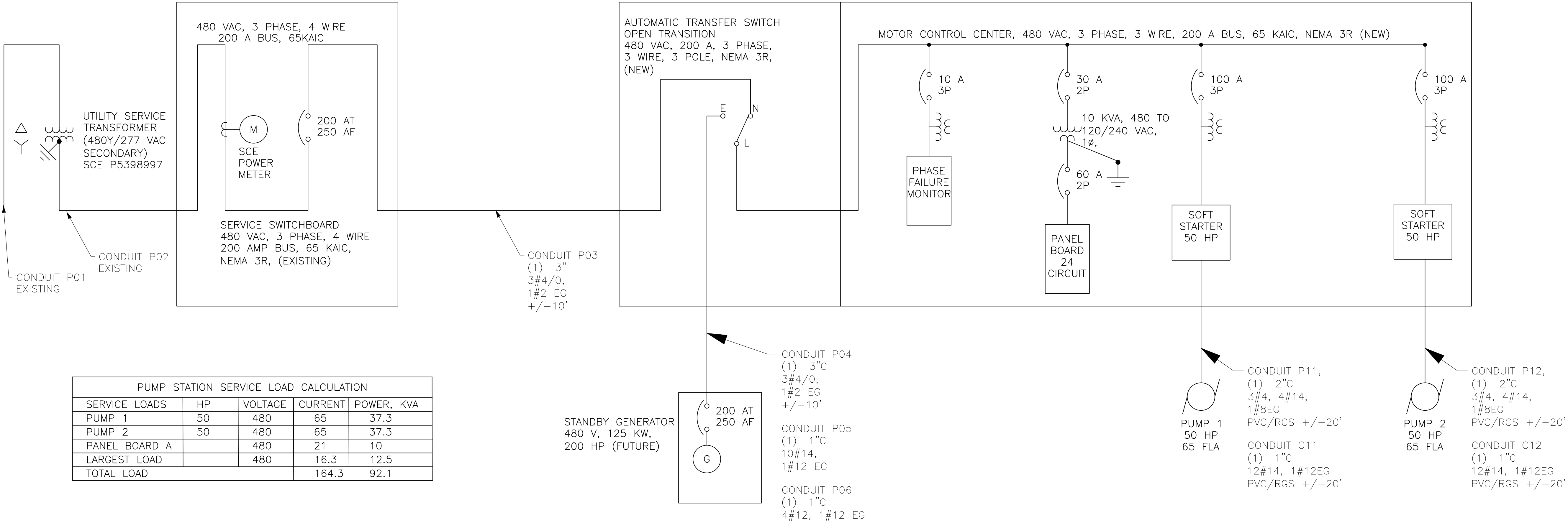
	BALL VALVE, NORMALLY CLOSED
	BALL VALVE, NORMALLY OPEN
	PLUG VALVE
	THREE WAY VALVE
	CHECK VALVE
	GATE VALVE
	GLOBE VALVE
	MOTORIZED VALVE OPERATOR
	MANUAL VALVE OPERATOR
	SOLENOID OPERATOR
	DRAIN
	PIPE BLIND FLANGE
	PIPE FLANGE
	PIPE UNION
	PIPE TEE
	PIPE REDUCER
	MAGNETIC FLOW METER
	PUMP, MIXER
	FIELD INSTRUMENT
	INSTRUMENT

ELECTRICAL SYMBOLS

	THERMAL SWITCH, NORMALLY CLOSED
	THERMAL SWITCH, NORMALLY OPEN
	PRESSURE SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	TIME DELAY, NORMALLY CLOSED
	TIME DELAY, NORMALLY OPEN
	FLOW SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	LEVEL SWITCH, NORMALLY CLOSED
	LEVEL SWITCH, NORMALLY OPEN
	POSITION SWITCH, NORMALLY CLOSED
	POSITION SWITCH, NORMALLY OPEN
	RELAY CONTACT, NORMALLY CLOSED
	RELAY CONTACT, NORMALLY OPEN
	THREE POSITION HAND SWITCH
	TWO POSITION HAND SWITCH
	PUSH BUTTON, NORMALLY CLOSED
	PUSH BUTTON, NORMALLY OPEN
	PUSH BUTTON, NORMALLY OPEN/CLOSED
	INDICATOR LAMP
	PUSH TO TEST INDICATOR LAMP
	CONTROL RELAY
	FUSE
	CIRCUIT BREAKER
	DISCONNECT
	MOTOR
	STARTER OVERLOAD
	CONTROL OR POWER TRANSFORMER
	GROUND
	SOLENOID VALVE
	LIGHT SWITCH
	CEILING LIGHT
	EXIT SIGN
	RECEPTACLE



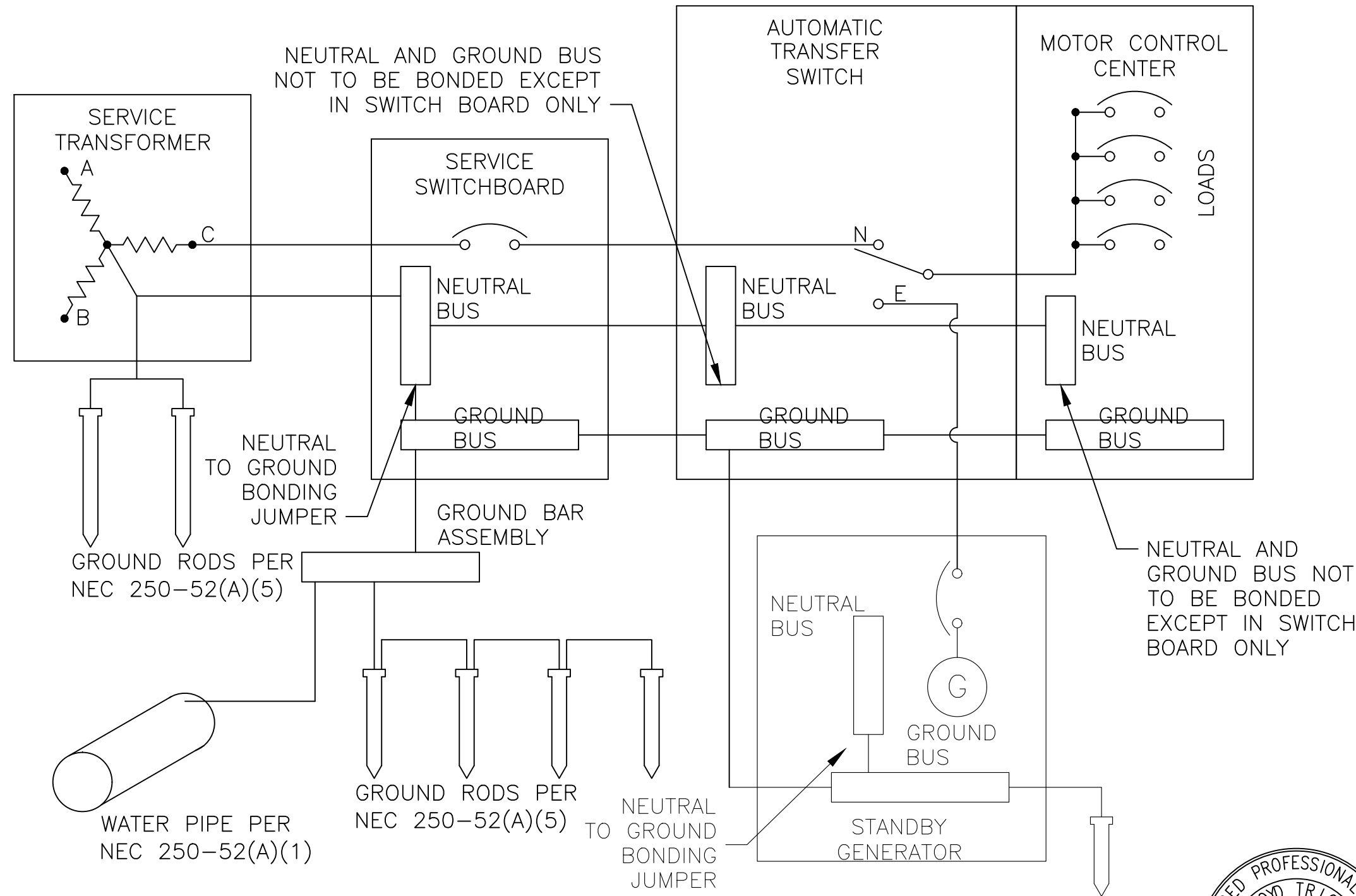




PUMP STATION SERVICE LOAD CALCULATION				
SERVICE LOADS	HP	VOLTAGE	CURRENT	POWER, KVA
PUMP 1	50	480	65	37.3
PUMP 2	50	480	65	37.3
PANEL BOARD A		480	21	10
LARGEST LOAD		480	16.3	12.5
TOTAL LOAD			164.3	92.1

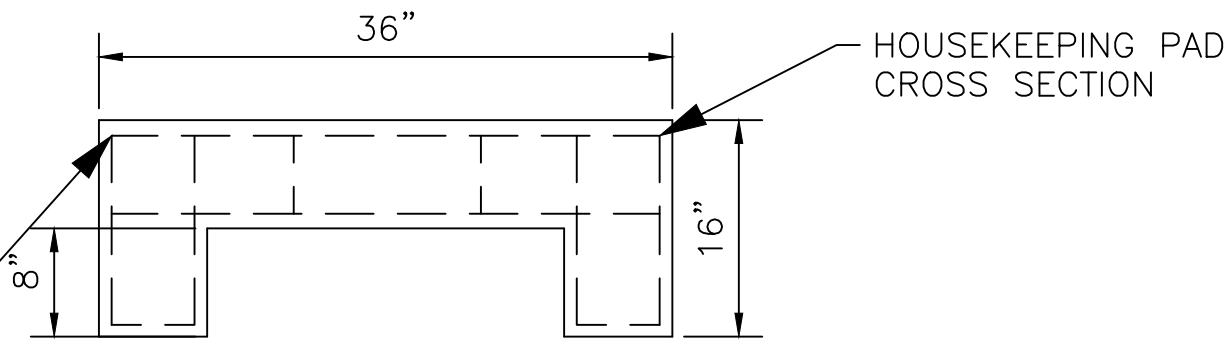
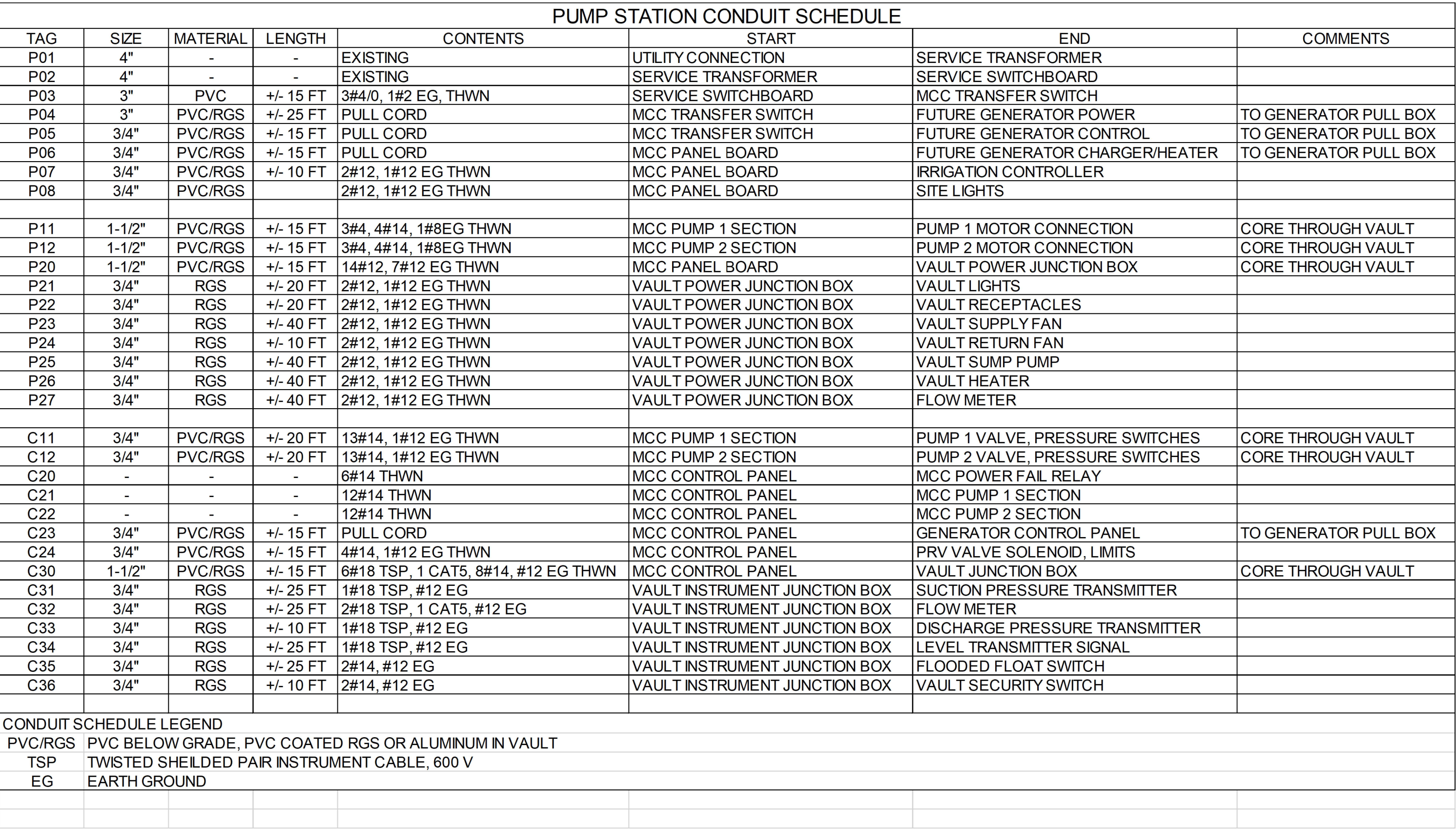
PUMP STATION SINGLE LINE DIAGRAM (NEW)

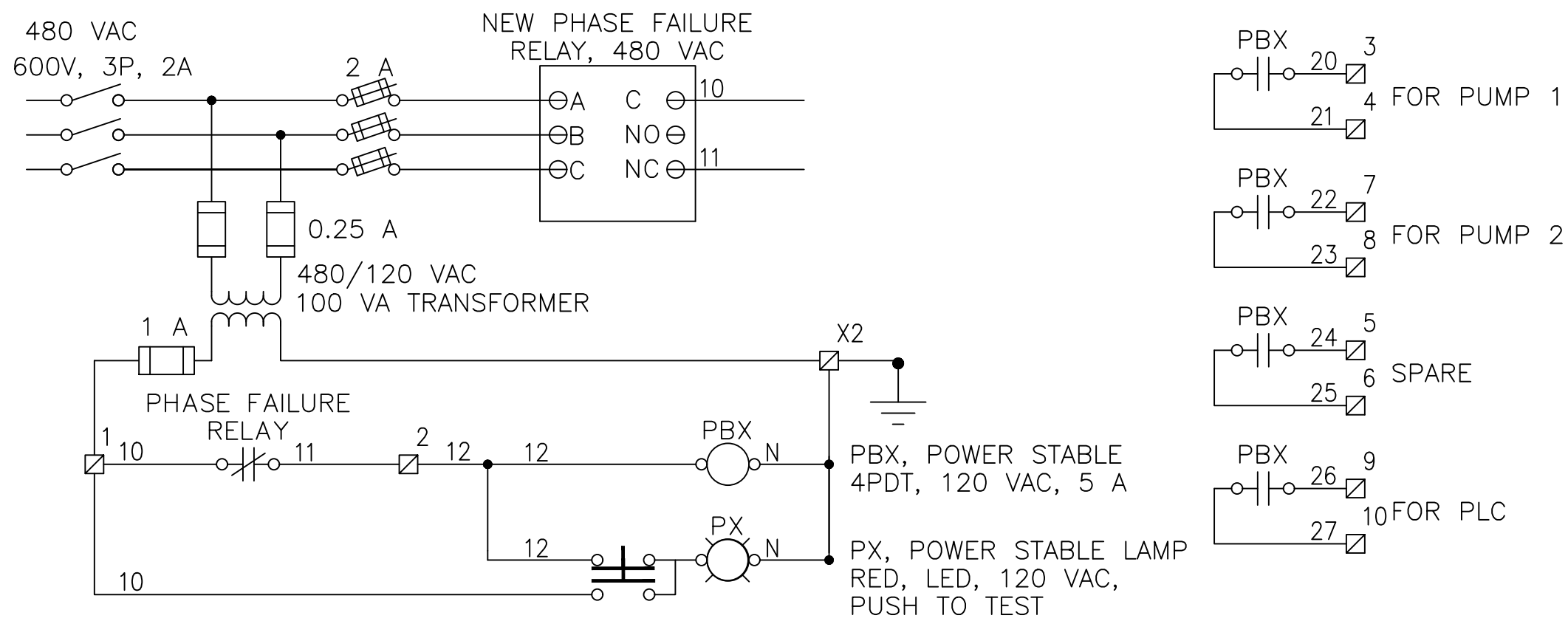
PUMP STATION PANELBOARD SCHEDULE									
CIRCUIT	SIZE	LOAD	A	B	A	B	LOAD	SIZE	CIRCUIT
1	20	VAULT LIGHTS	288		1200		GENERATOR HEATER	20	2
3	20	VAULT RECEPTACLES		600		1200	GENERATOR CHARGER	20	4
5	20	VAULT SUMP PUMP	600		120		IRRIGATION CONTROLLER	20	6
6	20	VAULT SUPPLY FAN		696		60	SITE LIGHTING (LED)	20	8
9	20	VAULT RETURN FAN	696		375		MCC HEATERS	20	10
11	20	VAULT SPACE HEATER		600		120	MCC FANS	20	12
13	20	VAULT SPACE HEATER	600		360		CONTROL PANEL	20	14
15	20	SPARE					SPARE	20	16
17	20	SPARE					SPARE	20	18
19									20
21									22
23									24
		PHASE TOTALS	2184	1896	2055	1380			
		TOTAL VA	7515						



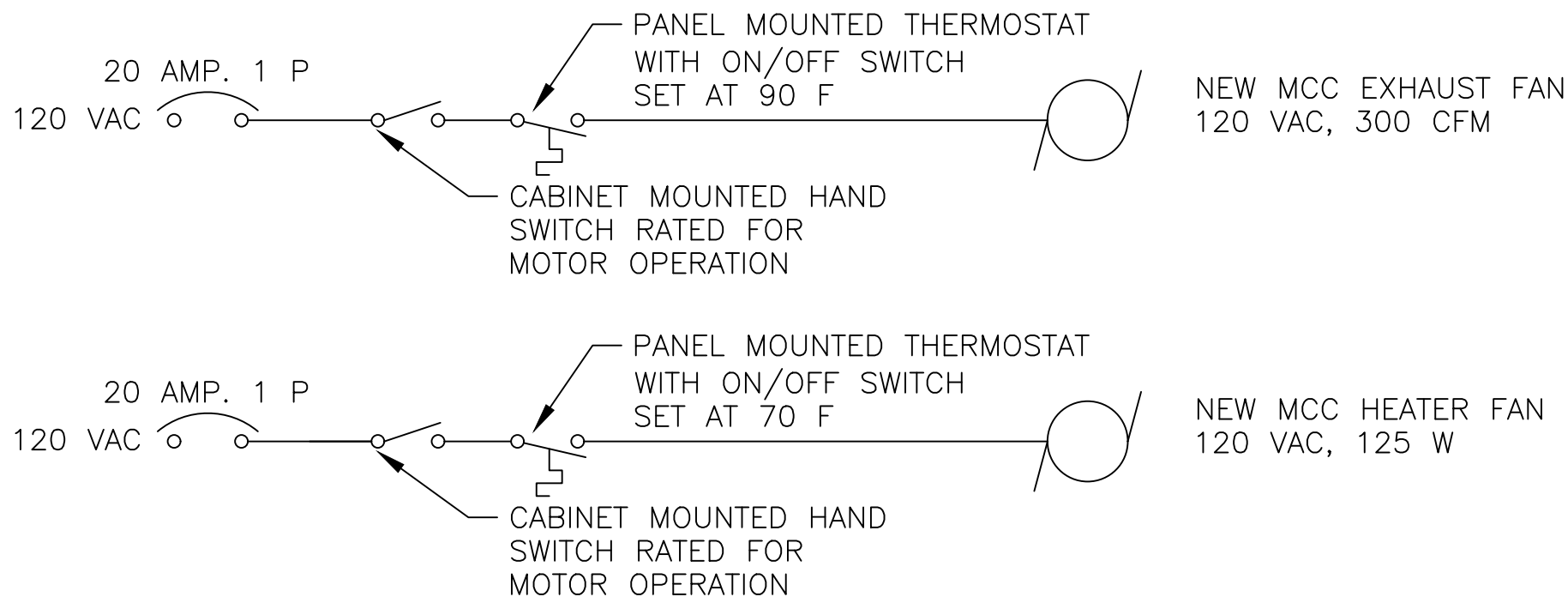
ELECTRICAL GROUNDING SCHEMATIC



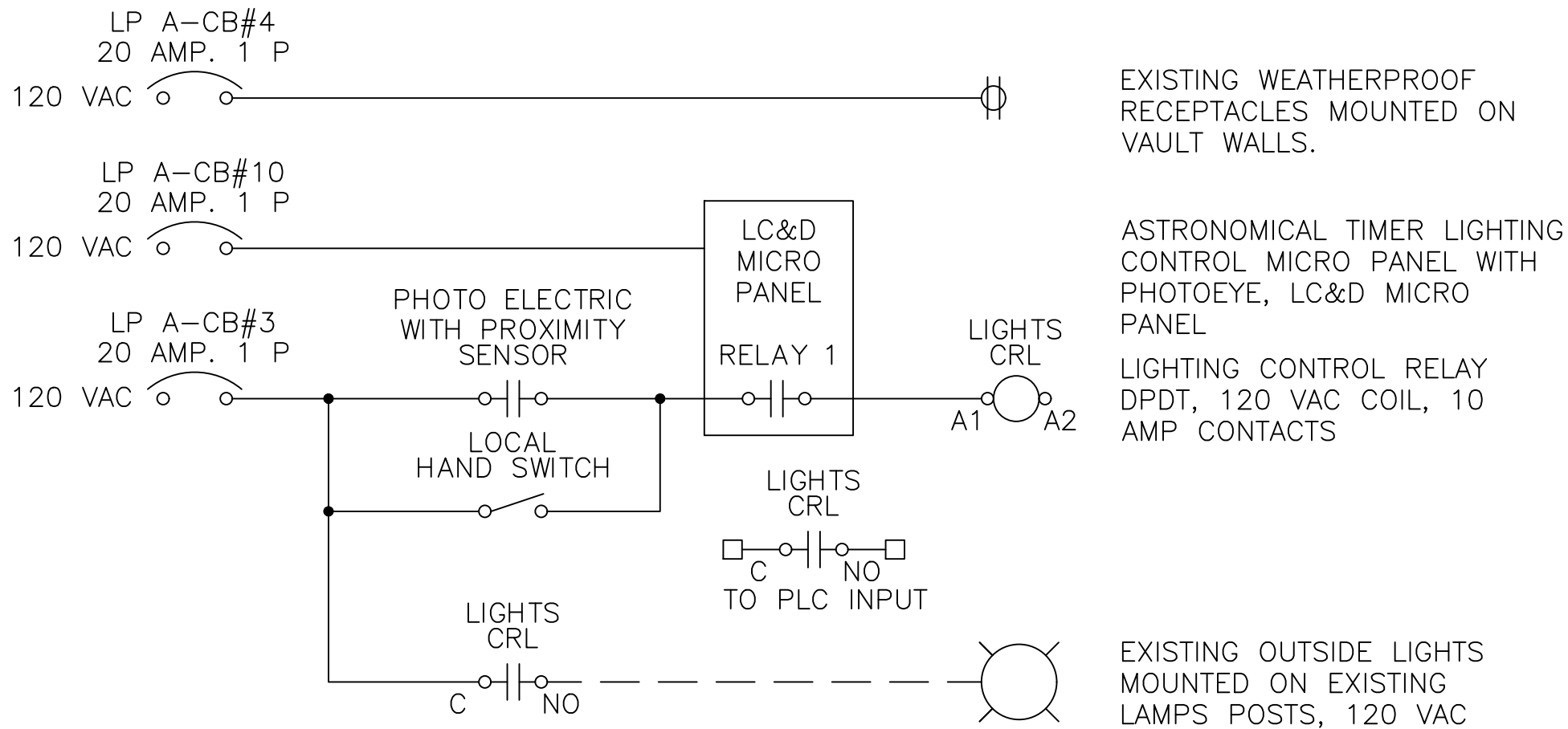




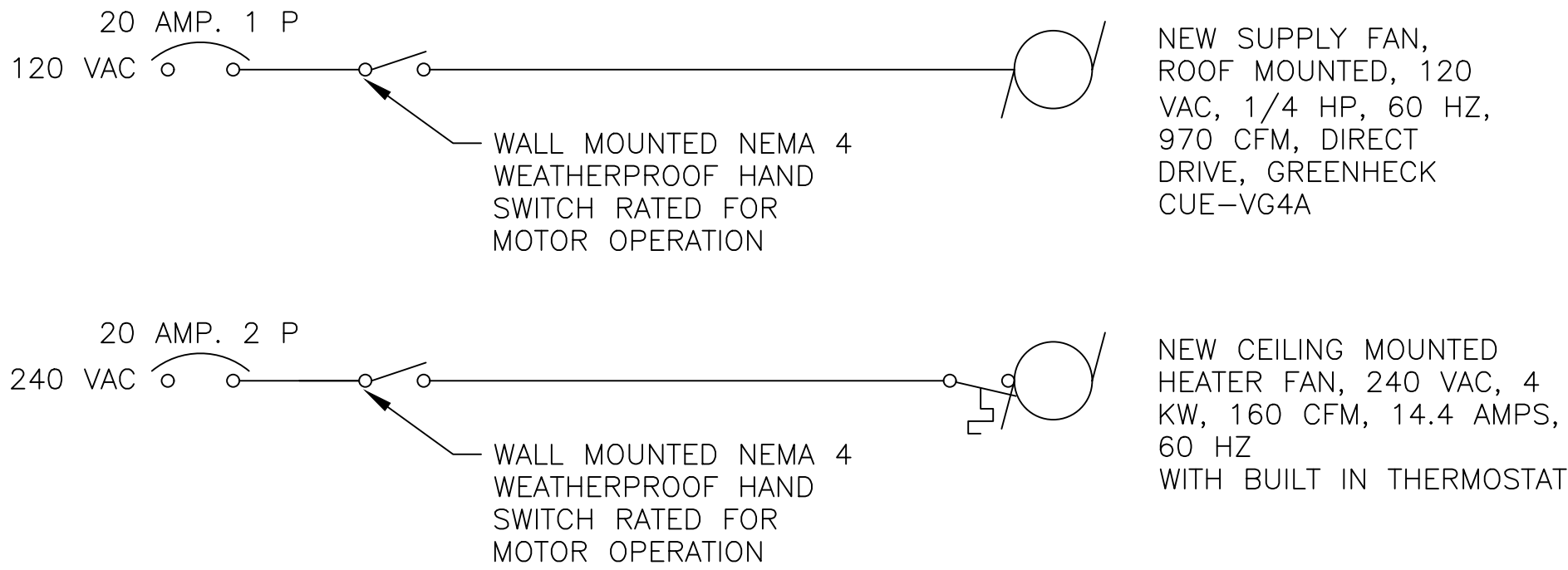
PHASE MONITOR WIRING DETAILS (NEW)



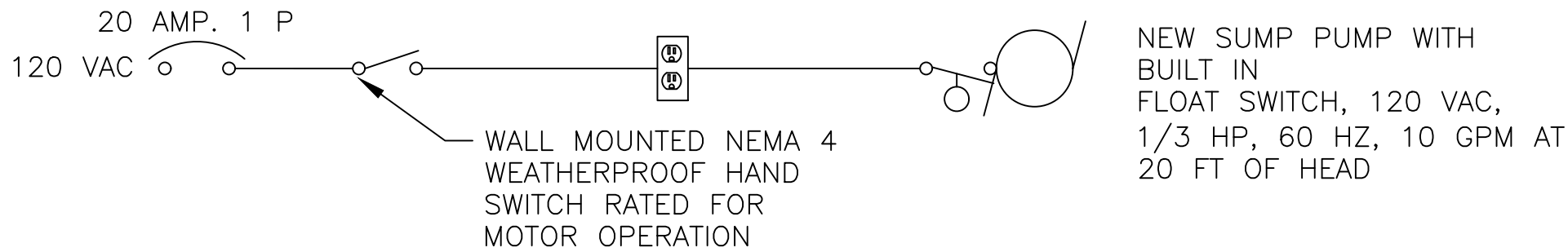
MCC EXHAUST FAN AND HEATER FAN WIRING SCHEMATICS (NEW)
TYPICAL FOR EACH MOTOR CONTROL CENTER SECTION



OUTSIDE LIGHTS AND RECEPTACLES WIRING SCHEMATICS (NEW)



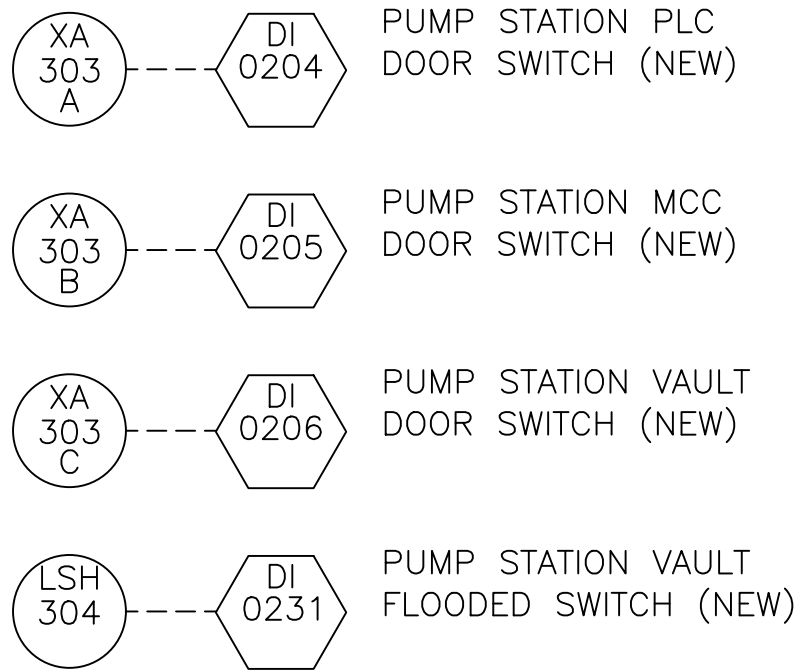
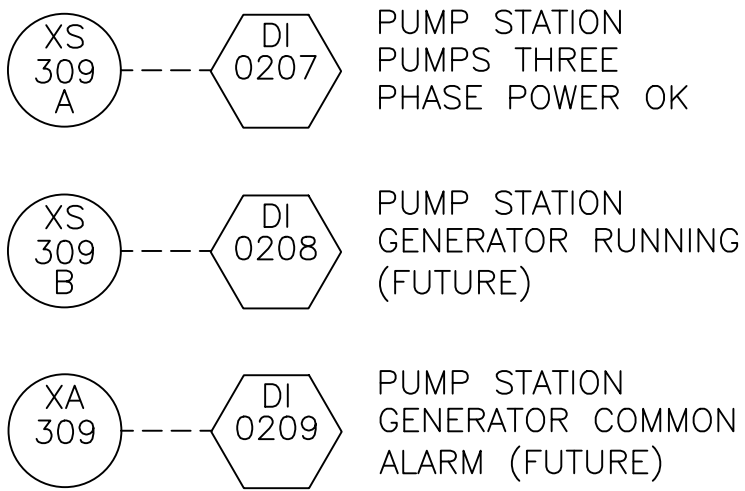
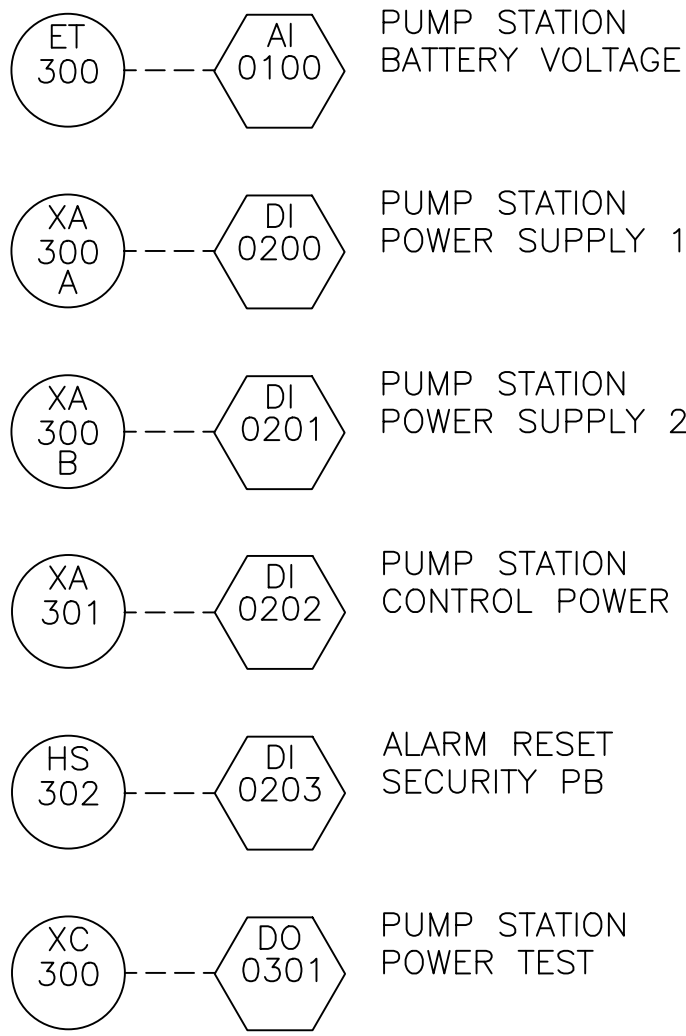
VAULT SUPPLY FAN AND HEATER FAN WIRING SCHEMATICS (NEW)



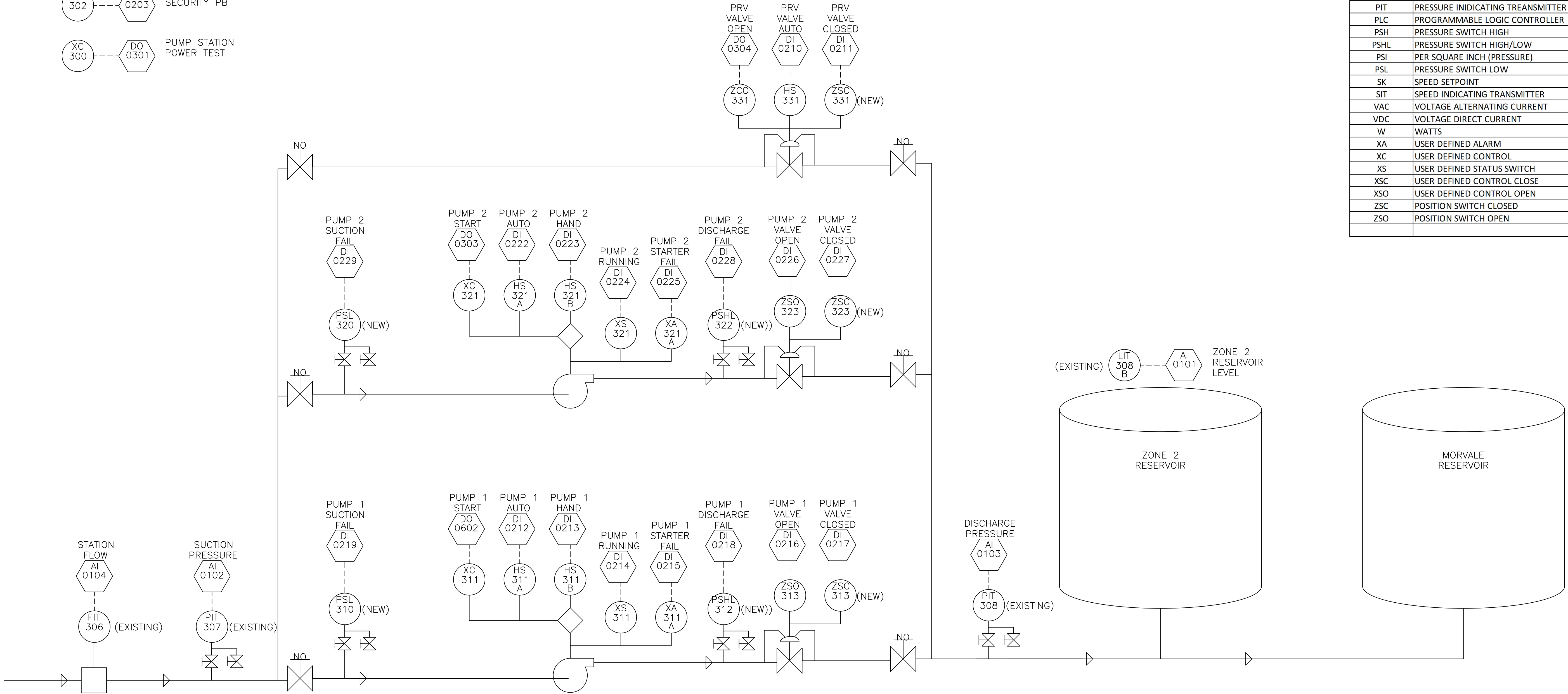
VAULT SUMP PUMP WIRING SCHEMATICS (NEW)



01-02-20 ISSUED FOR REVIEW				PREPARED BY: MSO 17528 Von Karman, Suite B Irvine, CA 92614 PH: (949) 250-8858 2885 East Hillcrest Drive, Suite 101 Thousand Oaks, CA 91322 PH: (805) 379-8858		DRAWN BY: LFT DESIGNED BY: LFT CHECKED BY: LFT PROJECT MANAGER		SPEC. NO. WW21-01 (M) PROJECT NO. 38892		ZONE II BOOSTER PUMP STATION UPGRADE MISCELLANEOUS ELECTRICAL DETAILS		SHEET E-7 7 OF 14 DRAWING NO. 116219	
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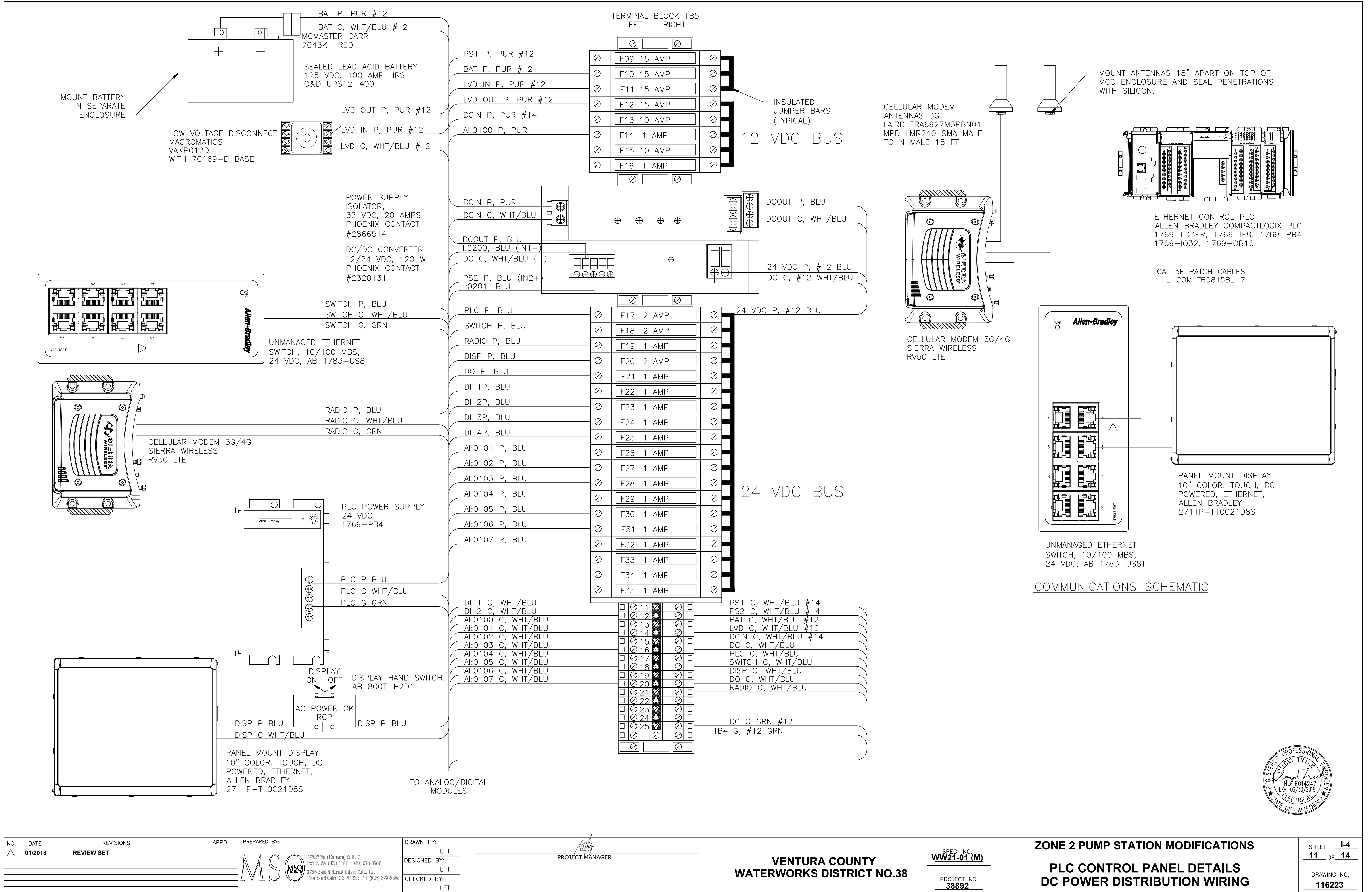


ABBREVIATION	DESCRIPTION
AI	ANALOG INPUT
AIT	ANALYTICAL INDICATING TRANSMITTER
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DPIT	DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
ET	VOLTAGE TRANSMITTER
FIT	FLOW INDICATING TREANSMITTER
GPM	GALLONS PER MINUTE
HS	HAND SWITCH
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LSA	LEVEL SWITCH ALARM
MHZ	MEGA HERTZ
NO	NORMALLY OPEN CONTACT
NC	NORMALLY CLOSE CONTACT
PIT	PRESSURE INDICATING TREANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PSH	PRESSURE SWITCH HIGH
PSHL	PRESSURE SWITCH HIGH/LOW
PSI	PER SQUARE INCH (PRESSURE)
PSL	PRESSURE SWITCH LOW
SK	SPEED SETPOINT
SIT	SPEED INDICATING TRANSMITTER
VAC	VOLTAGE ALTERNATING CURRENT
VDC	VOLTAGE DIRECT CURRENT
W	WATTS
XA	USER DEFINED ALARM
XC	USER DEFINED CONTROL
XS	USER DEFINED STATUS SWITCH
XSC	USER DEFINED CONTROL CLOSE
XSO	USER DEFINED CONTROL OPEN
ZSC	POSITION SWITCH CLOSED
ZSO	POSITION SWITCH OPEN

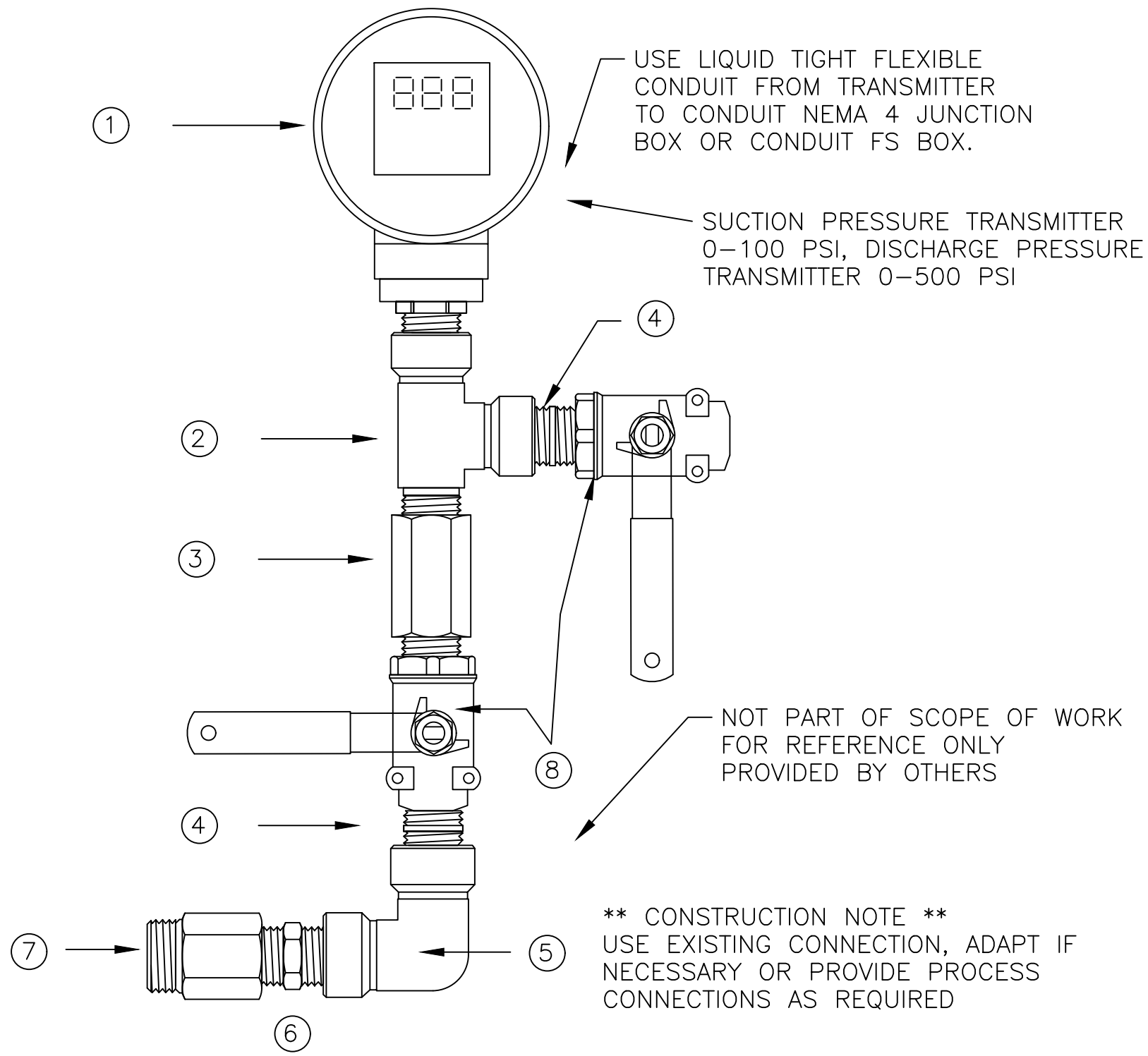


ZONE 2 PUMP STATION PROCESS AND INSTRUMENTATION DIAGRAM





NO.	DATE	REVISIONS	APPD.	PREPARED BY:	DRAWN BY:	SPEC. NO.	SHEET
1	01/2018	REVIEW SET		MSO	LFT	WW21-01 (M)	1-4
				17526 Van Korman, Suite B Irvine, CA 92614 PH. (949) 250-8668	DESIGNED BY: LFT		11 OF 14
				2886 East Villacrest Drive, Suite 101 Thousand Oaks, CA 91322 PH. (805) 378-8668	CHECKED BY: LFT	PROJECT NO. 38892	DRAWING NO. 116223



ITEM	QTY	DESCRIPTION	MANUFACTURER, PART NUMBER
1	1	PRESSURE TRANSMITTER, 0-500 PSI, 4-20MA, DISPLAY, 1/2" NPT	SPECIFICATION SECTION 13801
1	1	PRESSURE TRANSMITTER, 0-100 PSI, 4-20MA, DISPLAY, 1/2" NPT	SPECIFICATION SECTION 13801
2	1	STREET TEE, 1/2" NPT	SWAGELOK, SS-8-ST
3	1	ADAPTER, 1/2" FM NPT, STAINLESS STEEL	SWAGELOK, SS-8-A
4	2	CLOSE NIPPLE, 1/2" NPT	SWAGELOK, SS-8-CN
5	1	90° ELBOW, 1/2" NPT	SWAGELOK, SS-8-E
6	1	NIPPLE, 1" x 1/2" MALE NPT, STAINLESS STEEL	SWAGELOK, SS-8-HN
7	1	REDUCING BUSHING, 3/4" MALE TO 1/2" FEMALE NPT	SWAGELOK, SS-12-RB-8

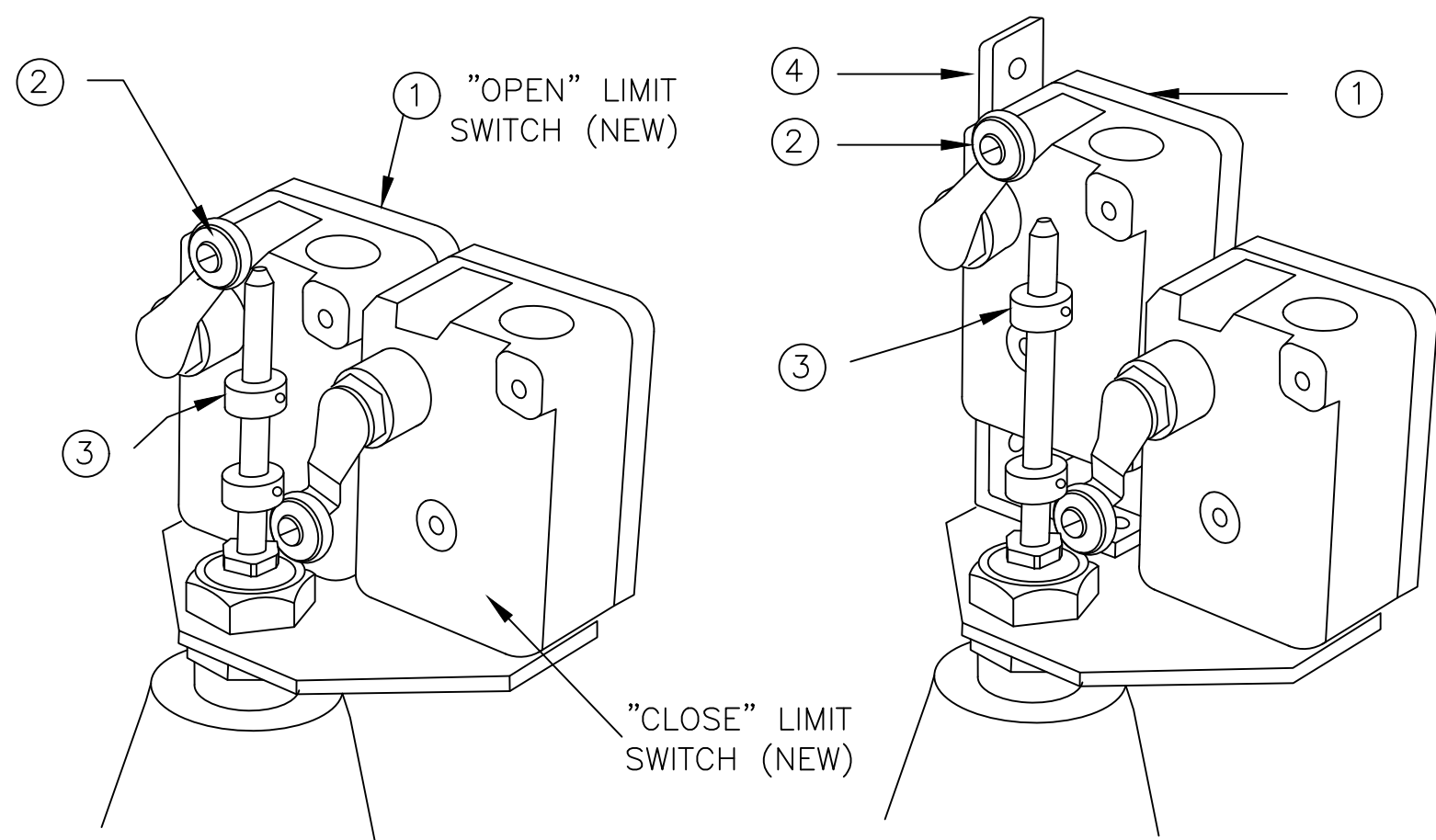
A PRESSURE TRANSMITTER ASSEMBLY (EXISTING)

TYPE A

** CONSTRUCTION NOTE **
FURNISH & INSTALL LIMIT SWITCH,
LEVER ARM AND COLLAR

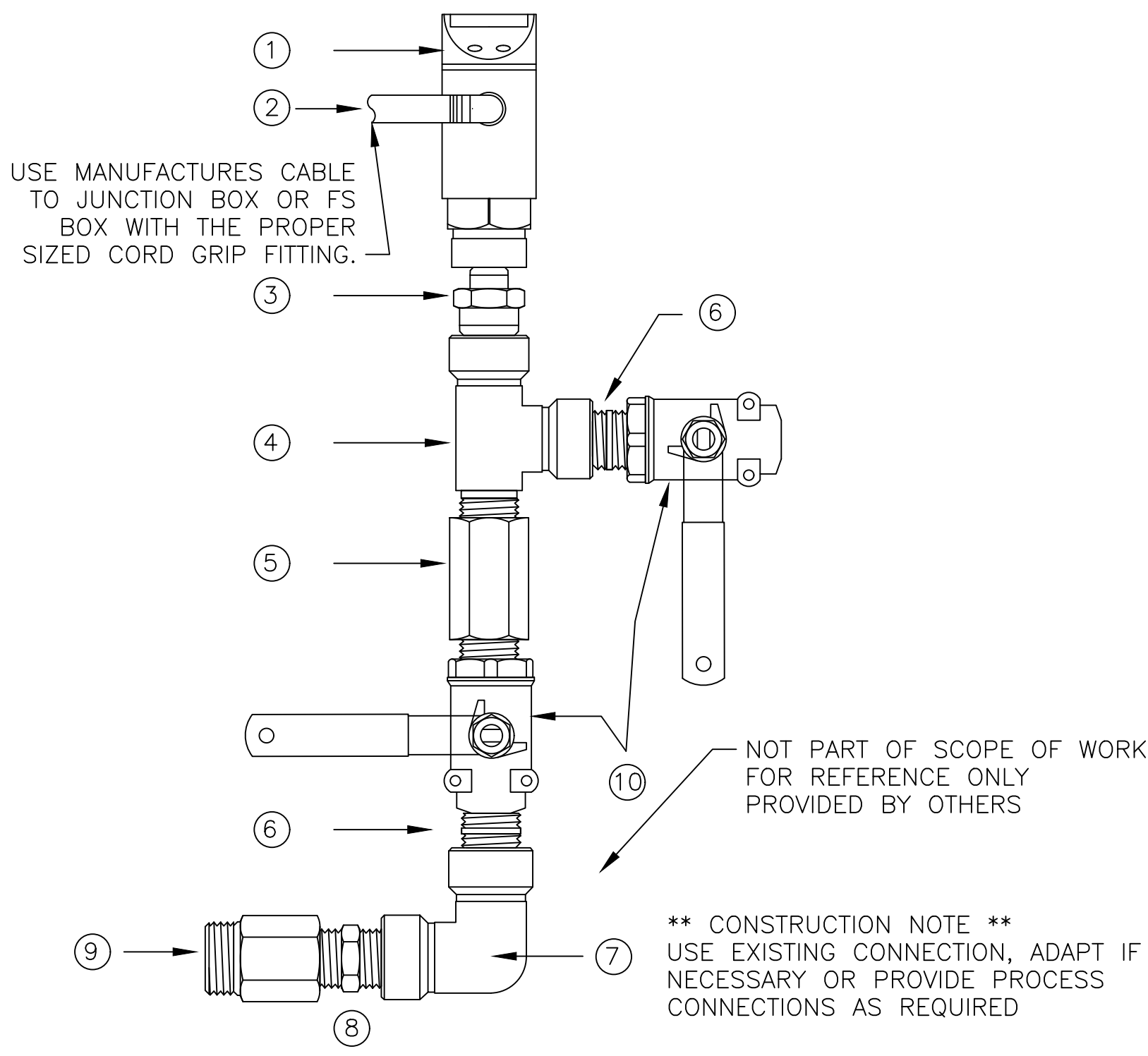
TYPE B

** CONSTRUCTION NOTE **
(1) FURNISH & INSTALL LIMIT SWITCH,
LEVER ARM, AND COLLAR
(2) FURNISH & INSTALL BRACKET TO
RAISE LIMIT SWITCH AS REQUIRED.



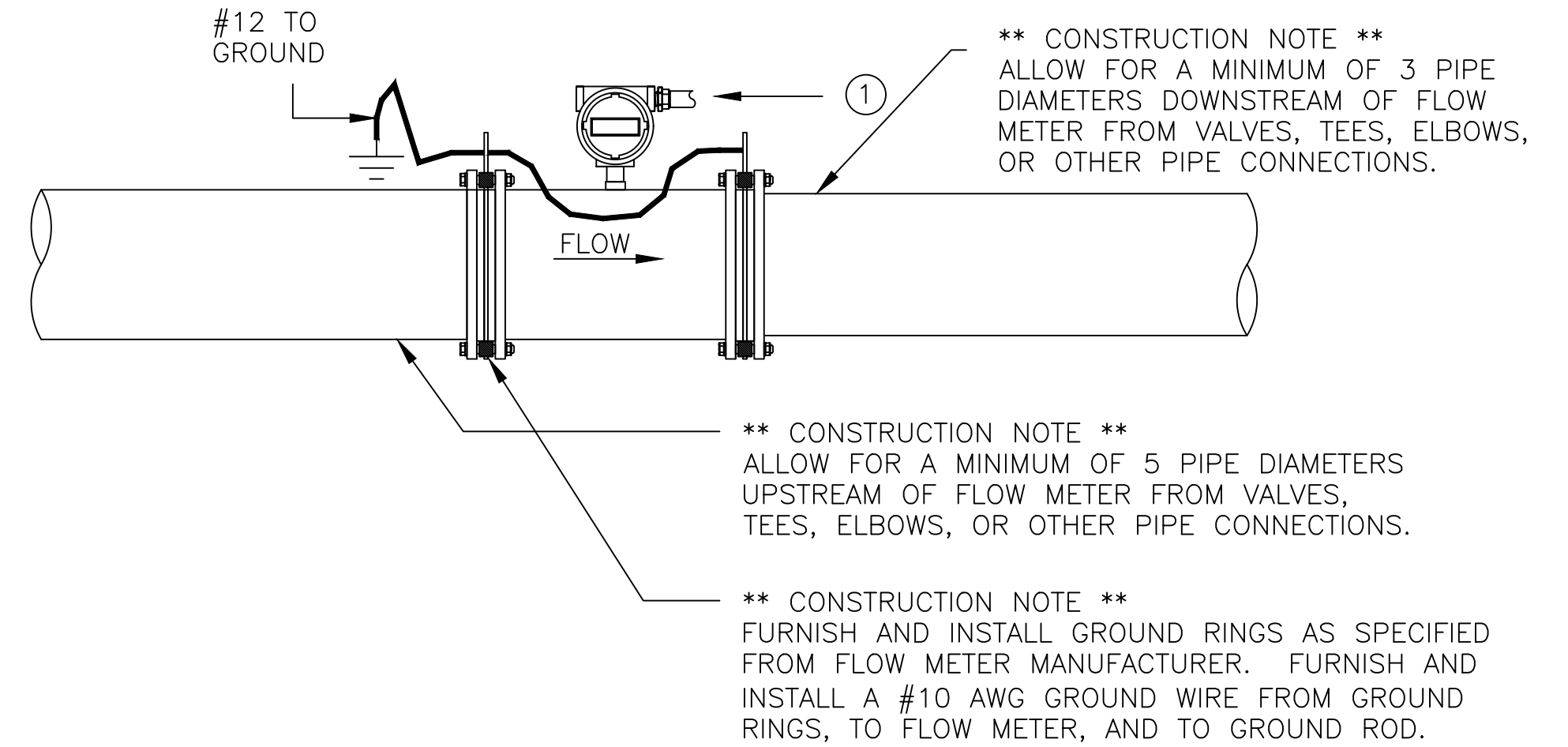
ITEM	QTY	DESCRIPTION	MANUFACTURER, PART #
1	2	LIMIT SWITCH, DPDT	SPECIFICATION SECTION 13801
2	2	LEVER ARM WITH ROLLER	SPECIFICATION SECTION 13801
3	1	SHAFT COLLAR TO FIT ACTUATOR SHAFT	SIMILAR TO GRAINGER 2X568
4	1	BRACKET FOR LIMIT SWITCH, STEEL, 10" x1 1/4"	SIMILAR TO GRAINGER 1WDD8

D CLA VALVE LIMIT SWITCHES MOUNTING ASSEMBLY (NEW)



ITEM	QTY	DESCRIPTION	MANUFACTURER, PART NUMBER
1	1	PRESSURE SWITCH, 0-363 PSI, 110VAC	IFM EFECTOR, PN4223
2	1	QUICK DISCONNECT CABLE, 5 PIN, MALE, 4 M	IFM EFECTOR, E18026
3	1	HEX REDUCING NIPPLE, 1/2" NPT TO 1/4" NPT	SWAGELOK, SS-8-HRN-4
4	1	STREET TEE, 1/2" NPT	SWAGELOK, SS-8-ST
5	2	SNUBBER, 1/2" NPT, OPTIONAL	WIKA, 50409662
6	1	CLOSE NIPPLE, 1/2" NPT	SWAGELOK, SS-8-CN
7	1	90° ELBOW, 1/2" NPT	SWAGELOK, SS-8-E
8	1	NIPPLE, 1" x 1/2" MALE NPT, STAINLESS STEEL	SWAGELOK, SS-8-HN
9	2	REDUCING BUSHING, 3/4" MALE TO 1/2" FEMALE NPT	SWAGELOK, SS-12-RB-8
10	1	BALL VALVE, 1/2" NPT, LOCKING HANDLE	APOLLO, 76-103-01A

B PRESSURE SWITCH ASSEMBLY (NEW)



ITEM	QTY	DESCRIPTION	MANUFACTURER, PART #
1	1	FLOW METER, 6" MAGNETIC, FLANGED, 120 VAC, INTEGRAL TRANSMITTER	SPECIFICATION SECTION 13801
2	1	GROUND RING, 6",	SPECIFICATION SECTION 13801

C FLOW METER ASSEMBLY (EXISTING)