

Las Virgenes Municipal Water District  
4232 Las Virgenes Rd  
Calabasas, California

Cornell Pump Station Improvements Project  
Technical Memorandum  
ADDENDUM NO.1

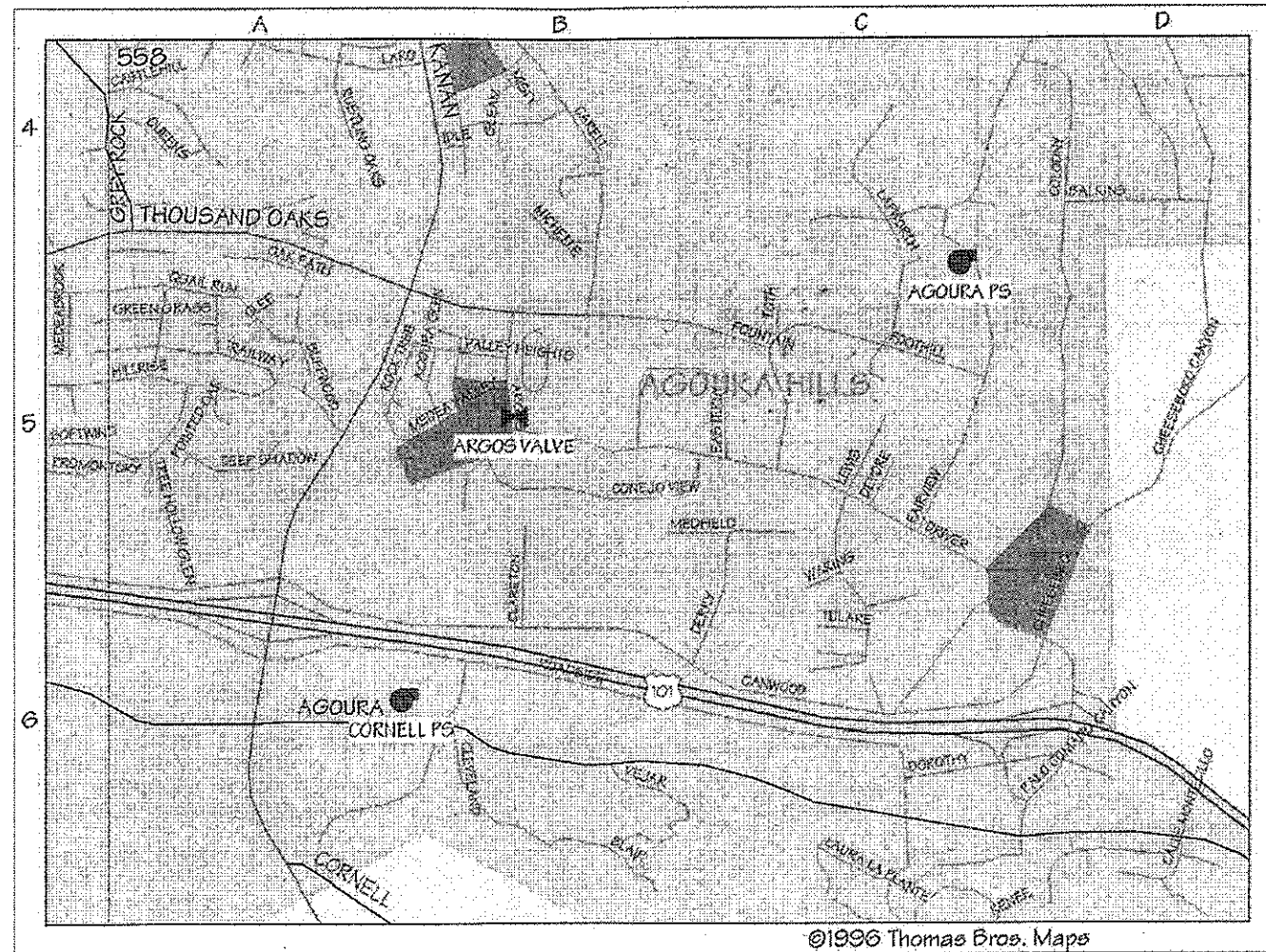
January 22, 2019

Additional information has been added to Cornell Pump Station Improvements Project. Addendum No.1 contains Cornell Pump Station VFD Upgrades as-builts (2011). If there is any concerns in meeting the proposal deadline (February 6<sup>th</sup>) in light of the new information presented, please forward any comments and concerns to Mercedes Acevedo, macevedo@lvmwd, phone number: 818-251-2147.

*Mercedes Acevedo*

Mercedes Acevedo, EIT  
Project Manager, LVMWD

# LAS VIRGENES MUNICIPAL WATER DISTRICT CORNELL PUMP STATION VFD UPGRADE



## PROJECT SCOPE OF WORK

- A) REMOVE EXISTING BREAKERS, VFD, TRANSFORMER, TESCO EQUIPMENT, AND TERMINALS FROM EXISTING VFD PANEL.
- B) REMOVE EXISTING PRESSURE TRANSMITTERS, PRESSURE GAUGES, AND PRESSURE SWITCHES. CAP AND RELOCATE EXISTING SENSOR PIPING FOR NEW LOCATION.
- C) FURNISH AND INSTALL NEW SWITCHGEAR PANEL AND BREAKERS FOR MAIN, VFD, AIR CONDITIONER, AND SERVICE POWER. FURNISH AND INSTALL A NEW DISCONNECT, CONDUIT, AND WIRES FROM SWITCHGEAR TO DISCONNECT AND TO VFD AIR CONDITIONER.
- D) INSTALL THE DISTRICT SUPPLIED BREAKER AND BREAKER ENCLOSURE FOR THE VFD BESIDE THE EXISTING VFD ENCLOSURE. FURNISH AND INSTALL CONDUITS, WIRE, AND POWER TERMINALS TO CONNECT TO EXISTING WIRES FROM SWITCHGEAR.
- E) INSTALL DISTRICT SUPPLIED LINE REACTOR, VFD, AND OUTPUT FILTER IN EXISTING VFD ENCLOSURE. FURNISH AND INSTALL POWER TERMINAL BLOCKS, AND CONTROL WIRING AS DETAILED ON THE DRAWINGS. REPLACE EXISTING VFD PANEL DOORS AND INSTALL HAND SWITCHES AND LIGHTS ON PANEL DOORS. REPLACE PANEL DOORS OR REPLACE PANEL IF NECESSARY.
- F) FURNISH AND INSTALL NEW BREAKERS, NEW CONDUITS AND WIRES FROM EXISTING PANEL BOARD B TO VARIOUS LOADS.
- G) INSTALL THE DISTRICT SUPPLIED PRESSURE TRANSMITTER/SWITCH/GAUGES FOR EAST AND WEST PROCESS PIPING. FURNISH AND INSTALL PRESSURE CONTROL PANEL WITH RELAYS, TERMINALS, AND PUSH BUTTONS.
- H) FURNISH AND INSTALL TEMPERATURE SENSOR EQUIPMENT IN PLC PANEL. WIRE AS SHOWN ON DRAWINGS.

## PROJECT DRAWING SHEET INDEX

- SHEET DESCRIPTION
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  - 14 MISCELLANEOUS WIRING DETAILS.

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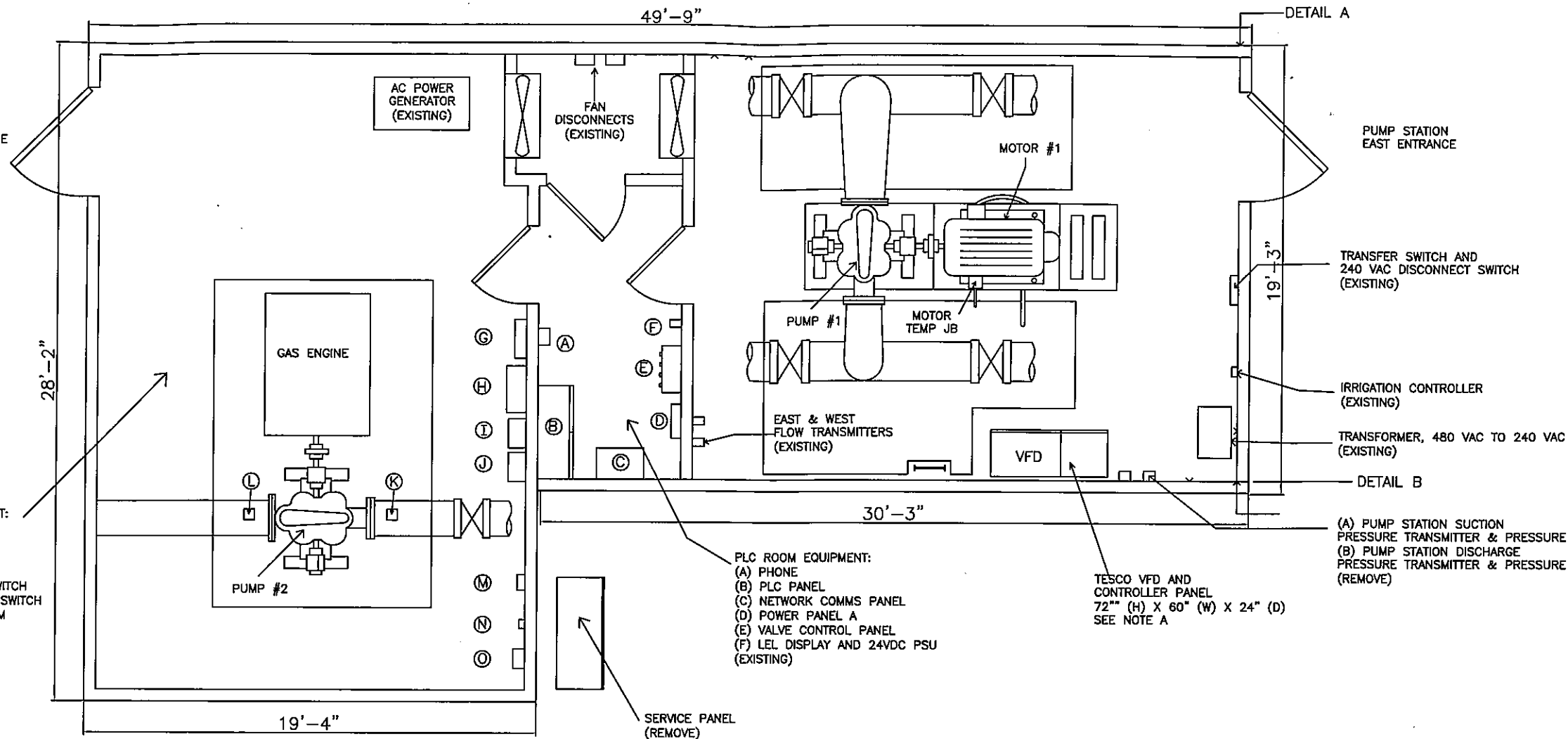
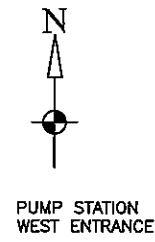


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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
LOCATION, DRAWING LISTING, AND  
SCOPE OF WORK

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR
1	1/2011	LFT	LFT		REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

SHEET 1 OF 14  
DRAWING No. 1358-001  
JOB No. 1358  
SCALE: NONE  
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BY A SPECIFIC DETAIL



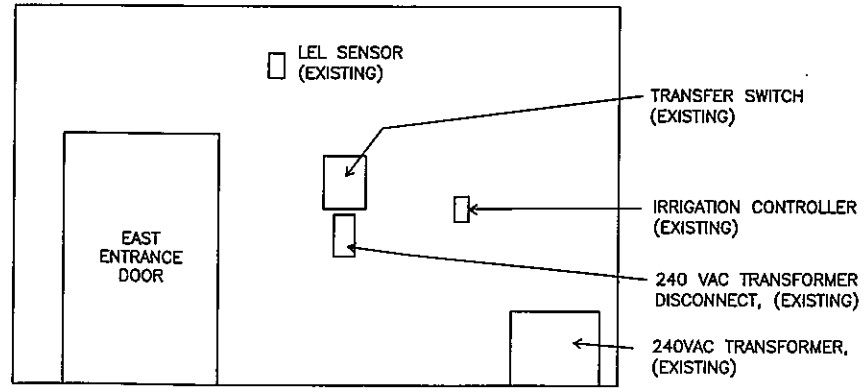
- GAS ENGINE ROOM EQUIPMENT:**
- (G) POWER PANEL B
  - (H) MURPHY PANEL
  - (I) STARTER MOTOR PANEL
  - (J) MURPHY 24VDC PANEL
  - (K) DISCHARGE PRESSURE SWITCH
  - (L) SUCTION LOW PRESSURE SWITCH
  - (M) IGNITION CONTROL SYSTEM
  - (N) MAGNAHELIC, 0-8" H2O
  - (O) CATALYST MONITOR (EXISTING)

- PLC ROOM EQUIPMENT:**
- (A) PHONE
  - (B) PLC PANEL
  - (C) NETWORK COMMS PANEL
  - (D) POWER PANEL A
  - (E) VALVE CONTROL PANEL
  - (F) LEL DISPLAY AND 24VDC PSU (EXISTING)

- (A) PUMP STATION SUCTION PRESSURE TRANSMITTER & PRESSURE SWITCH, (REMOVE)
- (B) PUMP STATION DISCHARGE PRESSURE TRANSMITTER & PRESSURE SWITCH (REMOVE)

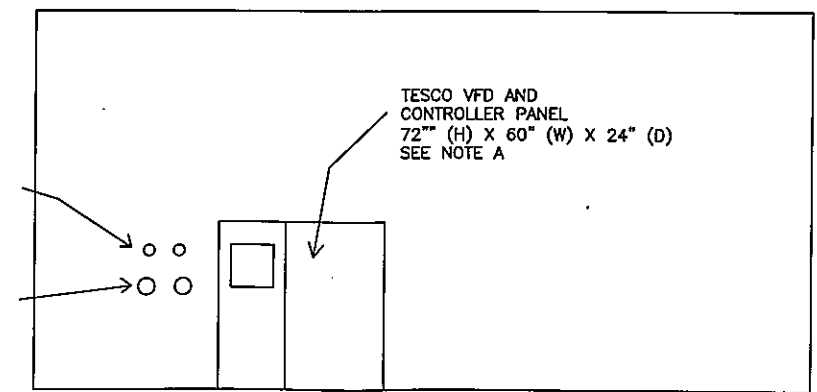
PUMP STATION - PLAN VIEW

- CONSTRUCTION NOTES:**
- A) DISCONNECT POWER FROM VFD PANEL. REMOVE EXISTING VFD, MAIN BREAKER, TRANSFORMER, LOAD BREAKERS, TESCO DISPLAY, TERMINALS, AND BACK PLATES.
  - B) REMOVE PRESSURE TRANSMITTERS GAUGES, AND SWITCHES. CAP EXISTING PROCESS LINES.

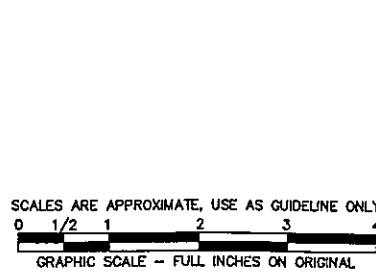


DETAIL A - EAST WALL ELEVATION

- PUMP STATION SUCTION & DISCHARGE PRESSURE TRANSMITTERS SEE NOTE B
- PUMP STATION SUCTION & DISCHARGE PRESSURE SWITCHES SEE NOTE B



DETAIL B - SOUTH WALL ELEVATION

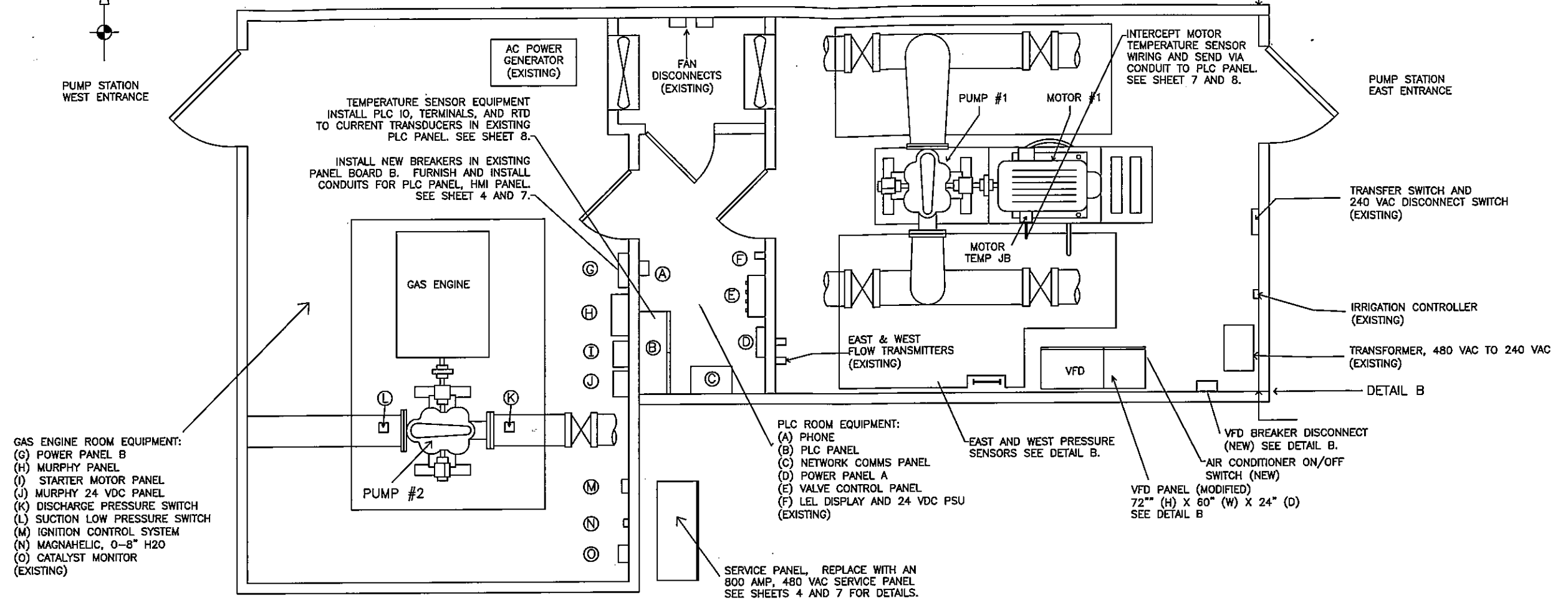
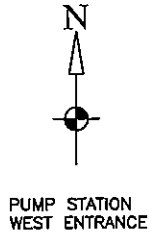


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LAS VIRGENES MUNICIPAL WATER DISTRICT  
 CORNELL PUMP STATION VFD UPGRADE  
 SITE LAYOUT - EXISTING  
 DEMOLITION NOTES

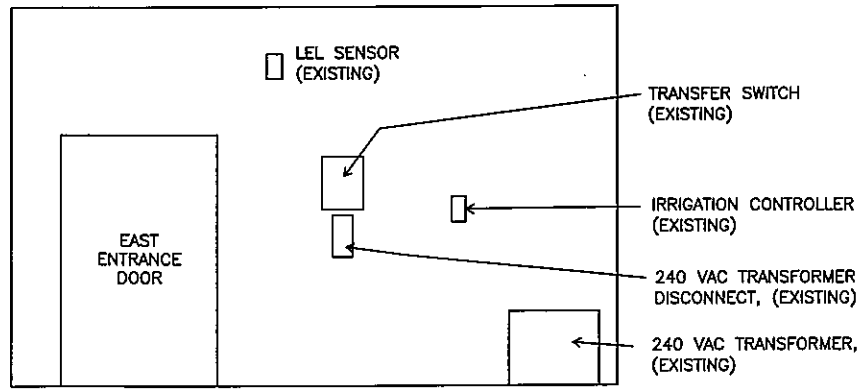
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SHEET 2 OF 14  
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 JOB No. 1358  
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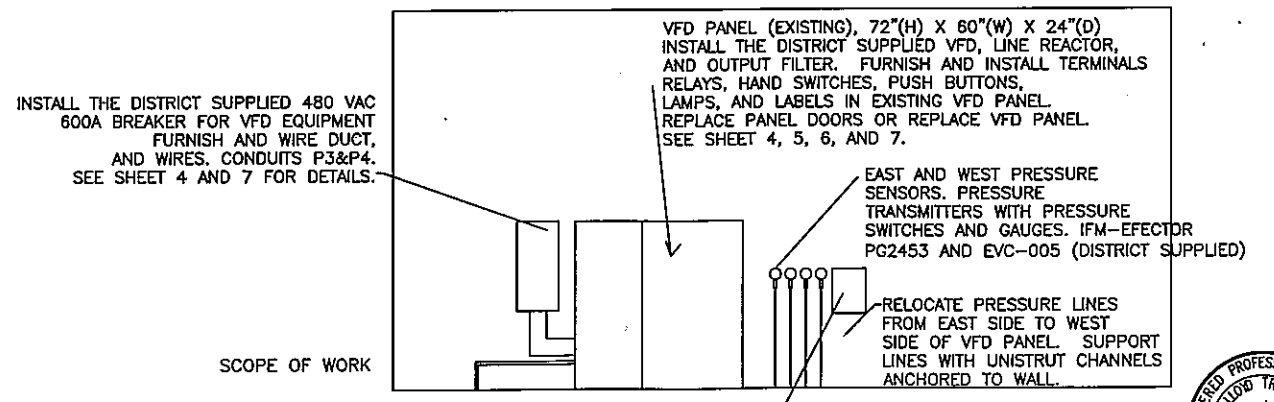


- GAS ENGINE ROOM EQUIPMENT:
- (G) POWER PANEL B
  - (H) MURPHY PANEL
  - (I) STARTER MOTOR PANEL
  - (J) MURPHY 24 VDC PANEL
  - (K) DISCHARGE PRESSURE SWITCH
  - (L) SUCTION LOW PRESSURE SWITCH
  - (M) IGNITION CONTROL SYSTEM
  - (N) MAGNAHELIC, 0-8" H2O
  - (O) CATALYST MONITOR (EXISTING)

PUMP STATION - PLAN VIEW



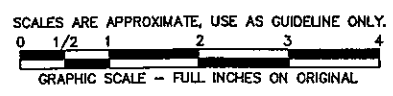
DETAIL A - EAST WALL ELEVATION



DETAIL B - SOUTH WALL ELEVATION



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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
SITE LAYOUT - MODIFIED  
CONSTRUCTION NOTES

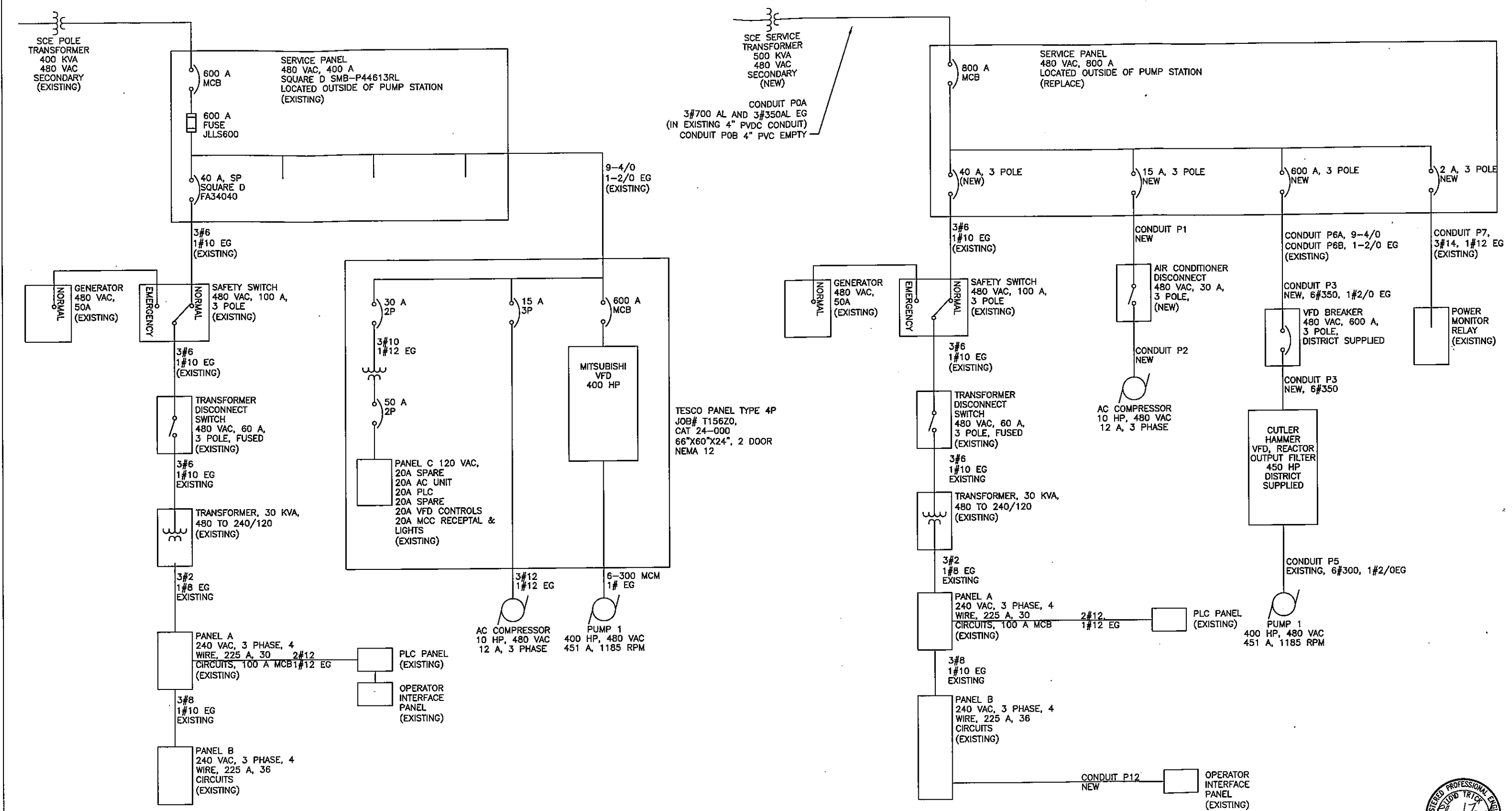
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SHEET 3 OF 14

DRAWING No. 1358-003

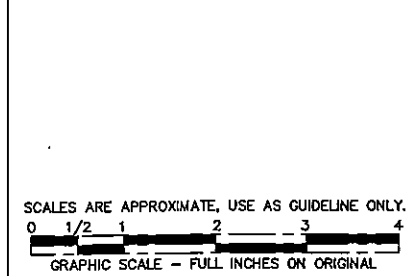
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SINGLE LINE - EXISTING

SINGLE LINE - MODIFICATIONS



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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
SINGLE LINE EXISTING AND MODIFICATIONS  
DETAILS

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SHEET 4 OF 14

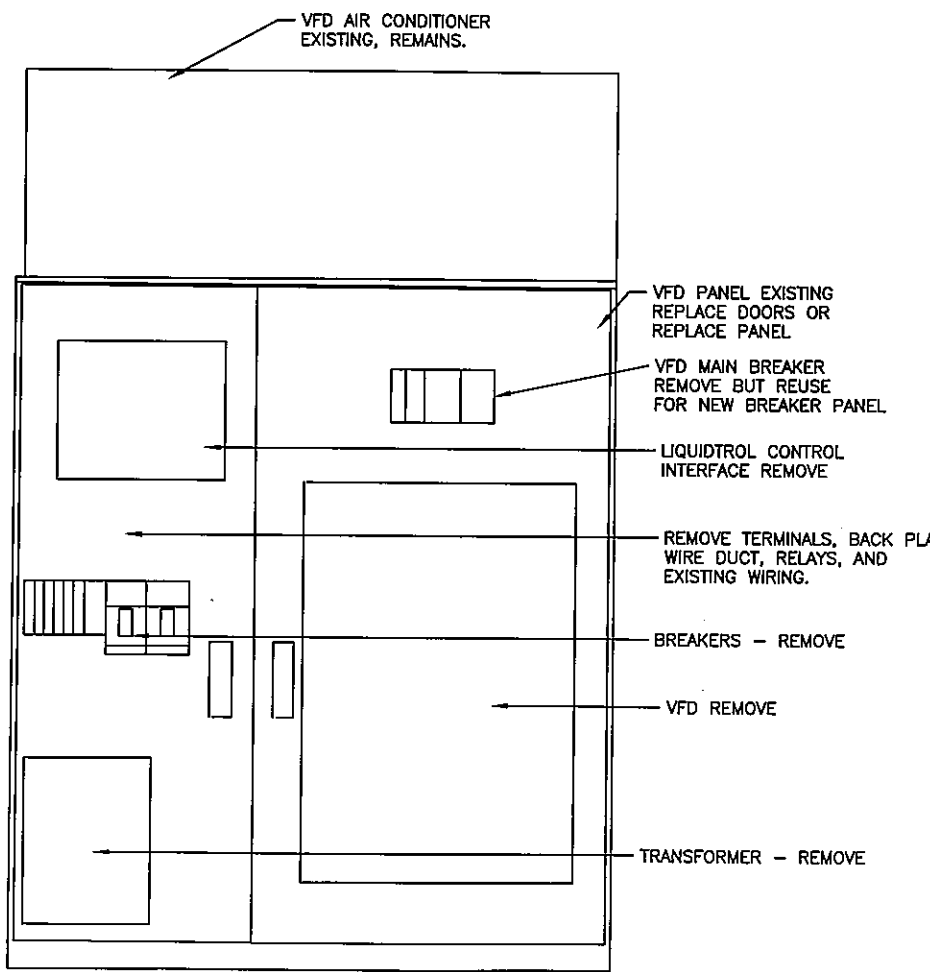
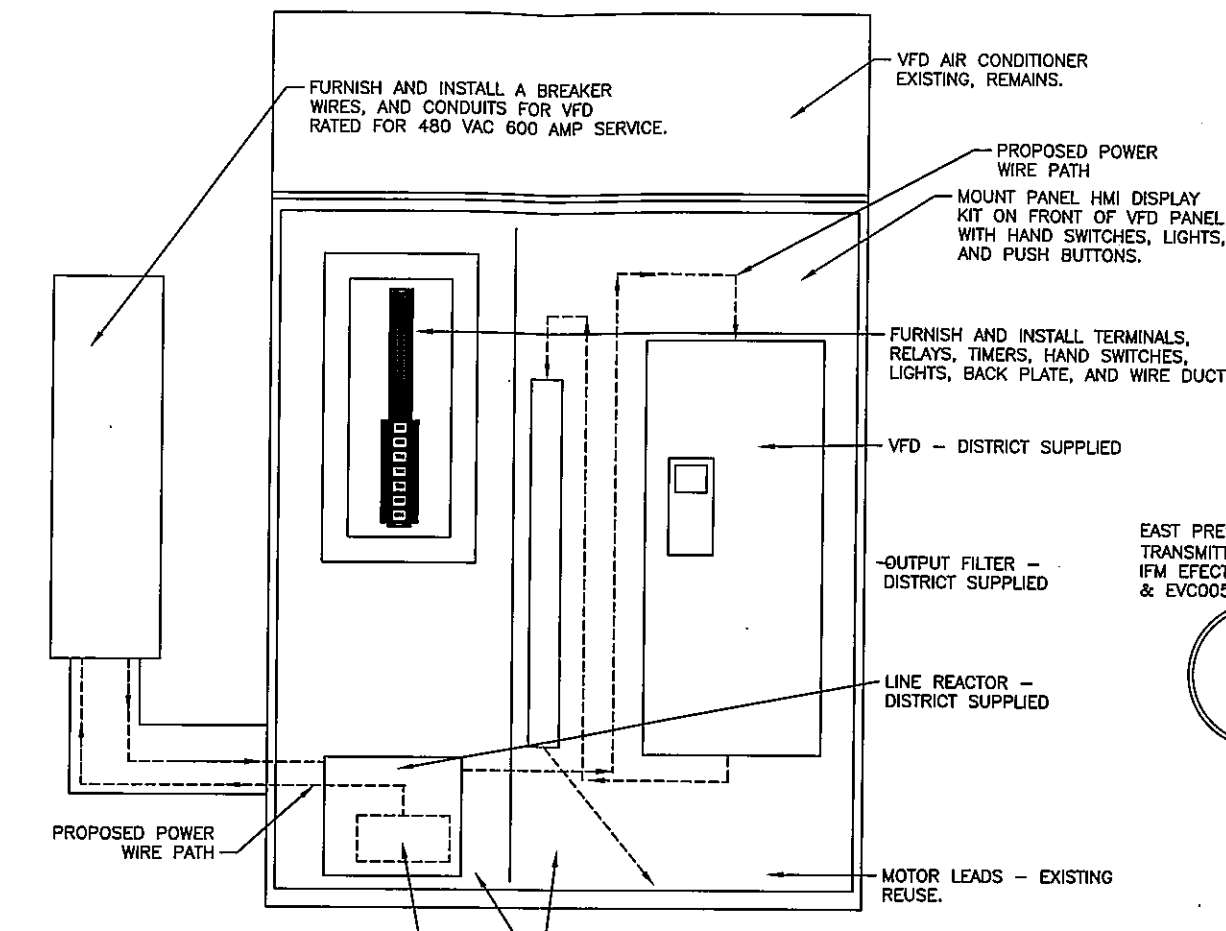
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JOB No. 1358

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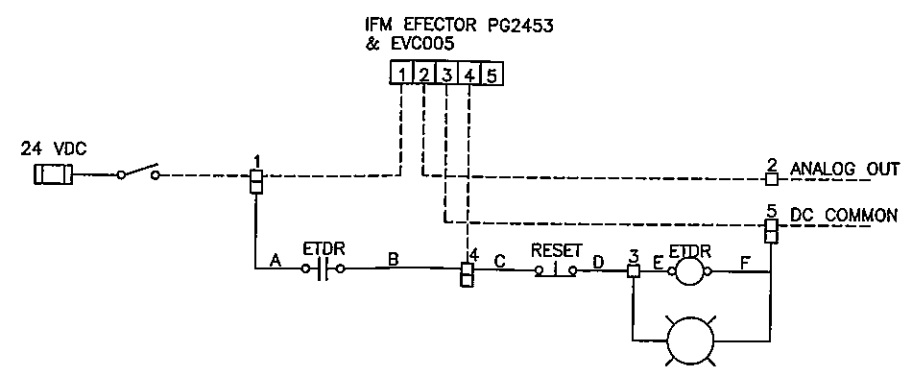
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PRESSURE PANEL PARTS LIST			
ITEM	QUANTITY	DESCRIPTION	PART NUMBER
A	1	ENCLOSURE, NEMA 4, 16"X12"X10"	
	1	ENCLOSURE BACK PLATE	
B	3	RELAYS, 4PDT, 24 VDC COIL	
	3	RELAY BASES, 4 POLE	
C	2	PUSH BUTTONS, NC	
	2	LED, RED, PTT, 24 VDC	
D	24	FEED THROUGH TERMINALS	WAGO 280-101
	4	FEED THROUGH TERMINALS END PLATE	WAGO 280-301
	10	FEED THROUGH TERMINALS JUMPERS	WAGO 280-402
	2	DIN RAIL END ANCHORS	WAGO 249-116
	1	DIN RAIL	WAGO 210-112
E	1 LOT	WIRE, #14 AWG, #18 AWG, #18 TSP,	
F	1 LOT	WIRE FERRULES, #18 AEG	FERRULESDIRECT.COM

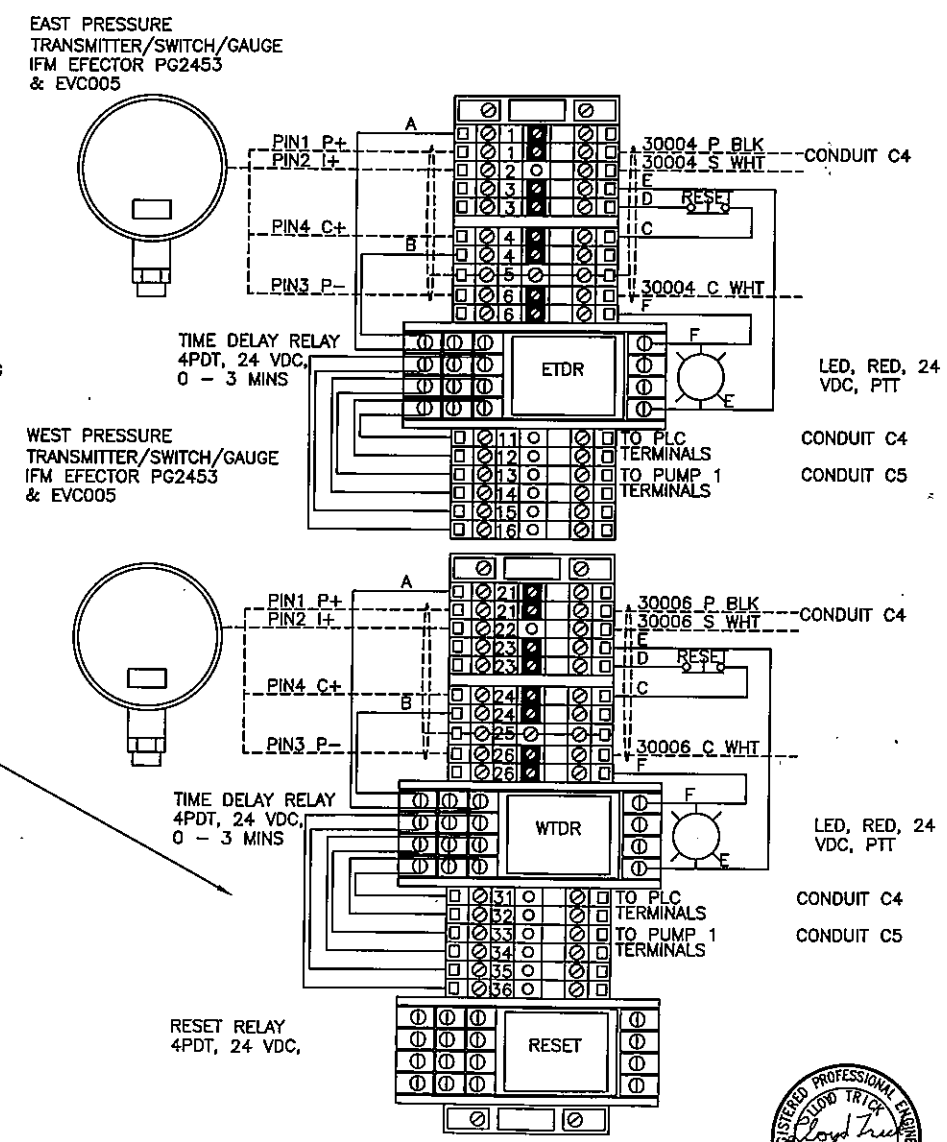


**VFD PANEL - MODIFICATIONS**

INSTALL DISTRICT SUPPLIED PRESSURE SENSORS (2). FURNISH AND INSTALL PRESSURE PANEL WITH TERMINALS, RELAYS, AND PUSH BUTTONS. MOUNT TERMINALS AND RELAYS, AND RESET PUSH BUTTONS IN A NEW NEMA 4 16"X12"X10" ENCLOSURE. INSTALL CONDUITS FROM ENCLOSURE TO VFD, PLC, AND PUMP 2 FOR CONTROLS SIGNALS.



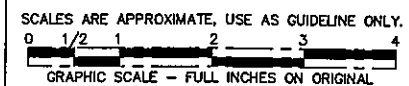
**EAST AND WEST PRESSURE SCHEMATIC**



**EAST AND WEST PRESSURE SENSORS**



**VFD PANEL - EXISTING**



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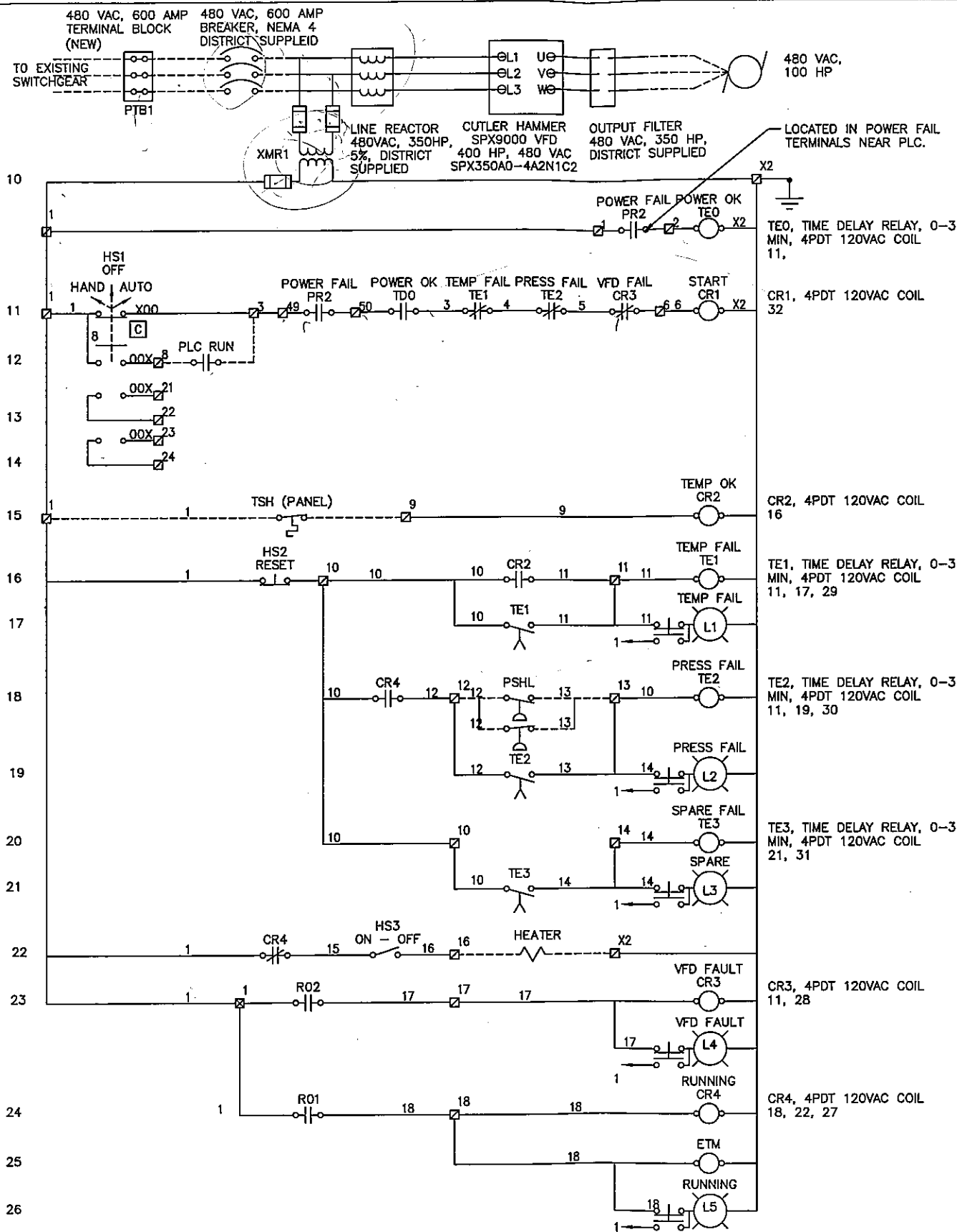
**LAS VIRGENES MUNICIPAL WATER DISTRICT  
 CORNELL PUMP STATION VFD UPGRADE  
 VFD ENCLOSURE MODIFICATIONS AND  
 PRESSURE SENSOR MODIFICATIONS**

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SHEET 5 OF 14  
 DRAWING No. 1358-005  
 JOB No. 1358  
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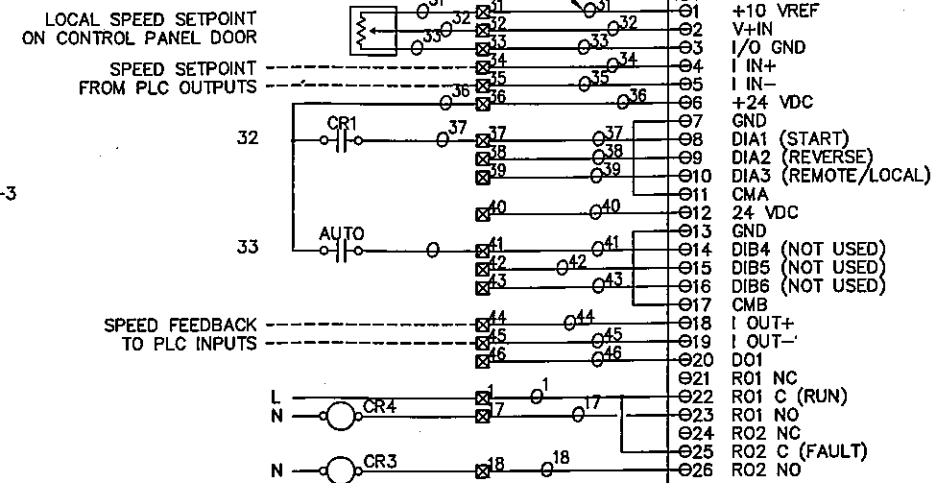
VFD WIRING PARTS LIST

DEVICE NAME	DESCRIPTION
PTB1	POWER TERMINAL BLOCK, 480 VAC, 600 AMP
PTB2	POWER TERMINAL BLOCK, 480 VAC, 600 AMP
XMR1	CONTROL TRANSFORMER, 100 VA, 480 TO 120VAC
HS1	3 POSITION HAND SWITCH, 2 NO 2 NC
HS2	PUSH BUTTON, 2 NC, RED
HS3	2 POSITION HAND SWITCH, 1 NO, 1NC
TD0	TIME DELAY RELAY, 4PDT, 120VAC COIL AND BASE
TD1	TIME DELAY RELAY, 4PDT, 120VAC COIL AND BASE
TD2	TIME DELAY RELAY, 4PDT, 120VAC COIL AND BASE
TD3	TIME DELAY RELAY, 4PDT, 120VAC COIL AND BASE
CR1	RELAY, 4PDT, 120 VAC COIL, AND BASE
CR2	RELAY, 4PDT, 120 VAC COIL, AND BASE
CR3	RELAY, 4PDT, 120 VAC COIL, AND BASE
CR4	RELAY, 4PDT, 120 VAC COIL, AND BASE
ETM	ELASPE TIME METER, 120 VAC
L1	LED, RED, PTT, 120 VAC
L2	LED, RED, PTT, 120 VAC
L3	LED, RED, PTT, 120 VAC
L4	LED, RED, PTT, 120 VAC
L5	LED, GREEN, PTT, 120 VAC
NAME PLATE	HAND OFF AUTO
NAME PLATE	RESET
NAME PLATE	HEATER ON OFF
NAME PLATE	MOTOR HIGH TEMP
NAME PLATE	DISCHARGE FAIL
NAME PLATE	SPARE
NAME PLATE	VFD FAULT
NAME PLATE	RUNNING
50	RELAY LABELS, WIRE LABELS
	TERMINALS

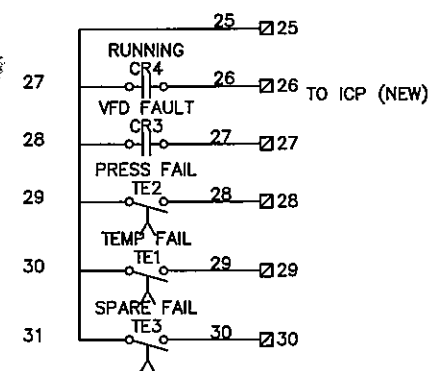


VFD WIRING SCHEMATIC

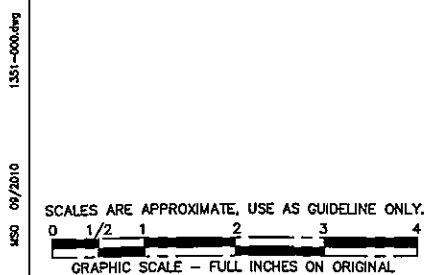
USE 18 AWG THHN WIRE FOR VFD CONTROL CONNECTIONS



VFD WIRING SCHEMATIC



VFD SCHEMATIC TERMINAL LAYOUT



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LAS VIRGENES MUNICIPAL WATER DISTRICT  
 CORNELL PUMP STATION VFD UPGRADE  
 VFD WIRING SCHEMATIC

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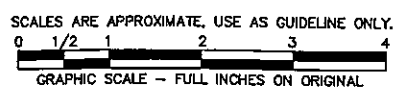
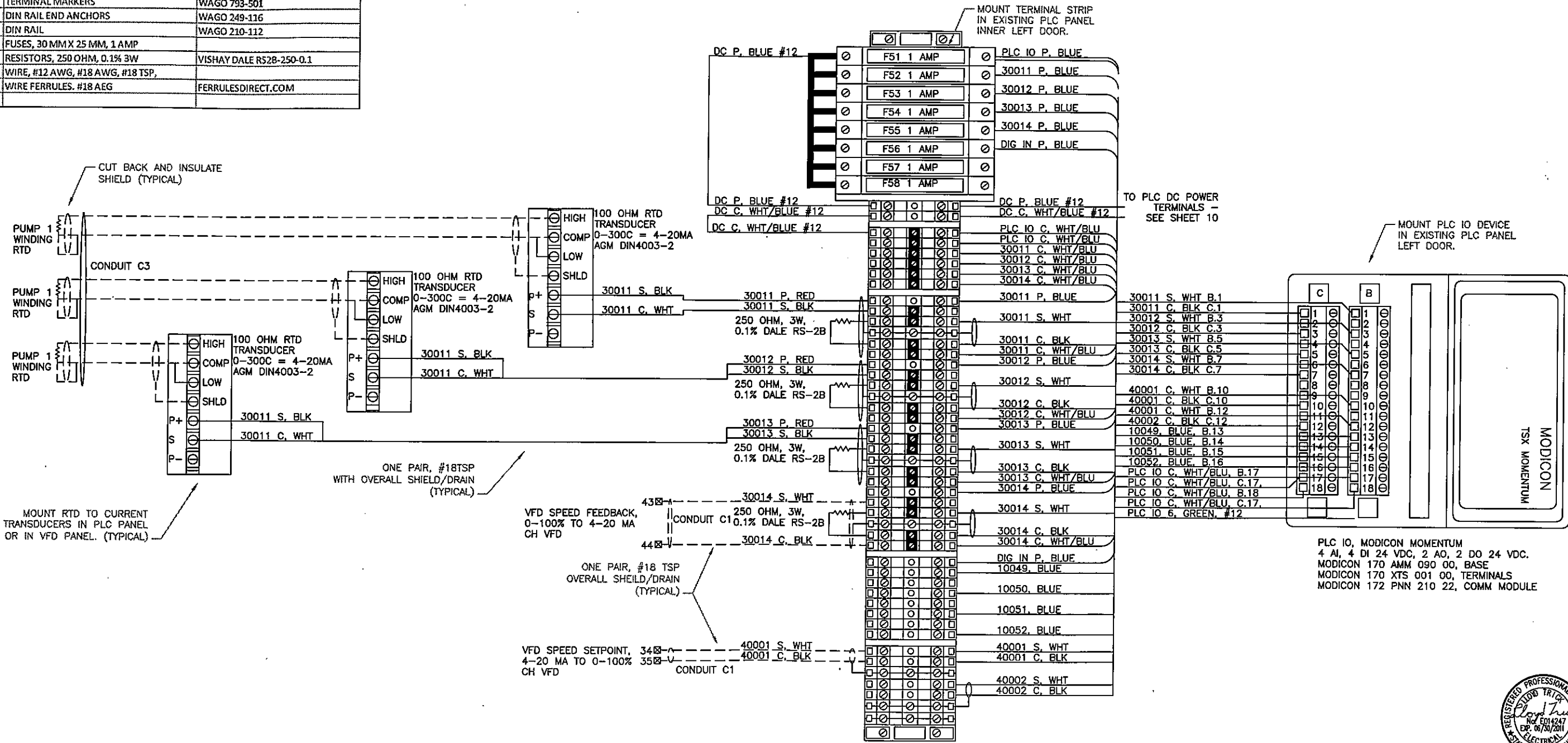
SHEET 6 OF 14  
 DRAWING No. 1358-006  
 JOB No. 1358  
 SCALE: NONE  
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THERMAL EQUIPMENT PARTS LIST			
ITEM	QUANTITY	DESCRIPTION	PART NUMBER
A	1	PLC IO BASE, 4 AI, 4 DI, 2 AO, 2 DO, 24 VDC	MODICON 170 AMM 090 00
	1	PLC IO TERMINALS	MODICON 170 XTS 001 00
	1	PLC IO COMMUNICATIONS MODULE	MODICON 172 PNN 210 22
B	4	RTD TO CURRENT SENSORS, DIN RAIL	AGM DIN4003-2
C	8	FUSE TERMINALS	WAGO 281-622
	1	FUSE TERMINALS END PLATE	WAGO 281-309
	8	FUSE TERMINALS JUMPER BAR	WAGO 281-402
	40	FEED THROUGH TERMINALS	WAGO 280-101
	4	FEED THROUGH TERMINALS END PLATE	WAGO 280-301
	30	FEED THROUGH TERMINALS JUMPER 5	WAGO 280-402
	2	FEED THROUGH TERMINALS JUMPER -10	WAGO 210-103
	7	GROUND TERMINALS	WAGO 280-107
	1 LOT	TERMINAL MARKERS	WAGO 793-501
	4	DIN RAIL END ANCHORS	WAGO 249-116
	1	DIN RAIL	WAGO 210-112
	10	FUSES, 30 MM X 25 MM, 1 AMP	
D	4	RESISTORS, 250 OHM, 0.1% 3W	VISHAY DALE RS28-250-0.1
E	1 LOT	WIRE, #12 AWG, #18 AWG, #18 TSP,	
F	1 LOT	WIRE FERRULES, #18 AEG	FERRULESDIRECT.COM

- PANEL CONSTRUCTION NOTES:**
- UNLESS OTHERWISE SPECIFIED, ALL INTERIOR CONTROL PANEL WIRING (SHOWN SOLID) SHALL BE #18 AWG THHN OR HW, COLOR AS INDICATED.
  - ALL FIELD WIRING (SHOWN IN DASHED LINES) SHALL BE #14 AWG W/ TYPE THHN/THWN INSULATION, COLOR AS INDICATED.
  - ALL WIRES UNDER 12 AWG SHALL USE WIRE FERRULES IN PANEL TERMINAL WERE APPROPRIATE.
  - ALL WIRES SHALL HAVE HEAT SHRINK WIRE LABELS AS INDICATED; BRADEY PS-187-150W.
  - ALL WIRES SHALL HAVE LABELS ON BOTH ENDS OF THE WIRE AS SHOWN ON THE DRAWINGS.
  - TERMINAL SUPPORTS SHALL BE PLACED AT 8" INTERVALS FOR ALL TERMINAL RAILS.
  - ALL EQUIPMENT, TERMINAL RAILS, AND WIRE DUCT SHALL BE MOUNTED WITH 10-32 SCREWS TO THE BACK PLATE WILL BE DRILLED AND TAPPED FOR THE SCREWS.
  - NO SELF TAPPING SCREWS SHALL BE ALLOWED FOR ANY MOUNTING.
  - MOUNT A CHART FOR FUSE SIZE AND FUNCTION ON INSIDE OF PANEL.
  - TERMINAL STRIP TO BE FABRICATED IN A UL-508 CERTIFIED PANEL SHOP.



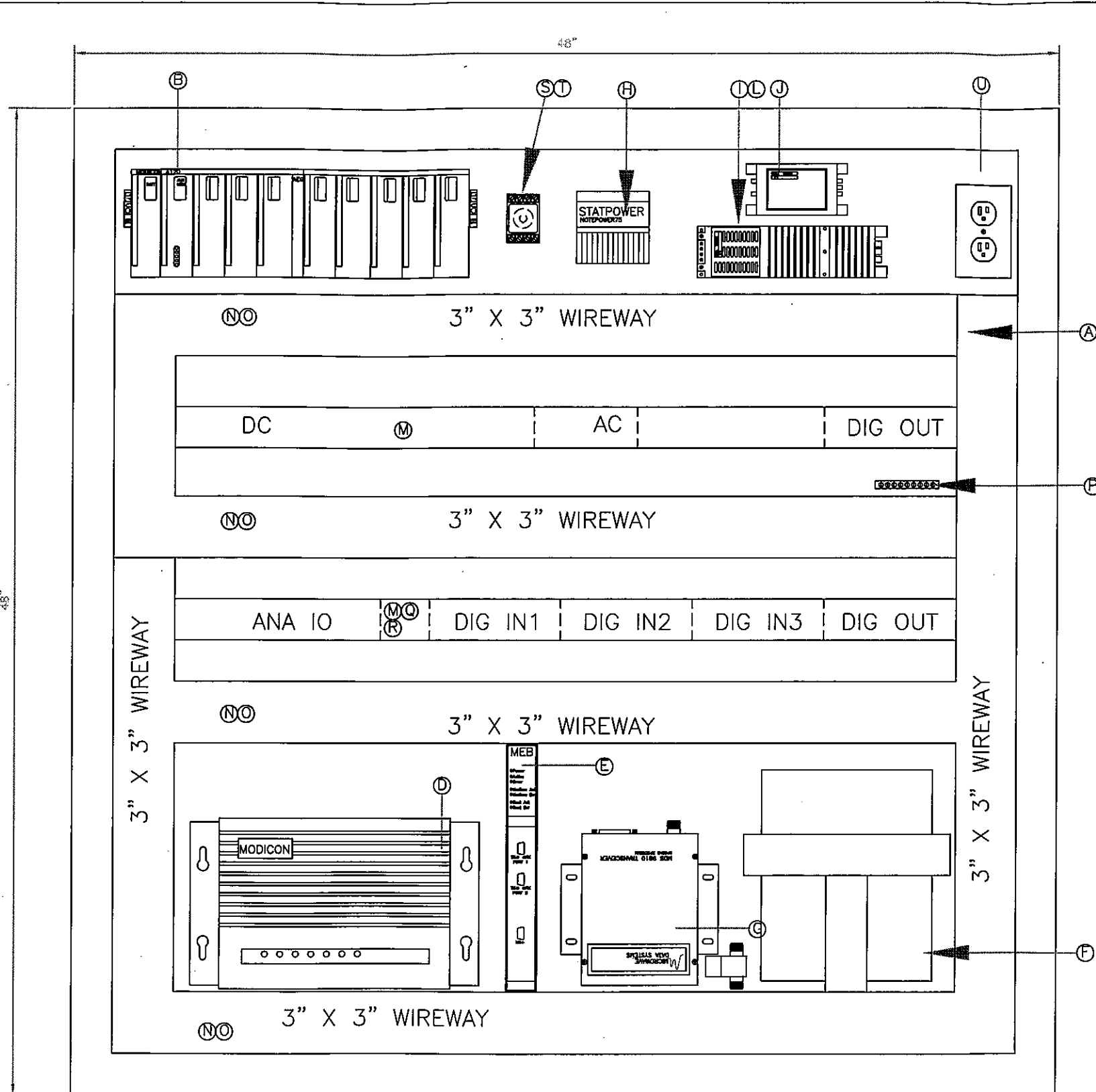
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**LAS VIRGENES MUNICIPAL WATER DISTRICT  
 CORNELL PUMP STATION VFD UPGRADE  
 TEMPERATURE SENSOR EQUIPMENT  
 WIRING DETAILS, PARTS LIST**

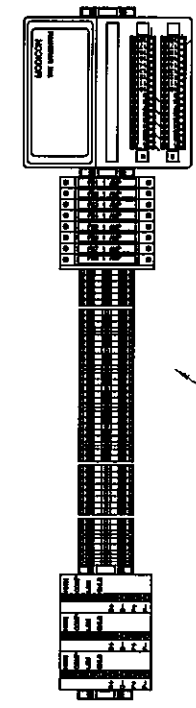
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SHEET 8 OF 14  
 DRAWING No. 1358-008  
 JOB No. 1358  
 SCALE: NONE  
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PANEL PARTS LIST			
ITEM	QUANTITY	DESCRIPTION	MANUFACTURER, PART NUMBER
A	1	NEMA 4 ENCLOSURE	HOFFMAN A-484812WFLP
	1	ENCLOSURE BACK PLATE	HOFFMAN A-48P48
B	1	PROGRAMMABLE LOGIC CONTROLLER	MODICON PC-E984-275
	1	PLC PRIMARY RACK	MODICON AS-HDTA-200
	1	PLC SECONDARY RACK	MODICON AS-HDTA-201
	2	ANALOG INPUT MODULE, 4 PT	MODICON AS-BADU-206
	3	DIGITAL INPUT MODULE, 16 PT	MODICON AS-BDEP-216
	3	RELAY OUTPUT MODULE, 8 PT	MODICON AS-BDAP-208
C	2	SERIAL CABLE CONNECTOR DB25/RJ45	MODICON 110 XCA 204 01
	2	SERIAL CABLE RJ45 3 FEET	MODICON 110 XCA 282 01
D	1	MODBUS PLUS BRIDGE MUX	MODICON NW-BM85C002
	1	MODBUS PLUS TERMINATOR	MODICON NW-MBK1-185
	1	MODBUS PLUS CABLE	BEIDEN 9841
E	1	MODBUS PLUS/ETHERNET BRIDGE	NR&D MEB-1CP
	1	SINGLE SLOT RACK & POWER SUPPLY	NR&D NRK-2
	2	SYMAX PROGRAMMING CABLE	NR&D NRC-902
F	1	DSS DSU MODEM	ADTRAN DSU III AR
	1	SURFACE MOUNT TELEPHONE LINE BOX	ORTRONICS OR-812001049
G	1	SPREAD SPECTRUM RADIO	MDS 9810
	1	PANEL RADIO JUMPER CABLE	ANDREW VFX1-NMNM-3
	1	RADIO SURGE PROTECTOR	POLYPHASE IS-B50LN-C2
H	1	DC INVERTER, 12 VDC TO 120 VAC	STATPOWER NOTEPOWER 50
I	1	POWER SUPPLY, 15 VDC, 100W	VICOR VI-LF2-CW
J	1	DC/DC CONVERTER 12/24 50 W	VICOR VI-L03-CY
K	1	BATTERY, 12 VDC SEALED LEAD ACID	DYNASTY UPS12-170
L	1	RESISTOR, 100K OHMS, 1W, 1.0%	DALE RS-2B 100K 1.0
M	35	FUSE TERMINALS	ALLEN BRADLEY 1492-H6
	3	FUSE TERMINALS END PLATES	ALLEN BRADLEY 1492-37
	3	FUSE TERMINALS JUMPER BARS	ALLEN BRADLEY 1492-N49
	210	FEED THRU TERMINALS	ALLEN BRADLEY 1492-W3
	10	FEED THRU TERMINALS ENDPLATES	ALLEN BRADLEY 1492-EB3
	15	FEED THRU TERMINALS JUMPER BARS	ALLEN BRADLEY 1492-CJ510
	16	FEED THRU TERMINALS JUMPER BARS	ALLEN BRADLEY 1492-CJ52
	8	DISCONNECT TERMINALS	ALLEN BRADLEY 1492-WK03
	15	GROUND TERMINALS	ALLEN BRADLEY 1492-WG4
	10	TERMINAL STRIP END BARRIER	ALLEN BRADLEY 1492-EA35
	2	TERMINAL STRIP	WEIDMULLER 996497
	16	TERMINAL STRIP SUPPORT BLOCK	WEIDMULLER 049492
N	4	WIREWAY 3"X3"X6", WHITE	PANDUIT F-3X3WH6N
O	4	WIREWAY COVER, 3"X6", WHITE	PANDUIT C-3WH6N
P	1	GROUND BAR	
Q	7	RESISTOR, 500 OHMS, 3W, 1.0%	DALE RS-2B 500 1.0
R	2	RESISTOR, 10K OHMS, 3W, 1.0%	DALE RS-2B 10K 1.0
S	1	LOW VOLTAGE DISCONNECT RELAY	TIME MARK CORP. 2601-12DC
T	1	LOW VOLTAGE DISCONNECT BASE	TIME MARK CORP. 51X120
U	1	GFI RECEPTACLE	



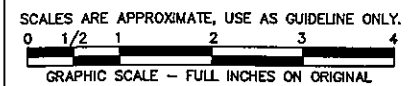
CONSTRUCTION NOTE:  
INSTALL TEMPERATURE  
TERMINAL DEVICE ON  
LEFT DOOR OF EXISTING  
PANEL.

THIS DRAWING IS FOR REFERENCE  
ONLY EXCEPT FOR  
AREAS DENOTED AS SCOPE OF  
WORK.

ENCLOSURE LAYOUT  
SCALE 1" = 3"



1251-012LW

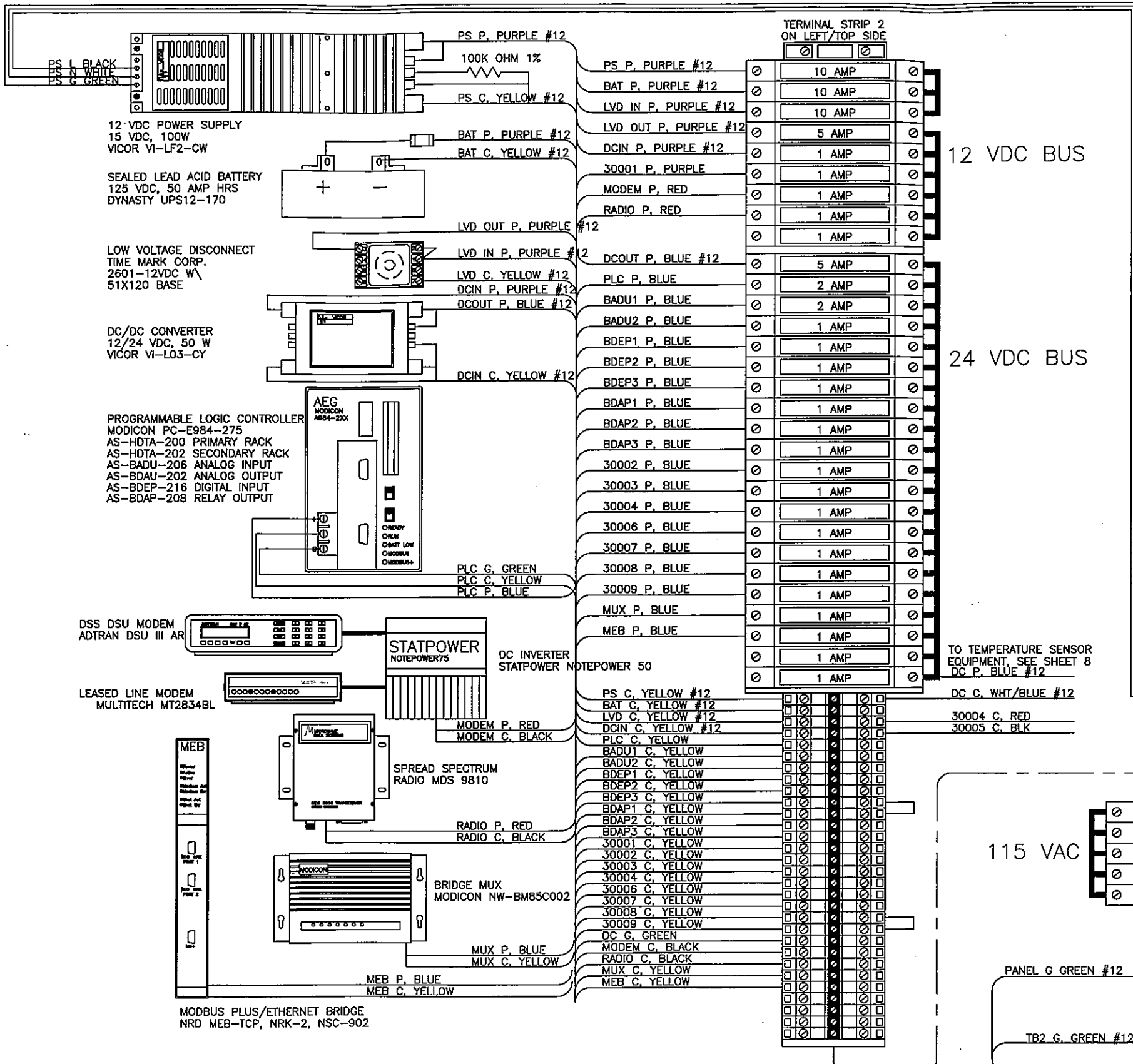


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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
PLC CONTROL PANEL, EXISTING  
LAYOUT AND PARTS LIST

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR
1	01/2011	LFT	LFT		FOR REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

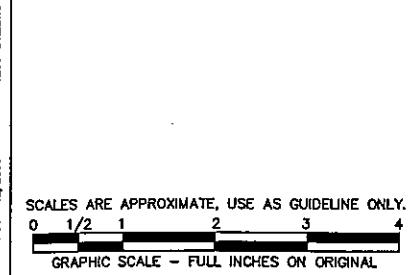
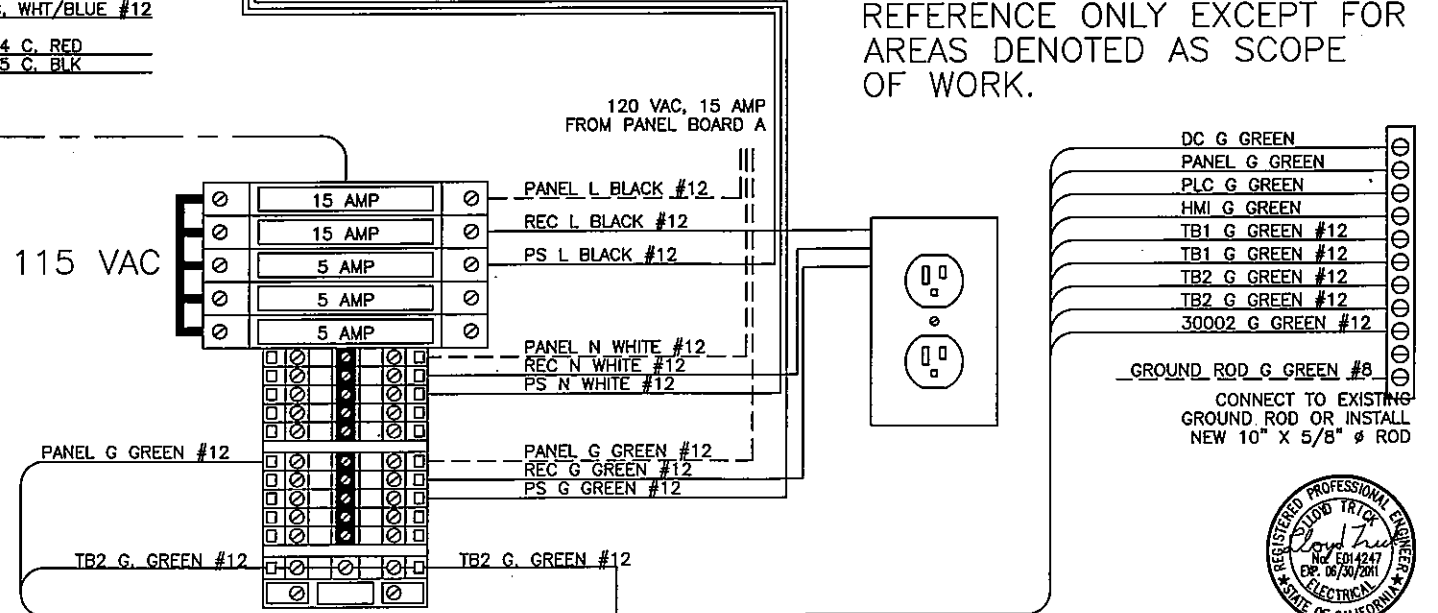
SHEET 9 OF 14  
DRAWING No. 1358-009  
JOB No. 1358  
SCALE: NONE  
UNLESS NOTED OTHERWISE  
BY A SPECIFIC DETAIL



TERMINAL BLOCK TYPES AND PART NUMBERS			
FRONT VIEW	PART NUMBER	MANUFACTURER	DESCRIPTION
	996497	WEIDMULLER	SLOTTED ASSEMBLY RAIL, 35mm
	1492-W3	AB	FEED-THROUGH TERMINAL BLOCK
	1492-EB3	AB	END SECTION FOR FEED THROUGH TERMINAL
	1492-CJ5-10	AB	JUMPER BAR - 10 BLOCKS
	1492-CJ5-2	AB	JUMPER BAR - 2 BLOCKS
	1492-H6	AB	FUSE HOLDER TERMINAL BLOCK 1 1/4" X 1/4" FUSE
	1492-N37	AB	END SECTION FOR FUSE TERMINAL BLOCK
	1492-N49	AB	JUMPER BAR - 10 BLOCKS
	1492-WKD3	AB	DISCONNECT SWITCH TERMINAL BLOCK
	1492-WG4	AB	GROUND TO RAIL TERMINAL BLOCK
	1492-N23	AB	END BRACKET
	EGU 4/24 45946	WEIDMULLER	SURGE PROTECTION TERMINAL BLOCK
	049492	WEIDMULLER	TO SUPPORT TERMINAL RAIL AND ISOLATE TERMINAL STRIP FROM PANEL BACKPLATE MOUNT UNDER TERMINAL RAIL AT 8" INTERVALS

PANEL CONSTRUCTION NOTE: UNLESS OTHERWISE SPECIFIED, ALL INTERIOR CONTROL PANEL WIRING (SHOWN SOLID) SHALL BE #18 AWG THHN OR HW AND ALL FIELD WIRING (SHOWN IN DASHED LINES) SHALL BE #14 AWG w/ TYPE THHN/THWN INSULATION, COLOR AS INDICATED. ALL WIRES UNDER 12 AWG SHALL USE FERRULES IN PANEL TERMINAL WERE APPROPRIATE. ALL WIRES SHALL HAVE HEAT SHRINK WIRE LABELS AS INDICATED; BRADLEY PS-187-150W TERMINAL SUPPORT SHALL BE PLACED AT 8" INTERVALS FOR TERMINAL RAILS ONLY.

THIS DRAWING IS FOR REFERENCE ONLY EXCEPT FOR AREAS DENOTED AS SCOPE OF WORK.

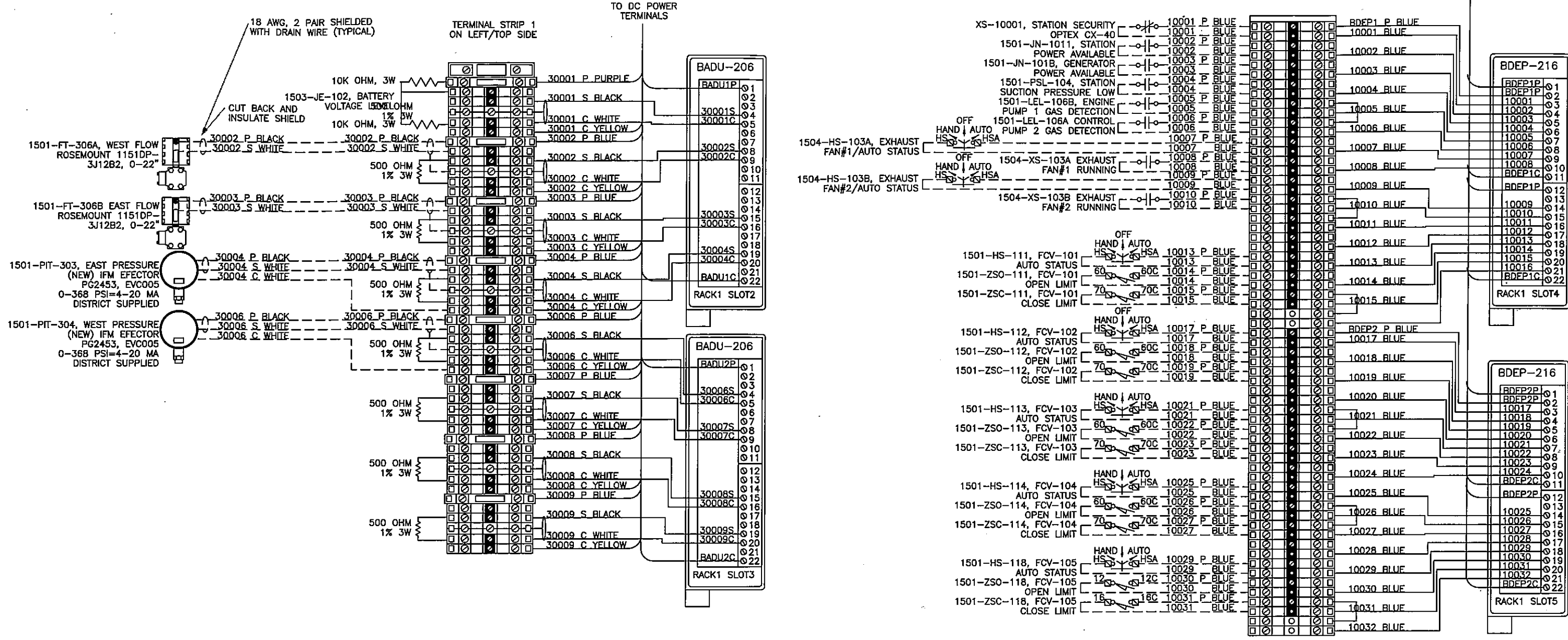


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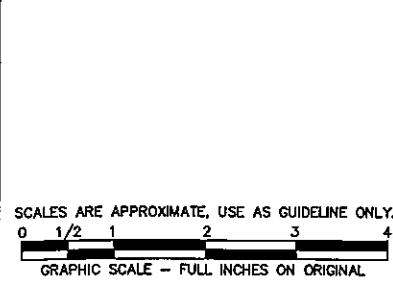
LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
PLC CONTROL PANEL, EXISTING  
AC AND DC POWER DISTRIBUTION

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR
1	01/2011	LFT	LFT	LFT	FOR REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

SHEET 10 OF 14  
DRAWING No. 1358-010  
JOB No. 1358  
SCALE: NONE  
UNLESS NOTED OTHERWISE  
BY A SPECIFIC DETAIL



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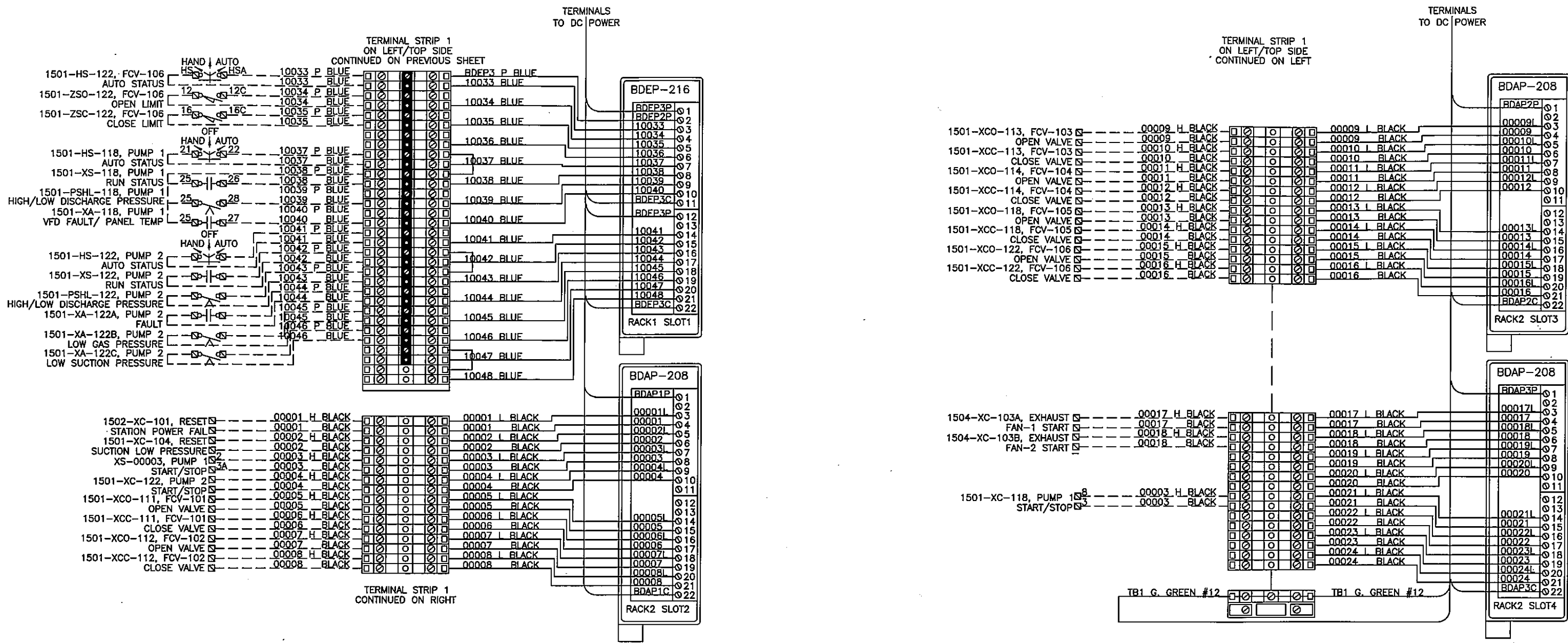
**MSO** Technologies

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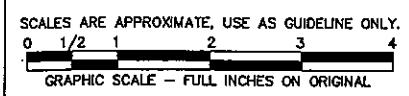
LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
PLC CONTROL PANEL, EXISTING  
ANALOG INPUTS, DIGITAL INPUTS DETAILS

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR	SHEET
1	01/26/11	LFT	LFT	LFT	FOR REVIEW	11 OF 14
2	05/20/11	LFT	LFT	LFT	RECORD	DRAWING No. 1358-011
						JOB No. 1358
						SCALE: NONE
						UNLESS NOTED OTHERWISE BY A SPECIFIC DETAIL



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1358-012.DWG  
MSO 12/2008



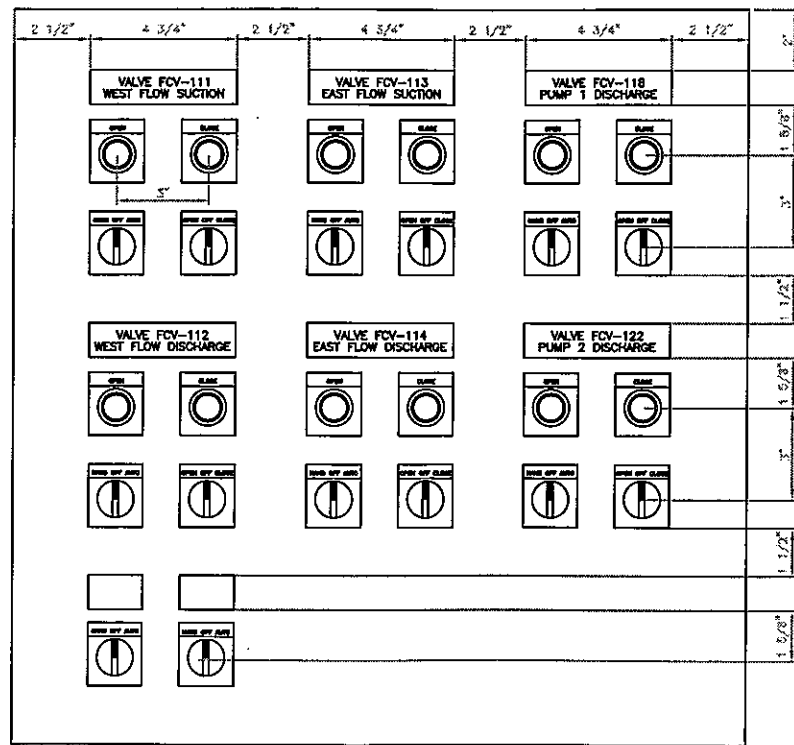
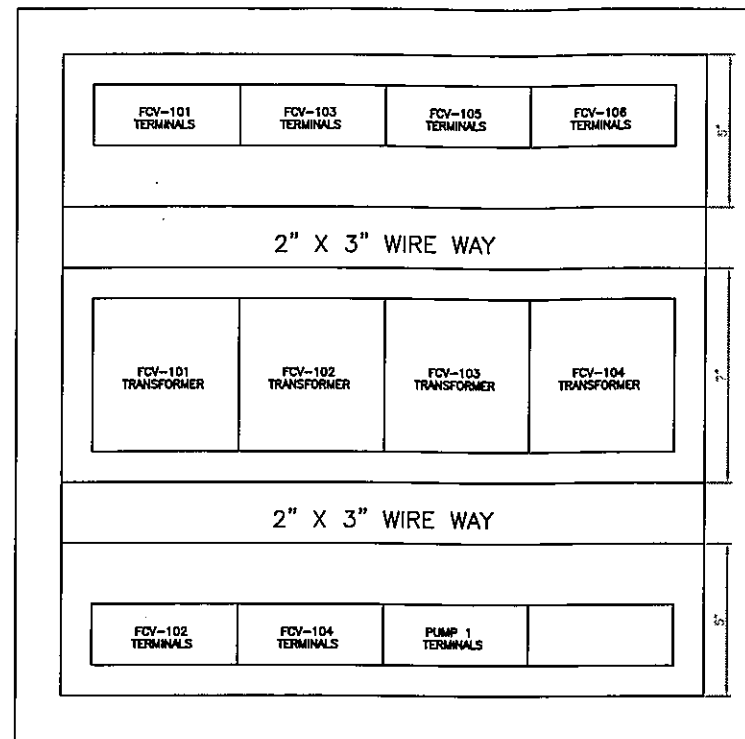
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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
PLC CONTROL PANEL, EXISTING  
DIGITAL INPUTS/OUTPUTS WIRING DETAILS

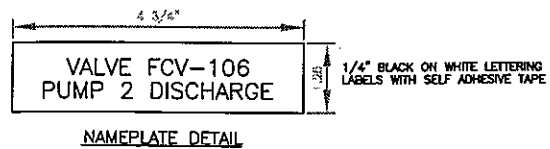
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1	01/2011	LFT	LFT	LFT	FOR REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

SHEET 12 OF 14  
DRAWING No. 1358-012  
JOB No. 1358  
SCALE: NONE  
UNLESS NOTED OTHERWISE BY A SPECIFIC DETAIL

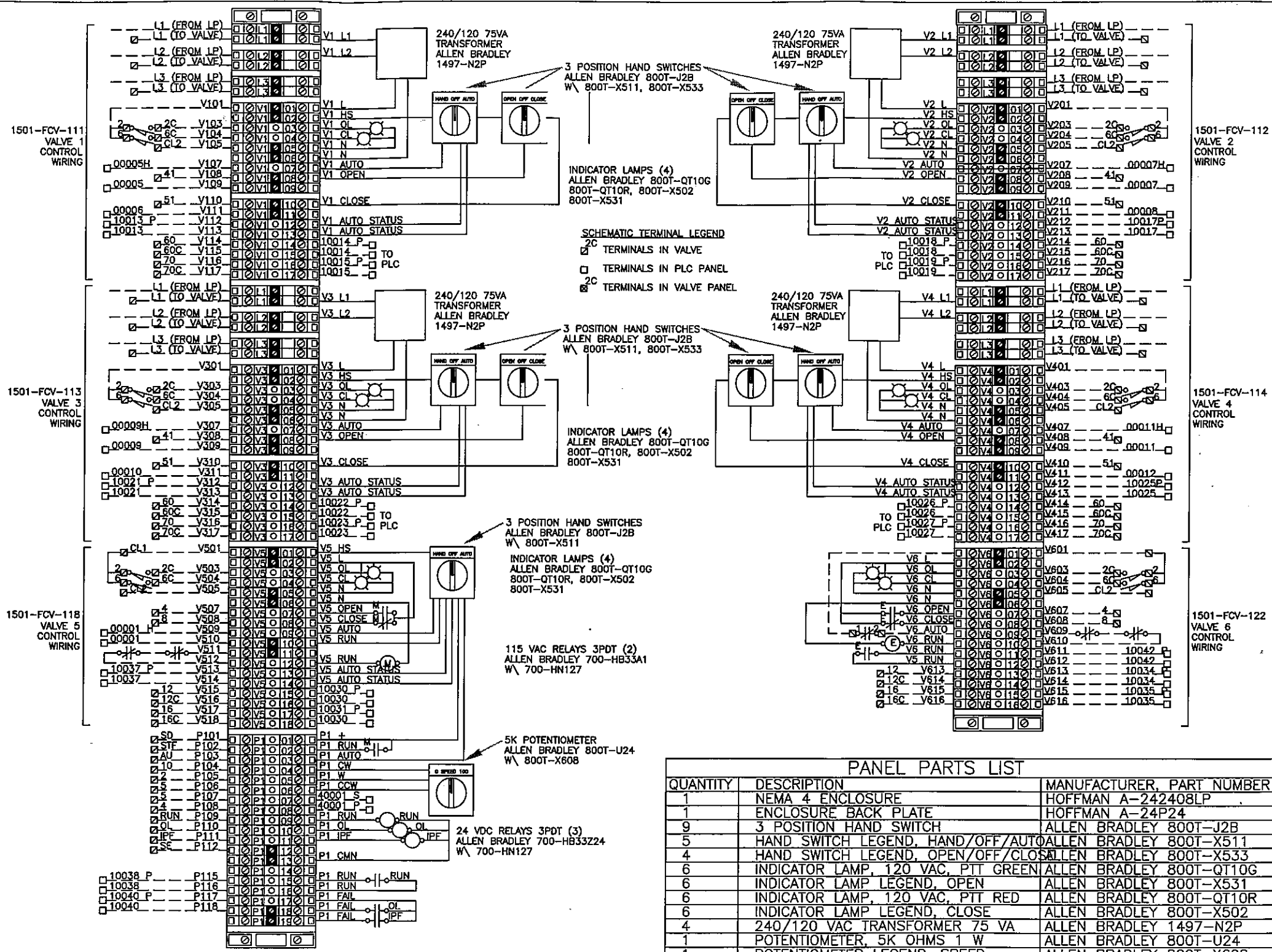




PANEL INTERIOR AND EXTERIOR LAYOUT



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PANEL TERMINAL LAYOUT AND WIRING PLAN

PANEL PARTS LIST

QUANTITY	DESCRIPTION	MANUFACTURER, PART NUMBER
1	NEMA 4 ENCLOSURE	HOFFMAN A-242408LP
1	ENCLOSURE BACK PLATE	HOFFMAN A-24P24
9	3 POSITION HAND SWITCH	ALLEN BRADLEY 800T-J2B
5	HAND SWITCH LEGEND, HAND/OFF/AUTO	ALLEN BRADLEY 800T-X511
4	HAND SWITCH LEGEND, OPEN/OFF/CLOSE	ALLEN BRADLEY 800T-X533
6	INDICATOR LAMP, 120 VAC, PTT GREEN	ALLEN BRADLEY 800T-QT10G
6	INDICATOR LAMP LEGEND, OPEN	ALLEN BRADLEY 800T-X531
6	INDICATOR LAMP, 120 VAC, PTT RED	ALLEN BRADLEY 800T-QT10R
6	INDICATOR LAMP LEGEND, CLOSE	ALLEN BRADLEY 800T-X502
4	240/120 VAC TRANSFORMER 75 VA	ALLEN BRADLEY 1497-N2P
1	POTENTIOMETER, 5K OHMS 1 W	ALLEN BRADLEY 800T-U24
1	POTENTIOMETER LEGEND, SPEED	ALLEN BRADLEY 800T-X608
2	120 VAC 3PDT RELAYS, 10 A	ALLEN BRADLEY 700-HB33A1
3	24 VDC 3PDT RELAYS, 10 A	ALLEN BRADLEY 700-HB33Z24
5	3PDT RELAY BASES	ALLEN BRADLEY 700-HN127
200	FEED THROUGH TERMINALS	ALLEN BRADLEY 1492-WJ3
24	FEED THROUGH JUMPER BARS 2 POLE	ALLEN BRADLEY 1492-CJ52
36	FEED THROUGH TERMINAL END PLATES	ALLEN BRADLEY 1492-EB3
4	END BARRIER	ALLEN BRADLEY 1492-EA35
1	TERMINAL RAIL, SLOTTED	ALLEN BRADLEY 199-DR1
1	2" X 3" WIRE WAY	PANDUIT F-2X3WH6N
1	2" WIREWAY COVER	PANDUIT C-2WH6N

SCALES ARE APPROXIMATE, USE AS GUIDELINE ONLY.

0 1/2 1 2 3 4

GRAPHIC SCALE - FULL INCHES ON ORIGINAL



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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
VALVE CONTROL PANEL - EXISTING  
PANEL LAYOUT, PARTS LIST, WIRING DETAILS

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR
1	01/2011	LFT	LFT	LFT	FOR REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

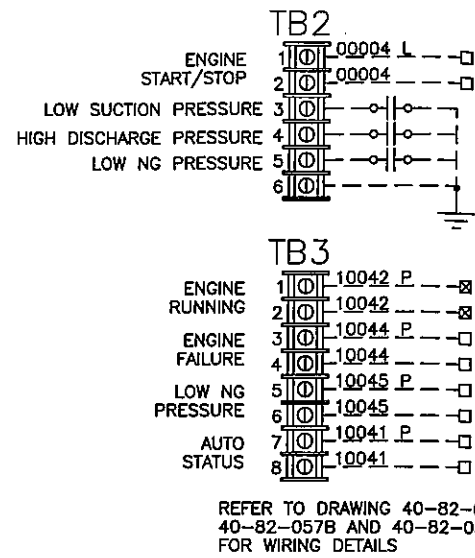
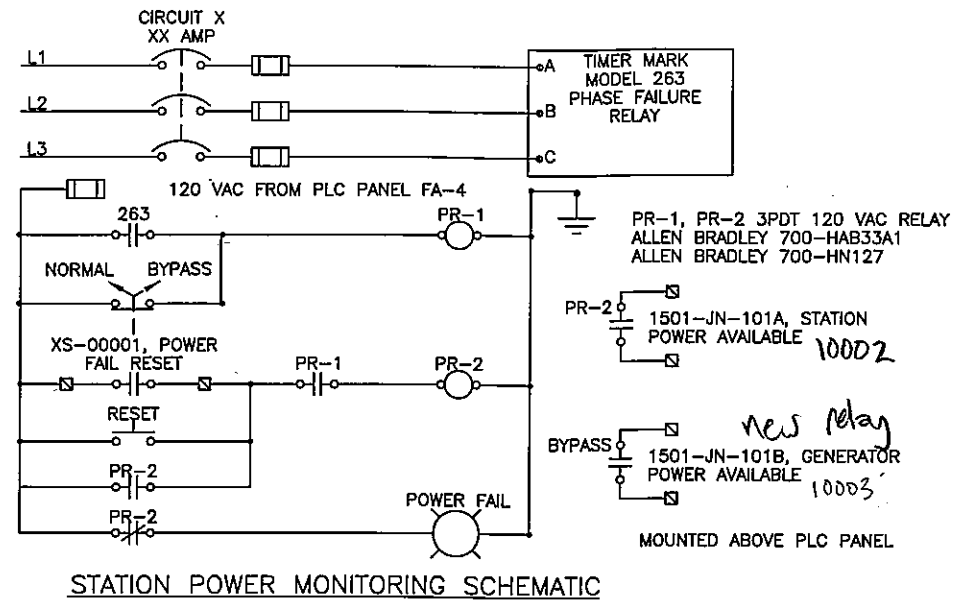
SHEET 13 OF 14

DRAWING No. 1358-013

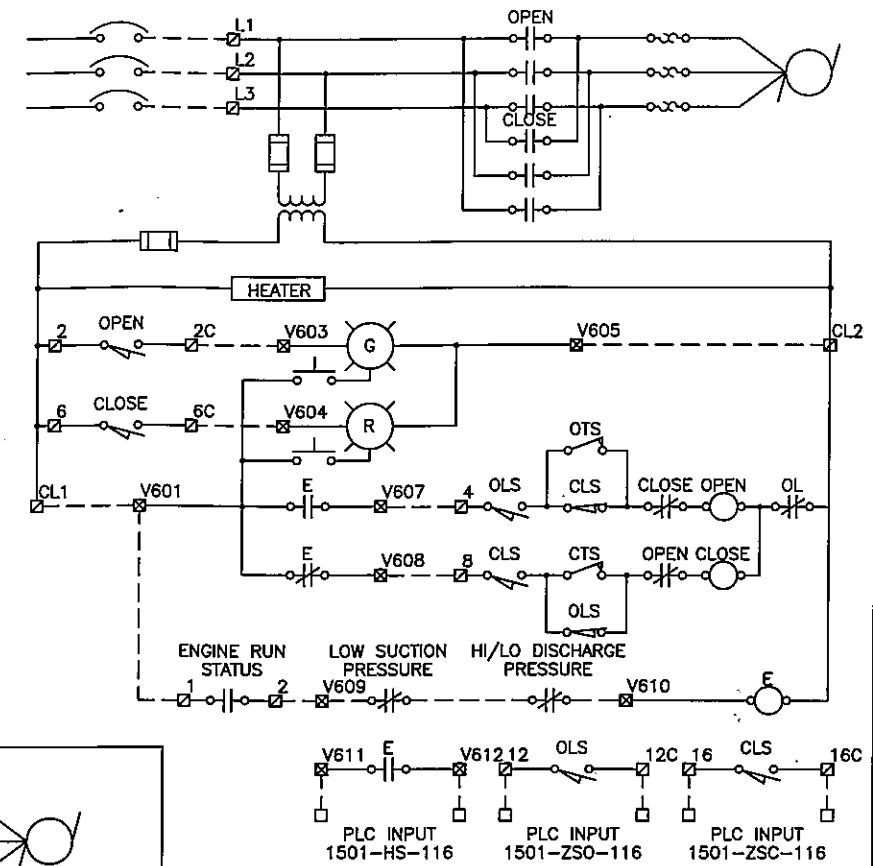
JOB No. 1358

SCALE: NONE

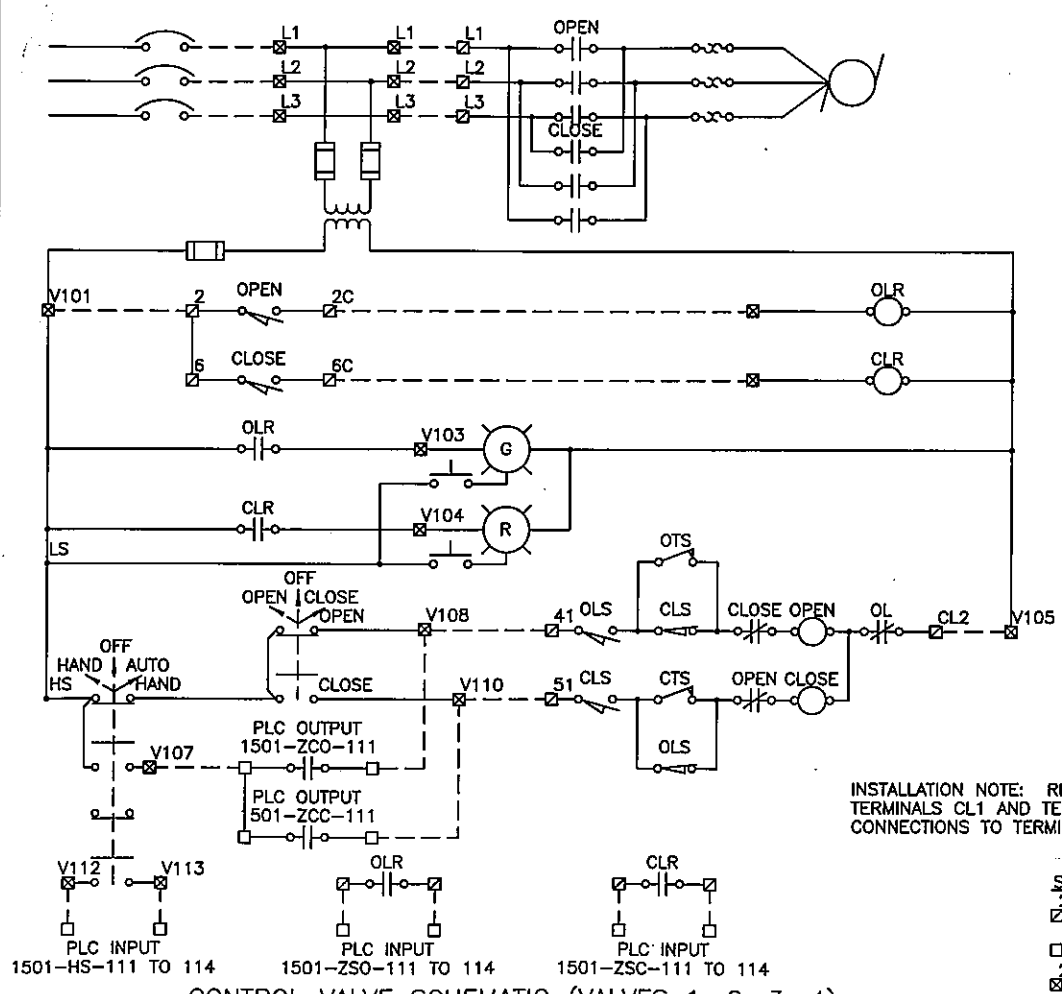
UNLESS NOTED OTHERWISE BY A SPECIFIC DETAIL



INSTALLATION NOTE: REPLACE EXISTING MURPHY SERIES 100 CONTROLLER WITH MURPHY SERIES 500 CONTROLLER. THE CONTROL WILL OCCUPY THE SAME MOUNTING AND WIRING CONFIGURATION. PLEASE REFER TO MANUFACTURERS DRAWINGS 40-82-057,B,C



CONTROL VALVE SCHEMATIC (VALVE 6)



CONTROL TRANSFORMER  
ALLEN BRADLEY 1497-N2P  
240/120 75 VA

OPEN/CLOSE RELAYS  
ALLEN BRADLEY 700-HAB33A1  
ALLEN BRADLEY 700-HN127

HAND/OFF/AUTO HAND SWITCH  
ALLEN BRADLEY 800T-J2B W/  
ALLEN BRADLEY 800T-X511

OPEN/OFF/CLOSE HAND SWITCH  
ALLEN BRADLEY 800T-J2B W/  
ALLEN BRADLEY 800T-X533

OPEN LIMIT SWITCH LAMP, PTT, GREEN  
ALLEN BRADLEY 800T-QT10G W/  
ALLEN BRADLEY 800T-X531

CLOSE LIMIT SWITCH LAMP, PTT, RED  
ALLEN BRADLEY 800T-QT10R W/  
ALLEN BRADLEY 800T-X502

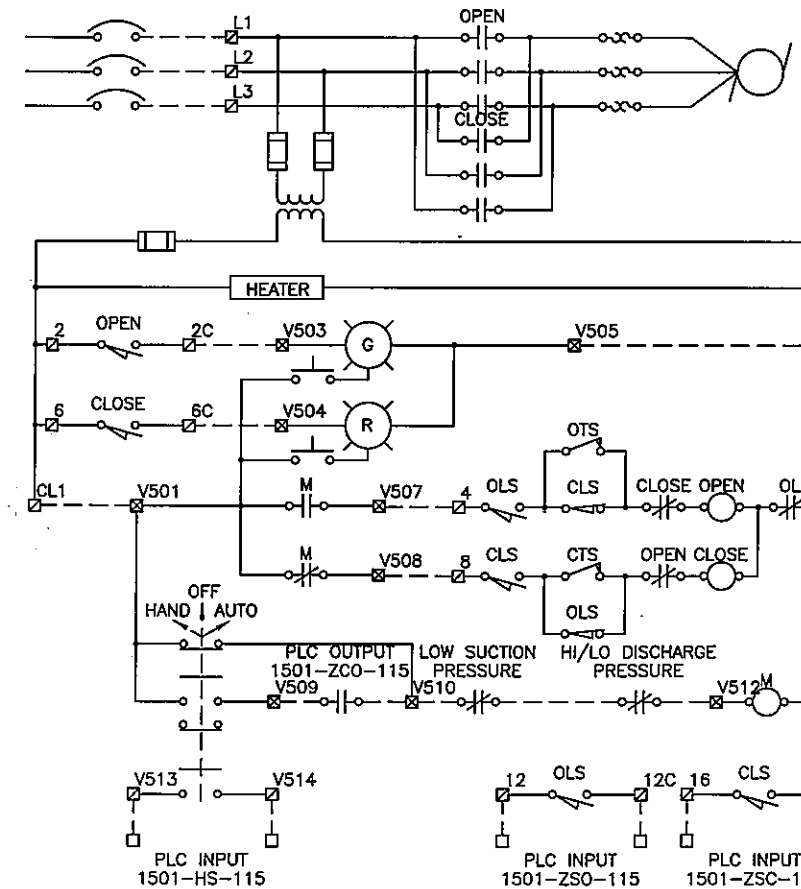
INSTALLATION NOTE: REMOVE EXISTING CONNECTIONS BETWEEN TERMINALS CL1 AND TERMINALS 60 AND 70. REMOVE ANY WIRE CONNECTIONS TO TERMINAL 7.

**SCHEMATIC TERMINAL LEGEND**

2C TERMINALS IN VALVE

□ TERMINALS IN PLC PANEL

2C TERMINALS IN VALVE PANEL



OPEN LIMIT SWITCH LAMP, PTT, GREEN  
ALLEN BRADLEY 800T-QT10G W/  
ALLEN BRADLEY 800T-X531

CLOSE LIMIT SWITCH LAMP, PTT, RED  
ALLEN BRADLEY 800T-QT10R W/  
ALLEN BRADLEY 800T-X502

INSTALLATION NOTE: REMOVE EXISTING CONNECTIONS BETWEEN TERMINALS CL1 AND TERMINALS 16 AND 12. REMOVE ANY WIRE CONNECTIONS TO TERMINAL 19, 20 & 21.

120VAC 3PDT RELAY, 10 AMP  
ALLEN BRADLEY 700-HB33A1 W/  
ALLEN BRADLEY 700-HN127

**SCHEMATIC TERMINAL LEGEND**

2C TERMINALS IN VALVE

□ TERMINALS IN PLC PANEL

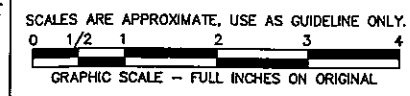
2C TERMINALS IN VALVE PANEL

CONTROL VALVE SCHEMATIC (VALVES 1, 2, 3, 4)

CONTROL VALVE SCHEMATIC (VALVE 5)

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1351-012.DWG  
MSO 12/2008



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LAS VIRGENES MUNICIPAL WATER DISTRICT  
CORNELL PUMP STATION VFD UPGRADE  
CONTROL SCHEMATICS FOR VALVES, POWER FAIL, AND ENGINE MURPHY CONTROLLER

ISSUE No.	ISSUE DATE	DRWN BY	DES'D BY	CHK'D BY	ISSUED FOR
1	01/2011	LFT	LFT	LFT	FOR REVIEW
2	05/2011	LFT	LFT	LFT	RECORD

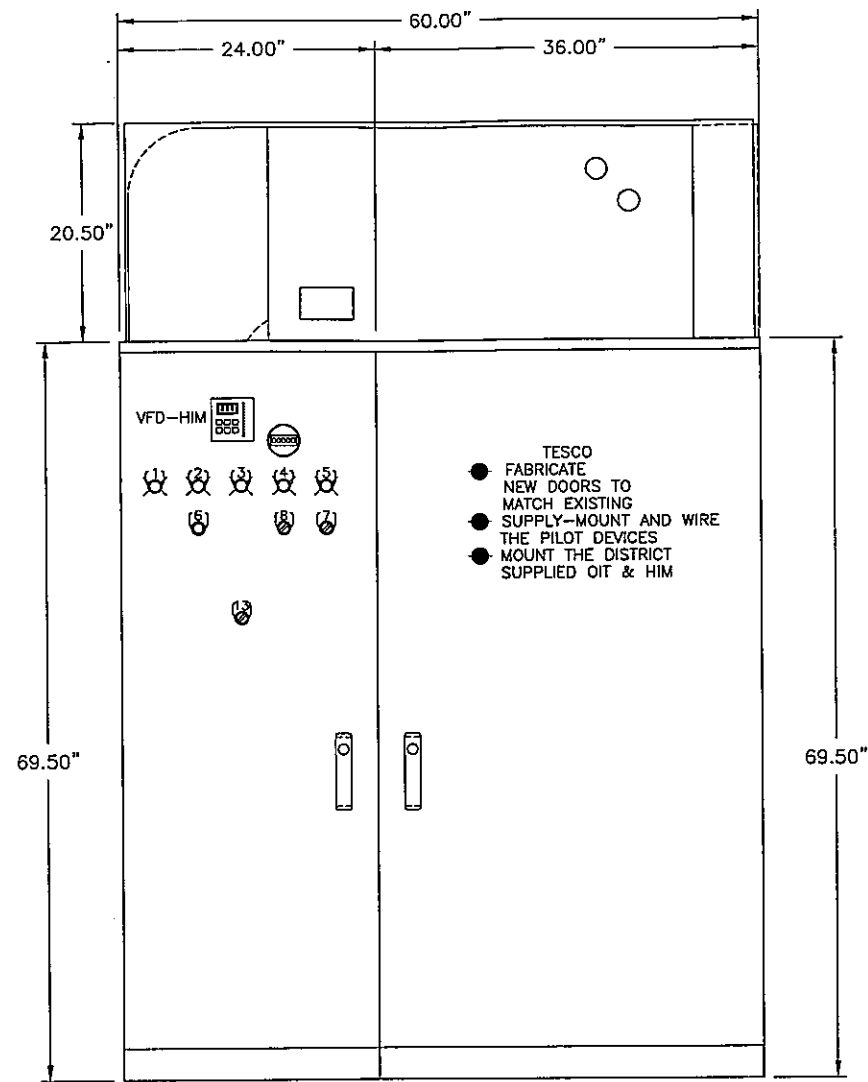
SHEET 14 OF 14

DRAWING No. 1358-014

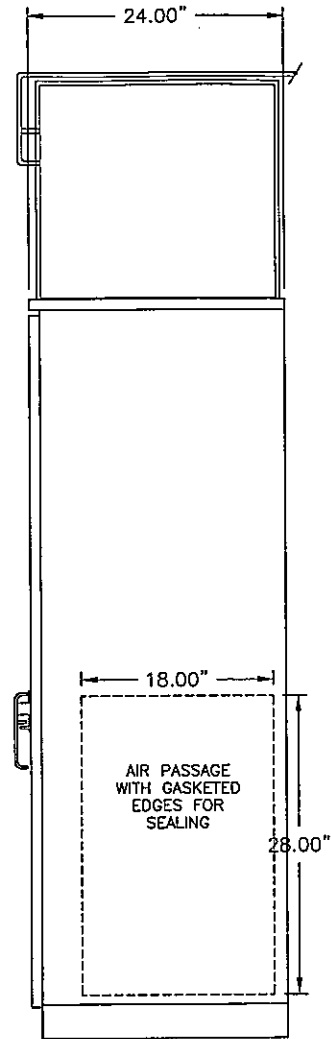
JOB No. 1358

SCALE: NONE  
UNLESS NOTED OTHERWISE BY A SPECIFIC DETAIL

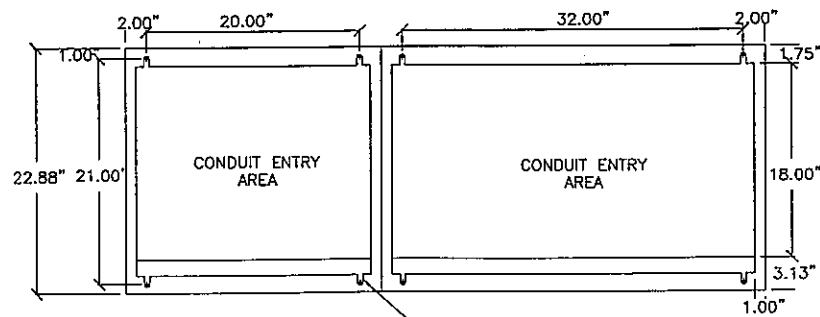




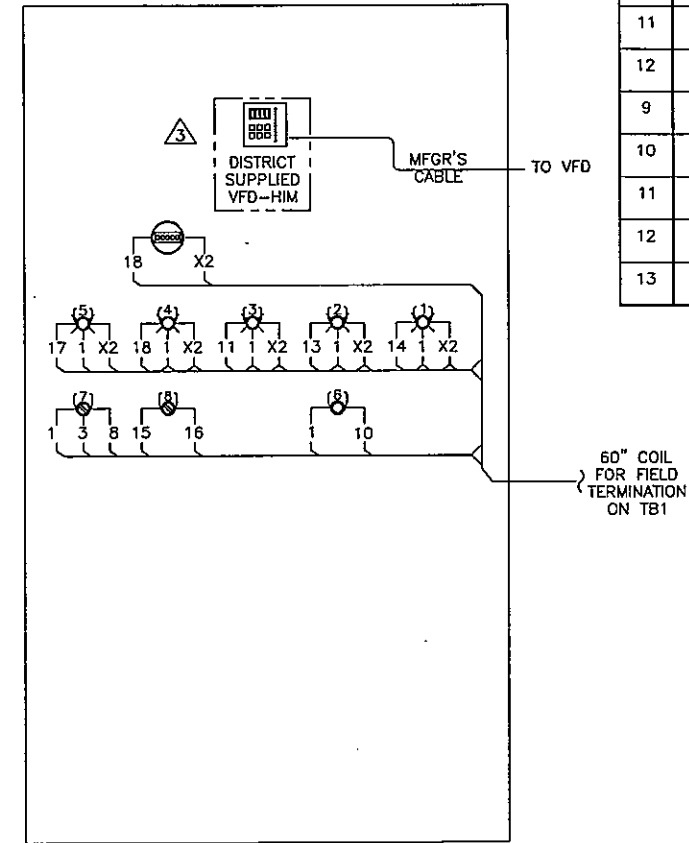
FRONT ELEVATION



RIGHT SIDE

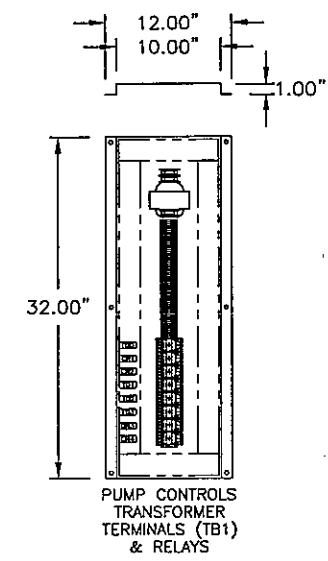


BASE PLAN



INSIDE VIEW OF NEW CONTROL COMPARTMENT DOOR  
NOT TO SCALE

LEGENDPLATE LIST				
P = .75"x3" Plate				
LP = .5"x1.5" Plate				
R = Ring Type				
Tag#	Qty	Type	Engraving	Letter
1	1	R	SPARE	.188"
2	1	R	DISCHARGE FAIL	.188"
3	2	R	MOTOR HIGH TEMP	.188"
4	1	R	RUNNING	.188"
5	1	R	VFD FAULT	.188"
6	1	R	RESET	.188"
7	1	R	OFF HAND AUTO	.188"
8	1	R	MOTOR HEATER AUTO OFF	.188"
9	1	LP	TE0	.188"
10	1	LP	CR1	.188"
11	1	LP	CR2	.188"
12	1	LP	TE1	.188"
9	1	LP	TE2	.188"
10	1	LP	TE3	.188"
11	1	LP	CR3	.188"
12	1	LP	CR4	.188"
13	1	R	VFD SPEED	.188"



PUMP CONTROLS TRANSFORMER TERMINALS (TB1) & RELAYS

REV	DATE	BY	DESCRIPTION
3	5-27-11	G G	FIELD REVISION
2	4-20-11	G G	AS BUILT
1	4-12-11	G G	SHOP RELEASE

**TESCO**  
CONTROLS INC.  
(916) 395-8800  
8440 FLORIN ROAD  
SACRAMENTO, CA 95828

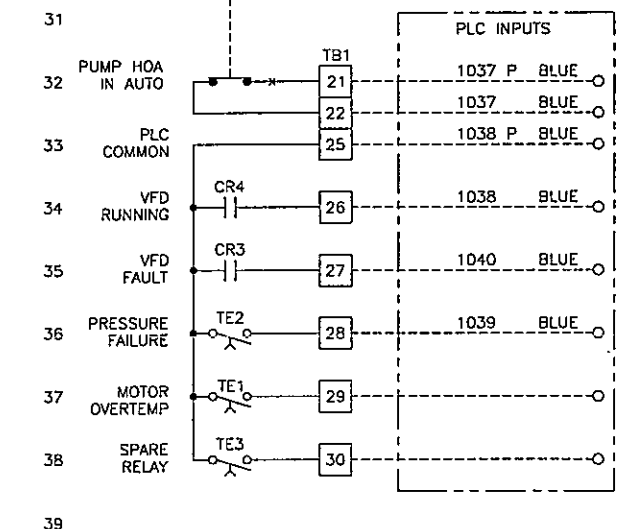
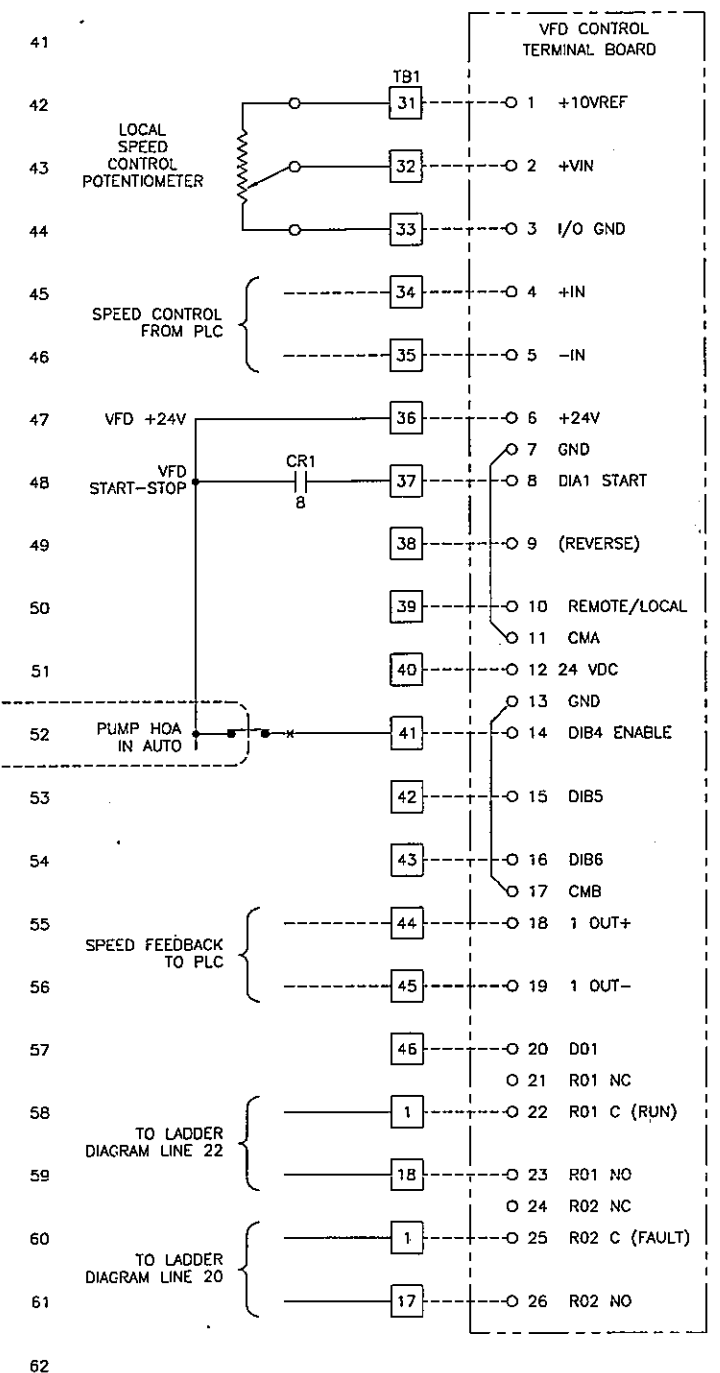
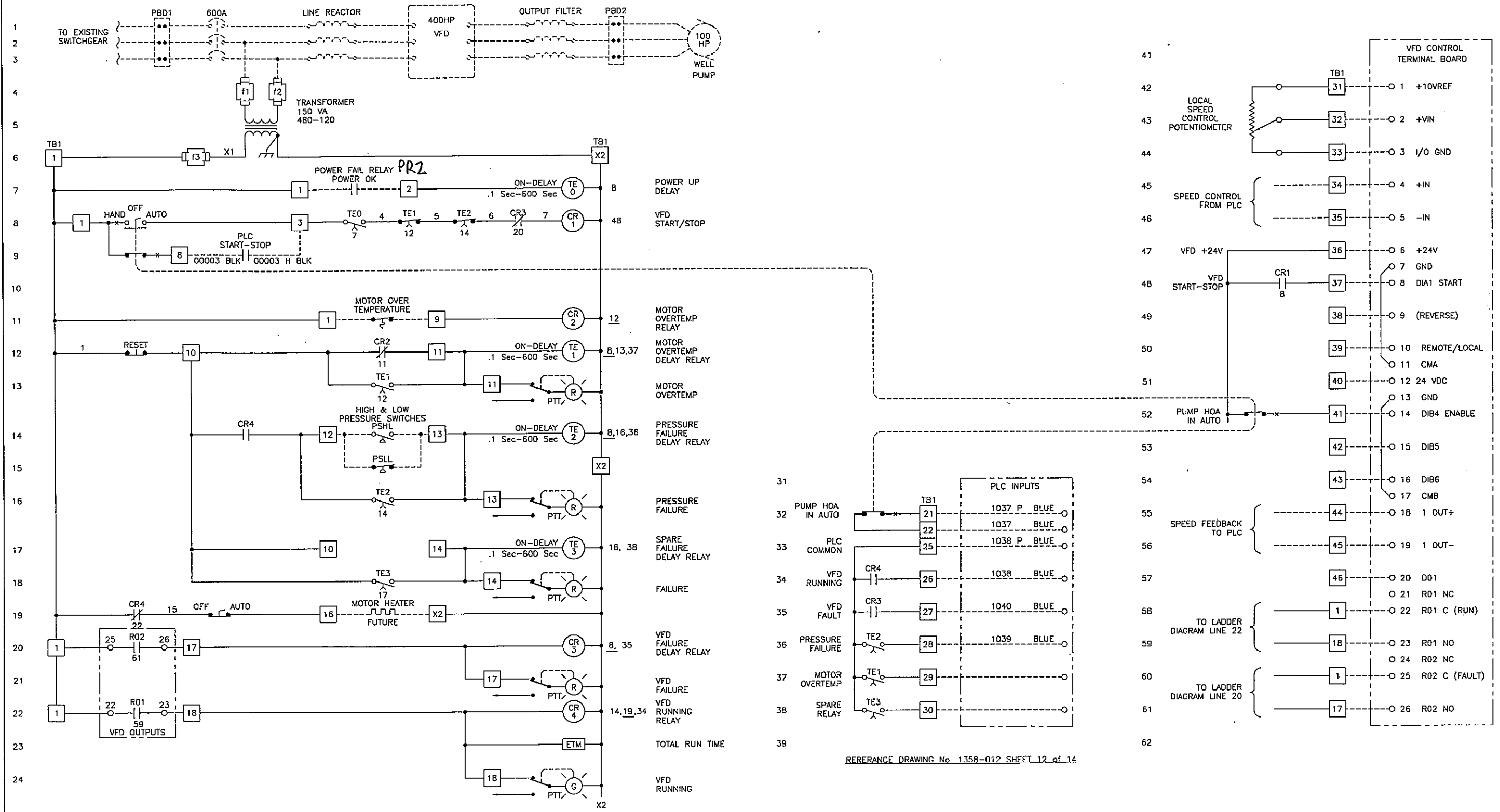
LAS VIRGENES MUNICIPAL WATER  
CORNELL PUMP STATION  
REVISED VFD - MCC LAYOUT

DATE	DESIGN BY	DRAWN BY	CHK'D BY	SHEET #	DRAWING #
03-03-11	G G	G G		1 OF	15760x1-01



# POWER DIAGRAM

ALL POWER DISTRIBUTION EQUIPMENT IS BY OTHERS



REFERENCE DRAWING No. 1358-012 SHEET 12 of 14

7:15 15760x1 15 15760x1 15760x1-02 ENG. 5/1/2011 5:15:29 PM

REV	DATE	BY	DESCRIPTION
1	4-20-11	G G	AS BUILT

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CONTROLS INC.  
(916) 395-8800  
8440 FLORIN ROAD  
SACRAMENTO, CA 95828

## TERMINAL STRIP TB1  
## O TERMINATION POINT ON A DEVICE

LAS VIRGENES MUNICIPAL WATER CORNELL PUMP STATION REVISED VFD - CONTROL SCHEMATIC				
DATE	DESIGN BY	DRAWN BY	CHK'D BY	SHEET #
03-04-11	G G	G G		2 OF
				DRAWING #
				15760x1-02