

HSP VALVE LIMIT SWITCH (VLS) CONTACT POSITIONS						
ROTOR	CONTACT	VALVE POSITION			FUNCTION	SCHEMATIC DESIGNATION
		FULL CLOSED	5% OPEN	95% OPEN		
LSO	1				VALVE CLOSE BY-PASS	VLS T
	2				SPARE	VLS Z
	3				VALVE CLOSE INDICATION	VLS 2
	4				OPEN LIMIT	VLS 4
LSC	5				VALVE OPEN BY-PASS	VLS 5
	6				PUMP START INTERLOCK	VLS 6
	7				VALVE OPEN INDICATION	VLS 7
	8				CLOSE LIMIT	VLS 8
LSA	9				PUMP SHUT DOWN	VLS 9
	10				SPARE	VLS T0
	11				SPARE	VLS T1
	12				SPARE	VLS T2
LSB	13				INCOMPLETE SEQUENCE	VLS T3
	14				SPARE	VLS T4
	15				SPARE	VLS T5
	16				SPARE	VLS T6
TSC	17	TORQUE SWITCH (VALVE CLOSE CIRCUIT)				VLS T7
TSD	18	TORQUE SWITCH (VALVE OPEN CIRCUIT)				VLS T8

— INDICATES CLOSED CONTACT

DEVICE FUNCTIONS

SS-HOA  
3-POSITION (HAND-OFF-AUTO), MAINTAINED, SELECTOR SWITCH ALLOWS CHOICE OF MANUAL (HAND) OR AUTOMATIC (AUTO) CONTROL FOR VALVE OPEN AND CLOSE. NORMAL OPERATION IS IN THE "AUTO" POSITION.

PB3/OPEN, PB4/CLOSE  
MOMENTARY PUSHBUTTONS FOR MANUAL (HAND) INITIATION OF VALVE OPEN OR VALVE CLOSE.

K9  
A MERCURY SWITCH (PS-LWCO) CLOSING ON LOW WATER PRESSURE, WHICH CAUSES RELAY "K9" (LOCATED IN THE SUPERVISORY CONTROL PANEL) TO OPERATE, THUS INITIATING VALVE CLOSING AND HSP STOP.

CS1-3  
CONTROL SWITCH IN HSP MOTOR STARTER/CONTROLLER SWITCHGEAR WHICH ALLOWS THE OPERATOR TO MANUALLY INITIATE VALVE CLOSING FROM THE HSP MOTOR STARTER/CONTROLLER SWITCHGEAR.

K2  
UPON INPUT OF A DIGITAL SIGNAL BY THE SUPERVISORY CONTROLS OPERATOR (FROM A LOCATION REMOTE TO THE STATION), K2 CONTACT CLOSING, THUS INITIATING VALVE CLOSING AND HSP MOTOR STOP.

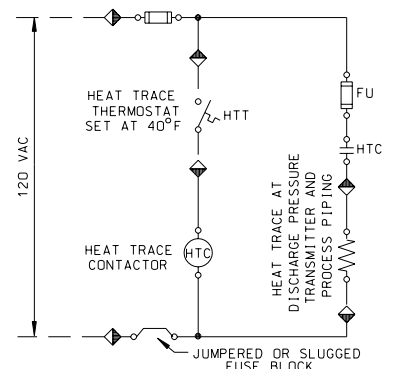
HS1 - SELECTOR SWITCH  
2-POSITION (SCP/MCC), MAINTAINED, SELECTOR SWITCH LOCATED ON THE SUPERVISORY CONTROL PANEL. WHEN IN THE "MCC" POSITION, CONTACT HS1-4 IS CLOSED ALLOWING THE OPERATOR TO INITIATE VALVE CLOSING (HSP STOP) WITH CONTROL SWITCH CS1-3 FROM THE HSP MOTOR STARTER/CONTROLLER SWITCHGEAR.

VLSX-1 & VLSX-2  
AUXILIARY RELAYS USED AS CONTACT MULTIPLIERS FOR VALVE OPEN/CLOSED INDICATIONS.

VLS - VALVE LIMIT SWITCH  
CONTACT IS OPEN OR CLOSED DEPENDING ON THE POSITION OF THE VALVE AS INDICATED IN THE "VALVE LIMIT SWITCH CONTACT POSITIONS" SCHEDULE.

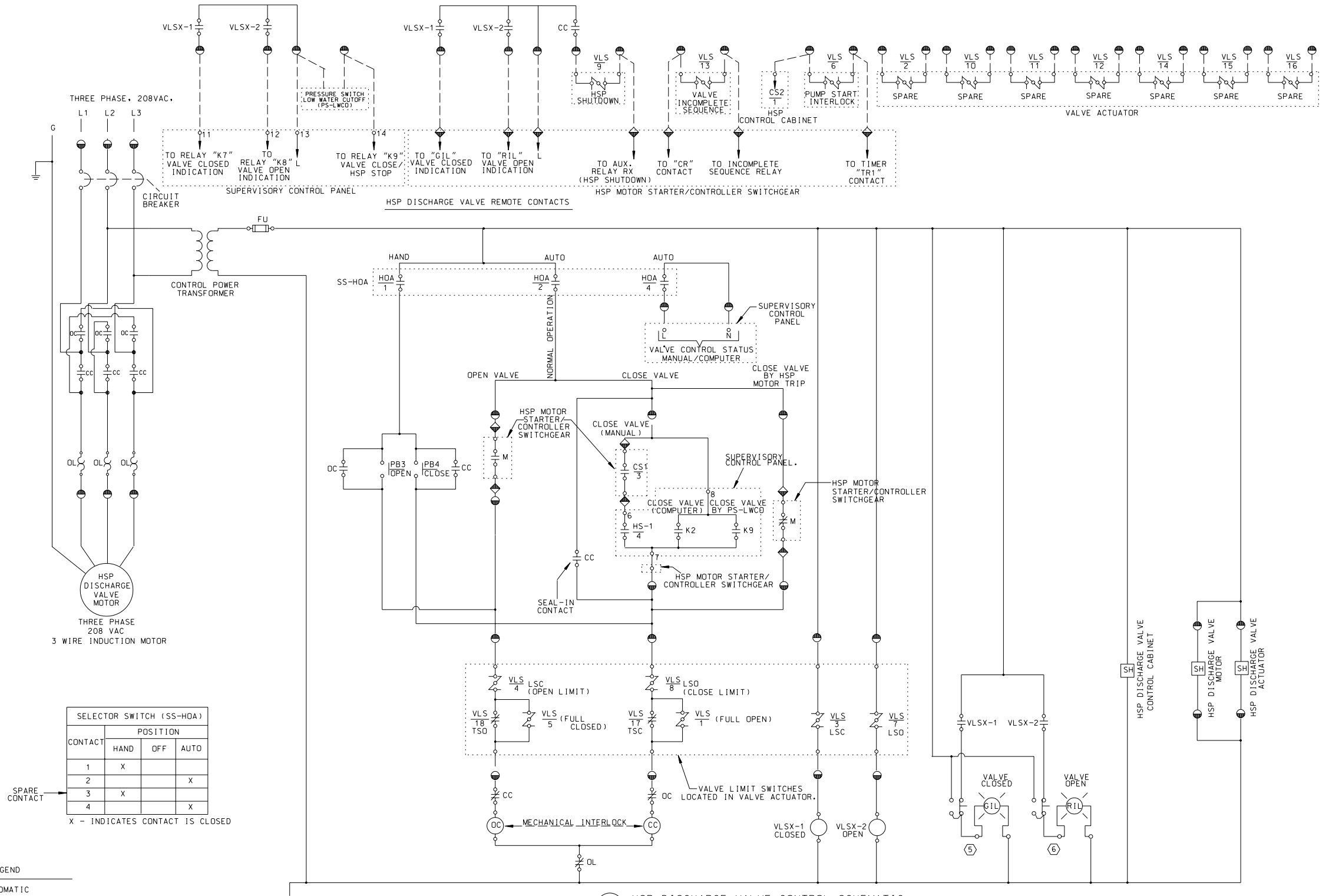
OC - OPEN CONTACTOR/COIL  
UPON ENERGIZATION, ALLOWS VALVE TO OPEN.

CC - CLOSE CONTACTOR/COIL  
UPON ENERGIZATION, ALLOWS VALVE TO CLOSE.



HSP HEAT TRACE CONTROL SCHEMATIC

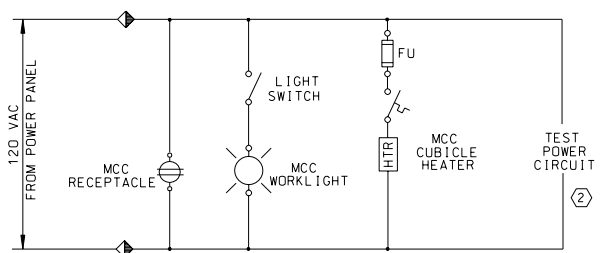
◆ TERMINAL POINT IN HEAT TRACE CONTROL CABINET  
DARK SIDE INDICATES CONNECTIONS INTERNAL TO PANEL.



SELECTOR SWITCH (SS-HOA)		
CONTACT	POSITION	
	HAND	AUTO
1	X	
2		X
3	X	
4		X

X - INDICATES CONTACT IS CLOSED

- LEGEND
- AUTO AUTOMATIC
  - CC CLOSE CIRCUIT/COIL
  - CPT CONTROL POWER TRANSFORMER
  - CS1 CONTROL SWITCH
  - DPS DIFFERENTIAL PRESSURE SWITCH
  - FU FUSE
  - G GROUND
  - GIL GREEN INDICATING LIGHT
  - HOA HAND-OFF-AUTO
  - HSP HIGH SERVICE PUMP
  - LWCO LOW WATER CUTOFF
  - M MAIN CONTACTOR AUXILIARY CONTACT
  - MOV MOTOR OPERATED VALVE
  - OC OPEN CIRCUIT/COIL
  - OL OVERLOAD
  - P PRIMARY
  - PB PUSH BUTTON
  - PS PRESSURE SWITCH
  - RIL RED INDICATING LIGHT
  - SH SPACE HEATER
  - S SECONDARY
  - SS SELECTOR SWITCH
  - SUPV SUPERVISORY
  - TSD TORQUE SWITCH OPEN
  - TSC TORQUE SWITCH CLOSE
  - VLS VALVE LIMIT SWITCH
  - VLSX VALVE LIMIT SWITCH AUXILIARY RELAY
  - Ø PHASE



MCC WORKLIGHT, FLOW METER POWER & RECEPTACLES (HSP 1, 2, 3, & 4)

◆ TERMINAL POINT IN MOTOR STARTER/CONTROLLER CUBICLE  
DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.

HSP DISCHARGE VALVE CONTROL SCHEMATIC

- ◆ TERMINAL POINT IN HSP DISCHARGE VALVE CONTROL CABINET (REMOTE TO VALVE ACTUATOR)  
DARK SIDE INDICATES CONNECTIONS INTERNAL TO PANEL.
- ◆ TERMINAL POINT IN MOTOR STARTER/CONTROLLER CUBICLE  
DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.

No.	Revision	Drawn	Approved	Date

Revisions

DESIGN STANDARDS  
PUMP STATION

HSP DISCHARGE VALVE  
CONTROL SCHEMATICS

Developer SAN ANTONIO WATER SYSTEM  
Cont. Budget Proj.

SUBMITTED GRUBB ENGINEERING, INC.

APPROVED

Map No. Section No. Job No. E08