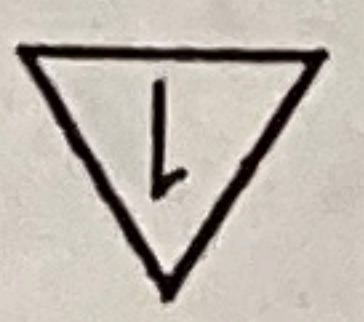


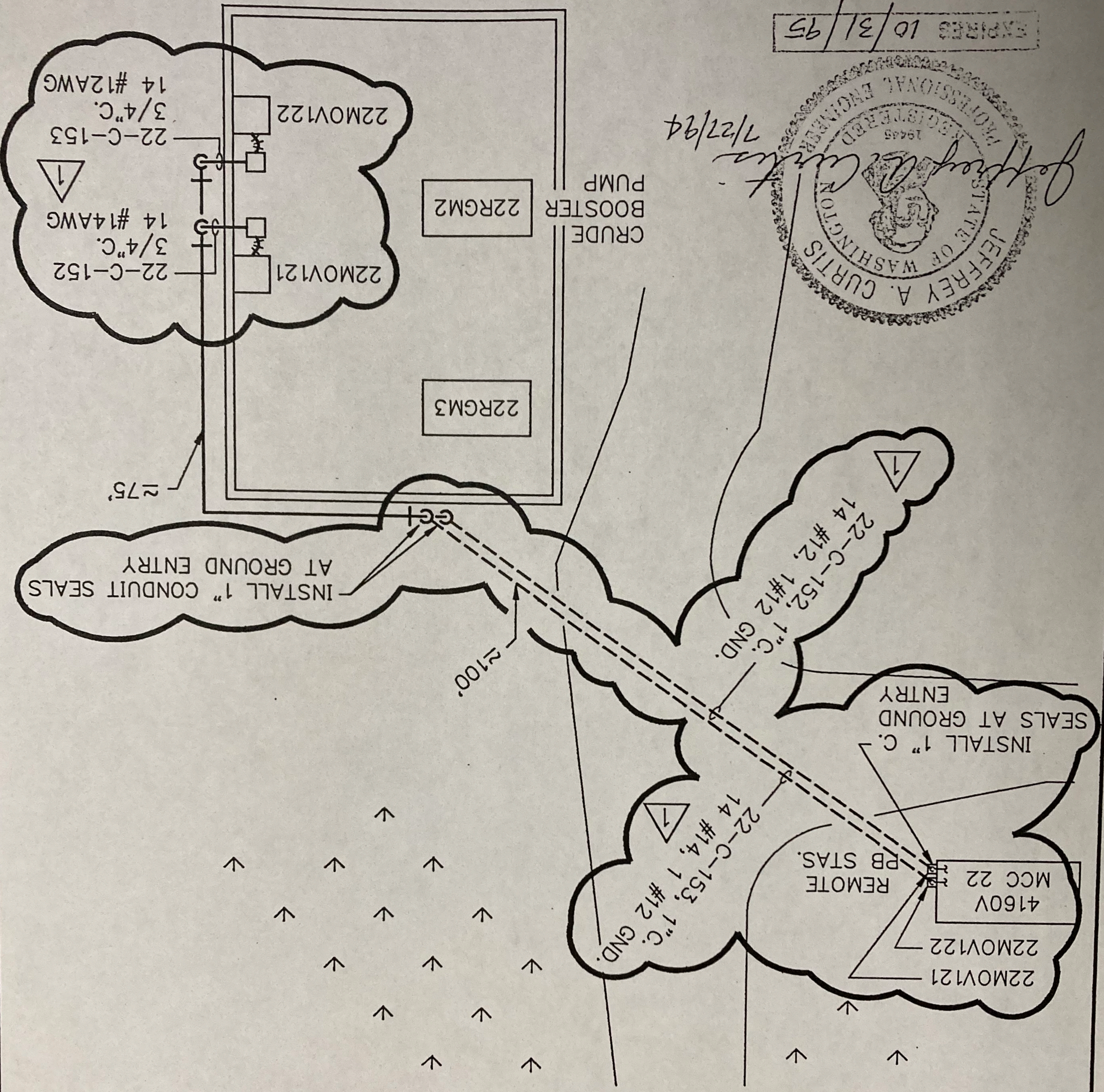
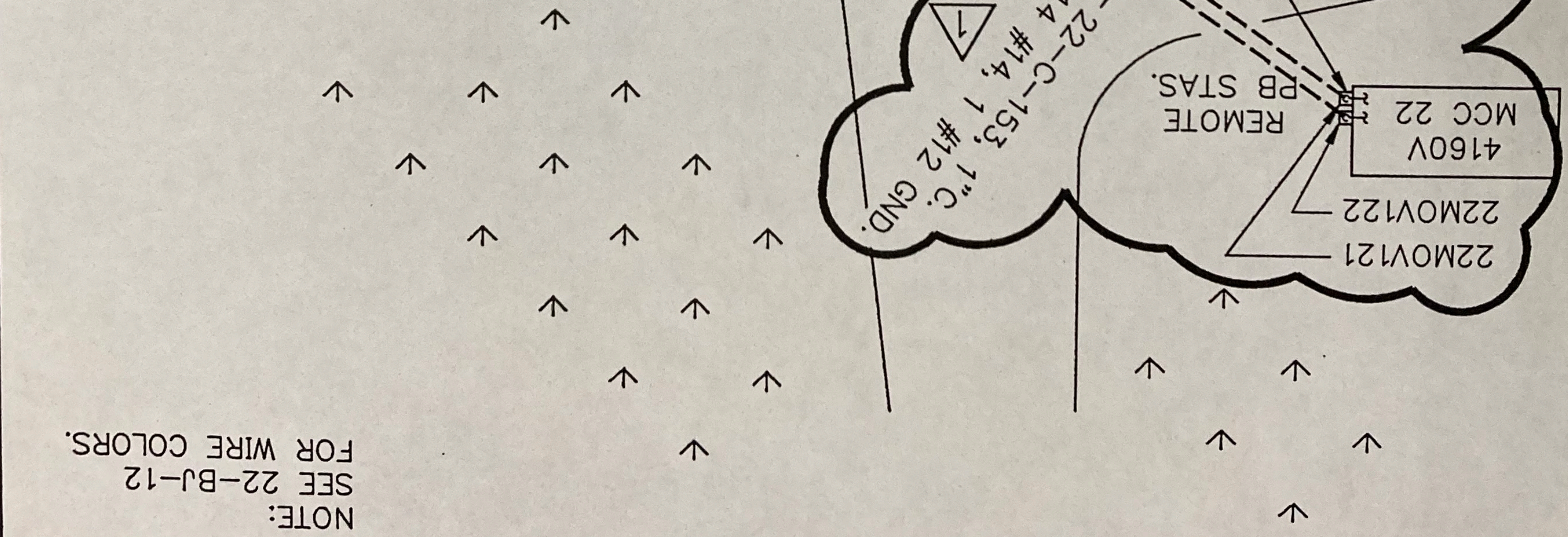
LOCATION R.P. & S
 SUBJECT INSTALL MOV 121 & MOV 122 SHUTDOWN SWITCHES
 SCOPE SKETCH - W.O. 9313410
 APPVD. BY ERW
 CHKD. BY ERW
 APPVD. BY JK
 CHIEF ENGR
 FILE NO. 22AJ0001

AS-BUILT MOV CONTROL STATIONS,
 CONDUIT ROUTING AND FILL.

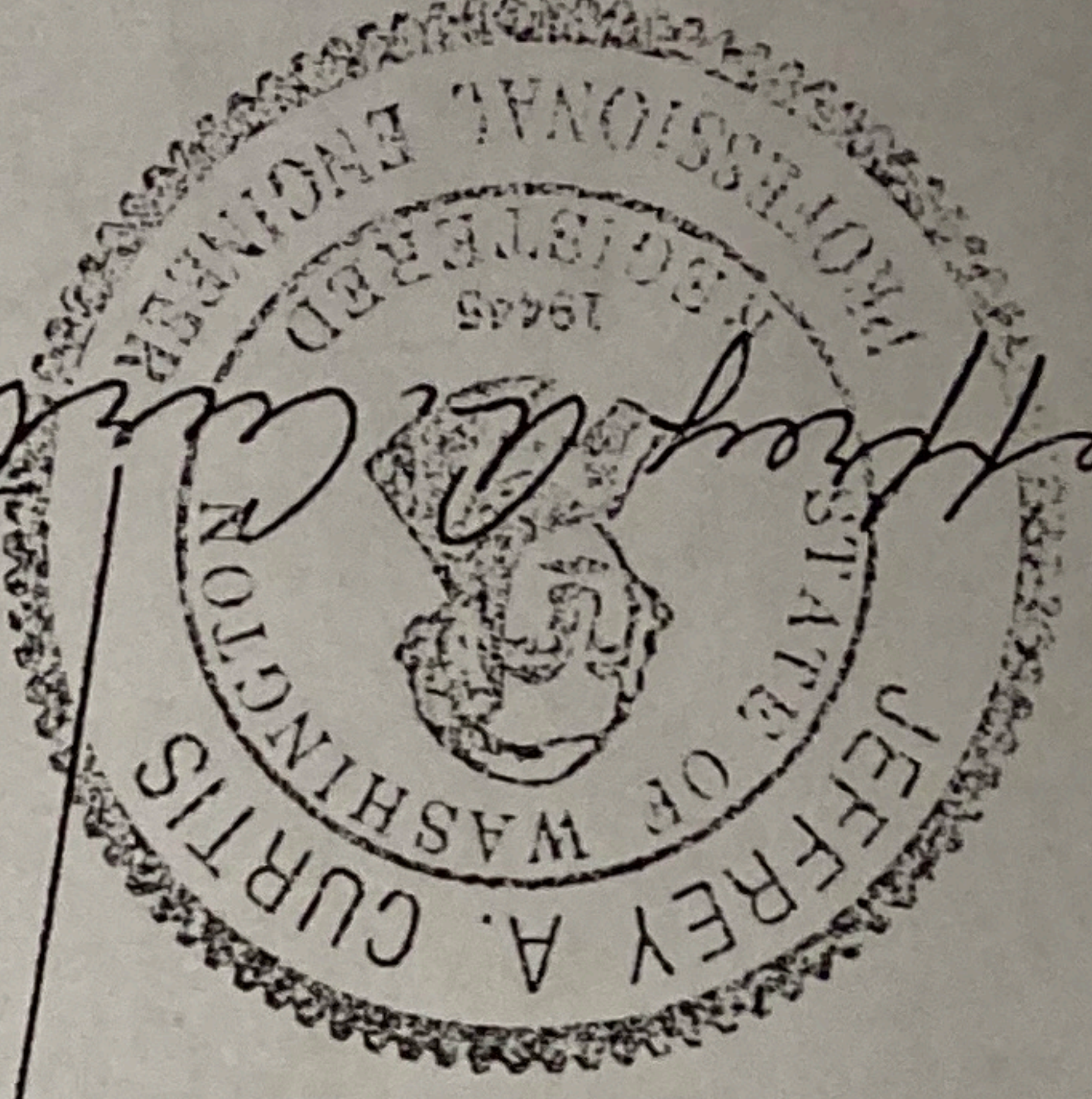


3/9/94

NOTE:
 SEE 22-BJ-12
 FOR WIRE COLORS.



EXPIRES 10/31/95



7/27/94

Jeffrey A. Curtis

LOCATION R.P. & S. SHT. NO. SK-091493
 SUBJECT INSTALL MOV 121 & MOV 122 PUSHBUTTON STATIONS DATE 09/15/93
INSTALLATION DETAILS - W.O. 9313410 BY ERW
 BM NO. 5059 CHKD. BY JAC
 APPVD. BY JAC
 CHIEF ENGR. _____
 FILE NO. 22BJ0002

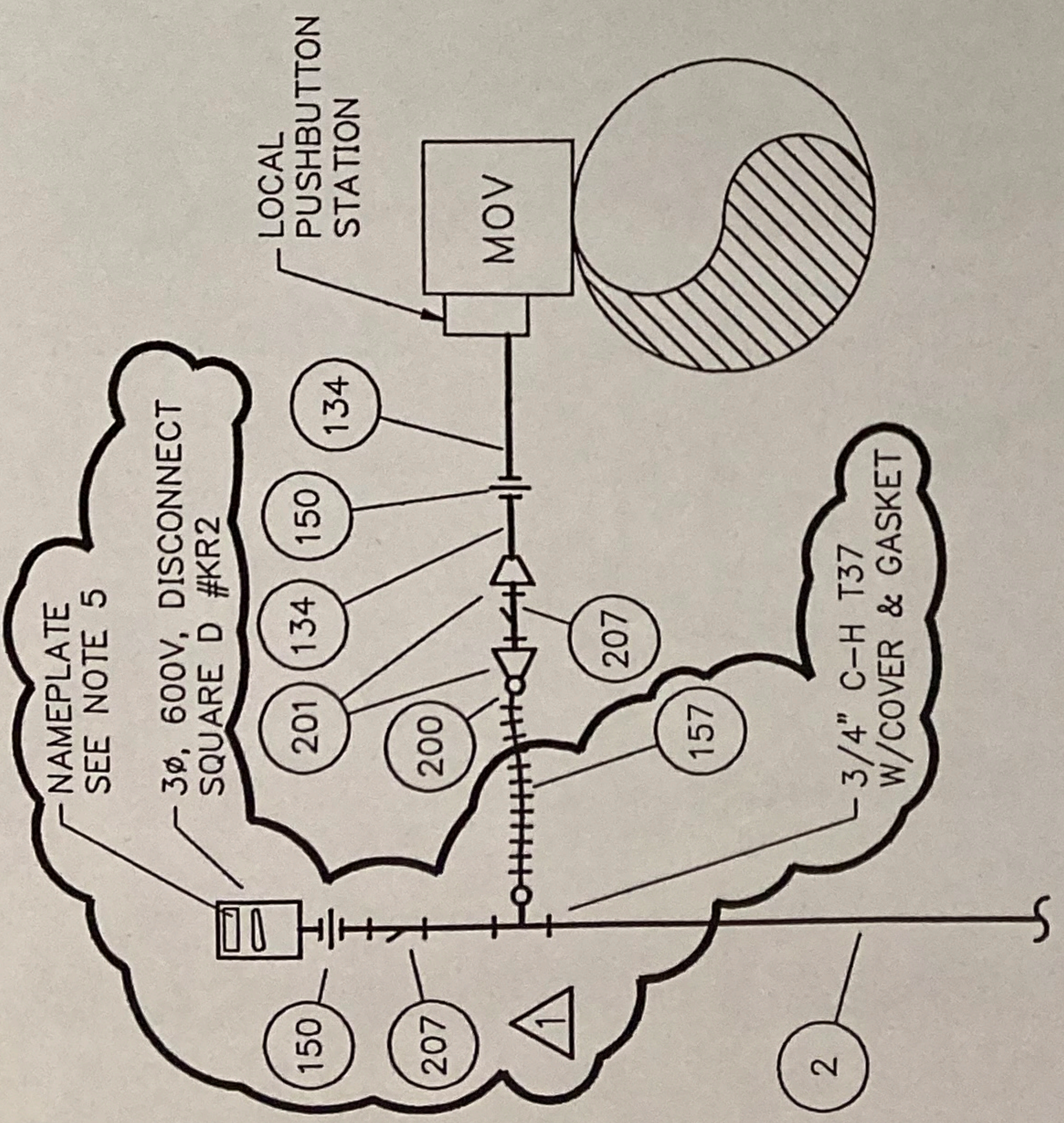
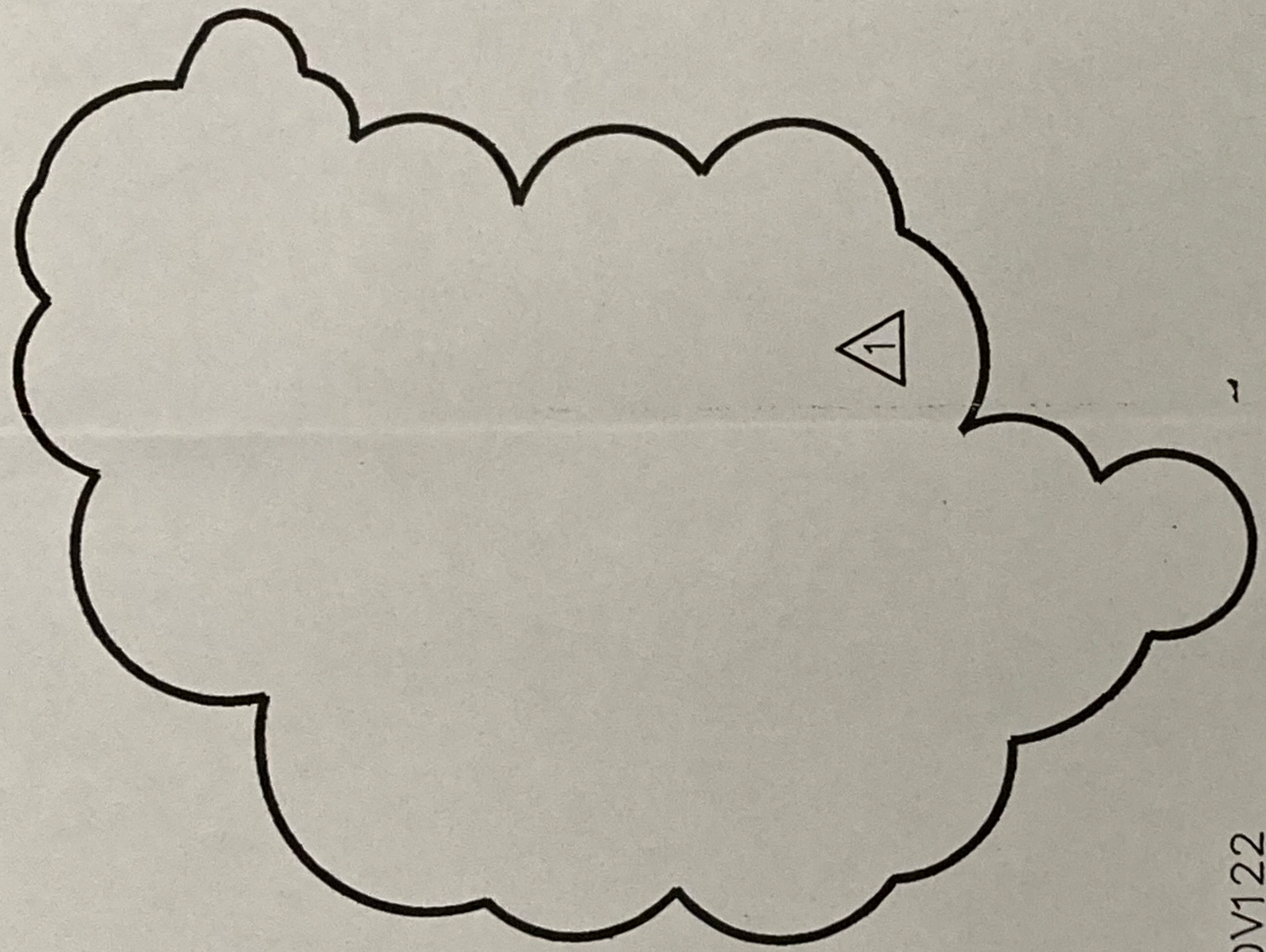
REV. 1 - ADD DISCONNECT SWITCH FOR 120VDC.

LIST OF MATERIALS

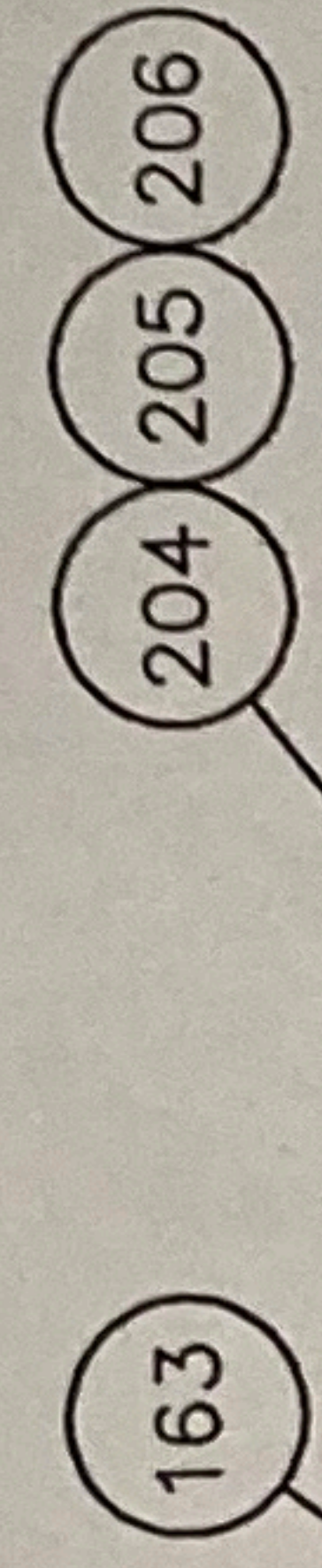
ITEM	QTY	DESCRIPTION
2	A/R	CONDUIT, 3/4" RIGID GALVANIZED STEEL
134	3	CONDUIT NIPPLE, 3/4" GALVANIZED RIGID STEEL
148	1	FITTING, CONDUIT SEAL, 3/4" C-H #EYS 21
150	2	UNION, 3/4" CROUSE HINDS #JUNY205
157	2	CONDUIT, 3/4" LIQUIDTITE FLEXIBLE METAL, TYPE UA
163	1	PLATE, 1/4" A-36 STEEL
200	4	FITTING, LIQUIDTITE, STRAIGHT MALE CONN. O-Z #4Q-75
201	2	FITTING, CONDUIT, 1" x 3/4" REDUCER, C-H #RE32
202	2	FITTING, CONDUIT COUPLING, 3/4" TYPE RGS
204	2	BOLT, HEX HEAD, 304 STAINLESS STEEL
205	4	NUT, HEX HEAD, 304 STAINLESS STEEL
206	2	WASHER, LOCK TYPE, STAINLESS STEEL
207	1	FITTING, CONDUIT, 1" F/F SEAL, C-H #EYS31

NOTES:

- TYPICAL FOR 2 INSTALLATIONS.
- FLEX CONDUIT (LIQUIDTITE) IS TO BE NO LONGER THAN THREE FEET AND NO SHORTER THAN 18 INCHES.
- SEE DWG. 22-BJ-12 FOR WIRING DETAILS.
- SEE STANDARD DETAIL 9S-9171-2 DETAIL "E" & 9S-9359-0 DETAIL "B" FOR INSTRUMENT SUPPORT DETAILS. MOUNT BOTH PUSHBUTTON STATIONS ON ONE PLATE.
- REFERENCE NAMEPLATE SCHEDULE #22-BP-46.



TYPICAL FOR 22MOV121 & 22MOV122
 REFERENCE DRAWING 22-AP-30

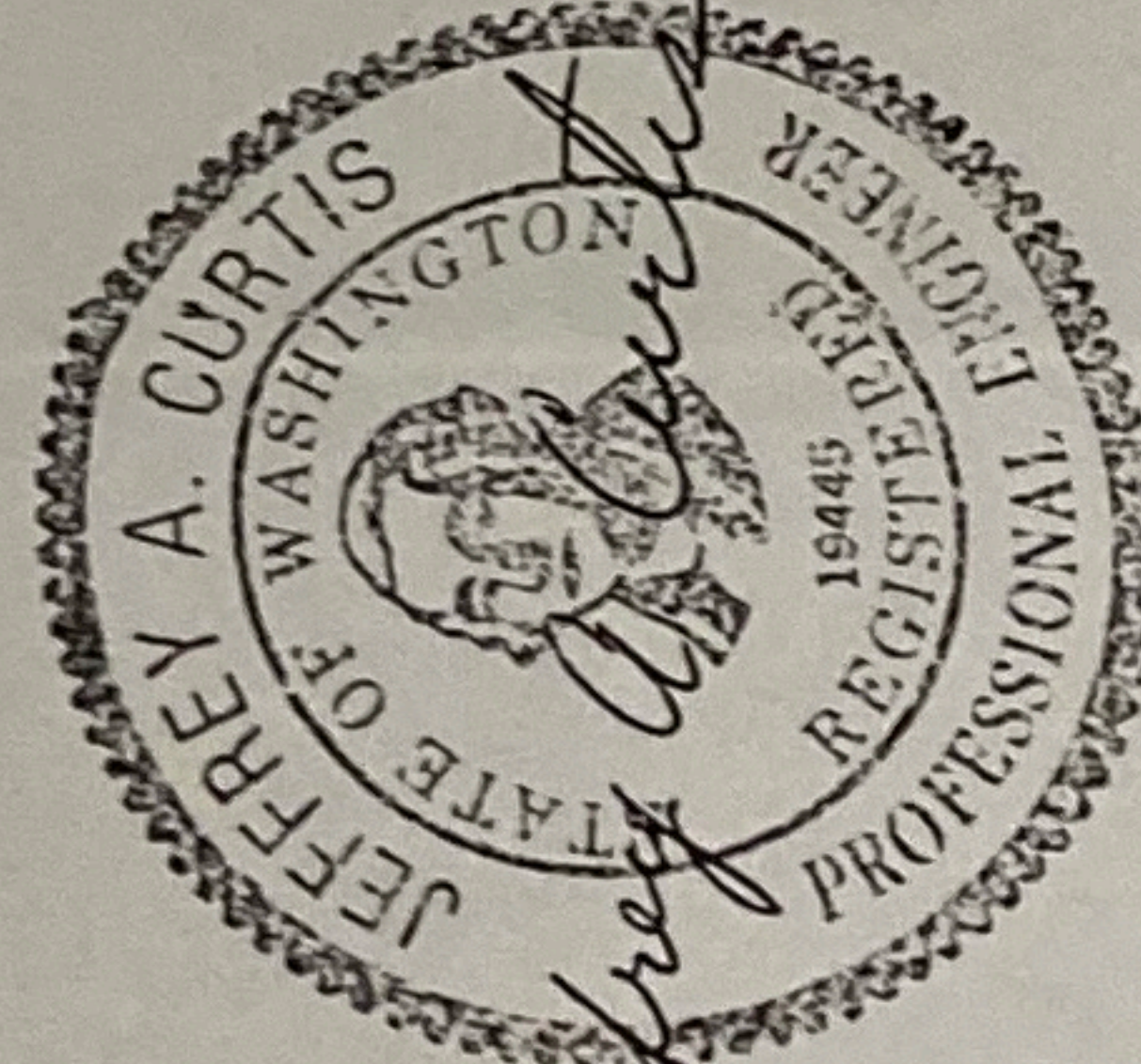


SEE NOTE 4

PUSHBUTTON STATION MOUNTING DETAIL (TYP. 2 PLACES)

DETAIL A

REMOTE PUSHBUTTON STATION MOUNTING DETAIL SIDE VIEW

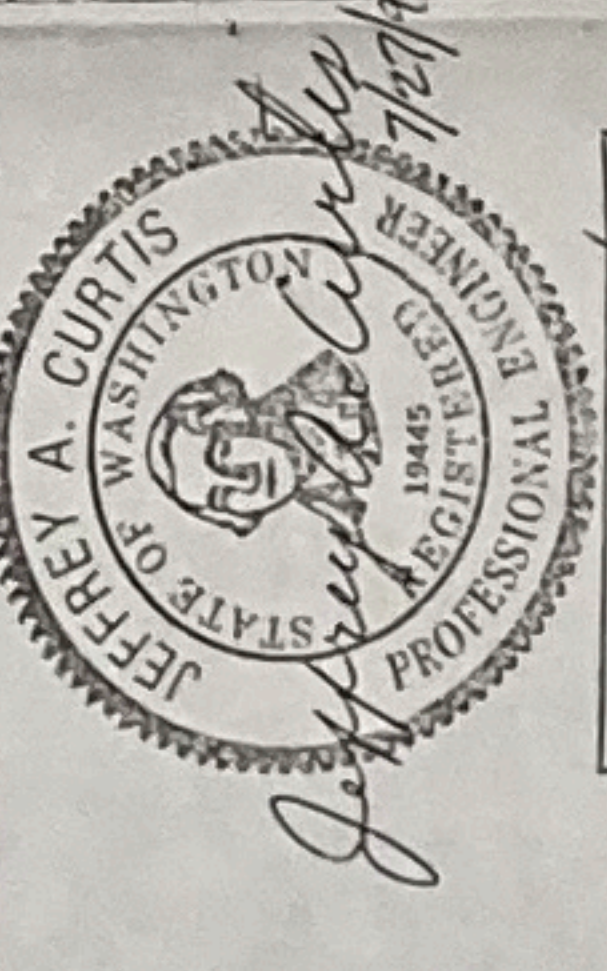


Jeffrey A. Curtis 7/27/94

EXPIRES 10/31/95

TITLE CLASS 11-202 AMBOARD 5012
 CONTROLLER WIRING DIAGRAM
 DWG 6464 D44 SUB. 1

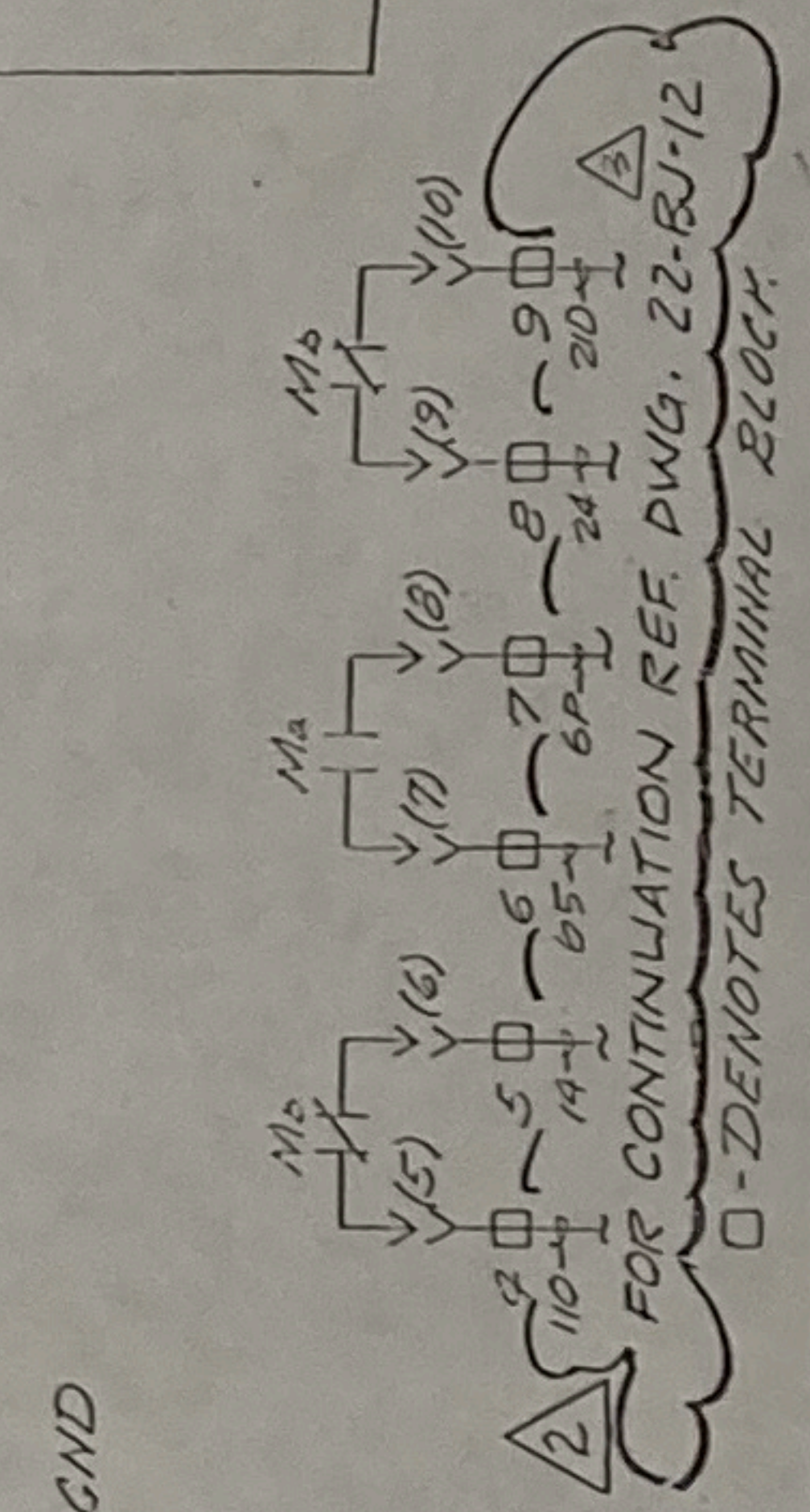
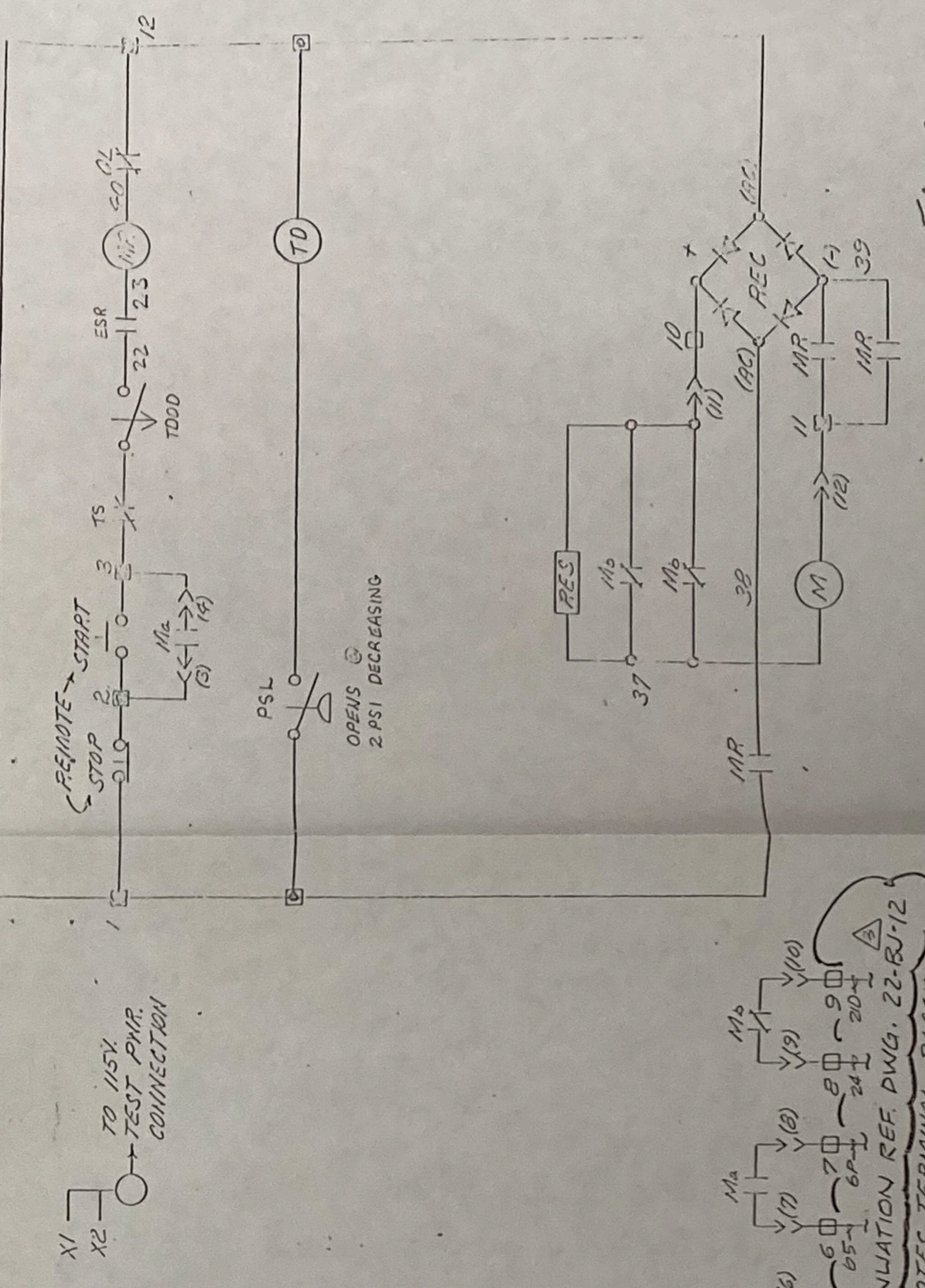
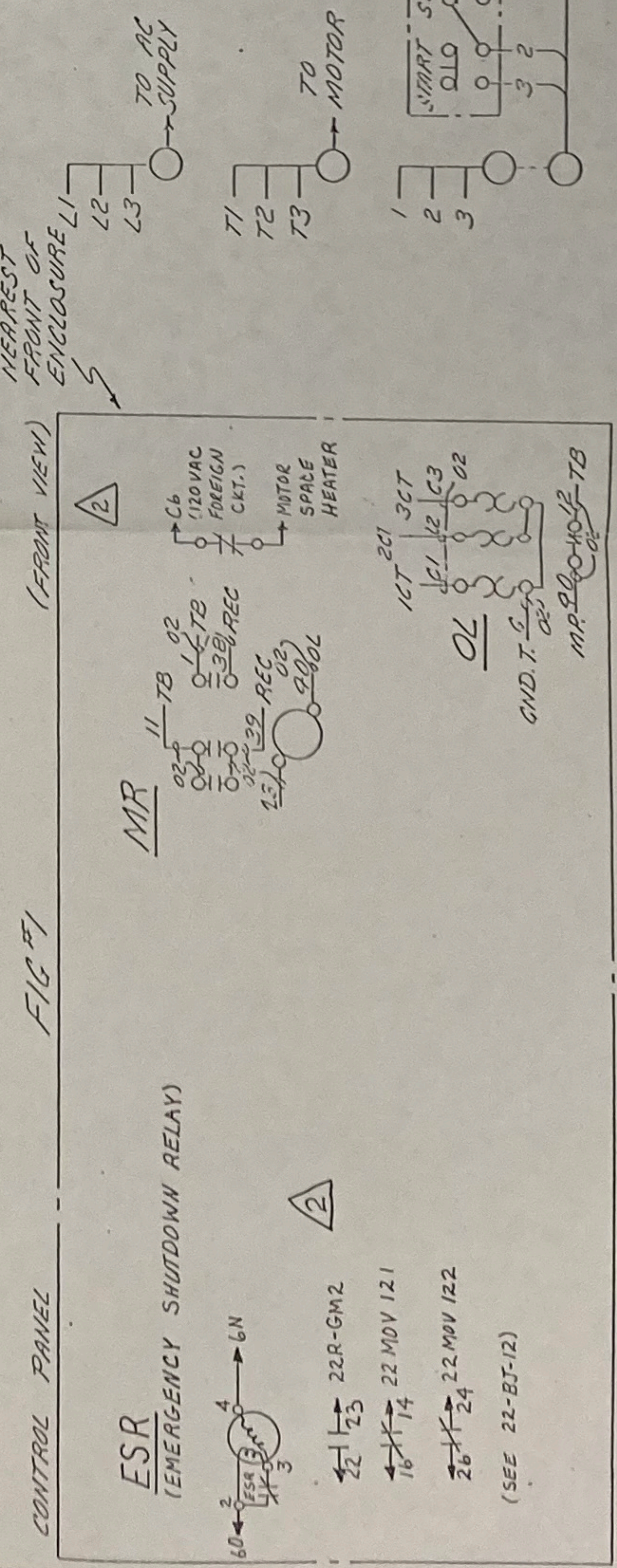
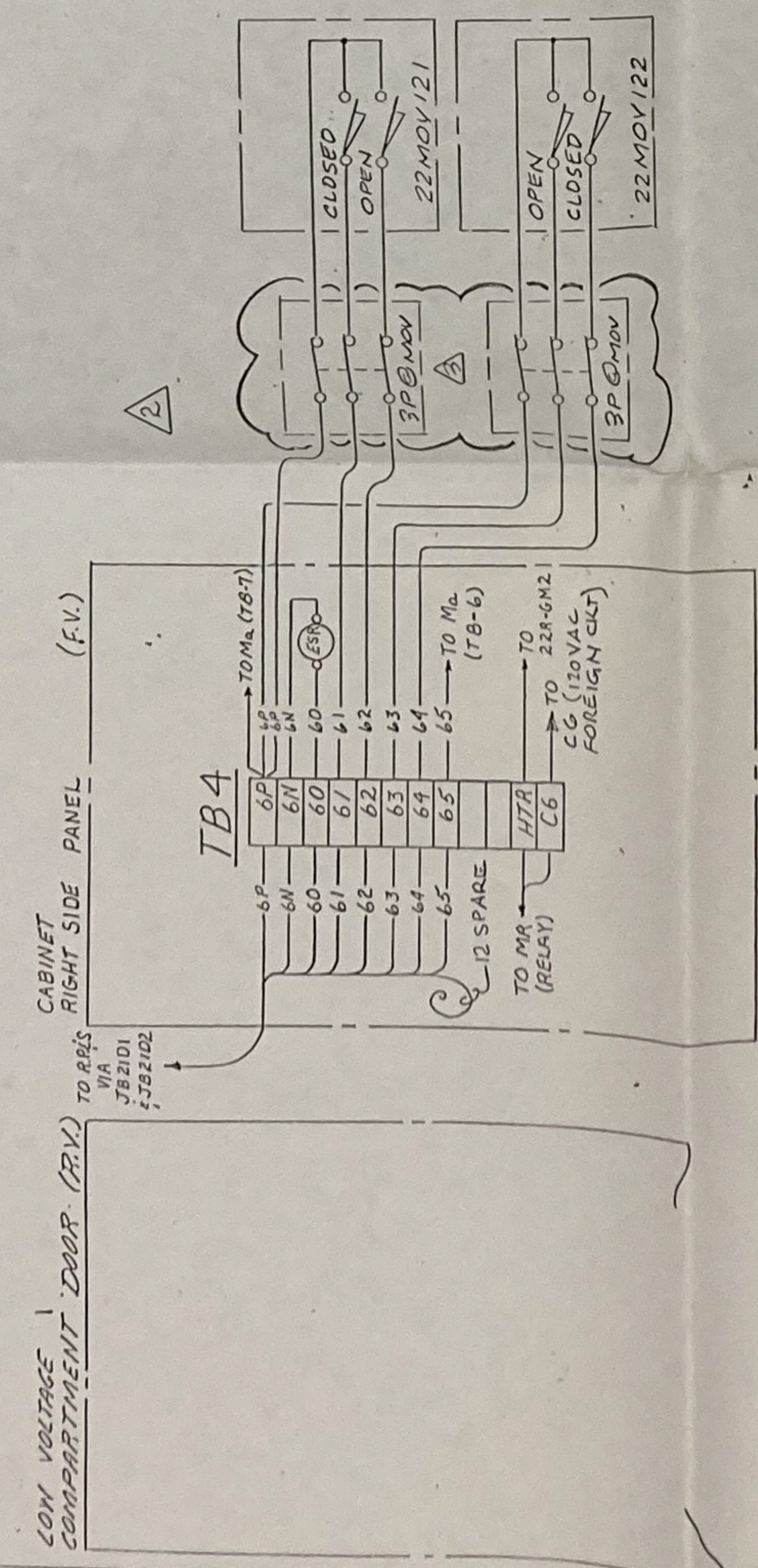
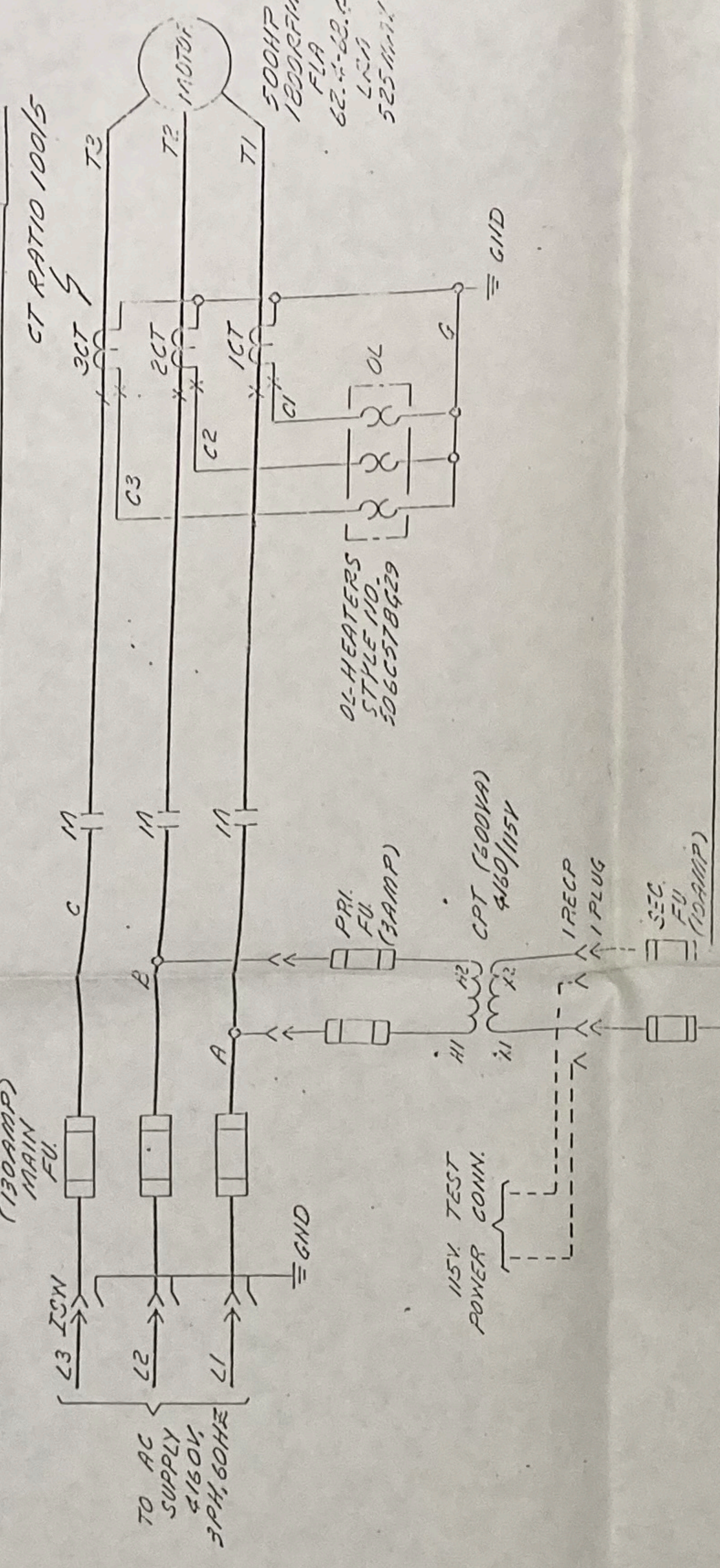
Stamped for revisions
 A and B only.



EXPIRES 10/31/95

ITEM	DESCRIPTION - MATERIAL	PATT. NO. OR REF. DWG.	FIN. CH. LINE NO.	STYLE NO.	REQD.	TOOL REQUIRED
01	2" OF 26-010 CABLE "BELLING"				1	
02	COMP. PRECABLE			3486DE801	1	
03	CONTACTOR PRECABLE			346023002	REF	
04	MAIN CONN. 3/16" OF 19-0785 CABLE "BELLING"			346023002	REF	

DESCRIPTION	ITEMS OF THIS DWG.	MULTIPLY
A. UNARMED WIRE	01 TO 03	1
CABLE	01 TO 03	1

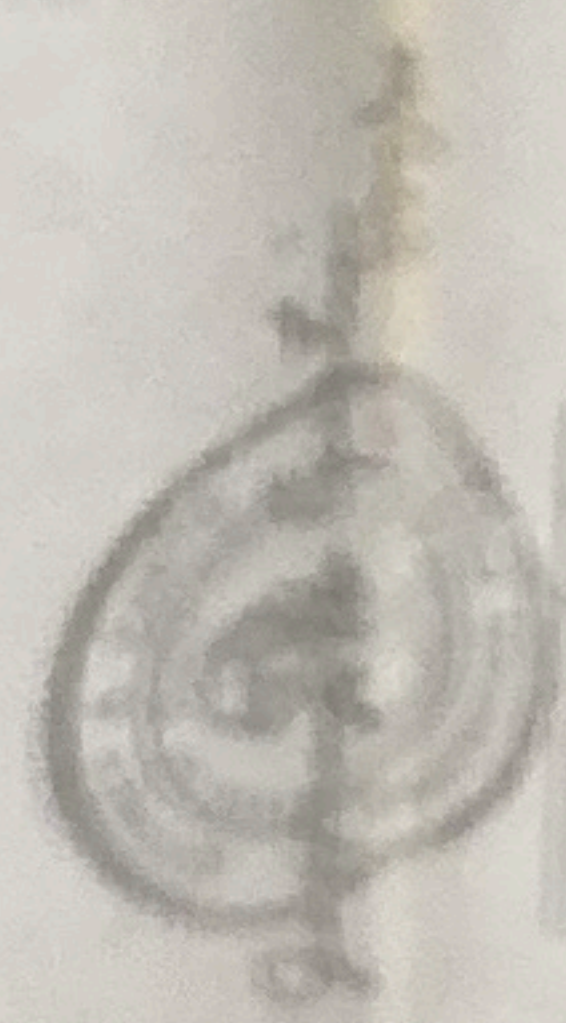


FP 22-G16-4

WESTINGHOUSE ELECTRIC CORPORATION
 TITLE CLASS 11-202 AMBOARD 5012
 CONTROLLER WIRING DIAGRAM
 DIMENSION: 1/8" INCHES - SCALE
 DWG. NO. 6464 D44
 APPD. WALTER FUNKE
 DATE 10/31/95

FP 22-G16-4

6464

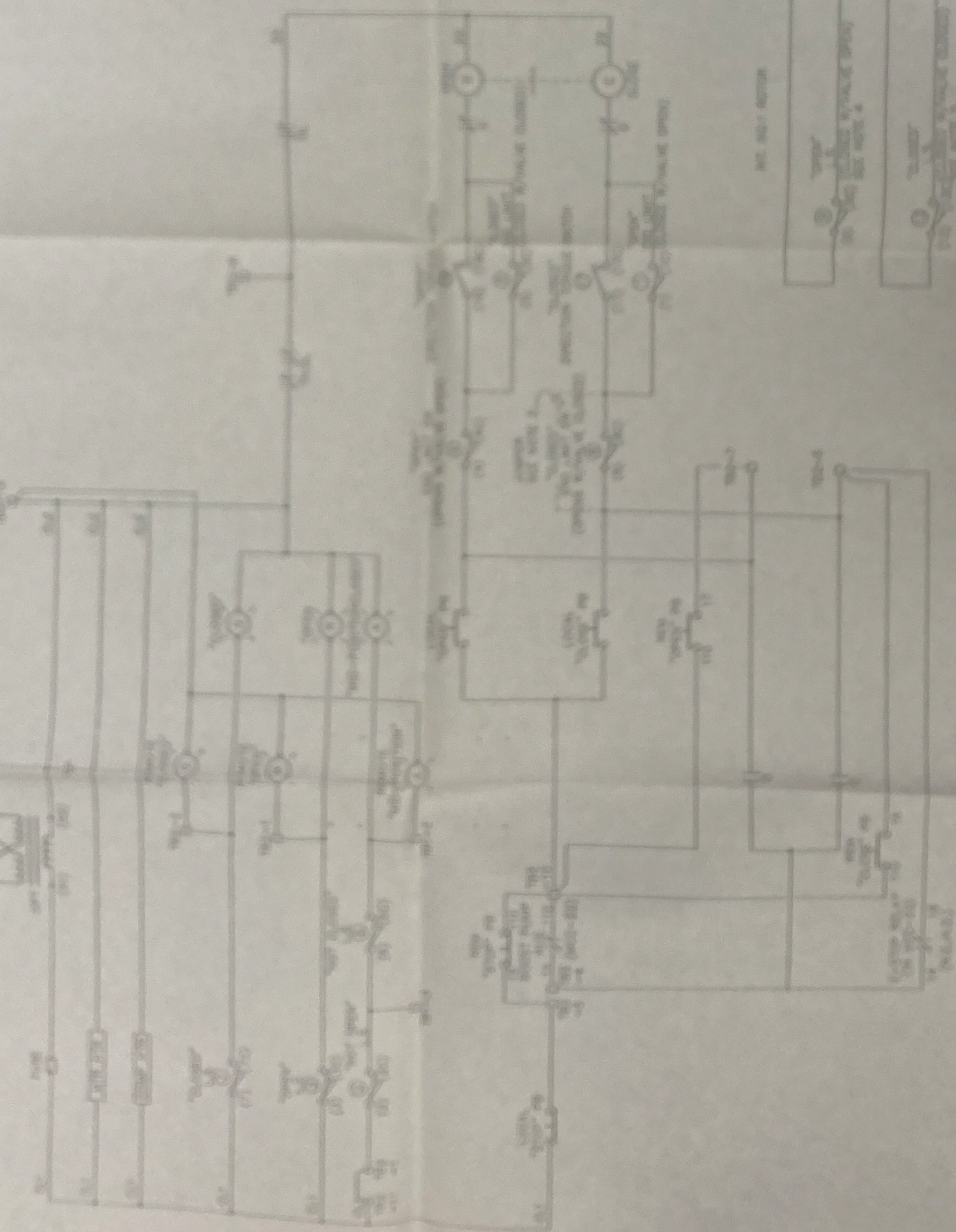
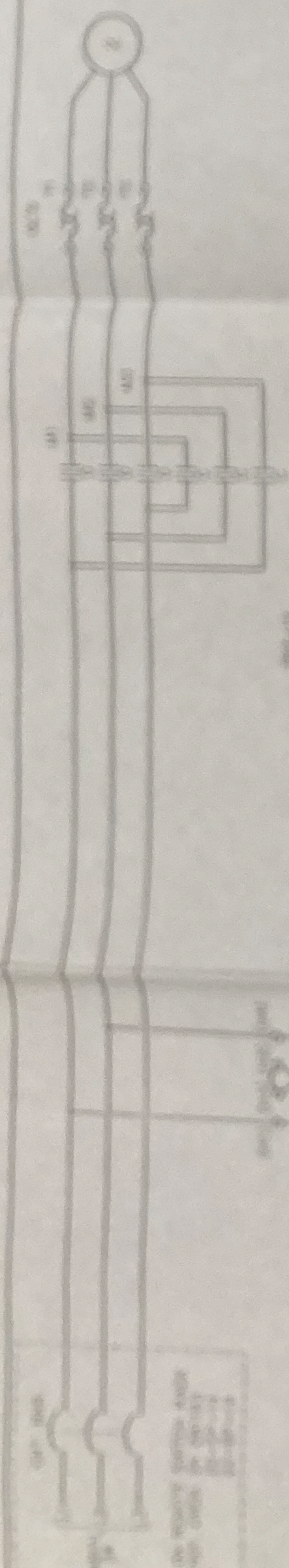


NOTES

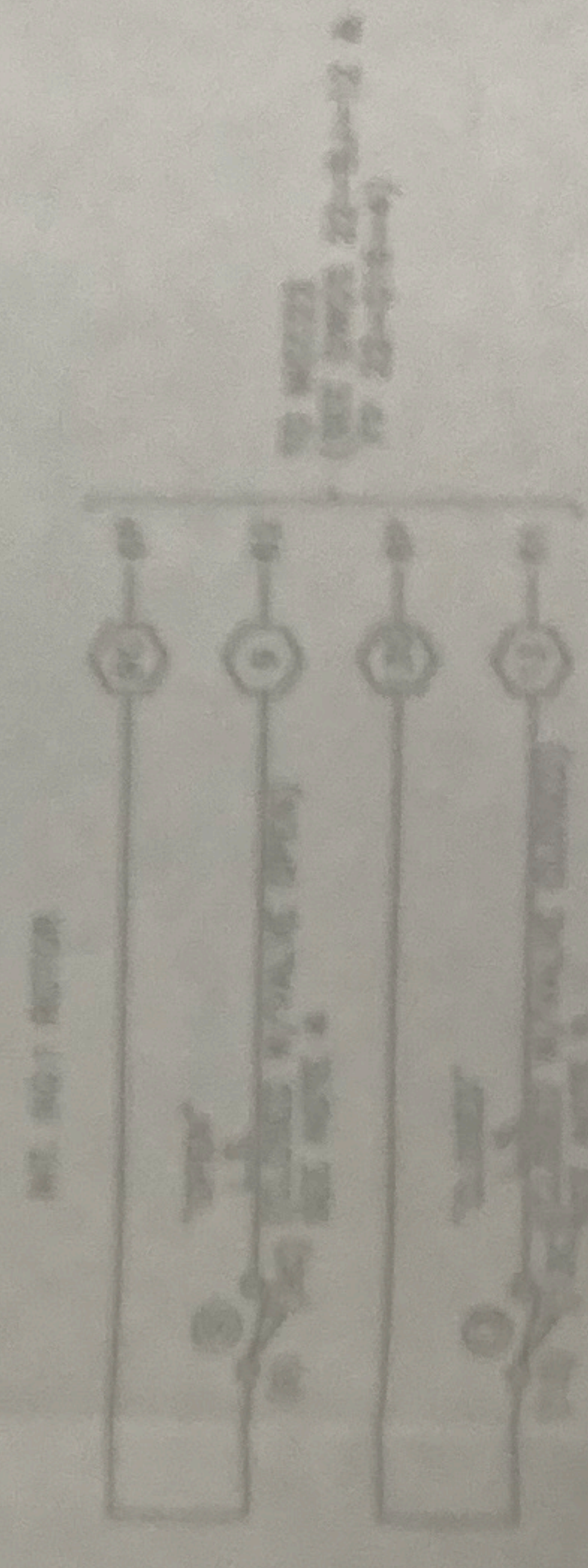
- 1. BEFORE SETTING UP THE MOTOR, THE MOTOR SHALL BE SET AT VALVE POSITION AS INDICATED IN POINT A AND B.
- 2. PROCEED WITH CONNECTION FOR HIGH VOLTAGE (CONNECTED TO 480V, 3Ø, 3W, 4W) & AS TO AS FOR LOW VOLTAGE (CONNECTED TO 480V TO 11).
- 3. CHECKS OUT WITH MOTOR & FOR RUNNING VALVE ABOVE "START" SWITCH (1).
- 4. SET LIMIT SWITCH TO CLOSE WITH (2) OPEN.
- 5. SET LIMIT SWITCH TO CLOSE BEFORE (3) OR (4) OPEN.

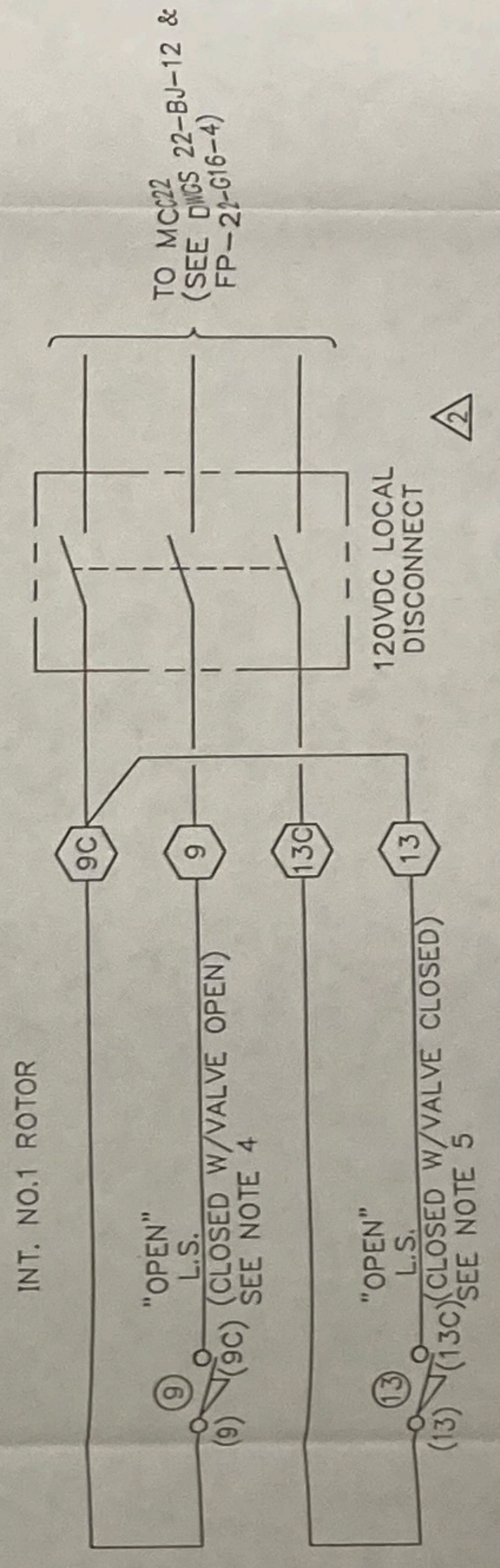
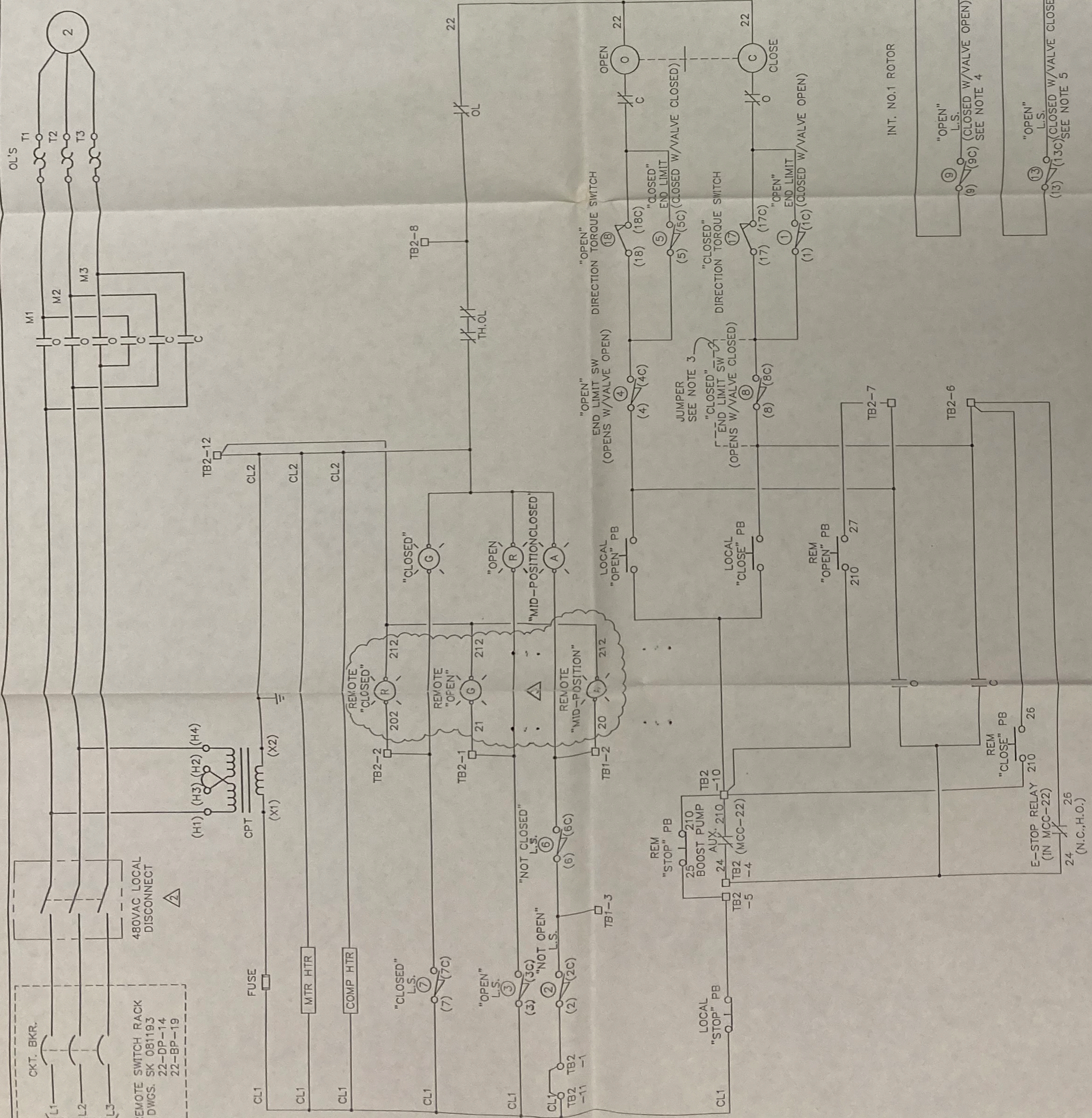
TERMINO REFERENCING & MARKING
 INC.
 PUGET SOUND PLANT
 480V MOTOR OPERATED VALVE INLET
 MOTOR CONTROL SCHEMATIC

22-DP-47



ENCLOSURE
OF MOTOR OPERATED VALVE (MOT)





DEH	12/2/93	AS-BUILT	5059	4/18/94	JAC	APPROVED	JOB
MCC	11/7/93	ADDED DISCONNECTS	5059				
DLS	09/16/93	ADDED PUSHBUTTONS, LIGHTS	5059				
MCC	8/13/93	ISSUED FOR CONSTRUCTION	4980				
BY	DATE	ESTIMATE	B.M.				

INITIALS-	DATE	SCALE	NONE	CAD FILE NO.	22DP0008	REV. NO.
DWN. BY	DLS	9/16/93			DRAWING NUMBER	
CHK. BY						
APP'D. BY						
SYMBOL						
CHG. ENGR.						

22MOV122
AT CRUDE BOOSTER PUMP 22R-02 (OUTLET)

7/21/94
10/31/95

NOTES

1. ROTORS INT.1 & INT.2 CAN BE SET AT VALVE POSITION FULL OPEN. FULL CLOSED OR ANY POSITION IN BETWEEN AS INDICATED BY POINT A AND B.
2. TRANSFORMER CONNECTION FOR HIGH VOLTAGE CONNECT H3 TO H2, H1 TO L1 & H4 TO L2. FOR LOW VOLTAGE CONNECT H1 & H3 TO L1.
3. JUMPER OUT LOCAL SWITCH 8 FOR CLOSING VALVE AGAINST TORQUE SWITCH 17.
4. SET LIMIT SWITCH TO CLOSE WHEN VALVE IS ABOUT 65% OPEN.
5. SET LIMIT SWITCH TO CLOSE BEFORE (8) OR (7) OPENS.

THIS DRAWING HAS NOT BEEN REVISIONED. IT IS THE SOLE PROPERTY OF TEXACO REFINING AND MARKETING INC. IT IS TO BE USED ONLY FOR THE PROJECT AND NOT BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF TEXACO REFINING AND MARKETING INC. ANY UNAUTHORIZED REPRODUCTION OR COPIING OF THIS DRAWING IS STRICTLY PROHIBITED.

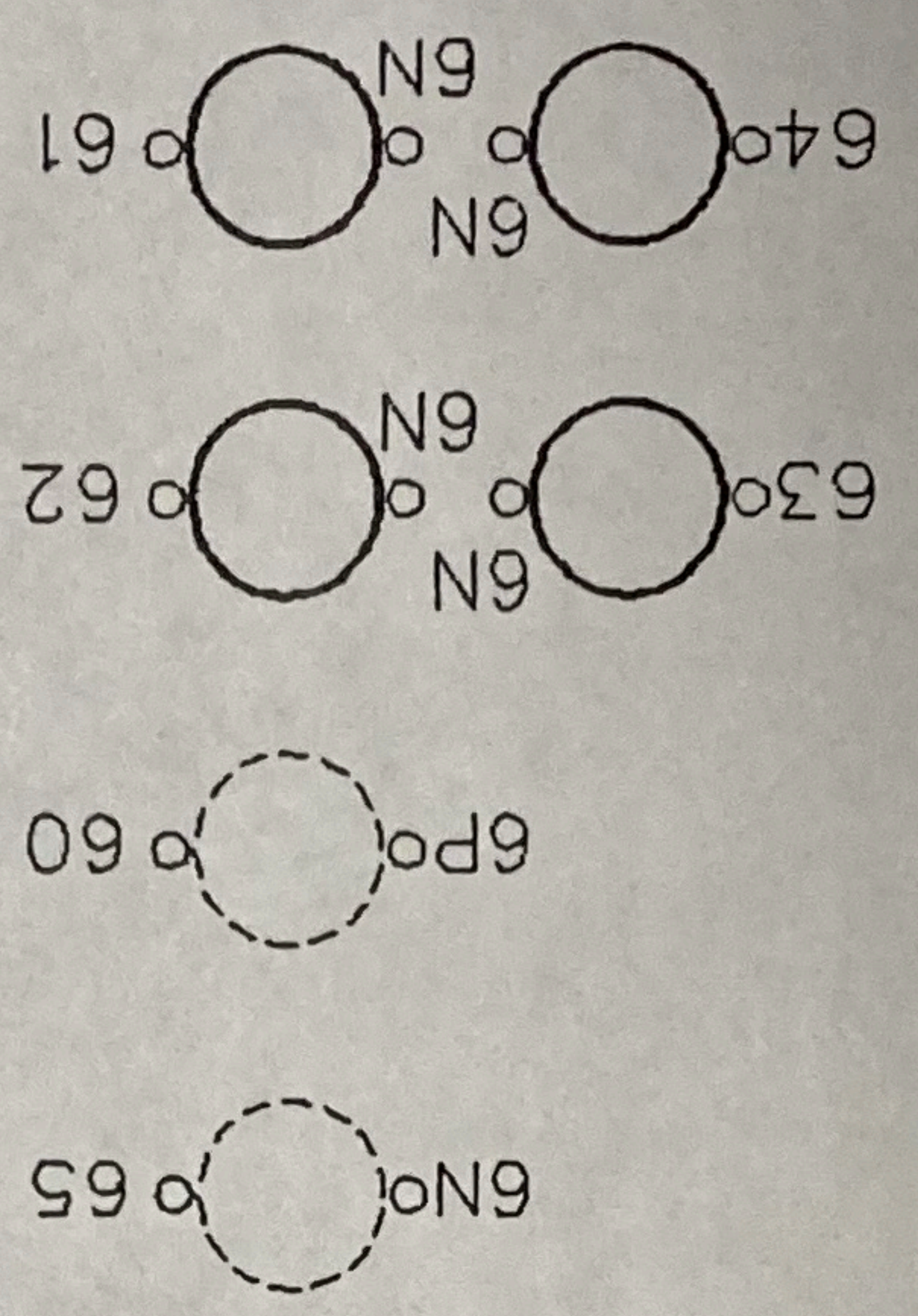
TEXACO REFINING & MARKETING INC.
PUGET SOUND PLANT
ANACORTES, WASHINGTON

PLANT 22 - WHARF & LOADING
480V MOTOR OPERATED VALVE OUTLET
MOTOR CNTRL SCHEMATIC-22MOV122

APPROVED	DATE	ESTIMATE	B OF M	BY	DATE	DESCRIPTION	REVISIONS
		5059	EW		4/13/94	REVISED PER AS-BUILT	
							NUMBER
							0

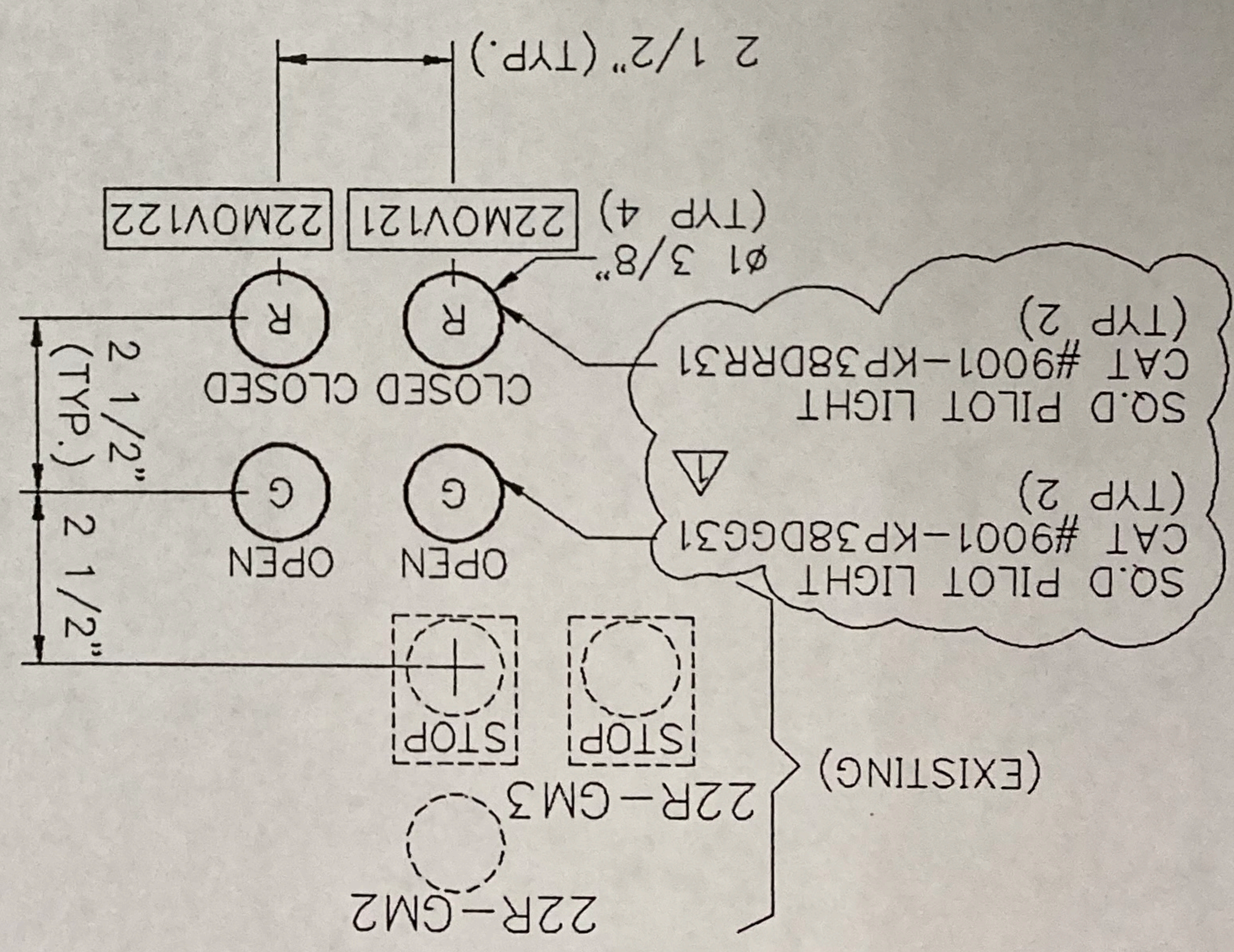
RP&S CONTROL PANEL
REAR VIEW

(22MOV122)(22MOV121)



EXPIRES 10/31/95

RP&S CONTROL PANEL
FRONT VIEW



Jeffrey A. Curtis
7/22/94



SHT.NO. SK-092893
DATE 09/29/93
BY ERW
CHKD. BY
APPVD. BY *JAC*
CHIEF ENGR
FILE NO. 22AJ0005

LOCATION R.P. & S
SUBJECT INSTALL MOV 121 & MOV 122 SHUTDOWN SWITCHES
R.P. & S. CONTROL ROOM LIGHTS - W.O. 9313410
BM NO. 5059

50-1301-T

Master
File Copy

TEXACO
BILL OF MATERIAL
PUGET SOUND PLANT

B.M. 5059

W.O. 9313410

SHEET 1 of 4

TITLE: RP&S, DOCKLINE CRUDE BOOSTER PUMP, INSTALL CONTROLS FOR MOV'S

CHARGE: PSP290

MODIFICATION REVIEW CONDUCTED 9-29-93

APPROVAL: JAC

P&ID'S REVISED 22-DA-0020

REV 2

MASTER	PM	AMM	AMO	AMT	OPR	PWR	PRO	ER	EH&S	LAB	ENG	CA	GMF
DIST.		X	X	X	X	X					X	X	X

REVISIONS	2	2	0			0	2	7			1	1	
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B M C O P I E S	D R A W I N G S	22-DA-0020 FR1	22-DA-0020 FR5	22-BJ-12	SK-091393	SK-091493	95-9359-0	95-9171-2	22-AP-30	FP 22-G16-4	22-DP-47	22-DP-48	SK-092893
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16	TOTALS	12	12	12	12	12	12	12	12	12	12	12	12
1	M&C	1	1	1	1	1	1	1	1	1	1	1	1
1	STOREHOUSE												
1	PF/I&T												
6	PF/I&E	6	6	6	6	6	6	6	6	6	6	6	6
1	I&E (WEO)	1	1	1	1	1	1	1	1	1	1	1	1
	AF/NS												
	AF/SS												
	AF/OFF PLT												
	AF/SHOPS												
	F/MACH SHP												
	F/MT-BT												
	F/FCU-BoHo												
	F/POLY-ALK												
	F/CRU-HTU												
	F/CPD												
2	F/RP&S	2	2	2	2	2	2	2	2	2	2	2	2
	INSP DEPT												
1	ENG'R DEPT												
	EQUIP FILE												
	"R" STAMP												
1	RAM												
1	JAC/PWR	1	1	1	1	1	1	1	1	1	1	1	1
1	DEL/PWR	1	1	1	1	1	1	1	1	1	1	1	1

10/31/95

Master
File Copy

TEXACO
PUGET SOUND PLANT
BILL OF MATERIAL

BM 5059

WO 9313410

SHEET 2 OF 4

TITLE: RP&S, DOCKLINE CRUDE BOOSTER PUMP, INSTALL CONTROLS FOR MOVS

CHARGE PSP 290 MADE BY DEL CHECKED BY ISSUE DATE /0 - / - ⁹³~~88~~

PURPOSE: THE PURPOSE OF THIS BM IS TO INSTALL THE CONTROL WIRING FOR THE NEW MOTOR OPERATORS ON THE BLOCK VALVES AT THE INLET AND OUTLET OF THE DOCK LINE CRUDE BOOST PUMP. AS A RESULT OF THE INSTALLATION DESCRIBED HEREIN, THE BLOCKING VALVES AT THE INLET AND OUTLET OF THE CRUDE BOOST PUMP WILL AUTOMATICALLY SHUT WHEN THE PUMP'S EMERGENCY STOP BUTTON IS PUSHED BACK IN THE RP&S CONTROL ROOM. ALL LOCAL CONTROL OF THE TWO VALVES WHICH IS NOW EMPLOYED WILL STILL BE AVAILABLE.

SCOPE: IT IS THE INTENT OF THIS PROJECT TO OBTAIN A FULLY FUNCTIONAL CONTROL CIRCUIT FOR THE BOOSTER PUMP MOV'S. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ANY WORK AND FURNISHING ANY MATERIAL NECESSARY TO ACHIEVE THIS RESULT (UNLESS OTHERWISE STATED IN THIS SCOPE). THE INSTALLATION IS TO BE COMPLETED IN ACCORDANCE WITH GOOD INSTALLATION PRACTICE AND IN COMPLIANCE WITH APPLICABLE FEDERAL AND STATE CODES.

ALL WORK MUST BE COMPLETED NO LATER THAN NOVEMBER 19, 1993.

THE WORK DESCRIBED IN THIS BILL OF MATERIAL CANNOT BE COMPLETED WITHOUT PRIOR COMPLETION OF BM 5022A, WHICH PROVIDED FOR RECONDITIONING OF CONDUIT AND WIRE BETWEEN THE RP&S CONTROL ROOM AND MCC-22.

THE CONTRACTOR SHALL NOTIFY DALE LAIRD, EXT 848 WHEN WORK IS TO BEGIN. SHOULD QUESTIONS OR PROBLEMS ARISE DURING INSTALLATION, OR IF ANY ADDITIONAL TECHNICAL DETAIL IS REQUIRED TO COMPLETE INSTALLATION, CONTACT DALE LAIRD, EXT 848, OR IF HE CANNOT BE REACHED, CONTACT JEFF CURTIS, EXT 850.

CAUTION: TAKE ALL NECESSARY SAFETY PRECAUTIONS WHEN PERFORMING WORK IN THE VICINITY OF MCC-22 AND THE VALVE OPERATORS. THIS WORK WILL REQUIRE APPROACHING ENERGIZED LINES, EQUIPMENT, AND DEVICES WITH VOLTAGES OF UP TO 4160 VAC LINE-TO-LINE.

1. LOCATE THE STARTER FOR 22R-GM2 IN MCC-22 AND LOCK IT OUT. LOCATE CIRCUIT #6 ON THE SINGLE-PHASE LIGHTING PANEL 22-J ON THE POLE NEXT TO MCC-22. DEENERGIZE AND LOCK OUT THE CIRCUIT. LOCATE THE EMERGENCY SHUTDOWN RELAY (ESR) IN MOTOR STARTER 22R-GM2. ENSURE THAT THE CONTROL VOLTAGE (120 VAC) IN THE STARTER (MCC-22) IS DEENERGIZED. LOCATE THE SOURCE OF THE BATTERY-BACKED 120 VDC SOURCE FOR THE ESR IN THE RP&S CONTROL BUILDING AND DISCONNECT FROM 22R-GM2. (THIS DC POWER IS FED TO MCC-22 VIA THE TELEPHONE CABLE RUNNING DOWN THE WEST SIDE OF "A" STREET.) THE COIL OF THE ESR SHOULD THEN DE-ENERGIZE. DISCONNECT ALL WIRES FROM THE ESR AND TAPE AND IDENTIFY THE ENDS. REMOVE THE ESR FROM THE STARTER ENCLOSURE AND SET ASIDE. INSTALL NEW 120 VDC RELAY (ALLEN-BRADLEY 700DC-N400Z1) AND CONNECT WIRES ACCORDING TO DWG #22-BJ-12.

2. LOCATE THE EMERGENCY STOP BUTTON FOR THE BOOST PUMP, 22R-GM2, IN THE RP&S CONTROL ROOM. LOCATE AND DISCONNECT THE SOURCE OF 120VDC POWER "6P"

TEXACO
PUGET SOUND PLANT
BILL OF MATERIAL

BM 5059

WO 9313410

SHEET 3 OF 4

TITLE: RP&S, DOCKLINE CRUDE BOOSTER PUMP, INSTALL CONTROLS FOR MOV5

CHARGE PSP 290 MADE BY DEL CHECKED BY ISSUE DATE - - 88

AND "6N", TO THE STOP BUTTON AND "RUN" INDICATING LIGHT. LOCATE THE EASTERMOST OF THE TWO REMAINING SPARE 1" PLUGGED-OFF CONDUITS ON THE SOUTH SIDE OF MCC-22. UNPLUG BOTH ENDS AND INSTALL 1" SEALING FITTINGS WITH DRAINS. ROUTE 1" CONDUIT UP THE SIDE OF MCC-22 AND MAKE AN ENTRY SIMILAR TO THE EXISTING ONE. AT THE OTHER END, INSERT A 1" TO 3/4" REDUCER AND ROUTE 3/4" CONDUIT AROUND TO 22MOV121 AS SHOWN ON DWG. 22-AP-30 AND SKETCH SK-091393. FROM A "TEE" FITTING AT 22MOV122, ROUTE 3/4" CONDUIT TO THE TWO REMOTE PUSHBUTTON STATIONS BY THE START/STOP STATION FOR 22R-GM2 PUMP MOTOR.

3. MOUNT NEW STRIP OF 20 TERMINALS ON SOUTH WALL OF STARTER RIGHT ABOVE THE SLIDE-OUT RELAY PANEL. LABEL THIS TERMINAL BLOCK "TB-4". TERMINATE 8 OF THE 20 WIRES ON TB-4 AND IN JB21D1 AND JB21D2 AND LABEL AS 6P, 6N, 6O, 61, 62, 63, 64, 65, AND THE REMAINDER AS "SPARE", LEAVING THEM COILED IN THE J-BOXES. (SEE DWG. 22-BJ-12)

4. PULL IN AND TERMINATE 16 CONDUCTORS PLUS GROUNDS PER DWGS 22-BJ-12, SK-91393, 22-DP-47, AND 22-DP-48.

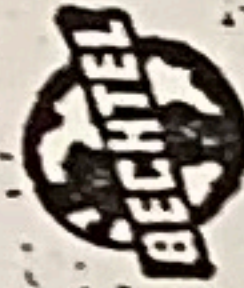
5. LOCATE "MR" RELAY IN MCC-22. DISCONNECT "MR" RELAY AND REMOVE FROM STARTER. INSTALL NEW 4-POLE "MR" RELAY (ALLEN-BRADLEY 700-PK400A1) AND RECONNECT AS BEFORE. REMOVE WIRE NOS. 4 & 5 FROM THE NORMALLY CLOSED AUXILLIARY CONTACT OF THE STARTER (THE MOTOR SPACE HEATER CIRCUIT POWERED FROM BREAKER 6 ON THE POLE) AND REWIRE TO A NORMALLY CLOSED CONTACT OF THE NEW "MR" RELAY.

6. INSTALL THE FOUR VALVE POSITION INDICATOR LIGHTS BESIDE THE EMERGENCY STOP BUTTON AND LABEL PER SK092893. RECONNECT DC POWER PER DWG 22-BJ-12. CHECK OPERATION OF STOP BUTTON AND INDICATOR LIGHTS AND MAKE ANY REQUIRED CORRECTIONS OR ADJUSTMENTS. CHECK ALL AC CONTROL WIRING FOR CONTINUITY AND SHORTS. UPON SATISFACTION REAPPLY POWER AND CHECK SYSTEM FOR OPERATION AND MAKE ANY CORRECTIONS OR ADJUSTMENTS REQUIRED.

7. UPON COMPLETION OF PROJECT, ALL WORK SHALL BE INSPECTED BY A TEXACO PSP REPRESENTATIVE AND AS-BUILT DRAWINGS SHALL BE RETURNED TO TEXACO PSP POWER DEPARTMENT.

TEXACO
 PUGET SOUND PLANT
 BILL OF MATERIALS

ITEM	QUAN	DESCRIPTION	FURNISHED BY
1	2	SEALING FITTING, 1", W/DRAIN, C-H #EYD3	CONTRACTOR
2	6FT	LIQUIDTIGHT FLEXIBLE METAL CONDUIT, 3/4", TYPE "UA"	CONTRACTOR
3	4	CONNECTOR, LIQUIDTIGHT, 3/4", STRAIGHT, O-Z/GEDNEY #4Q-75	CONTRACTOR
4	3	HUB, 3/4", MYERS #ST-2	CONTRACTOR
5	3	CONDUIT BODY, 3/4", FORM 7, C-H #T27	CONTRACTOR
6	2	CONDUIT BODY, 3/4", FORM 7, C-H #LB27	CONTRACTOR
7	5	CONDUIT BODY COVER, 3/4", FORM 7, C-H #270	CONTRACTOR
8	3	CONDUIT BODY GASKET, 3/4", FORM 7, C-H #GASK572	CONTRACTOR
9	1	REDUCER, 1"-3/4", C-H #RE32	CONTRACTOR
10	70FT	CONDUIT, 3/4", TYPE RGS	CONTRACTOR
11	2000FT	WIRE, #14 AWG COPPER, BLACK, 600V TYPE THWN	CONTRACTOR
12	100FT	WIRE, #14 AWG COPPER, WHITE, 600V TYPE THWN	CONTRACTOR
13	100FT	WIRE, #14 AWG COPPER, GREEN, 600V TYPE THWN	CONTRACTOR
14	1	RELAY, 4-POLE, 120VDC COIL, A-B 700N-DC400Z1	ORN 345697
15	1	RELAY, 4-POLE, 120VAC COIL, A-B 700-PK400A1	ORN 345697
16	2	INDICATING LIGHT, 120 V, ADALET XLSGS	ORN 345699
17	2	INDICATING LIGHT, 120 V, ADALET XLSRS	ORN 345699
18	20	TERMINAL BLOCKS, 600V, TUBE-NUT STYLE, FOR #12 AWG THWN, MADE INTO ONE STRIP.	CONTRACTOR



CENTRIFUGAL PUMP DATA SHEET

POWER: VOLTS, CYCLES, STEAM: LBS./SQ. IN. GA.

PHASES, SPECIFICATION NO. 2525-G2, B. M. NO. M/R 2525-22-G-1

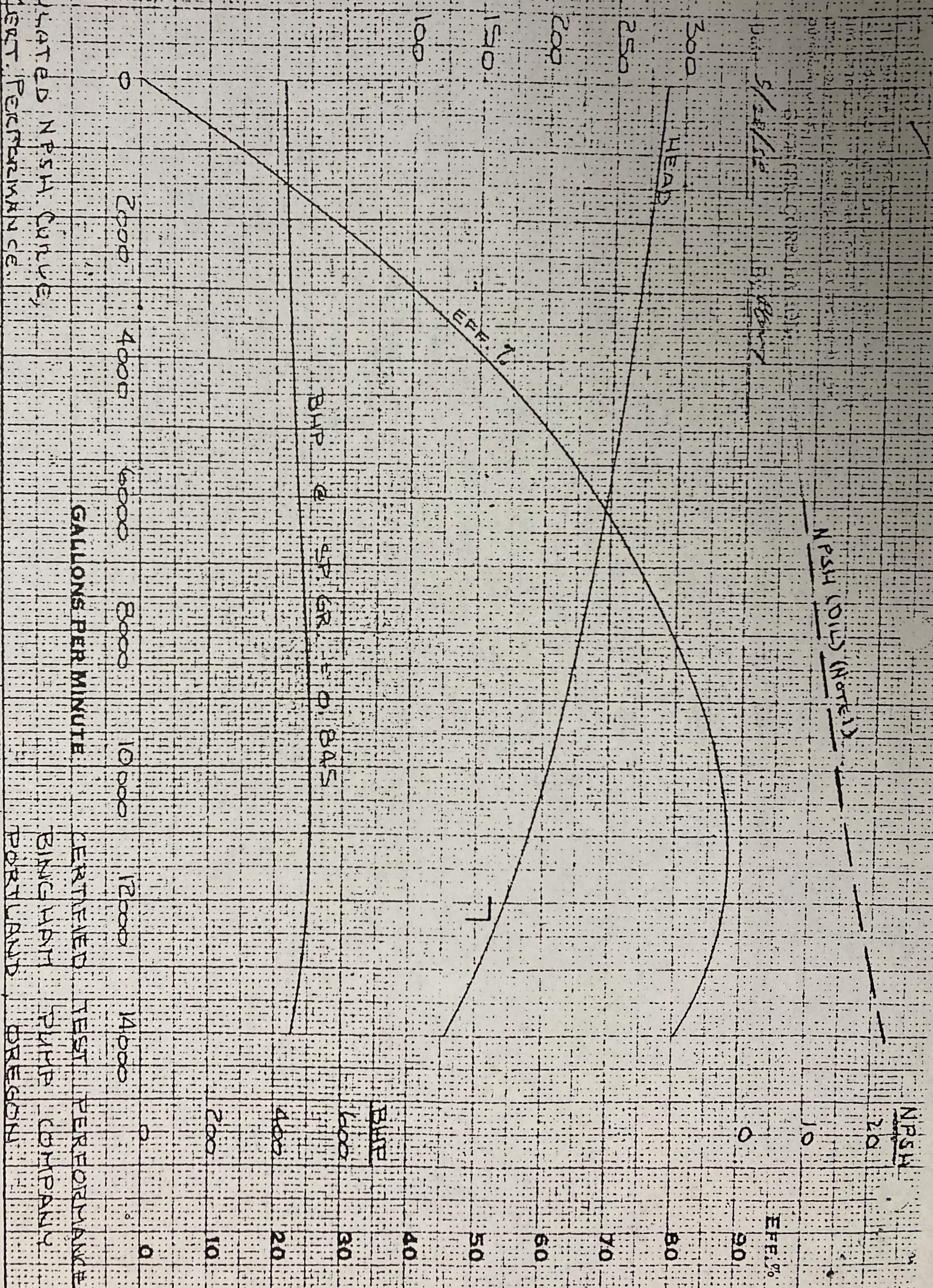
ALTERNATE CANCEL

Main data table with columns for Pump No., Plant Equip. No., Service, and various technical specifications (A-F) for multiple pump units.

Summary table with columns for Manufacturer's Type & Size, Corporation, and other administrative details.

0525-22-57-B-0

TOTAL DYNAMIC HEAD IN FEET



THE TEXAS COMPANY
ITEM NO. 22R-G3
PUMP NO. 35081

CHARACTERISTIC CURVE SHEET
BINGHAM PUMP CO.
PORTLAND OREGON

IMPELLER
MAX. DIA. 17 1/2 IN.
MIN. DIA. 17' x 16 1/2"
DIA. IMPPELLER REQUIRED
16 x 20 x 17 HSL PUMP
CERTIFIED TEST PERFORMANCE
BINGHAM PUMP COMPANY
PORTLAND OREGON
REFERENCE CURVE No. 1760 R.P.M.
6400-R 16263

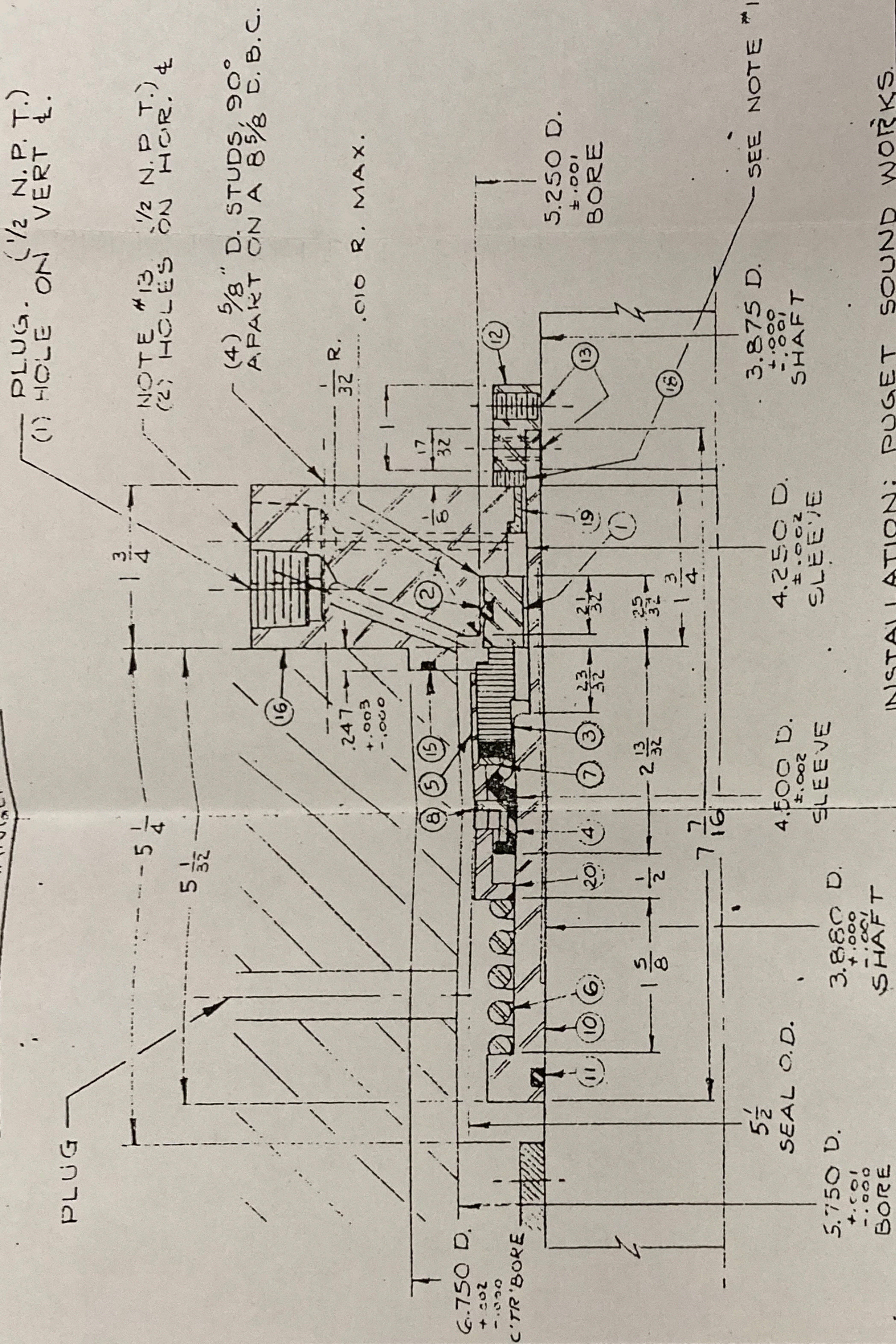
NOTES:
CALCULATED NPSH CURVE,
NOT TEST PERFORMANCE.

NPSH (OILS) (NOTE 1)

DATE 5/28/50
BY H. BERRY

F-SP-5109

"DEAD END" ARRANGEMENT



INSTALLATION: PUGET SOUND WORKS.

NOTES THAT APPLY TO THIS LAYOUT ARE INDICATED BY CHECK MARK BELOW. THESE ARE IMPORTANT AND MUST BE OBSERVED FOR PROPER SEAL INSTALLATION AND OPERATION.

1. SLEEVE MUST BE LIQUID TIGHT ON SHAFT.
2. SURFACE OVER WHICH SEAL IS INSTALLED MUST BE: SMOOTH & FREE OF BURRS.
3. SLEEVE SHAFT MUST BE CORROSION RESISTANT MATERIAL 125 BRINELL MINIMUM TO DIMENSIONS & TOLERANCES INDICATED.
4. 1/4" R. AT END OF 3.880 SHAFT TO START SEAL.
5. STEP IN SLEEVE MUST BE IN LINE WITH FACE OF STUFFING BOX WITHIN 1/4".
6. BEFORE COMPLETING THE SEAL INSTALLATION, WIPE THE LAPPED SEALING FACES OF THE SEAT AND WASHER PERFECTLY CLEAN. THEN OIL BOTH FACES WITH CLEAN LIGHT OIL.
7. OIL # 4 IN SEAL ASSEMBLY BEFORE INSTALLING IN UNIT.
8. OIL SEAT RING IN SEAL ASSEMBLY BEFORE INSTALLING IN UNIT.
9. WHEN END PLATE IS SUPPLIED BY "JOHN CRANE", PIPE TAPS ARE MARKED FOR EASE OF INSTALLATION AS FOLLOWS: "F" - INDICATES BY PASS FOR FLUSH OVER SEAL FACES. "O" - INDICATES BY PASS FROM DISCH. AT HIGHER PRESSURE (20 POUND MINIMUM) THAN SUCTION PRESSURE IS AB. & DRAIN. BY PASS FROM DISCH. AT HIGHER PRESSURE (20 POUND MINIMUM) THAN SUCTION PRESSURE IS AB. SOLUTELY NECESSARY TO PROVIDE PROPER COOLANT AND LUBRICATION FOR SEALING FACES. OTHERWISE SEAL MAY RUN DRY AND FAILURE OCCUR.
10. BY PASS FROM HIGH PRESSURE TO LOW PRESSURE STUFFING BOX AT 20 POUNDS MINIMUM DIFFERENTIAL PRESSURE.
11. PRESSURE IN SEAL CHAMBER MUST BE MAINTAINED OR SEAL MAY RUN DRY AND FAILURE OCCUR.
12. CIRCULATE GALLONS PER MINUTE OF SEAL INLET AT BOTTOM, OUTLET AT TOP. COOL IF NECESSARY TO MAINTAIN AT P. B. 1. ABOVE THE PRESSURE AGAINST INBOARD "F" TEMPERATURE (MAX.)
13. INJECT CLEAR LIQUID.
14. SPACER (NO. 16) IS ONLY FOR PURPOSE OF PROPERLY LOCATING SEAL. AFTER END PLATE, BEARINGS, SHAFT, AND SEAL ARE LOCKED IN PLACE, SPACER MUST BE REMOVED BEFORE UNIT IS PUT INTO OPERATION.
15. APPLY "JOHN CRANE" PLASTIC LEAD SEAL NUMBER 2.

ITEM	PART	DWG. #	MATERIAL
1	SEAT	D-4250-21	STELL. CR. REQ
2	SEAT RING	18-66-28	BUNA-N
3	WASHER	D-4500-56	CARBON
4	BELLOWS	U-4500-39	BUNA-N
5	RETAINER	D-4500-47	18-B S.S.
6	SPRING	316	18-B S.S.
7	DISC	D-4500-26	18-B S.S.
8	DRIVE BAND	F-1213-A-1	18-B S.S.
9	SPACER	F-4500-29	302 S.S.
10	SLEEVE	18-66-19	BUNA-N
11	"O" RING (SLV)	D-3875-57	BRASS
12	DRIVE COLLAR	3/16-24 x 1/2 L.S.	303 S.S.
13	SETScrew (S)	18-66-37	BUNA-N
14	GASKET	F-4250-12	STEEL
15	GLAND PLATE	D-4250-33	BRASS
16	SPACER	D-4250-22	BRONZE
17	BUSHING	D-4500-15	18-B S.S.
18	SPRING PLATE		
19			
20			

SPECIAL PART

OPERATING CONDITIONS:

LIQUID - ARABIAN CRUDE

S. S. C-845

SPEED 1760 R.P.M. 31 PS.I.A. (SUCTION)

PRESSURE 31 PS.I.A. IN BOX 89.8 PS.I.A. (DISCH.)

TEMPERATURE 80° F.

CODE: BPI91

UNIT REF.

16 x 20 x 17 HSL PUMP BY BINGHAM PUMP CO.

SER. # 33080, 81

ITEM # 22R-G2, -G3

REVISIONS A

B/P REF.

DWG. # D-5405 DT'D. 9-4-57

& DATA SHEET DT'D. 9-23-57

BY BINGHAM

"JOHN CRANE" 5-4500-T-1B

4 1/2" BELLOWS SHAFT SEAL

FOR 3.880" D. SHAFT

BINGHAM PUMP CO.

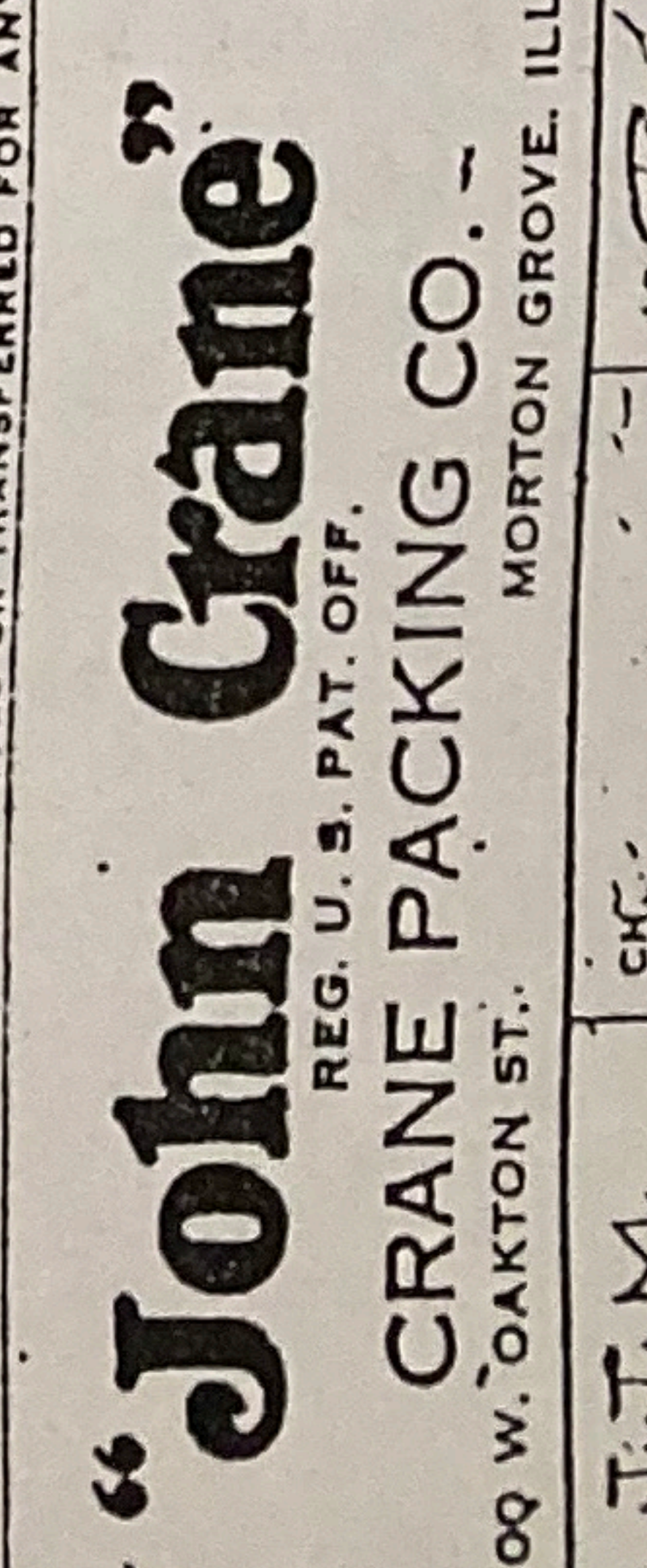
BECHTEL CORP.

THE TEXAS CO.

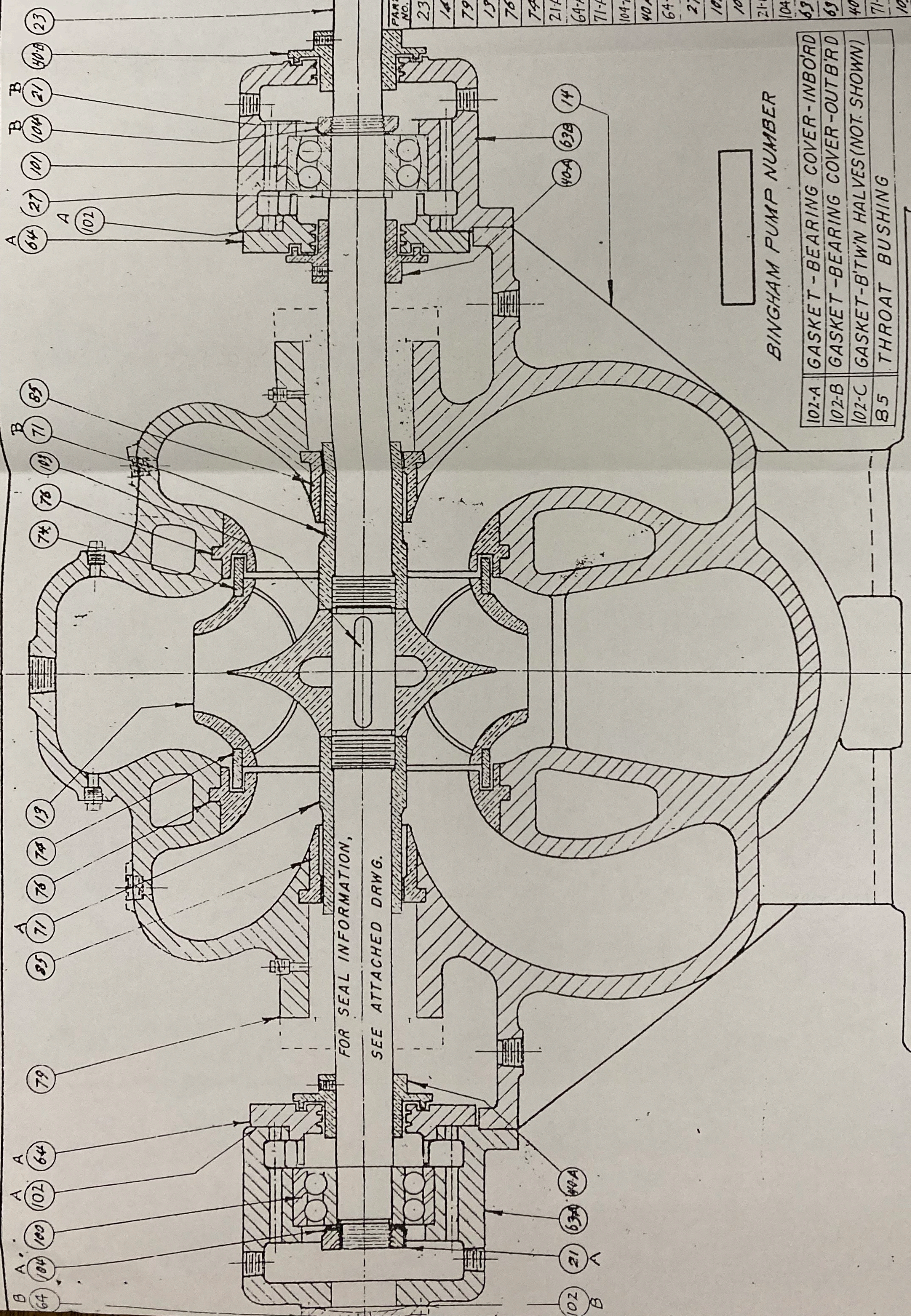
DATE 10-11-57 SCALE 2/3:1

DR. J.J.M. CHK. AP. R. J. M.

FORM EDB-8-4000-11-58



B-9002



FOR SEAL INFORMATION,
SEE ATTACHED DRWG.

PART NO.	NAME OF PART.
23	SHAFT
14	BOTTOM HALF
79	TOP HALF
19	IMPELLER
76	CASING WEARING RING
74	IMPELLER WEARING RING
21A	LOCKNUT - PUMP END
64A	BEARING COVER - INBOARD
71-A	SHAFT SLEEVE - PUMP END
104-A	LOCKWASHER - PUMP END
40A	DEFLECTOR DISC - INBOARD
64-B	BEARING COVER - OUTBOARD
27	SHAFT COLLAR
101	BALL BEARING - RADIAL
100	BALL BEARING - THRUST
21-B	LOCK NUT - DRIVE END
104-B	LOCK WASHER - DRIVE END
63A	BEARING HOUSING - PUMP END
63B	BEARING HOUSING - DRIVE END
40B	DEFLECTOR DISC - DRIVE END
71-B	SHAFT SLEEVE - DRIVE END
109	IMPELLER KEY

BINGHAM PUMP NUMBER

102-A	GASKET - BEARING COVER - INBOARD
102-B	GASKET - BEARING COVER - OUTBOARD
102-C	GASKET - B'TW'N HALVES (NOT SHOWN)
B5	THROAT BUSHING

DOUBLE SUCTION - HORIZONTALLY SPLIT
 TYPE HS CENTRIFUGAL PUMP
 DR: RBN DATE 3-20-58 SCALE
 BINGHAM PUMP CO. PORTLAND, OREGON B-9002

Third floor dehumidification