ELECTRICAL SYMBOLS

AFF TOP OF OUTLET UNLESS NOTED	SYMBOL	DESCRIPTION		
	○	CEILING OUTLET WITH FLUORESCENT FIXTURE		
	Ⓑ	FLUORESCENT EMERGENCY BATTERY PACK, MOUNTED IN OR ON TOP OF FIXTURE. SECTION 16500		
	⊗	CEILING/WALL OUTLET WITH EXIT SIGN FIXTURE, SINGLE OR DOUBLE FACED AS REQUIRED.		
	— · —	LIGHTING CONTROL WIRE		
4'-0"	S	LOCAL SWITCH, SINGLE POLE, 120-277V, 20A	BRYANT #4901G	
4'-0"	S^3	LOCAL SWITCH, 3-WAY, 120-277V, 20A	BRYANT #4903G	
4'-0"	S^4	LOCAL SWITCH, 4-WAY, 120-277, 20A	BRYANT #4904G	
2'-0"		125V, 3W, 20A, 2P, 1φ DUPLEX RECEPTACLE, WALL	BRYANT 5362	5-20R
2'-0"		125V, 3W, 20A, 2P, 1φ DOUBLE DUPLEX RECEPTACLES, WALL IN DOUBLE-GANG BOX	BRYANT 5362	5-20R
ACS	GFA	125V, 3W, 20A, 2P, 1φ DUPLEX GROUND FAULT RECEPTACLE, WALL	BRYANT GFR53FT	NEMA 5-20R
2'-0"	WP	125V, 3W, 20A, 2P, 1φ DUPLEX GROUND FAULT RECEPTACLE, WALL WITH WEATHER PROTECTIVE COVER	BRYANT GFR53FT GFRWPH(V)	5-20R
	Ⓢ	ELECTRIC MOTOR		
	——	ELECTRICAL CONDUIT		
	—⏚—	GROUNDING ELECTRODE CONDUCTOR (GEC) CONNECTED TO GROUND RODS AS DETAILED		
5'-0"		DISCONNECT SWITCH, SECTION 16170		
5'-0"	MS	MOTOR STARTER, SECTION 16482		
5'-0"	MP	MOTOR PROTECTIVE SWITCH W/PILOT AND HEATER(S)	SECTION 16482	
6'-0"	PNL	ELECTRICAL PANEL, SURFACE MOUNT.		
6'-8"	HA	EMERGENCY SHOWER ALARM, ALARM FURNISHED BY DIV 15.		
2'-0"	▼	TELEPHONE OUTLET, WALL, WITH 1" CONDUIT TO ACCESSIBLE CEILING VOID		
2'-0"	HC	COMPUTER OUTLET, WALL, WITH 1" CONDUIT TO ACCESSIBLE CEILING VOID		

RTU CONFIGURATION TABLE

RTU NO.	MODE	COMM. METHOD	POWER	ENCL.	PLC/RAM/PORTS	EXT. RACK	PRE-WIRE	HMI STYLE	OPTIONS	REQ'D I/O
MASTER *	MASTER	ZOOM MODEM & HRDWIRE MODEM LEASE TEL. LINE & 2PR. SHLD.	120 VAC	NEMA 1	E255 COMPACT/ 16K RAM/ 1MOD & 1MOD+	AS REQ'D.	TERMINAL BLOCKS	PANELMATE PLUS 1500	INTERPOS. RELAYS	INPUT: 8 BINARY (ON/OFF) OUTPUT: 8 BINARY (S/S)
WELL #3, WELL #4	SLAVE	HRDWIRE MODEM 2 PAIR SHLD. 22 GA. TW. PR.	480 VAC (TRANS)	NEMA 4	110 CPU 512/ 8K RAM/ 2MODBUS/ASCII	AS REQ'D.	TERMINAL BLOCKS	XBT-P11010 LCD DISPLAY	INTERPOS. RELAYS	OUTPUT: 4 BINARY (S/S)
TANK **	SLAVE	ZOOM MODEM LEASED TELE. LINE	120 VAC	NEMA 1	110 CPU 512/ 8K RAM/ 2MODBUS/ASCII	AS REQ'D.	TERMINAL BLOCKS	XBT-P11010 LCD DISPLAY		INPUT: 4 ANALOG (4-20 Ma)

NOTE: ALL RTUS ARE BASED ON SQUARE-D CLASS 6370 "RTU-PAK", INCLUDING SPECIFIED PLC, COMMUNICATIONS DEVICE(S), BINARY AND ANALOG I/O, AND ALL NECESSARY WIRING, RACKS, ENCLOSURES, MOUNTING ETC. NECESSARY FOR A COMPLETE AND FUNCTIONING SYSTEM. A COMPLETE OPERATING SYSTEM INCLUDES DEMONSTRATION OF PID CONTROL SEQUENCE AS SPECIFIED ON DRAWINGS SHEET 16 OF 19, AND MINIMUM 24 HOURS ON-SITE TRAINING FOR THE OWNER. INCLUDE ALSO 16 ADDITIONAL HOURS FOR CUSTOMIZATION OF PANELMATE 1500 GRAPHICS.

* INSTALL A SQUARE-D CLASS 8501, TYPE KX 15A RELAY WITH SOCKET IN RTU ENCLOSURE FOR PLC CONTROL OF RECEPTACLE CIRCUIT L-2. WIRE RECEPTACLE CIRCUIT THROUGH THIS RELAY. REFER TO PID SEQUENCE, DRAWINGS SHEET 16 OF 19.

** REFER TO DRAWINGS SHEET 11 OF 19 FOR RTU MOUNTING LOCATION AT WATER TANK. PROVIDE 120VAC RTU POWER FROM ADJACENT POWER PANEL. EXTEND A 2 TWISTED PAIR CABLE FROM RTU MODEM THROUGH EXISTING SPARE CONDUIT TO TELCO NID (NETWORK INTERFACE DEVICE) LOCATION ON METERING STRUCTURE.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION
4/32-1	RECESSED MOUNTED 2' X 4' 4 LAMP FLUORESCENT SPECIFICATION PREMIUM STATIC TROFFER WITH FLUSH STEEL DOOR, LITHONIA ASL PATTERN 19 LENS, .156" NOMINAL THICKNESS OR KSH-19 LENS, (NO SUBSTITUTION OF OR NO "HOGGED OUT" LENS), SPECIFIED ELECTRONIC BALLASTS, SUITABLE FOR VOLTAGE ENCOUNTERED, AND COMPLETE WITH FOUR (4) SPECIFIED T8 LAMPS. MUST MEET VCP CRITERIA OF SECTION 16500, PART 3 (EXECUTION) OF PROJECT SPECIFICATIONS. A COMPLETE IND. TEST LABORATORY PHOTOMETRIC REPORT, INCLUDING VCP DATA AT 100 FOOTCANDLES, SHALL BE INCLUDED IN THE SHOP DRAWING SUBMITTAL IN ORDER FOR A SUBSTITUTION TO BE CONSIDERED FOR A/E REVIEW AND EVALUATION. FIXTURES SHALL BE SUITABLE FOR MOUNTING IN THE TYPE OF CEILING CONSTRUCTION ENCOUNTERED ON THE JOB. LITHONIA #2SP432 SERIES OR ACCEPTED EQUAL.
2/32-2	SAME AS TYPE TWO (2) EXCEPT TWO (2) LAMPS AND ONE (1) BALLAST. LITHONIA #2SP232 SERIES OR ACCEPTED EQUAL.
2/32-3	SURFACE MOUNTED, 1' X 4', 2 LAMP FLUORESCENT INDUSTRIAL TYPE FIXTURE WITH 20% UPLIGHT REFLECTOR, 20 GAUGE COLD-ROLLED STEEL CHANNEL, WHITE ENAMEL FINISH, SPECIFIED ELECTRONIC BALLAST SUITABLE FOR THE VOLTAGE ENCOUNTERED, COMPLETE WITH TWO (2) SPECIFIED T8 LAMPS AND 14 GAUGE BAKED WHITE ENAMEL FINISH WIREGUARD. LITHONIA #AF232 SERIES OR ACCEPTED EQUAL.
2/110-4	SURFACE MOUNTED 1' X 8' 2 LAMP FLUORESCENT INDUSTRIAL TYPE FIXTURE WITH 20% UPLIGHT, PARABOLIC, DEEP DIE EMBOSSED REFLECTOR, 20 GAUGE COLD-ROLLED STEEL CHANNEL, WHITE ENAMEL FINISH, MOUNTED TO UNDERSIDE OF TRUSSES UTILIZING KINDORF CHANNEL, 277V SPECIFIED BALLAST, TWO (2) F96T12/41U/HO 800 MA LAMPS, FULL COVERAGE END PLATES (ONE PAIR PER FIXTURE) AND 14 GAUGE BAKED WHITE ENAMEL FINISH WIREGUARD. LITHONIA PV296 HO SERIES OR ACCEPTED EQUAL.
28-5	WALL MOUNTED 28 WATT FLUORESCENT SMALL WALL-PAK FIXTURE WITH CORROSION RESISTANT DIE-CAST ALUMINUM HOUSING, WHITE PAINTED ALUMINUM REFLECTOR, ONE-PIECE INJECTION MOLDED UV-STABILIZED POLYCARBONATE REFRACTOR, 277V NORMAL POWER FACTOR -20 DEGREE F STARTING INTEGRAL BALLAST AND COMPLETE WITH 28 WATT DTT FLUORESCENT LAMP AND BUILT-IN PHOTOCELL. FIXTURE SHALL BE UL LISTED FOR WET LOCATIONS. COLOR MEDIUM BRONZE. LITHONIA TWL-28DTT-277-PEK-DMB HI-TEK SERIES OR ACCEPTED EQUAL.
EXIT	SINGLE (DOUBLE, AS INDICATED) FACE UNIVERSAL MOUNT STENCIL FACED 277V EMERGENCY EXIT SIGN WITH RED LETTERS, LED LAMPS, DIE-CAST ALUMINUM CONSTRUCTION, FIRE ALARM FLASHING INTERFACE, AND SHALL MEET UL NFPA LIFE SAFETY CODE # 101 WITH NICAD BATTERY FOR 90 MINUTES EMERGENCY OPERATION. FIXTURE SHALL BE 11.5" WIDE X 8" HIGH X 2" DEEP COMPLETELY SELF-CONTAINED (BATTERY, CHARGER, ETC., CONTAINED IN FIXTURE). MOUNTING CANOPY SHALL BE DIE-CAST ALUMINUM. LITHONIA LES-ELN SIGNATURE SERIES OR ACCEPTED EQUAL.

PANEL MP — VOLTS 480/277 — MFG SQUARE-D — WIRE 4 — PNL TYPE I-LINE, TYPE HCM — PHASE 3 — ENCLOSURE SURFACE WITH DOOR — MAIN AMPS 400

MAIN BREAKER 400A, TOP LOCATION, NEUTRAL AMPS 400, GROUND BUS YES

CIRCUIT NO	CIRCUIT DESCRIPTION	KVA	BRKR. FRAME	BRKR. POLES	BRKR. AMPS	BRKR. KAIC	WIRE PHASE	WIRE NEUT	WIRE EGC	CONDUIT	400A MAIN BRKR.	CONDUIT	WIRE EGC	WIRE NEUT	WIRE PHASE	BRKR. KAIC	BRKR. AMPS	BRKR. POLES	BRKR. FRAME	KVA	CIRCUIT DESCRIPTION	CIRCUIT NO
1	EXIT LIGHTING	0.2	FH	1	20	65	12	12	12	3/4								1	FH		SPACE ONLY	2
3	LIGHTING	1.4	FH	1	20	65	12	12	12	3/4								1	FH		SPACE ONLY	4
5	LIGHTING	1.0	FH	1	20	65	12	12	12	3/4								1	FH		SPACE ONLY	6
7	EXTERIOR LIGHTING	0.1	FH	1	20	65	12	12	12	3/4								1	FH		SPACE ONLY	8
9	SPARE		FH	1	20	65												1	FH		SPACE ONLY	10
11	SPARE		FH	1	20	65												1	FH		SPACE ONLY	12
13	30 HP PUMP	33	FC	3	60	65	4	-	8	1-1/4		3/4	12	-	12	65	20	3	FC	10	ELECTRIC HEATERS	14
15	50 HP PUMP	54	FC	3	100	65	1	-	6	1-1/2		1-1/4	8	-	6	10	50	3	FC	19	30 KVA TRANSFORMER	16
17	50 HP PUMP (FUTURE) SPARE BREAKER		FC	3	100	65										10	100	3	FC	---	SPARE BREAKER	18
	TOTAL	89.7	ADD															TOTAL		29	= TOTAL	118.7 KVA (143 AMPS)

PANEL LOCATION: ELECTRIC ROOM — REMARKS:

EGC = EQUIPMENT GROUND CONDUCTOR. PROVIDE IN ACCORDANCE WITH NEC TABLE 250-95 UNLESS OTHERWISE INDICATED.
NEUT = NEUTRAL CONDUCTOR. PROVIDE SAME SIZE AS PHASE CONDUCTOR UNLESS OTHERWISE INDICATED.
PHASE CONDUCTOR IS ONLY INDICATED ONCE FOR TWO & THREE POLE CKTS.
KAIC = AMPS INTERRUPTING CURRENT x 1000.

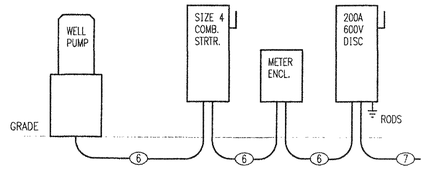
PANEL L — VOLTS 208/120 — MFG SQUARE-D — WIRE 4 — PNL TYPE NQOD — PHASE 3 — ENCLOSURE SURFACE WITH DOOR — MAIN AMPS 100

MAIN BREAKER 100A, TOP LOCATION, NEUTRAL AMPS 100, GROUND BUS YES

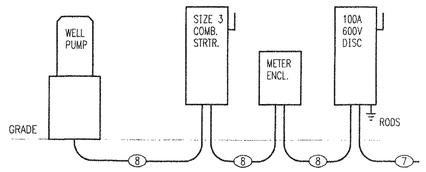
CIRCUIT NO	CIRCUIT DESCRIPTION	KVA	BRKR. FRAME	BRKR. POLES	BRKR. AMPS	BRKR. KAIC	WIRE PHASE	WIRE NEUT	WIRE EGC	CONDUIT	100A MAIN BRKR.	CONDUIT	WIRE EGC	WIRE NEUT	WIRE PHASE	BRKR. KAIC	BRKR. AMPS	BRKR. POLES	BRKR. FRAME	KVA	CIRCUIT DESCRIPTION	CIRCUIT NO
1	RECEPTACLES	0.4	QOB	1	20	10	12	12	12	3/4		3/4	12	12	12	10	20	1	QOB	0.4	PLC CONT'L RECEPT.	2
3	RECEPTACLES	0.5	QOB	1	20	10	12	12	12	3/4		3/4	12	12	12	10	20	1	QOB	1.2	SEPTIC PUMP	4
5	RECEPTACLES	0.7	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	6
7	RECEPTACLES	0.7	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	8
9	RECEPTACLES	0.8	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	10
11	MASTER RTU	0.5	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	12
13	BATHROOM EXH. FAN	0.2	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	14
15	F-2 & MOD	0.8	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	16
17	HWCP & ALARM	0.3	QOB	1	20	10	12	12	12	3/4								1	QOB		SPACE ONLY	18
19	WATER HEATER	4.5	QOB	2	30	10	10	10	10	3/4								2	QOB		SPACE ONLY	20
21	HP INDOOR	5.5	QOB	2	40	10	8	8	8	1								2	QOB			22
23	HP OUTDOOR	2.5	QOB	2	30	10	10	10	10	3/4								2	QOB			24
	TOTAL	17.4	ADD															TOTAL		1.6	= TOTAL	19 KVA (53 AMPS)

PANEL LOCATION: ELECTRIC ROOM — REMARKS:

EGC = EQUIPMENT GROUND CONDUCTOR. PROVIDE IN ACCORDANCE WITH NEC TABLE 250-95 UNLESS OTHERWISE INDICATED.
NEUT = NEUTRAL CONDUCTOR. PROVIDE SAME SIZE AS PHASE CONDUCTOR UNLESS OTHERWISE INDICATED.
PHASE CONDUCTOR IS ONLY INDICATED ONCE FOR TWO & THREE POLE CKTS.
KAIC = AMPS INTERRUPTING CURRENT x 1000.



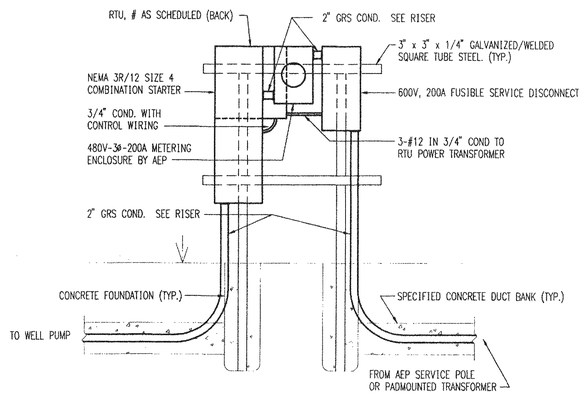
100 HP WELL #3 PUMP POWER RISER
SCHEMATIC



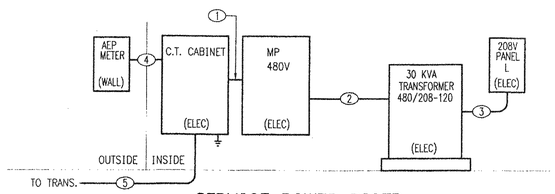
40 HP WELL #4 PUMP POWER RISER
SCHEMATIC

WIRE AND CONDUIT SIZING SCHEDULE (RISER DIAGRAMS):

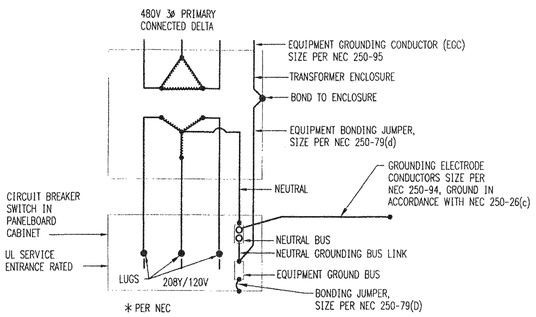
1. 4 - #500 & 1 - #1/0 IN 3-1/2" COND.
2. 3 - #6 & 1 - #8 IN 1-1/4" COND.
3. 4 - #1 & 1 - #6 IN 2" COND.
4. 1 - 1-1/4" EMPTY CONDUIT.
5. 2 - 4" CONDUITS FROM AEP TRANSFORMER
6. 3 - #3/0 & 1 - #4 IN 2" COND.
7. SERVICE FROM AEP, IN 2" COND.
8. 3 - #1 & 1 - #6 IN 1-1/2" COND.



WELL PUMP CONTROL EQUIPMENT MOUNTING DETAIL
SCALE: 1/2" = 1' - 0" — 100 HP WELL #3 SHOWN, 40 HP WELL #4 SIMILAR

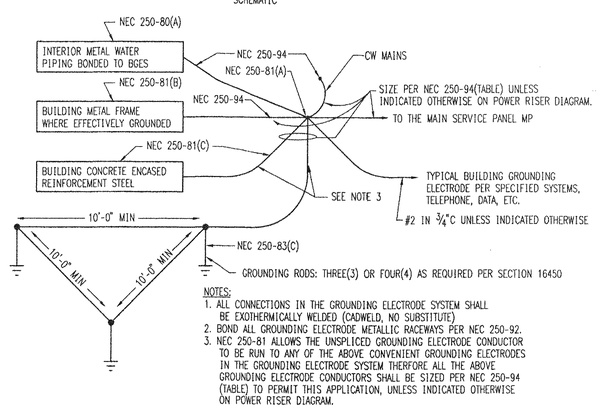


SERVICE POWER RISER
SCHEMATIC



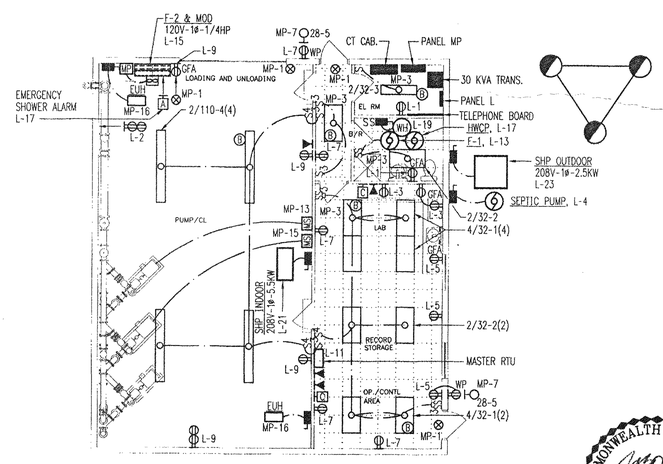
* INCREASE SIZE OF EQUIPMENT GROUND CONDUCTOR BETWEEN TRANSFORMER & PANELBOARD TO COMPENSATE FOR VOLTAGE DROP.

TYPICAL WIRING DIAGRAM DRY-TYPE TRANSFORMER
NO SCALE (THREE PHASE)



NOTES:
1. ALL CONNECTIONS IN THE GROUNDING ELECTRODE SYSTEM SHALL BE EXOTHERMICALLY WELDED (CADWELD, NO SUBSTITUTE)
2. BOND ALL GROUNDING ELECTRODE METALLIC RACEWAYS PER NEC 250-92.
3. NEC 250-81 ALLOWS THE UNSPLICED GROUNDING ELECTRODE CONDUCTOR TO BE RUN TO ANY OF THE ABOVE CONVENIENT GROUNDING ELECTRODES IN THE GROUNDING ELECTRODE SYSTEM THERFORE ALL THE ABOVE GROUNDING ELECTRODE CONDUCTORS SHALL BE SIZED PER NEC 250-94 (TABLE) TO PERMIT THIS APPLICATION, UNLESS INDICATED OTHERWISE ON POWER RISER DIAGRAM.

GROUNDING GRID SYSTEM DETAIL
SCHEMATIC



CHLORINATION BUILDING ELECTRICAL PLAN
SCALE: 1/8" = 1' - 0"

COMMONWEALTH OF VIRGINIA — J.B. OBENCHAIN, JR. — No. 20761 — 6/24/99 — PROFESSIONAL ENGINEER

WHITESCARVER, HURD & OBENCHAIN, INC.
CONSULTING ENGINEERS
4932 FRONTAGE ROAD NW
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ACEC

DES: JBO	DRF: JBO	CHK: JBO	COMM: 99110

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540.473.1253 FAX: 540.473.1254

Drawn JBO	GREENFIELD CHLORINATION FACILITY	SEE PLAN	
Designed JBO		JUNE 1999	
Checked JBO		PROJECT: 97075	
Approved JBO	ELECTRICAL	19 of 19	