

ELECTRICAL NOTES

- CONTRACTOR SHALL VERIFY THE HORSEPOWER OF ALL MOTOR LOADS AND SHALL INCREASE OR DECREASE THE BRANCH CIRCUIT SIZE AS REQUIRED.
- VERIFY WIRING AND CONNECTIONS WITH ACTUAL VALVE OPERATOR THAT IS FURNISHED.
- BARGE POWER CABLES CONSIST OF 5 CABLES, ALL 3 COND. TYPE G PORTABLE POWER CABLES AS FOLLOWS:
BARGE MIXER (2 EA.) - 3 C/#8 W/GROUND
BARGE PUMP (2 EA.) - 3 C/#6 W/GROUND
120 V POWER (1 EA.) - 3 C/#6 W/GROUND - USE ONE CONDUCTOR AS REMOTE BARGE LIGHT SWITCH LEG.
EACH CABLE TO BE 500' LONG (AFTER INSTALLATION). BUNDLE CABLES TOGETHER FOR EXTENSION TO BARGE & TIE AT 18" O.C. WITH EXTRA HEAVY CROSS SECTION PANDUIT TYPE PLT LASHING TIES.
- SECURE BARGE POWER CABLE BUNDLE TO ONE OF BARGE HOSES AT 4' O.C. WITH 4 WRAPS OF #12 AWG TYPE TW INSULATION SOLID COPPER WIRE. TWIST ENDS TO DRAW UP TIGHT & CONNECT ENDS TOGETHER WITH COMPRESSION CONNECTOR.
- LEAVE 8' OF UNBUNDLED SLACK CABLE AHEAD OF STRAIN BUSHINGS AT BARGE.
- SWITCH LOCATION IS ASSUMED, VERIFY LOCATION WITH SUPPLIERS SHOP DWGS.
- CHARGING STATION IS SHOWN WITH 120 V, 30 AMP, L5-30R RECEPTACLE, CONTRACTOR VERIFY TYPE REQUIRED BEFORE INSTALLING.
- LOCATION OF POWER COMPANY ELECTRIC SERVICE IS SHOWN FOR REFERENCE ONLY. THE EXACT LOCATION OF POLES AND LINES SHALL BE COORDINATED WITH THE POWER COMPANY BY THE CONTRACTOR.
- PROVIDE WEATHER PROOF 2P-30A NON-FUSIBLE SAFETY SWITCH DISCONNECT ON EACH LIGHT POLE FOR SWITCHING OFF LIGHT.

ELECTRICAL SYMBOLS

- S₃, WP, M LIGHTING SWITCH, 120V OR 277 VOLT AS APPLICABLE, SINGLE POLE. 3-WAY, WEATHERPROOF OR MOTOR RATED AS INDICATED.
- WP DUPLEX CONVENIENCE RECEPTACLE, 120V, 20 AMP. WEATHERPROOF AS INDICATED.
- S SURF. MT. - INDICATES SURFACE MOUNTED DEVICE.
- △ POWER RECEPTACLE, TYPE AS INDICATED.
- HSP MANUAL MOTOR STARTER WITH OVERLOADS AND RUN PILOT.
- SAFETY SWITCH, TYPE AS INDICATED.
- //— RUN BELOW GROUND OR FLOOR
- //— RUN ABOVE GROUND OR FLOOR
- ***** LIQUID TIGHT FLEX CONDUIT.
- △ TELEPHONE OR TELEPHONE DEVICE OUTLET. EXTEND 3/4" C, WITH PULL ROPE FROM OUTLET TO TELEPHONE CABINET.
- POINT OF CONNECTION AND CIRCUIT RUN. HASH MARKS INDICATE NUMBER OF CONDUCTORS EXCEPT GROUNDS (2#12 UNLESS NOTED) AND INDICATES HOME RUN TO ITEM AS NOTED, 'S' INDICATES #18 AWG SHIELDED CABLE.

MAKE-UP AIR UNITS (MAU-1 AND MAU-2): CAMBRIDGE ENGINEERING, INC. MODEL M115E, CAPACITY 80 KW; 273.2 MBT 10 STEPS OF CONTROL, 2500 CFM @ 0.5 IN. H₂O E.S.P. COMPLETE WITH RAIN HOOD FRESH AIR INTAKE WITH BIRD SCREEN, INLET DAMPERS WITH TWO POSITION ELECTRIC OPERATOR CONTROLLED TO CLOSE AUTOMATICALLY WHEN FAN STOPS, RUBBER-IN-SHEAR VIBRATION ISOLATORS AND TYPE ERS SPACE TEMPERATURE CONTROL; REMOTE MODULATING SPACE THERMOSTAT, MODULATING HIGH LIMIT IN UNIT. UNIT CONSTRUCTION SHALL BE SUITABLE FOR INDOOR SERVICE AND SHALL HAVE A U.L. APPROVED HEATER. REMOTE CONTROL STATION SHALL BE FURNISHED WITH BLOWER ON-OFF SWITCH AND PILOT, HEATER ON-OFF SWITCH AND PILOT, TEMPERATURE SET POINT ADJUSTMENT, 480V-30.

EXHAUST FANS: GREENHECK					
MARK	CAP-CFM	S.P.	H.P.	MAXIMUM TIP SPEED	MODEL
F-1	1250	1/8	1/4	5030	CE-10-A
F-2	220	1/8	1/40	3020	SW-7-1/2

UNIT HEATERS: BERKO					
MARK	CAP-MBH	CAP-KW	H.P. FAN	CFM	MODEL
UH-1	25.5	7.5	1/10	350	HUH-727-A
UH-2	17.0	5	1/10	350	HUH-527-A

ALL UNIT HEATERS @ 277V-10 COMPLETE WITH WALL MOUNTING, BRACKETS, BUILT-IN THERMOSTAT AND OPERATING SAFETIES.

- INFRA-RED HEATERS:
- CHROMALOX MODEL RD035-30S 5000 WATT QUARTZ LAMP @ 480 VOLTS.
 - CHROMALOX MODEL RD026-60S 2000 WATT METAL SHEATH LAMP @ 277 VOLTS.

INFRA-RED HEATER THERMOSTAT - CHROMALOX TYPE WR-80, RANGE 20°-80° F, 5000 W, 277 V DUTY, 4.4 A 120 V DUTY.

CONTACTOR - NEMA SIZE O, 2 POLE CONTACTOR IN NEMA 1 ENCLOSURE WITH FUSED 120 V CONTROL CKT. TRANSFORMER, 120 V COIL. SWITCH WITH THERMOSTAT. SQUARE-D CLASS 8502, PROVIDE ON-OFF SELECTOR SWITCH.

MOTOR CONTROL CENTER - 600 A, 480 V INTEGRAL W/SWITCH BOARD. SQUARE-D MODEL 4 W/DEVICES AS SCHEDULED BELOW. ALL MOTOR STARTERS SHALL BE EQUIPPED AS INDICATED ON THE SCHEMATIC.

MARK OR CKT. NO.	DEVICE	FEED TO	WITH
1	SIZE 1 STARTER	SLUDGE PUMP 7-1/2 HP	3 #12, 3/4" C.
2	SIZE 1 STARTER	SLUDGE PUMP 7-1/2 HP	3 #12, 3/4" C.
3	SIZE 1 STARTER	SLUDGE PUMP 7-1/2 HP	3 #12, 3/4" C.
4	SIZE 2 STARTER	BELT WASH PUMP 25 HP	3 # 6 THW CU, 1" C.
5	SIZE 2 STARTER	BELT WASH PUMP 25 HP	3 # 6, THW CU, 1" C.
6	SIZE 1 STARTER	DILUTION PUMP 5 HP	3 #12, 3/4" C.
7	SIZE 1 STARTER	DILUTION PUMP 5 HP	3 #12, 3/4" C.
8	SIZE 1 STARTER	SLUDGE MIXER 3 HP	3 #12, 3/4" C.
9	SIZE 1 STARTER	FAN 1/4 HP	3 # 14, 1/2" C.
10	SIZE 1 STARTER	FAN 1/4 HP	3 # 14, 1/2" C.
11	SIZE 1 STARTER	HYDRAULIC POWER UNIT, 3 HP	3 #12, 3/4" C.
12	SIZE 1 STARTER	BELT CONVEYOR DRIVE 5 HP	3 #12, 3/4" C.
13	SPACE		
14	600 A MAIN LUG COMPARTMENT		
15	TRANSFORMER A CIRCUIT BREAKER DISCONNECT		
16	30 KVA, 3-PHASE DRY TRANSFORMER 480 V PRIMARY, 120/208 VOLT SECONDARY.		
17	PANEL HB AS FOLLOWS: 3 PHASE, 4-WIRE, 120/208 VOLT, CIRCUIT BREAKER PANEL, 100 AMP MAIN BREAKER, 30 POLE SPACE, BOLTED BRANCH BREAKERS AS FOLLOWS:		
CIRCUIT NO.	BREAKER	FEED TO	WITH
1,2	1P-20 GFI	RECEPTACLES	# 12
3,5,7	1P-20	RECEPTACLES	# 12
4,6,8,9,10,11,13	1P-20	LIGHTS	# 12
12	2P-30	WATER HEATER	# 10
14	1P-15	MAIN CONTROL PANEL	# 14
15,17,19	1P-15	ELECTRICAL CONTROL VALVES	# 14
16, 18	1P-20	POLYMER MIXER	# 12

CIRCUIT NO.	BREAKER	FEED TO	WITH
20,22,24	1P-15	POLYMER METERING PUMP	# 12
21	1P-15	CONTROL PANEL CC	# 14
23	1P-30	LIFT TRUCK	
		CHARGE STATION	# 10
25	1P-15	SLUDGE PUMP HYDRAULIC CONTROL	# 14
27	1P-15	TELEPHONE BOX	# 14
28	1P-20	SPARE	
29	1P-20	WEIGH SCALE	# 12

TIME CLOCK (OUTDOOR LIGHTING) - SINGLE POLE, 24 HOUR, 120 VOLT, ASTRONOMIC DIAL IN NEMA 1 ENCLOSURE. USE TO SWITCH COIL IN LIGHTING CONTACTOR BELOW. TAKE POWER FROM LIGHTING CONTACTOR TRANSFORMER, PARAGON, TORK OR EQUAL.

OUTDOOR LIGHT CONTROL - 2 POLE, 20 AMP, 480 VOLT LIGHTING CONTACTOR IN NEMA 1 SURFACE MOUNTED ENCLOSURE WITH HOA SELECTOR AND FUSED 120 VOLT CONTROL CKT. TRANSFORMER. 120 VOLT COIL.

TELEPHONE EQUIPMENT CABINET - 14" W X 25" H X 4-1/2" DP TELEPHONE SERVICE BOX WITH 5/8" PLYWOOD BACKBOARD, 25 LINE CAPACITY, BENNER-HAWMAN BN1130W.

ELECTRICAL EQUIPMENT SCHEDULE, SLUDGE DEWATERING BUILDING

MAIN SWITCHBOARD - 277/480 VOLT, 3-PHASE, 4-WIRE, MULTI-SECTION, SECONDARY SWITCHBOARD WITH DEVICES AS INDICATED AND SCHEDULED, EQUAL TO SQUARE-D "POWER-STYLE".

METERING CABINET - TO APPALACHIAN POWER REQUIREMENTS FOR 600 AMP SERVICE.

MAIN CIRCUIT BREAKER - 3P-600 AMP TRIP, SUITABLE AS SERVICE ENTRANCE EQUIPMENT. COMPLETE WITH SECONDARY LIGHTNING ARRESTOR.

PANEL HA - 277/480 V CIRCUIT BREAKER DISTRIBUTION SECTION, 600 AMP WITH BRANCHES AS FOLLOWS:

CIRCUIT NO.	BREAKER	FEED TO	WITH
1	3P-15	POLYMER FEEDER	3 #12, 3/4" C.
2	3P-15	POLYMER FEEDER	3 #12, 3/4" C.
3	3P-15	SLUDGE GRINDER	3 #12, 3/4" C.
4	3P-125	MAU-1	3 #1 THW CU, 1-1/4" C.
5	3P-125	MAU-2	3 #1 THW CU, 1-1/4" C.
6	3P-90	NON-POTABLE WATER HEATER	3 # 1/0 THW AL, 1-1/2" C.
7	1P-30	UNIT HEATER	2 #10, 3/4" C.
8	1P-30	UNIT HEATER	2 #10, 3/4" C.
9	3P-100A	WINCH DRIVES	SEE PLANS
10	2P-20	OUTDOOR LIGHTS	2 #12, 3/4" C, INSIDE DIRECT BURY OUTSIDE
11	3P-60	PANEL HB AT BARGE	SEE PLANS
12	2P-15	INFRA-RED HEATER A	2 #12, 1/2" C.
13	1P-20	INFRA-RED HEATER B	2 #12, 1/2" C.
14	3P-25	BELT PRESS	4 #10, 3/4" C.
15	3P-25	BELT PRESS	4 #10, 3/4" C.
16	3P-25	BELT PRESS	4 #10, 3/4" C.

EQUIPMENT SCHEDULE - BARGE CONTROL STATION

ENCLOSURE - 62" H X 60" W X 12" DP TWO DOOR FLOOR MOUNTED STEEL NEMA 4 PANEL ENCLOSURE WITH INTERIOR PANEL, HOFFMAN.

VENTILATION LOUVER - 5-5/8 X 5-1/2 LOUVER KIT, CUT INTO ENCLOSURE SIDE, PROVIDE GALVANIZED STEEL INSECT SCREEN BEHIND LOUVER.

LIGHT SWITCH (BARGE AND EXTERIOR) - WEATHERPROOF LIGHT SWITCH.

LIGHT SWITCH (INTERIOR) - LIGHT SWITCH IN DEVICE BOX WITH METAL COVER.

RECEPTACLE - GROUND FAULT SINGLE RECEPTACLE IN DEVICE BOX WITH METAL COVER.

SPACE HEATER - 100 W, 120 V CHROMALOX TYPE SCB-100 HEATER IN PORCELAIN LAMP HOLDER, MOUNTED ON OCTAGON BOX.

THERMOSTAT - 120 V LINE DUTY HEATING, ADJUSTABLE, PENN A19BAB-3.

INTERIOR LIGHT - 100 W INCANDESCENT WITH GLASS GLOBE, HUBBELL HO. MOUNTED TO OUTLET BOX.

PANEL HB - 277/480 VOLT CIRCUIT BREAKER PANELBOARD INTERIOR ONLY. GROUNDED NEUTRAL FOR SERVICE EQUIPMENT 60 AMP MAIN CIRCUIT BREAKER, 100 AMP BUSSING. SQUARE D TYPE HCN-0936-1MN. COMPLETE WITH MOUNTING HARDWARE, BRANCHES AS FOLLOWS:

2 EA.	3P-30A	FEED TO BARGE PUMP STARTERS
2 EA.	3P-15A	FEED TO BARGE MIXER STARTERS
1 EA.	2P-15A	FEED TO TRANSFORMER B

TRANSFORMER B - 1.5 KVA, 480 PRI, 120V SEC. SINGLE PHASE DRY TRANSFORMER, SORREL 1.5 SIF.

120 V CIRCUIT BREAKER - 1P-20A CIRCUIT BREAKER MOUNTED TO BACK PANEL.

SELECTOR SWITCHES AND PILOT LIGHTS - MOUNT IN ENCLOSURE DOOR, SQUARE-D TYPE K WITH WATERTIGHT PROTECTIVE CAPS.

RESISTANCE SENSITIVE RELAYS - 120 VOLT, SQUARE-D TYPE TO-20.

MOTOR STARTERS - NEMA SIZE 1, 3-POLE OPEN MAGNETIC STARTERS WITH OVERLOAD PROTECTION FOR BARGE PUMPS (12.8 FLA) AND BARGE MIXERS (4.8 FLA). FURNISH WITH BACK MOUNT RUN TIME METERS.

LIGHTNING ARRESTOR - SECONDARY TYPE, 3 POLE, 600 V DUTY, SQUARE-D, G. E.

EQUIPMENT SCHEDULE, WINCH CONTROL STATION

ENCLOSURE - 48" H X 36" W X 12" DP SINGLE DOOR STEEL NEMA 4 PANEL ENCLOSURE WITH INTERIOR PANEL. HOFFMAN.

VENTILATION LOUVER - 5-5/8 X 5-1/2 LOUVER KIT, CUT INTO ENCLOSURE SIDE, PROVIDE GALVANIZED STEEL INSECT SCREEN BEHIND LOUVER.

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LIGHTNING ARRESTOR - SECONDARY TYPE, 3 POLE, 600 V DUTY. SQUARE-D, G.E.

CIRCUIT BREAKER (460 V) - 3 POLE, 480 VOLT, 70 AMP TRIP MOLDED CASE CIRCUIT BREAKER WITH MOUNTING HARDWARE.

MOTOR STARTER - 3 POLE, 460 VOLT OPEN TYPE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS INDICATED. RATED FOR JOGGING DUTY, TO WINCH SUPPLIER'S REQUIREMENTS.

LIGHT FIXTURE SCHEDULE

- 2 X 800 MA, 48" LAMP, 4' PENDANT MOUNT VAPOR TIGHT FLUORESCENT REFLECTOR. CORROSION RESISTANT CONSTRUCTION, TEMPERED GLASS LENS, 120 V. BENJAMIN FV.
- 2 X 150W INCANDESCENT WEATHERPROOF FLOODLIGHT IN LAMPHOLDER, 2 RED DOT L 300 LAMPHOLDERS ON DOUBLE FIXTURE OUTLET BOX AND COVER.
- SAME AS B EXCEPT ONE L300 LAMPHOLDER.
- 100 W INCANDESCENT WEATHERPROOF WALL MOUNT, CLEAR PRISMATIC POLYCARBONATE LENS, PROGRESS P S691-68.
- SAME AS A FIXTURE EXCEPT 2-40 W FLUORESCENT LAMPS.
- 2 X 40 W LAMP PENDANT MOUNT INDUSTRIAL FLUORESCENT REFLECTOR. 10% UPLIGHT, PORCELAIN ENAMEL REFLECTOR, 120 V, BENJAMIN "LITE-LINE FL".
- 1 X 20 W FLUORESCENT OPEN LAMP OVER MIRROR LIGHT, CHROMED CHANNEL, 120 V PROGRESS P 7425.
- 2 X 40 W 4', PENDANT MOUNT, WET LOCATION FLUORESCENT WRAPAROUND. CLEAR ACRYLIC LENS, 120 V BENJAMIN "STREAM-FLO/FA".
- 1 X 150 W INCANDESCENT REFLECTOR YARDLIGHT. HUBBELL YCM-14.
- 1 X 100 W INCANDESCENT INDUSTRIAL REFLECTOR W/GLASS GLOBE AND CAST GUARD, POST TOP DAVIT MOUNT. HUBBELL ACP7-14111.
- 400 W HIGH PRESSURE SODIUM FLOODLIGHT, CAST ALUMINUM NATURAL FINISH, 480 VOLT, TRUNNION MOUNT, HPF BALLAST. HUBBELL MVM-0400 S-1-1-5. MOUNT UP 24' ON BUILDING WALL.
- SAME AS 0-1 EXCEPT MOUNT UP 20' ON 30' PRESSURE TREATED WOOD POWER POLE. NOTE 9.
- DOCKLIGHT - 300 W INCANDESCENT 40" REACH WITH WIRE LAMP GUARD. PHOENIX DL-300D2.
- EMERGENCY LIGHT - 6 VOLT WALL MOUNT, LEAD-CALCIUM BATTERY PACK WITH TWO 25 WATT LAMPS, INTEGRAL CHARGER AND VOLTMETER, 120 V EXIDE FSS-25-V. DIRECT CONNECT TO LIGHTING CIRCUIT SERVING SAME AREA.

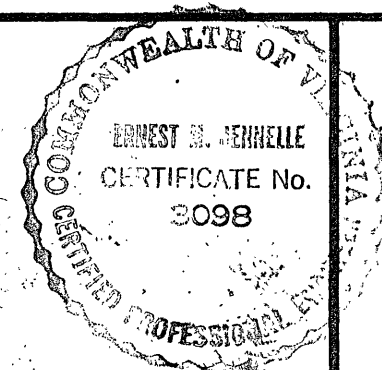
CONTROL INTERCONNECTION SCHEDULE

- △ - 3#10. BELT DRIVE POWER
- 3#10. HYDRAULIC DRIVE POWER
- 2#14. BELT SPEED CONTROL
- 2#16. SHIELDED PAIR BELT SPEED
- 2#14. BELT WASH
- 2#14. BELT MISALIGNMENT ALARM
- 2#14. BELT TENSION ALARM
- 2#14. WASH WATER PRESSURE ALARM 1 1/2".
- △ - 2#14. LOW POLYMER LEVEL 1 1/2".
- △ - 7#14. SLUDGE PUMP MOTOR CONTROL 3/4" C.
- △ - 2#14. FROM DRY CONTACTS, CONVEYOR BELT ZERO SPEED SWITCH 1/2" C.
- △ - 2#14. TO REMOTE ALARM HORNS 1/2" C.
- △ - 2#14. CONVEYOR ZERO SPEED
- 2#14. REMOTE ALARM HORN 3/4" C.
- △ - 10#14. HYDRAULIC DRIVE AND CONVEYOR BELT DRIVE CONTROL 3/4" C.
- △ - 10#14. DILUTION PUMPS
- 10#14. WASH PUMPS
- 8#14. FANS
- 6#14. SLUDGE PUMP RUN
- 5#14. SLUDGE BASIN MIXER 2" C.
- △ - 2#14. REMOTE ALARM HORNS 1/2" C.

2		
1		
NO.	DATE	DESCRIPTION

REVISIONS

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PREPARED FOR
CITY OF ROANOKE
ROANOKE, VIRGINIA

CITY OF ROANOKE WASTEWATER TREATMENT PLANT
SLUDGE DEWATERING FACILITIES

ELECTRICAL
NOTES

SCALE:	SHEET
NO SCALE	26
DATE:	OF
AUG. 1981	33
DESIGNED BY:	FILE NUMBER
D.B.	
DRAFTED BY:	PP 2967
DPC	