ONE-LINE DIAGRAM LEGEND

- 1500KVA 2.4KVD-480Y/277 3Ø, 60HZ — TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED
- 20 — 22: 3#8,#10G,2" — CIRCUIT NO.22 WITH #8 INSULATED CONDUCTORS, 1#10 BARE GROUND WIRE ALL IN 2" CONDUIT TO 20 HP MOTOR
- 15 — AUXILIARY ITEMS MAY NOT BE SHOWN COMPLETELY — ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A STEAM GENERATOR OR AN AIR HANDLING UNIT, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.
- INDICATES THAT ALL OR PART OF CIRCUIT MAY BE ROUTED IN DUCT BANK OR UNDERGROUND. CONDUIT SIZE SHOWN ON ONE-LINE IS ABOVE GROUND AND/OR INSIDE OF STRUCTURE. SEE DUCT BANK SCHEDULE AND SECTIONS FOR CONDUIT SIZE OF UNDERGROUND PORTION OF CIRCUIT.
- HIGH VOLTAGE DRAWOUT AIR OR VAQUUM CIRCUIT BREAKER
- 3P-20 — LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE
- S4 — SIZE 4 COMBINATION MAGNETIC MOTOR STARTER
- LOW VOLTAGE DRAWOUT AIR CIRCUIT BREAKER
- HIGH VOLTAGE DRAWOUT CONTACTOR
- FUSE AND DISCONNECT SWITCH
- S2 — SIZE 2 COMBINATION MAGNETIC MOTOR STARTER, REVERSING OR 2 SPEED
- S1 — SIZE 1 COMBINATION REDUCED VOLTAGE STARTER
- POTENTIAL TRANSFORMER
- CURRENT TRANSFORMER

CONDUIT & WIRING INSTALLATION LEGEND

- CONDUIT EXPOSED
- CONDUIT CONCEALED
- CONDUIT TURNING UP. CONDUIT TURNING DOWN.
- CONDUIT PLUGGED FLUSH. CONDUIT CAPPED.
- L2-5 — TYPICAL FOR HOME RUN TO BE ROUTED TO LIGHTING PANEL L2 & CONNECTED TO CIRCUIT #5 (MINIMUM NO. 12 AWG CONDUCTORS AND 3/4" CONDUIT)
- A — LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE
- 11 — FLUORESCENT FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE.
- LP1-3 — RECEPTACLE POWERED FROM LIGHTING PANEL LP1, CIRCUIT 3
- A LP2-2 — LIGHTING FIXTURE POWERED FROM LIGHTING PANEL LP2, CIRCUIT 2 (NON-SWITCHED)
- LPA-4 A 11 — LIGHTING FIXTURE POWERED FROM LIGHTING PANEL LPA, CIRCUIT 4, VIA SWITCH A
- E — UNDERGROUND CONCRETE ENCASED ELECTRICAL DUCT BANK
- UNDERGROUND CONCRETE ENCASED ELECTRICAL BANK ROUTED BENEATH SLAB-ON-GRADE
- EE — DIRECT BURIED CONDUIT
- GROUND CONDUCTOR

SCHEMATIC SYMBOLS

- WIRE CONNECTION POINT
- EXTERNAL CONNECTION POINT
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- STARTER, CONTACTOR OR RELAY COIL
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- MAINTAINED PUSH BUTTON
- NORMALLY CLOSED GEARED LIMIT SWITCH
- NORMALLY OPEN GEARED LIMIT SWITCH
- INDICATING LIGHT
- FUSE
- POTENTIOMETER
- CAPACITOR
- DIODE
- RESISTOR
- CONTROL POWER TRANSFORMER
- SWITCH
- MS — MANUAL STARTER
- OL — OVERLOAD
- ELECTRODE
- FLOAT SWITCH (CLOSING ON RISING LEVEL)
- FLOAT SWITCH (OPENING ON RISING LEVEL)
- P — PRESSURE SWITCH (CLOSING ON RISING PRESSURE)
- P — PRESSURE SWITCH (OPENING ON RISING PRESSURE)
- V — VACUUM SWITCH (CLOSING ON INCREASING VACUUM)
- V — VACUUM SWITCH OPENING ON INCREASING VACUUM)
- TEMPERATURE SWITCH (CLOSING ON RISING TEMPERATURE)
- TEMPERATURE SWITCH (OPENING ON RISING TEMPERATURE)
- FLOW ACTUATED SWITCH (CLOSING ON INCREASE IN FLOW)
- FLOW ACTUATED SWITCH (OPENING ON INCREASE IN FLOW)
- ON TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- ON TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS ENGERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- TORQUE SWITCH (NORMALLY OPEN)
- TORQUE SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY OPEN)
- LIMIT SWITCH (NORMALLY OPEN, HELD CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED, HELD OPEN)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY OPEN, CLOSING ON INCREASING DIFF.)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY CLOSED, OPENING ON INCREASING DIFF.)

MISCELLANEOUS SYMBOLS

- BELL
- HORN
- T — THERMOSTAT
- J — JUNCTION BOX
- GROUND ROD
- GROUND ROD WITH TEST WELL
- GROUND CONNECTION
- DISCONNECT SWITCH
- COMBINATION STARTER
- POWER PANEL
- LIGHTING PANEL
- MISCELLANEOUS PANEL
- LIGHTING CONTACTOR

COMMUNICATION SYMBOLS

- HORN SPEAKER
- DUAL HORN SPEAKER
- WALL MOUNTED CONE SPEAKER
- SK — CEILING MOUNTED CONE SPEAKER
- WS WP — WALL STATION
- DS — DESK TOP STATION
- RH WP — REMOTE HANDSET
- SA — SPEAKER AMPLIFIER
- LB — LINE BALANCE ASSEMBLY
- TG — TONE GENERATOR
- TI — TELEPHONE INTERFACE
- IA — INTERFACE AMPLIFIER
- IJB — INTERCOM JUNCTION BOX

NOTE: WP=WEATHERPROOF H=HAZARDOUS AREA

SWITCH & OUTLET SYMBOLS

S	SINGLE POLE SWITCH	S_{PL}	SWITCH WITH PILOT LIGHT		DUPLEX RECEPTACLE 120 VOLT		120 VOLT DUPLEX RECEPTACLE (UPS)
S_2	TWO POLE SWITCH	S_{KO}	KEY OPERATED SWITCH		SIMPLEX RECEPTACLE		DUPLEX FLOOR OUTLET
S_3	THREE-WAY SWITCH	S_{XP}	EXPLOSION PROOF SWITCH		RANGE RECEPTACLE		TELEPHONE OUTLET
S_4	FOUR-WAY SWITCH	S_{DM}	DIMMER SWITCH		TWISTLOCK RECEPTACLE		TELEPHONE FLOOR OUTLET
S_M^{C1}	MOMENTARY SWITCH CONTROLLING CONTACTOR C1	S_{3A}	THREE-WAY SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION	30	240V, 1Ø RECEPTACLE, TYPICAL AMPERE RATING NOTED	CX	COAXIAL CABLE OUTLET
S_{WP}	WEATHERPROOF SWITCH			60	480V, 3Ø WELDING RECEPTACLE, TYPICAL AMPERE RATING NOTED		

ABBREVIATIONS

A	AMBER, AMPERE, ALARM
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AM	AMMETER
ANN	ANNUNCIATOR
AR	ALARM RELAY
AS	AMMETER SWITCH
AT	AMPERE TRIP
AWG	AMERICAN WIRE GAGE
BC	BATTERY CHARGER
BR	BRAKE
BT	BEARING TEMPERATURE
C	CLOSE, COUNTER OR CONTACTOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CB"A"	CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN OR TRIPPED CLOSED WHEN BREAKER IS CLOSED)
CB"B"	CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN OR TRIPPED OPEN WHEN BREAKER IS CLOSED)
CD	CONTROL DAMPER
CI	CELL INTERLOCK
CKT	CIRCUIT
CL2	CHLORINE
COS	CABLE OPERATED SWITCH
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CURRENT OR CONTROL RELAY
CS	CONTROL STATION
CT	CYCLE TIMER OR CURRENT TRANSFORMER
CTC	CYCLE TIMER CLUTCH
CTM	CYCLE TIMER MOTOR
2/C	2 CONDUCTOR
4"C	4" CONDUIT
DC	DIRECT CURRENT
DI	DOOR INTERLOCK
DM	DAMPER MOTOR OR DEMAND METER
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPR	DIFFERENTIAL PRESSURE REGULATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DS	DISCONNECT SWITCH
DVLS	DISCHARGE VALVE LIMIT SWITCH
E	ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE
EC	EMPTY CONDUIT
EL	ELEVATION OR EMERGENCY LIGHT
EMH	ELECTRICAL MANHOLE
ER	ELECTRODE RELAY
ES	END SWITCH
ETM	ELAPSED TIME METER
EX	EXISTING
F	FORWARD
FS	FLOW SWITCH
G	GREEN OR GROUND
GD	GROUND DETECTOR
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GLS	GEARED LIMIT SWITCH
#8G	#8 GROUND WIRE
H	HIGH OR HUMIDISTAT
HC	HOT CIRCUIT
HH	HANDHOLE
HMT	HIGH MOTOR TEMPERATURE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HWCO	HIGH WATER CUTOFF
HZ	HERTZ (CYCLE)
I/O	INPUT/OUTPUT
INST	INSTANTANEOUS
J	JUNCTION BOX
JB	JUNCTION BOX
K	KEY INTERLOCK
KCMIL	THOUSAND CIRCULAR MIL
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
KWH	KILOWATT HOUR
L	LOW, LEVEL
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTACTOR
LOA	LOCAL-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LP	LIGHTING PANEL
LS	LIMIT OR LEVEL SWITCH
LWCO	LOW WATER CUTOFF
1-1PR#16S	ONE, SINGLE PAIR, TWISTED, SHIELDED #16 CABLE
3-7/C#14	THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES

M	MAGNETIC MOTOR STARTER
MA	MILLIAMPERE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCLU	MOTOR CONTROL LINEUP
MD	MOISTURE DETECTOR
MFM	MAGNETIC FLOW METER
MFR	MANUFACTURER
MH	MANHOLE OR MOUNTING HEIGHT
MOV	MOTOR OPERATED VALVE
MPR	MOTOR PROTECTION RELAY
MS	MANUAL MOTOR STARTER
MSH	MOTOR SPACE HEATER
MV	MILLIVOLT
MVA	MEGA VOLT AMPERE
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER
O	OPEN
OCB	OIL CIRCUIT BREAKER
OL	OVERLOAD
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
P	PRIMARY
PCS	PLANT CONTROL SYSTEM
PB	PUSH BUTTON OR PULL BOX
PF	POWER FACTOR METER
PH	PHASE, CHEMICAL TERM
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	POWER PANEL
PRS	PROXIMITY SWITCH
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER, PROGRAM TIMER
2P	2 POLE
R	RED, RAISE, RELAY OR REVERSE
RECP	RECEPTACLE
RES	RESISTOR
RT	REPEATING TIMER
RTD	RESISTANCE TYPE TEMP DETECTOR
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE STARTER
S2	SIZE 2 STARTER
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SH	SPACE HEATER
SN	SOLID NEUTRAL
SO	SOLENOID OILER
SP	SINGLE POLE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SELECTOR SWITCH
SSS	SOLID STATE STARTER
SUPV	SUPERVISORY CONTROL
SV	SOLENOID VALVE
SWB	SWITCHBOARD
SWGR	SWITCHGEAR
T	THERMOSTAT, TIMER, OR TOTALIZER
TACH	TACHOMETER
TB	TERMINAL BLOCK
TC	TIMER CLUTCH
TD	TIME DELAY RELAY
TEMP	TEMPERATURE
TM	TIMER MOTOR
TQ	TORQUE
TS	TEMPERATURE SWITCH
TTB	TELEPHONE TERMINAL BOX
UG	UNDERGROUND
UV	UNDER VOLTAGE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPERE
VAR	VARMETER
VLS	VALVE LIMIT SWITCH
VM	VOLTMETER
VPI	VALVE POSITION INDICATOR
VS	VOLTMETER SWITCH
W	WHITE OR WATTS
WH	WATTHOUR METER
WM	WATT METER
WP	WEATHERPROOF
WPI	WEATHERPROOF IN-USE
X	AUXILIARY RELAY
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	YELLOW
Z	AUXILIARY RELAY
ZS	POSITION SWITCH
ZSS	ZERO SPEED SWITCH

AREA DESIGNATIONS

~~THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON~~ THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

- AREA TYPE 1A — CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES, AND ACCESSORIES.
- AREA TYPE 4 — INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
- AREA TYPE 7A — CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 7B — CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 12 — INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS.
2. SPARE WIRES SHALL BE TAPED AND COILED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12 AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC., NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

GENERAL NOTES

1. SOLID LINES (————) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES ( ) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (– – – – –) INDICATE FUTURE WORK OR EQUIPMENT.
4. REFER TO THE FOLLOWING DRAWING(S) FOR INSTRUMENTATION LEGEND: I-1, I-2, I-3
5. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
6. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
   - A. ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
   - B. FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
   - C. SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
   - D. DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

Raw Water Intake

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
0	ZKO	SGS		12/04/15	ISSUED FOR CONSTRUCTION

90.90.0 - Electrical Drawings
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PLOTTED:
USER: ROE49383
DWG VER: 1.000
XREF1:
XREF2:
XREF3:
XREF4:

SCOTT G. STOCKWELL Lic. No. 0407-032079 — 12-04-2015 — PROFESSIONAL ENGINEER — COMMONWEALTH OF VIRGINIA

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Virginia Beach, VA

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
LEGEND & ABBREVIATIONS

DESIGNED: ZKO
DETAILED: RTD
CHECKED:
APPROVED:
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 182262

E-00-001
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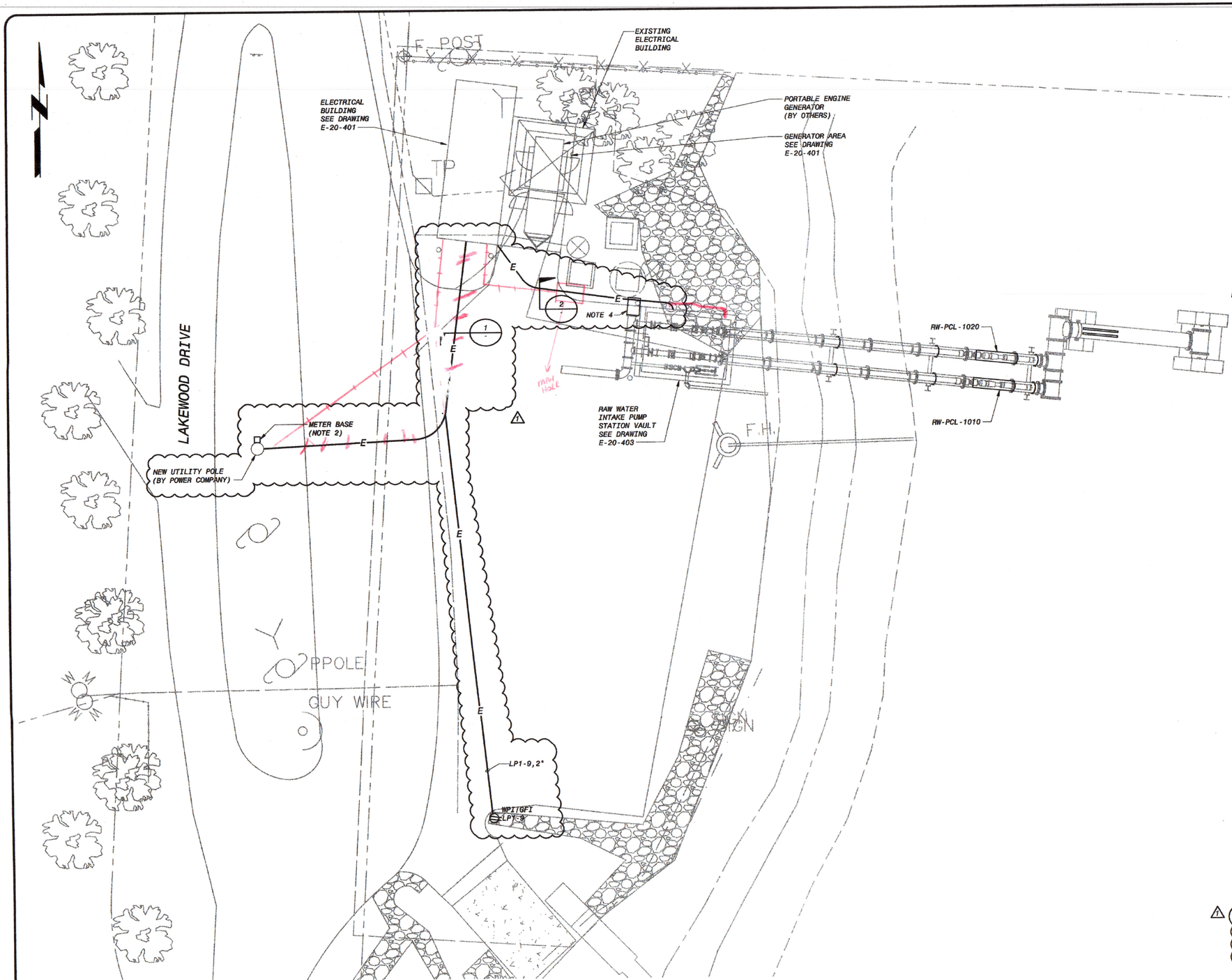
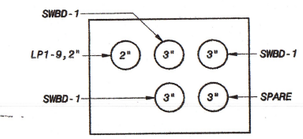
OF

D17000

Varney Received 02.08.16



INTAKE STRUCTURE - ELECTRICAL SITE PLAN
1" = 10'-0"



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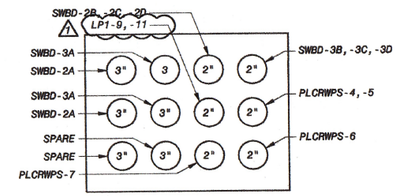

SECTION 2
NO SCALE
(NOTE 3)

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND AND ABBREVIATIONS & GENERAL REQUIREMENTS.
2. COORDINATE WITH POWER COMPANY TO DETERMINE LOCATION OF METER BASE. LOCATION SHOWN IS BASED ON TRANSFORMER MOUNTED CURRENT TRANSFORMERS.
3. CONTRACTOR SHALL FIELD COORDINATE DUCT BANK LOCATION TO AVOID EXISTING BURIED INFRASTRUCTURE.
4. IN ORDER TO AVOID CONFLICT WITH FUTURE PIPING THE TOP OF DUCT BACK WITHIN SPECIFIED BOUNDARY SHALL BE AT AN ELEVATION NO GREATER THAN 797.5'.

10' 0 10' 20'
1"=10'

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
1	ZKO	SDS		01/12/16	GENERAL REVISIONS
0	ZKO	SDS		12/04/15	ISSUED FOR CONSTRUCTION

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XREF2:
XREF3:
XREF4:

50.3040 - Electrical Drawings
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PLOTTED:
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DWG VER: 1000

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DAVID R. STOCKMAN
Lic. No. 0402-032079
1-13-2016
PROFESSIONAL ENGINEER

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Virginia Beach, VA

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
INTAKE STRUCTURE
SITE PLAN

DESIGNED: ZKO
DETAILED: DGP
CHECKED: SDS
APPROVED:
DATE: 01/12/16

0 1/2 1
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PROJECT NO.
189317

E-20-101
SHEET
OF

FD7000
D7000

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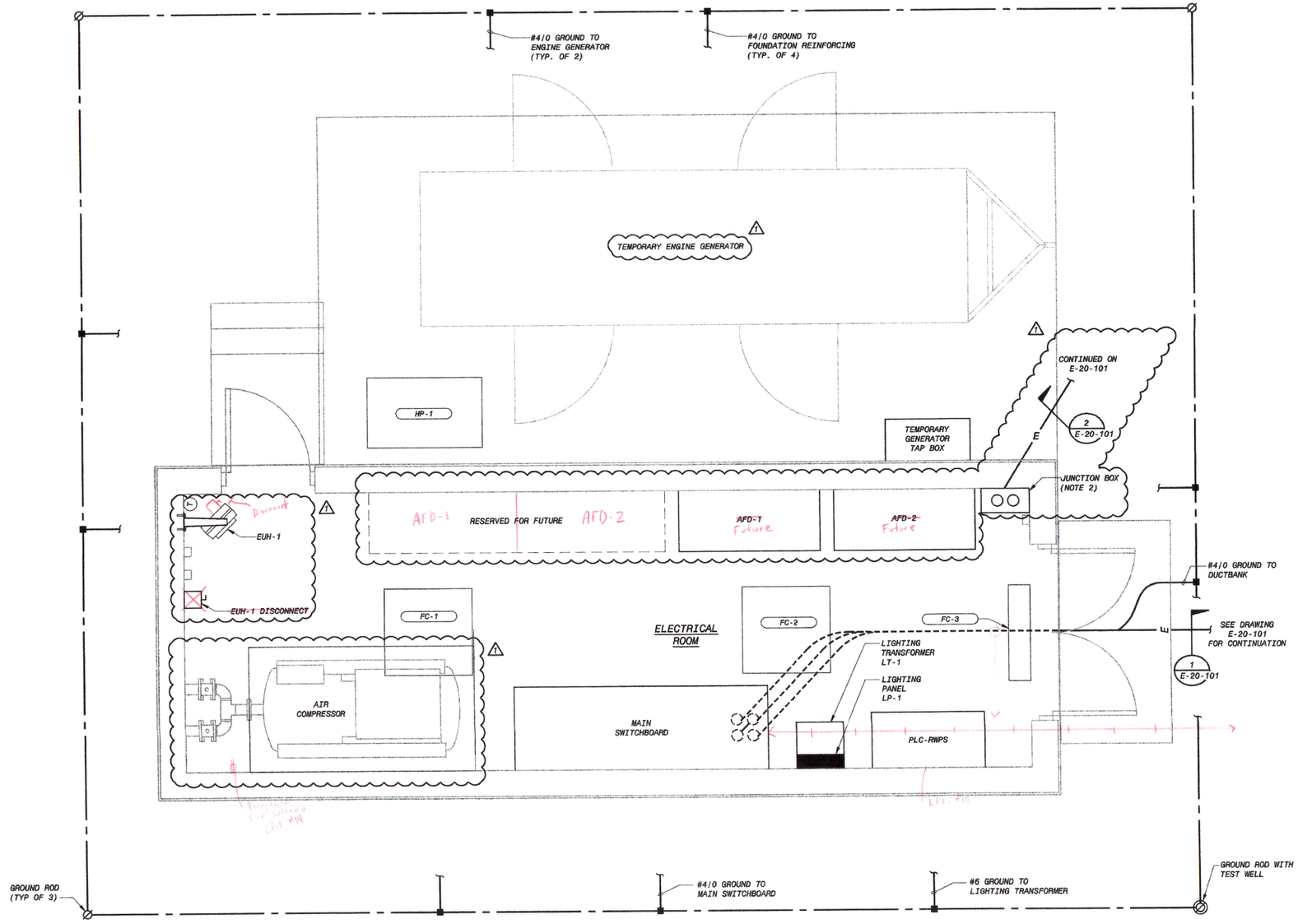

ELECTRICAL POWER PLAN

1/2"=1'-0"

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. ALL CONDUITS IN DUCT BANK SECTION 2 SHALL TURN UP IN JUNCTION BOX.

12" 6" 0 1' 2' 3' 4' 5'

1/2"=1'-0"

ISSUED FOR CONSTRUCTION

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1	ZKO	SDS	
0	ZKO	SDS	

DATE	REVISIONS AND RECORD OF ISSUE
01/12/16	GENERAL REVISIONS
08/04/15	ISSUED FOR CONSTRUCTION

SD 3040 - Electrical Drawings

E-20-401.dwg

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XREF4:

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LIC. NO. 0402-022077
1-13-2016
PROFESSIONAL ENGINEER

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BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
RAW WATER PUMPING STATION
ELECTRICAL BUILDING POWER PLAN

DESIGNED: ZKO
DETAILED: RTD
CHECKED: SDS
APPROVED:
DATE: 01/12/16

0 1/2 1
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PROJECT NO.
189317

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OF

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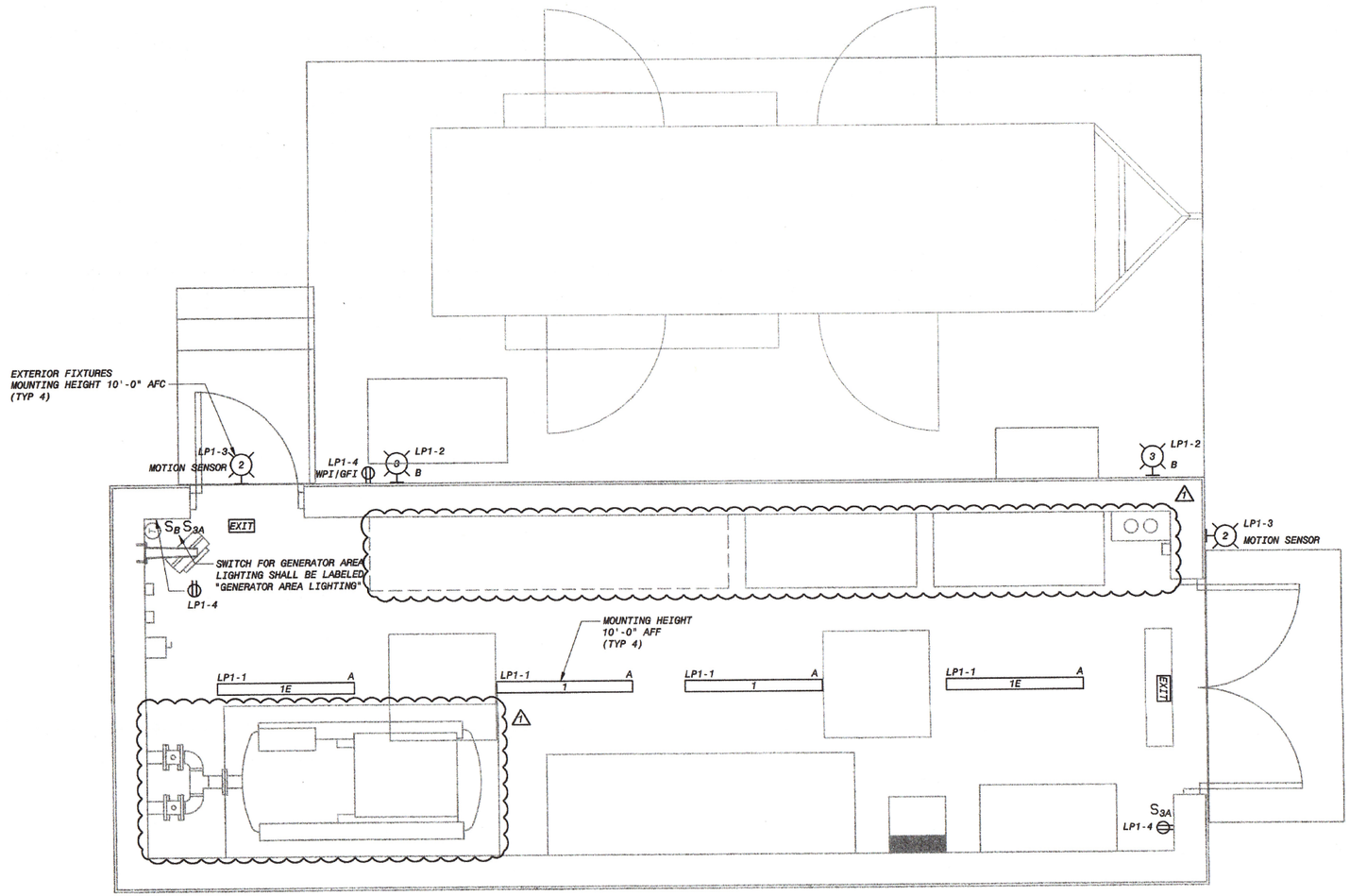
D7000



ELECTRICAL LIGHTING PLAN

1/2"=1'-0"

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

12" 6" 0 1' 2' 3' 4' 5'

1/2"=1'-0"

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	REVISIONS AND RECORD OF ISSUE	DATE
1	ZXQ	SDS		GENERAL REVISIONS	01/12/16
0	ZXQ	SDS		ISSUED FOR CONSTRUCTION	07/04/15

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COMMONWEALTH OF VIRGINIA
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SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
RAW WATER PUMPING STATION
ELECTRICAL BUILDING LIGHTING PLAN

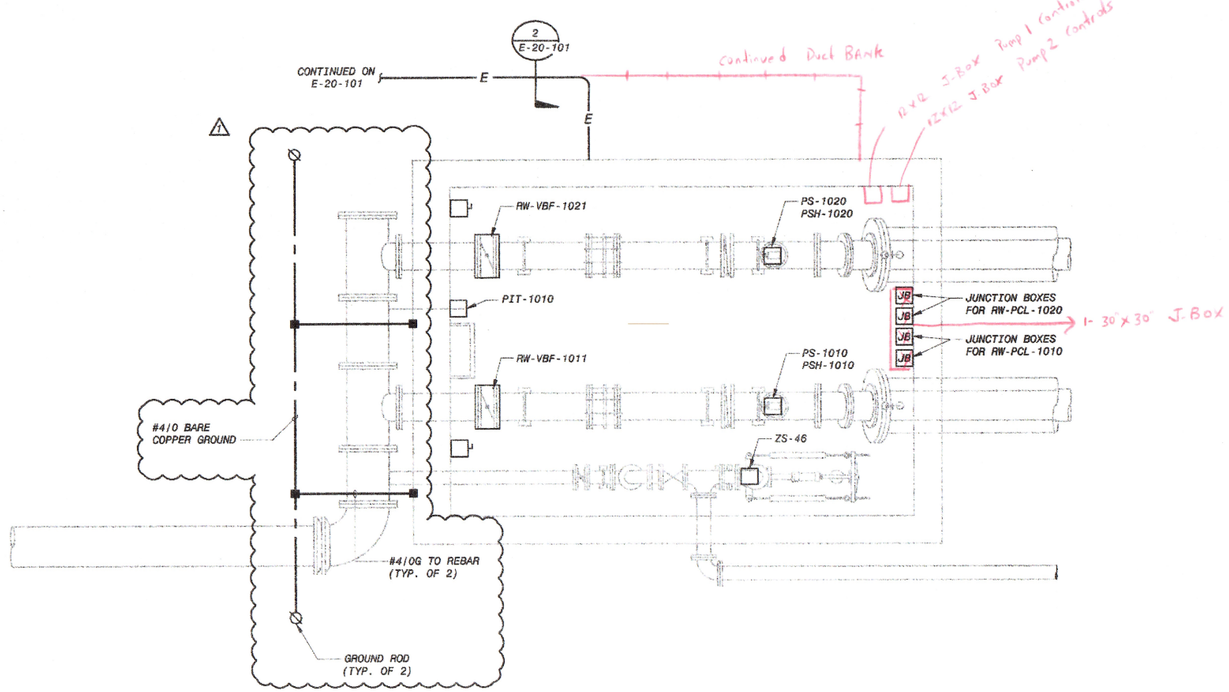
DESIGNED: DGP
DETAILED: DGP
CHECKED: SDS
APPROVED:
DATE: 01/12/16

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 189317

E-20-402
SHEET
OF

FD7000
D7000



RAW WATER INTAKE PUMP STATION VAULT
POWER PLAN
3/8" = 1'-0"

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
1	ZKO	SGS		02/04/15	ISSUED FOR CONSTRUCTION
0	ZKO	SGS		01/12/16	GENERAL REVISIONS

50.3040 - Electrical Drawings
E-20-403.dwg
SAVED: DREB6984, 11/13/2016 9:30:00 AM
PLOTTED:
USER: DREB6984
DWG VER: 1000
XREF1:
XREF2:
XREF3:
XREF4:

COMMONWEALTH OF VIRGINIA
SCOTT G. STOCKAM
LIC. NO 0401-022017
1-13-2016
PROFESSIONAL ENGINEER

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Virginia Beach, VA

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
RAW WATER INTAKE PUMP STATION VAULT
POWER PLAN

DESIGNED: ZKO
DETAILED: DGP
CHECKED: SGS
APPROVED:
DATE: 01/12/16

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
189317

E-20-403
SHEET
OF

1:07000
07000

LIGHTING FIXTURE SCHEDULE

FIXTURE	LAMP	MOUNTING HGT	DESCRIPTION	MANUFACTURER
1	LED 69.5 WATT 6000 LUMENS	AS SPECIFIED ON DRAWINGS	Z SERIES LED STRIPLIGHT, 48 INCHES, MEDIUM DIFFUSE LENS, 3000 K COLOR TEMPERATURE, 80 CRI, WHITE, WITH HANGER CHAIN, 120V	LITHONIA #: ZL1F L48 6000LM MDD 30K 80CRI WH ACCESSORIES #: HC36
1E	LED 69.5 WATT 6000 LUMENS	AS SPECIFIED ON DRAWINGS	Z SERIES LED STRIPLIGHT, 48 INCHES, MEDIUM DIFFUSE LENS, 3000 K COLOR TEMPERATURE, 80 CRI, EMERGENCY BATTERY PACK, WHITE, WITH HANGER CHAIN, 120V	LITHONIA #: ZL1F L48 6000LM MDD 30K 80CRI E7W WH ACCESSORIES #: HC36
2	10 LED 24 WATT 1959 LUMENS	AS SPECIFIED ON DRAWINGS	LED WALL MOUNT FIXTURE, ONE ENGINE (10 LEDS), 4000K, TYPE IV DISTRIBUTION, EMERGENCY BATTERY BACKUP, MOTION SENSOR, 120V	LITHONIA #: WST LED 1 10A700/40K SR4 120 ELCW PIR DDBXD
3	20 LED 72 WATT 4683 LUMENS	AS SPECIFIED ON DRAWINGS	LED WALL MOUNT FIXTURE, TWO ENGINES (20 LEDS), 5000K, TYPE III MEDIUM DISTRIBUTION, EMERGENCY BATTERY BACKUP, 120V	LITHONIA #: TSH LED 20C 1000 50K T3M 120 ELSW DDBXD
EXIT	LED EXIT SIGN	AS SPECIFIED ON DRAWINGS	CONSTRUCTED OF THERMOPLASTIC HOUSING THAT IS IMPACT RESISTANT, SCRATCH-RESISTANT, AND CORROSION-PROOF, WHITE HOUSING COLOR, UNIVERSAL MOUNTING, 120/277V	LITHONIA #: LQM S W 3 R 120/277

PANELBOARD: LP-1
SERVICE: 120/208V, 3PH, 4W, S/N
MOUNTING: SURFACE
BUS: COPPER
RATING:225A
MAINS:3P-50
LOCATION: RAW WATER PUMP STATION-ELECTRICAL ROOM

PHASE "A" V.A.	PHASE "B" V.A.	PHASE "C" V.A.	LOAD	P	BKR	CKT #		BKR	P	LOAD	PHASE "A" V.A.	PHASE "B" V.A.	PHASE "C" V.A.
260			ELECTRICAL ROOM LIGHTING	1	20	1	2	20	1	GENERATOR AREA LIGHTING	300		
	300		OUTDOOR LIGHTING	1	20	3	4	20	1	ELECTRICAL ROOM RECEPTACLES		540	
		161	FC-2	2	20	5	6	20	2	FC-1			161
161				-	20	7	8	20	-	-	161		
	180		OUTDOOR DECK RECEPTACLE	1	20	9	10	20	2	FC-3		70	
		200	RW-VBF-1011	1	20	11	12	20	-	-			70
200			RW-VBF-1021	1	20	13	14	20	1	SPARE			
			SPARE	1	20	15	16	20	1	SPARE			
			SPARE	1	20	17	18	20	1	SPARE			
			SPACE	1		19	20		1	SPACE			
			SPACE	1		21	22		1	SPACE			
			SPACE	1		23	24		1	SPACE			
621			TOTAL "A"			1082				TOTAL "A"	461		
	480		TOTAL "B"			1090				TOTAL "B"		610	
		361	TOTAL "C"			592				TOTAL "C"			231
			TOTAL =			2764							

1

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
1	ZKO	SGS		01/12/16	GENERAL REVISIONS
0	ZKO	SGS		12/04/15	ISSUED FOR CONSTRUCTION

50.3040 - Electrical Drawings
E-20-501.dwg
SAVED: DRE69694, 1/12/2016 2:28:49 PM
PLOTTED:
USER: DRE69694
DWG VER: 1000
XREF1:
XREF2:
XREF3:
XREF4:

COMMONWEALTH OF VIRGINIA
SCOTT D. STOCKAM
Lic. No 0402-020079
1-13-2016
PROFESSIONAL ENGINEER

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Virginia Beach, VA

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

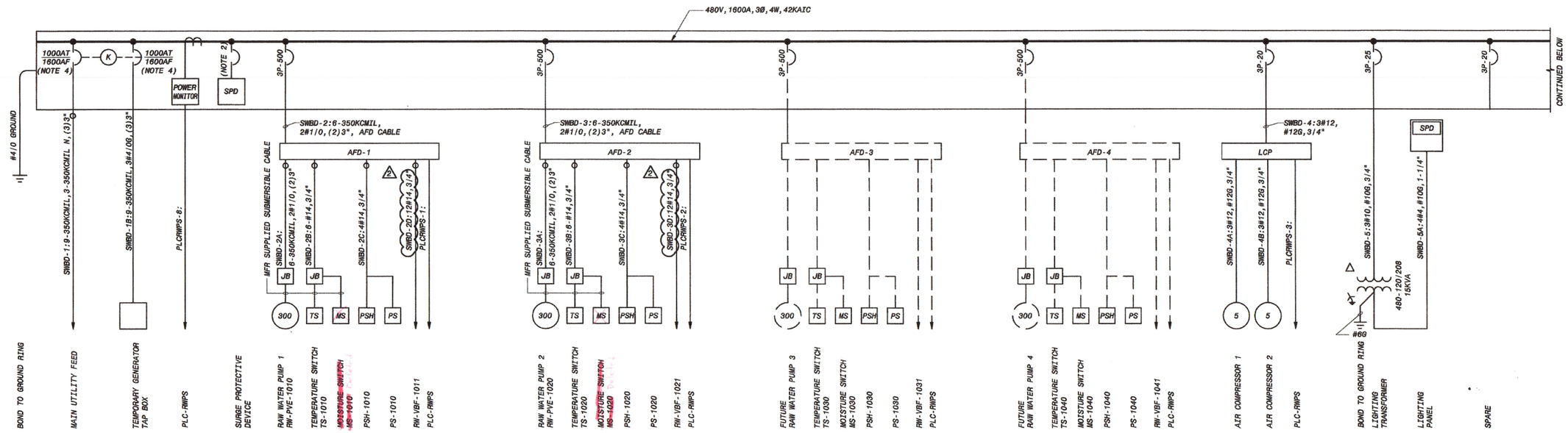
ELETRICAL
LIGHTING FIXTURE & PANELBOARD SCHEDULES
AND DETAILS

DESIGNED: ZKO
DETAILED: RTD
CHECKED: SGS
APPROVED:
DATE: 01/12/16

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

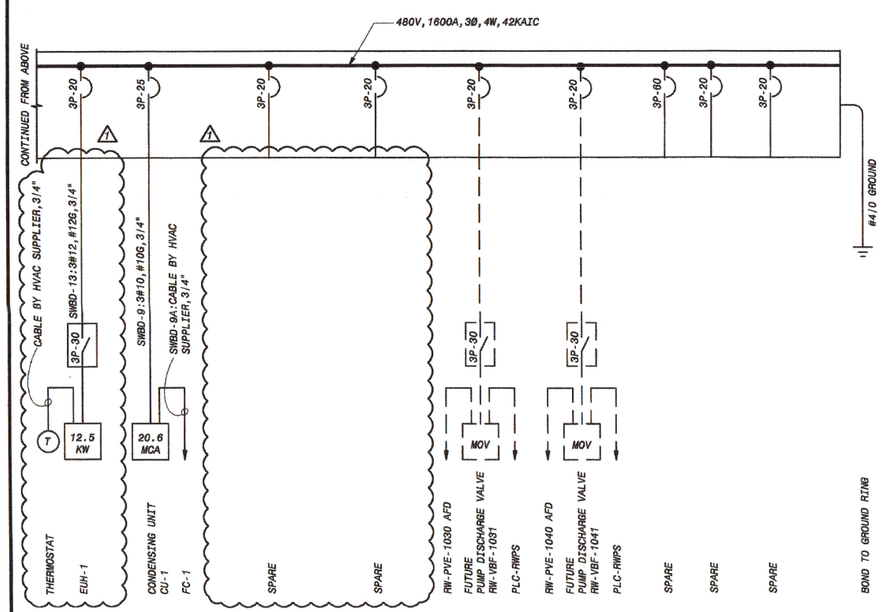
PROJECT NO.
189317

E-20-501
SHEET
OF



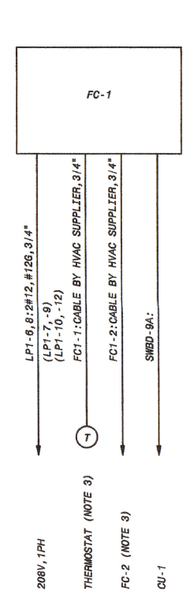
MAIN SWITCHBOARD ONE-LINE DIAGRAM

NO SCALE



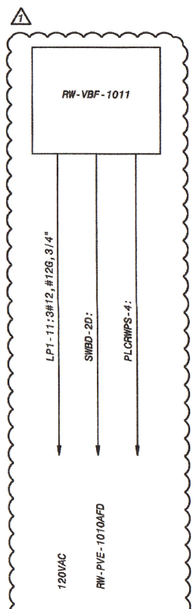
MAIN SWITCHBOARD ONE-LINE DIAGRAM (CONT.)

NO SCALE



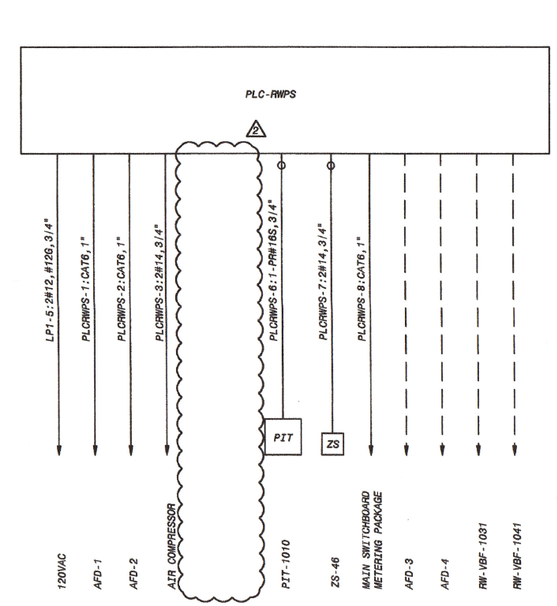
FAN COIL FC-1 ONE-LINE DIAGRAM

TYPICAL FOR FC-2 & FC-3



RW-VBF-1011 ONE-LINE DIAGRAM

TYPICAL FOR RW-VBF-1021



PLC-INTAKE ONE-LINE DIAGRAM

NO SCALE

NOTES:

1. SEE DRAWING E-00-001 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SPD BREAKER SHALL BE SIZED PER MFR. RECOMMENDATIONS.
3. CONTROL CABLE FOR HVAC SHALL DAISY CHAIN FROM CU-1 TO FC-1 TO FC-2 TO FC-3. WALL MOUNTED THERMOSTAT CONTROLS SHALL BE CONNECTED TO FC-1 AND FC-2. CONDUIT BY ELECTRICAL CONTRACTOR, CABLE BY HVAC SUPPLIER.
4. CONDUCT FACTORY AND ON-SITE TESTING OF GROUND FAULT FUNCTIONALITY OF BREAKER.

ISSUED FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
2	ZKO	SDS		07/18/16	ECN-013
1	ZKO	SDS		01/12/16	GENERAL REVISIONS
0	ZKO	SDS		12/04/15	ISSUED FOR CONSTRUCTION

XREF1:
XREF2:
XREF3:
XREF4:

50.3040 - Electrical Drawings E-20-701.dwg
SAVED: DRE66694, 7/18/2016 10:38:58 AM
PLOTTED: DRE66694, 4/8/2014 12:47:
USER: DRE66694 DWG VER: 1000

COMMONWEALTH OF VIRGINIA
SCOTT D. SPOCKAMY
Lic. No. 0402-032079
PROFESSIONAL ENGINEER
7-18-2016

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Virginia Beach, VA

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
RAW WATER PUMPING STATION / INTAKE

ELECTRICAL
MAIN SWITCHBOARD & PLC
ONE-LINE DIAGRAMS

DESIGNED: ZKO
DETAILED: JES
CHECKED: SDS
APPROVED:
DATE: 07/18/16

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 189317

E-20-701
SHEET
OF

F07000
D7000