NOTES:

1. DESIGN DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW THE GENERAL REQUIREMENTS. ALL EQUIPMENT AND INSTALLATION SHALL BE IN ACCORDANCE WITH ST. JOHNS COUNTY DESIGN STANDARDS AND SPECIFICATIONS.

2. ALL MATERIAL SHALL BE NEW AND SHALL CONFORM WITH THE STANDARDS OF THE UNDERWRITERS' LABORATORIES, INC., AMERICAN NATIONAL STANDARDS INSTITUTE, NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION, INSULATED POWER CABLE ENGINEERS ASSOCIATION, AND INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS, IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THE PARTICULAR TYPE OF MATERIALS IN QUESTION.

3. THE INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE REGULATIONS OF THE LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE, APPLICABLE CITY, STATE, AND LOCAL CODES AND REGULATIONS AND OTHER APPLICABLE CODES, INCLUDING UTILITY COMPANY CODES.

4. ALL PERMITS REQUIRED BY STATE OR LOCAL ORDINANCES SHALL BE OBTAINED, AND AFTER COMPLETION OF THE WORK, A CERTIFICATE OF FINAL INSPECTION AND APPROVAL FROM THE ELECTRICAL INSPECTOR SHALL BE FURNISHED TO THE OWNER. ALL PERMITS FOR INSTALLATION, INSPECTIONS, CONNECTIONS, ETC., SHALL BE TAKEN OUT AND PAID FOR BY THE CONTRACTOR AS PART OF THE WORK UNDER THIS SECTION.

5. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED TO BE FREE FROM DEFECTS. ANY PART OF THE SYSTEM CONSIDERED DEFECTIVE BY THE ENGINEER WITHIN THE GUARANTEE PERIOD SHALL BE IMMEDIATELY REPLACED OR CORRECTED TO THE ENGINEER'S SATISFACTION WITHOUT FURTHER EXPENSE TO THE OWNER.

6. THE PROJECTS GROUNDING SYSTEM SHALL CONSIST OF A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC SPECIFICATIONS, BONDED TO A MAIN GROUND BUS INTERCONNECTING ALL POWER DISTRIBUTION EQUIPMENT. GROUND ROD SECTIONS SHALL BE COUPLED AND DRIVEN TO ESTABLISH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS THROUGHOUT THE GROUNDING SYSTEM.

7. UNLESS OTHERWISE INDICATED, ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA 12/3R ALUMINUM OR 316 STAINLESS STEEL; CONDUCTORS SHALL BE STRANDED TYPE XHHW-2 COPPER; CONDUCTORS WITHIN THE WET WELL DEMARCATION BOXES SHALL BE STRANDED TYPE XHHW-2 TINNED COPPER. UNDERGROUND CONDUIT SHALL BE SCH 40 PVC; EXPOSED CONDUIT SHALL BE SCH 80 PVC; CONDUIT FROM THE WET WELL TO THE DEMARCATION BOXES SHALL BE SCH 80 PVC; SUPPORT CHANNEL AND MOUNTING STRUT SHALL BE MINIMUM 1.5" X 1.5" ALUMINUM. ALL MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL, INCLUDING BUT NOT LIMITED TO NUTS, BOLTS, WASHERS, BRACKETS, ETC. ANTI-SEIZE COMPOUND SHALL BE USED FOR ALL NUTS AND BOLTS. SCREWS ARE NOT ALLOWED. ALL MATERIALS AND INSTALLATION SHALL BE SUITABLE FOR "CORROSIVE ATMOSPHERES".

8. THE PUMP CONTROL PANEL WET WELL LEVEL CONTROL SYSTEM SHALL INCLUDE A MULTIPLEX PUMP CONTROLLER AND SUBMERSIBLE MULTI-POINT LEVEL PROBE FOR AUTOMATIC LEAD/LAG PUMP CONTROL AND ALTERNATION; AND 24V CONTROL POWER TRANSFORMER AND HIGH/OFF LEVEL FLOAT SWITCHES FOR HIGH LEVEL ALARM AND BACKUP PUMP CONTROL.

9. DUCT SEAL IS REQUIRED AT ALL CONDUIT CONNECTIONS IN AND OUT OF THE DEMARCATION BOX. ADDITIONALLY, DUCT SEAL IS REQUIRED AT ALL CONDUIT CONNECTIONS IN AND OUT OF THE PUMP CONTROL PANEL.

10. PROVIDE SITE LIGHT POLE WITH SERVICE FROM THE PUMP CONTROL PANEL (3/4"C, 3#12). PROVIDE WP DUPLEX GFI RECEPTACLE WITH CAST ALUMINUM BOX AND COVER, AND WP LIGHT SWITCH WITH CAST ALUMINUM BOX AND COVER, MOUNTED ADJACENT TO THE PUMP CONTROL PANEL. SITE LIGHT POLE SHALL BE FIBERGLASS DIRECT BURIED POLE. LUMINAIRE SHALL BE RAB MODEL A17-5T70SF WITH 24" LONG ALUMINUM SPOKE BRACKET ARM. LUMINAIRE SHALL NOT HAVE PHOTOCELL (NOT DUSK TO DAWN). POLE, LUMINAIRE AND ARM SHALL HAVE BRONZE FINISH. LUMINAIRE MOUNTING HEIGHT SHALL BE 12'. LOCATE LIGHT POLE ON RIGHT-HAND SIDE OF THE PUMP CONTROL PANEL.

11. IN ACCORDANCE WITH THE LATEST ST. JOHNS COUNTY UTILITIES DEPARTMENT STANDARDS, THE NEW PUMP CONTROL PANEL, EXPLOSION PROTECTED TYPE EX TERMINAL BOXES, WET WELL LEVEL CONTROLS, AND UL SERVICE ENTRANCE MAIN FUSED DISCONNECT SWITCH SHALL BE FURNISHED BY THE SJCUD APPROVED LIFT STATION ELECTRICAL EQUIPMENT SUPPLIER.

12. IN ACCORDANCE WITH THE LATEST ST. JOHNS COUNTY UTILITIES DEPARTMENT STANDARDS, THE SCADA SYSTEM RTU, ANTENNA MAST, AND ANTENNA, SHALL BE PROVIDED BY A SJCUD APPROVED SCADA SYSTEM INTEGRATOR. FOR STATIONS EQUIPPED WITH FORCE MAIN PRESSURE SENSORS AND/OR WATER MAIN PRESSURE SENSORS, THE PRESSURE SENSORS SHALL BE PROVIDED BY THE SCADA SYSTEM INTEGRATOR.

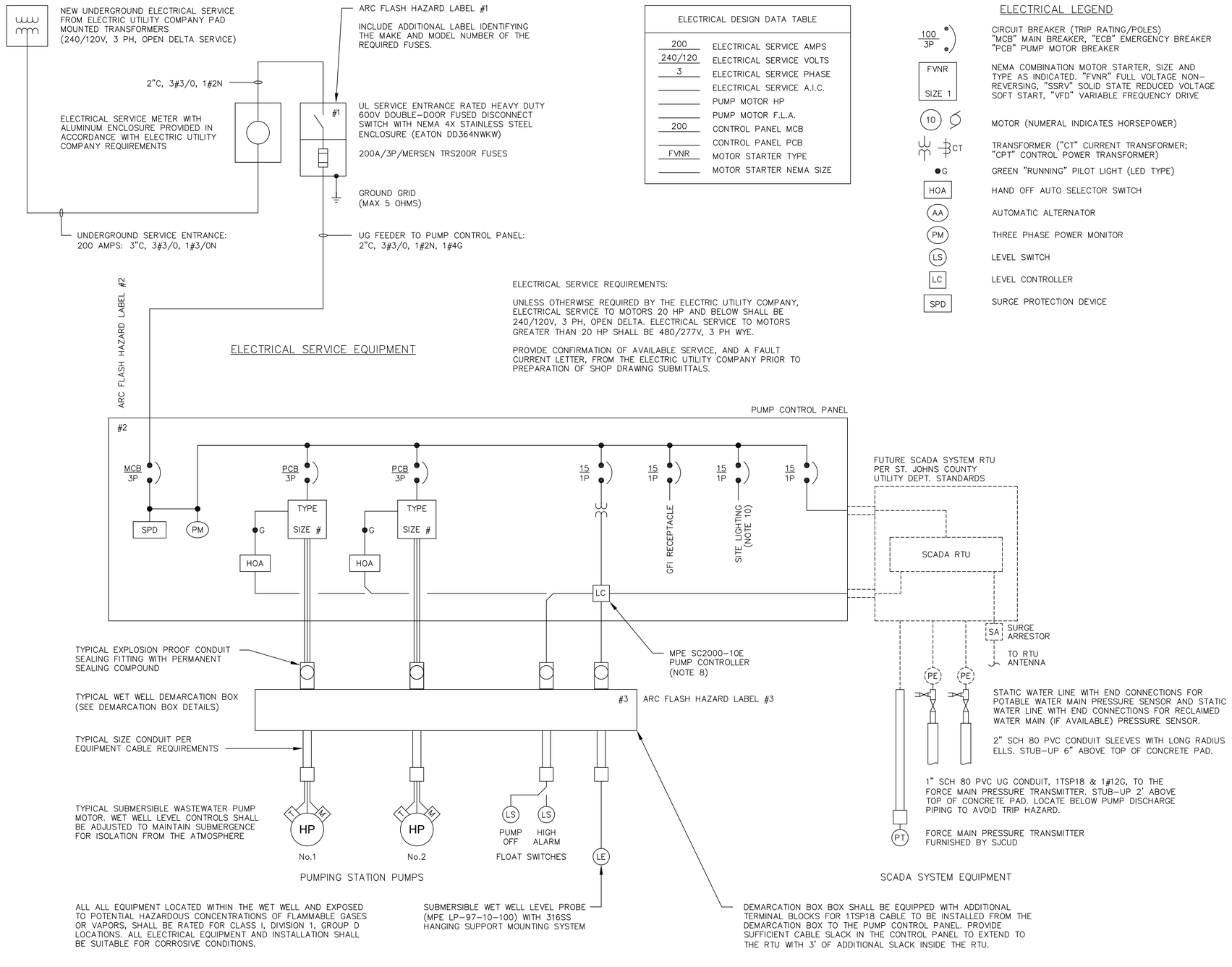
ELECTRICAL SYSTEMS ANALYSIS:

1. THE CONTRACTOR SHALL INCLUDE A BID ALLOWANCE AS SHOWN IN SECTION 1.4.1.5 OF THE SJCUD "MANUAL OF WATER, WASTEWATER AND REUSE DESIGN STANDARDS AND SPECIFICATIONS" TO OBTAIN THE SERVICES OF AN INDEPENDENT SPECIALTY ENGINEERING FIRM TO PROVIDE A PRELIMINARY AND A FINAL SHORT CIRCUIT, DEVICE EVALUATION, PROTECTIVE DEVICE COORDINATION, AND ARC FLASH STUDY OF THE COMPLETE ELECTRICAL DISTRIBUTION SYSTEM, IN ACCORDANCE WITH SJCUD STANDARDS

2. THE CONTRACTOR SHALL PROVIDE, WITH THE SHOP DRAWING SUBMITTALS, A LISTING OF THE FOLLOWING INFORMATION FOR EACH POWER DISTRIBUTION FEEDER: CONDUIT SIZE, CONDUIT TYPE, CONDUCTOR SIZE, CONDUCTOR TYPE, CONDUCTOR LENGTH.

3. THE SERVICE ENTRANCE MAIN FUSED DISCONNECT SWITCH FUSE SELECTION SHALL BE IN ACCORDANCE WITH THE SJCUD STANDARDIZED FUSES: MERSEN TRS100R AND TRS200R. HOWEVER, SELECTION OF AN INTERMEDIATE TRS-R FUSE SHALL BE UTILIZED WHEN POSSIBLE TO REDUCE THE DOWNSTREAM HAZARD RISK CATEGORY.

4. THE CONTRACTOR SHALL PROVIDE THE SERVICE ENTRANCE FUSE SIZE DETERMINED BY THE FINAL APPROVED ELECTRICAL SYSTEMS ANALYSIS.



ELECTRICAL SERVICE REQUIREMENTS:

UNLESS OTHERWISE REQUIRED BY THE ELECTRIC UTILITY COMPANY, ELECTRICAL SERVICE TO MOTORS 20 HP AND BELOW SHALL BE 240/120V, 3 PH, OPEN DELTA. ELECTRICAL SERVICE TO MOTORS GREATER THAN 20 HP SHALL BE 480/277V, 3 PH WYE.

PROVIDE CONFIRMATION OF AVAILABLE SERVICE, AND A FAULT CURRENT LETTER, FROM THE ELECTRIC UTILITY COMPANY PRIOR TO PREPARATION OF SHOP DRAWING SUBMITTALS.

ELECTRICAL DESIGN DATA TABLE	
200	ELECTRICAL SERVICE AMPS
240/120	ELECTRICAL SERVICE VOLTS
3	ELECTRICAL SERVICE PHASE
	ELECTRICAL SERVICE A.I.C.
	PUMP MOTOR HP
	PUMP MOTOR F.L.A.
200	CONTROL PANEL MCB
	CONTROL PANEL PCB
FVNR	MOTOR STARTER TYPE
	MOTOR STARTER NEMA SIZE

ELECTRICAL LEGEND

100 / 3P	CIRCUIT BREAKER (TRIP RATING/POLES) "MCB" MAIN BREAKER, "ECB" EMERGENCY BREAKER "PCB" PUMP MOTOR BREAKER
FVNR SIZE 1	NEMA COMBINATION MOTOR STARTER, SIZE AND TYPE AS INDICATED. "FVNR" FULL VOLTAGE NON-REVERSING, "SSRV" SOLID STATE REDUCED VOLTAGE SOFT START, "VFD" VARIABLE FREQUENCY DRIVE
10	MOTOR (NUMERAL INDICATES HORSEPOWER)
CT	TRANSFORMER ("CT" CURRENT TRANSFORMER; "CPT" CONTROL POWER TRANSFORMER)
G	GREEN "RUNNING" PILOT LIGHT (LED TYPE)
HOA	HAND OFF AUTO SELECTOR SWITCH
AA	AUTOMATIC ALTERNATOR
PM	THREE PHASE POWER MONITOR
LS	LEVEL SWITCH
LC	LEVEL CONTROLLER
SPD	SURGE PROTECTION DEVICE

TYPICAL SJCUD LIFT STATION – SINGLE LINE DIAGRAM

NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

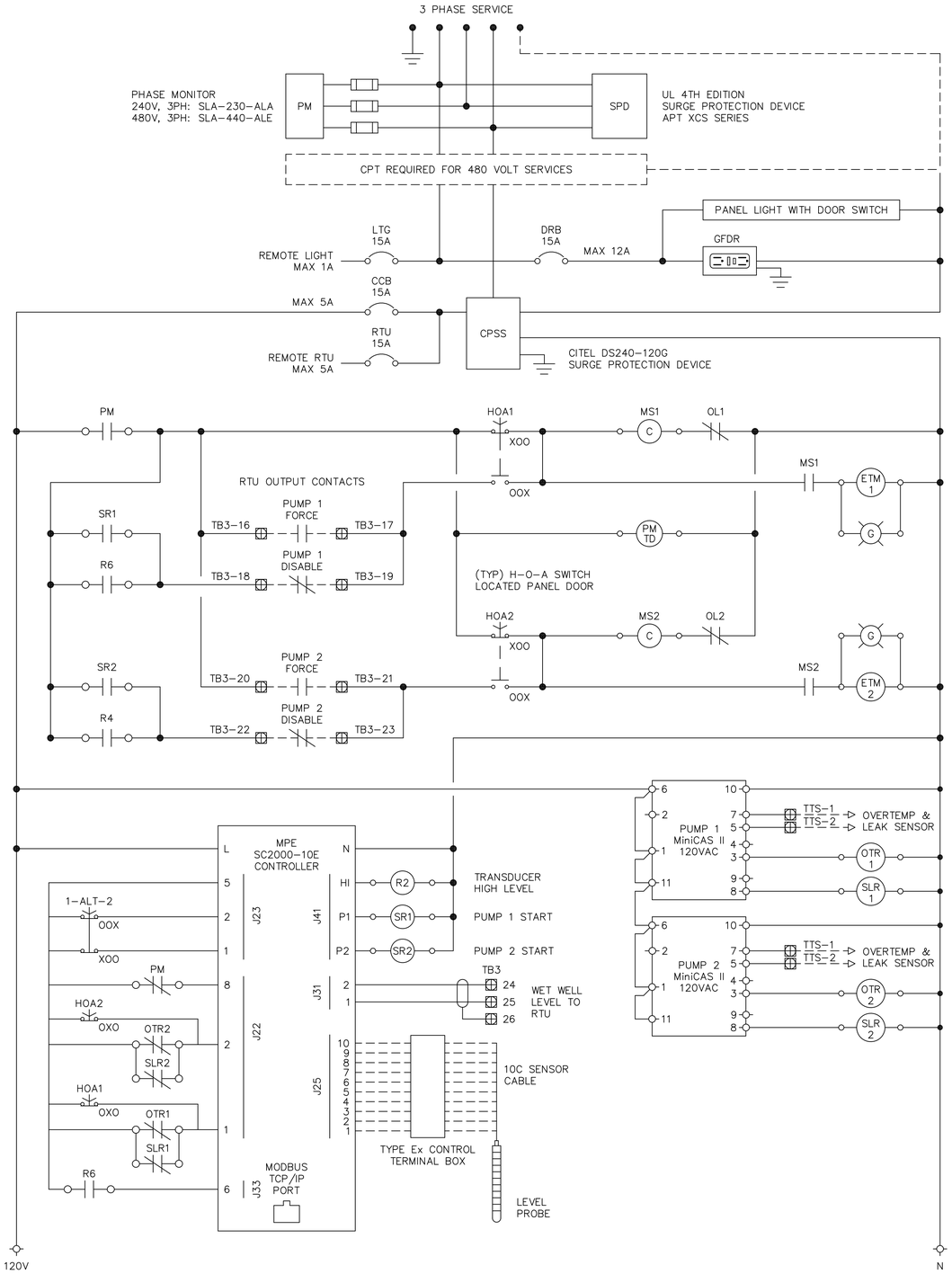
DESIGN ENGINEER

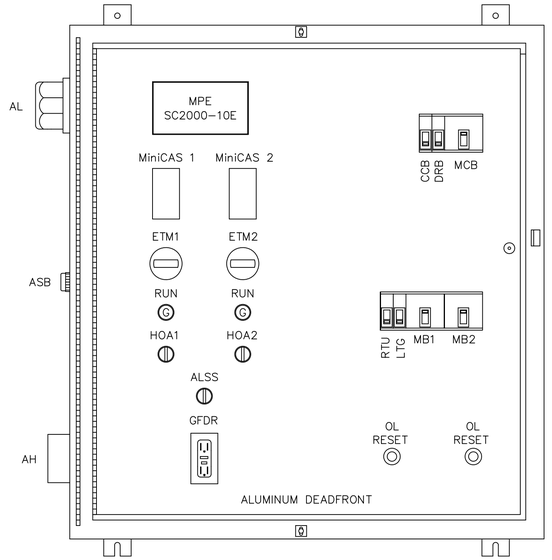
FLORIDA REGISTRATION NO.

St. Johns County Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

SJCUD STANDARD SUBMERSIBLE LIFT STATION
ELECTRICAL SINGLE LINE DIAGRAM
200A 240/120V 3 PHASE

NO. SHEETS
SHEET NO.
DRAWING NO. E201

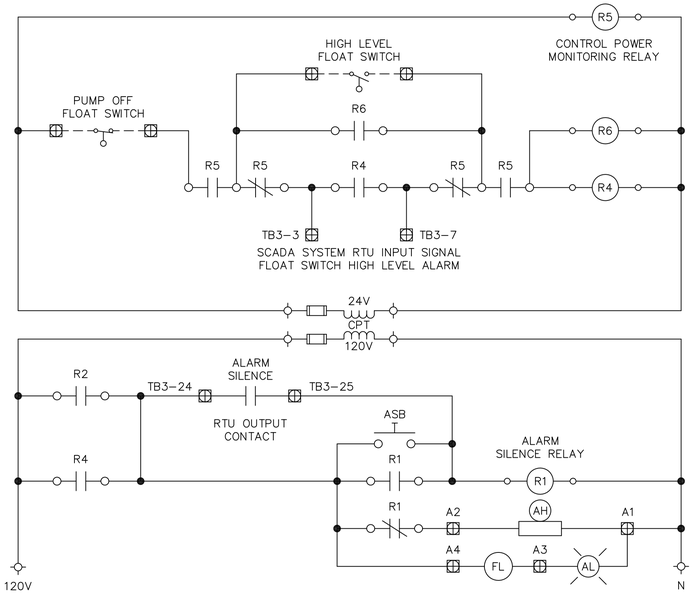




OUTER DOOR REMOVED TO SHOW DEADFRONT LAYOUT
NEMA TYPE 12/3R S.S. ENCL. WITH CONTINUOUS HINGE
ALL HARDWARE STAINLESS STEEL, WITH 3-PT LATCH

NOTES:

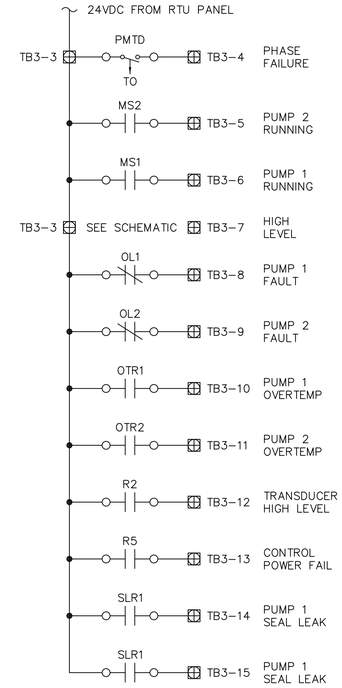
1. CONTROL PANEL TO BE UL AND SERVICE ENTRANCE RATED.
2. ALL CONTROL PANEL WIRING, RTU WIRING, AND ALL WIRING FROM THE CONTROL PANEL TO THE RTU, SHALL BE TINNED CONDUCTORS.
3. ALL CONTROL RELAYS SHALL BE TPDT.
4. POWER MONITOR TIME DELAY RELAY "PMTD" SHALL BE EATON TMR6 TIME DELAY ON DE-ENERGIZE RELAY PROVIDING OFF DELAY FUNCTION WITHOUT REQUIRING INPUT VOLTAGE DURING OFF TIME DELAY. SET OFF TIME DELAY AT 60 SECONDS.
5. FIELD TERMINAL BLOCKS SHALL BE ANGLE MOUNTED TO FACILITATE FIELD CONNECTIONS.
6. TERMINALS FOR PUMP CONTROLS (RTU OUTPUTS, 120VAC) TB3-16 THRU TB3-25 SHALL BE COLOR CODED RED. TERMINALS FOR SCADA SIGNALS (RTU INPUTS, 24VDC) TB3-3 THRU TB3-15 SHALL BE COLOR CODED BLUE.



CONTROL PANEL LEGEND

AH	–	ALARM HORN
AL	–	ALARM LIGHT
ASB	–	ALARM SILENCE BUTTON
ASR	–	ALARM SILENCE RELAY
ALSS	–	ALTERNATOR LEAD SELECTOR SWITCH
CPSS	–	CONTROL POWER SURGE SUPPRESSOR
CCB	–	CONTROL CIRCUIT BREAKER
DPDT	–	DOUBLE POLE DOUBLE THROW
DRB	–	DUPLEX RECEPTACLE BREAKER
ETM	–	ELAPSED TIME METER
F	–	FUSE
FB	–	FUSE BLOCK
FL	–	FLASHER
G	–	GREEN LED "RUNNING" PILOT LIGHT
GFDR	–	GROUND FAULT DUPLEX RECEPTACLE
LCB	–	LIGHTING CIRCUIT BREAKER
MB	–	MOTOR BREAKER
MCB	–	MAIN CIRCUIT BREAKER
MS	–	MOTOR STARTER
OL	–	OVERLOAD
OT	–	OVERTEMP
PB	–	POWER BLOCK
PM	–	PHASE MONITOR
R	–	RELAY
RCB	–	RTU CIRCUIT BREAKER
RL	–	RUNNING LIGHT
SPD	–	SURGE PROTECTION DEVICE
TB	–	TERMINAL BLOCK
TTS	–	THERMAL TERMINAL STRIP

SCADA SYSTEM RTU INPUT SIGNALS



NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

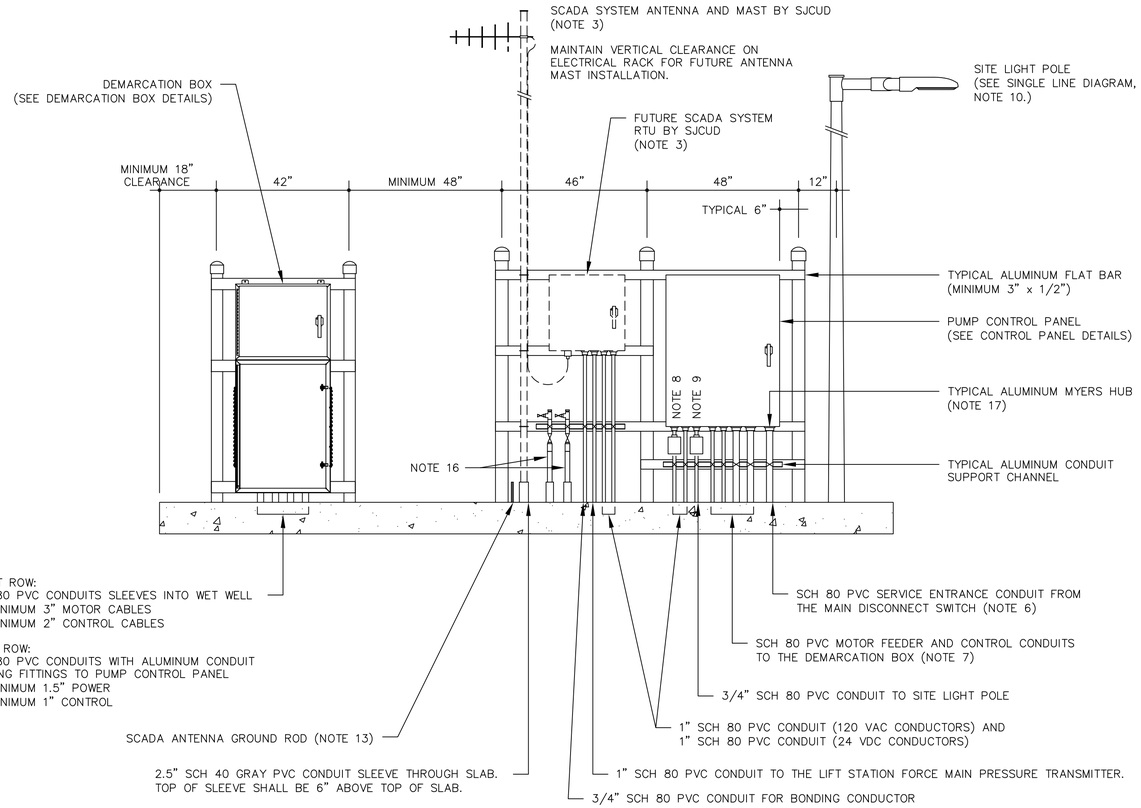
DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

DESIGN ENGINEER
FLORIDA REGISTRATION NO.

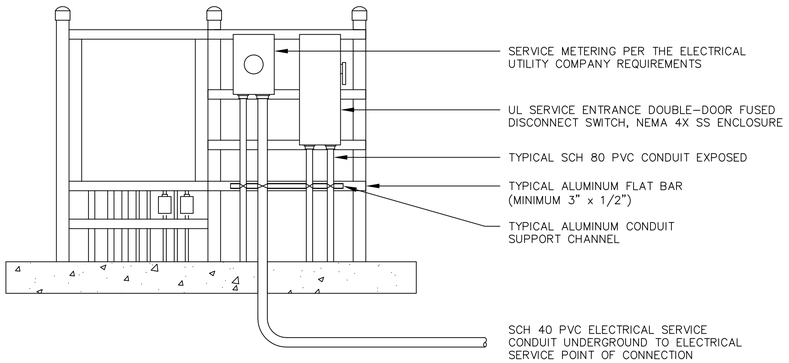
St. Johns County
Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

SJCUD STANDARD SUBMERSIBLE LIFT STATION
PUMP CONTROL PANEL DETAILS
CONTROLLER TYPE

NO. SHEETS
SHEET NO.
DRAWING NO. E202



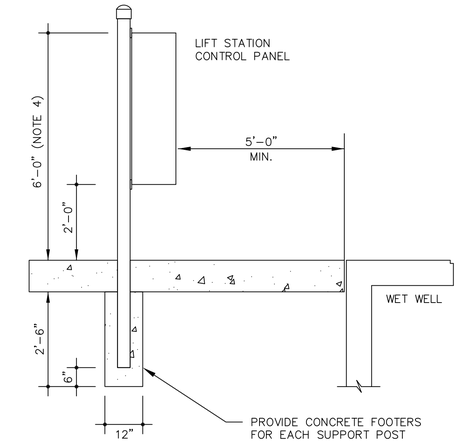
FRONT VIEW



REAR VIEW

TWO SIDED ELECTRICAL EQUIPMENT RACK DETAIL

NOT TO SCALE

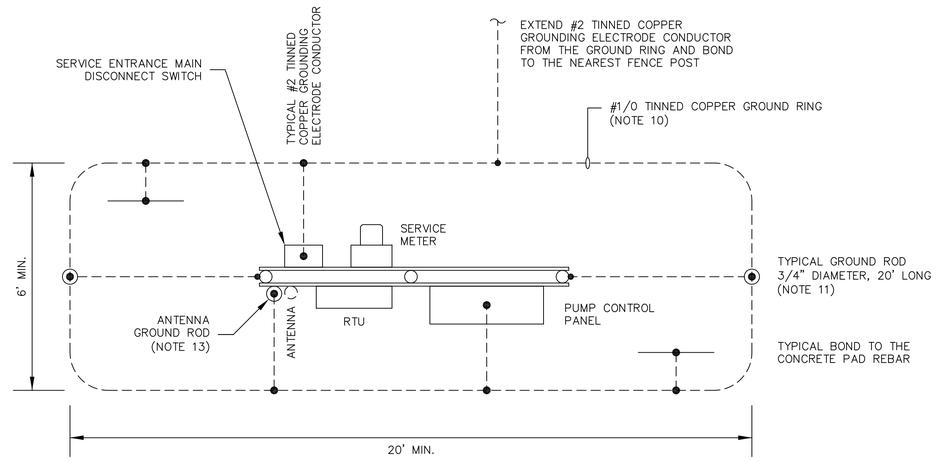


TYPICAL ELECTRICAL RACK SUPPORT POST DETAIL

NOT TO SCALE

MIN. 4" RIGID ALUMINUM CONDUIT SUPPORT POST WITH PIPE CAPS AT 6" ABOVE TOP OF THE PUMP CONTROL PANEL. PROVIDE MASTIC SEAL COATING ON ALL SURFACES BELOW GRADE OR EMBEDDED IN CONCRETE. TYPICAL SPACING SHALL BE 46" ON CENTER. SPACING FOR 36" WIDE CONTROL PANELS SHALL BE 48" ON CENTER.

PIPE CAPS SHALL BE THREADED ALUMINUM CAPS OR THREADED ALUMINUM COUPLINGS WITH ALUMINUM PLUGS.



ELECTRICAL EQUIPMENT GROUNDING SYSTEM DETAIL

NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL SCHEDULE AN ELECTRICAL PRE-CONSTRUCTION COORDINATION SITE MEETING WITH SJCUD AND THE ELECTRICAL DESIGN ENGINEER TO COORDINATE SITE SPECIFIC REQUIREMENTS OF THE ELECTRICAL EQUIPMENT INSTALLATION.
2. THE CONTRACTOR SHALL SCHEDULE AN ELECTRICAL ROUGH-IN SITE INSPECTION WITH SJCUD AND THE ELECTRICAL DESIGN ENGINEER TO INSPECT THE ELECTRICAL EQUIPMENT INSTALLATION PRIOR TO POURING CONCRETE.
3. THE CONTRACTOR SHALL REVIEW THE SCADA SYSTEM DETAILS AND SHALL MAKE ALL PROVISIONS REQUIRED FOR THE FUTURE INSTALLATION OF THE SCADA SYSTEM RTU AND ANTENNA INCLUDING: SLEEVE FOR THE ANTENNA MAST, GROUND ROD FOR THE ANTENNA MAST, RTU POWER AND CONTROL CONDUITS, FORCE MAIN PRESSURE TRANSMITTER CONDUIT, AND THE WATER MAIN PRESSURE TRANSMITTER STATIC WATER LINE.
4. UNLESS OTHERWISE INDICATED SET THE TOP OF EACH EQUIPMENT ENCLOSURE AT 6'-0" ABOVE THE TOP OF THE CONCRETE SLAB. ADJUST AS REQUIRED TO MAINTAIN THE BOTTOM OF EACH ENCLOSURE A MINIMUM OF 2'-0" ABOVE THE TOP OF THE CONCRETE SLAB. CONTACT SJCUD FOR APPROVAL OF ALL PROPOSED ADJUSTMENTS PRIOR TO CONSTRUCTION.
5. SET THE BOTTOM OF THE DEMARCATION BOX AT 3" ABOVE THE TOP OF THE CONCRETE SLAB. TERMINATE WET WELL CONDUITS WITH ENDBELL FITTINGS. SET THE TOP OF THE ENDBELL FITTINGS AT 1" ABOVE THE BOTTOM OF THE DEMARCATION BOX. SEAL WET WELL CONDUIT OPENINGS WITH DUCT SEAL. SEE DEMARCATION BOX DETAILS.
6. THE CONTROL PANEL SERVICE ENTRANCE CONDUIT FROM THE MAIN SERVICE DISCONNECT SWITCH SHALL BE POSITIONED ON THE FAR RIGHT-HAND SIDE OF THE PUMP CONTROL PANEL.
7. THE PUMP MOTOR CONDUITS FROM THE DEMARCATION BOX SHALL ENTER THE PUMP CONTROL PANEL BELOW THE MOTOR STARTERS. THE CONTROL CONDUITS SHALL ENTER THE PUMP CONTROL PANEL BELOW THE ASSOCIATED TERMINAL BLOCKS.
8. SITE LIGHT POLE SWITCH: ALUMINUM FS BOX WITH LIGHT SWITCH AND WP COVER.
9. RECEPTACLE: ALUMINUM FS BOX WITH DUPLEX GFI RECEPTACLE AND WP WHILE IN-USE COVER.
10. GROUNDING ELECTRODE SYSTEM: PROVIDE A GROUND RING PER NEC 250.52, ENCIRCLING THE ELECTRICAL SERVICE EQUIPMENT, CONSISTING OF CONTINUOUS #1/0 TINNED COPPER CONDUCTOR AT 30" BELOW GRADE.
11. PROVIDE GROUND RODS (MINIMUM 3/4" DIAMETER, 20' LONG COPPER CLAD STEEL) BONDED TO EACH END OF THE GROUND RING, AT LEAST 20' APART. GROUND ROD SECTIONS SHALL BE COUPLED AND DRIVEN TO ESTABLISH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS THROUGHOUT THE GROUNDING ELECTRODE SYSTEM.
12. GROUNDING ELECTRODE CONDUCTOR: PROVIDE MINIMUM #2 TINNED COPPER GROUNDING ELECTRODE CONDUCTOR FROM THE GROUND RING TO THE SERVICE ENTRANCE DISCONNECT SWITCH, PUMP CONTROL PANEL, RTU, SCADA SYSTEM ANTENNA TOWER, ELECTRICAL EQUIPMENT RACK END POSTS, AND FENCE. USE GROUND CLAMPS RATED FOR CONNECTIONS TO END POSTS AND FENCE POSTS. GROUND CLAMPS SHALL BE RATED FOR DIRECT BURIAL. INSTALL GROUNDING ELECTRODE CONDUCTORS IN 3/4" SCH 80 PVC CONDUIT SLEEVE FOR MECHANICAL PROTECTION.
13. THE TOP OF THE GROUND ROD FOR THE SCADA SYSTEM ANTENNA SHALL EXTEND NO MORE THAN 6" AND NO LESS THAN 4" ABOVE THE CONCRETE SLAB.
14. THE COMPLETE GROUND RING SHALL BE INSIDE THE LIFT STATION FENCE. THE GROUND RING MAY BE OFFSET FROM THE CENTER OF THE ELECTRICAL RACK WHEN NECESSARY TO STAY WITHIN THE FENCE. SET THE GROUND RODS CENTERED BETWEEN THE ELECTRICAL EQUIPMENT RACK END POSTS AND THE PERIMETER FENCE. INCREASE THE DISTANCE FROM THE END POSTS WHERE REQUIRED TO ACHIEVE MINIMUM 20' SPACING BETWEEN GROUND RODS.
15. BOND THE NEAREST FENCE POST TO THE ELECTRICAL EQUIPMENT GROUND RING AND BOND THE DEMARCATION BOX AND RACK TO THE ELECTRICAL EQUIPMENT GROUND RING.
16. STATIC WATER LINE WITH END CONNECTIONS FOR POTABLE WATER MAIN PRESSURE MONITORING AND STATIC WATER LINE WITH END CONNECTIONS FOR RECLAIMED WATER MAIN (IF AVAILABLE) PRESSURE MONITORING. SEE SCADA SYSTEM DETAILS.
17. PROVIDE ALUMINUM MYERS HUBS ON ALL CONDUIT CONNECTIONS TO ALL ELECTRICAL EQUIPMENT ENCLOSURES INCLUDING SERVICE METER, SERVICE DISCONNECT SWITCH, CONTROL PANEL, DEMARCATION BOX AND RTU.
18. THE CONTRACTOR SHALL PROVIDE MACHINE PRINTED HEAT SHRINK WIRE MARKERS ON EACH END OF EACH CABLE AND CONDUCTOR INCLUDING WITHIN THE PUMP CONTROL PANEL, DEMARCATION BOX AND RTU. WIRE MARKER NUMBERING FOR EACH CONDUCTOR CONNECTED TO THE PUMP CONTROL PANEL SHALL MATCH THE CONTROL PANEL TERMINAL BLOCK NUMBERS. WIRE MARKER NUMBERING FOR EACH WET WELL CABLE AND CONDUCTOR SHALL MATCH THE DEMARCATION BOX TERMINAL BLOCK NUMBERS. THE WIRE MARKERS ON BOTH ENDS OF EACH CABLE AND CONDUCTOR SHALL HAVE THE SAME NUMBERING.

NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

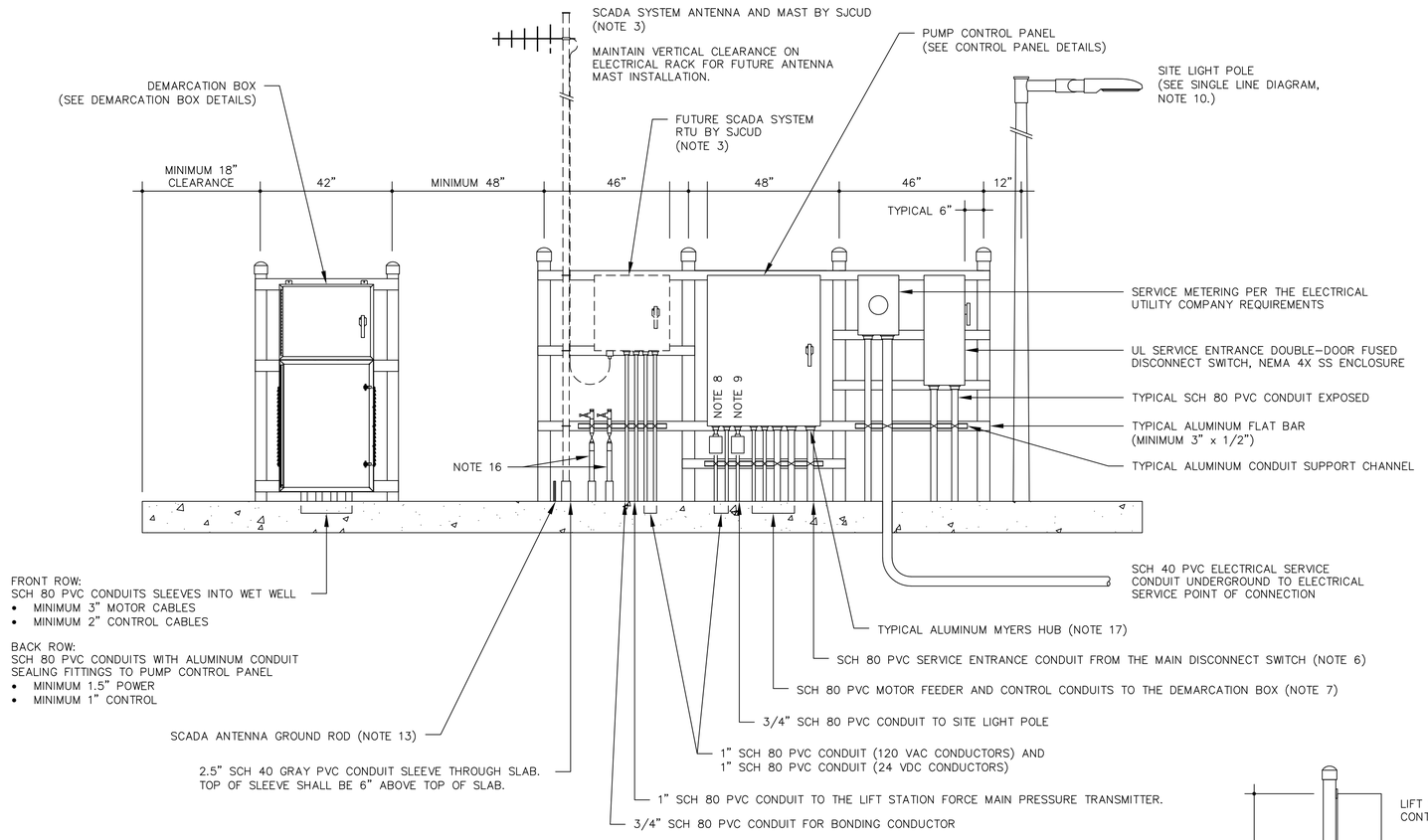
DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

DESIGN ENGINEER
FLORIDA REGISTRATION NO.

St. Johns County Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

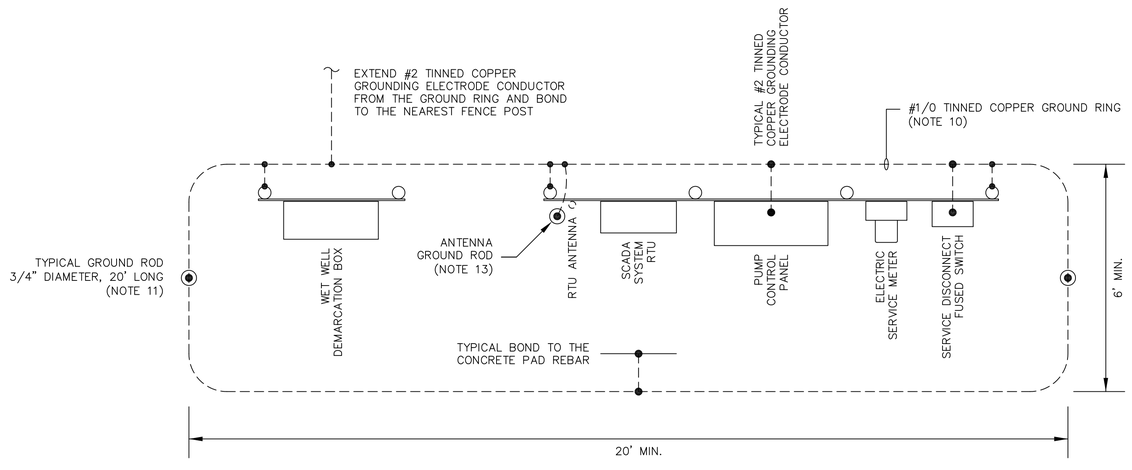
SJCUD STANDARD SUBMERSIBLE LIFT STATION
ELECTRICAL DETAILS
TWO SIDED RACK

NO. SHEETS
SHEET NO.
DRAWING NO. E203



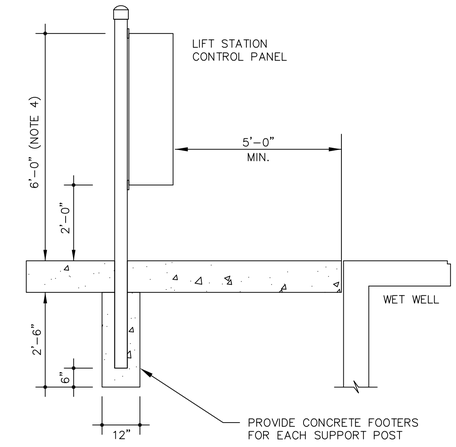
SINGLE SIDED ELECTRICAL EQUIPMENT RACK DETAIL

NOT TO SCALE



ELECTRICAL EQUIPMENT GROUNDING SYSTEM DETAIL

NOT TO SCALE



TYPICAL ELECTRICAL RACK SUPPORT POST DETAIL

NOT TO SCALE

MIN. 4" RIGID ALUMINUM CONDUIT SUPPORT POST WITH PIPE CAPS AT 6" ABOVE TOP OF THE PUMP CONTROL PANEL. PROVIDE MASTIC SEAL COATING ON ALL SURFACES BELOW GRADE OR EMBEDDED IN CONCRETE. TYPICAL SPACING SHALL BE 46" ON CENTER. SPACING FOR 36" WIDE CONTROL PANELS SHALL BE 48" ON CENTER.

PIPE CAPS SHALL BE THREADED ALUMINUM CAPS OR THREADED ALUMINUM COUPLINGS WITH ALUMINUM PLUGS.

NOTES:

1. THE CONTRACTOR SHALL SCHEDULE AN ELECTRICAL PRE-CONSTRUCTION COORDINATION SITE MEETING WITH SJCUD AND THE ELECTRICAL DESIGN ENGINEER TO COORDINATE SITE SPECIFIC REQUIREMENTS OF THE ELECTRICAL EQUIPMENT INSTALLATION.
2. THE CONTRACTOR SHALL SCHEDULE AN ELECTRICAL ROUGH-IN SITE INSPECTION WITH SJCUD AND THE ELECTRICAL DESIGN ENGINEER TO INSPECT THE ELECTRICAL EQUIPMENT INSTALLATION PRIOR TO POURING CONCRETE.
3. THE CONTRACTOR SHALL REVIEW THE SCADA SYSTEM DETAILS AND SHALL MAKE ALL PROVISIONS REQUIRED FOR THE FUTURE INSTALLATION OF THE SCADA SYSTEM RTU AND ANTENNA INCLUDING: SLEEVE FOR THE ANTENNA MAST, GROUND ROD FOR THE ANTENNA MAST, RTU POWER AND CONTROL CONDUITS, FORCE MAIN PRESSURE TRANSMITTER CONDUIT, AND THE WATER MAIN PRESSURE TRANSMITTER STATIC WATER LINE.
4. UNLESS OTHERWISE INDICATED SET THE TOP OF EACH EQUIPMENT ENCLOSURE AT 6'-0" ABOVE THE TOP OF THE CONCRETE SLAB. ADJUST AS REQUIRED TO MAINTAIN THE BOTTOM OF EACH ENCLOSURE A MINIMUM OF 2'-0" ABOVE THE TOP OF THE CONCRETE SLAB. CONTACT SJCUD FOR APPROVAL OF ALL PROPOSED ADJUSTMENTS PRIOR TO CONSTRUCTION.
5. SET THE BOTTOM OF THE DEMARCATION BOX AT 3" ABOVE THE TOP OF THE CONCRETE SLAB. TERMINATE WET WELL CONDUITS WITH ENDBELL FITTINGS. SET THE TOP OF THE ENDBELL FITTINGS AT 1" ABOVE THE BOTTOM OF THE DEMARCATION BOX. SEAL WET WELL CONDUIT OPENINGS WITH DUCT SEAL. SEE DEMARCATION BOX DETAILS.
6. THE CONTROL PANEL SERVICE ENTRANCE CONDUIT FROM THE MAIN SERVICE DISCONNECT SWITCH SHALL BE POSITIONED ON THE FAR RIGHT-HAND SIDE OF THE PUMP CONTROL PANEL.
7. THE PUMP MOTOR CONDUITS FROM THE DEMARCATION BOX SHALL ENTER THE PUMP CONTROL PANEL BELOW THE MOTOR STARTERS. THE CONTROL CONDUITS SHALL ENTER THE PUMP CONTROL PANEL BELOW THE ASSOCIATED TERMINAL BLOCKS.
8. SITE LIGHT POLE SWITCH: ALUMINUM FS BOX WITH LIGHT SWITCH AND WP COVER.
9. RECEPTACLE: ALUMINUM FS BOX WITH DUPLEX GFI RECEPTACLE AND WP WHILE IN-USE COVER.
10. GROUNDING ELECTRODE SYSTEM: PROVIDE A GROUND RING PER NEC 250.52, ENCIRCLING THE ELECTRICAL SERVICE EQUIPMENT, CONSISTING OF CONTINUOUS #1/0 TINNED COPPER CONDUCTOR AT 30" BELOW GRADE.
11. PROVIDE GROUND RODS (MINIMUM 3/4" DIAMETER, 20' LONG COPPER CLAD STEEL) BONDED TO EACH END OF THE GROUND RING, AT LEAST 20' APART. GROUND ROD SECTIONS SHALL BE COUPLED AND DRIVEN TO ESTABLISH A MAXIMUM RESISTANCE TO GROUND OF 5 OHMS THROUGHOUT THE GROUNDING ELECTRODE SYSTEM.
12. GROUNDING ELECTRODE CONDUCTOR: PROVIDE MINIMUM #2 TINNED COPPER GROUNDING ELECTRODE CONDUCTOR FROM THE GROUND RING TO THE SERVICE ENTRANCE DISCONNECT SWITCH, PUMP CONTROL PANEL, RTU, SCADA SYSTEM ANTENNA TOWER, ELECTRICAL EQUIPMENT RACK END POSTS, AND FENCE. USE GROUND CLAMPS RATED FOR CONNECTIONS TO END POSTS AND FENCE POSTS. GROUND CLAMPS SHALL BE RATED FOR DIRECT BURIAL. INSTALL GROUNDING ELECTRODE CONDUCTORS IN 3/4" SCH 80 PVC CONDUIT SLEEVE FOR MECHANICAL PROTECTION.
13. THE TOP OF THE GROUND ROD FOR THE SCADA SYSTEM ANTENNA SHALL EXTEND NO MORE THAN 6" AND NO LESS THAN 4" ABOVE THE CONCRETE SLAB.
14. THE COMPLETE GROUND RING SHALL BE INSIDE THE LIFT STATION FENCE. THE GROUND RING MAY BE OFFSET FROM THE CENTER OF THE ELECTRICAL RACK WHEN NECESSARY TO STAY WITHIN THE FENCE. SET THE GROUND RODS CENTERED BETWEEN THE ELECTRICAL EQUIPMENT RACK END POSTS AND THE PERIMETER FENCE. INCREASE THE DISTANCE FROM THE END POSTS WHERE REQUIRED TO ACHIEVE MINIMUM 20' SPACING BETWEEN GROUND RODS.
15. BOND THE NEAREST FENCE POST TO THE ELECTRICAL EQUIPMENT GROUND RING AND BOND THE DEMARCATION BOX AND RACK TO THE ELECTRICAL EQUIPMENT GROUND RING.
16. STATIC WATER LINE WITH END CONNECTIONS FOR POTABLE WATER MAIN PRESSURE MONITORING AND STATIC WATER LINE WITH END CONNECTIONS FOR RECLAIMED WATER MAIN (IF AVAILABLE) PRESSURE MONITORING. SEE SCADA SYSTEM DETAILS.
17. PROVIDE ALUMINUM MYERS HUBS ON ALL CONDUIT CONNECTIONS TO ALL ELECTRICAL EQUIPMENT ENCLOSURES INCLUDING SERVICE METER, SERVICE DISCONNECT SWITCH, CONTROL PANEL, DEMARCATION BOX AND RTU.
18. THE CONTRACTOR SHALL PROVIDE MACHINE PRINTED HEAT SHRINK WIRE MARKERS ON EACH END OF EACH CABLE AND CONDUCTOR INCLUDING WITHIN THE PUMP CONTROL PANEL, DEMARCATION BOX AND RTU. WIRE MARKER NUMBERING FOR EACH CONDUCTOR CONNECTED TO THE PUMP CONTROL PANEL SHALL MATCH THE CONTROL PANEL TERMINAL BLOCK NUMBERS. WIRE MARKER NUMBERING FOR EACH WET WELL CABLE AND CONDUCTOR SHALL MATCH THE DEMARCATION BOX TERMINAL BLOCK NUMBERS. THE WIRE MARKERS ON BOTH ENDS OF EACH CABLE AND CONDUCTOR SHALL HAVE THE SAME NUMBERING.

NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

DESIGN ENGINEER

FLORIDA REGISTRATION NO.

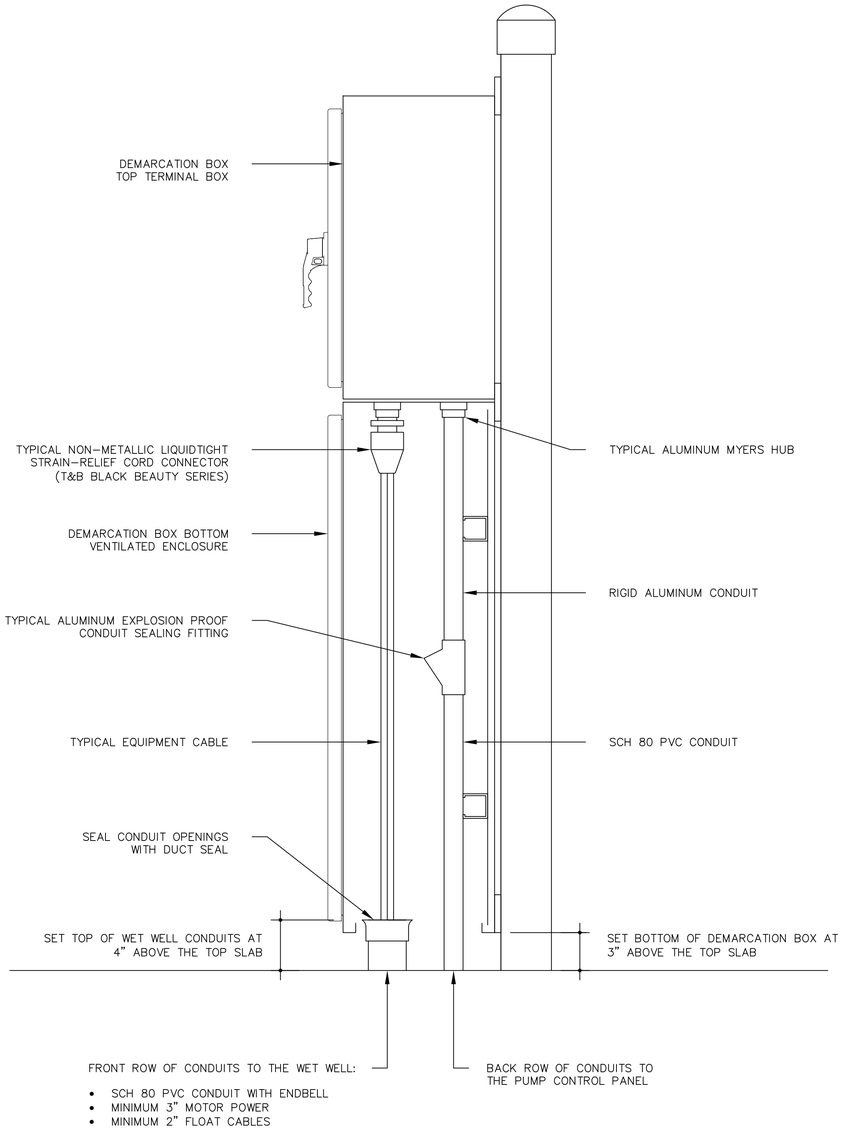
St. Johns County Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

SJCUD STANDARD SUBMERSIBLE LIFT STATION ELECTRICAL DETAILS ONE SIDED RACK

NO. SHEETS

SHEET NO.

DRAWING NO. E203



- SCH 80 PVC CONDUIT WITH ENDBELL
- MINIMUM 3" MOTOR POWER
- MINIMUM 2" FLOAT CABLES

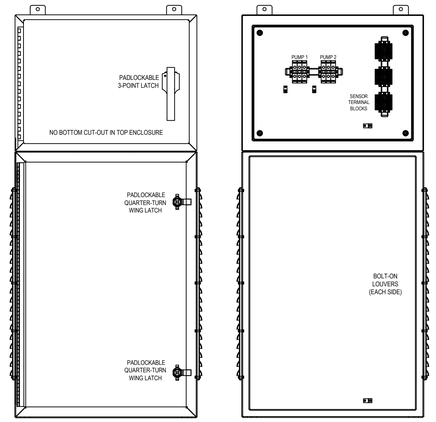
TYPICAL WET WELL DEMARCATION BOX CONDUIT DETAIL
NOT TO SCALE

TOP SECTION:

- NEMA 4X ENCLOSURE 24"H, 30"W, 12"D
- MINIMUM 0.08 ALUMINUM OR 316SS
- GROUNDING STUDS ON BODY & DOOR
- SUBPANEL

BOTTOM SECTION:

- NEMA 3R ENCLOSURE 42"H, 30"W, 12"D
- MINIMUM 0.125 ALUMINUM OR 316SS
- GROUNDING STUDS ON BODY & DOOR
- TOP CUTOUT 9.5" x 21.5"
- BOTTOM CUTOUT 9.5" x 21.5"
- SIDE LOUVERS 4" WIDE, 1" HIGH



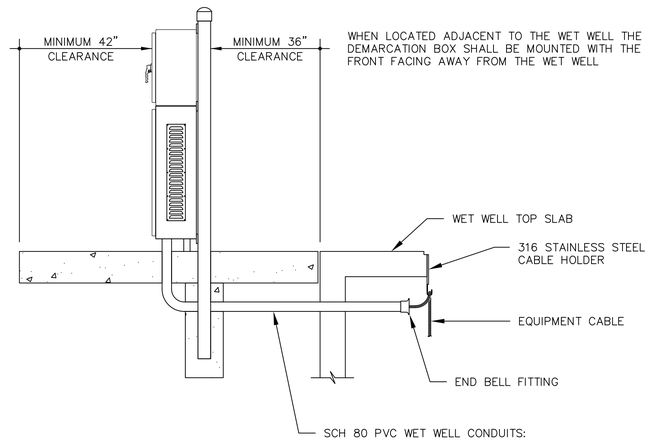
TYPICAL WET WELL DEMARCATION BOX DETAIL
NOT TO SCALE

TERMINAL BLOCKS:

- PUMP POWER TERMINAL BLOCKS: SQUARE-D 9080LBA
- SENSOR TERMINAL BLOCKS: ALLEN-BRADLEY 1492-J4
- GROUND LUGS: PANDUIT LAMA2-14-Q

GENERAL NOTES:

- SEAMS TO BE CONTINUOUSLY WELDED AND GROUND SMOOTH
- SEAMLESS FOAM-IN-PLACE GASKETS
- ROLLED LIP AROUND THREE SIDES OF DOORS
- REMOVE DOORS BY PULLING STAINLESS STEEL CONTINUOUS HINGE PIN
- PROVIDE COLLAR STUDS ON INSIDE REAR FOR MOUNTING OPTIONAL PANELS
- STAINLESS STEEL HARDWARE
- BONDING PROVISION ON DOORS; GROUNDING STUDS ON BODIES



- MAXIMUM 31% FILL
- MINIMUM 3" FOR EACH MOTOR POWER CABLE
- MINIMUM 2" FOR EACH TWO FLOAT CABLES

TYPICAL WET WELL CONDUIT DETAIL
NOT TO SCALE

NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

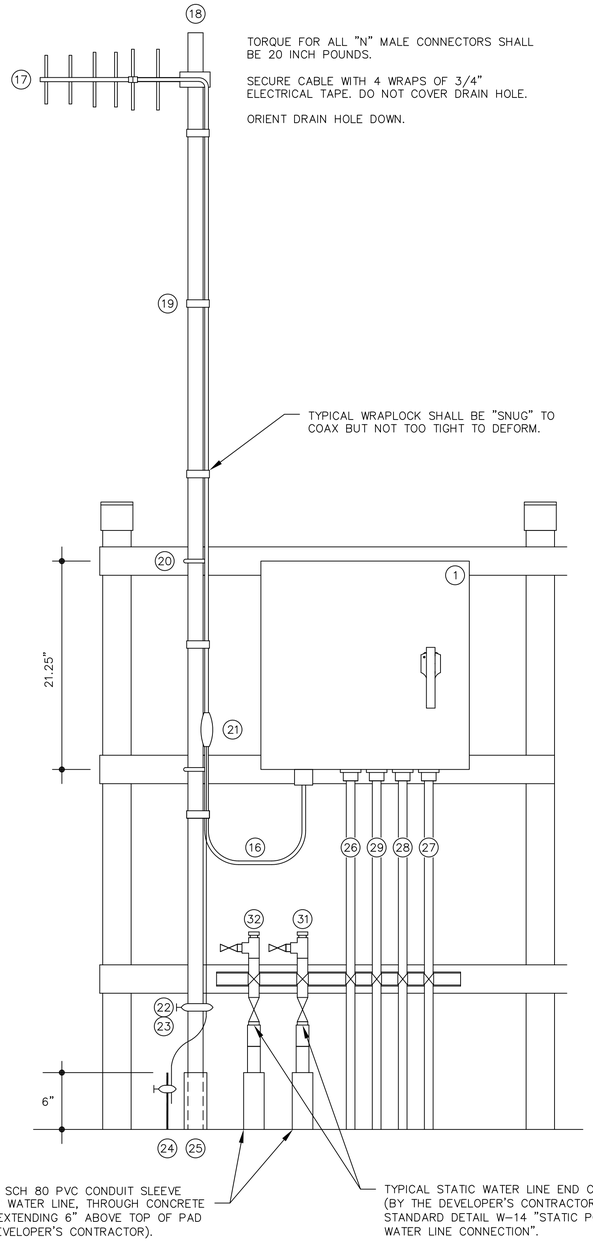
DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

DESIGN ENGINEER
FLORIDA REGISTRATION NO.

St. Johns County
Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

SJCUD STANDARD SUBMERSIBLE LIFT STATION DEMARCATION BOX DETAILS

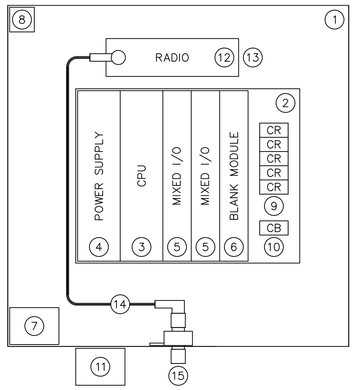
NO. SHEETS
SHEET NO.
DRAWING NO. E204



SCADA SYSTEM ANTENNA DETAIL
NOT TO SCALE

SCADA SYSTEM EQUIPMENT SCHEDULE		
ITEM	DESCRIPTION	
1	RTU ENCLOSURE, SCHAEFER'S ELECTRICAL ENCLOSURE MODEL SPN4AL-20208-735, DO NOT SUBSTITUTE,	
	NEMA 12/3R ALUMINUM ENCLOSURE, PADLOCK PROVISIONS, ALUMINUM TOP, SIDES, AND DOOR SUN SHIELDS	
2	MOTOROLA ACE3600 METAL CHASSIS WITH 3 I/O SLOT FRAME	V214/V103
3	MOTOROLA ACE3600 RTU WITH UPGRADE TO CPU3680 AND SECURITY ENABLE OPTION	F7509/V448/VA00360AA
	MOTOROLA CPU PLUG-IN ETHERNET 10/100 M PORT	V212
4	MOTOROLA ACE3600 AC POWER SUPPLY WITH BATTERY CHARGER	V261
5	MOTOROLA ACE3600 MIXED I/O MODULE 16DI, 4DO EE, 4AI, ±20 mA WITH FLOATING POWER SUPPLY	V245/V260
6	MOTOROLA ACE3600 BLANK I/O MODULE	V20
7	MOTOROLA BATTERY POWER CABLE	FKN8376
	BATTERY BACKUP 12V, 7AH, SEALED RECHARGEABLE SLA BATTERY, TOYO-USP 6FMS7	
8	INTRUSION SWITCH WITH PULL TO DEFEAT FEATURE HONEYWELL MICRO SWITCH 1DM401	
9	DIN RAIL MOUNTED DIGITAL OUTPUT CONTROL RELAYS OMRON G2R-1-SNI-DC12-S, 12VDC, SPDT, PTT	
10	DIN RAIL MOUNTED CIRCUIT BREAKER SUPPLEMENTARY PROTECTOR EATON FAZ-C10/1-SP	
11	DITEK DTK-120HW SURGE PROTECTION DEVICE 120VAC	
12	4RF DIGITAL RADIO MODEL APSQ-N220-SSC-HD-22-ENAA	
	4RF DIGITAL RADIO DIN RAIL MOUNTING BRACKET APSB-MBRK-DIN (NOTE 15)	
	RADIO POWER CABLE 12VDC WITH PLUG COMPATIBLE WITH MOTOROLA POWER SUPPLY	
13	RADIO COMMUNICATION CABLE TYPE 568B ETHERNET CABLE, 1M	
14	LMR-195 FLEXIBLE COAX, RIGHT ANGLE N MALE/RIGHT ANGLE TNC MALE CONNECTORS, 36" LONG	
15	TIMES MICROWAVE LP-HBX-NFF COAX SURGE ARRESTER	
16	TIMES MICROWAVE LMR-400-DB COAX, TYPE N MALE CONNECTORS EZ-400-NMH-D	
17	SAMCO MODEL SAM-260W YAGI ANTENNA	
18	ANTENNA MAST 2" x 20' LONG SCHEDULE 40 ALUMINUM PIPE, TOP WELDED CLOSED	
19	1/2" SS WRAPLOCK BANDS, 3' ON CENTER. TIE WRAPS ARE NOT ACCEPTABLE.	
20	3/8" SS U-BOLTS. ANTI-SEIZE MUST BE USED ON ALL THREADS.	
21	TESSCO GK-S38 COAX GROUND KIT	
22	GROUNDING CLAMP RATED FOR DIRECT BURIAL	
23	NO.2 AWG SOLID TINNED COPPER CONDUCTOR	
* 24	COPPER CLAD STEEL GROUND ROD, 3/4" DIAMETER, 20' LONG	
* 25	2.5" SCHEDULE 40 GRAY PVC CONDUIT SLEEVE THROUGH SLAB	
* 26	3/4" SCH 80 PVC CONDUIT FOR BONDING CONDUCTOR	
* 27	1" SCH 80 PVC "POWER" CONDUIT TO PUMP CONTROL PANEL, 120 VAC CONDUCTORS	
* 28	1" SCH 80 PVC "CONTROL" CONDUIT TO PUMP CONTROL PANEL, 24 VDC CONDUCTORS	
* 29	1" SCH 80 PVC CONDUIT TO THE LIFT STATION FORCE MAIN PRESSURE TRANSMITTER (1TSP18 SIGNAL)	
30	FORCE MAIN PRESSURE TRANSMITTER: VEGA VEGABAR 82 MODEL B82.IXDSDAGGSZXAIJKX (SEE NOTE 16)	
* 31	STATIC WATER LINE FOR POTABLE WATER MAIN PRESSURE SENSOR	
* 32	STATIC WATER LINE FOR RECLAIMED WATER MAIN (IF AVAIALBLE) PRESSURE SENSOR	

* BY THE DEVELOPER'S CONTRACTOR

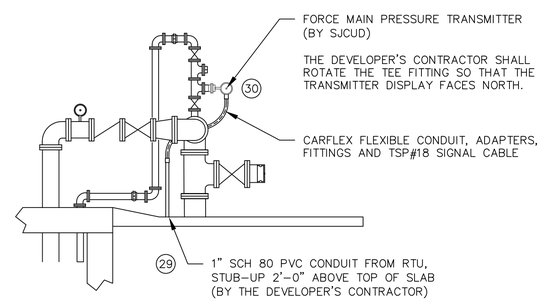


SCADA SYSTEM RTU DETAIL
NOT TO SCALE

RTU I/O SCHEDULE			
MIXED I/O MODULE		MIXED I/O MODULE	
DI	SIGNAL DESCRIPTION	DI	SIGNAL DESCRIPTION
01	RTU INTRUSION SWITCH	01	SPARE
02	HIGH LEVEL	02	SPARE
03	PHASE FAILURE	03	SPARE
04	PUMP 1 RUNNING	04	SPARE
05	PUMP 2 RUNNING	05	SPARE
06	PUMP 1 FAIL	06	SPARE
07	PUMP 2 FAIL	07	SPARE
08	CONTROL POWER	08	SPARE
09	PUMP 1 OVERTEMP	09	SPARE
10	PUMP 2 OVERTEMP	10	SPARE
11	TRANSDUCER HIGH LEVEL	11	SPARE
12	PUMP 1 SEAL LEAK	12	SPARE
13	PUMP 2 SEAL LEAK	13	SPARE
14	SPARE	14	SPARE
15	SPARE	15	SPARE
16	SPARE	16	SPARE
DO	SIGNAL DESCRIPTION	DO	SIGNAL DESCRIPTION
01	PUMP 1 DISABLE	01	ALARM SILENCE
02	PUMP 2 DISABLE	02	SPARE
03	PUMP 1 REMOTE RUN	03	SPARE
04	PUMP 2 REMOTE RUN	04	SPARE
AI	SIGNAL DESCRIPTION	AI	SIGNAL DESCRIPTION
01	WET WELL LEVEL	01	WATER MAIN PRESSURE
02	FORCE MAIN PRESSURE	02	RECLAIM WATER PRESSURE
03	SPARE	03	SPARE
04	SPARE	04	SPARE

SCADA SYSTEM NOTES:

1. SJCUD SHALL EMPLOY THE SERVICES OF A SJCUD PRE-APPROVED SCADA SYSTEM INTEGRATOR TO PERFORM ALL SCADA SYSTEM ADDITIONS AND MODIFICATIONS INCLUDING: NEW RTU, ANTENNA, AND ANTENNA MAST.
2. THE SCADA SYSTEM SUPPLIER SHALL MODIFY AND UPGRADE THE EXISTING SJCUD MASTER SCADA SYSTEM AS REQUIRED TO INCORPORATE THE NEW FACILITIES.
3. THE CONTRACTOR AND THE SCADA SYSTEM SUPPLIER SHALL COORDINATE ALL SCADA SYSTEM INSTALLATION WITH THE SJCUD SCADA SYSTEM SUPERVISOR.
4. THE SCADA SYSTEM RTU SHALL BE A SJCUD STANDARD LIFT STATION RTU WITH MOTOROLA ACE3600 RTU CONFIGURED WITH MIXED I/O MODULES AS INDICATED. PROVIDE POWER AND SIGNAL LINE SURGE PROTECTION.
5. PRIOR TO SHOP DRAWING SUBMITTALS, THE SCADA SYSTEM SUPPLIER SHALL CONFIRM RADIO/ANTENNA SELECTION WITH THE SJCUD SCADA SYSTEM SUPERVISOR.
6. IN ORDER TO MAINTAIN FCC PART 15 COMPLIANCE, ALL ANTENNA WORK MUST BE PERFORMED OR CERTIFIED BY AN FCC CERTIFIED TECHNICIAN. THE SJCUD SCADA SUPERVISOR WILL INSPECT AND CERTIFY (AT NO CHARGE) BUT WILL NOT PERFORM CORRECTIVE ACTIONS.
7. ANTENNA MAST GROUND ROD SHALL BE BONDED (UNDERGROUND) TO THE STATION ELECTRICAL SYSTEM GROUNDING GRID.
8. ALL GROUNDING CONDUCTORS SHALL HAVE AN EVEN SLOPE FROM POINT OF CONTACT TO THE GROUND ROD (NO 90° BENDS).
9. ALL GROUND CONTACT POINTS SHALL BE PROTECTED BY AN ANTI-OXIDATION COMPOUND.
10. ALL RF CONNECTORS SHALL BE TIGHTENED TO MANUFACTURER SPECIFICATIONS, AND SHALL BE PROPERLY SEALED. COLD SHRINK IS NOT ACCEPTABLE.
11. DRAIN HOLES ON ANTENNAS MUST BE ORIENTED DOWN.
12. ALL THREADED CONNECTIONS, EXCEPT ANTENNA CONNECTIONS, SHALL BE PROTECTED WITH ANTI-SEIZE TREATMENT.
13. THE "POWER" CONDUIT FROM THE RTU TO THE PUMP CONTROL PANEL SHALL BE USED FOR ALL 120 VAC CONDUCTORS, INCLUDING THE RTU INPUT POWER AND THE DIGITAL OUTPUT CONDUCTORS.
14. THE "CONTROL" CONDUIT FROM THE RTU TO THE PUMP CONTROL PANEL SHALL BE USED FOR ONLY 24 VDC CONDUCTORS, INCLUDING THE DIGITAL INPUT SIGNAL CONDUCTORS AND THE ANALOG INPUT SIGNAL CABLES. PROVIDE 1TSP#18 CABLE FOR EACH ANALOG INPUT SIGNAL.
15. PROVIDE DIN RAIL ON BACK PLANE AT THE RTU RADIO MOUNTING LOCATION FOR THE 4RF RADIO MOUNTING BRACKET. MOUNT THE DIN RAIL USING EXISTING TAPPED SCREW HOLES. DO NOT DRILL AND TAP NEW HOLES.
16. THE SCADA SYSTEM SUPPLIER SHALL PROVIDE THE FORCE MAIN PRESSURE TRANSMITTER: VEGABAR 82.



FORCE MAIN PRESSURE TRANSMITTER DETAIL
NOT TO SCALE

NO.	BY	DATE	SYMBOL	REVISIONS
6.				
5.				
4.				
3.				
2.				
1.				

DESIGNER:
DRAWN BY:
DATE:
CHECKED BY:
DATE:

DESIGN ENGINEER
FLORIDA REGISTRATION NO.

St. Johns County Utility Department
1205 STATE ROAD 16
ST. AUGUSTINE, FL 32084
PHONE: (904) 209-2626 FAX: (904) 209-2627

SJCUD STANDARD SUBMERSIBLE LIFT STATION
SCADA SYSTEM DETAILS

NO. SHEETS
SHEET NO.
DRAWING NO. E205