MONITORING PLAN

GROUNDWATER MONITORING AREA
YARD PIPING PLAN

NOTES

1. ALL YARD PIPING, UNLESS OTHERWISE SHOWN, SHALL BE SOLVENT WELDED PVC LAYED AT EXISTING SITE GRADE AND COVERED WITH FILL MATERIAL.
   PVC PIPING SHALL BE LAID WHERE POSSIBLE IN COMMON TRENCHES AND MARKED WITH FIRE IRONED IN PERMANENT MARKINGS AT 10' INTERVALS.

2. MAINTAIN SLOPE AND GRADE OF GRAVITY LINES AS INDICATED ON THE DRAIINGS.

DESIGNED — 
DRAWN — 
CHECKED — 
APPROVED — 

H & S JOB NUMBER 44237-001

THE SCALE FOR SHOWN IS 1/20

1" = 20'
ELECTRICAL NOTES

DISEMBRACE LIABILITIES BY ELECTRICAL EQUIPMENT, DEVICES, OUTLINES, FIXTURES, ETC. WITH CIVIL, STRUCTURAL, MECHANICAL, AND INSTRUMENTATION DRAWINGS FROM THIS DRAWING WORK. DO NOT SCALD ELECTRICAL

ALL WIRING SHALL BE COPPER.

PREVIEW, GROUNDED CIRCUITRY CONDUCTOR FROM EACH EQUIPMENT CONNECTOR AND OUTPUT TO SHEATHING OR IN TRUNKING.

PREVIEW AN UNPLUGGED GROUNDING CONDUCTOR IN ALL FENDS AND BRANCH CIRCUITS.

CONTRACTOR SHALL PROVIDE ADDITIONAL, LOCATION ROUTE, CONDUITS, AND OTHER MATERIALS AND LABOR NECESSARY TO COMPLETE MANUAL CIRCUIT PROD WHERE THIS FORD DISTRICT EXCEEDS CAPACITY OF CURB BRACKET, PROFESSIONAL AND OTHER CONNECTING POINTS.

WIRE CHOICE SHALL BE THE SOLE CONSTRUCTION OF THE CONTRACTOR, REFER TO THE APPLICABLE DRAWING FOR CABLE USAGE, SIZES AND LOCATIONS.

ALL ELECTRICAL, EQUIPMENT, DEVICES, ETC. LOCATED OUTSIDE SHALL BE WEATHERPROOF.

REFER TO STRUCTURAL DRAWINGS FOR CONCRETE WORK.

EXISTING UTILITIES AND OTHER UNDERGROUND OR CONCEALED CABLES ARE SHOWN FOR HISTORICITY ONLY. FINAL TAILING AND ROUTING MAY DIFFER FROM THE SHOWN. CONTRACTOR IS RESPONSIBLE FOR THE INTERIOR LOCATION OF EXISTING UTILITIES AND OTHER UNDERGROUND OR CONCEALED CABLES.

ELECTRICAL SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM AS DESCRIBED WITHIN THESE DRAWINGS.

2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARD AND WITH MANUFACTURERS' RECOMMENDATIONS. ALL WORK, MATERIALS AND EQUIPMENT SHALL COMPLY WITH THE MATERIAL, ELECTRICAL CODE CODE EXCEPT.

3. ALL METERING AND GROUNDED CIRCUITRY SHALL BE DESIGNED TO A REASONSABLE WORKMANSHIP APPROACH TO THE INSTALLATION. THE APPLICABLE CODES AND CONSTRUCTION ENCOURAGES.

4. HAZEN AND SAWYER IS NOT RESPONSIBLE FOR THIS INSTALLATION FOR QUALITY OF MATERIALS, ENSURING THAT THE INSTALLATION IS IN ACCORDANCE WITH THE INSTALLATION PERMITTED BY THE MANUFACTURER. ALL METERING AND GROUNDED CIRCUITRY SHALL BE DESIGNED FOR 10 DAYS.

5. PROVIDE COPPER CONDUITS WITH DUAL, RATED THICK-TYPE TITANIUM SEAL.

6. PROVIDE COPPER CONDUITS WITH DUAL, RATED THICK-TYPE TITANIUM SEAL.

7. PROVIDE COPPER CONDUITS WITH DUAL, RATED THICK-TYPE TITANIUM SEAL.

ELECTRICAL SITE PLAN

PUMP 12, PUMP 15, BLOWER, RECEPTACLE, FLOOD VALVE, FLOATS, AND FIELD AND RETURN FLOW METERS

PUMP 13, RECEPTACLE, FLOOD VALVE, FLOATS, AND FIELD AND RETURN FLOW METERS

NOTE: PROVIDE STAINLESS STEEL JUNCTION BOXES AT PUMP 12 AND PUMP 13 TO CONTINUE CONDUITS ON TO PUMP 13 SITE AND TO CONNECT TO COMPONENTS AT EACH SITE. MOUNT RECEPTACLE 2 FEET ABOVE GRADE, ADJACENT TO TANK.
3/4" C, 2-#12, 1-#12G TO EACH PUMP

1" C, 3- #16 TSP TO FLO

PUMP 1

---

1/4" 1'-0"

LIGHT FIXTURE IN SHED

TANK 2 LEVEL FLOATS

5/4"C, 2-#12, 1-#16 TSP TO EACH PUMP

NEW FLOW METERS ON EXISTING LINES

5/4"C, #12 WIRING FOR EACH LIGHTING AND RECEPTACLE CIRCUIT

NEW CONTROL PANEL

---

5/4", 1-#16 TSP TO EACH FLOW METER

---

ELECTRICAL SITE PLAN

3/4", #16 TSP TO EACH FLOW METER

---

NEW FLOW METERS ON EXISTING LINES

---

ELECTRICAL SITE PLAN AND DETAILS
WIRING SPECIFICATIONS:

AC WIRING

POWER

24VAC 1-16AWG WHT, 2-16AWG WHT/WHITE, 3-16AWG WHT/GREEN

CONTROLS

1-16AWG WHT/RED, 2-16AWG WHT/WHITE, 3-16AWG WHT/GROUND

FIELD: 16AWG TWISTED PAIR

SERIAL:

1-16AWG WHT/BLUE, 2-16AWG WHT/GREY

DC WIRING

POWER

24VDC 1-16AWG WHT/BLUE, 2-16AWG WHT/WHITE

CONTROLS

1-16AWG WHT/RED, 2-16AWG WHT/WHITE, 3-16AWG WHT/GROUND

FIELD: 16AWG TWISTED PAIR

SERIAL:

1-16AWG WHT/BLUE, 2-16AWG WHT/GREY
FRONT VIEW

RIGHT SIDE VIEW

LEFT SUB PANEL

BACK SUB PANEL

RIGHT SUB PANEL

ALUMINUM OR S/S
SUNSHIELD (TOP, SIDES, & BACK)

BLACK BOX CONVERTER SHELF

ACE POWER SUPPLY MOUNTING BRACKET

SIDE VIEW

EDCO AC SURGE PROTECTOR MOUNTING BRACKET

EDCO SHELF FRONT VIEW

ESSENTIALS SHELF SIDE VIEW

H & E WIREWAY MOUNTING NUMBER

DRAWING NUMBER

CONTRACT NUMBER

REGISTER ONE BUILDING, 1 DOOR PRINCE PALM
TAMPA, FL 33619 SUITE 200

PHONE: (813) 256-8275
FAX: (813) 256-8276

Hazen and Sawyer
1616 East Hall Avenue
Orlando, Florida 32803
Phone: 407-843-3011
Fax: 407-843-3012

Project Manager:

Drafting and Drafting

P.O. Drawer 460

Please provide all necessary details and specifications as per the project requirements.
### Bill of Materials (Cont’d)

<table>
<thead>
<tr>
<th>ITEM QTY</th>
<th>DESCRIPTION</th>
<th>MTR</th>
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<tr>
<td>1</td>
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<td>TELEPHONE WIRE</td>
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<td>1-50 CURCULAR SNAP MOUNTING</td>
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<tr>
<td>2</td>
<td>FLUORESCENT LIGHT KIT</td>
<td>ALLEN BRADLEY M-2714842</td>
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<td>1</td>
<td>3-POSITION SELECTOR SWITCHES (ON DASH PANEL)</td>
<td>A/B BULLETIN 800</td>
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<td>1</td>
<td>CLOSET LOOP PANEL AV UNIT</td>
<td>MC CLEAN 780</td>
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### Panel Tag Schedule

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### Panel Nameplate

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### Materials

- **Aluminum**: Adhesive back, laminated plastic.
- **Lettering**: 1/8"-inch Helvetica medium, unless otherwise noted.

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**Florida Department of Health**

**Florida Department of Health**

**Florida Department of Health**

**Bill of Materials**

**Panel Tag Schedule**

**Panel Nameplate**

**Materials**: Adhesive back, laminated plastic.

**Lettering**: 1/8"-inch Helvetica medium, unless otherwise noted.
1.01 THE REQUIREMENT

A. Furnish, (test, install) and place in satisfactory operation all PLC control strategies, operator interface programming, and electrical programming as noted herein.

B. The PLC programming and operator interface is to be fully tested at the manufacturer's shop prior to shipping. Once delivered, the programming is to be checked out prior to operation of the equipment. Tests will be performed by the Engineer that the programs are correct and perform all functions as intended.

C. All control functions are to be performed by the PLC. The operator interface is to be used for manual override of equipment, adjustment of setpoints, and to download stored data from the PLC.

1.02 I/O INTERFACE

A. The PLC will communicate wirelessly with a laptop computer which shall function as the operator interface. The laptop computer shall be supplied with the PLC control panel and be set up to provide full access to the PLC for operator manually override of all equipment, ability to make adjustments to setpoints, download stored data from the PLC, and make modifications to the PLC program as needed.

B. The PLC shall include a data storage module capable of storing up to a month of data as described herein. The operator interface laptop will be used to download the data on a periodic basis. The data shall be downloaded in CSV Excel format.

C. The following displays shall be created and stored on the laptop for operator interface:

Menu Bar – menu bar across the top of each display to provide quick access to any display.

Control Display – tabular display of all pumps, blower, and valves. For each device, provide on/off, D/F, and run times for fault and control the equipment. For each device, provide a LED run indicator (light, indicator for valves) that is grey when not running (or valve closed). For each pump and blower, provide the totalized runtime value calculated by the PLC (in hours and tenths of hours up to 999,999,999). For each pump with an associated flow meter, provide the totalized flow value. Provide a totalized doily volume calculated by the PLC. For each pump, show flow (in gallons per minute) and totalized flow metered by the PLC. For each pump, show pump runtime.

Setpoint Display – tabular display for all control setpoints as described herein with simple print and click access to each setpoint that allows value changes by typing in a value's current settable range.

Timer/Status Display – for all timer setpoints, provide a 24-hour, bar-graph format display to show the relative on and off times of each pump and blower.

1.03 PUMP 1 – CISTERN SEPIC TANK 2 TO STEorage TANK 1

A. Control Description: Pump shall start on LOW level in STEorage TANK 1 and stop on MED level in STEorage TANK 1. If PUMP 13 is running as part of its normal timed sequence, PUMP 1 shall remain off. Pump 1 shall start in the event of a power failure. When both pumps are running, the pump with the highest flow rate will continue running until it is shut down.

B. Data Storage: Record totalized runtime, daily pump runtime, and number of start per day.

1.04 PUMP 2 – STEorage TANK 1 TO STEorage TANK 5

A. Control Description: Pump shall start on LOW level in STEorage TANK 1 and stop on MED level in STEorage TANK 5. Pump shall start on LOW level in STEorage TANK 5 until pump runtime. Pump 2’s start and run are set for a set amount of time.

B. Data Storage: Record totalized runtime, daily pump runtime, and number of start per day.

1.05 PUMP 3 – STEorage TANK 1 TO NITRIFICATION UNIT

A. Control Description: Pump shall start up to 8 times a day and run for a set amount of time. Provide a totalized startup volume pumped as well as the totalized volume pumped as only (subsequent return flow from supply flow). One pulse equals one gallon.

B. Data Storage: Record totalized runtime, daily pump runtime, and number of start per day.

1.06 PUMP 4 – STEorage TANK 1 TO Hydrospipyter System 1

A. Control Description: Pump shall start a set number of times a day (up to 24 times) and run for a set amount of time. The number of start times a day and the cycle duration time setpoint shall be adjustable from the operator interface. The PLC shall divide the number of start times a day entered into 1440 minutes (24 hours) to determine the start time of the pump starting from the main power feed to the PLC. The pump shall start every 90 minutes (0.50, 0.50, 0.33, 0.33, 0.33, 0.33, 0.33). For uneven values, the PLC shall divide the number (1440 divided by the number of start times a day) until LOW level in STEorage TANK 1 is reached. Pump start 60 sec on LOW level in STEorage TANK 1 and remain off until LOW level in STEORAGE TANK 1 is reached.

B. Data Storage: Record totalized runtime and daily pump runtime. Receive pulse input from flow meter and record totalized daily volume pumped. One pulse equals one gallon.

1.07 PUMP 5 – STEorage TANK 1 TO h–it–a–u system

A. Control Description: Pump shall start 6 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration time setpoint. The 6 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. Pump 5 shall start every 110.37 minutes (00:37), 12:03, 23:03, 00:37, 12:03, 23:03. For uneven values, the PLC shall round to the nearest minute as indicated in example.

B. Data Storage: Record totalized runtime and daily pump runtime. Calculate totalized daily volumes pumped based on flow rate entered by operator (calculated from pump maximum capacity, frequency, and stroke length set at pump).

1.08 PUMPS 6 through 9 – Hydrospipyter System 2 Recirculation pumps

A. Control Description: Pumps shall start when PUMP 14 starts and each pump shall run for a set amount of time. Provide 1 global cycle duration time setpoint for all 4 pumps. The cycle duration time setpoint shall be adjustable from the operator interface.

B. Data Storage: Record totalized runtime and daily pump runtimes.

1.09 PUMPS 10 and 11 – De–fiee Feed from Pumps

A. Control Description: Pump shall start a set number of times a day (up to 24 times) and run for a set amount of time. The number of start times a day and the cycle duration time setpoint shall be adjustable from the operator interface. The PLC shall divide the number of start times a day entered into 1440 minutes (24 hours) to determine the start time of the pump starting from the main power feed to the PLC. The pump shall start every 110.37 minutes (00:37), 12:03, 23:03, 00:37, 12:03, 23:03. For uneven values, the PLC shall round to the nearest minute as indicated in example.

B. Data Storage: Record totalized runtime and daily pump runtimes. Calculate totalized daily volumes pumped based on flow rate entered by operator (calculated from pump maximum capacity, frequency, and stroke length set at pump).

1.10 PUMP 12 – NO3 DRIP STORAGE Tank 4 to NO3 DRIP System

A. Control Description: Pump shall start up to 8 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration time setpoint. The 6 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. Pump shall stop on LOW level in STEorage TANK 4 and remain off until LOW level in STEorage TANK 4 is reached. Pump shall also start with flush cycle (see VALUE 1 CONTROL).

B. Data Storage: Record totalized runtime and daily pump runtimes. Record separate daily runtimes for the timed sequence described above and for the flush sequence. Receive pulse inputs from the supply and return flow meters and record totalized daily volume pumped as only (subsequent return flow from supply flow). One pulse equals one gallon.

1.11 PUMP 13 – STEorage TANK 5 TO STEorage SYSTEM 3

A. Control Description: Pump shall start up to 8 times a day and run for a set amount of time. Provide 6 individual start times based on a 24-hour clock format (HH:MM). Provide 1 global cycle duration time for all 8 start times. The 8 start times and the 1 cycle duration time setpoint shall be adjustable from the operator interface. The PLC shall divide the number of start times a day entered into 1440 minutes (24 hours) to determine the start time of the pump starting from the main power feed to the PLC. The pump shall start every 90 minutes (0.50, 0.50, 0.33, 0.33, 0.33, 0.33, 0.33). Pump shall also start with flush cycle (see VALUE 2 CONTROL).

B. Data Storage: Record totalized runtime. Record separate daily runtimes for the timed sequence described above and for the flush sequence. Receive pulse inputs from the supply and return flow meters and record totalized daily volume pumped as only (subsequent return flow from supply flow). One pulse equals one gallon.