

**ADDENDUM #01
TO THE BID & SPECIFICATIONS FOR
BOLTON ESTATES WASTE WATER REHABILITATION
COUNTY PROJECT SBI 000367
February 22, 2016**

This Addendum forms a part of the Contract Documents and modifies the original specifications and drawings. This Addendum consists of one (1) page plus the five (5) attachments listed here:

Attachment 1: SHEET C100 GENERAL NOTES

- Added treatment notes and permit number.

Attachment 2: SHEET C101 SITE PLAN

- Added an additional pump to the existing basin.
- Removed dosing pumps in equipment shelter.
- Bury existing force main from basin to equipment shelter.
- Install influent pipe on west side of recirculation tank.

Attachment 3: SHEET C103 PASSIVE VENT DETAILS

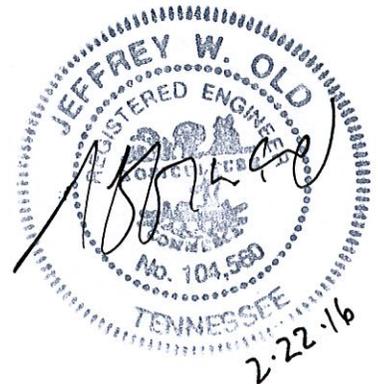
- Mound option should include dirt and 4 inches of no. 57 stone on top.

Attachment 4: SHEET C104 RECIRCULATION TANK

- Relocated 96" dimension line to bottom of tank.
- Added maximum depth note for the discharge gravity line.

Attachment 5: Specification Section 11390

- Added vendor BioClere by AquaPoint to the list of approved vendors.



The time limit for questions regarding the plans and specifications will be moved to February 29, 2016 at 12:00 PM. The Bid Date will be moved to March 7, 2016 at 2:00 PM. Prospective Bidders who desire an original copy of this Addendum shall contact the Engineer at the number listed below.

** Please sign, date and return fax or e-mail this first sheet to Fisher & Arnold, Inc. (fax # 901-748-3115), attention to Jeffrey Old, P.E. (e-mail: jold@fisherarnold.com ; phone #: 901-748-1811).

I have received Addendum No. 01 including all attachments.

Name Company Date

SECTION 11390

PACKAGE FILTER SYSTEM SPECIFICATIONS

PART 1 – GENERAL

1.01 DEFINITIONS

Wherever used in these specifications and printed with initial bold capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. *Bid* – The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the work to be performed.
2. *Bidder* – The individual or entity who submits a Bid directly to the Owner.
3. *Contractor* – The individual or entity with whom Owner has entered into the agreement.
4. *Engineer* – The individual or entity named as such in the agreement.
5. *Inspector* - The specific individual designated by the Owner, Engineer, Contractor, and Manufacture to ensure quality control by inspecting and certifying that the installation of the AdvanTex[®] treatment system is in compliance with the Manufactures recommendations and requirements.
6. *Manufacture* – A supplier, fabricator, distributor, material man, or vendor having a direct contract with Contractor or Owner to furnish materials or equipment to be incorporated in the work by contractor.
7. *Owner* – The individual or entity with whom Contractor has entered into the agreement and for whom the work is to be performed.
8. *Operator* – The individual or entity with whom the owner has entered into an agreement and for whom operation and maintenance shall be performed.

1.02 GENERAL DESCRIPTION

The **MANUFACTURER** shall furnish a complete advanced treatment package(s), consisting of a pump vault, effluent screen, discharge assembly, ball valve, check valve, splice box, treatment system, recirculating splitter valve, and controls.

1.03 SUBMITTALS

The **MANUFACTURER** shall furnish six (6) sets of shop drawings and technical data sheets. The submittals shall clearly specify the materials of construction, equipment compatibility, along with drawings for each unique package being supplied.

1.04 OR-EQUAL EVALUATIONS

A. Throughout the equipment specifications you will find the term “or approved equal.” For this project, this term “approved equal” shall mean equal in the

judgment of the **ENGINEER**. Should the **CONTRACTOR** seek approval of a product other than the brand or brands named in the specifications, it shall furnish written evidence that such product conforms in all respects to the specified requirements, and that it has been used successfully elsewhere under similar conditions. It will not be the responsibility of the **MANUFACTURE** specified within these specifications to provide research, documentation, or data supporting the difference between the “or equal” and the specified product. This will be the sole responsibility of the **CONTRACTOR** seeking the approval.

- B. Where the specified requirements involve conformance to recognized codes or standards, the **BIDDER** shall furnish evidence of such conformance in the form of test or inspection reports, prepared by a recognized agency, and bearing an authorized signature. Manufacturer’s standard data and catalog cut sheets will not be considered sufficient in themselves, and the engineer will not be responsible for seeking further data from the manufacturer, or for otherwise researching the product. Failure to provide complete data will be cause for rejection of the product. The submission shall include any impacts that could be expected from the alternative product and shall also indicate any product that would require a license or royalty, the actual fees, and a note that these fees would be handled by the **BIDDER**. The **BIDDER** shall provide submissions; meeting the above parameters no less than TWO WEEKS prior to **BID** opening for review by the **ENGINEER**. **CONTRACTORS** seeking approval of “or equal” products or systems shall provide, at minimum, the following.
- C. Product/System submittals, including, but not limited to;
1. The number of years the **MANUFACTURER** has been in business of manufacturing relevant products/systems
 - a. Size of company, including
 - 1) Number of employees related to relevant products/systems
 - 2) Number of engineers on staff related to relevant products/systems
 - b. Product specifications and a detailed description of how each product or component is “equal” to the specified product, system, or component. A side by side comparison is required.
 - 1) Equipment/system warranty along with exclusions
 - 2) Performance claims, including, but not limited to;
 - a) Treatment design
 - Surface area
 - Maintenance frequency
 - b) Pump motor description

- Manufacturer and origin
 - Length of service
 - Number of units in operation
 - Life-cycle cost (repair and replacement frequency)
 - Warranty
- c) Pump liquid end description
- Manufacturer and origin
 - Length of service
 - Number of units in operation
 - Life-cycle cost (repair and replacement frequency and cost). Note liquid ends must be remove-able and repairable and cleanable.
 - Warranty
- d) Corrosion resistance
- e) Pump Lead description
- Lead must be SOOW, extra heavy duty cord (600V) CSA approved.
- f) Control panel components
- Manufacturer and origin
 - Length of service
 - Number of units in operation
 - Warranty
 - Enclosure description
- c. Evidence of successfully obtaining approval for a system with similar permit requirements with the regulating authority
- d. Summary of product/system track record and history, including, but not limited to;
- 1) Number of similarly sized systems
 - 2) Detailed summary of, at minimum, ten (10) similarly sized systems, at least five (5) years old, including, but not limited to;
 - Project name, location, and application
 - Years in operation
 - Current average daily flows and design flows

- Operator name and contact information
2. **BIDDER** shall specify and furnish documentation related to manufacturer (or representative) support services, including, but not limited to;
 - a. Installation training program and support material
 - b. Installation oversight program and support material
 - c. Operator training program and support material
 - d. Startup services program and support material

1.05 EXPERIENCE CLAUSE

The equipment furnished shall be manufactured and supplied by a company experienced in the design and manufacture of advanced treatment systems. **MANUFACTURERS** shall have a minimum ten (10) years' experience in the design and manufacture of advanced treatment systems of similar size and equipment specified. **MANUFACTURERS** shall have at minimum of twenty-five (25) successful installations of advanced treatment systems.

1.06 WARRANTY BOND

The **MANUFACTURER** shall, upon request, furnish a two-year warranty bond. The warranty bond will guarantee the performance of the equipment in the event that it fails within the bond period.

1.07 MANUFACTURER

The **MANUFACTURER** shall be Orenco Systems[®], Inc. or approved equal. The **MANUFACTURER** shall furnish a complete factory built advanced treatment system, each consisting of a pump vault, effluent screen, discharge assembly, ball valve, check valve, splice box, treatment system, recirculating splitter valve, and controls. The **MANUFACTURER** shall supply detailed installation and O&M instructions. The **MANUFACTURER** shall also provide the following support personnel:

- Professional engineer or personnel under the direct supervision of a professional engineer dedicated to supporting the project through design, construction, and O&M.
- Asset Management Department dedicated to assisting operators with operational and maintenance activities.

1.08 WARRANTY

The advanced treatment system **MANUFACTURER** shall provide a three (3) year warranty for the entire treatment system, including, but not limited to the pump, pump vault, hose and valve assembly, control panel, and splice box. Warranty term shall ensue after **OWNER'S** acceptance and system startup procedures are complete. The **MANUFACTURER** shall submit detailed exclusions from the warranty or additional cost items required to maintain the equipment in warrantable condition. The warranty shall be documented in product literature.

1.09 SERVICABILITY

The advanced treatment system components shall be completely serviceable,

with easy access to the pump(s), effluent screen, treatment system, and floats. The pump shall be designed for removal without removing the effluent screen and floats.

1.10 PUMPS

The pump must be approved for use in pump vault as described in these specifications. Pump shall be 3/4 to 1.0 hp, 230 VAC, single phase, 60 Hz, two-wire motor, with 10 foot long extra heavy duty (SOOW) electrical cord with ground. The pumps must be submersible High-Head Effluent pumps. Pumps shall be UL and CSA listed for use with effluent. The pumps must have a minimum 24-hour run dry capability without water lubrication. The pumps shall have a 1/8-inch bypass orifice to ensure flow circulation for motor cooling and to prevent air bind. The pump shall have a floating impeller design to protect against up thrust and increase pump life. The pumps liquid ends must be repairable (by replacing impellers and/or diffusers) for better long-term cost of ownership. The motor must be rated for continuous use and frequent cycling, at least 100 cycles per day. The motor cable must be suitable for Class 1, Division 1 and 2 applications. The pumps shall be lightweight for easy removal and maintenance. The pump intake screen must be 1/8-inch mesh polypropylene. The pump shall have internal thermal overload protection and internal lightning protection. All pumps shall undergo 3-point (Dead head, Design Flow, and Design Flow + 30%) wet testing at the factory to confirm performance.

1.11 TANKS GENERAL

A. The **MANUFACTURER** shall provide the structural design and certification to the engineer for review. The design shall be in accordance with accepted engineering practice. Precast concrete or fiberglass tanks shall have been designed by a registered engineer and approved by state or local regulatory agencies or authorities.

B. Loading Criteria:

- a. There shall be 140 lbs./cu.ft. for minimum weight of saturated backfill, or 127 lbs./cu.ft. for unsaturated backfill (500 lbs./sq.ft.minimum).
- b. Minimum lateral loading shall be 62.4 lbs./cu.ft. Lateral loading shall be determined from ground surface.
- c. The tank shall also support a concentrated wheel load of 2500 lbs.

C. There are four (4) typical loading conditions that should be analyzed:

1. 4 ft. Bury + Full Exterior Hydrostatic Load
2. 4 ft. Bury + Full Exterior Hydrostatic Load + 2500 lb. Wheel Load.
3. 1 ft. Bury + 2500 lb. Wheel Load.
4. Tank Full, Interior Hydrostatic Load and Unsupported by Soil.

Load Case 4 represents the tank full of liquid at 62.4 lbs/cu.ft. This condition

addresses seam and haunch stress-strain relationships that occur during watertightness testing, as well as poor soil bedding conditions that provide inadequate support.

- D. Tanks requiring deep burial (>48") or subject to truck or heavy traffic loading require special consideration. (A minimum soil cover of 12" shall be used, unless specified otherwise by manufacturer.)
- E. All tanks shall be structurally sound and watertight and shall be guaranteed in writing by the tank **MANUFACTURER** for a period of two years from the date of final acceptance. **MANUFACTURER'S** signed guarantee shall accompany **BIDS**. The tank guarantee/warranty shall be furnished at the time of submittal. Tank warranty shall not be limited liability to replacement cost of the tanks. The septic tank shall be capable of withstanding long-term hydrostatic loading, in addition to the soil loading, due to a water table maintained at ground surface.
- F. Tanks shall be manufactured and furnished with access openings 20" in diameter and of the configuration shown on the manufacturer's drawings. Modification of completed tanks will not be permitted.
- G. Inlet plumbing shall include an inlet tee that penetrates 18" into the liquid from the inlet flow line. (The depth may vary depending on the tank's height; in all cases, though, the inlet should extend to a level below the bottom of the maximum scum depth.) The inlet plumbing shall allow for natural ventilation back through the building sewer and vent stack.
- H. Tanks shall be capable of successfully withstanding an aboveground static hydraulic test and shall be individually tested.
- I. All tanks shall be installed in strict accordance with the manufacturer's recommended installation instructions

1.12 CONCRETE TANKS

- A. Walls, bottom and top of reinforced concrete tanks shall be designed across the shortest dimension using one-way slab analysis. Stresses in each face of monolithically constructed tanks may be determined by analyzing the tank cross-section as a continuous fixed frame.
- B. The walls and bottom slab shall be poured monolithically; alternatively, water stops may be provided.
- C. Reinforcing steel shall be ASTM A-615 Grade 60, $f_y = 60,000$ psi. Details and placement shall be in accordance with ACI 315 and ACI 318.
- D. Concrete shall be ready-mix with cement conforming to ASTM C150, Type II. It shall have a cement content of not less than six (6) sacks per cubic yard and maximum aggregate size of 3/4". Water/cement ratio shall be kept low ($0.35 \pm$), and concrete shall achieve a minimum compressive strength of 4000 psi in 28 days. The Contractor shall submit a concrete mix design to the Engineer for review and approval. Three (3) concrete sample cylinders shall be taken and tested for each tank manufactured until the manufacturer and Engineer are satisfied that the minimum compression strength is being obtained. To ensure compliance, the manufacturer shall then make and set three (3) sample cylinders for a minimum of 20% of the remaining tanks at the

- discretion of the Engineer. If the minimum compressive strength is not being obtained, the manufacturer shall be required to make and test sample cylinders for each tank manufactured. Calcium chloride will not be allowed in the mix design. The cost of testing cylinders shall be the tank manufacturer's responsibility. The tank manufacturer may supply a Swiss hammer for compressive testing in the field in lieu of sample cylinders.
- E. Tanks may be protected by applying a heavy cement-base waterproof coating, on both inside and outside surfaces, in compliance with Council of American Building Officials (CABO) report #NRB-168; 6181; however, the tank should be watertight without the addition of seal coatings.
 - F. Form release used on tank molds shall be Nox Crete™ or approved equal. Diesel or other petroleum products are not acceptable.
 - G. Tanks shall not be moved from the manufacturing site to the job site until the tank has cured for seven (7) days or has reached two-thirds of the design strength.
 - H. Tanks shall be manufactured and furnished with access openings of the size and configuration to accommodate individual packaged pump systems. For 24" diameter access risers, the tank manufacturer shall cast in place a flanged tank adapter to facilitate the bonding of a 24" diameter access riser. The flanged tank adapter shall be made of 1/4" thick ABS and shall have an outside diameter of 27" and an inside diameter of 22-3/4". The flanged adapter shall be Orenco Systems®, Inc. Model PRTA24 or engineer-approved equal. The adapter must have an overall height of no less than 3" to allow 1-1/2" exposed for sufficient bonding area once the adapter is installed in the tank. For 21" and 30" diameter access risers, either a grooved tank adapter plate (Model RRFTA or RRFTA30) or a flanged tank adapter (Model PRTA30) may be installed in the tank. The adapter shall be manufactured of fiberglass or ABS and shall accommodate either a 21" or 30" diameter access riser.
 - I. The septic tank and the top slab shall be sealed with a preformed flexible plastic gasket. The flexible plastic gasket shall be equal to the flexible butyl resin sealant congeal CS-102 or CS-202 as manufactured by Concrete Sealants, Inc. of New Carlisle, Ohio, and shall conform to federal specification SS-S-00210(2iOA) and AASHTO M-198. A mechanical fastening method shall be used if the seasonal groundwater level may reach the top slab seam of the tank.
 - J. In order to demonstrate watertightness, tanks shall be tested at the factory and again on-site prior to acceptance. Inlets to the septic tank will be watertight pipe seal Cast-A-Seal™ (Manufactured by Press-Seal Gasket Corporation) or approved equal. Each tank shall be tested at the factory, prior to shipping, by filling with water to the soffit and letting stand. After 24 hours, the tank shall be refilled to the soffit and the exfiltration rate shall be determined by measuring the water loss during the next two (2) hours. Any leakage shall be cause for rejection. After installation is completed and before backfilling, each tank shall be filled with water to a point 2" above the

top of the tank and the water loss measured after a twenty four-hour period. After it has been determined that there is no leakage, test the access riser seam. Backfill to a minimum depth of 2" above the riser seam to prevent damage from hydrostatic uplift. Fill the tank to a point 2" above the riser seam (the field test period may be reduced to not less than two (2) hours). No tank will be accepted if there is any leakage over the two (2) hour period.

1.13 FIBERGLASS TANKS

A. The **MANUFACTURER** shall be Orenco Systems®, Inc. or approved equal. The **MANUFACTURER** shall supply detailed installation, O&M instructions, and warranty terms to the **ENGINEER**.

1. Method of Calculations:

- a. Fiberglass tanks shall be analyzed using finite element analysis for buried structures.
- b. Calculations shall address the following:
 - c. strength
 - d. buckling
 - e. deflection of 5% of the tank diameter, based on service load (including long-term deflection lag)
 - f. buoyancy

2. Performance testing

B. The material properties and laminates considered in this analysis shall be fiberglass reinforced polyester resin, using grades of resin and fiberglass considered acceptable for use with septic tank construction. The thicknesses for different regions of the tanks shall be described and shown in shop drawings for each individual tank.

Typical primary strength properties are listed below:

Tensile Modulus (psi)	1,000,000
Ultimate Tensile strength (psi)	10,000
Ultimate Compressive strength (psi)	21,000
Ultimate Flexural strength (psi)	18,000
Ultimate Shear In-Plane (psi)	7,000

C. In lieu of calculations for fiberglass tanks, the supplier may elect in-situ performance testing.

D. In-situ testing of each tank model shall include use of strain gauge and deflection gauge. The tank will be subjected to external forces equal to twice the actual load.

E. Maximum initial deflection based on test loading shall not exceed 3% of the tank diameter.

F. Performance testing will be evaluated by a Registered Professional Engineer (P.E.). The Engineer will have the sole responsibility to determine the

maximum external loading on any of the tank models.

- G. The tank shall be constructed with a glass fiber and resin content specified by the manufacturer and with no exposed glass fibers. Any permanent metal part shall be 300 series stainless steel.
- H. Inspections may be made by the engineer in the supplier's yard, within the plant, upon delivery and again after installation. The minimum wall thickness shall be 3/16". If the wall thickness is suspected to be less than 3/16" or if delamination is suspected within any portion of the tank, the engineer may drill a 1/4" diameter hole through the tank wall for inspection purposes. If the required minimum 3/16" thickness is not found, repair if feasible shall be the responsibility of the contractor. If repair is judged not feasible, the tank shall be rejected. If twenty percent (20%) or more of the tanks are rejected for any of the aforementioned reasons, each tank under this BID will become suspect of substandard quality and subject to rejection by the engineer. If the required minimum 3/16" thickness is found and no delamination is present, the repair of the inspection holes shall be the responsibility of the engineer.
- I. The engineer shall specify the minimum weight of each tank model that will be allowed. The manufacturer will permanently mark the weight of each tank on the top near the access hole.
- J. The minimum tank weight shall be specified by the manufacturer's engineer (e.g., 330 lbs for 1000-gallon tanks, 450 lbs for 1500-gallon tanks; add 30 lbs for internal baffle).
- K. Holes specified for the tank shall be provided by the manufacturer. Resin or other appropriate sealant shall be properly applied to all cut or ground edges so that no glass fibers are exposed and all voids are filled.
- L. Orenco Systems[®], Inc. EPDM gaskets, or approved equal, shall be used at the inlet to join the tank wall and the inlet piping. ABS or Schedule 40 PVC pipe and fittings shall be used at the inlets.
- M. Inlet plumbing shall include an inlet tee that penetrates 18" into the liquid from the inlet flow line. (The depth may vary depending on the tank's height; in all cases, though, the inlet should extend to a level below the bottom of the maximum scum depth). The inlet plumbing shall allow for natural ventilation back through the building sewer and vent stack.
- N. In order to demonstrate watertightness, tanks shall be tested at the factory and again on-site prior to acceptance. Each tank shall be tested at the factory, prior to shipping, by filling with water to the soffit and letting stand for a minimum of two (2) hours. Any leakage shall be cause for rejection. After installation is completed and before backfilling, completely fill the tank with water, to a level two (2) inches into the riser. Wait a minimum of two (2) hours (or as required by local rules) and inspect the tank for leaks. There should be no drop in liquid level and no visual leakage from seams, pinholes, or other imperfections. Once the tank is proven to be watertight, drop the

water level in the tank below the invert – but not below the mid-seam.

- O. Each tank shall be marked in the uppermost surface above or near the outlet and include a permit or identification number, weight of tank, type of tank, and date of manufacture.
- P. Installation shall be in accordance with the manufacturer's recommendations, or as shown on the Contract Plans, whichever is more stringent–no variations.

PART 2 - PRODUCTS

2.01 RISERS

Risers **MANUFACTURER** shall be Orenco Systems[®], Inc. Risers shall be required for access to internal vaults and access into the septic tanks for septage pumping. All risers shall be constructed watertight. The risers shall be attached to the tanks such that a watertight seal is provided. Risers shall extend 3" above original grade to allow for settlement and to ensure positive drainage away from the access. Risers shall be a minimum of 30" in nominal diameter when the depth of bury is 36" or greater or duplex pumping assemblies are used. All other risers shall be a minimum of 24" in nominal diameter and shall vary in height depending on the depth of bury on the various tanks. Adhesive required to adhere the PVC or fiberglass risers to either fiberglass or ABS tank adapters shall be a two-component methacrylate structural adhesive or approved equal. To ensure product compatibility, a single manufacturer shall supply risers, lids, and attachment components.

2.02 INLET AND RECIRCULATING SPLITTER/BALL VALVE RISERS

Inlet risers shall be Orenco Systems[®], Inc. Model Perma-Loc, Ultra-Rib, KOR FLO or engineer-approved equal. The material shall be PVC as per ASTM D-1784 and tested in accordance with AASHTO M304M-89. The risers shall be constructed of non-corrosive material and designed-to-be buried in soil. Risers shall have a minimum stiffness of 10 psi, when tested according to ASTM D2412. Risers shall be capable of withstanding a truck wheel load (54 square inches) of 2500 pounds for 60 minutes with a maximum vertical deflection of a 1/2 an inch. Risers shall extend to 3 inches above the ground surface to allow for settlement and shall have a minimum nominal diameter of 24 inches.

- Inlet & Outlet flanges grommets: insert holes for FRP style splitter valve flanges or grommets for old style splitter valves shall be drilled/installed by the manufacturer of the valve.

2.03 OUTLET RISERS

Outlet risers shall be Orenco Systems[®], Inc. Model Perma-Loc, Ultra-Rib, KOR FLO or engineer-approved equal. The material shall be PVC as per ASTM D-1784 and tested in accordance with AASHTO M304M-89. The risers shall be constructed of non-corrosive material and designed-to-be buried in soil. Risers shall have a minimum stiffness of 10 psi, when tested according to ASTM D2412.

Risers shall be capable of withstanding a truck wheel load (54 square inches) of 2500 pounds for 60 minutes with a maximum vertical deflection of 1/2 an inch. Risers shall have a minimum nominal diameter of 24 inches for simplex pumping applications or 30 inches when used in a duplex pumping application and shall be factory-equipped with the following:

- Electrical and Discharge Grommets: when applicable, Orenco Systems[®], Inc. EPDM grommets shall be installed by the manufacturer for discharge piping, vent piping, and/or the electrical conduit to assure a watertight seal. The manufacturer of the access risers shall install the grommets at the factory.

2.04 RISER-TO-TANK ATTACHMENT

All attachment components shall be constructed of waterproof, non-corrosive materials, such as PVC, ABS, fiberglass, or stainless steel. Adhesives and sealants shall be waterproof, corrosion resistant and approved for the intended application. The riser-to-tank connection shall be watertight and structurally sound. The riser-to-tank connection shall be capable of withstanding a vertical uplift of 5000 pounds to prevent riser separation due to tank settlement, frost heave, or accidental vehicle traffic over the tank. Risers shall be attached to tanks with one of the following attachment systems, or approved equal:

1. Orenco Systems[®], Inc. Model PRTA24 tank adapter cast into tank lid or bolted to lid using Model PRTA24BDKIT bolt down kit, and a two-component methacrylate structural adhesive.
2. Orenco Systems, Inc. Model PRTA24-2 tank adapter cast into tank lid and a two-component methacrylate structural adhesive when tank burial depth is greater than 36 inches.
3. Orenco systems, Inc. Model RRFTA30 tank adapter bolted to tank lid using RRFTA30BDKIT bolt down kit, and a two-component methacrylate structural adhesive.
4. Orenco Systems, Inc. Model PRTA30 tank adapter cast into tank lid or bolted to tank using PRTA30RBDKIT bolt down kit, and a two-component methacrylate structural adhesive.

2.05 LIDS

One lid shall be furnished with each access riser. Lids shall be Orenco Systems[®], Inc. DuraFiber Model FLD24G, or FLD30G or **ENGINEER**-approved equal, as appropriate, fiberglass with green non-skid finish, and provided with stainless steel bolts, and wrench. **MANUFACTURER** shall provide evidence that lids have been used successfully in continuous field service for a minimum of five years to demonstrate long-term integrity and suitability for the application. Lids shall be waterproof, corrosion resistant and UV resistant. Lids shall be flat, with no noticeable upward dome; a crown or dome of no more than 1/8" is allowable. Lids shall not allow water to pond on them. Lids shall have a green non-skid finish. Self-lubricating plastics, such as polyethylene, shall not be considered

non-skid without addition of a non-skid coating. Lids shall form a watertight seal with the top of riser. Lids shall be capable of withstanding a truck wheel load (81 square inches) of 2500 pounds for 60 minutes with a maximum vertical deflection of 3/4 of an inch. Lids shall be provided with tamper-resistant stainless steel fasteners and a tool for fastener removal. Tamper-resistant fasteners include recessed drives, such as hex, Torx, and square. Fasteners that can be removed with common screwdrivers, such as slotted and Phillips, or fasteners that can be removed with standard tools, such as pliers or crescent wrenches, are not considered tamper-resistant. To prevent a tripping hazard, fasteners shall not extend above the surface of the lid. Optional components may include the following:

1. Traffic bearing lid: The traffic bearing lid shall be a cast iron frame and cover, part number 6024, 3060, 4036, as manufactured by Sather Manufacturing Co., Inc., or approved equal, which will fit over a standard lid. The cover shall have the word SEWER cast into it.
2. Rigid closed-cell foam insulation of 2-inch or 4-inch thickness shall be attached to the underside of the lid. Any fasteners shall be made of corrosion resistant stainless steel. The insulation shall have an R-value of no less than 10 per 2-inch increment.

2.06 RISER INSTALLATION

Riser installation shall be accomplished according to the **MANUFACTURER'S** instructions. For cold weather areas, risers shall be backfilled with 3/8" pea gravel or other similar granular material to prevent frost heave.

2.07 PUMP VAULT

Standard: Flow Inducer Series

Orenco Systems[®], Inc. Model FITR Series, Flow Inducer Tower or engineer-approved equal, installed in conformance with the engineer's plans. Tower shall consist of up to five (5) 5-inch diameter PVC flow inducers each with eight (8) 2-inch diameter holes evenly spaced around the bottom. Tower will accept one to five high-head effluent pumps.

- When using a flow inducer tower within a fiberglass tank, a VB1806-FRP platform or engineer-approved equal shall be used to provide a flat stable surface for flow inducer support.

2.08 DISCHARGE HOSE AND VALVE ASSEMBLY

Orenco Systems[®], Inc. Model HV200BSQ or engineered-approved equal. Discharge assembly shall be 2-inch diameter and include 150 psi PVC ball valve, 200 psi PVC true union check valve, PVC flex hose with working pressure rating of 60 psi, and Schedule 40 PVC pipe with cam coupler adapter for quick disconnect. Optional components may include the following:

1. Drainback: In cold weather climates a drain-back style discharge assembly shall be used which includes an 1/8" drain back orifice above the check valve. This valve style may be used with a cold weather kit.
2. Cold weather kit: For cold weather climates and deep bury tanks, Orenco Systems[®], Inc. Model Cold Weather Kit or engineer-approved equal.
3. High-pressure flex hose: Orenco Systems[®], Inc. Model HVX200PR series or engineer-approved equal. Shall be constructed of a special elastomer compound with a working pressure of 250psi for systems requiring a higher horsepower pump.

2.09 FLOAT SWITCH ASSEMBLY

Telemetry control panels:

A. Flow Equalization Tank

Float switch shall be Orenco Systems[®], Inc. Model MF4A with three switch floats mounted on a PVC stem attached to the filter cartridge. The floats must be adjustable and must be removable without removing the pump vault. The high level/lag pump enable, timer override on/off, timer on/off and low-level alarms shall be preset as shown in the engineer's plans. Each float lead shall be secured with a nylon strain relief bushing at the splice box. The floats shall be UL or CSA listed.

B. Recirculation-Blend Tank

Float switch shall be Orenco Systems[®], Inc. Model MF3A with three switch floats mounted on a PVC stem attached to the filter cartridge. The floats must be adjustable and must be removable without removing the pump vault. The high level, timer override on/off, and low-level alarms shall be preset as shown in the engineer's plans. Each float lead shall be secured with a nylon strain relief bushing at the splice box. The floats shall be UL or CSA listed.

2.10 HIGH-HEAD EFFLUENT PUMP

A. Simultaneous Three-Pod Dosing

All pumps shall comply with general requirements set forth in section I (above). Orenco Systems[®], Inc., Model PF7510 series or engineer-approved equal 1Hp, 230 VAC, single phase, 60 Hz, two-wire motor, with 10 foot long extra heavy duty (SO) electrical cord with ground. Pump shall be UL and CSA listed as an effluent pump.

2.11 ELECTRICAL SPLICE BOX

External Splice Box

Orenco Systems[®], Inc. Model SBEX series external splice box or engineer-approved equal, UL approved for wet locations, equipped with up to four (4) electrical cord grips and two 3/4-inch outlet fitting. Also included shall be UL listed waterproof butt splice connectors.

2.12 RECIRCULATING SPLITTER/BALL VALVE

Standard: MM4-FRP or MM6-FRP

Orenco Systems[®], Inc. Model MM4-FRP or MM6-FRP, 4 or 6-inch diameter ball valve assembly to provide guaranteed return of treated effluent returning from filter. The ball valve is designed to redirect 100% of flow to recirculation/dilution tank during periods of low flow or 100% to final discharge during periods of high flow. Must be manufactured of corrosion resistant PVC, Fiberglass, polyethylene and ABS components and allow for easy removal using a sliding quick-disconnect. The item is patented and the engineer knows of no equivalent.

2.13 DRY CHEMICAL FEEDER

Not used.

2.14 CONTROLS AND ALARMS

- A. Controls and alarms shall be listed per UL 508. Panels shall be repairable in the field without the use of soldering irons or substantial disassembly.
- B. A dedicated phone line or Ethernet cable shall be installed and is required to allow real-time connectivity with the telemetry control panel and alarm communication. Phone dialers shall not be considered as an equivalent.
- C. Panel shall be Orenco Systems, Inc. TCOM™ control panel or engineer-approved equal, meeting the following:
 1. Data Collection and Utilization: Logs data for system conditions and events such as pump run time, pump cycles, and alarm conditions.
 2. Downloadable Logs: Download logs into a *.dif or ASCII format for simple conversion to common spreadsheet or word processor programs.
 3. Multi-Level Password Security: Only qualified personnel can remotely access site.
 4. Program Logic Rules: Simple “If ... then” declarations. Rules can be written based on several operands, including the following:
 5. Input/output status
 6. Point status
 7. Date: mm/dd/yy format
 8. Time of day: 24 hour clock
 9. Timers
 10. Historical data (allows for control optimization or detection of trends)

11. Schedule functions to control digital "Points" based on date or day of week/time.
 12. Automatic daylight savings time adjustment.
 13. Automatic call-out to pagers during alarm conditions when panel detects trends that could lead to system failure.
- D. In addition, the unit shall have the capability of real-time direct connection to the panel via laptop serial port, to allow the operator real-time access to detailed logged data and the ability to change point values.

1. Standard Components

- a. Motor-Start Contactor: 120V 16 FLA, 1 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 VAC, 16 FLA, 3 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% FLA).
- b. HOA 3- Way Toggle Switch: Single-pole switch, Hands (manual) Off, Auto ON. 20 amps, 1 hp.
- c. Controls Circuit Breaker: 10 amps, OFF/ON switch. Single-pole 120 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
- d. Pump Circuit Breaker: 20 amps, OFF/ON switch. Single-pole for 120 VAC or double-pole for 230 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
- e. Audio Alarm: 95 dB at 24", warble-tone sound.
- f. 120 VAC Ground Fault Interrupter (GFI)
- g. Current Sensor: 120 VAC with adjustable high & low alarm set points.
- h. Visual Alarm: 7/8" diameter red lens, "push-to-silence." NEMA 4, 1-watt bulb, 120 VAC.
- i. Touch Screen Display: interface module with 5.7 color touch screen.
- j. Panel Enclosure: NEMA 4X rated, constructed of UV-resistant fiberglass or NEMA 4, constructed of steel; hinges and latch are stainless steel. Conduit couplings provided.
- k. Remote Telemetry Unit: ATRTU-Net; self-powered 24 VDC at 10 mA max, 8 digital inputs, 8 analog inputs expandable to 16 with expansion board. On-board modem (9600 baud), Ethernet port (10 base T, RJ45jack) and Modbus port (R5422/485 terminals).
- l. Deadfront User interface

2. Optional Components

- a. Pump Run Light: 7/8" green lens. NEMA 4, 1-watt bulb, 120 VAC.
- b. Effluent Alarm: 95db at 24", warble-tone sound.
- c. Flashing Light: Lexan lens, flanged base, red, UL-recognized.
- d. Heater: Anti-condensation heater. Self-adjusting, radiates additional wattage as temperature drops.
- e. Intrinsically Safe Control Relays: 120 VAC. Listed per UL 698A, for Class 1 Div. 1, Groups A, B, C, D hazardous locations. Larger enclosure required.
- f. 3- Way (main, auto, off) manual transfer/disconnect switch
- g. Event Counter: 120 VAC, 6-digit, non-resettable.
- h. Elapsed Time Meter: 120 VAC, 7-digit, non-resettable. Limit of 99,999 hours; accurate to 0.01 hours.

2.15 INSTALLATION

All treatment, pumping system, and electrical components shall be installed in accordance with the **MANUFACTURER'S** recommendations, the engineer's plans, and all state and local regulations.

2.16 LOCATION

The pump control panel shall be mounted on an exterior backboard or inside a control building nearest to the tank and pumps. If mounting to an exterior wall, try to select a garage or outbuilding where the sound of the motor contactor engaging will not be noticed. If a garage or outbuilding wall isn't available, installation should include use of sound-deadening insulation. (Post and panel mounting assemblies are acceptable.) The control panel shall be located within 50 feet and in sight of the pump motor or shall be provided with a lockable disconnect switch. The panel, when possible, should be mounted in the shade and protected from the weather. The panel should be located at a convenient height (usually about five feet above the ground) and where it will be accessible for maintenance.

2.17 AX100 ADVANTEX TREATMENT SYSTEM

Orenco Systems[®], Inc. AX100 AdvanTex[®] Treatment System shall be installed in conformance with the engineer's plans and manufacturer's guidelines. The AX100 is a packed bed filter consisting of a proprietary textile media housed in a 16' x 8' x 3.5'. The media has been specifically engineered for wastewater applications. The item is patented and the engineer knows of no equivalent.

2.18 ADVANTEX[®] VENTILATION SYSTEM

A. Ventilation system shall be a passive system and include air intake and exhaust ports on each pod.

2.19 BioClere by AquaPoint

- A. The BioClere treatment system by AquaPoint has been approved for use on this project as an “or equal” equipment vendor. See notes in paragraph 1.04 in this section regarding the use of an alternate equipment vendor.
- B. Vendor contact information: Craig Lindell, Aquapoint.3 LLC; chlindell@aquapoint.com ; (774) 930-3899.

PART 3 – EXECUTION

3.01 PRECONSTRUCTION CONFERENCE

Before any work at the site is started, a conference attended by the **OWNER**, **CONTRACTOR**, **ENGINEER**, **MANUFACTURE**, **OPERATOR** and others as appropriate will be held to establish a working understanding among the parties as to the work involved for installing each component of the treatment system. At this conference, the **OWNER**, **CONTRACTOR**, **ENGINEER**, and **MANUFACTURE** shall designate, in writing, a specific individual to act as **INSPECTOR** for the installation of the treatment system. Any cost or fees associated with the services of the **INSPECTOR** or the **ENGINEER** during construction will be the responsibility of the **OWNER**.

3.02 INSTALLATION AND FIELD TESTING TRAINING

The **MANUFACTURER** shall provide the services of a trained representative to instruct the installing **CONTRACTOR’S** crew and **INSPECTOR** regarding the proper installation and field testing of each component per the **MANUFACTURE’S** recommendations and requirements. The **MANUFACTURER** shall have a trained representative provide installation and field testing training services for a minimum of one (1) visit of a minimum of one (1) eight-hour day at the beginning of construction.

3.03 QUALITY CONTROL

- A. To ensure quality control, the **INSPECTOR** shall inspect and certify that an initial installation of the AdvanTex[®] system is in compliance with the **MANUFACTURE’S** recommendations and requirements.
- B. Upon completion of the inspection, the **INSPECTOR**, in coordination with the **ENGINEER**, shall perform or direct the **CONTRACTOR** to perform any required adjustments to the equipment and place into operation under the supervision of the **ENGINEER**. All equipment and materials required to perform the testing shall be the responsibility of the **CONTRACTOR**. A letter of completion shall be signed by the **INSPECTOR** and copies faxed, emailed, or mailed to the **ENGINEER** and **MANUFACTURE** within one (1) week of the AdvanTex[®] system being installed and prior to System Commissioning.
- C. The **MANUFACTURER** shall provide the services of a trained representative for a minimum of one (1) visit of a minimum of one (1) eight-hour day for the purpose of quality control during construction.

3.04 SYSTEM COMMISSIONING

- A. The **MANUFACTURER** shall provide the services of a trained representative for training the **OWNER'S** service provider, and inspecting the AdvanTex[®] installation. The inspection will include items covered from the installation training. Upon system commissioning, the **MANUFACTURER'S** trained representative shall provide the **ENGINEER** a written report of findings. The **ENGINEER** should then perform or direct the **CONTRACTOR** to perform any required adjustments to the equipment and place into operation. All equipment and materials required to perform additional testing shall be the responsibility of the **CONTRACTOR**. The **MANUFACTURER** shall submit to the **ENGINEER** and **OWNER**, a detailed start-up checklist, according to the manufacturer's inspection and startup procedures.
- B. The **MANUFACTURER** shall provide the services of a trained representative for a minimum of one (1) visit of a minimum of one (1) eight-hour day for the purpose of system commissioning.

3.05 MANUFACTURER SITE VISITS

- A. The **MANUFACTURE** shall provide the services of a manufacturer's representative for a minimum of three (3) visits of a minimum of one (1) eight-hour day each. The visits shall be for the following:
1. INSTALLATION AND FIELD TESTING TRAINING
 2. QUALITY CONTROL
 3. SYSTEM COMMISSIONING
- B. The visits shall be scheduled after the Pre-Construction Meeting and after an Inspector is designated.

3.06 SPARE PARTS

The **MANUFACTURER** shall provide a spare pump, six (6) spare floats, check valve, control components, and nozzles, and various other necessary components deemed necessary.

3.07 OPERATION AND MAINTENANCE

The **MANUFACTURER** shall provide five (5) operation and maintenance manuals, four (4) to be sent to the **OWNER**, and one (1) sent to the **ENGINEER**.

END OF SECTION

REMOVE EX. FENCE FOR NEW EXPANDED FENCE AREA

8'Ø 6000 GAL RECIRCULATION TANK; USE EXCAVATED EARTH FOR EMBANKMENT AROUND PODS.

EXPAND FENCED AREA



ROBERT M. AND RAYMOND N. BREWER
KV-2119

NOTES:

1. FOR COMPATIBILITY AND TO INSURE A COMPLETE AND OPERATIONAL SYSTEM, THE EQUIPMENT SUPPLIER WILL FURNISH AX100 PODS, RECIRCULATION TANK (WITH CONTENTS AS SHOWN ON C104), RECIRC. PUMPS, SPECIALTY PIPING, PASSIVE VENTS, CONTROLS, AND ALL OTHER PROPRIETARY APPURTENANCES. IF CONTRACTOR SEEKS TO HAVE AN ALTERNATE BRAND DEEMED "EQUAL", SEE SPECIFICATIONS FOR SUBMITTAL REQUIREMENTS PRIOR TO BID.
2. CONTRACTOR WILL PROVIDE UNINTERRUPTED SEWER SERVICE FOR THE HOMES OF BOLTON ESTATES DURING CONSTRUCTION. TYING IN THE NEW SYSTEM WILL BE COORDINATED WITH SHELBY COUNTY ENGINEERING.

EX. ELECTRIC LINE APPROXIMATE LOCATION FIELD VERIFY PRIOR TO CONSTRUCTION

EX. PAD-MOUNTED TRANSFORMER

EX. FENCE

EX. EQUIPMENT SHELTER

REPLACE EX. FLOW METER

EX. PROPERTY LINE SHELBY COUNTY, TN INST. 11093287

EX. 2" F/M, APPROXIMATE LOCATION. FIELD VERIFY PRIOR TO CONSTRUCTION.

1 NEW CONTROL PANEL WITH FILTER SYSTEM SHALL OPERATE PUMPS ON AN ALTERNATING LEAD/BACKUP BASIS

PROVIDE & INSTALL ADDITIONAL PUMP ORENCO MODEL P500712 CODE: 1H04B

RETAIN EX. PUMP FOR NEW SYSTEM

4" TEE AND CLEAN OUT (TYP.)

4" SDR 17 PVC PIPE TO EX. UNDERGROUND TANK. FITTINGS AS REQ'D. 2% SLOPE, 3' MIN. COVER.

REPLACE 30' OF EXISTING FENCE

EX. INFLUENT LINE

PROPERTY LINE LOT 20, BOLTON ESTATES SUBDIVISION PLAT BOOK 173, PAGE 25

20' INGRESS/EGRESS & UTILITY ESMT.

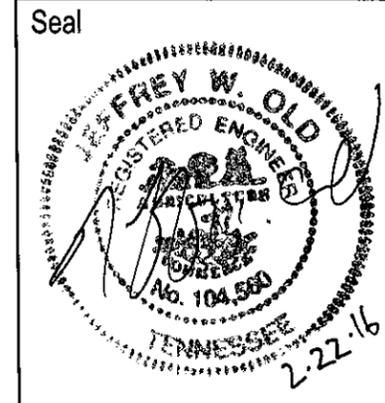
ADVANTEK AX100 SYSTEM (3 PODS) OR APPROVED EQUAL.

NEW ORENCO PF501012 EFFLUENT PUMP. SEE DETAILS ON SHEET C104

EX. GRAVEL ACCESS ROAD

INTERCEPT EX. INFLUENT LINE, CAP PIPE TO THE EX. INTAKE TANK WEST. MATCH EX. PIPE SIZE, FITTINGS AS REQUIRED.

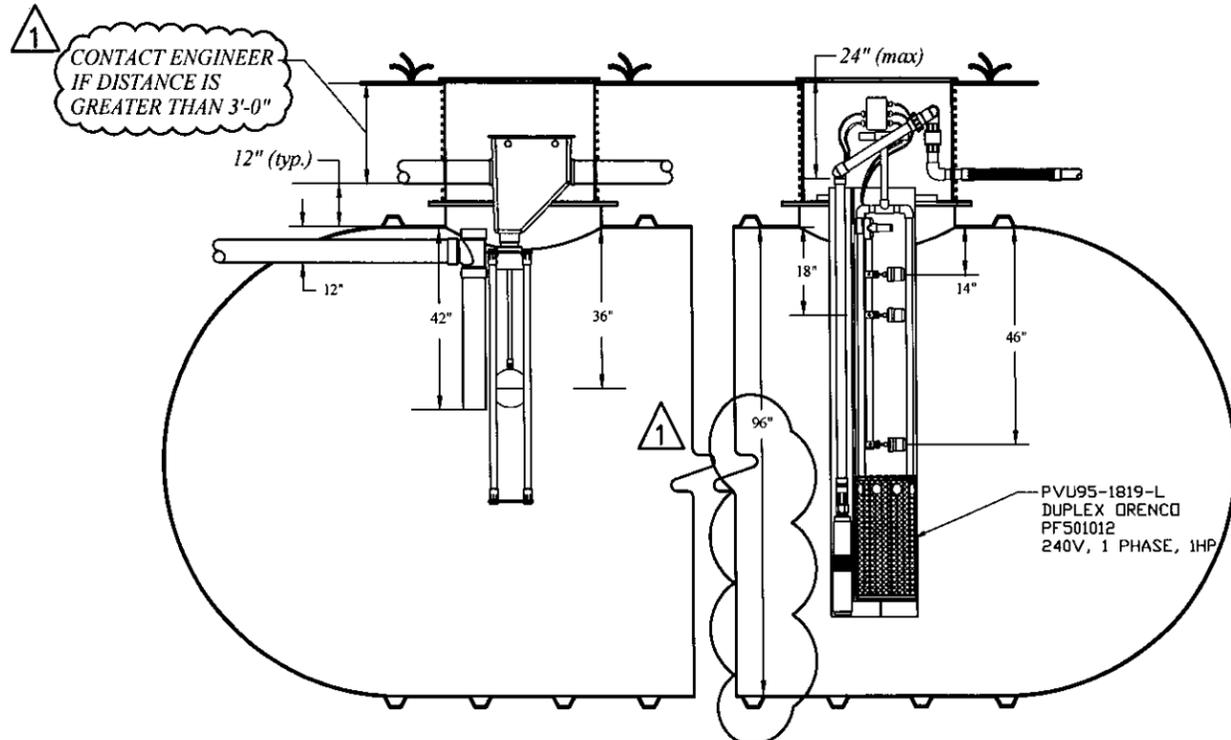
1 REVISION PER ADDENDUM 1. JWO 2/17/16



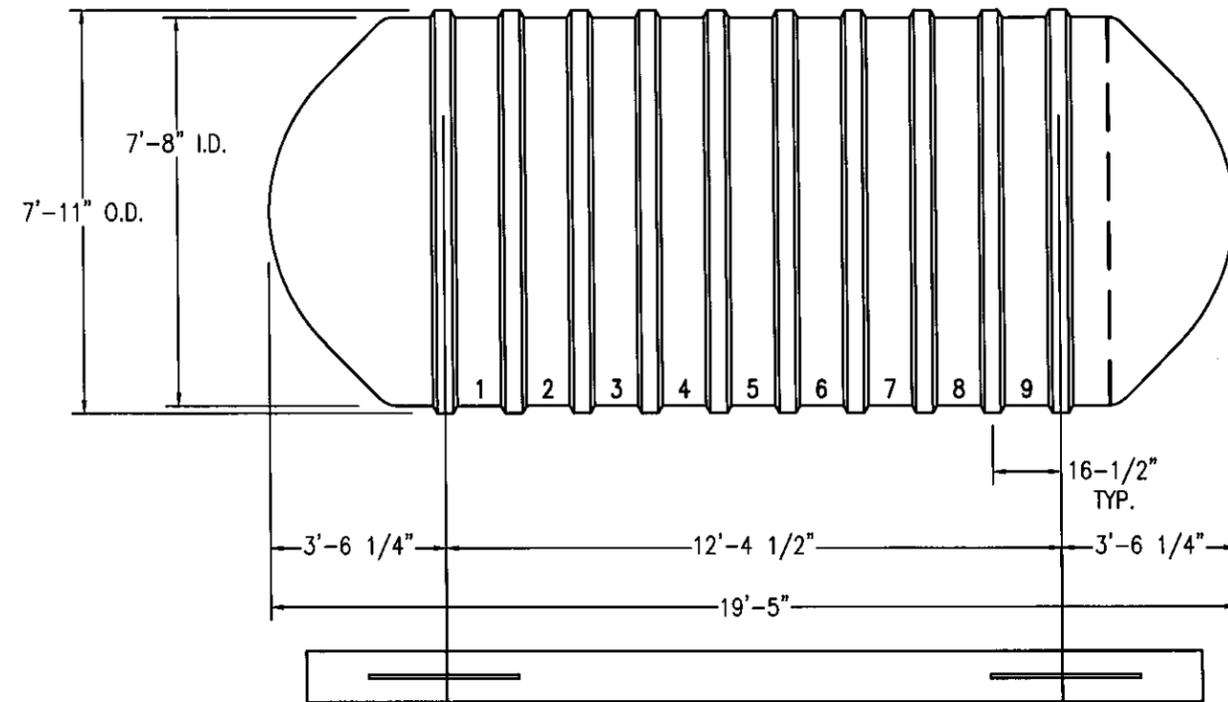
FISHER ARNOLD
ENGINEERING INTEGRATION
9190 Crestwyn Hills Drive | Memphis, Tennessee 38125-9539
901.748.1811 | Fax: 901.748.3115 | www.fisherarnold.com

BOLTON ESTATES WASTE WATER
SHELBY COUNTY
BOLTON, TN

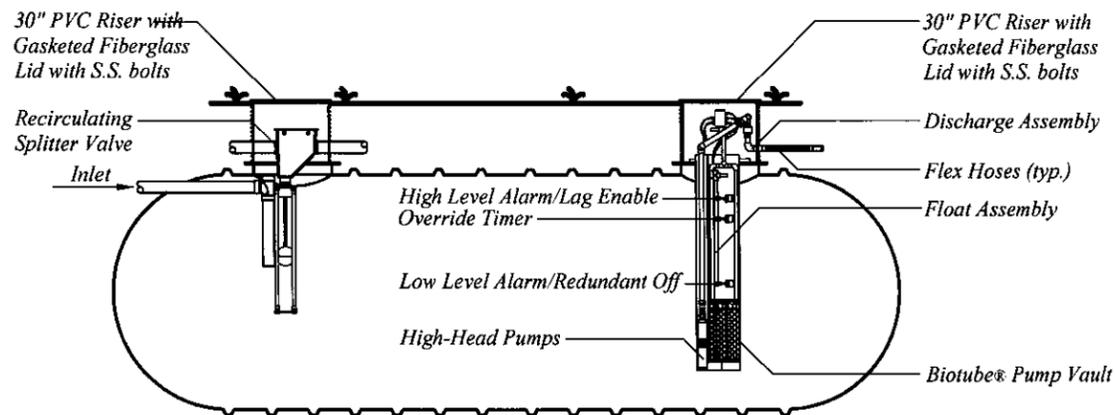
DESIGN: JWO	DRAWN: JWB	SCALE: 1" = 20'	SHEET
DATE: 01/14/2016	SITE PLAN		C101
JOB #: A9105			



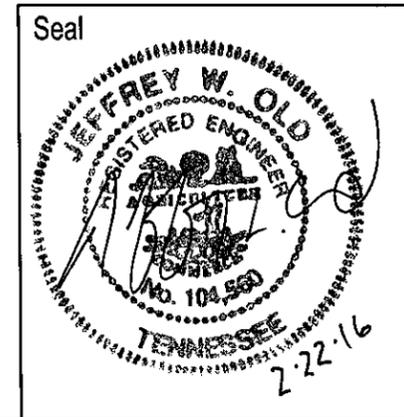
RECIRCULATION TANK FLOAT AND RSV SETTINGS
N.T.S.



OPTIONAL 12"x 12"x 18' DEADMAN
RECIRCULATION TANK
N.T.S.

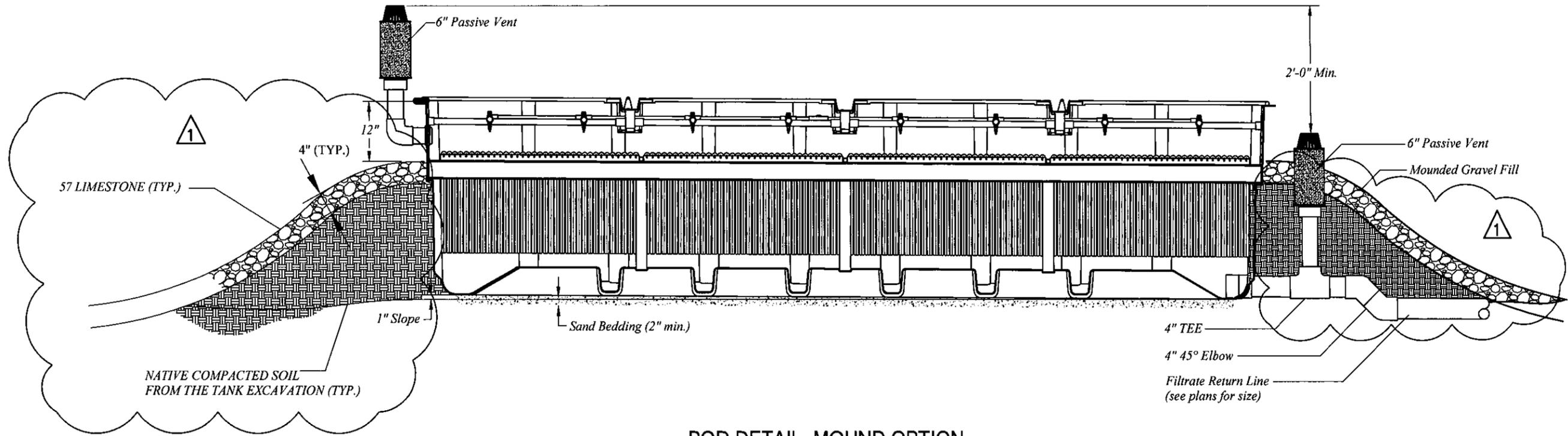


RECIRCULATION TANK MECHANICAL ASSEMBLY
N.T.S.



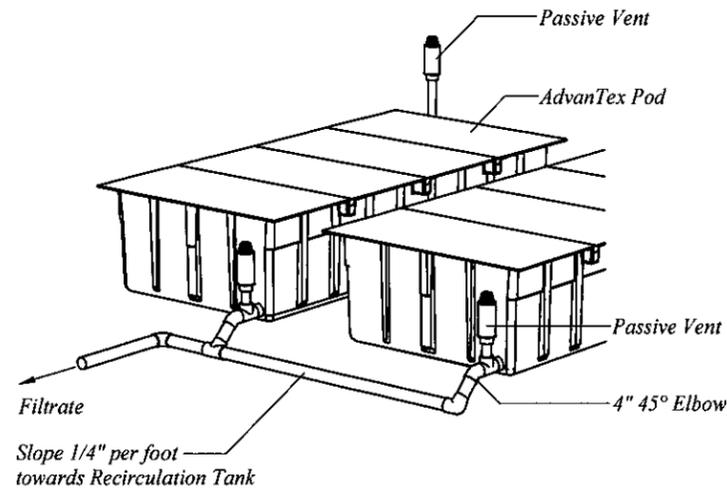
1 REVISION PER ADDENDUM 1. JWO 2/17/16

 FISHER ARNOLD ENGINEERING INTEGRATION 9180 Crestwyn Hills Drive Memphis, Tennessee 38125-8538 901.748.1811 Fax: 901.748.3115 www.fisherarnold.com	BOLTON ESTATES WASTE WATER SHELBY COUNTY BOLTON, TN		DESIGN: JWO DATE: 01/14/2016 JOB #: A9105	DRAWN: JWB RECIRCULATION TANK	SCALE: N.T.S.	SHEET C104



POD DETAIL- MOUND OPTION

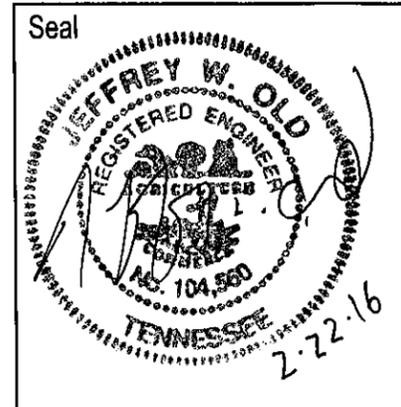
$\frac{1}{2}'' = 1'-0''$



MULTI POD FILTRATE RETURN WITH PASSIVE VENTS

N.T.S.

Δ 1 REVISION PER ADDENDUM 1. JWO 2/17/16



 <p>FISHER ARNOLD ENGINEERING INTEGRATION 9180 Crestwyn Hills Drive Memphis, Tennessee 38125-8538 901.748.1811 Fax: 901.748.3115 www.fisherarnold.com</p>	<p>BOLTON ESTATES WASTE WATER SHELBY COUNTY BOLTON, TN</p>	DESIGN: JWO	DRAWN: JWB	SCALE: 1/2"=1'-0"	SHEET
		DATE: 01/14/2016	PASSIVE VENT DETAILS		
		JOB #: A9105			

GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY THE SHELBY COUNTY ENGINEERING OFFICE AT 901-222-7705 A MINIMUM OF 24 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. ALL NEWLY CUT OR FILLED AREAS LACKING ADEQUATE VEGETATION SHALL BE SEEDED, MULCHED, FERTILIZED, AND/OR SODDED AS SPECIFIED TO EFFECTIVELY CONTROL SOIL EROSION.
3. THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE AND NOT NECESSARILY ALL OF SAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE APPROPRIATE UTILITY COMPANY TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES PRIOR TO THE INITIATION OF ANY CONSTRUCTION ON THE PROJECT OR IN THE STREETS BORDERING THE PROJECT. THE CONTRACTOR SHALL ALSO ASSUME FULL RESPONSIBILITY FOR DAMAGE TO ANY UTILITIES ENCOUNTERED WITHIN AND ADJACENT TO THE CONSTRUCTION LIMITS, WHETHER SHOWN ON THE PLANS OR NOT, DURING THE WORK ON THE PROJECT. FOR SITE LOCATIONS OF EXISTING UTILITIES INVOLVING MLG&W, BELLSOUTH AND/OR TEXAS GAS, CALL 1-800-351-1111. FOR SANITARY SEWER LOCATIONS, CALL RANDY CRAWFORD AT 901-508-5782.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AT ALL TIMES.
5. ALL CONSTRUCTION MATERIALS AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE SHELBY COUNTY CONSTRUCTION SPECIFICATIONS, UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL PROPERTY LINES PRIOR TO CONSTRUCTION. GRADING, CLEARING AND THE ERECTION OR REMOVAL OF FENCES ALONG PROPERTY LINES SHALL BE FULLY COORDINATED WITH ADJACENT PROPERTY OWNERS.
7. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS PRIOR TO COMMENCEMENT OF WORK. ANY CONSTRUCTION WORK AFFECTED BY SAID DISCREPANCIES AND/OR VARIATIONS SHALL CEASE UNTIL ADDRESSED BY THE PROJECT ENGINEER.
8. ALL WORK SHALL BE PERFORMED IN SUCH A MANNER THAT ADJACENT PROPERTIES ARE NOT DAMAGED OR ADVERSELY AFFECTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A SAFE WORK ENVIRONMENT, INCLUDING THE INSTALLATION OF TEMPORARY FENCING AND OTHER SAFETY BARRIERS AS NECESSARY DURING ALL PHASES OF CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION RELATED SURVEYING, INCLUDING ALL LAYOUT AND GRADE STAKING.
11. IT IS MANDATORY THAT THERE SHALL BE NO INTERRUPTION OF SEWER OR WATER SERVICE TO USERS AT ANY TIME DURING THE CONSTRUCTION OF THE PROJECT. IT IS ALSO MANDATORY THAT THERE SHALL BE NO RELEASE OF SEWAGE TO THE ENVIRONMENT AT ANY TIME.

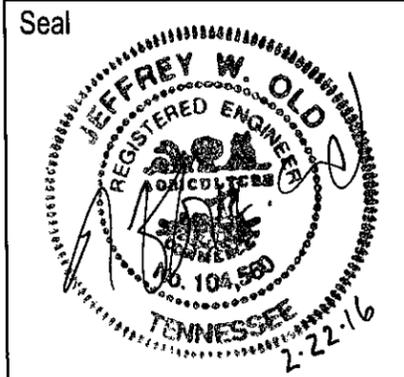
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PROJECT FLOW PARAMETERS-INFLUENT
BOD₅ 100-300 RANGE

PROJECT TREATMENT GOALS EFFLUENT
BOD₅ 45 mg/L

TDEC PERMIT NUMBER
SOP-04050

1 REVISION PER ADDENDUM 1. JWO 2/17/16



 <p>FISHER ARNOLD ENGINEERING INTEGRATION 9180 Crestwyn Hills Drive Memphis, Tennessee 38125-8538 901.748.1811 Fax: 901.748.3115 www.fisherarnold.com</p>	<p>BOLTON ESTATES WASTE WATER SHELBY COUNTY BOLTON, TN</p>	DESIGN: JWO	DRAWN: JWB	SCALE: N/A	SHEET C100
		GENERAL NOTES			
		DATE: 01/14/2016	JOB #: A9105		