HTE# REPAIR

Harnett County Department of Public Health

25761

Improvement Permit

A building permit cannot be issued with only an Improvement Permit

PROPERTY LOCATION: UNION CIRCLE

ISSUED TO: DEMETRIES MCLAURIN SUBDIVISION WOODSHIRE LOT # 77

NEW ☐ REPAIR ☒ EXPANSION ☐

Type of Structure: 4 BEDROOM HOUSE (EXISTING)

Site Improvements required prior to Construction Authorization Issuance:

Proposed Wastewater System Type: _____

Projected Daily Flow: 480 GPD

Number of bedrooms: 4 Number of Occupants: 8 max

Basement ☐Yes ☒ No

Pump Required: ☒Yes ☐ No ☐ May be required based on final location and elevations of facilities

Type of Water Supply: ☐ Community ☒ Public ☐ Well Distance from well 100 feet

Permit valid for: ☒ Five years ☐ No expiration

Permit conditions: _____

Authorized State Agent:: _____ REHS Date: 11/2/09 SEE ATTACHED SITE SKETCH

The issuance of this permit by the Health Department in no way guarantees the issuance of other permits. The permit holder is responsible for checking with appropriate governing bodies in meeting their requirements. This site is subject to revocation if the site plan, plat, or the intended use changes. The Improvement Permit shall not be affected by a change in ownership of the site. This permit is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to conditions of this permit..

Construction Authorization

(Required for Building Permit)

The construction and installation requirements of Rules .1950, .1952, .1954, .1955, .1956, .1957, .1958. and .1959 are incorporated by references into this permit and shall be met. Systems shall be installed in accordance with the attached system layout.

ISSUED TO: DEMETRIES MCLAURIN PROPERTY LOCATION: UNION CIRCLE

SUBDIVISION WOODSHIRE LOT # 77

Facility Type: 4 BEDROOM HOUSE ☐ New ☐ Expansion ☒ Repair

Basement? ☐ Yes ☒ No Basement Fixtures? ☐ Yes ☒ No

Type of Wastewater System** _____ (Initial) Wastewater Flow: 480 GPD

(See note below, if applicable ☐)

SEE PROPOSAL (Repair)

Installation Requirements/Conditions

Septic Tank Size _____ gallons

Pump Tank Size _____ gallons

Number of trenches _____

Exact length of each trench _____ feet

Trenches shall be installed on contour at a Maximum Trench Depth of: _____ inches (Trench bottoms shall be level to +/-1/4" in all directions)

Trench Spacing: _____ Feet on Center

Soil Cover: _____ inches (Maximum soil cover shall not exceed 36" above the trench bottom)

Pump Requirements: _____ ft. TDH vs. _____ GPM

_____ inches below pipe

Aggregate Depth: _____ inches above pipe

_____ inches total

Conditions: SEE SEPTEMBER 2009 PROPOSAL FROM FEBRUARY ASSOCIATES. FOR ALL SYSTEM SPECIFICATIONS.

**If applicable: *I understand the system type specified is different from the type specified on the application. I accept the specifications of this permit.*

Owner/Legal Representative Signature: _____ Date: _____

This Construction Authorization is subject to revocation if the site plan, plat, or the intended use changes. The Construction Authorization shall not be transferred when there is a change in ownership of the site. This Construction Authorization is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to the conditions of this permit. SEE ATTACHED SITE SKETCH

Authorized State Agent: _____ REHS (OLIVER TOLKOOFF) Date: 11/2/09

Construction Authorization Expiration Date: 11/2/14

FEBRUARY ASSOCIATES, INC.
700 OLD OAKS LANE
PITTSBORO NC 27312

Phone: (919) 545-0785
Email: february86@earthlink.net
Fax: (919) 542-3482

Memo

November 2, 2009

To: Oliver Tolksdorf
fax: 910 893 9371

From: Kathy Morris
pages: 2

Re: Lot 77 Woodshire

Attached is the Treatment Equipment Disclosure document that was missing from the plans we sent you in September. I received it from the builder this morning. It goes into the plans as page 5.

Please let me or Mike Eaker know when we might be able to get this repair permitted. I'm assuming the builder is still paying for pump & haul on this site, and I expect he's anxious to get everything resolved.

TREATMENT EQUIPMENT DISCLOSURE

Property Physical Address: 200 Union Circle
Legal Description:/ PIN: _____
State of North Carolina, County of Harnett

The Owner owns or controls the property upon which a ground absorption sewage treatment system (hereinafter "system") is installed, such system being designated a Type V, Treatment Standard II, system under the Rules for Sanitary Sewage Collection, Treatment and Disposal found at 15A N. C. administrative Code 18A.1900.

The Environmental Management Commission adopts rules governing the operation and maintenance of innovative wastewater systems approved and permitted under Subsection (a) of Section 130A-343 of the General Statutes of North Carolina to protect the public health and environment. The implementing code, 15A N.C. Administrative Code 18A.1961, requires a contract to be executed between the system owner and a management entity prior to the issuance of an Operation Permit for the Treatment System and shall be in effect for as long as the system is in use. The AdvanTex® Treatment System Dealer, the management entity for the system, requires that the Inspection and Maintenance Agreement be in place for as long as the AdvanTex® Treatment System equipment is in operation.

An Inspection and Maintenance Agreement for the system and associated equipment must be in place for the first three years of operation in order to maintain the manufacturer's warranty on the equipment. Discontinuance of the Inspection and Maintenance Agreement places the system and equipment out of service, which places the equipment in noncompliance with any and all expressed or implied warranty agreements. The Inspection and Maintenance Agreement shall be for a period of no less than thirty-six months and be renewed every thirty-six months. Inspection and maintenance of the system must be performed by a service provider trained and Authorized by the AdvanTex® Treatment System Equipment Dealer, AQWA, Inc., to service the equipment. The Equipment Dealer will provide for inspection and maintenance services and may offer the Owner a list of Authorized Service Providers from which to choose. The Inspection and Maintenance Agreement shall have a minimum of one inspection visit per year, but shall include all necessary visits to meet conditions or requirements of the State of North Carolina.

Discontinuance of the Inspection and Maintenance Agreement places the system and equipment out of service, which places the equipment in noncompliance with any and all expressed or implied warranty agreements. If the system is placed out of service, the local Health Department may be notified and an Out of Service Notification recorded by the Equipment Dealer or Authorized Service Provider. The Equipment Dealer and Authorized Service Provider shall have the authority to record an Out of Service Notification on the property deed, remove this document from the property deed when the equipment is removed from the property, place the system out of service for non-payment of fees or denial of reasonable access to the system for the purpose of inspection and maintenance by the Authorized Service Provider, and release any system information to mortgage, title and insurance companies, or regulatory agencies.

The system is equipped for 24 hour performance monitoring. The system includes a telemetry control panel requiring permanent connection to home phone service for reporting system performance to the manufacturer via 800 number service. Telephone service must be established prior to issuance of the Operations Permit and discontinuance of telephone service/access places the system and equipment out of service.

This document will be filed by the property owner with the deed of the property upon installation of the equipment. This agreement is binding upon subsequent owners as long as the equipment is in operation and shall be disclosed at property transfers by the Owner.

Owner(s): _____ Demetries McLaurin 13/Oct/09
Signature — Printed Name — Date

_____ _____ _____
Signature — Printed Name — Date

Notary: Loretta J. Faircloth Loretta J. Faircloth 10/13/09
Signature — Printed Name — Date

Commission Expires: June 8, 2013

LORETTA J. FAIRCLOTH NOTARY PUBLIC CUMBERLAND COUNTY

FEBRUARY ASSOCIATES, INC.
700 OLD OAKS LANE PHONE (919) 545-0785
PITTSBORO NC 27312 FAX (919) 542-3482

AdvanTex Pretreatment with Time-Dosed Pressure Manifold (TS-II)

Prepared by Kathy Morris, R.S., P.G. **Date:** 9/9/09

County: Harnett

Name: McLaurin (owner) **Water supply:** community water system

Property address: 200 Union Circle, Lillington

SYSTEM PARAMETERS

BDR 4 Daily Flow: 480 gal/day Original permit: 17900

EXISTING SYSTEM: existing pump-to-EEZZFlow single line, sized for 3-bedroom house. System failing (P&H)

Upgrade to 4-bedroom size: abandon [redacted] existing drainline media. Install new trenches between old, with pressure manifold distribution. Add pretreatment.

SYSTEM DESCRIPTION

Existing 1000-gallon septic tank and pump tank. ADD: risers to inlet & outlet manholes on ST. UPGRADE: ST effluent filter; PT riser. ADD: one AdvanTex pretreatment unit, 1000-gallon recirculation tank with pump in filtering pump vault, Vericomm control panel, UV disinfection unit. REPLACE: field dosing pump (unless existing pump is tested and meets new dosing criteria). ADD: time-dosing control floats to field dosing tank.

See NOTES section for additional requirements.

All proprietary components are to be installed according to standards and procedures set forth in Innovative Wastewater System Approval IWWS-2004-3-R1 (AdvanTex) and subsequent revisions.

All requirements of 15A NCAC 18A.1970 shall be met.

CONTENTS

Designer:
Kathy Morris
February Associates, Inc.
700 Old Oaks Lane
Pittsboro NC 27312
(919)545-0785

Soil Scientist:
Mike Eaker
Southeastern Soil & Environmental Assoc, Inc.
PO Box 9321
Fayetteville NC 28311
(910)822-4540

Client:
Caviness and Cates
contact: Ms. P.J. Satterly

Vendors:
AQWA Steve Barry
Wilson NC
(252)243-7694

Owner:
McLaurin

Permitting Authority:
Harnett County Health Department
Oliver Tolksdorf
(910)893-7547 x 6288

Notes

Tank testing: existing tanks shall be watertested. If they cannot meet watertight standards they must be replaced with approved new tanks.

Utility location: all existing underground utilities, including water line, must be clearly marked on on the site prior to the pre-construction meeting.

Pre-construction meeting: Before installation of system can take place, installer must schedule a pre-construction meeting on the site . This meeting should include the installer, the owner or representative, the Health Department, the soil scientist, the designer, the vendors of proprietary products, and others designated by Health Department.

Please try to schedule this meeting two weeks ahead.

Trench depth variation: The new trenches must fit between segments of the old, which do not lie on contour. Note trench depth guidance on site plan; install new trenches LEVEL.
New trenches are sized for gravel. Accepted media may be used, with no further reduction.

Construction inspections: The installer shall arrange for necessary inspections by vendors and Health Department during construction, and shall also arrange for a final start-up inspection. This final inspection should include the vendors, Health Department, designer, owner or representative, Certified Operator, and others designated by Health Department.

AQWA™
The clear leader.

April 14, 2009

To whom it may concern,

Subject: Designer Certification, AdvanTex Treatment Systems

The following Designer's certification for Advantex Wastewater Treatment Systems with Drip systems is up to date. Kathy Morris is trained and experienced with the system design, application, and installation, and is able to provide these services to property owners and builders. We will notify the Health Department should any changes be made to this listing.

Kathy Morris
February Associates, Inc.
700 Old Oaks Lane
Pittsboro, NC 27312
Phone: (919) 545-0785

Please provide a copy of this letter to property owners who are issued permits or requesting information regarding AdvanTex Treatment Systems.

Sincerely,

Mike Barry
Vice President

AQWA
The clear leader.

8/20/2009

February Associates, Inc.
700 Old Oaks Lane
Pittsboro, NC 27312
ATTN: Kathy Morris R.S., P.G.

Subject: 200 Union Circle, Harnett County, NC

Flow Characteristics (Four (4) Bedrooms)
Design Flow – 480 GPD – Per Table I
Peak Flow – 528 GPD (+10%)
Average Flow – 384 GPD (-20%)

Influent (not to exceed)
BOD5 = 350 mg/l
TSS = 200 mg/l
TKN = 100 mg/l

Effluent (TS-II per design)
CBOD5 = 10 mg/l
TSS = 10 mg/l
TN = >60% Reduction
Fecal Coliform = <1,000 cfu

This certification reflects the design parameters as indicated above and assumes no other environmental factors that will adversely affect treatment. Excessive floor strippers, cleaners, grease, chemotherapy agents, antibiotics, or other non-biodegradable substances may adversely affect system performance.

A copy of this letter should be submitted to the county or state regulatory agency.

Sincerely,

Steve Barry R.S.

AQWA, Inc.

252 | 243 | 7693 PHONE 252 | 243 | 7694 FAX
2604 | Willis Court | Wilson, NC | 27896 ADDRESS
www.aqwa.net WEB

Treatment Standards

15A NCAC 18A .1970 ADVANCED WASTEWATER PRETREATMENT SYSTEM

(a) ADVANCED PRE-TREATMENT SYSTEM PERFORMANCE STANDARDS: A wastewater system with a design flow of up to 3000 gallons per day approved pursuant to 15A NCAC 18A .1957(c) or .1969 that includes an advanced pretreatment component shall be specifically designed to meet one of the effluent quality standards specified in Table VII prior to dispersal of the effluent to the soil and shall comply with the requirements of this Rule.

Table VII (Effluent Quality Standards for Advanced Pretreatment Systems)

Parameter	NSF-40	TS-I	TS-II
Carbonaceous Biochemical Oxygen Demand (CBOD)	<25 (mg/l)*	<15 (mg/l)	<10 (mg/l)
Total Suspended Solids (TSS)	<30 (mg/l)	<15 (mg/l)	<10 (mg/l)
Ammonium Nitrogen (NH4-N)		<10 (mg/l)	<10 (mg/l)
Total Nitrogen (TN) (TN is Total Kjeldahl Nitrogen plus Nitrate+Nitrite Nitrogen)			<20 mg/l or >60% removal
Fecal Coliform		<10,000 (colonies/100 ml)	<1,000 (colonies/100 ml)

*mg/l is milligrams per liter

Sampling Requirements

(n) SYSTEM PERFORMANCE: The performance of each system shall be monitored by the certified wastewater treatment facility operator (ORC). A performance report shall be submitted annually to the local health department by the ORC. Type of monitoring and monitoring frequency shall vary by type of approval, the designated performance standard, system design flow, and history of system performance as follows:

(1) Each system shall be visually inspected by the ORC at least annually using a procedure proposed by the manufacturer and approved by the state as part of the product's RWTS, Experimental, Controlled Demonstration, Innovative or Accepted System approval, as applicable,

(2) The 7-day and 30-day influent wastewater flow from the facility to the system prior to a monitoring visit shall be measured by the ORC using the recording device delineated in Subparagraph (k)(3) of this Rule, or by an alternate approved means. For systems serving Vacation Rentals subject to the North Carolina Vacation Rental Act, G.S. 42A, this visit shall be scheduled during the seasonal high use period and shall be coincident with any required water quality sampling. For existing systems where it is not feasible to directly obtain the past 7-day and 30-day influent wastewater flow data, wastewater usage during the 7 to 30 day period prior to the monitoring visit shall be estimated by using either elapsed time clock readings when an effluent pump is present, water meter readings, or as otherwise specified in the product or site-specific system approval.

(3) Effluent from an approved Controlled Demonstration, RWTS and Innovative System shall be sampled prior to disposal in the absorption field as follows:

(A) A Controlled Demonstration system shall be sampled quarterly for all applicable performance parameters until the system receives Innovative approval, unless the product specific approval includes an alternate monitoring schedule proposed by the manufacturer and approved by the State;

(B) Sites with an approved RWTS or Innovative system shall be grab or composite sampled annually for all applicable performance parameters (semi-annually when the design flow is 1500 to 3000 gallons per day). After two years of data have been collected from at least 50 separate sites that indicate compliant system performance, the number of parameters sampled for TS-I and TS-II Systems may be reduced by 50 percent. An alternative monitoring schedule may be proposed by the manufacturer and approved by the State when determined to provide an equal or more reliable indication of system performance compliance; or

(C) Sites with a design flow up to 1500 gallons per day, which are being managed under an on-going maintenance and operation contract between the owner and the system manufacturer or ORC authorized by the manufacturer, can alternatively be sampled randomly if the manufacturer chooses to comply with the performance audit requirements as stipulated in 15A NCAC 18A .1969(h)(8), when there are at least 10 operational systems covered under such contracts. The manufacturer can also choose to include other existing sites in the performance audit required prior to obtaining accepted system status. Notwithstanding this provision for random sampling, sampling at any other site not being sampled during the audit may be determined to be necessary by the ORC during the visual inspection of the system pursuant to Subparagraph (1) of this Paragraph.

An influent sample to the pre-treatment system (e.g., septic tank effluent) shall be taken concurrently whenever the system effluent is sampled and analyzed for at least BOD and TKN. Effluent shall be re-sampled within 15 days when laboratory results indicate non-compliance with Part (o)(1)(C) of this Rule and analyzed at least for the non-compliant parameter(s), unless an alternate re-sampling schedule is required for a site included in a performance audit. When re-sampling, an influent sample shall be collected concurrently and analyzed for the corresponding parameter.

(4) An Accepted System with a design flow up to 1500 gallons per day shall comply with Subparagraphs (n)(1) and (n)(2) of this Rule and 15A NCAC 18A .1969(h)(9). Routine sampling of individual sites shall no longer be carried out, unless determined to be necessary during the visual inspection of the system pursuant to Subparagraph (n)(1) of this Rule or if required as part of an enforcement action by the local health department or the State. In the event that sampling is determined to be necessary, an alternative monitoring schedule may be proposed by the manufacturer or the State and approved by the Commission when the system is granted accepted Status.

(5) All samples shall be collected, preserved, transported and analyzed in compliance with 40 CFR 136. The manufacturer shall demonstrate that the system can be sampled in compliance with 40 CFR 136 and that the method for system sampling accurately monitors system performance. Samples shall be analyzed by a state certified laboratory. Samples shall be analyzed for the applicable parameters. The sample collector shall maintain a complete chain of custody from sample collection to analysis for each sample collected. The results of all analyses for each sample shall be reported by the certified wastewater laboratory directly to the ORC and simultaneously to the health department and the state. Repeat sampling at any site shall be performed as required in the system approval, approved performance audit, this Rule, or as otherwise directed by the health department or state as part of an enforcement action. The owner or manufacturer or manufacturer's representative may also re-sample a system to verify or refute sample results, as long as the results of all samples collected are similarly reported.

Southeastern Soil & Environmental Associates, Inc.

P.O. Box 9321
Fayetteville, NC 28311
Phone/Fax (910) 822-4540
Email mike@southeasternsoil.com

June 15, 2009

Harnett County Health Dept.
307 Cornelius Harnett Blvd.
Lillington, NC 27546

Re: Hydraulic conductivity (Ksat) analysis for proposed LTAR increase, pretreated subsurface waste disposal repair system, Woodshire Subdivision, Lot 77, Harnett County, North Carolina

To whom it may concern,

An evaluation of soil and hydraulic conductivity (Ksat) has been conducted on the aforementioned property. The purpose of the investigation was to determine soil absorption rates for a proposed pretreatment subsurface waste disposal septic system to serve a 4 bedroom single family residence. [The residence was originally permitted by the local health department as a 3 bedroom home. Inadvertently, a 4 bedroom home was built on the property. Subsequently, the initially permitted septic system has failed]. All ratings and determinations were made in accordance with "Laws and Rules for Sanitary Sewage Collection, Treatment, and Disposal, 15A NCAC 18A .1900".

The soil in the proposed area consisted of 6 to 10 inches of loamy sand, underlain by a sandy clay that extended to 38 or more inches. This material was firm, sticky and plastic. Below this layer was a sandy clay loam (C horizon) that was firm to friable and extended to 60+ inches. [Note: Soil textures are estimates based on field measures. No laboratory measurements were required.]

Three compact constant head permeameter (CCHP) measurements were made in the presence of the local health department to determine a Ksat rate at depths ranging from 34 to 54 inches. Measurements ranged from 0.52 to 0.837 cm/hr. This equates to 3.06 to 4.93 gpd/sq. ft. 10% of the slowest Ksat measured (3.06 gpd/sq. ft.) equates to 0.306 gpd/sq. ft. (the originally assigned rate by the local health department was 0.3 gpd/sq. ft.) Using pretreatment typically allows application rates to be increased up to 100 percent. This equates to a 0.612 gpd/sq. ft. LTAR.

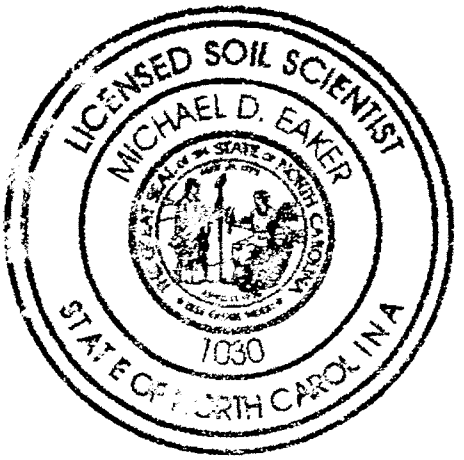
The proposed repair system is based on a 0.60 gpd/sq. ft. application rate which is approximately 20 percent of the measured rate. In my opinion, this rate should allow for sufficient drainage from the proposed repair system.

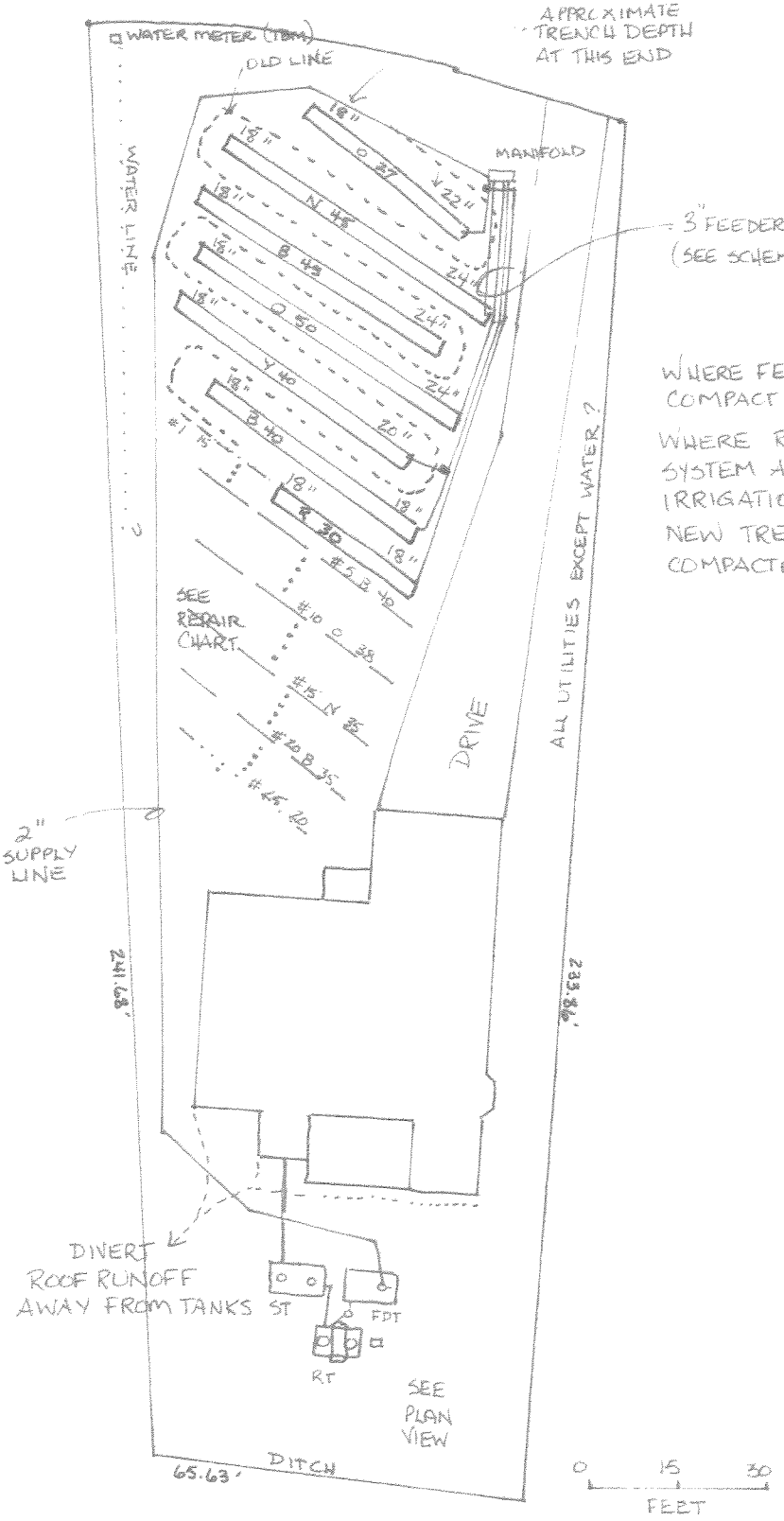
It is imperative that the homeowner not exceed the designed flow for this system of 480 gallons per day. Excessive water flows can lead to premature failure of the system resulting in the need for additional repairs.

It is also imperative that no grading, rutting, filling, compacting, etc. occur in the area of the proposed drainfield. I trust this is the information required at this time. Please call if you have any questions.

Sincerely,

Mike Eaker
NC Licensed Soil Scientist # 1030



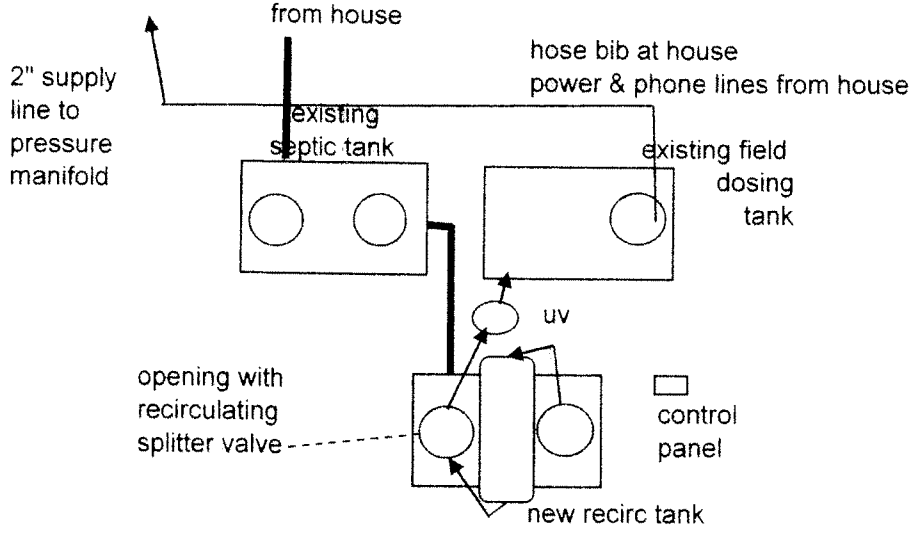


200 UNION CIRCLE	LOT 77 WOODSHIRE	FEBRUARY ASSOCIATES, INC.	
	HARNETT CO.	DRAWN BY: K. MORRIS	700 Old Oaks Lane Pittsboro NC 27312 (919)545-0785
SCALE:	1" = 30'	DATE: 8-14-09	

200 Union Circle, Lillington

Harnett County

PLAN VIEW, PROCESS FLOW
no scale



TAP CHART - INITIAL SYSTEM

Lot 77 Woodshire

Bench Mark 6.70 is = 100.00 set at water meter **Design Head:** 2.00

line	color	avg rod read	Elevation	available	used	tap size	flow/tap	gal/day	trench area	LINE LTAR
1	orange	5.9	100.80	27	27	1/2" 40 w/ fd	3.55	50.56	81	0.624
2	neon	6.8	99.90	48	45	1/2" 80	5.50	78.34	135	0.580
3	blue	7.6	99.10	49	45	1/2" 80	5.50	78.34	135	0.580
4	orange	7.7	99.00	52	50	1/2" 80	5.50	78.34	150	0.522
5	yellow	8.6	98.10	44	40	3/4" 80 w/ fd	5.05	71.93	120	0.599
6	blue	9.3	97.40	42	40	above	5.05	71.93	120	0.599
7	red	10.0	96.70	30	30	see line 1	3.55	50.56	90	0.562
			total	feet =	277	gal/min =	33.70		LTAR =	0.600
						antisiphon	0.00		ltar + 5%=	0.630
						TOTAL FLOW	33.70	GPM		

ELEVATIONS:

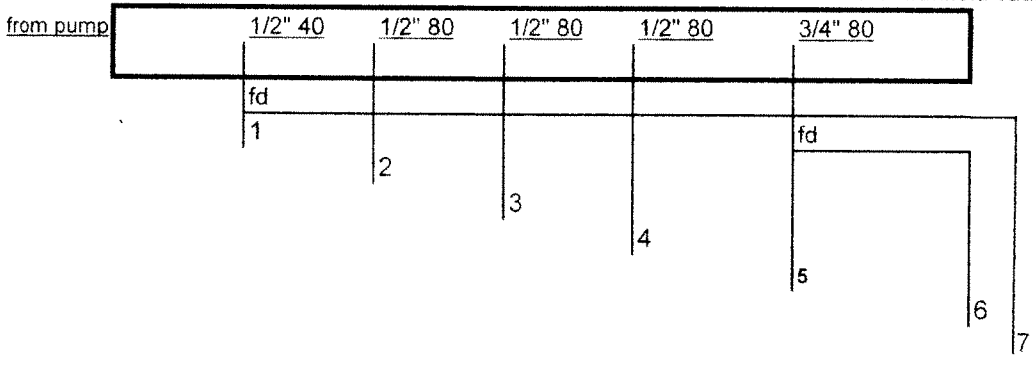
pump tank	89.00
pump	84.00
manifold	101.30
other	

(such as highest point on supply line, if between pump tank and field)

DOSE APPROXIMATION:

			PUMPING UP HILL?	y	
% PIPE VOLUME	69.98%		DESIGN FLOW	480	gpd
DOSE VOLUME	126	gal	PUMP RUN TIME	14.24	min/day
DOSE PUMP TIME	3.74	min/dose	PUMP TANK GAL/IN	21	gal/inch
DRAWDOWN	6.00	in	ELEVATION HEAD	17.30	feet
SUPPLY LINE LENGTH	300	ft	FRICTION & FITTINGS LOSS	8.27	feet
SUPP. LINE SCOUR VEL	3.22	ft/sec	DESIGN HEAD	2.00	feet
			TOTAL DYNAMIC HEAD	**27.57**	**feet**

Schematic is not to scale. Place flow dividers and/or tees OUTSIDE the manifold vault.



TIMED DOSING REQUIREMENTS		
Doses per day	4	
Dose interval	6	hours
Volume per dose	120	gal
Dosing rate	33.70	gpm
Pump run time	3.56	minutes

TIMER SETTINGS:
3.56 minutes ON
(3 minutes 34 seconds)
5 hours 56.44 minutes OFF
(5 hrs 56 minutes 26 seconds

See pump tank diagram for float settings

Lot 77 Woodshire **Pressure Manifold Materials**

This summary of materials includes major components of the system, and is meant to assist the installer in preparing an estimate. It does not include consumable supplies (glue, etc.), exaxt numbers of fittings, or materials incidental to standard installation. It does not include any specified drainage - curtain drains, etc.

septic tank	1000	gallon	existing	
effluent filter	yes			
pump tank	1000	gallon	existing	
field dosing pump	one	Zoeller N153		
see pretreat spex	simplex			
floats	three	with panel	mounted on float tree	
check valves	one	2" diameter	1 in FDT	
isolation valve	one	2" diameter	1 in FDT	
gate valves	one	2" diameter	at manifold	
threaded unions	one	2" diameter	1 in FDT	
supply line	300	feet	2" Sch. 40	LENGTH IS APPROXIMATE
manifolds	48	inch (minimum)	4" diam. Sch. 80, in approved vault	

taps	1/2" Sch 40:	1	3/4" Sch 40:		1" Sch 40:	
5	1/2" Sch 80:	3	3/4" Sch 80:	1	1" Sch 80:	

flow dividers	two	
y's	none	
inspection ports	5	If installed outside manifold vault, install as tee, riser, and cap in each feeder pipe
feeder pipes	as needed	3" Sch. 40
trenches	277	feet, polystyrene aggregate or chambers
fittings	couplings, tees, elbows, etc. as needed to connect components cleanouts, valve boxes, etc. as needed to provide access and protection to components	

System Curve Data	gpm	friction loss	TDH
	10	0.87	20.17
	20	3.15	22.45
	30	6.67	25.97
	40	11.36	30.66

DETAILS OF DRIP LINES

480 gpd @ 0.3 gal/sq.ft/day
1600 square feet
800 linear feet on 2' centers

Lot 77 Woodshire repair

TBM line	6.7 color	100.0 rod read	set at elev.	water meter length
1	*	10.0	96.70	15
2	*			15
3	*			15
4	*			15
5	blue	10.3	96.40	40
6	*			40
7	*			39
8	*			39
9	*			38
10	orange	10.9	95.80	38
11	*			37
12	*			37
13	*			36
14	*			36
15	neon	11.6	95.10	35
16	*			35
17	*			35
18	*			35
19	*			35
20	blue	12.4	94.30	35
21	*			33
22	*			30
23	*			27
24	*			25
25	*			20
26	*			15
				800

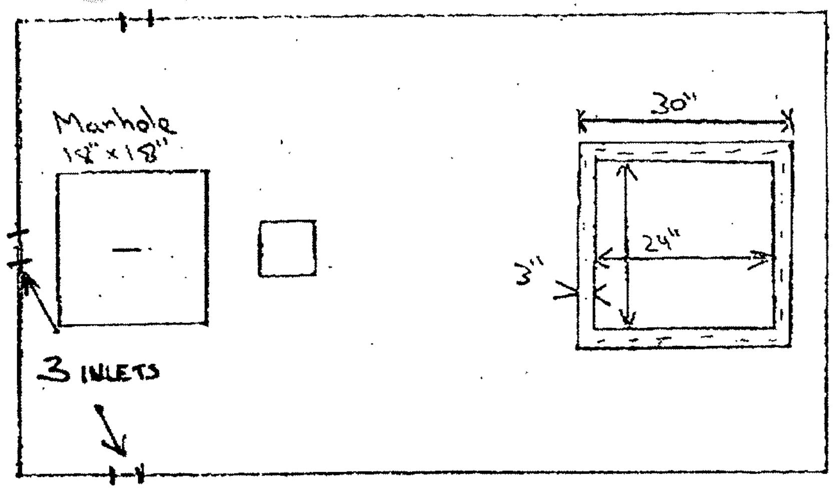
Address . P.O. Box 665
Warsaw, N.C. 28398

Note 1: Pump tank size and MFGR's indentifying imprint to be at left of outlet opening.

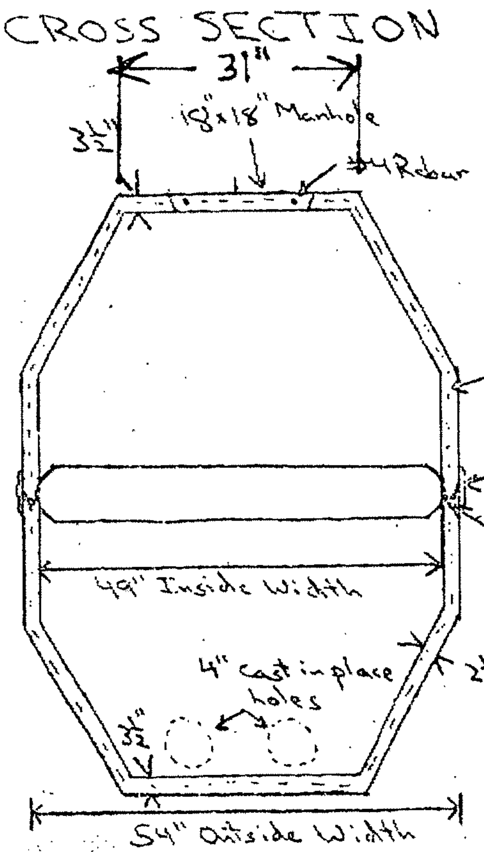
Pump Tank concrete 3500 PSI

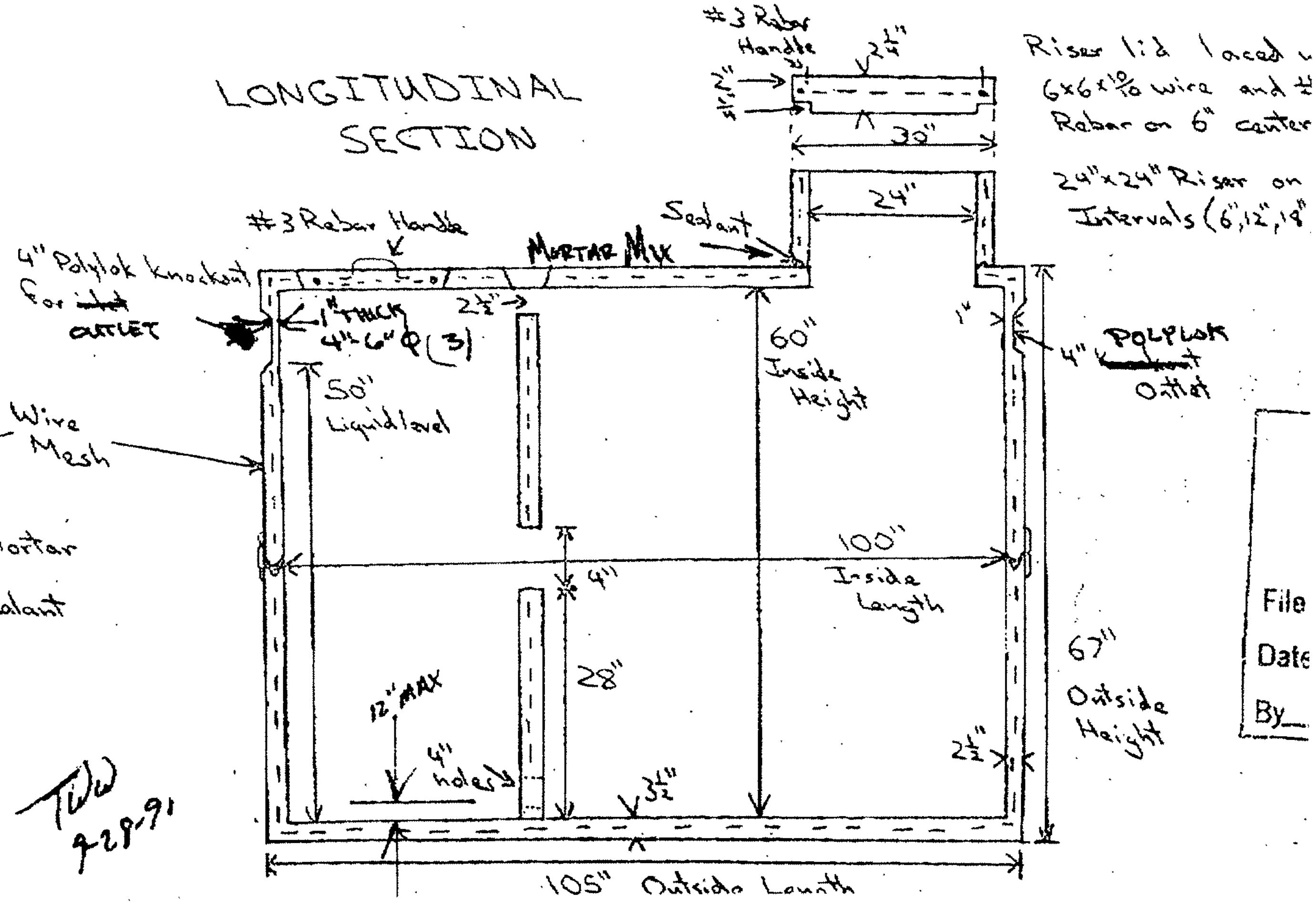
Total liquid working capacity 1000 gal.

Sealant: 1" diameter Concrete Sealant for groove, mortar mixture to be put on outside of Seam.



STB 833
PT 134





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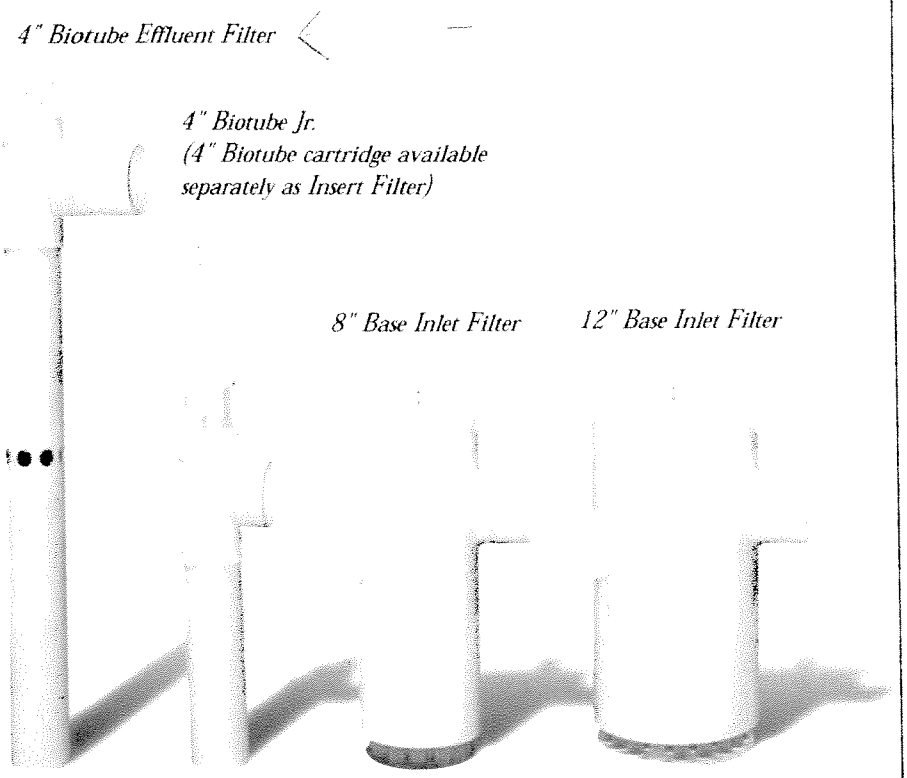
Date
By

Residential Biotube® Effluent Filters

Applications

Our patented* 4" Biotube Effluent Filters, Biotube Jr., Biotube Insert Filters, and Biotube Base Inlet Filters are ideal for residential septic tanks. They prevent large solids from leaving the tank, dramatically improving wastewater quality and extending the life of residential drainfields.



Orenco's superior effluent filters resist clogging better than all other brands. Our standard, full-sized 4" Biotube Effluent Filter provides maximum long-term protection in a complete package, with housing. Our 4" Biotube Jr., at half the size of our standard model, has more filtering capacity than the full-sized filters sold by other manufacturers. For tanks with existing outlet tees, the Jr. Insert Filter is ideal. And for low-profile tanks, there's the Base Inlet Filter.

Covered by patent numbers 5,492,635 and 4,439,323

To Order

Call your nearest Orenco Systems®, Inc. distributor. For nearest distributor, call Orenco at 1-800-348-9843 or go to www.orenco.com and click on "Distributor Locator."

APS-FT-1
Rev. 3.1 © 1/03
Orenco Systems®, Inc.

Standard Features & Benefits

- Has 5-10 times more flow area than other brands, so lasts many times longer between cleanings, increasing homeowner satisfaction
- Installs in minutes inside new or existing tanks; extendable tee handle for easy removal
- Easy to clean by simply hosing off whenever the tank needs pumping
- Removes about two-thirds of suspended solids, on average, extending drainfield life
- Corrosion-proof construction, to ensure long life

Optional Features & Benefits

- Alarm available, to signal the need for cleaning
- Flow modulating discharge orifices available to limit flow rate leaving tank, mitigating surges and increasing retention time
- Custom and commercial sizes available

Biotube Filtering Process

Effluent from the relatively clear zone of the septic tank, between the scum and sludge layers, horizontally enters the Biotube Effluent Filter. Effluent then enters the annular space between the housing and the Biotubes, utilizing the Biotubes' entire surface for filtering. Particles larger than the Biotube's mesh are prevented from leaving the tank.

Orenco Systems®
Incorporated

Changing the Way the World Does Wastewater®

www.orenco.com
www.vericomm.net

Submittal Data Sheet

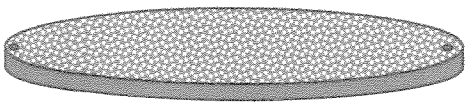
Fiberglass Access Lids

Orenco Systems® Incorporated
1-800-348-9843

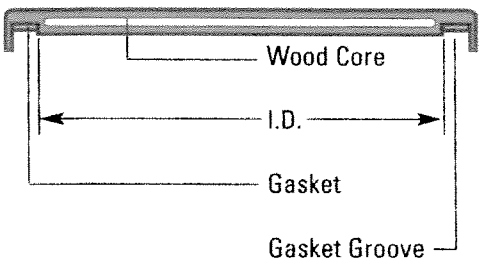
Applications

Orenco Fiberglass Access Lids are used as riser covers, pump basin covers, and access port covers. Lids fit Perma-Loc, Ultra-Rib, KOR FLO, and Ultra-Corr pipe.

Actual View



Cutaway View



General

Orenco Fiberglass Access Lids are molded using fiberglass reinforced polyester resin encapsulating a wood core. The finish is green and the top surface is textured to provide a non-skid surface. (Gasketed lids include a polyurethane or neoprene gasket.) Lid comes with either two or four 1/4" stainless steel flathead socket cap screws and a hex key wrench. Orenco Fiberglass Access Lids are capable of supporting a 2500 lb. wheel load; however, they are not designed or recommended for vehicular traffic.

Standard Models

FL18G-4BU, FL21G, FL24G, FL24-4B, FL24G-4BK, FL30G, FL48G

Nomenclature

FL □□ □ - □ - □ - □

- Fiberglass lid
- Lid diameter: 18", 24", 30", 48"
- Options:
  - G = gasket
  - V = vent
  - CF = carbon filter
  - I2 = 2" insulation
  - I4 = 4" insulation
- Attachment method:
  - Blank = 2-bolt-hole lid (30" diameter only)
  - 4B = 4-bolt-hole lid (24" diameter only)
  - 4BU = 4-bolt-hole lid Ultra-Rib (18" and 24" diameter only)
- Color:
  - Blank = green
  - B = brown
- Riser pipe:
  - Blank = Ultra-Rib, Perma-Loc
  - K = KOR FLO, Ultra-Corr

Specifications

Dimensions	Model FL18	Model FL21	Model FL24	Model FL30	Model FL48
O.D. (in.)	20.25	22.5	26.25	32.0	53.875
Groove I.D. (in.)	17.5	20.25	23.25	29.5	47.5
Avg. Thickness (in.)	0.75	0.75	0.75	1.0	1.5

Options Available

Feature	Model Code Adder	Optional/Standard
Air Vent	V	Optional
Carbon Filter[1]	CF	Optional
Lid Insulation[2]	I2 or I4	Optional

[1]For more information on this option, refer to the Carbon Filters Submittal Data Sheet, NSU-RLA-CF-1.

[2]Blue styrofoam; R-value per 2" increment is 10.

Materials of Construction

Fiberglass Reinforced Polyester
Wood Core
Neoprene or Polyurethane Gasket

AdvanTex®-AX20 Filter

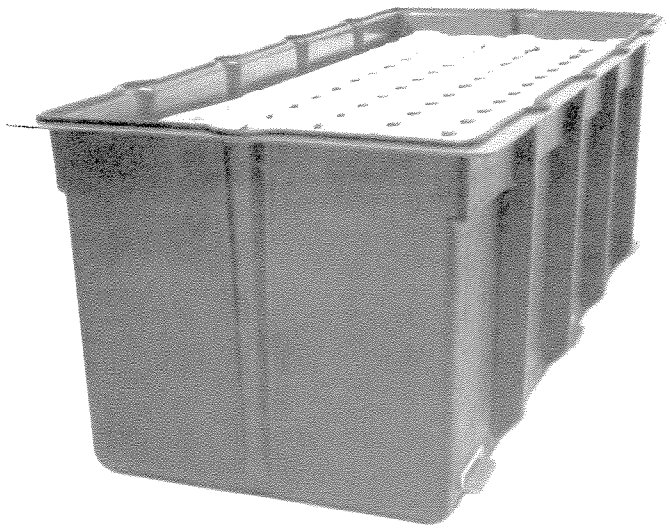
Residential Technical Data Sheet

Applications

Orenco's AdvanTex® Treatment System* is an innovative technology for onsite treatment of residential wastewater. The heart of the System is the AdvanTex® Filter, a sturdy, watertight fiberglass basin filled with an engineered textile material. This lightweight, highly absorbent textile material treats a tremendous amount of wastewater in a small space. The AdvanTex® Treatment System is ideal for:

- Small sites
- System upgrades and repairs
- New construction
- Poor soils
- Nitrogen reduction
- Price-sensitive markets
- Pretreatment

For sizing, see "AdvanTex® Design Criteria," NDA-ATX-2.



The heart of the AdvanTex® Treatment System is this sturdy, watertight fiberglass basin filled with an engineered textile material.

**Covered by U.S. patent numbers 5,980,748; 5,531,894; 5,480,561; 5,360,556; 5,492,635; and 4,439,323. Additional patents pending.*

Features/Unique Specifications

To specify this product, require the following:

- Wastewater treatment to better than "Secondary" Treatment Standards
- Consistent treatment, even during peak flows
- Timer operation for flow monitoring, flow modulation, and surge control
- Fixed film textile media (a polyester plastic), operated in an unsaturated condition
- Consistent media quality
- Low maintenance beyond annual servicing
- Low energy consumption (under $1.25-2.50/month power cost at national average electric rate of $.08 kWh)
- Complete pre-manufactured package, ready-to-install
- Watertight construction, corrosion-proof materials, tamper-proof lid bolts
- Anti-flotation flanges
- Quiet operation

Standard Models

AX20, AX20N

(AX20 units carrying the NSF logomark are labeled AX20N, per NSF protocol.)

Physical Specifications

Approximate Dimensions**

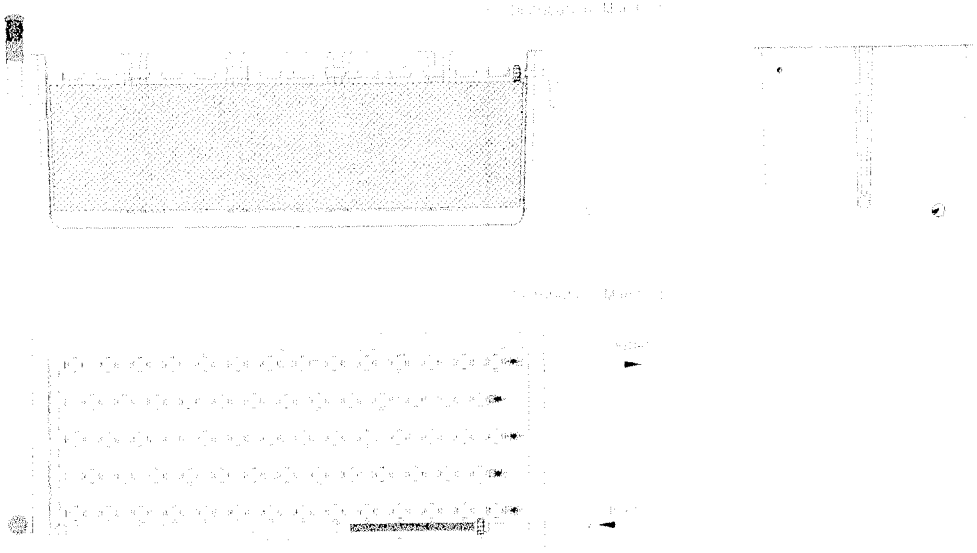
Filter Basin Length	91 in.
Width	40 in.
Height	31 in.
Area (footprint)	20 sq. ft.
Filter Dry Weight	300 lbs.

***See AdvanTex® Treatment System drawings for exact dimensions*

AdvanTex AX20 detail

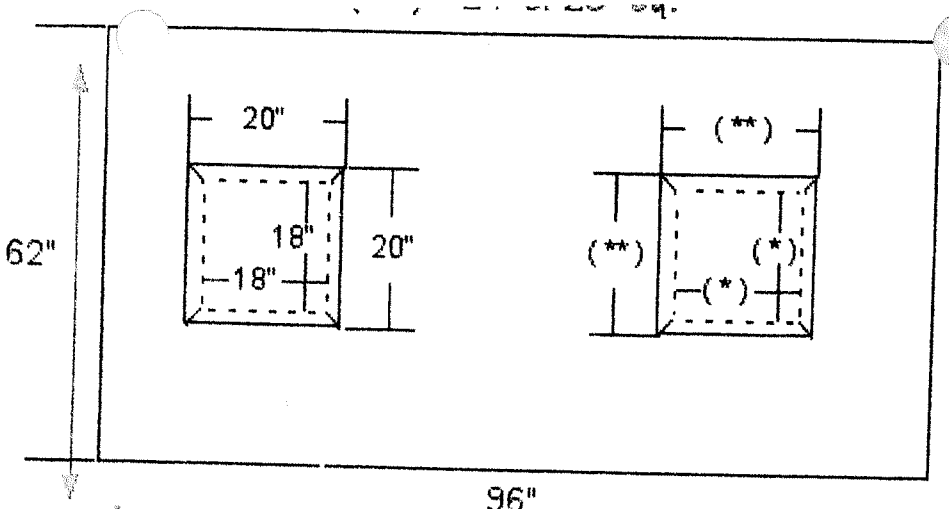
Scale: 1" = 2'-0"

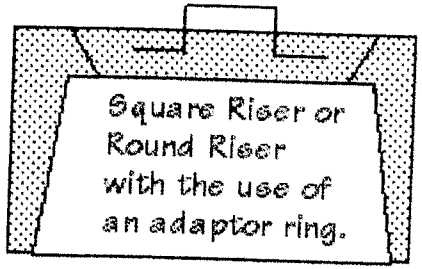
Orenco Systems
Incorporated

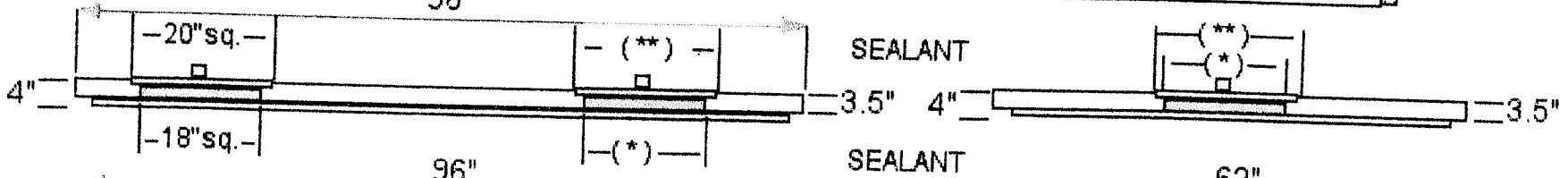


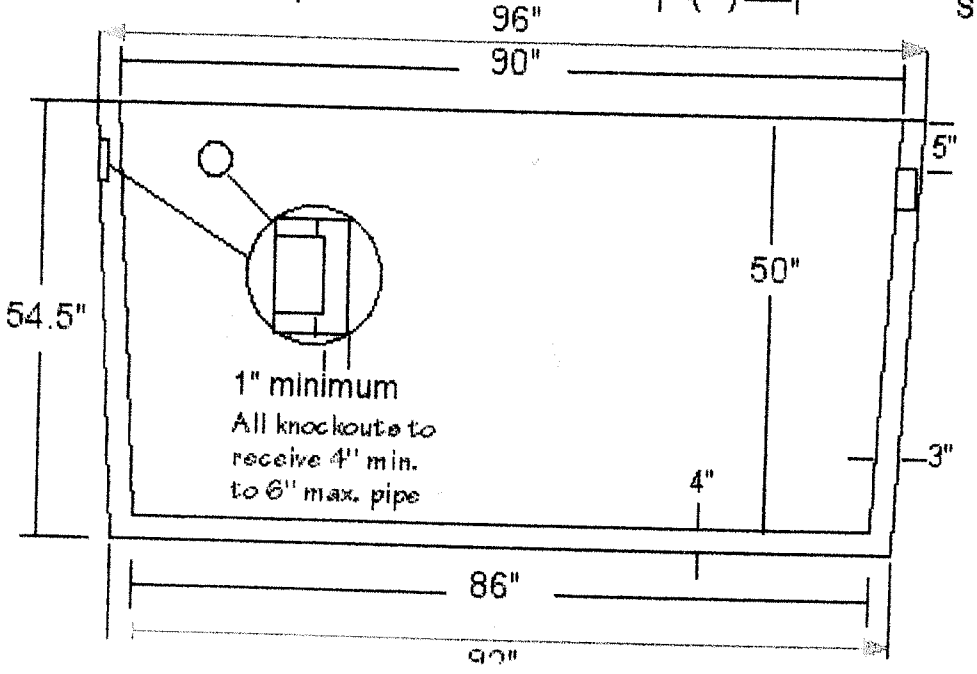
Date: 12/16/93 PT214 BLACKWELDER

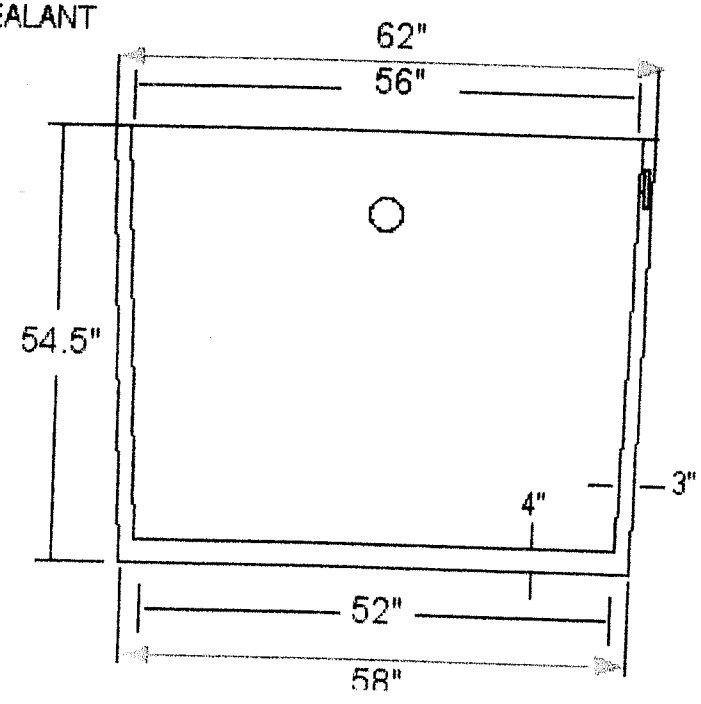
LIQUID CAPACITY: 1,028.57 Gallons
2.0 yds. - 8,000 lbs.









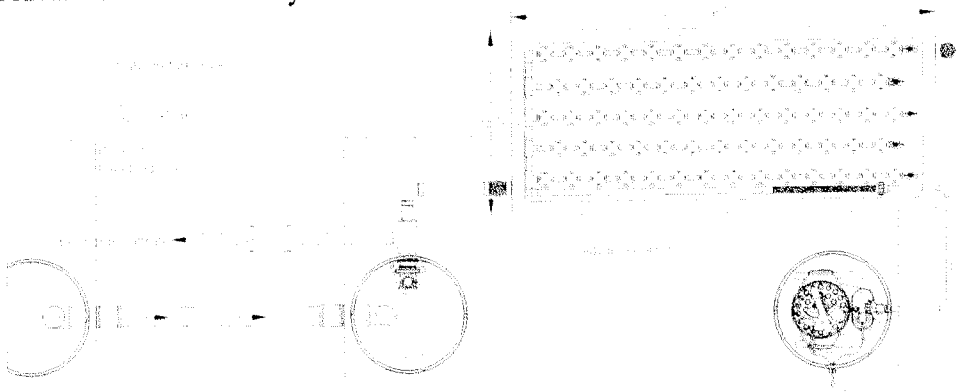


BLACKWELDER
PT-214

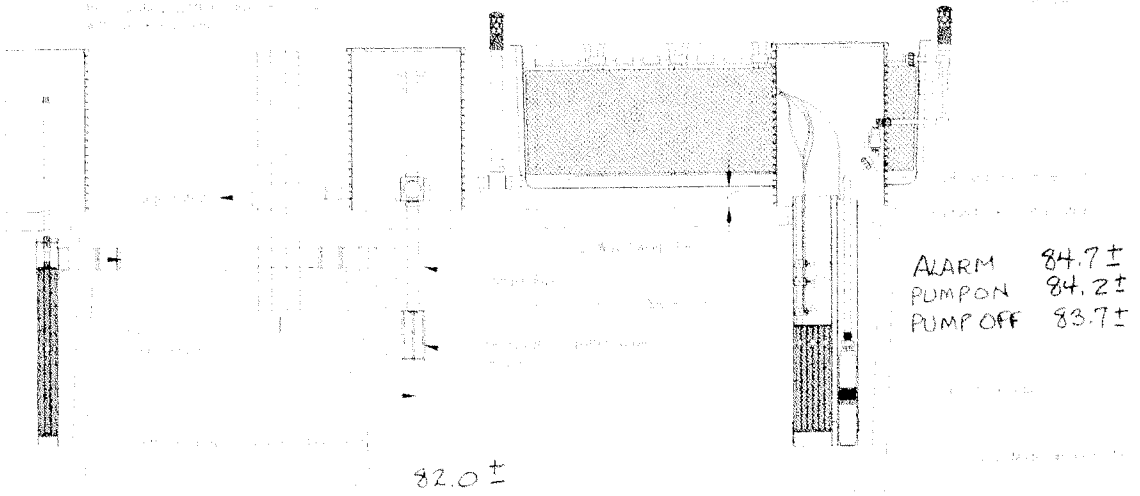
REGRC
TANK

AdvanTex Treatment System

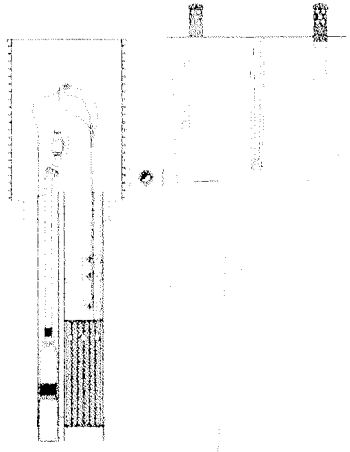
AX 20
DESIGN FLOW < OR = 500 GPD
NORTH CAROLINA
CONFIGURATION



Top View



Side View



End View

ELECTRIC TANK DETAILS

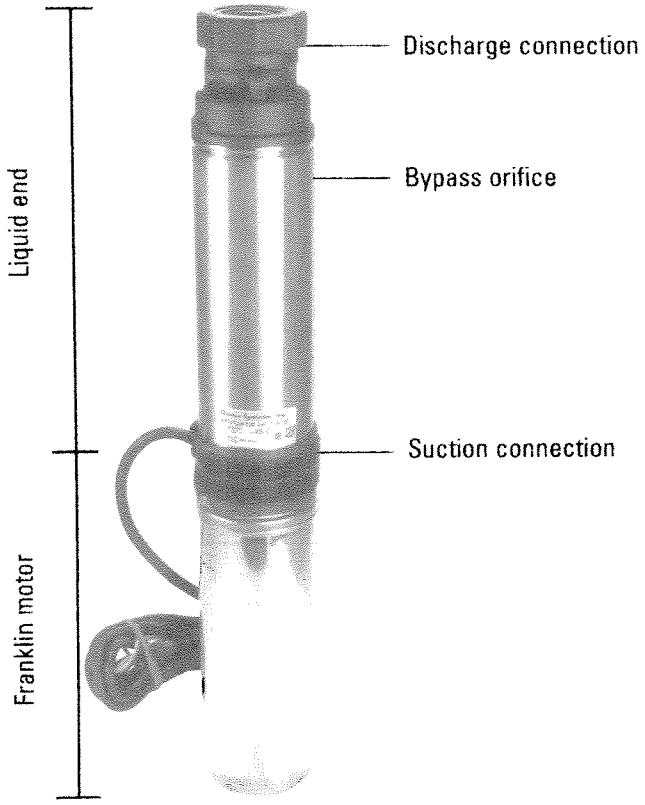
PF Series High-Head Effluent Pumps

Technical Data Sheet

Applications

Our submersible High-Head Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or separate dosing tanks to collection and treatment systems. All our pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics; all are field-serviceable and repairable with common tools; and all standard 60-Hz PF Series models are UL and CSA listed for use with effluent.

Orenco High-Head Effluent Pumps are used in a variety of applications, including pressurized drainfields, packed bed filters, mounds, aerobic units, effluent irrigation, effluent sewers, wetlands, lagoons, and more.



Features/Specifications

To specify this pump for your installation, require the following:

- Minimum 24-hour run-dry capability without water lubrication
- 1/8-inch bypass orifice to ensure flow recirculation for motor cooling and to prevent air bind
- Repairable (nondisposable) liquid end for better long-term cost of ownership
- Corrosion-resistant construction
- Super stainless Franklin Electric motor, rated for continuous use and frequent cycling
- Type SOOW motor cable (suitable for Class I, Division 1 and Division 2 applications)
- Five-year warranty from date of manufacture against defects in materials or workmanship

Standard Models

See specs chart, page 2, for a complete list.

Nomenclature

3005-11-30

PF □□ □□ □ □-□□

Cord length:
Blank = 10'
20 = 20'
30 = 30'
50 = 50'

Voltage (nameplate):
1 = 115 (1/2 hp only)
200 = 200
2 = 230 (220 if 50 Hz)
4 = 460

Frequency:
1 = single-phase 60 Hz
3 = three-phase 60 Hz
5 = single-phase 50 Hz

Horsepower:
05 = 1/2 hp
07 = 3/4 hp
10 = 1 hp
15 = 1-1/2 hp

Nominal flow (gpm):
10
20
30
50

Pump (PF Series)

C US LR80980

21

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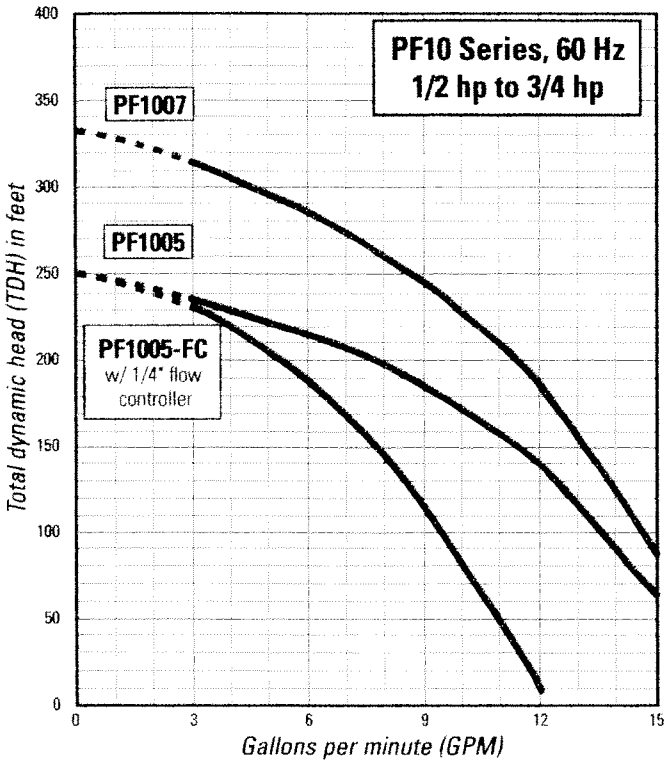
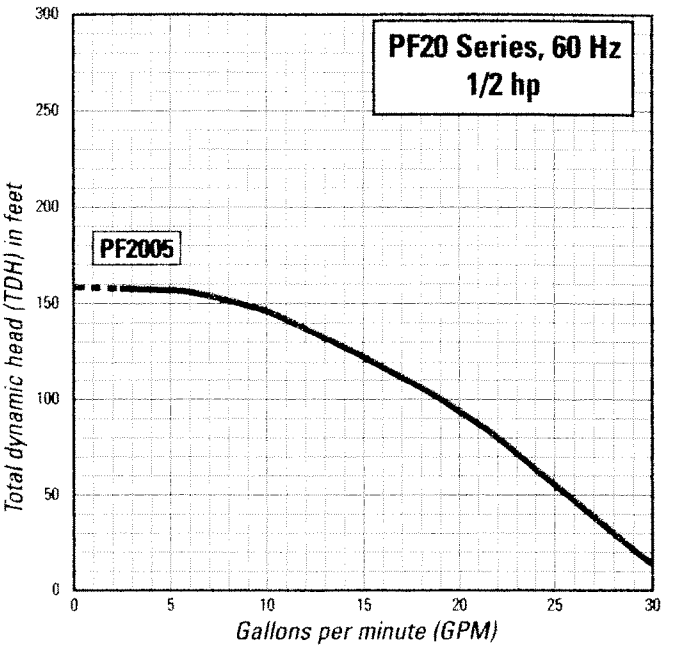
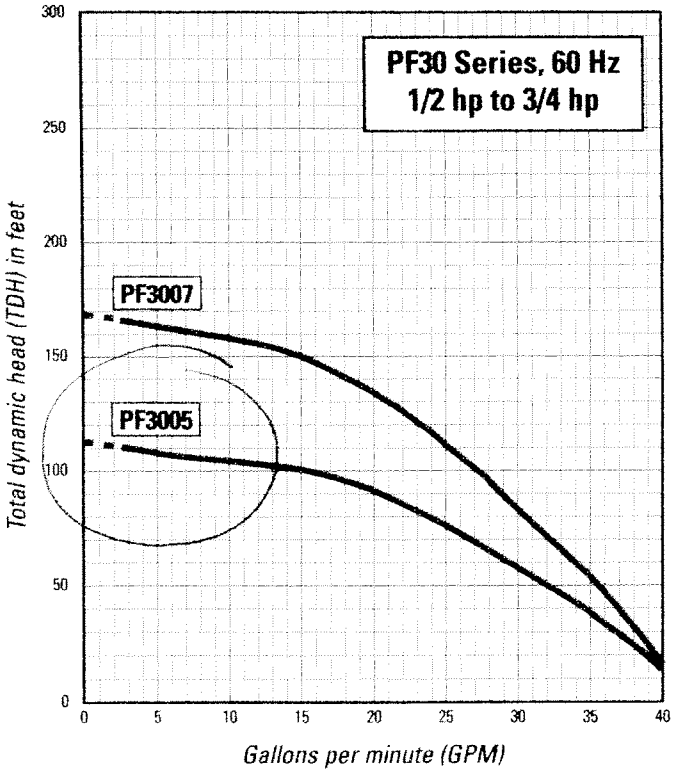
PF Series High-Head Effluent Pumps (continued)

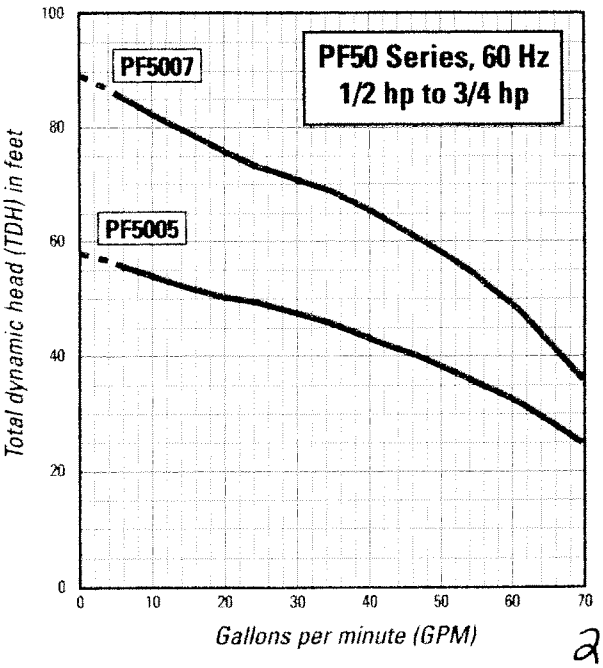
Using a Pump Curve

A *pump curve* helps you determine the best pump for your system. Pump curves show the relationship between flow (gpm) and pressure (TDH), providing a graphical representation of a pump's optimal performance range. Pumps perform best at their *nominal flow rate*—the value, measured in gpm, expressed by the first two numerals in an Orenco pump nomenclature.









NTD-PU-PF-1
Rev. 1.0, 3/07

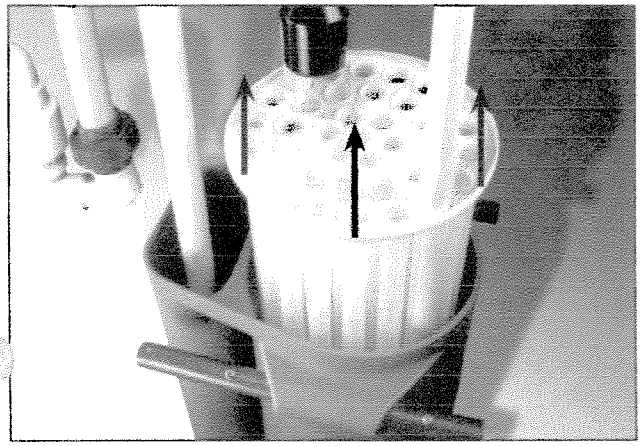
Model Code for Ordering

Biotube® Pump Vault

PVU □□-□□□□-□

- Support pipe length:
  - Blank = standard support pipes for 24" riser
  - L = long support pipes for 30" riser
  - NB = no bracket (for support pipe)
- Inlet hole height: 13", 19", 25", custom (specify)
- Cartridge height: 18", 24", 36"
- Vault height: 48", 57", 68", 72", 78", 84", 95", custom (specify)
- Universal pump vault (for simplex and duplex applications)

Orenco's Biotube Pump Vault is available in standard and customized configurations. Contact Orenco or your nearest distributor for sizing recommendations.

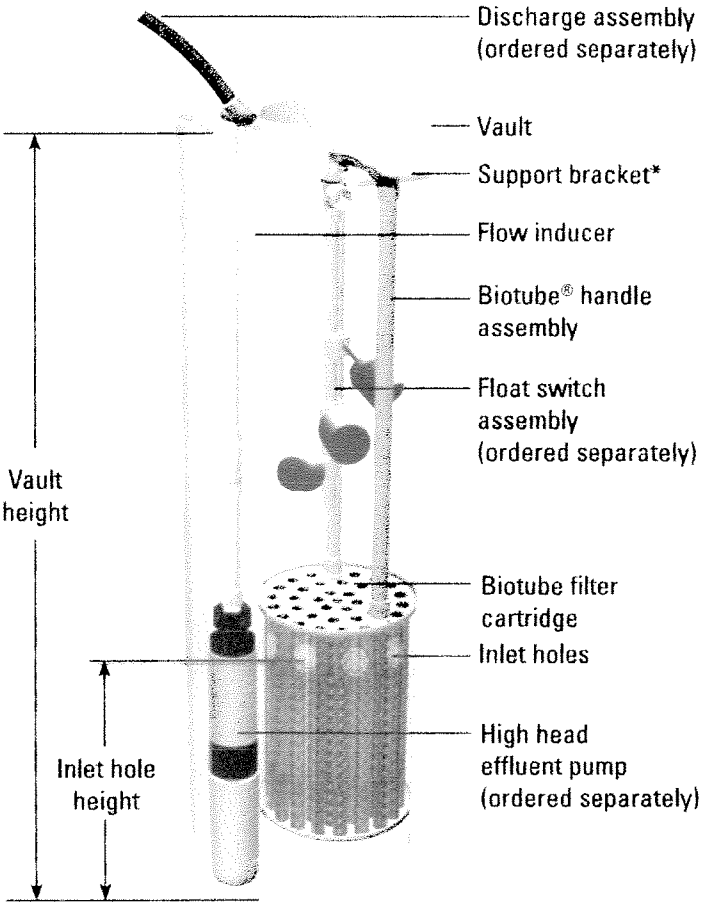


Easy access design allows filter cartridge removal without pulling the pump or vault; simplifies filter inspection and maintenance.

Biotube Cartridge Effective Filter and Flow Area

Cartridge Height	Filter Area	Flow Area
18 in. (457 mm)	14.5 ft² (1.3 m²)	4.4 ft² (0.4 m²)
24 in. (610 mm)	19.7 ft² (1.8 m²)	5.9 ft² (0.5 m²)
36 in. (914 mm)	30.0 ft² (2.8 m²)	9.0 ft² (0.8 m²)

Biotube Pump Vault Components



** The distance between the top of the vault and the bottom of the support bracket is 3 inches (76 mm), so the vault extends that far above the opening on which the support pipes rest.*

To Order

Call your nearest Orenco Systems®, Inc. distributor. For nearest distributor, call Orenco at 800-348-9843 or go to www.orenco.com and click on "Distributor Locator."

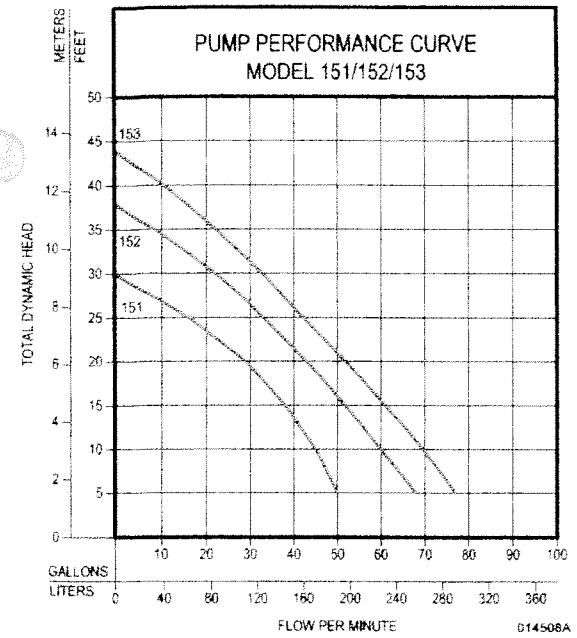
Tank Access and Riser Diameter

Biotube Application	Minimum Tank Access Diameter	Recommended Tank Access Diameter	Minimum Riser Diameter
PVU with Simplex Pump	19 in. (483 mm)	20 in. (508 mm)	24 in. (610 mm)
PVU with Duplex Pumps	19 in. (483 mm)	20 in. (508 mm)	30 in. (762 mm)
PVU with Recirculating Splitter Valve*	23 in. (584 mm)	23 in. (584 mm)	30 in. (762 mm)**

** RSV2Q or RSV3Q for AdvanTex® Treatment Systems*

***24-in. riser can be used with no-bracket (NB) PVU.*

Distributed By:



TOTAL DYNAMIC HEAD/FLOW
PER MINUTE
EFFLUENT AND DEWATERING

MODEL		151		152		153	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	50	189	69	261	77	291
10	3.0	45	170	61	231	70	265
15	4.6	38	144	53	201	61	231
20	6.1	29	110	44	167	52	197
25	7.6	16	61	34	129	42	159
30	9.1	–	–	23	87	33	125
35	10.7	–	–	–	–	22	85
40	12.2	–	–	–	–	11	42
Shut-off Head		30 ft. (9.1m)		38 ft. (11.6m)		44 ft. (13.4m)	

014508B

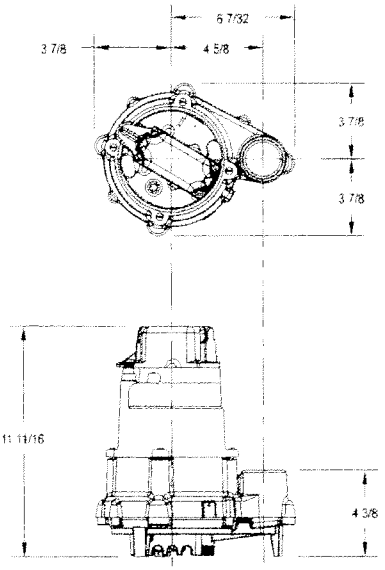
CONSULT FACTORY FOR SPECIAL APPLICATIONS

- Timed dosing panels available.
- Electrical alternators, for duplex systems, are available and supplied with an alarm.
- Variable level control switches are available for controlling single phase systems.
- Double piggyback variable level float switches are available for variable level long and short cycle controls.
- Sealed Qwik-Box available for outdoor installations. See FM1420.
- Over 130°F. (54°C.) special quotation required.

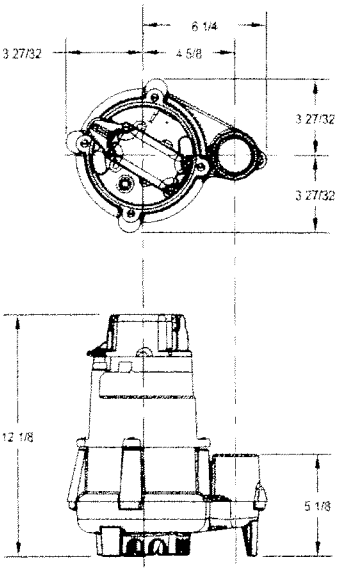
151/152/153 Series

151/152/153 MODELS				Control Selection	
Model	Volts-Ph	Mode	Amps	Simplex	Duplex
N151	115 1	Non	6.0	1	2 or 3
BN151	115 1	Auto	6.0	Included	2 or 3
E151	230 1	Non	3.2	1	2 or 3
BE151	230 1	Auto	3.2	Included	2 or 3
N152	115 1	Non	8.5	1	2 or 3
BN152	115 1	Auto	8.5	Included	2 or 3
E152	230 1	Non	4.3	1	2 or 3
BE152	230 1	Auto	4.3	Included	2 or 3
N153	115 1	Non	10.5	1	2 or 3
BN153	115 1	Auto	10.5	Included	2 or 3
E153	230 1	Non	5.3	1	2 or 3
BE153	30 1	Auto	5.3	Included	2 or 3

Model 151



Models 152 / 153



SELECTION GUIDE

1. Single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
2. See FM0712 for correct model of Electrical Alternator E-Pak.
3. Variable level control switch 10-0225 used as a control activator, specify duplex (3) or (4) float system.

⚠ CAUTION

All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

RESERVE POWERED DESIGN

For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.

http://www.zoeller.com

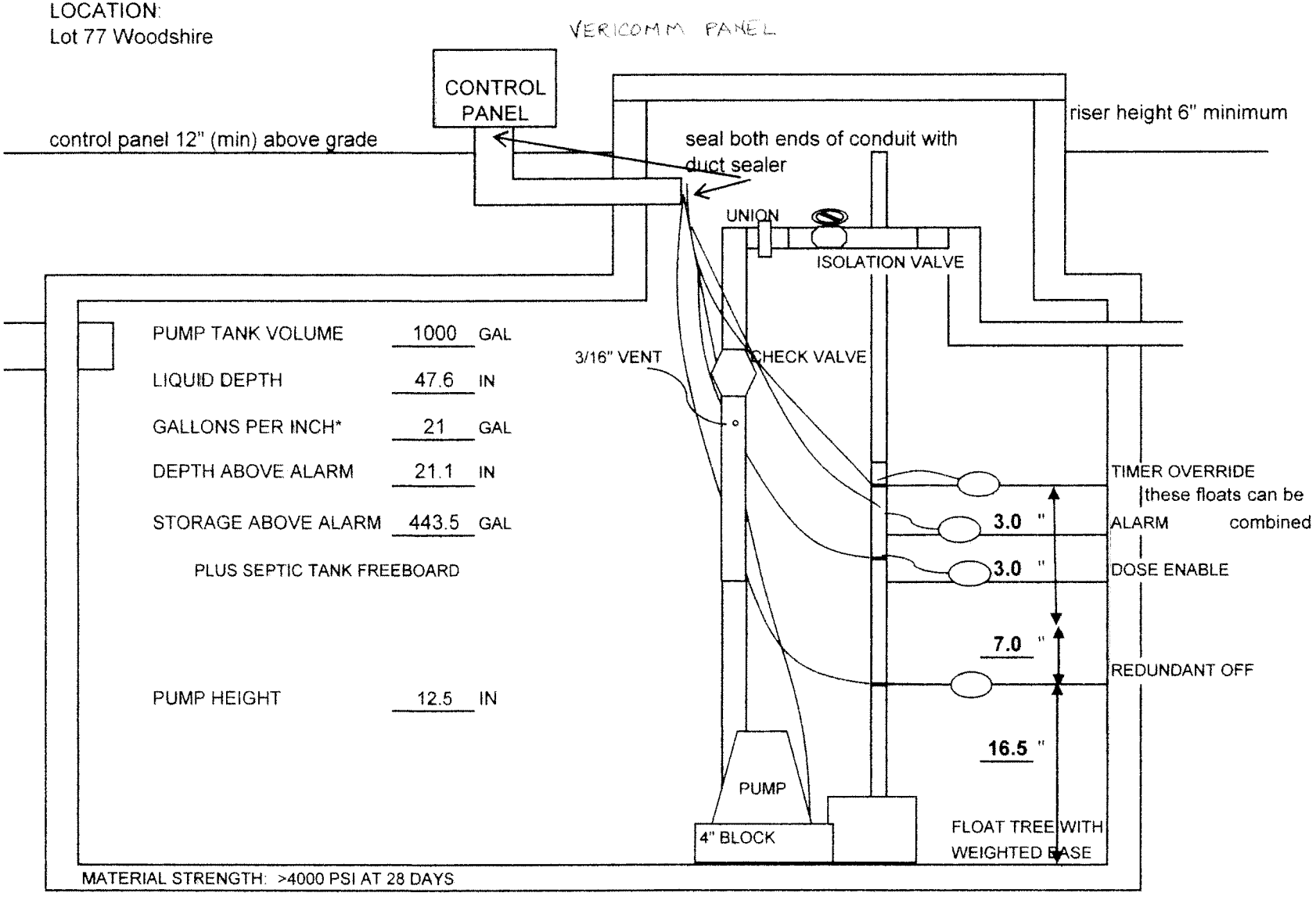
ZOELLER PUMP CO.

MAIL TO: P.O. BOX 16347
Louisville, KY 40256-0347
SHIP TO: 3649 Cane Run Road
Louisville, KY 40211-1961
(502) 778-2731 • 1 (800) 928-PUMP
FAX (502) 774-3624

Manufacturers of...
"Quality Pumps Since 1939"

Field dosing tank FLOAT SETTINGS

LOCATION:
Lot 77 Woodshire



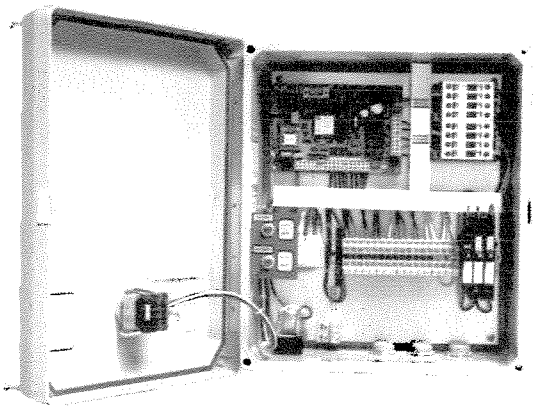
For AdvanTex® Treatment Systems

VeriComm® AXB_ Control Panels

Technical Data Sheet

Applications

VeriComm® AXB1 and AXB2 remote telemetry control panels are used with two-pump operations — recirculation and discharge (on-demand or timed) — for AdvanTex® Treatment Systems. Coupled with the VeriComm web-based Monitoring System, these affordable control panels give water/wastewater system operators and maintenance organizations the ability to monitor and control each individual system's operation remotely, with real-time efficiency, while remaining invisible to the homeowner. VeriComm AXB panels allow remote operators to change system parameters, including timer settings, from the web interface.



Typical AXB_ VeriComm® Control Panel

Standard Models:
VCOM AXB1, VCOM AXB2

To Specify...

To specify this panel for your installation, require the following:

Basic Control Logic: Three Operating Modes

- A "Start-up Mode" for the initial 30 days, during which the system collects trend data to establish operating standards for future reference.
- A "Normal Mode" that manages day-to-day functions.
- A "Test Mode" that suspends data collection and alarm reporting during installation and service.

Data Collection and Utilization

- Data logs of system conditions and events, such as pump run times, pump cycles, and alarm conditions.

Troubleshooting and Diagnostic Logic

- Troubleshooting capabilities that can report suspected failed components, which then trigger Alarms.

Advanced Control Logic

- Advanced control logic that activates during float malfunctions to diagnose the situation and keep the system operating normally until servicing.

Communication and Alarm Management

- Remote telemetry capabilities coupled with a web-based monitoring application (see *VeriComm Monitoring System*, ATD-WEB-VCOM-1) for communication and alarm management. Updating of point values (including timer settings) and receipt of queued changes during each communication session with host. Communication sessions that occur monthly, at a minimum, and more frequently during alarm conditions.
- Multiple methods of communication, as follows:

Call-In to VeriComm® Host

- Automatic notification to host of "Alarms," which signal fault conditions that need to be addressed immediately (e.g., pump failure).
- Automatic notification to host of "Alerts," which signal less critical fault conditions and which trigger the panel's troubleshooting logic and alternative operating mode (e.g., stuck float switch).
- Automatic notification to host of "Updates," which include alarm updates or all-clear notifications following Alarms/Alerts, as well as normally scheduled monthly panel reports.
- Manual, forced communication from panel to host to effect an updating of point values and receipt of queued changes.

Real-Time Direct Connection to Panel

- Manual, direct connection at the site via RS-232 serial port, to allow a local operator real-time access to detailed logged data and the ability to change point values from a laptop.
- Manual, forced communication by local operator/homeowner at the site to initiate an auto-answer mode, allowing a remote operator real-time access to detailed logged data and the ability to change point values.

During real-time, manual connections, software with open architecture (and password security) is used; no proprietary software is required. VT100 protocol allows access and control from any computer modem (Mac or PC) with a simple communication program (e.g., Windows® HyperTerminal); multilevel password protection in panel ensures that only qualified personnel can access the panel's data.

Additional Features

- Status light indicators on the board, including . . .
  - Flashing green LED for normal operation
  - Yellow LEDs for status of digital inputs
  - Red LEDs for status of digital outputs and modem activity
- UL-recognized and FCC-approved

For more information, try our online demo at www.vericomm.net (no password required).

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ATD-CP-VCOM-7
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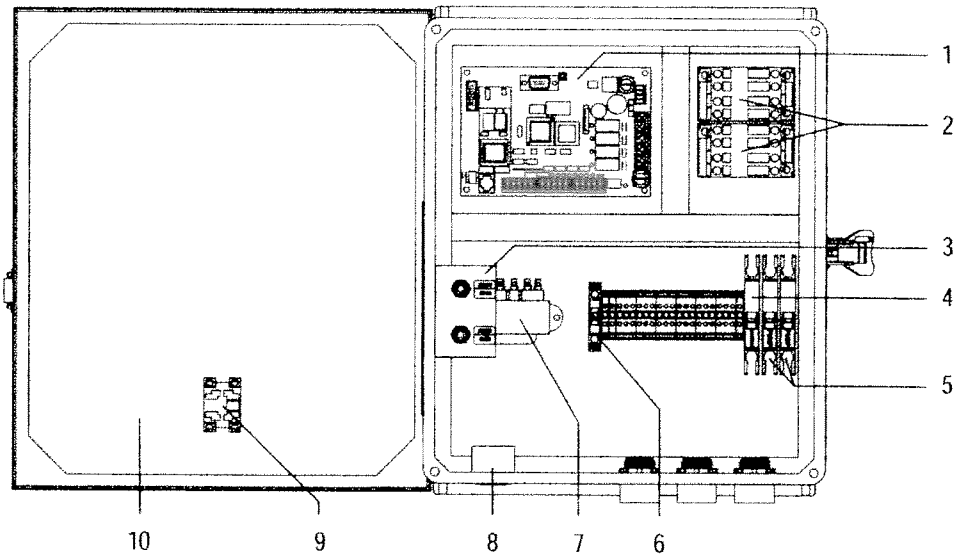
VeriComm® AXB_ Control Panels

Technical Data Sheet

1. VeriComm® Remote Telemetry Board
2. Motor-Start Contactors
3. Toggle Switches
4. Control Circuit Breaker
5. Pump Circuit Breakers
6. Fuse
7. Transformer
8. Audio Alarm
9. Visual Alarm
10. Panel Enclosure



Standard Components

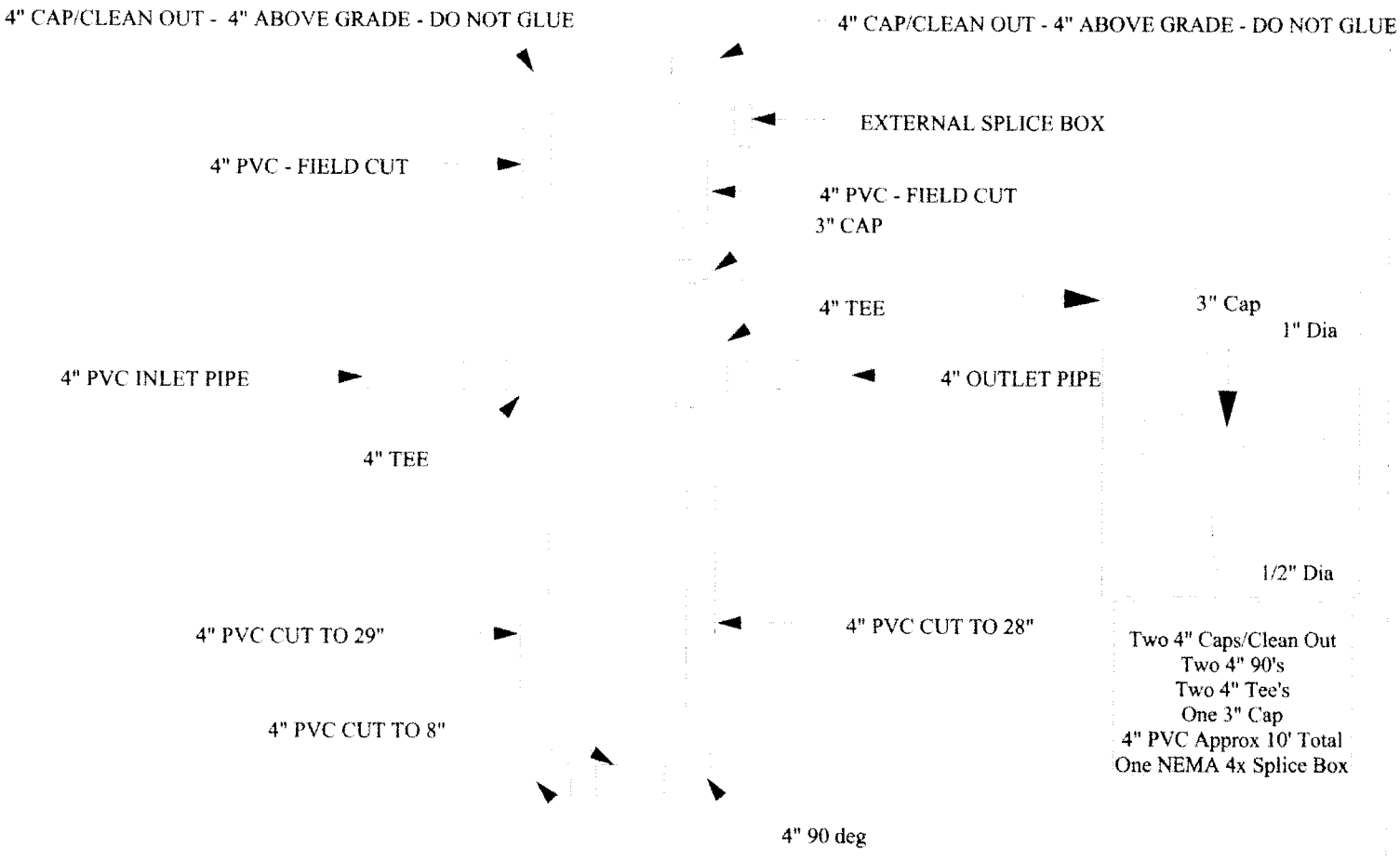
Feature	Specifications
1. VeriComm® Remote Telemetry Unit*	ATRTU-100: 36/18 VAC (center tap transformer), 8 digital inputs, 4 analog inputs, 4 digital outputs, 0 analog ouputs, on-board modem (2400 baud), LED input and output indicators, 1-year battery backup of data and program settings.
2. Motor-Start Contactors	120 VAC: 14 FLA, 3/4 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 VAC: 14 FLA, 2 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA).
3. Toggle Switches	Single-pole switch, automatic On, with spring-loaded, momentary, manual On. 20 amps, 1 hp.
4. Control Circuit Breaker	10 amps, OFF/ON switch. Single-pole 120 VAC, double-pole 240 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
5. Pump Circuit Breakers	20 amps, OFF/ON switch. Single-pole 120 VAC, double-pole 240 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
6. Fuse	120 VAC Primary, 36 VCT @ 0.85A Secondary.
7. Transformer	250 VAC, 1A.
8. Audio Alarm	80 dB at 24", warble-tone sound.
9. Visual Alarm	7/8" diameter red lens, "Push-to-silence." NEMA 4, 1 Watt bulb, 120 VAC.
10. Panel Enclosure	Measures 15.50" high x 13.30" wide x 6.70" deep. NEMA 4X rated. Constructed of UV-resistant fiberglass; hinges and latch are stainless steel. Conduit couplings provided.
VCOM-AXB1	120 VAC, 3/4 hp, 14 amps, single-phase, 60 Hz.
VCOM-AXB2	240 VAC, 2 hp, 14 amps, single-phase, 60 Hz.

Optional Components

Feature	Specifications	Product Code Adder
Pump Run Light	7/8" diameter green lens. NEMA 4, 1 watt bulb, 120 VAC.	PRL
Anticondensation Heater	Self-adjusting; radiates additional wattage as temperature drops.	HT
Programmable Timer	Discharge side timed dosing.	PT
UV Disinfection Compatibility	UV grounded power circuit and alarm contacts.	UV

* *See VeriComm® Remote Telemetry Unit (ATD-CP-VCOM-1) and VeriComm® Monitoring System (ATD-WEB-VCOM-1) for details.*

CONTRACTOR PROVIDED UV EQUIPMENT (SINGLE BULB)



SINGLE BULB UV UNIT - CALL AQWA (888)552-AQWA WITH ANY QUESTIONS

OPERATION AND MAINTENANCE

COMPONENT	FREQUENCY	TASK
septic tank	3 - 6 months	measure solids accumulation
		check for infiltration/exfiltration
		check condition of effluent filter; clean as needed
	as needed	remove accumulated solids when depth exceeds 6"
recirculation tank, field dosing tank	3 - 6 months	measure solids accumulation
		check for infiltration/exfiltration
	as needed	remove accumulated solids
supply lines, feeder lines, manifolds	6 - 12 months	check for exposed pipe, leakage
lateral field	3 - 6 months	check for exposed pipe, leakage, ponding
	2 - 4 weeks	mow grass (if applicable)
	4 - 6 months	remove saplings & other volunteer vegetation
pumps, floats	6 months	verify float settings & operation
		inspect pump vaults
		verify pump delivery rates
UV light	monthly	wipe UV bulb
AdvanTex	monthly	inspect control panel and AdvanTex filter

These are minimum standards. Follow specific guidelines and requirements found in Operation and Maintenance Manuals provided by manufacturers.

FINAL LANDSCAPING

Tanks & pretreatment module area: Fill any areas that have settled following backfilling. Grade to shed runoff away from risers, pretreatment module, and control panel mounting. Cover exposed soil with 2-3" of mulch. Screening plantings (shrubs, etc) are allowed as long as nothing is planted within ten feet of risers, module, control panel, or headworks.

Field and repair area: Trench backfill should be mounded slightly to accommodate settling. Reseed as needed. NO permanent irrigation system may be installed in field or repair area.