BU - 000679

ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3625 PERMIT # AP-244272

SEPTIC: IMPROVEMENT PERMIT / AUTHORIZATION TO CONSTRUCT / OPERATION PERMIT / EXISTING SYSTEM

PIN # 4761 -- 59 -- 4495

APPLICANT/OWNER: ADAMS HOME AEC, LLC, APPLICANT ADDRESS: 3401 SAINT VARDELL LANE, SUITE B, CHARLOTTE, N.C. 28217

SITE ADDRESS: 173 NORTHLAKE DRIVE, STATESVILLE, N.C. 28677 PHONE: 704-361-5437 ALT. PHONE 704-621-4664

SITE DIRECTIONS: (E) ON 70, (R) ON BETHESDA, (L) ON NORTHLAKE, LOT ON (L) SAP CONTROLLED: [x] YES [ ] NO

SUBDIVISION: NORTHLAKE SECTION: 1 LOT # 55 LOT AREA: 0.54 AC DESIGN FLOW: 360 GPD L.T.A.R.: .15

Septic Tank	1000	(gal)	STB	Date	[x] New System	[ ] Repair	[ ] Expansion	System Type: I II III IV (V) VI	[x] Residence	No. Bedrooms	3	Water Supply
Pump Tank	100	(gal)	PT	Date	System Description:	TSI DRIP IRRIGATION			[ ] Business	No. Persons	6	[ ] Private
Pump Make		Model		Serial #	Repair System Description:	TSI DRIP IRRIGATION			[ ] Other	No. Employees	—	[x] Public
# Nitrification Fields	1	# Lines	28	Linear Ft	1327FT	Maintenance Agreement Required:	[x] YES	[ ] NO	[ ] Slab	[x] Crawl Space		[ ] Community
Trench Width	1.N	Trench Bottom Depth(Low side)	15IN	Gravel Depth	—	[ ] GRAVITY	[x] PRESSURE		[ ] Basement w/plumbing	[ ] Basement w/o plumbing		

Comments / Conditions:

INITIAL SITE SKETCH

SEE ATTACHED SITE PLAN
BY: PIEDMONT DESIGN ASSOCIATES, P.A. AND AGRI-WASTE TECHNOLOGY, INC.
APPROVED 8-25-2021

AS BUILT SKETCH

FOR SEPTIC FINAL INSPECTION CALL: 704-664-3703 between 8am-9am the day the inspection is needed. Be sure to speak with an inspector to confirm your time.

Permit can be suspended or revoked if any false information is supplied toward securing the permit / any unauthorized changes are made to the site / any unauthorized changes are made in the installation of the system. CONTACT A LOCATOR SERVICE PRIOR TO ANY EXCAVATION

[ ] IMPROVEMENT PERMIT *with plat valid without expiration.* [x] IMPROVEMENT PERMIT *with site plan valid for 60 mos.* [x] AUTHORIZATION TO CONSTRUCT *valid for period equal to IMPROVEMENT PERMIT--not to exceed 60 mo.*

Owner / Applicant Signature: _____ Date: 8/27/21 Installed by: Precision Excavation

IMPROVEMENT PERMIT by: Burgent C. White Date: 8-25-2021 OPERATION PERMIT by: _____ Date: 10/27/21

AUTHORIZATION TO CONSTRUCT by: Burgent C. White Date: 8-25-2021 Existing System Inspected by: _____ Date: _____

FOR SEPTIC FINAL INSPECTION: CALL 704-664-3703 between 8am-9am the day the inspection is needed.

ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3625 PERMIT # AP-244272

SEPTIC: IMPROVEMENT PERMIT / AUTHORIZATION TO CONSTRUCT / OPERATION PERMIT / EXISTING SYSTEM

PIN # 4761 -- 59 -- 4495

APPLICANT/OWNER: ADAMS HOME AEC, LLC, APPLICANT ADDRESS: 3401 SAINT VARDELL LANE, SUITE B, CHARLOTTE, N.C. 28217

SITE ADDRESS: 173 NORTH LAKE DRIVE, STATESVILLE, N.C. 28677 PHONE: 704-361-5437 ALT. PHONE 704-621-4664

SITE DIRECTIONS: (E) ON 70, (R) ON BETHESDA, (L) ON NORTHLAKE, LOT ON (L) SAP CONTROLLED: [x] YES [ ] NO

SUBDIVISION: NORTHLAKE SECTION: 1 LOT # 55 LOT AREA: 0.54 AC DESIGN FLOW: 360 GPD L.T.A.R.: .15

Septic Tank 1000 (gal) STB Date
Pump Tank 100 (gal) PT Date
Pump Make Model Serial #
Nitrification Fields 1 # Lines 28 Linear Ft 1327 FT
Trench Width 1 IN Trench Bottom Depth(Low side) 15 IN Gravel Depth —

[x] New System [ ] Repair [ ] Expansion System Type: I II III IV (V) VI
System Description: TSI DRIP IRRIGATION
Repair System Description: TSI DRIP IRRIGATION
Maintenance Agreement Required: [x] YES [ ] NO
[ ] GRAVITY [x] PRESSURE

[x] Residence No. Bedrooms 3
[ ] Business No. Persons 6
[ ] Other No. Employees —
[ ] Slab [x] Crawl Space
[ ] Basement w/plumbing [ ] Basement w/o plumbing

Water Supply: [ ] Private [x] Public [ ] Community

Comments / Conditions:

INITIAL SITE SKETCH

SEE ATTACHED SITE PLAN
BY: PIEDMONT DESIGN ASSOCIATES, P.A. AND AGRI-WASTE TECHNOLOGY, INC.
APPROVED 8-25-2021

OP in Munis
244272
10/27/21

AS BUILT SKETCH

FOR SEPTIC FINAL INSPECTION CALL: 704-664-3703 between 8am-9am
the day the inspection is needed. Be sure to speak with an inspector to confirm your time.

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[ ] **IMPROVEMENT PERMIT** *with plat valid without expiration.* [x] **IMPROVEMENT PERMIT** *with site plan valid for 60 mos.* [x] **AUTHORIZATION TO CONSTRUCT** *valid for period equal to IMPROVEMENT PERMIT--not to exceed 60 mo.*

Owner / Applicant Signature: Date: 8/27/21 Installed by:

IMPROVEMENT PERMIT by: Bryant C. White Date: 8-25-2021 OPERATION PERMIT by: Date:

AUTHORIZATION TO CONSTRUCT by: Bryant C. White Date: 8-25-2021 Existing System Inspected by: Date:

FOR SEPTIC FINAL INSPECTION: CALL 704-664-3703 between 8am-9am the day the inspection is needed.

Item	Date	Initials
Drain Lines Checked		
Tanks Checked		
Pressure Manifold or Valve Box Checked		
Pressure Head Set		
Electrical Checked		
Floats Set		
Alarm Checked		
Maintenance Contract Needed? Y / N		
Comments:		

Repairs Only	
	State Code
Failing System Code	
Type of Distribution	G or P
Type of Failure/Malfunction	
Primary Cause of Failure/Malfunction	
Age of System? _____	
Initial or Repair? _____	

ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3625 PERMIT # AP-244272

SEPTIC: IMPROVEMENT PERMIT / AUTHORIZATION TO CONSTRUCT / OPERATION PERMIT / EXISTING SYSTEM

PIN # 4761 -- 59 -- 4495

APPLICANT/OWNER: ADAMS HOME AEC, LLC, APPLICANT ADDRESS: 3401 SAINT VARDELL LANE, SUITE B, CHARLOTTE, N.C. 28217

SITE ADDRESS: 173 NORTH LAKE DRIVE, STATESVILLE, N.C. 28677 PHONE: 704-361-5437 ALT. PHONE 704-621-4664

SITE DIRECTIONS: (E) ON 70, (R) ON BETHESDA, (L) ON NORTHLAKE, LOT ON (L) SAP CONTROLLED: [x] YES [ ] NO

SUBDIVISION: NORTHLAKE SECTION: 1 LOT # 55 LOT AREA: 0.54 AC DESIGN FLOW: 360 GPD L.T.A.R.: .15

Septic Tank	1000 (gal)	STB	SHOAF TLED	Date	9/11	[x] New System [ ] Repair [ ] Expansion	System Type: I II III IV V VI	[x] Residence	No. Bedrooms 3
Pump Tank	1000 (gal)	P	ORENCO Advantage	Date	9/22/21	System Description:	TSI DRIP IRRIGATION	[ ] Business	No. Persons 6
Pump Make	Orenco	Model	PF 3005 II	Serial #	Recirc	Repair System Description:	TSI DRIP IRRIGATION	[ ] Other	No. Employees —
# Nitrification Fields	1	# Lines	28	Linear Ft	1327FT	Maintenance Agreement Required:	[x] YES [ ] NO	[ ] Slab	[x] Crawl Space
Trench Width	1.N	Trench Bottom Depth(Low side)	15IN	Gravel Depth	—		[ ] GRAVITY [x] PRESSURE	[ ] Basement w/plumbing	[ ] Basement w/o plumbing

Water Supply: [ ] Private [x] Public [ ] Community

Comments / Conditions: Pump (Discharge) Orenco PF 3005-II

INITIAL SITE SKETCH

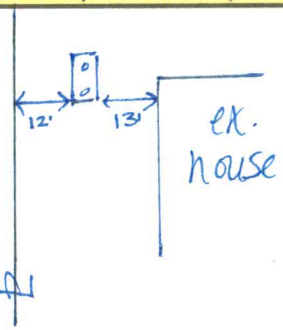
SEE ATTACHED SITE PLAN
BY: PIEDMONT DESIGN ASSOCIATES, P.A. AND AGRI-WASTE TECHNOLOGY, INC.
APPROVED 8-25-2021

100 psi

AS BUILT SKETCH

FOR SEPTIC FINAL INSPECTION CALL: 704-664-3703 between 8am-9am the day the inspection is needed. Be sure to speak with an inspector to confirm your time.

As Built - Septic tank (NTS)



vacuum seal checked 5"Hg, 2 min 9/24/21

10/14/21: Supply line to off site checked from house to 1st telecom box on easement. Still needs checked from telecom to stub out

Permit can be suspended or revoked if any false information is supplied toward securing the permit / any unauthorized changes are made to the site / any unauthorized changes are made in the installation of the system. CONTACT A LOCATOR SERVICE PRIOR TO ANY EXCAVATION

[ ] IMPROVEMENT PERMIT *with plat valid without expiration.* [x] IMPROVEMENT PERMIT *with site plan valid for 60 mos.* [x] AUTHORIZATION TO CONSTRUCT *valid for period equal to IMPROVEMENT PERMIT--not to exceed 60 mo.*

Owner / Applicant Signature: [signature] Date: 8/27/21 Installed by: Precision Excavation

IMPROVEMENT PERMIT by: Buzzy C. White Date: 8-25-2021 OPERATION PERMIT by: Date:

AUTHORIZATION TO CONSTRUCT by: Buzzy C. White Date: 8-25-2021 Existing System Inspected by: Date:

FOR SEPTIC FINAL INSPECTION: CALL 704-664-3703 between 8am-9am the day the inspection is needed.

173 Northlake : lot 55

Item	Date	Initials
Drain Lines Checked	10/20/21	DW
Tanks Checked	9/24/21	DW
Pressure Manifold or Valve Box Checked		
Pressure Head Set		
Electrical Checked		
Floats Set		
Alarm Checked		
Maintenance Contract Needed? Y / N		
Comments:		

Repairs Only	
	State Code
Failing System Code	
Type of Distribution	G or P
Type of Failure/Malfunction	
Primary Cause of Failure/Malfunction	
Age of System? _____	
Initial or Repair? _____	

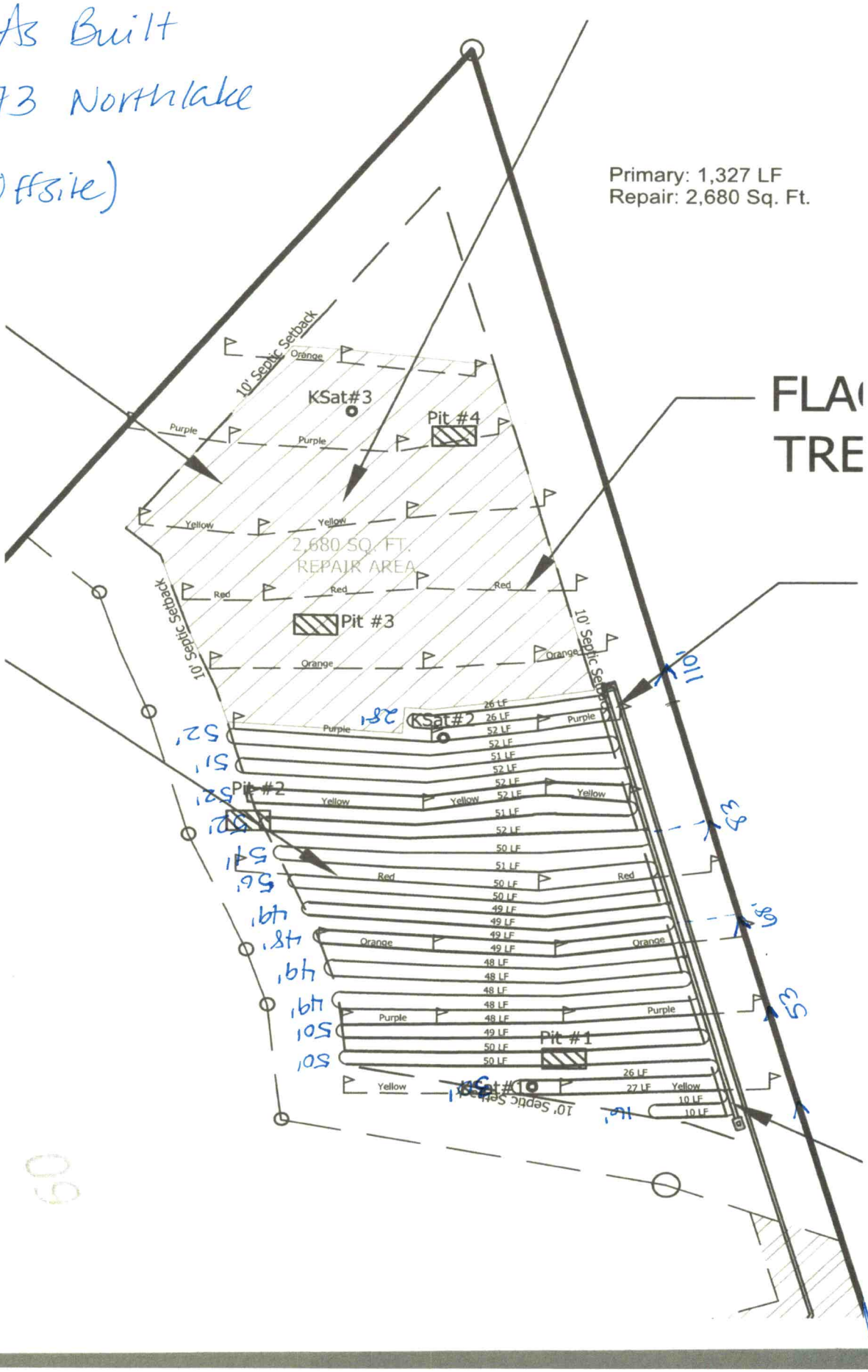
Septic
Tank Seal Check: 9/24/21 DW
(tank letter attached)

master meter ok per David

As Built

173 Northlake

(Offsite)



STATE OF NORTH CAROLINA, COUNTY OF IREDELL

This agreement is made and entered into this 5th day of October, 2021 by and between Judy Fair (hereinafter referred to as the "Owner") and AQWA, Inc. (hereinafter referred to as the "Contractor"). The effective date corresponds to the date of the Health Department Operations Permit.

WITNESSETH

WHEREAS, 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 Va system (Treatment Standard II w/nitrogen reduction) under the Rules for Sanitary Sewage Collection, Treatment and Disposal found at 15A N.C. Administrative Code 18A.1900 et seq.; and,

WHEREAS, 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 said system; and,

WHEREAS, 15A N.C. Administrative Code 18A.1961 requires that a condition of the Operation Permit for said system be that a properly executed contract between the system owners and a management entity shall be in effect for as long as the system is in use; and,

WHEREAS, the Contractor is a management entity, of a type authorized by 15A N.C. Administrative Code 18A.1961 to manage a Type Va, TS II system.

NOW THEREFORE, in consideration of the premises and of the mutual covenants and promises contained in this Agreement, it is hereby agreed by and between the Owner and the Contractor as stipulated below.

1. The Contractor's Obligations. The Contractor shall perform the following services on the Owner's system located at 173 Northlake Dr, Statesville, NC 28677:

   a) The Contractor shall inspect the system at least at the frequency, required in Table V (b) of 15A N.C. Admin. Code 18A.1961(b) for a Type Va System and as specified in the State approval document for the equipment.

   b) The Contractor shall monitor the routine operation of the system using the telemetry equipped control panel at least monthly and make such performance data available to the Owner if requested.

   c) The Contractor shall take up to two laboratory samples of effluent per year from the system as prescribed by the Health Department to monitor system performance at no additional expense to the Owner.

   d) The Contractor shall perform the maintenance procedures in accordance with the conditions of the Operation Permit, specifications as set forth by the design engineer, 15A N.C. Administrative Code 18A.1961, specifications of the applicable N. C. Department of Natural Resources system approval document, and the manufacturers Operations and Maintenance Manual. Routine maintenance procedures include: inspect the structural integrity and maintain all of the physical and mechanical components of the system, inspect the performance and condition of the AdvanTex® Treatment System and drip drainfield, check and set pressures in the system, check and adjust pump delivery

rate of the system, clean septic tank filter if applicable and accessible, perform any other requirements of the operations permit.

e) The Contractor shall have an Operator on call 24 hours daily. All emergency services will be billed to the Owner.

f) The Contractor shall report the results of its inspections to the local health department at the frequency specified in Table V (b) of 15A N.C. Administrative Code 18A.1961(b) for a Type Va System.

g) If an inspection indicates the need for system repairs, the Contractor shall notify the local health department within 48 hours of the inspection.

h) The Contractor shall notify the Owner of needed repairs, which are outside of the scope of routine scheduled maintenance described in subparagraph (d) above. The Contractor shall perform necessary repairs to the system at the request of the Owner and shall be entitled to payment therefore at the Contractor's normal charge for services and materials.

i) The Contractor shall employ or shall contract with a State certified Operator(s) if required by Table V (b) of 15A N.C. Administrative Code 18A.1961(b) for a Type Va System.

j) The Contractor shall respond to a request for service or maintenance call within twenty-four (24) hours upon receipt of request.

2. The Owner's Obligations.

a) The Owner shall pay to the Contractor the sum of $895.00 for periodic inspections (first year, four inspections) and $695.00 (customary rate subsequently), for routine maintenance procedures, required sampling and periodic reports. The annual fee will be renewed at the end of each 12 month period. The annual fee may be amended upon sixty (60) days advance notice to the Owner but may not be increased more than six (6) percent per year. The Owner shall pay to the Contractor his normal and customary fees for any work performed on the system as a result of unscheduled service or maintenance calls. One unscheduled service or maintenance call is included in the first year's fee. All subsequent unscheduled service or maintenance calls will be at $85 per hour, with a four hour minimum, plus materials. All fees are due and payable within thirty (30) days of billing. Payments due to the Contractor and unpaid by the Owner after thirty (30) days shall incur a late fee of $25 per month for each month payment is not received by the Contractor.

b) Within thirty (30) days of receipt of notice of needed repairs pursuant to paragraph 1.h. above, the Owner shall request the Contractor to complete needed repairs.

c) The Owner shall provide the Contractor with such access to the system as is reasonably necessary for the Contractor to comply with the terms of this Agreement and requirements of the local health department.

d) The Owner shall keep the area of the septic system equipment and drain field properly mowed and protected from traffic.

e) The Owner shall provide year-round telephone service to the telemetry control panel, which requires access to the home phone line with "toll free" 800 number access. Or the Owner can provide hard-wired Ethernet equipment directly between the home router and the control panel if the control panel is set up to do so.

f) The Owner shall apply and enforce the "Do's and Don'ts" as prescribed by the manufacturer in the provided publication.

3. Term. This Agreement shall remain in effect until terminated.

a) Automatic Termination. This agreement shall automatically terminate if the Operations Permit for the system is revoked and all appeals of revocation are exhausted or time for taking an appeal has passed.

b) Termination by Mutual Consent. The Parties may mutually agree to terminate this Agreement by giving written notice of termination by mutual consent to the local health department thirty (30) days in advance of the date of termination.

c) Termination by the Owner. The Owner may terminate this Agreement by giving notice to the Contractor and to the local health department thirty (30) days in advance of the date of termination.

d) Termination by the Contractor.

1) The Contractor may terminate this Agreement for cause by giving written notice of intent to terminate this Agreement to the Owner and to the local health department thirty (30) days in advance of the date of termination. Cause shall be defined as:

a) failure of the Owner to remit payment for any bill for services performed under and in accordance with this Agreement if said bill is not paid within thirty (30) days of receipt by the Owner of the bill. If said bill is paid after notice of termination of this Agreement, the Agreement shall continue in effect; or,

b) failure of the Owner to provide to the Contractor authorization to complete needed repairs within thirty (30) days of receipt of notice of needed repairs pursuant to paragraph 1.h. above. If said authorization to complete needed repairs or evidence of completion of said repairs is provided after notice of termination is given but prior to the date of termination of this Agreement, this Agreement shall continue in effect; or,

c) failure of the Owner to allow the Contractor such access to the system as is reasonably necessary in order for the Contractor to comply with the terms of this Agreement.

2) The Contractor may not terminate this Agreement without cause, but may assign its rights and duties under this Agreement as provided in paragraph 4, below.

4. Assignment.

a) Assignment by the Owner. The Owner shall notify the Contractor of the name and address of any purchaser of the property on which the system is located. The Owner shall also notify any purchaser of the property on which the system is located, of the existence of this Agreement and shall assign all rights and duties under this Agreement to said purchaser. Prepaid annual service fees are non-refundable and any prorations are to be handled between seller/purchaser at closing. All prepaid service and account balance will be transferred to the purchaser at closing and any proration will be reconciled between seller and purchaser at closing.

b) Assignment by the Contractor. The Contractor may assign its rights and duties under this Agreement to another management entity, which is qualified pursuant to 15A N.C. Administrative Code 18A.1961 to manage a Type Va system upon thirty (30) days written notice to the Owner and to the local health department.

5. Use of Subcontractors. The Contractor may subcontract with such manufacturers, suppliers and contractors as it deems desirable to perform any of the Contractor's duties under this Agreement. The Contractor shall at all times remain responsible for the performance of and payment for all work performed by all subcontractors.

6. Representations. The Parties represent to each other that each has the power, authority and legal right to enter into and perform its obligations as set forth in this Agreement.

7. Regulatory Amendments. References in this Agreement to sections of the Administrative Code shall include such rules as they may be amended in the future.

8. No Implied Waiver. The waiver by either Party, of the default or a breach by the other Party of any provision of this Agreement shall not operate or be construed to operate as a waiver of any subsequent default or breach. The failure at any time of either Party to enforce any provision of this Agreement (a) shall not be construed to be a waiver of such provisions, or of any other provision; and (b) shall not in any way affect the validity of this Agreement, or any part of this Agreement, or the right of either Party thereafter to enforce each provision of this Agreement.

9. Notice. Every notice required under this Agreement shall be in writing and shall be deemed sufficiently given if delivered in person or sent by certified or registered mail, return receipt requested, postage prepaid to the Party to be notified and addressed as follows:

To the Owner: Judy Fair, 173 Northlake Drive,, Statesville, NC 28677

To the Contractor: AQWA, Inc., 2604 Willis Court, Wilson, NC 27896

To the Local Health Department: 318 Turnersburg Hwy., Statesville, NC 28625

The date of any notice shall be the date of personal delivery or the date shown on the return receipt as the date of delivery or attempted delivery, as the case may be. Changes in the respective addresses to which notice may be directed may be made from time to time by either Party by notice to the other Party.

10. Place of Agreement. This Agreement and any questions concerning its validity, the system construction or performance shall be governed by the laws of the State of North Carolina, notwithstanding the place of execution, or the order in which the signatures of the Parties are affixed.

11. Entire Agreement and Amendment. This Agreement supersedes all prior negotiations, agreements and understandings between the Parties with respect to Inspection and Maintenance of the system and constitutes the entire Inspection and Maintenance Agreement between the Parties. To be effective, any amendment or modification to this Agreement must be in writing and must be signed by the Parties.

12. Severability. In the event that any provision of this Agreement shall, for any reason, be determined to be invalid, illegal or unenforceable in any respect, the Parties shall negotiate in good faith and agree to such amendments, modifications or supplements of or to this Agreement or such other appropriate actions as shall, to the maximum practicable in light of such determination, implement and give effect to the intentions of the Parties as reflected in this Agreement, and the other provisions of this Agreement shall, as so amended, modified, supplemented or otherwise affected by such actions, remain in full force and effect.

IN TESTIMONY WHEREOF, the Parties hereto have executed this Agreement in duplicate originals, one of which is retained by each of the Parties, the day and year first above written.

Owner:

Judy Ann Fair
Signature

Judy Ann Fair
Printed Name

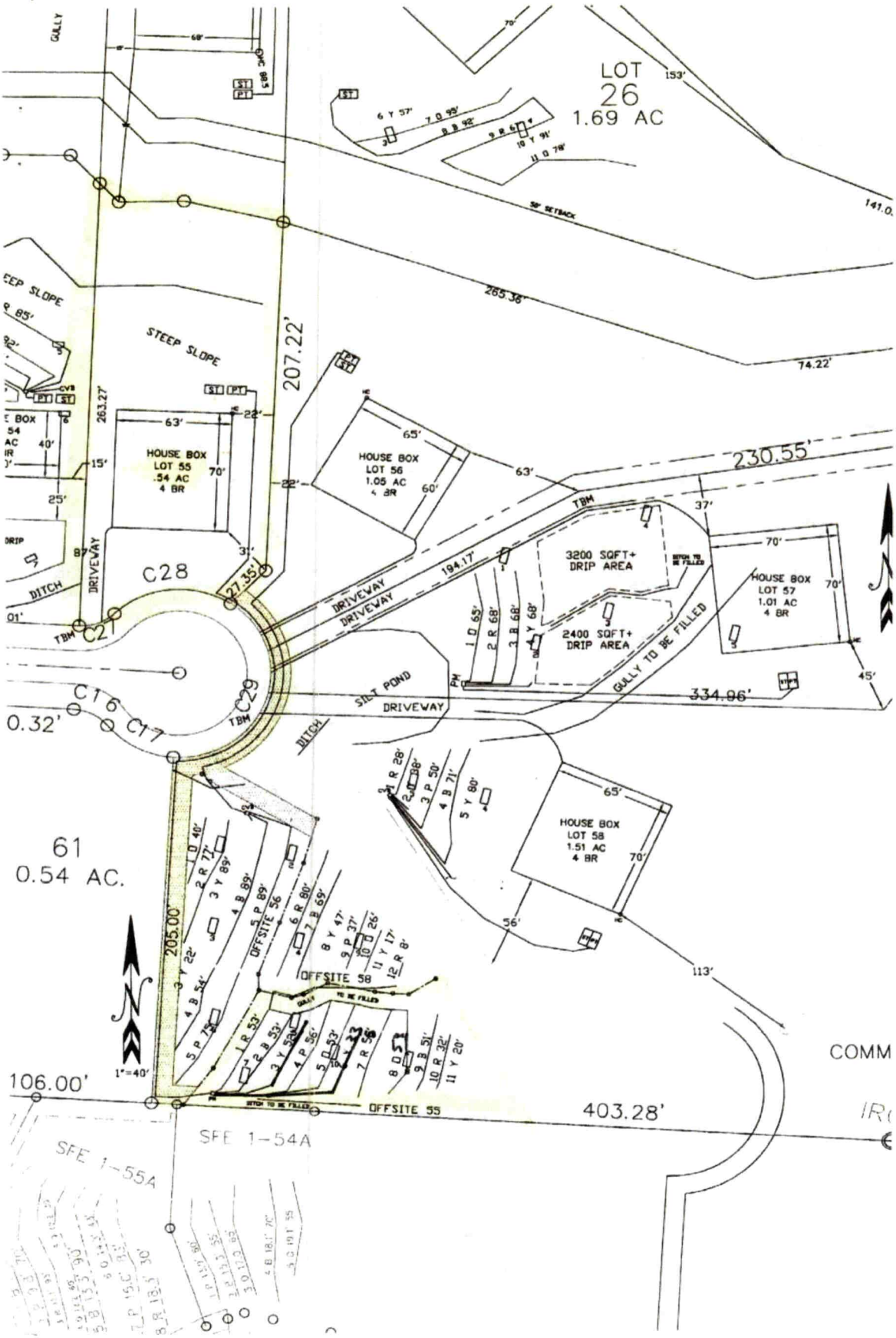
Mike Barry
Contractor
Mike Barry
Chief Operating Officer, AQWA, Inc.



KSAT Tests Overview



KSAT Test Close Up

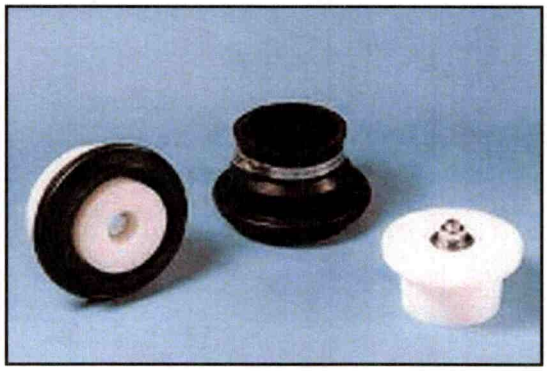

LOT
26
1.69 AC
GULLY
STEEP SLOPE
207.22'
263.27'
HOUSE BOX
LOT 55
.54 AC
4 BR
HOUSE BOX
LOT 56
1.05 AC
4 BR
HOUSE BOX
LOT 57
1.01 AC
4 BR
HOUSE BOX
LOT 58
1.51 AC
4 BR
3200 SQFT+
DRIP AREA
2400 SQFT+
DRIP AREA
DRIVEWAY
DITCH
SILT POND
GULLY TO BE FILLED
DITCH TO BE FILLED
TBM
C28
C27
C16
C17
C29
C2
230.55'
194.17'
334.96'
265.38'
74.22'
141.0
403.28'
205.00'
106.00'
OFFSITE 56
OFFSITE 58
OFFSITE 55
61
0.54 AC.
1"=40'
SEE 1-54A
SEE 1-55A
COMM

CAST-A-SEAL® 402/402F

CAST-IN BOOT-TYPE CONNECTOR
for 1-1/4" to 6"PVC Pipe

What It Is

CAST-A-SEAL 402/402F is a watertight flexible connector that is cast into the structure when the concrete is poured. The connector is folded into the casting position and placed on the reusable heavy-duty solid plastic mandrel that is installed directly to the form. After the concrete is cured, the form is opened, removing the mandrel from the gasket, but leaving the **CAST-A-SEAL 402/402F** connector embedded in the concrete. The gasket is then simply unfolded at the jobsite and is tightened around the pipe using the supplied stainless steel take-up clamp.



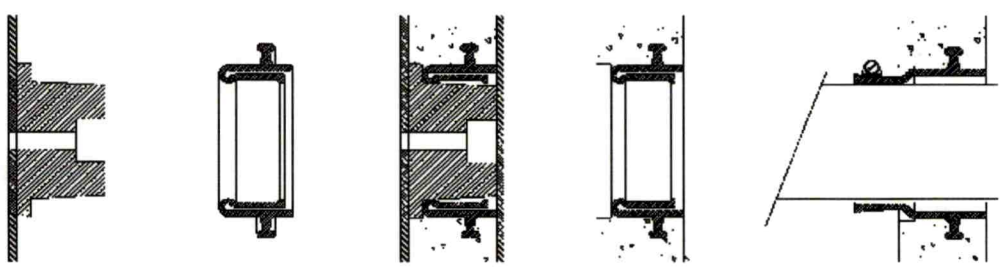
Why It's Better

- Simple cast-in design provides flexible watertight connection
- Eliminates infiltration and exfiltration
- Improves on-site system performance and minimizes maintenance
- Protects groundwater from unintended discharges
- Use in on-site treatment structures, grease interceptors, manholes, wet wells, pump and lift stations, stormwater structures, or any application requiring a flexible watertight connector

How It Performs

CAST-A-SEAL 402/402F *meets or exceeds all requirements of the following Standards, Codes, Specifications and/or Test Methods:*

ASTM C 1227	***IAPMO Z1000***
ASTM C 1644	***IAPMO Z1001***
ASTM C 923	***NPCA Best Practices***
ASTM C 1244	***NOWRA Model Code***
ASTM C 1478	



Attach mandrel to outside form wall.

Invert gasket into casting position.

Place gasket and mandrel in form and pour.

Strip form and mandrel, leaving gasket in place.

Invert gasket to outside of tank, insert pipe and tighten take-up clamp.

Press-Seal believes all information is accurate as of its publication date. Information, specifications, and prices are all subject to change without notice. Press-Seal is not responsible for any inadvertent errors. Copyright 2007

PRESS-SEAL GASKET CORPORATION
Providing Products and Services That Protect Our Planet's Clean Water Supply
800-348-7325 Fax (260) 436-1908
email: sales @press-seal.com
web: www.press-seal.com

Made in USA

CAST-A-SEAL® 402/402F

PRODUCT SPECIFICATION and SELECTION

Submittal Specification

A flexible Pipe-to-Structure connector shall be employed in the connection of the sanitary sewer pipe to precast structures. The connector shall be CAST-A-SEAL® 402/402F as manufactured by Press-Seal Gasket Corporation, Fort Wayne, Indiana, or approved equal. The connector shall be the sole element relied on to assure a flexible, watertight seal of the pipe to the precast structure. The connector shall consist of a rubber gasket and an external take-up clamp.

The rubber gasket element shall be constructed solely of synthetic or natural rubber, and shall meet or exceed the physical property requirements of ASTM C 923.

The external take-up clamp shall be constructed of Series 300 non-magnetic stainless steel and shall utilize no welds in its construction. The clamp shall be installed by torquing the adjusting screw using a torque-setting wrench available from the connector manufacturer.

Selection of the proper size connector for the structure and pipe requirement, and installation thereof, shall be in strict conformance with the recommendations of the connector manufacturer. Any dead end pipe stubs installed in connectors shall be restrained from movement per ASTM C 923.

The finished connection shall provide sealing to 13 psi (minimum) and shall accommodate deflection of the pipe to 7 degrees (minimum) without loss of seal.

Vacuum testing shall be conducted in strict conformance with ASTM C 1244 prior to backfill. Other testing shall be conducted in strict conformance with the requirements of the connector manufacturer.

CAST-A-SEAL 402	PIPE SIZE	PIPE O.D. RANGE	WALL THICKNESS*	APPLICATION
452.0250	1.25" - 2"	1.5" - 2.75"	2.5" - 6"	STANDARD
452.0450	4"	4.2" - 4.7"	2.5" - 6"	STANDARD
452.0402F1	4"	4.2" - 4.7"	2.5" - 6"	Closed Face
452.0650	6"	6.2" - 6.7"	2.5" - 6"	STANDARD
CAS ADAPTER	3"	3.2" - 3.6"	---	Use with 4" CAST-A-SEAL

PRODUCT PERFORMANCE

CAST-A-SEAL402/402F meets and/or exceeds all requirements of ASTM C 923, including physical properties of materials and performance testing, including:

- 13 psi minimum in straight alignment
- 10 psi at minimum 7°angle
- 10 psi minimum under shear load of 150 lbs/in. pipe diameter

CAST-A-SEAL 402/402F meets and/or exceeds the requirements of the following Standards, Specifications, Codes, and Test Methods:

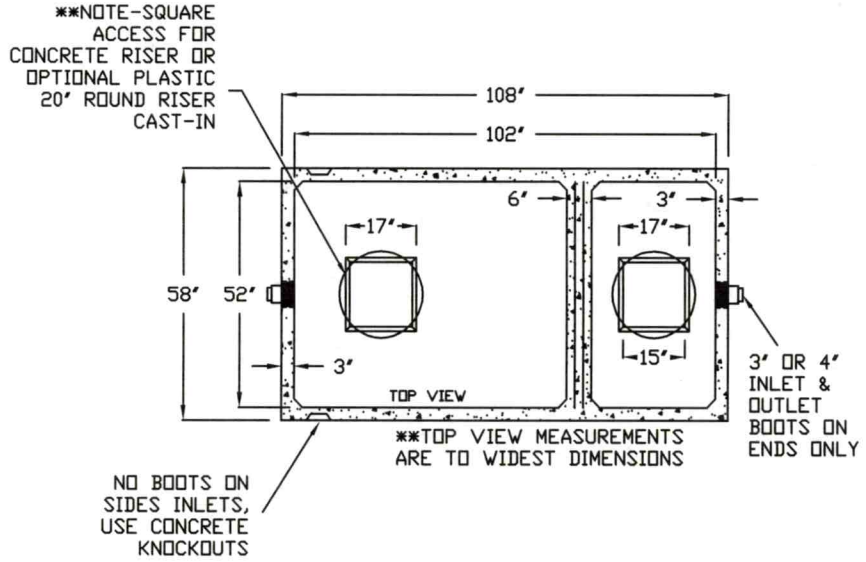
- ASTM C 923 *Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals*
- ASTM C 1644 *Standard Specification for Resilient Connectors Between Reinforced Concrete On-SIte Wastewater Tanks and Pipes*
- ASTM C 1478 *Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals*
- ASTM C 1244 *Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test*
- IAPMO/ANSI Z1000 *Standard for Prefabricated Septic Tanks*
- IAPMO/ANSI Z1001 *Standard for Prefabricated Gravity Grease Interceptors*
- *NPCA Best Practices Manual for Precast Concrete On-Site Wastewater Tanks*
- *NOWRA Model Code Framework*

TYPICAL TEST RESULTS for CAST-A-SEAL 402/402F (as in ASTM C 1644, C 923, and C 1478)

Test	ASTM Test Method	Test Requirements	Typical Result
CHEMICAL RESISTANCE; 1N SULFURIC ACID and 1N HYDROCHLORIC ACID	D 534, AT 22°C FOR 48 HRS	NO WEIGHT LOSS NO WEIGHT LOSS	NO WEIGHT LOSS NO WEIGHT LOSS
TENSILE STRENGTH	D 412	1200 PSI, MIN.	2100 PSI
ELONGATION AT BREAK	D 412	350%, MIN.	525%
HARDNESS	D 2240 (SHORE A DUROMETER)	±5 FROM THE MANUFACTURER'S SPECIFIED HARDNESS	<2
ACCELERATED OVEN-AGING	D 573, 70± 1°C FOR 7 DAYS	DECREASE OF 15%, MAX. OF ORIGINAL TENSILE STRENGTH, DECREASE OF 20%, MAX. OF ELONGATION	-13% TENSILE CHANGE, -14% ELONGATION CHANGE
COMPRESSION TEST	D 395, METHOD B, AT 70°C FOR 22 HRS	DECREASE OF 25%, MAX. OF ORIGINAL DEFLECTION	13%
WATER ABSORPTION	D 471 IMMERSE 0.75 BY 2-IN.SPECIMEN IN DISTILLED WATER AT 70°C FOR 48 hrs	INCREASE OF 10%, MAX. OR ORIGINAL BY WEIGHT	3.50%
OZONE RESISTANCE	D 1171	RATING 0	PASS
LOW-TEMP, BRITTLE POINT	D 746	NO FRACTURE AT -40°C	PASS
TEAR RESISTANCE	D 624, METHOD B	200 LBF/IN. (MIN.)	450 LBF/IN.

Press-Seal believes all information is accurate as of its publication date. Information, specifications, and prices are all subject to change without notice. Press-Seal is not responsible for any inadvertent errors. Copyright 2007

PRESS-SEAL GASKET CORPORATION
Providing Products and Services That Protect Our Planet's Clean Water Supply
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email: sales @press-seal.com
web: www.press-seal.com
an ISO 9001:2000 Registered Company

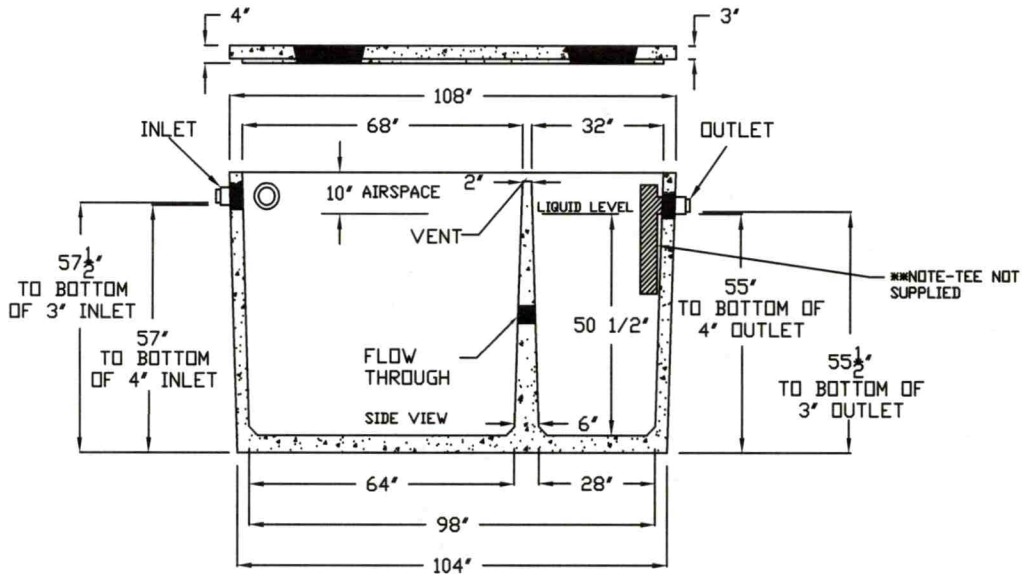


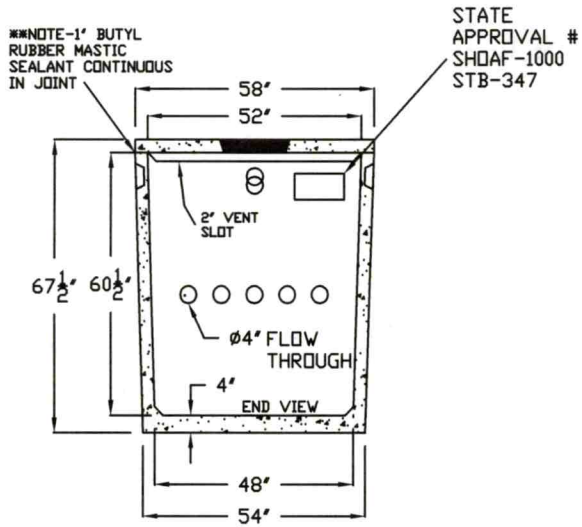
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826

MODEL: TS 1000 STB
NON TRAFFIC
1000 Gallon Septic Tank

WWW.SHOAFPRECAST.COM
SHOAF-1,000 SEPTIC TANK
STB-347 NON TRAFFIC
LIQUID CAPACITY-1,000 GALLONS/AIRSPACE-10'
TANK HEIGHT-67 1/2'
BOTTOM OF TANK TO CENTER OF INLET-59'
BOTTOM OF TANK TO CENTER OF OUTLET-57'
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-3' OR 4' PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,500 LBS.
REINFORCEMENT PER STATE CODE

SCALE - N.T.S.





Submittal Data Sheet

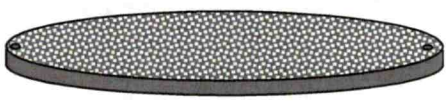
Fiberglass Access Lids

Orenco Systems® Incorporated
1-800-348-9843

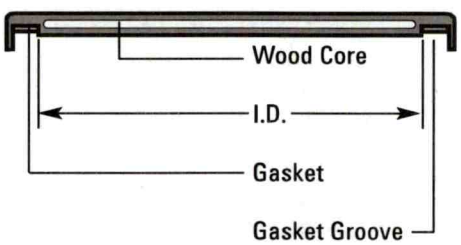
Applications

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□□-□-□-□ **FL24-4B**

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

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

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Technical Data Sheet

Access Risers – Ultra-Rib™

Orenco Systems® Incorporated
1-800-348-9843

Applications

Orenco's Access Risers provide access to septic tank openings and can be cast into the tops of concrete tanks, bonded in place, or bolted down using a riser tank adaptor. They can also be used as valve enclosures.



General

Orenco Ultra-Rib™ Access Risers are constructed of ribbed PVC pipe and are available in 12", 18", 21", and 24" diameters. They can be ordered in 3-inch increments in lengths up to 13 ft for 12" and 18" diameter risers, and up to 14 ft for 21" and 24" diameter risers.

Standard Models

RR12XX, RU18XX, RR21XX, RR24XX

Nomenclature

R □ □□ □□ + □ + □ RR24XX

- Riser
- Routing code:
  - U = Ultra-Rib™: 18"
  - R = Ultra-Rib™: 12", 21", 24"
- Riser diameter: 12"‡, 18"‡, 21", 24"
- Riser height (inches)
- Splice Box:
  - S = 1" grommet installed (for Orenco SB1 - SB4 splice boxes)
  - L = 1-1/4" grommet installed (for Orenco SB5, SB6 splice box)
  - S1 = SB1 attached
  - S2 = SB2 attached
  - S3 = SB3 atached
  - S4 = SB4 attached
  - L5 = SB5 attached
  - L6 = SB6 attached
  - SX = Predrilled hole for external splice box*
  - XS = Explosion-proof splice box for simplex pumps†
  - XD = Explosion-proof splice box for duplex pumps†
  - XT = Explosion-proof splice box for triplex pumps†
- Discharge grommet:
  - 10 = 1"
  - 12 = 1-1/4"
  - 15 = 1-1/2"
  - 20 = 2"

* Minimum riser height 18"
† Used in Class I Division I environments
‡ Not intended for use over pump vaults

Materials of Construction

Ultra-Rib™ PVC Pipe:	PVC

Specifications

Model	RR12XX	RU18XX	RR21XX	RR24XX
I.D.	11.74 in. (298 mm)	17.65 in. (448 mm)	20.5 in. (521 mm)	23.50 in. (597 mm)
Wall Thickness - excluding ribs	0.10 in. (3 mm)	0.19 in. (5 mm)	0.25 in. (6 mm)	0.20 in. (5 mm)
O.D. - including ribs	14.60 in. (371 mm)	19.44 in. (494 mm)	22.63 in. (575 mm)	28.50 in. (724 mm)
Weight per foot (meter)	5 lb (7.4 kg)	11 lb (16.4 kg)	15 lb (22.3 kg)	19 lb (28.3 kg)

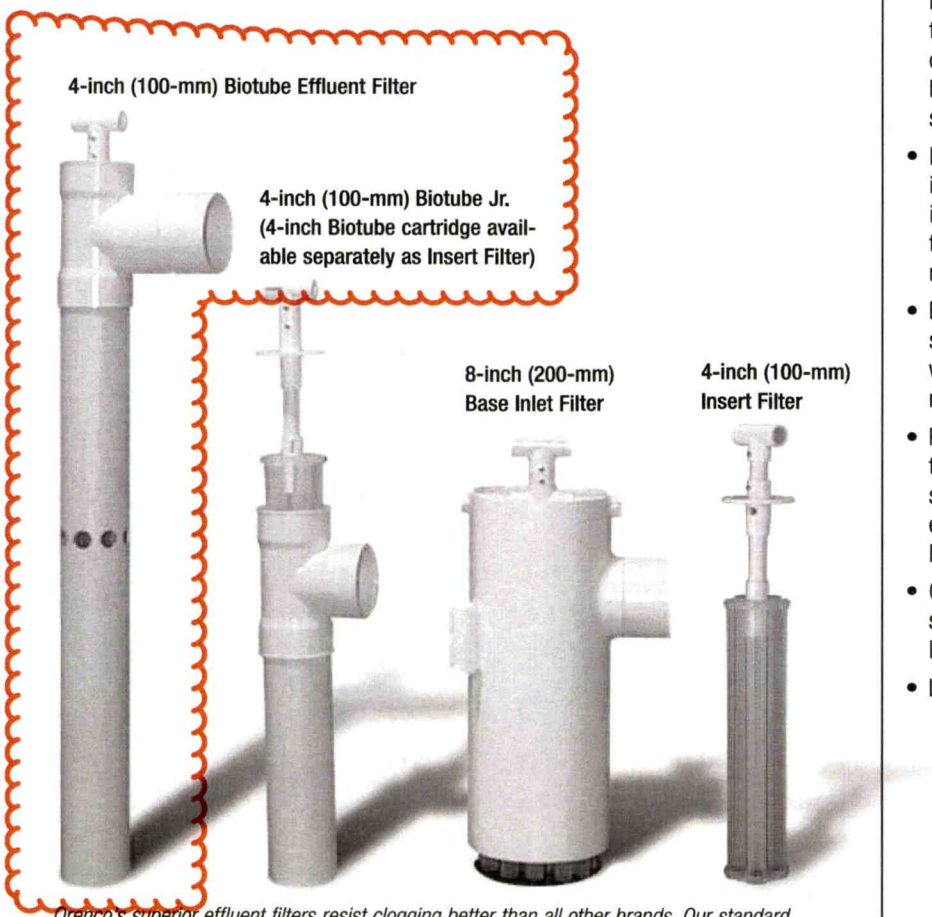
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Orenco SYSTEMS® *Product Sheet*

Residential Biotube® Effluent Filters

Applications

Our patented* 4-inch (100-mm) Biotube Effluent Filters, Biotube Jr., Biotube Base Inlet Filters, and Biotube Insert Filters are ideal for residential septic tanks and have a lifetime warranty. 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-inch (100-mm) Biotube Effluent Filter provides maximum long-term protection in a complete package, with housing. Our 4-inch (100-mm) Biotube Jr., at half the size of our standard model, has more filtering capacity than the full-sized filters sold by other manufacturers. For low-profile tanks, there's the Base Inlet Filter. And for tanks with existing outlet tees, the Biotube Insert Filter is ideal.

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

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; extendible 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
- Lifetime warranty

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.

To Order

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

Orenco® SYSTEMS

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800-348-9843 • 541-459-4449 • www.orenco.com

FT □ □ 04 □□ - □□ M A - □ **FTPS0436-28NC**

- For customized options (e.g., NC indicates North Carolina regions)
- Indicates float bracket attached
- Indicates flow modulation plate installed
- Cartridge height, 28" and 36" are standard
- Housing height, 36" and 44" are standard
- Indicates filter diameter (inches)
- W = fits 3034 outlet pipe
  S = fits schedule 40 outlet pipe
- P = 1/16" filtration
  Blank = 1/8" filtration
- Biotube effluent filter series

FT □ □□ 22 - 14 B □

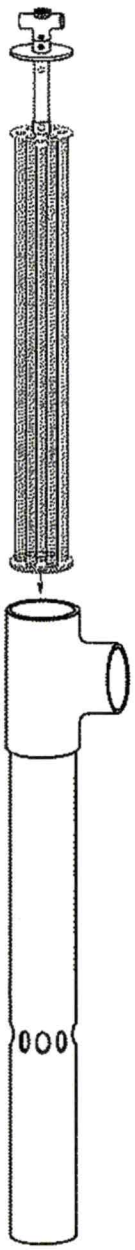
- Add codes for standard options:
  A = float bracket
- Base inlet model
- Cartridge height, 14" standard
- Housing height, 22" standard
- Indicates filter diameter (inches)
  08 = 8"
  12 = 12"
- P = 1/16" filtration
  Blank = 1/8" filtration
- Biotube effluent filter series

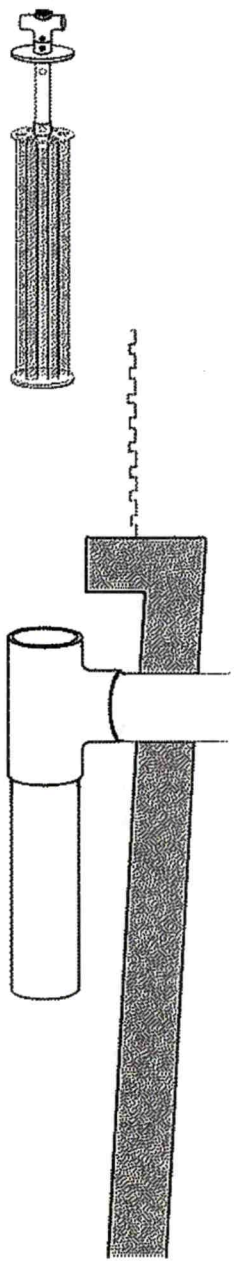
FT J □ □ 04 18 M A - □

- For customized options (e.g., NC indicates North Carolina regions)
- Indicates float bracket attached
- Indicates flow modulation plate installed
- Cartridge height (inches)
- Indicates filter diameter (inches)
- W = fits 3034 outlet pipe
  S = fits schedule 40 outlet pipe
- P = 1/16" filtration
  Blank = 1/8" filtration
- Jr. series
- Biotube effluent filter series

FT i □ 0418 - □ - □

- For customized options (e.g., NC indicates North Carolina regions)
- W = fits 3034 outlet pipe
  S = fits schedule 40 outlet pipe
- Cartridge height (inches)
- Indicates filter diameter (inches)
- P = 1/16" filtration
  Blank = 1/8" filtration
- Insert series
- Biotube effluent filter series



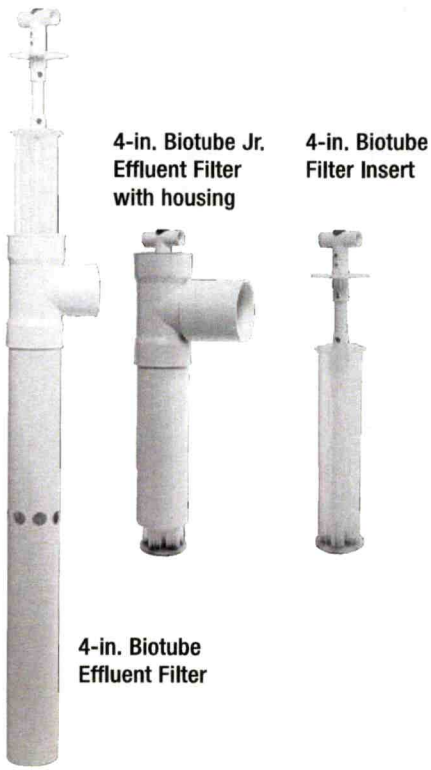


Orenco® SYSTEMS *Instructions*

4-in. Biotube® Effluent Filter

Installation and Maintenance Instructions

Biotube Effluent Filters* extend drainfield life by preventing solids from leaving the septic tank. Our 4-in. (nominal size) filter comes in its own housing, in both 44-in. (1118-mm) and 36-in. (914-mm) lengths. Our Jr. insert filter is 18 in. (457 mm) long, fits in a nominal 4-in. outlet tee, and comes with or without its own housing. Biotube Effluent Filters install in minutes, inside new or existing tanks.

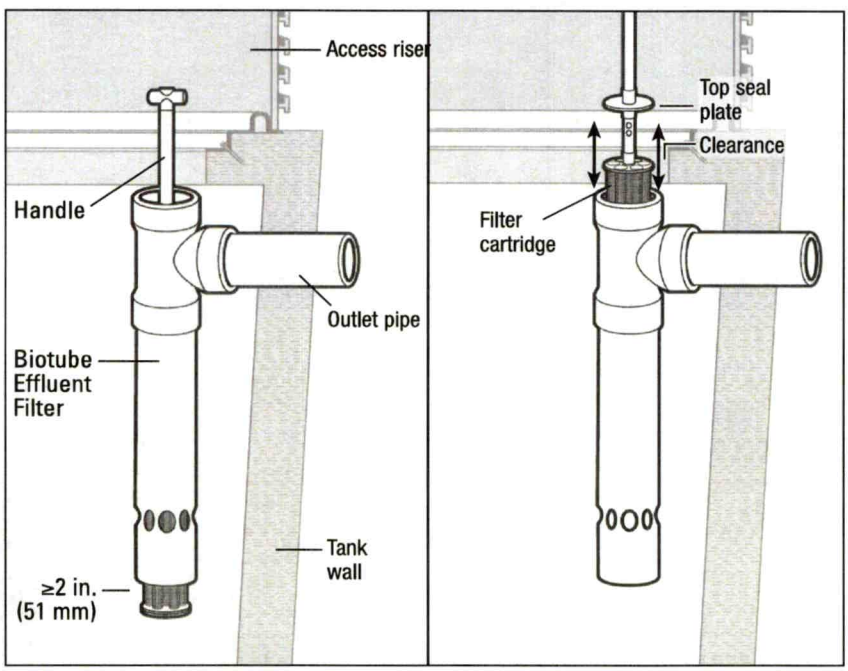


Installation Instructions

Step 1: Test-Fit the Effluent Filter

Test-fit the effluent filter on the septic tank's outlet pipe without gluing. Make sure it fits plumb. Install the assembly as snug as possible to the tank wall, but ensure sufficient clearance for removing the filter cartridge.

If using the 4-in. Biotube Insert Filter, adjust the length of the outlet tee so that the bottom of the Insert Filter extends at least 2 in. (51 mm) below the bottom of the outlet tee.



*Protected by U.S. Patent Numbers 5,492,635 and 4,439,323

Installation Instructions (continued)

Step 2: Attach Filter to Tank

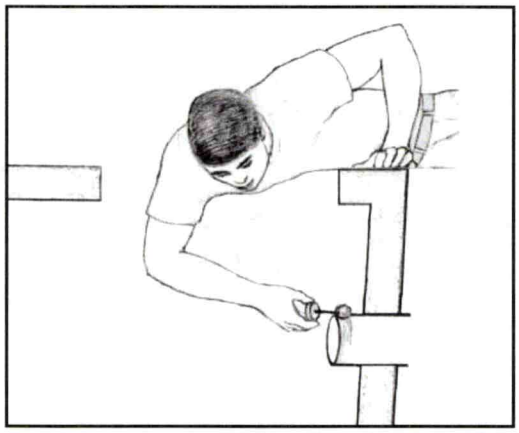
Two attachment methods can be used:

1) Glue the filter onto the tank outlet pipe using appropriate primer and glue.

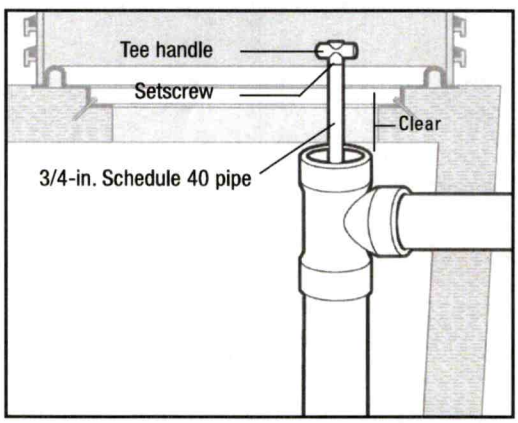
2) A stainless steel setscrew can be used to secure the filter instead of glue.

Step 3: Extend Cartridge Handle

For easier access when servicing, the cartridge handle may be extended using a longer length of 3/4-in. Schedule 40 PVC pipe.



This illustration shows the gluing technique for installing a filter into a new septic tank. Installing a filter into an existing tank is a custom, site-specific job.



Cartridge handles can be extended for easier access.

Orenco Systems®, Inc., 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-459-4449 • www.orenco.com

Maintenance Instructions

To ensure the effluent filter is functioning properly, inspect it every year. Under normal conditions, your effluent filter will function for several years before cleaning is necessary. Clean the filter when it becomes clogged enough to restrict normal flows out of the septic tank. At a minimum, clean the filter whenever the tank is pumped. High-level alarms, which activate when the filter is clogged, are recommended to prevent backups.

Be sure to dress properly when inspecting and cleaning the filter. Wear full-length pants and shirt, shoes, gloves, and goggles or glasses.

Step 1

Remove the access lid to your septic tank by unscrewing the stainless steel lid bolts with the hex head wrench provided. If your lid is above ground, it will be easy to find. If it is buried below ground, find the marker that indicates its location.

Step 2

Remove the filter cartridge by grasping the tee handle and lifting it out of its housing.

Step 3

Spray the cartridge tubes with a hose to remove any material sticking to them. Ensure that the three orifices in the optional flow modulation plate inside the filter are clear of any debris. Make sure the rinse water runs back into the tank, but do not allow solids material to fall into the open filter housing.

Step 4

Firmly place the cartridge back into the housing.

Step 5

Some effluent filters come with an alarm that activates when the filter needs cleaning. If you have an alarm, check to make sure it is working by lifting the float with a stick. An audible horn should sound. The alarm panel is normally mounted on the side of the house or in the garage.

Note: If your effluent filter doesn't have an alarm system and you would like one, call your local septic system installer.

Step 6

Record the date that you inspected and/or cleaned your filter on the form that follows this page. If you checked the alarm or made any other observations about the tank or system, include that information under "Notes."

Step 7

Attach the access lid by placing it on the riser, matching the holes in the lid with the holes in the riser. Insert each lid bolt through the lid and the hole in the riser and tighten with hex head wrench provided. Before leaving, pull up firmly on the lid to make sure it is secure.

Inspection/Maintenance Form

Date Installed: _____ **Model Tank:** _____ **Size:** _____

Model: _____ **Single/Double Compartment:** _____

Date Inspected	Cleaned Yes	Cleaned No	Notes

Important Names and Numbers

System Service Provider: _____ **Phone:** _____

System Installer: _____ **Phone:** _____

Septic Tank Pumper: _____ **Phone:** _____

Electrician: _____ **Phone:** _____

System Designer: _____ **Phone:** _____

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TREATMENT EQUIPMENT DISCLOSURE

Property Physical Address: 173 Northlake Dr., Statesville, 28677,
State of North Carolina, County of Iredell

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 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 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, AQWA Inc., 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 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 two service visits per year, but shall include all necessary visits to meet conditions or requirements of the State of North Carolina, the system and equipment Design Engineer, or the County or Regional Health Department.

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 North Carolina Department of Health Office or 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 system performance reporting to the Manufacturer via 800 number service. Telephone installation to the wastewater control panel will be completed prior to start-up inspection and issuance of the Operations Permit and service will be established by the Owner within 5 working days following issuance of the Certificate of Occupancy. Discontinuance of telephone service or access places the system Out of Service.

This document will be filed with the Deed of the property by the Owner prior to start-up and issuance of the operations permit by Iredell County. This agreement is binding upon subsequent owners as long as the equipment is in operation and shall be disclosed at property transfers.

Owner:

Judy Ann Fair
Signature

Judy Ann Fair
Printed Name

****

STATE OF North Carolina:

COUNTY OF Mecklenburg:

I, Alice Hicks, a Notary Public of the County and State aforesaid, certify that Judy Fair personally came before me, this day and acknowledged the due execution of the foregoing document for the purposes therein expressed.

WITNESS my hand and Notarial Seal, this 5th day October, 2021.

Alice J Hicks
Notary Public

12/09/2022
Commission Expires

SEAL

ALICE J HICKS
Notary Public
Mecklenburg
County
My Comm. Exp.
12-09-2022
NORTH CAROLINA

CALCULATIONS

FOR A GROUND ABSORPTION SEWAGE DISPOSAL SYSTEM USING SEPTIC TANK, TS-I ADVANCED TREATMENT AND SUBSURFACE DRIP DISPOSAL TO SERVE A 3 BEDROOM RESIDENCE

LOT 55 NORTHLAKE SUBDIVISION

Iredell County, North Carolina

July 6, 2021
Revised August 16, 2021

Prepared for:
Adams Homes
10115 Kincey Ave, #160
Huntersville, NC 28078
Phone: (704) 361-5437

Prepared by:
PIEDMONT DESIGN ASSOCIATES, P.A.
125 East Plaza Drive, Suite 101
Mooresville, NC 28115
Phone: 704-664-7888
Fax: 704-664-1778
NCBELS No.: C-1007



GEOFLOW
SUBSURFACE DRIP

Updated Mar 2015

FIELD FLOW

Job Description:	*Lot 55 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*8-Jul-21*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a **guide** for **small** systems with **residential** waste & is not a comp

Worksheet 1- Field Flow

Total field

Total Quantity of effluent to be disposed per day	360	gallons / day
Hydraulic loading rate	0.15	gallons / sq.ft. / da
Minimum Dispersal Field Area	2,400	square ft.
Total Dispersal Field Area	2,654	square ft.

Flow per zone

Number of Zones	1	zone(s)
Dispersal area per zone	2,654	square ft.
Choose line spacing between WASTEFLOW lines	2	ft.
Choose emitter spacing between WASTEFLOW emit	2	ft.
Total linear ft per zone (minimum required)	1,327	ft. per zone
Total number of emitters per zone	664	emitters per zone
Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
	Wasteflow Classic	
	Wasteflow PC - 1/2gph	
	Wasteflow PC - 1 gph	
Pressure at the beginning of the dripfield	45	psi
Feet of Head at the beginning of the dripfield	103.95	ft.
What is the flow rate per emitter in gph?	0.53	gph
Dose flow per zone	**5.86**	**gpm**

Note: A few States or Counties require additional flow for flushing. Please check your local regul
Flush velocity calculation below is for PC dripline. Classic dripline requires less flow to flush tha
Please refer to Geoflow's spreadsheet "Design Flow and Flush Curves" at www.geoflow.com or ca

If required, choose flush velocity	2	ft/sec
How many lines of WASTEFLOW per zone?	6	lines
Fill in the *actual* length of longest dripline lateral	270	ft.
Flush flow required at the end of each dripline	1.48	gpm
Total Flow required to achieve flushing velocity	8.88	gpm
Total Flow per zone- worst case scenario	**14.74**	**gpm**

Select Filters and zone valves

Select Filter Type	Vortex Screen Filter	
Recommended Filter (item no.)	AP4E-1.5F	Screen Filter 0-20g
Select Zone Valve Type	Electric Solenoid	-
Recommended Zone Valve (item no.)	0	0

-

Dosing

Number of doses per day / zone:	12	doses
Timer ON. Pump run time per dose/zone:	5.07	mins:secs
Timer OFF. Pump off time between doses	1:54	hrs:mins
Per Zone - Pump run time per day/zone:	1:01	hrs:mins
All Zones - Number of doses per day / all zones	12	doses / day
Allow time for field to pressurize	0:00:30	hrs:mins:secs
Filter flush timer	0:00:20	hrs:mins:secs
Drain timer	0:05:00	hrs:mins:secs
Field flush timer	0:01:00	hrs:mins:secs
Field flush counter	37	cycles
Time required to complete all functions per day	**2:23**	hrs:mins
Dose volume per zone	30	gallons per dose

GEOFLOW
SUBSURFACE DRIP

PUMP SIZING

Job Description:	*Lot 55 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*7/8/2021*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a guide for small systems with residential waste & is not a complete hy
Pressure losses may be grossly overstated, particularly if designing with WASTEFLOW C
The letters on the diagram(right) match the letters in section 2 below.

Worksheet - Pump Sizing

Section 1 - Summary from Worksheet 1

Flow required to dose field	5.86	gpm
Flow required to flush field	8.88	gpm
Flow required to dose & flush field	14.74	gpm
Filter	AP4E-1.5F	
No. of Zones	1	zones
Zone valve	-	
Dripline	Wasteflow PC - 1/2gph	
Dripline longest lateral	270.00	ft.

Section 2	Ft of head	Pressure
A. Flush line - Losses through return line		
Select Pipe from dropdown menu	PVC schedule 40	
Select Flush Line Diameter	1-1/2" inch	
Length of return line	635 ft.	
Equivalent length of fittings	127 ft.	
Elevation change. (if downhill enter 0)	**20** ft.	
Pressure loss in 100 ft of pipe	0.63 ft.	0.27 psi
Total pressure loss from end of dripline to return tank	*24.8 ft.*	10.73 psi
B. Dripline - Losses through Wasteflow dripline		
Length of longest dripline lateral	**270** ft.	
Minimum dosing pressure required at end of dripline	24.79 ft.	10.73 psi
Loss through dripline during flushing	8.45 ft.	3.66 psi
Total minimum required dripline pressure	*33.24 ft.*	14.39 *psi*
A+B. Minimum Pressure required at beginning of dripfield		
CALCULATED pressure required at beginning of dripfi	*58.03 ft.*	25.12 *psi*
SPECIFIED pressure at beginning of dripfield (from wo	**104.0 ft.**	45.00 *psi*
Great! SPECIFIED Pressure is greater than CALCULATED Pressure requirement. Go to next step		
C. Drip components - Losses through headworks		
Filter	15.0 ft.	6.50 psi
Zone valve pressure loss (not in diagram)	- ft.	- psi
Flow meter pressure loss (not in diagram)	4.04 ft.	1.75 psi
Other pressure losses	5.00 ft.	2.16 psi
Total loss through drip components	**24.06 ft.**	10.41 psi
D. Supply line - Minimum Pressure head required to get from pump tank to top of dripfield		
Select Pipe from dropdown menu	PVC schedule 40	
Select Supply line diameter	1-1/2" inch	
Length of supply line	635 ft.	
Equivalent length of fittings	127 ft.	
Height from pump to tank outlet	6 ft.	
Elevation change. (if downhill enter 0)	20 ft.	
Pressure loss/gain in 100 ft. of pipe	1.61 ft.	0.70 psi
Total gain or loss from pump to field	***38.2 ft.***	16.56 psi
Total dynamic head	**166.2 ft.**	71.97 *psi*
Pump capacity * - Field Flush Flow	**14.7 gpm**	71.97 *psi*
- Field Dose Flow	**5.9 gpm**	
- Filter Flush Flow	**- gpm**	- *psi*
Pump Model Number	**Orenco PF 2010-12**	
Voltz / Hp / phase	**230V - 1 HP - 1 Phase**	

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com



Soil Suitability for Domestic Sewage Treatment and Disposal Systems
173 Northlake Drive (Lot 55), Statesville, NC. 28677 (Iredell County, NC)

PREPARED FOR: Adams Homes, (Attention: Bob Cashion)

PREPARED BY: Jeff Vaughan
Trevor Hackney

DATE: July 6, 2021

The following report is a summary of saturated hydraulic conductivity tests (K_{sat}) and soil profile evaluations conducted at 173 Northlake Drive (Lot 55), Statesville, NC, on June 24, 2021 (Attachment 1). The tests/evaluations were performed by Trevor Hackney of Agri-Waste Technology, Inc., (AWT) using a Johnson Permeameter. The lot was previously evaluated by Bryant White of the Iredell County Environmental Health Department, Jeff Vaughan, and Trevor Hackney. The proposed septic system is to serve an existing three-bedroom home on the property. A subsurface drip with pretreatment septic system is proposed for the initial and repair system. The system is completely proposed within an off-site easement across the road from the existing structure. There is an existing ditch on the South side of the drainfield easement that should be filled prior the system installation.

A map of the property showing the septic system layout and K_{sat} test locations is available as Attachment 1. Three in-field K_{sat} tests were conducted within the proposed septic system drainfield area as delineated by Iredell County Environmental Health Department and AWT. A summary of the computational spreadsheets, field datasheets, soil profile descriptions, and pictures are provided as Attachment 2. The purpose of the tests is to provide an estimated loading rate for a subsurface drip with pre-treatment septic system, with the understanding that the final loading rate will be set by the Iredell County Environmental Health Department. Results from the K_{sat} tests are detailed in Table 1 below.

Based on the pit evaluations performed by Bryant White and AWT the trench bottom should be installed at 15 inches at this site due to the disturbed soil surface. The treatment zone will be identified as 15-24 inches. The K_{sat} tests were performed at various depths near this treatment zone on the site.

Table 1. K_{sat} Results for 173 Northlake Drive (Lot 55), Statesville, NC.

Adams Homes; 173 Northlake Drive (Lot 55), Statesville, NC.
K_{SAT} Summary

	Ksat Test Depth	Permeability	
Ksat #	(in)	(in/hr)	(gal/day/ft^2)
1	21	0.174	2.610
2	13	0.457	6.834
3	17	0.627	9.373

	(in/hr)	(gal/day/ft^2)	(gal/day/ft^2)	(gal/day/ft^2)
	100%	100%	25%	10%
Geomean Treatment Zone (9-21")	0.37	5.51	1.377	0.551

Results of the K_{sat} tests within the offsite drainfield easement showed that the soil would support a loading rate of up to 0.55 GPD/ft^2 based on the geomean of the three tests performed in the treatment zone. However, due to the nature of the underlying soils in the area and given the type of system expected for installation, we do not recommend a loading rate exceeding 0.15GPD/ft^2. At a loading rate of 0.15GPD/ft^2, 1,200' of drip tubing will be necessary per system. The attached drawing proves that 1,327' of drip tubing can be installed for the primary system with 2,680 sq. ft. of area reserved for the repair area. This accounts for 127' of blanking for the primary system. If it is determined that this amount of blanking is not necessary during installation AWT recommends the additional drip tubing be installed as a part of the primary system.

We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.

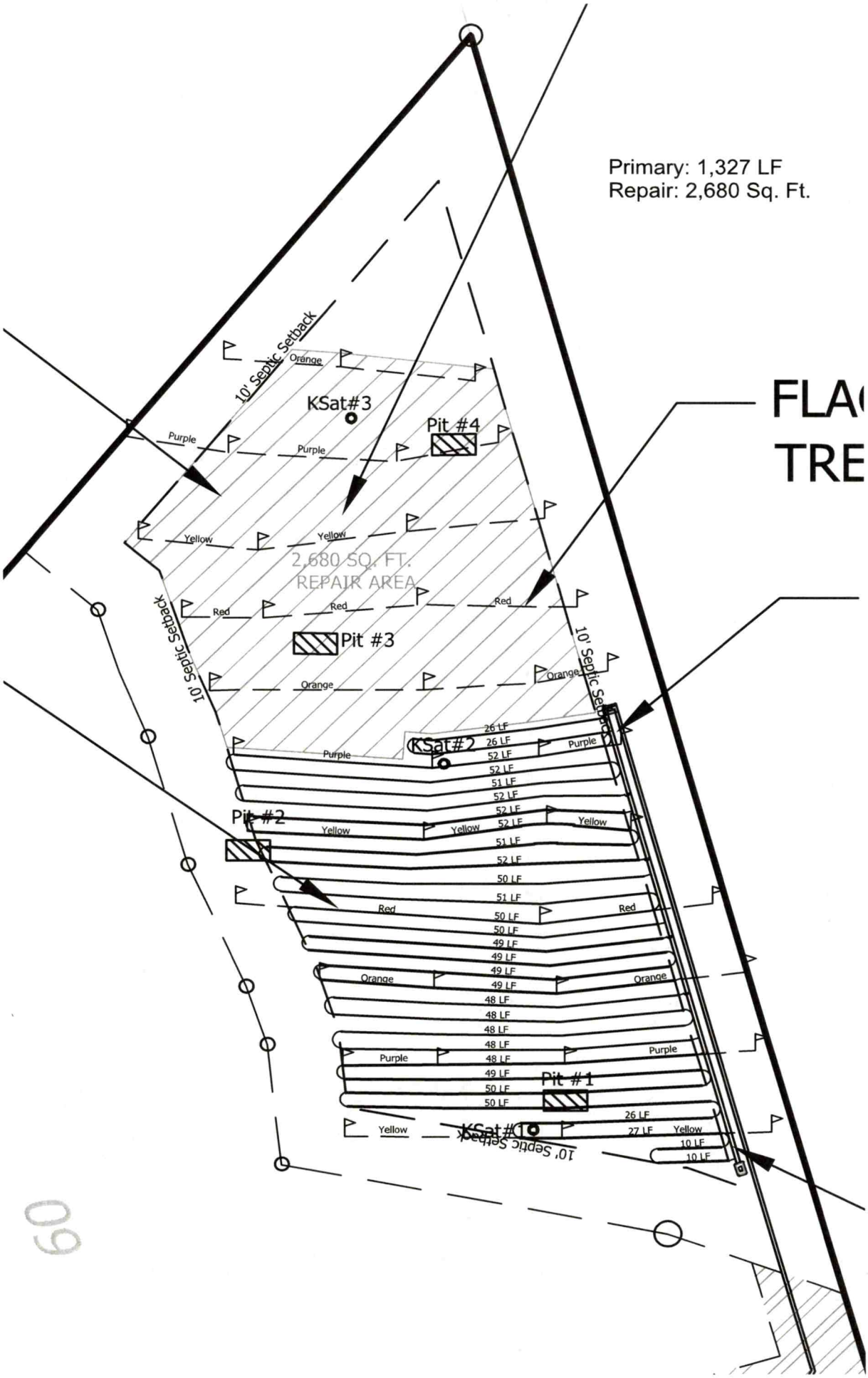
Sincerely,

Jeff Vaughan

Trevor Hackney

Trevor Hackney

Attachment 1: KSAT & Pit Location/Layout Drawing


Primary: 1,327 LF
Repair: 2,680 Sq. Ft.
FLA
TRE
10' Septic Setback
KSat#3
Pit #4
Pit #3
Pit #2
Pit #1
KSat#2
KSat#1
2,680 SQ. FT.
REPAIR AREA
Purple
Yellow
Red
Orange
26 LF
27 LF
52 LF
51 LF
50 LF
49 LF
48 LF
10 LF

Attachment 2: KSAT Logs/KSAT Soil Description Sheets/Pictures

Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

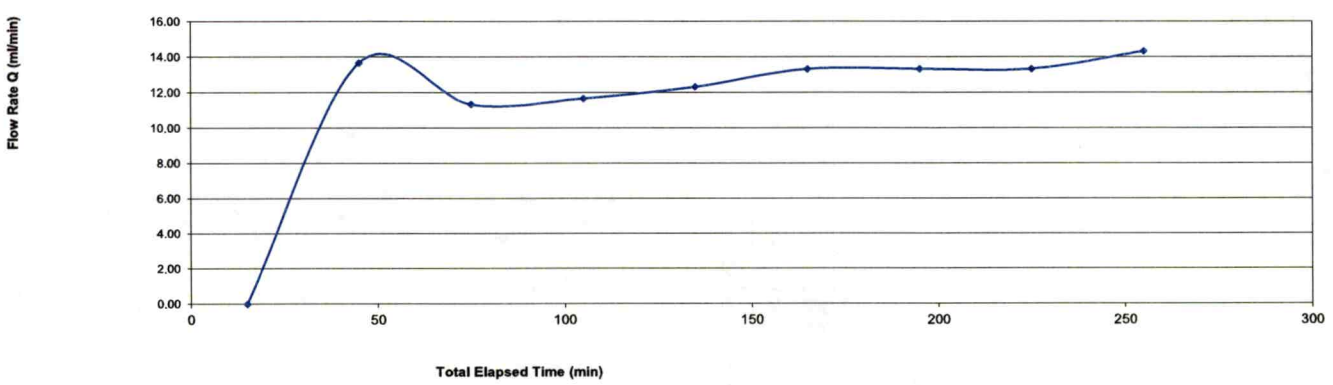
Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #1	**Solution and Terminology (USBR 7300-89 Condition I)***	
Project No.....:		**Investigators.....:**	T. Hackney	$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$	
Project Location...:	173 Northlake Drive (Lot 55)	**Date.....:**	June 24, 2021	where:	
Boring Depth.....:	21 in (Specify units)	**WCU Base Ht. h:**	17.0 cm***	K_B: (Coefficient of Permeability) @ base Tmp. T_B °C:	25
Boring Diameter...:	7.0 cm	**WCU Susp. Ht. S:**	5.0 cm	Q: Rate of flow of water from the borehole	
Boring Radius r.....:	3.50 cm	**Const. Wtr. Ht. H:**	22.0 cm	H: Constant height of water in the borehole	
Soil/Water Tmp. T:	25 °C	**H/r**.....:**	6.3	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T.....:	0.000891 kg/m·s	**Dyn. Visc. @ T_B.:**	0.000891 kg/m·s	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	K_B Equivalent Values (cm/sec)	K_B Equivalent Values (cm/day)	K_B Equivalent Values (in/hr)	K_B Equivalent Values (ft/day)
Start Soak		12:30:00 PM								
3,250	#VALUE!	12:45:00 PM	0:15:00	15.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2,840	410	1:15:00 PM	0:30:00	30.00	13.67	1.3	1.26E-04	10.9	0.18	0.36
2,500	340	1:45:00 PM	0:30:00	30.00	11.33	1.0	1.05E-04	9.0	0.15	0.30
2,150	350	2:15:00 PM	0:30:00	30.00	11.67	1.1	1.08E-04	9.3	0.15	0.31
1,780	370	2:45:00 PM	0:30:00	30.00	12.33	1.1	1.14E-04	9.8	0.16	0.32
1,380	400	3:15:00 PM	0:30:00	30.00	13.33	1.2	1.23E-04	10.6	0.17	0.35
980	400	3:45:00 PM	0:30:00	30.00	13.33	1.2	1.23E-04	10.6	0.17	0.35
580	400	4:15:00 PM	0:30:00	30.00	13.33	1.2	1.23E-04	10.6	0.17	0.35
150	430	4:45:00 PM	0:30:00	30.00	14.33	1.3	1.32E-04	11.4	0.19	0.38

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**1.23E+00**	**1.23E-04**	**10.6**	**0.17**	**0.35**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Used Values from 3:15-4:15				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		255.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #2
Project No.....:		**Investigators.....:**	T. Hackney
Project Location...:	173 Northlake Drive (Lot 55)	**Date.....:**	June 24, 2021
Boring Depth.....:	13 in **(Specify units)**	**WCU Base Ht. h:**	17.0 **cm*** **
Boring Diameter...:	7.0 **cm**	**WCU Susp. Ht. S:**	5.0 **cm**
Boring Radius r.....:	3.50 **cm**	**Const. Wtr. Ht. H:**	22.0 **cm**
Soil/Water Tmp. T:	25 **°C**	**H/r**.....:**	6.3
Dyn. Visc. @ T.....:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.000891 **kg/m·s**

Solution and Terminology (USBR 7300-89 Condition I)*

$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5})-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$

where:

K_B: (Coefficient of Permeability) @ base Tmp. T_B °C: 25

Q: Rate of flow of water from the borehole

H: Constant height of water in the borehole

r: Radius of the cylindrical borehole

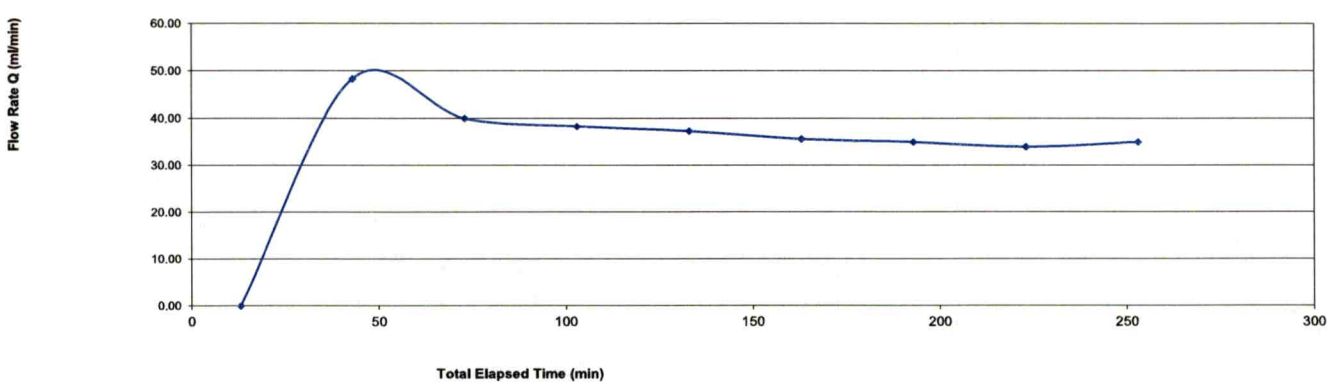
V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	K_B Equivalent Values (cm/sec)	K_B Equivalent Values (cm/day)	K_B Equivalent Values (in/hr)	K_B Equivalent Values (ft/day)
Start Soak		12:33:00 PM								
3,250	#VALUE!	12:46:00 PM	0:13:00	13.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
1,800	1,450	1:16:00 PM	0:30:00	30.00	48.33	4.5	4.46E-04	38.5	0.63	1.26
600	1,200	1:46:00 PM	0:30:00	30.00	40.00	3.7	3.69E-04	31.9	0.52	1.05
3,250		1:46:00 PM								
2,100	1,150	2:16:00 PM	0:30:00	30.00	38.33	3.5	3.54E-04	30.6	0.50	1.00
980	1,120	2:46:00 PM	0:30:00	30.00	37.33	3.4	3.45E-04	29.8	0.49	0.98
3,250		2:46:00 PM								
2,180	1,070	3:16:00 PM	0:30:00	30.00	35.67	3.3	3.29E-04	28.4	0.47	0.93
1,130	1,050	3:46:00 PM	0:30:00	30.00	35.00	3.2	3.23E-04	27.9	0.46	0.92
3,250		3:46:00 PM								
2,230	1,020	4:16:00 PM	0:30:00	30.00	34.00	3.1	3.14E-04	27.1	0.44	0.89
1,180	1,050	4:46:00 PM	0:30:00	30.00	35.00	3.2	3.23E-04	27.9	0.46	0.92

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**3.22E+00**	**3.22E-04**	**27.8**	**0.46**	**0.91**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Averaged Last 4 Values				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		253.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #3
Project No.....:		**Investigators.....:**	T. Hackney
Project Location...:	173 Northlake Drive (Lot 55)	**Date.....:**	June 24, 2021
Boring Depth.....:	17 in (Specify units)	**WCU Base Ht. h:**	17.0 cm***
Boring Diameter...:	7.0 cm	**WCU Susp. Ht. S:**	5.0 cm
Boring Radius r.....:	3.50 cm	**Const. Wtr. Ht. H:**	22.0 cm
Soil/Water Tmp. T:	25 °C	**H/r**.....:**	6.3
Dyn. Visc. @ T.....:	0.000891 kg/m·s	**Dyn. Visc. @ T_B.:**	0.000891 kg/m·s

Solution and Terminology (USBR 7300-89 Condition I)*

$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$

where:

K_B: (Coefficient of Permeability) @ base Tmp. T_B °C: 25

Q: Rate of flow of water from the borehole

H: Constant height of water in the borehole

r: Radius of the cylindrical borehole

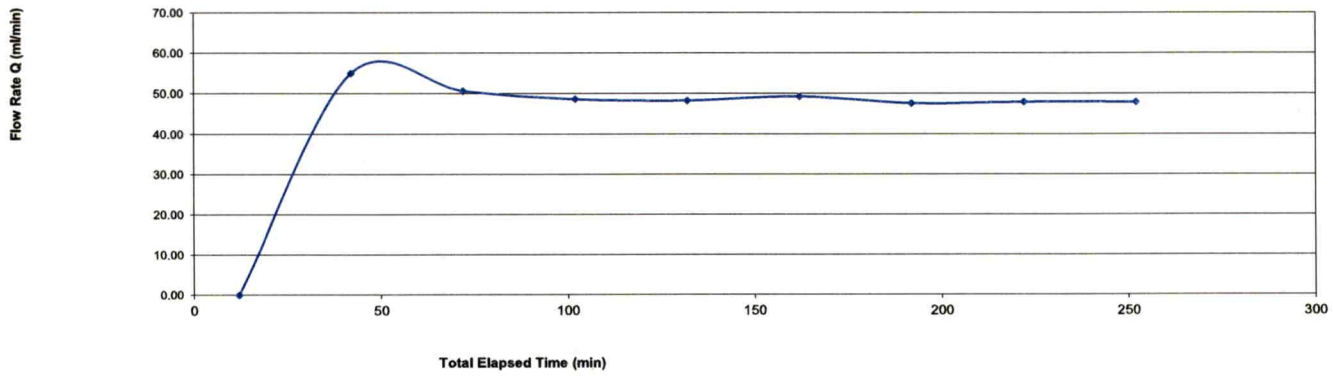
V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
Start Soak		12:35:00 PM								
3,250	#VALUE!	12:47:00 PM	0:12:00	12.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
1,600	1,650	1:17:00 PM	0:30:00	30.00	55.00	5.1	5.08E-04	43.9	0.72	1.44
3,250		1:17:00 PM								
1,730	1,520	1:47:00 PM	0:30:00	30.00	50.67	4.7	4.68E-04	40.4	0.66	1.33
270	1,460	2:17:00 PM	0:30:00	30.00	48.67	4.5	4.49E-04	38.8	0.64	1.27
3,250		2:17:00 PM								
1,800	1,450	2:47:00 PM	0:30:00	30.00	48.33	4.5	4.46E-04	38.5	0.63	1.26
320	1,480	3:17:00 PM	0:30:00	30.00	49.33	4.6	4.55E-04	39.3	0.65	1.29
3,250		3:17:00 PM								
1,820	1,430	3:47:00 PM	0:30:00	30.00	47.67	4.4	4.40E-04	38.0	0.62	1.25
380	1,440	4:17:00 PM	0:30:00	30.00	48.00	4.4	4.43E-04	38.3	0.63	1.26
3,250		4:17:00 PM								
1,810	1,440	4:47:00 PM	0:30:00	30.00	48.00	4.4	4.43E-04	38.3	0.63	1.26

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**4.42E+00**	**4.42E-04**	**38.2**	**0.63**	**1.25**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Averaged Last 3 Values				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		252.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH, ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

Sheet __1__ of _1___
PROPERTY ID #: _____
COUNTY: ___Iredell__

SOIL/SITE EVALUATION
***for* ON-SITE WASTEWATER SYSTEM**
(Complete all fields in full)

OWNER: _____Adams Homes_____KSAT Description Sheet_____ APPLICATION DATE_____
ADDRESS:_____173 Northlake Drive, Statesville, NC_____ DATE EVALUATED: _6/24/21____
PROPOSED FACILITY: Single Family Residence_PROPOSED DESIGN FLOW (.1949): 360 GPD__ PROPERTY SIZE:_0.54 ac.+ Offsite Easement
LOCATION OF SITE: _____173 Northlake Drive, Statesville, NC _____ PROPERTY RECORDED: _____
WATER SUPPLY: ☐ Private ☑ Public ☐ Well ☐ Spring ☐ Other _____
EVALUATION METHOD: ☑ Auger Boring ☐ Pit ☐ Cut TYPE OF WASTEWATER: ☑ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941)		OTHER PROFILE FACTORS				PROFILE CLASS & LTAR
			.1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	.1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	
1	KSAT 1 21"	0-5"	Fill Soil	-	-	36+"		-	.16 GPD/ft²
		5-15"	L, WSBK	Fr; SS; SP					
		15-36+"	C; SBK	FI; SS; SP					
2	KSAT 2 13"	0-8"	Fill Soil	Fr; SS; SP	-	26"		Saprolite	.16 GPD/ft²
		8-12"	SCL, WSBK	Fr; SS; SP					
		12-26"	C, SBK	FI; SS; SP					
		26+"	CL; WSBK	Fr; SS; SP					
3	KSAT 3 17"	0-6"	Fill Soil	-	-	34+"		-	.16 GPD/ft²
		6-10"	SCL; WSBK	Fr; SS; SP					
		10-34+"	C; SBK	Fi; SS; SP					
4									

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	P.S	P.S.
System Type(s)	Subsurface Drip W/ Pretreatment	Subsurface Drip W/ Pretreatment
Site LTAR	.15 GPD/ft²	.15 GPD/ft²

OTHER FACTORS (.1946): _____
SITE CLASSIFICATION (.1948): _____

EVALUATED BY: _ _____ Jeff Vaughan_&_Trevor Hackney _____
OTHER(S) PRESENT: _____ _____

COMMENTS:_____

Updated February 2014

SPECIFICATIONS, CALCULATIONS, & SUPPORTING MATERIAL FOR A GROUND ABSORPTION SEWAGE DISPOSAL SYSTEM USING SEPTIC TANK, TS-I ADVANCED TREATMENT AND SUBSURFACE DRIP DISPOSAL TO SERVE A 3 BEDROOM RESIDENCE

LOT 55 NORTHLAKE SUBDIVISION

Iredell County, North Carolina

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SECTION I -GENERAL

Adams Homes is seeking a septic system permit to construct a new 3-bedroom residence on lot located at Lot 54 Northlake Subdivision in Iredell County, North Carolina. Due to limited available space, soil conditions and limiting topography, a TS-I advanced treatment system with low pressure subsurface drip effluent disposal system is currently proposed. The treatment and disposal system will consist of a baffled septic tank with effluent filter, Orenco AX-20RT with pumps and controls. Other components include drip headworks and subsurface disposal. The design flow has been set at 360 GPD.

Trevor Hackney with AWT evaluated the lot for an offsite septic system. They found enough area to support a 3-bedroom septic system utilizing subsurface drip disposal for the primary and repair. An application rate of 0.15 G/D/SF has been recommended for both the primary and repair areas. The effluent will be pretreated using a septic tank, Orenco Advantex AX-20RT Module recirculating textile-media enclosed filter bed and pressure dosed using subsurface drip irrigation technology.

The system is designed to accept and treat domestic waste only. No other discharge is allowed, including condensate water from HVAC systems, etc.

The Engineer has designed a textile-media filter and drip irrigation system that dispenses treated effluent through drip irrigation using design criteria intended to comply with NC DEM Administrative Code 15A NCAC 2H.0200 and 15A NCAC 18A .1969, and NC DEH Onsite Section Innovative Waste Water System IWWS – 2000-02R (Geoflow Sub-Surface Drip System) & OSI Advantex Recirculating Textile-Media Filter. (IWWS-2015-01-R1).

Until plan acceptance and construction, the drip field and repair field shall be maintained undisturbed. This shall include placement of signs, ribbons and barricades to avoid traffic, storage, or parking in the area. Encroachment by any utility or others is not permitted.

The Contractor shall be prohibited from working while the site is wet. The Contractor shall contact the Engineer or the Soil Scientist prior to commencement of work after rainfall.

The Engineer and/or the Soil Scientist have the right to suspend work until soil moisture conditions are favorable to optimal installation.

The installer shall be knowledgeable of the type of system to be installed and shall have prior instruction on the installation of the various components of the system and shall have the prior approval of the component manufacturers, (Orenco) and (Geoflow), and the approval of the Design Engineer.

The Engineer and Field Representative of treatment and disposal shall provide written acceptance of the system installation prior to issuance of operation permit.

Scope of the Project: The scope of this project is to construct a system to collect the domestic waste from the proposed 3-bedroom residence and convey it via gravity to a properly sized two-compartment septic tank. The outlet at the second compartment of the tank will have a slotted wastewater effluent filter. From the septic tank the effluent flows to a two-compartment module that contains the treatment unit and recirculation chamber. After treatment, effluent passes through headworks assembly. A timer-controlled turbine pump will dose treated effluent to the drip field.

The drip dosing system will have solenoid valves, spin clean filter, flow meter, air release valves and other apparatus and controls to allow the automatic dosing and maintenance of the system.

The pump controls will have a 24-hour clock, programmable as determined by the operator. Controls shall also have elapsed run time clock and cycle counter for each pump. Unless alternately provided with the advanced Pretreatment System, the drip system control panel shall enable the daily, 7-day and 30-day monitoring requirements of Rule .1970 to be met, such as by data logging the field dosing times or field flow meter readings. The controls shall also have manual operating capabilities and alarms. The controls are to be located at a readily accessible location at the residence.

DIRECTIONS TO THE PROPERTY:
Take Interstate 77 North to Exit 42. Turn left at end of ramp onto Highway 21. Turn right on Oswalt Amity Road. Go past Amity Hill Road. Turn left on Bethesda Road. Turn right on Northlake Drive. Lot is located on left before Cul de sac.

SECTION II - REGULATIONS

In addition to compliance with laws, rules and regulations as required under the General Conditions of these Documents, the Contractor shall comply with the following specific regulations as applicable to the nature of work included under this Contract.

Reference Material:

(1) GEOFLOW SUBSURFACE DRIP SYSTEMS. Design and Installation Manual, October, 2007, Geoflow, Inc.

(2) LAWS AND RULES FOR GROUND ABSORPTION SEWAGE DISPOSAL SYSTEMS. SECTION .1900 OF THE N.C. Administrative Code: Title 10 Health Services; Environmental Health; Subchapter 10a; Sanitation. Published by: N.C. Dept. of Human Resources; Amended effective January 10, 1997.

(3) EPA 625/R-00/008 Design Manual - On-site Wastewater Treatment and Disposal System; February, 2002; Chapter 7.

(4) NC DEM Administrative Code: 15A NCAC 2H.0200, 15A NCAC T15A Section .1900

(5) OSI ADVANTEX Treatment System, Manual including performance information, OSI, Inc.

(6) EPA: Technology Assessment of Intermittent Sand Filter, April 1985.

(7) NC DHHS-OSWPS – Innovative Approvals for Geoflow, Inc. & Orenco Systems, Inc.

SECTION III - BASIS OF DESIGN

DEVELOPMENT DESCRIPTION

Location	Lot 55 Northlake Subdivision Iredell County, NC
Water Supply	Community Water Supply
Sewage Disposal	On-Site Septic System with One TS-I Recirculating Textile Media Filter & Subsurface Drip Irrigation
Application Rate	0.15 G/D/Sq. Ft. (0.15 G/D/Sq. Ft. Repair)

PROJECTED WASTEWATER FLOWS

Proposed Use	3 Bedroom Residence
Base Design Flow	360 G/D

DESIGN BASIS - TREATMENT SYSTEM

Septic Tank	1,000-gallon precast baffled concrete tank w/ OSI 4" Biotube Filter at outlet (Top Seam Tank Only)
Effluent Filter	(1) Orenco Model FTPS0436-28-NC
Pretreatment	(1) Orenco Advantex AX20RT Textile packed bed media filter module
Pretreatment Control Panel	VCOM-AX20B1/PTHTUVSA

DESIGN BASIS - DRIP SYSTEM

Design Flow	360 G/D
Application Rate	0.15 G/D/SF
Area	2,680 SF Minimum (2,680 Sq. Ft. Repair Minimum)
Force Main	(1) +/-635 LF 1-Inch Dia. SCH 40 PVC
Flush Return Main	(1) +/-635 LF 1-Inch Dia. SCH 40 PVC
Drip Lines	Single zone with a minimum total of 1,327 LF Geoflow Wasteflow PC; Drip Line with constant flow rate pressure compensating emitters at 2' centers; Drip Lines at 2' centers
Emitters	Zone 1 – 664 emitters @ 0.53 G/H = 5.87 G/M
Operating Pressure Range	10 – 60 PSI
Drip Field Pump	Orenco Systems, Inc. PF Series Pump Model PF2010-12 1 HP/230 V/1 Ph (14.7 G/M @ 166.2 Ft TDH)
Drip Field Dosing Pump Controller	VCOM-AX20B1/PTHTUVSA programmable controller •Pump run timer •Pump run contacts •Elapsed pump run clock •Pump cycle counter •Zone valve contacts •Filter flush valve contacts •Alarm Features •Float input functions

System Dosing Rate	5.87 G/M
Dosing Time per Day	61.32 Minutes per Day
Pump Run	12 times per day for 5.11 minutes per dose
Flush Time	Every 37th cycle, system to be flushed.
Discharge Volume	12 Doses x 5.11 min x 5.87 G/M = 360 G/D
Headworks	AQWA Single Zone Headworks
Solenoid Valves	(2) Geoflow Model SVLV-B-100 (1 Supply | 1 Return)
Filter	1.5" Spin Filter Geoflow Model AP4E-1.5F Vortex spin clean filter (w/automatic backwash cycle: 3 minute, 15 seconds)
Flow Meter	3/4" Geoflow Model FM-DDS-075 Flow Meter with Flow Rate/Totalizer
Air Vents	(1) Geoflow Model APVBK-1

SECTION IV - COMPONENTS OF SYSTEM

- Three Bedroom residence collection system
- 1,000-gallon septic tank with slotted filter and access port
- Pretreatment – One OSI Advantex Textile filter containing module with cover & appurtenances
- Single zone offsite subsurface drip system (pump tank, force mains, pump, pump control with audiovisual alarm, spin clean filter, meter, valves, shelter, drip lines and appurtenances.)

A. TREATMENT SYSTEM

1. General Requirements - The Contractor shall furnish, install, test, and place into service and warrant the complete system. The major system components including septic tank, slotted filter, textile filter (pretreatment) module, headworks assembly, drip field and controls. Accessories shall be supplied by a single operating entity and shall be equal to that as specified.
2. Five sets of submittal documents and shop drawings for all mechanical equipment and major materials including piping, tanks, and all other accessories shall be furnished to the Engineer for approval. No equipment shall be installed prior to approval by the Engineer.
3. Precast Structures - General: This section shall apply to all precast tanks as shown on the Contract Drawings.
4. Approvals: The tank designs shall have been approved by the Division of Environmental Health of NC DHHS and shall have the approval number imprinted on the delivered tank. The tank shall be State Approved and equal to that manufactured by Shoaf Precast, Inc. Openings or inserts shall be cast in during manufacture. Concrete shall have a minimum compressive strength of 4,000 PSI @ 28 days. Shop drawings shall be submitted to the Engineer for approval. If tanks are to be located in traffic area, then tanks shall be constructed to meet H-20 highway loadings. All tanks shall be top seam only.
5. Precast Tank Installation: Installer shall excavate for and install the precast concrete tank as per plans. Installer shall ensure that the tank remains level and true to grade after placement and filling with water. The precast tanks shall be tested for water tightness by an approved method such as 24-hour water tightness test with maximum allowable leakage not to exceed a maximum of 1/2-inch rise or fall in 24 hours or vacuum test. Contractor shall use clean, potable water free of any sediment for water testing. Either test method shall be run with risers/and inlet/outlet pipes in place. Testing shall begin after the water level in the tank has stabilized. Each tank shall be installed in the location and to the elevations shown on the plans. A 6" undercut shall be made to allow for washed stone leveling course for the tank to rest on.

   Once testing of the tank has been completed, the tanks shall be backfilled in lifts with well compacted, debris free earth to a level, which directs surface water away from the tanks. Tank access holes in the yard shall be installed and grouted watertight and the earth raked smooth for grassing. All tank lids shall be lockable or constructed to prevent easy removal. Tank access in traffic area shall be 24" cast iron manhole frame and lid. Tanks shall not be pumped during extremely wet conditions.
6. Septic Tank shall consist of a 1,000-gallon capacity, reinforced, top-seam precast concrete tank with full baffle and shall have easy access to each chamber from ground level for checking and pumping. The first chamber of the septic tank shall consist 2/3 to 3/4 of the volume of the total tank and the baffle shall contain a horizontal opening across the tank at about midway its height. The PVC outlet tee shall extend one-fourth depth of liquid level and contain an effluent filter. Locate the septic tank at such height as to provide approximately 15" of cover soil over top of the tank or as necessary to receive gravity flow from the collection system from the residence. Provide access at each end of the tank. All metal installed in tank shall be stainless steel.
7. Slotted Effluent Filter: An Orenco 4" Biotube effluent filter shall be installed in the PVC outlet tee of the septic tank. The filter shall be manufactured by Orenco System Incorporated. Filter shall be Orenco model FTPS0436-28-NC.
8. Advantex Textile Bio-Filter: One textile-containing packed bed media filter module with cover shall be used, one module for a maximum of 4 bedrooms or 480 gallons per module per day. The module shall be as described in manufacturer's literature attached herein.

   The module shall be pressure dosed with effluent filtered from the septic tank. Discharge from the module shall spill over via gravity to the drip field-dosing chamber of the Orenco AX-20RT Module.

Treatment Performance Standards (TS-I): Tertiary treatment without nitrogen reduction.

The Advantex Textile packed bed media filter module shall be designed installed and operated to meet the following standards:

1. Biochemical Oxygen Demand, 5-day (BOD_5) < 15 mg/l
2. Total Suspended Solids (TSS) < 15 mg/l
3. Ammonium-nitrogen (NH_4-N) < 10 mg/l
4. Fecal coliform bacteria densities < 10,000 colonies/100 mL

Standards are arithmetic means, except fecal coliforms is a geometric mean.

Advantex Unit and all associated appurtenances are available through AQWA at (888) 552-2792.

9. Control Panel: Control panel for the advanced treatment unit shall be mounted 36" or more above grade and readily accessible. The unit shall be as manufactured by Orenco Systems, Inc. The treatment system control panel shall be designed to control the treatment unit dosing pump. The control panel shall be provided factory pre-wired and tested in a NEMA 4X lockable fiberglass enclosure which shall contain the following components. Motor contactors and circuit breakers for use with 230V AC 1 Ph current using a max 1½ HP motor, programmable logic unit shall include time functions, elapsed pump run clock and pump cycle counter, motor function, valve controls and float input function and fused transformer for valves. An audiovisual alarm condition light and siren shall be mounted on the top of the panel and include a separately fused transformer. The unit shall have a hand-off-auto (H-O-A) switch. Product shall be as supplied by AQWA at (888) 552-2792.

   The controller shall be able to perform the following functions: receive input for floats and provide operator set timer-controlled pump operation.

   Floats, pump and control circuits, and the control panel shall meet the requirements of Rule .1952(c). Panel and control equipment shall include lightning protection, be protected from unauthorized access, and always remain accessible to the system operator.

   The activation of any alarm shall result in the activation of a dry and a 120 V powered alarm contacts. These contacts may be used to activate externally mounted alarm devices and telemetry systems. The alarm contacts will automatically reset when the R/O-N Switch for the activated alarm is placed in the reset / off position.

   Panel Operation:
   - High Level Alarm Float: When lifted this float will activate the audible alarm and the illuminated pushbutton.
   - Pump Enable Float: When lifted this float will activate the normal dose function.
   - Redundant Off & Low-Level Alarm Float: When lowered this float will activate the audible alarm and illuminated pushbutton. This float will also deactivate the pump in both auto and manual.
   - Pump Operation: The pump dosing cycles will be controlled by the liquid level in the tank.

   Components Include:
   - Motor contractor & circuit breaker rated for use with 230VAC, 1Ph and 1 Ph max
   - Top mounted audiovisual alarm (360 degree flashing red light and 90dB minimum)

10. Float Switches: Water level float control switches shall be equal to Orenco System, Inc., mechanically activated switches, with cable of adequate length to terminate in the pump control panel. No splicing of wire allowed between switches and control box. Use mercury switched on control circuits and properly rated mechanical switches on power circuits. Conduit between the pump tank and he control panel shall be sealed to prevent sewer gas from entering the control panel. The dosing tanks shall have 4 float switches, a low-level "pump off" switch, a "pump enabling" float "timer override" and at "high water alarm" float. Floats shall be hung from a stainless-steel float bracket attached to the riser and be within 12 inches of lid of riser. Float bracket shall be attached to riser so that no damage is made to riser and any bolt penetrations into riser shall be sealed watertight with a silicon caulk or manufacturer approved equal. Float clamps or brackets shall be supplied by the manufacturer. The lower level control or "pump-off" must be positioned above the pump, so that the pump remains submerged at all times. The upper level control "pump-enabling" is positioned to pump a specified volume of effluent or assures that a full dose is available for timer-controlled dosing. The "high water alarm" control float is mounted at same level the

"timer override" float control. (Note: Care must be taken to insure that floats do not become fouled by other components in the tank such as the electric power cord or the lifting rope.)

DRIP SYSTEM

1. Piping and Valves: All supply and return manifold piping and fittings shall be Schedule 40 PVC conforming to ASTM D1785 as shown on plans and other pressure sewer pipe shall be Class 200 PVC (ASTM D2241) (SDR 21). All couplings and fittings shall be of polyvinyl chloride compounds (ASTM D1784, Type I, Grade I).

2. Wasteflow PC Dripline: The dripline shall consist of nominal sized 1/2" linear low-density polyethylene tubing, with turbulent flow, drip emitters bonded to the inside wall. The tubing shall have an outside diameter (O.D.) of approximately 0.63 inches. The tubing shall consist of three layers; the inside layer shall be a bactericide protection; the middle layer shall be black and the outside layer shall be purple striped for ease of identification as effluent water. The dripline shall have emitters spaced at 24" centers along the full length of the tubing. Tubing shall be installed at a minimum of 15 inches below ground surface to a maximum of 16 inches. The emitters shall be pressure compensating to ensure equal dosing from pressure ranges of 10 to 60 PSI. The emitters shall be molded from virgin polyethylene with silicon rubber diaphragms. The emitter shall have a nominal discharge rate of 0.53 gallons per hour within the system design operating pressure. Each emitter shall be impregnated with Treflan to inhibit root intrusion and shall be guaranteed by the manufacturer to inhibit root intrusion for a period of ten (10) years. Wasteflow PC pressure compensating wasteflow dripline shall be Geoflow Model Number WFPC 16-4-24 as available through AQWA at (888) 552-2792.

3. Ball Valves: All thermoplastic ball valves shall be constructed from PVC Type I Cell Classification 12454 or CPVC Type IV Cell Classification 23447. All o-rings shall be Viton. All valves shall have Safe-T-Shear stem and double stop polypropylene or CPVC handle. All valve union nuts shall have Buttress threads for structural integrity. All seal carriers shall be Safe-T-Blocked. All valve components shall be replaceable for valve serviceability using rebuild kits. All valves shall be warranted against defects in material and workmanship for a period of one year. All valves shall be listed for potable water use by the National Sanitation Foundation (NSF). All 1/2" through 2" valves shall be pressure tested at 235 PSI and all 2-1/2" through 6" valves shall be pressure rated at 150 PSI for water at 73 degrees Fahrenheit, as manufactured by Spears Manufacturing Company or approved equal.

4. Swing Check Valves: Swing check valves shall be flow control PVC swing check valves with rubber flapper and PVC cap as manufactured by Geoflow Model CV-S-10 as supplied by AQWA at (888) 552-2792.

5. Air Vacuum Relief Valve: The air vacuum relief valve provides instant and continuous vacuum relief and non-continuous air relief. Both the body and the removable dirt cover shall be constructed of molded plastic. The body and the dirt cover shall be connected with a 1-inch pipe thread. The ball shall be constructed of a low-density plastic and the internal seal shall be constructed of vinyl. The air vacuum relief valve shall seal at 5 PSI. Inlet size shall be 1-inch male pipe thread. The air vent shall be Geoflow Item Number APVBKV-1 with attached Schrader valve as supplied by AQWA at (888) 552-2792.

6. Drip System Dosing Pump: For the drip field, an Orenco PF Series Model 2010-12 1 HP/230 V/1 Ph, capable of pumping 14.7 GPM @ 166.20' TDH for the drip irrigation. Details of pump installation are shown on the plan. Product shall be as supplied by AQWA at (888) 552-2792.

7. Drip System Controller shall be mounted 36" or more above grade and readily accessible. The unit shall be as manufactured by Orenco Systems, Inc. The panel model number shall be VCOM AXB2PTROUVSA. The Orenco Treatment System Control Panel is designed to control the irrigation pump, floats, UV, headworks as well as the dosing of the treatment unit. The control panel shall be provided factory pre-wired and tested in a NEMA 4X lockable fiberglass enclosure which shall contain the following: Components shall include motor contactors and circuit breakers for use with 230V AC 1 Ph current using a max 1½ HP motor. Programmable logic unit shall include time functions, motor function, valve controls and float input function. Unit shall include fused transformer for valves. An audiovisual alarm condition light and siren shall be mounted on the top of the panel and include a separately fused transformer. The unit shall have a hand-off-auto (H-O-A) switch. Product shall be as supplied by AQWA at (888) 552-2792.

   The controller shall be able to perform the following functions: receive input for floats and rain sensors, provide operator set timer-controlled pump operation, timer-controlled contacts for zone valves, scour valves and flush valves. The controller shall have an event counter, which shall count the number of moisture sensor overrides. The controller shall have an elapsed pump run clock and pump cycle counter.

Unless alternately provided with the Advanced Pretreatment System, the drip system control panel shall enable the daily, 7-day and 30-day monitoring requirements of Rule .1970 to be met, such as by data logging the field dosing times or field flow meter readings.

Floats, pump and control circuits, and the control panel shall meet the requirements of Rule .1952(c). Panel and control equipment shall include lightning protection, be protected from unauthorized access, and remain accessible at all times to the system operator.

The activation of any alarm shall result in the activation of a dry and a 120 V powered alarm contacts. These contacts may be used to activate externally mounted alarm devices and telemetry systems. The alarm contacts will automatically reset when the R/O-N Switch for the activated alarm is placed in the reset / off position.

Panel Operation:

- High Level Alarm Float: When lifted this float will activate the audible alarm and the illuminated pushbutton. *Note: This function can be combined with the Override Timer On & Off Function.*
- Override Timer & Off Float: When lifted this float will activate the normal timer function. This timer is capable of cycling at a faster rate to accommodate high flow conditions. This float being enabled will force the pump to dose at twice the operating cycle until the effluent is at normal levels in the pump tank again.
- Timer On & Off Float: When lifted this float will activate the normal timer function. This timer will begin with its 'off' cycle.
- Redundant Off & Low Level Alarm Float: When lowered this float will activate the audible alarm and illuminated pushbutton. This float will also deactivate the pump in both auto and manual.
- Pump & Valve Operation: The pump dosing cycles will be controlled by the timer. During high flow conditions, the pump dosing cycles will be controlled by the override timer. Zone valves (if provided) will open as programmed and the pump comes on. The spin filter valve will open for 1 minute (field adjustable) to allow for drainage of the return line. After an operator defined number of cycles (field adjustable prime numbers), the field flush valve and the zone valve will open for one cycle. At the end of the dose, the field flush valve closes and normal operation resumes. Since the flush cycle is to be set at an odd interval (prime number), the next flush cycle will fall on the opposite zone (if provided).

Components Include:

- Motor contractor & circuit breaker rated for use with 230VAC, 1Ph and 1 Ph max
- Programmable logic unit
- Timer Functions
- Valve control
- Transformer for the valves
- Fuse for the transformer
- Top mounted audiovisual alarm (360 degree flashing red light and 90dB minimum)

8. Headworks: The system headworks shall contain the filter flow meter, the solenoid valves, gauges, fittings, and other apparatus as called for. The headworks shall be located as indicated on the plans. It shall be installed to allow easy access to all components for testing, servicing or replacement. The unit shall be enclosed in a suitable protective insulated shelter (i.e. Large meter box), secured from tampering. All valves located within this box shall be located a minimum of 18" below the box lid. Adequate freeze protection shall be provided. Headworks shall be AQWA Single Zone model. Product shall be as supplied by AQWA at (888) 552-2792.
9. Electric Solenoid Valve: All solenoid valves shall be Contamination Resistant Remote Control Valves. All solenoid valves shall be electrically operated and shall be provided with a 24-volt AC solenoid coil. All valves shall be provided with an auxiliary manually operated internal bleed lever and flow control. Valves shall be globe type with 150 PSI pressure rating. Solenoid valves shall be provided with iron pipe sized female pipe thread end connections. All valves shall be treated for sewage effluent. Solenoid valve model shall be SVLV-B as manufactured by Geoflow, Inc. Electrical wiring to solenoid valves shall be type UF wire, UL listed. Product shall be as supplied by AQWA at (888) 552-2792.
10. Spin Clean Filter: The Y filter body shall be molded from glass reinforced black plastic with a 1.5" inch male pipe thread (MPT) inlet and outlet. The two-piece body shall be capable of being serviced by unscrewing and shall include an O-ring seal. An additional 1.5" MPT outlet shall be capable of periodic flushing. The 150-mesh filter screen is all stainless, providing a 28.4 square inch filtration area. The outer support shell shall be woven stainless steel cloth. The inner and outer screens shall be soldered together. The screen collar shall be molded from vinyl. The 1.5-inch filter shall be Geoflow Model Number AP4E-1.5F. Product shall be as supplied by AQWA at (888) 552-2792.

11. Flow Meter: The Contractor shall install a turbine style ¾" flow meter with rate/totalizer equal to Geoflow series with flow setter mount. Installed in headworks box. The flow meter model FM-DDS-075 is manufactured by Geoflow. Product shall be as supplied by AQWA at (888) 552-2792

SECTION V - SYSTEM INSTALLATION

The field's perimeter shall be flagged by the General Contractor's Surveyor. The areas shall be barricaded to be protected from unauthorized vehicular traffic.

Site shall be cleared of large diameter and small diameter trees at the hub and other vegetation and debris by system installer only. If a tree is unable to be removed, the contractor shall raise the canopy on tree to a minimum of 8 feet above the existing ground surface so that sunlight can reach the ground surface. If shown on the plan, areas shall be filled with an approved material approved by the consulting Soil Scientist and/or the Consulting Engineer. Drip irrigation lines shall be installed on contour. Drip irrigation lines shall be installed in the ground after the ground surface has been scarified and raked smooth as directed herein. The tubing shall be installed at a minimum depth of 15 inches to a maximum of 16 inches with care to be certain that tubing is not kinked or deformed. After installation, the area shall be raked smooth to drain and to prepare for stabilization. Drip tubing that cannot go through an obstacle such as a root shall be routed around or below the obstacle and not over and exposed on the ground surface.

No work shall be performed on the drip field under wet conditions. "If it is too wet to plow," it is too wet to work on drip field. The Contractor shall avoid the smearing of the wetted surface and should this occur, work shall be suspended. After installation of the lines, the ground surface shall be shaped to allow good surface drainage to prevent ponding of surface water. All disturbed areas shall be raked smooth and stabilized according to specifications.

Drip Irrigation Tubing Storage and Handling

The drip irrigation tubing should be kept in the shade due to temperature sensitivity of the tubing and away from exposure to direct sunlight except during the actual installation process.

Construction Sequence

Rule of Thumb: "If soil is too wet to plow," it is too wet to install the system.

1. Lay out drip irrigation field network area with stakes and flagging to ten feet (minimum) beyond the limits of the line. As soon as the absorption area is designated, it should be flagged, roped off and isolated from construction traffic. This barrier should be maintained until the Owner accepts the system. Refer to site plan for the size of absorption area and field locations. Observe all side yard, building, and other setback restrictions.
2. Clear site of any and all man-made debris, construction materials, etc. Dispose of legally. Cut all trees in the area of the nitrification field flush with the ground. Do not remove any stumps with any earth moving equipment. Stumps shall be ground up with minimal distribution to surrounding soil. Fill areas shown on the plan with an approved soil material approved by the Consulting Soil Scientist and/or the Consulting Engineer.
3. Prior to actually beginning construction of the system, verify invert elevations of all tanks, carefully locate, lay out and identify disposal site, manifolds and the drip piping networks, using a tripod mounted engineer's leveling instrument to accurately establish each lateral along a level contour. (A 2' minimum drip line separation must be maintained centerline to centerline.)
4. Install drip lines, piping, valves, and headworks. Ensure good bedding and cover and uniform slope as specified. All valve boxes shall be flush or slightly above the ground and clear of debris. Install washed stone in bottom to cover exposed soil.
5. Install septic tank, filter module and pump tank at elevations to allow proper operation. The recirculation and pump tank will each contain a pump and a pump enabling float switch, a pump disabling float switch and a high-water alarm float switch. The pump tank will be set at elevation to receive gravity from the filter. All components shall be checked and proper flow verified.
6. Perform leak test on tanks as called for herein. Provide riser access as called for.
7. Carefully backfill tanks, module and trenches to finish grade with clean debris free earth (no stone).
8. Install pumps, filters, fittings and floats.
9. Install control system and wire per NC Building Code and NEC. Contractor shall verify available electrical power before ordering components. Provide and connect to properly sized and number of breakers in the main panel board.
10. Seed all disturbed areas except for the drip field. Drip field shall be stabilized only until leaf litter covers area. Follow seeding specifications.

Final Landscaping: After the system is installed, the following should be checked to ensure that the system will not be overloaded with excess rainwater and run-off.

(a) The drip field is shared to shed rainwater and is free of low area.

(b) Curtain drains, grassy swales or ditches for diverting ground and surface water are properly installed.

(c) Gutter and downspout drains are directed away from the system.

Any problems should be corrected before approving the system.

Finally, drip field shall be stabilized and all other disturbed areas shall be planted with grass according to specifications.

Seeding: After completion of the drip fields, the site shall be stabilized with tall fescue grass. This should be seeded at the rate of 25 lbs. per acre each for a total of 50 lbs. per acre. Before seeding, lime should be added at the rate of 1.5 tons per acre. Fertilizer should be added at the rate of 100 units of Nitrogen, 120 lbs. of P_2O_5 and 120 lbs. of K_2O. Both the lime and fertilizer should be lightly incorporated into the soil before adding seed. After seeding, the area should be mulched until stand is established. Due to the erosion potential of this soil, this is an important part of the system.

SECTION VI - OPERATING CHECKS AND ADJUSTMENTS (START-UP)

The system shall consist of one 1,000-gallon septic tank with slotted filter, Orenco Advantex AX-20RT textile containing module with cover with recirculation pump and drip field with pump, headworks, controls and other apparatus.

All components of the system shall be checked and taken through a complete test cycle in the presence of the Owner's Engineer and to his satisfaction. If the test fails, adjustments shall be made and the test repeated until the system is determined to operate properly.

Septic Tank: Check water level, inlet pipe, outlet pipe and slotted filter. Verify that the filter can be removed for service and handle is within 12" from top of riser.

Textile Filter: Using manufacturer's instruction, become familiar with filter components and operation.

Drip System Dosing Tank Pump Chamber - Sequence of Operation: Effluent fills pump tank to level that will activate the "Pump Enabling" float. Pump can now operate. The control panel will be set to allow the prescribed pump cycles per day based on customer setting of the programmable timer. When a pump is called for service, and the level in the dosing tank permits, the zone valve (if provided) and filter flush valve will open. After an adjustable time, the filter flush valve will close, and the system will continue to dose the active drip zone for the operator selectable time. If the timer override float is activated, the pump will be allowed to dose for 5.11 minutes and disable for one hour. Then the pump will activate again until the water level in thank reaches normal again.

Dosing Cycle: If the system is equipped with multiple zones, all zones are dosed individually on an alternating basis so that each field is dosed once every other dosing cycle. The appropriate zone valve opens, the pump doses the field for 5.11 minutes and then the zone valve closes and the pump stops.

After an operator defined number of cycles (field adjustable prime numbers), the field flush valve and one zone valve will open for one cycle. At the end of the dose, the pump stops and the field flush and zone valves close. Since the flush cycle is to be set at an odd interval (prime number), the next flush cycle will fall on the opposite zone.

The pump shall operate delivering a timer controlled predetermined dose to the designated drip field. The pump shall also shut off when the low water level "pump off" switch is activated.

If the "high water alarm" float switch is activated, the controller shall activate audible and flashing alarm systems. Once energized, the flashing and audible alarm unit must be shut-off manually. After installation, each field shall be independently pressurized and the function and operating pressure checked to verify compliance with the specifications and required wetted area shown on the Plans. System pressure is to be obtained at the Schrader Valves located at the ends of the manifolds as shown on the plans. **The pressure and flow reading shall be recorded for comparison with future readings. The owner/operator cannot tell if the system is operating properly unless he has this info.**

SEEDING SPECIFICATIONS

SLOPES 3:1 or FLATTER

1. Apply agricultural lime at the rate of 90 LB/1000 SF.
2. Apply 10-10-10 commercial fertilizers at the rate of 20 LB/1000 SF.
3. Seed in accordance with the following schedule and application rate:

DATE	TYPE	PLANTING RATE
Aug 15 - Nov 1	Tall Fescue	200 LB/AC or 7 LB/1000 SF
Nov 1 - Mar 1*	Tall Fescue And	200 LB/AC or 7 LB/1000 SF
	Abruzzi Rye	25 LB/AC or 2 LB/1000 SF
Mar 1 - Apr 15	Tall Fescue	200 LB/AC or 7 LB/1000 SF
Apr 15 - Jul 30	Hulled Common Or Bermuda	30 LB/AC or 1 LB/1000 SF
Jul 15 - Aug 15	Tall Fescue And	200 LB/AC or 7 LB/1000 SF
	Brown Millet Or	35 LB/AC or 3 LB/1000 SF
	Sorghum-Sudan Hybrids	30 LB/AC or 3 LB/1000 SF

4. Mulch with straw applied at the rate of 75-100 LB/1000 SF.

* Heavily mulched during January - March period.

SLOPES GREATER THAN 3:1 TO 2:1

1. Apply agricultural lime at the rate of 90 LB/1000 SF.
2. Apply 10-10-10 commercial fertilizers at the rate of 20 LB/1000 SF.
3. Seed in accordance with the following schedule and application rate.

DATE	TYPE	PLANTING RATE
Mar 1 - Jun 1	Sericea Lespediza (scarified) &	50 LB/AC or 11 LB/1000 SF
Mar - Apr	Add Tall Fescue or	150 LB/AC or 32 LB/1000 SF
Mar - Jun	Add Weeping Lovegrass	5 LB/AC or 1 LB/1000 SF
Jun - Sep 1**	Tall Fescue and	60 LB/AC or 12 LB/1000 SF
	Brown Top Millet	35 LB/AC or 3 LB/1000 SF
	Sorghum Sudan Hybrids	30 LB/AC or 1 LB/1000 SF
Sep - Mar 1	Sericea Lespediza (unhulled-unscarified)	70 LB/AC or 14 LB/1000 SF
	Tall Fescue	150 LB/AC or 32 LB/1000 SF
	Millet or Sudan	20 LB/AC or 1 LB/1000 SF

** Temporary - Reseed September 1 at recommended rates.

4. Mulch with 3" straw applied at the rate of 50-90 LB/1000 SF.

CALCULATIONS

FOR A GROUND ABSORPTION SEWAGE DISPOSAL SYSTEM

USING SEPTIC TANK, TS-I ADVANCED TREATMENT AND

SUBSURFACE DRIP DISPOSAL TO SERVE A 3 BEDROOM

RESIDENCE

LOT 55 NORTHLAKE SUBDIVISION

Iredell County, North Carolina

July 6, 2021
Revised August 16, 2021

Prepared for:
Adams Homes
10115 Kincey Ave, #160
Huntersville, NC 28078
Phone: (704) 361-5437

Prepared by:
PIEDMONT DESIGN ASSOCIATES, P.A.
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NCBELS No.: C-1007



GEOFLOW
SUBSURFACE DRIP

Updated Mar 2015

FIELD FLOW

Job Description:	*Lot 55 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*8-Jul-21*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a guide for small systems with residential waste & is not a comp

Worksheet 1- Field Flow

Total field

	Total Quantity of effluent to be disposed per day	360	gallons / day
	Hydraulic loading rate	0.15	gallons / sq.ft. / da
	Minimum Dispersal Field Area	2,400	square ft.
	Total Dispersal Field Area	2,654	square ft.

Flow per zone

	Number of Zones	1	zone(s)
	Dispersal area per zone	2,654	square ft.
	Choose line spacing between WASTEFLOW lines	2	ft.
	Choose emitter spacing between WASTEFLOW emit	2	ft.
	Total linear ft per zone (minimum required)	1,327	ft. per zone
	Total number of emitters per zone	664	emitters per zone
	Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
		Wasteflow Classic	
		Wasteflow PC - 1/2gph	
		Wasteflow PC - 1 gph	
	Pressure at the beginning of the dripfield	45	psi
	Feet of Head at the beginning of the dripfield	103.95	ft.
	What is the flow rate per emitter in gph?	0.53	gph
	Dose flow per zone	5.86	gpm

Note: A few States or Counties require additional flow for flushing. Please check your local regul
Flush velocity calculation below is for PC dripline. Classic dripline requires less flow to flush tha
Please refer to Geoflow's spreadsheet "Design Flow and Flush Curves" at www.geoflow.com or ca

	If required, choose flush velocity	2	ft/sec
	How many lines of WASTEFLOW per zone?	6	lines
	Fill in the *actual* length of longest dripline lateral	270	ft.
	Flush flow required at the end of each dripline	1.48	gpm
	Total Flow required to achieve flushing velocity	8.88	gpm
	Total Flow per zone- worst case scenario	14.74	gpm

Select Filters and zone valves

	Select Filter Type	Vortex Screen Filter	
	Recommended Filter (item no.)	AP4E-1.5F	Screen Filter 0-20
	Select Zone Valve Type	Electric Solenoid	-
	Recommended Zone Valve (item no.)	0	0

Dosing

	Number of doses per day / zone:	12	doses
	Timer ON. Pump run time per dose/zone:	5.07	mins:secs
	Timer OFF. Pump off time between doses	1:54	hrs:mins
	Per Zone - Pump run time per day/zone:	1:01	hrs:mins
	All Zones - Number of doses per day / all zones	12	doses / day
	Allow time for field to pressurize	0:00:30	hrs:mins:secs
	Filter flush timer	0:00:20	hrs:mins:secs
	Drain timer	0:05:00	hrs:mins:secs
	Field flush timer	0:01:00	hrs:mins:secs
	Field flush counter	37	cycles
	Time required to complete all functions per day	2:23	hrs:mins
Dose volume per zone		30	gallons per dose

GEOFLOW
SUBSURFACE DRIP

PUMP SIZING

Job Description:	*Lot 55 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*7/8/2021*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a guide for small systems with residential waste & is not a complete hy
Pressure losses may be grossly overstated, particularly if designing with WASTEFLOW C
The letters on the diagram(right) match the letters in section 2 below.

Worksheet - Pump Sizing

Section 1 - Summary from Worksheet 1		
Flow required to dose field	5.86	gpm
Flow required to flush field	8.88	gpm
Flow required to dose & flush field	14.74	gpm
Filter	AP4E-1.5F	
No. of Zones	1	zones
Zone valve	-	
Dripline	Wasteflow PC - 1/2gph	
Dripline longest lateral	270.00	ft.

Section 2	Ft of head	Pressure
A. Flush line - Losses through return line		
Select Pipe from dropdown menu	PVC schedule 40	
Select Flush Line Diameter	1-1/2" inch	
Length of return line	635 ft.	
Equivalent length of fittings	127 ft.	
Elevation change. (if downhill enter 0)	20 ft.	
Pressure loss in 100 ft of pipe	0.63 ft.	0.27 psi
Total pressure loss from end of dripline to return tank	*24.8 ft.*	10.73 psi
B. Dripline - Losses through Wasteflow dripline		
Length of longest dripline lateral	270 ft.	
Minimum dosing pressure required at end of dripline	24.79 ft.	10.73 psi
Loss through dripline during flushing	8.45 ft.	3.66 psi
Total minimum required dripline pressure	*33.24 ft.*	14.39 *psi*
A+B. Minimum Pressure required at beginning of dripfield		
CALCULATED pressure required at beginning of dripfi	*58.03 ft.*	25.12 *psi*
SPECIFIED pressure at beginning of dripfield (from wo	104.0 ft.	45.00 *psi*
Great! SPECIFIED Pressure is greater than CALCULATED Pressure requirement. Go to next step		
C. Drip components - Losses through headworks		
Filter	15.0 ft.	6.50 psi
Zone valve pressure loss (not in diagram)	- ft.	- psi
Flow meter pressure loss (not in diagram)	4.04 ft.	1.75 psi
Other pressure losses	5.00 ft.	2.16 psi
Total loss through drip components	24.06 ft.	10.41 psi
D. Supply line - Minimum Pressure head required to get from pump tank to top of dripfield		
Select Pipe from dropdown menu	PVC schedule 40	
Select Supply line diameter	1-1/2" inch	
Length of supply line	635 ft.	
Equivalent length of fittings	127 ft.	
Height from pump to tank outlet	6 ft.	
Elevation change. (if downhill enter 0)	20 ft.	
Pressure loss/gain in 100 ft. of pipe	1.61 ft.	0.70 psi
Total gain or loss from pump to field	*38.2 ft.*	16.56 psi
Total dynamic head	166.2 ft.	71.97 *psi*
Pump capacity * - Field Flush Flow	14.7 gpm	71.97 *psi*
- Field Dose Flow	5.9 gpm	
- Filter Flush Flow	- gpm	- *psi*
Pump Model Number	Orenco PF 2010-12	
Voltz / Hp / phase	230V - 1 HP - 1 Phase	

Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com



Soil Suitability for Domestic Sewage Treatment and Disposal Systems
173 Northlake Drive (Lot 55), Statesville, NC. 28677 (Iredell County, NC)

PREPARED FOR: Adams Homes, (Attention: Bob Cashion)

PREPARED BY: Jeff Vaughan
Trevor Hackney

DATE: July 6, 2021

The following report is a summary of saturated hydraulic conductivity tests (K_{sat}) and soil profile evaluations conducted at 173 Northlake Drive (Lot 55), Statesville, NC, on June 24, 2021 (Attachment 1). The tests/evaluations were performed by Trevor Hackney of Agri-Waste Technology, Inc., (AWT) using a Johnson Permeameter. The lot was previously evaluated by Bryant White of the Iredell County Environmental Health Department, Jeff Vaughan, and Trevor Hackney. The proposed septic system is to serve an existing three-bedroom home on the property. A subsurface drip with pretreatment septic system is proposed for the initial and repair system. The system is completely proposed within an off-site easement across the road from the existing structure. There is an existing ditch on the South side of the drainfield easement that should be filled prior the system installation.

A map of the property showing the septic system layout and K_{sat} test locations is available as Attachment 1. Three in-field K_{sat} tests were conducted within the proposed septic system drainfield area as delineated by Iredell County Environmental Health Department and AWT. A summary of the computational spreadsheets, field datasheets, soil profile descriptions, and pictures are provided as Attachment 2. The purpose of the tests is to provide an estimated loading rate for a subsurface drip with pre-treatment septic system, with the understanding that the final loading rate will be set by the Iredell County Environmental Health Department. Results from the K_{sat} tests are detailed in Table 1 below.

Based on the pit evaluations performed by Bryant White and AWT the trench bottom should be installed at 15 inches at this site due to the disturbed soil surface. The treatment zone will be identified as 15-24 inches. The K_{sat} tests were performed at various depths near this treatment zone on the site.

Table 1. K_{sat} Results for 173 Northlake Drive (Lot 55), Statesville, NC.

Adams Homes; 173 Northlake Drive (Lot 55), Statesville, NC.
K_{SAT} Summary

	Ksat Test Depth	Permeability	
Ksat #	(in)	(in/hr)	(gal/day/ft^2)
1	21	0.174	2.610
2	13	0.457	6.834
3	17	0.627	9.373

	(in/hr) 100%	(gal/day/ft^2) 100%	(gal/day/ft^2) 25%	(gal/day/ft^2) 10%
Geomean Treatment Zone (9-21")	0.37	5.51	1.377	0.551

Results of the K_{sat} tests within the offsite drainfield easement showed that the soil would support a loading rate of up to 0.55 GPD/ft^2 based on the geomean of the three tests performed in the treatment zone. However, due to the nature of the underlying soils in the area and given the type of system expected for installation, we do not recommend a loading rate exceeding 0.15GPD/ft^2. At a loading rate of 0.15GPD/ft^2, 1,200' of drip tubing will be necessary per system. The attached drawing proves that 1,327' of drip tubing can be installed for the primary system with 2,680 sq. ft. of area reserved for the repair area. This accounts for 127' of blanking for the primary system. If it is determined that this amount of blanking is not necessary during installation AWT recommends the additional drip tubing be installed as a part of the primary system.

We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.

Sincerely,

Jeff Vaughan

Jeff V

Trevor Hackney

Trevor Hackney

Northlake Lot 55 Ph 1

AQWA Inc.
2604 Willis Court, Wilson, NC 27896
Phone: 252-243-7693 ~ Email: aqwatammysanders@gmail.com

Customer Name:	Fair	Date of Inspection:	3/13/2024
Address:	Fair-173 Northlake Drive Statesville, NC 28677	Arrival Time:	9:00:00 AM
System AX ID:	AX-154304	Departure Time:	10:55:00 AM
County:	Iredell		
Permit No.			

Inspection and Maintenance Checklist - AX-RT Sub Surface or Surface Drip Dispersal

Septic Tank Inspection

Tank At Site: Tank 1

Tank 1 Inlet Readings: 0 Scum, 12 Sludge

Tank 2 Inlet Readings: _____ Scum, _____ Sludge

Tank 1 Outlet Readings: 0 Scum, 10 Sludge

Tank 1 Outlet Readings: _____ Scum, _____ Sludge

Tank Inspection Questions	Tank 1	Tank 2
Clean Effluent Filter:	Cleaned	
Check for Influent or Effluent Blockages:	No Blockage	
Inspect Tank/Riser for Leaks:	None Seen	

Control Panel Inspection

Check Pump Operates In Manual Mode: Yes

Recirculation Pumps

Pump 1 Timer Settings: 0.8 Dose, 10 Rest

Pump 1 - Counters and Elapsed Time Meters: 15681 CT, 1559.9 ETM

Dose Pumps

Pump 1 Timer Settings: Demand Dose, Demand Rest

Pump 1 - Counters and Elapsed Time Meters: 672 CT, 32.9 ETM

Verify Conduit Seal: Verified

AX-RT Treatment Pod Inspection

Pod Inspection	Pod 1
Inspect for Ponding or Bridging:	None
Check and Record PSI:	4.5
Verify Orifice Position and Assess for Clogging:	Cleaned
Check for Odors:	None
Clean, Brush, Flush Lateral:	Done
Recheck and Record PSI	4.5
Flush Pod Throroughly:	Done
Inspect and Clean Vents:	Cleaned

Inspection and Maintenance Checklist - AX-RT Sub Surface or Surface Drip Dispersal

Recirculation Chamber Inspection

Verify Inlet Flow: No Inflow
Inspect Liquid: Normal Level
Record Scum/Sludge Levels:

Inlet Readings:				Outlet Readings:			
0	Scum	0	Sludge	0	Scum	0	Sludge

Inspect Tank/Riser for Leakage:	None Seen	Verify All Floats Work:	Operating Properly
Pump Sludge to Septic Tank:	Not Needed	Verify Audible Alarm Works for High Water float:	Works Properly
Pull Pump and Clean Screen:	Cleaned	Verify Neat Wrap of Float and Pump Cords:	Checked
Verify No Leaking In Piping or Flex Hoses:	None Seen	Verify Conduit Seal:	Verified

Ultraviolet Disinfection Unit Inspection

Does System Have a UV? No
How Many UV Disinfectant Units Present?

UV Disinfectant Unit Inspection	UV 1	UV2
After Disconnecting Power, Clean or Replace Bulb As Needed:		
Flush Housing Thoroughly:		
Return Power and Verify Proper Function:		

Dosing Chamber Inspection

Inspect for Tank/Riser Leakage: None Seen
Inspect Liquid: Normal Level
Record Scum/Sludge Levels:

Inlet Readings:				Outlet Readings:			
	Scum		Sludge	0	Scum	0	Sludge

Visually Check Liquid Level:	Normal	Verify Audible Alarm Works for High Water float:	Works Properly
Verify No Leaks In Piping or Flex Hoses:	None Seen	Verify Neat Wrap of Float and Pump Cords:	Checked
Inspect Pump Intake:	Ok	Delivery Rate at Start Up:	8
Verify All Floats Work:	Operating Properly	Verify Conduit Seal:	Verified
Turbidity:	0.00		

Drip Irrigation System Area Inspection

Areas Mowed and Clear of Obstruction: Inaccessible
Area Free of Ponding or Surface Effluent: See Notes
Curtain Drains, Ditches, Swales Functioning Properly: Yes
Return Valves and Control Panel to proper settings Done

Control Panel Communication Checked: **No link or activity light on lantronix. Please have internet established on the line to the panel for remote monitoring of alarm conditions. Lack of monitoring is a permit violation.**

Inspection Notes

There is break in the dripfield system somewhere. There could be a break in the supply line to the dripfield or a break in the drip field manifold or tubing itself. We are unable to determine due to the area for all of the components being overgrown. It all must be mowed and maintained for us to evaluate. Please contact us when you have this done for a return service call. NOTE: all components of the wastewater system and field area should be kept mowed and maintained per permit.

Paul Smith

Operator

Paul Smith

Operators Signature

AQWA Inc.
2604 Willis Court, Wilson, NC 27896
Phone: 252-243-7693 ~ Email: aqwatammysanders@gmail.com

Customer Name:	Fair	**System:**	SSD
Inspector:	Paul Smith	**Date of Inspection:**	March 13, 2024
Arrival Time:		**Departure Time:**	

Drip Irrigation Maintenance Checklist

Current Readings

	Pump	Filter Flush	Zone Flush	Zone 1	Zone 2	Zone 3	Zone 4
Counter	672	671	68	672			
Timer	32.9	3.6	3.5	32.9			

Flow Meter: 55620

Previous Inspection Readings

Date of Previous Inspection: 10/5/2023

	Pump	Filter Flush	Zone Flush	Zone 1	Zone 2	Zone 3	Zone 4
Counter	387	386	39	387			
Timer	19.8	2.1	2.1	19.8			

Flow Meter: 37160

Elapsed Calculations

Elapsed Days: 160

	Pump	Filter Flush	Zone Flush	Zone 1	Zone 2	Zone 3	Zone 4
Counter	285	285	29	285			
Timer	13.1	1.5	1.4	13.1			

Total Flow Since Last Visit: 18460 **Number of Days:** 160 **Average Daily Flow:** 115.375

Spin Filter: Cleaned **Filtrate Return Line:** Yes Closed

Zone Testing

	Zone 1	Zone 2	Zone 3	Zone 4
Pre Filter (PSI)				
Post Filter (PSI)				
Dose Rate (GPM)	25			
Supply PSI				
Return PSI				
Flush Rate GPM	24			
Flush Supply PSI				
Flush Return PSI				

Inspection Comments

There is a break in dose line going to field or in field. The supply line

and field is covered in brush and thorn bushes. Please have field accessible for maintenance of the system. No repairs made due to overgrowth.

Inspector's Signature