Permit/File #: _____

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

ROY COOPER • Governor
KODY H. KINSLEY • Secretary
MARK BENTON • Chief Deputy Secretary for Health
SUSAN KANSAGRA • Assistant Secretary for Public Health
Division of Public Health

Submittal Includes: ☒ **(a2) Improvement Permit** ☒ **(a2) Construction Authorization** ☐ **Fee $**_____

IMPROVEMENT PERMIT FOR G.S. 130A-335(a2)

County: Harnett
PIN/Lot Identifier: 0642-85-3054 (Birchwood Trails, Lot 74)
Issued To: KB Homes
Property Location: 119 Thunderbird Lane, Fuquay Varina, NC 27526
Subdivision (if applicable) Birchwood Trails Lot #: 74 Block: _____ Section: _____
LSS Report Provided: Yes ☒ No ☐
If yes, name and license number of LSS: Heath Clapp #1354

New ☒ Expansion ☐ System Relocation ☐ Change of Use ☐
Facility Type: SFR (4-bedroom)
Number of bedrooms: 4 Number of Occupants: 8 Other: _____
Design Wastewater Strength: ☒ Domestic ☐ High Strength ☐ Industrial Process Wastewater
Proposed Design Daily Flow: 480 GPD Proposed LTAR (Initial): 0.3 Proposed LTAR (Repair): 0.15 - 0.3
Proposed Wastewater System Type*: Pressure Manifold PPBPS T&J Panel (Initial) Pump Required: ☒ Yes ☐ No ☐ May be required
Proposed Wastewater System Type*: Anaerobic Drip Irrigation (Repair) Pump Required: ☒ Yes ☐ No ☐ May be required
**Please include system classification for proposed wastewater system types in accordance with Rule .1301 Table XXXII*
Effluent Standard: ☒ DSE ☐ HSE ☐ NSF/ANSI 40 ☐ TS-I ☐ TS-II ☐ RCW
Saprolite System (Initial): ☐ Yes ☒ No Saprolite System (Repair): ☐ Yes ☒ No
Fill System (Initial): ☐ Yes ☒ No If yes, specify: ☐ New ☐ Existing (when adding more than 6 inches of fill to system area provide a fill plan)
Fill System (Repair): ☐ Yes ☒ No If yes, specify: ☐ New ☐ Existing (when adding more than 6 inches of fill to system area provide a fill plan)
Usable Depth to LC (Initial)[x]: 32" Usable Depth to LC (Repair)[x]: 18" ***[x] Limiting Condition***
Max. Trench Depth (Initial)[‡]: 20" Max. Trench Depth (Repair)[‡]: 6" ***[‡] Measured on the downhill side of the trench***
Artificial Drainage Required: ☐ Yes ☒ No If yes, please specify details: _____
Type of Water Supply: ☐ Private well ☐ Public well ☐ Shared well ☒ Municipal Supply ☐ Spring ☐ Other: _____
Drainfield location meets requirements of Rule .0508: Yes ☒ No ☐ Drainfield location meets requirements of Rule .0601: Yes ☒ No ☐
Permit valid for: ☒ Five years [site plan submitted pursuant to GS 130A-334(13a)] ☐ No expiration [plat submitted pursuant to GS 130A-334(7a)]

Permit conditions:

Licensed Soil Scientist Print Name: Heath Clapp
Licensed Soil Scientist Signature: Heath Clapp Date: 11/11/2025

The LSS evaluation is being submitted pursuant to and meets the requirements of G.S. 130A-335(a2).

See attached site sketch

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Permit/File #: _____

This Section for Local Health Department Use Only

Initial submittal received: _____ by _____
Date *Initials*

G.S. 130A-335(a3) states the following:

When an applicant for an Improvement Permit submits to a local health department an Improvement Permit application, the permit fee charged by the local health department, the common form developed by the Department, and a soil evaluation pursuant to subsection (a2) of this section, the local health department shall, within five business days of receiving the application, conduct a completeness review of the submittal. A determination of completeness means that the Improvement Permit includes all of the required components. If the local health department determines that the Improvement Permit is incomplete, the local health department shall notify the applicant of the components needed to complete the Improvement Permit. The applicant may submit additional information to the local health department to cure the deficiencies in the Improvement Permit. The local health department shall make a final determination as to whether the Improvement Permit is complete within five business days after the local health department receives the additional information from the applicant. If the local health department fails to act within any period set out in this subsection, the applicant may treat the failure to act as a determination of completeness. The Department shall develop a common form for use as the Improvement Permit.

The review for completeness of this Improvement Permit was conducted in accordance with G.S. 130A-335(a3). This Improvement Permit is determined to be:

☐ Incomplete (If box is checked, information in this section is required.)

The following items are missing:

_____

_____

Copies of this were sent to the LSS and the Applicant on _____
Date

State Authorized Agent: _____ Date: _____

☐ Complete

State Authorized Agent: _____ Date: _____

This Improvement Permit is issued pursuant to G.S. 130A-335 (a2) and (a3) using the signed and sealed LSS/LG evaluation(s) attached here. The issuance of this permit in no way guarantees the issuance of other permits. The permit holder is responsible for checking with appropriate governing bodies in meeting their requirements. *This permit is subject to revocation if the site plan, plat, or the intended use changes.* The Improvement Permit shall not be affected by a change in ownership of the site. This permit is subject to compliance with the provisions of 15A NCAC 18E and to the conditions of this permit.

The Department, the Department's authorized agents, and the local health departments shall be discharged and released from any liabilities, duties, and responsibilities imposed by statute or in common law from any claim arising out of or attributed to evaluations, submittals, or actions from a licensed soil scientist or licensed geologist pursuant to GS 130A-335(a2).

Improvement Permit Expiration Date: _____

See attached site sketch

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Permit/File #: _____

Re-submittal of Improvement Permit

LHD USE ONLY: This IP resubmittal received: _____ by _____
Date *Initials*

The following items are being resubmitted pursuant to G.S. 130A-335(a3) for issuance of the Improvement Permit:

_____

_____

_____

_____

I, _____hereby attest that the information required to be included with this re-submittal
Licensed Soil Scientist (Print Name)
is accurate and complete to the best of my knowledge and that the proposed Improvement Permit meets all applicable federal, State, and local laws, regulations, rules, and ordinances.

_____ _____
Signature of Licensed Soil Scientist *Date*

The section below is for Local Health Department use after submittal of items noted as missing above.

LHD Follow-up Completeness Review of Improvement Permit

The review for completeness of this Improvement Permit re-submittal was conducted in accordance with G.S. 130A-335(a3). This Improvement Permit is determined to be:

☐ Incomplete (If box is checked, information in this section is required.)

The following items are missing:

_____

_____

Copies of this were sent to the LSS and the Applicant on _____
Date

State Authorized Agent: _____ Date: _____

☐ Complete

State Authorized Agent: _____ Date: _____

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Permit/File #: _____

CONSTRUCTION AUTHORIZATION FOR G.S. 130A-335(a2)

County: Harnett **Pre-Construction Conference Required:** Yes ☐ No ☒

PIN/Lot Identifier: 0642-85-3054 (Birchwood Trails, Lot 74)

Issued To: KB Homes

Property Location: 119 Thunderbird Lane, Fuquay Varina, NC 27526

AOWE/PE Plans/Evaluations Provided: Yes ☒ No ☐ If yes, name and license number of AOWE/PE: Heath Clapp, 10057E

Facility Type: SFR (4-bedroom)

Number of bedrooms: 4 Number of Occupants: 8 Other: _____

☒ New ☐ Expansion ☐ Repair ☐ System Relocation ☐ Change of Use

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

Crawl Space? ☐ Yes ☒ No Slab Foundation? ☒ Yes ☐ No

Type of Wastewater System* PPBPS T&J Panel Pressure Manifold (Initial) Anaerobic Drip Irrigation (Repair)

**Please include system classification for proposed wastewater system types in accordance with Rule .1301 Table XXXII*

Design Daily Flow: 480 GPD Wastewater Strength: ☒ Domestic ☐ High Strength ☐ Industrial Process WW

Session Law 2014-120 Section 53, Engineering Design Utilizing Low-flow Fixtures and Low-flow Technologies? ☐ Yes ☐ No
(if yes, please provide engineering documentation)

Effluent Standard: ☒ DSE ☐ HSE ☐ NSF/ANSI 40 ☐ TS-I ☐ TS-II ☐ RCW

Type of Water Supply: ☐ Private well ☐ Public well ☐ Shared well ☒ Municipal Supply ☐ Spring ☐ Other: _____

Installation Requirements/Conditions

Septic Tank Size: 1,250 gallons Total Trench/Bed Length: 300 feet Trench/Bed Spacing: 9 feet on center

Trench/Bed Width: 36 inches LTAR: 0.3 gpd/ft² Usable Depth to LC (Initial)ˣ: 32" ˣ***Limiting condition***

Soil Cover: 0 inches Slope Corrected Maximum Trench/Bed Depth‡: 20" inches ‡ ***Measured on the downhill side of the trench***

Pump Tank Size (if applicable): 1,275 gallons Requires more than 1 pump? ☐ Yes ☐ No

Pump Requirements: 16.27 ft. TDH vs. 25.22 GPM Grease Trap Size (if applicable): N/A gallons

Distribution Method: ☐ Serial ☐ D-Box or Parallel ☒ Pressure Manifold(s) ☐ LPP ☐ Other: _____

Artificial Drainage Required: Yes ☐ No ☒ If yes, please specify details: _____

Legal Agreements *(If the answer is "Yes" to any type of legal agreements, please attach a copy of the agreement.)*

Multi-party Agreement Required [.0204(g)]: ☐ Yes ☒ No Declaration of Restrictive Covenants: ☐ Yes ☒ No

Easement, Right-of-Way, or Encroachment Agreement Required [.0301(b)]: ☐ Yes ☒ No

Management Entity Required: ☐ Yes ☒ No Minimum O&M Requirements: _____

Permit conditions:

_____

_____

_____

_____

_____

The requirements of 15A NCAC 18E are incorporated by reference into this permit and shall be met. Systems shall be installed in accordance with the attached site sketch. *This Construction Authorization is subject to revocation if the site plan, plat, or the intended use changes.* The Construction Authorization shall not be affected by a change in ownership of the site. This Construction Authorization is subject to compliance with the provisions of 15A NCAC 18E, or 15A NCAC 18A .1900, as applicable, and to the conditions of this permit.

AOWE/PE Print Name: Heath Clapp

AOWE/PE Signature: Heath Clapp Date: 11/11/2025

This AOWE/PE submittal is pursuant to and meets the requirements of G.S. 130A-335(a2) and (a5).

See attached site sketch

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Permit/File #: _____

This Section for Local Health Department Use Only

Initial submittal received: _____ by _____
Date *Initials*

G.S. 130A-335(a5) states the following:

When an applicant for a Construction Authorization, or an Improvement Permit and Construction Authorization together, submits a Construction Authorization, or an Improvement Permit and Construction Authorization application together, the permit fee charged by the local health department, the common form developed by the Department, and any necessary signed and sealed plans or evaluations conducted by a person licensed pursuant to Chapter 89C of the General Statutes as a licensed engineer or a person certified pursuant to Article 5 of Chapter 90A of the General Statutes as an Authorized On-Site Wastewater Evaluator, the local health department shall, within five business days of receiving the application, conduct a completeness review of the submittal. A determination of completeness means that the Construction Authorization or Improvement Permit and Construction Authorization includes all of the required components. If the local health department determines that the Construction Authorization or Improvement Permit and Construction Authorization is incomplete, the local health department shall notify the applicant of the components needed to complete the Construction Authorization or Improvement Permit and Construction Authorization. The applicant may submit additional information to the local health department to cure the deficiencies in the Construction Authorization or Improvement Permit and Construction Authorization. The local health department shall make a final determination as to whether the Construction Authorization or Improvement Permit and Construction Authorization is complete within five business days after the local health department receives the additional information from the applicant. If the local health department fails to act within any period set out in this subsection, the applicant may treat the failure to act as a determination of completeness. The applicant may apply for the building permit for the project upon the decision of completeness of the Construction Authorization or Improvement Permit and Construction Authorization by the local health department or if the local health department fails to act within five business days. The Authorized On-Site Wastewater Evaluator or licensed engineer submitting the evaluation pursuant to this subsection may request that the local health department revoke or suspend the Construction Authorization or Improvement Permit and Construction Authorization for cause. Upon written request of the Authorized On-Site Wastewater Evaluator or licensed engineer, the local health department shall suspend or revoke the Construction Authorization or Improvement Permit and Construction Authorization pursuant to G.S. 130A-23. The Department shall develop a common form for use as the Construction Authorization.

The review for completeness of this Construction Authorization was conducted in accordance with G.S. 130A-335(a5). This Construction Authorization is determined to be:

☐ Incomplete (If box is checked, information in this section is required.)

The following items are missing: _____

_____

Copies of this were sent to the AOWE/PE and the Applicant on _____
Date

State Authorized Agent: _____ Date: _____

☐ Complete

State Authorized Agent: _____ Date of Issuance: _____

This Construction Authorization is issued pursuant to G.S. 130A-335(a2) and (a5) using the signed and sealed plans or evaluations attached here. This Construction Authorization is subject to revocation if the site plan, plat, or the intended use changes. The Construction Authorization shall not be affected by a change in ownership of the site. This Construction Authorization is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to the conditions of this permit.

The Department, the Department's authorized agents, and the local health departments shall be discharged and released from any liabilities, duties, and responsibilities imposed by statute or in common law from any claim arising out of or attributed to plans, evaluations, preconstruction conference findings, submittals, or actions from a person licensed pursuant to Chapter 89C of the General Statutes as a licensed engineer or a person certified pursuant to Article 5 of Chapter 90A of the General Statutes as an Authorized On-Site Wastewater Evaluator in GS 130A-335(a2), (a5), and (a7). The Department, the Department's authorized agents, and the local health departments shall be responsible and bear liability for their actions and evaluations and other obligations under State law or rule, including the issuance of the operations permit pursuant to GS 130A-337.

Construction Authorization Expiration Date: _____

See attached site sketch

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Permit/File #: _____

Re-submittal of Construction Authorization

LHD USE ONLY: This CA resubmittal received: _____ by _____
Date *Initials*

The following items are being resubmitted pursuant to G.S. 130A-335(a5) for issuance of the Construction Authorization:

_____

_____

_____

_____

I, _____hereby attest that the information required to be included with this re-submittal
Authorized Onsite Wastewater Evaluator (Print Name)
is accurate and complete to the best of my knowledge and that the proposed Construction Authorization meets all applicable federal, State, and local laws, regulations, rules, and ordinances.

_____ _____
Signature of Authorized On-Site Wastewater Evaluator *Date*

The section below is for Local Health Department use after submittal of items noted as missing above.

LHD Follow-up Completeness Review of Construction Authorization

The review for completeness of this Construction Authorization re-submittal was conducted in accordance with G.S. 130A-335(a5). This Construction Authorization is determined to be:

☐ Incomplete (If box is checked, information in this section is required.)

The following items are missing:

_____

_____

Copies of this were sent to the AOWE/PE and the Applicant on _____
Date

State Authorized Agent: _____ Date: _____

☐ Complete

State Authorized Agent: _____ Date: _____

Permit/File #: _____

ADDENDUM TO G.S. 130A-335(a2) SUBMITTAL

County: _____

PIN/Lot Identifier: _____

Issued To: _____

Additional Improvement Permit Conditions:

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Additional Construction Authorization Conditions:

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_____

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250, Cary NC 27518
agriwaste.com | 919.859.0669

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
Birchwood Trails – Lot 74
119 Thunderbird Lane, Fuquay Varina, NC 27526
(Harnett County)
October 7, 2025

Soil suitability for domestic sewage treatment and disposal systems was evaluated on October 1, 2025, for the property located at 119 Thunderbird Lane in Fuquay Varina, NC (Harnett County). Heath Clapp of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. This evaluation was done to facilitate permitting for a septic system for a 4-bedroom home. This report and attached documents were prepared *to this application is to be used to issue an Improvement Permit in accordance with G.S. 130A-335(a2) and (a3). The LSS evaluation is being submitted pursuant to and meets the requirements of G.S. 130A-335(a2).*

A drawing of the site plan, septic layout, septic system design, and soil pit locations is included in Attachment 1. Profile descriptions for each soil boring are included in Attachment 2.

The total property area is approximately 0.58 acres. The house and septic area are an open field. The proposed septic system for the property is a pressure manifold fed, PPBPS T&J Panel (50% reduction) system for the initial and an anaerobic drip irrigation septic system for the repair.

<u>Soil Suitability for Domestic Sewage Treatment and Disposal Systems</u>
The drawing in Attachment 1 details the property boundaries, soil boring locations, and layout of drain field trenches. Multiple soil borings were advanced within the proposed septic system area on the property. Soil borings were examined to determine soil suitability for on-site sewage disposal systems in accordance with 15A 18A .1900 Rules for Sewage Treatment and Disposal Systems. Soil borings 1-5 surround the initial drainfield area and are suitable for a conventional style trench. Soil borings 3-10 surround the repair drainfield area and are suitable for an anaerobic drip irrigation septic system.

The layout shown in Attachment 1 indicates there is available space for a four-bedroom septic system. The initial system can be installed with the use of a PPBPS T&J Panel (50% Reduction) drainfield product based on the layout in the field. The repair system will be an anaerobic drip irrigation septic system.

The proposed LTAR (Long Term Acceptance Rate) by AWT for the initial system is 0.3GPD/ft^2. The soils on this property are group III soils within the distribution and treatment zone as used to define the LTAR. With an LTAR of 0.3GPD/ft^2, 267 linear feet of PPBPS T&J Panel (50% reduction) trench is necessary to support a 4-bedroom home for the initial system. The attached drawing proves that 275 linear feet of PPBPS T&J Panel (50% reduction) trench can be installed within the suitable soils area on the property. **The maximum slope corrected trench depth for the initial system is 20"**.

The proposed LTAR (Long Term Acceptance Rate) by AWT for the repair system is 0.15 – 0.3 GPD/ft^2. The soils on this property are group III soils within the distribution and treatment zone as used to define the LTAR. With an LTAR of 0.15 – 0.3 GPD/ft^2, 1,600 - 3,200 ft^2 of anaerobic drip irrigation area is necessary to support a 4-bedroom home for the repair system. The attached drawing proves that there is approximately 4,100 ft^2 of suitable soils area on the property to locate the repair system. The maximum trench bottom should not exceed 6" for the repair system.

Any logging, disturbances, or grading done in the usable area or within the proposed setbacks will change the potential of using the area designated for a drainfield. Prior to moving forward with the development on the property, the Harnett County Health Department should be contacted to complete the necessary Construction Oversight and to issue an OP (Operations Permit) for the property once the septic system has been installed.

Conclusions

An IP (Improvement Permit) and CA (Construction Authorization) for this property can be issued with the site plan that is in Attachment 1. A CA permit will be required to secure a building permit for the property. The county issues an Operation Permit after the system has been installed to meet the specifications of the Authorization to Construct. Additional septic layouts have been or will be performed as needed. It will be critical to not disturb any of the proposed septic area or there is a risk that the IP and CA will be revoked. The LSS/AOWE Evaluation and attached documents were prepared *to this application is to be used to issue an Improvement Permit in accordance with G.S. 130A-335(a2) and (a3). The LSS/AOWE evaluation is being submitted pursuant to and meets the requirements of G.S. 130A-335(a2) and (a5).*

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

Sincerely,

Heath Clapp, NC LSS

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250, Cary NC 27518
agriwaste.com | 919.859.0669

SOIL & SITE EVALUATION for ON-SITE WASTEWATER SYSTEMS

Evaluation Date	10/1/2025	Site Location	119 Thunderbird Lane, Fuquay Varina, NC 27526	County	Harnett
PIN/Parcel	0642-85-3054	Property Size	0.58 acres	Property Recorded	Yes
Proposed Facility	SFR	Bedrooms	4	Wastewater Strength	Domestic
Water Supply	Municipal	Design Flow (.0400)	480	Evaluation Method	Auger

			Soil Morphology		Other Factors					
Profile #	.0502 Landscape Position Slope %	Horizon Depth (in)	.0503 Structure Texture	.0503 Consistence Mineralogy	.0504 Soil Wetness Color	.0505 Soil Depth (in)	.0506 Saprolite	.0507 Restrictive Horizon	.0509 Profile Class LTAR	.0502(d) Slope Correction
1, 2, 5	4%	Ap 0-10"	LS	NS, NP, VFr	10YR 3/3	44	S	S	0.4	1.6
		E 10-18"	LS	NS; NP; VFr	10YR 7/6					
		Bt1 18-44"	SCL	S; SP; Fi-Fr	2.5YR 5/8					
		Bt2 44"+	SCL	S; P; Fi	2.5YR 5/8		**System Type**		Conventional	
					10YR 6/2					
3, 4	4%	Ap 0-10"	LS	NS, NP, VFr	10YR 3/3	34	S	S	0.4	1.6
		E 10-18"	LS	NS; NP; VFr	10YR 7/6					
		Bt1 18-34"	SCL	S; SP; Fi-Fr	2.5YR 5/8					
		Bt2 34"+	SCL	S; P; Fi	2.5YR 5/8		**System Type**		Conventional	
					10YR 6/2					
6	4%	Ap 0-10"	LS	NS, NP, VFr	10YR 3/3	36	S	S	0.4	1.6
		E 10-18"	LS	NS; NP; VFr	10YR 7/6					
		Bt1 18-36"+	SCL	S; SP; Fi-Fr	2.5YR 5/8					
							System Type		Conventional	
7, 8, 9, 10	1%	Ap 0-2"	LS	NS, NP, VFr	10YR 3/3	19	S	S	0.4	0.4
		E 2-12"	LS	NS; NP; VFr	10YR 7/6					
		Bt1 12-19"	SCL	S; SP; Fi-Fr	2.5YR 5/8					
		Bt2 19"+	SCL	S; P; Fi	2.5YR 5/8		**System Type**		Anaerobic Drip	
					10YR 6/2					

Evaluated By:
Heath Clapp, LSS

Site Classification	Suitable	**Site Classification**	Suitable
Primary LTAR	0.4	**Repair LTAR**	0.4
Primary Trench Depth	20"	**Repair Trench Depth**	6"

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250, Cary NC 27518
agriwaste.com | 919.859.0669

SOIL & SITE EVALUATION for ON-SITE WASTEWATER SYSTEMS

LEGEND

Soil Group	Soil Texture	Conventional LTAR	Anaerobic Dip LTAR	Aerobic Drip LTAR (TS-II)	Mineralogy & Moist	Mineralogy & Wet	Structure
I	S (Sand) LS (Loamy Sand)	0.8-1.2	0.4-0.6	0.8-1.5	Lo (Loose)	NS (Non Sticky)	SG (Single grain) M (Massive)
II	SL (Sandy Loam) L (Loam)	0.6-0.8	0.3-0.4	0.6-0.8	VFR (Very Friable) FR (Friable)	SS (Slightly Sticky) S (Sticky)	GR (Granular) SBK (Subangular Blocky)
III	SiL (Silt Loam) SCL (Sandy Clay Loam) CL (Clay Loam)	0.3-0.6	0.15-0.3	0.2-0.6	FI (Firm) VFI (Very Firm) EFI (Extremely Firm)	VS (Very Sticky) NP (Non Plastic) SP (Slightly Plastic)	ABK (Angular Blocky) PR (Prismatic)
IV	SiCL (Silty Clay Loam) SC (Sandy Clay) SiC (Silty Clay) C (Clay)	0.1-0.4	0.05-1.5	0.05-0.2	SEXP (Slighty Expansive) EXP (Expansive)	P (Plastic) VP (Very Plastic)	PL (Platy)

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 1/20/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Hartsfield & Nash Agency, Inc.
10405 Ligon Mill Rd., Ste H
Wake Forest NC 27587

License#: 1000009111 AGRITEC-01

CONTACT NAME: Connie Garkalns
PHONE (A/C, No, Ext): 984-235-4273 **FAX (A/C, No):** 919-556-8758
E-MAIL ADDRESS: connie@hartsfield-nash.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Selective Insurance Company of	39926
INSURER B : Accident Fund	10166
INSURER C : Evanston Insurance Company	35378
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
Agri-Waste Technology Inc
501 N. Salem St Ste 203
Apex NC 27502

COVERAGES **CERTIFICATE NUMBER:** 1304989694 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:			S 2253659	1/18/2025	1/18/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 2,000,000 $ 300,000 $ 10,000 $ 2,000,000 $ 4,000,000 $ 4,000,000 $
A	**AUTOMOBILE LIABILITY** X ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY			S 2253659	1/18/2025	1/18/2026	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ 1,000,000 $ $ $ $
A	X **UMBRELLA LIAB** X OCCUR **EXCESS LIAB** CLAIMS-MADE DED RETENTION $			S 2253659	1/18/2025	1/18/2026	EACH OCCURRENCE AGGREGATE $	$ 2,000,000 $ 2,000,000 $
B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N: N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		100003072	1/18/2025	1/18/2026	X PER STATUTE / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
C A	Prof & Pollution Liability Leased & Rented			MKLV3ENV104794 S 2253659	8/22/2024 1/18/2025	8/22/2025 1/18/2026	Each Claim Equipment	5,000,000 25,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

Artisan Custom Homes
21016 Catawba Avenue
Cornelius NC 28031
USA

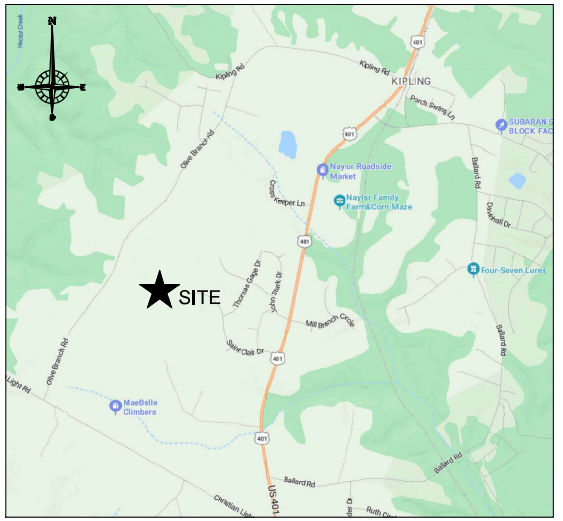
CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Connie Garkalns

BIRCHWOOD TRAILS - LOT 74

Project Location	119 Thunderbird Lane,
	Fuquay Varina, NC 27526
	Harnett County
	PIN: 0642-85-3054
Project Owner	KB Home
	1800 Perimeter Park Drive, STE 140,
	Morrisville, NC 27560
	919-768-7960
	enpollock@kbhome.com
Project Consultant	Heath Clapp, LSS, AOWE
	(919) 629-6404
	Jeff Vaughan, LSS, AOWE
	(919) 367-6313
	Agri-Waste Technology, Inc.
	1225 Crescent Green, Suite 250
	Cary, NC 27518
	(919) 859-0669
	(919) 233-1970 Fax
System Overview	Single Family Residence
	Four (4) Bedroom, 480 gpd
	Conventional Pressure Manifold
	PPBPS T&J Panel (50% Reduction) Trench Product



VICINITY MAP

Sheet Index

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250
Cary, North Carolina 27518
919-859-0669
www.agriwaste.com

KB Home
Birchwood Trails - Lot 74

Project Location:
119 Thunderbird Lane,
Fuquay Varina, NC 27526
Harnett County
PIN: 0642-85-3054

Project Owner:
KB Home
1800 Perimeter Park Drive, STE 14
Morrisville, NC 27560
919-768-7960
enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

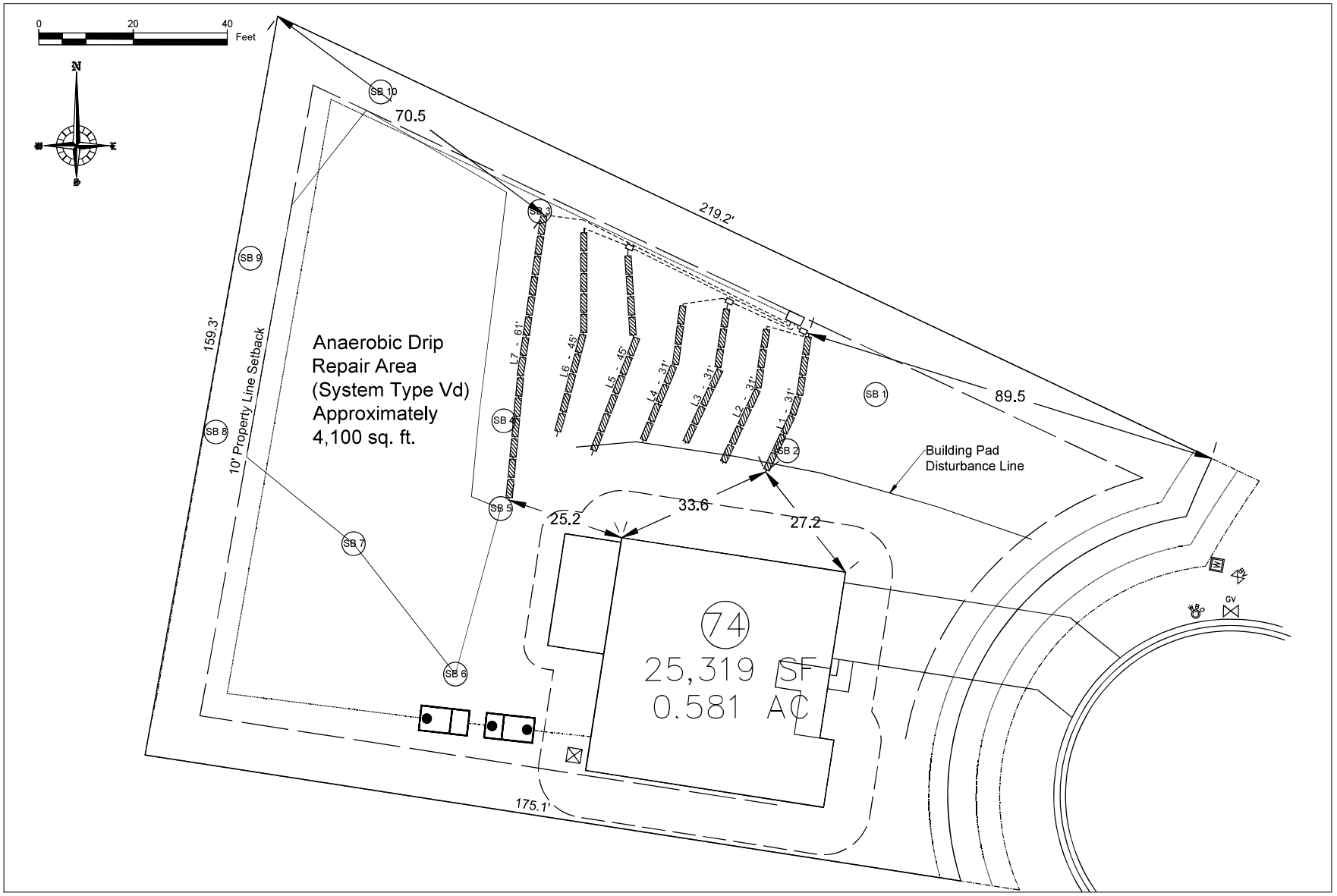
NC ONSITE WASTEWATER EVALUATOR
Certification Number
10057E
Heath Clapp

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

DRAWN BY: H. Clapp	CREATED ON: 11/6/2025
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-1



1 WW-2 PROPERTY LAYOUT

SOURCE: AWT, Inc.

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250
Cary, North Carolina 27518
919-859-0669
www.agriwaste.com

KB Home
Birchwood Trails - Lot 74

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119 Thunderbird Lane,
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Harnett County
PIN: 0642-85-3054

Project Owner:
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1800 Perimeter Park Drive, STE 140,
Morrisville, NC 27560
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enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

NC ONSITE WASTEWATER EVALUATOR
Certification Number
10057E
Heath Clapp

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Property Layout

DRAWN BY:	CREATED ON:
H. Clapp	11/6/2025
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER

WW-2

General Drainfield Notes:

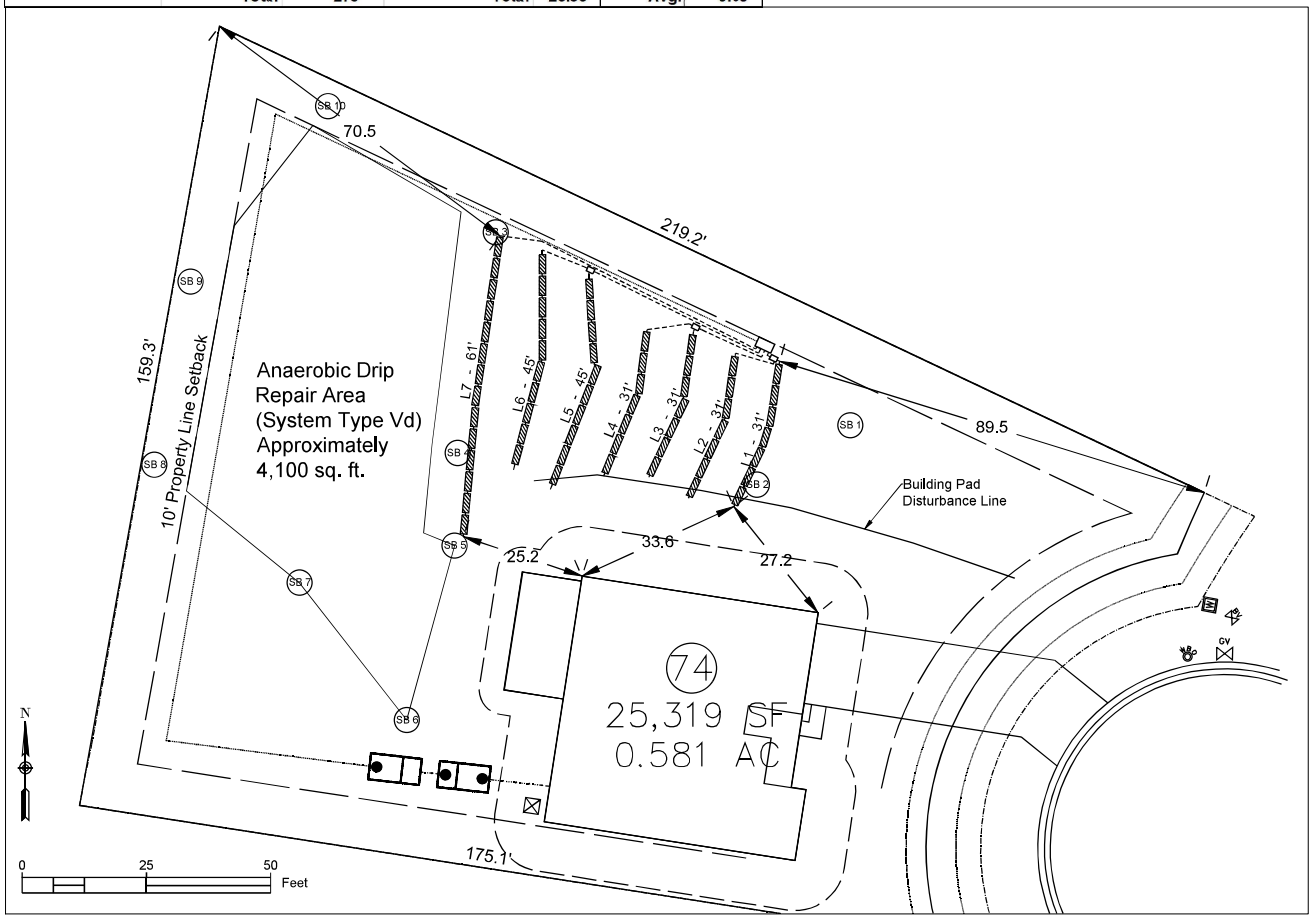
1. Clear all trees less than 8" in diameter (measured at a height 3' from soil surface) from the drainfield.
2. Vegetation that will re-grow from a cut stump shall be stumped or pulled from the ground. Stumps shall not be pushed over.
3. Drainfield area shall be cleared of all leaves, pine straw, debris, etc. The accumulated material shall be removed from the drainfield.
4. In clayey soils, sides of trenches shall be raked and limed per manufacturer's instructions.
5. Supply lines shall be installed with a minimum of 18" cover.
6. The trenches shall be backfilled appropriately so that no low areas are present.
7. Apply lime over the drainfield area as needed. Seed fine fescue over the drainfield at the rate recommended by the seed manufacturer. Hand rake the seed into the soil surface. Straw the seeded area at the rate of 1.5-2 bales per 1000 sq. ft.

DRAINFIELD INFO. - **Primary**

Proposed Type of System/Distribution: ***Pump to Pressure Manifold using PPBPS, Horizontal***

Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
2	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
3	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
4	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
5	interp	45	1/2in SCH 40, Split	3.56	0.079	0.537
6	interp	45	1/2in SCH 40, Split	3.56	0.079	0.537
7	interp	61	1/2in SCH 80	5.48	0.090	0.610
	Total	**275**	**Total**	**23.55**	**Avg.**	**0.58**

Note:
Primary distribution is pressure manifold utilizing PPBPS T&J Panel (50% Reduction) trench product.



1 WW-3 Primary Drainfield

SOURCE: Agri-Waste Technology, Inc.

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250
Cary, North Carolina 27518
919-859-0689
www.agriwaste.com

KB Home
Birchwood Trails - Lot 74

Project Location:
119 Thunderbird Lane,
Fuquay Varina, NC 27526
Harnett County
PIN: 0642-85-3054

Project Owner:
KB Home
1800 Perimeter Park Drive, STE 140,
Morrisville, NC 27560
919-768-7960
enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

ONSITE WASTEWATER
Certification Number
10057E
Heath Clapp
NC EVALUATOR

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Primary Drainfield

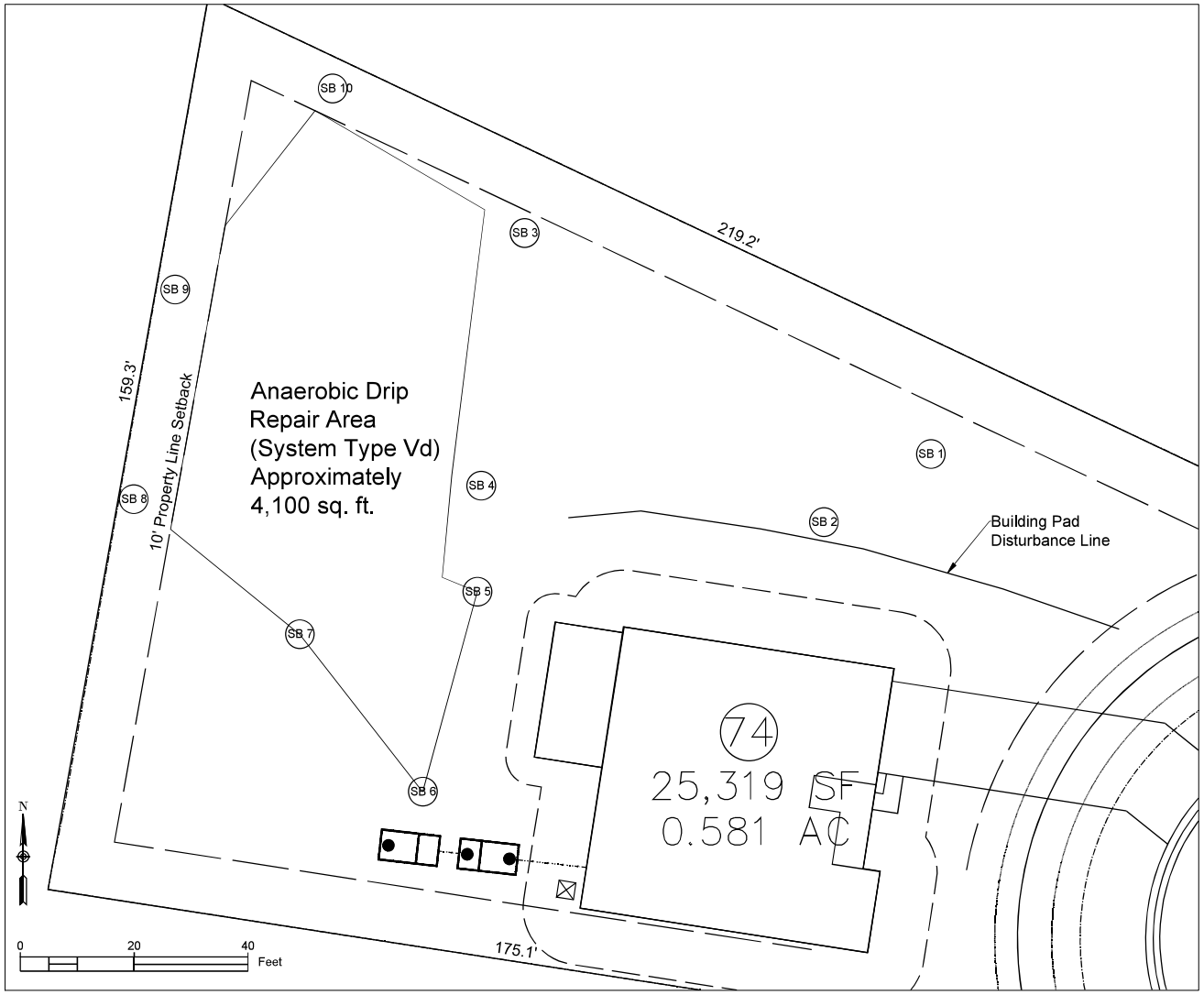
DRAWN BY:	CREATED ON:
H. Clapp	11/6/2025
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-3

General Drainfield Notes:

1. Clear all trees less than 8" in diameter (measured at a height 3' from soil surface) from the drainfield.
2. Vegetation that will re-grow from a cut stump shall be stumped or pulled from the ground. Stumps shall not be pushed over.
3. Drainfield area shall be cleared of all leaves, pine straw, debris, etc. The accumulated material shall be removed from the drainfield.
4. In clayey soils, sides of trenches shall be raked and limed per manufacturer's instructions.
5. Supply lines shall be installed with a minimum of 18" cover.
6. The trenches shall be backfilled appropriately so that no low areas are present.
7. Apply lime over the drainfield area as needed. Seed fine fescue over the drainfield at the rate recommended by the seed manufacturer. Hand rake the seed into the soil surface. Straw the seeded area at the rate of 1.5-2 bales per 1000 sq. ft.

Note:
Repair system is anaerobic drip irrigation.



1 WW-4 Repair Drainfield

SOURCE: Agri-Waste Technology, Inc.

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
1225 Crescent Green, Suite 250
Cary, North Carolina 27518
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KB Home
Birchwood Trails - Lot 74

Project Location:
119 Thunderbird Lane,
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enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

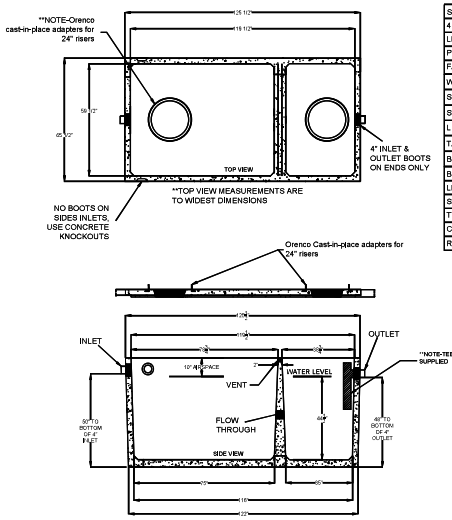
NC ONSITE WASTEWATER EVALUATOR
Certification Number
10057E
Heath Clapp

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Repair Drainfield

DRAWN BY:	CREATED ON:
H. Clapp	11/6/2025
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-4



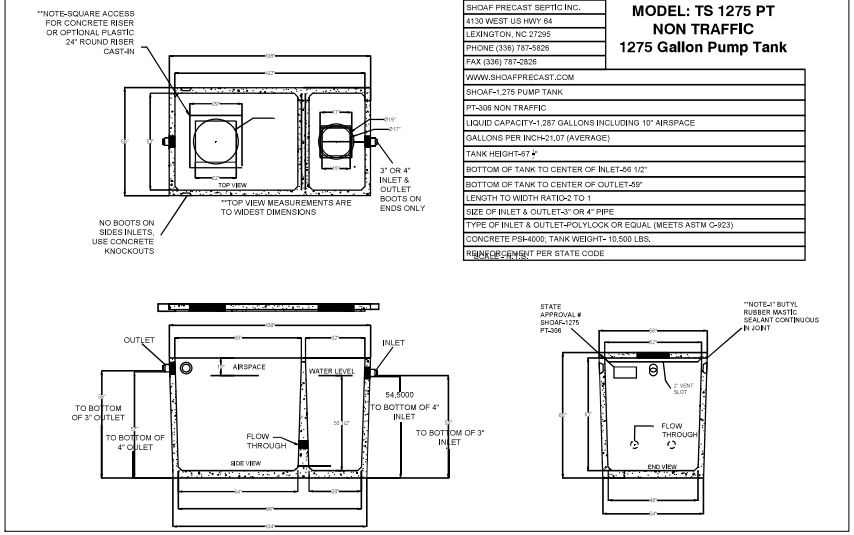
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,250 SEPTIC TANK
STB-389
LIQUID CAPACITY-1,252 GALLONS/10" AIRSPACE
TANK HEIGHT-61 ½"
BOTTOM OF TANK TO CENTER OF INLET-52"
BOTTOM OF TANK TO CENTER OF OUTLET-50"
LENGTH 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- 11,000 LBS.
REINFORCEMENT PER STATE CODE

MODEL: TS 1250 STB
NON TRAFFIC
1250 Gallon Septic Tank

SCALE - N.T.S.

1 WW-5 **Septic Tank**

SOURCE: Shoaf Precast Septic, Inc.



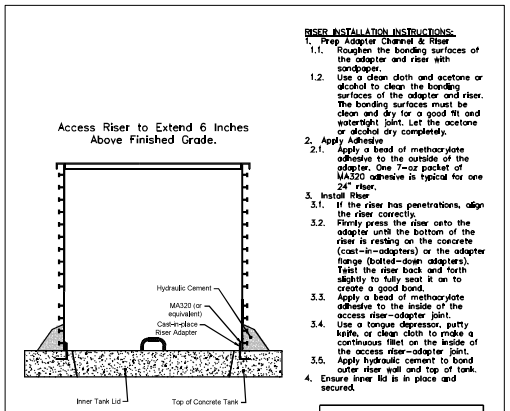
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,275 PUMP TANK
PT-306 NON TRAFFIC
LIQUID CAPACITY-1,287 GALLONS INCLUDING 10" AIRSPACE
GALLONS PER INCH-21.07 (AVERAGE)
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-59"
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

MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

SCALE - N.T.S.

2 WW-5 **Pump Tank (or equiv. tank with 1-day storage)**

SOURCE: Shoaf Precast Septic, Inc.



RISER INSTALLATION INSTRUCTIONS:

1. Prep Adapter Channel & Riser
   - 1.1. Roughen the bonding surfaces of the adapter and riser with sandpaper.
   - 1.2. Use a clean cloth and acetone or alcohol to clean the bonding surfaces of the adapter and riser. The bonding surfaces must be clean and dry for a good fit and watertight joint. Let the acetone or alcohol dry completely.
2. Apply Adhesive
   - 2.1. Apply a bead of methacrylate adhesive to the outside of the adapter. One 7-oz packet of MA320 adhesive is typical for one 24" riser.
3. Install Riser
   - 3.1. If the riser has penetrations, align the riser correctly.
   - 3.2. Firmly press the riser onto the adapter until the bottom of the riser is resting on the concrete (cast-in-adapters) or the adapter flange (bolted-down adapters). Twist the riser back and forth slightly to fully seat it on to create a good bond.
   - 3.3. Apply a bead of methacrylate adhesive to the inside of the access riser-adapter joint.
   - 3.4. Use a tongue depressor, putty knife, or clean cloth to make a continuous fillet on the inside of the access riser-adapter joint.
   - 3.5. Apply hydraulic cement to bond outer riser wall and top of tank.
4. Ensure inner lid is in place and secured.

FOR RISER WALL PENETRATIONS	
Grommet Size, Inches (Nominal IPS Pipe Size)	Hole Saw Size, Inches
1/2	1
3/4	1 1/4
1	1 9/16
1 1/4	1 3/4
1 1/2	2 1/8
2	2 3/4
3	3 7/8
4	5

3 WW-5 **Riser Installation**

NOTES

1. Installation to follow all NC DHHS and Harnett County applicable rules and regulations.
2. Harnett County Health Department to perform construction inspections and final system certification.
3. Septic Tank to have approved effluent filter.
4. Contractor to abide by all safety regulations during system installation.
5. Contractor shall backfill around all access areas such that storm water is shed away from potential entry points.
6. Invert elevations of all components to be verified in field by contractor to insure proper operation.
7. All system piping to be SCH40 PVC (except where noted).
8. All gravity elbows to be long radius or long sweeping type elbows.
9. Actual installation and placement of treatment system to be overseen by Contractor.
10. Tanks to be set on 6" minimum gravel base. Use #5 or #57 stone for base.
11. Contractor to seed and/or mulch disturbed areas to coincide with existing landscape. Area shall not be left with uncovered soil.
12. Mount Control Panel a minimum of 24" above grade.
13. Power to panel to be installed by licensed electrician per code. One 15-amp circuit and one 20-amp circuit with individual neutrals to be run from house to control panel.
14. All risers to have cast-in-place tank adapters and be single-piece riser. Risers to extend 6" above soil surface and be designed to prevent surface water inflow.
15. Backfill around tank(s) shall be gravel or tank hole shall be over-excavated a minimum of 2' in all directions to allow for mechanical tamping of backfill.
16. All penetrations to be sealed.
17. All pressure lines to maintain 18" min. cover.
18. Contractor to adjust tank placement to meet site constraints.

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919-859-0669
www.agriwaste.com

KB Home
Birchwood Trails - Lot 74

Project Location:
119 Thunderbird Lane,
Fuquay Varina, NC 27526
Harnett County
PIN: 0642-85-3054

Project Owner:
KB Home
1800 Perimeter Park Drive, STE 140,
Morrisville, NC 27560
919-768-7960
enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

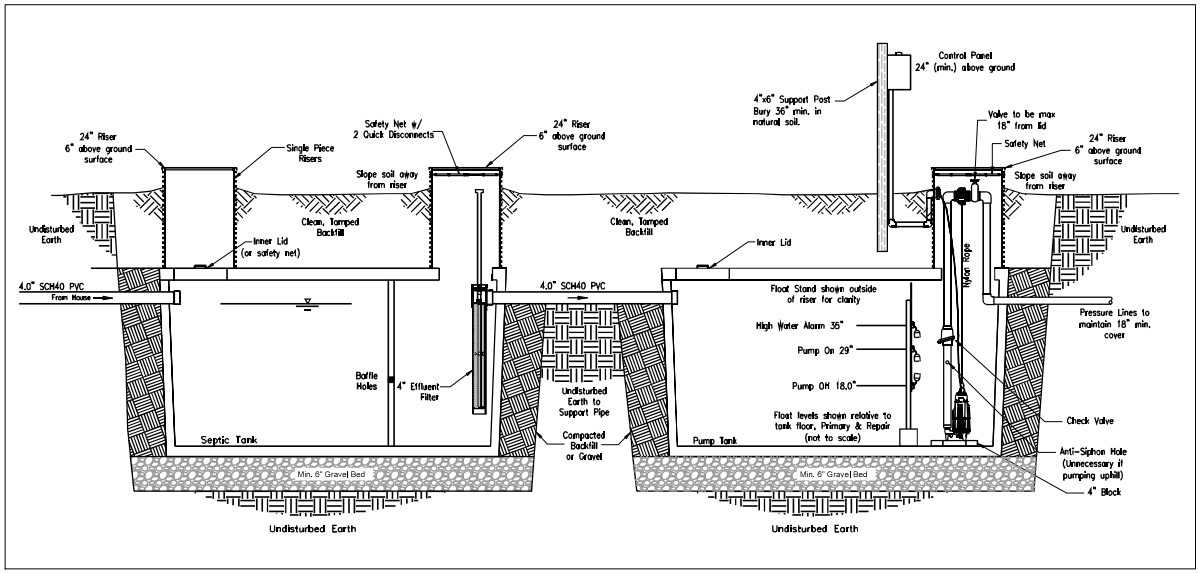
NC ONSITE WASTEWATER EVALUATOR
Certification Number
10057E
Heath Clapp

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Detail Sheet 1

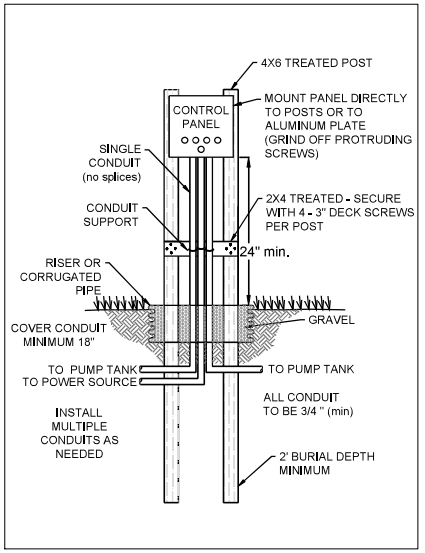
DRAWN BY:	CREATED ON:
H. Clapp	11/6/2025
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-5



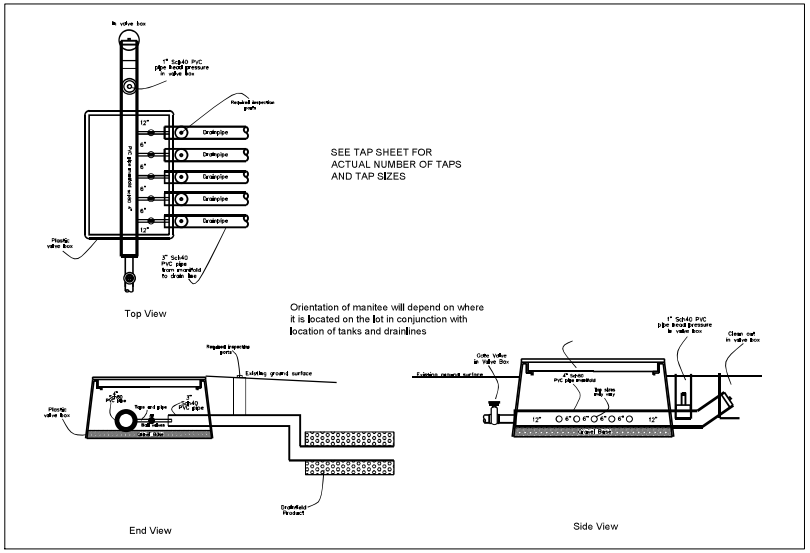
1 WW-6 **SYSTEM PROFILE VIEW**

N.T.S.



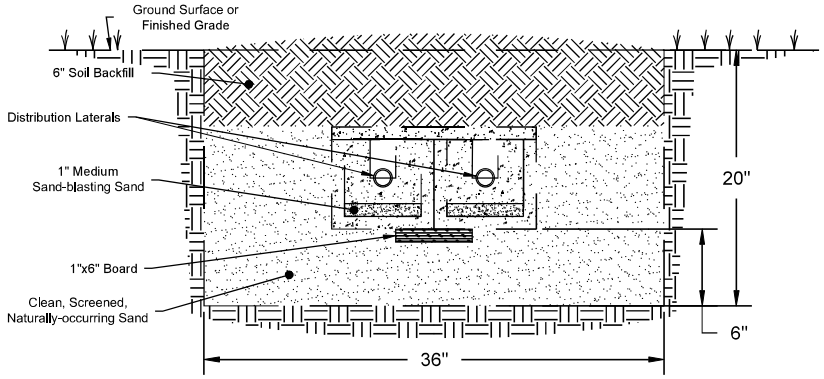
6 WW-6 **CONTROL PANEL SUPPORT**

N.T.S. SOURCE: AWT



4 WW-6 **PRESSURE MANIFOLD INSTALLATION (Manitee) - For Illustration Only**

N.T.S. SOURCE: AWT



2 WW-6 **TRENCH X-SECTION (Typical)**

N.T.S. Source: AWT

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
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919-859-0689
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Birchwood Trails - Lot 74

Project Location:
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Harnett County
PIN: 0642-85-3054

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enpollock@kbhome.com

NC ONSITE WASTEWATER EVALUATOR SEAL

NC ONSITE WASTEWATER EVALUATOR
Certification Number
10057E
Heath Clapp

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Detail Sheet 2

DRAWN BY:	CREATED ON:
H. Clapp	11/6/2025
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER

WW-6

Septic System Design - Summary Page

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N Salem Street, Suite 203, Apex, NC 27502
agriwaste.com | 919.859.0669

Project: Birchwood Trails - Lot 74
Property: 119 Thunderbird Lane, Fuquay Varina, NC 27526
Subdiv.: Birchwood Trails
Lot #: 74

Date: 10/6/2025
County: Harnett
Permit #:

Project Manager:
Heath Clapp, LSS
hclapp@agriwaste.com
919-629-6404

Designer:
Heath Clapp, LSS
hclapp@agriwaste.com

Owner: KB Home
Address: 1800 Perimeter Park Drive, STE 146, Morrisville, NC, 27560
Phone: 919-768-7960
Email: enpollock@kbhome.com

EHS:

Type of System: III b
PIN: 0642-85-3054

Soil Parameters

Soil Evaluation By:
Heath Clapp, LSS

Special Conditions/Notes:

LTAR: 0.30 gpd/ft^2

Design Parameters

Type of Establishment: Dwelling Units, no more than 2 persons per bedroom
Unit: Bedroom
# of Units: 4

Septic Tank Specifications

Min. Tank Capacity: 960 gal
Actual Tank Volume: 1,250 gal
Tank Manufacturer: Shoaf
Tank Model: TS 1250 STB

	Exterior	Interior	
Length:	125.5	119.5	in.
Width:	65.5	59.5	in.
Depth:	61.5	54.5	in.

Primary Drainfield Specifications

Type of Distribution: Parallel Pressure Manifold
Trench Media: PPBPS, Horizontal
Trench Width: 3 ft
Trench Depth: 20 in.
(or as specified on permit)

Trench Bottom Area: 1600 ft^2
Minimum Drain Line: 267 ft
Actual Drain Line: 275 ft
Number of Lines: 7
Minimum Line Spacing: 8 ft O.C.

Wastewater Treatment System Design Calculations

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Septic Tank Sizing

Daily Flow Estimate:

Unit	# of Units	Flow/Unit	Flow/Day
Bedroom	4	120	480
		Q=	480 gpd

Septic Tank Minimum Capacity: Per NCAC T15A:18A .1952(b)(2)(A):

For large residences, multiple dwelling units, or places of business or public assembly with Q <= 600,

Minimum Liquid Capacity (V)= 960 gal

Septic Tank Specs:

Manufacturer:	Shoaf	
Model:	TS 1250 STB	
Volume:	1,250	gal
Weight:	11,000	lbs

	Exterior	Interior	
Length:	125.5	119.5	in.
Width:	65.5	59.5	in.
Depth:	61.5	54.5	in.

Shape of Risers: Circular
Diameter: 2.00 ft

Pump Tank Storage & Float Settings

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Tank Manufacturer	Shoaf
Tank Model	TS 1275 PT

Interior Height (in.)	**60.5**	in.
Avg. Storage	**21.07**	gal/in.

Primary System

Elevations, measured from bottom towards top (0 = Interior Bottom of Tank):

Top of pump (including 4" block)	16.1	in.	(Pump height = 12 1/16")
Pump Off	18.0	in.	
Pump On	29.0	in.	(set for dose volume)
Alarm On	35.0	in.	(6 in. above On Float)

Emergency Storage Available		
Pump Tank	537	gal
Days of Storage	1.12	days

(determined from "interior top of tank" - "High Water Alarm")

ELEVATIONS

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Benchmark	0		
BM Elev	0	ft	
Septic Tank	1,250	gal	
Ground Surface			294.00 ft
Depth of Soil Cover	12	in.	1.00 ft
Overall Ht of Tank	61.5	in.	5.13 ft
Elev, Base of Tank			287.88 ft
Ht to 4" Inlet Invert	50	in.	4.17 ft
Elev, 4" Inlet Invert			292.04 ft
Ht to 4" Outlet Invert	48	in.	4.00 ft
Elev, 4" Outlet Invert			291.88 ft
Gravel Base	6	in.	0.50 ft
Elev, Bot of Excavation			287.38 ft
Pump Tank	1287	gal	
Ground Surface			293.50 ft
Depth of Soil Cover	16	in.	1.33 ft
Overall Ht of Tank	67.5	in.	5.63 ft
Elev, Base of Tank			286.54 ft
Ht to 4" Inlet Invert	57	in.	4.75 ft
Elev, 4" Inlet Invert			291.29 ft
Ht to 2" Outlet Invert	54.5	in.	4.54 ft
Elev, 2" Outlet Invert			291.08 ft
Gravel Base	6	in.	0.50 ft
Elev, Bot of Excavation			286.04 ft
ST Inlet Pipe			
Grade @ Stub-out			296 ft
Depth of Stub-out, top			1.5 ft
Elev, Stub-out Invert			294.15 ft
Elev @ ST Inlet Invert			292.04 ft
Length			21 ft
Slope			10.0 %
Pipe, ST to PT			
ID	4	in.	0.33 ft
OD	4.5	in.	0.38 ft
Elev, ST Outlet Invert			291.88 ft
Elev, PT Inlet Invert			291.29 ft
Length			2 ft
Slope			29.2 %
Cover over inlet pipe			1.60 ft
Pump Reqmt.			
Floor Thickness	4	in.	0.33 ft
Elev, Pump Tank Floor			286.88 ft
Pump Block Ht.	4	in.	0.33 ft
Elev, Pump Intake			287.21 ft
Grade @ Primary Manifold			296.30 ft
Min. Cover	18	in.	1.50 ft
Max Elev, Primary			294.80 ft
Max Elev, Repair			294.50 ft
Elev Diff, Primary			7.59 ft
Elev Diff, Repair			7.29 ft

Drainfield Design

Project	Birchwood Trails - Lot 74
Location	119 Thunderbird Lane, Fuquay Varina, NC 27526
County	Harnett

Drainfield Sizing

Primary

LTAR	0.3 gpd/ft^2		
Daily Design Flow	480 gpd	**Type of Drainfield Media**	PPBPS, Horizontal
Req. Drainfield Area	1,600 ft^2	**Required Drainline**	
Trench Width, Eff.	3 ft	**After 50% Reduction**	267 ft
Required Drainline	533 ft	**Minimum Line Spacing**	8 ft (O.C.)

Repair

LTAR	0.15 gpd/ft^2		
Daily Design Flow	480 gpd	**Type of Drainfield Media**	Drip
Req. Drainfield Area	3,200 ft^2	**Required Drainline**	
Trench Width, Eff.	2 ft	**After 0% Reduction**	1600 ft
Required Drainline	1600 ft	**Minimum Line Spacing**	2 ft (O.C.)

Drainfield Layout

Line	Use	Flag Color	Elevation (ft)	Line Length (ft)	Used as Primary (ft)	Used as Repair (ft)
1	Layout Line	interp		31	31.0	
2	Layout Line	interp		31	31.0	
3	Layout Line	interp		31	31.0	
4	Layout Line	interp		31	31.0	
5	Layout Line	interp		45	45.0	
6	Layout Line	interp		45	45.0	
7	Layout Line	interp		61	61.0	
			Total	275	275	0
			Count	7	7	0

Note: Line length totals are shown to the nearest foot.

PRESSURE MANIFOLD DESIGN (Primary)

Site Information

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Design Information

Estimated Daily Flow	480	gal/day
L.T.A.R. (from Harnett Co.)	0.3	gal/day/ft^2
L.T.A.R. + 5%	0.315	gal/day/ft^2
Trench Width	3	ft.
Line Length Required	533	ft.
Length after 50% Reduction	267	ft
L.T.A.R. Reduced	0.600	gal/day/ft^2
L.T.A.R. Reduced + 5%	0.630	gal/day/ft^2

DRAINFIELD INFO. - **Primary**

Proposed Type of System/Distribution: ***Pump to Pressure Manifold using PPBPS, Horizontal***

Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
2	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
3	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
4	interp	31	1/2in SCH 80, Split	2.74	0.088	0.601
5	interp	45	1/2in SCH 40, Split	3.56	0.079	0.537
6	interp	45	1/2in SCH 40, Split	3.56	0.079	0.537
7	interp	61	1/2in SCH 80	5.48	0.090	0.610
	Total	**275**	**Total**	**23.55**	**Avg.**	**0.58**

#N/A

Total Run Time	20.38	min.	
Drainfield Capacity	446.4	gal	
% of Drainfield Cap	51.9%		(Max. 98.4% to not exceed 7.2 gal/panel)
Dose Volume	231.7	gal/dose	
Run Time/Dose	**9.8**	**minutes**	Time to deliver max. 3.6 gal/panel
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	11.00	in.	

Manifold Box

Number of Taps	4	with		3	Split(s)
Manifold Length	3.5	ft.	(approximate)		

PUMP DESIGN

System (initial/repair): **Primary**

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane, Fuquay Varina, NC 27526
County: Harnett

Friction Losses

Suction Head	0	ft	*(submersible 0)*
Elev. Difference (highest point from pump)	7.59	ft	
Design Pressure At Outlet	2	ft	

Supply Line - 2" Schedule 40 PVC

Pipe Diameter, Nominal	2	in.			
Pipe Diameter (ID)	2.047	in.	Flow	23.55	gpm
Pipe Length	277	ft	Velocity	2.30	ft/sec
Pipe Length for Fittings	27.7	ft	Meets requirement that 2 ft/s < v < 5 ft/s.		
Equivalent Length	304.7	ft			
Estimated Friction Loss in Supply Line			3.18	ft	
Friction Loss - Taps/Special Fittings			3.5	ft	
TOTAL			**16.27**	**ft.**	

Flow for Anti-Siphon Hole

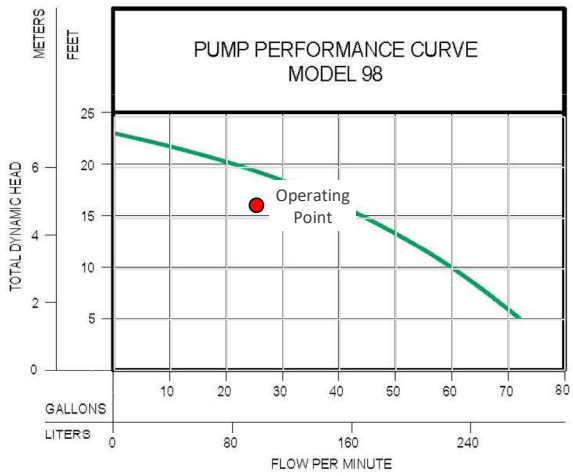
Hole Diameter	3/16	in.
Hole Flowrate	1.67	gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**25.22**	**gpm**

Required Horsepower	0.16	hp
TDH	**16.27**	**ft**

Pump Selection

Manufacturer:	Zoeller
Model:	N98
Horsepower:	**0.5**



Septic Tank Buoyancy Calculation

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Tank Size (nominal) 1250 gal

Properties/Assumptions:

Min. liquid level to be maintained in tank at all times after initial installation.

Min. depth to water table	12.0	in.	from ground surface
Effluent Density	62.4	lb/ft^3	(Specific Weight of Water)
Concrete Density	142.6	lb/ft^3	
Soil App. Sp. Grav.	1.3		*(typical value)*
Soil Cover Over Tank	12	in.	(minimum)
Additional Cover	0	in.	for pipe grade
Unsubmerged wt of soil	81.1	lb/ft^3	
Submerged wt of soil	49.9	lb/ft^3	50% Porosity Assumed

Tank Dimensions (from supplier):

		Exterior		*Interior*		
		Top	Bottom	Top	Bottom	
Tank	Length	125.5	122.0	119.5	116.0	in.
	Width	65.5	62.0	59.5	56.0	in.
	Height	58.5	(w/o lid)	54.5		in.
Lid	Length	125.5	in.			
	Width	65.5	in.			
	Height	3.0	in.			

Area of Riser Openings 6.28 ft^2

Permanent Liquid Depth in Tank 0.0 in. 0.00 ft

Tank Weight 11,000 lb (per manufacturer)

Buoyancy Force Calculation:

Buoyancy Force Specific Weight of Water x Displaced Volume

Displaced Volume	281.4	ft^3 *
Buoyancy Force	**17,558**	**lb.**

Weight Calculation:

Tank Weight	11000	lb		
Water Weight in Tank	0	lb	Volume	0.0 ft^3 *
Soil Weight Over Tank	4121	lb		
Soil Friction Force	4037	lb		
Total Weight	**19,158**	**lb**		

Factor of Safety = 1.09

Note: Total weight must be greater than buoyancy force so that tank will not float during high water table conditions.
** Volume calculated by the prismoidal formula.*

Pump Tank Buoyancy Calculation

Project: Birchwood Trails - Lot 74
Location: 119 Thunderbird Lane,
Fuquay Varina, NC 27526
County: Harnett

Tank Size (nominal) 1287 gal

Properties/Assumptions:

Min. liquid level to be maintained in tank at all times after initial installation.

Min. depth to water table	12	in.	from ground surface
Effluent Density	62.4	lb/ft^3	(Specific Weight of Water)
Concrete Density	142.6	lb/ft^3	
Soil App. Sp. Grav.	1.3		*(typical value)*
Soil Cover Over Tank	12	in.	(minimum)
Additional Cover	4	in.	for pipe grade
Unsubmerged wt of soil	81.1	lb/ft^3	
Submerged wt of soil	49.9	lb/ft^3	50% porosity assumed

Tank Dimensions (from supplier):

		Exterior		*Interior*		
		Top	Bottom	Top	Bottom	
Tank	Length	108.0	104.0	102.0	98.0	in.
	Width	58.0	54.0	52.0	48.0	in.
	Height	64.5	(w/o lid)	60.5		in.
Lid	Length	108.0	in.			
	Width	58.0	in.			
	Height	3.0	in.			

Area of Riser Openings 3.14 ft^2

Permanent Liquid Depth in Tank 0.0 in. 0.00 ft

Tank Weight 10500 lb (per manufacturer)

Buoyancy Force Calculation:

Buoyancy Force Specific Weight of Water x Displaced Volume

Displaced Volume	233.5	ft^3 *
Buoyancy Force	**14,573**	**lb**

Weight Calculation:

Tank Weight	10500	lb		
Water Weight in Tank	0	lb	Volume	0.0 ft^3 *
Soil Weight Over Tank	3945	lb		
Soil Friction Force	4227	lb		
Total Weight	**18,672**	**lb**		

Factor of Safety = 1.28

Note: Total weight must be greater than buoyancy force so that tank will not float during high water table conditions.
** Volume calculated by the prismoidal formula.*