Engineers and Soil Scientists

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

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
Birchwood Trails – Lot 70
Olive Branch Rd. Fuquay Varina, NC 27526
(Harnett County)
June 8, 2023

Soil suitability for domestic sewage treatment and disposal systems was evaluated on April 24, 2023, for the property located at Olive Branch Rd. in Fuquay Varina, NC (Harnett County). Jeff Vaughan, Heath Clapp, and Trent Bostic 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 pit are included in Attachment 2.

The total property area is approximately .58 acres. The house and septic area are an open field. The proposed septic system for the property is a pressure manifold fed, accepted status system for initial and repair.

<u>Soil Suitability for Domestic Sewage Treatment and Disposal Systems</u>
The drawing in Attachment 1 details the property boundaries, soil pit locations, and layout of drain field trenches. Multiple soil pits and borings were advanced within the proposed septic system area on the property. Soil pits/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. All soil pits/borings were provisionally suitable for a conventional style trench. Soil pits/borings are within the proposed drainfield area.

The layout shown in Attachment 1 indicates there is available space for a four-bedroom accepted system. The initial system can be installed with the use of an accepted status drainfield based on the layout in the field.

The proposed LTAR (Long Term Acceptance Rate) by AWT is 0.4GPD/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 0.4GPD/ft^2, 600 linear feet of trench is necessary to support a 4-bedroom home for the initial and repair system with the use of an accepted trench product. The maximum slope corrected trench depth is 22 inches. The attached drawings substantiate that the necessary linear footage of trench can be installed on the property for the initial and 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,

Jeff Vaughan, NC LSS

County: Harnett

IMPROVEMENT PERMIT FOR G.S. 130A-335(a2)/SL2022-11

PIN/Lot Identifier: Lot 70

Issued To: Ballentine Associates

Property Location: Olive Branch Rd. Fuquay Varina, NC 27526

Subdivision: Birchwood Trails Lot #: 70 Block: _____ Section: _____

LSS Report Provided: Yes ☑ No ☐

If yes, name and license number of LSS: Jeff Vaughan (1227)

New ☑ Repair ☐ Expansion ☐ System Relocation ☐

Proposed Structure: SFR (4-bedroom)

Proposed Wastewater System Type: Accepted (Initial) Accepted (Repair)

Fill System: ☐ Yes ☑ No If yes, specify: ☐ New ☐ Existing (when adding more than 6 inches of fill to system area please provide a fill plan)

Proposed Design Daily Flow: 480 GPD Proposed LTAR (Initial): 0.4 Proposed LTAR (Repair): 0.4

Design Wastewater Strength: ☑ domestic ☐ high strength ☐ industrial process

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

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

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

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

Drainfield location meets requirements of Rule .1945: Yes ☑ No ☐

Drainfield location meets requirements of Rule .1950: 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: Jeff Vaughan

Licensed Soil Scientist Signature: _____ Date: 06/08/2023

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

See attached site sketch

County: Harnett

This Section for Local Health Department Use Only

Initial submittal received: _____ by _____
Date *Initials*

Permit Number: _____

G.S. 130A-335(a4) states the following: *'If a local health department fails to act on an application for an improvement permit submitted pursuant to subsection (a3) of the section within 10 business days of receipt of a complete application, the local health department shall issue the improvement permit.'*

In accordance with G.S. 130A-335(a3) the improvement permit application is:

☐ 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 Owner on _____
Date

State Authorized Agent: _____ Date: _____

☐ Denied (See attached report.)

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

State Authorized Agent: _____ Date: _____

☐ Complete

State Authorized Agent: _____ Date of Issuance: _____

This Improvement Permit is issued pursuant to G.S. 130A-335 (a2), (a3), and (a4) using the signed and sealed LSS/LG evaluation(s) attached here. The issuance of this permit by the Health Department in no way guarantees the issuance of other permits. The permit holder is responsible for checking with appropriate governing bodies in meeting their requirements. This site is subject to revocation if the site plan, plat, or the intended use changes, or if information submitted in the application was falsified, inaccurate or misleading. The Improvement Permit shall not be affected by a change in ownership of the site. This permit is subject to compliance with the provisions of the Laws and Rules for Sewage Treatment and Disposal and to conditions of this permit. The location and identification of all property lines, easements, water lines, and other appropriate utilities shall be the responsibility of the owner.

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

County: Harnett

CONSTRUCTION AUTHORIZATION FOR G.S. 130A-335(a2)/SL2022-11

PIN/Lot Identifier: Lot 70

Issued To: Ballentine Associates

Property Location: Olive Branch Rd. Fuquay Varina, NC 27526

AOWE/PE Plans/Evaluations Provided: Yes ☑ No ☐ If yes, name and license number of AOWE/PE: Jeff Vaughan, 10003E

Facility Type: SFR (4-bedroom)

☑ New ☐ Expansion ☐ Repair System Relocation ☐

Basement? ☐ Yes ☑ No Basement Fixtures? ☐ Yes ☑ No

Type of Wastewater System** Accepted (Initial) Accepted (Repair)

Design Daily Flow: 480 GPD Wastewater Strength: ☑ domestic ☐ high strength ☐ industrial process

Session Law 2014-120 Section 53, Engineering Design Utilizing Low-flow Fixtures and Low-flow Technologies? ☐ Yes ☑ No

Installation Requirements/Conditions

Septic Tank Size: 1200 gallons Total Trench/Bed Length: 300 feet Trench/Bed Spacing: 9 feet on center

Drainfield square footage: 900 Trench/Bed Width: 36 inches LTAR: 0.4 gpd/ft²

Soil Cover: _____ inches Slope Adjusted Maximum Trench/Bed Depth: 22 inches

Aggregate Depth: _____inches above pipe _____inches below pipe _____inches total

Pump Tank Size (if applicable): 1200 gallons Requires more than 1 pump? ☐ Yes ☑ No

Pump Requirements: _____ ft. TDH vs. _____ GPM Grease Trap Size (if applicable): _____ 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 [.1937(h)]: Yes ☐ No ☑

Easement, Right-of-Way, or Encroachment Agreement Required [.1938(j)]: ☐ Yes ☑ No

Declaration of Restrictive Covenants: ☐ Yes ☑ No

****If applicable:**

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

Owner/Legal Representative Print Name: _____

Owner/Legal Representative Signature: _____ Date: _____

Pre-Construction Conference Required: Yes ☐ No ☑

Conditions: _____

_____

_____

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

AOWE/PE Print Name: Jeff Vaughan

AOWE/PE Signature: _____ Date: 06/08/2023

NC ONSITE WASTEWATER EVALUATOR Certification Number 10003E

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

See attached site sketch

County: _____

This Section for Local Health Department Use Only

Initial submittal received: _____ by _____
Date *Initials*

Permit Number: _____

G.S. 130A-335(a6) states the following: *'If a local health department fails to act on an application for a construction authorization submitted pursuant to subsection (a5) of the section within 10 business days of receipt of a complete application, the local health department shall issue the construction authorization.'*

In accordance with G.S. 130A-335(a5) the construction authorization application is:

☐ 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 Owner on _____
Date

State Authorized Agent: _____ Date: _____

☐ Denied (See attached report.)

Copies of this were sent to the AOWE/PE and the Owner 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), (a5), and (a6) 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, or if information submitted in the application was falsified, inaccurate or misleading. 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 location and identification of all property lines, easements, water lines, and other appropriate utilities shall be the responsibility of the owner. Final landscaping shall be constructed to divert water and establish vegetative cover.

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

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

PROPERTY ID #: Lot 70
COUNTY: Harnett

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

CLIENT: Ballentine Associates _ APPLICATION DATE 6/8/2023
ADDRESS: 221 Providence Rd. Chapel Hill, NC 27514 DATES EVALUATED: 04/24/2023
PROPOSED FACILITY: Single Family Residence PROPOSED DESIGN FLOW (.1949): 480GPD PROPERTY SIZE: 0.58 ac
LOCATION OF SITE: Olive Branch Rd. Fuquay Varina, NC 27526 PROPERTY RECORDED: No
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, 2 3 4		A 0-6"	LS; Gr	NS; NP; VFr	10YR 3/3	36"			Provisionally Suitable 0.4GPD/ft2
		E 6-20"	LS; Gr	NS; NP; VFr	10YR 7/6				
		Bt1 12-36"	SCL; SBK	SS; SP; Fi-Fr	2.5YR 5/8				

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	Provisionally Suitable	Provisionally Suitable
System Type(s)	Accepted	Accepted
Site LTAR	0.4GPD/Ft^2	0.4GPD/Ft^2

OTHER FACTORS (.1946): ___
SITE CLASSIFICATION (.1948): Provisionally Suitable
EVALUATED BY: Jeff Vaughan, Trent Bostic, Heath Clapp

COMMENTS

LEGEND

use the following standard abbreviations

LANDSCAPE POSITION	GROUP	SOIL TEXTURE	CONVENTIONAL .1955 LTAR*	LPP .1957 LTAR*	MINERALOGY/ CONSISTENCE	STRUCTURE
CC (Concave Slope) CV (Convex Slope) D (Drainage Way)	I	S (Sand) LS (Loamy Sand)	1.2 - 0.8	0.6 - 0.4	SEXP (Slightly Expansive) EXP (Expansive)	G (Single Grain) M (Massive) CR (Crumb)

DS (Debris Slump)	II	SL (Sandy Loam)	0.8 - 0.6	0.4 - 0.3		GR (Granular)
FP (Flood Plain)		L (Loam)				SBK (Subangular Blocky)
FS (Foot Slope)						ABK (Angular Blocky)
H (Head Slope)	III	Si (Silt)	0.6 - 0.3	0.3 - 0.15		PL (Platy)
L (Linear Slope)		SiCL (Silty Clay Loam)				PR (Prismatic)
N (Nose Slope)		CL (Clay Loam)				
R (Ridge)		SCL (Sandy Clay Loam)			**MOIST**	**WET**
S (Shoulder Slope)		SiL (Silt Loam)				
T (Terrace)					VFR (Very Friable)	NS (Non-sticky)
	IV	SC (Sandy Clay)	0.4 - 0.1	0.2 - 0.05	FR (Friable)	SS (Slightly Sticky)
		SiC (Silty Clay)			FI (Firm)	S (Sticky)
		C (Clay)			VFI (Very Firm v. Very Sticky)	VS (Very Sticky)
		O (Organic)	None	None	EFI (Extremely Firm)	NP (Non-plastic)
						SP (Slightly Plastic)
						P (Plastic)
						VP (Very Plastic)

*Adjust LTAR due to depth, consistence, structure, soil wetness, landscape, position, wastewater flow and quality.

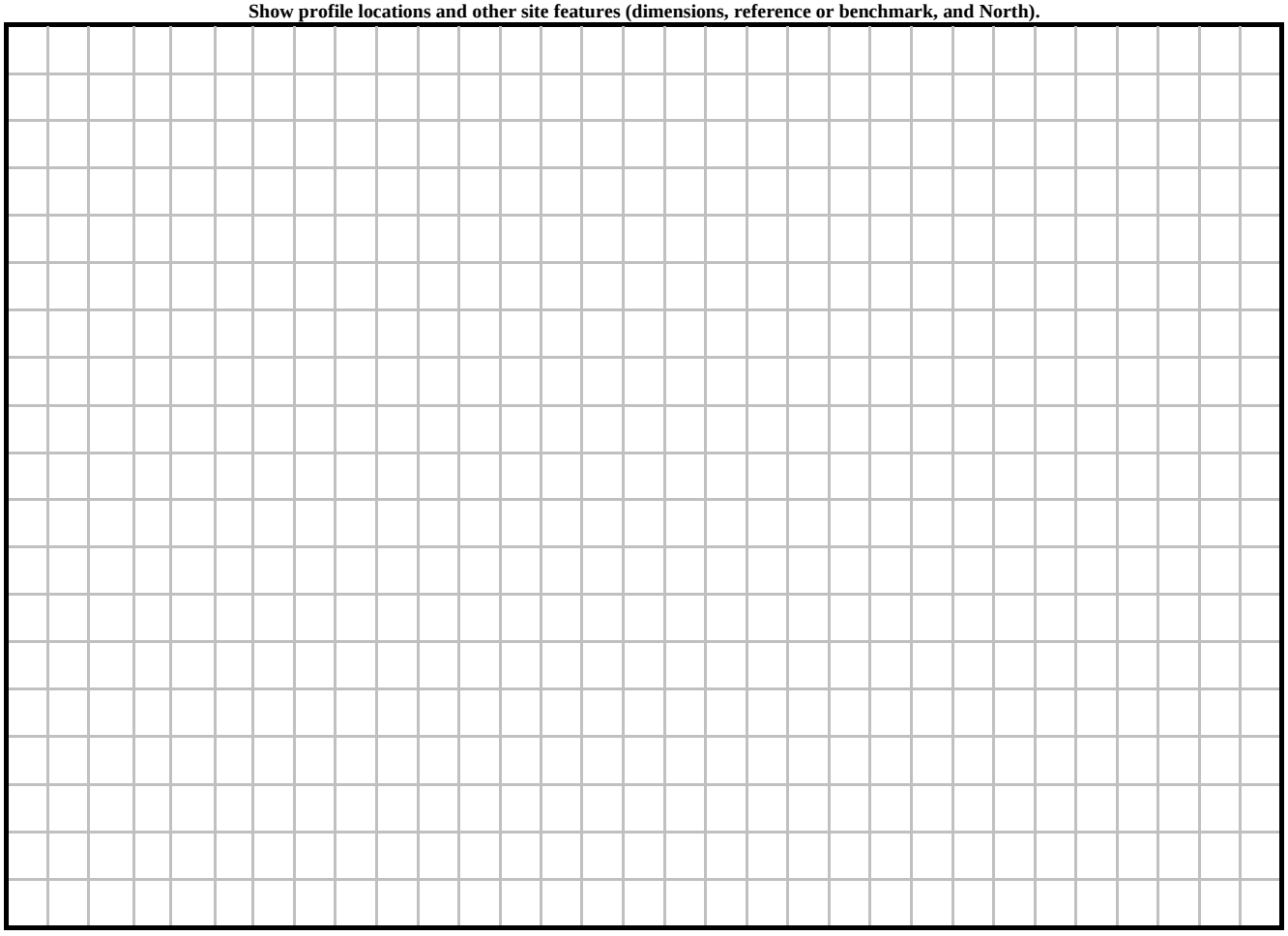
NOTES

HORIZON DEPTH	In inches below natural soil surface
DEPTH OF FILL	In inches from land surface
RESTRICTIVE HORIZON	Thickness and depth from land surface
SAPROLITE	S(suitable) or U(unsuitable)
SOIL WETNESS	Inches from land surface to free water or inches from land surface to soil colors with chroma 2 or less - record Munsell color chip designation
CLASSIFICATION	S (Suitable), PS (Provisionally Suitable), or U (Unsuitable)

Evaluation of saprolite shall be by pits.

Long-term Acceptance Rate (LTAR): gal/day/ft^2

Show profile locations and other site features (dimensions, reference or benchmark, and North).



BIRCHWOOD TRAILS - LOT 70

Project Location	Olive Branch Rd
	Fuquay Varina, NC 27526
	Harnett County
	PIN: ----
Project Owner	Ballentine Associates, PA
	221 Providence Rd
	Chapel Hill, NC 27514
	919-929-0481
	dillons@ballentineassociates
Project Consultant	Jeff Vaughan, L.S.S
	(919) 367-6313
	Trent Bostic
	(919) 367-6322
	Agri-Waste Technology, Inc.
	501 N. Salem Street, Suite 203
	Apex, NC 27502
	(919) 859-0669
	(919) 233-1970 Fax
System Overview	Single Family Residence
	Four (4) Bedroom, 480 gpd
	Pressure Manifold Distribution
	Accepted/Innovative Trench Product

VICINITY MAP

Sheet Index

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

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

NC ONSITE WASTEWATER EVALUATOR SEAL

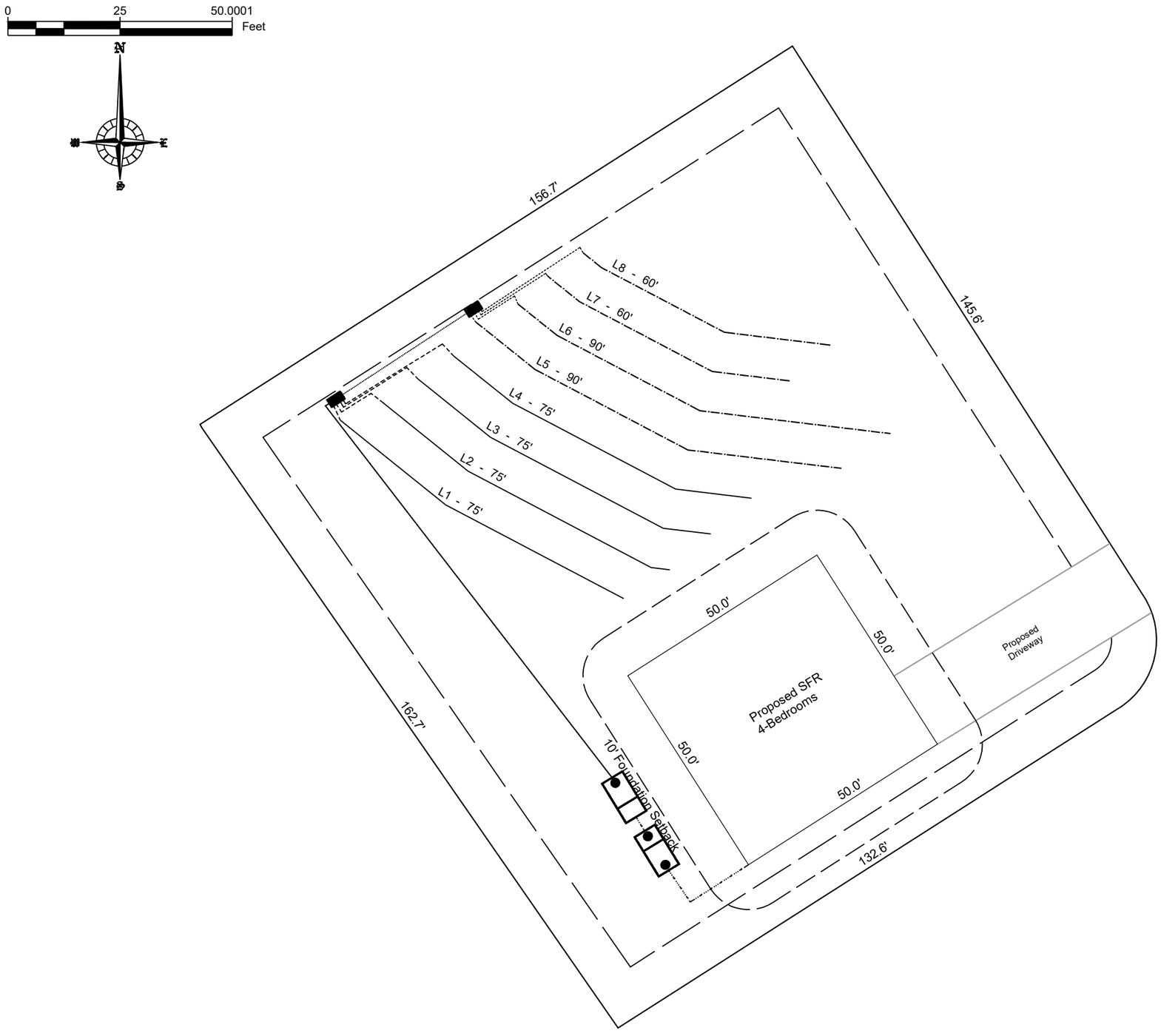
NC ONSITE WASTEWATER EVALUATOR
Certification Number
10003E

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-1



1
WW-2

PROPERTY LAYOUT

SOURCE: AWT, Inc. (Boundary survey performed by Bennett Surveys)

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

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

NC ONSITE WASTEWATER EVALUATOR SEAL

NC ONSITE WASTEWATER EVALUATOR
Certification Number
10003E

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Property Layout

DRAWN BY:	CREATED ON:
H. Clapp	6/8/2023
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

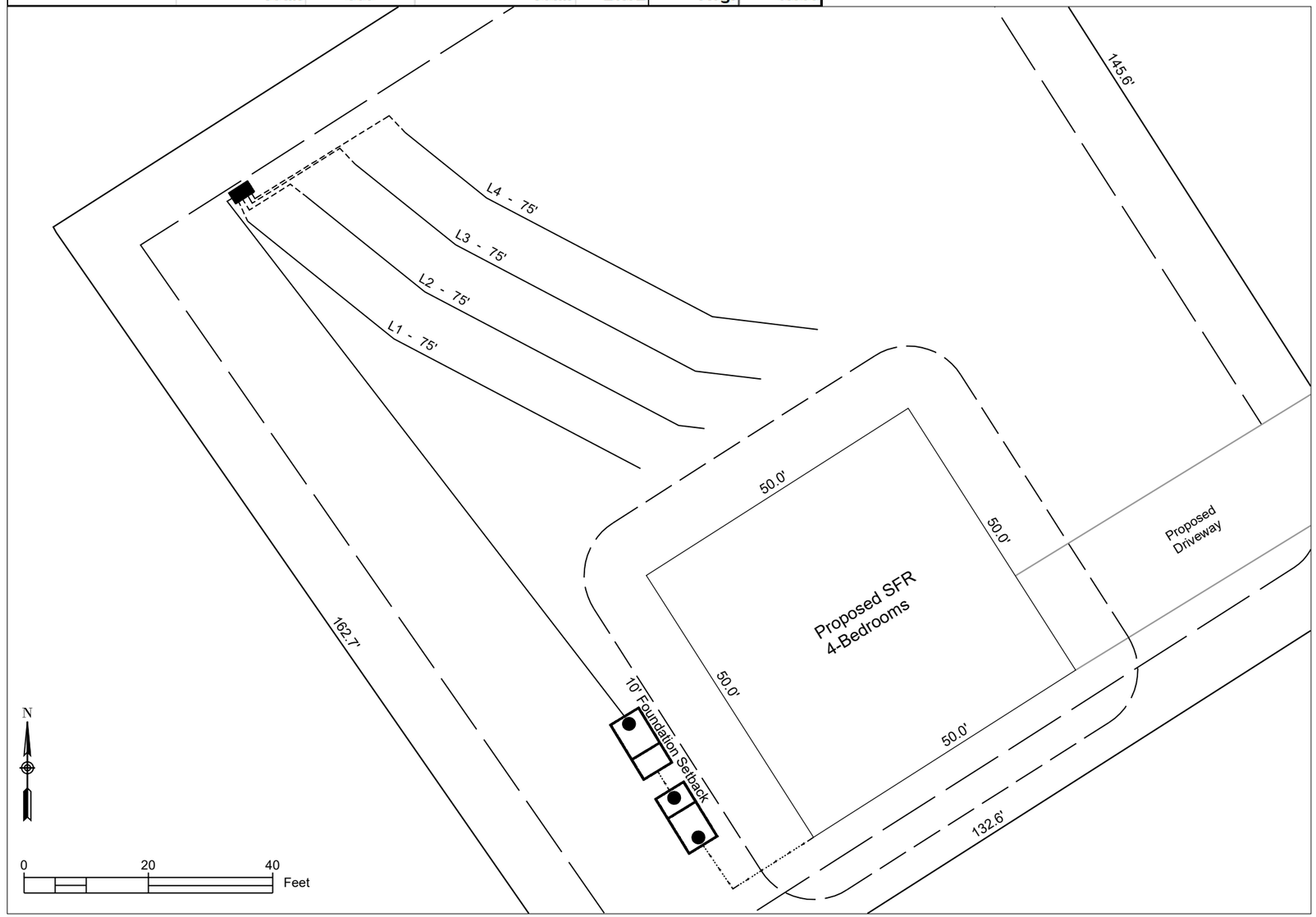
DRAWING NUMBER

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 EZflow***					
Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	blue	75	1/2in SCH 80	5.48	0.073	0.533
2	yellow	75	1/2in SCH 80	5.48	0.073	0.533
3	pink	75	1/2in SCH 80	5.48	0.073	0.533
4	red	75	1/2in SCH 80	5.48	0.073	0.533
	Total	**300**	**Total**	**21.92**	**Avg.**	**0.533**



1 WW-3 Primary Drainfield

SOURCE: Agri-Waste Technology, Inc.

AWT
Engineers and Soil Scientists
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919-859-0669
www.agriwaste.com

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

NC ONSITE WASTEWATER EVALUATOR
Certification Number 10003E

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Primary Drainfield

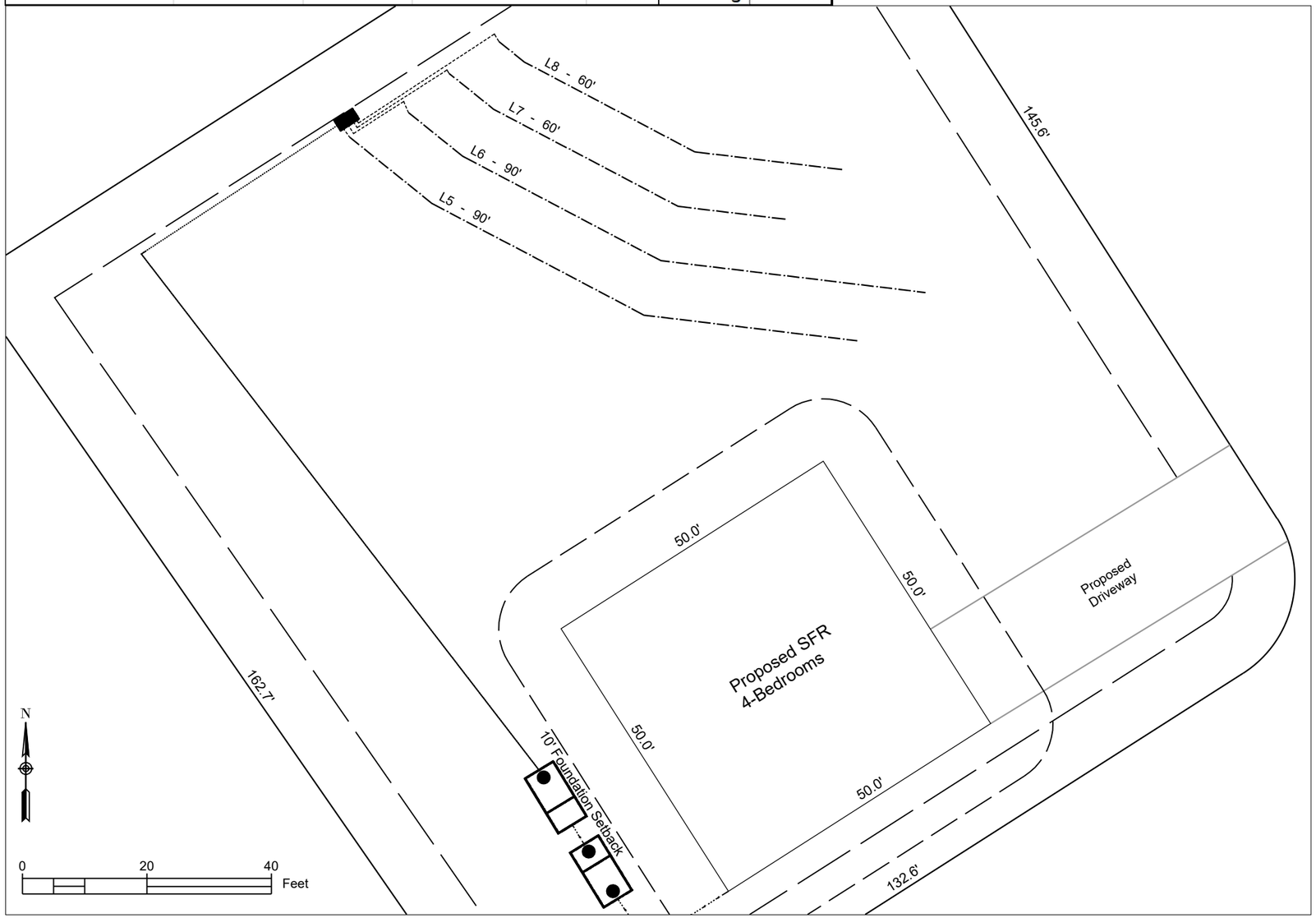
DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

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.

DRAINFIELD INFO. - **Repair**						
Proposed Type of System/Distribution:		***Pump to Pressure Manifold using EZflow***				
Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
5	blue	90	1/2in SCH 80	5.48	0.061	0.539
6	orange	90	1/2in SCH 80	5.48	0.061	0.539
7	yellow	60	1/2in SCH 40, Split	3.56	0.059	0.525
8	pink	60	1/2in SCH 40, Split	3.56	0.059	0.525
	Total	**300**	**Total**	**18.07**	**Avg.**	**0.532**



1 WW-4 Repair Drainfield

SOURCE: Agri-Waste Technology, Inc.

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

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

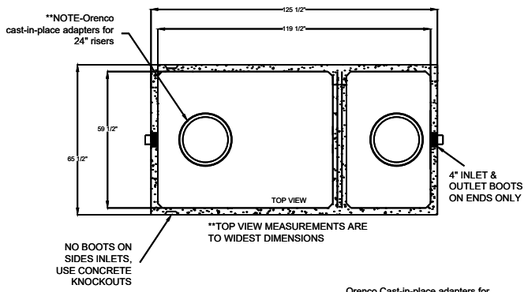
NC ONSITE WASTEWATER EVALUATOR
Certification Number
10003E

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Repair Drainfield

DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-4

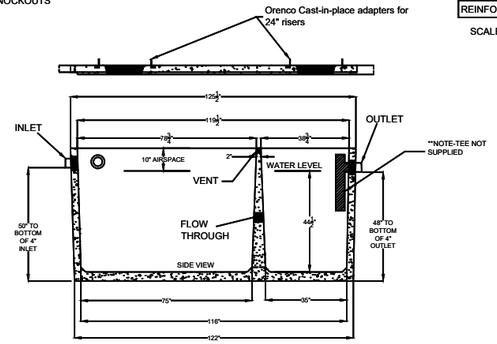


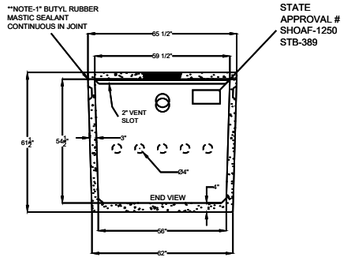
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826

MODEL: TS 1250 STB
NON TRAFFIC
1250 Gallon Septic Tank

WWW.SHOAFPRECAST.COM
SHOAF-1,250 SEPTIC TANK
STB-389
LIQUID CAPACITY-1,252 GALLONS/10" AIRSPACE
TANK HEIGHT-61 3/4"
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

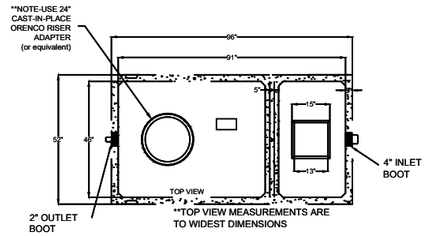
SCALE - N.T.S.





1 WW-5 **Septic Tank**

SOURCE: Shoaf Precast Septic, Inc.

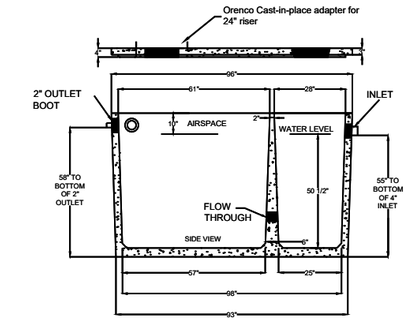


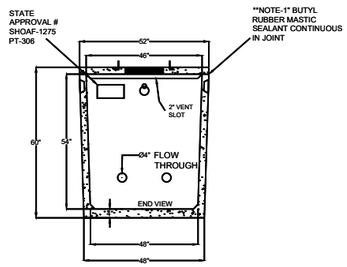
SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826

MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

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 3/4"
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

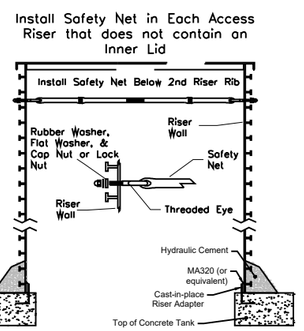
SCALE - N.T.S.





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 safety net and inner lid are 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 Safety Nets**

SOURCE: SIM-TECH, Inc.

NOTES

1. Installation to follow all NC DHHS and Harnett County applicable rules and regulations.
2. Harnett County 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. Spigot to be located on outside of building within 50' of tanks.
18. All pressure lines to maintain 18" min. cover.
19. Contractor to adjust tank placement to meet site constraints.

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

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

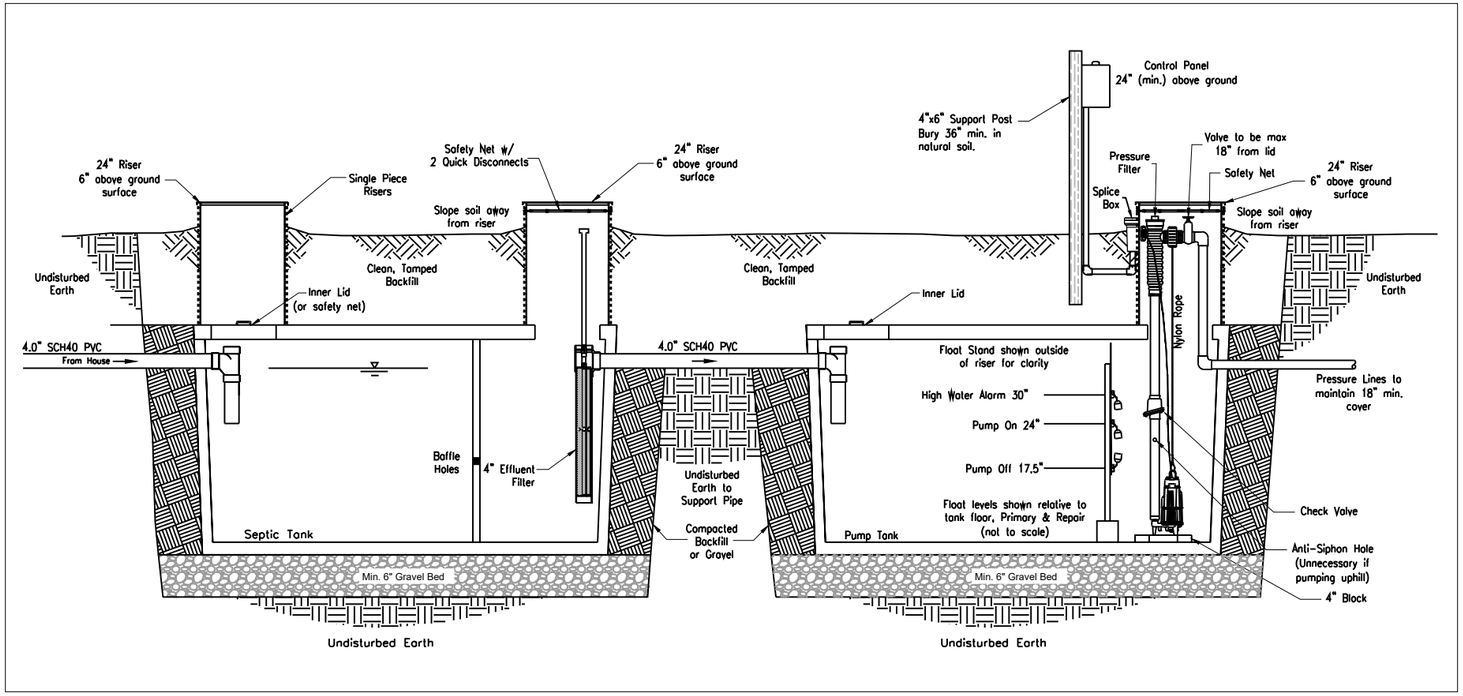
NC ONSITE WASTEWATER
Certification Number
10003E
EVALUATOR

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Detail Sheet 1

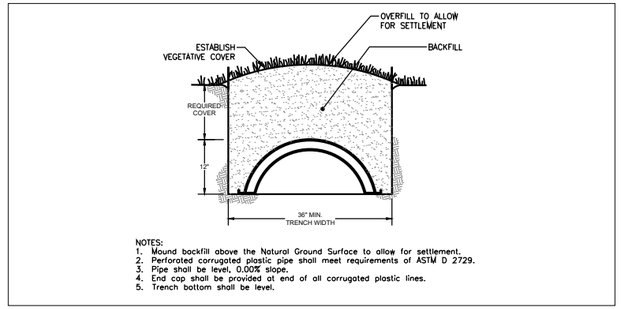
DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-5



1 SYSTEM PROFILE VIEW

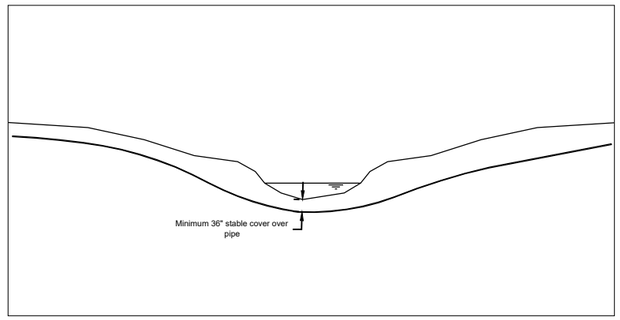
WW-6 N.T.S.



NOTES:
1. Mound backfill above the Natural Ground Surface to allow for settlement.
2. Perforated corrugated plastic pipe shall meet requirements of ASTM D 2729.
3. Pipe shall be level, 0.00% slope.
4. End cap shall be provided at end of all corrugated plastic lines.
5. Trench bottom shall be level.

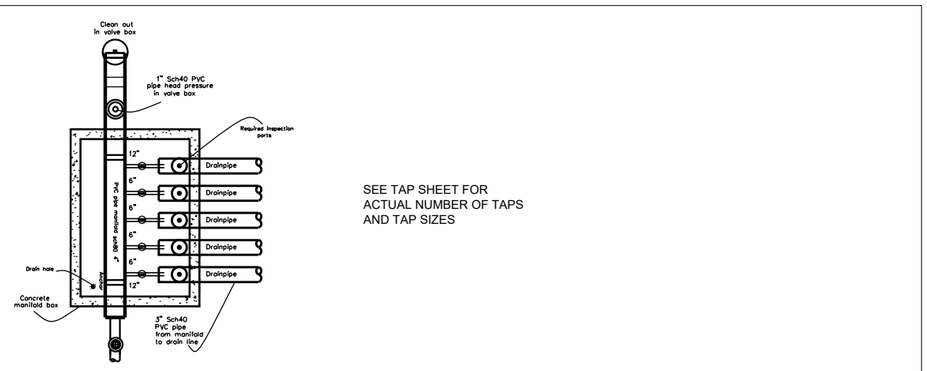
2 TRENCH X-SECTION (Typical)

WW-6 N.T.S. Source: AWT



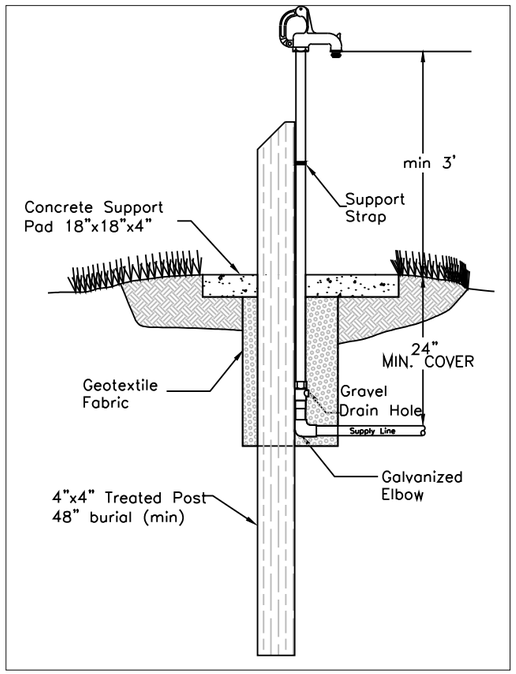
3 STREAM CROSSING MIN. DEPTH

WW-6 N.T.S. Source: AWT



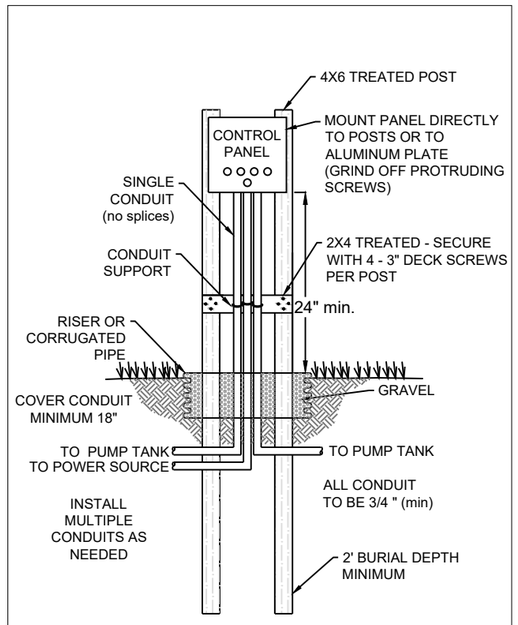
4 PRESSURE MANIFOLD INSTALLATION (Typical) - For Illustration Only

WW-6 N.T.S. SOURCE: AWT



5 YARD HYDRANT (if required)

WW-6 N.T.S. SOURCE: AWT



6 CONTROL PANEL SUPPORT

WW-6 N.T.S. SOURCE: AWT

AWT
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NC ONSITE WASTEWATER
Certification
Number
10003E
EVALUATOR

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Detail Sheet 2

DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-6

Trenching and Excavation Safety

The employer must comply with the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.

Inspection of Excavations

OSHA standards require that a competent person inspect trenches daily and as conditions change before worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Access and Egress

OSHA standards require safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet (1.22 meters) or deeper. These devices must be located within 25 feet (7.6 meters) of all workers.

Recommendations

Heavy equipment and trucks should stay as far as possible from the edge of any trench.
Always use pads under stabilizers to minimize ground pressures that could lead to failures.

(b) Definitions

"Cemented soil" means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

"Cohesive soil" means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

"Dry soil" means soil that does not exhibit visible signs of moisture content.

"Fissured" means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

"Granular soil" means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

"Layered system" means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

"Moist soil" means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

"Plastic" means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

"Saturated soil" means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.

"Soil classification system" means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

"Stable rock" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

"Submerged soil" means soil which is underwater or is free seeping.

"Type A" means cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A.

However, no soil is Type A if:

(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.

"Type B" means:

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
(v) Dry rock that is not stable; or
(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

"Type C" means:

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

"Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

"Wet soil" means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) Requirements

(1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.
(2) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.
(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.
(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.
(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) Acceptable visual and manual tests

(1) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

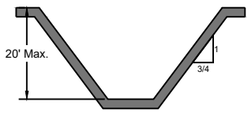
(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.
(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.
(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.
(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.
(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.
(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.
(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

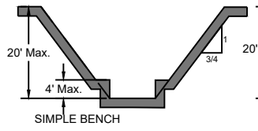
(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.
(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.
(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences.If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.
(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.
(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:
(A) If the sample develops cracks as it dries, significant fissures are indicated.
(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.
(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures.If they pulverize easily into very small fragments, the material is granular.

EXCAVATIONS IN TYPE A SOILS

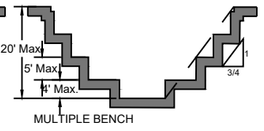
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1

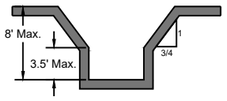


SIMPLE BENCH

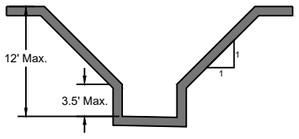


MULTIPLE BENCH

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1 and maxium bench dimensions as follows:

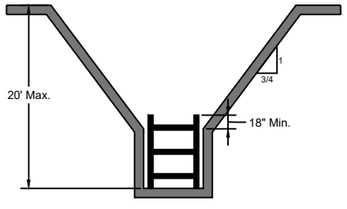


All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.

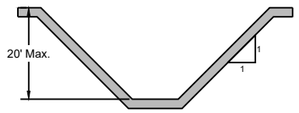
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

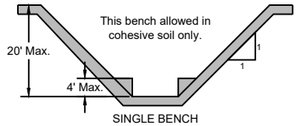
EXCAVATIONS IN TYPE B SOILS

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

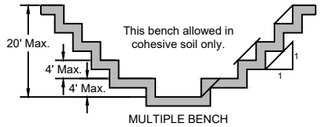


SIMPLE SLOPE

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maxium bench dimensions as follows:

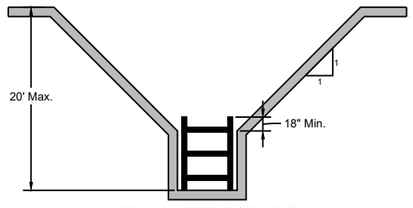


SINGLE BENCH



MULTIPLE BENCH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

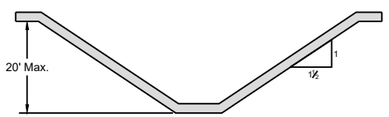


VERTICALLY SIDED LOWER PORTION

All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

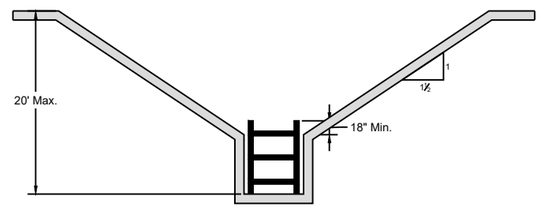
EXCAVATIONS IN TYPE C SOILS

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1½:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

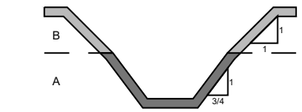


VERTICALLY SIDED LOWER PORTION

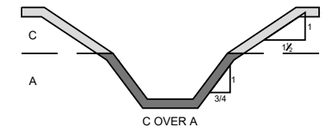
All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

EXCAVATIONS IN LAYERED SOILS

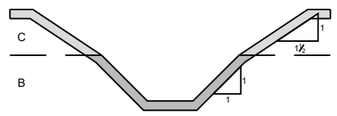
All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



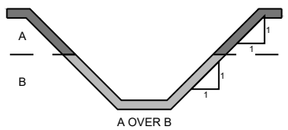
B OVER A



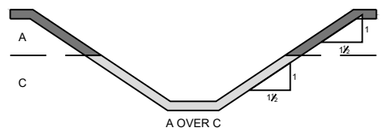
C OVER A



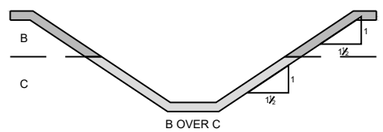
C OVER B



A OVER B



A OVER C



B OVER C

All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

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

Ballentine Associates, PA
Birchwood Trails - Lot 70

Project Location:
Olive Branch Rd
Fuquay Varina, NC 27526
Harnett County
PIN: ----

Project Owner:
Ballentine Associates, PA
221 Providence Rd
Chapel Hill, NC 27514
919-929-0481
dillons@ballentineassociates

NC ONSITE WASTEWATER EVALUATOR SEAL

NC ONSITE WASTEWATER EVALUATOR
Certification Number 10003E

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Excavation Safety

DRAWN BY: H. Clapp	CREATED ON: 6/8/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER

WW-7

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 70
Property: Olive Branch Road, Fuquay Varina, NC 27526
Subdiv.:
Lot #: 70
Date: 6/2/2023
County: Harnett
Permit #:

Project Manager:
Jeff Vaughan, PhD, LSS
jvaughan@agriwaste.com
919-859-0669

Engineer:
Heath Clapp
hclapp@agriwaste.com

Owner: Ballentine Associates, PA
Address: 221 Providence Road, Chapel Hill, NC 27514
Phone: 919-929-0481
Email: dillons@ballentineassociates.com
EHS:
Type of System: III b
PIN: 0

Soil Parameters

Soil Evaluation By:
-

Special Conditions/Notes:

LTAR: 0.400 gpd/ft^2

Design Parameters

Type of Establishment: Residence, 5 or fewer bedrooms
Unit: Bedroom
# of Units: 4

Septic Tank Specifications

Min. Tank Capacity: 1,000 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:	62.0	54.5	in.

Primary Drainfield Specifications

Type of Distribution: Parallel Pressure Manifold
Trench Media: EZflow
Trench Width: 3 ft
Trench Depth: 22 in.
(or as specified on permit)

Trench Bottom Area: 1200 ft^2
Minimum Drain Line: 300 ft
Actual Drain Line: 300 ft
Number of Lines: 4
Minimum Line Spacing: 9 ft O.C.

Wastewater Treatment System Design Calculations

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Septic Tank Sizing

Daily Flow Estimate:

Unit	# of Units	Flow/Unit	Flow/Day
Bedroom	4	120	480
			0
			0
		Q=	480 gpd

Septic Tank Minimum Capacity: Per NCAC T15A:18A .1952(b)(1):

For individual residences with 4 bedrooms,

Minimum Liquid Capacity (V)= 1,000 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:	62.0	54.5	in.
Shape of Risers:	Circular		
Diameter:	2.00	ft	

Pump Tank Storage & Float Settings

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
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)	15.7	in.	(Pump height = 11 11/16")
Pump Off	17.5	in.	
Pump On	24.0	in.	(set for dose volume)
Alarm On	30.0	in.	(6 in. above On Float)
Emergency Storage Available			
Pump Tank	643	gal	
Days of Storage	1.34	days	

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

Repair System

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

Top of pump (including 4" block)	15.7	in.	(Pump height = 11 11/16")
Pump Off	17.5	in.	
Pump On	24.0	in.	(set for dose volume)
Alarm On	30.0	in.	(6 in. above On Float)
Emergency Storage Available			
Pump Tank	643	gal	
Days of Storage	1.34	days	

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

ELEVATIONS

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Benchmark	0		
BM Elev	0	ft	
Septic Tank	1,250	gal	
Ground Surface			291.00 ft
Depth of Soil Cover	16	in.	1.33 ft
Overall Ht of Tank	61.5	in.	5.13 ft
Elev, Base of Tank			284.54 ft
Ht to 4" Inlet Invert	50	in.	4.17 ft
Elev, 4" Inlet Invert			288.71 ft
Ht to 4" Outlet Invert	48	in.	4.00 ft
Elev, 4" Outlet Invert			288.54 ft
Gravel Base	6	in.	0.50 ft
Elev, Bot of Excavation			284.04 ft
Pump Tank	1275	gal	
Ground Surface			291.00 ft
Depth of Soil Cover	18	in.	1.50 ft
Overall Ht of Tank	67.5	in.	5.63 ft
Elev, Base of Tank			283.88 ft
Ht to 4" Inlet Invert	54.5	in.	4.54 ft
Elev, 4" Inlet Invert			288.42 ft
Ht to 2" Outlet Invert	58	in.	4.83 ft
Elev, 2" Outlet Invert			288.71 ft
Gravel Base	6	in.	0.50 ft
Elev, Bot of Excavation			283.38 ft
ST Inlet Pipe			
Grade @ Stub-out			291 ft
Depth of Stub-out, top			1.5 ft
Elev, Stub-out Invert			289.15 ft
Elev @ ST Inlet Invert			288.71 ft
Length			10 ft
Slope			4.4 %
Pipe, ST to PT			
ID	4	in.	0.33 ft
OD	4.5	in.	0.38 ft
Elev, ST Outlet Invert			288.54 ft
Elev, PT Inlet Invert			288.42 ft
Length			4 ft
Slope			3.1 %
Cover over inlet pipe			1.94 ft
Pump Reqmt.			
Floor Thickness	4	in.	0.33 ft
Elev, Pump Tank Floor			284.21 ft
Pump Block Ht.	4	in.	0.33 ft
Elev, Pump Intake			284.54 ft
Grade @ Primary Manifold			292.00 ft
Grade @ Repair Manifold			293.00 ft
Min. Cover	18	in.	1.50 ft
Max Elev, Repair			291.50 ft
Elev Diff, Repair			6.96 ft

Drainfield Design

Project	Birchwood Trails, Lot 70
Location	Olive Branch Road, Fuquay Varina, NC 27526
County	Harnett

Drainfield Sizing

Primary

LTAR	0.4 gpd/ft^2		
Daily Design Flow	480 gpd	**Type of Drainfield Media**	EZflow
Req. Drainfield Area	1,200 ft^2	**Required Drainline**	
Trench Width, Eff.	3 ft	**After 25% Reduction**	300 ft
Required Drainline	400 ft	**Minimum Line Spacing**	9 ft (O.C.)

Repair

LTAR	0.4 gpd/ft^2		
Daily Design Flow	480 gpd	**Type of Drainfield Media**	EZflow
Req. Drainfield Area	1,200 ft^2	**Required Drainline**	
Trench Width, Eff.	3 ft	**After 25% Reduction**	300 ft
Required Drainline	400 ft	**Minimum Line Spacing**	9 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	blue		75	75.0	
2	Layout Line	yellow		75	75.0	
3	Layout Line	pink		75	75.0	
4	Layout Line	red		75	75.0	
5	Layout Line	blue		90		90.0
6	Layout Line	orange		90		90.0
7	Layout Line	yellow		60		60.0
8	Layout Line	pink		60		60.0
9	Layout Line					
10	Layout Line					
11	Layout Line					
12	Layout Line					
13	Layout Line					
14	Layout Line					
			Total	600	300	300
			Count	8	4	4

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

PRESSURE MANIFOLD DESIGN (Primary)

Site Information

Project: Birchwood Trails, Lot 70
Location: Oliva Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Design Information

Estimated Daily Flow	480	gal/day
L.T.A.R.	0.4	gal/day/ft^2
L.T.A.R. + 5%	0.420	gal/day/ft^2
Trench Width	3	ft.
Line Length Required	400	ft.
Length after 25% Reduction	300	ft
L.T.A.R. Reduced	0.533	gal/day/ft^2
L.T.A.R. Reduced + 5%	0.560	gal/day/ft^2

DRAINFIELD INFO. - **Primary**

Proposed Type of System/Distribution: ***Pump to Pressure Manifold using EZflow***

Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	blue	75	1/2in SCH 80	5.48	0.073	0.533
2	yellow	75	1/2in SCH 80	5.48	0.073	0.533
3	pink	75	1/2in SCH 80	5.48	0.073	0.533
4	red	75	1/2in SCH 80	5.48	0.073	0.533
	Total	**300**	**Total**	**21.92**	**Avg.**	**0.533**

Note: Line lengths are calculated in 5' increments to reflect use of EZflow product.

Total Run Time	21.90	min.	
Drainfield Capacity	195.9	gal	
% of Drainfield Cap	69.9%		(Req. Range 66-75%)
Dose Volume	136.9	gal/dose	
Run Time/Dose	**6.2**	**minutes**	Range 5-7 minutes unless uphill, checked
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	6.50	in.	

Manifold Box

Number of Taps: 4 with 0 Split(s)
Manifold Length: 3.5 ft. (approximate)

PRESSURE MANIFOLD SYSTEM DESIGN (Repair)

Site Information

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Design Information

Estimated Daily Flow	480	gal/day
L.T.A.R.	0.4	gal/day/ft^2
L.T.A.R. + 5%	0.420	gal/day/ft^2
Trench Width	3	ft.
Line Length Required	400	ft.
Length after 25% Reduction	300	ft
L.T.A.R. Reduced	0.533	gal/day/ft^2
L.T.A.R. Reduced + 5%	0.560	gal/day/ft^2

DRAINFIELD INFO. - **Repair**

Proposed Type of System/Distribution: ***Pump to Pressure Manifold using EZflow***

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
5	blue	90	1/2in SCH 80	5.48	0.061	0.539
6	orange	90	1/2in SCH 80	5.48	0.061	0.539
7	yellow	60	1/2in SCH 40, Split	3.56	0.059	0.525
8	pink	60	1/2in SCH 40, Split	3.56	0.059	0.525
	Total	**300**	**Total**	**18.07**	**Avg.**	**0.532**

Note: Line lengths are calculated in 5' increments to reflect use of EZflow product.

Total Run Time	26.56	min.	
Drainfield Capacity	195.9	gal	
% of Drainfield Cap	69.9%		(Req. Range 66-75%)
Dose Volume	136.9	gal/dose	
Run Time/Dose	**7.6**	**minutes**	Range 5-7 minutes unless uphill, checked
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	6.50	in.	

Manifold Box

Number of Taps: 2 with 2 Split(s)
Manifold Length: 2.5 ft. (approximate)

PUMP DESIGN

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

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Friction Losses

Suction Head	0	ft	*(submersible 0)*
Elev. Difference (highest point from pump)	5.96	ft	
Design Pressure At Outlet	2	ft	

Supply Line - 1.5" Schedule 40 PVC

Pipe Diameter, Nominal	1.5	in.			
Pipe Diameter (ID)	1.59	in.	Flow	21.92	gpm
Pipe Length	105	ft	Velocity	3.54	ft/sec
Pipe Length for Fittings	10.5	ft	Meets requirement that 2 ft/s < v < 5 ft/s.		
Equivalent Length	115.5	ft			
Estimated Friction Loss in Supply Line			3.61	ft	
Friction Loss - Taps/Special Fittings			3.5	ft	
TOTAL			**15.07**	**ft.**	

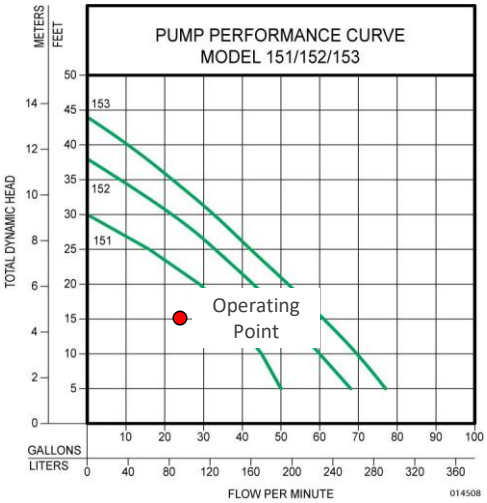
Flow for Anti-Siphon Hole

Hole Diameter	3/16	in.
Hole Flowrate	1.61	gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**23.53**	**gpm**
Required Horsepower	0.14	hp
TDH	**15.07**	**ft**

Pump Selection

Manufacturer:	Zoeller
Model:	N151
Horsepower:	**0.33**



PUMP DESIGN

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

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Friction Losses

Suction Head	0	ft	*(submersible 0)*
Elev. Difference (highest point from pump)	6.96	ft	
Design Pressure At Outlet	2	ft	

Supply Line - 1.5" Schedule 40 PVC

Pipe Diameter, Nominal	1.5	in.			
Pipe Diameter (ID)	1.59	in.	Flow	18.07	gpm
Pipe Length	200	ft	Velocity	2.92	ft/s
Pipe Length for Fittings	20	ft		Meets requirement that 2 ft/s < v < 5 ft/s.	
Equivalent Length	220	ft			
Estimated Friction Loss in Supply Line			4.81	ft	
Friction Loss - Taps/Special Fittings			3.5	ft	
TOTAL			**17.26**	**ft.**	

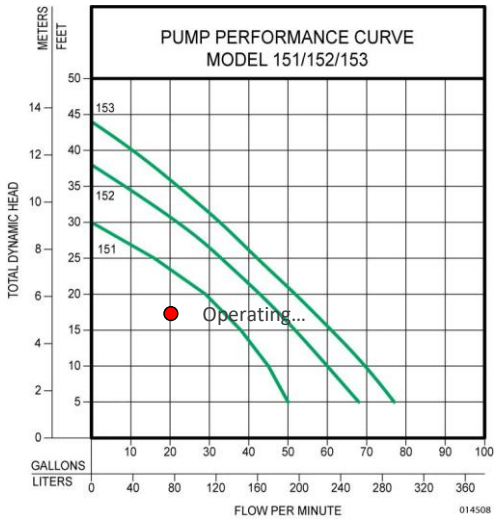
Flow for Anti-Siphon Hole

Hole Diameter	3/16	in.
Hole Flowrate	1.72	gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**19.79**	**gpm**
Required Horsepower	0.14	hp
TDH	**17.26**	**ft.**

Pump Selection

Manufacturer:	Zoeller
Model:	N151
Horsepower:	**0.33**



Septic Tank Buoyancy Calculation

Project: Birchwood Trails, Lot 70
Location: Olive Branch Road,
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	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	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	283.5	ft^3 *
Buoyancy Force	**17,689**	**lb.**

Weight Calculation:

Tank Weight	11000	lb		
Water Weight in Tank	0	lb	Volume	0.0 ft^3 *
Soil Weight Over Tank	4966	lb		
Soil Friction Force	4037	lb		
Total Weight	**20,004**	**lb**		

Factor of Safety = 1.13

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 70
Location: Olive Branch Road,
Fuquay Varina, NC 27526
County: Harnett

Tank Size (nominal) 1275 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	6	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	234.1	ft^3 *
Buoyancy Force	**14,606**	**lb**

Weight Calculation:

Tank Weight	10500	lb		
Water Weight in Tank	0	lb	Volume	0.0 ft^3 *
Soil Weight Over Tank	4281	lb		
Soil Friction Force	4227	lb		
Total Weight	**19,008**	**lb**		

Factor of Safety = 1.30

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.*

AGRITEC-01 GKROHL

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 1/23/2023

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

CONTACT NAME: Connie Garkalns
PHONE (A/C, No, Ext): (919) 556-3698 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 the Southeast	39926
INSURER B : ACCIDENT FUND INSURANCE COMPANY OF AMERICA	10166
INSURER C : Evanston Insurance Company	
INSURER D :	
INSURER E :	
INSURER F :	

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

COVERAGES **CERTIFICATE NUMBER:** **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			S 2253659	1/18/2023	1/18/2024	EACH OCCURRENCE	$ 2,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 300,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 4,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 4,000,000
	OTHER:							$
A	AUTOMOBILE LIABILITY			S 2253659	1/18/2023	1/18/2024	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR			S 2253659	1/18/2023	1/18/2024	EACH OCCURRENCE	$ 2,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 2,000,000
	DED RETENTION $							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	N / A		100003072	1/18/2023	1/18/2024	X PER STATUTE OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N: N						E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
C	Prof & Pollution			MKLV3ENV103400	8/22/2022	8/22/2023	Each Claim	5,000,000
A	Leased / Rented			S 2253659	1/18/2023	1/18/2024	Equipment	25,000

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

CERTIFICATE HOLDER

***This is ONLY For Informational Purposes
Contact Agency for Specific Holder info to be added
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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
Gina Krohl