BLDR-2024-45272

ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3625

PERMIT # OSWP-2023-33651

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

PIN # 4724-33-6970

PPLICANT / OWNER: Boundary Development | APPLICANT ADDRESS: 630 Signal Hill Drive Ext., Statesville, NC 28625

TE ADDRESS: 1002 WESTMINSTER DR, STATESVILLE, NC 28677 | PHONE: 7043632845 | ALT. PHONE:

TE DIRECTIONS: | SAP CONTROLLED: YES ☐ NO ☑

UBDIVISION: Robinson Forest | SECTION: | LOT #: 5 | LOT AREA: 0.57 | DESIGN FLOW: 480 | L.T.A.R.: 0.3

eptic Tank: 1000 (gal)	STB: 2 3 4	Date:	☐ New System ☐ Repair ☐ Expansion	System Type: III	☑ Residence	No. Bedrooms: 4	Water Supply: New Well
ump Tank: (gal)	PT:	Date:	System Description: Gravity Chambers		☐ Business	No. Persons: 4	
ump Make:	Model:	Serial #:	Repair System Description: PM PPBPS		☐ Other	No. Employees:	
Nitrification Fields: 1	# Lines: 5	Linear Ft.: 400	Maintenance Agreement Required: ☐ YES ☑ NO		☑ Slab	☐ Crawl Space	
rench Width: 36	Trench Bottom Depth (Low side): 20		Gravel Depth:	☑ GRAVITY ☐ PRESSURE	☐ Basement w/ Plumbing	☐ Basement w/o Plumbing	

omments / Conditions: This Improvement Permit is issued pursuant to G.S. 130A-335 (a2) and (a3) using the signed and sealed LSS/LG evaluation(s) ttached here. This Construction Authorization is issued pursuant to G.S. 130A-335(a2) and (a5) using the signed and sealed plans or evaluations attached here.

INITIAL SITE SKETCH

AS BUILT SKETCH

See as built on next page

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

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

wner / Applicant Signature: | Date:

IPROVEMENT PERMIT by: Benjamin A Botkins | Date: 9/8/2023

UTHORIZATION TO CONSTRUCT by: Benjamin A Botkins | Date: 9/8/2023

Installed By: Russell Williams

OPERATION PERMIT by: | Date: 3/27/24

Existing System Inspected By: | Date:

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

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
8. 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.

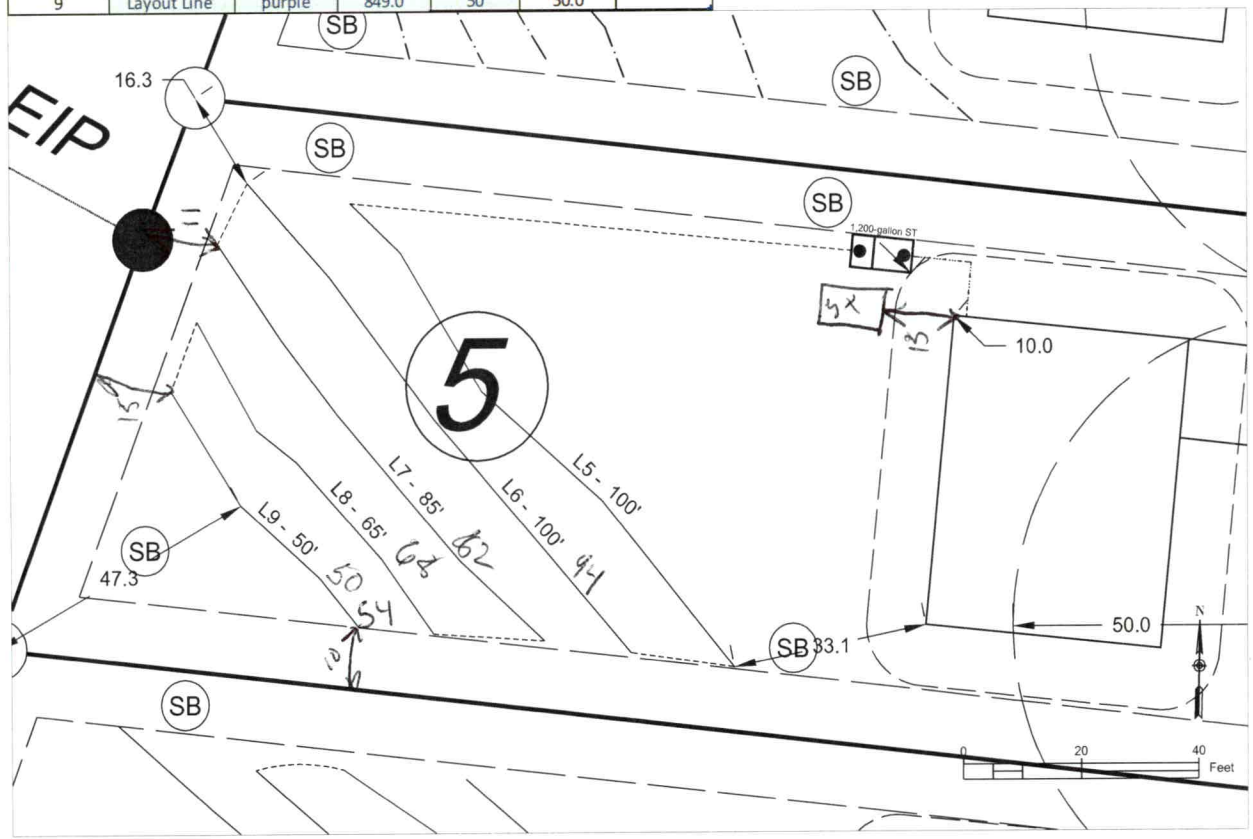
Installation Notes:

Contractor to adjust tank placements as necessary to maintain:

1. 25' downslope/15' sideslope/10' upslope setback from foundation drain
2. Min. 12" cover over Septic Tank (Not to exceed 36")
3. Min. 18" cover over pipes
4. Min. 2% grade on gravity pipe from house to Septic Tank

Line	U	Flag Colo	Elevation (ft)	Line Length (	Used as Primary (	Used as Repair (f
1	Layout Line	yellow	856.0	50		35.0
2	Layout Line	pink	855.0	65		65.0
3	Layout Line	white	854.5	90		82.0
4	Layout Line	purple	854.0	100		87.0
5	Layout Line	yellow	853.5	100	100.0	
6	Layout Line	pink	852.0	100	100.0	
7	Layout Line	red	852.5	90	85.0	
8	Layout Line	yellow	850.0	70	65.0	
9	Layout Line	purple	849.0	50	50.0	

Note:
Primary system is chambers w/ serial distribution.



System Layout

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

Ted Benbow
Robinson Woods - Lot 5

Project Location:
Westminster Dr
Statesville, NC 28677
Iredell County
PIN: 4724-33-6970

Project Owner:
Ted Benbow
630 Signal Hill Dr
Statesville, NC 28625
704-878-9661
tedb@boundarydevelopment.com

For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
System Layout

DRAWN BY:	CREATED ON:
T. Bostic	11/8/2022
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-3

Permit #: OSWP-2023-33651

This Section for Local Health Department Use Only

Initial submittal received: 8/28/2023 (Date) by BB (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: Benjamin A Botkins Date of Issuance: 9/8/2023

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: 9/8/2028

See attached site sketch

Permit #: OSWP-2023-33651

This Section for Local Health Department Use Only

Initial submittal received: 8/28/2023 (*Date*) by BB (*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: Benjamin A Botkins Date: 9/8/2023

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 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 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 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 evaluations, submittals, or actions from a licensed soil scientist or licensed geologist pursuant to GS 130A-335(a2).

Improvement Permit Expiration Date: 9/8/2028

See attached site sketch

Benjamin Botkins
Westminster submittals
Aug 30, 2023 at 8:24:23 AM
Garrison Davis

Garrison can you sign the below statement and return to me so I can place with the files, this statement is now required for all submittals.

I understand that the documentation and fees, as required in G.S. 130A-335(a2), (a3), (a5), and (ae), attached to this application are to be used to issue an Improvement Permit and/or Construction Authorization pursuant to G.S. 130A-335(a2),(a3), and (a5). I understand that authorized county and state officials are granted right of entry to the property indicated on this application to conduct necessary inspections to determine compliance with applicable laws and rules. I understand that if the information in the application for an Improvements Permit and/or Construction Authorization is falsified, changed, or the site is altered, then the Improvement Permit and Construction Authorization shall become invalid.

Applicant Signature: [signature] Date: 8/30/23

Owner's Signature: GARRISON DAVIS Date: 8/30/23

County: Iredell

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

PIN/Lot Identifier: 4724-33-6970

Issued To: Ted Benbow

Property Location: Westminster Dr, Statesville, NC 28677

Subdivision: Robinson Woods Lot #: 5 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: Single Family Residence

Proposed Wastewater System Type: Gravity, Chambers (Initial) Pressure Manifold, T&J Panel (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): 0.3 Proposed LTAR (Repair): 0.3

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: Jeff V Date: 11/10/2022

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

See attached site sketch

County: Iredell

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

PIN/Lot Identifier: 4724-33-6970

Issued To: Ted Benbow

Property Location: Westminster Dr, Statesville, NC 28677

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

Facility Type: Single Family Residence

☑ New ☐ Expansion ☐ Repair System Relocation ☐

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

Type of Wastewater System** Gravity, Chambers (Initial) Pressure Manifold, T&J Panel (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: 1,200 gallons Total Trench/Bed Length: 400 feet Trench/Bed Spacing: 9 feet on center

Drainfield square footage: 1,200 Trench/Bed Width: 36 inches LTAR: 0.3 gpd/ft²

Soil Cover: 6 inches Slope Adjusted Maximum Trench/Bed Depth: 20 inches

Aggregate Depth: _____inches above pipe _____inches below pipe 12 inches total

Pump Tank Size (if applicable): _____ 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: Jeff Vaughan Date: 11/10/2022

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

See attached site sketch

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

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
Westminster Dr, Statesville, NC 28677
(Iredell County PIN: 4724-33-6970)
November 10, 2022

Soil suitability for domestic sewage treatment and disposal systems was evaluated on October 13, 2022, for the property located at Westminster Drive in Statesville, NC. Jeff Vaughan, Trevor Hackney, Nathan Estevez, 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 boring locations is included in Attachment 1. Profile descriptions for each soil boring are included in Attachment 2.

The total property area is approximately 0.57 acres. The house and septic area have been cleared. The proposed septic system for the property is a gravity dosed Chamber system for initial and a pressure manifold T&J Panel for repair.

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
The drawing in Attachment 1 details the property boundaries, soil boring locations, and layout of drain field trenches. Four 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. These borings were advanced with hand auger borings. All soil borings were provisionally suitable for a conventional style trench. Soil borings are within the proposed drainfield area.

The layout shown in Attachment 1 indicates there is available space for a four-bedroom conventional system. The initial system can be installed with the use of the accepted (25% reduction) trench product based on the drainfield layout in the field.

The proposed LTAR (Long Term Acceptance Rate) by AWT is 0.3GPD/ft^2. The soils on this property are group IV soils within the distribution and treatment zone as used to define the LTAR. With an LTAR of 0.3GPD/ft^2, 400 linear feet of trench is necessary to

support a 4-bedroom home for the initial system with the use of the innovative (25% reduction) trench product. The maximum slope corrected trench depth is 20 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, Iredell 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

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

PROPERTY ID #: 4724-33-6970
COUNTY: Iredell

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

CLIENT: Ted Benbow APPLICATION DATE 11/10/2022
ADDRESS: 630 Signal Hill Dr, Statesville, NC 28625 DATES EVALUATED: 10/13/2022
PROPOSED FACILITY: Single Family Residence PROPOSED DESIGN FLOW (.1949): 480GPD PROPERTY SIZE: 0.57 ac
LOCATION OF SITE: Westminster Dr, Statesville, NC PROPERTY RECORDED: Yes
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	8-10%	A 0-6"	L; Gr	NS; NP; VFr	2.5YR 4/4	36" +			Provisionally Suitable 0.3GPD/ft2
		Btl 6-13"	CL; Gr	NC; NP;Vfr	2.5YR 3/6				
		Btl 13-36+"	C; SBK	SS; SP; Fi	2.5YR 4/7				

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	Provisionally Suitable	Provisionally Suitable
System Type(s)	T&J Panel	T&J Panel
Site LTAR	0.3GPD/Ft^2	0.3GPD/Ft^2

OTHER FACTORS (.1946):
SITE CLASSIFICATION (.1948): Provisionally Suitable
EVALUATED BY: Jeff Vaughan, Trevor Hackney, Nathan Estevez
Trent Bostic

COMMENTS

LEGEND

use the following standard abbreviations

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



AGRITEC-01 CGARKALNS

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 9/19/2022

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 — 39926
INSURED Agri-Waste Technology Inc 501 N. Salem St Ste 203 Apex, NC 27502	INSURER B : Accident Fund National Insurance Company — 12305
	INSURER C : Evanston Insurance Company
	INSURER D :
	INSURER E :
	INSURER F :

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						EACH OCCURRENCE	$ 2,000,000
	CLAIMS-MADE X OCCUR			S 2253659	1/18/2022	1/18/2023	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						COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO			S 2253659	1/18/2022	1/18/2023	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						EACH OCCURRENCE	$ 2,000,000
	EXCESS LIAB CLAIMS-MADE			S 2253659	1/18/2022	1/18/2023	AGGREGATE	$ 2,000,000
	DED RETENTION $							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						X PER STATUTE OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N	N / A		100003072	1/18/2022	1/18/2023	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	1/18/2022	1/18/2023	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
****

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

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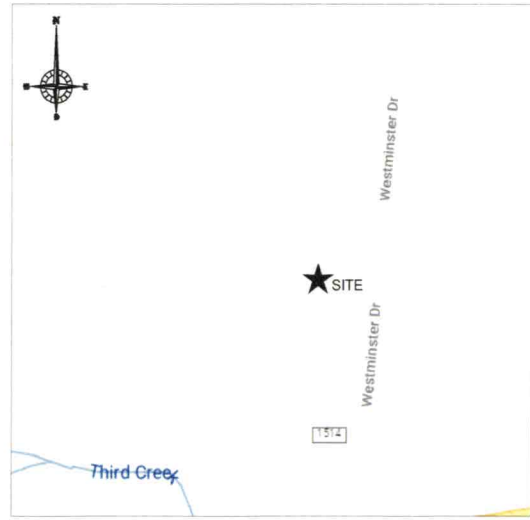
ROBINSON WOODS - LOT 5

Project Location
Westminster Dr
Statesville, NC 28677
Iredell County
PIN: 4724-33-6970

Project Owner
Ted Benbow
630 Signal Hill Dr
Statesville, NC 28625
704-878-9661
tedb@boundarydevelopment.com

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
Chambers Dispersal System w/
Serial Distribution



VICINITY MAP

Sheet Index

Sheet 1	Cover Sheet
Sheet 2	Property Layout
Sheet 3	Primary Layout
Sheet 4	Repair Layout
Sheet 5	Detail Sheet
Sheet 6	Detail Sheet
Sheet 7	Excavation Safety

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Robinson Woods - Lot 5

Project Location:
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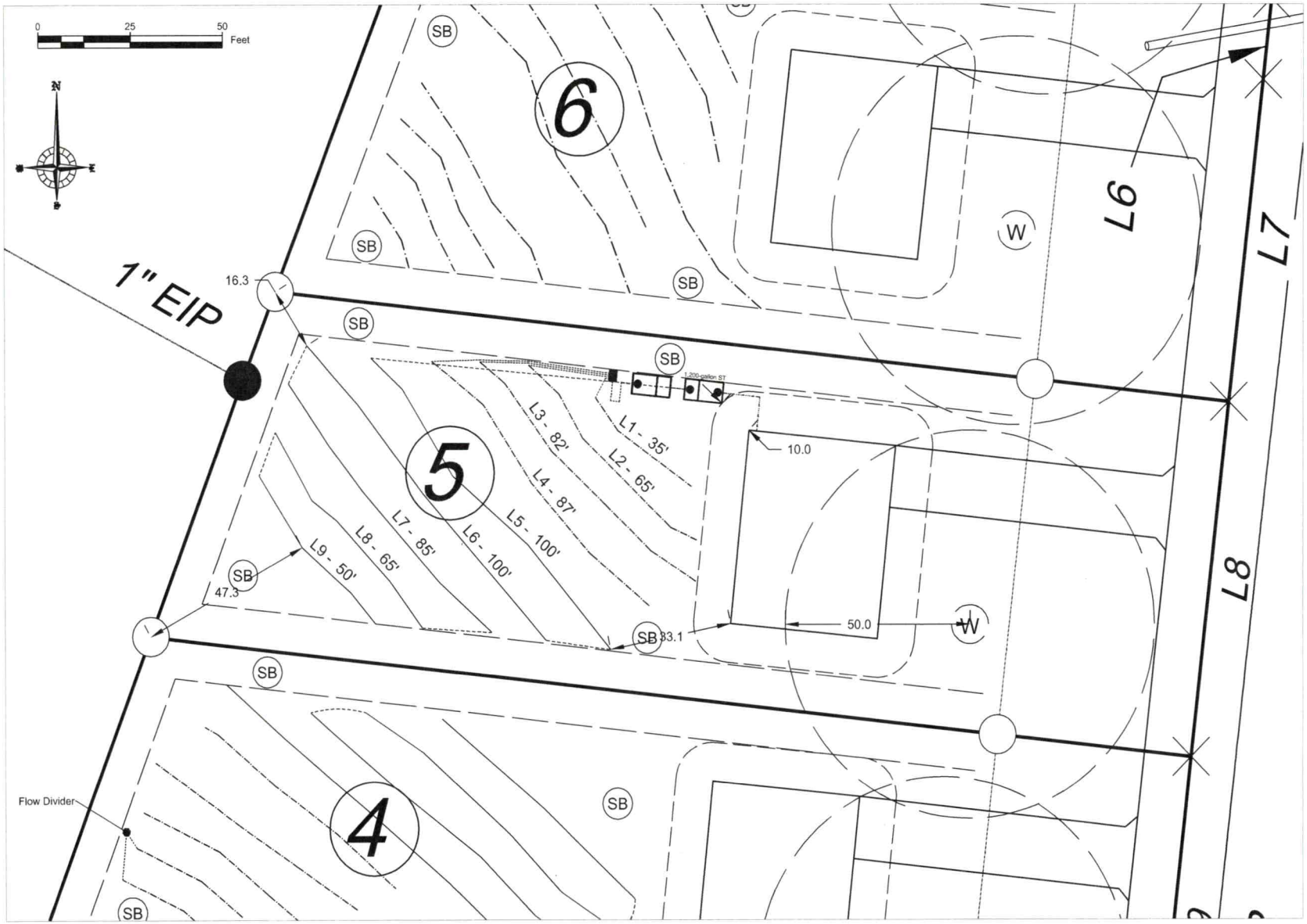
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REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

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T. Bostic	11/8/2022
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DRAWING NUMBER
WW-1



1 PROPERTY LAYOUT
WW-2 N.T.S. SOURCE: AWT, Inc.

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Ted Benbow
Robinson Woods - Lot 5

Project Location:
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Statesville, NC 28677
Iredell County
PIN 4724-33-6970

Project Owner:
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704-875-9661
tedb@boundarydevelopment.com

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REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Property Layout

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T. Bostic	11/8/2022
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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
8. 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.

Installation Notes:

Contractor to adjust tank placements as necessary to maintain:

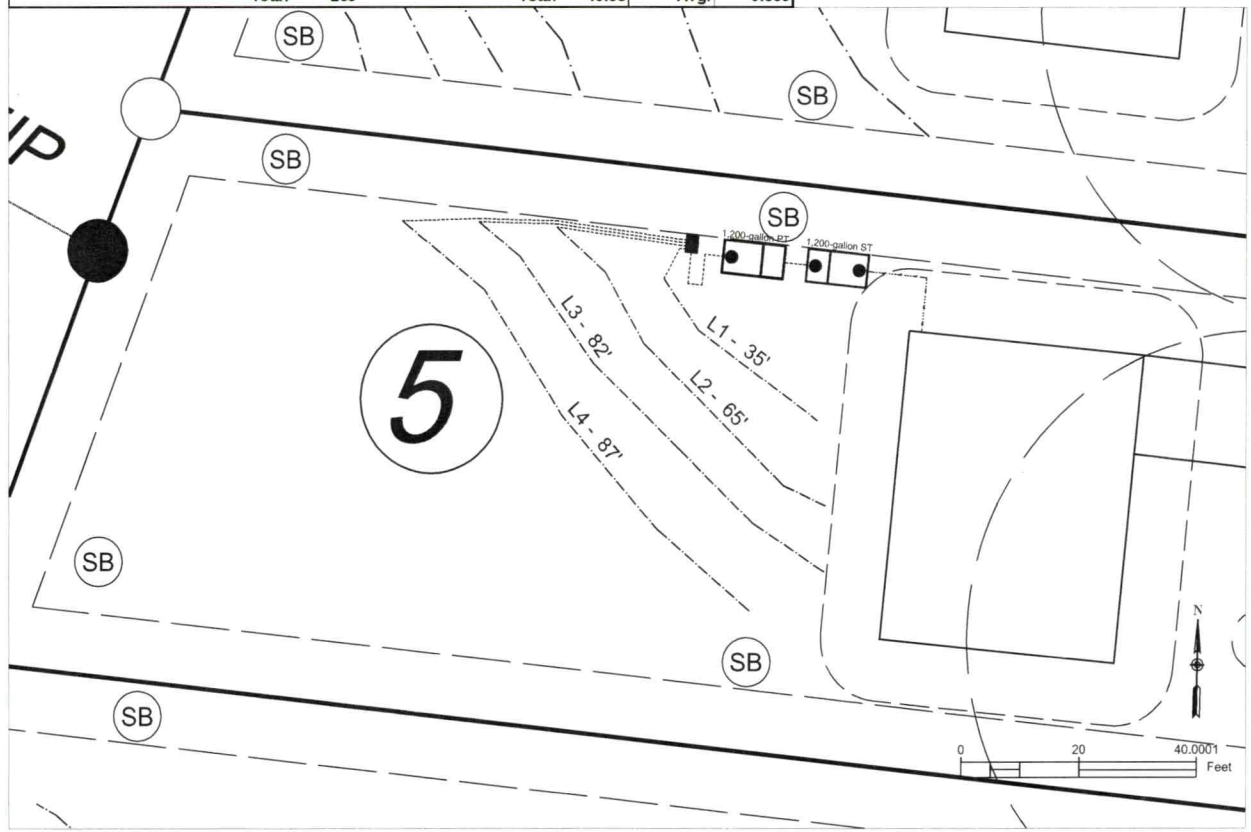
1. 25' downslope/15' sideslope/10' upslope setback from foundation drain
2. Min. 12" cover over Septic Tank (Not to exceed 36")
3. Min. 18" cover over pipes
4. Min. 2% grade on gravity pipe from house to Septic Tank

Note:
Repair distribution is a pressure manifold.

DRAINFIELD INFO. - **Repair**

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

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	yellow	35	1/2in SCH 80	5.48	0.157	0.617
2	pink	65	3/4in SCH 80	10.10	0.155	0.613
3	white	82	3/4in SCH 40	12.50	0.152	0.601
4	purple	87	3/4in SCH 40	12.50	0.144	0.566
	Total	**269**	**Total**	**40.58**	**Avg.**	**0.599**



1 WW-4 System Layout

SOURCE: Agri-Waste Technology, Inc.

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Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
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919-859-0669
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Ted Benbow
Robinson Woods - Lot 5

Project Location:
Westminster Dr
Statesville, NC 28677
Iredell County
PIN: 4724-33-6570

Project Owner:
Ted Benbow
630 Signal Hill Dr
Statesville, NC 28625
704-878-9661
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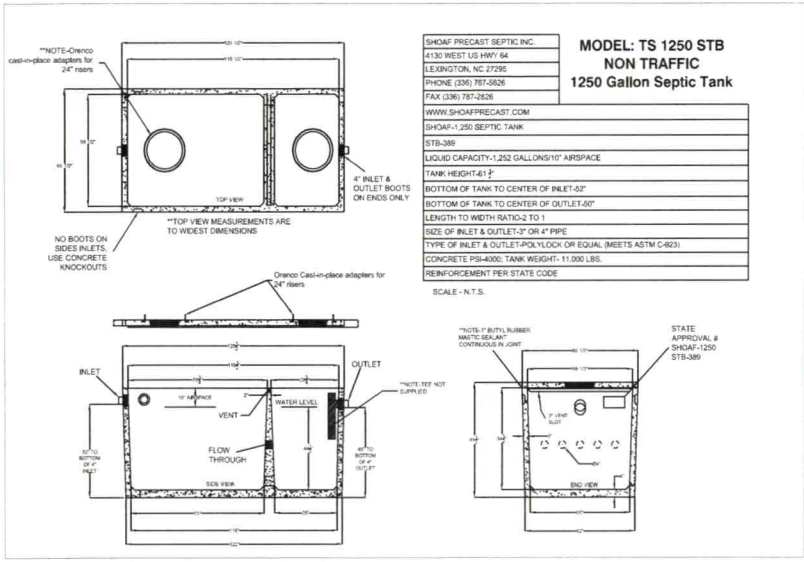
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SHEET TITLE
System Layout

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T. Bostic	11/8/2022
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DRAWING NUMBER
WW-4



SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2626
WWW.SHOAFPRECAST.COM

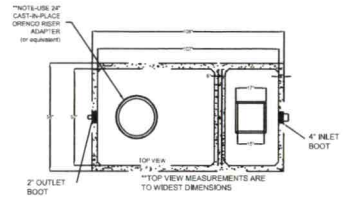
MODEL: TS 1250 STB
NON TRAFFIC
1250 Gallon Septic Tank

SHOAF-1,250 SEPTIC TANK
STB-389
LIQUID CAPACITY-1,252 GALLONS/10" AIRSPACE
TANK HEIGHT-61"
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 (or equivalent)**

SOURCE: Shoaf Precast Septic, Inc.

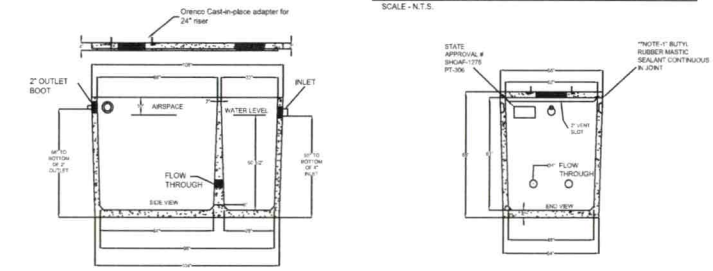


SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2626
WWW.SHOAFPRECAST.COM

MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

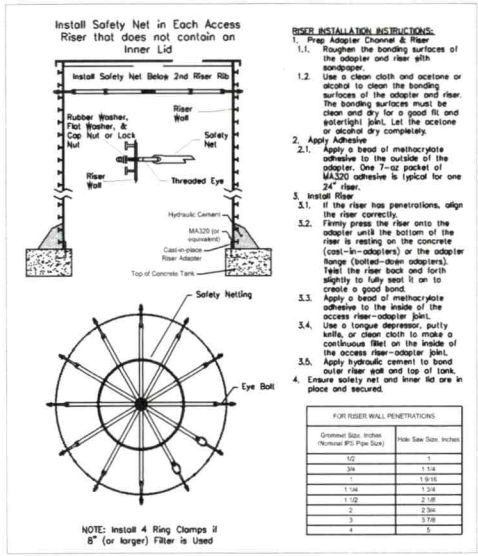
SHOAF-1,275 PUMP TANK
PT-306 NON TRAFFIC
LIQUID CAPACITY-1,287 GALLONS INCLUDING 10" AIRSPACE
GALLONS PER INCH-21.07 (AVERAGE)
TANK HEIGHT-61"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-59"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-3" OR 4" PIPE
TYPE OF INLET & 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 gap 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 Iredell County applicable rules and regulations.
2. Iredell 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.

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Apex, North Carolina 27502
919-859-0669
www.agriwaste.com

Ted Benbow
Robinson Woods - Lot 5

Project Location:
Westminster Dr
Statesville, NC 28677
Iredell County
PIN: 4724-33-6970

Project Owner:
Ted Benbow
630 Signal Hill Dr
Statesville, NC 28625
704-878-9661
tedb@boundarydevelopment.com

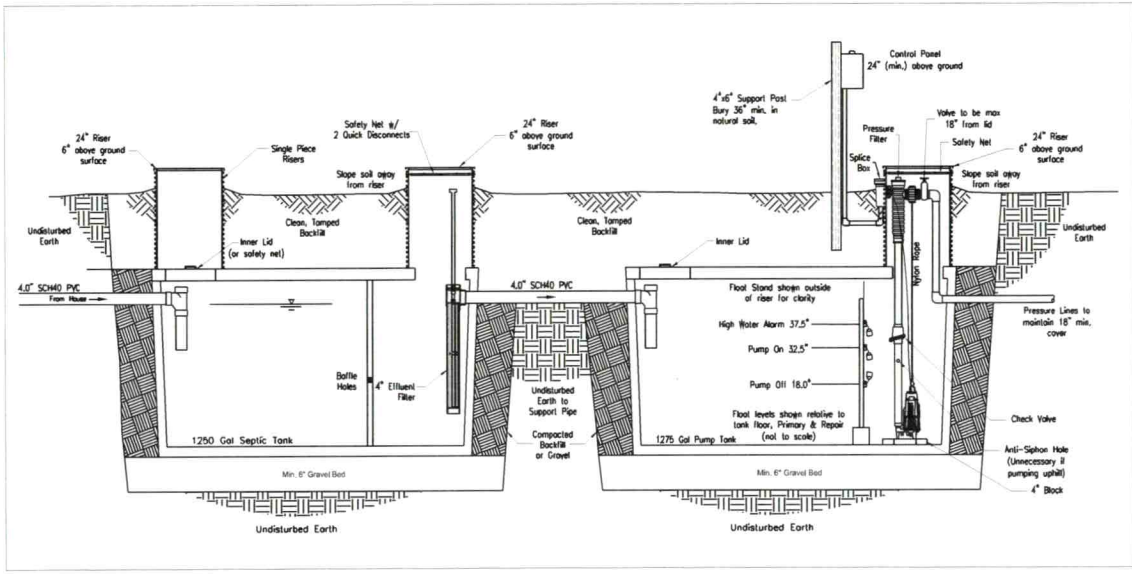
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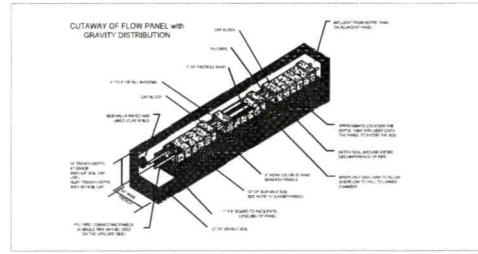
SHEET TITLE
Detail Sheet 1

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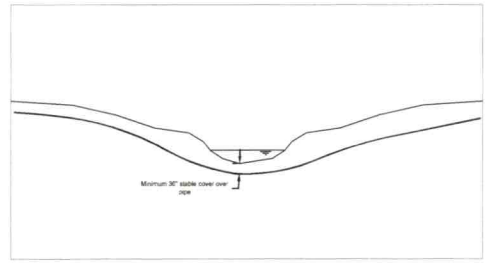
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WW-5



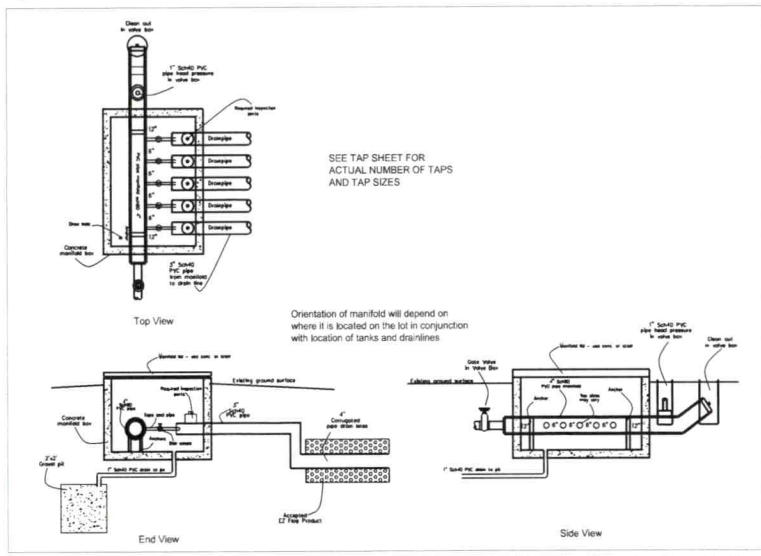
1 WW-6 **SYSTEM PROFILE VIEW**
N.T.S.



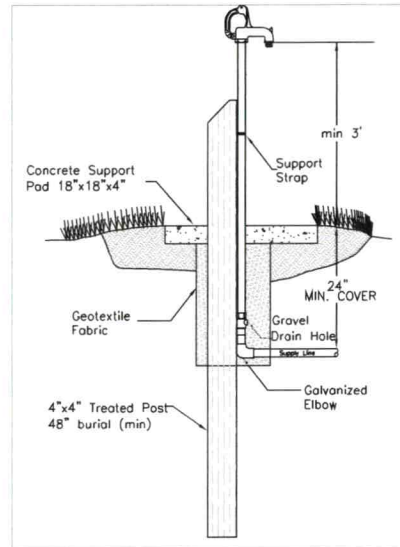
2 WW-6 **TRENCH X-SECTION (Typical)**
N.T.S. Source: AWT



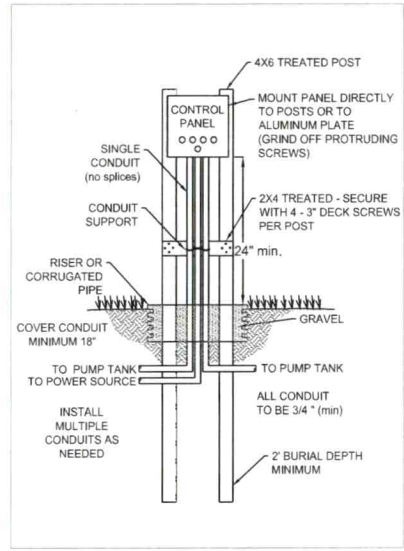
3 WW-6 **STREAM CROSSING MIN. DEPTH**
N.T.S. Source: AWT



4 WW-6 **PRESSURE MANIFOLD INSTALLATION (Typical) - For Illustration Only**
N.T.S. SOURCE: AWT



5 WW-6 **YARD HYDRANT (if required)**
N.T.S. SOURCE: AWT



6 WW-6 **CONTROL PANEL SUPPORT**
N.T.S. SOURCE: AWT

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SHEET TITLE
Detail Sheet 2

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T. Bostic	11/8/2022
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####	####

DRAWING NUMBER
WW-6

Septic System Design - Summary Page

ENGINEERS & SOIL SCIENTISTS
AGRI-WASTE TECHNOLOGY, INC.

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

Project: Robinson Woods
Property: Westminster Dr
Statesville, NC 28677
Subdiv.: Robinson Woods
Lot #: 5
Owner: Ted Benbow
Address: 630 Signal Hill Dr
Statesville, NC 28625
Phone: 704-878-9661
Email: tedb@boundarydevelopment.com
EHS:

Date: 11/10/2022
County: Iredell
Permit #:
Type of System: III g
PIN: 4724336970

Soil Parameters

Soil Evaluation By:
-

Special Conditions/Notes:

LTAR: 0.30 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 Distribution Box
Trench Media: Chambers
Trench Width: 3 ft
Trench Depth: 20 in.
(or as specified on permit)

Trench Bottom Area: 1600 ft^2
Minimum Drain Line: 400 ft
Actual Drain Line: 400 ft
Number of Lines: 5
Minimum Line Spacing: 9 ft O.C.

Wastewater Treatment System Design Calculations

Project: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

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: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

Tank Manufacturer	Shoaf
Tank Model	TS 1275 PT

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

Repair 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	32.5	in.	(set for dose volume)
Alarm On	37.5	in.	(5 in. above On Float)

Emergency Storage Available		
Pump Tank	485	gal
Days of Storage	1.01	days

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

ELEVATIONS

Project: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

Benchmark SW Property Corner
BM Elev 846 ft

Septic Tank	1,250 gal	
Ground Surface		859.00 ft
Depth of Soil Cover	12 in.	1.00 ft
Overall Ht of Tank	61.5 in.	5.13 ft
Elev, Base of Tank		852.88 ft
Ht to 4" Inlet Invert	50 in.	4.17 ft
Elev, 4" Inlet Invert		857.04 ft
Ht to 4" Outlet Invert	48 in.	4.00 ft
Elev, 4" Outlet Invert		856.88 ft
Gravel Base	6 in.	0.50 ft
Elev, Bot of Excavation		852.38 ft

Pump Tank	1275 gal	
Ground Surface		858.00 ft
Depth of Soil Cover	12 in.	1.00 ft
Overall Ht of Tank	67.5 in.	5.63 ft
Elev, Base of Tank		851.38 ft
Ht to 4" Inlet Invert	54.5 in.	4.54 ft
Elev, 4" Inlet Invert		855.92 ft
Ht to 2" Outlet Invert	58 in.	4.83 ft
Elev, 2" Outlet Invert		856.21 ft
Gravel Base	6 in.	0.50 ft
Elev, Bot of Excavation		850.88 ft

ST Inlet Pipe		
Grade @ Stub-out		860 ft
Depth of Stub-out, top		1.5 ft
Elev, Stub-out Invert		858.15 ft
Elev @ ST Inlet Invert		857.04 ft
Length		20 ft
Slope		5.5 %

Pipe, ST to PT		
ID	4 in.	0.33 ft
OD	4.5 in.	0.38 ft
Elev, ST Outlet Invert		856.88 ft
Elev, PT Inlet Invert		855.92 ft
Length		4 ft
Slope		24.0 %
Cover over inlet pipe		1.60 ft

Pump Reqmt.		
Floor Thickness	4 in.	0.33 ft
Elev, Pump Tank Floor		851.71 ft
Pump Block Ht.	4 in.	0.33 ft
Elev, Pump Intake		852.04 ft
Grade @ Repair Manifold		857.00 ft
Min. Cover	18 in.	1.50 ft
Max Elev, Repair		855.50 ft
Elev Diff, Repair		3.46 ft

Drainfield Design

Project	Robinson Woods
Location	Westminster Dr
	Statesville, NC 28677
County	Iredell

Drainfield Sizing

Primary

LTAR	0.3 gpd/ft^2		
Daily Design Flow	480 gpd	**Type of Drainfield Media**	Chambers
Req. Drainfield Area	1,600 ft^2	**Required Drainline**	
Trench Width, Eff.	3 ft	**After 25% Reduction**	400 ft
Required Drainline	533 ft	**Minimum Line Spacing**	9 ft (O.C.)

Repair

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.)

Drainfield Layout

Line	Use	Flag Color	Elevation (ft)	Line Length (ft)	Used as Primary (ft)	Used as Repair (ft)
1	Layout Line	yellow	856.0	50		35.0
2	Layout Line	pink	855.0	65		65.0
3	Layout Line	white	854.5	90		82.0
4	Layout Line	purple	854.0	100		87.0
5	Layout Line	yellow	853.5	100	100.0	
6	Layout Line	pink	852.0	100	100.0	
7	Layout Line	red	852.5	90	85.0	
8	Layout Line	yellow	850.0	70	65.0	
9	Layout Line	purple	849.0	50	50.0	
			Total	715	400	269
			Count	9	5	4

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

For Chambers or Low-profile Chambers:

Effective trench lengths are shown. Add 1' for total installation length.

PRESSURE MANIFOLD SYSTEM DESIGN (Repair)

Site Information

Project: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

Design Information

Estimated Daily Flow	480 gal/day
L.T.A.R. (from Iredell 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. - **Repair**

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

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	yellow	35	1/2in SCH 80	5.48	0.157	0.617
2	pink	65	3/4in SCH 80	10.10	0.155	0.613
3	white	82	3/4in SCH 40	12.50	0.152	0.601
4	purple	87	3/4in SCH 40	12.50	0.144	0.566
	Total	**269**	**Total**	**40.58**	**Avg.**	**0.599**

Note: Line lengths are calculated in 4'4" increments to reflect use of PPBPS product.

Total Run Time	11.83 min.	
Drainfield Capacity	446.4 gal	
% of Drainfield Cap	68.5%	(Max. 97.3% to not exceed 7.2 gal/panel)
Dose Volume	305.6 gal/dose	
Run Time/Dose	**7.5 minutes**	Time to deliver max. 7.2 gal/panel
Volume/depth	21.07 gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	14.50 in.	

Manifold Box

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

PUMP DESIGN

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

Project: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

Friction Losses

Suction Head	0	ft	*(submersible 0)*
Elev. Difference (highest point from pump)	3.46	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 40.58 gpm
Pipe Length	15	ft	Velocity 3.96 ft/s
Pipe Length for Fittings	1.5	ft	Meets requirement that 2 ft/s < v < 5 ft/s.
Equivalent Length	16.5	ft	
Estimated Friction Loss in Supply Line	0.47	ft	
Pressure Filter Friction Loss	0.23	ft	*(from manufacturer)*
Friction Loss - Taps/Special Fittings	3.5	ft	
TOTAL	**9.66**	**ft.**	

Flow for Anti-Siphon Hole

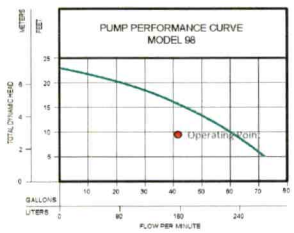
Hole Diameter	1/8	in.
Hole Flowrate	0.57	gpm

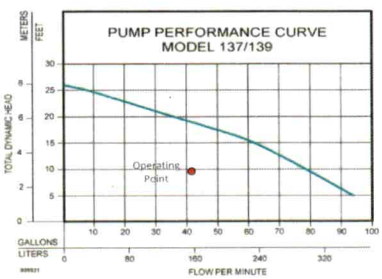
Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**41.15 gpm**	

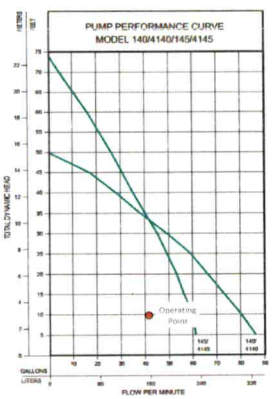
Required Horsepower 0.16 hp
TDH **9.66 ft.**

Pump Selection

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







Septic Tank Buoyancy Calculation

Project: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

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	36.0 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 Top	Exterior Bottom	Interior Top	Interior 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	168.7 ft^3 *
Buoyancy Force	**10,525 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 = 1.82

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: Robinson Woods
Location: Westminster Dr
Statesville, NC 28677
County: Iredell

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	36	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	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	146.8	ft^3 *
Buoyancy Force	**9,160**	**lb**

Weight Calculation:

Tank Weight	10500	lb		
Water Weight in Tank	0	lb	Volume	0.0 ft^3 *
Soil Weight Over Tank	3274	lb		
Soil Friction Force	4227	lb		
Total Weight	**18,001**	**lb**		

Factor of Safety = 1.97

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.*