BLDR-2024-57012

ICHD - ENVIRONMENTAL HEALTH DIVISION

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

PERMIT # OSWP-2023-20494

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

PIN # 4765-91-8897

APPLICANT / OWNER: Agri-Waste Technology | APPLICANT ADDRESS: 501 N Salem St., Apex, NC 27502

SITE ADDRESS: 169 LONE PINE RD, STATESVILLE, NC 28625 | PHONE: | ALT. PHONE:

SITE DIRECTIONS: | SAP CONTROLLED: YES ☑ NO ☐

SUBDIVISION: Carson Creek | SECTION: P2 | LOT #: 16 | LOT AREA: 1.246 | DESIGN FLOW: 480 | L.T.A.R.: 0.3

Septic Tank: 1250 (gal)	STB: 760	Date: –	☐ New System ☐ Repair ☐ Expansion	System Type: III	☐ Residence	No. Bedrooms: 4	Water Supply: Municipal Water
Pump Tank: (gal)	PT:	Date:	System Description: install per AWT		☐ Business	No. Persons: 8	
Pump Make:	Model:	Serial #:	Repair System Description: per AWT		☐ Other	No. Employees:	
# Nitrification Fields: 1	# Lines: 4	Linear Ft.: 400	Maintenance Agreement Required: ☐ YES ☑ NO		☑ Slab	☐ Crawl Space	
Trench Width: 36	Trench Bottom Depth (Low side): 20		Gravel Depth: –	☑ GRAVITY ☐ PRESSURE	☐ Basement w/ Plumbing	☐ Basement w/o Plumbing	

Comments / Conditions:

INITIAL SITE SKETCH

This permit is issued pursuant to G.S. 130A-335 (a2), (a3) & (a4) using the Signed and Sealed LSS/LG Evaluation attached hereto.

LSS# 1227

AS BUILT SKETCH

BCW 11-4-2024 - TANK

Installed as Drawn

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

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

Owner / Applicant Signature: | Date:

IMPROVEMENT PERMIT by: | Date: 4/27/2023

AUTHORIZATION TO CONSTRUCT by: | Date: 6/18/24

Installed By: FRYE GRADING

OPERATION PERMIT by: | Date: 11/8/24

Existing System Inspected By: | Date:

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

County: Iredell

This Section for Local Health Department Use Only

Initial submittal received: 4/27/2023 (Date) by BB (Initials)

Permit Number: OSWP-2023-20494

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: Benjamin A Bell Date of Issuance: 4/27/2023

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: 4/27/2028

See attached site sketch

County: Iredell

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

PIN/Lot Identifier: 4765-91-5272

Issued To: Kenson Homes LLC

Property Location: Lot 16, 169 Lone Pine Road, Statesville, NC. 28625

Subdivision: Carson Creek Lot #: 16 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 25% Reduction (Initial) Pressure Manifold 50% Reduction (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): 0.3GPD/ft2 Proposed LTAR (Repair): 0.3 GPD/ft2

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:

The repair system will be a pressure manifold horizontal panel block system

Licensed Soil Scientist Print Name: Jeff Vaughan

Licensed Soil Scientist Signature: _____ Date: 3/29/2023

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: 4765-91-5272

Issued To: Kenson Homes LLC

Property Location: Lot 16, 169 Lone Pine Road, Statesville, NC. 28625

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 25% Reduction (Initial) Pressure Mainfold 50% Reduction (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: 400 feet Trench/Bed Spacing: 9 feet on center

Drainfield square footage: 1200 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 _____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): NA 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: 3/29/2023

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

See attached site sketch

AGRITEC-01 GKROHL

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 3/14/2023

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
INSURED Agri-Waste Technology Inc 501 N. Salem St Ste 203 Apex, NC 27502	INSURER B : ACCIDENT FUND INSURANCE COMPANY OF AMERICA — 10166
	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							
	[ ] CLAIMS-MADE [X] OCCUR			S 2253659	1/18/2023	1/18/2024	EACH OCCURRENCE	$ 2,000,000
							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	1/18/2023	1/18/2024	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							
	[ ] EXCESS LIAB [ ] CLAIMS-MADE			S 2253659	1/18/2023	1/18/2024	EACH OCCURRENCE	$ 2,000,000
	[ ] DED [ ] RETENTION $						AGGREGATE	$ 2,000,000
								$
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	1/18/2023	1/18/2024	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
****

CANCELLATION

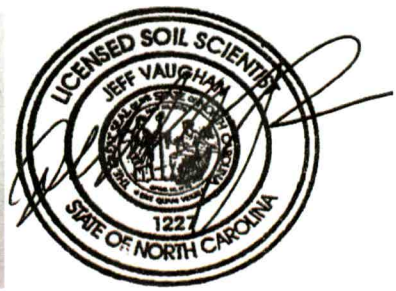
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Gina Krohl

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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
(Lot 16) 169 Lone Pine Road, Statesville, NC 28625
Iredell County

PREPARED FOR: Kenson Homes, LLC, Client

PREPARED BY: Jeff Vaughan, Licensed Soil Scientist
Trevor Hackney, Environmental Scientist

DATE: March 23, 2023

Soil suitability for domestic sewage treatment and disposal systems was evaluated on February 8, 2023, for the property located at 169 Lone Pine Road (Lot 16), Statesville, NC. Jeff Vaughan and Trevor Hackney of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. This evaluation was done to facilitate permitting 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, and boring locations is included in Attachment 1. Profile descriptions for each boring are included in Attachment 2. Additional documentation about the property is included in Attachment 3.

The total property area is approximately 1.25 acres. The property is an open field. The home and pool are proposed near the front of the property with the septic system proposed behind the home. The proposed system is a gravity 25% reduction primary system with a pressure manifold 50% reduction repair system.

<u>Soil Suitability for Domestic Sewage Treatment and Disposal Systems</u>
The drawing in Attachment 1 details the property boundaries (as surveyed by Blue Ridge Engineering), soil boring locations, and layout of drain field trenches (Completed by AWT). Four soil borings were assessed 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 a hand auger. All soil borings are being utilized for the drain field area.

A septic layout was performed to demonstrate available space (.1945). The layout in Attachment 1 indicates there is available space for a four-bedroom primary and repair septic system utilizing the 25% reduction drain field material for the primary and 50% reduction drain field material for the repair system.

The proposed LTAR (Long Term Acceptance Rate) by AWT is 0.3 GPD/ft^2. The soils on this property are group IV soils within the distribution and treatment zone as used to define the LTAR. Since usable slope corrected soil depths meet or exceed 32" AWT is recommending the use of innovative style trench to utilize the 25% reduction for the initial system. With an LTAR of 0.3 GPD/ft^2, 400 linear feet of innovative trench are necessary to support a four-bedroom home initial system. The repair field will require 267 linear feet of horizontal panel block style trench. The maximum trench bottom should not exceed 20". The attached drawing proves that 400 linear feet of trench can be installed for the primary system and 269 linear feet of trench can be installed for the repair system with the proposed home and pool location. The repair system will be a pump system due to the T & J Panel recommendations for maximum line lengths.

Any disturbances or grading done in the usable area will change the potential of using the area designated for a drain field. Prior to moving forward with building on the property, Iredell County Environmental Health Department should be contacted to complete the necessary review of this documentation to issue an IP (Improvement Permit) for the property and the CA (Construction Authorization).

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 in order 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)*

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

Sincerely,

Jeff Vaughan

Trevor Hackney

Trevor Hackney

Attachment 1: Site Plan/Drawing

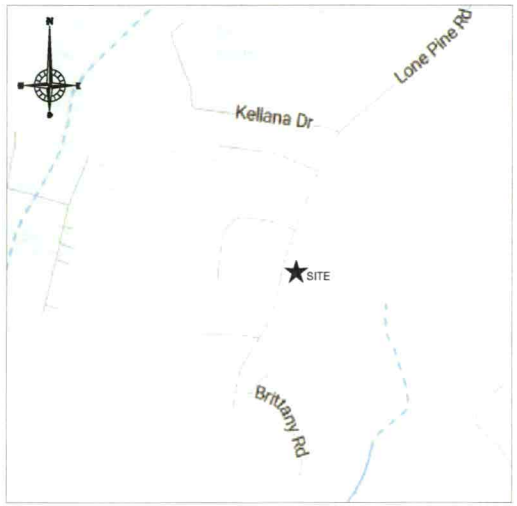
KENSON HOMES LOT 16

Project Location
Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.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
Gravity Fed with Parallel Distribution
Accepted/Innovative Trench Product



VICINITY MAP

Sheet Index

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

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

Kenson Homes
Kenson Homes Lot 16

Project Location:
Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner:
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.com

FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

DRAWN BY: T. Bostic	CREATED ON: 03/21/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER
WW-1

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

Project: Kenson Homes Lot 16
Property: Lone Pine Rd
Statesville, NC 28625
Subdiv.: Carson Creek
Lot #: 16

Owner: Kenson Homes
Address: 185 Shelbourne Pl
Mooresville, NC 28117
Phone: 760-522-7415
Email: fkv4@aol.com

EHS:

Date: 3/22/2023
County: Iredell
Permit #:
Type of System: III g
PIN: 4765915272

Soil Parameters

Soil Evaluation By:

-

Special Conditions/Notes:

LTAR: 0.300 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: Serial Continuous
Trench Media: Chambers
Trench Width: 3 ft
Trench Depth: 24 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: 4
Minimum Line Spacing: 9 ft O.C.

Wastewater Treatment System Design Calculations

Project: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
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: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
County: Iredell

Tank Manufacturer	Shoaf
Tank Model	TS 1275 PT

Repair System

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

Top of pump (including 4" block)	14.1 in.	(Pump height = 10 1/16")
Pump Off	16.0 in.	
Pump On	27.0 in.	(set for dose volume)
Alarm On	33.0 in.	(6 in. above On Float)

Emergency Storage Available	
Pump Tank	579 gal
Days of Storage	1.21 days

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

ELEVATIONS

Project: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
County: Iredell

Benchmark NW Property Corner
BM Elev 874.96 ft

Septic Tank	1,250 gal	
Ground Surface		869.00 ft
Depth of Soil Cover	12 in.	1.00 ft
Overall Ht of Tank	61.5 in.	5.13 ft
Elev, Base of Tank		862.88 ft
Ht to 4" Inlet Invert	50 in.	4.17 ft
Elev, 4" Inlet Invert		867.04 ft
Ht to 4" Outlet Invert	48 in.	4.00 ft
Elev, 4" Outlet Invert		866.88 ft
Gravel Base	6 in.	0.50 ft
Elev, Bot of Excavation		862.38 ft

Pump Tank	1275 gal	
Ground Surface		868.00 ft
Depth of Soil Cover	12 in.	1.00 ft
Overall Ht of Tank	67.5 in.	5.63 ft
Elev, Base of Tank		861.38 ft
Ht to 4" Inlet Invert	54.5 in.	4.54 ft
Elev, 4" Inlet Invert		865.92 ft
Ht to 2" Outlet Invert	58 in.	4.83 ft
Elev, 2" Outlet Invert		866.21 ft
Gravel Base	6 in.	0.50 ft
Elev, Bot of Excavation		860.88 ft

ST Inlet Pipe		
Grade @ Stub-out		871 ft
Depth of Stub-out, top		1.5 ft
Elev, Stub-out Invert		869.15 ft
Elev @ ST Inlet Invert		867.04 ft
Length		25 ft
Slope		8.4 %

Pipe, ST to PT		
ID	4 in.	0.33 ft
OD	4.5 in.	0.38 ft
Elev, ST Outlet Invert		866.88 ft
Elev, PT Inlet Invert		865.92 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		861.71 ft
Pump Block Ht.	4 in.	0.33 ft
Elev, Pump Intake		862.04 ft
Grade @ Repair Manifold		864.00 ft
Min. Cover	18 in.	1.50 ft
Max Elev, Repair		862.50 ft
Elev Diff, Repair		0.46 ft

Drainfield Design

Project	Kenson Homes Lot 16
Location	Lone Pine Rd Statesville, NC 28625
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	pink	865.8	110	110.0	
2	Layout Line	orange	865.7	110	90.0	
3	Layout Line	white	865.5	110	80.0	
4	Layout Line	pink	865.0	120	120.0	
5	Layout Line	orange	864.9	80		78.0
6	Layout Line	purple	864.5	80		69.0
7	Layout Line	pink	864.0	120		60.0
8	Layout Line	pink	964.0	120		60.0
9	Layout Line					
10	Layout Line					
11	Layout Line					
12	Layout Line					
			Total	850	400	267
			Count	8	4	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: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
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.
5	orange	78	1/2in SCH 40	7.11	0.091	0.619
6	purple	69	1/2in SCH 80	5.48	0.079	0.540
7	pink	60	1/2in SCH 80	5.48	0.091	0.621
8	pink	60	1/2in SCH 80	5.48	0.091	0.621
	Total	**267**	**Total**	**23.55**	**Avg.**	**0.600**

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

Total Run Time	20.38	min.	
Drainfield Capacity	460.8	gal	
% of Drainfield Cap	50.3%		(Max. 96.8% to not exceed 7.2 gal/panel)
Dose Volume	231.8	gal/dose	
Run Time/Dose	**9.8**	**minutes**	Time to deliver max. 7.2 gal/panel
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	11.00	in.	

Manifold Box

Number of Taps: 3 with 4 Split(s)
Manifold Length: 3.0 ft. (approximate)

PUMP DESIGN

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

Project: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
County: Iredell

Friction Losses

Suction Head	0	ft	*(submersible 0)*
Elev. Difference (highest point from pump)	0.46	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	23.55 gpm
Pipe Length	70	ft	Velocity	3.81 ft/s
Pipe Length for Fittings	7	ft		Meets requirement that 2 ft/s < v < 5 ft/s.
Equivalent Length	77	ft		
Estimated Friction Loss in Supply Line			2.75	ft
Friction Loss - Taps/Special Fittings			3.5	ft
TOTAL			**8.71**	**ft.**

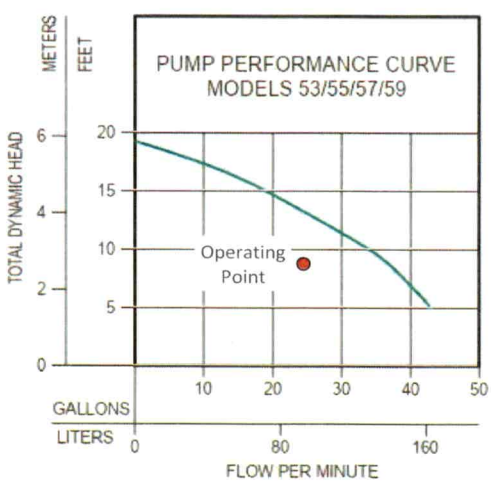
Flow for Anti-Siphon Hole

Hole Diameter	3/16	in.
Hole Flowrate	1.22	gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**24.77**	**gpm**
Required Horsepower	0.09	hp
TDH	**8.71**	**ft.**

Pump Selection

Manufacturer:	Zoeller
Model:	N57
Horsepower:	**0.3**



Septic Tank Buoyancy Calculation

Project: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
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	12.0	in.	from ground surface
Effluent Density	62.4	lb/ft^3	(Specific Weight of Water)
Concrete Density	142.6	lb/ft^3	
Soil App. Sp. Grav.	1.3		*(typical value)*
Soil Cover Over Tank	12	in.	(minimum)
Additional Cover	0	in.	for pipe grade
Unsubmerged wt of soil	81.1	lb/ft^3	
Submerged wt of soil	49.9	lb/ft^3	50% Porosity Assumed

Tank Dimensions (from supplier):

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

Weight Calculation:

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

Factor of Safety = 1.09

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

Pump Tank Buoyancy Calculation

Project: Kenson Homes Lot 16
Location: Lone Pine Rd
Statesville, NC 28625
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	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	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

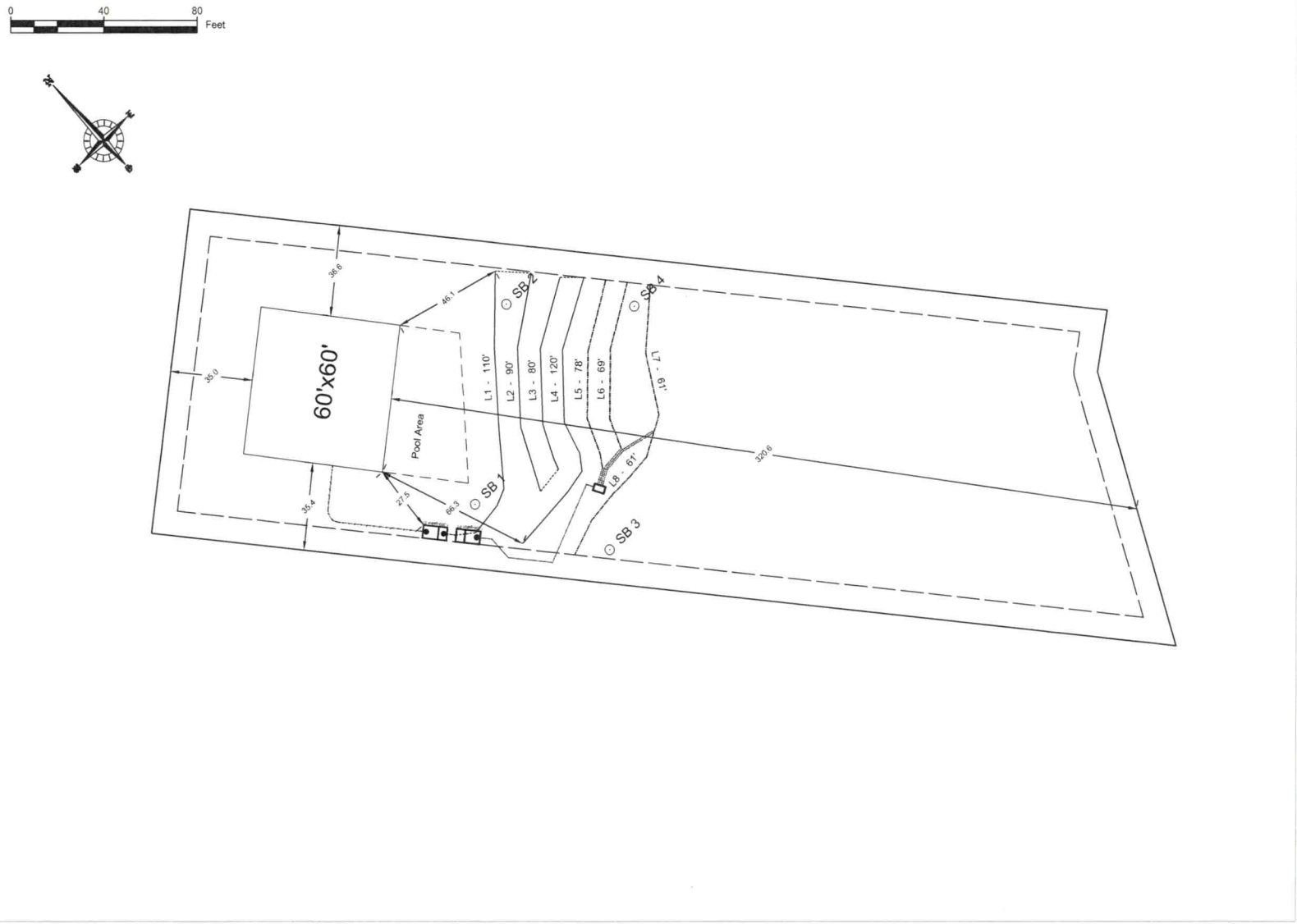
Displaced Volume	232.5	ft^3 *
Buoyancy Force	**14,508**	**lb**

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 = 1.24

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.*



PROPERTY LAYOUT

SOURCE: AWT, 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

Kenson Homes
Kenson Homes Lot 16

Project Location:
Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4769915272

Project Owner:
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
fkw4@aol.com

FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE

Property Layout

DRAWN BY: T. Bostic	CREATED ON: 03/21/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

DRAWING NUMBER

WW-2

General Drainfield Notes:

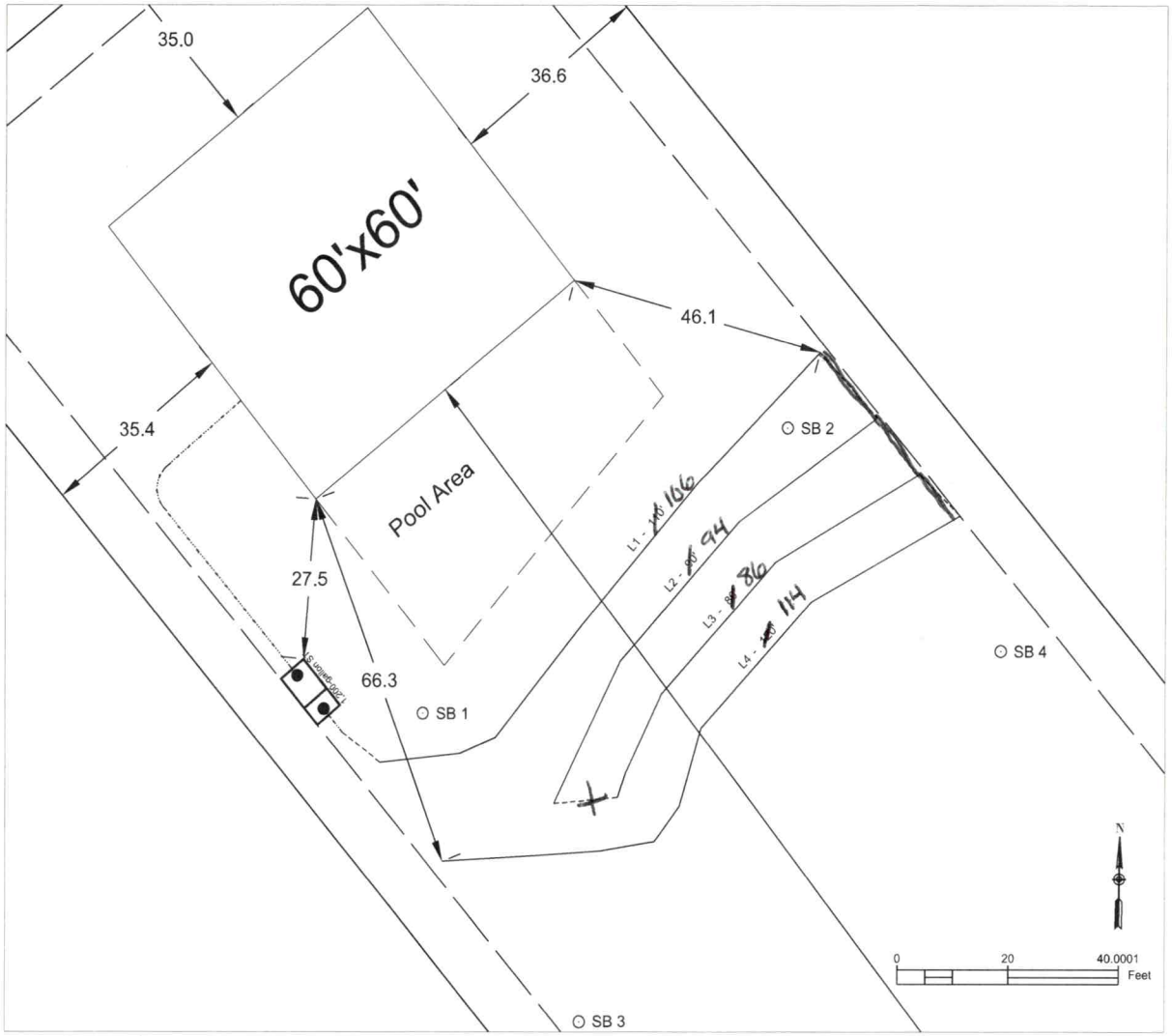
1. Clear all trees less than 8" in diameter (measured at a height 3' from soil surface) from the drainfield.
2. Vegetation that will re-grow from a cut stump shall be stumped or pulled from the ground. Stumps shall not be pushed over.
3. Drainfield area shall be cleared of all leaves, pine straw, debris, 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
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. 5' downslope NO 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:
Primary distribution is serial using Quick4 Plus Standard.



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

Kenson Homes
Kenson Homes Lot 16

Project Location:
Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner:
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
fkvt4@aol.com

FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Primary Layout

DRAWN BY:	CREATED ON:
T. Bostic	03/21/2023
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-3

General Drainfield Notes:

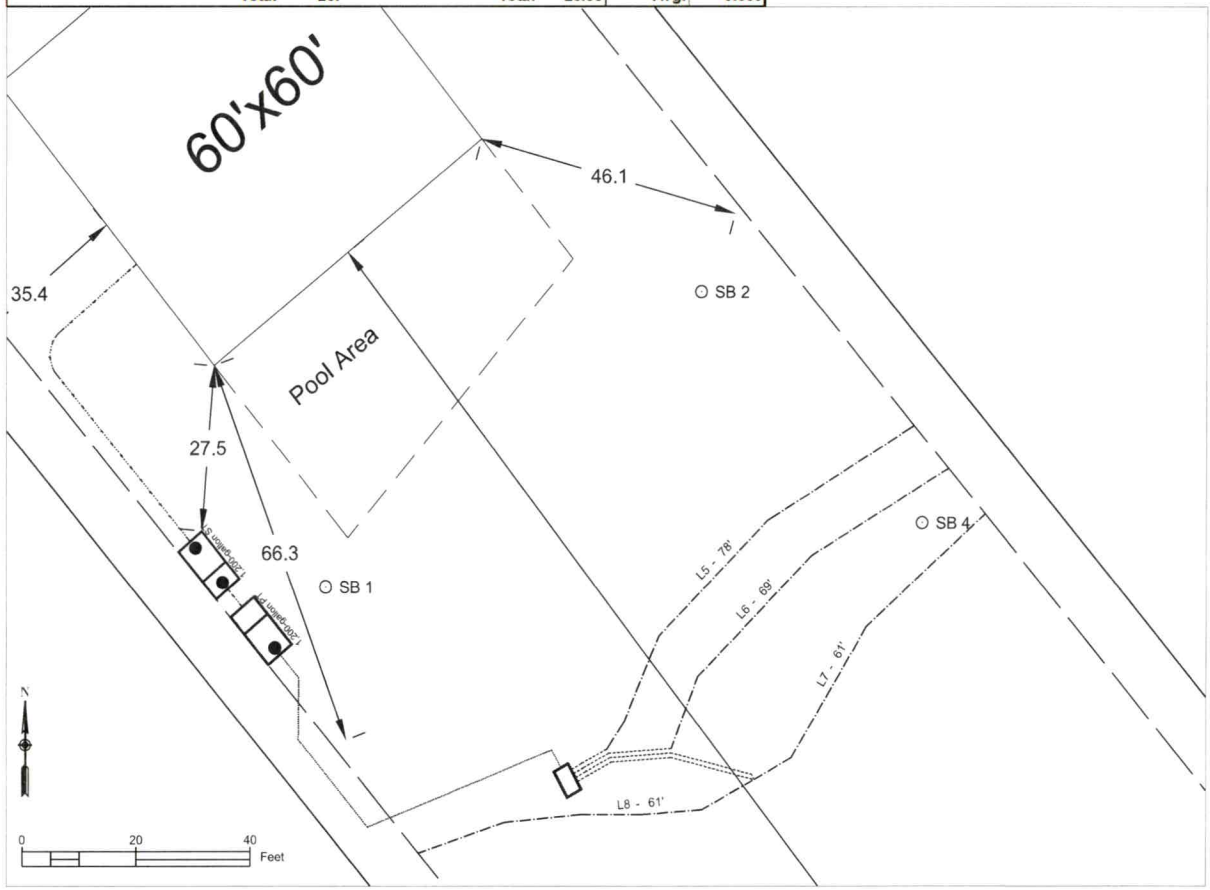
1. Clear all trees less than 8" in diameter (measured at a height 3' from soil surface) from the drainfield.
2. Vegetation that will re-grow from a cut stump shall be stumped or pulled from the ground. Stumps shall not be pushed over.
3. Drainfield area shall be cleared of all leaves, pine straw, debris, 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 PPBPS, Horizontal***

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
5	orange	78	1/2in SCH 40	7.11	0.091	0.619
6	purple	69	1/2in SCH 80	5.48	0.079	0.540
7	pink	60	1/2in SCH 80	5.48	0.091	0.621
8	pink	60	1/2in SCH 80	5.48	0.091	0.621
	Total	**267**	**Total**	**23.55**	**Avg.**	**0.600**

Note:
Repair distribution is pressure manifold utilizing horizontal panel block.



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

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fsv4@aol.com

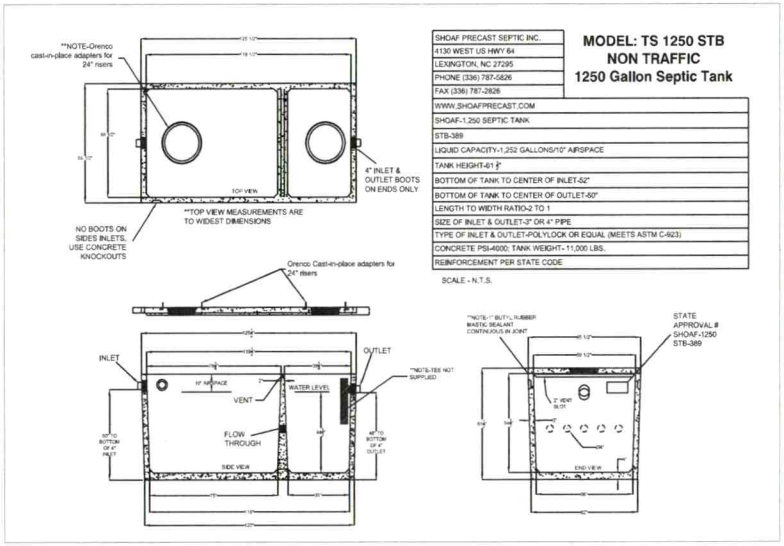
FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Repair Drainfield

DRAWN BY: T. Bostic	CREATED ON: 03/21/2023
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

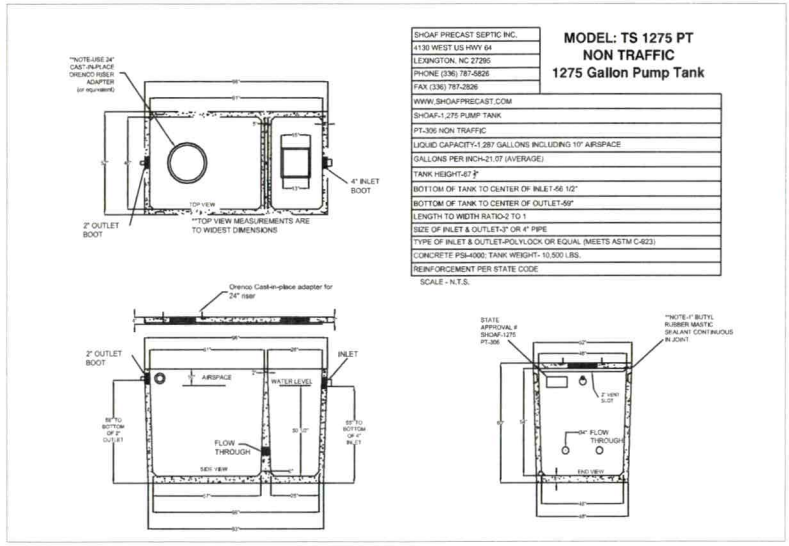
MODEL: TS 1250 STB
NON TRAFFIC
1250 Gallon Septic Tank

WWW.SHOAFPRECAST.COM
SHOAF-1,250 SEPTIC TANK
STB-389
LIQUID CAPACITY-1,252 GALLONS/10" AIRSPACE
TANK HEIGHT-61 ½"
BOTTOM OF TANK TO CENTER OF INLET-52"
BOTTOM OF TANK TO CENTER OF OUTLET-60"
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

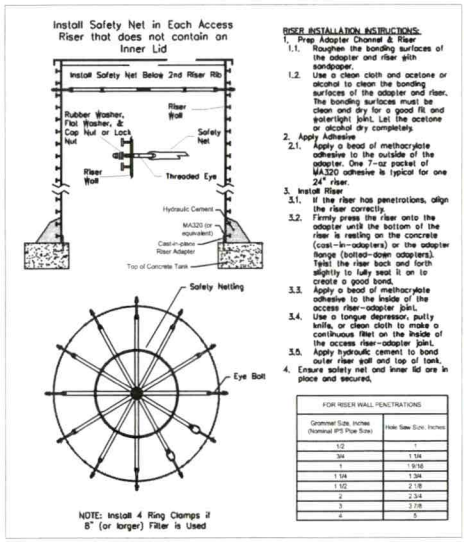
MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

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 ½"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-59"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-3" OR 4" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT- 10,500 LBS.
REINFORCEMENT PER STATE CODE

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 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.

AWT
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501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0969
www.agriwaste.com

Kenson Homes
Kenson Homes Lot 16

Project Location:
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Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner:
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
flu4@aol.com

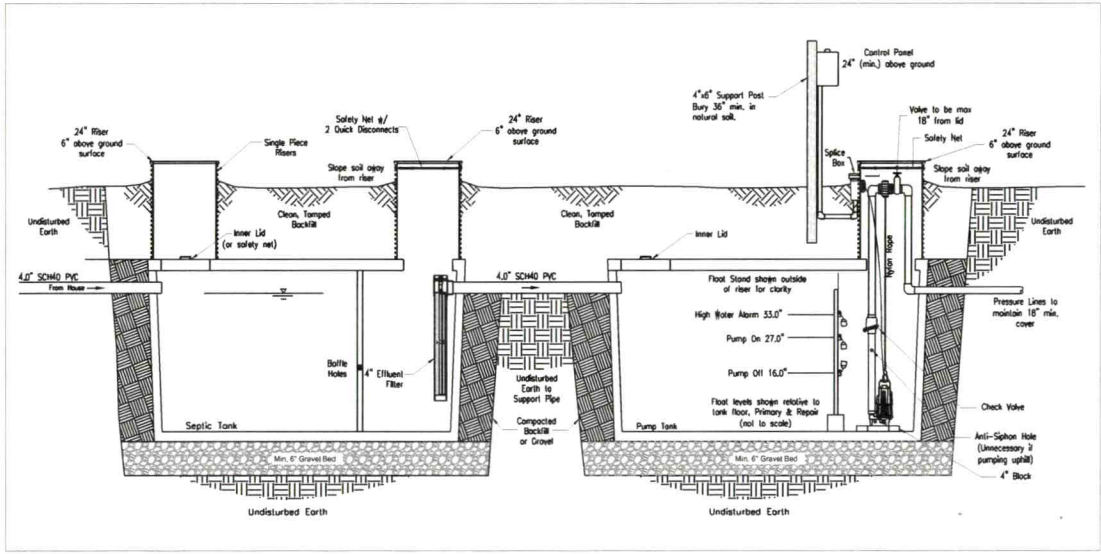
FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

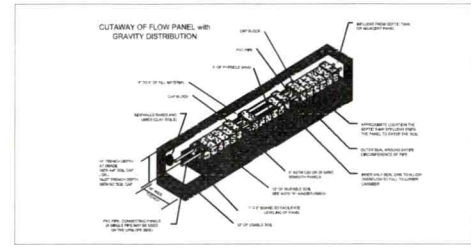
SHEET TITLE
Detail Sheet 1

DRAWN BY: T. Bostic	CREATED ON: 03/21/2023
REVISED BY: ####	REVISED ON: ####
RELEASED BY: ####	RELEASED ON: ####

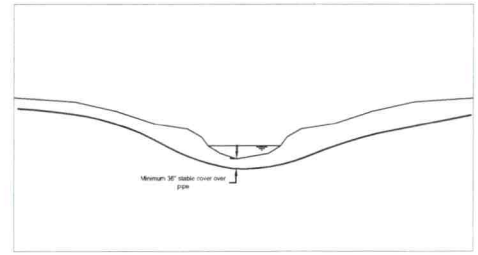
DRAWING NUMBER
WW-5



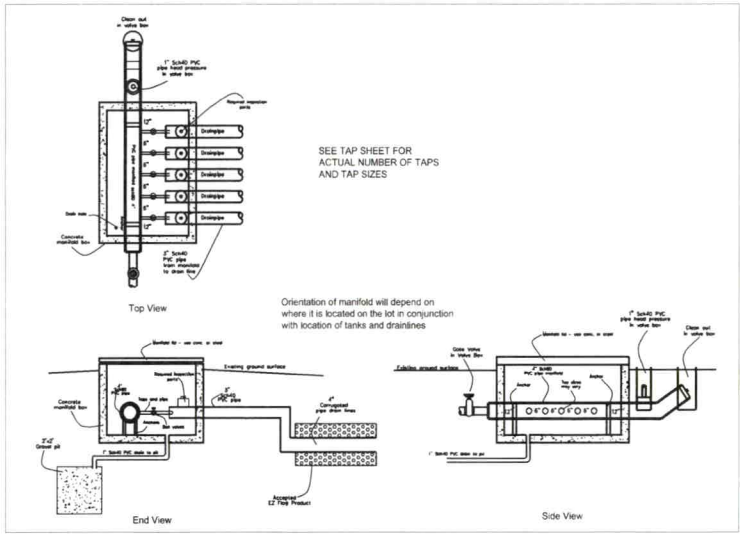
1 WW-6 **SYSTEM PROFILE VIEW**
N.T.S.



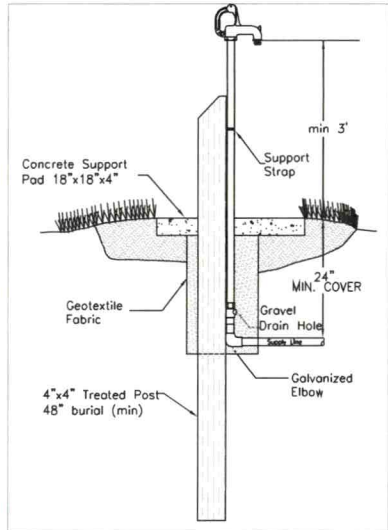
2 WW-6 **TRENCH X-SECTION (Typical)**
N.T.S. Source: AWT



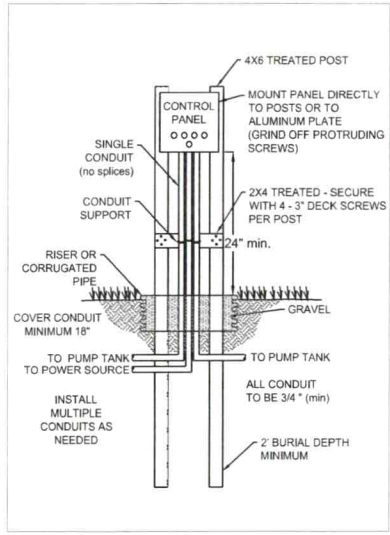
3 WW-6 **STREAM CROSSING MIN. DEPTH**
N.T.S. Source: AWT



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

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

Kenson Homes
Kenson Homes Lot 16

Project Location:
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Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner:
Kenson Homes
165 Shelbourne Pl
Mooresville, NC 28117
760-622-7415
flw4@aol.com

FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Detail Sheet 2

DRAWN BY:	CREATED ON:
T. Bostic	03/21/2023
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.

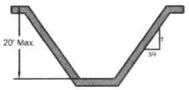
(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material material is cohesive material. Soil composed primarily of coarse-grained 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.

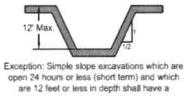
(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(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 dry soil breaks into clumps which do not 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 can 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.

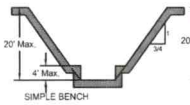
EXCAVATIONS IN TYPE A SOILS

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

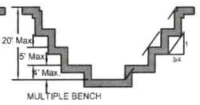




Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.

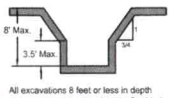


SIMPLE BENCH



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

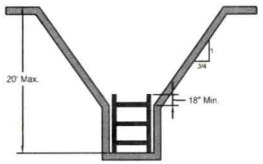


All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



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.

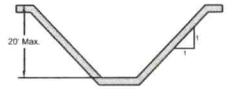
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



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).

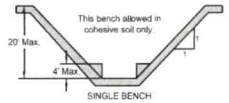
EXCAVATIONS IN TYPE B SOILS

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

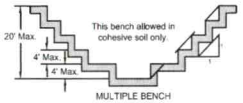


SIMPLE SLOPE

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

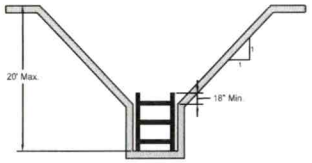


SINGLE BENCH



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).

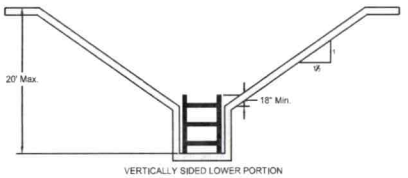
EXCAVATIONS IN TYPE C SOILS

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

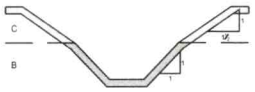
All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



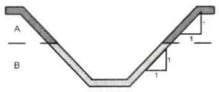
B OVER A



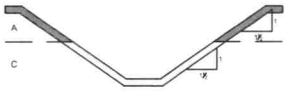
C OVER A



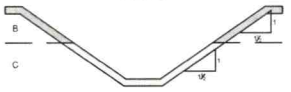
C OVER B



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

Kenson Homes
Kenson Homes Lot 16

Project Location:
Lone Pine Rd.
Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner:
Kenson Homes
185 Shelbourne Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.com

FINAL DESIGN
RELEASED FOR CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Excavation Safety

DRAWN BY:	CREATED ON:
T. Bostic	03/21/2023
REVISED BY:	REVISED ON:
####	####
RELEASED BY:	RELEASED ON:
####	####

DRAWING NUMBER
WW-7

Attachment 2: Soil Boring Description Sheets

COUNTY: Iredell Co.__

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

CLIENT: __Kenson Properties LLC_____ APPLICATION DATE_____
ADDRESS:____ _____169 Lone Pine rd Statesville, NC (Lot 16) DATE EVALUATED: __2/8/2023 _
PROPOSED FACILITY: _Single Family Residence___PROPOSED DESIGN FLOW (.1949): ___480 GPD____ PROPERTY SIZE: ___1.25____
LOCATION OF SITE: 169 Lone Pine rd Statesville, NC (Lot 16)_____ PROPERTY RECORDED: _____
WATER SUPPLY: ☐ Private ☒ Public ☐ Well ☐ Spring ☐ Other _____
EVALUATION METHOD: ☒ Auger Boring ☐ Pit ☐ Cut TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941)		OTHER PROFILE FACTORS				PROFILE CLASS & LTAR
			.1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	.1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	
SB 1	10%	0-12"	SCL; GR	SS; SP; FR	-	40"	-	Saprolite	Provisionally Suitable 0.3 GPD/Ft^2
		12-40"	C; SBK	SS; SP; FI					
		40+"	CL; MA	SS; SP; FR					
SB 2	7%	0-10"	SCL;GR	SS; SP; FR	-	35"	-	SAP	Provisionally Suitable 0.3 GPD/Ft^2
		10-35"	C; SBK	SS; SP; FI					
		35+"	CL; MA	SS; SP; FR					
				SS; SP; FR					
SB 3	9%	0-8"	SCL; GR	SS; SP; FR	-	35"	-	SAP	Provisionally Suitable 0.3 GPD/Ft^2
		8-35"	C; SBK	SS; SP; FI					
		35+"	CL; MA	SS; SP; FR					
SB 4	6%	0-10"	SCL; GR	SS; SP; FR	-	34"	-	SAP	Provisionally Suitable 0.3 GPD/Ft^2
		10-34"	C; SBK	SS; SP; FI					
		34+"	CL; MA	SS; SP; FI					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	Provisionally Suitable	Provisionally Suitable
System Type(s)	Conventional 25% Reduction	Pressure Manifold 50% Reduction
Site LTAR	0.3 GPD/Ft^2	0.3 GPD/Ft^2

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

EVALUATED BY: ___Jeff Vaughn_____
OTHER(S) PRESENT: _____Trevor Hackney_____

COMMENTS

Updated February 2014

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.

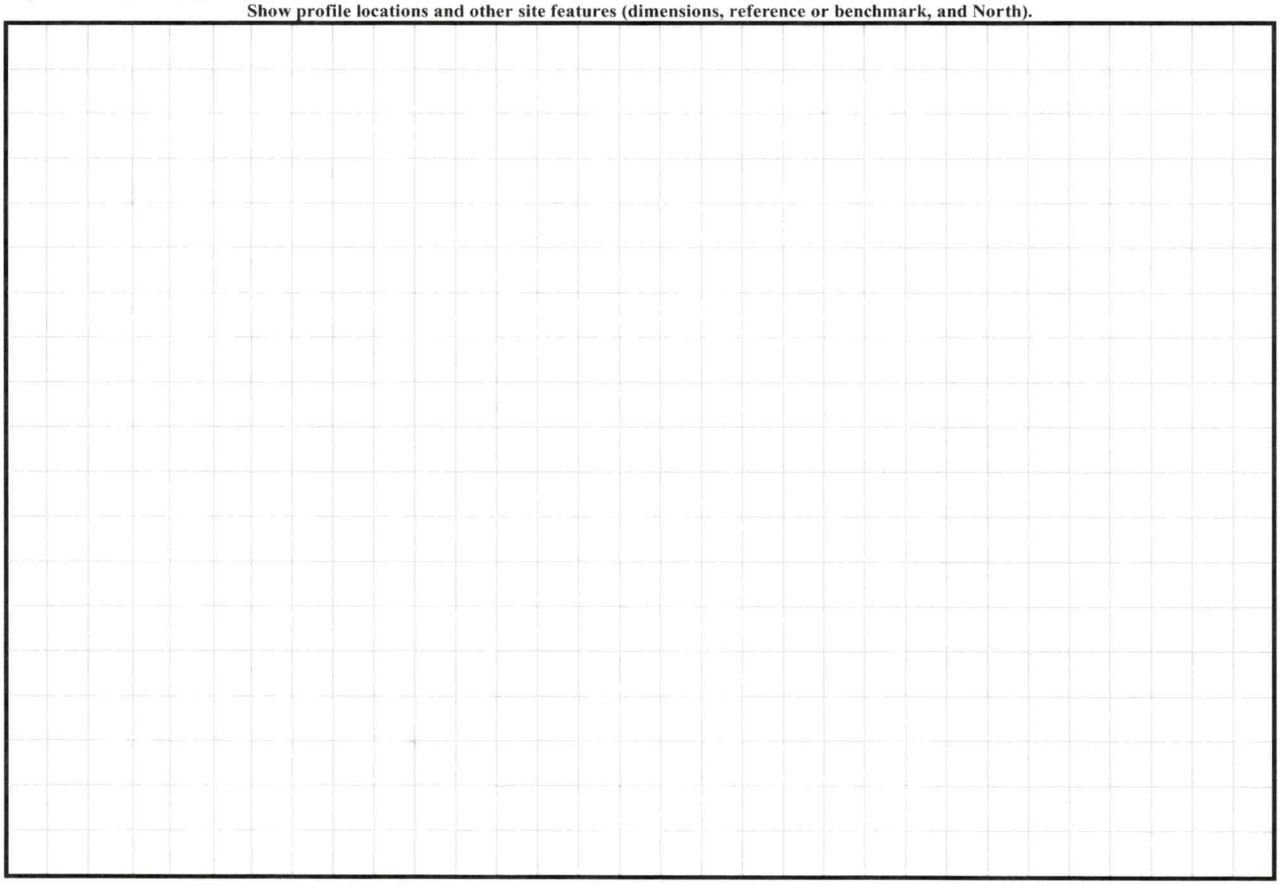
NOTES

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).



Attachment 3: Additional Documentation



PRELIMINARY - SKETCH PLAN

THIS IS A PRELIMINARY SKETCH PLAN INTENDED FOR PLANNING AND DESIGN. THIS IS NOT A CONSTRUCTION PLAN. THIS PLAN HAS NOT BEEN APPROVED BY GOVERNING AUTHORITIES. ZONING COMPLIANCE DATA SHOWN HEREON HAS NOT BEEN CONFIRMED BY GOVERNING AUTHORITIES.

0 200 400 600

SCALE: 1" = 200'

Blue Ridge Engineering PLLC
924 Main Street - Suite 200
North Wilkesboro, NC 28659
336.838.2500
www.ridge.blue
Firm #P-0205

HOUSE LAYOUT SKETCH PLAN

JOB #18066
LOTS 1,2, 10-18
March 16, 2021

KENSON PROPERTIES, LLC
PROPOSED RESIDENTIAL SUBDIVISION
LONE PINE ROAD STATESVILLE, NC

ICHD - ENVIRONMENTAL HEALTH DIVISION

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

PERMIT # OSWP-2022-5108

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

PIN # 4765-91-5272

APPLICANT / OWNER: Agri-Waste Technology | APPLICANT ADDRESS: 501 N Salem St., Apex, NC 27502

SITE ADDRESS: 169 LONE PINE RD, STATESVILLE, NC 28625 | PHONE: 760-522 7415 | ALT. PHONE:

SITE DIRECTIONS: Hwy 64 to Lone Pine Site on Left. | SAP CONTROLLED: YES ☐ NO ☒

SUBDIVISION: Carson Creek | SECTION: 2 | LOT #: FD 16 | LOT AREA: 1.25 | DESIGN FLOW: 480 | L.T.A.R.: .30

Septic Tank: (gal) 1000	STB:	Date:	☑ New System ☐ Repair ☐ Expansion	System Type: III	☑ Residence	No. Bedrooms: 4	Water Supply: Municipal Water
Pump Tank: (gal) 1000	PT:	Date:	System Description: PM - 25% Reduction		☐ Business	No. Persons: 8	
Pump Make:	Model:	Serial #:	Repair System Description: PM - 25% Reduction		☐ Other	No. Employees:	
# Nitrification Fields: 1	# Lines: 4	Linear Ft.: 400	Maintenance Agreement Required: ☐ YES ☑ NO		☑ Slab	☐ Crawl Space	
Trench Width: 36.	Trench Bottom Depth (Low side): 15in		Gravel Depth: -	☐ GRAVITY ☑ PRESSURE	☐ Basement w/ Plumbing	☐ Basement w/o Plumbing	

Comments / Conditions: *Lot must be Recorded prior to AC

INITIAL SITE SKETCH

This permit is issued pursuant to G.S. 130A-335(a2), (a3) & (a4) using the signed and sealed LSS/LG Evaluation attached here, from:

Agri-Waste Technology, Inc.

LSS# 1227

AS BUILT SKETCH

Revoked

Revoke it? Old permit?

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

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

Owner / Applicant Signature: | Date: | Installed By:

IMPROVEMENT PERMIT by: Benjamin A Bass | Date: 12-9-2022 | OPERATION PERMIT by: | Date:

AUTHORIZATION TO CONSTRUCT by: | Date: | Existing System Inspected By: | Date:

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

County: Iredell

This Section for Local Health Department Use Only

Initial submittal received: 12-1-2022 (Date) by BB. (Initials)

Permit Number: OSWP-2022-5108.

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: Benjamin A. Bell Date of Issuance: 12-9-2022.

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: 12-9-2027.

See attached site sketch

County: Iredell

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

PIN/Lot Identifier: 4765-91-5272

Issued To: Kenson Homes LLC

Property Location: Lot 16, Lone Pine Road, Statesville, NC. 28625

Subdivision: Carson Creek Lot #: 16 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: Pressure Mainfold 25% Reduction (Initial) Pressure Manifold 25% Reduction (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): 0.3GPD/ft2 Proposed LTAR (Repair): 0.3 GPD/ft2

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:

Add 3 inches of fill for a soil cap to the system.

Licensed Soil Scientist Print Name: Jeff Vaughan

Licensed Soil Scientist Signature: Jeff Vaughan Date: 8/12/22

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: 4765-91-5272

Issued To: Kenson Homes LLC

Property Location: Lot 16, Lone Pine Road, Statesville, NC. 28625

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** Pressure Mainfold 25% Reduction (Initial) Pressure Mainfold 25% Reduction (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: 1250 gallons Total Trench/Bed Length: 400 feet Trench/Bed Spacing: 9 feet on center

Drainfield square footage: 1200 Trench/Bed Width: 36 inches LTAR: 0.3 gpd/ft²

Soil Cover: 6 inches Slope Adjusted Maximum Trench/Bed Depth: 15 inches

Aggregate Depth: _____inches above pipe _____inches below pipe _____inches total

Pump Tank Size (if applicable): 1275 gallons Requires more than 1 pump? ☐ Yes ☒ No

Pump Requirements: 23.24 ft. TDH vs. 22.20 GPM Grease Trap Size (if applicable): NA 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: Bring in 3 inches of fill for a soil cap.

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: 8/12/22

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

See attached site sketch

County: Iredell.

This Section for Local Health Department Use Only

Initial submittal received: 12-9-2022 (Date) by BB. (Initials)

Permit Number: OSWP-2022-5108

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: Benjamin A. Batts Date of Issuance: 12-9-2022.

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.

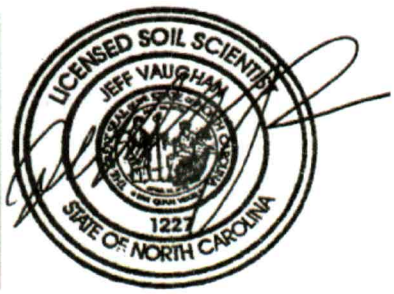
The Department, the Department's authorized agents, and the local health departments shall be discharged and released from any liabilities, duties, and responsibilities imposed by statute or in common law from any claim arising out of or attributed to plans, evaluations, preconstruction conference findings, 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: 12-9-2027.

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
Lot 16, Lone Pine Road, Statesville, NC 28625
Iredell County

PREPARED FOR: Kenson Homes, LLC, Client

PREPARED BY: Jeff Vaughan, Licensed Soil Scientist
Trevor Hackney, Environmental Scientist

DATE: July 18, 2021

Soil suitability for domestic sewage treatment and disposal systems was evaluated from June 23-27, 2022, for the property located on Lone Pine Road (Lot 16), Statesville, NC. Jeff Vaughan and Trevor Hackney of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. This evaluation was done to facilitate permitting 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, and boring locations is included in Attachment 1. Profile descriptions for each boring are included in Attachment 2. Additional documentation about the property is included in Attachment 3.

The total property area is approximately 1.25 acres. The property is an open field. The home and pool are proposed near the middle of the property with the septic system proposed towards the front of the property. The proposed system is a pump to pressure manifold septic system.

Soil Suitability for Domestic Sewage Treatment and Disposal Systems
The drawing in Attachment 1 details the property boundaries (as surveyed by Blue Ridge Engineering), soil boring locations, and layout of drain field trenches (Completed by AWT). Six soil borings were assessed 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 a hand auger. Soil borings 2-6 are being utilized for the drain field area.

A septic layout was performed to demonstrate available space (.1945). The layout in Attachment 1 indicates there is available space for a four-bedroom pressure manifold primary and repair septic system utilizing the 25% reduction of innovative drain field material for the primary and repair system.

The proposed LTAR (Long Term Acceptance Rate) by AWT is 0.3 GPD/ft^2. The soils on this property are group IV soils within the distribution and treatment zone as used to define the LTAR. Since usable soil depths meet or exceed 27" AWT is recommending the use of innovative style trench to utilize the 25% reduction for the initial and repair system. With an LTAR of 0.3 GPD/ft^2, 400 linear feet of innovative trench are necessary to support a four-bedroom home initial system. The repair field will require 400 linear feet of 25% reduction trench. The maximum trench bottom should not exceed 15". With this trench bottom depth a minimum of a 3 inch soil cap will need to be brought in. The attached drawing proves that 400 linear feet of trench can be installed for the primary system and 404 linear feet of trench can be installed for the repair system with the proposed home and pool location.

Any disturbances or grading done in the usable area will change the potential of using the area designated for a drain field. Prior to moving forward with building on the property, Iredell County Environmental Health Department should be contacted to complete the necessary review of this documentation to issue an IP (Improvement Permit) for the property and the CA (Construction Authorization).

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 in order 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)*

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

Sincerely,

Jeff Vaughan

Trevor Hackney

Trevor Hackney

Attachment 1: Site Plan/Drawing

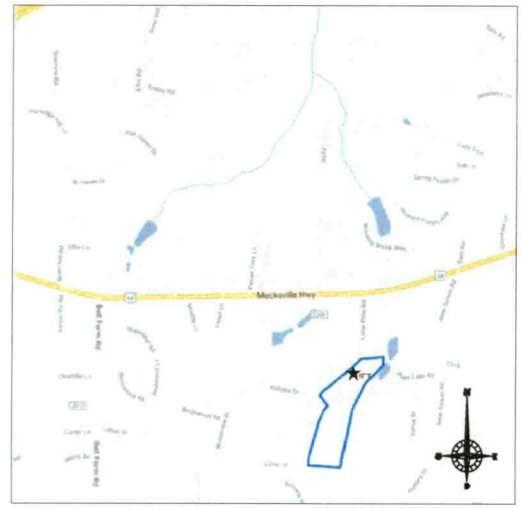
CARSON CREEK LOT 16

Project Location
179 Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272

Project Owner
Kenson Homes, LLC
185 Shelburne Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.com

Project Consultant
Jeff Vaughan, L.S.S
(919) 367-6313
Rodney L Huffman, PE
(919) 367-6313
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/ Pressure Manifold Distribution



VICINITY MAP

Sheet Index

Sheet 1	Cover Sheet
Sheet 2	Property Layout
Sheet 3	Component Layout
Sheet 4	Primary Drainfield
Sheet 5	Repair Drainfield
Sheet 6	Detail Sheet 1
Sheet 7	Detail Sheet 2
Sheet 8	Excavation Safety

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

Kenson Homes, LLC
Carson Creek Lot 16

Project Location:
179 Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272
PID: ----

Project Owner:
Kenson Homes, LLC
185 Shelburne Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.com

PROFESSIONAL ENGINEER SEAL

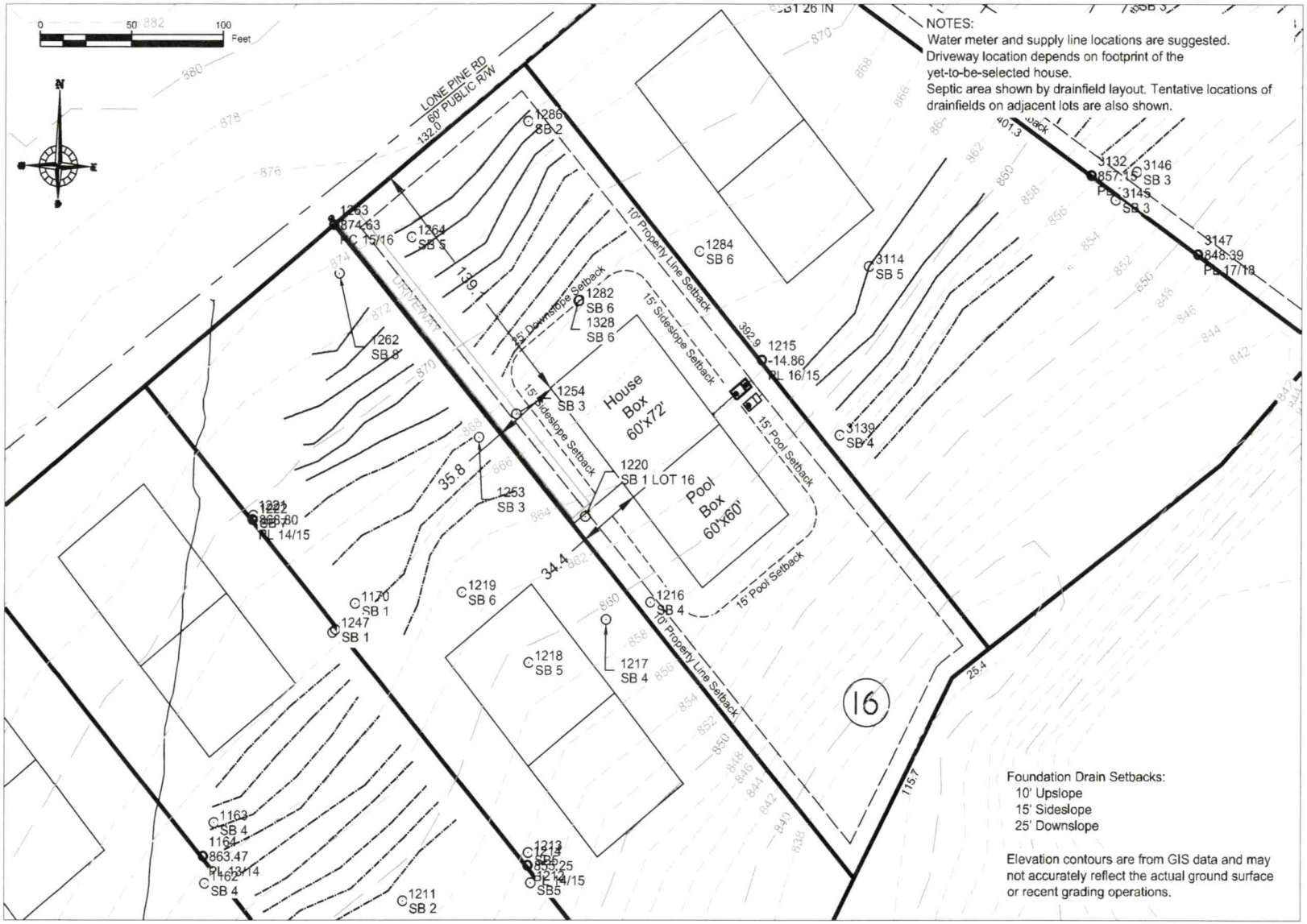
For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
---	---
RELEASED BY:	RELEASED ON:
---	---

DRAWING NUMBER
WW-1



PROPERTY LAYOUT

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

AWT
Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-459-9669
www.agriwaste.com

Kenson Homes, LLC
Carson Creek Lot 16

Project Location:
179 Lone Pine Rd
Statesville, NC 28625
Install County
PIN: 4764913272
PID: —

Project Owner:
Kenson Homes, LLC
185 Shellbarre Pl
Mooresville, NC 28117
760-522-7415
fkv4@aol.com

For Review Only

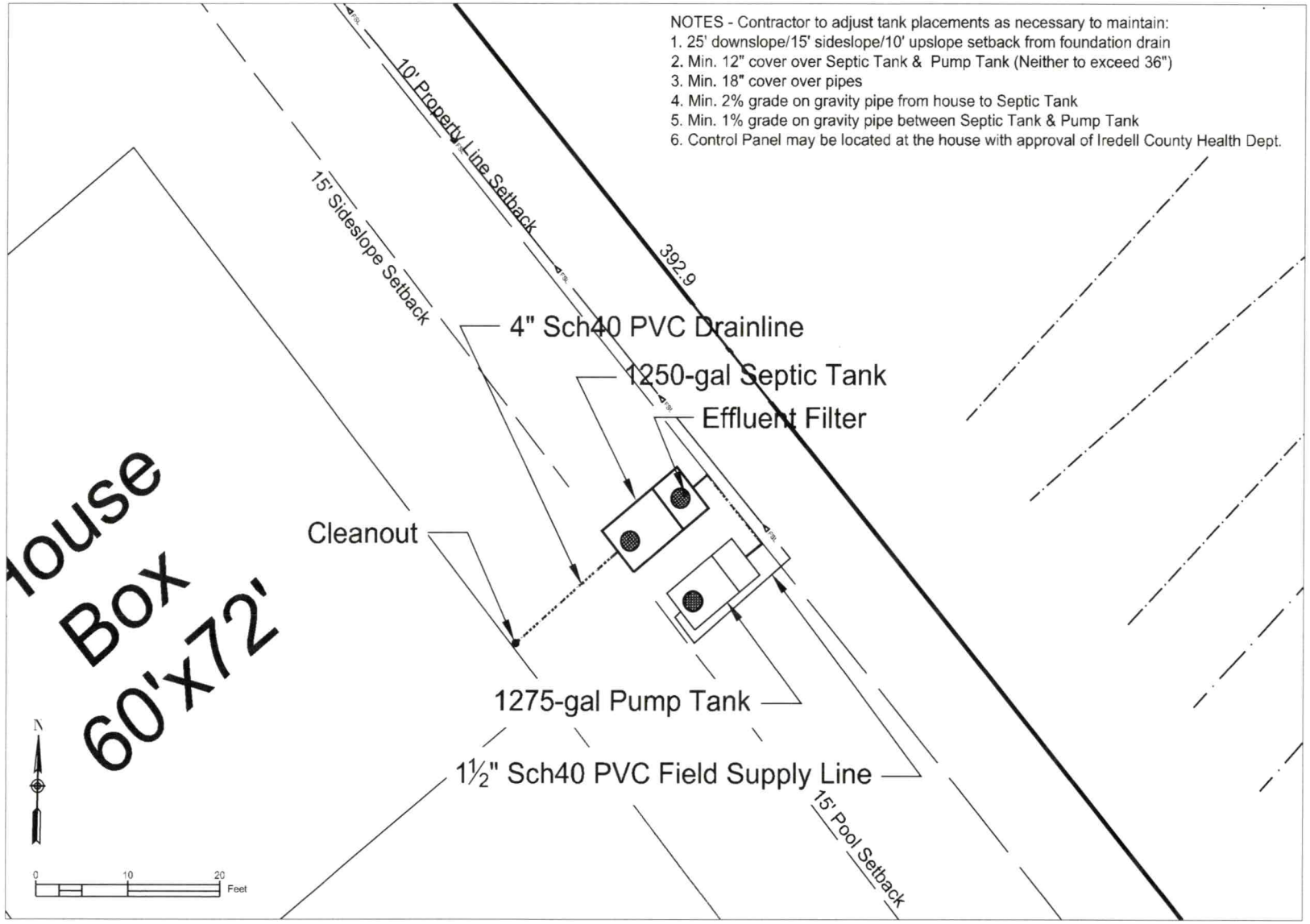
NO.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Property Layout

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
—	—
RELEASED BY:	RELEASED ON:
—	—

DRAWING NUMBER
WW-2

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 & Pump Tank (Neither to exceed 36")
3. Min. 18" cover over pipes
4. Min. 2% grade on gravity pipe from house to Septic Tank
5. Min. 1% grade on gravity pipe between Septic Tank & Pump Tank
6. Control Panel may be located at the house with approval of Iredell County Health Dept.



COMPONENT LAYOUT
WW-3 N.T.S. SOURCE: AWT, Inc.

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-459-9669
www.agriwaste.com

Kenson Homes, LLC
Carson Creek Lot 16

Project Location:
179 Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765815272
PID: —

Project Owner:
Kenson Homes, LLC
185 Shelburne Pl
Mooresville, NC 28117
760-522-7415
fkv43@aol.com

PROFESSIONAL ENGINEER SEAL

For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Component Layout

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
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 panel manufacturer's instructions.
5. Manifold 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 Chambers***

Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	yellow	102	3/4in SCH 80, Split	5.05	0.050	0.392
2	orange	98	3/4in SCH 80, Split	5.05	0.052	0.408
3	red	102	3/4in SCH 80, Split	5.05	0.050	0.392
4	white	98	3/4in SCH 80, Split	5.05	0.052	0.408
	Total	**400**	**Total**	**20.2**	**Avg.**	**0.400**



1 WW-4 Primary 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
919-858-0959
www.agriwaste.com

Kerson Homes, LLC
Carson Creek Lot 16

Project Location:
179 Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765915272
PID: —

Project Owner:
Kerson Homes, LLC
185 Shelburne Pl
Mooresville, NC 28117
700-522-7415
fivehtsol.com

PROFESSIONAL ENGINEER SEAL

For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Primary Drainfield

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
—	—
RELEASED BY:	RELEASED ON:
—	—

DRAWING NUMBER
WW-4

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 panel manufacturer's instructions.
5. Manifold 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 Chambers***

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
5	yellow	102	3/4in SCH 80, Split	5.05	0.050	0.392
6	orange	98	3/4in SCH 80, Split	5.05	0.052	0.408
7	red	102	3/4in SCH 80, Split	5.05	0.050	0.392
8	white	98	3/4in SCH 80, Split	5.05	0.052	0.408
	Total	**400**	**Total**	**20.2**	**Avg.**	**0.400**



Repair Drainfield

SOURCE: Agri-Waste Technology, Inc.

AWT
Engineers and Soil Scientists
Agri-Waste Technology, Inc.
301 N. Salem Street, Suite 203
Apex, North Carolina 27502
(919)-459-9959
www.agriwaste.com

Kenson Homes, LLC
Carson Creek Lot 16

Project Location:
173 Lone Pine Rd
Statesville, NC 28625
Iredell County
PIN: 4765816272
PID: ---

Project Owner:
Kenson Homes, LLC
185 Shelburne Pl
Mooresville, NC 28117
760-522-7415
fkw4@aol.com

PROFESSIONAL ENGINEER SEAL

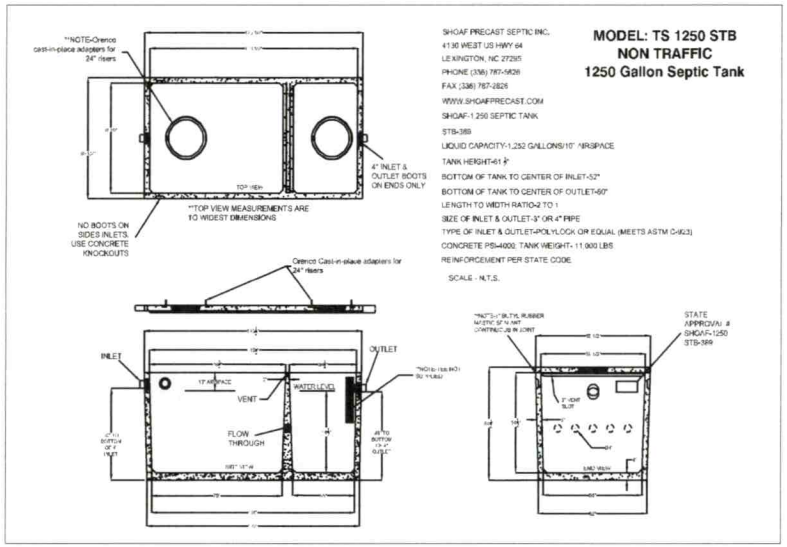
For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Repair Drainfield

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
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RELEASED BY:	RELEASED ON:
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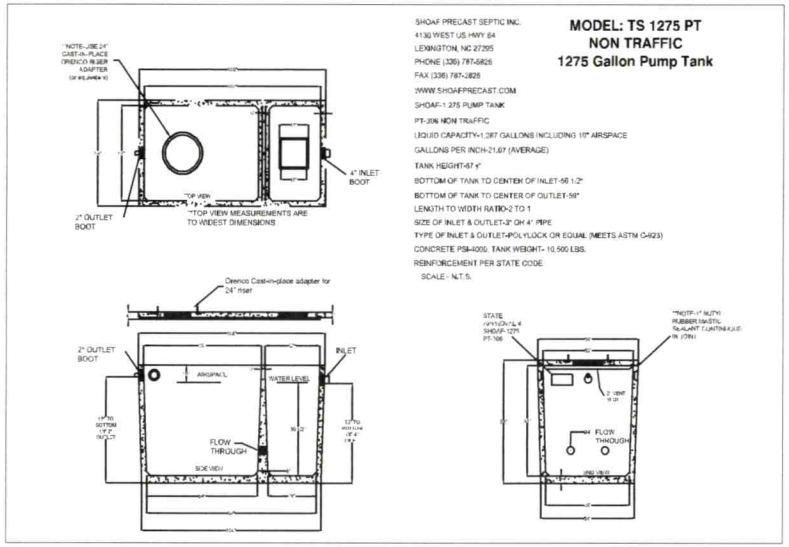
DRAWING NUMBER
WW-5



SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,250 SEPTIC TANK
STB-389
LIQUID CAPACITY-1,252 GALLONS/10" AIRSPACE
TANK HEIGHT-61 ½"
BOTTOM OF TANK TO CENTER OF INLET-52"
BOTTOM OF TANK TO CENTER OF OUTLET-60"
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.

MODEL: TS 1250 STB
NON TRAFFIC
1250 Gallon Septic Tank

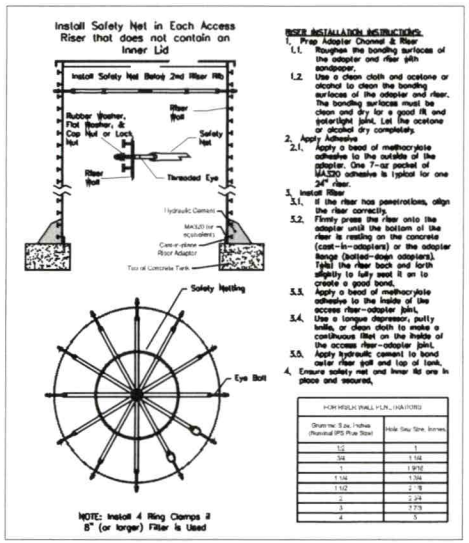
1 WW-6 Septic Tank (or equivalent 1,250-gal tank)
SOURCE: Shoaf Precast Septic, Inc.



SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM
SHOAF-1,275 PUMP TANK
PT-306 NON TRAFFIC
LIQUID CAPACITY-1,287 GALLONS INCLUDING 10" AIRSPACE
GALLONS PER INCH-21.67 (AVERAGE)
TANK HEIGHT-67 ½"
BOTTOM OF TANK TO CENTER OF INLET-56 1/2"
BOTTOM OF TANK TO CENTER OF OUTLET-58"
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.

MODEL: TS 1275 PT
NON TRAFFIC
1275 Gallon Pump Tank

2 WW-6 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 pith 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 galt and top of tank.
4. Ensure safety net and inner rib are in place and secured.

HDR 26/SCH 40 WALL PLYL. (WATER)	
Drain line: Size, Inches (Nominal IPS Pipe Size)	Hole Saw Size, Inches
1½	1
¾	1 1/16
1	1 5/16
1 1/4	1 3/4
1 1/2	2 1/8
2	2 3/4
3	3 7/8
4	5

3 WW-6 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. Two 15-amp circuits 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.
511 N. Salem Street, Suite 201
Apex, North Carolina 27502
919-859-0569
www.agriwaste.com

Kenson Homes, LLC
Carson Creek Lot 16

Project Location:
173 Lone Pine RD
Statesville, NC 28625
Iredell County
PIN: 4756913272
PID: ----

Project Owner:
Kenson Homes, LLC
185 Shelton Ln Pl
Mooresville, NC 28117
760-522-7415
flw4@aol.com

PROFESSIONAL ENGINEER SEAL

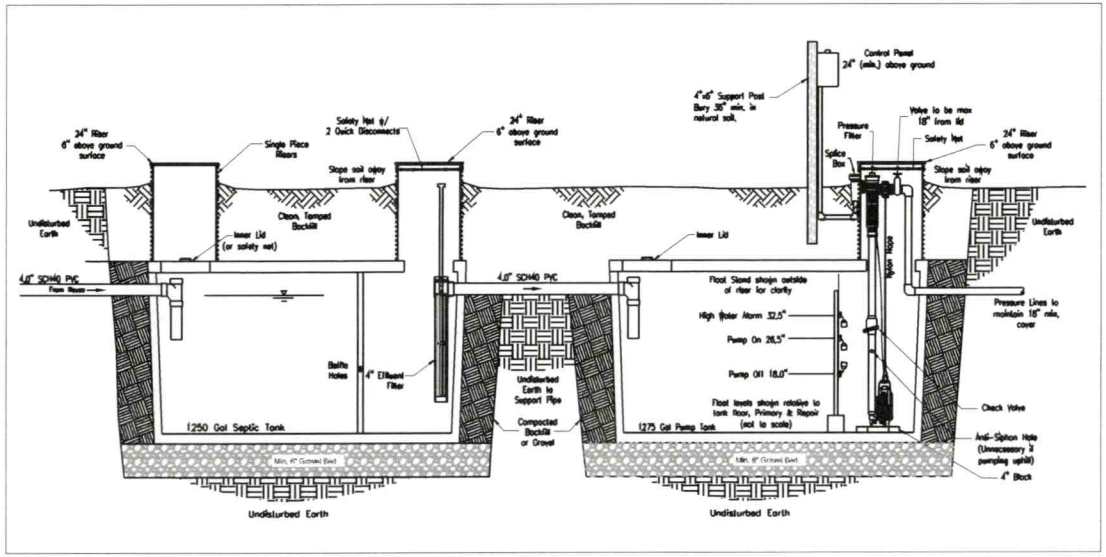
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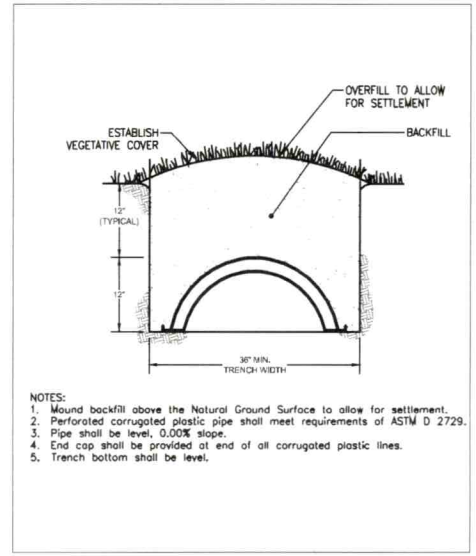
SHEET TITLE
Detail Sheet 1

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
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RELEASED BY:	RELEASED ON:
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DRAWING NUMBER
WW-6

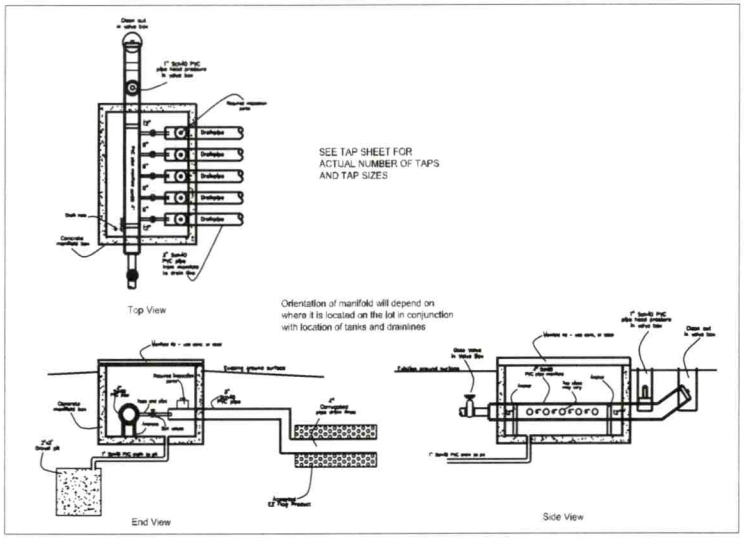


1 WW-7 **SYSTEM PROFILE VIEW**
N.T.S.

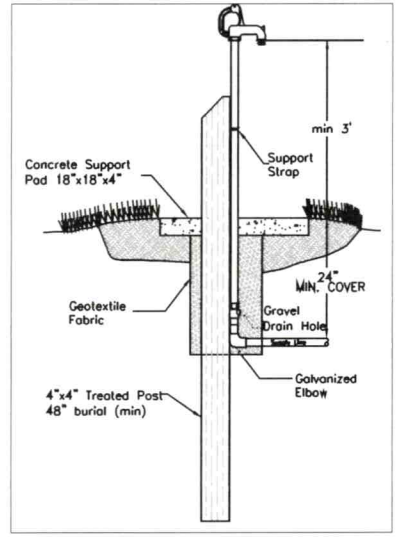


NOTES:
1. Mound backfill above the Natural Ground Surface to allow for settlement.
2. Perforated corrugated plastic pipe shall meet requirements of ASTM D 2729.
3. Pipe shall be level, 0.00% slope.
4. End cap shall be provided at end of all corrugated plastic lines.
5. Trench bottom shall be level.

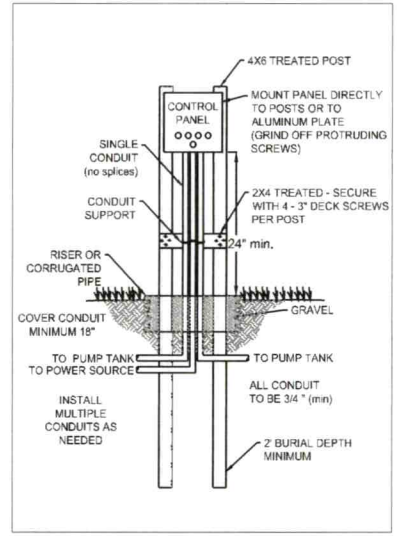
2 WW-7 **CHAMBERS - TRENCH X-SECTION (Typical)**
N.T.S. Source: AWT



4 WW-7 **PRESSURE MANIFOLD INSTALLATION (Typical) - For Illustration Only**
N.T.S. SOURCE: AWT



5 WW-7 **YARD HYDRANT (if required)**
N.T.S. SOURCE: AWT



6 WW-7 **CONTROL PANEL SUPPORT**
N.T.S. SOURCE: AWT

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Mooresville, NC 28117
780-522-7415
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PROFESSIONAL ENGINEER SEAL

For Review Only

REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Detail Sheet 2

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R. Huffman	8/8/2022
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RELEASED BY:	RELEASED ON:
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DRAWING NUMBER
WW-7

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.

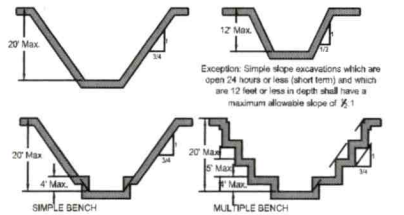
(d) Acceptable visual and manual tests

(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.

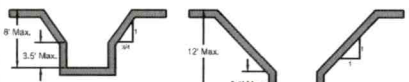
EXCAVATIONS IN TYPE A SOILS

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.

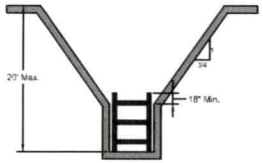
All benched excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1 and maxium bench dimensions as follows:



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.

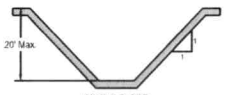
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



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).

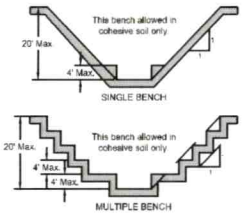
EXCAVATIONS IN TYPE B SOILS

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

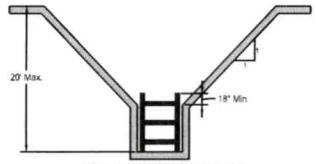


SIMPLE SLOPE

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



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.

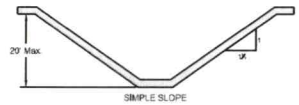


VERTICALLY SIDED LOWER PORTION

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

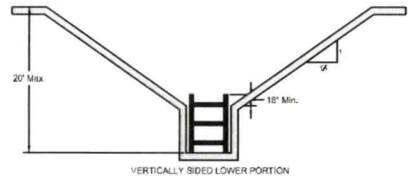
EXCAVATIONS IN TYPE C SOILS

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.

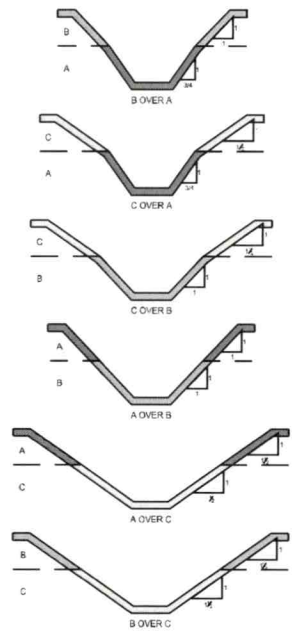


VERTICALLY SIDED LOWER PORTION

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.



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

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PROFESSIONAL ENGINEER SEAL

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REV.	ISSUED DATE	DESCRIPTION

SHEET TITLE
Excavation Safety

DRAWN BY:	CREATED ON:
R. Huffman	8/8/2022
REVISED BY:	REVISED ON:
—	—
RELEASED BY:	RELEASED ON:
—	—

DRAWING NUMBER
WW-8

Pressure Manifold System - Design Summary Page

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Agri-Waste Technology, Inc.

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919-859-0669
Engineer:
Rodney L. Huffman, PhD, PE
rhuffman@agriwaste.com

Project: Carson Creek Lot 16
Property: 179 Lone Pine Rd
Statesville, NC 28625
Subdiv.: Carson Creek
Lot #: 16

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Phone: 760-522-7415
Email: FKV4@aol.com

EHS:

Date: 8/8/2022
County: Iredell
Permit #:
Type of System: III b
PIN: 4765915272

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 Pressure Manifold
Trench Media: Chambers
Trench Width: 3 ft
Trench Depth: 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: 4
Minimum Line Spacing: 9 ft O.C.

Wastewater Treatment System Design Calculations

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
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: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
County: Iredell

Tank Manufacturer	Shoaf
Tank Model	TS 1275 PT

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

Primary System

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

Top of pump (including 4" block)	16.1 in.	(Pump height = 12 1/8")
Pump Off	18.0 in.	
Pump On	26.5 in.	(set for dose volume)
Alarm On	32.5 in.	(6 in. above On Float)

Emergency Storage Available	
Pump Tank	590 gal
Days of Storage	1.23 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)	16.1 in.	(Pump height = 12 1/8")
Pump Off	18.0 in.	
Pump On	26.5 in.	(set for dose volume)
Alarm On	32.5 in.	(6 in. above On Float)

Emergency Storage Available	
Pump Tank	590 gal
Days of Storage	1.23 days

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

ELEVATIONS

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
County: Iredell

Benchmark Iron pin - W corner of Lot 16
BM Elev 874.63 ft

Septic Tank	1,250 gal		
Ground Surface		864.04	ft
Depth of Soil Cover	14 in.	1.17	ft
Overall Ht of Tank	61.5 in.	5.13	ft
Elev, Base of Tank		857.75	ft
Ht to 4" Inlet Invert	50 in.	4.17	ft
Elev, 4" Inlet Invert		861.92	ft
Ht to 4" Outlet Invert	48 in.	4.00	ft
Elev, 4" Outlet Invert		861.75	ft
Gravel Base	6 in.	0.50	ft
Elev, Bot of Excavation		857.25	ft
Pump Tank	1275 gal		
Ground Surface		863.29	ft
Depth of Soil Cover	12 in.	1.00	ft
Overall Ht of Tank	67.5 in.	5.63	ft
Elev, Base of Tank		856.67	ft
Ht to 4" Inlet Invert	54.5 in.	4.54	ft
Elev, 4" Inlet Invert		861.21	ft
Ht to 2" Outlet Invert	58 in.	4.83	ft
Elev, 2" Outlet Invert		861.50	ft
Gravel Base	6 in.	0.50	ft
Elev, Bot of Excavation		856.17	ft
ST Inlet Pipe			
Grade @ Stub-out		864.1	ft
Depth of Stub-out, top		1.5	ft
Elev, Stub-out Invert		862.25	ft
Elev @ ST Inlet Invert		861.92	ft
Length		15	ft
Slope		2.2	%
Pipe, ST to PT			
ID	4 in.	0.33	ft
OD	4.5 in.	0.38	ft
Elev, ST Outlet Invert		861.75	ft
Elev, PT Inlet Invert		861.21	ft
Length		13.5	ft
Slope		4.0	%
Cover over inlet pipe		1.77	ft
Pump Reqmt.			
Floor Thickness	4 in.	0.33	ft
Elev, Pump Tank Floor		857.00	ft
Pump Block Ht.	4 in.	0.33	ft
Elev, Pump Intake		857.33	ft
Grade @ Primary Manifold		871.11	ft
Grade @ Repair Manifold		874.33	ft
Min. Cover	18 in.	1.50	ft
Max Elev, Primary		869.61	ft
Max Elev, Repair		872.83	ft
Elev Diff, Primary		12.28	ft
Elev Diff, Repair		15.50	ft

Drainfield Design

Project	Carson Creek Lot 16
Location	179 Lone Pine Rd
	Statesville, NC 28625
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	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**	Chambers
Req. Drainfield Area	1,600 ft^2	**Required Drainline**	
Trench Width	3 ft	**After 25% Reduction**	400 ft
Required Drainline	533 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	yellow	867.9	112	102	
2	Layout Line	orange	868.6	111	98	
3	Layout Line	red	869.4	110	102	
4	Layout Line	white	869.8	112	98	
5	Layout Line	yellow	870.6	113		102
6	Layout Line	orange	871.2	117		98
7	Layout Line	red	872.1	111		102
8	Layout Line	white	873.2	110		98
			Total	896	400	400
			Count	8	4	4

Note: Line length totals are shown to the nearest foot.
Effective trench length is shown for chambers. Add 1' for actual installation length.

PRESSURE MANIFOLD SYSTEM DESIGN (Primary)

Site Information

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
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 25% Reduction:	400	ft
L.T.A.R. Reduced:	0.400	gal/day/ft^2
L.T.A.R. Reduced + 5%:	0.420	gal/day/ft^2

DRAINFIELD INFO. - **Primary**

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

Line No.	Flag Color	Line Length (ft)	Tap	Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
1	yellow	102	3/4in SCH 80, Split	5.05	0.050	0.392
2	orange	98	3/4in SCH 80, Split	5.05	0.052	0.408
3	red	102	3/4in SCH 80, Split	5.05	0.050	0.392
4	white	98	3/4in SCH 80, Split	5.05	0.052	0.408
	Total	**400**	**Total**	**20.2**	**Avg.**	**0.400**

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

Total Run Time	23.76	min.	
Drainfield Capacity	261.2	gal	
% of Drainfield Cap	69.0%		(Req. Range 66-75%)
Dose Volume	180.2	gal/dose	
Run Time/Dose	**8.9**	**minutes**	Range 5-7 minutes unless uphill, checked
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	8.55	in.	

Manifold Box

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

PRESSURE MANIFOLD SYSTEM DESIGN (Repair)

Site Information

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
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 25% Reduction:	400	ft
L.T.A.R. Reduced:	0.400	gal/day/ft^2
L.T.A.R. Reduced + 5%:	0.420	gal/day/ft^2

DRAINFIELD INFO. - **Repair**

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

Line No.	Flag Color	Line Length (ft.)		Flow (gpm)	Flow/Foot (gpm/ft)	Line L.T.A.R.
5	yellow	102	3/4in SCH 80, Split	5.05	0.050	0.392
6	orange	98	3/4in SCH 80, Split	5.05	0.052	0.408
7	red	102	3/4in SCH 80, Split	5.05	0.050	0.392
8	white	98	3/4in SCH 80, Split	5.05	0.052	0.408
	Total	**400**	**Total**	**20.2**	**Avg.**	**0.400**

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

Total Run Time	23.76	min.	
Drainfield Capacity	261.2	gal	
% of Drainfield Cap	69.0%		(Req. Range 66-75%)
Dose Volume	180.2	gal/dose	
Run Time/Dose	**8.9**	**minutes**	Range 5-7 minutes unless uphill, checked
Volume/depth	21.07	gal/in.	(Per tank manufacturer's specifications)
Estimated Drawdown	8.55	in.	

Manifold Box

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

PUMP DESIGN

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

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
County: Iredell

Friction Losses

Suction Head	0 ft		*(submersible 0)*
Elev. Difference (highest point from pump)	12.28 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	20.2 gpm
Pipe Length	177 ft	Velocity	3.26 ft/sec
Pipe Length for Fittings	17.7 ft		Meets requirement that 2 ft/s < v < 5 ft/s.
Equivalent Length	194.7 ft		
Estimated Friction Loss in Supply Line	5.23 ft		
Pressure Filter Friction Loss	0.23 ft		*(from manufacturer)*
Friction Loss - Taps/Special Fittings	3.5 ft		
TOTAL	**23.24 ft.**		

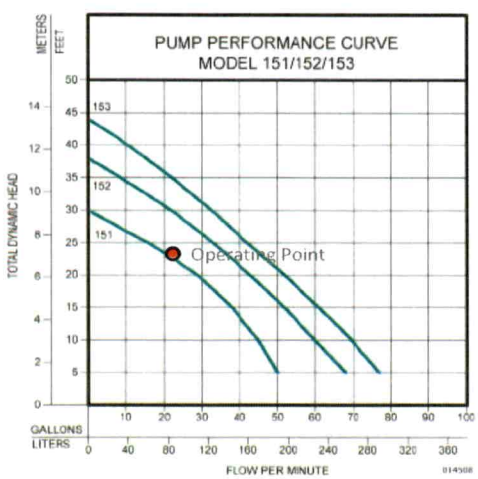
Flow for Anti-Siphon Hole

Hole Diameter	3/16 in.
Hole Flowrate	2.00 gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**22.20 gpm**	
Required Horsepower	0.21 hp	
TDH	**23.24 ft**	

Pump Selection

Manufacturer:	Zoeller
Model:	N152
Horsepower:	**0.4**



PUMP DESIGN

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

Project: Carson Creek Lot 16
Location: 179 Lone Pine Rd
Statesville, NC 28625
County: Iredell

Friction Losses

Suction Head	0 ft		*(submersible 0)*
Elev. Difference (highest point from pump)	15.50 ft		
Design Pressure At Outlet	2 ft		

Supply Line - *2.0" Schedule 40 PVC*

Pipe Diameter, Nominal	1.5 in.		
Pipe Diameter (ID)	1.59 in.	Flow	20.2 gpm
Pipe Length	217 ft	Velocity	3.26 ft/s
Pipe Length for Fittings	21.7 ft		Meets requirement that 2 ft/s < v <
Equivalent Length	238.7 ft		
Estimated Friction Loss in Supply Line		6.41 ft	
Pressure Filter Friction Loss		0.23 ft	*(from manufacturer)*
Friction Loss - Taps/Special Fittings		3.5 ft	
TOTAL		**27.64 ft.**	

Flow for Anti-Siphon Hole

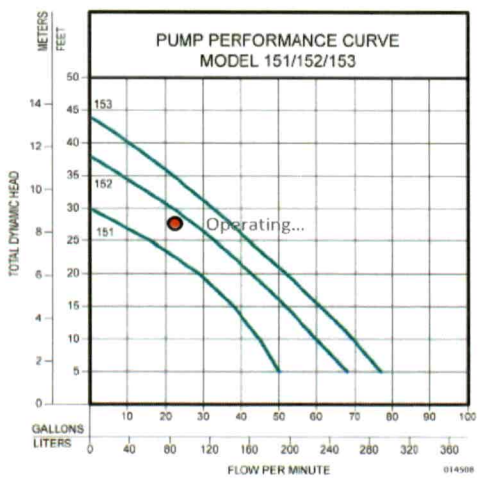
Hole Diameter	3/16 in.
Hole Flowrate	2.18 gpm

Pump Efficiency	0.7	*(assumed, typical)*
Motor Efficiency	0.9	*(assumed for electric pumps)*
Flow	**22.38 gpm**	

Required Horsepower	0.25 hp
TDH	**27.64 ft.**

Pump Selection

Manufacturer:	Zoeller
Model:	N152
Horsepower:	**0.4**



Attachment 2: Soil Boring Description Sheets

COUNTY: Iredell Co.

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

CLIENT: Kenson Properties LLC APPLICATION DATE
ADDRESS: Lone Pine rd Statesville, NC (Lot 16) DATE EVALUATED: 6/23/22-6/27/2022
PROPOSED FACILITY: Single Family Residence PROPOSED DESIGN FLOW (.1949): 480 GPD PROPERTY SIZE: 1.25
LOCATION OF SITE: Lone Pine rd Statesville, NC (Lot 16) PROPERTY RECORDED:
WATER SUPPLY: ☐ Private ☒ Public ☐ Well ☐ Spring ☐ Other
EVALUATION METHOD: ☒ Auger Boring ☐ Pit ☐ Cut TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941)		OTHER PROFILE FACTORS				PROFILE CLASS & LTAR
			.1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	.1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	
SB 1	10%	0-12"	SCL; GR	SS; SP; FR	C2 observed	26"	-	C2	Provisionally Suitable 0.25
		12-26"	C; SBK	SS; SP; FI					
		26+	SS; SP; FI	C; SBK					
SB 2	7%	0-10"	SCL;GR	SS; SP; FR		44"	-	SAP	Provisionally Suitable 0.3
		10-30"	C; SBK	SS; SP; FI					
		30-44"	CL; WSBK	SS; SP; FR					
		44+	CL; MA	SS; SP; FR					
SB 3	12%	0-8"	SCL; GR	SS; SP; FR	-	41"	-	SAP	Provisionally Suitable 0.3
		8-30"	C; SBK	SS; SP; FI					
		30-41"	CL; WSBK	SS; SP; FR					
		41+"	CL; MA	SS; SP; FR					
SB 4	8%	0-10"	SCL; GR	SS; SP; FR	-	30"	-	-	Provisionally Suitable 0.3
		10-30"	C; SBK	SS; SP; FI					
		30+"	C; SBK	SS; SP; FI					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	Provisionally Suitable	Provisionally Suitable
System Type(s)	Conventional Innovative	Conventional Innovative
Site LTAR	0.3 GPD/Ft^2	0.3 GPD/Ft^2

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

EVALUATED BY: Jeff Vaughan
OTHER(S) PRESENT: Trevor Hackney

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).



SOIL/SITE EVALUATION

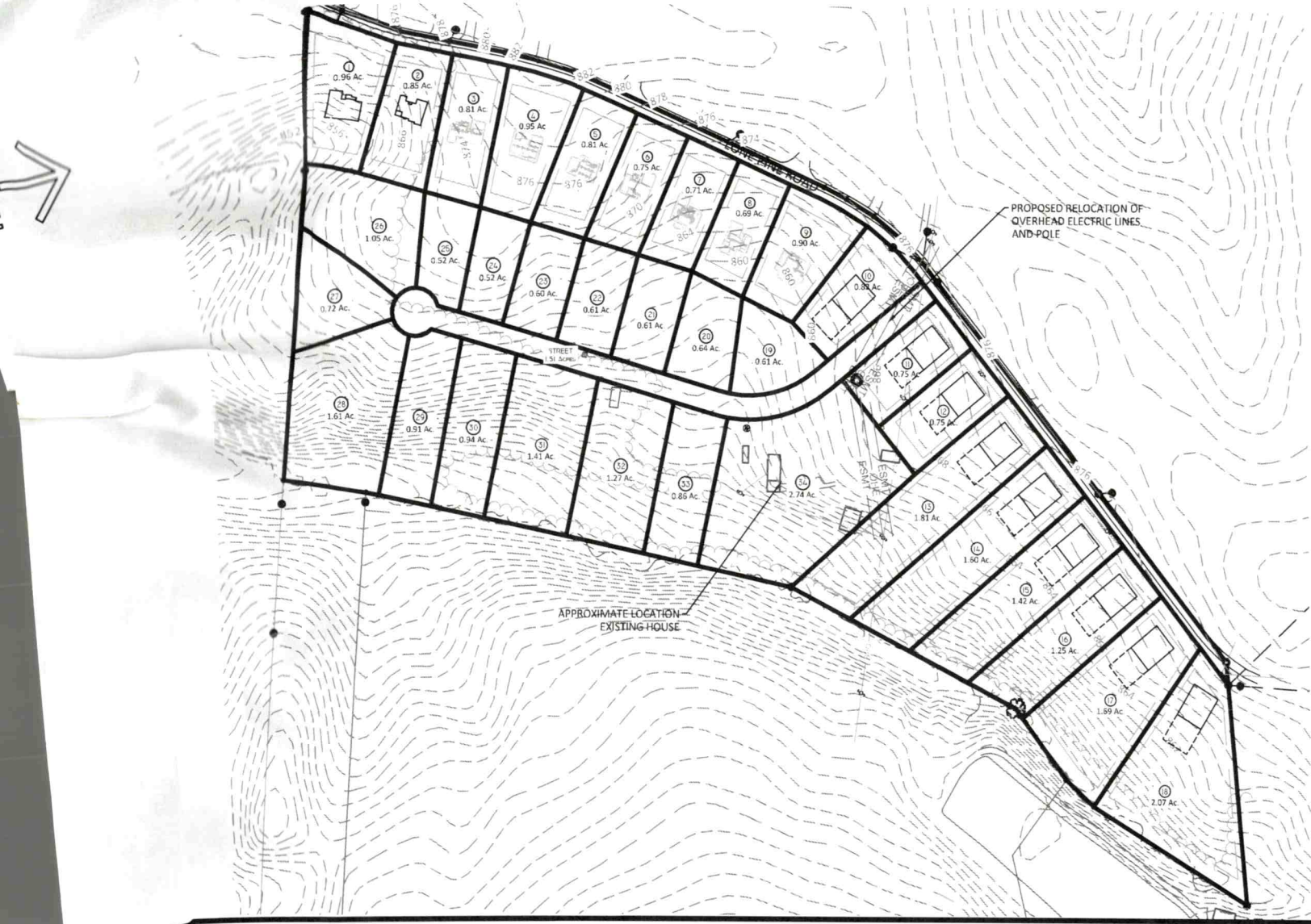
(Continuation Sheet-Complete all field in full)

PROPERTY ID #:
DATE OF EVALUATION: ___6/23/22-6/27/22
COUNTY: _ Iredell Co.__

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	
SB 5	5%	0-28"	C; SBK	SS; SP; FI	-	48"	-	-	0.3
		28-48"	CL; WSBK	SS; SP; FR					
SB 6	8%	0-12"	SCL; GR	SS; SP; FR	-	48"	-	-	0.3
		12-48"	C; SBK	SS; SP; FI					

COMMENTS:_____

Attachment 3: Additional Documentation



PRELIMINARY - SKETCH PLAN

THIS IS A PRELIMINARY SKETCH PLAN INTENDED FOR PLANNING AND DESIGN. THIS IS NOT A CONSTRUCTION PLAN. THIS PLAN HAS NOT BEEN APPROVED BY GOVERNING AUTHORITIES. ZONING COMPLIANCE DATA SHOWN HEREON HAS NOT BEEN CONFIRMED BY GOVERNING AUTHORITIES.

0 200 400 600

SCALE: 1" = 200'

Blue Ridge Engineering PLLC
924 Main Street - Suite 200
North Wilkesboro, NC 28659
336.838.2500
www.ridge.blue
Firm #P-0205

HOUSE LAYOUT SKETCH PLAN

JOB #18066
LOTS 1,2, 10-18
March 16, 2021

KENSON PROPERTIES, LLC
PROPOSED RESIDENTIAL SUBDIVISION
LONE PINE ROAD STATESVILLE, NC