



**North Carolina Onsite Wastewater Contractor Inspector Certification Board
Authorized Onsite Wastewater Evaluator Permit Option for Non-Engineered Systems
Notice of Intent (NOI) to Construct**

New Expansion Repair Relocation Relocation of Repair Area

Owner or Legal Representative Information:
 Name: Stewart-Proctor, PLLC c/o Michael Stewart, PE
 Mailing address: 319 Chaponoke Rd #106 City: Raleigh State: NC Zip: 27603
 Phone: 919-779-1855 Email: stewartpe@aol.com

Authorized Onsite Wastewater Evaluator Information:
 Name: Jeff Vaughan Certification #: 10003E
 Mailing address: 501 N Salem St, Ste 203 City: Apex State: NC Zip: 27502
 Phone: 919-859-0669 Email: jvaughan@agriwaste.com

Site Location Information:
 Site address: Rawls Church Rd, Fuquay Varina, NC 27526
 Tax parcel identification number or subdivision lot, block number of property: 0655-50-7726
 County: Harnett

System Information:
 Wastewater System Type: IIIb
 Daily Design Flow: 1,250
 Sapro-lite System: Yes No Subsurface Operator Required: Yes No
 Water Supply Type: Private Well Public Water Supply Spring Other: _____

Facility Type:
 Residential # Bedrooms _____ Maximum # of Occupants _____
 Business Type of Business and Basis for Flow: Dealership - 50 employees
 Public Assembly Type of Public Assembly and Basis for Flow: _____



Required Attachments:
 Plat or Site Plan
 Evaluation of Soil and Site Features by Licensed Soil Scientist

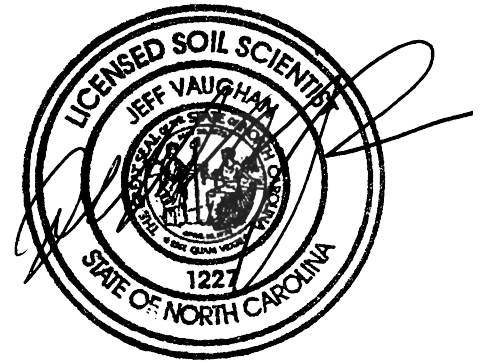
Attest: On this the 29 day of NOV, 2023 by signature below I hereby attest that the information required to be included with this NOI to Construct is accurate and complete to the best of my knowledge. Furthermore, I hereby attest that I have adhered to the laws and rules governing onsite wastewater systems in the state of North Carolina.
 This NOI shall expire on 29 day of NOV, 2028.
 Signature of Authorized Onsite Wastewater Evaluator: *Jeff Vaughan*
 Signature of Owner or Legal Representative: _____

Disclosure: The owner may apply for a building permit for the project upon submitting a complete NOI to Construct and the fee required (if any) to the local health department. An onsite wastewater system authorized by an authorized onsite wastewater evaluator shall be transferable to a new owner with the consent of the authorized onsite wastewater evaluator.

Local Health Department Receipt Acknowledgement:
 Signature of Local Health Department Representative: _____ Date: _____



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



**Soil Suitability for Domestic Sewage Treatment and Disposal Systems
Revels Tractor
Rawls Church Rd, Fuquay Varina, NC 27526
(PIN: 0655-50-7726; Harnett County)**

PREPARED FOR: Stewart-Proctor, PLLC c/o Michael Stewart, PE

PREPARED BY: Jeff Vaughan, Senior Agronomist & Soil Scientist
Trent Bostic, Senior Associate Soil Scientist

DATE: November 30, 2023

Soil suitability for domestic sewage treatment and disposal systems was evaluated on September 13, 2023, for the property located at Rawls Church Road in Fuquay Varina, NC. A layout was also performed. Jeff Vaughan, Trent Bostic, and Heath Clapp of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. This evaluation was done to facilitate permitting for a septic system. This report and attached documents were prepared to meet the requirements for an Authorized On-Site Wastewater Evaluator to meet G.S. 130A-336.2

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.

Site Conditions

The total property area is approximately 12.76 acres. The property is an open field. The drawing in Attachment 1 details the property boundaries, building locations, boring locations, and layout of drain field trenches (Completed by AWT).

Soil Suitability for Domestic Sewage Treatment and Disposal Systems

Multiple 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 shown are provisionally suitable for a conventional style trench. The proposed LTAR (Long Term Acceptance Rate) by AWT is 0.4 GPD/ft². The soils on this property are group IV soils within the distribution and treatment zone as used to define the LTAR. The maximum trench bottom should not exceed 24”.

Field Layout & System Design

A septic layout was performed to demonstrate available space (.1945). The layout in Attachment 1 indicates there is available space for a 1,250 GPD primary and repair system utilizing a 25% reduction product. With an LTAR of 0.4 GPD/ft², 781 linear feet of trench is necessary to support a the 50-employee business initial and 781 linear feet of trench is required for the repair system. The attached drawing proves that 1,600+ linear feet of trench can be installed within the proposed location on the property. The proposed initial septic system is a pressure manifold innovative/accepted status product with a 25% reduction. The repair will also be a pressure manifold utilizing an innovative/accepted status product with a 25% reduction.

Any disturbances or grading done in the usable soils area may change the potential of using the area designated for a drain field and can result in a revoked permit.

A pre-construction meeting with the installer and AOWE is required before system installation.

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

Sincerely,

Jeff Vaughan, AOWE

A handwritten signature in black ink, appearing to read "Jeff Vaughan". The signature is stylized and cursive.

Property ID#: 0655-50-7726
 Property Recorded: _____
 County: Harnett

**SOIL/SITE EVALUATION
 FOR
 ON-SITE WASTEWATER SYSTEM**

Applicant: Michael-Stewart, Stewart-Proctor, PLLC
 Address: 319 Chapanoke Road #106,
Raleigh, NC 27603

Buyer: __ Agent: __ Phone: (919)779-1855
 Date Evaluated: 8/3/2023
 Proposed Facility: Commercial
 Property Size: 12.76 Acres

Location Site: 0 Rawls Church Road, Fuquay Varina, NC 27526

Water Supply: On Site Well__ Comm. Well__ Public__ Other__

Evaluation Method: Auger Boring X Pit __ Cut __

TYPICAL PROFILE

| Horizon/ Depth (IN) | Matrix | Mottles | Mottle Abundance / Contrast | (a)(1) Texture | (a)(2) Structure | (a)(3) Minerolog y | Consistence Wet | Consistence Moist |
|------------------------|-----------------|------------------|-----------------------------------|-------------------|---------------------|--------------------------|--------------------|----------------------|
| A 0-14" | 10YR 5/2 | None | None | LS | GR | NEXP | NS, NP | Fr |
| E 14-25" | 2.5Y 6/4 | None | None | LS | GR | NEXP | NS, NP | Fr |
| Bt1 25-36"+ | 10YR 5/8 | 7.5YR 5/8 | 1, m, D | SCL | SBK | SEXP | SS, SP | Fr |
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|------------------------------|--------------------------|--------------|--|
| .1940 Landscape Pos/Slope % | - Suitable, <15% | Profile LTAR | - 0.4 – 0.1 GPD/ft ² |
| .1942 Wetness Condition | - Suitable | System Type | - Provisionally suitable for conventional or shallow conventional septic systems due to texture, structure, and depth. |
| .1943/.1956 Saprolite | - Suitable | | |
| .1944 Restrictive Horizon | - Suitable | | |
| .1948 Profile Classification | - Provisionally suitable | | |

Comments: Represents majority of borings in the suitable area. Some indications of wetness were seen, but were not dominant in the profiles.

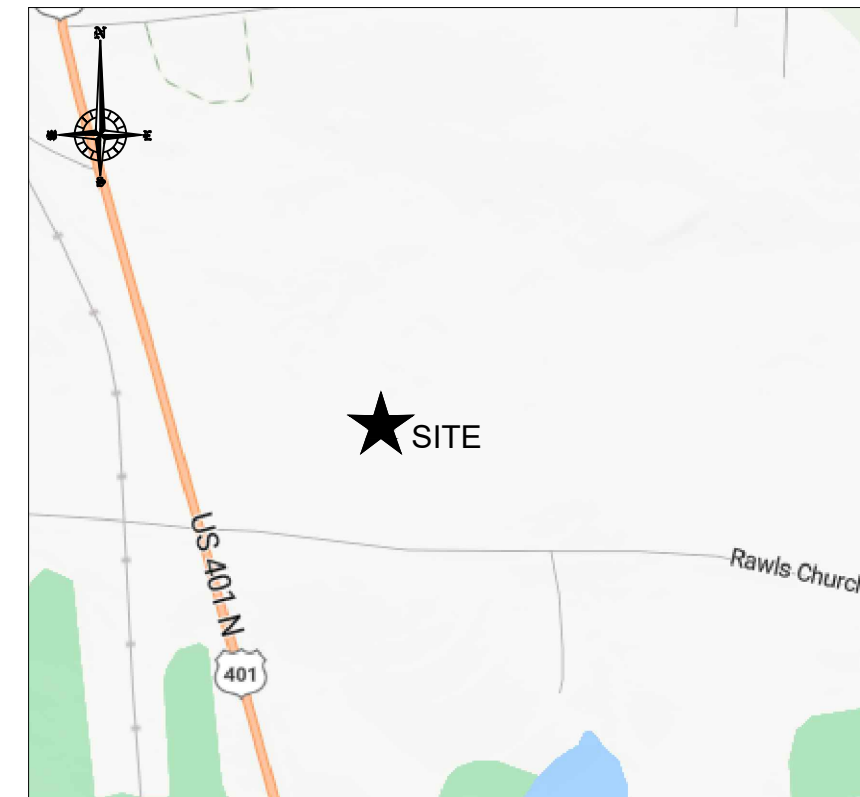
EVALUATED BY: Heath Clapp, Brent Purdum
COMMENTS: _____

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

| <u>LANDSCAPE POSITION</u> | <u>TEXTURE GROUP</u> | <u>TEXTURE CLASS</u> | <u>.1955 LTAR</u> (gal/day/sqft) |
|---------------------------|----------------------|-----------------------|-------------------------------------|
| CC - Concave Slope | I | S - Sand | 1.2 - .08 |
| CV - Convex Slope | | LS - Loamy Sand | |
| DS - Debris Slump | II | SL - Sandy Loam | 0.8 - 0.6 |
| D - Depression | | L - Loam | |
| DW - Drainage Way | III | SCL - Sandy Clay Loam | 0.6 - 0.3 |
| FP - Flood Plain | | CL - Clay Loam | |
| FS - Foot Slope | | SiL - Silt Loam | |
| H - Head Slope | | Si - Silt | |
| I - Interflueve | | SiCL - Silt Clay Loam | |
| L - Linear Slope | IV | SC - Sandy Clay | 0.4 - 0.1 |
| N - Nose Slope | | C - Clay | |
| P - Pocosin | | SiC - Silty Clay | |
| R - Ridge | | O - Organic | |
| S - Shoulder | | | |
| T - Terrace | | | |
| <u>MOIST CONSISTENCE</u> | | <u>MOTTLES</u> | <u>WET CONSISTENCE</u> |
| <u>STRUCTURE</u> | Vfr - Very Friable | 1 - Few | NS - Non Sticky |
| G - Single Grain | Fr - Friable | 2 - Common | SS - Slightly Sticky |
| M - Massive | Fi - Firm | 3 - Many | S - Sticky |
| CR - Crumb | Vfi - Very Firm | | VS - Very Sticky |
| GR - Granular | Efi - Extremely Firm | F - Faint | |
| SBK - Subgranular Blocky | | D - Distinct | NP - Non Plastic |
| ABK - Angular Blocky | | P - Prominent | SP - Slightly Plastic |
| PL - Platy | | f - Fine | P - Plastic |
| PR - Prismatic | | m - Medium | VP - Very Plastic |
| | | c - Coarse | |

REVELS TRACTOR

| | |
|--------------------|--|
| Project Location | Rawls Church Rd Fuquay Varina, NC 27526 Harnett County PIN: 0655-50-7726 |
| Project Owner | Stewart-Proctor, PLC 319 Chapanoke Rd #106 Raleigh, NC 27603 919-779-1855 stewartpe@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 | Business 50 Employees, 1,250 GPD Pressure Manifold Accepted/Innovative Trench Product |



VICINITY MAP

Sheet Index

| | |
|---------|-----------------|
| Sheet 1 | Cover Sheet |
| Sheet 2 | Property Layout |
| Sheet 3 | Primary Layout |
| Sheet 4 | Repair Layout |
| Sheet 5 | Tank Sheet |
| Sheet 6 | Detail Sheet |

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

Stewart-Proctor, PLC
Revels Tractor

Project Location:
Rawls Church Rd
Fuquay Varina, NC 27526
Harnett County
PIN: 0655-50-7726

Project Owner:
Stewart-Proctor, PLC
319 Chapanoke Rd #106
Raleigh, NC 27603
919-779-1855
stewartpe@aol.com

NC ONSITE WASTEWATER
EVALUATOR SEAL



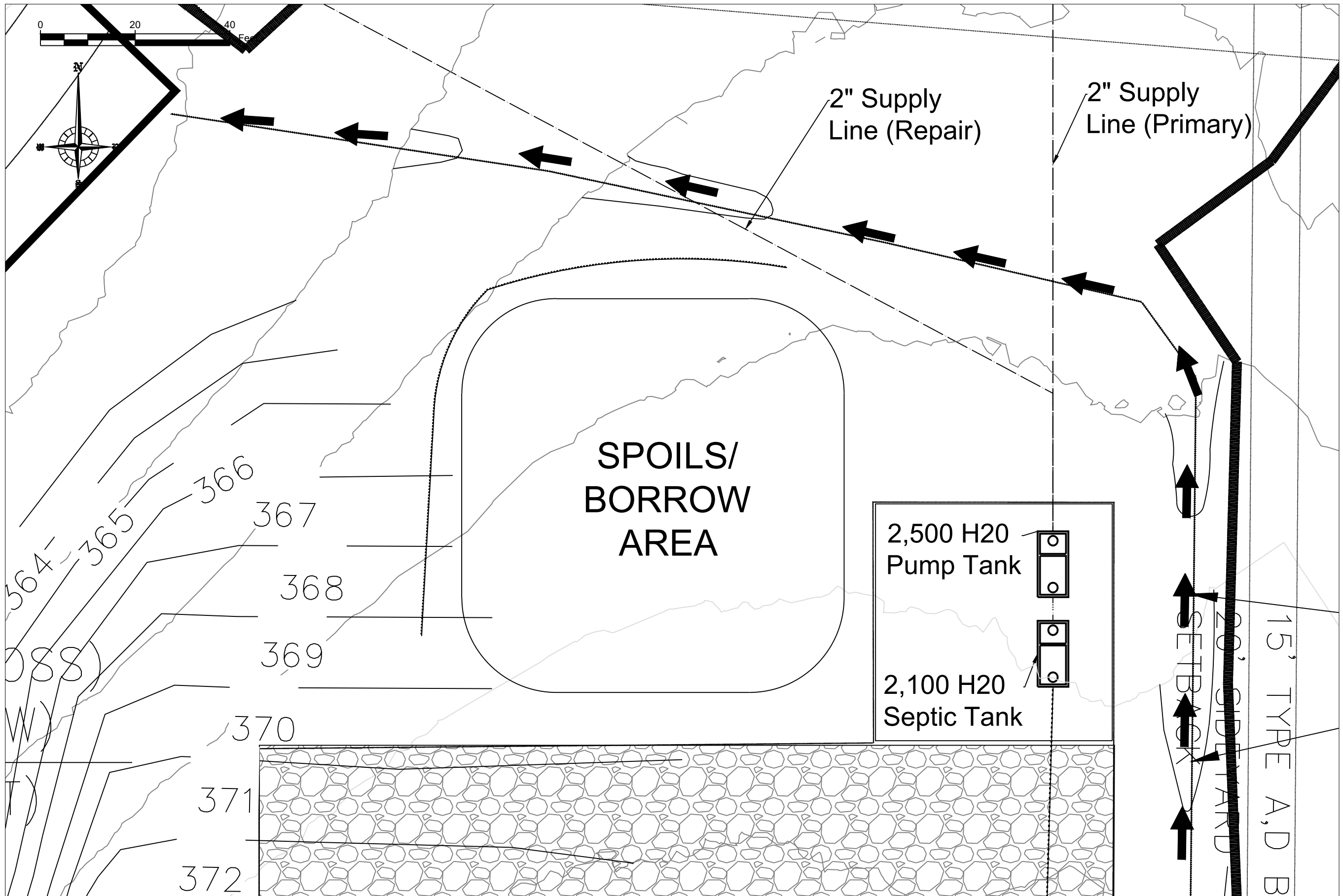
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SHEET TITLE
Cover Sheet

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|------------------------|---------------------------|
| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

DRAWING NUMBER
WW-1





Stewart-Proctor, PLC
 Revels Tractor

Project Location:
 Rawls Church Rd
 Fuquay Varina, NC 27526
 Harnett County
 PIN: 0655-50-7726

Project Owner:
 Stewart-Proctor, PLC
 319 Chapanoke Rd #106
 Raleigh, NC 27603
 919-779-1855
 stewartpe@aol.com

NC ONSITE WASTEWATER
 EVALUATOR SEAL



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SHEET TITLE

Tank Location

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|------------------------|---------------------------|
| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

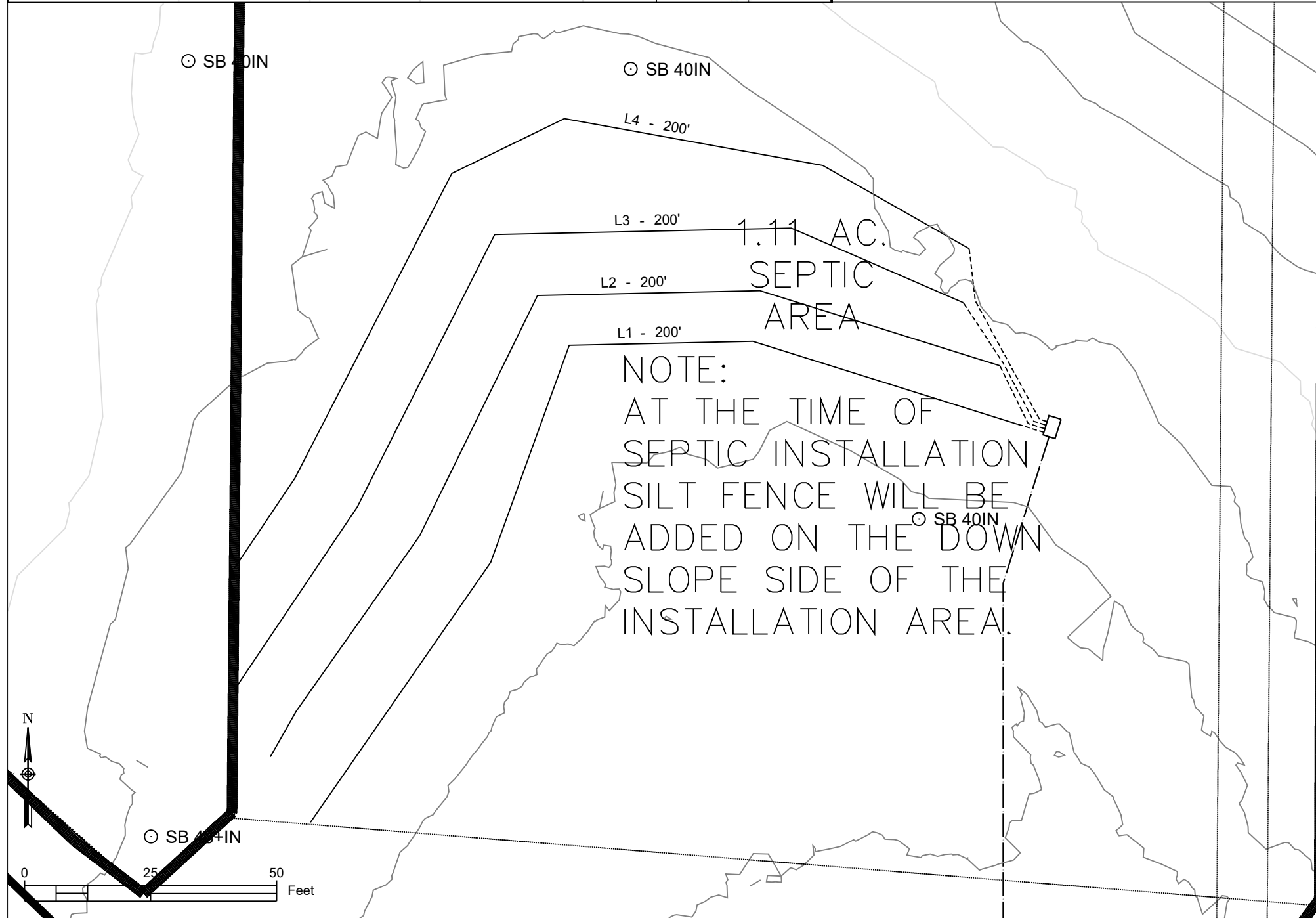
DRAWING NUMBER
WW-3

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. - Primary | | | | | | |
|---------------------------------------|------------|--|--------------|--------------|--------------------|---------------|
| Proposed Type of System/Distribution: | | Pump to Pressure Manifold using EZflow | | | | |
| Line No. | Flag Color | Line Length (ft) | Tap | Flow (gpm) | Flow/Foot (gpm/ft) | Line L.T.A.R. |
| 1 | purple | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 2 | white | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 3 | red | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 4 | yellow | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| Total | | 800 | Total | 28.44 | Avg. | 0.521 |

Note:
Primary distribution is pressure manifold utilizing accepted trench product.



Primary Drainfield
SOURCE: Agri-Waste Technology, Inc.

Stewart-Proctor, PLC
Revels Tractor

Project Location:
Rawls Church Rd
Fuquay Varina, NC 27526
Harnett County
PIN: 0655-50-7726

Project Owner:
Stewart-Proctor, PLC
319 Chapanoke Rd #106
Raleigh, NC 27603
919-779-1855
stewartpe@aol.com

NC ONSITE WASTEWATER EVALUATOR SEAL



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SHEET TITLE
Primary Drainfield

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| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

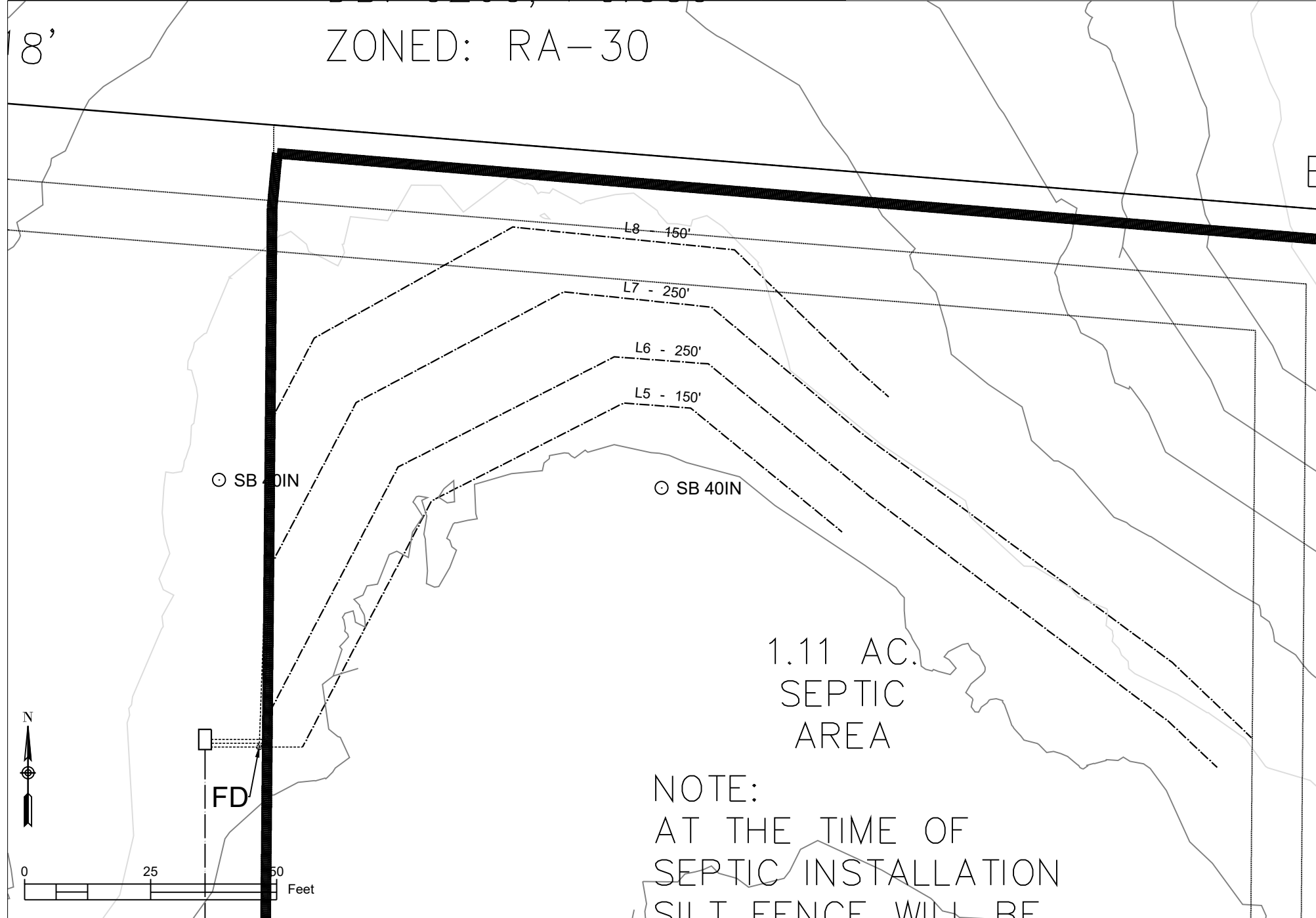
DRAWING NUMBER
WW-4

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 manufacturer's instructions.
5. Supply lines shall be installed with a minimum of 18" cover.
6. The trenches shall be backfilled appropriately so that no low areas are present.
7. Apply lime over the drainfield area as needed. Seed fine fescue over the drainfield at the rate recommended by the seed manufacturer. Hand rake the seed into the soil surface. Straw the seeded area at the rate of 1.5-2 bales per 1000 sq. ft.

| DRAINFIELD INFO. - Repair | | | | | | |
|---------------------------------------|------------|--|---------------------|-------------|--------------------|---------------|
| Proposed Type of System/Distribution: | | Pump to Pressure Manifold using EZflow | | | | |
| Line No. | Flag Color | Line Length (ft.) | | Flow (gpm) | Flow/Foot (gpm/ft) | Line L.T.A.R. |
| 5 | orange | 150 | 3/4in SCH 40, Split | 6.25 | 0.042 | 0.531 |
| 6 | blue | 250 | 3/4in SCH 80 | 10.10 | 0.040 | 0.515 |
| 7 | orange | 250 | 3/4in SCH 80 | 10.10 | 0.040 | 0.515 |
| 8 | purple | 150 | 3/4in SCH 40, Split | 6.25 | 0.042 | 0.531 |
| Total | | 800 | Total | 32.7 | Avg. | 0.523 |

Note:
Repair distribution is pressure manifold utilizing accepted trench product.



1 Repair Drainfield
SOURCE: Agri-Waste Technology, Inc.



NC ONSITE WASTEWATER EVALUATOR SEAL

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SHEET TITLE
Repair Drainfield

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| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

DRAWING NUMBER
WW-5

Stewart-Proctor, PLC
Revels Tractor
Project Location:
Rawls Church Rd
Fuquay Varina, NC 27526
Harnett County
PIN: 0655-50-7726
Project Owner:
Stewart-Proctor, PLC
319 Chapanoke Rd #106
Raleigh, NC 27603
919-779-1855
stewartpe@aol.com

Stewart-Proctor, PLC
Revels Tractor

Project Location:
Rawls Church Rd
Fuquay Varina, NC 27526
Harnett County
PIN: 0655-50-7726

Project Owner:
Stewart-Proctor, PLC
319 Chapanoke Rd #106
Raleigh, NC 27603
919-779-1855
stewartpe@aol.com

NC ONSITE WASTEWATER
EVALUATOR SEAL



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SHEET TITLE

Detail Sheet 1

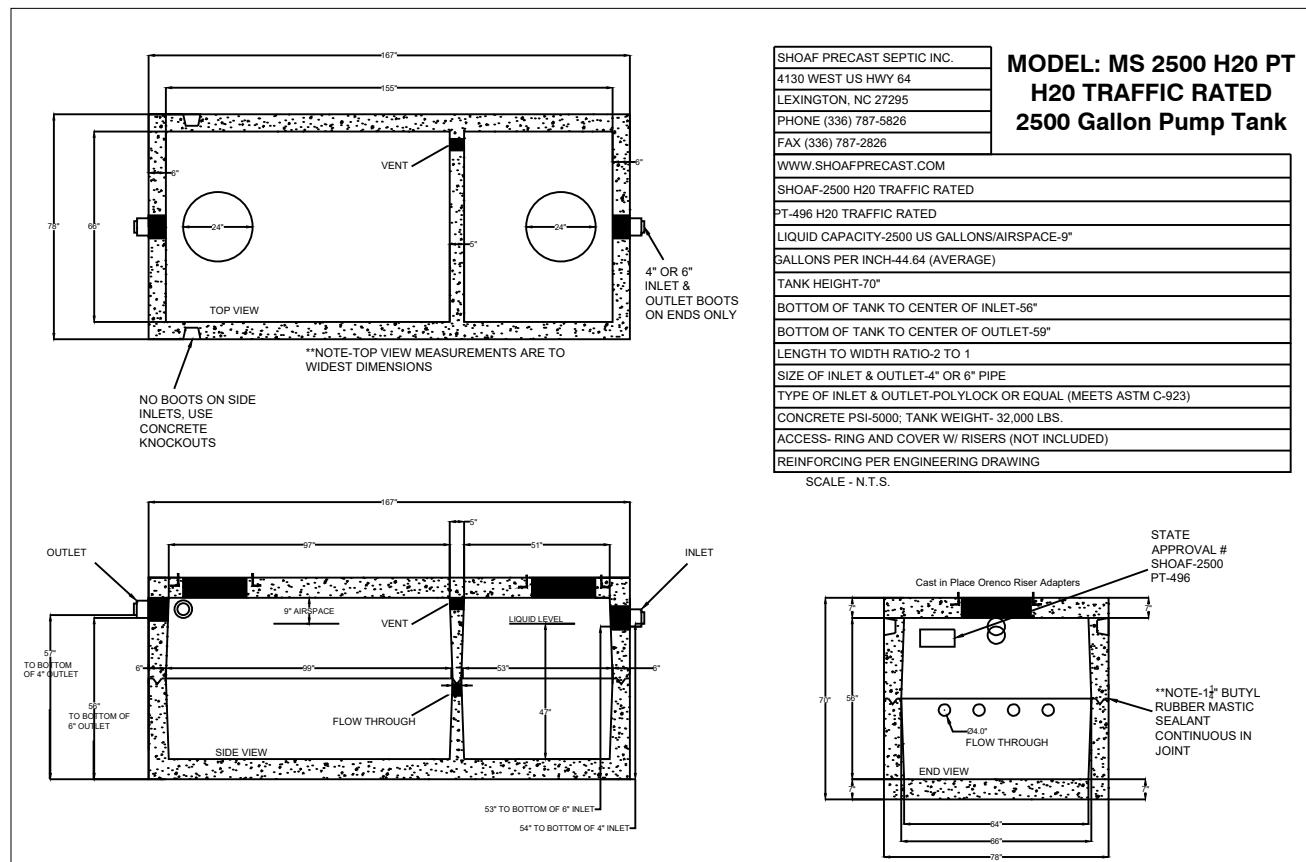
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| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
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DRAWING NUMBER

WW-6

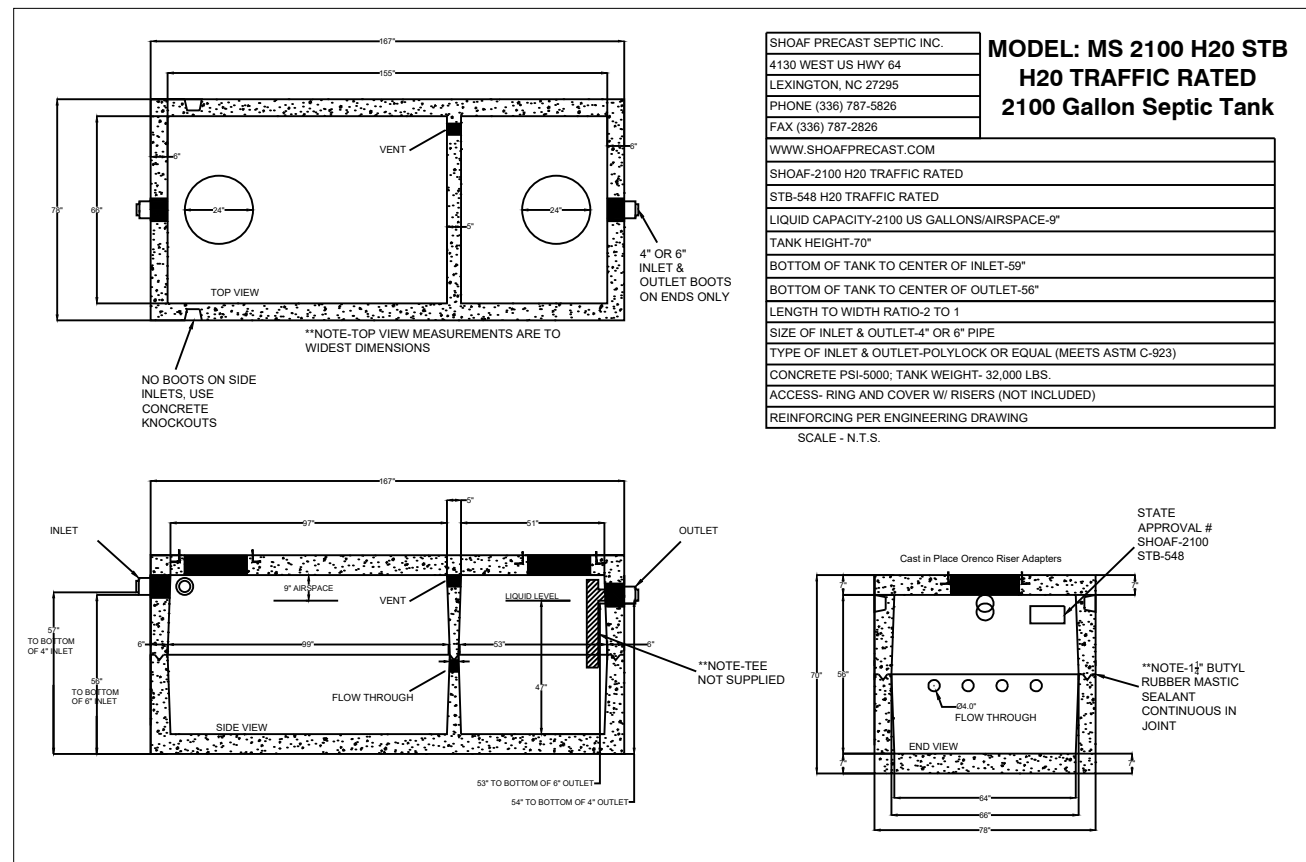


SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
WWW.SHOAFPRECAST.COM

MODEL: MS 2500 H20 PT
H20 TRAFFIC RATED
2500 Gallon Pump Tank

SHOAF-2500 H20 TRAFFIC RATED
PT-496 H20 TRAFFIC RATED
LIQUID CAPACITY-2500 US GALLONS/AIRSPACE-9"
GALLONS PER INCH-44.64 (AVERAGE)
TANK HEIGHT-70"
BOTTOM OF TANK TO CENTER OF INLET-56"
BOTTOM OF TANK TO CENTER OF OUTLET-59"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" OR 6" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-5000; TANK WEIGHT- 32,000 LBS.
ACCESS- RING AND COVER W/ RISERS (NOT INCLUDED)
REINFORCING PER ENGINEERING DRAWING
SCALE - N.T.S.

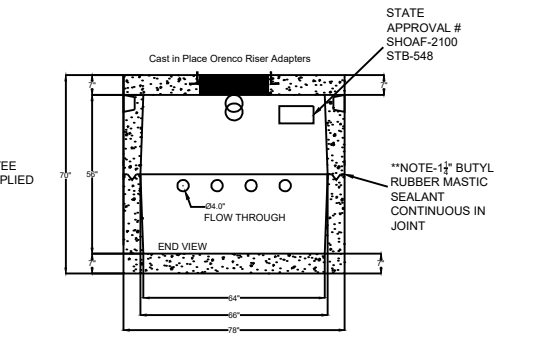
2 Pump Tank (or equiv. tank with 1-day storage)
SOURCE: Shoaf Precast Septic, Inc.



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

MODEL: MS 2100 H20 STB
H20 TRAFFIC RATED
2100 Gallon Septic Tank

SHOAF-2100 H20 TRAFFIC RATED
STB-548 H20 TRAFFIC RATED
LIQUID CAPACITY-2100 US GALLONS/AIRSPACE-9"
TANK HEIGHT-70"
BOTTOM OF TANK TO CENTER OF INLET-59"
BOTTOM OF TANK TO CENTER OF OUTLET-56"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-4" OR 6" PIPE
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-5000; TANK WEIGHT- 32,000 LBS.
ACCESS- RING AND COVER W/ RISERS (NOT INCLUDED)
REINFORCING PER ENGINEERING DRAWING
SCALE - N.T.S.



1 Septic Tank
SOURCE: Shoaf Precast Septic, Inc.

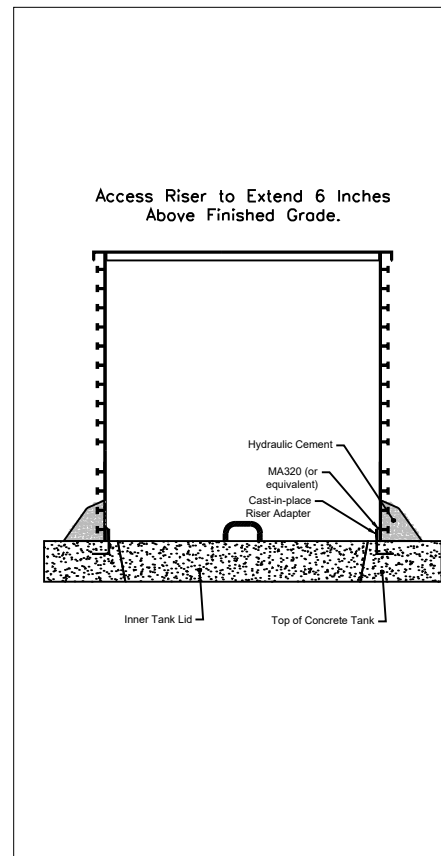


NOTES

- Installation to follow all NC DHHS and Harnett County applicable rules and regulations.
- AWT to perform construction inspections and final system certification.
- Septic Tank to have approved effluent filter.
- Contractor to abide by all safety regulations during system installation.
- Contractor shall backfill around all access areas such that storm water is shed away from potential entry points.
- Invert elevations of all components to be verified in field by contractor to insure proper operation.
- All system piping to be SCH40 PVC (except where noted).
- All gravity elbows to be long radius or long sweeping type elbows.
- Actual installation and placement of treatment system to be overseen by Contractor.
- Tanks to be set on 6" minimum gravel base. Use #5 or #57 stone for base.
- Contractor to seed and/or mulch disturbed areas to coincide with existing landscape. Area shall not be left with uncovered soil.
- Mount Control Panel a minimum of 24" above grade.
- 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.
- 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.
- 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.
- All penetrations to be sealed.
- All pressure lines to maintain 18" min. cover.
- Contractor to adjust tank placement to meet site constraints.

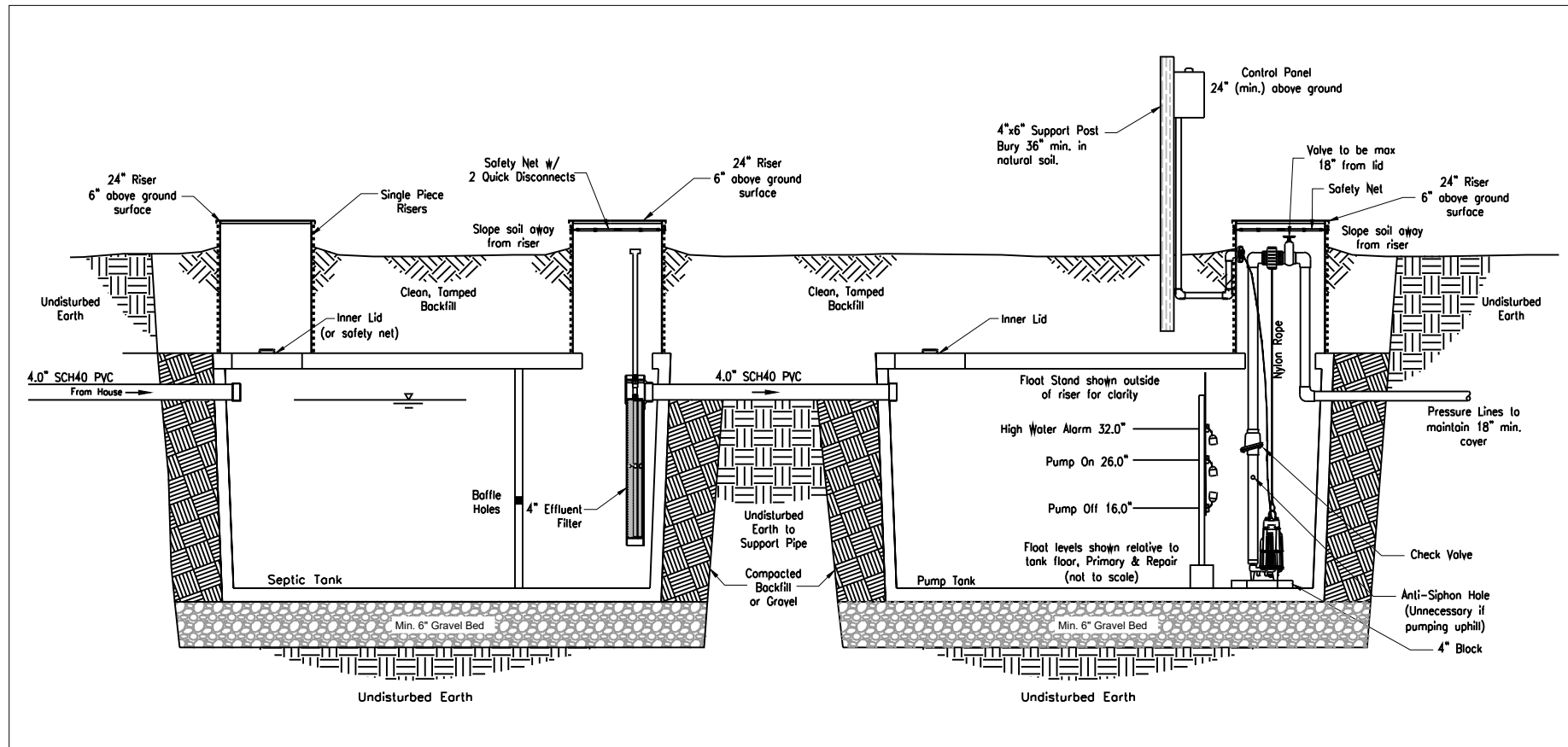
- RISER INSTALLATION INSTRUCTIONS:**
- Prep Adapter Channel & Riser
 - Roughen the bonding surfaces of the adapter and riser with sandpaper.
 - Use a clean cloth and acetone or alcohol to clean the bonding surfaces of the adapter and riser. The bonding surfaces must be clean and dry for a good fit and watertight joint. Let the acetone or alcohol dry completely.
 - Apply Adhesive
 - 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.
 - Install Riser
 - If the riser has penetrations, align the riser correctly.
 - 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.
 - Apply a bead of methacrylate adhesive to the inside of the access riser-adapter joint.
 - Use a tongue depressor, putty knife, or clean cloth to make a continuous fillet on the inside of the access riser-adapter joint.
 - Apply hydraulic cement to bond outer riser wall and top of tank.
 - Ensure inner lid is in place and secured.

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



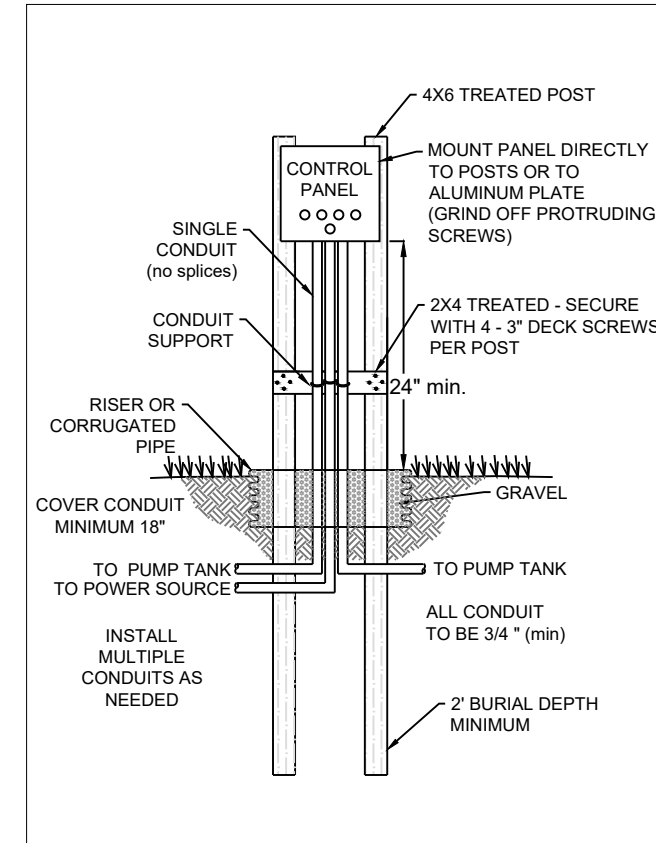
3 Riser Installation
SOURCE: Shoaf Precast Septic, Inc.





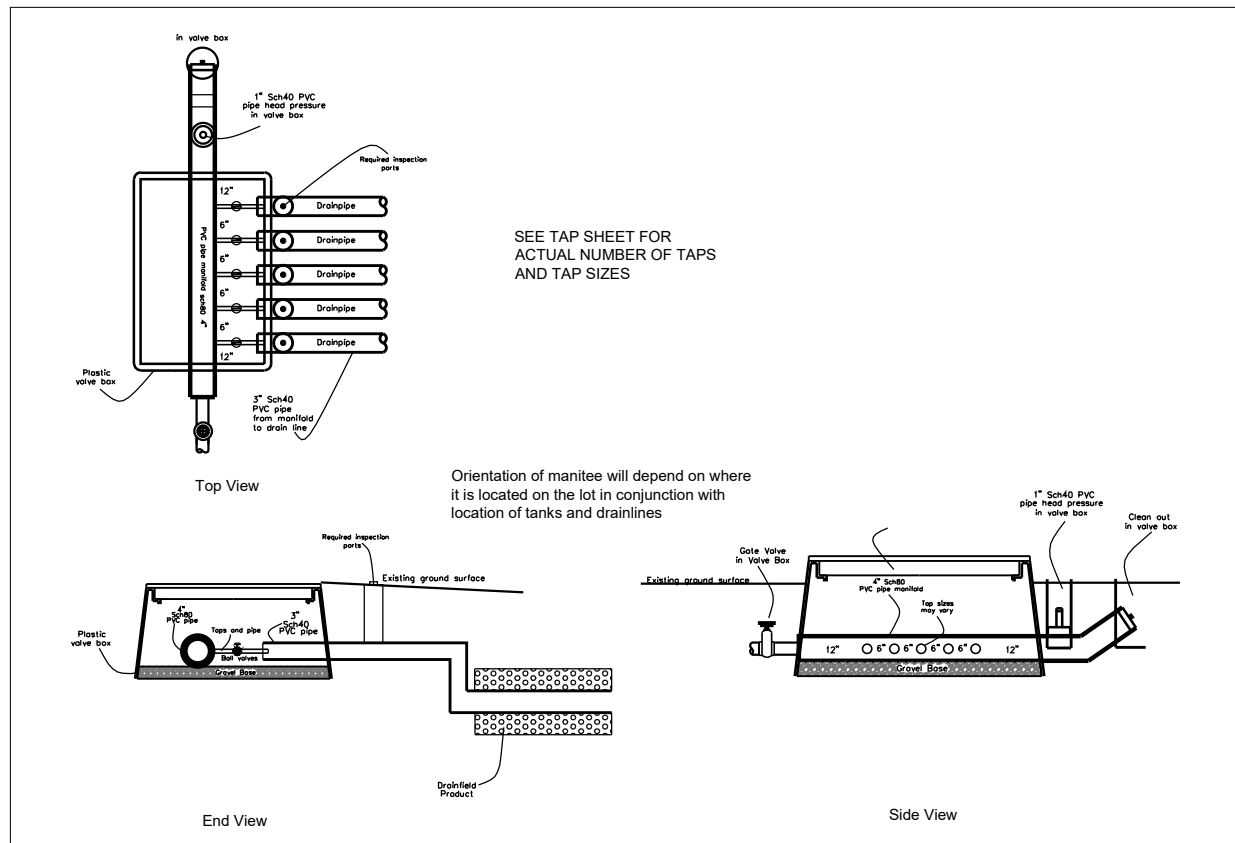
1 SYSTEM PROFILE VIEW

WW-7 N.T.S.



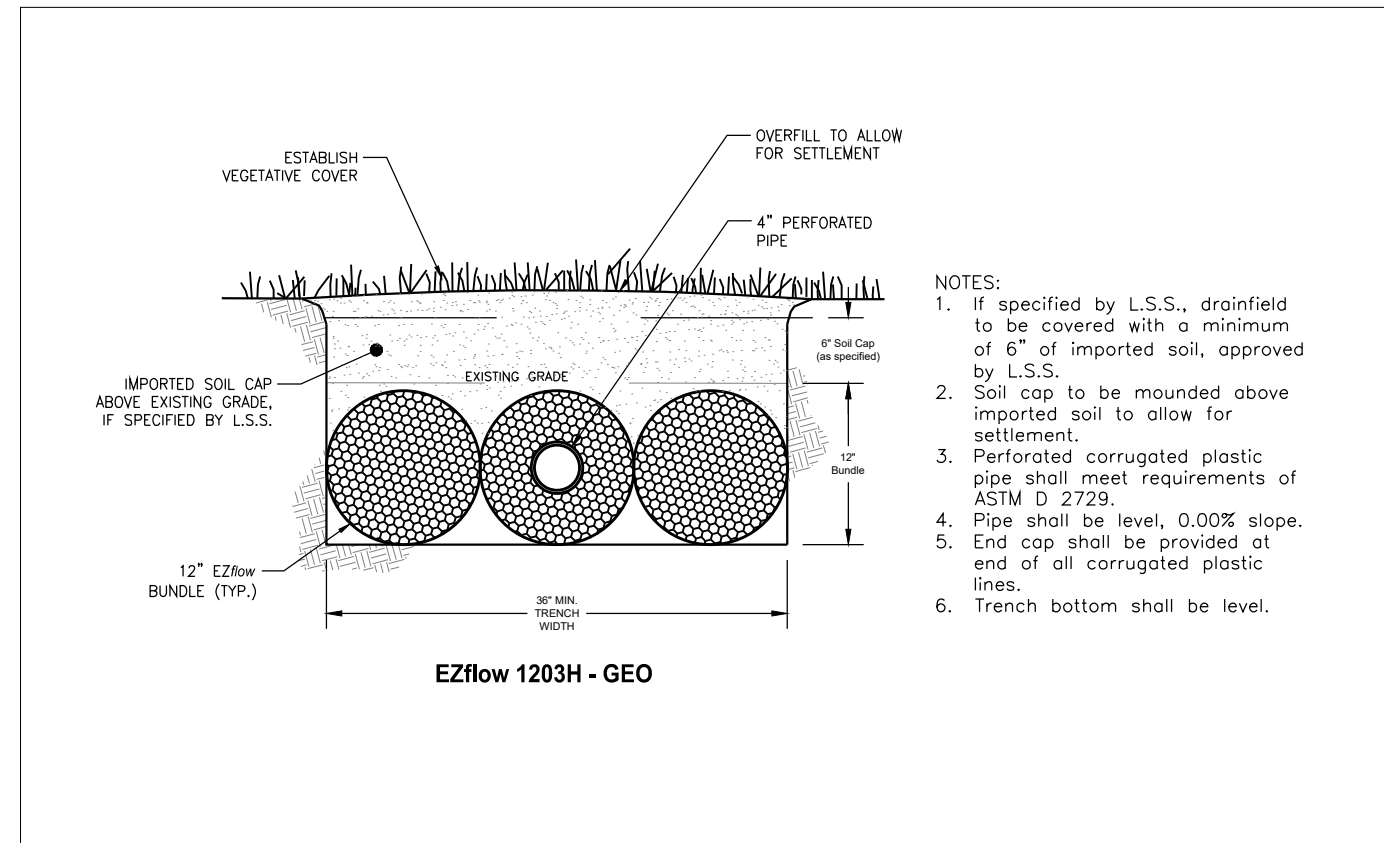
6 CONTROL PANEL SUPPORT

WW-7 N.T.S. SOURCE: AWT



4 PRESSURE MANIFOLD INSTALLATION (Manitee) - For Illustration Only

WW-7 N.T.S. SOURCE: AWT



2 TRENCH X-SECTION (Typical)

WW-7 N.T.S. Source: AWT



| REV. | ISSUED DATE | DESCRIPTION |
|------|-------------|-------------|
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SHEET TITLE

Detail Sheet 2

| | |
|------------------------|---------------------------|
| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

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 shear 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 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.

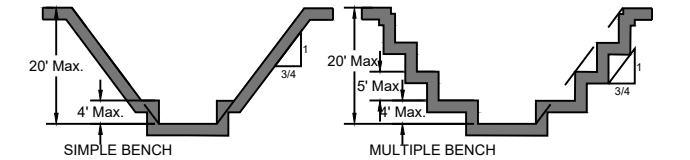
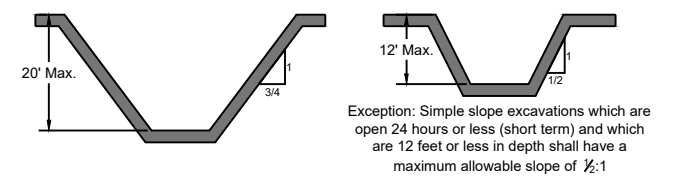
(d) Acceptable visual and manual tests

- (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 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 spill 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.

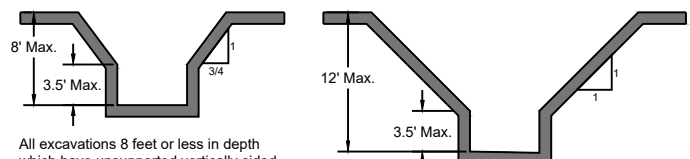
- (2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.
 - (i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads 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 D2489 - "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 soil, 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 shear vane.
 - (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 3/4:1.

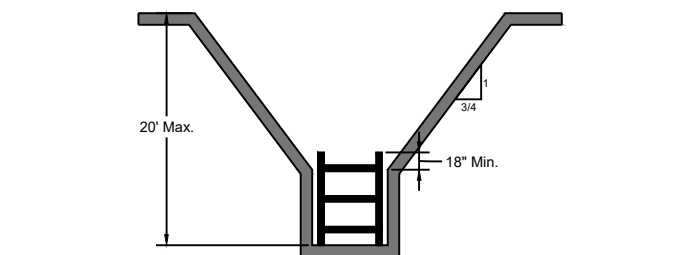


All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1 and maximum bench dimensions as follows:



All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.

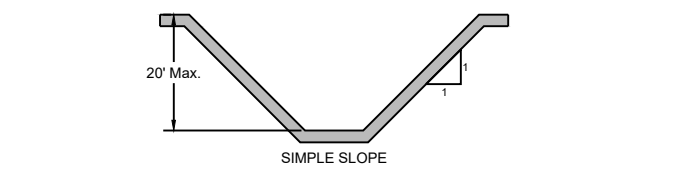
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



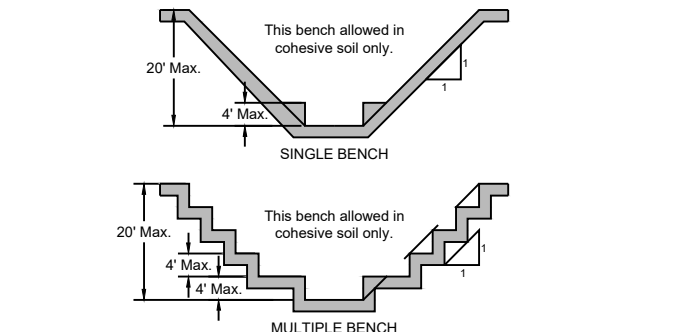
All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

EXCAVATIONS IN TYPE B SOILS

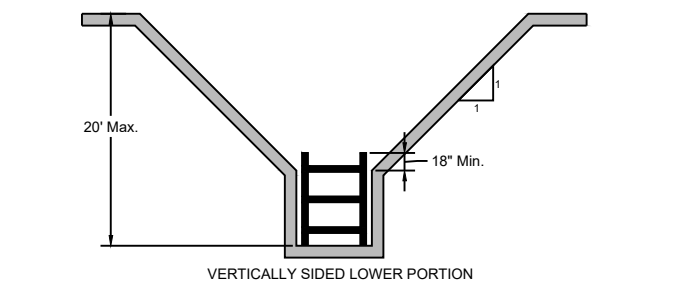
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.



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



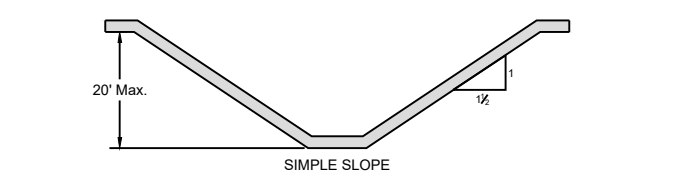
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



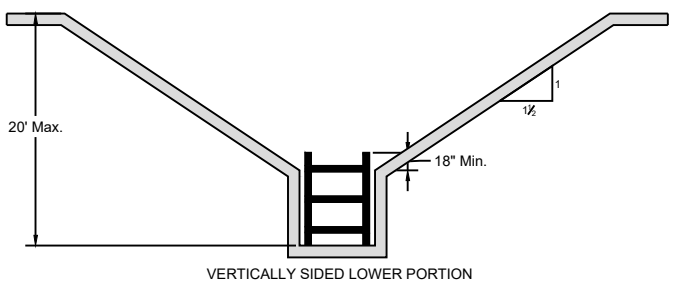
All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

EXCAVATIONS IN TYPE C SOILS

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.



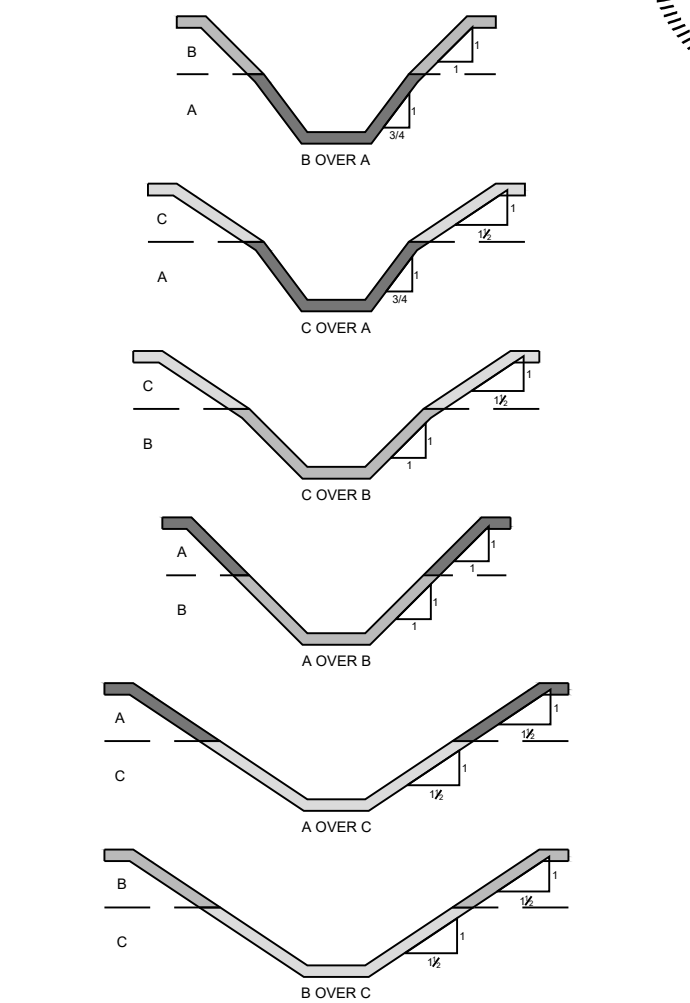
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 1 1/2:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



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).



Stewart-Proctor, PLC
Revels Tractor

Project Location:
Rawls Church Rd
Fuquay Varina, NC 27526
Harnett County
PIN: 0655-50-7726

Project Owner:
Stewart-Proctor, PLC
319 Chapanoke Rd #106
Raleigh, NC 27603
919-779-1855
stewartpe@aol.com

NC ONSITE WASTEWATER EVALUATOR SEAL



| REV. | ISSUED DATE | DESCRIPTION |
|------|-------------|-------------|
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SHEET TITLE
Excavation Safety

| | |
|-------------------------------|----------------------------------|
| DRAWN BY: T. Bostic | CREATED ON: 11/29/2023 |
| REVISED BY: #### | REVISED ON: #### |
| RELEASED BY: #### | RELEASED ON: #### |

DRAWING NUMBER
WW-8

Septic System Design - Summary Page



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: Revels Tractor
Property: Rawls Church Rd
Fuquay Varina, NC 27526

Date: 11/29/2023

County: Harnett

Owner: Stewart-Proctor, PLLC
Address: 319 Chapanoke Rd #106
Raleigh, NC 27603

Type of System: III b

Phone: 919-779-1855

Email: stewartpe@aol.com

PIN: 0655-50-7726

EHS:

Soil Parameters

Soil Evaluation By:

-

Special Conditions/Notes:

LTAR: 0.40 gpd/ft²

Design Parameters

Type of Establishment: Business (other)

Unit: Employee

of Units: 50

Septic Tank Specifications

| | | | | |
|----------------------------|-----------------|-----------------|-----------------|-----------|
| Min. Tank Capacity: | 1,963 gal | Exterior | Interior | |
| Actual Tank Volume: | 2,100 gal | Length: | 167.0 | 153.0 in. |
| Tank Manufacturer: | Shoaf | Width: | 78.0 | 64.0 in. |
| Tank Model: | MS 2100 H20 STB | Depth: | 70.0 | 56.0 in. |

Primary Drainfield Specifications

| | | | | | |
|------------------------------------|----------|-------------------|------------------------------|------|-----------------|
| Type of Distribution: | Parallel | Pressure Manifold | Trench Bottom Area: | 3125 | ft ² |
| Trench Media: | EZflow | | Minimum Drain Line: | 782 | ft |
| Trench Width: | 3 | ft | Actual Drain Line: | 800 | ft |
| Trench Depth: | 24 | in. | Number of Lines: | 4 | |
| <i>(or as specified on permit)</i> | | | Minimum Line Spacing: | 9 | ft O.C. |

Wastewater Treatment System Design Calculations

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Septic Tank Sizing

Daily Flow Estimate:

| Unit | # of Units | Flow/Unit | Flow/Day |
|----------|------------|-----------|----------|
| Employee | 50 | 25 | 1250 |
| | | | 0 |
| | | | 0 |

Q= 1,250 gpd

Septic Tank Minimum Capacity:

Per NCAC T15A:18A .1952(b)(2)(B):

For large residences, multiple dwelling units, or places of business or public assembly with $600 < Q \leq 1500$,

Minimum Liquid Capacity (V)= 1,963 gal

Septic Tank Specs:

Manufacturer: Shoaf
 Model: MS 2100 H20 STB
 Volume: 2,100 gal
 Weight: 32,000 lbs

| | Exterior | Interior | |
|---------|----------|----------|-----|
| Length: | 167.0 | 153.0 | in. |
| Width: | 78.0 | 64.0 | in. |
| Depth: | 70.0 | 56.0 | in. |

Shape of Risers: Circular

Diameter: 2.00 ft

Pump Tank Storage & Float Settings

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

| | |
|-------------------|----------------|
| Tank Manufacturer | Shoaf |
| Tank Model | MS 2500 H20 PT |

| | |
|---|------------------------------------|
| Interior Height (in.) | 56.0 in. |
| Avg. Storage | 44.64 gal/in. |
| <u>Primary System</u> | |
| <u>Elevations, measured from bottom towards top (0 = Interior Bottom of Tank):</u> | |
| Top of pump (including 4" block) | 15.7 in. (Pump height = 11 11/16") |
| Pump Off | 17.5 in. |
| Pump On | 25.5 in. (set for dose volume) |
| Alarm On | 31.5 in. (6 in. above On Float) |
| Emergency Storage Available | |
| Pump Tank | 1094 gal |
| Days of Storage | 0.87 days |
| (determined from "interior top of tank" - "High Water Alarm") | |
| <u>Repair System</u> | |
| <u>Elevations, measured from bottom towards top (0 = Interior Bottom of Tank):</u> | |
| Top of pump (including 4" block) | 15.7 in. (Pump height = 11 11/16") |
| Pump Off | 17.5 in. |
| Pump On | 25.5 in. (set for dose volume) |
| Alarm On | 31.5 in. (6 in. above On Float) |
| Emergency Storage Available | |
| Pump Tank | 1094 gal |
| Days of Storage | 0.87 days |
| (determined from "interior top of tank" - "High Water Alarm") | |

ELEVATIONS

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Benchmark 0
BM Elev 0 ft

Septic Tank 2,100 gal
 Ground Surface 372.50 ft
 Depth of Soil Cover 84 in. 7.00 ft
 Overall Ht of Tank 70 in. 5.83 ft
 Elev, Base of Tank 359.67 ft
 Ht to 4" Inlet Invert 57 in. 4.75 ft
 Elev, 4" Inlet Invert 364.42 ft
 Ht to 4" Outlet Invert 54 in. 4.50 ft
 Elev, 4" Outlet Invert 364.17 ft
 Gravel Base 6 in. 0.50 ft
 Elev, Bot of Excavation 359.17 ft

Pump Tank 2500 gal
 Ground Surface 372.00 ft
 Depth of Soil Cover 84 in. 7.00 ft
 Overall Ht of Tank 70 in. 5.83 ft
 Elev, Base of Tank 359.17 ft
 Ht to 4" Inlet Invert 54 in. 4.50 ft
 Elev, 4" Inlet Invert 363.67 ft
 Ht to 2" Outlet Invert 58 in. 4.83 ft
 Elev, 2" Outlet Invert 364.00 ft
 Gravel Base 6 in. 0.50 ft
 Elev, Bot of Excavation 358.67 ft

ST Inlet Pipe
 Grade @ Stub-out 373 ft
 Depth of Stub-out, top 1.5 ft
 Elev, Stub-out Invert 371.15 ft
 Elev @ ST Inlet Invert 364.42 ft
 Length 15 ft
 Slope 44.9 %

Pipe, ST to PT
 ID 4 in. 0.33 ft
 OD 4.5 in. 0.38 ft
 Elev, ST Outlet Invert 364.17 ft
 Elev, PT Inlet Invert 363.67 ft
 Length 4 ft
 Slope 12.5 %
 Cover over inlet pipe 7.73 ft

Pump Reqmt.
 Floor Thickness 7 in. 0.58 ft
 Elev, Pump Tank Floor 359.75 ft
 Pump Block Ht. 4 in. 0.33 ft
 Elev, Pump Intake 360.08 ft

Grade @ Primary Manifold 364.00 ft
 Grade @ Repair Manifold 362.00 ft
 Min. Cover 18 in. 1.50 ft
 Max Elev, Primary 362.50 ft
 Max Elev, Repair 360.50 ft
 Elev Diff, Primary 2.42 ft
 Elev Diff, Repair 0.42 ft

Drainfield Design

Project Revels Tractor
Location Rawls Church Rd
 Fuquay Varina, NC 27526
County Harnett

Drainfield Sizing

Primary

| | | | |
|-----------------------------|-------------------------|---------------------------------|-------------|
| LTAR | 0.4 gpd/ft ² | Type of Drainfield Media | EZflow |
| Daily Design Flow | 1,250 gpd | Required Drainline | |
| Req. Drainfield Area | 3,125 ft ² | After 25% Reduction | 782 ft |
| Trench Width, Eff. | 3 ft | Minimum Line Spacing | 9 ft (O.C.) |
| Required Drainline | 1042 ft | | |

Repair

| | | | |
|-----------------------------|-------------------------|---------------------------------|-------------|
| LTAR | 0.4 gpd/ft ² | Type of Drainfield Media | EZflow |
| Daily Design Flow | 1,250 gpd | Required Drainline | |
| Req. Drainfield Area | 3,125 ft ² | After 25% Reduction | 782 ft |
| Trench Width, Eff. | 3 ft | Minimum Line Spacing | 9 ft (O.C.) |
| Required Drainline | 1042 ft | | |

Drainfield Layout

| Line | Use | Flag Color | Elevation (ft) | Line Length (ft) | Used as Primary (ft) | Used as Repair (ft) |
|--------------|-------------|------------|----------------|------------------|----------------------|---------------------|
| 1 | Layout Line | purple | | 200 | 200.0 | |
| 2 | Layout Line | white | | 200 | 200.0 | |
| 3 | Layout Line | red | | 200 | 200.0 | |
| 4 | Layout Line | yellow | | 200 | 200.0 | |
| 5 | Layout Line | orange | | 150 | | 150.0 |
| 6 | Layout Line | blue | | 250 | | 250.0 |
| 7 | Layout Line | orange | | 250 | | 250.0 |
| 8 | Layout Line | purple | | 150 | | 150.0 |
| 9 | Layout Line | pink | | | | |
| 10 | Layout Line | | | | | |
| Total | | | | 1600 | 800 | 800 |
| Count | | | | 8 | 4 | 4 |

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

PRESSURE MANIFOLD DESIGN (Primary)

Site Information

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Design Information

| | |
|-----------------------------|-------------------------------|
| Estimated Daily Flow | 1,250 gal/day |
| L.T.A.R. (from Harnett Co.) | 0.4 gal/day/ft ² |
| L.T.A.R. + 5% | 0.420 gal/day/ft ² |
| Trench Width | 3 ft. |
| Line Length Required | 1042 ft. |
| Length after 25% Reduction | 782 ft |
| L.T.A.R. Reduced | 0.533 gal/day/ft ² |
| L.T.A.R. Reduced + 5% | 0.560 gal/day/ft ² |

DRAINFIELD INFO. - Primary

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

| Line No. | Flag Color | Line Length (ft) | Tap | Flow (gpm) | Flow/Foot (gpm/ft) | Line L.T.A.R. |
|--------------|------------|------------------|--------------|--------------|--------------------|---------------|
| 1 | purple | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 2 | white | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 3 | red | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| 4 | yellow | 200 | 1/2in SCH 40 | 7.11 | 0.036 | 0.521 |
| Total | | 800 | Total | 28.44 | Avg. | 0.521 |

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

| | | |
|----------------------|---------------------|--|
| Total Run Time | 43.95 min. | |
| Drainfield Capacity | 522.4 gal | |
| % of Drainfield Cap | 68.4% | (Req. Range 66-75%) |
| Dose Volume | 357.3 gal/dose | |
| Run Time/Dose | 12.6 minutes | Range 5-7 minutes unless uphill, checked |
| Volume/depth | 44.64 gal/in. | (Per tank manufacturer's specifications) |
| Estimated Drawdown | 8.00 in. | |

Manifold Box

| | | | | |
|-----------------|---------|---------------|---|----------|
| Number of Taps | 4 | with | 2 | Split(s) |
| Manifold Length | 3.5 ft. | (approximate) | | |

PRESSURE MANIFOLD SYSTEM DESIGN (Repair)

Site Information

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Design Information

| | |
|-----------------------------|-------------------------------|
| Estimated Daily Flow | 1,250 gal/day |
| L.T.A.R. (from Harnett Co.) | 0.4 gal/day/ft ² |
| L.T.A.R. + 5% | 0.420 gal/day/ft ² |
| Trench Width | 3 ft. |
| Line Length Required | 1042 ft. |
| Length after 25% Reduction | 782 ft |
| L.T.A.R. Reduced | 0.533 gal/day/ft ² |
| L.T.A.R. Reduced + 5% | 0.560 gal/day/ft ² |

| DRAINFIELD INFO. - Repair | | | | | | | |
|---|------------|-------------------|---------------------|--------------|--------------------|---------------|--------------|
| Proposed Type of System/Distribution: Pump to Pressure Manifold using EZflow | | | | | | | |
| Line No. | Flag Color | Line Length (ft.) | | Flow (gpm) | Flow/Foot (gpm/ft) | Line L.T.A.R. | |
| 5 | orange | 150 | 3/4in SCH 40, Split | 6.25 | 0.042 | 0.531 | |
| 6 | blue | 250 | 3/4in SCH 80 | 10.10 | 0.040 | 0.515 | |
| 7 | orange | 250 | 3/4in SCH 80 | 10.10 | 0.040 | 0.515 | |
| 8 | purple | 150 | 3/4in SCH 40, Split | 6.25 | 0.042 | 0.531 | |
| Total | | 800 | | Total | 32.7 | Avg. | 0.523 |

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

| | | |
|----------------------|---------------------|--|
| Total Run Time | 38.23 min. | |
| Drainfield Capacity | 522.4 gal | |
| % of Drainfield Cap | 68.4% | (Req. Range 66-75%) |
| Dose Volume | 357.3 gal/dose | |
| Run Time/Dose | 10.9 minutes | Range 5-7 minutes unless uphill, checked |
| Volume/depth | 44.64 gal/in. | (Per tank manufacturer's specifications) |
| Estimated Drawdown | 8.00 in. | |

| Manifold Box | | |
|-----------------|---------|-----------------|
| Number of Taps | 3 | with 2 Split(s) |
| Manifold Length | 3.0 ft. | (approximate) |

PUMP DESIGN

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

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Friction Losses

| | | | |
|--|--------------|------------|---|
| Suction Head | 0 | ft | (submersible 0) |
| Elev. Difference (highest point from pump) | 2.42 | ft | |
| Design Pressure At Outlet | 2 | ft | |
| Supply Line - 2" Schedule 40 PVC | | | |
| Pipe Diameter, Nominal | 2 | in. | |
| Pipe Diameter (ID) | 2.047 | in. | |
| Pipe Length | 200 | ft | |
| Pipe Length for Fittings | 20 | ft | |
| Equivalent Length | 220 | ft | |
| Estimated Friction Loss in Supply Line | 3.25 | ft | |
| Flow | 28.44 | gpm | |
| Velocity | 2.77 | ft/sec | Meets requirement that 2 ft/s < v < 5 ft/s. |
| Friction Loss - Taps/Special Fittings | 3.5 | ft | |
| TOTAL | 11.17 | ft. | |

Flow for Anti-Siphon Hole

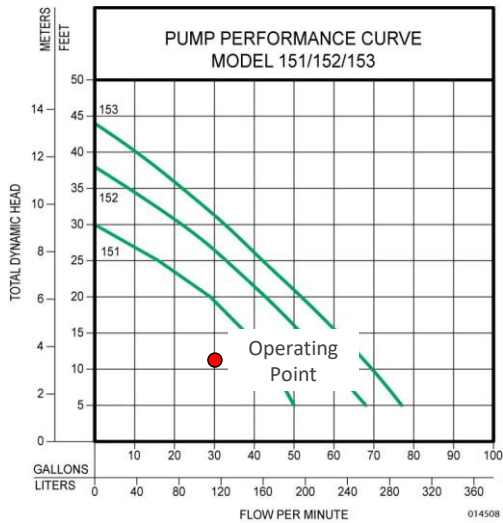
Hole Diameter 3/16 in.
 Hole Flowrate 1.39 gpm

Pump Efficiency 0.7 (assumed, typical)
 Motor Efficiency 0.9 (assumed for electric pumps)
Flow 29.83 gpm

Required Horsepower 0.13 hp
TDH 11.17 ft

Pump Selection

| | |
|---------------|---------|
| Manufacturer: | Zoeller |
| Model: | N151 |
| Horsepower: | 0.33 |



PUMP DESIGN

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

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Friction Losses

| | | |
|--|-----------|---|
| Suction Head | 0 ft | (submersible 0) |
| Elev. Difference (highest point from pump) | 0.42 ft | |
| Design Pressure At Outlet | 2 ft | |
| Supply Line - 2" Schedule 40 PVC | | |
| Pipe Diameter, Nominal | 2 in. | |
| Pipe Diameter (ID) | 2.047 in. | Flow 32.7 gpm |
| Pipe Length | 325 ft | Velocity 3.19 ft/s |
| Pipe Length for Fittings | 32.5 ft | Meets requirement that 2 ft/s < v < 5 ft/s. |
| Equivalent Length | 357.5 ft | |
| Estimated Friction Loss in Supply Line | 6.85 ft | |
| Friction Loss - Taps/Special Fittings | 3.5 ft | |
| TOTAL | | 12.76 ft. |

Flow for Anti-Siphon Hole

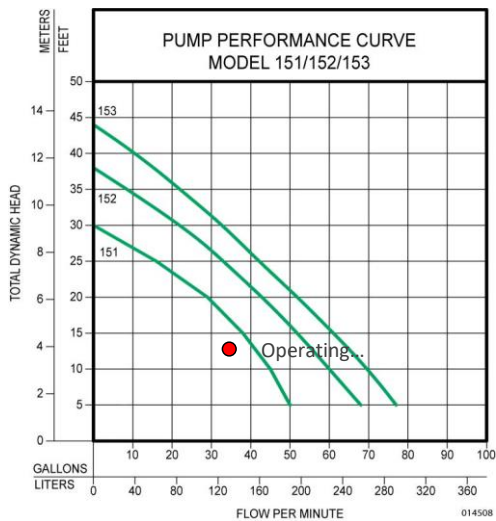
Hole Diameter 3/16 in.
 Hole Flowrate 1.48 gpm

Pump Efficiency 0.7 (assumed, typical)
 Motor Efficiency 0.9 (assumed for electric pumps)
Flow 34.18 gpm

Required Horsepower 0.17 hp
TDH 12.76 ft.

Pump Selection

| | |
|---------------|---------|
| Manufacturer: | Zoeller |
| Model: | N151 |
| Horsepower: | 0.33 |



Septic Tank Buoyancy Calculation

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Tank Size (nominal) 2100 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 | 72 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):

| | | <u>Exterior</u> | | <u>Interior</u> | |
|--------------------------------|--------|----------------------|-----------|--------------------|-----------|
| | | Top | Bottom | Top | Bottom |
| Tank | Length | 167.0 | 167.0 | 153.0 | 153.0 in. |
| | Width | 78.0 | 78.0 | 64.0 | 64.0 in. |
| | Height | 63.0 | (w/o lid) | 56.0 | in. |
| Lid | Length | 167.0 in. | | | |
| | Width | 78.0 in. | | | |
| | Height | 7.0 in. | | | |
| Area of Riser Openings | | 6.28 ft ² | | | |
| Permanent Liquid Depth in Tank | | 0.0 in. | | 0.00 ft | |
| Tank Weight | | 32,000 lb | | (per manufacturer) | |

Buoyancy Force Calculation:

| | |
|--|-------------------------|
| Buoyancy Force Specific Weight of Water x Displaced Volume | |
| Displaced Volume | 565.4 ft ³ * |
| Buoyancy Force | 35,279 lb. |

Weight Calculation:

| | | | |
|-----------------------|------------------|--------|-----------------------|
| Tank Weight | 32000 lb | Volume | 0.0 ft ³ * |
| Water Weight in Tank | 0 lb | | |
| Soil Weight Over Tank | 32040 lb | | |
| Soil Friction Force | 6709 lb | | |
| Total Weight | 70,750 lb | | |

Factor of Safety = 2.01

Note: Total weight must be greater than buoyancy force so that tank will not float during high water table conditions.

* Volume calculated by the prismatic formula.

Pump Tank Buoyancy Calculation

Project: Revels Tractor
Location: Rawls Church Rd
 Fuquay Varina, NC 27526
County: Harnett

Tank Size (nominal) 2500 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 | 72 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):

| | | <i>Exterior</i> | | <i>Interior</i> | |
|--------------------------------|--------|----------------------|-----------|--------------------|-----------|
| | | Top | Bottom | Top | Bottom |
| Tank | Length | 167.0 | 167.0 | 153.0 | 153.0 in. |
| | Width | 78.0 | 78.0 | 64.0 | 64.0 in. |
| | Height | 63.0 | (w/o lid) | 56.0 | |
| Lid | Length | 167.0 in. | | | |
| | Width | 78.0 in. | | | |
| | Height | 7.0 in. | | | |
| Area of Riser Openings | | 3.14 ft ² | | | |
| Permanent Liquid Depth in Tank | | 0.0 in. | | 0.00 ft | |
| Tank Weight | | 32000 lb | | (per manufacturer) | |

Buoyancy Force Calculation:

| | |
|--|-------------------------|
| Buoyancy Force Specific Weight of Water x Displaced Volume | |
| Displaced Volume | 546.5 ft ³ * |
| Buoyancy Force | 34,103 lb |

Weight Calculation:

| | | | |
|-----------------------|------------------|--------|-----------------------|
| Tank Weight | 32000 lb | | |
| Water Weight in Tank | 0 lb | Volume | 0.0 ft ³ * |
| Soil Weight Over Tank | 33236 lb | | |
| Soil Friction Force | 6709 lb | | |
| Total Weight | 71,945 lb | | |

Factor of Safety = 2.11

Note: Total weight must be greater than buoyancy force so that tank will not float during high water table conditions.

* Volume calculated by the prismatic formula.

