

AMP'd Engineering, PLLC

Civil Engineer – Consulting Engineer – Land Development

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Firm License Number P-1532

WASTEWATER DISPOSAL SYSTEM

For

Xcessive Risk Development, INC

Harnett County, North Carolina

To serve: Haven
Lot 26 – 3 Bedroom

Owner: Xcessive Risk Development, Inc
8754 Reed Drive, Suite 14
Emerald Isle, NC 28594

Agency: Environmental On-Site Health Department
Harnett County Health Department

April 2023



I. Purpose

This report was prepared for the sole purpose of permitting Lot 26 of the Haven subdivision Harnett County, NC.

II. Description

The project will be consistent of one 3-bedroom single family home producing 360 GPD. The effluent will fall with gravity flow from the building to a 1,000 gallon septic and then into a 1,000 gallon pump tank.

Supply Line was designed to have 110 LF plus 10%, designed for a total of 121 feet. One pump will be utilized to operate the system.

III. Soil Investigation

Haywood Pittman, LSS, has provided soil analysis and has staked the proposed field for the project. As shown on the map, the disposal field is located approximately 100 feet Northeast of the Collection Site.

IV. Site Evaluation

Soil suitability was evaluated by Haywood Pittman, LSS, and found to be that the wetness condition was found from 24"-28" from the surface with an assigned LTAR of 0.24 gpdpsf. For more soil information see report by Pittman Soil Consulting.

V. Design

The septic tank shall be located as shown on the attached plan or approved by engineer and the pump tank shall be located as shown on the attached plan or approved by engineer to collect wastewater from the home and meet all required setbacks.

Design Flow: 3 bedrooms x 120 gpd per bedroom = 360 gpd
Septic Tank Size: V = 1,000 gallon
Pump Tank Size: V = 1,000

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Gravity lines shall have cleanouts at 50' and shall be sloped per NC Building code and per Rule .1955(o)(1), shall be a minimum of 2%.

Pump tank shall have operable 24"x24" square hatch light in weight and be hinged with locking mechanism.

The nitrification field as shown should be 5-50' Horizontal Panel Block, type III, with pressure manifold and 14"-16" TB. System will require at minimum 6" fill over system and 5' beyond system.

Haywood Pittman, LLS, established the LTAR at 0.24.

Total Dynamic head calculation is derived utilizing 36 gpm (7.11 gpm per tap) with a total distance of 121 feet from the pump tank at the collection site to the pressure manifold at the distribution site.

Supply line to be 2" PVC Sch 40. Force main to have cleanouts at the end of each line, at all main junctions and at least every 500 feet. Force main to have a minimum of 30" of cover.

Dosing: Daily dose – 360 gallons to the distribution field, preferable 6 doses per day yielding 60 gallons per dose, the field yields a total flow from above 36 gpm, the tank shall run approximately 1 min 40 seconds (60 gallons). For a tank size of 1,000 gallons yields approximately 300 gallons per foot or 25 gallons per inch or say 2.4 inches for typical dose.

Float Design: There shall be three (3) float system located at the collection site where simplex pump tank is utilized. The floats shall meet .1952(c)(5).

A float tree shall be constructed of PVC making the float system readily available to be removed and maintained or adjusted. They should be positioned to be free of turbulence within the tank. Simplex system shall have off, on and high alarm.

Control Panel shall be NEMA-4x and shall be clearly identified. Panel shall be mounted on a ground contact treated 4x4 within 10' of the pump tank and shall be 4' above grade. Control panel shall be a simplex system having the capability to turn off, on, and high-water alarm. Control panel shall be

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equipped with the following: H-O-A switch, event counter, elapsed time meter, run light, alarm light, audible alarm, convenience outlet and shall meet NC .1952 rules.

Line should be pressure tested prior to connection to ensure no leaks. Test per the following:

1. Close the downstream, normally open outlet valve at the pressure manifold.
2. Open the normally closed valve for flushing air from the line.
3. Fill the line to be tested and ensure all air is flushed from the line.
4. Carefully monitor the discharge (normally closed) valve which is open to ensure air is evacuated.
5. Hook up hydrostatic pump and increase pressure until 50 psi.
6. Hold 50 psi for two (2) hours for successful test.
7. If pressure does not hold, evaluate for leaking and re-test after repair until passed.

Manifold Design: Required ratio inside areas of manifold compared to laterals shall exceed 0.7:1.

Inside area of 1/2" pipe Sch 40 PVC – 0.311 inches radius = 0.304 sq inches

5 laterals present – 1.52 sq inches total present.

3" diameter manifold – comparison

Inside area of 3" pipe Sch 40 PVC – 1.534 inches radius = 7.393 sq inches

$7.393/1.52 = 4.86 > 0.7$ required

2" schedule 40 force main

Friction loss per 100 feet @ 36 gpm = 3.03 feet

121 feet x 3.03 feet of head loss / 100 foot = 3.7 feet

Total friction loss = 3.7 feet + 20 % = 4.4 feet

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TDH for Nitrification Field

$$\begin{aligned} \text{TDH} &= \text{design} + \text{lift} + \text{friction in pipe} + \text{misc} \\ &= 2' + 20' + 4.4' + 4' \\ &= 30.4' \text{ at } 36 \text{ gpm as previously designed} \end{aligned}$$

Pump to be used:

Zoller 161 or approved equal to match below pump curve.

