ROLLANS *SOIL & ENVIRONMENTAL SERVICES*

2120 Graham Road, Mount Ulla, NC 28125 *Phone/Fax (704) 278 – 0989*

Ashley Rollans, NC Licensed Soil Scientist
Mobile: (704) 746-5046
E-mail: Rollansfortcj@aol.com

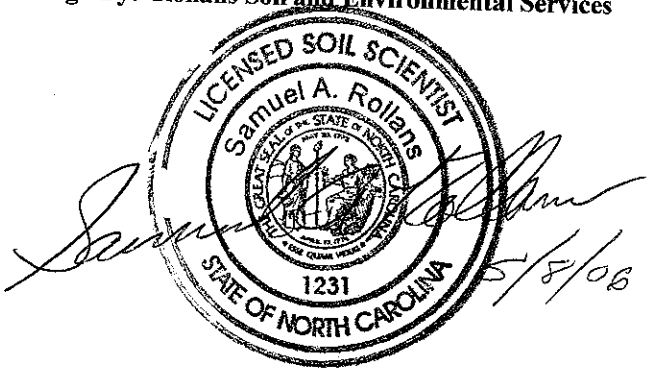
Brady Freeman, Registered Sanitarian
Mobile: (704) 746-6497
E-mail: bfree209@yahoo.com

Attached is a proposed design for an Accepted (25% reduction) Septic System with Pressure Manifold distribution for a 3 bedroom single family residence on Lot #2 FairhavenSubdivision, Iredell County, North Carolina.

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May 3, 2005
Project No. 01-1239
Design By: Rollans Soil and Environmental Services



5/8/06

INFORMATION FOR THE INSTALLER:

- The permit should be read very carefully prior to bidding. The following are details that must be considered along with all other considerations.
- Tanks shall be approved by DEHNR, and certification supplied by the manufacturer.
- Tanks shall be water tested prior to installation.
- The installer shall be responsible to the owner for placement of the tanks and to insure that final grades are returned to the original natural grade, with exception of added structural features.
- The supply trench shall be compacted to eliminate cavities left during initial fill placement.
- Installation of the system shall be during dry conditions in order to protect the soil structure.
- All fittings shall be pressure rated fittings.
- All joints shall be cleaned with PVC pipe cleaner and a heavy bodied glue applied to weld all joints.
- Where required by the county health department, post installation inspections by the designer must be scheduled 5 week days in advance.
- Trenches shall be carefully excavated so the bottom is within 2" from the highest to . the lowest points of elevation within the trench. If the bottom elevation needs adjusting after it has been trenched, it will be done by removing high points rather than filling low points. It is extremely important to insure that trenches are not over excavated during initial trenching. All fine grading within the trench will be hand done with a shovel. No loose material will be left in the trench
- All pipe openings in the tanks shall be properly grouted. This also applies to the joints around the riser.
- All tanks shall be properly back filled and compacted to prevent slump at a later date.
- Earth dams, constructed of relatively impervious material, shall be installed at the beginning and end of each lateral.
- No heavy equipment shall be used on the field during or after installation. The use of a small loader (i.e. Bobcat) or a trencher (i.e. Ditch Witch 2300/2310) may be used for installation.
- Elevations at pinflag locations should be checked by the installer prior to beginning trenches.
- Pumptank riser should be 6" above grade, control panel should be 12" above grade.
- Septic tank riser shall be a minimum of 6" above finished grade.
- Design precludes use of foundation drains on the residence.
- System is specified as an accepted 25% reduction installation.
- Repair is specified as an accepted 25% reduction installation.
- Rake trench walls, lime sidewalls, install trenches 36" wide and have no more than 1/4" fall in 10 feet.
- DO NOT CUT HOUSE SITE, BACKFILL FOR POSITIVE DRAINAGE.

PRESSURE MANIFOLD SYSTEM
FOR WASTEWATER TREATMENT

Owner: Greg Cairns

Address: PO Box 1682
Mooresville, NC 28115

Phone: 704-746-6211

County: Iredell
Location: Fairhaven Subdivision Lot #2

Source of Wastewater Flow: 3 Bedroom Single Family Residence
Estimated Daily Wastewater Production: 480 gpd
System Flow: 21.33

Design Specifications

Drainfield Size: 300
Loading Rate: .3 gpd/ft²
Depth of Gravel in Trench: NA (25% reduction)
Gravel Size: NA (25% reduction)
Trench Depth: 36 in.
Trench Width: 36 in.
Septic Tank Size: 1000
Pump Tank Size: 1000

Estimated Supply Line Length: 110
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 19.14
Dosing Volume: 137.13
Supply Manifold: 4 in. SCH 80 PVC
Supply Manifold Length: 4 ft. (minimum)
Supply Manifold Volume: N/A

Recommended Float Controls: SJE Sensor Float Control Switches as Required for Control Panel or County Approved Equivalents
Recommended Control Panel: SJE-Rhombus Model 112 (NEMA 4x) Control Panel or County Approved Control Panel.

Pressure Head: 2 ft.
Friction Head: 1.40
Elevation Head: 19.90
Total Dynamic Head: 26.79

Threaded Union: In Tank
Gate Valves: 1 in Tank
1 at Pressure Manifold
Check Valves: In Tank
Anti-Siphon Hole: NA
Additional Comments: Soil suitability was performed by Rollans Soil & Environmental Services.

FAIRHAVEN SUBDIVISION LOT 2
PRESSURE MANIFOLD DESIGN

DESIGN FLOW:	360
SOIL APPLICATION RATE:	.3 gpd/ft²
TOTAL AREA TRENCH BOTTOM:	900
TOTAL LATERAL LENGTH:	300
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	300
SUPPLY LINE LENGTH:	110
TOTAL DYNAMIC HEAD:	26.79
MANIFOLD SIZE:	4 in.SCH 80 PVC
DOSING VOLUME:	137.13
PUMP TANK DRAW DOWN*:	6.5
SEPTIC TANK SIZE:	1000
PUMP TANK SIZE:	1000

**Pump tank draw down based on a volume basis of 21 gallons per inch. Draw down may vary among pump tank manufacturers.*

FAIRHAVEN LOT #2

Project #: 01-1239

LAYOUT FOR 3 BEDROOM HOME

May 3, 2006

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		0.9			100.00		
TANK		15.50	85.40				
HOUSE		11.00	89.90				
INSTR. 1			100.90				
1	***PINK***			***2.60***	***98.30***	***100***	***100***
2	***BLUE***			***3.90***	***97.00***	***100***	***100***
3	***ORANGE***			***5.20***	***95.70***	***100***	***100***
4	RED			6.70	94.20	76	76
5	PINK			7.70	93.20	77	77
6	BLUE			9.10	91.80	77	77
7	ORANGE			9.80	91.10	70	70
					Total	**600**	**600**

	LINE LENGTH	LTAR GPD/FT²	SYSTEM TYPE	SOIL LTAR GPD/FT²	TRENCH SYSTEM	DISTRIBUTION
* *System*	*300*	*0.30*	*ACCEPT.*	*0.30*	*25% RED.*	**PRESSURE**
Repair	300	0.30	ACCEPT.	0.30	25% RED.	**MANIFOLD** LOW PRESSURE

Notes:

** TBM located on FRONT corner of lot 1/2 (see site plan)
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS, HI, and FS indicate rod readings

PRESSURE MANIFOLD TAPSHEET - FAIRHAVEN LOT#2

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/Tap	Trench Area
1	PINK	98.3	100	SCH 40 1/2	7.11	300
2	BLUE	97	100	SCH 40 1/2	7.11	300
3	ORANGE	95.7	100	SCH 40 1/2	7.11	300
	total	feet =	300	gal/min =	21.33	
			Des. Flow	360		
			Pump Run=	6.43		
			soil LTAR	0.3		
			LTAR +5%	0.315		
			LTAR with ACCEPTED	0.33075		
			LTAR with ACCEPTED + 5%	0.3472875		

17.79 Total
Found 3/4" Solid Iron
1"=40'
S01°42'22"E 167.20
51.00
PRESSURE MANIFOLD
145.18
1 P 2.6 100'
2 B 3.9 100'
3 O 5.2 100'
AH1
AH5
4 R 6.7 76'
5 P 7.7 77'
AH2
6 B 9.1 77'
AH3
7 O 9.8 70.25'
AH4
S.T.
P.T.
98.05
206.83
0.60 Acres
Lot 2
60'
30'
WELL
DRIVE
107.05
S00°49'48"W
C1
C2
C24
L24
L25
35' Front Se
5.52
Found 3/4"
18.78
42'27"E

CALCULATIONS

Location FAIRHAVEN SUBDIVISION

Project Number 01-1239

Lot No: Lot 2

No. of Bedrooms	3
Design Flow	360 $^{gal}/_{day}$
LTAR	.3 gpd/ft²
25% RED.? (YES OR NO)	YES
Supply Line Length	110 ft.
Supply Line Volume	19.14 gal.
Required Feet of Line	300 ft.
Amount of Line from Layout	300 ft.
Gallons per Minute	21.33 $^{gal}/_{min}$
Required Septic Tank Capacity	1000 gal.
Minimum Standard Tank Size	1000
Lateral Line Volume	195.9 gal.
Dosing Volume	137.13 gal.

Note: Dosing Volume based on70% of lateral line volume

Tank Draw Down	6.5 *Generic Draw Down of 21 gal.per in.*
Pump Run Time	6.43 minutes
Elevation Head	19.9 ft.
Pressure Head	2 ft.
Friction Factor	1.27 ft./100 ft. *(From the interpolater.)*
Friction Head	1.40 ft.
Total Dynamic Head (+15%)	26.79 ft.

FRICTION FACTOR INTERPOLATER
2" SCH 40 PVC

GPM	*f*
20	0.84
	-0.88
25	1.27
	-1.28
30	1.78
	-1.76
35	2.37
	-2.25
40	3.03
43.07	3.48
45	3.77
48.14	4.28
50	4.58
57.11	5.89
60	6.42