ROLLANS *SOIL & ENVIRONMENTAL SERVICES*

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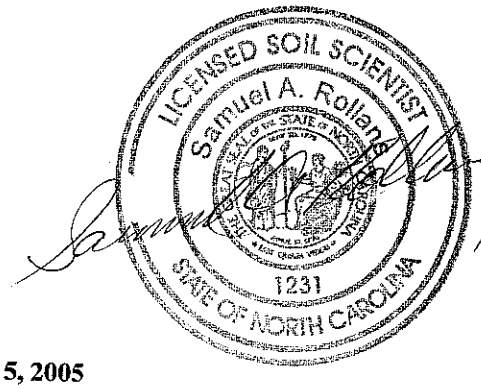
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Attached is a proposed design for a PPBPS Septic System with low pressure distribution for a 3 bedroom single family residence on Lot #27 in Norman Shore Subdivision, Iredell County, North Carolina.

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12/12/05

December 5, 2005
Project No. 01-1170
Design By: Rollans Soil & Environmental Services

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant: Gemini Homes

Address: PO Box 367
Terrell, NC 28682

Phone: 704-489-9497

County: Iredell

Location: Norman Shore Subdivision Lot #27

Source of Wastewater Flow: 3 Bedroom Single Family Residence

Estimated Daily Wastewater Production: 360 gpd

System Flow: 23.18076923

Design Specifications

Drainfield Size: 245

Loading Rate: 0.25 gpd/ft.^{2}

Depth of Gravel in Trench: NA (PPBPS)

Gravel Size: NA (PPBPS)

Trench Depth: 36 in.

Trench Width: 36 in.

Septic Tank Size: 1000

Pump Tank Size: 1000

Estimated Supply Line Length: 103

Supply Line Diameter: 2 in. SCH 40 PVC

Supply Line Volume: 17.92

Dosing Volume: 136.37

Supply Manifold: N/A

Supply Manifold Length: N/A

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: 1.31

Elevation Head: 12.10

Total Dynamic Head: 17.72

Threaded Union: In Tank

Gate Valves: 1 in Tank
1 per lateral (4)

Check Valves: In Tank

Anti-Siphon Hole: NA

Additional Comments: Soil suitability was performed by Rollans Soil & Environmental Services

Norman Shore Lot 27
LP PPBPS

DESIGN FLOW:	360
SOIL APPLICATION RATE:	0.25 gpd/ft²
TOTAL AREA TRENCH BOTTOM:	735
TOTAL LATERAL LENGTH:	245
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	240
SUPPLY LINE LENGTH:	103
TOTAL DYNAMIC HEAD:	17.72
MANIFOLD SIZE:	N/A
DOSING VOLUME:	136.37
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.*

Norman Shore Lot 27

Project #: 01-1170

LAYOUT FOR 3 BEDROOM HOME

December 5, 2005

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		5.0			100.00		
INSTR. 1			105.00				
HOUSE CNR				6.90	98.10		
P. TANK				8.00	97.00		
1	***PINK***			***2.90***	***102.10***	***40***	***40***
2	***RED***			***3.70***	***101.30***	***65***	***65***
3	***ORANGE***			***4.00***	***101.00***	*72*	*70*
4	***BLUE***			***4.40***	***100.60***	*70*	*70*
5	PINK			5.40	99.60	55	55
6	ORANGE			5.70	99.30	55	55
					Total	357	355

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION	
** System*	*245*	*0.25*	*MOD.*	*0.25*	*PPBPS*	*LOW PRESSURE*	
Repair	110	0.25	MOD.	0.25	PPBPS	LOW PRESSURE	***NOT NEEDED***

Notes:

** TBM located top of ground at EIP at corner of lot (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

LP PPBPS TAPSHEET -Norman Shore Lot 27

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
1	PINK	102.1	*40*	0.156	**0.41**	120	9.230769231
2	RED	101.3	*65*	0.156	**0.41**	195	15
3	ORANGE	101	*70*	0.156	**0.41**	210	16.15384615
4	BLUE	100.6	*70*	0.156	**0.41**	210	16.15384615

total	**feet =**	**245**	**gal/min =**	**23.180769**	
		Des. Flow	**360**		
		Pump Run=	**5.88**		
		soil LTAR	**0.25**		
		LTAR +5%	**0.2625**		
		LTAR with mod.	**0.27**		
		LTAR with mod.. + 5%	**0.2835**		

.156 equals 5/32 inch hole

CALCULATIONS

Location Norman Shore

Project Number 01-1170

Lot No: Lot 27

No. of Bedrooms	3	
Design Flow	360	$^{gal}/_{day}$
LTAR	0.25	$^{gal}/_{ft^2\ day}$
PPBPS? (YES OR NO)	YES	
Supply Line Length	103	ft.
Supply Line Volume	17.922	gal.
Required Feet of Line	240	ft.
Amount of Line from Layout	245	ft.
Gallons per Minute	23.18077	$^{gal}/_{min}$

Note: Flow/hole (.41gpm) x # of panels (66)

Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	56.53846	
Dosing Volume	136.37	gal.

Note: Dosing Volume based on 67% of # of panels times 3.6 gal/panel

Tank Draw Down	6.5	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	12.1	ft.
Pressure Head	2	ft.
Friction Factor	1.27	ft./100 ft. *(From the interpolater.)*
Friction Head	1.31	ft.
Total Dynamic Head (+15%)	17.72	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