ROLLANS ***SOIL & ENVIRONMENTAL SERVICES***

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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 #15 in Highland Ridge Subdivision, Iredell County, North Carolina.

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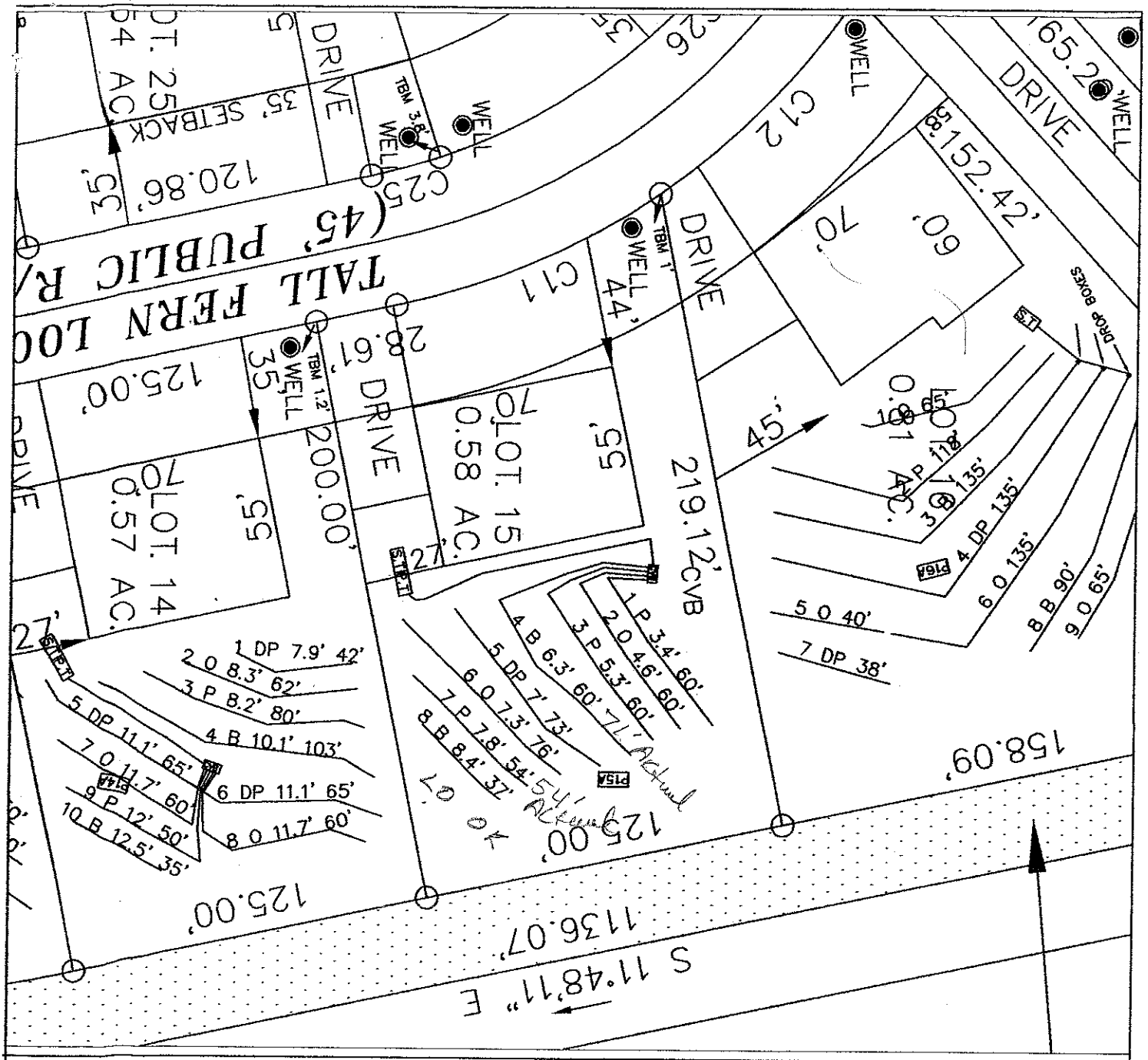
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March 13, 2007
Project #: 01-1329
Design By: Rollans Soil & Environmental Services

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.
- Design precludes foundation drains.
- Septic tank riser shall be a minimum of 6" above finished grade.
- System is specified as a PPBPS installation.
- Repair is specified as a PPBPS installation.
- Backfill 4 - 6" of material (County Approved) over panels, rake trench walls, lime side-walls, install trenches 36" wide and have no more than 1/4" fall in 10 feet.



LEGEND

House Box.

System lines.

Repair lines.

House Corner Shot.

T.B.M.

GRAPHIC SCALE
1" = 50'

50 0 50 100

FOR PRELIMINARY PLANNING PURPOSES ONLY. ALL LOTS WILL REQUIRE FINAL APPROVAL BY THE COUNTY HEALTH DEPARTMENT ON A LOT BY LOT BASIS. THIS MAP SHOULD BY USED AS A GENERAL GUIDE, SOME ADJUSTMENTS WILL BE NECESSARY IN THE FIELD DUE TO SOIL VARIABILITY AND COMPLEX TOPOGRAPHIC FEATURES. THIS MAP ONLY REFLECTS EXISTING SOIL SUITABILITY FOR ON-SITE SEPTIC TANK SYSTEMS.

PLEASE REFER TO ATTACHED SOIL REPORT FOR ADDITIONAL SITE SPECIFIC INFORMATION

ROLLANS SOIL & ENVIRONMENTAL SERVICES
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MAP TITLE: SITE PLAN & DRAINFIELD AREAS

PROJECT NAME: ORCHARDS OF LLD / HIGHLAND RIDGE

LOCATION/DATE: PERRY ROAD, IREDELL COUNTY, NORTH CAROLINA, FEBRUARY 2007

JOB # : 01-1329
FILE: C:\JOBS\01-1329
PROJECT MGR.: C.B.F.
FIELD WORK: C.B.F. & A.L.P.
DRAWN BY: C.B.F.

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant:	Orchard Farms LLC
Address:	227 Hideaway Lane Mooresville, NC 28117
Phone:	704-201-6465
County:	Iredell
Location:	HIGHLAND RIDGE LOT #15
Source of Wastewater Flow:	3 Bedroom Single Family Residence
Estimated Gallons Per Day Flow:	360
System Flow:	22.96

Design Specifications

Drainfield Size:	240
Loading Rate (gpd/ft.^{2}):	0.25
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:	96
Supply Line Diameter:	2 in. SCH 40 PVC
Supply Line Volume:	16.70
Dosing Volume:	135.07
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:	1.22
Elevation Head:	5.00
Total Dynamic Head:	9.45
Threaded Union:	In Tank
Gate Valves:	1 in Tank 1 per lateral
Check Valves:	In Tank
Anti-Siphon Hole:	NA
Additional Comments:	Soil suitability was performed by Rollans Soil & Environmental Services

HIGHLAND RIDGE LOT #15
LP PPBPS

DESIGN FLOW (gpd):	360
SOIL APPLICATION RATE (gpd/ft.^{2}):	0.25
TOTAL AREA TRENCH BOTTOM:	720
TOTAL LATERAL LENGTH:	240
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	240
SUPPLY LINE LENGTH:	96
TOTAL DYNAMIC HEAD:	9.45
MANIFOLD SIZE:	N/A
DOSING VOLUME:	135.07
PUMP TANK DRAW DOWN*:	6.4
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.*

HIGHLAND RIDGE LOT #15

Project #: 01-1329

LAYOUT FOR 3 BEDROOM HOME — March 13, 2007

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		1.0			100.00		
INSTR. 1			101.00				
HOUSE CNR				3.70	97.30		
P. TANK				7.00	94.00		
1	*PINK*			*3.40*	*97.60*	*60*	*60*
2	*ORANGE*			*4.60*	*96.40*	*60*	*60*
3	*PINK*			*5.30*	*95.70*	*61*	*60*
4	*BLUE*			*6.30*	*94.70*	*70*	*60*
5	DARK PINK			7.00	94.00	73	73
6	ORANGE			7.30	93.70	76	76
7	PINK			7.80	93.20	54	54
8	BLUE			8.40	92.60	37	37
					Total	**491**	**480**

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR	TRENCH SYSTEM	DISTRIBUTION
** System*	*240*	*0.25*	*MOD.*	*0.250*	*PPBPS*	*LOW PRESSURE*
Repair	240	0.25	MOD.	0.250	PPBPS	LOW PRESSURE

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 -Highland Ridge LOT 15

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
1	*PINK*	97.6	*60*	0.156	0.41	180	14
2	*ORANGE*	96.4	*60*	0.156	0.41	180	14
3	*PINK*	95.7	*60*	0.156	0.41	180	14
4	*BLUE*	94.7	*60*	0.156	0.41	180	14
							56
	total	feet =	240	gal/min =	22.96		
			Des. Flow	480			
			Pump Run=	5.88			
			soil LTAR	0.25			
			LTAR +5%	0.2625			
			LTAR with mod.	0.5			
			LTAR with mod.. + 5%	0.525			

.156 equals 5/32 inch hole

CALCULATIONS

Location Highland Ridge

Project Number 01-1329

Lot No: Lot 15

No. of Bedrooms	3	
Design Flow	360	$^{gal}/_{day}$
LTAR	0.250	$^{gal}/_{ft^2\ day}$
PPBPS? (YES OR NO)	YES	
Supply Line Length	96	ft.
Supply Line Volume	16.704	gal.
Required Feet of Line	240	ft.
Amount of Line from Layout	240	ft.
Gallons per Minute	22.96	$^{gal}/_{min}$
Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	56	
Dosing Volume	135.07	gal.

Note: Dosing Volume based on 33% of # of panels times 3.6 gal/panel

Tank Draw Down	6.4	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	5	ft.
Pressure Head	2	ft.
Friction Factor	1.27	ft./100 ft. *(From the interpolater.)*
Friction Head	1.22	ft.
Total Dynamic Head (+15%)	9.45	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

SOIL/SITE EVALUATION

(Continuation Sheet)

Sheet ___ of ___

DEPARTMENT OF ENVIRONMENT
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

lot 15 Highland Ridge

PROPERTY ID #: ___
DATE OF EVALUATION: 1/07
COUNTY: Iredell

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) .1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
15 A	LSS 5-10%	0-11	BSbl w/ WSBK	fri SSSP SmP	—	59	—	—	PS .3
		11-25	RC w/ WSBK	fri SSSP SmP					
		25-59	BLK WSBK	fri SSSP SmP					
				common SAP					
P 2		0-6	GR SL	fri SSSP SmP	lower chroma many SAP	MB's 57"	—	—	PS .25
		6-14	SBK C	fri SSSP SmP					
		14-40	f/MBK C	fri SSSP SmP					
		40-57	WSBK CL	fri SSSP SmP					
P 3		0-4	GR BSCL	FR SS SP	com SAP many SAP				.3
		4-42	f SBK RC	FR SS SP					
		42-56	WF SBK CL	FR SS SP					
2	5%	0-15	MSBK/ASBK C	fri SSSP SmP	common many SAP Quartz @ 34"				PS .3
		15-30	WSBK CL	fri SSSP SmP					
		30-55	WSBK CL	fri SSSP SmP					

COMMENTS: ___

TALL FERN LOOP
(45' PUBLIC R/W)
35' SETBACK
120.86'
DRIVE
152.42'
70'
60'
44'
28.61'
125.00'
35'
70'
60'
27'
200.00'
LOT 15
0.58 AC.
LOT 16
0.81 AC.
45'
219.12'
LOT 14
0.57 AC.
P14A
P15A
P16A
125.00'
225.00'
158.09'
1136.07'
S 11°48'11" E
LEGEND
House Box.
System lines.
Repair lines.
House Corner Shot.
T.B.M.
GRAPHIC SCALE
1" = 50'
50
0
50
100
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PERTH ROAD
IREDELL COUNTY, NORTH CAROLINA
FEBRUARY 2007
JOB # : 01-1329
FILE: C:\JOBS\01-1329
PROJECT MGR.: C.B.F.
FIELD WORK: C.B.F. & A.L.P.
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