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Attached is a proposed design for a PPBPS Septic System with low pressure distribution for a 4 bedroom single family residence on Lot # 194 in Sec. 10 CL&T, Iredell County, North Carolina.

Contents:

	Page
Information for the Installer	1
Design Information	
Design Specifications	2-3
Layout Specifications	4
System Tapsheet	5
Site Plan/System Plan	6-7
Calculations	8
Profile Descriptions	9

February 25, 2009
Project #: 01-1473
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 NC DENR, 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.
- 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 AND EXISTING BED PRETREATED (TSII) TO GO DOWN TO 30' FROM 760' CONTOUR.**
- 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.
- EXISTING WELL TO BE ABANDONED PROPERLY.

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant: Don & Elizabeth Anderson

Address: 3000 Siminon Tree Road
Charlotte, NC 28270
Phone: 704-905-7808
County: Iredell
Location: CL&T SEC. 10 LOT 194

Source of Wastewater Flow: 4 Bedroom Single Family Residence
Estimated Gallons Per Day Flow: 480
System Flow: 22.14

Design Specifications

Drainfield Size: 230
Loading Rate (gpd/ft.^{2}): 0.35
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: 78
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 13.57
Dosing Volume: 130.25
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: 0.99
Elevation Head: 15.10
Total Dynamic Head: 20.80

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

CL&T SEC. 10 LOT 194
LP PPBPS

DESIGN FLOW (gpd):	480
SOIL APPLICATION RATE (gpd/ft.^{2}):	0.35
TOTAL AREA TRENCH BOTTOM:	690
TOTAL LATERAL LENGTH:	230
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	228.5714286
SUPPLY LINE LENGTH:	78
TOTAL DYNAMIC HEAD:	20.80
MANIFOLD SIZE:	N/A
DOSING VOLUME:	130.25
PUMP TANK DRAW DOWN*:	6.2
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.*

CL&T SEC. 10 LOT 194

Project #: 01-1473

LAYOUT FOR 4 BEDROOM HOME

February 25, 2009

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		1.4			100.00		
INSTR. 1			101.40				
HOUSE CNR				6.20	95.20		
P. TANK				15.50	85.90		
1	*DARK PINK*			*5.40*	*96.00*	*90*	*90*
2	*ORANGE*			*7.50*	*93.90*	*105*	*90*
3	*BLUE*			*11.10*	*90.30*	*50*	*50*
4	BLUE			11.10	90.30	25	25
4	RED			13.10	88.30	60	60
4	BLUE			18.10	83.30	63	63
					Total	**393**	**378**

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION
** System*	*230*	*0.350*	*MOD.*	*0.350*	*PPBPS*	*LOW PRESSURE*
Repair	48'+EXISTING BEI	0.350	MOD.	0.350	PPBPS	LOW PRESSURE PRE-TREATED

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 -CL&T SEC. 10 LOT 194

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
1	***DARK PINK***	96	***90***	0.156	**0.41**	270	21
2	***ORANGE***	93.9	***90***	0.156	**0.41**	270	21
3	***BLUE***	90.3	***50***	0.156	**0.41**	150	12
							54
	total	**feet =**	**230**	**gal/min =**	**22.14**		

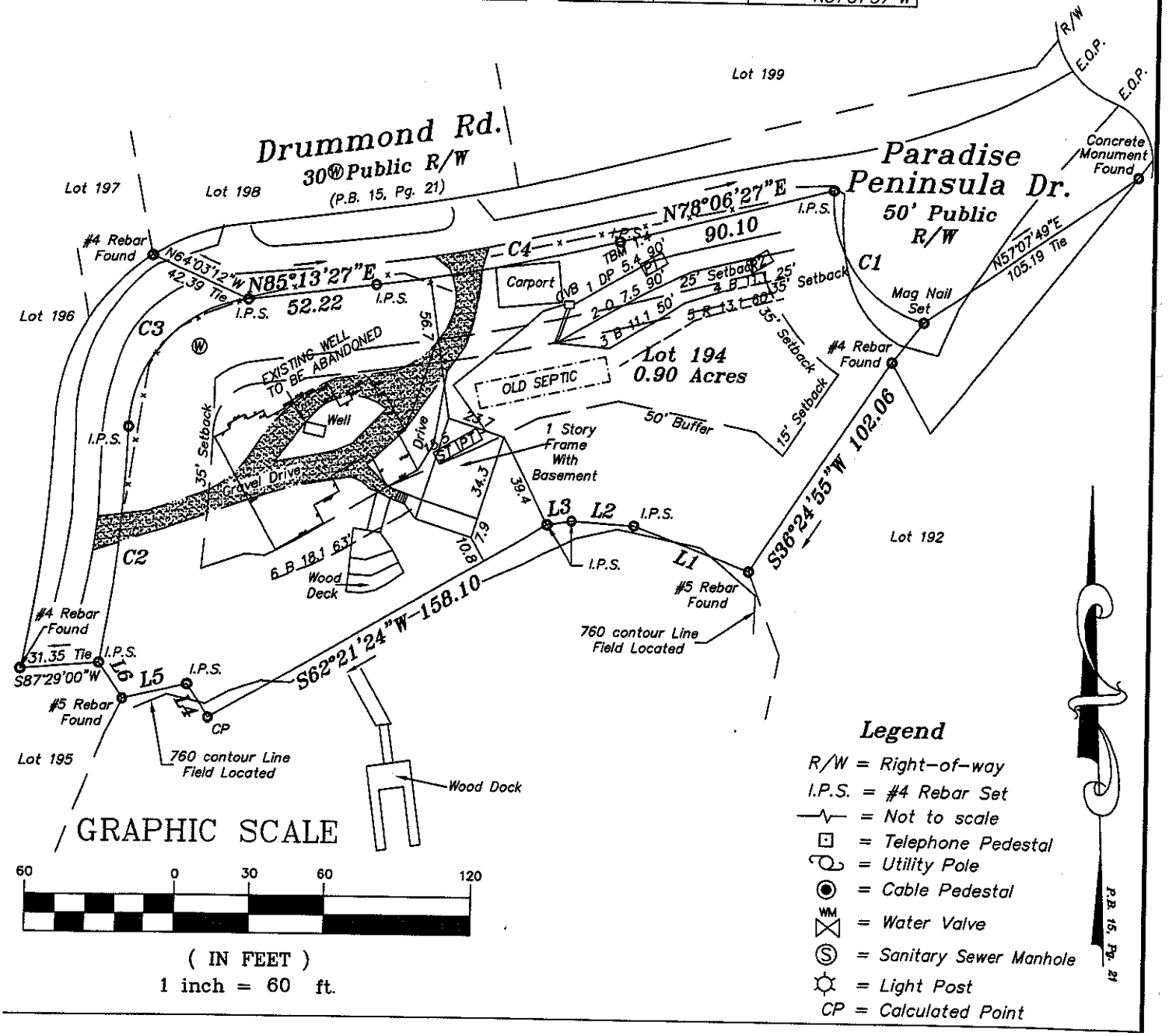
Des. Flow	**360**
Pump Run=	**5.88**
soil LTAR	**0.35**
LTAR +5%	**0.3675**
LTAR with mod.	**0.7**
LTAR with mod.. + 5%	**0.735**

.156 equals 5/32 inch hole

4) Area by coordinate method.

CURVE TABLE				
CURVE	LENGTH	RADIUS	BEARING	CHORD
C1	69.62	50.00	S33°04'41"E	64.13
C2	94.81	632.01	N08°29'38"E	94.72
C3	76.04	53.77	S44°42'37"W	69.86
C4	101.74	818.47	N81°40'06"E	101.67

LINE TABLE		
LINE	LENGTH	BEARING
L1	50.13	S67°21'36"E
L2	25.74	S84°22'36"E
L3	9.88	N82°59'24"E
L4	15.86	S31°13'36"E
L5	26.45	N79°13'24"E
L6	17.21	N31°51'57"W



CALCULATIONS

Location CL&T SEC. 10 LOT 194

Project Number 01-1473

Lot No: 194

No. of Bedrooms	4	
Design Flow	480	$^{gal}/_{day}$
LTAR	0.350	$^{gal}/_{ft^2\ day}$
PPBPS? (YES OR NO)	YES	
Supply Line Length	78	ft.
Supply Line Volume	13.572	gal.
Required Feet of Line	228.5714	ft.
Amount of Line from Layout	230	ft.
Gallons per Minute	22.14	$^{gal}/_{min}$
Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	54	
Dosing Volume	130.25	gal.

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

Tank Draw Down	6.2	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	15.1	ft.
Pressure Head	2	ft.
Friction Factor	1.27	ft./100 ft. *(From the interpolater.)*
Friction Head	0.99	ft.
Total Dynamic Head (+15%)	20.80	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