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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 #32 in Autumn Grove Subdivision, Iredell County, North Carolina.

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November 9, 2007
Project #: 01-1449
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.

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant:	E&J DEVELOPMENT
Address:	227 Hideaway Lane Mooresville, NC 28117
Phone:	704-201-6465
County:	Iredell
Location:	AUTUMN GROVE LOT 32
Source of Wastewater Flow:	4 Bedroom Single Family Residence
Estimated Gallons Per Day Flow:	480
System Flow:	27.47

Design Specifications

Drainfield Size:	240
Loading Rate (gpd/ft.^{2}):	0.275
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:	35
Supply Line Diameter:	2 in. SCH 40 PVC
Supply Line Volume:	6.09
Dosing Volume:	161.60
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:	0.62
Elevation Head:	3.80
Total Dynamic Head:	7.39
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

AUTUMN GROVE LOT 32
LP PPBPS

DESIGN FLOW (gpd):	480
SOIL APPLICATION RATE (gpd/ft.^{2}):	0.275
TOTAL AREA TRENCH BOTTOM:	870
TOTAL LATERAL LENGTH:	290
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	290.9090909
SUPPLY LINE LENGTH:	35
TOTAL DYNAMIC HEAD:	7.39
MANIFOLD SIZE:	N/A
DOSING VOLUME:	161.60
PUMP TANK DRAW DOWN*:	7.7
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.*

AUTUMN GROVE LOT 32

Project #: 01-1449

LAYOUT FOR 4 BEDROOM HOME

November 9, 2007

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		3.0			100.00		
INSTR. 1			103.00				
HOUSE CNR				4.80	98.20		
P. TANK				5.00	98.00		
1	ORANGE			2.30	100.70	34	34
2	PINK			3.20	99.80	62	62
3	RED			3.90	99.10	71	71
4	BLUE			4.80	98.20	70	70
5	ORANGE			5.40	97.60	108	108
6	***PINK***			***6.20***	***96.80***	***80***	***80***
7	***RED***			***6.80***	***96.20***	***70***	***70***
8	***BLUE***			***7.40***	***95.60***	***60***	***60***
9	***RED***			***8.00***	***95.00***	***50***	***50***
10	***PINK***			***8.80***	***94.20***	***30***	***30***
					Total	**635**	**635**

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION
**** System***	***290***	***0.275***	***MOD.***	***0.275***	***PPBPS***	***LOW PRESSURE***
Repair	345	0.275	MOD.	0.275	PPBPS	LOW PRESSURE

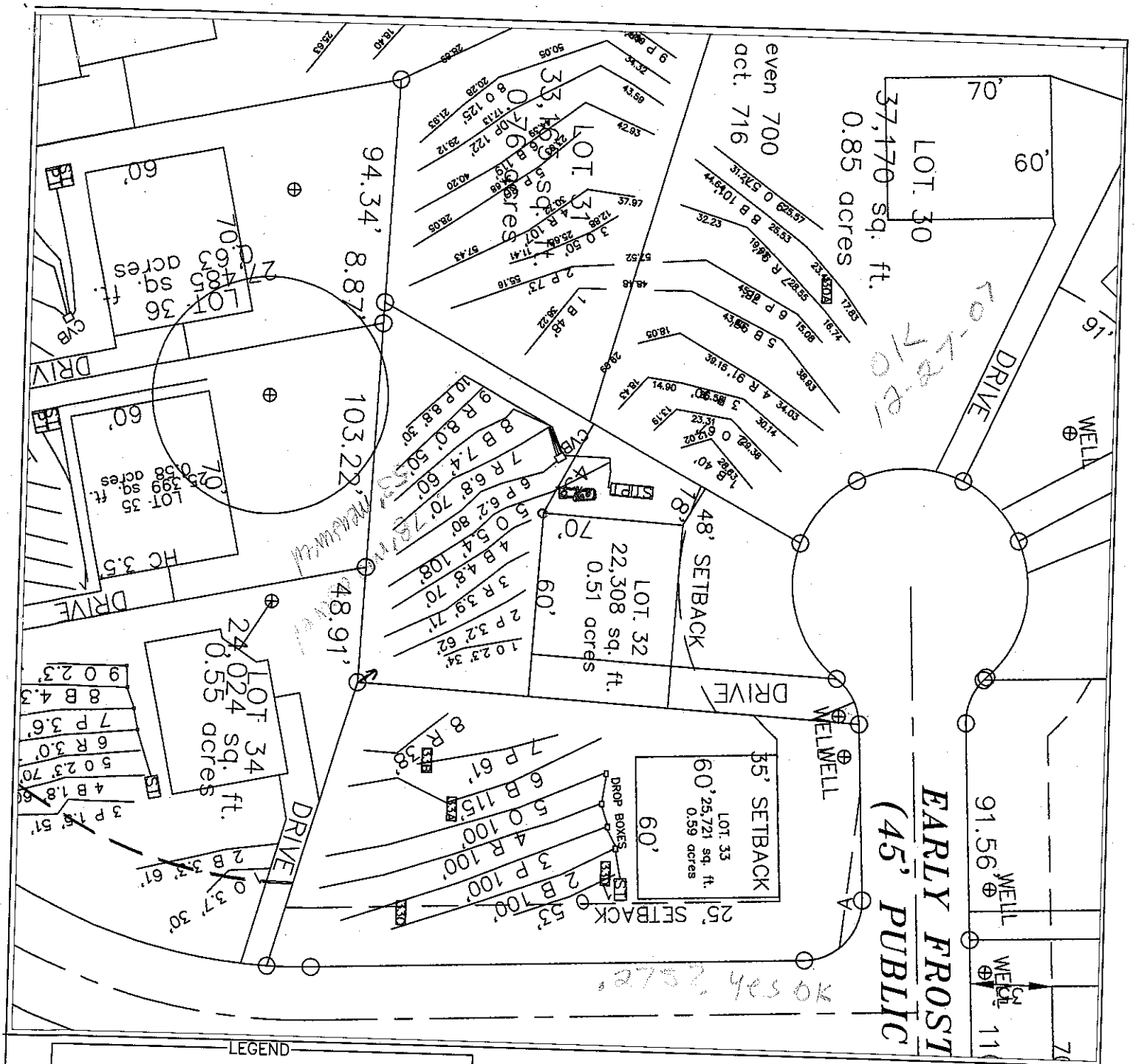
Notes:
** TBM located top of ground at EIP at corner of lot (see site plan)
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS, HI, and FS indicate rod readings

LP PPBPS TAPSHEET -AUTUMN GROVE LOT#32

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
6	*PINK*	96.8	*80*	0.156	**0.41**	240	18
7	*RED*	96.2	*70*	0.156	**0.41**	210	16
8	*BLUE*	95.6	*60*	0.156	**0.41**	180	14
9	*RED*	95	*50*	0.156	**0.41**	150	12
10	*PINK*	94.2	*30*	0.156	**0.41**	90	7
							67
	total	**feet =**	**240**	**gal/min =**	**27.47**		
			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



LEGEND

House Box.

System lines.

Repair lines.

GRAPHIC SCALE
1" = 60'

60 0 60 60

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

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MAP TITLE: SITE PLAN & DRAINFIELD AREAS

PROJECT NAME: E&J DEVELOPMENT/AUTUMN GROVE SUBDIVISION

LOCATION/DATE: HWY 21/115 IREDELL COUNTY, NORTH CAROLINA AUGUST 2007

JOB # : 01-1043
FILE: C:\JOBS\01-1043
PROJECT MGR.: C.B.F.
FIELD WORK: C.B.F., A.L.P. & M.D.B.
DRAWN BY: C.B.F. & M.D.B.

CALCULATIONS

Location Autumn Grove

Project Number 01-1043

Lot No: Lot 32

No. of Bedrooms	4	
Design Flow	480	$^{gal}/_{day}$
LTAR	0.275	$^{gal}/_{ft^2\,day}$
PPBPS? (YES OR NO)	YES	
Supply Line Length	35	ft.
Supply Line Volume	6.09	gal.
Required Feet of Line	290.9091	ft.
Amount of Line from Layout	290	ft.
Gallons per Minute	27.47	$^{gal}/_{min}$
Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	67	
Dosing Volume	161.60	gal.

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

Tank Draw Down	7.7	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	3.8	ft.
Pressure Head	2	ft.
Friction Factor	1.78	ft./100 ft. *(From the interpolater.)*
Friction Head	0.62	ft.
Total Dynamic Head (+15%)	7.39	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