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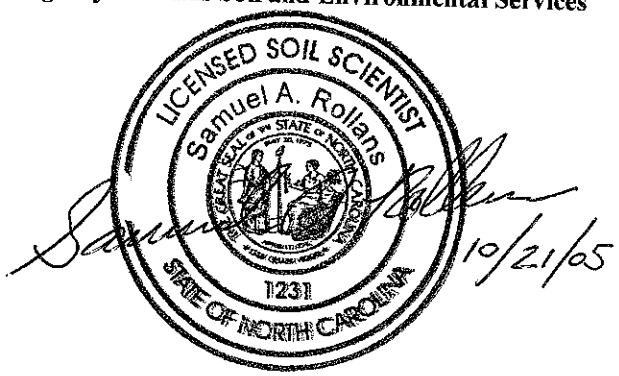
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Attached is a proposed design for an Accepted (25% reduction) Septic System with Pressure Manifold distribution for a 4 bedroom single family residence on Lot #15 Lakewood Crossing Subdivision, Iredell County, North Carolina.

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October 7, 2005
Project No. 01-1089
Design By: Rollans Soil and Environmental Services



10/21/05

PRESSURE MANIFOLD SYSTEM
FOR WASTEWATER TREATMENT

Owner: Nation Land Company LLC

Address: 4330 Sterilite Street SE
Massillion, OH 44646
Phone: 330-832-4091
County: Iredell
Location: Lakewood Crossing Subdivision Lot #15

Source of Wastewater Flow: 4 Bedroom Single Family Residence
Estimated Daily Wastewater Production: 480 gpd
System Flow: 21.33

Design Specifications

Drainfield Size: 399
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: 96
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 16.70
Dosing Volume: 182.38
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: 1.22
Elevation Head: 19.40
Total Dynamic Head: 26.01

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.

LAKEWOOD CROSSING SUBDIVISION LOT 15
PRESSURE MANIFOLD DESIGN

DESIGN FLOW:	480	
SOIL APPLICATION RATE:	.3 gpd/ft²	
TOTAL AREA TRENCH BOTTOM:	1197	
TOTAL LATERAL LENGTH:	399	
NUMBER OF FIELDS:	1	
LATERAL LENGTH REQUIRED PER FIELD:	400	
SUPPLY LINE LENGTH:	96	
TOTAL DYNAMIC HEAD:	26.01	
MANIFOLD SIZE:	4 in.SCH 80 PVC	
DOSING VOLUME:	182.38	
PUMP TANK DRAW DOWN*:	8.7	
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.*

LAKEWOOD CROSSING LOT #15

Project #: 01-1089

LAYOUT FOR 4 BEDROOM HOME

October 7, 2005

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		1.0			100.00		
TANK		18.90	82.10				
HOUSE		14.50	86.50				
INSTR. 1			101.00				
1	BLUE			2.10	98.90	112	112
2	RED			3.50	97.50	121	121
3	PINK			5.30	95.70	130	130
4	***RED***			***6.50***	***94.50***	***133***	***133***
5	***ORANGE***			***7.70***	***93.30***	***133***	***133***
6	***PINK***			***9.40***	***91.60***	***133***	***133***
					Total	**762**	**762**

	LINE LENGTH	LTAR GPD/FT²	SYSTEM TYPE	SOIL LTAR GPD/FT²	TRENCH SYSTEM	DISTRIBUTION
** System*	*399*	*0.30*	*ACCEPT.*	*0.30*	*25% RED.*	**PRESSURE**
Repair	363	0.30	*MOD.*	0.30	PPBPS	**MANIFOLD** LOW PRESSURE

Notes:

** TBM located on corner of lot 15 and 16 (see site plan)

**TBM is assumed to be 100'

**All measures in feet

**Nitrification lines are demonstrated on contour via colored pin flags

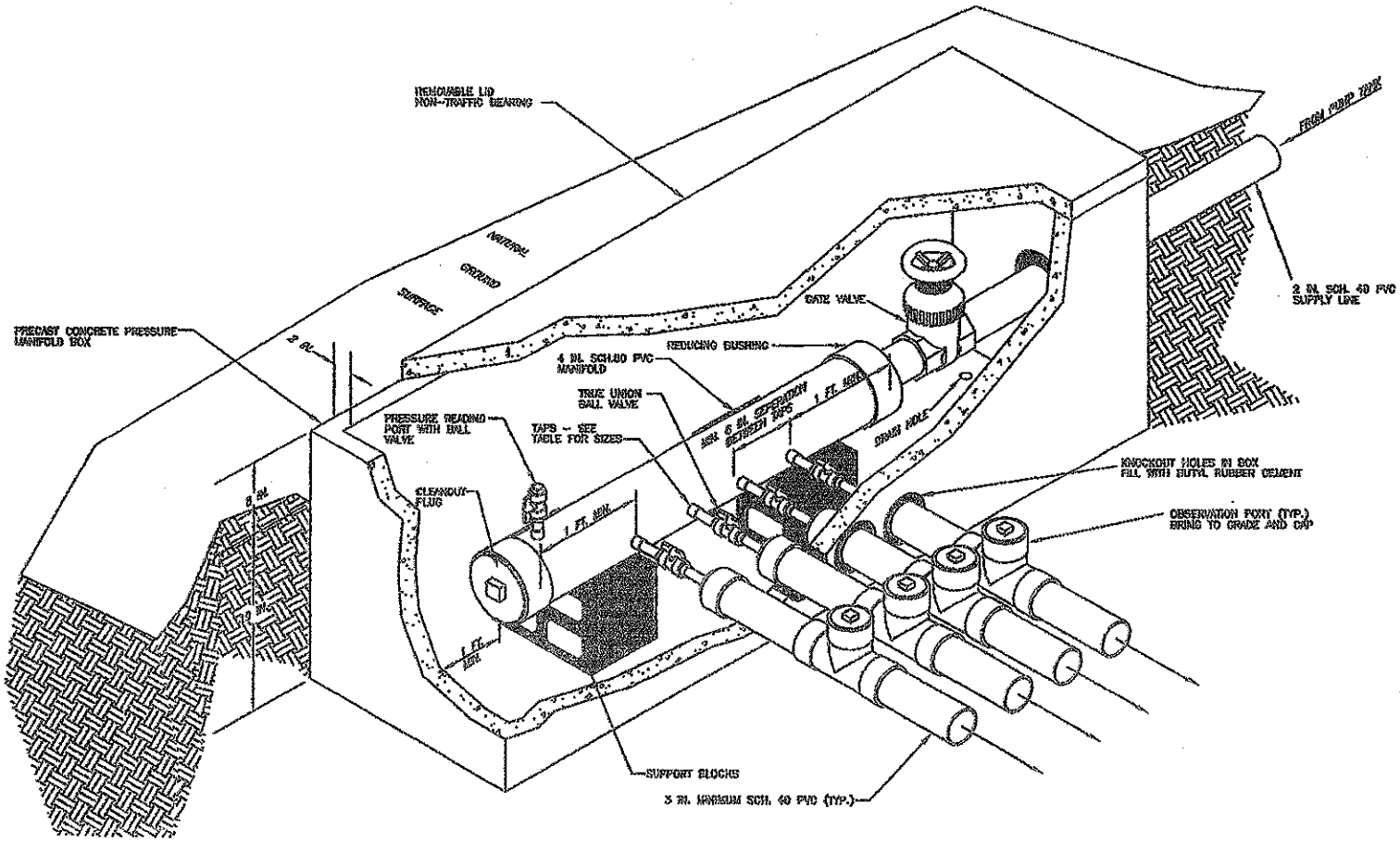
**BS, HI, and FS indicate rod readings

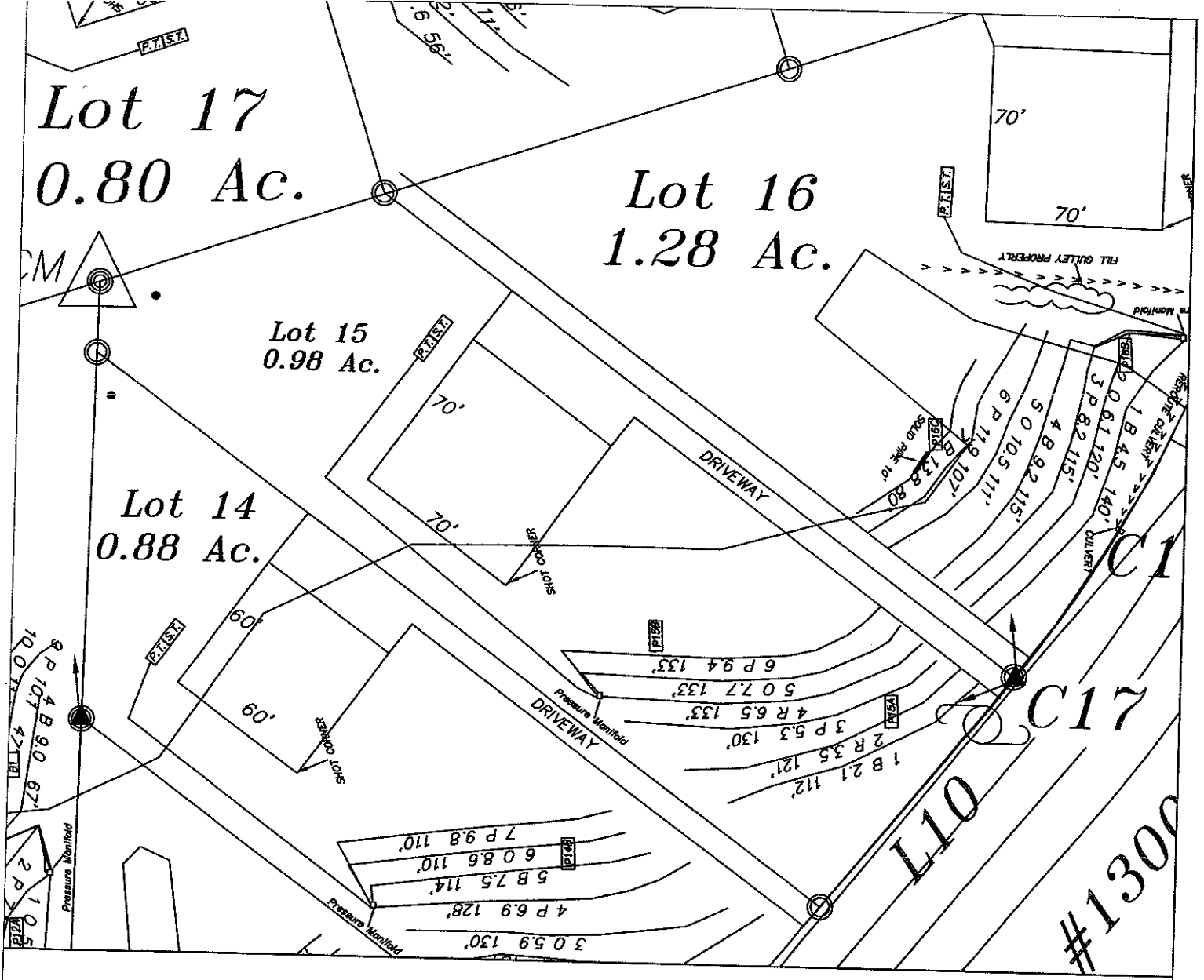
PRESSURE MANIFOLD TAPSHEET - LAKEWOOD CROSSING LOT#15

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/Tap	Trench Area
4	***RED***	94.5	**133**	SCH 40 1/2	**7.11**	399
5	***ORANGE***	93.3	**133**	SCH 40 1/2	**7.11**	399
6	***PINK***	91.6	**133**	SCH 40 1/2	**7.11**	399
	total	**feet =**	**399**	**gal/min =**	**21.33**	
			Des. Flow	**480**		
			Pump Run=	**8.55**		
			soil LTAR	**0.3**		
			LTAR +5%	**0.315**		
			LTAR with ACCEPTED	**0.4**		
			LTAR with ACCEPTED + 5%	**0.42**		

TYPICAL SCHEMATIC
OF PRESSURE MANIFOLD





LEGEND

- Areas contain soils with 24 inches or more of useable material and have potential for conventional, modified conventional and low-pressure pipe (lpp) septic systems.
- Unsuitable areas.
- System lines.
- Repair lines.
- Temporary Bench Mark (TBM)
- Well Location.

GRAPHIC SCALE
1" = 60'

60 0 60 120

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: RIDGELINE DEVELOPMENT CORP. / ANNISTON PHASE II

LOCATION/DATE: SHEARER CHAPEL ROAD, IREDELL COUNTY, NORTH CAROLINA, AUGUST 2005

JOB # : 01-1005
FILE: C:\JOBS\01-1005
PROJECT MGR.: S.A.R.
FIELD WORK: S.A.R.
DRAWN BY: S.A.R.

CALCULATIONS

Location LAKEWOOD CROSSING SUBDIVISION

Project Number 01-1089

Lot No: Lot 15

No. of Bedrooms 4

Design Flow 480 $^{gal}/_{day}$

LTAR .3 gpd/ft²

25% RED.? (YES OR NO) YES

Supply Line Length 96 ft.

Supply Line Volume 16.704 gal.

Required Feet of Line 400 ft.
Amount of Line from Layout 399 ft.

Gallons per Minute 21.33 $^{gal}/_{min}$

Required Septic Tank Capacity 1000 gal.
Minimum Standard Tank Size 1000

Lateral Line Volume 260.547 gal.

Dosing Volume 182.38 gal.
Note: Dosing Volume based on70% of lateral line volume

Tank Draw Down 8.7 *Generic Draw Down of 21 gal.per in.*

Pump Run Time 8.55 minutes

Elevation Head 19.4 ft.
Pressure Head 2 ft.
Friction Factor 1.27 ft./100 ft. *(From the interpolater.)*
Friction Head 1.22 ft.

Total Dynamic Head (+15%) 26.01 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