# ROLLANS *SOIL & ENVIRONMENTAL SERVICES*

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**Attached is a proposed design for an existing PPBPS Septic System with low pressure distribution from a 3 bedroom single family residence to a 4 bedroom residence at 172 Bal Moral Drive, Iredell County, North Carolina.**

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LICENSED SOIL SCIENTIST Samuel A. Rollans 1231 STATE OF NORTH CAROLINA

1/27/06

**January 26, 2006**
**Project No. 01-1186**
**Design By: Rollans Soil & Environmental Services**

# LP PPBPS SYSTEM
# FOR WASTEWATER TREATMENT

| | |
|---|---|
| **Owner/Applicant:** | ABJ Construction, Inc. |
| **Address:** | 1184 Brawley School Road<br>Mooresville, NC 28117 |
| **Phone:** | 704-664-4353 |
| **County:** | Iredell |
| **Location:** | 172 Bal Moral Drive |
| **Source of Wastewater Flow:** | 4 Bedroom Single Family Residence |
| **Estimated Daily Wastewater Production:** | 480 gpd |
| **System Flow:** | 33.85384615 |

## Design Specifications

| | |
|---|---|
| **Drainfield Size:** | 270 |
| **Loading Rate:** | 0.30 gpd/ft.$^2$ |
| **Depth of Gravel in Trench:** | NA (PPBPS ) |
| **Gravel Size:** | NA (PPBPS ) |
| **Trench Depth:** | 36 in. |
| **Trench Width:** | 24 in. |
| **Septic Tank Size:** | 1000 |
| **Pump Tank Size:** | 1000 |
| **Estimated Supply Line Length:** | 120 |
| **Supply Line Diameter:** | 2 in. SCH 40 PVC |
| **Supply Line Volume:** | 20.88 |
| **Dosing Volume:** | 170.47 |
| **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:** | 2.84 |
| **Elevation Head:** | 18.20 |
| **Total Dynamic Head:** | 26.50 |
| **Threaded Union:** | In Tank |
| **Gate Valves:** | 1 in Tank<br>1 per lateral (4) |
| **Check Valves:** | In Tank |
| **Anti-Siphon Hole:** | NA |
| **Additional Comments:** | Soil suitability was performed by Rollans Soil & Environmental Services |

## 172 Bal Moral Drive
## LP PPBPS

| | |
|---|---|
| **DESIGN FLOW:** | 480 |
| **SOIL APPLICATION RATE:** | 0.30 gpd/ft² |
| **TOTAL AREA TRENCH BOTTOM:** | 540 |
| **TOTAL LATERAL LENGTH:** | 270 |
| **NUMBER OF FIELDS:** | 1 |
| **LATERAL LENGTH REQUIRED PER FIELD:** | 266.6666667 |
| **SUPPLY LINE LENGTH:** | 120 |
| **TOTAL DYNAMIC HEAD:** | 26.50 |
| **MANIFOLD SIZE:** | N/A |
| **DOSING VOLUME:** | 170.47 |
| **PUMP TANK DRAW DOWN*:** | 8.1 |
| **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.*

# 172 Bal Moral Drive

Project #: 01-1186

LAYOUT FOR 4 BEDROOM HOME

January 26, 2006

| LINE # | FLAG COLOR | BS | HI | FS | ELEVATION | FLAGGED LINE LENGTH | DESIGN LINE LENGTH |
|---|---|---|---|---|---|---|---|
| TBM | | 4.7 | | | 100.00 | | |
| INSTR. 1 | | | 104.70 | | | | |
| HOUSE CNR | | | | 5.00 | 99.70 | | |
| P. TANK (existing) | | | | 17.20 | 87.50 | | |
| 1 | BLUE | | | 1.50 | 103.20 | 45 | 45 |
| 2 | ORANGE | | | 2.70 | 102.00 | 72 | 72 |
| 3 | PINK | | | 3.50 | 101.20 | 51 | 51 |
| *4* | *RED (existing)* | | | *4.00* | *100.70* | *100* | *100* |
| *5* | *RED (existing)* | | | *4.50* | *100.20* | *100* | *100* |
| *6* | *BLUE* | | | *4.70* | *100.00* | *35* | *35* |
| *7* | *ORANGE* | | | *6.10* | *98.60* | *35* | *35* |
| 8 | PINK | | | 8.70 | 96.00 | 52 | 52 |
| 9 | BLUE | | | 9.70 | 95.00 | 40 | 40 |
| 10 | PINK | | | 11.60 | 93.10 | 30 | 30 |
| | | | | | Total | 560 | 560 |

| | LINE LENGTH | LTAR GPD/FT2 | SYSTEM TYPE | SOIL LTAR GPD/FT2 | TRENCH SYSTEM | DISTRIBUTION |
|---|---|---|---|---|---|---|
| ** System* | *270* | *0.3* | *MOD.* | *0.30* | *PPBPS* | *LOW PRESSURE* |
| Repair | 290 | 0.3 | MOD. | 0.30 | PPBPS | LOW PRESSURE |

Notes:

** TBM located top of concrete driveway at green pin flag (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

**All laterals designed on 8' centers

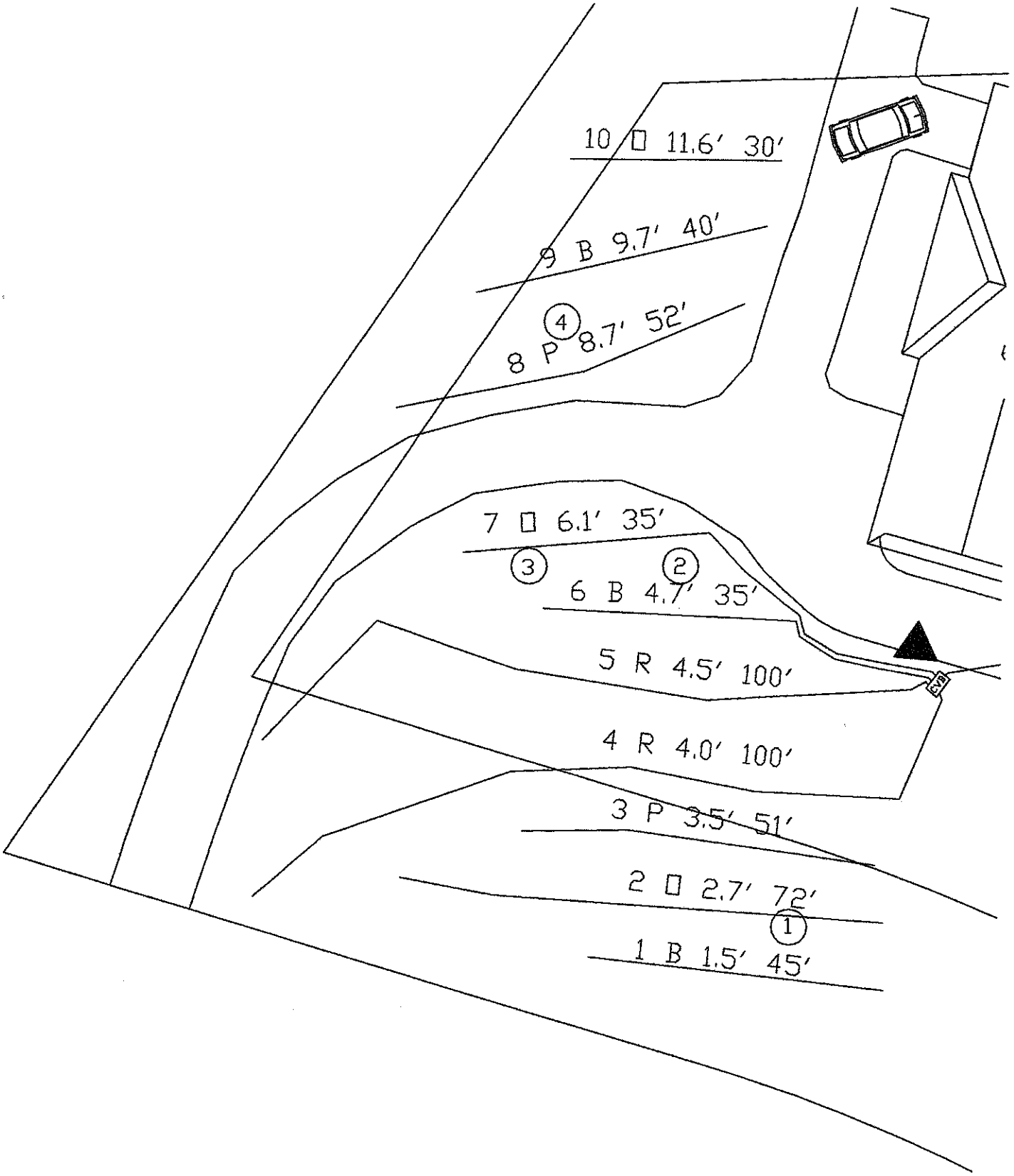
# LP PPBPS TAPSHEET -172 Bal Moral Drive

## SYSTEM

| Line # | Color | Elevation | Length | Hole Size | Flow/hole | Trench Area | Number of Panels |
|---|---|---|---|---|---|---|---|
| 4 | RED (existing | 100.7 | 100 | 0.188 | **0.59** | 300 | 23 |
| 5 | RED (existing | 100.2 | 100 | 0.188 | **0.59** | 300 | 23 |
| 6 | BLUE | 100 | 35 | 0.156 | **0.41** | 105 | 8 |
| 7 | ORANGE | 98.6 | 35 | 0.156 | **0.41** | 105 | 8 |

| | | | | |
|---|---|---|---|---|
| **total** | **feet =** | **270** | **gal/min =** | **33.853846** |
| | | **Des. Flow** | **360** | |
| | | **Pump Run=** | **5.04** | |
| | | **soil LTAR** | **0.3** | |
| | | **LTAR +5%** | **0.315** | |
| | | **LTAR with mod.** | **0.6** | |
| | | **LTAR with mod.. + 5%** | **0.63** | |

**.188 equals 3/16 inch hole**
**.156 equals 5/32 inch hole**


10 □ 11.6′ 30′
9 B 9.7′ 40′
8 P 8.7′ 52′
4
7 □ 6.1′ 35′
3
2
6 B 4.7′ 35′
5 R 4.5′ 100′
4 R 4.0′ 100′
3 P 3.5′ 51′
2 □ 2.7′ 72′
1
1 B 1.5′ 45′

1" = 20′

## CALCULATIONS

Location 172 Bal Moral Drive

Project Number 01-1186

Lot No: N/A

No. of Bedrooms 4

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

LTAR 0.3 $^{gal}/_{ft^2\ day}$

PPBPS? (YES OR NO) YES

Supply Line Length 120 ft.

Supply Line Volume 20.88 gal.

Required Feet of Line 266.6667 ft.
Amount of Line from Layout 270 ft.

Gallons per Minute 33.85385 $^{gal}/_{min}$

*Note: Flow/hole (.41gpm) x # of panels (64)*

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

Panel Volume 3.6 gal.
# of Panels 62
Dosing Volume 170.47 gal.

*Note: Dosing Volume based on 76% of # of panels times 3.6 gal/panel*

Tank Draw Down 8.1 *Generic Draw Down of 21 gal.per in.*

Pump Run Time 5.04 minutes

Elevation Head 18.2 ft.
Pressure Head 2 ft.
Friction Factor 2.37 ft./100 ft. *(From the interpolater.)*
Friction Head 2.84 ft.

Total Dynamic Head (+15%) 26.50 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 |