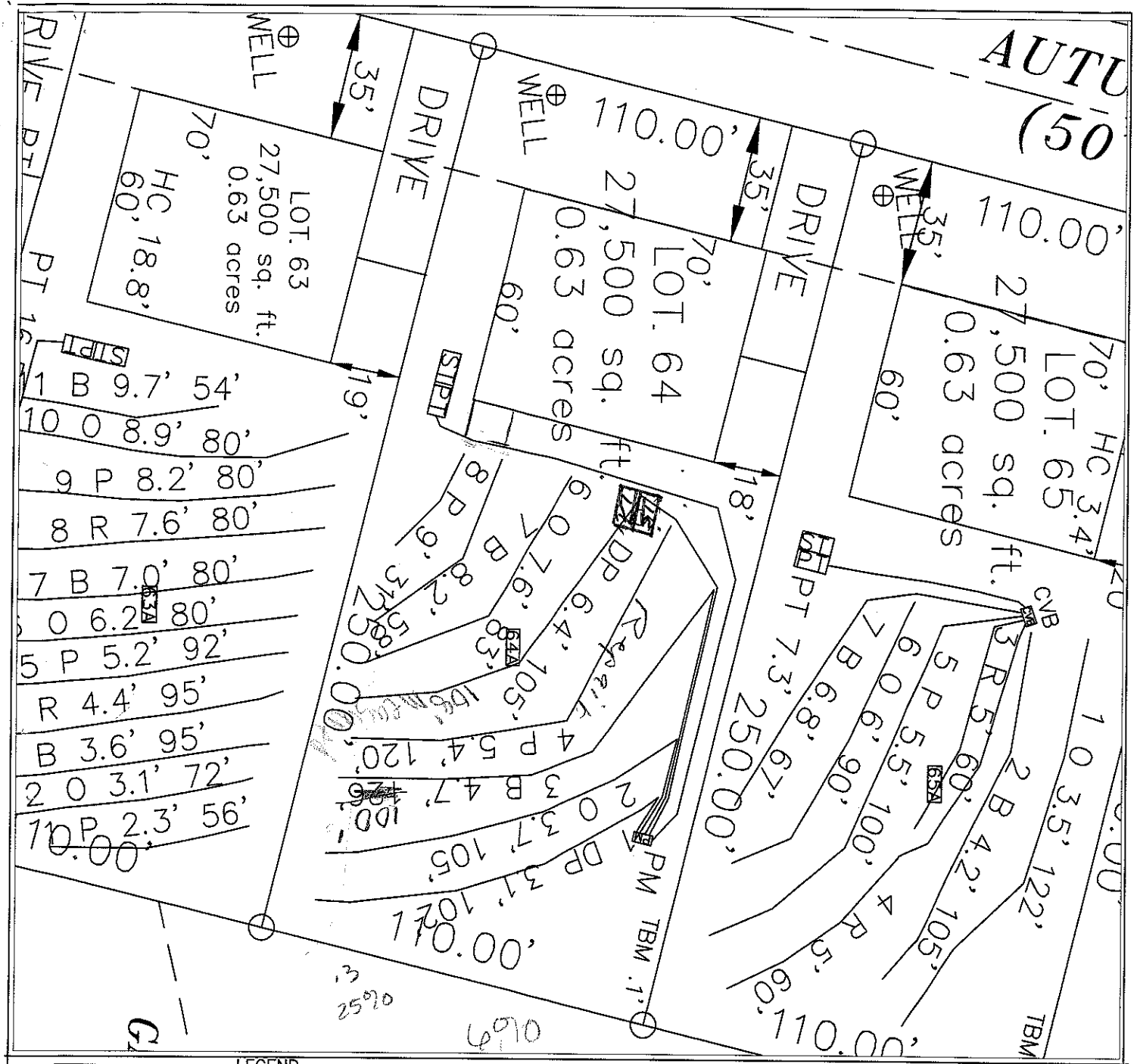



LEGEND

House Box.

System lines.

Repair lines.

OK 11-8-07

GRAPHIC SCALE
1" = 40'

40 0 40 80

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
470 NORTH BROAD STREET SUITE D
MOORESVILLE, NC 28115
PHONE: (704) 658-1723
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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.

# SOIL/SITE EVALUATION

*(Continuation Sheet)*

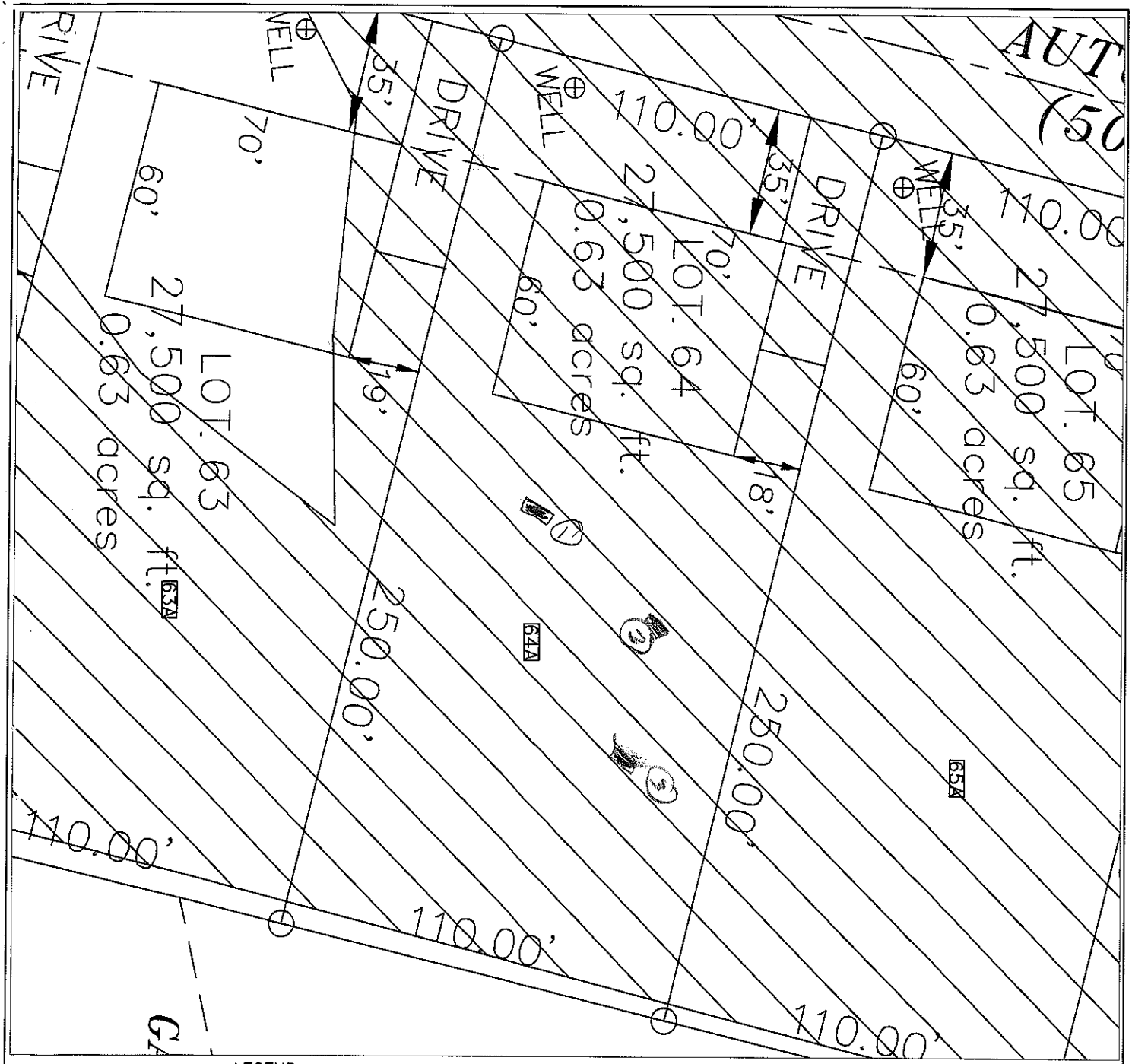
*Sheet ____ of ____*

DEPARTMENT OF ENVIRONMENT
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

PROPERTY ID #: _____
DATE OF EVALUATION: _____
COUNTY: _____

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| P | SS | 0-5 | B scl gr | SS, SP, Fr SE SP | — | 50" | PS | — | PS |
| 64A | 0-5% | 5-16 | R C MFSBK | SS, SP, Fr SE SP | | | | | |
| | | 16-37 | R CL MFSBK | SS, SP, Fr SE SP | | | | | |
| | 6% | 37-50 | R CL MFSBK | SS, SP, Fr SE SP | common sap | | | | .3 |
| | | 50-67 | Var. L Sap Mass | SS, SP, Fr SE SP | common RCL inc. | | | | |
| | | 0-6 | wk gr scl | Fr SS SP | | | | | |
| | | 6-28 | mo sbk c | fr SS SP | | | | | .3 |
| | | 28-50 | wk sbk cl | fr SS SP | fr c sap | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | 0-9 | BSCL WK | fri SSSP Sap | | | | | |
| | | 9-28 | RC MFSBK | fri SSSP Sap | | | | | |
| | | 28-53 | RCL WSBK | fri SSSP Sap | many SAP inc | 53 | — | — | .3 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | 0-5 | Br sbk SL CL | Fr SS SP | | | | | |
| | | 5-24 | mo sbk RED CL | Fr SS SP | | | | | |
| | | 24-48 | wk sbk RED CL | Fr SS SP | m-sap | 48 | | | .3 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

COMMENTS: _____




LEGEND

House Box.

System lines.

Repair lines.

GRAPHIC SCALE
1" = 40'

40 0 40 80

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

# ROLLANS *Soil & Environmental Services, Inc.*

*470 North Broad St., Suite D, Mooresville, NC 28115 Phone: (704) 658-1723 Fax: (704) 658-1724*

**Ashley Rollans**, NC Licensed Soil Scientist
Mobile: (704) 746-5046
E-mail: Rollansfortcj@aol.com

**Brady Freeman**, Registered Sanitarian
Mobile: (704) 746-6497
E-mail: bfree209@yahoo.com


**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 #64 Autumn Grove Subdivision, Iredell County, North Carolina.**

**Contents:** **Page**


Information for the Installer---------- 1

Design Information
- Design Specifications---------- 2-3
- Layout Specifications---------- 4
- System Tapsheet---------- 5
- Pressure Manifold Diagram---------- 6

Site Plan/System Plan---------- 7

Calculations---------- 8

Profile Descriptions---------- 9


**August 30, 2007**
**Project #: 01-1043**
**Design By: Rollans Soil and Environmental Services**

# PRESSURE MANIFOLD SYSTEM
# FOR WASTEWATER TREATMENT

| | |
|---|---|
| **Owner:** | Orchard Farms LLC |
| **Address:** | 227 Hideaway Lane<br>Mooresville, NC 28117 |
| **Phone:** | 704-201-6465 |
| **County:** | Iredell |
| **Location:** | Autumn Grove LOT 64 |
| **Source of Wastewater Flow:** | 4 Bedroom Single Family Residence |
| **Estimated Gallons Per Day Flow:** | 480 |
| **System Flow:** | 28.44 |

## Design Specifications

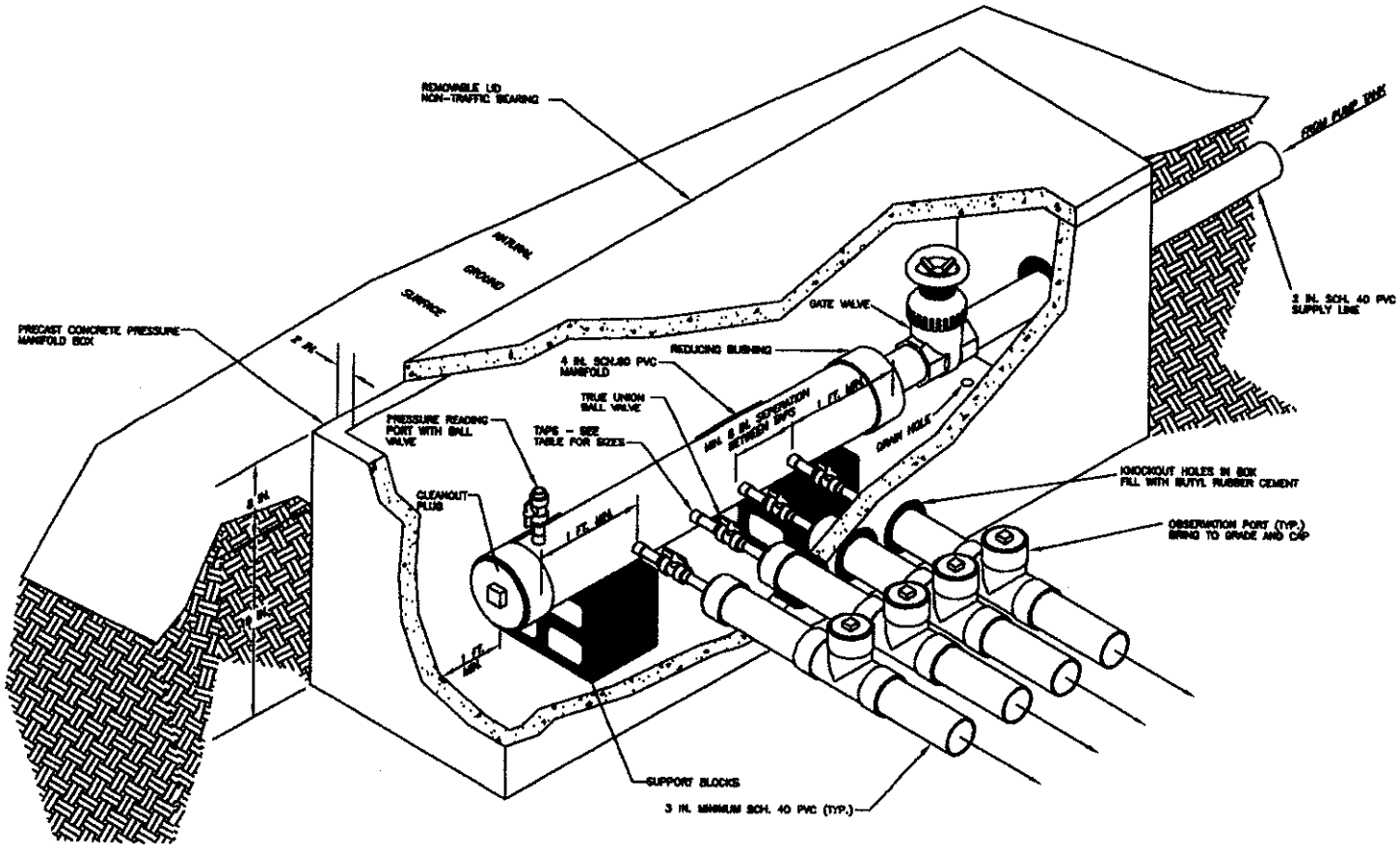
| | |
|---|---|
| **Drainfield Size:** | 400 |
| **Loading Rate (gpd/ft.$^2$):** | 0.3 |
| **Depth of Gravel in Trench:** | NA (25% reduction ) |
| **Gravel Size:** | NA (25% reduction ) |
| **Trench Depth:** | 36 in. |
| **Trench Width:** | 36 in. |
| **Septic Tank Size:** | 1000 |
| **Pump Tank Size:** | 1000 |
| **Estimated Supply Line Length:** | 182 |
| **Supply Line Diameter:** | 2 in. SCH 40 PVC |
| **Supply Line Volume:** | 31.67 |
| **Dosing Volume:** | 195.90 |
| **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:** | 3.24 |
| **Elevation Head:** | 12.00 |
| **Total Dynamic Head:** | 19.83 |
| **Threaded Union:** | In Tank |
| **Gate Valves:** | 1 in Tank<br>1 at Pressure Manifold |
| **Check Valves:** | In Tank |
| **Anti-Siphon Hole:** | NA |
| **Additional Comments:** | Soil suitability was performed by Rollans Soil & Environmental Services. |

# Autumn Grove LOT 64
## PRESSURE MANIFOLD DESIGN

| | |
|---|---|
| **DESIGN FLOW (gpd):** | 480 |
| **SOIL APPLICATION RATE (gpd/ft.$^2$):** | 0.3 |
| **TOTAL AREA TRENCH BOTTOM:** | 1200 |
| **TOTAL LATERAL LENGTH:** | 400 |
| **NUMBER OF FIELDS:** | 1 |
| **LATERAL LENGTH REQUIRED PER FIELD:** | 400 |
| **SUPPLY LINE LENGTH:** | 182 |
| **TOTAL DYNAMIC HEAD:** | 19.83 |
| **MANIFOLD SIZE:** | 4 in.SCH 80 PVC |
| **DOSING VOLUME:** | 195.90 |
| **PUMP TANK DRAW DOWN*:** | 9.3 |
| **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.*

# TYPICAL PRESSURE MANIFOLD DETAIL



# Autumn Grove LOT 64

Project #: 01-1043

LAYOUT FOR 4 BEDROOM HOME

August 30, 2007

| LINE # | FLAG COLOR | BS | HI | FS | ELEVATION | FLAGGED LINE LENGTH | DESIGN LINE LENGTH |
|---|---|---|---|---|---|---|---|
| TBM | | 0.1 | | | 100.00 | | |
| INSTR. 1 | | | 100.10 | | | | |
| HOUSE | | | 90.40 | 9.70 | | | |
| TANK | | | 90.00 | 10.10 | | | |
| *1* | ***DARK PINK*** | | | ***3.10*** | ***97.00*** | ***102*** | ***100*** |
| *2* | ***ORANGE*** | | | ***3.70*** | ***96.40*** | ***105*** | ***100*** |
| *3* | ***BLUE*** | | | ***4.70*** | ***95.40*** | ***126*** | ***100*** |
| 4 | PINK | | | 5.40 | 94.70 | 120 | 120 |
| *5* | ***DARK PINK*** | | | ***6.40*** | ***93.70*** | ***105*** | ***100*** |
| 6 | ORANGE | | | 7.60 | 92.50 | 83 | 83 |
| 7 | BLUE | | | 8.20 | 91.90 | 58 | 58 |
| 8 | PINK | | | 9.00 | 91.10 | 31 | 31 |
| | | | | | **Total** | **730** | **692** |

| | LINE LENGTH | LTAR GPD/FT$^2$ | SYSTEM TYPE | SOIL LTAR GPD/FT$^2$ | TRENCH SYSTEM | DISTRIBUTION |
|---|---|---|---|---|---|---|
| ****System*** | ***400*** | ***0.3*** | ***ACCEPT.*** | ***0.3*** | ***25% RED.*** | **PRESSURE MANIFOLD** |
| Repair | 292 | 0.3 | MOD. | 0.3 | PPBPS | LOW PRESSURE |

**Notes:**

** TBM located on left front corner lot 47 (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 - Autumn Grove LOT#64

## SYSTEM

| Line # | Color | Elevation | Length | Hole Size | Flow/Tap | Trench Area |
|---|---|---|---|---|---|---|
| *1* | ***DARK PINK*** | 97 | **100** | SCH 40 1/2 | **7.11** | 300 |
| *2* | ***ORANGE*** | 96.4 | **100** | SCH 40 1/2 | **7.11** | 300 |
| *3* | ***BLUE*** | 95.4 | **100** | SCH 40 1/2 | **7.11** | 300 |
| *5* | ***DARK PINK*** | 93.7 | **100** | SCH 40 1/2 | **7.11** | 300 |
| | **total** | **feet =** | **400** | **gal/min =** | **28.44** | |
| | | | **Des. Flow** | **480** | | |
| | | | **Pump Run=** | **6.89** | | |
| | | | **soil LTAR** | **0.30** | | |
| | | | **LTAR +5%** | **0.315** | | |
| | | | **LTAR with ACCEPTED** | **0.33075** | | |
| | | | **LTAR with ACCEPTED + 5%** | **0.3472875** | | |

## CALCULATIONS

Location Autumn Grove

Project Number 01-1043

Lot No: Lot 64

| | | |
|---|---|---|
| No. of Bedrooms | 4 | |
| Design Flow | 480 | $^{gal}/_{day}$ |
| LTAR | 0.3 | $^{gpd/ft^2}$ |
| 25% RED.? (YES OR NO) | YES | |
| Supply Line Length | 182 | ft. |
| Supply Line Volume | 31.668 | gal. |
| Required Feet of Line | 400 | ft. |
| Amount of Line from Layout | 400 | ft. |
| Gallons per Minute | 28.44 | $^{gal}/_{min}$ |
| Required Septic Tank Capacity | 1000 | gal. |
| Minimum Standard Tank Size | 1000 | |
| Lateral Line Volume | 261.2 | gal. |
| Dosing Volume | 195.90 | gal. |

*Note: Dosing Volume based on75% of lateral line volume*

| | | |
|---|---|---|
| Tank Draw Down | 9.3 | *Generic Draw Down of 21 gal.per in.* |
| Pump Run Time | 6.89 | minutes |
| Elevation Head | 12 | ft. |
| Pressure Head | 2 | ft. |
| Friction Factor | 1.78 | ft./100 ft. *(From the interpolater.)* |
| Friction Head | 3.24 | ft. |
| Total Dynamic Head (+15%) | 19.83 | 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 |