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

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**February 12, 2008**
**Project #: 01-1043**
**Design By: Rollans Soil and Environmental Services**

# PRESSURE MANIFOLD SYSTEM FOR WASTEWATER TREATMENT

| | |
|---|---|
| **Owner:** | E & J DEVELOPMENT |
| **Address:** | 227 Hideaway Lane<br>Mooresville, NC 28117 |
| **Phone:** | 704-201-6465 |
| **County:** | Iredell |
| **Location:** | Autumn Grove LOT 38 |

| | |
|---|---|
| **Source of Wastewater Flow:** | 4 Bedroom Single Family Residence |
| **Estimated Gallons Per Day Flow:** | 480 |
| **System Flow:** | 42.66 |

## Design Specifications

| | |
|---|---|
| **Drainfield Size:** | 540 |
| **Loading Rate (gpd/ft.$^2$):** | 0.225 |
| **Depth of Gravel in Trench:** | NA (25% reduction ) |
| **Gravel Size:** | NA (25% reduction ) |
| **Trench Depth:** | 18 in. |
| **Trench Width:** | 36 in. |
| **Septic Tank Size:** | 1000 |
| **Pump Tank Size:** | 1000 |

| | |
|---|---|
| **Estimated Supply Line Length:** | 259 |
| **Supply Line Diameter:** | 2 in. SCH 40 PVC |
| **Supply Line Volume:** | 45.07 |
| **Dosing Volume:** | 264.47 |
| **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:** | 9.01 |
| **Elevation Head:** | 13.90 |
| **Total Dynamic Head:** | 28.65 |

| | |
|---|---|
| **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 38
## PRESSURE MANIFOLD DESIGN

| | |
|---|---|
| **DESIGN FLOW (gpd):** | 480 |
| **SOIL APPLICATION RATE (gpd/ft.$^2$):** | 0.225 |
| **TOTAL AREA TRENCH BOTTOM:** | 1620 |
| **TOTAL LATERAL LENGTH:** | 540 |
| **NUMBER OF FIELDS:** | 1 |
| **LATERAL LENGTH REQUIRED PER FIELD:** | 533.3333333 |
| **SUPPLY LINE LENGTH:** | 259 |
| **TOTAL DYNAMIC HEAD:** | 28.65 |
| **MANIFOLD SIZE:** | 4 in.SCH 80 PVC |
| **DOSING VOLUME:** | 264.47 |
| **PUMP TANK DRAW DOWN*:** | 12.6 |
| **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 38

Project #: 01-1043

LAYOUT FOR 4 BEDROOM HOME

February 12, 2008

| LINE # | FLAG COLOR | BS | HI | FS | ELEVATION | FLAGGED LINE LENGTH | DESIGN LINE LENGTH |
|---|---|---|---|---|---|---|---|
| TBM | | 1.4 | | | 100.00 | | |
| INSTR. 1 | | | 101.40 | | | | |
| HOUSE | | | 87.80 | 13.60 | | | |
| TANK | | | 87.80 | 13.60 | | | |
| 1 | DARK PINK | | | 1.10 | 100.30 | 41 | 41 |
| 2 | BLUE | | | 1.90 | 99.50 | 117 | 117 |
| 3 | PINK | | | 2.40 | 99.00 | 56 | 56 |
| 4 | RED | | | 3.80 | 97.60 | 174 | 174 |
| ***5*** | ***ORANGE*** | | | ***4.70*** | ***96.70*** | ***117*** | ***90*** |
| ***6*** | ***RED*** | | | ***5.20*** | ***96.20*** | ***97*** | ***90*** |
| ***7*** | ***BLUE*** | | | ***6.00*** | ***95.40*** | ***93*** | ***90*** |
| ***8*** | ***ORANGE*** | | | ***6.90*** | ***94.50*** | ***95*** | ***90*** |
| ***9*** | ***RED*** | | | ***8.20*** | ***93.20*** | ***114*** | ***90*** |
| ***10*** | ***BLUE*** | | | ***9.10*** | ***92.30*** | ***117*** | ***90*** |
| 11 | PINK | | | 10.80 | 90.60 | 87 | 87 |
| 12 | ORANGE | | | 11.90 | 89.50 | 64 | 64 |
| | | | | | **Total** | **1172** | **1079** |

| | LINE LENGTH | LTAR GPD/FT$^2$ | SYSTEM TYPE | SOIL LTAR GPD/FT$^2$ | TRENCH SYSTEM | DISTRIBUTION |
|---|---|---|---|---|---|---|
| **** System*** | ***540*** | ***0.225*** | ***ACCEPT.*** | ***0.225*** | ***25% RED.*** | **PRESSURE** |
| Repair | 539 | 0.225 | ACCEPT. | 0.225 | 25% RED. | **MANIFOLD** PRESSURE MANIFOLD |

Need 533'

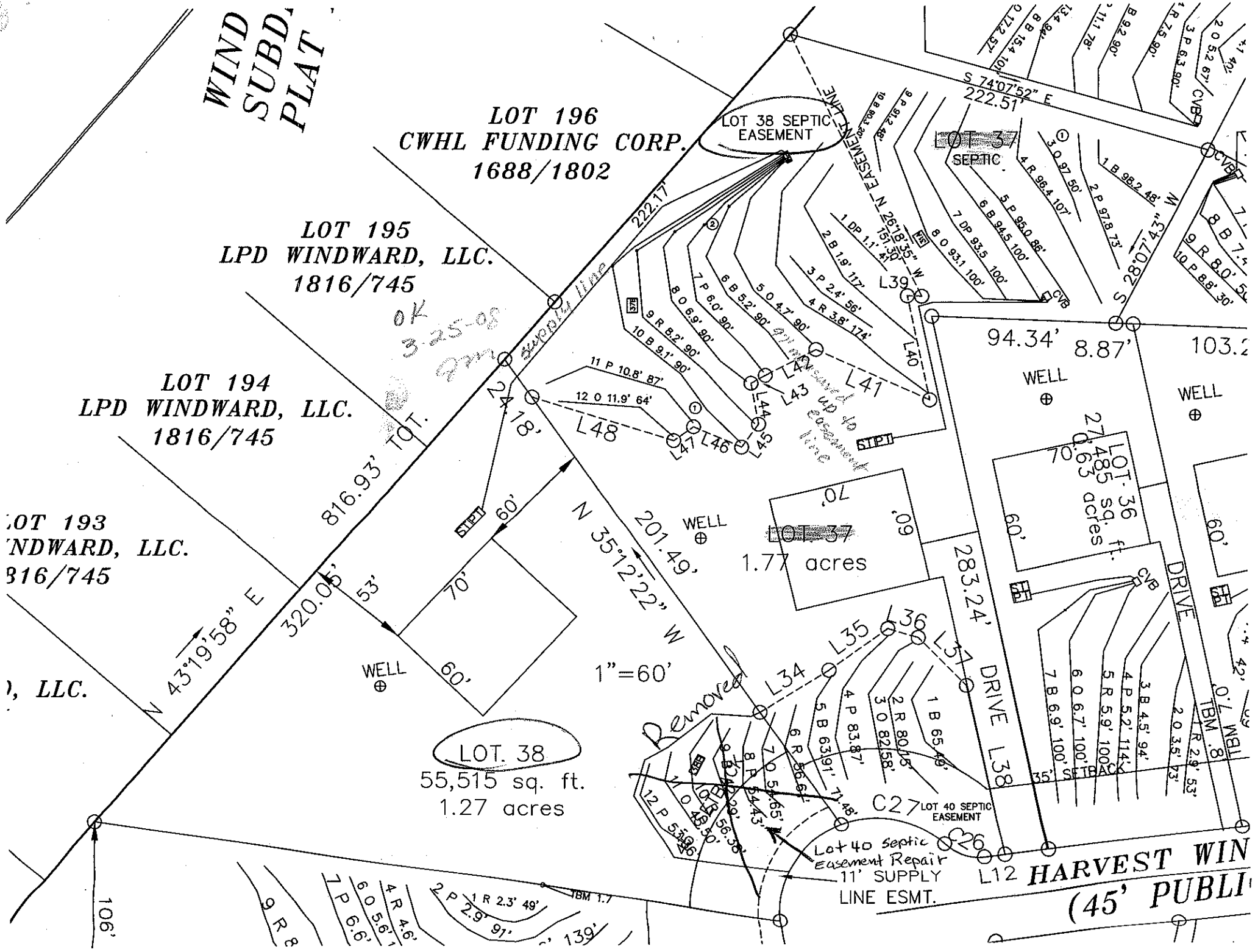
**Notes:**

** TBM located on left front corner lot 68 (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# 38

## SYSTEM

| Line # | Color | Elevation | Length | Hole Size | Flow/Tap | Trench Area |
|---|---|---|---|---|---|---|
| *5* | ***ORANGE*** | 96.7 | **90** | SCH 40 1/2 | **7.11** | 270 |
| *6* | ***RED*** | 96.2 | **90** | SCH 40 1/2 | **7.11** | 270 |
| *7* | ***BLUE*** | 95.4 | **90** | SCH 40 1/2 | **7.11** | 270 |
| *8* | ***ORANGE*** | 94.5 | **90** | SCH 40 1/2 | **7.11** | 270 |
| *9* | ***RED*** | 93.2 | **90** | SCH 40 1/2 | **7.11** | 270 |
| *10* | ***BLUE*** | 92.3 | **90** | SCH 40 1/2 | **7.11** | 270 |
| | **total** | **feet =** | **540** | **gal/min =** | **42.66** | |
| | | | **Des. Flow** | **480** | | |
| | | | **Pump Run=** | **6.20** | | |
| | | | **soil LTAR** | **0.225** | | |
| | | | **LTAR +5%** | **0.23625** | | |
| | | | **LTAR with ACCEPTED** | **0.2480625** | | |
| | | | **LTAR with ACCEPTED + 5%** | **0.260465625** | | |


WIND
SUBD.
PLAT
LOT 196
CWHL FUNDING CORP.
1688/1802
LOT 195
LPD WINDWARD, LLC.
1816/745
LOT 194
LPD WINDWARD, LLC.
1816/745
LOT 193
NDWARD, LLC.
816/745
), LLC.
LOT 38 SEPTIC EASEMENT
S 74°07'52" E
222.51'
222.17'
N 26°18'35" W
151.50'
S 28°07'43" W
94.34'
8.87'
103.2
WELL
LOT 37
SEPTIC
LOT 37
1.77 acres
LOT 36
485 sq. ft.
.63 acres
70.
.09
60'
283.24'
DRIVE
DRIVE
L38
L39
L40
L41
L42
L43
L44
L45
L46
L47
L48
L34
L35
L36
L37
L12
C27
C26
LOT 40 SEPTIC EASEMENT
Lot 40 Septic Easement Repair
11' SUPPLY LINE ESMT.
Removed
Surveyed up to easement line
OK 3-25-08
2418'
816.93' TOT.
320.05'
53'
70'
60'
60'
N 35°12'22" W
201.49'
N 43°19'58" E
106'
WELL
WELL
WELL
LOT 38
55,515 sq. ft.
1.27 acres
1"=60'
35' SETBACK
TBM 7.0
TBM 1.7
(45' PUBLI
HARVEST WIN

## CALCULATIONS

Location Autumn Grove

Project Number 01-1043

Lot No: Lot 38

| | | |
|---|---|---|
| No. of Bedrooms | 4 | |
| Design Flow | 480 | $^{gal}/_{day}$ |
| LTAR | 0.225 | $^{gpd/ft^2}$ |
| 25% RED.? (YES OR NO) | YES | |
| Supply Line Length | 259 | ft. |
| Supply Line Volume | 45.066 | gal. |
| Required Feet of Line | 533.3333 | ft. |
| Amount of Line from Layout | 540 | ft. |
| Gallons per Minute | 42.66 | $^{gal}/_{min}$ |
| Required Septic Tank Capacity | 1000 | gal. |
| Minimum Standard Tank Size | 1000 | |
| Lateral Line Volume | 352.62 | gal. |
| Dosing Volume | 264.47 | gal. |

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

| | | |
|---|---|---|
| Tank Draw Down | 12.6 | *Generic Draw Down of 21 gal.per in.* |
| Pump Run Time | 6.20 | minutes |
| Elevation Head | 13.9 | ft. |
| Pressure Head | 2 | ft. |
| Friction Factor | 3.48 | ft./100 ft. *(From the interpolater.)* |
| Friction Head | 9.01 | ft. |
| Total Dynamic Head (+15%) | 28.65 | 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 |

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

Sheet ___ of ___
PROPERTY ID #: ___
COUNTY: FAGBEL

# SOIL/SITE EVALUATION
## *for* ON-SITE WASTEWATER SYSTEM

OWNER: E & J Development
ADDRESS: ___
PROPOSED FACILITY: ___
LOCATION OF SITE: Lot 38 Autumn Grove
WATER SUPPLY: ☑ Private ☐ Public ☐ Well ☐ Spring ☐ Other ___
EVALUATION METHOD: ☑ Auger Boring ☐ Pit ☐ Cut

APPLICATION DATE ___
DATE EVALUATED: ___
PROPOSED DESIGN FLOW (.1949): 480
PROPERTY SIZE: ___
PROPERTY RECORDED: ___
TYPE OF WASTEWATER: ☐ Sewage ☐ Industrial Process ☐ Mixed

| PROFILE # | .1940 LANDSCAPE POSITION/ SLOPE % | HORIZON DEPTH (IN.) | SOIL MORPHOLOGY (.1941) | | OTHER PROFILE FACTORS | | | | PROFILE CLASS & LTAR |
|---|---|---|---|---|---|---|---|---|---|
| | | | .1941 STRUCTURE/ TEXTURE | .1941 CONSISTENCE/ MINERALOGY | .1942 SOIL WETNESS/ COLOR | .1943 SOIL DEPTH | .1956 SAPRO CLASS | .1944 RESTR HORIZ | |
| 38A 1 | LSS 5% | 0-4 | BSCL GR | fri SSSPSeaP | | | | | |
| | | 4-14 | RYC MFSBK | fr. SSSPSeaP | few SAP | | | | |
| | | 14-42 | RYCl WSBK | fri SSSPSeaP | common SAP | 42 | PS | — | .3 |
| | | 42-48 | Vwd SAP | fr SSSPSeaP | — | | | | |
| | | | | | | | | | |
| 38B 2 | | 0-6 | BSCL WSBK | fri SSSPSeaP | | | | | |
| | | 6-24 | RBC WFSBK | Fri SSSPSeaP | — | 48 | — | — | .25-.55 |
| | | 24-48 | RYC WFSBK | fri SSSPSeaP | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 37A 3 | ✓ | 0-6 | BSCL GR | fri SSSPSeaP | — | | | | |
| | | 6-38 | RCMFBK | FRI/fr SSSP | | | | | |
| | | 38-60 | RC WFABK/SBK | fri SSSPSeaP | 2 chroms C 38" | 60" | — | 38" | .225 to 38" |
| | | | | | | | | | |
| | | | | | | | | | |
| P1 4 | 10% | 0-10 | mo fsbk cl | fr SSSP | Red | | | | |
| | | 10-43 | mo/wk sbk c | fr SSSP | | c-mn | to 24" | | .25 |
| | | 43-54 | wk sbk cl | fr SSSP | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| DESCRIPTION | INITIAL SYSTEM | REPAIR SYSTEM |
|---|---|---|
| Available Space (.1945) | PS | PS |
| System Type(s) | | |
| Site LTAR | .225 | .225 |

OTHER FACTORS (.1946): ___
SITE CLASSIFICATION (.1948): ___
EVALUATED BY: ROLLANS SOIL & Environment
OTHER(S) PRESENT: ___

COMMENTS: ___

P2

0-6 Br scl gr f

6-30 R C mo f sbk

30-60 R Cl mo/wk s