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Lot 28, Ballard Woods Subdivision

On-Site Wastewater Design Specifications

House Footprint: 52ft X 52ft
Bedrooms: 3 (360gpd flow)

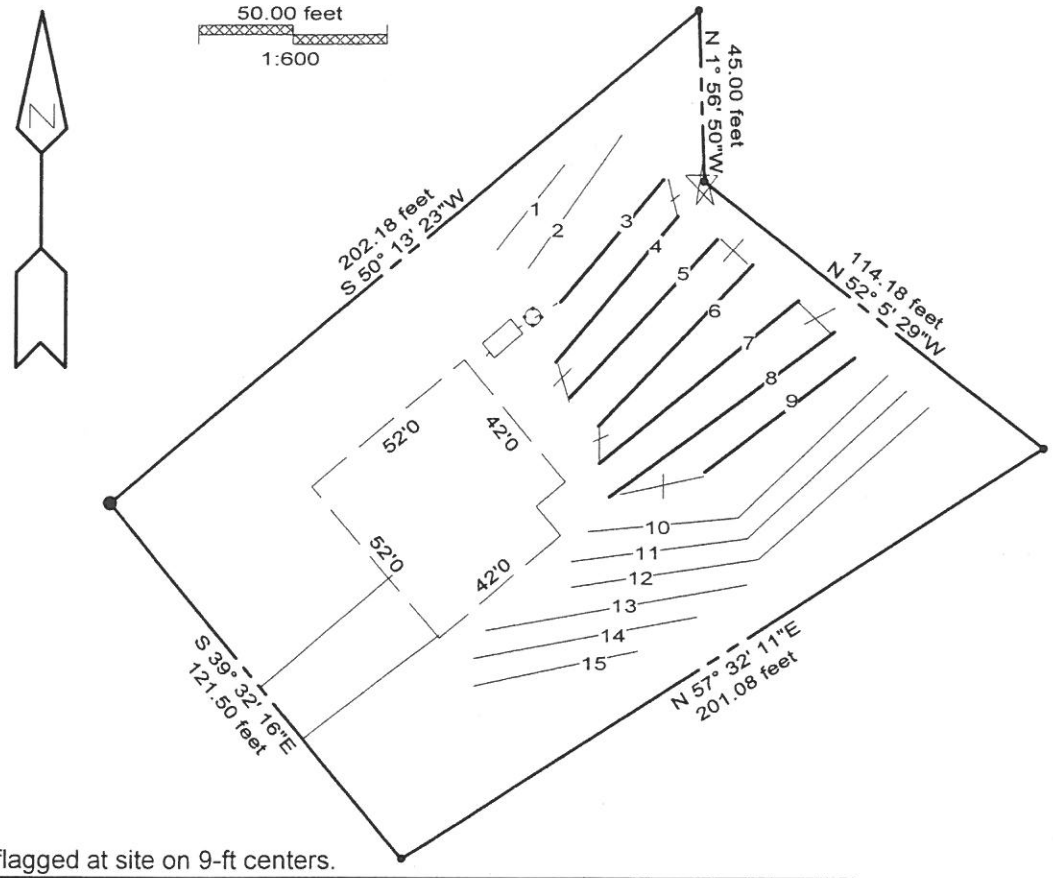
Initial System: 1 X 400ft Serial Distribution
Innovative Drainline, Saprolite System
on contour at 36 inches
Soil LTAR 0.225 gal/day/sqft

Repair System: 554ft Low Pressure Pipe System
on contour at 12 inches
LTAR 0.13 gal/day/sqft

Prepared By: KDB
Hal Owen & Associates, Inc.
Soil & Environmental Scientists
P.O. Box 400, 266 Old Coats Rd.
Lillington, NC 27546-0400
Phone: (910) 893-8743

LEGEND

EIP	Septic Tank
Supply Line	Pump Tank
Proposed Well	D-Box
Existing Well	Pressure Manifold



Lines flagged at site on 9-ft centers.

Initial/ Repair	Line #	Color	Drainline Length(ft)	Measured Field Line Length (ft)	Relative Elevation (ft)
-	1	B	-	28	103.48
-	2	Y	-	43	102.47
Initial	3	R	42	42	100.92
Initial	4	W	50	50	99.84
Initial	5	B	57	57	98.71
Initial	6	Y	59	59	96.94
Initial	7	R	68	68	96.52
Initial	8	B	74	74	95.37
Initial	9	W	50	50	94.71
Repair	10	Y		95	94
Repair	11	R		103	93.14
Repair	12	B		110	92.31
Repair	13	W		70	91.58
Repair	14	Y		61	90.89
Repair	15	R		44	89.88

Lot 28, Ballard Woods Subdivision

Initial System

Low Pressure Pipe Distribution Flow Sheet

Subfields	Line #	Line Color	Line Length	Relative Elev(ft)	Elevation Change	Pressure Head(ft)	Hole Size	Flow/ Hole	Flow/ Lateral	gpm/ft	# Holes	Hole Spacing	First/Last Holes
1	10	Y	95	94.0	0.0	4.0	5/32	0.5757	13.24	0.1394	23	4	3.50
	11	R	103	93.1	0.9	4.9	5/32	0.6346	10.79	0.1047	17	5.5	7.50
	12	B	110	92.3	1.7	5.7	5/32	0.6866	10.30	0.0936	15	7	6.00
			308				**% Decrease top to bottom**			**32.86**			
2	13	W	70	91.6	0.0	4.0	5/32	0.5757	6.33	0.0905	11	6	5.00
	14	Y	61	90.9	0.7	4.7	5/32	0.6234	4.36	0.0715	7	7	9.50
	15	R	44	89.9	1.7	5.7	5/32	0.6872	2.75	0.0625	4	10	7.00
			175				**% Decrease top to bottom**			**30.94**			87.50

Calculations:

Flow/Hole = 11.79 d^2 $h^{1/2}$ **Flow/Lateral** = (flow/hole) x #holes

gpm/ft = (flow /hole) x # Holes / Line Length

Supply Ln (d)Volume = Supply Line Length /100 x Pipe Size & Volume Table

Lateral Ln Vol (1&1/4) =Total linear footage /100 x Pipe Size & Volume Table

Manifold Vol. = Manifold Length x Pipe Volume /100

Dose Vol = Supply Line Vol. + Manifold Vol. + 5(Lateral Line Vol.)

Run Time = Dose Volume /Total Flow

Draw Down = Dose Vol /Pump Tank Vol x liquid depth of tank(inches)

Elev Head = Manifold Elevation - (Pump Tank Elevation - 5ft)

Design Specifications

Supply Line (d)Vol=	
Lateral Line (d)Vol=	
Manifold (d)Vol=	
Dose Vol Range=	
Dose Vol=	@ x

Total Flow =	47.77
LTAR=	0.13
Run Time =	
Draw Down=	

Pressure Head (ft)=	4
Elevation Head (ft)=	
Friction Head (ft)=	
TDH (ft)=	

Friction Head = [0.00113 x (Supply Line Length(ft) + 70ft for fittings in pump tank) x Flow(gpm)^1.85] / Pipe Inside Diameter(in)^4.87 *Computed by the Hazen Williams Formula*

TDH = Pressure Head + Elevation Head + Friction Head

Prepared By: Hal Owen and Associates, Inc.
P.O Box 400, Lillington, NC 27546
Ph (910) 893-8743 / Fx 893-3594

6/19/2006

Report Number:
R06159-0055
Account Number:
45569

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401
Fax No. (804) 271-6446 Email: office@al-labs-eastern.com

Send To: HAL OWEN & ASSOC INC
POB 400
LILLINGTON, NC 27546

Grower: KARL KELLY
BALLARD WOODS - LOT 28

Submitted By: HAL OWEN & ASSOC INC

Farm I D: **Field I D:**

SOIL ANALYSIS REPORT

Analytical Method(s):

Page: 1 **Date Received:** 6/7/2006 **Date of Analysis:** 6/8/2006 **Date of Report:** 6/9/2006

Sample Number	Lab Number	Organic Matter %	Organic Matter ENR lbs/A	Organic Matter Rate	Phosphorus Available ppm	Phosphorus Available Rate	Phosphorus Reserve ppm	Phosphorus Reserve Rate	Potassium K ppm	Potassium K Rate	Magnesium MG ppm	Magnesium MG Rate	Calcium CA ppm	Calcium CA Rate	Sodium NA ppm	Sodium NA Rate	pH Soil pH	pH Buffer Index	Acidity H meq/100g	C.E.C. meq/100g
PIT-1	3880																			
PIT-2	3881																			

Sample Number	Percent Base Saturation K %	Mg %	Ca %	Na %	H %	Nitrate NO3-N ppm	Nitrate Rate	Sulfur SO4-S ppm	Sulfur Rate	Zinc ZN ppm	Zinc Rate	Manganese MN ppm	Manganese Rate	Iron FE ppm	Iron Rate	Copper CU ppm	Copper Rate	Boron B ppm	Boron Rate	Soluble Salts ms/cm	Soluble Salts Rate	Chloride CL ppm	Chloride Rate	Aluminum AL ppm	Aluminum Rate
PIT-1																									
PIT-2																									

Values on this report represent the plant available nutrients in the soil.
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams).
Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to the sample(s) tested. Samples are retained a maximum of thirty days after testing. Soil Analysis prepared by: A & L EASTERN LABORATORIES, INC.

by: Paul Chu, Ph.D.

Report Number:
R06159-0055
Acount Number:
45569

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237 • (804) 743-9401
Fax No. (804) 271-6446 • Email: office@al-labs-eastern.com

TO: HAL OWEN & ASSOC INC
POB 400
LILLINGTON, NC 27546

RE: KARL KELLY
BALLARD WOODS - LOT 28

HAL OWEN & ASSOC INC

Date Received: 6/7/06 **Date Reported:** 06/09/2006

REPORT OF ANALYSIS

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
3880	PIT-1	Sand	31	%	Bouyoucos 1962
		Silt	55	%	Bouyoucos 1962
		Clay	14	%	Bouyoucos 1962
		Soil Textural Class	Silt Loam		Bouyoucus 1962
3881	PIT-2	Sand	29	%	Bouyoucos 1962
		Silt	61	%	Bouyoucos 1962
		Clay	10	%	Bouyoucos 1962
		Soil Textural Class	Silt Loam		Bouyoucus 1962

ALE-MISC

Paul Chu

Paul Chu, Ph.D.

HAL OWEN & ASSOCIATES, INC.
P. O. BOX 400, LILLINGTON, NC 27546
VOICE. (910) 893-8743 FAX: (910) 893-3594

PROPERTY ID #:
PROPERTY RECORDED:
COUNTY: Harnett

SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM

APPLICANT: Karl Kelly OWNER: ☒ AGENT: ☐ PHONE: (919) 454-4297
ADDRESS: 308 Flatrock Lane DATE EVALUATED: 05 July 2006
Holly Springs, NC 27540 PROPOSED FACILITY: 3 BR Home
PROPERTY SIZE: 0.574 Acres
LOCATION OF SITE: Ballard Woods – Lot 28 – (SR 1437) Ballard Road
WATER SUPPLY: On-Site Well ☐ Comm. Well ☐ Public ☒ Other EVALUATION METHOD: Auger Boring ☒ Pit ☐

PROFILE 1

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	MOTTLE ABUNDANCE/ SIZE / CONTRAST	.1941 (a)(1) TEXTURE	.1941 (a)(2) STRUCTURE	.1941 (a)(3) MINEROLOGY	CONSISTENCE MOIST	CONSISTENCE WET
A	0-3	5 YR 5/3	---	---	SL	Gr	SEXP	Fr	SS/SP
Bt1	3-8	5 YR 6/6	---	---	CL	2MSBK	SEXP	Fi	S/P
Bt2	8-16	5 YR 5/6	---	---	C	2MSBK	SEXP	Fi	S/P
Bt3	16-22	5 YR 5/6	7.5 YR 7/6	1 f P sapp	C	2MSBK	SEXP	Fi	S/P
BC	22-28	5 YR 5/6	7.5 YR 7/6	Varigated	SiCL	1MSBK	SEXP	Fi	SS/SP
C1	28-63	---	---	Varigated	SiL	---	SEXP	Fr	SS/SP
C2	63-72	---	---	Varigated	SiL	---	SEXP	Fr	SS/SP

.1940 LANDSCAPE POS./ SLOPE%	L 12%	PROFILE LTAR	0.225
.1942 WETNESS CONDITION	> 72"	SYSTEM TYPE	Conventional at 36"
.1943/.1956 SAPROLITE	28"		
.1944 RESTRICTIVE HORIZON	>72"		
.1948 PROFILE CLASSIFICATION	Provisionally suitable for saprolite systems		
COMMENTS:	C1 is well weathered saprolite, C2 contains ~20% coarse fragments		

PROFILE 2

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	MOTTLE ABUNDANCE/ SIZE/ CONTRAST	.1941 (a)(1) TEXTURE	.1941 (a)(2) STRUCTURE	.1941 (a)(3) MINEROLOGY	CONSISTENCE MOIST	CONSISTENCE WET

.1940 LANDSCAPE POS./ SLOPE%		PROFILE LTAR	
.1942 WETNESS CONDITION		SYSTEM TYPE	
.1943/.1956 SAPROLITE			
.1944 RESTRICTIVE HORIZON			
.1948 PROFILE CLASSIFICATION			
COMMENTS:			

EVALUATED BY: Hal Owen, Licensed Soil Scientist

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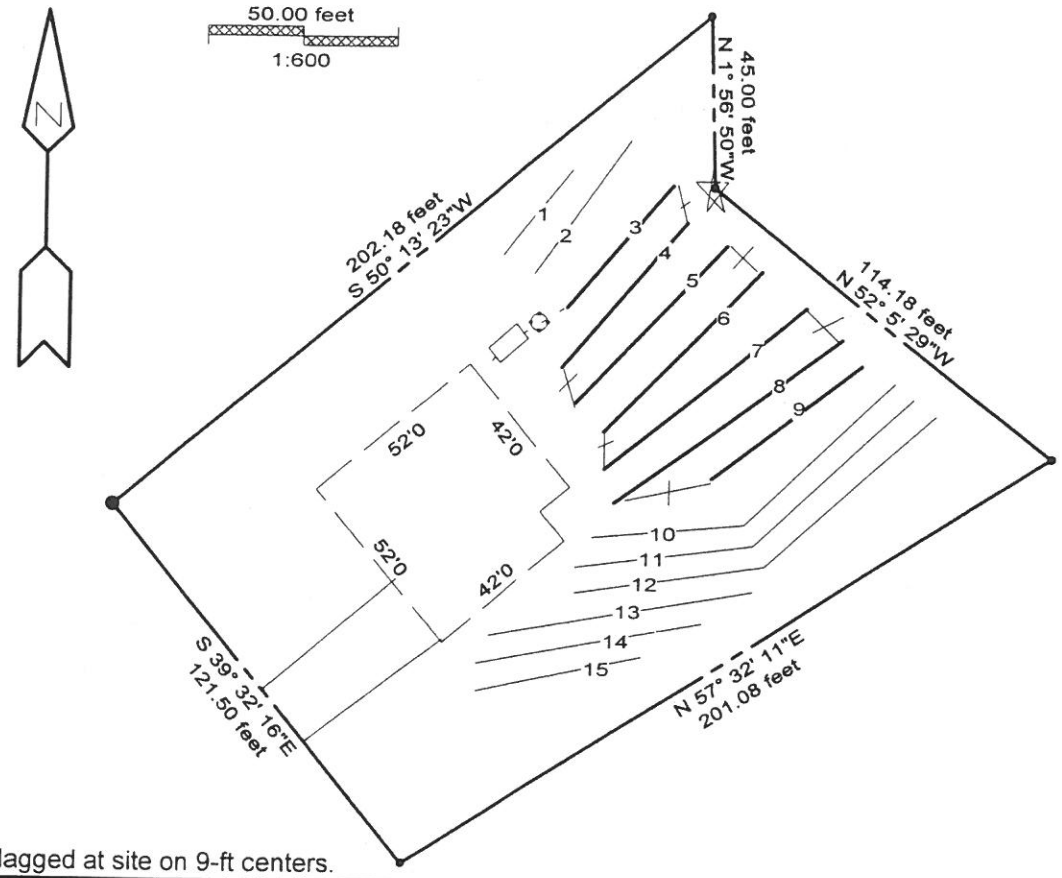

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