Residential Subsurface Wastewater Treatment and Disposal System Proposal

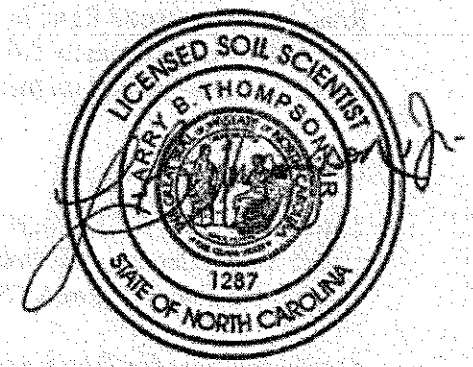
for

Riverwood Bend – Lot 3
120 Riverwood Road
Mooresville, North Carolina

PIN: 4637261111
April 22, 2014

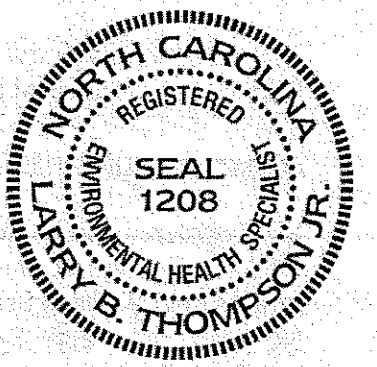
Prepared for:

True Homes
2649 Brekonridge Centre Drive
Monroe, NC 28110
704-238-1229



Prepared by:

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Midland, NC 28107-0541
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larry@thompsonenv.com



Details

True Homes has contracted with Thompson Environmental Consulting, Inc. (TEC) to prepare a revised septic proposal for a 4-bedroom single family residence to be located on Lot 3 of the Riverwood Bend subdivision (120 Riverwood Road) in Mooresville, North Carolina.

Based upon an investigation performed by TEC on the 0.68 acre lot, it was determined that a sufficient amount of "Suitable" Group IV soils were available for the installation of a pump-to prefabricated porous block panel system (PPBPS) for a 4-bedroom residence (PPBPS for both the initial and repair system) served by a private well.

True Homes would like to request that the Iredell County Health Department, Environmental Health Division, (ICHD) consider issuing the appropriate permits for a subsurface wastewater treatment and disposal system based upon the following proposal.

Location

The subject property is located at the in the northeast corner of the intersection of McCrary Road and Riverwood Road in Mooresville, North Carolina. From Mooresville, travel west on NC 150 approximately 5.6 miles, turn left onto McCrary Road and left onto Riverwood Road. Lot 3 is located on the left.

References

Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A, Section .1900, Department of Environment and Natural Resources, Division of Environmental Health, On-Site Wastewater Section, October 2011.

Onsite Wastewater Treatment and Disposal Systems; EPA 625/R-00/008 Design Manual, February 2002.

Design, Installation and Maintenance of the T & J Panel Wastewater Treatment System; Sixth Edition, published by T & J Panel.

Primary Investigator's Credentials

NC Registered Sanitarian No. 1208
NC Licensed Soil Scientist No. 1287
Professional Wetland Scientist No. 1346
NC Subsurface Septic System Operator No. 22199
NC Grade IV Wastewater System Installer No. 1762
NC Certified Wastewater System Inspector No. 17621

Plans and Specifications

A. Septic Tank

1. The septic tank shall be State approved (Section .1953 of 15A NCAC 18A), watertight, structurally sound, and 1000 gallons in capacity.
2. The septic tank will be fitted with an approved effluent filter.
3. It is the responsibility of the septic contractor to thoroughly inspect the septic tank prior to accepting delivery to assure that the tank has had time to properly cure and is free of cracks or other structural deficiencies.

B. Pump Tank

1. The pump tank shall be State approved, of one-piece construction, watertight, structurally sound and 1000 gallons in capacity. Again, it is the responsibility of the septic tank contractor to thoroughly inspect each pump tank prior to accepting delivery.
2. All pipe penetrations into the tank shall be booted (i.e., C-293 boot with a stainless steel strap).
3. The pump tank shall have access risers that extend, at a minimum, 6 inches above finished grade and must have less than 36 inches of fill over its top once finished grade has been established (a reinforced concrete tank will be required if finished soil cover is 36 inches or greater in depth).
4. Floats, pump and control circuits, and the control panel shall meet the requirements of Rule .1952(c). Panel and control equipment shall include lightning protection, be protected from unauthorized access, and remain accessible at all times to the system operator.
5. The pump and alarm controls shall be provided with manual circuit disconnects within a watertight, corrosion resistant, Nema 4x rated control panel. The control panel must be securely mounted outside, adjacent to the pump tank riser and at a minimum of 12 inches above finished grade. Pump and float control wiring should be long enough to reach from the tank to the control panel without splicing, routed through wire conduit, and sealed at the openings within the pump tank as well as the control panel enclosure. It is paramount that the conduit is properly sealed to prevent the escape of flammable gases from the pump tank. Furthermore, there must be two electrical circuits for the pump tank controls: one for the pump and one for the alarm controls.
6. Float switch tie downs must be made of a corrosion resistant material (per OWPS, all metal in the tanks shall be stainless steel). Floats should be mounted on a separate "float tree" rather than the pump supply line (see pump tank detail).
7. The pump removal system will be via a pump tether made of nylon rope or its equivalent. The tether material should be resistant to mildew and rot.

C. Pipes and Fittings

1. All discharge piping, connectors and supply lines should be made of SCH 40 PVC.

2. All joints must be properly "welded" utilizing the appropriate PVC cement for each application.
3. The supply line from the pump tank to the pressure manifold shall be 2 inch Schedule 40 PVC (approximate length of supply line is 78 feet).
4. The lateral distribution lines shall be 1¼ inch Schedule 40 PVC. Holes in the laterals should be drilled on site and at the 12 o'clock position (one hole per panel). Lateral hole size is 5/32 of an inch.
5. There shall be a threaded PVC union above each pump to facilitate easy removal of the pumps for maintenance or replacement.
6. The end of each lateral is to be provided with a "turn up", contained within a turf/gate valve box, that provides above ground access for periodic clean out and pressure head adjustment.

D. Valve Box

1. The control valves (gate valves) for each lateral distribution line shall be contained within one manifold box/vault of adequate size. The box should be placed upon a gravel base.
2. The supply manifold conveys effluent from the pump to the lateral distribution lines.
3. The supply manifold should be constructed by connecting a series of (3) 2" x 2" x 1 ¼" tees to the 2 inch supply line (upper red and white drainlines will be center fed).

E. Backfill

1. Backfill sand shall be clean, washed, medium sand that is naturally occurring and falls within the gradation of ASTM C-33 specification (used in the ready mix industry and is readily available).

F. Drain Field Installation

1. The drain field has been previously laid out on-site utilizing metal stemmed flags. Once this area has been approved by the ICHD, the property owner/builder should mark this area and isolate it as much as possible from construction traffic. Prior to the system installation, the septic contractor shall contact the ICHD and the system designer for a preconstruction conference at which time the drain field area will be re-verified.
2. Under no circumstances shall any construction take place within the drain field area while the soil is in a wet condition. If the installer has doubts as to whether or not the drain field area is dry enough to begin construction, the ICHD should be contacted for permission to proceed with the installation.
3. The specified system is a Type IVa, pre-fabricated permeable block panel system – specifically the 16-inch high panel system manufactured by T&J Panel Wastewater Treatment System, Patent No. 4013559; telephone: 1-800-222-2577. The installer must follow the manufacturer's guidelines for installing the T&J Panel

System and should request an installation manual from the manufacturer prior to beginning construction.

4. The initial drain field consists of five (5) lateral trenches 2-feet wide by various lengths (4 at 60 feet and 1 at 30 feet).
5. It is essential that the lateral trenches be constructed on contour with the land, with each trench being excavated level from beginning to end. The use of a tripod mounted engineer's level is essential to assure that each trench is constructed as level as possible.
6. The maximum trench depth for this system shall be **36-inches**. Each trench shall be placed on a minimum of 8-foot on centers.
7. Once trenches are dug, the side walls shall be raked and a light dusting of lime applied.
8. Backfill the trench with 6 inches of sand and level to grade. Once leveled, place 1 x 4 or 6-inch boards on top of the sand the entire length of each trench. Once the grade boards have been set, the panels may be set into the trench. The panels should be placed 6-inches apart.
9. Once the panels have been set, line the top chamber of each panel with 10 – 12 pounds of clean particle sand (medium sand blasting sand). Coverage depth should be approximately 1 inch thick. *Please note that this sand is not the same material specified for backfill.*
10. Tar seal rope, or approved foam, should be placed in the "U" outs of each end of the panel to form seals. Once the tar rope is in place, the 1¼ inch Schedule 40 PVC laterals can be added and the seal completed by the addition of more tar rope on the top and sides of the pipe. Now that the connection and seals are complete, a block cap is placed on each end of the panel so that all openings are covered.
11. The end of each lateral should be fitted with a short turn up topped by a threaded female coupling with cap. Each turn up must be fitted with a turf/gate valve box with lid fitted flush to finished grade.
12. Once the lateral has been installed and the panels closed, the trench is ready to be backfilled to the top with the sand used in the trench bottom. At this point, the trenches should be left open for the final inspection by the ICHD.

G. Final Landscaping

1. The drainfield shall be shaped to shed rainwater and be free from low spots.
2. The Minimum soil cover over the top of the septic drainlines is 6-inches.
3. The entire area of the drainfield should be planted with grass as soon as possible to prevent erosion. The soil should be properly tilled, limed (if necessary) and fertilized prior to planting. After applying grass seed, the area should be heavily mulched with straw or other suitable material.

H. Utility Conflicts

1. The builder and property owner must take special care in planning for water, power, gas, telephone and cable lines. These utilities shall be kept clear of all parts of the septic system and its proposed repair area. Improper planning for underground utilities can negatively impact the installation and, in some cases, cause irreparable

damage. If there are any questions regarding preferred routes, contact the ICHD as soon as possible. Irrigation systems should not be placed in the drain field area.

Maintenance

J. Operation and Maintenance

The designed system is classified as a Type IVa wastewater treatment and disposal system and will require ongoing maintenance. State regulations require that a system of this type be managed by a person certified (Certified Subsurface System Operator) by the North Carolina Department of Environment and Natural Resources to operate subsurface wastewater systems (Section .1961 Maintenance of Sewage Systems). A "Maintenance Contract" between the system owner and a Certified Operator will be required by MCGWS prior to the issuance of a final system approval or Operation Permit.

1. The minimum inspection/maintenance and reporting frequency for a Type IVa system is twice a year by the Certified Operator. The local health department is required to inspect the system once every three years.
2. The septic and pump tanks shall be pumped out when the solids within the septic tank reach an elevation that is equivalent to 25% of the volume of the tank. In some situations, the tanks may need to be pumped more frequently; for example, if you are using a garbage disposal, it is recommended that the septic and pump tanks be cleaned out annually. Regardless, the Certified Operator will be able to advise when it is necessary to pump out tank solids.
3. Pressure head for laterals should be checked and adjusted semi-annually, flushing with clean water as necessary to remove any accumulated solids.
4. The effluent filters should be inspected semi-annually. When it becomes necessary to clean the effluent filters, the filters should be removed and the accumulated debris washed back into the septic or pump tank – not onto the lawn.
5. All piping and valves should be inspected semi-annually for damage and corrections/repairs made immediately.
6. The pump and float controls/switches should be inspected semi-annually to assure proper operation.
7. The drain field area should be maintained to prevent over growth of vegetation. Any damp areas, leakages or malfunctions should be addressed immediately.
8. Divert gutter downspouts and surface water runoff away from the septic and pump tanks.

Design Specifics

Daily Design Flow:	480 GPD – 4 bedroom house
Septic Tank Size:	1000 gallons (2 compartments)
Pump Tank Size:	1500 gallons
Effluent Loading Rate:	Design = 0.3 GPD per sq. ft. (50 % reduction for the PPBPS)
Supply Length and Diameter:	Approx. 78 ft. of 2 in. SCH 40
Number of Laterals:	(5) 3' Wide x Varying Lengths - 4 at 60 feet - 1 at 30 feet
Total Length of Drainline:	270 Feet
Number of Panels:	63
Maximum Trench Depth:	36 inches
Distribution Method:	Manifold with Valve Box
Flow Rate Through System:	25.83 gallons per minute
Elevation/Friction Head:	17 feet
Pressure Head:	2 feet
Pump Requirements:	25.83 GPM at 19 Feet TDH
Recommended Pump:	Goulds WEO3L or equivalent
Dose Volume:	226.80 gallons
Check Valve:	Yes

42" start
49" end

63
3.6
378
189
2268
29.3 gallons

9"

29.3
3 | 205.9

68.

29
4
120

PPBPS Design Worksheet										
								Permit #:		
								PIN:	4637261111	
System Requirements								Address:	Lot 3 - Riverwood Bend	
Design Flow	480	gpd							Mooresville, NC	
LTAR	0.300	gpd/ft.^2						Consultant:	Larry Thompson	
Linear footage	533	ft. (conventional)						Phone:	704-301-4881	
Linear footage	267	ft. (50% Reduction)								
								Reviewed By:		
Design Layout								Date:		
Laterals	Length (ft)	# Panels								
Line # 1	60	14								
Line # 2	60	14								
Line # 3	60	14								
Line # 4	60	14								
Line # 5	30	7								
Totals	**270**	**63**								
Absorption Area										
Length (ft)	Width (ft)	Area (ft^2)								
270	2	540								
System Pressure Head	2	ft.	Value selected by system designer (must be between 2-5 ft.)							
Orifice Diameter	5/32	in.	Size selected by system designer (1/8 in. minimum)							
Flow Rate per Orifice	0.41	gpm	Determined from orifice flow design table (value dependent on pressure head & orifice diameter)							
Total System Flow Rate	25.83	gpm	Total number of panels required multiplied by the orifice flow rate							
System Dose Volume	226.80	gal.	Total number of panels required multipled by 3.6 gal./panel							
Pump Run Time	8.78	min.	System dose volume divided by the total system flow rate							
Pump Tank Drawdown	11.34	in.								
Comments:										
1. Install system using 2 ft. wide trenches.										
2. Install drainlines on 8 ft. centers, level, and on contour.										
3. System design requires effluent pump for distribution.										
4. 100% repair area required for property.										

T & J Panels	
Linear Feet	# Panels
50	11
60	14
70	16
80	18
90	21
100	23

Thompson Environmental Consulting, Inc.
PO Box 541
Midland, NC 28107-0541
704-301-4881

SHEET 1 OF 1

COUNTY: Iredell
TAX ID: 4637261111

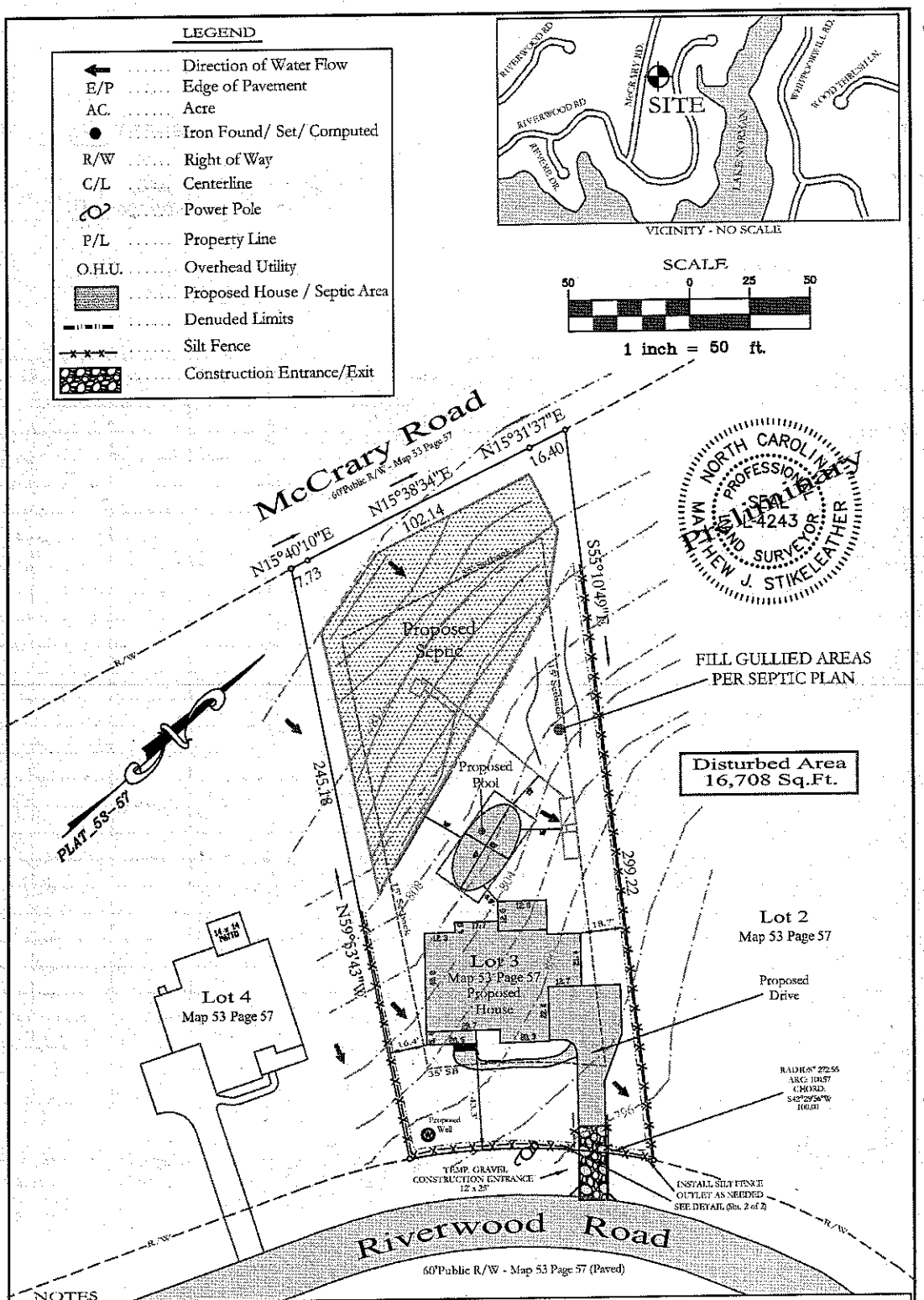
OWNER: True Homes
LOCATION: Riverwood Bend - Lot 3

DATE: April 22, 2014

PROFILES		SB-1	SB-2	SB-3	SB-4						
LANDSCAPE POSITION	.1940	ls	ls	ls	ls						
SLOPE (%)	.1940	77%	7%	7%	10%						
HORIZON 1 DEPTH	.1943	0-4	0-8	0-15	0-14						
TEXTURE	.1941 (a)(1)	l	cl	cl	cl						
CONSISTENCE	.1941	fr	fr	fr	fr						
STRUCTURE	.1941 (a)(2)	gr	sbk	sbk	sbk						
CLAY MINERALOGY	.1941 (a)(3)	-	se	se	se						
HORIZON 2 DEPTH	.1943	4-12	8-34	15-48+	14-48+						
TEXTURE	.1941 (a)(1)	cl	c	c	c						
CONSISTENCE	.1941	fi	fi	fi	fi						
STRUCTURE	.1941 (a)(2)	sbk	sbk	sbk	sbk						
CLAY MINERALOGY	.1941 (a)(3)	se	se	se	se						
HORIZON 3 DEPTH	.1943	12-40	34-48+								
TEXTURE	.1941 (a)(1)	c	cl								
CONSISTENCE	.1941	fi	fi								
STRUCTURE	.1941 (a)(2)	sbk	sbk								
CLAY MINERALOGY	.1941 (a)(3)	se	se								
HORIZON 4 DEPTH	.1943	40-48+									
TEXTURE	.1941 (a)(1)	cl									
CONSISTENCE	.1941	fi									
STRUCTURE	.1941 (a)(2)	sbk									
CLAY MINERALOGY	.1941 (a)(3)	se									
SOIL WETNESS	.1942										
RESTRICTIVE HORIZON	.1944										
SAPROLITE	.1943/.1956										
CLASSIFICATION	.1948	s	s	s	s						
L.T.A.R. (gpd/ft^2)	.1955	0.3	0.3	0.3	0.3						

OTHER FACTORS (.1946):		**SITE LTAR (gpd/ft^2):**	**0.3**
AVAILABLE SPACE (.1945):	provisionally suitable		
SITE CLASSIFICATION (.1948):	provisionally suitable	SYSTEM TYPE:	PPBPS
EVALUATED BY:	Larry Thompson	OTHERS PRESENT:	

COMMENTS:



NOTES

THIS PROPERTY IS SUBJECT TO ALL EASMENTS, RIGHTS-OF-WAY, AND RESTRICTIONS OF RECORD. THIS SURVEY WAS COMPLETED WITHOUT A FULL TITLE SEARCH. PROPERTY IS SUBJECT TO DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS,RECORDED,OR UNRECORDED.

UNDERGROUND UTILITIES WERE NOT LOCATED AT THE TIME OF THIS SURVEY.

THIS IS NOT A BOUNDARY SURVEY. ALL INFORMATION GATHERED FROM PLATS OF RECORD.

CONTOUR DATA WAS GATHERED FROM IREDELL CO. GIS WEBSITE AND IS CONSIDERED APPROXIMATE.

SEE SHEET 2 OF 2 FOR ADDITIONAL EROSION CONTROL NOTES AND SPECIFICATIONS.

DISTANCES SHOWN FROM PROPOSED HOUSE TO THE PROPERTY LINE ARE FROM THE FOUNDATION.

INFO FOR THE WELL SITE AND SEPTIC AREA WAS TAKEN FROM SME PLANS DATED 11-1-07.

THIS PLAN HAS NOT BEEN REVIEWED BY A SEPTIC SCIENTIST TO DETERMINE IF THE PROPOSED POOL IS ABLE TO BE BUILT.

PLOT PLAN FOR:
TRUE HOMES, LLC
#120 Riverwood Road

SCALE	TOWNSHIP	COUNTY	STATE	DATE
1" =50'	DAVIDSON	IREDELL	N.C.	04-10-14

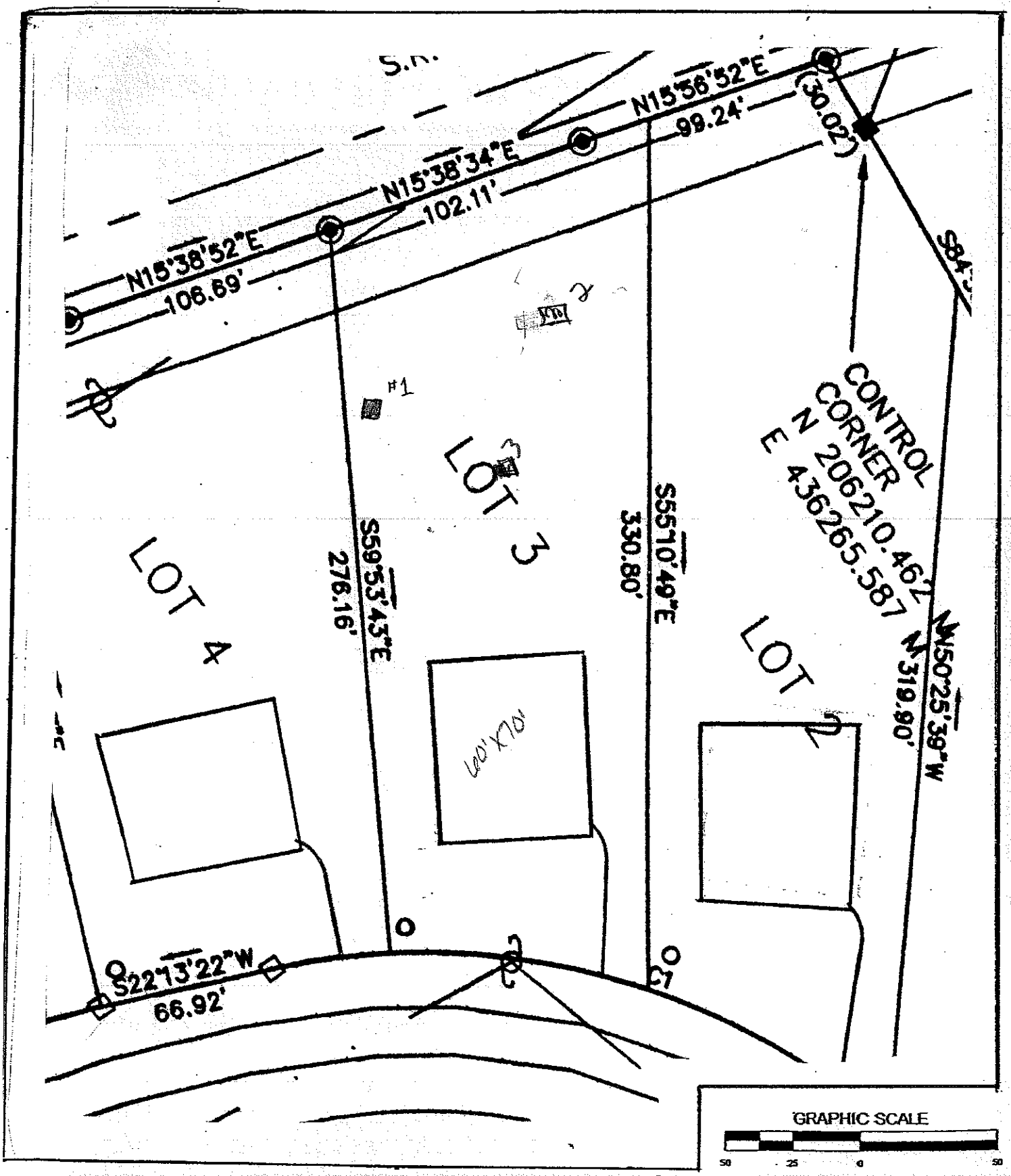
LOT 3 RIVERWOOD BEND SUBDIVISION

MAP 53 PAGE 57 - DEED 2235-1567 - TAX # 4637261111

DEED RECORDED: 2235-1567
MAP RECORDED:
SURVEYED: CJS
MAPPED: MJS

SURVEYOR:
PROVIDENCE LAND GROUP, PLLC
3716 PROVIDENCE ROAD SOUTH
WAXHAW NC 28173
704-400-0117
NC FIRM # P-0910

Providence



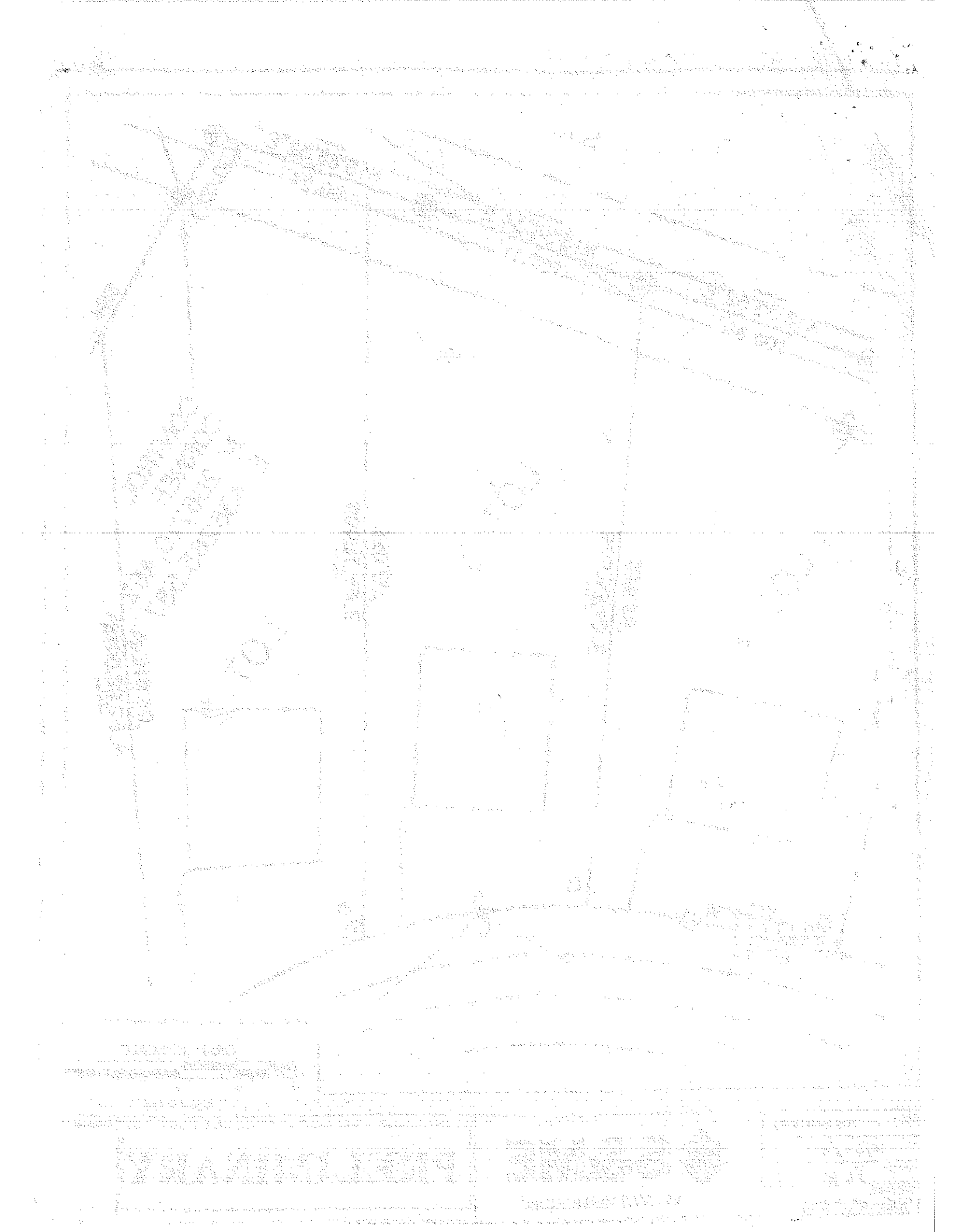
LE:	AS SHOWN
E:	10/03/07
WN BY:	PLM
JECT NO:	1588-07-051

S&ME

WWW.SMEINC.COM

PRELIMINARY

FIGURE NO.



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

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

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

OWNER: Lakeland Luxury — APPLICATION DATE ___
ADDRESS: ___ DATE EVALUATED: ___
PROPOSED FACILITY: 4 BR SFD — PROPOSED DESIGN FLOW (.1949): 480 GPD — PROPERTY SIZE: ___
LOCATION OF SITE: LOT 3 — PROPERTY RECORDED: ___
WATER SUPPLY: ☒ Private ☐ Public ☒ Well ☐ Spring ☐ Other ___
EVALUATION METHOD: ☐ Auger Boring ☒ Pit ☐ Cut — TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1948 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
1 (23)	L 6-10%	0-32	Mo, sbk, C	Fr, SS, SP	(Red)	F-C - Sap. Inclus.			0,30
		32-50	Wk, sbk, CL	Fr, SS, SP	(Red)				
2		0-15	gr SL						.275 - .30
		15-25	WK sbk CL	fr SS SP	Red				
		25-40	WK sbk CL	fr SS SP	C - rock floaters				
		40-48	WK sbk CL	fr SS SP	Red				
3	10%	0-20	MO sbk RCL	fr SS SP					.3 - .35
		20-38	MO sbk CL	fr SS SP					
		38-58	WK sbk CL	fr SS SP	f - sap				
4									

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)		
System Type(s)		
Site LTAR		

OTHER FACTORS (.1946): ___
SITE CLASSIFICATION (.1948): ___
EVALUATED BY: ___
OTHER(S) PRESENT: ___

COMMENTS: ___