LOT 47 OAKBROOK SUBDIVISION

RECLASSIFICATION BY .1948(d) USING SANDLINED TRENCH THROUGH QUESTIONABLE SAPROLITE INTO PROVISIONALLY SUITABLE SAPROLITE

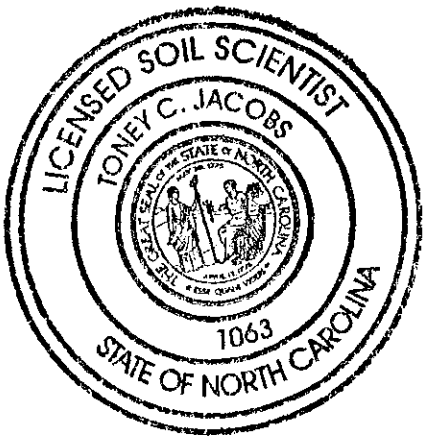
by
Toney C. Jacobs & Associates, Inc.
Consulting Soil Scientists
168 Broadbill Drive
Mooresville, N. C. 28115

August 14, 1997



To: Mr. David Hinson, R. S.
Iredell County Health Dept.
Mooresville, N. C.28115

Mr. Mike Krom
19 Yacht Cove
Mooresville, N. C. 28115



Toney C. Jacobs, CPSS

SAND LINED TRENCH GRAVITY DISTRIBUTION CONVENTIONAL SYSTEM

Design Considerations

This system is proposed for a very large single family residential lot of 2.22 acres in a newly developed community of modest single family homes in southern Iredell County. A large part of the lot is steep slope and stream bottom, but the usable for the house, system, and repair is more than sufficient. All of the upper part of the lot is provisionally suitable topography for a septic system. A small amount of the P.S. soil/saprolite is lost to 100' radius of the adjacent well on Lot 20. Soil profiles vary in relation to depth and B, BC, and C horizons and textures at each of four pits on the lot. The system is designed for a 3-bedroom home to be served by a private well water supply (located on site plan). Because this is a new 1996 plat, the proposed drainfield does require a 100% repair area. This reclassification also applies to the repair. The subsurface approximately 24 - 36" of soil material is questionably unsuitable saprolite over provisionally suitable saprolite per the 1995 rule change. Three saprolite samples were collected from the lot for particle size analysis. All three of these samples were loamy sand with 7.5, 2.4, and 3.7% clay (particle size data enclosed). This reclassification should also be considered with documentation from lot 56 in June and lot 19 in August 1997. These pits closely resemble the Lockhart Series which has a deep BC and C horizon of sandy loam. By denuding the top 36" in the drainfield area the site is provisionally suitable by rule .1948(d). This is not feasible, but placing the lines 18" deeper allows for conventional gravity technology and a higher application rate (0.4 - 0.6). Overall, the saprolite has a fine sandy loam texture. Using the low end of this range the system should have a very good expectation of service. The need for a French drain is not indicated because of the deep soil/saprolite profile and good drainage character.

Location

The approximately 2.22 acre building lot is on the left of Lismark Dr., off Valleyview Road, 0.5 miles off Hwy. 21, Iredell County, N. C.

Reference

(1) *Laws and Rules for Ground Absorption Sewage Disposal Systems 15A NCAC 18A. 1900,* NCDEHNR-DEH.

(2) Hoover, M. T., R. Evans, T. Hinson, R. Health. (no date) *Performance of Sand Lined Trench Septic Systems on Wet, Clayey Soils in Northeastern North Carolina.* College of Agriculture & Life Sciences, NCSU.

Recommendation

Three hundred (300) lineal feet of gravity lines with approximately equal repair in shorter lines. Repair system can have many modified or alternative options if needed.

Ownership Responsibility for a Gravity Distribution System

Conservation measures should be undertaken in plumbing fixture specifications to minimize the volume of wastewater entering the disposal system, including, but not limited to the following precautions:

(a) Provide water conserving plumbing fixtures within the facility. Waterclosets must be 1.6 gal. flush (per code). Showerhead should also have restrictions or be of low volume design.

(b) Develop conservative water use habits.

System must be properly installed by a *qualified* and *competent* contractor following the requirements of the Iredell County Department of Environmental Health, DEH, the N.C. Building Code, and Plumbing Code. This plan, as any, is a guide to a minimum standard, but cannot take the place of experience and common sense.

Components of System

1. Two compartment septic tank - 1000 gal.
2. Distribution box with speed levers
3. Conventional laterals with gravity distribution over 18" of sand in ground absorption trenches, 3 feet wide, level end to end, as flagged in the field. If the installer does not understand this or its importance, he should not begin construction until certain of all requirements.

Construction Sequence

1. Contour has been flagged as noted on drawing and in specifications.
2. Carefully install laterals and speed line box according to the attached design layout.
3. Carefully backfill distribution trench to grade with clean clay or clay loam soil fill material which is carefully placed and compacted.
4. The installation contractor shall stabilize the area of construction by planting with Kentucky 31 tall Fescue and mulching. Area to be limed and fertilized with 0.5 tons lime, 75 units of N, 150 units P, and 100 units of K per disturbed acre. This is approximately one-tenth acre.

5. The septic tank shall consist of an approved 1000-gallon capacity reinforced, precast watertight, concrete tank with full baffle and shall have easy access to each chamber from ground level for inspection. The first chamber of the septic tank shall consist of 2/3 to 3/4 of the volume of the total tank and the baffle shall contain a horizontal opening across the tank at about midway . Locate the septic tank at such height as to provide approximately 8" of cover soil over top of the tank.

6. Final Landscaping: After the system is installed, the absorption field should be reshaped to shed rainwater and be free of low areas to insure that the system will not be overloaded with excess rainwater and run-on.

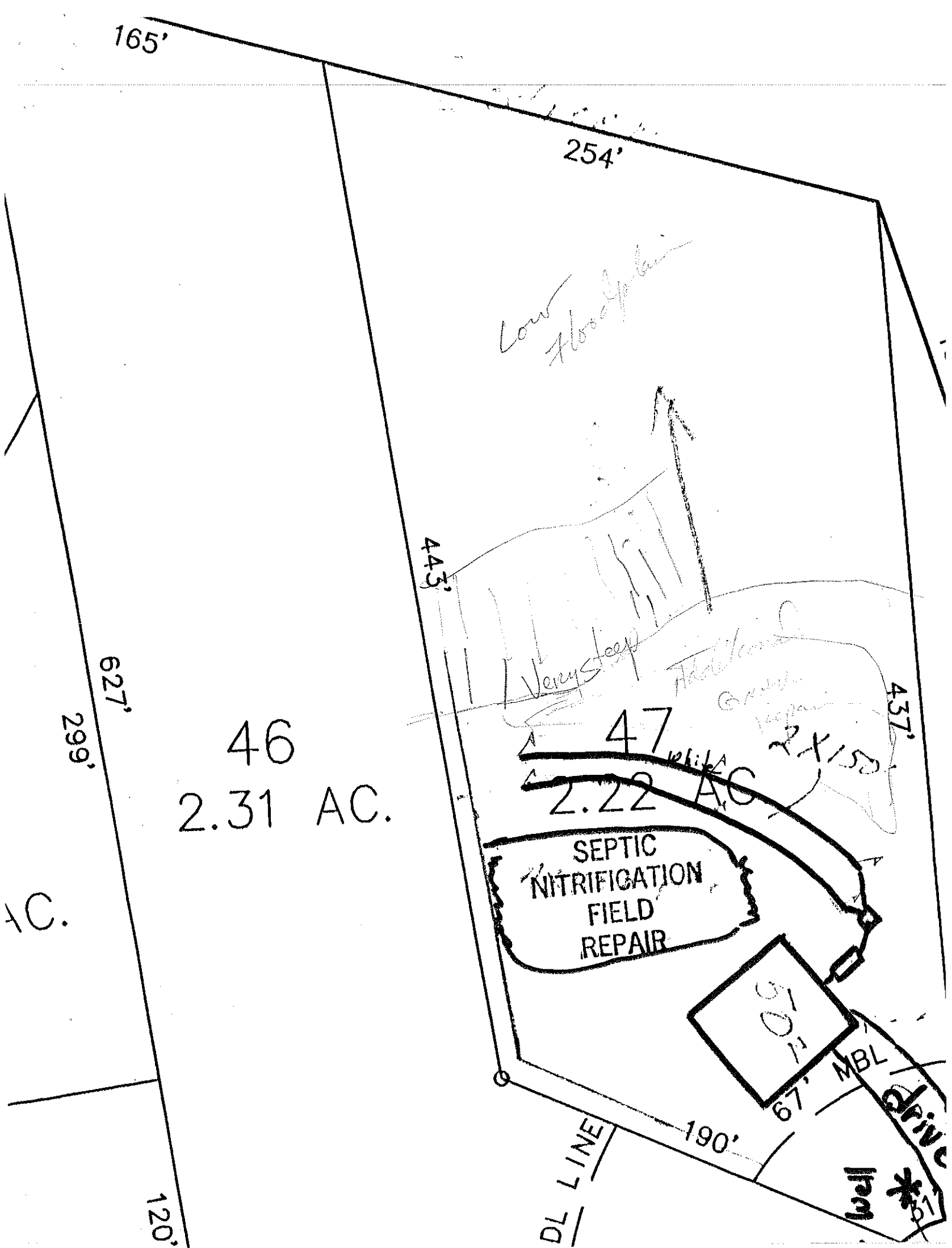
Concluding Note:

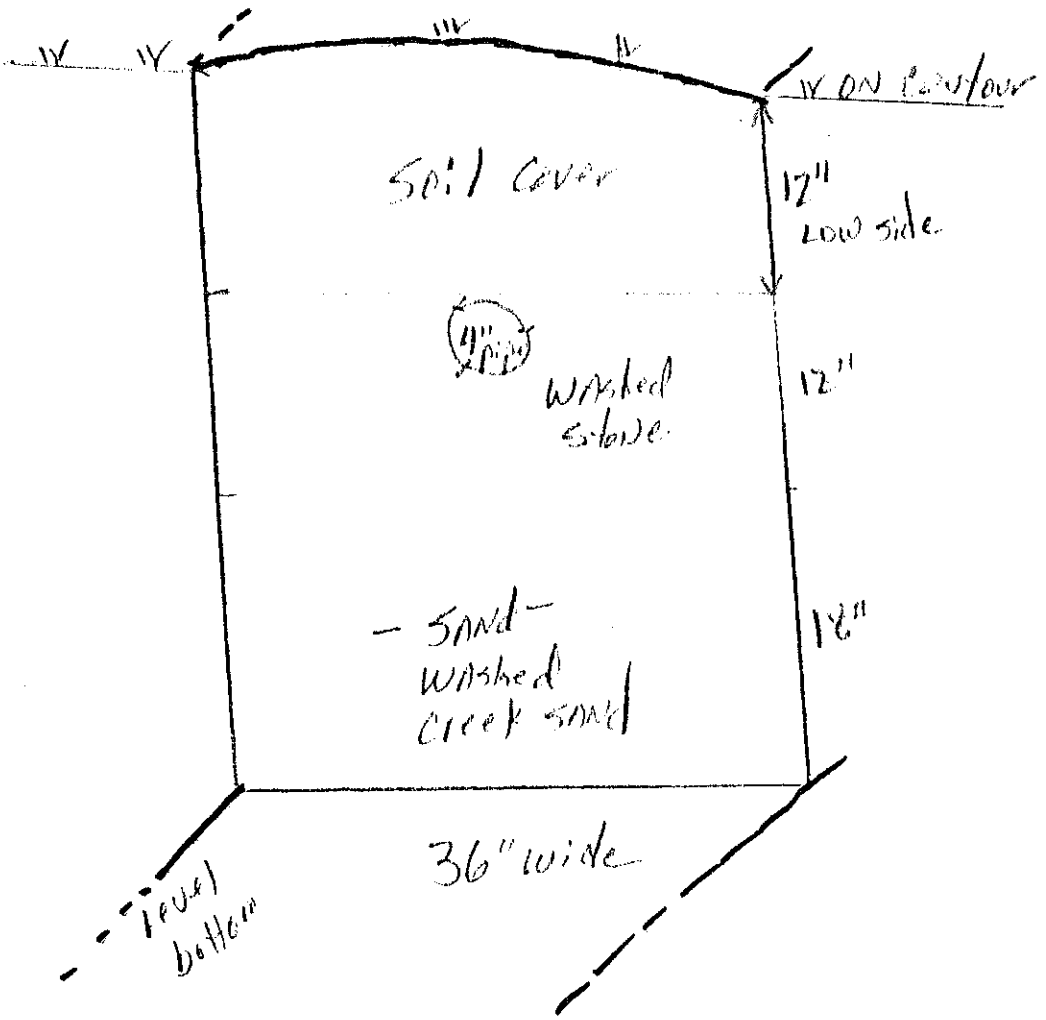
This plan was done to facilitate permitting by the Iredell County Health Department by an agent of the owner. Any additions, or additional requirement(s), or deletions to enhance design or workability which will facilitate a permit are welcomed and may be made by note on this plan without returning entire design. The designer realizes that most plans can be changed and/or improved upon. The installer must realize that this is an exact plan and must be installed with exacting measurements. Should the installer desire a change, it must be approved by the health department in writing. If there are questions, please give me a call.

Design Specifications

Lot 47 - Oakbrook Subdivision

Daily design flow:	360 gpd. - 3 bedroom house
Septic tank size:	1000 gal. (2 compartments)
Effluent loading rate:	0.4 gpd/sf conventional
Number and length of laterals:	2 lines of 150' each end-fed Repair same configuration.
Trenches	36" wide, 42" deep, backfill 18" sand, 12" stone with normal distribution pipe in stone, 12" soil cover


165'
254'
443'
627'
299'
437'
46
2.31 AC.
47
2.22 AC
SEPTIC
NITRIFICATION
FIELD
REPAIR
MBL
190'
67'
120'
AC.


1V
1V
1V
1V
1V ON Pavement
Soil Cover
17"
Low side
11"
Washed
stone
12"
- Sand -
Washed
Creek sand
18"
Level
bottom
36" wide

PARTICLE SIZE ANALYSIS

SERIES: Lockhart LAB ID# - 2
PEDON # 0 COLLECTED 11-7-96
HORIZON: inches
SAMPLE SIZE IS 80 GRAMS
BY TCJ
PHOTO:

	30 sec	90 sec	3 hr	10 hr
READING	21	16	7	6
BLANK	4	4	4	4
TEMP C	24	24	24	24

1. Concentration C=R-R1 at
   30 seconds= 17
   90 seconds= 12
   3 hours= 3
   10 hours= 2

2. P=(C/Co)*100
   30 seconds= 21.25
   90 seconds= 15
   3 hours= 3.75
   10 hours= 2.5

3. d=theta / t^.5 * Tcorr
   30 sec d= 65.5092
   90 sec d= 38.94688
   3 hrs d= 3.74
   10 hrs d= 2.06

% sand = 82
% silt = 15.57
% clay = 2.43

Textural Class =LOAMY SAND

PARTICLE SIZE ANALYSIS

SERIES: Lockhart LAB ID# - 3
PEDON # 0 COLLECTED 11-7-96
HORIZON: inches
SAMPLE SIZE IS 80 GRAMS
BY TCJ
PHOTO:

	30 sec	90 sec	3 hr	10 hr
READING	17	13	8	7
BLANK	4	4	4	4
TEMP C	24	24	24	24

1. Concentration C=R-R1 at
   30 seconds= 13
   90 seconds= 9
   3 hours= 4
   10 hours= 3

2. P=(C/Co)*100
   30 seconds= 16.25
   90 seconds= 11.25
   3 hours= 5
   10 hours= 3.75

3. d=theta / t^.5 * Tcorr
   30 sec d= 67.15817
   90 sec d= 39.72582
   3 hrs d= 3.73
   10 hrs d= 2.05

% sand = 86.56
% silt = 9.74
% clay = 3.7

Textural Class =LOAMY SAND

PARTICLE SIZE ANALYSIS

SERIES: Lockhart LAB ID# - 6
PEDON # 0 COLLECTED 11-7-96
HORIZON: inches
SAMPLE SIZE IS 80 GRAMS
BY TCJ
PHOTO:

	30 sec	90 sec	3 hr	10 hr
READING	20	16	11	10
BLANK	4	4	4	4
TEMP C	24	24	24	24

1. Concentration C=R-R1 at
   30 seconds= 16
   90 seconds= 12
   3 hours= 7
   10 hours= 6

2. P=(C/Co)*100
   30 seconds= 20
   90 seconds= 15
   3 hours= 8.75
   10 hours= 7.5

3. d=theta / t^.5 * Tcorr
   30 sec d= 65.80901
   90 sec d= 38.94688
   3 hrs d= 3.67
   10 hrs d= 2.02

% sand = 82.62
% silt = 9.9
% clay = 7.48

Textural Class =LOAMY SAND