

BALLYCASTLE ROAD
001-391-84

6/1/2007

duponbj

Groundwater and Wastewater Services File Imaging Project
May 2007
Barcode Font = IDAutomationHC39M

INDIVIDUAL WATER AND WASTEWATER SYSTEMS PROGRAM
APPLICATION FOR SERVICES

544FA

40

[ ] CRT

Mecklenburg County Health Dept.
Environmental Health Division
c/o Hal Marshall Ctr. (Suite 214)
700 N. Tryon St.
Charlotte, NC 28202

(704)336-5102

COPY

PERSON FILING APPLICATION:

NAME: [redacted] DEWNGA (last) L (first) C (mi)

ADDRESS: 1653 S. HIGHWAY 16 PHONE: (704) 827 1396

CITY: STANLEY STATE: NC ZIPCODE: 28164

Date:

PROPERTY OWNER:

NAME: ALM (last) KEITH (first) L. (mi)

ADDRESS: 1040 W. 54TH ST. PHONE: (__) _____

CITY: KANSAS CITY STATE: MO ZIPCODE: 64112

PROPERTY INFORMATION (FROM ENGINEERING FORM):

TAX/PARCEL NUMBER: 001-394-14

STREET ADDRESS: 21134 BALLYCASTLE RD

ZONING:

Township (check one):
[X] 0 Mecklenburg County [ ] 2 Davidson [ ] 4 Pineville [ ] 6 Huntersville
[ ] 1 Charlotte [ ] 3 Cornelius [ ] 5 Matthews [ ] 7 Mint Hill

SUBDIVISION OR MOBILE HOME PARK NAME:

LOT NUMBER: LOT SIZE (in acres):

TYPE APPLICATION (check one):

[redacted]

[X] ADDITION - GARAGE OR RENOVATION/NO MAJOR CHANGES (X)
DET

[redacted]

[ ] EXCHANGE MOBILE HOME - SAME # BEDROOMS (Y)
[ ] ADDITION - INCREASE ROOMS/OCCUPANCY/MOBILE HOME SIZE (A or M)
[ ] COMMERCIAL OR INDUSTRIAL (N)

RESIDENTIAL PROPERTY (Type Building, check one):
[ ] SINGLE MOBILE HOME (S) [X] HOUSE (H) [ ] MULTIPLE FAMILY (U)
[ ] DOUBLE WIDE (D) [ ] MODULAR HOME (M) [ ] OTHER _____ (O)

NUMBER BEDROOMS: NUMBER OCCUPANTS:

SYSTEM CLASSIFICATION:

COMMERCIAL/INDUSTRIAL PROPERTY:
Type Business _____ # Employees ___ Per Shift ___ ___ ___
Industrial Wastes (Y/N) ___
Underground Storage Tanks On Property (Y/N) ___ Type _____

WATER SUPPLY (check one):
[ ] Community (C) [ ] Shared Well (S)
[ ] Municipal (M) [ ] Other 'spring' (O)
[X] Private Well (P)

FUTURE ADDITIONS - ALL PLANNED ADDITIONS MUST BE ENTERED (check all that apply):
[ ] Swimming Pool [ ] Jacuzzi [ ] Stable/Barn [ ] Workshop [X] None
[ ] Garage [ ] Storage Building [ ] Deck/Patio [ ] Bedrooms [ ] Other

The undersigned, owner, or legal agent for the owner, of the property described above as the "JOB LOCATION" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the MECKLENBURG COUNTY HEALTH DEPARTMENT to enter onto the property for the purpose of processing this request.

Signed: [signature] Date: 5/1/98

NOTICE:

The undersigned, an authorized agent of the MECKLENBURG COUNTY HEALTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. This approval is granted in accordance with the provisions of Laws And Rules For Sanitary Sewage Collection, Treatment And Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

...No work shall be conducted on the septic tank system until an installation, Construction, Alteration and/or Repair approval is granted by this Department.

...This permit is not transferable.

... USE Existing System

[ ] IMPROVEMENT PERMIT - VALID 60 MONTHS FROM ISSUANCE
[ ] MOBILE HOME EXCHANGE APPROVAL - VALID 6 MONTHS FROM ISSUANCE
[ ] ADDITION/RENOVATION APPROVAL - VALID 1 YEAR FROM ISSUANCE

[signature] 5-7-98
Environmentalist Date

WATER : 122791

DAS DON ALLEN SURVEYORS, INC.

Rt 7 BOX 293 • MOORESVILLE, N.C. 28115 • (704) 664-7029

File 5448A

THIS IS TO CERTIFY THAT ON THE 21st DAY OF AUGUST 19 90 I SURVEYED THE PROPERTY SHOWN ON THIS PLAT, AND THAT THE TITLE LINES AND THE WALLS OF THE BUILDINGS ARE SHOWN HEREON.

SIGNED _____ SEAL

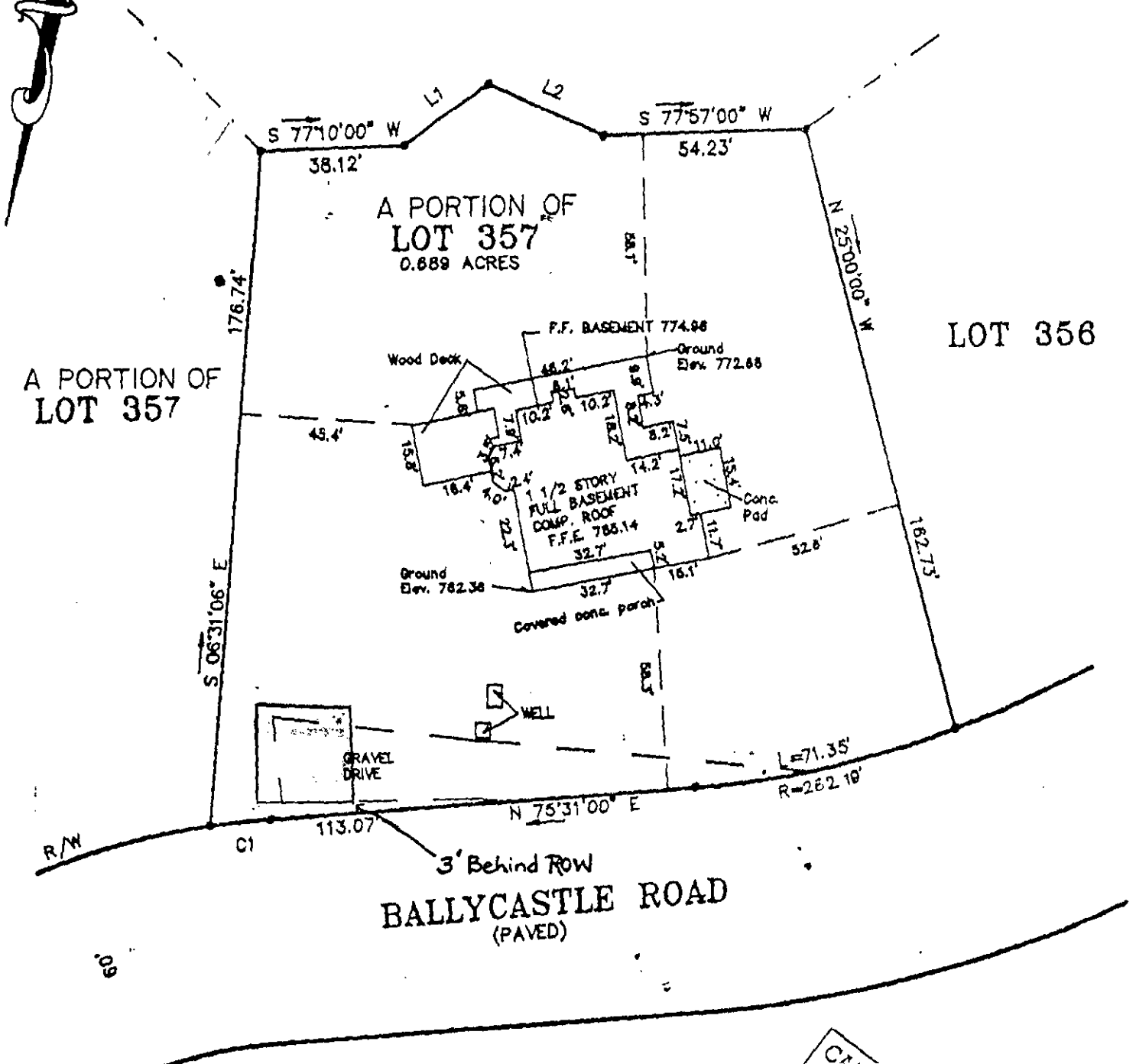
DONALD RAY ALLEN, RLS
L-1131

COPY

LINE	DIRECTION	DISTANCE
L1	S 44°32'50" W	27.30'
L2	N 70°00'00" W	33.82'

CURVE	RADIUS	LENGTH
C1	203.62'	18.10'

LAKE NORMAN



INDIVIDUAL WATER AND WASTEWATER SYSTEMS PROGRAM
APPLICATION FOR SERVICES

[ ] CRT

5448A

Mecklenburg County Health Dept.
Environmental Health Division
c/o Hal Marshall Ctr., Suite 211
700 N. Tryon St.
Charlotte, NC 28202

(704)336-5102

PERSON FILING APPLICATION:

NAME: [redacted] DELLINGER (last) L (first) C (mi)

ADDRESS: 1635 S. HIGHWAY 16 PHONE: (704) 827 1396

CITY: STANLEY STATE: NC ZIPCODE: 28164

Date:

PROPERTY OWNER:

NAME: ALM (last) KEITH (first) L. (mi)

ADDRESS: 1040 W. 54TH ST. PHONE: (__) _____

CITY: KANSAS CITY STATE: MO ZIPCODE: 64112

PROPERTY INFORMATION (FROM ENGINEERING FORM):

TAX/PARCEL NUMBER: 001-394-14

STREET ADDRESS: 21134 BALLYCASTLE RD

ZONING: _____

Township (check one):
[X] 0 Mecklenburg County [ ] 2 Davidson [ ] 4 Pineville [ ] 6 Huntersville
[ ] 1 Charlotte [ ] 3 Cornelius [ ] 5 Matthews [ ] 7 Mint Hill

SUBDIVISION OR MOBILE HOME PARK NAME:

LOT NUMBER: LOT SIZE (in acres):

TYPE APPLICATION (check one):

[redacted]

[ ] EXCHANGE MOBILE HOME - SAME # BEDROOMS (Y)
[ ] ADDITION - INCREASE ROOMS/OCCUPANCY/MOBILE HOME SIZE (A or M)
[ ] COMMERCIAL OR INDUSTRIAL (N)

[X] ADDITION - GARAGE OR RENOVATION/NO MAJOR CHANGES (X)

[redacted]

RESIDENTIAL PROPERTY (Type Building, check one):
[ ] SINGLE MOBILE HOME (S) [X] HOUSE (H) [ ] MULTIPLE FAMILY (U)
[ ] DOUBLE WIDE (D) [ ] MODULAR HOME (M) [ ] OTHER _____ (O)

NUMBER BEDROOMS: NUMBER OCCUPANTS:

SYSTEM CLASSIFICATION:

COMMERCIAL/INDUSTRIAL PROPERTY:
Type Business _____ # Employees ___ Per Shift ___ ___ ___
Industrial Wastes (Y/N) ___
Underground Storage Tanks On Property (Y/N) ___ Type _____

WATER SUPPLY (check one):
[ ] Community (C) [ ] Shared Well (S)
[ ] Municipal (M) [ ] Other 'spring' (O)
[X] Private Well (P)

FUTURE ADDITIONS - ALL PLANNED ADDITIONS MUST BE ENTERED (check all that apply):
[ ] Swimming Pool [ ] Jacuzzi [ ] Stable/Barn [ ] Workshop [X] None
[ ] Garage [ ] Storage Building [ ] Deck/Patio [ ] Bedrooms [ ] Other

The undersigned, owner, or legal agent for the owner, of the property described above as the "JOB LOCATION" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the MECKLENBURG COUNTY HEALTH DEPARTMENT to enter onto the property for the purpose of processing this request.

Signed: [signature] Date: 5/1/98

NOTICE:

The undersigned, an authorized agent of the MECKLENBURG COUNTY HEALTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. This approval is granted in accordance with the provisions of Laws And Rules For Sanitary Sewage Collection, Treatment And Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

...No work shall be conducted on the septic tank system until an installation, Construction, Alteration and/or Repair approval is granted by this Department.

...This permit is not transferable.

...

[ ] IMPROVEMENT PERMIT - VALID 60 MONTHS FROM ISSUANCE
[ ] MOBILE HOME EXCHANGE APPROVAL - VALID 6 MONTHS FROM ISSUANCE
[ ] ADDITION/RENOVATION APPROVAL - VALID 1 YEAR FROM ISSUANCE

Environmentalist Date

WWATER : 122791

File
5498A

DAS DON ALLEN SURVEYORS, INC.

Rt 7 BOX 293 • MOORESVILLE, N.C. 28115 • (704) 664-7029

THIS IS TO CERTIFY THAT ON THE 21st DAY OF AUGUST 19 90 I SURVEYED THE PROPERTY SHOWN ON THIS PLAT, AND THAT THE TITLE LINES AND THE WALLS OF THE BUILDINGS ARE SHOWN HEREON.

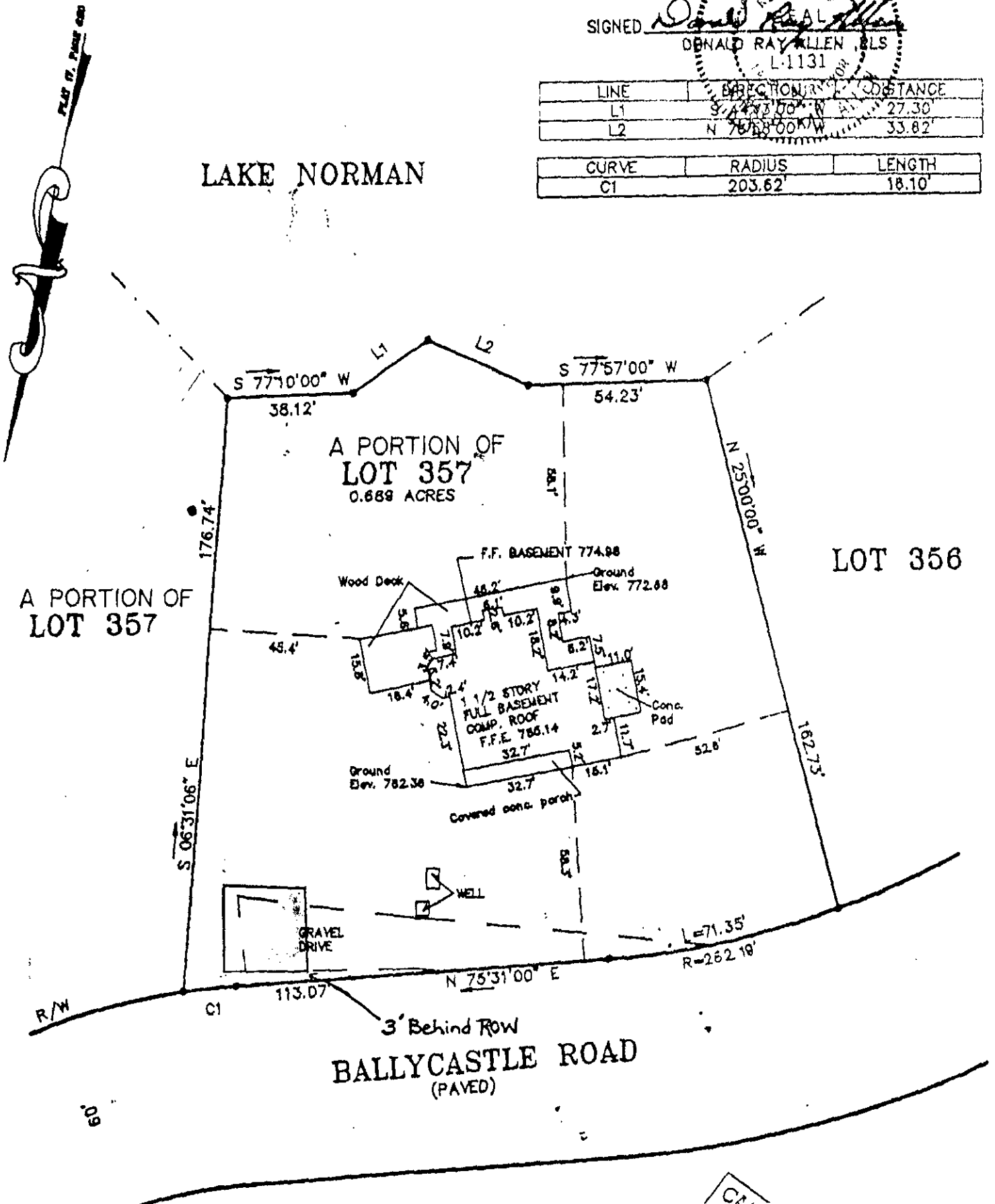
SIGNED _____

DONALD RAY ALLEN, RLS
L-1131

LINE	DIRECTION	DISTANCE
L1	S 77°10'00" W	27.30'
L2	N 77°57'00" W	33.82'

CURVE	RADIUS	LENGTH
C1	203.62'	18.10'

LAKE NORMAN

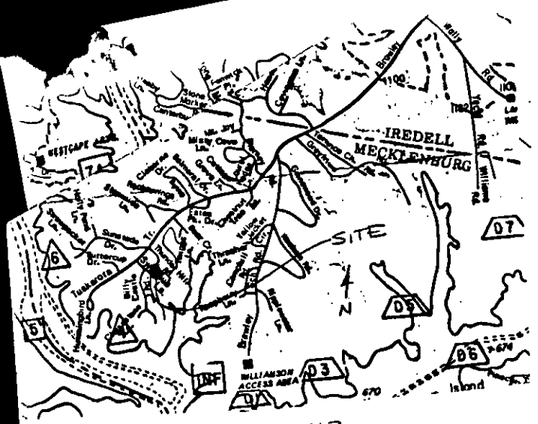


KEITH ALM
BALLYCASTLE ROAD
MECKLENBURG CO., NC

DRAWN BY: MLT
DATE: 3-21-89 REV 4-24-89
SCALE: 1"=20'

5-31-89. RELOCATE TANKS
RELOCATE 2 LINES TO WEST
SIDE OF HOUSE.

NOTE: SYSTEM AS SHOWN IS 14LF
OVERSIZED TO 0.3 APPLICATION
RATE.

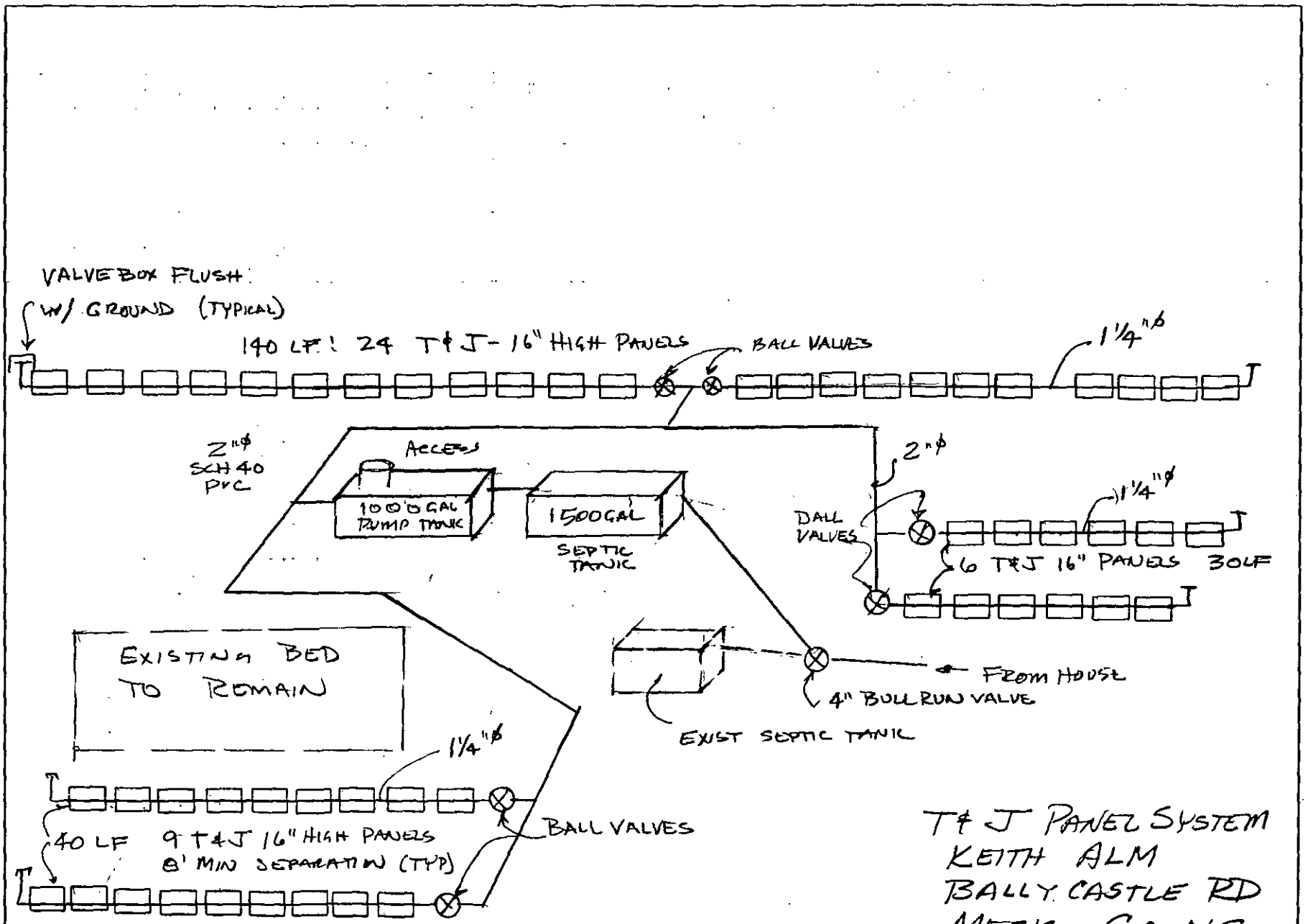


VICINITY MAP
NTS

NORTH CAROLINA PROFESSIONAL SEAL 3370 ENGINEER B. K. BARRINGER, JR.

B K Barringer 4-24-89 5-31-89

B.K. Barringer, Jr. P.E.
104 Westfield Center
MOORESVILLE, NORTH CAROLINA 28115
(704) 664-7888



T & J PANEL SYSTEM
KEITH ALM
BALLY CASTLE RD
MECIC, CO NC.

REVISED LAYOUT 5-31-89

B. K. Barringer, Jr., P.E.
104 Westfield Center
Mooresville, N.C. 28115

JOB _____ SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

DELUXE BUSINESS FORMS - 1-800-843-4294
A DIVISION OF DELUXE CHECK PRINTERS
053010

CERTIFICATE OF COMPLETION/OPERATION PERMIT

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

FILE: 5448-A DATE: 4/30/90

TC: 601 391 84 ☐ L ☐ CRT

SERIAL № 13284

Name of Owner Keith Alm Juris.: McNeck

Address of Property 21134 Ballycastle Rd.

Inspection Data:

Tank Material PCC

Total Length of Drainfield —

Number of Lines — @ —

Cover Depth —

Water Supply Source P/well

Distance to Water Source >50

Excavation Inspected —

Tank(s) Inspected —

Wash Line Inspected —

High Water Alarm Inspected installed

PLOT

Design: 1500 ST, 1000 PT Bullrunvalve, T&J, Cecil CTR# 36

The undersigned has inspected the Septic Tank System described above, and certifies it has been Armstrong Dene Ez #16.

☑ installed or constructed ☐ altered or repaired

☑ in accordance with the permit issued ☐ as detailed in the plot above

and meets the provisions of 10 NCAC 10A .1900, "Laws And Rules For Sanitary Sewage Collection, Treatment, And Disposal" in effect on the date of issuance of the permit. The issuance of this

☐ Certificate of Completion ☑ Operation Permit

does not in any way guarantee that the system will operate properly or relieve any person now or hereafter owning, controlling, or using such system from any liability resulting from the failure of the system to operate properly. This document is issued subject to those restrictions and conditions shown on the permit(s) and the provisions of 10 NCAC 10A .1900 in addition to those listed below under "COMMENTS." This document shall be null and void if any information contained in the application is untrue or if any additions are made to the property which would increase the requirements for said system.

COMMENTS: T&J panels sys. installed according to plans. Bullrun to operate no. 1 first.

Tim Whittaker, R.S.
Environmentalist

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

Gene —

This may need 611 $30
NFA
additional $ —

It appears they've only paid $95

Tim Pl... looks like ... needed ... 4105

COPY

PRESENTED FOR REGISTRATION

89 MAY 31 PM 2:22

ANNIE A. POWERS
REGISTER OF DEEDS
MECKLENBURG CO., N.C.

FILE NO. 5448A

STATE OF NORTH CAROLINA

COUNTY OF MECKLENBURG

ACKNOWLEDGEMENT OF REQUEST BY OWNER FOR RECLASSIFICATION OF SITE FROM "UNSUITABLE" TO "PROVISIONALLY SUITABLE" UNDER 10 NCAC 10A .1948(c)

The undersigned, KEITH L. ALM & ELIZABETH R. ALM,

owner of property located at 21134 BALLYCASTLE ROAD, MOORESVILLE, NORTH CAROLINA,

("the site") and described in an instrument recorded in Book 5422 at Page 0275, Mecklenburg Public Registry,

hereby acknowledges that he applied to the Mecklenburg County Department of Environmental Health ("the Department") for a permit to install a septic tank sewage disposal system on the site; that the Department evaluated the site for suitability for such a system in accordance with the regulations promulgated by the North Carolina Commission for Health Services as 10 NCAC 10A .1934 et seq; that the Department originally classified the site as "unsuitable" pursuant to the standards set forth in the regulations; that the undersigned requested pursuant to 10 NCAC 10A .1948(c) that the Department reclassify the site as "provisionally suitable" in light of the particular septic tank system proposed by the undersigned; that the Department considered various studies, data and other information which indicate to the Department that the septic tank system proposed by the undersigned can reasonably be expected to function satisfactorily and thus that the findings specified in 10 NCAC 10A .1948(c)(1), (2), and (3) can be made; and that the Department therefore reclassified the site as "provisionally suitable" and issued an appropriate permit for such proposed septic tank system.

The undersigned further acknowledges that the proper design, construction, operation and maintenance of such septic tank system is his responsibility and that neither the Department nor its officials, employees or agents warrant or guarantee that the said system installed pursuant to the permit issued by the Department will function in a satisfactory manner for any given period of time or that the Department, its officials, employees or agents assume any liability for any damages of any kind which are caused, or which may be caused, by a malfunction of such system.

The undersigned further agrees for himself, his heirs and assigns that he shall indemnify and hold harmless the Department, its employees and officials, as well as Mecklenburg County and its employees and officials, for any damages or other claims of any person or persons whatsoever arising out of the installation, operation, or failure of said septic tank system.

The undersigned further agrees for his heirs and assigns that, in the event any septic tank system installed under authority of the aforesaid permit fails to perform adequately in any respect, he will take whatever measures are required to correct same; or if such is impossible he will discontinue use of said system immediately.

Use of the singular masculine pronoun forms herein shall be deemed to also include the plural and feminine forms as the context may require.

This document shall be placed on the public records of the Register of Deeds of Mecklenburg County and indexed therein under the Grantor Index in the name or names of the undersigned, and the foregoing acknowledgements shall henceforth be binding on all persons claiming any right, title, or interest in the site.

This 31st day of May, 1989.

Keith L. Alm (SEAL)

Elizabeth R. Alm (SEAL)

STATE OF NORTH CAROLINA
COUNTY OF MECKLENBURG

I, Mary R. Jackson, a Notary Public for said County and State, do hereby certify that Keith L. Alm & Elizabeth R. Alm personally appeared before me this date and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and notarial seal, this 31st day of May, 1989.

OFFICIAL SEAL
Notary Public-North Carolina
COUNTY OF FORSYTH
MARY R. JACKSON
My Commission expires 12-22-91

Mary R. Jackson
Notary Public

Commission Expires _____

APPLICATION FOR AN IMPROVEMENT PERMIT

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

(OFFICE USE ONLY)

FILE: ~~5448A~~ 5448A

TC: 001-391-84

SERIAL: № 17666 ☒ L ☐ CRT

JOB LOCATION

① ADDRESS: 2134 ~~Lot 357 Section 6~~ Ballycastle Rd (STREET NO. / STREET) ② FILE:

③ JURISDICTION: ④ TAX PARCEL NO.: 001-391-99

⑤ SUBDIVISION: ⑥ LOT: ⑦ BLOCK:

OWNER

⑧ NAME: Keith (FIRST) L. (MIDDLE) Alm (LAST)

⑨ MAILING ADDRESS: 1017 Shaker Court

⑩ CITY: Winston Salem ⑪ STATE: N.C. ⑫ ZIP: 27104

⑬ PHONE: (WORK) 919-744-2966 ⑭ (HOME) 919-768-2160

REQUEST

This request is for a(n):

⑮ ☐ New permit ⑰ ☐ Authorization for mobile home exchange

⑯ ☐ Repair or alteration permit ⑱ ☒ Other (specify) Check Existing System to work on New Residence

DESIGN CRITERIA

System will serve:

⑲ ☒ Residence ⑳ ☐ Mobile home ㉑ ☐ Business or place of public assembly

㉒ Number of bedrooms? 4 ㉕ Type?

㉓ Maximum occupancy? 6 ㉖ Maximum number of employees?

㉔ Basement? ☒ yes ☐ no ㉗ Maximum number of seats?

WATER SUPPLY

㉘ Water supply from (present or proposed):

A ☒ Individual well

B ☐ Municipal system

C ☐ Community well

D ☐ Community system

㉙ The undersigned, owner of the property described above as the "JOB LOCATION" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the MECKLENBURG COUNTY HEALTH DEPARTMENT to enter onto the property for the purpose of processing this request.

Signed: L. C. Dellinger - Contractor

Date:

IMPROVEMENT PERMIT

The undersigned, an authorized agent of the MECKLENBURG COUNTY HEALTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. This approval is granted in accordance with the provisions of Laws And Rules For Sanitary Sewage Collection, Treatment And Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

... No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair permit is issued by this Department.

... This permit is not transferable, and shall become null and void 36 months from the date of issuance.

Agreement Form on File

Environmentalist Date

Jim Ericson 6-7-89

Director or Authorized Section Head Date

This permit must be signed by the Director of Mecklenburg County Health Department or an authorized section head in order to be valid.

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION

CHARGE SLIP

Date 1/31/89

Name/Company L. C. Dellinger Building

Sanitation ____

Vector Control ____

O.P.W.D. /

Service: Inspection with Rose #12628 cabin

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
PAID

JAN 31 1989

Fee: $ 95.00

ck #15255
$95.00

Completed by

Collected by

Ex 33 before

go (y)

cross Bridge

store

guy black truck

INSTALLATION, CONSTRUCTION, ALTERATION, AND/OR REPAIR PERMIT

MECKLENBURG COUNTY ENVIRONMENTAL HEALTH

1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 336-4500

FILE: 5448 A DATE: 8/4/89

TC: 001-391-84 ☐ L

SERIAL NO 12825

Permission is hereby given to ✓ Install or Construct, ____ Alter or Repair the individual septic tank wastewater treatment system with subsurface, soil absorption effluent discharge as specified herein at the described location. This permit is granted based upon the information supplied in the application dated 7/31/89. All work shall be completed on or before 7/1/90 after which date this permit shall be null and void. The system shall meet all of the construction requirements of 10 NCAC 10A .1900 which are in effect on the date of the granting of this permit. A Certificate of Completion or an Operation Permit must be obtained from the Mecklenburg County Department of Environmental Health before any system can be covered up or placed into service. The issuance of this permit does not in any way guarantee that the system will operate properly, and it exempts any person now or hereafter owning, controlling or using such system from any liability resulting from the failure of the system to operate properly.

Liner & Tank OK 8/11/89

Ball-run Valve to be installed

See Comments

Liquid Capacity of Septic Tank 1500 gallons

Liquid Capacity of Dosing Tank 1000 gallons

Tank Construction PVC

Absorption and/or Nitrification Lines:

Trench Width - feet

Total Line Length - feet

Number of Lines -

Depth of Stone - inches

Distance from House 5' feet

Distance from Property Line 10' feet

Distance from Well >50 feet

PLOT OF SYSTEM

NAME OF OWNER Keith Nix

LOCATION OF PROPERTY 21314 Ballantyne Rd

Comments: Manifold system to be installed according to plan on file

Section Head or Section Head

Phila S. Walker
Environmentalist

If this permit is for the installation or construction of a new system, it must be signed by the division or a section head of the Department of Environmental Health in order to be valid. Only the signature of the Environmentalist is required where an existing system is being altered or repaired.

WHITE - ENVIRONMENTAL HEALTH DEPARTMENT'S COPY CANARY - ENVIRONMENTALIST'S COPY PINK - OWNER OR AGENTS COPY

100

89 08-14 08:33 *

INSTALLATION, CONSTRUCTION, ALTERATION, AND/OR REPAIR PERMIT

MECKLENBURG COUNTY · ENVIRONMENTAL HEALTH ·
1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

FILE: 5448 A DATE: 8/4/89

TC: 001-391-84 ☐ L

SERIAL № 12825

Permission is hereby given to ✓ Install or Construct, _____ Alter or Repair the individual septic tank wastewater treatment system with subsurface, soil absorption, effluent discharge as specified herein at the described location. This permit is granted based upon the information supplied in the application dated 1/31/89. All work shall be completed on or before 8/4/89, after which date this permit shall be null and void. The system shall meet all of the construction requirements of 10 NCAC 10A .1900 which are in effect on the date of the granting of this permit. A Certificate of Completion or an Operation Permit must be obtained from the Mecklenburg County Department of Environmental Health before any system can be covered up or placed into service. The issuance of this permit does not in any way guarantee that the system anticipated to be constructed will operate properly, or relieve any person now or hereafter owning, controlling or using such system from any liability resulting from the failure of the system to operate properly.

See comments

PLOT OF SYSTEM

Liquid Capacity of Septic Tank 1500 gallons

Liquid Capacity of Dosing Tank 1000 gallons

Tank Construction PVC

Absorption and/or Nitrification Lines:

Trench Width - feet

Total Line Length - feet

Number of Lines -

Depth of Stone - inches

Distance from House 5' feet

Distance from Property Line 10' feet

Distance from Well >50 feet

NAME OF OWNER Keith Alm

LOCATION OF PROPERTY 21134 Ballycastle Rd

Comments: Modified system to be installed according to plan on file

Jim Ennis
Division or Section Head

Philo S. Walker
Environmentalist

* If this permit is for the installation or construction of a new system, it must be signed by the division or a section head of the Department of Environmental Health in order to be valid. Only the signature of the Environmentalist is required where an existing system is being altered or repaired.

WHITE - ENVIRONMENTAL HEALTH DEPARTMENT'S COPY ● CANARY - ENVIRONMENTALIST'S COPY ● PINK - OWNER OR AGENTS COPY

Mecklenburg County
Health Department

Basil G. Deita, M.D., M.P.H.
Health Director

May 30, 1989

Keith L. Alm
1017 Shaker Court
Winston Salem, NC 27104

RE: Property located at 21134 Ballycastle Road
FILE: 5448A
PARCEL: 001-391-84

Dear Mr. Alm:

Receipt of your plans for a modified waste disposal system for the property referenced above is acknowledged.

Your plans for the modified system for the above property as submitted are approved with the following comments:

- The well should be located 100 feet or no less than 50 feet away from any part of the sewage disposal system and repair area.
- Water saving plumbing devices and low flush or microflush toilets must be installed when constructing the residence.

Upon execution and recording with the Register of Deeds Office, Mecklenburg County, of the enclosed "Septic Tank Agreement Form", an Improvements Permit may be issued by this office.

Sincerely,

Jim Ericson, R.S., Supervisor
On Premises Waste Disposal & Water Supply

JE/ir

Enclosures - 3 Septic Tank Agreement Forms

RECEIVED
MECKLENBURG COUNTY
HEALTH DEPT.

MAY 3 1989

ENVIRONMENTAL HEALTH
DIVISION

RECOMMENDED INDIVIDUAL RESIDENCE

T & J PANEL

GROUND ABSORPTION, WASTEWATER

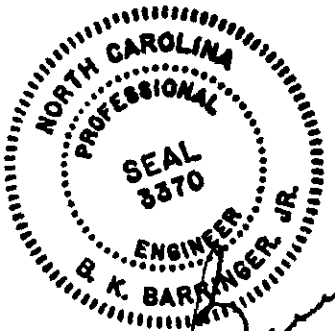
DISPOSAL SYSTEM

for

Keith Alm
Ballycastle Road
File 5448A: Parcel 001-391-99
Mecklenburg County, N.C.

March 22, 1989
Revised April 25, 1989

Owner:
Keith Alm
1017 Shaker Court
Winston-Salem, NC 27104



4-25-89

Prepared By:
B. K. Barringer, Jr., P.E.
N. C. Registration No. 3370
104 Westfield Center
Mooresville, N. C. 28115
(704)664-7888

T & J PANEL SYSTEM

DESIGN CONSIDERATIONS:

PROPOSED FOUR BEDROOM HOME with two baths and a washing machine. The unit will be serviced by a water well located a minimum of 50' from the septic system.

LOCATION: The property is located on Ballycastle Road, a gravel road off Thunderhill Road and south of Brawley School Road. The proposed field is located to the east of the proposed house location.

TERRAIN: The property, where the field is to be located, slopes north to south at approximately 12%.

REFERENCE MATERIAL:

(1) DESIGN AND INSTALLATION (Manual)
OF LOW PRESSURE PIPE WASTE WATER TREATMENT SYSTEMS
By: Craig Cogger; Bobby L. Carlisle; Dennis Osborne; Ed Holland
Published by: UNC Sea Grant College Pub. UNC-SC-82-03
May, 1982.

(2) LAWS AND RULES FOR GROUND ABSORPTION SEWAGE DISPOSAL SYSTEMS. SECTION .1956 OF THE N.C. Administrative Code: Title 10 Health Services; Environmental Health; Subchapter 10a; Sanitation. Published by: N.C. Dept. of Human Resources; July 1, 1982. Paragraph .1956 (a)(ii)(B).

(3) EPA 625/1-80-012 Design Manual
Onsite Wastewater Treatment and Disposal System Oct.,1980;
Chapter 7.

RECOMMENDATIONS: Due to shallow soil depth, sloping lot, and limited area, a precast porous block panel system (PPBPS) - T & J - is recommended for the location.

OWNERSHIP RESPONSIBILITY FOR A LOW PRESSURE PIPING SYSTEM

It must be kept in mind that this system is designed to accept a moderate amount of waste water (which is called the EFFLUENT), in a minimal water absorbing soil.

Conservation measures must be undertaken by all members of the organization to minimize the volume of waste water entering the disposal system, including, but not limited to, the following precautions:

(a) Provide water conserving plumbing fixtures within the facility;

(b) Develop conservative water use habits;

(c) Monitor and maintain the system as necessary for proper operation;

(d) Check and pump the septic tank sludge on a regular basis of approximately every year if garbage disposal is included in the residence, or approximately every three years otherwise.

(e) Make rapid repairs to leaking plumbing fixtures and faucets.

(f) Avoid excessive watering of the lawn in the vicinity of the disposal field.

CONSTRUCTION SEQUENCE AND COMPONENTS OF THE SYSTEM

Refer to T & J Panel System's manufacturing and installment manual. Furnish and install all items required for a complete system in accordance with plans and specifications; for requirements of the County Dept. of Environmental Health (CDEH); the N. C. Dept. of Environmental Health (NCDEH); the N. C. Building Code, Plumbing Code and Electrical Code; and the National Electric Code. System must be properly installed by a qualified, competent contractor.

COMPONENTS OF SYSTEM

1. Two compartment septic tank
2. Pumping chamber
3. Submersible effluent pump and level controls
4. High water alarm signals (audible and visible)
5. Supply pipe
6. Bull run valve
7. Ball valves
8. Existing system
9. T & J 16" high panels & distribution laterals

CONSTRUCTION SEQUENCE:

(1) Lay out T & J, 16" high, Panel System network area and repair area with stakes and flagging to ten feet (minimum) beyond the limits of the network. As soon as the absorption area is designated, it should be flagged, roped off and isolated from construction traffic. This barrier should be maintained until the system is accepted by the Owner. Refer to site plan for the size of absorption area. The Engineer has previously flagged the general limits of the nitrification field. See site plans for flag locations.

(2) Protect existing bed and septic tank from any construction traffic.

(3) Clear site of existing house and all man-made debris, construction materials, etc. Dispose of legally.

(4) Existing septic tank is to be pumped out and tested to determine if it is in good working order. It shall be connected to proposed system with a bull run valve. Existing system will remain as a reserve system.

(5) Prior to actually beginning construction of the system, carefully locate, lay out and identify and disposal site, manifolds and the lateral panel piping networks, using a tripod mounted engineer's leveling instrument to accurately establish each lateral along a level contour. Note: Lateral panel runs which conflict with cut-off-in-place stumps or trees shall "snake" by with a 12" minimum trench clearance and then continue along its projection run. (The 6' minimum trench separation must be maintained.)

(6) Excavate for and construct curtain drain (if shown on the plan.)

(7) Excavate lateral network trenches 24" wide by 28" deep (see detail). Remove loose soil from bottom of trench.

(8) Install sand in bottom of the lateral trench to the proper depth of approximately 22" below finish ground level.

(9) Follow the manufacturer's guidelines for installing the T & J Panel System.

(10) All joints in lateral and the manifold piping shall be water tight connections to insure that the only source of the water seepage from the system is through the orifices as designed. See layout and details. Carefully install manifold and lateral network according to the attached designed layout. A larger diameter protective sleeve with cap or approved box with lid shall be placed over the turned up lateral and positioned level with the ground surface (so as not to be damaged by mowing machine.)

(11) Carefully backfill manifold trenches to finish grade with clean (debris free earth (no stone).

(12) Leave absorption area with a raked surface, ready for grassing.

(13) The installation contractor shall stabilize the area of construction by planting and seeding with Kentucky 31 tall fescue and shall keep the planted area watered and mulched until such time that a hardy stand of grass is established. (See Grassing Specification.)

(14) The septic tank shall consist of a 1,500 gallon capacity, reinforced, precast concrete tank with full baffle and shall have easy access to each chamber from ground level for checking and pumping. The first chamber of the septic tank shall consist 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 its height. Locate the septic tank at such height as to provide approximately 8" of cover soil over top of the tank.

(15) The dosing tank shall consist of a 1,000 gallon capacity, reinforced, precast concrete tank without baffle and shall have a concrete mounting pad (concrete blocks) for accommodating the pump. Provide access for entry into the tank directly over the pump location, and extending 6" above final grade. Use a 30" diameter concrete well casing and concrete well cap.

(16) All piping and fittings shall be PR160 PVC. Glue for all PVC pipe joints shall be as recommended by the pipe manufacturer.

(17) PUMP: The submerged pump shall be Model WHR5A manufactured by F.E.Myers Co., Ashland, OH, or equal, 1/2hp, 115v/1ph; 7.5 amps; capable of pumping 50 gallons per minute at an 12.6' head.

(18) PUMP ON-OFF water level control switch shall by Myers, Model MLC-20, mercury switch, with three prong, piggy back plug.

(19) HIGH WATER ALARM SWITCH shall be equal to Myers, model FLCA-30, mercury switch, red colored ball with support bracket.

(20) HIGH WATER ALARM CONTROL BOX shall be equal to Myers, model FLCA CA-SS4 with connection box having buzzer alarm, on, off, test switch with terminal block for all connections. Control box shall be supplied by two separate 115 volt circuits, one plug circuit, and one alarm circuit.

(21) A "HOME OWNER'S WARNING SIGN" shall be located within the house to inform the owner of what action to take in case the "High Water Alarm" is activated. This sign shall contain the name, address, telephone number, and emergency telephone number of the person to contract immediately upon malfunction of the system.

(22) PUMP AND CONTROLS: Details of pump installation are shown on the plan. The pump must be placed on two concrete blocks next to each other on the bottom of the tank. This prevents the pumping of any solid particles which can clog the LPP system. A piece of nylon rope or other non corrodible material should be attached to the pump and to the outlet pipe for lifting the pump in and out of the chamber. (The PVC outlet pipe is too fragile to support the pump.)

Controls are fastened to the outlet pipe with clamps or brackets supplied by the manufacturer. The lower level control or "pump-off" must be positioned above the pump, so that the pump remains submerged at all times. The supper level control "pump-on" is positioned to pump a specified volume of effluent. The high water control float is then mounted about 3" above the upper pump-on control. (Note: Care must be taken to insure that floats do not become fouled by other components in the tank such as the electric power cord or the lifting rope.)

The pump outlet pipe should be connected to the supply manifold with a threaded PVC union (or dresser coupling) to allow quick removal. The gate valve must also be installed in the supply line (within the pump chamber) to allow final adjustment of the pressure. If effluent will be pumped down hill, a 1/4" siphon-breaker hole must be drilled in the bottom of the supply line before it leaves the pump tank. This breaks any vacuum in the system and prevents the inadvertent siphoning of effluent out of the tank. This hole is very important.

(23) ELECTRICAL CONNECTIONS: The pump and high water alarm must be placed on separate electrical circuits. (If the pump circuit fails, the alarm must still be able to operate.) Follow the manufacturers' recommendations for the proper fuses or circuit-breakers. All electrical connections must be made outside the pumping chamber. Power cords from the pumps and controls should be plugged into a NEMA approved outdoor receptacle mounted outside of the pumping chamber. The receptacle must not be located inside the pumping chamber due to the corrosive and explosive gasses that may form from the sewage.

Electrical connections may be made inside the pumping tank only if wired inside a sealed, water tight box. Some level control switches have a box built into the housing,k but are more expensive than the plug-in devices.

Wiring between the pumping chamber and the house should meet State and local code requirements. A lightning arrester is recommended to protect the pump and controls from electrical surges.

(24) PROPER OPERATION CHECK: After all components have been installed and connected, the system should be checked for proper operation. With electrical power turned off, fill the pumping chamber with water from a garden hose (or allow effluent to accumulate) until the liquid rises to the level of the high-water alarm float. Turn on the electrical power. The alarm light should go on in the house, and the pump should start operating. The alarm light should go off when the liquid level falls below the high-water float. The pump should turn off when the liquid reaches the lowest float control. Be sure the pump is still completely submerged.

(25) PRESSURE HEAD ADJUSTMENT: The pressure head must be adjusted to match that specified in the design. The pressure head is measured as the height liquid will rise above the turn-up elbow when the pump is running. To adjust the head:

(a) Glue a 4' length of pipe (preferably clear) to a threaded adapter that will screw onto the turn-up adapters. (Call this the "test tube".)

(b) Replace the turn-up cap with the "test tube".

(c) Turn the power on to allow liquid to rise in the "test tube".

(d) Adjust the ball valve beginning at the end of each lateral until the effluent reaches the desired height in the "test tube". Remember to include the distance below the ground surface to the lateral line when measuring the height. The pressure head should be 2' for each line. This is the height above the lateral the liquid should be in the temporary "test tube".

(25) FINAL LANDSCAPING: After the T & J System is installed, the following should be checked to insure that the system will not be overloaded with excess rain water and run off:

(a) The distribution field is shaped to shed rain water and is free of low area.

(b) Gutter and downspout drains are directed away from the system.

Any problems should be corrected before approving the system.

Finally, the entire area should be planted with grass according to specifications.

DESIGN SPECIFICATIONS - T & J PANEL SYSTEM
Keith Alm — Ballycastle Road
Mecklenburg County — 3-22-89 Rev. 4-25-89

Daily design waste flow:	480 gpd
Septic tank size:	1,500 gal. (2 compartment)
Pumping tank size:	1,000 gal.
Effluent loading rate:	0.30 gpd/sf
Total linear feet and diameter of laterals	266 ft. of 1-1/4" dia. PVC and T & J 16" high panels
Total length and diameter of supply manifold:	60 lf - 2" dia. PVC
Number and length of laterals:	3 laterals at 42 lf 1 split lateral at 140 lf total
Number of panels:	51
Manifold placement:	See layout sheet
Hole size:	5/32"
Hole spacing:	2 holes per panel
Total number of holes:	102
Flow rate through the system:	42 gpm
Elevation head (pump to end of manifold):	11'
Pressure head:	2'
Friction head:	1.3'
Total head:	14.3'
Pump requirements:	42 gpm at 14.3'; use Myers 1/2 hp WHR5A pump
Dosing volume:	184 gal.
Depth of water pumped per dose:	8.5"
Pump run per dose:	4.4 min.
Check valve:	yes
Syphon break hole:	yes

EEDING SPECIFICATIONS

:1 SLOPES OR FLATTER

. Apply agricultural lime at the rate of 30 lbs/1000 sf.
. Apply 10-10-10 commercial fertilizer at the rate of 20 lb/1000 sf.
. Seed in accordance with the following schedule and application rate:

DATE	TYPE	PLANTING RATE
8/15 - 11/1	Tall Fescue	200 lb/ac or 7 lb/1000 sf
11/1 - 3/1*	Tall Fescue and	200 lb/ac or 7 lb/1000 sf
	Abruzzi Rye	25 lb/ac or 1/2 lb/1000 sf
3/1 - 4/15	Tall Fescue	200 lb/ac or 7 lb/1000 sf
4/15 - 7/30	Mulled Common or Bermuda Grass	30 lb/ac or 1 lb/1000 sf
7/15 - 8/15	Tall Fescue and	200 lb/ac or 7 lb/1000 sf
	Browntop Millet or	35 lb/ac or 7/8 lb/1000 sf
	Sorghum-Sudan Hybrids	30 lb/ac or 3/4 lb/1000 sf

. Mulch with straw applied at the rate of 75-100 lb/1000 sf.

* Heavily mulched during January - March period.

LOPES GREATER THAN 3:1 TO 2:1 SLOPES

. Apply agricultural lime at the rate of 50 lb/1000 sf.
. Apply 10-10-10 commercial fertilizer at the rate of 20 lb/1000 sf.
. Seed in accordance with the following schedule & application rate:

DATE	TYPE	PLANTING RATE
3/1 - 6/1	Sericea Lespediza (scarified) and	50 lb/ac or 11 lb/1000 sf
3 - 4	Add Tall Fescue or	150 lb/ac or 3-1/2 lb/1000 sf
3 - 6	Add Weeping Lovegrass	5 lb/ac or 1/8 lb/1000 sf
6 - 9/1**	Tall Fescue and	60 lb/ac or 1-1/2 lb/1000 sf
	Brown Top Millet	35 lb/ac or 7/8 lb/1000 sf
	or Sorghum	30 lb/ac o 3/4 lb/1000 sf
	Sudan Hybrids	
9 - 3/1	Sericea Lespediza (unhulled-unscarified)	70 lb/ac or 1-3/4 lb/1000 sf
	Tall Fescue	150 lb/ac or 3-1/2 lb/1000 sf
	Millet or Sudan	20 lb/ac or 1/2 lb/1000 sf

** Temporary - Reseed September 1 at recommended rates.

. Mulch with 3" straw applied at the rate of 50-90 lb/1000 sf and anchor with asphalt emulsion tack coat applied at the rate of 14-28 gal/1000 sf or 800-1200 gal/ac.

Mecklenburg County
Health Department

Basil G. Delta, M.D., M.P.H.
Health Director

February 20th, 1989

Keith L. Alm
1017 Shaker Court
Winston Salem, NC 27104

RE: Property located at Ballycastle Rd.
FILE: 5448A
PARCEL: 00139184

Dear Sir:

At your request, a field investigation was conducted on the property designated above for the purpose of determining site suitability for the installation of a ground absorption sewage disposal system. The results of this investigation showed the property to be classified UNSUITABLE for the installation of such a system. A copy of the Site Evaluation Report (Serial Number 11897) is enclosed.

State regulations provide that sites originally classified unsuitable may be utilized for the installation of alternate or modified sewage disposal systems provided the requirements of 10 NCAC 10A .1948 (c) are met. A reprint of this section is enclosed for your information.

Should you desire to file for permission to install an alternate or modified sewage treatment system on the property, please submit an Application For An Improvement Permit with an ACCURATELY dimensioned plot plan detailing the location of current and/or proposed buildings, wells and sewage disposal systems to this office. They will be reviewed, and if it is determined that the proposed system may reasonably be expected to function satisfactorily, an Improvement Permit will be issued by the Department upon completion by you, of a formal request for lot reclassification.

If I may be of any assistance, please feel free to call.

Very truly yours,

Sylvia D. Daniel, R.S., Supervisor
On Premises Waste Disposal & Water Supply

Enclosure (2)

MECKLENBURG COUNTY ENVIRONMENTAL HEALTH
SITE EVALUATION REPORT

File: 5448A Action: 2

SERIAL NUMBER № 11997 Parcel: 001-391-99

Location: Ballycastle Road

Subdivision:

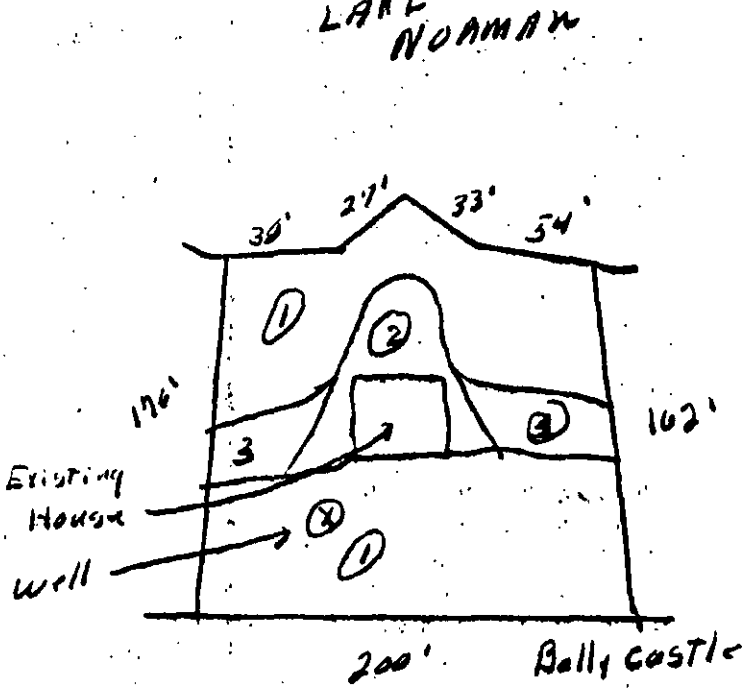
Lot: Block: Acres: .69

Owner: Keith L. Alm
Address: 1017 Shaker Court
Winston Salem, N. C. 28104

Comments: _____

Described by: William B. Marlin

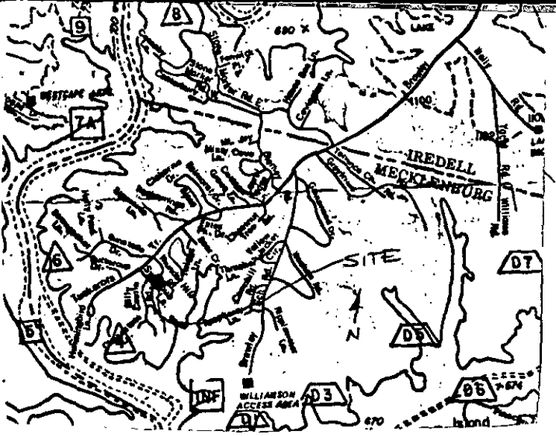
Date: 2-17-81



*** EVALUATION KEY ***

S = Suitable U = Unsuitable
PS = Provisionally Suitable
The "Area Classification" below indicates the suitability of areas in the diagram.

FACTORS	AREA 1	AREA 2	AREA 3	AREA 4	AREA 5	AREA
Topography	S PS (U) complex slopes	S (PS) U 10-20%	(S) PS U 0-15%	S PS U	S PS U	S PS
Texture	S PS U	S (PS) U clay	S (PS) U clay	S PS U	S PS U	S PS
Structure	S PS U	S (PS) U Blocky	S (PS) U Blocky	S PS U	S PS U	S PS
Drainage	S PS U	S (PS) U >36" to water	S (PS) U >36" to water	S PS U	S PS U	S PS
Depth	S PS U	S PS (U) 26-32"	S (PS) U 36"	S PS U	S PS U	S PS
Restrictive Horizons	S PS U	S (PS) U >36"	S (PS) U >36"	S PS U	S PS U	S PS
Available Space	S PS U	S PS (U) Restricted	S PS (U) Restricted	S PS U	S PS U	S PS
Other (specify)	S PS U	S PS U	S PS U	S PS U	S PS U	S PS
Soil Group/Series	Complex slopes	IVA Pamlico silt loam	IVA Pamlico silt loam			
Area Classification	S PS (U)	S PS (U)	S PS (U)	S PS U	S PS U	S PS



VICINITY MAP
NTS

LAKE NORMAN

N 76°-58'-00" W
33.62'

S 44°-13'-00" W
27.30'

S 77°-10'-00" W
38.12'

S 77°-57'-00" W
54.23'

ABANDON
EXIST. DRIVE

N 25°-00'-00" W

50' MIN

15" RED OAK

10" WATER OAK

8" DOGWOOD

140 LF T&J

44'-9"

1000 GAL PUMP TANK

8" DOGWOOD

9' MIN TYP

42 LF T&J

500 FT² EXIST. BED (TO REMAIN)

DIST. SEPTIC TANK (TO REMAIN)

54'-0"

3 BEDRM HOUSE

BULL RUN VALVE

4"Ø

6' MIN

1500 GAL SEPTIC TANK

47'-4"

10' MIN

42 LF T&J

20" MAPLE

SPINE

REPAIR AREA
2100 FT² (MIN)

55'

10' MIN

162.73'

176.74'

S 06°-31'-06" E

50' R MIN

WELL

768
770
772
774
776
778
780
782
784

16.10'
R=203.62'

S 75°-31'-00" W
113.07'

71.34'
R=262.19'

R/W

BALLY CASTLE ROAD
(GRAVEL)

NORTH

T&J PANEL SYSTEM FOR:

KEITH ALM
BALLYCASTLE ROAD
MECKLENBURG CO., NC

DRAWN BY: MLT
DATE: 3-21-89 REV 4-24-89
SCALE: 1"=20'

NORTH CAROLINA PROFESSIONAL SEAL 3870 ENGINEER B. K. BARRINGER, JR.

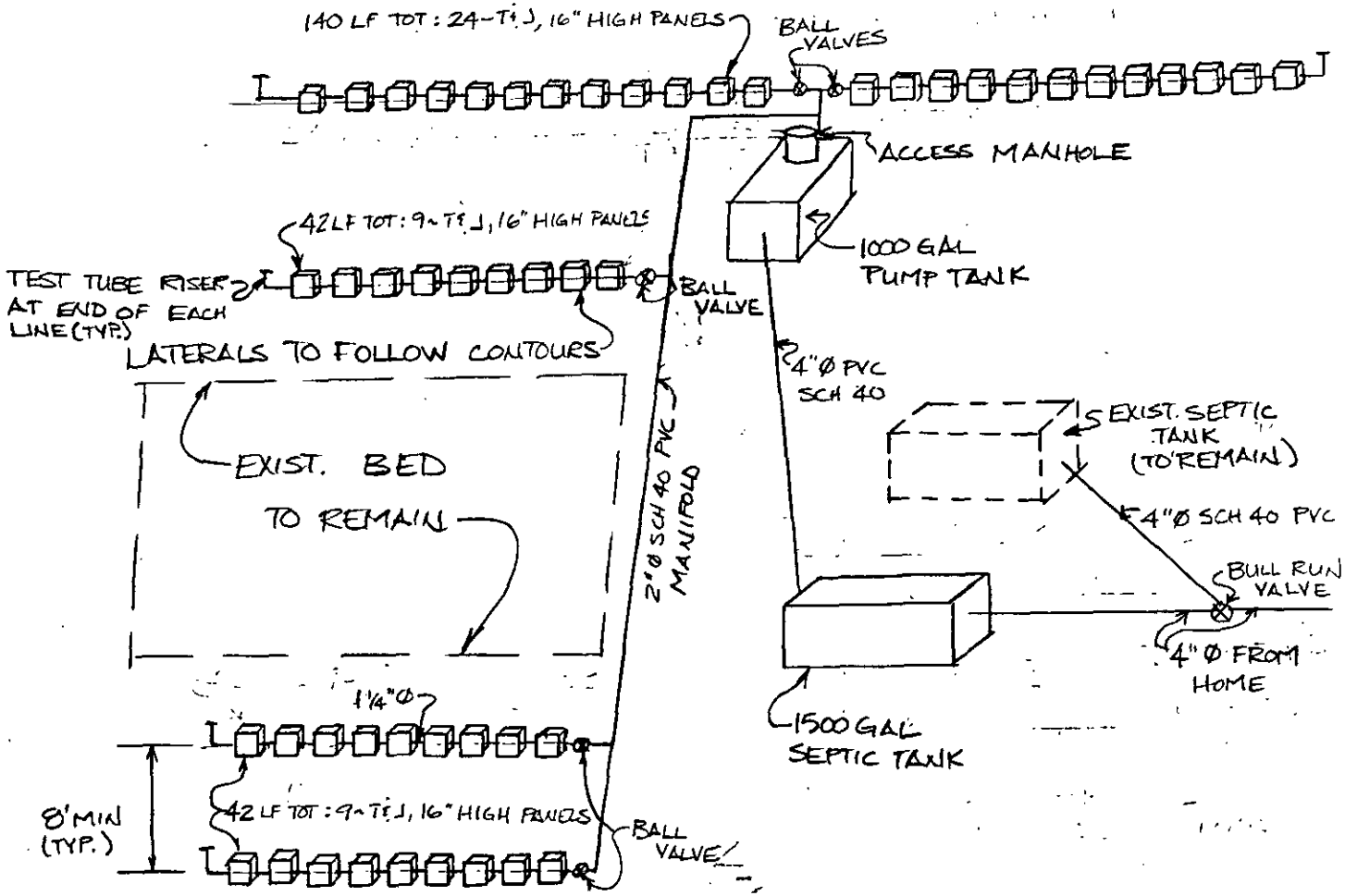
4-24-89

B.K. Barringer, Jr. P.E.
104 Westfield Center
MOORESVILLE, NORTH CAROLINA 28115

(704) 664-7888

T&J PANEL SYSTEM FOR:

KEITH ALM
BALLYCASTLE ROAD
MECKLENBURG CO., NC



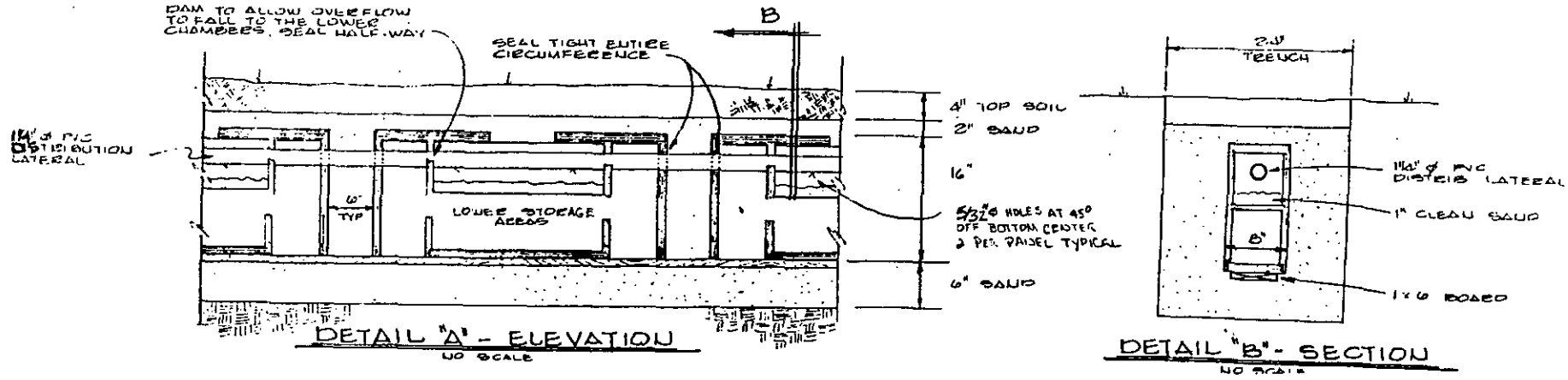
SCHEMATIC LAYOUT

NO SCALE

B.K. Barringer, Jr. P.E.
104 Westfield Center
MOORESVILLE, NORTH CAROLINA 28115

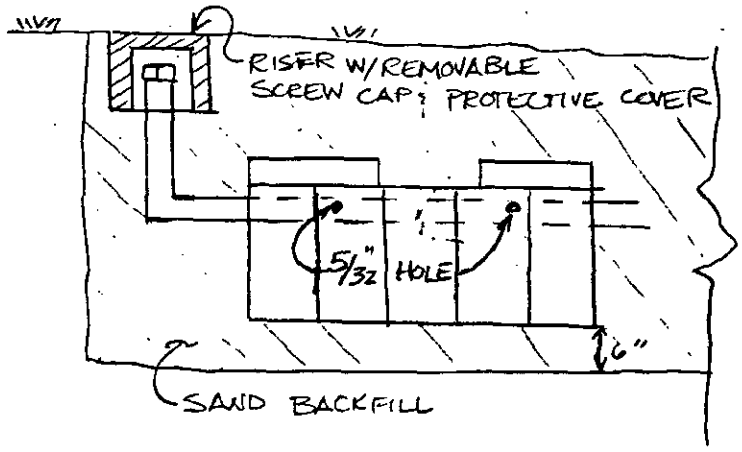
(704) 664-7888

T & J PANEL AS MFG'D
BY STATESVILLE
CONCRETE PRODUCTS

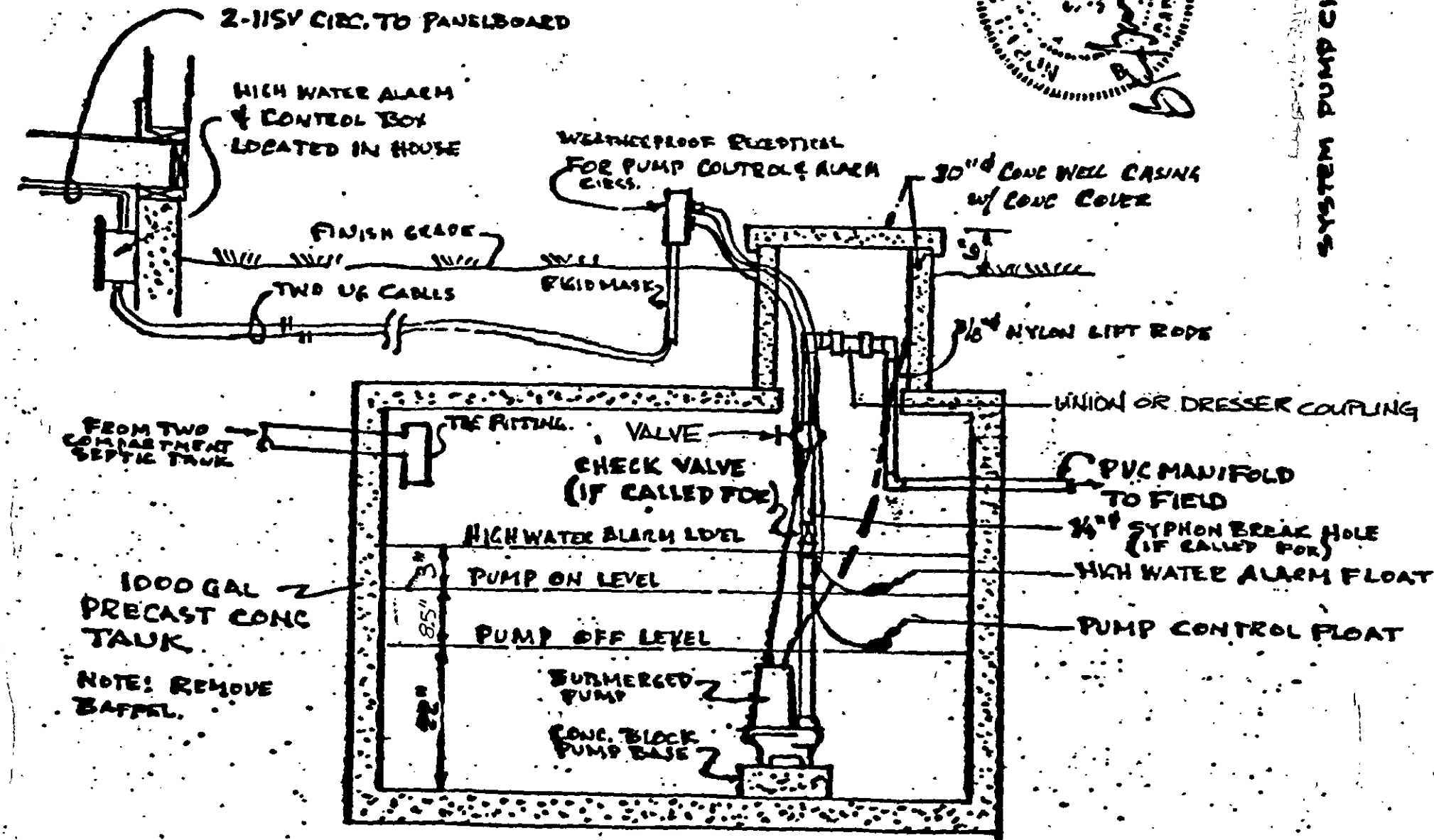


DETAIL "A" - ELEVATION
NO SCALE

DETAIL "B" - SECTION
NO SCALE



B.K. Barringer, Jr. P.E.
104 Westfield Center
MOORESVILLE, NORTH CAROLINA 28115



PUMPING CHAMBER DIAGRAM

NO SCALE

1000 GAL TANK

SYSTEM PUMP CHAMBER

KEITH ALM

T & J PANEL SYS.

→ 4 BR HOME:

120 GPD/BR x 4 BR = 480 GPD

→ USE EFFLUENT LOADING RATE OF 0.30 GPD/SF

480 GPD / 0.30 GPD/SF = 1600 SF

1600 SF / 3 FT WIDE TRENCH = 533 LF

→ T & J PANEL:

FOR 16" HIGH PANEL: 533 LF x 0.5 = 266 LF

USE 1 ~ 140 LF & 3 ~ 42 LF LINES

→ PANELS ARE 46" WIDE WITH APPROX. 6" SEPARATION B/W PANE

NO. OF PANELS IN 42' LINE: $\frac{42 \times 12"}{52"} = 9.7$

NO. OF PANELS = 9 WITH 10" B/N PANELS

NO. OF PANELS IN 104' LINE = $\frac{104 \times 12"}{52"} = 24$

NO. OF PANELS = 24 WITH 6" B/W PANELS

PUMP TANK SIZE = 2 x DAILY WASTE FLOW

= 2 x 480 GPD = 960 GPD

USE 1000 GAL TANK

→ SEPTIC TANK SIZE: USE 1500 GAL TANK

KEITH ALM
T&J PANEL SYS.

→ DOSING VOLUME:

THE DOSING CYCLE IS DESIGNED TO PUMP ENOUGH EFFLUENT TO FILL THE TOP CHAMBER (3.6 GAL FOR 16" PANEL) OF EACH PANEL IN THE SYSTEM.

TOT. NO OF PANELS = 3(9) + 24 = 51

51 × 3.6 GAL = 184 GAL/DOSE

DOSING DEPTH = (184 GAL/DOSE / 1000 GAL TANK)(50" − 4" (depth to outlet "T") / 12"/FT (thickness of con) = 0.
= 8.

→ CALC NO. OF HOLES:

2 ~ 5/32" HOLES PER PANEL (TYP.)

51 PANELS × 2 = 102 HOLES

W/2' PRESSURE HEAD ; 5/32" HOLES

FLOW RATE = 0.41 GPM

TOT. DOSING RATE = 0.41 GPM × 102 = 42 GPM

→ PUMP: PRESSURE HEAD = 2' (MIN)

ELEV. HEAD = 11' (2" line)

FRICTION HEAD = $1.2\left(\frac{30}{100}\right)(2.95) = 1.3'$

TOT. HEAD = 14.3'

USE MYERS WHR5A - ½ HP PUMP

→ CHECK VALVE:

$V_{STORAGE} = \frac{60}{100}(16.2) + \left[3\left(\frac{42}{100}\right) + \frac{140}{100}\right]6.4 = 27$ GAL

¼ DAILY FLOW = $\frac{480}{4}$ = 120 GAL > 27 GAL ∴ NO CHECK VALVE

Design, Installation and Maintenance

of the

T & J Panel Wastewater Treatment System

draft

This manual has special sections for:

Sanitarians
Septic Tank Installers

Although this manual is sectioned for specific user groups, we at T & J Panel suggest that you familiarize yourself with the complete manual.

Sanitarians

In the early days of the T & J Panel System, when it was still considered an experimental system, the primary reason for permitting the Panel System was because of insufficient space for a conventional system. Now with inclusion in the Sewage Regulations (10NCAC 10A .1956(3)(a)(ii)), the Panel System should be considered when a quality effluent may be needed, space is limited, usuable soil is limited, or there are indications that at some future time space may be needed for other uses. When there is a trend for added development such as pools, other special landscaping, or additions to the home, the T & J Panel System may prevent insufficient space later. As an example, there was a subdivision where three of five homes in the same block added in-ground pools. Each of these pools impacted the existing nitrification lines. As the sanitarian, if you can forsee such a trend developing, discuss the Panel System with the home owner.

As noted in the regulations, the PPBPS is only permitted where soils are suitable for a conventional system, however, only one-half of the space is needed. The Panel System will allow the use of the best soils on the lot. This system may be gravity fed or pumped using the LP Panel System as described. Most of the concepts for T & J Panel layout are the same as for a conventional system. The biggest differences are areal needs and quality of effluent being introduced into the soil.

For comparison, a 3 bedroom house with a 0.4 gpd application rate is compared.

(These 3 steps are the same as with the conventional system.)

1) 120 gal. per bedroom x 3 bedroom=360 gal./day design flow

2) 360/0.4 application rate=900 ft. sq. of trench bottom

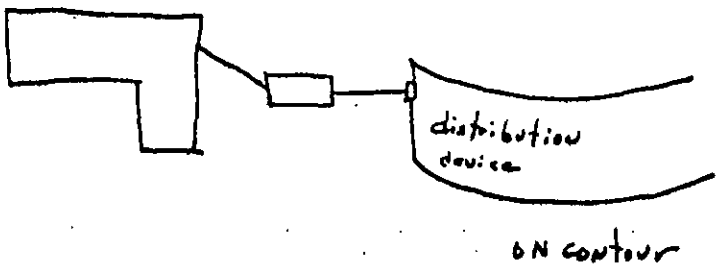
3) 900 ft. sq. 3 ft. wide trench=300 lineal feet of conventional system.

This system requires a 2700 ft. sq. area on the lot for the system and equal space for repair which equals 5400 sq. ft. of suitable and useable area. To calculate the T & J Panel System, the above calculations must be made thru step (3). For the Panel System an additional step 10NCAC 10A .1956(3)(a)(ii)(B) allows for a PPBPS (this is the T & J Panel System).

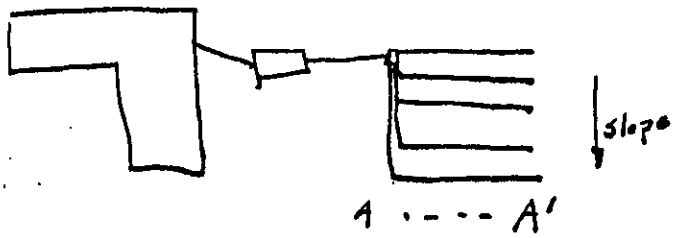
300 lineal feet of conventional system x 0.5 for the 16" high panel=150 lineal feet of Panel trench.

This PPBPS requires a 1200 ft. sq. area on the lot for the system and equal space for the repair. With the Panel System the installation and repair can go into the same space as the conventional gravel trench.

Areal space should always be a consideration for any system, but especially noteable with the Panel System. The following is a simplistic example of this concept.



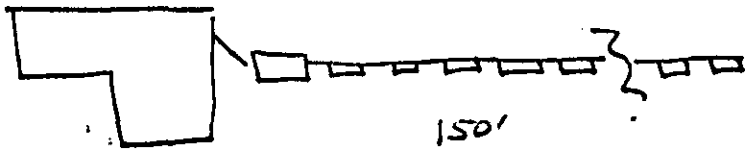
System of 150 lineal feet of Panel System



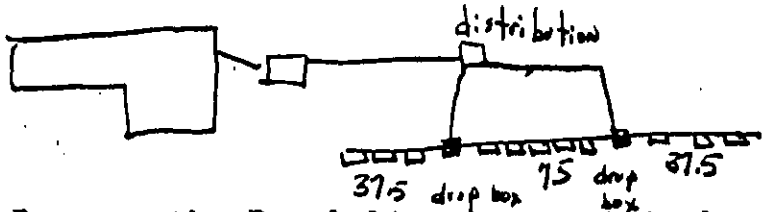
Here are the five lines of 30 feet each.

This is not a desireable design because the effluent must pass the thru the area A-A' which can place a strain on that area and cause a failure because of hydraulic overload.

Another extreme with this same example would be the use of a single trench fed from only one point.



Here the areal space is good and chance of hydraulic overloading is greatly reduced in a properly designed system; but downline distribution in the Panel line does not give optimum treatment.



In this situation a multiple feed shall be used.

Because the Panel lines are put in level, they feed both ways equally. No gravity line should exceed 75', unless it is fed from multiple points. If this 75 foot line can be fed from the middle, it will provide a much better system. In both of these examples, we are specifying the Panel System, but the logic applies to the conventional as well.

To calculate the number of panels needed for 150 lineal feet, multiply 150x12=1800", then divide by 52 which is 46 inches for the panel, plus 6 inches of space, which equals 34.6 panels or 34 panels in the system, or see design chart that follows. If these go into 2 trenches or more, there should be a balanced number of panels between lines, not 14 in one line and 20 in the other. An 18 and 16 split would be acceptable. Usually on the permit, the lines are illustrated as small blocks. (Enclosed are two actual permits used for Panel

COUNTY HEALTH DEPARTMENT

(SEPTIC TANK) IMPROVEMENTS PERMIT AND CERTIFICATE OF COMPLETION
(Ground Absorption Sewage Disposal System - G. S. Chapter 130-Article 13C)

R OR CONTRACTOR _____ DATE _____ PERMIT NO. _____

E: Business _____ Home _____

TION _____

_____ S. R. No. _____

IVISION NAME _____ LOT NO. _____ SECTION OR BLOCK NO. _____

(✓) Mobile Home ( ) Business ( ) Other _____

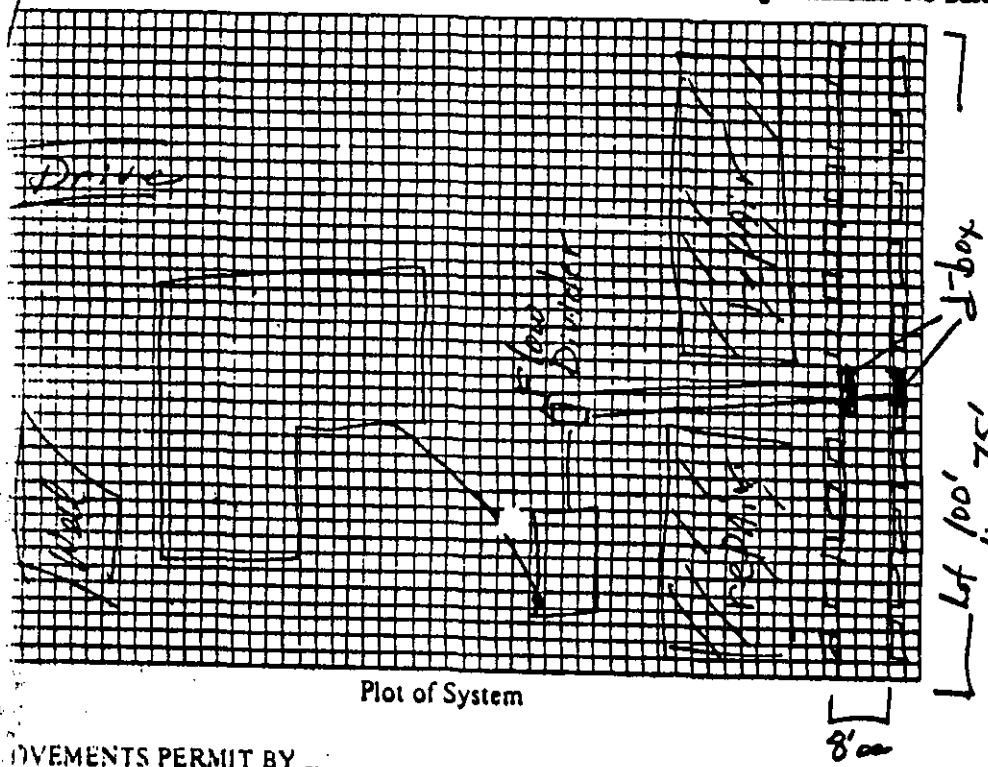
drooms 3 No. Bathrooms 2½

ge Disposal Unit	N/A	Yes ( )	No ( )
Dishwasher		Yes (✓)	No ( )
Wash. Machine		Yes (✓)	No ( )
ıtable		Yes (✓)	No ( )

Character & Porosity of Soil: clay loam over clay
Percolation Rate: 0.4 gal/ft²/day
Topography: 6% slope
Depth to Water Table: >60'
Rock or other impervious formations: None

ea _____

Basement with Plumbing ____ Basement without Plumbing ____ No Basement ✓



Plot of System

8'oc

Size of Tank 1000 w/ baf Gals.
Nitrification Field: PPBPS
No. of Lines (2) 75' lines of 16" Tr
Sq. Ft. N/A Linear Ft. Pan.
Depth of Stone in Lines N/A
Water Supply: Individual ( )
Public ( )

Installed by Best Tank Co.

I understand and agree to install septic tank system as specified on this Improvements Permit.

Signed: [signature]

OVEMENTS PERMIT BY _____

IENTS: 2 lines of 17 panels each - split in middle - equal flow to each
2' wide trenches 8' o.c.
install According to manufactors guidelines

IFICATE OF COMPLETION BY _____ DATE _____

ING SYSTEM CHECKED BY: _____ DATE _____

CONSTRUCTION MUST COMPLY WITH ALL OTHER APPLICABLE STATE AND LOCAL REGULATIONS.
is VOID if any unauthorized changes are made in installation of system and/or if any false information is supplied in making ...mits Permit.

Health Dept. Copy: White Inspection Dept. Copy: Yellow Sanitarian's Copy: Pink Owner's Copy: Gold

COUNTY HEALTH DEPARTMENT

(SEPTIC TANK) IMPROVEMENTS PERMIT AND CERTIFICATE OF COMPLETION
(Ground Absorption Sewage Disposal System -- G. S. Chapter 130-Article 13C)

ER OR CONTRACTOR _____ DATE _____ PERMIT NO. _____

NE: Business _____ Home _____

TION _____

_____ S. R. No. _____

IVISION NAME _____ LOT NO. _____ SECTION OR BLOCK NO. _____

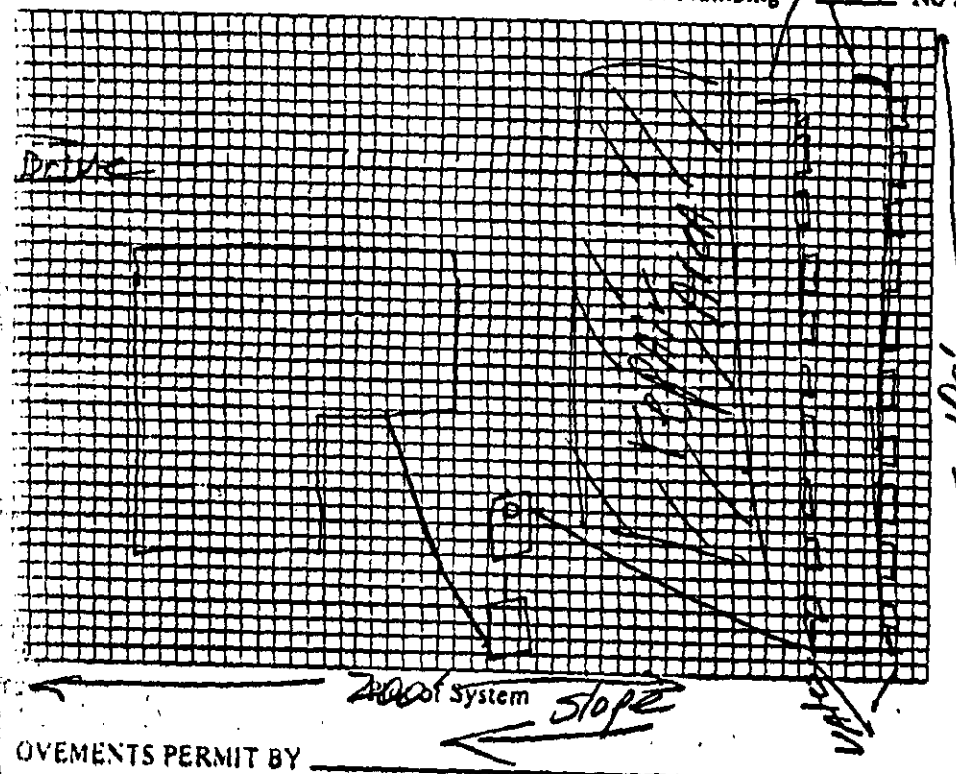
(✓) Mobile Home ( ) Business ( ) Other _____

drooms _____ No. Bathrooms _____
e Disposal Unit N/A Yes ( ) No ( )
Dishwasher Yes (✓) No ( )
Wash. Machine Yes (✓) No ( )
ntable Yes (✓) No ( )
rea 20,000

Character & Porosity of Soil Clay loam over clay
Percolation Rate 0.4 gpf/24 hrs
Topography 6% Slope
Depth to Water Table >60"
Rock or other impervious formations N/A

— Basement with Plumbing ____ Basement without Plumbing ____ No Basement

Pressure Distribution



Size of Tank 1000 septic 1000 Gals.
Nitrification Field:
No. of Lines (2) 75' PPBFS of Tr-
Sq. Ft. _____ Linear Ft. _____ Lgth.
Depth of Stone in Lines N/A
Water Supply: Individual ( )
Public ( )

Installed by _____

I understand and agree to install septic tank system as specified on this Improvements Permit.

Signed: Homeowner

OVEMENTS PERMIT BY _____

IENTS: _____

IFICATE OF COMPLETION BY _____ DATE _____

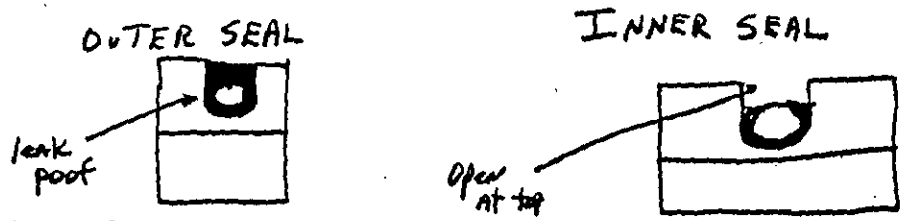
ING SYSTEM CHECKED BY: _____ DATE _____

CONSTRUCTION MUST COMPLY WITH ALL OTHER APPLICABLE STATE AND LOCAL REGULATIONS.
VOID if any unauthorized changes are made in installation of system and/or if any false information is supplied in making
Permit.

Health Dept Copy: White Inspection Dept. Copy: Yellow Sanitarian's Copy: Pink Owner's Copy: Gold

The Panel System may be installed as either a gravity or pumped system. When pumped, the designer should consult the LPP manual for specifics (See permits).

Backfill sand should be a clean, washed, medium creek sand. The ASTM C33 specification is one used for ready mix concrete sand and this should be available from any concrete plant. Clean particle sand for use in the top chamber of each panel is available from the Panel System distributor. This sand should be about 1 inch thick. Please note the seals on the drawing. The outer seals are closed completely. The inner seals only come to the top of the pipe (see drawing below). This causes downline flow and also allows for overflow should the system become filled. Sidewalls should be raked and limed when installed in clay soils.



What to look for at the final inspection.

Gravity system	Depth of panels Is the system level Are the seals properly constructed Was the proper sand used Were sidewalls raked and limed
Pumped system	All those above Size of pump-dose cycle and correct head Even distribution of effluent 3.6 gal/per panel

Installer

Generally, on level open land, a Panel System can be installed in about the same time as a conventional system; however, traditionally, Panel Systems have been installed where space and topography have restricted use of a conventional system, and for this reason system installations have required more time. Many installers enjoy the change of working with panels, not handling gravel, and the satisfaction of knowing a system is being installed where previously a conventional system was not possible.

Enclosed is an order sheet for the T & J Panel System indicating materials which will be needed. The Panel distributor for your area will lead you through this sheet when ordering or pricing the system. The order sheet has been filled in for a 300 lineal feet conventional system, which equals a 150 feet Panel System, gravity and pressure dosed. After ordering, your panels will be shipped to the job site on pallets, banded together.

Materials Chart For 16 Inch Panels

Materials needed per panel:

- Three feet of half inch tar seal rope per panel.
- Two feet of two inch PR160 pipe per panel or same linear feet as line layout of pressure system of one and a quarter inch pipe. Add pipe for tie in of lines to tank and house.
- One hundred pounds of partical sand (sand blasting sand fine texture) per eight panels.
- Same linear feet of one by six boards as line length.
- Bag powder lime when in clay soils.

Panel and C-33 Sand fill

50 LF - 11 panels
8½ tons sand

60 LF - 14 panels
10 tons sand

70 LF - 16 panels
11½ tons sand

80 LF - 18 panels
13½ tons sand

90 LF - 21 panels
15 tons sand

100 LF - 23 panels
16½ tons sand

110 LF - 25 panels
18½ tons sand

120 LF - 27 panels
20 tons sand

130 LF - 30 panels
21½ tons sand

140 LF - 32 panels
23 tons sand

150 LF - 34 panels
25 tons sand

160 LF - 37 panels
26½ tons sand

170 LF - 39 panels
28 tons sand

180 LF - 41 panels
30 tons sand

190 LF - 43 panels
31½ tons sand

200 LF - 46 panels
33 tons sand

DATE:

T S J PANEL MATERIAL WORKSHEET

HOMEOWNER: _____ COUNTY: _____

ADDRESS: _____

DESCRIPTION OF SYSTEM: Gravity System

# or Size		COST
34	T S J Panel _____ Inch (caps N/C)	
*	2" PR 160 Pipe	
*	2" Fitting _____	
102	Tar Seal Rope For Panels(3' per panel)	
4	Bag Partical Sand (1-100lb bag per 10 panels)	
2	Pallets (returnable)	
25 tons	Screen Creek Sand (FM 2.3 - 2.8)	
150'	1 X 4 Boards	
1	Powder Lime	
1	Septic Tank 1000 Gallon	
yes	Tar Seal Rope for Septic Tank	
*	4" PVC Pipe Schedule 40	
*	4" Fittings _____	
2	Distribution Box	
*	4" Flex pipe	
1	Flow Divider	

* job specific

Sub-Total

Del. Charge

Tax (4.5%)

TOTAL

DATE:

T S J [illegible] MATERIAL [illegible] SHEET

HOMEOWNER: _____

ADDRESS: _____ COUNTY: _____

DESCRIPTION OF SYSTEM: Pressure Distribution

# or Size		COST
34	T S J Panel 16 Inch Caps N/C]	
*	2" PR 160 Pipe	
*	2" Fitting _____	
102	Tar Seal Rope For Panels[3' per panel]	
4	Bag Partical Sand (1-100lb bag per 10 panels]	
2	Pallets [returnable]	
25 tons	Screen Creek Sand [FM 2.3 - 2.8]	
150'	1 X 4 Boards	
1	Powder Lime	
2	Septic Tank 1000 Gallon	
yes	Tar Seal Rope For Septic Tank	
*	4" PVC Pipe Schedule 40	
*	4" Fittings _____	
	Distribution Box	
*	4" Flex Pipe	
*	Pump + Alarm	

Sub-Total

Del. Charge

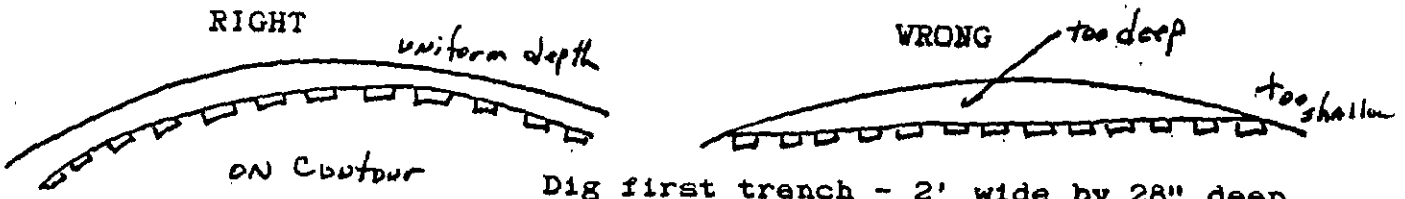
Tax [4.5%]

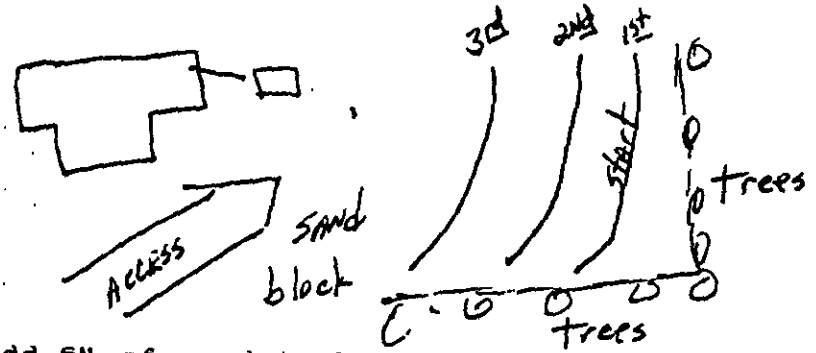
TOTAL

* job specific

Installation for multiple line systems should begin in the most confining area and be worked to the more open areas. This is an example of a multiple line installation-Gravity fed System. Start at the furtherest or most confining line (this is to avoid running over newly installed panels).

Lines should be dug on contour to avoid deep placement or running out of the ground.



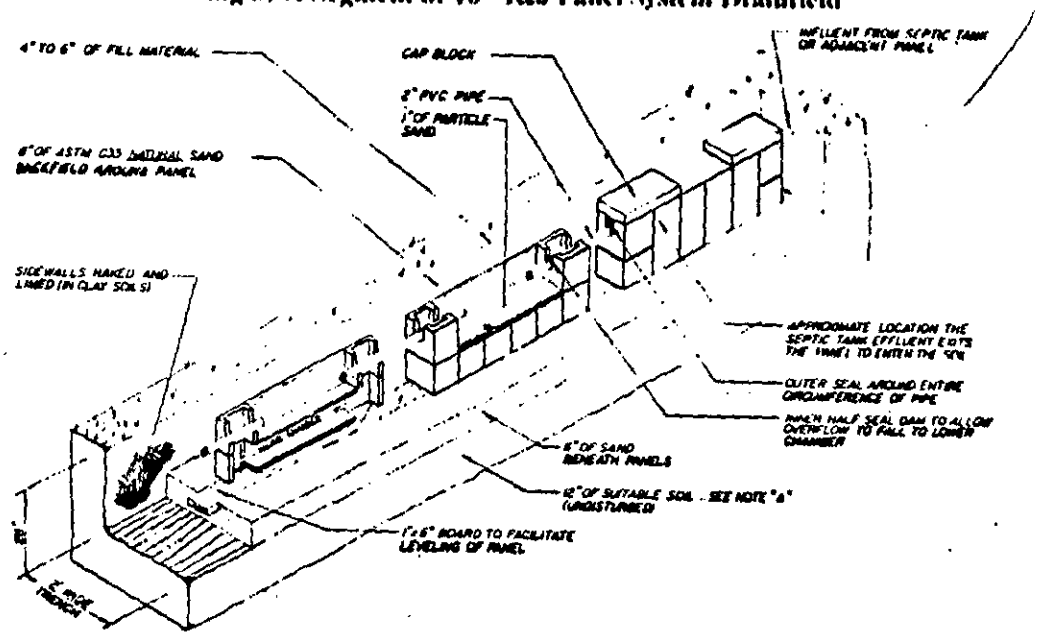


Dig first trench - 2' wide by 28" deep
Check grade for level
Rake sidewalls in clayey soils
Do not add lime until all smeared areas on the sides have been raked or picked off
Add a dusting of agricultural lime to both sides of trench
Set grade stakes

Add 6" of sand to bottom of trench and level. This will be firmed by foot traffic during leveling. After leveling, lay 1x6 boards flat on the sand and level. (These boards must be level as panels will sit directly on them.)

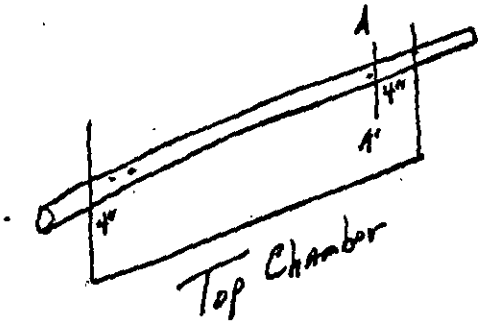
After the grade board is leveled, panels can be set onto the board either by two people or the backhoe or loader. Each panel weighs approximately 155 pounds and can be handled by two men. Panels should be set 6" apart. Six pounds of clean particle sand is then added to a depth of 1" to each end of the Panel in the upper chamber. After the line is set, appropriate sections of 2 inch PR160 PVC pipe or equivalent is used to tie each panel together. This pipe should be placed where the effluent discharges into the upper-middle chamber between the air chambers on either side. This pipe shall be sealed at the outer cradle completely, while the inner cradle shall be sealed only to the top radius of the pipe to allow air flow from the air chambers to the upper-middle chamber. This seal shall be made with a tar or butyl seal rope product that is pliable and soft. Once this is completed, there shall be a cap block placed over the air chamber and inlet of the upper-middle chamber. After the placement of the cap block, which may serve as an inspection port at a later date, the nitrification trench is backfilled to the top of the cap blocks with the sand as previously specified. With the sand to the top of the cap block, trenches should be left for the sanitarian to inspect. Soil cover should be added after the final inspection.

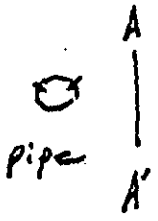
Isometric Drawing of A Segment of 16" T&J Panel System Drainfield



The LP Panel uses technology similar to that of Low Pressure Pipe (LPP) System. The tables and distribution design described in the LPP manual is applicable to the Panel System. The system should be used with 2-4 feet of head. In many respects a LP Panel is similar to an LPP with the holes discharging into the panels.

The dosing cycle for the Panel System is designed to pump enough effluent to fill the top chamber of each panel in the system. The top chamber of each 16" panel holds 3.6 gallons of waste water. In the 34 panel example 34 x 3.6=122 gallons per cycle. Two holes are drilled in the distribution pipe of each panel, one on each end at the clock positions of 10 and 2 o'clock, 4 inches back from the end of the top chamber.

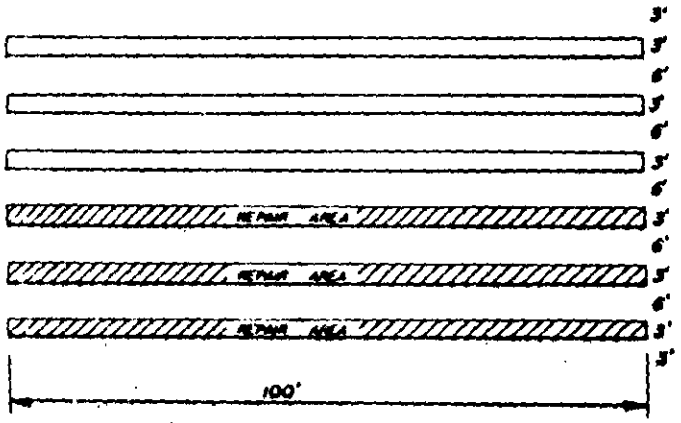




For specific details, or a pictoral demonstration, there is a special VCR film showing the complete installation of the Panel system available from T & J. T & J representatives will work with the counties on their first Panel System to insure a quality installation.

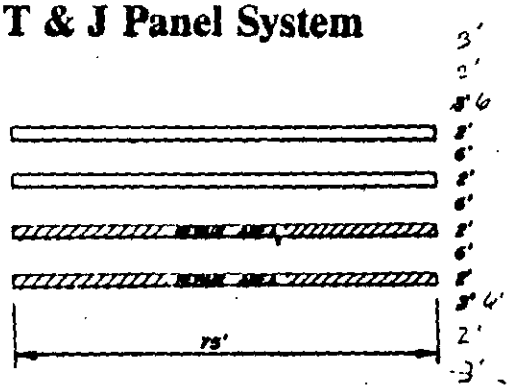
See the difference in a real space needed with the T&J Panel System Wastewater Treatment System when compared to a conventional tile/stone nitrification system.

Conventional System



A total suitable and usable area of 5400 square feet is needed for a conventional system.

T & J Panel System



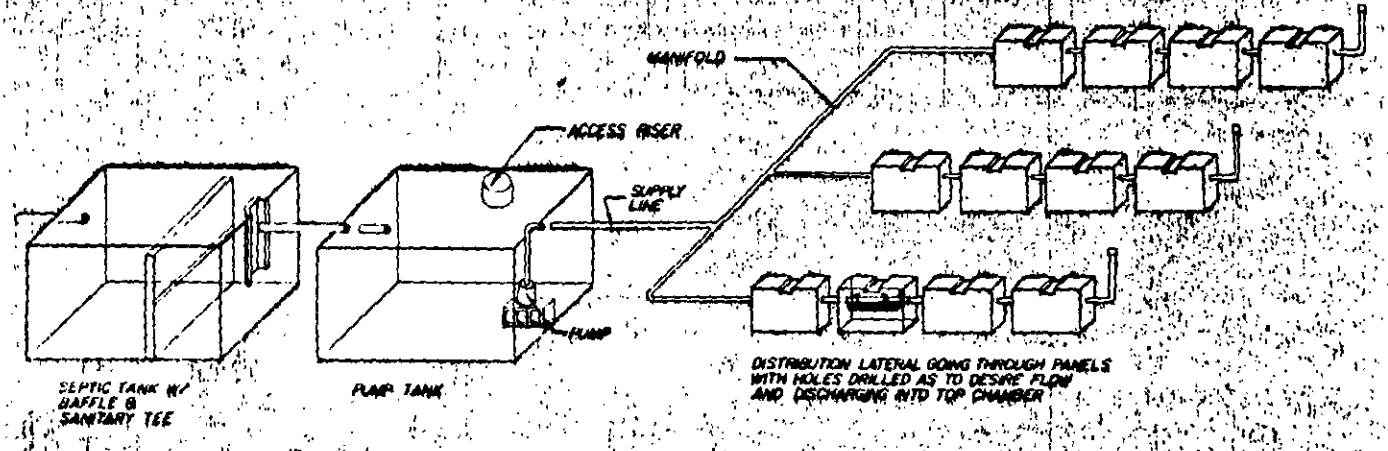
A total suitable and usable area of 2400 square feet is needed for the T & J Panel System**.

*Typical 3 bedroom house in a clay soil with 0.4 gallon per day per foot square application rate with a design flow on 120 gallons per day per bedroom.

**The T & J Panel Wastewater Treatment System is included in the North Carolina Sewage regulations as a PPBPS as of August 1, 1988. This allows for a 50% reduction in lineal footage of trench with the 16 inch panel as illustrated above. (See note "A")
Note A - This reflects North Carolina Codes. Please check local codes and practices for your area.

Low Pressure Panels (LP Panel) - Alternative installation for the T&J Panel System.

The LP offers a high quality effluent with a uniform distribution of wastewater throughout the entire system.



- Uniform distribution of the effluent.
- Elimination of localized overloading.
- Works with 2-4 feet of pressure head.
- Dosing and resting cycles.
- Placing of the effluent into the sidewall near the surface—where the more porous soils are found.
- The aerobic action of the T&J Panel's design.
- The filtration of the effluent through the T&J Panel System and its sand backfill.

THE T.&J. PANEL
WASTEWATER TREATMENT SYSTEM
PATENT NUMBER 4013559

P.O. Box 288 • Statesville, North Carolina 28677
N.C. WATS 1-800-222-2577 • (704) 872-9566

There are many new developments in ground absorption sewage disposal system on the market today. The T&J Panel System is designed to make the most out of the least amount of space possible. This is made possible by the fuller use of the more porous top soil and the limited effect of evapotranspiration and the wicking action of the block as the effluent is kept close to the surface of the ground and fused through the pores of the block to the sidewall area of the drainfield lines. This more general distribution and wicking allows for the use of the entire sidewall area and helps prevent the sealing off of the bottom and lower sidewalls that often occurs in a conventional system.

A 16 inch high panel is 46 inches long, 8 inches wide, and weighs about 155 pounds. There is a 6 inch by 6 inch air chamber at each end of the panel which extends from top to bottom to ensure aerobic action in each level of the field lines. Each panel has a storage chamber just below the top chamber for storage during peak use periods. A 24 inch panel is also available for use in repair or specially engineered systems.

Limited Warranty

The structural integrity of each T&J Panel, when installed in accordance with manufacturer's instructions, is warranted against defective materials and workmanship for one year from date of manufacture. Should a defect appear within the warranty period, purchaser must inform T&J Panel System of the defect before the warranty expires. T&J Panel System will supply a replacement unit. T&J Panel System's liability specifically excludes the cost of removal and/or installation of the panels. There are no other warranties with respect to the units, including no warranties of merchantability or of fitness for a particular purpose. The warranty does not extend to incidental, consequential, special or indirect damages. The company shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other loss or expense incurred by buyer. Specifically excluded from warranty coverage are: Damage to the panels due to ordinary wear and tear; alteration, accident, misuse, abuse or neglect of the panels; the panels being subjected to stresses greater than those prescribed in the installation instructions; the placement by buyer of improper materials into buyer's system; or any other event not caused by the company. Furthermore, in no event shall the company be responsible for any loss or damage to the buyer, the panels or any third party resulting from its installation or shipment. Buyer shall be solely responsible for ensuring that installation of the system is completed in accordance with all applicable laws, codes, rules and regulations. Any alteration of this warranty must be noted as "Warranty" in writing by the company.

Engineering and Test Data by Law Environmental Services and Ayers and Associates is available from the manufacturer at the address below.

THE T&J PANEL
WASTEWATER TREATMENT SYSTEM
PATENT NUMBER 4013559

P.O. Box 288 • Statesville, North Carolina 28677
N.C. WATS 1-800-222-2577 • (704) 872-9566

Distributed by

Serving people with a better quality system

PROPOSED PLOT PLAN

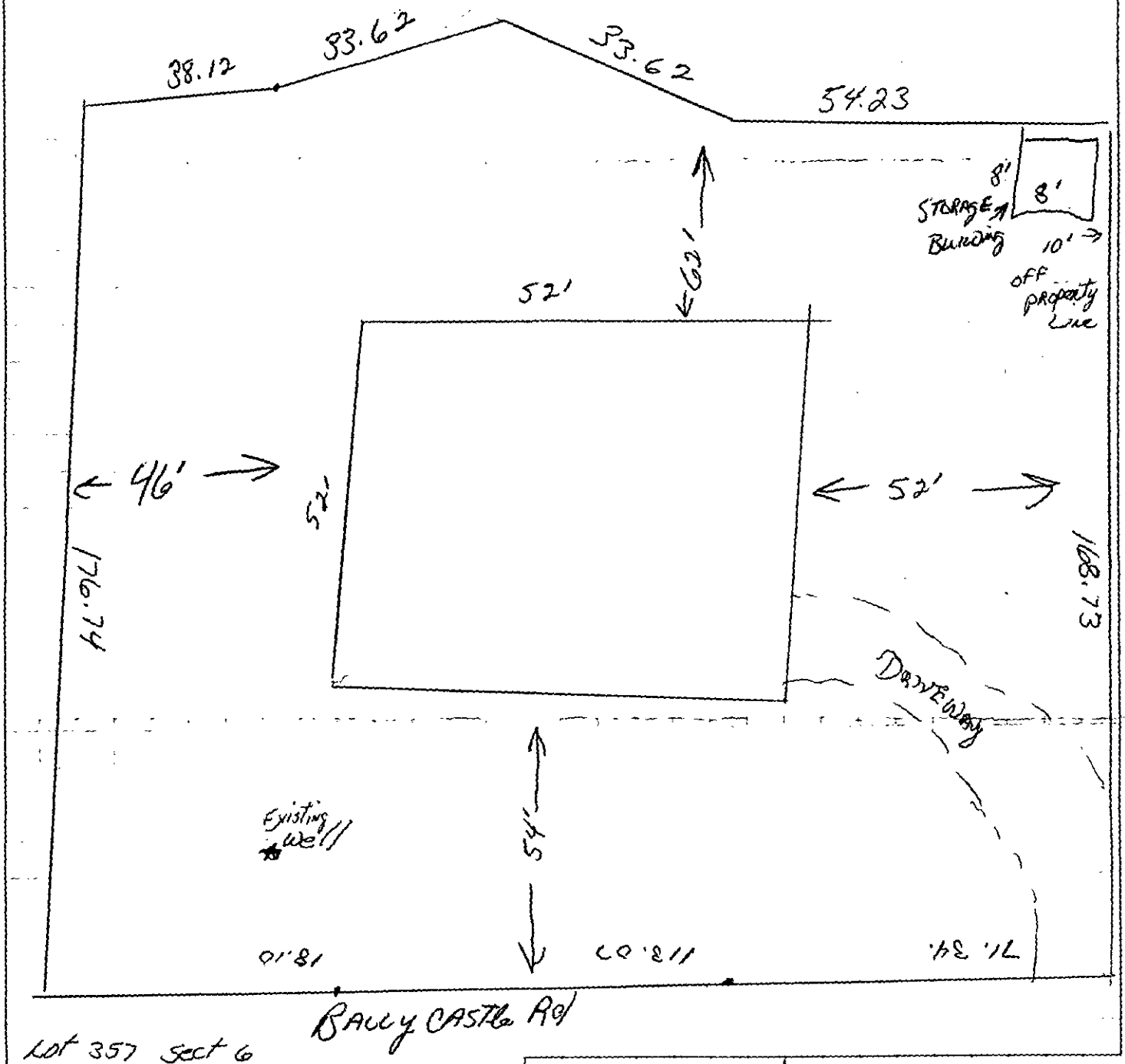
MECKLENBURG COUNTY · ENVIRONMENTAL HEALTH ·

1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

FILE: ~~[illegible]~~ 5448A

TC: _____

Draw in and name all roads adjoining the property. Draw in and accurately dimension the lot concerned. Accurately indicate property boundaries, proposed and/or existing structures and driveways, underground utilities, and wells and springs within 100 feet of the proposed building or drainfield.



Lot 357 Sect 6

Signed: L. C. Wellington Bliss

Date: 1-31-89

Mecklenburg County
Health Department

Basil G. Delta, M.D., M.P.H.
Health Director

February 20th, 1989

Keith L. Alm
1017 Shaker Court
Winston Salem, NC 27104

RE: Property located at Ballycastle Rd.
FILE: 5448A
PARCEL: 00139184

Dear Sir:

At your request, a field investigation was conducted on the property designated above for the purpose of determining site suitability for the installation of a ground absorption sewage disposal system. The results of this investigation showed the property to be classified UNSUITABLE for the installation of such a system. A copy of the Site Evaluation Report (Serial Number 11997) is enclosed.

State regulations provide that sites originally classified unsuitable may be utilized for the installation of alternate or modified sewage disposal systems provided the requirements of 10 NCAC 10A .1948 (c) are met. A reprint of this section is enclosed for your information.

Should you desire to file for permission to install an alternate or modified sewage treatment system on the property, please submit an Application For An Improvement Permit with an ACCURATELY dimensioned plot plan detailing the location of current and/or proposed buildings, wells and sewage disposal systems to this office. They will be reviewed, and if it is determined that the proposed system may reasonably be expected to function satisfactorily, an Improvement Permit will be issued by the Department upon completion by you, of a formal request for lot reclassification.

If I may be of any assistance, please feel free to call.

Very truly yours,

Sylvia D. Daniel, R.S., Supervisor
On Premises Waste Disposal & Water Supply

Enclosure (2)

Environmental Health Division
1200 Blythe Boulevard • Charlotte, North Carolina 28203 • (704) 376-4603

MECKLENBURG COUNTY ENVIRONMENTAL HEALTH
SITE EVALUATION REPORT
SERIAL NUMBER 11997

File: 5449A

Action 2

Parcel: 001-391-99

☐ PC

Location: Ballycastle Road

Subdivision:

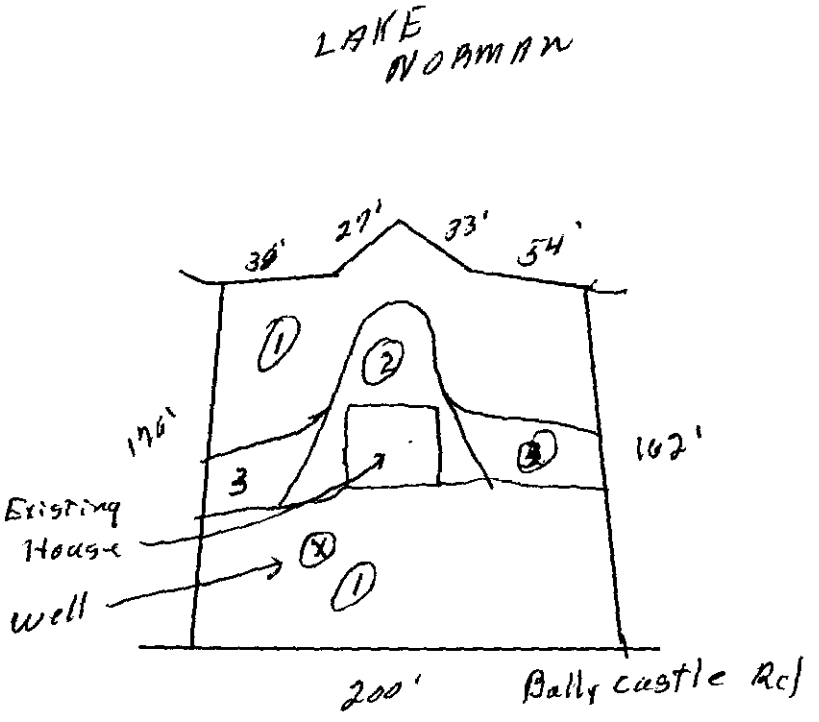
Lot: Block: Acres: .69

Owner: Keith L. Alm
Address: 1017 Shaker Court
Winston Salem, N. C. 27104

Comments: _____

Described by: William R. Marlin

Date: 2-17-89



***** EVALUATION KEY *****

S = Suitable U = Unsuitable
PS = Provisionally Suitable
The "Area Classification" below indicates the suitability of areas in the diagram.

FACTORS	AREA 1	AREA 2	AREA 3	AREA 4	AREA 5	AREA 6
Topography	S PS (U) complex slopes	S (PS) U 10-20%	(S) PS U 8-15%	S PS U	S PS U	S PS U
Texture	S PS U —	S (PS) U clay	S (PS) U clay	S PS U	S PS U	S PS U
Structure	S PS U —	S (PS) U Blocky	S (PS) U Blocky	S PS U	S PS U	S PS U
Drainage	S PS U —	S (PS) U >36" to water	S (PS) U >36" to water	S PS U	S PS U	S PS U
Depth	S PS U —	S PS (U) 26-32"	S (PS) U 36"+	S PS U	S PS U	S PS U
Restrictive Horizons	S PS U —	S (PS) U >36"	S (PS) U >36"	S PS U	S PS U	S PS U
Available Space	S PS U —	S PS (U) Restricted	S PS (U) Restricted	S PS U	S PS U	S PS U
Other (specify)	S PS U	S PS U	S PS U	S PS U	S PS U	S PS U
Soil Group/Series	Complex slopes	IUA Potato-like	IUA Cecil-like			
Area Classification	S PS (U)	S PS (U)	S PS (U)	S PS U	S PS U	S PS U

RECEIVED
MECKLENBURG COUNTY
HEALTH DEPT.

APPLICATION FOR SOIL INVESTIGATION

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
1200 BLYTHE BOULEVARD
CHARLOTTE, NC 28203
PHONE (704) 376-4603

ENVIRONMENTAL HEALTH DIVISION

(OFFICE USE ONLY)

FILE: 5448A

TC: _____

☐ PC ☐ REPT

JOB LOCATION

① ADDRESS: Ballycastle Rd. Lake Norman, N.C.

② SUBDIVISION: Section 6 ③ LOT: Portion Lot 357 ④ BLOCK: _____

⑤ PARCEL REFERENCE: BOOK NO.: PO 001 PAGE NO.: 391 PARCEL NO.: 99

⑥ DEED REFERENCE: BOOK NO.: 542 PAGE NO.: 275

OWNER

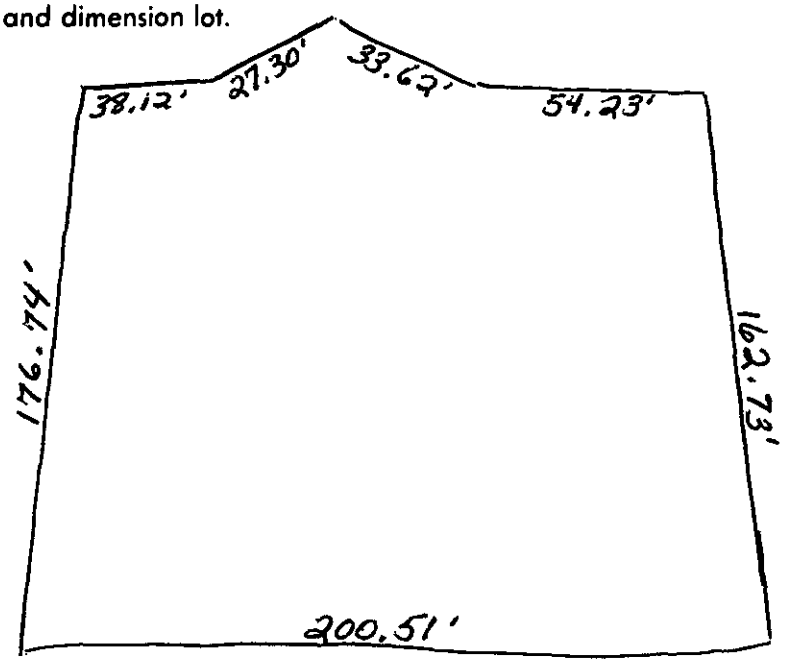
⑦ NAME: Keith (Elizabeth R.) L. Alm
(FIRST) (MIDDLE) (LAST)

⑧ MAILING ADDRESS: 1017 Shaker Ct.

⑨ CITY: Winston-Salem ⑩ STATE: N.C. ⑪ ZIP: 27104

⑫ PHONE: (WORK) 919-744-2966 (HOME) 919-768-2160

⑬ Accurately diagram and dimension lot.



⑭ The undersigned, owner of the property described above as the "JOB LOCATION" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the MECKLENBURG COUNTY HEALTH DEPARTMENT to enter onto the property for the purpose of processing this request.

Signed: Elizabeth R. Alm

Date: 2/7/89

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

WHITE - HEALTH DEPARTMENT'S COPY • CANARY - ENVIRONMENTALIST'S COPY • PINK - OWNER'S COPY

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION

CHARGE SLIP

Date 2/10/89

Name/Company Keith Alm

Sanitation ____
Vector Control ✓
O.P.W.D. ____

Service: Soil investigation
Baltzcastle Rd
5448A

MECKL... HEALTH DE... ENVIRONMENTAL HEALTH DIVISION
PAID
FEB 20 1989

Fee: $ 30.00

CK # 5352
9/20/89

Completed by

Collected by