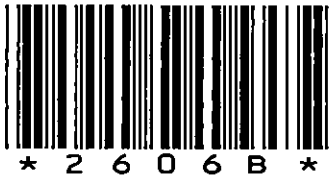
GCI
GEO-ENVIRONMENTAL
CONSULTANTS, INC.

Jason S. Lowery
Environmental Scientist

11704 Reames Road
Charlotte, NC 28269-7637

Phone (704) 596-8788
Fax (704) 596-8770

A Common Sense Approach To A Cleaner Environment



15145 MARSHALL VALLEY CT

13915429

12/31/2007

duponbj

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

FEE: 100.00 CK # 1505
DATE: 7-17-98 VH2

APPLICATION FOR IMPROVEMENT PERMIT FOR RESIDENTIAL SITE INDIVIDUAL WATER AND WASTEWATER SYSTEMS PROGRAM

1 ICRT

TYPE APPLICATION: X NEW SYSTEM __ EXPANSION/ ALTERATION OF EXISTING SYSTEM __ REPAIR OF EXISTING SYSTEM

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

FILE #: 2606B

PROPERTY INFORMATION (FROM ENGINEERING FORM) FOR JOB LOCATION: 154-29

TAX/PARCEL NUMBER: 139-152-01 [redacted]

STREET ADDRESS: 15145 Meadow Valley Ct

SUBDIVISION OR MOBILE HOME PARK NAME: LEMMOND ACRES

LOT NUMBER: [redacted]

TYPE OF BUILDING (CHECK ONE):

__ SINGLE MOBILE HOME(S) __ MODULAR HOME (M)
__ DOUBLE WIDE (D) __ MULTIPLE FAMILY (U)
X HOUSE (H) __ OTHER (O)

TOWNSHIP (CHECK ONE):

X 0 MECKLENBURG __ 4 PINEVILLE
__ 1 CHARLOTTE __ 5 MATTHEWS
__ 2 DAVIDSON __ 6 HUNTERSVILLE
__ 3 CORNELIUS __ 7 MINT HILL

HEATED SQUARE FOOTAGE: [redacted]

NUMBER OF BEDROOMS: [redacted] NUMBER OF OCCUPANTS: 3

CLOSING DATE [redacted]/15/98

FOUNDATION FOR RESIDENCE:

__ WITHOUT BASEMENT ON SLAB
X CRAWL SPACE
__ WITH BASEMENT /PLUMBING
__ WITH BASEMENT /NO PLUMBING

IF EXPANSION/ALTERATION OF EXISTING SYSTEM, DESCRIBE THE PROPOSED BUILDING ADDITION:

WILL THERE BE A HOME BUSINESS IN THE RESIDENCE: [redacted] YES X NO TYPE: [redacted]

WATER SUPPLY (CHECK ONE):

X COMMUNITY (C) __ MUNICIPAL (M) __ PRIVATE WELL (P)
__ SHARED WELL (S) __ OTHER 'SPRINGS' (O)

IF ANY OF THE FOLLOWING ARE LOCATED ON THE PROPERTY, PLEASE SHOW LOCATION ON PLAT:

BURIED CABLES, LANDFILLS, STUMPHOLES __ YES X NO
EXISTING WASTEWATER SYSTEMS __ YES X NO
EASTMENTS OR RIGHT-OF-WAYS __ YES X NO
WELL, SPRINGS OR WATERLINES __ YES X NO
DESIGNATED WETLANDS __ YES X NO

PROPERTY OWNER:	LEGAL AGENT FOR PROPERTY OWNER, IF APPLICABLE:
NAME: HELMS (LAST) BRIAN (FIRST) B (MI) (PRO REALTY & DEVELOPMENT)	NAME: JONES BIRCH G (LAST) (FIRST) (MI)
ADDRESS: 6918 LINKSIDE CT.	DAYTIME PHONE: (704) 841-132[redacted]
CITY: CHARLOTTE STATE: NC ZIP: 28277	
DAYTIME PHONE: 704 309 - 4286	

WHAT DATE WAS THE PROPERTY ORIGINALLY DEEDED AND RECORDED? JAN 1998

An Improvement Permit is subject to suspension or revocation if site plans or the intended use change or if information submitted in this application is falsified or changed. 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: Birch Jones DATE: 7/1/98

7/1/98

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR., SUITE 211, 700 N. TRYON ST., CHARLOTTE, N.C. 28202., (704) 336-5102

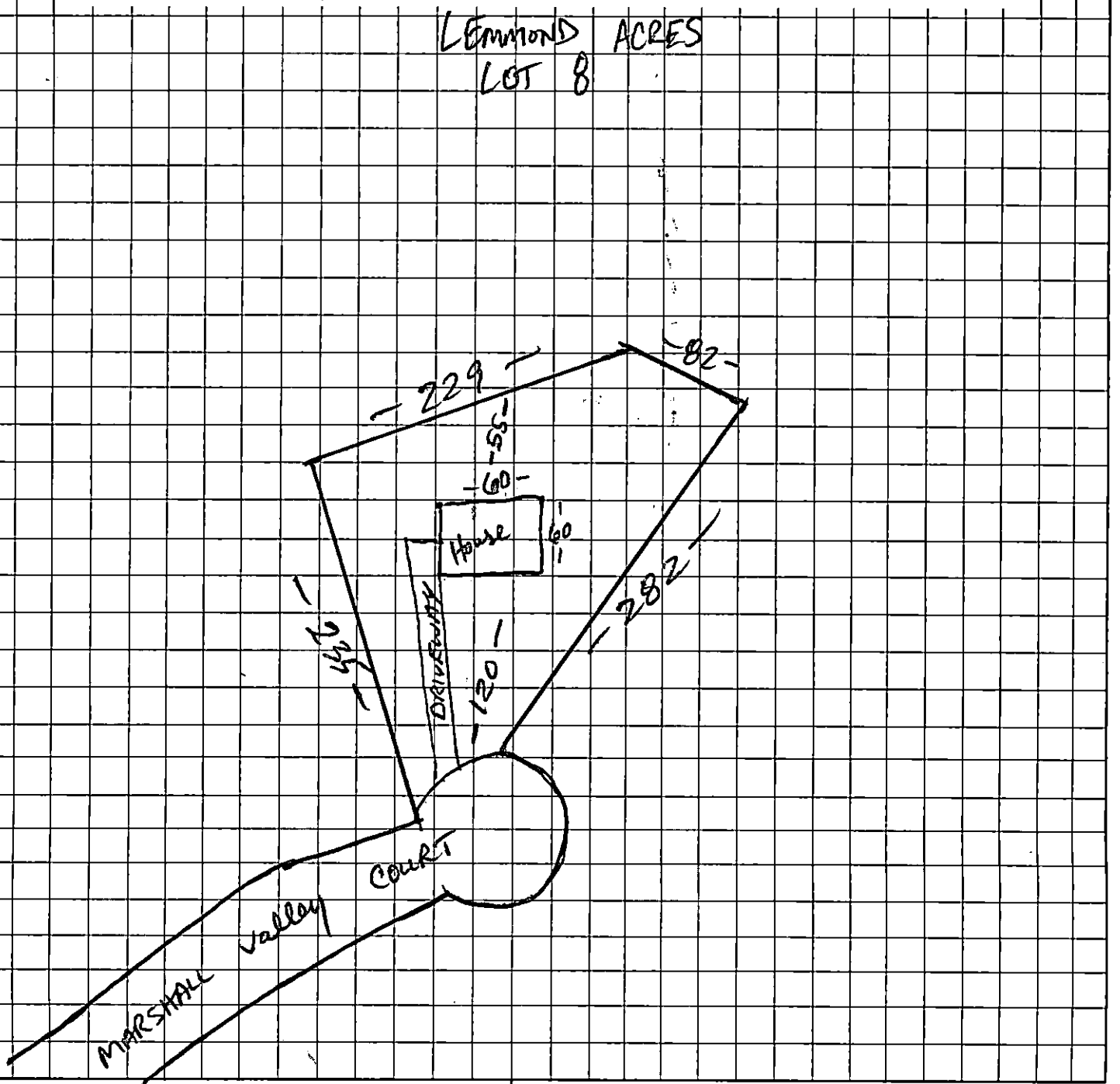
PROPOSED PLOT PLAN

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON STREET
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 8606B

TC: 139-152-0190

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.



OWNER/AGENT SIGNATURE

DATE

APPROVAL DATE

White - Health Department's Copy Canary - E.H.S. Copy Pink - Owner's Copy

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

43 (40)

Sheet 1
PROPERTY ID #: PO 139-152-0
Lot # : 8
File # : 2606B

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

OWNER: Pro Realty & Development APPLICANT: Brick Jones
ADDRESS: 1918 Tenbrook Ct. Charlotte DATE EVALUATED: 8-14-96
PROPOSED FACILITY: residence PROPOSED DESIGN FLOW (.1949): 480gpd PROPERTY SIZE: .15 ±
LOCATION OF SITE: Marshall Valley Ct PROPERTY RECORDED:
WATER SUPPLY: ☐ Private ☐ Public ☐ Well ☐ Spring ☑ Other
EVALUATION METHOD: ☑ Auger Boring ☐ Pit ☐ Cut
TYPE OF WASTEWATER: ☑ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	S/P-S 3-12% .1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
1	LS	0-4"	gr/sl	Fr/SEAP/SS/SP	>34" TO 50:1 wetness	34"	N/A	None	US IV .28g/ft²
		4-34"	SBK/SC	Fr/SEAP/S/P					
2	LS	0-4"	gr/c	Fr/SEAS/SS/SP	>16" TO 50:1 wetness	16"	N/A	None	US IV
		4-16"	SBK/C	Fr/SEAP/SSD					
3	LS	0-3	gr/sl	Fr/SEAP/NS/NP	2.5Y 7/1 @6"	14" ~~24"~~	N/A	None	US VII
		3-14"	SBK/SCl	Fr/SEAP/SS/SD					
4	LS	0-14"	gr/scl	Fr/SEXP/SS/SP	>29" TO 50:1 wetness	29"	N/A	None	US
		14-29"	SBK/SC	Fr-VFP/Mix/SS/VSP					

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

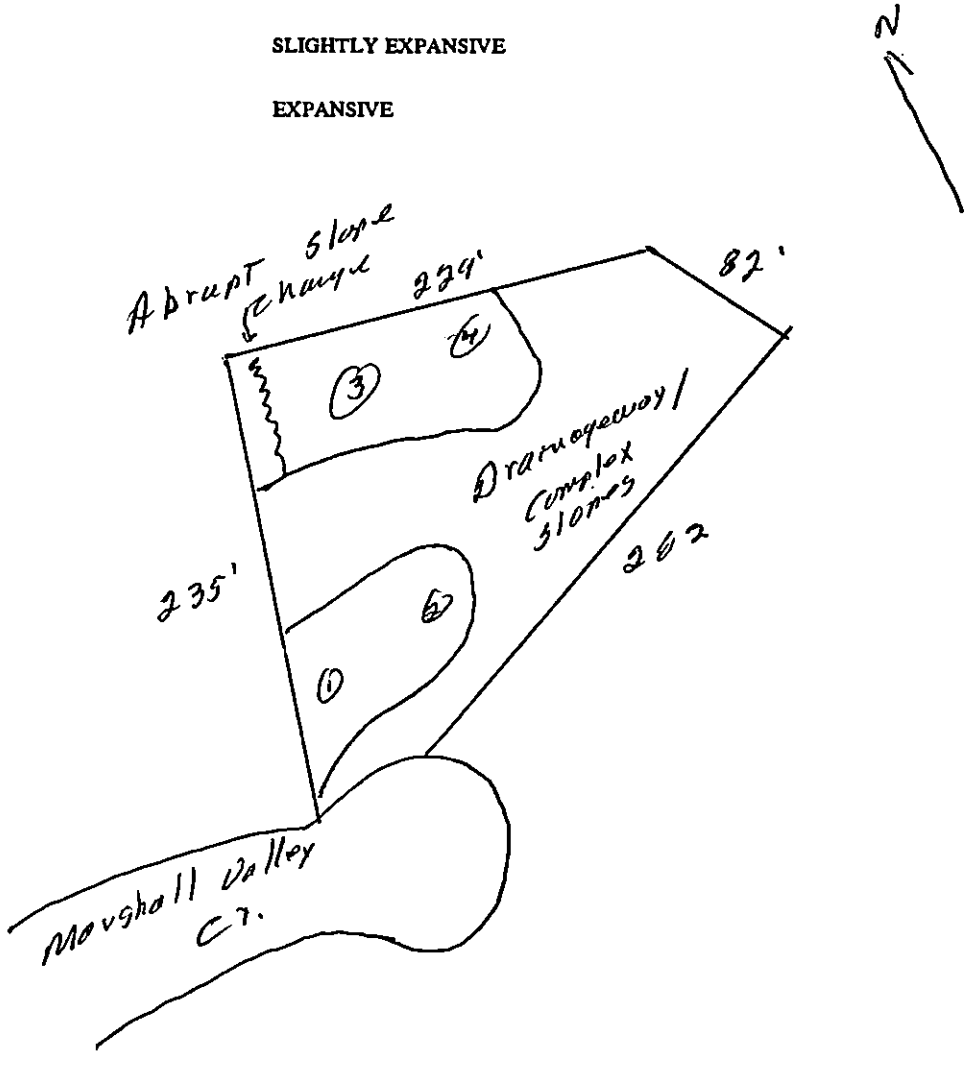
OTHER FACTORS (.1946):
SITE CLASSIFICATION (.1948): Unsuitable
EVALUATED BY: W. R. Marlin 8-14-96
OTHER(S) PRESENT: LSS

FILE # 2606B

COMMENTS NOW Repair

LANDSCAPE POSITION	GROUP	TEXTURE	.1955 LTAR	CONSISTENCE MOIST	CONSISTENCE WET
R-RIDGE	I	S-SAND	1.2-0.8		
S-SHOULDER SLOPE		LS-LOAMY SAND		VFR-VERY FRIABLE	NS-NON-STICKY
L-LINEAR SLOPE				FR-FRIABLE	SS-SLIGHTLYSTICKY
FS-FOOT SLOPE	II	SL-SANDY LOAM	0.8-0.6	FI-FIRM	S-STICKY
N-NOSE SLOPE		L-LOAM		VFI-VERY FIRM	VS-VERY STICKY
H-HEAD SLOPE				EFI-EXTREMELY FIRM	NP-NON-PLASTIC
CC-CONCLAVE SLOPE	III	SI-SILT	0.6-0.3		SP-SLIGHTLYSTICKY
CV-CONVEX SLOPE		SICL-SILTY CLAY LOAM			P-PLASTIC
T-TERRACE		CL-CLAY LOAM			VP-VERY PLASTIC
FP-FLOOD PLAIN		SCL-SANDY CLAY LOAM			
	IV	SC-SANDY CLAY	0.4-0.1		
		SIC-SILTY CLAY			
		O-ORGANIC			

STRUCTURE	MINERALOGY
SG-SINGLE GRAIN	SLIGHTLY EXPANSIVE
M-MASSIVE	
CR-CRUMB	EXPANSIVE
GR-GRANULAR	
SBK-SUBANGULAR BLOCKY	
ABK-ANGULAR BLOCKY	
PL-PLATY	
PR-PRISMATIC	



w/ CC approval # 14576 ed Lennard ACS

FEE: 150/ **AUTHORIZATION FOR WASTEWATER SYSTEM CONSTRUCTION**
DATE: 12/15/99 C **VOID SIXTY (60) MONTHS FROM DATE OF ISSUANCE**

DATE: 6-6-00 PERMIT NO: 2606B

Marshall PARCEL NO: 139-154-29 ~~26~~

JOB LOCATION ADDRESS: 15145 Lennard Acres Ct. 2nd

PROPERTY OWNER: Birch G Jones

BUILDING CONTRACTOR: Brian B. Helms

SUBDIVISION NAME: Lennard Acres Lot 8

AUTHORIZATION ISSUED BY: T B Thompson Jr. DATE: 6-6-00
DEHNR AUTHORIZED AGENT

AUTHORIZATION CONDITIONS

1. WASTEWATER SYSTEM CONSTRUCTION AND INSTALLATION MUST MEET ALL CONDITIONS AND SPECIFICATIONS AS SET FORTH IN IMPROVEMENT PERMIT NO. 2606 AND THE ATTACHED SITE PLAN WITH SYSTEM DETAILS. CONSTRUCTION AND INSTALLATION MUST ALSO MEET ALL REQUIREMENTS SET FORTH IN THE RULES GOVERNING SANITARY SEWAGE COLLECTION, TREATMENT, AND DISPOSAL AND ANY OTHER APPLICABLE RULES AND LAWS.

2. AN INSTALLATION, CONSTRUCTION, ALTERATION AND/OR REPAIR APPROVAL MUST BE SECURED PRIOR TO INSTALLATION OF THE SEPTIC TANK SYSTEM. THE INSTALLER OF THE SYSTEM SHALL BE A REGISTERED SEPTIC TANK CONTRACTOR WITH MECKLENBURG COUNTY HEALTH DEPARTMENT.

3. ANY ALTERATION IN SITE OR SOIL CONDITIONS (INCLUDING LOCATION OF STRUCTURES AND APPURTENANCES) OR MODIFICATION IN USE, DESIGN WASTEWATER FLOW, OR WASTEWATER CHARACTERISTICS AS SPECIFIED IN THE ASSOCIATED IMPROVEMENT PERMIT AND APPLICATION, MAY SUBJECT THIS AUTHORIZATION AND ASSOCIATED PERMIT(S) TO REVOCATION.

4. OTHER CONDITIONS: See conditions of Improvement Permit

OWNER CERTIFICATION

I CERTIFY THAT THERE HAVE BEEN NO ALTERATIONS IN SITE OR SOIL CONDITIONS OR MODIFICATIONS TO FACILITY, WASTEWATER FLOW, OR WASTEWATER CHARACTERISTICS FROM THOSE SPECIFIED IN THE ORIGINAL APPLICATION OR ASSOCIATED IMPROVEMENT PERMIT UNLESS AUTHORIZED IN WRITING BY THE MECKLENBURG COUNTY HEALTH DEPARTMENT. I ALSO UNDERSTAND THAT ANY SUCH ALTERATIONS, MODIFICATIONS, OR FALSE INFORMATION ARE GROUNDS FOR REVOCATION OF PERMITS AND AUTHORIZATION TO CONSTRUCT.

X Brian Jones X 6-14-00
SIGNATURE OF OWNER/OWNER'S REPRESENTATIVE DATE

Mecklenburg County
Health Department

Conditions of Improvement Permit

File Number: 2606B
Site Address: Lot 8, Lemmond Acres

1. The wastewater treatment and disposal system permitted is a pump-to-innovative system.
2. The system will require a single phase, simplex control panel with alarm. The control panel must have a Nema 4x weather proof rating.
3. A pressure manifold shall be used to distribute effluent to the innovative drain field trenches
4. Septic and pump tanks must be installed in an area not subject to vehicular traffic. System installer must ensure that finished soil cover over the tanks will not be greater than 36 inches in depth. Soil cover greater than 36 inches will require reinforced tanks.
5. Upslope surface water diversion improvements will be required around the wastewater drain field.
6. Nitrification trenches shall be constructed as level as possible but in no case shall the fall in a single trench bottom exceed one-fourth inch in 10 feet as determined by an engineer's level or equivalent.
7. Any changes in the site must be pre-approved by the Mecklenburg County Environmental Health Department.
8. The wastewater treatment and disposal drain field area, including the designated repair areas, shall not be used for any of the following:

    - Grading or filling
    - Parking or driving heavy equipment in the area or subjecting the site to possible soil compaction
    - Construction staging area
    - Installation of lawn irrigation components
    - Installation of underground utilities or cables of any type
    - Burial of any debris or material
    - Utilizing the area for gravesites
    - Diversion of storm water runoff into this area

9. Septic system installer must be registered with Mecklenburg County prior to meeting for the required pre-construction conference.
10. System installer will be required to operate the system at the time of the final inspection. Arrangements must be made to have the pump tank filled with water prior to the requested final inspection.
11. The system owner shall have the contents of the septic tank checked, and the contents of the tank removed, periodically from all compartments, to ensure proper operation of the system. The contents of the septic tank shall be pumped whenever the solids level is found to be more than 1/3 of the liquid depth in any compartment.
12. All septic tank riser and effluent filter rules will apply to this system. It is strongly recommended that access risers be added to both ends of the septic tank, extending to at least finish grade. This will allow periodic inspection of the solids level in the tank as well as help facilitate the periodic cleaning of the effluent bio-filter.
13. The local Health Department is required, by the State, to perform system reviews of Type IIIb systems at a minimum of every 5 years. The owner of the system is responsible for paying any inspection fees, as determined by the Board of County Commissioners, at the time of the required inspection.

Signature Owner/Agent _____ **Date** 6/14/00

PEOPLE • PRIDE • PROGRESS

Environmental Health Division

700 North Tryon Street • Suite 211 • Charlotte, North Carolina 28202-2236

Permit Number 26066

CONDITIONS OF IMPROVEMENT PERMIT

Tax Number: 139-154-29

- The IMPROVEMENT PERMIT is subject to revocation if site plans or the intended use change. There is to be NO grading, filling or disturbance of the soil in the area of the septic tank system or repair area.
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is NOT transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement	___ Yes	✓ No	___ Partial Basement	
Type Primary Wastewater System Type (circle one): I II (III) IV V VI	___ Conventional ___ Prefabricated, permeable block panel system ___ Shallow Placed Conventional	___ Low Pressure Pipe ___ Large Diameter Pipe ___ Fill ___ Other	✓ Innovative or Experimental: ___ IWWS-93-1 ___ IWWS-93-2 ___ IWWS-94-1	
.26 Long-term acceptance rate	480 Max gallons/day wastewater flow	1350 Absorption Area (sq ft)	9' Trench spacing (min. on centers)	
N/A community Serviced by private well	1500 Gallon septic tank	450 Total trench length (ft)	22" Maximum trench depth (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions)	
4 Bedrooms in residence	1000 Gallon pump tank	N/A Depth of stone innovative		
Any surface waters present:	Type:	Minimum separation distance:		
Site modifications required:				
Additional Conditions: - Pressure Manifold required - Surface water diversion required - Nemalk simplex control panel required - Agreement Form required.				
Repair Area System Type Type (circle one): I II III (IV) V VI	✓ Conventional ___ Prefabricated, permeable block panel system ___ Shallow Placed Conventional	___ Low Pressure Pipe ___ Large Diameter Pipe ___ Fill ___ Other	___ Innovative or Experimental: ___ IWWS-93-1 ___ IWWS-93-2 ___ IWWS-94-1	
534 Absorption Area (Sq ft) 267 Total Trench Length (Ft)	N/A Depth of Stone Trench Sand backfill	6 Trench spacing (min. on centers)	26" Maximum Trench Depth	
For existing system, enter the year originally installed:				

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 Sewage, 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 Improvement permit is transferable.

DENR Authorized Agent Date 6-6-00 | Owner/Agent Signature Date 6-14-00

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, N.C. 28202.
(704) 336-5102

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH,
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

INSTALLATION, CONSTRUCTION, ALTERATION, AND/OR REPAIR APPROVAL

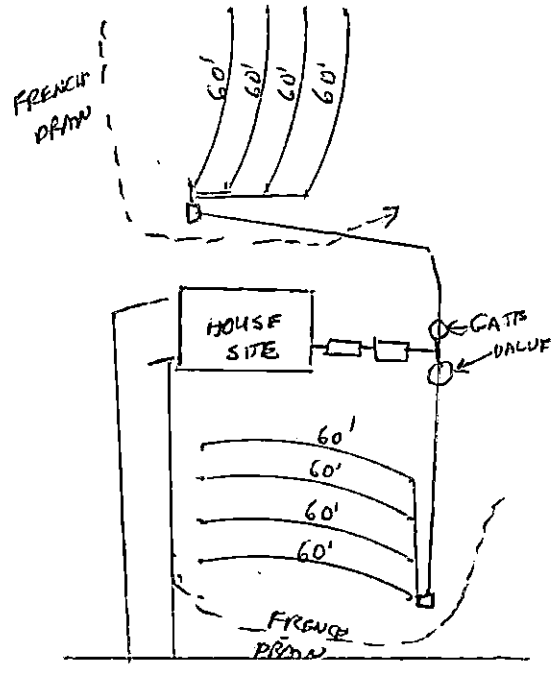
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 2606B DATE: 5-2301

TC: 139-154-29 ☐/L

SERIAL Nº 18714 X

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 7-1-98. All work shall be completed on or before _____, after which date this permit shall be null and void. The system shall meet all of the construction requirements of 15A NCAC 18A. 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 Health Department 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.



PLOT OF SYSTEM

Liquid Capacity of Septic Tank 1500 gallons

Liquid Capacity of Dosing Tank 1000 gallons

Tank Construction PCC

Trench Depth 22"

Absorption and/or Nitrification Lines:

Trench Width 3 feet

Trench Walls Scored and Porous _____

Total Line Length 480 feet

Number of Lines 8

Depth of Stone N/A inches

Distance from House 10 feet

Distance from Property Line 10 feet

Distance from Well 50' feet

NOTICE: This system shall not be installed while soils are in a wet condition.

NAME OF OWNER BIRCH JONES

LOCATION OF PROPERTY 15145 MARSHAL VALLEY COURT

Comments: (1) INSTALL INTERCEPTOR/ FRENCH DRAINS WHERE INDICATED.

(2) INSTALL 480' OF INNOVATIVE TYPE III-6, 240' IN FRONT AND 240' IN BACK.

(3) INSTALL 6" OF SOIL COVER OVER DRAINFIELD

(4)

Environmental Health Specialist

WHITE - HEALTH DEPARTMENT's COPY • CANARY - E.H.S. COPY • PINK - OWNER OR AGENT's COPY

CERTIFICATE OF COMPLETION/OPERATION PERMIT

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5102

FILE: 2606B DATE: 6-4-01

TC: 139-15~~A~~-29 ☐ L ☒ CRT

SERIAL Nº 18642

Name of Owner BIRCH JONES Juris.:

Address of Property 15145 MARSHAL VALLEY COURT

Inspection Data:

Tank Material PCC 1500

Total Length of Drainfield 480

Number of Lines 8 @ 60'

Cover Depth 12"

Water Supply Source COMMUNITY WELL

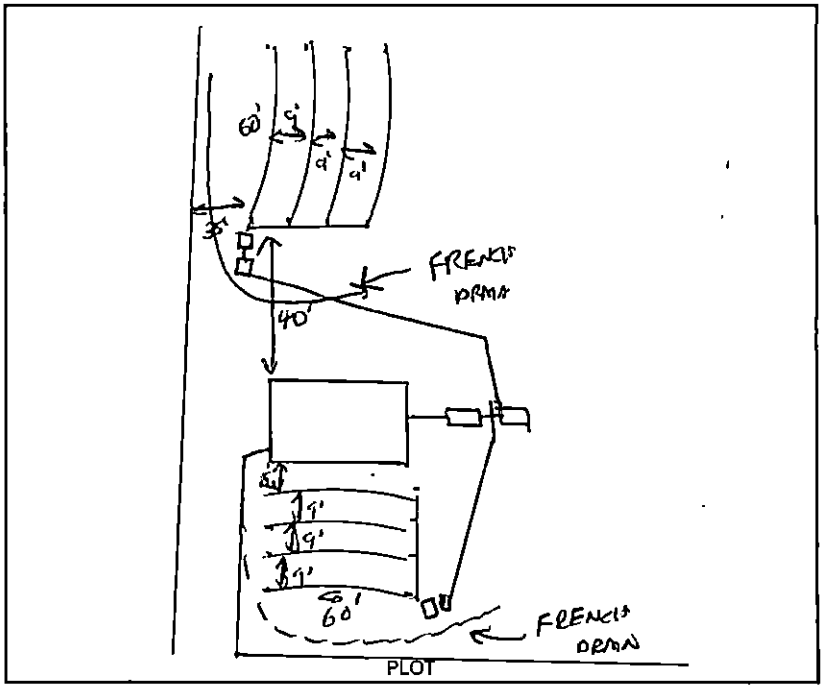
Distance to Water Source >100'

Excavation Inspected 6-4-01

Tank(s) Inspected 6-4-01

Wash Line Inspected —

High Water Alarm Inspected 6-4-01



Design 1500 ST 1000 DT 1800 SFT INNOVATIVE 480 LF CTR# WJ NORWOOD

The undersigned has inspected the Septic Tank System described above, and certifies it has been

☐ installed or constructed ☐ altered or repaired

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

and meets the provisions of I5A NCAC 18A. 1900, "Laws And Rules For Sewage Treatment and Disposal Systems" in effect on the date of issuance of the permit. This 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 I5A NCAC 18A. 1990 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.

Notice: Disturbance of the designated repair area may result in the suspension/revocation of this permit.

COMMENTS: TYPE III - B, G PUMP IS A HYDROMATIC SHEF 40"

Environmental Health Specialist

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

STATE OF NORTH CAROLINA

COUNTY OF MECKLENBURG

WASTEWATER TREATMENT AND DISPOSAL SYSTEM DESIGN AGREEMENT: 15A NCAC 18A .1948 AND ANY OF THE FOLLOWING RULES: .1956; .1957(a); .1957(b); or .1957(c); OR .1969

FILE # 2606-B Lot 8
PARCEL # 139-152-0 PO

The undersigned, Birch Grovel Jones, owner of property located at 15145 marshall valley Ct, (the "site") and described in an instrument recorded in Book 9464 at Page 076, Mecklenburg Public Registry, hereby acknowledges that the undersigned applied to the Mecklenburg County Health Department (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 15A NCAC 18A .1900 et seq.; that the Department originally classified the site as "unsuitable" pursuant to the standards set forth in the regulations; that the undersigned requested 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 is allowed by the rules; 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 the responsibility of the designer, owner, developer, installer, or user of the system, as applicable, 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 acknowledges that the following conditions will apply to the site:

- Any changes on the property may make the Improvement Permit Null and void and may make the Improvement Permit subject to revocation.

2000 80362 258

FILE COPY
FILED FOR REGISTRATION
DATE 6/8/00
BOOK
STAMPS
DOC. # 11342
TIME 1:34 Am
PAGE
REG. OF DEEDS JUDITH A. GIBSON NEGRETTE MECKLENBURG COUNTY, NC

This instrument was prepared by: BIRCH JONES
Mail after recording to: 10923 GLADEWATER DR
MATTHEWS, NC 28105

- Do not grade, cut, fill, pave, construct a building or deck, dig a well, install a swimming pool or otherwise cover or disturb the soil (except for planting and maintaining grass or other ground covers) in a manner which will adversely affect the repair area or area where the septic tank system is located.

- When a private certified operator is required, no improvement permit for the designated repair shall be issued unless there is a private certified operator to carry out this management program in the service area where the proposed system is to be located. (Refer to Rule .1961, "Maintenance of Sewage Systems," for further information.)

- Additional fees will be required according to the Mecklenburg County user fee schedule applicable at the time for the issuance of a repair permit for any subsequent repairs to the sewage treatment and disposal system or for installation of a replacement system.

- At the time repairs to the sewage treatment and disposal system are to be made or a replacement system installed, the regulations in effect at that time will govern the repairs or installation of a replacement 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.

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.

IN WITNESS WHEREOF, the undersigned has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, this 7th day of June, ~~199~~ 2000

_____ (Corporate Name)

By: _____

_____ President

ATTEST:

_____

_____ Secretary

(Corporate Seal)

Birch Grove Jones (SEAL)

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

STATE OF NORTH CAROLINA
COUNTY OF Mecklenburg

I, Ofelia Amador, a Notary Public for said County and State, do hereby certify that Birch Grove Jones personally appeared before me this date and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and notarial seal, this 17th day of June, ~~199~~ 2000

Ofelia Amador
Notary Public

My Commission Expires:
3/23/03

(4) Bedrm. Pumped, PRESSURE MANIFOLD
EEE-ZZZ LAY SEPTIC SYS. E-Z (2012)
LAY REPAIR AREA.

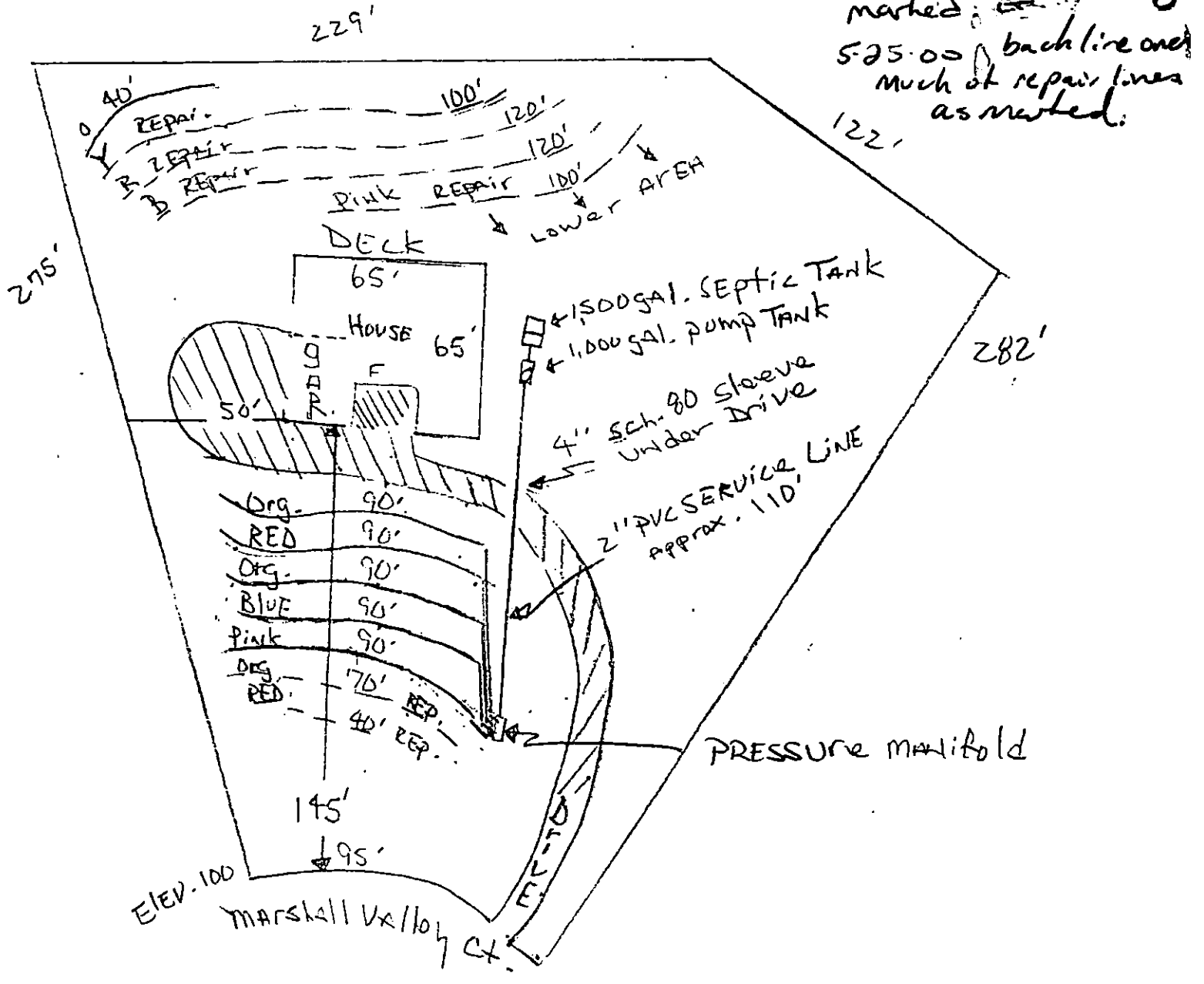
(5) 90' E-Z LAY LINES = 450' .28 LTAR

1,500 GAL. SEPTIC TANK
1,000 GAL. PUMP TANK
- A PRESSURE MANIFOLD (SEE SPEC. SHEETS)
MANIFOLD BOX

MCHD.
File: 2666-B
Lot 8
LEMMOND ACRES

5.18.05 csv - back line not clearly marked. Tim Whittaker stated that he would contact us when lines were clearly marked.

5.25.05 back line ones much of repair lines as marked.



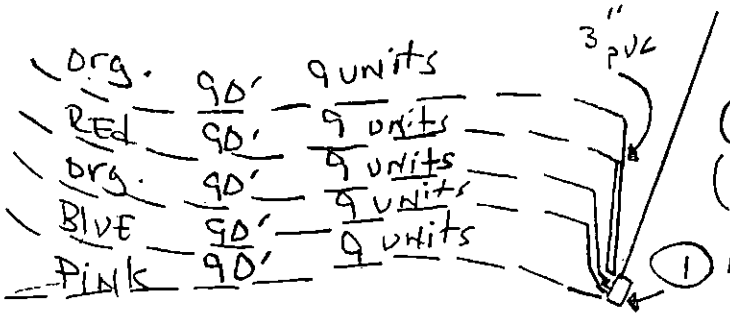
T. Whittaker
(704) 986-9540

SCALE

File: 2606-B

(4) Bedrm. (2012) E-2 LAY
1,500 gal. Septic Tank Riser/filter RULES apply.
1,000 gal. Pump Tank (SEE P.T. SPEC. SHEET)
* ① pressure manifold or (drop box distribution ON
(SEE SPEC sheets) Approval by M.C.H.D.) ONLY.

Pump Tank ELEVATION = E 118.0 ±
manifold ELEV. = 106.5 ±

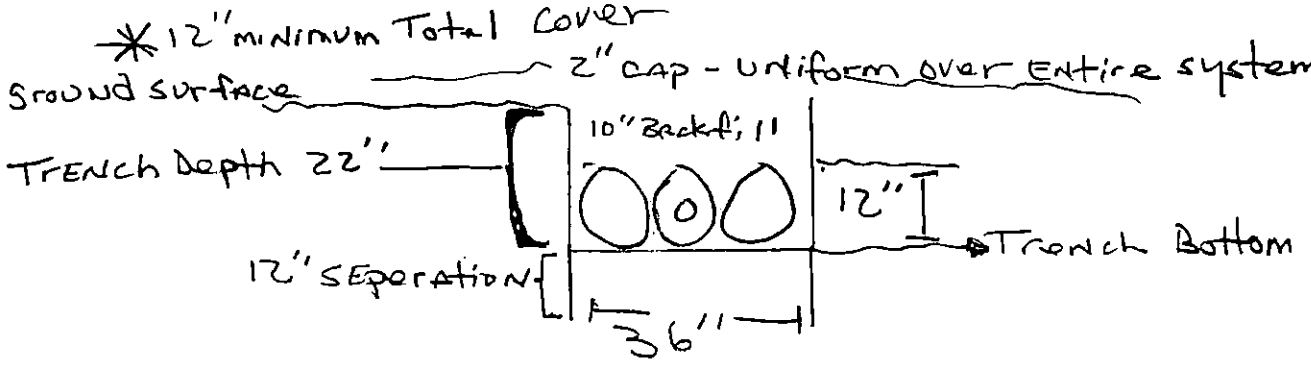


(5) 90' LINES = 450'
(9) UNITS PER LINE = 45 UNITS

TDH = 16.28 @ 33.55 GPM.
9" drawdown
pump Cycle = 6 minutes

* 5 TAPS
* ½ SCHED. 80 TAPS
* 6" Sch. 80 manifold Pipe

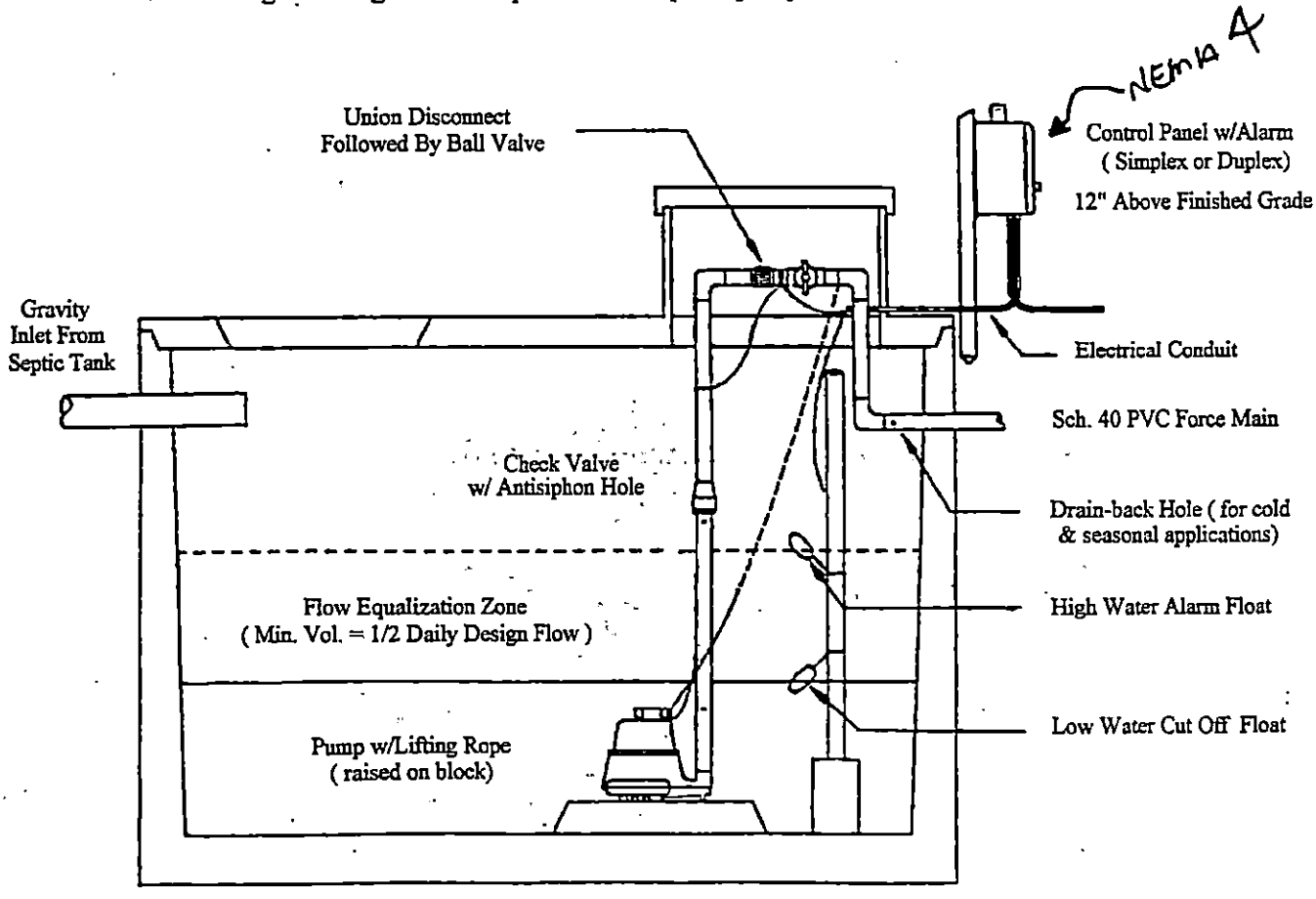
Trench Profile

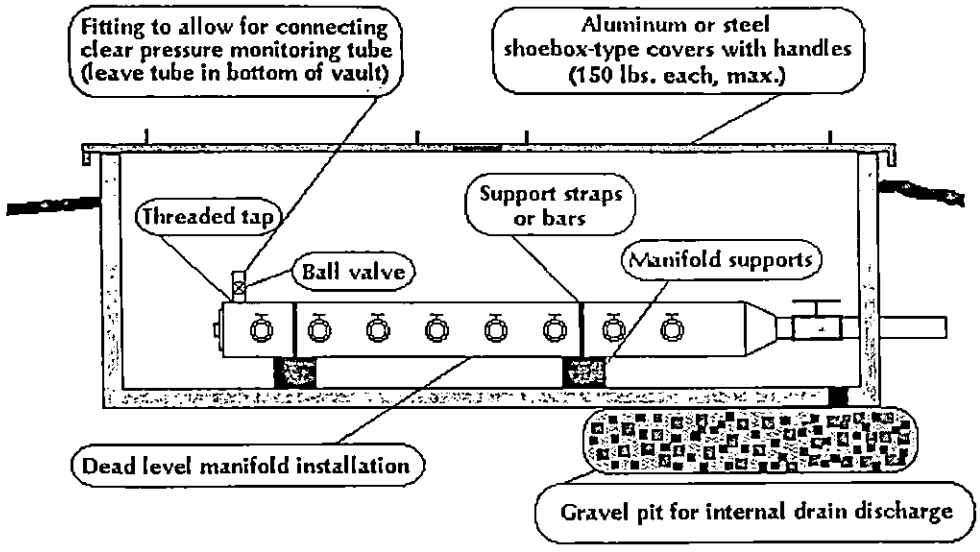


T.W. NOT CALLED

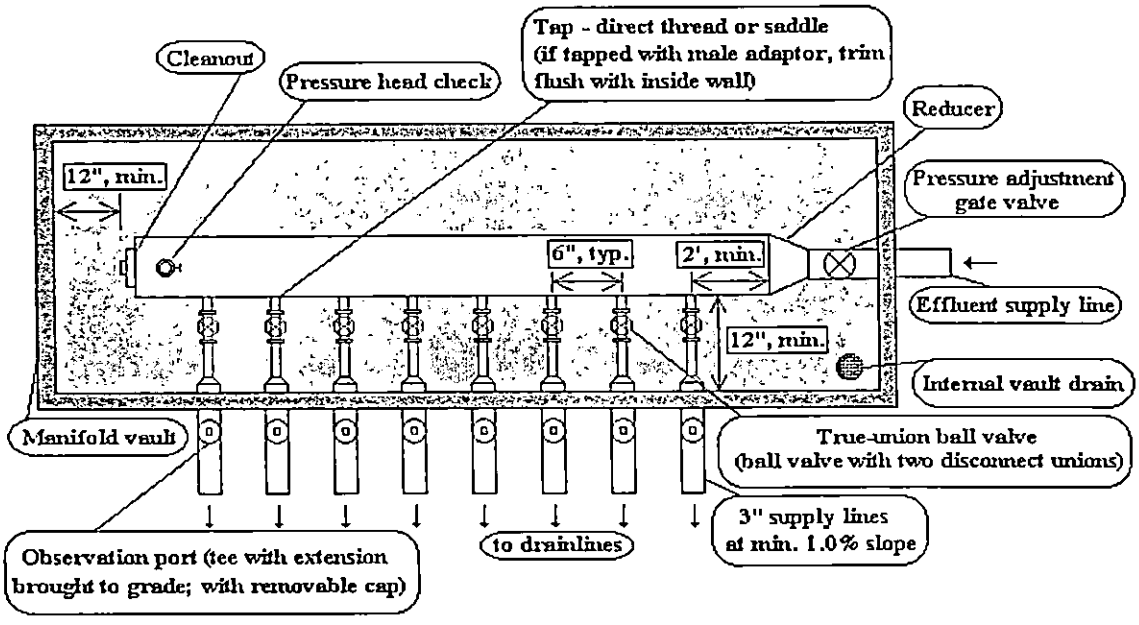
TYPICAL PUMP TANK DETAIL

1. Pump tank shall have an access manhole extending at least 6 inches above finished grade.
2. Pump and control circuits shall be provided with manual circuit disconnects within a watertight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the pump tank, securely mounted at least 12 inches above finished grade. The pump(s) shall be manually operable without requiring the use of special tools or entrance into the tank for testing purposes. Conductors shall be conveyed to the disconnect enclosure through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes provided inside the tank. Wire grips, duct seal, or other suitable material shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.
3. The pump tank shall have a properly functioning high-water alarm. The alarm circuit shall be supplied ahead of any pump overload and short circuit protective devices. The alarm shall be audible and visible by system users and included in the pump and control enclosure (Simplex or Duplex Control Panel).
4. Float switch for the high water alarm shall be set no more than 3 inches above the high water level of pump cycle.
5. Pump floats should be set so that level of water at end of pump cycle is above the top of the pump.
6. Float switch tie downs to be made of corrosion resistant material, no tape or metal hose clamps.
7. Pump discharge shall have a check valve.
8. Anti-siphon hole (three-sixteenth inch) is required between the pump and the check valve.
9. Watertight testing will be required on two piece pump tanks.





Profile View of Pressure Manifold for Sloping Site Installation (not to scale)



Plan View of Pressure Manifold for Sloping Site Installation (not to scale)

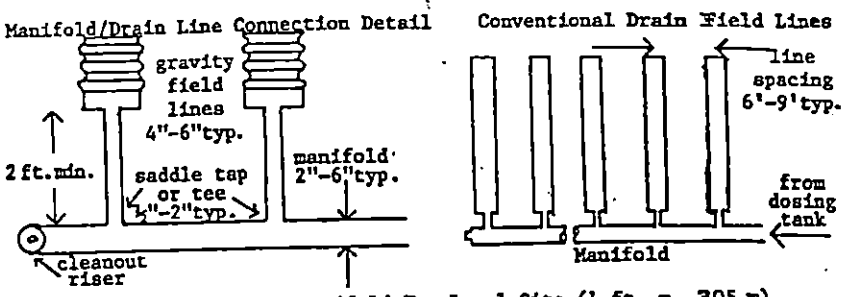


Fig. 1 Pressure Manifold For Level Site (1 ft. = .305 m)

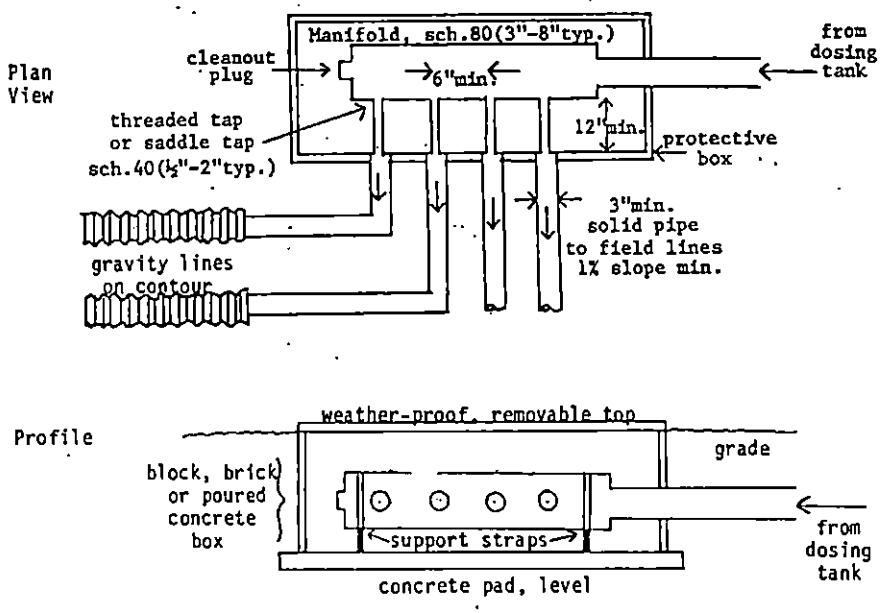


Fig. 2 Pressure Manifold For Sloping Sites

GEO-ENVIRONMENTAL CONSULTANTS, INC.
11704 Reames Road
Charlotte, NC 28269
Telephone: (704)596-8788
Fax: (704)596-8770

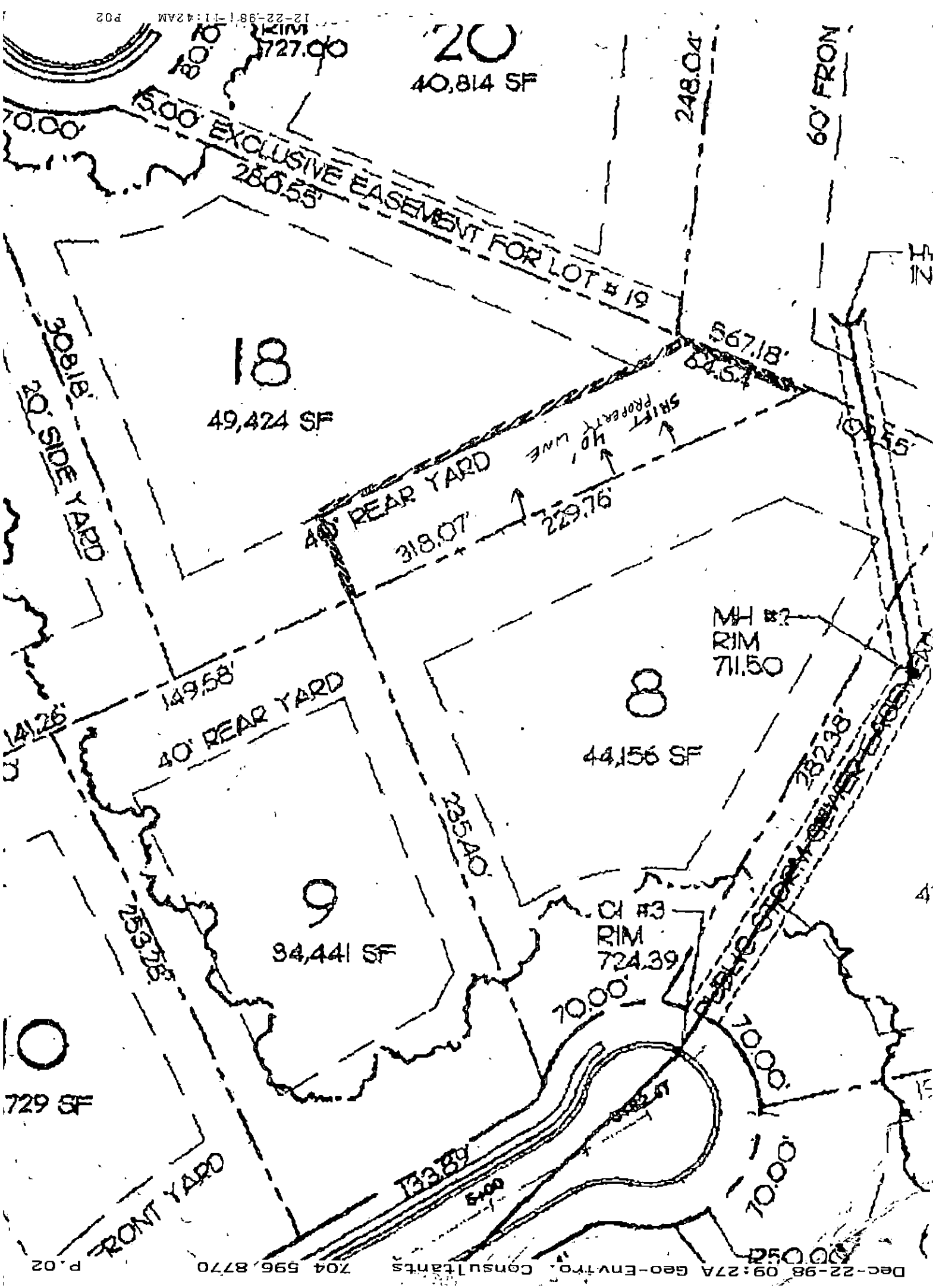
FACSIMILE TRANSMISSION

FAX TO: DREW WALKER DATE: 12-22-98
COMPANY: FAX NO: 336-6894
FROM: Keith Anthony TOTAL PAGES: 2
PROJECT#: (Including Cover Sheet)
RE:

MESSAGE:

DREW,
ATTACHED IS LOT LAYOUT FOR #8 & #18. BILL MARLIN LOOKED AT #18 WITH THE ADJUSTED PROPERTY LINE AND SAID THAT A SYSTEM WOULD WORK ON LOT #18. MY QUESTION NOW IS LOT #8. I KNOW BILL HAD SOME QUESTIONS, BUT WILL AN LPP SYSTEM AT LEAST WORK ON THE LOT WITH THE ADJUSTED PROPERTY LINE.
I REALLY APPRECIATE YOUR HELP
THANK YOU

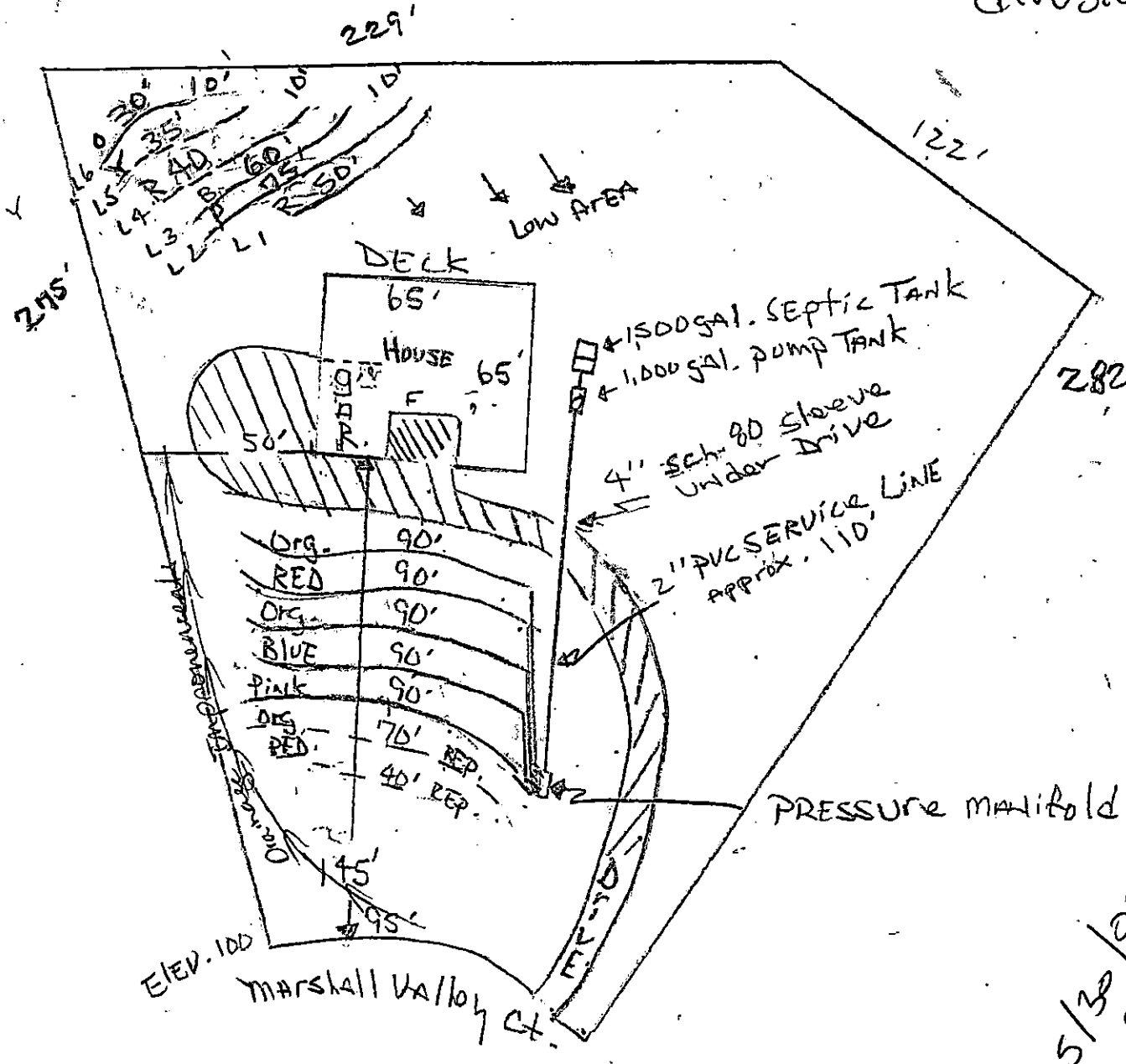
THE INFORMATION CONTAINED IN THIS FACSIMILE IS PRIVILEGED AND CONFIDENTIAL, INTENDED FOR THE SOLE USE OF THE ADDRESSEE. IF THE READER OF THIS FACSIMILE IS NOT THE INTENDED RECIPIENT, OR THE EMPLOYEE OR AGENT RESPONSIBLE FOR DELIVERING IT TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION, OR COPYING OF THIS COMMUNICATION IS STRICTLY PROHIBITED BY LAW. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE NOTIFY THE PERSON LISTED ABOVE, IMMEDIATELY, AND RETURN THE ORIGINAL BY MAIL TO THE SENDER AT THE ADDRESS LISTED ABOVE.



12-22-98 11:42AM P02
Dec-22-98 09:27A Geo-Envtro. Consultants 704 596 8770 P.02

(4) Bedrm. Pumped, Pressure manifold
EEE-ZZZ Lay Septic Sys. (PPBPS) Panel
Block Repair Area, 285' shown. (Type III)
(5) 90' E-Z Lay Lines = 450' .28 LTAR
1,500 gal. Septic Tank
1,000 gal. Pump Tank
- A pressure manifold (see spec. sheets)
manifold Box

MCHD.
File: 2606-E
Lot 8
Lemmond Acres
Reviewed 6-6-00 ts
Add surface H_2O diversion. ts

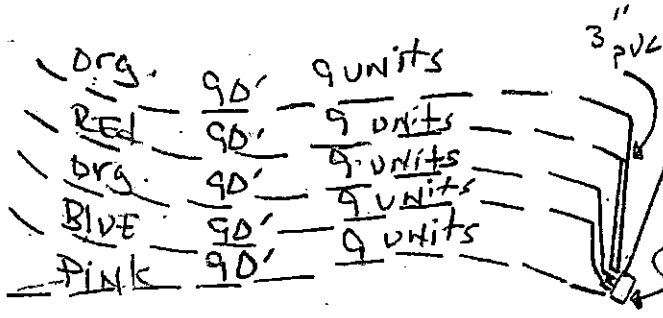


Revised 5/30/00
J. Whittaker
(704) 866-9540
Scale 50

File: 2606-B

(4) Bedrm. (2012) E-2 LAY
1,500 gal. Septic Tank Riser/filter RULES apply.
1,000 gal. Pump Tank (SEE P.T. SPEC. SHEET)
* (1) pressure manifold or (drop box distribution ON
(SEE SPEC sheets) Approval by M.C.H.D.) ONLY.

Pump Tank ELEVATION = E 118.0 ±
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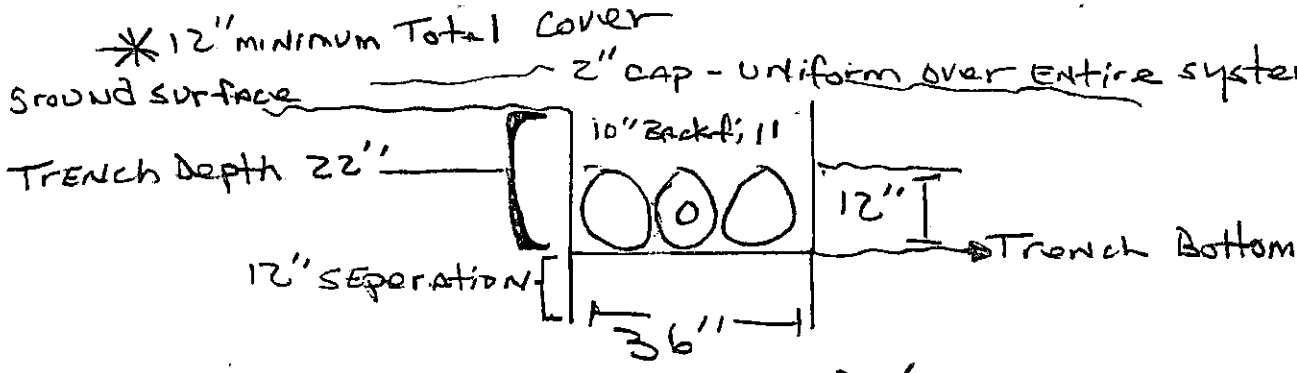


(5) 90' LINES = 450'
(9) UNITS PER LINE = 45 UNITS

* 5 TAPS
* ½ SCHED. 80 TAPS
* 6" Sch. 80 manifold Pipe

TDH = 16.28 @ 33.55 GPM.
9" drawdown
pump Cycle = 6 minutes

Trench Profile



(REPAIR AREA) (PPBPS Type IV)

L1	50'
L2	70'
L3	60'
L4	40'
L5	35'
L6	30'

Total 285'

T.W. NOT SCALED

Plan initially denied - system is not marked on-site.
Larry Thompson, L.S.

GCI

GEO-ENVIRONMENTAL
CONSULTANTS, INC.

A Common Sense Approach To A Cleaner Environment

11704 Reames Road, Charlotte, NC 28269-7637 • 704-596-8788 • FAX: 704-596-8770

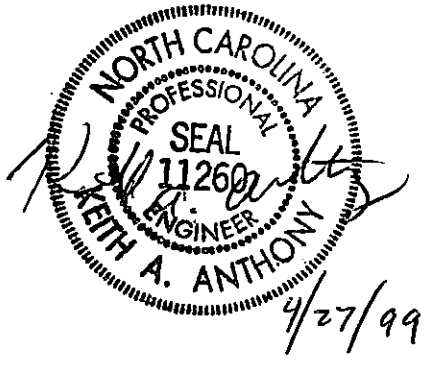
RESIDENTIAL LOW PRESSURE PIPE SYSTEM
FOR
SUBSURFACE WASTEWATER DISPOSAL
LOT #8 - LEMMOND ACRES DRIVE
MINT HILL, NORTH CAROLINA

Prepared For
Mr. Brian Helms
Pro Realty And Development, Inc.
11901 Albemarle Road
Charlotte, NC 28227

Prepared by
GEO-ENVIRONMENTAL CONSULTANTS, INC.
11704 Reames Road
Charlotte, NC 28269

GCI Project No. 98195

April 1999



BACKGROUND

The property is planned for single family 4-bedroom residence.

Mecklenburg County Soil Scientist, Mr. William Marlin, performed a site investigation on August 14, 1998. He classified the site as unsuitable for available space with an area on the front portion of the lot with a LTAR of 0.28 gpd/ft^2. A portion of Lot # 18 located behind Lot # 8 was deeded to Lot # 8 in order to have enough room for a repair area.. See attached Soil/Site Evaluation report.

The residence will be served by a community well which is located approximately 500 feet away.

The location of the nitrification field is on a slightly sloping portion of the site. The area is wooded. Trees will need to be cut and removed, however, no stumps shall be removed. Care shall be taken to ensure minimum land disturbance. The nitrification field along with the designated repair area is shown on the attached figure.

APPLICATION INFORMATION

1) Application for Improvement Permit has been submitted to Mecklenburg County Health Department by the property owner, Mr. Brian Helms.
2) Property is shown on attached portion of development survey. The MCHD file number is 2606B.
3) Owner: Mr. Brian Helms
Pro Realty and Development, Inc.
11901 Albemarle Road
Charlotte, NC 28227
(704) 814-0326 (Office)
(704) 545-6246 (Fax)

Engineer: Mr. Keith A. Anthony, P.E.
Geo-Environmental Consultants, Inc.
11704 Reames Road
Charlotte, NC 29269
(704) 596-8788 (Office)
(704) 596-8770 (Fax)

4) Project described herein is a new project.
5) Water supply for development is provided by a community well shown on the attached plat.
6) Facility to be served by the proposed system is a 4-bedroom single family residence.
7) Wastewater system components are described herein.

LOCATION

The property is located in the cul-de-sac of Marshall Valley Court located off Cabarrus Road in Mint Hill, North Carolina.

REFERENCES

1) Design and Installation of Low Pressure Pipe Waste Treatment System by: Craig Cogger, Bobby L. Carlile, Dennis Osborne, Ed Holland; published by UNC Sea Grant College Pub. UNC-SG-82-03, May 1982
2) Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A, Section .1900, Department of Environment Health and Natural Resources, August 1, 1998

PLANS AND SPECIFICATIONS FOR SPECIFIC SYSTEM COMPONENTS

Septic Tank

1) The septic tank receives wastewater directly from the house.
2) A septic tank shall be watertight, structurally sound, and not subject to excessive corrosion or decay.
3) The 1500 gallon septic tank must be of two-compartment design for maximum solids retention. The inlet compartment of a two-compartment tank shall hold between two-thirds and three-fourths of the total tank capacity.
4) Effluent from the two-compartment septic tank flows by gravity through a four-inch solid PVC pipe to the pumping tank.
5) Both the septic tank and pumping tank must be provided with aboveground concrete or masonry manhole risers to provide easy access for clean-out and pump service.
6) When prefabricated concrete tanks or tanks of other material are used, they shall be constructed in accordance with the plans which have been approved by the State and shall comply with all requirements of Section .1953 of 15A NCAC 18A.
7) On the outlet tee of the septic tank a biofilter should be installed. This biofilter should be equivalent to a Zabel Model A1800. An access port over the biofilter should be installed. See attached product sheet from Zabel Environmental Technology.

Pumping Tank

1) 1000 gallon pumping tank shall have an access manhole extending at least 6 inches above finished grade.
2) Pump and control circuits shall be provided with manual circuit disconnects within a watertight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the pump tank, securely mounted at least 12 inches above finished grade. The pump(s) shall be manually operable without requiring the use of special tools or entrance into the tank for testing purposes. Conductors shall be conveyed to the disconnect enclosure through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes provided inside the tank. Wire grips, duct seal or other suitable material shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.
3) The pumping tank shall have a properly functioning high-water alarm. The alarm circuit shall be supplied ahead of any pump overload and short circuit protective devices. The alarm shall be audible and visible by system users and included in the pump and control enclosure (Simplex or Duplex Control Panel).
4) Float switch for the high water alarm shall be set no more than 3 inches above the high water level of pump cycle.

5) Pump floats should be set so that level of water at end of pump cycle is above the top of the pump.
6) Float switch tie downs to be made of corrosion resistant material, no tape or metal hose clamps.
7) Pump discharge piping shall be of Schedule 40 PVC and shall have a check valve.
8) Anti-siphon hole (three-sixteenth inch) is required between the pump and the check valve.
9) Watertight testing will be required on two piece pump tanks.

Pipe and Fittings

1) All pipes and fittings should be made of PVC plastic.
2) All joints must be sealed with an appropriate PVC-solvent cement. The supply manifold from the pumping tank to the LPP distribution field is two-inch Schedule 40 PVC.
3) There should be a threaded PVC union above the pump to allow easy removal or replacement. Lateral lines are made of 1 1/4-inch PR160 PVC. Holes in the laterals are drilled on site.
4) A globe valve for final pressure adjustment is installed in the supply manifold inside the pumping tank.
5) The end of each lateral line is equipped with a capped "turn-up" that provides aboveground access for clean-out or back-flushing. Using 45-degree elbows rather than 90-degree elbows for the turn-ups will make clean-out easier to do.

Pump, Float Controls and Alarm System

1) A septic-tank effluent pump or a submersible sump pump that will not be corroded by sewage should be used in the pumping tank. A Little Giant Model #16S-CIM by Tecumseh Products, or equivalent, should be used to pump 60 gpm at 16 feet of head. See attached product sheet from the "USA Blue Book."
2) The controls for the pumping system include a switching control for turning the pump on and off and a high water alarm to signal pump malfunctions.
3) The controls must also be sealed against entry of corrosive and explosive gases from the effluent and should have NEMA (National Electrical Manufacturing Association) approval.
4) Mercury switches are activated by a sealed float which contains a tube of mercury in contact with power leads. Best performance has been obtained using two switches - one to close the pump circuit and the other to open it. See attached product sheet from the "USA Blue Book".
5) In addition to the on and off control floats, there must be a separate float control for the high-water alarm. This may be a sealed, mercury-float switch mounted several inches above the on float. The high-water alarm should be located within the house and consist of a light bulb and/or audible signal mounted over a sign marked "wastewater system alarm". It should be on a separate electrical circuit from the pump power line, and be equipped with a test switch. The alarm is activated if the water level in the pumping tank rises above the "pump-on" float control. The tank provides at least one day or more of excess storage capacity (depending on water use in the home) during which time the system must be repaired.

Home Water-Saving Devices

Any home with an LPP system must be equipped with low-flow showerheads (three gallons per minute) and low-flush commodes (3 ½ gallons or less per flush) in order to minimize the hydraulic load on the system. Those devices are a simple, low-cost way of reducing water consumption with no inconvenience to the homeowner.

CONSTRUCTION INSTALLATION

Site Preparation

1) One of the most important concerns for an LPP system is to protect the site from soil disturbance by heavy equipment.
2) As soon as the absorption area has been designed, it should be flagged, roped off and "quarantined" from construction traffic. No site preparation or LPP construction work should occur if the soil is wet.
3) After the location is staked out and the soil is dry enough the site should be cleared of brush and small trees. If larger trees are removed, they should be cut off rather than uprooted in order to avoid creating depressions and damaging the soil-pore network.
4) Provisions must be made for intercepting or diverting surface water away from the absorption area.
5) After the area has been cleared and shaped, the location of the lateral lines and supply manifold should be accurately staked out according to design specifications. Each lateral line must be laid out along a level contour using a transit.

Tank Installation

1) The two-compartment septic tank is installed.
2) The pumping tank is installed next to the septic tank.
3) The tanks are connected with an appropriate length of solid, four-inch PVC pipe.

Supply Manifold

1) The supply manifold conveys effluent from the pump to the distribution laterals.
2) The manifold joins each lateral through a short riser pipe connecting a reducing tee on the manifold to a 1 1/4 inch elbow or tee on the lateral. This assembly places each lateral pipe about six inches higher than the supply manifold and helps prevent the back-flow of effluent from a higher lateral to a lower lateral. Use a 2" x 2" x 1 1/4" tee rather than "bushing down" when connecting laterals to the manifold.
3) After the supply manifold has been placed in its trench and lateral lines connected, it should be backfilled with tightly tamped soil. The supply-manifold trench must not be backfilled with gravel, or the trench may become a conduit for downslope flow of effluent from the laterals.

Lateral Lines

1) Laterals will be placed at 5' minimum separation.
2) The depth of a given lateral trench should be uniform from the manifold to the end of the lateral. In no case should the trench bottom be allowed to slope away from the manifold.
3) Small earthen dams are placed at the beginning of each lateral trench to help maintain uniform distribution of effluent along each trench.
4) Lateral trench bottoms are then lined with three to six inches of gravel.
5) The 1 1/4-inch PVC pipes should be laid out and cut to proper lengths for the lateral lines. Holes are drilled (in a straight line) facing upwards (except for a hole 1/3 of the way from beginning and end of each line) after the laterals have been cut to proper length.
6) Holes are only drilled through one side of the pipe.
7) Sleeve laterals in 4" diameter perforated corrugated pipe. The corrugated pipe shall have three rows of holes, each hole between ½" and 3/4" in diameter and spaced longitudinally approximately 4" on centers. The rows of holes may be equally spaced 120° on centers around the periphery, or three rows may be located in the lower portion of the pipe, the outside rows being approximately on 120° centers.
8) A short turn-up with a capped end is at the end of each lateral. The capped end must be brought up above or flush with the final grade. Using two 45 degree bends for constructing cleanouts is recommended.
9) Rock used in nitrification trench shall be clean, washed gravel or crushed stone and graded or sized between 3/8" to 1". The rock shall be placed a minimum of 12" deep with at least 6" between the pipe and the trench bottom and 2" over the pipe, and distributed uniformly across the trench bottom and over the pipe.
10) Use geotextile fabric over the trench at the gravel-backfill interface to prevent soil intrusion.

Pump and Controls

1) The pump must be placed on two concrete blocks set next to each other on the bottom of the tank. This prevents the pumping of any solid particles which can clog the LPP system
2) 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.
3) The lower level control or "pump-off" must be positioned above the pump, so that the pump remains submerged at all time.
4) The pump outlet pipe should be connected to the supply manifold with a threaded PVC union to allow quick removal.
5) A 1/4-inch 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.

Electrical Connections

1) The pump and high-water alarm must be placed on separate electrical circuits.
2) All electrical connections must be made outside the pumping tank. Power cords from the pump and controls should be plugged into a NEMA-approved outdoor receptacle mounted outside of the pumping tank.

3) Wiring between the pumping tank and the house should meet state and local code requirements.

PROPER OPERATION CHECK

1) After all connections have been installed and connected, the system should be checked for proper operation. With electrical power turned off, fill the pumping tank with a garden hose (or allow effluent to accumulate) until the liquid rises to the level of the high-water alarm float.
2) 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.

PRESSURE HEAD ADJUSTMENT

1) 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:
   - Glue a four-foot length of pipe (preferably clear) to a threaded adapter that will screw onto the turn-up adapters at the end of each lateral.
   - Replace the turn-up cap with the pipe and adapter
   - Turn the power on to allow liquid to rise in the pipe
   - Adjust the gate or globe valve in the pumping tank until the effluent reaches the desired height in the pipe. Remember to include the distance below the ground surface to the lateral line when measuring the height.

FINAL LANDSCAPING

1) After the LLP system is installed, the following should be checked to ensure that the system will not be overloaded with excess rainwater and runoff:
   - The distribution field is shaped to shed rainwater and is free of low areas
   - Grassy swales or ditches for diverting surface water are properly installed
   - Gutter and downspout drains are directed away from the system.

2) Finally, the entire area should be planted with grass in order to prevent erosion. The soil should be properly tilled, limed (if necessary) and fertilized before planting. After applying an appropriate grass seed, the area should be heavily mulched with straw or other suitable material.

QUALITY ASSURANCE REQUIREMENTS

The LPP system must be installed by a qualified, contractor that is on the Mecklenburg County list of competent contractors. GCI also recommends that the construction and installation of the LPP system be spot checked by an independent design engineer recognized by Mecklenburg County to have experience in the design of LPP systems. Critical stages of the installation which should be

checked are:

1. System layout
2. Septic and pump tank installation prior to backfilling
3. Manifold and lateral installation prior to backfilling.
4. Final landscaping, operation and pressure head check.

If quality assurance is not provided by GCI, then the homeowner and/or installation contractor assumes liability for proper system operation.

The system design is based on a maximum waste flow of 480 gallons per day. Homeowners should pay particular attention to the section titled Homeowner Suggestions for ways to minimize the burden on the system.

MAINTENANCE

1) Any person owning or controlling the property upon which a ground absorption sewage treatment and disposal system is installed shall be responsible for the following items regarding the maintenance of the system:
   - Ground absorption sewage treatment and disposal systems shall be maintained at all times to prevent seepage or discharge of sewage or effluent to the surface of the ground or to surface waters.
   - Ground absorption sewage treatment and disposal systems shall be checked and the contents of the septic tank removed periodically to ensure proper operation of the system.
2) A contract shall be executed between the system owner and a management entity prior to the issuance of an Operation Permit for a system required to be maintained by a public or private management entity. The contract shall include the specific requirements for maintenance and operation, responsibilities of the owner and system operator, provisions that the contract shall be in effect for as long as the system is in use, and other requirements for the continued proper performance of the system. It shall also be a condition of the Operation Permit that subsequent owners of the system execute such a contract.

OPERATION AND MAINTENANCE PROCEDURE

The system is classified as Type IV. The Regulations require that the system be operated by a person certified by the N.C. Department of Environmental Health to operate this type of system.

Operating, Maintenance and Inspection procedures shall include but not be limited to the following:

- Minimum inspection/maintenance frequency shall be 2 times per year, with reporting frequency every 6 months to the local Health Department.
- Septic system shall be pumped every 4 years or when solids accumulate to 1/3 the volume of the tank.
- On a two- to five-year basis, clean and inspect Biofilter. When washing the filter, debris must be sprayed directly back into the septic tank and not onto the lawn.
- The LPP system should be observed by the regulatory agency one, three, six and nine months after initial installation, and then every 3 years. An inspection report should be completed and filed each time the system is checked.
- All laterals shall be pressure flushed annually with clean water.

- Pressure head for laterals should be checked and adjusted one month after installation and annually thereafter.
- All piping, fittings, turn-ups and valve boxes shall be checked annually for damage and/or proper operation and corrections made immediately.
- The property should be inspected to insure all surface water is deflected away from the fields and tank. Any ponding of surface water should be corrected.
- Grasses shall be mowed and maintained and any erosion shall be corrected promptly.
- The nitrification field area shall be checked for leakages, blowouts or malfunction, indications of damp or mushy areas compared to surrounding area or evidence of noticeable odor of sewage. Repairs shall be made immediately.
- The pump electrical should be checked to insure tight, clean connections with no corrosion and proper operation.
- Pump switches shall be checked for free operation and proper level set.
- Pump draw down depth and delivery rate shall be checked twice a year.
- Check septic tank and pump tank for evidence of damage or leakage. Check the quality of effluent including grease and sludge accumulation.

The system operator in conjunction with the local Health Department shall establish an operation and maintenance program and procedure based on experience obtained from similar installations.

HOMEOWNER SUGGESTIONS

Most low pressure pipe systems do not require much effort to operate and maintain. Even though the effort is small, the system must be maintained properly so that it operates reliably and at a minimum cost. Following are suggestions for the home owner to minimize the burden on a low pressure pipe system.

1) Garbage disposals should not be used in on-site systems. The ground garbage adds large amounts of solids to a septic tank, causing sludge to build up very quickly.
2) Grease, cooking oils and coffee grounds should never be put into a septic tank.
3) Items such as disposable diapers, cigarettes, facial tissues and other solid or paper wastes should not be flushed into the on-site system.
4) Used motor oil and other such oily liquids should not be put into a septic tank.
5) Using less water can reduce the amount of water flowing to the treatment and disposal field.
6) Water-saving fixtures and devices can be installed on sinks, toilets and showers to reduce the rate at which the water flows from the fixture.
7) Dishwashers and washing machines should only be run with full loads.
8) Leaky faucets and toilets can add large volumes of water to the daily flow of water into the on-site system. Repair the leaks to save water and give the treatment and disposal field a rest.
9) Roof drains, basement sump pumps, foundation drains, and other such drains should not empty into the on-site system. These drains should be directed to another part of the lot away from the treatment and disposal field.

APPENDIX

DESIGN SPECIFICATIONS
Low Pressure Piping System
Lemmond Acres - Lot #8

Daily waste flow	480 gal
Septic tank size	1500 gal
Pumping tank size	1000 gal
Effluent loading rate	0.28 gal/ft^2/day
Absorption area	3430 ft^2
Total length of laterals	686 ft
Lateral diameter	1 1/4 in dia. PVC
Lateral configuration	14 x 50 ft lines
Supply line length	100 ft
Supply line diameter	2 in dia. sch 40 PVC
Manifold placement	side
Hole size	5/32 in
Hole spacing	Varies, see Table 1
Number of holes	Varies, see Table 1
Flow per hole	Varies, see Table 1
Total flow	43.6 gpm
Elevation head	12 ft
Friction head	0.89 ft
Pressure head	2 ft
Total head	15 ft
Pump requirements	45 gpm, 15 ft of head
Storage volume in laterals	63 gal
Storage volume in supply line	27 gal
Total storage volume	90 gal
Dosing volume	340 gal
Dosing depth*	16.5 in
Pump run per dose	7 minutes, 30 seconds
Check valve	Yes
Siphon break hole	Yes

* Double check dosing depth against pump tank dimensions

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TABLE 1
RESIDENTIAL LOW PRESSURE PIPE SYSTEM
LOT #8 - Lemmond Acres
GCI Project No. 98195

Lateral	Length (FT)	Elevation (FT)	Pressure Head (FT)	Flow Rate/ Hole (GPM)	Hole Spacing (FT)	# of Holes	Flow/Line (GPM)
A1	50	722	2	0.41	6	8	3.28
A2	50	721.5	2.5	0.45	7	7	3.15
A3	50	721	3	0.50	8	6	3.00
A4	50	720.5	3.5	0.54	8	6	3.24
A5	50	720	4	0.58	9	5	2.90
A6	50	719.5	4.5	0.61	9	5	3.05
A7	50	719	5	0.64	9	5	3.20
B1	50	718.5	2	0.41	6	8	3.28
B2	50	718	2.5	0.45	7	7	3.15
B3	50	717.5	3	0.50	8	6	3.00
B4	50	717	3.5	0.54	8	6	3.24
B5	50	716.5	4	0.58	9	5	2.90
B6	50	716	4.5	0.61	9	5	3.05
B7	50	715.5	5	0.64	9	5	3.20
							43.64

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY KLL DATE 4-26-99

CHKD. BY _____ DATE _____

CLIENT	PRO REALTY	SHEET	1 OF 2
PROJECT	LEMMOND ACRES - LOT #8	PROJECT NO.	98195
SUBJECT	LPP DESIGN		

SIZE OF ABSORPTION AREA

4 BEDROOMS 4 x 120 gpd = 480 gpd

LOADING RATE (FROM W. MARLIN 8-14-98) = 0.28 gpd/ft²

480 gpd / 0.28 gpd/ft² (½) = 3430 ft²

TOTAL LENGTH OF DISTRIBUTION LINES

3430 ft² / 5' = 686 ft

USE 14 LINES, 50' EACH, 5' SPACING

SIZE SEPTIC AND PUMPING TANKS

2 x 480 gpd = 960 gal

USE 1500 gal SEPTIC TANK

USE 1000 gal PUMPING TANK

DOSING RATE → SEE TABLE

PUMP SELECTION

ASSUME 2" SUPPLY LINE 100' LONG

ASSUME FRICTION HEAD = 1.2 x PIPE FRICTION

FROM TABLE 3 pg 9, DESIGN MANUAL, 1½ (43.6 gpm), 20 gpm, 2" ϕ

(100'/100') x 0.74 = 0.74 ft

FRICTION HEAD = 1.2 x 0.74 = 0.89 ft

FIND TOTAL HEAD

ASSUME 12' ELEVATION FROM PUMP TO END OF LINES

ASSUME 2' PRESSURE HEAD

0.89 ft FRICTION HEAD

12' + 2' + 0.89 = 14.9 FEET

PUMP 45 gpm AGAINST 15 FEET

USE LITTLE GIANT MODEL 10SH-CIM

GEO-ENVIRONMENTAL CONSULTANTS, INC.

BY KAO DATE 4-26-99

CHKD. BY _____ DATE _____

CLIENT	PRO REALTY	SHEET	2 OF 2
PROJECT	LEMMOND ACRES – LOT #8	PROJECT NO.	98195
SUBJECT	LPP DESIGN		

DOSING VOLUME

DETERMINE MINIMUM DOSING VOLUME

$$V_{MIN} = V_{SUPPLY} + 5\,V_{LATERALS}$$

2" SUPPLY LINES $\left(\frac{100' + 40'}{100'}\right) \times 19.4\ gal = 27.16\ gal$

1¼" LATERALS $14\left(\frac{50'}{100'}\right) \times 9.0\ gal = 63\ gal$

$V_{MIN} = 27.16\ gal + 5(63\ gal) = 342\ gal$

USING A DOSING VOLUME OF 340 gal/DOSE GIVES ABOUT 1½ DOSES PER DAY.

DOSING DEPTH

1000 gALLON PUMP TANK 90" LONG, 53" WIDE

$90" \times 53" \times 1"\ DEPTH \times \frac{1\ FT^3}{1728\ IN^3} \times 7.48\ \frac{gal}{FT^3} = 20.65\ \frac{gal}{IN\ DEPTH}$

$\frac{340\ gal\ DOSE}{20.65\ gal/IN} = 16.5\ INCH\ DOSING\ DEPTH$

PUMP RUN PER DOSE

$340\ gal / 45\ gal/min = 7\ MINUTES,\ 30\ SECONDS$

REPAIR AREA

PORTION OF PROPERTY "BORROWED" FROM LOT #18

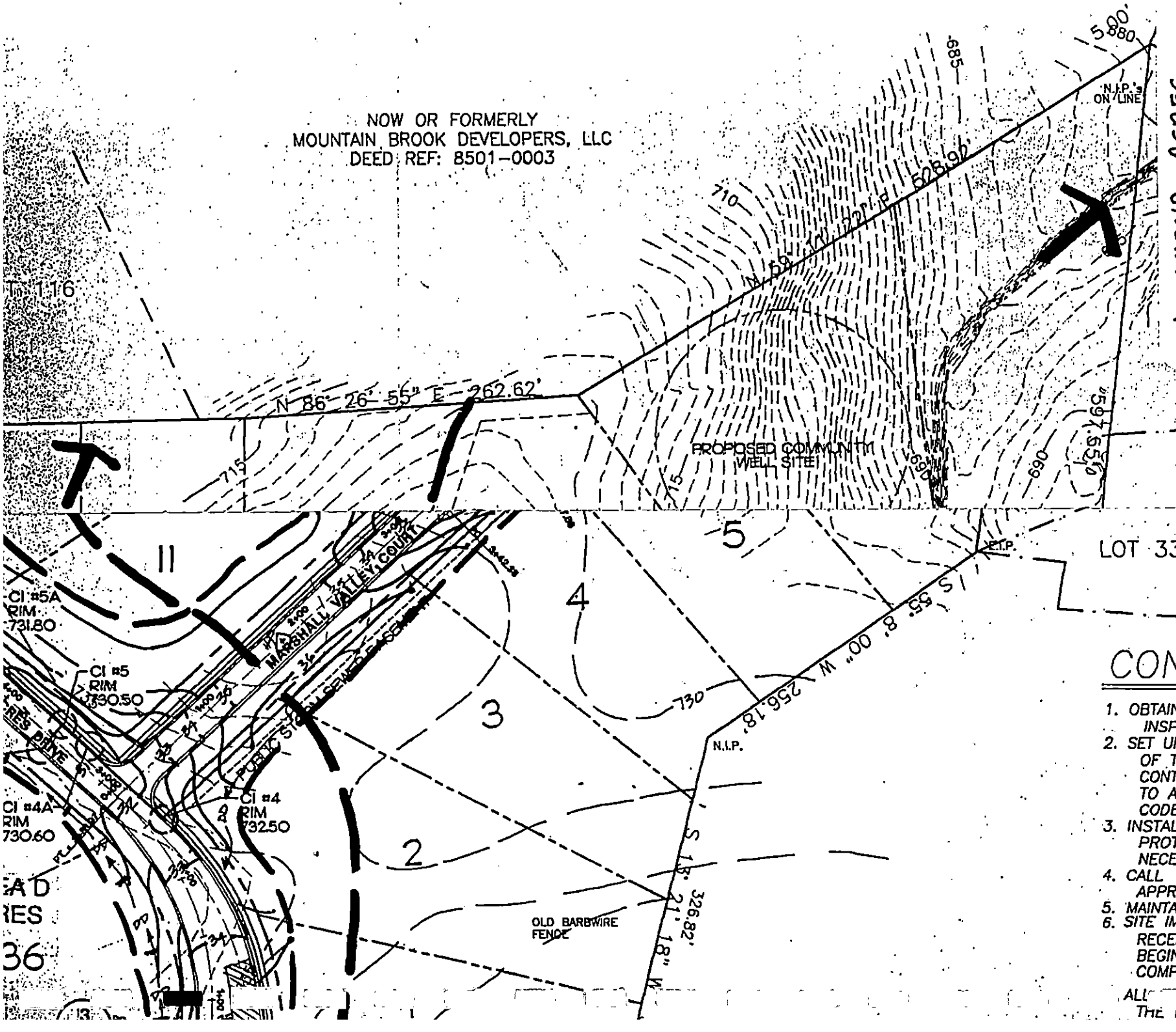
LOADING RATE (FROM W. MARLIN 12-14-98) = 0.25 gpd/ft²

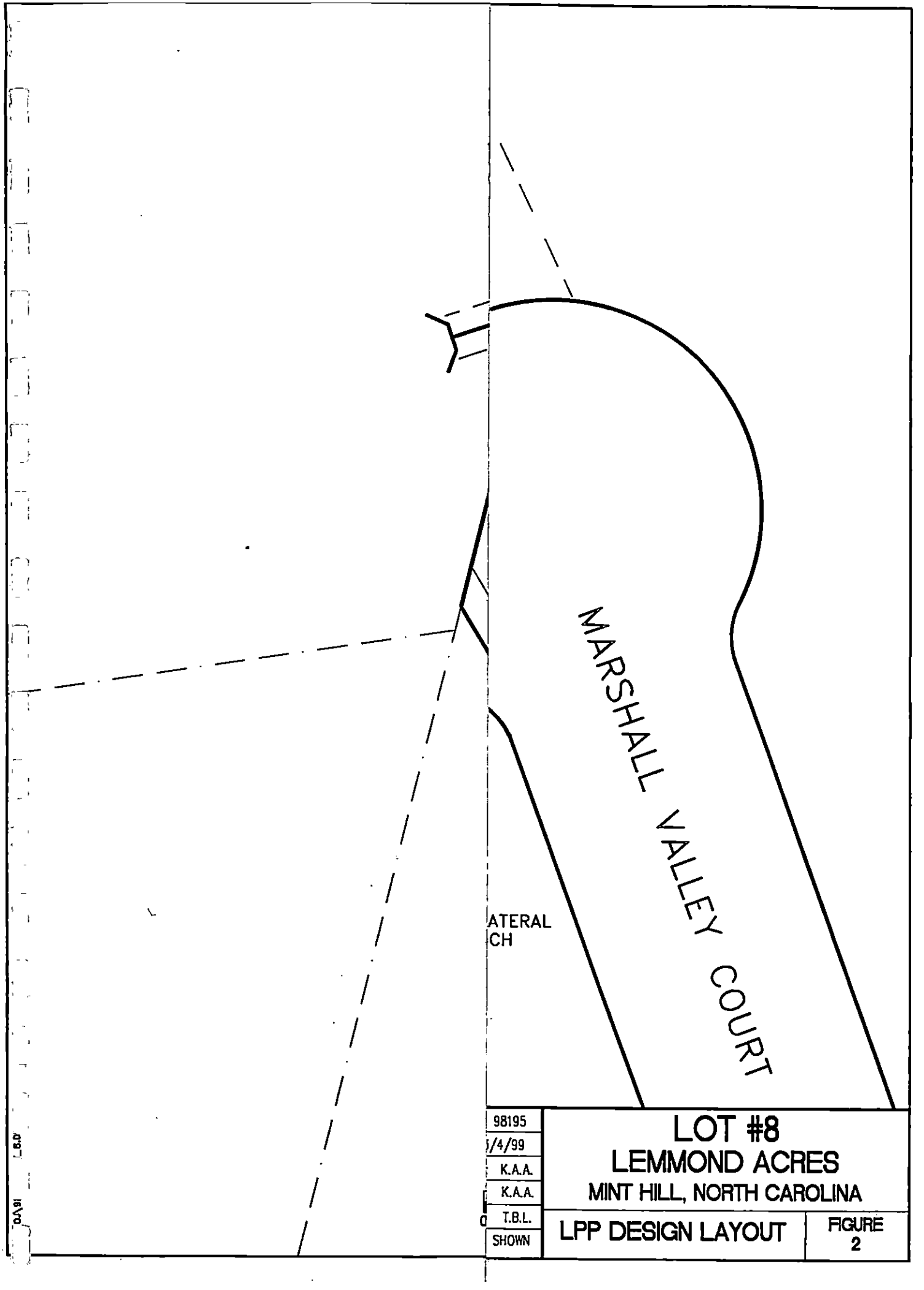
$480\ gpd / 0.25\ gpd/ft^2\ (1/2) = 3840\ ft^2$

$3840\ ft^2 / 5' = 768\ ft$

USE 8 LINES, 100' EACH, 5' SPACING

REPAIR AREA 35' x 100'


NOW OR FORMERLY
MOUNTAIN BROOK DEVELOPERS, LLC
DEED REF: 8501-0003
LEMMOND ACRES
REF: LAND DESIGN
SHEET NO. S-2.0
FIGURE 1
N.I.P.'s ON LINE
N 86° 26' 55" E 262.62'
N 59° 11' 22" E 628.92'
PROPOSED COMMUNITY WELL SITE
LOT 33
P.T.P.
S 55° 8' 00" W 256.18'
S 18° 21' 18" W 326.82'
N.I.P.
MARSHALL VALLEY COURT
PUBLIC STREET
OLD BARBWIRE FENCE
CI #5A RIM 731.80
CI #5 RIM 730.50
CI #4A RIM 730.60
CI #4 RIM 732.50
685
690
695
700
710
715
720
730
5880
5970.55
T 116
36
11
5
4
3
2
CONSTRUCTIO
1. OBTAIN GRADING PERMIT FRO
INSPECTOR JOHN KNOX(33
2. SET UP PRE-CONSTRUCTION C
OF THE COUNTY ENGINEE
CONTROL MEASURES. FAILU
TO ANY LAND DISTURBING
CODE AND IS SUBJECT TO
3. INSTALL SILT FENCE, INLET
PROTECTION AND OTHER M
NECESSARY TO INSTALL THE
4. CALL FOR ON-SITE INSPEC
APPROVED, BEGIN CLEARING
5. MAINTAIN EROSION CONTROL
6. SITE IMPROVEMENTS PHASE
RECEIVE APPROVAL FOR IMP
BEGIN STORM DRAINAGE AN
COMPLETE SITE CONSTRUCTI
ALL SIO NTR EAS
THE N.C. EROSION AND SED

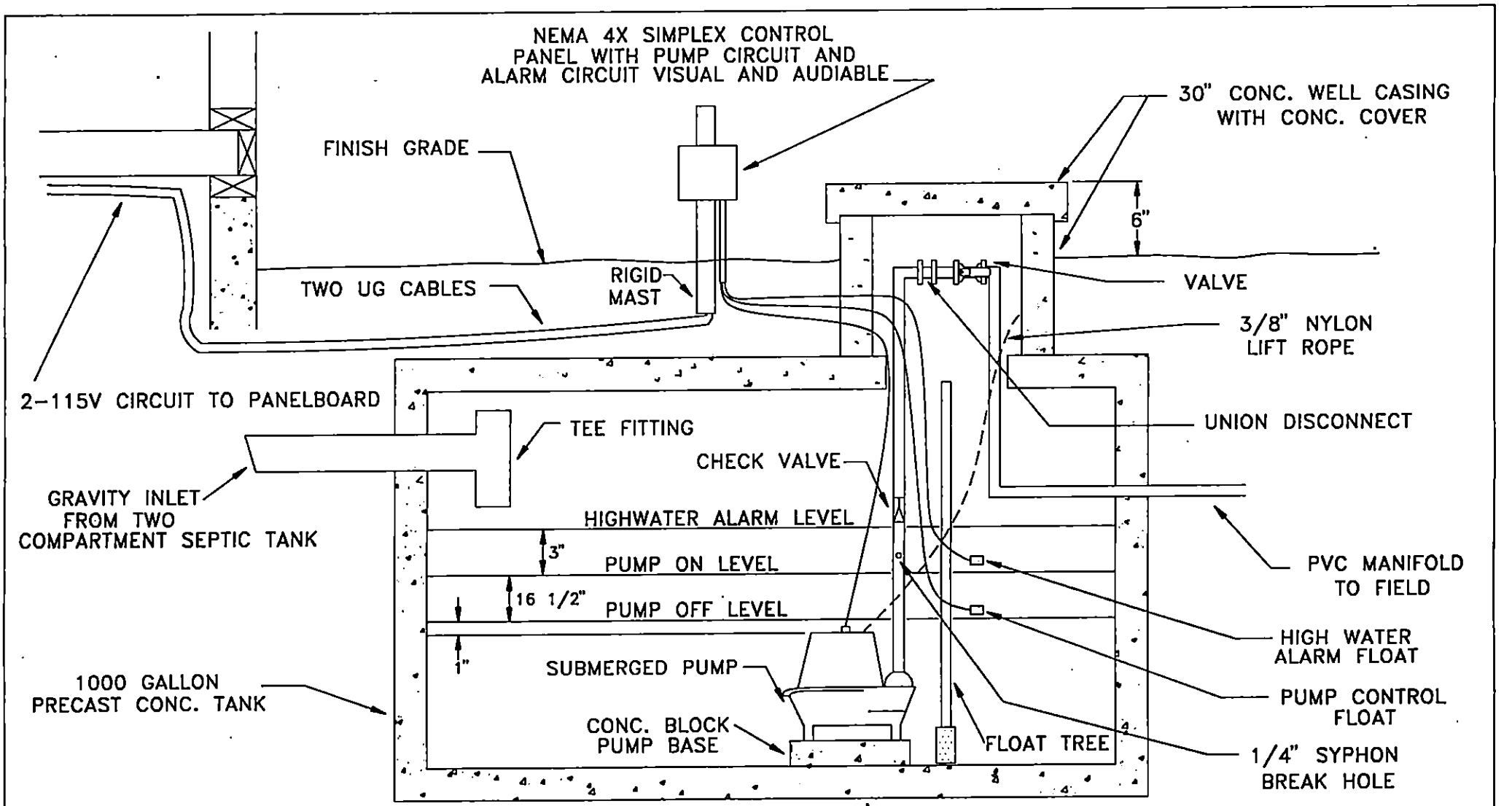


98195	
/4/99	
K.A.A.	
K.A.A.	
T.B.L.	
SHOWN	

LOT #8
LEMMOND ACRES
MINT HILL, NORTH CAROLINA

LPP DESIGN LAYOUT

FIGURE 2



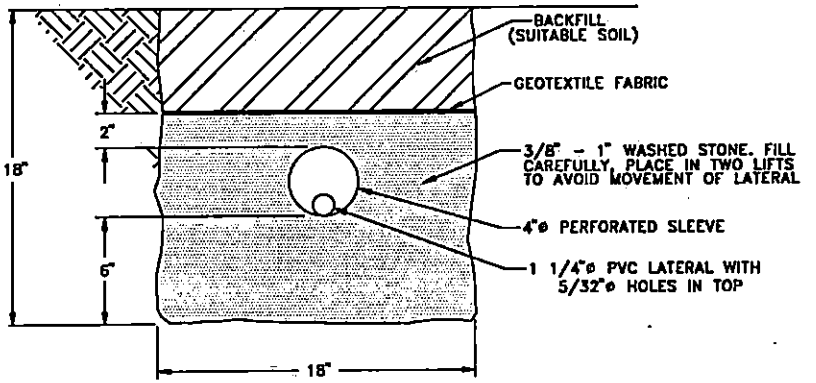
GCI
GEO-ENVIRONMENTAL CONSULTANTS, INC.
GEOTECHNICAL/ENVIRONMENTAL ENGINEERS & SCIENTISTS
11704 REAMES ROAD, CHARLOTTE, NC 28269-7637
PHONE (704)596-8788 FAX (704)596-8770

PROJECT #:	98195
DATE:	2/99
PROJECT MGR:	K.A.A.
DESIGN BY:	K.A.A.
DRAWN BY:	J.S.C.
SCALE:	NOT TO SCALE

LOT #8
LEMMOND ACRES
MINT HILL, NORTH CAROLINA

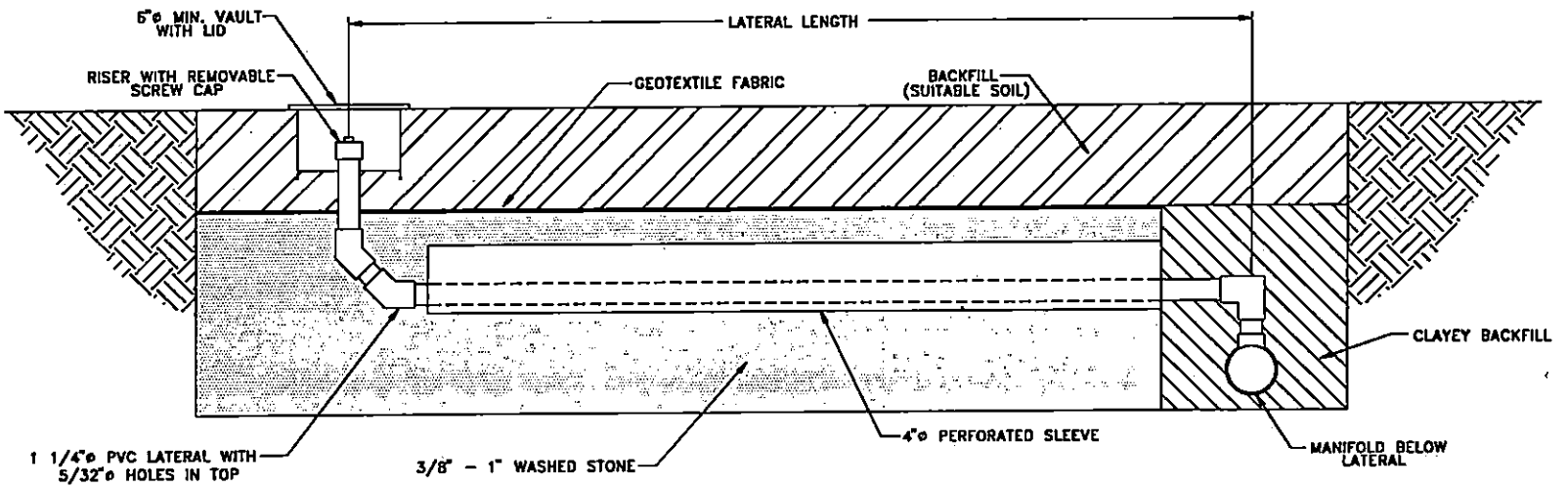
PUMPING TANK DIAGRAM

FIGURE 3



LATERAL TRENCH

NOT TO SCALE



MANIFOLD AND LATERAL

NOT TO SCALE

GCI
GEO-ENVIRONMENTAL CONSULTANTS, INC.
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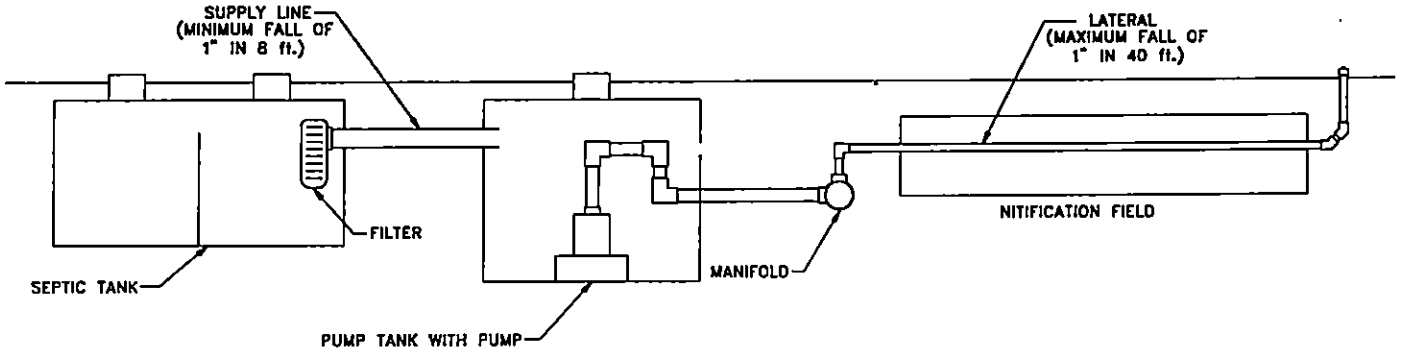
PROJECT #:	98195
DATE:	3/99
PROJECT MGR:	K.A.A.
DESIGN BY:	K.A.A.
DRAWN BY:	T.B.L.
SCALE:	NOT TO SCALE

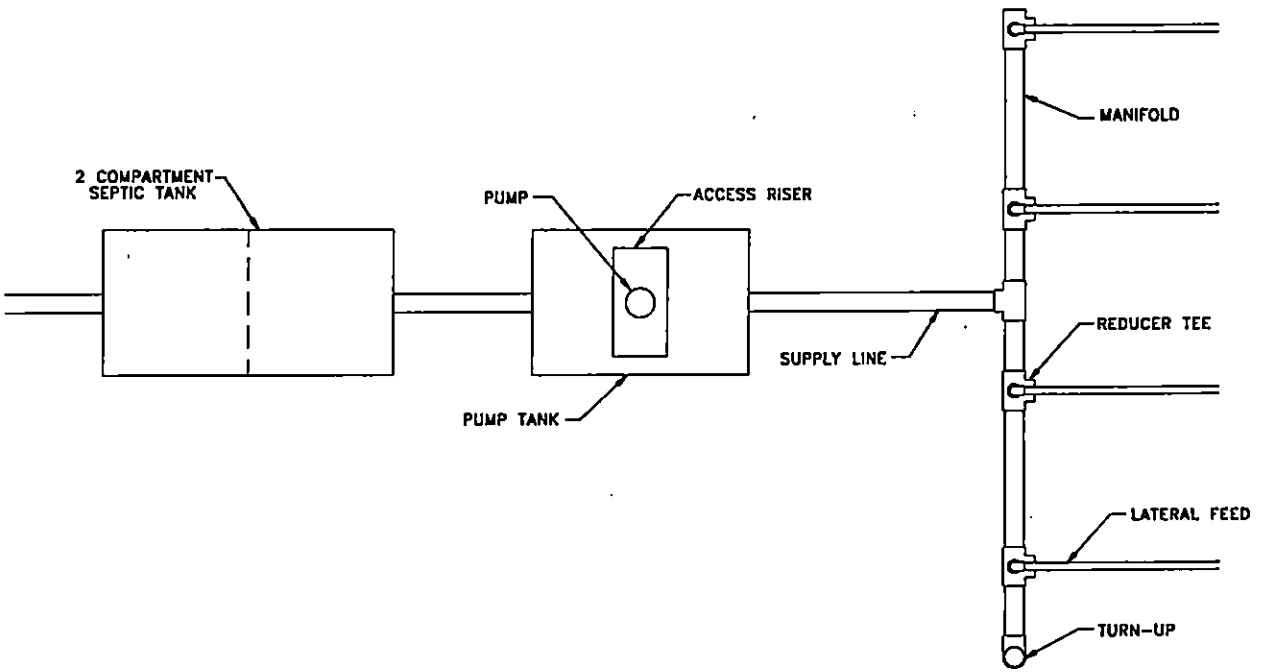
LOT #8
LEMMOND ACRES
MINT HILL, NORTH CAROLINA

LPP LATERALS

FIGURE 4

P:\PROJ\98195\MAN_LAT.DWG





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11704 REAMES ROAD, CHARLOTTE, NC 28269-7637
PHONE (704)596-8788 FAX (704)596-8770

PROJECT #:	98195
DATE:	3/99
PROJECT MGR:	K.A.A.
DESIGN BY:	K.A.A.
DRAWN BY:	T.B.L.
SCALE:	NOT TO SCALE

LOT #8
LEMMOND ACRES
MINT HILL, NORTH CAROLINA

PRESSURE MANIFOLD SYSTEM

FIGURE 5

P:\PROJ\98195\MAN_SYS.DWG

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

#3

Sheet ___
PROPERTY ID #: PO 139-152-6
Lot # : 8
File # : 2606A

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

OWNER: Cox Realty & Development APPLICANT: Brick Lowe DATE EVALUATED: 8-14-96
ADDRESS: 1916 Timberlake Cir. Charlotte PROPOSED DESIGN FLOW (.1949): 400GPD PROPERTY SIZE: .75 ±
PROPOSED FACILITY: residence PROPERTY RECORDED: ___
LOCATION OF SITE: Marshall Valley Ln
WATER SUPPLY: ☐ Private ☐ Public ☐ Well ☐ Spring ☒ Other ___
EVALUATION METHOD: ☒ Auger Boring ☐ Pit ☐ Cut
TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

	.1940 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	LS	0-4"	gr/sl	Fr/SEAP/SS/SP	34" TO SOIL WETNESS	34"	N/A	None	US IV .28gpd/ft²
		4-34"	SBM/SC	F:/SEAP/S/P					
2	LS	0-4"	gr/c/	Fr/SEAP/SS/SP	16" TO SOIL WETNESS	16"	N/A	None	US IV
		4-16"	SBK/C	F:/SEAP/SI/CL					
3	LS	0-3	gr/sl	Fr/SEAP/NS/NP	2.5Y 7/1 @ 6"	14"	N/A	None	US III
		3-14"	SBK/scl	Fr/SEAP/SS/SP					
4	LS	0-14"	gr/sl	Fr/SEAP/SS/SP	29" TO SOIL WETNESS	29"	N/A	None	US
		14-29"	SBK/SC	F:-V F:/Mixed/SS/SP					

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

OTHER FACTORS (.1946): ___
SITE CLASSIFICATION (.1948): Unsuitable
EVALUATED BY: W A. Medlin 8-14-96

FILE # 26069

COMMENTS Well Repair

LANDSCAPE POSITION	GROUP	TEXTURE	.1955 LTAR
R-RIDGE S-SHOULDER SLOPE L-LINEAR SLOPE FS-FOOT SLOPE N-NOSE SLOPE H-HEAD SLOPE CC-CONCLAVE SLOPE CV-CONVEX SLOPE T-TERRACE FP-FLOOD PLAIN	I	S-SAND LS-LOAMY SAND	1.2-0.8
	II	SL-SANDY LOAM L-LOAM	0.8-0.6
	III	SI-SILT SICL-SILTY CLAY LOAM CL-CLAY LOAM SCL-SANDY CLAY LOAM	0.6-0.3
	IV	SC-SANDY CLAY SIC-SILTY CLAY O-ORGANIC	0.4-0.1

CONSISTENCE MOIST	WET
VFR-VERY FRIABLE FR-FRIABLE FI-FIRM VFI-VERY FIRM EFI-EXTREMELY FIRM	NS-NON-STICKY SS-SLIGHTLYSTICKY S-STICKY VS-VERY STICKY NP-NON-PLASTIC SP-SLIGHTLYSTICKY P-PLASTIC VP-VERY PLASTIC

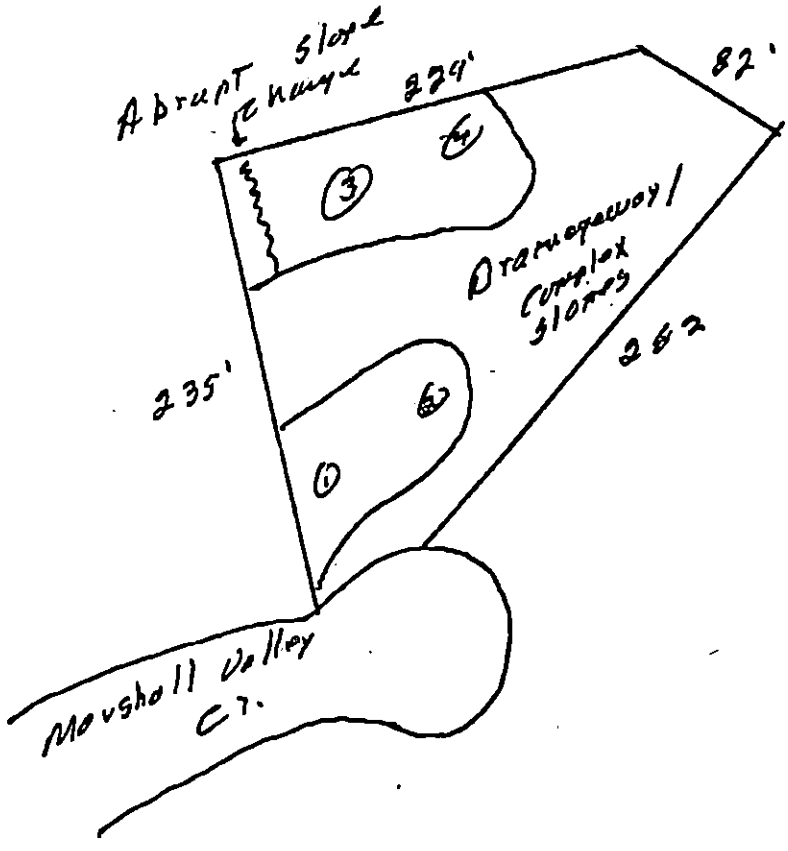
STRUCTURE

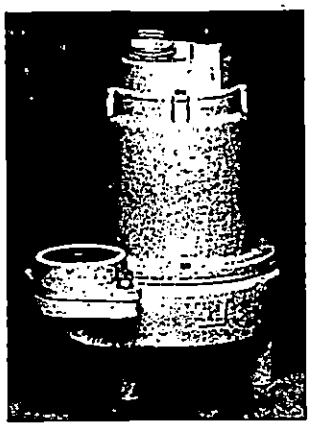
SG-SINGLE GRAIN
M-MASSIVE
CR-CRUMB
GR-GRANULAR
SBK-SUBANGULAR BLOCKY
ABK-ANGULAR BLOCKY
PL-PLATY
PR-PRISMATIC

MINERALOGY

SLIGHTLY EXPANSIVE

EXPANSIVE

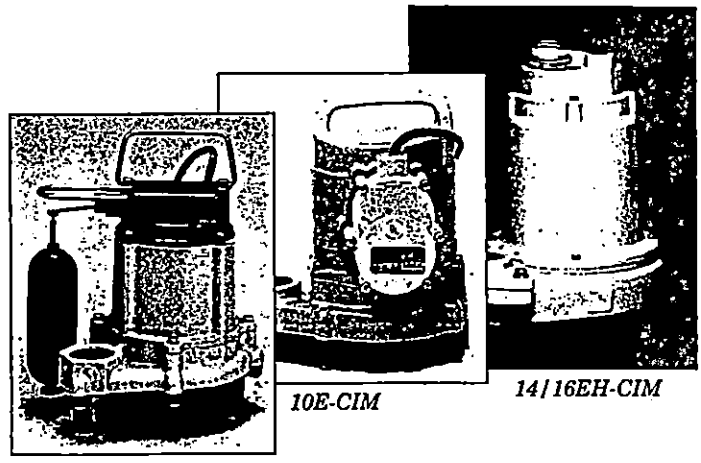




14S-CIM



10S-CIA-RFS
10SH-CIA-RFS



6E-CIA-SFS

10E-CIM

14/16EH-CIM

Sewage Ejector Pumps

- Continuous Duty - UL Listed, CSA Approved
- 2" NPT discharge

Little Giant PUMP COMPANY SUBSIDIARY
TECUMSEH PRODUCTS COMPANY

Submersible sewage pumps for extended or continuous use. Move large volumes of wastewater and sewage up to 2" in diameter (1¼" on 10SH). For heavy duty residential, commercial, and general industrial applications.

Heavy duty oil-filled cast iron housing provides for cooler running and longer motor life. Epoxy coated for corrosion and rust resistance. Mechanical seal (stainless steel spring, nitrile parts, carbon and ceramic face). Vortex impeller (nylon on 9S/10S/10SH; cast iron on 14S/16S). Thermal overload protection. Maximum fluid temperature: 140°F. Minimum sump is 18" diameter and 24" deep, except for 14S/16S units which require 30" deep sump.

Automatic models have piggy back float switch that allows you to set on/off levels. These pumps can also be used manually. 115V models come with 3-prong plug. **10SH Series Pumps**—*Excellent alternatives to Hydromatic model SP-40.* High head for loading dock sumps, elevator pits, and applications where sump screen normally clogs.

PUMP	PERFORMANCE GPM @ FEET OF HEAD					
	5	10	15	20	30	SHUTOFF
9S SERIES	80.0	50.0	24.0	-	-	18.0'
10S SERIES	110.0	85.0	50.0	-	-	20.0'
10SH SERIES	120.0	100.0	80.0	55.0	-	28.0'
14S SERIES	135.0	100.0	70.0	35.0	-	25.0'
16S SERIES	180.0	160.0	125.0	100.0	40.0	35.0'

MODEL	TYPE	V	PH	HP	CORD	STOCK#	EACH
9S-CIM*	MANUAL	115V	1PH	.40	15'	66140	$19.087
10S-CIM*	MANUAL	115V	1PH	1/2	15'	66142	291.20
10SH-CIM*	MANUAL	115V	1PH	1/2	15'	66163	262.79
14S-CIM*	MANUAL	115V	1PH	1/2	20'	66144	402.12
16S-CIM*	MANUAL	230V	1PH	1	20'	66146	501.59
16S-CIM*	MANUAL	208V**	1PH	1	20'	66145	518.47
9S-CIA-RFS	AUTO	115V	1PH	.40	15'	66148	232.36
10S-CIA-RFS	AUTO	115V	1PH	1/2	15'	66150	331.95
10SH-CIA-RFS	AUTO	115V	1PH	1/2	15'	66165	297.54

3 Phase 16S-CIM pumps available upon request. Call for details.
** Manual Operation Pumps can be converted to automatic operation by using float switches found in the "Electrical" section.*
*** These models rated 200-208V.*

Heavy Duty Dewatering and Effluent Pumps

- Continuous Duty - UL Listed, CSA Approved
- 1½" NPT discharge

Submersible sump/effluent pumps have non-clogging impeller that handles liquids and solid waste up to ¾" in diameter (½" on 6E series). Designed for heavy duty commercial, municipal and general industrial applications. Ideal for areas that accumulate light debris that would clog a standard sump pump. All pumps have epoxy-coated, oil-filled cast iron motor housing for cooler running and longer life. All have mechanical seals (stainless steel spring, nitrile parts, carbon and ceramic face). Thermal overload protection. Maximum fluid temperature: 140°F. Use with nonflammable liquids compatible with pump materials. 115V models have 3-prong plug.

14EH and 16EH units have cast iron impeller. All others have nylon impeller. 8E, 9E, and 10E series have vortex impeller and piggy back remote float switches which allow you to set on/off levels. These pumps can also be used manually. 6E automatic has factory preset snap-action float switch that turns on at 8½" and off at 3½". Minimum sump is 18" diameter and 24" deep. 14EH and 16EH pumps are high head and require 30" sump depth.

PUMP	PERFORMANCE GPM @ FEET OF HEAD						
	5	10	15	20	40	60	SHUTOFF
6E SERIES	50.0	42.0	27.0	-	-	-	20.0'
8E SERIES	52.0	45.0	34.0	-	-	-	21.0'
9E SERIES	57.0	53.0	40.0	30.0	-	-	23.0'
10E SERIES	80.0	67.0	52.0	33.0	-	-	26.0'
14EH SERIES DON'T USE UNDER 20'				60.0	20.0	-	50.0'
16EH SERIES HIGH HEAD; DON'T USE UNDER 30'					70.0	30.0	81.0'

MODEL	TYPE	V	PH	HP	CORD	STOCK#	EACH
6E-CIM-25*	MANUAL	115V	1PH	1/3	25'	66160	$111.63
10E-CIM*	MANUAL	115V	1PH	1/2	15'	66162	249.31
14EH-CIM*	MANUAL	115V	1PH	1/2	20'	66164	416.41
16EH-CIM*	MANUAL	230V	1PH	1	20'	66166	511.73
6E-CIA-SFS	AUTO	115V	1PH	1/3	10'	66168	126.06
8E-CIA-RFS	AUTO	115V	1PH	1/3	10'	66170	161.89
9E-CIA-RFS	AUTO	115V	1PH	.40	15'	66172	194.74
10E-CIA-RFS	AUTO	115V	1PH	1/2	15'	66174	286.00

3 Phase 16EH-CIM pumps available upon request. Call for details.
** Manual Operation Pumps can be converted to automatic operation by using float switches found in the "Electrical" section.*

Note: This is a condensed catalog. Some items are not shown. Our 448 page master catalog will be sent to you free of charge with your first order.

Junior Super Single® pump switch



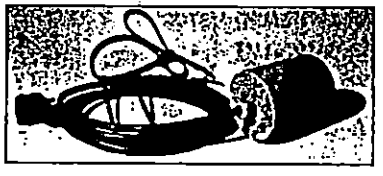
- Directly controls pumps
- Switch inside float
- No panel needed

Mercury switch is rated at 13 amps for ½ HP 120V or 1HP 230V motors. Equipped with 16/2 neoprene cord. Designed to attach to a pipe, float is 2.81" dia. x 3.42" long and is constructed of PVC. Pump range can be set 3.5 to 17 inches.

Switches are stocked with 110V plugs, which can be cut off for 230V or hard wire installations. Not intended to operate pump controller. Normally open contacts for pump down. Normally closed contacts also available. Attaches to pipe.

CONTACTS	CORD LENGTH	STOCK #	EACH
NO	20'	29278	$45.90
NO	30'	29279	49.70
NC	30'	29280	49.70

SJE PumpMaster® pump switch



- Mechanical action
- No mercury
- 120/230V

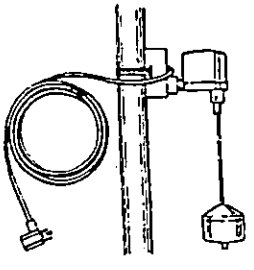
Designed to control motors directly as long as they are equipped with integral thermal O.L. Pumping range is 7" to 36". Float is 3.05" dia. x 3.56" long. PVC construction. Equipped with 110V plug that can be cut off for 230V or hard wire installation. Attaches to pipe.

13AMP MAX. ½ HP @ 120V/ 1 HP @ 230V

CONTACTS	CORD	STOCK #	EACH
NO	20'	29240	$45.31
NO	30'	29241	49.11
NC	30'	29243	49.11

15AMP MAX. ¾ HP @ 120V/ 2 HP @ 230V

CONTACTS	CORD	STOCK #	EACH
NO	20'	29250	$60.58
NO	30'	29251	65.38
NO	20' W/ 230V PLUG	29254	61.98
NC	30'	29253	65.38



Vertical Float Pump Down Switch

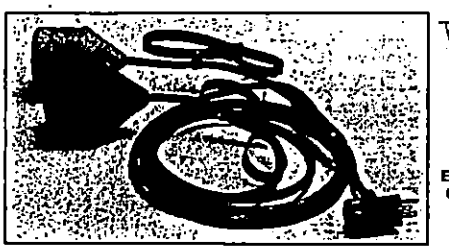
- Ideal for applications with limited space

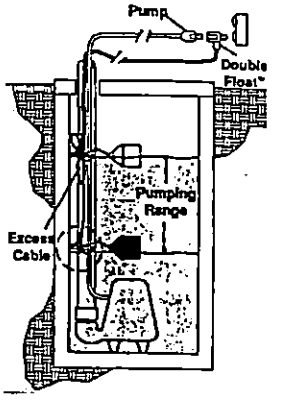
Mounts on 1¼" to 3¾" O.D. pipe and extends out only 5.93". 13 Amp rating is suitable ½ HP @ 115V or 1 HP @ 230V motors. 15 ft. cord has piggy-back plug which can be removed for direct wiring. Impact resistant PVC switch and housing, PVC mounting bracket, and an acetal plastic lift rod provide excellent corrosion resistance. Float adjusts for ¾" to 6½" travel.

Use this level control only with pumps equipped with integral thermal overload protection and do not use it in locations classified as hazardous.

115V VERTICAL FLOAT SWITCH	43811	44.16
230V VERTICAL FLOAT SWITCH	43813	45.56

Double Float™ pump switch





- Wide pumping range-1" to 48"
- Suitable for turbulent applications

Replaces need for small control panel by directly switching pumps with internal circuitry. Patented holding relay circuitry is also designed to eliminate chattering due to turbulent conditions. Floats are thick wall PVC with mercury contacts for use in liquids up to 140°F. 14 ga 2 and 3 conductor neoprene cables. Floats are mounted to pump discharge pipe with releasable pipe clamps.

UL Listed for water and sewage and CSA Certified. 120V switches are rated for pumps 1HP and less; 230V switches for 2HP or less. For direct use only with pumps with integral thermal overload protection or they may be wired to operate control panels for larger pump applications. Select Normally Open contacts for pump down (emptying) OR Normally Closed for pump up (filling).

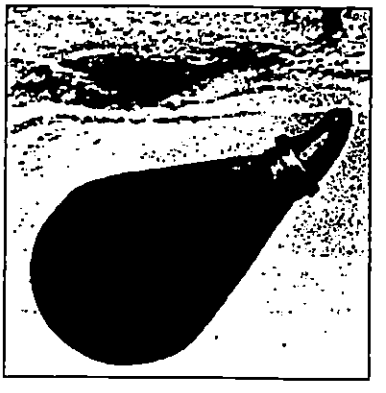
All switches are supplied with piggyback plugs. If you plan to cut off the plugs for hand wiring, 120V switches can be used only with 120VAC and 230V switches only with 230VAC circuits.

120 VAC

CONTACTS	CORD	STOCK #	EACH
NO	20 FT.	29282	$89.57
NO	30 FT.	29283	95.30
NC	30 FT.	29284	95.30

230 VAC

NO	20 FT.	29285	$92.24
NO	30 FT.	29286	97.97
NC	30 FT.	29287	97.97



Flygt ENM Float Switches - 3 wire

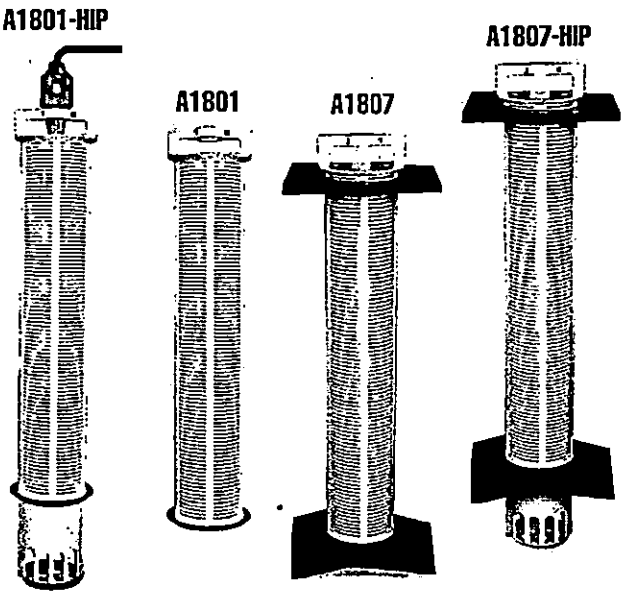
- No mercury

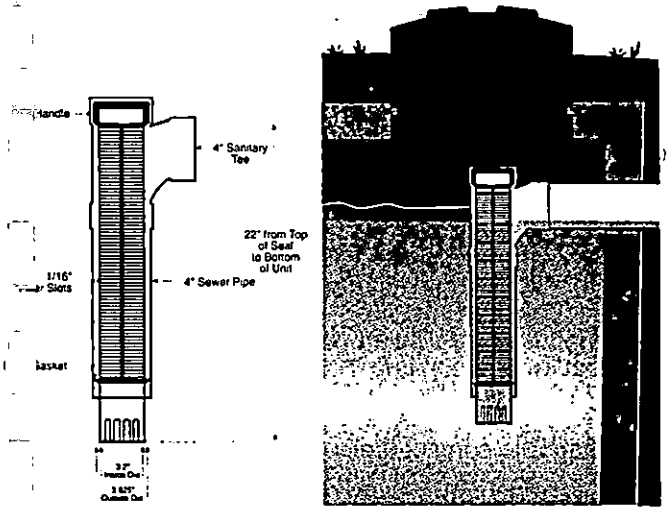
Our Genuine Flygt float switch has an internal weight and is housed in a smooth, chemical resistant, polypropylene casing. A unique boot with a locked compression fitting provides a secure yet flexible means of attaching the cable to the float. Both the Flygt and generic can be wired NC or NO. Not rated for potable water.

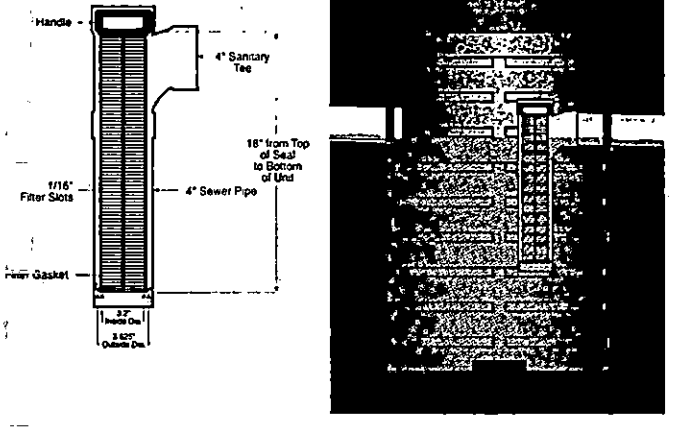
20' FLYGT	60515	$139.86	
40' FLYGT	60520	150.19	
60' FLYGT	60525	152.25	
GENERIC 20' SPDT*	47713	45.49	3+ 43.10
GENERIC 40' SPDT*	47717	62.22	3+ 58.96
GENERIC 60' SPDT*	47719	78.96	3+ 74.82

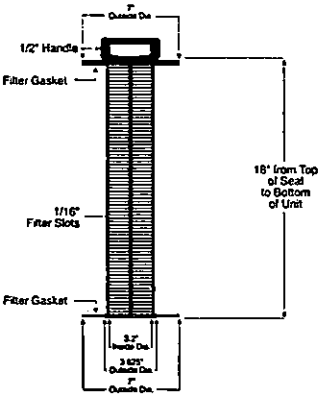
**External weight. Generics contain mercury.*

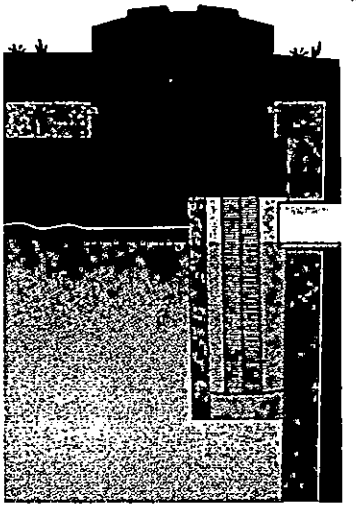
A1800s











Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584, U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824, Other Patents Pending

Zabel™ A1800 Series Residential Wastewater Effluent Filter Product Specification

1. Product Name: Zabel™ The A1800 Residential Wastewater Filters, U.S. Patent Nos.: 5,382,357; 5,482,621; Canadian Patent No: 2,135,937; Other patents pending.
2. Model Numbers: A1800; A1800-HIP, A1800-HIP-SF, A1801, A1801-HIP, A1801-HIP-SF, A1807, A1807-HIP
3. Application: Single family homes no more than four bedrooms. **Zabel's™ New Residential High Performance Filter** is designed to provide extra protection for homes with garbage disposals and still sloughs the solids back into the tank.
4. Performance Specification
   4.1. All A1800 Models: Maximum daily flow - 800 gpd.
   4.2. Multiple Filters may be installed in manifolds to handle larger flows.
   4.3. TSS: Average reduction in TSS within 6 months of installation - 40 percent in typical residential wastewater.
5. Materials: All materials are non-corrosive PVC
6. New System Installation: Center the top of the 4-inch Filter Case under an outlet access opening at least 8 inches in diameter. Securely fasten the bell coupling of the case by a PVC solvent weld connection to the 4-inch PVC pipe extending through the outlet wall of the tank. The pipe extending through the end wall may be any schedule four-inch pipe. Location of the PVC outlet pipe in the tank end wall shall conform to local code. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket **only** into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. A riser to grade over the Outlet Access Opening is recommended.
7. Existing System Installation: The filter cartridge, Model A1801 may be installed in any existing 4" outlet Tee and pipe. The filter may be installed in an existing tank if an adequate outlet access opening already exists and the filter can be installed without damaging the existing tank. If a 4-inch PVC outlet pipe does not extend into the tank, the filter can be installed utilizing a plumbing flange. For septic tanks with cast in place concrete baffles use the A1807 model. Insert bottom of filter through thick gasket and slide to top of filter cartridge. Install filter cartridge with top gasket **only** into tank baffle, to ensure gasket lies flat without hanging over the edge of baffle. **Do not trim** gasket unless it overhangs edge of baffle. Remove filter cartridge and install thin gasket into the groove at the bottom of the cartridge. Reinsert the cartridge into the concrete baffle to complete installation. If the existing tank cannot be used, the filter can be installed in existing systems using a Zabel Container Assembly Model CA100 or Zeus™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters more than 12 inches below grade. Tap the cartridge on the inside of the inspection port or hose off the cartridge into the tank if needed and reinsert into the case. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
10. Service Frequency: The filter should be cleaned when the septic tank is normally inspected and pumped as required by local regulation. The A1800's are designed to slough most normal solids off the inside of the vertical walls and back into the tank when the effluent flow is in a resting state. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system
11. Warranty: The A1800's are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.
12. Dimensions:

	Diameter	Cartridge Height	Filtration	Total Filter Surface	Lineal Feet of Weir
A1800	4"	18"	1/16"	158.4 in²	61
A1800-HIP	4"	22"	1/2"-1/16"	*158.4 in²	*61
A1807	4"	18"	1/16"	158.4 in²	61

*Calculations are for the 1/16" area only.