David A. Roberts Engineering
SPECIALIZING IN WATER AND WASTEWATER ENGINEERING PROJECTS
Mailing Address
309 N. ZION ST.
LANDIS, N.C. 28088
BUS. PHONE (704) 857-3800
Office Location
HIGHWAY 29/601 and
DAUGHERTY ROAD

NORTH CAROLINA PROFESSIONAL SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS

September 21, 1992

Mr. Wesley Sparks
Iredell County Health Department
412 East Center Street
Mooresville, N.C. 28114

Subject: Low Pressure Wastewater Disposal System
Lot #19 and #20 Combined, Knotty Pine Subdivision
Knotty Pine Lane off Perth Road
Iredell County, North Carolina
Odell Stamey - Owner/Developer

Dear Mr. Sparks:

This wastewater disposal system has been installed by Delbert Bostian, and our inspection on September 7, 1992 revealed the flushing of the lines, balancing the heads, testing the alarm, and adjusting the levels of the float switches. At that time, the electrical connection within the access manhole over the pump tank was found to be out of compliance with electrical requirements, and the Owner/Developer was so notified. Final shaping and seeding of the disturbed area at the disposal trenches was also needed.

The Owner/Developer called me this morning to acknowledge that the electrical connection at the access manhole over the pump tank has been properly completed, and that the electrical service to this residence should be switched on. I talked with you and with building inspector Neal Wooten about this matter this morning, and I advised Neal that he had my permission to authorize the turning "On" of the power at this location if he found the electrical wiring at the box to be satisfactory.

The wastewater disposal system at this location has been installed in general compliance with approved engineering plans and specifications.

Please let me know if you have any questions or if I can be of additional service.

With kind regards,

David A. Roberts

David A. Roberts

copy: Odell Stamey
Delbert Bostian

SPECIFICATIONS

FOR

ON-SITE, GROUND ABSORPTION

WASTEWATER DISPOSAL SYSTEM

SERVING

PROPOSED THREE-BEDROOM RESIDENCE

LOT #19 & #20 COMBINED, KNOTTY PINE SUB-DIVISION

KNOTTY PINE LANE OFF PERTH ROAD

IREDELL COUNTY, NORTH CAROLINA

FOR

ODELL STAMEY

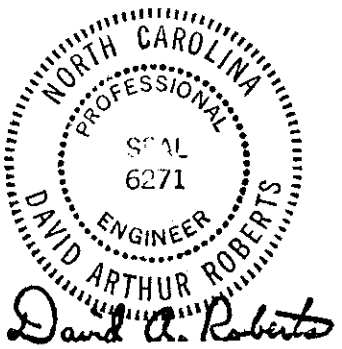
1316 SOUTH MAIN STREET

KANNAPOLIS, N.C. 28081

PREPARED BY:

DAVID A. ROBERTS, P.E.
CONSULTING ENGINEER
309 NORTH ZION STREET
LANDIS, NORTH CAROLINA 28088
(704) 857-3800

MAY 19 1992



David A. Roberts Engineering
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CAUSEWAY ROAD

NORTH CAROLINA PROFESSIONAL SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS

May 19, 1992

Subject: Site and Soil Evaluation for Recommended On-site Low Pressure Wastewater Disposal System
Lot #19 and #20 Combined, Knotty Pine Subdivision
Knotty Pine Lane Off Perth Road
Iredell County, North Carolina

Proposed Building to be Served by the Wastewater System:
Three-bedroom home, 2 1/2 baths, dishwasher, no garbage disposal, with clothes washer, no basement.

Location: This property is located along the southern margin of Knotty Pine Lane at the cul-de-sac at its end approximately 1/4 mile east of its intersection with Perth Road in Iredell County.

Terrain: This tract is rolling, upland terrain located along the side and bottom of the hill and drains toward the south and west.

Vegetation: This property is wooded in mixed hardwoods, pines, scattered cedars, and scrub undergrowth over most of the lot, but the northwest front half of the lot has been cleared.

Soil Profile: The soil in the area of the proposed on-site wastewater system, was evaluated by Health Department personnel in the area of the proposed wastewater system.

Recommendations for On-site Wastewater Disposal System:
The wastewater disposal system recommended for this site and for the residence to be constructed thereon, consist of a low pressure piping system and contains 1,500 gallon septic tank, 1,000 gallon dosing tank, new 1 1/4" diameter PVC low pressure distribution system, pump with controls, and a warning panel to indicate if malfunction of the system does occur.
The disposal field should be of "modified low pressure" distribution system requiring shallow placement of disposal line with 8" capping over the existing soil using suitable loamy or sandy loam soil material.

EXPLANATION OF SYSTEM OPERATION AND DESIGN

The wastewater disposal system recommended for this site consists of a "modified" low pressure piping system and contains a septic tank, a dosing tank with pump and controls, a shallow distribution system of low pressure piping, an alarm system for indicating when problems with the system occur, subsurface interceptor trenches and spreading useable soil to 8" depth over existing soil surface at disposal trenches. It should be kept in mind that this system is designed to accommodate a moderate amount of wastewater from the household and that all measures should be undertaken to minimize the volume of water entering the system to include the following precautions: (a) Providing water conserving plumbing fixtures within the house; (b) Making rapid repairs to leaking plumbing fixtures; (c) Developing conservative water use habits on the part of all members of the household; (d) Monitoring and maintaining the system as may be necessary for proper operation; (e) Checking and pumping the septic tank sludge on a regular basis of approximately every year when garbage grinders are included in the wastewater system (NOT RECOMMENDED) or every three years when garbage grinders are not included; (f) Insuring proper installation of this system by a competent Installation Contractor; and (g) Avoiding excessive sprinkling of the yard in the vicinity of the absorption fields. The system as recommended is intended to provide satisfactory wastewater disposal for the site encountered for a reasonable period of time. Due to the rather complex inter-relationship between soil properties, system installation, wastewater habit patterns of the household, system maintenance, vegetative activity, climate and rainfall, and other factors over which the Engineer has no control, yet which ultimately influence the successful operation of a wastewater disposal system, the Engineer requires that he be relieved of any liability that may result from failing or malfunctioning of this system of wastewater disposal. The persons occupying this residence should be familiar with the contents of the Engineer's recommendations. A CONFERENCE SHOULD BE HELD WITH THE ENGINEER AND THE INSTALLATION CONTRACTOR IN ATTENDANCE PRIOR TO BEGINNING ANY ACTUAL CONSTRUCTION OF THE WASTEWATER DISPOSAL SYSTEM REPAIR IN ORDER TO ANSWER ANY QUESTIONS AND TO INSURE THAT THE INSTALLATION CONTRACTOR WILL MAKE NO CHANGES TO THE RECOMMENDED SYSTEM WITHOUT FIRST OBTAINING WRITTEN PERMISSION FOR SUCH CHANGES FROM THE ENGINEER. THE CONTRACTOR SHALL COORDINATE HIS WORK SCHEDULE WITH THE ENGINEER AND WITH REPRESENTATIVES OF THE HEALTH DEPARTMENT IN ORDER THAT APPROPRIATE AND TIMELY INSPECTIONS OF THE CONSTRUCTION WORK CAN BE MADE.

PREPARED BY: DAVID A. ROBERTS, P.E. OF LANDIS, N.C.

SITE PREPARATION REQUIREMENTS FOR
CONSTRUCTION OF A
"MODIFIED" LOW PRESSURE PIPE SYSTEM OF WASTEWATER DISPOSAL

NOTE: PRIOR TO BEGINNING ANY ACTUAL CONSTRUCTION OF THE WASTEWATER DISPOSAL SYSTEM, THE INSTALLATION CONTRACTOR SHALL NOTIFY THE ENGINEER OF HIS INTENDED CONSTRUCTION SCHEDULE AND SHALL ARRANGE A PRE-CONSTRUCTION CONFERENCE WITH THE ENGINEER AT THE SITE FOR THE PURPOSE OF REVIEWING THE WORK TO BE DONE AND FOR ANSWERING ANY QUESTIONS THE INSTALLATION CONTRACTOR MAY HAVE ABOUT THE CONSTRUCTION OF THE WASTEWATER SYSTEM. NO CHANGES ARE TO BE MADE TO THE WASTEWATER DISPOSAL SYSTEM WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

1. Prior to beginning construction of any portion of the residence to be built on this site, lay out the boundaries of the area on the site into which the "modified" low pressure wastewater system will be installed. Such boundary should be approximately ___70___ feet wide by ___85___ feet long or larger, and should be laid out to follow the contour of the land surface.

2. Remove all small trees, bushes and undergrowth from the area of the proposed disposal field by cutting them off at ground level and removing them from the area. Large trees may remain. Do not use heavy equipment for site clearing.

3. Use a wide trenching machine or narrow backhoe to excavate the trenches ___12___ inches wide and ___10___ inches deep to accommodate 1 1/4 inch diameter P.V.C. laterals. Trenches are to be laid out to follow the contour of the existing land surface as nearly as possible. Remove loose soil from the bottom of the trenches. At approximately ___15___ feet intervals, leave undisturbed earthen dams in the bottom of the trenches approximately ___6___ inches high and approximately ___12___ inches long.

4. Powder the bottom and the sidewalls of the trenches with lime (calcium carbonate). Use sufficient quantity to obtain a white covering over the area. Lightly rake the sidewalls and bottom of the trenches to scarify soil surfaces and to mix the lime powder into the soil.

5. Install small stone (3/8" to 1" size) in the bottom of the trenches to the proper depth, approximately ___4___ inches below the top of the trench, in preparation to receive the

9. The Installation Contractor shall smooth the disturbed land surface after installation of the laterals and manifold piping, and shall leave the surface neatly shaped to shed rainwater and ready for seeding. The Installation Contractor shall stabilize the area of construction by planting and seeding with Kentucky 31 tall fescue and shall keep the planted areas watered and mulched until such time that a hardy stand of grass is established. Prior to seeding, evenly distribute and mix with the soil 8-8-8 commercial fertilizer at the rate of approximately 40 square feet per pound (1,000 pounds per acre). For soils with a pH of 6.5 or less, hydrated agricultural lime shall be applied at the rate of 20 square feet per pound (2,000 pounds per acre) and at a rate of 40 square feet per pound (1,000 pounds per acre) for soils with a pH greater than 6.5 as determined by soil samples tested by the North Carolina Agriculture Department or as approved by the Engineer. Seed shall be sowed at a rate of 200 square feet of area planted per pound of grass seed and shall be raked lightly into the top 1/8 inch of soil, rolled lightly with a light weight lawn roller, and watered with a fine spray.

10. The pre-treatment 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 pre-treatment tank shall contain 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 pre-treatment tank at such height as to provide approximately 8 inches of cover soil over top of the tank. The tank shall be properly sealed using 1" diameter butyl rubber pliable sealant as approved by the tank manufacturer.

11. The dosing tank shall consist of a 1,000 gallon capacity, reinforced precast concrete tank with baffle containing two 4" diameter openings located no more than 12" above the tank floor. Provide access for entry into the tank directly over the pump location and extending 6 inches above final grade. The tank shall be properly sealed using 1" diameter butyl rubber pliable sealant as approved by the tank manufacturer. After joining, plaster along the joint with hydraulic cement, cement mortar, or other approved waterproofing sealant.

12. The new pump to be installed into the dosing tank shall be Goulds 1 horsepower WS1012BF Series pump, Model 3887, or Myers 1 horsepower WHR10-21C Series pump, or Zoeller 1 horsepower E284 Series pump, or Hydromatic 1 horsepower SK100MZ Series pump or approved equal. Such pump shall consist of 1 horsepower motor capable of handling 3/4" sphere solids, heads to 27.8 feet total, flows of 54.4 gallons per minute, and shall require 230 volts, single phase, 60 hertz,

12 amp service.

13. The pump shall be operated automatically by use of Super Single Pump Switch, Model #15ssd, 230 v., or approved equal, equipped with a three-pronged series plug (configuration per NEMA5-15) for 1 horsepower pump and set for 17 inch start/stop level adjustment.

14. Pump and control circuits shall be provided with manual circuit disconnects within a water-tight, corrosion-resistant, outside enclosure (NEMA 4X or equivalent) adjacent to the pump tank, securely mounted at least 12 inches above the 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.

15. The "Owner Warning Panel" shall be located at a conspicuous location within the building at a location as selected by the owner. The "Owner Warning Panel" shall contain the name, address, telephone number, and emergency phone number of the person to contact immediately should malfunctions occur and warnings be given by means of the "Owner Warning Panel".

16. The "Owner Warning Panel" shall contain a sign marked "Wastewater System Alarm". The Installation Contractor shall install a "Tank Alert" warning system by S.J. Electro Systems, Inc., of Detroit Lakes, MN. which shall consist of a float and alarm panel. Such "Tank Alert" shall be connected with a separate circuit from that supplying power to the pump. The alarm shall be mounted in a location approved by the Engineer which will insure it being easily audible from any location within the house.

17. All control and power wiring for the entire wastewater disposal system shall be in compliance with all local, state, and federal regulations, codes, and ordinances, and shall be confined on the site generally to the area of the pump, control floats, and "Owner Warning Panel". The Installation Contractor shall be responsible for the costs of obtaining all power and control wiring for this system and shall coordinate his work with the electrical contractor and with the Owner.

18. The wastewater system Installation Contractor shall agree to provide a minimum of one year of regular service to the

occupant for maintenance and upkeep of this system at no additional cost to the occupant, and such one year period shall begin from the date of final inspection and acceptance of the system construction by the occupant, the Engineer, and representatives of the Health Department. After the above one year period has expired, the Installation Contractor shall offer the occupant a continuation of maintenance and upkeep service at a reasonable charge as may be negotiated between the Installation Contractor and the occupant. Such service shall include checking the entire system at least twice yearly, offering quick response servicing in case of a malfunction of the system (maximum of 24 hours after warning is given by the "Occupant's Warning Panel") and performing such servicing of components and replacing of worn or defective equipment as may be necessary to keep the system operating in good condition. In the event that the Installation Contractor will not be willing to agree to above described one year maintenance period, then any other time period must be acceptable to the occupant, the Engineer, and to the Health Department.

19. If the site topography is such that rainwater runoff from the building roof is likely to flow toward and through the area of the wastewater disposal trenches, then the stormwater shall be piped away from the area of the disposal field.

INITIAL SYSTEM

DESIGN SPECIFICATIONS FOR LOW PRESSURE PIPE SYSTEM FOR PROPOSED THREE-BEDROOM HOME LOCATED ON LOT #19 & #20 COMBINED, KNOTTY PINE SUBDIVISION, IREDELL COUNTY, N.C. - ODELL STAMEY - OWNER

DAILY WASTEFLOW:	360 gpd
SEPTIC TANK SIZE:	1,500 gallons
PUMPING TANK SIZE:	1,000 gallons
EFFLUENT LOADING RATE:	0.1252 gpd/sq. ft.
TOTAL ABSORPTION AREA:	2,875 sq. ft.
TOTAL LINEAR FEET AND DIAMETER OF LATERALS:	575 feet of 1 1/4" diameter PVC
TOTAL LINEAR FEET OF 4" POROUS PLASTIC TUBING:	575 feet
TOTAL LENGTH AND DIAMETER OF SUPPLY MANIFOLD:	12 feet of 4" diameter 210 feet of 3" diameter 50 feet of 2" diameter
NUMBER AND LENGTH OF LATERALS:	1 @ 55', 3 @ 60', 2 @ 65', 3 @ 70'
MANIFOLD PLACEMENT:	One end
HOLE SIZE:	5/32" diameter
TOTAL NUMBER OF HOLES:	107 orifices
TOTAL FLOW THROUGH SYSTEM (SEE ORIFICE DATA SHEET)	Total from 107 orifices = 52.4 gpm Anti-siphon hole 2 gpm TOTAL 54.4 gpm
ELEVATION HEAD:	20.9 feet
PRESSURE HEAD:	2.1' highest line
FRICTION HEAD:	4.8'
TOTAL HEAD:	27.8 feet
STORAGE VOLUME IN PIPES:	Manifold = 96.3, Laterals = 51.8 Total = 148.1 gals

DOSING VOLUME:	360 gallons = 17" in 1,000 gal. tank
CHECK VALVE NEEDED:	Yes
PUMP REQUIREMENTS:	54.4 gpm at 27.8' feet of head. Use Hydromatic 1 HP, SK100M2 or Goulds 1 horsepower WS1012BF Pump, Model 3887 or Myers 1 HP WHR 10-21C Series pump, or Zoeller E284 Series pump or approved equal. Pump with 3" diameter discharge piping.
AREA OF SOIL FILL:	8" suitable soil cap- extend 2 1/2' beyond disposal trenches

ORIFICE DATA SHEET

INITIAL WASTEWATER SYSTEM

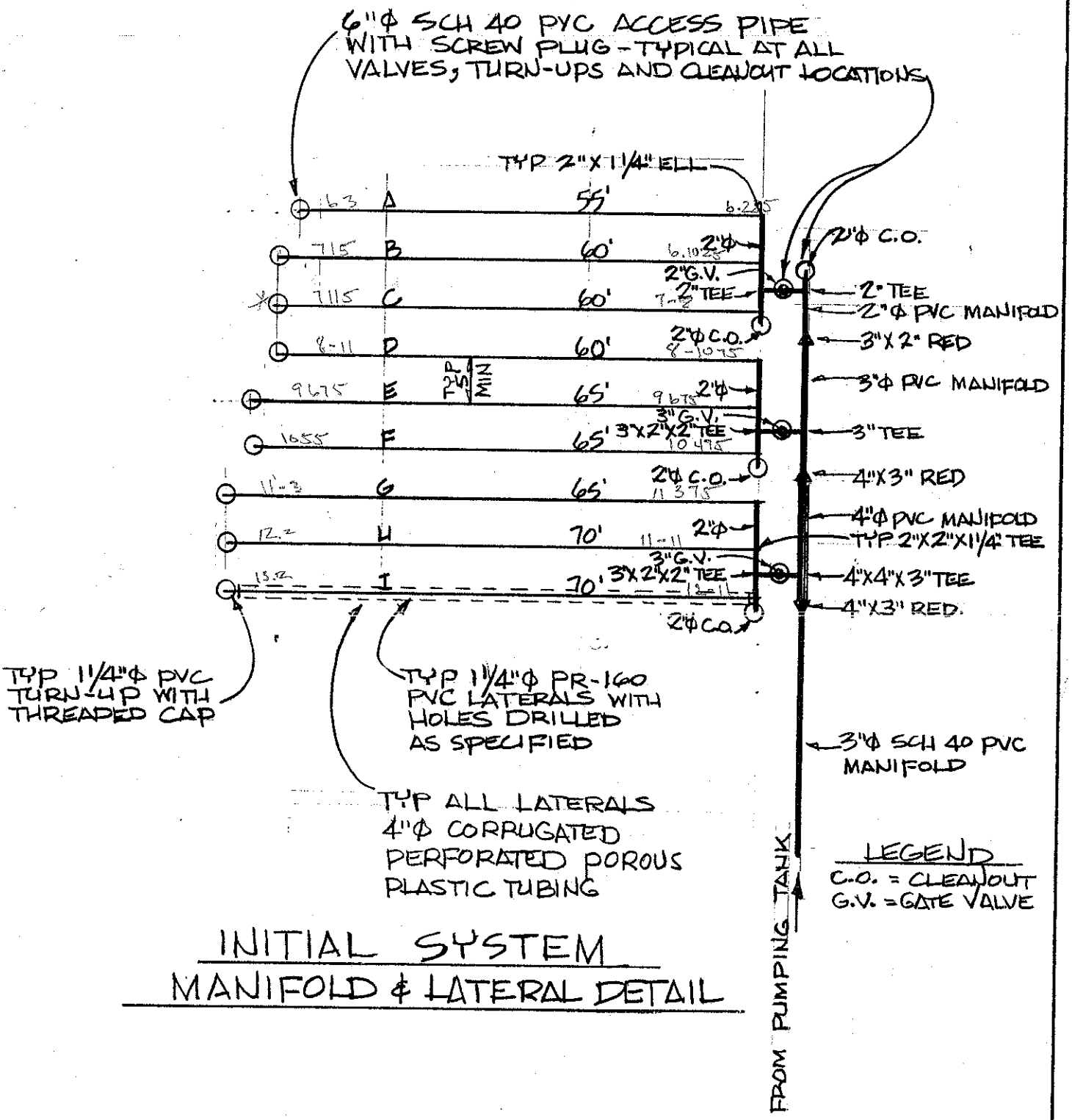
LETTER IDENTIFICATION OF LATERALS	LENGTH OF LATERALS	ELEVATION OF LATERALS	HEAD AT LATERAL	SIZE OF ORIFICE	FLOW PER ORIFICE (gpm)	NUMBER OF ORIFICES PER LATERAL	FLOW PER LATERAL (gpm)	DISTANCE FROM MANIFOLD PIPE TO FIRST ORIFICE	ORIFICE SPACING (on center)	DISTANCE FROM LAST ORIFICE TO END OF LATERAL
A	55'	94.1	2.1	5/32"Ø	0.42	13	5.46	2'-8"	4'-3"	1'-4"
B	60'	93.2	3.0	5/32"Ø	0.50	12	6.00	1'-8"	5'-0"	3'-4"
C	60'	92.3	3.9	5/32"Ø	0.57	10	5.70	4'-0"	6'-0"	2'-0"
D	60'	91.4	2.1	5/32"Ø	0.42	14	5.88	1'-3"	4'-4"	2'-5"
E	65'	90.5	3.0	5/32"Ø	0.50	12	6.00	3'-7"	5'-5"	1'-10"
F	65'	89.7	3.8	5/32"Ø	0.56	10	5.60	2'-2"	6'-6"	4'-4"
G	70'	88.9	2.2	5/32"Ø	0.43	14	6.02	3'-4"	5'-0"	1'-8"
H	70'	88.1	3.0	5/32"Ø	0.50	12	6.00	1'-11"	5'-10"	3'-11"
I	70'	87.2	3.9	5/32"Ø	0.57	10	5.70	4'-8"	7'-0"	2'-4"
LINES TOTAL	575' TOTAL					107 TOTAL	52.36 TOTAL			

All laterals shall be 1 1/4" Ø PR160 PVC piping with 5/32" Ø holes located along the pipe length as outlined herein.

LOT #19 & #20 COMBINED, KNOTTY PINE SUBDIVISION, IREDELL COUNTY, N.C.
ODELL STAMEY, OWNER, 1316 SOUTH MAIN STREET, KANNAPOLIS, N.C. 28081

PREPARED BY DAVID A. ROBERTS, P.E. OF LANDIS, N.C.

MAY 19, 1992



INITIAL SYSTEM MANIFOLD & LATERAL DETAIL

MANIFOLD AND LATERAL DETAIL

FOR

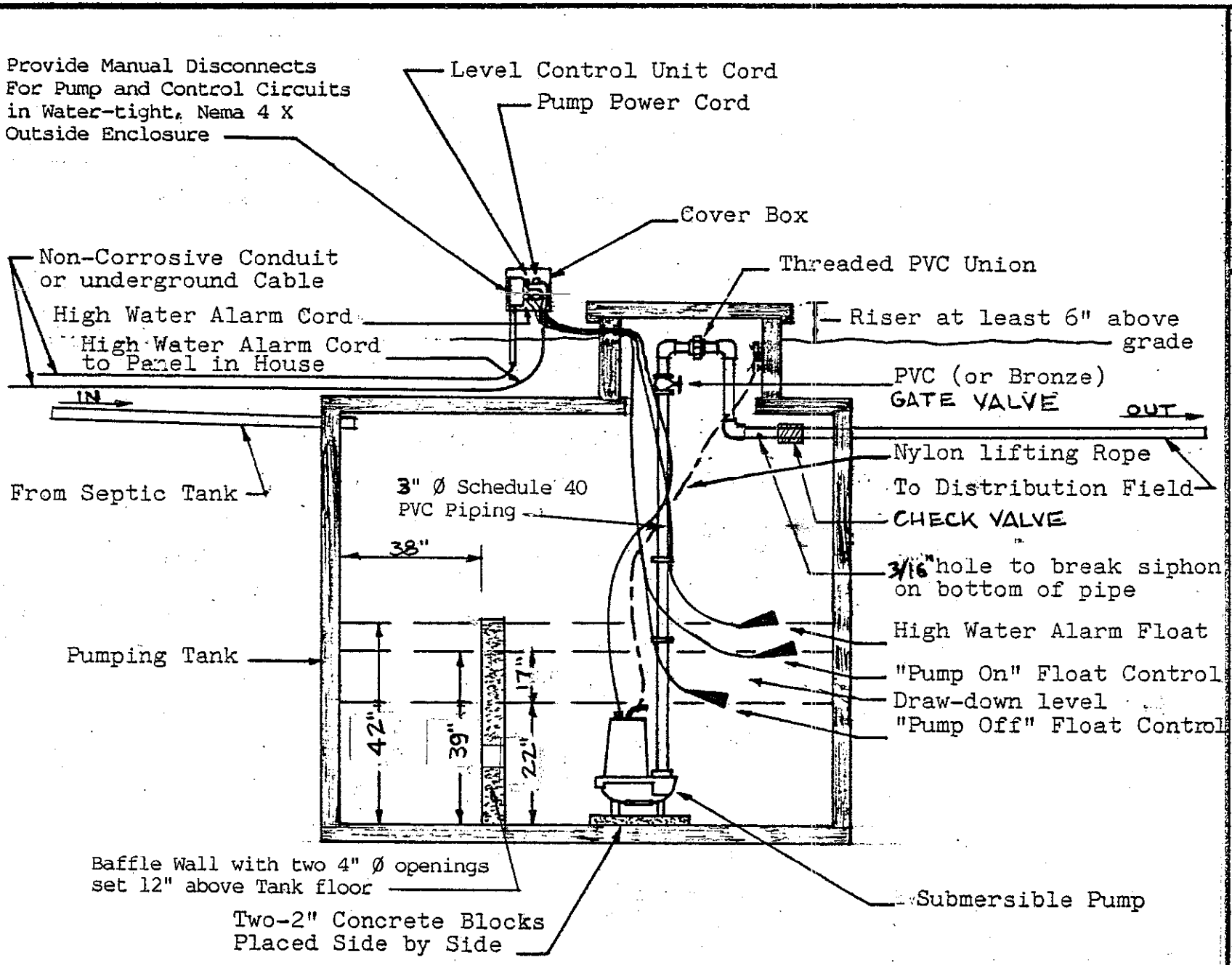
LOW PRESSURE WASTEWATER DISTRIBUTION SYSTEM

PREPARED BY: DAVID A. ROBERTS, P.E. OF LANDIS, N.C.

NO SCALE

NORTH CAROLINA PROFESSIONAL SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS

David A. Roberts



NORTH CAROLINA REGISTERED SEAL 6271 ENGINEER DAVID A. ROBERTS

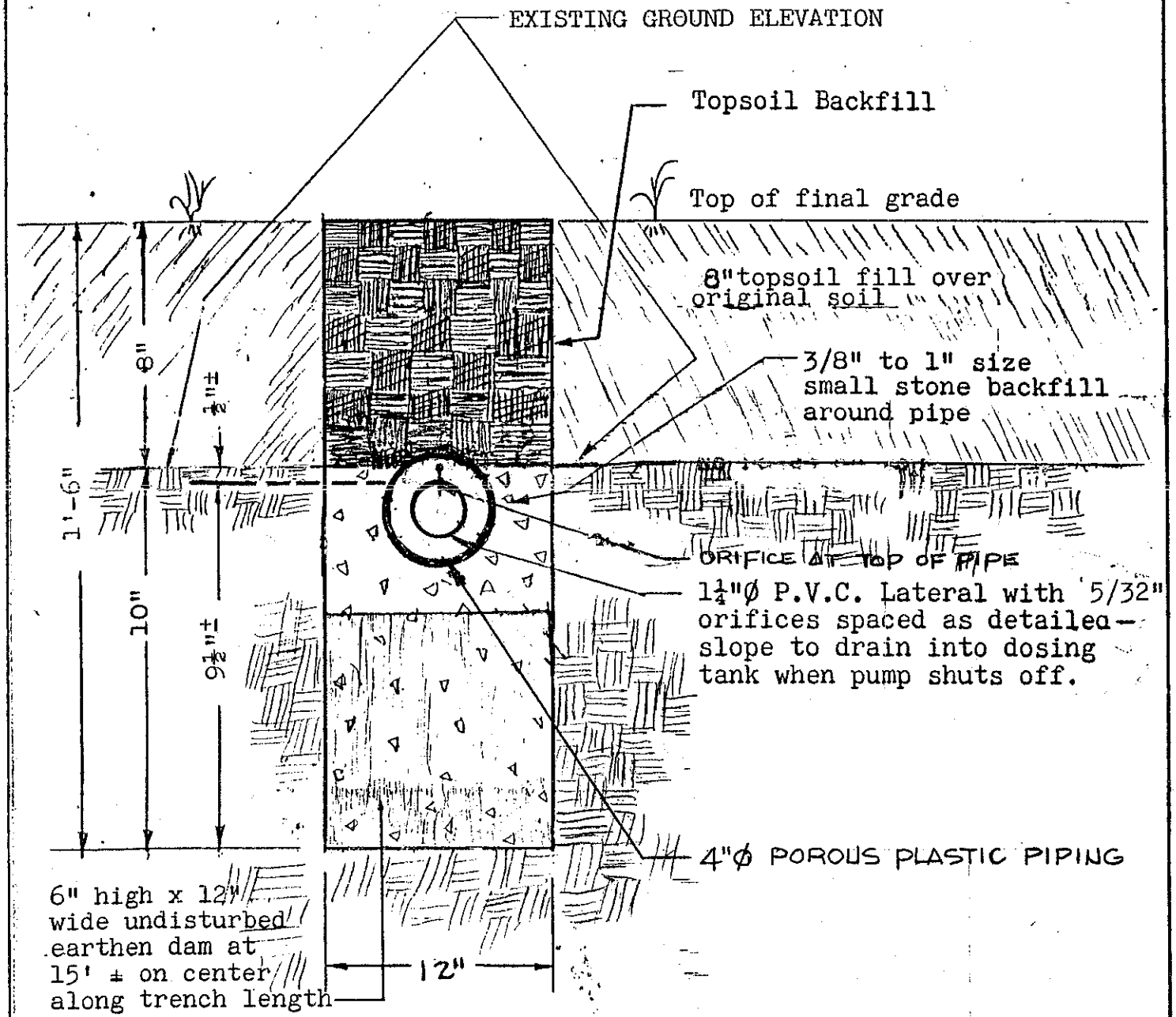
PUMPING CHAMBER DETAILS FOR

RECOMMENDED WASTEWATER DISPOSAL SYSTEM

No Scale

PREPARED BY DAVID A. ROBERTS, P. E. OF LANDIS, N. C.

NOTE: Install lime powder to trench sidewalls and bottom...Scarify lightly...before installing stone.



TYPICAL SECTION THROUGH LATERAL TRENCH OF RECOMMENDED LOW PRESSURE WASTEWATER DISPOSAL SYSTEM

Prepared by David A. Roberts, P. E. of Landis, N. C.

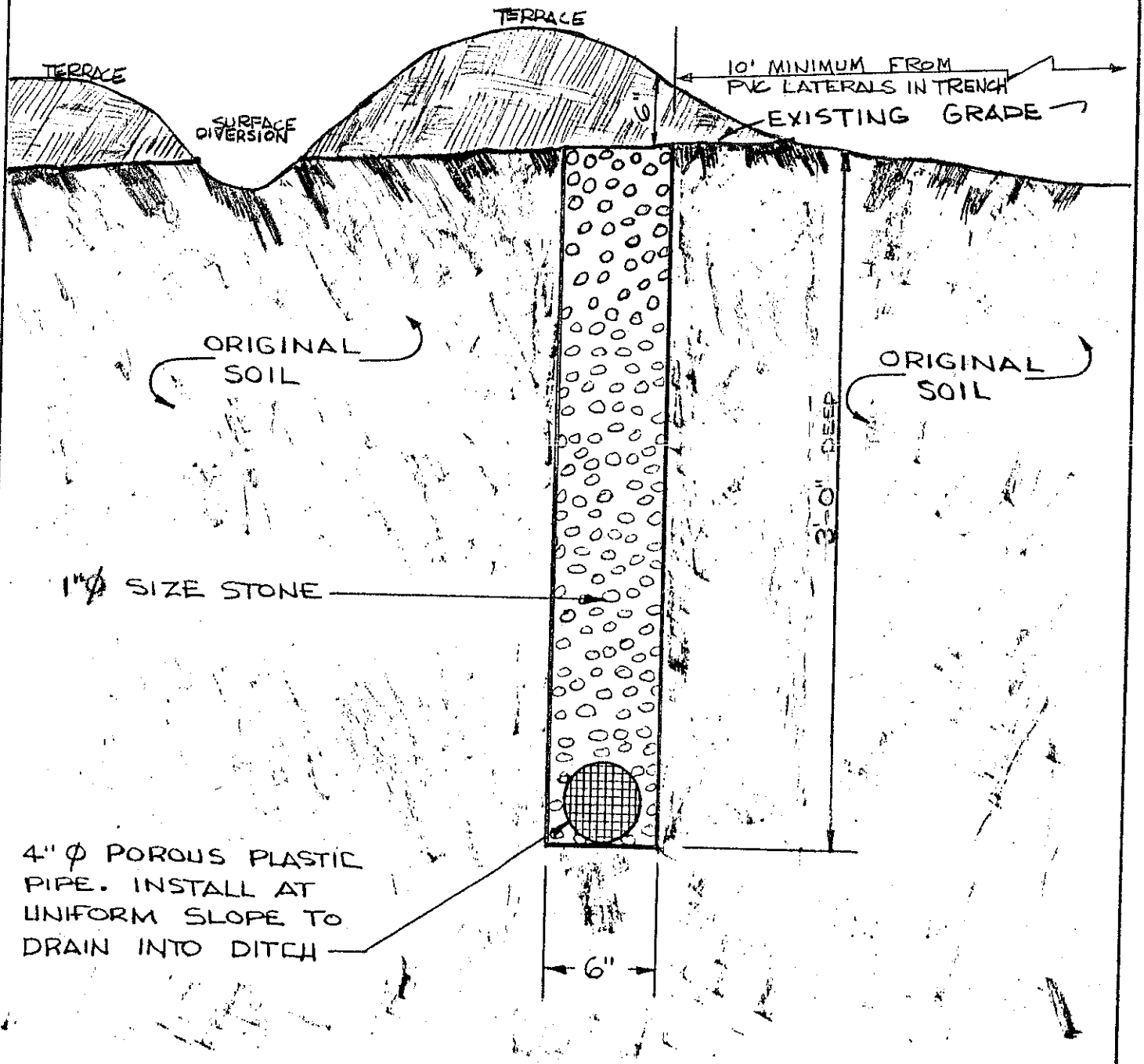
No Scale

(C)

NORTH CAROLINA REGISTERED SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS

David A. Roberts

BUILD TERRACE AND SURFACE DIVERSION UPHILL OF AND ADJACENT TO THE INTERCEPTOR TRENCH. SLOPE TO DRAIN TOWARD THE MAIN DRAINAGEWAY CROSSING THIS PROPERTY.



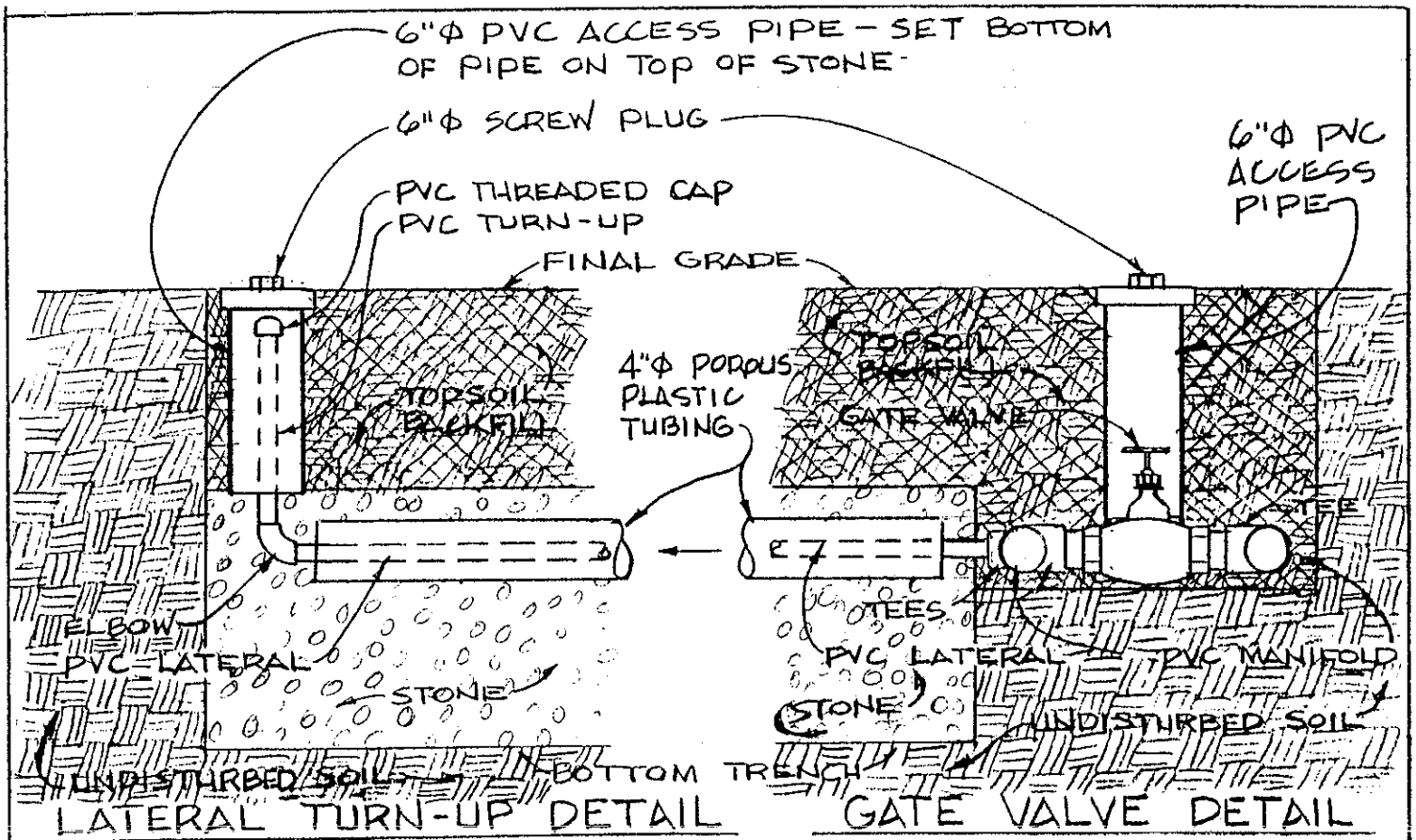
INTERCEPTOR TRENCH SECTION FOR

RECOMMENDED WASTEWATER DISPOSAL SYSTEM

PREPARED BY DAVID A. ROBERTS, P.E. - LANDIS, N.C.

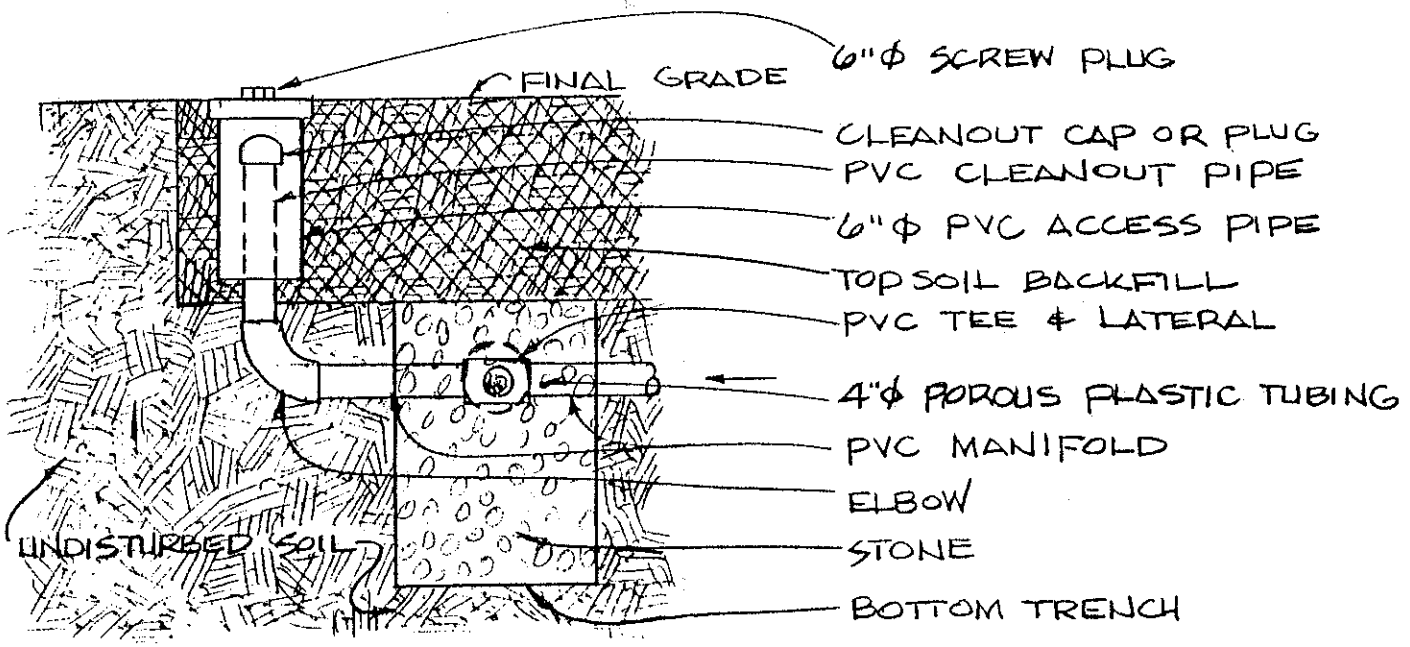
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NORTH CAROLINA REGISTERED SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS



LATERAL TURN-UP DETAIL

GATE VALVE DETAIL



MANIFOLD CLEANOUT DETAIL

TYPICAL DETAILS OF SYSTEM COMPONENTS FOR LOW PRESSURE PIPING SYSTEM OF ON-SITE WASTEWATER DISPOSAL

PREPARED BY DAVID A ROBERTS, P.E., LANDIS, N.C.

No Scale

NORTH CAROLINA PROFESSIONAL SEAL 6271 ENGINEER DAVID ARTHUR ROBERTS

David A. Roberts

RECOMMENDED SCHEDULE FOR SYSTEM MAINTENANCE, OPERATIONS, AND

MONITORING OF "MODIFIED" LOW PRESSURE
WASTEWATER DISPOSAL SYSTEM

1. The septic tank should be checked periodically for sludge accumulation and should be pumped out as needed with the sludge being disposed of properly. Check yearly if garbage grinder is included within the wastewater system (not recommended) or check every three years for systems without garbage grinders.
2. The absorption field should be protected from storm water accumulation and from excessive sprinkling of the lawn where absorption lines are located. Pipe downspout stormwater away from the area of the absorption field and provide diversion ditches around the disposal field to divert surface run-off.
3. The development of conservative water use habits by all members of the household will greatly enhance the life of this system.
4. Leaking plumbing fixtures should be corrected as soon as possible, or could result in premature failure of the wastewater disposal system.
5. Accumulated solids in the laterals should be back flushed annually by unscrewing the caps of each of the turn-ups and back-flushing with a garden hose using clean water.
6. Pressure head in the upper or lower laterals should be checked and adjusted annually.
7. Pump maintenance should follow the manufacturer's recommendations.
8. Pump and control float operation should be checked during all routine inspections and at least twice annually.
9. All rutted or eroded areas that may occur within the soil capping area over the disposal trenches should be carefully filled with suitable loamy soil material and reseeded with fescue grass, to maintain a hearty stand of grass in this location. Mow and rake the grass in this area as needed during the growing season.

PREPARED BY: DAVID A. ROBERTS, P.E. OF LANDIS, N.C.

FUTURE REPAIR SYSTEM

DESIGN SPECIFICATIONS FOR LOW PRESSURE PIPE SYSTEM FOR PROPOSED THREE-BEDROOM HOME LOCATED ON LOT #19 & #20 COMBINED, KNOTTY PINE SUBDIVISION, IREDELL COUNTY, N.C. - ODELL STAMEY - OWNER

DAILY WASTEFLOW:	360 gpd
SEPTIC TANK SIZE:	1,500 gallons
PUMPING TANK SIZE:	1,000 gallons
EFFLUENT LOADING RATE:	0.1333 gpd/sq. ft.
TOTAL ABSORPTION AREA:	2,700 sq. ft.
TOTAL LINEAR FEET AND DIAMETER OF LATERALS:	540 feet of 1 1/4" diameter PVC
TOTAL LENGTH AND DIAMETER OF SUPPLY MANIFOLD:	14 feet of 4" diameter 237 feet of 3" diameter 65 feet of 2" diameter
NUMBER AND LENGTH OF LATERALS:	1 @ 25', 1 @ 30', 5 @ 35', 2 @ 75', and 2 @ 80'
MANIFOLD PLACEMENT:	One end
HOLE SIZE:	5/32" diameter
TOTAL NUMBER OF HOLES:	100 orifices
TOTAL FLOW THROUGH SYSTEM (SEE ORIFICE DATA SHEET)	Total from 100 orifices = 49.6 gpm Anti-siphon hole 2 gpm TOTAL 51.6 gpm
ELEVATION HEAD:	20.9 feet
PRESSURE HEAD:	2.0' highest line
FRICTION HEAD:	6.3'
TOTAL HEAD:	28.2 feet
STORAGE VOLUME IN PIPES:	Manifold = 111.6, Laterals = 48.6 Total = 160.2 gals
DOSING VOLUME:	360 gallons = 17" in 1,000 gal. tank

CHECK VALVE NEEDED:	Yes
PUMP REQUIREMENTS:	51.9 gpm at 28.2' feet of head. Use same pump as initial wastewater system.
AREA OF SOIL FILL:	8" suitable soil fill to extend 2 1/2' beyond disposal trenches

ORIFICE DATA SHEET

REPAIR SYSTEM

IDENTIFICATION OF LATERALS	LENGTH OF LATERALS	ELEVATION OF LATERALS	HEAD AT LATERAL	SIZE OF ORIFICE	FLOW PER ORIFICE (gpm)	NUMBER OF ORIFICES PER LATERAL	FLOW PER LATERAL (gpm)	DISTANCE FROM MANIFOLD PIPE TO FIRST ORIFICE	ORIFICE SPACING (on center)	DISTANCE FROM LAST ORIFICE TO END OF LATERAL
AA	75'	86.3	2.5'	5/32"Ø	0.46	16	7.36	1'-3"	4'-9"	2'-6"
BB	75'	85.3	3.5'	5/32"Ø	0.54	13	7.02	3'-4"	5'-10"	1'-8"
CC	80'	84.4	2.4'	5/32"Ø	0.45	16	7.20	1'-8"	5'-0"	3'-4"
DD	80'	83.2	3.6'	5/32"Ø	0.55	12	6.60	4'-6"	6'-8"	2'-2"
EE	25'	94.0	2.0'	5/32"Ø	0.41	6	2.46	1'-5"	4'-2"	2'-9"
FF	30'	92.9	3.1'	5/32"Ø	0.51	6	3.06	3'-4"	5'-0"	1'-8"
GG	35'	91.9	4.1'	5/32"Ø	0.59	6	3.54	1'-11"	5'-10"	3'-11"
HH	35'	90.8	2.6'	5/32"Ø	0.46	8	3.68	2'-9"	4'-5"	1'-4"
II	35'	89.9	3.5'	5/32"Ø	0.54	6	3.24	1'-11"	5'-10"	3'-11"
JJ	35'	88.9	2.6'	5/32"Ø	0.46	6	2.76	3'-11"	5'-10"	1'-11"
KK	35'	88.0	3.5'	5/32"Ø	0.54	5	2.70	2'-4"	7'-0"	4'-8"
11 LINES TOTAL	540' TOTAL					100 TOTAL	49.62 TOTAL			

All laterals shall be 1 1/4" Ø PR160 PVC piping with 5/32" Ø holes along its length as outlined herein.

LOT #19 & #20 COMBINED, KNOTTY PINE SUBDIVISION, IREDELL COUNTY, N.C.
ODELL STAMEY, OWNER, 1316 SOUTH MAIN STREET, KANNAPOLIS, N.C. 28081

PREPARED BY DAVID A. ROBERTS, P.E. OF LANDIS, N.C.

MAY 19, 1992