Grand Bay Sub. Amenities Area

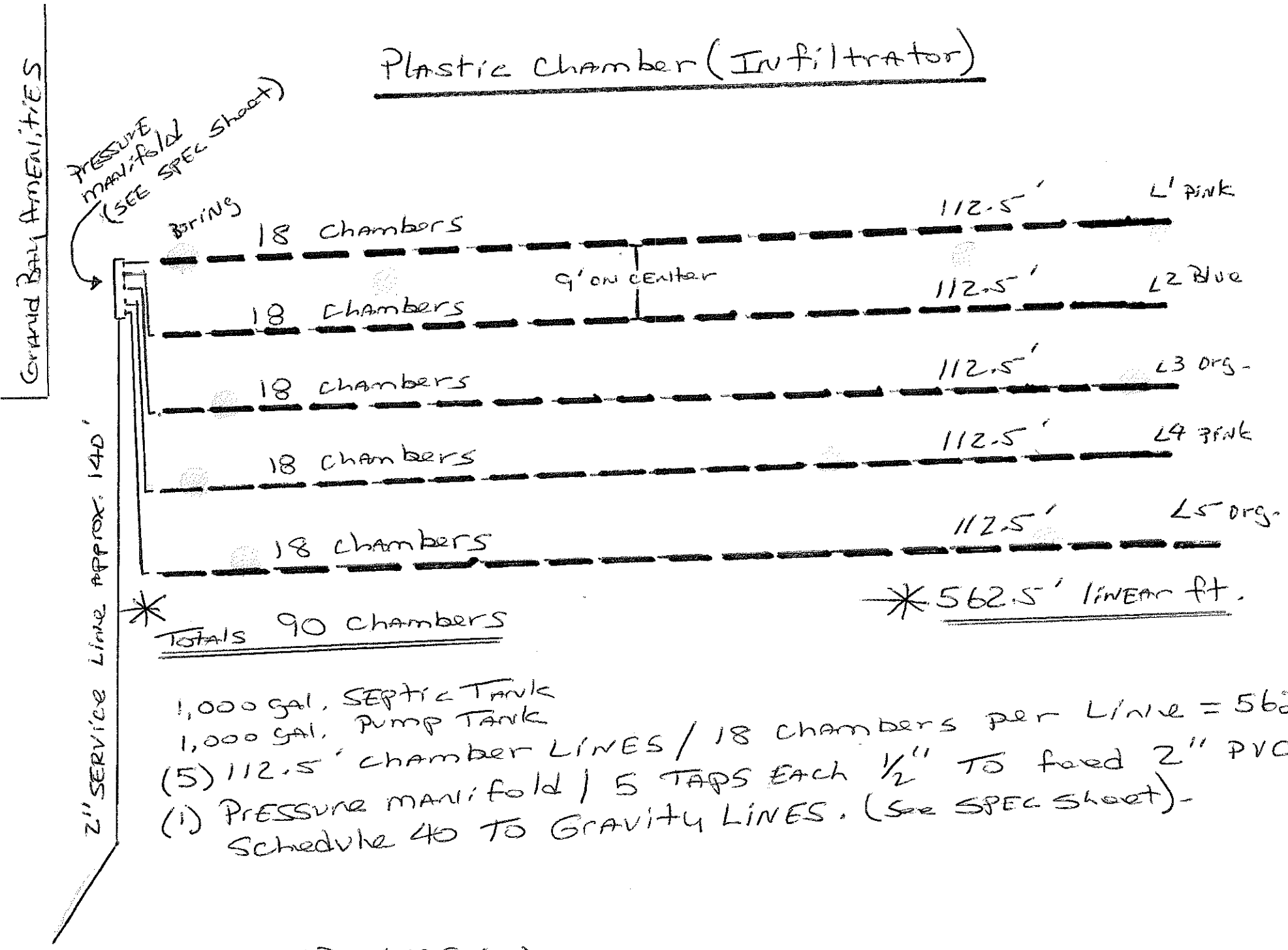
On-Site Sewage Disposal

Plastic Chamber Plan

Thomas Wilson Properties
166 Catawba Air Rd.
Mooresville, NC 28115
663-5115

T. Whittaker
866-9540

Plastic Chamber (Infiltrator)



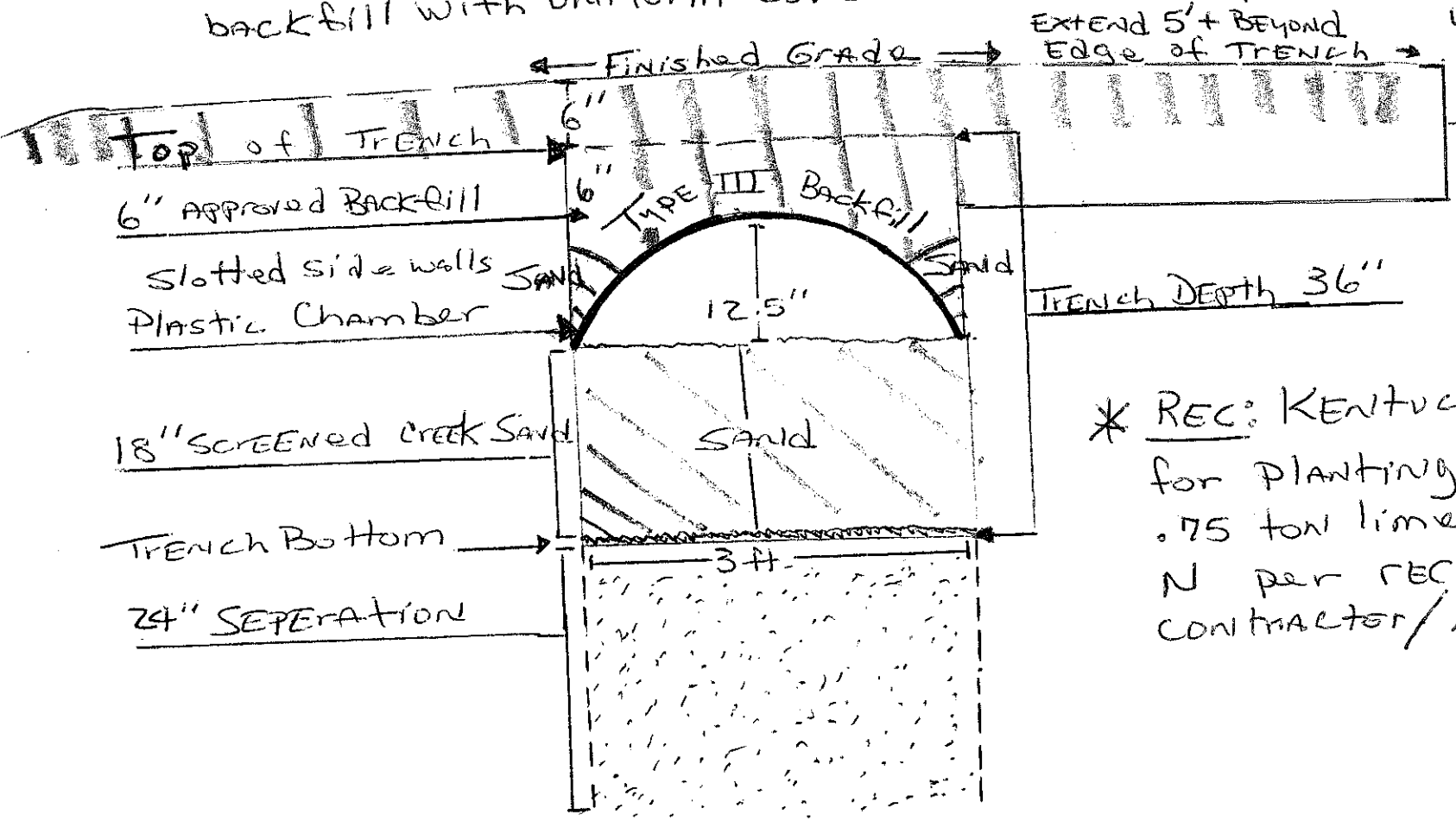
1,000 gal. Septic Tank
1,000 gal. Pump Tank
(5) 112.5' chamber Lines / 18 chambers per Line = 562.5'
(1) Pressure manifold / 5 taps each 1/2" to feed 2" PVC Schedule 40 to Gravity Lines. (See spec sheet).

= Soil Borings (10)

Not Scaled

Grand Bay Amenities Area

** **Trench Profile:** 36" depth, 36" wide, Excavate to ~~36~~ 60" then backfill with 18" of screened creek sand. Place chambers on top of sand. Backfill slotted chambers sidewalls with sand. Then backfill with uniform cover approved Type III material.



* **Rec:** Kentucky 31 Fescue for planting. Limed with .75 ton lime, 100 units N per rec. of finish contractor/Landscaper.

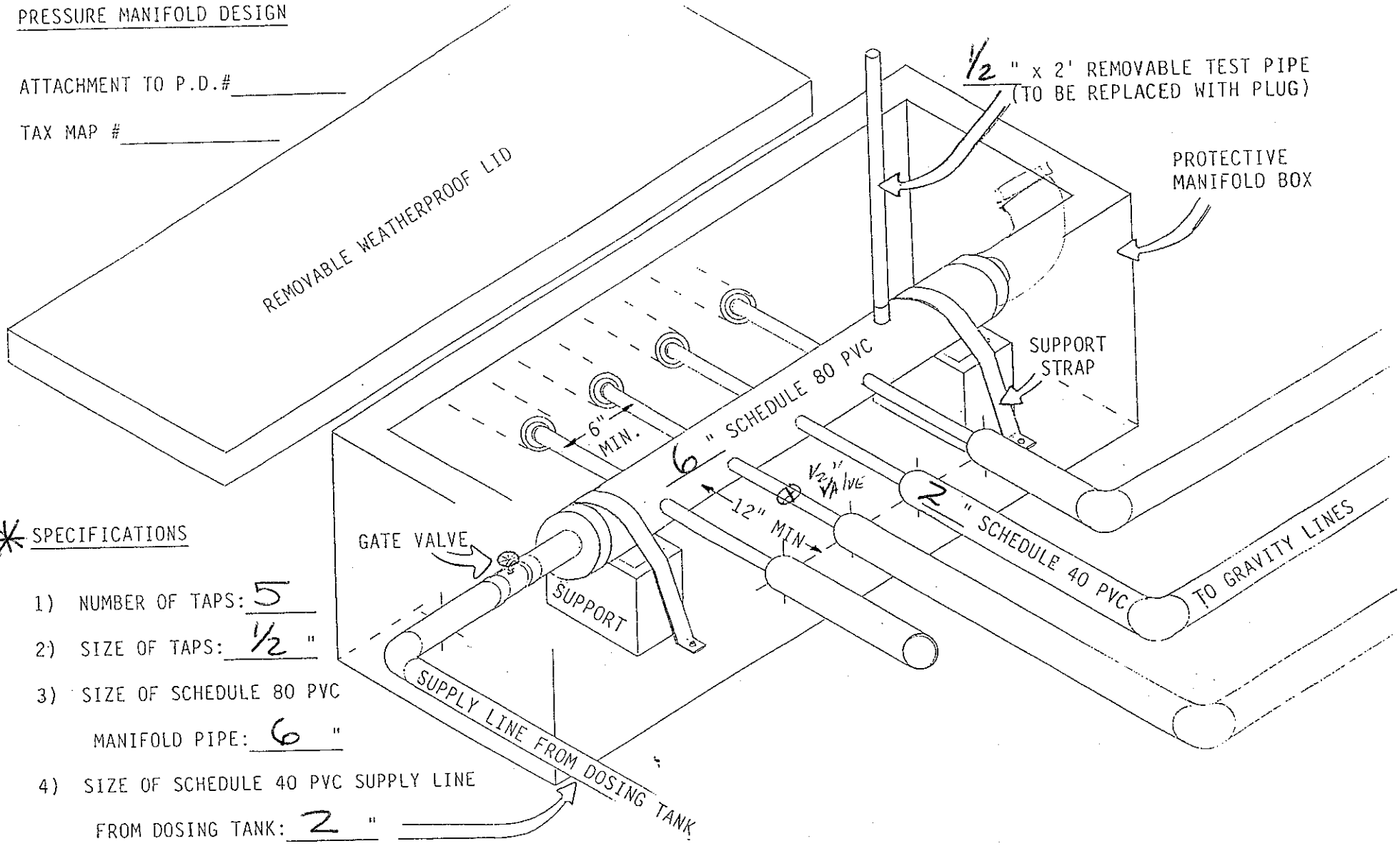
Inwinkler 866-954

Manifold SPECS: Grand Bay Amenities

PRESSURE MANIFOLD DESIGN

ATTACHMENT TO P.D.#_____

TAX MAP #_____



* SPECIFICATIONS

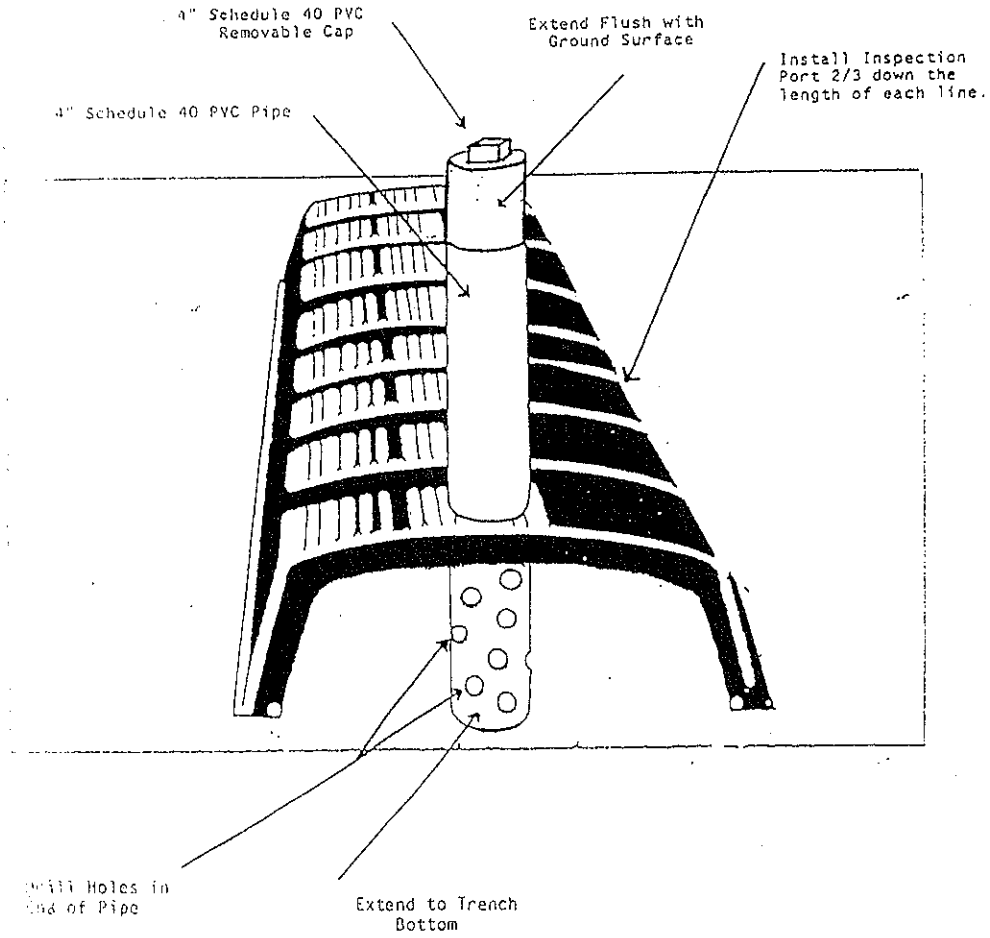
1) NUMBER OF TAPS: 5
2) SIZE OF TAPS: 1/2 "
3) SIZE OF SCHEDULE 80 PVC MANIFOLD PIPE: 6 "
4) SIZE OF SCHEDULE 40 PVC SUPPLY LINE FROM DOSING TANK: 2 "

Grand Bay Amenities

INSPECTION ACCESS DESIGN

Attachment To PD# _____

Tax Map # _____



NOTICE TO SEPTIC SYSTEM INSTALLER

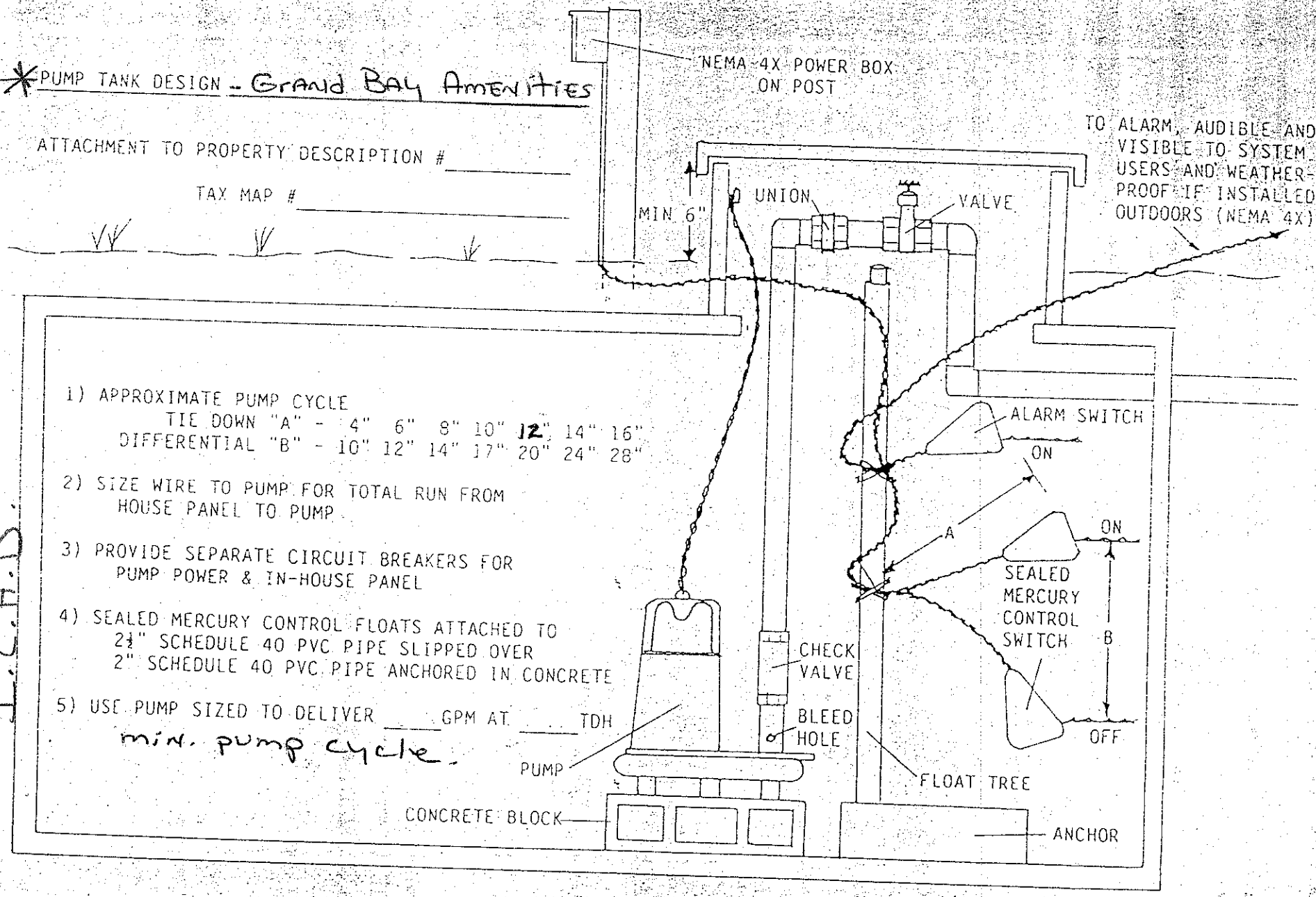
This septic system permit calls for the use of a chambered system. Remember, the first six inches of trench bottom must be backfilled with non-clay material. CLEAN Sand or washed screenings may be used at a rate of 5 tons per 100 linear feet.

On-site topsoil must be excavated, stockpiled, and approved by the Iredell County Health Department BEFORE it can be used as this non-clay backfill. Topsoil containing vegetative matter or rocks will not be approved for use.

*PUMP TANK DESIGN - Grand Bay Amenities

ATTACHMENT TO PROPERTY DESCRIPTION #_____

TAX MAP #_____



1) APPROXIMATE PUMP CYCLE
TIE DOWN "A" - 4" 6" 8" 10" **12"** 14" 16"
DIFFERENTIAL "B" - 10" 12" 14" 17" 20" 24" 28"

2) SIZE WIRE TO PUMP FOR TOTAL RUN FROM HOUSE PANEL TO PUMP.

3) PROVIDE SEPARATE CIRCUIT BREAKERS FOR PUMP POWER & IN-HOUSE PANEL

4) SEALED MERCURY CONTROL FLOATS ATTACHED TO 2½" SCHEDULE 40 PVC PIPE SLIPPED OVER 2" SCHEDULE 40 PVC PIPE ANCHORED IN CONCRETE

5) USE PUMP SIZED TO DELIVER ____ GPM AT ____ TDH min. pump cycle.

H.C.H.D.

CHANNEL RD
EXISTING WELL
PERTH RD
WILSON LAKE
NORMANDY RD
GRANT RALEIGH
850
800
2
3
4
5
6

THE INFILTRATOR™

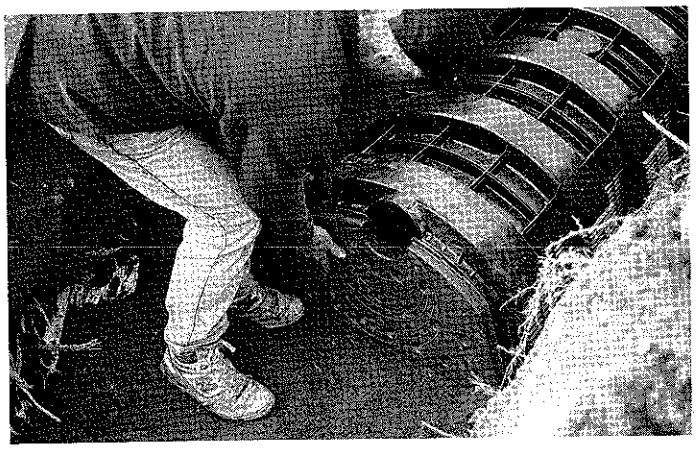
SEPTIC SYSTEM INSTALLATION INSTRUCTIONS

1 Excavate and level 3' wide trenches.

2 Prepare trench bottom and sides in accordance with state and local regulations. (Infiltrator Systems recommends raking sidewall and bottom infiltrative surfaces to eliminate smearing.)

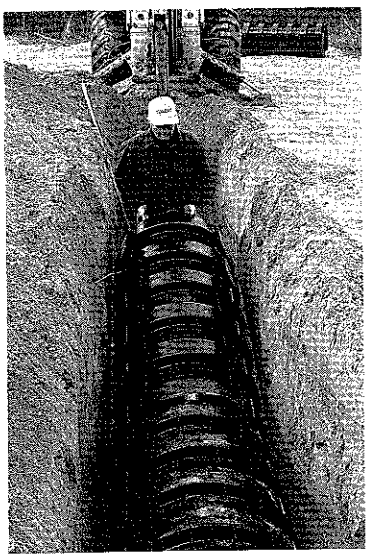
3 Screw splash plate on bottom of open end plate.

4 Screw open end plate into inlet end (without interlocks) of first INFILTRATOR™ chamber with splash plate extending into unit.



5 Place first unit in the inlet end of trench with interlocks downstream.

6 Run distribution pipe through inlet opening in end plate but not beyond splash plate. Single screw may be used to hold in place. **Pipe does not normally run the length of system.**



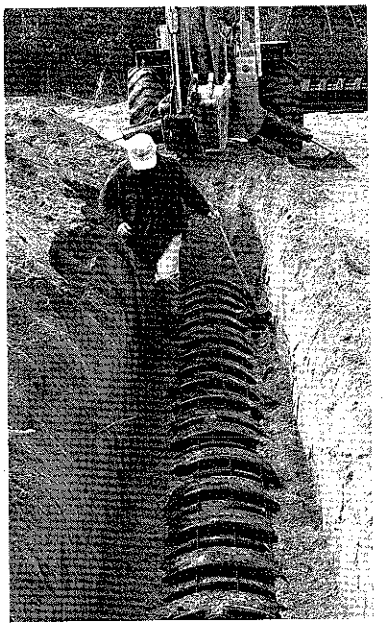
7 Connect INFILTRATOR™ units together, fully engaging interlocks to form desired trench length.

a. The joints may be screwed together for ease in construction.

b. Trench grade should be checked with a level or surveying equipment.

8 Screw closed end plate in downstream end of last unit to hold in place. **NOTE:** For serial distribution, or to loop the trenches together, use an open end plate at the downstream end of the trench, and run a pipe from the opening to the next trench.

9 Fill side wall area to top of slots with native soil. "Walk" fill into place to give proper support of sides. **THIS IS VERY IMPORTANT TO ACHIEVE FULL STRENGTH.**



10 Backfill to a minimum of 12" of cover after compaction and settling for H-10 units and 18" for H-20 units. Avoid large rocks in the backfill material. **CAUTION:** Avoid vehicle traffic on system during construction since soil has not settled. This is particularly important in sand, since loose sand offers very little structural support. Most states advise avoiding vehicle traffic to prevent compaction of the infiltrative surface. (After proper depth of cover is compacted and settled, INFILTRATOR™ leaching chambers will then support vehicle weight not to exceed 16,000 lbs. per axle for H-10 units and 32,000 lbs. per axle for H-20 units.)



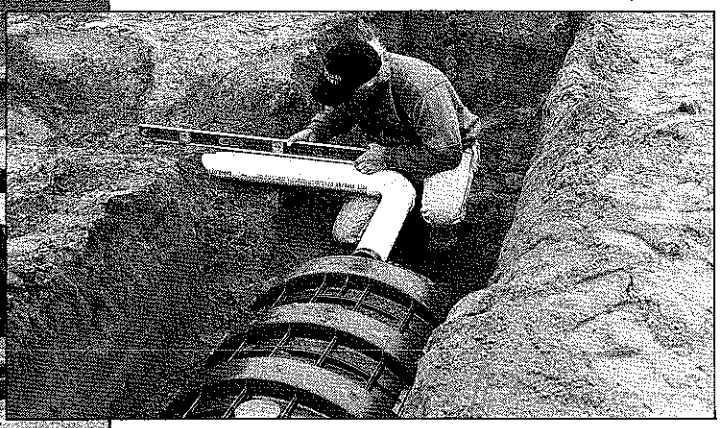
INFILTRATOR™ is a trademark of Infiltrator Systems, Inc.

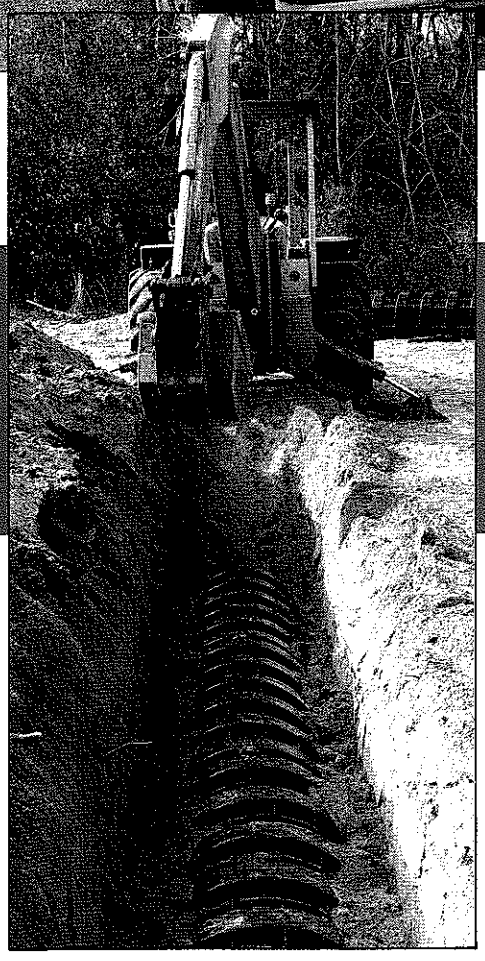
IT'S TIME TO COME OUT OF THE STONE AGE!

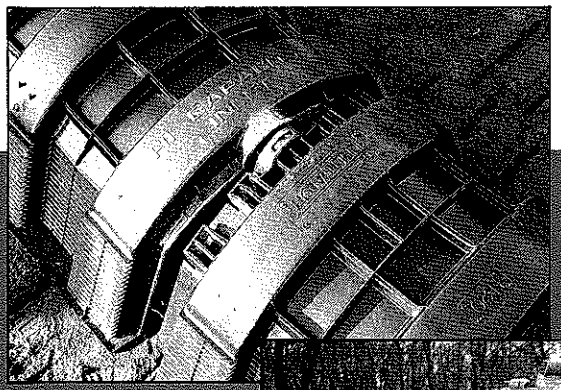
THE INFILTRATOR®

The Chamber Leach Field System Engineered for Excellence



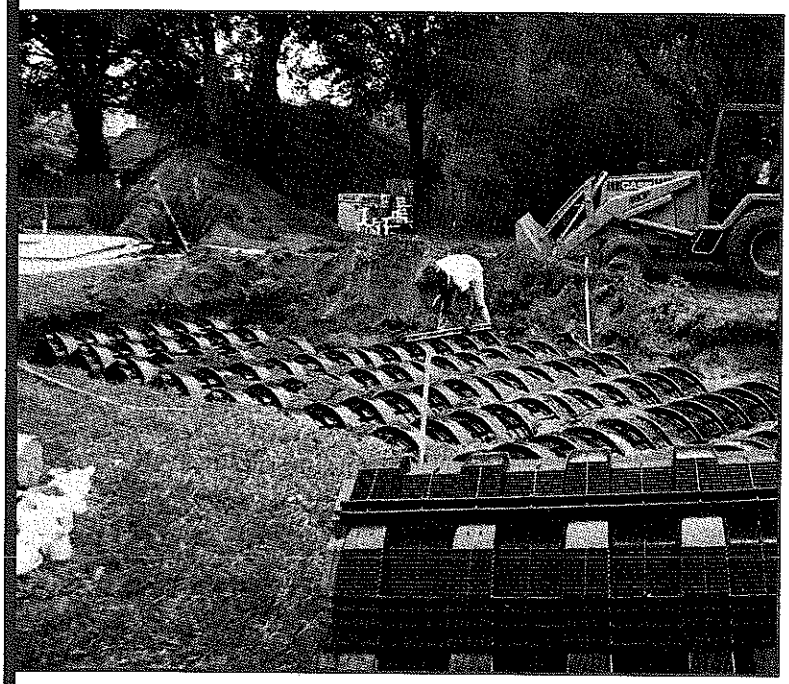








A Revolutionary Approach to Septic Leach Fields... The INFILTRATOR® Chamber System



"We have installed over 250 of the INFILTRATOR® chamber systems to date. Due to our soils, systems are installed 10"-14" deep, with additional topsoil cover added to achieve a 24" final depth. We have found this system advantageous in the battle to overcome small lot size, and as a successful method of septic drainfield repair."

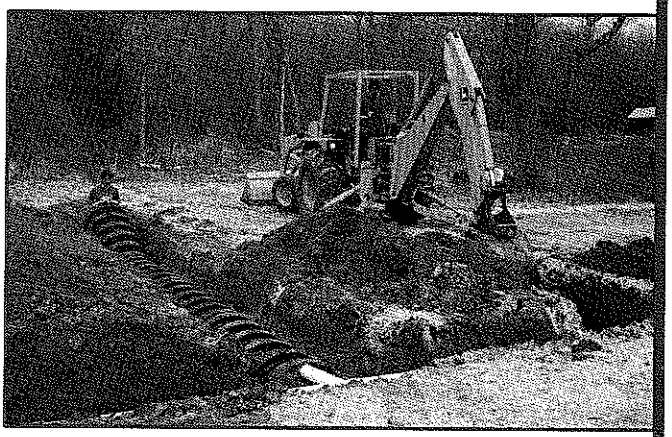
Kenneth E. Spach
Sr. Health Environmentalist
Jessamine County Health Dept.
Nicholasville, Kentucky

"The INFILTRATOR® chamber system leads to the elimination of using rock as a material to create a water storage void in drainfield trenches. Rock, much less the vast amounts of water used to wash it, is too valuable a resource to simply bury in the ground and be abandoned when and if the systems fail."

David Thompson
Environmental Officer
Cottonwood County
Windom, Minnesota

OVER 60,000 SYSTEMS INSTALLED NATIONWIDE

- Cost-effective for replacement of conventional gravel and pipe systems.
- **No gravel required** eliminating its negative effects.
- More efficient than gravel.
- Easy to inspect.
- Lightweight for easy installation.
- Patented leaching sidewall.
- 16,000 lbs/axle load rating (H-10) with 12" of cover.



INFILTRATOR® SYSTEMS INC.

P.O. Box 768 • Old Saybrook, Connecticut 06475

800-221-4436

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State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Environmental Health

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Richard K. Rowe, Director

DEHNR

August 25, 1994

AUG 29 1994

INFILTRATOR SYSTEMS, INC.

Mr. James M. Nichols, President
Infiltrator Systems, Inc.
P.O. Box 768
Old Saybrook, CT 06475

Dear Mr. Nichols:

Enclosed is the revised innovative wastewater system approval (IWSS-93-2-R1) that represents the formal status of the standard unit Infiltrator chambered sewage effluent subsurface disposal system in North Carolina. This revised approval is based on several discussions and meetings with your staff, including Mr. Randy May, the developer of the product, and additional documentation submitted to our office subsequent to our initial approval of December 2, 1993.

We greatly appreciate the extra effort of your staff, specifically Mr. May, Mr. Steve Dix, and Mr. Richard Crumley, in providing specific responses on several issues with the supporting documentation and supplemental information.

If you have any questions or if we can provide further assistance, please feel free to contact us.

Sincerely,

Steve J. Steinbeck, P.G., Head
On-Site Wastewater Services Branch

Enclosure

cc: Richard Crumley (w/encl.)

Division of Environmental Health

On-Site Wastewater Section

Innovative Wastewater System Approval

AUG 29 1994

INFILTRATOR SYSTEMS, INC.

Innovative Wastewater System No: IWWS-93-2-R1

Issued to: Infiltrator Systems, Inc.
P. O. Box 768
Old Saybrook, CT 06475

For: "Infiltrator" chambered sewage effluent subsurface disposal system.
[Standard Model with H-10 Load Design]

Date: August 25, 1994

In accordance with 15A NCAC 18A .1969, an application by Infiltrator Systems, Inc. of Old Saybrook, CT for approval of the chamber (gravel-less) nitrification trench system has been reviewed, and the standard unit Infiltrator system has been found to meet the standards of an innovative system when all of the following conditions are met:

I. Permitting:

Prior to the installation of the standard unit Infiltrator nitrification trench system at a site for which application is being made for an improvement permit or at a site for which an improvement permit has been previously issued for a system described in 15A NCAC 18A .1955, .1956, or .1957, the owner or authorized agent shall notify the local health department. The local health department shall issue an improvement permit or amend the previously issued improvement permit allowing for the use of the proposed innovative system upon a finding that all provisions of this approval and all other applicable rules shall be met. Use of the proposed innovative system and any conditions shall be described in the improvement permit or amended improvement permit, as applicable. Such information shall also be described on the operation permit to be issued upon the acceptable completion of the system installation.

II. System Description:

a. Pretreatment by septic tank as required in 15A NCAC 18A .1952.

b. Standard chamber unit consisting of a high density polyethylene arch-shaped injection molded chamber with an average inside width of 2.5 ft.(30 inches) and an overall length of 6 ft 2¼ inches. The standard unit height is approximately one foot high with ¼ inch wide slotted sidewalls approximately 6 inches high.

The chamber sidewall slope is approximately 20 degrees toward the chamber center or away from the trench sidewall. Note: 16 Infiltrator chamber units are approximately equal to 100 linear feet.

c. Each chamber unit is designed to mechanically interlock with the downstream chamber forming a complete nitrification trench that consists of an inlet plate with a splash plate located below the inlet on the trench bottom and a solid end plate to be located at the distal end of any chamber nitrification line.

III. Siting Criteria:

The standard unit Infiltrator nitrification trench assembly may be utilized on sites which meet the following criteria:

a. Sites which are classified Suitable or Provisionally Suitable for a conventional nitrification field system in accordance with 15A NCAC 18A .1948(a) or (b).

b. Sites which have been reclassified as Provisionally Suitable in accordance with 15A NCAC 18A .1956(1), (2), (4), (5), and (6).

c. Sites which meet the criteria for new or existing fill in accordance with 15A NCAC 18A .1957(b).

d. The required vertical separation shall be measured from the bottom edge of the chamber.

IV. Infiltrator chamber system sizing:

a. The maximum long-term acceptance rate (LTAR) shall be as follows:

		LTAR (gpd/ft^2)	
		Natural Soil	Saprolite
Soil Group I	Sands	0.8 - 1.0	0.4 to 0.6
Soil Group II	Coarse Loams	0.6 - 0.8	0.1 to 0.4
Soil Group III	Fine Loams	0.3 to 0.6	---
Soil Group IV	Clays	0.1 to 0.4	---

b. The LTAR shall be based on the most hydraulically limiting naturally occurring soil horizon within three feet of the ground surface or to a depth of one foot below trench bottom, whichever is deeper.

c. To determine the total trench bottom area (ft^2) required; the design daily sewage flow shall be divided by the applicable long-term acceptance rate shown in (a) above. The minimum linear footage of Infiltrator chamber system required shall

be determined by dividing the total trench bottom area by 4 feet when used in a conventional nitrification trench. No reduction in area is allowed for Infiltrator systems installed in bed or fill systems.

Example:

Assume: Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil.

Then: Total computed trench bottom area is:
360 gpd/0.5 LTAR = 720 ft^2;

The required linear footage of Infiltrator system is:
720 $ft.^2$/4.0 ft = 180 linear ft.
(where 4.0 ft. is the equivalency factor for the standard unit Infiltrator chamber system).

d. To determine the minimum number of Infiltrator chamber units required in a nitrification trench divide the trench bottom area by 24 and round to the nearest whole number.

720 ft^2/24 = 30 units

e. The mininum area (without reduction or equivalency factor) for a bed system shall be determined as required in 15A NCAC 18A.1955(d) except that the chambers shall be placed in rows next to each other.

f. The available space requirements of 15A NCAC 18A. 1945 shally apply. Also this approved innovative system may be designated as the required replacement system.

V. Design and Installation Criteria:

a. The Infiltrator chamber system used in nitrification trenches shall be in 3 ft. wide maximum excavation and constructed not less than nine feet on centers.

b. The inlet to the Infiltrator chamber shall be in the uppermost portion of the specially prepared inlet panel with a spash plate below the inlet on the trench bottom.

c. Clean Group I, II, or III soil backfill (soil normally found in the upper 10 inches of the trench excavation) shall be placed along the chamber sidewall area to a minimum compacted (walked in) height of 6 inches above the trench bottom. Addition backill (Group I, II, III, or IV) shall be placed to a minimum compacted height of 12 inches above the chamber. No excavation equipment shall travel over the chamber system.

It is critical to note that the nitrification trench bottom shall be at least 24 inches below finished grade, and the inlet invert shall be approximately 8 inches above the trench bottom, and at least 17 inches below finished grade.

d. Individual chamber trenches shall be constructed level in all directions (both across and along the trench bottom) and shall follow the contour the ground surface elevation (uniform depth) with continuous interlocking chambers, including specially constructed Infiltrator angle chamber units, without any dams, step downs or other water stops.

e. Infiltrator systems installed on a sloping site may use distribution devices or stepdowns as described in 15A NCAC 18A .1955(j) and (l) when it is necessary to change level nitrification line segments from upper to lower elevations.

f. Manufacturer's installation instructions for the Infiltrator system used in septic tank systems shall be followed except as required herein or 15A NCAC 18A .1900 et seq.

g. The system shall be installed by a contractor authorized in writing by the manufacturer.

VI. Operation and Maintenance Requirements

The Infiltrator chamber system shall have a minimum classification as a Type III g. system (other non-conventional trench systems) in accordance with Table V(a) of 15A NCAC 18A .1961(b).

VII. Repair Systems

The provisions of 15A NCAC 18A .1961(c) shall apply to the use of the standard Infiltrator chamber system for repairs to existing malfunctioning septic tank systems.

Approved by: Steve F. Steinbeck

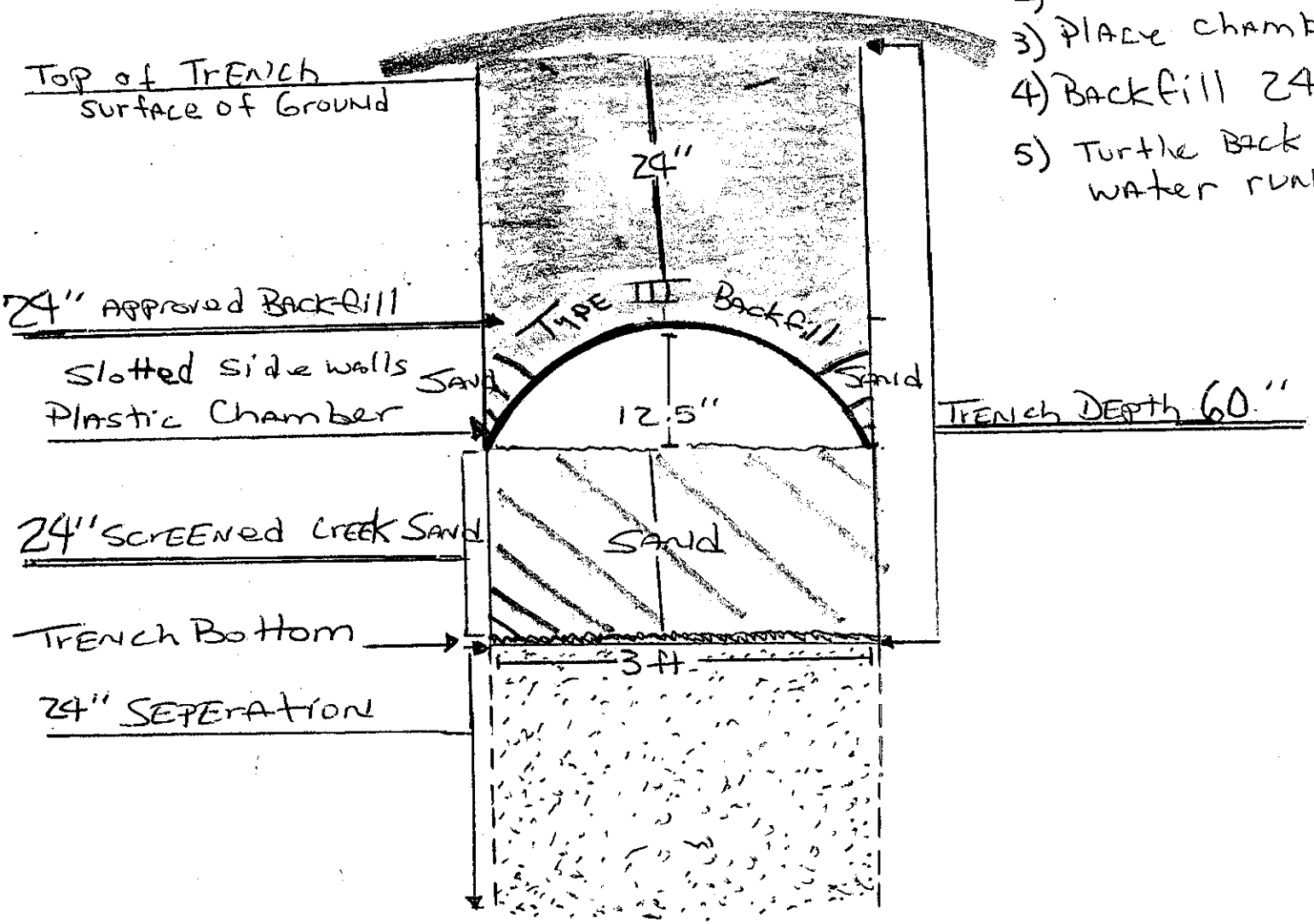
Date: August 25, 1994

Grand Bay Amenities Area

I.C.H.D.

*Trench Profile:

1) Excavate Trench to 60"
2) Place 24" Sand into Trench
3) Place chamber on Top of Sand
4) Backfill 24" approved material
5) Turtle Back slope for uniform water run-off.



T. Whittaker

Actual Dimensions

Not Scaled

7/25/97

Iredell County Health Department
Environmental Health Section
412 E. Center Avenue
Mooresville, NC 28115

ATTN: Mr. Wesley Sparks

RE: GRAND BAY SUBDIVISION, AMENITIES AREA ON-SITE SEWAGE DISPOSAL SYSTEM & REPAIR AREA, PROPERTY DESCRIPTION # 22126, GRAND BAY DRIVE, IREDELL COUNTY, NC.

Thomas Wilson Properties, owners and developers of the Grand Bay Subdivision and Tim Whittaker, environmental consultant, agreed upon and allowed the Iredell County Health Department to approve and permit the Presman plastic chamber septic system for the amenities area.

The approval of this area by the Iredell County Health Department was done so under the accordance to .1948 (c) and (d) and all applicable sections thereof.

The septic system was installed as designed by Tim Whittaker and approved by the Iredell County Health Department upon completion. An on-site visit by Tim Whittaker confirmed the installment and completion of the septic system. Electrical components of the septic system are the responsibility of the owners and an electrical contractor for final sign-off and securing power.

If additional information or on-site visits is required, I will comply. Call (704) 866-9540, anytime.

Sincerely,

Tim Whittaker

tw
cc

LOS ANGELES COUNTY