

The Care and Feeding of your Septic System

The Homeowner Guide to On-Site Sewage Disposal Systems



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Foreword:

This booklet is a sincere effort to present the new user with some basic and clear guidelines on the use and care of subsurface sewage disposal septic systems. It is hoped that the information presented in this booklet will help the user prevent avoidable septic system failures. In order to achieve clarity or to emphasize a point, this booklet is written in simple language and some statements have been oversimplified. Readers wishing to receive more detailed information on any particular section may call the County of San Luis Obispo Planning and Building department, at (805) 781-5600, or e-mail btolle@co.slo.ca.us

Why this Guide?

Many people living on the Central Coast use some type of on-site system for their sewage disposal. Of the various types of on-site systems used, the most common is the subsurface sewage disposal septic system consisting of a septic tank and leachfield. This type of system is placed underground, usually near the home or establishment it serves. Carefully designed, well-built septic systems, properly installed in suitable locations can provide low cost treatment for wastewater, but like any device, they must be maintained properly.

When homeowners and tenants are not aware of how to care for their systems, expensive failures can result. When a septic tank system fails, plumbing backs up or slows down and wastewater in the leach field may be forced to the ground surface where its presence causes a potential health hazard. Natural water bodies can become polluted. Ultimately, the homeowner or user may have the substantial expense associated with having to install a new leach field; therefore it makes good economic and environmental sense to take care of your septic system. The proper operations and maintenance of septic systems are discussed in this guide.

How a Septic System Works:

A septic (subsurface sewage disposal) system consist of a septic tank and a leachfield. A standard leachfield may consist of leachlines, leachbed, or drywell, The term cesspool is defined as a covered hole or pit for receiving sewage and is by today's standards an outmoded, improper system, and not allowed. Wastewater (also called effluent, raw sewage, or grey water) from the home, including the laundry, is discharged into the septic tank where most of the solids are removed. Raw sewage from the house or establishment requires some form of treatment prior to being discharged as a clarified liquid into the leaching field. Laundry wastewater (graywater) must be properly disposed of through an approved subsurface sewage disposal system. It must not be discharged upon the surface of the ground.

The Septic Tank:

A typical septic tank has a volume of 750-1500 gallons; may be made of concrete, steel, or fiberglass, and is approximately eight feet long, five feet deep, and wide. Septic tanks are watertight chambers which promote the growth of anaerobic bacteria for the biological decomposition of sewage and the separation of grease and organic particles from the wastewater. They are sized for a minimum detention period of twenty-four hours and are constructed with a pair of baffles or sanitary tees to prevent the flow-through of floating solids, to minimize the raw sewage from leaving the tank and from disturbing the settled sludge and floating scum.

Septic tanks are made with two openings: one for each chamber. They are located on the top of the tank so as to permit access to the tank inlet and outlet chambers. If your septic tank is not equipped with two access risers or markers it is important that they be installed for easy access in the future. It is best to have the risers included when the tank is placed during the construction phase. New state laws will require all septic tanks to be equipped with risers to grade.

Septic tanks are designed to handle all the normal, daily (24 hours) effluent flow which a household or commercial enterprise can produce. For this reason, design is based upon the maximum capacity of a single family home in terms of personal occupancy, and bedrooms ie. 2 bedrooms (4-people); 3-bedrooms (6 people); 4-bedrooms (8-people) etc. A commercial establishment is rated on its generated peak effluent load as determined by waste-producing fixtures or an actual flow of the prototype establishment. In a home, the design allows for the inclusion of a laundry. **Waste from garbage grinders, Roof and footing drainage, garage drains, and water softener wastes should not be allowed into the residential septic system.**

Although minimum capacities for septic tanks (750 gallons) have been established, larger units have many advantages. Longer detention times, (due to the larger capacity), permit better separation and less carry-over of scum and sludge and tend to prolong the life of the subsurface disposal leachlines, leachbeds, and drywells. Larger tanks require less frequent cleaning, are slightly more expensive and allow for future expansion of the home, ie (additional bedrooms or waste discharge fixtures.) They provide a good, cost benefit return particularly if incorporated in the initial installation. If the septic tank is upsized, the corresponding size of the leachfield must also be increased. The total septic tank process then produces an effluent that can be leached into most soils without clogging.

The Soil Absorption System:

The most common standard absorption system design consists of a series of horizontal trenches (leachlines), 18-36 inches wide, the bases of which are generally two to four feet below ground surface. A leachbed is simply the joining of the leachline trenches into one large square bed which may serve as a space saver in small constricted lots. A seepage pit or dry well is usually a three to six foot wide pit filled with rock and can be upwards of 50 feet deep, depending on soil porosity.

In leachlines, a level perforated pipe is used to distribute the wastewater throughout the rock absorption system where it eventually soaks into the soil particles. Aerobic (bacterial) treatment of the wastewater is accomplished as it flows through the rock and the various soil textures. Leachlines, plastic chambers, and leachbeds operate on the principle of evapotranspiration as well as percolation due to their close proximity to the ground surface. Because of the principal of evapotranspiration, leachlines and leachbeds may not be placed under pavement, driveways, or planted areas requiring frequent watering. Seepage pits rely on percolation only, and are generally favored by industry as these may be placed under paved surfaces. Although septic tanks improve the quality of raw sewage, the effluent is still rich in pollutants and harmful organisms, and may not be discharged directly onto the ground surface, water, or groundwaters. Effluent penetration in the soil is directly related to its porosity. Effluent percolates at rates which vary with the texture of the soil. Very coarse (sandy) textured soils generally provide smaller size leaching fields and pits because of good porosity characteristics, but may not provide effective treatment due to this porosity. Very fine soil particles (clays) may be too tight to allow wastewater to pass through. Soils feasibility (percolation) tests are conducted to determine the proper porosity for proposed absorption systems and are accomplished by Registered Civil Engineers, Certified Engineering Geologists, or approved Registered Environmental Health Specialists.

County Codes requires that all on-site sewage disposal absorption systems be designed so that there is an additional 100% expansion area available on the property in case the original leachfield fails. Therefore on some lots there may not be suitable areas for a swimming pool, patio, or other permanent structures due to this sewage disposal expansion code requirement. In order to build any other structure on the property, a research of building plans will have to be concluded at the Building and Planning Department. Permits must be secured before any additional building is commenced.

Locating your Septic Tank:

In order to provide for easy location and to facilitate regular maintenance, Installers, Developers, and Contractors should provide the homeowner with detailed plot plans indicating a scaled location of the septic system. Prior to construction, the Planning and Building Department approves a detailed plot plan showing the exact location and size of the septic tank and the leach fields. If you cannot locate your tank from your own records, the septic tank may be located by probing with a fiberglass rod, Starting at the cleanout, outside the house, follow the pipeline until you reach the septic tank. A licensed septic contractor can best provide this assistance. After locating the tank, the tops are usually buried two to four feet deep. It would be wise to add risers and manhole covers to the tank lids after you have located the tank. These will make it easy to locate the tank in the future, and make pumping and repair much easier, and cheaper as less labor will be involved not having to dig-up the system. After 2007, all septic tanks will be required to have risers, gas tight lids, and effluent filters.

Maintaining your Septic Tank System:

The most important step in maintaining a trouble-free septic system operation is to remove the accumulated solid residues and scum from the tank before they start to wash out into the absorption field and before you observe signs that your system is failing. Remember, once the soil absorption system is clogged, cleaning the tank will do little good; you will probably need a new leachfield.

How often your tank will need pumping depends on the size of the tank, the number of people in the household, and the kinds of wastewater discharging appliances you use. Routinely, tanks should be cleaned every three years for single family dwellings and every year for commercial establishments. These periods may vary depending on usage.

For those who do not care to be "Do-It-Yourselfers," It would be advisable to consult a licensed professional. Septic tank contractors and plumbers with C-42 licenses, are listed in the telephone book Yellow-Pages. They are experienced in locating, uncovering, and cleaning septic systems.

What Can Go Wrong?

Little can go wrong with the septic tank itself. Tanks sometimes suffer structural damage and or deterioration, but problems occur most often in the plumbing or in the absorption field. If your plumbing backs up suddenly under normal use in dry weather, temporary blockages caused by tree roots entering the leachfield distribution drain pipes develop over a period of time. A professional may be able to clear these blockages in the distribution drain pipe.

More serious difficulties occur when the soil surrounding the absorption system becomes clogged. When sludge and scum are not removed periodically from the tank, they accumulate until they are transported out into the absorption field. The carry over of solids from the septic tank is the most common cause of absorption system clogging and failure. When no maintenance is performed, the perforated distribution drain pipe or the pores in the earth walls of the soil absorption system become clogged. A leachfield that is only partially clogged may work well during dry weather, but when winter rains soak the ground or when household water use is high, the system becomes overloaded. The system then performs sluggishly and a failure is imminent.

You can suspect a malfunctioning absorption field if:

1. There are odors, persistent wet spots and/or lush green growth in any areas of your system.
2. Your waste plumbing becomes sluggish over a period of time.
3. Your waste plumbing becomes sluggish when it is being used heavily or during wet weather.
4. Problems persist even though the septic tank has been pumped / cleaned recently.

MAINTENANCE SUGGESTIONS:

The following suggestions are designed to increase the useful life of your septic system. Their applicability and effectiveness vary slightly with each home or system.

A. Minimize the liquid load

The less wastewater you produce, the less soil will have to absorb. Water conservation is the cheapest and easiest way to protect your septic system. Remember, the capacity of the septic tank must not be exceeded in any one day. This can be achieved by:

1. Repairing leaky fixtures.
2. Washing clothes only when you have a full load. Avoid doing several loads in one day. The septic system design includes the average use of the clothes washer (three to four loads a week)
3. Take short showers instead of baths. Don't turn the shower on all the way and turn off the water while lathering.
4. Install a water saving device in your toilet tank and don't flush unnecessarily.
5. Don't let water run while washing teeth, hands, vegetables, dishes, etc. Use a stoppered drain.
6. Many other ways of conserving water exist. Use hot water re-circulation devices where feasible. Be alert and institute other water saving ideas.

B. Minimize the solids load

Do not use your septic system for anything that can be disposed of some other way. The less material you put into your septic tank, the better the quality of the effluent going to the leaching system.

1. Minimize or avoid using the garbage disposal unit. Remove scraps with the garbage or properly compost them.
2. Collect grease in a container near the sink rather than pouring it down the drain.
3. Minimize the discharge of paper products. Non-degradable items, such as disposable diapers, sanitary napkins, Kleenex, kitty litter and paper towels are especially harmful. Use a good quality approved toilet tissue that breaks up easily when wet.
4. Basically three products should go into the septic tank: human wastes, toilet paper, and water from toilets, bathing fixtures, kitchen sinks and laundry washers.
5. Ordinary use of household chemicals will not affect the bacteria in your system if not used in excessive amounts. Do not use your tank to get rid of oils, paints, insecticides or other poisonous liquids.
6. Septic tank additives, chemicals, yeasts, bacteria, enzymes, etc. do not increase the bacterial solids break down in the tank and will not affect (increase) the time needed for routine pumping. Experiments with chemicals to unclog absorption fields have not proven reliable.

C. Additional Means to Protect the Installed Septic System

1. Do not plant large trees over the absorption system. Small feeder roots will enter the drain holes of the leachfield drain lines and form a mat within the drain line. This mat blocks the flow in the level drain line rendering the remainder of the line unusable. Large roots may displace the drain line. As a general rule, large trees must be as distant as possible from any trenches. Trees with a trunk diameter of nine inches should be at least ten feet distance from any trenches.
2. Ideally the leachline/bed system should be left in uncovered open sunny areas so as to be provided maximum evapotranspiration. This is an important factor in these systems, but not applicable to seepage pits or dry wells.
3. Do not allow rain water or drainage water to pond over the leachfield. Maximum saturation and temporary failure may occur until the ponding dissipates.
4. Do not construct walkways patios, swimming pools, permanent structures or parking lots, over or within the leachline/bed areas. This would prevent maximum evapotranspiration, may cause damage to the system and may cause a premature failure.
5. **REMEMBER THAT SAN LUIS OBISPO COUNTY CODES PROVIDE THAT AN EXPANSION AREA SYSTEM EQUAL TO THE SIZE OF THE INSTALLED SYSTEM BE RESERVED FOR FUTURE USE. DO NOT BUILD ANY STRUCTURES IN THIS AREA.**
6. Keep vehicles and grazing animals off your leachline/bed system; underground pipes and soil porosity can be damaged by constant heavy pressure on top of them.
7. **BEFORE PURCHASING A HOUSE OR COMMERCIAL ESTABLISHMENT UTILIZING AN ON-SITE WASTEWATER DISPOSAL SYSTEM, INSIST ON A PROFESSIONAL INSPECTION AND REPORT THAT THE SEPTIC TANK AND THE DISPOSAL FIELD ARE IN GOOD WORKING ORDER.**
8. Your tank should be routinely pumped and inspected at least every three (3) years. For commercial systems, pumping and inspection should be done annually.

D. Steps to consider if your leachfield system fails.

If a septic tank pumper, soils engineer, or other competent professional has determined that your leachfield has failed, a portion or all of the system may have to be replaced. If your system requires repair or replacement, contact a licensed septic tank contractor/plumber with a C-42 license or a registered civil engineer with soils expertise. A permit to repair must be obtained from the Planning & Building Department prior to any construction. In some cases, depending on the extent of the damage and chance that the un-repaired system may be an immediate hazard to the public, the contractor may call the planning department and request an emergency repair permit. If allowed, the repairs to the septic system may be made before the permit is granted. The contractor, and or owner, must come into the Planning and Building Department within 48 hours of the repair and bring all required plot plans, fees, and application forms for final approval.

If there is no detailed plot plan depicting the entire system on record, the owner must provide a current septic system plot plan depicting the old system, the part of the system to be abandoned, and the location of the new system.

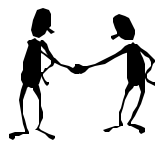
In some cases, the contractor may utilize some of the old field, this is O.K., often times by adding on to the existing system it rests the older system and restores it to working order by allowing it to dry out, and by allowing aerobic bacterial processes to remove or alter some of the clogging material.

Inspecting Your Own Tank

Should you suspect a problem, you may wish to inspect your own tank. To inspect, remove the manhole cover at the inlet end. The best practice is to check both scum and sludge levels, but the following simplified procedure works well in most cases. Use a shovel to push the scum layer away from the side of the tank so that you can estimate it's thickness. If the thickness of the scum layer is a foot or more, the tank must be pumped immediately. Replace the manhole cover and wash the shovel and your hands for sanitary precaution. Make arrangements with a licensed septic tank contractor/ pumper to clean and check the tank and leach system.

CONCLUSION

A properly designed, constructed and maintained septic system should last as long as the structure it serves. Incorrect design, faulty soils percolation testing, improper installation, environmental occurrences, such as floods, earthquakes, 100-year rains, etc., may cause premature system failures. However the vast majority of septic system failures are precipitated by user abuse, that is, not following the items listed in this guideline. Follow these procedures carefully, ask questions of the professionals who test, design and install your system. Remember, if the commodes cannot flush, the most beautiful house in the realm is useless to its proud owner!



Quick List of Do's and Don'ts



Do have your septic tank pumped and inspected every three to five years.

Do keep a record of inspections, repairs, and pumping.

Do practice water conservation. Repair dripping faucets and leaking toilets, run washing machine and dishwasher throughout the week, not all on one day, avoid long showers, discontinue use of garbage disposals, put kitchen waste in the garbage instead of down the sink, use water-saving features in faucets, shower heads and toilets. Also utilize hot water recirculation systems.

Do learn the location of your septic system and drainfield. Keep a sketch of it handy for service visits. If your system has a flow diversion valve, learn it's location, and turn it once a year, flow diverters can add many years to the life of your system.

Do divert drains and surface water from driveways and hillsides away from the septic system. Keep sump pumps and house footing drains away from the septic system as well.

Do monitor leachfield inspection risers before and after a heavy rain.

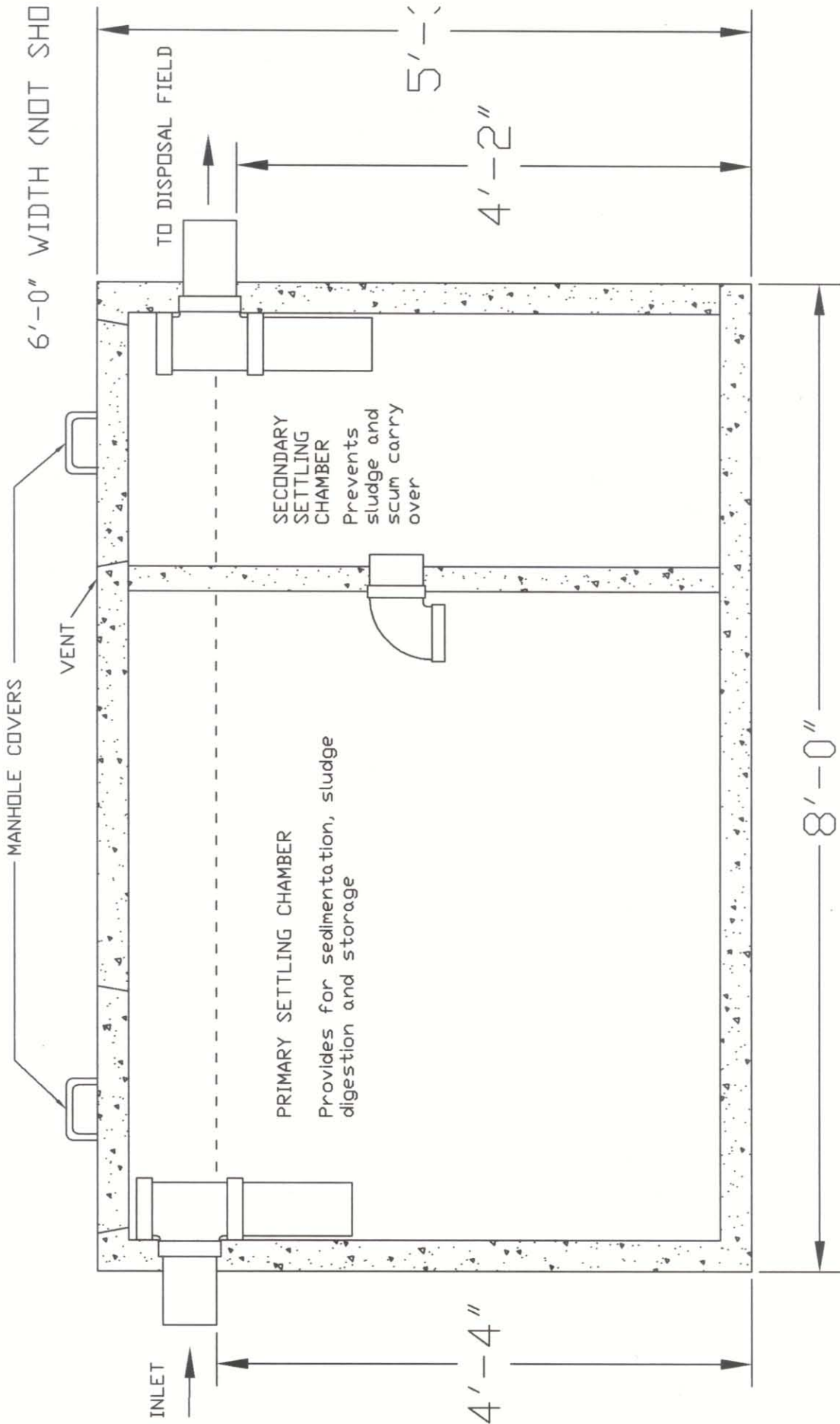
Do refer to our guide on the web site for proper design and clearances.

Don't allow anyone to drive or park over any part of the system. The area over the drainfield should be left undisturbed with only a mowed grass cover. Roots from nearby trees or shrubs may clog and damage your drain field.

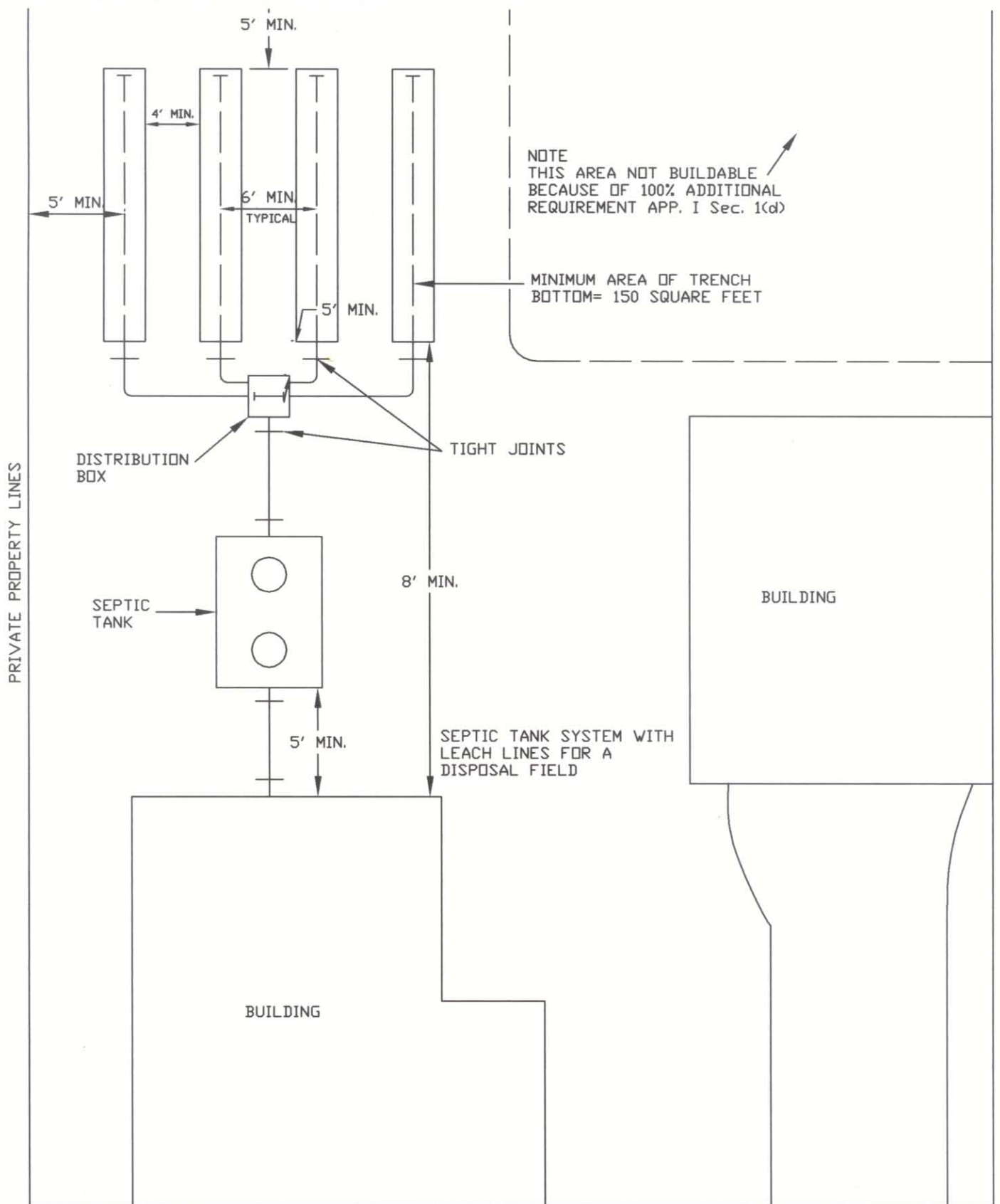
Don't make or allow repairs to your septic system without obtaining required permits from the Planning & Building Department. Use professional licensed septic contractors when needed.

Don't use commercial septic tank additives. These products usually do not help and some may hurt your system in the long run.

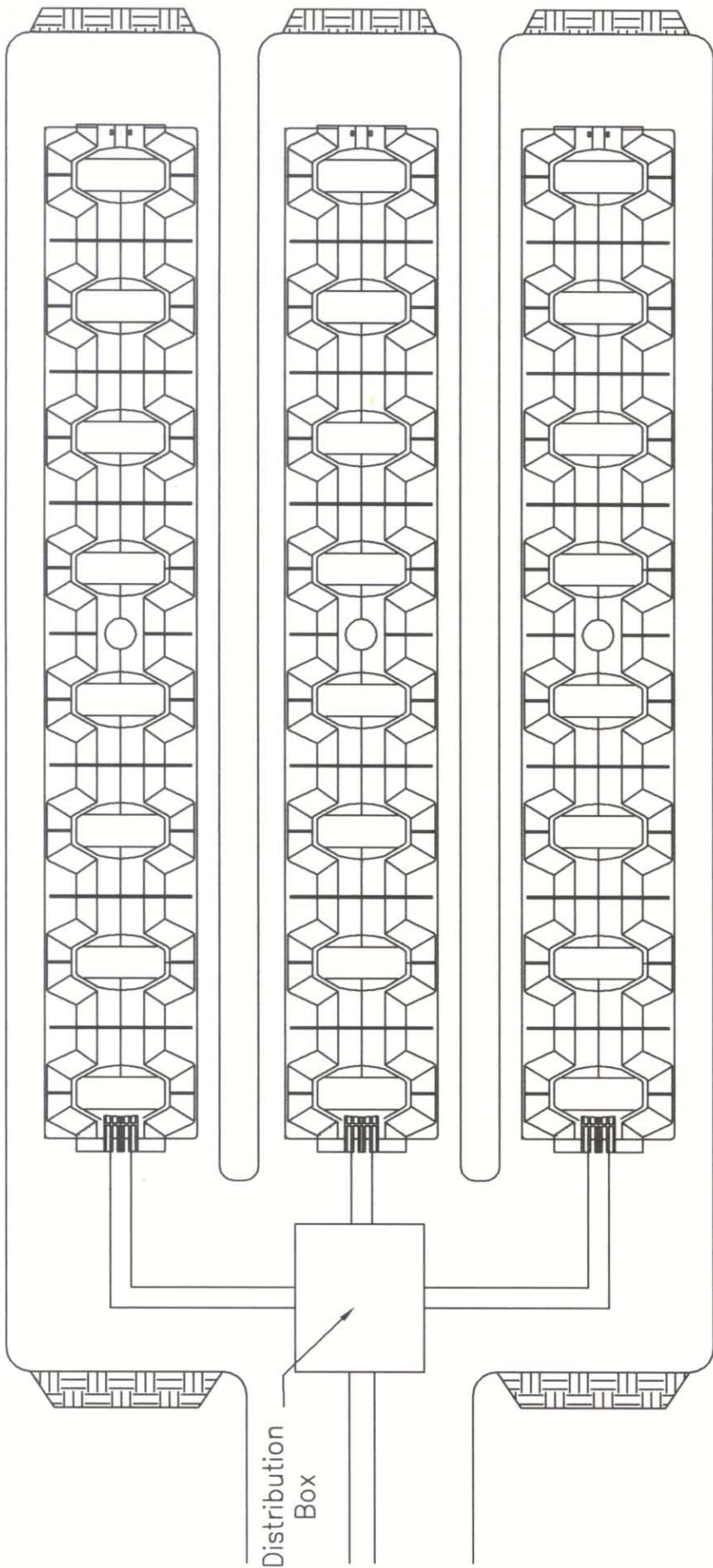
Don't use your toilet as a trash-can by dumping non-degradables down your toilet drains. Also don't poison your septic system and the groundwater by pouring harmful chemicals down the drain. They can kill the beneficial bacteria that treat your wastewater. Keep the following materials out of your septic system: Paints, solvents, resins, latex, grease, disposable diapers, oven cleaners, degreasers, pesticides, oil, or any hazardous materials.



TYPICAL CONCRETE 1000 GALLON SEPTIC TANK (3 BEDROOM DWELLING)

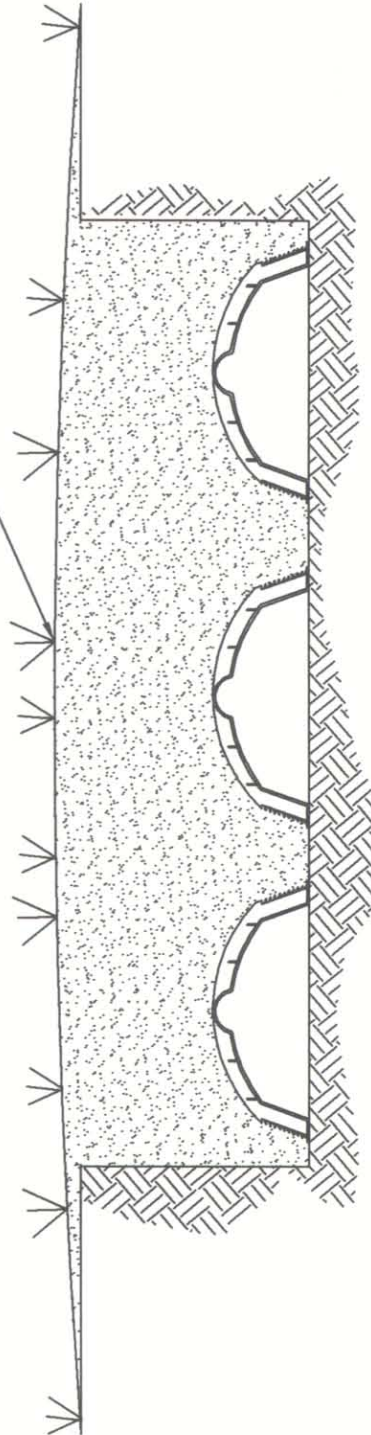


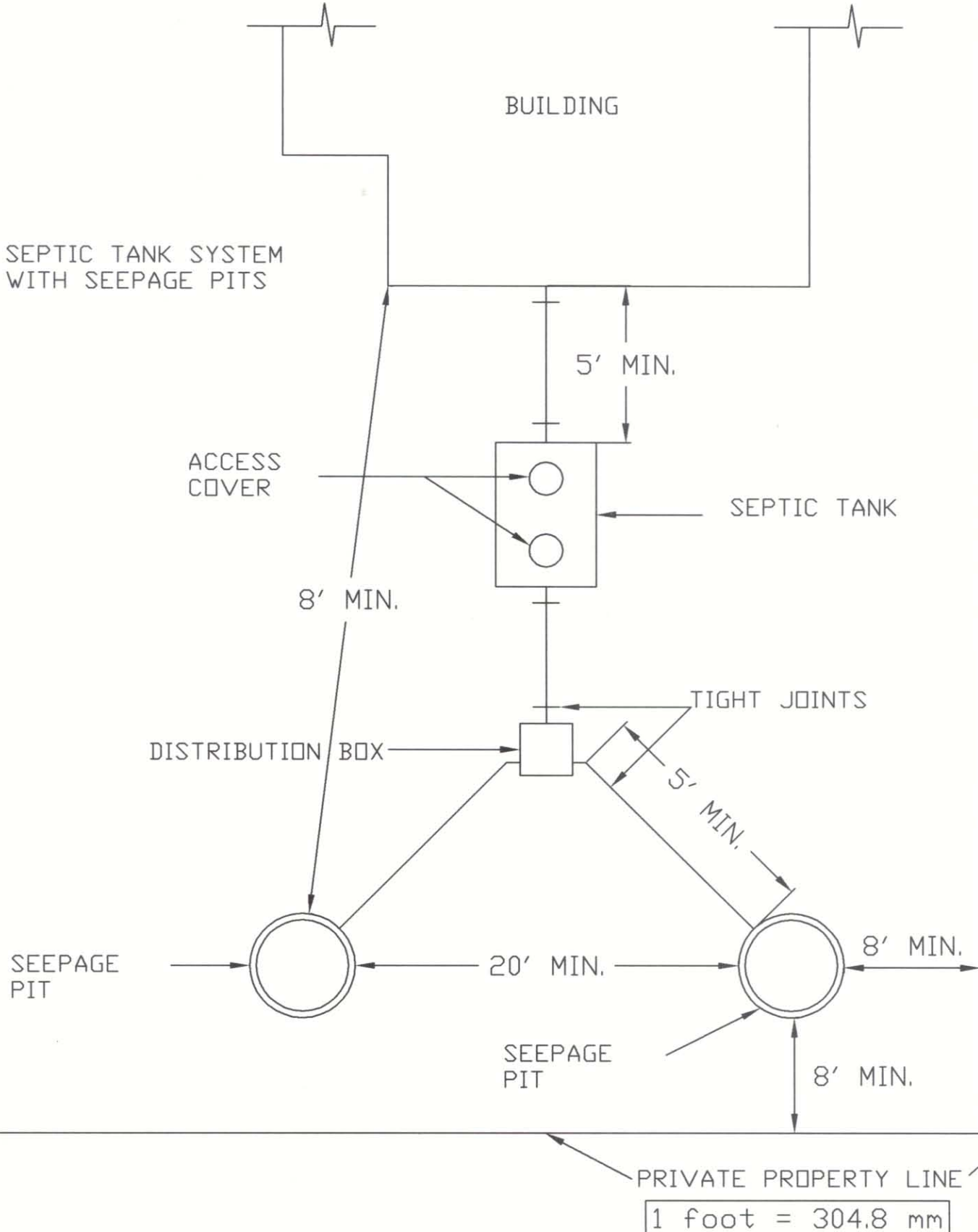
Typical leachline plot plan



PLACEMENT OF LEACHING CHAMBERS IN TYPICAL APPLICATION

SUITABLE VEGETATION FOR INCREASED EVAPOTRANSPIRATION (WATER TOLERANT GRASS)





Typical seepage pit plot plan