

Niagara  Region

PUBLIC WORKS

**Development Services Division
Private Sewage Systems**

A Guide to Septic Tank Systems

PUBLIC WORKS DEPARTMENT
2201 St. David's Road, Thorold, ON
P.O. Box 1042, Thorold, ON L2V 4T7
Telephone: 905-685-4225
Fax: 905-687-8056

A GUIDE TO SEPTIC TANK SYSTEMS

SEWAGE DISPOSAL

For septic tank systems serving dwellings, sewage is defined as waste of domestic origin, which is human body waste, toilet or other bathroom waste, waste from other showers and tubs, liquid or water borne kitchen waste or laundry waste,

A correctly designed, located, constructed and maintained sewage disposal system will function effectively and safely. An improperly designed, located, constructed, or inadequately maintained system can lead to considerable nuisance and expense and seriously endanger health and the environment.

SOIL ASSESSMENT

The suitability of soil for absorbing liquid waste depends on characteristics such as its grain size and gradation: the presence of organic compounds: its' structure, density and moisture content; "plastic" properties and chemical composition These characteristics must be assessed to decide the percolative capacity of the soil for handling septic tank effluent.

When necessary, the local ministry office deals with the applications. Evidence showing that a certificate of approval has been issued is normally required before a building permit is issued. Aside from this legal requirement, it is in your best interest to get advice before you start to build because the sewage disposal system may be the determining factor in establishing the location and ground elevation of your house or other buildings.. Information concerning regulations and application for approval forms may be obtained from your local health unit or ministry office. In addition, the regulation prescribes the following requirements for the construction, operation and maintenance of all sewage systems:

- Except for a Class 7 sewage system [a hauled sewage system, the sewage system or any part thereof shall not emit, discharge or deposit sewage or effluent onto the surface of the ground. Sewage or effluent shall not emit, discharge, seep, leak or otherwise escape from the sewage system, or any part thereof into a piped water supply, well water supply, a watercourse, ground water or surface water. Sewage or effluent shall not emit, discharge, seep, leak or otherwise escape from the sewage system or any part thereof other than from a place or part of the sewage system where the system is designed or intended to discharge sewage or effluent. Insects and animal life shall be prevented from gaining access to sewage contained in the sewage system.
- No sewage system or any part thereof shall emit, discharge, deposit or allow the emission, discharge or deposit of micro-organisms of intestinal origin into the natural environment in such a manner as may be a hazard to health.
- No gas shall emit, discharge, or otherwise escape from the sewage system into any building or structure except in the manner in which the sewage system was designed or intended to emit or discharge gas.
- No connections to the sewage system from non sewage wastewater sources shall be made.
- The operator of the sewage system shall keep it maintained at all times so that its construction remains in accordance with the certificate of approval and any order made under the Act. Based on the results of an inspection and any soil testing undertaken, the percolation rate, "T" time, expressed in minutes per centimetre, is selected and used in the accompanying tables.

ABSORPTION TRENCH LEACHING BED DESIGN (DRAWINGS 1 AND 2)

Under normal conditions the ideal location for a leaching bed is in well drained sandy loam soil, remote from any wells or surface water, The regulation requires the bottom of absorption trenches to be at least 0.90 metres above the high ground water table, and at least 0.90 metres above the maximum elevation of rock or of soil with a percolation time of greater than 50 minutes per centimetre. Where water table is the limiting factor, it is the highest water table that is of concern rather than the average water table or that found at the time of the site investigation.

Gravity flow is permitted for leaching beds with up to 150 metres of distribution pipe. If required by topography, a pump can be used to lift the effluent to a point where gravity flow resumes. If 150 metres or more of distribution pipe is used, the sewage system must have a pump or siphon, contained in a separate compartment which may be part of the tank structure. The pump or siphon must be designed and constructed so that it is capable of discharging from the compartment, within a 15 minute time period, a volume of tank effluent not less than three quarters of the total interior volume of the distribution pipe.

The maximum length of any single absorption trench in a leaching bed is 30 metres. The area of a leaching bed should be free of trees and bushes so that the bed is well aired and sunlight can reach the surface.. Trees should only be permitted within the area of the bed if no damage will occur from the roots, taking into account the size and type of tree, and the arrangement of the tile or pipe runs.

A good growth of grass should be encouraged and maintained over the entire leaching bed area. The plant roots absorb liquid in the soil and transpire it to the atmosphere through their leaves. Sunlight should be allowed to reach the bed to promote evaporation.. Traffic, which can destroy the cover of vegetation, compact the soil above the bed, and damage the distribution pipes should be avoided.

BEDS ON SLOPING SITES

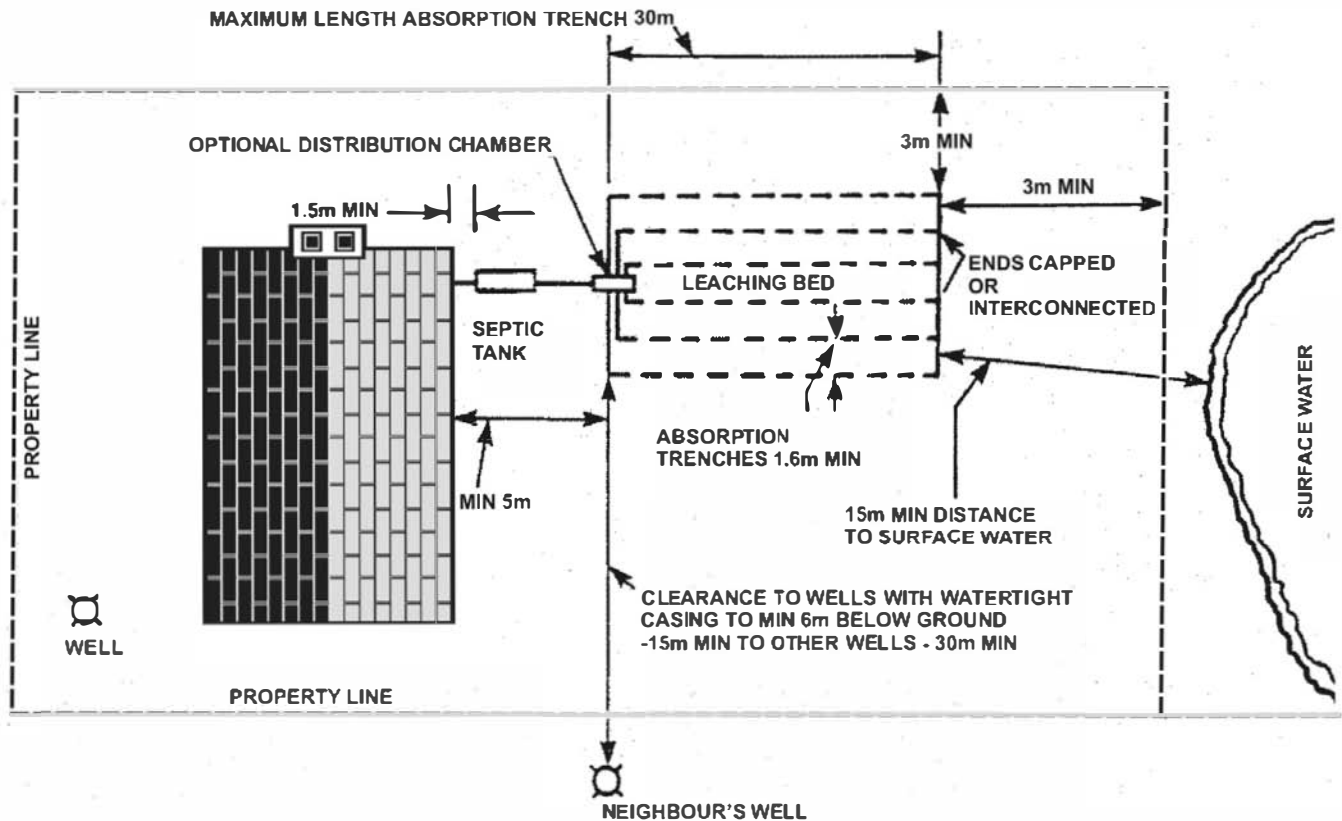
Leaching beds constructed in the conventional manner (Drawings 1 & 2) require sites that are level or only slightly sloped. The cost and other problems of leveling the required area will generally limit conventional construction methods to slopes with no more than a one metre rise for each 10 metres horizontal distance (10%). Special methods of installation are required where more steeply sloped sites are encountered. Information on these methods is available from ministry or health unit offices for sloped sites 10% up to 25% (1 metre vertical to 4 metres horizontal). Leaching, beds are not to be constructed on areas where the slope exceeds 25% in any direction.

RAISED LEACHING BEDS – (DRAWING 3)

In cases where 0.9 metres of acceptable soil is not available between the bottom of the pipe trenches and underlying rock or unacceptable soil, a leaching bed of selected material, may be constructed to form a mound in which the absorption trenches can be set thus obtaining the desired 0.9 metre clearance below the trenches. An unacceptable soil is one having a per colation rate 'T" in excess of 50 minutes per centimetre. Similarly, a raised bed may be required in order to provide the 05 metres minimum clearance between the bottom of the trenches and high ground water table.

Where high ground water, or a shallow depth of acceptable soil, requires the construction of a leaching bed in imported fill, vertical absorption of the treated sewage in the soil will be restricted.. There will be increased lateral movement of liquid in the soil in any direction in which ground water flows away from the bed. To guard against the liquid breaking out to the surface, the regulation requires that there be at least 0.25 metres of acceptable soil cover for at least 15 metres beyond the outer pipes in any direction that this in-ground movement will take place. If surface soils are acceptable, but of inadequate depth, more soil must be added to provide the required depth.. If soils of T-time exceeding 50 minutes per centimetre are at the surface, there is no option but to add acceptable soils to meet the mantle requirement.

Drawing 1



TYPICAL ARRANGEMENT OF A SEPTIC TANK SYSTEM

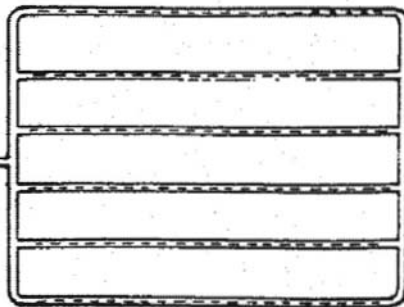
NOTES:

- 1 The above layout is suitable for a leaching bed using normal construction methods.
2. Location of tank and leaching bed to be on lower ground than adjacent Wells or springs, if possible.
3. Internal plumbing and main drainage outlet should be designed with a view to connecting to possible future sanitary sewers.
4. Roof water, surface water discharge from footing drains, etc. must be excluded from entry to septic tank.
5. Leaching beds NOT to be located in swampy ground or in ground liable to flooding.
6. See the Regulation regarding details for the sitting of the septic tank and tile bed.

CLASS 4 SEWAGE SYSTEM
TYPICAL SMALL SEPTIC TANK SYSTEM

Drawing 2

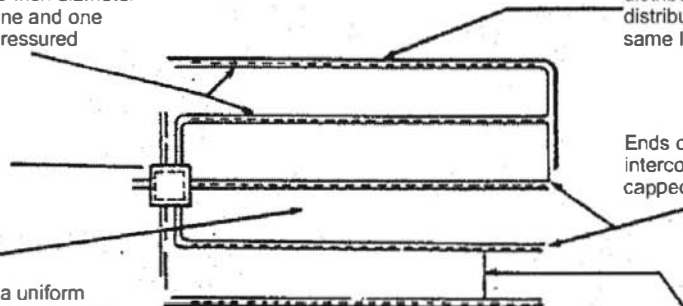
Effluent from septic tank or proprietary aerobic treatment plant



LEACHING BED PLAN (WITH HEADER)

Distribution pipe of not less than three inch diameter and size for gravity flow systems or one and one quarter inch diameter trade size for pressured systems

Maximum length of single line of distribution pipe is 30m. Each line of distribution pipe to be approximately the same length



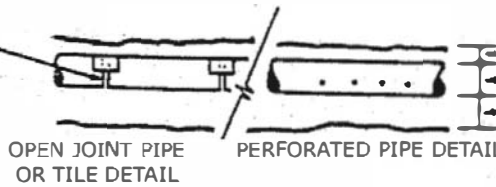
Ends of lines of distribution pipe may be interconnected with solid walled pipe or capped

Each line of distribution pipe to have a uniform downward slope from the inlet of not less than 30 mm and not more than 30 mm (or each 10 m of its length).

LEACHING BED PLAN (WITH DISTRIBUTION BOX)

Lines of distribution pipe centred at least 1.6m span

Open-jointed distribution pipe or tile shall have an open space of not less than 6 mm and not more than 12mm between each pipe or tile and the upper half of every open space shall be covered with tar paper in such a manner as to prevent soil, gravel or other foreign matter from entering the distribution pipe through the open space



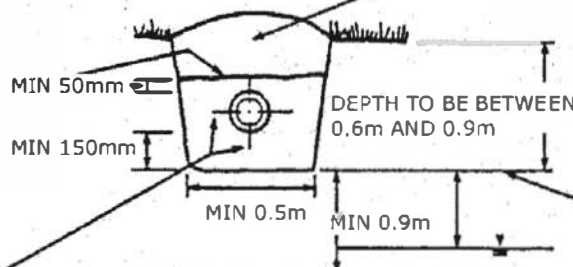
OPEN JOINT PIPE OR TILE DETAIL

PERFORATED PIPE DETAIL

ADSORPTION TRENCH (LONGITUDINAL SECTIONS)

Backfill to be porous soil placed in such a manner so as to ensure that after the backfill settles the surface of the leaching bed will not form any depressions

Stone layer to be completely covered with untreated building paper pea gravel straw or other like material in such a manner as to prevent soil from entering the stone

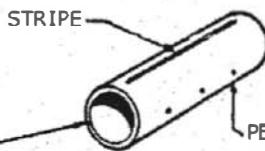


The bottom of the trench shall be at all points at least 0.9m above high ground water table and at least 0.9m above maximum elevation of rock or soil with percolation time greater than 50min/cm

ROCK OR SOIL WITH "T" GREATER THEM 50 MIN/CM

MAXIMUM ELEVATION OF GROUND WATER TABLE

Stone to be either 19 mm clear aggregate, washed, to be free of fine materials, or clean gravel screened to be between 19 mm and 53 mm in size



STRIPE

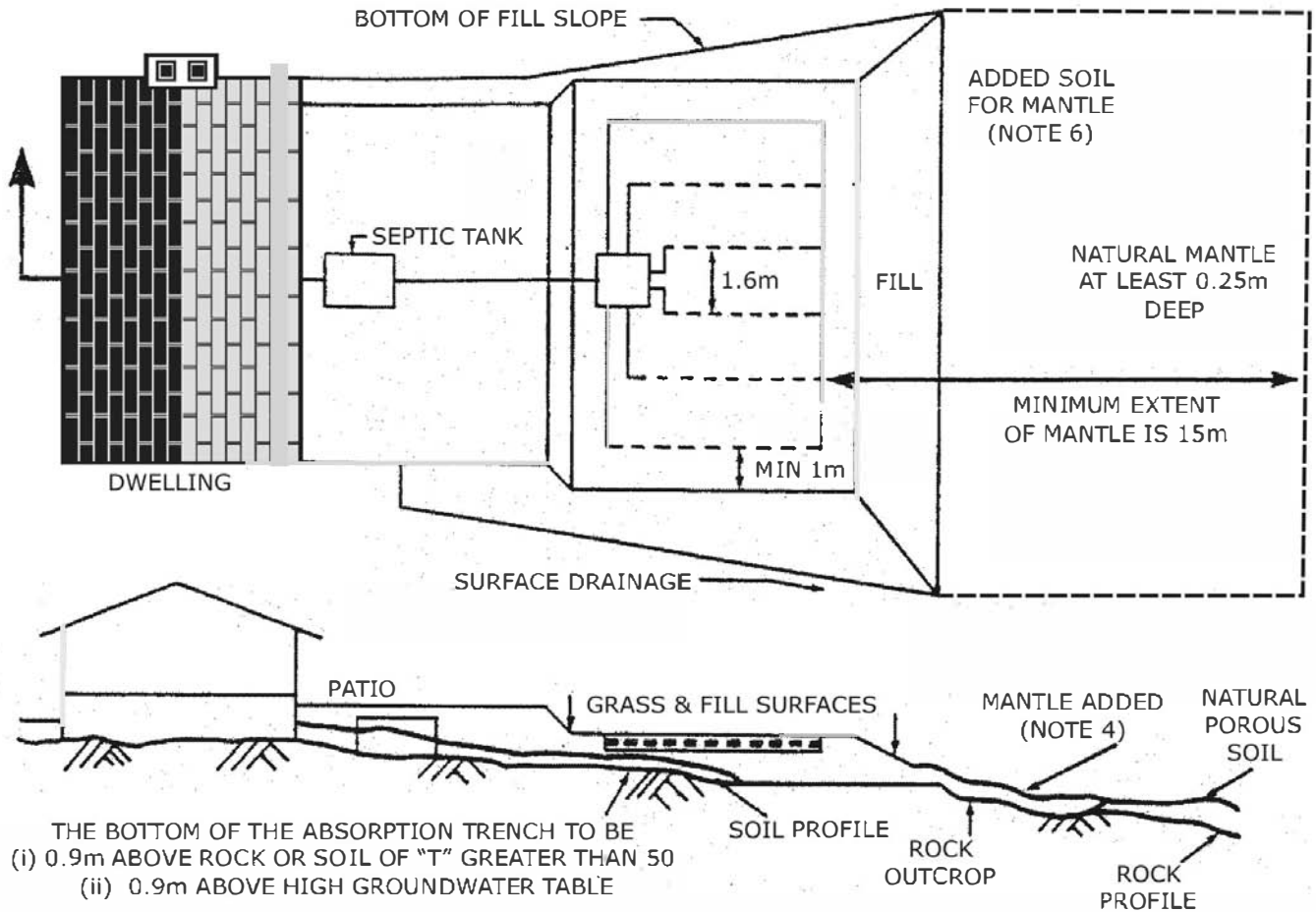
PERFORATION

PERFORATED PIPE

Perforations at approximately 4 and 8 o'clock positions when laid. A stripe along top at 12 o'clock position on some pipe facilitates proper alignment of perforations when installing. Minimum hole diameter of 12 mm and spacing of hole to provide at least 5800 mm² of hole area per standard length (approx 3 m) of pipe.

CLASS 4 SEWAGE SYSTEM TYPICAL DETAILS - SMALL LEACHING BEDS

Drawing 3



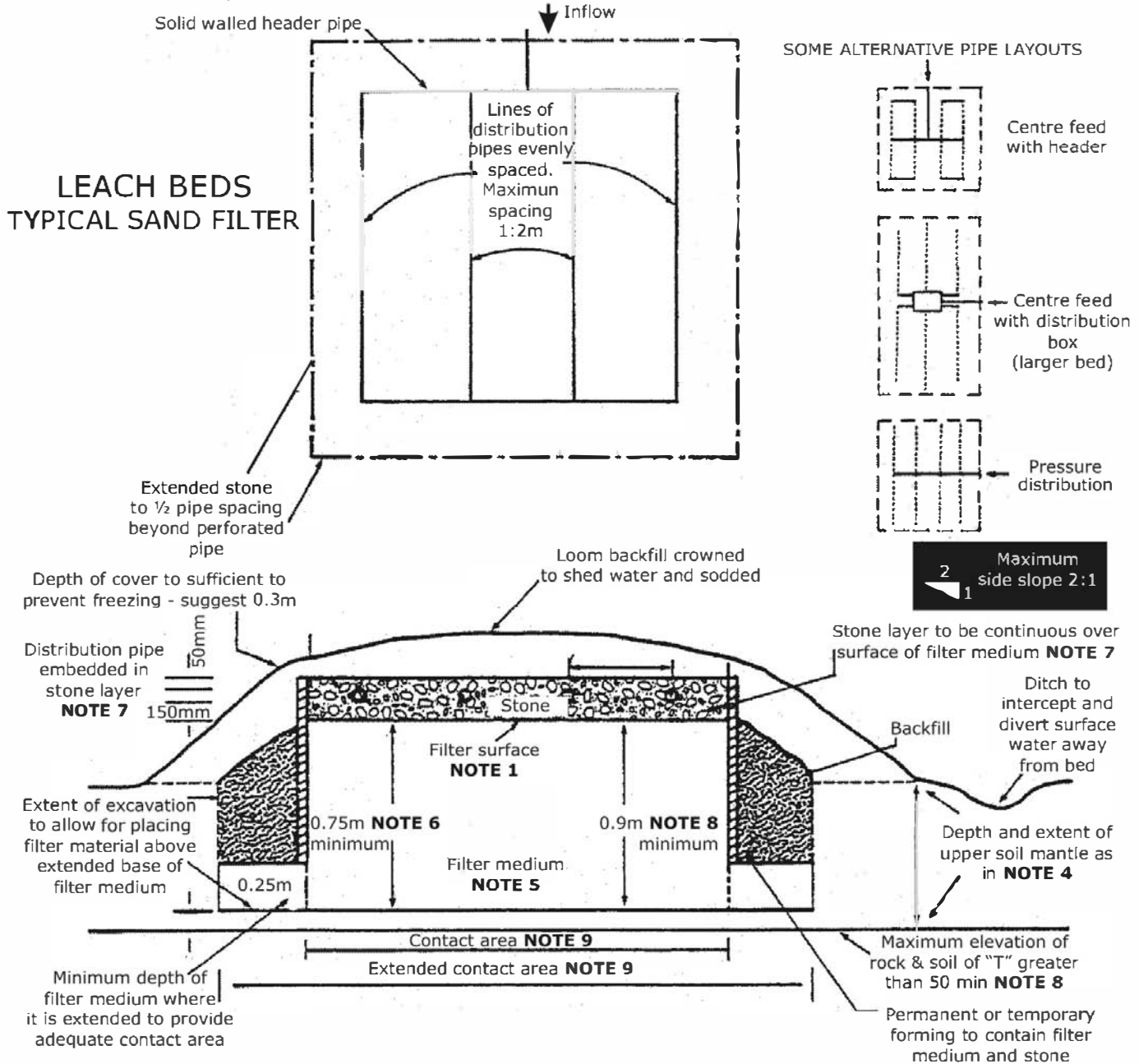
PLAN AND PROFILE - TYPICAL RAISED BED

1. Clearances from buildings, lot lines, wells, etc., as for normal leaching beds plus 2 metres horizontal for each 1 metre vertical that surface of bed is above grade
2. Fill slope must be stable for the material used, but not steeper than 2 metres horizontal to 1 metre vertical.
3. Percolation rate "T" of imported material should preferably be not less than 2 mm/cm.
4. Effluent passing through fill must be absorbed into natural soil beneath the fill or into the surrounding permeable soil without ponding or breakout to surface. The relationship between the percolation time of the fill forming the leaching bed and that of the soil on which it is placed, and the requirements for a minimum soil mantle for 15 metres beyond the outer pipes in any direction in which the effluent from the leaching bed may move in the soil, are contained in the regulation and illustrated in appendix 641.
5. Details of absorption trench construction same as in drawing no 8.11.
6. Where soil mantle (note 4) is absent, or of inadequate depth, soil must be added to meet the requirements of the regulation.. This may be added over an area or, where the topography is uneven, only over the routes in which it is obvious that the in-ground movement will take place.

LEACHING BEDS TYPICAL LAYOUT - RAISED LEACHING BED

Drawing 4 TYPICAL SAND FILTER

(ADAPTABLE FOR USE WITH BOTH CLASS IV AND VI SEWAGE SYSTEMS)



Refer to O, Reg., 374/81 (Sec., 10 and Sec. 12) for regulations governing sand filter type leaching beds.

1. Maximum area of filter surface 50 m²

2. Permissible loading on filters:

Class IV sewage systems 75 L/m²/day for flows up to 3000 l./day.
50 l./m²/day for flows between 3000 L/day - 5000 l./day.

Class VI sewage systems 150l./m²/day for flows up to 6000 l./day
100 l./m²/day for flows between 6000 l./day and 10000 l./day.

3. The maximum daily sewage flow of a sewage system in which the leaching bed may be of the filter type is 5,000 l. for a class 4 sewage system, and 10000 L for a class 6 sewage system. At maximum size in each case two 5Cm2 filters are required,

4. A soil mantle of T not greater than 15mm /cm and at

least 0.25 m, n depth is required to extend at least 15m beyond the outer distribution pipes in any direction in which the effluent from the bed will move laterally. It must be added if the soil in or on which the filter bed is to be constructed has a "T" value exceeding 15mm/cm

5. Only filter material meeting grading requirements acceptable to the Ministry of the Environment may be used

6. Minimum depth of specified filter material 075 in

7. Pipe to be bedded in stone that is either 19mm clear aggregate washed to be free of fine material or clean gravel screened to be between 19 and 53 mm in size

8. Surface of sand filter material to which sewage is applied must be a minimum of 0.9 m above rock or soil of greater than 50 minutes/cm and at least 0,5 m above the high groundwater table

9. Contact area between the filter medium and the underlying soil must not be less than the area $A-QT/850$ where Q is the daily sewage flow in litres and T is the percolation time of the underlying soil

The quality of imported fill is also restricted by regulation in order to prevent the construction of a leaching bed in imported granular material which is placed directly on a relatively impermeable soil with no provision made for lateral dispersal. This restriction only applies where the upper 0.25 metres of natural soil has a percolation time exceeding 15 minutes per centimetre.

FILTER TYPE LEACHING BEDS - (Drawing 4)

A filter type bed is one where a distribution pipe network is set in a continuous layer of stone above a filter bed of sand, specified in the regulation as to depth and type of material. The surface of the filter sand must have the same clearances above rock, above soil with T-time greater than 50 minutes per centimetre or above high ground water tables, as is required for the bottom of an absorption trench. A filter type bed offers some space saving as far as the sewage treatment area is concerned, but the problem of dispersal of the treated sewage in the soil and the need for a soil mantle to prevent its breakout to the surface are the same. This problem may be accentuated because the application of sewage to the soil is concentrated over a smaller area. Filter beds are not an acceptable option to an absorption trench bed unless the specified filter medium is obtained, or the daily sewage flow does not exceed 5000 litres.

Filter beds are designed according to permissible sewage loading and other regulatory requirements. A typical sand filter is shown in Drawing 4.

CLEARANCES FOR PARTS OF A SEPTIC TANK SYSTEM

In locating a septic tank system, all the clearances listed hereunder are to be measured horizontally (see Drawing 1). They are the minimums required according to the regulation and may have to be increased to prevent pollution if soil or other site conditions so dictate.

Table 8.2.1.6.B from Part 8 Ontario Building Code

No septic tank shall be closer than:

- 15 metres to a well, lake, river, stream, watercourse, pond, spring or reservoir.
- 1.5 metres to any building or structure (including a swimming pool).
- 3 metres to any property boundary.

No distribution pipe in a leaching bed shall be closer than:

- 15 metres to a well which has a watertight casing to at least 6 metres below ground.
- 30 metres to a spring used as a source of potable water or a well, other than a well with a watertight casing to a depth of at least 6 metres.
- 5 metres to any building or structure.
- 3 metres to any property boundary.
- 15 metres to a lake, river, pond, stream or reservoir or to a spring not used as a source of potable water.

Note: The distribution pipe clearance listed above must be increased in any direction in which the surface of the leaching bed is raised above natural grade. The increase is 2 metres horizontally for each 1 metre raised.

SEPIIC TANK SYSTEMS

A septic tank should not be closer than:

- 15 metres to any well, lake, river, stream, water course, pond, spring or reservoir.
- 1.5 metres to any building or structure
- 3 metres to any property boundary.

The distribution pipe in a leaching bed shall not be closer than:

- 15 metres to a well with a watertight casing to at least 6 metres below ground.
- 30 metres to a spring used as a source of potable water or a well other than a well with a watertight casing to a depth of at least 6 metres.
- 5 metres to any building or structure.
- 3 metres to any property boundary.
- 15 metres to a lake, river, pond, stream or reservoir or to a spring not used as a source of potable water

The distribution pipe clearance listed above must be increased in any direction in which the surface of the leaching bed is raised above natural grade, The increase is 2 metres for each 1 metre raised.

The above distances are minimum according to the regulation and may have to be increased to prevent pollution if soil or other site conditions so dictate.

ABSORPTION TRENCH LEACHING BEDS LENGTH OF DISTRIBUTION PIPE IN METRES FOR VARIOUS DESIGN SOIL PERCOLATION TIMES (T) FOR PRIVATE DWELLINGS (General Guidelines Only!)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6	COLUMN 7
Number of Bedrooms	T from 1 to 5 Min. inclusive	T greater than 5 min. but not greater than 10 min.	T greater than 10 min. but not greater than 15 min.	T greater than 15 min. but not greater than 20 min.	T greater than 20 min. but not greater than 25 min.	T greater than 25 min.
2 or less	40	40	70	100	130	5.5T
3	40	60	100	140	180	8T
4	40	80	130	180	230	10T
For each bedroom over 4 add	5	12	20	27	35	1.5T

NOTES: This table is for domestic systems only. It does not apply to schools, motels, hospitals or other such public or commercial premises.

**MINIMUM AREA OF THE SURFACE OF THE FILTER
MEDIUM IN FILTER TYPE LEACHING BEDS FOR PRIVATE
DWELLINGS—SEPTIC TANK SYSTEMS**

Number of Bedrooms	Minimum Surface Area of Filter Medium Square Metres
2 or less	15
3	22
4	28
For each bedroom over 4 add	4

CARE & MAINTENANCE OF A SEWAGE SYSTEM

WHAT YOU NEED TO KNOW

The way you treat your septic system will influence how long the system lasts and how well it functions. If you own or rent a property served by an on-site sewage system, you need to think about how your actions affect the system. You need to be careful about what substances you flush down the drain and how often your septic tank is cleaned out and inspected. These decisions will impact on the effectiveness of your septic system and making the wrong one can lead to expensive and time consuming problems. Sometimes, they can also result in harm to the natural environment or public health by polluting lakes or contaminating drinking water supplies.

In order to avoid the inconvenience and cost associated with the repair or replacement of a failed septic system, you should know how to properly operate and maintain your septic system. This brochure provides some helpful advice for property owners about the steps they can and should take to help their septic system perform well for years to come.

COMMON SEPTIC SYSTEM PROBLEMS

There are a number of common signs of trouble with septic systems. These include:

- toilets or drains which are backed up or run more slowly than usual
- foul odours in the house or drinking water
- sogginess in the ground around the septic tank or leaching bed area
- surface flooding of sewage or septic tank effluent around the septic system
- activated alarm signals (lights or bells) on special treatment units
- dosing pumps which run constantly or not at all (Note: not all systems have pumps)
- unusually green or thick grass growing in or around the leaching bed area
- significant algae growth in or around nearby lakes or water bodies
- high levels of nitrates, bacteria or other contaminants in well water

Toilets and Drains are NOT Garbage Cans!

Some items you flush down a toilet or pour down a drain can significantly reduce the ability of the beneficial bacteria in a septic system to break down and treat domestic sewage. Harmful chemicals

and substances will kill bacteria and render a septic system useless. Bulky or hard-to-break down products can clog pipes, quickly fill septic tanks and decrease the effectiveness of the system. Septic tank additives/starters may be harmful to septic systems and are not necessary to begin or continue septic tank operation.

NEVER put the following items or substances into a septic system:

- fats, oils and grease,
- gasoline, antifreeze,
- varnishes, paints and solvents,
- caustic drain and toilet bowl
- cleaners,
- photographic solutions,
- bleach, pesticides,
- nail polish remover,
- cat box litter,
- tampons, sanitary napkins,
- diapers, paper towels, facial
- tissues, condoms, plastics,
- coffee grounds, egg shells and
- other kitchen waste or
- cigarette filters.

TIPS ON MAINTAINING YOUR SEPTIC SYSTEM

There are a number of steps property owners can take to improve the functioning of their septic system and extend its life:

- conserve water and reduce waste flow into the system by installing water saving features in plumbing fixtures, using dishwashers and laundry machines only with full loads, taking shorter showers rather than full baths, fixing leaky faucets and avoiding the use of garbage disposal units — too much water will overload a septic system
- ensure septic tanks are inspected at least every two years by a qualified person and pump tanks out at least every 3 - 5 years (or sooner since frequency depends on tank/household size). These actions can be combined
- do not impair access to the septic tank so that proper maintenance and servicing can occur
- reduce the use of phosphate-based detergents, soaps and cleaners to minimize algae growth in nearby lakes and rivers. Phosphates can impair water quality and fish habitat
- avoid the construction of parking areas, patios, tennis courts or decks in the area of or over the leaching bed. The extra traffic or weight can crush pipes or compact the soil or fill material. Construction can also limit oxygen from getting into the soil or fill
- have an effluent filter installed in the septic tank to reduce the amount of solids entering the leaching bed and prevent clogs
- do not use snowmobiles over the leaching bed area in winter since this reduces the natural insulation of the bed provided by the snow cover
- avoid planting trees or shrubs on the leaching bed area since roots can clog the perforated pipes and shade the leaching bed area, thereby limiting evaporation and transpiration
- minimize grass watering around the leaching bed area. Extra water can reduce the bed's ability to absorb and treat wastewater from the house
- exercise caution about waste flows from water treatment units, furnace condensate discharges and water softener back washes. These substances can harm the septic system, especially in large quantities

- direct rainwater runoff from roofs, patios and driveways away from the leaching bed area and septic tank access ports to avoid system overload

TANK INSPECTION AND CLEANING

Having your septic tank inspected regularly is one of the least costly ways to avoid the inconvenience and expense of doing a major septic system repair. Inspections can determine if the outflow to the leaching bed is clogged because of a back-up in the tank, if too much solid or scum material is in the tank or whether the tank needs to be pumped more frequently. *Because they contain deadly gases, septic tanks should only be inspected by firms specializing in this work.*

How often you need to pump the tank depends on the size or capacity of the tank, the flow of wastewater entering the tank and the volume of solids in the wastewater stream. Generally, this should occur every 3 - 5 years, but factors can change during the life of the septic tank. More people living in the house or the addition of a high water use appliance can exceed the capacity of the existing tank, requiring more frequent pump outs. Summer and early fall are the best times to pump out a septic tank. Pumping at this time of the year leaves sufficient time before winter for the tank to refill and bacterial activity to become re-established. As well, the ground around the tank will not be frozen (allowing easier access) and higher water tables which typically occur in the spring will have receded.

NEW SEPTICS TECHNOLOGIES ...

Typical Septic Tank

More and more companies are developing innovative ways to improve the effectiveness of on-site sewage disposal technology. Some of these systems add other parts to the traditional septic system, such as pump chambers to provide more regular or controlled flow of wastewater to the leaching bed area and oxygen enrichment treatment units (sometimes called aerobic treatment units) which add oxygen to the wastewater to assist bacterial activity.

Other types of pre-treatment units use different materials such as special sands, peat or other filter materials. These systems are becoming increasingly popular because of the quality of the wastewater they produce and because they can reduce the overall size of the septic system, especially the leaching bed area. The effectiveness of these systems is only as good as the degree to which they are properly maintained and operated by the property owner. Many have parts which require regular lubrication, uninterrupted electrical connections, servicing and regular check-ups. Some systems require a maintenance agreement between the property owner and the manufacturer.

WHO DO YOU CALL ABOUT SEPTIC PROBLEMS ?

If you suspect your septic system is not working, a firm which pumps septic tanks may be able to identify the nature of the problem and recommend further action. Alternatively, you can call a licensed company which installs or repairs septic systems. In Ontario, septic installers must be licensed by the Province. These companies must have qualified people working for them who have passed an examination administered by the Ministry of Municipal Affairs and Housing. Before you hire someone to do work, make sure they have the right license. Most septic installers will be listed in the yellow pages section of your telephone book under "septics"

If you suspect a problem with your system, you may also want to contact the local agency which enforces the Ontario Building Code requirements for septic systems. This may be either your municipal building department, board of health or conservation authority. If a septic system needs a significant repair or replacement, it will be one of these agencies which will have to issue a building permit and inspect the work once it is completed. You can find these agencies listed in the "blue pages" of the telephone book.

SEPTICS AND THE ONTARIO BUILDING CODE

As of April 6, 1998, the rules for smaller on-site septic systems are covered by the Ontario Building Code (OBC). While these rules are put in place by the Province of Ontario, local agencies such as municipal building departments, boards of health or conservation authorities are responsible for issuing permits and doing inspections.

The OBC includes regulations related to the operation and maintenance of septic systems requirements for servicing by qualified people, wastewater monitoring and sampling, septic tank pump outs, etc. If you have questions about the OBC requirements for a new or existing septic system, you should contact the septic enforcement agency in your area. If you have general questions about how the Ontario Building Code works, you can contact:

**Ministry of Municipal Affairs and Housing
Housing Development and Buildings
Branch,
777 Bay Street, 2nd Floor,
Toronto, ON M5G 2E5
Tel: (416) 585 - 6666 or
Fax: (416) 585 - 7531
or
visit the Ministry's web site at:
<http://obc.mah.gov.on.ca>**

FURTHER INFORMATION

If this information sheet has not answered all of your questions about septic tank systems or if it leaves a problem unresolved, you should contact the nearest **Ministry of Municipal Affairs and Housing, Niagara Region Public Works Department or Niagara Region Health Services Department.**

FURTHER INFORMATION SEPTIC SYSTEMS PERMITS CONTACT:

**PUBLIC WORKS DEPARTMENT
Development Services Division
Private Sewage Systems
2201 St. David's Road, P.O. Box 1042
Thorold, Ontario L2V 4T7
Tel: 905-685-4225
Toll-free: 1 800 263-7215
Fax: 905-687-8056**

<http://www.niagararegion.ca/government/works/development-services.aspx>

(Development Applications Forms and Fees)