
**A GUIDE TO THE INSTALLATION OF
PRIVATE SEWAGE DISPOSAL SYSTEMS
AND SINGLE LOT DEVELOPMENT**

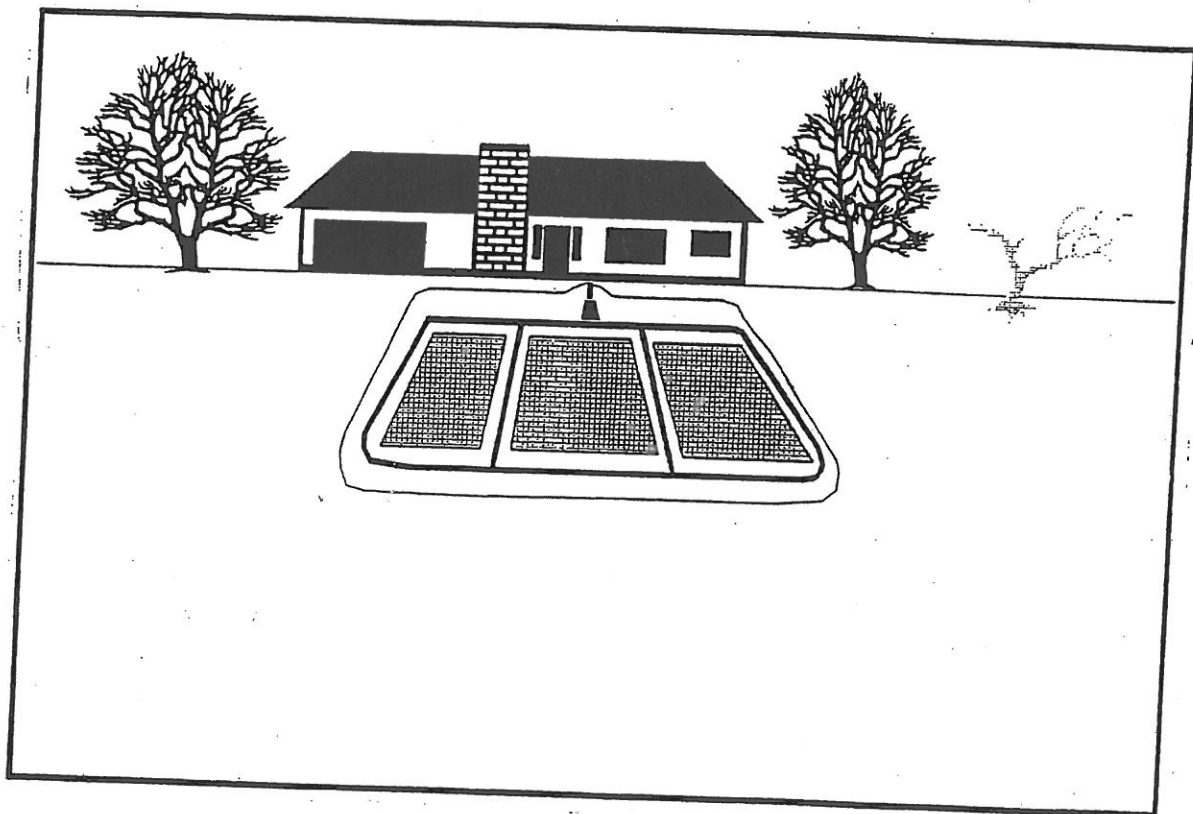


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A. INTRODUCTION

Any building that is supplied with water under pressure and is located in an area not serviced by municipal sewers must have its own sewage disposal system. Sewage must be disposed of in a sanitary manner to prevent it from becoming a health hazard.

There are many types of sewage disposal systems, of which the most common type is a Class 4 system consisting of a septic tank and leaching bed. The purpose of a Class 4 sewage disposal system is to return to the soil, the sewage from the household so that ground water does not become contaminated and no sewage appears at the ground surface.

Before any building is constructed or renovated, it is the owner's responsibility to contact various agencies to obtain building requirements, approvals and/or permits. Some of these agencies include:

- the local municipal office for information on building and plumbing code requirements and permits
- the Ministry of Transportation for approval to install a sewage system on land abutting a Provincial highway.

B. OWNER'S LEGAL REQUIREMENTS

1.0 Authorities:

- Ontario's Building Code regulates the design, construction, alteration and repair of sewage systems under the Building Code Act.
- Any contravention of the Building Code Act and the Building Code (sewage systems) may be dealt with under the Provincial Offences Act, or other means of litigation i.e. Health Protection and Promotion Act.

2.0 Sewage System Building Permit:

- A Building Permit for the sewage system must be obtained from the municipality for any proposed sewage system before the municipality will grant a building permit for the proposed building.
- The issued building permit must be posted on the building facing the road.
- The completed sewage system must be inspected before it is backfilled.

- A Building Permit for a sewage system may be revoked at any time with proper cause.
- Once a Building Permit for a sewage system has been issued, no changes can be made to the design unless first approved by the building department

Note: Malfunctioning sewage systems must be reported to the building department

3.0 Installers

- Sewage disposal system installers must be licensed by Ministry of Municipal Affairs and Housing.

C. COMMON TYPES OF SEWAGE SYSTEMS

There are many types of sewage disposal systems, of which the most common type is a conventional Class 4 system. Occasionally, under special conditions a Class 5 system may be required.

1.0 Class Four System

- The conventional Class 4 sewage disposal system consists of a septic tank and a leaching bed.
- The size of a leaching bed is based on the percolation rate of the soil in which the leaching bed is constructed and an estimate of the daily volume of sewage produced.
- **A licensed installer or an engineer can assist you in the design of a sewage system suitable for your needs.**

2.0 Class Five System

- A Class 5 sewage system consists of a holding tank for the storage or retention of sewage at the site where it is produced.
- The sewage in the holding tank must be pumped out regularly and disposed of by a licensed sewage hauler.
- For a Class 5 sewage system, a pump-out agreement must be made between the property owner and a licensed sewage hauler.
- **A Class 5 sewage system is prohibited for any new construction under the Building Code.**
- A holding tank can only be used for developed lots to correct a malfunctioning sewage system when there is no other viable means of sewage disposal and a licensed sewage hauler is available.

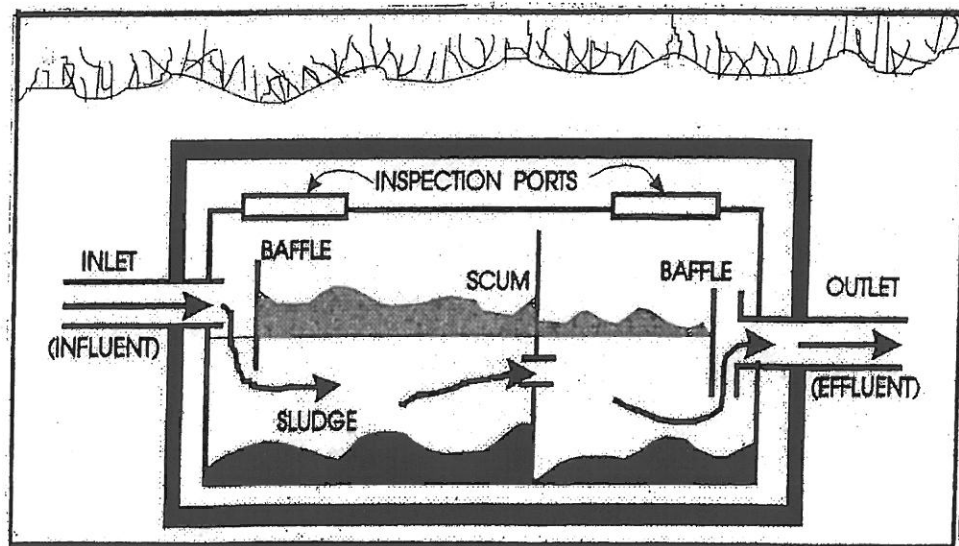
D. COMPONENTS OF A CLASS 4 SEWAGE SYSTEM

The basic components of a Class 4 sewage system are a septic tank and leaching bed. Some Class 4 systems also require a distribution box, pump and pump chamber. These components are described below.

1.0 Septic Tank

- The septic tank is located between the house and the leaching bed.
- The septic tank consists of two compartments and is usually made of concrete, plastic or fiberglass.
- Solid waste in the sewage separates from the liquid waste and remains in the first compartment of the tank where it is broken down by bacteria. The liquid waste enters the second compartment and flows into the distribution pipes of the leaching bed.
- Baffles at the septic tank inlet and outlet prevent solid waste from entering the leaching bed and clogging the distribution pipes.
- The size of the septic tank for a home is based on the daily sewage flow. No septic tank shall be less than 3600 litres and must be at least twice the daily sewage flow.

FIGURE D-1: SEPTIC TANK DIAGRAM



2.0 Leaching Bed

- The leaching bed consists of several absorption trenches containing perforated pipes which are embedded in gravel and laid with a grade of about 30 to 50 mm or 3 to 5 cm (1.18" or 1.97") per 10 metres (30 feet) of pipe.
- The liquid waste from the septic tank travels down the perforated pipes and trickles through the stone and into the soil.
- In the stone and soil layer, oxygenating bacteria break down the sewage.
- The leaching bed must be laid out in a system of even distribution.
- The size of the leaching bed is determined by the type of home, the number of bedrooms in the home and the percolation rate of the soil in which the leaching bed is to be installed.

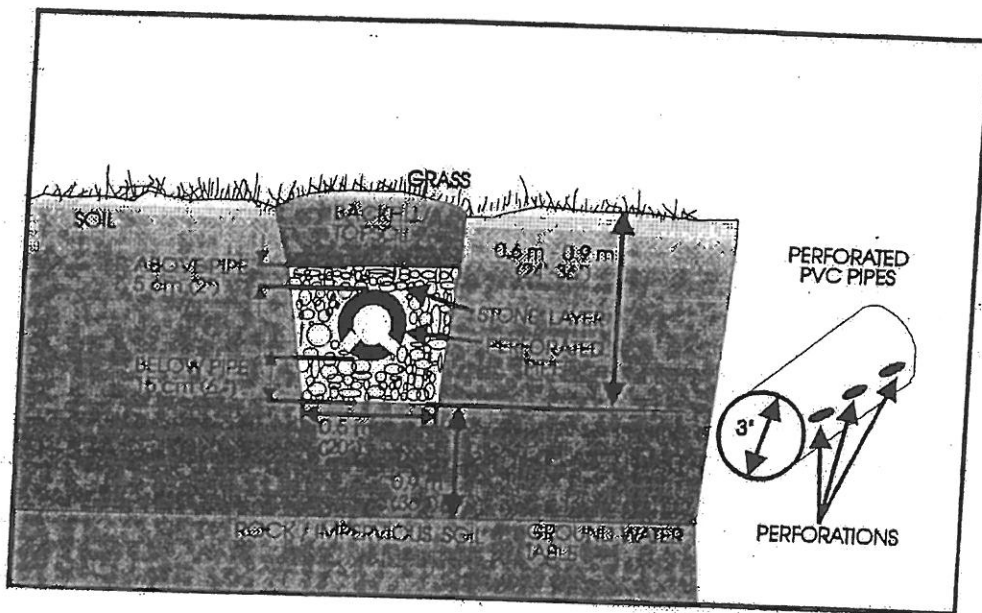


FIGURE D-2: CROSS SECTION VIEW OF A LEACHING BED TRENCH

2.1 Daily Residential Sewage Flows

CHART D-3: DAILY SEWAGE FLOWS IN LITRES/DAY (Q)

Residential Occupancy	Volume (Litres)
Apartments, Condominiums, Other Multi-family Dwellings - per person	275
Boarding Houses	
a) Per person,	
i) with meals and laundry facilities, or,	200
ii) without meals or laundry facilities, and,	150
b) Per non-resident staff per 8 hour shift	40
Boarding School - per person	300
Dwellings	
a) 1 bedroom dwelling	750
b) 2 bedroom dwelling	1100
c) 3 bedroom dwelling	1600
d) 4 bedroom dwelling	2000
e) 5 bedroom dwelling	2500
f) Additional flow for ²	
i) each bedroom over 5	500
ii) A) each 10 m ² (or part thereof) over 200 m ² up to 400 m ² (³)	100
B) each 10 m ² (or part thereof) over 400 m ² up to 600 m ² (³), and	75
C) each 10 m ² (or part thereof) over 600 m ² (³), or	50
iii) each <i>fixture unit</i> over 20 <i>fixture units</i>	50
Hotels and Motels (excluding bars and restaurants)	
a) Regular per room	250
b) Resort hotel, cottage, - per person	500
c) Self-service laundry, add per machine	2500
Work Camp/Construction Camp, semi-permanent - per worker	250

2.2 Length Of Distribution Tile Calculation

The minimum length of distribution tile is calculated using the formula:

$$L = \frac{Q \times T}{200}$$

- L = total length of distribution tile required in metres
- Q = total daily sewage flow in litres/day
- T = percolation rate in minutes per centimetre

2.3 Example of Length of Distribution Tile Calculation

Percolation rate (T) = 16 minutes/centimetre
3 bedroom home; Q = 1,600 litres/day

$$L = \frac{Q \times T}{200} = \frac{1,600 \times 16}{200} = 128 \text{ meters}$$

Therefore, 128 metres or approximately 420 feet of distribution tile are required for the leaching bed.

It is recommended that a 3 bedroom house be provided with at least 106 metres or 350 feet of tile in sandy soil, regardless of the percolation rate.

3.0 Pump and Pumping Chamber

- The pump chamber collects a specific amount of liquid waste which is pumped into the leaching bed by an electrical pump. The entire leaching bed area is dosed with sewage each time the pump chamber is filled.
- A pump and pumping chamber are required when the leaching bed is greater than 500 feet (150 m), or to pump the sewage to a leaching bed when it is at a higher elevation than the septic tank.
- The pump and pumping chamber are located after the septic tank and before the leaching bed.

4.0 Distribution Box

- The distribution box is located between the septic tank and leaching bed.
- A distribution box is a small concrete or plastic box to which the pipes of the leaching bed are connected.
- A distribution box is used to evenly distribute sewage. For example, it is required when there are an uneven number of absorption trenches to evenly distribute the sewage to them and it should be noted on the site plan so it can be located in the future.

5.0 Contingency Area

- A contingency area is an area equal in size to the existing sewage system which is reserved for a replacement sewage system in case the existing system malfunctions.
- Trees, pools or any other structures cannot be placed in this area.
- The contingency area is usually located near the existing leaching bed area.

E. OBTAINING A SEWAGE SYSTEM BUILDING PERMIT

1.0 Requirements for Completion of an Application for Sewage System Building Permit

- Sewage System Building Permit applications are available at your municipal office.

To complete an application for a Sewage System Building Permit and have it accepted, you must provide the following information:

- Basic soil and site information
- Description of the home to be serviced
 - number of bedrooms
 - number of bathrooms and/or number of plumbing fixture units - please complete the Estimate of Fixture Units sheet in Appendix 1, Page 1.
- Site Plan
 - drawn by property owner, or a competent qualified agent and attached to the application.
 - for details and an example - see page 12.
- **The application must be signed by the owner of the property.**

2.0 Application Fee (Make the cheque payable to the municipality)

- To process a Building Permit application for a sewage system, a fee of **\$500.00** is required (includes most homes).
- To repair an existing sewage system, a fee of **\$300.00** is required.

3.0 Sewage System Inspections

- When a Building Permit application for either a Class 4 or 5 sewage system is accepted, an Inspector conducts a site visit to ensure that the proposed sewage system on the site plan is feasible for the lot and meets the requirements of the Ontario Building Code. This inspection usually takes place within three working days after the application is received.
- If the requirements of the Ontario Building Code are met, a copy of the Building Permit and site plan are sent to you. It is **your responsibility** to post the application on the front of the building at the site and ensure that the site plan is available at the site before the system is installed.
- If the requirements of the Ontario Building Code are not met, the application will either be accepted with specific conditions that will have to be met, or it will be refused.
- The sewage system contractor or property owner must notify the building department before the sewage system is backfilled. During the final inspection the septic tank and leaching bed or holding tank are inspected to ensure all components meet the regulations and design specifications.
- **With two (2) days advance notice, inspections are conducted Monday through Friday from 8:30 a.m. to 4:30 p.m. except on statutory holidays.**

4.0 Adverse Weather Conditions

- It is recognized that certain weather conditions can adversely affect the accuracy of assessments and installation of sewage systems and be responsible for future failure of a system. Year round assessments and installations are subject to the following restrictions:
 - (a) no applications or installations will be approved during adverse weather conditions,
 - (b) no on-site soil tests will be conducted during the period when there is frost in the ground,
 - (c) no approval of the lot being appraised will be given during periods when there is snow covering the installation,
 - (d) during the winter months, installers and/or owners must consult with the Sewage System Inspector prior to commencing with construction of the sewage system.

Note: See also Owner's Legal Requirements page 3.

F. SOIL TESTS

- The following soils tests must be performed in the area where you and your sewage system contractor have planned to install the sewage disposal system.
- If a soil consultant or engineer is doing the tests, the Inspector is not required to be on the site or view the test holes.

1.0 Soil Profile

1.1 Purpose

The purpose of the soil profile is:

- To determine if a water table exists within the depth of the excavation.
 - the bottom of a leaching bed trench must be at least 0.9 metres or 3 feet above the high ground water table
- To determine whether or not the soil structure is consistent in the excavation i.e. all sand, all clay or a mixture.
 - the bottom of a leaching bed trench must be at least 0.9 metres or 3 feet above rock or heavy clay, having a percolation rate greater than 50 minutes/centimetre

1.2 Instructions

- Make an excavation in the soil with the following dimensions:
 - depth - 1.8 meters or 6 feet
 - diameter - large enough to be able to see the bottom of the excavation in day light
- This excavation is usually made by a backhoe, especially in heavier soils.
- An Inspector will observe this excavation at the same time you have arranged for the percolation rate to be validated or accepted.

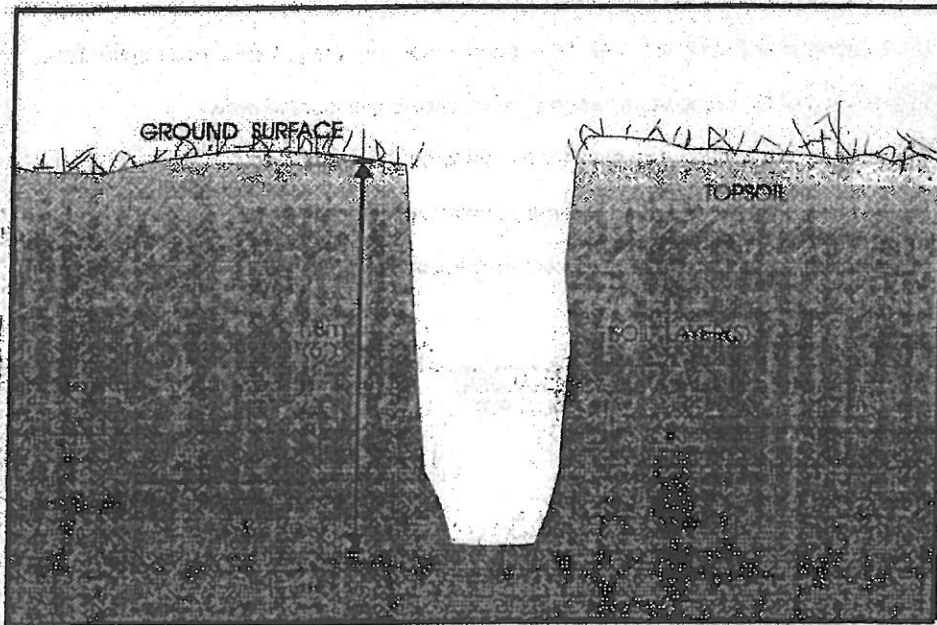


FIGURE F-1: SOIL PROFILE TEST HOLE DIAGRAM

2.0 Percolation Test

- The percolation test must be done by sieve analysis by an engineer or through a lab. The sample must be taken at the three foot level.

G. SITE PLAN REQUIREMENTS

1.0 List of Items to Document

- Each application shall be accompanied by the appropriate fee and two complete sets of plans and specifications dated and signed by the person doing the site evaluation. Each evaluation report shall include a scaled map and profile drawing of the site showing:
 1. the legal description, lot size, property dimensions, existing right-of-ways, easements or municipal/utility corridors,
 2. the location of any structure, well, lake, pond, reservoir, river, stream, or property line,
 3. the location of the proposed sewage system, showing its components,
 4. the location of a contingency area for a replacement sewage system,
 5. the location of any unsuitable, disturbed or compacted areas and,
 6. the proposed access routes for system maintenance.

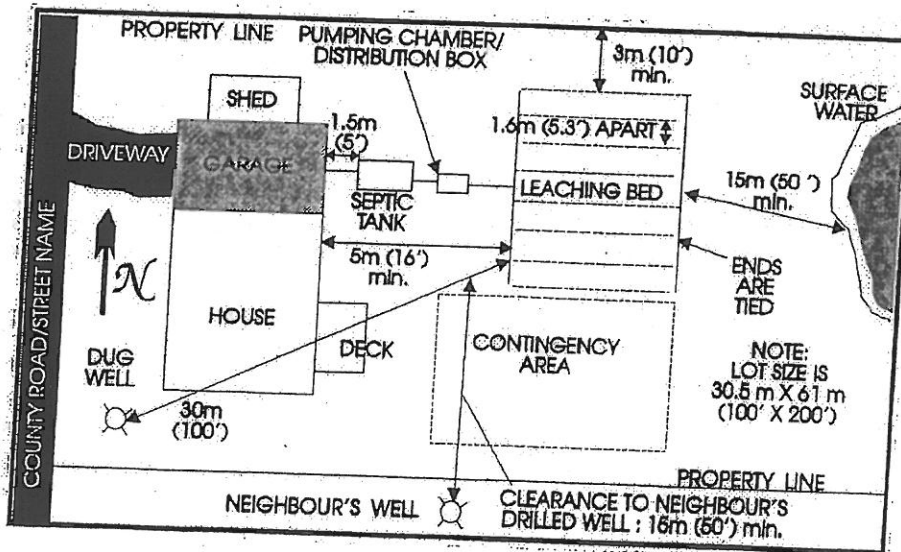


FIGURE G-1: TYPICAL SITE PLAN DRAWING

2.0 Protect the Leaching Bed

- Keep vehicles and any heavy equipment off the leaching bed area; the weight of the vehicle will crack or damage the pipes and compress the soil.

3.0 Landscaping

- Seed or sod the leaching bed area as soon as possible.
- Shrubs or trees should not be planted over or near the leaching bed area, as the roots can clog the drainage pipes.
- Automatic lawn sprinklers must not be installed in the leaching bed area.
- Ensure nothing is built over top of the leaching bed.

4.0 Maintenance of Sewage System

- A septic tank needs to be inspected and pumped out regularly. If the septic tank is not pumped out, solids in the sewage can accumulate to the point where they will flow into the leaching bed and clog the pipes.
- The septic tank should be pumped out every two to three years.
- Check to ensure the baffles in the septic tank are in place.
- The septic tank must be pumped out by a licensed sewage hauler. They are listed in the yellow pages, under Septic Tanks - Cleaning.
- It is not necessary to leave any material in the tank as starter. No commercial starters, bacterial feeds or cleaners are required. The bacteria needed in a sewage system occur naturally in human waste.

I. SEVERANCE REQUIREMENTS

The following information applies to all types of severances and the lots thus being created, up to a maximum of four lots. When five or more lots are being created you must proceed by a plan of subdivision.

Approval of an undeveloped lot in a severance application by the _____ is based on the criteria that a non-luxury, three bedroom house will eventually be built on the lot.

1.0 Lot Size

- The minimum lot size for a severance is 1,850 square metres or 20,000 square feet of useable land. Useable land is free of trees and does not include land associated with an area subject to erosion, flooding or containing extreme variation in contour.

2.0 Minimum Clearances Required For A Site Plan

CHART G-2: MINIMUM CLEARANCES FROM THE SEPTIC TANK

Items	Minimum Clearance
house/building/structure	1.5 metres
lake/pond/river/stream	15 metres
property line	3 metres
well	15 metres
deck or patio	1.5 metres

CHART G-3: MINIMUM CLEARANCES FROM THE LEACHING BED DISTRIBUTION PIPES

Items	Minimum Clearances
house/building/structure	5 metres
dug well	30 metres
drilled well or well with a water tight casing to depth of 6 metres (20 feet)	15 metres
stream, river or any body of water	15 metres
swimming pool	5 metres
closed drain	3 metres
water line (plumbing code)	2.4 metres
property line	3 metres

H. GENERAL REQUIREMENTS

1.0 Final Grading

- During final grading, ensure that:
 - the leaching bed and area around it are graded to shed water
 - rain water down spouts and sump pumps' discharge to the surface are directed away from the leaching bed
 - when necessary, swales are constructed to direct surface water flows around and away from the leaching bed area

- The proposed lot size may need to be increased if any of the following apply:
 - the percolation rate exceeds 20 minutes per centimetre
 - a home containing more than three bedrooms is intended to be built/exists
 - a luxury home (one containing an interior plumbing system which contains 20 or more plumbing fixture units according to the Plumbing Code) is intended to be built/exists
 - structures such as swimming pools, outbuildings etc., are planned/exist.

2.0 Soils Tests

- The soil profile and percolation test described on pages 11 and 12 of this guide are required for each lot associated with the severance.
- The information from these tests is used to determine the area for:
 - the leaching bed and contingency area for any undeveloped lot
 - the contingency area for any developed lot

3.0 Site Plan

- A site plan must be submitted to show the following for both the severed and retained lots:
 - the house and any other buildings
 - the sewage system (septic tank and leaching bed)
 - the water supply, i.e. drilled well, dug well, or municipal water line, etc.
 - the contingency area
 - any private or municipal drains
 - any streams, rivers, lakes or ponds
 - neighbour's sewage system and water supply
- A typical site plan is shown on page 12.

4.0 Lot Assessment Fees

- When a lot assessment involving the above soil tests is conducted to satisfy the conditions of a severance, the fee of \$125.00 must be paid to the municipality for its services. A fee of \$75.00 is payable for all other severance appraisals.

J. CONCLUSION

- Your sewage system is an expensive undertaking, and in order to get the most value out of your investment, ensure that all plumbing fixtures are working properly and maintain your system as outlined in this guide.
- The Municipality and its employees are not responsible for the satisfactory functioning of your sewage system.
- For further inquires or appointments contact your municipal office to arrange for an inspector to call.

APPENDICES

1. Appendix 1

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