

# Part 8

## Sewage Systems

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# Part 8

## Sewage Systems

### Section 8.1. General

#### 8.1.1. Scope

##### 8.1.1.1. Scope

(1) The scope of this Part shall be as described in Section 2.1. and applies to the design, *construction*, operation, and maintenance of *sewage systems*.

##### 8.1.1.2. Definitions

(1) In this Part,

*Soil* means in-situ, naturally occurring, unconsolidated mineral or organic material, at the earth's surface which is at least 100 mm thick and capable of supporting plant growth, and includes material compacted or cemented by soil forming processes, but does not include displaced materials such as gravel dumps, mine spoils, or like deposits.

#### 8.1.2. Application

##### 8.1.2.1. Classification of Systems

(1) All *sewage systems* shall be classed as one of the following:

- (a) Class 1-- a chemical toilet, an incinerating toilet, a recirculating toilet, a self-contained portable toilet and all forms of privy including a *portable privy*, an *earth pit privy*, a *pail privy*, a *privy vault* and a composting toilet system,
- (b) Class 2 -- a *greywater* system,
- (c) Class 3 -- a cesspool,
- (d) Class 4 -- a *leaching bed* system,
- (e) Class 5 -- a system which requires or uses a *holding tank* for the retention of *hauled sewage* at the site where it is produced prior to its collection by a *hauled sewage system*,

##### 8.1.2.2. Operation and Maintenance

(1) Operation and maintenance of *sewage systems* shall comply with Section 8.9.

#### 8.1.3. Limitations

##### 8.1.3.1. Discharge

(1) Except as provided in Sentences (2) to (5) the *sewage system* shall be designed and *constructed* to receive only *sanitary sewage* of domestic origin. (See Appendix A.)

(2) Where laundry waste is not more than 20% of the total daily design *sanitary sewage* flow, it may discharge to a *sewage system*.

(3) Where industrial process waste water is treated to the contaminant levels found in domestic *sanitary sewage* it may discharge to a *leaching bed* provided the *treatment unit* and *sewage system* are designed in accordance with good engineering practice. (See Appendix A.)

(4) Where all kitchen waste water from a restaurant has passed through an operating grease interceptor, it may discharge to a *leaching bed system* provided the *sewage system* has been designed in accordance with good engineering practice.

(4.1) Waste water from a kitchen equipped with a garbage grinder may be directed to the *sewage system* provided the system has been designed to accept such waste water.

(5) Water softener and iron filter discharge may be directed to the *sewage system* provided the system has been designed to accept such discharges.

(6) *Storm sewage* shall not be discharged into a *sewage system*.

(7) The interceptor required in Sentence (4) shall have a minimum flow rate as required by Sentence 7.4.4.3.(8) using a 60 second drain down time.

## 8.2. Design Standards

### 8.2.1. General Requirements

#### 8.2.1.1. Scope

(1) This Subsection applies to the design of *sewage systems*.

#### 8.2.1.2. Site Evaluation

(1) A site evaluation shall be conducted on every site where a new or replacement *sewage system* is to be installed. (See Appendix A.)

(2) The *percolation time* shall be determined by either percolation tests or by classifying the *soil* according to the Unified Soil Classification System as described in the Supplementary Guidelines to the 1997 OBC.

(3) Where the *percolation time* is determined by a percolation test, there shall be a minimum of 3 locations selected, suitably spaced to accurately evaluate the *leaching bed* area, with the highest *percolation time* of the tests being used. (See Appendix A.)

#### 8.2.1.3. Sewage System Design Flows

(1) For *residential occupancies*, the total daily design *sanitary sewage* flow shall be at least the value in Column 2 as determined from Table 8.2.1.3.A. (See Appendix A.)

◆ (2) For all other *occupancies*, the total daily design *sanitary sewage* flow shall be at least the value in Column 2 as determined from Table 8.2.1.3.B. (See Appendix A.)

(3) Where a *building* contains more than one establishment, the total daily design *sanitary sewage* flow shall be the sum of the total daily design *sanitary sewage* flow for each establishment.

◆ (4) Where an *occupancy* is not listed in Table 8.2.1.3.B., the highest of metered flow data from at least 3 similar establishments shall be acceptable for determining total daily design *sanitary sewage* flow.

Table 8.2.1.3.A.  
*Residential Occupancy*  
Forming Part of Sentence 8.2.1.3.(1)

<i>Residential Occupancy</i>	Volume (litres)
Apartments, Condominiums, Other Multi-family Dwellings - per person <sup>(1)</sup>	275
Boarding Houses	
a) Per person,	
i) with meals and laundry facilities, or	200
ii) without meal 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 <sup>(2)</sup>	
i) each bedroom over 5,	500
ii) A) each 10 m <sup>2</sup> (or part thereof) over 200 m <sup>2</sup> up to 400 m <sup>2</sup> <sup>(3)</sup> ,	100
B) each 10 m <sup>2</sup> (or part thereof) over 400 m <sup>2</sup> up to 600 m <sup>2</sup> <sup>(3)</sup> , and	75
C) each 10 m <sup>2</sup> (or part thereof) over 600 m <sup>2</sup> <sup>(3)</sup> , 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
Column 1	2

#### Notes to Table 8.2.1.3.A.:

- (1) The *occupant load* shall be calculated using Subsection 3.1.16.
- (2) Where multiple calculations of sewage volume is permitted the calculation resulting the highest flow shall be used in determining the design daily *sanitary sewage* flow.
- (3) Total finished area, excluding the area of the finished basement.

**Table 8.2.1.3.B.**  
**Other Occupancies**  
 Forming Part of Sentence 8.2.1.3.(2)

Establishments <sup>(1)</sup>	Volume (litres)
Airports, Bus Terminals, Train Stations, Dock/Port Facilities (Food Services Excluded) a) Per Passenger, and b) Per Employee per 8 hour shift	20 40
Assembly Hall per seat a) No food service, or b) Food Service Provided	8 36
Barber Shop/Beauty Salon per service chair	650
Bowling Alleys (Food Service not included) per lane	400
Churches per seat a) No kitchen facilities, or b) Kitchen facilities provided	8 36
Country Club (Excluding Food Service) a) Per Resident, b) Per employee per 8 hour shift, and c) Per member or patron	375 50 40
Day Care Facility per person (staff and children)	75
Dentist Office a) Per wet service chair, and b) Per dry service chair	275 190
Doctors Office a) Per practitioner, and b) Per employee per 8 hour shift	275 75
Factory (excluding process or cleaning waters) per employee per 8 hour shift a) No showers, or b) Including showers	75 125
Flea Markets <sup>(2)</sup> (Open 3 or less days per week) a) Per non-food service vendor space, b) Per food service establishment / 9.25 m <sup>2</sup> of floor space, and c) per limited food service outlet	60 190 95
Column 1	2

**Table 8.2.1.3.B. (Cont'd)**  
**Other Occupancies**  
 Forming Part of Sentence 8.2.1.3.(2)

Establishments <sup>(1)</sup>	Volume (litres)
<b>Food Service Operations</b>	
a) Restaurant (not 24 hour), per seat	125
b) Restaurant (24 hour), per seat	200
c) Restaurant on controlled access highway, per seat	400
d) Paper Service Restaurant, per seat	60
e) Donut Shop, per seat	400
f) Bar and Cocktail Lounge, per seat	125
g) Drive-in Restaurant per parking space	60
h) Take-out Restaurant (no seating area)	
i) Per 9.25 m <sup>2</sup> of floor area, and	190
ii) Per employee per 8 hour shift	75
i) Cafeteria, per meal	12
j) Food outlet	
i) excluding delicatessen, bakery and meat department, per 9.25 m <sup>2</sup> of floor space,	40
ii) Per 9.25 m <sup>2</sup> of delicatessen floor space	190
iii) Per 9.25 m <sup>2</sup> of bakery floor space	190
iv) Per 9.25 m <sup>2</sup> of meat department floor space, and	380
v) Per water closet	950
<b>Hospitals per Bed</b>	
a) Including laundry facilities, or	750
b) Excluding laundry facilities	550
<b>Nursing Homes, Rest Homes, etc. per bed</b>	450
<b>Office Building<sup>(4)</sup></b>	
a) Per employee per 8 hour shift, or	75
b) Per each 9.3 m <sup>2</sup> of floor space	75
<b>Public Parks</b>	
a) With toilets only per person, or	20
b) With bathhouse, showers, and toilets per person	50
<b>Recreational Vehicle or Campground Park</b>	
a) Per site without water or sewer hook-up, or	275
b) Per site with water and sewer hook-up	425
<b>Schools per student</b>	
a) Day school,	30
b) With showers,	30
c) With cafeteria, and	30
d) Per non-teaching employee per 8 hour shift	50
Column 1	2

**Table 8.2.1.3.B. (Cont'd)**  
**Other Occupancies**  
 Forming part of Sentence 8.2.1.3.(2)

Establishments <sup>(1)</sup>	Volume (litres)
Service Stations (No vehicle washing) <sup>(4)</sup> a) Per water closet, and i) Per fuel outlet, or ii) Per vehicle served	950 560 20
Shopping Centre (excluding food and laundry) per 1.0 m <sup>2</sup> of floor space	5
Stadiums, Race Tracks, Ball Parks per seat	20
Stores <sup>(3)</sup> a) Per 1.0 m <sup>2</sup> of floor area, or b) Per water closet	5 1230
Swimming and Bathing Facilities (Public) per person	40
Theaters a) Indoor, auditoriums per seat, b) Outdoor, drive-ins per space, or c) Movie theaters per seat	20 40 15
Veterinary Clinics a) Per practitioner, b) Per employee per 8 hour shift, and c) Per stall, kennel, or cage if floor drain connected	275 75 75
Warehouse a) Per water closet, and b) Per loading bay	950 150
Column 1	2

**Notes to Table 8.2.1.3.B.:**

- (1) The *occupant load* shall be calculated using Subsection 3.1.16.
- (2) Reserved.
- (3) Flea markets open more than 3 days per week shall be assessed using the volumes stated under the heading "Stores".
- (4) Where multiple calculations of *sanitary sewage* volume is permitted the calculation resulting in the highest flow shall be used in determining the design daily *sanitary sewage* flow.

**8.2.1.4. Clearances** (See Appendix A.)

(1) Unless it can be shown to be unnecessary, where the *percolation time* is 10 minutes or greater, the location of all components within a *sewage system* shall be in conformance with the clearances listed in Articles 8.2.1.5. or 8.2.1.6.

(2) Unless it can be shown to be unnecessary, where the *percolation time* is less than 10 minutes, the clearances listed in Articles 8.2.1.5. and 8.2.1.6. for wells, lakes, ponds, reservoirs, rivers, springs or streams shall be increased to compensate for the lower *percolation time*.

(3) No *building* shall be *constructed* closer to any part of a *sewage system* than the clearances listed in Articles 8.2.1.5. or 8.2.1.6.

(4) If more than one *sewage system* is located on a lot or parcel of land, there shall be no overlap of any part of the systems.

**8.2.1.5. Clearance Distances for Class 1, 2 and 3 Sewage Systems**

(1) Except as provided in Sentences 8.2.1.4.(1) and (2), no Class 1, 2, or 3 *sewage system* shall have a horizontal distance of less than that permitted by Table 8.2.1.5.

**8.2.1.6. Clearances for a Class 4 or 5 Sewage System**

(1) Except as provided in Sentences 8.2.1.4.(1) and (2), a *treatment unit* shall not be located closer than the minimum horizontal distances as set out in Table 8.2.1.6.A.

(2) Except as provided in Sentences 8.2.1.4.(1) and (2), a *distribution pipe* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.B. and these distances shall be increased when required by Sentence 8.7.4.2.(9).

(3) Except as provided in Sentences 8.2.1.4.(1) and (2), a *holding tank* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.C.

**Table 8.2.1.5.**  
**Clearance Distances for Sewage Systems**  
Forming Part of Sentence 8.2.1.5.(1)

Clearance Distances for Class 1, 2 and 3 Sewage Systems				
	Minimum horizontal distance in metres from a well with watertight casing to a depth of at least 6 m	Minimum horizontal distance in metres from a spring used as a source of <i>potable</i> water or well other than a well with a water tight casing to a depth of at least 6 m	Minimum horizontal distance in metres from a lake, river, pond, stream, reservoir, or a spring not used as a source of <i>potable</i> water	Minimum horizontal distance in metres from a property line
Earth Pit Privy	15	30	15	3
Privy Vault Pail Privy	10	15	10	3
Greywater System	10	15	15	3
Cesspool	30	60	15	3
Column 1	2	3	4	5



**Table 8.2.1.6.A.**  
**Minimum Clearances for Treatment Units**  
 Forming part of Sentence 8.2.1.6.(1)

Structure	1.5 m
Well	15 m
Lake	15 m
Pond	15 m
Reservoir	15 m
River	15 m
Spring	15 m
Stream	15 m
Property Line	3 m
Column 1	2

**Table 8.2.1.6.B.**  
**Minimum Clearances for Distribution Piping**  
 Forming part of Sentence 8.2.1.6.(2)

Structure	5 m
Well with a watertight casing to a depth of 6 m	15 m
Any other well	30 m
Lake	15 m
Pond	15 m
Reservoir	15 m
River	15 m
A spring not used as a source of potable water	15 m
Stream	15 m
Property Line	3 m
Column 1	2

**Table 8.2.1.6.C.**  
**Minimum Clearances for Holding Tanks**  
 Forming part of Sentence 8.2.1.6.(3)

Structure	1.5 m
Well with a watertight casing to a depth of at least 6 m	15 m
Any other well	15 m
A spring	15 m
Property Line	3 m
Column 1	2

## 8.2.2. Treatment and Holding Tanks

### 8.2.2.1. Application

(1) This Subsection applies to any tank used in a *sewage system* for collecting, treating, holding or storing *sanitary sewage*.

### 8.2.2.2. Tanks

(1) Subject to Sentence 8.2.2.2.(2.1), a tank that is used as a *treatment unit* in a Class 4 *sewage system* or a *holding tank* in a Class 5 *sewage system* shall conform to the requirements of CSA B66 "Prefabricated Septic Tanks and Sewage Holding Tanks". ★

(2) Subject to Sentence 8.2.2.2.(2.1), material standards, access and *construction* methods and practices for a tank used for other Classes of *sewage systems* shall conform to the requirements of CSA B66 "Prefabricated Septic Tanks and Sewage Holding Tanks". ★

(2.1) Tanks referred to in Sentences 8.2.2.2.(1) and (2) are not required to conform to the requirements of Clause 9.2(j) of CSA B66 "Prefabricated Septic Tanks and Sewage Holding Tanks". ★

(3) Sentence (2) does not apply to a tank that is an integral part of a prefabricated Class 1 *sewage system*.

(4) Access openings shall be located to facilitate the pumping of all compartments and the servicing of the inlet and outlet of each compartment not accessible by removal of the tank top or part thereof.

(5) A tank shall not be covered by *soil* or *leaching bed fill* having a depth greater than the maximum depth of burial that the tank is designed to withstand.

(6) A tank shall be securely anchored when located in an area subject to flooding or where *ground water* levels may cause hydrostatic pressures.

### 8.2.2.3. Septic Tanks

◆ (1) The minimum *working capacity* of a *septic tank* shall be the greater of 3 600 L and,

- (a) in *residential occupancies*, twice the daily design *sanitary sewage* flow, or
- (b) in *non-residential occupancies*, three times the daily design *sanitary sewage* flow.

(2) Every *septic tank* shall be *constructed* in such a manner that any *sanitary sewage* flowing through the tank will pass through at least 2 compartments.

(3) The *working capacity* of the compartments required in Sentence (2) shall be sized such that:

- (a) the first compartment is at least 1.3 times the daily design *sanitary sewage* flow but in no case less than 2 400 L, and
- (b) each subsequent compartment shall be at least 50% of the first compartment.

(4) Where multiple tanks are to be used to meet the requirements of Sentences (2) and (3), the tanks shall be connected in series such that:

- (a) the first tank in the series shall have at least a capacity as calculated in Clause (3)(a), however at no time shall a tank having a *working capacity* of less than 3 600 L be used,
- (b) all additional tanks after the first tank, excluding pump or dosing tanks shall have at least a *working capacity* equal to Clause (3)(b),
- (c) the pipe between the outlet of one tank and the inlet of the next tank in the series shall have a minimum slope of 2 per cent,
- (d) there shall be no partitions in the tank except where a partition is required to maintain the structural integrity of the tank, in which case openings within the partition shall be provided to allow the free movement of *sanitary sewage* throughout the tank,
- (e) Reserved, and
- (f) all piping between tanks shall be continuous and shall be connected to the tank through the use of flexible watertight seals which will permit differential movement between the tanks.

(5) Partitions separating the *septic tank* into compartments shall extend at least 150 mm above the liquid level at the outlet, and there shall be one or more openings through or above the partition.

(6) The openings required between compartments referred to in Sentence (2) shall have a total cross-sectional area of at least three times the area of the inlet pipe and be located between the top and a level 150 mm above the liquid level at the outlet to provide for the free flow or air between compartments.

(7) *Sanitary sewage* shall pass from one compartment to another of the *septic tank* by means of either,

- (a) a device similar to that described in CSA-B66, "Prefabricated Septic Tanks and Sewage Holding Tanks" for outlet devices, or
- (b) through two or more openings through the partition located in a horizontal line, and evenly spaced across the width of the partition, centred at approximately 40% of the liquid depth below the surface of the liquid, and having a total area of between three and five times that of the cross-sectional area of the inlet pipe.

(8) A *septic tank* shall be of such design and *construction* as will permit the collection and holding of *sanitary sewage* therein to a depth of not less than 1 200 mm except that a depth of not less than 900 mm is permitted where the excavation is in rock, or to avoid rupture or displacement of the tank due to *ground water* pressure.

### 8.2.2.4. Holding Tanks

(1) All *holding tanks* shall be of such design and *construction* as will allow the complete removal of solid matter that can be expected to settle in the *holding tank* through an apparatus or device suitable for allowing the contents of the *holding tank* to be removed from the *holding tank*.

(2) A *holding tank* shall have a *working capacity* of not less than 9 000 L.

(3) Where two or more tanks are used to meet the requirement of Sentence (2), they shall be deemed to be one *holding tank* provided they are connected in such a manner as will allow the *sanitary sewage* contained therein to flow between the tanks.

(4) The *working capacity* of the tanks described in Sentence (3) shall not include any portion of any tank that cannot be completely drained due to the manner in which the connections are made.

## Section 8.3. Class 1 Sewage Systems

### 8.3.1. General Requirements

#### 8.3.1.1. Scope

(1) This Section applies to the *construction* of a Class 1 *sewage system*.

#### 8.3.1.2. Application

(1) Except as provided in Sentence (2), a Class 1 *sewage system* shall be designed only to receive human body waste for disposal.

(2) Where the *sewage system* is specifically designed for the biological decomposition of non-waterborne biodegradable kitchen wastes or requires the addition of small quantities of plant matter to improve the decomposition of human body waste, it may receive such wastes in addition to human body waste.

(3) Where the *sewage system* is designed with a drain for the removal of excess liquid, then the *sewage system* shall drain to a Class 3, 4, or 5 *sewage system*.

### 8.3.2. Superstructure Requirements

#### 8.3.2.1. Construction Requirements

- (1) A privy as described in Subsections 8.3.3., 8.3.4. and 8.3.5. shall be enclosed with a superstructure that:
- is *constructed* of strong durable weatherproof materials,
  - has a solid floor supported by a sill *constructed* of treated timber, masonry or other material of at least equal strength and durability,
  - is easily sanitized,
  - unless it is equipped solely as a urinal, is equipped with one or more seats each having a cover and being supported by an enclosed bench or riser which is lined with an impervious material on all interior vertical surfaces,
  - is equipped with a self-closing door,
  - has one or more openings for purposes of ventilation, all of which are screened,
  - has a ventilation duct that is screened at the top end and that extends from the underside of the bench or

riser to a point above the roof of the superstructure, and

- shall not have any openings for the reception of human body waste, other than urinals and those *constructed* in accordance with Clause (1)(d).

### 8.3.3. Earth Pit Privy

#### 8.3.3.1. Construction Requirements

- (1) An *earth pit privy* shall be *constructed* in the following manner:
- the bottom of the pit shall be at least 900 mm above the *high ground water table*,
  - the sides of the pit shall be reinforced so as to prevent collapse thereof,
  - the pit shall be surrounded on all sides and on its bottom by not less than 600 mm of *soil or leaching bed fill*, and
  - the *soil or leaching bed fill* around the base of the sides of the superstructure of the *earth pit privy* shall be raised or mounded to a height of at least 150 mm above ground level.

### 8.3.4. Privy Vaults and Pail Privy

#### 8.3.4.1. Construction Requirements

- (1) A privy-vault or a *pail privy* shall be *constructed* in the following manner:
- the container or structure which is to be used for the holding or storage of *sanitary sewage* shall be watertight and made of a material which can be easily cleaned,
  - the *soil or leaching bed fill* around the base of the sides of the superstructure shall be raised or mounded to a height of at least 150 mm above ground level, and
  - the surface of the ground in the area of the privy-vault or *pail privy* shall be so graded that surface drainage will be diverted away from the privy.

### 8.3.5. Portable Privy

#### 8.3.5.1. Construction Requirements

- (1) A *portable privy* shall be *constructed* in the following manner:
- the *portable privy* shall have a watertight receptacle which shall be suitable for the holding and storage of any *sanitary sewage* deposited therein,
  - the receptacle for the holding and storage of sewage

- shall be designed and *constructed* in such a manner as to allow it to be easily emptied and cleaned, and
- (c) the *portable privy* shall be *constructed* of such material and in such a manner that it can withstand the stresses to which it will be subjected during its transportation to and from sites where it is to be used and during loading and unloading from vehicles used for the transportation of the *portable privy* to and from sites where it is to be used.

## Section 8.4. Class 2 Sewage Systems

### 8.4.1. General Requirements

#### 8.4.1.1. Scope

(1) This Section applies to the *construction* of a Class 2 *sewage system*.

#### 8.4.1.2. Application

(1) A Class 2 *sewage system* shall be designed only for the treatment and disposal of *greywater*.

- (2) The total daily design flow for a Class 2 *sewage system* shall be calculated based on the *fixtures* discharging to the system as follows:
  - (a) 200 L per *fixture* unit where there is a supply of pressurized water, and
  - (b) 125 L per *fixture* unit where there is no supply of pressurized water.

### 8.4.2. Design and Construction Requirements

#### 8.4.2.1. Construction Requirements

(1) The bottom of the pit shall be at least 900 mm above the *high ground water table*.

(2) The pit shall be *constructed* in such a manner as to prevent the collapse of its sidewalls.

(3) Any material used to support or form the sidewalls of the pit shall be an open jointed material of a type that will permit *leaching* from the pit.

(4) The pit shall be provided with a tight, strong cover that shall remain over the pit except when it is necessary to

remove it for purposes of adding *greywater* to or removing *greywater* from the pit or for purposes of maintenance of the pit.

(5) The earth around the perimeter of the pit shall be raised or mounded to a height of at least 150 mm above ground level.

(6) The surface of the ground in the area of the pit shall be so graded that surface drainage in the area will be diverted away from the pit.

(7) The pit shall be surrounded on all sides and on its bottom by at least 600 mm of *soil* having a *percolation time* of less than 50 minutes.

#### 8.4.2.2. Maximum Sewage Flow

(1) A Class 2 *sewage system* shall not be *constructed* where the daily design *greywater* flow to the system exceeds 1 000 L/day.

#### 8.4.2.3. Sizing

(1) A Class 2 *sewage system* shall be designed and *constructed* so that the loading rate to the side walls shall be not more than the value calculated using

$$L_R = \frac{400}{T}$$

where  $L_R$  = *Loading rate* of the sidewalls in litres per day/m<sup>2</sup>

$T$  = *Percolation time*

## Section 8.5. Class 3 Sewage Systems

### 8.5.1. General Requirements

#### 8.5.1.1. Scope

(1) This Section applies to the *construction* of a Class 3 *sewage system*.

#### 8.5.1.2. Application

(1) A Class 3 *sewage system* shall not be *constructed* where the daily design *sanitary sewage* flow to the system exceeds 1 000 L/day.

(2) A Class 3 *sewage system* shall be designed to receive only the contents of a Class 1 *sewage system* or *effluent* from a Class 1 *sewage system* for disposal.

## 8.5.2. Design and Construction Requirements

### 8.5.2.1. Construction Requirements

(1) The bottom of the cesspool shall be at least 900 mm above the *high ground water table*.

(2) The cesspool shall be *constructed* in such a manner as to prevent the collapse of its sidewalls.

(3) Any material used to support or form the sidewalls of the cesspool shall be an open jointed material of a type that will permit *leaching* from the cesspool.

(4) The cesspool shall be provided with a tight strong cover that shall remain over the cesspool except when it is necessary to remove it for the purposes of adding *sanitary sewage* to or removing *sanitary sewage* from the cesspool or for purposes of maintenance of the cesspool.

(5) Where the cesspool extends to the ground surface, the cover required in Sentence (4) shall be lockable.

(6) The *soil* or *leaching bed fill* around the perimeter of the cesspool shall be raised or mounded to a height of at least 150 mm above ground level.

(7) The surface of the ground in the area of the cesspool shall be so graded that surface drainage in the area will be diverted away from the cesspool.

(8) The cesspool shall be surrounded on all sides and on its bottom by at least 600 mm of *soil* or *leaching bed fill*, except the top where the cesspool extends to the surface of the ground.

## Section 8.6. Class 4 Sewage Systems

### 8.6.1. General Requirements

#### 8.6.1.1. Scope

(1) This section applies to the *construction* of a Class 4 *sewage system*.

### 8.6.1.2. General Requirements

(1) The *treatment unit* shall be connected to a *leaching bed constructed* in accordance with the requirements of Section 8.7.

### 8.6.1.3. Pumps and Siphons

(1) Where the total length of *distribution pipe* required is 150 m or more, the *sewage system* shall have at least one pump or a siphon contained in a dosing tank that may be a separate compartment within the tank structure, for distribution of the *effluent*.

(2) Alternating siphons shall not be installed in a *sewage system*.

(3) Where 2 or more pumps are employed within a dosing tank, the pumps shall be designed such that the pumps alternate dosing, and dosing shall continue in the event that one pump fails.

(4) Where a pump or siphon is required, the pump or siphon shall be designed to discharge a dose of at least 75% of the internal volume of the *distribution pipe* within a time period not exceeding fifteen minutes.

## 8.6.2. Treatment Units

### 8.6.2.1. Septic Tank Systems

(1) Where a *septic tank* system has been designed to incorporate an *effluent filter*, the *effluent filter* shall form an integral part of the outlet device or be contained within a separate tank or compartment which may form an integral part of the *septic tank* structure.

(2) All *effluent filters* shall be sized and installed in accordance with the manufacturer's recommendations.

### 8.6.2.2. Other Treatment Units

(1) A *treatment unit* other than those described in Article 8.6.2.1. and Sentence (2) shall be designed such that *effluent* does not exceed the maximum concentrations stipulated in Column 2 of Table 8.6.2.2.A

(2) A *treatment unit* that is used in conjunction with a *leaching bed constructed as shallow buried trenches* shall be designed such that the *effluent* does not exceed the maximum concentrations stipulated in Column 3 of Table 8.6.2.2.A.

(3) All *treatment units* referred to in Sentences (1) and (2) that contain mechanical components shall be equipped with an audible and visual warning alarm so located to warn the occupants of the *building* served or the operator of the *treatment unit* of a malfunction in the operation of the *treatment unit*.

(4) All *treatment units* referred to in Sentences (1) and (2) shall permit the sampling of the *effluent*.

(5) A *treatment unit* described in the Supplementary Guidelines to the 1997 OBC is deemed to comply with the requirements of Table 8.6.2.2.A. as set out in the Guideline.

(6) Every manufacturer or distributor of a *treatment unit* shall provide, for each model sold, printed literature that describes the unit in detail and provides complete instructions regarding the operation, servicing, and maintenance requirements of the unit and its related components necessary to ensure the continued proper operation in accordance with the original design and specifications.

**Table 8.6.2.2.A.**

**Other Treatment Unit Effluent Quality Criteria**  
Forming Part of Sentence 8.6.2.2.(1), (2) and (5)

Parameter	Secondary Effluent <sup>1</sup>	Tertiary Effluent <sup>1</sup>
BOD <sub>5</sub>	40	15
CBOD <sub>5</sub>	30	10
Suspended Solids	30	10
Column 1	2	3

Note to Table 8.6.2.2.A.:

1. Maximum concentration based on 30 day averages in milligrams per litre (mg/L)

## Section 8.7. Leaching Beds

### 8.7.1. General Requirements

#### 8.7.1.1. Application

(1) This Section is applicable to the *construction* of *leaching beds*.

## 8.7.2. Construction Requirements

### 8.7.2.1. General Requirements

- (1) A *leaching bed* shall not be located:
  - (a) in an area that has an average slope that exceeds one unit vertically to four units horizontally,
  - (b) in *soil* or *leaching bed fill* having a *percolation time*
    - (i) less than one minute, or greater than 125 minutes if *constructed* as a *shallow buried trench*, or
    - (ii) less than one minute, or greater than 50 minutes for all other *leaching beds*, or
  - (c) in or on an area that is subject to flooding that may be expected to cause damage to the *leaching bed* or impair the operation of the *leaching bed*.
- (2) A *leaching bed* shall not be covered with any material having a hydraulic conductivity less than 0.01 m/day.

(3) The surface of the *leaching bed* shall be shaped to shed water and together with the side slopes of any raised portion, shall be protected against erosion in such a manner as to not inhibit the evaporation and transpiration of waters from the *soil* or *leaching bed fill*, and to not cause plugging of the *distribution pipe*.

(4) No part of a *leaching bed* shall be sloped steeper than 1 unit vertically to 4 units horizontally.

- (5) A *leaching bed* shall be designed to be protected from compaction or any stress or pressure that
- (a) may result in the impairment or destruction of any pipe in the *leaching bed*, or
  - (b) may result in the smearing of the *soil* or *leaching bed fill*.

### 8.7.3. Absorption Trench Construction

#### 8.7.3.1. Length of Distribution Pipe

- (1) The total length of *distribution piping* shall
  - (a) not be less than 30 m when *constructed* as a *shallow buried trench*, or
  - (b) not be less than 40 m for any other *absorption trench*.

(2) Except as provided in Sentences (1), (3), and (4) every *leaching bed* constructed by means of *absorption trenches* shall have a total length of *distribution pipe* not less than the value determined by the formula:

$$L = \frac{QT}{200}$$

where:

- L = total length of *distribution pipe* in metres  
 Q = the total daily design *sanitary sewage* flow in litres  
 T = the design *percolation time*

(3) Except as provided in Sentence (1), where the *treatment unit* is described in Article 8.6.2.2., the *leaching bed* may have a total length of *distribution pipe* not less than the value determined by the formula:

$$L = \frac{QT}{300}$$

where:

- L = total length of *distribution pipe* in metres  
 Q = the total daily design *sanitary sewage* flow in litres  
 T = the design *percolation time*

(4) Except as provided in Sentence (1), where the *leaching bed* is constructed as a *shallow buried trench*,  
 (a) the total length of *distribution pipe* when located in or on *soil* or *leaching bed fill* of 50 minutes or less, shall not be less than the value determined by the formula:

$$L = \frac{Q}{75}$$

where:

- L = the length of *distribution pipe* in metres  
 Q = the total daily design *sanitary sewage* flow in litres  
 (b) the total length of *distribution pipe* when located in or on *soil* or *leaching bed fill* of more than 50 minutes, shall not be less than the value determined by the formula:

$$L = \frac{Q}{40}$$

where:

- L = the length of *distribution pipe* in metres  
 Q = the total daily design *sanitary sewage* flow in litre

### 8.7.3.2. Absorption Trenches

- (1) Except as provided in Sentence (2), *absorption trenches* shall be,
- approximately the same length and not more than 30 m in length,
  - at least 500 mm and not more than 1 000 mm in width,
  - at least 300 mm and not more than 900 mm in depth,
  - centred at least 1 600 mm apart,
  - at least 900 mm at all points on the bottom of the *absorption trench*, or 900 mm from the surface of a filter bed above the *high ground water table*, rock or *soil* with a *percolation time* greater than 50 minutes, and
  - backfilled, after the installation of the *distribution pipe* with *leaching bed fill*, so as to ensure that after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.

(2) *Absorption trenches* constructed as *shallow buried trenches* shall be

- approximately the same length and not more than 30 m in length,
- at least 300 mm and not more than 600 mm in width,
- at least 300 mm and not more than 600 mm in depth,
- centred at least 1 600 mm apart,
- at least 900 mm at all points on the bottom of the *absorption trench* above the *high ground water table* or rock, and
- backfilled, after the installation of the *distribution pipe* with *leaching bed fill*, so as to ensure that after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.

### 8.7.3.3. Distribution Pipe

- (1) The *distribution pipe* used in the construction of a *leaching bed* shall be
- of not less than 3 in. trade size for gravity flow systems, or 1 in. trade size for pressurized systems,
  - installed on a layer or covering at least 150 mm in depth and 500 mm in width comprised of stone that is either
    - 19 mm clear aggregate washed to be free of fine material, or
    - clean gravel screened to between 19 mm and 53 mm in size,

- (c) installed with a uniform downward slope from the inlet with a drop of not less than 30 mm and not more than 50 mm for each 10 m of *distribution pipe*, and
- (d) covered with stone of the type used below the *distribution pipe* to a height of at least 50 mm above the top of the *distribution pipe*.

(2) Prior to backfilling, the stone layer required in Clause (1)(d) shall be protected in such a manner so as to prevent *soil*, or *leaching bed fill* from entering the stone by completely covering with:

- (a) untreated building paper, or
- (b) a permeable geo-textile fabric.

(3) Every pressurized *distribution pipe* shall be self-draining so as to prevent freezing of its contents.

(4) Every pressurized *distribution pipe* shall have orifices of at least 3 mm in diameter, spaced equally along the length of the pipe.

## 8.7.4. Fill Based Absorption Trenches

### 8.7.4.1. Loading Requirements

- (1) The area described in Sentence 8.7.4.2.(1) shall be designed such that the *loading rate* does not exceed, for *soil* having a *percolation time* set out in Column 1 of Table 8.7.4.1.A., the maximum value set out opposite thereto in Column 2 of Table 8.7.4.1.A.

Table 8.7.4.1.A.

#### Loading Rates for Fill Based Absorption Trenches and Filter Beds

Forming Part of Sentences 8.7.4.1.(1) and 8.7.5.2.(2)

Percolation Time (T) of Soil (min/cm)	Loading Rates (L/m <sup>2</sup> /day)
1 < T ≤ 20	10
20 < T ≤ 35	8
35 < T ≤ 50	6
T > 50	4
Column 1	2

### 8.7.4.2. Construction Requirements

(1) A *leaching bed* comprised of *absorption trenches* may be constructed in *leaching bed fill* if unsaturated *soil* or *leaching bed fill* complying with Clause 8.7.2.1.(1)(b) extends

- (a) to a depth of at least 250 mm over the area covered by the *leaching bed fill*, and
- (b) for at least 15 m beyond the outer *distribution pipes* in any direction in which the *effluent* entering the *soil* or *leaching bed fill* will move horizontally.

(2) If the unsaturated *soil* or *leaching bed fill* described in Sentence (1) has a *percolation time* greater than 15 minutes, any *leaching bed fill* added to form the *leaching bed* shall have a *percolation time* not less than 75% of the *percolation time* of the unsaturated *soil* or *leaching bed fill*.

(2.1) *Leaching bed fill* that does not meet the requirements of Sentence (2) may be used to form the *leaching bed* if

- (a) the distance from the bottom of the *absorption trench* to native *soil* is not less than 900 mm, or
- (b) where the distance from the bottom of the *absorption trench* to native *soil* is less than 900 mm, the *percolation time* of the least permeable *soil* or *leaching bed fill* within 900 mm from the bottom of the *absorption trench* is used to calculate the length of the *distribution pipe* under Article 8.7.3.1.

(3) Sentence (2) does not apply to any *leaching bed fill* added as backfill above the stone layer in which the *distribution pipe* is located.

(4) All *leaching bed fill* added shall be stabilized against erosion.

(5) The site to which the *leaching bed fill* is added shall be generally clear of vegetation.

(6) The *leaching bed fill* that is added shall be compacted in layers in such a manner as to avoid uneven settlement of the *distribution pipes*.

(7) Any *distribution boxes*, *header lines*, *absorption trenches*, or *distribution pipes* shall be installed only after the *leaching bed fill* has been compacted in accordance with Sentence (6).

(8) Except as provided in Sentence (8.1), the sides of the added *leaching bed fill* shall be sloped to ensure stability, but shall not be steeper than one unit vertically to four units horizontally.



- (8.1) The side slope of the *leaching bed fill* may be increased up to one unit vertically to three units horizontally if measures are taken to prevent erosion and ensure stability of the *leaching bed fill*.

(9) The distances as set out in Column 2 of Table 8.2.1.6.B. shall be increased by twice the height that the *leaching bed* is raised above the original grade.

## 8.7.5. Filter Beds

### 8.7.5.1. Application

(1) The total daily design *sanitary sewage* flow shall not exceed 5 000 L where the *treatment unit* is a *septic tank*, or 10 000 L where the *treatment unit* is described in Article 8.6.2.2.

### 8.7.5.2. Loading Requirements

(1) The effective area of the surface of the filter medium in each filter bed shall be at least 10 m<sup>2</sup> and not more than 50 m<sup>2</sup>.

- (2) The area described in Sentence 8.7.4.2.(1) shall be designed such that the *loading rate* does not exceed, for *soil* having a *percolation time* set out in Column 1 of Table 8.7.4.1.A., the maximum value set out opposite thereto in Column 2 of Table 8.7.4.1.A.

(3) Where the total daily design *sanitary sewage* flow does not exceed 3 000 L, the effective area shall be such that the loading on the surface of the filter medium does not exceed 75 L/m<sup>2</sup> per day.

(4) Where the total daily design *sanitary sewage* flow exceeds 3 000 L,

- (a) the effective area shall be such that the loading on the surface of the filter medium does not exceed 50 L/m<sup>2</sup> per day, and
- (b) the *leaching bed* shall be comprised of more than one filter bed, each of similar size and adjacent to each other.

- (5) Where a *treatment unit* designed to produce *effluent* not exceeding the maximum concentrations stipulated in Column 2 of Table 8.6.2.2.A. is used in conjunction with a filter bed, the effective area shall be such that the loading on the surface of the filter medium does not exceed 100 L/m<sup>2</sup> per day.

### 8.7.5.3. Construction Requirements

(1) Sentences 8.7.4.2.(1) to (7) and (9) apply to the *construction* of a filter bed.

(2) The lines of *distribution pipe* shall be evenly spaced over the surface of the filter medium to which the *sanitary sewage* is applied. (See Appendix A.)

(3) The filter medium shall have a minimum depth of 750 mm below the stone layer and shall be clean sand comprised of particles ranging in size between the limits of

- (a) an effective size of .25 mm with a uniformity coefficient not less than 3.5,
- (b) an effective size of 2.5 mm with a uniformity coefficient not greater than 1.5, and
- (c) having a uniformity coefficient not greater than 4.5

(4) The filter medium shall be unsaturated for its entire depth.

(5) Where there is more than one filter bed in a *leaching bed*, the filter beds shall be separated by at least 5 m between the *distribution pipes* of the filter beds.

(6) The base of the filter medium shall extend to a thickness of at least 250 mm over an area meeting the requirements of the following:

$$A = \frac{QT}{850}$$

where:

- A = the area of contact in square metres between the base of the filter medium and the underlying *soil*.
- Q = the total daily design *sanitary sewage* flow in litres
- T = the lesser of 50 and the *percolation time* of the underlying *soil*

## 8.7.6. Shallow Buried Trenches

### 8.7.6.1. Limitation on Installation

(1) The design and installation of a *shallow buried trench* shall be carried out by a person competent in this field of work.

### 8.7.6.2. Construction Requirements

(1) The *treatment unit* shall provide an *effluent* quality as required in Sentence 8.6.2.2.(2).

(2) The *effluent* shall be distributed through a *pressurized distribution system* having a pressure head of not less than 600 mm when measured to the most distant point from the pump.

(3) A *shallow buried trench* shall not be constructed unless the *soil* or *leaching bed fill* is sufficiently dry to resist the compaction and smearing during excavation.

(4) Every *chamber* shall be as wide as the *shallow buried trench* in which it is contained, and the cross-sectional height of the *chamber* at its centre point shall not be less than half the width of the trench.

(5) Every *chamber* shall contain only one *pressurized distribution pipe*.

## Section 8.8. Class 5 Sewage Systems

### 8.8.1. Application

#### 8.8.1.1. Prohibited Installation

(1) Except as provided in Article 8.8.1.2., a Class 5 *sewage system* shall not be installed.

#### 8.8.1.2. Acceptable Installation

(1) A Class 5 *sewage system* may be installed in the following circumstances:

- (a) where the proposed use of the *sewage system* is for a temporary operation, excluding seasonal recreational use, not exceeding 12 months in duration,
- (b) to permit the extension of an existing single-family dwelling provided that
  - (i) the extension will not increase the wastewater load, and
  - (ii) the *building* is already served by a Class 5 *sewage system*,
- (c) to remedy an unsafe *sewage system* where the remediation of the unsafe condition by the installation of a Class 4 *sewage system* is impracticable,

- (d) to upgrade a *sewage system* serving an existing *building*, where upgrading through the use of a Class 4 *sewage system* is not possible due to lot size, site slope or clearance limitations, or
- (e) as an interim measure for a lot or parcel of land until municipal sewers are available, provided that the municipality undertakes to ensure the continued operation of an approved *hauled sewage system* until the municipal sewers are available.

(2) Where a Class 5 *sewage system* is installed, a written agreement for the disposal of *sanitary sewage* from the *sewage system* shall be entered into with a *hauled sewage system* operator.

### 8.8.2. General Requirements

#### 8.8.2.1. Construction Requirements

(1) All Class 5 *sewage systems* shall be equipped with a device that shall produce an audible and visual warning alarm so located to warn that the *sewage system* is nearing capacity.

(2) The device required in Sentence (1) shall be designed to provide suitable advance warning to the *building* occupants considering

- (a) the total daily design *sanitary sewage* flow,
- (b) the location of the Class 5 *sewage system*, and
- (c) the response time of the *hauled sewage system* contractor.

(3) Except as provided in Sentence (4) all *holding tanks* shall be provided with a vent that:

- (a) is not less than 3 inch trade size,
- (b) terminates at least
  - (i) 300 mm above finished grade with a vent cap, or
  - (ii) 600 mm above finished grade with a vent cap when the *holding tank* is located in an area subject to flooding, and
- (c) terminates at least 3.5 m away from any air inlet, window, or door.

(4) A vent from a *holding tank* may connect into the *venting system* of the *building* served by the *holding tank* provided that:

- (a) the vent is not less than 3 in. trade size, and
- (b) the installation of the vent shall conform to the requirements in Part 7.

### 8.8.2.2. Sizing of Holding Tanks

(1) All *holding tanks* used in residential dwellings shall have a minimum 7 day holding capacity based on the total daily design *sanitary sewage* flow.

## Section 8.9. Operation and Maintenance

### 8.9.1. General

#### 8.9.1.1. Scope

(1) This Section applies to the operation and maintenance of all *sewage systems*.

#### 8.9.1.2. General Requirements for Operation and Maintenance

- (1) Every *sewage system* shall be operated and maintained so that,
- the *sewage system* or any part thereof shall not emit, discharge or deposit *sanitary sewage* or *effluent* onto the surface of the ground,
  - sanitary 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 the *sanitary sewage* or *effluent*, and
  - except as provided in Sentence (2), *sanitary 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*.

(2) Clause (1)(c) does not apply to the use of a *sewage system* designed and operated such that properly treated *effluent* is discharged into *soil*.

### 8.9.2. Operation

#### 8.9.2.1. Scope

(1) The requirements of this Subsection are in addition to the requirements of Subsection 8.9.1.

### 8.9.2.2. General

- (1) Every *sewage system* shall be operated in accordance with,
- the basis on which the *construction* and use of the *sewage system* was approved or required under this Act or predecessor legislation, as the case may be, and
  - the requirements of the manufacturer of the *sewage system*.

### 8.9.2.3. Class 4 Sewage Systems

(1) Every Class 4 *sewage system* shall be operated in accordance with the literature required in Sentence 8.6.2.2.(f).

- (2) No person shall operate a *treatment unit* other than a *septic system* unless the person has entered into an agreement whereby servicing and maintenance of the *treatment unit* and its related components will be carried out by a person who:
- possesses a copy of the literature required by Sentence 8.6.2.2.(f), and
  - is authorized by the manufacturer to service and maintain that type of *treatment unit*.

- (3) The person authorized by the manufacturer to service and maintain the *treatment unit* and who has entered into the agreement referred to in Sentence (2) with the person operating the *treatment unit* shall notify the *chief building official* if
- the agreement is terminated, or
  - access for service and maintenance of the *treatment unit* is denied by the person operating the *treatment unit*.

### 8.9.2.4. Shallow Buried Trenches

(1) Every person operating a *treatment unit* that is designed and *constructed* to produce *effluent* described in Column 3 of Table 8.6.2.2.A. shall, at the intervals described in Sentence (2),

- take a grab sample of the effluent to determine whether it complies with the levels contained in Column 3 of Table 8.6.2.2.A. for BOD, and suspended solids,
- carry out the sampling required by Clause (1)(a) in accordance with the methods described in the "Standard Methods for the Examination of Water and Wastewater", and
- promptly submit the results of the sampling required by Clause (1)(a) to the *chief building official*.

- (2) The sampling required by Clause (1)(a) shall be conducted:
- (a) initially, once during the first 12 months after the *sewage system* was put into use, and
  - (b) thereafter, once during every 12 month period, at least 10 months and not more than 18 months after the previous sampling has been completed.

- (i) the basis on which the *construction* and use of the *sewage system* was approved or required under this Act or predecessor legislation, as the case may be, and
  - (ii) the requirements of the manufacturer of the *sewage system*, and
- (b) all components of the *sewage system* function in their intended manner.

### 8.9.2.5. Class 5 Sewage Systems

(1) Every Class 5 *sewage system* shall be operated in accordance with the agreement referred to in Sentence 8.8.1.2.(2).

(2) No Class 5 *sewage system* shall be operated once it is filled with *sanitary sewage* until such time as the *sanitary sewage* is removed from the *sewage system*.

## 8.9.3. Maintenance

### 8.9.3.1. Scope

(1) The requirements of this Subsection are in addition to the requirements of Subsection 8.9.1.

### 8.9.3.2. General

- (1) Every *sewage system* shall be maintained so that,
  - (a) the *construction* of the *sewage system* remains in accordance with,

(2) The land in the vicinity of a *sewage system* shall be maintained in a condition that will not cause damage to, or impair the functioning of, the *sewage system*.

### 8.9.3.3. Interceptors

(1) Every *grease interceptor* referred to in Article 8.1.3.1. shall be maintained so that the grease retained is below the rated capacity of the *interceptor*.

### 8.9.3.4. Class 4 Sewage Systems

(1) *Septic tanks* and other *treatment units* shall be cleaned whenever sludge and scum occupy 1/3 of the *working capacity* of the tank.

### 8.9.3.5. Shallow Buried Trenches

(1) The pressure head at the furthest point from the pump in all *distribution pipes* shall be checked for compliance with Article 8.7.6.2. and the design specification at least every 36 months.