

MS6

# BAND TECHNICAL PUBLICATIONS



SEPTIC TANK SYSTEMS  
O & M GUIDE

E78  
.C2  
B35  
no. MS6  
c. 1



Indian and Northern  
Affairs Canada

Affaires indiennes  
et du Nord Canada

Canada



Indian and Northern  
Affairs Canada

Affaires indiennes  
et du Nord Canada

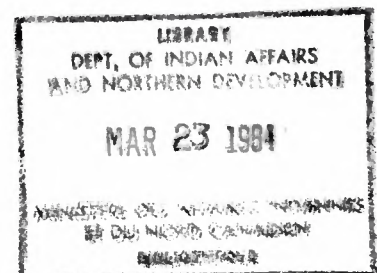
Technical Services  
and Contracts

Services techniques  
et marchés

SEPTIC TANK SYSTEMS  
O & M GUIDE

FEBRUARY 1984

Disponible en français



©Published under the authority of the  
Hon. John C. Munro, P.C., M.P.,  
Minister of Indian Affairs and  
Northern Development,  
Ottawa, 1983.

QS-3354-000-EE-A1

Cette publication peut aussi être obtenue  
en français sous le titre:

Guide d'exploitation et d'entretien des  
systèmes à fosse septique

# SEPTIC TANK SYSTEMS O&M GUIDE

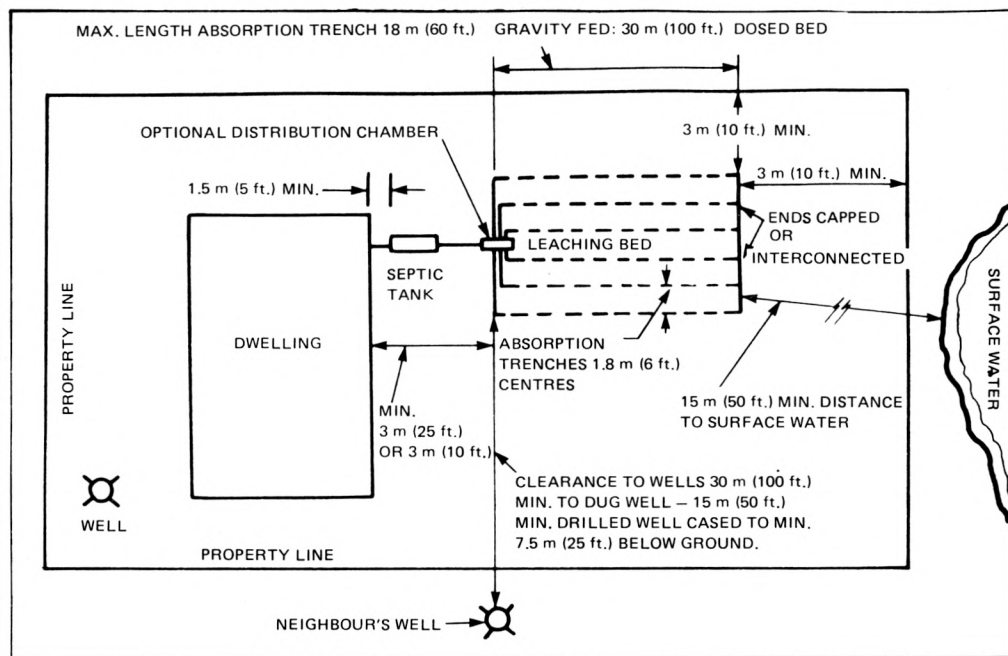
## Table of Contents

- 1.0 INTRODUCTION
  
- 2.0 OPERATION AND MAINTENANCE
  - 2.1 Grease Traps
  - 2.2 Detergents, Lye and Other Household Cleaners or Disinfectants
  - 2.3 Waste Discharges From Household Water Softener Units
  - 2.4 Addition of Preparations to Start, Accelerate or Improve Bacterial Action in the Tank
  - 2.5 Septic Tank Inspection
  - 2.6 Septic Tank Inspection Methods
    - 2.6.1 When to Empty a Septic Tank
    - 2.6.2 Scum And Sludge Measurement Methods
  - 2.7 Pump-out Contractors
  - 2.8 Protection Of Leaching Beds
  - 2.9 Overloading the Septic Tank System
  
- 3.0 REFERENCES

## SEPTIC TANK SYSTEM O&M GUIDE

### 1.0 INTRODUCTION

The municipality usually operates and maintains sewage treatment plants and sewerage systems in cities and smaller urban communities. In areas not served by sewers, householders are responsible for their own sewage disposal. The most common method is the septic tank and soil absorption system (see Figure 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. Min. 8 m (25 ft.) from dwelling if tile field equal to or above level of lowest floor or 3 m (10 ft.) if tile field is below level of lowest floor.
4. Internal plumbing and main drainage outlet should be designed with a view to connecting to possible future sanitary sewers.
5. Roof water, surface water, discharge from footing drains, must be excluded from entry to septic tank.
6. Leaching beds NOT to be located in swampy ground or in ground liable to flooding.

Figure 1 Typical Arrangement of Septic Tank System

A correctly designed and constructed septic tank and soil absorption system will function effectively and safely, but a system which is poorly designed and located or badly constructed, can cause public health problems and be very expensive to repair. It is most important that the installation be planned and built so that sewage does not surface in the tile field area (ponding) causing possible disease transmission by insects or by direct contact, or contamination of surface or ground water supplies.

2.0 OPERATION AND MAINTENANCE

2.1 Grease Traps

For normal domestic systems no grease trap is necessary as only a small amount of grease enters the system, usually from the kitchen.

2.2 Detergents, Lye and Other Household Cleaners or Disinfectants

Care should be taken to make sure that excessive and unnecessary quantities of detergents, lye, and other household cleaners or disinfectants do not enter the septic tank. The amounts required for normal domestic use will not hinder the bacterial action in the septic tank.

2.3 Waste Discharges from Household Water Softener Units

Water softeners do not have an adverse effect on the action of the septic tank but will slightly shorten the life of the leaching bed installed in some clay type soils.

When installing a water softener, extreme care should be taken in connecting the unit to the disposal system in order to prevent cross connection between the water supply and the waste plumbing system. This may be prevented by installing a backflow preventer.

Waste discharges from the water softener should not be connected directly to the tile field.

#### 2.4 Addition of Preparations to Start, Accelerate or Improve Bacterial Action in the Tank

All bacteria necessary for the operation of septic tanks are already contained in the sewage entering the system. No commercial additives are necessary to promote bacteriological action and in some cases will hinder it.

#### 2.5 Septic Tank Inspection

Septic tanks should be inspected at least once a year and pumped out when necessary; however with proper design capacities it should not be necessary to pump out a tank more than once every three years.

When a tank is not pumped out when required, sludge or scum will be carried into the leaching or absorption bed. This will clog the bed and stop it functioning entirely. When an absorption bed becomes clogged the septic tank must be pumped out and the bed replaced.

#### 2.6 Septic Tank Inspection Methods

##### 2.6.1 When to Empty a Septic Tank

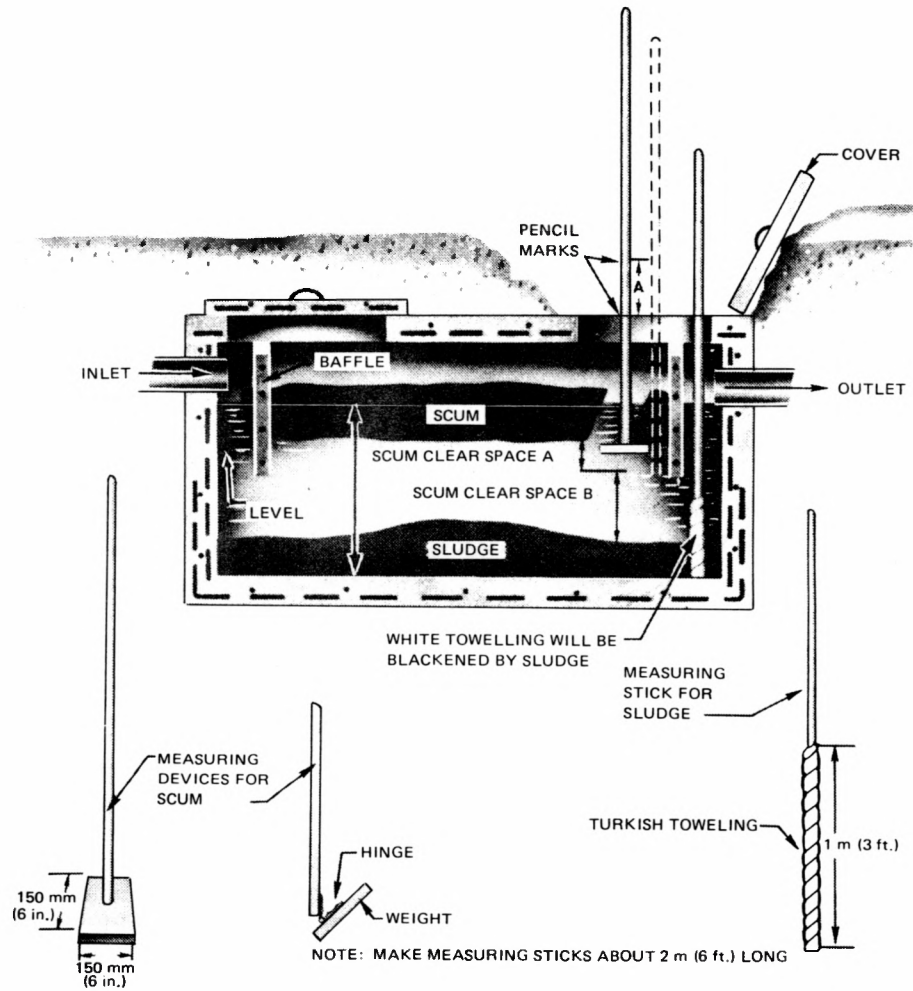
A septic tank should be emptied when the bottom of the scum mat is within approximately 75 mm (3 in.) of the bottom of the outlet fitting, or the surface of the sludge accumulation comes within 450 mm (18 in.) of the outlet fitting (see Figure 2).

##### 2.6.2 Scum And Sludge Measurement Methods

###### 2.6.2.1 Scum Measurement

Scum can be measured with a stick to which a weighted flap has been hinged, or with any device that can be used to feel out the bottom of the scum mat. Force the stick through the mat. The hinged flap will fall into a horizontal position. Then raise the stick until you can feel resistance

from the bottom of the scum. You can use the same tool to find the distance to the bottom of the outlet device (see Figure 2).



NOTE: CLEAN WHEN A IS 80 mm (3 in.) AND WHEN B IS 460 mm (18 in.)

Figure 2 Devices For Measuring Sludge And Scum



### 2.6.2.2 Sludge Measurement

A long stick wrapped with rough, white towelling and lowered to the bottom of the tank will show the depth of sludge and the depth of liquid in the tank. Lower the stick behind the outlet device to avoid scum particles. After several minutes, carefully remove the stick. The sludge line can be distinguished by sludge particles clinging to the towelling (see Figure 2).

### 2.7 Pump-out Contractors

In most localities there are contractors who will pump out septic tanks. Septic tanks should not be washed or disinfected after pumping. Using a strong light, inspect all interior surfaces of the tank for leaks and cracks. Pumped-out septic tanks often contain toxic gases and only an experienced person should clean out or repair them.

A small amount of sludge should be left in the tank for seeding purposes. Seeding is the method which re-activates the bacteriological process in the tank during start-up.

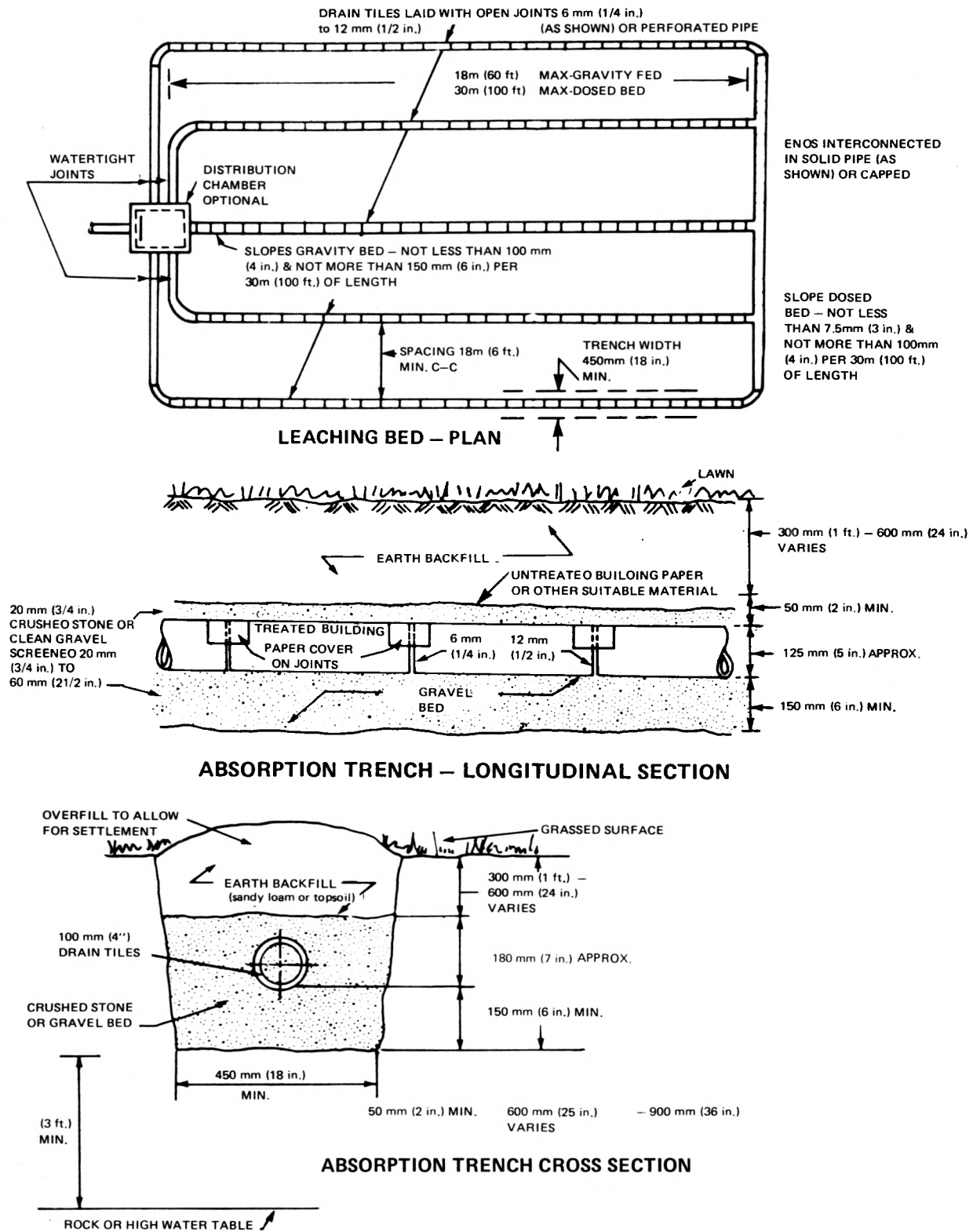
The contents of the tank must be disposed of in a dumping area approved by the local health and/or environment authority and is the responsibility of the pump-out contractor.

### 2.8 Protection Of Leaching Beds

At least once a year dosing tanks and distribution boxes should be opened and settled solids removed as necessary (see Figure 3 for design details).

When designing a septic tank system consider the following:

- a. Sump pumps, eavetroughs, and roof drains should not be discharged to the disposal bed area, nor should a sump pump discharge directly into a field absorption bed.
- b. The lot should be graded so that surface water is carried away from the disposal field and away from the house.



**NOTE:**  
As alternative to the drain tiles shown use 75 mm (3 in.) perforated pipe in gravity fed leaching beds of up to 152 linear meters (500 ft.) of absorption trench and 100 mm (4 in.) perforated pipe in all leaching beds dosed by a siphon or pump.

Figure 3 Leaching Bed And Absorption Trench

A tile field can be damaged by vehicular traffic, root growth and freezing. To prevent deep root growth, maintain a good grass cover. Do not permit the area to be used as a parking lot as the weight of a car, truck or snowmobile can break the distribution line.

In winter snow forms a natural insulation and destroying the snow cover can cause frost to penetrate the tile field. Do not use the area as a skating rink. Erecting a snow fence around the area will help preserve the snow cover and also discourage snowmobilers.

## 2.9 Overloading the Septic Tank System

The septic tank can be overloaded by the following:

- a. the after effects of large house parties;
- b. flooding of the surface of the leaching bed due to lawn watering, surface or roof drainage or because of faulty valve closures; and
- c. an increase in family size, or a change in ownership with an increase in household population.

If the increase in household population exceeds the design capacity of the septic tank a larger size tank should be installed. For example a 4500 litre (1000 gallon) tank may be required instead of a 2700 or 3600 litre (600 or 800 gallon) (see Figure 4 and Table 1).

A tile field or leaching bed can be expanded by adding additional tile runs providing the field is still functioning properly.

## 3.0 REFERENCES

Great Lakes - Upper Mississippi River Board of State Sanitary Engineers. 1980. Recommended Standards for Individual Sewage Systems.

Ontario. Ministry of the Environment.  
Information Services Branch. Septic Tank  
Systems. Toronto, Ontario.

U.S. Department of Health, Education and Welfare.  
Public Health Service. 1969. Manual of Septic  
Tank Practice. Rockville, Maryland: Consumer  
Protection and Environmental Health Service  
Environmental Control Administration.

Table 1

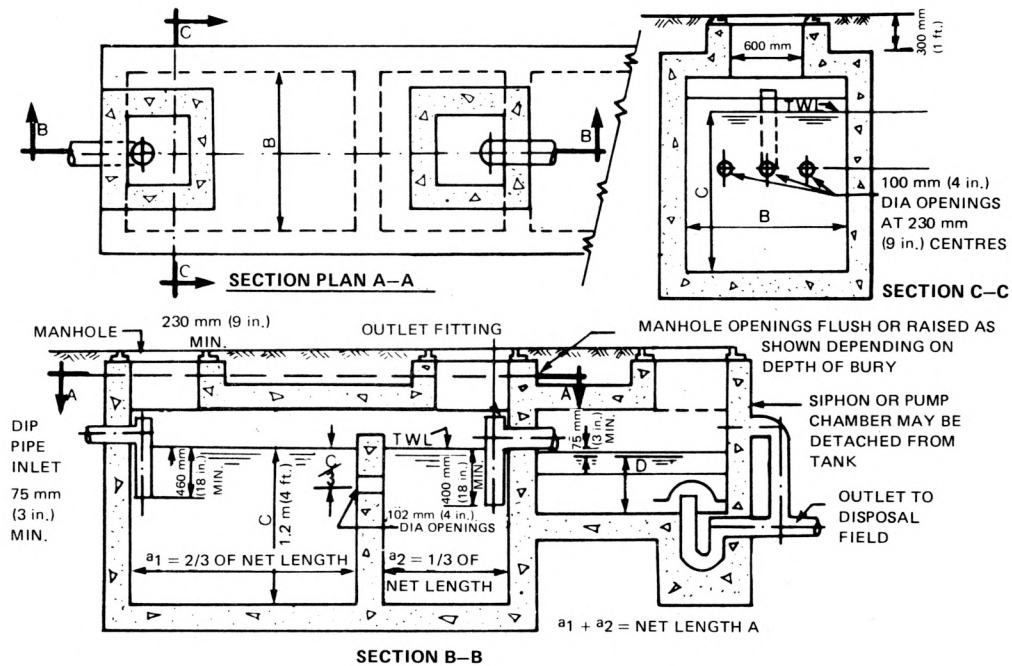
SEPTIC TANKS - WORKING CAPACITIES AND DIMENSIONS

NO. OF BEDROOMS	NO. OF OCCUPANTS	WORKING CAPACITY L (GAL.) REQUIRED	RECOMMENDED INTERNAL DIMENSIONS OF RECTANGULAR TANK - m (ft. - ins.)			
			LENGTH 1st COMPARTMENT (2/3)	LENGTH 2nd COMPARTMENT (1/3)	WIDTH	WATER DEPTH
2 or less	4 or less	*2300 (500)	1.4 (4'6")	0.7 (2'3")	0.9 (3'0")	1.2 (4'0")
3	5 or 6	*2730 (600)	1.6 (5'4")	0.8 (2'8")	0.9 (3'0")	1.2 (4'0")
4	7 or 8	3400 (750)	1.8 (6'0")	0.9 (3'0")	1.1 (3'6")	1.2 (4'0")
5	9 or 10	4100 (900)	1.8 (6'0")	0.9 (3'0")	1.2 (4'0")	1.2 (4'0")
6	11 or 12	4900 (1080)	1.9 (6'4")	1.0 (3'3")	1.2 (4'0")	1.4 (4'6")
COLUMN 1	2	3	4	5	6	7

\*Suitable in areas of low consumption of water.

Note: The above dimensions are calculated for households with an automatic washer. The recommended minimum capacity is 3400 L (750 imp. gal.) for areas using normal water consumption.

Figure 4 Septic Tank With Siphon ( Note Item #6 )

**NOTES:**

1. Manhole access shall be provided to each compartment located to facilitate servicing of the inlet and outlet.
2. Baffles may be used at inlet and outlet of tank instead of dip-pipes. The top edge should be not less than 150 mm (6 in.) above T.W.L. and bottom edge not less than 460 mm (18 in.) below T.W.L.
3. Inlet pipe may enter side wall of tank if convenient, but centre-line of pipe must not be more than 150 mm (6 in.) from inlet end wall.
4. The slope of the inlet pipe should be such that inlet velocity does not exceed 1 m (3 ft.) per second (25 mm (1 in.) in 18 m (6 ft.) for 102 mm (4 in.) dia. pipe; 25 mm (1 in.) in 3.6 m (12 ft.) for 150 mm (6 in.) dia. pipe).
5. Provision should be made for not less than 300 mm (1 ft.) of cover to tank (this may be raised above general ground level when available fall to distribution system is limited).
6. A siphon or pump shall be used to dose the leaching bed when more than 152 m (500 ft.) of distribution pipe is required.
7. Dimension D should be according to siphon manufacturer's requirements.
8. Add 230 mm (9 in.) to dimension C for total internal depth.
9. Inspect tanks annually. Tank to be cleaned when the level of the bottom of the scum is within 76 mm (3 in.), or the surface of the sludge is within 480 mm (18 in.), of the bottom of the outlet fitting.