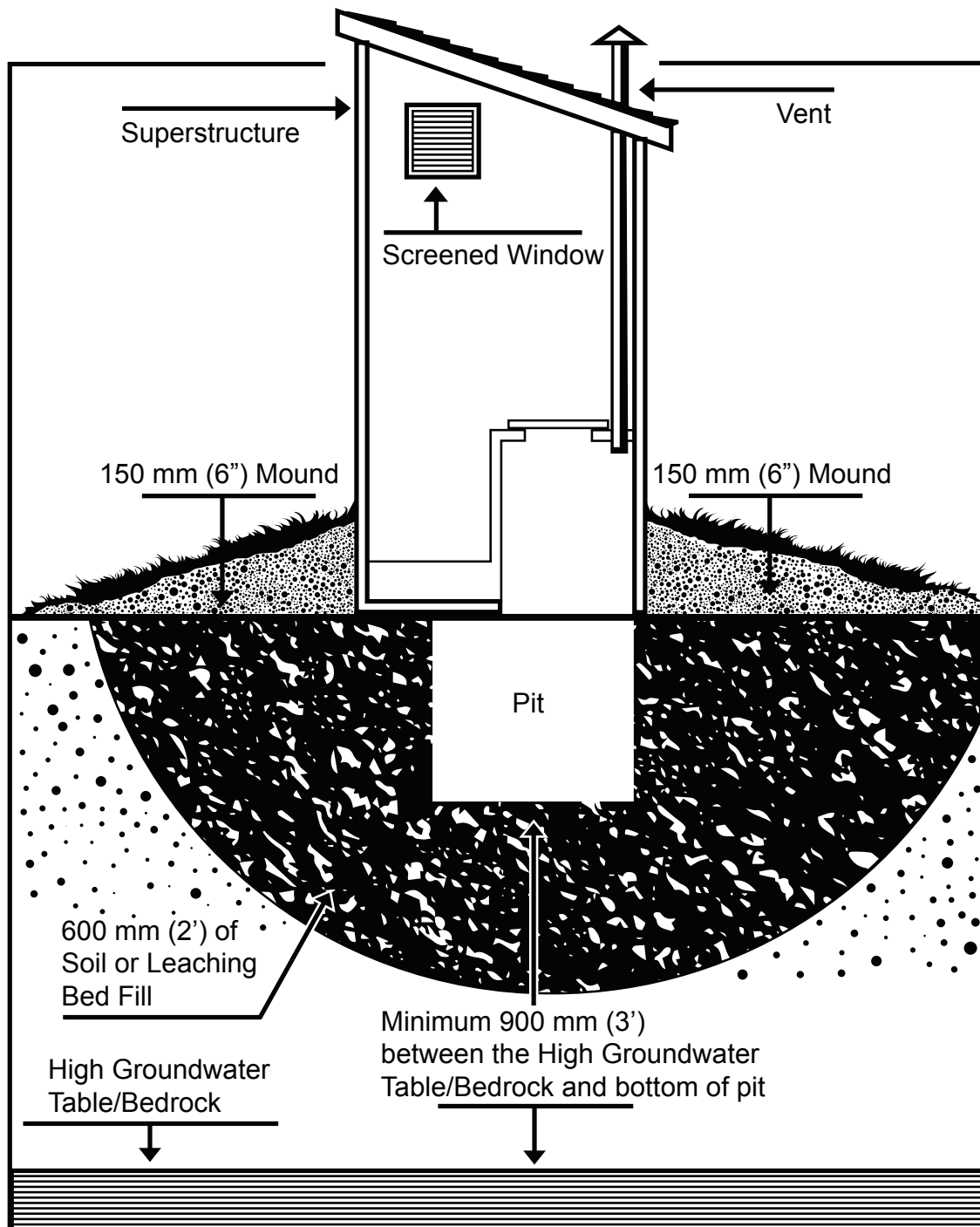


# A Practical Guide to Class 1 Sewage Treatment Systems (Pit Privy)



Revised: March 17, 2016

# Privies

## Class 1 Sewage Treatment Systems

A class 1 sewage treatment system must be designed to only receive human waste for treatment and dispersal.

A class 1 sewage treatment system includes:

- chemical toilets
- Incinerating toilets
- Recirculating toilets
- Self-contained portable toilets
- Composting toilet systems
- All forms of privies including
  - portable privies
  - earth pit privies
  - privy vaults
  - pail privies

## Location

The following minimum distances must be followed when installing a class 1 sewage treatment system:

- 15m (50 feet) from any drilled well
- 30m (100 feet) from any dug well
- 15m (50 feet) from any lake, pond, river, stream or any other water course

## Soils

The bottom of the pit must be a minimum of 0.9m (3 feet) above the high water table or bedrock. Because the human waste sewage is treated by the bacteria in the soil, it is important to have 0.9m of unsaturated soil to provide adequate treatment and to protect against contamination.

The top 2-5 cm of soil will filter all solids in the human waste sewage. The remaining sewage bacteria will be treated by the soil bacteria as the liquid moves down through the soil.

## Construction

- Use strong, durable weatherproof materials
- Make the door open inward so that the door can be open for winter use without having to remove snow.
- Construct the bench and floor with a very slight grade to facilitate the flow of cleaning water; 1/8 to 1/4 of an inch.
- Do not use a door plate so that the area can be swept and mopped easily.
- Use half-round moulding in the corner behind the bench and at the base of the bench
- Use a no-wax floor covering, in one piece, from the front of the privy across the floor, up and over the bench and two feet up the back wall. This will seal the floor and bench and create a very easy cleaning surface.
- Cover the side walls, part of the way up, with no-wax covering to improve cleaning.
- Use window and clear fibreglass roofing to allow adequate lighting.
- Cover the inside of the bench with a heavy gauge plastic to waterproof the complete area.
- Use spring-loaded hinges for the door to meet the requirement of "self-closing door."

## Consider

- Extend one corner of the superstructure into the pit and use this as a corner of the pit and the frame. This will help prevent pushing the privy over.
- Use a flat roof instead of a peaked roof; this will result in 2 fewer corners for hornet nests.
- Include an extended roof plus modesty panel to allow for the use of a urinal.
- Construct two benches of different heights to accommodate smaller people and children. A step could be used, however, the whole would have to be larger and this could cause problems for smaller people and children.

## **Ventilation**

### **1. Pit**

The pit should have air movement to prevent long-term buildup of odors. This may be accomplished by a large pipe with a "whirly-gig" on the top which draws out the stale air and replaces it with fresh air. The pit may also be vented by using two pipes of different heights to create air movement inside the pit. Usually the higher pipe is also the deepest pipe which would be first to pick up the wind currents and direct the flow into the lower part of the pit, while the shorter pipe returns the stale air from the upper portions of the pit to the atmosphere.

### **2. Usable part of the privy**

The common practice is to have one small vent which is totally insufficient. Cross ventilation is required from all sides at the top. To create complete movement of air, two small bottom vents will supply ventilation of the floor and seat area.

### **3. Site location**

Many privies are located out of sight, in heavy tree growth where there is little air movement. A location, well ventilated and exposed to the prevailing winds, will allow all ventilation practices to operate at a maximum.

### **4. Sealing the superstructure from the pit**

Toilet seats are a problem because the nobs on the seat and lid create an air gap which results in ventilation inside the privy. The nobs should be removed and complete rings of weather stripping installed so that the seat is sealed to the bench and the lid makes a complete seal when closed.

## **Summary**

A privy which is well vented, properly located and constructed to facilitate easy cleaning will serve the needs of all without complaint or inconvenience.

# Ontario Building Code

## Minimum Legal Requirements for Class 1 Sewage Treatment Systems (Pit Privies)

### 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 to receive only 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. to 8.3.5. shall be enclosed with a superstructure that,
  - (a) is constructed of strong durable weatherproof materials,
  - (b) has a solid floor supported by a sill constructed of treated timber, masonry or other material of at least equal strength and durability,
  - (c) is easily sanitized,
  - (d) 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 that is lined with an impervious material on all interior vertical surfaces,
  - (e) is equipped with a self-closing door,
  - (f) has one or more openings for purposes of ventilation, all of which are screened,
  - (g) 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
  - (h) shall not have any openings for the reception of human body waste, other than urinals and those constructed in accordance with Clause (1)(d).

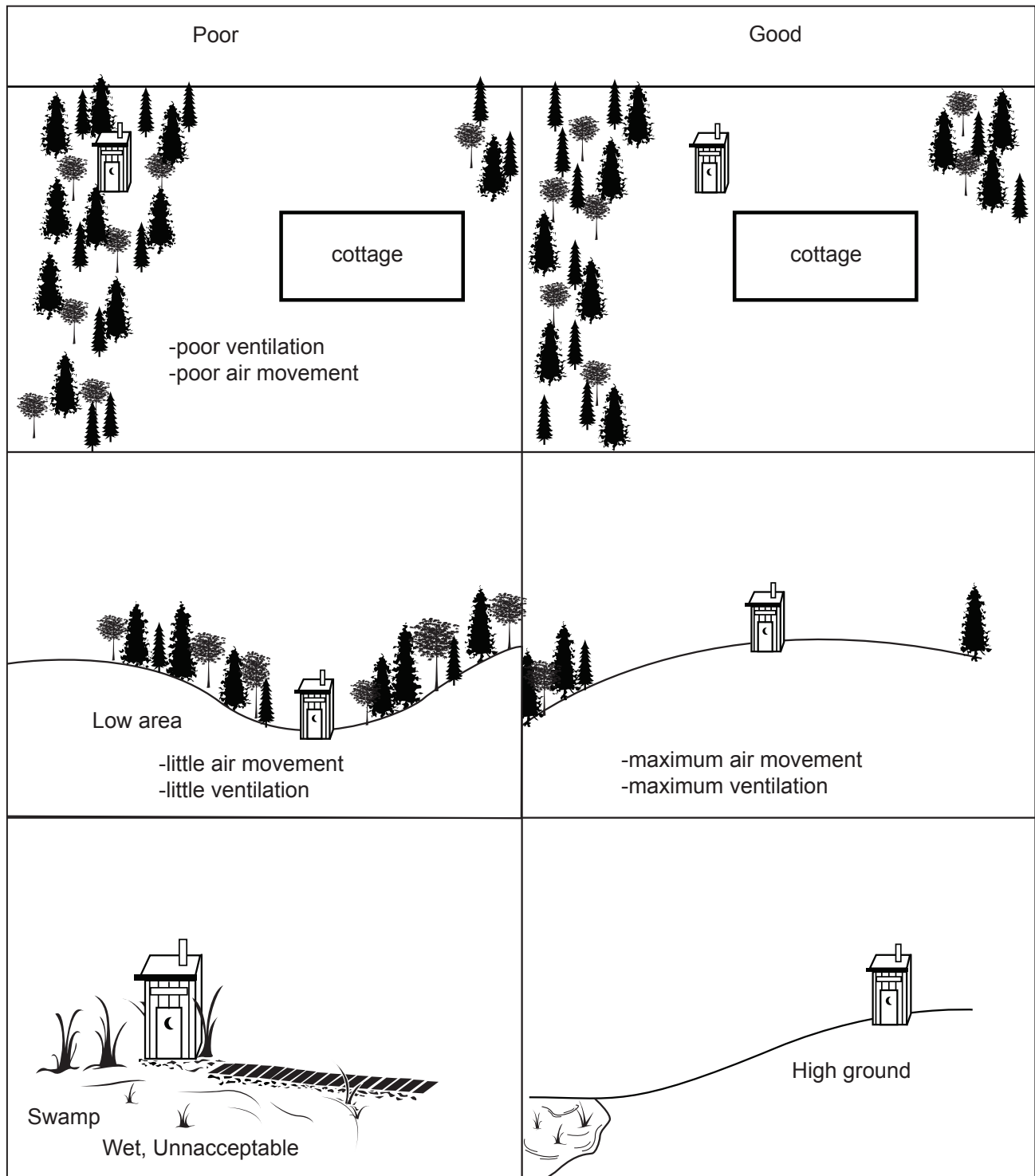
### 8.3.3. Earth Pit Privy

#### 8.3.3.1. Construction Requirements

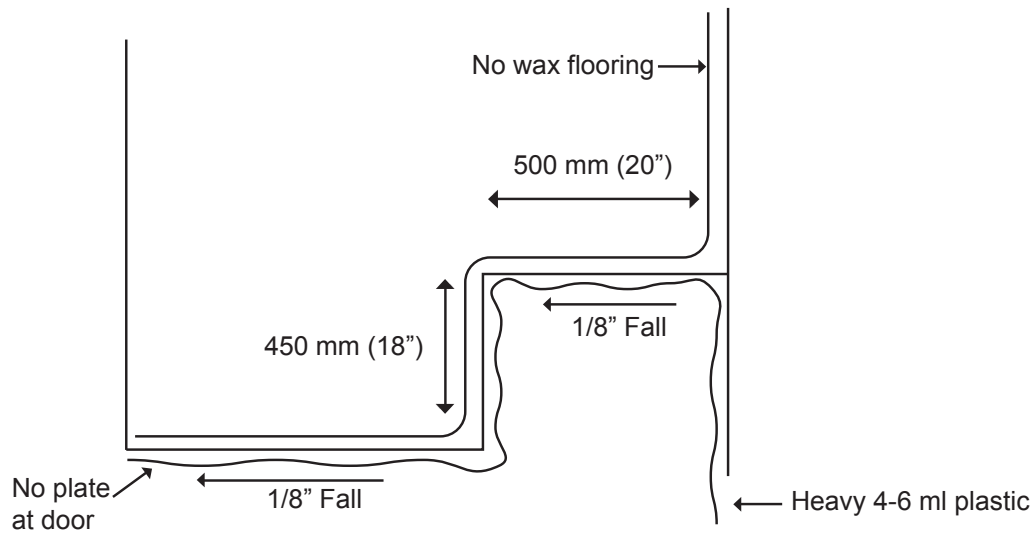
- (1) An earth pit privy shall be constructed in the following manner:
- (a) the bottom of the pit shall be at least 900 mm above the high ground water table/ bedrock,
  - (b) the sides of the pit shall be reinforced so as to prevent their collapse,
  - (c) the pit shall be surrounded on all sides and on its bottom by not less than 600 mm of soil or leaching bed fill, and
  - (d) 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.

Minimum distance from a drilled well	15m (50 feet)
Minimum distance from a dug well	30m (100 feet)
Minimum distance from a lake, river, etc.	15m (50 feet)
Minimum distance from a property line	3m (10 feet)

# Location

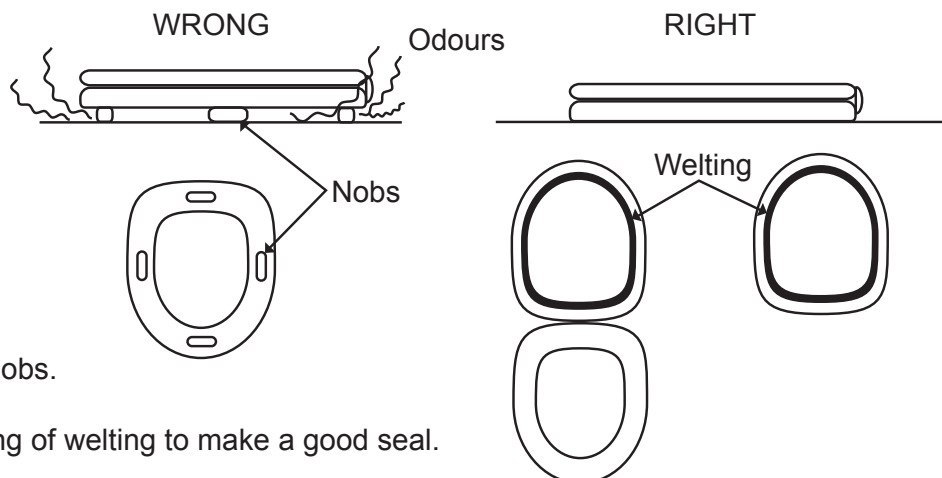


## Privy Bench



1. Slope floor and bench 1/8" to facilitate run-off when cleaning.
2. Round corners with 1/2" moulding.
3. Line floor, bench and walls with no wax flooring.
4. Seal with 4-6 ml plastic under floor bench and back wall to prevent pit gases seeping into privy.
5. All interior walls should be flat and smooth to facilitate cleaning.

## Toilet Seats

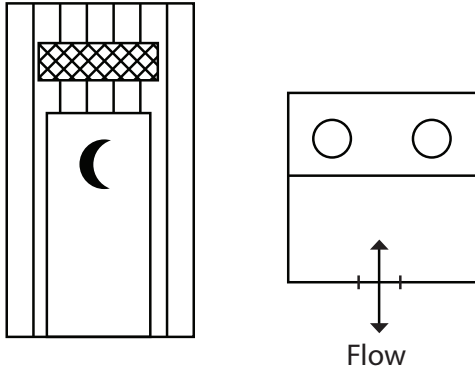


1. Remove nobs.
2. Place a ring of welting to make a good seal.



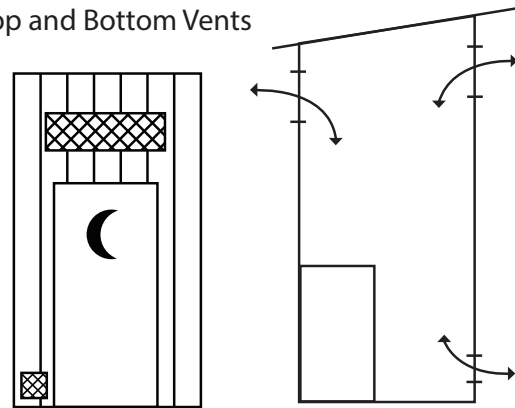
# Interior Ventilation

Front Vent

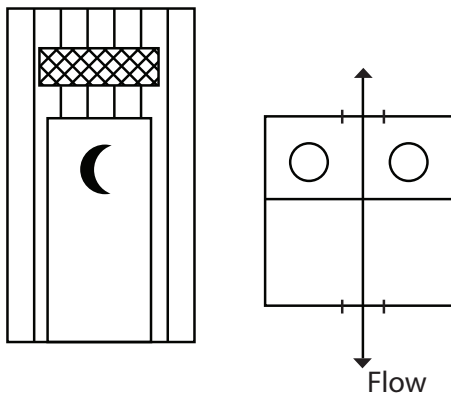


Poor

Top and Bottom Vents

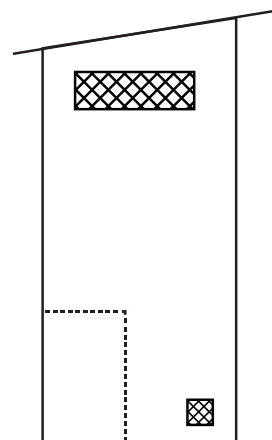


Front and Back Vents

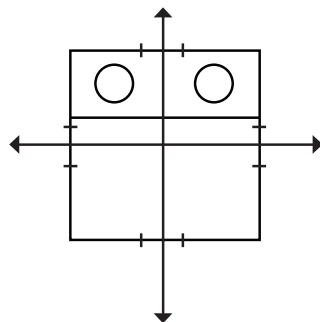


Better

Top and Side Vents



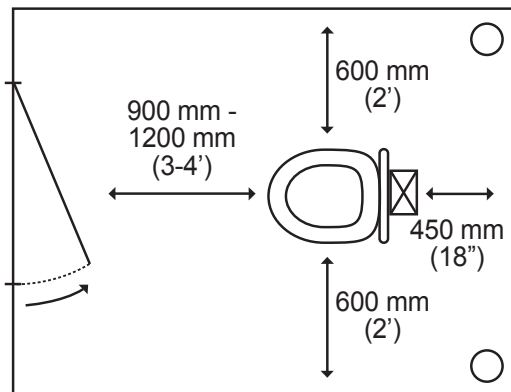
All Sides Vents



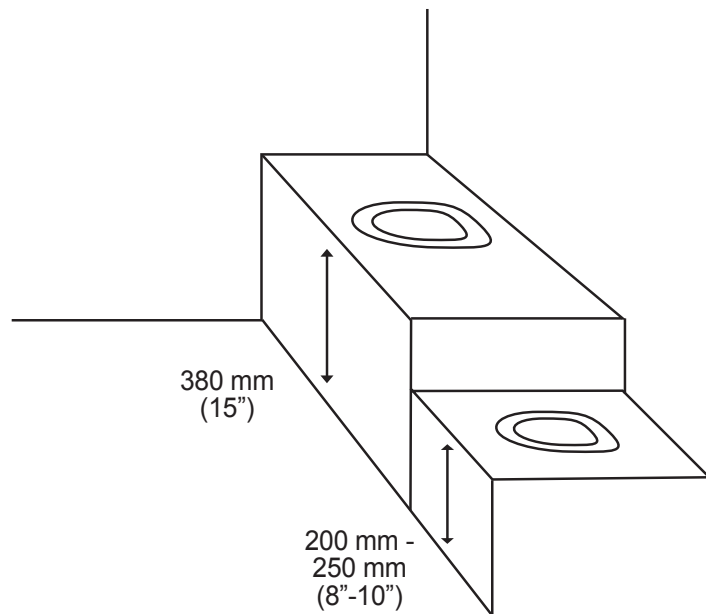
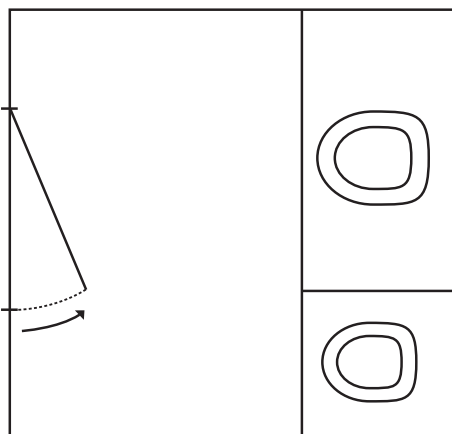
Best

# Privy Design

## 1. Drop tube.

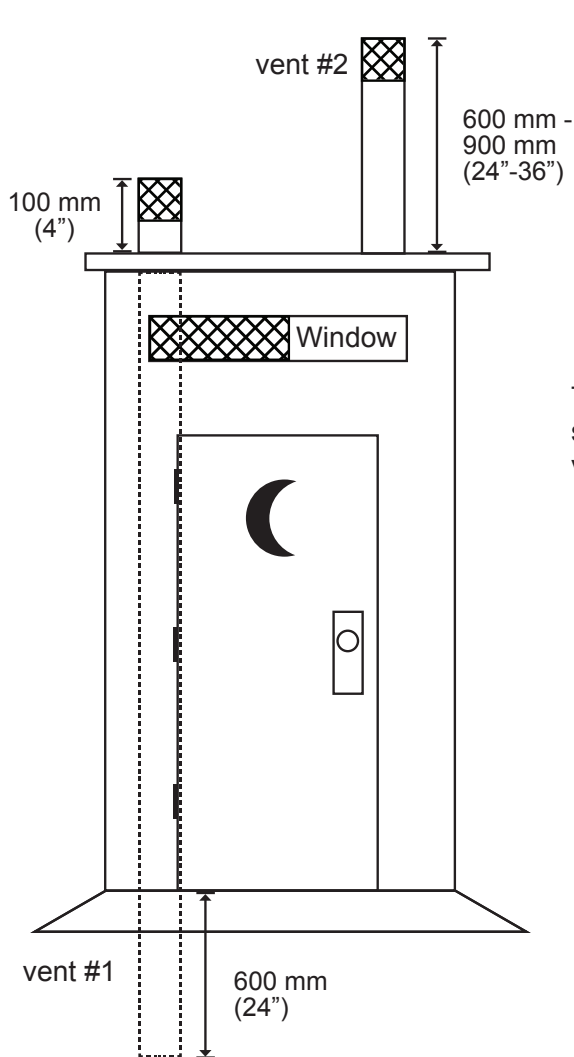


## 2. Two step bench



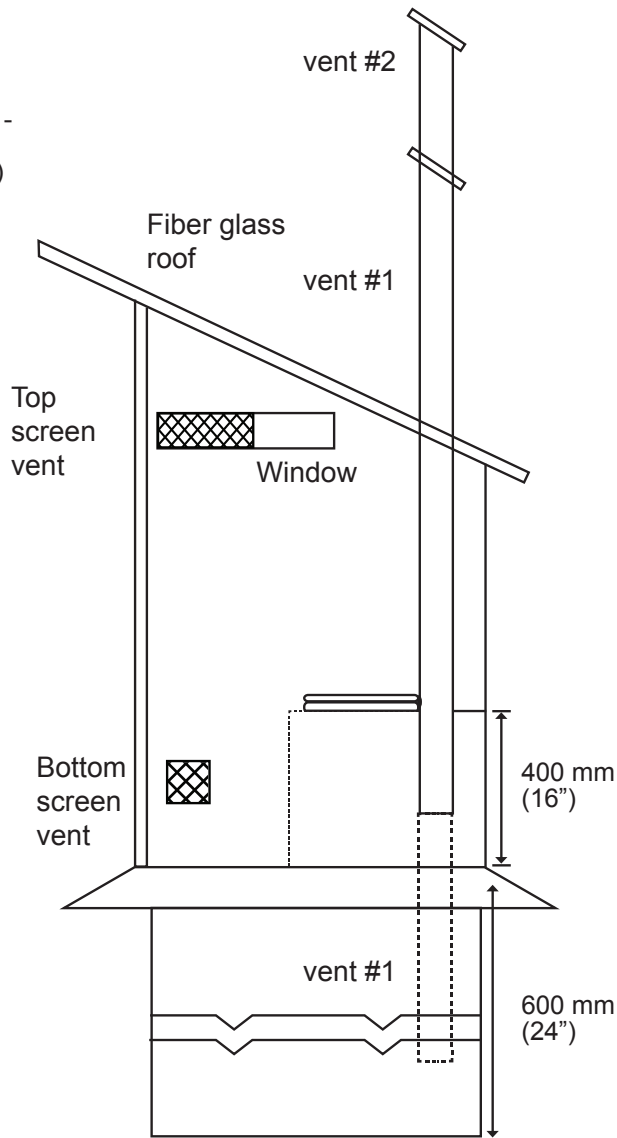
Design	Advantages
Drop tube to pit	<ul style="list-style-type: none"> <li>• easy to clean</li> <li>• no messy bench</li> <li>• open area</li> <li>• easy to construct</li> </ul>
Two step bench	<ul style="list-style-type: none"> <li>• accomodates both children and adults.</li> </ul>

# Ventilation



## When building a privy:

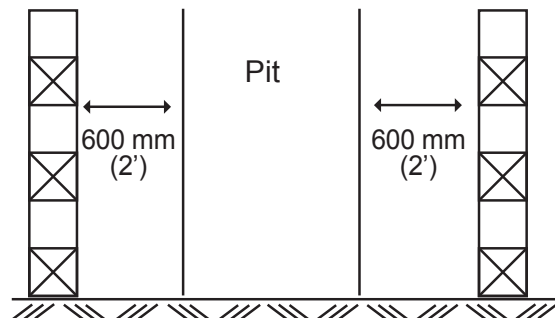
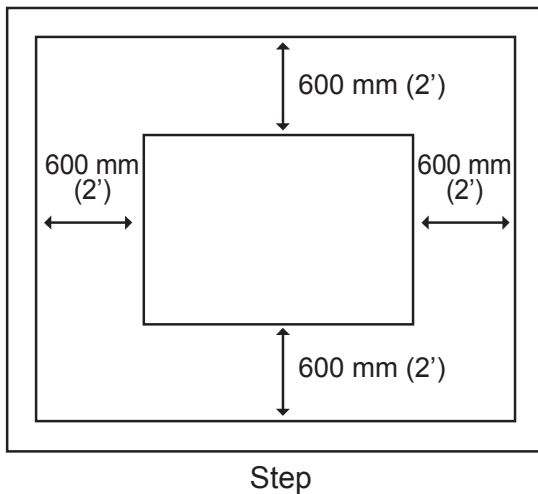
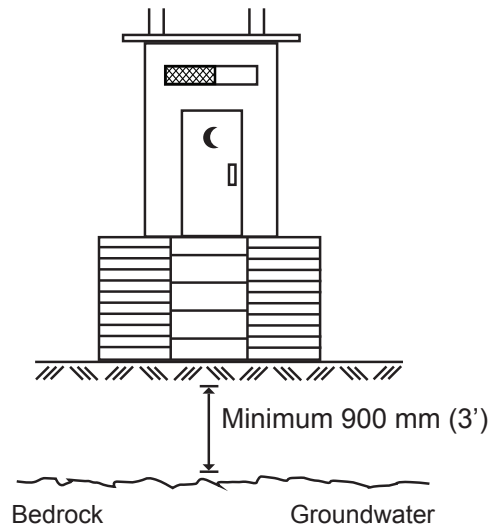
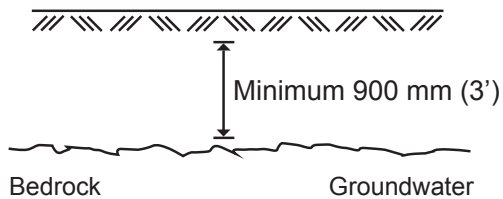
1. Locate the privy in an open area for maximum ventilation
2. Make sure there are 2 vents coming from pit.
3. Make sure to top vents on all sides.
- e) Make sure the toilet seat is sealed.
- f) Make vents as large as practical.



## Pit Vents must:

1. Be a minimum diameter of 100 mm (4")
2. Be 100 mm (4") and 600 mm (24") above roof.
3. Extend 400 mm (16") below seat.
4. Extend 600 mm (24") into pit.
5. Have a screened top.
6. Maintain the maximum distance between vent pipes.

# High Ground Water



1. There must be a minimum of 900 mm (3') of earth separating the bottom of the pit and the high groundwater table/bedrock.

2. There must be a minimum of 600 mm (2') of earth separating the vertical pit and the raised mound.

3. A minimum slope of 3:1 is required for a raised mound.

