# EWCE 333
# Wastewater Engineering and Sanitation

## Lecture 4

**Instructor**
**Lt Col Kazi Shamima Akter, Ph.D., Engrs**
**Department of EWCE, MIST**

# Lecture Outlines

| Topics | Reference |
| --- | --- |
| • Ventilated Improved Pit (VIP) Latrine<br><br>• Reed Odorless Earth Closet (ROEC) | Water Supply and Sanitation - Feroz Ahmed and Mujibur Rahman<br>ITN -BUET |

# Ventilated Improved Pit Latrine (VIP)

## Scope of use

- Families that use solid materials like news paper, stone, etc. for anal cleansing are not recommended to use pour-flush latrines as water seal is likely to become blocked or broken.

- In such cases a latrine direct access to the pit is more appropriate and therefore, ventilated improved pit (VIP) may be a good solution.

# Ventilated Improved Pit Latrine (VIP)

**Basic difference from other pit latrines**

The basic difference of VIP Latrine from pit latrine is,

(i) it requires a vent pipe and

(ii) design should be such that it maintains continuous airflow.

This also increases the cost of super structure.

# Ventilated Improved Pit Latrine (VIP)

## Elements of ventilated pit Latrines:

- Pit
- Cover slab
- Vent pipe - large enough ≥ 150mm dia. to allow free passage of air with fly screen
- Super structure.

# Types of VIP

## (1) Single Pit VIP Latrine

-Suitable where mechanical emptying is possible when the pit is full

-Manual emptying is not recommended as the excreta at the top are fresh and potentially dangerous for the emptier

-Usually designed for longer life (e.g., 10 years) where feasible and act as permanent structure.

-When a single pit VIP latrine becomes full, there are two options-

- Constructing a new one
- Emptying the existing pit

# Types of VIP

## (2) Twin Pit VIP Latrine

-Two separate pits, with the superstructure located centrally over the off-set pits.

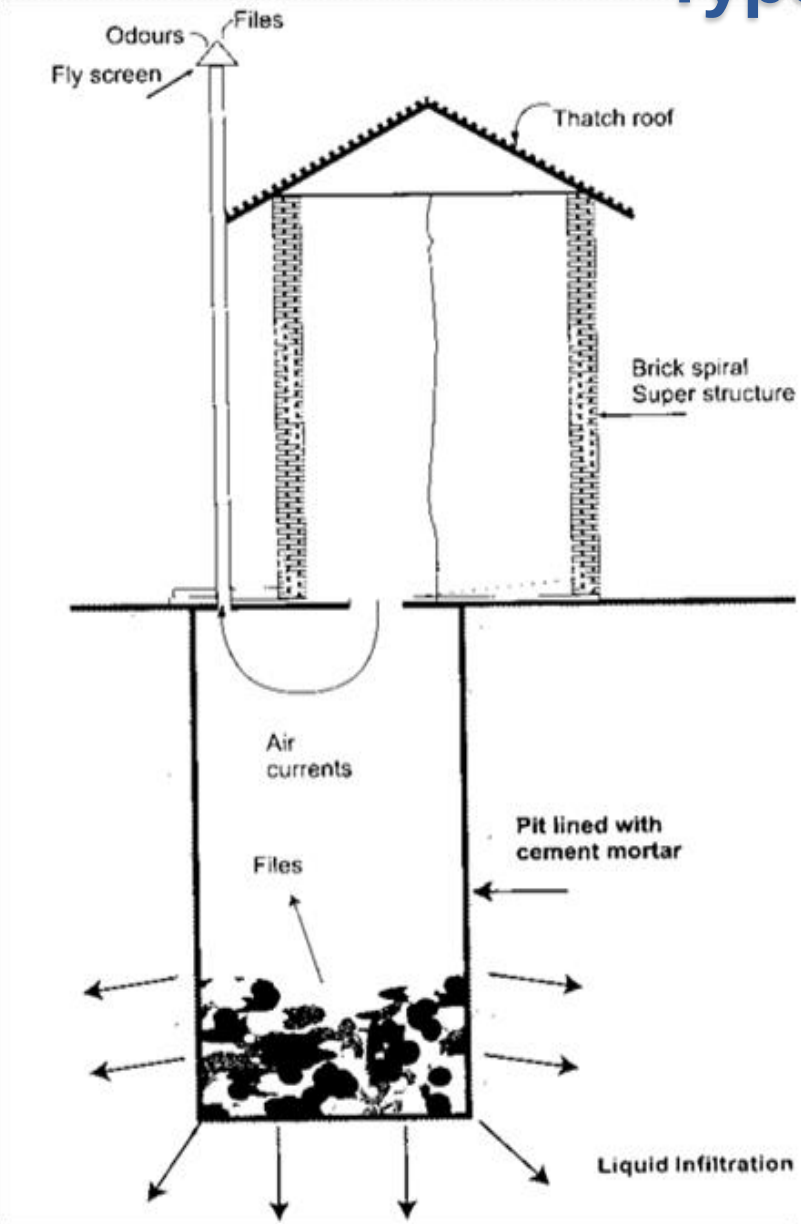
-The slab covering the pit has two squat holes, one over each pit.

-Only one hole and pit are used at a time.

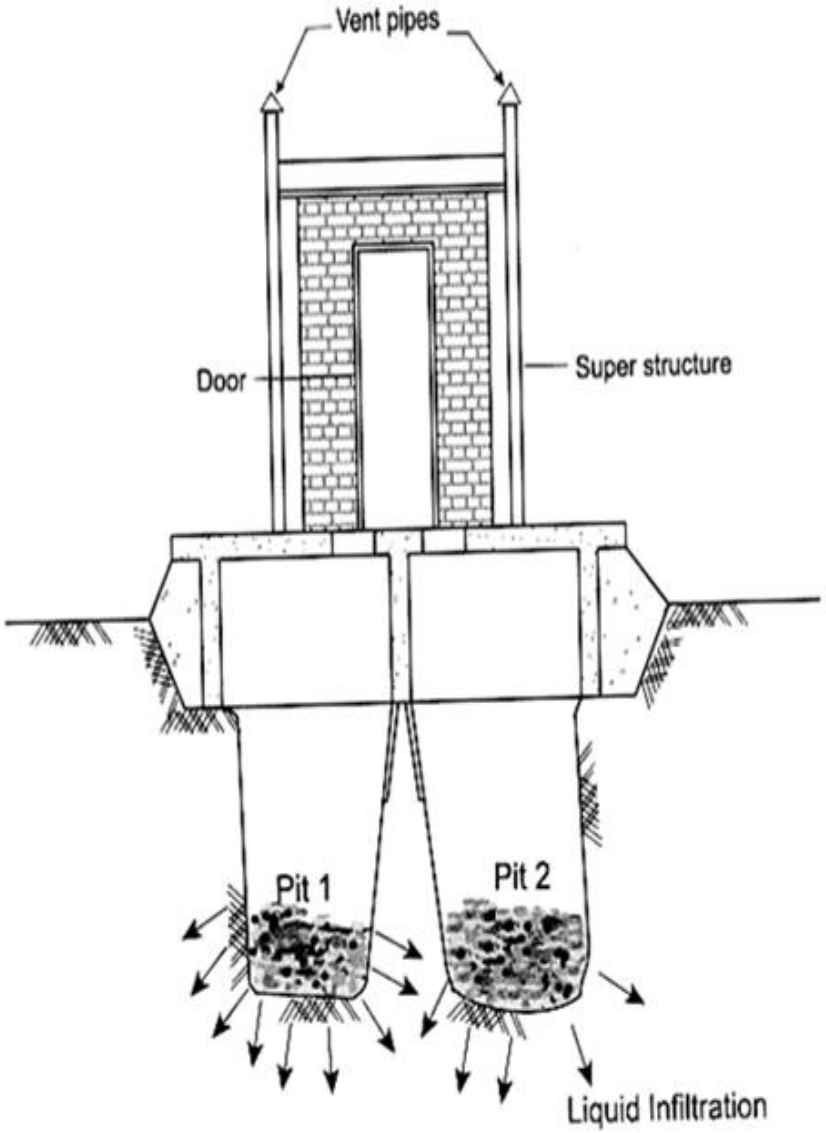
-When the pit is full (e.g., in 1-3 years), its squat hole is covered up and the second pit is put into service.

-When the second pit is full, the contents of the first pit are removed and it is put back into service. This cycle continues.

# Types of VIP




Single Pit VIP Latrine




Twin Pit VIP Latrine

# Advantages of VIP

- Minimum water requirement
- Control odor and insects
- Low-cost
- Easy to construct and maintain

# Major Problems of VIP

- Requirement of unobstructed ventilated pipe (even 0.5m higher than surrounding building) makes the latrine more suitable for low-density area than high-density urban area
- Improper design / climatic condition may not allow sufficient air flow
- Potential for groundwater pollution.

# Design of VIP

**Problem:**

Design a VIP latrine for a family of eight. The family uses water for anal cleansing. The ground water table is 2.0 m below the ground surface.

(Ref: Water Supply and Sanitation - Feroz Ahmed and Mujibur Rahman, ITN –BUET)