

## **9.6. TRAPS**

Trap is a bend or depression in a Sanitary fittings which is always full of water. It does not allow air connection between the fitting and outside drain or sewer pipe. Foul gases thereby cannot enter the Building to cause nuisance. Efficiency of the trap depends on depth of water seal. Its minimum value is 50 m.m. Greater the depth of seal, more effective is the trap. Depth of seal in practice varies from 25 mm to 75 mm.

### **9.6.1. Requirement of a Good Trap**

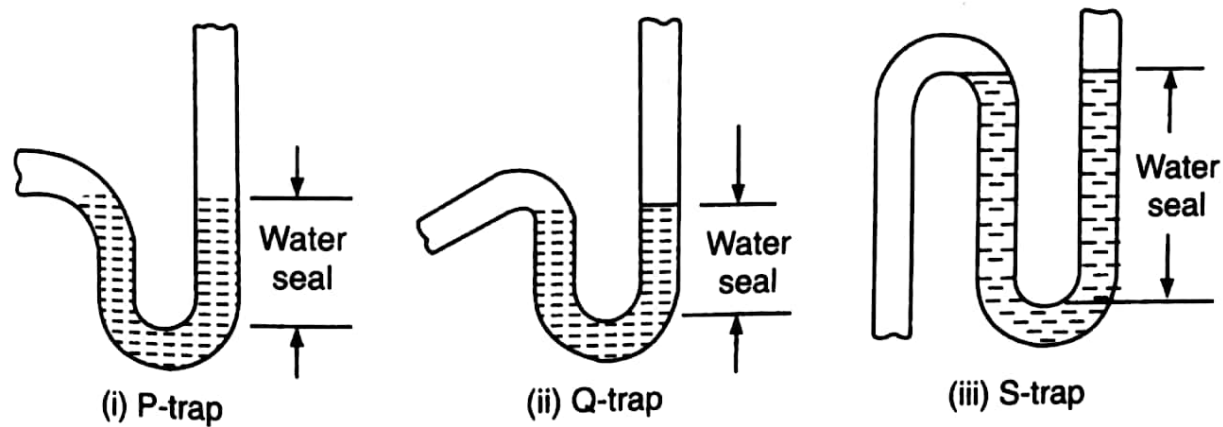
- (i) It should be made of non-absorbent material.
- (ii) It should provide good depth of water seal all the times having large surface area.
- (iii) It should be self-cleaning having no projections inside which may obstruct the flow of sewage.
- (iv) It must be provided with suitable access for cleaning.

**9.6.5. Classification of Traps**

Traps may be classified into following ways:

(A) According to their Shape

- (i) P-Trap
- (ii) Q-Trap
- (iii) S-Trap.



**Fig. 9.2. Trap**

These traps essentially consists of a U-Tube which retain water acting as a seal between foul gases and atmosphere.

(B) According to their Uses:

- (i) Floor-traps
- (ii) Gully-traps
- (iii) Grease-traps
- (iv) Intercepting Traps

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## Advantages and Disadvantages of Intercepting Traps

### Advantages

- (i) Helps in quick removal of foul matter received from building drains into the sewer.
- (ii) Helps in preventing entry of foul gases from sewer into the building.
- (iii) Helps in preventing entry of harmful bacterias from sewer into the building.

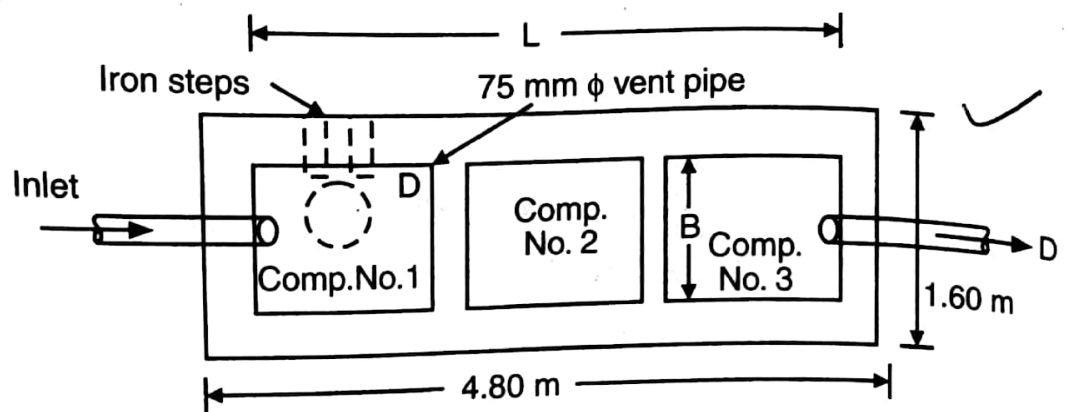
### Disadvantages

- (i) Difficult to clean trap through inspection arm.
- (ii) When the discharge from building drain is less then solid matter retained in trap will start decomposing.
- (iii) The trap obstruct the normal flow of sewage.
- (iv) The trap effects ventilation of sewers.
- (v) Provision of trap increases the cost of building drainage.

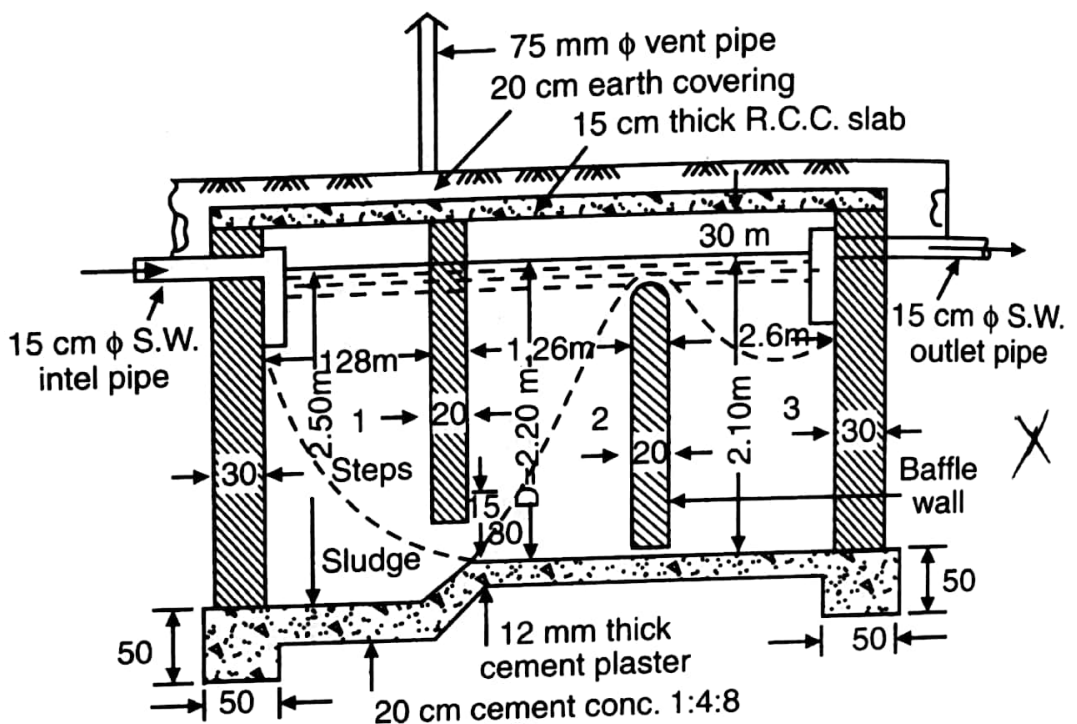
(vi) Maintenance cost much less than ...

## 10.8. SEPTIC TANK

A masonry or concrete structure, built below the ground level, where biochemical reactions take-place due to an aerobic bacteria is called a Septic Tank. Septic Tank was first used in INDIA in the year 1806.



(a) Plan



(b) L-Section

Fig. 10.6. Septic Tank

### 10.8.1. Principle of Working

These tanks work on the principle of biological actions which is brought about by bacteria which converts the solid matter of sewage into liquids and gases. Gases like carbon-di-oxide, hydrogen sulphide etc., are evolved. Mainly anaerobic bacteria (which thrive in absence of oxygen) takes part in the liquification.

Septic tank is either a concrete or masonry structure and is built below ground level. It is designed on the basis of continuous flow. It is rectangular in size. The length of the tank is 3 times the breadth. It is divided into 2 to 3 compartments. Air and light are excluded from the tank and due to this the anaerobic action takes place. A space of 15 to 30 cm is provided above the scum and bottom of slab for collection of gases which go to the atmosphere through vent pipes.

**Table 10.2.** Showing sizes of septic tanks [I.S. 2470-1963 (Part I)]

No. of users	Length (L) in Met.	Breadth (B) in Met.	Liquid depth (D) Min in Met.	Liquid capacity to be provided in m <sup>3</sup>	Free Board min. in cm.	Sludge to be removed	Recommended ended Interval of cleaning
1	2	3	4	5	6	7	8
5	1.5	0.75	11.0	1.12	↑	0.18	6 months
			11.0	1.12		0.36	1 year
			11.05	1.18		0.72	2 years
10	2	0.9	11.0	1.80		0.36	6 months
			11.0	1.80		0.72	1 year
			11.4	2.52		1.44	2 years
15	2	0.9	11.0	1.10	30 cms	0.14	6 months
			11.3	2.35		1.08	1 year
			12.0	3.60		2.16	2 years
20	2.3	1.1	11.0	2.50		0.72	6 months
			11.0	2.50		1.44	1 year
			11.3	3.30		2.88	2 years
50	4	1.4	11.8	4.55		1.80	6 months
			11.0	5.60		3.60	1 year
			11.3	7.30		7.20	2 years
			12.0	11.20	↓		

**Table 10.3.** Period of cleaning and storage capacity

Period of cleaning	Storage capacity
6 Months	0.028 m <sup>3</sup>
1 Year	0.050 m <sup>3</sup>
2 Years	0.001 m <sup>3</sup>
3 Years	0.085 m <sup>3</sup>

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### 10.8.5 Advantages and Disadvantages

✓ The main advantages are:

- (i) The production of a sludge which is lighter in weight and contains less water.
- (ii) No skilled attendance required.
- (iii) No mechanical moving parts.
- (iv) They are very cheap and convenient on small scale.

Septic tanks are unsuitable for large populations due to following:

#### ✓ Disadvantages

- (i) The size becomes too large.
- (ii) BOD and bacteria removal efficiency goes low.
- (iii) Initial expenditure is high.
- (iv) The effluent is with high BOD and foul gases