

SETTLING TANKS

Introduction

- A Sedimentation Tank is a tank in which suspended solids are allowed to settle out of a liquid under the influence of gravity
- These particles settled at the bottom
- They are removed by scrapers
- Colour and turbidity will be removed



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- Slowing down the flow in large tanks so that the floccules settle; so sludge forms
 - Bubbling air into a tank so that the floccules float (*DAF*); scum on the surface forms
 - Tank is shaped so that the velocity reduces as the flow moves upwards
 - Sludge Blanket forms where, **flow velocity = weight of the floccules**
 - This sludge blanket acts as a filter that removes smaller particles

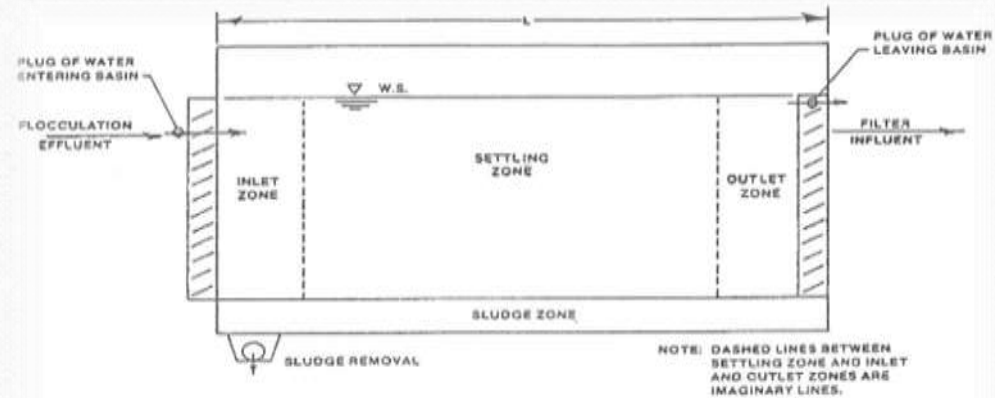
- 4 major zones

I. Inlet zone

II. Outlet zone

III. Settling zone

IV. Sludge zone



Sedimentation basin zones

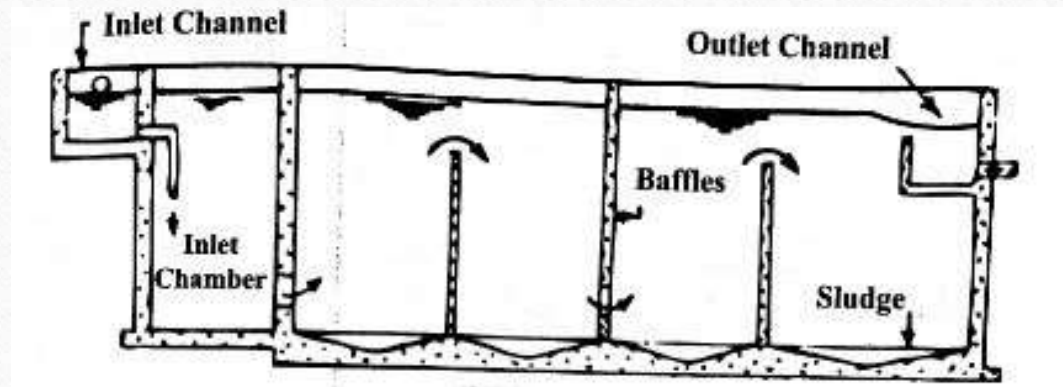
Types of sedimentation tanks

- Based on **methods of operation**

- i. Fill and Draw type
- ii. Continuous flow type

- Based on **location**

- i. Primary tank
- ii. Secondary tank



- Based on **shape**

- i. Circular tank

- ii. Rectangular tank

- iii. Hopper bottom tank

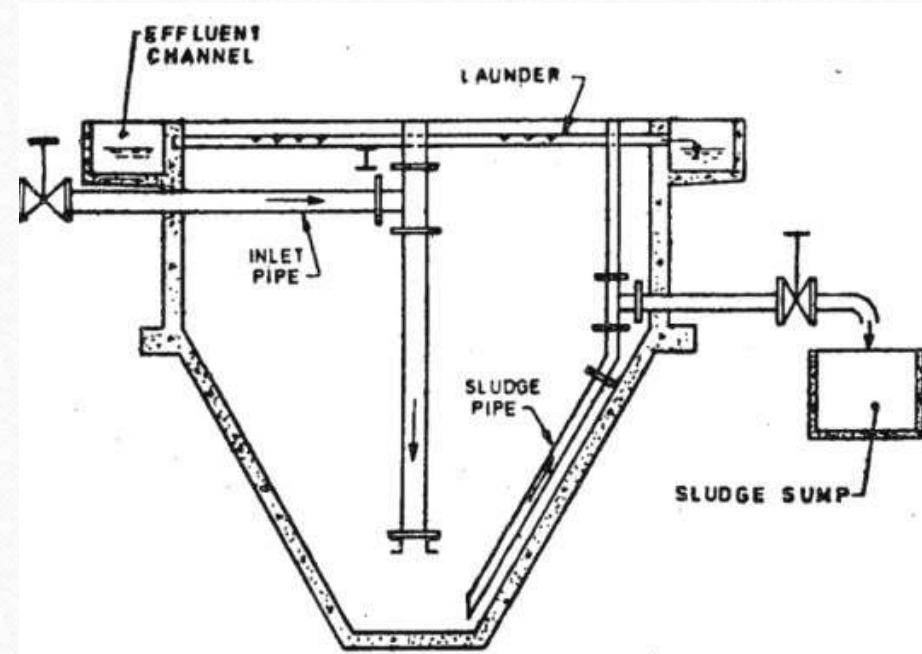


Design Guidelines

- Detention period : 1 – 3 hours
- Velocity of flow : Not greater than 30 cm/min (horizontal flow)
- Tank dimensions : $L:W = 3:1$ to $5:1$
- Depth : 2.5 to 5.0 m (3 m).
- Slopes : Rectangular 1% towards inlet and circular 8%

Technology

- 3 Types of tanks
 1. Rectangular- large
 2. Circular- small & medium
 3. Square
- High-Rate Tube Settlers
- Water inlet with baffles



Continued..

- Lamellar separators

These structures work in two ways,

1. Very large surface area onto which particles may fall and become stabilized
2. Flow is temporarily accelerated between the plates and then immediately slows down

this helps to aggregate very fine particles that can settle as the flow exits the plates

Advantages

- Circular Sedimentation Tank

1. Easy sludge removal
2. High clarification efficiency
3. Small to medium sized applications
4. For plants with constant flow rates and quality

- Rectangular Sedimentation Tank

1. Easy to operate and low maintenance costs
2. large capacity plants
3. Commonly used in municipal and industrial applications



Thank You!!!!
