

## Primary Treatment of Wastewater - Design Specifications, Objectives, Types

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### What is Primary Treatment of Wastewater

Primary Treatment of Wastewater is a plain sedimentation process to remove suspended organic solids from the sewage. Chemicals are sometimes used to remove finely divided and colloidal solids.

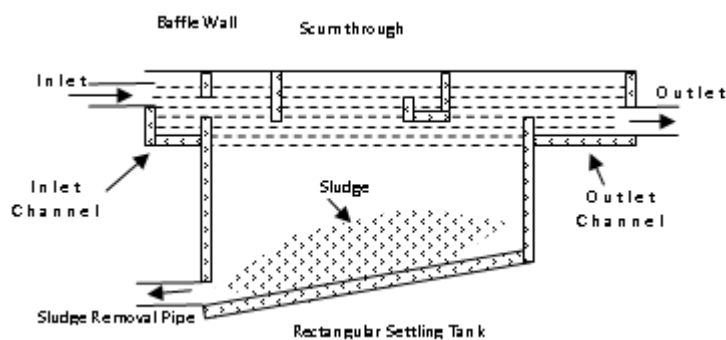
### Objectives of Primary Treatment

The main objectives of primary treatment of wastewater are:

1. To reduce the strength of sewage to the extent of 30% to 50%.
2. To remove settleable solids by 80% to 90%.
3. To reduce BOD by 30% to 35%.
4. To make the sewage fit for further treatment process.

### Primary Sedimentation Tank

Primary sedimentation tank is also known as primary clarifier and is located just after grit chamber. It may be rectangular, circular or square shape. The principle and construction details are same as that of plain sedimentation tank of W.T.P.



### Design Specifications of Primary Sedimentation Tank

1. Hydraulic loading rate (surface overflow rate)/settling velocity  $V_s = (0.3 - 0.7) \text{ mm/sec}$  ( $1 - 2.5 \text{ m/hr}$ )
2. Detention time / retention time  $T_d = 1 - 2 \text{ hrs}$
3. Depth of Tank =  $(1 - 5) \text{ m}$
4. BOD removal  $(20 - 40) \%$

5. Suspended solids removal (30 – 60) %
6. Minimum number of tanks = 2
7. Sludge accumulated = 2.5 Kg of wet solids / m<sup>3</sup> of flow.

### **Types of Primary Sedimentation Tanks**

1. Typical primary sedimentation tank
2. Circular Radial Flow Tank
3. Up Flow Tanks