Design of Primary Settling Tank

Step 1] Finding Diameter of settling tank :

Let us assume an overflow rate = 30 300 $m^3/day/m^2$

$= 30/24 = 1.25 \quad m^3/hr/m^2$

We have, Q = A x V

∴ Overflow rate (V) = $\frac{Q}{A}$

$$1.25 = \frac{625}{\frac{\pi}{4} \text{ x } d^2}$$

∴ d = 25.23 mt. = 26 mt

∴ Provide circular tank of diameter 26 mt.

Step 2] Finding Velocity of flow in settling tank :

We have, Q = A x V

$$V = \frac{Q}{A}$$

$$= \frac{625}{\frac{\pi}{4} \text{ x } 26^2}$$

$$= 1.18 \quad m^3/hr$$

Step 3] Finding Detention time for settling tank :

Detention time (D. T.) = $\frac{C}{Q}$

$$= \frac{\text{Area of Tank x Depth of water}}{625}$$

$$= \frac{\frac{\pi}{4} \text{ x } 26^2 \text{ x } 3}{625}$$

$$= 2.40 \text{ Hrs.}$$