

SLOW SAND FILTER

BIOLOGICAL FILTER

- 1. Supernatant (Raw) Water • Depth - 1.5 m
- Provides constant head of water to promote downward flow of water
- Also provides waiting period of 3 - 12 hours which helps to undergo purification by sedimentation & oxidation
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2. Sand Bed

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Thickness - 1 m • Sand grains diameter - 0.3 mm • Supported by layer of graded gravel • Rate of filtration - 0.1-0.4 $\text{m}^3/\text{hour}/\text{per square meter of sand bed surface}$

• Vital Layer - Surface of filter get covered with a slimy growth known as Schmutzdecke /Vital/ Zoogloal/ Biological Layer

• Extends - 3 cm into the top portion of sand bed.

• Slimy gelatinous layer consist of thread like algae, bacteria, planktons & diatoms

• Heart of slow sand filter - Filtered

water can be used only after formation of vital layer (k/a Ripening of the filter)

- Removes organic matter & oxidizes ammoniacal nitrogen into nitrates

- 3. Under Drainage System - Perforated pipes which provides an outlet for filtered water & supporting the filter from below

- 4. Filter Controls -

Equipped with valves & devices, to maintain a constant rate of filtration

- Venturi-Meter - measure's sand bed Resistance / Loss of head (When exceeds 1.3m, it is uneconomical to run the filter)

Filter cleaning • Supernatant water is cleaned

off

- Sand bed is cleaned by scrapping off the top portion to the depth of 2cm
- After 20 - 30 scrapping, plant is closed down & new bed is constructed.

Advantages

- Simple & Cheap to construct
- Physical, chemical & biological quality of filtered water is very high
- Removes total bacteria count by