

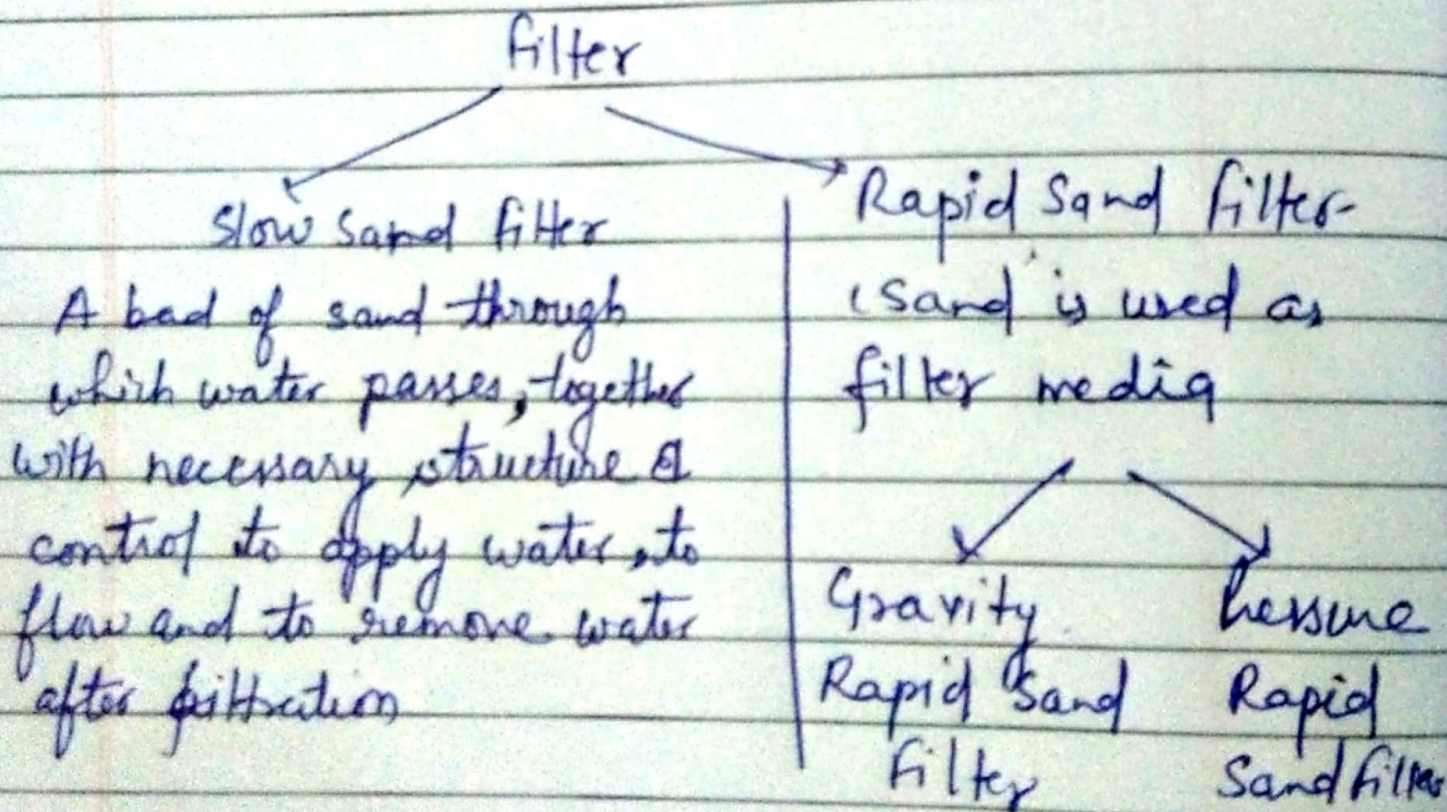
WATER SUPPLY & WASTE WATER TREATMENT

Filtration -

many water treatment unit uses filter to remove particles from water.

{ clay, silt, natural matter
precipitates from other treatment }
microorganism, iron, mg.

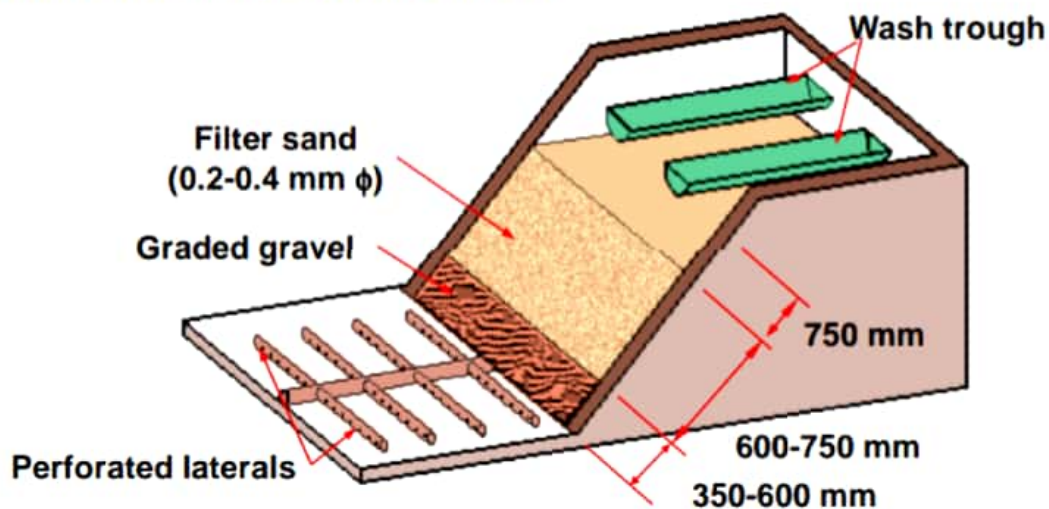
• filtration enhances the effectiveness of disinfection.



★ Slow Sand Filter (SSF)

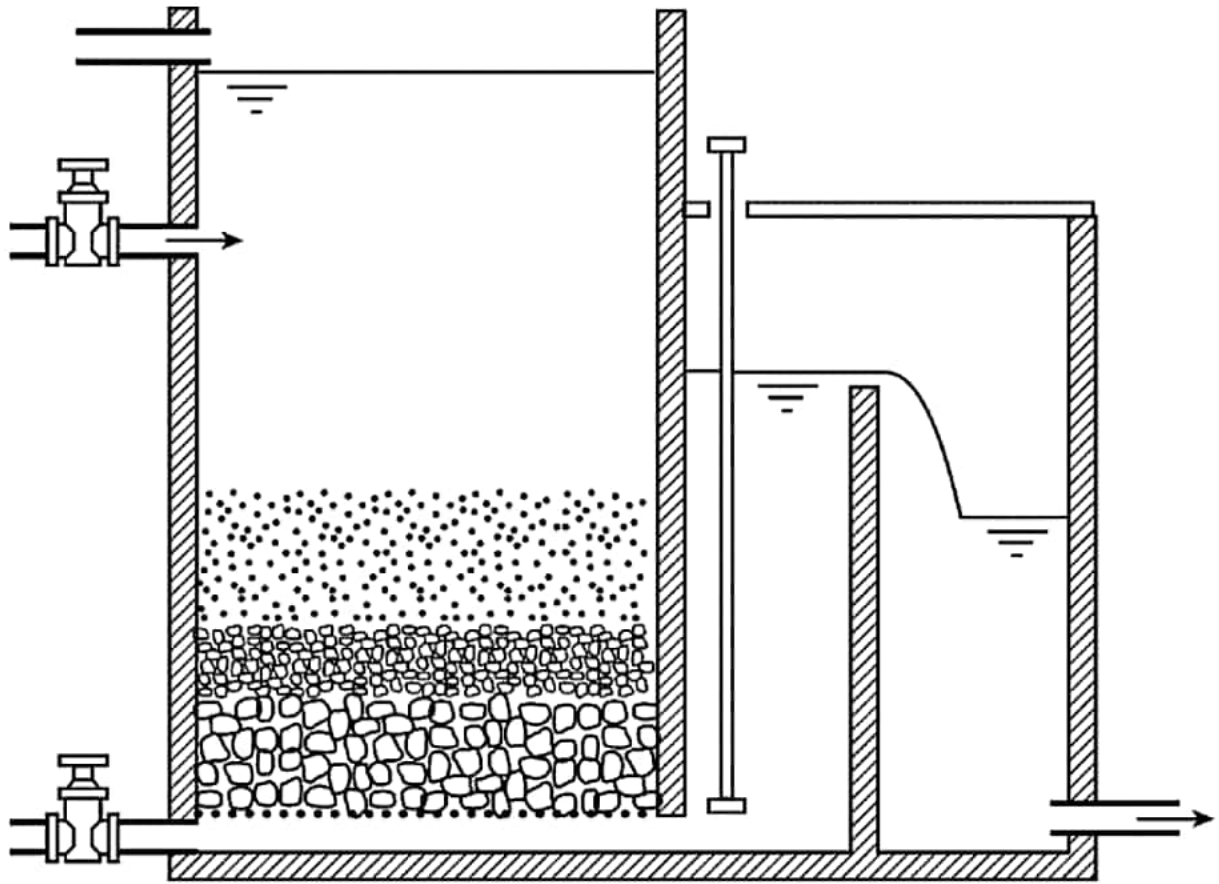
Basic Elements :

- Concrete basin (minimum 2, so that one can be taken out of service for cleaning and maintenance).
- Under drains - consists of pipes and channels to collect and cover the filtered water to outlets
- Gravel bed to prevent the sand entering the drainage pipe;
- Flow control devices at the inlet and outlet to have quasi constant flow out of the filter.



Extracted from Prof C Visvanathan's lecture notes

Process



Principle of a slow sand filter. Source: WHO (n.y.)

The basic principle of the process is very simple. Contaminated freshwater flows through a layer of sand, where it not only gets physically filtered but biologically treated. Hereby, both sediments and pathogens are removed. This process is based on the ability of organisms to remove pathogens.

Advantages

- Very effective removal of bacteria, viruses, protozoa, turbidity and heavy metals in contaminated fresh water
- Simplicity of design and high self-help compatibility: construction, operation and maintenance only require basic skills and knowledge and minimal effort
- If constructed with gravity flow only, no (electrical) pumps required
- Local materials can be used for construction
- High reliability and ability to withstand fluctuations in water quality

Disadvantages

- Minimal quality and constant flow of fresh water required: turbidity (<10-20 NTU) and low algae contamination. Otherwise, pre-treatment may be necessary
- Cold temperatures lower the efficiency of the process due to a decrease in biological activity
- Loss of productivity during the relatively long filter skimming and ripening periods
- Very regular maintenance essential; some basic equipment or ready-made test kits required to monitor some physical and chemical parameters