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Water Filtration

Description of a Typical Gravity Filter System

During backwashing, wash water passing upward through the filter carries out the impurities that accumulated in the media

The flow is directed upward, hydraulically expanding the filter media

The water is collected in the wash-water troughs that discharge to the outlet flume



















Water Filtration

Filter Media

A filter medium is defined by *effective size* and *uniformity coefficient*.

Effective size is the 10-percentile diameter; that is, 10% by weight of the filter material is less than this diameter, $D_{\rm 10}$

Uniformity coefficient is the ratio of the 60-percentile size to the 10-percentile size $(D_{60}\,/D_{10})$



Water Filtration

Filter Media

Conventional sand medium has an effective size of 0.45-0.55 mm, a uniformity coefficient less than 1.65

A sand filter bed with a relatively uniform grain size can provide effective filtration throughout its depth

Water Filtration

Multimedia Filters

Dual-media filter beds usually employ anthracite and sand

However, other materials have been used, such as activated carbon and sand

Multimedia filter beds generally use anthracite, sand, and garnet.

However, other materials have been used, such as activated carbon, sand, and garnet.



Water Filtration

Multimedia Filters

The main advantages of multimedia filters compared to singlemedium filters are:

- 1. Longer filtration runs,
- 2. Higher filtration rates, and
- 3. The ability to filter a water with higher turbidity



The advantages of the multimedia filters are due to:

- 1. The media particle size,
- 2. The different specific gravities of the media, and
- 3. The media gradation.

