15A NCAC 18C .0708 GRAVITY FILTERS

(a) Filtration Rates. The standard rate of filtration for a single media filter shall be two gallons per minute per square foot. Higher filtration rates up to four gallons per minute per square foot may be approved for dual media or multi-media filters. Filtration rates in excess of four gallons per minute per square foot may be approved subject to pilot plant or plant scale demonstrations conducted in accordance with Rule .0714 of this Section, and demonstrated equivalent treatment efficiency based on case-specific engineering evidence.

(b) Wash Water Rate. The backwash rate of flow shall be designed to theoretically expand the filter media 50 percent.

(c) Rate Control Devices. Rate control equipment shall be provided to control or regulate the filtration rate and the backwash rate. If declining rate filtration is to be used, orifice plates shall be installed on each filter effluent pipe to control maximum filtration rates.

(d) Surface Washers. Filter beds shall be equipped with a revolving or fixed system of nozzles designed for agitation of the entire beds.

(e) Gauges and Flow Indicators. Gauges or meters shall be installed to indicate the rate of filtration, the loss of head, and the backwash rate for every filter.

(f) Filter Media:

(1) Filter Sand. Filter sand shall be clean silica sand having:

(A) an effective size of 0.35 mm to 0.55 mm;

(B) a uniformity coefficient of not more than 1.70;

(C) a dust content passing 150 mesh tyler of less than 0.5 percent; and

(D) a minimum depth of at least 24 inches.

(2) Anthracite Filter Media. If anthracite coal is used as a single filter media, it shall have an effective size of 0.35 mm to 0.55 mm and a uniformity coefficient of 1.70 or less. Minimum depth of the media shall be 24 inches.

(3) Dual Media or Multi-media Filters. Particle sizes in dual media and mixed media filter beds shall be within 0.15 mm to 1.2 mm. Influent water quality shall be considered in specifying particle sizes of mixed media beds. The minimum depth of the filter media shall be 24 inches.

(g) Supporting Media and Underdrain System. The underdrain system and layers of gravel or other media supporting the filter media shall be designed to provide uniform filtration and uniform backwash throughout the filter media.

(h) Wash Water Troughs Elevation. The elevation of the bottom of the wash water troughs for new installations shall be above the maximum level of the expanded media during washing at the normal design wash water rate. The elevation of the top of the wash water troughs shall provide a two-inch freeboard above the expanded media at the maximum rate of wash.

(i) Turbidity Monitoring. Turbidimeters employing the nephelometric method, which measures the intensity of scattered light, shall be provided for the continuous determination of the turbidities of filtered water from each filter unit.

(j) Sampling Tap. A tap shall be installed for sampling of the effluent from each filter.

(k) Multiple Filter Units. Two or more filter units shall be provided such that the annual average daily demand can be satisfied at the approved filtration rate with one filter removed from service.

(l) Structural Design. Filters shall have vertical walls with no protrusions or curvature. Floors of filter rooms shall be designed to prevent flooding or spillage into filters through overflow drainage and a minimum of four-inch curbs around the filters.

(m) Filter to Waste. All filters shall have provisions for filtering to waste with backflow prevention.

(n) Filter Backwash. Backwash capacity to ensure cleaning of the filters shall be provided.

History Note: *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
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