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Intermittent Sand Filter Design Policy

SITE CRITERIA FOR DISPOSAL FIELDS

- 1) Useable Soils Depth: Must provide a minimum of 2 feet of useable soils below bottom of disposal trench. This soil must be free of groundwater.
- 2) Percolation Rate: Permeability is to be established at disposal trench depth, (5 to 90 MPI for design purposes). There must be reasonable permeability at 1 foot below bottom of disposal trench.
- 3) Slope: 0 to 30 percent.
- 4) Topography: Avoid depressions, swales and concave slopes.

DESIGN PARAMETERS

- 1) Daily design wastewater flows are 150 gpd/bedroom. A maximum reduction of 25% may allow for low flow fixture specification.
- 2) Application rate of effluent to ISF surface is 1.0 gallon per square foot per day.
- 3) Design is to provide for multiple dosing per day to the ISF. Minimum dose volume should not be less than five times the volume of the effective distribution piping. Maximum dosing should not be greater than 25% of daily design flows
- 4) A minimum of 6 feet of residual head at the distribution orifice should be maintained. Minimum orifice sizing shall be 1/8th inch in diameter and shall require 1/8th inch screening in the pump tank.
- 5) General application rates for intermittent sand filter effluent to disposal trenches shall range from .2 gal/day/square foot to 1.0 gal/day/square foot. See Table "C".
- 6) Disposal trenches will be designed in compliance with site criteria. Shallow disposal trenches will be sized on bottom area only.

CONSTRUCTION STANDARDS

- 1) All materials used in intermittent sand filter system construction shall be structurally sound, durable and capable of withstanding normal installation and operation stresses. Component parts subject to malfunction or excessive wear shall be readily accessible for repair and replacement.
- 2) Septic tanks shall be two compartment, 1200 gallon capacity, monolithic poured concrete. Water and gas tight risers to finished grade are required for both the primary and secondary sides of the septic tank.
- 3) Pump tanks shall be sized to accommodate two times the daily design flow (if parcel served by public water system) or one times the daily design flow plus 250 gallons (if parcel served by private well or spring) in reserve capacity above the alarm activation level. This is a safety measure in the event of power outage or pump breakdown. Audio and visual alarms are required to be placed in an approved location.

- 4) To avoid infiltration and intrusion problems, all tanks located in seasonally high ground water situations, shall be tested for water tightness.
- 5) Pressurized piping and fittings shall be Schedule 40 PVC.
- 6) Distribution laterals shall be designed so that each lateral may be flushed and checked for residual head at the distal end.
- 7) Filter sand shall be clean medium sand with an effective size (D10) of .25 to .50 millimeters in diameter. The uniformity coefficient should be 4 or less.
- 8) The depth of effective filter sand shall be 30 inches.
- 9) Drain rock below the filter sand is to be clean, small diameter, rounded rock. Rock associated with and below the distribution laterals is to be similarly clean. (Typically classified as double washed).
- 10) Intermittent sand filters shall be constructed on stable undisturbed earthen conditions.
- 11) Approved flexible membrane liners shall have properties which are at least equivalent to 30 mil unreinforced polyvinylchloride. Approved liners shall have factory fabricated "boots" suitable for field bonding. Liners shall be installed so as to preclude punctures and abrasions. Surfaces that are contacted by the liner shall be free of sharp edges, corners, roots, nails, wire and other projections that might puncture, tear, or cut the liner. The bottom of the liner is to be protected by a layer of approximately 4 inches in depth of clean bedding sand raked smooth.
- 12) A capped monitoring pipe, minimum diameter of 4 inches, shall be installed at the interface of distribution rock and filter sand.
- 13) Durable filter fabric is required to be placed over the top of the distribution rock with fabric overlapping the sides approximately 6 inches. Final soil covering depth over the ISF unit is to be no less than 12 inches. Maximum soil covering shall not exceed 18 inches. Finish grading to eliminate standing water and infiltration is required.
- 14) When a pump vault is required to be placed in the ISF, the minimum diameter of the pump vault shall be 21 inches.
- 15) A functional sampling tap assembly, designed to allow filling of a 12 inch high sample bottle, is required to be installed downstream of all intermittent sand filters. (1/2 inch minimum discharge).

DISPOSAL TRENCHES

- 1) A minimum soil covering depth of 12 inches is required over the top of the drain rock filter barrier. Borrowed, mounded cover, where required, shall be similar to adjacent native topsoil. Soils shall be worked only during reasonably dry soil conditions. Mounded cover is prohibited on slopes greater than 25 percent.
- 2) Disposal trench configuration shall comply with design parameters. Disposal trenches less than 12 inches deep into native soils shall be prohibited on slopes greater than 25 percent.
- 3) Monitoring pipes with a minimum inside diameter of four inches, shall be placed approximately five feet down slope of the near sidewall of the disposal trenches. The number of monitoring pipes and locations required will be determined at the plan check stage and is site specific. Where mounded cover is required; monitoring pipes will be generally required to be placed at the toe of the mounded cover but not more than ten feet from the near sidewall of the lowest disposal trench.
- 4) Other methods of ISF effluent disposal will be considered on a case by case, site specific evaluation by the Environmental Health Wastewater Committee.