15A NCAC 18E .1602 DESIGN AND CONSTRUCTION STANDARDS

(a) Drip dispersal systems shall be preceded by pretreatment designed to comply with one of the following effluent standards: DSE, NSF/ANSI 40, TS-I, TS-II, or RCW as specified in Table III of Rule .0402(a), Table XXV of Rule .1201(a), or Rule .1002, of this Subchapter, as applicable.

(b) The pump tank shall meet one of the following conditions:

(1) a separate pump tank sized in accordance with Rule .0802 of this Subchapter; or

(2) a pump tank or compartment that is part of an advanced pretreatment system approved in accordance with Section .1700 of this Subchapter.

Pump tank operating levels shall not result in effluent backing up into a part of any pretreatment component designed for free gravity flow drainage. All pump submergence, dose volume, flow equalization, and emergency storage capacity requirements for the dosing system shall be met without interfering in the performance of the pretreatment components.

(c) Pumps shall meet the following conditions:

(1) have sufficient capacity to accommodate projected flow and total dynamic head conditions;

(2) deliver 15 to 60 psi of pressure during dosing events;

(3) provide minimum flow and pressure as required to backwash or forward flush headworks filter;

(4) maintain velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(5) maintain velocities of one foot per second at the distal end of each drip lateral line during automatic field flushing for advanced pretreatment effluent. Valving shall be provided to achieve flushing velocities of two feet per second at the distal end of each dripline with manual flushing.

Pump manufacturer requirements shall be followed to protect the pump intake from solids that may accumulate in the pump tank and for pump cooling during operation.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, provisions for filter cleaning, and field flushing valves. Zone and isolation valves may be located in the headworks assembly or in the drip dispersal field. The headworks assemblies shall meet the following conditions:

(1) filters shall remove particles greater than 115 microns at the peak operating flow rate, during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a pump operating flow rate within the filter manufacturer's specified acceptable operating range;

(2) filters for drip dispersal systems receiving DSE shall be configured with two independently backwashed disk filters;

(3) for drip dispersal systems receiving advanced pretreatment effluent, single or multiple screens or disc filters may be used, designed to be cleaned by either backwashing or forward washing;

(4) filter cleaning and field flushing residuals shall be returned to the head of the septic tank or settling tank prior to being returned to the pretreatment unit;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also be used to monitor pump operating flow rates during dosing and flushing events; and

(6) the headworks and associated components shall be in a separate enclosure that is freeze protected, UV and corrosion resistant, and accessible for routine operation, maintenance, monitoring and servicing. Design shall facilitate access to all internal components.

(e) The drip dispersal field shall consist of one or more separately dosed zones comprised of a supply and return manifold, manifold to lateral connections, laterals containing drip tubing with emitters, blank sections of tubing, and associated field appurtenances. Drip emitter and associated field appurtenances design shall meet the following:

(1) drip emitters shall be designed and demonstrated to uniformly distribute wastewater effluent at a pre-determined rate when operated in accordance with manufacturer's specified pressure range for emitter operation. Emitter design coefficient of variation, Cv, shall be five percent or less. Emitters shall be designed to be self-cleaning and to resist root intrusion. Hydraulic design of a drip dispersal zone shall be based upon achieving no more than a 10 percent variation in flow from any emitter over the entire zone, regardless of emitter elevation or position along the lateral including any effluent redistribution due to drainback;

(2) drip emitters shall be pressure compensating unless the manufacturer and designer provide documentation and calculations that a maximum 10 percent flow variance allowance can otherwise be achieved with non-pressure compensating emitters in a PIA Approval or on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be spaced at uniform intervals along the tubing on 24-inch centers or less, and drip tubing with emitters shall be spaced an average of 24 inches on centers or less, in accordance with the proposed system design. Spacing shall be chosen as needed to ensure a sufficient number and density of emitters are present to achieve uniform distribution and instantaneous emitter loading rates that do not exceed the hydraulic capacity of the receiving infiltrative surfaces;

(4) connections between supply and return manifolds, and between runs or drip lateral sections installed at varying elevations or locations shall be made with solvent welded solid Schedule 40 PVC or flexible PVC;

(5) blanking sections of tubing without drip emitters shall be used where unfavorable site conditions, such as rocks, trees, or roots, are encountered along a drip run. Blanking tubing shall be a different color from the drip tubing or marked tubing of the same material, specification, and diameter as the connecting dripline, or flexible PVC;

(6) the manufacturer shall specify methods for drainback prevention; and

(7) field appurtenances shall include the following:

(A) air or vacuum relief valve at the highest elevation of each zone;

(B) cleanout at both ends of the supply and return manifolds;

(C) pressure monitoring fittings at the zone inlet and outlet points;

(D) pressure regulating valve where needed;

(E) for two or more zones: solenoid valves for each zone in the headworks or at the field, with an isolation valve on the supply line side; and a check valve with an isolation valve for each zone between the return manifold and the common return line; and

(F) valves, vents, cleanouts, and pressure monitoring fittings shall be provided with protective vaults or boxes that are decay resistant, ultraviolet rated, and accessible to the Management Entity from the ground surface.

(f) An integrated controller shall be provided that meets the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at equal intervals throughout the day, at a projected average flow, and to accommodate the DDF. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to comply with system design and the projected range of operating conditions;

(3) provide a minimum dose volume per zone that is a minimum of five times the liquid capacity of the drip laterals or so 80 percent of each dose is delivered when the minimum pressure in the field network is 10 psi;

(4) provide for automatic cleaning of headworks filter(s);

(5) provide for adjustable automatic forward flushing, or field flushing, of the drip laterals with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) provide for monitoring of pump cycles and run times;

(7) include telemetry, in accordance with Rule .1103(c) of this Subchapter, for systems with a DDF greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system;

(8) for systems with a DDF greater than 3,000 gpd the controller shall monitor flow volume to each zone and provide a flow variance indication when flow is plus or minus 20 percent of design. The telemetry system and alarm shall be designed to be functional during power outages;

(9) for multi-zone systems, the system controller shall provide for a zone to be rested or taken out of service manually. The controller shall have the capability to bypass zones and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats are to be configured to ensure the minimum dose is available prior to initiating a dosing cycle and to ensure that a full dose is delivered.

(g) Alternatives to the design criteria in this Rule may be proposed by the manufacturer during the PIA approval process or by a PE on a project-specific basis. These alternatives shall be reviewed and approved by the Department on a case-by-case basis when documentation is provided that the system will meet the performance standards of this Section.

History Note: *Authority G.S. 130A-343;*
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