

APPENDIX C

DRIP DISTRIBUTION SYSTEMS

I. Introduction

All soil absorption components and technologies shall be designed and installed to meet the requirements of rule 3701-29-15 of the Administrative Code for soil absorption. This appendix establishes the minimum standards for drip distribution systems to be used for dispersal of sewage effluent from approved septic tanks, pre-treatment components.

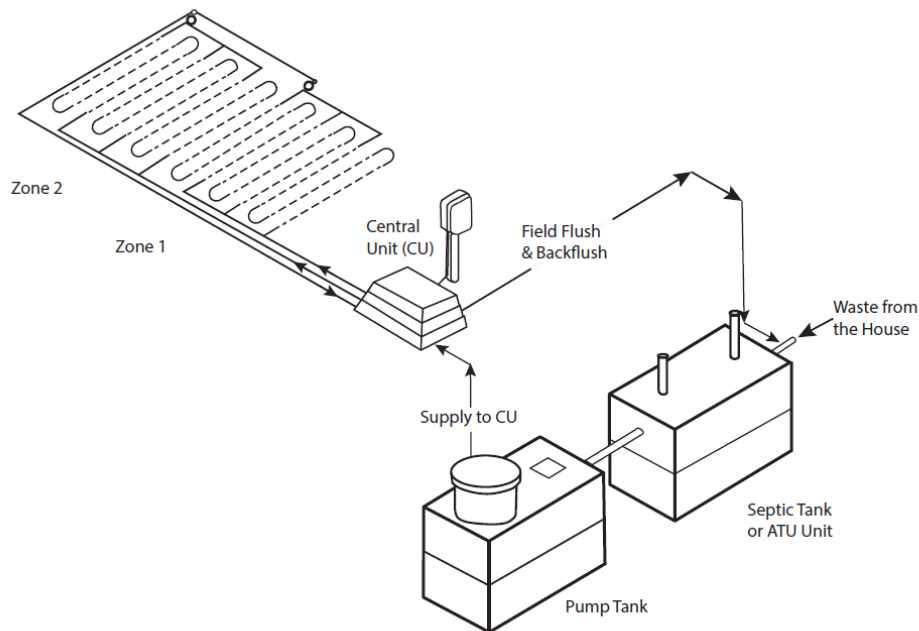


Figure 1. Drip Distribution System

II. Drip Assurance

Any person intending to provide a fully supported drip distribution STS shall submit written assurances of compliance to ODH for approval. In addition to the written assurances, a submittal shall include sample designs, manuals for the drip distribution and other STS components as applicable, and any other information required in the drip distribution assurances application. Any

changes proposed after the originally approved assurance package must be approved by the Ohio Department of Health.

- (A) The written assurances shall indicate how the responsible party demonstrates compliance with the following:
- (1) Assure that the site and soil conditions and limitations reported for each site represent accurate information and that the designs comply with those site and soil conditions and limitations.
 - (2) Assure that designs comply with the conditions, specifications, and other provisions set forth in this chapter.
 - (3) Assure the provision of training to installers and oversight as necessary to assure proper installation.
 - (4) Assure that upon completion of an installation, a system start-up is conducted to establish baseline performance and compliance with design specifications.
 - (5) Assure that more than one qualified service provider is reasonably available to system owners to conduct O&M requirements for the entire system through service contract provisions. The drip assurance party may choose to train the system owner to be the service provider for that system only. This does not preclude the system owner from meeting the requirements for registration as a service provider in rule 3701-29-03 of the Administrative Code. Forms, programs, or instructions supporting start-up procedures and O&M service and monitoring shall be provided with the written assurances.
 - (6) The department may audit any drip assurance party, drip distribution installations and associated service providers.

III. Site Limitations and Conditions for Use

- (A) Drip distribution systems shall be oriented and installed parallel to natural surface contours and shall be sited to avoid natural drainage features and depressions that may hold surface water
- (B) Drip distribution designs shall address surface water diversion as needed. An interceptor drain in accordance with rule 3701-29-16 of the Administrative Code may be used upslope of the drip distribution

components to intercept the horizontal flow of subsurface water to reduce its impact on the down gradient drip distribution absorption area.

- (C) Drip distribution systems may be installed on a slope greater than twenty-five per cent with special safety consideration and installation criteria as needed.

IV. Drip Distribution Design

- (A) The method and calculations for sizing the soil absorption area in accordance with rule 3701-29-15 of the Administrative Code shall be included in the design with reference to any manufacturer, supplier, or designer specifications but shall not be less than that determined in accordance with the soil evaluation information or the maximum loading rate allowable for use of the timed micro-dosing distribution soil depth credit.
- (B) Drip distribution areas shall be sited, and the drip tubing installed, parallel to natural surface contours.
- (C) The design shall specify that any disturbance or damage in the drip distribution or replacement areas may result in the invalidation of the design.
- (D) The design shall indicate the vertical separation distance from the drip tubing to limiting conditions and justify the placement of the drip tubing at a specific subsurface depth not to exceed one foot, at-grade, or a specific sand fill elevation. Placement of the drip tubing greater than one foot in depth shall only be permitted when unique site conditions are present, and the designer can justify in the design that all other conditions (i.e. loading rates, vertical separation, timed micro-dosing rates) can be met.
- (E) The drip tubing shall be spaced to ensure that SILR and HLLR are met.
- (F) Drip tubing spacing may range from six inches to two feet on center when placed on sand fill that meets one of the following specifications:
 - (1) Sand meeting the gradation requirements of ASTM C33, provided not more than five per cent passes the No. 200 (75 μ m) sieve as determined by ASTM C117, "Test Method for Material Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing".

- (2) Having an effective size between 0.15 to 0.3 millimeters, a uniformity coefficient of 5 or less, with not more than five per cent passing the No. 200 (75 μm) sieve as determined by ASTM C117, "Test Method for Material Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing" and not less than eighty per cent passing the No. 8 (2.36mm) sieve.
- (G) Cover material and depth specifications including precautions for freeze protection of the entire distribution system shall be included in the design.
- (H) Any selected pretreatment component shall meet the STS design specifications including additional capacity if needed to accommodate added flow from field flushes. Use of pretreatment to justify reductions in either the soil absorption area or vertical separation distance shall be specified in the design.
- (I) Only pressure compensating emitters shall be used for STS drip distribution. The design shall specify the flow rate of the emitters and approximate absorption area per emitter.
- (J) Dosing controls shall prevent flow to the drip distribution component in excess of the daily design flow. Controls shall provide a means to record alarm events, troubleshoot system malfunctions, and monitor flow over time and flow rates during both dosing and flushing events including the use of a flow meter to monitor system operation.
- (K) Drip tubing shall be maintained through an automated scouring flush at a frequency adequate to prevent coating of the drip tubing and clogging of emitters. The frequency shall be specified in the design and shall not be less than twice a month per zone under normal operating conditions and shall be adjustable for actual operating conditions.
- (L) Drip tubing flushes and filters flushes used to reduce solids going to emitters shall be returned to the influent end of the pretreatment component or septic tank. In the case where flush volumes may disrupt the process of a septic tank or pretreatment component, added capacity shall be required.
- (M) For management purposes, at least two zones shall be included in the drip distribution design, with an easily accessible shutoff mechanism for each zone. The timed micro-doses may be applied simultaneously or alternately to each zone.

- (N) Air release valves are required at the highest elevation in each zone to vent the zone and prevent soil fines from entering the emitters during drain down after the pump shuts off.
- (O) The design shall specify how to minimize gravity redistribution after dosing.

V. Site Preparation and Installation

The installation of drip distributed systems shall comply with these rules, any permit issued by the board of health, and the following:

- (A) All vegetation shall be cut close to the ground and removed from the site
- (B) Soil moisture conditions shall be evaluated and basal area preparation shall not proceed when there is risk of smearing or compaction of soil.
- (C) When drip tubing is placed at-grade or on sand fill, the basal area preparation shall be specified in the design. The basal area preparation shall not reduce the infiltrative capacity of the soil surface. The degree of basal area preparation shall be determined on a site-by-site basis depending on the soil conditions but shall not extend deeper than the topsoil. Any basal scarification or other basal area preparation shall be conducted working along the contour. Sand may be incorporated into the basal area during the preparation process. Following basal area preparation, a layer of sand fill shall be placed on the entire basal area to prevent damage from precipitation and foot traffic.
- (D) Following installation and before STS approval by the board of health, the responsible party and/or the registered installer shall conduct a start-up procedure and document baseline measurements needed for future O&M and monitoring. Baseline measurements and monitoring information shall include but is not limited to dose rates and flushing flow rates for each zone and calculation of daily flow averages.
- (E) Alarm event instructions shall be readily accessible at alarm panel.

VI. Operation and Maintenance

- (A) In conjunction with O&M management requirements, and as a condition of an installation and operation permit for a drip distribution STS, the board of health shall require the owner of a drip distribution STS to maintain an O&M service contract.

(B) The O&M and monitoring of the entire STS shall be conducted at least annually, or more often as required by the responsible party or the manufacturer of any component of the drip distribution STS, and shall be conducted by the responsible party or by a service provider who has been qualified by the responsible party.

(C) O&M records shall be submitted to the board of health.