

## APPENDIX A

## TECHNICAL STANDARDS FOR USE OF LEACHING TRENCHES FOR SOIL ABSORPTION

## 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 leach trenches to be used for dispersal of sewage effluent from approved septic tanks, pre-treatment components, or GWRS.

## II. Limitations and Conditions for Use

- (A) Trenches shall be oriented parallel to natural surface contours and shall be sited to avoid natural drainage features and depressions that may hold surface water. A variation of plus or minus three inches along the surface contour may be permissible to accommodate trench installation along the contour.
- (B) STS designs shall address surface water diversion as needed. An interceptor drain may be installed upslope of the leaching trench soil absorption component to intercept horizontal flow of subsurface water to reduce its impact on the down gradient leaching trenches in accordance with rule 3701-29-16 of the Administrative Code.
- (C) Special safety considerations and installation criteria as needed are required for installing trenches on a slope greater than fifteen per cent. Manufacturer prohibitions and instructions shall be followed. When the depth to a limiting condition requires the approved distribution media or product to be installed to within six inches of or above natural grade, and fill material is placed between and/or over trenches for the purpose of creating trench sidewall, soil cover installation on slopes greater than fifteen per cent may not be feasible due to the risk of material slippage and maintenance of appropriate trench depths.

## III. Leaching Trench Design

- (A) The leaching trench bottom area shall be of adequate size and configuration to disperse the effluent and prevent surface seepage and shall comply with the sizing requirements within rule 3701-29-15 of the Administrative Code.

- (1) The total leaching trench infiltrative surface area shall be calculated using the soil loading rate from table 3 of rule 3701-29-15 of the Administrative Code and the daily design flow. Unless timed low pressure distribution is used, additional leaching trench infiltrative surface area, for the purpose of resting portions of the leach field, shall be added to the calculated soil absorption component area in all leaching systems. The additional area shall be no less than twenty-five per cent of the required minimum area under this rule. When resting any portion of the soil absorption system, the daily design flow to the trenches in use shall not exceed the design soil loading rate.
  - (2) The minimum leaching trench infiltrative surface area permitted for approved leaching trench products using a non-gravel, fines-free distribution system shall be no less than seventy-five per cent of the required area calculated using table 3 of rule 3701-29-15 of the Administrative Code.
  - (3) When multiple technologies that are approved for soil absorption area sizing reduction are used in a system (i.e. pretreatment plus gravel-less leaching), only one sizing reduction can be applied to the system.
- (B) The daily design flow and linear loading rate will establish the minimum length of trenches along each contour. Partial trenches that do not provide the required length along contour are not permitted. Leach trench lengths exceeding one hundred fifty feet, as a result of lineal loading rate calculations, are permissible. The manifold shall be placed in the center for trenches longer than one hundred fifty feet. Use of low pressure distribution in systems with trenches longer than one hundred fifty feet may be considered.
- (C) Leaching trenches for new sewage treatment system installations shall have a maximum width of two feet. Leaching trenches may be up to three feet wide for system alteration or replacements when two-foot wide trenches will cause installation of a soil absorption component other than leaching trenches when leaching trenches would otherwise be authorized, or the installation of a leaching trench configuration that is disadvantageous for the proper dispersal of the effluent. The minimum length as determined in accordance with table 4 of rule 3709-29-15 of the Administrative Code and the specified trench width shall be used to determine the number of leaching trenches needed to accommodate the daily design flow. Approved leaching trench products using a non-gravel,

finest-free distribution system shall have a minimum projected product width that substantially fills the trench to within two inches.

- (D) Trench depth shall be determined by the limiting condition and have a minimum depth of two inches into the in situ soil across the entire bottom width of the trench. A leaching trench bottom shall be as level as practicable along its length and shall be installed in accordance with the guidelines set forth in this appendix.
- (E) The space between trench walls of adjacent trenches shall be no less than four feet for gravity distributed trenches, and no less than three feet between trenches when using low pressure distribution. Trench spacing of no less than two feet between trenches may be used when using low pressure distribution where soils have coarse to loamy sands, and fine to loamy very fine sand textures found on lines one and two of table 3 of rule 3701-29-15 of the Administrative Code.

#### IV. Distribution Network and Media

- (A) Trench distribution media shall consist of one of the following:
  - (1) Coarse aggregate having a minimum thickness of eight inches with a minimum of two inches of coarse aggregate above and below the distribution pipe;
  - (2) Approved chamber or bundled polystyrene distribution media products having a minimum eight inch height used in accordance with manufacturer specifications for installation; or
  - (3) Other alternative distribution media materials as authorized by the department of health.
- (B) A geotextile fabric, straw covering, or other barrier as specified for proprietary products shall be used to prevent the introduction of soil fines into the distribution media and shall allow for free movement of air and water. The soil cover shall have a depth of at least six inches after settling or greater if specified for a proprietary product and shall be of a quality to allow for oxygen transfer and growth of vegetation.
- (C) Distribution pipe used in leaching trenches with gravity distribution shall extend the entire length of the trench shall be a minimum of three inches in diameter and meet ASTM D1785, ASTM D2729, ASTM F405, or ASTM F810 standards. Distribution pipes must have at least one row of holes of

no less than one-half inch in diameter or equivalent area, spaced no more than forty inches apart.

- (D) The low pressure distribution network for a pressure dosed system shall be designed and installed in accordance with rule 3701-29-15.1 of the Administrative Code.
- (E) Effluent distribution devices, including distribution boxes, flow dividers, and flow diversion devices shall be:
  - (1) Structurally sound and watertight to prevent infiltration of surface and ground water;
  - (2) Placed level on a solid foundation of soil, concrete, or sand to prevent differential settlement of the device;
  - (3) Backfilled in a manner to minimize migration of effluent between trenches; and
  - (4) Have sufficient size openings to allow access for maintenance.
- (F) Alternative dosing and distribution methods when gravity flow is not possible or preferred are allowed. Serial distribution of effluent, as defined in rule 3701-29-01 of the Administrative Code, is prohibited. STS designs shall specify the means of distribution and management requirements, including but not limited to:
  - (1) Specification of either parallel or sequential distribution using devices with access to grade and mechanism for flow diversion for the sequential resting of each trench in the soil absorption component.
  - (2) Distribution device connections between the tank or another distribution device, and to a leaching trench, shall be watertight and shall include properly supported, solid pipe meeting ASTM D1785, ASTM D2729, or ASTM F810 standards to prevent settling and damage under normal loads and operating conditions. The material used to backfill or bed the piping shall not allow sewage or effluent to bypass the piping for distribution service.
  - (3) A means for determining the liquid level or capacity of each leaching trench shall be provided. If an inspection port is used or required by the local board of health, the port shall be anchored and accessible with at least a two inch opening and a removable watertight cap.

- (4) For short term repairs or resting of leaching trenches, easily accessible shut-off mechanisms shall be provided to allow for segregation of flows to each trench.
- (5) References or specifications for dosing or distribution methods, such as lift tanks, flood dosing, surge and reserve capacity for timed dosing, or low pressure distribution.

#### V. Operation and Maintenance

- (A) A leaching trench system shall be operated, maintained, and monitored as required by the operation permit issued by the board of health. For sewage treatment systems where a pretreatment component precedes a leaching trench, any service agreement for the pretreatment component shall include the maintenance and monitoring of all system components. In conjunction with any operation permit conditions or O&M provisions required by the board of health, the O&M of a trench soil absorption system may include but is not limited to:
  - (1) Monitoring the liquid level or capacity of the leaching trench soil absorption component;
  - (2) Management of flow diversion mechanisms for the purpose of resting portions of the soil absorption area;
  - (3) Checking for surface water infiltration or clear water flows from the dwelling or structures into the system or onto the soil absorption area;
  - (4) Monitoring for proper operation of mechanical components and/or distribution methods, as applicable;
  - (5) Checking surface grade for vegetative cover, erosion or settling, and any seepage in the area of the soil absorption component; and
  - (6) Any other O&M requirements specified by the manufacturer of the system.
- (B) When leaching trenches use low pressure distribution, the system O&M requirements shall include:
  - (1) Monitoring the dose volume and operating pressure head of the distribution system and compare to baseline measurements.

- (2) Pressure distributed leaching trenches shall be inspected at a frequency of at least once a year. Inspection shall include flushing of distribution laterals.
- (3) Review and document event counters, elapsed time meters, flow meters, and alarm condition where present.