CONNECTICUT PUBLIC HEALTH CODE

On-site Sewage Disposal Regulations, and Technical

Standards for Subsurface Sewage Disposal Systems

PHC Section 19-13-B100a (Building Conversions, Changes in Use, Building Additions, etc)

Effective August 3, 1998

PHC Section 19-13-B103 (Design Flows 5,000 Gallons per Day or Less)

Effective August 16, 1982

Technical Standards for Subsurface Sewage Disposal Systems

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PHC Section 19-13-B104 (Design Flows Greater than 5,000 Gallons per Day)

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State of Connecticut
Department of Public Health
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Building Conversions, Changes in Use, Additions

19-13-B100a. Building Conversions/Changes in Use, Building Additions, Garages/Accessory Structures, Swimming Pools, Sewage Disposal Area Preservation.

(a) Definitions. As used in this section:

(1) **"**Accessory structure" means a permanent non-habitable structure which is not served by a water supply and is used incidental to residential or non-residential buildings. Accessory structures include, but are not limited to, detached garages, open decks, tool and lawn equipment storage sheds, gazebos, and barns.

(2) "Building conversion" means the act of winterizing a seasonal use building into year round use by providing one or more of the following: (A) a positive heating supply to the converted area; or,(B) a potable water supply which is protected from freezing; or, (C) energy conservation in the form of insulation to protect from heat loss.

(3) "Change in use" means any structural, mechanical or physical change to a building which allows the occupancy to increase; or the activities within the building to expand or alter such that, when the building is fully utilized, the design flow or required effective leaching area will increase.

(4) "Code-complying area" means an area on a property where a subsurface sewage disposal system can be installed which meets all requirements of Section 19-13-B103 of the Regulations of Connecticut State Agencies, and the Technical Standards except for the one hundred percent reserve leaching area referred to in Section VIII A of the Technical Standards.

(5) "Design flow" means the anticipated daily discharge from a building as determined in accordance with Sections IV and VIII F of the Technical Standards.

(6) "Potential repair area" means an area on a property which could be utilized to repair or replace an existing or failed septic system and includes areas on the property where exceptions to Section 19-13-B103 of the Regulations of Connecticut State Agencies could be granted by the local director of health or the Commissioner of Public Health but does not include areas beyond those necessary for a system repair and areas of exposed ledge rock.

(7) "Technical Standards" means those standards established by the Commissioner of Public Health in the most recent revision of the publication entitled "Technical Standards for Subsurface Sewage Disposal Systems" prepared pursuant to Section 19-13-B103d (d) of the Regulations of Connecticut State Agencies. These standards can be obtained from the Department of Public Health, 410 Capitol Avenue, MS #51SEW, P.O. Box 340308, Hartford, CT 06134-0308, or by calling (860) 509-7296.

(b) Building conversion, change in use. If public sewers are not available, no building or part thereof shall be altered so as to enable its continuous occupancy by performing any building conversion, nor shall there be a change in use unless the local director of health has determined that after the conversion or change in use, a code-complying area exists on the lot for installation of a subsurface sewage disposal system. The determination by the local director of health of whether a code-complying area exists on the property shall be based upon analysis of existing soil data. If soil data is not available, the property owner shall perform soil testing. The property owner or the owner's authorized agent shall submit design plans or a sketch to demonstrate how the property contains a code-complying area that can accommodate a sewage disposal system. The local director of health may require expansion of the existing sewage disposal system or installation of a new sewage disposal system at the time of the change in use for those properties whenever the proposed change in use results in a more than 50% increase in the design flow.

(c) Building additions. If public sewers are not available, no addition to any building shall be permitted unless the local director of health has determined that after the building addition a code-complying area exists on the lot for the installation of a subsurface sewage disposal system. Once a code-complying area is identified, portions of the property outside this designated area may be utilized for further development of the property. This determination by the local director of health shall be based upon analysis of existing soil data to determine if a code-complying area exists. If soil data is not available, the property owner shall perform soil testing. The property owner or the owner's authorized agent shall submit design plans or a sketch to demonstrate how the property contains a code-complying area that can accommodate a sewage disposal system. If the applicant submits soil test data, design plans or a sketch and is unable to demonstrate a code-complying area, the building addition shall be permitted, provided:

(1) The size of the replacement system shown on design plans or sketch provides a minimum of 50% of the required effective leaching area per the Technical Standards,

(2) The replacement system shown on the plans or sketch provides a minimum of 50% of the required Minimum Leaching System Spread (MLSS) per the Technical Standards,

(3) The proposed design does not require an exception to Section 19-13-B103d (a)(3) of the Regulations of Connecticut State Agencies, regarding separation distances to wells,

(4) The addition does not reduce the potential repair area, and

(5) The building addition does not increase the design flow of the building.

The local director of health may require expansion of the existing sewage disposal system or installation of a new sewage disposal system at the time of building addition whenever the proposed addition results in a more than 50% increase in the design flow. The separation distance from an addition to any part of the existing sewage disposal system shall comply with Table 1 in Section II of the Technical Standards.

(d) Attached or detached garages, accessory structures, below or above ground pools. If public sewers are not available, no attached garage, detached garage, accessory structure, below or above ground pool shall be permitted unless the local director of health has determined that after construction of the attached garage, detached garage, accessory structure, below or above ground pool, a code-complying area exists on the lot for installation of a subsurface sewage disposal system. This determination by the local director of health shall be based upon analysis of existing soil data. If soil data is not available, the property owner shall perform soil testing. The property owner or the owner's authorized agent shall submit design plans or a sketch to demonstrate how the property contains a code-complying area that can accommodate a sewage disposal system. If the applicant submits soil test data, design plans or a sketch and is unable to demonstrate a code-complying area, the attached or detached garage, below or above ground pool, or accessory structure shall be permitted, provided the structure does not reduce the potential repair area. The separation distance from the attached or detached garage, below or above ground pool, or accessory structure to any part of the existing sewage disposal system shall comply with Table 1 in Section II of the Technical Standards.

(e) Sewage disposal area preservation. If public sewers are not available, no lot line shall be relocated or any other activity performed that affects soil characteristics or hydraulic conditions so as to reduce the potential repair area, unless the local director of health has determined that after the lot line relocation or disturbance of soils on the lot a code-complying area exists for the installation of a subsurface sewage disposal system. This determination by the local director of health shall be based upon analysis of existing soil data. If soil data is not available, the property owner shall perform soil testing. The property owner or the owner's authorized agent shall submit design plans or a sketch to demonstrate how the property contains a code-complying area that can accommodate a sewage disposal system. In no case shall a relocated lot line violate Subsection (d) of Section 19-13-B103d of the Regulations of Connecticut State Agencies that requires that each subsurface sewage disposal system shall be located on the same lot as the building served.

(f) Decision by Director of Health. Any final decision of the local director of health made in regard to this section shall be made in writing and sent to the applicant. Any decision adverse to the applicant or which limits the application shall set forth the facts and conclusions upon which the decision is based. Such written decision shall be deemed equivalent to an order, and may be appealed pursuant to Section 19a-229 of the Connecticut General Statutes.

STATEMENT OF PURPOSE

The regulations up-date and clarify existing requirements for maintaining subsurface sewage disposal areas on lots which are served by on-site subsurface sewage disposal systems. The purpose is to regulate building conversions; activities which would potentially increase the water usage discharged to a subsurface sewage disposal system; construction activities or lot line changes which would reduce the area available for sewage disposal purposes.

Effective August 3, 1998

PUBLIC HEALTH CODE REGULATIONS

On-Site Sewage Disposal Systems with Design Flows of 5,000 Gallons per Day or Less and Non-Discharging Toilet Systems

19-13-B103a. Scope

These regulations establish minimum requirements for household and small commercial subsurface sewage disposal systems with a capacity of 5,000 gallons per day or less, non-discharging toilet systems and procedures for the issuance of permits or approvals of such systems by the director of health or registered sanitarian, as required by Section 25-54i(g) of the General Statutes.

19-13-B103b. Definitions

The following definitions shall apply for the purposes of Sections 19-13-B103c to 19-13-B103f, inclusive:

(a) **Sewage** means domestic sewage consisting of water and human excretions or other waterborne wastes incidental to the occupancy of a residential building or a non-residential building, as may be detrimental to the public health or the environment, but not including manufacturing process water, cooling water, waste water from water softening equipment, blow down from heating or cooling equipment, water from cellar or floor drains or surface water from roofs, paved surface or yard drains.

(b) **Septic tank** means a water-tight receptacle which is used for the treatment of sewage and is designed and constructed so as to permit the settling of solids, the digestion of organic matter by detention and the discharge of the liquid portion to a leaching system.

(c) **Subsurface sewage disposal system** means a system consisting of a house sewer; a septic tank followed by a leaching system, any necessary pumps and siphons, and any groundwater control system on which the operation of the leaching system is dependent.

(d) **Residential building** means any house, apartment, trailer or mobile home, or other structure occupied by individuals permanently or temporarily as a dwelling place but not including residential institutions.

(e) **Residential institution** means any institutional or commercial building occupied by individuals permanently or temporarily as a dwelling, including dormitories, boarding houses, hospitals, nursing homes, jails, and residential hotels or motels.

(f) **Nonresidential building** means any commercial, industrial, institutional, public or other building not occupied as a dwelling, including transient hotels and motels.

(g) **Impervious soil** means soil that has a minimum percolation rate slower than one inch in sixty minutes when the groundwater level is at least eighteen inches below the bottom of the percolation test hole.

(h) **Suitable soil** means soil having a minimum percolation rate of one inch in one to sixty minutes when the groundwater level is at least eighteen inches below the bottom of the percolation test hole.

(i) **Maximum groundwater level** means the level to which groundwater rises for a duration of one month or longer during the wettest season of the year.

(j) **Open watercourse** means a well defined surface channel, produced wholly or in part by a definite flow of water and through which water flows continuously or intermittently and includes any ditch, canal, aqueduct or other artificial channel for the conveyance of water to or away from a given place, but not including gutters for storm drainage formed as an integral part of a paved roadway; or any lake, pond, or other surface body of water, fresh or tidal; or other surface area intermittently or permanently covered with water.

(k) **Local director of health** means the local director of health or his authorized agent.

(l) **Technical Standards** means the standards established by the Commissioner of Public Health in the most recent revision of the publication entitled "Technical Standards for Subsurface Sewage Disposal Systems" available from the State Department of Public Health.

(m) **Department** means the State Department of Public Health.

(n) **Gray water** means domestic sewage containing no fecal material or toilet wastes.

(o) **Drawdown area** means that area adjacent to a well in which the water table is lowered by withdrawal of water from the well by pumping at a rate not exceeding the recharge rate of the aquifer.

19-13-B103c. General Provisions

(a) All sewage shall be disposed of by connection to public sewers, by subsurface sewage disposal systems, or by other methods approved by the Commissioner of Public Health, in accordance with the following requirements.

(b) All sewers, subsurface sewage disposal systems, privies and toilet or sewage plumbing systems shall be kept in a sanitary condition at all times and be so constructed and maintained as to prevent the escape of odors and to exclude animals and insects.

(c) The contents of a septic tank, subsurface sewage disposal system or privy vault shall only be disposed of in the following manner.

(1) If the contents are to be disposed of on the land of the owner, disposal shall be by burial or other method which does not present a health hazard or nuisance; or

(2) If the contents are to be disposed of on land of other than the owner;

(A) The contents shall be transferred and removed by a cleaner licensed pursuant to Connecticut General Statutes Chapter 393a, and

(B) Only on the application for and an issuance of a written permit from the local director of health in accordance with the provisions of this section;

(3) If the contents are to be dispersed on a public water supply watershed, only on the application and issuance of a written permit by the Commissioner of Public Health in accordance with the provisions of this section.

Each application for a permit under (c) (2) and (3) shall be in writing and designate where and in what manner the material shall be disposed of.

(d) All material removed from any septic tank, privy, sewer, subsurface sewage disposal system, sewage holding tank, toilet or sewage plumbing system shall be transported in water-tight vehicles or containers in such a manner that no nuisance or public health hazard is presented. All vehicles used for the transportation of such material shall bear the name of the company or licensee and shall be maintained in a clean exterior condition at all times. No defective or leaking equipment shall be used in cleaning operations. All vehicles or equipment shall be stored in a clean condition when not in use. Water used for rinsing such vehicles or equipment shall be considered sewage and shall be disposed of in a sanitary manner approved by the local director of health.

(e) Septic tanks shall be cleaned by first lowering the liquid level sufficiently below the outlet to prevent sludge or scum from overflowing to the leaching system where it could cause clogging and otherwise damage the system. Substantially all of the sludge and scum accumulation shall be removed whenever possible, and the inlet and outlet baffles shall be inspected for damage or clogging. Cleaners shall use all reasonable precaution to prevent damaging the sewage disposal system with their vehicle or equipment. Accidental spillage of sewage, sludge or scum shall be promptly removed or otherwise abated so as to prevent a nuisance or public health hazard.

(f) No sewage shall be allowed to discharge or flow into any storm drain, gutter, street, roadway or public place, nor shall such material discharge onto any private property so as to create a nuisance or condition detrimental to health. Whenever it is brought to the attention of the local director of health that such a condition exists on any property, he shall investigate and cause the abatement of this condition.

19-13-B103d. Minimum Requirements

(a) Each subsurface sewage disposal system shall be constructed, repaired, altered or extended pursuant to the requirements of this section unless an exception is granted in accordance with the following provisions:

(1) A local director of health may grant an exception, except with respect to the requirements of Section 19-13-B103d (d) and Technical Standard IIA, for the repair, alteration, or extension of an existing subsurface sewage disposal system where he determines the repair, alteration or extension cannot be effected in compliance with the requirements of this section and upon a finding that such an exception is unlikely to cause a nuisance or health hazard. All exceptions granted by the local director of health shall be submitted to the Commissioner of Public Health within thirty days after issuance on forms provided by the Department.

(2) The Commissioner of Public Health may grant an exception to the requirements of Section 19-13-B103d (d) upon written application and upon a finding that:

(A) A central subsurface sewage disposal system serving more than one building is technically preferable for reasons of site limitations, or to facilitate construction, maintenance or future connection to public sewers, or;

(B) A subsurface sewage disposal system not located on the same lot as the building served is located on an easement attached thereto. Such easement shall be properly recorded on the land records and shall be revocable only by agreement of both property owners and the Commissioner of Public Health.

(3) The Commissioner of Public Health may grant an exception to the requirements of Technical Standard IIA, upon written application and upon a finding that such an exception is unlikely to pollute the well in such a manner as to cause a health hazard.

(b) **Technical Standards**.

Subsurface sewage disposal systems within the scope of this regulation shall be designed, installed and operated in accordance with the technical standards established in the "Technical Standards for Subsurface Sewage Disposal Systems" published by the Commissioner of Public Health. The Technical Standards shall be reviewed annually and changes to the Technical Standards shall be available on January 1st of each year.

(c) **Large Subsurface Disposal Systems.**

The Commissioner of Public Health shall approve plans for subsurface sewage disposal systems serving a building with a designed sewage flow of two thousand gallons per day or greater, and no such systems shall be constructed, repaired, altered or extended unless the plans for such systems are approved by the Commissioner in accordance with the following:

(1) Plans for the system are submitted at least twenty days prior to approval to construct by the local director of health.

(2) The plans are designed by a professional engineer registered in the State of Connecticut.

(3) The plans submitted contain:

(A) The basis of design,

(B) Soil conditions and test pit locations,

(C) Maximum groundwater and ledge rock elevations,

(D) Original and finished surface contours and elevations,

(E) Property lines, and

(F) Locations of buildings, open watercourses, ground and surface water drains, nearby wells and water service lines.

(d) **Location.**

Each building shall be served by a separate subsurface sewage disposal system. Each such system shall be located on the same lot as the building served.

(e) **Disposal of Sewage in Areas of Special Concern.**

(1) Disposal systems for areas of special concern shall merit particular investigation and special design, and meet the special requirements of this subsection. The following are determined to be areas of special concern:

(A) A minimum soil percolation rate faster than one inch per minute, or

(B) Slower than one inch in thirty minutes, or

(C) Maximum groundwater less than three feet below ground surface, or

(D) Ledge rock less than five feet below ground surface, or

(E) Soils with slopes exceeding twenty-five per cent, or

(F) Consisting of soil types interpreted as having severe limitations for on-site sewage disposal by most recent edition of the National Cooperative Soil Survey of the Soil Conservation Service, or

(G) Designated as wetland under the provisions of Sections 22a-36 through 22a-45 of the Connecticut General Statutes, as amended, or

(H) Located within the drawdown area of an existing public water supply well with a withdrawal rate in excess of fifty gallons per minute, or within five hundred feet of land owned by a public water supply utility and approved for a future well site by the Commissioner of Public Health.

(2) In such areas of special concern, the local director of health may require investigation for maximum groundwater level to be made between February 1 and May 31, or such other times when the groundwater level is determined by the Commissioner of Public Health to be near its maximum level.

(3) (A) Plans for new subsurface systems in areas of special concern shall:

(i) Be prepared by a professional engineer registered in the State of Connecticut;

(ii) Include all pertinent information as to the basis of design, and soil conditions, test pit locations, groundwater and ledge rock elevations, both original and finished surface contours and elevation, property lines, building locations, open watercourses, ground and surface water drains, nearby wells and water service lines;

(iii) Demonstrate an ability to solve the particular difficulty or defect associated with the area of special concern and which caused its classification. The Commissioner or local director of health, as the case may be, may require a study of the capacity of the surrounding natural soil absorb or disperse the expected volume of sewage effluent without overflow, breakout, or detrimental effect on ground or surface waters if in their opinion such may occur.

(B) The plans for new subsurface disposal systems in areas of special concern shall be submitted to the local director of health and the Commissioner of Public Health for a determination as to whether the requirements of the subsection have been met, except that such submission need not be made to the Commissioner of Public Health if the local director or authorized agent has been approved to review such plans by the Commissioner of Public Health in accordance with Section B103e (b). All submissions to the Commissioner of Public Health shall be made at least 20 days prior to issuance of an approval to construct by the local director of health.

(4) If application is made for the repair, alteration or extension of an existing subsurface disposal system in an area of special concern, the local director of health may require that the applicant comply with the requirement of Subdivision (3) if he determines that the contemplated repair, alteration or extension involves technical complexities which cannot reasonably be addressed by himself, his authorized agent or the system installer.

(5) While a sewage disposal system in an area of special concern is under construction, the local director of health may require that the construction be supervised by a professional engineer registered in the State of Connecticut, if in the opinion of the local director of health it is necessary to insure conformance to the plans approved or because of the difficulties likely to be encountered. The engineer shall make a record drawing of the sewage disposal system, as installed, which he shall submit to the local director of health prior to issuance of a discharge permit.

(6) In such areas of special concern, the Commissioner of Public Health or the local director of health who has been approved by the Commissioner to review engineering plans in areas of special concern pursuant to Section 19-13-B103e (b) may require a study of the capacity of the surrounding natural soil to absorb or disperse the expected volume of sewage effluent without overflow, breakout, or detrimental effect on ground or surface waters.

(f) **Gray Water Systems**.

Disposal systems for sinks, tubs, showers, laundries and other gray water from residential buildings, where no water flush toilet fixtures are connected, shall be constructed with a septic tank and leaching system at least one-half the capacity specified for the required residential sewage disposal system.

19-13-B103e. Procedures and Conditions for the Issuance of Permits and Approvals

No subsurface sewage disposal system shall be constructed, altered, repaired or extended without an approval to construct issued in accordance with this section. No discharge shall be initiated to a subsurface sewage disposal system without a discharge permit issued in accordance with this section. Such permits and approvals shall be issued and administered by the local director of health.

(a) **No Permit or Approval Shall be Issued**:

(1) For any subsurface sewage disposal system which is designed to discharge or overflow any sewage or treated effluent to any watercourse;

(2) For any new subsurface sewage disposal system until it is demonstrated to the satisfaction of the local director of health that there is a public water supply available or a satisfactory location for a water supply well complying with Sections 19-13-B51a through 19-13-B51m of the Public Health Code;

(3) For any new subsurface sewage disposal system where the soil conditions in the area of the leaching system are unsuitable for sewage disposal purposes at the time of the site investigation made pursuant to this section. Unsuitable conditions occur where the existing soil is impervious, or where there is less than four feet depth of suitable existing soil over ledge rock, two feet of which is naturally occurring soil, or where there is less than 18 inches depth of suitable existing soil over impervious soil, or where the groundwater level is less than 18 inches below the surface of the ground for a duration of one month or longer during the wettest season of the year;

(4) For any new subsurface sewage disposal system where the surrounding naturally occurring soil cannot adequately absorb or disperse the expected volume of sewage effluent without overflow, breakout or detrimental effect on ground or surface water.

(b) **Approval of Agents by Commissioner of Public Health**

(1) A local director of health shall authorize only persons approved by the Commissioner of Public Health to investigate, inspect and approve plans relating to subsurface sewage disposal systems.

(2) The Commissioner of Public Health shall approve agents of the local director of health whose qualifications to investigate, inspect and approve plans relating to subsurface sewage disposal systems have been established by attending training courses and passing examinations given by the Department of Public Health, as follows:

(A) Agents who have attended training courses and passed examinations relative to Sections 19-13-B100, 19-13-B103 and 19-13-B104 of the Public Health Code and the Technical Standards shall be approved to investigate, inspect and approve all plans for subsurface sewage disposal systems except those prepared by a professional engineer registered in the State of Connecticut pursuant to Section 19-13-B103d (c) or (e).

(B) Agents who have attended training courses and passed examinations relative to the engineering design of subsurface sewage disposal systems shall be approved to investigate, inspect and approve plans for such systems prepared by a professional engineer registered in the State of Connecticut pursuant to Section 19-13-B103d (e).

(c) **Application for Permit or Approval.**

(1) No investigation, inspection or approval of a subsurface sewage disposal system shall be made, or permit issued without an application by the owner in accordance with the following requirements.

(2) Applications for permits shall:

(A) Be on forms identical to Form #1 in the Technical Standards; or

(B) Be on forms prepared by the local director of health and deemed by the Commissioner of Public Health as equivalent to Form #1 in the Technical Standards; and

(C) Have attached a plot plan of the lot, which shall be a surveyor's plan if available or one prepared from information on the deed or land records.

(3) All the requested information shall be provided. If the information is not provided, it shall be indicated why it is not available or the application may be determined incomplete, and be rejected.

(d) **Site Investigation**.

(1) The local director of health or a professional engineer registered in the State of Connecticut representing the applicant shall make an investigation of the site proposed for the subsurface sewage disposal system and report the findings and recommendations of the investigations on a form identical to Form #2 in the Technical Standards to include:

(A) A record of soil test location, measures and observations.

(B) Soil percolation results.

(C) Observations of groundwater and ledge rock.

(D) A conclusion as to the suitability of the site for subsurface sewage disposal.

(E) Special requirements for design of the system, or further testing which shall be in accordance with the most recent edition of the Technical Standards.

(2) Prior to the site investigation, the applicant shall:

(A) Provide for the digging of a suitable number of percolation test holes and deep observation pits in the area of the proposed leaching system and extending at least four feet below the bottom of the proposed leaching system, at the direction of the local director of health;

(B) Provide water for performing the percolation tests;

(C) If required by the local director of health, locate by field stakes or markers the sewage disposal system, house, well or property lines.

(3) The site investigation shall be made within ten working days of application unless otherwise required by subsection 19-13-B103d (e).

(4) The local director of health shall:

(A) Assure the accuracy of the findings of soil tests and deep observation pits; and

(B) When the maximum groundwater level is in doubt the local director of health shall investigate pursuant to Section 19-13-B103d (e).

(5) The size of the leaching system shall be based on the results of soil percolation tests made in the area of the proposed leaching system or on other methods of determining the soil absorption capacity in accordance with the Technical Standards.

(6) In areas of special concern, or for leaching systems with a design sewage flow of 2,000 gallons per day or greater, the local director of health may require from the applicant whatever further testing or data necessary to assure that the sewage disposal system will function properly. Further testing may be required prior to or subsequent to issuance of the approval to construct. Such tests may include permeability tests, sieve analysis or compaction tests of natural soil or fill materials, and the installation of groundwater level monitoring wells, or pipes, as well as additional observation pits and soil percolation tests.

(e) **Submission of Plan**.

(1) Every plan for a subsurface sewage disposal system shall be submitted to the local director of health.

(2) Every plan for a subsurface sewage disposal system shall include all information necessary to assure compliance with the requirements of Section 19-13-B103d of these regulations, and contain as a minimum the following information: the location of the house sewer, the location and size of the septic tank, the location and description of the leaching system, property lines, building locations, watercourses, ground and surface water drains, nearby wells and water service lines.

(3) Where required by the local director of health under subsections 19-13-B103d (c) and (e) of these regulations, the plan shall be prepared by a professional engineer, registered in the State of Connecticut, and shall be forwarded by the local director to the Commissioner of Public Health, together with his comments and recommendations.

(4) No plan shall be submitted directly by the applicant or engineer to the Commissioner of Public Health, unless requested by the local director of health.

(f) **Approval to Construct**.

(1) Upon determination that the subsurface sewage disposal system has been designed in compliance with the requirements of Section 19-13-B103d of these regulations, the local director of health shall issue an approval to construct. Approvals to construct shall be valid for a period of one year from the date of their issuance and shall terminate and expire upon a failure to start construction within that period. Approvals to construct may be renewed for an additional one year period by the local director of health upon a demonstration of reasonable cause for the failure to start construction within the one year period.

(2) Each subsurface sewage disposal system shall be constructed by a person licensed pursuant to Chapter 393a of the General Statutes. Such person shall notify the local director of health at least twenty-four hours prior to commencement of construction.

(3) The Commissioner of Public Health shall approve in accordance with Subsection 19-13-B103d (c) plans for a subsurface sewage disposal system to serve a building, the design sewage flow from which is two thousand gallons a day or greater prior to issuance of an approval to construct by the local director of health.

(4) Approval to construct a subsurface sewage disposal system in an area of special concern shall not be issued until twenty days following submission of the plans to the Commissioner of Public Health in accordance with subsection 19-13-B103d (e), unless earlier approved by the Commissioner.

(g) **Inspection**.

(1) The local director of health shall inspect all subsurface sewage disposal systems for compliance with Subsection 19-13-B103d and the approved plans for construction prior to covering and at such other times as deemed necessary.

(2) After construction, and prior to covering, the subsurface sewage disposal system installer shall notify the local director of health the site is prepared for inspection. Such inspection shall take place as soon thereafter as feasible, but not later than two (2) working days after receipt of the request unless the owner agrees to an extension.

(3) A final inspection report shall be prepared by the local director of health on forms deemed by the Commissioner of Public Health as equivalent to Form #3 in the Technical Standards.

(4) A record plan of the sewage disposal system, as built, shall be required by the local director of health.

(h) **Permit to Discharge**.

(1) Upon determination that the subsurface sewage disposal system has been installed in compliance with the requirements of Section 19-13-B103d of these regulations and the approved plans, the local director of health shall issue a permit to discharge. A copy of such permit shall be sent to the local building official. No permit to discharge shall be issued until all required forms are completed and an approved as-built plan or record drawing is received.

(2) Any permit to discharge issued by the Commissioner of Public Health or a local director of health for a household or small commercial subsurface sewage disposal system with a capacity of five thousand gallons per day or less shall be deemed equivalent to a permit issued under Subsection 25-54i(b) of the Connecticut General Statutes. Such permits shall:

(A) Specify the manner, nature and volume of discharge;

(B) Require proper operation and maintenance of any pollution abatement facility required by such permit;

(C) Be subject to such other requirements and restrictions as the Commissioner deems necessary to comply fully with the purposes of this chapter and the Federal Water Pollution Control Act; and

(D) Be issued on forms approved by the Commissioner of Public Health.

(3) The local director of health shall record the granting of an exception from any requirement of Section 19-13-B103d on the permit to discharge.

(i) **Enforcement.**

(1) A permit to discharge to a subsurface sewage disposal system shall not be construed to permit any sewage overflow, nuisance, or similar condition or the maintenance thereof.

(2) If such a condition is found to exist, the permit to discharge may be revoked, suspended, modified or otherwise limited and any such condition is subject to an order to abate the condition pursuant to Connecticut General Statutes Section 19-79.

(j) **Records.**

Copies of completed applications, investigation reports, review and inspection forms and as-built plans or record drawings of each sewage disposal system, certified as complying with this Section, shall be kept in the files of the town or health district for a minimum of ten years.

(k) **Rights of Applicant**.

(1) All site investigations, inspections, review of plans and issuance of permits or approvals by the local director of health shall be made without unreasonable delay.

(2) When requested in writing by the applicant, the local director of health shall designate in writing within 20 working days the requirement(s) of Section 19-13-B103d or 19-13-B103e of these regulations which prevents such investigation, inspection, review, permit or approval.

(3) Any final decision of the local director of health made in regard to these sections shall be made in writing and sent to the applicant. Any decision adverse to the applicant or which limits the application shall set forth the facts and conclusions upon which the decision is based. Such written decision shall be deemed equivalent to an order, and may be appealed pursuant to Section 19-103 of the General Statutes.

19-13-B103f. Non-discharging Sewage Disposal Systems

(a) All non-discharging sewage disposal systems shall be designed, installed and operated in accordance with the Technical Standards and the requirements of this section, unless an exception is granted by the Commissioner upon a determination that system shall provide for the proper and complete disposal and treatment of toilet wastes or gray water.

(b) **Composting Toilets**.

(1) The local director of health may approve the use of a large capacity composting toilet or a heat-assisted composting toilet for replacing an existing privy or failing subsurface sewage disposal system, or for any single-family residential building where application is made by the owner and occupant, and the lot on which the building will be located is tested by the local director of health and found suitable for a subsurface sewage disposal system meeting all the requirements of Section 19-13-B103d of these regulations.

(2) All wastes removed from composting toilets shall be disposed of by burial or other methods approved by the local director of health.

(c) **Incineration Toilets**.

The local director of health may approve the use of incineration toilets for non-residential buildings or for existing single-family residential dwellings for the purpose of abating existing sewage problems or replacing the existing non-water carriage toilets.

(d) **Chemical Flush Toilets and Chemical Privies**.

(1) The local director of health may approve chemical flush toilets or chemical privies for nonresidential use where they are located outside of buildings used for human habitation. Chemical flush toilets or chemical privies located inside human habitations shall be approved by the Commissioner of Public Health and the local director of health.

(2) Liquid waste from chemical flush toilets or chemical privies shall be disposed of in a location and manner approved by the local director of health. Such liquid shall not be disposed of on a public water supply watershed or within five hundred feet of any water supply well unless approved by the Commissioner of Public Health.

(e) **Dry Vault Privies**.

(1) The local director of health may approve dry vault privies for nonresidential use where they are located outside of buildings used as human habitation.

(2) Wastes removed from dry privy vaults shall be disposed of by burial or other methods approved by the local director of health.

STATEMENT OF PURPOSE:

These regulations up-date existing Public Health Code requirements for the design of subsurface sewage disposal with design flows of 5,000 gallons per day or less and non-discharge toilet systems. Sewage disposal systems conforming to this regulation and designed in compliance with published Technical Standards will provide for the preservation and improvement of public health.

Effective August 16, 1982

Technical Standards for Subsurface Sewage Disposal Systems

Effective August 16, 1982
Revised January 1, 2011

Disclaimer: The listing of any proprietary product, technology or system in these Technical Standards shall not be considered an endorsement of the product, technology or system, nor does it convey intellectual property rights.

I. DEFINITIONS

A. **Accessory structure** means a permanent non-habitable structure, which is not served by a water supply and is used incidental to residential or non-residential buildings. Accessory structures include, but are not limited to, attached and detached garages, covered entryways, screened and enclosed 3-season (non-winterized) porches/sunrooms, open decks, tool and lawn equipment storage sheds, gazebos, barns, etc. Small (<200 square feet), portable structures such as sheds without permanent support foundations (concrete slab, piers, footings) are not considered permanent structures. Decks are permanent structures.

B. **Approved aggregate** means stone aggregate, two (2) inch nominal tire chip aggregate, or other product approved by the Commissioner of Public Health for use in leaching system construction.

C. **Bedroom** means those areas within a residential building that are, or have the potential to be, utilized as a sleeping area on a consistent basis. In order to be deemed a bedroom the room shall meet all of the following criterion:

1. Be habitable space, or planned habitable space that has "roughed- in" mechanicals, such as heating ducts, electrical wiring, water lines, or plumbing waste lines, etc., but is not currently "finished" for Building Code certificate of occupancy purposes. Small rooms with a floor area less than seventy (70) square feet are not considered bedrooms, unless the room has been historically designated a bedroom in an existing home. It is noted that the Building Code stipulates that habitable rooms (except kitchens) shall have a floor area not less than seventy (70) square feet. As such, bedrooms in new construction are required to have a floor area no less than seventy (70) square feet.

2. Provides privacy to the occupants. Large (minimum 5 foot width) openings or archways can be utilized to eliminate room privacy.

3. Full bathroom facilities (containing either a bathtub or shower) are conveniently located to the bedroom served. Convenience in this case means on the same floor as the bedroom or directly accessed from a stairway.

4. Entry is from a common area, not through a room already deemed a bedroom.

D. **Building served** means the physical structure that contains the habitable/interior portion of the building connected to the subsurface sewage disposal system. The building served includes any portion of the habitable structure permanently attached to the structure including, but not limited to, basements and 4-season (winterized) porches/sunrooms. The building served does not include attached accessory structures.

E. **Building sewer** means a sewer pipe extending from the building served to the septic tank or grease interceptor tank. Pipes approved for use under this classification are listed in Table 2.

F. **Effective leaching area (ELA)** means a measure, in square feet, of the relative size of a leaching system or product that takes into account the amount of infiltrative area and type of infiltrative interface. Effective leaching area criterion, product ratings, and sizing requirements are included in Section VIII.

G. **Footing or foundation drains** means drainage systems, consisting of stone or other free draining material with or without piping, which are installed to collect and redirect groundwater in order to protect below grade portions of a building.

H. **Free draining material** (i.e., gravel, broken stone, rock fragments, etc.) means backfill that meets Connecticut Department of Transportation Form 816 Specification M.02.07 (or latest specification) and is coarser than the surrounding excavation material.

I. **Leaching gallery** means a hollow structure with an open bottom (minimum 40-inch width) with perforated walls surrounded by approved aggregate in a six (6) foot wide level excavation.

J. **Leaching pit** means a hollow, covered structure with perforated sides and which is surrounded on the sides by approved aggregate.

K. **Leaching system** means a structure, excavation, or other facility designed to allow sewage effluent to percolate into the underlying soil without overflow, and to mix with the groundwater. Leaching systems include leaching trenches, leaching galleries, leaching pits, and proprietary leaching systems.

L. **Leaching trench** means a level excavation, not exceeding four (4) feet in width, with vertical sides and flat bottoms filled with approved aggregate, and equipped with an effluent distribution pipe running the entire length of the excavation.

M. **Proprietary leaching system** means a manufactured product approved by the Commissioner of Public Health to be used as a leaching system.

N. **Select fill** means clean bank run sand, clean bank run sand and gravel, or approved manufactured fill having a gradation which conforms to the specifications stipulated in Section VIII A or ASTM C 33. Note: See Section VIII A for additional manufactured fill approval requirements.

O. **Solid pipe** means pipe that has no loose or open joints, perforations, slots or porous openings that would allow liquid to leak into or out of the pipe.

P. **Stone aggregate** means crushed or broken stone, or crushed and uncrushed gravel meeting the gradation for No. 4 or No. 6 aggregate per Connecticut Department of Transportation Form 816 Specification M.01.01 (or latest specification), and the #40 and #200 sieve gradation stipulated in Section VIII A, based on a wet sieve analysis. Stone aggregate shall be free of silt, dirt or debris, and shall have a loss of abrasion of not more than 50% using AASHTO Method T-96, and when tested for soundness using AASHTO Method T-104 not have a loss of more than 15% at the end of 5 cycles.

Q. **Tight pipe** means solid pipe that exhibit both acceptable wall strength and watertight joints. Pipes approved for use under this classification are listed in Table 2-C.

R. **Two (2) inch nominal tire chip aggregate** means tire chips approved for distribution and/or use by the Department of Environmental Protection (DEP) for use in leaching system construction via a DEP Beneficial Use Determination approval. Two (2) inch nominal tire chip aggregate shall be graded or sized in accordance with ASTM D 448 size number 2, 24 or 3, and shall have at least 95% by weight ranging from ½ inch to a maximum of 4 inches in any one direction. Such aggregate shall have no more than 2% by weight of fines (< #200 sieve) based on a wet sieve analysis, and not more than 5% by weight of tire chips containing wire protruding more than ½ inch from the sides of the tire chips. Approved distributers shall have two (2) inch nominal tire chip aggregate tested annually for the above standards and submit reports by July 1st of each year to the Commissioner of Public Health and DEP.

S. **Watertight tank seal** means a pipe to tank connection (inlet & outlet pipe seal) that meets ASTM C 1644, ASTM C 923, or is accepted by the Commissioner of Public Health as an approved equal based on review of a company's submission of specifications and supporting documentation demonstrating that the seal meets the performance criteria of either of the previously cited ASTM standards.

II. LOCATION OF SUBSURFACE SEWAGE DISPOSAL SYSTEMS

A. Minimum separating distances

The minimum separating distances specified in Table 1 are required and shall be maintained between the cited items and subsurface sewage disposal systems, except for approved piping. Tables 2, 2-C and 2-D list specific applications whereby approved piping shall have reduced separating distances to cited items. Groundwater control systems only need to comply with the separating distances cited in Item G. Proposed relocation of lot lines reviewed pursuant to PHC Section 19-13-B100a (e) shall comply with the distances cited in Item I. Separating distance compliance shall be based on horizontal measurements except for non-vertical closed loop geo-exchange bore holes that utilize measurements taken from the closest portion of the bore hole.

Table 1

Item	Separating Distance (Feet)	Special Provisions
A. Water supply well (potable, open loop geo-exchange, irrigation), spring or domestic water suction pipe. Required withdrawal rate: < 10 gal. per minute 10 to 50 gal. per minute > 50 gal. per minute	 75 150 200	1. Separating distance to leaching system shall be doubled if the percolation rate is faster than one minute/inch and system is less than eight (8) feet above ledge rock. 2. Separating distance shall be increased as necessary to protect the sanitary quality of a public water supply well. 3. Separating distance between a domestic water suction pipe and a septic tank/pump chamber/grease interceptor tank shall be reduced to 25 feet if tank is verified to be watertight.
B. Human habitation on adjacent property	15	Building without drains. See item G for distance to building with drains.
C. Building served	15	Building without drains. See item G for distance to building with drains. Separating distance to a septic tank/pump chamber/grease interceptor tank shall be reduced to 10 feet for building served without drains.
D. Open watercourse	50	When not located on a public water supply watershed, distance shall be reduced as necessary to not less than 25 feet on lots in existence prior to the effective date of this regulation (8/16/82) and thereafter recorded as required by statute.
E. Public water supply reservoir	100	
F. Surface or groundwater drain constructed of solid pipe	25	Tight pipe with rubber gasketed joints or approved equal (See Table 2-C) are exempted from this requirement as long as the pipe excavation is not backfilled with free draining material, however no tight pipe shall be less than 5 feet from system. Leakage tests may be required to verify water tightness.
G. Groundwater drains (curtain, foundation, footing etc.), stormwater infiltration or retention/detention system Upgradient or on sides Downgradient	 25 50 *(2)*	1. No such drain shall be constructed downgradient of a leaching system for the purpose of collecting sewage effluent regardless of the distance. 2. Distance to septic tank/pump chamber/grease interceptor tank shall be reduced to 25 feet if tank is verified to be watertight.
H. Top of embankment (Downgradient and on sides of leaching system)	10	Cuts within 50 feet downgradient of leaching systems shall not be allowed if bleed-out conditions are possible.
I. Property line Upgradient or on sides Downgradient	 15 *(2)* 25 *(2,3)*	1. Separating distance to septic tank/pump chamber/grease interceptor tank and reserve leaching system shall be reduced to 10 feet. 2. Separating distance shall be reduced to 10 feet if the top of the leaching system is below original grade, grading rights from the affected property owner are secured, or retaining walls are utilized (See Section VIII A for retaining wall provisions). 3. Separating distance between the primary leaching system and downgradient property line shall be reduced to 15 feet if MLSS is not applicable or on flat groundwater table lot.
J. Potable water and irrigation lines that flow under pressure	10	Excavations between 10 – 25 feet from system shall not be backfilled with free draining material.
K. Below ground swimming pool	25	See item G for downgradient pools with drains.
L. Above ground swimming pool	10	Includes hot tubs.
M. Accessory structure	10	Structure shall have no footing drains. See item G if drains provided. Structure without full wall, frost protected footings shall be reduced to 5 feet.
N. Utility service trench (Underground electric, gas, phone services, etc.)	5	Excavations between 5 – 25 feet from system shall not be backfilled with free draining material.
O. Water treatment wastewater system	10	See Section X.
P. Closed loop geo-exchange system Bore hole (BH), Trench Geo-exchange piping to BH, Trench	 50 10	Separating distance to a septic tank/pump chamber/grease interceptor tank shall be reduced to 25 feet if tank is verified to be watertight. Excavations between 10 – 25 feet from system shall not be backfilled with free draining material.

B. Record Plans

Following system installation and final inspection, a record plan of the subsurface sewage disposal system, as built, shall be prepared. The record plan shall locate building sewer exit location at building, sewage system access points (tank cleanouts, distribution boxes, etc.) and leaching system ends. Drawing can be a plan to scale or a tie plan from two or more permanent reference points. Tie plans shall note distance between reference points. A licensed installer shall prepare and submit the record plan unless an engineered record drawing is required by local director of health in accordance with PHC Section 19-13-B103d (e) (5). Record plans shall be submitted in a timely manner to avoid delays in permit issuance by the local director of health in accordance with PHC Section 19-13-B103e (k).

C. Plan Adherence

The licensed installer is responsible to construct the subsurface sewage disposal system in accordance with the plan approved by the local director of health in accordance with PHC Section 19-13-B103e (f). Modifications to the approved plan shall be authorized by the plan designer and approved by the local director of health.

D. System Abandonment

Abandonment of subsurface sewage disposal system components (i.e., septic tank, hollow leaching structure) or cesspool shall be performed in such a manner as to eliminate the danger of inadvertent collapse of the component or cesspool. The responsibility for abandonment lies with the property owner. Structures that are to be abandoned shall be emptied of all sewage prior to abandonment. Structures shall be filled with sand, gravel, or crushed and backfilled with clean soil.

E. Benchmarks

Plans by professional engineers shall provide benchmarks that provide for vertical and horizontal controls, or field staking by the design firm shall be required.

III. PIPING

A. Building sewers

Building sewers shall be not less than 4 inches in diameter, and approved piping is listed in Table 2. A minimum grade of 1/4-inch per foot shall be provided for 4-inch sewers, and 1/8-inch per foot for 6 and 8-inch sewers. Building sewers shall be laid with tight joints to the septic tank or grease interceptor tank, and in a straight line with uniform grade wherever possible. Accessible manholes or surface cleanouts shall be provided at one or more cumulative changes of directions exceeding 45^{o} (See Figure 1), unless a 90^{o} sweep pipe approved in Table 2 is utilized. Accessible manholes or surface cleanouts shall be provided for each 75-foot length of building sewer from the foundation wall to the septic tank or grease interceptor tank. Long building sewer lines shall be avoided to reduce the danger of groundwater infiltration and sewer blockages. Approved piping located within the sanitary radius of a water supply well shall provide the minimum separation distances specified in Table 2.

B. Water pipe trenches

Whenever possible, pressurized water service mains and building sewer lines shall be located in separate trenches at least 10 feet apart. Where laid in the same trench, the water pipe shall be laid on a bench at least 18 inches above the top of the sewer pipe and at least 12 inches (preferably 18 inches) from the side of the sewer trench (See Figure 2). Building sewer pipes shall be located a minimum 25 feet from water suction pipes (See Table 2). When it is necessary to cross a pressurized water service line with a pipe serving a subsurface sewage disposal system, the pipe shall be listed in either Table 2 or Table 2-C. Table 2 shall apply when the water service is located below the sewer pipe. Table 2-C shall apply when the water service is located above a sewer. Sewer force mains listed in Table 2-D may cross over or under pressurized water service lines.

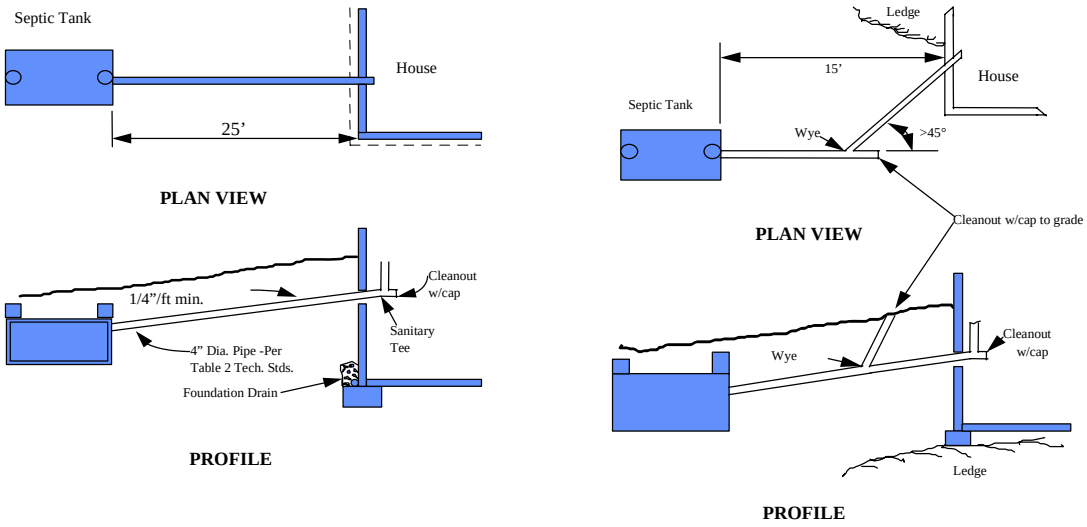


Figure 1 - Building Sewers

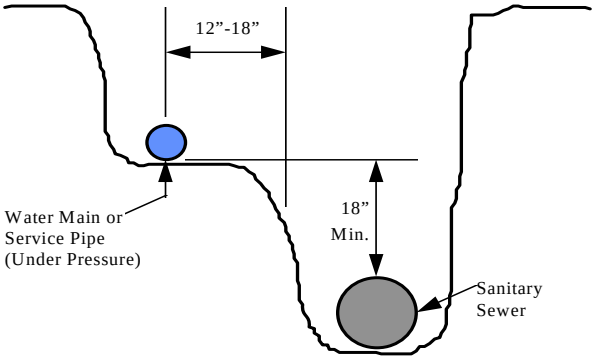


Figure 2 - Water Pipe Trenches

C. Procedure for Air Pressure Testing of Sewer Pipe

1. Test is conducted between two (2) consecutive manholes, as directed by the engineer.
2. The test section of the sewer line is plugged at each end. One of the plugs used at the manhole shall be tapped and equipped for the air inlet connection for filling the line from the air compressor.
3. All service laterals, stubs and fittings into the sewer test section shall be properly capped or plugged, and carefully braced against the internal pressure to prevent air leakage.
4. Connect air hole to tapped plug selected for the air inlet. Then connect the other end of the air hose to the portable air control equipment which consists of valves and pressure gages used to control:
   a) the air entry rate to the sewer test section, and
   b) to monitor the air pressure in the pipe line.
   More specifically, the air control equipment includes a shut-off valve, pressure regulating valve, pressure reduction valve and a monitoring pressure gate having a pressure range from 0 to 5 psi. The gage shall have minimum divisions of .10 psi and an accuracy of ±.04 psi. Figure 3 illustrates diagrammatically a typical control equipment apparatus.
5. Connect another air hose between the air compressor (or other source of compressed air) and the air control equipment. This completes the test equipment set-up. Test operations may commence.
6. Supply air to the test section slowly, filling the pipeline until a constant pressure of 3.5 psig is maintained. The air pressure shall be regulated to prevent the pressure inside the pipe from exceeding 5.0 psig.
7. When constant pressure of 3.5 psig is reached, throttle the air supply to maintain the internal pressure above 3.0 psig for at least 5 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall. During this stabilization period, it is advisable to check all capped and plugged fittings with a soap solution to detect any leakage at these connections.

If leakage is detected at any cap or plug, release the pressure in the line and tighten all leaky caps and plugs. Then start the test operation again by supplying air. When necessary to bleed off air to tighten or repair a faulty plug, a new 5-minute interval shall be allowed after the pipeline has been refilled.

8. After the stabilization period, adjust the air pressure to 3.5 psig and shut off or disconnect the air supply. Observe the gage until the air pressure reaches 3.0 psig. At 3.0 psig, commence timing with a stop watch which is allowed to run until the line pressure drops to 2.5 psig at which time the stop watch is stopped. The time required, as shown on the stopwatch, for a pressure loss of 0.5 psig is used to compute the air loss. Most authorities consider it unnecessary to determine the air temperature inside the pipeline and the barometric pressure at the time of the test.
9. If the time, in minutes and seconds, for the air pressure to drop from 3.0 to 2.5 psig is greater than that shown on Table 3 for the designated pipe size, the section undergoing test shall have passed and shall be presumed to be free of defects. The test may be discontinued at that time.
10. If the time, in minutes and seconds, for the 0.5 psig drop is less than that shown in Table 3 for the designated pipe size, the section of pipe shall not have passed the test; therefore, adequate repairs shall be made and the line retested.
    a) Pipe sizes with their respective Recommended Minimum Times, in Minutes and Seconds, for Acceptance by the Air Test Method.
    b) For eight (8) inch and smaller pipe, only: if, during the 5-minute saturation period, pressure drops less than 0.5 psig after the initial pressurization and air is not added, the pipe section undergoing tests shall have passed.
    c) Multi Pipe Sizes: When the sewer line undergoing test is 8" or larger diameter pipe and includes 4" or 6" laterals, the figures in Table 3 for uniform sewer main sizes will not give reliable or accurate criteria for the test. Where multi-pipe sizes are to undergo the air test, the engineer can compute the "average" size in inches, which is then multiplied by 38.2 seconds. The results will give the minimum time in seconds acceptable for a pressure drop of 0.5 psig for the "averaged" diameter pipe.

Time Requirements for Air Testing

PIPE SIZE (INCHES)	TIME	
	MINUTES	SECONDS
4	2	32
6	3	50
8	5	06
10	6	22
12	7	39
15	9	35
18	11	34

(For larger diameter pipe use the following: Minimum time in seconds = 462 X pipe diameter in ft)

Table 3

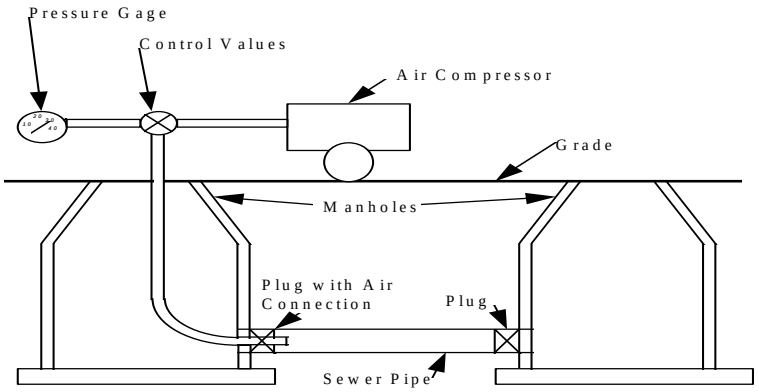


Figure 3 - Typical Air Test Equipment Layout

Table 2
Approved Building Sewer Pipe from Building Served to Septic Tank or Grease Interceptor Tank

NOTE: The local director of health shall inspect all building sewer piping and joints prior to covering

USE	PIPE DESCRIPTION	ACCEPTABLE JOINT	REMARKS
Building sewer from foundation wall to septic tank or grease interceptor tank. Note: The following minimum distances shall be maintained from wells, springs, or domestic water suction pipes based on withdrawal rates: <10 gpm: 25 feet 10 – 50 gpm: 75 feet >50 gpm: 100 feet To reduce separation distances for the <u>following other items listed in Table 1:</u> -Human habitation on adjacent property -Building served -Open Watercourse -Drains/Drain Piping -Property line -Pressure water lines -Swimming pools -Accessory structures -Utility service trench -Closed loop geo-exchange bore hole, trench (10 feet minimum)	Cast iron hubless ASTM A 888	Cast iron split sleeve bolted joint with rubber gasket, MG coupling or equal OR 3”-wide, heavy -duty, stainless steel banded coupling with rubber gasket; clamp-all, ANACO SD 4000, or equal	Roll-on “donut type” gaskets not acceptable if connection is within 25 feet of foundation wall. Pipe shall be properly bedded, laid in straight line on uniform grade
	Cast iron bell and spigot ASTM A 74	Rubber compression gaskets	Stainless steel 3” wide shear band coupling required for connection of dissimilar piping materials
	PVC Schedule 40 or 80, ASTM D 1785 or ASTM D 2665	Rubber compression gasket couplings, Harco Mfg., ASTM D 3139 or equal* OR Solvent weld couplings/ fittings using proper two step PVC solvent solution procedure	*Use of 3”-wide approved stainless steel banded couplings on PVC, ASTM D 1785 or 2665 is acceptable UL (gray) Piping - Schedule 40 or 80- 36”min. radius sweep piping (90º) may be utilized without a cleanout. ABS Schedule 40 is not acceptable
	Ductile iron ANSI A 21.51	Rubber compression gaskets	Connection to cast iron building sewer shall be made with compression gaskets.
	PVC AWWA C 900 (PC 100 psi min.)	Rubber compression gaskets	“O”-ring gasket is not acceptable
	PVC ASTM F 1760, Schedule 40	Rubber compression gaskets	Only 4” pipe approved Minimum 1’ cover in vehicular loaded traffic areas

Table 2-A
Accepted Sewer Pipe* for Public Sewer Connections/Laterals within the Sanitary Radius of a Water Supply Well

All sewer lines installed within the sanitary radius of a water supply well shall be inspected and approved by the local director of health or sewer inspector prior to back filling.

USE	PIPE DESCRIPTION	ACCEPTABLE JOINT	REMARKS
Public sewer connections/laterals within the sanitary radius of a water supply well, spring, or domestic water suction pipe. Note: The following minimum distances shall be maintained from wells, springs, or domestic water suction pipes based on withdrawal rates: <10 gpm: 25 feet 10 – 50 gpm: 75 feet >50 gpm: 100 feet Note: Exterior pump chambers, septic tanks, and grease traps/interceptors are sources of pollution and shall be located at least 75 feet from <10 gpm water supply wells. Increased separating distances required for wells with withdrawal rates of 10 gpm or greater (See PHC Sec. 19-13-B51d) Note: Force mains shall use pressure pipe rated for the particular application. **Acceptable sewer pipe between building and pump chamber, septic tank, or grease trap/interceptor effective January 1, 2011.	Cast iron hubless ASTM A 888**	Cast iron split sleeve bolted connector with rubber gasket, MG coupling or equal to 3" wide, heavy-duty stainless steel banded coupling with rubber gasket; Clamp-all, ANACO SD 4000, or equal	Roll-on "donut type" gaskets not acceptable if used within 75 feet of well. Pipe shall be properly bedded in accordance with pipe manufacturer's specifications, laid in a straight line on a uniform grade
	Cast iron bell and spigot, ASTM A 74**	Rubber compression gaskets	
	Ductile iron ANSI A21.51**	Rubber compression gasket	
	Extra strength PVC pressure water pipe AWWA C 900** (PC 100 psi min.)	Rubber compression gasket	
	Schedule 40 or 80, PVC ASTM D 1785** or ASTM D 2665**	Rubber compression gasketed couplings, Harco Mfg., ASTM D 3139 or equal OR	Use of 3" wide approved stainless steel banded couplings on PVC Schedule 40 ASTM D 1785 is acceptable
	PVC ASTM D 2241: SDR 21, 17 or 13.5	Solvent weld couplings/ fittings using proper two step PVC solvent solution procedure	ABS Schedule 40 is not acceptable
	PVC ASTM F 1760, Schedule 40** or SDR 35		Joints shall meet ASTM D 3212 specifications
	PVC ASTM D 3034, SDR 35 PVC ASTM F 789 PVC ASTM F 679	Integral rubber compression gaskets or roll-on compression gaskets	Bedding in accordance with ASTM D 2321 for PVC pipe
	PVC, CONTECH A-2026, ASTM F 949 PVC, CONTECH A-2000, ASTM F 949	Elastomeric gasket meets ASTM F 477 Gaskets meets ASTM F 477	Joints meet ASTM 3212 Joints meet ASTM 3212
	PE, ASTM D 3035, SDR 11 or lower	No joints, Heat butt fused connections ok	

*Accepted sewer pipe list originally prepared as guidance prepared jointly between the Department of Environmental Protection & the Department of Public Health (DPH), and issued to Local Health Departments & Water Pollution Control Authorities. Other pipes can only be considered acceptable if approved by DPH's Drinking Water Section for applications near public water supply wells, or by DPH's Private Well Program for all other water supply wells.

Table 2-B
Accepted Sewer Pipe* for Public Sewer Mains within the Sanitary Radius of a Water Supply Well

All public sewer mains installed within the sanitary radius of a water supply well shall be low-pressure air tested in the presence of the design engineer. A report of the test results should be submitted to the local director of health.

USE	PIPE DESCRIPTION	ACCEPTABLE JOINT	REMARKS
Public sewer mains within the sanitary radius of a water supply well, spring, or domestic water suction pipe. Note: The following minimum distances shall be maintained from wells, springs, or domestic water suction pipes based on withdrawal rates: <10 gpm: 25 feet 10 – 50 gpm: 75 feet >50 gpm: 100 feet	Cast iron hubless pipe ASTM A 888	Cast iron split sleeve bolted connector with rubber gasket MG coupling or equal or 3"-wide heavy duty stainless steel banded coupling with rubber gasket; Clamp-All ANACO SD 4000 or equal	Roll-on "donut type" gaskets not acceptable if used within 75 feet of well. Pipe shall be properly bedded, in accordance with pipe manufacturer's specifications, laid in a straight line on a uniform grade
	Ductile iron ANSI A21.51	Rubber compression gaskets	
	Extra strength PVC pressure water pipe AWWA C 900 (PC 100 psi min.)	Rubber compression gaskets	
Note: Force mains shall use pressure pipe rated for the particular application.	Reinforced concrete water pipe, steel cylinder type, not pre-stressed AWWA C-300	Rubber compression gaskets	
Note: Pump stations/structures are sources of pollution and shall be at least 75 feet from <10 gpm water supply wells. Increased separating distances required for wells with withdrawal rates of 10 gpm or greater (See PHC Sec. 19-13-B51d)	Schedule 40, PVC ASTM D 1785 or ASTM D 2665 PVC ASTM D 2241: SDR 21, 17 or 13.5 PVC ASTM F1760, Schedule 40 or SDR 35 PVC ASTM D 3034, SDR 35 PVC ASTM F 789 PVC ASTM F 679 PVC, CONTECH A-2026, ASTM F 949 PVC, CONTECH A-2000, ASTM F 949	Rubber compression gasketed couplings, Harco Mfg., ASTM D3139 or equal* OR Solvent weld couplings/fittings using proper two step PVC solvent solution procedure Elastomeric gasket meets ASTM F 477 Gaskets meet ASTM F 477	*Use 3"-wide stainless steel banded couplings on PVC Schedule 40 ASTM D 1785 is acceptable ABS Schedule 40 is not acceptable Joints shall meet ASTM D 3212. Bedding in accordance with ASTM D 2321 for PVC pipe Joint meets ASTM D 3212 Joint meets ASTM D 3212
	PE, ASTM D 3035, SDR 11 or lower	No joints, Heat butt fused connections ok	

*Accepted sewer pipe list originally prepared as guidance prepared jointly between the Department of Environmental Protection & the Department of Public Health (DPH), and issued to Local Health Departments & Water Pollution Control Authorities. Other pipes can only be considered acceptable if approved by DPH's Drinking Water Section for applications near public water supply wells, or by DPH's Private Well Program for all other water supply wells.

Table 2-C
Approved Tight Pipe for Distribution Piping within 25 Feet of an Open Watercourse or Drain, or within the Sanitary Radius of a Water Supply Well, and Approved Tight Pipe for Groundwater or Surface Water Piping within 25 Feet of a Subsurface Sewage Disposal System

USE	PIPE DESCRIPTION	ACCEPTABLE JOINT	REMARKS
Distribution piping within 25 feet of an open watercourse, surface or groundwater drain, cellar, footing or foundation drain OR Groundwater and surface water drainage pipes within 25 feet of a subsurface sewage disposal system. OR Distribution pipe within the sanitary radius of a water supply well, spring, or domestic water suction pipe. Note: The following minimum distances shall be maintained from wells, springs, or domestic water suction pipes based on withdrawal rates: <10 gpm: 25 feet 10 – 50 gpm: 75 feet >50 gpm: 100 feet	Cast iron hubless pipe ASTM A-888	Cast iron split sleeve bolted connector with rubber gasket MG coupling or 3"-wide, heavy duty stainless steel banded coupling with rubber gasket; Clamp-All ANACO SD 4000 or equal	Roll-on "donut type" gaskets not acceptable if used within 25 ft. of watercourse or drain. Pipe shall be properly bedded in accordance with manufacturer's specifications, laid in a straight line on a uniform grade
	Cast iron bell and spigot ASTM A-74	Rubber compression gaskets	
	Ductile iron ANSI A21.51	Rubber compression gaskets	
	Extra strength PVC pressure water pipe AWWA C-900 (PC 100 psi min.)	Rubber compression gaskets	
	Reinforced Concrete Pipe ASTM C 76	Rubber compression gaskets, ASTM C 443	
	Reinforced concrete water pipe, steel cylinder type, AWWA C-300/ C-301	Rubber compression gaskets	
To reduce separation distances for the <u>following other items listed in Table 1:</u> -Human habitation on adjacent property -Building served -Property line -Pressure water lines -Swimming pools -Accessory structures -Utility service trench -Closed loop geo-exchange bore hole, trench (10 feet minimum)	Schedule 40 or 80, PVC ASTM D 1785 or ASTM D 2665 PVC ASTM D 2241: SDR 21, 17 or 13.5	Rubber compression gasketed couplings, Harco Mfg.,ASTM D3139 or equal* or Solvent weld couplings/fittings using proper two step PVC solvent solution procedure	*Use of 3"-wide approved stainless steel banded couplings on PVC ASTM D 1785 is acceptable ABS Schedule 40 is not acceptable
	PVC ASTM F1760, SDR 35 PVC ASTM D 3034, SDR 35 PVC ASTM F 789 PVC ASTM F 679	Rubber compression gaskets or Solvent weld couplings/fittings using proper two step PVC solvent solution procedure	Joint shall meet ASTM D 3212 specifications.
	PVC, CONTECH A-2026, ASTM F 949	Elastomeric gasket meets ASTM F 477	Joint meets ASTM D 3212
	PVC, CONTECH A-2000, ASTM F 949	Gaskets meet ASTM F 477	Joint meets ASTM D 3212
	PE, ADS N-12, ASTM F 667, AASHTO M-294, 24-inch maximum diameter PE, Hancor Blue Seal, ASTM F 667, AASHTO M-294, 24-inch maximum diameter	Series 35 ADS coupling, o-ring gasket or WT Pipe/joint (Gasketed bell/spigot) Blue Seal coupling/rubber compression gasket	Coupling: ASTM D 3034/F 1336 Joints (Coupling and WT) meet ASTM D 3212 Joint meets ASTM D 3212

Table 2-D

Approved Sewer Pipe for Use as Sewer Force Main for Specific Applications

USE	PIPE DESCRIPTION	ACCEPTABLE JOINT	REMARKS
Sewer force main piping within the sanitary radius of a water supply well, spring, or domestic water suction pipe. Note: The following minimum distances shall be maintained from wells, springs, or water suction pipes based on withdrawal rates: <10 gpm: 25 feet 10 – 50 gpm: 75 feet >50 gpm: 100 feet	PVC pressure pipe ASTM D 2241: SDR 21, 17, or 13.5	Bell and spigot with compression rubber gaskets	
OR Sewer force main within 25 feet of an open watercourse, surface or groundwater drain, footing or foundation drain.	PVC pressure water pipe AWWA C-900 (PC 200 psi minimum)		
To reduce separation distances for the <u>following other items listed in Table 1:</u>	PVC ASTM D 1785 / ASTM D 2665, Schedule 40 or Schedule 80	Solvent welded, threaded joints or gasketed couplings	
-Human habitation on adjacent property -Building served -Property line -Pressure water lines -Swimming pools	PE ASTM D 2239 PE ASTM D 2737	No joints within 75 ft. of well or 25 ft. of open watercourse, ground or surface water drains	Pipe available in 100-ft. and longer coiled lengths
-Accessory structures -Utility service trench -Closed loop geo exchange bore hole, trench (10 feet minimum)	PE ASTM D 3035, SDR 11 or lower	No joints, Heat butt fused connections ok	

IV. DESIGN FLOWS

A. Residential buildings

Design flows for residential buildings are based on the number of bedrooms in the building with a design flow of 150 gallons per day (GPD) per bedroom, except for additional bedrooms beyond 4 in a single-family home which have a 75 GPD per bedroom design flow.

B. Nonresidential buildings and residential institutions

Table 4 shall be used for determining the daily design flow from nonresidential buildings and residential institutions unless specific water use data (minimum 1 year period) is available for the facility or similar facilities. Whenever water use data from "similar" facilities is utilized to calculate the design flow for a building, the data shall be accompanied with additional supporting information (i.e., building size, plumbing fixture information, hours of operation, etc.) to establish that the comparison is appropriate. Design flow based on metered flows shall use a minimum 1.5 safety factor applied to all metered average daily water use.

The required effective leaching area for subsurface sewage disposal systems serving restaurants, bakeries, food service establishments, residential institutions, laundromats, beauty salons, and other nonresidential buildings with problematic sewage is based on the design flow and the application rates listed in Table 7 (See Section VIII F). Such buildings or discharges are designated in Table 4 with a notation that Table 7 application rates are to be utilized for leaching system sizing purposes. Problematic sewage is wastewater that is a concern due to the nature or strength of the sewage.

For nonresidential buildings that are not specifically listed in Table 4, the strength and nature of the wastewater shall be taken into consideration in the determination as to the appropriate application rate. The strength of the wastewater can be correlated to the 5-day biochemical oxygen demand (BOD5). For reference purposes, a wastewater BOD5 concentration of 110 mg/l is weak, 220 mg/l is medium, and 400 mg/l is strong per Metcalf and Eddy, Inc. *Wastewater Engineering-Treatment, Disposal, and Reuse Third Edition* (McGraw-Hill, Inc., 1991), table 3-16, p. 109. Weak strength wastewater shall utilize Table 8 application rates whereas strong wastewater shall utilize Table 7 application rates. Medium strength wastewater shall utilize Table 7 for a conservative design unless otherwise approved by the Commissioner of Public Health.

Table 4

Building Type	Design Flow (GPD)
Schools, per pupil	
Base Flow (Excludes Kitchen & Showers)	
High School	12
Junior High/Middle School	9
Kindergarten/Elementary School	8
Day Care Center	10
Additional Flows for Kitchen & Showers	
Kitchen (Table 7 Ap. Rate)	3
Showers	3
Residential	100
Commercial Buildings**	
Office (Average 200 sq. ft. gross area/person), per employee	20
Retail/Supermarket Building*, per sq. ft. gross area	0.1
*Supermarkets shall increase design flow to account for delis and bakeries Deli and bakery flow: (Table 7 Ap. Rate)	
Industrial Building, per sq. ft. of gross area	0.1
Factory (Average 200 sq. ft. gross area/person), per employee	25
(Add 10 GPD for showers)	
**Design flows may be reduced if documentation (building/floor plans, statement of use, etc.) supports the reduction	

Camps/Family Campgrounds	
Residential Camp (Semi permanent), per person	50
Campground with Central Sanitary Facilities, per person	35
Campground per Camp Space (Water and sewer hook-ups)	75
Day Camp, per person	15
Residential Institutions (Table 7 Ap. Rate)	
Hospital, per bed	250
Rest Home, per bed	150
Convalescent Home, per bed	150
Institution, per resident	100
Residential motels/hotels, per room	150
Group Home/Community Living Arrangement, per client*	100-150**
*Use maximum occupancy unless state license restricts occupancy & requires local health department approval in accordance with PHC Section 19-13-B100a for occupancy increases	
**Use higher flow for large tub/on-site laundry.	
Restaurants, Food Service Establishments and Bars (Table 7 Ap. Rate)	
Restaurant (Public toilets provided), per seat	30*
Restaurant (No public toilets), per seat	20*
*Design flow shall be increased by 50% if breakfast, lunch & dinner are provided	
Take-out Food Service, per meal served	5
Bar/Cocktail Lounge (No meals), per seat (Table 8 Ap. Rate)	15
Recreational Facilities	
Swimming pool, per bather	10
Tennis Court, per court: indoor/outdoor	400/150
Theater, Sport Complex, per seat	3.5
Church/Religious Building	
Worship Service, per seat	1
Sunday School, per pupil	2
Social Event (Meals served), per person (Table 7 Ap. Rate)	5
Miscellaneous	
Auto Service Station, per car serviced	5
Salon, (Table 7 Ap. Rate)	
Per styling chair/station (hair)	200
Per pedicure chair/spa (5 gallon maximum basin)	100
Per manicure chair/station	50
Barber Shop, per chair	50
Dental/Medical Office with Examination Rooms, per sq. ft. of gross area	0.2
Dog Kennel, per run (Roof shall be provided) (Table 7 Ap. Rate)	25
Laundromat (Commercial: Require DEP Permit), per machine (Table 7 Ap. Rate)	400
Motel (Transient, No Food Service, Kitchenette or Laundry Facilities), per room	75
Motel (Transient, With Kitchenette but no Laundry Facilities), per room	100
Marina (Bath-house & Showers Provided), per boat slip	20

C. Water usage monitoring

Plans for large (2,000 GPD or greater) subsurface sewage disposal systems shall include provisions to monitor domestic sewage generation via the use of water meters or other available means (i.e., pump cycling and dose volume documentation).

D. Permits to discharge

Permits to discharge issued by the local director of health shall be on approved forms (Form #4 or approved equal) as required by PHC Section 19-13-B103e (h). The discharge permits shall specify the design flow and

permitted flow. The design flow shall equal the permitted flow, except for non-compliant repairs with limited leaching systems. The permitted flow for non-compliant repairs shall be determined using the most limited percentage of the required ELA or MLSS provided. The discharge permit shall recommend the average daily discharge not exceed 2/3 of the permitted flow in order to allow the subsurface sewage disposal system to operate with a sufficient factor of safety.

E. Management programs

Local health departments and municipalities implementing decentralized sewage system management programs (i.e., Sewer Avoidance and Pump-out Ordinances, Decentralized Wastewater Management Districts, etc.) shall submit proposed or revised ordinances and regulations to the Commissioner of Public Health for review prior to adoption.

V. SEPTIC TANKS AND GREASE INTERCEPTOR TANKS

A. General

1. Septic Tank Standards

All subsurface sewage disposal systems shall be provided with a septic tank that shall be made of concrete or other durable material. Septic tanks and grease interceptor tanks, including the riser and cover assemblies, located under vehicular travel areas shall be rated for H-20 wheel loadings. It is recommended that single compartment septic tanks, especially when undersized, be replaced in conjunction with leaching system repairs. Single compartment septic tanks shall only be allowed to remain in use if the tank is evaluated and determined to be in satisfactory condition and properly baffled. Some proprietary leaching system companies do not support use of their products with single compartment septic tanks. Proprietary leaching system companies should be consulted if a repair plan includes their leaching system product and a single compartment septic tank.

a) Concrete Septic Tanks

All concrete septic tanks shall be produced with a minimum 4,000-psi concrete with 4 to 7 percent air entrainment. Concrete septic tanks shall not be shipped until the concrete has reached the 4,000-psi compressive strength. Concrete septic tanks shipped prior to 14 days from the date of manufacture shall include documentation that the tank reached minimum strength prior to shipping. Concrete septic tank construction shall conform to the most current ASTM C 1227 standard with the following exceptions:

- There is no maximum liquid depth.
- The air space above the liquid level shall be a minimum 8 inches.
- Inspection ports over the compartment wall are optional.
- The mid-depth connection can utilize a minimum 4-inch diameter pipe.
- Inlet & outlet pipe connections shall be watertight tank seals whenever the plan designer specifies use of such seals. Note: Section VI C stipulates that pump chambers in shallow groundwater areas shall utilize watertight tank seals.
- Effluent filters do not have to meet the performance criteria of NSF/ANSI Standard 46-2005; however, approved effluent filter companies shall notify the Commissioner of Public Health by July 1, 2011 as to whether their filters meet the performance criteria in above standard.

Concrete septic tank pre-casters shall file tank specifications/drawings with the Commissioner of Public Health along with certifications by a State of Connecticut licensed professional engineer that the tanks meet the above noted ASTM requirements and the requirements of this section prior to distribution of tanks in the State of Connecticut. The Commissioner of Public Health shall maintain a list of approved septic tank pre-casters that have met this requirement.

b) Non-Concrete Septic Tanks

All non-concrete septic tanks shall meet all of the applicable requirements set forth in subsections 2, 3, and 4 of Section V A regarding tank configuration, tank access, and tank cleaning. Non-concrete tanks shall be marked with the manufacturer's name and tank designation number. Non-concrete septic tanks shall be installed with strict adherence to the manufacturer's installation instructions in order to avoid tank damage or tank deformation. Proper bedding, backfill, and compaction shall be confirmed with

each tank installation. Shallow groundwater conditions may prohibit installation of certain tanks due to tank design limitations or warranty restrictions. Tank bottoms located below maximum groundwater levels shall be provided with anti buoyancy/floatation provisions (check with manufacturer). Manufacturers of non-concrete septic tanks shall file up-to-date specifications, technical support documentation, and dated installation instructions with the Commissioner of Public Health. The Commissioner of Public Health shall maintain a list of approved non-concrete septic tanks. The approved list as of the date of this revision is provided in Appendix D.

2. Tank Configuration

All septic tanks shall contain an inlet baffle submerged for a depth of 8 to 18 inches and an outlet baffle, unless tank is provided with an approved effluent filter, submerged to a depth of at least 10 inches, but no lower than 40 percent, of the liquid depth. Connection of piping and baffles made out of dissimilar materials (i.e., PVC and ABS) require use of multi-purpose 2-step solvent cement meeting ASTM D 3138. The inlet baffle shall encompass not more than 48 square inches of liquid surface area. All baffles shall extend a minimum of 5 inches above the tank's liquid level and an air space of at least a 1/2-inch shall be provided above the baffle. Inlet and outlet piping entering and exiting the septic tank shall be as level as possible with a pitch no greater than 1/4-inch per foot. All newly installed tanks shall have an approved non-bypass effluent filter at the outlet. Effluent filters shall provide a minimum 45 square inches of total opening area. The Commissioner of Public Health shall maintain a list of approved effluent filters. The approved list as of the date of this revision is provided in Appendix B.

The outlet invert of the septic tank shall be 3 inches lower than the inlet invert. Tanks shall be installed with the inlet invert between 2 and 4 inches above the outlet invert. The outlet invert of the tank shall be set at a higher elevation than the top of all leaching structures (except in pump systems), or in the case of leaching systems utilizing serial distribution, higher than the high-level overflow elevation of the upper most leaching system row. All septic tanks (except tanks in series) shall have two compartments with 2/3 of the required capacity in the first compartment (See Figure 4). The transfer port shall be at mid-depth (opening in middle 25% of liquid depth). Inlet and outlet piping shall be sealed with a sealed flexible joint connector. Inlet & outlet pipe seals shall be watertight tank seals whenever use of such seals is specified. The minimum liquid depth of septic tanks shall be 36 inches.

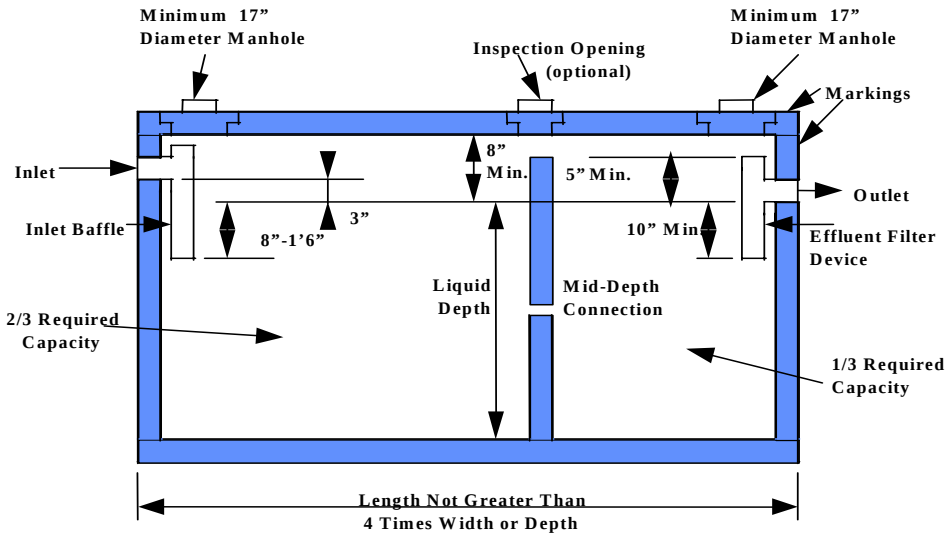


Figure 4 – Typical Septic Tank

Additional septic tank capacity may be obtained by utilizing a maximum of two tanks in series. When two septic tanks are placed in series, the following is required: each tank shall be of single compartment design, the minimum volume of the first tank shall be twice the required minimum volume of the second, mid-depth baffles shall be provided at the connection of the two tanks, an effluent filter shall be provided for the outlet of the second tank (See Figure 5).

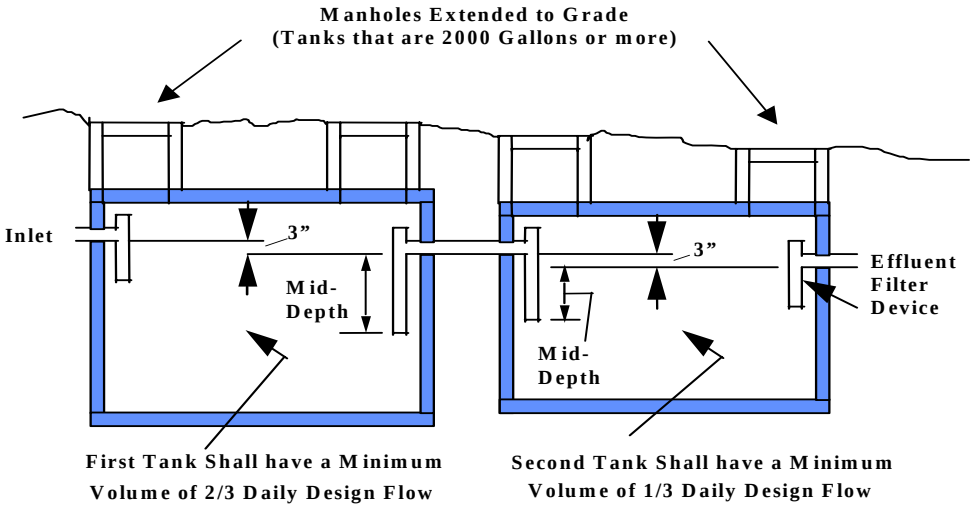
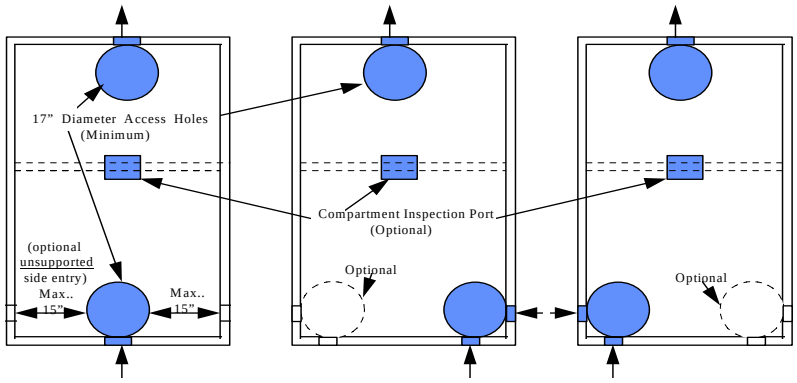


Figure 5 - Septic Tanks in Series

3. Septic Tank Access

Septic tanks shall have removable covers or manholes to provide access for the purpose of inspection and cleaning. Septic tanks shall be provided with a minimum 6 inches of cover. Cleanout manholes shall be located at a depth not greater than 12 inches below final grade level. Existing tanks that exceed the 12-inch depth shall be retrofitted with a cleanout riser(s) at the time of tank cleaning; riser retrofits are not required for non-cleanout openings (inspection & baffle openings) unless the opening provides access to an effluent filter. New tanks and existing tanks deeper than 24 inches below finish grade shall be provided with 24-inch minimum inside diameter access risers over each cleanout manhole opening. Riser cover assemblies shall be concrete or other durable material. Cleanouts shall consist of a minimum 17-inch inside diameter opening and shall be located directly over the inlet baffle and effluent filter (See Figure 6).

If a tank provides side inlets, the maximum distance between the interior wall surface and the cleanout manhole shall be 15 inches unless heavy-duty piping (Schedule 40, ASTM D 1785/2665) is used or the pipe inside the tank shall be supported. Baffle extensions shall not have more than a 1/4-inch per foot pitch. All tank covers shall be stepped and be provided with handles consisting of 3/8-inch coated rebar or approved plastic handles. Below ground plastic handles and plastic riser covers cannot be used unless provisions are made to allow for manhole locating with a metal detector. Septic tanks in paved areas, and large (2000 gallons or greater) septic tanks except for single-family residential buildings, shall have manholes extended to grade. Where covers are flush with or above grade, either the lid shall weigh a minimum 59 pounds or the cover shall be provided with a lock system to prevent unauthorized entrance. Riser and manhole extensions to grade shall be designed and constructed to prevent stormwater infiltration. Tanks that exceed 15 feet in length shall provide a minimum of three manholes. The overall length shall not be greater than 4 times either the width or the depth.



Type "C" Tank Center Entry | **Type "R" Tank** Right Entry | **Type "L" Tank** Left Entry

Figure 6 – Standard Septic Tank Configurations

4. Septic Tank Cleaning

Septic tanks shall be cleaned as often as necessary to prevent a buildup of sludge, grease and scum which will adversely affect the performance of the subsurface sewage disposal system. In a properly functioning system, wastewater should not backflow from the leaching system into the septic tank at the time of pumping under normal use conditions (not as a result of large volume flood tests). Backflow indicates the leaching system is surcharged, and unless otherwise required by the local director of health, tank pump-out reports shall report the backflow conditions and note the system was "malfunctioning" at the time of the septic tank pump-out. As with other malfunctioning system signs (wastewater overflowing outlet baffle, back-up into building sewer or riser, etc.), a recommendation should be made for a more in-depth assessment of system operation by a licensed installer or professional engineer unless condition is a result of a clogged effluent filter. Subsurface sewage disposal systems that discharge sewage onto the ground surface, into an open watercourse, or otherwise cause health hazards or nuisance conditions shall be identified as "failing", and the local director of health shall investigate and take necessary action pursuant to PHC Section 19-13-B103c (f) to abate the conditions.

Inlet and outlet baffles shall be inspected for damage or clogging at the time of the tank pump out. When provided, effluent filters shall be properly cleaned at the time of each tank pump out by washing the filter waste into the septic tank or, if rinse water is not available, exchanged with a clean effluent filter. All contaminated effluent filters shall be treated as sewage and handled properly during the cleaning and/or exchange process.

5. Septic Tank Markings

Tank information (size, date manufactured, name of manufacturer, and indication of limit of external loads/cover depths required by Section 13 of ASTM C 1227) shall be located on the top of the tank between the outlet access hole and outlet wall, or on the vertical outlet wall between the top of the tank and the top of the outlet opening. All septic tanks shall be manufactured with manhole covers or risers that have been placarded with notification of its two-compartment construction and a warning that "Entrance into the tank could be fatal".

6. Performance Testing

Watertight tank seals shall be specified whenever tank water-tightness is critical (i.e., infiltration into a pump chamber is a concern or when a repair septic tank is proposed within the sanitary radius of a water supply well). Plans or approvals requiring tank leakage testing shall utilize a vacuum test or water-pressure test in accordance with the following, unless otherwise specified by the design engineer:

Vacuum Test: Assemble empty tank including temporary sealing of inlet and outlet pipes and all access openings. Attach a vacuum device that is capable of drawing a minimum vacuum pressure of 7 inches (175 mm) of mercury (HG). To measure negative pressure drawn, the vacuum device shall utilize a calibrated gauge (range no greater than 0-10 inches/HG), mercury manometer, or water manometer accurate to within 0.2 inches/HG. Apply a vacuum to 4 inches (100 mm)/HG. Tank passes leakage test once negative pressure is held for 5 minutes without loss of pressure. If the tank fails test, then the tank can be repaired per manufacturer's recommendations and retested.

Water-Pressure Test: Seal the tank. Fill with water and let stand for 24 hours. Refill the tank. The tank passes the leakage test if the water level is held for 1 hour.

B. Septic tank capacities

1. The minimum liquid capacities/volumes of septic tanks serving residential buildings shall be based on the following:

Minimum Septic Tank Capacities for Residential Buildings

	Single-family	**Multi-family**
1-3 bedrooms	1,000 gallons	1,000 gallons
4 bedrooms	1,250 gallons	1,250 gallons
For each bedroom beyond 4	Add 125 gallons per bedroom	Add 250 gallons per bedroom

2. The minimum liquid capacity of a septic tank serving a non-residential building or a residential institution shall equal the 24-hour design flow (See Table 4). In no case shall a septic tank be installed with a liquid capacity of less than 1000 gallons. In cases of non-residential buildings that are subject to high peak sewage flows, the liquid capacity of the septic tank shall provide a minimum detention time of 2 hours under peak flow conditions. The detention time is the volume of the liquid in the tank divided by the flow rate through the tank. The required septic tank capacity shall be increased by a minimum of 50% at food service establishments and restaurants in instances of repairs of existing subsurface sewage disposal systems where it is determined that it is not feasible to install a grease interceptor tank or internal automatic grease recovery unit.

3. When more than 25 percent of the building's design flow will be pumped into the septic tank, the size of the tank shall be increased 50 percent beyond the minimum capacity required per Section V B.

4. The liquid capacity of a septic tank shall be increased whenever a residential building contains a garbage grinder or large capacity bathtub in accordance with the following:

Garbage grinder: Add 250 gallons to required capacity of the septic tank. Garbage grinders are not recommended for use with subsurface sewage disposal systems.

Large tub: 100 to 200 gallon tub: Add 250 gallons to required capacity of the septic tank
Over 200 gallon tub: Add 500 gallons to required capacity of the septic tank.

C. Grease interceptor tanks

Grease interceptor tanks shall be provided for restaurants and other Class 3 & 4 food service establishments with design flows of 500 gallons per day or greater for new construction, and repairs of existing subsurface sewage disposal systems where feasible. If it is not feasible to install a grease interceptor tank on a food service/restaurant system repair, a mechanical automatic grease recovery unit (AGRU) is recommended for the internal wastewater piping in the kitchen. If a grease interceptor tank or an internal AGRU is not included in a food service/restaurant septic system repair, then the required septic tank capacity shall be increased by a minimum of 50% (See Section V B).

Grease interceptor tanks shall receive wastewater from the kitchen waste lines only. Effluent discharged from the grease interceptor tank shall be directed to the inlet side of the septic tank. The capacity of grease interceptor tanks shall be a minimum of 1000 gallons and shall meet or surpass the 24-hour design flow. For restaurants and food service establishments with design flows of 2,000 gallons per day or greater, two grease interceptor tanks in series shall be provided. Such grease interceptor tanks shall have a combined liquid volume meeting or surpassing the 24-hour design flow. Grease interceptor tanks shall have inlet and outlet baffles that extend to a depth of 6 to 12 inches above the tank bottom (see Figure 7) and extend at least 5 inches above the liquid level. Effluent filters are not required on grease interceptor tanks, but they can be used if the manufacturer of the filter specifies that it is suitable for grease, oil, scum, and solids removal for this type of waste. All manholes over grease interceptor tank cleanouts shall be watertight and extended to grade to facilitate cleaning. Tanks deeper than 24 inches below finish grade shall be provided with large (24-inch minimum inside diameter) access risers over each cleanout manhole opening. Grease interceptor tanks shall be provided with manhole covers that have been placarded with notification as to the danger of entering the tank due to noxious gases.

Grease interceptor tanks can be single or two-compartment tanks and shall be constructed out of concrete or other durable material. Concrete grease interceptor tanks shall meet all structural and access requirements for concrete septic tanks. This includes applicable configuration (pipe seals, inlet/outlet differential, etc.) and access requirements (riser sizes, stepped covers, etc.) consistent with the requirements for concrete septic tanks. Concrete grease interceptor tanks shall be marked with tank information (size, name of manufacturer, date manufactured, loading limits), and be subject to other applicable septic tank provisions (performance testing, cleaning, tank abandonment, etc.). Non-concrete grease interceptor tanks shall meet all of the requirements for concrete grease interceptor tanks excluding the structural and marking requirements. The Commissioner of Public Health shall approve non-concrete grease interceptor tanks. Some manufactures of plastic (polyethylene) septic tanks do not authorize their tanks be used as grease interceptor tanks due to the high temperature of the wastewater. Non-concrete grease interceptor tanks shall be marked with the manufacturer's name and tank designation number.

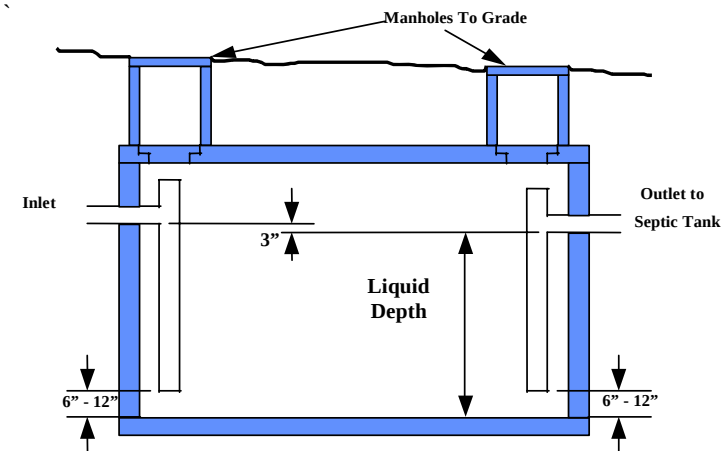


Figure 7 - Grease Interceptor Tank

VI. EFFLUENT DISTRIBUTION, PUMP SYSTEMS & AIR INJECTION PROCESSES

A. General

Septic tank effluent shall be distributed by gravity, pump, or siphon in a manner that promotes uniform distribution of effluent and full utilization of the leaching system. Leaching systems shall be designed to avoid effluent backflow into the septic tank. The outlet invert of the tank shall be set at a higher elevation than the top of all leaching structures (except in pump systems), or in the case of leaching systems utilizing serial distribution, higher than the high-level overflow elevation of the upper most leaching system row. Leaching systems designed for serial distribution shall be designed so that the high-level overflow invert elevations are within the top 3 inches (0.25 feet) of the leaching structure (trench, gallery, etc.). It is recommended that subsurface sewage disposal systems be designed to allow for gas and air transfer from the leaching system back through the septic tank and building vents. Fully flooded distribution boxes should be avoided, and it is recommended that distribution piping/boxes be designed so that there is an air space in all pipes during normal leaching system operation.

Leaching systems shall be provided with access points consisting of distribution boxes, cleanouts (galleries, pits), or capped sanitary tees. Access points on large (2000 GPD or greater) and non-residential leaching systems in paved areas shall be provided with H-20 load rated risers to grade. At least one access point shall be provided for each leaching system row. A single distribution box feeding row segments at the same elevation on either side of the distribution box shall constitute access points for both row segments. Leaching systems with rows at the same elevation shall have ends connected wherever feasible (see Figure 8). Non-level leaching systems may apply effluent by dosing (pump, siphon), serial distribution with high-level overflow (See Figures 9 and 10), or by approved effluent splitting devices (i.e., Polylok Dipper D-Box, Equalizer pipe inserts, or Zoeller Tru Flow D-box).

B. Mandatory Dosing

Large subsurface sewage disposal systems (2000 GPD or greater) with more than 600 linear feet of leaching system shall utilize intermittent dosing arrangements. Dosing can be accomplished by pump, siphon, or other approved methods such as the Rissy Plastics' Floating Outlet Distribution Chamber (FLOUT). Dosing systems shall be designed to dose the leaching system at a frequency of 3 to 6 cycles per day unless timed dosing is utilized. Dosing chambers shall have access manholes to grade. Large subsurface sewage disposal systems utilizing pump systems shall be designed with duplicate alternating pumps. Alternating pump and siphon systems shall be designed to provide full leaching system utilization in the event one pump or siphon fails to operate.

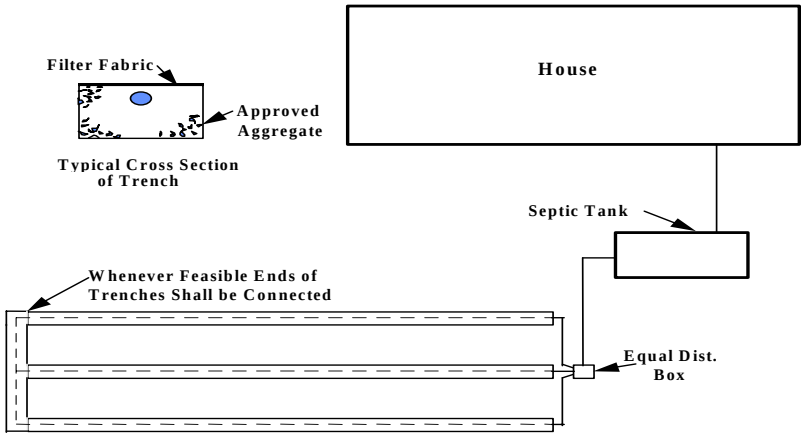
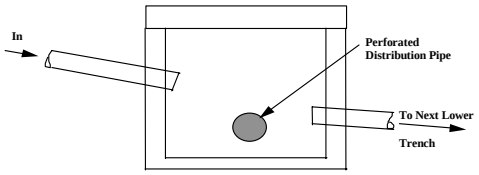
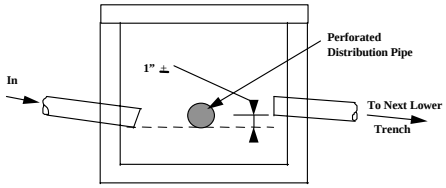


Figure 8 - Level Leaching Systems



High - Level Overflow Dist. Box



Reversed Distribution Box

Note: The high-level overflow invert elevation shall be set in the upper 3 inches of the leaching system row feeding the lower elevation leaching system row. Use of reversed distribution boxes are not recommended in order to ensure gas transfer.

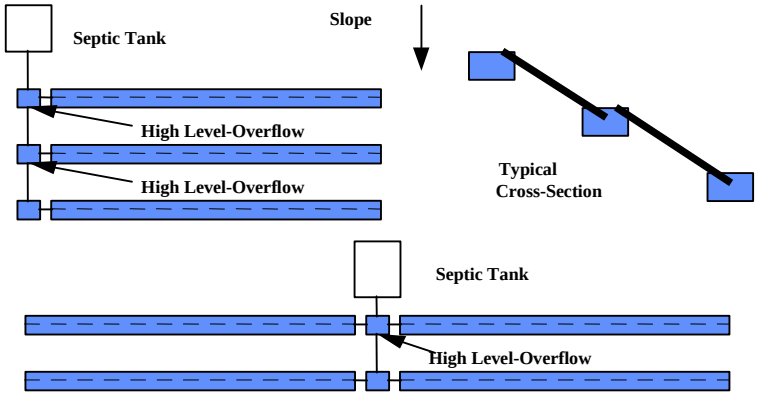


Figure 9 - Serial Distribution Boxes and Systems

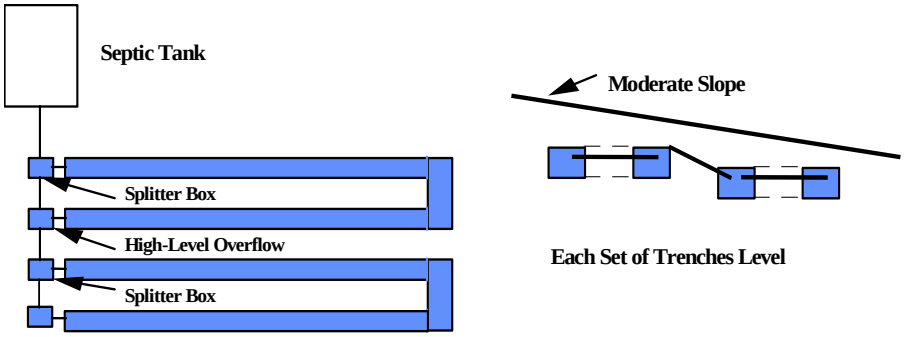


Figure 10 - Alternative Distribution Systems

C. Pump Systems

Effluent pump chambers shall be provided with watertight risers/manholes to grade and high-level alarms. Pump chambers deeper than 24 inches below finish grade shall provide 24-inch minimum inside diameter risers over access manholes. Effluent pumps shall be approved by the manufacturer for use in sewage disposal systems. Force mains shall be freeze protected by locating pipe below the frost line, allowing back drainage into the pump chamber through a weep hole, or other means (insulation). Back siphonage from the leaching system and/or excessive pump cycling shall be avoided when a weep hole is provided. Approved force mains are listed in Table 2-D. Pump chambers in shallow groundwater areas shall utilize watertight tank seals, and it is strongly recommended that the tank be tested for leakage to ensure water tightness.

Small subsurface sewage disposal systems (< 2000 GPD) shall provide either duplicate alternating pumps or a single pump with emergency storage volume in the pump chamber equal to at least the daily design flow. Emergency storage shall be the volume above the alarm level and below the inlet pipe (See Figure 11).

Specifications shall be provided for all the internal components of the pump chamber including the pump(s), piping, floats/transducers, alarms, disconnect chain, valves, etc. Pump on/off levels and alarm level shall be specified along with the dose volume and emergency storage provided. Pump systems can utilize pressure transducers, mechanical float switches, etc. The sale of mercury float switches is banned in the State of Connecticut. The pump shall be rated to handle the design flow rate at the total dynamic head for the installation. A check valve shall be provided on the pump discharge line unless the pump manufacturer does not require one. Pipe unions, lift chain, and manhole location shall allow for convenient pump removal for routine maintenance, and electrical and pump connections shall be readily accessible from the ground surface. Piping attached to the pump shall be set close enough to the top of the chamber under the manhole to allow for servicing, and a quick-disconnect device shall be utilized to allow for easy removal of the pump for maintenance. Internal pump chamber appurtenances shall be non-corrosive and suitable for the corrosive sewage effluent environment. All electrical work for the pump requires a permit from the local building official.

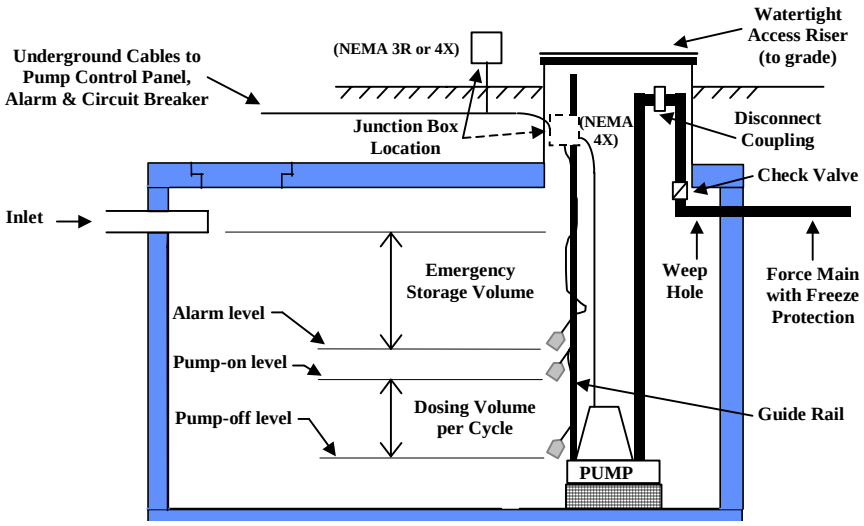


Figure 11 - Pump Chamber

Pump systems can utilize timed-dosed or volume-dosed systems. Pump systems shall avoid dosing large volumes of effluent into leaching systems with limited storage capacities. Dosing volume should not exceed 20 percent of the internal leaching system storage volume, unless otherwise recommended by the Commissioner of Public Health.

Pump chambers shall be concrete or other durable material, and the inlet of the pump chamber shall be at or below the septic tank outlet. The Commissioner of Public Health shall approve non-concrete pump chambers. Pump chambers, including the riser and cover assemblies, located under vehicular travel areas shall be rated for H-20 wheel loadings. Non-concrete pump chambers shall be installed in accordance with the manufacturer's instructions. See Section V A 1 b for further restrictions and requirements for the installation of non-concrete tanks. Concrete pump chambers shall meet all structural requirements for concrete septic tanks, and shall be

marked with tank marking information (size, name of manufacturer, date manufactured, loading limits) and be subject to other applicable septic tank provisions (performance testing, tank abandonment, etc.).

Low-pressure distribution systems require a professional engineer design. The design shall include access and flushing provisions for the purpose of routine maintenance and checking pressure in the lines. Provisions shall also be provided for flow adjustment to the distribution lines. The design shall also include pressure filters, orifice shields, manifold access and pipe information (size, specifications, hole diameter/spacing) as well as pump information. The design engineer shall specify operation and maintenance requirements (i.e., flushing of the lines, checking pressure heads).

Raw sewage pumps are not recommended for use with subsurface sewage disposal systems. Where pumping is required, and the installation of a separate effluent pump chamber is not possible, combination septic tank/effluent pump systems may be utilized. In the event raw sewage pumps are necessary, solids handling (ejector) pumps are recommended over grinder pumps. If raw sewage pumps are necessary for basement fixtures, upper level flows should be directed to the septic tank by gravity where feasible. In the event more than 25% of the daily design flow will be pumped into the septic tank, the required septic tank capacity shall be increased per Section V B 3. Raw sewage pumps outside the building served are considered part of the subsurface sewage disposal system; therefore, they shall be installed in compliance with the separation distance requirements in Table 1. Raw sewage pumps/vaults below basement slab elevation are considered outside the building unless they are installed in a sealed pit or otherwise designed to contain potential leakage in the basement. Exterior raw sewage pump systems shall be provided with an access to grade and a system malfunction alarm.

Combination septic tank/effluent pump systems may be utilized in instances where space constraints, site limitations or other technical justifications make it advantageous to install a single tank/pump unit. Combined septic tank/effluent pump systems shall utilize an approved screened pump vault installed in the second compartment of an oversized two-compartment septic tank. Emergency storage shall be provided for single pump systems. Draw down is only allowed in the second compartment. Use of mid-liquid depth tee baffles with a compartment connection pipe at the liquid level shall be utilized to draw down effluent in second compartment only (See Figure 12). Required septic tank capacity shall be provided below the "pump-off" level.

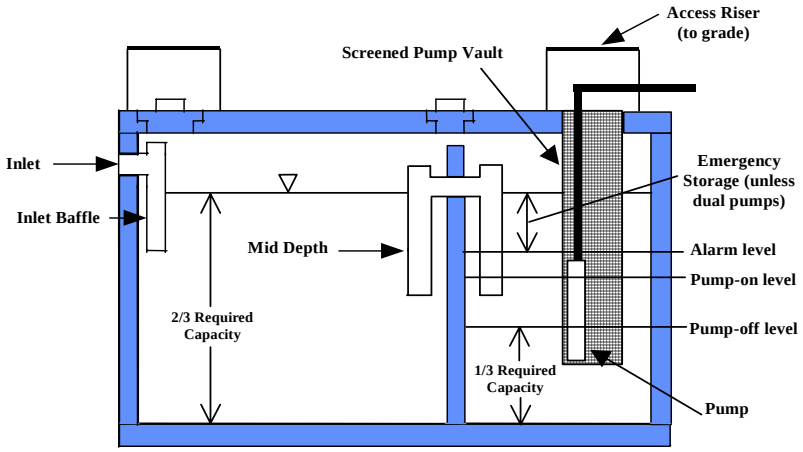


Figure 12 - Combination Septic Tank/Pump System with Tee Baffle Connection

D. Leaching System Enhancement/Rejuvenation

The patented Soil Air System provided by Geomatrix, LLC may be utilized on new leaching systems, or on existing systems that are not at risk of hydraulically overloading the naturally occurring soil and provide the required minimum separation distance above ledge rock and maximum groundwater. Utilization of the Soil Air System requires a permit from the local director of health. Site investigations will be necessary to gather soil test information if the data is not readily available.

Existing sewage disposal systems that are determined to be candidates for the Soil Air System shall be evaluated to determine the extent of current code compliance. A repair plan shall be prepared identifying the location of the existing system and, if feasible, a code-complying area. Sites that cannot support a code-complying area

shall have a potential repair area identified. Large systems (2,000 GPD or greater) require engineered plans that shall be approved by the Commissioner of Public Health as required by PHC Section 19-13-B103d (c). The local director of health may require engineered plans in areas of special concern on sites less than 2,000 gallons per day in accordance with PHC Section 19-13-B103d (e)(4).

The Soil Air System shall not be utilized on cesspools, or on excessively undersized leaching systems, unless it is determined that it is not feasible to expand the leaching system. Leaching systems are considered to be excessively undersized if they provide less than 50 percent of the required effective leaching area. The local director of health may require further upgrades to existing sewage disposal systems in conjunction with implementation of the Soil Air System. Upgrades may include leaching system expansion or the installation of additional tanks (septic, grease interceptor).

Soil Air Systems shall be periodically evaluated and monitored to verify satisfactory system operation. The permit to discharge shall stipulate that the local director of health be notified in writing in the event the Soil Air System is no longer in use on a site. A standard tee baffle can only be utilized in place of an effluent filter on the septic tank outlet if Geomatrix, LLC and the system designer are in agreement that it is advantageous to do so. The effluent filter shall be re-installed once the Soil Air System is removed.

E. Leaching System Clogging Break-up

The patented Terra-lift process may be utilized on existing sewage disposal systems that provide the required minimum separation distance above ledge rock and maximum groundwater, and that have historically operated satisfactorily but have experienced declining capacity due to infiltrative surface clogging. Utilization of the Terra-lift process requires a permit from the local director of health. Site investigations will be necessary to gather soil test information if the data is not readily available.

Existing sewage disposal systems that are determined to be candidates for the Terra-lift process shall be evaluated to determine the extent of current code compliance. A repair plan shall be prepared identifying the location of the existing system and, if feasible, a code-complying area. Sites that cannot support a code-complying area shall have a potential repair area identified. Large systems (2,000 GPD or greater) require engineered plans that shall be approved by the Commissioner of Public Health as required by PHC Section 19-13-B103d (c). The local director of health may require engineered plans in areas of special concern on sites less than 2,000 gallons per day in accordance with PHC Section 19-13-B103d (e)(4).

The Terra-lift process shall not be utilized on cesspools, or on excessively undersized leaching systems, unless it is determined that it is not feasible to expand the leaching system. Leaching systems are considered to be excessively undersized if they provide less than 50 percent of the required effective leaching area. The local director of health may require further upgrade of existing sewage disposal systems in conjunction with implementation of the Terra-lift process. Upgrades may include leaching system expansion or the installation of additional tanks (septic, grease interceptor).

VII. PERCOLATION TESTS

A percolation test consists of three steps: 1) presoaking the percolation hole, 2) refilling and allowing the hole to saturate under certain conditions, and 3) determining the minimum uniform percolation rate after saturation. The purpose of the presoak is to allow sufficient soil-water contact time. During the presoak, swelling clays that may be present in the soil will expand thereby reducing the void space in the soil. Sufficient presoaking allows the advancing capillary wetting front, which controls the water flow rate in unsaturated soils, to move away from the test hole so that an apparent equilibrium flow rate is reached. Percolation tests should be avoided when the ground is overly saturated due to heavy rain events, flooding, etc.

Percolation tests shall be made in a 6 to 12 inch diameter hole dug to the depth of the proposed leaching system. At locations where there appears to be 2 or more soil strata of different texture or structure, each strata shall be tested separately with holes at relative depths. In calculating the required leaching area (primary and reserve), only representative test results in the area and at the depth of the proposed leaching system shall be used, but all site percolation tests and observation pits shall be reported.

The required presoak time will vary depending on the soil and its moisture content. Presoaking shall be started by filling the percolation hole with a 12-inch depth of water. If the water seeps away in less than 2 hours, the hole may be refilled to a 12-inch depth and the percolation test begun. If any water remains in the hole after 2 hours, it

shall be refilled to a 12-inch depth and allowed to presoak for at least 2 additional hours before the percolation test is begun. However, extended presoaking is not required when determined that the soil contains an insignificant amount of clays. Any test hole that has continuously contained water for at least 4 hours shall be considered adequately presoaked. Tests performed immediately after the presoak period yield more accurate results. If tests cannot be performed immediately, test holes may be presoaked in the morning and tested in the afternoon, or presoaked one day and tested the following day. If more than 30 hours have elapsed following the initial presoak, the test hole shall be presoaked once again.

Following the presoak, the hole shall be refilled with 12 -inch depth of water to begin percolation test. There will be an initial drop of the water level in the test hole that shall diminish as an apparent equilibrium rate is attained. The minimum uniform percolation rate following saturation shall be used to calculate the size of the leaching system.

Whenever a leaching system is installed entirely in select fill above existing grade, it shall be sized on the slower percolation rate of either the underlying receiving soil or select fill. In cases where the underlying receiving soil has a percolation rate slower than 20 minutes per inch, the leaching system may be sized on a 10.1 – 20.0 minute per inch rate as long as the select fill has a percolation rate faster than 20 minutes per inch. MLSS calculations shall be based on the percolation rate of the receiving soil (See Appendix A).

VIII. LEACHING SYSTEMS

A. General

Leaching systems shall not be constructed in areas where high groundwater, surface flooding, or ledge rock will interfere with its effective operation. Leaching systems should be installed as shallow as possible and preferably not under parking or vehicular travel areas. The maximum depth of the bottom of a leaching system below finished grade shall be 8 feet. The maximum width of leaching products (i.e., trenches, galleries, proprietary systems) shall be 6.5 feet, except for leaching pits. Entering deep test pits above the waist can result in bodily harm or death in the event of cave in. Use of shallow shelves is recommended to allow for assessment of the soil in the upper profile of the pit. Refer to OSHA standards for pit safety measures/restrictions. Site investigation documentation shall be recorded on Form #2 or Form #2 Alternate.

The bottom of any leaching system shall be a minimum 18 inches above the maximum groundwater level and a minimum 4 feet above ledge rock. Additional separation shall be provided if the natural occurring soil has a percolation rate faster than one (1) minute per inch, and for large sewage disposal systems. Whenever the design percolation rate is faster than one (1) minute per inch, the minimum separation to maximum groundwater shall be increased to 24 inches, and the minimum separation above ledge rock shall be increased to 8 feet or the distances shall be doubled from any water supply well in accordance with the Special Provisions in Table 1, Item A. For large (2,000 GPD or greater) subsurface sewage disposal systems the minimum separation above maximum groundwater shall be increased to 24 inches unless the design engineer conducts a mounding analysis that demonstrates the mounded maximum groundwater table is at least 18 inches below the bottom of the leaching system.

The applicant shall submit calculations to demonstrate compliance with the Minimum Leaching System Spread (MLSS) criteria using the procedure outlined in Appendix A. No subsurface sewage disposal system shall be denied based solely upon non-compliance with MLSS, but may be denied if the applicant is unable to demonstrate compliance with PHC Section 19-13-B103e (a)(4).

Interconnecting end sections on level leaching systems, and the extensions on L-shaped or U-shaped leaching systems may be credited in certain instances. However, the length of the main row(s) shall only be measured to the center of the interconnecting segment or extension. Leaching systems utilizing products with effective leaching area of 7.4 SF/LF and higher shall not receive credit for U-shaped, L-shaped, or box-shaped leaching system configurations, unless MLSS is not applicable or the groundwater hydraulic gradient is level (essentially 0% slope). U-shaped, L-shaped, or box-shaped leaching system configurations may present a concern for non-uniform effluent loading on MLSS applicable sites with sloped hydraulic gradients.

Local health departments should advise against the creation of new lots that have unsuitable soil conditions pursuant to PHC Section 19-13-B103e (a) in the primary or reserve leaching system area. Unsuitable soil conditions include areas with less than 18 inches of soil above maximum groundwater, and areas with less than 4 feet of soil above ledge rock. In the context of determining leaching area suitability, the area shall include soil within 10 feet in all directions from the side edge of the leaching structure (trench, gallery, etc.).

New subsurface sewage disposal systems constructed in areas where there is no definite schedule for the extension of public sewers within 5 years shall be laid out in such a manner to provide an acceptable reserve leaching area of suitable soil; or in the case of existing single-family residential building lots created prior to January 1, 2007, potentially suitable soil. An area with potentially suitable soil contains less than 4 feet of existing soil above ledge rock but at least 2 feet of which is naturally occurring soil. The reserve area shall be sized based on its percolation rate and have the feasibility to be constructed in conformance with all aspects of the Public Health Code and Technical Standards, except MLSS, for the purpose of enlargement or replacement of the primary leaching system. Reserve areas are not required for repairs of existing leaching systems. Single-family residential building lot shall not be required to fill a reserve area at the time of installation of the primary system. Reserve areas for multi-family dwellings and commercial buildings do not have to be prepared with necessary select fill unless the designated reserve area is located under asphalt pavement or poured concrete (parking or vehicular travel areas).

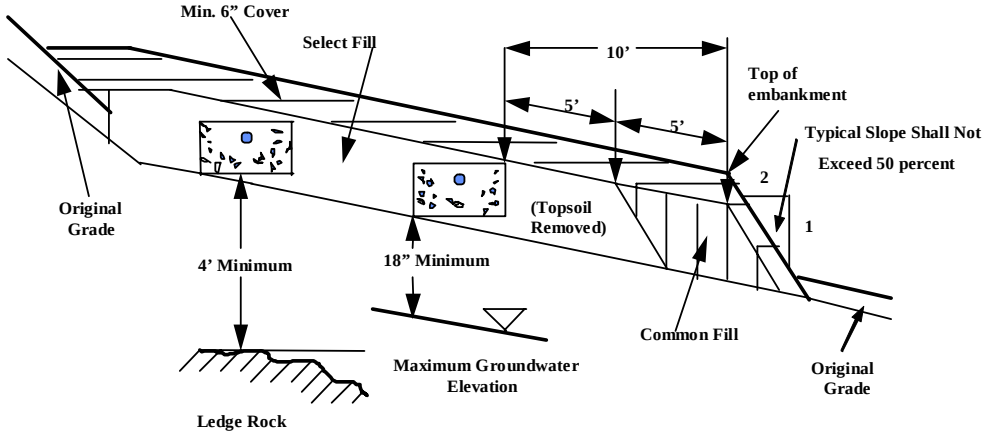


Figure 13 - Minimum Separating Distances Above Ledge Rock and Maximum Groundwater

All subsurface sewage disposal systems shall be protected from siltation and erosion during and after construction. The ground surface over the entire subsurface sewage disposal system shall be graded and maintained to lead surface water away from the area. Leaching systems shall be covered with a minimum of 6 inches of soil and finished in a condition that will prevent erosion over and adjacent to the leaching system. Proprietary leaching systems shall be covered with additional soil in conformance with the manufacturer's installation specifications. The licensed installer shall properly cover the leaching system within 2 working days following the local health department's final inspection and approval.

All leaching systems located in vehicular travel areas shall be capable of handling H-20 wheel loads as follows: 1) Precast concrete structures (galleries, pits) shall be H-20 load rated. 2) Leaching trenches shall have a minimum 12 inches of cover. 3) Proprietary leaching systems shall only be used in vehicular travel areas if authorized by the manufacturer, and shall be H-20 load rated. Proprietary leaching system companies authorizing placement of systems in vehicular travel areas shall file supporting documentation with the Commissioner of Public Health.

Subsurface sewage disposal system design plans that include retaining walls shall provide design information and specifications including type of retaining wall structure, groundwater control mechanisms (drains, weep holes), footings, and a cross-section showing existing and proposed grades. Groundwater drains utilized in retaining wall construction shall meet the minimum separating distances listed in Table 1. Retaining walls within 50 feet downgradient of a leaching system shall not act as a hydraulic barrier to groundwater and wastewater movement in the receiving soil. The inner edge of the retaining wall shall be at least 10 feet from the leaching system. Retaining walls shall be designed to prevent seepage from occurring through the above grade portions of the wall.

No cast iron or ductile iron piping shall be allowed following the septic tank or grease interceptor tank due to corrosive factors. Use of 3-inch diameter PVC meeting ASTM D 2729, or 4-inch diameter PVC meeting ASTM D 3034, SDR 35 or equal, is required for all solid effluent distribution piping. Approved effluent distribution pipes are listed in Table 5. All distribution piping located within 25 feet of a drain or open water course, or within the sanitary radius of a water supply well, shall be approved piping with rubber gasketed joints or approved equal (See Table 2-C). Solid effluent distribution pipe between a septic tank and a leaching system shall not have a negative pitch.

Whenever two different types of leaching products are utilized side-by-side, the average of the required minimum center to center spacing shall be maintained. The specified center to center spacing is also applicable for the primary system relative to the reserve system. Leaching system products with an effective leaching area of 7.4 SF/LF and higher shall not be utilized where the underlying receiving soil has a percolation rate slower than 30 minutes per inch. The length of individual leaching trenches, gallery, or proprietary leaching system row segments shall not exceed 75 feet measured from the inlet, except that in installations where intermittent dosing exceeding 25 gallons/cycle is used, a maximum length of 100 feet may be utilized.

Stone aggregate utilized in leaching system installations shall meet the following gradations for either No. 4 stone aggregate or No. 6 stone aggregate:

	No. 4 Stone Aggregate (A.K.A., 1 & 1/4 " Stone)	**No. 6 Stone Aggregate (A.K.A., 3/4" Stone)**
SIEVE SIZE	**PERCENT PASSING (by weight)**	**PERCENT PASSING (by weight)**
2-inch	100	N/A
1.5-inch	90 – 100	N/A
1-inch	20 – 55	100
3/4-inch	0 – 15	90 - 100
1/2-inch	N/A	20 - 55
3/8-inch	0 – 5	0 - 15
#4	N/A	0 - 5
#40	0 - 3	0 - 3
#200	0 – 1.5	0 – 1.5

A layer of non-woven filter fabric shall be placed over all approved aggregate used in leaching system construction before backfilling. Minimum average roll values for fabric used for covering stone aggregate shall have a unit weight of 1.5 oz./yd² (per ASTM D 5261), a permittivity of 1.0 sec-¹ (per ASTM D 4491), and a trapezoid tear strength of 15 lbs. (per ASTM D 4533). Minimum average roll values for fabric used for covering two (2) inch nominal tire chip aggregate shall have a unit weight of 3.0 oz./yd² (per ASTM D 5261), a permittivity of 1.0 sec-¹ (per ASTM D 4491), and trapezoid tear strength of 35 lbs. (per ASTM D 4533). All non-woven filter fabric used for covering approved aggregate shall bear the appropriate manufacturer's label specifying the product's name and identification number. Labeling shall be affixed in such a manner to be readily visible to facilitate inspection. The Commissioner of Public Health shall maintain a list of approved filter fabrics. The approved list as of the date of this revision is provided in Appendix C.

Select fill placed within and adjacent to leaching system areas shall be comprised of clean sand, or sand and gravel, free from organic matter and foreign substances. The select fill shall meet the following requirements unless otherwise approved by the design engineer. Select fill exceeding 6% passing the #200 sieve based on a wet sieve analysis cannot be approved by the design engineer.

1. The select fill shall not contain any material larger than the three (3) inch sieve.
2. Up to 45% of the dry weight of the representative sample may be retained on the #4 sieve. Note: This is the gravel portion of the sample.
3. The material that passes the #4 sieve is then reweighed and the sieve analysis started.
4. The remaining sample shall meet the following gradation criteria:

SIEVE SIZE	**PERCENT PASSING**	
	WET SIEVE	**DRY SIEVE**
#4	100	100
#10	70 - 100	70 - 100
#40	10 - 50 *	10 - 75
#100	0 - 20	0 - 5
#200	0 - 5	0 - 2.5

* Percent passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 sieve does not exceed 5%.

Select fill that does not meet the dry sieve gradation criteria, but meets the wet sieve gradation criteria, is acceptable. Sieve testing of select fill is required for large (2,000 GPD or greater) systems whenever the leaching system is located totally in select fill above existing grade. The local director of health may require sieve testing of select fill on small systems (less than 2,000 GPD) in accordance with PHC Section 19-13-B103e (d) (6).

The licensed installer is responsible for preparing the leaching area with necessary select fill. The topsoil in the leaching system area shall be removed and the subsoil scarified prior to select fill placement, unless otherwise directed by the design engineer. The installer shall take the necessary steps to protect the underlying receiving soil from over compaction or damage. The installer is responsible for properly compacting select fill to facilitate construction and to prevent settling. Select fill shall extend a minimum of five 5 feet laterally in all directions beyond the outer perimeter of the leaching system.

The Commissioner of Public Health shall approve manufactured fill. Rock used to produce manufactured fill shall have a loss of abrasion of not more than 50 % using AASHTO Method T-96, and when tested for soundness using AASHTO Method T 104 not have a loss of more than 15% at the end of 5 cycles. Suppliers of manufactured fill shall make application for approval to the Commissioner of Public Health. Documentation shall be submitted on the quarry operation and production process. Fill specifications (gradation, permeability, etc.) and a narrative of the quality control/quality assurance program shall also be included for all active quarries. The manufactured fill producers shall provide annual product registrations to the Commissioner of Public Health by July 1st of each year.

Individuals distributing two (2) inch nominal tire chip aggregate for leaching system construction shall receive approval from both the Commissioner of Public Health and the Department of Environmental Protection (DEP). Distributors shall arrange for annual testing (Due: July 1st of each year) by a Professional Engineer licensed in Connecticut or a NVLAP accredited laboratory to confirm compliance with the specifications noted in the definition of such material. Two (2) inch nominal tire chip aggregate shall not be utilized in leaching systems under vehicular travel areas unless otherwise authorized by the Commissioner of Public Health. Two (2) inch nominal tire chip aggregate shall not be utilized as a substitute for stone aggregate unless authorized by the plan designer, and shall not be utilized with proprietary leaching systems unless authorized by the leaching system product manufacturer.

Leaching systems utilizing two (2) inch nominal tire chip aggregate shall be covered with heavy-duty filter fabric. DEP approvals for the distribution/use of two (2) inch nominal tire chip aggregate include record keeping requirements, and installers utilizing such aggregate shall provide a bill of lading along with a copy of the DEP approval to the local director of health prior to issuance of the permit to discharge. DEP approvals for use of two (2) inch nominal tire chip aggregate in leaching system construction prohibit the on-site abandonment of such systems, unless approved by the local director of health following confirmation that the two (2) inch nominal tire chip aggregate is to remain at least 18 inches above maximum groundwater.

B. <u>Leaching Trenches</u>

Leaching trench rows shall be installed level and follow ground contours. Trench widths shall be 18, 24, 30, 36, or 48 inches. The trenches shall contain a depth of at least 12 inches of approved aggregate. Approved stone aggregate shall meet the No. 4 or No. 6 stone aggregate gradation. A distribution pipe shall be laid the entire length of the trench near the top layer of aggregate. Distribution pipes shall be of acceptable material (See Table 5) with suitable perforations or open joints laid in a downward direction. Distribution pipes shall be laid level or on a grade not exceeding 2 to 4 inches per 100 feet. The distribution pipes shall be covered with at least 2 inches of approved aggregate, and there shall be at least 6 inches (for 48-inch wide trenches) or 12 inches (for 36-inch or less wide trenches) of this material under the distribution pipe.

For the purposes of Section VIII F & G, the effective leaching area of leaching trenches and corresponding minimum center to center spacing between trenches shall be as follows:

Trench Depth (inches)	Trench Width (inches)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
18	18	2.1	7
18	24	2.4	7
18	30	2.7	7
18	36	3.0	7
12	48	3.0	8

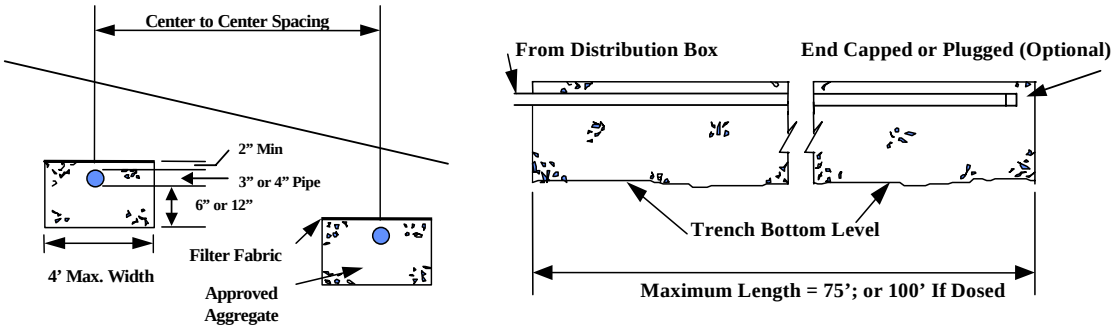


Figure 14 - Leaching Trenches

C. Leaching Pits

Leaching pits shall be hollow structures with perforated walls and tight covers. The side walls shall be surrounded by at least 12 inches, but not more than 24 inches, of approved aggregate and the hollow structure shall be no less than 5 feet nor greater than 10 feet in diameter. Approved stone aggregate shall meet the No. 4 stone aggregate gradation. Covers shall be equipped with a cleanout manhole. Center to center spacing of leaching pits shall be at least 4 times the diameter of the hollow structure. No more than two leaching pits shall be connected in series. The bottom of leaching pits shall not be more than 8 feet below finished grade. Leaching pits shall not be used where the percolation rate is slower than 20 minutes per inch.

For the purposes of Section VIII F & G, the effective leaching area of leaching pits shall consist of only the side area of the usable aggregate-filled excavation. The maximum utilization of a leaching pit cannot be higher than the septic tank outlet elevation or the high-level overflow elevation of the serial distribution box.

Effective Leaching Area = Excavation Diameter X π X Pit Depth
(Note: π equals approximately 3.14)

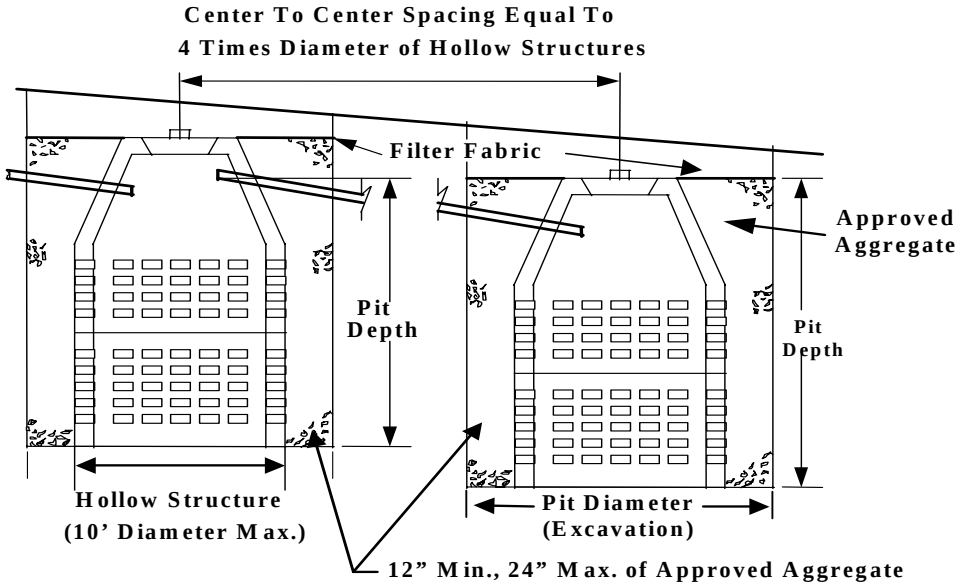


Figure 15 – Leaching Pits

Table 5 – Effluent Distribution Pipe

USE	PIPE DESCRIPTION	TYPE OF JOINT	REMARKS
Solid and perforated effluent distribution pipe used after the septic tank, except for such solid piping that is located within 25 feet of a drain or open watercourse, or within the sanitary radius of a water supply well. See Table 2-C for distribution piping located within 25 feet of a drain or open watercourse, or within the sanitary radius of a water supply well. (Also see Table 2-D for sewage force main)	PVC ASTM D 3034, SDR 35 PVC ASTM F 789, PS-46 PVC ASTM F 891, PS-50 PVC ASTM F1760 SDR35	Rubber compression gasket, or bell and spigot with no gasket	Heavy duty plastic pipe for shallow pipe installation
	PVC ASTM D 2729 - only 3" diameter pipe (see remarks for use of 4" pipe)	Bell and spigot, no gaskets	4" diameter pipes can be used but shall be bedded in 6" min. of approved aggregate and covered with 2" min. of aggregate or with other special bedding requirements to protect against crushing
	PE ASTM F 810, SDR 38 PE ASTM D 3350 - only 3" diameter pipe (see remarks for use of 4" pipe)	Bell and spigot, no gaskets	4" diameter corrugated smooth interior wall polyethylene leaching pipe meeting ASTM D 3350 and performance specification ASTM F 405 may be used without bedding
	PE corrugated rigid pipe: ASTM 1248 (coil pipe not acceptable) - only 3" diameter pipe (see remarks for use of 4" pipe)	Sleeve joints	
	PE ADS N-12, ASTM F 667, AASHTO M-294	Snap on sleeve joint	Gasket couplings for watertight installation are available

D. Leaching Galleries

Leaching gallery rows shall be installed level and follow ground contours. Leaching galleries shall be hollow structures with perforated or open joint sides and tight covers, and 12 inches of approved aggregate shall be placed on the sides of concrete galleries and on the ends of the gallery rows. Leaching galleries shall provide a minimum 40 inches of open bottom width. The sidewalls shall have a minimum depth of 12 inches and a maximum depth of 4 feet, including up to 6 inches of approved aggregate above the top of the structure. Whenever approved aggregate is placed on top of the structure for additional credit, the distribution pipe should be located in the approved aggregate above the structure if feasible. Stone aggregate backfill for concrete galleries shall meet the No. 4 stone aggregate gradation. The width of the trench excavation shall not be less than 6 feet and the width of the hollow structure(s) shall be not less than 4 feet. The bottom of each leaching gallery row shall be level, and the total length of excavated gallery row shall be utilized to calculate effective area.

For the purposes of Section VIII F & G, the effective leaching area of gallery rows and corresponding minimum center to center spacing between rows shall be as follows:

Gallery Height (inches)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
48	9.2	12
36	8.0	12
30	7.4	12
27	7.1	12
24	6.8	12
18	6.2	12
12	5.9	12

Single plastic chambers (i.e., Infiltrator ISI 3050, Cultec Recharger 330XL HD) or multiple plastic chambers may be utilized in a gallery configuration (See Figure 16) as long as the minimum open bottom width is provided, and the proprietary leaching system company authorizes such installation practice. Stone aggregate backfill for plastic chambers shall meet the No. 4 or No. 6 stone aggregate gradation.

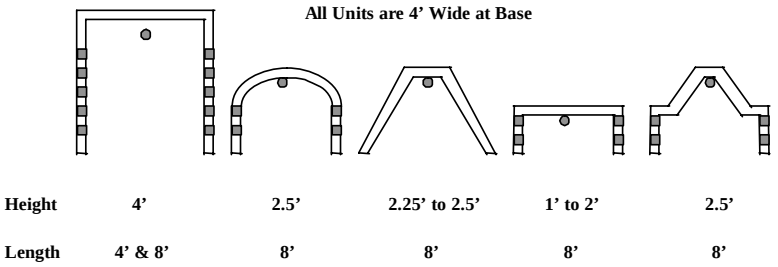
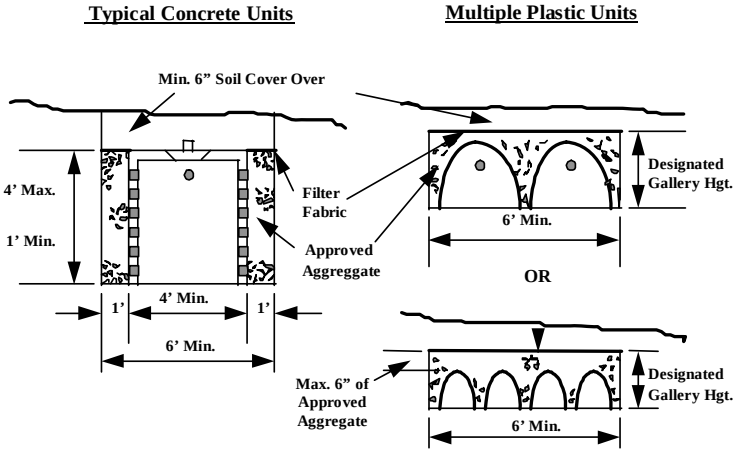


Figure 16 - Typical Leaching Gallery Structures



E. Proprietary Leaching Systems

Installation procedures, including the minimum depth of cover, shall be per manufacturer's specifications. It is the responsibility of proprietary leaching system companies to ensure that installers are properly trained on installation protocols. Proprietary leaching system rows shall be installed level and follow ground contours. Proprietary leaching systems that require placement of soil at the infiltrative interface shall be backfilled with select fill, unless otherwise noted. Several proprietary leaching products require use of ASTM C 33 sand or washed sand meeting Department of Transportation (DOT) Form 816 Specification M.03.01 for fine aggregate. ASTM C 33 sand and DOT washed sand have no medium and large gravel (3/8 to 3 inches), and limited (less than 5%) small gravel (#4 sieve to 3/8 inches). Sand specified for the infiltrative interface shall meet select fill gradation specifications for the #100 and #200 sieves.

Two (2) inch nominal tire chip aggregate shall not be utilized for backfill with proprietary systems unless so authorized by the leaching system product manufacturer. Approved stone aggregate utilized in proprietary leaching systems shall meet stone aggregate requirements, and the No. 4 or No. 6 stone aggregate gradation.

1. Plastic Leaching Chambers

a) Plastic Leaching Chambers Backfilled with Select Fill or Approved Aggregate

For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Infiltrator - Equalizer 24	15" x 11"	2.3	7
Infiltrator - Equalizer 36	22" x 13.5"	2.7	7
Infiltrator - Sidewinder (Stand.)	34" x 12"	3.7	7
Infiltrator - Sidewinder (High Cap.)	34" x 16"	3.9	7

The above units shall be backfilled with select fill or approved aggregate to receive full credit. A 0.4 SF/LF ELA reduction shall be assessed if the chambers are backfilled with soil not meeting select fill gradation requirements.

b) Plastic Leaching Chambers Backfilled with Approved Aggregate

The following chambers cannot be backfilled with select fill unless the chambers are lined/covered with filter fabric (See Section VIII E 7 for ELA). The chambers can be used without being lined/covered by filter fabric, however the chambers shall be backfilled with approved aggregate. For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Cultec - Contactor EZ-24	16" x 12"	1.9	7
Cultec - Contactor EZ-24 (PDS)	16" x 12"	2.5	7
Cultec - Contactor 75	26.5" x 12.4"	2.6	7
Cultec - Contactor 100	36" x 12.5"	3.7	7
Cultec - Contactor 100 (PDS)	36" x 12.5"	4.3	7
Cultec - Contactor 125	26.5" x 18"	2.9	7
Cultec - Recharger 180	36" x 20.5"	4.4	7
Cultec - Recharger 180 (PDS)	36" x 20.5"	5.1	9
Cultec - Recharger 280	46" x 26.5 "	6.5	10
Cultec - Recharger 280 (PDS)	46" x 26.5 "	7.1	10
Cultec - Recharger 330XL HD	52" x 30"	5.6	11
Infiltrator Quick 4 Equalizer 24	16" x 11"	2.0	7
Infiltrator Quick 4 Equalizer 36	22" x 12"	2.6	7
Infiltrator Quick 4 Standard	34" x 12"	3.6	7
Infiltrator Quick 4 High Capacity	34" x 16"	4.1	7
ADS/Hancor- BioDiffuser ARC 36	34.5" x 13"	3.7	7
ADS/Hancor - BioDiffuser ARC 36HC	34.5" x 16"	4.1	7

2. Eljen In-drains

Eljen In-drain units shall be bedded on the bottom and sides with sand fill meeting both the manufacturer's specifications and select fill specifications. For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Eljen In-drain - Type "B" Unit	36" x 7"	4.7	7
Mantis 430-10, Internal Distribution Pipe	30" x 12"	6.5	9
Mantis 430-10, Top Distribution Pipe	30" x 12"	11.0	12
Mantis 536-8	36" x 18"	11.0	12

3. Ruck A Fins

Ruck A Fins units shall be bedded on the bottom and sides with sand fill meeting both the manufacturer's specifications and select fill specifications. For the purpose of Section VIII F & G, the effective leaching area of the approved product listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Ruck A Fins - R1032C	32" x 7"	7.0	9

4. FORM CELL Living Filter

Living Filter units shall be bedded on the bottom and sides with sand fill meeting both the manufacturer's specifications and select fill specifications. For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
Living Filter- LF1210	29" x 18"	3.9	7
Living Filter- LF1810	29" x 24"	5.5	9
Living Filter- LF2410	29" x 30"	7.0	9
Living Filter- LF3010	29" x 36"	8.6	9
Living Filter- LF3610	29" x 42"	10.1	12
Living Filter- LF1224	60" x 18"	7.4	11
Living Filter- LF1826	64" x 24"	11.0	12
Living Filter- LF2426	64" x 30"	14.2	14
Living Filter- LF3026	64" x 36"	17.3	14
Living Filter- LF3626	64" x 42"	20.4	14

5. GreenLeach Filter

GreenLeach Filter (GLF) units shall be bedded on the bottom and sides with sand fill meeting both the manufacturer's specifications and select fill specifications. For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
GLF 12.62	62" x 12"	7.9	12
GLF 15.62	62" x 15"	9.4	12
GLF 18.62	62" x 18"	11.0	14
GLF 21.62	62" x 21"	12.5	14
GLF 24.62	62" x 24"	14.0	14
GLF 27.62	62" x 27"	15.5	14
GLF 30.62	62" x 30"	17.0	14
GLF 33.62	62" x 33"	18.5	14
GLF 36.62	62" x 36"	20.0	14
GLF 12.37	37" x 12"	4.7	9
GLF 15.37	37" x 15"	5.6	9

GLF 18.37	37” x 18”	6.5	9
GLF 21.37	37” x 21”	7.3	9
GLF 24.37	37” x 24”	8.2	9
GLF 27.37	37” x 27”	9.1	9
GLF 30.37	37” x 30”	9.9	9
GLF 33.37	37” x 33”	10.8	12
GLF 36.37	37” x 36”	11.7	12

6. Cur-Tech Systems

Cur-Tech units shall be backfilled on the sides with sand fill meeting both the manufacturer’s specifications and select fill specifications. For the purpose of Section VIII F & G, the effective leaching area of the Cur-Tech Systems, LLC products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
CTL-12	72” x 14”	8.3	12
CTL-18	72” x 20”	10.7	14
CTL-24	72" x 26"	13.0	14
CTL-48	72" x 50"	21.9	14

7. Corrugated Leaching Systems Lined/Covered with Filter Fabric

Units shall be lined/covered with filter fabric and backfilled with select fill. For the purpose of Section VIII F & G, the effective leaching area of the approved products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (Diameter / W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
GEO-FLOW	12” Diam	2.3	7
Presby Env. - ENVIRO-SEPTIC	12” Diam	2.3	7
Presby Env. - SIMPLE-SEPTIC	12” Diam	1.5	7
ADS - SB2	10” Diam	0.9	7
Cultec - Contactor EZ-24	16” x 12”	1.9	7
Cultec - Contactor EZ-24 (PDS)	16” x 12”	2.5	7
Cultec - Contactor 75	26.5” x 12.4”	2.6	7
Cultec - Contactor 100	36” x 12.5”	3.7	7
Cultec - Contactor 100 (PDS)	36” x 12.5”	4.3	7
Cultec - Contactor 125	26.5” x 18”	2.9	7
Cultec - Recharger 180	36” x 20.5”	4.4	7
Cultec - Recharger 180 (PDS)	36” x 20.5”	5.1	9
Cultec - Recharger 280	46” x 26.5 ”	6.5	10
Cultec - Recharger 280 (PDS)	46” x 26.5 ”	7.1	10
Cultec - Recharger 330XL HD	52” x 30”	5.6	11
Infiltrator Quick 4 Equalizer 24	16” x 11”	2.0	7
Infiltrator Quick 4 Equalizer 36	22” x 12”	2.4	7
Infiltrator Quick 4 Standard	34” x 12”	3.3	7
Infiltrator Quick 4 High Capacity	34” x 16”	3.7	7
ADS/Hancor - BioDiffuser ARC 36	34.5” x 13”	3.9	7
ADS/Hancor - BioDiffuser ARC 36HC	34.5” x 16”	4.5	7

The above Cultec, Infiltrator, and ADS/Hancor fabric-lined chambers shall be backfilled with select fill to receive full credit. A 0.4 SF/LF ELA reduction shall be assessed if the chambers are backfilled with soil not meeting select fill gradation requirements.

8. Geomatrix

For the purpose of Section VIII F & G, the effective leaching area of the Geomatrix Systems, LLC products listed below and corresponding minimum center to center spacing shall be as follows:

Product Name	Dimensions (W x H)	Effective Leaching Area (SF/LF)	Center to Center Spacing (feet)
GeoMat 1200	12" x 1"	1.0	7
GeoMat 3900	39" x 1"	3.0	8
GeoMat 7800	78" x 1"	5.9	13
LowPro WE 1200	72" x 1"	5.2	12
LowPro WE 3900	72" x 1"	5.6	12
GeoMat Edge ST 600	72" x 6"	14.0	14
GeoMat Edge ST 1200	72" x 14"	27.2	14
GeoMat Edge WE 1200	72" x 13"	27.2	14
GST 6206	62" x 6"	5.9	12
GST 6212	62" x 12"	10.0	12
GST 6218	62" x 18"	14.0	13
GST 6224	62" x 24"	18.1	13
GST 6230	62" x 30"	22.1	13
GST 6236	62" x 36"	26.2	13
GST 3706	37" x 6"	3.6	8
GST 3712	37" x 12"	5.9	10
GST 3718	37" x 18"	8.2	10
GST 3724	37" x 24"	10.5	12
GST 3730	37" x 30"	12.9	12
GST 3736	37" x 36"	15.2	12
GeoU636	36" x 6.5"	8.0	9
GeoU672	72" x 6.5"	15.5	14
GeoU1236	36" x 12.5"	14.8	12
GeoU1272	72" x 12.5"	28.8	14
GeoU1836	36" x 18.5"	21.7	12
GeoU1846	46" x 18.5"	27.4	12
GeoU1851	51" x 18.5"	29.9 (max. allowed)	13
GeoU3921	21" x 39"	27.4	12
GeoU3926	26" x 39"	29.9 (max. allowed)	12

In accordance with the stipulations of Geomatrix Systems, LLC, all GeoMat Edge and GeoU leaching systems shall be installed in conjunction with a Soil Air System approved for use by Geomatrix Systems, LLC. See Section VI D for additional information on use of the patented Soil Air System.

S-Box, LLC proprietary leaching system products, which were included as approved leaching systems in the January 1, 2009 Technical Standards for Subsurface Sewage Disposal Systems, have been assigned to Geomatrix Systems, LLC. The Commissioner of Public Health has been notified that Geomatrix Systems, LLC plans on providing S-Box products along with their current product line. The S-Box approvals will be re-issued to Geomatrix Systems, LLC once the required documentation (installation instructions, specifications sheets, etc.) is submitted to the Commissioner of Public Health.

F. Leaching System Sizing

1. **Residential Buildings:** Leaching system sizing for residential buildings is based on a design flow of 150 gallons per day (GPD) per bedroom, except for additional bedrooms beyond 4 in a single-family home which are based on a design flow of 75 GPD per bedroom (See Section IV). The required effective leaching area for subsurface sewage disposal systems serving residential buildings shall be designed on the basis of the number of bedrooms and percolation rate in accordance with Table 6.

Table 6 - Residential Buildings

Percolation Rate (Minutes to Drop One Inch)	Square Feet of Required Effective Leaching Area				
	2-Bedroom Building	3-Bedroom Building	4-Bedroom Building	For Each Bedroom Above 4	
				Single Family	Multi-family
LESS THAN 10.1	375	495	660	82.5	165
10.1-20.0	500	675	900	112.5	225
20.1-30.0	565	750	1000	125	250
30.1-45.0	675	900	1200	150	300
45.1-60.0	745	990	1320	165	330

2. **Restaurants, Residential Institutions, and Nonresidential Buildings with Problematic Sewage:** The required effective leaching area for subsurface sewage disposal systems serving restaurants, bakeries, food service establishments, residential institutions, laundromats, beauty salons, and other nonresidential buildings with problematic sewage shall be based on the design flow and the application rates listed in Table 7. See Section IV for design flow and problematic sewage information.

Table 7 - Restaurants, Residential Institutions, and Nonresidential Buildings with Problematic Sewage

Percolation Rate (Minutes to Drop One Inch)	Application Rate (Gallons per day per square foot of Effective Leaching Area)
LESS THAN 10.1	0.8
10.1 to 20.0	0.7
20.1 to 30.0	0.6
30.1 to 45.0	0.5
45.1 to 60.0	0.4

3. **Nonresidential Buildings with Non-problematic Sewage:** The required effective leaching area for subsurface sewage disposal systems for nonresidential buildings other than those covered by Section VIII F 2 (Table 7) shall be based on the design flow and the application rates listed in Table 8. See Section IV for design flow and problematic sewage information.

Table 8 - Nonresidential Buildings with Non-Problematic Sewage

Percolation Rate (Minutes to Drop One Inch)	Application Rate (Gallons per day per square foot of Effective Leaching Area)
LESS THAN 10.1	1.5
10.1 to 20.0	1.2
20.1 to 30.0	0.9
30.1 to 45.0	0.7
45.1 to 60.0	0.6

FOR TABLES 7 and 8: REQUIRED EFFECTIVE LEACHING AREA = $\frac{\text{DESIGN FLOW}}{\text{APPLICATION RATE}}$

G. Leaching System Product Approvals, ELA Ratings, Center to Center Spacing

All approved leaching system products are assigned an effective leaching area (ELA) rating in square feet per linear foot (SF/LF) of product, except leaching pits (See Section VIII C). Approved leaching systems with assigned ELA ratings are listed in the various subsections of Section VIII, or in leaching system product approvals issued by the Commissioner of Public Health. Proprietary leaching system companies shall submit new product approval requests to the Commissioner of Public Health along with product specifications, drawings, cross-sections, dated installation instructions, and a completed product application/measurement worksheet provided by the Commissioner of Public Health. The Commissioner of Public Health may require third party/independent test data in conjunction with proprietary leaching system reviews/approvals that are deemed substantially different than those currently approved. The Commissioner of Public Health may require proprietary leaching system companies that have products listed in the January 1, 2011 revision of the Technical Standards to submit the following information and documentation on all currently approved products: Product specifications, drawings, cross-sections, product marking information, dated installation instructions, internal storage capacities, and a completed product application/measurement worksheet provided by the Commissioner of Public Health.

All approved leaching systems are assigned an ELA rating that is calculated in accordance with crediting criterion that takes into account several factors including the type of leaching system interface on which the biologically active layer (bio-mat) forms. For the purpose of the ELA ratings, the factors noted for stone are used also for two (2) inch nominal tire chip aggregate, an approved aggregate/stone substitute. Interface Factors for different leaching system interfaces are as follows:

Open:	2.0	
Filter Fabric (No Stone):	1.5	Note: Factor reduced by % obstructed.
Stone:	1.0	
Filter Fabric & Stone:	0.75	

The filter fabric interface factors also apply to cardboard and cardboard/filter fabric interfaces. Three types of leaching system interfaces are credited: sidewall interfaces, bottom interfaces, and internal interfaces. Sidewall interfaces discharge wastewater that does not pass through the product footprint area, which is the horizontal area within a rectangular boundary around the outermost perimeter of the leaching system interface. Bottom interfaces discharge wastewater from the bottom of the product. Internal interfaces are non-bottom leaching surfaces that discharge wastewater from within and through the product footprint area. No credit is given for bottom interfaces that include cardboard. Horizontal measurements are used for bottom interfaces, except for corrugated pipes. Vertical measurements are utilized for sidewall and internal leaching interfaces, except for corrugated pipes. Corrugated pipes have measurements taken along the perimeter of the pipe. Sidewall and internal interfaces are credited up to the leaching unit's pipe invert unless otherwise established by the Commissioner of Public Health.

The Commissioner of Public Heath shall establish crediting limitations that are applicable to competing bio-mats (overlapping bio-mats of specified thickness) and internal interfaces. Until such time that crediting limitations are finalized, ELA ratings shall not exceed 29.9 SF/LF. The Commissioner of Public Heath shall also establish minimum internal storage requirements for leaching system products.

Leaching system center to center minimum spacing, except for leaching pits (See Section VIII C), is determined based on the following:

- Products with ELA ratings of 5.0 SF/LF or less: 7 foot minimum; however, a minimum 4 foot side edge to side edge shall be provided.
- Products with ELA ratings of 5.1 to 10.0 SF/LF: 9 foot minimum; however, a minimum 6 foot side edge to side edge shall be provided.
- Products with ELA ratings exceeding 10.0 SF/LF: 12 foot minimum; however, a minimum 8 foot side edge to side edge shall be provided.

Further center to center reductions will be considered at the time leaching system minimum storage requirements and leaching system crediting criterion for internal interfaces and competing bio-mats are established. Reduced spacing will only be considered if it is satisfactorily demonstrated that the licensed installer can reasonably install the particular leaching product without compromising the installation.

IX. GROUNDWATER, ROOF, CELLAR, PARKING LOT AND YARD DRAINAGE

No groundwater drainage or drainage from roofs, cellars, roads, parking lots or yards shall discharge into or within 25 feet of any portion of a subsurface sewage disposal system. Drainage structures designed to collect such discharges shall be located not less than 50 feet downgradient of a subsurface sewage disposal system. Stormwater swales shall be constructed to lead water away from the subsurface sewage disposal system. Minimum separation distances for groundwater drains and stormwater infiltration systems are provided in Table 1. Table 2-C lists approved tight piping for groundwater and surface water piping located within 25 feet of a subsurface sewage disposal system. It is noted that drains shall be located at least 25 feet from water supply wells pursuant to PHC Section 19-13-B51d. Increased separation distances are required to water supply wells with withdrawal rates exceeding 10 gallons per minute.

Groundwater control drains (curtain drains), when provided, shall be located upgradient of the leaching system and on the sides if necessary. The depth of these drains shall be designed to lower the groundwater at least 2 feet below the bottom of the entire leaching system (see Figure 17). Drains shall be equipped with a collection pipe located 6 to 12 inches above the bottom of the trench collecting groundwater, and discharge away from the leaching system area. This collection pipe shall have a minimum diameter of four (4) inches and shall consist of open-joint tile, porous or perforated pipe. Perforated collection pipes are typically installed with holes on the bottom of the pipe. The collection pipe shall be surrounded by clean stone or gravel to a depth necessary to control groundwater, or as designed by a professional engineer.

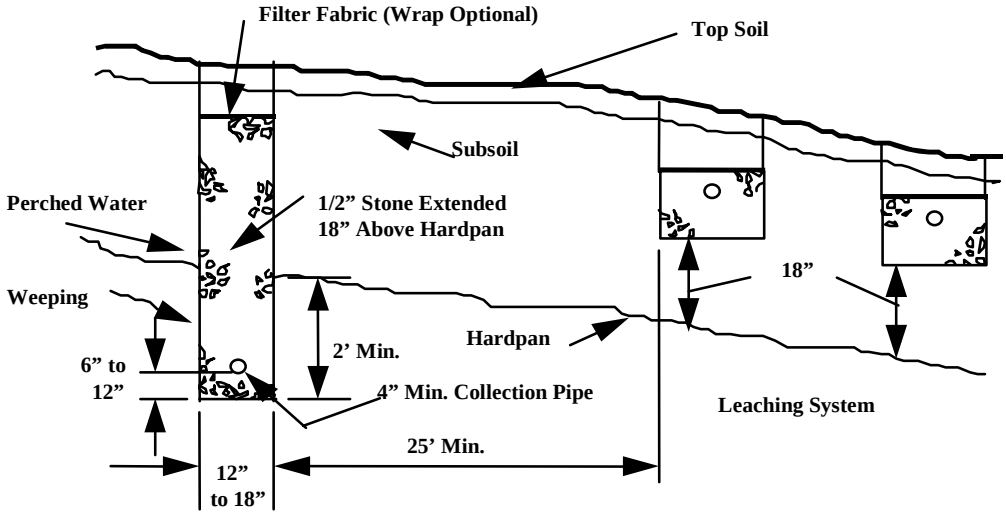


Figure 17 - Typical Curtain Drain Construction

X. OTHER WASTEWATER

Oils, greases, industrial/commercial wastes, toxic chemicals and wastewater that is not sewage, as defined in PHC Section 19-13-B103b (a), shall not be discharged to a subsurface sewage disposal system. Discharge of wastewater from water treatment systems (i.e., water softeners, iron or manganese removal filters) to surface water, sanitary sewer system, subsurface sewage disposal system or to the ground surface are prohibited unless otherwise authorized by the Department of Environmental Protection (DEP), or unless the Commissioner of Public Health authorizes the discharge to subsurface sewage disposal systems after a finding is made that it is incidental wastewater. On-site disposal of water treatment system wastewater via a separate/dedicated subsurface disposal system shall be in accordance with DEP guidance or General Permit. Dedicated water treatment wastewater disposal systems shall meet the minimum separation distances specified in Table 1.

XI. NON-DISCHARGING TOILET & SEWAGE DISPOSAL SYSTEMS

A. Large Capacity Composting Toilets

Large capacity composting toilets shall have separate receiving, composting and storage compartments, arranged so that the contents are moved from one compartment to another without spillage, or escape of odors within the dwelling. No large capacity composting toilets shall have an interior volume of less than sixty-four cubic feet. All toilet waste shall be deposited in the receiving chamber, which shall be furnished with a tight self-closing toilet lid. Food waste or other materials necessary to the composting action shall be deposited in the composting compartment through a separate opening with a tight fitting lid. The final composting material shall be removed from the storage compartment through a cleanout opening fitted with a tight door or lid. The cleanout shall not be located in a food storage or preparation area. The receiving and composting compartments shall be connected to the outside atmosphere by a screened vent. The vent shall be a minimum of six inches in diameter and shall extend at least twenty feet above the openings in the receiving and composting compartments, unless mechanical ventilation is provided. Air inlets shall be connected to the storage compartment only, and shall be screened.

B. Heat Assisted Composting Toilets

Heat assigned composting toilets shall have a single compartment furnished with a tight, self-closing toilet lid. The compartment shall be connected to the outside atmosphere by a screened vent. There shall be a mechanical ventilation fan arranged to control the humidity in the compartment and provide positive venting of odors to the outside atmosphere at all times. A heating unit shall be provided to maintain temperature in the optimum range for composting.

C. Incineration Toilets

Gas or oil fired or electrical incineration toilets shall meet applicable fire and building codes. No ignition or incineration shall occur unless the toilet lid is closed, and the blower shall operate continuously during incineration. A combustion temperature of 1,400^{o}F or higher shall be maintained during incineration.

D. Chemical Flush Toilets

Chemical flush toilets shall have toilet bowls that may be flushed when required by chemicals or chemical solutions. The liquid shall be discharged to a holding tank for removal of solids by settlement or other means prior to re-circulation. The toilet bowl shall be trapped or otherwise constructed to exclude odors, and the toilet's holding tank shall be vented to the outside atmosphere. The toilet's holding tank shall be emptied or additional chemicals added when odors or other objectionable conditions occur.

E. Dry Vault Privies

Dry vault privies shall be constructed with adequate storage space for excreta, and a fly-tight vault with a screened vent to the outside atmosphere. Self-closing, fly tight doors or self-closing seat covers shall be provided. Dry vault privies shall be constructed so as to permit ready cleaning. Separating distances shall comply with Table 1.

F. Chemical Privies

Chemical privies shall be constructed with a watertight vault with a screened vent to the outside atmosphere. Separating distances shall comply with Table 1. Chemicals shall be added to the liquid in the pit through a covered opening outside the toilet building. The vault shall be emptied, or additional chemicals added, when odors or other objectionable conditions occur.

G. Holding Tanks

Pursuant to PHC Section 19-13-B103c (a), the Commissioner of Public Health shall approve holding tanks for buildings governed by the scope of PHC Section 19-13-B103a. Holding tank proposals shall be submitted through the local director of health to the Commissioner of Public Health. Holding tanks shall include manholes to grade to facilitate routine pumping, and a high-level indicator alarm shall be provided. Separating distances shall comply with Table 1.

Form #1 Technical Standards for Subsurface Sewage Disposal Systems

APPLICATION FOR APPROVAL TO CONSTRUCT A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #:_____

To the Director of Health, Town of:_____ Date: _____

Application is hereby made for an approval to construct a subsurface sewage disposal system for a:

_____
(Residential Building, Restaurant, Retail Building, etc.)

located at:_____
(Street Address, Lot Number, Subdivision Name, Map, Block, Lot, etc.)

New System_____Addition_____Repair_____Other_____

Owner_____Address_____Tel.No._____

Installer_____Address_____Tel.No._____

Installer License No._____

In accordance with detailed information stated below:

Application fee paid_____ Signed_____
(Owner or duly authorized representative)

GENERAL INFORMATION

Soil Tests Conducted (Date):_____Lot size_____sq.ft.

Area of Special Concern (Y/N):_____If yes, Reason(s):_____

Basis of Design (# of Bedrooms, Restaurant Seats, Building Size, etc.):_____

Engineered Plan Required (Y/N):_____If yes, Name of Engineer:_____

Address of Engineer:_____

Design Plan Approved (Y/N):_____Date of Approved Plan:_____Revision Date:_____

Type of Water Supply_____If well, has location been approved (Y/N):_____

Well Driller's Name:_____Address:_____

OFFICE USE ONLY

Approval to Construct is hereby issued by:_____Date:_____
(Print Name)
Signature:_____Title:_____

Note: Approvals to Construct shall be issued by the Local Director of Health or Registered Sanitarian

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location_____

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE:_____ (Record all Test Pits)

TEST PIT:	TEST PIT:	TEST PIT:	TEST PIT:
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.):_____

SOIL MOISTURE (High, medium, low, etc.): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

LOCATION DRAWING INCLUDING ALL TEST PITS AND PERCOLATION HOLES

SPECIAL CONDITIONS		CONCLUSIONS	
Design Flow > 2000 GPD		Suitable for Sewage Disposal	
Public Water Supply Watershed		Unsuitable for Sewage Disposal	
Probable High Groundwater		Additional Investigation Req'd	
Slope > 25 percent		Wet Season Monitoring Req'd	
Perc Rate < 1 min/inch		Retest During Wet Season	
Perc Rate > 30 min/inch		Licensed Engineer Plan Req'd	
Ledge < 5 feet below grade		Other:	
Limited Suitable Area			
Open Watercourse or Wetlands			
Flood Plain / Seasonal Flooding			
Max. G.W. < 36 inches below grade			

DESIGN RECOMMENDATIONS/COMMENTS

Form completed by:_____
(Certified Local Health Agent or P.E.)

Accuracy assured by (If P.E. completed form):_____
(Certified Local Health Agent)

Others present for site investigation (Engineer, developer, installer etc.):

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Location: _____ Weather: _____

Percent Slope: _____ Parent Material: _____ Date: _____ Time: _____

Completed by: _____ Accuracy Assured by (if P.E. completed form): _____

P.E. or Certified Local Health Agent — Certified Local Health Agent

Others Present for Site Investigation: _____

(Installer, Developer, P.E., etc.)

Test Pit #: Depth to Observed Ground-Water (inches): Weeping: Standing: Observed Ledge:

Soil Horizon	Depth (inches)	Matrix Color (moist)	Redoximorphic Features			Soil Texture (USDA)	Gravel Percent	Soil Consistence	Roots	Other
			Depth	Color	%					

Test Pit #: Depth to Observed Ground-Water (inches): Weeping: Standing: Observed Ledge:

Soil Horizon	Depth (inches)	Matrix Color (moist)	Redoximorphic Features			Soil Texture (USDA)	Gravel Percent	Soil Consistence	Roots	Other
			Depth	Color	%					

Test Pit #: Depth to Observed Ground-Water (inches): Weeping: Standing: Observed Ledge:

Soil Horizon	Depth (inches)	Matrix Color (moist)	Redoximorphic Features			Soil Texture (USDA)	Gravel Percent	Soil Consistence	Roots	Other
			Depth	Color	%					

Special Conditions		Location Drawing
Design Flow > 2000 GPD		
Public Water Supply Watershed		
Probable High Ground Water		
Slope > 25 Percent		
Perc Rate < 1 min/inch		
Perc Rate > 30 min/inch		
Ledge < 5 feet Below Grade		
Limited Suitable Area		
Open Watercourse or Wetland		
Flood Plain/Seasonal Flooding		
G.W. < 36 inches Below Grade		
Conclusions		
Suitable for Sewage Disposal		
Unsuitable for Sewage Disposal		
Additional Investigation Required		
Wet Season Monitoring Required		
Retest During Wet Season		
Licensed Engineer Plan Required		**Design Requirements:**
Other:		

Percolation Test Data

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

Application/Permit #: _____

Final Inspection Report

Local Health Department: _____

Property Owner: _____

Property Address: _____ Town: _____

Licensed Installer: _____ License #: _____

Approved Plan Information

Check one: New System ☐ Repair/Replacement System ☐

Residential Building: _____ bedrooms Large Tub: YES NO Garbage Disposal: YES NO

Non residential Building/Residential Institution: _____ GPD

Plan Prepared by: _____ Title: _____

Plan Approved by: _____ Date: _____

Approval to Construct

Date Permit Issued: _____ Permit Issued by: _____

Registered Sanitarian or Director of Health

Inspection Information

Type	Date	Licensed Installer Present? Yes/No	Comments
Field Stake Inspection (house, well, property lines, system etc.)			
Strip/Scarification			
Select Fill Placement			Sieve required (Yes/No)
Other:			
Final Inspection			

Was 24 Hour (min) Installer Notice Given (Y/N) : _____ Date Final Inspection Requested: _____

Final Inspection Completed by: _____ Date of As-Built Approval: _____

Permit to Discharge Issued by: _____ Date: _____

Registered Sanitarian or Director of Health

Final Inspection Report

House Sewer Information

Pipe Type and ASTM Specification:_____ Pipe Size: _____ in.

Pipe Invert Elevations at: Pipe Length: _____ ft.

Foundation Wall: _____ Pitch Required: _____

Septic Tank: _____ Pitch Provided: _____

Tank Information

Septic Tank Size : _____ Gallons Tank Inlet Elevation: _____

Tank Manufacturer: Tank Outlet Elevation: _____

Date Manufactured: Riser Needed (Y/N): _____

Outlet Filter Type/Manufacturer: _____

Pump Chamber Size: _____ Gallons Pump Alarm Checked (Y/N): _____

Pump Chamber Manufacturer: Float Control Elevation Verified (Y/N): _____

Grease Interceptor Tank Size: _____ Gallons Grease Interceptor Tank Manufacturer: _____

Leaching System Information

Approved Aggregate: Free of silt dirt and debris (Y/N): _____ Sieve Required (Y/N): _____

Filter Fabric Present (Y/N):_____ Type:_____ Aggregate Meets PHC Specifications (Y/N): _____

Select Fill (Y/N):_____ Meets PHC Specifications (Y/N):_____ Sieve Information on File (Y/N): _____

Leaching System Description (product, size, length, number of rows, level or serial etc.): _____

Effective Leaching Area Required: _____ sq. ft. Reserve Area Provided (N/A, Y/N):_____

Effective Leaching Area Provided: _____ sq. ft. Center to Center Spacing:_____ft.

System Installed Per Approved Plan Elevations (Y/N):_____ Elevations Field Verified (Y/N): _____

Elevation notes: _____

Separation Distances

Separation Distances Conform with Approved Plan (Y/N):_____

Separation Distances Field Verified (Y/N):_____

Form #4 Technical Standards for Subsurface Sewage Disposal Systems

PERMIT TO DISCHARGE

Approval is hereby given to _____, in accordance with Public
(Property Owner)
Health Code Section 19-13-B103e (h) to discharge to a subsurface sewage disposal system located at

_____
(Street Address)
in the town of _____, CT that will receive domestic sewage from a:

Residential building containing _____bedrooms. Single family (Y/N):____.
Restaurant containing _____seats.
Commercial/Office building providing _____square feet.
Other structure as described: _____.

Design Flow =_____ gallons per day. **Permitted Flow =_____ gallons per day.**
The design flow shall equal the permitted flow, except for non-compliant repairs (See Section IV D).

In order to provide a sufficient factor of safety it is recommended that the average daily discharge not exceed 2/3 of the permitted flow or_____ gallons per day.

Operation and Maintenance: Septic tank shall be inspected regularly and pumped as needed but not less frequently than every five years. The septic tank has an effluent filter (Y/N)_____. Effluent filters require periodic cleaning. Failure to clean filters can result in sewage backup into the building or effluent breakout. Restaurants serviced by external grease interceptor tank(s) require quarterly inspections and cleaning as necessary. Tank pump-outs tracked by local health department (Y/N)_____. If yes, stipulate pump-out requirements: _____.

Special Requirements and Restrictions: 1.System malfunction or failure shall be addressed._____
_____
_____

Exceptions (Repairs Only): ______
_____
_____
_____

File Information: Construction Permit No. _____. Approved as-built on file (Y/N) _____.

Date of Final Inspection: _____Inspected By:_____

Permit Issuance: Issued by: _____Title: _____
(Director of Health or Registered Sanitarian)

Signature: _____Date:_____

Permit expiration date (5 years from issuance date): _____

APPENDIX A: MINIMUM LEACHING SYSTEM SPREAD

All subsurface sewage disposal systems, when applicable, shall provide a leaching system spread that equals or surpasses the minimum leaching system spread (MLSS). The MLSS formula is based on hydraulic principles and is calculated utilizing factors reflective of the building's design flow and the hydraulic characteristics of the site. MLSS is not applicable on sites that have a receiving soil depth exceeding 60 inches, reserve leaching areas, or on sites where a licensed professional engineer has satisfactorily demonstrated through a hydraulic analysis or loading test that the receiving soil can disperse the building's permitted flow without overflow or breakout. In accordance with Public Health Code (PHC) regulations, **new systems and code-complying areas are required to have sufficient naturally occurring soil that can absorb or disperse the design flow**. Naturally occurring soil is formed from natural processes independent of human actions, and does not include fill placed by humans or deposited as a result of human actions.

Multiple leaching systems with shared receiving soil shall be evaluated collectively as a single system. On sloped lots, leaching systems in the same hydraulic window shall be at least 50 feet apart to avoid a MLSS assessment as a single system. On lots with flat groundwater tables, leaching systems located within 25 feet of one another shall be evaluated as a single system. Septic tank effluent shall be applied uniformly to the leaching system. If MLSS is applicable, single leaching system rows shall contain leaching units with the same or relatively equal ELA ratings (within 10 percent), or a hydraulic assessment shall be required to ensure no portion of the receiving soil is overloaded.

MLSS Formula

MLSS (feet)	=	HF x FF x PF
HYDRAULIC FACTOR (HF)	=	Factor based on the hydraulic gradient and receiving soil depth.
FLOW FACTOR (FF)	=	Factor based on the design flow of the building served.
PERCOLATION FACTOR (PF)	=	Factor based on the percolation rate of the receiving soil.

Definitions & Factor Information

Hydraulic gradient: The percent slope of the naturally occurring grade, or when demonstrated, the percent slope of the restrictive layer. The hydraulic gradient shall be the average gradient within and at least 25 feet downgradient of the leaching system. On lots with purported flat groundwater tables, the hydraulic gradient shall be confirmed to be level (essentially zero) by evaluating groundwater elevations within and at least 25 feet around the perimeter of the leaching system.

Leaching system spread: The leaching system length (feet) of sewage effluent application to the receiving soil as measured along a uniform elevation. On lots with flat groundwater tables, the leaching system spread shall be the entire length of the perimeter of the leaching system. On all other lots, the leaching system spread shall be measured perpendicular to the hydraulic gradient, and shall take into account converging and diverging contours at least 25 feet downgradient of the leaching system.

Restrictive layer: The first layer beneath the receiving soil that impedes downward movement of sewage effluent. Restrictive layers include ledge rock, groundwater, and impervious soil (percolation rate slower than 60 minutes per inch). The groundwater restrictive layer can be determined by field verification of redoximorphic features or groundwater monitoring. If groundwater monitoring is performed, the groundwater restrictive layer shall be the average of at least five (5) consecutive weekly readings taken in the most restrictive 30-day period of the wet season.

Receiving soil: The soil above the restrictive layer that is available to disperse sewage effluent from the leaching system. On lots with flat groundwater tables, the receiving soil shall include the soil around the perimeter of the leaching system. On all other lots, the receiving soil shall include the soil downgradient of the leaching system.

Receiving soil depth (RS Depth): The depth of receiving soil above the restrictive layer. On lots with flat groundwater tables, the RS Depth shall be the average depth within and 25 feet around the perimeter of the leaching system. On all other lots, the RS Depth shall be the average depth within and at least 25 feet downgradient of the leaching system. Large systems (2,000 GPD or greater) warrant evaluation of receiving soil depths within 50 feet downgradient of the leaching system.

USE OF MLSS FORMULA

New Systems and Code-Complying Areas: New subsurface sewage disposal systems approved pursuant to PHC Section 19-13-B103, and code-complying areas identified pursuant to PHC Section 19-13-B100a shall provide leaching system spreads that equal or surpass the MLSS. PHC regulations require that these systems have sufficient **naturally occurring soil** that can adequately absorb or disperse the expected volume of sewage effluent without overflow, breakout or detrimental effect on ground or surface water. For new systems, MLSS applies to the primary system only, although it is recommended that reserve areas provide additional spread and hydraulic capacity.

Properties that have less than 18 inches of naturally occurring soil (<18" of RS Depth in HF Chart) cannot be approved unless a licensed professional engineer conducts a hydraulic analysis or loading test to demonstrate compliance with PHC Section 19-13-B103e (a)(4). Sites without unsaturated naturally occurring soil are not candidates for hydraulic assessments since the naturally occurring soil is already in an "overflowed" condition.

Repairs and Potential Repair Areas: Repairs approved pursuant to PHC Section 19-13-B103, and potential repair areas identified pursuant to PHC Section 19-13-B100a shall provide leaching system spreads that equal or surpass the MLSS based on naturally occurring soil. On a site with less than 18 inches of naturally occurring soil, or when the leaching system cannot meet the MLSS, an exception from the local director of health shall be required. Exceptions may only be granted when determined they are unlikely to cause a nuisance, health hazard, or result in a breakout or surfacing of sewage effluent. In making this determination, the local director of health shall require an assessment referred to as a **non-compliant repair (NCR) MLSS**. The NCR MLSS takes into account the hydraulic capacity of existing receiving soil and fill included in the system design and installation. The following criterion shall be utilized in calculating the NCR MLSS:

1. Receiving soil fill shall have a percolation rate of 30 minutes per inch or faster, and shall be clean material free of debris and foreign objects.
2. The receiving soil in the leaching system area shall be measured from the bottom of the leaching system to the restrictive layer.
3. On lots with flat groundwater tables, the receiving soil 25 feet around the perimeter of the leaching system shall have a minimum depth of 6 inches. On all other lots, the receiving soil 25 feet downgradient of the leaching system shall have a minimum depth of 12 inches.
4. The RS Depth may include both naturally occurring soil and fill, and shall have a minimum depth of 18 inches and a maximum of depth 60 inches.
5. A percolation rate of 10.1-20 minutes per inch shall be used for a select fill layer included in the receiving soil. Percolation rates of different receiving soil layers shall be applied proportionality.

Leaching systems shall provide the maximum percent possible of the NCR MLSS based on a RS Depth of 18.0-22.0 inches. On sites where the NCR MLSS cannot be provided, additional fill shall be considered to reduce the NCR MLSS. Leaching systems that provide less than 50 percent of the NCR MLSS, or do not comply with Items 3 or 4 above, shall require a system designed by a professional engineer and a study of the receiving soil's ability to absorb or disperse the permitted flow in accordance with PHC Section 19-13-B103d (e)(4).

For the purposes of PHC Section 19-13-B100a (c)(2) and Section IV D, the required MLSS shall be equivalent to the NCR MLSS. The permitted flow noted on the Permit to Discharge shall be based on the most limited percentage of the required ELA or NCR MLSS provided. The Permit to Discharge shall clearly state that the system is non-compliant relative to MLSS, and that an exception has been granted.

HYDRAULIC FACTORS (HF)

Hydraulic Gradient (% Slope)

Receiving Soil Depth (Inches)	<1.0	1.0-2.0	2.1-3.0	3.1-4.0	4.1-6.0	6.1-8.0	8.1-10.0	10.1-15.0	>15.0
0.1 - 17.9	See Comments in Use of MLSS Formula								
18.0 - 22.0	72	62	54	48	42	34	30	28	26
22.1 - 26.0	66	56	48	42	34	30	28	26	24
26.1 - 30.0	56	49	42	34	30	28	26	24	20
30.1 - 36.0	48	42	34	30	28	26	24	20	18
36.1 - 42.0	42	36	30	28	26	24	20	18	16
42.1 - 48.0	36	32	28	26	24	20	18	16	14
48.1 - 60.0	30	28	24	22	20	18	16	14	10
>60.0	MLSS Need Not be Considered								

FLOW FACTORS (FF)

Flow Factor = Design Flow/300

Residential: Design Flow for each bedroom is 150 gallons per day (GPD), except for bedrooms beyond 4 in single-family residential buildings which have a 75 GPD per bedroom design flow.

Single-family homes:	**FF**	
2 Bedroom Home = 300/300	1.0	
3 Bedroom Home = 450/300	1.5	
4 Bedroom Home = 600/300	2.0	
5 Bedroom Home = 675/300	2.25	Increase FF by 0.25 for each additional bedroom
Multi-family buildings:		
Same as above except 5 Bedrooms = 750/300	2.5	Increase FF by 0.5 for each additional bedroom

Non-Residential: Design Flow (GPD) / 300

PERCOLATION FACTORS (PF)

Percolation Rate	Percolation Factor (PF)
Up to 5.0 Minutes/Inch	1.0
5.1 to 10.0 Minutes/Inch	1.2
10.1 to 20.0 Minutes/Inch	1.5
20.1 to 30.0 Minutes/Inch	2.0
30.1 to 45.0 Minutes/Inch	3.0
45.1 to 60.0 Minutes/Inch	5.0

APPENDIX B: APPROVED SEPTIC TANK EFFLUENT FILTERS

MANUFACTURER	MODEL
ORENCO SYSTEMS	FT0444-36, FT0854-36, FT1254-36, FT1554-36
PREMIER TECH	EFT-080
POLYLOK	PL-68, PL-122, PL-525, PL-625
RISSY PLASTICS	45 – CLIK N' STICK
THORSBY & BOWNE	SANITEE
TUF-TITE	EF-4, EF-6
ZABEL	A100, A300, A1800, A1801, A100-HIP, A300-HIP A1800-HIP, A1801-HIP, A600-12, A600-8
ZOELLER	170-0017, 170-0078, 5000-0007
NORWECO	BIO-KINETIC BK2000
BIO-MICROBICS	ST 416, ST 418, ST 818, ST 838, ST 1618, ST 1638
BOWCO INDUSTRIES	EF-235
GAG-SIMTECH	STF-110, STF-110-7R, STF-110-6W, STF-110-8B

APPENDIX C: APPROVED FILTER FABRICS FOR COVERING STONE AGGREGATE

MANUFACTURER/ DISTRIBUTOR	DESIGNATION NUMBER
AMERICAN ENGINEERING FABRICS	AEF-480
BRADLEY INDUSTRIAL TEXTILE	PHOENIX LIJOMA
CARTHAGE MILLS	M35
CULTEC*****	410*
DUPONT	SF20
ENGINEERED SYNTHETIC PRODUCTS	TNS R020
GEO FABRICS	GF 150
L&M SUPPLY COMPANY	L&M 231
MIRAFI	65304 (4' WIDE) 65303 (3' WIDE)
SKAPS INDUSTRIES	SKAPS GT 120
SRW PRODUCTS	SRW PRODUCTS DF1 SRW PRODUCTS DF2
TERRA TEX	S01.5, P01.5
TYPAR	3151, 3201
US FABRIC INC	US 1.5 CT

***Also approved to cover two (2) inch nominal tire chip aggregate**

APPENDIX D: APPROVED NON-CONCRETE SEPTIC TANKS

MANUFACTURER	DESIGNATION/ID NUMBER	GALLONS
NORWESCO Note: STD (Standard Tank) BSR. (Bruiser Tank) RRM (Rochester Tank)	STD 1000 STD 1250 STD 1500 BSR 1000 BSR 1250 BSR 1500 RRM 3445 RRM 3455 RRM 3465	1000 1250 1500 1000 1250 1500 1050 1250 1500
SNYDER INDUSTRIES Plumbed tanks are provided with inlet & outlet piping whereas unplumbed tanks are not.	Dominator Tanks (Plumbed) 1001010W95314 1001411W95304 1001511W95303 Dominator Tanks (Unplumbed) 1001010W95307 1001411W95302 1001511W95302	 1000 1250 1500 1000 1250 1500
COON MANUFACTURING Manufacturer stipulates tank shall be re-filled within 12 hours of pumping.	M1000 M1500	1000 1500
DEN HARTOG INDUSTRIES (Ace Roto-Mold) *Single compartment tank can be used in series with another single compartment tank.	AST 1000-1* AST 1250-1* AST 1500-1* AST 1000-2 AST 1250-2 AST 1500-2	1000 1250 1500 1000 1250 1500
ROTH GLOBAL PLASTICS FRALO Brand: ST = Septech Model Roth Brand: RMT = Roth Multi-Tank Model	ST-1000E ST-1060 ST-1250 ST-1500 RMT-1000E RMT-1060 RMT-1250 RMT-1500	1000 1060 1250 1500 1000 1060 1250 1500
INFILTRATOR SYSTEMS	TW-900 TW-1050 TW-1250 TW-1500	900 1050 1250 1500

PUBLIC HEALTH CODE REGULATION

On-Site Sewage Disposal Systems with Design Flows Greater than 5,000 Gallons per Day

Sec. 19-13-B104a – Scope

These regulations set standards for domestic sewage disposal systems receiving flows greater than 5,000 gallons per day; community sewage systems as defined in Section 7-245, Connecticut General Statutes, which utilize land treatment and disposal, alternative on-site sewage treatment systems; and septage disposal systems which utilize land treatment and disposal.

Sec. 19-13-B104b - Definitions

(a) **Alternative on-site sewage treatment systems** means a system serving one or more buildings on one property which utilizes a method of treatment other than a subsurface sewage disposal system and which involves a discharge to the waters of the state.

(b) **Domestic sewage** means sewage that consists of water and human excretions or other waterborne wastes incidental to the occupancy of the residential buildings or a nonresidential building but not including manufacturing process water, cooling water, wastewater from water softening equipment, commercial laundry wastewater, blowdown from heating or cooling equipment, water from cellars or floor drains or surface water from roofs, paved surfaces or yard drains.

(c) **House sewer** means a tight sewer pipe extending from the building served by a subsurface sewage disposal system.

(d) **Land treatment and disposal** means a system which utilizes soil materials for the treatment of domestic sewage and disposes of the treated effluent by percolation into underlying soil and mixing with the groundwater.

(e) **Local Director of Health** means the local director of health or his authorized agent.

(f) **Person** means any individual, partnership, association, firm, corporation or other entity, except a municipality, and includes the federal government, the state or any instrumentality of the state and any officer or governing or managing body of any partnership, association, firm or corporation.

(g) **Septage** means any water of material withdrawn from a septic tank used to treat domestic sewage.

(h) **Subsurface sewage disposal system** means a system consisting of a house or collection sewer, a septic tank followed by a leaching system, any necessary pumps or siphons, and any groundwater control system on which the operation of the leaching system is dependent.

Sec. 19-13-B104c - General Provisions

(a) All sewers, sewage disposal systems, toilets, or sewage plumbing systems shall be kept in a sanitary condition at all times and be so constructed and maintained as to prevent the escape of odors and to exclude animals and insects. All such systems shall adhere to the requirements set forth in Section 25-54i of the Connecticut General Statutes.

(b) The contents of the septic tank, subsurface sewage disposal system or privy vault shall only be disposed of in the following manner.

(1) If the contents are to be disposed of on the land of the owner, disposal shall be by burial or other method which does not present a health hazard or nuisance; or

(2) If the contents are to be disposed of on land of other than the owner;

(A) The contents shall be transferred and removed by a cleaner licensed pursuant to Connecticut General Statutes Chapter 393a, and

(B) Only on the application for and an issuance of a written permit from the local director of health in accordance with the provisions of this section;

(3) If the contents are to be disposed of on a public water supply watershed, only on the application and issuance of a written permit by the Commissioner of Public Health in accordance with the provisions of this section.

Each application for a permit under subdivisions (2) and (3) of subsection (b) shall be in writing and designate where and in what manner the material shall be disposed of.

(c) All material removed from any septic tank, privy, sewer, subsurface sewage disposal system, sewage holding tank, toilet or sewage plumbing system shall be transported in watertight vehicles or containers in such a manner that no nuisance or public health hazard is presented. All vehicles used for transportation of such material shall bear the name of the company or licensee and shall be maintained and clean exterior conditions at all times. No defective or leaking equipment shall be used in cleaning operations. All vehicles or equipment shall be stored in a clean condition when not in use. Water used for rinsing such vehicles or equipment shall be considered sewage and shall be disposed of in a sanitary manner approved by the local director of health.

(d) Septic tanks shall be cleaned by first lowering the liquid level sufficiently below the outlet to prevent sludge or scum from overflowing to the leaching system where it could cause clogging or otherwise damage the system. Substantially all of the sludge or scum accumulation shall be removed whenever possible, and the inlet and outlet baffles shall be inspected for damage or clogging. Cleaners shall use all reasonable precautions to prevent damaging the sewage disposal system with vehicles or equipment. Accidental spillage of sewage, sludge, or scum be promptly removed or otherwise abated so as to prevent a nuisance or public health hazard.

(e) No sewage shall be allowed to discharge or flow into any storm drain, gutter, street, roadway or public place, nor shall such material discharge onto any private property so as to create a nuisance or condition detrimental to health. Whenever it is brought to the attention of the local director of health that such a condition exists on any property, he shall investigate and cause the abatement of this condition.

(f) Persons who intend to conduct site investigations for the purpose of designing or constructing any septage or sewage disposal system within the scope of these regulations shall notify the local director of health of the time and place of such site investigations. Notice shall be provided to the local director of health in a timely manner to allow attendance at such site investigations by the director of health.

(g) Persons who propose sewage or septage disposal systems within the scope of this regulation shall submit plans for such systems to the Commissioner of Public Health and the local director of health. Plans shall be submitted in a timely manner to allow review and comment on such plans to be directed to the Commissioner of Environmental Protection. Such plans shall be prepared by a professional engineer registered in the State of Connecticut and shall include a report of the findings of all site investigations, the basis of design, a preliminary or final design and other information necessary for the preservation and improvement of public health.

(h) Persons who intend to construct sewage or septage disposal systems within the scope of these regulations shall file final construction plans with the local director of health at least two working days prior to the start of construction. All such systems shall be inspected during construction by the local director of health. Persons constructing such systems shall give prior notification to the local director of health of any changes which are proposed or required during construction. Persons constructing such systems shall provide the local director of health with a record drawing of the system, as-built, prior to utilizing the system.

Sec. 19-13-B104d - <u>Minimum Requirements</u>

(a) All sewage or septage disposal systems under the scope of these regulations shall meet the following minimum requirements necessary for the preservation and improvement of public health, unless an exception is granted by the Commissioner of Public Health upon his determination that public health shall not be impaired by such exception.

(b) All structures or facilities for the treatment or disposal of sewage or septage shall be located at least 50 feet from any open water source and 100 feet from any public supply reservoir, unless designed and constructed to prevent the leakage or overflow of raw or treated sewage to the ground or surface water.

(c) All structures, facilities or locations containing sewage or septage which is exposed to the atmosphere shall be located at least 150 feet from any school, residential building or institution, and shall be fenced or otherwise made inaccessible to the public.

(d) The following minimum separating distances shall be maintained between any discharge or overflow of raw or treated sewage or septage to the ground waters and any drinking water supply well or spring.

Required Withdrawal Rate	Minimum Separation Distance
Under 10 gallons per minute	75 feet
10 to 50 gallons per minute	150 feet
Over 50 gallons per minute	200 feet

(e) The following minimum separating distances shall be maintained between any sewer, structure or facility for the conveyance or treatment of sewage or septage and any drinking water supply well or spring.

Required Withdrawal Rate	Minimum Separation Distance
Under 10 gallons per minute	25 feet
10 to 50 gallons per minute	75 feet
Over 50 gallons per minute	100 feet

Statement of Purpose

The regulations up date existing Public Health Code requirements for the design and installation of large subsurface sewage disposal systems, the design flow of which exceed 5,000 gallons per day. Sewage disposal systems conforming to this regulation and designed to include the latest state-of-the-art technology will provide for the preservation and improvement of public health.