

Rolette County Public Health District

ONSITE SEWAGE

TREATMENT SYSTEMS

Rules and Regulations



Public Health
Prevent. Promote. Protect.

Effective Date: June 1, 2016

with revision/update to Section IV, E. 2., a. (January 19, 2023)
Addition to Intent and Applicability # 9 (July 20, 2023)

Rolette County Public Health District

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PART I - ADMINISTRATION

I - NOTICE OF RULES AND REGULATIONS

A. INTENT AND APPLICABILITY

1. Onsite sewage treatment systems located in **Rolette County** shall be designed, installed, operated, and maintained in a manner that follows all rules and regulations set forth in this document.
2. These regulations shall be effective on and after June 1, 2016
3. These regulations are written and adopted in accordance with the authority granted the Board of Health in the North Dakota Century Code 23-35. The intent is to hereby provide health and safety standards and criteria for design, installation, operation, and maintenance of onsite sewage treatment systems that are in accordance with these regulations to prevent adverse effects to the health, safety, and general welfare of the public and environment.
4. These regulations shall be administered and enforced by the Approving Authority.
5. Nothing contained in these regulations will be construed to prevent the Approving Authority from requiring compliance with higher requirements than those contained herein where such higher requirements may be essential to maintain safe and sanitary conditions.
6. Whenever brought to the attention of the Approving Authority that any condition exists for any onsite sewage treatment system that is not an approved method of collection and treatment and may be dangerous, unsafe, unsanitary, a nuisance, or risk to life, health, or property, or otherwise in violation of these regulations, it is the responsibility of the Approving Authority to investigate the problem and order any person using or maintaining any such condition to repair, alter, change, remove, or demolish the problem area within a reasonable period of time for the protection of life, health, and/or property.
7. In any case, where a provision of these regulations is found to conflict with a provision of any zoning, building, safety, health ordinance, code, or law, the provision which establishes the more stringent standard for the promotion of health and safety shall prevail.
8. If any section, subsection, sentence, clause, phrase, or portions of these regulations are for any reason held to be invalid or unconstitutional by the decision of a court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of these regulations.
9. A sewer permit is not required when there is an addition to an existing structure such as a home, shop, etc. provided that the water consumption is not going to be increased because of the addition.
10. The RCPHD Board of Health has adopted these rules and regulations, which apply to **Rolette County, not including tribal and trust lands within Rolette County**. The provisions of this code shall be enforced by the Approving Authority.

II- DEFINITIONS

For the purpose of these regulations certain terms or words used herein shall be interpreted as follows: the word "shall" is mandatory, the words "should" and "may" are permissive. All distances, unless otherwise specified, shall be measured horizontally.

"Approving Authority" means the Environmental Health Division of Lake Region District Health Unit (LRDHU). A Memorandum of Understanding exists between Rolette County Public Health District and Lake Region District Health Unit for the provision of environmental health services.

"As-Built" means a document provided by the Approving Authority for the purpose of the contractor or property owner to fill out completely to show the details of the installed onsite sewage treatment system. As-built drawings are required for each onsite sewage treatment system installed, including holding tanks, regardless if a health inspection was completed by the Approving Authority.

"Bedroom" means a room within a dwelling that in the judgment of the Approving Authority might reasonably be used as a sleeping room. A bedroom could include spaces classified as a den, office, study area(s), or rooms with closets that have potential to become a bedroom.

"Black Water" means wastewater or "sewage" that has come into contact with fecal matter and urine and contains pathogens that can cause disease.

"Board of Health" means Lake Region District Health Unit Board of Health and or Rolette County Board of Health.

"Capacity" means the liquid volume of a sewage tank. Liquid capacity means the total volume of the liquid capacity of a sewage tank. Working capacity means the liquid volume capacity of a sewage tank using inside dimensions below the outlet.

"Cesspool or Seepage Pit" means an underground pit into which raw sewage and/or other untreated liquid wastes are discharged. In cesspools and seepage pits, untreated waste liquids and raw sewage are permitted to contaminate surrounding soils and water sources. Cesspools and seepage pits are illegal, no matter the installation date, and must be removed when work is done on the sewer system; a complaint has been filed or before the property can be sold.

"Clean Sand (clean, washed sand)" means soil texture composed by weight of at least 25 percent of very coarse sand and medium sand varying in size from 2.0 to 0.25 mm, less than 50 percent of fine or very fine sand ranging in size between 0.25 and 0.05 mm, and no more than 10 percent of particles smaller than 0.05 mm. The jar test (**See Appendix, Figure AN**) can be used as a method for testing clean sand.

"Continuing Education/Training" means contractors are required to attend an approved onsite sewage training before being licensed and **every two years (every other year)** thereafter to maintain their license to install onsite sewage treatment systems.

"Contractors" means onsite sewage treatment system contractors, licensed through the Approving Authority, for the purpose of these regulations.

"Design Manual" means the University of Minnesota Extension Service, Design Manual for Septic System Professionals in Minnesota, used as guidance supplement.

"Dosing Device" means a commercially manufactured sewage effluent pump, siphon, or grinder pump.

"Drainfield" means an in-ground or out-of-ground soil absorption field which uses pipes placed in a favorable soil so that sewage effluent from the septic tank can percolate through and into the soil.

"Drain Field Rock (clean, washed rock)" means crushed igneous rock or similar insoluble rock that is durable and decay-resistant and material free from dust, sand, silt, or clay. The size should range from $\frac{3}{4}$ inch diameter to 2.5 inch diameter, with no more than five (5) percent by weight passing a three-quarter inch sieve, and no more than one (1) percent by weight passing a number 200 sieve. Materials greater than 2.5 inches in diameter shall not exceed five (5) percent by weight.

“**Failure**” or mal-functioning” of an onsite sewage treatment system may constitute any of the following:

- ◆ Sewage backing up in to a building;
- ◆ Sewage discharged (flowing or ponding) directly on top of the surface of the ground or into any river, stream, lake, wetland, pond, or similar water courses;
- ◆ Sewage discharged into any abandoned/unused well (potable water contamination), or into any crevice, sink hole, or any other opening either natural or artificial in a rock formation
- ◆ Use of a “cesspool” on the property for sewage disposal;
- ◆ Improper minimum setback distances for the location of the onsite sewage treatment system; and
- ◆ Improper installation of the system.

“**Geotextile Fabric**” means durable non-woven fabric that must permit the passage of water without passage of overlying soil material into the drainfield rock medium. ASTM standards for the fabric: Unit weight of at least 3 oz/yd². Permittivity of at least 1.0 sec-1. Trapezoid tear strength of at least 35 lbs. mesh size equal to U.S. Sieve No 70.

“**Greywater**” means wastewater coming from domestic equipment (i.e. bathtubs, showers, sinks, dishwashers, washing machines) or a source other than toilets wastes. It is not sanitary and shall be treated by the onsite sewage treatment system to limit pollution and health risks.

“**Holding Tank**” means a WATERTIGHT cement, plastic, or fiberglass tank for the collection and temporary storage of sewage - designed and constructed to be removed and disposed of at another site. Holding tanks shall be a minimum of 1,000 gallons and have a minimum of one access hole of at least 18” in diameter, that must be capped above or even with the top of the ground.

“**Lake Region District Health Unit**” means the counties represented by the Lake Region District Health Unit, which are Benson, Eddy, Pierce, and Ramsey counties; with the administration office located at 524 4th Avenue NE, Unit 9, Devils Lake, ND 58301. A Memorandum of Understanding exists between Rolette County Public Health District and Lake Region District Health Unit for the provision of environmental health services.

“**Limiting Condition**” means actual soil saturation, redoximorphic features, or active fluctuating seasonal soil water table, bedrock, or any physically identifiable condition that limits installation of a septic system.

“**NDCC**” means North Dakota Century Code.

“**Onsite Sewage Treatment System**” may also be referred to as OSTs or onsite sewage system. An onsite sewage treatment system shall be defined as all private methods of collecting and disposing of sewage including: a holding tank and/or septic tank and sewage treatment system, but not including sewage treatment systems connected to lagoons or other sewage treatment systems which are connected to larger rural or municipal sewer systems.

“**Ordinary High Water Mark**” means a line on the bank or shore to which the high water ordinarily rises each year and is the waterward limit of upland vegetation and soil. It is generally recognizable by a visible change in the soil and vegetation.

“**Redoximorphic Features**” means features formed by the process of reduction, translocation, and/or oxidation of Iron (Fe) and Manganese (Mn) oxides, caused by active fluctuating seasonal soil water table. Redoximorphic features were formerly known as “Mottles”.

“**Rolette County Public Health District (RCPHD)**” means the service area of Rolette County. A Memorandum of Understanding exists between Rolette County Public Health District and Lake Region District Health Unit for the provision of environmental health services. The RCPHD Board of Health has adopted these rules and regulations, which apply to **Rolette County, not including tribal and tribal trust lands within Rolette County**. The provisions of this code shall be enforced by the Approving Authority.

“**Rules and Regulations**” means the Rolette County Public Health District Onsite Sewage Treatment System Rules and Regulations, and may also be referred to simply as “regulations” in this document.

“**Septic Tank**” means a watertight tank (usually underground) constructed of cement, plastic or fiberglass, is designed and constructed to receive sewer discharge from a building or preceding tank. It stores liquids for a detention period that provides separation of solids from liquids and digestion of organic matter (decomposition), and allows the effluent to discharge to a succeeding tank, treatment and/or dosing device, or soil treatment system.

“**Setback**” means a distance, measured horizontally unless otherwise noted, which shall be provided and maintained to provide protection and prevent potential hazards, nuisances, or contamination.

“**Soil Absorption Area**” shall mean only the area that was designed to accept sewage, and not the entire mound. (See Appendix, Figure AO)

“**Soil Treatment Area**” means an area where sewage tank effluent is treated and disposed of below the ground surface by filtration and percolation through the soil and also by evapotranspiration, and includes those systems commonly known as seepage beds, trench drain fields, shallow trenches, at grades, and mounds. If the filtration and percolation through the soil is inadequate, the effluent may contaminate the local groundwater, including well water drinking water sources.

“**State Plumbing Code**” means the North Dakota State Plumbing Code (*Chapter 62-03.1-03 – Private Sewage Disposal Systems*).

III - GENERAL PROVISIONS

1. All onsite sewage treatment systems shall be constructed, added to, altered, and maintained in accordance with these regulations. The building contractor, plumbing contractor, onsite sewage treatment system contractor, and the owner are jointly responsible for compliance with these regulations.
2. When a private, public or non-community sewage system is deemed available to a premises used for human occupancy, a permit shall be refused for the construction of an onsite sewage treatment system. A public sewer shall be deemed available when a public sewer line is in place within any street, alley, right-of-way, or easement that adjoins or abuts the premises for which the permit is requested, or when the improvement to be served is located within a reasonable distance of a public sewer to which a connection is practical. A reasonable distance shall be deemed not greater than 200 feet for a single family residence or commercial establishment.
3. The minimum lot size on which an onsite sewage treatment system may be installed is forty thousand square feet (40,000 square feet), except where zoning requires more. This affects any new lots legally recorded after June 1, 2016. If there are section lines or other easements on the property, such as the main rural water line, those easement areas that onsite sewage systems cannot be constructed over cannot be figured into the 40,000 square foot requirements.
4. No property shall be improved in excess of its capacity to properly treat sewage effluent in the quantities and by the means provided in these regulations. If the estimated sewage flow from a building is less than 2,500 gallons/day an onsite treatment sewage system shall be designed in accordance with these regulations. If the estimated sewage flow is greater than 2,500 gallons/day a professional engineer may be required to design the system. A permit shall still be required to be issued by the Approving Authority for such sites.
5. An onsite sewage system or parts of an onsite sewage system shall not be located in any parcel of land other than the parcel of land which is the site of the building, structure, or premises owned and/or served by such families without written legal documentation allowing such to occur.
6. Campers, up to a park model, that can be pulled down the road with a pickup truck are allowed to have a holding tank. Anything larger than a park model and any “stick-built” homes (i.e. trailer house, double-wide) shall install a drainfield on the property.
7. Sewage shall not be discharged into any abandoned or unused well, or into any crevice, sink hole or other opening either natural or artificial in rock formation. Cesspools (seepage pits) are not an approved method of collection or treatment and shall not be installed. When a cesspool is found to be either abandoned or actively used on a site, it shall be pumped out by a licensed septic pumper and then removed or filled up with soil, sand, or gravel. This becomes effective: (1) When any portion of an onsite sewage system is being worked on; (2) the Approving Authority receives a complaint and a cesspool is found; and/or (3) before the property can be sold or transferred. This requirement shall be binding on all systems whether installed prior to these regulations or not.
8. All material removed from any septic tank, privy, sewer, subsurface disposal system, sewage holding tank or toilet shall be transported in water-tight vehicles or containers meant for that purpose and in such a manner that no nuisance or public health hazard is presented. All septic pumpers shall be licensed and follow the North Dakota Department of Health septic pumper rules.

9. A permit to construct or alter an onsite sewage treatment system is valid for a period of 12 months from the date of issuance. The permit may be extended by the Approving Authority, if given prior approval to extend the permit. A new application will be necessary if the house or location has changed or if the permit expires without the Approving Authority being contacted for an extension within a year of the date the permit was issued.
10. A permit to construct or alter an onsite sewage treatment system is not a guarantee of performance. While strict adherence to a permitted design should greatly reduce the incidence of system failures, the Lake Region District Health Unit/Approving Authority does not accept any responsibility for system failure. Proper installation, operation, and maintenance, however, will decrease the possibility of premature failure.

IV - PERMITS AND APPROVAL PROCESS FOR CONSTRUCTION

A. PERMIT APPLICATION/APPLICANT REQUIREMENTS

1. All sewage and sewage effluent shall be disposed of by an approved method of collection and treatment. Water-carried sewage from bathrooms, kitchens, laundry fixtures, and other household plumbing shall not be disposed of in any manner that will be dangerous, unsafe, unsanitary, a nuisance, or risk to life, health, or property, or otherwise in violation of these regulations.
2. Where public sewage treatment systems are not available and construction of an onsite sewage treatment system is planned, a contractor or property owner shall make an application to the Approving Authority for a written permit to do so.
 - a.) A permit is not required to investigate problems with existing septic tanks, pump chamber tanks, or pipes leading to the tanks. However, property owners or contractors shall be required to have or obtain an approved permit prior to installing or replacing any tanks and/or repairing, altering, or extending any drainfield as described in these regulations.
3. Applications for permits shall be made upon forms furnished by the Approving Authority. The fee for a permit shall be approved and set by the Approving Authority. The fee shall be applied per each system collecting black and/or gray water (holding tank and/or septic tank and drainfield). If there are separate septic systems on the same property, they shall require separate permits. Holding tanks collecting oils, greases, and other hazardous products for the protection of surface or groundwater may also require permits and/or other documentation.
4. Applicants shall note the following as part of the application process:
 - a.) In addition to these regulations, zoning and other applicable regulations in place shall be followed in order to receive a permit for a septic system; including setback requirements for elevation, section lines, right-of-ways, roads, and other such requirements for compliance.
 - b.) Due to the critical nature of proper siting for an onsite sewage treatment system, an onsite sewage treatment system permit shall be issued prior to a building permit being issued.
 - c.) In those areas where building permits are not required, no construction on the site shall begin prior to obtaining an onsite sewage treatment system permit.
5. As part of the permit application process, the applicant shall provide accurate information to the Approving Authority for the following:
 - a.) Legal location of lot, size of lot, and property boundaries
 - b.) Distance to the nearest residences, businesses, industries, and recreational sites
 - c.) Location in relation to the flood plain and distance to the nearest river, creek, stream, lake, and/or other water courses, and the ordinary high water mark of them
 - d.) Location of septic systems, location and depth of wells, and any buildings within the lot and on neighboring lots
 - e.) Location of right-of-ways, buried utilities, and geothermal systems

- f.) The maximum number of contemplated bedrooms, water using devices, garbage disposal use, and the square footage of the house to be served by the system or the anticipated rate of sewage flow for commercial establishments
- g.) Disturbances to the soil where the onsite sewage treatment system will be located and past surveys and construction of the site (including any underground lines on the property), and any other information pertinent to the site, as requested by the Approving Authority.

B. PERMIT APPLICATION REVIEW AND INSPECTION REQUIREMENTS

1. All submitted permit applications for onsite sewage systems must be reviewed by the Approving Authority.
2. For sites not requiring an inspection, after the permit application is reviewed and approved to be designed, a permit may be issued for the site.
3. For sites that require an onsite sewer inspection prior to issuing a permit, in addition to the information collected from the permit application/applicant, the Approving Authority may require the following information be provided and or conducted prior to, during and/or after the inspection:
 - a.) Soil profile information: soil borings or soil excavations at the most likely location for the sewage system to determine soil conditions, properties, and permeability to a depth of up to five (5) feet.
 - If the soil where the onsite sewage treatment system will be located has been or appears to be disturbed, the onsite sewage treatment system shall be designed by a professional engineer. A permit shall be required to insure that the engineers design meets regulation requirements for such sites. All onsite sewage systems designed by anyone other than the Approving Authority shall have final approval by the Approving Authority before doing any onsite sewer construction.
 - b.) The general area and slope for the layout of the soil absorption field or soil treatment area.
 - c.) Public records (such as soil surveys or maps or percolation tests)

C. DESIGN PARAMETERS/PERMIT ISSUANCE

1. Upon review of an application and after any necessary inspections have taken place, the design of the onsite sewage system can be completed and a permit issued for the site, keeping in mind the following design parameters:
 - a.) Onsite sewage treatment systems shall be designed with a minimum of 200 square feet of soil absorption field per bedroom, (i.e. minimum requirement for a two bedroom home requires at least 400 square feet; three bedroom home requires at least 600 square feet)
 - b.) Homes/livable buildings larger than 2,000 square feet per floor and sites with larger water using devices shall be designed and installed accordingly. The lineal footage of the drainfield shall be expected to be sized larger, as determined by the Approving Authority for the size of the livable area. Extenuating circumstances shall be determined by the Approving Authority.
 - c.) Drainage from footings, drain tile, sump pumps, eve spouts/roof, furnaces, RO Water system, water softeners and storm waters shall not be designed to be discharged into or on top of any onsite sewage treatment system. Chlorinated water from pools and spas shall not be discharged into or on top of any onsite sewage treatment system. Backwash drains in commercial buildings/shops may not be designed to be plumbed in to the drainfield.
 - d.) For design criteria for sewage flow for "other" types of onsite sewage treatment systems other than permanent dwellings, **See Appendix, Figure AA**. Various types of "other types of establishments" are indicated in the table and are sized according to their estimated volume of sewage effluent, soil type and other aspects that may pertain to the septic system. Design flow determination for "other establishments" not listed in the table shall be determined and approved by the Approving Authority.
2. From the inspection and applicant information gathered and other requirements of these regulations, the Approving Authority will issue the permit with the following minimum design information for the onsite sewage treatment system:

- a.) Minimum sizing and specifications for the type of system to be installed
- b.) Plot diagram of the general area of the system
- c.) Special provisions of the permit
- d.) Owner education supplemental information

D. REQUIREMENTS FOR CONSTRUCTION/CONTRACTORS

1. Once a septic design is completed and a permit is issued for a site, the onsite sewage system may be installed.
2. No person, firm, partnership, joint venture, association, business trust, corporation, or organized group of persons or contractor or sub-contractor (except the property owner) shall engage in the business of installing or constructing onsite sewage treatment systems without first obtaining an onsite sewer license issued by the Approving Authority. It is prohibited to obtain or attempt to obtain a license by means of fraud, misrepresentation, or concealment. Anyone providing technical design, consultation, construction, installation, maintenance, and repair services on all land recognized as fee lands shall be subject to follow these regulations.
3. Onsite sewer contractors shall obtain suitable continuing education, which pertains to onsite sewage treatment systems, in order to obtain a license. The Board of Health shall establish training requirements for contractors. The Board of Health has established the minimum qualified training requirements for contractors doing work in **Rolette County** as one qualified training course, determined by the Approving Authority, before they are licensed and every other year thereafter to maintain their license. Reciprocity for training in other jurisdictions may be made on an individual basis by the Approving Authority. Note: The RCPHD Board of Health has adopted these rules and regulations, which apply to **Rolette County, not including tribal and tribal trust lands within Rolette County**. The provisions of this code shall be enforced by the Approving Authority.
4. An applicant for a license to construct onsite sewage treatment systems shall submit a completed application for a license on a form provided by the Approving Authority. The license fee to construct onsite sewage treatment systems, shall be established by the Approving Authority. The license fee is non-refundable and non-transferable.
5. A license issued from the Approving Authority is valid for one calendar year, unless revoked for cause. The license shall be renewed on or before March 15th, a renewal date set by the Approving Authority, or before a contractor begins any onsite sewage system work. Anyone who renews or applies for a license after March 15th of each year will be assessed a late fee, set by the Approving Authority. As part of the license renewal process, before a license is issued to a contractor, all as-built drawings shall be submitted from the prior year's work. In addition, training status and any probation concerns shall be addressed prior to a license being renewed.
6. All new construction and/or alterations/modifications to existing systems shall be done by a licensed onsite sewage treatment system contractor or the property owner. Property owners are not required to be licensed to install their own systems, but they shall have an onsite sewage treatment system permit issued for the site of installation before installing their system. In addition, they shall have appropriate equipment to install the system. Property owners who do not attend an approved training shall meet other requirements set forth by the Approving Authority, including alternative training and/or meetings with the Approving Authority to ensure the requirements of the permit are/will be fulfilled.
7. Mound systems, at-grade systems, and commercial sites shall be installed by an onsite sewer contractor licensed with the Approving Authority. Mound systems and at-grade systems which are anticipated to be installed by an onsite sewer contractor who, as determined by the Approving Authority, may not or does not have enough field experience in constructing such systems will have additional requirements to fulfill prior to installing such systems.
8. At the time of septic installation, a minimum of one person on the site of the sewer construction shall: ♦ be current on his/her training requirements; ♦ have a copy of the permit available onsite as reference; and ♦ be knowledgeable about and oversee the system construction from start to

finish, including ensuring the Approving Authority has been contacted to allow for inspection of the site.

E. INSPECTIONS AND DOCUMENTATION

1. After a permit is issued and an onsite sewage system is ready to be constructed, it shall be the duty of the contractor or property owner to contact the Approving Authority to allow for a final inspection of the construction site.
 - a.) Notification of at least two working days prior to backfill and cover shall be provided. Notification on the day of construction shall also be required.
 - b.) It shall be the duty of the owner or occupant of the property to give free access to the property at reasonable times for the purpose of making such inspections. Not providing prior notice of sewer construction work may result in probation and/or other measures taken. Inspections may take place at any time before, during, or after the sewer construction is taking place.
 - c.) No part of an onsite sewage treatment system shall be covered until it has been inspected or permission to cover the system has been given by the Approving Authority.
 - d.) Upon completion of the system and final inspection of the system, if found satisfactory, the Approving Authority may issue the applicant a certificate of approval of the system as specified in the permit. A copy of the inspection results may be furnished to the contractor and/or property owner.
 - e.) If upon inspection, it is found that any construction is not in agreement with the design outlined in the permit or otherwise in violation of these regulations, an order will be given to rectify such conditions.
 - f.) Once the installation of an onsite sewage treatment system is completed, the contractor or property owner shall submit an as-built drawing/plan of the system installed (holding tank and/or septic tank and drainfield system) to the Approving Authority. As-built drawings shall be submitted on a form provided by the Approving Authority within a reasonable period of time after the construction of the system has been completed. As-built drawings serve as the final document for the site of construction, and may serve in place of the final inspection, when one is not conducted. As-built drawings shall be submitted for each system installed, regardless if an inspection was conducted by the Approving Authority. Photographs of the construction site will be required to be submitted to the Approving Authority, when requested.
2. In addition to requirements for inspections on properties requesting a permit for construction (new construction or altering the septic system with existing house) the Approving Authority shall also be notified of the following situations to allow for investigation/inspection:
 - a.) When a property is being sold or transferred
 - When requested to inspect a property with an existing onsite sewage treatment system (OSTS) on it, the status of the existing system shall be determined by the adopting authority, based on information provided by the property owner and visual inspection. The inspection will take into account regulations in place and design parameters used at the time of installation of the existing system.
 - If the onsite sewage treatment system is found to be “failing” at the time of/during the process of the property being sold or transferred, the onsite sewage treatment system shall be brought up to the current regulations within a reasonable period of time determined by the Approving Authority.
 - b.) When a property has an existing onsite sewage treatment system on it and the site will have a new house built on the property
 - The existing onsite sewage treatment system shall be inspected and permitted based on the new home information and current regulations. If the current system is found to be up

to current regulations and meet design standards for the new house, the house may be hooked into the existing system.

- c.) When an existing system is being worked on and the drainfield appears to be failing
 - The concerns of the existing system shall be investigated. An inspection will take place as deemed necessary by the Approving Authority.
- 3. Investigations and or inspections may also take place for the following:
 - a.) When an onsite sewage treatment system appears to be failing and it is brought to the attention of the Approving Authority by visual inspection or reported by a third party.
 - b) If a system is “failing”, needs repair, a complaint is received and the system is found to be “failing”, the system was constructed without a permit, then the system will need a new permit with a design that meets current regulations.

F. COMPLIANCE WITH THE REGULATIONS

1. Penalties

- a.) Any person violating any of the provisions of these regulations shall be guilty of a Class B misdemeanor (NDCC Ch. 23-35-13).
 - Improperly designed, installed, operated, and maintained onsite sewage treatment systems are a menace to the health and general welfare of the public and are hereby declared a nuisance; and are subject to the requirements specified under North Dakota Century Code (NDCC) Section 23-35-08 and Section 23-35-09.
 - If upon inspection of a non-permitted, failing system, the Approving Authority determines that a contractor or property owner is in violation of these regulations, and it is determined that a corrective action is necessary, the property owner and/or contractor will be notified in writing of the findings and instruct the contractor and/or property owner to take steps to correct such violations within a reasonable period of time.
 - Failure of a contractor or property owner to comply with these regulations may cause the Approving Authority to fine, revoke, or suspend his/her license and be required to rectify the situation. The contractor or property owner will be notified in writing of the misdemeanor fine and/or the revoking or suspending of a license.
- b.) Any property owner or contractor shall have the right to appeal the decisions of the Approving Authority to the Board of Health.
 - Appeals to rulings shall be made to the Board of Health within 30 days after the date of the ruling. The written appeal must state the grounds upon which the appeal is made. The Board of Health shall fix a reasonable time for the hearing of appeals and give due notice to interested parties. The Board of Health must rule on all appeals within 30 days and the final outcome of such appeal shall be based on a majority vote of the Board. Within 15 days after the hearing, the Board of Health shall take action and shall have the Approving Authority mail, a copy of its order to the petitioner.
 - The decisions/rulings of the Board of Health may be appealed to the District court, following the procedures provided in Section 28-34-01 of the North Dakota Century Code.

2. Variances

- a.) In a case where a permit is required by RCPHD and a property owner cannot comply with the regulations, he/she may apply to the Board of Health for a variance. If a permissible option exists for the project, and a practical difficulty does not exist, then a variance cannot be applied for and will not be granted. *Refer to Policy #2016-OSTS.*
 - If the variance is approved, an onsite sewage treatment system permit shall be obtained.
 - The fee for the variance application will be set by the Board of Health.

- The decisions/rulings of the Board of Health may be appealed to the District court, following the procedures provided in Section 28-34-01 of the North Dakota Century Code.

PART II - INSTALLATION/CONSTRUCTION STANDARDS

Conventional onsite sewage treatment system technology consists of a septic tank and gravity or pressure flow to a series of soil treatment trenches or a pressurized bed, at-grade, or mound system. These regulations address conventional systems. New choices for treatment may be available but shall be addressed with the Approving Authority prior to installation of such systems.

A typical onsite sewage treatment system has three major components: (1) the plumbing, which collects effluent from toilets, sinks, washing machines, and other water-using devices; (2) the septic tank, which serves as the collection and pre-treatment device, and (3) the soil treatment area (above-ground or below-ground systems). This following sections address the septic tank and treatment systems from the tank on.

I - General Provisions

1. All septic system products should be installed according to manufacturer instructions as long as the products do not contradict these regulations. This includes maximum depth/bury requirements for septic tank and drainfield products. All perforated pipe used for onsite sewage treatment systems shall be rigid. Coiled pipe cannot be used in an onsite sewage treatment system.
2. No onsite sewage treatment system shall be installed during wet conditions or conditions under which the soil would become smeared during construction, or when the soil is frozen.
3. Driveways, buildings or other structures shall not be constructed over any part of any system.
4. Below-ground systems shall be installed as shallow as possible to allow for maximum aeration/ aerobic conditions for the trenches. The maximum depth to the bottom of the soil absorption area will range from six to 24 inches from the surface of the original natural ground (determined by the Approving Authority) and will be indicated on each permit.
5. For all systems, a grass cover shall be established by the owner or his agent over the soil treatment system. The grass over the drainfield should be mowed to keep it short. After construction of the system is complete, it should not be driven over with anything larger than a riding lawn mower.
6. For all systems, a minimum of one foot of straw cover over the septic system is recommended the first year after installation, particularly if the system will be installed late in the season or if the system will be used minimally before the ground freezes.
7. Abandoned sewage disposal systems, septic tanks, pumping and other chambers and seepage beds shall be disconnected from buildings. The tank and chambers shall be pumped out, crushed, and filled with earth or properly removed. The Approving Authority must be notified to approve abandonment procedures.
8. For any sites that have been formerly permitted or authorized by the Approving Authority, any septic work done on those sites including: installation of or work on a septic tank or sewage treatment system, or other work shall be submitted to the Approving Authority to be filed with any current documentation from the site.

II - STORAGE OF SEWAGE

A. SEPTIC TANKS (See Appendix, Figures AD and AE)

The purpose of the septic tank is to provide an environment for the first stage of treatment in onsite sewage treatment systems by promoting physical settling, flotation, and the anaerobic digestion of sewage. Additionally, the tank allows storage of both digested and undigested solids until they are removed for treatment.

1. Specifications and Construction of Septic Tanks

- a.) All septic tanks, regardless of material or method of construction, shall be:
 - Watertight
 - Structurally designed and constructed to withstand all anticipated earth pressures or other loads under saturated soil conditions with the tanks empty.
 - Constructed of sound durable materials not subject to excessive corrosion or decay.
 - Shall be made of concrete, plastic or fiberglass; metal tanks are not allowed. Installed level and on a solid bed.
- b.) The liquid depth of any septic tank or compartment thereof shall not be less than 30 inches. A liquid depth greater than six and one-half feet (78 inches) shall not be considered in determining tank capacity.
- c.) No tank or compartment thereof shall have an inside horizontal dimension less than 24 inches.
- d.) The inlet and outlet shall be located at opposite ends of the septic tank along the axis of maximum dimension. The inlet invert shall be not less than three inches above the outlet invert.
- e.) There shall be at least one inch between the underside of the top of the tank and the highest point of the inlet and outlet devices.
- f.) Baffles/Tees: Baffles are devices installed in a septic tank, located at the inlet and outlet areas, for proper operation of the tank and to provide maximum retention of solids. The Inlet and outlet connections of the tank shall be submerged by means of baffles or sanitary tees.
 - Inlet and outlet baffles shall be constructed of acid resistant concrete, acid resistant fiberglass or plastic. Baffles shall be integrally cast with the tank, or affixed with stainless steel connectors.
 - Sanitary tees shall be affixed to the inlet and outlet pipes with permanent waterproof adhesive.
 - The inlet baffle or sanitary tee, shall extend at least six inches but not more than 20 percent of the total liquid depth below the liquid surface and at least one inch above the crown of the inlet sewer.
 - The outlet baffle, or sanitary tee, and the baffles between compartments shall extend below the liquid surface a distance equal to 40 percent of the liquid depth except that penetration of the indicated baffles or sanitary tees for horizontal cylindrical tanks shall be 35 percent of the total liquid depth. They also shall extend above the liquid surface. Baffles shall extend at least six inches above the liquid surface.

- g.) Access to the septic tank shall be as follows: There shall be a minimum of one manhole 18 inches least dimension and located within six (6) feet of all tank walls. If the manhole is at or above ground level it should have a locking device on it and be childproof and watertight. Manholes placed below ground level must have a minimum of six (6) inches of earth cover and a maximum of 12 inches of earth cover.
- h.) There shall be an inspection pipe at least four (4) inches in diameter or a manhole over both the inlet and outlet baffles. The inspection pipes must extend through the cover and be capped flush or above finished grade.
- i.) Suspended solids filters shall be required to be installed on septic tanks in certain circumstances, including for: commercial sites; any building with a garbage disposal; mound systems, and at-grade systems. Sites with a grinder pump in the basement may also be required to add a filter on the outlet of the septic tank, if designated on the permit. Filters installed on septic tanks shall be installed on the outlet of the septic tank, and regularly maintained. If more than one septic tank is installed on the site, the filter shall be installed on the outlet of the last tank, closest to the pump chamber or drainfield.
- j.) Multiple Tanks:
- Where more than one tank is used to obtain the required liquid volume, the tanks shall be connected in a series. Each tank shall comply with all other provisions of these regulations.
 - No more than four septic tanks in a series can be used to obtain the required liquid volume.
 - The first tank shall be no smaller than any subsequent tanks in the series.
- k.) Compartment Tanks:
- Compartment tanks shall be approved by the Approving Authority.
 - Septic tanks larger than 3,000 gallons and fabricated as a single unit shall be divided into two or more compartments. When a septic tank is divided into two compartments, not less than one-half nor more than two-thirds (2/3) of the total volume shall be in the first compartment. When a septic tank is divided into three or more compartments, one-half of the total volume shall be in the first compartment and the other half equally divided in the other compartments.
 - Connections between compartments shall be baffled to obtain effective retention of scum and sludge.
 - Adequate venting shall be provided between compartments by baffles or by an opening of at least 50 square inches near the top of the compartment wall.
 - Adequate access to each compartment shall be provided by one or more pipes at least 18 inches least dimension, and located within six (6) feet of all walls of the tank, as well as inspection pipes (at least four (4) inches in diameter) or a manhole over both the inlet and outlet baffles.
- l.) Depth of Septic Tanks:
- Septic tanks/holding tanks shall be installed according to manufacturer instructions, including maximum depth and other bury requirements.
 - Where septic tanks are installed above frost line, precautions must be taken to prevent the septic tank from freezing, including providing proper insulation over the tank and pipes leading to/from the tank(s).
- m.) Service Limited:

- No septic tank shall serve more than one property unless extenuating circumstances exist and then it shall be authorized only by the Approving Authority.

n.) Septic Tank Capacity:

- The minimum septic tank working capacity of all septic tanks shall conform to the following listed tables determined by the number of bedrooms contemplated in the dwelling served and/or other dwelling occupancy information and the occupant load as described from the table listed below, whichever is greater in other building occupancies.

Number of Bedrooms	Liquid Working Capacity
1 to 3	1,000 gallons
4 to 5	1,500 gallons
6 to 7	2,000 gallons
8 to 9	2,500 gallons

** For ten or more bedrooms, the septic tank shall be sized as an "other" establishment.*

- If a garbage disposal unit is installed or to be installed in a residence, the design for the site shall include: septic tank capacity shall be increased by 50 percent and the lineal footage of the drainfield shall be increased by 25 percent. In addition, either multiple compartmented tanks or suspended solids filter must be provided.
- Pump chamber tank capacity, whether separate or a multiple/compartament tank cannot be included in the sizing for the septic tank liquid capacity required for the site.
- All tanks installed are highly recommended to have a suspended solids filter installed on them. *For sites requiring a filter, see Part II, Section II (Septic Tanks), A.1.i.*
- Other establishments: the liquid capacity of a septic tank serving other than a dwelling with sewage flows up to 1,500 gallons/day shall have the capacity to hold a minimum of 36 hours of sewage flow. In no instance shall the liquid capacity of the tank be less than 1,000 gallons. For sewage flows greater than 1,500 gallons per day, the minimum liquid capacity shall be equal to 1,125 gallons plus 75 percent of the daily sewage flow.
- Each new or altered system will be designed utilizing the guidelines provided in the "Design Manual" and these regulations. Each design will be designed to meet or exceed the minimum standard of these regulations.

o.) Location:

- The septic tank shall be installed in a location so that it is accessible by a commercial septic pumper truck for the removal of liquids and accumulated solids.
- The septic tank shall be placed on firm and settled soil capable of bearing the weight of the tank and its contents. (**See Appendix, Figure AB for setback requirements**). All pipes leading to and from the tank shall also be placed on firm and settled soil.
- The tank(s) shall be provided adequate soil cover to prevent water from accumulating and settling over the tank(s).

p.) Maintenance

- The owner or agent of any septic tank shall regularly inspect and arrange for the removal and sanitary disposal of sewage from the tank whenever the top of the sludge layer is less than 12 inches below the bottom of the outlet baffle or whenever the bottom of the scum layer is less than three inches above the bottom of the outlet baffle.
- In general, it is recommended that the septic tanks be checked yearly and pumped out when necessary. Septic tanks may be required by the Approving Authority to be inspected and pumped out by a licensed septic pumper at the time of sale or transfer of property.

B. HOLDING TANKS

1. Holding Tanks are considered watertight septic tank devices capable of storing sewage, but are not intended to treat sewage effluent. Holding tanks are not allowed, except under certain extenuating circumstances. Holding tanks may be allowed only as replacements for existing, non-conforming systems or for campers that can be pulled behind a pickup, up to a park model. The Approving Authority will make the final decision on a case by case basis.
2. A holding tank shall be constructed of the same materials and by the same procedures as those specified for watertight septic tanks. Holding tanks shall be structurally designed and constructed to withstand all anticipated earth pressures or other loads under saturated soil conditions with the tanks empty and shall be constructed of sound durable materials not subject to excessive corrosion or decay.
 - Shall be made of concrete, plastic or fiberglass; metal tanks are not allowed.
3. A holding tank that will be used at a later date as a septic tank with a drainfield shall be constructed of the same materials as required of septic tanks, including requirements for inspection pipes, manholes, baffles, working capacity, and other specifications, including being designed specifically to be buried underground, and installed according to the manufacturer instructions.
4. Holding tanks shall be protected against flotation by weight of tank, earth anchors, or shallow bury depths. The tanks must be **WATERTIGHT**, have a minimum of 1,000 gallon capacity, have an inspection pipe on at least the inlet area, and have a minimum of an 18 inch diameter cleanout capped above or even with the top of the ground and readily accessible.
 - Installed level and on a solid bed
5. Holding tanks shall be located in an area that is readily accessible for pumping under all weather conditions and where accidental spillage will not create a nuisance.
6. Holding tanks shall have an appropriate electrical warning system to indicate when the water level is within one foot of the top of the tank.
7. In extenuating circumstances where underground treatment is not feasible, consideration may be given to a special method of collection and disposal. When there is a watertight holding tank used to collect the sewage, a contract with a licensed septic pumper shall be in place and the tank shall be pumped out only by a licensed septic pumper. A contract for disposal and treatment of the sewage wastes shall be maintained by the owner with a licensed septic pumper, municipality, agency, or firm established for that purpose. A copy of the contract or receipts shall be made available to the Approving Authority upon request. Pumping effluent from a holding tank onto the ground or into any body of water is illegal and will be prosecuted according to NDCC Ch. 23-35.
8. Outdoor toilets (privies) shall not be installed unless there is a watertight holding tank under them to contain the sewage. Installation of all privies shall be approved prior to construction by the Approving Authority. A contract with a licensed septic pumper shall be in place and the tanks shall be pumped out only by a licensed septic pumper.
9. Determining the size requirement(s) for holding tank size and liquid capacity, based on extenuating circumstances noted above are as follows:
 - a.) For a single family dwelling, not located in a flood plain, holding tank capacity should be 1,000 gallons minimum or 400 gallons times the number of bedrooms, whichever yields the greatest volume.

- b.) For “other establishments”, the capacity should be based on measured flow rates or estimated flow rates. Holding tanks serving other establishments must provide storage of at least five times the daily flow rate.

III - PRESSURE DISTRIBUTION AND PUMPING SYSTEMS

A. PIPING MATERIAL

1. All piping from the building drain to the onsite sewage treatment system shall be four inches or larger service schedule 40 acrylonitrile-butadiene-styrene or polyvinyl chloride plastic pipe, type PSP PVC sewer pipe SDR 35 40, and fittings A.S.T.M. D3033 or D3034.

B. SPECIFICATIONS FOR DOSING DEVICES/PUMPS/PUMP SYSTEMS

1. Dosing devices/pumps/pump systems are used to move either raw sewage or septic tank effluent to different parts of the onsite sewage treatment system. This section pertains to pumps installed after the septic tank.
 - a.) Sumps and ejectors installed before the septic tank must meet the requirements set forth in Section 710.0 of the Uniform Plumbing Code.
 - b.) Sites with ejector pumps shall have a minimum of a two compartment septic tank installed and may also require a filter on the outlet of the septic tank.
2. Dosing/Pump Chamber
 - a.) The dosing chamber shall be watertight and constructed of durable materials not subject to corrosion or decay such as: concrete, plastic or fiberglass.
 - b.) There shall be one or more manholes, at least 24 inches in dimension and preferably located directly above the dosing device. The riser shall come to or above the surface of the ground; be secure, watertight and childproof.
 - c.) An external electrical outlet must be provided for connection to the pump and control switches. Openings for wiring into the pump chamber must be sealed.
 - d.) The size of the effluent dose, working capacity, and liquid capacity of the pump chamber shall be determined by the design of the soil treatment system, but in no case shall the dosing chamber be sized to provide a dose of less than 75 gallons.
 - e.) The pump chamber shall have an electrical high water alarm installed on them.
3. Dosing Devices for Gravity Distribution
 - a.) A pump or commercially manufactured siphon shall deliver the dose to the soil treatment unit for gravity distribution over the soil treatment area.
 - b.) For dwellings, the dosing device shall discharge at least 10 gallons per minute but not more than 45 gallons per minute, for gravity distribution.
 - c.) For other establishments, the dosing device should discharge at a rate of at least 10 percent greater than the water supply flow rate but not faster than the rate at which effluent will flow out of the distribution device.
 - d.) If the dosing device is a commercially manufactured siphon, a maintenance inspection shall be made at least every six months by the owner or his agent. The siphon shall be maintained in proper operating condition.
4. Pump Requirements

- a.) The pump shall be a commercially manufactured sewage effluent pump, switched, with weight displacement or a mercury float switch. Floats shall be attached to the stand pipe. The audio-visual alarm may be located in the building or on a post in the yard.
 - b.) A quick couple union on the stand pipe shall be accessible from the ground surface.
 - c.) The pump shall be set on a pedestal/block on the bottom of the pump chamber tank to minimize grit and solids entering the impeller.
 - d.) The pump shall be sized to discharge in the maximum time of 20 minutes.
 - e.) A one quarter (1/4) inch weep-hole on the discharge pipe shall be located just inside the dosing chamber.
 - f.) If a check valve is used, it should be located near the drainfield and be well insulated.
 - g.) When the soil treatment area is at a higher elevation than the pump, sufficient dynamic head shall be provided for both the elevation difference and friction loss.
5. Dosing Devices for Pressure Distribution
- a.) The dosing device shall be a commercially manufactured sewage effluent pump.
 - b.) The pump capacity and the pressure distribution laterals shall be sized by the Approving Authority.

IV - SOIL TREATMENT SYSTEMS

A. BELOW GROUND SYSTEMS

Below-grade systems are constructed in original soil with distribution of effluent occurring below the soil surface. It is the underlying soil that treats the sewage effluent before it reaches surface or ground waters. The two types of below-grade soil treatment systems commonly used are trenches and seepage beds.

1. Location (***See Table AB for setback requirements***)
2. Size
 - a.) The total area and depth of trenches shall be determined by the Approving Authority and shall be based on the infiltration rate of the soil, the depth of limiting condition, and the anticipated volume of sewage.
3. Design and Location
 - a.) The bottom of the trenches shall be a minimum of 24 inches above the limiting condition.
 - b.) The trenches shall not be less than 18 inches nor more than 36 inches wide.
 - c.) Trenches should not exceed 100 feet in length from either side of the drop boxes without approval of the Approving Authority.
 - d.) The minimum required distance of undisturbed soil between below-ground trenches shall be as follows:
 - 18 – 24 inch width trenches = six (6) feet
 - 36 inch width trenches = nine (9) feet

If the slope is greater than six (6) percent, a minimum of 10 feet of undisturbed soil is required between each of the trenches.
 - e.) The bottom of the trench excavation shall be level throughout the length of the trench and the trench must installed perpendicular to the slope.
 - f.) The bottom and sides of the soil treatment system shall be excavated using a bucket with teeth, and in a manner as to leave the soil in a natural, un-smearred, and un-compacted

condition. Excavation shall be made only when the soil moisture content is less than the plastic limit.

- g.) When the percolation rate is slower than 15 minutes per inch, excavation shall be by back-hoe/track-hoe or other means that allow the equipment wheels or tracks to remain on the surface soil. Excavation equipment or other vehicles shall not be driven on the soil treatment area.
- h.) If smearing occurs while excavating, the bottom and sides shall be raked. Minimize or avoid walking in the trench to prevent compaction, loss of soil structure, and the subsequent reduction in the soils infiltrative capacity (to prevent compaction and loss of soil structure).
- i.) The minimum depth of soil cover over the distribution pipes shall be at least 12 inches. The maximum depth of soil cover over the distribution pipes shall not be more than 36 inches. There shall be adequate mounded soil cover provided over the entire septic system, to allow the soil over the septic system to settle and once settled it will still be a minimum of 12 inches over the distribution pipes.
- j.) A grass cover shall be established by the owner or his agent over the soil treatment system. The grass over the drainfield should be mowed to keep it short. After construction of the system is complete, it should not be driven over with anything larger than a riding lawnmower.

4. Standard Trench Systems (i.e. with rock filter material)

In addition to the requirements stated in Part II, Section IV, Subsection A, standard trench systems shall require the following:

- a.) Filter Material-There shall be a layer of at least 6 inches but not more than 24 inches of filter material in the bottom of the trenches and beds.
 - Drainfield Rock used as filter material around the perforated pipe shall be: Clean, washed three-fourths (3/4) – 2.5 inches in diameter, crushed igneous rock or similar insoluble, durable and decay-resistant material free from dust, sand, silt, or clay. There shall be no more than five (5) percent by weight passing a three-fourths (3/4) inch sieve, and no more than one (1) percent by weight passing a number 200 sieve. Materials greater than 2.5 inches in diameter shall not exceed five (5) percent by weight.
- b.) Distribution Pipes
 - Distribution pipe shall be straight, (coiled pipe is not allowed), at least four inches in diameter, and constructed of sound and durable material not subject to corrosion or decay or to loss of strength under continuously wet conditions. Perforated pipe used for sewage distribution shall have one or more holes of no less than one-half (1/2) inch diameter spaced not more than 36 inches apart. Distribution pipes shall have load bearing capacity of not less than 1,000 pounds per lineal foot.
 - Distribution pipe for pressure systems shall be sized by the Approving Authority.
- c.) The distribution pipes shall be laid level away from the distribution device or on a uniform slope of no more than four inches per 100 feet.
- d.) The filter material shall completely encase the distribution pipes to a depth of at least two inches.
- e.) The filter material shall be covered with geotextile fabric. Geotextile fabric is durable non-woven fabric that must permit the passage of water without passage of overlying soil material into the drainfield rock. ASTM standards for the fabric: unit weight of at least 3oz/yd². Permittivity of at least 1.0 sec-1. Trapezoid tear strength of at least 35 lbs. Mesh size equal to U.S. Sieve No. 70.

5. Gravelless Trench Systems

In addition to the requirements stated in Part II, Section IV, Subsection A, gravelless trench systems shall require the following:

a.) Gravelless Pipe System **(See Appendix, Figure AI)**

- Gravelless pipe is a polyethylene corrugated wrapped pipe used in place of rock for a trench system. This pipe has an inside diameter of 8 – 10 inches, and is wrapped in either geotextile or nylon filter material. The corrugations are usually one-half (1/2) inch, with three-fourths (3/4) inch separations.
- Typically, manufacturers place the holes at four (4) o'clock and eight (8) o'clock. It allows the effluent to wick around on the geotextile fabric.
- The loading rate for a 10 inch gravelless pipe is the same as that of a three (3) foot wide trench with six (6) inches of rock below the pipe.
- The eight (8) inch pipe (inside diameter) is sized the same as equivalent to a two (2) foot wide trench with six (6) inches of rock. The loading rates are key to the design of the system.
- Keep these two major construction guidelines in mind: (1) Keep it dry. These materials will not overcome the plastic limit in soils. (2) Keep it level. It is critical that the pipe be laid level.
- A gravelless pipe system must be supported all the way around during initial backfilling to prevent movement of the pipe. If the pipe is too tight in the trench and space is not filled with soil during back-filling, there will not be adequate pipe support and a good base.
- Gravelless pipe systems are designed to be surrounded by soil. DO NOT backfill the excavation with drainfield rock. The system will not function properly with rock.

b.) Chamber System **(See Appendix, Figure AJ)**

- The chamber system is another type of gravelless technology that uses something other than rock to fill the trenches. The chambers come in various widths and are dome shaped with an open bottom design.
- The loading rate for Chambers is the same as 6 inches of rock under the pipe for the chamber with (six) 6 inch high slatted sides.
- The chamber with 12 inch high slatted sides is sized the same as a rock system that has 12 inches of rock under the pipe.
- DO NOT use rock around or under this system.
- The chamber system is installed level and perpendicular to the slope along the contour.
- Drop boxes or end caps may be used to connect the chambers together at the ends.
- To prevent erosion of the trench bottom, a form of splash plate protection that will not erode or deteriorate shall be installed at the point where effluent is being delivered to the first trench.

6. Drop Boxes (for standard and gravelless trench systems)

Drop boxes are used to distribute sewage by gravity flow that loads one section to a predetermined level before overflowing to the next section. If serial distribution cannot be achieved, parallel distribution may be used, if authorized by the Approving Authority.

a.) Drop Box Specifications (See Appendix, Figure AF and AG)

- Drop boxes shall be placed on firm and settled soil, be watertight, and constructed of durable materials not subject to excessive corrosion or decay. Connections between drop boxes shall be constructed with watertight pipe with a minimum diameter of 4 inches.
- The invert of the inlet pipe shall be at least one inch higher than the invert of the outlet pipe to that trench. The invert of the outlet pipe to the next trench shall be at least two inches higher than the invert of the outlet pipe to the trench in which the box is located.
- When septic tank effluent is delivered to the drop box, the effluent discharge into the drop box shall be directed against a wall or side of the box on which there is no outlet, or against the bottom of the drop box.
- Each drop box shall have a removable cover. In addition, each trench line shall have an inspection pipe that extends above or to the ground surface to permit inspection, and have a visible durable marker at grade or above ground. Rebar should also be installed next to the inspection pipes to be able to easily find and inspect the system. Trenches may outlet one side or both sides of the drop box. There are four (4) sides; could be up to two sides used.
- When using drop boxes with serial distribution, the first and subsequent trenches must not be directly connected, this allows the trenches to work independently and does not create head on the last trench. This setup allows each individual trench line to be fully utilized prior to distribution to remaining trench lines.
- Each trench line end cap or drop box shall have an inspection pipe installed, four (4) inches in diameter, at one or both ends, at the time of construction. The first trench should have an inspection pipe at the entrance of the trench. The inspection pipes shall be properly secured to prevent them from being able to be easily moved or pulled out of the ground. Inspection pipes shall have tight fitting covers on them.
- The minimum depth of soil cover above the top of the drop boxes shall be at least 12 inches.

7. Bed Systems (**See Appendix, Figure AQ**)

a.) Location (**See Appendix, Table AB for setback requirements**)

- Not recommended for sites with a significant slope (greater than four (4) percent); and shall not be installed for commercial business facility sites.

b.) Size

- The minimum size and depth of each bed shall be determined by and shall be based on the infiltration rate of the soil, the anticipated volume of sewage and the depth of limiting condition. Designers must size beds with 50 percent more square footage than trenches to allow for the fact that there is very little sidewall with a seepage bed and low oxygen transfer.

c.) Design and Construction/Determination of Soils

- The bottom of the bed shall be level, at least 24 inches above limiting condition (**See Appendix, Figure AQ**).
- The bed shall not be more than 100 feet in length.
- The bottom and sides of the soil treatment system shall be excavated in such a manner as to leave the soil in a natural, un-smearred and un-compacted condition. Excavation shall be made only when the soil moisture content is less than the plastic limit.
- When the percolation rate is slower than 15 min/inch, excavation shall be by backhoe or other means that allow the equipment wheels or tracks to remain on the soil surface. Excavation equipment or other vehicles shall not be driven on the soil treatment area.
- There shall be a layer of at least (six) 6 inches but not more than 24 inches of filter material in the bottom of the bed, when using rock.
- Distribution pipes - Distribution pipes shall be straight, (coiled pipe is not allowed), at least four inches in diameter and constructed of sound, durable material not subject to corrosion, decay, or to loss of strength under continuously wet conditions. Distribution pipe for pressure systems shall be sized by the Approving Authority.
- The distribution pipes shall be laid level away from the manifold pipe or in a uniform slope of no more than four inches per 100 feet. The distribution pipes shall be uniformly spaced no more than five feet apart and not more than 30 inches from the sidewalls of the bed.
- The (rock) filter material shall completely encase the distribution pipes to a depth of at least two inches. The (rock) filter material shall be covered with geotextile fabric.
- If the bed is wider than 12 feet, pressure distribution should be considered to deliver the effluent because it provides better oxygen transfer to the middle of the bed.
- The bed shall be backfilled and crowned above the finished grade to allow for settling. The top six inches of soil shall have the same texture and density as the adjacent soil.
- The minimum depth of soil cover over the distribution pipes shall be at least 12 inches. The maximum depth of soil cover over the distribution pipes shall be not more than 36 inches. There shall be adequate mounded soil cover provided over the entire bed system to allow the soil over the system to settle and once settled it will still provide a minimum of 12 inches over the pipes.

- The owner or their agent shall establish a grass cover over the onsite sewage system. The grass over the drainfield should be mowed to keep it short. After construction of the system is complete, it should not be driven over with anything larger than a riding lawnmower.

B. ABOVE-GROUND SYSTEMS

Above-ground systems are used when the natural soil will not accomplish the necessary acceptance or treatment below grade. The construction of these systems is a more exacting process than construction of below-grade systems. Above-ground systems may be the only choice for proper treatment on a site. Above-ground systems applications include sites with seasonal high soil water tables, bedrock, excessively permeable soils and slowly permeable soils. All above-ground systems must utilize a pump and pressure distribution. Above-ground systems, for the purposes of this document are at-grade and mound systems.

1. At-Grade Systems (See Appendix, Figure AP)

a.) Location (See Appendix, Figure AB for setback requirements)

- An at-grade system is installed with the distribution media placed at the original soil surface. It is designed to solve similar problems as the mound, but where the soil conditions are somewhat more favorable. The natural soil serves as the treatment medium and disperses the effluent into the environment.
- There shall be a minimum of 24 inches of undisturbed, unsaturated soil where the at-grade system will be installed.
- At-grade systems shall be located on flat areas or crests of slopes.

b.) Size

- The size of each at-grade system will be determined by the Approval Authority and shall be based on the filtration rate of the fill material, the original soil underneath the system, and the anticipated volume of sewage effluent and the slope of the site.

c.) Design

- The design of each at-grade system will be determined by the Approving Authority using the Design Manual and these regulations. At-grade systems shall be installed by onsite sewer contractors who are licensed with the Approving Authority.
- Sites requiring an at-grade system shall not have a garbage disposal installed.
- All newly installed at-grade systems, shall have a suspended solids filter installed on the outlet of the septic tank.
- An at-grade system shall only be designed for a single family residence, not multi-unit housing.

2. Mound Systems (using rock as the filter material) (See Appendix, Figure AO)

a.) Location (See Appendix, Figure AB for setback requirements)

- A mound should be used when there exists a limiting condition above 24 inches in depth. In these situations, a mound has an advantage over a trench because the mound provides a greater depth of underlying infiltration capacity.
- There shall be a minimum of 12 inches of undisturbed, unsaturated soil where the mound system will be installed.
- Whenever possible, mounds shall be located on flat areas or crests of slopes. The side slopes on the mound shall be no steeper than 4 to 1. Mounds shall not be located on

natural slopes of more than three (3) percent if the percolation rate is slower than 120 minutes per inch to a depth 12 inches below the sand layer.

- Mounds shall not be located on slopes exceeding six (6) percent if the soil percolation rate is slower than 60 minutes per inch to a depth of at least 12 inches below the sand layer. Avoid depressions, based on slopes and concave slopes unless suitable drainage is provided.
- The percolation rate must be faster than 30 minutes per inch for mounds to be constructed on slopes up to 12 percent. Mounds shall not be located on slopes exceeding 12 percent under any soil percolation rate conditions.

b.) Size

- The size of each mound will be determined by the Approving Authority and shall be based on the filtration rate of the fill material, the original soil underneath the system, and the anticipated volume of sewage effluent and the slope of the site.

c.) Design

- The design of each mound will be determined by the Approving Authority using the Design Manual and these regulations. Mound systems shall be installed by onsite sewer contractors.
- Sites requiring mounds shall not have a garbage disposal installed. All newly installed mound systems, in addition to any being worked on as of the effective date of these regulations shall have a suspended solids filter installed on the outlet of the septic tank and any garbage disposals installed shall be removed.
- A mound system shall only be designed for single family residence not multi-unit housing.

d.) Specifications

- A minimum of 12 inches of clean, washed sand shall be placed where the filter material is to be located. A crawler tractor or backhoe with tracks, shall be used to move the sand into place. At least six (6) inches of sand shall be kept beneath equipment to minimize compaction of the plowed layer. The sand layer upon which the washed rock is placed shall be level.

Clean, washed, sand, described on the basis of a sieve analysis, is a soil texture composed by weight of at least 25 percent of very coarse, coarse and medium sand varying in size from 2.0 to 0.25 mm, less than 50 percent of fine or very fine sand ranging in size between 0.25 and 0.50 mm, and no more than 10 percent of the particles smaller than 0.05 mm.

- A depth of at least nine (9) inches of filter material shall be placed over the sand bed area below the distribution pipe. Filter material shall consist of three-fourths (3/4) inch – 2.5 inch clean, washed rock.

Drainfield rock is clean, washed, rock: crushed igneous rock or similar insoluble, durable and decay resistant material free from dust, sand, silt, or clay. The size shall range from three-fourths (3/4) inch diameter to 2.5 inch diameter, with no more than five (5) percent by weight passing a three-fourths (3/4) inch sieve, and no more than one (1) percent by weight passing a number 200 sieve. Materials greater than 2.5 inch in diameter shall not exceed five (5) percent by weight. Distribution of effluent over washed rock filter material shall be by perforated pipe under pressure. A minimum of two (2) inches of filter material on top of the pipe is required.

e.) Construction Surface Preparation

- The discharge pipe from the pump to the mound area shall be installed prior to soil surface preparation. The outlet pipe from the pump shall be brought up into the mound area at the manifold location. The trench shall be carefully backfilled and compacted to prevent seepage of effluent back towards the pump chamber.
- The total area selected for a mound, including the dikes shall be roughened perpendicular to the slope using a plow, chisel plow or backhoe teeth. If using a plow, there shall not be a dead furrow under the mound.
- Mound construction shall proceed immediately after surface preparation is completed.

f.) Pressure Distribution

- The details of the manifold as well as the number and size of perforation holes and laterals shall be determined by the Approving Authority. Holes shall be drilled straight into the pipes and not at an angle. A sewage effluent pump shall be used as specified by the Approving Authority.
- The perforated pipe laterals shall be connected to the manifold pipe with the ends capped and all joints glued. The laterals shall be spaced no less than 12 inches from the edge of the filter material.
- The perforated pipe laterals shall be installed level with the perforation holes straight down.
- The manifold pipe shall be connected to the supply pipe from the pump. The manifold shall be sloped toward the supply pipe from the pump.

g.) General Construction of a Mound System

- At least two inches of washed rock (filter material) shall be placed over the lateral distribution pipes. Sand shall be installed to the top of the rock bed sides but not on top of the rock bed, sloping sand away at the proper slope. Geotextile fabric shall be placed over the filter material. Geotextile fabric shall be in one piece, cut to the width of the filter area and extend a few inches beyond the filter area.
- Construction vehicles shall not be allowed on the filter material until backfill is placed.
- Sandy Loam soil shall be placed on the filter material to a minimum depth of 1 foot in the center of the mound and to a depth of six (6) inches on the sides. The purpose of the sandy loam is to avoid undue soil compaction so that the pore spaces are maintained, and soil, air and moisture can move freely. A minimum of six inches of topsoil shall be placed on the fill material over the entire area of the mound.
- A grass topsoil cover shall be established over the entire area of the mound as soon as possible. Keep the mound area mowed. No shrubs shall be planted on the top of the mound. Shrubs may be placed at the foot and side slopes of the mound. After construction of the system is complete, the mound shall not be driven over with anything larger than a riding lawnmower. Straw cover is recommended over the mound system for the first winter.
- Whenever mounds are located on slopes, a diversion shall be constructed immediately upslope from the mound to intercept and direct runoff around the mound.

V - ALTERNATIVE SYSTEMS

Where unusual conditions exist, special treatment systems other than those specifically mentioned in these regulations may be provided.

A. ALTERNATIVE SYSTEMS

1. Reasonable assurance of performance of such system is presented to the Approving Authority.
 - a.) The engineering design of such system complying with the intent of these regulations is first approved by the Approving Authority.
 - b.) There is no discharge to the ground surface or to surface waters
 - c.) Treatment of wastes is in such a manner so as to protect the public health and general welfare.

APPENDIX

Figure AA: Sewage Flows for Establishments

Estimated Sewage Flow from Other Establishments (Gallons/day)		
Dwelling units	Unit	Average daily flow
Hotel or luxury hotel	guest	55
	square foot	0.28
Motel	guest	38
	square foot	0.33
Rooming house	resident	45
	add for each nonresident meal	3.3
Daycare (no meals)	child	19
Daycare (with meals)	child	23
Dormitory	person	43
Labor camp	person	18
Labor camp (semi permanent)	employee	50
Commercial	Industrial	
Retail store	square foot	0.13
	customer	3.8
	toilet	590
Shopping center	employee	11.5
	square foot	0.15
	parking space	2.5
Office	employee 8-hour shift	18
	square foot	0.18
Medical office*	square foot	1.1
	practitioner	275
	patient	8
Industrial building*	employee 8-hour shift	17.5
	employee 8-hour shift with showers	25
Laundromat	machine	635
	load	52.5
	square foot	2.6
Barber shop*	chair	68
Beauty salon*	station	285
Flea market	nonfood vendor space	15
	limited food vendor space	25
	with food vendor space	50
Eating and drinking establishments		
Restaurant (does not include bar or lounge)	meal without alcoholic drinks	3.5
	meal with alcoholic drinks	8
	seat (open 16 hours or less)	30
	seat (open more than 16 hours)	50
	seat (open 16 hours or less, single service articles)	20
	seat (open more than 16 hours, single service articles)	35

Estimated Sewage Flow from Other Establishments (Gallons/day)		
Dwelling units	Unit	Average daily flow
Restaurant (short order)	customer	7
Restaurant (drive- in)	car space	30
Restaurant (carry out including caterers)	square foot	0.5
Institutional meals	meal	5
Food outlet	square foot	0.2
Dining hall	meal	8.5
Coffee shop	customer	7
Cafeteria	customer	2.5
Bar or lounge (no meals)	customer	4.5
	seat	36
Entertainment establishments		
Drive-in theater	car stall	5
Theater	auditorium seat	4.5
Bowling alley	alley	185
Country club	member (no meals)	22
	member (with meals and showers)	118
	member (resident)	86
Fairground and other similar gatherings	visitor	1.5
Stadium	seat	5
Dance hall	person	6
Health club	gym member	35
Outdoor recreation and related lodging facilities		
Campground	campsite with sewer hook-up (per person)	32
	campsite with sewer hook-up (per site/space)	100
	campsite without sewer hook-up, with central toilet or shower facility (per site)	50
	campsite without sewer hook-up, with central toilet or shower facility, served by dump station (per site)	63
Permanent mobile home	mobile home	225
Camp, day without meals	person	20
Camp, day with meals	person	25
Camp, day and night with meals	person	45
Resort	lodge hotel person	62
Cabin, resort	person	50
Retail resort store	customer	4
Park or swimming pool	guest	10
Visitor center	visitor	13

Estimated Sewage Flow from Other Establishments (Gallons/day)		
Dwelling units	Unit	Average daily flow
Transportation		
Gas station	convenience store customer	3.5
	Service station* customer	11
	service bay	50
	toilet	250
	square foot	0.25
Car wash* (does not include car wash water)	square foot	5
Airport, bus station, rail depot	passenger	5
	square foot	5
	restroom	565
Institutional		
Hospital*	bed	220
Mental health hospital*	bed	147
Prison or jail	inmate	140
Nursing home, other adult congregate living	resident	125
Other public institution	person	105
School (no gym, no cafeteria, and no showers)	student	14
School (with cafeteria, no gym and no showers)	student	18
School (with cafeteria, gym, and showers)	student	27.5
School (boarding)	student	95
Church	seat	4, add for each meal prepared 5
Assembly hall	seat	4
Miscellaneous		
Public lavatory	user	5
Public shower	shower taken	11
* Waste other than sewage is only allowed to be discharged into the system if the waste is suitable to be discharged to groundwater.		
Unless otherwise noted in Table I, the flow values do not include flows generated by employees. A flow value of 15 gallons/employee/eight-hour shift must be added to the flow amount. Design flow determination for establishments not listed in Table I shall be determined by the best available information & approved by the LUG.		

Slaughter-houses: Do not allow blood to enter system. Collect blood separately and sell to a renderer. To provide sufficient time to stabilize the remaining high strength waste, twice the capacity is required.

Dairy: Septic tanks and drainfields will not treat milk or whey wastes. Do not allow to enter system.

Swimming Pool/Spa: Chlorinated water shall not be allowed to enter system.

Figure AB:

MINIMUM SETBACK DISTANCES (in feet)

<u>FEATURE</u>	<u>SEPTIC TANK</u>	<u>SOIL TREATMENT AREA</u>	<u>DISTRIBUTION DEVICE</u>
Water supply well less than 100 feet deep	100'	100'	100'
Water supply well greater than 100 feet deep or buried suction pipe	50'	50'	50'
Buried pipe distributing water under pressure	10'	10'	10'
Building	10'	20'	
Lot line	10'	10'	
Lakes, Rivers & Wetlands, ordinary high water mark	100'	100'	100'
Geothermal lines	10'	100'	
Minimum vertical isolation (From the bottom of the absorption system to the seasonal high soil water table or limiting condition whichever occurs first) (See Appendix, Figure AM)	---	2'	

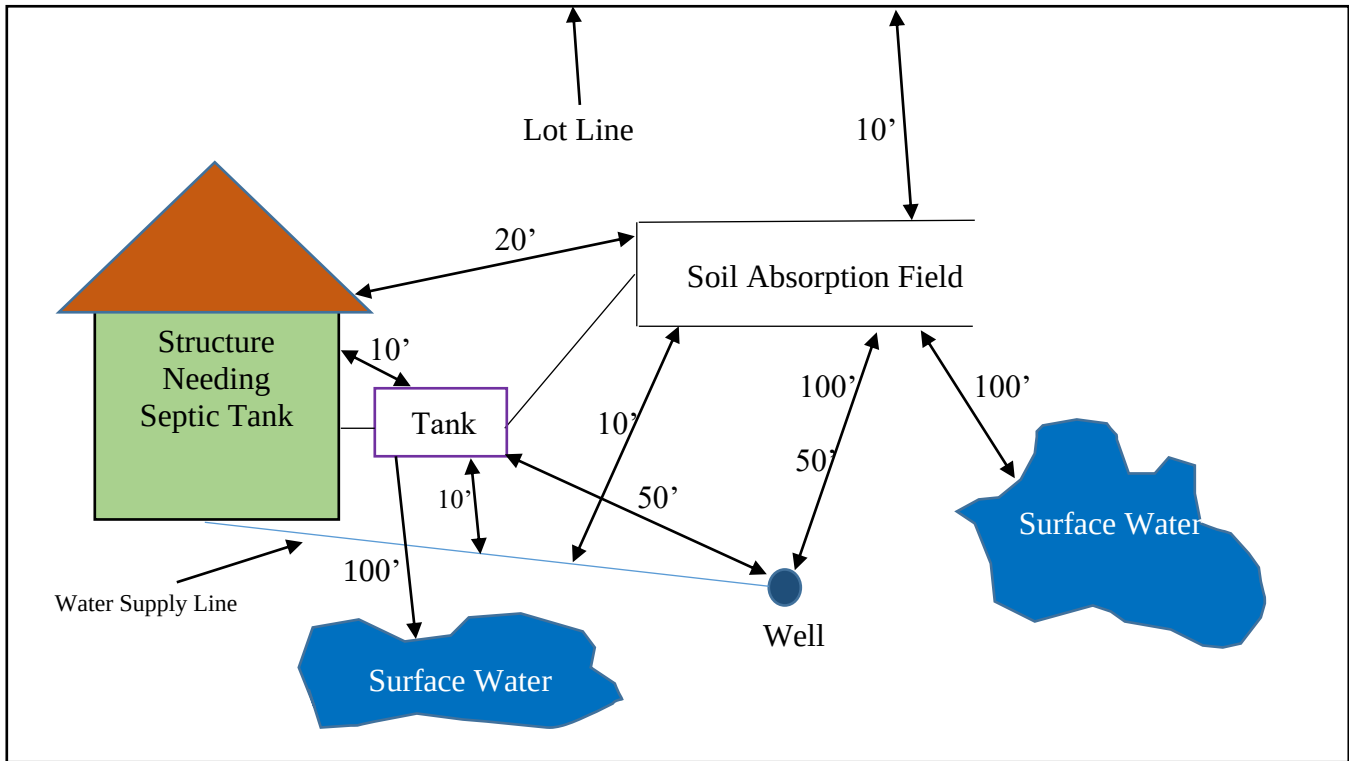


Figure AC: Methods of securing manhole cover to prevent unauthorized entry.

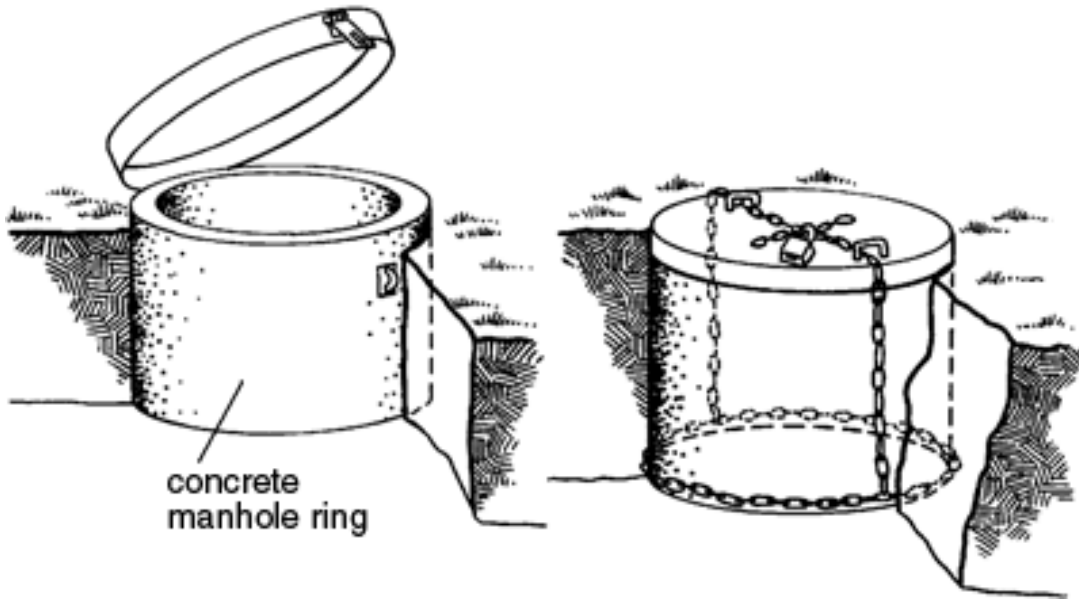


Figure AD: Single Compartment Septic Tank

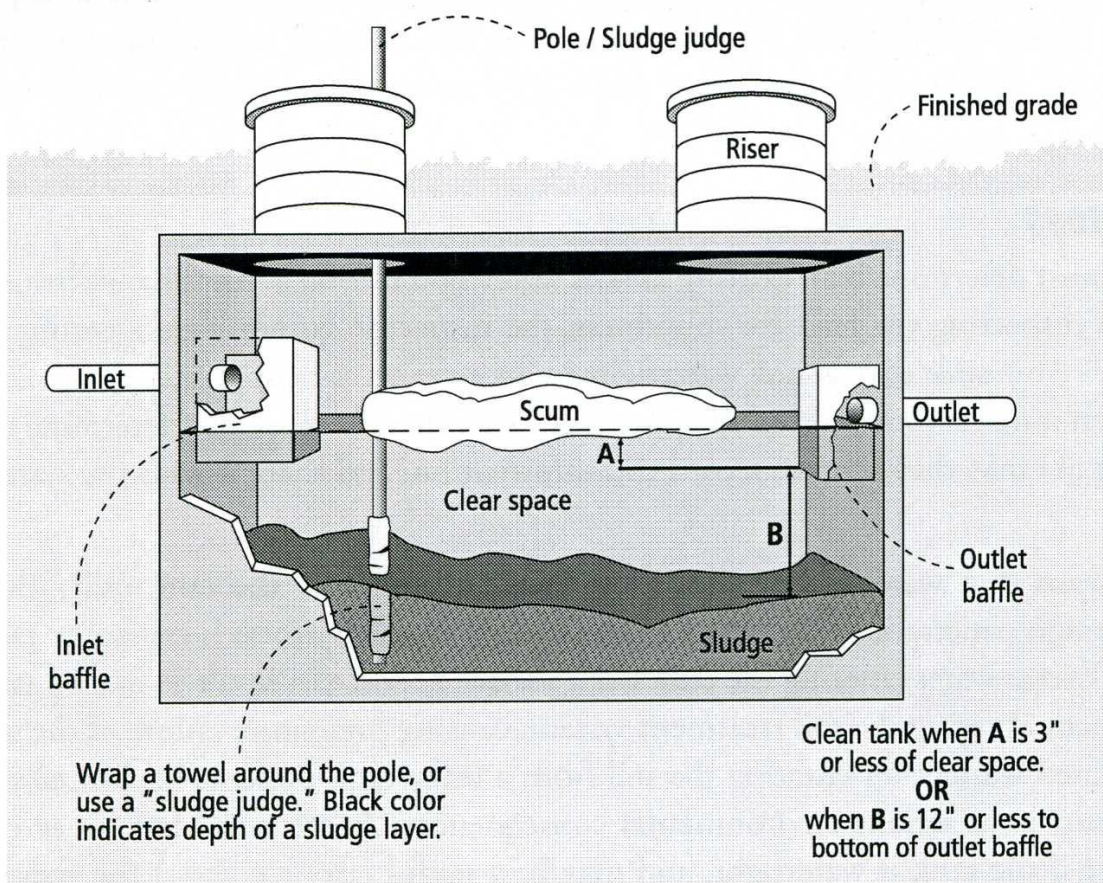


Figure AE: Single Compartment Septic Tank

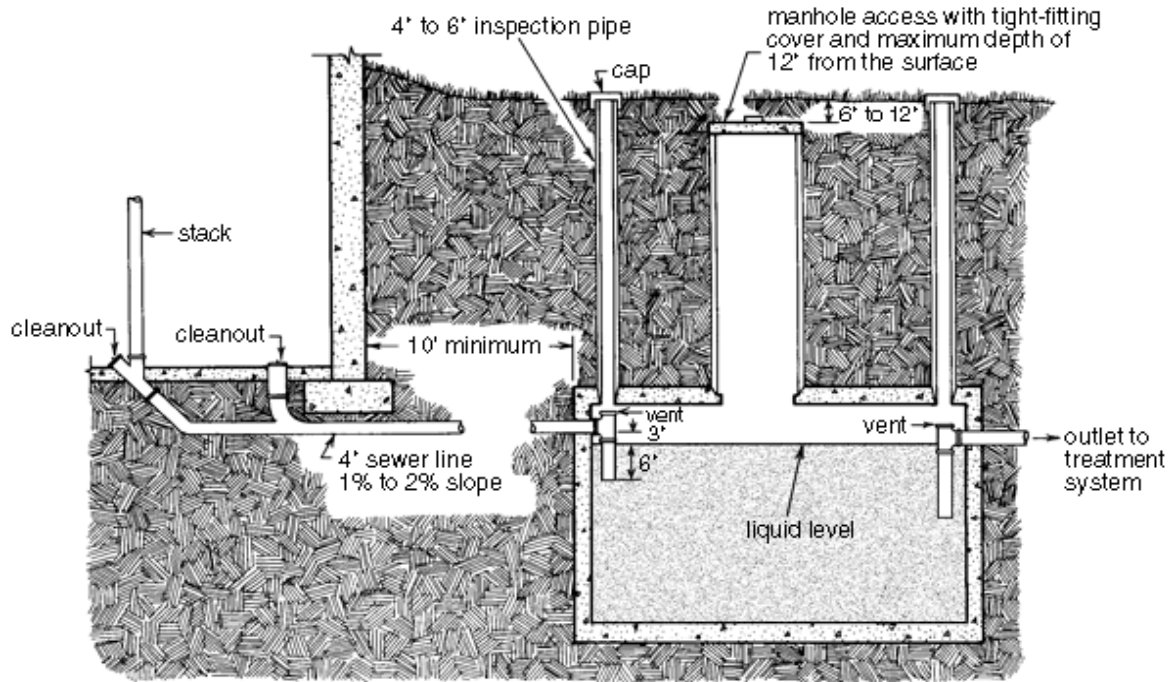


Figure AF: Drop Boxes

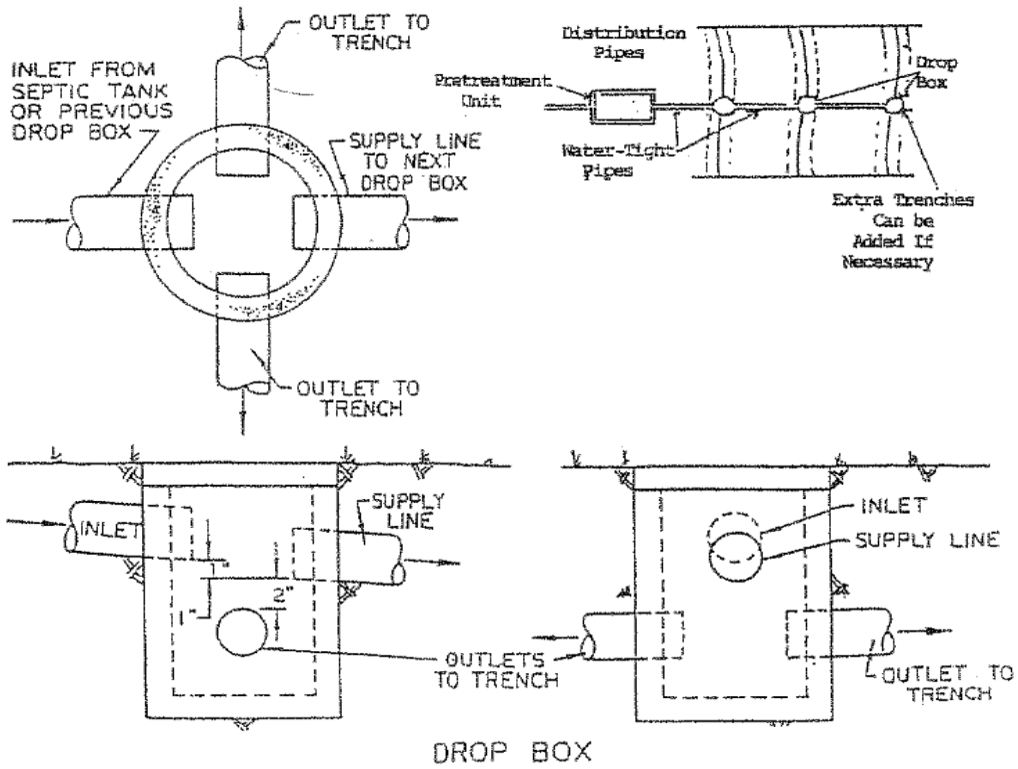


Figure AG: Drop Box Distribution

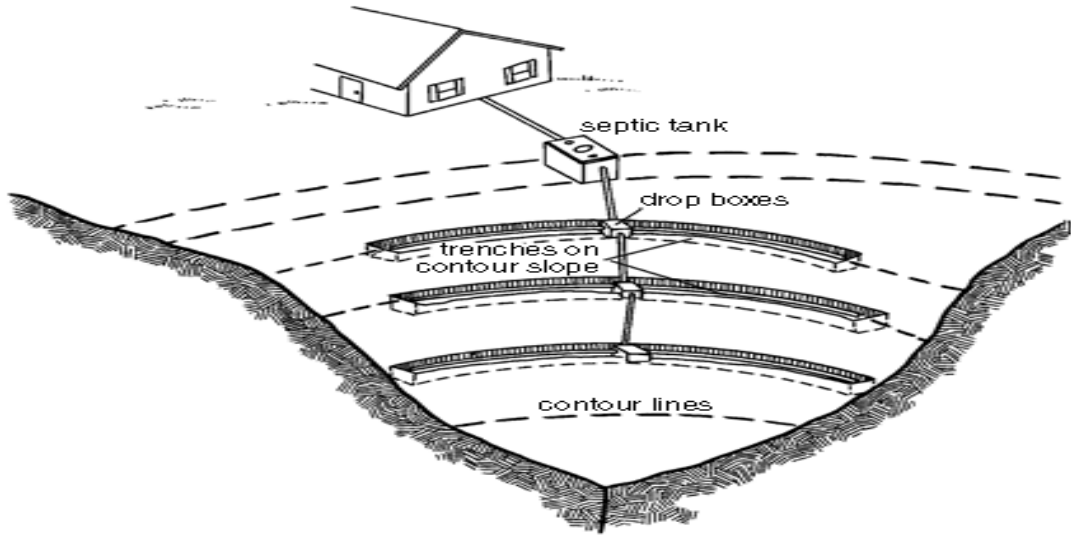


Figure AH: Standard Trench (“Rock”)

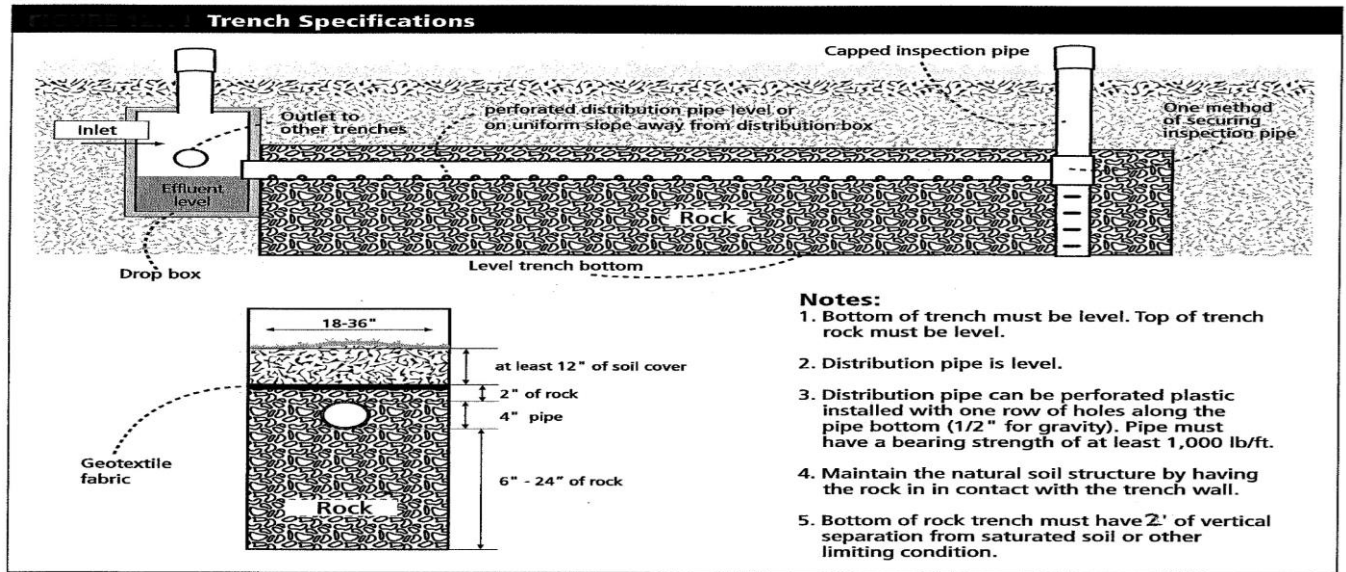


Figure AI: Gravelless Pipe Trench

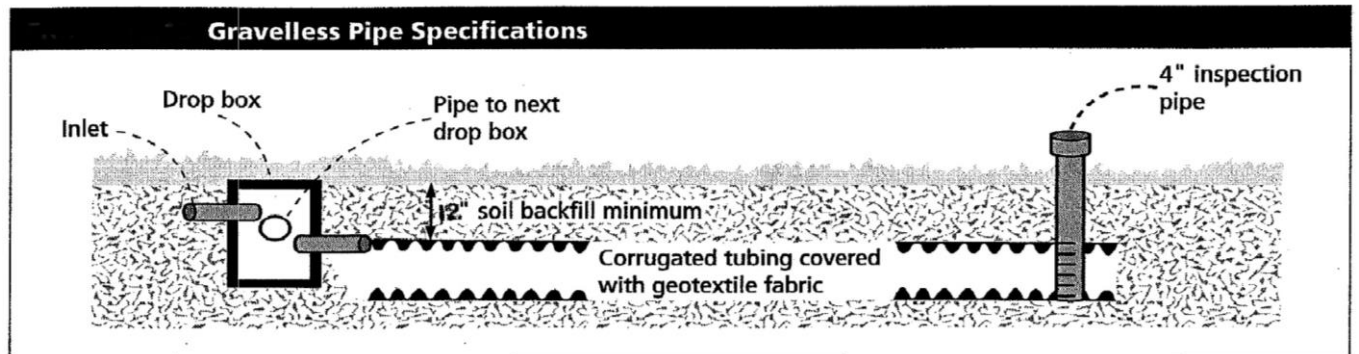


Figure AJ: Chamber System Drawing

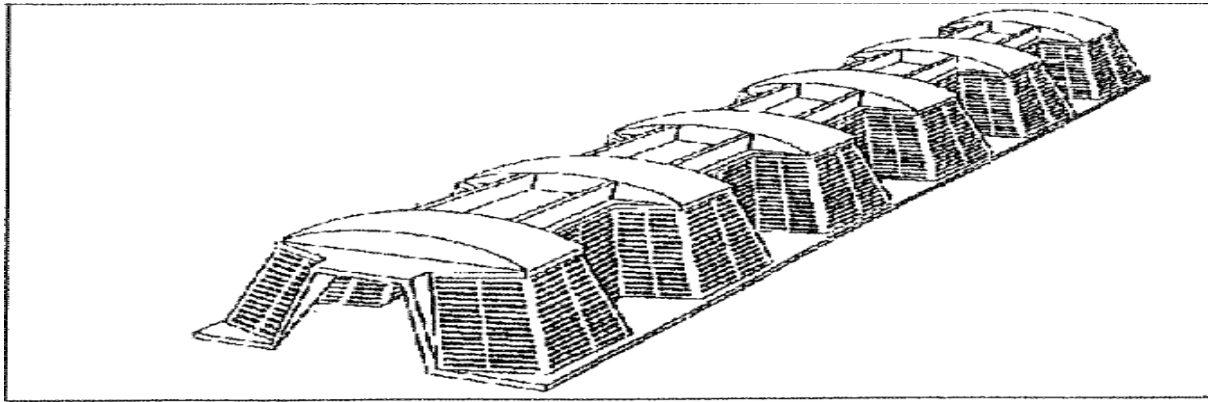


Figure AK: Septic Tank and Pump System

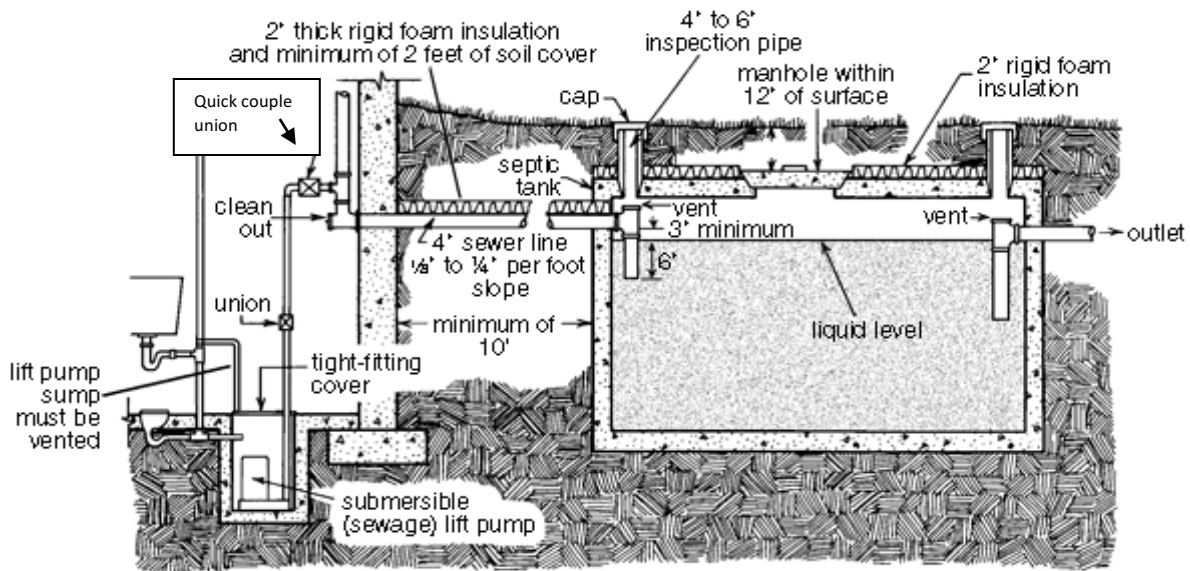


Figure AL: Pump septic tank effluent to an area with suitable soil

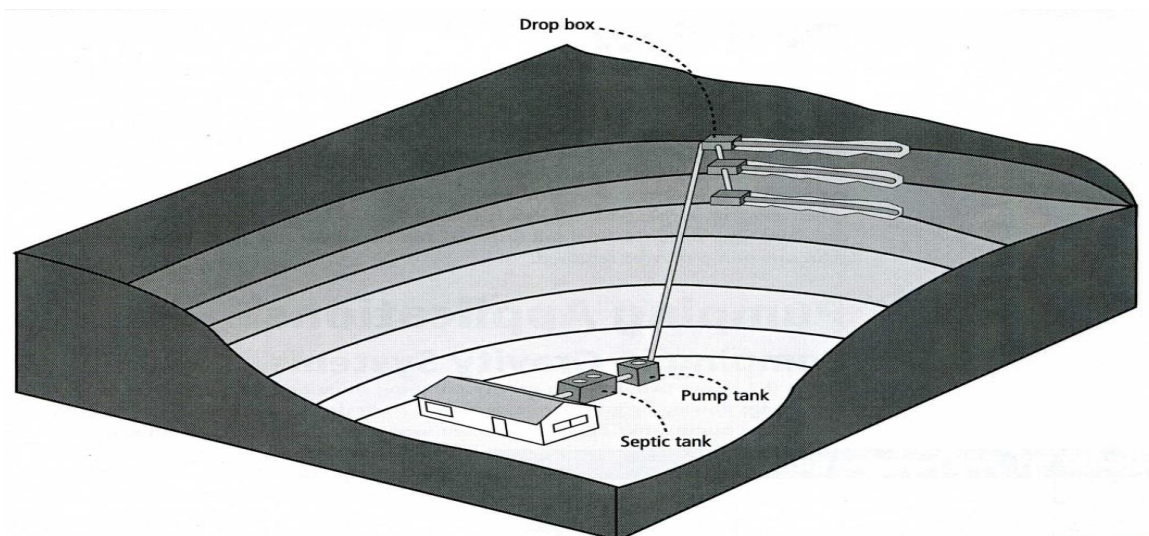


Figure AM: Setback from Seasonal High Soil Water Table

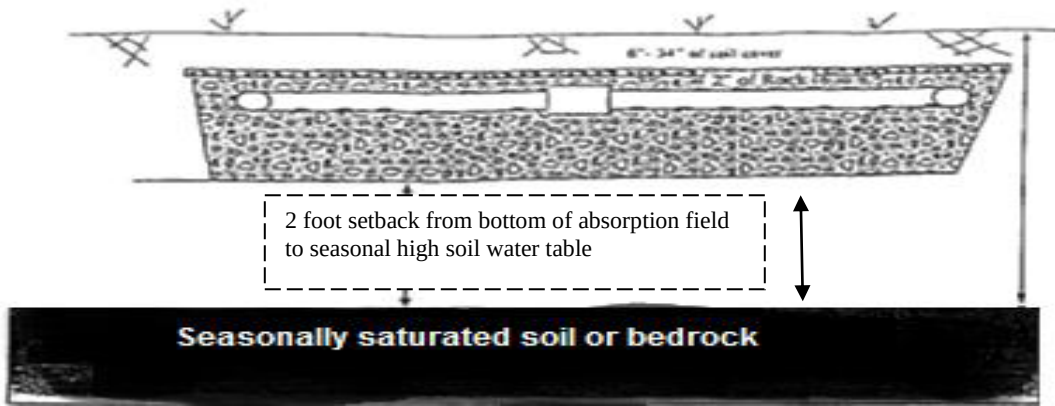


Figure AN: Jar Test

JAR TEST FOR CLEAN SAND FOR MOUNDS

Sand is defined as a soil texture composed by weight of at least 25 percent of very coarse sand, and medium sand varying in size from 2.0 to 0.25 mm, less than 50 percent of fine or very fine sand ranging in size between 0.25 and 0.05 mm, and no more than 10 percent of particles smaller than 0.05 mm.

The jar test can be used as a method for testing for clean sand.

Using a One Quart Mason Jar:

Put 2 inches of sand in the jar; then fill the jar with water. Agitate the sand thoroughly. If the fines that settle out in one hour are greater than 1/8 inch, then the percentage of fines is too great, and the sand SHALL NOT be used for mound construction.

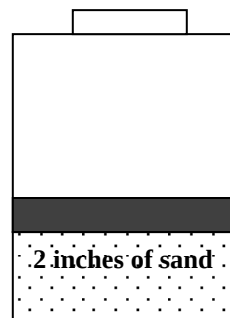


Figure AO: Mound System Drawings (a)

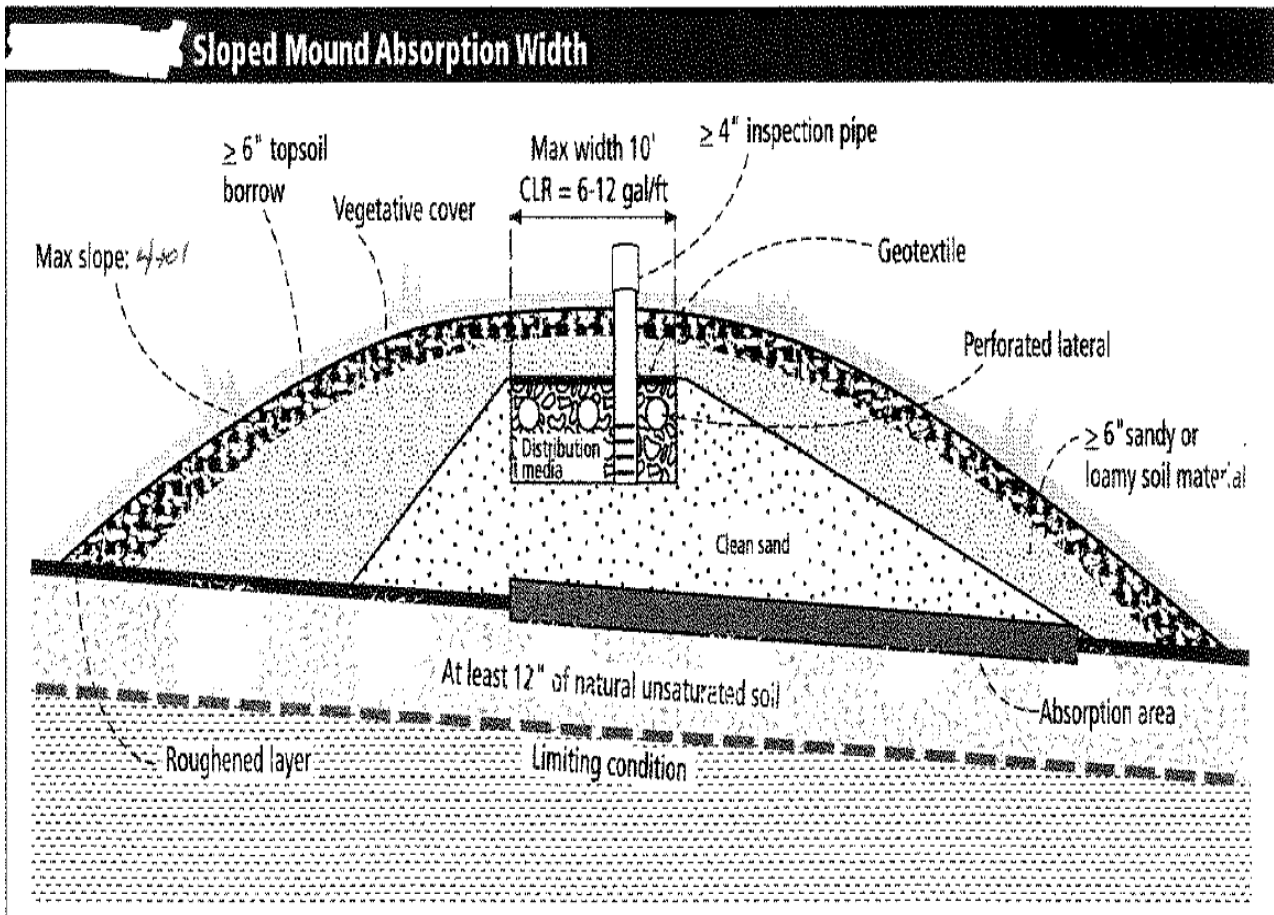
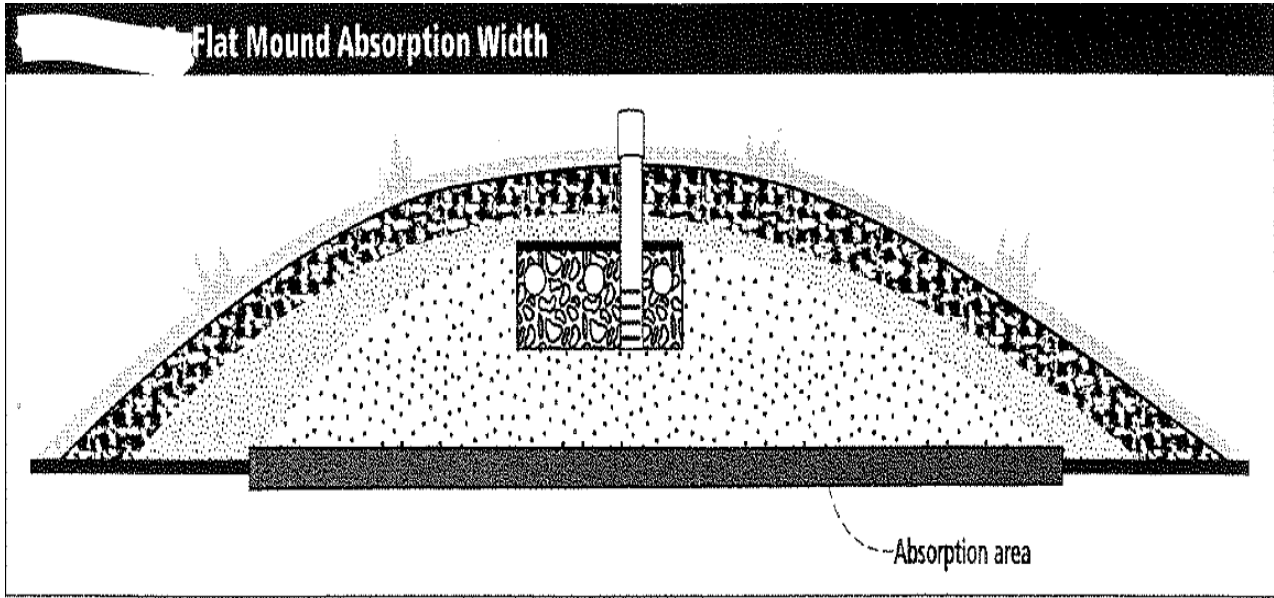


Figure AO: Mound System Drawing (b)

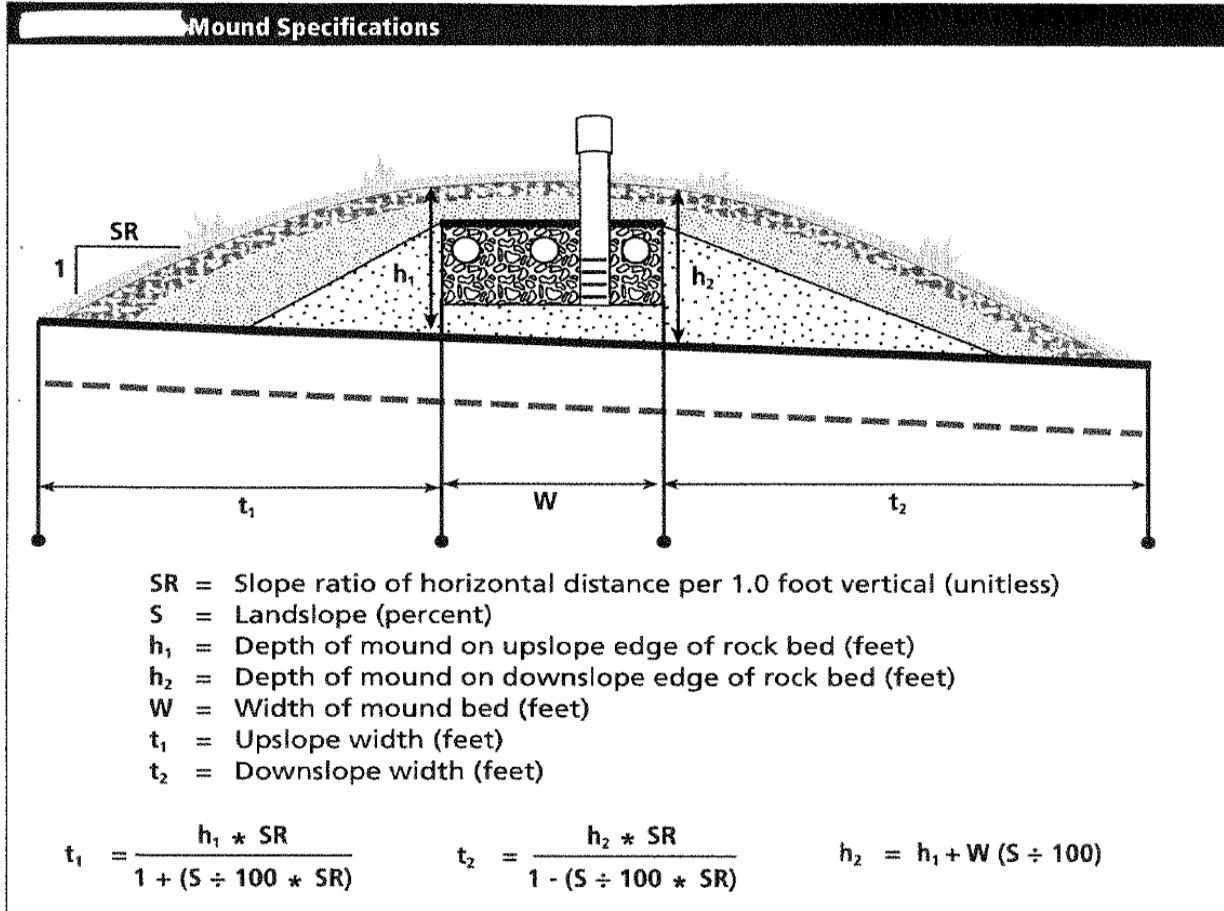


Figure AO: Mound System Drawing (c)

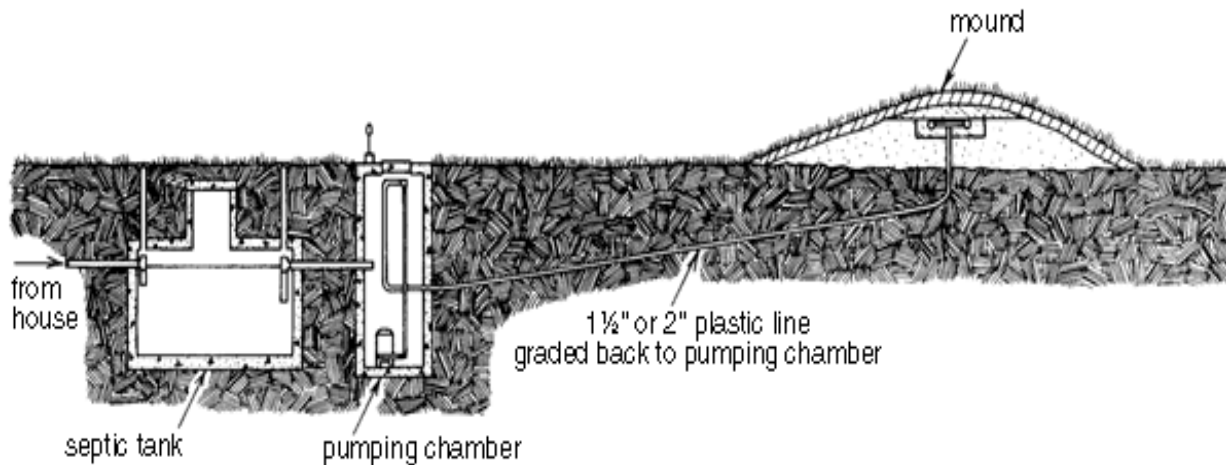


Figure AP: At-Grade System

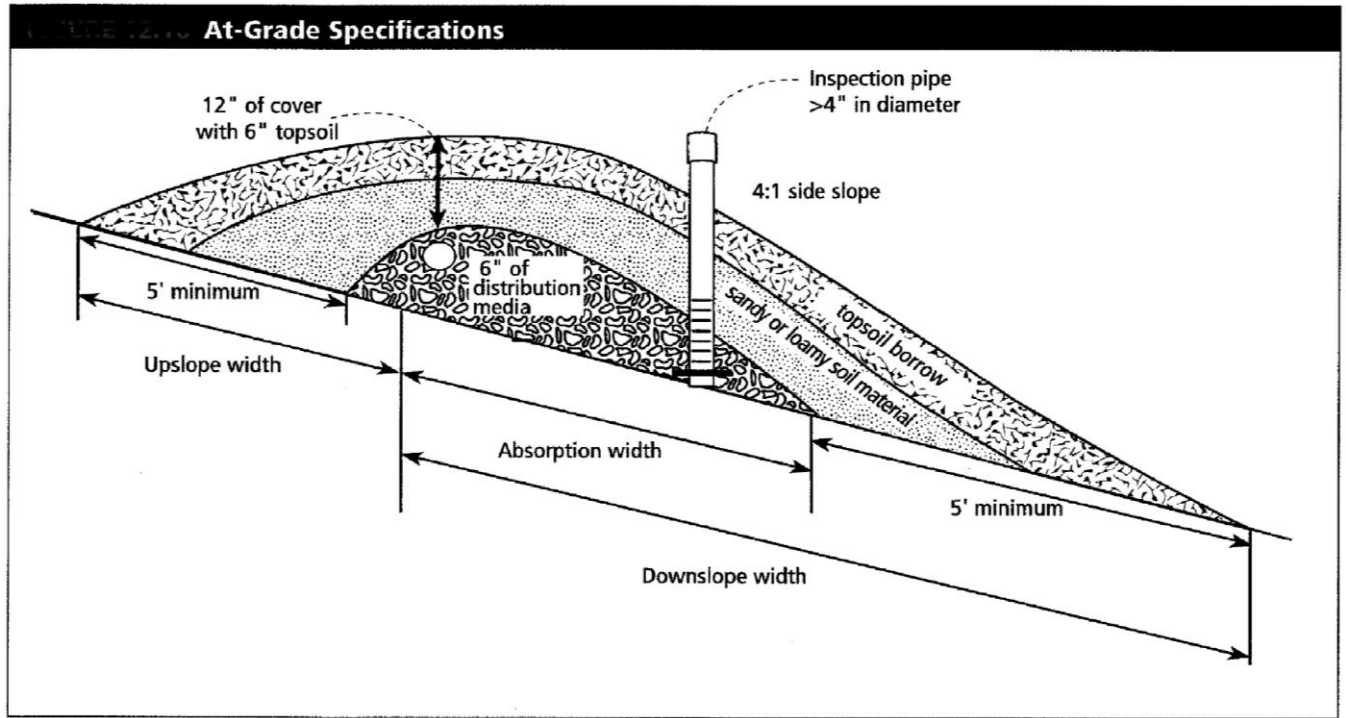


Figure AQ: Bed System

