SECTION 15

CONVENTIONAL SUBSURFACE SEWAGE DISPOSAL SYSTEMS

A. Site/Soil Conditions, Assessment Methodology and Criteria for Conventional System Disposal Fields

IMPORTANT NOTE: The provisions and requirements outlined in this Subsection shall not be solely limited to conventional subsurface sewage disposal systems. The contents of this Subsection shall also pertain to alternative subsurface sewage disposal systems where the Department determines that any of the following provisions or requirements are applicable to said systems or their installation sites.

For the purposes of ascertaining site/soil area suited for subsurface sewage disposal system use, a land parcel is assessed as a *whole*, not just where a proposed subsurface sewage disposal system is to be located. Though a proposed dwelling (or other structure) will physically occupy only a small portion of a land area, the characteristics of the entire land parcel must be investigated (or in the case of a very large tract of land, the immediate five to ten acres in the vicinity of a proposed structure location) to determine the potential of said land parcel to support, in accordance with the provisions of these regulations, the installation of a subsurface sewage disposal system to serve the proposed dwelling.

In order to delineate and subsequently designate an appropriate area upon a land parcel for the placement of the disposal field trenches of a conventional system, the site and soils criteria outlined in this *Subsection* shall be utilized in combination with all other applicable provisions in these regulations. Thus, the methods and criteria utilized by the Department to assess a site location upon a parcel of land includes, but shall not be limited to, the following:

1. Soil Absorption Characteristics or MPI Rates

   (a) The MPI rate of the soil, for a proposed subsurface sewage disposal system site, shall be determined by conducting a detailed field examination of the actual soil characteristics and properties (i.e. soil structure, texture, drainage classification, etc.).

   (b) The soil series and soil rating criteria, as established by the Department (See *Appendix 1*), shall be utilized in establishing the appropriate soil absorption rate for said site.

   (c) Soils which are determined to have estimated or actual (i.e. determined via a percolation test) soil absorption rate of <15MPI (i.e. between 1MPI and 14MPI) shall not be utilized for subsurface sewage disposal system installations.

   (d) Soils which are determined to have estimated soil absorption rates of 15MPI, 30MPI, 45MPI, 60MPI and 75MPI may be utilized for conventional system use where said soil sites are in accordance with the provisions outlined in *Subsection B and C of this Section*.

   (e) Soils which are determined to have estimated soil absorption rates in excess of 75MPI shall not be approved for conventional system use. However, where such soils are encountered, such sites may be assessed via percolation testing, in accordance with the provisions outlined in *Appendix 2*, in order to establish the actual percolation rate (i.e. water absorption rate) of said site where the Department has specifically approved the use of this method of land assessment.

   (f) Upon sites that have been assessed via percolation testing, soil absorption rates of between 76MPI and 105MPI may be utilized for conventional system use where said soil sites are in accordance with the provisions outlined in *Subsection B and C of this Section*.

   (g) Upon sites that have been assessed via percolation testing and where the soil absorption rate is established to be in excess of 105MPI, said sites shall not be approved for conventional subsurface sewage disposal system use.

2. Soil Drainage Characteristics and Associated Soil Drainage Improvement Practices

   Soil drainage characteristics of a proposed subsurface sewage disposal system site include the manner in which water is moving internally through the soil (i.e. subsurface drainage) and the manner in which water moves upon the ground surface (i.e. surface drainage) of said site. See *Appendix 1* and/or *Appendix 5*.

   (a) Soils which are determined to be within the drainage classification of Somewhat Poorly Drained, Poorly Drained or Very Poorly Drained shall not be approved nor utilized for subsurface sewage disposal system installations.

(b) Soils/sites which are determined to have acceptable soil absorption rates but require the implementation of a soil drainage improvement practice, as determined by the Department, shall have available *positive outlet(s)* to allow for the proper discharge of all waters collected and conducted by the said method of drainage improvement. See *Appendix 5*

(c) Upon any land parcel proposed for subsurface sewage disposal system use requiring a soil drainage improvement practice and where the availability of a proper positive drainage outlet(s) is questionable, proof of such shall be demonstrated in a manner indicated by the Department (i.e. additional surveying and/or engineering work, etc.). See *Appendix 5*

3. Soil Depth Characteristics

These characteristics pertain to the soil depth to either rock (i.e. solid bedrock) or non-rock type of restrictive layer or horizon within the soil (i.e. fragipans, clay horizons, Cr horizons, water tables, etc.). See *Appendix 1, Chapter 3, Section D, Part (7)*.

(a) There shall exist a minimum of thirty-six (36) inches of natural soil over any layer(s) of bed rock or the upper limits of any type of water table.

(b) Where the minimum soil depth may be present but the soil contains a non-rock restrictive horizon, there shall exist a minimum depth of twenty-four (24) inches of unencumbered soil over said restrictive horizon.

4. Physical Site Conditions

(a) A site shall contain an amount of land space which is in accordance with the provisions outlined in Subsections B and C of this Section and said site shall be free of *Installation Restrictive Characteristics.* See definition in *Section 3*.

(b) A site shall contain an amount of land space which is in accordance with the provisions outlined in Subsections B and C of this Section and said site shall be located so as to be separated, by the specified distances from any of the encumbrances outlined in *Section 13*.

(c) A site shall not be located upon any land surface which has a natural slope in excess of twenty-five (25) percent.

(d) A site shall consist of natural soils which have not been disturbed in any manner. Subsurface sewage disposal systems shall not be placed in fill material, disturbed soils, compacted soils, etc.

5. Slippage Soils

Where designated conventional system septic field areas contain slippage soil (as outlined in the provisions of *Article 13* of the *Williamson County Zoning Ordinance*) on slopes of between 15-25%, the following requirements shall be met:

(a) A geotechnical engineer shall prepare a report identifying the location, character, and extent of the slippage soil areas. The report shall include design recommendations for proper drainage and construction of the septic system to ensure slope stability.

(b) Plans for subsurface sewage disposal systems in this classification shall be prepared by an engineer licensed in the State of Tennessee, with experience designing on-site wastewater systems. The design plans shall be prepared in consultation with the geotechnical engineer and shall be in compliance with the geotechnical report. Said plans shall be submitted for review and approval by the Department and shall be subject to all applicable provisions outlined in *Section 19, Parts C, D, E, F and G*.

(c) The Department shall require that both the conventional system engineer of record and the geotechnical engineer provide on-site construction supervision and/or inspection of the system installation.

Said engineers shall also provide written documentation to the Department outlining their observations, findings and/or recommendations, along with stamped/sealed as-built drawings certifying the successful installation of the system in conformance with the approved design plans and geotechnical report.

6. Land Parcel Size

A land parcel shall be a minimum of one (1.00) acre in size to be considered for the use of conventional subsurface sewage disposal systems.

7. Method of Land Assessment

The methods which may be utilized to assess a parcel of land (i.e. determine whether or not the land parcel meets the provisions and criteria of this Subsection), including the conditions under which they may be used, are prescribed in *Section 27*.

B. Sizing of the Conventional System Disposal Field

Where an appropriate soil absorption rate has been established by the Department, or by an approved soil consultant (i.e. via conducting a Extra High-Intensity soil mapping procedure, the results of which have been verified by the Department), the said soil absorption rate shall dictate the size (i.e. linear footage requirements and the total disposal field area requirement) of the subsurface sewage disposal system.

The actual amount of land surface area required for a system installation, and its mandatory duplicate area, shall be in accordance with applicable provisions of *Appendix 7, Appendix 8 and/*or *Appendix 9*. Therefore, dependent upon the type of structure or facility the conventional subsurface sewage disposal system is intended to serve, the Department shall determine which Appendix (i.e. *Appendix 7, 8 and/or 9*) shall apply to properties being assessed.

Where percolation tests are conducted, the size of a subsurface sewage disposal system and its duplicate area, dependent upon the type of structure or facility the conventional subsurface sewage disposal system is intended to serve, shall be determined by the Department in accordance with the provisions outlined in *Appendix 7* and *Appendix 9*.

IMPORTANT NOTE: Where any site(s) have been assessed via percolation testing, regardless of the actual results of said test (i.e. percolation rates that are calculated to be between 15MPI and 74MPI), the minimum soil absorption rate that shall be utilized for the purposes of designing a conventional system shall be 75MPI (or 405 Square Feet of Trench Bottom Area per Bedroom - See Appendix 9).

C. Duplication Areas on Unplatted Land Parcels

Where conventional subsurface sewage disposal systems are installed, sufficient additional area shall be available for the complete replacement of the disposal field, in an area of undisturbed, acceptable soil area large enough to install a system (i.e. being in accordance with requirements and characteristics of the particular area of soil designated for said duplicate area use) as a secondary disposal field as required by these regulations. The initial installation area, and its duplicate area (i.e. the Total Disposal Field Area Requirement) shall be in accordance with the provisions of *Appendix 8* where soil permeability rates (i.e. MPI ratings) are determined by the Department to be between 30MPI and 60MPI. For sites where soil permeability rates (i.e. MPI ratings) are determined by the Department to be between 75MPI and 105MPI, the Total Disposal Field Area Requirement shall be calculated and determined in accordance with the provisions outlined in *Appendix 9, Subsection A*.

D. Disposal Field Designs and Configurations

Design of the disposal field shall be of the recirculating (for level lots), serial distribution type or a controlled distribution type as determined by the Department, based upon site and soil conditions.

1. Recirculating Disposal Field Design

Where the maximum elevation difference, from the highest elevation point to the lowest elevation point, contained within the entire area which has been designated or platted for the subsurface sewage disposal system disposal field, does not exceed four (4) inches of declination within a prescribed length of one hundred (100) feet, migrating in a direction away from the proposed septic tank installation, the recirculating system design is preferred. A recirculating design provides equal distribution of the effluent throughout the entire system by connecting successive trenches on both ends and thus, maintaining an established elevation (such that every point of the trench bottom surface, within the entire extent of disposal field, maintains that same established elevation and so as none of the trenches exceed the twenty-four inch maximum trench depth) of the bottom of every disposal field trench. In summary, the recirculating system design requires that all trench bottoms contain zero elevation change (i.e. shall be level).

2. Serial Distribution Disposal Field Design

Where the maximum elevation difference, from the highest elevation point to the lowest elevation point, contained within the entire area which has been designated for the subsurface sewage disposal system absorption field installation, exceeds four (4) inches of declination within a prescribed length of one hundred (100) feet, migrating in a direction away from the proposed septic tank installation, a serial distribution system shall be required. In serial distribution, distribution of the effluent is reliant upon each successive trench being connected in such a manner so as to provide portage from the discharge end of the previous trench into the inlet end of the successive trench. The aforementioned connection is provided by a closed pipe laid upon an undisturbed section of ground so as to provide an arrangement whereby all effluent is discharged to the first trench until it is entirely filled with liquid. Upon filling, the excess effluent is then carried by the closed line (i.e. crossover line or crossover) to the inlet end of the next trench. In this manner each portion of the subsurface sewage disposal system is used in succession while providing for maximum absorption capabilities of any given trench.

3. Controlled Distribution Systems

The design of a controlled distribution system differs from the aforementioned systems in that the serial and recirculating systems (by virtue of their arrangement on the landscape) rely upon the trench configuration as a vehicle for dispersing the effluent; whereas in controlled distribution, the effluent is apportioned by a device which simultaneously allocates equal amounts of effluent directly into each and every disposal field trench served by the controlled distribution device (i.e. Distribution Box or Pressure Distribution Manifold).

In addition to providing equal distribution of effluent to each trench, these systems shall be constructed to prevent hydraulic overloading of any individual trench. Thus, this type of system requires that all disposal field trenches be of equal length.

Controlled Distribution Systems shall be required on:

(a) Any site or property where the established soil absorption rating of the proposed subsurface sewage disposal area is 61MPI to 105MPI (whether the rate is determined by the Department, an approved soil consultant, or by an actual percolation test, accepted by the Department), or

(b) A site-specific basis on any site or property where the established soil absorption rating of the proposed, platted or designated subsurface sewage disposal area is 20MPI to 60MPI (whether the rate is determined by the Department or an approved soil consultant) and the site characteristics are favorable for said use as determined by the Department.

The factors used in the determination of favorable site characteristics consist of, but are not limited to:

(1) Site topography,

(2) Soil properties (i.e. properties other than soil absorption ratings) and

(3) Sewage flow rates (i.e. flows from the structure generating the sewage) which necessitate the equal distribution of effluent to all sewage disposal trenches.

4. Controlled Distribution Devices

There are two (2) types of effluent distribution controlling devices utilized in the setup of Controlled Distribution Systems. The types of devices used to provide controlled distribution shall be limited to the Distribution Box or the Pressure Distribution Manifold (See *Appendix 11*). The design and proposed usage of either device shall be approved by the Department prior to installation.

IMPORTANT NOTE: Where the use of controlled distribution devices are required by the Department, all disposal field trenches of the constructed subsurface sewage disposal system shall be of equal length.

(a) Distribution Box (D-Box)

The D-Box shall be in accordance with the specifications presented in *Appendix 11*. Controlled Distribution Systems utilizing a distribution box as the device for ensuring equal distribution of effluent shall require that the box be installed between the septic tank and the proposed area platted or designated for the construction of the subsurface sewage disposal field. The distribution box shall be secure and level in order to maintain proper apportionment of the effluent. The distribution box has one inlet, to accept effluent from the septic tank, and multiple outlets. The distribution box is then connected, via the outlets, with a conduit to the individual trenches which receive effluent from the device.

(b) Pressure Distribution Manifold (PDM)

Where the Department has determined that the site characteristics are favorable, as outlined in Subpart (b), of Part 3, of this Subsection, and where a conventional subsurface sewage disposal system installation requires the use of a sewage/effluent pump (i.e. a pump is necessary to transport the effluent to the disposal field site), a Pressure Distribution Manifold shall be required. Any Pressure Distribution Manifold shall be constructed in the same manner as a LPP manifold (See *Appendix 3*).

The same materials, methods of assembly, construction techniques and pressure testing inspection shall be utilized. See typical design detail shown in *Appendix 11*. Controlled Distribution Systems utilizing a Pressure Distribution Manifold as the device for ensuring equal distribution of effluent shall require that the device be installed between the pump tank and the proposed area platted or designated for the subsurface sewage disposal field. The Pressure Distribution Manifold and its control valves are then connected, via the outlets from the valves, with a conduit to the individual trenches which receive effluent from the device.

5. Effluent Brake Device (EBD)

The Effluent Brake is a device, constructed of PVC piping and fittings, placed between the end of a supply line and the inlet to a D-Box or the first disposal field trench. The purpose of the device is to reduce the energy or impact of the pumped effluent from the supply line before it enters the D-Box or the sewage disposal trench. See typical design detail shown in *Appendix 14.*

A *Splash Box* is another type of effluent brake device which may be utilized. Where a splash box is used in lieu of a PVC pipe device, all specifications regarding the box to be used and all aspects of its installation shall be subject to the approval of the Department.

The effluent brake device shall be required, as a part of the system installation, on any subsurface sewage disposal system utilizing a sewage/effluent pump where the use of a pressure distribution manifold is not required. The Department shall have the authority to specify when and where these devices are to be utilized on a subsurface sewage disposal system installation.

IMPORTANT NOTE: Where the use of an EDB device is required by the Department, the use of a check valve in the pump tank setup shall be required regardless of the supply line length.

6. Alternating Valves

Where alternating valves are required for use by the Department, said valve shall be of a type constructed from Schedule 40 PVC plastic. The valve shall have one inlet port and two outlet ports. Said valve shall have an internally operating valve device. The valve shall be operated externally by the use of a hand-held key device.

The use of alternating valves shall be restricted to sites where the Department has determined that the use of any of the aforementioned Controlled Distribution system setups will not be appropriate for a specific conventional subsurface sewage disposal system installation.

The alternating valve, where its installation is specifically required, shall always be located at the highest elevation, upslope from the highest or first disposal field trench, placed at a minimum of five feet from said trench and that the valve base is at a level above the top of the gravel media of the first disposal field trench. The piping to the valve inlet and the piping leading from each outlet port, shall not be less than three (3) inches in diameter (inside measurement) and shall be Schedule 40 PVC. The valve and all of its associated piping network, shall be bedded upon firm earth or gravel so as ensure that the valve and all piping has consistent slope (i.e. no sagging pipes) to its destination. There shall be attached to the valve, in a vertical position, a four inch diameter PVC portion of pipe to serve as the access riser to the ground surface. The initial portion of pipe shall be of a sufficient length so as to ensure that said pipe stands well above any final grading elevation. At the ground surface, there shall be attached to the vertical pipe an end-cap fitting with a screw-in plug. After the final grading of the installation site, the vertical access pipe shall stand a minimum of six (6) inches above the finished grade.

Where an alternating valve is required on a new subsurface sewage disposal system installation, the total required linear footage of the disposal field shall be equally divided and installed as two separate cells. Each separate valve outlet shall serve to apportion effluent to its respective cell. The maximum difference in field line footage from one cell to the other shall be twenty (20) feet. See *Appendix 14* for diagram of the alternating valve setup.

7. Large Conventional Systems

Large conventional systems are those systems serving single sources with a projected wastewater flow rate exceeding 750 gallons per day (gpd).

(a) When the design daily flow from a single source exceeds 750 gallons per day (gpd), a properly designed dosing system shall be used for discharging septic tank effluent into the disposal field. Said dosing system shall consist of a pump tank, a sewage/effluent pump and either an effluent brake device (EBD) or a controlled distribution device. (Refer to the above *Parts 4 and 5 of this Subsection* regarding effluent brake devices and controlled distribution devices). The configuration and required components of said dosing system shall be specified by the Department on a site specific basis.

Plans for subsurface sewage disposal systems in this classification shall be prepared by an engineer licensed in the State of Tennessee. Said plans shall be submitted for review and approval by the Department and shall be subject to all provisions outlined in *Section 19, Parts C, D, E, F and G*.

(b) When the design daily flow from a single source exceeds 2000 gallons per day (gpd), pump tanks, sewage/effluent pumps and Pressure Distribution Manifold devices (refer to the above *Part 4, subpart b of this Subsection*) shall be used to equally apportion effluent to cells or zones of individual disposal field trenches. The manner (i.e. system design, required system components, system configuration, etc.) in which the equal distribution of effluent shall be accomplished shall be specified by the Department on a site specific basis. Each set (i.e. cell or zone) of individual disposal field trenches shall not exceed a design capacity of 2000 gallons per day flow.

Plans for subsurface sewage disposal systems in this classification shall be prepared by an engineer licensed in the State of Tennessee. Said plans shall be submitted for review and approval by the Department and shall be subject to all provisions outlined in *Section 19, Parts C, D, E, F and G*.

(c) Large conventional systems shall be designed to maximize the distribution of the effluent throughout the system.

(d) Soil buffer zones shall be required at a frequency and size as determined by a Department Soil Scientist after conducting a detailed soil and site evaluation.

8. Configurations of Systems and Components

In *Parts 1 through 6 of this Subsection*, the various types of subsurface sewage disposal system designs, components, devices and general requirements have been presented. Utilizing the aforementioned information, there are seven (7) possible configurations or arrangement setups of conventional subsurface sewage disposal systems.

NOTE: The placement of Curtain Drains, or any other type of soil drainage improvement practice, may be required by the Department on any of the types of subsurface sewage disposal system configurations presented.

The following information outlines the various configurations under their appropriate categories:

(a) Gravity Flow (GF) Systems

Where the appropriate soil and/or site conditions exist, the appropriate gravity flow system shall be specified by the Department. Each of the following descriptions of the system setup is in sequential order of the path of the sewage and sewage/effluent as it flows to the disposal field.

(1) GF System - Serial Distribution

This configuration consists of the septic tank, tight line and the disposal field trenches setup for serial distribution.

(2) GF System - Recirculating Distribution

This configuration consists of the septic tank, tight line and the disposal field trenches setup for recirculating distribution.

(3) GF System - Controlled Distribution - D-Box

This configuration consists of the septic tank, tight line, D-Box and the disposal field trenches. The controlled distribution setup requires that each individual field line is to be of equal length and dosed with effluent via the distribution box.

(b) Pump (P) Systems

When the soil and/or site conditions mandate the use of a sewage/effluent pump, the appropriate pump system shall be specified by the Department. Each of the following descriptions, of the system setup, is in sequential order of the path of the sewage and sewage/effluent as it flows to the disposal field.

(1) P System - Serial Distribution

This configuration consists of the septic tank, a pump tank containing an appropriately sized sewage effluent pump tank, supply line from pump, effluent brake and the disposal field trenches setup for serial distribution.

(2) P System - Recirculating Distribution

This configuration consists of the septic tank, supply line from pump, effluent brake and the disposal field trenches setup for recirculating distribution.

(3) P System - Controlled Distribution - D-Box

This configuration consists of the septic tank, supply line from pump, effluent brake, D-Box and the disposal field trenches. The controlled distribution setup requires that each individual field line is to be of equal length and dosed with effluent via the distribution box.

(4) P System - Controlled Distribution - PDM

This configuration consists of the septic tank, supply line from pump, PDM and the disposal field trenches. The controlled distribution setup requires that each individual field line is to be of equal length and dosed with effluent via the pressure distribution manifold.

The Department shall use the criteria presented in this Section, in conjunction with the information obtained during the course of a site investigation and assessment, and make the determination as to what type of system configuration will be specified for a property to be permitted for the installation of a subsurface sewage disposal system.

E. Prior to the Construction of a Conventional System

Conventional systems shall only be installed by persons specifically licensed to install said subsurface sewage disposal systems in Williamson County or by property owners or tenants exempted in accordance with *Section 24*. The licensed, approved installer shall have in his/her possession the *Permit to Install* packet prior beginning the installation of the conventional system. The packet will include the Permit to Install, a copy of the actual *Permit for Construction of a Subsurface Sewage Disposal System (i.e. the Construction Permit)* issued for the lot and any other pertinent supporting documentation. The installer shall be required to obtain this information prior to contacting the inspector for a Layout Inspection. Only after the inspector has approved the Layout Inspection with the installer, will the installer be able to begin the construction of the conventional system. See *Section 20* of these regulations for specific requirements and procedures in the installation and inspection process.

F. Construction of the Conventional System

The information in this Subsection covers the specifications, dimensions, tolerances, materials, components and methods for the construction of any type of conventional subsurface sewage disposal system.

1. For any portion of any type of subsurface sewage disposal system, where the sewage/effluent flows by gravity (e.g. the tight line from the septic tank to the disposal field, piping from a D-Box or Alternating Valve to field lines, etc.), the minimum pipe size shall not be less than three (3) inches in diameter (inside measurement) and shall be Schedule 40 PVC. The only exception being the solid pipe extending from a valve in a pressure distribution manifold to a disposal field trench; that pipe shall be of the same diameter as the required valve size. All gravity flow piping shall be bedded upon firm earth or gravel so as to prevent sagging, crushing or breakage. Additionally, all gravity flow piping (i.e. Schedule 40 PVC piping) connections made to corrugated field line piping, shall be in accordance with the provisions outlined in *Appendix 12*.

2. Where a sewage/effluent pump is utilized, the pipe size from the septic tank to the pump tank shall not be less than three (3) inches in diameter (inside measurement), shall be Schedule 40 PVC and shall be firmly bedded to prevent sagging, crushing or breakage. In order to provide bedding support for said pipe, the void space in the septic tank hole and the pump tank hole (i.e. the space between the septic tank and the pump tank, and side-wall of the excavated hole) shall be filled to the level of the invert of the inlet and outlet holes of each tank with gravel. The pipe from the pump tank to the disposal field shall be appropriately sized in order to achieve minimum scour velocity of 2.5 feet per second.

3. When a pump system is to be utilized, all pump specifications shall be in accordance with the provisions outlined in *Section 16.*

4. Materials and components used in the construction of subsurface sewage disposal systems shall be in accordance with the provisions outlined in *Appendix 12*.

5. The piping connections between the structure and the septic tank, regarding the utilization and placement of cleanouts and the minimum pipe size (i.e. pipe diameter), shall be in accordance with all applicable Williamson County building/plumbing codes.

6. The disposal field trenches shall follow the natural, existing ground surface contours of the designated sewage disposal system area.

7. A minimum of six (6) feet of undisturbed earth between adjacent trench walls shall be required. Refer to Figure A14-10, in *Appendix 14*.

8. Adjacent trenches in a serial distribution system shall be connected with a crossover line in such a manner that each trench is completely filled with septic tank effluent to the full depth of the gravel media before effluent flows to a succeeding trench.

9. In constructing crossover lines, the installer shall insure that an undisturbed block of earth remains between trenches. The trench for the crossover pipe, where it connects with the preceding absorption trench, shall not be excavated deeper than the top of the media. The crossover line shall rest on undisturbed earth and the backfill material shall be carefully tamped. This section pertains primarily to a serial distribution system. Pipe for crossover lines shall have no perforations, shall have a minimum inside diameter of three (3) inches and shall be constructed of Schedule 40 PVC pipe and fittings. See *Appendix 14* for construction details. The lengths of pipe used for crossover lines shall not be considered part of the required absorption area.

10. The incoming and outgoing crossover lines of each individual trench shall be separated by a minimum distance which is equal to eighty percent (80%) of the total length of said disposal field trench (e.g. the incoming and outgoing crossovers of a one-hundred foot long disposal field trench shall be separated by a minimum distance of eighty feet).

11. The invert of the highest point in the PVC pipe of the first crossover line shall be a minimum of four (4) inches lower than the invert of the septic tank outlet. See *Appendix 14* for construction details. Subsequently, the inverts of the high-points of the successive crossover pipes shall be at the same elevation as that (i.e. invert) of the first crossover pipe or lower.

12. Trenches shall not be excavated when the soil is wet enough to smear or compact easily. These soil conditions shall be determined by a Department Soil Scientist.

13. Media for the disposal fields shall consist of suitable materials as approved by the department. See Materials Specifications for Conventional Systems in *Appendix 12*.

14. Media for the disposal fields shall extend from a minimum of two (2) inches above the top of the perforated field line pipe to a minimum of six (6) inches below the bottom of the perforated field line pipe (thus, a minimum of twelve (12) inches total). This depth shall be maintained across the entire width and along the total length of the field line trench.

15. The top of the disposal field media shall be a minimum of four (4) inches below the invert of the tank outlet.

16. The media for the disposal fields shall be covered with untreated building paper, a layer of straw at least four (4) inches thick or other comparable filter fabric determined to be equivalent by the Department.

17. Soil material excavated from trenches shall be used in backfilling. The excess soil material shall be spread in such a manner so as to crown the entire disposal field area, in order to prevent ponding of any surface water, until initial settling has taken place. The disposal field site shall be shaped to shed water and be free of low spots.

18. There shall be a maximum of twelve (12) inches of soil material (i.e. the soil material excavated from the trenches on that site) cover over the disposal field media. The remaining excavated soil material, from that site, shall be utilized in accordance with *Part 17 of this Subsection*.

19. The bottoms of the sewage disposal trenches shall be constructed as level as possible, but in no case shall the fall in a single trench bottom exceed one-half (½) inch in twenty-five (25) feet (the fall providing for the directional flow of the effluent to migrate from the inlet to the outlet of a single trench). The amount of fall shall be determined by an engineering/surveying level instrument. Thus, in a 100 foot sewage disposal trench (this being the maximum allowable length, per *Part 30 of this Subsection*) the maximum total fall shall not exceed two (2) inches. Under no circumstances shall the bottom of the sewage disposal trench, or portion thereof, contain rise from the inlet end to the outlet end of said trench.

20. The width of the sewage disposal trench shall be thirty-six (36) inches.

21. The depth of the sewage disposal trench shall be twenty-four (24) inches.

22. All non-perforated piping under pavement (e.g. gravel, concrete, asphalt, etc.) or paved areas (e.g. driveways, sidewalks, etc.) shall be sleeved with a continuous section of Schedule 80 (minimum) PVC pipe or equivalent, of the next largest nominal pipe size. The sleeving pipe shall extend a minimum of ten (10) feet to either side of the pavement or paved area.

23. All non-perforated piping which breeches, crosses or traverses any size stream or man-made water course shall be constructed in accordance with the documentation (i.e. the supporting documentation pertaining to the Construction Permit) provided by the Department. The Department shall assess any proposed crossing of this type on a case-by-case basis and determine the specific requirements for said crossing (i.e. the methodology, construction materials, crossing location, etc.) for each site.

24. All non-perforated (i.e. solid PVC lines) piping which breeches, crosses or transverses a constructed drain (i.e. curtain drain, drawdown drain, etc.) shall be sleeved with a continuous section of Schedule 80 (minimum) PVC pipe or equivalent, of the next largest nominal pipe size. The sleeving pipe shall extend a minimum of five (5) feet to either side of the constructed drain. Where these crossings are made, they shall be routed in the direction that is perpendicular to the course of the constructed drain. Thus, aforementioned piping will be at a ninety (90) degree angle to the route of the constructed drain.

25. The lengths of pipe used for supply lines, manifolds or tight lines shall not be considered as part of the required absorption area.

26. The pipe used in the disposal field trenches shall be corrugated polyethylene, shall have a diameter of four (4) inches and shall be perforated with one-half (½) inch holes. The invert of said pipe shall be have a vertical separation of six (6) inches above the disposal field trench bottom.

27. All conventional subsurface sewage disposal systems shall require the placement of 1”x 6” grade boards in the disposal field trenches. Said grade boards shall support the four (4) inch corrugated piping. The one-by-six (1"x 6") lumber boards shall be installed on edge in a vertical orientation (i.e. not tilting in any manner) and supported by the placement of vertical supports consisting of wooden stakes, sections of metal pipe or metal reinforcement rod (rebar). The vertical supports shall be placed, as a minimum, at the end of individual section of lumber. The placement of intermediate vertical supports may be required by the Department. In lieu of the vertical type of support, horizontal supports constructed of lumber may be utilized. Horizontal supports shall be positioned in the same manner (i.e. spacing) as the vertical supports. The grade board shall be securely attached to the method of support utilized. The grade board shall be placed in the disposal field trench so as to be centered in said trench (i.e. the grade board being eighteen inches from each sidewall of the disposal field trench). The four (4) inch corrugated piping shall be secured to the grade board utilizing gutter spikes or an equivalent sized metal nail. The maximum spacing of said spikes or nails shall be five (5) feet. The placement of intermediate spikes or nails, in order to effectively secure the corrugated pipe, may be required by the Department. See *Appendix 14*.

28. Prior to the beginning of construction on a parcel of land, having platted or designated areas for subsurface sewage disposal, fencing shall be erected, in accordance with the provisions outlined in *Appendix 10*, so as to protect said areas from disturbance or damages to the soils from construction practices and vehicular traffic or vehicular parking. Bull dozers, trucks and other heavy vehicles shall not be allowed to run over the designated subsurface sewage disposal areas.

29. After the installation of the subsurface sewage disposal system, all protective fencing shall be reestablished and shall remain in place for the duration of all construction activities on the parcel of land. The area of the disposal field shall not be used for vehicular traffic or vehicular parking. Bull dozers, trucks and other heavy vehicles shall not be allowed to traverse over the septic tank, disposal field trenches, other parts of the system or upon any duplicate disposal field areas.

30. The maximum length of a single sewage disposal trench shall not exceed 100 feet. The minimum length of a single sewage disposal trench shall be forty (40) feet. Should an installer request to construct sewage disposal trenches longer than 100 feet in length, an advanced written request to the Department is required. The Department will review the request on a site specific basis. Written approval from this Department is required prior to this type of installation. Requests to install trenches less than forty (40) feet in length will not be granted by the Department.

31. A septic tank shall not be bypassed by any direct line (laundry, grease, or other gray-water, etc.) to the sewage disposal field.

32. Down-spouts shall not be connected to the subsurface sewage disposal system. Down-spouts or other surface water shall be diverted away from the subsurface sewage disposal system.

33. Water lines shall under no circumstances, cross, pass through, go under or come within ten (10) feet of the platted or designated subsurface sewage disposal field area(s), or any of its related components (i.e. septic tank, tight line, curtain drain, etc.)

    IMPORTANT NOTE: Should an installer encounter a situation where there is the need to cross a tight line, supply line or soil drainage improvement practice pipe line with a water line, an advanced written request to the Department shall be required. Such requests shall be made by the Construction Permit recipient. This request shall be accompanied by a set of detailed construction drawings, which show the proposed crossing site on the subject property. The Department will review the request and construction drawings on a site specific basis. Written approval from this Department is required prior to this type of installation.

34. All subsurface sewage disposal systems and their related components shall be installed in accordance with the setbacks, buffer zones and minimum distance boundaries as set forth in *Section 13.*

35. Should an installer propose to utilize a Rock Slide® for a system installation, the installer shall contact a Department inspector prior to the Layout inspection to advise the inspector of this intent. During the Layout inspection, the installer shall discuss and plan the proposed use of the device (i.e. the methods of setting the device, how the device will exit the disposal field trenches, etc.) for that particular site. Where a Rock Slide® is utilized, conformance to Part 27 of this Subsection may be waived.

36. The initial subsurface sewage disposal system installation shall be in the primary area as designated on the valid Construction Permit. The duplicate areas shall be held in protected reserve for future repair purposes. The unauthorized installation of a system in an area other than the designated primary area shall be grounds for the immediate revocation of the installer's license.

G. Inspection of the Conventional System Installation

No subsurface sewage disposal system or its related components shall be covered without an approved final inspection and written authorization from the Department. See *Section 20*.