

# APPENDIX K

## PRIVATE SEWAGE DISPOSAL SYSTEMS

### K 1 Private Sewage Disposal – General.

(A) Where permitted by Section 713.0, the building sewer may be connected to a private sewage disposal system complying with the provisions of this appendix. The type of system shall be determined on the basis of location, soil porosity, and groundwater level, and shall be designed to receive all sewage from the property. The system, except as otherwise approved, shall consist of a septic tank with effluent discharging into a subsurface disposal field, into one (1) or more seepage pits, or into a combination of subsurface disposal field and seepage pits. The Authority Having Jurisdiction may grant exceptions to the provisions of this appendix for permitted structures that have been destroyed due to fire or natural disaster and that cannot be reconstructed in compliance with these provisions provided that such exceptions are the minimum necessary.

(B) Where the quantity or quality of the sewage is such that the above system cannot be expected to function satisfactorily for commercial, agricultural, and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible wastes are produced; for occupancies producing abnormal quantities of sewage or liquid waste; or when grease interceptors are required by other parts of this code, the method of sewage treatment and disposal shall be first approved by the Authority Having Jurisdiction. Special sewage disposal systems for minor, limited, or temporary uses shall be first approved by the Authority Having Jurisdiction.

(C) Disposal systems shall be designed to utilize the most porous or absorptive portions of the soil formation. Where the groundwater level extends to within twelve (12) feet (3658 mm) or less of the ground surface or where the upper soil is porous and the underlying stratum is rock or impervious soil, a septic tank and disposal field system shall be installed.

(D) Disposal systems shall be located outside of flood hazard areas.

**Exception:** Where suitable sites outside of flood hazard areas are not available, disposal systems may be located in flood hazard areas on sites where the effects of inundation under conditions of the design flood are minimized.

(E) All private sewage disposal systems shall be so designed that additional seepage pits or subsurface drain fields, equivalent to at least one hundred (100) percent of the required original system, may be installed if the original system cannot absorb all the sewage. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the one hundred (100) percent expansion area.

(F) No property shall be improved in excess of its capacity to properly absorb sewage effluent by the means provided in this code.

**Exception:** The Authority Having Jurisdiction may, at its discretion, approve an alternate system.

(G) No private sewage disposal system, or part thereof, shall be located in any lot other than the lot that is the site of the building or structure served by such private sewage disposal system, nor shall any private sewage disposal system or part thereof be located at any point having less than the minimum distances indicated in Table K-1.

Nothing contained in this code shall be construed to prohibit the use of all or part of an abutting lot to provide additional space for a private sewage disposal system or part thereof when proper cause, transfer of ownership, or change of boundary not in violation of other requirements has been first established to the satisfaction of the Authority Having Jurisdiction. The instrument recording such action shall constitute an agreement with the Authority Having Jurisdiction, which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be recorded in the office of the County Recorder as part of the conditions of ownership of said properties and shall be binding on all heirs, successors, and assigns to such properties. A copy of the instrument recording such proceedings shall be filed with the Authority Having Jurisdiction.

(H) When there is insufficient lot area or improper soil conditions for adequate sewage disposal for the building or land use proposed, and the Authority Having Jurisdiction so finds, no building permit shall be issued and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data and test reports satisfactory to the

Authority Having Jurisdiction have been submitted and approved.

(I) Nothing contained in this appendix shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with additional requirements than those contained herein, where such additional requirements are essential to maintain a safe and sanitary condition.

(J) Alternate systems may be used only by special permission of the Authority Having Jurisdiction after being satisfied of their adequacy. This authorization may be based on extensive field and test data from conditions similar to those at the proposed site, or may require such additional data as may be necessary to provide assurance that the alternate system will produce continuous and long-range results at the proposed site, at least equivalent to systems which are specifically authorized.

If demonstration systems are to be considered for installation, conditions for installation, maintenance, and monitoring at each such site shall first be established by the Authority Having Jurisdiction.

**Aerobic Systems.** Approved aerobic systems may be substituted for conventional septic tanks provided the Authority Having Jurisdiction is satisfied that such systems will produce results at least equivalent to septic tanks, whether their aeration systems are operating or not.

### K 2 Capacity of Septic Tanks.

The liquid capacity of all septic tanks shall conform to Tables K-2 and K-3 as determined by the number of bedrooms or apartment units in dwelling occupancies and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from Table 7-3 of this Code, whichever is greater in other building occupancies. The capacity of any one septic tank and its drainage system shall be limited by the soil structure classification, as specified in Table K-4.

### K 3 Area of Disposal Fields and Seepage Pits.

The minimum effective absorption area in disposal fields in square feet ( $m^2$ ), and in seepage pits in square feet ( $m^2$ ) of sidewall, shall be predicated on the required septic tank capacity in gallons (liters) and/or estimated waste/sewage flow rate, whichever is greater, and shall conform to Table K-4 as determined for the type of soil found in the excavation, and shall be as follows:

- (1) When disposal fields are installed, a

minimum of one hundred and fifty (150) square feet ( $14 m^2$ ) of trench bottom shall be provided for each system exclusive of any hard pan, rock, clay, or other impervious formations. Sidewall area in excess of the required twelve (12) inches (305 mm) and not to exceed thirty-six (36) inches (914 mm) below the leach line may be added to the trench bottom area when computing absorption areas.

- (2) Where leaching beds are permitted in lieu of trenches, the area of each such bed shall be at least fifty (50) percent greater than the tabular requirements for trenches. Perimeter sidewall area in excess of the required twelve (12) inches (305 mm) and not to exceed thirty-six (36) inches (914 mm) below the leach line may be added to the trench bottom area when computing absorption areas.
- (3) No excavation for a leach line or leach bed shall extend within five (5) feet (1,524 mm) of the water table nor to a depth where sewage may contaminate the underground water stratum that is usable for domestic purposes.

**Exception:** In areas where the records or data indicate that the groundwaters are grossly degraded, the five (5) foot (1,524 mm) separation requirement may be reduced by the Authority Having Jurisdiction. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

- (4) The minimum effective absorption area in any seepage pit shall be calculated as the excavated sidewall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations. The minimum required area of porous formation shall be provided in one or more seepage pits. No excavation shall extend within ten (10) feet (3,048 mm) of the water table nor to a depth where sewage may contaminate underground water stratum that is usable for domestic purposes.

**Exception:** In areas where the records or data indicate that the groundwaters are grossly degraded, the ten (10) foot (3,048 mm) separation requirement may be reduced by the Authority Having Jurisdiction.

The applicant shall supply evidence of

groundwater depth to the satisfaction of the Authority Having Jurisdiction.

- (5) Leaching chambers shall be sized on the bottom absorption area (nominal unit width) in square feet. The required area shall be calculated using Table K-4 with a 0.70 multiplier.

#### **K 4 Percolation Test.**

(A) Wherever practicable, disposal field and seepage pit sizes shall be computed from Table K-4. Seepage pit sizes shall be computed by percolation tests, unless use of Table K-4 is approved by the Authority Having Jurisdiction.

(B) In order to determine the absorption qualities of seepage pits and of questionable soils other than those listed in Table K-4, the proposed site shall be subjected to percolation tests acceptable to the Authority Having Jurisdiction.

(C) When a percolation test is required, no private disposal system shall be permitted to serve a building if that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (33.8 L/m<sup>2</sup>) or more than 5.12 gallons per square foot (208 L/m<sup>2</sup>) of leaching area per 24 hours. If the percolation test shows an absorption rate greater than 5.12 gallons per square foot (208 L/m<sup>2</sup>) per 24 hours, a private disposal system may be permitted if the site does not overlie groundwaters protected for drinking water supplies, a minimum thickness of two (2) feet (610 mm) of the native soil below the entire proposed system is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

#### **K 5 Septic Tank Construction.**

(A) Plans for all septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, reinforcing, structural calculations, and such other pertinent data as may be required.

(B) Septic tank design shall be such as to produce a clarified effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations.

(C) Septic tanks shall be constructed of solid durable materials not subject to excessive corrosion or decay and shall be watertight.

(D) Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of any septic tank shall be not less than two-thirds (2/3) of the total capacity of the tank, nor less than five hundred (500) gallons (2.0 m<sup>3</sup>) liquid capacity, and shall be at least three (3) feet (914 mm) in width and five (5) feet (1,524 mm) in length. Liquid depth shall be not less than two (2) feet (610 mm) and six (6) inches (152 mm) nor more than six (6) feet (1,829 mm). The secondary compartment of any septic tank shall have a minimum capacity of two hundred fifty (250) gallons (1.0 m<sup>3</sup>) and a maximum capacity of one-third (1/3) of the total capacity of such tank. In septic tanks having over a fifteen hundred (1,500) gallon (6.0 m<sup>3</sup>) capacity, the secondary compartment may be not less than five (5) feet (1,524) in length.

(E) Access to each septic tank shall be provided by at least two (2) manholes twenty (20) inches (508 mm) in minimum dimension or by an equivalent removable cover slab. One access manhole shall be located over the inlet and one (1) access manhole shall be located over the outlet. Wherever a first compartment exceeds twelve (12) feet (3,658 mm) in length, an additional manhole shall be provided over the baffle wall.

(F) The inlet and outlet pipe openings shall not be larger in size than the connecting sewer pipe. The vertical leg of round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than four (4) inches (102 mm). A baffle-type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a four (4) inch (100 mm) horizontal dimension when measured at the inlet and outlet pipe inverts.

(G) The inlet and outlet pipe or baffle shall extend four (4) inches (100 mm) above and at least twelve (12) inches (305 mm) below the water surface. The invert of the inlet pipe shall be at a level not less than two (2) inches (51 mm) above the invert of the outlet pipe.

(H) Inlet and outlet pipe fittings or baffles and compartment partitions shall have a free vent area equal to the required cross-sectional area of the house sewer or private sewer discharging therein to provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, house sewer, and stack to the outer air.

(I) The sidewalls shall extend at least nine (9) inches (229 mm) above the liquid depth. The cover of the

septic tank shall be at least two (2) inches (51 mm) above the back vent openings.

**(J)** Partitions or baffles between compartments shall be of solid, durable material and shall extend at least four (4) inches (102 mm) above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four (4) inches (102 mm) in size, shall be installed in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Wooden baffles are prohibited.

**(K) Structural Design.**

**(1) General.** Each such tank shall be structurally designed to withstand all anticipated earth or other loads. All septic tank covers shall be capable of supporting an earth load of not less than five hundred (500) pounds per square foot (23.9kPa) when the maximum coverage does not exceed three (3) feet (914 mm).

**(2) Flood Loads.** In flood hazard areas, tanks shall be anchored to counter buoyant forces during conditions of the design flood. The vent termination and service manhole of the tank shall be a minimum of 2 feet (610 mm) above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or the outflow of the contents of the tanks during conditions of the design flood.

**(L)** Septic tanks installed under concrete or blacktop paving shall have the required manholes accessible by extending the manhole openings to grade in a manner acceptable to the Authority Having Jurisdiction.

**(M) Materials.**

**(1) Concrete Septic Tanks.**

All materials used in constructing a septic tank shall be in accordance with applicable standards in Chapter 14, Table 14-1.

**(2) Steel Septic Tanks.**

The minimum wall thickness of any steel septic tank shall be No. 12 U.S. gauge (0.109) (2.8 mm), and each such tank shall be protected from corrosion both externally and internally by an approved bituminous coating or by other acceptable means.

**(3) Alternate Materials.**

(i) Septic tanks constructed of alternate materials may be approved by the

Authority Having Jurisdiction when complying with approved applicable standards.

(ii) Wooden septic tanks are prohibited.

**(N) Prefabricated Septic Tanks.**

- (1) Manufactured or prefabricated septic tanks shall comply with all approved applicable standards and be approved by the Authority Having Jurisdiction.
- (2) Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided as required by the Authority Having Jurisdiction.

**K 6 Disposal Fields.**

**(A)** Distribution lines shall be constructed of clay tile laid with open joints, perforated clay pipe, perforated bituminous fiber pipe, perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the effluent into the trench area.

**(B)** Before placing filter material or drain lines in a prepared excavation, all smeared or compacted surfaces shall be removed from trenches by raking to a depth of one (1) inch (25.4 mm) and the loose material removed. Clean stone, gravel, slag, or similar filter material acceptable to the Authority Having Jurisdiction, varying in size from three fourths (3/4) inch to two and one-half (2-1/2) inches (19.1 mm to 64 mm), shall be placed in the trench to the depth and grade required by this section. Drain pipe shall be placed on filter material in an approved manner. The drain lines shall then be covered with filter material to the minimum depth required by this section, and this material covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

**Exception:** Listed or approved plastic leaching chambers may be used in lieu of pipe and filter material. Chamber installations shall follow the rules for disposal fields, where applicable, and shall conform to manufacturer's installation instructions.

**(C)** A grade board staked in the trench to the depth of filter material shall be utilized when the distribution line is constructed with drain tile or a flexible pipe material that will not maintain alignment without continuous support.

	Minimum	Maximum
Number of drain lines per field	1	–
Length of each line	–	100 ft. (30,480 mm)
Bottom width of trench	18 in. (457 mm)	36 in. (914 mm)
Spacing of lines, center-to-center	6 ft. (1,829 mm)	–
Depth of earth cover of lines [preferred –18 in. (457 mm)]	12 in. (305 mm)	–
Grade of lines	level	3 in./100 ft. (25 mm/m)
Filter material under drain lines	12 in. (305 mm)	–
Filter material over drain lines	2 in. (51 mm)	–

**(D)** When seepage pits are used in combination with disposal fields, the filter material in the trenches shall terminate at least five (5) feet (1,524 mm) from the pit excavation, and the line extending from such points to the seepage pit shall be approved pipe with watertight joints.

**(E)** Where two (2) or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The inverts of all outlets shall be level, and the invert of the inlet shall be at least one (1) inch (25.4 mm) above the outlets. Distribution boxes shall be designed to ensure equal flow and shall be installed on a level concrete slab in natural or compacted soil.

**(F)** All laterals from a distribution box to the disposal field shall be approved pipe with watertight joints. Multiple disposal field laterals, wherever practicable, shall be of uniform length.

**(G)** Connections between a septic tank and a distribution box shall be laid with approved pipe with watertight joints on natural ground or compacted fill.

**(H)** When the quantity of sewage exceeds the amount that can be disposed in five hundred (500) lineal feet (152.4 m) of leach line, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic siphon or pump that discharges the tank once every three (3) or four (4) hours. The tank shall have a capacity equal to sixty (60) to seventy-five (75) percent of the interior capacity of the pipe to be dosed at one time. Where the total length of pipe exceeds one thousand (1,000) lineal feet (304.8 m), the dosing tank shall be provided with two (2) siphons or pumps dosing alternately and each serving one-half (1/2) of the leach field.

**(I)** Disposal fields shall be constructed as follows:  
(See chart above.)

Minimum spacing between trenches or leaching beds shall be four (4) feet (1,219 mm) plus two (2) feet (610 mm) for each additional foot (305 mm) of depth in excess of one (1) foot (305 mm) below the bottom of the drain line. Distribution drain lines in leaching beds shall not be more than six (6) feet (1,829 mm) apart on centers, and no part of the perimeter of the leaching bed shall be more than three (3) feet (914 mm) from a distribution drain line. Disposal fields, trenches, and leaching beds shall not be paved over or covered by concrete or any material that can reduce or inhibit any possible evaporation of sewer effluent.

**(J)** When necessary on sloping ground to prevent excessive line slope, leach lines or leach beds shall be stepped. The lines between each horizontal section shall be made with watertight joints and shall be designed so each horizontal leaching trench or bed shall be utilized to the maximum capacity before the effluent shall pass to the next lower leach line or bed. The lines between each horizontal leaching section shall be made with approved watertight joints and installed on natural or unfilled ground.

#### **K 7 Seepage Pits.**

**(A)** The capacity of seepage pits shall be based on the quantity of liquid waste discharging thereinto and on the character and porosity of the surrounding soil, and shall conform to Section K 3 of this appendix.

**(B)** Multiple seepage pit installations shall be served through an approved distribution box or be connected in series by means of a watertight connection laid on undistributed or compacted soil; the outlet from the pit shall have an approved vented leg fitting extending at least twelve (12) inches (305 mm) below the inlet fitting.

**(C)** Each seepage pit shall be circular in shape and shall have an excavated diameter of not less than four (4) feet (1,219 mm). Each such pit shall be lined with

approved-type whole new hard-burned clay brick, concrete brick, concrete circular-type cesspool blocks, or other approved materials. Approval shall be obtained prior to construction for any pit having an excavated diameter greater than six (6) feet (1,829 mm).

**(D)** The lining in every seepage pit shall be laid on a firm foundation. Lining materials shall be placed tight together and laid with joints staggered. Except in the case of approved-type precast concrete circular sections, no brick or block shall be greater in height than its width, and shall be laid flat to form at least a four (4) inch (102 mm) wall. Brick or block greater than twelve (12) inches (305 mm) in length shall have chamfered matching ends and be scored to provide for seepage. Excavation voids behind the brick, block, or concrete liner shall have a minimum of six (6) inches (152 mm) of clean three-fourths (3/4) inch (19.1 mm) gravel or rock.

**(E)** All brick or block used in seepage pit construction shall have a minimum compressive strength of twenty-five hundred (2,500) pounds per square inch (17,237 kPa).

**(F)** Each seepage pit shall have a minimum sidewall (not including the arch) of ten (10) feet (3,048 mm) below the inlet.

**(G)** The arch or dome of any seepage pit may be constructed in one of three ways:

- (1) Approved-type hard-burned clay brick or solid concrete brick or block laid in cement mortar.
- (2) Approved brick or block laid dry.  
In both of the above methods, an approved cement mortar covering of at least two (2) inches (51 mm) in thickness shall be applied, said covering to extend at least six (6) inches (152 mm) beyond the sidewalls of the pit.
- (3) Approved-type one or two-piece reinforced concrete slab of twenty-five hundred (2,500) pounds per square inch (17,237 kPa) minimum compressive strength, not less than five (5) inches (127 mm) thick and designed to support an earth load of not less than four hundred (400) pounds per square foot (19.2 kPa). Each such cover shall be provided with a nine (9) inch (229 mm) minimum inspection hole with plug or cover and shall be coated on the underside with an approved bituminous or other nonpermeable protective compound.

**(H)** The top of the arch or cover must be at least eighteen (18) inches (457 mm) but not more than four (4) feet (1219 mm) below the surface of the ground.

**(I)** An approved vented inlet fitting shall be provided in every seepage pit so arranged as to prevent the inflow from damaging the sidewall.

**Exception:** When using a one- or two-piece concrete slab cover inlet, fitting may be a one-fourth (1/4) bend fitting discharging through an opening in the top of the slab cover. On multiple seepage pit installations, the outlet fittings shall be per Section K 7(B) of this appendix.

### K 8 Cesspools.

**(A)** A cesspool shall be considered only as a temporary expedient pending the construction of a public sewer; as an overflow facility when installed in conjunction with an existing cesspool; or as a means of sewage disposal for limited, minor, or temporary uses, when first approved by the Authority Having Jurisdiction.

**(B)** Where it is established that a public sewer system will be available in less than two (2) years and soil and groundwater conditions are favorable to cesspool disposal, cesspools without septic tanks may be installed for single-family dwellings or for other limited uses when first approved by the Authority Having Jurisdiction.

**(C)** Each cesspool, when permitted, shall conform to the construction requirements set forth in Section K 7 of this appendix for seepage pits and shall have a minimum sidewall (not including arch) of twenty (20) feet (6,096 mm) below the inlet, provided, however, that when a strata of gravel or equally pervious material of four (4) feet (1,219 mm) in thickness is found, the depth of such sidewall need not be more than ten (10) feet (3,048 mm) below the inlet.

**(D)** When overflow cesspools or seepage pits are added to existing installations, the effluent shall leave the existing pit through an approved vented leg extending at least twelve (12) inches (305 mm) downward into such existing pit and having its outlet flow line at least six (6) inches (152 mm) below the inlet. All pipe between pits shall be laid with approved watertight joints.

**Grease and Garbage, Commercial Kitchens**

$$\text{Number of meals per peak hour} \times \text{Waste flow rate} \times \text{Retention time} \times \text{Storage factor} = \text{Interceptor size (liquid capacity)}$$

**Sand-Silt Oil, Auto Washers**

$$\text{Number of vehicles per hour} \times \text{Waste flow rate} \times \text{Retention time} \times \text{Storage factor} = \text{Interceptor size (liquid capacity)}$$

**Silt-Lint Grease, Laundries, Laundromats**

$$\text{Number of machines} \times \text{2 cycles per hour} \times \text{Waste flow rate} \times \text{Retention time} \times \text{Storage Factor} = \text{Interceptor size (liquid capacity)}$$

**Waste Flow Rate**

See Table K-3 of this appendix for estimated flow rates.

**Retention Times**

Commercial kitchen waste:

Dishwasher and/or disposal.....2.5 hours

Single service kitchen:

Single serving with disposal.....1.5 hours

Sand-silt oil .....2.0 hours

Lint-silt (laundry) .....2.0 hours

**Storage Factors**

Fully equipped commercial kitchen.....8 h. operation: 1  
 16 h. operation: 2  
 24 h. operation: 3  
 Single service kitchen .....1.5  
 Auto washers .....self-serve: 1.5  
 employee operated: 2  
 Laundries, laundromats .....1.5 (allows for rock filter)

**K 9 Commercial or Industrial Special Liquid-Waste Disposal.**

(A) When liquid wastes contain excessive amounts of grease, garbage, flammable wastes, sand, or other ingredients that may affect the operation of a private sewage disposal system, an interceptor for such wastes shall be installed.

(B) Installation of such interceptors shall comply with Section 1009.0 of this code, and their location shall be in accordance with Table K-1 of this appendix.

(C) A sampling box shall be installed when required by the Authority Having Jurisdiction.

(D) Interceptors shall be of approved design and be of not less than two (2) compartments. Structural requirements shall be in compliance with the applicable subparts of Section K 5 of this appendix.

(E) Interceptors shall be located as close to the source as possible and be accessible for servicing. All necessary manholes for servicing shall be at grade level and be gastight.

(F) Waste discharge from interceptors may be connected to a septic tank or other primary system or be disposed into a separate disposal system.

(G) **Recommended Design Criteria.** (Formula may be adapted to other types of occupancies with similar wastes.) See charts on this page.

**K 10 Inspection and Testing.**

**(A) Inspection.**

(1) Applicable provision of Section 103.5 of this code and this appendix shall be complied with. Plans may be required per Section 101.3 of this code.

- (2) System components shall be properly identified as to manufacturer. Septic tanks or other primary systems shall have the rated capacity permanently marked on the unit.
- (3) Septic tanks or other primary systems shall be installed on dry, level, well-compacted soil.
- (4) If design is predicated on soil tests, the system shall be installed at the same location and depth as the tested area.

**(B) Testing.**

- (1) Septic tanks or other primary components shall be filled with water to flow line prior to requesting inspection. All seams or joints shall be left exposed (except the bottom), and the tank shall remain watertight.
- (2) A flow test shall be performed through the system to the point of effluent disposal. All lines and components shall be watertight. Capacities, required air space, and fittings shall be in accordance with the provisions set forth in this appendix.

**TABLE K-1**  
Location of Sewage Disposal System

Minimum Horizontal Distance In Clear Required From:	Building Sewer	Septic Tank	Disposal Field	Seepage Pit or Cesspool
Buildings or structures <sup>1</sup>	2 feet (610 mm)	5 feet (1,524 mm)	8 feet (2,438 mm)	8 feet (2,438 mm)
Property line adjoining private property	Clear <sup>2</sup>	5 feet (1,524 mm)	5 feet (1,524 mm)	8 feet (2,438 mm)
Water supply wells	50 feet <sup>3</sup> (1,5240 mm)	50 feet (1,5240 mm)	100 feet (30.5 m)	150 feet (45.7 m)
Streams and other bodies of water	50 feet (1,5240 mm)	50 feet (1,5240 mm)	100 feet <sup>7</sup> (15,240 mm) <sup>7</sup>	150 feet <sup>7</sup> (30.5 m) <sup>7</sup>
Trees	–	10 feet (3,048 mm)	–	10 feet (3,048 mm)
Seepage pits or cesspools	–	5 feet (1,524 mm)	5 feet (1,524 mm)	12 feet (3,658 mm)
Disposal field	–	5 feet (1,524 mm)	4 feet <sup>4</sup> (1,219 mm)	5 feet (1,524 mm)
On-site domestic water service line	1 foot <sup>5</sup> (305 mm)	5 feet (1,524 mm)	5 feet (1,524 mm)	5 feet (1,524 mm)
Distribution box	–	–	5 feet (1,524 mm)	5 feet (1,524 mm)
Pressure public water main	10 feet <sup>6</sup> (3,048 mm)	10 feet (3,048 mm)	10 feet (3,048 mm)	10 feet (3,048 mm)

**Note:**

When disposal fields and/or seepage pits are installed in sloping ground, the minimum horizontal distance between any part of the leaching system and ground surface shall be fifteen (15) feet (4,572 mm).

<sup>1</sup> Including porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.

<sup>2</sup> See also Section 313.3 of the Uniform Plumbing Code.

<sup>3</sup> All drainage piping shall clear domestic water supply wells by at least fifty (50) feet (15,240 mm). This distance may be reduced to not less than twenty-five (25) feet (7,620 mm) when the drainage piping is constructed of materials approved for use within a building.

<sup>4</sup> Plus two (2) feet (610 mm) for each additional one (1) foot (305 mm) of depth in excess of one (1) foot (305 mm) below the bottom of the drain line. (See also Section K 6.)

<sup>5</sup> See Section 720.0 of the Uniform Plumbing Code.

<sup>6</sup> For parallel construction – For crossings, approval by the Health Department shall be required.

<sup>7</sup>These minimum clear horizontal distances shall also apply between disposal fields, seepage pits, and the mean high tide line.

**TABLE K-2**  
Capacity of Septic Tanks\*

Single-Family Dwellings – Number of Bedrooms	Multiple Dwelling Units or Apartments – One Bedroom Each	Other Uses: Maximum Fixture Units Served per Table 7-3	Minimum Septic Tank Capacity in Gallons	(Liters)
1 or 2		15	750	(2,838)
3		20	1,000	(3,785)
4	2 units	25	1,200	(4,542)
5 or 6	3	33	1,500	(5,678)
	4	45	2,000	(7,570)
	5	55	2,250	(8,516)
	6	60	2,500	(9,463)
	7	70	2,750	(10,409)
	8	80	3,000	(11,355)
	9	90	3,250	(12,301)
	10	100	3,500	(13,248)

\*Note:

Extra bedroom, 150 gallons (568 liters) each.

Extra dwelling units over 10,250 gallons (946 liters) each.

Extra fixture units over 100,25 gallons (95 liters) per fixture unit.

Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units without further volume increase.

**TABLE K-3**

Estimated Waste/Sewage Flow Rates

Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations. The designer should evaluate each situation and, if figures in this table need modification, they should be made with the concurrence of the Authority Having Jurisdiction.

Type of Occupancy	Gallons (liters) Per Day
1. Airports .....	15 (56.8) per employee 5 (18.9) per passenger
2. Auto washers .....	Check with equipment manufacturer
3. Bowling alleys (snack bar only) .....	75 (283.9) per lane
4. Camps:	
Campground with central comfort station.....	35 (132.5) per person
Campground with flush toilets, no showers.....	25 (94.6) per person
Day camps (no meals served) .....	15 (56.8) per person
Summer and seasonal .....	50 (189.3) per person
5. Churches (Sanctuary) .....	5 (18.9) per seat
with kitchen waste .....	7 (26.5) per seat
6. Dance halls .....	5 (18.9) per person
7. Factories	
No showers.....	25 (94.6) per employee
With showers .....	35 (132.5) per employee
Cafeteria, add .....	5 (18.9) per employee
8. Hospitals .....	250 (946.3) per bed
Kitchen waste only .....	25 (94.6) per bed
Laundry waste only .....	40 (151.4) per bed
9. Hotels (no kitchen waste) .....	60 (227.1) per bed (2 person)

TABLE K-3 (Continued)

Type of Occupancy	Gallons (liters) Per Day
10. Institutions (Resident) .....	75 (283.9) per person
Nursing home .....	125 (473.1) per person
Rest home .....	125 (473.1) per person
11. Laundries, self-service	
(minimum 10 hours per day) .....	50 (189.3) per wash cycle
Commercial .....	Per manufacturer's specifications
12. Motel .....	50 (189.3) per bed space
with kitchen .....	60 (227.1) per bed space
13. Offices .....	20 (75.7) per employee
14. Parks, mobile homes .....	250 (946.3) per space
picnic parks (toilets only) .....	20 (75.7) per parking space
recreational vehicles –	
without water hook-up .....	75 (283.9) per space
with water and sewer hook-up .....	100 (378.5) per space
15. Restaurants – cafeterias .....	20 (75.7) per employee
toilet .....	7 (26.5) per customer
kitchen waste .....	6 (22.7) per meal
add for garbage disposal .....	1 (3.8) per meal
add for cocktail lounge .....	2 (7.6) per customer
kitchen waste – Disposable service .....	2 (7.6) per meal
16. Schools – Staff and office .....	20 (75.7) per person
Elementary students .....	15 (56.8) per person
Intermediate and high .....	20 (75.7) per student
with gym and showers, add .....	5 (18.9) per student
with cafeteria, add .....	3 (11.4) per student
Boarding, total waste .....	100 (378.5) per person
17. Service station, toilets .....	1000 (3785) for 1st bay
	500 (1892.5) for each additional bay
18. Stores .....	20 (75.7) per employee
public restrooms, add .....	1 per 10 sq. ft. (4.1/m <sup>2</sup> ) of floor space
19. Swimming pools, public .....	10 (37.9) per person
20. Theaters, auditoriums .....	5 (18.9) per seat
drive-in .....	10 (37.9) per space

(a) **Recommended Design Criteria.** Sewage disposal systems sized using the estimated waste/sewage flow rates should be calculated as follows:

- (1) Waste/sewage flow, up to 1,500 gallons/day (5,677.5 L/day)  
Flow x 1.5 = septic tank size
- (2) Waste/sewage flow, over 1,500 gallons/day (5,677.5 L/day)  
Flow x 0.75 + 1,125 = septic tank size
- (3) Secondary system shall be sized for total flow per 24 hours.

(b) Also see Section K 2 of this appendix.

**TABLE K-4**  
Design Criteria of Five Typical Soils

Type of Soil	Required sq. ft. of leaching area/ 100 gal. (m <sup>2</sup> /L)		Maximum absorption capacity in gals./sq. ft. of leaching area for a 24 hr. period (L/m <sup>2</sup> )	
Coarse sand or gravel	20	(0.005)	5.0	(203.7)
Fine sand	25	(0.006)	4.0	(162.9)
Sandy loam or sandy clay	40	(0.010)	2.5	(101.8)
Clay with considerable sand or gravel	90	(0.022)	1.1	(44.8)
Clay with small amount of sand or gravel	120	(0.030)	0.8	(32.6)

**TABLE K-5**

Required Square Feet of Leaching Area/100 gal. Septic Tank Capacity (m <sup>2</sup> /L)		Maximum Septic Tank Size Allowable	
		Gallons	(liters)
20–25	(0.005–0.006)	7500	(28,387.5)
40	(0.010)	5000	(18,925.0)
90	(0.022)	3500	(13,247.5)
120	(0.030)	3000	(11,355.0)

**K 11 Abandoned Sewers and Sewage Disposal Facilities.**

(A) Every abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within five (5) feet (1,524 mm) of the property line.

(B) Every cesspool, septic tank, and seepage pit that has been abandoned or has been discontinued otherwise from further use, or to which no waste or soil pipe from a plumbing fixture is connected, shall have the sewage removed therefrom and be completely filled with the earth, sand, gravel, concrete, or other approved material.

(C) The top cover or arch over the cesspool, septic tank, or seepage pit shall be removed before filling, and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection has been called and the cesspool, septic tank, or seepage pit has been inspected. After such inspection, the cesspool, septic tank, or seepage pit shall be filled to the level of the top of the ground.

(D) No person owning or controlling any cesspool, septic tank, or seepage pit on the premises of such person or in that portion of any public street, alley, or other public property abutting such premises shall fail, refuse, or neglect to comply with the provisions of this section or upon receipt of notice so to comply with the Authority Having Jurisdiction.

(E) Where disposal facilities are abandoned consequent to connecting any premises with the public sewer, the permittee making the connection shall fill all abandoned facilities as required by the Authority Having Jurisdiction within thirty (30) days from the time of connecting to the public sewer.

**K 12 Drawings and Specifications.**

The Authority Having Jurisdiction, Health Officer, or other department having jurisdiction may require any or all of the following information before a permit is issued for a private sewage disposal system or at any time during the construction thereof.

(A) Plot plan drawn to scale, completely dimensioned, showing direction and approximate slope of surface, location of all present or proposed retaining walls, drainage channels, water supply lines or wells, paved areas and structures on the plot, number of bedrooms or plumbing fixtures in each structure,

and location of the private sewage disposal system with relation to lot lines and structures.

(B) Details of construction necessary to ensure compliance with the requirements of this appendix together with a full description of the complete installation including quality, kind, and grade of all materials, equipment, construction, workmanship, and methods of assembly and installation.

(C) A log of soil formations and groundwater levels as determined by test holes dug in close proximity to any proposed seepage pit or disposal field, together with a statement of water absorption characteristics of the soil at the proposed site, as determined by approved percolation tests.