SECTION 10

DESIGN AND CONSTRUCTION OF TANKS

This section outlines the requirements for the design and construction of septic tanks, settling tanks and pump tanks.

NOTE 1: The use of the term "tank(s)" in this section refers to ~~both~~ septic tanks, settling tanks and pump tanks.

NOTE 2: The provisions for septic tanks outlined below shall also apply to settling tanks.

A. Tank Requirements

All tanks shall be watertight, structurally sound and not subject to excessive corrosion or decay. Septic tanks shall be of two-compartment design. The inlet compartment of a two-compartment septic tank shall be between two-thirds and three-fourths of the total tank capacity. Pump tanks shall be of single-compartment design.

B. Tank Design and Construction

Minimum standards of design and construction of pre-cast reinforced concrete tanks are as follows:

1. The liquid depth may range from thirty (30) to sixty (60) inches for tanks of less than three thousand (3000) gallons capacity and may not exceed seventy-eight (78) inches for tanks with a capacity of three thousand (3000) gallons or greater.

2. Septic tanks shall be manufactured with a partition so that the tank contains two compartments. The partition shall be located at a point not less than two-thirds (⅔) nor more than three-fourths (¾) the length of the tank from the inlet end. All tank wall thickness shall be no less than two and one half (2½) inches thick throughout the tank except for knockouts or the groove for a slide-in partition. The groove for the slide in partition (where applicable) shall leave a concrete thickness of not less than two and one-fourth (2¼) inches in the tank walls. The partition (where applicable) shall have a minimum thickness of two and one-half (2½) inches and shall be structurally sound and shall not be subject to excessive corrosion or decay.

3. There shall be three knockouts in the inlet compartment (i.e., one on the tank end and one on each side-wall), a knockout in the partition (where applicable) and a knockout in the outlet end of the tank. The knockouts for these openings shall leave a concrete thickness of not less than one (1) inch in the tank wall. The knockouts shall be made for a minimum of four-inch pipe or a maximum of six-inch pipe. In lieu of the partition wall knockout, a four (4) to six (6) inch slot extending at least half way across the width of the septic tank may be used. The top of the slot shall be located no closer than twelve (12) inches to the liquid level of the septic tank and the bottom of the slot shall be no lower than four (4) inches below the midpoint of the liquid depth of the septic tank. A four (4) inch diameter, or equivalent, air passage opening in the partition shall be provided above the liquid level of the septic tank.

4. The tees or baffles shall be a minimum diameter of either three (3) inch cast iron soil pipe tee branch, three (3) inch cast iron sanitary tee branch, three (3) inch cast-in-place baffle or three (3) inch PVC tee branch or equivalent in durability and performance as determined by the Department.

5. The inlet invert shall enter the tank at least three (3) inches above the liquid level of the tank.

6. An inlet tee or baffle shall be provided to divert the incoming sewage downward and extend at least twelve (12) inches below the liquid level.

7. The partition tees or baffles and outlet tee or baffle, unless the tank outlet is provided with an approved effluent filter, shall extend eighteen (18) inches or one-third (⅓) the liquid depth, whichever is the lesser, below the liquid level of the tank. A tee or baffle shall be provided on the first compartment side of the partition at the same elevation as the outlet tee or baffle unless an inter-compartmental connecting slot is utilized as described in *Part 3 of this Subsection*.

8. After the effective date of the adoption of *Section 37*, an approved effluent filter shall be installed on the outlet piping network in the second compartment of the septic tank and the settling tank. Refer to the provisions outlined in *Section 37*.

9. Air space equal to at least twenty (20) percent of the liquid depth shall be provided between the top of the tank and the liquid level.

10. Adequate access openings above each tee or baffle shall be provided in the tank top. Access shall be provided for cleaning or rodding out of the inlet pipe and the interconnecting tees or baffles in the partition, for inserting the suction hose for tank pumping, and for entrance of a person if internal repairs are needed after pumping.

    (a) If the knockouts on the inlet compartment sides of the tank are to be used, access to these tees or baffles shall also be provided for cleaning and rodding of the inlet pipe. To accomplish this, it may be necessary to extend the tee so it will be located under an access port or, a clean-out must be provided on the inlet line immediately outside the septic tank.

    (b) A manhole opening shall be provided to each compartment with each having a minimum opening of eighteen (18) inches by eighteen (18) inches as the opening cuts the plane of the bottom side of the top of the tank.

    (c) All circular shaped manholes shall have a minimum diameter of twenty (20) inches as the opening cuts the plane of the bottom side of the top of the tank.

    (d) The manhole covers shall be beveled on all sides in such manner so as to accommodate a uniform load of one hundred fifty (150) pounds per square foot without damage to the cover or the top of the tank.

    (e) Manhole covers and/or opening covers shall have a handle of steel or other corrosion resistant material equivalent in strength to a No. 3 reinforcing rod (rebar).

11. Tanks of Multi-slab construction shall have all joints properly sealed to ensure watertightness. The sealing materials and methodology utilized must be approved by the Department.

12. The tank shall be properly vibrated and rodded prior to curing to eliminate any type of honeycomb effect in the concrete.

13. The top, bottom, ends, sides and slide-in partitions (where applicable) of the tank must have a minimum thickness of two and one-half (2½) inches except for knockouts or the slide-in partition groove.

14. After curing, tanks manufactured in two (2) sections shall be joined and sealed at the joint by the manufacturer by using a mastic sealant and/or pliable sealant that is both waterproof and corrosion resistant.

15. Tank Labeling

    Pre-cast tanks shall be provided with a suitable legend, cast or etched in the wall at the outlet end and within six (6) inches of the top of the tank, identifying the manufacturer by name and address or registered trademark and indicating the liquid capacity of the tank, in US gallons.

16. Tank Testing

    At the discretion of the Department, all tanks may be subject to testing for structural integrity and watertightness.

    (a) Structural integrity

        The verification of this item may require load testing or documented certification that said tank meets or exceeds the structural design requirements as outlined in ASTM C1227. Additionally, tanks shall be undamaged and free of stress cracks, holes, etc.

    (b) Watertightness

        The verification of this item shall be from either vacuum testing or water-pressure testing in accordance with the specifications as outlined in ASTM C1227.

C. Additional Tank Design Requirements

Plans for prefabricated tanks, other than those for manufactured pre-cast reinforced concrete tanks, shall be approved by the Department on an individual basis. Said design information, furnished to the Department by the designer, shall indicate that the tank will provide equivalent effectiveness as those designed in accordance with the provisions of *Subsection B of this Section*.

D. Cast-In-Place Tanks

Tanks other than approved prefabricated tanks shall be constructed consistent with the provisions of Subsection B of this Section, except as follows:

1. Cast-in-place concrete tanks shall have a minimum wall thickness of six (6) inches.

2. Cast-in-place concrete tanks of 1000 US gallons or smaller shall have a minimum top and bottom thickness of four (4) inches.

3. Cast-in-place concrete tanks with a capacity of greater than 1000 US gallons shall have a minimum top and bottom thickness of six (6) inches.