

CLEAR CREEK COUNTY Public and Environmental Health	Septic Tanks and Vaults	Section 17
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1. Watertightness and Testing

- A. Septic tanks, vaults, pump tanks, other treatment components, risers, and lids shall not allow infiltration of ground water or surface water and shall not allow the release of wastewater or liquids through other than designed openings.
- B. Acceptable watertightness testing methods performed at a manufacturer’s site or in the field include water filling the tank or vacuum testing.
- C. Testing of septic tanks shall be performed and evaluated as specified in Section 9 of ASTM C1227-12 for concrete tanks or in Standard IAPMO/ANSI Z1000-2007 for other prefabricated septic tanks.
- D. Each unit shall be inspected in the field for conditions that may compromise its watertightness. The inspection shall be performed after the tank installation but before backfilling.
- E. If the inspection in the field indicates that the tank may be damaged or is not watertight, the health officer may require that the tank be tested for watertightness by the tank manufacturer or the licensed Systems Contractor.

2. Tank Anchoring

- A. In locations where ground water or floodwaters may cause instability problems to the septic tank, vault or other treatment unit in the OWTS due to flotation, that component or unit shall be anchored in a manner sufficient to provide stability when the tank is empty. Risers shall be included in the buoyancy calculations.
- B. If a manufacturer provides recommendations for anchoring designs, they may be used if they meet the conditions present at the site.
- C. If a manufacturer does not provide recommendations for provisions to compensate for buoyancy or if the professional engineer chooses to provide his/her own designs, the anchoring system design shall be prepared by the professional engineer.

3. Identification and Data Marking

- A. All tanks and treatment units shall be permanently and legibly marked in a location for the purpose of inspection that is readily visible when inspected before backfilling. The marking inscription shall include the following:
 - 1. Name of manufacturer;

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2. Model or serial number, if available;
3. Effective volume and unit of measure;
4. Maximum depth of earth cover and external loads the tanks is designed to resist; and
5. Inlet and outlet identifications, if relevant.

4. Liquid Capacities for Septic Tanks

- A. Sizing for residential capacity for new installations shall be based upon the number of bedrooms and whether internal dosing siphons or pumps are provided.
- B. For multi-family and non-residential applications, a septic tank shall be sized to permit detention of incoming wastewater design flows for a minimum of 48 hours.
- C. For systems that remove toilet waste for separate treatment, tank capacity may be less than 1,000 gallons if it provides a minimum of 48 hours retention time.
- D. Minimum tank size for new installations other than for a single-family residence is 400 gallons.

Table 17-1 Minimum Septic Tank Capacity

Number of Bedrooms	Total Tank Capacity (gallons)	1st Compartment Capacity (min)
3 or less	1,000	500
4	1,250	625
5	1,500	750
Each Additional	Add 250	Add 125

5. Tank Design and Dimension Criteria

- A. The manufacturer shall provide sufficient information to demonstrate that the tank will meet the design specification.
- B. A septic tank shall have two or more compartments or more than one tank may be used in series. The first compartment of a two-compartment tank or the first tank in a series shall hold no less than one-half of the required effective volume.
- C. The inlet invert shall be at least two (2) inches higher than the outlet invert.
- D. An inlet tee or baffle shall be provided and shall extend above the surface of the liquid at least five (5) inches and shall extend a minimum of eight (8) inches below the liquid surface.

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- E. The outlet tee or baffle shall extend at least 14 inches below the outlet invert and, if needed, be modified to accommodate an effluent screen. The outlet tee or baffle that accommodates an effluent screen shall be located so that the effluent screen has sufficient clearance to be removed through the access opening with a riser in place.
- F. The distance from the outlet invert to the underside of the tank top shall be at least ten (10) inches.
- G. Liquid depth of a septic tank shall be a minimum of 30 inches and the maximum depth shall not exceed the tank length.
- H. The transfer of liquid from the first compartment to the second or successive compartment shall be made at a liquid depth of between 35 and 40 percent of the liquid depth measured from the liquid surface. Liquid transfer shall not be made in the sludge zone.
- I. At least one (1) access manhole no less than 20 inches across shall be provided in each compartment of a septic tank.
- J. A septic tank shall have a minimum of 25 square feet of liquid surface area and have at least a six-foot separation between inlets and outlets. Septic tanks in series, combined, shall have a minimum of 25 square feet of liquid surface area and the sum of the distances between inlets and outlets of all tanks shall be at least six (6) feet. The requirements for liquid surface area and separation between inlet and outlet may be waived for tanks with less than 750 gallons effective volume.

6. Structural Design – General Requirements

- A. The design of each tank model and size by each manufacturer shall be certified by a professional engineer as complying with these design and structural requirements and the watertightness standard of these Regulations.
- B. Certification by a professional engineer shall be submitted to the Division for acceptance.
- C. All seams or connections including between tank and risers shall be sealed to be watertight.

7. Structural Design - Concrete Tanks

- A. Concrete septic tanks shall comply with the structural design criteria of ASTM C1227-12 (Standard Specification for Precast Septic Tanks).
- B. Tank slab lids or mid-seam tanks shall be sealed to be watertight.

8. Structural Design - Fiberglass, Fiberglass-Reinforced Polyester, and Plastic Tanks

- A. All fiberglass, fiberglass-reinforced polyester, and plastic tanks shall meet the minimum design and structural criteria of IAPMO/ANSI Z1000-2007 (American Standards for Prefabricated Septic Tanks).
- B. All tanks shall be sold and delivered by the manufacturer or manufacturer's designated representative, preferably completely assembled. On-site tank assembly will be allowed on an as-needed basis.
- C. Tanks shall be structurally sound and support external forces as specified in standard referenced above when empty and internal forces when full. Tanks shall not deform or creep resulting in deflection of more than five (5) percent in shape as a result of loads imposed.
- D. All tanks shall be constructed of sound, durable materials, and not be subject to excessive corrosion, decay, frost damage, or cracking.

9. Structural Design - Metal Tanks

- A. Metal tanks are prohibited.

10. Grease Interceptor Tanks

- A. All commercial food service facilities and other facilities generating fats, oils, and greases in their waste shall install a grease interceptor tank.
- B. Grease interceptor tanks shall treat only those portions of the total wastewater flow in which grease and oils are generated.

11. Oil/Water Separators

- A. Unless the system consists of a sealed vault or holding tank, discharges from oil/water separators shall not be conveyed to the OWTS.

12. Installation of Septic Tanks

- A. Septic tanks shall be transported, handled, and set in accordance with the manufacturer's recommendations so as to avoid undue strain on the tank and the pipes entering and exiting the tank.
- B. Septic tanks shall be installed on a solid base and shall be level.
- C. Septic tanks shall be installed at least five (5) feet from soil treatment areas or evaporation systems.
- D. Risers shall meet the requirements of Section 16.2.

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- E. Roof drains, foundation drains, water softener discharge lines, area drains, or cistern overflows shall not enter any tanks or any part of the system and shall be placed in a manner which diverts water away from the system.
- F. All septic tanks shall be installed so that sufficient access is provided for routine maintenance and pumping of each compartment of the tank.
- G. The tank shall be completely covered by backfill and no portion of the tank except for the risers and lids may remain exposed.
- H. All areas disturbed by the installation of the septic tank shall be re-graded and re-seeded to control erosion.

13. Dosing

- A. Unless otherwise provided for in these Regulations, dosing will be required for all new installations and for repairs where the existing septic tank is being replaced or upgraded.
- B. Dosing may be accomplished by means of a dosing siphon or a pump and may be demand or time based.
- C. Dosing is not required for new systems with a design flow of less than 150 gallons per day or where TL1 effluent is to be applied and topography or other conditions will not allow the use of a dosing siphon.
- D. Dosing for repairs is not required for systems where the engineer provides justification that dosing would be more detrimental to the system.
- E. A pump may be, or a dosing siphon shall be, installed pursuant to Section 16.14.
- F. The dose calculation shall be sized to account for the daily flow and dosing frequency.