CLEAR CREEK COUNTY Public & Environmental Health	Component Design Standards	Section 16

1. General Standards

A. An OWTS shall be designed and constructed to achieve the treatment level specified by the design.

B. The OWTS shall be designed and constructed such that each component shall function, when installed and operated, in a manner not adversely affected by normal operating conditions including erosion, corrosion, vibration, shock, climactic conditions, and usual household chemicals.

C. Each OWTS component shall be free of non-functional protrusions or sharp edges or other hazards which could cause injury to persons, animals, or properties.

D. The OWTS design shall be such as to exclude flies and rodents and other vectors and to prevent the creation of nuisances and public health hazards, and shall provide for efficient operation and maintenance.

E. All components used in the system shall be approved by the design engineer.

F. All components shall be installed and used in accordance with the recommendation of the manufacturer or the requirements of these Regulations, whichever is more stringent.

2. Accessibility for Inspection, Maintenance, and Servicing

A. Each treatment component, including, septic, dosing, and pump tanks, of an OWTS other than the soil treatment area shall be equipped with access manholes with risers that extend to or above final grade, located to permit periodic physical inspection, collection and testing of samples and maintenance of all components and compartments.

B. Septic tanks shall have risers a minimum of 24-inch diameter over each access manhole made of corrosion-resistant material and all risers shall extend to or above final grade.

C. Each riser lid brought to the surface shall have a secure closing mechanism, such as a lock, special headed bolts or screws, or sufficient weight to prevent unauthorized access.

D. Each access riser lid shall have a watertight connection to prevent infiltration or exfiltration.

E. Components that require access for maintenance shall include but not be limited to submerged bearings, moving parts, pumps, siphons, valves, tubes, intakes, slots, distribution boxes, drop boxes, cleanouts, effluent screens, filters, inlet and outlet baffles, aerators, treatment equipment, and other devices.

F. Components shall be designed and constructed so that, when installed, they will be easily maintained, sampled, and serviced according to the manufacturer's recommendations. Easy physical access to treatment components by maintenance personnel and equipment shall be provided, such as but not limited to, extending access points to at least six (6) inches below the top of the riser and clear of any protrusions that may prevent easy removal of necessary components.

3. Sampling Access

A. If sampling for testing or as a requirement for a permit will be required of effluent from a component other than the soil treatment area, an accessible sampling point shall be provided.

B. If sampling of the treated wastewater from the soil treatment area will be required for testing or as a requirement for a permit, a monitoring well or wells shall be constructed. Monitoring wells shall be located down gradient from the soil treatment area, accessible, and provided with a properly securable cover at or above the ground surface. Monitoring wells up gradient of the system may also be required. Lysimeters or other collection devices under the soil treatment area may be used instead of a monitoring well if approved by the health officer or other issuer of a permit.

4. Plumbing Codes

A. Plumbing fixtures, building sewers, vents, sewer lines, and other appurtenances shall be designed, operated, and maintained so as to comply with the minimum requirements of the most recently revised locally enforceable plumbing code.

5. Electrical Equipment

A. All electrical work, equipment, and material shall comply with the requirements of the currently applicable National Electrical Code as designated by the State Electrical Board Rules and Regulations (3 CCR 710-1).

B. Electrical components shall be protected from moisture and corrosive gases.

C. Splice Boxes

1. Splice boxes shall be located outside the pump system access riser and be accessible from the ground surface.

2. No wire splices shall be made inside the tank, dosing chamber, or riser. Wire splicing shall be completed with corrosion-resistant, watertight connectors.

6. Indicators of Capacity

A. A signal device shall be installed in all vaults or holding tanks to provide a warning to the user that the liquid level in the vault or holding tank has reached a maximum of 75% capacity. The signal device shall meet the requirements of Section 20.2.

7. Indicators of Failure for Malfunctioning for Systems Utilizing Mechanical Apparatus

A. A signal device shall be installed which will provide a recognizable indication or warning to the user that the system or component is not operating or is operating but malfunctioning.

B. This indication or warning shall be a visual signal or an audible signal or both and shall be located in a centralized area within visual and audible range of the system user. A signal or message may also be sent remotely to a maintenance provider.

C. If located on the exterior of a structure, the signal device shall be enclosed in a waterproof housing and shall have a sound pressure level of at least 80 decibels (dB) measured at 24 inches from the housing.

8. Component Operating Instructions

A. The manufacturer of proprietary treatment units utilizing mechanical components shall provide clear, concise written instructions covering the components which, when followed, shall assure proper installation and safe and satisfactory operation and maintenance.

B. If the OWTS uses public domain technology, the design engineer shall provide clear, concise written instructions covering the components which, when followed, shall assure proper installation and safe and satisfactory operation and maintenance.

9. Pipe Standards and Bedding Requirements

A. All wastewater lines used in an OWTS shall be constructed of compatible pipe, primer, bonding agent, and fittings.

B. Where unperforated plastic pipe and fittings are used for gravity flow, the minimum wall thickness of the pipe shall conform to ASTM Standard D 3034 or equivalent or greater strength. Schedule 40 pipe is preferred.

C. Perforated distribution pipe surrounded by rock within a soil treatment area shall have a minimum wall thickness and perforations conforming to ASTM Standard D 2729 or equivalent or greater strength. Corrugated polyethylene pipe with smooth interior that meets ASTM F405 or AASHTO M252 specifications or equivalent may be used.

D. Schedule 40 or pipe of equivalent or greater strength shall be used for the placement of piping under driveways or roadways and in instances where sewer line setback distances are granted a variance for any reason.

E. Tile pipe, open-joint pipe, and cast iron pipe is prohibited for use in an OWTS.

F. Pressure pipe shall be rated for the intended use to accommodate pump discharge pressure.

G. All system piping, except for distribution laterals within the STA, shall be bedded with select material before final inspection by the health officer. Select bedding material shall consist of loose, granular material, free from stones, clods, frozen soil, or other deleterious material. Select material may consist of on-site job-excavated or imported material. Bedding material shall be mechanically compacted to support piping.

10. Sewer Lines

A. Except for pressurized systems, sewer lines shall be installed such that gravity flow is maintained throughout the length of the line.

B. If the tank consists of a sealed vault, the grade of the building sewer shall be sufficient to assure gravity flow into the tank.

C. Bends in the sewer line between the structure and the first treatment components shall be limited to 45 degree ells or long sweep 90 degree bends.

D. There shall be at every change of direction greater than 45 degrees or at least one clean-out for every 100 feet of four inch sewer line and every 75 feet of three inch sewer line. The clean-out shall be of the same material as the pipe, extend at least 12 inches above final grade and fitted with a removable cap.

E. Building sewer clean-outs shall be located outside of the dwelling, unless the Department has received written approval from the appropriate building department the clean out has been located inside the dwelling, extend at least 12 inches above final grade, and be fitted with a removable cap.

F. Non-pressurized sewer lines shall have a minimum diameter of three (3) inches.

G. The inlet and outlet pipes of the septic tank shall be grouted and sealed with watertight materials.

11. Distribution Boxes

A. A distribution box, if used, shall be of sufficient size to distribute effluent equally to the lateral lines of a trench or absorption bed system. The box shall be constructed with the inlet invert at least one (1) inch above the level of the outlet inverts. Flow equalizers or similar devices shall be used to adjust the flow between lines. Access to the box shall be provided with a manhole riser with access lid at or above grade if the top of the box does not reach final grade. The distribution box should be level.

12. Drop Boxes

A. In sequential or serial distribution, a watertight box may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow to the next trench. A drop box shall have a riser at or above final grade, if the top of the drop box does not reach final grade. Outlet lines in sequential distribution shall be designed and installed so that they may be capped off for resting periods. The drop box shall be level.

13. Step-Down/Relief Lines

A. In sequential or serial distribution, an unperforated pipe may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow from that trench.

14. Wastewater Pumping Systems

A. Pumps

1. Non-clog pump opening shall have at least two-inch diameter solids handling capacity where raw wastewater is pumped. A pump opening shall not have more than 3/4 inch diameter solids handling capacity if previously settled effluent is pumped.

2. Pumps shall be certified to the applicable UL or CSA electrical safety standard, bear the seal of approval of CSA, UL, or an equivalent testing program and be constructed of corrosion resistant materials.

3. Grinder pumps shall also be certified to NSF/ANSI Standard 46 and bear the seal of approval of the NSF or equivalent testing and certification program.

B. Floats and Switches

1. Automatic liquid level controls shall be provided to start and shut off pumps at a frequency or level specified in the design.

2. Floats shall be mounted on a stem free of hindrances that would prevent adjustment and separate from the pump discharge piping to allow for removal, adjustment, and replacement of the float without removing the pump.

3. Float switches shall be certified to the applicable UL or CSA electrical safety standard, bear the seal of approval of CSA, UL, or an equivalent certification program and be constructed of corrosion resistant materials.

C. Location of Pump or Siphon

1. A pump may be, or a dosing siphon shall be, installed in a separate tank following the septic tank and be of sufficient volume to allow siphon cycling commensurate with the design capacity. The use of a three compartment septic tank, sized to provide effective volume in the first two compartments with the pump in the third compartment is acceptable.

2. The second compartment of the septic tank shall not be used as the pump tank unless it can be demonstrated to the satisfaction of the health officer that the minimum 48 hours detention time will not be decreased and the pump is screened or provided with an approved filtering device to assure that only liquid effluent will be discharged.

3. Pumps shall be installed on a solid base with a minimum of eight (8) inches from the bottom of the pumping chamber to elevate the pump intake above any sludge layer.

D. Pump or Siphon Discharge Piping

1. The discharge line from the pumping or siphon chamber or tank shall be protected from freezing by burying the pipe below frost level or sloping the pipe to allow it to be self-draining. Drainage shall be provided through the bottom of the pump or through a weep hole located in the discharge line prior to exiting the tank.

2. The pump discharge piping shall have a quick disconnect that is accessible within the riser to allow for easy pump access and removal.

3. The pipe shall be sized to maintain a velocity of two (2) or more feet per second.

4. Automatic air/vacuum release valves shall be installed at high points in the pressure line where necessary to prevent air or vacuum locking and allow self draining of the lines.

5. In-vault pumps shall be provided with quick-disconnect joints to allow for routine removal for maintenance and replacement as well as a surrounding screen of filter for pumps placed in the second compartment of septic tanks.

E. Controls

1. The pump system shall have an audible and visual alarm notification in the event an excessively high water condition occurs.

2. The pump shall be connected to a control breaker separate from the high water alarm breaker and from any other control system circuits.

3. The pump system shall have a switch so the pump can be manually operated.

4. The pump system for pressure dosing and higher level treatment systems shall have a mechanism for tracking either the amount of time the pump runs or the number of cycles the pump operates.

5. Control panels shall be UL listed.

15. Effluent Screens

A. An effluent screen shall be installed in all septic tanks in new installations and repairs where the septic tank is replaced.

B. If a pump or dosing siphon is used to remove septic tank effluent from the final compartment of the septic tank, an effluent screen shall be provided prior to the pump or siphon inlet. A pump vault equipped with a filter cartridge may be considered equivalent to an effluent screen preceding the pump.

C. The effluent screen shall be cleaned at manufacturer-recommended intervals, or more often, if use patterns indicate.

D. Effluent screens shall comply with the requirements of Section 16.2.F.

16. Floor Drains

A. Floors drains from any facility, workshop or garage shall not be connected to any OWTS unless that system consists solely of a sealed vault or holding tank.