Commercial Contractor Examination
Study Guide

The purpose of this study guide is to assist you in preparing for the commercial contractor's certification exam for septic tank contractors. The Georgia Department of Public Health "Rules and Regulations for On-Site Sewage Management Systems" Chapter 511-3-1-.16 requires the certification of individuals performing services as a septic tank contractor, inspection personnel, maintenance personnel, or sewage pumper. After February 20, 2000 all sewage system contractors must have a valid "Georgia On-Site Sewage System Contractors Certification. Contractors who do not have a certification or who violate any of the provisions of the Department's rules will be guilty of a misdemeanor and subject to appropriate punishment under Georgia Law.

Contractor certification has been divided into several categories beginning with the residential contractor's certification that all onsite sewage management system installers must have. Additional modules such as this one have been added to address contractors involved in more complex or specialized sewage system installations. The "Commercial Contractors Certification" will focus on larger commercial or industrial installations that may require additional features such as dosing devices or components such as tanks which have to be built or fabricated at the construction site.

Septic Tanks

Some commercial installations may be able to use pre-cast or pre-manufactured septic tanks. Such tanks may be made of concrete, plastic, fiberglass or such other materials as are approved by the department. Larger tanks will have to be constructed on-site. All tanks whether pre-manufactured or constructed on site shall be constructed so the length is at least one and one-half (1½) times the width and shall have two (2) compartments. Tank compartment partitions will be located at a point not less than two-thirds (2/3) or more than three-fourths (¾) the length of the tank from the inlet end. Compartment partitions will be constructed so a pass-thru hole or slot equal to or greater than the diameter of the inlet pipe is positioned below the liquid surface a minimum of 25% to a maximum of 50% of the total liquid depth. Total liquid depth for larger poured-in-place tanks shall be a maximum of sixty-six inches (66").

The walls and bottom of poured-in-place septic tanks must be reinforced. Reinforcing can be accomplished by using either a minimum six inch by six inch (6" x 6") No. 10 gage welded steel reinforcing wire or fibrous reinforcing material conforming to ASTM specifications for such materials. Tank lids must be reinforced using three-eights steel reinforcing rods (rebar) which shall be spaced twelve inches (12") on center each way extending a minimum of two and one-half (2½") inches and a maximum of three inches (3") from the outside edge of the tank lid. In general, the tank must be able to withstand a uniform live load of one hundred fifty (150) pounds per square foot in addition to all loads to which an underground tank is normally subjected. Walls, bottoms and lids of poured-in-place septic tanks shall have a minimum thickness of four inches (4"). Tank lids shall be constructed in one or two pieces and shall have securable, removable access openings located so the inlet and outlet tees can be readily accessed. Access openings shall be a minimum of fifteen inches (15") free space and a maximum of twenty-four inches (24"). Tanks with more than twelve inches (12") of cover must extend access openings to within twelve inches (12") of the ground surface.

All tanks shall be equipped with four inch (4”) PVC, ASTM 3034 rated or equivalent tees at the inlet and outlet ends of the tank. Tees shall be constructed so they extend into the liquid a minimum of twenty-five percent (25%) and a maximum of fifty percent (50%) of the liquid depth of the tank. The invert of the outlet tee shall be located two inches (2") below the invert of the inlet tee. Outlet tees shall be equipped with an approved effluent filter.

Concrete used for poured-in-place or pre-cast septic tanks shall have a minimum 28 day compressive strength of 4000 pounds per square inch. When pouring concrete, care should be taken to assure such operations are not done during freezing or otherwise inclement periods that could damage the integrity of the finished product. The finished product should have a smooth homogeneous consistency and finish. Vibrating the forms or mix may be helpful in eliminating “honeycombing” or “bridging” in the finished product. It will ultimately be the on-site sewage contractor’s responsibility to assure the quality of the finished product.

Dosing Tanks and Devices

On-site sewage management systems requiring five hundred linear feet of field line (500') or more must be equipped with a dosing device. Dosing can be accomplished using pumps or siphons. Systems requiring at least five hundred (500') but less than one thousand (1000') linear feet of field line will need a single pump or siphon. Systems requiring one thousand linear feet (1000') or more will need alternating pumps or siphons.

Dosing tanks shall meet the construction requirements for septic tanks with regard to construction materials and reinforcement. One or two-piece tanks may be used. When two piece tanks are used sections must be joined by using mastic, butyl rubber, or other pliable sealant that is water proof, corrosion resistant and approved for use in septic tanks. There shall be no requirement as to length, width, or shape of the tank. Tanks may have a single compartment or if a partition is used it must have two four inch diameter holes, or equivalent, located no more than 12 inches above the tank bottom. Dosing tanks using pumps must have a reserve capacity of one days flow however tanks for siphons will not be required to have one days flow reserved. All tanks, however, must have an operating liquid capacity of 60% to 75% the interior volume of the absorption lines to be dosed. All tanks shall have switches and alarms that notify the owner of a malfunction.

When determining dosing tank requirements dose volume, flow rates, waste water characteristics and other similar information should be taken into consideration. As with septic tanks, large capacity dosing tanks will need to be constructed on site. Dosing tanks shall have a water-tight access cover at least twenty-four inches (24") in diameter extending to the ground surface or no more than twelve inches (12") below the ground surface.

When pumps are used to dose field lines, consideration must be given to the wastewater characteristics, desired discharge rate and total dynamic head required for the system. Total dynamic head is determined by adding the elevation difference between the lowest water level in the tank and the elevation of the discharge outlet, to the total friction losses incurred in the discharge pipe. The desired pump must be able to overcome that amount of head or more at an acceptable discharge rate, to be satisfactory for use in the system. When field lines are above the elevation of the operating water level of the tank, a check valve should be used to prevent the contents of discharge pipes from emptying back into the tank.

When field lines are below the elevation of the operating water level of the tank, a hole or other vacuum breaking device should be placed in the discharge pipe before it exits the tank to prevent siphoning the remaining contents of the tank after the pump shuts off.

Siphons are the non-mechanical alternative to pumps. As the dosing tank fills, head pressure increases in the tank to a point that will force the effluent thru the siphon which is a specially designed trap, creating suction in the discharge line that empties the contents of the dosing tank to the level of the siphon bell and sniff hole. Equilibrium is then re-established in the line until the water level rises again to the level that the process starts all over again. As with pumps, single siphons are used for systems with more than 500 linear feet of field line and alternating siphons are used for systems with more than 1000 linear feet of field line. When installing siphons, care should be taken to assure they are installed level and are primed with water.

Grease Traps

Grease traps are required for any installation where the amount of grease in the effluent stream exceeds fifty milligrams per liter (50 mg/l). Grease traps are rarely used for homes. Their main application is in treating kitchen waste waters from motels, cafeterias, restaurants, hospitals, schools and other institutions with large volumes of kitchen wastewater. The purpose of the grease trap is to separate the grease from the other water carried waste which will protect the pipes in the system from clogging with grease and also help prevent clogging of the soil in the same manner. Effluent from the grease trap is deposited in the septic tank along with the other water carried waste from the facility. In Georgia the minimum sized grease trap allowable is one hundred twenty-five (125) gallons. The sizing of grease traps should take into consideration the type of facility served and the estimated daily sewage flow. Consult your local health department for assistance in sizing grease traps.

Grease traps may be constructed of any of the materials used for conventional septic tanks. They should be cleaned regularly to prevent clogging. It is recommended that grease traps be cleaned when seventy-five percent (75%) of their grease retention capacity is reached.

General

Commercial on-site sewage disposal systems shall adhere to all the standards established for residential systems unless otherwise specifically addressed in the permit. Systems shall be sized according to the anticipated daily sewage flow for the facility to be served. For residential type facilities both single and multi family, one hundred fifty (150) gallons per bedroom will be used to estimate the number of gallons per day sewage flow. In facilities where garbage grinders are to be used, tank capacity shall be increased by fifty percent (50%). All solid pipe used in the installation of on-site sewage disposal systems shall be schedule 40 PVC or equivalent. Cast iron shall be considered to meet the equivalency standard.

Safety should always be a primary consideration in the construction of systems. All wiring and electrical components for systems requiring electrical components should meet the standards set forth in the National Electrical Code. When excavating trenches care should be taken to minimize the risk of injury to employees operating equipment and doing hand work in trenches. Trenches that exceed sixty inches (60") in depth should have walls stabilized with appropriate shoring devices.