

Bulletin 4-2 Requirements and Recommendations

✓	Directive	Citation/ Page	Required or Recommended Standard
	INTRODUCTION		
	All domestic wastewater shall be discharged to an approved sewage collection system or an approved lagoon, septic system, or alternative system.	Page 1; K.A.R. 28-5-6	Required
	Wastewater from a home shall be discharged to a properly designed and maintained septic tank-soil absorption field or wastewater pond, an approved alternative treatment and disposal system, or a permitted sewage treatment plant.	Page 1	Required
	Seepage pits, cesspools, and dry wells (rat holes) are not permitted.	Page 1	Required
	Industrial or commercial wastewater (from shops, manufacturing, car washes, etc.) is not permitted to be discharged to an onsite soil absorption system, so it shall not be mixed with domestic wastewater.	Page 1	Required
	WASTEWATER FLOWS		
	Surface runoff from roofs and paved areas, subsurface drainage from footing drains and sump pumps, and cooling water are not domestic wastewater and must be excluded from soil absorption systems. Such water may be used to maintain operating water level in wastewater ponds.	Page 2	Required
	Design flow is estimated by multiplying the number of household bedrooms by 150 gallons per day (gpd). This is based on 75 gallons per person per day for two people in each bedroom. This also assumes at some water using appliances such as clothes washer, dishwasher, water softener, etc.	Page 2	Required
	Adjustments should be made for a water softener, which may increase water use by as much as 10 gallons per capita per day or possibly more where water is very hard.	Page 2	Recommended
	SITE & SOIL EVALUATION		
	Four feet of aerated soil below the bottom of the absorption field is necessary.	Page 2	Required
	In sandy soil, it is recommended that as much vertical separation as possible be provided.	Page 2	Recommended
	Soil must absorb the septic tank effluent, treat the wastewater, and transmit treated wastewater away from the soil absorption areas.	Page 2	Required
	A site and soil evaluation should be completed in order to locate the area to be used for the absorption field, to verify the soil characteristics, and to size the system.	Page 3	Recommended
	Slopes steeper than 20% are not recommended for lateral field installations.	Page 3	Recommended
	The range of values for each of several properties that cause the soil to be placed in slight, moderate, and severe limitation rating for soil absorption systems is shown in Table 1.	Pages 2 & 3 (Table 1)	Required when a soil evaluation is conducted
	The wastewater system area should be chosen prior to any construction on a site and should be an integral part of the homesite design and development.	Page 3	Recommended
	A soil profile analysis is highly recommended to ensure suitability of the area and to establish the loading rate so that adequate space is available for the absorption field and its replacement.	Page 3	Recommended
	The soil profile should be analyzed to a depth of at least four feet below the bottom of the absorption area or at least six feet below the surface	Page 3	Recommended
	At least three soil profile pits should be dug surrounding the area to establish the range of soil characteristics that are present on the site, and to determine the best location for the absorption field.	Page 3	Recommended
	Recommended loading rates are based on soil texture, structure and consistence information.	Pages 3 & 4 (Table 2)	Required when recommended loading rates are used
	System design should be based on the most limiting soil texture found in the first four feet of soil below the bottom of the proposed absorption lateral.	Page 4	Recommended
	It is highly recommended that the absorption field and an equal area reserved for future use be marked and fenced so they will not be disturbed during construction.	Page 4	Recommended

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	If a site plan is prepared, setback distances to property lines, wells, surface water and buildings must be checked and included.	Page 4	Required
	Where evaporation substantially exceeds precipitation, as in central and western Kansas, a reduction in soil absorption area may be used when the soil is well suited to wastewater absorption. A well suited soil has medium to coarse texture, percolation rates less than 45 minutes per inch and wastewater loading rates of 0.5 gallons per square foot per day or more.	Page 3 (Table 3)	Recommended
	For marginal, high clay, soil that has low loading rates, no reduction should be used regardless of location in Kansas.	Page 4	Recommended
	The procedure for doing a percolation test is described in Appendix A (page 14). Use loading rate and absorption field recommendations in Table 4, or use another method specified by the local sanitary code.	Pages 4 & 5 (Table 4)	Recommended
	Minimum required and recommended separation distances for private wastewater systems are given in Table 5. Structures and boundaries to consider include easements, buildings, property lines, utilities, wells, water lines, surface water courses, and components of the wastewater disposal system.	Pages 4 & 5 (Table 5)	Required
	Twenty-five feet is required between an onsite wastewater system and a public potable water line.	Page 4 (Table 5) and KDHE guidelines for public water supplies.	Required
	100 feet is required between an onsite wastewater system and a public water supply well or suction line.	Page 4 (Table 5) and K.A.R. 28-30-8(a)	Required
	When lot dimension, topography, or soil condition make maintaining the required 50 feet separation distance between a wastewater lagoon and a property line or dwelling foundation impossible, a written variance from the affected property owners shall be obtained and filed with deeds.	Page 4 (Table 4; footnote 10)	Required
	When limiting properties occur in the soil profile, a variation of conventional laterals, wastewater ponds or alternative treatment systems may be used to compensate for the limiting condition. Variations and alternatives that may be considered are summarized in Table 6. When possible, sites with these restrictive conditions should be avoided due to higher cost, larger land area, and greater maintenance requirements for the alternatives systems.	Page 4 (Table 6)	Recommended
SEPTIC TANK			
	The septic tank is sized so that wastewater flow through the tank takes at least 24 hours even with sludge and scum accumulation.	Page 6	Recommended
	Septic tanks are designed to handle all the daily flow a household will normally produce and must have sufficient capacity for the minimum recommended volume of at least two times the daily wastewater flow.	Page 6	Required
	Septic tank capacities -- <ul style="list-style-type: none"> • Table 7 gives minimum and recommended capacities for sizing septic tanks. • Septic tank capacities are based on the number of household bedrooms. For each additional bedroom, add 300 gallons to the minimum value and 450 gallons to the recommended value. • Septic tank capacity (gallons) is the volume held by the tank below the liquid level (invert of the outlet pipe). • The minimum tank size is 1,000 gallons. 	Page 6 (Table 7)	Required
	Septic tank effluent filters are highly recommended.	Page 6	Recommended
	If two compartment tanks or two tanks in series are used, the first compartment shall be sized to contain from one-half to two-thirds of the total tank capacity.	Page 6	Required
	Total tank capacity should be sized to retain at least two-to-three times the total daily wastewater flow as shown in Table 7.	Page 6	Recommended

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	Tanks shall never be closer than 50 feet from any water supply. Greater distances are preferred if possible.	Page 6	Required
	A 100-foot separation is required if the water source serves a public water supply.	Page 6	Required
	The septic tank shall not be located closer than 10 feet from any building, in swampy areas, or in areas located within the 100 year flood plain.	Page 6	Required
	There shall be no permanent structure (patio, building, driveway, etc.) over the tank, lateral or other part of an onsite wastewater system.	Page 6	Required
	To avoid damage to the onsite wastewater system, heavy equipment should not have to cross any portion of the system when servicing the septic tank.	Page 6	Recommended
	A sketch of the wastewater disposal system as constructed, showing measurements should be made and delivered to the homeowner, and filed with the permit. Figure 3 shows an example septic system sketch.	Pages 6 & 8 (Figure 3)	Recommended
	All abandoned or unused septic tanks, cesspools, seepage pits or other holes that have received wastewater shall be emptied and plugged following procedures described in K-State Research & Extension bulletin MF-2246.	Page 6	Required
	SEPTIC TANK DESIGN/CONSTRUCTION SPECIFICATIONS – General Requirements Regardless of the Construction Material		
	Structural design -- <ul style="list-style-type: none"> • The septic tank including all extensions to the surface shall be watertight to prevent leakage into or out of the tank. • The tank shall be structurally sound and made of materials resistant to corrosion from soil and acids. • Steel tanks are not acceptable. 	Page 7 Paragraph A	Required
	Liquid depth and inside length -- <ul style="list-style-type: none"> • Septic tank liquid depth must be at least three feet but shall not exceed six-and-one-half feet. • The effective inside length of tanks shall not be less than one-and-a-half nor greater than four times the effective inside width. 	Page 7 Paragraph B	Required
	The minimum tank capacity is two times the daily wastewater flow using 150 per bedroom or 1,000 gallons, whichever is larger.	Page 7 Paragraph C	Required
	Tanks sized three times daily flow are recommended.	Page 7 Paragraph C	Recommended
	Tanks sized three times daily flow shall be required when garbage disposals are used.	Page 7 Paragraph C	Required
	Support -- <ul style="list-style-type: none"> • The top of all tanks shall be designed and constructed to support a minimum uniform load of 400 lbs. per square foot plus a 2,500 lb. axle load. • When buried more than two feet, the tank, especially the top, shall support an additional 100 lbs. per square foot for each foot of soil or portion thereof in excess of two feet. 	Page 7 Paragraph D	Required
	If the tank is placed in an area subject to any vehicular traffic, it shall be certified to meet H-20 highway loading by a Kansas licensed structural engineer	Page 7 Paragraph E	Required
	Space above liquid line for scum is required for that portion of the scum that floats above the liquid.	Page 7 Paragraph F	Required
	Liquid depth -- <ul style="list-style-type: none"> • For vertical sidewall tanks, the distance between the top of the tank and the outlet invert should be 15% of the liquid depth with a minimum of seven inches. • In horizontal, cylindrical tanks, an area equal to approximately twelve and one-half (12 ½) percent of the total volume should be provided above the liquid line. This condition is met if the space above the liquid level (distance from outlet invert to top of tank) is 15% of the tank diameter. 	Page 7 Paragraph F	Recommended

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	Sewage lines carrying solids from the source to the tank should have sufficient slope to maintain velocities that keep solids moving. For household size lines, a slope of between one percent (1/8 inch per foot) and two percent (1/4 inch per foot) is usually best.	Page 8 Paragraph G	Recommended
	The last 15 feet of sewer line preceding the tank shall not slope more than two percent (1/4 inch per foot).	Page 8 Paragraph G	Required
	The inlet and outlet baffle or tee and compartment baffle should extend above the liquid level to one inch below the top of the tank.	Page 8 Paragraph H	Recommended
	The invert of the inlet pipe shall be located at least three inches above the invert of the outlet when the tank is level.	Page 8 Paragraph I	Required
	The septic tank or pumping tank inlet shall be a sanitary tee, elbow or long sweep elbow with low head inlet or baffle to direct incoming sewage downward and prevent flow from disturbing the floating scum layer.	Page 8 Paragraph J	Required
	The septic tank or pumping tank inlet should extend eight inches below the liquid level, but should not penetrate deeper than 20% of the liquid depth.	Page 8 Paragraph J	Recommended
	The outlet tee or baffle should generally extend below the liquid surface a distance equal to 35% of the liquid depth. For horizontal, cylindrical tanks, this distance should be reduced to 30 percent of liquid depth.	Page 8 Paragraph K	Recommended
	Inlet and outlet openings shall be designed and constructed to be water tight for at least a 20-year life of the system.	Page 8 Paragraph L	Required
	Two compartment tanks-- <ul style="list-style-type: none"> • The dividing baffle shall extend from bottom of the tank to at least six inches above the liquid line. • The opening in the dividing baffle may be any shape and shall be at least two inches minimum dimension with a total area of at least 12 square inches. • The baffle opening is to be centered 35% of liquid depth (30% for cylindrical tanks) below the liquid level. 	Page 8 Paragraph M	Required
	Septic tank openings and attachments -- <ul style="list-style-type: none"> • Septic tanks shall have an access manhole with 20 inches minimum dimension for each compartment. • If the manhole does not extend to surface grade, a small diameter (at least one-and-a-half inch diameter) pipe shall extend to surface from the cover to mark the location of the manhole. This pipe shall not penetrate the lid of the tank. • Inspection risers at least 6 inches in diameter shall extend to surface grade centered over the inlet and outlet tees. • All below grade attachments to the tank, connections, riser, extensions and lid shall be water tight. • When any opening larger than eight inches extends to the surface, that opening shall be child and tamper resistant. This can be accomplished with lids weighting at least 65 pounds, locks, or anchors that are not removable without special tools. 	Page 8 Paragraph N	Required
	The sewer line from the house to the tank, all fittings and pipe in the tank, all extensions to the surface from the top of the tank and the first 10 feet exiting the tank shall be schedule 40 pipe or heavier.	Page 8 Paragraph O	Required

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	<p>Septic tank design --</p> <ul style="list-style-type: none"> • Septic tanks shall be designed for at least a 20-year life. They shall be designed and constructed to withstand extremes in loads resulting from adverse conditions without excessive deflection, deforming, creep, cracking or breaking. • Change in shape shall be limited to 5%. • Loads shall be based on 62.4 pounds per cubic foot for water and water saturated soil. • Top loads for design shall be in uniform 400 pounds per square foot plus 2,500 pound axle point load. • If the tank will be placed deeper than two feet or subject to vehicular traffic over the tank, a design by a Kansas licensed structural engineer shall be done for the specific conditions. 	Page 9 Paragraph P	Required
	<p>SEPTIC TANK DESIGN/CONSTRUCTION SPECIFICATIONS – Special Considerations for Concrete Tanks</p>		
	Figure 2 shows the dimensions or a typical precast concrete septic tank.	Page 7 (Figure 2)	Required
	If the tank will be placed deeper than two feet or subject to vehicular traffic over the tank, a design by a Kansas licensed structural engineer shall be done for the specific conditions.	Page 7 (Figure 2, footnote 20)	Required
	<p>Concrete design mix --</p> <ul style="list-style-type: none"> • The concrete design mix shall be for a compressive strength of at least 4,000 lbs. per square inch at 28 day cure. • The water-cement ratio shall not exceed 0.45. 	Page 9 Paragraph A	Required
	Baffles or other interior concrete units shall not be used for precast or poured in place concrete septic tanks unless they are cast or built into the tank wall at the time the tank is constructed	Page 9 Paragraph B	Required
	Air entrainment additives shall be added to five percent volume.	Page 9 Paragraph C	Required
	Other chemical admixtures are encouraged to reduce water content, improve placement in forms	Page 9 Paragraph C	Recommended
	<p>Concrete tanks and lids shall receive proper care during the hydration (hardening) period by:</p> <ol style="list-style-type: none"> 1. monitoring and controlling temperature of the concrete and gradients (i.e., maintain 50 to 90 degrees Fahrenheit for conventional cure and up to 140 degrees Fahrenheit under low pressure steam cure); and 2. monitoring and controlling humidity to prevent adverse moisture loss from fresh concrete (i.e., prevent or replenish loss of essential moisture during the early relatively rapid state of hydration). 	Page 9 Paragraph D	Required
	<p>Reinforcing steel --</p> <ul style="list-style-type: none"> • Reinforcing steel shall be placed as designed by a Kansas licensed structural engineer to ensure floor, wall, and top do not crack from moisture, frost, soil load, water load, axle load, or other stresses. Loads as specified above shall be used for the design condition. • Reinforcing steel shall be covered by a minimum of one inch of concrete and placed within plus or minus one-quarter (1/4) inch. 	Page 9 Paragraph E	Required
	A monolithic pour is the preferred construction procedure.	Page 9 Paragraph F	Recommended

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	<p>Two-piece tanks --</p> <ul style="list-style-type: none"> • Very large tanks that are cast in two pieces and assembled in the field shall meet the same structural strength standard as specified earlier. • Two piece tanks shall have permanently sealed structurally sound joints and shall be water tested after assembly. • A Kansas licensed structural engineer shall determine if the tank meets the strength specification. 	Page 9 Paragraph F	Required
	<p>Additional corrosion resistance measures --</p> <ul style="list-style-type: none"> • In areas of high sulfate water (greater than 250 mg/L), additional corrosion resistance measures is appropriate. Recommended measures include: <ul style="list-style-type: none"> ○ ASTM C150 Type II cement (moderate sulfate resisting); ○ ASTM C150 Type V cement (high sulfate resisting); or ○ coating interior concrete surfaces above the water line. • Coatings that provide additional protection of the concrete include asphalt, coal tar, or epoxy. The product used should be acid resistant and provide a moisture barrier coating for the concrete. 	Page 9 Paragraph G	Recommended
	Corrosion resistance products must not bleed into the water.	Page 9 Paragraph G	Required
	Manufacturers are strongly urged to follow guidelines and meet standards of American Concrete Institute, National Precast Concrete Association, and American Society for Testing and Materials. Manufacturers should identify and advertise their products that meet applicable standards.	Page 9 Paragraph H	Recommended
SEPTIC TANK DESIGN/CONSTRUCTION SPECIFICATIONS – Special Considerations for Fiberglass, Fiberglass Reinforced Polyester, and Polyethylene Tanks			
	All tanks shall be sold and delivered completely assembled.	Page 9 Paragraph A	Required
	Tanks shall be structurally sound and support external forces as specified above when empty and internal forces when full. Tanks shall not deform or creep resulting in deflection more than five percent in shape as a result of loads imposed.	Page 9 Paragraph B	Required
	Tanks and all below grade fittings and connections shall be water tight.	Page 9 Paragraph C	Required
SEPTIC TANK PLACEMENT SPECIFICATIONS			
	Avoid causing compaction in the lateral field during placement of the septic tank.	Page 9 Paragraph A	Required
	<p>Unsuitable natural soil –</p> <ul style="list-style-type: none"> • Tanks shall be placed on a bed of at least four inches of sand, pea gravel, or crushed non-corrosive granular material. • Material shall be no larger than two inches in diameter. • Bed depth shall be at least four times the largest material diameter. 	Page 9 Paragraph B	Required
	<p>Access manholes and inspection openings –</p> <ul style="list-style-type: none"> • Access manholes should be at surface grade. Where top of the tank must be more than 12 inches below surface grade, a watertight extension collar shall be added to raise the cover. • Inspection openings placed over inlet and outlet tees or baffles shall be at least six inches in diameter and extend to the surface. 	Page 10 Paragraph C	Required
	Septic tanks should not be placed into the water table (including perched or seasonal).	Page 10 Paragraph D	Recommended
	Plastic tanks shall not be used in high or seasonally high water tables unless precautions are taken to drain groundwater.	Page 10 Paragraph D	Required
	Septic tanks shall be watertight.	Page 10 Paragraph E	Required

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	Precast one piece tanks are best tested for watertightness at the plant before delivery.	Page 10 Paragraph E	Recommended
	Two piece tanks that are assembled on-site must be tested following placement but before back filling.	Page 10 Paragraph E	Required
	The tank hole shall provide ample space around the tank for access to do compaction. Backfill shall be in uniform, compacted layers not exceeding two feet thick and surround the tank.	Page 10 Paragraph F	Required
	Because of potential soil collapse, compaction should be done from the surface without entering trenches deeper than five feet.	Page 10 Paragraph E	Recommended
	ABSORPTION FIELD SIZE		
	The wastewater design flow is based on 150 gallons per day per bedroom.	Page 10	Required
	Loading rate is determined from the soil profile, from the percolation test rate, or by using another method as specified in the local code.	Page 11 (Table 2, pg 4 or Table 4, pg 5)	Required
	The soil absorption area is calculated by dividing the wastewater flow in gallons per day by the loading rate (gallons per day per square foot).	Page 11	Required
	Length of laterals -- <ul style="list-style-type: none"> • The maximum gravity lateral run shall not exceed 100 feet and preferably should be less than 60 feet. • If a lateral is supplied from the center, the total length shall not exceed 200 feet (100 feet to each side) and a maximum of 120 feet is preferred. • Lateral systems on level sites with all laterals on the same elevation shall be connected at each end with a level manifold or connector pipes as shown in Figure 3 so there are no dead ends. 	Pages 8 & 11 (Figure 3)	Required
	Step down or serial distribution as shown in Figure 4 is recommended for sites that slope one-and-a-half (1 ½) percent or more and/or result in more than six inches difference in cover for a level lateral system.	Page 10, 11 & 12 (Figure 4)	Recommended
	Adjacent absorption field trenches should be separated by at least six feet of undisturbed soil. Table 8 shows the minimum spacing for trench widths ranging from 18 to 36 inches. Individual trenches should be constructed on contour with the surface grade and with a level trench bottom to keep the trench cover a uniform thickness.	Pages 11 & 12 (Table 8)	Recommended
	A minimum of six inches of rock or gravel shall be placed in the trench under the distribution pipe, followed by enough gravel to cover the pipe by two inches.	Page 12	Required
	The soil cover over the trench should not be less than six inches to provide adequate water holding capacity for grass nor more than 12 inches to maximize water and nutrient use by vegetation. Generally, the total trench depth should be as shallow as possible, but not less than 18 inches.	Page 12	Recommended
	Perforated distribution pipe shall be used and, where pressure is not required, 4-inch diameter pipe is adequate. See standard lateral trench design and dimensions shown in Figure 5.	Page 12	Required
	When a shallow in-ground lateral system is used, the shallow, rock-filled trench shall be covered with a synthetic geotextile barrier material (at least three ounce nylon or five ounce polypropylene nonwoven filter fabric) before the lateral and interval between laterals is covered with topsoil brought to the site.	Page 12	Required

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	<p>At-grade lateral systems –</p> <ul style="list-style-type: none"> • The rock lateral shall be covered with barrier material before the lateral and interval space is covered with topsoil and brought to the site. • The at-grade lateral requires tilling the soil strip under the lateral on a level contour. • A pressure dosing system shall be included as a part of the at-grade design. • Orifices in the pipe shall be sized and spaced to evenly distribute flow throughout the lateral system. • If the area is too large to pressurize the entire system, a multizone design and sequencing valve shall be used to dose zones in sequence. 	Page 12	Required
	When an at-grade lateral and pressure dosing system is used, the distribution lateral line pressure should not exceed five feet of head.	Page 12	Recommended
	The use of an effluent filter on the septic tank outlet is strongly encouraged to prevent solids from plugging the absorption field, prolong the life of the absorption field, improve performance of the system, and help reduce the strength of wastewater effluent.	Page 12	Recommended
	ABSORPTION FIELD MATERIAL SPECIFICATIONS		
	<p>Rigid PVC or corrugated polyethylene plastic pipe --</p> <ul style="list-style-type: none"> • All materials used in the plumbing, wastewater line, and lateral fields shall meet standards specified by ASTM (American Society for Testing and Materials). • In gravity lateral pipes, perforations are circular, ½ inch diameter and are placed at the four and eight o'clock positions on the pipe circumference. • In no circumstance is slotted pipe acceptable as the narrow slot openings plug easily. 	Page 12	Required
	<p>Porous media for the trench –</p> <ul style="list-style-type: none"> • Crushed stone or washed gravel is commonly used. • The media gradation shall be three-quarter (¾) inches to two inches in diameter, with the smaller sizes preferred to reduce masking of the infiltration surface. • Rock having a hardness of three or more on the Moh's Scale of Hardness is required. • Larger diameter and smaller diameter material, or soft aggregate such as calcite limestone are not acceptable and shall not be used. • Fines shall not exceed five percent by volume. 	Page 12	Required
	<p>Fines --</p> <ul style="list-style-type: none"> • Fines should be eliminated as much as possible. • Unwashed material is generally unacceptable. 	Page 12	Recommended
	Gravel less chambers are good choices for laterals when suitable rock or gravel is not locally available, is expensive, or access to the site is restricted.	Page 12	Recommended
	Recycled tire chunks are a suitable substitute for rock. 90% of the pieces should be one-half (½) to four inches in size with no fines.	Page 13	Recommended
	Wire strands shall not extend more than one-half (1/2) inch from recycled tire pieces.	Page 13	Required
	<p>Cover for porous media –</p> <ul style="list-style-type: none"> • The porous media shall be covered with a filter fabric (at least three ounce nylon or five ounce polypropylene) before backfilling to prevent soil from sifting through the media. • Traditional untreated building paper or three inch layer of straw are not recommended. • Filter fabric is required when tire pieces are used as the porous media. • Materials relatively impervious to air and moisture are not permitted. • 	Page 13	Required

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	FIELD CONSTRUCTION SPECIFICATIONS		
	Protection of the absorption field area – <ul style="list-style-type: none"> • Heavy equipment, such as loaded trucks, should be kept away from the absorption field by marking the site. Excessive equipment or foot traffic can compact even relatively dry soils. • Construction should not proceed when wet soil can be rolled out into a soil wire one-quarter (1/4) inch in diameter or smaller without falling apart. • Before beginning construction, contours should be determined and level lateral locations should be marked by flags or stakes on the contour. 	Page 13	Recommended
	Excavation and leveling of trenches – <ul style="list-style-type: none"> • Trenches shall not be excavated deeper than the design depth or wider than the design width. • Following excavation, the trench sides and bottom shall be raked to remove any smearing and graded to assure a bottom with no more than one inch difference in elevation along the entire lateral length or the complete field for a level system. • The lateral pipe and rock cover shall not vary more than one inch in elevation along the lateral length using a surveyor level or laser. • The trench bottom should then be immediately covered with at least six inches of rock or the chamber. 	Page 13	Required
	Placement of distribution pipes – <ul style="list-style-type: none"> • Place pipes carefully on the rock and level with perforations at four o'clock and eight o'clock. • Place rock around and over the pipe to a cover depth of at least two inches. 	Page 13	Recommended
	Placement of barriers and backfill – <ul style="list-style-type: none"> • Filter fabric or other barrier shall be placed to protect from soil movement into the rock. • Earth backfill shall be carefully placed to fill the trench cavity. • The backfill shall be mounded above the trench about 20 percent of the soil fill height to allow for settling. 	Page 13	Required
	MAINTAINING ONSITE WASTEWATER SYSTEMS		
	Minimum annual maintenance requirements -- <ul style="list-style-type: none"> • Check the sludge and scum in the tank to determine pumping requirements; tanks need to be pumped regularly depending on wastewater flow and tank size (often three to five years). • Check the baffles or tees to ensure they are intact, secure, and in good condition. • Check the tank and soil absorption area monthly for indications of leaks or failure. • Check observation ports in each lateral. • Check effluent filter and clean as needed. • A maintenance file should be kept by the owner for easy reference and for information when ownership changes. 	Page 13	Recommended
	WASTEWATER STABILIZATION PONDS		
	Applicability – <ul style="list-style-type: none"> • Wastewater ponds (lagoons) should be considered for individual household wastewater where soil conditions have severe limitations for conventional lateral absorption field systems. • Single family wastewater ponds should not be considered if septic tank-lateral field systems are feasible. • Wastewater ponds are especially applicable on sites with very restrictive permeability, high clay subsoil (i.e., slow percolation rates), or shallow bedrock where adequate area is available. 	Page 14	Recommended

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	Requirements – <ul style="list-style-type: none"> • All private wastewater ponds must be non-discharging • All private wastewater ponds must be fenced. • Maintenance is required to remove vegetation at the water’s edge, to mow vegetation on embankments, and to remove trees that will shade the pond. 	Page 14	Required
	ALTERNATIVE SYSTEMS GUIDELINES		
	Counties have the authority to grant a variance for alternative systems	Page 14	Recommended
	No private onsite wastewater system shall have a surface discharge	Page 14	Required
	APPENDIX A – Conducting a Percolation Test		
	The purpose, a brief description, materials needed, and procedure are provided in Appendix A.	Pages 14&15	Recommended
	All test holes shall be the same size to help ensure consistency in results.	Page 15	Required
	APPENDIX B – Sources of Additional Information		
	Appendix B – <ul style="list-style-type: none"> • K-State Extension & Research bulletins • Other standards related to onsite wastewater system materials and procedures 	Page16	Recommended