Table III – Correction Factors

slope as a percentage	downslope correction factor	upslope correction factor
0 %	1.00	1.00
2%	1.06	0.94
4%	1.14	0.89
6%	1.22	0.85
8%	1.32	0.81
10%	1.44	0.77
12%	1.58	0.74

SOURCE: Miss Code Ann. §41-67-3

Subchapter 7. SPRAY IRRIGATION DISPOSAL SYSTEM

Rule 5.7.1. **General:**

1. The treatment facility and pump/dosing chamber shall be designed, constructed and installed so all joints, seams, and component parts preclude infiltration of surface and groundwater, while preventing the escape of wastewater or other liquids.

2. Electrical equipment shall be protected with safety devices (overload interrupting devices, fuses, etc.). Electrical equipment shall comply with appropriate National Electrical Manufacturer's Association (NEMA). Electrical component parts shall be covered by the manufacturer's limited warranty and must be installed in a manner to eliminate potential contact with sewage or effluent, including connections.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.2. **Soil and Site Evaluation:**

1. A satisfactory soil and site evaluation will comply with the following criteria:

    a. Absence of or protection from frequent flooding.

    b. Landscape position with positive surface runoff.

    c. Slopes of less than sixteen (16)%.

d. Depth to high water table of greater than six (6) inches.

e. Depth to bedrock, fragipan, redoximorphic features or plinthite of greater than twelve (12) inches.

f. Soil texture and color defined by the Natural Resource Conservation Service as indicating good drainage and suitable for surface application of wastewater, based on a soil boring of five (5) feet.

2. Sizing of the spray disposal field will be based on the most restrictive soil within twelve (12) inches of the naturally occurring ground surface.

3. To overcome the lack of sufficient depth, to a restrictive horizon and/or Seasonal High Water Table, a clean fill material of a texture of sandy loam may be used as fill material. Organic matter shall be removed, from the native soil surface, prior to placing and incorporating the fill. This fill must be incorporated into the native soil to prevent a textural interface from developing. When fill material is used the entire fill area must be sodded to prevent erosion, or other effective erosion control methods used. The full depth of fill material must extend at least ten (10) feet in all directions from outer edge of the spray field and at that point shall be sloped at a grade of no steeper than 3 to 1 (Table II).

4. The non compliance of one or more of the above items may (1) require a design alteration or (2) prohibit the use of a Spray Irrigation Disposal system. Slopes of greater than sixteen (16) % may be considered on a case by case basis.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.3. **Location of Spray Irrigation Disposal Systems:**

1. All components of the spray irrigation disposal system shall be located a minimum of:

   a. Five (5) feet from any dwelling or permanent structure.

   b. Ten (10) feet from any property line.

2. The Advanced Treatment System and pump/dosing chamber shall be located a minimum of fifty (50) feet from any public, private or individual potable water source.

3. Potable water lines and wastewater lines shall not be laid in the same trench. The potable water lines and wastewater lines shall maintain a minimum horizontal separation of 10 feet. Where a potable water line must cross a wastewater line, the potable water line within ten (10) feet of

the point of crossing shall be at least twelve (12) inches above the wastewater line.

4. Spray Irrigation systems shall not be located in depressed areas where surface water will accumulate. Provisions shall be made to minimize the flow of surface water over the effluent disposal field.

5. There shall be maintained, from the outer edge of the spray pattern, the following distances:

   a. One hundred (100) feet from any public, private or individual potable water source and be located at a lower elevation.

   b. Fifty (50) feet from recreational waters, shellfish waters or other sensitive areas for spray fields located on slopes of less than eight (8) percent or if the soil texture is sandy loam or lighter or sandy clay or heavier.

   c. Seventy five (75) feet from recreational waters, shellfish waters or other sensitive areas for spray fields located on slopes of greater than eight (8) percent or if the soil texture is sandy loam or lighter or sandy clay or heavier.

   d. Twenty five (25) feet from dwellings, swimming pools, businesses or other inhabited structures.

   e. Twenty five (25) feet from lot lines, porches, patios and decks.

   f. Fifteen (15) feet from outbuildings.

   g. Ten (10) feet from walkways, private roads, driveways and parking areas.

   h. Effluent should not be sprayed upon any vessel containing wastewater.

6. Where all or part of the Spray Irrigation system is proposed to be installed on property other than the owner’s, an easement in perpetuity shall be legally recorded in the proper county and a copy furnished to the local county Health Department prior to listing Spray Irrigation as an option. The easement shall be of sufficient area to permit access, construction and maintenance of the system.

7. It is the intent of these regulations that a minimum separation of fifty (50) feet between independent spray disposal fields be maintained. Over lapping of the required setback from property lines cannot be negated by the granting of easements.

8. In soils that contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay), within two (2) feet of the surface, there shall be maintained a minimum of six (6) inches of unsaturated soil between the Seasonal High Water Table.

9. In soils that do not contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay), within two (2) feet of the surface, there shall be maintained a minimum of twelve (12) inches of unsaturated soil between the Seasonal High Water Table.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.4. **Registration:** The term "manufacturer" for this section will mean the Certified Manufacturer of the treatment method, unless otherwise specified. Each manufacturer's treatment and disposal components shall be registered with the Department as a system. The treatment method shall be in compliance with the current standards of *National Sanitation Foundation/American National Standards Institute International Standard 40 and/or 245* and the applicable sections of the regulations.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.5. **Pump/Dosing Chambers:**

1. The pump/dosing chamber shall have a minimum working capacity of 1.5 times the maximum volume produced for timed-dose and per manufacturer's specifications for demand-dose systems.

2. The dosing chamber shall be equipped with an audible high water alarm.

3. The pump/dosing chamber shall have a grade level access large enough to allow servicing and/or removal of the largest component in the chamber. Access ports shall be protected against unauthorized entrance or removal.

4. The pump/dosing chamber shall be vented through the grade level access or by means of a separate vent. In either case the vent shall be a minimum of one (1) inch in diameter.

5. The pump/dosing chamber shall be made of material resistant to the corrosive effects of wastewater, chemicals used for disinfection and designed to withstand the lateral and bearing loads to which it is expected to be subjected.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.6. **Minimum Pump Specifications**:

1. The pumping system shall be designed to deliver wastewater at the required volume and pressure specified by the spray irrigation head manufacturer.

2. The pumping system shall be equipped with a low water cutoff to prevent damage to the pump during low water conditions in the dosing chamber.

3. The pump shall be constructed of corrosion resistant materials suitable for effluent pumping.

4. The pump shall be sized per manufacturers' specifications to meet or exceed the hydraulic head of the system while delivering the required volume.

5. The pump shall be installed in compliance with manufacturers' specifications so as not to violate pump warranty.

6. The suction and pressure lines shall be PVC schedule 40 and shall be sized to deliver the required volume at the design pressure while not exceeding a velocity of five (5) feet per second.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.7. **Minimum Filter Specifications:**

1. The filter shall filter the effluent to the minimum specifications of the spray irrigation head manufacturer to prevent clogging.

2. The filter shall be made of material resistant to the corrosive effects of wastewater and chemicals used for disinfection.

3. The filters shall be readily accessible for inspection and/or service.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.8. **Minimum Specifications for Irrigation Equipment:**

1. Sprinklers, valves, controllers and all other equipment used in a spray irrigation system shall be designed, manufactured and warranted by their manufacturer for use in effluent disposal systems.

2. Sprinklers must be of low trajectory type designed to reduce aerosols. Low trajectory spray sprinklers have a nozzle trajectory equal to or less than thirty (30) degrees.

3. Sprinklers shall be connected to their supply line by means of polyethylene (PE) pipe or a swing joint manufactured specifically for this purpose.

4. Radius reduction by means of nozzle retaining screw, distance control diffuser pin or other similar devices shall not be allowed.

5. Impact and pop-up sprinklers may be used. Sprinkler risers greater than twenty four (24) inches in height must be braced.

6. Equipment susceptible to freezing must be adequately protected to prevent freezing.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.9. **Minimum Specifications for Disinfection:** Effluent discharge from spray irrigation systems shall be adequately disinfected prior to surface application. The method of disinfection and the disinfection equipment must be in compliance with Chapter 6 Disinfection.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.7.10. **Minimum Specifications for the Spray Field:**

1. Spray irrigation systems may not be installed in drain ways, swamps, marshes, floodplain, concave landscape positions or other areas which would be prohibited.

2. Treated effluent shall be sprayed evenly over the entire spray field area with non overlapping patterns. The spray field shall consist of a minimum of three (3) spray heads.

3. The effluent distribution system shall be designed, constructed and maintained to provide for even distribution of effluent throughout the spray field.

4. Surface runoff of sprayed effluent from the spray field area shall not be permitted. Rainwater shall be diverted away from the spray field area.

5. The spray field area shall be designed and operated to prevent surface accumulation of sprayed effluent.

6. In order to prevent entrapped air causing serious problems pipelines shall be routed on contour, downhill or even uphill but not up and downhill along the same section of pipe.

7. The size of the spray field area shall be determined by soil texture and slope of the site to be sprayed (See Table 1).

SOURCE: Miss Code Ann. §41-67-3

Table I **– SIZING – Spray Irrigation**

Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/Ft^2	Absorption Area in Ft^2/Bedroom			Additional Absorption Area Over 2 Persons Per Bedroom		
			Slope			Slope		
			0 to 8 %	9 to 12%	13 to 16%	0 to 8 %	9 to 12%	13 to 16%
Gravel	NOT SUITABLE							
Coarse and Medium Sand Fine and Loamy Sand Sandy Loam	< 0.5	1.2 0.8 0.6	694	928	1,040	347	478	520
Loam Silt Loam Sandy Clay Loam	< 0.5 – 1.0 < 0.5- 1.0 1.0 – 2.0	0.45	1387	1734	2323	694	867	1162
Silt Clay Loam Clay Loam Sandy Clay	1.0 – 2.0 1.0 – 2.0 > 2.0	0.2 – 0.3 0.2 – 0.3 -	2782	4637	6951	1391	2319	3476
Silty Clay Clay	> 2.0	-	6951	8693	11588	3476	4347	5794

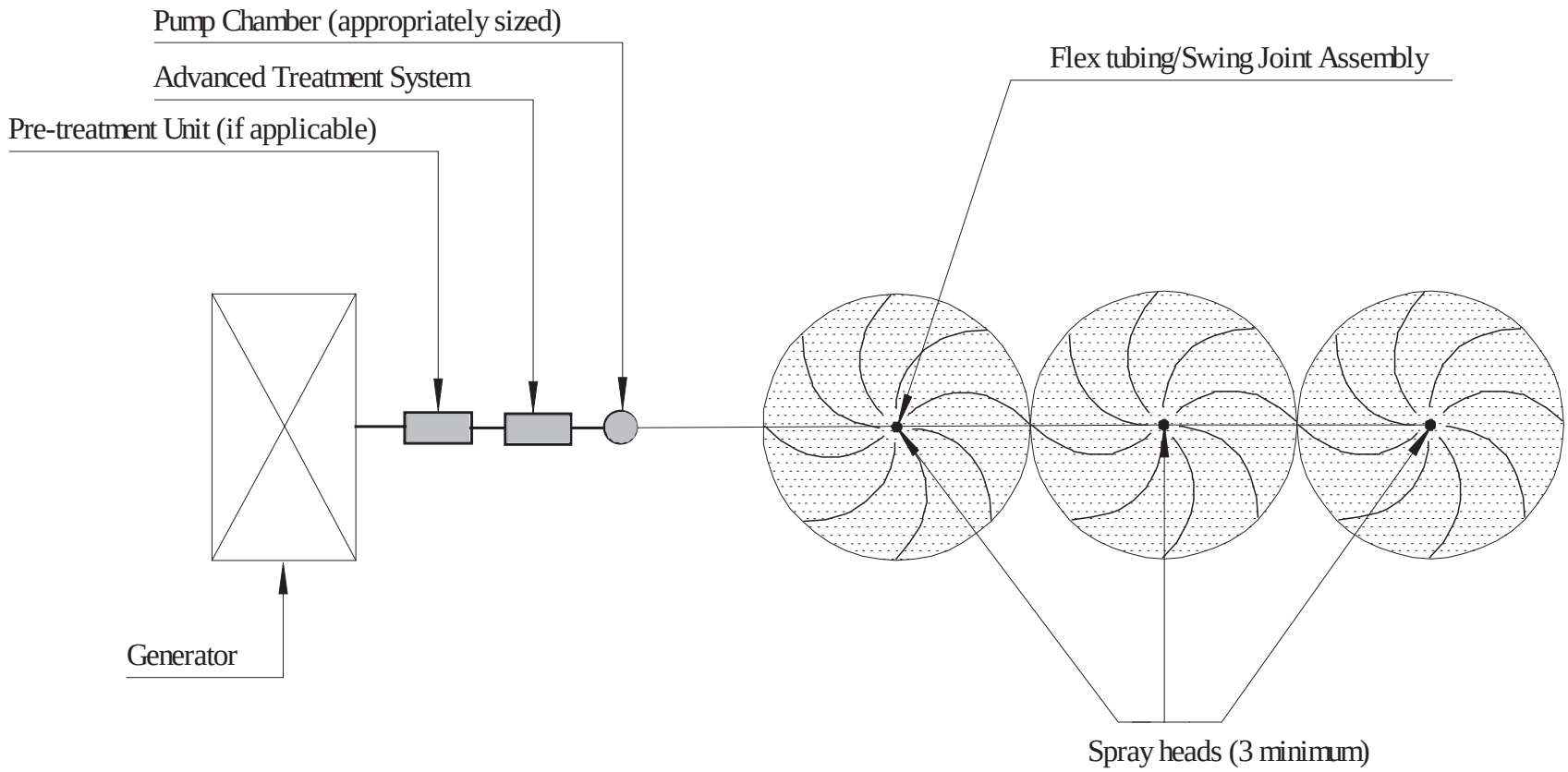
SOURCE: Miss Code Ann. §41-67-3

Table II **FILL MATERIAL**

Seasonal High Water Table Depth (inches)	…with a Restrictive Horizon/Layer (inches)	…without a Restrictive Horizon/Layer (inches)
0	6	12
1	5	11
2	4	10
3	3	9
4	2	8
5	1	7
6	-	6
7	-	5
8	-	4
9	-	3
10	-	2
11	-	1
12	-	-

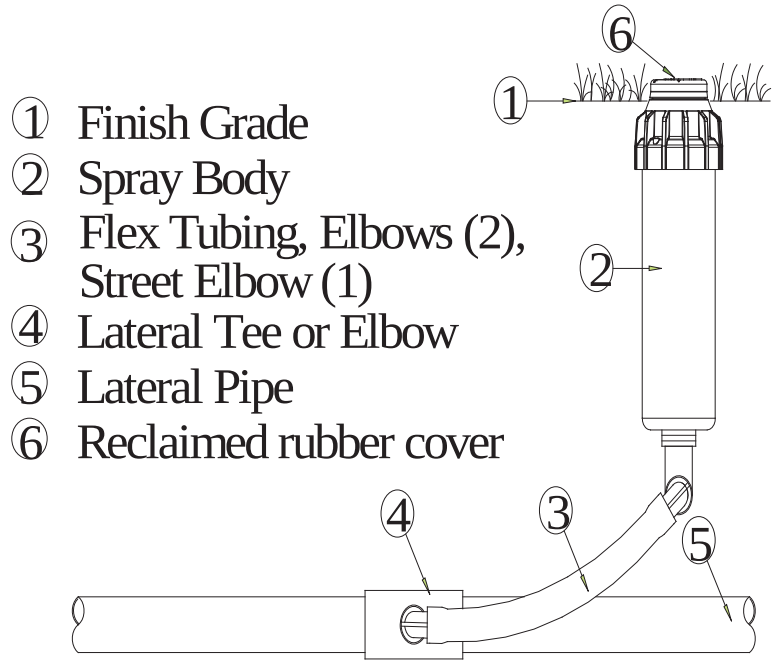
SOURCE: Miss Code Ann. §41-67-3

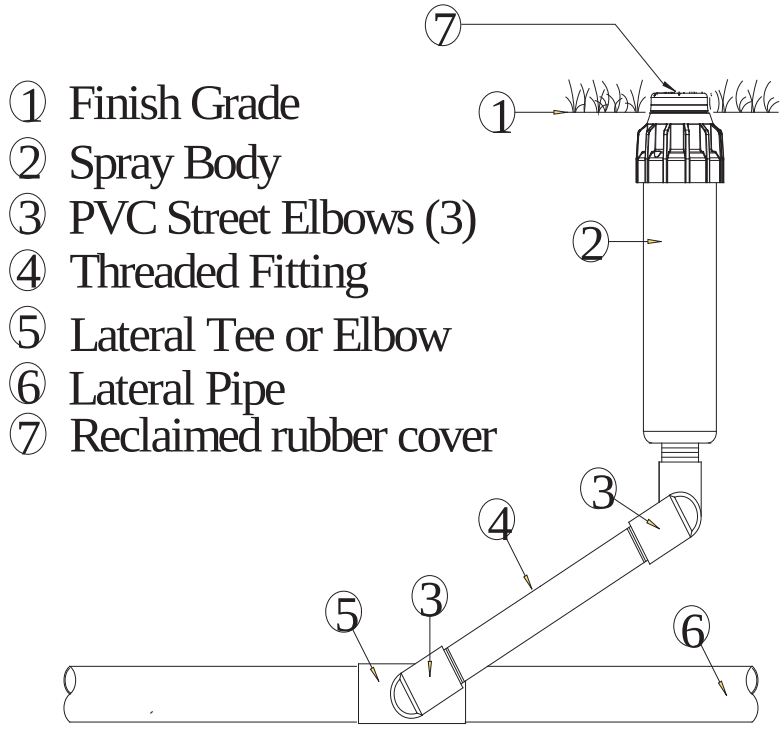
Figure I **SPRAY IRRIGATION SYSTEM**



SOURCE: Miss Code Ann. §41-67-3

Figure II **FLEX TUBE/SWING JOINT ASSEMBLY**





SOURCE: Miss Code Ann. §41-67-3

Subchapter 9. OVERLAND DISCHARGE

Rule 5.9.1. Overland Discharge is a system used to dispose Advanced/Alternate treated effluent. Overland Discharge may be a single (1) point discharge or multi-point (2 or 4) discharge, with a level manifold. These discharge options can be gravity-fed or pressurized, with the use of a pump. Careful evaluation of the site, soils and geographical conditions are necessary to prevent runoff, erosion, groundwater pollution and nuisance conditions.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.9.2. **Definitions:**

1. Advanced Treatment System – an Individual On-site Wastewater treatment system that complies with Section 41-67-10. ***Miss Code* of 1972, Annotated** Section 41-67-2(a)

2. Components – all physical, mechanical, and electrical components of any wastewater disposal system.

3. Discharge area – area of land receiving the treated effluent.

4. Distribution box – A connection source for a single inlet line to multiple distribution lines.

5. Manifold – 3" or larger Schedule 40 PVC pipe used in distributing a flowing discharge from some type of advanced treatment unit or treatment filter, such as a Plant Rock Filter or Sand Filter.

6. Maintenance – the inspecting and evaluating of an Alternative System or Advanced Treatment System. The replacement of any component registered with a specific Advanced Treatment System (i.e., aerator, diffuser, control panel, etc.).

7. Multi-point discharge – 2 or 4 discharge points that deliver effluent from a level manifold. (Figure I, Figure II and Figure IV)

8. Single point discharge – discharge line consisting of 1 point only.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.9.3. **Design:**

1. The discharge area receiving the effluent shall have a minimum 6 inches of naturally occurring soil free of a restrictive horizon, redoximorphic feature or predominately-grey color (>50%) and shall be maintained to prevent surface accumulation or ponding. Overland Discharge is not recommendable on hydric soils conditions.

2. The texture of the subsoil material having the slowest permeability rates within 2 feet below the surface receiving effluent shall be used to determine setback.

3. The discharge area must be sufficiently sized to maintain the outermost edge of the effluent.

4. Slopes of greater than 20 percent shall not be considered for discharge areas unless justified by a Certified Engineer Evaluator

SOURCE: Miss Code Ann. §41-67-3

Rule 5.9.4. **Location/Setbacks:**

1. The discharge area must be seeded, maintained with sod, permanent vegetative cover, or a wooded area.

2. Discharge area must be a minimum of:

   a. Water Supply

      i. 100 feet from any public, private or individual potable water sources, unless protected by topographic features.

      ii. 50 feet from any public, private or individual potable water source for all vessel(s) holding wastewater.

      iii. 10 feet horizontal separation from any potable water line.

      iv. 10 feet horizontal separation from any water meter.

      v. Potable water lines must not pass under or through any part of the wastewater disposal system which includes the collection and distribution of the wastewater or effluent.

   b. Sensitive Waters

      i. 100 feet on slopes of greater than 8 percent

      ii. Slopes of less than or equal to 8 percent (Table I)

   c. Property Lines

      i. 50 feet down slope or same grade

      ii. 10 feet up slope.

   d. Residence and Buildings

i. 25 feet from habitable

ii. 15 feet from non-habitable

e. Additional Structures

i. 25 feet from porches, patios and decks

ii. 10 feet from walkways, driveways and parking areas

iii. 25 feet from swimming pools

iv. 10 feet horizontal separation from an Advanced Treatment System

3. Discharge area shall not be located in depressed areas where surface water will accumulate. Provisions shall be made to minimize the flow of surface water over the effluent disposal area.

4. Where all or part of the treatment and disposal system is proposed to be installed on property other than the owner's, a deeded easement in perpetuity shall be legally recorded in the appropriate county. The deeded easement shall be obtained to include a sufficient area to permit access, construction and maintenance.

5. Deeded easements or right-of-way areas for utilities, surface or subsurface drainage, roads, streets, ponds or lakes shall not be used as available space for location of discharge areas.

6. No site utilizing a discharge area shall be approved which is located wholly within an area which is frequently flooded, swamp, marsh, wetland, or drain-way, etc. When a site is located partially within this area, that portion not directly affected may be considered for discharge area.

7. Treatment, disposal, disinfection and/or pump chambers shall not be located under dwellings or other permanent structures.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.9.5. **Treatment:**

1. Wastewater disposed of by Overland Discharge must meet the requirement established by *American National Standards Institute/National Sanitation Foundation* (*ANSI/NSF) International Standard Number 40* testing protocol, as set forth in Regulation Governing Residential Individual Onsite Wastewater Disposal Systems: Certification.

2. Treated effluent must be adequately disinfected as outlined in Appendix 11 (Design Standard for Disinfection).

SOURCE: Miss Code Ann. §41-67-3

Rule 5.9.6. **Distribution:** The inlet and outlet on the tank (septic tank or ATU) must be 4 inch Schedule 40 pipe for a minimum of 3 feet onto undisturbed soil. Once the outlet pipe has extended a minimum of 3 feet onto undisturbed soil, it can then be reduced to a minimum of 3 inch Schedule 40 pipe for the entire discharge line.

1. Gravity Fed

   a. Single point discharge: Gravity-fed discharge using a single point discharge line on 1% or greater slope

   b. Distribution manifold: For gravity-fed multi-point discharge distribution by manifold, the level manifold must be constructed using flow diverting devices (Figure I) in such a manner to be self draining. Distribution box (Figure III): A distribution box may used for multi-point discharge. The distribution box must be installed level to ensure equal distribution of effluent. Outlet lines should have equal slopes for a minimum of 5 feet after leaving the D-box. The D-box should have a baffle wall, or some means of reducing the pressure from the inlet flow.

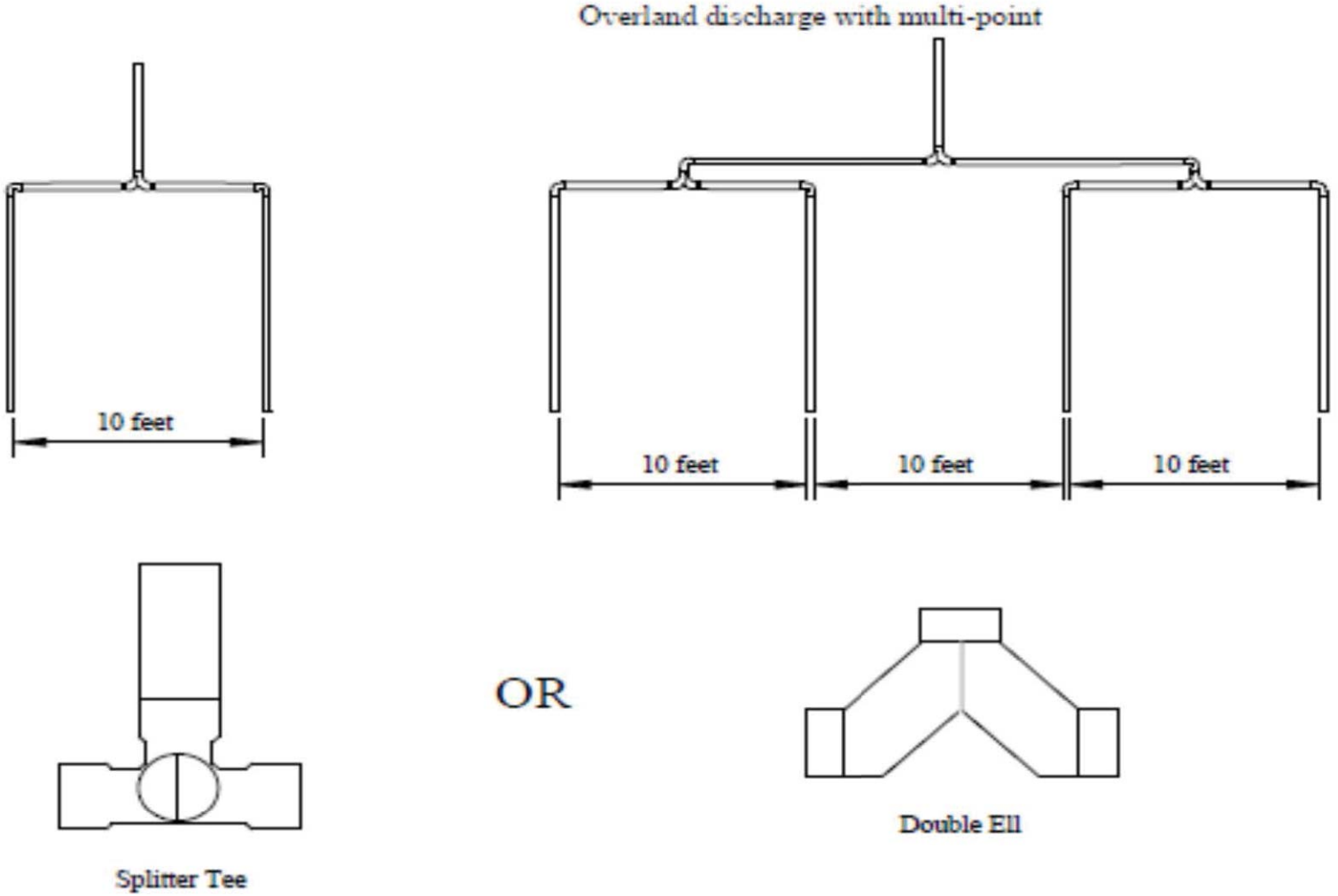
2. Pressurized Distribution

   a. Distribution box (Figure III): A distribution box may used for multi-point discharge. The distribution box must be installed level to ensure equal distribution of effluent. Outlet lines should have equal slopes for a minimum of 5 feet after leaving the D-box. The D-box should have a baffle wall, or some means of reducing the pressure from the inlet flow.

   b. Distribution manifold (Figure IV): If effluent is to be delivered to a level manifold under pressure, the distribution system shall be designed to provide pressure at the point of discharge not to exceed 5 pounds per square inch. This can be achieved by pumping directly into the head of the manifold or into a baffled distribution box.

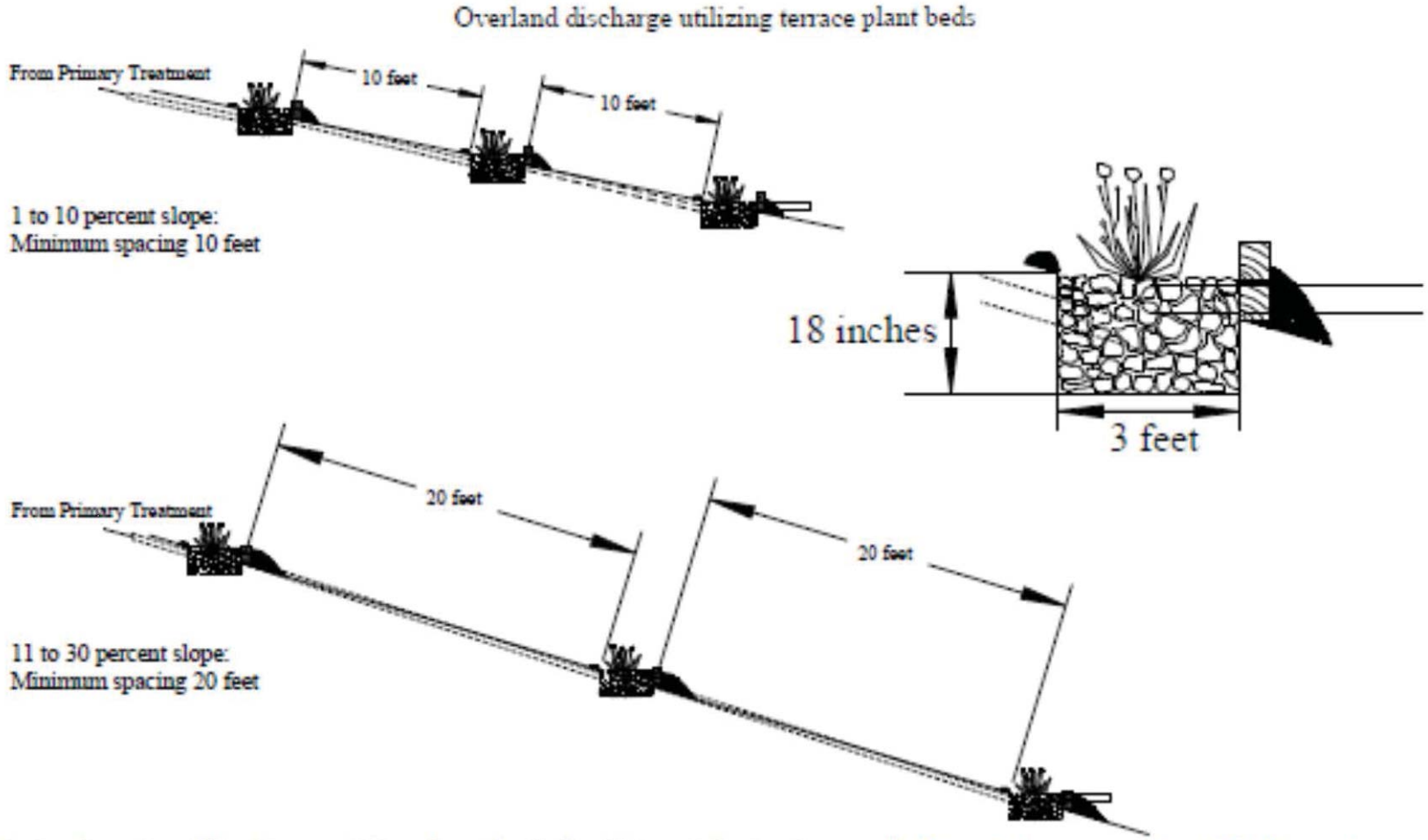
SOURCE: Miss Code Ann. §41-67-3

Figure 1 – Gravity Fed Manifold



SOURCE: Miss Code Ann. §41-67-3

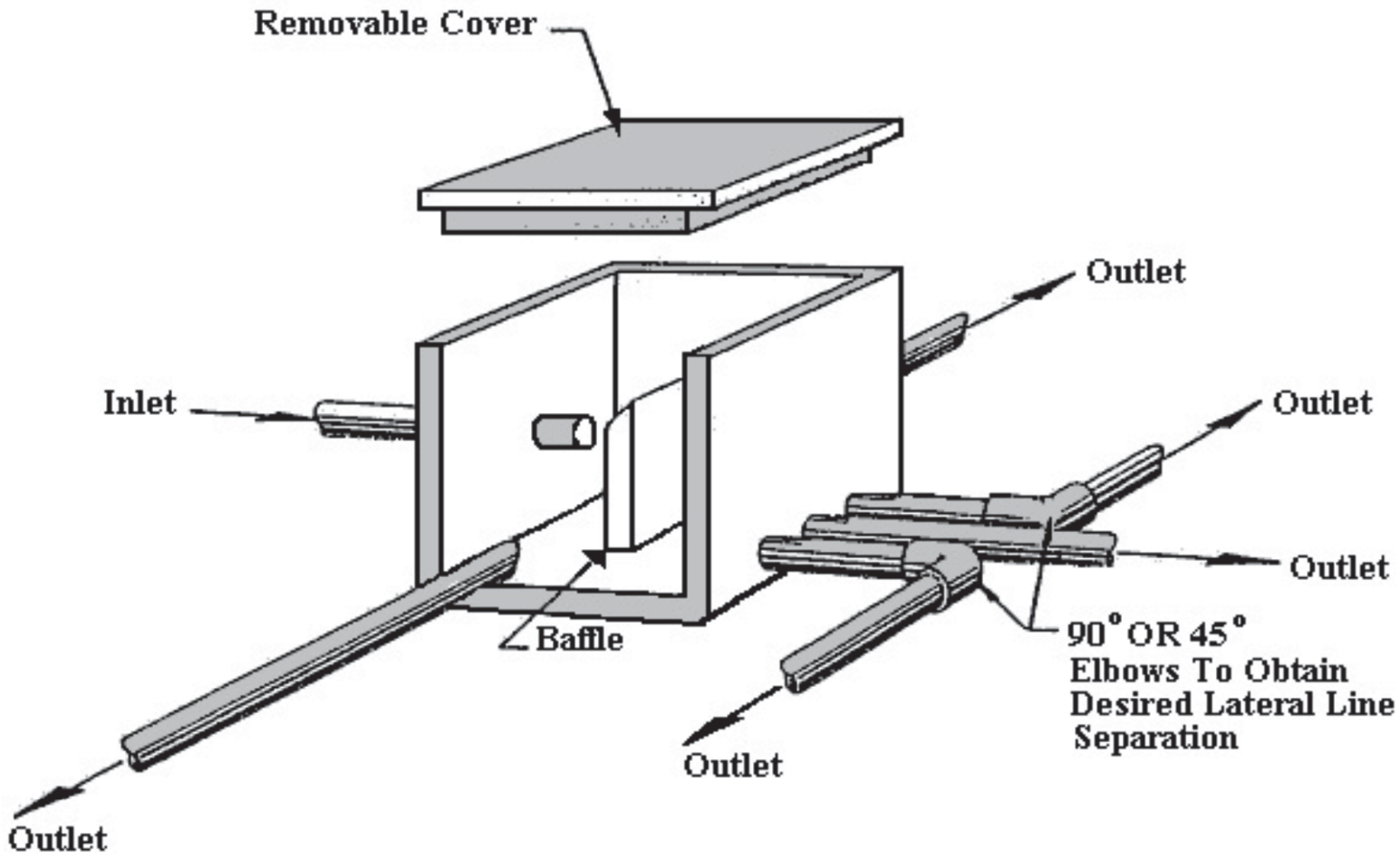
Figure 2– Terrace Plant Beds



Further absorption of the effluent could be enhanced with the addition of plantings (canna, calla lilies, elephant ears, etc.) in a bed following the distribution manifold.

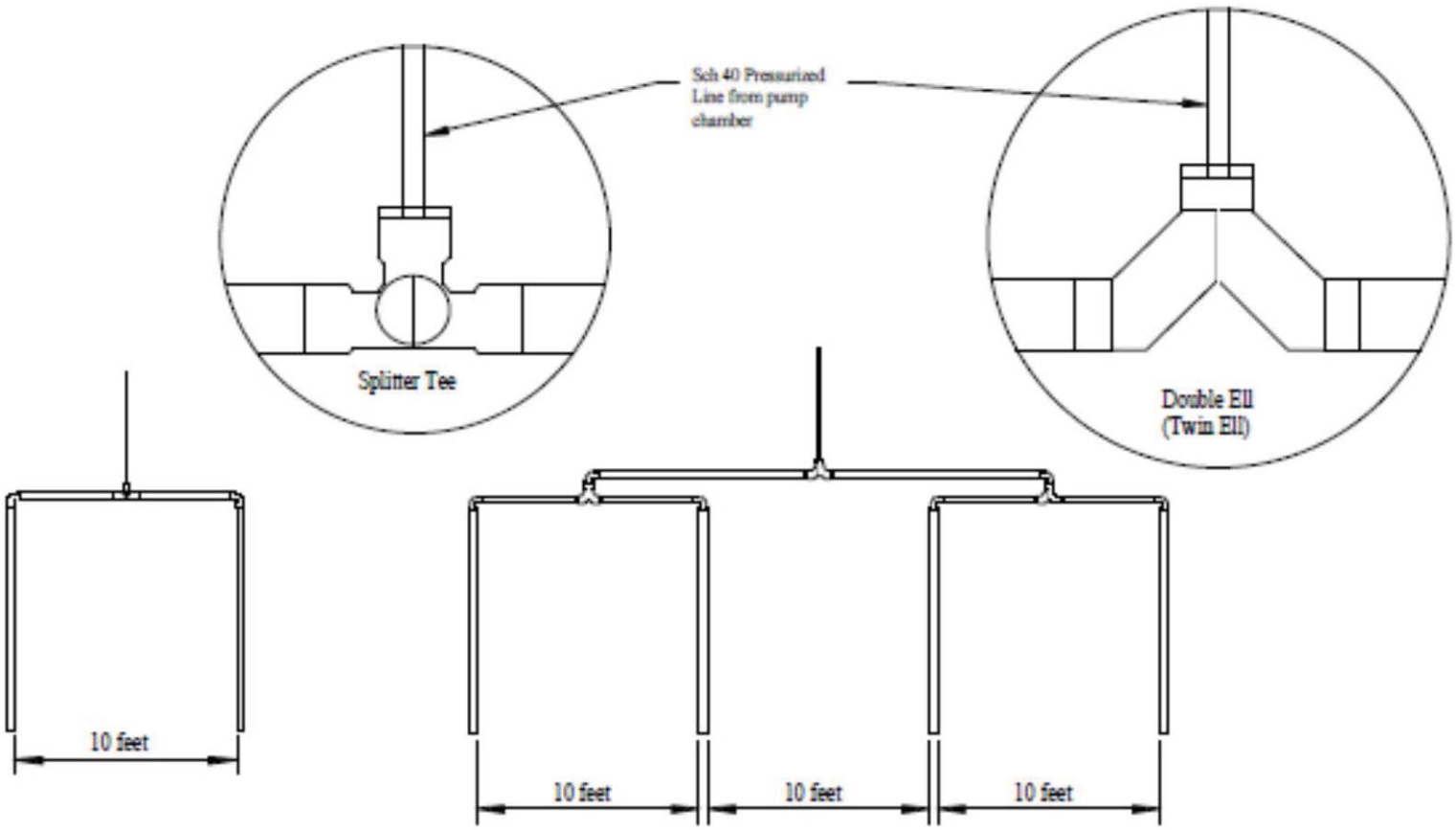
SOURCE: Miss Code Ann. §41-67-3

Figure 3– Distribution Box



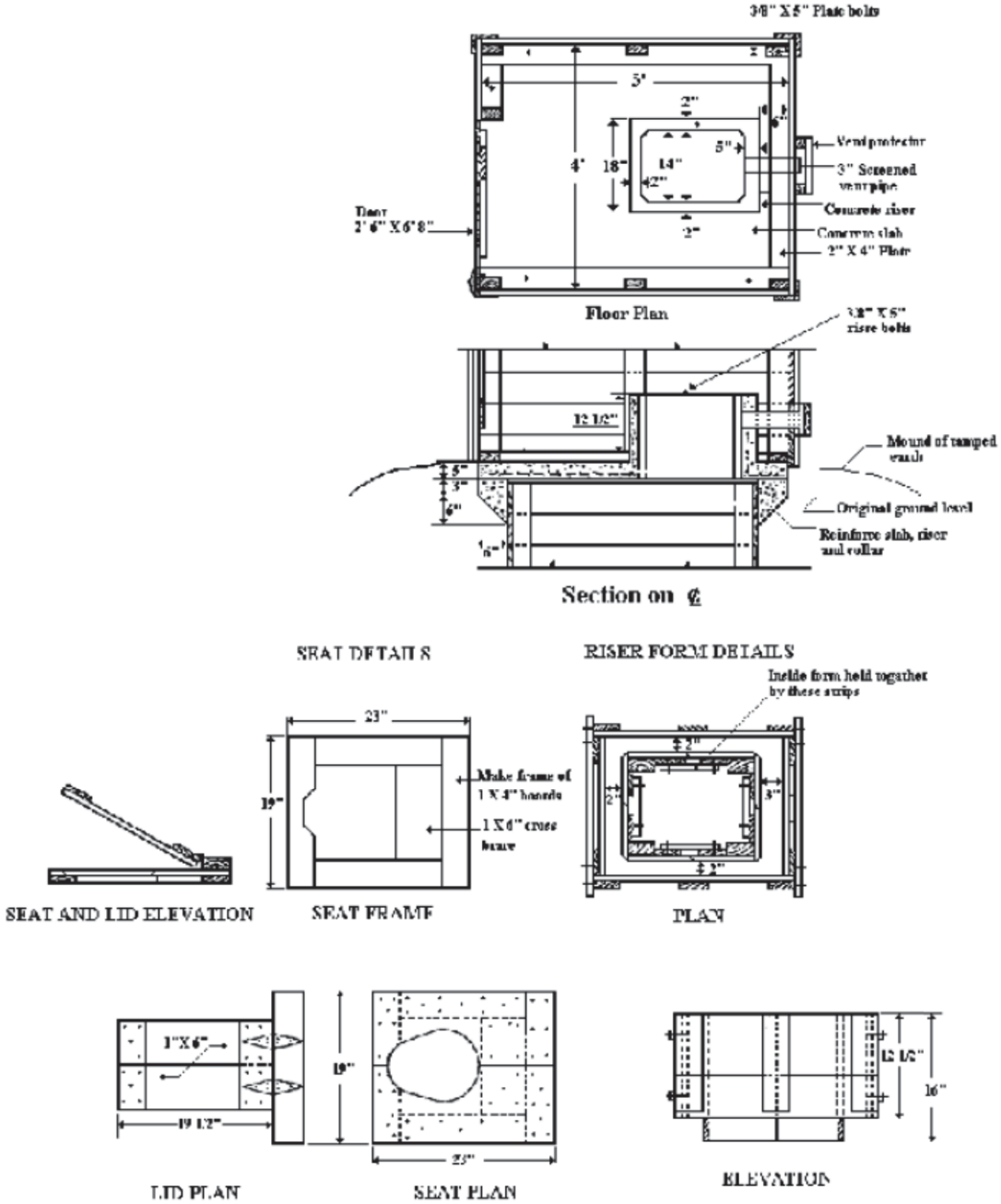
SOURCE: Miss Code Ann. §41-67-3

Figure 4 – Pressurized Manifold



SOURCE: Miss Code Ann. §41-67-3

Figure 2 – Details of Pit Privies



SOURCE: Miss Code Ann. §41-67-3

Chapter 6. DISINFECTION

Rule 6.1.1. **Introduction:** The discharge of treated wastewater shall be disinfected when the effluent will be disposed of by means of a surface discharge (Overland Discharge or Spray Irrigation). Individual On-site Wastewater Disposal Systems that utilize surface discharge shall have an approved method of effluent disinfection prior to disposal.

The most common disinfect is chlorine. Other methods of wastewater disinfection are ultra-violet and ozone.

SOURCE: Miss Code Ann. §41-67-3

Rule 6.1.2. **Definitions:**

1. Advanced Treatment System (ATS) – An Individual On-site Wastewater Disposal System that treats and complies with Section **41-67-10**. Section **41-67-2(a)**

2. Chlorine – a highly irritating, greenish-yellow gaseous halogen, capable of combining with nearly all other elements, produced principally by electrolysis of sodium chloride and used widely to purify water, as a disinfectant and bleaching agent, and in the manufacture of many important compounds including chloroform and carbon tetrachloride.

3. Chlorinator – a device that allows the treated effluent to pass around and over calcium hypochlorite tablets or the treated effluent is dosed with a specific amount of liquid chlorine by the use of an approved dispersal method.

4. Chlorine Contact Chamber –chamber designed to provide a minimum of 1 hour detention time at the peak design flow.

5. Chlorine (liquid) – an aqueous solution of calcium hypochlorite used as a disinfection agent.

6. Chlorine (tablet) – a solid form of calcium hypochlorite, a common disinfectant. These tablets dissolve in the wastewater, releasing the hypochlorite, which then becomes hypochlorous acid, the primary disinfectant.

7. Chlorine Residual – free chlorine remaining after the chlorination process has occurred.

8. Disinfection – treatment to destroy harmful microorganisms and viruses.

9. Feeder Tube – a device which holds Chlorine tablets in place in order to contact effluent.

10. Ozone – an unstable, poisonous allotrope of oxygen, O_3, which is formed naturally in the ozone layer from atmospheric oxygen by electric discharge or exposure to ultraviolet radiation, also produced in the lower atmosphere by the photochemical reaction of certain pollutants. It is a highly reactive oxidizing agent used to deodorize air, purify water, and treat industrial wastes.

11. Pathogen – An agent that causes disease, especially living microorganisms such as bacteria, viruses, or fungus.

12. Swimming Pool Chlorine – Chlorine made from Trichlorisocyanuric acid instead of calcium hypochlorite. **These tablets are not acceptable for use in On-site systems.** They do not dissolve as quickly as wastewater grade tablets and do not treat effluent as required. Also, if not continually immersed in water, these tablets can be explosive due to the release of nitrogen chloride gas.

13. Ultra-violet disinfection – disinfection device that uses ultra-violet light source to eliminate or destroy bacteria, viruses and other pathogenic organisms.

14. Ultra-violet light – radiation lying in the ultra-violet range; wave lengths shorter than light but longer than X-rays

SOURCE: Miss Code Ann. §41-67-3

Rule 6.1.3. **Design**: It is important that wastewater be adequately treated prior to disinfection. The effectiveness of a disinfection system depends on the characteristics of the wastewater, the amount of time the microorganisms are exposed to the disinfectant, and the chamber configuration. The design for each type of disinfection is as follows:

1. Chlorine Tablet or Liquid

   a. The Chlorine Contact Chamber must meet the following requirements:

      i. Constructed from concrete, fiberglass or polyethylene in accordance with *Appendix 01*.

      ii. Constructed to withstand the earth pressures encountered and able to withstand the chemical effects of chlorine and wastewater.

      iii. Equipped with baffles or provided with an inlet to provide adequate mixing and contact of chlorine and effluent. The inlet and outlet must be Schedule 40 PVC pipe, 4 inches in diameter with the outlet tee extending 6 inches from the bottom of the chamber. (Figure I)

      iv. Designed and located to have access a minimum of 6 inched above final grade.

      v. Provide 65 gallons (minimum) capacity or 1 hour retention.

      NOTE: If the chlorine contact chamber is an integral component part of the design of the Advanced Treatment System the efficiency shall be certified by the third party certifying entity.

      vi. Sealed (water-tight) to prevent the entry of surface or ground water. It is recommended that the outlet be placed above any seasonal water tables as indicated by gray mottles. An approved

sealant shall be applied to the lid, inlet, outlet and access opening to prevent groundwater and surface water intrusion.

vii. Consideration will be given to 2 flow-through units with common-wall construction so that each side satisfies the detention requirements. The chlorine feed rate will be proportioned in accordance with the flow and the chlorine demand of the wastewater. Adequate mixing during the chlorine contact period will be insured by the installation of adequate baffling.

viii. Pumped periodically for sludge accumulation and properly disposed.

b. The feeder tube and liquid chlorinator dosing compartment must meet the following requirements:

i. Installed level on undisturbed earth or backfilled with sand.

ii. Charged with a minimum of 3 calcium hypochlorite chlorine tablets or the dosing compartment is 1/2 filled with liquid chlorine.

iii. Equipped with a method for removal. The method of removal must be within 3 inches of the chlorinator opening.

iv. Constructed of Schedule 40 PVC pipe, 3 inches in diameter and provide removal of all chlorine tablets when feeder tube is removed from chlorinator. (Figure II)

v. Childproof and Tamper resistant, or limited access cover.

2. Ultra-violet

a. The main components of a ultra-violet disinfection system are mercury arc lamps, a reactor, and ballasts. The source of the ultra-violet radiation is either the low-pressure or medium-pressure mercury arc lamp with low or high intensities.

b. The optimum wavelength to effectively inactivate microorganisms is in the range of 250 to 270 nm. Low-pressure lamps emit essentially monochromatic light at a wavelength of 253.7 nm. Standard lengths with diameter of 1.5 – 2.0 cm. The ideal lamp wall temperature is between 95 and 122°F.

c. The effectiveness of a ultra-violet disinfection system depends on the characteristics of the wastewater, the intensity of the ultra-violet radiation, the amount of time the microorganisms are exposed to the radiation, and the reactor configuration.

d. All ultra-violet disinfection must provide a flow either parallel or perpendicular to the lamps and have a ballast or control box which provides a starting voltage for the lamps and maintains a continuous current.

e. There are two types of ultra-violet disinfection reactor configurations that exist:

i. Contact: This reactor contains a series of mercury lamps are enclosed in quartz sleeves to minimize the cooling effects of the wastewater. The lamps are placed parallel or perpendicular to the direction of the wastewater flow. Flap gates or weirs are used to control the level of the wastewater.

ii. Noncontact: This reactor contains mercury lamps suspended outside the transparent conduit, which carries the wastewater to be disinfected.

f. The ultra-violet disinfection must provide the following:

i. Necessary hydraulic properties for maximize exposure to ultra-violet radiation.

ii. Necessary intensity of ultra-violet radiation needed for effective inactivation of microorganisms.

iii. Necessary radiation for peak flow condition, suspended or colloidal solids, initial bacterial density and any other physical and chemical parameters (i.e., hardness, iron, pH or TSS).

g. The ultra-violet disinfection system must ensure that sufficient radiation is transmitted to the organisms to render them sterile. All surfaces between the radiation and target organisms must be clean, and the ballast, lamps, and reactors must be functioning at peak efficiency.

h. The sleeves or tubes must be cleaned regularly by mechanical wipers, ultrasonics, or chemicals. The cleaning frequency is dependent upon the wastewater characteristics produced by the Advanced Treatment System.

i. The retention time for complete inactivation will be determined by size of reactor and lamp intensity.

j. All disinfection systems certified by *American National Standards Institute/National Sanitation Foundation International Standard 46* will be accepted for registration in Mississippi provided documentation is submitted with application.

k. All disinfection systems not certified by *American National Standards Institute/National Sanitation Foundation International Standard 46* must submit all documentation to determine compliance with 102.03 through 102.07.

3. Ozone

a. These products will be reviewed by the Division in accordance with design, construction and installation for the specific location and usage.

b. These products will only be approved by the Division after certification by a Professional Engineer registered in the State of Mississippi after having shown it can be constructed and installed by the Certified Installer.

c. This product will require that the Professional Engineer train and certify the Maintenance Provider in it routine operation and maintenance, as well as safety guidelines.

SOURCE: Miss Code Ann. §41-67-3

Rule 6.1.4. **Location/Setbacks:**

1. The disinfection system shall not be located in an area that collects surface water.

2. The disinfection system shall be installed according to the following setbacks:

a. 5 feet from foundations, deck, out-building, etc

b. 10 feet from property lines

c. 50 feet from any public, private or individual potable water source

3. No vehicular traffic shall be allowed over the tank(s), disinfection system or any part of the Individual On-site Wastewater disposal System.

4. Tanks and disinfection system shall not be located under dwellings or other permanent structures.

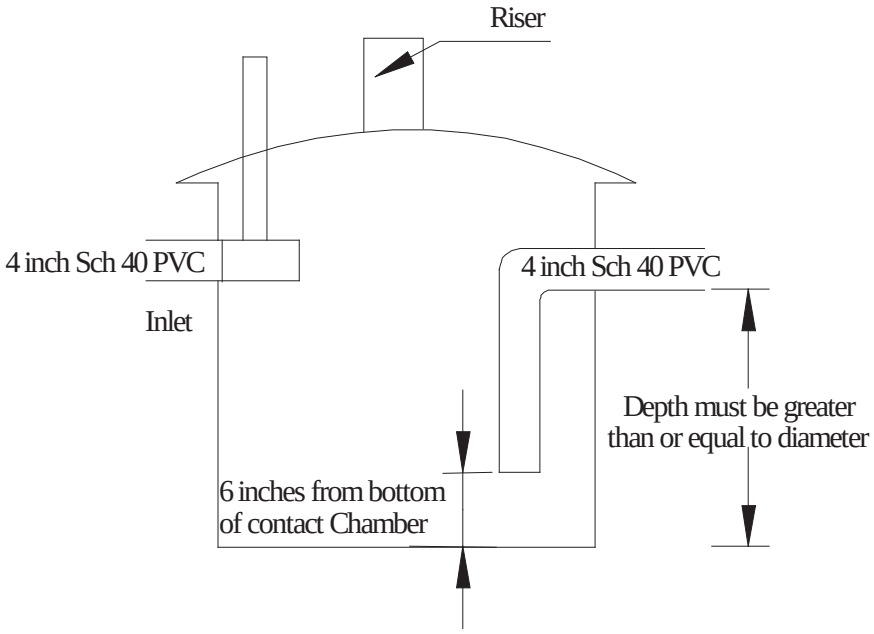
SOURCE: Miss Code Ann. §41-67-3

Rule 6.1.5. **Treatment:**

1. Tablets shall not be in contact with treated effluent except during times of flow. Other designs that meet the criteria of proper effluent contact will be considered suitable after review by the Division.

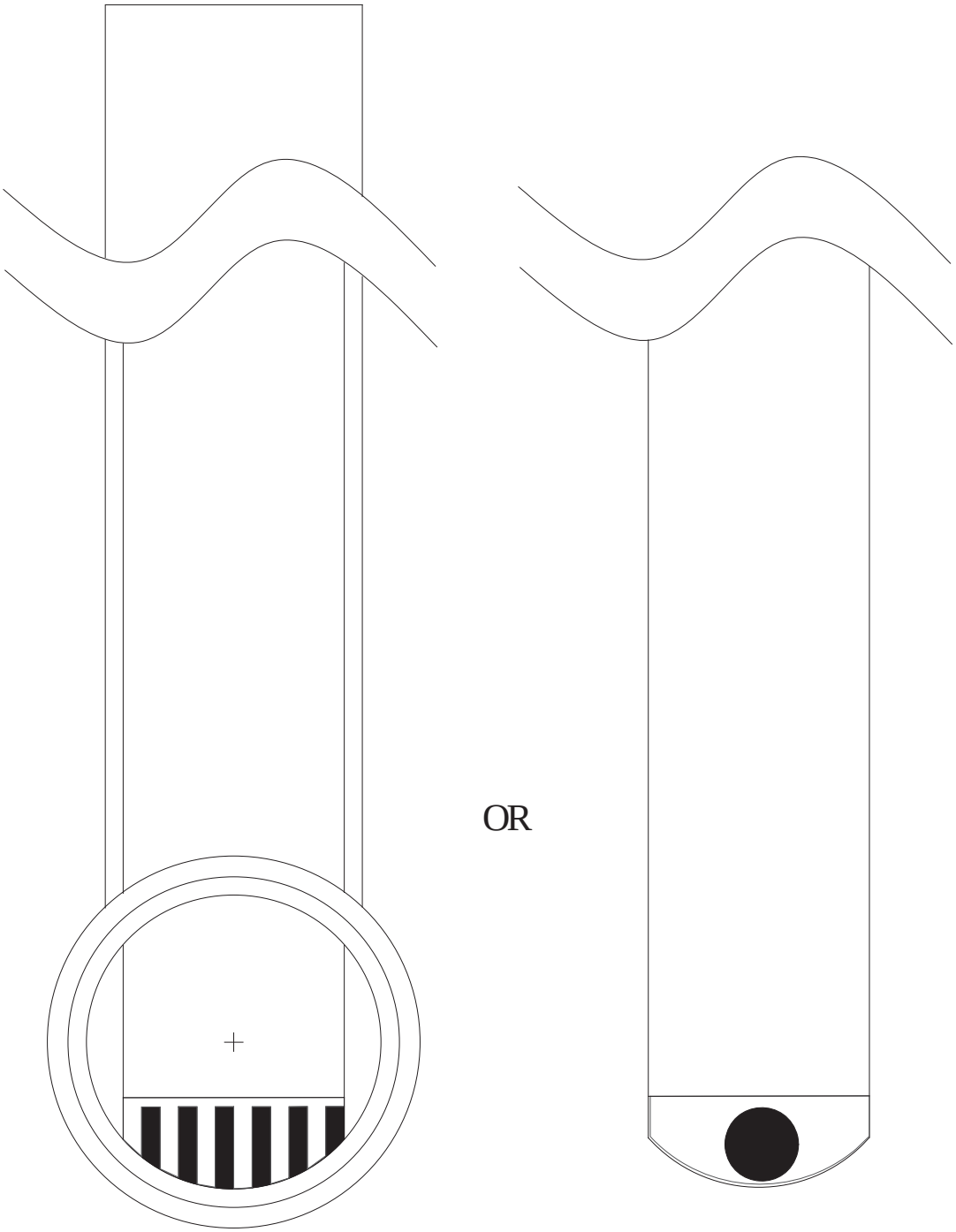
2. The level of chlorination is a chlorine residual of not less than 0.1 to no greater than 1 ppm (parts per million) or a maximum of 400 fecal colonies/100 ml.

Figure 1
Chlorine Contact Chamber
65 gallon minimum



SOURCE: Miss Code Ann. §41-67-3

Figure 2 Cross Section of Chlorinator Feeder Tube



SOURCE: Miss Code Ann. §41-67-3