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

5. The suction and pressure lines shall be PVC schedule 40 or equal and be sized to meet the hydraulic requirements of the system.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.3.4. Electrical: All electrical components shall be in compliance with the National Electrical Code.

SOURCE: Miss Code Ann. §41-67-3

Subchapter 4. AGGREGATE

Rule 5.4.1. In a conventional onsite wastewater system treatment begins in the septic tank, under anaerobic conditions. Final treatment and disposal takes place in the soil of the drainfield, an aerobic environment. It is necessary for this aerobic condition to exist in the soil of the drainfield for proper treatment of the effluent.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.2. **Definitions:**

1. Aggregate System - any subsurface disposal system that utilizes gravel, crushed stone, tire chips or other approved aggregate media.

2. Conventional Subsurface Aggregate Disposal System - any gravity-fed subsurface disposal field utilizing a loose aggregate media ranging from 36 to 12 inches in depth.

    a. Standard Subsurface Disposal 25 in. to 36 in.

    b. Shallow Subsurface Disposal 12 in. to 24 in.

3. Tire Chips - Coarse aggregate made from recycled tires to substitute volumetrically for mineral aggregate for use as media in a conventual subsurface disposal field.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.3. **Site Evaluation:**

1. Information obtained during the soil and site evaluation will determine which type(s) of IOWDS may be utilized for an individual lot.

2. Prior to completing the Soil and Site Evaluation/System Recommendation, the Environmentalist shall visit the lot and conduct the soil and site evaluation.

3. The soil determinations will be made based on soil borings to a depth of five feet or to a depth sufficient to reach a restrictive horizon. Restrictive soil or site conditions may preclude the use of any subsurface disposal system.

4. A soil and site evaluation will be based on the following criteria:

    a. Absence of or protection from frequent flooding.

    b. Landscape position with good surface runoff.

    c. Slopes of less than 15%.

    d. Depth to high water table of greater than four feet.

    e. Depth to bedrock, fragipan or plinthite of greater than four feet.

    f. Soil texture and color defined by the Natural Resource Conservation Service as indicating good drainage and suitability for soil absorption, based on a soil boring of five feet.

    g. Available area in which to install an individual onsite wastewater disposal system meeting all requirements of this regulation. The area for repairs and future extensions shall be no less than 50% of the space required for the recommended system. Systems utilizing surface land application discharge are exempt from the 50% additional area requirement.

    h. The non compliance of one or more of the above items may require a design alteration of an underground system.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.4. **Location of Onsite Wastewater Disposal Systems:**

1. All components of the onsite wastewater disposal system shall be located a minimum of:

    a. five (5) feet from any dwelling.

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

2. Any vessel holding wastewater shall be located a minimum of 50 feet from any public, private or individual potable water source.

3. The effluent disposal field shall be located at a lower elevation or in a landscape position that will preclude any surface runoff from flowing in the direction of the well site and a minimum of 100 feet from any public, private or individual potable water source.

4. Potable water lines shall not pass under or through any part of the sewage disposal system. Where a water supply line must cross a sewer line, the bottom of the water service within ten feet of the point of crossing, shall be at least 12 inches above the top of the sewer line. The sewer line shall be of Schedule 40 pipe with cemented joints at least ten feet on either side of the crossing. Water and sewer lines shall not be laid in the same trench. The water and sewer lines, when laid on the same elevation , shall maintain a minimum separation distance of 10 feet.

5. The surface of or the surface above the disposal field shall not be used for vehicular traffic or vehicular parking.

6. No portion of an onsite wastewater disposal system shall be located under dwellings or other permanent structures.

7. Effluent disposal systems shall not be located in depressed areas where surface water will accumulate. Provision shall be made to minimize the flow of surface water over the effluent disposal field.

8. Subsurface wastewater disposal field setbacks from sensitive waters. [See Table I].

9. Slopes of greater than 30% shall not be considered for subsurface disposal installation.

10. Where all or part of the onsite wastewater disposal 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. The easement shall be of sufficient area to permit access, construction and maintenance of the onsite sewage disposal system.

11. No site for an effluent disposal field or expansion area shall be approved which is located wholly within an area which is frequently flooded, swamp, marsh, or wetland. Except that if permits have been issued by the proper regulatory agency authorizing the use of wetlands for building sites, the property shall be evaluated using standard soil and site criteria for IOWDS.

12. When a proposed lot is located partially within a frequently flooded area, that portion of said lot not within the flood prone area may be considered for approval for the effluent disposal field.

13. There shall be maintained a minimum of 12 inches of unsaturated soil between the bottom of the subsurface disposal system and a perched or seasonal water table in soils that contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay) within five feet of the surface.

14. There shall be maintained a minimum of 24 inches of unsaturated soil between the bottom of the subsurface disposal system and any perched or seasonal water table in soils that do not contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay) within five feet of the surface.

15. 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 individual onsite sewage disposal systems.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.5. **Underground Absorption:**

1. The size of the subsurface sewage disposal system shall be determined by soil texture [See Table II].

2. Soils with excessively rapid permeability rates, gravel and coarse sand, shall be considered unsuitable for subsurface disposal unless the native soil is replaced with a suitably thick (greater than two feet) layer of loamy sand or sand textured soil.

3. Soils with excessively slow permeability rates, silty clay and clay, shall be considered unsuitable for conventional subsurface disposal.

4. Subsurface disposal systems shall be placed no deeper than 36 inches below the surface.

5. Conventional subsurface disposal systems shall have a minimum 12 inches of soil backfill [Figure 1][Figure 2].

6. The minimum distance between absorption trench sidewalls shall be six feet.

7. Aggregate -type absorption trenches shall be a minimum of 24 inches and a maximum of 36 inches in width.

8. Trenches shall not be excavated when the soil is wet enough to smear or compact easily.

9. The bottom of the trenches or bed and the distribution lines shall have a grade from level to no greater than two inches fall per 100 feet.

10. There shall be a minimum of three feet of undisturbed soil between the excavation for the septic tank or treatment plant and the beginning of the absorption trench, bed or effluent line.

11. Media for the disposal fields shall extend from at least two inches above the top of the perforated field line pipe to at least six inches below the bottom of the perforated field line pipe a minimum of 12 inches total [Figure 1].

12. Stone media for the disposal fields shall consist of crushed rock, gravel or other suitable material, as approved by the Mississippi Department of Health, Division of Onsite Wastewater, varying in size from½ to 2½ inches. The material shall be free from dust, sand, clay, or excessive fines.

13. Tire chips shall be allowed for use as coarse aggregate in onsite wastewater treatment and disposal system drainfields and may substitute for stone aggregate on a one-for-one basis, volumetrically when the following physical properties are met:

    a. Tire chips are to be a normal two (2) inches in size and may range from one-half (1/2) inch to a maximum of four (4) inches in any direction.

    b. Exposed wire may protrude no more than one-half (1/2) inch from the sides of the chip. No more than (10%) by weight shall exceed this standard.

    c. No more than (10%) by weight shall pass through a one-half (1/2) inch screen.

    d. At least 80% of the bead wire must be removed from the tires to be chipped.

    e. Fines of less than 2 mm in size are prohibited. Fines in this context is defined as particles or substances which can settle to the bottom of the absorption trench and contribute to the clogging or blocking of infiltrative surfaces (dirt, dust, grit, crumb rubber and similar substances).

14. The media for the disposal fields shall be covered with untreated building paper, heavy craft paper, a layer of straw at least two inches thick, or other acceptable material, as approved by the Mississippi Department of Health, Division of Onsite Wastewater.

15. Soil material excavated from trenches shall be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

16. When a change in elevation of the disposal trench is required, a connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the

aggregate in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the aggregate. Crossover lines shall be laid on undisturbed earth. The invert of the crossover must be at least four inches lower than the invert of the septic tank effluent line.

17. Standard manufactured fittings compatible with the pipe shall be used to connect all pipes within the effluent disposal field.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.6. **Certification:**

1. Any manufacturer wishing to provide tire chips for use in onsite sewage treatment and disposal system drainfields in the state of Mississippi must first receive a certification from the State Department of Health, Division of Onsite Wastewater. Manufacturers must provide proof they can produce a tire chip coarse aggregate in conformance with the standards in Section V, part 13.

2. Tire chip coarse aggregate from certified manufacturers shall be labeled as drainfield aggregate on the freight bill-of-lading. The bill-of-lading shall clearly certify that the material meets the requirement s for drainfield use. Contractors purchasing tire chip coarse aggregate shall retain a copy of the freight bill-of lading as documentation of the aggregate size and quality.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.7. Alternating Disposal Fields

1. An alternating effluent disposal field system provides two complete disposal fields, separated by a valving system so that each system could alternately be used and rested. This "resting" has shown to be useful in regenerating the soil's capability for absorbing the effluent.

2. The size of each field can be from 50 to 100 percent of the required square footage of a single disposal field.

3. The length of time each field would be used and then rested will be determined on a case-by-case basis.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.8. Shallow Disposal Fields: Shallow aggregate systems can sometimes be used where the depth to the restrictive horizon or water table is less than 25 inches. Placement of the system may be as shallow as 12 inches for aggregate systems [Figure 2 and Section IV part 14 and 15 of this design standard]. Shallow installations may be placed in any texture shown as suitable in Table II.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.9. **Absorption Beds:**

1. Absorption beds and trenches should be located a minimum of 10 feet from any trees, except for subsurface drip irrigation.

2. Absorption beds have a smaller "footprint" than the same square footage of trench system. This lends them useful in certain installations where the amount of useable space is limited. [FIGURE 3].

3. The amount of bottom absorption area required shall be the same as shown in [TABLE II]. The bottom of the bed should have a relatively level grade.

4. Lines for distributing effluent shall be spaced from 3 to 6 feet apart and not greater than 3 feet from the sidewall. The number of lines will depend on the square feet and width of the bed to be constructed.

5. Care should be taken to prevent heavy machinery from damaging the bed during backfilling.

6. The effluent must be equally distributed to the bed by means of a distribution box or with a pipe manifold [FIGURE 4].

SOURCE: Miss Code Ann. §41-67-3

Rule 5.4.10. **Distribution of Effluent:**

1. When a change in elevation of the disposal trench is required, a distribution box, connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the aggregate in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the aggregate. The distribution box shall be level and supply all lines equally. Field lines must be equal lengths when served by one distribution box.

2. Distribution boxes may be used to connect the effluent line to the effluent distribution lines. Non-perforated rigid pipe shall exit the distribution box for a minimum of five feet at level grade before the effluent distribution line (perforations) begins [FIGURE 7].

3. Crossover lines shall be laid on undisturbed earth. The invert of the crossover must be at least four inches lower than the invert of the septic tank outlet line.

    a. Crossovers shall be constructed as shown in FIGURE 5.

SOURCE: Miss Code Ann. §41-67-3

SETBACK REQUIREMENTS FROM SENSITIVE WATER
Minimum Distance from the Water Edge

Soil Textural Class	Slope of Less Than 8 Percent	Slope of More Than 8 Percent
Gravel	NOT APPLICABLE	
Coarse Sand	50 feet	50 feet
Medium Sand	50 feet	50 feet
Fine Sand	50 feet	50 feet
Loamy Sand	50 feet	50 feet
Sandy Loam	50 feet	50 feet
Light Loam	50 feet	50 feet
Heavy Loam	50 feet	50 feet
Silt Loam	50 feet	50 feet
Sandy Clay Loam	50 feet	50 feet
Light Clay Loam	50 feet	50 feet
Heavy Clay Loam	50 feet	50 feet
Light Silty Clay Loam	50 feet	50 feet
Heavy Silty Clay Loam	50 feet	50 feet
Sandy Clay	50 feet	50 feet
Silty Clay	50 feet	50 feet
Clay	50 feet	50 feet

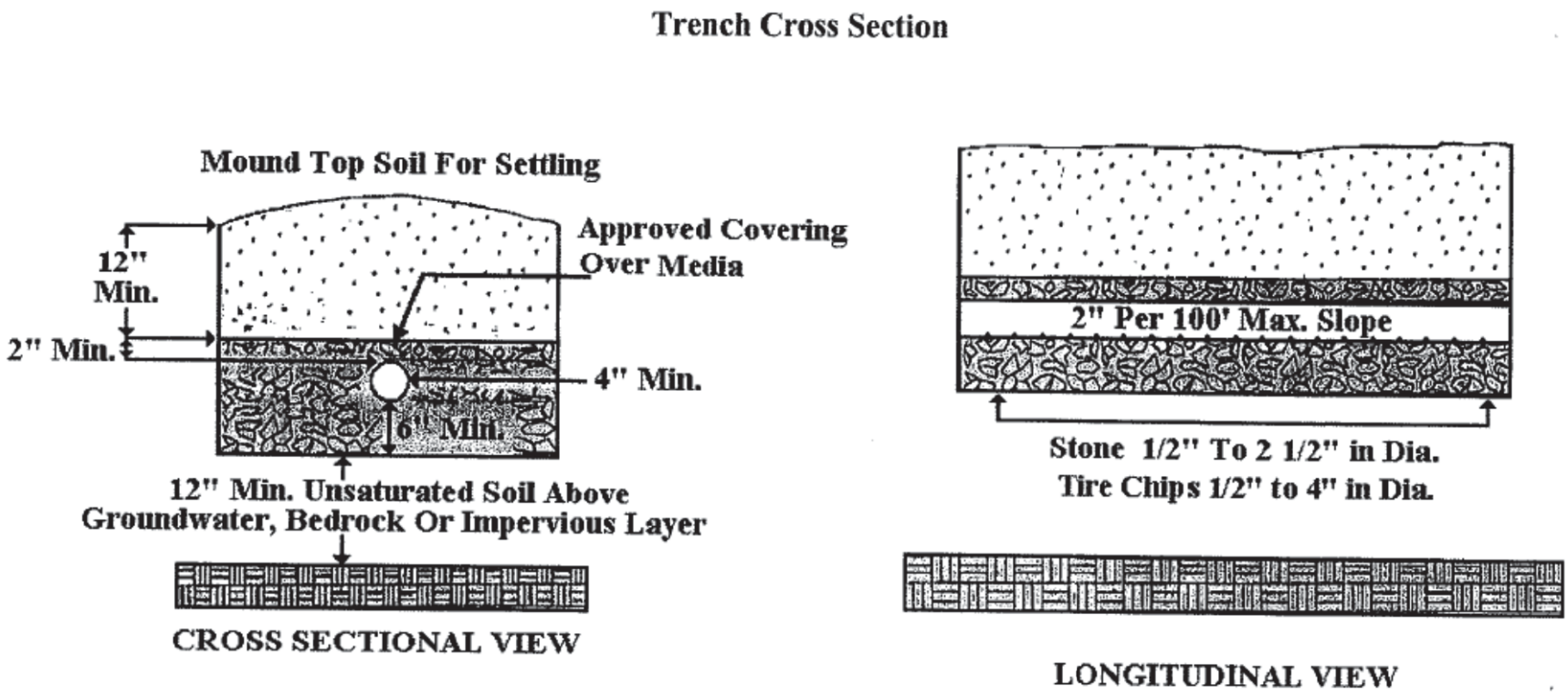
The effluent disposal setback is based on the soil texture of the horizon in which the absorption trench or bed is to be placed. These setbacks are to be used on all individual on-site wastewater disposal systems except **spray irrigation disposal and overland discharge**.

Table II – **SIZING – AGGREGATE (Gravel, Crushed Stone, Tire Chips, or other approved media)**
Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area Per Bedroom (3' Trench)		Additional Absorption Area Over 2 Persons Per Bedroom	
			Ft^2	Lf	Ft^2	Lf
Gravel	-	-	NOT SUITABLE			
Coarse Sand	-	1.2	108	36	54	18
Medium Sand	-	1.2	108	36	54	18
Fine Sand	-	0.8	163	54	81	27
Loamy Sand	-	0.8	163	54	81	27
Sandy Loam	<.5	0.6	217	72	108	36
Light Loam	<.5	0.6	217	72	108	36
Heavy Loam	.5 – 1	0.45	289	96	144	48
Silt Loam	<1	0.45	289	96	144	48
Sandy Clay Loam	1 – 2	0.45	289	96	144	48
Light Clay Loam	1 – 1.5	0.30	433	144	217	72
Heavy Clay Loam	1.5 – 2.0	0.20	650	217	325	108
Light Silty Clay Loam	1 – 1.5	0.30	433	144	217	72
Heavy Silty Clay Loam	1.5 – 2.0	0.20	650	217	325	108
Sandy Clay	>2.0	-	NOT SUITABLE			
Silty Clay	>2.0	-	NOT SUITABLE			
Clay	>2.0	-	NOT SUITABLE			

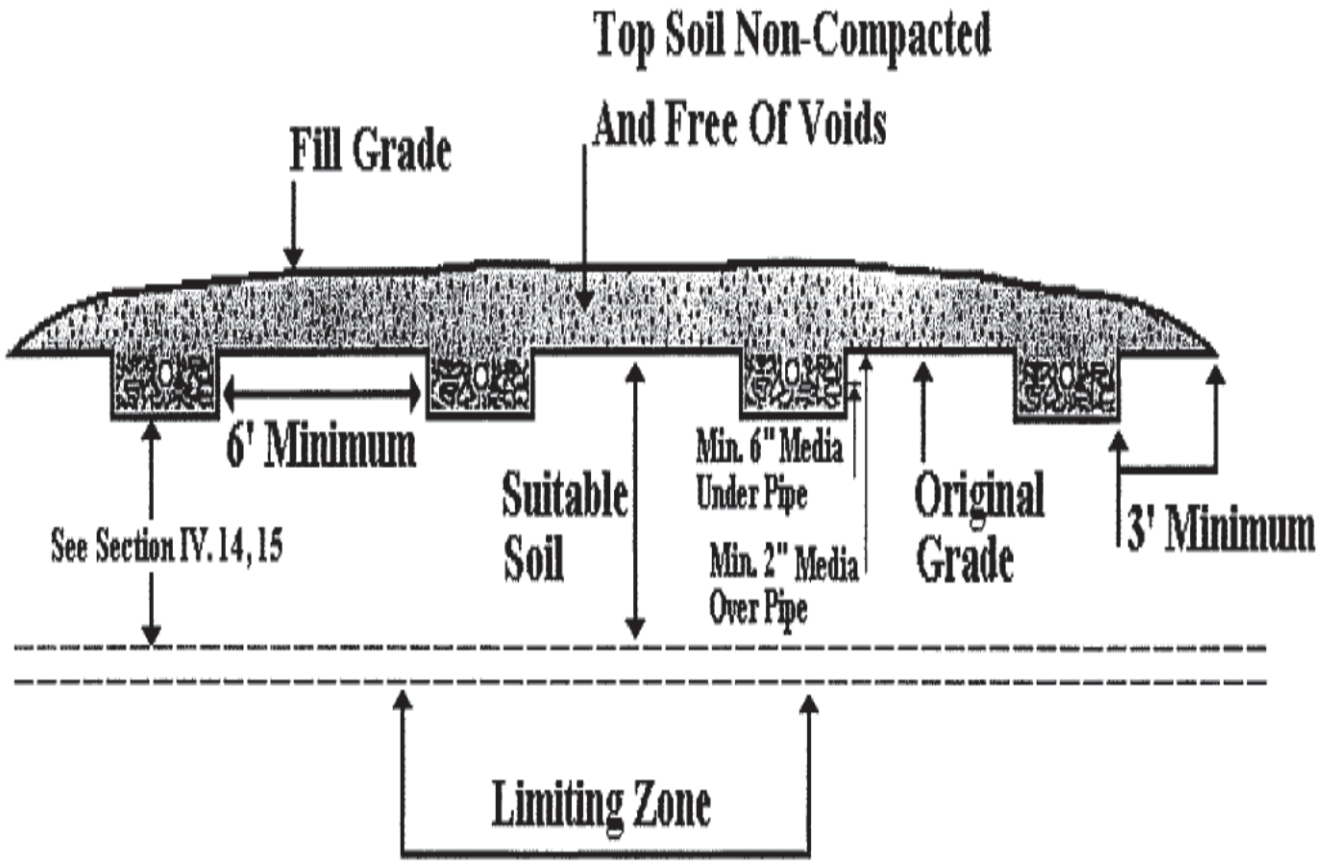
SOURCE: Miss Code Ann. §41-67-3

Figure I – Conventional Subsurface Absorption



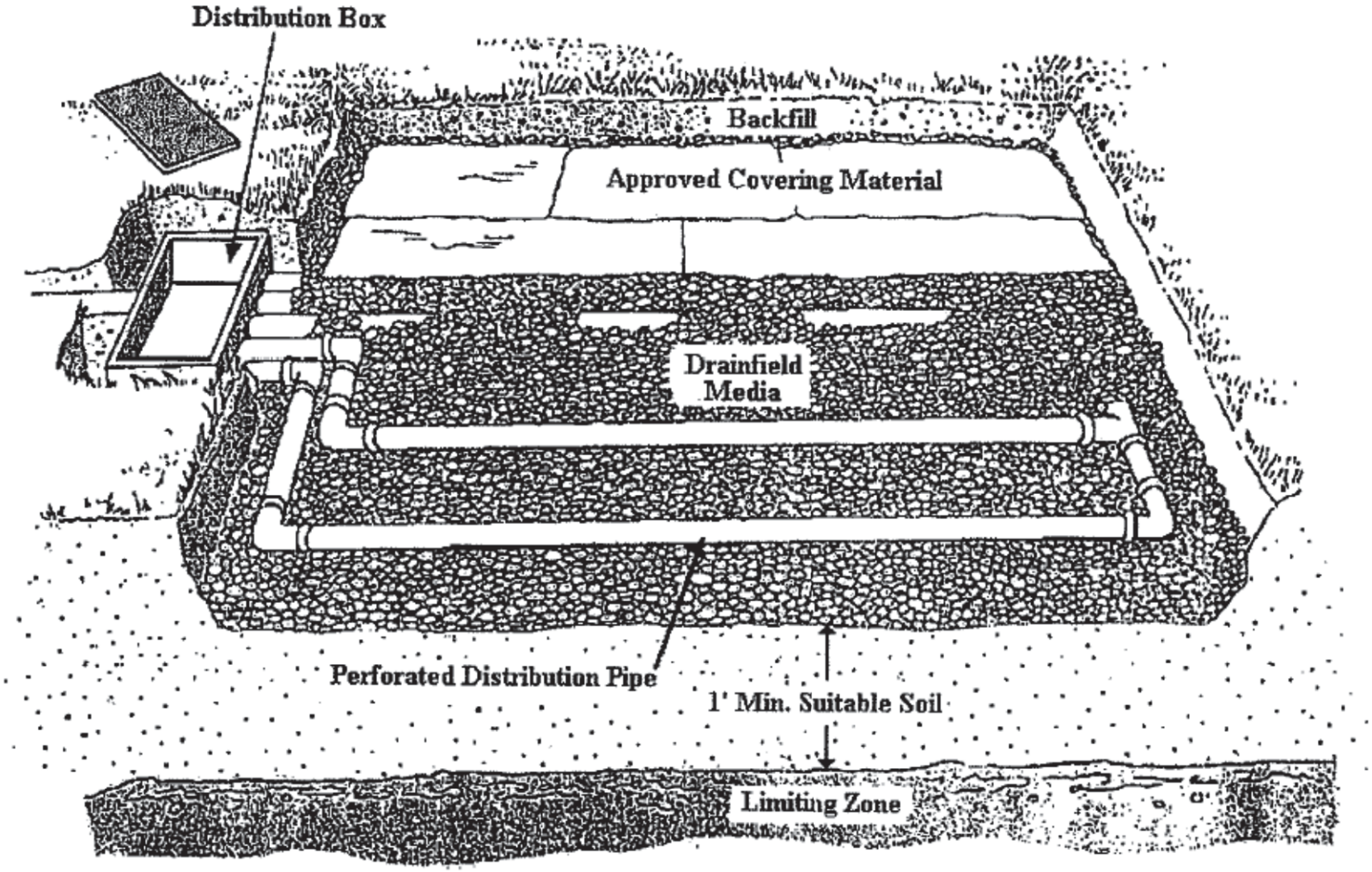
SOURCE: Miss Code Ann. §41-67-3

Figure II – Ultra Shallow Absorption Field



SOURCE: Miss Code Ann. §41-67-3

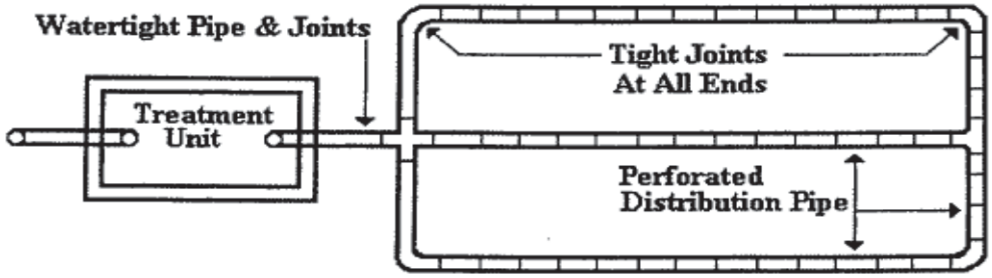
Figure III – Conventional Absorption Bed



SOURCE: Miss Code Ann. §41-67-3

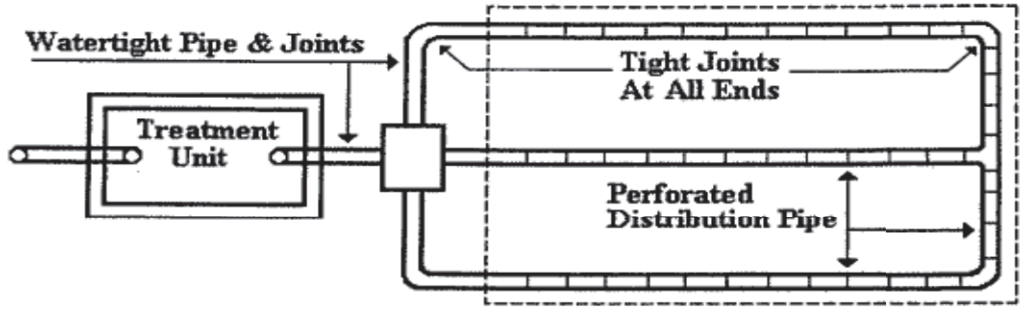
Figure IV – Effluent Distribution for Absorption Beds

Pipe Manifold Type
Drawing I



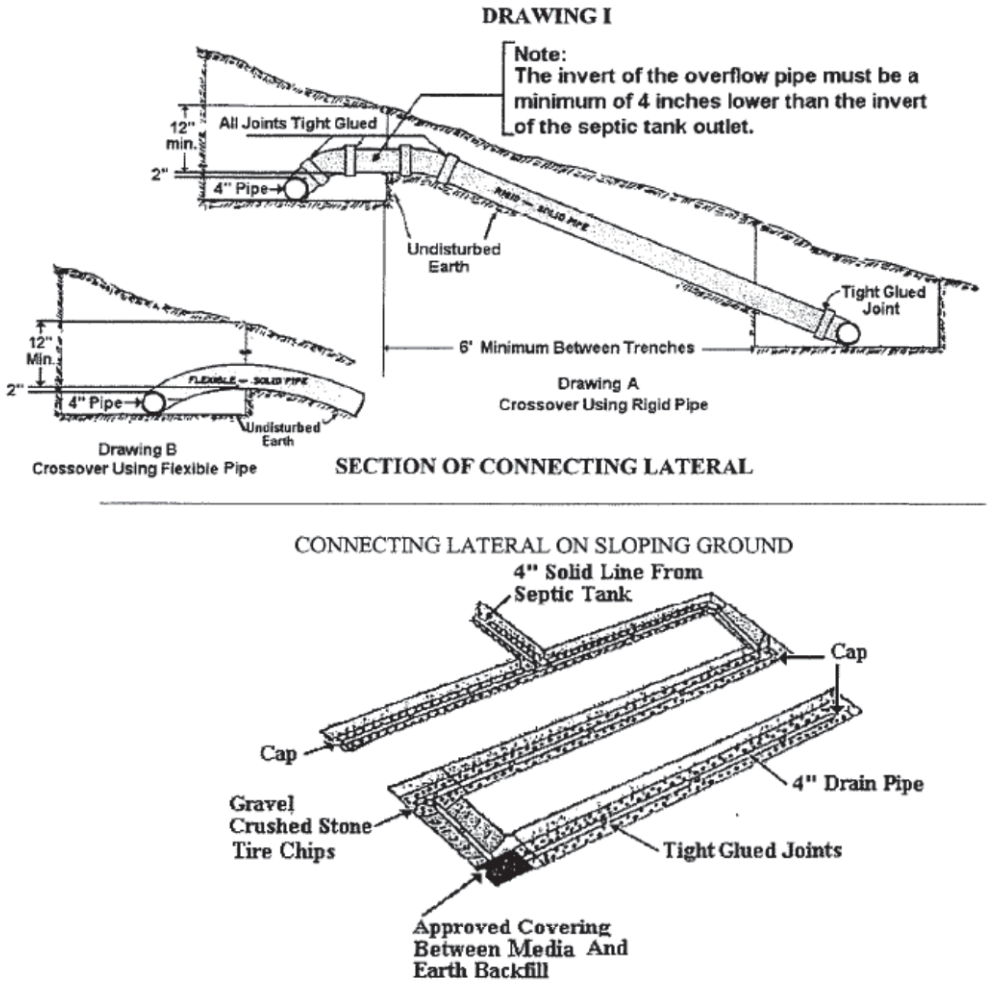
In absorption bed systems where the entire infiltrative surface is at one elevation closed loop networks may be used. The distribution pipe is laid level over the media filled excavation and the ends connected together with additional pipe with ell or tee fittings.

Distribution Box Type
Drawing II



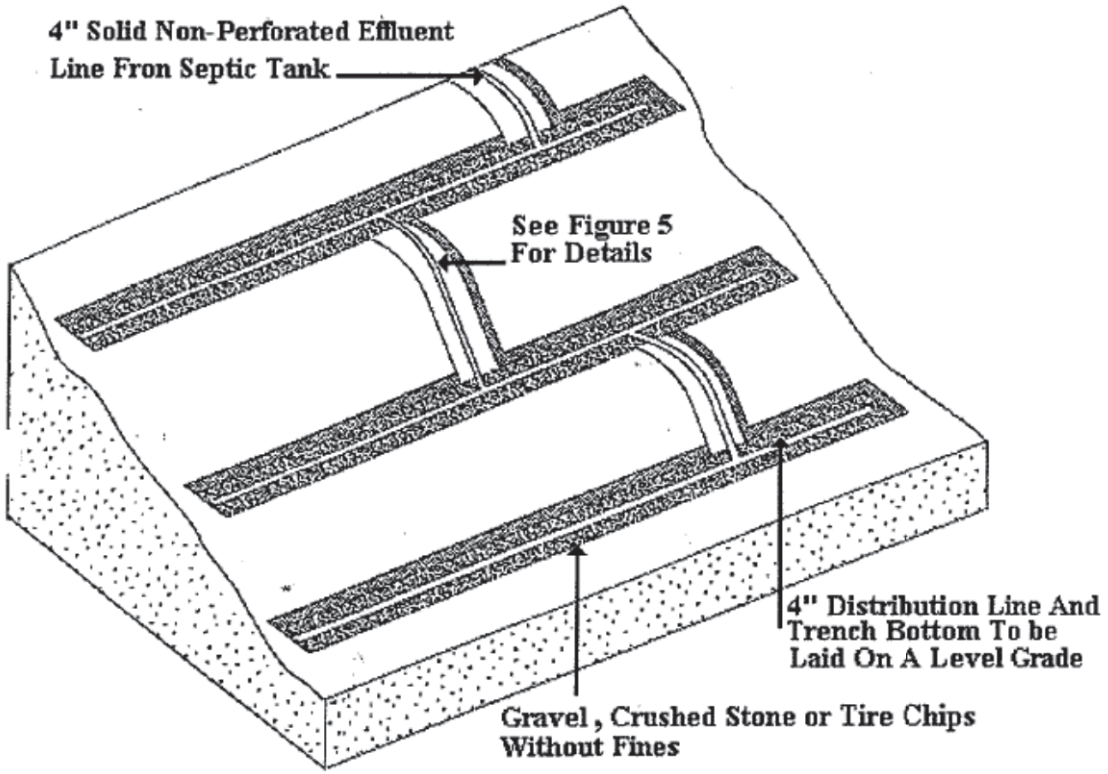
SOURCE: Miss Code Ann. §41-67-3

Figure V – Connection Lateral [Spill overs]



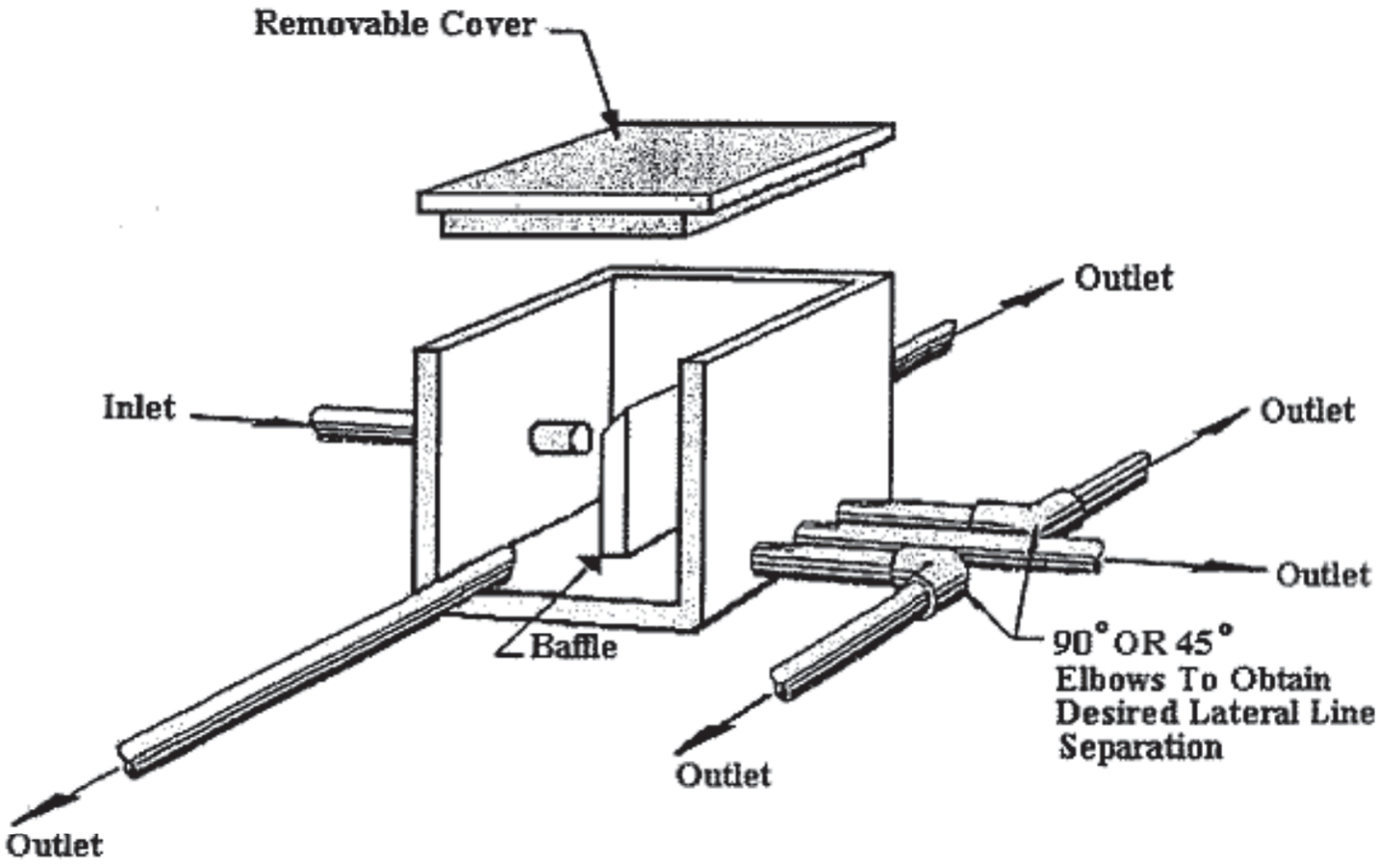
SOURCE: Miss Code Ann. §41-67-3

Figure VI – Conventional Absorption Bed



SOURCE: Miss Code Ann. §41-67-3

Figure VII – Distribution Box



SOURCE: Miss Code Ann. §41-67-3

Subchapter 5. AGGREGATE REPLACEMENT

Rule 5.5.1. In a conventional onsite wastewater system treatment begins in the septic tank, under anaerobic conditions. Final treatment and disposal takes place in the soil of the drain field, an aerobic environment. It is necessary for this aerobic condition to exist in the soil of the drain field for proper treatment of the effluent.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.2. **Definitions:**

1. Chamber System - a system of bottomless molded plastic chambers installed in direct contact with the trench bottom to infiltrate primary treated effluent into the soil for final treatment and disposal.

2. Aggregate Replacement Disposal System - any normally gravity-fed subsurface disposal field utilizing an alternate media or technology to act as a replacement for the aggregate media. These system depths range from 36 to 6 inches in depth.

    a. Standard Subsurface Disposal 25 in. to 36 in.

    b. Shallow Subsurface Disposal 13 in. to 24 in.

    c. Ultra-shallow Subsurface Disposal 6 in. to 12 in.

3. Large Diameter Aggregate Replacement System - subsurface disposal system that utilizes large diameter pipe covered with a filtering material approved by the Mississippi State Department of Health for use in IOWDS systems.

4. Multi-Pipe Aggregate Replacement System - subsurface disposal system that utilizes a multiple arrangement of piping, approved by the Mississippi State Department of Health, to replace the aggregate media of conventional soil absorption systems for use in IOWDS systems.

5. Treatment - a process applied to wastewater which causes the resulting effluent to meet or exceed EPA secondary standards for treated wastewater for surface discharge and which does not endanger the public health.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.3. **Site Evaluation:**

1. Information obtained during the soil and site evaluation will determine which type(s) of IOWDS may be utilized for an individual lot.

2. Prior to completing the Soil and Site Evaluation/System Recommendation, the Environmentalist shall visit the lot and conduct the soil and site evaluation.

3. The soil determinations will be made based on soil borings to a depth of five feet or to a depth sufficient to reach a restrictive horizon. Restrictive soil or site conditions may preclude the use of any subsurface disposal system.

4. A soil and site evaluation will be based on the following criteria:

   a. Absence of or protection from frequent flooding.

   b. Landscape position with good surface runoff.

   c. Slopes of less than 15%.

   d. Depth to high water table of greater than four feet.

   e. Depth to bedrock, fragipan or plinthite of greater than four feet.

   f. Soil texture and color defined by the Natural Resource Conservation Service as indicating good drainage and suitability for soil absorption, based on a soil boring of five feet.

   g. Available area in which to install an individual onsite wastewater disposal system meeting all requirements of this regulation. The area for repairs and future extensions shall be no less than 50% of the space required for the recommended system. Systems utilizing surface land application discharge are exempt from the 50% additional area requirement.

5. The non compliance of one or more of the above items may require a design alteration of an underground system.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.4. **Location of Onsite Wastewater Disposal Systems**:

1. All components of the onsite wastewater disposal system shall be located a minimum of:

   a. five feet from any dwelling.

   b. ten feet from any property line.

2. Any vessel holding wastewater shall be located a minimum of 50 feet from any public, private or individual potable water source.

3. The effluent disposal field shall be located at a lower elevation or in a landscape position that will preclude any surface runoff from flowing in the direction of the well site and a minimum of 100 feet from any public, private or individual potable water source.

4. Potable water lines shall not pass under or through any part of the sewage disposal system. Where a water supply line must cross a sewer line, the bottom of the water service within ten feet of the point of crossing, shall be at least 12 inches above the top of the sewer line. The sewer line shall be of Schedule 40 pipe with cemented joints at least ten feet on either side of the crossing. Water and sewer lines shall not be laid in the same trench. The water and sewer lines, when laid on the same elevation, shall maintain a minimum separation distance of 10 feet.

5. The surface of or the surface above the disposal field shall not be used for vehicular traffic or vehicular parking.

6. No portion of an onsite wastewater disposal system shall be located under dwellings or other permanent structures.

7. Effluent disposal systems shall not be located in depressed areas where surface water will accumulate. Provision shall be made to minimize the flow of surface water over the effluent disposal field.

8. Subsurface wastewater disposal field setbacks from sensitive waters. [See Table I].

9. Slopes of greater than 30% shall not be considered for subsurface disposal installation.

10. Where all or part of the onsite wastewater disposal 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. The easement shall be of sufficient area to permit access, construction and maintenance of the onsite sewage disposal system.

11. No site for an effluent disposal field or expansion area shall be approved which is located wholly within an area which is frequently flooded, swamp, marsh, or wetland. Except that if permits have been issued by the proper regulatory agency authorizing the use of wetlands for building sites, the property shall be evaluated using standard soil and site criteria for IOWDS.

12. When a proposed lot is located partially within a frequently flooded area, that portion of said lot not within the flood prone area may be considered for approval for the effluent disposal field.

13. There shall be maintained a minimum of 12 inches of unsaturated soil between the bottom of the subsurface disposal system and a perched or seasonal water table in soils that contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay) within five feet of the surface.

14. There shall be maintained a minimum of 24 inches of unsaturated soil between the bottom of the subsurface disposal system and any perched or seasonal water table in soils that do not contain a restrictive horizon (fragipan, chalk, bedrock, clay or silty clay) within five feet of the surface.

15. 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 individual onsite sewage disposal systems.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.5. **Underground Absorption:**

1. Aggregate replacement systems shall comply with all criteria for subsurface gravel disposal systems except in sections pertaining to the gravel media or as specified in this regulation.

2. The size of the subsurface sewage disposal system shall be determined by soil texture and estimated wastewater flow.

3. Soils with excessively rapid permeability rates, gravel and coarse sand, shall be considered unsuitable for subsurface disposal unless the native soil is replaced with a suitably thick (greater than two feet) layer of loamy sand or sand textured soil.

4. Soils with excessively slow permeability rates, silty clay and clay, shall be considered unsuitable for conventional subsurface disposal.

5. Subsurface disposal systems shall be placed no deeper than 36 inches below the surface.

6. Aggregate replacement subsurface disposal systems shall have a minimum 12 inches of soil backfill.

7. The minimum distance between absorption trench sidewalls shall be six feet.

8. Trenches shall not be excavated when the soil is wet enough to smear or compact easily.

9. There shall be a minimum of three feet of undisturbed soil between the excavation for the septic tank or treatment plant and the beginning of the absorption trench, bed or effluent line.

10. The bottom of the outlet of the septic tank, aerobic treatment plant or vessel supplying effluent to the pipe must be a minimum of one inch above the top of the aggregate replacement system.

11. Care must be taken when backfilling to prevent the pipe from shifting during the backfilling process.

12. Soil material excavated from trenches shall be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

13. Standard manufactured fittings compatible with the pipe shall be used to connect all pipes within the effluent disposal field.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.6. **Alternating Disposal Fields:**

1. An alternating effluent disposal field system provides two complete disposal fields, separated by a valving system so that each system could alternately be used and rested. This "resting" has shown to be useful in regenerating the soil's capability for absorbing the effluent.

2. The size of each field can be from 50 to 100 percent of the required square footage of a single disposal field.

3. The length of time each field would be used and then rested will be determined on a case-by-case basis.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.7. Shallow and Ultra-shallow Disposal Fields: Shallow or ultra-shallow systems can sometimes be used where the depth to the restrictive horizon or water table is less than the minimum required. Placement of the system may be as shallow as 6 inches for large diameter double-six aggregate replacement pipe systems. Ultra-shallow installations shall be restricted to soil textures of loam or lighter. Shallow installations may be placed in any texture shown as suitable in the system specific sizing tables.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.8. Sizing: The large diameter aggregate replacement systems shall be sized in accordance with the following tables.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.9. **Construction:**

1. Large diameter aggregate replacement absorption trenches shall be a minimum of 24 inches and a maximum of 36 inches in width.

2. The bottom of the trenches or bed and the distribution lines shall have a grade from level to no greater than two inches fall per 100 feet for double six inch large diameter aggregate replacement pipe and one inch fall per 100 feet for eight and ten inch large diameter aggregate replacement pipe.

3. Overlap filter wrap at coupling joints and seal using factory approved methods.

4. The 4" pipe from the septic tank, aerobic treatment plant or vessel supplying effluent to the aggregate replacement pipe shall be installed into an offset connector particular to the type and manufacturer of the pipe. These connectors will also be used when crossovers are constructed to change elevations of field system.

5. Fabric must be pulled over offset connector and sealed using a factory approved method.

6. The ends of the large diameter aggregate replacement pipe shall be closed with an end cap particular to the type and manufacturer of the pipe.

7. Care must be taken during backfilling to prevent the aggregate replacement pipe from “crawling” when backfill is applied.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.10. **Distribution of Effluent:**

1. Aggregate Replacement Pipe Systems

   a. When a change in elevation of the disposal trench is required, a distribution box, connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the Aggregate replacement pipe in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the aggregate replacement pipe. The distribution box shall be level and supply all lines equally. Field lines must be equal lengths when served by one distribution box.

   b. Distribution boxes may be used to connect the effluent line to the effluent distribution lines. Non-perforated rigid pipe shall exit the distribution box for a minimum of five feet at level grade before the effluent distribution line (perforations) begins.

c. Crossover lines shall be laid on undisturbed earth. The invert of the crossover must be at least four inches lower than the invert of the septic tank outlet line. Crossovers shall be constructed as shown in Figure 1.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.11. **Absorption Beds**: Absorption beds may be constructed using large diameter aggregate replacement filter wrap pipe.

1. Absorption beds and trenches should be located a minimum of 10 feet from any trees.

2. The amount of linear footage required shall be the same as for trench configurations. The bottom of the bed should have a relatively level grade; the grade within the bed shall not exceed the grade allowed for trench installations.

3. Lines for distributing effluent shall be spaced from 3 to 6 feet apart with the first and last pipe placed next to the sidewall of the bed. The number of lines will depend on the lineal feet of aggregate replacement line (Table II & III) and width of the bed to be constructed.

4. Care should be taken to prevent heavy machinery from damaging the bed during backfilling.

5. The effluent must be equally distributed to the bed by means of a distribution box or with a pipe manifold.

6. When a change in elevation of the disposal trench is required, a connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the aggregate replacement pipe in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the pipe. Crossover lines shall be laid on undisturbed earth. The invert of the crossover must be at least four inches lower than the invert effluent line of the septic tank, aerobic treatment plant or vessel supplying effluent to the pipe [Figure 1].

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.12. **Multi-Pipe Aggregate Replacement Systems:**

1. General: The multi-pipe aggregate replacement system is a system that utilizing bundles of four inch perforated pipe to provide a void space. The top pipe in one bundle of this system receives the treated effluent for distribution throughout the disposal system. All multi-pipe aggregate

replacement systems must be installed by a Certified Installer that is factory-trained and authorized by the manufacturer.

2. Sizing: The multi-pipe aggregate replacement systems shall be sized in accordance with the TABLE IV.

3. Construction

   a. The bottom of the trenches and the distribution lines shall have a grade from level to no greater than two inches fall per 100 feet for multi-pipe aggregate replacement systems.

   b. Multi-pipe aggregate replacement system trenches shall be a minimum of 24 and a maximum of 36 inches in width.

   c. The multi-pipe aggregate replacement system must be installed with effluent being distributed to each trench distribution pipe by use of a distribution box or a level pipe header.

      i. When a change in elevation of the disposal trench is required, a distribution box or approved crossover shall be used. The distribution box, if used, shall be level and supply all lines equally.

      ii. Distribution boxes may be used to connect the effluent line to the effluent distribution lines. Non-perforated rigid pipe shall exit the distribution box for a minimum of five feet at level grade before the effluent distribution line (perforations) begins.

   d. The system shall be covered with a manufacturer-approved, geotextile cloth before backfilling.

   e. The geotextile cloth shall cover the open ends of the void and distribution pipes at their termination at the ends of the trench.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.13. When a change in elevation of the disposal trench is required, an additional distribution box or connecting lateral/crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the multi-pipe aggregate replacement distribution pipe in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the distribution system. Crossover lines shall be laid on undisturbed earth. The invert of the crossover must be at least four inches lower than the invert effluent line of the septic tank, aerobic treatment plant or vessel supplying effluent to the pipe.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.14. **Absorption Bed [Multi-pipe System]**

1. Multi-pipe systems installed in a bed configuration shall have the same lineal foot requirements as indicated for their respective trench configurations. The length and width of the bed to be constructed will be determined by the number of multi-pipe systems wide and the length selected to comply with the lineal footage required under Table IV.

2. The multi-pipe system shall be placed side by side in the bed. Any side by side placement of multi-pipe systems shall constitute a bed.

3. The bottom of the bed should have a relatively level grade, from the end and side to side. The grade within the bed shall not exceed the grade allowed for trench installations.

4. The effluent must be equally distributed to the bed by means of a distribution box or with a pipe manifold.

5. The multi-pipe system may be cut in-order to accommodate setbacks. The multi-pipe system shall be cut to a length which preserves the integrity of the banded void pipes and provides adequate banding of the system a minimum of every 18 inches to a maximum of every 20 inches. Manufactured couplers shall be used to join cut ends of the void pipes.

6. The system shall be covered with a manufacturer-approved geotextile cloth before backfilling.

7. The geotextile cloth shall cover the open ends of the void pipes.

8. Care should be taken to prevent heavy machinery from damaging the bed during backfilling.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.15. **Expanded Polystyrene (EPS) Aggregate Systems**

1. General: The EPS Aggregate system utilizes bundles of expanded polystyrene aggregate to replace rock aggregate in a subsurface disposal system. Effluent is distributed via a 4 inch perforated pipe incorporated into the center of one EPS bundle. System configurations of multiple bundles will incorporate one bundle run containing the 4 inch perforated pipe in conjunction with bundles containing only EPS aggregate. This 4 inch perforated pipe receives the treated effluent for distribution throughout the trench. The expanded polystyrene aggregate must be contained in a material that is resistant to the effects of wastewater, will prevent the loss of aggregate from the container and strong enough to

retain the shape of the bundles during system installation and backfilling. All EPS Aggregate Systems must be installed by a factory-trained installer that is an authorized representative of the manufacturer.

2. Construction

   a. The EPS Aggregate System absorption trenches shall be a minimum of 24 inches and a maximum of 36 inches in width.

   b. The bottom of the trenches and the distribution lines shall have a grade from level to no greater than two inches fall per 100 feet.

   c. The grade shall be measured from the trench bottom and not the effluent distribution line encased in the EPS bundle.

   d. The EPS Aggregate system shall be covered with an approved cover material before backfilling. Covering material shall consist of craft paper or other bio-degradable product approved and/or supplied by the manufacturer.

3. Distribution of Effluent [EPS Aggregate System]

   a. When a change in elevation of the disposal trench is required, a distribution box, connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the distribution pipe in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the system [Figure 2]. The invert of the crossover must be at least four inches lower than the invert of the septic tank outlet line.

   b. Distribution boxes may be used to connect the effluent line to the effluent distribution lines. The distribution box shall be level and supply all lines equally. Field lines must be equal lengths when served by one distribution box. Non-perforated rigid pipe shall exit the distribution box for a minimum of five feet at level grade before the effluent distribution line (perforations) begins.

4. Absorption Beds [EPS Aggregate Systems]: Absorption beds may be constructed using the EPS Aggregate system.

   a. Absorption beds and trenches should be located a minimum of 10 feet from any trees.

   b. The amount of linear footage required for EPS horizontal systems shall be the same as for trench configurations [Table V]. The bottom of the bed should have a relatively level grade; the grade within the bed shall not exceed the grade allowed for EPS trench

installations. EPS triangular systems shall not be used in bed configurations.

c. The EPS bundles shall be placed side by side in the bed. The number of bundles will depend on the lineal footage required and the width of the bed to be constructed.

d. Care should be taken to prevent heavy machinery from damaging the bed during backfilling.

e. The effluent must be equally distributed to the bed by means of a distribution box or with a pipe manifold.

5. Sizing

a. EPS Aggregate systems shall be sized in accordance Table

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.16. **Chamber Subsurface Disposal Systems:**

1. General: Chamber systems utilize molded plastic bottomless chambers which are installed in a drain field excavation with the open bottom of the chamber in direct contact with the trench bottom. The chambers are linked together in such a manner as to completely cover the excavation with adjacent chambers in contact with each other. Effluent is introduced into the chambers and is absorbed into the soil for final treatment and disposal. All chamber systems must be installed by a factory trained and authorized installer.

2. Chamber Class Designation

a. Each model of chamber will be assigned a class designation based on the bottom square footage of the chamber section. This square footage will be derived by a multiple of the outside width and the useable length of the chamber section.

b. Chamber models will be assigned a class designation according to Table VII.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.17. **Construction:**

1. The chamber system absorption trenches shall be a minimum of 18 inches and a maximum of 36 inches in width.

2. The bottom of the trenches shall have a grade from level to no greater than two (2) inches fall per 100 feet.

3. The grade shall be measured from the trench bottom and not the chamber top.

4. The chamber system shall be covered as per the manufacturer's specifications. In all cases there shall be a minimum of 12 inches of soil cover over the chamber system.

5. The minimum height of a chamber, at its centerline, shall be 8 inches.

6. The last chamber in each "run" shall be terminated with an end plate.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.18. **Distribution of Effluent [Chamber Systems]**

1. When a change in elevation of the chamber system is required, a distribution box, connecting lateral or crossover must be used. At the point where a crossover line leaves a lateral, the trench for the crossover line shall be dug no deeper than the top of the endplate inlet or the inlet in the top of the chamber in the preceding trench so that an undisturbed block of earth will remain in place for the full depth of the system. The invert of the crossover must be at least four inches lower than the invert of the septic tank outlet line.

2. Distribution boxes may be used to connect the effluent line to the effluent distribution lines. The distribution box shall be level and supply all lines equally. Field lines (chambers) must be equal lengths when served by one distribution box. Non-perforated rigid pipe shall exit the distribution box for a minimum of five feet at level grade before the effluent distribution line begins.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.5.19. **Sizing of the Chamber System:**

1. Chamber systems installed in a trench configuration shall be sized in accordance with Table VIII.

2. Chamber systems installed in a bed configuration shall have the same number of chamber sections as indicated for a trench system. The length and width of the bed to be constructed will depend on the number of chamber sections to be installed as indicated by Table VIII. Any side-by-side placement of chambers shall constitute a bed.

a. Absorption beds and trenches should be located a minimum of 10 feet from any trees.

b. The bottom of the bed should have a relatively level grade; the grade within the bed shall not exceed the grade allowed for trench installations.

c. The chambers shall be placed side by side in a bed with separation between each chamber row per individual manufacturer's requirements.

d. Care should be taken to prevent heavy machinery from damaging the bed during backfilling.

e. The effluent must be equally distributed to the bed by means of a distribution box or with a pipe manifold.

SOURCE: Miss Code Ann. §41-67-3

SETBACK REQUIREMENTS FROM SENSITIVE WATER
Minimum Distance from the Water Edge

Soil Textural Class	Slope of Less Than 8 Percent	Slope of More Than 8 Percent
Gravel	NOT APPLICABLE	
Coarse Sand	50 feet	50 feet
Medium Sand	50 feet	50 feet
Fine Sand	50 feet	50 feet
Loamy Sand	50 feet	50 feet
Sandy Loam	50 feet	50 feet
Light Loam	50 feet	50 feet
Heavy Loam	50 feet	50 feet
Silt Loam	50 feet	50 feet
Sandy Clay Loam	50 feet	50 feet
Light Clay Loam	50 feet	50 feet
Heavy Clay Loam	50 feet	50 feet
Light Silty Clay Loam	50 feet	50 feet
Heavy Silty Clay Loam	50 feet	50 feet
Sandy Clay	50 feet	50 feet
Silty Clay	50 feet	50 feet
Clay	50 feet	50 feet

The effluent disposal setback is based on the soil texture of the horizon in which the absorption trench or bed is to be placed. These setbacks are to be used on all individual on-site wastewater disposal systems except **spray irrigation disposal and overland discharge**.

SIZING – AGGREGATE REPLACEMENT (Large Diameter Pipe)

Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area Per Bedroom**						Additional Absorption Area Over 2 Persons Per Bedroom**					
			Ft^2			*Lf			Ft^2			*Lf		
			6	8	10	6	8	10	6	8	10	6	8	10
Gravel	-	-	NOT SUITABLE											
Coarse Sand	-	1.2	164	164	108	55	55	36	82	82	54	27	27	18
Medium Sand	-	1.2	164	164	108	55	55	36	82	82	54	27	27	18
Fine Sand	-	0.8	247	247	165	82	82	55	124	124	82	41	41	27
Loamy Sand	-	0.8	247	247	165	82	82	55	124	124	82	41	41	27
Sandy Loam	<.5	0.6	325	325	217	108	108	72	163	163	108	54	54	36
Light Loam	<.5	0.6	325	325	217	108	108	72	163	163	108	54	54	36
Heavy Loam	.5 – 1	0.45	437	437	290	146	146	97	218	218	145	73	73	48
Silt Loam	<1	0.45	437	437	290	146	146	97	218	218	145	73	73	48
Sandy Clay Loam	1 – 2	0.45	437	437	290	146	146	97	218	218	145	73	73	48
Light Clay Loam	1 – 1.5	0.30	650	650	433	217	217	144	325	325	217	108	108	72
Heavy Clay Loam	1.5 – 2.0	0.20	975	975	650	325	325	217	488	488	325	163	163	108
Light Silty Clay Loam	1 – 1.5	0.30	650	650	433	217	217	144	325	325	217	108	108	72
Heavy Silty Clay Loam	1.5 – 2.0	0.20	975	975	650	325	325	217	488	488	325	163	163	108
Sandy Clay	>2.0	-	NOT SUITABLE											
Silty Clay	>2.0	-	NOT SUITABLE											
Clay	>2.0	-	NOT SUITABLE											

Minimum and maximum trench widths are 24 and 36 inches, respectively.

*Linear footages assume 24 inch trench width.

** Bedroom is equivalent to 130 gallons per day.

SOURCE: Miss Code Ann. §41-67-3

SIZING – AGGREGATE REPLACEMENT (Multi-Pipe System)

Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area Per Bedroom**					Additional Absorption Over 2 Person Per Bedroom**				
			MPS -14 & 36XX***		MPS-13	MPS-11	MPS-9	MPS-14 & 36XX***		MPS-13	MPS-11	MPS-9
			Ft^2	Lf	Lf	Lf	Lf	Ft^2	Lf	Lf	Lf	Lf
Gravel	-	-	NOT SUITABLE									
Coarse Sand	-	1.2	108	36	28	32	38	54	18	14	16	19
Medium Sand	-	1.2	108	36	28	32	38	54	18	14	16	19
Fine Sand	-	0.8	163	54	42	49	58	81	27	21	24	29
Loamy Sand	-	0.8	163	54	42	49	58	81	27	21	24	29
Sandy Loam	<.5	0.6	217	72	55	64	76	108	36	28	32	38
Light Loam	<.5	0.6	217	72	55	64	76	108	36	28	32	38
Heavy Loam	.5 – 1	0.45	289	96	74	86	102	144	48	37	43	51
Silt Loam	<1	0.45	289	96	74	86	102	144	48	37	43	51
Sandy Clay Loam	1 – 2	0.45	289	96	74	86	102	144	48	37	43	51
Light Clay Loam	1 – 1.5	0.30	433	144	110	128	171	217	72	55	64	77
Heavy Clay Loam	1.5 – 2.0	0.20	650	217	165	193	230	325	108	82	97	115
Light Silty Clay Loam	1 – 1.5	0.30	433	144	110	128	171	217	72	55	64	77
Heavy Silty Clay Loam	1.5 – 2.0	0.20	650	217	165	193	230	325	108	82	97	115
Sandy Clay	>2.0	-	NOT SUITABLE									
Silty Clay	>2.0	-	NOT SUITABLE									
Clay	>2.0	-	NOT SUITABLE									

Minimum and maximum trench widths are 24 and 36 inches, respectively.
** Bedroom is equivalent to 130 gallons per day.
***XX represents either 9, 11, or 14 pipes.

SOURCE: Miss Code Ann. §41-67-3

SIZING – AGGREGATE REPLACEMENT (Expanded Polystyrene System) "Horizontal" Configuration

Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area Per Bedroom**							Additional Absorption Over 2 Person Per Bedroom**						
			3-8	4-9	3-10H		1-12	2-12	3-12	3-8	4-9	3-10H		1-12	2-12	3-12
			Lf	Lf	Ft^2	Lf	Lf	Lf	Lf	Lf	Lf	Ft^2	Lf	Lf	Lf	Lf
Gravel	-	-	NOT SUITABLE													
Coarse Sand	-	1.2	42	27	108	30	75	37	25	21	14	54	15	38	19	13
Medium Sand	-	1.2	42	27	108	30	75	37	25	21	14	54	15	38	19	13
Fine Sand	-	0.8	63	41	163	46	114	57	38	32	21	81	23	57	29	19
Loamy Sand	-	0.8	63	41	163	46	114	57	38	32	21	81	23	57	29	19
Sandy Loam	<.5	0.6	83	54	217	60	151	75	50	42	27	108	30	76	38	25
Light Loam	<.5	0.6	83	54	217	60	151	75	50	42	27	108	30	76	38	25
Heavy Loam	.5 – 1	0.45	112	73	289	81	201	101	67	56	37	144	40	101	52	33
Silt Loam	<1	0.45	112	73	289	81	201	101	67	56	37	144	40	101	52	33
Sandy Clay Loam	1 – 2	0.45	112	73	289	81	201	101	67	56	37	144	40	101	52	33
Light Clay Loam	1 – 1.5	0.30	167	109	433	120	299	153	100	84	55	217	60	100	77	50
Heavy Clay Loam	1.5 – 2.0	0.20	250	163	650	178	449	225	150	125	82	325	89	225	113	75
Light Silty Clay Loam	1 – 1.5	0.30	167	109	433	120	299	153	100	84	55	217	60	100	77	50
Heavy Silty Clay Loam	1.5 – 2.0	0.20	250	163	650	178	449	225	150	125	82	325	89	225	113	75
Sandy Clay	>2.0	-	NOT SUITABLE													
Silty Clay	>2.0	-	NOT SUITABLE													
Clay	>2.0	-	NOT SUITABLE													

Minimum and maximum trench widths are 24 and 36 inches, respectively.

** Bedroom is equivalent to 150 gallons per day.

SOURCE: Miss Code Ann. §41-67-3

SIZING – AGGREGATE REPLACEMENT (Expanded Polystyrene System) "Triangular" Configuration

Results of the Soil and Site Evaluation

Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area Per Bedroom**		Additional Absorption Over 2 Person Per Bedroom**	
			3-10 Inch		3-10 Inch	
			Ft^2	Lf	Ft^2	Lf
Gravel	-	-	NOT SUITABLE			
Coarse Sand	-	1.2	54	27	26	13
Medium Sand	-	1.2	54	27	26	13
Fine Sand	-	0.8	83	42	42	21
Loamy Sand	-	0.8	83	42	42	21
Sandy Loam	<.5	0.6	109	55	55	28
Light Loam	<.5	0.6	109	55	55	28
Heavy Loam	.5 – 1	0.45	146	73	73	36
Silt Loam	<1	0.45	146	73	73	36
Sandy Clay Loam	1 – 2	0.45	146	73	73	36
Light Clay Loam	1 – 1.5	0.30	217	108	109	55
Heavy Clay Loam	1.5 – 2.0	0.20	326	163	163	81
Light Silty Clay Loam	1 – 1.5	0.30	217	108	109	55
Heavy Silty Clay Loam	1.5 – 2.0	0.20	326	163	163	81
Sandy Clay	>2.0	-	NOT SUITABLE			
Silty Clay	>2.0	-	NOT SUITABLE			
Clay	>2.0	-	NOT SUITABLE			

Minimum and maximum trench widths are 24 and 36 inches, respectively. The **Triangular Configuration** can only be installed in a trench.

** Bedroom is equivalent to 150 gallons per day.

SOURCE: Miss Code Ann. §41-67-3

CHAMBER SYSTEM

Classification

CLASS	SQUARE FEET/CHAMBER SECTION
I	7.51 – 9.50
II	9.51 – 11.50
III	11.51 – 13.50
IV	13.51 – 15.50
V	15.51 – 17.50
VI	17.51 – 19.50
VII	19.51 – 21.50
VIII	21.51 – 23.50

SOURCE: Miss Code Ann. §41-67-3

SIZING – AGGREGATE REPLACEMENT (Chamber System)

Results of the Soil and Site Evaluation

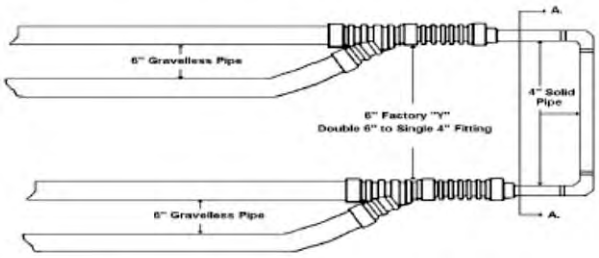
Soil Textural Class	Ribbon Lengths (Inches)	EPA Manual Application Rate GPD/ Ft^2	Absorption Area in Ft^2 Per Bedroom**	Number of Pieces Per Bedroom based on Chamber Class**				Additional Pieces Over 2 Persons Per Bedroom Based on Chamber Class**			
				I	II	III	IV	I	II	III	IV
Gravel	-	-	NOT SUITABLE								
Coarse Sand	-	1.2	76	9	7	6	5	5	4	3	3
Medium Sand	-	1.2	76	9	7	6	5	5	4	3	3
Fine Sand	-	0.8	115	13	11	10	8	7	6	5	4
Loamy Sand	-	0.8	115	13	11	10	8	7	6	5	4
Sandy Loam	<.5	0.6	152	17	15	12	10	9	8	6	5
Light Loam	<.5	0.6	152	17	15	12	10	9	8	6	5
Heavy Loam	.5 – 1	0.45	204	23	19	16	14	9	8	6	5
Silt Loam	<1	0.45	204	23	19	16	14	12	10	8	7
Sandy Clay Loam	1 – 2	0.45	204	23	19	16	14	12	10	8	7
Light Clay Loam	1 – 1.5	0.30	303	33	28	24	21	17	14	12	11
Heavy Clay Loam	1.5 – 2.0	0.20	455	50	43	34	30	25	22	17	15
Light Silty Clay Loam	1 – 1.5	0.30	303	33	28	24	21	17	14	12	11
Heavy Silty Clay Loam	1.5 – 2.0	0.20	455	50	43	34	30	25	22	17	15
Sandy Clay	>2.0	-	NOT SUITABLE								
Silty Clay	>2.0	-	NOT SUITABLE								
Clay	>2.0	-	NOT SUITABLE								

Minimum and maximum trench widths are 18 and 36 inches, respectively.

** Bedroom is equivalent to 150 gallons per day.

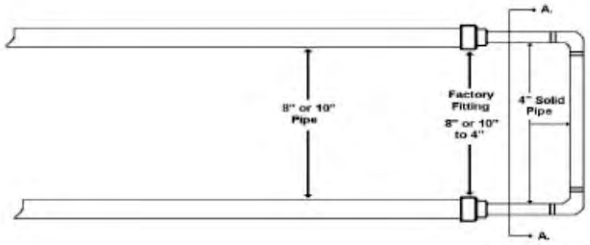
SOURCE: Miss Code Ann. §41-67-3

Figure I – Top View of Connecting Laterals for Large Diameter Pipes



Top View (Double Six Connecting Lateral)

The double six lines shall be joined with a factory connector that will reduce the two lines to a single four inch pipe. The crossover will be constructed with solid pipe and the factory connector will be used to go from four inch to double six for the lower line.

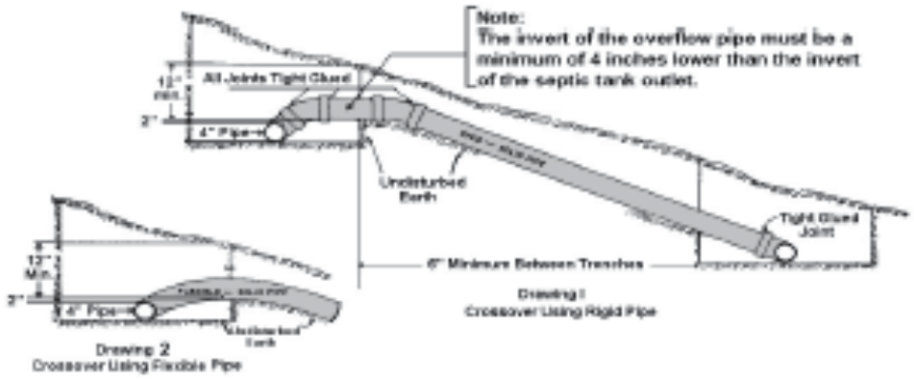


Top View (8 and 10 inch Connecting Lateral)

The upper line shall be joined to the crossover line with a factory connector that will reduce the 8 or 10 inch line to a four inch pipe. The crossover will be constructed with solid pipe and the factory connector will be used to go from four inch to 8 or 10 inch pipe for the lower line.

SOURCE: Miss Code Ann. §41-67-3

Figure II – Connection Laterals of Multi-pipe System, Expanded Polystyrene System, and Chamber System



SOURCE: Miss Code Ann. §41-67-3

Subchapter 6. SUBSURFACE DRIP IRRIGATION

Rule 5.6.1. Subsurface Drip Irrigation is a system that utilizes 3 basic design principles. They are (1) uniform distribution of effluent, (2) dosing and resting cycles and (3) shallow placement of tubing. This system uses small diameter pipe with emitters and must be preceded by a treatment system that conforms to the manufacturer's specifications particular to that system. The effluent must be adequately filtered before distribution to the disposal field(s). Only Subsurface Drip Irrigation Systems that provide for **timed dosing** are acceptable. The term manufacturer, unless otherwise specified, is considered the manufacturer of the treatment device. (Figure I)

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.2. **Definitions**

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

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

3. Distribution manifold – pvc pipe that delivers the treated effluent to the drip tubing.

4. Emitter – small labyrinth inside of drip tubing that eliminates pressure and releases drops of treated effluent.

5. 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.).

6. Subsurface Drip Irrigation System – a system that relies on advanced treatment and filtration of the treated effluent. Final disposal occurs in the upper limits of the soil horizon and is distributed through small diameter tubes that have emitters that slowly drip the treated water into the soil.

7. Tubing – a small diameter line made of a material that forms a tube which contains emitter and manufacturer’s fittings.

8. Vacuum breakers/air release valve – relieves pressure off the treated effluent and allows air to escape the system without causing damage.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.3. **Design:** Utilizing USDA soil groups as classified by textures is the most appropriate criteria on which to base loading rates for this system. The size of the disposal field shall be based on the most restrictive soil, naturally

occurring within 2 feet of the ground surface or to a depth of 1 foot below the trench bottom, whichever is deeper. Criteria and techniques for soil and site evaluation can be found in Chapter 03 Regulation Governing Residential On-site Wastewater Disposal Systems: Soil and Site Evaluation.

1. Prior to the design of the Subsurface Drip Irrigation System, the suitability of the site must be demonstrated through acceptable soil permeability rates, acceptable soil conditions (Table I) and other topographic characteristics. The design and construction of the Subsurface Drip Irrigation System must conform to the drip tubing manufacturer's specification (Figure 1).

2. A minimum of 6 inches of naturally occurring soil must be present above a restrictive horizon or a predominantly gray soil (>50%) before placement of appropriate fill. Subsurface Irrigation System is not recommendable on hydric soils conditions.

3. Except where hydric soils are present, a clean fill material may be used to overcome seasonal water table limitation. The fill material shall consist of a minimum of 50 percent sand particles equal to or greater than 0.25 *mm*. Clay content shall be 20 percent or less. 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 2 feet in all directions from drip tubing and at that point shall be sloped at a grade of no steeper than 3 to 1.

4. In soils that contain a restrictive horizon, within 5 feet of the surface, there shall be a minimum of 12 inches of unsaturated soil between the bottom of the drip tubing and any perched or seasonal water table.

5. In soils that do not contain a restrictive horizon, within 5 feet of the surface, there shall be a minimum of 24 inches of unsaturated soil between the bottom of the drip tubing and any perched or seasonal water table.

6. Drip tubing must be installed a minimum of 6 inches deep. The maximum depth may not exceed 18 inches. In all cases there shall be a minimum of 12 inches separation between the water table and restrictive horizon.

7. Minimum separation between drip emitter shall be 2 feet. A 2 foot horizontal separation must be between drip tubing lines for slopes of less that 20 percent-for slopes of 20 percent or greater shall be a minimum of 3 foot horizontal separation.

8. Drip tubing shall either be placed 4 inches lower than the supply manifolds or water breaks shall be used to prevent effluent from flowing along the drip tubing to the supply manifold trenches.

9. Valves, fittings, level control switches and all other components must be designed and manufactured to resist the corrosive effects of wastewater and common household chemicals.

10. 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)* requirements. Electrical component parts shall be covered by the manufacturer's limited warranty.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.4. **Location / Setbacks:**

1. All components of the Subsurface Drip Irrigation System shall be located a minimum of:

    a. Water Supply (Public/Private)

        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.

    b. Water Supply Components

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

        ii. 10 feet horizontal separation from any water meter.

        iii. 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.

    c. Sensitive Waters

        i. 100 feet on slopes of greater than 8 percent

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

    d. Property Lines

        i. 10 feet down slope or same grade

ii. 10 feet up slope.

e. Residence and Buildings

i. 5 feet from habitable and non-habitable

f. Additional Structures

i. 5 feet from porches, patios, decks, walkways, driveways and parking areas

ii. 25 feet from swimming pools

2. No vehicular traffic or parking is allowed in the area of the treatment and disposal system.

3. Advanced treatment, pump chamber, and Subsurface Drip Irrigation field shall not be located under dwellings or other permanent structures.

4. Disposal shall not be located in depressed areas where surface water will accumulate. Provision shall be made to minimize the flow of surface water.

5. 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.

6. 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 a Subsurface Drip Irrigation System.

7. Drip Tubing shall be on contour and shall not be installed perpendicular (or up and down, etc.) to the slope. Elevation differences in a line or the entire grid shall not exceed the drip tubing manufacturers' specifications.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.5. **Treatment:**

1. Wastewater effluent 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 Regulations Governing Residential Individual Onsite Wastewater Disposal Systems: Certification. The type of treatment must also conform to drip tubing manufacturers' specifications.

2. The treatment and dosing chamber shall be designed, constructed and installed so all joints, seams, and component parts shall preclude infiltration of groundwater, and prevent escape of wastewater or liquids.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.6. **Distribution:**

1. Drip Tubing

   a. The drip tubing may be installed using any of the following methods:

      i. Excavation by a trenching machine.

      ii. Approved plowing method as determined by the tubing manufacturer. The insertion tool must be of the type that does not pull or stretch the drip line during insertion. The use of "cable plows" or any type insertion method that employs pulling the drip line through the plowed trench is prohibited.

   b. To insure equal dosing of the field there can be no more than a 10 percent variance in the flow between any 2 emitters in the entire field.

   c. The length of each distribution line shall not exceed drip tubing manufacturer's specifications to insure equal distribution to each emitter.

   d. If necessary, pressure compensating devices or regulators shall ensure equal distribution from all emitters at +/- 10% of the designed discharge rate.

   e. Emitter outlet orifices are non-directional device.

2. Pump Chambers

   a. During normal operating procedures the inlet to the treatment system shall not become surcharged.

   b. The pump chamber shall have a minimum capacity of 1.5 times the estimated daily flow.

   c. The pump chamber shall be equipped with an audible high water alarm, and may utilize a functional self-opening relief valve.

d. The pump chamber shall have a grade level access allowing a minimum of 17 inch diameter or 15 inch square, to allow servicing and/or removal of the largest component in the chamber. Access ports shall be protected against unauthorized entrance or removal, by use of tamper proof fasteners or a lid weighing 65 pounds or more.

e. The pump 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 1 inch in diameter.

f. The pump chamber shall be made of material resistant to the corrosive effects of wastewater and designed to withstand the lateral and bearing loads to which it is expected to be subjected.

g. All openings shall be sealed with mastic, butyl rubber or other pliable sealant that is waterproof, corrosion resistant and approved for use in contact with wastewater, in a manner to prevent the entrance of surface and groundwater.

h. The high water alarm must be set as to allow a reserve capacity equal to ½ day estimated flow.

3. Minimum Pump Specifications

a. The pumping system shall be capable of dosing the disposal field a minimum of 6 equally spaced doses per 24 hour period. Each dose volume shall not exceed the estimated maximum daily flow divided by the number of dosing cycles. It is acceptable that daily usage of less than the design flow rate will result in a diminished number of cycles. An emergency override float is required to accommodate conditions which exceed the normal daily flow rate. (Table III).

b. The pumping system shall be designed to discharge the required volume of wastewater within the pressure range specified by all component-manufacturers.

c. The pump shall be equipped with a low water cutoff to prevent damage to the pump during low water conditions in the pump chamber.

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

e. The pump shall be sized per pump and components manufacturers' specifications to meet or exceed the hydraulic requirement of the system.

f. The pump shall be installed as not to violate the pump warranty.

g. The suction and pressure lines shall be Schedule 40 or equal and be sized to meet or exceed the hydraulic requirements of the system.

4. Minimum Filter Specifications

a. The filter shall filter effluent to prevent clogging to the specifications of the drip tubing manufacturer.

b. The filter shall achieve the required filtration at a rate equal to or greater than the peak discharge rate, including filter and/or system backwash.

c. An independent third party, acceptable to the Division, shall certify the filter performance. Verification from a manufacturer of filters or by an independent registered Professional Engineer.

d. The filter shall be made of material resistant to the corrosive effects of wastewater and common household chemicals.

e. The filter shall be readily accessible for inspection, service and/or maintenance.

f. The filter flush volume and velocity shall be per filter manufacturer's specifications.

g. The filter residue shall be returned to the treatment system.

h. The Subsurface Drip Irrigation System must provide an automatic field flush to prevent the build-up of solids in the distribution system, with its discharge returning to the treatment system and be capable of achieving a flushing velocity of a minimum of 1 foot per second. The return line must be permanently installed as a component of the system. A hose bib shall be prohibited as a component.

5. Component Specifications

a. Vacuum breakers shall be installed as per drip tubing manufacturer's specification, a minimum of 1 vacuum breaker/air release valve for each drip field zone.

b. Vacuum breakers shall be located in a protective enclosure that will prevent the accumulation of any substance that would prevent their proper operation and shall have a grade level access.

c. All materials shall meet applicable *American Society for Testing and Materials (ASTM)* standards and be resistant to common household chemicals. The drip tubing manufacturer must certify drip tubing as designed and manufactured for the disposal of wastewater. The drip tubing must be color coded, by the manufacturer, to be easily identified as tubing designed for wastewater disposal.

d. Equipment susceptible to freezing must be adequately protected.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.7. **Documentation:**

1. Installation Manual

a. The drip manufacturer must provide for registration, detailed instructions for installation, initiation of service and operation and maintenance to the distributor, installer and Division of On-site Wastewater. Specific instructions shall include but not limited to:

i. Recommendations concerning types of wastewater which cannot be disposed of by the system.

ii. Arrangement of plumbing connections.

iii. Electrical wiring of components.

iv. Installation instructions that specifies how to locate the system in well drained areas that also provides protection for vents, pumps, filters and controls from snow, ice, or water vapor accumulations.

v. A drawing with each major component numbered, and identified with the same designation on an illustration, photograph, or print.

vi. Recommended frequency of maintenance; maintenance instructions; and procedures for removal and disposal of wastes.

2. Homeowner's Manual

a. A Homeowner's manual shall be provided to the consumer by the drip tubing and advanced treatment unit manufacturers with each Subsurface Drip Irrigation system. The manual shall include:

i. Model number.

ii. Design and flow diagrams.

iii. Limited warranties.

iv. Replacement and service policies.

v. General installation instructions that specifies how to locate the system in well-drained areas that also provides protection for vents, pumps, filters, and controls from snow, ice, or water vapor accumulations.

vi. Detailed operation and maintenance requirements (including consumer responsibility, parts, and service).

vii. Recommendations concerning types of wastewater which cannot be disposed of by the system.

viii. Arrangement of plumbing connections.

ix. Electrical wiring of components.

3. Limited Warranty

a. The manufacturer shall provide a 2 year limited warranty, from date of installation, covering all parts and materials.

b. Each manufacturer shall furnish the consumer with a limited warranty identifying the replacement policy covering all mechanical and electrical component parts.

4. Initial Service Policy

a. A 2 year initial service policy shall be furnished to the consumer by the manufacturer, and shall be included in the original purchase price. This policy shall provide as a minimum:

i. The 4 inspection/service calls (at least one every 6 months) over the 2 year period including inspection, adjustment, and servicing of mechanical, electrical, and other applicable component parts to insure proper function. The first inspection shall be conducted a minimum of 6 months from installation.

b. If any improper operation is observed, which cannot be corrected at the time of the service call, the consumer and the Department shall be notified immediately in writing of the conditions and the estimated date of correction.

5. Continuing Maintenance Agreement

   a. A continuing maintenance agreement, in perpetuity, is required on Subsurface Drip Irrigation Systems. Property owner must submit an Affidavit (Maintenance) and a copy of the current continuing maintenance agreement before system is approved or re-approved as an existing system.

6. Stand-by Parts

   a. Standby mechanical and electrical component parts shall be stocked by the local distributor for use when the drip system's mechanical or electrical components must be removed from the installation site for repairs.

7. Guaranteed Parts

   a. The physical, mechanical and electrical component parts shall be guaranteed against any defects in material and workmanship as warranted. The cost of replacing damaged component parts, not due to reasonable wear and tear, is excluded from this provision.

8. Mechanical Parts

   a. Mechanical parts shall be protected against damage or impairment of efficiency by flooding or surcharging.

   b. Mechanical parts shall not require periodic maintenance or adjustment by the consumer other than changing a fuse and similar devices, or visual inspection of the warning light.

   c. Mechanical parts shall be covered by the manufacturer's limited warranty.

9. Service

   a. Service shall be available within no more than 2 days following a request.

10. Service Label

    a. A clearly visible, permanently attached label or plate, giving instructions for obtaining service, shall be placed at the audible signal.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.8. **Responsibility:** The consumer shall be responsible for maintaining and operating the Subsurface Drip Irrigation System in accordance with the Regulations Governing Individual On-site Wastewater Disposal Systems, Appendixes, advanced treatment system manufacturer's specifications and the drip tubing manufacturer's specifications.

SOURCE: Miss Code Ann. §41-67-3

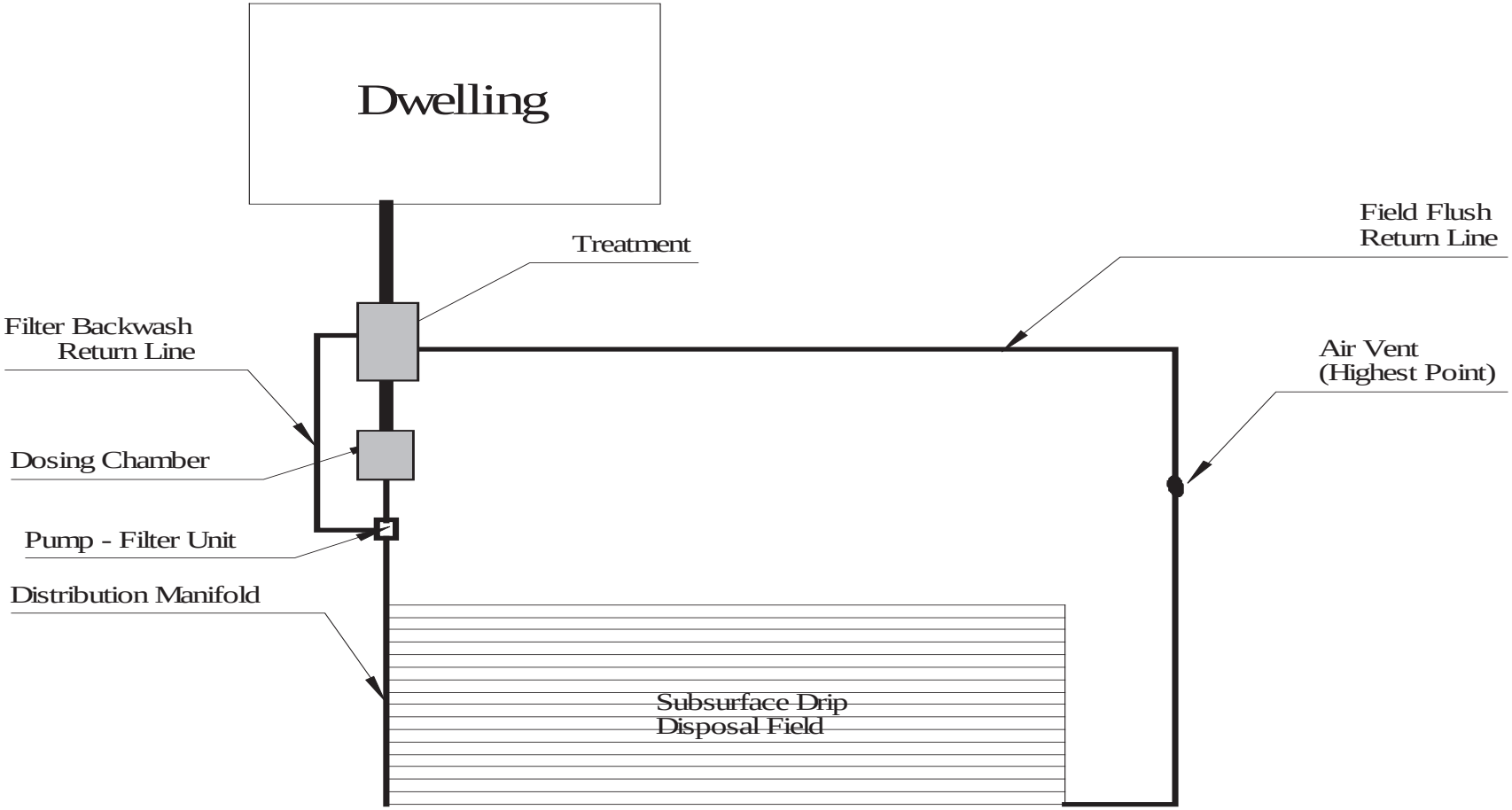
Rule 5.6.9. **Existing System:** In addition to the visual inspection conducted by the Environmentalist the following will apply:

1. The system must be inspected by a Certified Installer that is manufacturer's authorized representative to verify that the Subsurface Drip Irrigation System is functioning.

2. The manufacturer's authorized representative must furnish written verification, to the Department, that an inspection was made.

SOURCE: Miss Code Ann. §41-67-3

Figure I – Subsurface Drip Irrigation System (Example Sketch Only)



SOURCE: Miss Code Ann. §41-67-3

Table I – SIZING - Drip Irrigation

Results of the Soil and Site Evaluation

Soil Textural Class	Loading Rate GPD/ Ft^2	Lf Per Bedroom	Additional Lf/Person Over 2 Person Per	Depth of Drip Line in Inches
Gravel	NOT SUITABLE			
Coarse Sand	0.5	130	65	6-18
Medium Sand	0.5	130	65	6-18
Fine Sand	0.5	130	65	6-18
Loamy Sand	0.5	130	65	6-18
Sandy Loam	0.3	217	109	6-18
Light Loam	0.3	217	109	6-18
Heavy Loam	0.3	217	109	6-18
Silt Loam	0.3	217	109	6-18
Sandy Clay Loam	0.3	217	109	6-18
Light Clay Loam	0.15	434	217	6-18
Heavy Clay Loam	0.15	434	217	6-18
Light Silty Clay Loam	0.15	434	217	6-18
Heavy Silty Clay Loam	0.15	434	217	6-18
Sandy Clay	0.15	434	217	6-18
Silty Clay	0.05	1300	650	6-18
Clay	0.05	1300	650	6-18

SOURCE: Miss Code Ann. §41-67-3

Table II - **SETBACK REQUIREMENTS FROM SENSITIVE WATER (**Minimum Distance from the Water Edge)

Soil Textural Class	Slope of Less Than 8 Percent	Slope of More Than 8 Percent
Gravel	NOT APPLICABLE	
Coarse Sand	100 feet	100 feet
Medium Sand	100 feet	100 feet
Fine Sand	100 feet	100 feet
Loamy Sand	100 feet	100 feet
Sandy Loam	100 feet	100 feet
Light Loam	50 feet	100 feet
Heavy Loam	50 feet	100 feet
Silt Loam	50 feet	100 feet
Sandy Clay Loam	50 feet	100 feet
Light Clay Loam	50 feet	100 feet
Heavy Clay Loam	50 feet	100 feet
Light Silty Clay Loam	50 feet	100 feet
Heavy Silty Clay Loam	50 feet	100 feet
Sandy Clay	100 feet	100 feet
Silty Clay	100 feet	100 feet
Clay	100 feet	100 feet

SOURCE: Miss Code Ann. §41-67-3

Table III – Subsurface Drip Irrigation Pump Cycles (Minimum Requirements)

Pump Cycles/24 Hours	Gallons Pumped/Bedroom/Cycle	Additional Gallons Pumped Per Person Over 2 Per Bedroom
6	25	12.5
8	18.75	9.375
10	15	7.5
12	12.5	6.25

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.10. **Design Elevated Sand Mound Disposal System**

1. These guidelines present requisite site characteristics, design criteria, and construction techniques for on-site mound sewage systems. These guidelines provide a systematic approach to mound system design for typical domestic household wastewater. For systems serving other than single family dwellings the designer is cautioned that simple extrapolation of this information **may not** be appropriate.

2. When addressing wastewater flows that differ from a septic tank, such as those characterized by high biological oxygen demand (BOD5), total suspended solids (TSS), or oil and grease, the elevated sand-mound has inherent limitations. Wastewater from non-domestic sources should be evaluated on a case by case basis, to determine the amount of pretreatment necessary to apply to an elevated sand mound. The waste water applied to an elevated sand mound should not exceed 220 mg/l BOD5 or 145 mg/l TSS (no TSS particles should be retained on a 1/8th inch screen).

3. Mounds are an excellent treatment and disposal choice on appropriate sites, but they are not very forgiving. Special attention must be given to siting, design, pre-construction planning, site preparation, filter media selection, construction and maintenance of these systems. Quality control throughout the process cannot be overemphasized.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.11. **General:**

1. Successful function of any on-site system is characterized by a two-fold process: treatment and disposal. The final treatment is accomplished predominately by physical and microbiological/chemical processes within the soil environment. These processes are affected by:

   a. wastewater strength and characteristics,

   b. soil moisture levels

   c. the nature of the receiving soil, and

   d. the soil loading rate.

2. Disposal is primarily affected by the depth of the unsaturated receiving soils, their hydraulic conductivity, and the area available for disbursement. The mound system relies on a single-pass flow pattern in unsaturated flow conditions through specified filter media (sand) for sewage treatment. The elevated sand-mound system incorporates the disposal component by discharging directly into the underlying soil.

3. A elevated sand-mound system is characterized by:

   a. a pretreatment device (a septic tank with an approved filter, or a treatment plant)

   b. pressure distribution components (pumping chamber, pump and controls, and distribution laterals.), and

   c. the “mound” (fig. 1). The “mound” consists of:

      i. filter media (sand),

      ii. an absorption area,

      iii. a distribution system, and

      iv. a soil cap and topsoil cover.

(Figure 1)

4. A septic tank with an approved filter or a aerobic treatment unit may be used as the pretreatment for the elevated sand mound. The effluent, pumped from the pump chamber into the distribution network in the absorption bed area, flows through the filter media where it is treated through biological and chemical processes. The treated effluent then passes into the natural soil, that must have at least six (6) inches of unsaturated soil.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.12. Pre-Treatment: The preliminary treatment for an elevated sand-mound will be either an aerobic treatment unit or a septic tank with an approved filter. The pre-treatment method selected shall comply with the applicable sections of the Regulation Governing Individual Disposal.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.13. **Pumping Chambers:**

1. The pumping chamber shall have a minimum capacity of 750 gallons or twice the daily flow, whichever is the largest.

2. The pumping chamber shall be equipped with an audible and/or visual high water alarm.

3. The high water alarm must be set to allow a reserve capacity of 50% in the chamber when activated.

4. The pumping 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.

5. The pumping chamber shall be vented through the grade level access or by means of a separate vent. In either case, the vent shall be equal to or greater than two times the diameter of the inlet port of the pump.

6. The pumping chamber shall be made of material resistant to the corrosive effects of wastewater and designed to withstand the lateral and bearing loads to which it is subjected.

7. All openings shall be sealed with a mastic, butyl rubber, or other pliable sealant that is waterproof, corrosive resistant and approved for use in contact with wastewater, in a manner to prevent the entrance of surface and groundwater.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.14. **Minimum Pump Specifications:**

1. Although timed dosed systems are preferred, an elevated sand mound may utilize either a timed dosed or on-demand dosing cycles. Each dose volume shall not exceed the estimated maximum daily flow divided by the number of dosing cycles.

2. The pump selected must be able to fully charge the distribution system without hydraulically overloading the absorption area.

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

4. The pump shall be equipped with a low water cutoff to prevent damage to the pump during low water conditions.

5. The pump shall be sized per manufacturers' specifications to meet or exceed the hydraulic head of the system.

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

7. The suction and pressure lines shall be schedule 40 or equal and be sized to meet or exceed the hydraulic head of the system.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.15. **Distribution System Specifications:**

1. The distribution system in an elevated sand mound shall consists of three components:

    a. a pressurized distribution manifold- that shall consist of a small diameter (1"- 1.5") schedule 40 pipe, to receive the effluent from the pump. This pipe shall be connected as to not create any dead ends, and shall have 3/8" holes drilled in it every 36" pointing up. See Figures 2 and 3. The effluent from the pump must come to the center of this distribution manifold and absorption area.

    b. field drain pipe to house the pressurized distribution manifold- A 4" field line pipe with the holes pointing down is acceptable. Other field drain pipe designs may be acceptable, but first must go through the experimental protocol.

    c. distribution media- ½" to 2.5" gravel to a depth of 1' is acceptable. The design of the absorption area must comply with design guidelines for gravel underground absorption. If other distribution media is approved, they must comply with the appropriate regulations and guidelines.

    d. **Figure 2: SIDE VIEW OF DISTRIBUTION SYSTEM IN ABSORPTION AREA OF AN ELEVATED SAND MOUND**

    e. **Figure 3: TOP VIEW OF ABSORPTION AREA WITH DISTRIBUTION NETWORK AND FIELD LINE PIPE.**

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.16. **Site Requirements for Elevated Sand Mounds:** It is not possible to outline every conceivable soil, site or design situation which may occur. The following section addresses basic criteria that every elevated sand-mound will need to follow.

1. Site conditions where elevated sand mounds are applicable:

    a. Permeable soils with high water tables: The elevated sand mound is useful in many difficult soils and can be effective in overcoming high water tables. In fact, the use of an elevated sand mound on permeable soils with high water tables may be the most practical use of this system. Whether the water table is seasonal or permanent, these soils have inadequate vertical separation to provide satisfactory treatment with conventional systems. The mound system addresses these conditions by elevating the absorption area to achieve the needed vertical separation. Passing

the effluent through the filter media will result in a more thoroughly treated effluent, before it reaches the water table.

b. Slowly permeable soils: The elevated sand mound has an application on these soils, although may be costly due to the size of the basal area required. The elevated sand mound applies the effluent to the lighter textured top soil over a large area moving laterally until it is absorbed into the less permeable subsoil. On slowly permeable soils with high water tables, 5:1 side slopes are recommended.

c. Excessively permeable soils: These sites present the risk of inadequate wastewater treatment before it reaches unprotected aquifers. The elevated sand-mound system treats the wastewater to a higher level before it reaches the excessively permeable sub-soil.

2. Slope limitations with elevated sand mounds: Slope limitations for elevated sand-mounds are more restrictive than for conventional systems, particularly for mounds used on sites with slowly permeable soils. Elevated sand-mounds should not be considered on sites with slowly permeable soils and slopes of 6% or steeper. Elevated sand-mounds should not be considered on sites with permeable soils and slopes of 12% or greater. Figures 4 and 5 show how to place an elevated sand-mound on a flat and sloping site.

a. **Figure 4**

b. **Figure 5**

3. Minimum soil depth requirements - This is probably the most important factor determining how well the elevated sand-mound will function. If the soil has a restrictive horizon, the seasonal water table may not be any closer than 6 inches from the surface. If the soil does not have a restrictive horizon, the seasonal water table may not be any closer than 12 inches from the surface. If the restrictive horizon is not well defined, 12" of unsaturated soil is required. In all cases, there shall be a minimum of a 24" separation between the bottom of the absorption area and the water table.

4. Topography-Slopes - On permeable soils the maximum slope for the elevated sand mound is 12%. On slowly permeable soils (light clay loam or heavier) the maximum allowable slope for the elevated sand-mound is 6%. A crest of a slope is preferred because the elevated sand-mound can be situated to allow flow in both directions away from the filled area. It is certainly preferred that the design allows for the effluent to flow away from the elevated sand mound.

5. Level sites-Design should allow the effluent to flow in every direction away from the elevated sand-mound. On level sites with slowly permeable

soils, effluent may have a tendency to stack under the absorption area that may result in surface seepage around the base of the mound. The elevated sand-mounds should be placed in areas that allow the effluent to flow away from the filled area.

6. Setback requirements- The set back requirements on Table 1 will be from the perimeter of the basal area, although no part of the system shall extend fully to a property line. The edge of the side slope must be at least 3 feet from a property line.

    a. **Table 1: Setbacks**

7. Reserve area- An area must be set aside to replace the elevated sand mound in the case of failure. Due to the nature of a mound failure the following criteria must be met:

    a. the area must be large enough to replace the entire system in a new untouched area.

    b. the area must meet all the initial requirements of the original mound system, including but not limited to soil conditions, water table restrictions and setback requirements.

    c. the area must not be used by property owner in a way which would adversely affect the placement of a new elevated sand mound system.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.17. **System Design:**

1. A soil and site evaluation must be performed on the lot. See also Section VII. The loading rate of the natural soil must be determined from Table 2:

    a. **Table 2: Soil loading rates**

2. Determine the average daily flow from the residence: Number of bedrooms X 130 gallons per day

3. Determining the size of the absorption area, basal area, side slopes, and maximizing length requirements:

    a. Sizing the absorption area – The absorption area size shall be determined by the **loading** rate of the fill material. The fill material shall be coarse sand, 0.5-1.0 mm (USDA designation), and is the same as concrete sand (Section S-703, MS Standard Specification for State Aid road and bridge construction). The **loading rate** of this material is 1.2 gallons per day per square foot. Note: A fill

material as heavy as a light loam may be used, but this will change the size of the absorption area size. Use the appropriate **loading rate** of the fill to calculate the absorption area.

i. Example: Three (3) bedroom home @ 390 gallons per day

ii. 390 gallons per day / 1.2 gallons per day per square foot = 325 square feet

iii. Absorption area = 325 square feet

b. Sizing the basal area: Using the information gathered from the soil and site evaluation, determine the loading rate of the natural soil within two (2) feet of the surface. Use the heaviest textured soil loading rate to size the basal area. Divide the average daily flow from the residence by the loading rate of the natural soil.

i. Example: Three (3) bedroom home @ 390 gallons per day a natural soil of a heavy loam

ii. 390 gallons per day /0.45 gallons per day per square foot = 867 square feet basal area

c. Maximizing length of the elevated sand mound: To the greatest extent possible, the elevated sand mound should be as long as possible. The length of the basal area and absorption area must always be at least 4 times the width. However, the width of the absorption area shall never be less than 2 feet.

d. Filter media depth: There shall be a vertical separation between the seasonal water table and the bottom of the absorption area of at least 2 feet in every situation. This separation may include up to 12 inches of unsaturated natural soil.

e. Calculation of side slopes: Side slope requirements will be different on level sites than on sloping sites. The side slope on the downhill side must be longer than the side slope going up hill. The following chart gives the correction factor on various slope conditions:

(Table 3: Correction factors)

i. Example: Given: 3' high mound with 9' side slopes placed on a 6% slope.

ii. Table 3: Correction factors

iii. Upslope side slope: 9' X .85 = 7.65' side slope

iv. Downslope side slope: 9' X 1.22 = 10.98' side slope

f. **Figure 6**

g. **Figure 7**

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.18. System Placement

1. 1. All components of the elevated sand mound system shall be located a minimum of:

   c. Five feet from any dwelling.

   d. Ten feet from any property line.

2. The aerobic treatment plant, septic tank, and pump chamber shall be located a minimum of 50 feet from any public, private or individual potable water source.

3. The elevated sand mound shall be located at a lower elevation and a minimum of 100' from any public, private, or individual potable water source.

4. Potable water lines shall not pass under or through any part of the elevated sand mound system. Where a water supply line must cross a sewer line, the bottom of the water service within ten feet of the point of crossing, shall be at least 12" above the top of the sewer line. The sewer line shall be of Schedule 40 pipe with cemented joints at least ten feet on either side of the crossing. Water and sewer lines shall not be laid in the same trench. The water and sewer lines shall maintain a minimum separation distance of ten feet.

5. The area for the mound or the replacement area shall not be used for vehicular traffic or vehicular parking.

6. Aerobic treatment plants, septic tanks, pumping chambers or disposal system shall not be placed under a dwelling or other permanent structure.

7. Elevated sand mounds 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 disposal system area.

8. Elevated sand mounds located on slopes of less than eight percent shall have a minimum setback from recreational waters, shellfish waters or other sensitive areas as prescribed in Table 4.

9. Elevated sand mounds located on slopes of greater than eight percent or greater shall be located a minimum of 100 feet from recreational waters, shellfish waters and other sensitive areas.

10. Where all or part of the elevated sand mound is proposed to be installed on property other than the owner's, an easement in perpetuity shall be legally recorded in the proper county. The easement shall be of sufficient area to permit access, construction and maintenance of the elevated sand mound.

11. No site for an elevated sand mound or replacement area shall be located wholly within an area which is frequently flooded, swamp, marsh, or wetland. Except that if permits have been issued by the proper regulatory agency authorizing the use of wetlands for building sites and the installation of an individual onsite wastewater disposal system. The property shall be evaluated using standard soil and site criteria for IOWDS.

12. When a proposed lot is located partially within a frequently flooded area, that portion of said lot not within the flood prone area may be considered for approval for the elevated sand mound.

13. A minimum of 6 (six) inches of naturally occurring soil must be present above a restrictive horizon or a predominantly gray soil before placement of any fill.

14. 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 an elevated sand mound.

SOURCE: Miss Code Ann. §41-67-3

Rule 5.6.19. Construction

1. Site Preparation: Good construction techniques are essential if the mound is to function properly. The following techniques should be considered:

    c. Step 1: Rope off the site to prevent damage to the area during other construction activity on the lot. Vehicular traffic over the area should be prohibited to avoid soil compaction.

    d. Step 2: Stake out the mound perimeter and bed in the proper orientation. Reference stakes set some distance from the mound perimeter are also required in case the corner stakes are disturbed.

    e. Step 3: Cut and remove any excessive vegetation. Trees should be cut at ground surface and the stumps left in place.

f. Step 4: Measure the average ground elevation along the upslope edge of the bed to determine the bottom elevation of the bed.

g. Step 5: Install the delivery pipe from the dosing chamber to the center of the mound. Lay the pipe below the frost or slope it uniformly back to the dosing chamber so it may drain after dosing. Back fill and compact the soil around the pipe.

h. Step 6: Plow the area within the mound perimeter. Use a two bottom or larger moldboard plow, plowing 7 to 8 in. (18 to 20 cm) deep parallel to the contour. Single bottom plows should not be used, as the trace wheel runs in every furrow, compacting the soil. Each furrow should be thrown upslope. A chisel plow may be used in place of a moldboard plow. Roughening the surface with backhoe teeth may be satisfactory, especially in wooded sites with stumps. Rototilling is not recommended because of the damage it does to the soil structure. However, rototilling may be used in granular soils, such as sands. Plowing should not be done when the soil is too wet. Smearing and compaction of the soil will occur. If a sample of the soil taken from the plow depth forms a wire when rolled between the palms, the soil is too wet. If it crumbles, plowing may proceed.

2. Fill Placement

c. Step 1: Place the fill material on the upslope edges of the plowed area. Keep trucks off the plowed area. Minimize traffic on the downslope side.

d. Step 2: Move the fill material into place using a small track type tractor with a blade. Always keep a minimum of 6 in. of material beneath the tracks of the tractor to minimize compaction of the natural soil. The fill material should be worked in this manner until the height of the fill reaches the elevation of the top of the absorption bed.

e. Step 3: With the blade of the tractor, form the absorption bed. Hand level the bottom of the bed, checking it for the proper elevation. Shape the sides to the desired slope.

3. Distribution Network Placement

c. Step 1: Carefully place the coarse aggregate in the bed. Do not create ruts in the bottom of the bed. Level the aggregate to a minimum depth of 6 in. (15 cm).

d. Step 2: Assemble the distribution network on the aggregate. The manifold should be placed so it will drain between doses, either out

the laterals or back into the pump chamber. The laterals should be laid level.

e. Step 3: Place additional aggregate to a depth of at least 2 in. (5 cm) over the crown of the pipe.

f. Step 4: Place a suitable backfill barrier over the aggregate.

4. Covering

c. Step 1: Place finer textured soil material such as clay or silt loam over the top of the bed to a minimum depth of 6 in. (15 cm).

d. Step 2: Place 6 in. (15 cm) of good quality topsoil over the entire mound surface.

e. Step 3: Plant grass over the entire mound using grasses adapted to the area. Shrubs can be planted around the base and up the sideslopes. Shrubs should be somewhat moisture tolerant since the downslope perimeter may become moist during early spring and late fall. Plantings on top of the mound should be drought tolerant, as the upper portion of the mound can become dry during the summer.

5. Operation and Maintenance

c. Routine Maintenance: A properly designed and constructed mound should operate satisfactorily with virtually no regular maintenance.

d. Rehabilitation: Three failure conditions may occur within the mound. They are (1) severe clogging at the bottom of the absorption area, (2) severe clogging at the fill material and natural soil interface, and (3) plugging of the distribution network. Usually these failures can be easily corrected.

i. If severe clogging occurs at the bottom of the absorption bed, its cause should first be determined. If it is due to failure to maintain the pretreatment unit, hydrogen peroxide to oxidize the accumulated organics at the infiltrative surface could be used. The chemical can be applied directly to the bed or through the dosing chamber. Because of the danger in handling this strong oxidant, this treatment should be done by professionals.

ii. If the clogging is due to overloading or unusual wastewater characteristics, efforts should be made to reduce the wastewater volume or strength. It may be necessary to

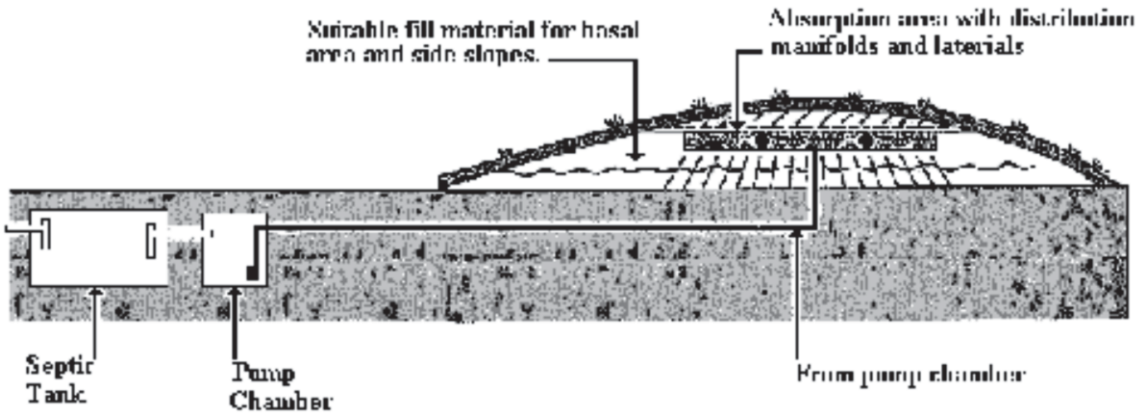
enlarge the mound. The mound cap should be removed and the aggregate in the absorption bed stripped out. The area downslope of the mound should be plowed and additional fill added to enlarge the mound to the proper size. The absorption bed can then be reconstructed.

iii. Severe clogging at the fill and natural soil interface will cause surface seepage at the base of the mound. This area should be permitted to dry and the downslope area plowed. Additional fill can then be added. If this does not correct the problem, the site may have to be abandoned.

iv. Partial plugging of the distribution piping may be detected by extremely long dosing times. The ends of the distribution laterals should be exposed and the pump activated to flush out any solid material. If necessary, the pipe can be rodded.

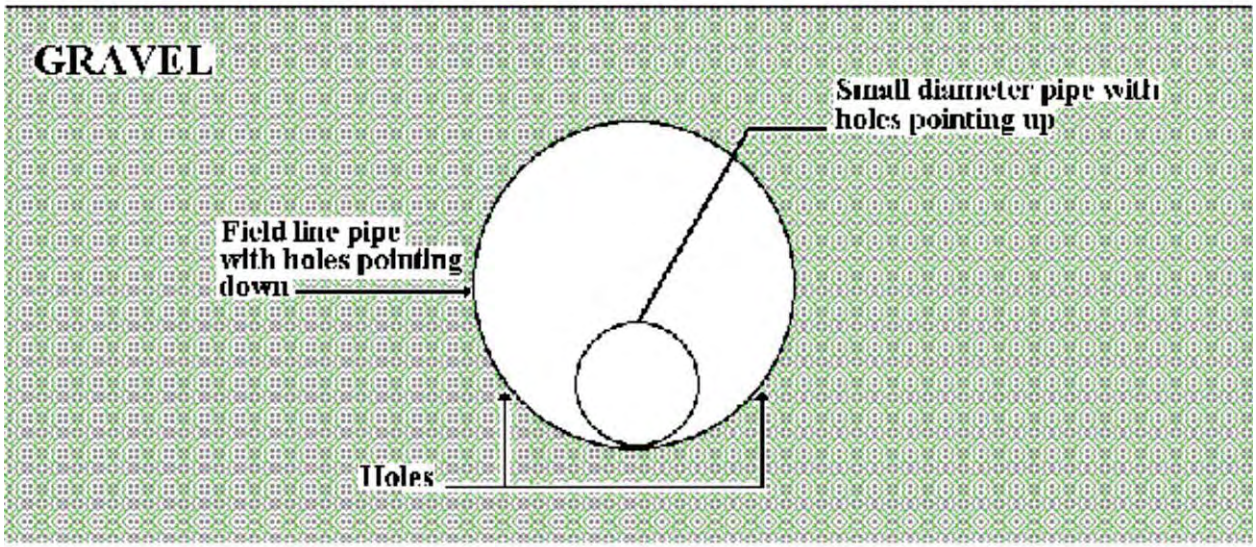
SOURCE: Miss Code Ann. §41-67-3

Figure 1 – Elevated Sand Mound (Example Sketch Only)



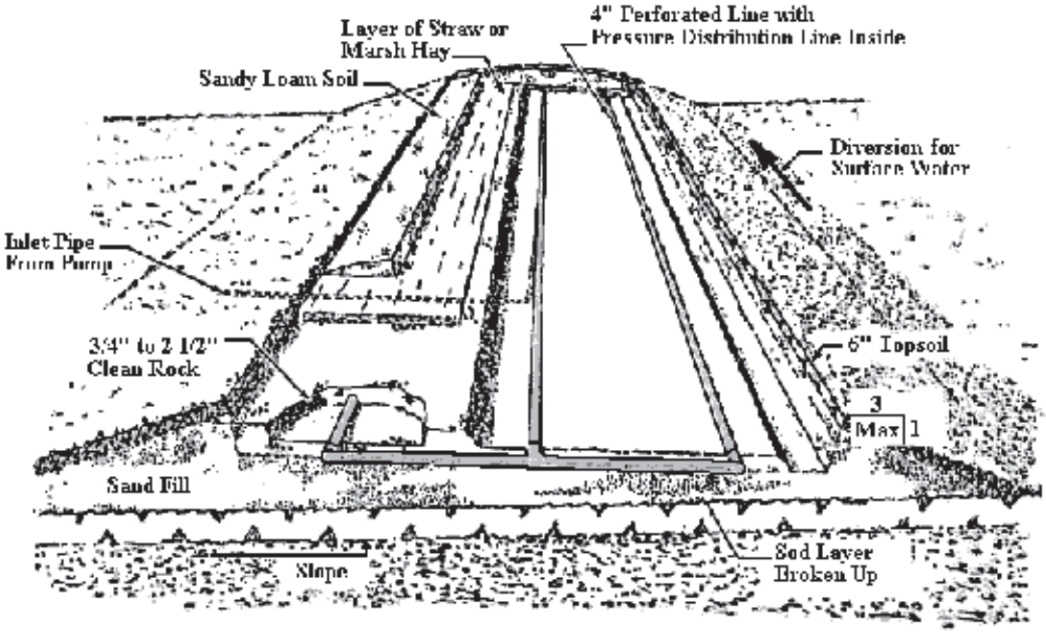
SOURCE: Miss Code Ann. §41-67-3

Figure 2 – Side View of Distribution System and Absorption Area



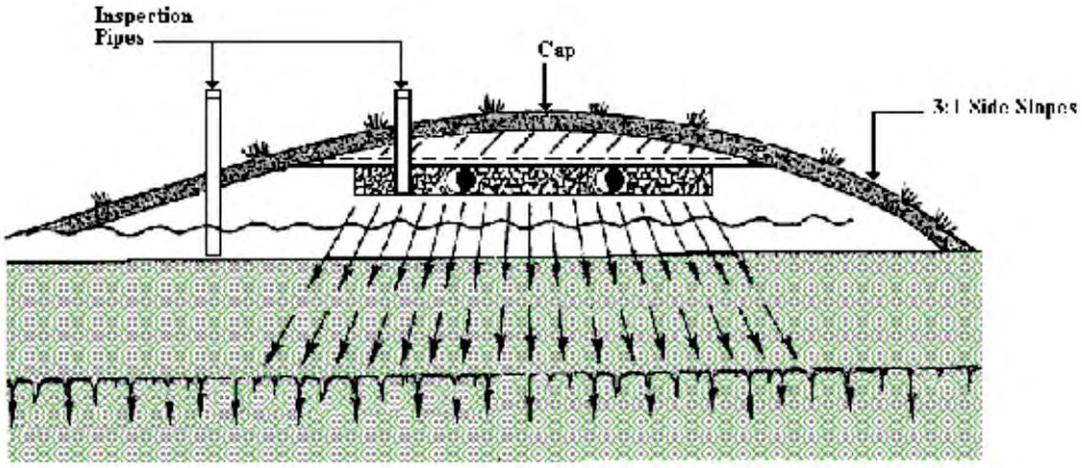
SOURCE: Miss Code Ann. §41-67-3

Figure 3 – Top View of Absorption Area with Distribution Network and Field Line Pipe



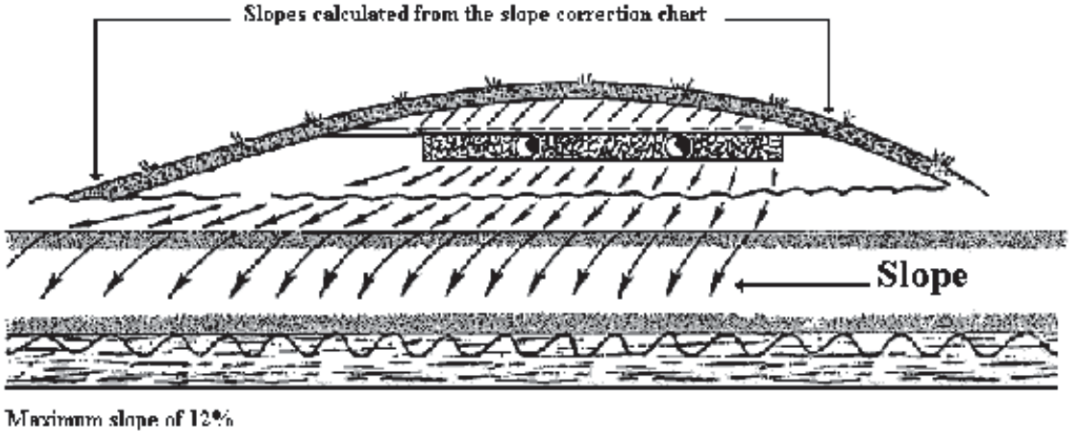
SOURCE: Miss Code Ann. §41-67-3

Figure 4 – Level Site Placement



SOURCE: Miss Code Ann. §41-67-3

Figure 5 – Sloping Site Placement



SOURCE: Miss Code Ann. §41-67-3

Figure 6 – Side Slope Calculation (Examples)

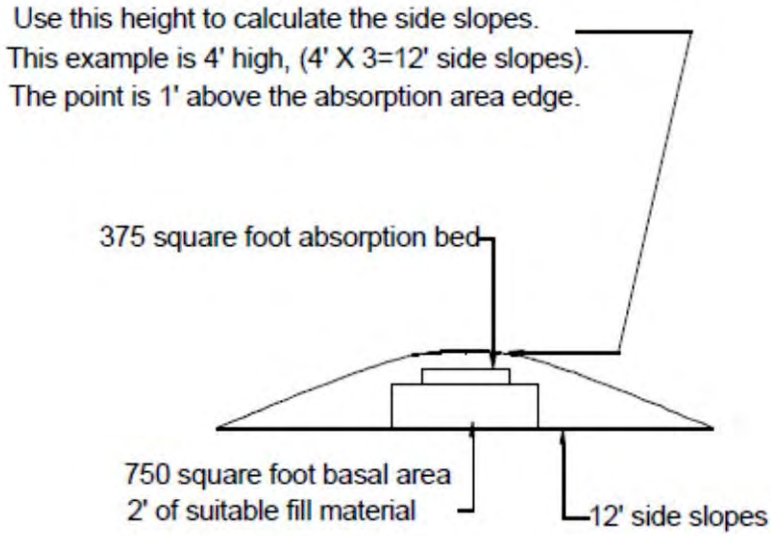
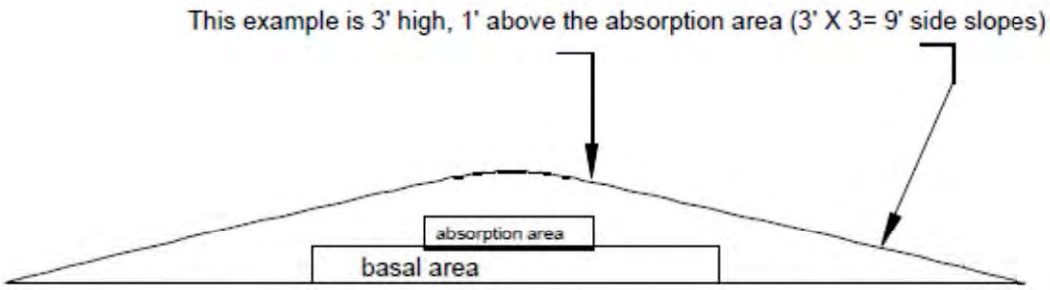


Figure 7



SOURCE: Miss Code Ann. §41-67-3

Table I – Setback Requirements

	When the item setback from is uphill	When the item setback from is downhill
Setback distances from property lines, driveways, buildings, ditches, etc.	10 feet	30 feet
Setback from wells	100 feet	Mound must be downhill from well on property. All other cases 100'.
Slope 8% or less for sensitive waters	Coarse to medium sand, fine sand, loamy sand, silty clay, clay	100 ft
Slope 8% or less for sensitive waters	Loam, silt, silt loam, sandy clay loam, silty clay loam, clay loam	50 ft

SOURCE: Miss Code Ann. §41-67-3

Table II – Soil Loading Rates

Soil Textural Class	Ribbon Length (inches)	EPA Manual Appl. rate gpd/ft^2
Gravel and Coarse Sand		1.2
Coarse to Medium Sand	-	1.2
Fine Sand, Loamy Sand	-	0.8
Sandy Loam	<.5	0.6
Loam	<.5	0.6
	.5-1	0.45
Silt Loam	<1	0.45
Sandy Clay Loam	1-2	0.45
*Silty Clay Loam or, *Clay Loam	1-1.5	0.30
	1.5-2.0	0.20

SOURCE: Miss Code Ann. §41-67-3

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)%.