INDIANA STATE DEPARTMENT OF HEALTH

RULE 410 IAC 6-8.1

RESIDENTIAL SEWAGE DISPOSAL SYSTEMS

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INDIANA STATE DEPARTMENT OF HEALTH
1330 WEST MICHIGAN STREET
INDIANAPOLIS, IN 46206

RULE 410 IAC 6-8.1

TABLE OF CONTENTS

LIST OF TABLES

INDIANA STATE BOARD OF HEALTH

Rule 410 IAC 6-8.1
Residential Sewage Disposal Systems

Adds 410 IAC 6-8.1 to update and clarify the requirements pertaining to the design, construction, installation, maintenance, and operation of residential sewage disposal system. Repeals 410 IAC 6-8. Effective 30 days after filing with the secretary of state.

410 IAC 6-8.1-1 "ABS" defined

Sec 1. As used in this rule, "ABS" means acrylonitrile-butadiene-styrene.

410 IAC 6-8.1-2 "ASTM" defined

Sec 2. As used in this rule, "ASTM" means American Society for Testing and Materials.

410 IAC 6-8.1-3 "Board" defined

Sec 3. As used in this rule," board" means the Indiana state board of health.

410 IAC 6-8.1-4 "Commissioner" defined

Sec 4. As used in this rule, "commissioner" means the commissioner of the Indiana state board of health or his legally authorized representative.

410 IAC 6-8.1-5 "Distribution box" defined

Sec 5. As used in this rule, "distribution box" means a structure designed to distribute effluent by gravity from a septic tank equally into the pipes of an absorption system connected thereto.

410 IAC 6-8.1-6 "Drainageway" defined

Sec 6. As used in this rule, "drainageway" means the channel portion of the landscape in which surface water or rainwater runoff gathers intermittently to flow to a lower elevation.

410 IAC 6-8.1-7 "Dwelling" defined

Sec 7. As used in this rule, "dwelling" means any house or place used or intended to be used as a place of seasonal or permanent human habitation or for sleeping for one (1) or two (2) families.

410 IAC 6-8.1-8 "Residential sewage disposal system failure" defined

Sec 8. As used in this rule, "residential sewage disposal system failure" means a residential sewage disposal system which exhibits one (1) or more of the following:

(1) The system refuses to accept sewage at the rate of design application thereby interfering with the normal use of residential plumbing fixtures.

(2) Effluent discharge exceeds the absorptive capacity of the soil, resulting in ponding, seepage, or other discharge of the effluent to the ground surface or to surface waters.

(3) Effluent is discharged from the system causing contamination of a potable water supply, ground water, or surface waters.

A failed residential sewage disposal system is a health hazard.

410 IAC 6-8.1-9 "Fill" defined

Sec 9. As used in this rule, "fill" means soil transported and deposited by man, as well as soil recently transported and deposited by natural erosion forces. Fill is evidenced by one (1) or more of the following:

(1) No soil horizons or indistinct soil horizons.
(2) Depositional stratification.
(3) Presence of a soil horizon which has been covered.
(4) Materials in a horizon such as cinders or construction debris.
(5) Position in the landscape.

410 IAC 6-8.1-10 "Foundation drain" defined

Sec 10. As used in this rule, "foundation drain" means that portion of a residential drainage system provided to drain only ground water from outside of the foundation of the house or from under the basement floor.

410 IAC 6-8.1-11 "Health officer" defined

Sec 11. As used in this rule, "health officer" means the health officer of a local board of health.

410 IAC 6-8.1-12 "Loading rate" defined

Sec 12. As used in this rule, "loading rate" means the allowable rate of application of septic tank effluent to the soil. It is expressed in gallons per day per square foot.

410 IAC 6-8.1-13 "Owner" defined

Sec 13. As used in this rule, "owner" means the owner of a dwelling or his agent.

410 IAC 6-8.1-14 "Person" defined

Sec 14. As used in this rule, "person" means any individual, partnership, copartnership, firm, company, corporation, association, trust, estate, or any other legal entity, its or their successors or assigns or agents of the aforesaid.

410 IAC 6-8.1-15 "PVC" defined

Sec 15. As used in this rule, "PVC" means polyvinyl chloride.

410 IAC 6-8.1-16 "Residential drain" defined

Sec 16. As used in this rule, "residential drain" means the horizontal piping in a house drainage system which receives the discharge from soil, waste, and drainage pipes inside the walls of the house and conveys the same to the residential sewer.

410 IAC 6-8.1-17 "Residential sewage disposal system" defined

Sec 17. As used in this rule, "residential sewage disposal system" means all equipment and devices necessary for proper conduction, collection, storage, treatment, and on-site disposal of sewage from a one (1) or two (2) family dwelling. Included within, but not limited to the scope of this definition, are residential sewers, septic tanks, soil absorption systems, temporary sewage holding tanks, and sanitary vault privies.

410 IAC 6-8.1-18 "Residential sewer" defined

Sec 18. As used in this rule, "residential sewer" means the horizontal piping beginning two (2) feet outside the house which carries discharges from the residential drain to its connection with a sanitary sewerage system or a residential sewage disposal system.

410 IAC 6-8.1-19 "Sanitary sewerage system" defined

Sec 19. As used in this rule, "sanitary sewerage system" means a sewer or a system of sewers which convey sewage away from the lot on which it originates to a wastewater treatment facility owned and operated by an incorporated city or town, conservancy district, regional sewer district, or private utility.

410 IAC 6-8.1-20 "SCS" defined

Sec 20. As used in this rule, "SCS" means United States Department of Agriculture, Soil Conservation Service.

410 IAC 6-8.1-21 "SDR" defined

Sec 21. As used in this rule, "SDR" means standard dimension ratio.

410 IAC 6-8.1-22 "Septic tank" defined

Sec 22. As used in this rule, "septic tank" means a watertight structure into which sewage is discharged for settling and solids digestion.

410 IAC 6-8.1-23 "Sewage" defined

Sec 23. As used in this rule, "sewage" means all water-carried waste derived from ordinary living processes.

410 IAC 6-8.1-24 "Sludge" defined

Sec 24. As used in this rule, "sludge" means the digested or partially digested solid material accumulated in a septic tank.

410 IAC 6-8.1-25 "Soil absorption" defined

Sec 25. As used in this rule, "soil absorption" means a process which utilizes the soil to treat and dispose of effluent from a septic tank.

410 IAC 6-8.1-26 "Soil absorption system" defined

Sec 26. As used in this rule, "soil absorption system" means pipes laid in a system of trenches or elevated beds into which the effluent from the septic tank is discharged for soil absorption.

410 IAC 6-8.1-27 "Soil horizon" defined

Sec 27. As used in this rule, "soil horizon" means a layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistency, kinds and numbers of organisms present, and degree of acidity or alkalinity.

410 IAC 6-8.1-28 "Soil profile analysis" defined

Sec 28. As used in this rule, "soil profile analysis" means the observation and evaluation of the physical characteristics of the soil horizons or layers to a depth of at least five (5) feet or, if shallower, to a layer which cannot be readily penetrated.

410 IAC 6-8.1-29 "Soil scientist" defined

Sec 29. As used in this rule, "soil scientist" means an individual with a baccalaureate degree with a major in agronomy, soils, or a closely allied field of science who is proficient in the application of the principles of pedology to soil classification, investigation, education, and consultation and on the effect of measured, observed and inferred soil properties and their use.

410 IAC 6-8.1-30 Administrative authority

Sec 30. (a) This rule shall be administered by the local boards of health through their health officer and his authorized representatives.

(b) Local boards of health which wish to adopt or amend a local ordinance governing the design, construction, and operation of residential sewage disposal systems shall do so only after the commissioner has confirmed in writing that the ordinance does not violate this rule or state sewage disposal statutes.

(c) Each local health department residential sewage disposal system permit program is subject to review by the board. Such review may include, but not be limited to, a review of the permits issued, supporting documentation, and a review of system installations.

(d) Whenever the board determines that there has been a violation of this rule, the commissioner shall notify the health officer. Such notice shall:

(1) be in writing;

(2) be sent to the health officer by certified mail;

(3) include a statement of the reasons for the issuance of the notice;

(4) specify the remedial action necessary to effect compliance with the rule; and

(5) allow reasonable time as determined by the board for the performance of any act it requires to correct the problem.

(e) If a health officer fails to comply with a directive issued in accordance with subsection (d), the board may require the health officer to submit all, or any portion thereof deemed appropriate by the board, of the permits proposed for issuance for residential sewage disposal system construction, together with all documentation upon which the proposed permit issuance will be based, to the commissioner for review and written approval prior to permit issuance by the health officer. Such review shall continue until the board is satisfied that compliance with the rule has been obtained and is likely to continue, and has so notified the health officer in writing.

410 IAC 6-8.1-31 General sewage disposal requirements

Sec 31.(a) No person shall throw, run, drain, seep, or otherwise dispose into any of the surface waters or ground waters of this state, or cause, permit, or suffer to be thrown, run, drained, allowed to seep, or otherwise disposed into such waters, any organic or inorganic matter from a dwelling or residential sewage disposal system that would cause or contribute to a health hazard or water pollution.

(b) The design, construction, installation, location, maintenance and operation of residential sewage disposal systems shall comply with the provisions of this rule.

(c) All residential sewage disposal systems utilizing sanitary privies shall conform to Indiana state board of health bulletin SE 11, "The Sanitary Vault Privy," 1986 Edition.

(d) Any dwelling which is not connected, or cannot be connected, to a sanitary sewerage system and which does not utilize a sanitary privy for its residential sewage disposal system shall be provided with a residential sewage disposal system which includes a septic tank and a soil absorption system that has not failed.

(e) A temporary sewage holding tank is an alternative method of sewage disposal subject to the written approval of the commissioner required in subsection (f). A temporary sewage holding tank shall not be used as a primary means of residential sewage disposal except where necessary to prevent continued discharge of wastewater from a failed existing system. A temporary sewage holding tank may be used as follows:

(1) As a temporary storage facility for no more than one (1) year where occupancy of the home must continue while the system is being renovated.

(2) Where such facility is owned and operated temporarily by a conservancy district, sewer district, private utility, or municipality as a part of its sewage disposal plan or for no more than one (1) year while connection to sanitary sewer is being secured.

(f) If any conditions preclude the installation of a residential sewage disposal system as described in this rule, the local board of health may not approve the use of any other alternative residential sewage disposal system without the express written approval of the commissioner.

(g) In order to permit development of new or more efficient sewage treatment or disposal processes, the commissioner may approve the installation of experimental equipment, facilities, or pollution control devices for which extensive experience or records of use have not been developed in Indiana. The applicant for such approval must submit evidence of sufficient clarity and conclusiveness to convince the commissioner that the proposal has a reasonable and substantial probability of satisfactory operation without failure.

(h) No portion of the residential sewage disposal system or its associated drainage system shall be constructed upon property other than that from which the sewage originates unless easements, which grant permission for such construction and access for system maintenance, have been obtained for that property and have been legally approved and recorded by the proper authority or commission.

(i) Residential sewage disposal systems shall not be used for the disposal of water from roof drains, foundation drains, swimming pool main drains, hot tub drains, or area drains. Neither shall they be used for the disposal of chemical wastes in quantities which would pollute ground water or inhibit solids settling or digestion in the septic tank.

(j) Any jetted bathtub with a capacity of greater than one hundred twenty-five (125) gallons will be treated as an extra bedroom for the system sizing requirements of this rule.

410 IAC 6-8.1-32 System failure correction

Sec 32. Should a residential sewage disposal system fail, the failure shall be corrected by the owner within the time limit set by the health officer.

410 IAC 6-8.1-33 Written permit

Sec 33. (a) The owner or agent of the owner shall obtain a written permit, signed by the health officer, for construction of a residential sewage disposal system prior to:

(1) Construction of a residence or placement of a mobile home which will not be connected to a sanitary sewerage system.

(2) Any replacement, reconstruction of, expansion or remodeling of a residence which may increase the number of bedrooms.

(3) Any addition to, alteration of, or repair of an existing residential sewage disposal system.

The application for such a permit shall be made on a form approved by the commissioner, which application shall contain information outlined in section 48 of this rule, the profile analysis of all the soils in which the system is to be constructed, and any other information deemed necessary by the health officer. Other than the approval referenced in subsection (c), the approval of a site by the local plan commission or the county recorder does not constitute approval by the local health officer. The provisions of this rule relating to system design and installation shall not apply where alterations become necessary due to system defect, failure, or malfunction. Such alterations shall be made in accordance with the best judgment of the local board of health except that such alterations shall not be contrary to section 31(a) of this rule and no portion of a soil absorption system shall be constructed to a depth greater than forty-eight (48) inches below the ground surface.

(b) If it is determined that the proposed system design does not meet the minimum requirements of this rule, the permit shall be denied and the owner shall be notified in writing of the basis for the denial. The notification shall also state that the owner has the right to appeal the denial and shall state the procedure for registering any such appeal.

(c) Individual lots in subdivisions designed to utilize on-site residential sewage disposal systems, for which the plats were approved by the local plan commission, county health department, or the county recorder, and recorded prior to the effective date of this rule are exempt from the provisions of sections 49(4) and 52(a) of this rule if the soils on

the individual lot have characteristics which would allow the soil to be rated "slight" or "moderate" in accordance with guidelines as set forth in the soils manuals and handbooks of the Soil Conservation Service. The soil absorption system to serve each lot which is exempted by this section shall meet the sizing criteria of Table I.

TABLE I

PERMEABILITY RATING	SQUARE FEET NEEDED IN TRENCH BOTTOM PER BEDROOM
2" to 6" per hour	250 square feet per bedroom
1" to 2" per hour	330 square feet per bedroom

(d) Individual lots in subdivisions designed to utilize on-site residential sewage disposal systems, the plats for which were approved by the local plan commission and recorded prior to the effective date of this rule will be granted an exemption by the state board from the provisions of section 49(4) of this rule if the health officer of the county in which the development is located certifies to the commissioner, in writing, that:

(1) the health department has reviewed and recommended approval to the local plan commission, either verbally, in writing, or by other locally acceptable routine procedure, when the subdivision plat was being considered by that agency; and

(2) that no lots in the subdivision currently have system failures as defined in section 8 of this rule.

The certification must be accompanied by a brief description of the system approved for each lot for which exemption is requested including information on the design of the system as well as information on the type of soil on the site. An affirmative response to subdivisions (1) through (2) must be included in the certification for the exemption to the provisions of section 49(4) of this rule to be granted.

(e) The permittee shall notify the health officer or his designee when the work is ready for final inspection and at least forty-eight (48) hours or two (2) working days before any subsurface portions are to be covered. The permit for a residential sewage disposal system that has been covered less than forty-eight (48) hours or two (2) working days after said notification has been made may be revoked by the health officer. Requirements of permits issued for the construction of residential sewage disposal systems shall not be considered as fulfilled until the installation is completed to the satisfaction of the health officer or his duly authorized representative.

(f) The board, its agent, or the health officer or his or her agent shall be permitted to enter upon all properties at the proper time for purposes of inspection, observation, measurement, sampling, and testing necessary to assure compliance with this rule.

410 IAC 6-8.1-34 Violation

Sec 34. (a) Any person found to be violating this rule may be served by the health officer with a written order stating the nature of the violation and providing a time limit for satisfactory correction thereof.

(b) After receiving an order in writing from the local board of health or the health officer, the owner of the property shall comply with the provisions of this rule as set forth in said order and within the time limit specified therein. Said order shall be served on the owner or the agent of the owner, but may be served on any person who, by contract with the owner, has assumed the duty of complying with the provisions of an order.

401 IAC 6-8.1-35 Revocation of permit

Sec 35. (a) If an applicant is refused a permit, the local board of health shall, upon request, afford the applicants the opportunity for a fair hearing. The parties involved may agree to use the procedures set forth in IC 4-21.5, the Administrative Procedure and Orders Act.

(b) The local board of health may revoke a permit which had been issued for construction of a residential sewage disposal system if it finds that the owner of the permit has failed to comply with this rule. Upon such notice the local board shall, upon request, afford the applicant the opportunity for a fair hearing. The parties involved may agree to use the procedures set forth in IC 4-21.5, the Administrative Procedure and Orders Act.

410 IAC 6-8.1-36 Location and size

Sec 36. (a) The residential sewer shall be located at least fifty (50) feet from any water supply well or subsurface pump suction line. Sewers constructed of water works grade ductile iron pipe with mechanical joints or PVC pressure sewer pipe with an SDR rating of twenty six (26) or less, having mechanical or compression gasket joints, may be located within the fifty (50) foot distance. In no case, however, shall sewers be located closer than twenty (20) feet to dug and bored water supply wells nor closer than ten (10) feet to drilled and driven water supply wells or subsurface pump suction lines.

(b) Water lines and sewers shall not be laid in the same trench. A horizontal separation of ten (10) feet shall be maintained between water lines and sewers. Where crossings are necessary, a minimum of eighteen (18) inches vertical clearance must be maintained. When it is impossible to maintain proper horizontal and vertical separation, the sewer shall be constructed of ductile iron pipe with mechanical joints or PVC pressure sewer pipe with an SDR rating of twenty-six (26) or less, having mechanical or compression gasket joints within ten (10) feet of the water line; said sewer shall be pressure tested to assure water tightness prior to back filling.

(c) The residential sewer shall be a minimum of four (4) inches in diameter. Four (4) inch sewers shall be installed with a positive slope of not less than four (4) inches in twenty-five (25) feet and not more than thirty-six (36) inches in twenty-five (25) feet. Six (6) inch sewers, if utilized, shall be installed with a positive slope of not less than two (2) inches in twenty-five (25) feet and not more than thirty-six (36) inches in twenty-five (25) feet.

410 IAC 6-8.1-37 Septic tanks; general requirements

Sec 37. (a) All septic tanks, dosing tanks, lift stations and soil absorption systems shall be located in accordance with Table II as follows:

TABLE II

Minimum Distance in Feet From	Septic Tank, Dosing Tank, Lift Station	Upslope From Absorption System	Downslope From Absorption System
Private water supply well	50*	50*	50*
Private geothermal well	50*	50*	50*
Commercial water supply well	100*	100*	100*
Commercial geothermal well	100*	100*	100*
Public water supply well or reservoir	200*	200*	200*
Other lake or reservoir	50	50	50
Stream, ditch, or drainage tile**	25	25	25
Dwelling, inground swimming pool, or other structure	10	10	50***
Front, side, or rear lot lines	5	5	5
Water lines continually under pressure	10	10	10
Suction water lines	50	50	50

*The distances enumerated shall be doubled for soil absorption systems constructed where there exist horizons, layers or strata within thirty-four (34) inches of the ground surface with a loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table V of section 49(4) of this rule, unless that hazard can be overcome through system design.

**See Table IV of section 43(d) of this rule for perimeter drain separation.

***If the slope of the site on which the absorption system is to be built is greater than two percent (2%) or if the loading rate of the soil in the dispersal area has a loading rate of three-tenths (0.3) gallons per day per square foot or less, at least fifty (50) feet of dispersal area must be provided downslope of the absorption system. If the slope of the site on which the absorption system is to be built is two percent (2%) or less and if the

loading rate of the soil in the dispersal area is not less than five-tenths (0.5) gallons per day per square foot, at least thirty (30) feet of dispersal area must be provided downslope of the absorption system. No obstruction to horizontal flow of water such as parking areas, building foundations, swimming pools, or any other facility that would compact soil in the dispersal area, may be placed in the dispersal area.

(b) Septic tanks shall be water tight and constructed of durable material such as concrete, fiber glass, or plastic and shall be protected from corrosion.

410 IAC 6-8.1-38 Septic tanks; capacity

Sec 38. (a) Every septic tank shall have a minimum capacity below the water line as specified in Table III as follows:

TABLE III
REQUIRED MINIMUM CAPACITIES
FOR SEPTIC TANKS

Number of Bedrooms in Dwelling	Normal Liquid Capacity of Tank in Gallons
2 or less	750
3	1,000
4	1,250
5	1,500
5+	1,500, plus 150 multiplied by the number of bedrooms over 5

(b) Minimum water depth in any compartment shall be thirty (30) inches.

(c) Maximum depth of water for calculating capacity of tank shall not exceed six and one-half (6 1/2) feet.

(d) All septic tank effluent including effluent from tanks fitted with aeration units for aerobic digestion shall discharge into a soil absorption system or other treatment system as approved in accordance with section 31(g) of this rule.

410 IAC 6-8.1-39 Septic tanks; construction details

Sec 39. (a) The septic tank inlet baffle or sanitary tee shall extend six (6) inches below the liquid level and at least to the top of the inlet sewer.

(b) The septic tank outlet baffle or sanitary tee, and baffles or submerged pipes between compartments, shall extend below the liquid level a distance of four-tenths (0.4) times the tank liquid depth. A gas deflection baffle shall be provided below the outlet of the tank. This baffle shall be constructed of durable materials not subject to corrosion or decay and shall be configured to deflect rising gas bubbles away from the outlet structure and toward the interior of the tank.

(c) There shall be at least one (1) inch clear space between the under side of the septic tank cover and the top of the inlet and outlet baffles or tees.

(d) Scum storage capacity (space between the liquid level and the top of the outlet baffle) shall be not less than fifteen percent (15%) of the total liquid depth of the septic tank.

(e) The septic tank inlet baffle shall not be more than twelve (12) inches nor less than eight (8) inches from the inside of the inlet end of the tank. The outlet baffle shall not be more than six (6) inches nor less than four (4) inches from the outlet end of the tank. Baffles shall be constructed of durable materials not subject to corrosion or decay.

(f) The bottom of the inlet to the septic tank or the first compartment receiving the flow shall not be less than three (3) inches above the flow line of the outlet from that compartment.

(g) Access manholes at least eight (8) inches in diameter extending to the ground surface and fitted with safely secured, gas tight covers, shall be provided for each septic tank or compartment.

(h) Access for inspection shall be provided in the top of the septic tank above the inlet and outlet baffles of each tank and compartment.

(i) Reinforced or unreinforced concrete septic tanks wherein the concrete has a compressive strength of less than four thousand (4,000) pounds per square inch shall have walls of four (4) inch or greater thickness.

(j) Reinforced concrete septic tanks wherein the concrete has a compressive strength of four thousand (4,000) pounds per square inch or greater shall have walls of two and one-half (2 1/2) inch or greater thickness.

(k) Cast-in-place concrete septic tanks shall have the walls and floor at least six (6) inches thick poured from a 1:2:3 mix in one (1) operation.

(l) Concrete block septic tanks shall have at least eight (8) inch walls with cores filled with concrete, and shall be reinforced at the corners. The walls shall be set on a concrete slab at least six (6) inches thick and the wall-to-floor connection shall be satisfactorily sealed.

(m) Septic tank bottoms shall conform to the specifications set forth for septic tank walls.

(n) Concrete septic tank tops shall be a minimum of four (4) inches in thickness and reinforced with one-fourth (1/4) inch reinforcing rods in a six (6) inch grid or equivalent.

(o) All drain holes shall be plugged after the septic tank has been set.

(p) All septic tanks shall be installed level and the tank checked prior to covering to assure that it is level.

(q) Tanks fitted with aeration units for aerobic digestion shall conform to Standard 40 of the National Sanitation Foundation or to the standards of an equivalent testing laboratory and shall provide a minimum aerobic treatment capacity of one hundred fifty (150) gallons per bedroom per day or five hundred (500) gallons per day, whichever is greater.

410 IAC 6-8.1-40 Septic tanks; connecting pipes

Sec 40. (a) All inlet and outlet connections to the septic tank shall be sealed to the tank in a water tight manner.

(b) All joints in the sewer connecting septic tanks in series shall be water tight.

410 IAC 6-8.1-41 Gravity distribution of effluent; distribution boxes

Sec 41. (a) For gravity distribution of effluent, a distribution box or series of distribution boxes shall be installed between the septic tank and the subsurface absorption system, and each absorption line shall connect directly thereto.

(b) The preferred material for use in constructing distribution boxes is concrete (three thousand (3,000) pounds per square inch). Other materials may be considered on a case-by-case basis. All materials must be resistant to corrosion and decay and must have sufficient structural strength to contain sewage and resist lateral compressive and bearing loads. The minimum interior width of a distribution box shall be twelve (12) inches. The distribution box shall be fitted with a water tight, removable lid for access.

(c) Each distribution box shall be designed to split the effluent flow equally among the effluent ports. All effluent ports shall be at the same elevation and be of the same diameter. The effluent ports shall be located at an elevation at least one (1) inch lower than the influent port. The influent port shall be located or baffled to prevent unequal distribution of effluent to the distribution system. If baffles are provided, the baffles and their mounts or retainers shall provide a passageway for effluent between the box bottom and the bottom edge of the baffle of no more than two (2) inches. The baffle shall extend to one (1) inch above the top of the inlet. An elbow may be used in place of a baffle. The elbow must be a ninety (90) degree elbow and be turned down into the distribution box. The end of the elbow must be not more than two (2) inches above the bottom of the distribution box. The interior bottom of the distribution box shall be at least four (4) inches below the invert elevation of the effluent ports. A minimum of eight (8) inches freeboard above the invert elevation of the effluent port shall be provided.

(d) The distribution box shall be placed on a stable foundation of undisturbed soil. The box shall be leveled and the outlets shall be checked to assure that they are at a uniform elevation.

410 IAC 6-8.1-42 Piping

Sec 42. Piping used in a residential sewage disposal system shall meet or exceed the following applicable standards:

(1) Gravity sewer standards as follows:

(A) The following for PVC piping:
(i) ASTM D 2665 - 89a for four (4) inch and six (6) inch pipe only.
(ii) ASTM D 3034 - 89 for the following:
(AA) SDR 35 for four (4) inch through fifteen (15) inch pipe.
(BB) SDR 36 with compression fittings for special crossings above or below portable water lines.

(B) The following for ABS piping:
(i) ASTM D 2661 - 87a for four (4) inch and six (6) inch pipe only.
(ii) ASTM D 2680 - 89 for eight (8) inch through fifteen (15) inch pipe.
(iii) ASTM D 2751 - 89 SDR 23.5 or SDR 35 for six (6) inch pipe.

(2) Pressure sewers and pressure effluent distribution lines as follows:

(A) The following for PVC piping:
(i) ASTM D 2241 - 89 SDR 13.5, 17, 21, or 26.
(ii) ASTM D 1785 - 89 Schedule 40, 80, or 120.

(B) The following for ABS piping:
(i) ASTM D 1527 - 89 Schedule 40, 80.
(ii) ASTM D 2282 - 89 SDR 13.5, 17, 21, or 26.

Compression fittings must be used on pressure sewers when they are located ten (10) feet or less from a water line.

(3) Absorption field laterals standards as follows:

(A) Only sewer pipe listed in subdivisions (1) through (2), potable water pipe (four (4) inches or more in diameter), or pipe meeting ASTM D 2729 - 89 or ASTM F 810 - 85, is suitable for absorption field gravity laterals.

(B) The distribution pipe used in absorption field trenches for gravity fed absorption systems must have at least two (2) rows of holes, but no more than three (3) rows. The rows shall be separated by one hundred twenty (120) degrees; the holes must be one-half (1/2) inch to three-fourths (3/4) inch in diameter, and be spaced laterally as follows:

(i) One half (1/2) inch holes at two and one-fourth (2 1/4) inch or closer spacing in each row of holes.

(ii) Five-eighths (5/8) inch holes at three and one-half (3 1/2) inch or closer spacing in each row of holes.

(iii) Three-fourths (3/4) inch holes at five (5) inch or closer spacing in each row of holes.

(4) Pipe for water table modification standards as follows:

(A) ASTM C 412 - 83 for concrete pipe.
(B) ASTM C 4 - 62 for vitrified pipe.
(C) ASTM 498 - 65 for clay pipe
(D) The following for polyethylene pipe:
(i) ASTM F 405 - 89
(ii) ASTM F 667 - 85
(iii) SCS 606

410 IAC 6-8.1-43 Drainage

Sec 43. (a) A diversion or drainageway to divert surface drainage away from the absorption system site is required when the elevation of the landscape adjoining the proposed subsurface soil absorption system site is equal to or higher than that of the proposed site and the higher landscape may be expected to discharge water onto the proposed site. Diversion ditches or drainageways shall have a positive grade of at least two-tenths (0.2) feet per one hundred (100) feet.

(b) When a subsurface drainage system is constructed to lower a perched or apparent seasonal high water table, the following shall apply:

(1) If the seasonal high water table is perched, the subsurface drain trench around the system shall be constructed at least two (2) inches into the massive clay, glacial till, or fragipan. If the site has a slope of equal to or less than two percent (2%), the subsurface drain shall surround the system. If the site slope exceeds two percent (2%), the subsurface drain shall be constructed only on the upslope side of the system.

(2) The subsurface drain tile shall be at least four (4) inches in diameter, shall be slotted, and, when installed in sands, loamy sands, sandy loams, fine sandy loams, loams, silt loams, or silts shall be wrapped with a geotextile fabric with an effective opening size no smaller than two-tenths (0.2) millimeter and no larger than eighty-five hundredths (0.85) millimeter.

(3) The subsurface drain trench shall have a positive slope of at least two-tenths (0.2) feet per one hundred (100) feet and shall be constructed with no sags in the line.

(4) A subsurface drain trench installed upslope from a residential sewage disposal system shall be backfilled with aggregate no larger than that to be used in the absorption system. The trench shall be backfilled to the surface or to a point no more than six (6) inches from the ground surface.

(5) The subsurface drain trench and the associated discharge piping shall be constructed to permit water to flow by gravity throughout its length. No pumps or siphons shall be utilized to effect the movement of the collected water.

(c) When a subsurface drain is provided, it shall be sufficiently deep to lower the seasonal water table at least twenty-four (24) inches below the center of the absorption system.

(d) The subsurface drain and the soil absorption system shall be located so as to comply with the clearances listed in Table IV, as follows, but at no point shall they be separated by less than ten (10) feet:

TABLE IV
PERIMETER DRAIN CLEARANCE FROM
SOIL ABSORPTION FIELDS

Soil Absorption System Loading Rate in Gallons per day per square foot	Required Clearance in Feet
0.75 or greater	25
0.6 or less	10

(e) The subsurface drain shall not cross any portion of the soil absorption system.

(f) Tile outlets shall be provided with rodent guards.

410 IAC 6-8.1-44 Dosing tanks

Sec 44. (a) Dosing tanks must be water tight and constructed of durable material such as concrete, fiber glass, or plastic and shall be protected from corrosion.

(b) Reinforced or unreinforced concrete dosing tanks wherein the concrete has a compressive strength of less than four thousand (4,000) pounds per square inch shall have walls of four (4) inch or greater thickness.

(c) Reinforced concrete dosing tanks wherein the concrete has a compressive strength of four thousand (4,000) pounds per square inch or greater shall have walls of two and one-half (2 1/2) inch or greater thickness.

(d) Cast in place concrete dosing tanks shall have the walls and floor at least six (6) inches thick poured from a 1:2:3 mix in a single operation.

(e) Concrete block dosing tanks shall have at least eight (8) inch thick walls with cores filled with concrete and shall be reinforced at the corners. The blocks shall be laid with tight mortar joints. The walls shall be set on a concrete slab at least six (6) inches thick and the wall-to-floor connection shall be satisfactorily sealed.

(f) The required liquid holding capacity of the dosing tank shall not be considered as any portion of the required liquid volume of the septic tank.

(g) The liquid holding capacity of a dosing tank must equal the daily average wastewater volume, in addition to the volume of liquid that will drain back from any pressure sewer when pumping ceases. Additional capacity must be provided to keep the dosing tank pump submerged at all times and to provide sufficient freeboard for a high water alarm.

(h) Each dosing tank shall be fitted with an effluent pump sized in conformance with sections 45 or 53 of this rule, with controls, and with a high water alarm switch set at a level above the design high water mark. The alarm shall be on a separate circuit from the pump and shall include an audible and visible alarm.

(i) Switches which are comparable to mercury float level switches shall be used for dosing tank pump start and stop controls and for high water alarms.

(j) Dosing tanks shall be provided with access ports, extending to the ground surface which are sufficiently large to allow access to maintain the tank and pumps. Safely secured, gas tight covers shall be provided for each required access port.

410 IAC 6-8.1-45 Effluent pumps

Sec 45. (a) All effluent pumps must be submersible pumps suitable for operation in a corrosive atmosphere.

(b) Effluent pumps shall be sized to deliver the total design flow rate while meeting the total dynamic head requirements of the system.

(c) Pumps must be fitted with breakaway flanges and lifting chains.

(d) Controls other than liquid level sensors shall not be located within the dosing tank.

410 IAC 6-8.1-46 Barrier materials

Sec 46. Barrier materials used to cover aggregate in an absorption system must be a six (6) inch thick layer of straw, or else a geotextile fabric with an effective opening size no smaller than twenty-hundredths (0.20) millimeters and no larger than eighty-five hundredths (0.85) millimeters. Building paper shall not be used as a barrier material.

410 IAC 6-8.1-47 Aggregate

Sec 47. (a) Aggregate to be used in absorption systems shall be gravel, stone or other approved materials. Crushed limestone, if used, must have a hardness of not less than three (3) on the Mohs scale of hardness.

(b) Aggregate shall be a mixture with no aggregate smaller in size than one-half (1/2) inch in diameter nor any aggregate larger than two and one-half (2 1/2) inches in diameter. The aggregate must be larger than the openings in the laterals. Fines, dust, sand, and clay shall be removed from the aggregate prior to its placement in the trench.

410 IAC 6-8.1-48 On-site evaluation

Sec 48. (a) Before issuance of any permit for construction of a residential sewage disposal system or the alteration of a soil absorption field, an on-site evaluation, which shall include an evaluation of the soil profile, shall be conducted. System feasibility, location, selection, and design shall be based on the site evaluation and information obtained from the soil profile. The site and soil information needed is outlined and further defined in subsection (e). Properties of the soil at each site shall be determined using the guidelines set forth in the soil manuals, technical bulletins, and handbooks of the SCS. The local health department may, when necessary, provide or require to be provided, a direct soil profile observation by a soil scientist, using the guidelines set forth in the soil manuals, technical bulletins, and handbooks of the SCS.

(b) When direct soils profile observations are made, soil profile information shall be recorded to a depth of five (5) feet or until a layer is encountered which cannot be readily penetrated, whichever is shallower.

(c) The on-site evaluation shall be conducted before construction begins. No construction on the residential sewage disposal system may take place if the residential sewage disposal system site is disturbed or altered after the on-site evaluation by the addition of fill material, (other than construction necessary for the residential sewage disposal system) or by cutting, scraping, compaction, or the removal of soil, until a new evaluation has been conducted and a modified permit has been issued.

(d) When any site limitations and soil information for the site has been thusly determined, the owner is responsible for designing a residential sewage disposal system which addresses the demands of the site in accordance with this rule, and which will meet local health department approval.

(e) The information needed to evaluate a site includes the following:

(1) Topographic information including the following:

(A) Slope and slope aspect.

(B) Surface drainage characteristics and patterns including swales, ditches, and streams.

(C) Proposed or existing location of house and well.

(D) Location of other major features or structures.

(E) Location of soil evaluation sites and appropriate soil type boundaries.

(F) Topographic position of the site.

(2) Soil characteristics as follows;

(A) Approximate depths of soil horizons.

(B) Soil color, structure, and texture at each horizon.

(C) Depth to any layer which has a loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot.

(D) Depth to seasonal high ground water as indicated by soil wetness characteristics.

(E) Depth to bedrock.

(F) Soil consistence at each horizon.

(G) Soil effervescence at each horizon.

(H) Presence or absence of roots.

(f) Soil absorption systems shall not be constructed in areas where surface drainage or run-off will have an adverse effect on the system, unless the surface run-off can be effectively diverted around the system.

(g) Soil absorption systems shall not be constructed below the floodway elevation of any flood having a peak discharge equaled or exceeded on the average of once in any one hundred (100) year period.

(h) Soil absorption systems shall not be constructed in areas subject to ponding.

410 IAC 6-8.1-49 Subsurface system selection criteria

Sec 49. Subsurface soil absorption systems are the systems of choice. All of the site conditions in this section must be met if subsurface soil absorption systems are to be constructed:

(1) Sufficient area exists on the lot for an appropriately sized system.

(2) The site has a slope of fifteen percent (15%) or less.

(3) The topographic position of the site on which the system is to be built is convex, hill slope, or flat. If surface and subsurface drainage can be diverted around the site, a toe slope position can be utilized.

(4) All soil horizons at the site from the ground surface to twenty-four (24) inches below the proposed trench bottom have a loading rate of not less than twenty-five hundredths (0.25) and not more than one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table V, as follows:

TABLE V

Loading Rates for Subsurface Systems
(in gpd/ft^2)

	SOIL STRUCTURE CLASSES							
Soil Texture Class	Single Grain	Granular Platy*	Strong: Angular, Subangular Blocky, Prismatic	Moderate: Angular, Subangular Blocky, Prismatic	Weak: Angular, Subangular Blocky, Prismatic	Fragipan: Very Course Prismatic	Structureless, Massive, Friable, V. Friable	Structureless, Massive, Compact, Firm, V. Firm
Gravel Coarse Sand	>1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loamy Coarse Sand Medium Sand	1.20	1.20	N/A	N/A	1.20	N/A	N/A	N/A
Fine Sand Loamy Sand Loamy Fine Sand	0.75	0.60	N/A	0.75	0.75	N/A	0.75	N/A
Very Fine Sand Loamy V. Fine Sand	0.50	0.50	N/A	0.75	0.60	N/A	0.60	N/A
Sandy Loam Coarse Sandy Loam	N/A	0.75	N/A	0.60	0.60	0.00	0.60	N/A
Fine Sandy Loam V. Fine Sandy Loam	N/A	0.75	N/A	0.60	0.60	0.00	0.60	N/A
Sandy Clay Loam	N/A	0.75	0.75	0.50	0.50	0.00	0.50	0.00
Loam	N/A	0.75	0.75	0.50	0.30	0.00	0.30	0.00
Silt Loam	N/A	0.60	0.60	0.50	0.30	0.00	0.30	0.00
Silty Clay Loam Clay Loam Sandy Clay	N/A	0.60	0.60	0.30	0.25	0.00	0.25	0.00
Silty Clay Clay	N/A	0.60	0.50	0.30	0.25	N/A	0.25	0.00
Muck	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A
Marl Bedrock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

N/A = NOT APPLICABLE

*Except where platy structure has been caused by soil compaction. Platy structure caused by compaction has a loading rate of 0.00 gpd/ft^2

(5) Any seasonal high water table at the site of the proposed system can be lowered to thirty-four (34) inches or more below the surface.

(6) Site conditions must permit distribution of effluent to each trench of the system so that each square foot of absorptive area can be loaded with an equal volume of effluent.

410 IAC 6-8.1-50 Subsurface system type selection criteria

Sec. 50 (a) A subsurface gravity feed trickle flow system may be constructed if:

(1) the design daily flow of the project is equal to or greater than four hundred fifty (450) gallons per day;

(2) the loading rate of the site is equal to or greater than twenty-five hundredths (0.25) gallons per day per square foot, and equal to or less than seventy-five hundredths (0.75) gallons per day per square foot, as determined from Table V of section 49(4) of this rule;

(3) the trench bottom will be at least thirty (30) inches above any horizon with a loading rate less than twenty-five hundredths (0.25) gallons per day per square foot; and

(4) the absorption field, including either half of an alternating field, is designed with a total absorption trench length which does not exceed five hundred (500) lineal feet.

(b) A subsurface gravity feed trickle flow system may also be constructed if:

(1) the design daily flow of the proposed system is less than four hundred fifty (450) gallons per day;

(2) the site has a loading rate of equal to or greater than twenty-five hundredths (0.25) gallons per day per square foot, and equal to or less than seventy-five hundredths (0.75) gallons per day per square foot, as determined from Table V of section 49(4) of this rule;

(3) the trench bottom will be at least twenty-four (24) inches above any horizon with a loading rate less than twenty-five hundredths (0.25) gallons per day per square foot; and,

(4) the absorption field, including either half of an alternating field, is designed with a total absorption trench length which does not exceed five hundred (500) lineal feet.

(c) A subsurface gravity feed trickle flow system which utilizes alternating fields or is dosed using pump assisted distribution may be constructed if:

(1) the design daily flow of the project is equal to or greater than four hundred fifty (450) gallons per day;

(2) the loading rate of the site is equal to or greater than twenty-five hundredths (0.25) gallons per day per square foot, and equal to or less than seventy-five hundredths (0.75) gallons per day per square foot, as determined from Table V of section 49(4) of this rule; and

(3) the trench bottom will be at least twenty-four (24) inches above any horizon with a loading rate less than twenty-five hundredths (0.25) gallons per day per square foot.

(d) If any soil absorption field, including either half of an alternating field, is designed with a total absorption trench length greater than five hundred (500) lineal feet, the absorption field shall be dosed using pump assisted distribution.

(e) If any soil horizon within twenty-four (24) inches of the proposed trench bottom has a loading rate of one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table V of section 49(4) of this rule, the subsurface soil absorption system shall utilize pressure distribution.

410 IAC 6-8.1-51 Elevated system selection criteria

Sec. 51. Elevated sand mound systems may be constructed if the following site conditions are met:

(1) Sufficient area exists on the lot for an appropriately sized system.

(2) The site on which the system is to be built has a slope of six percent (6%) or less.

(3) The topographic position of the site on which the system is to be built is convex, hill slope, or flat. If surface and subsurface drainage can be diverted around the site, a toe slope position can be utilized.

(4) There are no soil horizons within twenty (20) inches from the ground surface which have a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot as determined fromTable VI as follows:

TABLE VI

Loading Rates for Above Ground Systems
(in gpd/ft^2)

	SOIL STRUCTURE CLASSES							
Soil Texture Class	Single Grain	Granular Platy*	Strong: Angular, Subangular Blocky, Prismatic	Moderate: Angular, Subangular Blocky, Prismatic	Weak: Angular, Subangular Blocky, Prismatic	Fragipan: Very Course Prismatic	Structureless, Massive, Friable, V. Friable	Structureless, Massive, Compact, Firm, V. Firm
Gravel Coarse Sand	>1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loamy Coarse Sand Medium Sand	1.20	1.20	N/A	N/A	1.20	N/A	N/A	N/A
Fine Sand Loamy Sand Loamy Fine Sand	0.60	0.60	N/A	0.60	0.60	N/A	0.60	N/A
Very Fine Sand Loamy V. Fine Sand	0.50	0.50	N/A	0.50	0.50	N/A	0.50	N/A
Sandy Loam Coarse Sandy Loam	N/A	0.60	N/A	0.60	0.60	0.00	0.60	N/A
Fine Sandy Loam V. Fine Sandy Loam	N/A	0.60	N/A	0.60	0.60	0.00	0.60	N/A
Sandy Clay Loam	N/A	0.50	0.50	0.50	0.50	0.00	0.50	0.00
Loam	N/A	0.50	0.50	0.50	0.50	0.00	0.50	0.00
Silt Loam	N/A	0.50	0.50	0.50	0.50	0.00	0.50	0.00
Silty Clay Loam Clay Loam Sandy Clay	N/A	0.25	0.25	0.25	0.25	0.00	0.25	0.00
Silty Clay Clay	N/A	0.25	0.25	0.25	0.25	N/A	0.25	0.00
Muck	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A
Marl Bedrock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

N/A = NOT APPLICABLE

*Except where platy structure has been caused by soil compaction. Platy structure caused by compaction has a loading rate of 0.00 gpd/ft^2

(5) There are no soil horizons within twenty (20) inches from the ground surface which have a loading rate of more than one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table VI of subdivision (4) unless that hazard can be overcome through system design.

(6) Any seasonal high water table at the site of the proposed system can be lowered to twenty (20) inches or more from the surface.

(7) There is at least thirty (30) feet of dispersal area downslope of the downslope toe of the mound if the slope of the site on which the mound is to be built is two percent (2%) or less and if the loading rate of the soil in the dispersal area is not less than five-tenths (0.5) gallons per day per square foot. If the slope of the site on which the mound is to be built is greater than two percent (2%) or if the loading rate of the soil in the dispersal area has a loading rate of three-tenths (0.3) gallons per day per square foot or less, at least fifty (50) feet of dispersal area must be provided down slope of the downslope toe of the mound. No obstruction to horizontal flow of water such as parking areas, building foundations, swimming pools, or any other facility that would compact soil in the dispersal area, may be placed in the dispersal area.

410 IAC 6-8.1-52 Subsurface gravity feed trickle flow systems; construction requirements

Sec 52. (a) The minimum absorption area (in square feet) required for each gravity feed trickle flow subsurface soil absorption system shall be based on the following:

(1) The number of bedrooms and bedroom equivalents in the dwelling.

(2) The appropriate soil loading rate (in gallons per day per square foot) determined from Table V of section 49(4) of this rule;

(3) The vertical separation distance between the bottom of the proposed trench and any soil layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The loading rate used for this computation shall be the loading rate of the most restrictive horizon within twenty-four (24) inches of the trench bottom.

(4) The absorption area shall be computed using the following formula:

$$\text{area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{\text{loading rate in gpd/sq.ft.}}$$

(5) If the loading rate determined from Table V of section 49(4) is twenty-five hundredths (0.25) gallons per day per square foot or thirty-hundredths (0.30) gallons per day per square foot, the system may be reduced in size from the absorption area determined in subdivision (1) by nine tenths of one percent (0.9%) for each inch over twenty-four (24) inches to a maximum of sixty (60) inches between the trench bottom and a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The new absorption area shall then be computed using the following formula:

New Absorption Area* = A.A. - [A.A.x0.009(D.L. - D.T. - 24)] where:

A.A. = Absorption area determined in subdivision (4).
D.L. = Depth in inches from the ground surface to a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot.
D.T. = Depth in inches from the ground surface to the proposed trench bottom.

*Note: The value for the quantity (D.L. - D.T. - 24) may not exceed thirty-six (36). If a value of greater than thirty-six (36) is obtained then thirty-six (36) must be used for the computations.

(b) All gravity feed trickle flow subsurface soil absorption systems shall be located in accordance with the separation distances shown in Table II of section 37(a) of this rule. Gravity feed trickle flow subsurface soil absorption systems shall not be constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table V of section 49(4) of this rule.

(c) Soil absorption systems shall not be wholly or partly located in a drainage way subject to intermittent flooding.

(d) In order to provide equal flow distribution in gravity feed trickle flow subsurface soil absorption systems, each absorption trench must be individually connected to a distribution box by at least five (5) feet of unperforated pipe which is laid with a gravel free backfill. All absorption trenches served by a common distribution box must be constructed so that each square foot of the absorptive area served by the distribution box is loaded with an equal volume of effluent. The distal ends on the distribution lines may be manifolded together by piping on sites with slopes of two percent (2%) or less, but shall not be tied together on sites with slopes of greater than two percent (2%). When the distal ends of the absorption trenches are manifolded, the manifold trench area shall not count as meeting any of the minimum absorption area required by subsection (a).

(e) Each trench and distribution line in a gravity feed trickle flow subsurface soil absorption system shall be uniformly level throughout its length.

(f) No single absorption trench in a gravity feed trickle flow subsurface soil absorption system shall exceed one hundred (100) feet in length.

(g) On sloping sites, absorption trenches of a gravity feed trickle flow soil absorption system shall be constructed along the contour.

(h) There shall be a minimum separation of seven and one-half (7 1/2) feet, on center, between absorption field trenches.

(i) All gravity feed trickle flow subsurface soil absorption fields shall be designed to utilize trenches with a minimum width of eighteen (18) inches and a maximum trench width of thirty-six (36) inches.

(j) The minimum depth from original grade to the bottom of a trench of a gravity feed trickle flow subsurface soil absorption system shall not be less than ten (10) inches, and the maximum depth to the bottom of a trench of a gravity feed trickle flow subsurface soil absorption system shall not be more than thirty-six (36) inches.

(k) Perforated pipe distribution lines in the absorption trench of a gravity feed trickle flow subsurface soil absorption system shall be completely surrounded by aggregate which meets the specifications in section 47 of this rule. There shall be at least six (6) inches of aggregate below the pipe and at least two (2) inches of aggregate above the pipe.

(l) The aggregate used in a gravity feed trickle flow subsurface soil absorption system shall be covered with a six (6) inch layer of straw, or else a geotextile fabric barrier which meets the minimum requirements in section 46 of this rule, in such a manner as to prevent the aggregate from becoming clogged with the earth fill.

(m) A minimum of twelve (12) inches of cover shall be provided over the aggregate in the trenches, and any fill required to provide cover shall be crowned over the entire field to promote surface run-off.

(n) Subsurface soil absorption systems shall not be constructed in clayey soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. For the purpose of this rule, the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads one-eighth (1/8) inch in diameter without breaking apart and crumbling.

(o) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the absorption system before, during, and after construction of the trenches, especially during wet weather. Precaution is especially important where clayey soils are involved. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site and/or the system.

(p) Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or the system.

410 IAC 6-8.1-53 Subsurface gravity feed flood dosed systems

Sec 53. (a) The minimum absorption area (in square feet) required for each gravity feed flood dosed subsurface soil absorption system shall be based on the following:

(1) The number of bedrooms and bedroom equivalents in the dwelling.

(2) The appropriate soil loading rate (in gallons per day per square foot) determined from Table V of section 49(4) of this rule.

(3) The vertical separation distance between the bottom of the proposed trench and any soil layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The loading rate used for this computation shall be the loading rate of the most restrictive horizon within twenty-four (24) inches of the trench bottom.

(4) The absorption area shall be computed using the following formula:

$$\text{area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{\text{loading rate in gpd/sq.ft.}}$$

(5) If the loading rate determined from Table V of section 49(4) of this rule is twenty-five hundredths (0.25) gallons per day per square foot or thirty-hundredths (0.30) gallons per day per square foot, the system may be reduced in size from the absorption area determined in subdivision (1) by nine-tenths of one percent (0.9%) for each inch over twenty-four (24) inches to a maximum of sixty (60) inches between the trench bottom and a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The new absorption area shall then be computed using the following formula:

New Absorption Area* = A.A. - [A.A.x0.009(D.L. - D.T. - 24)] where:

A.A. = Absorption area determined in subdivision (4).
D.L. = Depth in inches from the ground surface to a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot.
D.T. = Depth in inches from the ground surface to the proposed trench bottom.

*Note: The value for the quantity (D.L. - D.T. - 24) may not exceed thirty-six (36). If a value of greater than thirty-six (36) is obtained then thirty-six (36) must be used for the computations.

(b) All subsurface gravity feed flood dosed absorption systems shall be located in accordance with the separation distances shown in Table II of section 37(a) of this rule. Subsurface gravity feed flood dosed soil absorption systems shall not be constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table V of section 49(4) of this rule.

(c) Subsurface gravity feed flood dosed soil absorption systems shall not be wholly or partly located in a drainage way subject to intermittent flooding.

(d) In order to provide equal flow distribution in gravity feed flood dosed systems, each absorption trench must be individually connected to a distribution box by at least five (5) feet of unperforated pipe which is laid with a gravel free backfill. All absorption trenches served by a common distribution box must be constructed so that each square foot of the absorptive area served by the distribution box is loaded with an equal volume of effluent.

(e) No single absorption trench shall exceed one hundred (100) feet in length.

(f) On sloping sites, absorption trenches shall be constructed along the contour.

(g) There shall be a minimum separation of seven and one-half (7 1/2) feet, on center, between absorption field trenches.

(h) All subsurface gravity feed flood dosed absorption fields shall be designed to utilize trenches with a minimum width of eighteen (18) inches and a maximum trench width of thirty-six (36) inches.

(i) The minimum depth from original grade to the bottom of a subsurface gravity feed flood dosed absorption trench shall not be less than ten (10) inches, and the maximum depth to the bottom of such trench shall not be more than thirty-six (36) inches.

(j) Perforated pipe distribution lines in the subsurface gravity feed flood dosed soil absorption trench shall be completely surrounded by aggregate which meets the specifications in section 47 of this rule. There shall be at least six (6) inches of aggregate below the pipe and at least two (2) inches of aggregate above the pipe.

(k) The aggregate shall be covered with a six (6) inch layer of straw, or else a geotextile fabric barrier which meets the minimum requirements in section 46 of this rule, in such a manner as to prevent the aggregate from becoming clogged with the earth fill.

(l) A minimum of twelve (12) inches of cover shall be provided over the aggregate in the trenches, and any fill required to provide cover shall be crowned over the entire field to promote surface run-off.

(m) Subsurface gravity feed flood dosed soil absorption systems shall not be constructed in clayey soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. For the purpose of this rule, the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads one-eighth (1/8) inch in diameter without breaking apart and crumbling.

(n) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the subsurface gravity feed flood dosed soil absorption system before, during, and after construction of the trenches, especially during wet weather. Precaution is especially important where clayey soils are involved. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site and/or the system.

(o) Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or the system.

(p) Trenches in a subsurface gravity feed flood dosed system shall not be manifolded together at the distal end of the trench.

(q) Each trench and distribution line in a subsurface gravity feed flood dosed system shall be uniformly level throughout its length.

(r) When a subsurface gravity feed flood dosed soil absorption system is used the dosing pump shall be sized, and its controls set to deliver the design daily flow in one (1) dose each day. Pump selection shall be based on manufacturers pump curves for the required discharge rate from Table VII, as follows, at the total head imposed on the pump:

TABLE VII

REQUIRED PUMP DISCHARGE RATES FOR
FLOOD DOSED SYSTEMS

Number of Bedrooms	Discharge rate in Gallons per minute
1	30
2	30
3	30-45
4	30-60
5	38-75
6	45-90

The total head for a subsurface soil absorption system using flood dosing shall be the elevation difference between the pump and the outlet in the distribution box in addition to the friction loss in the delivery pipe expressed in feet.

(s) The liquid holding capacity of a dosing tank must equal the design daily average wastewater volume as further modified herein. The delivery pipe from the pumping chamber to the absorption field must drain between doses. If the delivery pipe drains to the absorption field, the dosing tank volume shall be the daily average wastewater volume, minus the volume contained in the delivery pipe. If the delivery pipe drains back to the dosing tank, the dosing tank volume shall be the daily average wastewater volume plus the volume contained in the delivery pipe. Additional capacity must be provided to keep the dosing tank pump submerged at all times and to provide sufficient freeboard for a high water alarm.

(t) The distal end of the delivery pipe from the pumping chamber must be fitted with an elbow turned down, or else the distribution box must be baffled.

(u) The minimum inside diameter of the delivery pipe shall be one (1) inch; the maximum inside diameter of the delivery pipe shall be four (4) inches.

(v) Table VIII, as follows, shall be used in determining friction losses in the delivery pipes and manifold when plastic pipe is used.

TABLE VIII
FRICTION LOSSES IN PLASTIC PIPE

Friction Losses in Plastic Pipe (C_h = 150) Versus Flow Rate and Pipe Diameter
(1 in = 2.54 cm, 1 ft = 0.305 m, 1 gpm = 6.3 x $10^{-5}M^3/S$)

Diameter	1”	1 ¼”	1 ½”	2”	3”	4”	
Flow gpm	Friction Loss in feet / 1000 feet						Flow gpm
1	0.10						1
2	0.35	0.12					2
3	0.75	0.25	0.10				3
4	1.28	0.43	0.18				4
5	1.93	0.65	0.27	0.07			5
6	2.70	0.91	0.38	0.09			6
7	3.59	1.21	0.50	0.12			7
8	4.60	1.55	0.64	0.16			8
9	5.72	1.93	0.80	0.20			9
10	6.95	2.35	0.97	0.24			10
11		2.80	1.15	0.28			11
12		3.29	1.35	0.33			12
13		3.91	1.57	0.39			13
14		4.37	1.80	0.44	0.06		14
15		4.97	2.05	0.50	0.07		15
16		5.60	2.31	0.57	0.08		16
17		6.27	2.58	0.64	0.09		17
18		6.96	2.87	0.71	0.10		18
19			3.17	0.78	0.11		19
20			3.49	0.86	0.12		20
25			5.27	1.30	0.18		25
30				1.82	0.23	0.06	30
35				2.42	0.35	0.08	35
40				3.10	0.43	0.11	40
45				3.85	0.54	0.13	45
50				4.86	0.65	0.16	50
60					0.91	0.23	60
70					1.21	0.30	70
80					1.55	0.38	80
90					1.93	0.48	90
100					2.35	0.58	100
125					3.55	0.88	125
150					4.97	1.23	150
175						1.63	175
200						2.09	200
250						3.16	250
300						4.42	300

410 IAC 6-8.1-54 Subsurface gravity feed trickle flow alternating systems

Sec 54. (a) The minimum absorption area (in square feet) required for each gravity feed alternating field subsurface soil absorption system shall be based on the following:

(1) The number of bedrooms and bedroom equivalents in the dwelling.

(2) The appropriate soil loading rate (in gallons per day per square foot) determined from Table V of section 49(4) of this rule.

(3) The vertical separation distance between the bottom of the proposed trench and any soil layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The loading rate used for this computation shall be the loading rate of the most restrictive horizon within twenty four (24) inches of the trench bottom.

(4) The absorption area shall be computed using the following formula:

$$\text{Area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{\text{loading rate in gpd/sq.ft.}}$$

(5) If the loading rate determined from Table V of section 49(4) is twenty-five hundredths (0.25) gallons per day per square foot or thirty-hundredths (0.30) gallons per day per square foot, the system may be reduced in size from the absorption area determined in subdivision (1) by nine-tenths of one percent (0.9%) for each inch over twenty-four (24) inches to a maximum of sixty (60) inches between the trench bottom and a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The new absorption area shall then be computed using the following formula:

New Absorption Area* = A.A. - [A.A.x0.009(D.L. - D.T. - 24)] where:

A.A. = Absorption area determined in subdivision (4).
D.L. = Depth in inches from the ground surface to a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot.
D.T. = Depth in inches from the ground surface to the proposed trench bottom.

*Note: The value for the quantity (D.L. - D.T. - 24) may not exceed thirty-six (36). If a value of greater than thirty-six (36) is obtained then thirty-six (36) must be used for the computations.

(b) All subsurface gravity feed trickle flow alternating field systems shall be located in accordance with the separation distances shown in Table II of section 37(a) of this rule. Subsurface gravity feed trickle flow alternating systems shall not be constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table V of section 49(4) of this rule.

(c) Subsurface gravity feed trickle flow alternating field systems shall not be wholly or partly located in a drainage way subject to intermittent flooding.

(d) A diversion valve shall be installed between the septic tank and the distribution boxes. An access riser, extending to the ground surface, shall be installed over the diversion valve.

(e) Each trench and distribution line in a subsurface gravity feed trickle flow alternating field system shall be uniformly level throughout its length.

(f) In order to provide equal flow distribution in gravity feed trickle flow alternating field subsurface soil absorption systems, the absorption trenches in each side of the system must be individually connected to a distribution box by at least five (5) feet of unperforated pipe which is laid with a gravel free backfill. All absorption trenches served by a common distribution box must be constructed so that each square foot of the absorptive area served by the distribution box is loaded with an equal volume of effluent. The distal ends of the distribution lines may be manifolded together by piping on sites with slopes of two percent (2%) or less, but shall not be tied together on sites with slopes of greater than two percent (2%). When the distal ends of the absorption trenches are manifolded, the manifold trench area shall not count as meeting any of the minimum absorption area required by subsection (a).

(g) All absorption field distribution lines shall have an internal diameter of four (4) inches.

(h) No single absorption trench shall exceed one hundred (100) feet in length.

(i) On sloping sites, absorption trenches shall be constructed along the contour.

(j) There shall be a minimum separation of seven and one-half (7 1/2) feet, on center, between absorption field trenches.

(k) All subsurface gravity feed flood dosed absorption fields shall be designed to utilize trenches with a minimum width of eighteen (18) inches and a maximum trench width of thirty-six (36) inches.

(l) The minimum depth from original grade to the bottom of a subsurface gravity feed trickle flow alternating field absorption trench shall not be less than ten (10) inches, and the maximum depth to the bottom of such trench shall not be more than thirty-six (36) inches.

(m) Perforated pipe distribution lines in the subsurface gravity feed trickle flow alternating field soil absorption trench shall be completely surrounded by aggregate which meets the specifications in section 47 of this rule. There shall be at least six (6) inches of aggregate below the pipe and at least two (2) inches of aggregate above the pipe.

(n) The aggregate shall be covered with a six (6) inch layer of straw, or else a geotextile fabric barrier which meets the minimum requirements in section 46 of this rule. The barrier shall be installed in such a manner as to prevent the aggregate from becoming clogged with the earth fill.

(o) A minimum of twelve (12) inches of cover shall be provided over the aggregate in the trenches, and any fill required to provide cover shall be crowned over the entire field to promote surface run-off.

(p) Subsurface gravity feed trickle flow alternating field soil absorption systems shall not be constructed in clayey soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. For the purpose of this rule, the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads one-eighth (1/8) inch in diameter without breaking apart and crumbling.

(q) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the subsurface gravity feed trickle flow alternating field soil absorption system before, during, and after construction of the trenches, especially during wet weather. Precaution is especially important where clayey soils are involved. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site and/or the system.

(r) Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or the system.

410 IAC 6-8.1-55 Subsurface pressure distribution systems

Sec 55. (a) The minimum absorption area (in square feet) required for each subsurface pressure distribution soil absorption system shall be based on the following:

(1) The number of bedrooms and bedroom equivalents in the dwelling.

(2) The appropriate soil loading rate (in gallons per day per square foot) determined from Table V of section 49(4) of this rule.

(3) The vertical separation distance between the bottom of the proposed trench and any soil layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The loading rate used for this computation shall be the loading rate of the most restrictive horizon within twenty-four (24) inches of the trench bottom.

(4) The absorption area shall be computed using the following formula:

$$\text{Area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{\text{loading rate in gpd/sq.ft.}}$$

(5) If the loading rate determined from Table V of section 49(4) of this rule is twenty-five hundredths (0.25) gallons per day per square foot or thirty-hundredths (0.30) gallons per day per square foot, the system may be reduced in size from the absorption area determined in subdivision (1) by nine-tenths of one percent (0.9%) for each inch over twenty-four (24) inches to a maximum of sixty (60) inches between the trench bottom and a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot. The new absorption area shall then be computed using the following formula:

New Absorption Area* = A.A. - [A.A.x0.009(D.L. - D.T. - 24)] where:

A.A. = Absorption area determined in subdivision (4).
D.L. = Depth in inches from the ground surface to a layer with a loading rate of less than twenty-five hundredths (0.25) gallons per day per square foot.
D.T. = Depth in inches from the ground surface to the proposed trench bottom.

*Note: The value for the quantity (D.L. - D.T. - 24) may not exceed thirty-six (36). If a value of greater than thirty-six (36) is obtained then thirty-six (36) must be used for the computations.

(b) All subsurface pressure distribution systems shall be located in accordance with the separation distances shown in Table II of section 37(a) of this rule. Subsurface pressure distribution systems shall not be constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a loading rate greater than one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table V of section 49(4) of this rule unless that hazard can be overcome through system design.

(c) Subsurface pressure distribution soil absorption systems shall not be wholly or partly located in a drainage way subject to intermittent flooding.

(d) On sloping sites, absorption trenches in subsurface pressure distribution systems shall be constructed along the contour.

(e) There shall be a minimum separation of seven and one-half (7 1/2) feet, on center, between absorption field trenches in subsurface pressure distribution systems.

(f) All subsurface pressure distribution systems shall be designed to utilize trenches with a minimum width of eighteen (18) inches and a maximum trench width of thirty-six (36) inches.

(g) The minimum depth from original grade to the bottom of a trench in a subsurface pressure distribution system shall not be less than ten (10) inches, and the maximum depth to the bottom of a trench in a subsurface pressure distribution system shall not be more than thirty-six (36) inches.

(h) Perforated pipe distribution lines in the absorption trench of a subsurface pressure distribution system shall be completely surrounded by aggregate which meets the specifications in section 47 of this rule. There shall be at least six (6) inches of aggregate below the pipe and at least two (2) inches of aggregate above the pipe.

(i) The aggregate in a subsurface pressure distribution system shall be covered with a six (6) inch layer of straw, or else a geotextile fabric barrier which meets the minimum requirements in section 46 of this rule, in such a manner as to prevent the aggregate from becoming clogged with the earth fill.

(j) A minimum of twelve (12) inches of cover shall be provided over the aggregate in the trenches, and any fill required to provide cover shall be crowned over the entire field to promote surface run-off.

(k) Subsurface pressure distribution systems shall not be constructed in clayey soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay.
For the purpose of this rule, the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads one eighth (1/8) inch in diameter without breaking apart and crumbling.

(l) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the subsurface pressure distribution system before, during, and after construction of the trenches, especially during wet weather. Precaution is especially important where clayey soils are involved. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site and/or the system.

(m) Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or the system.

(n) Each pipe connected to an outlet in the manifold of a subsurface pressure distribution system shall be counted as a separate distribution pipe.

(o) Trenches in a subsurface pressure distribution system shall not be manifolded together at the distal end of the trench.

(p) Each trench and distribution line in a subsurface pressure distribution system shall be uniformly level throughout its length.

(q) The pump shall be sized and its controls set as follows:

(1) When a subsurface pressure distribution system is designed using a loading rate of less than one and two-tenths (1.2) gallons per day per square foot, the pump shall deliver the design daily flow in one (1) dose each day while maintaining an in-line residual pressure of two and five-tenths (2.5) to three (3) feet of head in the distribution line at the highest elevation in the soil absorption system during pumping.

(2) When a subsurface pressure distribution system is designed using a loading rate of one and two-tenths (1.2) gallons per day per square foot, the pump shall deliver four (4) doses each day, each dose being approximately one-fourth (1/4) of the daily design flow, while maintaining an in-line residual pressure of two and five-tenths (2.5) to three (3) feet of head in the distribution line at the highest elevation in the soil absorption system during pumping.

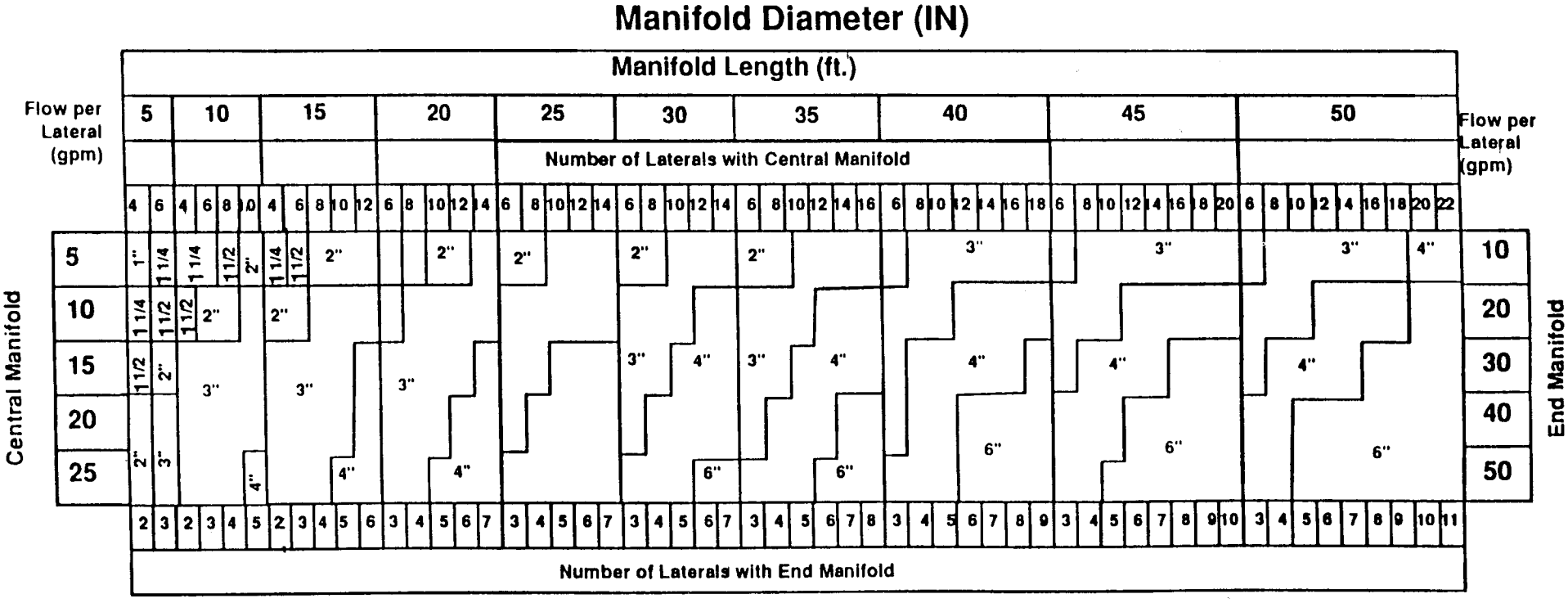
(r) The delivery pipe from the pumping chamber to the subsurface pressure distribution system must drain between doses. If the delivery pipe drains to the subsurface pressure distribution system, the dosing tank volume shall be the dose calculated using subsection (q)(1) or (q)(2), whichever is applicable, minus the volume contained in the delivery pipe. If the delivery pipe drains back to the dosing tank, the dosing tank volume shall be the dose calculated using subsection (q)(1) or (q)(2), whichever is applicable, plus the volume contained in the delivery pipe. Additional dosing tank capacity must be provided to keep the dosing tank pump submerged at all times and to provide sufficient freeboard for a high water alarm.

(s) The minimum inside diameter of the delivery pipe shall be two (2) inches; the maximum inside diameter of the delivery pipe shall be four (4) inches.

(t) Table VIII of section 53(v) of this rule, shall be used in determining friction losses in the delivery pipes and manifold when plastic pipe is used.

(u) The delivery manifold piping diameter shall be determined from Table IX of this subsection. The minimum inside diameter of the manifold shall be two (2) inches; the maximum inside diameter of the manifold shall be four (4) inches.

Table IX
Manifold Diameters for Various Manifold Lengths, Number of Laterals and Lateral Discharge Rates (for Plastic Pipe Only.)



Computed for Plastic Pipe Only. The Hazen-Williams equation was used to compute headlosses through each segment (Hazen-Williams C_h-150). The maximum manifold length for a given lateral discharge rate and spacing was defined as that length at which the difference between the heads at the distal and supply ends of the manifold exceeded 10 percent of the head at the distal end.

(v) The minimum inside diameter of the distribution pipes from the delivery manifold shall be one (1) inch; the maximum inside diameter of the distribution pipes shall be three(3) inches.

(w) The distribution pipes shall have one (1) row of holes spaced in accordance with Table X as follows:

TABLE X
SOIL LOADING RATES VERSUS LATERAL
HOLE SPACING

Soil Loading Rates Gallons per Day per Square Foot	Lateral Hole Spacing Feet Between Holes
1.2	3
0.75	3 to 5
0.5 and 0.6	3 to 6
0.25 and 0.3	3 to 7

(x) The holes in the lateral piping shall be placed in the trenches facing down and all burrs shall be removed from the edges of the holes.

(y) The hole size in the laterals shall be one-fourth (1/4) inch.

(z) The perforation discharge rate shall be determined in accordance with the formula used to compute the flow from a hole in the distribution line at in-line head as follows:

$Q = 11.78(d^2)(\sqrt{H})$

Where: "Q" = the volume of the flow from the hole
"d" = the diameter of the hole in the pipe
"H" = the in-line head at the hole

Table XI gives the discharge rates at varying heads which would be obtained using the formula above in which "d" equals one fourth (1/4) inch diameter holes.

TABLE XI

PERFORATION DISCHARGE RATES IN GPM
AT VARYING HEADS FOR 1/4 INCH DIAMETER HOLE SIZE

In-Line Head (feet)	Perforation Discharge Rate (gallons per minute)
1.5	0.90
2.0	1.04
2.5	1.17
3.0	1.28
3.5	1.38
4.0	1.47
4.5	1.56

(aa) Pump selection for soil absorption systems using pressure distribution shall be based on the manufacturers pump curves for the required pump discharge rate at the total head imposed on the pump. The pump discharge rate for level systems is calculated by using the following formula: Perforation discharge rate x number of perforations per 100 feet of distribution pipe x $\frac{\text{total length of distribution pipe}}{100}$

To obtain the pump discharge rate required for sloping sites the rate must be calculated individually for each distribution line, using the pump discharge rate formula based on the pressure on that line, and the sum of the calculated discharge rates determined for each individual line.

(bb) The end of each lateral shall be capped, and a one-fourth (1/4) inch hole shall be drilled in the upper half of the end cap.

(cc) All joints, including the end cap, shall withstand the pressures exerted on them.

410 IAC 6-8.1-56 Elevated sand mound systems

Sec 56. (a) The minimum basal area (in square feet) required for each elevated sand mound system shall be based on the following:

(1) The number of bedrooms and bedroom equivalents in the dwelling, and the appropriate soil loading rate (in gallons per day per square foot) determined from Table VI of section 51(4) of this rule. The absorption area shall be computed using the formula:

$$\text{Absorption area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{\text{loading rate in gpd/sq.ft}}$$

The loading rate used for this computation shall be the loading rate of the most restrictive horizon within twenty (20) inches of the soil surface.

(2) On level sites, the basal area shall be the entire area under the mound excluding the end slope areas. On sloping sites, the basal area shall be the area underneath and down slope of the aggregate bed.

(b) All elevated sand mound systems shall be located in accordance with the separation distances shown in Table II of section 37(a) of this rule. Elevated sand mound systems shall not be constructed where there exist horizons, layers, or strata within twenty (20) inches of the ground surface with a loading rate greater than one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table VI of section 51(4) of this rule unless that hazard can be overcome through system design.

(c) Elevated sand mound systems shall not be wholly or partly located in a drainage way subject to intermittent flooding.

(d) The elevated sand mound site as well as the downslope absorption area shall be staked out and protected from vehicular traffic.

(e) The elevated sand mound must be designed and constructed so that its longest axis is located along the contour. The mound dimensions should be as long and narrow as possible for the site.

(f) Elevated sand mound systems shall not be constructed in clayey soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. This includes those soils classified as sandy loam, silt loam, loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. For the purpose of this rule, the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads one-eighth (1/8) inch in diameter without breaking apart and crumbling.

(g) Excessive vegetation at the mound site must be cut and removed. If present, trees must be cut off at ground level and the stumps left in place.

(h) The delivery line from the dosing tank to the manifold shall be installed prior to plowing the mound site.

(i) The area within the mound perimeter shall be plowed to a depth of seven (7) to eight (8) inches, parallel to the contour, with a moldboard or chisel plow. If a moldboard plow is used, it shall have at least two (2) bottoms (shares) and the soil shall be turned upslope.

(j) The sand fill shall meet the following conditions:

(1) Sand fill must be placed on the plowed area immediately after plowing the site.

(2) The sand utilized must be medium textured sand which meets the size criteria of Table XII as follows:

TABLE XII

Sieve Size	Percent Passing Sieve *
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	5-30
No. 100	0-10
No. 200	0-3

*Note: The fine aggregate shall not have more than forty-five percent (45%) retained between any two (2) consecutive sieves. Aggregate which meets Indiana state highway Specification 23 meets this criteria.

(3) The sand shall be placed on the plowed area starting from the upslope edge. At least six (6) inches of sand fill must be kept between the vehicle wheels or tracks and the native soil of the mound site at all times.

(4) There shall be a minimum of twelve (12) inches of sand fill. The surface of the sand fill shall be raked smooth to eliminate any ruts. The toes of the fill shall be constructed to a minimum of a 3:1 slope.

(k) Aggregate shall be placed over the sand fill to form a bed, not trenches. The bottom of this aggregate bed shall be level.

(l) The aggregate used in the gravel bed shall meet the minimum requirements of section 47 of this rule. There shall be at least six (6) inches of aggregate beneath and two (2) inches of aggregate above the lateral lines.

(m) The aggregate bed shall be covered with a barrier material which meets the minimum requirements of section 46 of this rule.

(n) The total area of the aggregate bed (in square feet) shall be determined using the formula:

$$\text{Area} = \frac{150g \times \text{number of bedrooms and bedroom equivalents}}{1.2 \text{ gpd/sq.ft}}$$

Aggregate beds shall not be less than four (4) feet nor more than ten (10) feet in width. If more than one (1) aggregate bed must be constructed, each bed shall provide equal absorption area.

(o) A pressure distribution network shall be used for elevated sand mound systems. The pressure distribution system network shall be sized, and its controls set, to deliver four (4) doses each day, each dose being approximately one-fourth (1/4) of the daily design flow, while maintaining an in-line residual pressure of two and five-tenths (2.5) to three (3) feet of head in the distribution line during pumping.

(p) The pressure distribution network must drain between doses. If the delivery pipe drains to the distribution network, the dosing tank volume shall be the dose calculated using subsection (o), minus the volume contained in the delivery pipe. If the delivery pipe drains back to the dosing tank, the dosing tank volume shall be the dose calculated using subsection (o), plus the volume contained in the delivery pipe. Additional dosing tank capacity must be provided to keep the dosing tank pump submerged at all times and to provide sufficient freeboard for a high water alarm.

(q) The minimum inside diameter of the delivery pipe shall be two (2) inches; the maximum inside diameter of the delivery pipe shall be four (4) inches.

(r) Table VIII of section 53(v) of this rule, shall be used in determining friction losses in the delivery pipes and manifold when plastic pipe is used.

(s) The delivery manifold piping diameter shall be determined from Table IX of section 55(u) of this rule. The minimum inside diameter of the manifold shall be two (2) inches; the maximum inside diameter of the manifold shall be four (4) inches.

(t) The minimum inside diameter of the distribution pipes from the delivery manifold shall be one (1) inch; the maximum inside diameter of the distribution pipes shall be three (3) inches.

(u) The holes in the lateral pipes shall be placed in the trenches facing down and all burrs shall be removed from the edges of the holes.

(v) The hole size in the laterals shall be one-fourth (1/4) inch.

(w) The end of each lateral shall be capped and a one-fourth (1/4) inch hole drilled in the upper half of the end cap.

(x) The system shall maintain an in-line residual pressure of two and five-tenths (2.5) to three (3) feet of head during pumping.

(y) All joints, including the end cap, shall withstand the pressures exerted on them.

(z) The lateral lines in the absorption bed shall not be manifolded together.

(aa) The separation distance between laterals shall not be less than twenty-four (24) inches nor more than thirty-six (36) inches.

(bb) The holes on the bottom of the laterals shall be spaced thirty-six (36) inches on center, with the first hole located eighteen (18) inches from the manifold.

(cc) The elevated sand mound shall be designed and constructed to maintain at least a 3:1 slope on all sides.

(dd) The entire mound shall be covered with six (6) inches of a clayey textured soil with an additional six (6) inches of topsoil covering the clayey textured soil

(ee) The elevated sand mound shall be seeded or sodded with grasses and legumes adapted to the area. If the mound is seeded, the mound shall be protected by a cover of straw, burlap, or some other material that will protect it against erosion until a vegetative cover develops.

410 IAC 6-8.1-57 Matters incorporated by reference

Sec. 57.(a) Bulletin SE 11, "The Sanitary Vault Privy," 1986 Edition, is incorporated by reference as part of this rule. It may be obtained free of charge by request mailed to the board at 1330 West Michigan Street, Indianapolis, Indiana 46206-1964.

(b) National Sanitation Foundation Standard Number 40, "Individual Aerobic Wastewater Treatment Plants", 1983 edition, is incorporated by reference as part of this rule. Two (2) copies of the standard are available for reference in the files of the board. Copies of the standard may be obtained by mailing a request and fifteen dollars ($15) to the National Sanitation Foundation, 3475 Plymouth Road, P. O. Box 1468, Ann Arbor, Michigan 48106.

(c) Two copies of ASTM Standards D 1527-89, D 1785-89, D 2241-89, D 2282-89, D 2661-87a, D 2665-89a, D 2680-89, D 2729-89, D 2751-89, D 3034-89, F405-89, F667-85, F810-85, C412-83, C4-62, C498-65 and SCS Standard 606 are available for reference in the files of the board.