COMMERCIAL ONSITE SEWAGE SYSTEMS
RULE 410 IAC 6-10.1

Indiana State Department of Health
Environmental Public Health Division
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410 IAC 6-10.1-1 Definitions

Sec. 1. The definitions in this rule apply throughout this rule.

410 IAC 6-10.1-2 "AASHTO" defined

Sec. 2. "AASHTO" means the American Association of State Highway and Transportation Officials.

410 IAC 6-10.1-3 "ABS" defined

Sec. 3. "ABS" means acrylonitrile-butadiene-styrene.

410 IAC 6-10.1-4 "ANSI" defined

Sec. 4. "ANSI" means the American National Standards Institute.

410 IAC 6-10.1-5 "ASTM" defined

Sec. 5. "ASTM" means the American Society for Testing and Materials.

410 IAC 6-10.1-6 "Cluster system" defined

Sec. 6. "Cluster system" means an onsite sewage system designed to serve two (2) or more sewage-generating dwellings or facilities with multiple owners. Typically, the term includes a comprehensive, sequential land-use planning component and private ownership.

410 IAC 6-10.1-7 "Commissioner" defined

Sec. 7. "Commissioner" means the commissioner of the department or his or her legally authorized representative.

410 IAC 6-10.1-8 "Commercial onsite sewage system" or "onsite sewage system" defined

Sec. 8. "Commercial onsite sewage system" or "onsite sewage system" means all equipment and devices necessary for proper conduction, collection, storage, treatment, and on-site disposal of sewage from other than one-family or two-family dwellings, except where such dwellings are connected to a cluster system. However, an onsite sewage system serving two (2) single-family dwellings on the same property, with a combined DDF of less than or equal to seven hundred fifty (750) gallons per day, is a residential onsite sewage system, not a commercial onsite sewage system. Included within, but not limited to, the scope of this definition are building sewers, grease traps, septic tanks, dosing tanks, absorption fields, perimeter drains, vault privies, and temporary sewage holding tanks serving such facilities as the following:

(1) Apartment buildings.
(2) Campgrounds.
(3) Churches.
(4) Commercial establishments.
(5) Condominiums.
(6) Medical facilities.
(7) Mobile home parks.
(8) Motels.
(9) Office buildings.
(10) Restaurants.
(11) Schools.

410 IAC 6-10.1-9 "Commercial onsite sewage system failure" defined

Sec. 9. "Commercial onsite sewage system failure" means a commercial onsite sewage system that exhibits one (1) or more of the following:(1) The onsite sewage system refuses to accept sewage at the rate of design application thereby interfering with the normal use of commercial 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 onsite sewage system causing contamination of a potable water supply, ground water, or surface waters.

A failed commercial onsite sewage system is a health hazard.

410 IAC 6-10.1-10 "Construction permit" defined

Sec. 10. "Construction permit" means written approval by the department for the installation, repair, or replacement of a commercial onsite sewage system.

410 IAC 6-10.1-11 "Densic material" defined

Sec. 11. "Densic material" means relatively unaltered materials (do not meet requirements for any other named diagnostic horizons nor any other diagnostic soil characteristic) that have a noncemented rupture resistance class. The bulk density or the organization is such that roots cannot enter, except in cracks. These are mostly earthy materials, such as till, volcanic mudflows, and some mechanically compacted materials. Some noncemented rock can be densic materials if they are dense or resistant enough to keep roots from entering, except in cracks. Densic materials are noncemented and thus differ from paralithic materials and the material below a lithic contact, both of which are cemented. Densic materials have, at their upper boundary, a densic contact if they have no cracks or if the spacing of cracks that roots can enter is ten (10) centimeters (cm) or more. These materials can be used to differentiate soil series if the materials are within the series control section.

410 IAC 6-10.1-12 "Department" defined

Sec. 12. "Department" means the Indiana state department of health.

410 IAC 6-10.1-13 "Design daily flow" or "DDF" defined

Sec. 13. "Design daily flow" or "DDF" means the calculated peak daily sewage flow from a commercial facility used to design a commercial onsite sewage system.

410 IAC 6-10.1-14 "Distribution box" defined

Sec. 14. "Distribution box" means a structure designed to distribute effluent by gravity from a septic tank equally into the trenches of the soil absorption system connected thereto.

410 IAC 6-10.1-15 "Drainageway" defined

Sec. 15. "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 6-10.1-16 "Dwelling" or "residence" defined

Sec. 16. "Dwelling" or "residence" 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, and any associated outbuildings that are for the private use of the owner.

410 IAC 6-10.1-17 "Fill" defined

Sec. 17. "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 that has been covered.

(4) Materials in a horizon such as cinders or construction debris.

(5) Position in the landscape.

410 IAC 6-10.1-18 "Grease trap" defined

Sec. 18. "Grease trap" means a tank designed to intercept, congeal, and retain or remove fats, oils, and grease (FOGs) from sewage.

410 IAC 6-10.1-19 "Health officer" defined

Sec. 19. "Health officer" means the health officer of a local board of health.

410 IAC 6-10.1-20 "High strength waste" defined

Sec. 20. "High strength waste" means either of the following as defined by National Sanitation Foundation International (NSF) Standard 40 testing protocol:

(1) Influent to a septic tank or other pretreatment component having any or all of the following:

(A) A five (5) day biochemical demand (BOD5) greater than three hundred (300) mg/L.

(B) Total suspended solids (TSS) greater than two hundred (200) mg/L.

(C) Fats, oils, and grease (FOGs) greater than fifty (50) mg/L.

(2) Effluent from a septic tank or other pretreatment component discharged to a soil absorption field having any or all of the following:

(A) A BOD5 greater than one hundred seventy (170) mg/L.

(B) TSS greater than sixty (60) mg/L.

(C) FOGs greater than twenty-five (25) mg/L.

410 IAC 6-10.1-21 "INDOT" defined

Sec. 21. "INDOT" means the Indiana department of transportation.

410 IAC 6-10.1-22 "Interceptor drain" defined

Sec. 22. "Interceptor drain" means a subsurface drainage system constructed only on the upslope side or sides of a soil absorption system for the purpose of diverting subsurface water around the soil absorption system site.

410 IAC 6-10.1-23 "Local health department" defined

Sec. 23. "Local health department" means a local health department created pursuant to IC 16-20, or its duly authorized representative.

410 IAC 6-10.1-24 "NEMA" defined

Sec. 24. "NEMA" means the National Electrical Manufacturers Association.

410 IAC 6-10.1-25 "NRCS" defined

Sec. 25. "NRCS" means the United States Department of Agriculture, Natural Resources Conservation Service.

410 IAC 6-10.1-26 "NSF" defined

Sec. 26. "NSF" means the National Sanitation Foundation International.

410 IAC 6-10.1-27 "Operating permit" defined

Sec. 27. "Operating permit" means written approval by the department for the continued use and maintenance of a commercial onsite sewage system.

410 IAC 6-10.1-28 "Owner" defined

Sec. 28. "Owner" means the owner of a commercial facility or dwelling or his or her agent.

410 IAC 6-10.1-29 "Perimeter drain" defined

Sec. 29. "Perimeter drain" means a subsurface drainage system that completely surrounds a soil absorption system for the purpose of lowering a seasonal high water table or preventing movement of subsurface water into a soil absorption system site.

410 IAC 6-10.1-30 "Person" defined

Sec. 30. "Person" means any:
(1) individual;
(2) partnership;
(3) copartnership;
(4) firm;
(5) company;
(6) corporation;
(7) association;
(8) trust;
(9) estate; or
(10) other legal entity, its or their successors, assigns, or agents.

410 IAC 6-10.1-31 "PVC" defined

Sec. 31. "PVC" means polyvinyl chloride.

410 IAC 6-10.1-32 "Regulatory flood elevation" or "RFE" defined

Sec. 32. "Regulatory flood elevation" or "RFE" means the elevation of surface water resulting from a flood for which there is a one percent (1%) probability of equaling or exceeding that level in any given year as calculated by a method and procedure that is approved by the Indiana natural resources commission. The regulatory flood elevation is also referred to as the base flood elevation.

410 IAC 6-10.1-33 "Sanitary sewerage system" defined

Sec. 33. "Sanitary sewerage system" means a sewer or a system of sewers that conveys sewage away from the property on which it originates to a wastewater treatment facility owned and operated by:
(1) an incorporated city or town;
(2) a conservancy district;
(3) a regional sewer district; or
(4) a private utility.

410 IAC 6-10.1-34 "SDR" defined

Sec. 34. "SDR" means standard dimension ratio.

410 IAC 6-10.1-35 "Seasonal high water table" defined

Sec. 35. "Seasonal high water table" means the upper limit of soil saturated with water for periods long enough for anaerobic conditions to affect soil color.

410 IAC 6-10.1-36 "Segment drain" defined

Sec. 36. "Segment drain" means a subsurface drainage system constructed between two (2) soil absorption fields in the same onsite sewage system for the purpose of intercepting and diverting subsurface water away from the downslope soil absorption field.

410 IAC 6-10.1-37 "Septic tank" defined

Sec. 37. "Septic tank" means a watertight structure into which sewage is discharged for settling and solids digestion.

410 IAC 6-10.1-38 "Sewage" defined

Sec. 38. "Sewage" means all water-carried waste derived from ordinary living processes.

410 IAC 6-10.1-39 "Soil absorption" defined

Sec. 39. "Soil absorption" means a process that utilizes the soil to treat and disperse effluent from a septic tank.

410 IAC 6-10.1-40 "Soil absorption system" or "soil absorption field" defined

Sec. 40. "Soil absorption system" or "soil absorption field" means pipes or chambers laid in a system of subsurface trenches or pipes laid in elevated beds into which the effluent from the septic tank is discharged into the soil for treatment and dispersal.

410 IAC 6-10.1-41 "Soil horizon" defined

Sec. 41. "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:

(1) color;
(2) structure;
(3) texture;
(4) consistence;
(5) kinds and numbers of organisms present; and
(6) degree of acidity or alkalinity.

410 IAC 6-10.1-42 "Soil loading rate" defined

Sec. 42. "Soil 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 6-10.1-43 "Soil profile analysis" defined

Sec. 43. "Soil profile analysis" means the observation and evaluation of the physical characteristics of the soil horizons or layers to:

(1) a depth of at least five (5) feet; or
(2) if shallower, a layer that cannot be readily penetrated.

410 IAC 6-10.1-44 "Soil scientist" defined

Sec. 44. "Soil scientist" means an individual registered as a professional soil scientist with the Indiana Registry of Soil Scientists (IRSS) as provided for under IC 25-31.5.

410 IAC 6-10.1-45 "Start of construction" defined

Sec. 45. "Start of construction" means, but is not limited to, any site activity undertaken for the erection of a structure to be served by a commercial onsite sewage system.

410 IAC 6-10.1-46 "Subsurface drainage system" defined

Sec. 46. "Subsurface drainage system" means any pipe with or without a layer of gravel, stone, or coarse sand, placed below the surface of the ground and designed or constructed in such a manner as to:

(1) effectively lower a seasonal high water table; or

(2) prevent movement of subsurface water into a soil absorption system site.

Interceptor drains, perimeter drains, and segment drains are types of subsurface drainage systems.

410 IAC 6-10.1-47 "Technology new to Indiana" or "TNI" defined

Sec. 47. "Technology new to Indiana" or "TNI" means on-site sewage treatment or disposal methods, processes, or equipment not described in this rule that have been approved by the department in accordance with section 49(h) of this rule.

410 IAC 6-10.1-48 Administrative authority

Sec. 48. (a) The department, its agent, or the health officer or his or her agent shall be permitted to enter upon all properties at the proper time for the following purposes necessary to achieve compliance with this rule:

(1) Inspection.

(2) Observation.

(3) Measurement.

(4) Sampling.

(5) Testing.

(b) The department may delegate, in writing, to local health departments the plan review, approval, permit issuance, and inspection for individual commercial facilities with onsite sewage systems with a design daily flow of less than or equal to seven hundred fifty (750) gallons when the local health department complies with the requirements of the department for plan review, approval, and permit issuance. The department may revoke, in writing, such delegation when a local health department fails to comply with the requirements of the department for plan review, approval, and permit issuance. Local health departments may review plans and issue permits based on delegation when the department:

(1) has designated which on-site sewage system technologies are delegated to the local health department for plan review, approval, and permit issuance; and

(2) has provided design criteria to the local health department for each individual commercial onsite sewage system project.

410 IAC 6-10.1-49 General sewage disposal requirements

Sec. 49. (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 commercial facility or commercial onsite sewage system that would cause or contribute to a health hazard or water pollution.

(b) The:

(1) design;

(2) construction;

(3) installation;

(4) location;

(5) maintenance; and

(6) operation;

of commercial onsite sewage systems shall comply with the provisions of this rule.

(c) All commercial onsite sewage systems utilizing sanitary privies shall conform to department bulletin SE 11, "The Sanitary Vault Privy", 1986 Edition.

(d) Any commercial facility that is not connected, or cannot be connected, to a sanitary sewerage system shall be provided with a commercial onsite sewage system that 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 department. A temporary sewage holding tank shall not be used as a primary means of commercial sewage disposal except:

(1) where necessary to prevent continued discharge of sewage from a failed existing commercial onsite sewage system;

(2) when soil conditions exist that preclude the prompt construction of a soil absorption system on a site that has already received a construction permit; or

(3) where the holding tank is owned and operated by a conservancy district, sewer district, private utility, or municipality as a part of its sewage disposal plan or for not more than two (2) years while connection to sanitary sewer is being secured. This two (2) year time frame may be extended upon documentation of satisfactory operation of the holding tank.

(f) No portion of the commercial onsite sewage 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.

(g) Commercial onsite sewage systems shall not be used for the disposal of water from:

(1) roof drains;

(2) foundation drains;

(3) swimming pool main drains;

(4) hot tub drains; or

(5) area drains.

Neither shall they be used for the disposal of chemical wastes in quantities that would pollute ground water or inhibit solids settling or digestion in the septic tank.

(h) In order to encourage development of new or more efficient treatment or disposal processes, the department may issue construction permits for experimental and TNI commercial onsite sewage systems. Construction permits may be issued for installations, treatment, or disposal equipment, processes, or techniques for which extensive experience or records of use have not been developed in Indiana. However, the applicant must submit evidence of sufficient clarity and conclusiveness to convince the department that the proposal has a reasonable and substantial probability of satisfactory operation without causing a health hazard, nuisance, surface water pollution, or ground water pollution. The department may also require the applicant to satisfactorily document how and by whom the experimental facilities and any other portions of the commercial onsite sewage system, which could be damaged due to a failure of the experimental installation, are to be replaced if it becomes necessary.

410 IAC 6-10.1-50 Construction permit requirements

Sec. 50. (a) Except as allowed by subsection (c), or section 48(b) of this rule, for any commercial facility that will not be connected to a sanitary sewerage system, the owner or agent of the owner shall obtain a written construction permit, signed by the commissioner or his or her duly authorized representative, for construction of a commercial onsite sewage system prior to the:

(1) start of construction of a commercial facility;

(2) start of construction of a regulated facility;

(3) reconstruction of any commercial or regulated facility;

(4) addition to, alteration of, replacement, or repair of an existing commercial onsite sewage system;

(5) installation of an onsite sewage system for an existing commercial facility that did not previously have an onsite sewage system as defined in section 8 of this rule;

(6) expansion of a commercial or regulated facility that may increase the design daily flow;

(7) change of use of a commercial or regulated facility;
(8) change in operations that would increase the design daily flow; or
(9) change of operations that would result in the increase of the BOD5, TSS, or FOGs of the sewage.

(b) Nothing in this rule shall be construed as preventing requirements in local ordinance for the issuance of a commercial onsite sewage system, provided that the permit required by local ordinance is:

(A) issued only after permit issuance by the department (except as permitted in section 48(b) or subsection (c) of this rule); and
(B) is not in conflict with the permit issued by the department.

(c) Construction permits shall not be required for the following:
(1) Repair or replacement of commercial onsite sewage system equipment with new units of similar design and capacity, none of which will cause a health hazard or adversely affect ground water, facility operation, hydraulics, physiochemical treatment, biological treatment, solids removal, or the ultimate means of liquid disposal. This section shall not be construed as allowing the construction of replacement soil absorption fields or portions thereof without a valid construction permit issued in accordance with this rule.(2) Commercial onsite sewage systems for which a construction permit has been issued under 327 IAC 3, and which serve two (2) or more premises, and which are owned, operated, or maintained by an incorporated city or town, a conservancy district established under IC 14-33, or a regional sewer district established under IC 13-26. This section shall not be construed as an exemption from the requirement of subsection (a) for commercial onsite sewage systems located on the premises of and serving only schools or municipal facilities.

410 IAC 6-10.1-51 Application for construction permit

Sec. 51. (a) Application for a permit to construct a commercial onsite sewage system shall be made to the department on forms provided by the department. Application for a construction permit shall be made at least ninety (90) days prior to the date construction of the commercial onsite sewage system is to commence. An application shall be considered complete only when the form is completed in its entirety, including all supplemental information required or requested by the department. Unless waived by the department an application for permit shall include the following:

(1) The signature of the applicant or his or her designated agent.
(2) The name, business address, and business telephone number of the owner. For corporate owners, the name of the corporation, the name of its designated agent, and that agent's business address and business telephone number shall suffice.
(3) One (1) set of detailed construction plans and specifications certified and sealed by a professional engineer or architect currently registered in Indiana, said plans drawn to scale and having sufficient clarity to be reproduced to create legible microfilm. As provided in IC 25-21.5-1-7(b), registered land surveyors may only certify and seal plans for gravity sanitary sewers, storm sewers, and tile drains.
(4) A map or other documentation showing the location of the property involved.
(5) A plot plan, drawn to scale, showing the location of the proposed commercial onsite sewage system with respect to property lines, existing and proposed structures, roads, and parking lots, and any drinking water supply facilities within three hundred (300) feet of the commercial onsite sewage system. The plot plans shall also show site topography, with contours established at intervals of two (2) feet or less.
(6) The name, business address, and business telephone number of the registered engineer or architect who certified and sealed the construction plans and specifications required by subdivision (3), in writing.
(7) For those commercial onsite sewage systems that will include an absorption field, an on-site soils evaluation report prepared by a soil scientist, detailing his or her evaluation of soils observed in the area of the proposed absorption field. The on-site soils evaluation report shall include all information required in section 64 of this rule.

(8) For those commercial onsite sewage systems that will include a temporary sewage holding tank, documentation of sufficient clarity and conclusiveness to convince the department that the:

(A) sewage will be collected from the holding tank and disposed of, in compliance with IC 13-18-12;

(B) temporary sewage holding tank will be abandoned and a sewer connection will be made to another type of commercial onsite sewage system, or to a municipal or private utility sewer, or to a regional sewer district or conservancy district sewer, within two (2) years from the date of permit issuance; and

(C) holding tank has at least a three (3) day holding capacity at the ninety-five percent (95%) level, and will be equipped with an audio-visual alarm set to activate at the ninety-five percent (95%) level.

(9) Sewage characteristics and calculations used to estimate sewage flow on the peak day, in gallons, to be disposed of through each proposed commercial onsite sewage system. If more than one (1) type of facility is to be connected to a proposed commercial onsite sewage system, sewage characteristics and calculations used to estimate sewage flow, in gallons, from each facility on its peak day must be submitted.

(10) A summary delineating, for each diameter of pipe utilized, the estimated total length of sanitary sewer and sewage force main to be installed.

(11) For commercial facilities generating high strength waste as defined in section 20 of this rule, the plan submittal must include a process to accommodate the additional organic loading.

(12) All additional information requested by the department to substantiate that the proposed commercial onsite sewage system can reasonably be expected to treat and dispose of all sewage received without causing a health hazard, nuisance, surface water pollution, or ground water pollution.

(b) Requests for additional substantiating information made under subsection (a)(12) shall be addressed to the registered engineer or architect who certified and sealed the construction plans and specifications required by subsection (a)(3).

410 IAC 6-10.1-52 Standards for issuance

Sec. 52. The department may reject an application for permit to construct a commercial onsite sewage system for failure by the applicant to submit any of the following:

(1) All documentation required by section 51(a) of this rule.

(2) Evidence to fully justify the estimated sewage flows and sewage characteristics used as the basis of design for the commercial onsite sewage system.

(3) Evidence that the commercial onsite sewage system can be constructed, modified or installed, and operated in such a manner that it will not violate any sanitation, health, siting, or pollution control rules or ordinances existing at the time of application.

(4) Evidence that the commercial onsite sewage system conforms to applicable design criteria contained in this rule, standards of the department, or such other criteria acceptable to the department that can reasonably be expected to result in a commercial onsite sewage system that will consistently treat and dispose of all sewage received for the life of the facilities it serves, without causing a health hazard, nuisance, surface water pollution, or ground water pollution.

410 IAC 6-10.1-53 Construction permit conditions

Sec. 53. (a) The department may specify in its construction permits any limitations, terms, or conditions necessary to provide a functional, easily operated, enduring commercial onsite sewage system in accordance with this rule, or to prevent a health hazard, nuisance, surface water pollution or ground water pollution. In addition, all commercial onsite sewage system construction permits shall contain the following requirements, not necessarily verbatim:

(1) That the original permit expiration date shall be one (1) year after permit issuance.

(2) That if the applicant has started installation of equipment, piping, or tankage that will comprise part of the commercial onsite sewage system, on or before the original date of permit expiration, the permit shall expire two (2) years after issuance.

(3) That all necessary local permits and approvals be obtained before construction is begun.

(4) That any proposed changes, alterations, or additions to the commercial onsite sewage system herein approved, be submitted to the department for review and approval prior to the start of construction to effect the proposed changes, alterations, or additions.

(5) That no change in occupancy or use of the facility served be effected if it would result in sewage flow on the peak day in excess of the capacity of the commercial onsite sewage system as stated in the construction permit, or if it would result in sewage being generated of a type incompatible with absorption field disposal. Any such change in occupancy or use may be made only after the department has issued a construction permit for modifications to the subject commercial onsite sewage system that will allow it to accommodate increased sewage flows.

(6) That if pollution, health hazards, or nuisance conditions occur that are attributable to the commercial onsite sewage system permitted herein, immediate corrective action be taken by the owner.

(7) That the permittee notify the department and the local health department at least seven (7) days before construction of the approved commercial onsite sewage system is to commence.

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

410 IAC 6-10.1-54 Operating permits

Sec. 54. (a) The department may require written operating permits as follows:

(1) A written operating permit issued by the department shall be signed by the commissioner or his duly authorized representative.

(2) An operating permit shall be renewed as follows:

(A) At least once every three (3) years for onsite sewage systems having components, other than a septic tank, requiring scheduled inspection and maintenance.

(B) At least once every five (5) years for all other onsite sewage systems.

(b) An operating permit shall identify all components of an onsite sewage system requiring inspection and maintenance.

(c) The records for an operating permit requiring scheduled inspection and maintenance shall contain the following:

(1) The name, address, and telephone number of the service company contracted to perform inspection and maintenance.

(2) A description of the operation and maintenance document or documents used for scheduled inspection and maintenance.

(d) The owner shall provide the department with the following:

(1) Written documentation of all scheduled and unscheduled inspection and maintenance within one (1) month of the date performed.

(2) A copy of the inspection and maintenance contract.

(e) The operating permit for a commercial onsite sewage system in violation of subsection (d) may be revoked by the department in accordance with section 56 of this rule.

(f) Nothing in this rule shall be construed as preventing requirements in local ordinance for the issuance of an operating permit for a commercial onsite sewage system, provided that the permit required by local ordinance is not in conflict with an operating permit issued by the department.

410 IAC 6-10.1-55 Denial of an application for a construction or operating permit

Sec. 55. An application for a commercial onsite sewage system construction or operating permit may be denied by the department for any of the following causes:

(1) The commercial onsite sewage system design does not meet the minimum requirements of this rule.

(2) Failure to disclose all the facts relevant to the construction and use of the proposed commercial onsite sewage system or any misrepresentation made in the application.

(3) Failure of the owner, or the engineer or architect who certified and sealed the construction plans and specifications, to respond to a request for revised plans and specifications or additional information made under section 51 of this rule, within six (6) months of receiving the request.

(4) Any change relating to the design, construction, or use of the onsite sewage system not approved, in writing, by the department.

(5) A sanitary sewerage system of adequate capacity served by a sewage treatment facility owned by an incorporated city or town, conservancy district established under IC 14-33, regional sewer district established under IC 13-26, or private utility, is located within three hundred (300) feet of the property line of the affected property, or is available for connection at a construction cost and connection fee estimated by the department not to exceed one hundred fifty percent (150%) of the cost estimated by the department for installing commercial onsite sewage systems to serve the project were the commercial onsite sewage systems otherwise acceptable to the department.

(6) Failure to show that the commercial onsite sewage system can be constructed, operated, maintained, or abandoned in compliance with this rule.

410 IAC 6-10.1-56 Revocation or modification of a construction or operating permit

Sec. 56. A commercial onsite sewage system construction or operating permit may be revoked or modified by the department for any of the following causes:

(1) Violation of any of the provisions of this rule.

(2) Violation of any limitation, term, or condition contained in the construction or operating permit.

(3) Failure to disclose all facts relevant to construction, operation, and use of the commercial onsite sewage system in a manner that it can consistently treat and dispose of all sewage received for the life of the facilities it serves, without causing a health hazard, nuisance, surface water pollution or ground water pollution.

(4) Any misrepresentation made to obtain the construction or operating permit.

(5) Any change relating to the design, construction, or use of the onsite sewage system not approved, in writing, by the department.

(6) Any other change, situation, or activity relating to use of the commercial onsite sewage system that, in the judgment of the department, is not consistent with the purposes of this rule.

410 IAC 6-10.1-57 Petitions for appeal

Sec. 57. (a) Any notice of an issued permit, permit modification, notice of permit denial, or notice of permit revocation shall include the following:

(1) The basis for the issuance, modification, denial, or revocation.

(2) The method or methods available for compliance, if applicable.

(3) The time frame for compliance, if applicable.

(4) That the owner has the right to appeal.

(5) The procedure for registering any such appeal, under the provisions set forth in IC 4-21.5, the Administrative Orders and Procedures Act.

(b) Within fifteen (15) days following the date of receipt of an issued permit, permit modification, notice of permit denial, or notice of permit revocation, any person aggrieved by the action may file a petition for appeal concerning the action with the department. A petition for appeal shall:

(1) state the name and address of the person making the request;

(2) identify the interest of the petitioner that is affected by the permit issuance, denial, modification, or revocation;

(3) identify any persons whom the petitioner represents;

(4) state with particularity the reasons for the request;

(5) state with particularity the issues proposed to be considered; and

(6) include proposed terms or conditions that, in the judgment of the petitioner, would be appropriate to carry out the requirements of law and this rule governing the permits.

410 IAC 6-10.1-58 Violations

Sec. 58. (a) Should a commercial onsite sewage system fail, the failure shall be corrected by the owner within the time limit set by the department or the local health officer in whose jurisdiction the facility is located.

(b) If any component of a commercial onsite sewage system is found to be:

(1) defective;

(2) malfunctioning; or

(3) in need of service;

the department or the local health officer in whose jurisdiction the facility is located may require the repair, replacement, or service of that component. The repair, replacement, or service shall be conducted within the time limit set by the department or the local health officer in whose jurisdiction the facility is located.

(c) Any person found to be violating this rule may be served by the department or the local health officer in whose jurisdiction the facility is located with a written order stating the nature of the violation and providing a time limit for satisfactory correction thereof.

(d) After receiving an order in writing from the department or the local health officer in whose jurisdiction the facility is located, the owner of the property shall comply with the provisions of this rule as set forth in the order and within the time limit specified therein. The 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.

410 IAC 6-10.1-59 Construction and operating permit; transferability

Sec. 59. A commercial onsite sewage system construction or operating permit may only be transferred to another person by the current permit holder if the:

(1) current permit holder notifies the department and the local health department having jurisdiction, in writing, of the proposed transfer at least thirty (30) days before the transfer is proposed to occur;

(2) person to whom the permit is proposed to be transferred certifies to the department, in writing, at least thirty (30) days before the transfer is proposed to occur, any changes proposed in the occupancy or use of a facility to be served by the commercial onsite sewage system for which the subject construction permit was issued; and

(3) department provides written approval of the transfer.

410 IAC 6-10.1-60 Sewage flows

Sec. 60. (a) Sewage flows for commercial onsite sewage systems shall be determined from Table I as follows:

Table I - Estimated Sewage Flows	
Type of Establishment	Design Daily Flow (gpd)
Agricultural Labor Camp	50 per occupant
Airport[1]	3 per passenger 20 per employee
Apartment/Condominium	200 per one-bedroom 300 per two-bedroom 350 per three-bedroom
Assembly Hall[1]	3 per seat
Athletic Field[1]	1 per participant and spectator
Auction and Flea Market[1]	3 per customer
Banquet Caterer[1]	5 per person + 100 for dishwashing
Beauty Salon a) Perm or color changes b) Stylist c) Cut with wash d) Cut without wash Bed and Breakfast	 35 per customer 20 per stylist 10 per customer 5 per customer 150 per bedroom
Bowling Alley a) With bar or food, or both b) Without food service Bus Station[1]	 125 per lane 75 per lane 3 per passenger
Campground a) Day camp b) RV, with sewer hookup c) RV, without sewer hookup d) RV dump station e) Youth camp f) Cabins within campgrounds 1) without restroom 2) with restroom 3) with restroom and kitchen	 20 per camper + 20 per staff 50 per campsite 50 per campsite Included above, or 20 per campsite if on separate system 40 per camper + 40 per staff 50 per cabin 75 per cabin per bedroom 100 per cabin per bedroom
Church a) With full kitchen b) With warming kitchen c) Without kitchen	 5 per sanctuary seat 4 per sanctuary seat 3 per sanctuary seat
Coffee Shop[1]	6 per customer + 20 per employee
Conference Center/Meeting Rooms[1]	20 per attendee
Correctional Facilities	120 per inmate + 20 per employee
Day Care Centers	20 per child + 20 per employee
Dentist's Office	5 per patient 75 per dentist 75 per dental technician 20 per support staff

Department Store[1]	0.1 per square foot
Banquet Hall	
a) with food preparation	10 per seat
b) without food preparation	5 per seat
Doctor's Office	75 per doctor 75 per nurse 20 per support staff
Dormitory/Residence Hall	100 per person
Factory[1]	
a) With showers	35 per employee
b) Without showers	20 per employee
Fairground[1]	3 per visitor
Emergency Station	
a) Manned with firefighters	75 per firefighter
b) Unmanned with firefighters	20 per firefighter
c) EMT station	35 per EMT
Food Service Operations	
a) Fast food restaurant	50 per seat
b) Restaurant (not 24-hour)	35 per seat
c) Restaurant (24-hour)	50 per seat
d) Restaurant (not 24-hour), along interstate	50 per seat
e) Restaurant (24-hour), along interstate	70 per seat
f) Tavern/bar/cocktail lounge	35 per seat
Golf Course/Mini Golf[1]	
a) Comfort station (mid-course)	1.5 times max number of golfers
b) Restroom (main clubhouse)	5 times max number of golfers
Hotels[1]	100 per room
Kennels and Vet Clinics	
a) Cages	5 per cage
b) Inside runs	10 per run
c) Outside runs	20 per run
d) Grooming	10 per animal
e) Surgery	25 per surgery room
f) Staff	75 per veterinary doctor 75 per veterinary assistant 20 per support staff
Mobile Home Park	200 per lot
Motel[1]	100 per room
Nursing Home	100 per bed + 20 per employee
Office Building[1]	
a) Without showers	20 per employee
b) With showers	35 per employee
Picnic Area	5 per visitor
Race Tracks[1]	
a) Attendee	5 per attendee
b) Staff	20 per staff
Residential Cluster (5 House Min.)	120 per bedroom

School	
a) Elementary	15 per student
b) Secondary	25 per student
c) Amish	10 per student + 10 per staff
d) Boarding	75 per person
	150 per bedroom
Convenience Store/Service Station/Gas Station[1]	
a) Truck stop	1,000
with showers	30 per trucker
b) Small convenience store/service center/gas station	1,000
with fast food service	10 per seat
Single-family dwelling or duplex not on cluster system	150 per bedroom
Swimming Pool Bathhouse	10 per swimmer
Theater[1]	
a) Drive-in	10 per car space
b) Inside building	5 per seat
Visitor Center	5 per visitor
[1]These estimated flows do not include food service. If food service is provided, additional flows must be assigned, based on the type of food service and hours of operation.	

(b) For establishments not listed in Table I, contact the Division of Environmental Public Health of the department for assistance with determining flows.

(c) Designs for flows less than estimated from Table I may be considered based on substantial evidence (such as water meter readings) that lower flows will occur. Flow data from similar installations of equal capacity and similar surroundings may be considered on an individual basis.

410 IAC 6-10.1-61 Minimum separation distances

Sec. 61. (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 Separation Distances		
Minimum Distance in Feet from	Septic Tank and Other Treatment Units, Dosing Tank, Lift Station	Soil Absorption System
Private water supply well[1,2]	100	100
Private geothermal well[1,2]	100	100
Commercial water supply well[1]	100	100
Commercial geothermal well[1]	100	100
Public water supply well, lake,[1,3] or reservoir[1,3]	200	200
Other pond, retention pond, lake, or reservoir[3]	50	50
Storm water detention area[3, 4]	25	25
River, stream, ditch, or drainage tile[5]	25	25
Buildings, foundations, slabs, garages, patios, barns, aboveground and belowground swimming pools, retaining walls, closed loop geothermal systems, roads, driveways, parking areas, or paved sidewalks	10[6]	10[7]
Front, side, or rear lot lines	5	5
Water lines continually under pressure	10	10
Suction water lines	50	50

[1]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 soil loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table V of section 78(b)(8) of this rule, unless that hazard can be overcome through onsite sewage system design.
[2]The separation distance to a private water supply well abandoned in accordance with 312 IAC 13-10-2(e) may be reduced to ten (10) feet.
[3]Measured from the normal or ordinary high water mark.
[4]Storm water detention area: area designated for the temporary detention of storm water, with the outlet located at the lowest elevation of the depression.
[5]See section 63(f) of this rule for subsurface drainage system separation.
[6]Patios without footers, aboveground swimming pools, and sidewalks may be located within ten (10) feet of septic tank, as long as no required access points are obstructed.
[7]A minimum separation of ten (10) feet is required on all sites.

(b) Sewers shall not be located within one hundred (100) feet of any water supply well or subsurface pump suction line, except as follows:

(1) Sewers constructed of waterworks grade ductile iron pipe with tyton or mechanical joints, or PVC pressure sewer pipe with an SDR rating of twenty-six (26) or less with compression gasket joints, may be located within the one hundred (100) foot distance.

(2) In no case shall sewers be located closer than thirty (30) feet to any water source.

(c) If it is necessary to locate sewers or drains closer than two hundred (200) feet to a well or pump suction line in a mobile home park with twenty-five (25) or more lots, waterworks grade ductile iron pipe with mechanical joints, or SDR 26 PVC pressure sewer pipe with compression fittings shall be used. The piping shall not be constructed closer than seventy (70) feet to water sources.

(d) Water lines and sewers shall not be laid in the same trench and shall have the following requirements:

(1) A horizontal separation of ten (10) feet shall be maintained between water lines and sewers.

(2) Where crossings are necessary, a minimum of eighteen (18) inches vertical clearance must be maintained with the water line positioned above the sewer line when possible.

(3) 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 with the water line positioned above the sewer line when possible. The sewer shall be pressure tested to assure watertightness prior to back filling.

410 IAC 6-10.1-62 Dispersal area

Sec. 62. (a) A dispersal area is required for a soil absorption system when:

(1) the soil loading rate used to determine the size of the soil absorption system is five-tenths (0.5) gallons per day per square foot (gpd/ft^2) or less; or

(2) there is a horizon in the upper sixty (60) inches of the profile description with:

(A) bedrock;

(B) densic material;

(C) dense till;

(D) soil with fragic soil properties; or

(E) layers transitional to dense till (horizons in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution), unless:

(i) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and

(ii) the determination in item (i) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department.

(b) When the conditions in subsection (a) apply, the following requirements shall be met:

(1) For soil absorption system sites with a slope of one-half percent (1/2%) or less, a minimum dispersal area as described in Table III in subsection (c) shall be maintained on each side of the outside edge of the:

(A) outer trench parallel to the length of the trench; or

(B) INDOT Specification 23 sand and parallel to the long axis of the elevated sand mound.

(2) For soil absorption system sites with a slope of greater than one-half percent (1/2%), a minimum dispersal area as described in Table III in subsection (c) shall be maintained on the downslope side of the soil absorption system from the outside edge of the:

(A) downslope trench parallel to the length of the trench; or

(B) INDOT Specification 23 sand downslope and parallel to the long axis of the elevated sand mound.

(c) For sites that do not meet the conditions of subsection (a), the minimum dispersal area shall be ten (10) feet. For sites that meet the conditions of subsection (a), the dispersal area shall be as indicated in Table III, as follows:

Table III – Minimum Dispersal Areas for Soil Absorption Systems[1]	
Slope ≤ 1/2 %[2]: Onsite sewage system without perimeter drain	One-fourth (1/4) width of soil absorption system[5]
Slope > 1/2 %[3]: Onsite sewage system without perimeter drain	One-half (1/2) width of soil absorption system[5]
Any slope: Onsite sewage system with perimeter drain[4]	Ten (10) feet or the distance to the perimeter drain
[1]No buildings, foundations, slabs, garages, patios, barns, aboveground and belowground swimming pools, retaining walls, roads, driveways, parking areas, or paved sidewalks are allowed in the dispersal area.	
[2]Dispersal area is located on each side of the outside edge of the outer trench parallel to the length of the trench, or on each side of the outside edge of the sand area and parallel to the long axis of an elevated sand mound.	
[3]Dispersal area is located on the downslope side of the soil absorption system.	
[4]For onsite sewage systems with a subsurface perimeter drain without a seasonal high water table, the design and construction of the drain shall meet the requirements of section 63 of this rule.	
[5]Dispersal area width shall not be less than ten (10) feet. A dispersal area width of more than twenty-five (25) feet is not required.	

(d) Any disturbance within a dispersal area shall not create compacted soil material.

(e) The location of the dispersal area shall meet the following requirements:

(1) A dispersal area shall be located on the property, or adjoining property with easement.

(2) Nothing that would impede the flow of water shall be allowed in a dispersal area. This includes, but is not limited to, the following:

(A) buildings;

(B) foundations;

(C) slabs;

(D) garages;

(E) patios;

(F) barns;

(G) aboveground and belowground swimming pools;

(H) retaining walls;

(I) roads;

(J) driveways;

(K) parking areas;
(L) paved sidewalks;
(M) closed loop geothermal systems; or
(N) other structures.

(3) A dispersal area shall not be located in a closed depression where surface runoff or subsurface water movement will have an adverse effect on onsite soil absorption system performance or in areas subject to ponding.

(4) For soil absorption system sites with a slope of greater than one-half percent (1/2%), no part of the dispersal area may slope toward the soil absorption system.

410 IAC 6-10.1-63 Drainage

Sec. 63. (a) A surface diversion:

(1) shall be constructed if drainage from an adjoining upslope landscape affects the soil absorption system site;

(2) shall have a positive grade of at least two and four-tenths (2.4) inches per one hundred (100) feet, or a grade of two-tenths percent (0.2%);

(3) shall be of sufficient depth and width to move surface water away from the soil absorption system;

(4) shall be located:

(A) for subsurface trench onsite sewage systems that do not require additional soil cover, at least ten (10) feet from the soil absorption system, as measured from the downslope edge of the surface diversion to the outside edge of the nearest soil absorption system trench;

(B) for subsurface trench onsite sewage systems that require additional soil cover, at least ten (10) feet from the soil absorption system, as measured from the downslope edge of the surface diversion to the upslope edge of the additional soil cover; or

(C) for elevated sand mound onsite sewage systems, at least ten (10) feet from the soil absorption system, as measured from the downslope edge of the surface diversion to the upslope edge of the soil cover; and

(5) may be used in combination with an on-site subsurface drainage system.

(b) When a subsurface drainage system is constructed, it shall be sufficiently deep to lower a seasonal high water table as required in subsection (d) or (e).

(c) The subsurface drain shall surround the onsite sewage system.

(d) If the seasonal high water table is perched, the subsurface drain trench shall be constructed at least two (2) inches into structureless massive compact clay with firm or very firm consistence, glacial till, or fragipan whenever site and soil conditions permit. When the drain cannot be constructed at least two (2) inches into the structureless massive compact clay with firm or very firm consistence, glacial till, or fragipan, the depth of the drain shall be the following unless calculations are used to determine drain depth:

(1) For trench onsite sewage systems, the invert elevation of the subsurface perimeter, interceptor, or segment drain shall be at least thirty-six (36) inches below the invert elevation of any adjacent soil absorption trench bottom.

(2) For elevated sand mound onsite sewage systems, the invert elevation of the subsurface perimeter or interceptor drain shall be at least thirty-two (32) inches below existing grade.

(e) If drainage calculations are used to determine drain depth, drainage formulas and calculations shall be submitted to the department as part of the plan submittal, showing a lowering of the seasonal high water table:

(1) for subsurface trench onsite sewage systems, at least twenty-four (24) inches below the trench bottoms in the center of the soil absorption field; or

(2) for elevated sand mound onsite sewage systems, at least twenty (20) inches below original grade.

(f) Subsurface drainage systems shall be located at soil absorption system sites as follows:

(1) All portions of a subsurface drainage system shall be installed at least ten (10) feet from the outside edge of any soil absorption trench.

(2) All portions of a subsurface drainage system shall be installed at least ten (10) feet from the outside edge of the INDOT Specification 23 sand.

(3) Spacing of subsurface perimeter drains and segment drains installed parallel to the trench lengths along the contour of the site for a subsurface trench system or parallel to the long axis of an elevated sand mound must be less than or equal to sixty-five (65) feet, unless a greater spacing is determined through calculations.
(4) The subsurface drain shall not cross any portion of the soil absorption system.

(g) The subsurface drain pipe shall be:
(1) at least four (4) inches in diameter;
(2) slotted; and
(3) wrapped with a geotextile fabric with an effective opening size not smaller than two-tenths (0.2) millimeter and no larger than eighty-five hundredths (0.85) millimeter when installed in:
(A) sands;
(B) loamy sands;
(C) sandy loams;
(D) fine sandy loams;
(E) loams;
(F) silt loams; or
(G) silts.

(h) The subsurface drain trench shall:
(1) have a positive slope of at least two-tenths (0.2) foot per one hundred (100) feet when a four (4) inch drain pipe is used;
(2) have a positive slope of at least one-tenth (0.1) foot per one hundred (100) feet when a six (6) inch drain pipe is used; and
(3) be constructed with no sags in the line.

(i) A subsurface drain trench installed upslope from a commercial onsite sewage system shall be:
(1) backfilled to final grade with aggregate that meets the minimum requirements of subsection (k); or
(2) filled to within six (6) inches of final grade with aggregate that meets subsection (k) and the final six (6) inches to final grade with cover soil material.

(j) A subsurface drain trench installed on sides or downslope, and segment drain trenches may be:
(1) backfilled to final grade with aggregate that meets the minimum requirements of subsection (k); or
(2) filled to within six (6) inches of final grade with aggregate that meets the minimum requirements of subsection (k) and the final six (6) inches to final grade with cover soil material.

(k) The aggregate backfill for subsurface drain trenches shall meet the minimum requirements of:
(1) section 76 of this rule;
(2) washed aggregate with a gradation in the range of INDOT Specification 8 through 11; or
(3) INDOT Specification 23 sand or equivalent.

(l) When INDOT Specification 23 sand is used for backfill, the drainpipe shall be wrapped with a geotextile fabric.

(m) The aggregate used as backfill in the perimeter, interceptor, or segment drain trenches described in subsections (i)(2) and (j)(2) shall be covered with a geotextile fabric barrier that meets the minimum requirements in section 77 of this rule, in such a manner as to prevent the aggregate from becoming clogged with the earth fill.

(n) 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.

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

410 IAC 6-10.1-64 On-site evaluation

Sec. 64. (a) Before issuance of any permit for construction of a commercial onsite sewage system or the replacement or alteration of a soil absorption system, an on-site evaluation, which shall include a description of the soil profile, shall be conducted.

(b) Properties of the soil at each site shall be described by a soil scientist using the guidelines set forth in the soil manuals, technical bulletins, and handbooks of the NRCS.

(c) Soil profile information shall be recorded:
(1) to a depth of five (5) feet; or
(2) until a layer is encountered that cannot be readily penetrated;
whichever is shallower.(d) The on-site evaluation shall be conducted before application and plan submittal.

(e) The information in the written on-site soils evaluation report shall include the following:
(1) For topographic information, the following:
(A) The slope and slope aspect.
(B) Surface drainage characteristics and patterns including swales, ditches, and streams.
(C) The proposed or existing location of house and well or other water supply.
(D) The location of other major features or structures.
(E) The location of soil evaluation sites and appropriate soil type boundaries.
(F) The topographic position of the site.
(2) For soil characteristics, the following:
(A) Parent material.
(B) The approximate depths of soil horizons.
(C) The soil color, structure, and texture at each horizon.
(D) The horizon designation for each horizon.
(E) The depth to any layer that has a soil loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot or less than twenty-five hundredths (0.25) gallons per day per square foot.
(F) The depth to seasonal high ground water as indicated by soil wetness characteristics.
(G) The depth to bedrock.
(H) The soil consistence at each horizon.
(I) The soil effervescence at each horizon.
(J) The percent coarse fragments at each horizon.
(K) The percent clay at each horizon, by field estimation, for any horizon where the percent coarse fragments is greater than thirty-five percent (35%) by volume.
(L) The presence or absence of roots.
(M) Frost penetration depth, if applicable.

(f) When soil characteristics are to be used for calculations for the depth of a subsurface drainage system, the following information shall be recorded to a depth of eighty (80) inches:
(1) The information required in subsection (e)(2).
(2) Particle size family.

410 IAC 6-10.1-65 Construction of sewers

Sec. 65. (a) Sewers beginning three (3) feet outside the foundation walls of buildings shall be constructed of piping that meets the minimum requirements of section 75(a)(1) or 75(a)(2) of this rule.

(b) Sewers serving individual units may connect to the main sewer by wye fittings. Sewers serving more than one (1) unit must connect to the main sewer at a manhole.

(c) Sewers shall be laid to a uniform grade and at a slope equal to or greater than the minimum slopes shown in Table IV as follows and may not be increased in size for the sole purpose of reducing the required slope:

Table IV – Minimum Slope for Sewers	
Sewer Size	Minimum Slope in Feet per 100 Feet*
4 inch diameter (building sewer only)	1.33
6 inch diameter	0.61
8 inch diameter	0.40
10 inch diameter	0.28
12 inch diameter	0.22
15 inch diameter	0.15
16 inch diameter	0.14
18 inch diameter	0.12
21 inch diameter	0.10
24 inch diameter	0.08
*Based on the Hazen-Williams formula using C = 140.	

(d) No outside building sewer shall be less than four (4) inches in diameter. Minimum sewer diameters will vary upward from four (4) inches according to use. Because of slope, cleaning, and maintenance problems, installation of four (4) inch sewers is unacceptable except where they can adequately serve a building or facility having very low anticipated sewage flows. Sewers shall be adequately sized to carry average and intermittent peak flows. Soil, waste, vent, and drain piping inside the building shall comply with the Indiana Plumbing Code (675 IAC 16).

(e) Adequate sewer bedding shall be provided. All sewers shall be buried with at least two (2) feet of cover to protect them from freezing. Force mains must be buried deep enough to prevent freezing unless the lift station and force main can be designed such that the force main will drain completely.

(f) Sewers proposed under driveways, parking slabs, or other heavily loaded areas, shall be adequately constructed to prevent damage or breaking.

(g) Manholes must be installed at the end of each line, at all changes in grade, size, or alignment, at all intersections, and at intervals not greater than four hundred (400) feet for sewers fifteen (15) inches diameter or less. Intervals not greater than five hundred (500) feet are allowed for sewers eighteen (18) inches or greater in diameter.

(h) A drop manhole should be installed where a sewer enters the manhole twenty-four (24) inches or more above the manhole invert. The outside drop connection constructed with a drop manhole should be encased in concrete.

(i) The minimum acceptable diameter for manholes is forty-eight (48) inches. The access opening into the manhole must be at least twenty-two (22) inches in diameter.

(j) Cleanouts may be substituted for manholes on short sewer runs. Cleanouts must:
(1) be the same diameter as the sewer they are to serve; and
(2) extend to grade.
A cleanout may be installed at the terminus of a sewer provided that a manhole is within three hundred (300) feet of the terminus.

410 IAC 6-10.1-66 Grease traps

Sec. 66. (a) A grease trap shall be provided for the following:
(1) All commercial buildings with food service.
(2) All other commercial buildings with fats, oils, and grease greater than twenty-five (25) mg/L.

(b) Grease traps shall be:
(1) a commercially manufactured grease trap or grease recovery system installed inside the building and sized according to the manufacturer's recommendations and in accordance with the Uniform Plumbing Code;(2) a commercially manufactured grease trap or grease recovery system installed outside the building and sized according to the manufacturer's recommendations; or

(3) an approved septic tank installed outside the building with the:

(A) outlet baffle extended to within six (6) inches of the tank bottom; and

(B) septic tank risers extended to grade and covered with a securely fastened lid.

(c) Sewage from food service sinks, dishwashers, and kitchen floor drains shall discharge to the grease trap. All other sewage from the facility shall be discharged directly to a septic tank.

(d) The size of the grease trap shall be determined by the following formula:

(1) grease trap size (in gallons) = M × W × R × S

(2) Where:

(A) M = Meals served at peak hour

(B) W = Waste flow rate:

(i) With dishwashing machine = 6 gallons

(ii) Without dishwashing machine = 5 gallons

(iii) Single service kitchen = 2 gallons

(iv) Food waste disposal only = 1 gallon

(C) R = Retention time:

(i) With dishwasher = 2.5 hours

(ii) Single service = 1.5 hours

(D) S = Storage factor:

(i) Fully equipped kitchen, 8 hour operation = 1

(ii) Fully equipped kitchen, 16 hour operation = 2

(iii) Fully equipped kitchen, 24 hour operation = 3

(iv) Single service kitchen = 1.5

Except that the minimum storage capacity shall not be less than one thousand (1,000) gallons and does not need to exceed two thousand (2,000) gallons.

410 IAC 6-10.1-67 Sewage lift stations and force mains

Sec. 67. (a) Sewage lift stations:

(1) must be protected from damage by a one hundred (100) year flood event; and

(2) shall remain fully operational and accessible by maintenance vehicles during a twenty-five (25) year flood event and all weather conditions.

(b) Submersible pumps and motors must be designed specifically for raw sewage use. Pumps must be readily removable for maintenance, repair, or replacement by installation with guide rail systems, breakaway flanges, and lifting chains.

(c) Except where grinder or cutter pumps are used, raw sewage pumps shall be capable of passing spheres of at least three (3) inches in diameter. Effluent pumps may be used in lift stations following septic tanks.

(d) At least two (2) pumps shall be provided in each lift station. Pumps shall be of the same capacity. Each shall be capable of handling at least the expected maximum flow to the lift station.

(e) Controls other than float switches shall:

(1) be installed outside the lift station;

(2) comply with the Indiana Electrical Code (675 IAC 17); and

(3) include automatic pump alternators.

Encapsulated mercury float type switches are preferred over other types. Motor controls shall be protected by a conduit seal or other appropriate measures to exclude moisture from the wet well. Power cords shall meet the requirements of the Mine Safety and Health Administration for trailing cables. Ground fault interruption protection shall be used to de-energize the circuit in event of any failure of the cable.

(f) An audio-visual alarm system shall be provided to indicate power failure, pump failure, excessive water level or any cause of pump station malfunction. The alarm shall be:

(1) located in an area where it can be observed twenty-four (24) hours a day; and

(2) powered by a circuit separate from the pump circuit.

(g) Overflows from lift stations are not permitted.

(h) Pump discharge lines shall include suitable shutoff and check valves. Check valves shall be located between the pump and the shutoff valve and only in the horizontal portion of the line. Check valves should be omitted in discharge lines connected individually to pumps where the lines must drain back into the pump station wet well between pumpings.

(i) Force mains should be sized to provide a scouring velocity of at least two (2) feet per second at the design capacity of the pump.

(j) Automatic air relief valves shall be installed at high points in the force main to prevent air locking.

(k) Separation distances between sanitary force mains and water lines shall be the same as required for gravity sewers. A ten (10) foot horizontal separation is required between parallel water lines and force mains, and an eighteen (18) inch vertical separation is required where force mains cross water lines.

(l) Force mains crossing other properties will have to be kept accessible through construction and maintenance easements.

410 IAC 6-10.1-68 Septic tanks: general requirements

Sec. 68. (a) Septic tanks shall be:

(1) watertight and constructed of durable material such as concrete, fiberglass, polyethylene, or polypropylene; and

(2) protected from corrosion.

(b) Cast in place, concrete block, wood, or metal septic tanks are prohibited.

(c) Every septic tank shall have a minimum capacity below the water line to provide at least forty-eight (48) hours detention time.

(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 49(h) of this rule.

(e) Two-compartment tanks shall meet the following requirements:

(1) The liquid volume of the first compartment shall be between one-half (1/2) and two-thirds (2/3) of the total tank volume.

(2) The divider wall shall be:

(A) monolithically cast in the tank; or

(B) permanently secured within the tank body using noncorrosive fasteners or fittings.

(3) The transfer port or ports between the compartments shall consist of two (2) or more openings with a combined area of at least fifty (50) square inches. A continuous port across the width of the divider wall is also acceptable.

(4) The transfer port or ports shall be located in the middle twenty-five percent (25%) of the liquid depth.

(5) An access opening meeting the requirements of section 69(o) of this rule must be provided above each compartment, including a riser meeting the requirements of section 69(p) of this rule, for maintenance pumping above each compartment.

(f) When multiple tanks are used in series, no single tank may be less than seven hundred fifty (750) gallons. The larger of the two (2) tanks must be upstream of the other.

(g) When sewage is pumped into a septic tank using a grinder pump:

(1) a two-compartment tank must be used with the sewage pumped into the first compartment; or

(2) two (2) tanks in series must be used, with the sewage pumped into the first tank.

(h) Tanks fitted with aeration units for aerobic digestion shall:
(1) conform to NSF/ANSI Standard 40-2010, Residential Wastewater Treatment Systems, for Class I plants or to standards of an equivalent third party product testing laboratory acceptable to the department that meet or exceed the NSF/ANSI standards;
(2) bear a current registered certification mark;
(3) provide a minimum aerobic treatment capacity to properly process the design daily flow;
(4) be preceded by a septic tank that meets all of the requirements of this section and sections 69 and 71 of this rule; and
(5) discharge into a soil absorption system or other treatment system as approved in accordance with section 49(h) of this rule.

(i) Water softener backwash shall be discharged to:
(1) the building sewer;
(2) a secondary treatment device;
(3) the effluent sewer on the downstream side of either the septic tank or the secondary treatment device;
(4) the dosing tank serving the soil absorption system; or
(5) a separate soil absorption system constructed specifically for the water softener backwash.

410 IAC 6-10.1-69 Septic tanks: construction details

Sec. 69. (a) The minimum water depth in any compartment shall be thirty (30) inches.

(b) The maximum water depth for calculating septic tank capacity shall not exceed six and one-half (6 1/2) feet.

(c) The inlet baffle or sanitary tee shall extend at least:
(1) eight (8) inches below the liquid level; and
(2) to the top of the inlet sewer.

(d) All new septic tanks must be provided with an outlet filter that meets or exceeds the requirements of section 72 of this rule.

(e) Any septic tank not provided with an outlet filter shall be provided with:
(1) an outlet baffle or sanitary tee that extends below the liquid level at least ten (10) inches, but not more than forty percent (40%) of the tank liquid depth; and
(2) a gas deflection baffle that is:
(A) constructed of durable materials not subject to corrosion or decay; and
(B) configured to deflect rising gas bubbles toward the interior of the tank.

(f) There shall be at least one (1) inch clear space between the underside of the septic tank lid and the top of the inlet and outlet baffles or tees.

(g) Scum storage capacity (space between the liquid level and the top of the outlet baffle or tees) shall be not less than twelve and one-half percent (12.5%) of the liquid depth of the septic tank, and not less than nine (9) inches.

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

(i) The bottom of the septic tank inlet shall not be less than two (2) inches nor more than four (4) inches above the liquid level.

(j) Reinforced concrete septic tanks shall be constructed of concrete with a compressive strength of four thousand (4,000) pounds per square inch or greater.(k) Concrete septic tank walls shall be at least two and one-half (2 1/2) inches or greater in thickness. The design must allow at least one (1) inch cover over reinforcing steel or welded wire fabric.

(l) Concrete septic tank bottoms shall conform to the specifications set forth for septic tank walls.

(m) Concrete septic tank tops shall be a minimum of four (4) inches in thickness and reinforced with three-eighths (3/8) inch reinforcing rods in a twelve (12) inch grid or equivalent.

(n) Type III fibers are permitted only as a secondary reinforcing material. Fiber additions will be considered only for the purpose of resisting temperature and shrinkage efforts, and not as primary reinforcing material.

(o) All access openings shall meet the following requirements:
(1) At least one (1) opening eighteen (18) inches in minimum dimension per compartment for pumping access.
(2) An access opening shall be located over each of the following:
(A) The inlet.
(B) The outlet.
(C) The sanitary tee or baffle, if present, on the partition or divider wall of a two-compartment septic tank.
(3) All access openings shall be sized and positioned in such a way as to allow for maintenance, cleaning, and servicing of septic tanks and outlet filters.

(p) All risers shall meet the following requirements:
(1) Risers and riser covers shall be made of corrosion resistant materials and withstand design external loads.
(2) The lower section of the riser assembly shall be:
(A) cast into the tank lid; or
(B) sealed to the top of the tank with butyl sealant meeting ASTM C 990-09 to provide a watertight seal.
(3) All risers shall be fitted with watertight, securely fastened covers.

(q) Pipe connectors shall be provided that meet the following requirements:
(1) Each pipe penetration shall be sealed with a resilient rubber pipe connector that uses an expansion ring, tension band, or a take-up device for mechanically compressing the resilient portion of the connector against the pipe.
(2) All metallic mechanical devices, including expansion rings, tension bands, take-up devices, and screws, shall be constructed of series 300 stainless steel.
(3) Connectors shall conform to:
(A) ASTM C 1644-06, Standard Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes; or
(B) ASTM C 923-08, Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

410 IAC 6-10.1-70 Dosing tanks

Sec. 70. (a) Dosing tanks:
(1) must be watertight and constructed of durable material such as concrete, fiberglass, polyethylene, or polypropylene; and
(2) shall be protected from corrosion.

(b) Cast in place, concrete block, wood, or metal dosing tanks are prohibited.

(c) Reinforced concrete dosing tanks shall be constructed of concrete with a compressive strength of four thousand (4,000) pounds per square inch or greater.

(d) Concrete dosing tank walls shall be at least two and one-half (2 1/2) inches or greater in thickness. The design shall allow at least one (1) inch cover over reinforcing steel or welded wire fabric.

(e) 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.

(f) The liquid holding capacity of a dosing tank must equal the dose volume required by this rule for each type of soil absorption system, in addition to the volume of liquid that will drain back from any effluent force main when pumping ceases. Additional capacity must be provided to:

(1) keep the dosing tank effluent pump submerged at all times; and

(2) provide sufficient freeboard for a high water alarm.(g) Dosing tanks shall be provided with pipe connectors that meet the following requirements:

(1) Each pipe penetration shall be sealed with a flexible, resilient rubber pipe connector that uses an expansion ring, tension band, or a take-up device for mechanically compressing the resilient portion of the connector against the pipe.

(2) All metallic mechanical devices, including expansion rings, tension bands, take-up devices, and screws, shall be constructed of series 300 stainless steel.

(3) Conform to:

(A) ASTM C 1644-06, Standard Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes; or

(B) ASTM C 923-08, Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

(h) Each dosing tank shall be fitted with an effluent pump sized in conformance with section 73 and with section 84(b), 86(d), 86(q), 90(b), or 90(j) of this rule, whichever is applicable, with controls, and with a high water alarm switch set at a level above the design high water mark. The alarm shall:

(1) be on a separate circuit from the effluent pump; and

(2) include an audible and visible alarm.

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

410 IAC 6-10.1-71 Septic tanks and dosing tanks: installation and maintenance

Sec. 71. (a) Septic tanks and dosing tanks shall be installed level on:

(1) undisturbed soil;

(2) sand;

(3) aggregate not larger than one and one-half (1 1/2) inches in diameter; or

(4) an engineered base.

(b) All drain holes in septic tanks and dosing tanks shall be:

(1) fitted with a threaded fitting, cast in place, and plugged with a threaded plug; or

(2) plugged with an expandable pipe plug with a wing nut.

(c) When the top of the septic tank or dosing tank is installed at or above grade, all access openings shall be fitted with watertight, securely fastened covers.

(d) When the top of the septic tank or dosing tank is installed below grade, risers shall:

(1) be installed over access openings used for pumping and for maintenance of the outlet filter in the septic tank;

(2) be large enough for access to the tank through the access opening in the top of the septic tank or dosing tank to clean the tanks and to maintain floats, sensors, filters and pumps;

(3) have the lower section sealed to the top of the tank with butyl sealant meeting ASTM C 990-09 to provide a watertight seal, if the riser assembly is not cast into the tank lid;

(4) have joints between riser sections sealed in accordance with the manufacturer's instructions so as to be watertight;

(5) extend to or above final grade; and

(6) be fitted with a watertight cover securely fastened to the riser.

(e) Septic tanks and dosing tanks shall not be installed with the top of the riser below the RFE.(f) All joints in the sewer connecting septic tanks in series or septic tanks to dosing tanks shall be sealed in accordance with the manufacturer's instructions in order to be watertight and to withstand the pressures exerted on them.

410 IAC 6-10.1-72 Outlet filters

Sec. 72. (a) An outlet filter shall be installed in the septic tank of new onsite sewage systems and existing onsite sewage systems requiring a new septic tank.

(b) For onsite sewage systems requiring repair, or soil absorption systems requiring replacement, the department may require an outlet filter. The outlet filter, if required by the department, must meet the requirements of this section.

(c) Outlet filters shall be located in the outlet end of:
(1) a single septic tank when not used in series;
(2) the second compartment of two-compartment septic tanks;
(3) the last septic tank when two (2) or more tanks are used in series; or
(4) a secondary watertight structure located after the last septic tank prior to a dosing tank, distribution box, or secondary treatment unit.

(d) An access opening of eighteen (18) inches in minimum dimension shall be:
(1) located over the outlet filter; and
(2) provided with a riser to grade that meets the minimum requirements of section 69(o) and 69(p) of this rule.

(e) Outlet filters shall:
(1) conform to NSF/ANSI Standard 46-2010a, Evaluation of Components and Devices Used in Wastewater Treatment Systems, maintain a current product listing with an ANSI accredited third-party certifier, and bear a listing mark;
(2) prevent the passage of solids larger than one-eighth (1/8) of an inch;
(3) have inlets and outlets of at least four (4) inches in diameter;
(4) function without a bypass of unfiltered sewage, sludge, or scum, during normal use and during cleaning or exchange;
(5) be made of a noncorrosive material designed for use in sewage applications;
(6) maintain structural integrity, not tearing or distorting so as to make it inoperable during normal operation, throughout the life of the device; and
(7) have removable outlet filter cartridges.

(f) The outlet filter housing shall:
(1) connect to the outlet pipe or structure wall with noncorrosive fasteners;
(2) extend at least five (5) inches above the liquid level of the tank;
(3) be installed so the bottom of the filter inlet extends below the liquid level at least ten (10) inches, but not more than forty percent (40%) of the septic tank liquid depth;
(4) include a gas deflection device that remains in place when the filter cartridge is removed; and
(5) be solvent welded to a PVC Schedule 40 outlet pipe that meets the minimum requirements of section 75(a)(1) or 75(a)(2) of this rule, creating a watertight and mechanically sound joint.

(g) A filter alarm may be installed in the septic tank to indicate when the outlet filter is in need of service.

(h) An outlet filter with cartridge shall remain in service for the life of the septic tank.

(i) Outlet filter manufacturers shall provide installation and maintenance instructions with each outlet filter. Outlet filters shall be:
(1) installed according to manufacturer's recommendations;
(2) located so they do not interfere with pumping and cleaning of the septic tank; and
(3) placed to allow accessibility for routine maintenance without entering the septic tank or outlet structure if separate from the septic tank.

(j) Outlet filters shall be serviced according to the manufacturer's service recommendations, but no less frequently than each time the septic tank is cleaned, as follows:

(1) The outlet filter shall be:

(A) cleaned and washed so that the filter waste enters the septic tank; or

(B) exchanged with a clean filter.

(2) All contaminated effluent filters shall be treated as untreated sewage and handled properly during the cleaning or exchange process.

410 IAC 6-10.1-73 Effluent pumps

Sec. 73. (a) All effluent pumps shall be:

(1) submersible pumps suitable for use in a corrosive atmosphere;

(2) sized to deliver the total design flow rate while meeting the total dynamic head requirements of the onsite sewage system;

(3) connected to pump discharge piping that is adequately secured; and

(4) installed in such a manner as to allow for removal without entering the dosing tank or dewatering the dosing tank.

(b) Duplex pumps shall be used for flows greater than seven hundred fifty (750) gallons per day.

(c) Effluent pumps shall be provided with a suitable means of quick, convenient disconnection from the discharge piping, as follows:

(1) Fittings and valves shall be of compatible corrosion resistant material.

(2) A quick disconnect coupling, breakaway flange, or similar disconnect device shall be provided for each pump discharge pipe.

(3) Quick disconnect couplings and valves shall be readily accessible from the ground surface without entering the dosing tank.

(4) Submersible pumps shall be provided with a corrosion resistant lifting apparatus such as a rope or chain to facilitate removal of the pump. For projects involving flows greater than seven hundred fifty (750) gallons per day, pumps must be mounted on guide rails manufactured to withstand the corrosive environment of a dosing tank.

(d) All floats for pump operation shall be mounted according to manufacturer's specifications using fasteners manufactured for that purpose.

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

(f) Junction boxes shall be rated as a NEMA 4X, National Electrical Manufacturers Association, NEMA 250-2008. All connectors to the junction box shall form a watertight seal:

(1) to the junction box; and

(2) between connector openings and incoming wires.

(g) Any connector not used for wiring shall be fitted with a watertight plug.

410 IAC 6-10.1-74 Distribution box specifications

Sec. 74. (a) Concrete distribution boxes shall be constructed of concrete with a compressive strength of four thousand (4,000) pounds per square inch or greater. Other materials may be considered on a case-by-case basis. All materials must:

(1) be resistant to corrosion and decay; and

(2) have sufficient structural strength to contain sewage and resist lateral compressive and bearing loads.

(b) The minimum interior dimension of a distribution box shall be twelve (12) inches.

(c) The distribution box shall be fitted with a watertight, removable lid for access. The distribution box may be fitted with a riser to the ground surface. The riser joints and the lid connection to the riser must be watertight.

(d) 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.

(e) 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:

(1) provide a passageway for effluent between the box bottom and the bottom edge of the baffle of not more than two (2) inches; and

(2) extend to one (1) inch above the top of the inlet.

(f) An elbow or sanitary tee in the vertical position may be used in place of a baffle, as follows:

(1) If an elbow is used, the elbow must:

(A) be a ninety (90) degree elbow;

(B) be turned down into the distribution box with the end of the elbow not more than two (2) inches above the bottom of the distribution box; and

(C) include a weep hole in the upper part of the elbow.

(2) If a sanitary tee is used, the bottom of the sanitary tee must be not more than two (2) inches above the bottom of the distribution box and the top of the sanitary tee at least one (1) inch below the lid.

(g) Each distribution box shall be designed to split the effluent flow equally among the effluent ports. All effluent ports shall be:

(1) at the same elevation;

(2) of the same diameter; and

(3) located at an elevation at least one (1) inch lower than the influent port.

410 IAC 6-10.1-75 Pipe specifications

Sec. 75. (a) Piping used in a commercial onsite sewage system shall meet or exceed the following applicable standards:

(1) Gravity sewer pipe and gravity effluent sewer pipe shall meet the following standards:

(A) For PVC pipe, the following:

(i) ASTM D 2665-12 for four (4) inch and six (6) inch pipe only.

(ii) ASTM F 891-10 SDR 35 for four (4) inch through eight (8) inch cellular core pipe with minimum pipe stiffness of 50 (PS 50).

(iii) ASTM D 3034-08 for the following:

(AA) SDR 26 and SDR 35 for four (4) inch through fifteen (15) inch pipe.

(BB) SDR 26 with gasketed compression-type joints for special crossings above or below potable water lines where the vertical clearance of eighteen (18) inches required in section 61(d)(2) of this rule cannot be met.

(B) For ABS pipe, the following:

(i) ASTM D 2661-11 for four (4) inch and six (6) inch pipe only.

(ii) ASTM D 2680-01 (Reapproved 2009) for eight (8) inch through fifteen (15) inch pipe.

(iii) ASTM D 2751-05 SDR 23.5 or SDR 35 for four (4) inch and six (6) inch pipe only.

(C) ASTM F 480-12, Schedule 40 and 80.

(D) Waterworks grade ductile iron pipe with mechanical or tyton joints.

(2) Pressure sewer, effluent force main, manifold, and pressure distribution lateral pipe shall meet the following standards:

(A) For PVC pipe, the following:

(i) ASTM D 2241-09 SDR 13.5, SDR 17, SDR 21, or SDR 26.

(ii) ASTM D 1785-06 Schedule 40, 80, or 120.

(B) For ABS pipe, the following:

(i) ASTM D 1527-99 (Reapproved 2005) Schedule 40, 80, or 120, with solvent weld fittings.

(ii) ASTM D 2282-99 (Reapproved 2005) SDR 13.5, SDR 17, SDR 21, or SDR 26.

(b) Gasketed compression-type joints must be used on pressure sewers when they are located ten (10) feet or less from a water line.

(c) Soil absorption system gravity distribution laterals shall meet one (1) of the following standards:
(1) Four (4) inch diameter sewer pipe listed in subsection (a)(1) and (a)(2).
(2) Four (4) inch diameter PVC pipe meeting ASTM D 2729-11.
(3) Four (4) inch diameter smooth interior wall polyethylene pipe meeting ASTM F 810-07 or AASHTO M252-09 Type SP.

(d) Gravity distribution laterals shall have two (2) or three (3) rows of holes separated by one hundred twenty (120) degrees with five-eighths (5/8) inch or three-quarters (3/4) inch hole diameter with holes spaced at five (5) inches or less.

(e) Pipe for subsurface drainage systems shall meet the following standards for polyethylene pipe:
(1) ASTM F 405-05.
(2) ASTM F 667-12.
(3) NRCS 606, September 2003.

410 IAC 6-10.1-76 Aggregate specifications

Sec. 76. (a) Aggregate to be used in soil absorption systems shall be gravel, stone, or other materials listed by the department. Crushed limestone aggregate, if used, shall be rated as forty percent (40%) or less on the Los Angeles abrasion quality requirement of the INDOT 2012 Standard Specifications, Section 904, Aggregates.(b) Aggregate:
(1) 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; and
(2) must be larger than the openings in the gravity distribution laterals.

(c) Tire chips may be used in place of stone for soil absorption systems on a one-for-one basis, volumetrically. Tire chips used for soil absorption systems must have a nominal size of two (2) inches with chip dimensions being not less than one-half (1/2) inch and not greater than four (4) inches.

(d) Fines, sand, and clay shall be removed from the aggregate prior to its placement in the trench.

410 IAC 6-10.1-77 Barrier materials

Sec. 77. (a) The physical characteristics of barrier materials shall have the following minimum average roll values (MARV):
(1) A grab tensile strength equal to or greater than eighty (80) pounds in machine direction (MD) and cross-machine direction (CD) in accordance with ASTM D 4632-08.
(2) A grab tensile elongation @ break of equal to or greater than fifty percent (50%) in MD and CD in accordance with ASTM D 4632-08.
(3) A trapezoidal tear strength equal to or greater than thirty (30) pounds in MD and CD in accordance with ASTM D 4533-11.
(4) A CBR puncture resistance equal to or greater than one hundred seventy-five (175) pounds in accordance with ASTM D 6241-04 (Reapproved 2009).
(5) A permittivity of equal to or greater than 0.5 sec^{-1} in accordance with ASTM D 4491-99a (Reapproved 2009).
(6) A water flow rate equal to or greater than one hundred fifty (150) gallons per minute per square foot in accordance with ASTM D 4355-07.
(7) A UV resistance at five hundred (500) hours equal to or greater than seventy percent (70%) strength retained in accordance with ASTM D 4491-99a (Reapproved 2009).
(8) An apparent opening size (AOS) (U.S. Sieve) equal to or greater than forty (40) and equal to or less than seventy (70) sieve in accordance with ASTM D 4751-04.

(b) The chemical characteristics of barrier materials shall be:
(1) nonbiodegradable;
(2) resistant to acids and alkalies within a pH range of four (4) to ten (10); and
(3) resistant to common solvents.

410 IAC 6-10.1-78 Subsurface trench onsite sewage system site suitability

Sec. 78. (a) Onsite sewage system feasibility, location, and selection shall be based on the:
(1) site evaluation;
(2) information obtained from the on-site soils evaluation; and
(3) DDF.
If site conditions are acceptable, subsurface trench soil absorption systems are the systems of choice.

(b) All of the following site conditions in this section must be met if subsurface trench onsite sewage systems are to be constructed:
(1) Sufficient area exists on the lot for an appropriately sized subsurface trench onsite sewage system, while meeting the:
(A) separation distances of section 61 of this rule; and
(B) dispersal area requirements of section 62 of this rule.
(2) The topographic position of the site on which the onsite sewage 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 used.
(3) The site has a slope of fifteen percent (15%) or less.(4) Site conditions permit distribution of effluent to each trench of the subsurface soil absorption system so that each trench can be loaded with a proportionate volume of effluent.
(5) Site conditions permit any seasonal high water table at the site of the proposed subsurface trench soil absorption system to be lowered to at least thirty-four (34) inches below original grade, in accordance with section 63 of this rule.
(6) When there are no horizons from original grade to thirty-four (34) inches below original grade in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution, unless:
(A) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and
(B) the determination in clause (A) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department.
(7) When there are no soil horizons at the site from the original grade to thirty-four (34) inches below the original grade with:
(A) less than twenty percent (20%) clay by volume and greater than thirty-five percent (35%) coarse fragments by volume; or
(B) greater than or equal to twenty percent (20%) clay by volume and greater than sixty percent (60%) coarse fragments by volume.
(8) All soil horizons at the site from the original grade to thirty-four (34) inches below the original grade have a soil 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 - Soil Loading Rates for Subsurface Trench Onsite Sewage Systems (in gpd/ft^2)								
	SOIL STRUCTURE CLASSES							
SOIL TEXTURE CLASSES	Single Grain	Granular	Strong: Angular, Sub-Angular Blocky, Prismatic	Moderate: Angular, Sub-Angular Blocky, Prismatic	Weak: Angular, Sub-Angular Blocky, Prismatic; Platy[1]	Fragic Characteristics: Very Coarse Prismatic	Structureless, Massive, Friable, V. Friable	Structureless, Massive, Compact, Firm, V. Firm; Platy[2]
Gravel, Coarse Sand	>1.20	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	0.00
Fine Sandy Loam, V. Fine Sandy Loam	N/A	0.75	N/A	0.60	0.60	0.00	0.60	0.00
Loam	N/A	0.75	0.75	0.50	0.50	0.00	0.50	0.00
Silt Loam, Silt	N/A	0.75	0.75	0.50	0.30	0.00	0.30	0.00
Sandy Clay 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
Organic Soil Materials	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A
Limnic Soil Materials	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00
Bedrock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A NOT APPLICABLE								
[1]Naturally occurring platy structure.								
[2]Platy structure caused by mechanical compaction has a soil loading rate of 0.00 gpd/ft^2 unless broken up by methods approved by the department.								

(c) Subsurface trench soil absorption systems shall not be constructed as follows:

(1) In areas where surface runoff or subsurface drainage will have an adverse effect on the onsite sewage system, unless the surface runoff or subsurface drainage can be effectively diverted around the system.

(2) With the bottom of any of the trenches below the RFE.

(3) In areas subject to ponding.

(4) Wholly or partly located in a drainage way.

(5) Where compacted soil material is identified in the soil at a depth greater than twelve (12) inches, unless the compaction is broken up by a method approved by the department.

410 IAC 6-10.1-79 Subsurface trench onsite sewage system type selection criteria

Sec. 79. (a) Onsite sewage system feasibility, location, and selection shall be based on the:
(1) site evaluation;
(2) information obtained from the on-site soils evaluation; and
(3) DDF.

(b) A subsurface trench gravity system may be constructed if the:
(1) DDF of the project is equal to or greater than four hundred fifty (450) gallons per day;
(2) soil 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 in section 78(b)(8) of this rule;
(3) trench bottoms will be at least thirty (30) inches above any horizon with:
(A) a soil loading rate less than twenty-five hundredths (0.25) gallons per day per square foot or greater than seventy-five hundredths (0.75) gallons per day per square foot;
(B) any soil horizon in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution, unless:
(i) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and
(ii) the determination in item (i) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department;
(C) less than twenty percent (20%) clay by volume and greater than thirty-five percent (35%) coarse fragments by volume; or
(D) greater than or equal to twenty percent (20%) clay by volume and greater than sixty percent (60%) coarse fragments by volume; and
(4) soil absorption system, including either half of a subsurface trench alternating field onsite sewage system, is designed with a total absorption trench length that does not exceed five hundred (500) lineal feet.

(c) A subsurface trench gravity onsite sewage system may also be constructed if the:
(1) DDF of the proposed onsite sewage system is less than four hundred fifty (450) gallons per day;
(2) site has a soil 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 in section 78(b)(8) of this rule;
(3) trench bottoms will be at least twenty-four (24) inches above any horizon with:
(A) a soil loading rate less than twenty-five hundredths (0.25) gallons per day per square foot or greater than seventy-five hundredths (0.75) gallons per day per square foot;
(B) any soil horizon in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution, unless:
(i) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and
(ii) the determination in item (i) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department;
(C) less than twenty percent (20%) clay by volume and greater than thirty-five percent (35%) coarse fragments by volume; or
(D) greater than or equal to twenty percent (20%) clay by volume and greater than sixty percent (60%) coarse fragments by volume; and
(4) soil absorption system, including either half of a subsurface trench alternating field onsite sewage system, is designed with a total absorption system trench length that does not exceed five hundred (500) lineal feet.

(d) A subsurface trench onsite sewage system that utilizes alternating fields or is dosed using pump assisted distribution may be constructed if the:

(1) soil 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 in section 78(b)(8) of this rule; and

(2) trench bottoms will be at least twenty-four (24) inches above any horizon with:

(A) a soil loading rate less than twenty-five hundredths (0.25) gallons per day per square foot;

(B) any soil horizon in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution, unless:

(i) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and

(ii) the determination in item (i) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department;

(C) less than twenty percent (20%) clay by volume and greater than thirty-five percent (35%) coarse fragments by volume; or

(D) greater than or equal to twenty percent (20%) clay by volume and greater than sixty percent (60%) coarse fragments by volume.

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

(f) If any soil horizon within twenty-four (24) inches of the proposed trench bottom has a soil loading rate of one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table V in section 78(b)(8) of this rule, the onsite sewage system shall utilize pressure distribution.

410 IAC 6-10.1-80 Elevated sand mound onsite sewage system site suitability

Sec. 80. (a) Onsite sewage system feasibility, location, selection, and design shall be based on the:

(1) site evaluation;

(2) information obtained from the on-site soils evaluation; and

(3) DDF.

(b) Elevated sand mound onsite sewage systems may be constructed if the following site conditions are met:

(1) Sufficient area exists on the lot for an appropriately sized elevated sand mound onsite sewage system, while meeting the:

(A) separation distances of section 61 of this rule; and

(B) dispersal area requirements of section 62 of this rule.

(2) The topographic position of the site on which the elevated sand mound onsite sewage 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.

(3) The site on which the elevated sand mound onsite sewage system is to be built has a slope of six percent (6%) or less.

(4) Site conditions permit any seasonal high water table at the site of the proposed elevated sand mound onsite sewage system to be lowered to at least twenty (20) inches below original grade, in accordance with section 63 of this rule.

(5) When no soil horizon from the ground surface to twenty (20) inches below the ground surface in a soil developed from Wisconsin glacial till shows effervescence when treated with a ten percent (10%) hydrochloric acid solution, unless:

(A) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an onsite sewage system; and

(B) the determination in clause (A) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department.

(6) When there are no soil horizons from the ground surface to twenty (20) inches below the ground surface with:

(A) less than twenty percent (20%) clay by volume and greater than thirty-five percent (35%) coarse fragments by volume; or

(B) greater than or equal to twenty percent (20%) clay by volume and greater than sixty percent (60%) coarse fragments by volume.

(7) All soil horizons from the original grade to twenty (20) inches below the original grade have a soil loading rate of not less than twenty-five hundredths (0.25) gallons per day per square foot and not more than one and twenty-hundredths (1.20) gallons per day per square foot as determined from Table VI as follows:

Table VI – Soil Loading Rates for Elevated Sand Mound Onsite Sewage Systems (in gpd/ft^2)

	SOIL STRUCTURE CLASSES							
SOIL TEXTURE CLASSES	Single Grain	Granular	Strong: Angular, Sub-Angular Blocky, Prismatic	Moderate: Angular, Sub-Angular Blocky, Prismatic	Weak: Angular, Sub-Angular Blocky, Prismatic; Platy[1]	Fragic Characteristics: Very Coarse Prismatic	Structureless, Massive, Friable, V. Friable	Structureless, Massive, Compact, Firm, V. Firm; Platy[2]
Gravel, Coarse Sand	>1.20	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	0.00
Fine Sandy Loam, V. Fine Sandy Loam	N/A	0.60	N/A	0.60	0.60	0.00	0.60	0.00
Loam	N/A	0.50	0.50	0.50	0.50	0.00	0.50	0.00
Silt Loam, Silt	N/A	0.50	0.50	0.50	0.50	0.00	0.50	0.00
Sandy Clay 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
Organic Soil Materials	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A
Limnic Soil Materials	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00
Bedrock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A NOT APPLICABLE

[1] Naturally occurring platy structure.

[2] Platy structure caused by compaction has a soil loading rate of 0.00 gpd/ft^2 unless broken up by methods approved by the department.

(c) Elevated sand mound soil absorption systems shall not be constructed as follows:
(1) In areas where surface runoff or subsurface drainage will have an adverse effect on the onsite sewage system, unless the surface runoff or subsurface drainage can be effectively diverted around the system.
(2) Where the original grade is below the RFE.
(3) In areas subject to ponding.
(4) Wholly or partly located in a drainage way.
(5) Where compacted soil material is identified in the soil at a depth greater than twelve (12) inches, unless the compaction is broken up by a method approved by the department.

410 IAC 6-10.1-81 Table for onsite sewage system selection

Sec. 81. Onsite sewage system selection may be summarized in Table VII as follows:

Table VII - Table for Onsite Sewage System Selection based on requirements of 410 IAC 10.1

Site Requirements	Subsurface Trench Onsite Sewage Systems					Elevated Sand Mound Onsite Sewage Systems (Sec. 80)
	Gravity Flow[1] (Sec. 78, 79)		Flood Dosing or Alt. Fields[1] (Sec. 78, 79)	Flood Dosing[1] (Sec. 78, 79)	Pressure Dist. (Sec. 78, 79)	
Slope	≤ 15%		≤ 15%	≤15%	≤15%	≤ 6%
Design Daily Flow	≥ 450	< 450	Any	Any	Any	Any
Acceptable Loading Rate Range for determining system size	≥ 0.25 ≤ 0.75	≥ 0.25 ≤ 0.75	≥ 0.25 ≤ 0.75	≥ 0.25 ≤ 0.75	≥ 0.25 ≤ 1.20	≥ 0.25 ≤ 1.20
Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate < 0.25 gpd/ft^2	≥ 30	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate > 1.20 gpd/ft^2	≥ 24	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate = 1.20 gpd/ft^2	≥ 24	≥ 24	≥ 24	≥ 24	Press. Dist. required for SLR = 1.20	≥ 0
Distance from Trench Bottom (ground surface for mounds) to a Soil Horizon Developed from Wisconsin Glacial Till That Shows Effervescence[3]	≥ 30	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with < 20% Clay and > 35% Coarse Fragments by Volume	≥ 30	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with > 20% Clay and > 60% Coarse Fragments by Volume	≥ 30	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Distance from Trench Bottom (ground surface for mounds) to Seasonal High Water Table[2]	≥ 24	≥ 24	≥ 24	≥ 24	≥ 24	≥ 20
Total Lineal Feet of Trench	≤ 500	≤ 500	≤ 500 for Alt. Fields	Any	Any	N/A

[1]These conditions are also suitable for subsurface trench pressure distribution onsite sewage systems.

[2]For subsurface trench systems, if the distance from trench bottom to seasonal high water table is less than twenty-four (24) inches, drainage must be installed in accordance with section 63 of this rule. For elevated sand mound systems, if the depth of the seasonal high water table is less than twenty (20) inches below the ground surface, drainage must be installed in accordance with section 59 of this rule.
[3]See Sections 62(a)(2)(E), 78(b)(6), 79(b)(3)(B), 79(c)(3)(B), 79(d)(2)(B) and 80(b)(5).
This chart does not include considerations such as the specific landscape features that must be met, the size of the soil absorption system, the size of the area necessary for construction of the soil absorption system on the contour with necessary setback and separation distances, dispersal area, the diversion of surface drainage, the feasibility of subsurface drainage, the ability to obtain easements, etc.
This chart does not take into consideration the necessity to pump the effluent to overcome differences in elevation (when a subsurface trench gravity system might otherwise be constructed).

410 IAC 6-10.1-82 Subsurface trench onsite sewage systems: general design and construction requirements

Sec. 82. (a) The minimum absorption area (in square feet) required for each subsurface trench soil absorption system shall be based on the following:

(1) The DDF.

(2) The appropriate soil loading rate (in gallons per day per square foot) determined from Table V in section 78(b)(8) of this rule. The soil loading rate used for this computation shall be the soil loading rate of the most restrictive horizon in the first twenty-four (24) inches below the trench bottom.

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

$$\text{Area} = \frac{\text{DDF}}{\text{Soil loading rate in gpd/sq. ft.}}$$

(b) Subsurface trench soil absorption systems shall be as long and narrow as the site permits while not exceeding maximum trench length.

(c) All subsurface trench onsite sewage systems shall be located in accordance with the separation distances shown in Table II in section 61(a) of this rule.

(d) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the soil absorption system before, during, and after construction of the trenches, especially during wet weather. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site or the soil absorption system, or both.

(e) Subsurface soil absorption systems shall not be constructed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit, as follows:

(1) This applies to soils classified as the following:

(A) Sandy loam.
(B) Silt loam.
(C) Loam.
(D) Clay loam.
(E) Silty clay loam.
(F) Sandy clay.
(G) Silty clay.
(H) Clay.

(2) Sufficient samples shall be evaluated throughout the soil absorption system site, from the soil surface to the proposed depth of the soil absorption system trench bottoms, to assure that the plastic limit of the soil is not exceeded.

(3) 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.

(f) Vegetation at the soil absorption system site that would interfere with the soils evaluation, system layout, or system construction shall be cut and removed prior to installation without causing compacted soil material.

(g) If trees are present within the proposed soil absorption system:
(1) soil absorption trenches may be routed around trees provided the trenches follow the contour of the site; or
(2) tree stumps and root balls may be removed provided the resulting excavation will not exceed the permit requirements for width and depth of the soil absorption trench.

(h) Excessive smearing of the usable absorption trench sidewalls or bottom during construction may:
(1) result in irreversible damage to the soil infiltrative surface; and
(2) be grounds for rejection of the site or the onsite sewage system, or both.

(i) The commercial sewer shall be a minimum of four (4) inches in diameter. Four (4) inch sewers shall be installed with a positive slope of:
(1) not less than four (4) inches in twenty-five (25) feet; and
(2) not more than thirty-six (36) inches in twenty-five (25) feet.

(j) A six (6) inch commercial sewer, if utilized, shall be installed with a positive slope of:
(1) not less than two (2) inches in twenty-five (25) feet; and
(2) not more than thirty-six (36) inches in twenty-five (25) feet.

(k) A vertical drop may be installed in a commercial sewer. Each vertical drop shall have a cleanout located immediately upslope.

(l) Effluent sewers shall meet the following requirements:
(1) Effluent sewers shall be a minimum of four (4) inches in diameter.
(2) Effluent sewer pipe shall have a positive grade of at least two and four-tenths (2.4) inches per one hundred (100) feet or a grade of two-tenths percent (0.2%).

(m) All sewer and effluent sewer joints shall be sealed according to the manufacturer's recommendations in order to be watertight and to withstand the pressures exerted on them.

(n) The absorption trenches of a subsurface trench soil absorption system shall be constructed along the contour.

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

(p) All subsurface trench soil absorption 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.

(q) There shall be a minimum separation of seven and one-half (7 1/2) feet, on center, between soil absorption system trenches, measured perpendicular to the trenches.

(r) No single absorption trench in a subsurface trench soil absorption system shall exceed one hundred (100) feet in length, except for subsurface trench pressure distribution onsite sewage systems.

(s) Each trench and distribution lateral in a subsurface trench soil absorption system shall be uniformly level throughout its length and width.

(t) The distal ends of distribution laterals and trenches shall not be tied together.

(u) The distal end of each distribution lateral shall be capped, with the cap joint sealed according to the manufacturer's recommendations in order to be watertight and to withstand the pressures exerted on it.

(v) Perforated pipe distribution laterals in the absorption trench of a subsurface trench soil absorption system shall be completely surrounded by aggregate that meets the specifications in section 76 of this rule. There shall be at least six (6) inches of aggregate below the pipe.

(w) The minimum depth of aggregate above the distribution laterals shall be:
(1) two (2) inches throughout the entire length and width of trenches having a depth of twelve (12) inches or greater; or
(2) two (2) inches above the distribution lateral for the entire length of trenches having a depth of ten (10) inches to twelve (12) inches.

(x) The aggregate used in a subsurface trench soil absorption system shall be covered with a geotextile fabric barrier in such a manner as to prevent the aggregate from becoming clogged with the earth fill. The barrier material shall:
(1) meet the minimum requirements in section 77 of this rule;
(2) be placed on the aggregate to prevent soil particle movement into the aggregate; and
(3) cover the aggregate from side to side and from end to end.

(y) 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 soil absorption system to promote surface runoff.

(z) Tire chips, if used for aggregate, will have protruding wires and shall be removed from the ground surface during site cleanup.

410 IAC 6-10.1-83 Subsurface trench gravity onsite sewage systems: design and construction requirements

Sec. 83. (a) Subsurface trench gravity onsite sewage systems shall meet all of the requirements of:
(1) section 82 of this rule; and
(2) this section.

(b) A distribution box or series of distribution boxes shall be installed between the septic tank and the subsurface soil absorption system, and each absorption system trench shall be connected directly to a distribution box using an effluent sewer.

(c) Distribution boxes shall be installed level on either undisturbed soil, sand, sand mix, aggregate not larger than one-half (1/2) inch in diameter, or engineered base, and the outlets shall be checked to assure that they are at a uniform elevation.

(d) Effluent sewer pipe in a subsurface trench gravity onsite sewage system shall meet the following requirements:
(1) For installation prior to a distribution box, effluent sewer pipe shall be bedded according to manufacturer requirements and backfilled with debris-free soil material or aggregate without damaging the pipe.
(2) For installation after a distribution box, effluent sewer pipe shall be stabilized, bedded, and backfilled without damaging the pipe with debris-free soil material to prevent the movement of effluent along the outside of the pipe.

(e) The invert elevation of the end of each effluent sewer pipe connected to a distribution box shall be at the same elevation so that each gravity distribution lateral receives an equal volume of effluent.

(f) Each effluent sewer from an outlet of a distribution box that directly serves a trench shall extend into the aggregate in the trench.

(g) All soil absorption system gravity distribution laterals shall have an internal diameter of four (4) inches.

(h) Gravity distribution laterals in the aggregate trenches shall be installed level along their length:
(1) for two (2) hole gravity distribution laterals, the laterals shall be placed in the aggregate with the rows of holes located at one hundred twenty (120) and two hundred forty (240) degrees from vertical (rows of holes at four (4) o'clock and eight (8) o'clock); and
(2) for three (3) hole gravity distribution laterals, the laterals shall be placed in the aggregate with the rows of holes located at one hundred twenty (120), two hundred forty (240), and three hundred sixty (360) degrees from vertical (rows of holes at four (4) o'clock, eight (8) o'clock, and twelve (12) o'clock).

(i) In order to provide equal flow distribution in gravity feed subsurface soil absorption systems, each absorption field trench must be individually connected to a distribution box. The distribution box shall be at least five (5) feet from the proximal end of each soil absorption field trench and shall be connected to the absorption field trench by unperforated pipe that is laid with a gravel free backfill to the point where the unperforated pipe enters the aggregate in the trench. All absorption trenches served by a common distribution box must be constructed so that each trench served by the distribution box is loaded with an equal volume of effluent.

410 IAC 6-10.1-84 Subsurface trench flood dosed onsite sewage systems: design and construction requirements

Sec 84. (a) Subsurface trench flood dosed onsite sewage systems shall meet all of the requirements of:
(1) sections 82 and 83 of this rule; and
(2) this section.

(b) When a subsurface trench flood dosed soil absorption system is used, the dosing effluent pump shall be sized, and its controls set to deliver the DDF to the soil absorption field in each dose. Effluent pump selection shall be based on manufacturer's pump curves for the required discharge rate from Table VIII, as follows, at the total head imposed on the pump:

Table VIII - Required Effluent Pump Discharge Rates for Subsurface Trench Flood Dosed Onsite Sewage Systems	
Design Daily Flow	Discharge Rate in Gallons per Minute
150-299	30
300-449	30
450-599	30-45
600-749	30-60
750-899	38-75
900+	45-90

(c) The total head for a subsurface trench flood dosed soil absorption system shall be the elevation difference between the effluent pump off and the highest point in the force main or the outlet of the effluent force main in the distribution box, whichever is the highest elevation, in addition to the friction loss in the effluent force main expressed in feet.

(d) The effluent force main shall drain unless it is installed below the frost line, as listed in Table IX, as follows, and designed so that no effluent remains in any portion of the effluent force main located above the frost line:

Table IX - Frost Penetrations in Indiana (in inches)							
Adams	60	Franklin	48	Lawrence	48	Rush	54
Allen	60	Fulton	60	Madison	60	St. Joseph	60
Bartholomew	48	Gibson	42	Marion	54	Scott	36
Benton	60	Grant	54	Marshall	60	Shelby	54
Blackford	60	Greene	54	Martin	48	Spencer	36
Boone	54	Hamilton	54	Miami	60	Starke	60
Brown	48	Hancock	54	Monroe	48	Steuben	60
Carroll	60	Harrison	36	Montgomery	60	Sullivan	54
Cass	60	Hendricks	54	Morgan	48	Switzerland	42
Clark	36	Henry	54	Newton	60	Tippecanoe	60
Clay	54	Howard	60	Noble	60	Tipton	60
Clinton	54	Huntington	60	Ohio	42	Union	48
Crawford	36	Jackson	48	Orange	42	Vanderburgh	36
Daviess	48	Jasper	60	Owen	54	Vermillion	60
Dearborn	48	Jay	60	Parke	60	Vigo	60
Decatur	48	Jefferson	42	Perry	36	Wabash	60
Dekalb	60	Jennings	48	Pike	42	Warren	60
Delaware	60	Johnson	54	Porter	60	Warrick	36
Dubois	42	Knox	48	Posey	42	Washington	36
Elkhart	60	Kosciusko	60	Pulaski	60	Wayne	54
Fayette	54	LaGrange	60	Putnam	54	Wells	60
Floyd	36	Lake	60	Randolph	54	White	60
Fountain	60	LaPorte	60	Ripley	48	Whitley	60

(e) In addition to the liquid holding capacity of a dosing tank stated in section 70(f) of this rule the following shall apply:

(1) If the effluent force main drains to the soil absorption system, or if it does not drain between doses, the dosing tank volume shall be the DDF.

(2) If the effluent force main drains back to the dosing tank, the dosing tank volume shall be the DDF plus the volume contained in the effluent force main.

(f) The distal end of the effluent force main in the distribution box must be fitted with an elbow turned down, or else the distribution box must be baffled.

(g) The minimum inside diameter of the effluent force main shall be one (1) inch. The maximum inside diameter of the effluent force main shall be four (4) inches.

(h) Tables X and XI, as follows, shall be used in determining friction losses in the effluent force mains and manifold when plastic pipe is used:

Table X - Friction Losses in Plastic Pipe (per 100 feet of pipe)														
Pipe Diameter, Flow (gpm), Velocity (v)2, and Friction Loss Head (Hf)1														
Flow (gpm)	1"		1 ¼"		1 ½"		2"		2 ½"		3"		4"	
Q	v	H_f	v	H_f	v	H_f	v	H_f	v	H_f	v	H_f	v	H_f
1	0.37	0.11												
2	0.74	0.38	0.43	0.10										
3	1.11	0.78	0.64	0.21	0.47	0.10								
4	1.49	1.31	0.86	0.35	0.63	0.16								
5	1.86	1.92	1.07	0.52	0.79	0.24								
6	2.23	2.70	1.29	0.71	0.95	0.33	0.57	0.10						
8	2.97	4.59	1.72	1.19	1.26	0.56	0.77	0.17						
10	3.71	6.90	2.15	1.78	1.58	0.83	0.96	0.25	0.67	0.11				
15	5.57	14.7	3.22	3.76	2.37	1.74	1.43	0.52	1.01	0.22				
20	7.43	25.2	4.29	6.42	3.16	2.96	1.91	.87	1.34	0.37	0.87	0.13		
25	9.28	38.6	5.37	9.74	3.94	4.46	2.39	1.29	1.68	0.54	1.09	0.19		
30			6.44	13.6	4.73	6.27	2.87	1.81	2.01	0.76	1.30	0.26		
35			7.51	18.2	5.52	8.40	3.35	2.42	2.35	1.01	1.52	0.35	0.88	0.10
40			8.59	23.6	6.30	10.7	3.83	3.12	2.68	1.28	1.74	0.44	1.01	0.12
45					7.09	13.5	4.30	3.85	3.02	1.54	1.95	0.55	1.13	0.15
50					7.88	16.5	4.78	4.68	3.35	1.93	2.17	0.67	1.26	0.18
60					9.47	23.6	5.74	6.62	4.02	2.72	2.60	0.94	1.51	0.25
70							6.70	8.86	4.69	3.67	3.04	1.25	1.76	0.33
80							7.65	11.5	5.36	4.69	3.47	1.59	2.02	0.42
90							8.60	14.3	6.03	5.83	3.91	1.99	2.27	0.52
100									6.70	7.13	4.34	2.42	2.52	0.63
125									8.38	10.9	5.43	3.72	3.15	0.96
150											6.51	5.16	3.78	1.34
175											7.60	6.90	4.41	1.79
200											8.68	8.93	5.04	2.27
225													5.67	2.84
250													6.30	3.37
275													6.93	4.13
300													7.56	4.87
325													8.19	5.70

[1] This figure is based on flows for PVC Schedule 40 pipe (flow coefficient: C-150). Other values for friction loss may be used if documentation from the pipe manufacturer is provided with the plan submittal. Calculations using the Hazen-Williams equation may be used if provided with the plan submittal.

[2] Flow velocity must be at least 2 fps; flow velocities above 5 fps should be avoided.

Table XI - Plastic Pipe Fittings: Friction Loss - Equivalent Length of Straight Pipe (ft.)*							
Fitting:	1"	1 ¼"	1 ½"	2"	2 ½"	3"	4"
90° elbow, standard sharp, inside radius	5.3	6.7	7.5	8.6	9.3	11.1	13.1
90° elbow, long sweep radius	2.5	3.8	4.0	5.7	6.9	7.9	12.0
45° elbow, standard	1.4	1.8	2.1	2.6	3.1	4.0	5.1
Tee Flow (run flow)	1.7	2.3	2.7	4.3	5.1	6.2	8.3
Tee Flow (branch flow)	6.0	7.0	8.0	12.0	15.0	16.0	22.0
Gate Valve	0.6	0.8	1.0	1.5	1.6	2.0	3.0
Male/Female adapter	2.0	2.8	3.5	4.5	5.5	6.5	9.0
*Assigned values. Other values for friction loss may be used if documentation from the pipe manufacturer is provided with the plan submittal.							

410 IAC 6-10.1-85 Subsurface trench alternating field onsite sewage systems: design and construction requirements

Sec. 85. (a) Subsurface trench alternating field onsite sewage systems shall meet all of the requirements of:
(1) sections 82 and 83 of this rule; and
(2) this section.

(b) Each side of the soil absorption system shall contain the total square footage of soil absorption area calculated from section 82(a) of this rule.

(c) 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.

410 IAC 6-10.1-86 Subsurface trench pressure distribution onsite sewage systems: design and construction requirements

Sec. 86. (a) Subsurface trench pressure distribution onsite sewage systems shall meet all of the requirements of:
(1) section 82 of this rule; and
(2) this section.

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

(c) An inline residual pressure of two and five-tenths (2.5) to three (3) feet of head shall be maintained in the pressure distribution lateral at the highest elevation in the soil absorption system during pumping.

(d) The effluent pump shall be sized and its controls set as follows:
(1) When a subsurface pressure distribution onsite sewage system is designed using a soil loading rate of less than one and two-tenths (1.2) gallons per day per square foot, the pump shall deliver the DDF to the soil absorption field in each dose.
(2) When a subsurface pressure distribution onsite sewage system is designed using a soil 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 DDF.

(e) The effluent force main shall drain unless it is installed below the frost line, as listed in Table IX in section 84(d) of this rule and designed so that no effluent remains in any portion of the effluent force main located above the frost line.

(f) The liquid holding capacity of the dosing tank shall be determined as follows:

(1) If the effluent force main drains to the subsurface pressure distribution onsite sewage system, or if it does not drain between doses, the dosing tank volume shall be the dose calculated using subsection (d)(1) or (d)(2), whichever is applicable.(2) If the effluent force main drains back to the dosing tank, the dosing tank volume shall be the dose calculated using subsection (d)(1) or (d)(2), whichever is applicable, plus the volume contained in the effluent force main.

(3) Additional dosing tank capacity must be provided to:

(A) keep the dosing tank effluent pump submerged at all times; and

(B) provide sufficient freeboard for a high water alarm.

(g) For installation for a subsurface trench pressure distribution onsite sewage system, the effluent force main shall be stabilized and backfilled without damaging the pipe with debris-free soil material to prevent the movement of effluent along the outside of the pipe.

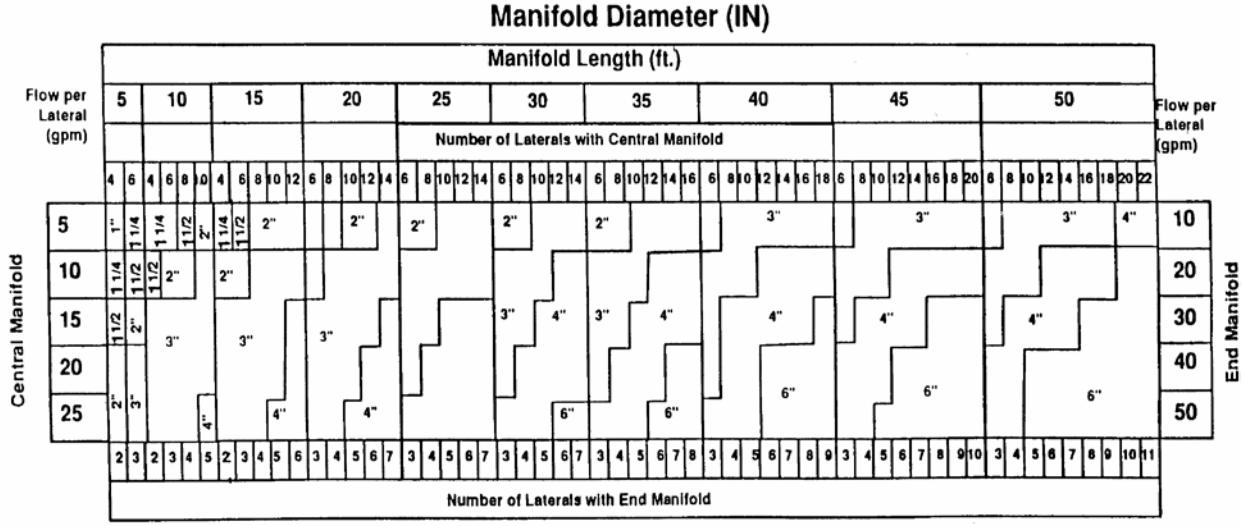
(h) The minimum inside diameter of the effluent force main shall be one and one-half (1 1/2) inches. The maximum inside diameter of the effluent force main shall be four (4) inches.

(i) Tables X and XI in section 84(h) of this rule shall be used in determining friction losses in the effluent force mains and manifold when plastic pipe is used.

(j) The minimum inside diameter of the manifold shall be one (1) inch. The maximum inside diameter of the manifold shall be six (6) inches. The manifold pipe diameter shall be determined from Table XII as follows:

Table XII

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.

(k) The minimum inside diameter of the pressure distribution laterals from the manifold shall be one (1) inch. The maximum inside diameter of the pressure distribution laterals shall be three (3) inches.

(l) Table XIII, as follows, may be used to calculate pipe volumes

Table XIII - Pipe Volume for Various Diameter Pipes (gal/ft)						
Pipe Diameter (in)	1	1 1/4	1 1/2	2*	3*	4*
Volume (gal/ft)	.045	.078	.106	.174	.384	.650
*These diameters and pipe volumes are for calculating the total volume of the effluent force main. They are not used for calculating volumes of pressure distribution laterals.						

(m) The pressure distribution laterals shall have one (1) row of holes spaced in accordance with Table XIV, as follows:

Table XIV - Soil Loading Rates Versus Pressure Distribution Lateral Hole Spacing for Subsurface Trench Pressure Distribution Systems	
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

(n) The holes in the pressure distribution laterals shall be placed in the trenches facing down, and all burrs shall be removed from the edges of the holes.

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

(p) The perforation discharge rate shall be determined in accordance with the formula used to compute the flow from a hole in the pressure distribution lateral at inline 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 inline head at the hole.

Table XV, as follows, gives the discharge rates at varying heads that would be obtained using the formula above in which "d" equals one-fourth (1/4) inch diameter holes:

Table XV - Perforation Discharge Rates in GPM at Varying Inline Heads for 1/4 Inch Diameter Hole Size	
Inline Head (feet)	Perforation Discharge Rate (gallons per minute)
2.5	1.17
3.0	1.28
3.5	1.38
4.0	1.47
4.5	1.56
5.0	1.65
5.5	1.73

(q) Effluent pump selection for soil absorption systems using pressure distribution shall be based on the manufacturer's pump curves for the required pump discharge rate at the total head imposed on the pump. The pump discharge rate for level onsite sewage systems is calculated by using the following formula:

Pump discharge rate = Perforation discharge rate × total number of perforations

To obtain the pump discharge rate required for sloping sites, the rate must be calculated individually for each pressure distribution lateral 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.

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

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

410 IAC 6-10.1-87 Elevated sand mound onsite sewage systems: design of the aggregate bed

Sec. 87. (a) The size of the aggregate bed shall be determined from the following:

(1) The minimum area of the aggregate bed shall be calculated as:

$$\text{minimum aggregate bed area } (ft^2)\ (AB) = \frac{\text{DDF (gpd)}}{1.2\ \text{gpd/ft}^2}$$

(2) The dimensions of the aggregate bed shall be as long and narrow as the site allows, while not exceeding the maximum bed width calculated in subdivision (3)(A).

(3) The maximum width of the aggregate bed shall meet the following requirements:

(A) The maximum aggregate bed width (ft.)$(AB_W) = 0.83\ ft^2/gpd \sqrt{\frac{\text{DDF (gpd)} \times \text{SLR (gpd/ft}^2)}{n}}$

where 0.83 is a conversion factor (ft^2/gpd)
SLR is soil loading rate, and
where: DDF is design daily flow, and
n is determined by the DDF in this chart

DDF (gpd)	n
≤ 1500	3
1501-3000	4
3001-4000	5

This number may be rounded down to the nearest whole number.

(B) For onsite sewage systems with a DDF of seven hundred fifty (750) gallons per day or less, the width of the aggregate bed shall be at least four (4) feet and not greater than ten (10) feet. The aggregate bed width shall not exceed the maximum bed width calculated in clause (A).

(C) For onsite sewage systems with a DDF of greater than seven hundred fifty (750) gallons per day, the following apply:

(i) If the soil loading rate is fifty-hundredths (0.50) gallons per day per square foot (gpd/ft^2) or less, the width of the aggregate bed shall be not greater than fifteen (15) feet, and shall not exceed the maximum bed width calculated in clause (A).

(ii) If the soil loading rate is greater than fifty-hundredths (0.50) gallons per day per square foot (gpd/ft^2), the width of the aggregate bed shall be not greater than twenty (20) feet, and shall not exceed the maximum bed width calculated in clause (A).

(4) The minimum length of the aggregate bed shall be calculated as:

$$\text{Minimum length of the aggregate bed } (AB_L) = \frac{\text{Minimum aggregate bed area (AB)}}{\text{Maximum aggregate bed width } (AB_W)}$$

(5) The depth of the aggregate bed shall be at least the sum of:

(A) at least six (6) inches of aggregate below the pressure distribution lateral;

(B) the outside diameter of the pressure distribution lateral; and

(C) at least two (2) inches of aggregate above the pressure distribution lateral.

(b) The aggregate bed shall be installed on the INDOT Specification 23 sand in the basal area, as listed in Table XVI in section 88(j) of this rule.(c) The location of the aggregate bed shall be:

(1) for sites with slopes of one-half percent (1/2%) or less, with its length positioned along the long axis in the center of the basal area; and

(2) for sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%), with its length positioned along the long axis at the upslope side of the basal area.

(d) The design of the aggregate bed shall comply with the following:

(1) The long axis of the aggregate bed shall be constructed along the contours of the absorption system site.

(2) The bottom of the aggregate bed shall be level along its length and width.

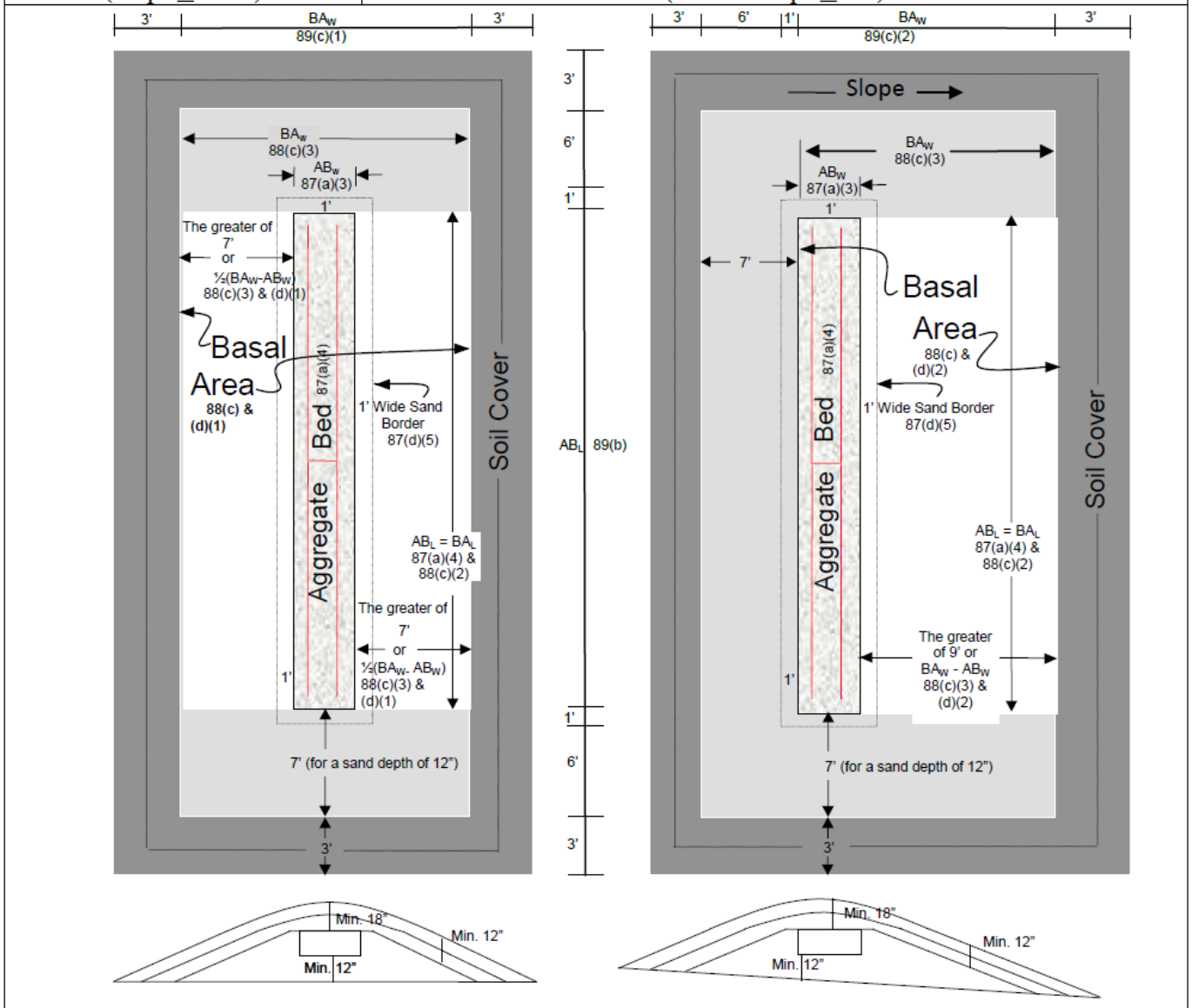
(3) Aggregate used in the aggregate bed shall comply with the requirements of section 76 of this rule.

(4) If more than one (1) aggregate bed is constructed, each of the aggregate beds shall be equal in area.

(5) A one (1) foot wide border of INDOT Specification 23 sand, level with the top of the aggregate bed, shall surround the aggregate bed.

Figure 1, as follows, presents a visual depiction of the location of the aggregate bed within the basal area:

Figure 1
Plan View of Sand Mound
(Based on Minimum Dimensions)



Legend: AB = Area of the Aggregate Bed, AB_L = Length of the Aggregate Bed, AB_W = Width of the Aggregate Bed, BA = Area of the Basal Area, BA_L = Length of the Basal Area, BA_W = Width of the Basal Area. Schematic is for a sand depth of 12 inches below the aggregate bed, and an aggregate bed depth of 6 inches below the laterals, plus the diameter of the laterals, plus 2 inches above the laterals.

410 IAC 6-10.1-88 Elevated sand mound onsite sewage systems: design of basal area

Sec. 88. (a) The dimensions of the basal area shall be as long and narrow as the site allows, in compliance with the requirements of subsection (c).

(b) Numerical dimensions provided in this section for basal area and elevated sand mound size are rounded up to the nearest whole number.

(c) The size of the basal area shall be determined from the following:

(1) The minimum size of the basal area shall be calculated as:

$$\text{Minimum basal area } (ft^2)(BA) = \frac{\text{DDF (gpd)}}{\text{soil loading rate (SLR)}}$$

using the soil loading rates from Table VI in section 80(b)(7) of this rule. The soil loading rate used for this computation shall be the soil loading rate of the most restrictive horizon in the first twenty (20) inches below the ground surface.

(2) The minimum length for the basal area (BA_L) shall equal the length of the aggregate bed (AB_L).

(3) The minimum width of the basal area (BA_W) shall be calculated as the greater of:

(A) $$\text{Minimum basal area width} = \frac{\text{minimum basal area (ft.}^2\text{) (BA)}}{\text{length of aggregate bed (ft) } (AB_L)}$$; or

(B)

Slope	Minimum Basal Area Width (BA_W)
0% ≤ slope ≤ 1/2%	Aggregate bed width + 14 ft.
1/2% < slope ≤ 6%	Aggregate bed width + 9 ft.

(C) The dimensions determined from clause (A) or (B) for the INDOT Specification 23 sand shall maintain a minimum sideslope grade of three-to-one (3:1).

(d) The location of the basal area within the elevated sand mound shall be:

(1) on sites with slopes of one-half percent (1/2%) or less, the area under the aggregate bed and extending an equal distance from each side along the length of the aggregate bed; and

(2) on sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%), the area under the aggregate bed and extending directly downslope from the aggregate bed.

(e) The design of the basal area shall be for:

(1) sites with slopes one-half percent (1/2%) or less; or

(2) sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%).

(f) The basal area shall be constructed on the tilled surface of the soil absorption system site in accordance with the provisions of section 94 of this rule.

(g) The long axis of the basal area and elevated sand mound shall be constructed along the contour of the soil absorption system site.

(h) The minimum depth of the INDOT Specification 23 sand under the aggregate bed shall be twelve (12) inches.

(i) The INDOT Specification 23 sand shall have a minimum final grade on all sides of three-to-one (3:1).

(j) The INDOT Specification 23 sand used in the elevated sand mound shall meet the following standard:

Table XVI - INDOT Specification 23 Sand*	
Sieve Sizes	Percent (%) Passing Sieve (by Weight)
3/8 in (9.50 mm)	100
No. 4 (4.75 mm)	95 – 100
No. 8 (2.36 mm)	80 – 100
No. 16 (1.18 mm)	50 – 85
No. 30 (600 μm)	25 – 60
No. 50 (300 μm)	5 – 30
No. 100 (150 μm)	0 – 10
No. 200 (75 μm)	0 – 3
*The sand shall not have more than forty-five percent (45%) retained between any two (2) consecutive sieves.	

(k) Figure 1 in section 87(d) of this rule presents a visual depiction of the location of the basal area within the elevated sand mound.

410 IAC 6-10.1-89 Elevated sand mound onsite sewage systems: dimensions of the elevated sand mound

Sec. 89. (a) Numerical dimensions for the soil material cover from the edge of the basal area to the edge of the elevated sand mound are based on a final grade of three-to-one (3:1) (on level sites). The plan views and numerical dimensions are for a simple slope (a slope that forms a plane). Elevated sand mounds sited on complex slopes are more difficult to design and construct on contour.

(b) The minimum length of an elevated sand mound shall be the sum of the following:
(1) The length of the aggregate bed (AB_L).
(2) Plus fourteen (14) feet, representing the two sideslopes of INDOT Specification 23 sand at both ends of the aggregate bed (including the one (1) foot level borders). A minimum endslope grade of three-to-one (3:1) shall be maintained on the INDOT Specification 23 sand.
(3) Plus six (6) feet, representing the soil material cover at both ends of the aggregate bed. A minimum endslope grade of three-to-one (3:1) shall be maintained on the soil cover material.

(c) The minimum width of the elevated sand mound shall be determined from the following:
(1) On sites with slopes one-half percent (1/2%) or less, the minimum width of an elevated sand mound is the sum of the following:
(A) The basal area width (BA_W) as determined in section 88(c)(3) of this rule.
(B) Plus six (6) feet, representing the soil material cover on both sides of the aggregate bed.
(2) On sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%), the minimum width of an elevated sand mound shall be the sum of the following:
(A) The basal area width (BA_W) as determined in section 88(c)(3) of this rule.
(B) Plus seven (7) feet, representing the sideslope of INDOT Specification 23 sand on the upslope side of the aggregate bed (including the one (1) foot level border), and shall maintain a minimum sideslope grade of three-to-one (3:1).
(C) Plus six (6) feet, representing the soil material cover on both sides of the aggregate bed. A minimum sideslope grade of three-to-one (3:1) shall be maintained on the soil cover material.

410 IAC 6-10.1-90 Elevated sand mound onsite sewage systems: pressure distribution network

Sec. 90. (a) The effluent force main shall drain unless it is installed below the frost line, as listed in Table IX in section 84(d) of this rule, and designed so that no effluent remains in any portion of the effluent force main located above the frost line.

(b) The effluent pump shall be sized, and its controls set, to deliver approximately one-fourth (1/4) of the DDF per dose.

(c) The liquid holding capacity of the dosing tank shall be determined as follows:

(1) If the effluent force main and manifold do not drain to the dosing tank, the dosing tank volume shall be one-fourth (1/4) of the DDF.

(2) If the effluent force main and manifold drain to the dosing tank, the dosing tank volume shall be one-fourth (1/4) of the DDF plus the volume of the effluent force main.

(3) Additional dosing tank capacity must be provided to:

(A) keep the dosing tank effluent pump submerged at all times; and

(B) provide sufficient freeboard for a high water alarm.

(d) The minimum inside diameter of the effluent force main shall be one and one-half (1 1/2) inches. The maximum inside diameter of the effluent force main shall be four (4) inches.

(e) Tables X and XI in section 84(h) of this rule, or equivalent tables provided by the pipe manufacturer, shall be used in determining friction losses in the effluent force main and manifold when plastic pipe is used. The Hazen-Williams equation may also be used to determine friction loss in the effluent force main and manifold.

(f) The design of the pressure distribution network shall meet the following requirements:

(1) The effluent force main shall approach the elevated sand mound as follows:

(A) On sites with slopes of one-half percent (1/2%) or less, from either end.

(B) On sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%), from the upslope side. If approach from the upslope side of the elevated sand mound is not possible due to site limitations, the effluent force main may approach from either end.

(2) The design (location) of the effluent force main shall provide for minimal disturbance of the basal area during installation.

(g) Manifolds shall be installed between the effluent force main and the pressure distribution laterals as follows:

(1) The manifold shall be located in the aggregate bed.

(2) The manifold pipe shall:

(A) for onsite sewage systems with a DDF of seven hundred fifty (750) gallons per day or less, have a diameter of two (2) inches; or

(B) for onsite sewage systems with a DDF of greater than seven hundred fifty (750) gallons per day, have the same diameter as the effluent force main or a diameter of two (2) inches, whichever is greater, but no greater than four (4) inches.

(h) The pressure distribution laterals shall meet the following requirements:

(1) Each pressure distribution lateral shall connect directly to the manifold.

(2) The length of each lateral shall be calculated as: Lateral length (L_{Lat}) = (AB_L - 3)/2

(3) No single pressure distribution lateral (from the manifold to the end cap) shall exceed fifty-five (55) feet in length.

(4) The diameter of the pressure distribution laterals shall be determined from Table XVII, as follows:

Table XVII - Pressure Distribution Lateral Diameter for Elevated Sand Mounds*			
Lateral Length, L (ft.)	L ≤ 25 ft.	25 ft. < L ≤ 40 ft.	40 ft. < L ≤ 55 ft.
Diameter (in.)	1 in.	1 1/4 in.	1 1/2 in.
*Pressure distribution lateral diameters for one-quarter (1/4) in. holes spaced at three (3) ft. on centers.			

(5) Pressure distribution laterals shall have one (1) row of holes with three (3) feet on center spacing.

(6) The holes in the pressure distribution laterals shall be one-quarter (1/4) inch in diameter.

(7) The number of holes per lateral, including the hole in the end cap, shall be calculated as:

Number of holes per lateral = (L_{Lat} – 1.50/3) + X;

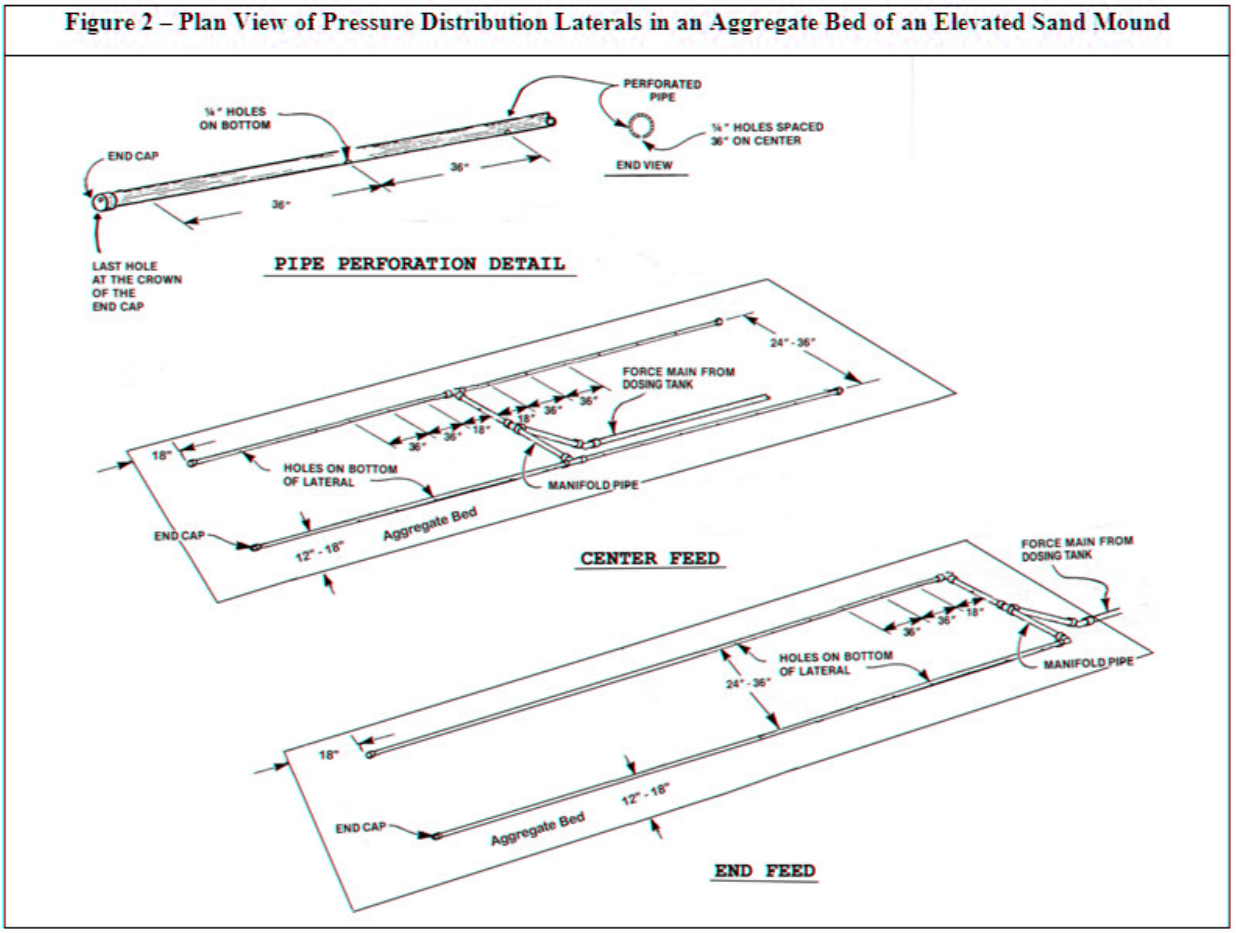
where: X = 1 if R < 0.5; and X = 2 if R ≥ 0.5; and

R = the remainder from the mathematical equation.

(8) The first hole in each lateral shall be eighteen (18) inches from the center of the manifold.(9) The last hole in the pressure distribution lateral before the end cap shall be at not less than eighteen (18) inches and not more than thirty-six (36) inches from the end cap.
(10) 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.
(11) Burrs shall be removed from the edges of all holes and from the interiors of all laterals.
(12) All pressure distribution laterals shall be:
(A) at the same elevation; and
(B) level throughout their lengths.
(13) The pressure distribution laterals shall be placed in the aggregate bed with all holes, except the end cap holes, facing down.

(i) Pressure distribution laterals shall be laid out as shown in Figure 2, as follows:
(1) The separation distance between pressure distribution laterals shall be not less than twenty-four (24) inches and not more than thirty-six (36) inches.
(2) Pressure distribution laterals shall be located not less than twelve (12) inches and not more than eighteen (18) inches from the sides of the aggregate bed along the length of the lateral.
(3) Pressure distribution laterals shall be attached to the manifold using nondirectional fittings designed to withstand the required pressures exerted on them.
inches from the end of the aggregate bed.
(4) The end of each pressure distribution lateral with the hole in the end cap of the lateral shall be eighteen (18) inches from the end of the aggregate bed.

Figure 2 – Plan View of Pressure Distribution Laterals in an Aggregate Bed of an Elevated Sand Mound



(5) All joints, including the end caps, shall withstand the pressures exerted on them.

(j) Effluent pump selection for elevated sand mound onsite sewage systems shall be based on the manufacturer's pump curves for the required pump discharge rate at the total dynamic head imposed on the pump, as follows:

(1) The total discharge rate of the effluent pump shall be the total number of one-quarter (1/4) inch holes in all laterals (including the holes in the end caps) times one and twenty-eight hundredths (1.28) gallons per minute (gpm).

(2) The total dynamic head imposed on the pump shall be the sum of the following:

(A) The design head shall be three (3) feet.

(B) Plus friction loss in the effluent force main and manifold as determined by Tables X and XI in section 84(h) of this rule when plastic pipe is used.

(C) Plus the static head which is the difference in elevation from the effluent pump and the highest point in the effluent force main or the connection to the manifold, whichever is the highest elevation.

410 IAC 6-10.1-91 Elevated sand mound onsite sewage systems: protection of the site

Sec. 91. (a) Before the start of any construction on the property, the following areas must be staked out and protected from disturbance:

(1) The soil absorption system area.

(2) The dispersal area.

(3) The subsurface drainage system area.

(4) The set-aside area (if required in the approved plan).

(5) Areas designated for future expansion (if required in the approved plan).

(b) Special caution shall be taken to prevent wheeled and tracked vehicles from compacting the area selected for placement of the elevated sand mound soil absorption system before, during, and after construction, especially during wet weather. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site or the onsite sewage system, or both.

410 IAC 6-10.1-92 Elevated sand mound onsite sewage systems: requirements for system construction

Sec. 92. (a) Site preparation, tilling, construction, finish grading, and soil stabilization shall:

(1) be performed in accordance with the approved plans; and

(2) not be performed when the soil is frozen.

(b) Elevated sand mound soil absorption systems, as follows, shall not be constructed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit.

(1) This applies to soils classified as the following:

(A) Sandy loam.

(B) Silt loam.

(C) Loam.

(D) Clay loam.

(E) Silty clay loam.

(F) Sandy clay.

(G) Silty clay.

(H) Clay.

(2) Sufficient samples shall be evaluated throughout the soil absorption system site, from the soil surface to the depth of tilling, to assure that the plastic limit of the soil is not exceeded.

(3) 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.

410 IAC 6-10.1-93 Elevated sand mound onsite sewage systems: installation of the effluent force main

Sec. 93. (a) To minimize disturbance of the basal area, the effluent force main must be brought above grade prior to entering the basal area and it must be extended upward through the INDOT Specification 23 sand to the point where it will enter the aggregate bed. The effluent force main shall be laid in the aggregate bed to the point of connection to the manifold.

(b) If the effluent force main is installed prior to tilling the elevated sand mound site, the following apply:

(1) The effluent force main must be installed a minimum of sixteen (16) inches below existing grade from the outlet of the dosing tank to the point where it comes up through the INDOT Specification 23 sand, outside of the basal area.

(2) The end of the effluent force main shall be fitted with a temporary vertical pipe extending at least three (3) feet above grade and temporarily capped during the construction process.

(3) The portion of the effluent force main which comes above existing grade must be bedded and stabilized properly as the sand is applied.

(c) If the effluent force main is installed after tilling of the site and placement of the INDOT Specification 23 sand, the following apply:

(1) The excavation must be hand dug through the INDOT Specification 23 sand.

(2) Dirt, sand, and debris must be prevented from entering the effluent force main during installation.

(3) The portion of the effluent force main that is installed in the INDOT Specification 23 sand must be properly bedded and stabilized.

410 IAC 6-10.1-94 Elevated sand mound onsite sewage systems: preparation of the site

Sec. 94. (a) For all elevated sand mound sites, the following requirements shall be met for site preparation:

(1) Vegetation that would interfere with the soils evaluation, system layout, or system construction shall be cut and removed (not scraped) prior to installation without causing compaction.

(2) Trees shall be cut off at the ground surface and removed, with only stumps left in place. The department may require scarring of the tree stumps.

(3) Tree roots that protrude above the tilled surface shall be cut off and removed without causing compacted soil material.

(4) The portion of the elevated sand mound site receiving INDOT Specification 23 sand shall be tilled along the contour of the site to a depth of seven (7) inches to fourteen (14) inches with a moldboard or chisel plow, or a bulldozer with a ripper. A backhoe may be used to till sites with special considerations as noted in subsection (b). The department or local health department may require field supervision of tilling operations. The following requirements apply:

(A) If a chisel plow or a bulldozer with a ripper is used, tillage shall be across the site along the contour of the site.

(B) If a moldboard plow is used:

(i) it shall have at least two (2) bottoms and make only one (1) pass across the area, along the contour of the site; and

(ii) on sites with slopes greater than one-half percent (1/2%), the furrows shall be turned upslope.

(b) For wooded sites, and sites that limit the use of larger equipment, a backhoe may be used to till the site if the following requirements are met:

(1) The use of a backhoe shall be approved, in writing, by the department or local health department.

(2) Tilling shall be performed along the contour of the site.

(3) The surface of the ground shall be tilled with the chisel teeth fitted onto the backhoe bucket.

(4) The backhoe shall remain on untilled soil.

(5) If a moldboard plow, chisel plow, or bulldozer with a ripper is used to till the site, the provisions of subsection (a)(4) must be utilized.

(c) If compacted soil material is identified in the soil from the surface to a depth of twelve (12) inches, tilling of the soil shall be to a depth of at least two (2) inches below the bottom of the compacted soil material. If compacted soil material is identified in the soil at a depth greater than twelve (12) inches, the site is unsuitable for elevated sand mound construction.

410 IAC 6-10.1-95 Elevated sand mound onsite sewage systems: placement of the sand on the basal area

Sec. 95. (a) The basal area shall be covered using sand that meets the requirements listed in Table XVI in section 88(j) of this rule.

(b) INDOT Specification 23 sand shall be placed on the tilled area immediately after tilling the site to protect the tilled surfaces from damage by precipitation.

(c) The depth of the INDOT Specification 23 sand under the aggregate bed shall be at least twelve (12) inches (on sites with slopes greater than one-half percent (1/2%), the depth of INDOT Specification 23 sand beneath the downslope side of the aggregate bed will be greater than twelve (12) inches).

(d) INDOT Specification 23 sand shall be placed on the tilled surface as follows:
(1) On sites with slopes one-half percent (1/2%) or less, from the ends of the elevated sand mound.
(2) On sites with slopes greater than one-half percent (1/2%) and less than or equal to six percent (6%), from the ends or upslope edge of the elevated sand mound.

(e) At least six (6) inches of INDOT Specification 23 sand shall be kept between the vehicle tracks or tires and the tilled soil of the site.

(f) The depth of INDOT Specification 23 sand around the aggregate bed shall be the sum of:
(1) the depth of the sand under the aggregate bed; and
(2) the depth of the aggregate bed.

(g) A one (1) foot wide border of INDOT Specification 23 sand shall surround the aggregate bed, level with the top of the aggregate bed.

410 IAC 6-10.1-96 Elevated sand mound onsite sewage systems: construction of the aggregate bed

Sec. 96. (a) The surface of the INDOT Specification 23 sand at the sand/aggregate interface shall be smooth and free of ruts and depressions before the placement of the aggregate.

(b) The depth of aggregate in the aggregate bed from side to side and end to end shall be at least:
(1) six (6) inches below the pressure distribution laterals;
(2) plus the outside diameter of the pressure distribution laterals;
(3) plus two (2) inches above the pressure distribution laterals.

(c) The aggregate bed shall be covered with a barrier material which meets the minimum requirements of section 77 of this rule. The barrier material shall cover the aggregate bed from side to side and from end to end.

410 IAC 6-10.1-97 Elevated sand mound onsite sewage systems: placement of the soil material and final grade

Sec. 97. (a) If the ground surface along the perimeter of the INDOT Specification 23 sand was not tilled during preparation of the elevated sand mound site, the perimeter shall be prepared by tilling in accordance with the requirements of section 94 of this rule.

(b) The soil material cover shall:
(1) have a texture other than sand or loamy sand;
(2) be capable of sustaining plant growth; and
(3) be placed on the INDOT Specification 23 sand without causing compacted soil material.

(c) Prior to placement of the soil cover material, the surface of the INDOT Specification 23 sand shall be prepared by:

(1) maintaining a minimum grade of at least three-to-one (3:1); and

(2) preparing the surface of the INDOT Specification 23 sand so that it is smooth and free of ruts and depressions.

(d) The aggregate and sand of the elevated sand mound shall be covered with a minimum of twelve (12) inches of soil material. An additional six (6) inches of that soil material, for a total of eighteen (18) inches, shall be placed over the center line of the long axis of the aggregate bed and crowned to promote surface runoff away from the elevated sand mound.

(e) Soil material shall be placed on the tilled portion of the sand perimeter and graded according to the requirements of subsection (f).

(f) The soil material cover shall have a minimum final grade on all sides of three-to-one (3:1).

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

410 IAC 6-10.1-98 Abandonment of an onsite sewage system

Sec. 98. (a) When the use of an onsite sewage system is discontinued, the following procedure must be followed for all tanks and electrical service:

(1) Electrical power must be disconnected at the source. All controls and panels must be removed.

(2) All above ground electrical lines (including buried service lines) that will not be used for other purposes must be removed.

(3) A licensed septic tank cleaner must pump all contents from all tanks in the onsite sewage system.

(4) The tanks must either be:

(A) removed or the lids crushed into the tanks and the holes or tanks must be backfilled with debris-free sand or other granular material, concrete, or soil material that is compacted to prevent settling. (If a sand mound is being abandoned, sand, aggregate and soil cover from the sand mound may be used for filling the tank or tanks); or

(B) filled with flowable fill.

(5) Properly grade and establish vegetative cover.

(b) The components of the soil absorption system may be left intact, if there are no plans to use the area for other purposes. Vegetative cover must be maintained.

(c) If effluent has surfaced, those areas must be covered with hydrated lime followed by top soil and a vegetative cover.

(d) If components of the soil absorption system are to be removed, the following procedure must be used:

(1) A licensed septic tank cleaner must pump all contents from all distribution boxes in the onsite sewage system.

(2) Allow sufficient time after the onsite sewage system is taken out of service and the tanks pumped to make sure the entire soil absorption system is completely dry.

(3) A contractor must remove the distribution network, aggregate and sand (if any) from the site.

(4) The contractor must dispose of the materials at a licensed landfill.

(5) The site must be properly graded and a vegetative cover established.

(e) Written documentation of tank abandonment must be provided to the department and the local health department by the owner in the form of a receipt from the contractor.

410 IAC 6-10.1-99 Matters incorporated by reference

Sec. 99. (a) Bulletin SE 11, "The Sanitary Vault Privy", 1986 Edition, is incorporated by reference as part of this rule. It is available at the department at 2 North Meridian Street, Indianapolis, Indiana 46204.

(b) NSF/ANSI Standard 40-2010 and Standard 46-2010a are incorporated by reference as part of this rule. Two (2) copies of each standard are available for reference in the files of the department. Copies of the standards may be obtained by mailing a request to the National Sanitation Foundation, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, Michigan 48113-0140, or at: www.techstreet.com/cgi-bin/joint.cgi/nsf

(c) ASTM Standards C 923-08, C 990-09, C 1644-06, D 1527-99 (Reapproved 2005), D 1785-06, D 2241-09, D 2282-99 (Reapproved 2005), D 2661-11, D 2665-12, D 2680-01 (Reapproved 2009), D 2729-11, D 2751-05, D 3034-08, D 4355-07, D 4491-99a (Reapproved 2009), D 4533-11, D 4632-08, D 4751-04, D 6241-04 (Reapproved 2009), F 405-05, F 480-12, F 667-12, F 810-07, and F 891-10 are incorporated by reference as part of this rule. Two (2) copies of each standard are available for reference in the files of the department. ASTM standards may be obtained at: http://www.astm.org/Standard/index.shtml

(d) AASHTO Standard M252-09 is incorporated by reference as part of this rule. Two (2) copies of the standard are available for reference in the files of the department. This standard may be obtained at: http://www.transportation.org(e) NRCS Standard 606, September 2003 is incorporated by reference as part of this rule. Two (2) copies of the standard are available for reference in the files of the department. This standard may be obtained at: http://efotg.nrcs.usda.gov/references/public/AL/tg606.pdf

(f) INDOT 2012 Standard Specifications, Section 904, Aggregates is incorporated by reference as part of this rule. Two (2) copies of the standard are available for reference in the files of the department. The standard may be obtained at: http://www.in.gov/dot/div/contracts/standards/book/sep11/sep.htm

(g) NEMA 250-2008 is incorporated by reference as part of this rule. Two (2) copies of the standard are available for reference in the files of the department. The standard may be obtained at http://webstore.ansi.org/RecordDetail.aspx?sku=NEMA%20250-008&source=google&adgroup=nema&gclid=CKe9-66a368CFSWFQAodnnii_A.