



**Dickinson-Iron District Health Department
Superior Environmental
Health Code
Technical Manual**

Revised January 2011

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INTRODUCTION

The Superior Environmental Health Code was adopted to promote public health, safety and welfare of the people of the Upper Peninsula of Michigan. Within the Code are the specifications for construction of an on-site sewage disposal and water supply systems. Due to the dynamic and complex nature of these private systems governed by the Code, an on-going technical guidance document is necessary. This Technical Guidance Manual has been adopted by the Health Board of the Dickinson-Iron District Health Department (DIDHD) and became effective March 13, 1998 to provide guidelines, specifications and standard practices used to implement the Superior Environmental Health Code. Appropriate revisions and additions shall be made, as needed.

ON-SITE SEWAGE DOSING CRITERIA FOR DRAINFIELD

Dickinson-Iron District Health Department

The following effluent dosing criteria for residential structures has been based on one hundred and fifty (150) gallons per bedroom per day and three doses per day for 1, 2, and 3 bedroom homes. The dosing is four times per day for a 4, 5, and 6 bedroom:

	<u>Gallons/day</u>	<u>Gallons/dose</u>	<u>Minimum tank size</u>
1 Bedroom	150	50	300 gallons
2 Bedroom	300	100	300 gallons
3 Bedroom	450	150	300 gallons
<hr/>			
4 Bedroom	600	150	300 gallons
5 Bedroom	750	190	500 gallons
6 Bedrooms	900	225	500 gallons

* Note: For each additional bedroom, add 50 gallons to the dose.

SEWAGE SYSTEM INSTALLER LICENSING PROCEDURES

Reference: Section 3.1 & 3.2

1. The applicant shall complete a written exam proctored by an environmental health (E.H.) representative of the local health department.
2. Upon satisfactory completion of the exam, (a score of 70% or better) the results will be reviewed and incorrect answers discussed with the applicant.
3. The applicant shall provide the E.H. clerk with pertinent information as to what is to be displayed on their license, along with contact information.
4. Once all of the license detail is completed on the new license, it shall be presented to the E.H. Director for his/her signature. If the E.H. Director is not available, the Health Officer will sign the license(s).
5. A separate license is required to be obtained from each local health department who has adopted the Superior Environmental Health Code in which the installer proposes to install systems. If the test has been taken within another jurisdiction, the test requirement can be waived.
6. The license will be valid for three (3) years; starting with the calendar year in which the license is first issued. The license shall expire on December 31st.
7. Upon making application for license renewal, an installer will not be required to take the exam portion of the license process, if he/she has attended at least one of the annual spring sewage contractors meetings within the three (3) years of the expiration date of their existing license.
8. Failure to renew the license by April of the following calendar year from date of expiration of the previous license may result in the installer being assessed a late penalty license fee.

Seasonal/Weather Restriction

Reference: Section 5.6.2 & 5.7.3

Site Evaluations

Site evaluations will be allowed during the designated restrictive months of the Code (December 1st through March 31st) with the following stipulations:

1. The routine construction application process is complied with.
2. If a backhoe excavation is unsuccessful in breaking through the frost line or if identification of the soil profile is obscured due to frost penetration, the site evaluation is to be discontinued.
3. If the site evaluation cannot be completed, the applicant will not be reimbursed for any portion of the site evaluation fee.
4. If another request is made for the same parcel by the same applicant when site conditions are conducive for conducting an evaluation, the permitting process will need to start over again, including payment of the site evaluation fee.

System Installations

System installations during the restricted months are mainly intended for emergency situations. An example of an emergency situation is the failure of an existing system that is creating an inconvenience to the resident(s) of the home or a nuisance. All other installation requests will be considered by the E. H. Director on an individual basis.

Prior to the E.H. Director, or his/her authorized representative giving consideration to such requests, a "Seasonal Weather Restriction Request" form must be completed by the property owner.

When a sewage system is to be installed within the restricted time frame the absorption system shall be completed the same day it was started.

Also, if during the installation process, it is noted that the soil that was excavated and set aside to later be used to backfill the absorption system appears to be freezing in large chunks; fresh approved fill will be required to be used for backfilling purposes.

Out of 100 Year Flood Plain

Reference: 5.7.1.1.G Minimum Site Requirements/100 Year Floodplain

This section of the code states that all sewage systems shall not be located in a floodplain of less than one hundred (100) years, or in an area subject to seasonal flooding or ponding of surface waters. Historically there has been much debate statewide regarding the interpretation of, “the site shall not be located in a floodplain”.

The property owner shall demonstrate that the following criteria are met when installing sewage systems in or near the one hundred (100) year floodplain:

The sewage system stone aggregate interface shall be located above the one hundred (100) year floodplain elevation.

NOTE: Permits from MDEQ, Land and Water Management Division may be required prior to placing fill for a conventional sewage system below or in a 100 year floodplain elevation.

Sewage System Abandonment

Reference: Section 5.9.2, 5.9.3

This section is provided to guide industry and regulators in the proper abandonment of a septic tank and/or absorption system. Regardless of the abandonment method chosen, a potential safety hazard must not be created.

Septic Tank

Abandonment shall not proceed until the septic tank is pumped and the contents properly disposed of by a licensed septage waste hauler. Alternative methods of septage and tank disposal may be approved in writing by the E.H. Director. Proper abandonment of a septic tank shall consist of one of the following methods:

1. Leave the tank in place, remove the top and completely fill it with material approved by the health officer. Provide compaction during the filling process to eliminate the potential to develop a sinkhole or any other type of safety hazard.
2. Remove and haul the tank to a licensed Type II landfill. Require containment of the septage with particular attention paid to over-the-roadway hauling so as to avoid exposing the public to a health hazard.

Absorption System

When it is practical to do so, the absorption system should be left in place. When the area is needed for other purposes, the absorption system may be removed. The disposal method to be used shall be one of the following:

1. Remove and haul the contaminated material to a licensed Type II landfill. Require containment of the contaminated material with particular attention paid to over-the-roadway hauling so as to avoid exposing the public to a health hazard.
2. A property owner may choose to bury the abandoned absorption system on their own premises, or the premises of another with that owner's permission. All components of the system shall be buried in a manner that does not create an environmental health hazard.

Aggregate

Reference: 5.10.1 of the Superior Environmental Health Code

Aggregate/filter material shall be clean, washed stone or other material approved by the E. H. Director that complies with all of the following specifications:

1. One hundred percent (100%) passing through a two and one-half inch (2 ½ ") sieve.
2. No material shall pass a one-half inch (½ ") sieve except for fines. Fines are material that will pass through a number two hundred (200) sieve.
3. The total fines content passing through a number two hundred (200) sieve, as determined by a loss by wash method, shall not exceed one-half percent (½%).

Aggregate shall be transported, stockpiled, and/or otherwise manipulated in a manner which will not contaminate it with fines exceeding one-half percent (½%) loss by wash method.

Slag, chipped rubber, synthetics, concrete pavement, and other alternative aggregate may be approved in writing by the E.H. Director.

Approved Filter Fabric

Reference: 5.10.5

All approved filter fabric used as an aggregate cover shall adhere to the following specifications:

	ASTM NO.	MINIMUM
Puncture Strength	4833	65 lbs.
Tensile Strength	4632	
Trapezoidal Tear	4533	
Apparent Opening Size (AOS)	4751	US Sieve #20

Absorption System Distribution

Reference: 5.10.4(b)

This section states:

A double header or wye (Y) shall be install when seven (7) or more laterals are used.

Note: To meet the requirements of this technical guidance manual, all absorption system headers which extend beyond twenty (20) feet must have a double header or wye (Y) installed.

Septic Tanks

Reference: Section 5.12(1)

This section states:

“Septic tanks shall be watertight and constructed of concrete or other material approved by the E.H. Director.”

1. In order to provide technical guidance to meet this standard, the following specifications have been established:
 - a. Pre-cast concrete tanks shall have a minimum wall, compartment and bottom thickness of two and one half inches (2 ½”) and shall be adequately reinforced. The top shall be at least four inches (4”) thick and able to withstand the load for which it was intended.
 - b. When a concrete block tank is permitted by the E. H. Director, the block shall have a minimum thickness of eight inches (8”), laid on a four inch (4”) minimum poured concrete floor. All block joints shall be adequately mortared. All block holes or cells shall be filled with mortar or concrete. The tank shall be made watertight by application of a waterproof sealant.
 - c. A cast-in-place concrete tank shall be approved by the E. H. Director prior to construction and comply with all specifications listed in part a.
 - d. For polyethylene septic and dosing tanks, the department is using the State of Wisconsin’s approval list.
2. The liquid capacity of all prefabricated septic tanks shall be permanently marked where easily visible.
3. Upon request of the E. H. Director, manufacturers shall demonstrate that their septic tanks are watertight.
4. All tanks shall be equipped with an outlet baffle, unless specified otherwise by the E. H. Director.
5. The tank inlet and outlet specifications are as follows:
 - a. Have a minimum diameter or square opening of four inches (4”).

- b. Be placed on opposite ends of the tank, unless otherwise approved by the E. H. Director.
 - c. The invert elevation of the inlet shall be at least two inches (2") higher than the invert elevation of the outlet.
 - d. The outlet shall be equipped with a baffle extending below the tank's liquid level a distance equal to but not less than thirty-five percent (35%) or greater than fifty percent (50%) of the liquid level.
 - e. They shall be installed with watertight connections. The E. H. Director may approve in writing other watertight connections.
6. Multiple compartment tanks shall comply with the following:
 - a. As measured from the invert elevation of the outlet, the first compartment shall contain at least two-thirds ($2/3$) of the total required liquid capacity.
 - b. Each compartment within a tank shall have an access port situated above its outlet baffle.
7. The minimum liquid depth of any compartment shall be thirty-six inches (36").
8. All tanks shall be provided with access ports for observation and maintenance purposes and include the following specifications:
 - a. An access port shall be provided over the inlet and have a minimum diameter or square opening of four (4) inches.
 - b. An access port shall be provided over the outlet baffle and be a minimum diameter or square opening of twenty (20) inches.
 - c. The ports shall be brought to ground surface. For safety purposes, they shall be of adequate weight and capped to discourage unauthorized access according to the manufacture's instructions and recommendations.
9. Tank manhole and cover
 - a. For those tank designs with a separate manhole utilized for maintenance purposes, it shall have a minimum diameter or square opening of twenty (20) inches.
 - b. If the manhole cover consists of the same material as the pre-cast concrete tank, it shall be considered adequate for safety purposes and unauthorized access. Polyethylene tank manhole covers shall be anchored in accordance with their manufactured specifications.
 - c. The manholes described above shall be brought to ground surface.

10. When it is anticipated that a portion of the tank may be installed in the water table, it shall be weighted or installed in such a manner to prevent it from floating or shifting.

***NOTE: No polyethylene tanks will be allowed where a high water table is evident.**

11. A tank shall be located to assure accessibility for inspection and cleaning. No construction or landscaping shall impede the tank's accessibility.

12. With few exceptions, the tank shall be located on the same side of a building that the sewer line exits the foundation wall. The building sewer shall be a minimum of five feet in length, and contain not more than two forty-five degree bends.

13. Tank ventilation shall be provided by means of a minimum of eight inches of air space between the underside of the top of the tank and the top of the tank outlet.

14. A multiple compartment tank shall have a four inch minimum diameter "tee" (baffle) placed in each common wall, utilizing the same specifications as established for the outlet baffle in section 12.

15. Upon completion of its installation, the septic tank(s) shall have a minimum final cover of six (6") inches.

Effluent Filters

Reference: Section 5.12

1. An effluent filter shall be installed in all newly installed tanks and used in accordance with the manufacturer's recommendations.
2. The filter shall meet the following specifications:
 - a. Be constructed of durable and corrosion-resistant materials.
 - b. Be designed to accommodate the effluent discharge for the system it serves.
 - c. Be designed to prevent the escape of suspended solids greater than one-eighth inch (1/8") in size during normal operation or malfunction.
 - d. The effluent filter manhole riser shall be brought to ground surface.

Absorption System

Conventional systems installed under the jurisdiction of the Superior Environmental Health Code and the Dickinson-Iron District Health Department will be sized based on the criteria contained within this section. All drainfield/trench systems installed in accordance with this technical guidance manual shall consist of a solid header with perforated laterals and footers.

Drainfield System

Native Soil Texture/ Structure	Permeability		Application Rate Per Sq. Ft.	Min. Absorption Area Sq. Ft. Per Bedroom	Minimum Square Feet of Drain Tile * SEE NOTE			
	in/hr	min/in	Bed	Bed	2 Br.	3 Br.	4 Br.	5 Br.
Coarse sand, Gravel, Gravelly sand	>20	<3						
Stratified sand and gravel, Med. Sand	20 - 6	3-10	0.75	250 sq. ft.	500 sq.ft.	750 sq. ft.	1,000 sq. ft.	1,250 sq. ft.
Fine sand Loamy sand	6 - 3	11-20	0.5	350 sq. ft.	700 sq. ft.	1,050 sq. ft.	1,400 sq. ft.	1,750 sq. ft.
Sandy loam Loam	3 - 2	21-30	0.375	450 sq. ft.	900 sq. ft.	1,350 sq. ft.	1,800 sq. ft.	2,250 sq. ft.
Silty loam, Sandy clay loam	2 - 1.35	31-45	0.3	550 sq. ft.	1,100 sq. ft.	1,650 sq. ft.	2,200 sq. ft.	2,750 sq. ft.
Clay loam, Silty clay loam								
Silty clay loam								
Silty clay, Clay								

NOTE: An undercut system may be considered whenever a soil evaluation reveals the soil to be classified in any of the native soil texture/structures listed in the above table with the exception of stratified sand and gravel or a medium sand classification. The design of an undercut system entails removing the soil within four (4) feet of the base of the absorption system and soil interface and replacing it with coarse/medium sand. The absorption system is then sized in accordance with the criteria established for fine sand.

Trench System

Native Soil Texture/ Structure	Permeability		Application Rate Per Sq. Ft.	Min. Absorption Area Sq. Ft. Per Bedroom	Minimum Square Feet of Drain Tile			
	in/hr	min/in			Trench	Trench	2 Br.	3 Br.
Coarse sand, Gravel, Gravelly sand	>20	<3						
Stratified sand and gravel, Med. Sand	20 - 6	3-10	1	188 sq. ft.	375 sq. ft.	564 sq. ft.	752 sq. ft.	942 sq. ft.
Fine sand Loamy sand	6 - 3	11-20	0.67	262 sq. ft.	524 sq. ft.	786 sq. ft.	1,048 sq. ft.	1,310 sq. ft.
Sandy loam Loam	3 - 2	21-30	0.5	338 sq. ft.	676 sq. ft.	1,014 sq. ft.	1,352 sq. ft.	1,690 sq. ft.
Silty loam, Sandy clay loam	2 - 1.35	31-45	0.4	412 sq. ft.	824 sq. ft.	1,236 sq. ft.	1,648 sq. ft.	2,060 sq. ft.
Clay loam, Silty clay loam								
Silty clay loam								
Silty clay, Clay								

NOTE: A 25% reduction was give to the sizing of a trench system. A standard trench width in accordance with this tech manual is thirty six inches.

NOTE: An undercut system may be considered whenever a soil evaluation reveals the soil to be classified in any of the native soil texture/structures listed in the above table with the exception of stratified sand and gravel or a medium sand classification. The design of an undercut system entails removing the soil within four (4) feet of the base of the absorption system and soil interface and replacing it with coarse/medium sand. The absorption system is then sized in accordance with the criteria established for fine sand.

Chamber System

- Sizing Criteria – Total absorption area of a chamber is determined by taking into consideration the base area of a chamber as well as one half square foot along the entire length of each side of the chamber. An example of sizing for a specific make of chamber is:

Infiltrator – Standard

Base = 2.83' wide x 6.22' length = 17.6 sq. '
 Sidewall = .5'/per side x 6.22' length = 6.22 sq. '
 Total Area = 23.5 sq. ' **(24 sq.')**

***NOTE:** Sizing criteria in the chart below is based on lineal feet of chambers with a standard width of 34". All chamber units installed at the present time within this department's jurisdiction are 34" in width. Adjustments will need to be made for chambers other than the standard 34" width.

Native Soil Texture/ Structure	Permeability		Application Rate Per Sq. Ft.	Min. Absorption Area Sq. Ft. Per Bedroom	Minimum Lineal Feet of Chambers * SEE NOTE			
	in/hr	min/in	Bed	Bed	2 Br.	3 Br.	4 Br.	5 Br.
Coarse sand, Gravel, Gravelly sand	>20	<3						
Stratified sand And gravel, Med. Sand	20 - 6	3 -10	0.75	250 sq. ft.	130	194	260	324
Fine sand Loamy sand	6 - 3	11-20	0.5	350 sq. ft.	180	272	362	454
Sandy loam Loam	3 - 2	21-30	0.375	450 sq. ft.	234	350	466	584
Silty loam, Sandy clay loam	2 - 1.35	31-45	0.3	550 sq. ft.	284	428	570	712
Clay loam, Silty clay loam								
Silty clay loam								
Silty clay, Clay								

Example: A 6 bedroom home with soils consisting of fine sand would be sized as follows:

6x300 sq.'/bedroom =1800 sq.'

1800 sq.' at 24sq.' per chamber = 75 chambers

75 x 6.22 lineal feet per chamber = 466 lineal feet of chamber

NOTE: An undercut system may be considered any time that a soil evaluation reveals the soil to be classified in any of the native soil texture/structures listed in the above table with the exception of stratified sand and gravel or a fine sand classification. The design of an undercut system entails removing the soil within four (4) feet of the base of the chamber and the soil interface and replacing it with coarse/medium sand. The absorption system is then sized in accordance with the criteria established for fine sand. The minimum width of a trench is four (4) feet. Sand is also placed along the sidewalls of the chambers to a height even with the top of the chamber.

Drywell System

For purposes of establishing sizing criteria for a drywell absorption system, the standard number of courses of cement block shall be ten. The standard number of cement blocks per course is thirteen.

A drywell is equal to 250 square feet of absorption area. One drywell per bedroom is required in proper soil conditions.

Bottom area = $9 \times 9 \times 0.7854 = 64$ square feet (area of a circle)

Sidewall area = $9 \times 3.1416 = 28$ (circumference of a circle)

$28 \times 80''$ (total height) = 186 square feet

Total = $186 + 64 = 250$ square feet

Soil identification by the sanitarian is crucial as to the proper use of this system. If the sanitarian determines that the soils are of the Medium/Coarse classification, drywells can be permitted.

Prior to backfilling the aggregate around the drywell, it shall be covered with approved filter fabric.

Privy Requirement

The Dickinson-Iron District Health Department has established the following as it relates to a habitable structure and on-site sewage disposal facilities:

If a structure is not to be serviced with water under pressure (either no water facilities at all or a well is an outside hand pump only), at a minimum, it will be necessary for the property owner to install or have installed an earth pit or vault privy in accordance with the regulations and standards set forth in the Superior Environmental Health Code and Technical manual, respectively.

On-site Sewage Design Criteria for Dog Kennels

The following sizing criteria shall be used for permit requests for dog kennels:

- 5 gallons/ kennel/ day
- The 5 gallon is based on each wash down anticipated

The sizing for soil type will be the Michigan Criteria for Subsurface Sewage Disposal

***Note:** All systems are permitted under the local Health Department permit. All flows over 50 gallons per day shall be required to contact MDRNE (Randy Conroy) for appropriate MDNRE permits.

***Note:** The 5 gallons per kennel is only for the proposed kennel flows. All other anticipated flows must be calculated in the final design.

Construction of Water Wells Under Emergency Conditions

Reference: Section 6.11

Section 6.11 of the Superior Environmental Health Code, titled "Emergency Conditions" contains the following language:

"When a lack of water results in undue hardship and the health department is closed, a well driller, property owner and/or tenant may initiate repair work or construction of a new well or water supply without prior notification or permit. The well driller, property owner and/or tenant shall contact the department on the next working day to obtain the required permit. The well driller, property owner, and/or tenant shall however, be responsible for complying with all other provisions of the Code."

The Code authorizes the maintenance of a technical manual by each health department which contains guidelines, specifications, and standard practices for implementing the Code. The following specifications have been implemented for Section 6.11 of the Code in Dickinson and Iron Counties:

Permission may be granted by the Health Officer of the Dickinson-Iron District Health Department or his or her representative to a water well driller registered in the State of Michigan to install a well without first having obtained a construction permit when all of the following specifications have been complied with:

1. The request is for a replacement well at an occupied residence.
2. The property owner and/or tenant have provided information to the Department that lack of water is resulting in undue hardship to them. If the request is made by a well driller, it will be necessary for the property owner or tenant to contact one of the staff of the Environmental Health (EH) Division of the Department.
3. After interviewing the owner and/or tenant, evaluating all temporary potable water alternatives available, and reviewing all pertinent information available, E.H. staff will use their professional judgment to determine whether an undue hardship condition does in fact exist.
4. The sanitarian is satisfied that the drilling of the new well in its proposed location will not have a negative impact on the environment.
5. During the Department's next regularly scheduled workday, the property owner, tenant, or well driller shall come in to the office, complete a well construction application, obtain a construction permit and pay the appropriate fee(s).

NOTE: E.H. staff are available for true emergencies 24 hours per day, 7 days per week. While home telephone numbers are available for many staff from local directories, they can always be reached for emergencies through the 911, Sheriff Dispatch System in either county.