Wash Fountain, circular and semi-circular	2	1¼
Receptors of Indirect Wastes, gravity flow discharge		
1½ inch receptor outlet diameter	2	1½
2 inch receptor outlet diameter	3	2
3 inch receptor outlet diameter	4	3
4 inch receptor outlet diameter	6	4
larger than 4 inch receptor outlet diameter	8	f
Soda Dispenser	½	1¼
Sterilizers,		
Bedpan	4	2
Garbage can washer	3	3
Instrument or water	1	1½
Urinal	2	g
Water Closet, nonpublic	4	g
Water Closet, public	6	g

a Based on discharge rate of the fixture.

b Includes foot, sitz and infant baths and regular bathtubs with or without showers or whirpool circulation piping.

c Based on discharge rates and number of outlets; a 4-inch diameter trap and drain pipe minimum recommended.

d Trap size corresponds to the size of the floor drain.

e Minimum trap size corresponds to size of the fixture's tail piece as provided by the manufacturer.

f Trap size corresponds to the size of the receptor drain outlet.

g Trap size specified in referenced standards of s. ILHR 84.20.

(4) SIZE OF DRAIN PIPING. (a) *Maximum loading.* 1. The total drainage load in any portion of drain piping shall not exceed the limits specified in Tables 82.30-2 and 82.30-3.

2. The drainage fixture unit values assigned to a receptor which is to receive only the indirect waste discharge from a relief valve on a domestic water heater may be disregarded when determining the minimum size of the building drain and building sewer. Any drain piping between the receptor and the building drain shall be sized by including the assigned fixture unit values for the type of receptor.

Note: See s. ILHR 82.31 (17) for sizing requirements of combination drain and vent systems.

(b) *Minimum size of underground drain piping.* Any pipe of the drain system installed underground, other than the building sewer, shall not be less than 2 inches in diameter. Any portion of underground drain piping which is 2 inches in diameter shall not exceed a length of 20 feet.

(c) *Minimum size of building sewers.* 1. Gravity flow sewers. The minimum size of a gravity flow sanitary building sewer shall be 4 inches in diameter. A municipality or sanitary district by ordinance may require that portion of the building sewer between the lot line and the public sewer to be larger than 4 inches in diameter.

2. Pressurized sewers. a. Sewers pressurized through the use of sewage ejectors, sewage pumps or sewage grinder pumps shall be sized to maintain a minimum flow velocity of 2 feet per second and shall be in accordance with the ejector or pump manufacturer's recommendations.

b. Pressurized building sewers shall be sized not less than 2 inches in diameter for sewage ejectors and sewage pumps, and 1¼ inches in diameter for all sewage grinder pumps.

(d) *Minimum size of private interceptor main sewers.* 1. Except as provided in subd. 3., the minimum size of a gravity flow private interceptor main sewer shall be 4 inches in diameter.

2. Except as provided in subd. 3., the minimum size of pressurized private interceptor main sewer shall be such so as to maintain a minimum flow velocity of 2 feet per second.

3. A municipality or a sanitary district may by ordinance, require the minimum size of a private interceptor main sewer to be larger than 4 inches in diameter.

4. Private interceptor main sewers 6 inches or less in diameter may not exceed the drainage fixture limits in Table 82.30-3.

5. Private interceptor main sewers 8 inches or larger in diameter shall conform with the design flow criteria specified in ch. NR 110.

(e) *Future fixtures.* Where provisions are made for the future installation of fixtures, the drainage fixture unit values of such fixtures shall be considered in determining the required sizes of drain and vent pipes. Construction to provide for future installations shall be terminated with a plugged fitting or fittings.

Table 82.30-2
HORIZONTAL AND VERTICAL DRAIN PIPING

Pipe Diameter (in inches)	Maximum Number of Drainage Fixture Units Which May Drain Through Any Portion of Horizontal and Vertical Drain Piping			
	Horizontal Drain Piping[a]	Vertical Drain Piping of 3 Branch Intervals or Less[b]	Vertical Piping in Drain Stacks of more than 3 Branch Intervals[b]	
			Total Discharge from Side Connections into One Branch Interval	Total Discharge through Any Portion
1¼	1	2	1	2
1½	3	4	2	8
2	6	10	6	24
3	20[c]	48[d]	20[c]	72[d]
4	160	240	90	500
5	360	540	200	1,100
6	620	960	350	1,900
8	1,400	2,200	600	3,600
10	2,500	3,800	1,000	5,600
12	3,900	6,000	1,500	8,400

Note: a: Does not include building drains and building sewers.

Note: b: Drain stacks may be reduced in size as the drainage load decreases to a minimum diameter of one half of the diameter required at the base of the stack, but not smaller than that required for a stack vent under s. ILHR 82.31 (14) (a).

Note: c: Not more than 2 water closets or similar flush action type fixtures of 4 or more drainage fixture units.

Note: d: Not more than 2 water closets or similar flush action type fixtures of 4 or more drainage fixture units within each branch interval nor more than 6 flush action type fixtures on the stack.

(12) PRIVATE INTERCEPTOR MAIN SEWERS. (a) The connection of a private interceptor main sewer to a public sewer shall be in accordance with the conditions of approval for the public sewer granted by the department of natural resources under s. 144.04, Stats.

(b) Private interceptor main sewers which discharge to a municipal treatment facility shall be designed in accordance with the appropriate water quality management plan.

(c) All private interceptor main sewers shall be tested in accordance with s. ILHR 82.21.

(d) Private interceptor main sewers 6 inches or less in diameter shall be installed in accordance with the criteria for building sewers specified in sub. (11) (b) and (c) and (d) and (e).

(e) Private interceptor main sewers 8 inches or larger in diameter shall be:

1. Provided with frost protection in accordance with sub. (11) (b); and

2. Installed in accordance with the municipal sewer criteria specified in s. NR 110.13.

(f) No private interceptor main sewer may pass through or under a building to serve another building, unless:

1. The private interceptor main sewer serves farm buildings or farm houses or both which are all located on one property; or

2. A petition for variance is granted under s. ILHR 82.20 (11). The approval or nonapproval of a petition for variance request relative to this paragraph shall be determined on an individual basis and shall be evaluated on site specific conditions including, at least, whether:

a. The private interceptor main sewer serves only buildings which are all located on one property;

b. The functions or operations of the buildings to be served by the interceptor main sewer are related; or

c. A document, which indicates the piping and distribution arrangement for the property and buildings, will be recorded with the register of deeds.

(13) LOCATION OF DRAIN PIPING. (a) Drain piping located below the ceilings of areas where food, ice or potable liquids are prepared, handled, stored or displayed shall be installed with the least number of joints and shall be installed in accordance with subds. 1. to 5.

1. All pipe openings through floors shall be provided with sleeves bonded to the floor construction and protruding not less than one inch above the top of the finish floor with the space between sleeve and the piping sealed.

2. Plumbing fixtures, except bathtubs and showers, shall be of the wall mounted type. Bathtubs shall have waste and overflow connections made above the floor and piped to a trap below the floor.

3. Floor and shower drains installed shall be equipped with integral seepage pans.

4. Cleanouts for piping shall be extended through the floor construction above.

5. Piping subject to operation at temperatures that will form condensation on the exterior of the pipe shall be thermally insulated.

(b) Where drain piping is located in ceilings of areas where food, ice or potable liquids are prepared, handled stored or displayed, the ceilings shall be of the removable type, or shall be provided with access panels in order to provide an access for inspection of the piping.

(c) Exposed drain piping shall not be located over a pool, surge tank or an open filter for a pool.

History: Cr. Register, February, 1985, No. 350, eff. 3-1-85; am. Table 82.30-1, (8) (a), (9) (c) (intro.) and 3., and (10) (b) 3. b., r. and recr. (4) (d) 2., Table 82.30-4, (10) (a) 2. b., (11) (intro.) and (f) 2., cr. (8) (a) 1. to 3. and (9) (d), r. (9) (c) 4., renum. (9) (c) 5. to be 4. and am., Register, May, 1988, No. 389, eff. 6-1-88; r. and recr. (4) (d), am. Table 82.30-3 and 82.30-7, r. (11) (intro.), renum. (11) (a) to (f) to be (b) to (g), cr. (11) (a) and (12) (f), Register, August, 1991, No. 428, eff. 9-1-91; am. Table 82.30-1, Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 82.31 Vents and venting systems. (1) SCOPE. The provisions of this section set forth the requirements for the design and the installation of vents and venting systems.

(2) MATERIALS. All vents and venting systems shall be constructed of approved materials in accordance with ch. ILHR 84.

(3) GENERAL. (a) *Vents.* Every trap and trapped plumbing fixture shall be provided with an individual vent, except as otherwise permitted in this chapter. Vents and venting systems shall be designed and installed so that the water seal of a trap shall be subject to a maximum pneumatic pressure differential equal to one inch of water column.

(b) MAIN STACK. Each gravity-flow sanitary building sewer shall be served by at least one stack which extends from a building drain to a vent terminal or vent header. The stack shall be not less than 3 inches in diameter from the building drain to the vent terminal or vent header.

(4) VENT STACKS AND STACK VENTS. (a) *Where required.* Where individual vents, relief vents, or other branch vents are required, a vent stack and a stack vent shall be installed to serve all drain stacks of 2 or more branch intervals.

(b) *Installation.* 1. The connection of the vent stack to a drain stack shall be at or below the lowest branch drain connection to the drain stack. The connection to the drain stack shall be by means of a wye pattern fitting installed in a vertical portion of the stack.

2. A vent stack and a stack vent shall:

a. Extend to a vent terminal in accordance with sub. (16);

b. Connect to a vent stack which extends to a vent terminal; or

c. Connect to a stack vent at least 6 inches above the flood level rim of the highest fixture discharging into a drain stack.

(8) INSTALLATION. (a) *Frost protection.* Adequate measures shall be taken to protect all portions of the water supply system from freezing. All private water mains and water services shall be installed below the predicted depths of frost specified in s. ILHR 82.30 (11) (a) 2. d., Figure 82.30-1 and Table 82.30-6, unless other protective measures from freezing are taken.

(b) *Location.* 1. Water supply piping may not be located in, under or above sanitary sewer manholes, sewage treatment tanks, holding tanks, dosing tanks, distribution boxes, soil absorption areas or seepage pits for private sewage systems.

2. Water supply piping shall be located at least 10 feet horizontally away from a sewage treatment tank, holding tank, dosing tank, distribution box, or soil absorption area for a private sewage system.

3. Water supply piping located downslope from a mound type private sewage system shall be at 25 feet horizontally away from the toe of the basal area.

Note: See also s. ILHR 84.30 (4) relative to water supply piping to be installed in contaminated soils.

4. If a private water main or a water service crosses a sanitary sewer, the water piping within 10 feet of the point of crossing shall be installed:

a. At least 12 inches above the top of the sewer from the bottom of the water piping;

b. At least 18 inches below the bottom of the sewer from the top of the water piping; or

c. Within a waterproof sleeve made of materials as specified for sanitary building sewers in s. ILHR 84.30 (2).

5. Private water mains and water services 2-1/2 inches or larger in diameter shall be installed at least 8 feet horizontally from any sanitary sewer. The distance shall be measured from center to center of the piping.

6. Except as provided in subd. 5., private water mains and water services 2 inches or less in diameter shall be installed at least 30 inches horizontally from any sanitary sewer. The distance shall be measured from center to center of the piping.

7. Private water mains and water services 2 inches or less in diameter may be installed less than 30 inches horizontally from a sanitary sewer, if the bottom of the water piping is installed at least 12 inches above the sewer, except that portion of a water service within 5 feet of developed length from the point where the water service first enters the building may be less than 12 inches above the sewer.

8. No private water main or water service may be installed within 6 inches of a storm sewer.

(c) *Limitations.* No private water main or water service may pass through or under a building to serve another building, unless:

1. The private water main or water service serves farm buildings or farm houses or both which are all located on one property; or

2. A petition for variance is granted under s. ILHR 82.20 (11). The approval or nonapproval of a petition for variance request relative to this paragraph shall determined be on an individual basis and shall be evaluated on site specific conditions including, at least, whether:

a. The private water main or water service serves only buildings which are all located on one property;

b. The functions or operations of the buildings to be served by the water main or water service are related; or

c. A document, which indicates the piping and distribution arrangement for the property and buildings, will be recorded with the register of deeds.

(d) *Water distribution piping.* 1. Water distribution piping shall be supported in accordance with s. ILHR 82.60.

2. Provisions shall be made to evacuate all water out of the water distribution system.

3. Except where parallel water meters are installed, water distribution piping shall be provided to bypass a water meter 1-1/2 inches or larger.

4. Water distribution piping shall be provided to bypass a water softener and an iron removal device. The bypass piping may be an internal part of the water softener or the iron removal device.

(e) *Valves.* 1. All control valves installed in a water service, except a valve serving only as a corporation cock, shall be accessible.

2. Stop and waste-type control valves may not be installed underground.

3. All control valves and fixture stop valves installed in a water distribution system shall be accessible. Control valves for the individual plumbing fixtures and appliances within dwelling units shall be accessible from within the dwelling unit.

(f) *Water hammer arrestors.* All plumbing fixtures, appliances and appurtenances with 3/8 inch or larger inlet openings and with solenoid actuated quick closing valves shall be provided with water hammer arrestors. Water hammer arrestors shall be installed in the fixture supplies serving the fixtures, appliances or appurtenances. Water hammer arrestors shall be accessible.

(g) *Temperature contol.* The water temperature to all showers in public buildings shall be controlled by thermostatic mixing valves or by individually controlled pressure balanced mixing valves.

(h) *Fittings and connections.* The drilling and tapping of water supply piping shall be prohibited except for:

1. Corporation cocks for a water service or a private water main; and

2. Self-tapping valves which serve individual plumbing appliances.

(i) *Flushing and disinfection of potable water supply systems.* 1. a. Before a newly constructed water supply system is to be put into use, the piping of the system shall be filled with water and allowed to stand for at least 24 hours. After 24 hours each water outlet shall be flushed beginning

with the outlet closest to the building control valve and then each successive outlet in the system. The flushing at each water outlet shall continue for at least one minute and until the water appears clear at the outlet.

b. Each portion of a water supply system which is altered or repaired shall be flushed for at least one minute and until the water appears clear.

2. New private water mains and extensions to private water mains shall be disinfected prior to use in accordance with AWWA C601 or the following method:

a. The pipe system shall be flushed with clean water until no dirty water appears at the points of outlet.

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Table 82.40-7

ALLOWABLE MAXIMUM LOAD FOR GALVANIZED STEEL PIPE, SCHEDULE 40
ASTM A53 and ASTM 120

Pressure Loss Due to Friction (in lbs. per 100 ft. of length	Pipe Diameter (in Inches)																											
	1/2"			3/4"			1"			1 1/4"			1 1/2"			2"			2 1/2"			3"			4"		
		WSFU			WSFU			WSFU			WSFU			WSFU			WSFU			WSFU			WSFU			WSFU	
	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT
0.5	-	-	-	1.5	-	1.5	3.5	-	3.5	7.0	-	9.0	11.0	4.0	15.0	21.0	7.0	32.0	34.0	19.0	67.0	60.0	75.0	175	122	375	485
1	0.5	-	0.5	2.5	-	2.5	5.0	-	6.0	10.5	4.0	14.0	16.0	5.0	23.0	30.0	14.0	55.0	49.0	46.0	124	87.0	180	310	180	770	810
2	2.0	-	2.0	4.0	-	4.0	7.5	-	9.5	15.5	5.0	22.5	23.0	7.5	37.0	45.0	37.0	110	72.0	116	235	127	405	510	260	1440	
3	2.5	-	2.5	5.0	-	6.0	9.5	-	12.5	19.0	6.0	28.5	29.0	12.0	52.0	55.0	62.0	150	90.0	192	325	160	615	695	285	1660	
4	2.5	-	2.5	5.5	-	6.5	11.0	4.0	15.0	22.0	7.0	35.0	34.0	19.0	67.0	65.0	90.0	200	105	270	400	180	770	810	NP		
5	3.0	-	3.0	6.5	-	8.0	12.5	4.5	17.5	25.0	8.5	42.0	39.0	26.0	83.0	73.0	120	240	120	365	475	NP					
6	3.5	-	3.5	7.5	-	9.5	14.0	4.5	20.0	28.0	11.0	50.0	43.0	32.0	103	81.0	152	280	NP								
7	3.5	-	3.5	8.0	-	10.0	15.0	5.0	22.0	31.0	15.0	57.0	46.0	40.0	113	NP											
8	4.0	-	4.0	8.5	-	11.0	16.0	5.0	23.0	33.0	17.0	63.0	50.0	48.0	128												
9	4.0	-	4.0	9.0	-	12.0	17.0	5.5	25.0	35.0	20.0	70.0	NP														
10	4.5	-	5.0	9.5	-	12.5	18.0	6.0	27.0	37.0	23.0	77.0															
11	5.0	-	6.0	10.0	4.0	13.0	19.0	6.0	28.5	NP																	
12	5.0	-	6.0	10.5	4.0	14.0	20.0	6.5	30.0																		
13	5.0	-	6.0	11.0	4.0	15.0	21.0	7.0	32.0																		
14	5.5	-	6.5	11.5	4.0	16.0	NP																				
15	6.0	-	7.0	12.0	4.0	17.0																					
16	6.0	-	7.0	12.5	4.5	17.5																					
17	6.0	-	7.0	13.0	4.5	18.0																					
18	6.0	-	7.0	13.5	4.5	19.0																					
19	6.5	-	8.0	NP																							
20	6.5	-	8.0																								
21	7.0	-	9.0																								
22	7.0	-	9.0																								
23	7.0	-	9.0																								
24	7.5	-	9.5																								
25	7.5	-	9.5																								
	NP																										

Note: WSFU means water supply fixture units.
GPM means - gallons per minute.
FM means - predominately flushometer type water closets or syphon jet urinals.
FT means - predominately flush tank type water closets or washdown urinals.
NP means - not permitted, velocities exceed 8 feet per second

For using this table, round the calculated pressure loss due to friction to the next higher number shown

ILHR 82.40 (7) (f) and (g) specifies minimum sizes for water distribution piping

Table 82.40-8

MAXIMUM ALLOWABLE LOAD FOR POLYBUTYLENE TUBING – ASTM D3309 AND CHLORINATED POLYVINYL CHLORIDE TUBING – ASTM D2846

Pressure Loss Due to Friction (in lbs. per 100 ft. of length	Pipe Diameter (in Inches)																	
	1/2"			3/4"			1"			1 1/4"			1 1/2"			2"		
		WSFU			WSFU			WSFU			WSFU			WSFU			WSFU	
	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT	GPM	FM	FT
0.5	–	–	–	0.5	–	0.5	2.5	–	2.5	4.0	–	4.0	6.5	–	8.0	13.0	4.5	18.0
1	–	–	–	1.5	–	1.5	3.5	–	3.5	6.0	–	7.0	9.5	–	12.5	19.0	6.0	28.5
2	–	–	–	2.5	–	2.5	5.5	–	6.5	9.0	–	12.0	14.0	4.5	20.0	28.0	11.0	50.0
3	0.5	–	0.5	3.5	–	3.5	6.5	–	8.0	11.5	4.0	15.0	17.0	5.5	25.0	35.0	20.0	70.0
4	1.0	–	1.0	4.0	–	4.0	7.5	–	9.5	13.0	4.5	18.0	20.0	6.5	30.0	42.0	30.0	100
5	1.5	–	1.5	4.5	–	5.0	8.5	–	11.0	15.0	5.0	22.0	23.0	7.5	37.0	47.0	42.0	117
6	2.0	–	2.0	5.0	–	6.0	9.5	–	12.5	16.5	5.5	24.0	25.0	8.5	43.0	52.0	53.0	136
7	2.0	–	2.0	5.5	–	6.5	10.5	–	14.0	18.0	6.0	27.0	27.0	10.0	48.0	58.0	70.0	165
8	2.0	–	2.0	6.0	–	7.0	11.5	4.0	16.0	19.0	6.0	28.5	30.0	14.0	55.0	NP		
9	2.5	–	2.5	6.0	–	7.0	12.0	4.0	17.0	20.5	6.5	31.0	32.0	16.0	60.0			
10	2.5	–	2.5	6.5	–	8.0	12.5	4.5	17.5	22.0	5.0	35.0	34.0	19.0	67.0			
11	2.5	–	2.5	7.0	–	9.0	13.5	4.5	19.0	23.0	6.0	38.0	NP					
12	3.0	–	3.0	7.0	–	9.0	14.0	4.5	20.0	24.0	7.0	40.0						
13	3.0	–	3.0	7.5	–	9.5	14.5	4.5	21.0	NP								
14	3.0	–	3.0	8.0	–	10.0	15.5	5.0	22.0									
15	3.0	–	3.0	8.0	–	10.0	16.0	5.0	23.0									
16	3.5	–	3.5	8.5	–	11.0	16.5	5.5	24.0									
17	3.5	–	3.5	8.5	–	11.0	NP											
18	3.5	–	3.5	9.0	–	12.0												
19	3.5	–	3.5	9.0	–	12.0												
20	4.0	–	4.0	9.5	–	12.5												
21	4.0	–	4.0	10.0	4.0	13.0												
22	4.0	–	4.0	NP														
23	4.0	–	4.0															
24	4.0	–	4.0															
25	4.0	–	4.0															
26	4.0	–	4.0															
27	4.5	–	5.0															
28	4.5	–	5.0															
29	4.5	–	5.0															
30	5.0	–	6.0															
31	5.0	–	6.0															
	NP																	

Note: WSFU means water supply fixture units.
GPM means gallons per minute.
FM means predominately flushometer type water closets or syphon jet urinals.
FT means predominately flush tank type water closets or washdown urinals.
NP means – not permitted, velocities exceed 8 feet per second

For using this table, round the calculated pressure loss due to friction to the next higher number shown

ILHR 82.40 (7) (f) and (g) specifies minimum sizes for water distribution piping.

History: 1-2-56; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72; r. and recr. Register, February, 1979, No. 278, eff. 3-1-79; renum. from H 62.13, Register, July, 1983, No. 331, eff. 8-1-83; renum. from ILHR 82.13 and r. and recr. (2) (b) and (4) (d) 1., am. (4) (c) 3. and (6) (a) (intro.), cr. (6) (b), Register, February, 1985, No. 350, eff. 3-1-85; r. and recr. Register, May, 1988, No. 389, eff. 6-1-88; am. (5) (d) 5 a., r. and recr. (7) (h) 1. and (8) (c), renum. (8) (c) 2. to 6. to be (8) (b) 4. to 8. and am. (8) (b) 4. c., Register, August, 1991, No. 428, eff. 9-1-91; am. (8) (b) 1. and 2., Register, April, 1992, No. 436, eff. 5-1-92.

Chapter ILHR 83

PRIVATE SEWAGE SYSTEMS

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Note: Chapter H 63 was created as an emergency rule effective 6-21-80; chapter H 63 as it existed on June 30, 1983 was renumbered to chapter ILHR 83.

ILHR 83.01 Purpose. (1) GENERAL. The underlying principles of this chapter as authorized in s. 145.02 (2), Stats., are basic goals in envirnomental health and safety accomplished by proper siting, design, installation, inspection, and maintenance of private sewage systems. The prerequisites necessary for the essential protection of the health of the public and the environment are the same everywhere. As unforeseen situations arise which are not specifically covered in this chapter the basic principles enumerated in this section shall serve to define intent.

(2) BASIC PRINCIPLES. (a) *Need.* Every building intended for human habitation or occupancy shall be provided with a properly functioning system for treatment and disposal of domestic waste.

(b) *Public sewers.* Every building intended for human habitation or occupancy on land abutting a street, right-of-way, or easement in which there is a public sewer, or on land deemed accessible to public sewer, shall have an individual connection to the public sewer and the private sewage system serving such building shall be properly abandoned.

(c) *Discharges prohibited.* Every private sewage system shall be designed, located and constructed to prevent any discharge of sewage or partially treated sewage into drain tiles, onto the ground surface, into the structure served, into the surface waters of the state or into the groundwater of the state including zones of seasonal soil saturation.

(d) *Maintenance.* Every private sewage system shall be adequately maintained.

(e) *Nuisance.* Every private sewage system shall be designed, located and constructed so as not to create a nuisance.

(f) *Sizing.* Every private sewage system shall be designed and constructed to adequately dispose of all the wastewater generated in the structure or facility it is serving.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.01, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.02 Definitions. For the purpose of this chapter, the following definitions shall apply. The dictionary meaning shall apply for all other words.

(1) "Aggregate" means washed graded hard rock that has been washed with water under pressure over a screen during or after grading to remove fine material and with a hardness value of 3 or greater on Moh's Scale of Hardness. Aggregate that can scratch a copper penny without leaving any residual rock material on the coin would have a harness of 3 or more on Moh's Scale of Hardness.

(2) "Alternative private sewage system" means a system as defined in s. 145.022 (1) (a), Stats. The alternative private sewage systems included in this chapter, but not limited by enumeration, are mound systems and shallow sub-surface pressure distribution systems used on sites not meeting the soil criteria for conventional private sewage systems.

(3) "Approved" means approved or accepted by the department.

(4) "Bedrock" means the rocks that underly soil material or are at the earth's surface. Bedrock is encountered when the weathered in-place consolidated material, larger than 2 mm in size, is greater than 50% by volume.

(5) "Building" means a structure having walls and a roof erected or set upon an individual foundation or slab-constructed base designed or used for the housing, shelter, enclosure or support of persons, animals or property of any kind. A mobile home is included in this definition. Each structure abutting another structure which does not have an ingress-egress doorway through the basement foundation walls, or structures with separate exterior or exterior abutting walls, or public use structures separated by an unpierced firewall, shall be considered as a separate or individual building.

(6) "Cesspool" means a covered excavation in the ground which receives sewage or other organic wastes from a drainage system, and so designed as to retain the organic matter and solids, permitting the liquids to seep into the soil cavities.

(7) "Cleanout" means a plug or cover made of material approved by the department joined by means of a screw thread to an opening in a pipe, which can be removed for the purpose of cleaning or examining the interior of the pipe.

(8) "Clear water wastes" means cooling water and condensate drainage from refrigeration compressors and air-conditioning equipment, water used for equipment chilling purposes, liquid having no impurities or where impurities have been reduced below a minimum concentration considered harmful, and cooled condensate from steam heating systems or other equipment.

(9) "Color" means the moist color of the soil based on Munsell soil color charts.

(10) "Conventional private sewage system" means a system as defined in s. 145.022 (1) (b), Stats. Conventional private sewage systems included in this chapter are systems using a conventional soil absorption system, a system installed in a filled area approved in writing by the department, and a dosing soil absorption system.

(11) "Conventional soil absorption system" means a system that employs gravity flow from the septic or other treatment tank and applies effluent to the soil through the use of a seepage trench, bed or pit. The distribution piping is 4 inch diameter pipe.

(12) "County" means the local government unit responsible for the regulation of private sewage systems. County government is the local governmental unit responsible except that towns, villages and cities are the responsible unit of government in any county that has a population in excess of 500,000.

(13) "Department" means the department of industry, labor and human relations.

(14) "Detailed soil map" means a map prepared by or for a state or federal agency participating in the national cooperative soil survey showing soil series, type and phases at a scale of not more than 2,000 feet to the inch and includes related explanatory information.

(15) "Dosing soil absorption system" means a system that employs a pump or automatic siphon to elevate or distribute effluent to the soil through the use of a seepage trench or bed. Distribution piping in seepage trenches or beds shall be 4 inch perforated pipe approved by the department.

(16) "Dwelling unit" means one or more rooms with provisions for living, sanitary and sleeping facilities which are used or intended to be used by one person or by 2 or more persons maintaining a common household.

(17) "Effluent" means liquid discharged from a septic or other treatment tank.

(18) "Failing private sewage system" has the meaning as given in s. 145.245 (4), Stats.

Note: Section 145.245 (4), Stats., reads: *"A failing private sewage system is one which causes or results in any of the following conditions: (a) the discharge of sewage into surface water or groundwater; (b) the introduction of sewage into zones of saturation which adversely affects the operation of a private sewage systems; (c) the discharge of sewage to a drain tile or into zones of bedrock; (d) the discharge of sewage to the surface of the ground; (e) the failure to accept sewage discharges and back up of sewage into the structure served by the private sewage system."*

(19) "Farm" means a parcel of 35 or more acres of contiguous land which is devoted primarily to agricultural use, as defined in s. 91.01 (1) and (5), Stats., which during the year preceeding application for a mound produced gross farm profits as defined in s. 91.09 (11) (a) 3m, Stats., of not less than $6,000 or which during the 3 years preceeding application produced gross farm profits, as defined in s. 91.09 (11) (a) 3m, Stats., of not less than $18,000.

(20) "Flood fringe" means that portion of a flood plain which is outside of the floodway and which is covered by flood waters during any regional floods. It is generally associated with standing water rather than rapidly flowing water.

(21) "Flood plain" means the land which has been or may be covered by flood water during regional floods. The flood plain includes the floodway and the flood fringe.

(22) "Floodway" means the channel of a river or stream and those portions of the flood plain adjoining the channel which carry and discharge flood water or flood flows during the regional floods.

(23) "Grease interceptor" means a watertight tank which is installed underground for the collection and retention of grease from cooking or food processing and which is accessible for periodic removal of the contents.

(24) "High groundwater"' means zones of soil saturation which include: Perched water tables, shallow regional groundwater tables or aquifers, or zones that are seasonally, periodically or permanently saturated.

(25) "High water level" means the highest known flood water elevation of any lake, stream, pond or flowage or the regional flood elevation established by a state or federal agency.

(26) "Holding tank" means an approved watertight receptacle for the collection and holding of sewage.

(27) "Horizontal reference point" means a stationary, easily indentifiable point to which horizontal dimensions can be related.

(28) "Industrial waste" means liquid wastes which result from processes employed in industrial establishments.

(29) "Legal description" means an accurate Metes and Bounds description, a lot and block number in a recorded subdivision, a recorded assessor's plat or a public land survey description to the nearest 40 acres.

(29m) "Local station" means a National Weather Service (NWS) precipitation station or other precipitation station accepted by the department as collecting precipitation data in accordance with NWS methods.

(30) "Manhole" means an opening of sufficient size to permit a person to gain access to a sewer or any portion of a plumbing system.

(31) "Mobile home" means a transportable structure mounted on a chassis and designed to be use with or without a permanent foundation as a dwelling unit. The phrase "without a permanent foundation" indicates that the support system is constructed with the intent that the mobile home thereon may be moved from time to time at the convenience of the owner. See ss. 218.10 (2) and 340.01 (29), Stats.

(32) "Mobile home park" means any plot or plots of ground owned by a person, state or local government upon which 2 or more units, occupied for dwelling or sleeping purposes regardless of mobile home ownership, are located, and whether or not a charge is made for such accommodation. See s. 66.058 (1) (i), Stats.

(33) "Nuisance" means any source of filth, odor or probable cause of sickness pursuant to the provisions of s. 146.14, Stats.

(34) "Percolation test" means the method specified in s. ILHR 83.09 (5) of testing absorption qualities of the soil.

(35) "Permeability" means the ease with which liquids move through the soil. One of the soil qualities listed in soil survey reports.

(36) "Pipe diameters" means the inside diameter.

(37) "Plumbing system" means a system as defined in s. 145.01 (10), Stats.

(38) "Potable water" means water which is satisfactory for human consumption, hygiene and culinary use and meets the requirements of the state administrative authority having jurisdiction.

(39) "Pressure distribution system" means a soil absorption system that employs a pump or automatic siphon and small diameter distribution piping with small diameter perforations to introduce effluent into the soil. Plan review and departmental approval is required for each system of this type.

(40) Private sewage system is defined in s. 145.01 (12), Stats.

(41) "Private residence" means a one- or 2-family building or dwelling. See dwelling unit.

(42) "Privy" means a structure that is not connected to a plumbing system which is used by persons for the deposition of human body wastes.

(43) "Public building" means any structure, including exterior parts of such building, such as a porch, exterior platform or steps providing means of ingress or egress, used in whole or in part as a place of resort, assemblage, lodging, trade, traffic, occupancy or use by the public, or by 3 or more tenants in accord with s. 101.01 (2) (g), Stats.

(44) "Reservoir" means a watertight receptacle basin or vault constructed above the ground surface or underground for the storage of potable water.

(45) "Public garage" means a building or part of a building used for the storage of land, air or water vehicles by 3 or more persons not of the same family or habitation.

(46) "Regional flood" means as defined in ch. NR 116, Wis. Adm. Code.

(47) "Regional flood elevation" means as defined in ch. NR 116, Wis. Adm. Code.

(48) "Seepage bed" means an excavated area larger than 5 feet in width which contains a bedding of aggregate and has more than one distribution line.

(49) "Seepage pit" means an underground receptacle so constructed as to permit disposal of effluent or clear wastes by soil absorption through its floor and walls.

(50) "Seepage trench" means an area excavated one to 5 feet in width which contains a bedding of aggregate and a single distribution line.

(51) "Septic tank" means a tank which receives and partially treats sewage through processes of sedimentation, oxygenation, flotation and

bacterial action so as to separate solids from the liquid in the sewage and discharges the liquid to a soil absorption system.

(52) "Sewage" means the liquid and water carried wastes created in and to be conducted away from residences, industrial establishments and public buildings.

(53) "Soil" means the unconsolidated material over bedrock.

(54) "Soil boring" means an observation pit dug by hand or backhoe, a hole dug by augering or a soil core taken intact and undisturbed with a probe.

(54m) "Soil consistence" means the cohesion among soil particles and the adhesion of soil to other substances.

(54q) "Soil horizon" means any layer of soil or soil material occurring approximately parallel to the land surface and differing from adjacent layers in physical, chemical, and biological properties or characteristics, including but not limited to color, texture, structure and consistency. Some types of soil horizons include:

(a) The "A" horizon means a mineral horizon that formed at the surface and is characterized by an accumulation of organic matter intimately mixed with the mineral fraction;

(b) The "B" horizon means a mineral horizon that formed below an "A" or "E" horizon and is dominated by concentrations of silicate clay, iron, aluminum, gypsum or silica; and

(c) The "E" horizon means a mineral horizon in which the main feature is the loss of silicate clay, iron, aluminum or a combination of these leaving a concentration of sand and silt particles of quartz or other resistant minerals.

(55) "Soil mottles" means spots or streaks of contrasting soil colors usually caused by soil saturation for some period of a normal year.

Note: Grayish colored mottles are called low chroma; reddish brown, red or yellow mottles are called high chroma.

(56) "Soil saturation" means the state when all the pores in a soil are filled with water. Water will flow from saturated soil into a bore hole.

(56m) "Soil structure" means the combination or arrangement of individual soil particles into definable aggregates or peds, which are characterized and classified on the basis of size, shape and degree of distinctness.

(56n) "Soil texture" means the relative proportions of the various soil separates in a soil, as specified in the United States department of agriculture system.

(57) "Topsoil" means the undisturbed surface horizon of a soil often characterized by a black or dark grayish brown color due to a higher content of organic matter.

(58) "Vent cap" means an approved appurtenance used for covering the vent terminal of an effluent disposal system to avoid closure by mischief or debris and still permit circulation of air within the system.

(59) "Vertical elevation reference point" means an easily indentifiable stationary point or object of constant elevation for establishing the relative elevation of percolation tests, soil borings and other locations.

(60) "Water service" means a pipe extended from the water main or private pumping system or other supply source with or without lateral extensions to the building, structure or other system to be served.

(61) "Workmanship" means work of such character that will fully secure the results sought in all the sections of this chapter as intended for the safety, welfare and health protection of all individuals.

(62) "Watercourse" means a stream usually flowing in a particular direction, though it need not flow continually, it may sometimes be dry. It must flow in a definite channel, having a bed, sides or banks, and usually discharges itself into some other stream or body of water. It must be something more than a mere surface drainage over the entire face of a tract of land, occasioned by unusual freshets or other extraordinary causes. It does not include the water flowing in the hollows or ravines in land, which is the mere surface water from rains or melting snow, and is discharged through them from a higher to a lower level, but which at other times are destitute of water. Such hollows or ravines are not in legal contemplation watercourses. (*Hoyt vs. City of Hudson* 27 Wis. 656 (1871), Wisconsin Supreme Court)

(63) MISCELLANEOUS. Standards or Specifications Abbreviations.

A.G.A. ..... American Gas Association, Inc.
..... 420 Lexington Ave., New York, New York 10017

A.N.S.I. ..... American National Standards Institute, Inc.
..... 1430 Broadway, New York, New York 10018

A.S.M.E. ..... American Society of Mechanical Engineers
..... 29 W. 39th St., New York, New York 10018

A.S.S.E. ..... American Society of Sanitary Engineering
..... P.O. Box 97, Bay Village, Ohio 44140

A.S.T.M. ..... American Society for Testing and Material
..... 1916 Race St., Philadelphia, Pennsylvania 19103

A.W.W.A. ..... American Water Works Association
..... Data Processing Department
..... 6666 West Quincy Avenue
..... Denver, Colorado 80235

C.S. ..... Commercial Standards, Supt. of Documents
..... Governmental Printing Office
..... Washington, D.C. 20401

F.S. ..... Federal Specifications
..... General Services Administration Regional Office 3
..... Washington, D.C. 20407

M.S.S. ..... Manufacturers Standardization Society
..... of the Valve and Fittings Industry
..... 127 Park Street, N.E., Vienna, Virginia 22180

N.S.F.....	National Sanitation Foundation
.....	Testing Laboratory, Inc., P.O. Box 1468
.....	Ann Arbor, Michigan 48106
U.L.....	Underwriters' Laboratories, Inc.
.....	333 Pfingsten Road, Northbrook, Illinois 60062
W.C.F.....	Water Conditioning Foundation
.....	1201 Waukegan Road, Glenview, Illinois 60025

Note: For definitions of master plumber, journeyman, restricted plumbers, apprentices, registered learners and certified soil tester, refer to ch. 145, Stats.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.02, Register, June, 1983, No. 330, eff. 7-1-83; cr. (29m), (54m), (56m) and (56n), Register, June, 1991, No. 426, eff. 7-1-91; r. and recr. (18), cr. (54q), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.03 Approvals and limitations. (1) ALLOWABLE USE. Septic tank and effluent absorption systems or other treatment tank and effluent disposal systems as may be approved by the department may be constructed when no public sewerage system is available to the property to be served. Unless specifically approved by the department, the private sewage system of each building shall be entirely separate from and independent of that of any other building. A private sewage system may be owned by the property owner or by a special purpose district. The use of a common system or a system on a different parcel than the structure will be subject to the same plan review procedures as for systems serving public buildings.

(2) PUBLIC SEWER CONNECTION. When public sewers approved by the department of natural resources become available to the premises served, the use of the private sewage system shall be discontinued within that period of time required by order, but not to exceed one year. The building sewer shall be disconnected from the private sewage system and be connected to the public sewer. All abandoned treatment tanks and seepage pits shall have the contents pumped and disposed of in accordance with ch. NR 113, Wis. Adm. Code. The top or entire tank shall be removed and the remaining portion of the tank or excavation shall be immediately filled with suitable soil material.

(3) FAILING SYSTEM. When a failing or malfunctioning private sewage system is encountered, the sewage disposal system shall be corrected or its use discontinued within that period of time required by county or departmental order, with a maximum time limit of one year.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.03, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.04 Specific limitations. (1) DOMESTIC WASTE. All water carried wastes derived from ordinary living uses shall enter the septic or treatment tank unless otherwise specifically exempted by the department or this chapter.

(2) CESSPOOLS. Cesspools are prohibited.

(3) INDUSTRIAL WASTES. The department of natural resources shall be contacted in regard to the treatment and disposal of all industrial wastes including those combined with domestic waste.

(4) CLEAR WATER. The discharge of surface, rain and other clear water into a private sewage system is prohibited.

(5) WATER SOFTENER AND IRON FILTER BACKWASH. Water softener or iron filter discharge may be directed to the private sewage system, or to the ground surface if a nuisance is not created.

(6) FLOODPLAIN. (a) *General.* A soil absorption system shall not be installed in a floodway. Soil absorption systems in the flood fringe shall not be installed unless written approval is received from the department. The department shall receive written approval from the local government and the department of natural resources for construction in, and filling of, the floodplain area prior to reviewing and approving plans.

(b) *New developments.* 1. Floodway. New private sewage systems shall not be installed in a floodway.

2. Flood fringe. In the flood fringe the installation of individual private sewage systems will be reviewed on a case-by-case basis. It is preferable that with new systems that are allowed in "fringe" areas they be installed on land contiguous to land outside the flood plain limit. However, developments in isolated areas within the flood fringe may also be approved. Land areas shall be filled and thus removed from the flood plain designation. The amount of area to be filled is site dependent and will be evaluated on a site-by-site basis. Individual sites shall be checked by the county and may be checked by department staff to insure that soil conditions and other factors are in full accord with ch. NR 116, Wis. Adm. Code. The requirements of this chapter must be met before any placement of fill is authorized to overcome specific flooding conditions. The filled area for the building and the filled area for the private sewage system shall be connected. The extent and design of the fill for the sewage disposal system shall be in accord with the current rules of the department for systems in fill. [See s. ILHR 83.10 (6).] The department of natural resources will determine whether an island within a river is located in a flood plain and if it is subject to flood plain regulations.

(c) *Existing developments.* 1. Floodway. The following types of replacement systems may be allowed on a case-by-case basis to abate a health hazard in floodway areas:

a. Holding tanks flood proofed in accordance with s. ILHR 83.18 (9); or

b. The installation of a replacement soil absorption system outside the flood plain limit connected to the development by a force main or to an approved acceptable site outside the floodway but in the flood fringe area. Septic tanks in the floodway shall be flood-proofed. The site must meet the requirements set forth in this chapter.

2. Flood fringe. Malfunctioning soil absorption systems may generally be replaced provided favorable soil conditions and other site factors exist.

a. County approval and acceptance shall be documented on plumbing form PLB 89 prior to state approval.

b. If filling is necessary and upon receipt of county approval, the specific design criteria and fill conditions will be stipulated for each installation in accord with this chapter.

Note: Soil absorption systems are preferable to holding tanks.

3. Processing of form PLB 89. Form PLB 89 serves as the basis for department approval of sewage disposal systems in flood plain areas. A copy of this form signed by the local authority will be submitted to the department of natural resources by the department. The county authority's signature is mandatory. Approval of a new or replacement system by the department of natural resources or the department will not be granted if the form is unsigned. The department of natural resources' approval indicated by signing form PLB 89 relates only to the accuracy of the flood plain data.

(d) *Special flood plain developments.* In certain flood plain areas where the installation of sewage disposal systems may be necessary but because of unique site conditions cannot comply with ch. NR 116, Wis. Adm. Code, or this chapter, the department of natural resources may authorize or approve special flood plain developments provided they are in accord with the purpose and intent of ch. NR 116, Wis. Adm. Code, and county flood plain ordinances. Special developments may include but not be limited to such projects as campgrounds in flood plain areas, or the expansion of certain nonconforming uses.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.04, Register, June, 1983, No. 330, eff. 7-1-83; am. (6) (c) 1. a., Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.05 Local filing requirements. (1) SOIL TEST REPORTS. The county shall establish a filing system for soil test reports. The county shall review soil test reports for proposed private sewage disposal systems and verify the data reported if necessary. If the soil test report is considered to be adequate, the county shall file the report.

(2) COUNTY PLAN EXAMINATION FOR ONE AND 2 FAMILY RESIDENCES. (a) *General.* Complete plans and specifications shall be submitted to the county with the application for sanitary permit. Plans shall be submitted on paper not less than 8½ by 11 inches in size. The county may set the number of plan copies required to adequately review the application for the sanitary permit and for the inspection of the private sewage system installation.

(b) PLANS AND SPECIFICATIONS. All plans shall include the following:

1. Plot plan. Detailed plot plan dimensioned or drawn to scale showing the lot size; the location of all septic tanks; holding tanks or other treatment tanks; building sewers—sanitary and storm; wells; water mains or water service; streams and lakes; dosing or pumping chambers; distribution boxes; effluent systems; dual disposal systems; replacement system areas; and the location of the building served. Adjoining properties shall be checked to insure that the site location distances in s. ILHR 83.10 (1) are complied with. All separating distances and dimensions shall be shown on the detailed plot plan.

2. Reference points. A vertical elevation reference point and a horizontal reference point.

3. Soil data. Soil boring and percolation test data related to the undisturbed and finished grade elevations, vertical elevation reference point and horizontal reference point. Surface elevations shall be given for all soil borings.

4. Occupancy. The maximum number of bedrooms in the residence shall be indicated.

5. Other specifications. Complete specifications for pumps and controls including dose volume, elevation differences (vertical lift), pipe friction loss, pump performance curve, pump model and pump manufacturer.

(3) FEES. The county may require plan examination fees or include these fees in the cost of the sanitary permit in accord with s. 145.19 (2), Stats.

(4) REVISED PLANS. Every installer of a private sewage system who modifies or changes the design of a system must submit to the county authority a revised plan. All changes or modifications must be approved by the county authority prior to installation.

(5) ACCEPTANCE. No private sewage system shall be used until the proper sanitary permit, inspection and a revised plan, if required, has been accepted and filed by the county authority.

(6) PLAN FILING. The county shall establish a filing system which provides a system of retrieval of sanitary permits and plans and may set by ordinance a filing fee. The county may require that additional information be included on the plan to aid in filing, indexing or retrieving permits and plans.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.05, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.055 Issuance of building permits. Pursuant to s. 66.036, Stats., building permits issued by a county, city, village or town for construction of any structure not served by a public sewer and requiring connection to a private sewage system shall be issued in accordance with the procedures of this section.

(1) NEW CONSTRUCTION. A county, city, village or town may not issue a building permit for construction of a new structure which requires the installation of a private sewage system unless a sanitary permit for the installation of the private sewage system has been obtained by the owner.

Note: Section ILHR 83.06 outlines the procedures for the issuance of sanitary permits. Section 145.19, Stats., mandates that no private sewage system may be installed unless the owner of the property holds a valid sanitary permit.

(2) RECONNECTIONS. (a) A county, city, village or town may not issue a building permit for the following conditions unless the owner provides the information specified in par. (b):

1. Construction of a structure to be connected to an existing private sewage system;

2. Disconnection of a structure from an existing private sewage system and connection of another structure to the system; or

3. Reconstruction of a structure that is connected to a private sewage system and that has become uninhabitable due to damage resulting from fire, wind or other manmade or natural disasters.

(b) Documentation shall be provided to verify:

1. That the existing private sewage system is not a failing system and has sufficient size and soil conditions to accommodate the wastewater load as specified in sub. (3); and

2. That the structure meets the set back requirements as specified in sub. (4).

(c) Determinations of approved documentation shall be in the form of a sanitary permit or in writing.

(3) CONSTRUCTION INVOLVING AN INCREASE OF WASTEWATER LOAD. (a) *General.* A county, city, village or town may not issue a building permit for construction of any structure connected to a private sewage system which will increase the wastewater load to an existing private sewage system or interfere with a functioning system as specified in this subsection, unless the owner of the proposed structure:

1. Possesses a sanitary permit to either modify the existing private sewage system or construct a new private sewage system to accommodate the increased wastewater load; or

2. Provides written documentation from the department or county verifying that the existing private sewage system has sufficient size and soil conditions to accommodate the increased wastewater load.

(b) *Determination of increased wastewater load.* For the purpose of this section:

1. Increased wastewater load in public buildings and places of employment results from any change in use of the structure from the original use that results in an increased volume of wastewater above that for which the system was originally designed.

2. Increased wastewater load in dwellings results from an increase in the number of bedrooms or from construction of any addition or remodeling which exceeds 25% of the total gross area of the existing dwelling unit. Increased wastewater load in dwellings does not result from construction of decks, patios, garages, porches, reroofing, painting, wiring, residing, window replacements or replacement of equipment or appliances.

3. Counties may establish additional criteria for determining increased wastewater load by ordinance.

(c) *Documentation.* Documentation to verify whether the size of the existing private sewage system can accommodate the increased wastewater load and to verify whether the system is installed in suitable soils shall include all of the following:

1. Information on the soil conditions of the soil absorption system. The information may consist of a valid existing soil report or new soil evaluation report for the system, prepared by a certified soil tester showing conformance with the minimum 3-foot vertical separation above bedrock and groundwater specified in s. ILHR 83.10 (2);

2. Information provided by a licensed master plumber or master plumber-restricted sewer, a certified soil tester, or plumbing inspector II for:

a. Sizing of the system relative to the existing usage, replacement area, and the proposed construction usage and the type of system; or

b. A copy of an affidavit signed by the owner and recorded with the register of deeds indicating that the existing private sewage system ca-

pacity serving a one- or 2-family dwelling is undersized and indicating whether a replacement area is available.

3. A plan prepared by a licensed master plumber or master plumber-restricted sewer, certified soil tester or plumbing inspector II setting forth the dimensions of the existing soil absorption area, tank location and related setbacks;

4. Information provided by a licensed master plumber or master plumber-restricted sewer, septic hauler or plumbing inspector II relative to the condition, capacities, baffles, and manhole covers for the existing treatment tanks, and the capacity of any additional treatment tanks required to accommodate the increased wastewater load; and

5. Information provided by a certified soil tester, a licensed master plumber, master plumber-restricted sewer, or plumbing inspector II showing that the system is not causing backup of sewage into the structure served, or discharge of sewage to the surface of the ground or to a drain tile, or discharge of sewage to any surface waters of the state.

(d) *On-site inspection.* If it cannot be determined from the information provided that an existing private sewage system can accommodate the increased wastewater load, the department or county may require additional information to be submitted to make the determination or the department or county shall inspect the system for:

1. The failure to accept sewage discharges and the backup of sewage into the structure served by the private sewage system;

2. The discharge of sewage to the surface waters of the ground or to a drain tile;

3. The discharge of sewage to any surface waters of the state; and

4. Conformance with the minimum 3-foot vertical separation above bedrock and groundwater specified in s. ILHR 83.10 (2).

(e) *Determinations by department or county.* 1. Determination of whether an existing private sewage system is of an adequate capacity to accommodate additional wastewater loads involving one- and 2-family dwellings shall be made by the county. A county may make determinations of whether an existing private sewage system is of an adequate capacity to accommodate additional wastewater loads generated by construction other than one- and 2-family dwellings involving less than 3,000 gallons per day of wastewater load.

2. Determination of whether an existing private sewage system is of an adequate capacity to accommodate additional wastewater loads generated by construction involving structures other than one- and 2-family dwellings and 3,000 gallons or more per day of wastewater load shall be made by the department.

(f) *Determination on soil conditions.* 1. If the existing private sewage system is a failing system, the system shall be ordered replaced.

2. If the existing private sewage system is installed in mottled soils, the owner may request a variance to use the existing system and perform groundwater monitoring to verify seasonal saturation conditions under s. ILHR 83.09 (7).

3. If the construction affects the only soil replacement area, written notice shall be provided to the owner indicating future wastewater options the owner may have available.

(g) *Determination on tanks.* 1. If the tanks are leaking, the tanks shall be ordered replaced.

2. If the baffles in the tank are deteriorated or missing, the baffles shall be ordered replaced.

3. If the exposed tank cover has no cover or is not locked or labeled, the cover shall be ordered replaced, locked and labeled.

4. If the tank capacity services a one- and 2-family dwelling and is:

a. Less than 500 gallons, the tank shall be ordered replaced or additional tank capacity shall be ordered added;

b. At least 750 gallons, the existing tank may be used provided no more than one additional bedroom is added;

c. At least 750 gallons and 2 or more bedrooms are being added, additional tank capacity shall be ordered added.

5. If the tank serves any structure other than a one and 2-family dwelling, additional tank capacity shall be ordered.

(h) *Determinations on setbacks.* All determinations on setbacks involving an increase in wastewater loads shall conform to sub. (4) (c) and (d).

(4) CONSTRUCTION NOT INCREASING WASTEWATER LOADS. (a) A county, city, village or town may issue a building permit for construction of:

1. Any structure on a property containing a private sewage system if the construction does not increase the wastewater load as specified in sub. (3); or

2. An accessory structure not connected to a private sewage system.

3. The completed construction shall conform to the setback limitations specified in s. ILHR 83.10 (1), 83.15 (4) (a) or 83.18 (7) (a).

(b) Documentation shall be provided by the owner, licensed master plumber or master plumber-restricted sewer, certified soil tester or plumbing inspector II showing the location and setback distances for the proposed construction of any structure relative to the components of the private sewage system.

(c) Determinations of whether the location and setback distances of a proposed construction will interfere with an existing private sewage system shall be made by the department or the county. On-site inspections may be made to verify the location and setback distances. Determinations shall be made in writing and provided to the agency responsible for issuing the building permit.

(d) No sanitary permit shall be required for construction that conforms to the setback requirements and that does not involve an increase in wastewater load.

(e) No building permit may be issued where setback requirements cannot be met unless:

1. A petition for variance is obtained from the department; or

2. The owner agrees in writing to correct any deficiencies discovered during construction for a system that cannot be located.

(f) Any variance submitted under this section shall be reviewed by the county prior to submitting to the department. The county may submit any information relative to the variance.

(5) FEES. The department or county may assess and collect a fee to defray the cost of administering this section.

History: Emerg. cr. 12-1-88; cr. Register, August, 1989, No. 404, eff. 9-1-89.

ILHR 83.056 Petitions for variances for existing systems. History: Cr. Register, August, 1989, No. 404, eff. 9-1-89; r. Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.06 County administration. (1) PRIVATE SEWAGE SYSTEM ORDINANCE. (a) *Adoption of ordinance.* Every county shall adopt an ordinance governing private sewage systems which conforms with this chapter. The ordinance shall apply to the entire area of the county. (Ref. s. 59.065 (1), Stats.)

(b) *Enforcement.* The county shall administer the private sewage system ordinance in accordance with s. 145.20, Stats., and this chapter.

(2) SANITARY PERMITS. (a) *General.* The county shall establish administrative procedures for the approval, disapproval or issuance of state sanitary permits in accord with s. 145.135, and s. 145.19, Stats., and this chapter.

(b) *Application.* The application for a sanitary permit shall be made on forms furnished by the department. Before a private sewage system is installed a licensed master plumber or master restricted plumber (sewer) shall sign the application for permit and assume responsibility for installation of the system. (Ref. ss. 145.06 and 145.135, Stats.)

(c) *Permit transfer.* When there is a change of ownership, building use or master plumber, a permit transfer form furnished by the department shall be submitted to the county for approval prior to the installation of a private sewage system. Failure to submit transfer forms to the county shall invalidate the sanitary permit in accord with s. 145.135 (1), Stats. The county may charge a fee for the transfer of a sanitary permit.

(d) *Posting.* The sanitary permit shall be issued by the county on forms furnished by the department. The sanitary permit shall be displayed conspicuously so as to be visible from the road fronting the lot during construction.

(3) COUNTY ORGANIZATION AND PERSONNEL. (a) *Assignment of duties.* The county board may assign the duties of administering the private sewage system program to any county office, department, committee, board, commission, position or employe.

(b) *Certified soil tester.* The county shall obtain the services of a certified soil tester, either as a county employe or under contract, to review and verify certified soil tester reports.

(4) COUNTY RESPONSIBILITIES. (a) *Review of soil test reports.* The county shall review certified soil tester reports for proposed private sewage systems and verify the report at the proposed site, if necessary.

(b) *Review of applications for sanitary permits.* The county shall approve or disapprove applications for sanitary permits and assist applicants in preparing an approvable application. (See s. ILHR 83.11.)

(c) *Written notice.* The county shall issue written notice to each applicant whose sanitary permit application is disapproved. Each notice shall state the specific reasons for disapproval and amendments to the application, if any, which render the application approvable. Each notice shall also give notice of the applicant's right to appeal and the procedures for conducting an appeal under ch. 68, Stats.

(d) *Inspections.* The county shall inspect all private sewage systems after construction but before backfilling no later than the end of the next workday, excluding Saturdays, Sundays and holidays, after receiving notice from the plumber in charge. Inspections shall be reported on forms furnished by the department.

(e) *Reports and surveys.* The county shall file reports and conduct surveys and inspections as required by the county or the department.

(f) *Investigate violations.* The county shall investigate violations of the private sewage system ordinance and s. 146.13, Stats., issue orders to abate the violations and submit orders to the district attorney, corporation counsel or attorney general for enforcement.

(g) *Other duties.* The county shall perform other duties regarding private sewage systems as considered appropriate by the county or as required by the rules of the department.

(5) DEPARTMENT RESPONSIBILITIES. (a) *Department approval.* The department may specify categories of private sewage systems for which approval by the department is required prior to issuance of sanitary permits by the county.

(b) *Department audit.* The department shall review the private sewage system program in each county to ascertain compliance with s. 145.20 (2), Stats., and with rules promulgated by the department. This review shall include a random audit of sanitary permits, including verification by on-site inspection.

(c) *Compliance.* If a county board does not adopt a private sewage system ordinance meeting the requirements of s. 59.065, Stats., or if the county does not appoint personnel meeting the requirements of s. 145.20 (1), Stats., or if the county does not comply with the requirements of s. 145.20 (2), Stats., the department may conduct hearings in the county seat upon 30 days notice to the county clerk. As soon as practicable after the public hearing, the department shall issue a written decision regarding compliance with s. 59.065 or 145.20 (1) and (2), Stats. If the department determines that there is a violation of these provisions, the county may not issue a sanitary permit for the installation of a private sewage system until the violation is corrected.

(d) *Training.* The department shall conduct training and informational programs for county officials and employes and persons licensed under this chapter and s. 146.20, Stats., to improve the delivery of service under the county private sewage system program. The department shall obtain the assistance of the Wisconsin county boards association in planning and conducting the training and informational programs.

Note: Subsections (3) to (5) are quoted from ch. 145, Stats.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.06, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.07 Plan review—department. (1) APPROVALS. (a) *One and 2 family residences.* Unless required elsewhere in this chapter, the submission of plans and specifications and departmental approval of initial, modified, additional or replacement construction of private sewage systems serving one and 2 family residences is not required. All applicable plans, permits and approvals required by county government shall be obtained prior to the commencing of construction. The county government shall require plans and specifications prior to issuing permits or approval. [See s. ILHR 83.05 (2).]

(b) *Public buildings—department approval.* Complete plans and specifications shall be submitted in accord with this section. Written approval shall be received before sanitary permits are issued for the initial installation of a private sewage system or for the addition to, modification or replacement of the system, if the system serves or will serve any public buildings. The owner shall submit a copy of the approved plans to the county authority. Included as public buildings but not limited by enumeration are: Theaters and assembly halls; schools and other places of instruction; apartment buildings, hotels and places of detention; factories, office and mercantile buildings; mobile home parks, campgrounds and camping resorts and parks.

(c) *Public buildings—local approval.* Approval by the county shall not eliminate the need for approval by the department for the installation of private sewage systems serving public buildings. Departmental approval shall not eliminate the need for obtaining all required county permits and approvals.

(d) *Plan review processing time.* The department shall review and make a determination on an application for plan review within 15 business days of receiving the required information and fees.

(2) SUBMISSION OF PLANS AND SPECIFICATIONS—PUBLIC BUILDINGS. All plans and specifications shall be submitted in duplicate and shall include the following:

(a) *Plot plan.* Detailed plot plan dimensioned or drawn to scale showing the lot size; the location of all septic tanks, holding tanks or other treatment tanks, building sewers—sanitary and storm, wells, water mains or water service, streams and lakes, dosing or pumping chambers, distribution boxes, effluent disposal systems, dual disposal systems, and disposal replacement areas; and the location of the public building served by such systems. Adjoining properties shall be checked to insure that the site location distances in s. ILHR 83.10 (1) are complied with. All distances and dimensions shall be shown on the detailed plot plan;

(b) *Legal description.* Legal description of the property on which the system is to be installed;

(c) *Reference points.* A vertical elevation reference point and a horizontal reference point;

(d) *Soil data.* Soil boring and percolation test data related to the undisturbed and finished grade elevations and vertical elevation reference point and horizontal reference point;

(e) *Contours—original grade.* Ground slope with 2-foot contours for the original, undisturbed grade elevation of the entire area of the soil absorption system and the area on all sides for a distance of 25 feet;

(f) *Contours—altered sites.* Ground slope with 2-foot contours for the grade elevation of the entire area of the soil absorption system and the area on all sides for a distance of 25 feet after alteration of the landscape;

(g) *Use and occupancy.* Complete data relative to the maximum expected use and occupancy of the building to be served considering all anticipated future growth plans;

(h) *Other specifications.* Complete specifications for pumps and controls including dose volume, elevation differences (vertical lift), friction loss, pump performance curve, pump model and pump manufacturer.

(3) PLAN EXAMINATION FEE. All plans and specifications submitted to the department for review shall be accompanied with fees as established in s. ILHR 83.08.

(4) PLAN REVISIONS. Revisions to approved plans and specifications shall be approved by the department.

(5) PLAN AVAILABILITY. One set of plans bearing the department's stamp of approval shall be maintained at the project site during construction of any private sewage system serving a public building.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.07, Register, June, 1983, No. 330, eff. 7-1-83; cr. (1) (d), Register, February, 1985, No. 350, eff. 3-1-85.

ILHR 83.08 Examination of plans and specifications. (1) PLAN EXAMINATION REQUIRED. Plans and specifications for private sewage systems serving public buildings, or use of experimental or alternate type systems, or a variance to this chapter and holding tanks shall be submitted to the department and written approval received before county sanitary permits are issued or work commences. The department shall immediately acknowledge receipt of all plans and specifications. The department may issue a permit to commence work provided plan review is not completed within 30 days. The issuance of a county permit shall not be construed as plan approval or as approval for any design or installation that is noncompliant. All noncode complying portions of the plumbing and private sewage system installed prior to complete plan review shall be removed.

(2) PLAN SUBMISSION. (a) *Stamping and signing plans.* All plans and specifications shall be sealed or stamped in accord with ch. A-E 1, Wis. Adm. Code by a registered architect, engineer or registered plumbing designer. A master plumber may design and submit for approval plumbing plans and specifications for a private sewage system which they are to install. Each sheet of plans and specifications the master plumber submits shall be signed, dated and include their Wisconsin master plumber license number. When more than one sheet is bound together into one volume, only the title sheet or index sheet need be signed and dated by the master plumber responsible for their preparation, provided the signed sheet clearly identifies all of the other sheets comprising the bound volume.

(b) *Submitting data.* All plans, preliminary or complete, shall be submitted in duplicate. Work shall not commence until written approval for the preliminary or complete plans is received from the department. The

plans submitted shall be prints that are clear, legible and permanent. All pertinent data shall be a part of or shall accompany all plans submitted for review. Plans will be examined in the order of receipt.

(c) *Additions and alterations.* This section shall apply to all additions, alterations and modifications as well as to all new private sewage systems and shall apply to all cases where there is a change of the type of occupancy or use of building which requires changes to or intended use of the plumbing or private sewage system so as to comply with this chapter for that occupancy or use.

(d) *Agent municipalities.* The department may designate counties as agents for the review of plans and specifications for private sewage systems serving public buildings. All requests for variances to the code or experimental or alternative private sewage system designs shall be submitted to the department for review.

(3) PLAN EXAMINATION FEES. Fees shall be charged in accordance with s. Ind 69.23 (2), Wis. Adm. Code.

(4) REVISIONS. After written approval is granted, plans and specifications of pumbing systems shall not be changed without written consent of the department and the architect, engineer, designer or master plumber responsible for the design.

(5) LIMITATIONS. In granting approval of plans, specifications, products, devices or materials, the department is not liable for any defects in construction, nor for any damages that may result from the specific installation.

(6) PLAN AVAILABILITY. The architect, professional engineer, registered designer, owner or plumbing contractor shall keep at the construction site one set of plans bearing the stamp of approval of the department.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; r. and recr. (3), Register, June, 1982, No. 318, eff. 7-1-82; renum. from H 63.08, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.09 Site evaluation. (1) GENERAL. Site evaluation shall be conducted by a soil tester certified by the department in accord with ch. ILHR 81. The evaluation shall include soil conditions, properties and permeability, depth to zones of soil saturation, depth to bedrock, slope, landscape position, all setback requirements and the potential for flooding. Soil test data shall relate to the undisturbed elevations and a vertical elevation reference point or benchmark must be established. Evaluation data shall be reported on forms provided by the department and signed by the certified soil tester. Reports shall be filed for all sites investigated within 30 days of the completion of testing.

(2) REPLACEMENT SYSTEM AREA. (a) *General.* On each parcel of land being initially developed, sufficient area of suitable soils, based on the soil tests and system location and site requirements contained in this chapter, for one replacement system shall be established. Where bore hole test data in the replacement system area are equivalent to that in the proposed system area, the percolation test may be eliminated.

(b) *Non-conforming site conditions.* The department shall be contacted for approval of replacement systems for all public buildings and all buildings where site conditions do not permit systems in accord with this chapter. Alternates for the disposal of effluents emanating from existing

structures may be accomplished by means other that those outlined in this chapter provided written local approval is obtained and submitted along with detailed plans and specifications to the department for review and consideration. Written approval shall be received from the department prior to the county issuing permits or work commences on these systems.

(c) *Undisturbed site.* The replacement system area shall not be disturbed to the extent that it is no longer a suitable system area. The replacement system area shall not be used for the following:

1. Construction of buildings;

2. Parking lots or parking areas;

3. Below ground swimming pools;

4. Any other use that may adversely affect the replacement area.

(3) SLOPE. (a) *General.* A conventional soil absorption system shall not be located on a land slope of greater than 20%. A conventional soil absorption system shall be located at least 20 feet from the crown of a land slope that is greater than 20% except where the top of the aggregate of a system is at or below the bottom of an adjacent roadside ditch.

(b) *Specific system designs.* Where a more restrictive land slope is to be observed for a soil absorption system other than a conventional system, the more restrictive land slope specified in the design sections of this chapter shall apply.

(4) SOIL BORINGS AND PROFILE DESCRIPTIONS. (a) *General.* Soil borings shall be conducted on all sites regardless of the type of private sewage system planned to serve the parcel. Borings shall extend at least 3 feet below the bottom of the proposed system. Borings shall be of sufficient size and extent to determine the soil characteristics important to on-site liquid waste disposal. Borehole data shall be used to determine the suitability of the soils at the site with respect to zones of seasonal or permanent soil saturation, and the depth to bedrock. Borings shall be conducted prior to percolation tests to determine whether the soils are suitable to warrant percolation tests and if suitable, at what depth percolation tests shall be conducted. The use of power augers for soil borings is prohibited.

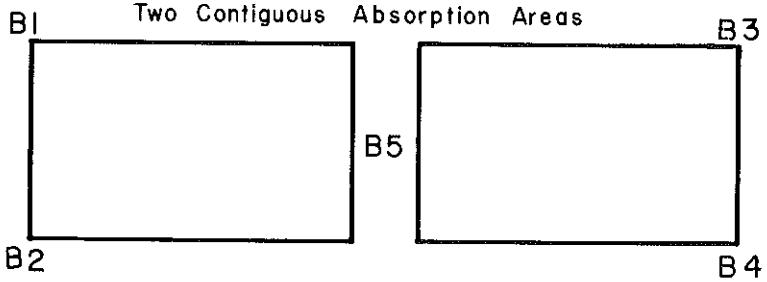
Note: Backhoe borings are preferable to borings augered or dug by hand.

(b) *Number.* There shall be a minimum of 3 suitable borings per soil absorption site. More soil borings may be necessary for accurate evaluation of a site.

1. Depth of borings. Borings shall be constructed to a depth of at least 3 feet below the proposed depth of the system.

2. Exceptions. On new parcels, the requirement of 6 borings (3 for initial area and 3 for replacement area) may be reduced to 5 if the initial and replacement system areas are contiguous and one boring is made on each outer corner of the contiguous area and the fifth boring is made between the system areas. See diagram.

Example Of Soil Boring Locations For Two Contiguous Absorption Areas



3. Reports. Regardless of the number of borings evaluated and conditions observed in borings, all soil information derived from borings shall be reported.

4. Location. Each borehole location shall be accurately located and referenced to the vertical elevation and horizontal reference point. Reports of boring locations shall either be drawn to scale, or have the horizontal dimensions clearly indicated between the borings and the horizontal reference point.

(c) *Soil description.* Soil profile descriptions shall be written for all borings. The thickness in inches of the different soil horizons observed shall be indicated. Horizons shall be differentiated on the basis of color, texture, soil mottles or bedrock. Depths shall be measured from the ground surface.

(d) *Soil mottles.* Zones of seasonal or periodic soil saturation shall be estimated at the highest level of soil mottles. The county or department may require a detailed description of the soil mottling on a marginal site. The abundance, size, contrast and color of the soil mottles should be described in the following manner.

1. Abundance. Abundance shall be described as few if the mottled color occupies less than 2% of the exposed surface; common if the mottled color occupies from 2 to 20% of the exposed surface; or many if the mottled color occupies more than 20% of the exposed surface.

2. Size. Size refers to length of the mottle measured along the longest dimension and shall be described as fine if the mottle is less than 5 millimeters; medium if the mottle is from 5 millimeters to 15 millimeters; or coarse if the mottle is greater than 15 millimeters.

3. Contrast. Contrast refers to the difference in color between the soil mottle and the background color of the soil and is described as faint if the mottle is evident but recognizable with close examination; distinct if the mottle is readily seen but not striking; or prominent if the mottle is obvious and one of the outstanding features of the horizon.

4. Color. The color(s) of the mottle(s) shall be given.

(e) *Observed groundwater.* The depth to groundwater if present shall be reported. Observed groundwater shall be reported at the level groundwater reaches in the soil borehole, or at the highest level of sidewall seep-

age into the boring. Measurements shall be made from ground level. Soil above the water level in the boring shall be checked for the presence of soil mottles.

(f) *Color patterns not indicative of soil saturation.* 1. One foot exception. Soil profiles that have an abrupt textural change with finer textured soils overlying more than 4 feet of unmottled, loamy sand or coarser soils can have a mottled zone in the finer textured material. If the mottled zone is less than 12 inches thick and is immediately above the textural change, then a soil absorption system may be installed in the loamy sand or coarser material below the mottled layer. If any soil mottles occur within the sandy material, then the site shall be unsuitable. The county or department may determine certain coarse sandy loam soils to be included as a coarse material.

2. Other soil color patterns. Soil mottles can occur that are not due to zones of seasonal or periodic soil saturation. Examples of such soil conditions not limited by enumeration are:

a. Soil mottles formed from residual sandstone deposits.

b. Soil mottles formed from uneven weathering of glacially deposited material, or glacially deposited material that may be naturally gray in color. This may include concretionary material in various stages of decomposition.

c. Deposits of lime in a profile derived from highly calcareous parent material.

d. Light colored silt coats deposited on soil ped faces.

e. Soil mottles that are usually vertically oriented along old or decayed root channels with a dark organic stain usually present in the center of the mottled area.

3. Reporting exceptions. A certified soil tester shall report any mottled soil condition. If soil mottles are observed that may not be due to soil saturation, the soil tester still shall report such condition and may request a determination from the department or the county authority on the acceptability of the site.

(g) *Bedrock.* The depth to bedrock except sandstone shall be established at the depth in a soil boring where greater than 50% of the weathered in-place material is consolidated. Sandstone bedrock shall be established at the depth where an increase in resistance to penetration of a knife blade occurs.

(4m) SOIL EVALUATION FOR ABSORPTION SYSTEMS. System sizing and siting for all soil absorption systems shall be based on soil morphological conditions specified in sub. (4) and Table 0, or percolation tests specified in sub. (5). Percolation tests shall not be performed nor shall percolation test results be accepted after July 1, 1994 except in accordance with sub. (4n).

TABLE 0

MAXIMUM WASTEWATER INFILTRATION RATES
FOR SOIL ABSORPTION SYSTEMS

	Soil Condition	If the answer to the condition is yes, the infiltrative, exposed natural soil surface for the system shall be sized using the identified soil loading factor in gallons per square foot per day [1,2,3]. Beds	Trenches
A.	Is the soil texture of the entire profile 3 feet below the infiltrative surface extremely gravelly sand, gravelly coarse sand or coarser?	0.4[4]	0.4[4]
B.	Is the soil structure of the horizon moderate or strong platy?	NP[5,6]	0.2[7]
C.	Is the soil texture of the horizon sandy clay loam, clay loam, silty clay loam, silt loam or finer, and the soil structure weak platy?	NP[5,6]	0.3[7]
D.	Is the moist soil consistence of the horizon stronger than firm or any cemented class?	NP[5,6]	NP[5,6]
E.	Is the soil texture of the horizon sandy clay, clay or silty clay of high clay content, and the soil structure massive or weak?	NP[5,6]	NP[5,6]
F.	Is the soil texture of the horizon sandy clay loam, clay loam, silty clay loam, silt or silt loam and the soil structure massive?	NP[5,6]	0.2[7]
G.	Is the soil texture of the horizon sandy clay, clay or silty clay of low clay content, and the soil structure moderate or strong?	0.2	0.3
H.	Is the soil texture of the horizon sandy clay loam, clay loam, silty clay loam or silt loam and the soil structure weak?	0.2	0.3
I.	Is the soil texture of the horizon sandy clay loam, clay loam or silty clay loam, and the soil structure moderate or strong?	0.4	0.5
J.	Is the soil texture of the horizon loam or sandy loam and the soil structure massive?	0.3	0.4
K.	Is the soil texture of the horizon loam or sandy loam and the soil structure weak?	0.4	0.5
L.	Is the soil texture of the horizon sandy loam, loam or silt loam, and the soil structure moderate or strong?	0.5	0.6
M.	Is the soil texture of the horizon very fine sand or loamy very fine sand? Or condition N below but with massive soil structure?	0.4	0.5
N.	Is the soil texture of the horizon fine sand or loamy fine sand?	0.5	0.6
O.	Is the soil texture of the horizon loamy sand, sand or coarse sand?	0.7	0.8

Footnotes to Table 0

1. The infiltration rates may be adjusted due to crossing horizons at the proposed infiltrative surface. Where such conditions occur, a weighted average may be used to determine the infiltration rate.
2. The infiltration rates and soil conditions specified may be verified by the county or department, who may require modification of these rates, particularly where soil conditions exist that are not specifically referenced in this table.
3. A soil description report (SBD-8330) shall be completed for each soil profile. The reported texture, structure and consistence shall be used in calculating the loading rate of the infiltrative soil surface.
4. Pressure distribution shall be provided in accordance with s. ILHR 83.14, except that doses shall be provided more than 4 times per day to increase retention time. Department written approval is required for sites where voids between gravels and cobbles are not filled with soil material of 2 millimeters or less in size. If at least a 6-foot separation below the proposed system to a limiting factor is evaluated and determined, or if a sand textured blanket at least one-foot thick is provided at the infiltrative surface, then a soil loading rate of 0.8 may be used with or without pressure distribution. Split spoon or power auger equipment may be used for evaluations at depths of more than 3 feet below the proposed system, provided such usage is noted on the soil description report.
5. NP = Not permitted. Systems may be permitted in these soils only with prior department approval. Site specific department approval will not be required where standard approvals have been issued based on a design concept or regional soil conditions.
6. Soil horizons meeting conditions D or E are not permitted within 3 feet below the infiltrative surface of either seepage beds or trenches. Soil horizons meeting conditions B, C or F are not permitted within 3 feet below the infiltrative surface of seepage beds.
7. Pressure distribution is required.

(4n) PERCOLATION TEST RESULTS FOR SIZING ABSORPTION SYSTEMS. The sizing of soil absorption systems shall be based upon either:

(a) Tables 1 and 4 if percolation test results are filed with the county in accordance with sub. (1), prior to July 1, 1991; or

(b) Tables 1a, 1b, and 4a if percolation test results are filed with the county in accordance with sub. (1) after July, 1991;

(c) Table 0 if soil evaluation reports as specified in sub. (4m) are filed with the county in accordance with sub. (1).

Note: Forms supplied by the department for use as specified in ss. ILHR 83.09 (4m) and (4n) are included in the Appendix.

(5) PERCOLATION TESTS AND PROCEDURES. (a) *Number and location.* At least 3 percolation tests in each system area shall be conducted. The holes shall be located uniformly in the location and to the bottom depth of the proposed absorption system. More percolation tests may be necessary depending on system design.

(b) *Exemption.* Percolation tests may not be required where a detailed soil map clearly indicates loamy sand or coarser material conditions at the depth of the proposed system, and for 3 feet below and the soil condition is confirmed by soil borings. The percolation rate for design purposes shall be calculated using the slowest permeability listed in the soil survey report for the map unit. The county or department may require proof of the map findings or soil texture and resultant anticipated percolation rate. The exemption of percolation tests does not eliminate the required bore hole test data.

(c) *Percolation test hole.* The test hole shall be dug or bored. It shall have vertical sides and have a horizontal dimension of 4 to 8 inches. The bottom and sides of the hole shall be carefully scratched with a sharp pointed instrument to expose the natural soil. All loose material shall be

removed from the hole and the bottom shall be covered with 2 inches of gravel or coarse sand.

(d) *Test procedure—sandy soils.* For tests in sandy soils the hole shall be carefully filled with clear water to a minimum depth of 12 inches above the bottom of the hole. The time for this amount of water to seep away shall be determined and this procedure shall be repeated. If the water from the second filling of the hole seeps away in 10 minutes or less, the test may proceed immediately as follows. Water shall be added to a point not more than 6 inches above the gravel or coarse sand. Thereupon, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of one hour. If 6 inches of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches. If 6 inches of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested as in par. (e).

(e) *Test procedure—other soils.* The hole shall be carefully filled with clear water and a minimum water depth of 12 inches shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter the soil shall be allowed to swell not less than 16 hours nor more than 30 hours. Immediately following the soil swelling period, the measurements for determining the percolation rate shall be made as follows. Any soil which has sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches over the gravel or coarse sand. Thereupon, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours unless 2 successive water level drops do not vary by more than 1/16 of an inch. At least 3 water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches above the gravel or coarse sand whenever it becomes nearly empty. Adjustment of the water level shall not be made during the last 3 measurement periods except to the limits of the last measured water level drop. When the first 6 inches of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for one hour. The water depth shall not exceed 6 inches at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

(f) *Mechanical test equipment.* Mechanical percolation test equipment shall be submitted to the department for approval.

(6) VERIFICATION. (a) *Borings.* Depth to soil mottles, depth to high groundwater, soil textures, depth to bedrock and land slope may be subject to verification by the county or the department. The county or the department may require backhoe pits to be provided for verification of soil boring data.

(b) *Percolation tests.* The results of percolation tests may be subject to verification by the county or the department. The county or the department may require that percolation tests be reconducted under supervision.

(c) *Filling.* Where the natural soil condition has been altered by filling or other methods used to improve wet areas, the department may require observation of high groundwater levels under saturated soil conditions.

Note: Detailed soil maps are of value for determining estimated percolation rates and other soil characteristics.

(7) MONITORING GROUNDWATER LEVELS. (a) *General.* A property owner or developer may provide documentation to the department and the county that soil mottling or other soil color patterns at a particular site are not an indication of seasonally saturated soil conditions or high groundwater levels. Documentation shall be made by conforming to the criteria in either subd. 1. or 2., unless sites are monitored against broad regional water tables in accordance with par. (b) 2.

1. A written report evaluating soil mottling and soil color patterns may be submitted to the department for review and approval. The report shall be prepared by a certified soil tester who has passed the examination specified in s. ILHR 81.646. The written report shall include the following:

a. A review of the soils and landscape in the area of the proposed system installation;

b. Soil descriptions to a depth of 5 feet below the bottom of the proposed system, to the depth of bedrock, or to a saturated zone, whichever is shallower, using the United States department of agriculture system. The soil description shall identify each soil horizon for its texture, structure, consistence, Munsell colors, depth measured from the soil surface, macroporosity, continuity, boundary conditions, and any other factors that would influence the operation or design of the proposed soil absorption system;

c. Description of the mottling including size, abundance, contrast and Munsell color and reasons for the mottling;

d. A recommended design loading rate from Tables 0, 1 or 4; linear loading rate; depth of the proposed system, geometry, and type of suitable soil absorption system that should be used on the site for disposal of wastewater;

e. The soil types or series listed in a United States department of agriculture soil survey in the immediate area;

f. A description of the site, including a 2 foot topographic contour map of the system area and 25 feet beyond; description of the vegetation and current land use; details of any artificial drainage; location of all compacted areas including roads and drives; and drainage patterns that may affect the proposed soil absorption system; and

g. Written comments provided by the county. If the county has no comments, the county shall so state.

2. Groundwater levels may be monitored at specific sites in accordance with the procedures in pars. (b) through (f). Written notice of an intent to monitor shall be submitted to the department and the county with a completed "Soil Description Report" (SBD-8330) prior to monitoring.

Note: The Soil Description Report form (SBD-8330) is available from Safety and Buildings Division, Private Sewage Section, P.O. Box 7969, Madison, Wisconsin, 53707.

3. The report shall be submitted to the department for review and approval. The department may perform an onsite inspection to review the soil conditions.

(b) *Precipitation.* 1. In areas not subject to broad regional water tables, monitoring results shall be considered when the highest of either the precipitation received at a local station, or the average of the 3 closest local stations, equals or exceeds, for both the periods (September 1 through the last day of February, and March 1 through May 31), 8.5 inches and 7.6 inches respectively.

2. Where sites are subject to broad regional water tables, such as large areas of sandy soils, the fluctuation observed over a several year cycle shall be considered. In such cases, data obtained from the United States geological survey or other independent agency utilizing United States geological survey procedures shall be used to determine if a regional water table is at or near its normal level. Determinations shall be made using hydrograph data and submitted on forms provided by the department.

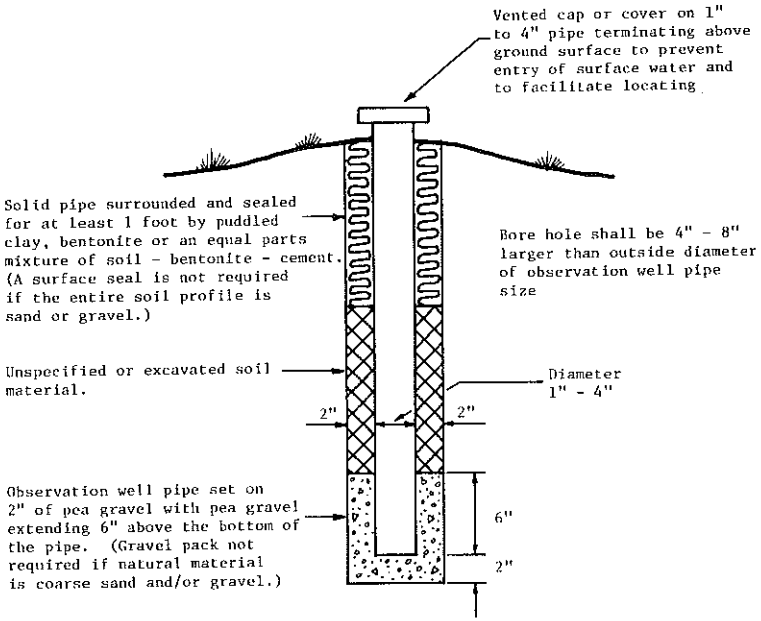
(c) *Artificial drainage.* Areas which are to be monitored shall be carefully checked for drainage tile and open ditches which could have altered natural high groundwater levels. Where such factors are involved, information on the location, design, ownership and maintenance responsibilities for such drainage shall be provided. Documentation shall be provided to show that the drainage network has an adequate outlet, and can and will be maintained. Sites affected by agricultural drain title shall not be acceptable for system installation.

(d) *Procedures.* 1. Soil tester. Monitoring shall be done by a certified soil tester.

2. Notification. The certified soil tester shall notify in writing, the county sanitary permit issuing authority or the department, of intent to monitor. It is expected the county authority or department may field check the monitoring at least once during the time of expected saturated soil conditions.

3. Number of wells. At least 3 wells shall be monitored at a site for a proposed system and replacement. If in the judgement of the county authority or the department more than 3 monitoring sites are needed, the certified soil tester shall be so advised in writing.

4. Monitoring well design. Monitoring wells designed as shown in the following sketch shall be constructed for monitoring. At least 2 wells shall extend to a depth of at least 6 feet below ground surface and shall be a minimum of 3 feet below the designed system depth. However, with layered mottled soil over permeable unmottled soil, at least one well shall terminate within the mottled layer. Site conditions may, in some cases, require monitoring at greater depths. It will be the responsibility of the certified soil tester to determine the depth of the monitoring wells for each specific site and if in doubt, they shall request the guidance of the county or the department.



(e) *Observations.* 1. Minimum frequency. The first observation shall be made on or before March 15th. Observations shall be made thereafter every 7 days or less until June 1st or until the site is determined to be unacceptable, whichever comes first. If water is observed above the critical depth at any time, an observation shall be made 1 week later. If water is present above the critical depth at both observations, monitoring may cease because the site is considered unacceptable. If water is not present above the critical depth at the second observation, monitoring shall continue until June 1st. If any 2 observations 7 days apart show the presence of water above the critical depth, the site is unacceptable and the department shall be notified in writing.

2. More frequent interval. The occurrence of rainfall(s) of ½ inch or more in a 24 hour period during monitoring may necessitate observations at more frequent intervals.

(f) *Reporting data.* 1. Unsuccessful site. When monitoring shows saturated conditions, data giving test locations, ground elevations at the wells, soil profile descriptions, soil series if available from soil maps, dates observed, depths to observed water and local precipitation data (monthly from September 1st to June 1st and daily during monitoring) shall be submitted in writing, with 2 copies sent to the department and one to the county authority.

2. Successful site. When monitoring discloses that the site is acceptable, documentation including location and depth of test holes, ground elevations at the wells, soil profile descriptions; soil series if available from soil maps; dates observed; results of observations, local precipitation data (monthly from September 1st to June 1st and daily during monitoring) and information on artificial drainage shall be submitted in

writing, with 2 copies to the department and one to the county authority. A request to install a soil absorption system shall be made to the department along with the appropriate review fee in s. ILHR 83.08 (3) (c).

(8) WINTER SOIL TESTING. (a) *General.* Soil testing should be done only when weather and light conditions make accurate evaluation of site conditions possible. Soil testing attempted under winter conditions is difficult and precautions should be observed.

(b) *Soil borings.* Soil borings and profile evaluations conducted between November 15th and March 15th shall be in accord with the following procedures. Borings shall be made with a backhoe. Soil profiles shall only be evaluated between the hours of 10:00 a.m. and 2:00 p.m. Soil profiles shall not be evaluated during times when the sky is completely overcast. When soil horizons are frozen, soil material must be thawed for hand texturing.

(c) *Percolation tests.* Percolation tests that are unprotected shall be conducted only on days when the air temperature is 20° F. or higher and the wind velocity is 10 m.p.h. or less. A heated structure or other protection from freezing shall be provided when the weather conditions listed above are not met. The bottom of the percolation hole shall be at least 12 inches below frost depth. If water freezes in the test hole at any time, the test data shall be void.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.09, Register, June, 1983, No. 330, eff. 7-1-83; cr. (4m) and (4n), r. and recr. (7) (a) and (b), Register, June, 1991, No. 426, eff. 7-1-91; r. and recr. (4n), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.10 Site requirements. (1) SOIL ABSORPTION SITE LOCATION. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any nearby water well or reservoir on the same or adjoining property, however, when this is not possible, the site shall be so located that surface water drainage from the site is not directed toward a well or reservoir and will by-pass the well or reservoir site by several feet. The soil absorption system shall be located not less than 5 feet from any lot line; 10 feet from a water service, or an uninhabited slab constructed building; 15 feet fom a swimming pool or habitable slab constructed building measured from the slab; 25 feet from the below grade foundation of any occupied or habitable building or dwelling, public water main or cistern; 50 feet from any water well, reservoir or from the high water mark of any lake, stream or other watercourse. Private sewage systems in compacted areas such as parking lots and driveways are prohibited. Surface waters shall be diverted away from any soil absorption site on the same or neighboring lots.

(2) GROUNDWATER, BEDROCK OR SLOWLY PERMEABLE SOILS. There shall be a minimum of 3 feet of soil between the bottom of the soil absorption system and high groundwater, or bedrock. Soil having a percolation rate of 60 minutes per inch or faster shall exist for the depth of the proposed soil absorption system and for at least 3 feet below the proposed bottom of the soil absorption system. There shall be 56 inches of suitable soil from original grade for a conventional soil absorption system.

(3) PERCOLATION RATE OR SOIL EVALUATION—TRENCH OR BED. A trench or bed type soil absorption system shall not be installed if the percolation rate for any one of the 3 tests is greater than 60 minutes per

inch. The soil infiltration rate listed in Table 0 or the slowest percolation rate shall be used to determine sizing of the soil absorption area.

(4) PERCOLATION RATE OR SOIL EVALUATION—SEEPAGE PIT. For a seepage pit, percolation tests shall be made in each horizon penetrated below the inlet pipe. Soil strata in which the percolation rates are greater than 30 minutes per inch shall not be included in sizing the soil absorption area. The infiltration rate determined from Table 0 or the slowest percolation rate shall be used to size the soil absorption area.

(5) SOIL MAPS. When a parcel of land consists entirely of soils having very severe or severe limitations for on-site liquid waste disposal as determined by use of a detailed soil map and interpretive data, that map and interpretive data may be used as a basis for denial for an on-site waste disposal system. However, the property owner shall be permitted to present evidence that a suitable site for an on-site liquid waste disposal system does exist.

(6) FILLED AREA. (a) *Departmental approval.* A soil absorption system shall not be installed in a filled area unless written approval is received from the department except if filled prior to certification as a subdivision lot under ch. ILHR 85.

(b) *Placement of fill.* Placement of fill does not guarantee approval for the installation of a soil absorption system. When evidence is made available showing that the filled area does meet the code requirements with regard to this area, percolation and elevation; departmental approval can be expected. This, in effect, would support application for a conventional system designed in fill.

(c) *Site and soil requirements.* 1. Bedrock. Sites that have less than 56 inches but at least 30 inches of soil over bedrock, where the original soil texture is sand or loamy sand (sand that has very few fine particles of silt or clay), may be filled with the same soil texture as the natural soil or coarser material up to and including medium sand in an attempt to overcome the site limitations. The fill material shall not be of a finer texture than the natural soil.

2. High groundwater. Sites that have less than 56 inches of soil over high groundwater or estimated high groundwater, where the original soil texture is sand or loamy sand (sand that has very few fine particles of silt or clay), may be filled following the criteria noted in this subsection.

3. Natural soil. Sites with soils finer than sand or loamy sand shall not be approved for systems in fill.

4. Monitoring. Sites that will have 36 inches of soil or less above high groundwater after the topsoil is removed shall be monitored for high groundwater levels in the filled area in accordance with s. ILHR 83.09 (7).

5. Inspection of fill. Placement of the fill material shall be inspected by the county or the department.

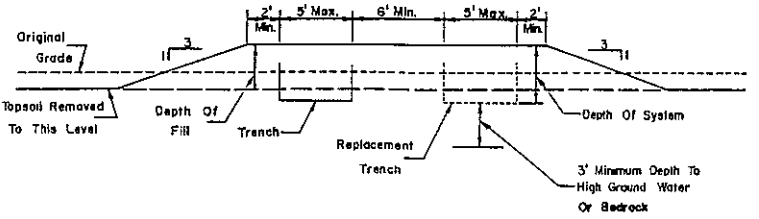
(d) *Design requirements.* 1. Size. A filled area shall be large enough to accommodate a shallow trench system and a replacement system. The size of the filled area shall be determined from the percolation tests or soil infiltration rate as determined from Table 0, based on natural soil and use of the building. When any portion of the trench system or its replace-

ment is in the fill, the fill shall extend to 2 feet beyond all sides of both systems before the side slope of the fill begins.

2. Soil test. Soil borings and percolation tests shall be conducted before filling to determine soil textures and depth to high groundwater or bedrock.

3. Topsoil. Vegetation and topsoil shall be removed prior to filling.

4. Side slope. Slopes at the edge of the filled areas can be a maximum 3 to 1 ratio, providing the 2 foot separating distance is maintained. See following sketch.



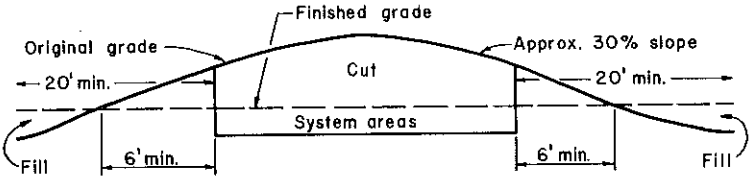
(7) ALTERING SLOPES. (a) *General.* In some cases, areas with slopes exceeding those specified in s. ILHR 83.09 (3) may be graded and reshaped to provide soil absorption sites. Care must be taken when altering any natural landscapes. Successful site alteration may be accomplished in accord with the following:

(b) *Site investigation.* Soil test data shall show that a sufficient depth of suitable soil material is present to provide the required amount of soil over bedrock and groundwater after alteration. In addition, a complete site evaluation as specified in s. ILHR 83.09 shall be performed after alteration of the site.

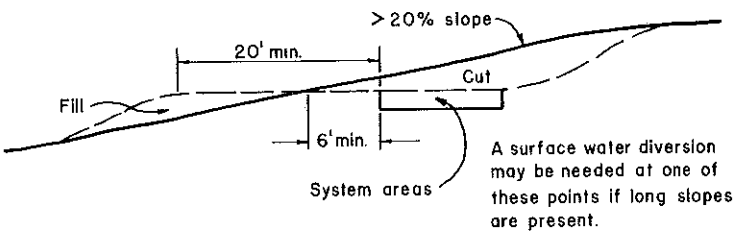
(c) *System location.* A soil absorption system must be installed in the cut area of an altered site. A soil absorption system shall not be installed in the fill area of an altered site. The area of fill on an altered site may be used as a portion of the required 20 foot separating distance from the crown of a critical slope. There shall be a minimum of 6 feet of natural soil between the edge of a system area and the downslope side of the altered area.

(d) *Site protection.* All altered slope areas shall be altered such that surface water drainage will be diverted away from the system areas. In some cases this may require the use of grassed waterways or other means of diverting surface waters. All disturbed areas shall be seeded or sodded with grass and appropriate steps must be taken to control erosion. Conceptual design sketches for altering slopes follow.

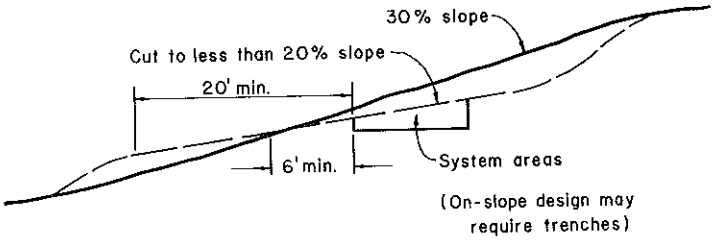
A. Excavation of complete hilltop



B. Excavation into hillside



C. Regrade of hillside



History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.10 and am. (6) (a), Register, June, 1983, No. 330, eff. 7-1-83; am. (3), (4), (6) (d) 1. and 4., Register, June, 1991, No. 426, eff. 7-1-91.

ILHR 83.11 Initial adverse determination. In all cases where property owners and/or developers receive initial adverse determinations and sanitary permits are refused by the county or the department, rejecting the use of a conventional private sewage system because of site limitation, the aggrieved party shall be given the reason, in writing, for rejection and any alternate course of actions available to them. The department shall provide to all sanitary permit issuing agents a list of alternatives which may be applied in the event conventional means of waste disposal are not acceptable.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.11, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.12 Sizing soil absorption systems. (1) GENERAL. Effluent from septic tanks and other approved treatment tanks shall be disposed of by soil absorption or by such other manner approved by the department.

(a) *Daily wastewater volumes of 5,000 gallons or less.* For systems having a daily effluent application of 5,000 gallons or less, sizing shall be in accord with this section.

(b) *Daily wastewater volumes of 5,000 gallons or more.* For systems receiving effluents in excess of 5,000 gallons per day, this section shall apply except that 2 systems of equal size shall be required. Each system shall have a capacity of no less than 75% of the area required for a single system. A suitable means of alternating waste application shall be provided. The dual system shall be considered as one system.

(c) *Pressure system.* A pressure distribution network may be used in place of a conventional or dosing conventional soil absorption system where a site is suitable for a conventional private sewage system. Pressure distribution systems may be approved as an alternative private sewage system if the site is unsuitable for conventional treatment. For sizing and design criteria, see s. ILHR 83.14.

(2) METHOD OF DISCHARGE. (a) *Daily flow 1,500 gallons or less.* For facilities having a daily effluent application of 1,500 gallons or less, flow from the septic or treatment tank to the soil absorption system may be by gravity or by dosing.

(b) *Systems over 1,500 gallons.* For systems over 1,500 gallons, the tank effluent must be discharged by pumping or by use of an automatic siphon.

Note: The dosing of effluents is recommended for all systems.

(3) SIZING-RESIDENTIAL SYSTEMS. (a) *Sizing based upon percolation tests.* The minimum amount of soil absorption area for a gravity flow system to serve a one- or 2-family dwelling based upon percolation results shall be determined in accordance with either Table 1 or Table 1a depending upon:

1. When the percolation results have been filed with the county as specified in s. ILHR 83.09 (1);

2. The total number of bedrooms contained within the dwelling; and

3. The method of absorption — trench, bed or pit.

(b) *Sizing based upon soil evaluation.* The minimum amount of soil absorption area for a gravity flow system to serve a one- or 2-family dwelling based upon soil evaluation conducted in accordance with s. ILHR 83.09 (4m) shall be determined by dividing the wastewater flow of 150 gallons per day per bedroom by the appropriate loading factor specified in Table 0.

Table 1

MINIMUM SOIL ABSORPTION AREAS FOR ONE- AND 2-FAMILY DWELLINGS BASED UPON PERCOLATION TEST RESULTS FILED PRIOR TO JULY 1, 1991

Percolation Rate (minutes per inch)	Minimum Absorption Area (square feet)		
	Trenches (bottom area)	Beds (bottom area)	Pits (sidewall area)
0 to less than 10	165	205	165
10 to less than 30	250	315	250
30 to less than 45	300	375	300
45 to 60	330	415	330

Table 1a

MINIMUM SOIL ABSORPTION AREAS FOR ONE- AND 2-FAMILY DWELLINGS BASED UPON PERCOLATION TEST RESULTS FILED ON OR AFTER JULY 1, 1991

Percolation Rate (minutes per inch)	Minimum Absorption Area (square feet)		
	Trenches (bottom area)	Beds (bottom area)	Pits (sidewall area)
0 to less than 10	195	240	195
10 to less than 30	275	350	275
30 to less than 45	315	390	315
45 to 60	330	415	330

(4) SIZING PUBLIC BUILDING SYSTEMS. (a) *Sizing based upon percolation tests.* 1. The minimum amount of soil absorption area for a gravity flow system to serve a building or structure other than a one- or 2-family dwelling based upon percolation results shall depend upon:

a. The type of occupancies or uses contained within the building or structure; and

b. The method of absorption—trench, bed or pit.

2. The minimum amount of soil absorption area for a gravity flow system to serve a building or structure other than a one- or 2-family dwelling based upon percolation results shall be determined by using Tables 1b and 2, and the following formula:

Minimum Soil Absorption Area (sq ft) = (Soil Absorption Area, Table 1b) x (Factor in Column 3, Table 2) x (Number of Units in Column 2, Table 2)

(b) *Sizing based upon soil evaluation.* The minimum amount of soil absorption area for a gravity-flow system to serve a building or structure other than a one- or 2-family dwelling based upon soil evaluation conducted in accordance with s. ILHR 83.09 (4m) shall be determined by dividing the appropriate wastewater flow as specified in Table 12 by the appropriate loading factor specified in Table 0.

Table 1b

MINIMUM SOIL ABSORPTION AREAS
FOR PUBLIC BUILDINGS AND STRUCTURES
BASED UPON PERCOLATION TEST RESULTS

Percolation Rate (minutes per inch)	Minimum Absorption Area (square feet)		
	Trenches (bottom area)	Beds (bottom area)	Pits (sidewall area)
0 to less than 10	110	140	110
10 to less than 30	165	205	165
30 to less than 45	200	250	200
45 to 60	220	280	220

Table 2

COLUMN 1	COLUMN 2	COLUMN 3
Building Classification	Units	Factor
Apartment building	1 per bedroom	1.5
Assembly hall—no kitchen	1 per person	0.02
Bar and cocktail lounge	1 per patron space	0.2
Beauty salon	1 per station	2.4
Bowling alley	1 per bowling lane	2.5
Bowling alley with bar	1 per bowling lane	4.5
Camp, day use only	1 per person	0.2
Camp, day and night	1 per person	0.45
Campground and camping resort	1 per camping space	0.9
Campground and sanitary dump station	1 per camping space	0.085
Car wash (automatic)	Subject to state approval	
Car wash (per car handwash)	1 per car	1.0
Catch basin—garages, service stations, etc.	1 per basin	2.0
Catch basin—truck wash	1 per truck	5.0
Church—no kitchen	1 per person	0.04
Church—with kitchen	1 per person	0.09
Condominium	1 per bedroom	1.5
Country club	Subject to state approval	
Dance hall	1 per person	0.06
Dining hall—kitchen and toilet	1 per meal served	0.2
Dining hall—kitchen only	1 per meal served	0.06
Dining hall—kitchen and toilet waste with dishwasher and/or food waste disposer	1 per meal served	0.25
Drive-in restaurant (all paper service)	1 per car space	0.3
Drive-in restaurant (inside seating)	1 per seat	0.3
Drive-in theater	1 per car space	0.1
Employes—in all buildings	1 per person	0.4
Hotel or motel and tourist rooming house	1 per room	0.9
Floor drain	1 per drain	1.0
Hospital	1 per bed space	2.0
Medical office buildings, clinics and dental offices		
Doctors, nurses and medical staff	1 per person	0.8
Office personnel	1 per person	0.25
Patients	1 per person	0.15
Migrant labor camp—central bathhouse	1 per employe	0.25
Mobile home (single installation)	(Use ILHR 83.12 (3))	
Mobile home park	1 per mobile home site	3.0
Nursing or rest homes	1 per bed space	1.0
Outdoor sports facility—toilet waste only	1 per person	0.085

Table 2 (continued)

COLUMN 1 Building Classification	COLUMN 2 Units	COLUMN 3 Factor
Park—toilet waste only	1 per acre	4.0
Park—showers and toilets	1 per acre	8.0
Restaurant—kitchen waste only	1 per seating space	0.18
Restaurant—toilet waste only	1 per seating space	0.42
Restaurant—kitchen and toilet	1 per seating space	0.6
Restaurant—(24-hr) kitchen and toilet	1 per seating space	1.2
Restaurant—dishwasher and/or food waste disposer	1 per seating space	0.15
Restaurant—(24-hr) with dishwasher/disposer	1 per seating space	1.5
Retail store	1 per customer	0.03
(Number of customers = 70% total area divided by 30 square feet/customer.)		
Self-service laundry—toilet wastes only	1 per machine	1.0
Auto washer (service bldgs., etc.)	1 per machine	6.0
Service station	1 per car served	0.15
Swimming pool bathhouse	1 per person	0.2
School—no meals, no showers	1 per classroom	5.0
School—meals served or showers	1 per classroom	6.7
School—meals and showers	1 per classroom	8.0
Showers—public	1 per shower	0.3

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.12, Register, June, 1983, No. 330, eff. 7-1-83; am. (3) and (4), Register, June, 1991, No. 426, eff. 7-1-91; r. and recr. (3), (4) and Table 1, cr. Tables 1a and 1b, Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.125 Sizing using soil evaluation. History: Cr. Register, June, 1991, No. 426, eff. 7-1-91; r. Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.13 Installation—conventional soil absorption systems. (1) SEEPAGE TRENCH EXCAVATIONS. Seepage trench excavations shall be 1 to 5 feet in width. Trench excavations shall be spaced at least 6 feet apart. The absorption area of a seepage trench shall be computed by using the bottom area only. The bottom area of the distribution header excavation shall not be computed as absorption area. Individual seepage trenches should not be over 100 feet long.

(2) SEEPAGE BED EXCAVATIONS. Seepage bed excavations shall be more than 5 feet wide and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom area only. Distribution piping in a seepage bed shall be uniformly spaced, no more than 6 feet and no less than 3 feet apart, and no more than 3 feet or less than 1 foot from the sidewall.

(3) SEEPAGE PITS. A seepage pit shall have a minimum inside diameter of 5 feet and shall consist of a chamber walled-up with material such as perforated precast concrete ring, concrete block, brick or other material approved by the department which allows effluent to percolate into the surrounding soil. The pit bottom shall be left open to the soil. Aggregate of ½ to 2½inches in size shall be placed into a 6-inch minimum annular space separating the outside wall of the chamber and sidewall excavation. The depth of the annular space shall be measured from the inlet pipe to the bottom of the chamber. Each seepage pit shall be provided with a 24-inch manhole extending to within 6 inches of the ground surface and a 4-inch diameter fresh air inlet which shall meet the requirements of sub. (7). An observation pipe is not required. Seepage pits shall be located 6 feet or more apart. Excavation and scarifying shall be in accord with sub. (4). The effective area of a seepage pit shall be the verti-

cal wall area of the walled-up chamber for the depth below the inlet for all strata for which the percolation rates are less than 30 minutes per inch. The 6 inches of annular opening outside the vertical wall area may be included for determination of effective area. Table 3 may be used for determining the effective sidewall area of circular seepage pits:

Table 3

EFFECTIVE ABSORPTION AREA FOR SEEPAGE PITS

Inside diameter of chamber in feet plus 1 foot for wall thickness plus one foot for annular space	Depth in feet of Permeable Strata Below Inlet					
	3	4	5	6	7	8
7	75	101	126	151	176	201
8	85	113	142	170	198	226
9	94	126	157	188	220	251
10	104	138	173	208	242	277
12	123	163	204	245	286	327

(4) EXCAVATION AND CONSTRUCTION. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated when the soil is so wet that soil material rolled between the hands will form a soil wire. All smeared or compacted soil surfaces in the side walls or bottom of the seepage trench or bed excavation shall be scarified to the depth of smearing or compaction and the loose material removed. If rain falls on an open excavation, the soil must be left until dry enough that a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

(5) AGGREGATE AND BACKFILL. A minimum of 6 inches of aggregate ranging in size from ½ to 2½ inches shall be laid into the trench or bed below the distribution pipe elevation. The aggregate shall be evenly distributed a minimum of 2 inches over the top of the distribution pipe. The aggregate shall be covered with synthetic materials approved by the department or with 9 inches of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. A minimum of 18 inches of soil back fill shall be provided above the covering.

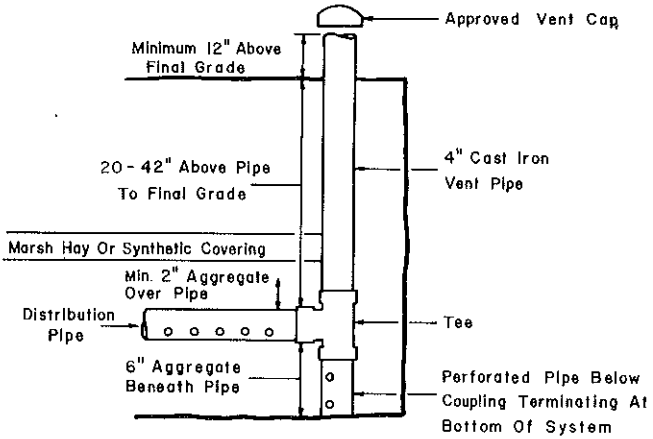
(6) DISTRIBUTION PIPING. (a) *General.* Distribution piping for gravity systems shall be a minimum of 4 inch I.D. approved pipe. The distribution header shall be constructed of approved solid wall pipe. The top of the distribution piping shall be laid 8 to 42 inches below the original surface in continuous straight or curved lines. The slope of the distribution pipes shall be 2 to 4 inches per 100 feet.

(b) *Distribution of effluent.* Effluent shall be distributed equally throughout the distribution network. Distribution of effluent to seepage trenches on sloping sites may be accomplished by utilizing a drop box design. Where dosing is required, the siphon or pump shall discharge a dose of minimum capacity equal to 75% of the combined volume of the distribution piping in the absorption system. When dosing is required, the dosing frequency shall be a maximum 4 times daily.

(7) FRESH AIR INLETS AND OBSERVATION PIPE. Fresh air observation inlets of cast iron shall be provided and connected to the perforated distribution pipe with an approved fitting or junction box and be placed so as to assure a free flow of air throughout the entire installation. The vent

pipes shall be at least 4 inches in diameter and extend at least 12 inches above the final grade and terminate with an approved vent cap. The observation pipe shall be perforated and extend to the bottom of the aggregate. See following sketch. Fresh air inlets shall be located at least 25 feet from any window, door or air intake of any building used for human habitation. A maximum of 4 distribution pipe lines may be served by one common 4-inch vent when interconnected by a common header pipe.

Fresh Air Inlets And Observation Pipe



(8) WINTER INSTALLATION. (a) *General.* Installation of soil absorption systems during periods of adverse weather conditions is not recommended. A soil absorption system shall not be installed if the soil at the system elevation is frozen.

(b) *Removal of snow cover.* Snow cover must be removed from the soil absorption area before excavation begins. Snow must not be placed in a manner that will cause water to pond on the soil absorption system area during snowmelt.

(c) *Excavated and backfill material.* Excavated soil material may be used as backfill for the system if the following conditions are met: The excavated material must be protected from freezing. If the excavated material freezes solid, it shall not be used as backfill. The first 12 inches of backfill shall be loose, unfrozen soil. The protective covering over the bed or trench gravel shall be a synthetic material approved by the department or 9 inches of uncompacted marsh hay or straw.

(d) *System inspection.* Inspection of systems installed during winter conditions shall include inspection of the trench or bed excavation prior to placement of gravel and inspection of backfill material at the time of placement.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.13, Register, June, 1983, No. 330, eff. 7-1-83; am. (6) (b), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.14 Pressure distribution systems. (1) GENERAL. A pressure distribution system may be used on any site meeting the conventional private sewage system criteria listed in s. ILHR 83.10. A pressure distri-

bution system may be approved as an alternative private sewage system under s. ILHR 83.22. There shall be a minimum depth to the top of the distribution piping of 6 inches from original grade for any pressure distribution system approved as an alternative private sewage system. The minimum required suitable soil depths from original grade for an alternative private sewage system using a pressure distribution network are as follows:

1 inch distribution pipe—49 inches suitable soil
2 inch distribution pipe—50 inches suitable soil
3 inch distribution pipe—52 inches suitable soil
4 inch distribution pipe—53 inches suitable soil

Department approval is required for use of a pressure distribution system.

(2) SOIL ABSORPTION AREA. (a) *Sizing.* The required soil absorption area shall be determined by dividing the total daily wastewater flow by the design loading rate.

(b) *Estimating wastewater flow.* 1. Residential. The estimated wastewater flow from a residence shall be 150 gallons per bedroom per day.

2. Public buildings. Daily wastewater flow rates for public buildings shall be based on the usage factors listed in s. ILHR 83.15 (3) (c) 2.

(c) *Design loading rate.* 1. Loading rates based on percolation test results shall be determined using Tables 4 or 4a, depending upon when the test results were filed with the county in accordance with s. ILHR 83.09 (1).

2. Loading rates based on soil evaluation conducted in accordance with s. ILHR 83.09 (4m) shall be based on using Table 0.

Table 4

**MAXIMUM DESIGN LOADING RATES
BASED UPON PERCOLATION TEST RESULTS
FILED PRIOR TO JULY 1, 1991**

Percolation Rate (minutes per inch)	Design Loading Factor (gal/sq ft/day)
0 to less than 10	1.2
10 to less than 30	0.8
30 to less than 45	0.72
45 to 60	0.4
greater than 60 to 120	0.24[a]

[a] For mound type systems only.

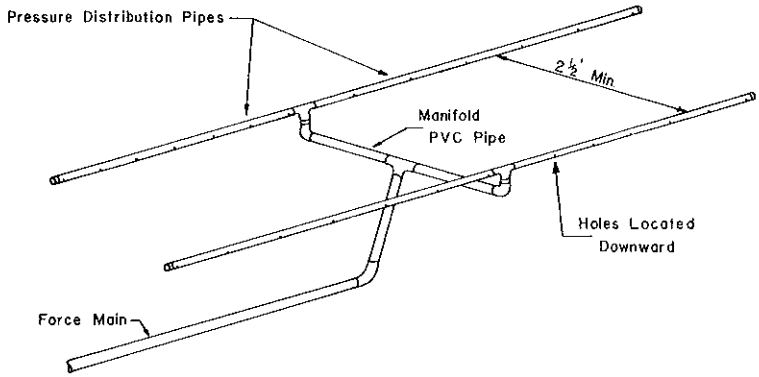
Table 4a

MAXIMUM DESIGN LOADING RATES BASED UPON PERCOLATION TEST RESULTS FILED ON OR AFTER JULY 1, 1991

Percolation Rate (minutes per inch)	Design Loading Factor (gal/sq ft/day)
0 to less than 10	0.8
10 to less than 30	0.6
30 to less than 45	0.5
45 to 60	0.4
greater than 60 to 120	0.3[a]

[a] For mound type systems only.

(3) PRESSURE DISTRIBUTION SYSTEM DESIGN. (a) *General.* Pressure distribution systems may discharge effluent into trenches or beds. Each pipe that is connected to an outlet of a manifold shall be counted as a separate distribution pipe. The horizontal spacing of distribution pipes shall be 30 to 72 inches. (See following sketch.) All distribution piping should be installed at the same elevation, or the plans and specifications shall provide for a design that insures equal flow through each of the perforations.



Bed Design Is Recommended Over Trenches

(b) *Design calculations.* Pressure distribution systems requiring less than 5,000 square feet of absorption area shall be designed using Tables 5 through 11. Systems requiring more than 5,000 square feet of absorption area shall be designed using design specifications and calculations other than those specified in Tables 5 through 11. Design specifications and calculations must be submitted and include perforation discharge rate, total headloss through the distribution piping, headloss through manifold piping, pump or siphon size and dosing volume. Formulas for these calculations may be obtained from the department.

(c) *Distribution pipe size.* Distribution pipe diameters may vary depending on the length of bed or trenches. Table 5 specifies maximum allowable distribution pipe lengths for various pipe and perforation sizes.

(d) *Manifolds.* 1. Size. The size of the manifold is based on the number, length and discharge rate of the distribution pipes. Table 6 shall be used for calculating distribution pipe discharge rate. Table 7 shall be used for calculating manifold diameter.

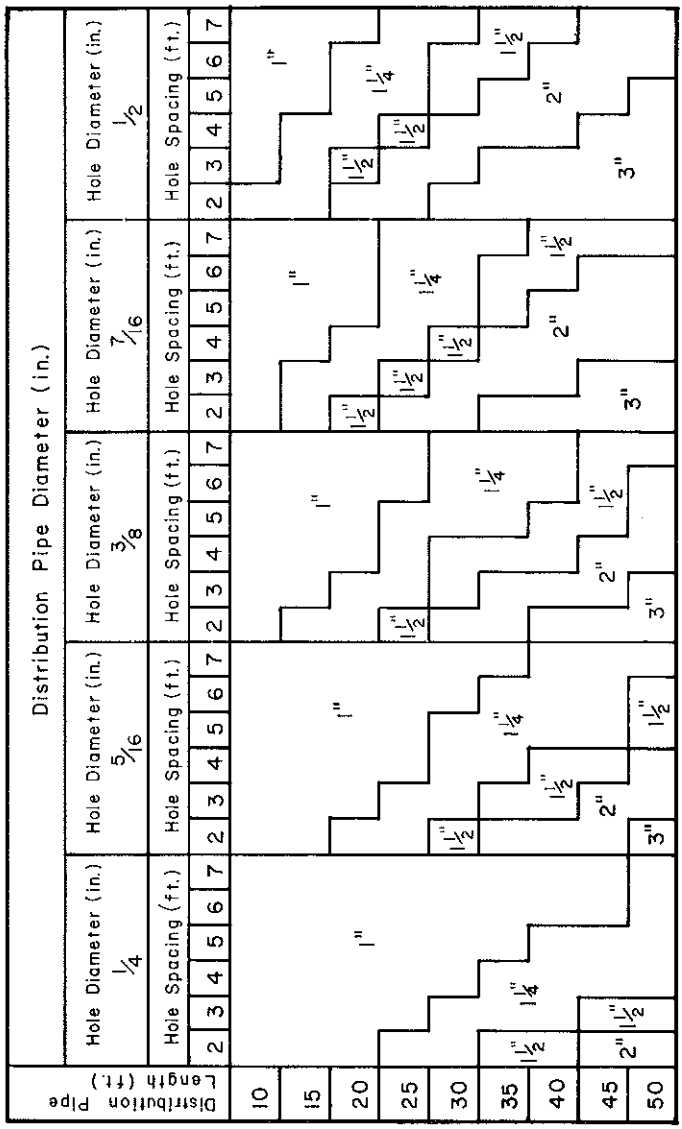
2. Distribution pipe connection. Distribution pipes should be connected to the manifold with tee's or 90° ells. Distribution pipes shall have the ends capped.

(e) *Force main.* The size of the force main between the pump and the manifold shall be based on the friction loss and velocity of effluent through the pipe. Force mains shall be constructed of approved pipe.

(4) BED AND TRENCH CONSTRUCTION. (a) *General.* The excavation and construction requirements for pressure distribution system trenches and beds shall meet the requirements specified in s. ILHR 83.13 (1), (2), (4), (5), (8).

(b) *Aggregate.* Aggregate shall be placed to a minimum depth of 6 inches beneath the distribution pipe with 2 inches spread evenly above the pipe. The aggregate shall be clean, non-deteriorating ½ to 2½ inch stone.

Table 5: Required Distribution Pipe Diameters For Various Hole Diameters, Hole Spacings And Distribution Pipe Lengths (for plastic pipe only)



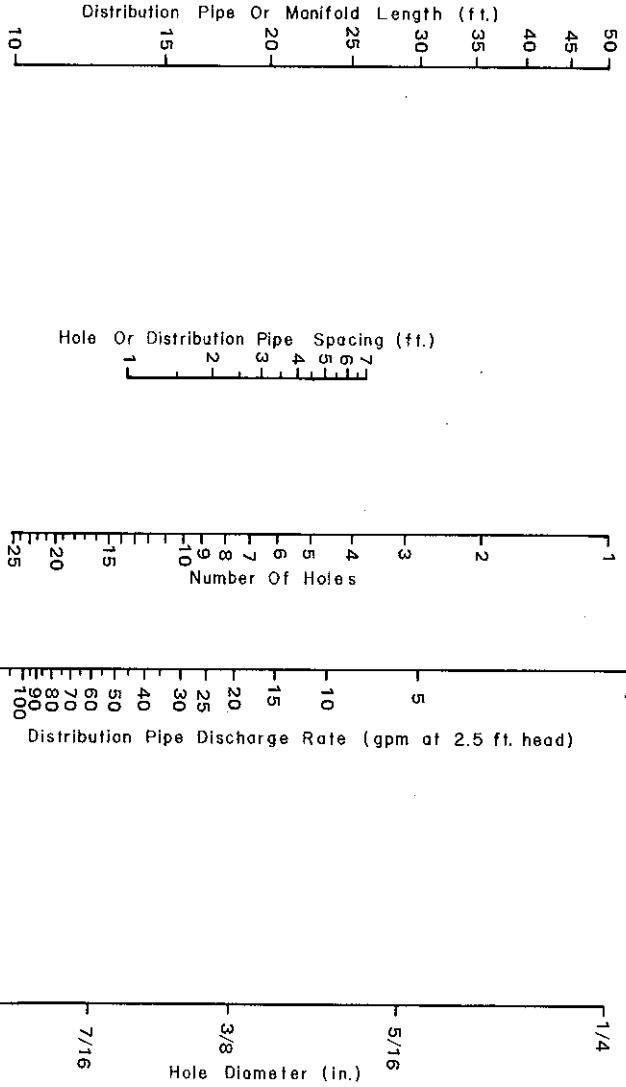
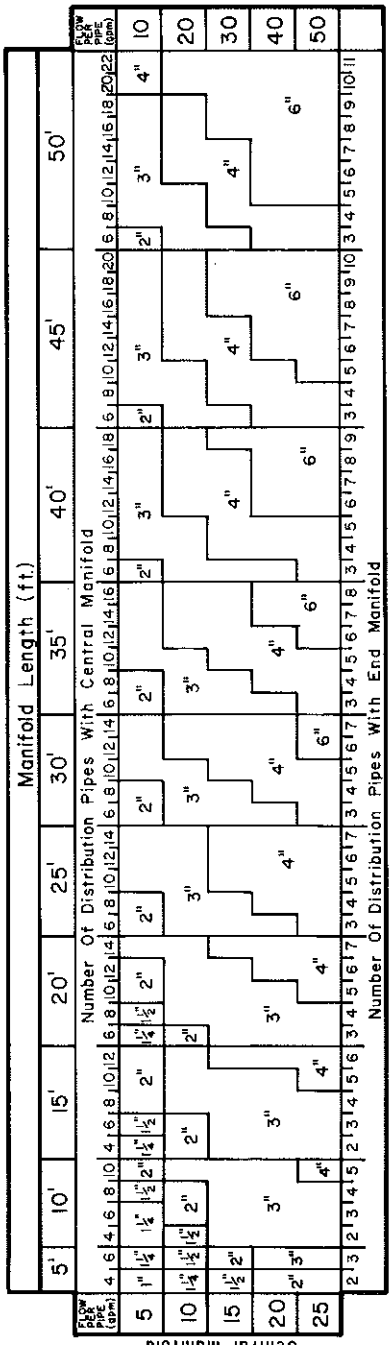

Distribution Pipe Or Manifold Length (ft.)
10
15
20
25
30
35
40
45
50
Hole Or Distribution Pipe Spacing (ft.)
1
2
3
4
5
6
7
25
20
15
10
9
8
7
6
5
4
3
2
1
Number Of Holes
150
100
90
80
70
60
50
40
30
25
20
15
10
5
1
Distribution Pipe Discharge Rate (gpm at 2.5 ft. head)
1/2
7/16
3/8
5/16
1/4
Hole Diameter (in.)

Table 6

Table 7: Recommended Manifold Diameters For Various Manifold Lengths, Number Of Distribution Pipes, And Distribution Pipe Discharge Rates (for plastic pipe only)



(c) *County inspection.* The county inspector shall inspect pressure systems at the time the aggregate is started to be placed and while the distribution piping is being installed.

(5) PUMPS AND PUMP CONTROLS. (a) *Pump selection.* Pump selection shall be based on the pump performance curve of the model selected. Pumps shall be rated by the manufacturer for use for sewage or effluent. The pump shall be capable of providing a minimum 2.5 feet of head at all of the perforations in the distribution network.

(b) *Discharge rate.* Table 8 shall be used to determine pump dosing rate based on the distribution pipe discharge rate and number of distribution pipes.

(c) *Friction loss.* Table 9 is the friction loss chart for schedule 40 plastic pipe (C = 150). The diameter of the pipe shall be increased if the velocity falls in the excessive range based upon flow rates in Table 9.

(d) *Pump and alarm controls.* 1. General controls. The control system for the pumping chamber shall consist of a control for operating the pump and an alarm system to detect when the pump is malfunctioning. Pump controls should be selected which give flexibility in adjusting the on/off depth. All pump and alarm controls shall be approved by the department. Pressure diaphram switches shall not be used. The following types of controls may be used.

a. Mercury level control. Mercury level control switches consist of a mercury switch sealed inside a bulb. Strictly an on/off switch, 2 are required.

Table 8

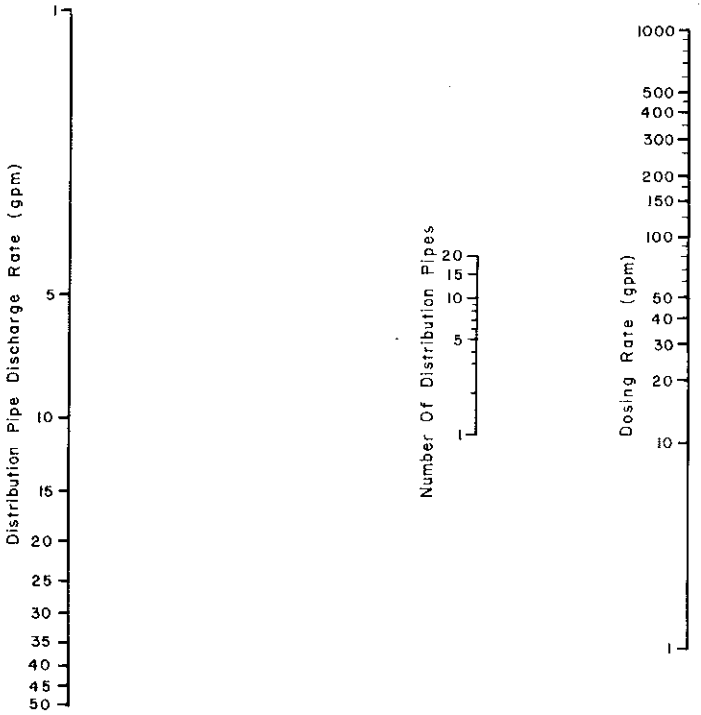

Distribution Pipe Discharge Rate (gpm)
1
5
10
15
20
25
30
35
40
45
50
Number Of Distribution Pipes
20
15
10
5
1
Dosing Rate (gpm)
1000
500
400
300
200
150
100
50
40
30
20
10
1

Table 9

FRICTION LOSS IN SCHEDULE 40 PLASTIC PIPE (C = 150)

Flow	Pipe Diameter (in)								
	1	1-1/4	1-1/2	2	3	4	6	8	10
gpm	ft/100 ft								
1	0.07								
2	0.28	0.07							
3	0.60	0.16	0.07						
4	1.01	0.25	0.12						
5	1.52	0.39	0.18						
6	2.14	0.55	0.25	0.07					
7	2.89	0.76	0.36	0.10					
8	3.63	0.97	0.46	0.14					
9	4.57	1.21	0.58	0.17					
10	5.50	1.46	0.70	0.21					
11		1.77	0.84	0.25					
12		2.09	1.01	0.30					
13		2.42	1.17	0.35					
14		2.74	1.33	0.39					
15		3.06	1.45	0.44	0.07				
16		3.49	1.65	0.50	0.08				
17		3.93	1.86	0.56	0.09				
18		4.37	2.07	0.62	0.10				
19		4.81	2.28	0.68	0.11				
20		5.23	2.46	0.74	0.12				
25			3.75	1.10	0.16				
30			5.22	1.54	0.23				
35				2.05	0.30	0.07			
40				2.62	0.39	0.09			
45				3.27	0.48	0.12			
50				3.98	0.58	0.16			
60					0.81	0.21			
70					1.08	0.28			
80					1.38	0.37			
90					1.73	0.46			
100					2.09	0.55	0.07		
125						0.85	0.12		
150						1.17	0.16		
175						1.56	0.21		
200							0.28	0.07	
250			Velocities in this area				0.41	0.11	
300			become too great for the				0.58	0.16	
350			various flow rates and				0.78	0.20	0.07
400			pipe diameter.				0.99	0.26	0.09
450							1.22	0.32	0.11
500								0.38	0.14
600								0.54	0.18
700								0.72	0.24
800									0.32
900									0.38
1000									0.46

b. Adjustable weight switch. Adjustable weight switches consist of a control located above the water level and 2 weights attached to a single cable which extends into the liquid.

2. Alarm system. The alarm system shall consist of a bell or light mounted in the structure and shall be located so it can be easily seen or heard. The high water warning device shall be installed 2 inches above the depth set for the on pump control. Alarm systems shall be installed on a separate circuit from the electrical service.

3. Electrical connections. Electrical connections shall be located outside the pumping chamber. All wiring to the pump chamber shall be installed in a conduit.

4. Duplex pumps. When 2 or more pumps are employed within a dosing tank, the pumps shall be interconnected such that the pumps alternate dosing, and dosing continues in the event that one pumps fails. Failure of a pump shall activate an alarm which is to remain audible or visible until manually turned off.

(6) DOSING. The dosing frequency shall be a maximum of 4 times daily. To establish the volume per dose, divide the daily wastewater flow by the dosing frequency. In addition, the dosing volume shall be at least 10 times the capacity of the distribution pipe volume. Table 10 provides the void volume for various pipe diameters. Table 11 shall be used to determine minimum dose volume based on distribution pipe diameter, length and number of distribution pipes.

Table 10

VOID VOLUME FOR VARIOUS DIAMETER PIPES

Diameter (inch)	Volume (gal/ft length)
1	0.041
1 ¼	0.064
1 ½	0.092
2	0.164
3	0.368
4	0.655
6	1.47

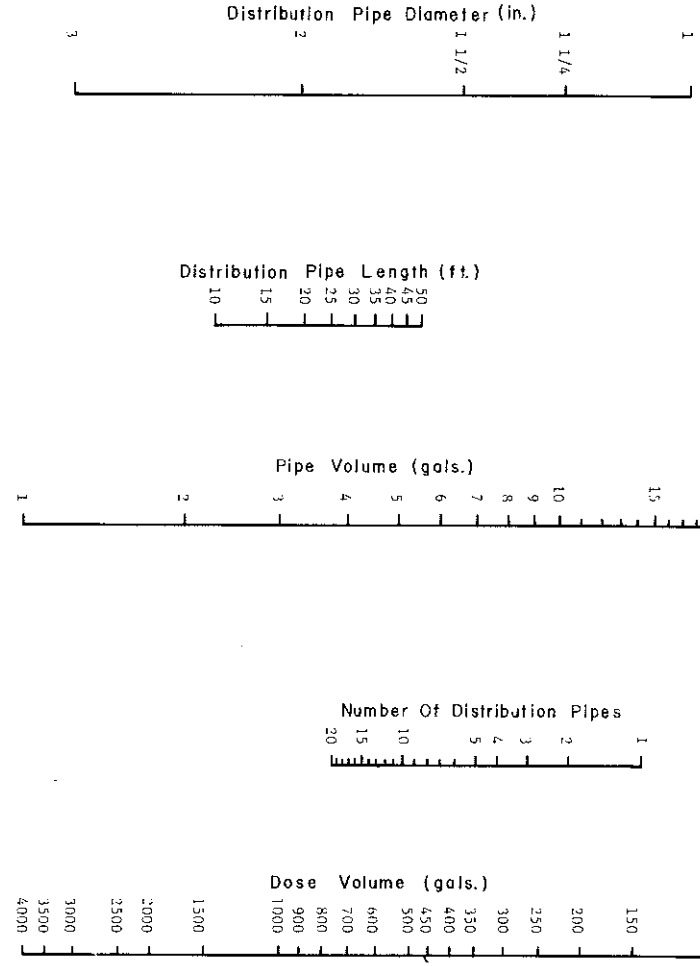


Table 11

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.14, Register, June, 1983, No. 330, eff. 7-1-83; am. (2) (a), r. and recr. (2) (c), Register, June, 1991, No. 426, eff. 7-1-91; r. and recr. (2) (a), (c), (5) (a) and Table 4, cr. (5) (d) 4. and Table 4a, Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.15 Septic tanks and other treatment tanks. (1) GENERAL. Septic tanks shall be fabricated or constructed of welded steel, monolithic concrete, fiberglass or other materials approved by the department. All tanks shall be watertight and fabricated so as to constitute an individual structure. The design of prefabricated septic tanks shall be approved by the department. Plans for site-constructed concrete tanks shall be approved by the department prior to construction.

(2) DESIGN OF SEPTIC TANKS. (a) *Liquid depth.* The liquid depth shall not be less than 3 feet nor more than an average of 6 feet. The total depth shall be at least 8 inches greater than the liquid depth.

(b) *Rectangular tanks.* Rectangular tanks shall have a minimum width of 36 inches and shall be constructed with the longest dimensions parallel to the direction of flow.

(c) *Cylindrical tanks.* Cylindrical tanks shall have an inside diameter of not less than 48 inches.

(d) *Label.* Each prefabricated tank shall be clearly marked to show liquid capacity and the name and address or registered trade mark of the manufacturer. The markings shall be impressed into or embossed onto the outside wall of the tank immediately above the outlet opening. Each site-constructed concrete tank shall be clearly marked at the outlet opening to show the liquid capacity. The marking shall be impressed into or embossed onto the outside wall of the tank immediately above the outlet opening.

(e) *Materials.* For septic tank material and construction specifications, see s. ILHR 83.20.

(f) *Inlet and outlet.* The inlet and outlet on all tanks or tank compartments shall be provided with open-end coated sanitary tees or baffles made of approved materials, so constructed as to distribute flow and retain scum in the tank or compartments. The inlet and outlet openings on all tanks shall contain a "boss" stop or other provision which will prevent the insertion of the sewer piping beyond the inside wall of the tank. The tees or baffles shall extend at least 6 inches above and 9 inches below the liquid level, but not to exceed ⅓ the liquid depth. At least 2 inches of clear space shall be provided over the top of the baffles or tees. The bottom of the outlet opening shall be at least 2 inches lower than the bottom of the inlet.

(g) *Manholes.* 1. Each single-compartment tank and each unit of a multi-compartment tank shall be provided with at least one manhole opening located over either the inlet or outlet opening.

2. Manholes and manhole risers for tanks shall provide an inside clearance of no less than 24 inches in diameter.

3. A manhole or top of a manhole riser for a tank shall terminate either:

a. At or below final grade, but no deeper than 6 inches; or

b. At least 4 inches above final grade.

4. a. Tanks of steel and fiberglass shall be provided with collars to accomodate manhole risers or extensions.

b. Collars for steel tanks and fiberglass tanks shall be of the same material as the tank.

c. Collars for steel tanks and fiberglass tanks shall be at least 2 inches in height.

d. Collars for steel tanks shall be permanently welded to the tank.

e. Collars for fiberglass tanks shall be an integral part of the tank.

(h) *Manhole covers.* 1. Manhole risers for tanks shall be provided with a substantial, fitted, watertight cover.

2. Manhole tank covers that are not buried shall have locking devices.

3. a. Manhole covers for tanks shall have warning labels printed in red or other contrasting color affixed to the manhole covers.

b. The wording used on the warning label shall clearly indicate the hazards present when entering a sewage or other treatment tank.

4. Covers, locking devices and warning labels shall be reviewed and approved as specified in s. ILHR 84.10.

(i) *Inspection opening.* An inspection pipe shall be provided directly over any inlet baffle or outlet baffle for a tank compartment over which a manhole opening is not provided. An inspection pipe shall:

1. Be of a material as listed in Table 84.30-2;

2. Be at least 4 inches in diameter;

3. Terminate at least 6 inches above the adjacent final grade; and

4. Terminate with a removable watertight cap or plug.

(3) CAPACITY AND SIZING. (a) *Minimum capacity.* The capacity of a septic tank or other treatment tank shall be based on the number of persons using the building to be served or upon the volume and type of waste. The minimum liquid capacity shall be 750 gallons.

(b) *Multiple tanks.* When the required capacity is to be provided by more than one tank, the minimum capacity of any tank shall be 750 gallons. When 3 or 4 tanks are installed, approval of the design of the system shall be obtained from the department. The installation of more than 4 tanks in series is prohibited. Installation of septic tanks in parallel is prohibited.

(c) *Sizing of tank.* 1. Residential. The minimum liquid capacity for one and 2 family residences is as follows:

SEPTIC TANK CAPACITY ONE AND TWO FAMILY RESIDENCES

Number of Bedrooms	Septic Tank
1	750
2	750
3	975
4	1,200
5	1,425
6	1,650
7	1,875
8	2,100

2. Public buildings. For buildings other than one and two family residences the liquid capacity shall be increased above the 750-gallon minimum as established in Table 12. For such buildings having kitchen and/or laundry waste, the tank capacity shall be increased to receive the anticipated volume for a 24-hour period from the kitchen and/or laundry. The liquid capacities established in Table 12 do not include employes.

Table 12

Apartment buildings (per bedroom—includes auto washer)	150 gals.
Assembly hall (per person—no kitchen)	2 gals.
Bars and cocktail lounges (per patron space)	9 gals.
Beauty salons (per station—includes customers)	140 gals.
Bowling alley (per alley)	125 gals.
Bowling alley with bar (per alley)	225 gals.
Campgrounds and camping resorts (per camp space)	100 gals.
Campground sanitary dump stations (per camp space) (omit camp spaces with sewer connection)	5 gals.
Camps, day use only—no meals served (per person)	15 gals.
Camps, day and night (per person)	40 gals.
Car wash (automatic)—subject to state approval	
Car wash (per car handwash)	50 gals.
Catch basins—garages, service stations, etc.(per basin, etc.)	100 gals.
Catch basins—truck washing (per truck)	100 gals.
Churches—no kitchen (per person)	3 gals.
Churches—with kitchen (per person)	7.5 gals.
Condominiums (per bedroom—includes auto washer)	150 gals.
Country clubs—subject to state approval	
Dance halls (10 sq. ft. per person)	3 gals.
Dining hall—kitchen and toilet waste—with dishwasher and/or with disposer(per meal served)	11 gals.
Dining hall—kitchen waste only (per meal served)	3 gals.
Drive-in restaurants—all paper service (per car space)	15 gals.
Drive-in restaurants—all paper service inside seating (per seat)	15 gals.
Drive-in theaters (per car space)	5 gals.
Employe—in all buildings, per employe—total all shifts	20 gals.
Floor drain (per drain)	50 gals.
Hospitals (per bed space)	200 gals.
Hotels or motels and tourist rooming houses (per room—2 persons per room)	100 gals.
Medical office buildings, clinics and dental offices	
Doctors, nurses, medical staff (per person)	75 gals.
Office personnel (per person)	20 gals.
Patients (per person)	10 gals.
Migrant labor camp, central bathhouse (per employe)	30 gals.
Mobile homes, single installation (use ILHR 83.15 (3) (c) 1)	
Mobile home parks, homes with bathroom groups (per site)	300 gals.
Nursing and rest homes—without laundry (per bed space)	100 gals.
Outdoor sport facilities (toilet waste only—per person)	5 gals.
Parks, toilet wastes (per person—75 persons per acre)	5 gals.
Parks, with showers and toilet wastes (per person—75 persons per acre)	10 gals.
Restaurant—kitchen waste only—without dishwasher and/or disposer (per seat)	9 gals.
Restaurant—toilet waste only (per seat)	21 gals.
Restaurant—kitchen and toilet wastes (per seating space)	30 gals.
Restaurant (24-hr)—kitchen and toilet wastes (per seating space)	60 gals.
Restaurant—dishwasher and/or food waste disposer (per seat)	3 gals.
Restaurant (24-hr)—dishwasher and/or food waste disposer (per seat)	6 gals.
Retail store—customers (Number of customers = 70% total area divided by 30 square feet/customer.)	1.5 gals.
Schools (per classroom—25 pupils per classroom)	450 gals.
Schools with meals served (per classroom—25 pupils per classroom)	600 gals.
Schools with meals served and showers provided (per classroom)	750 gals.
Self-service laundries (toilet waste only, per machine)	50 gals.
Auto washer (apartments, service buildings, etc.—per machine)	300 gals.
Service stations (per car)	10 gals.
Showers—public (per shower taken)	15 gals.
Swimming pool bathhouses (per person)	10 gals.

(4) INSTALLATION. (a) *Location.* 1. The location of sewage treatment tanks and pump and siphon tanks shall be in conformance with the setback distances listed in Table 12m.

2. a. A sewage treatment tank may not be located within a building or under a building, except as permitted in subpar. b.

b. A sewage treatment tank and pump or siphon tank may be located either under a cantilevered portion of a building or under an unenclosed deck structure, if at least 5 feet of vertical clearance for servicing purposes is provided between the top of the manhole and the obstruction.

3. No structural supports of buildings, portions of buildings, decks or porches may rest upon any portion of a sewage or other treatment tank.

Note: Pump and siphon tanks are commonly referred to as dosing tanks.

Table 12m

MINIMUM SETBACK DISTANCES FOR TREATMENT TANKS, PUMP AND SIPHON TANKS, SERVICING SUCTION LINES AND PUMP DISCHARGE LINES

Setback Element	Horizontal Distance (feet)
All Structures, Swimming Pools[a]	5
Lot or Property Line	2
Underground Water Supply System and Cistern	10
Well[b], High Water Mark of Lake, Stream, Pond, Flowage or Reservoir	25

[a] All structures include any building and portions of buildings with any type of foundation. Swimming pools include above ground and belowground pools.

[b] For location of wells, public, private or high capacity, reference should be made to ch. NR 112. For floodplains, refer to s. ILHR 83.18 (9).

(b) *Groundwater.* If the tank is installed in groundwater, adequate anchoring provisions shall be made.

(c) *Bedding.* A 3-inch thick compacted bedding shall be provided for all septic and other treatment tank installations. The bedding material shall be sand, gravel, granite, limerock or other noncorrosive materials of such size that 100% will pass a ½-inch screen.

(d) *Backfill.* 1. Steel and fiberglass tanks. The backfill material for steel and fiberglass tanks shall be as specified for bedding and shall be tamped into place, care being taken to prevent damage to the coating.

2. Concrete tanks. The backfill for concrete tanks shall be soil material, 100% of which shall pass a 4-inch screen and shall be tamped into place.

(e) *Manhole riser joints.* 1. Concrete. All joints on concrete risers and manhole covers shall be tongue and groove or shiplap type and sealed watertight using neat cement, mortar or bituminous compound.

2. Steel. All joints on steel risers shall be welded or flanged and bolted and be watertight. All steel manhole extensions shall be bituminous coated inside and outside.

3. Fiberglass. All methods of attaching fiberglass risers shall be watertight and approved by the department.

(5) DOSING TANKS. (a) *Material and construction.* 1. Dosing tanks. Dosing tanks shall be watertight and constructed of materials as specified in s. ILHR 83.20.

2. Review and approval. The design of site-constructed dosing tanks shall be reviewed and approved by the department prior to installation in accordance with s. ILHR 83.08.

3. Manholes. a. A dosing tank shall be provided with a manhole opening as specified in sub. (2) (g).

b. The dosing tank manhole cover shall terminate no less than 4 inches above grade and be provided with both a locking device and warning label as specified in sub. (2) (h) 1. to 3.

4. Label. A dosing tank shall be labeled in accordance with sub. (2) (d).

(b) *Capacity and sizing of pump tanks.* The minimum liquid capacity of a dosing tank or a dosing tank compartment employing one pump shall be determined from the distance between the bottom of the tank and the level of the inlet pipe to accomodate the cummulative volumes as specified in subds. 1 to 4. The minimum liquid capacity of dosing tank or dosing tank compartment employing multiple pumps shall accomodate the cumulative volumes as specified in subds. 2 to 4.

1. A reserve capacity shall be provided above the high-water alarm that is at least equal to the daily wastewater discharged from the building served. This volume shall be determined for one- and 2-family residences based on 100 gallons per bedroom, or by using Table 12 for other uses.

2. The dose volume shall be provided as determined by the system type as specified in s. ILHR 83.13 (6) (b) or s. ILHR 83.14 (6).

3. A liquid volume between the pump "on" setting and the alarm float level shall be provided.

4. A liquid volume shall be provided as calculated from the bottom of the tank to the pump "off" setting.

Note: See Appendix for further explanatory material.

(c) *Capacity and sizing of siphon tanks.* The minimum liquid capacity of a dosing tank employing a siphon shall be sufficient to accomodate volumes necessary to provide dosing as specified by the system type.

(d) *Venting.* 1. A dosing tank or a dosing tank compartment shall be provided with a vent that:

a. Is sized in accordance with Table 82.31-4, but not less than 2 inches in diameter; and

b. Is of a material listed in Table 84.30-2.

2. Except as provided in subd. 3, a vent serving a dosing tank or dosing tank compartment shall:

a. Terminate at least 12 inches above the adjacent final grade;

b. Terminate with a vent cap or return bend; and

c. Be located at least 10 feet horizontally from any door, window or fresh air intake.

Note: Rules of other federal or state agencies may specify greater separation distances between vents and fresh air intakes for hospitals and nursing homes.

3. A vent serving a dosing tank or a dosing tank compartment may:

a. Connect to the venting system serving a building or a structure, in which case the vent shall conform with the requirements specified in s. ILHR 82.31 (15) and (16); or

b. Be attached to the exterior of a building or a structure, in which case the vent shall conform with the requirements specified in s. ILHR 82.31 (16) (a) to (e).

(6) DESIGN OF OTHER SEWAGE TREATMENT TANKS. Other types of sewage treatment tanks shall be constructed in accordance with s. ILHR 83.20. Designs for site-constructed tanks shall be reviewed and approved by the department prior to installation in accordance with s. ILHR 83.08. Designs for prefabricated tanks shall be reviewed and approved by the department in accordance with s. ILHR 84.10.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.15, Register, June, 1983, No. 330, eff. 7-1-83; am. (4) (e), Register, February, 1985, No. 350, eff. 3-1-85; r. and recr. (2) (g) to (i), (4) (a), (5), (6), cr. Table 12m, r. (4) (e) and Table 13, renum. (4) (f) to be (4) (e), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.16 Maintenance and sludge disposal. (1) MAINTENANCE. Septic tanks and other treatment tanks shall be cleaned whenever the sludge and scum occupies ⅓ of the tank's liquid capacity. All sludge, scum, liquid and any other material removed from a private domestic sewage treatment and disposal system is hereafter referred to as sludge.

(2) SLUDGE DISPOSAL. See ch. NR 113, Wis. Adm. Code.

(3) COUNTY OPTION. Counties may establish a mandatory maintenance program to insure continuing maintenance of private sewage systems.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.16, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.17 Chemical restoration. No products for chemical restoration or chemical restoration procedures for private sewage systems may be used unless approved by the department.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.17, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.18 Holding tanks. (1) APPROVAL. Plans shall be submitted to the department for review, in accordance with ss. ILHR 83.07 and 83.08, for each application to install a holding tank. The installation and use of a holding tank shall be considered by the department on an individual basis. An application for a holding tank shall not be approved by the department, if:

(a) Any other type of private sewage system may be utilized as permitted under this chapter or ch. 145, Stats.; and

(b) The property contains an area of soil suitable for any other type of private sewage system as permitted under this chapter.

(2) PROHIBITION OF HOLDING TANKS. (a) *Department.* 1. The department may prohibit the installation and use of holding tanks for new construction in areas where:

a. The methods of final disposal of septage from existing holding tanks are not in compliance with the rules adopted under s. 146.20 (4g), Stats.;

b. There is insufficient disposal capacity for the septage at wastewater treatment facilities or land disposal sites;

c. Previously installed holding tanks have been found not to be watertight by the department or county due to geological conditions;

d. The county has failed to provide to the department accurate annual pumping reports required under sub. (4) (a) 3.; or

e. The results of the department's audits under s. 145.20 (3), Stats., indicate that sanitary permits have been issued for holding tanks in violation of sub. (1).

2. A departmental prohibition for the installation and use of holding tanks shall be established by departmental orders in accordance with s. 145.02 (3) (f), Stats. The order shall specify the conditions which must be corrected before the order will be lifted.

(b) *Local.* 1. A county may prohibit by ordinance the installation and use of holding tanks for new construction. If a county does not prohibit the installation and use of a holding tank for new construction, then any city, village or town within that county may prohibit by ordinance the installation and use of holding tanks for new construction.

2. An ordinance adopted under subd. 1. may prohibit the installation and use of holding tanks for specific building occupancies or specific geographical areas.

3. Before adopting an ordinance prohibiting the installation and use of holding tanks for new construction the local governmental unit shall submit a copy of the proposed ordinance to the department for review.

4. If a local governmental unit prohibits the installation and use of holding tanks for new construction, the local governmental unit shall establish an appeal procedure to the prohibition. Under the appeal procedure the local governmental unit may grant variances to the prohibition. The local governmental unit shall inform the department in writing of each variance granted.

(3) HOLDING TANKS ON PROPERTIES WITH EXISTING BUILDINGS. When the use of a holding tank becomes the only available alternative for the disposal of sanitary liquid waste for an existing building, local government shall allow the use of a holding tank or condemn the property. The requirements established for use of holding tanks for newly developed properties in this section shall also apply to replacement system uses.

(4) SERVICING CONTRACTS, AGREEMENTS AND STATEMENTS. (a) 1. Prior to the issuance of a sanitary permit for the installation of a holding tank the owner of the holding tank shall, except as provided by s. 146.20 (3) (d), Stats., contract with a person who is licensed under ch. NR 113 to have the holding tank serviced. The owner shall file a copy of the contract or their registration with the local governmental unit which has signed the pumping agreement under par. (b) and with the county. The

owner shall file a copy of any changes to the service contract or a copy of a new service contract with the local governmental unit within 10 business days from the date of change to the service contract.

Note: Section 146.20, Stats., relates to the servicing of septic tanks, soil absorption fields, holding tanks, grease traps and privies.

2. The person responsible for servicing a holding tank under subd. 1. shall submit to the local governmental unit which has signed the pumping agreement under par. (b) and to the county a report for the servicing on a semiannual basis. The service report shall include:

a. The name and address of the person responsible for servicing the holding tank;

b. The name of the owner of the holding tank;

c. The location of the property on which the holding tank is installed;

d. The sanitary permit number issued for the holding tank;

e. The dates on which the holding tank was serviced;

f. The volumes in gallons of the contents pumped from the holding tank for each servicing; and

g. The disposal sites to which the contents from the holding tank were delivered.

3. The county shall submit to the department an annual report summarizing the seminannual service reports which it is required to receive under subd. 2.

(b) 1. The owner of a holding tank shall enter into agreement with the appropriate county, city, village or town guaranteeing that the county or local governmental unit which signed the agreement will service the holding tank, if the owner fails to have the holding tank properly serviced in response to orders issued by the department, county or local governmental unit to prevent or abate a nuisance as described in ss. 146.13 and 146.14, Stats.

2. The owner or agent shall submit a copy of the pumping agreement required under subd. 1. to the department when plans for the proposed holding tank are submitted to the department for review under s. ILHR 83.08.

3. The pumping agreement required under subd. 1. shall be binding upon the owner, the heirs of the owner and assignees of the owner. The owner shall file the pumping agreement with the register of deeds. Upon reciept of a holding tank agreement, the register of deeds shall record the agreement in a manner which will permit the existence of the agreement to be determined by reference to the property where the holding tank is installed.

(c) The owner of a building or facility which will discharge more than 3,000 gallons of wastewater per day, as determined under s. ILHR 83.15 (3) (c) 2., to one or more holding tanks shall provide a written statement to the department describing the method of final disposal for the septage from the holding tanks. The department may not approve these types of holding tanks until the department receives written verification that the proposed methods of final disposal are acceptable to the department of

natural resources. The department shall notify the department of natural resources when a system of this type is approved.

(5) SIZING. (a) *One and 2 family residences.* The minimum liquid capacity of a holding tank for one and 2 family residences is as follows:

Number of Bedrooms	Holding Tank
1	2,000
2	2,000
3	2,000
4	2,500
5	3,000
6	3,500
7	4,000
8	4,500

(b) *Public buildings.* Public buildings shall have a minimum 5-day holding capacity, but not less 2,000 gallons. Sizing shall be based in accord with s. ILHR 83.15 (3) (c) 2. The 750 gallon minimum referred to in s. ILHR 83.15 (3) does not apply to holding tanks. No more than 4 holding tanks installed in series will be permitted.

(6) CONSTRUCTION. Holding tanks shall be constructed of welded steel, monolithic concrete, glass-fibre reinforced polyester or other materials approved by the department.

(7) INSTALLATION. (a) *Location.* 1. Holding tanks shall be located in conformance with the setback distances listed in Table 12m.

2. The service port or manhole cover of a holding tank shall be located no more than 25 feet from a service drive or road.

(b) *Warning device.* A high water warning device shall be installed so that it activates 1 foot below the inlet pipe. This device shall be either an audible or illuminated alarm. If the latter, it shall be conspicuously mounted. Electrical junction box, including warning equipment junctions, shall be located outside the holding tank unless they are housed in waterproof, explosion-proof enclosures. Electrical relays or controls shall be located outside the holding tank.

(c) *Manholes.* Each tank shall be provided with a manhole opening no less than 24 inches square or 24 inches inside diameter extending to a minimum of 4 inches above ground. Finish grade must be sloped away from the manhole to divert surface water from the manhole. Each manhole cover shall have an effective locking device. Manhole covers may have a service port reduced in size to 8 inch inside diameter 4 inches above finish grade level. The reduced opening must have an effective locking cover or a brass cleanout plug. Reduced locking devices or cleanouts must be approved by the department.

(d) *Septic tank.* If an approved septic tank is installed to serve as a holding tank, the inlet and outlet baffle may be removed and the outlet shall be sealed.

(e) *Vent.* 1. A holding tank shall be provided with a vent that:

a. Is not less than 2 inches in diameter; and

b. Is of a material listed in Table 84.30-2.

2. Except as provided in subd. 3, a vent serving a holding tank shall:

a. Terminate at least 12 inches above the adjacent final grade;

b. Terminate with a vent cap or return bend; and

c. Be located at least 10 feet horizontally from any door, window or fresh air intake.

Note: Rules of other federal or state agencies may specify greater separation distances between vents and fresh air intakes for hospitals and nursing homes.

3. A vent serving a holding tank may:

a. Connect to the venting system serving a building or a structure, in which case the vent shall conform with the requirements specified in s. ILHR 82.31 (15) and (16); or

b. Be attached to the exterior of a building or a structure, in which case the vent shall conform with the requirements specified in s. ILHR 82.31 (16) (a) to (e).

(f) *Servicing.* Holding tanks shall be serviced in accord with ch. 146, Stats., and ch. NR 113, Wis. Adm. Code.

(8) SERVICE SUCTION AND DISCHARGE LINES. (a) A service suction line or discharge line serving a holding tank for servicing purposes shall:

1. Be constructed of piping materials in accordance with ch. ILHR 84;

2. Terminate with a service port consisting of a quick disconnect fitting with a removable plug;

3. Have the service port of the suction line terminate at least 2 feet above final grade;

4. Have the service port identified as a sewage suction line with a permanent sign with lettering at least 1/2-inch in height;

5. Have the service port secured to a permanent support;

6. Be protected against frost in accordance with s. ILHR 82.30 (11) (b), unless the entire length of the line is drained after each pumping of the tank; and

7. Be at least 3 inches in diameter.

(b) A suction line serving a holding tank may not be installed such that the tank can be drained by gravity or by siphonic action.

(c) Where a lift station is employed for servicing the holding tank, the pump discharge line shall conform with par. (a), except that:

1. The discharge line shall be at least 2 inches in diameter; and

2. The lift station pump shall be activated by means of a keyed-switch at the service port.

(9) TANK IN FLOODPLAIN. (a) *Vent.* A vent serving a holding tank located in a floodplain shall terminate at least 2 feet above the established regional flood elevation.

(b) *Anchoring.* Anchoring of a holding tank located in a floodplain shall be provided to counter bouyant forces caused by a regional flood or periodic saturated soil conditions using the following formula:

Weight of the tank plus the weight of the anchor = 1.5 x (volume of water the tank displaces) x [the weight of water (62.4 pounds/cubic foot at 39°F)].

(c) *Manhole.* For a holding tank located in a floodplain:

1. At least 2 feet of elevation shall be provided between the top of the service manhole of a holding tank and the recorded regional flood elevation; or

2. A watertight manhole cover or service port shall be provided which is threaded or bolted to the riser.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.18, Register, June, 1983, No. 330, eff. 7-1-83; emerg. r. and recr. (1), (2) and (4) eff. 3-6-85; r. and recr. (1), (2) and (4), Register, September, 1985, No. 357, eff. 10-1-85; r. and recr. (7) (a), (e) and (8), cr. (9), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 83.19 Inspection and tests. (1) INITIAL INSPECTION PROCEDURES. (a) *General.* All private sewage systems shall be inspected after construction but before backfilling no later than the end of the next workday excluding Saturdays, Sundays and holidays after receiving notice from the licensed plumber responsible for the installation, i.e., the plumber in charge.

(b) *Notice for inspection.* The plumber in charge shall notify the county in person, by telephone or in writing when the private sewage system is ready for inspection.

(c) *Preparation for inspection.* When a private sewage system is ready for inspection, the plumber in charge shall make such arrangements as will enable the county or department inspector to inspect all parts of the system. The plumber shall have present the proper apparatus and equipment for conducting the inspection and shall furnish such assistance as may be necessary in making proper inspection.

(2) COVERING OF WORK. No part of the private sewage system may be backfilled until has been inspected and approved. If any part is covered before being inspected and approved it shall be uncovered at the discretion of the county or department inspector.

(3) OTHER INSPECTIONS. The county or department may require additional inspections other than the inspection prior to backfilling. Inspections may be required during the construction phase and after backfilling.

(4) INSPECTIONS FOR ADDITIONS, ALTERATIONS OR MODIFICATIONS. When a private sewage system is modified, altered or additions constructed, the inspection criteria required in this section shall apply.

(5) DEFECTS IN MATERIALS AND WORKMANSHIP. If inspection discloses defective material, design, siting or unworkmanlike construction which does not conform to the requirements of this chapter, the nonconforming parts shall be removed, replaced and reinspected.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.19, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.20 Materials. (1) MINIMUM STANDARDS. (a) *Approval.* Unless otherwise provided for in this chapter, all materials, fixtures or devices sold, used or entering into the construction of a private sewage system or parts thereof, shall be submitted to the department for approval and shall conform to approved applicable standards or to other equivalent standards acceptable to the department and shall be free from defects.

(b) *Identification.* Each length of pipe and each pipe fitting, fixture, material and device used in a private sewage system shall have cast, embossed, stamped or indelibly marked on it the maker's mark or name, the weight and quality of the product or identified in accord with the applicable approved standard. All materials and devices used in the construction of a private sewage system or parts thereof shall be marked and identified in a manner satisfactory to the department.

(c) *Conformance.* Standards listed or referred to in this section cover materials which shall conform to the requirements of this chapter when used in accordance with the limitations imposed in this chapter. Designs and materials for special conditions or materials not provided for herein may be used only after the department has been satisfied as to their adequacy and granted approval.

Note: Chapter ILHR 84 contains accepted and approved plumbing materials and the applicable standards.

(d) *Alterations.* In existing buildings or premises in which plumbing installations are to be altered, repaired or renovated, the department has discretionary powers to permit deviation from the provisions of this chapter provided that such a proposal to deviate is first submitted to the department for proper determination and approval.

(e) *Tests.* The department may require tests to be made or repeated, if at any time, there is reason to believe that any material or device no longer conforms to the requirements on which its approval was based.

(2) MATERIAL STANDARDS. Each material listed in Table 32 of s. ILHR 82.19, shall conform to at least one of the standards opposite it. Products conforming to one or more of the specifications listed shall be considered acceptable subject to limitations specified. See s. ILHR 83.02 (63) for a list of abbreviations. For materials not listed, consult the department.

(3) PRECAST CONCRETE AND SITE CONSTRUCTED TANKS. (a) Precast concrete tanks shall have a minimum wall thickness of 2 inches.

(b) *Materials.* The concrete used in constructing a precast or site-constructed tank shall be a mix to withstand a compressive load at least 3,000 pounds per square inch. All concrete tanks shall be designed to withstand the pressures to which they are subjected.

(c) *Joints.* The floor and sidewalls of a site-constructed concrete tank shall be monolithic except a construction joint will be permitted in the lower 12 inches of the sidewall of the tank. The construction joint shall have a keyway in the lower section of the joint. The width of the keyway shall be approximately 30% of the thickness of the sidewall with a depth equal to the width. A continuous water stop or baffle at least 6 inches in width shall be set vertically in the joint, embedded ½ its width in the concrete below the joint with the remaining width in the concrete above the joint. The water stop or baffle shall be copper, neoprene, rubber or polyvinylchloride designed for this specific purpose. Joints between the

concrete septic tank and its cover and between the septic tank cover and manhole riser shall be tongue and groove or shiplap type and sealed watertight using neat cement, mortar or bituminous compound.

(4) STEEL SEPTIC TANKS. For general tank design see s. ILHR 83.15. Steel tanks shall be fabricated of new, hot rolled commercial steel. The tanks including cover with rim, inlet and outlet collars and manhole extension collars shall be fabricated with welded joints in such a manner as to provide structural stability and water tightness. Steel tanks shall be coated, inside and outside in compliance with U.L. Standard 70 Bituminous Coated Metal Septic Tanks. Any damage to the bituminous coating shall be repaired by recoating. The gauge of the steel shall be as follows:

SEPTIC TANK CAPACITY

Tank Design			
Vertical Cylindrical			
500 thru 1,000 gallons	Bottom and sidewalls	14 ga	None
	Cover	12 ga	
	Baffles	12 ga	
1,001 thru 1,250 gallons	Complete tank	10 ga	None
1,251 thru 1,500 gallons	Complete tank	7 ga	None
Horizontal Cylindrical			
500 thru 1,000 gallons	Complete tank	13 ga	54" dia
1,001 thru 1,500 gallons	Complete tank	12 ga	64" dia
1,501 thru 2,500 gallons	Complete tank	10 ga	76" dia
2,501 thru 9,000 gallons	Complete tank	7 ga	76" dia
9,001 thru 12,000 gallons	Complete tank	1/4" plate	None
12,001 or more gallons	Complete tank	5/16" plate	None

(5) FIBERGLASS SEPTIC TANKS. (a) *General.* The following paragraphs apply to septic tanks made of glass-fiber reinforced polyester and intended for use in nonindustrial private sewage systems. For general septic tank design see s. ILHR 83.15. Unless otherwise indicated, the plastic terminology used in this section is in accordance with the definitions given in ASTM Standard D 883.

(b) *Materials.* Septic tanks, covers, baffles, flanges, manholes, etc., shall be made from polyester resins with glass-fiber reinforcement and meet the general design criteria as prescribed in s. ILHR 83.15 (1).

(c) *Resin.* The resin shall be a commercial grade of polyester resin and shall be evaluated as a laminate by tests conducted in accordance with ASTM Standard C 581. Unless otherwise approved by the department the same resin shall be used throughout the laminate.

(d) *Reinforcing material.* The reinforcing material shall be of a suitable commercial grade of glass-fiber (E Glass) treated with a coupling agent, approved by the glass-fiber manufacturer, that will provide a compatible bond between the resin and the glass. Glass-fiber surfacing materials, if used, shall be of a chemical-resistant glass (C glass) bonded with a suitable binder.

(e) *Fillers and pigments.* The resins used shall not contain fillers except as required for viscosity control. Up to 5% by weight of the total resin content of thixotropic agent that will not interfere with visual inspection may be added to the resin for viscosity control. Resins may contain pigments and dyes recognizing that such additions may interfere with visual inspection of laminate quality.

(f) *Laminate.* The laminate shall consist of the following: Primary chemical resistant surface; internal anti-wicking barrier; additional structural reinforcing section if required to meet the properties described in par. (h) and the following table; and exterior surface. (See following sketch.)

1) Primary Chemical-Resistant Surface 2) Internal Anti-Wicking Barrier											
1)	2)	2)	3)	3)	3)	To Desired Thickness For Strength	3)	3)	3)	3)	4)
3) Additional Structural Reinforcing Section 4) Exterior Surface											

(g) *Primary chemical resistant surface.* This surface shall be between 0.005 and 0.012 inch thick. It shall be a reinforced resin-rich surface. It shall be free from cracks and crazing and have a smooth finish.

(h) *Internal anti-wicking barrier.* Not less than 0.100 inch of chemical resistant laminate next to the inner surface shall be reinforced with not less than 20% or more than 30% by weight of mat or chopped strand.

(i) *Additional structural reinforcing sections.* This layer or body or the laminate shall be of chemically resistant construction suitable for the intended use and providing the additional strength necessary to meet the tensile and flexural requirements. When separate layers such as mat, cloth or woven roving are used, all layers shall be lapped at least one inch. Laps shall be staggered as much as possible. If woven roving or cloth is used, layers of chopped strand glass shall be placed as alternate layers.

(j) *Exterior surface.* This surface shall consist of a chopped strand glass over which shall be applied a resin-rich coating. This resin-rich surface layer shall contain less than 20% of reinforcing material.

(k) *Cut edges.* All cut edges shall be coated with resin so that no glass fibers are exposed and all voids are filled. Structural elements having edges exposed to the chemical environment shall be made with chopped strand glass reinforcement only.

(l) *Wall thickness.* The minimum wall thickness shall be as recommended by the manufacturer but in no case shall it be less than 3/16 inch regardless of operating conditions. Isolated small areas may be as thin as 80% of the specified minimum wall thickness.

(m) *Mechanical properties.* To establish proper wall thickness and other design characteristics, the minimum physical properties for any laminate shall be as shown in the following table and par. (n) below.

REQUIREMENTS FOR PROPERTIES OF NEWLY FABRICATED REINFORCED POLYESTER LAMINATES

Property at 73.4°F. in psi (MPa)*	Thickness in inches				Test Method
	3/16	1/4	5/16	3/8 & up	
Ultimate tensile strength, min.	9,000 (62)	12,000 (83)	13,500 (93)	15,000 (103)	ASTM D 638
Flexural strength, min.	16,000 (110)	19,000 (131)	20,000 (137)	22,000 (152)	ASTM D 790
Flexural modulas of elasticity (tangent), min.	700,000 (4823)	800,000 (5512)	900,000 (6201)	1,000,000 (6895)	ASTM D 790

*(MPa) = mega pascals

(n) *Surface hardness.* The laminate shall have a Barcol hardness of at least 90% of the manufacturer's minimum specified hardness for the cured resins when tested in accordance with ASTM D 2583. This requirement applies to both interior and exterior surfaces.

(o) *Appearance.* The finished laminate shall be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, air bubbles, pinholes, pimples and delamination. The inner surface shall be free from cracks and crazing and have a smooth finish and an average of not more than 2 pits per square foot providing the pits are less than ⅛ inch diameter and not more than 1/32 inch deep and are covered with sufficient resin to avoid exposure of inner surface fabric. Some waviness is permissible provided the surface is smooth and free from pits. Unless otherwise specified, ASTM D 2563 visual acceptance level 3 shall be the minimum standard for acceptance.

(p) *Tank design.* All tanks shall meet the general design criteria as outlined in s. ILHR 83.15 (1) and (2). Horizontal cylindrical tanks standard end enclosured shall be convexed heads with a maximum radius of curvature equal to the tank diameter. Rectangular tanks shall have external ribs to prevent sidewall deflection exceeding ½% of span at any location when tested by filling with water.

(q) *Shell joints.* Where tanks are manufactured in sections and joined by use of a laminate bond, the joint shall be glass-fiber reinforced resin at least the thickness of the heaviest section being joined. The reinforcement shall extend on each side of the joint a sufficient distance to make the joint at least as strong as the tank wall, and shall be not less than the minimum joint widths specified in the following table. The reinforcement shall be applied both inside and out, with the inner reinforcement considered as a corrosion resistant barrier only and not structural material.

MINIMUM TOTAL WIDTHS OF OVERLAYS FOR REINFORCED-POLYESTER TANK SHELL JOINTS

Tank wall thickness in inches	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4
Minimum outside overlay width in inches	4	4	5	6	7	8	9	10	11	12
Minimum inside overlay width in inches	4	4	5	5	6	6	6	6	6	6

(r) *Resistance to static load.* There shall be not more than 0.25% difference in dimensions before and after the tanks are statically loaded. For the static load test bed an empty tank in dry sand to a depth not exceeding 4 inches and oriented as in service. Load top segment of empty tank with evenly distributed load to a total weight in pounds equal to:

$L = 140 \times A_1 \times b$ where L = total load
A_1 = horizontal cross-sectional area of tank
b = depth of overburden expected

Rotate tank through 90° on its major axis. Bed tank in dry sand to a depth not exceeding 4 inches. Load sides of empty tank with evenly distributed load to total weight in pounds equal to:

$L = 70 \times A_2 \times b$ where L = total load
A_2 = vertical cross-sectional area of tank
b = depth of overburden expected

(s) *Siphoning or pumping.* There shall be no permanent deflection or change in length of any internal or external component of the tank during the pumping or siphoning when the tank is filled to its working level. There shall be no signs of leaking, weeping or other failure.

(t) *Weight.* No tank shall differ in gross weight by more than + 10 or − 5% from the weight of tanks that have been subjected to the tests for siphoning and static pressure.

(u) *Tests.* Tensil strength test shall be in accordance with ASTM D 638, except that the specimens shall be the actual thickness of the fabricated article and the width of the reduced section shall be one inch. Other dimensions of specimens shall be as designated by the ASTM standard for type one specimens for materials over ½ inch to one inch inclusive. Specimens shall not be machined on the surface. Test 5 specimens at 0.20 to 0.25 inch/minute crosshead speed, and average the results. Flexural strength shall be determined in accordance with Procedure A and Table 1 of ASTM D 790, except that the specimens shall be actual thickness of the fabricated article and the width shall be one inch. Other dimensions of specimens shall be as designated by the ASTM standard. Speci-

mens shall not be machined on the surface. Test 5 specimens, with the resin-rich side in compression. Determine the tangent modulus of elasticity in flexure by ASTM D 790.

(6) ALTERNATE AND EXPERIMENTAL MATERIALS. (a) *Intent.* The provisions of this chapter are not intended to prevent the use of any alternate material provided the material has first been approved and its use authorized by the department.

(b) *Approval.* The department may approve an alternate or experimental material in accord with s. 145.02 (2) (b), Stats., provided the proposed alternate or the experimental concepts are satisfactory and comply with the intent of this chapter.

(c) *Evidence or proof.* The department shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding the sufficiency of any proposed material.

(d) *Tests and standards.* Tests shall be made in accord with approved standards but in the absence of such standards, the department shall specify the test procedure.

(e) *Repeating tests.* The department may require tests to be made or repeated if at any time there is reason to believe that any material no longer conforms to the requirements on which its approval is based.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.20, Register, June, 1983, No. 330, eff. 7-1-83; r. and recr. (1) (c), Register, February, 1985, No. 350, eff. 3-1-85.

ILHR 83.21 Building sewers and drains. (1) GENERAL. Building sewers which terminate in a septic tank shall meet the same general criteria as listed in s. ILHR 82.30, except where specified in this section. All sanitary or special type drainage systems shall be connected by means of independent connections with a public sewer, approved private interceptor main sewer or private sewage system.

(2) COVER. Building sewers which terminate in a septic tank shall not be less than 18 inches from the top of the pipe to finished grade.

(3) MATERIALS. All building sewers which terminate in a septic tank shall be constructed of cast iron, vitrified clay, concrete, asbestos cement, plastic or bituminous fiber pipe or other materials approved by the department. The pipe from the septic tank to the soil absorption area shall be constructed of solid wall pipe approved by the department as specified in ch. ILHR 84.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.21, Register, June, 1983, No. 330, eff. 7-1-83; am. (1) and (3), Register, February, 1985, No. 350, eff. 3-1-85.

ILHR 83.22 Alternative private sewage systems. (1) GENERAL. Alternative private sewage systems shall be considered acceptable for use when the site, soil and system design criteria specified in s. ILHR 83.23 (1) and 83.14 (1) are met. Their installation shall be limited to the numbers specified in s. 145.022, Stats. A trial program shall terminate 5 years after the date of the start of a trial program. If the institutional control aspects specified as part of this section prove satisfactory at the end of a 5 year monitoring and assessment period, controlled use shall cease.

(2) REPLACEMENT SYSTEMS. (a) *Number.* There shall be no limit on the number of alternative private sewage systems installed as replacements for existing systems that have failed or are failure-prone.

(b) *Failure-prone system.* A failure-prone system shall be a holding tank or privy installed and in use prior to February 1, 1980.

(c) *Verification.* The existence of a failed or failure-prone system shall be verified in writing by the county.

(3) NEW CONSTRUCTION. (a) *Limitation.* In accord with s. 145.022, Stats., the number of alternative private sewage systems for new construction installed each calendar year in the state may not exceed 3% of the number of private sewage systems installed during the previous year. The number of alternative private sewage systems installed in any county in a calendar year may not exceed 5% of the total number of alternative private sewage systems allowed in the state for that year.

(b) *Exceptions.* The percent limitations in this section shall not apply to sites for which an approval is issued in the following manner:

1. Applications for approval had been completed and were on file with the department on February 1, 1980.

2. To individual lots for which a sanitary permit was issued under ch. ILHR 83, for a conventional system by the department or local permit issuing authority but later ruled unsuitable due to new or changed soil criteria being established by the department.

3. To one aditional second homesite on a farm to be occupied by a parent, child, sibling, grandchild, niece, nephew or first cousin who will be a primary or co-operator of the farm.

4. To lots meeting the site criteria for a conventional private sewage system.

Note: New soil condition criteria promulgated by the department is limited to 1) the existence of soil having a percolation rate of 60 minutes per inch or faster for the depth of the proposed soil absorption system and for 3 feet below the bottom of the system and 2) the presence of a few faint high chroma mottles in some glacial tills or clean sandy soils.

(c) *Verification.* The property owner requesting an exception shall submit a copy of an official document from the county having authority that indicates which exception the property is effected by. The exception shall be reported on forms furnished by the department.

(d) *Applicability.* The limitation, exceptions and verification shall apply to an individual lot and not to the owner of the property. Except for persons applying before February 1, 1980, more than one approval for new construction shall not be issued to any one individual.

(e) *Records.* The department and the county shall maintain an accurate record of the requests for approval received. The record shall include the date received; the property location; the name of the owner, soil tester and designer; and the type of private sewage system. Requests received over the number allowed in a county or in the state shall be carried over by the county in order to the next year.

(4) INSTITUTIONAL CONTROLS. (a) *General.* The institutional controls in effect during previous trial periods as enumerated in this subsection shall be continued for the 5 year controlled use period.

1. Application. Application for a mound approval shall be made on a form supplied by the department.

2. On-site inspection. Each proposed alternative private sewage system site shall be inspected for soil characteristics and limitations by the department or a county employe certified as a soil tester.

3. Plans. a. Plans and specifications prepared in accord with s. ILHR 83.04 (2) (b), shall be approved by the department and the appropriate county prior to permit issuance.

b. The approval shall remain in effect for 2 years after the date of approval. Approvals may be renewed. If construction does not commence within the 2 year period and the approval is not renewed, the approval is void and the permit as related to the limitation requirements may be reissued to another individual.

4. Inspections. a. Persons responsible for inspecting alternative private sewage systems shall be certified as a plumbing inspector II or III as specified in s. ILHR 81.15, they shall have attended a training session relating specifically to mound systems and have received certification of such attendance.

b. Mound systems shall be inspected at the time the ground surface is plowed, while the sand fill is being placed, at the time the distribution piping installation has been completed and after all work has been completed. Other inspections may be necessary dependent upon site conditions or as required in this chapter.

c. A report of each inspection on forms furnished by the department shall be submitted to the department with a copy retained in the county's files.

d. The person or persons making inspections shall submit a statement on forms furnished by the department indicating whether the installation was in accord with the approved plans and specifications within 10 days after the installation work is completed. A copy shall be retained in the county's files.

(b) *Maintenance.* An alternative private sewage system shall be maintained in acceptable working condition at all times with the septic tank pumped in accord with s. ILHR 83.16. A report of servicing on forms provided by the department shall be submitted to the department and the appropriate county.

(5) MONITORING AND EVALUATION. (a) *General.* The department shall monitor and evaluate the performance of the counties, installers, soil testers and system designers during the trial program for alternative private sewage systems. The results of the evaluations by the department will be used to determine whether each alternative private sewage system will be allowed for general use after the trial program.

(b) *State monitoring.* 1. Site evaluation. Department staff shall randomly field check 10% of the sites and a minimum if possible of 5 per county per year for which plans to construct alternative private sewage systems are received by the department. Comparisons shall be made to the soil test report and the county on-site inspection.

2. Installation evaluation. Department staff shall randomly check 10%, of all alternative private sewage system installations, and a mini-

mum if possible of 5 per county per year to determine if the system was properly constructed.

3. Continuing inspection. Department staff shall visually check as many alternative private sewage systems as possible during the 5 year control period to check for surfacing of effluent.

(c) *County monitoring.* The county shall visually inspect each alternative private sewage system within their jurisdiction a minimum of once every 2 years. The inspection shall consist of checking for surfacing of effluent around the system, ponding of effluent in the bed or trenches and to check the pump, pumping chamber and septic tank.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.22, Register, June, 1983, No. 330, eff. 7-1-83.

ILHR 83.23 Mound systems. (1) SOIL AND SITE REQUIREMENTS. (a) *General.* The installation of a mound in a floodplain or filled area is prohibited. Removal of fill material may not make a site suitable. A mound shall not be installed in a compacted area. A mound shall not be installed over a failing conventional system.

(b) *Soil boring and percolation tests.* A minimum of 3 soil borings shall be conducted in accord with s. ILHR 83.09 to determine depth to seasonal or permanent soil saturation or bedrock. Identification of a replacement system area is not required.

1. Slowly permeable soils with or without high groundwater. Mound sizing shall be based on soil evaluation or percolation test results. Where sizing is based on soil evaluation, the most limiting condition from Table 0 that occurs within the top 12 inches of the natural soil shall be used to determine the soil loading factor. Where sizing is based on percolation test results, percolation tests shall be conducted in the most restrictive soil horizon within 24 inches measured vertically from the top of existing grade. A mound system is suitable for the site if the percolation rate is greater than 60 minutes per inch and less than or equal to 120 minutes per inch.

2. Shallow permeable soils over creviced bedrock. Mound sizing shall be based on soil evaluation or percolation test results. Where sizing is based on soil evaluation, the most limiting condition from Table 0 that occurs within the top 12 inches of the natural soil shall be used to determine the soil loading factor. Where sizing is based on percolation testing, percolation tests shall be conducted in the most restrictive soil horizon within 18 inches measured vertically from the top of existing grade. A mound system is suitable for this site condition if the percolation rate is greater than 3 minutes per inch and less than or equal to 60 minutes per inch.

3. Permeable soils with high groundwater. Mound sizing shall be based on soil evaluation or percolation test results. Where sizing is based on soil evaluation, the most limiting condition from Table 0 that occurs within the top 12 inches of the natural soil shall be used to determine the soil loading factor. Where sizing is based on percolation testing, percolation tests shall be conducted in the most restrictive soil horizon within 24 inches measured vertically from the top of existing grade. A mound system is suitable for this site condition if the percolation rate is greater than 0 minutes per inch and less than or equal to 60 minutes per inch.

(c) *Depth to pervious rock.* There shall be at least 24 inches of unsaturated natural soil over creviced or porous bedrock.

(d) *Depth to groundwater.* 1. Except as provided in subd. 2., a mound system shall be allowed where at least 24 inches of unsaturated natural soil exists above estimated high groundwater as indicated by soil morphological conditions.

2. A mound system replacing an existing private sewage system shall be allowed where less than 24 inches of unsaturated natural soil exists above estimated high groundwater provided that:

a. The soils are not mottled or gleyed in the "E" or "B" horizon which is within 4 inches of the bottom of the "A" horizon; and

b. The cumulative depth of sandfill, as specified in sub. (2) (d) 1. a., and depth of suitable soil provides at least 3 feet of vertical separation to high groundwater.

Table 14

MINIMUM SAND FILL DEPTH (D) FOR MOUNDS ON SITES HAVING AT LEAST 24 INCHES ABOVE A SOIL OR SITE FACTOR

Soil or Site Factor[a]	Minimum Sand Fill Depth (D) (Inches)
Slowly Permeable Soils[b]	12
Estimated High Groundwater	12
Observed Bedrock	
creviced	24[c]
poorly cemented sandstone	18
Strate having 50% or more rock fragments by volume	12

[a] Soil type as identified in s. ILHR 83.23 (1).

[b] Refer to s. ILHR 83.23 (1) (b) 1. or soils having loading rates 0.3 or less.

[c] Minimum depth may be reduced to 18 inches on slopes greater than 10%.

(e) *Slopes.* 1. A mound may not be installed on a slope which is greater than 12%, except as permitted under subd. 2.

2. A mound replacing an existing private sewage system may not be installed on a slope which is greater than 20%.

(f) *Depth to rock strata or 50% by volume rock fragments.* There shall be at least 60 inches of soil over uncreviced, impermeable bedrock. If the soil contains 50% coarse fragments by volume in the upper 24 inches, a mound cannot be installed unless there is at least 24 inches of permeable, unsaturated soil that has less than 50% coarse fragments beneath this layer.

(2) MOUND DESIGN AND DIMENSIONS. (a) *Design criteria.* 1. A mound system to serve a building with a design daily discharge of 600 gallons or less and to be installed on a site with at least 24 inches above estimated high groundwater, bedrock, or slowly permeable soils shall be designed using:

a. Tables 17 to 28; or

b. The specifications of pars. (b) to (h).

2. A mound system to serve a building with a design daily discharge of more than 600 gallons and to be installed on a site with at least 24 inches above estimated high groundwater, bedrock or slowly permeable soils shall be designed using the specifications of pars. (b) to (h).

3. A mound system to replace an existing private sewage system, and to be installed on a site with less than 24 inches above estimated high groundwater, bedrock or slowly permeable soils shall be designed using the specifications of pars. (b) to (h) with depth of sand fill (D) increased according to the formula in par. (e).

Note: The dimensions and corresponding letter designations referenced in this section are shown in Figures 1 through 5.

(b) *Design of the absorption area.* The size of the absorption area is dependent upon the infiltrative capacity of the medium sand texture fill material and the daily wastewater flow. The infiltration rate for the medium sand shall be 1.2 gal/ft.^{2}/day. The required absorption area shall be determined by dividing the total wastewater flow by 1.2 gal/ft.^{2}

(c) *System configuration.* 1. Trenches. a. For slowly permeable soils with or without high groundwater, the effluent shall be distributed in the mound through a trench system. Trench length should be selected by determining the longest dimension that is perpendicular to any slope on the site. Trench width and trench spacing is dependent on specific site conditions.

b. Trenches shall be 2 to 4 feet in width.

c. The lineal feet of trench required shall be caluculated by dividing the required absorption area by the trench width (A). Trench length (B) shall not be more than 100 feet. Where more than one trench is required, the trenches should be of equal length. A mound should not have more than 3 trenches.

d. Trench spacing (C) shall be determined by comparing the estimated wastewater flow, the infiltrative capacity of the natural soil and the trench length (B). Trench spacing (C) shall be calculated as:

Trench spacing

$$(C) = \frac{\text{Estimated wastewater flow}}{\text{Number of trenches}} \div (0.24 \text{ gal/ft.}^2\text{/day}) \div \text{trench length (B)}.$$

The calculated trench spacing (C) shall be measured from center to center of the trenches.

Note: For facilities with more than 1,500 gallons per day that must use a trench system, the department should be contacted prior to system design.

2. Beds. A long, narrow bed design should be used for permeable soils with high water tables. The bed can be square or rectangular for shallow permeable soils over bedrock. The bed length (B) should be set after determining the longest dimension that is available and that is perpendicular to any slope on the site. The bed width (A) shall be determined by dividing the absorption area required by (B).

(d) *Mound dimensions.* 1. Mound height. On sites the mound height shall be calculated using the following equation where: sand fill depth (D), the downslope fill depth (E), the bed or trench depth (F), and the cap and topsoil depth (H).

$$\text{Mound height} = \frac{(D + E)}{2} + F + H$$

a. For sites having at least 24 inches above estimated high groundwater, bedrock, or slowly permeable soils, the minimum sand fill depth (D) shall be 12 inches, unless otherwise specified in Table 14. For mounds replacing existing private sewage systems on sites having less than 24 inches above estimated high groundwater, bedrock, or slowly permeable soils, the sand fill depth (D) shall be based on the following calculation:

Where D = 12 inches + (24 inches - depth in inches to soil or site factor)

am. On a sloping site, the sand fill depth (E) placed at the downslope edge of the bed or trench shall be increased so that the bottom of the bed or trench is level. The downslope sand fill depth (E) shall be increased according to one of the following calculations:

For beds: E = D + [(slope percentage)(A)].

For trenches: E = D + [(slope percentage) (C + A)].

b. The bed or trench depth (F) shall be at least .75 feet. At least 6 inches of aggregate shall be placed under the distribution pipes and at least 2 inches of aggregate shall be placed over the top of the distribution pipes.

c. The cap and top soil depth (H) at the center of the mound shall be at least 1.5 feet which includes 1 foot of subsoil and 0.5 feet of top soil. At the outer edges of the mound the minimum cap and top soil depth (G) shall be 1 foot which includes 0.5 feet of subsoil and 0.5 feet of top soil. The soil used for the cap can be top soil or finer textured subsoil.

2. Mound length. The total mound length (L) is equal to the bed or trench length plus the end slopes (K).

a. The end slope (K) =
mound depth at center x 3:1 slope = $\frac{[(D + E)}{2} + F + H]3.$

b. The total mound length (L) =
(bed or trench length, B) +2 (end slope, K).

3. Mound width. The total width (W) of a mound with a bed design shall be equal to the upslope width (J), the bed width (A) and the downslope width (I). When a trench design is used, the total width (W) shall be equal to the upslope width (J), the trench width or widths (A), the trench spacing (C) and the downslope width (I). On sloping sites the downslope width (I) shall be greater than the upslope width (J). On level sites the upslope width and the downslope width shall be the same.

a. Upslope width (J) = mound depth at upslope edge x 3:1 slope x slope correction factor from Table 15 =
(D + F + G) x 3 x correction factor

b. Downslope width (I) = mound depth at downslope edge x 3:1 slope x slope correction factor from Table 15 =

(E + F + G) x 3 x correction factor

c. The mound width (W) for a bed system =

upslope width (J) + bed width (A) + downslope width (I).

The mound width (W) for a trench system =

upslope width (J) + $\frac{\text{trench width (A)}}{2}$ + [(number trenches − 1) x (trench spacing (C))] + $\frac{\text{trench width (A)}}{2}$ + downslope width (I).

Table 15

DOWNSLOPE AND UPSLOPE WIDTH CORRECTIONS FOR MOUNDS ON SLOPING SITES

Slope %	Downslope Correction Factor	Upslope Correction Factor
0	1.0	1.0
1	1.03	.97
2	1.06	.94
3	1.10	.915
4	1.14	.89
5	1.18	.875
6	1.22	.86
7	1.27	.83
8	1.32	.80
9	1.38	.785
10	1.44	.77
11	1.51	.75
12	1.57	.73

(e) *Basal area.* 1. The minimum basal area shall be calculated using the infiltrative capacity of the natural soil and the total daily wastewater flow.

a. When using percolation test results, the minimum basal area shall be determined by dividing the total daily wastewater flow by the infiltrative capacity of the soil as specified in Table 4 or 4a.

b. When using soil evaluation, the minimum basal area shall be determined by dividing the total daily wastewater flow by the loading rate of the soil as specified in Table 0.

2. Basal area available, bed. On sloping sites the basal area shall be that area under the bed and downslope of the bed. On level sites the basal area shall be the entire area under the mound excluding the end slope areas. The appropriate equation from one of the following shall be used to determine the available basal area.

Bed length (B) x (bed width (A) + downslope width (I) = basal area available for sloping site

Bed length (B) x total mound width (W) = basal area available for level sites

3. Basal area available, trench. On sloping sites the basal area shall be that area under and downslope of the trenches. On level sites the basal area shall be the total area under the mound excluding the end slope areas. The appropriate equation from one of the following shall be used to determine the available basal area.

$$\text{Trench length (B)} \times \left[\text{mound width (W)} - \text{upslope width (J)} + \frac{\text{trench width (A)}}{2}\right] = \text{basal area available for sloping sites}$$

$$\text{Trench length (B)} \times \text{total mound width (W)} = \text{basal area available for level sites}$$

4. Adequacy of basal area. If the basal area available is not equal to or greater than the basal area required, the downslope width (I) on a sloping site shall be increased or the up and downslope widths (J) and (I) on a level site shall be increased until sufficient area is available.

(f) *Distribution system.* The distribution system for mounds for daily flows less than 600 gallons per day may be sized in accord with the applicable criteria in sub. (3) or with s. ILHR 83.14 (3). For all other buildings, the distribution system shall be designed in accord with s. ILHR 83.14 (3).

(g) *Pump selection.* Pump selection shall be based upon the criteria specified in s. ILHR 83.14 (5).

Note: For pump and alarm controls refer to s. ILHR 83.14 (5).

(h) *Dose volume.* The dose volume shall be calculated either:

a. According to s. ILHR 83.14 (6);

b. Using the design flow from Table 12; or

c. Using 150 gallons per bedroom for one- and 2-family residences.

Table 17

DESIGN CRITERIA FOR MOUND TRENCHES
LOADING RATES UP TO 150 GAL/DAY
SLOWLY PERMEABLE SOIL

PARAMETER	SYMBOL	UNITS	SLOPE %			
			0	2	4	6
Trench Width	A	Ft	3	3	3	3
Trench Length	B	Ft	42	42	42	42
No. of Trenches	—	—	1	1	1	1
Mound Height	D	Ft	1	1	1	1
	F	Ft	0.75	0.75	0.75	0.75
	G	Ft	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5
Mound Width	J	Ft	11 *	8	8	8
	I *	Ft	11	15	15	15
	W	Ft	25	26	26	26
Mound Length	K	Ft	10	10	10	10
	L	Ft	62	62	62	62
Dist. Pipe Length	P	Ft	20	20	20	20
Dist. Pipe Diameter	—	In	1	1	1	1
No. of Holes per Dist. Pipe**	—	—	9	9	9	9
Hole Spacing*	—	In	30	30	30	30
Hole Diameter**	—	In	1/4	1/4	1/4	1/4

* Additional width to obtain required basal area.
** Last hole is located at end of dist. pipe which is 15" from other hole.

Table 18

DESIGN CRITERIA FOR MOUND TRENCHES
LOADING RATES 151 TO 300 GAL/DAY
SLOWLY PERMEABLE SOIL

PARAMETER	SYMBOL	UNITS	SLOPE %			
			0	2	4	6
Trench Width	A	Ft	3	3	3	3
Trench Length	B	Ft	42	42	42	42
No. of Trenches	—	—	2	2	2	
Trench Spacing	C	Ft	15	15	15	15
Mound Height	D	Ft	1	1	1	1
	E	Ft	1	1.4	1.7	2.1
	F	Ft	0.75	0.75	0.75	0.75
	G	Ft	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12	8	8	8
	I *	Ft	12	20	20	20
	W	Ft	42	46	46	46
Mound Length	K	Ft	10	10	10	10
	L	Ft	62	62	62	62
Dist. Pipe Length	P	Ft	20	20	20	20
Dist. Pipe Diameter	—	In	1	1	1	1
No. of Holes per Dist. Pipe**	—	—	9	9	9	9
Hole Spacing**	—	In	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	15	15	15	15
Manifold Diameter***	—	In	2	2	2	2

* Additional width to obtain required basal area.
** Last hole is located at end of dist. pipe which is 15"from other hole.
*** Diameter dependent upon size of pipe from pump and inlet position.

Table 19

**DESIGN CRITERIA FOR MOUND TRENCHES
LOADING RATES 301 TO 450 GAL/DAY
SLOWLY PERMEABLE SOIL**

PARAMETER	SYMBOL	UNITS	SLOPE %			
			0	2	4	6
Trench Width	A	Ft	3	3	3	3
Trench Length	B	Ft	63	63	63	63
No. of Trenches	—	—	2	2	2	2
Trench Spacing	C	Ft	15	15	15	15
Mound Height	D	Ft	1	1	1	1
	E	Ft	1	1.4	1.7	2.1
	F	Ft	0.75	0.75	0.75	0.75
	G	Ft	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12 *	8	8	8
	I*	Ft	12	20	20	20
	W	Ft	42	46	46	46
Mound Length	K	Ft	10	10	10	10
	L	Ft	83	83	83	83
Dist. Pipe Length	P	Ft	31	31	31	31
Dist. Pipe Diameter	—	In	1-1/4	1-1/4	1-1/4	1-1/4
No. of Holes per Dist. Pipe**	—	—	13	13	13	13
Hole Spacing*	—	In	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	15	15	15	15
Manifold Diameter***	—	In	2	2	2	2

* Additional width to obtain required basal area.
** First hole is located 12"from the manifold.
*** Diameter dependent upon size of pipe from pump and inlet position.

Table 20

DESIGN CRITERIA FOR MOUND TRENCHES
LOADING RATES 451 TO 600 GAL/DAY
SLOWLY PERMEABLE SOIL

PARAMETER	SYMBOL	UNITS	SLOPE %			
			0	2	4	6
Trench Width	A	Ft	3	3	3	3
Trench Length	B	Ft	56	56	56	56
No. of Trenches	—	—	3	3	3	3
Trench Spacing	C	Ft	15	15	15	15
Mound Height	D	Ft	1	1	1	1
	E	Ft	1	1.7	2.3	3.0
	F	Ft	0.75	0.75	0.75	0.75
	G	Ft	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12*	8	8	8
	I*	Ft	12	20	20	20
	W	Ft	57	61	61	61
Mound Length	K	Ft	12	12	12	14
	L	Ft	80	80	80	84
Dist. Pipe Length	P	Ft	27.5	27.5	27.5	27.5
Dist. Pipe Diameter	—	In	1-1/4	1-1/4	1-1/4	1-1/4
No. of Holes per Dist. Pipe**	—	—	12	12	12	12
Hole Spacing**	—	In	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	30	30	30	30
Manifold Diameter***	—	In	2	2	2	2

* Additional width to obtain required basal area.
** Last hole is located at end of dist. pipe which is 15" from previous hole.
*** Diameter dependent upon size of pipe from pump and inlet position.

Table 21

**DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES UP TO 150 GAL/DAY
PERMEABLE SOIL OVER CREVICED BEDROCK**

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			3 to 60					3 to less than 30	
Slope	—	%	0	2	4	6	8	10[2]	12[2]
Bed Width	A[4]	Ft	10	10	10	10	10	10	10
Bed Length	B	Ft	13	13	13	13	13	13	13
Mound Height	D	Ft	2	2	2	2	2	2	2
	E	Ft	2	2.2	2.4	2.6	2.8	3.0	3.2
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12	11	10	10	9	9	9
	I	Ft	12	13	14	17	18	21	26
	W	Ft	34	34	34	37	37	41	45
Mound Length	K	Ft	12	12	12	13	13	13	15
	L	Ft	37	37	37	39	39	39	43
Dist. Pipe Length	P[3]	Ft	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe[1]	—	Ft	6	6	6	6	6	6	6
Hole Spacing[1]	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	6	6	6	6	6	6	6
Manifold Diameter	—	In	2	2	2	2	2	2	2

1 Last hole is located at end of dist. pipe which is 15" from previous hole.
2 On sites with 10-12% slope, the fill depth D may be reduced to 1.5 ft or the bed width may be reduced so E isn't so great.
3 Use a manifold with dist. pipes only on one side.
4 Beds can be any desired width.

Table 22

DESIGN CRITERIA FOR MOUND BEDS LOADING RATES 151 TO 300 GAL/DAY PERMEABLE SOIL OVER CREVICED BEDROCK

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			3 to 60				3 to less than 30		
Slope	—	%	0	2	4	6	8	10[2]	12[2]
Bed Width	A[4]	Ft	10	10	10	10	10	10	10
Bed Length	B	Ft	25	25	25	25	25	25	25
Mound Height	D	Ft	2	2	2	2	2	2	2
	E	Ft	2	2.2	2.4	2.6	2.8	3.0	3.2
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12	11	10	10	9	9	9
	I	Ft	12	13	14	17	18	21	26
	W	Ft	34	34	34	37	37	41	45
Mound Length	K	Ft	12	12	12	13	13	13	15
	L	Ft	49	49	49	51	51	51	55
Dist. Pipe Length	P[3]	Ft	12	12	12	12	12	12	12
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe[1]	—	—	5	5	5	5	5	5	5
Hole Spacing[1]	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	6	6	6	6	6	6	6
Manifold Diameter	—	In	2	2	2	2	2	2	2

1 Last hole is located 9" from end of dist. pipe.
2 On sites with 10-12% slope, the fill depth D may be reduced to 1.5 ft or the bed width may be reduced so E isn't so great.
3 This design is based on a manifold with dist. pipes on both sides. It could be designed using 24 ft. dist. pipes with manifold at end.
4 Beds can be any desired width.

Table 23

DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES 301 TO 450 GAL/DAY
PERMEABLE SOIL OVER CREVICED BEDROCK

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			3 to 60				3 to less than 30		
Slope	—	%	0	2	4	6	8	10[2]	12[2]
Bed Width	A[4]	Ft	10	10	10	10	10	10	10
Bed Length	B	Ft	38	38	38	38	38	38	38
Mound Height	D	Ft	2	2	2	2	2	2	2
	E	Ft	2	2.2	2.4	2.6	2.8	3.0	3.2
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12	11	10	10	9	9	9
	I	Ft	12	13	14	17	18	21	26
	W	Ft	34	34	34	37	37	41	45
Mound Length	K	Ft	12	12	12	13	13	13	15
	L	Ft	62	62	62	64	64	64	68
Dist. Pipe Length	P[3]	Ft	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe[1]	—	—	8	8	8	8	8	8	8
Hole Spacing[1]	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	¼	¼	¼	¼	¼	¼	¼
Manifold Length	R	Ft	6	6	6	6	6	6	6
Manifold Diameter	—	In	2	2	2	2	2	2	2

1 Last hole is located at end of dist. pipe which is 27" from previous hole.
2 On sites with 10-12% slope, the fill depth D may be reduced to 1.5 ft or the bed width may be reduced so E isn't so great.
3 Use a manifold with dist. pipes only on one side.
4 Beds can be any desired width.

Table 24

**DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES 451 TO 600 GAL/DAY
PERMEABLE SOIL OVER CREVICED BEDROCK**

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			3 to 60				3 to less than 30		
Slope	—	%	0	2	4	6	8	10[2]	12[2]
Bed Width	A[4]	Ft	10	10	10	10	10	10	10
Bed Length	B	Ft	50	50	50	50	50	50	50
Mound Height	D	Ft	2	2	2	2	2	2	2
	E	Ft	2	2.2	2.4	2.6	2.8	3.0	3.2
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	12	11	10	10	9	9	9
	I	Ft	12	13	14	17	18	21	26
	W	Ft	34	34	34	37	37	41	45
Mound Length	K	Ft	12	12	12	13	13	13	15
	L	Ft	74	74	74	76	76	76	78
Dist. Pipe Length	P[3]	Ft	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe[1]	—	—	10	10	10	10	10	10	10
Hole Spacing[1]	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	¼	¼	¼	¼	¼	¼	¼
Manifold Length	R	Ft	6	6	6	6	6	6	6
Manifold Diameter	—	In	2	2	2	2	2	2	2

1 Last hole is located 9" from end of dist. pipe.
2 On sites with 10-12% slope, the fill depth D may be reduced to 1.5 ft or the bed width may be reduced so E isn't so great.
3 Use a manifold with dist. pipes only on one side.
4 Beds can be any desired width.

Table 25

**DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES UP TO 150 GAL/DAY
PERMEABLE SOIL WITH HIGH GROUNDWATER**

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			0 to 60				0 to less than 30		
Slope	—	%	0	2	4	6	8	10	12
Bed Width	A	Ft	4	4	4	4	4	4	4
Bed Length	B	Ft	32	32	32	32	32	32	32
Mound Height	D	Ft	1	1	1	1	1	1	1
	E	Ft	1	1.1	1.2	1.2	1.3	1.4	1.5
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	9	9	8	8	7	7	6
	I	Ft	9	10	11	12	13	14	15
	W	Ft	22	23	23	24	24	25	25
Mound Length	K	Ft	10	10	10	10	10	11	11
	L	Ft	52	52	52	52	52	53	53
Dist. Pipe Length	P	Ft	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	2	2	2	2	2	2	2
No. of Holes per Dist. Pipe*	—	—	7	7	7	7	7	7	7
Hole Spacing*	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4

* Last hole is located at end of dist. pipe which is 21" from previous hole.

Table 26

**DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES 151 TO 300 GAL/DAY
PERMEABLE SOIL WITH HIGH GROUNDWATER**

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			0 to 60				0 to less than 30		
Slope	—	%	0	2	4	6	8	10	12
Bed Width	A	Ft	6	6	6	6	6	6	6
Bed Length	B	Ft	42	42	42	42	42	42	42
Mound Height	D	Ft	1	1	1	1	1	1	1
	E	Ft	1	1.1	1.2	1.4	1.5	1.6	1.8
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	9	9	8	8	7	7	6
	I	Ft	9	10	11	12	13	15	17
	W	Ft	24	25	25	26	26	28	29
Mound Length	K	Ft	10	10	10	10	10	11	11
	L	Ft	62	62	62	62	62	64	64
Dist. Pipe Length	P	Ft	20	20	20	20	20	20	20
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	4	4	4	4	4	4	4
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe *	—	Ft	9	9	9	9	9	9	9
Hole Spacing *	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	3	3	3	3	3	3	3
Manifold Diameter	—	In	2	2	2	2	2	2	2

* Last hole is located at end of dist. pipe which is 15" from previous hole.

Table 27

**DESIGN CRITERIA FOR MOUND BEDS
LOADING RATES 301 TO 450 GAL/DAY
PERMEABLE SOIL WITH HIGH GROUNDWATER**

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			0 to 60				0 to less than 30		
Slope	—	%	0	2	4	6	8	10	12
Bed Width	A	Ft	8	8	8	8	8	8	8
Bed Length	B	Ft	47	47	47	47	47	47	47
Mound Height	D	Ft	1	1	1	1	1	1	1
	E	Ft	1	1.2	1.3	1.5	1.6	1.8	2.0
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	9	9	8	8	7	7	6
	I	Ft	9	11	12	13	15	17	18
	W	Ft	26	28	28	29	30	32	32
Mound Length	K	Ft	10	10	10	10	11	11	12
	L	Ft	67	67	67	67	69	69	71
Dist. Pipe Length	P	Ft	23	23	23	23	23	23	23
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	In	32	32	32	32	32	32	32
No. of Holes per Dist. Pipe*	—	—	10	10	10	10	10	10	10
Hole Spacing*	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	64	64	64	64	64	64	64
Manifold Diameter	—	In	2	2	2	2	2	2	2

* Last hole is located at end of dist. pipe which is 21" from previous hole.

Table 28

DESIGN CRITERIA FOR MOUND BEDS
LOADING RATE 451 TO 600 GAL/DAY
PERMEABLE SOIL WITH HIGH GROUNDWATER

PARAMETER	SYMBOL	UNITS	PERCOLATION RATE MIN/IN						
			0 to 60				0 to less than 30		
Slope	—	%	0	2	4	6	8	10	12
Bed Width	A	Ft	10	10	10	10	10	10	10
Bed Length	B	Ft	50	50	50	50	50	50	50
Mound Height	D	Ft	1	1	1	1	1	1	1
	E	Ft	1	1.2	1.4	1.6	1.8	2	2.2
	F	Ft	.75	.75	.75	.75	.75	.75	.75
	G	Ft	1	1	1	1	1	1	1
	H	Ft	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Mound Width	J	Ft	9	8	8	8	7	7	6
	I	Ft	9	11	13	14	17	18	19
	W	Ft	28	29	31	32	34	35	35
Mound Length	K	Ft	10	10	10	10	11	11	12
	L	Ft	70	70	70	70	72	72	74
Dist. Pipe Length	P	Ft	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Dist. Pipe Diameter	—	In	1	1	1	1	1	1	1
No. of Dist. Pipes	—	—	6	6	6	6	6	6	6
Dist. Pipe Spacing	S	Ft	3	3	3	3	3	3	3
No. of Holes per Dist. Pipe*	—	—	10	10	10	10	10	10	10
Hole Spacing*	—	In	30	30	30	30	30	30	30
Hole Diameter	—	In	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Manifold Length	R	Ft	6	6	6	6	6	6	6
Manifold Diameter	—	In	2	2	2	2	2	2	2

* Last hole is 9" from end of dist. pipe.

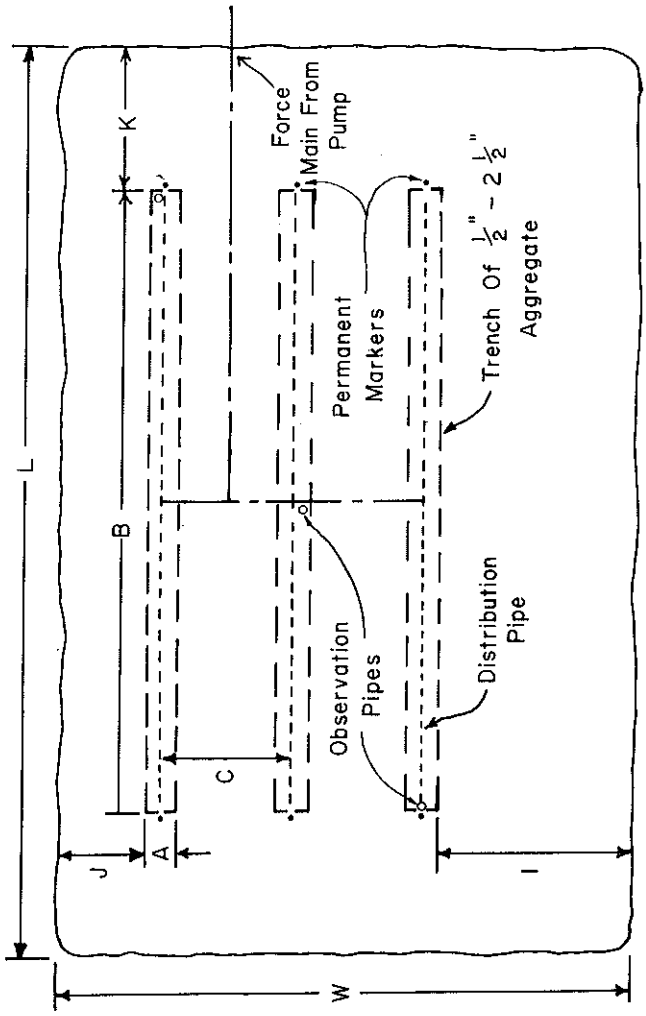


Figure 1

Mound Using 3 Trenches For Absorption Area

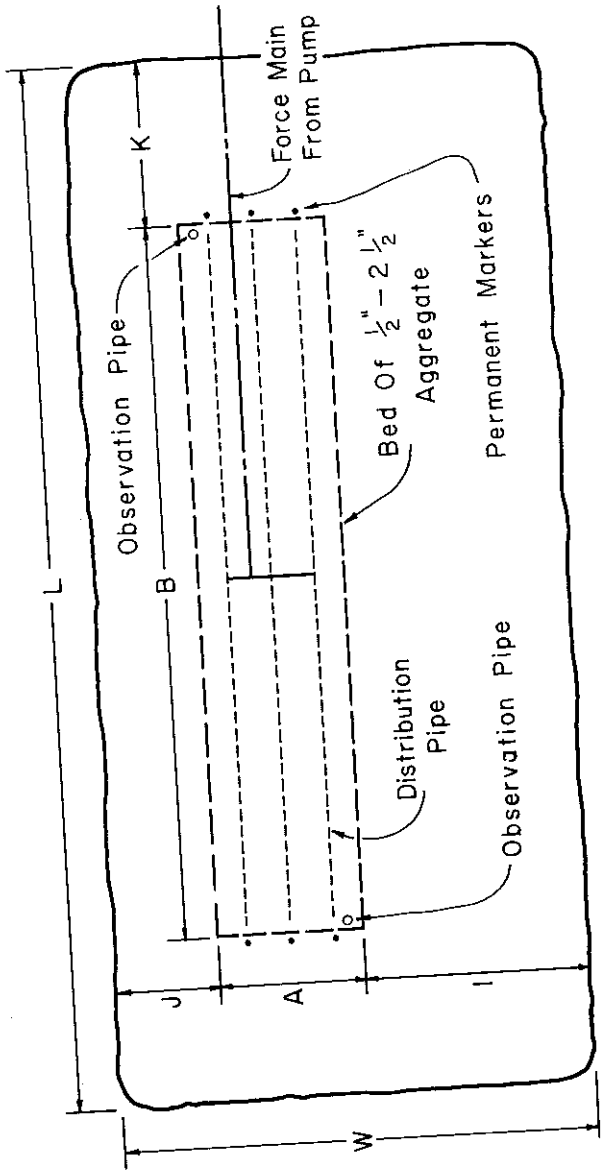
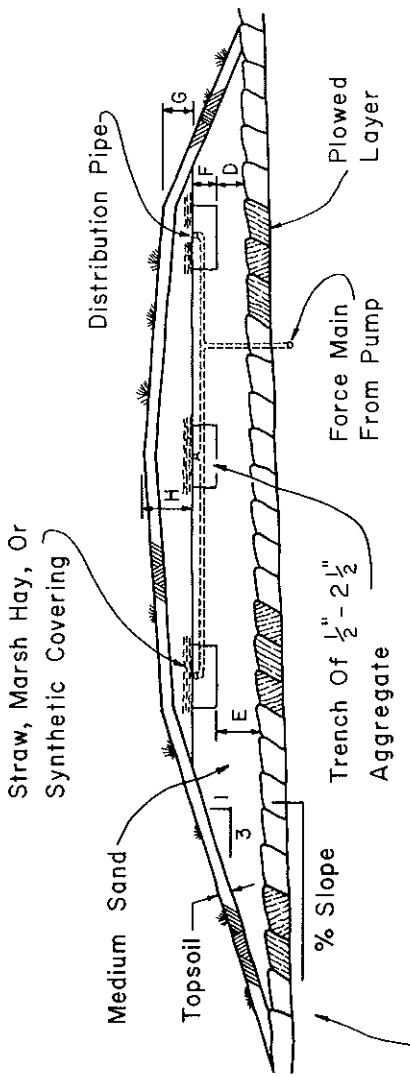


Figure 2

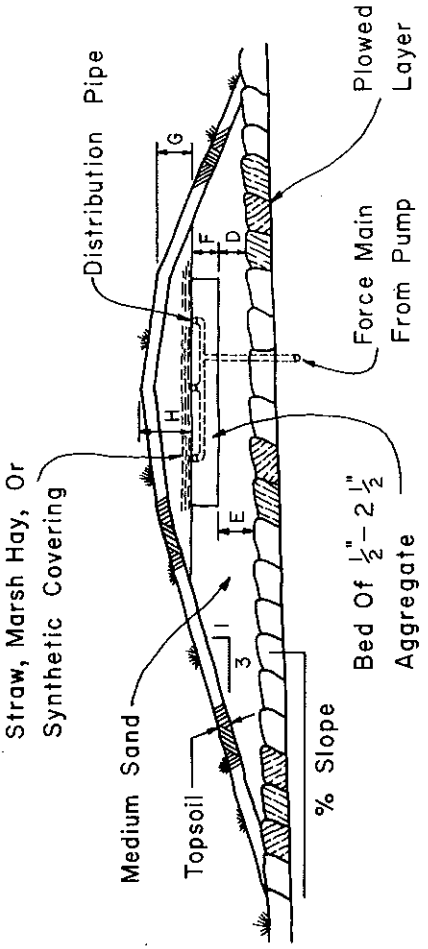
Plan View Of Mound Using A Bed For The Absorption Area

Figure 3

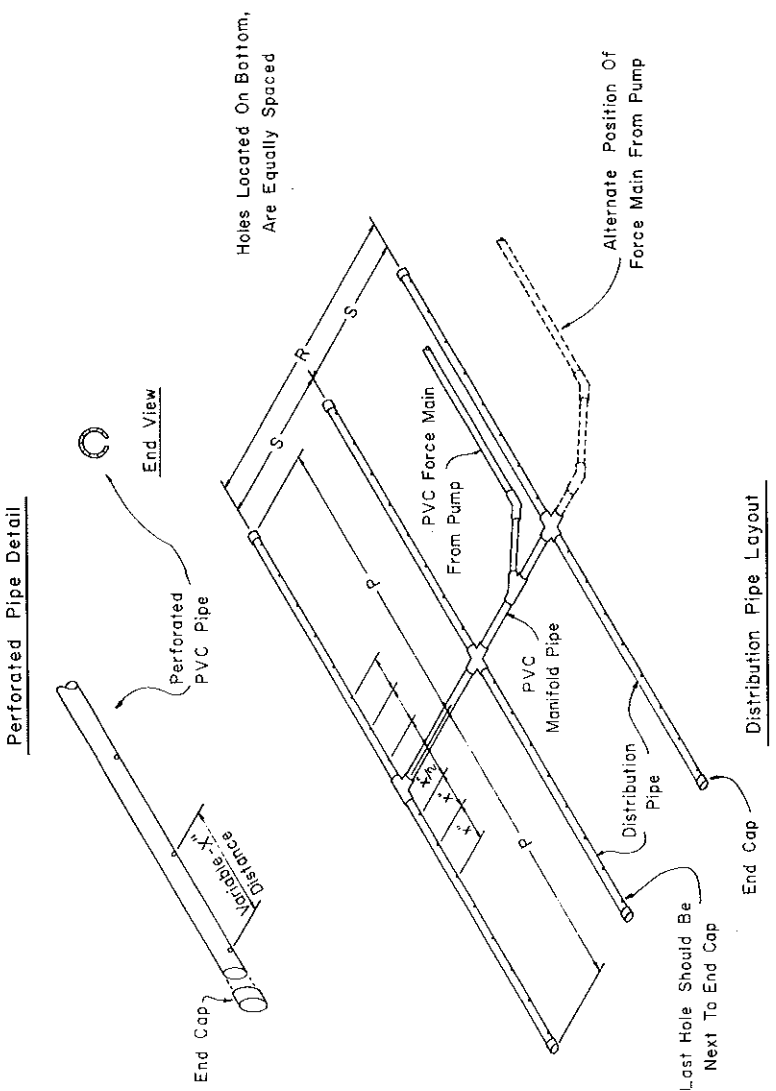


Cross Section Of A Mound System Using 3 Trenches For The Absorption Area

Figure 4



Cross Section Of A Mound System Using A Bed For The Absorption Area


Perforated Pipe Detail
End View
Perforated PVC Pipe
Variable "X" Distance
End Cap
Holes Located On Bottom, Are Equally Spaced
R
S
S
d
PVC Force Main From Pump
PVC Manifold Pipe
Alternate Position Of Force Main From Pump
Distribution Pipe
End Cap
Last Hole Should Be Next To End Cap
Distribution Pipe Layout

(3) CONSTRUCTION TECHNIQUES. Construction shall not commence if the soil is too wet. The soil is too wet for construction if at any level to a depth of 8 inches a soil wire can be formed by rolling the soil between the hands. Installation of mound systems when the soil on the site is frozen is prohibited for new construction.

(a) *Site preparation.* 1. Excess vegetation. Excess vegetation shall be cut and removed from the area of the mound. Small trees shall be cut to grade surface leaving the stumps in place.

2. Force main. The force main from the pumping chamber shall be installed before the mound site is plowed. The force main should be sloped uniformly towards the pumping chamber so that it drains after each dose.

3. Plowing. The site shall be plowed with a mold board plow or chisel plow. The site shall be plowed to a depth of 7 to 8 inches with the plowing perpendicular to the slope. Rototillers shall not be used. The sand fill shall be placed immediately after plowing. After plowing, all foot and vehicular traffic shall be kept off the plowed area.

(b) *Sand fill material.* 1. Fill quality. The fill material shall be medium sand texture which is defined as 25% or more very coarse, coarse and medium sand and less than 50% fine and very fine sand. The percentage of soil plus 1½ times the percentage of clay shall not exceed 15%. Fill materials with higher contents of silt and clay shall not be used.

2. Placement of sand fill. The medium sand fill shall be moved into place from the upslope and side edges of the plowed area. Vehicular traffic is prohibited in the area extending to 25 feet beyond the downslope edge of the mound. The sand fill shall be moved into place with a track-type tractor. A minimum of 6 inches of sand shall be kept beneath the tracks at all times.

3. Installation of the absorption area. Form the bed or trenches within the sand fill. The bottom of the trenches or bed shall be level. The elevation of the bottom of the trenches or bed shall be checked at the upslope and downslope edges to make certain that the fill has been placed to the proper depth.

4. Placement of the aggregate. A minimum of 6 inches of coarse aggregate ranging in size from ½ inch to 2½ inches shall be placed in the bed or trench excavation. The top of the aggregate shall be level.

5. Distribution system. Place the distribution system on the aggregate with the holes on the bottom of the distribution lines.

6. Cover. The top of the bed or trenches shall be covered with a minimum of 2 inches of aggregate ranging in size from ½ inch to 2½ inches. A minimum of 4 to 5 inches of uncompacted straw or marsh hay, or synthetic fabric approved by the department shall be placed over the aggregate. The cap and top soil cover shall be placed. The mound shall be seeded immediately and protected from erosion.

7. Maintenance. Maintenance shall be performed in accord with s. ILHR 83.16 (1). When the septic tank is pumped the pump chamber

shall be inspected and shall be pumped to remove any solids if present. Excess traffic in the mound area shall be avoided.

History: Cr. Register, December, 1980, No. 300, eff. 1-1-81; renum. from H 63.23, Register, June, 1983, No. 330, eff. 7-1-83; am. (1) (b) 1., 2. and 3., Register, June, 1991, No. 426, eff. 7-1-91; r. and recr. (1) (a), (d), (e), (2) (a), (d) 1. (intro.), a., (e) 1., (g) and (h), r. (2) (intro.), (3) and Tables 14 and 16, cr. (2) (d) 1. am. and Table 14, renum. (4) to be (3), Register, April, 1992, No. 436, eff. 5-1-92; correction in (2) (a) made under s. 13.93 (2m) (b) 7, Stats., Register, April, 1992, No. 436.

APPENDIX

CHAPTER ILHR 83
WIS. ADM. CODE

FORMS USED BY THE DEPARTMENT IN ADMINISTRATION OF THIS ADMINISTRATIVE CODE

INSTRUCTIONS AND EXAMPLE OF SIZING PRESSURE DISTRIBUTION SYSTEMS

DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

REPORT ON SOIL BORINGS AND PERCOLATION TESTS (115)

(H63.09(1) & Chapter 145,045)

SAFETY & BUILDINGS DIVISION
P.O. BOX 7969
MADISON, WI 53707

LOCATION: ¼ ¼	SECTION: /T N/R E (or) W	TOWNSHIP MUNICIPALITY	LOT NO.	BLK. NO.	SUBDIVISION NAME
COUNTY:	OWNER'S/BUYER'S NAME:	MAILING ADDRESS			

USE: ☐ Residence | NO. BEDRMS. | COMMERCIAL DESCRIPTION: | ☐ New ☐ Replace

DATES OBSERVATIONS MADE: PROFILE DESCRIPTIONS | PERCOLATION TESTS

RATING: S= Site suitable for system U= Site unsuitable for system

CONVENTIONAL: ☐S ☐U	MOUND: ☐S ☐U	IN-GROUND PRESSURE: ☐S ☐U	SYSTEM IN FILL: ☐S ☐U	HOLDING TANK: ☐S ☐U	RECOMMENDED SYSTEM (optional)

If Percolation Tests are NOT required under s.H63.09(5)(b), indicate:

DESIGN RATE:

If any portion of the system is in the Floodplain, indicate Flood(plain)elevation

PROFILE DESCRIPTIONS

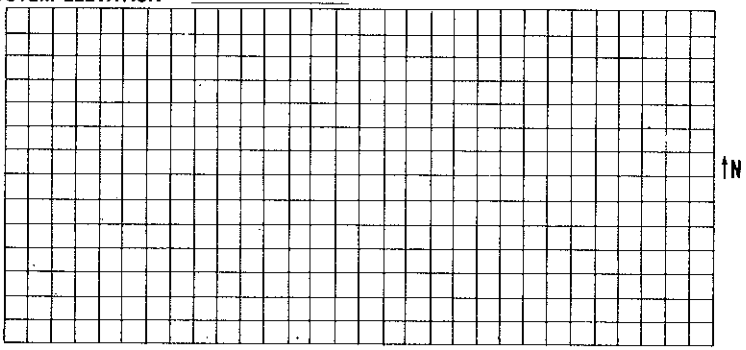
BORING NUMBER	TOTAL DEPTH IN	ELEVATION	DEPTH TO GROUNDWATER IN INCHES: OBSERVED	EST. HIGHEST	CHARACTER OF SOIL WITH THICKNESS, COLOR, TEXTURE, AND DEPTH TO BEDROCK (IF OBSERVED SEE ABBRV. ON BACK.)
B-					
B-					
B-					
B-					
B-					
B-					

PERCOLATION TESTS

TEST NUMBER	DEPTH INCHES	WATER IN HOLE AFTER SWELLING	TEST TIME INTERVAL MIN.	DROP IN WATER LEVEL INCHES: PERIOD 1	PERIOD 2	PERIOD 3	RATE MINUTES PER INCH
P-							
P-							
P-							
P-							
P-							
P-							

PLOT PLAN: Show locations of percolation tests, soil borings and the dimensions of suitable soil areas. Indicate scale or distances. Describe what are the horizontal and vertical elevation reference points and show their location on the plot plan. Show the surface elevation at all borings and the direction and percent of land slope.

SYSTEM ELEVATION



I, the undersigned, hereby certify that the soil tests reported on this form were made by me in accord with the procedures and methods specified in the Wisconsin Administrative Code, and that the data recorded and the location of the tests are correct to the best of my knowledge and belief.

NAME (print)	TESTS WERE COMPLETED ON	
ADDRESS	CERTIFICATION NUMBER	PHONE NUMBER (optional)
	CST SIGNATURE	

DISTRIBUTION: Original and one copy to Local Authority, Property Owner and Soil Tester

ILHR SBD-6395 (R. 92-92)

DILHR

SANITARY PERMIT APPLICATION

In accord with ILHR 83.05, Wis. Adm. Code

COUNTY

STATE SANITARY PERMIT #

☐ Check if revision to previous application

STATE PLAN I.D. NUMBER

–Attach complete plans (to the county copy only) for the system, on paper not less than 8½ x 11 inches in size.

–See reverse side for instructions for completing this application.

I. APPLICANT INFORMATION – PLEASE PRINT ALL INFORMATION.

PROPERTY OWNER			PROPERTY LOCATION ¼ ¼, S T , N, R E (or) W	
PROPERTY OWNER'S MAILING ADDRESS			LOT #	BLOCK #
CITY, STATE	ZIP CODE	PHONE NUMBER ( )	SUBDIVISION NAME OR CSM NUMBER	

II. TYPE OF BUILDING: (Check one) ☐ State Owned ☐ Public ☐ 1 or 2 Fam. Dwelling–# of bedrooms ____

☐ CITY ☐ VILLAGE ☐ TOWN OF: NEAREST ROAD

PARCEL TAX NUMBER(S)

III. BUILDING USE: (If building type is public, check all that apply)

1 ☐ Apt/Condo
2 ☐ Assembly Hall
3 ☐ Campground
4 ☐ Church/School
5 ☐ Hotel/Motel
6 ☐ Medical Facility/Nursing Home
7 ☐ Merchandise: Sales/Repairs
8 ☐ Mobile Home Park
9 ☐ Office/Factory
10 ☐ Outdoor Recreational Facility
11 ☐ Restaurant/Bar/Dining
12 ☐ Service Station/Car Wash
13 ☐ Other: Specify _____

IV. TYPE OF PERMIT: (Check only one in line A. Check line B if applicable)

A) 1. ☐ New System 2. ☐ Replacement System 3. ☐ Replacement of Tank Only 4. ☐ Reconnection of Existing System 5. ☐ Repair of an Existing System

B) ☐ A Sanitary Permit was previously issued. Permit # _____ Date Issued _____

V. TYPE OF SYSTEM: (Check only one)

Non-Pressurized Distribution	Pressurized Distribution	Experimental	Other
11 ☐ Seepage Bed	21 ☐ Mound	30 ☐ Specify Type _____	41 ☐ Holding Tank
12 ☐ Seepage Trench	22 ☐ In-Ground Pressure		42 ☐ Pit Privy
13 ☐ Seepage Pit			43 ☐ Vault Privy
14 ☐ System-In-Fill			

VI. ABSORPTION SYSTEM INFORMATION:

1. GALLONS PER DAY	2. ABSORP. AREA REQUIRED (sq. ft.)	3. ABSORP. AREA PROPOSED (sq. ft.)	4. LOADING RATE (Gals/day/sq. ft.)	5. PERC. RATE (Min./Inch)	6. SYSTEM ELEV. Feet	7. FINAL GRADE ELEVATION Feet

VII. TANK INFORMATION

	CAPACITY in gallons New Tanks	CAPACITY in gallons Existing Tanks	Total Gallons	# of Tanks	Manufacturer's Name	Prefab. Concrete	Site Constructed	Steel	Fiberglass	Plastic	Exper. App.
Septic Tank or Holding Tank						☐	☐	☐	☐	☐	☐
Lift Pump Tank/Siphon Chamber						☐	☐	☐	☐	☐	☐

VIII. RESPONSIBILITY STATEMENT

I, the undersigned, assume responsibility for installation of the onsite sewage system shown on the attached plans.

Plumber's Name (Print):	Plumber's Signature: (No Stamps)	MP/MPRSW No.:	Business Phone Number: ( )
Plumber's Address (Street, City, State, Zip Code):			

IX. COUNTY/DEPARTMENT USE ONLY

☐ Approved	☐ Disapproved ☐ Owner Given Initial Adverse Determination	Sanitary Permit Fee (Includes Groundwater Surcharge Fee)	Date Issued	Issuing Agent Signature (No Stamps)

X. CONDITIONS OF APPROVAL/REASONS FOR DISAPPROVAL:

SBD-6398 (formerly Pib-67) (R. 11/88) DISTRIBUTION: Original to County, One Copy To: Safety & Buildings Division, Owner, Plumber

DILHR

SANITARY PERMIT TRANSFER/RENEWAL

(PLB 67-T)

_____ COUNTY

UNIFORM PERMIT # _____

PERMIT RENEWAL DATE:	PERMIT TRANSFER DATE	ORIGINAL PERMIT ISSUANCE DATE:	STATE PLAN I.D. NUMBER:
PROPERTY LOCATION: ¼ ¼,S ,T N,R E (or) W		CITY: VILLAGE: TOWN OF:	
LOT NUMBER:	BLOCK NUMBER:	SUBDIVISION NAME:	NEAREST ROAD, LAKE OR LANDMARK:

PREVIOUS SANITARY PERMIT HOLDER (IF CHANGED):

NAME:	SIGNATURE:	PHONE NUMBER:
ADDRESS:		

SANITARY PERMIT TRANSFERRED TO:

NAME:	PHONE NUMBER:
ADDRESS:	

I, the undersigned, hereby assume responsibility for installation of the private sewage system that has previously been approved for this property.

PLUMBER'S SIGNATURE:		PREVIOUS PLUMBER'S NAME (IF CHANGED):	
PLUMBER'S ADDRESS:		PREVIOUS PLUMBER'S ADDRESS:	
MP/MPRSW NUMBER:	PHONE NUMBER: ( )	MP/MPRSW NUMBER:	PHONE NUMBER: ( )

SIGNATURE OF ISSUING AGENT:	DATE APPROVED:

DILHR-SBD-6399 (R. 5/82)

DISTRIBUTION: Original - County
Copy - Bureau of Plumbing
Copy - Owner
Copy - Plumber

PLB 68 _____ COUNTY

SANITARY PERMIT

_____

OWNER _____

PLUMBER _____ LIC. # _____

TOWN OF _____ LOCATED _____

_____ SEC _____ T _____ N;R _____ ☐

AND/OR LOT _____ BLOCK _____

_____ SUBDIVISION

CHAPTER 145.135 WISCONSIN STATUTES

(a) The purpose of the sanitary permit is to allow installation of the private sewage system described in the application for permit.

(b) The approval of the sanitary permit is based on regulations in force on the date of issue.

(c) The sanitary permit is valid for 2 years from original date of issuance and may be renewed for similar periods thereafter. Application for renewal shall be made through the county and shall comply with regulations in effect at the time.

(d) Changed regulations will not impair the validity of a sanitary permit until the time of renewal.

(e) Renewal of the sanitary permit will be based on regulations in force at the time renewal is sought. Changed regulations may impede renewal.

(f) The sanitary permit is transferable. A sanitary permit transfer shall be obtained from the county authority.

* If you wish to renew the permit, or transfer ownership of the permit, please contact the county authority.

_____ AUTHORIZED ISSUING OFFICER - DATE _____

THIS PERMIT EXPIRES _____ UNLESS RENEWED BEFORE THAT DATE

POST IN PLAIN VIEW

VISIBLE FROM THE ROAD FRONTING THE LOT
DURING CONSTRUCTION

SBD-6499 (R. 11/88)

PLB 68-T

COUNTY

SANITARY PERMIT

No. _____

TRANSFER/RENEWAL

OWNER _____

PLUMBER _____ LIC. # _____

TOWN OF _____ LOCATED _____

_____ SEC _____ T _____ N;R _____ ☐

AND/OR LOT _____ BLOCK _____

_____ SUBDIVISION

CHAPTER 145.135 WISCONSIN STATUTES

(a) The purpose of the sanitary permit is to allow installation of the private sewage system described in the application for permit.

(b) The approval of the sanitary permit is based on regulations in force on the date of issue.

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(d) Changed regulations will not impair the validity of a sanitary permit until the time of renewal.

(e) Renewal of the sanitary permit will be based on regulations in force at the time renewal is sought. Changed regulations may require renewal.

(f) The sanitary permit is transferable. A sanitary permit transfer shall be obtained from the county authority.

(g) If you wish to renew the permit or transfer ownership of the permit, please contact the county authority.

_____ AUTHORIZED ISSUING OFFICER - DATE _____

THIS PERMIT EXPIRES _____ UNLESS RENEWED BEFORE THAT DATE

POST IN PLAIN VIEW

VISIBLE FROM THE ROAD FRONTING THE LOT
DURING CONSTRUCTION

DILHR SBD 6494 (Rev. 04/82)

Wisconsin Department of Industry,
Labor and Human Relations
Safety & Buildings Division
Bureau of Building Water Systems

INSPECTION REPORT

Inspection Date			
Name of Premises	Address or Legal Description	City/Township	County

Master Plumber Name and Address	Master Plumber Firm Name and Address	Plan I.D. No.
		Sanitary Permit No.
Journeyman Plumber/Soil Tester	Licensed Person's Name(s) and License Number(s)	
Owner's Name and Address		

Page ____ of ____

Signature of Responsible Licensed Person (only one needed)

Signature of Plumbing Consultant/Private Sewage Consultant

SBD-6192 (R. 11/90) Original: District Copies to: (Check all that apply) ☐ DILHR ☐ Plumber ☐ Owner ☐ County/Local Insp. ☐ Other ____

Wisconsin Department of Industry, Labor and Human Relations
Safety and Buildings Division

PRIVATE SEWAGE SYSTEM INSPECTION REPORT (ATTACH TO PERMIT)

County:
Sanitary Permit No :
State Plan ID No :
Parcel Tax No :

GENERAL INFORMATION

Permit Holder's Name:	☐ City ☐ Village ☐ Town of:	
CST BM Elev :	Insp. BM Elev.:	BM Description:

TANK INFORMATION

TYPE	MANUFACTURER	CAPACITY
Septic		
Dosing		
Aeration		
Holding		

TANK SETBACK INFORMATION

TANK TO	P / L	WELL	BLDG.	Vent to Air Intake	ROAD
Septic					NA
Dosing					NA
Aeration					NA
Holding					

PUMP / SIPHON INFORMATION

Manufacturer		Demand
Model Number		GPM

TDH	Lift	Friction Loss	System Head	TDH	Ft

Forcemain	Length	Dia.	Dist. To Well

ELEVATION DATA

STATION	BS	HI	FS	ELEV.
Benchmark				
Bldg. Sewer				
St / Ht Inlet				
St / Ht Outlet				
Dt Inlet				
Dt Bottom				
Header / Man.				
Dist. Pipe				
Bot. System				
Final Grade				

SOIL ABSORPTION SYSTEM

BED / TRENCH DIMENSIONS	Width	Length	No. Of Trenches

SETBACK INFORMATION	SYSTEM TO	P / L	BLDG	WELL
	Type Of System.			

PIT DIMENSIONS	No. Of Pits	Inside Dia	Liquid Depth

LAKE / STREAM	LEACHING CHAMBER OR UNIT	Manufacturer:
		Model Number:

DISTRIBUTION SYSTEM

Header / Manifold	Distribution Pipe(s)	x Hole Size	x Hole Spacing	Vent To Air Intake
Length ____ Dia ____	Length ____ Dia ____ Spacing ____			

SOIL COVER

x Pressure Systems Only xx Mound Or At-Grade Systems Only

Depth Over Bed / Trench Center	Depth Over Bed / Trench Edges	xx Depth Of Topsoil	xx Seeded / Sodded	xx Mulched
			☐ Yes ☐ No	☐ Yes ☐ No

COMMENTS: (Include code discrepancies, persons present, etc.)

Plan revision required? ☐ Yes ☐ No
Use other side for additional information.

SBD-6710 (R 05/91)

Date	Inspector's Signature	Cert No

Wisconsin Department of Industry, Labor and Human Relations

SOIL DESCRIPTION REPORT

(Attach Soil Profile Location Map - To Scale - On A Separate, Signed Sheet)

Safety & Buildings Division
P.O. Box 7969
Madison, WI 53707

Page ___ of ___

Customer Name	Soil Evaluation Date	Current Land Use or Vegetative Cover	Parent Materials
Customer Address		Estimated Shallowest Groundwater	Flood Plain Elevation
County	Tax Parcel No.	System Loading Rate in Gallons Per Sq. Ft. Per Day	
Lot Legal Description		System Geometry and Depth	Slope and Aspect

Horizon	Depth In.	Dominant Color Munsell	Mottles Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Roots	Boundary	Remarks: clayskins pores, pH, and other	Loading GPD/ft.^{2}

Additional Remarks:

Other Site Features:

Limiting Factors/Depth: | CST Signature | Date Signed | ( ) Telephone No. | CST #

SBD-8330 (N. 01/90)

NOTE: Original Typed, Printed Or Written Form Must Be Submitted

REPORT ON SOIL BORINGS AND PERCOLATION TESTS

to

DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS, DIVISION OF SAFETY AND BUILDINGS

(Pursuant to H 65.06, Wisconsin Administrative Code)

NAME OF SUBDIVISION _____

LOCATION OF SUBDIVISION: CITY _____ VILLAGE _____ TOWN _____ (Check One) OF _____ COUNTY _____ SECTION _____ ; TOWN _____ N; RANGE _____ E W

NAME OF OWNER _____

ADDRESS _____
(Number & Street) (Place) (State) (Zip Code)

NAME OF SUBDIVIDER _____

ADDRESS _____
(Number & Street) (Place) (State) (Zip Code)

SUBDIVISION WATER SUPPLY FROM: PUBLIC WATER SUPPLY _____ PRIVATE WELLS _____

SUBDIVISION DATA: AREA IN ACRES _____ NUMBER OF LOTS _____ MINIMUM LOT AREA, SQUARE FEET _____

DISTANCE TO NEAREST NAVIGABLE SURFACE WATER _____ FEET. (IF WITHIN ¼ MILE)

NAME OF LAKE OR STREAM _____

DATES OBSERVATIONS MADE: SOIL BORINGS _____ PERCOLATION TESTS _____

SOIL BORING TESTS

TEST NUMBER	TOTAL DEPTH INCHES	DEPTH TO GROUND WATER, INCHES		CHARACTER OF EACH SOIL LAYER WITH THICKNESS IN INCHES
		OBSERVED	ESTIMATED HIGHEST	
1 –				
2 –				
3 –				
4 –				
5 –				
6 –				
7 –				
8 –				
9 –				
10 –				
11 –				
12 –				
13 –				
14 –				
15 –				
16 –				
17 –				
18 –				
19 –				
20 –				
21 –				
22 –				
23 –				
24 –				
25 –				

NOTE: IF SPACE IS INADEQUATE TO REPORT ALL SOIL BORINGS, USE ADDITIONAL FORMS.
DILHR SBD-6309 (N. 12/80)

OVER

PERCOLATION TESTS

TEST NUMBER	DEPTH* INCHES	CHARACTERS OF SOIL THICKNESS IN INCHES*	HOURS SINCE HOLE IS WETTED	WATER IN HOLE AFTER SWELLING	TEST TIME INTERVAL IN MINUTES	DROP IN WATER LEVEL, INCHES			MINUTES TO FALL ONE INCH
						SECOND TO LAST PERIOD	NEXT TO LAST PERIOD	LAST PERIOD	
P-									
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*DEPTH IS TO BE REPORTED ON BASIS OF FINAL GRADE

NOTE: IF SPACE IS INADEQUATE TO REPORT ALL PERCOLATION TESTS, USE ADDITIONAL FORMS.

I, THE UNDERSIGNED, UNDER PENALTY OF PERJURY, HEREBY CERTIFY THAT THE SOIL BORINGS AND PERCOLATION TESTS REPORTED ON THIS FORM WERE MADE BY ME IN ACCORD WITH THE PROCEDURES AND METHODS SPECIFIED IN CHAPTER H 65, WISCONSIN ADMINISTRATIVE CODE, AND THAT THE DATA RECORDED ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME _____ TITLE AND CST NO. _____
(Type or Print)

ADDRESS _____

DATE _____ SIGNATURE _____

DILHR

ON-SITE INVESTIGATION FOR
CONVENTIONAL SYSTEM IN-FILL

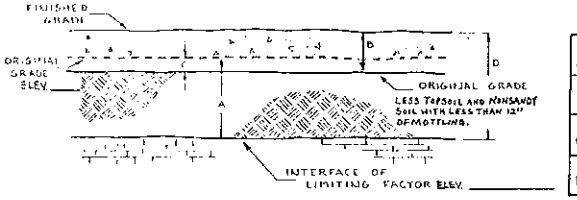
Safety & Buildings Division
Bureau Of Plumbing
P.O. BOX 7969
MADISON, WI 53707

Owners Name:		Legal Descriptions:	
Building Usage: ☐ New Building ☐ Replacement System ☐ Public ☐ Residential			No. of Bedrooms
Slope Feet Soil Absorption System Required:	Depth In Inches to Limiting Factor From Original Grade	Fill Is Placed To Overcome Depth To: ☐ Groundwater ☐ Bedrock	Fill Placed 20 Feet Around Area Proposed For Initial And Replacement Area ☐ Yes ☐ No
Date Fill Placed:	Topsoil and Nonsandy Soil Removed Prior to Placement of Fill: ☐ Yes ☐ No	Vegetation Removed Prior To Placement Of Fill: ☐ Yes ☐ No	Monitoring Required: ☐ Yes ☐ No
Texture Of Fill Material Same As Existing Soils: ☐ Yes ☐ No	Indicate Texture Of Fill Material:		Does Fill Conform To Section H 85.10(6) Wis. Admin. Code: ☐ Yes ☐ No

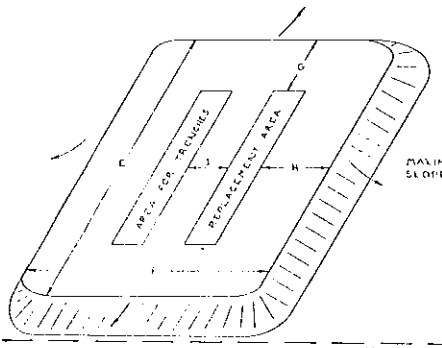
Explain Any Problems:

Complete The Following:

Bench Mark Elevation As Established On 115 _____ Finished Grade Elevation _____



Depth To Limiting Factor: A	
Depth Of Fill Material: B	
Depth of Topsoil and Nonsandy Soil With Less Than 12" of Mottling: C	
Finished Depth To Limiting Factor: D	



Total Length Of Area Filled: E	
Total Width Of Area Filled: F	
Dimension From Property Edge Of Trench To Edge Of Fill (min. 20') G	
Dimension From Proposed Edge Of Trench To Edge Of Fill (min. 20') H	
Separation Of Trenches (min. 6') I	

Signature of County Representative/On-Site Waste Specialist

DILHR SBD-6196 (R.02/83)

Name: _____ Date: _____

Department of Industry, Labor and Human Relations

GROUNDWATER MONITORING REPORT

Safety & Buildings Division
P.O. Box 7969
Madison, Wisconsin 53707

Location: ¼ ¼S /T N/R E(or)W	Lot No.	Block No.
Township/Municipality:		
County:	Owner's Name:	
Mailing Address:		
WELL NUMBER:		
WELL DEPTH:		

☐ PROPOSED SUBDIVISION ☐ INDIVIDUAL LOT

Rainfall Data Obtained From:

MONTHLY DATA					
Sept	Oct	Nov	Dec	Jan	Feb	Total(8.5")
March	April	May	Total (Need 7.6")		

Provide daily rainfall data on a separate sheet for March, April and May. Write total rainfall for March, April and May in the above boxes.

Note: Show depths in inches.

OBSERVATION DATE	DEPTH FROM SURFACE TO WATER/NONE WELL #	WELL #	WELL #	WELL #

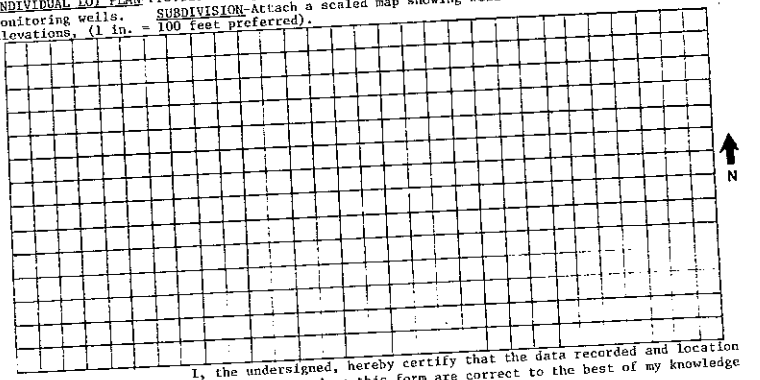
ARTIFICIAL DRAINAGE

Check the site for artificial drainage. If the site is affected by such drainage, submit complete details for the drainage system. CHECK ONE: will be responsible for maintenance of the drainage system. Indicate who

☐ No artificial drainage affecting this site. ☐ Information regarding artificial drainage affecting this site is attached.

Attach a SBD-6395(I15) or SBD-6309 (If a proposed subdivision), for soil information and estimated depth to high groundwater using mottling. Submit 2 copies of the Groundwater Monitoring Report to the Bureau of Plumbing, P.O. Box 7969, Madison, WI 53707 and submit 1 copy to the local authority.

INDIVIDUAL LOT PLAN-Provide a diagram showing accurate locations and surface elevations of all monitoring wells. SUBDIVISION-Attach a scaled map showing well locations and relative elevations, (1 in. = 100 feet preferred).



I, the undersigned, hereby certify that the data recorded and location of tests reported on this form are correct to the best of my knowledge and belief.

Date:	CST No:	Signature:

SBD-6412(R.12/87)

Wisconsin Department of Industry, Labor and Human Relations
Safety and Buildings Division

GROUNDWATER LEVEL MONITORING REPORT
(Hydrograph Method)

Office of Division Codes & Application
P O Box 7969
Madison, WI 53707
(608) 266-3815

Provide location description below:

County	Tax Parcel Number	Location 1/4 1/4	Section /T N/R E(or)W
Township/Municipality	Lot No.	Blk. No.	Subdivision Name/C.S.M. Number
Owner's/Buyer's Name	Owner's/Buyer's Mailing Address		

See instructions on the reverse side for items 1, 2 and 3 below.

REQUIRED DATA

1a. Observation Well Identification Number .....
1b. Observation Well Name (if applicable) .....
1c. Existing Water Level In Observation Well .....
Date Observation Made .....
1d. Assigned High Water Level .....
1e. Calculated Adjustment Factor .....

2a. Depth To Water Level At Proposed Location .....
Date Observation Made .....
2b. Calculated Adjustment Factor (if applicable) .....
2c. Maximum Depth Of Suitable Soil .....
2d. Estimated High Groundwater Level .....

OPTIONAL

3a. Observation Well Surface Elevation .....
3b. Estimated U.S.G.S. Elevation At Boring .....
3c. Recommended Private Sewage System .....
3d. Recommended Private Sewage System Elevation .....

CST Comments:

CERTIFIED SOIL TESTER VERIFICATION:

I, the undersigned, certify that the data reported on this form was obtained by me in accordance with the procedures and methods specified, and that the data recorded and the location of the tests are correct to the best of my knowledge and belief.

Name (print)	Certification Number	Telephone Number (optional)
Address	CST Signature	

COUNTY PERSONNEL VERIFICATION:

County Personnel Comments

I, the undersigned, verify the information recorded on this form is accurate and correct to the best of my knowledge and belief

On-Site Inspection Date (if applicable)	Signature of County Authority	Title

SBD-7987 (N. 05/88)

Copy Distribution: White - County; Yellow - DILHR; Green - Property Owner; Pink - Soil Tester

GROUNDWATER MONITORING REPORT INFORMATION AND INSTRUCTIONS

ILHR 83.09 (7) (b) states that "Where sites are subject to broad regional water tables such as large areas of sands or soils, the fluctuation of water level(s) over the several year cycle must be considered." The Hydrograph method of groundwater monitoring is available for sites which meet these criteria. A soil boring report must be completed to confirm there are no finer textured layers interbedded in the sand which could cause perching of water above a regional water table.

The descriptions below correspond to the items requested on the reverse side. It is important that all requested data be provided so the report is accurate and complete.

1a. Observation Well Identification: Can be obtained from published Hydrographs maintained by the Wisconsin Geological and Natural History Survey, and available through the county.

1b. Observation Well Name: Some wells used to obtain groundwater level information are not part of the U.S.G.S./G.N.H.S. reporting system. Provide any formally assigned name or method of identification.

1c. Existing Water Level in Observation Well: Measure the depth to groundwater from ground at the observation well site.

1d. Assigned High Water Level: Any Hydrograph which has been accepted for use as part of this groundwater monitoring procedure, has been assigned a high water level which must be used to calculate an adjustment factor used as part of this procedure. This figure can be obtained from the County.

1e. Calculated Adjustment Factor: Subtract the assigned high water level from the existing water level in the observation well to obtain this figure.

2a. Depth To Water Level At Proposed System Location: Measure the depth to groundwater from ground surface at the proposed system location.

2b. Calculated Adjustment Factor: Use the figure obtained in step 1e.

2c. Maximum Depth Of Suitable Soil: Subtract the calculated adjustment factor from the water level depth at the proposed system location.

2d. Estimated High Groundwater Level: Obtain from Soil Boring & Percolation Report Form (115).

Note: Completion of Section 3 is optional. However, information provided in this section may be helpful in assisting County Personnel in evaluating this Report.

Plan Identification No. _____

Gentlemen:

We have received a (PLB. 119) Groundwater Monitoring Report form from _____, CST for the _____ property located in the _____

_____.

Please answer or verify the following and return to this office. Monitoring data will be reviewed upon receipt of this information.

1. Were you notified by the CST of the intent to monitor groundwater levels at the above-mentioned site?

2. Were the wells propery installed?

3. Provide all observations you made during the time the site was monitored.

4. Did the soil tester monitor the site according to chapter ILHR 83, Wis. Adm. Code?

5. List any comments or pertinent information.

_____

Signature of Person Completing Form

STATE OF WISCONSIN-DEPARTMENT OF INDUSTRY, LABOR & HUMAN RELATIONS
DIVISION OF SAFETY & BUILDINGS - BUREAU OF PLUMBING
P.O. BOX 7969 - MADISON, WI, 53707

APPLICATION FOR THE USE OF AN ALTERNATIVE SYSTEM

cation: ¼ | ¼ S | T N/R E(or)W

Township/Municipality:

County:

Subdivision:

Street Address:

Mailing Address:

Landowners Name:

I (We), the undersigned, hereby make application for an alternative system on the above-described premises. I recognize that the above premises are not suited for a conventional private sewage system. If approval is granted, I agree to have the system installed in conformance with the Bureau's approval of plans and specifications.

I further understand that an alternative system is more complex in nature than a conventional private sewage system and as such will require detailed inspection during construction and monitoring after the system is put into use. I agree to permit both county officials charged with administering county sanitary ordinances and Bureau employes or other authorized persons to have access to the above described premises at any reasonable time for the purpose of inspection the construction of or monitoring of the system. I further agree to either personally or by my agent contact the proper county official to arrange the time and date to begin construction of the system.

I understand that this application does not permit me (the applicant) or my agent (the contractor) to begin installation. If the system is approved, the Bureau will send the applicant a letter of approval which authorizes construction of the alternative system after all necessary permits have been obtained.

I agree to give notice to any subsequent buyer that an application for an alternative system has been made and if installed, that the premises are served by an alternative system and further agree to give the buyer a copy of this application.

The Bureau accepts this application subject to this understanding and subject to all the conditions and obligations set out in this application.

_____ _____
Signature of Applicant Date

Subscribed and sworn to before me

STATE OF WISCONSIN } SS.
COUNTY OF _____ }

This _____ day of _____ 19___.

_____
Notary Public, State of Wisconsin

My Commission Expires: _____

DILHR-SBD-6413 (N. 05/81)

State of Wisconsin \ Department of Industry, Labor and Human Relations

SAFETY & BUILDINGS DIVISION
201 E. Washington Avenue
P.O. Box 7969
Madison, Wisconsin 53707
(608) 267-5119

APPLICATION FOR THE USE OF AN AT-GRADE SYSTEM

Location: Township/Municipality:

1/4 1/4 Section T N R E (or) W

Street Address: Subdivision: County:

Landowners Name: Mailing Address:

I, the undersigned, make application for an at-grade onsite sewage treatment system on the above described premises. If approval is granted, I agree to have the system constructed in conformance with the plans and specifications approved by the Department of Industry, Labor and Human Relations (DILHR).

I further understand that an at-grade system is considered an experimental onsite sewage system, and as such, will require detailed inspection during construction and monitoring after the system is put into use. I agree to permit county officials charged with administering county sanitary ordinances and DILHR employes, or other authorized persons such as the system designer, to have access to the above described premises at any reasonable time for the purpose of inspecting the construction, or monitoring the system. I agree to contact DILHR or county officials to arrange the time and date to begin construction of the system after I obtain a sanitary permit. I agree to pay the cost of monitoring wells required by DILHR for the purpose of measuring the wastewater treatment performance of this at-grade system.

I understand that this application does not permit me or my contractor to begin construction. (If the system is approved, DILHR will send the applicant a letter of approval, which authorizes construction of the system after all necessary permits have been obtained.)

I agree to give notice to any subsequent buyer that an application for an at-grade system has been made, and if installed, that the premises are served by an at-grade system. I further agree to give the buyer a copy of this application.

Signature of Applicant (valid only if notarized) Date

STATE OF WISCONSIN

COUNTY OF

Subscribed and sworn to before me this

(Date:)

Notary Public, State of Wisconsin

My Commission Expires:

SBD-8766 (N 06/90)

STATE OF WISCONSIN-DEPARTMENT OF INDUSTRY, LABOR & HUMAN RELATIONS
DIVISION OF SAFETY & BUILDINGS - BUREAU OF PLUMBING
P.O. BOX 7969 - MADISON, WI, 53707

APPLICATION FOR THE USE OF AN ALTERNATIVE SYSTEM

Location: ¼ ¼ S T N/R E(or)W | Township/Municipality:

Street Address: | Subdivision: County:

Landowners Name: | Mailing Address:

I (We), the undersigned, hereby make application for an alternative system on the above-described premises. I recognize that the above premises are not suited for a conventional private sewage system. If approval is granted, I agree to have the system installed in conformance with the Bureau's approval of plans and specifications.

I further understand that an alternative system is more complex in nature than a conventional private sewage system and as such will require detailed inspection during construction and monitoring after the system is put into use. I agree to permit both county officials charged with administering county sanitary ordinances and Bureau employes or other authorized persons to have access to the above described premises at any reasonable time for the purpose of inspection the construction of or monitoring of the system. I further agree to either personally or by my agent contact the proper county official to arrange the time and date to begin construction of the system.

I understand that this application does not permit me (the applicant) or my agent (the contractor) to begin installation. If the system is approved, the Bureau will send the applicant a letter of approval which authorizes construction of the alternative system after all necessary permits have been obtained.

I agree to give notice to any subsequent buyer that an application for an alternative system has been made and if installed, that the premises are served by an alternative system and further agree to give the buyer a copy of this application.

The Bureau accepts this application subject to this understanding and subject to all the conditions and obligations set out in this application.

_____ Date
Signature of Applicant

STATE OF WISCONSIN } SS.
COUNTY OF_____ }

Subscribed and sworn to before me

This_____ day of_____ 19__.

_____
Notary Public, State of Wisconsin

My Commission Expires: _____

DILHR-SBD-6413 (N. 05/81)

Document No.	**HOLDING TANK AGREEMENT**	This space reserved for recording data
Agreement Date	This agreement is made between the	
County or Local Governmental Unit	(Holding Tank(s) Owner(s)	
(Called Municipality below)		
We acknowledge that application is being made for the installation of (a) holding tank(s) on the following property, (Provide legal land description:)		Return To

or that continued use of the existing premises requires that a holding tank be installed on the property for the purpose of proper containment of sewage. Also, the property cannot now be served by a municipal sewer, or any other type of private sewage system as permitted under Ch. ILHR 83, Wis. Adm. Code, or Ch. 145, Stats.

As an inducement to the County of _____ to issue a sanitary permit for the above described property, we agree to the following:

1. Owner agrees to conform to all applicable requirements of Ch. ILHR 83, Wis. Adm. Code relating to holding tanks. If the owner fails to have the holding tank properly serviced in response to orders issued by the municipality to prevent or abate a nuisance as described in ss. 146.13 and 146.14, Stats. the municipality may enter upon the property and service the tank or cause to have the tank serviced and charge the owner by placing the charges on the tax bill as a special assessment for current services rendered. The charges will be assessed as prescribed by s. 66.60, Stats.

2. Owner agrees to pay all charges and costs incurred by the municipality for inspection, pumping, hauling or otherwise servicing and maintaining the holding tank in such a manner as to prevent or abate any nuisance or health hazard caused by the holding tank. The municipality shall notify the owner of any costs which shall be paid by the owner within thirty (30) days from the date of notice. In the event the owner does not pay the costs within thirty (30) days, the owner specifically agrees that all of the costs and charges may be placed on the tax roll as a special assessment for the abatement of a nuisance, and the tax shall be collected as provided by law.

3. The owner, except as provided by s. 146.20 (3) (d), Stats., agrees to contract with a person who is licensed under Ch. NR 113, Wis. Adm. Code to have the holding tank serviced and to file a copy of the contract or the owner's registration with the municipality and with the county. The owner further agrees to file a copy of any changes to the service contract or a copy of a new service contract with the municipality and the county within ten (10) business days from the date of change to the service contract.

4. The owner agrees to contract with a person licensed under Ch. NR 113, Wis. Adm. Code who shall submit to the municipality and to the county a report in accord with s. ILHR 83.18 (4) (a) 2., Wis. Adm. Code for the servicing on a semiannual basis. In the case of registration under s. 146.20 (3) (d), Stats., the owner shall submit the report to the municipality and the county.

5. This agreement will remain in effect only until the local governmental unit responsible for the regulation of private sewage systems certifies that the property is served by either a municipal sewer or a soil absorption system that complies with Ch. ILHR 83, Wis. Adm. Code. In addition, this agreement may be cancelled by executing and recording said certification with reference to this agreement in such manner which will permit the existence of the certification to be determined by reference to the property.

6. This agreement shall be binding upon the owner, the heirs of the owner and assignees of the owner. The owner shall submit the agreement to the register of deeds and the agreement shall be recorded by the register of deeds in a manner which will permit the existence of the agreement to be determined by reference to the property where the holding tank is installed.

Owner(s) Name(s) (Print)	Owner(s) Signature(s)	Subscribed and sworn to before me on this date:
		_____
Municipal Official Name (Print)	Municipal Official Signature	_____ Notary Public
		My commission expires:
Municipal Official Title (Print)		_____

SBD-6123 (R. 10/88) This instrument was drafted by the State of Wisconsin Department of Industry, Labor and Human Relations.

SANITARY PERMIT SUBMITTAL FORM

COUNTY_____

DATE_____

TOTAL AMOUNT_____

TOTAL PERMITS_____

PERMITS BY NUMBER AND DATE ISSUED:

This form must accompany each group of Sanitary Permits upon submission for State Funding.

PLEASE USE ADDITIONAL SHEETS IF NECESSARY.

DILHR-SBD-6153 (N.7/80)

MATERIAL REQUEST

Safety and Buildings Division
Bureau of Building Water Systems
201 E. Washington Avenue, Rm 141
P.O. Box 7969
Madison, WI 53707

PLEASE MAIL ALL REQUESTS TO:

County of:	Telephone No.: ( )	Address Change: ☐ Yes ☐ No
Mailing Address:		Zip Code:

FORM NO.:	TITLE OF MATERIALS REQUESTED:	QUANTITY ORDERED:	QUANTITY SENT:
SBD-6499	Sanitary Permit		
SBD-6494	Sanitary Permit Transfer / Renewal		
SBD-6398	Sanitary Permit Application		
SBD-6399	Transfer / Renewal form For Sanitary Permit Application		
SBD-6710	Private Sewage System Inspection Report		
SBD-6153	Sanitary Permit Submittal Form		
SBD-6395	Report On Soil Borings And Percolation Tests (115)		
SBD-6412	Groundwater Monitoring Report		
SBD-6432	Privy Installation Agreement		
SBD-7009	Publ.: Is The Grass Greener Over Your Septic System?		
SBD-8330	Soil Description Report		
SBD-6232	Material Request		

STATE USE ONLY - ASSIGNMENT OF SANITARY PERMIT NUMBERS!

THE FOLLOWING PERMIT NUMBERS ARE ASSIGNED TO THE COUNTY IDENTIFIED ABOVE:

Sanitary Permit No. _____ Through & including _____ = _____ Permits

Initials	Date Shipped

Total Permits Issued:

SBD 6232 (R. 0691)

DILHR COPY

PRIVY INSTALLATION AGREEMENT - COPY TO BE ATTACHED TO THE SANITARY PERMIT APPLICATION.

Property Owner(s):	Reserved For Recording Data
Mailing Address:	
Location: ¼, ¼, S , T N, R E or W	
City, Village, Township Of:	
Parcel Tax Number:	
Legal Description:	

1. No plumbing will be installed in the privy.
2. No plumbing will be installed in the premises served by the privy unless a code compliant soil absorption system or holding tank exists, or a valid sanitary permit to install such a system has been issued.
3. A privy vault / pit shall maintain minimum setbacks as specified in Table 1.

Table 1	Well	Building	Lake / Stream	Additional County Setbacks
Open Pit	50 Ft	25 Ft	Min. 75 Ft	
Sealed Vault	25 Ft	25 Ft	Min. 75 Ft	

4. Privies for public buildings shall comply with ILHR 52.63, Wis Adm. Code.
5. Privies used for one- and two-family purposes shall be constructed in such a manner so as to exclude flies, rats and other vermin. Doors should be self-closing and vault ventilators should terminate at least one foot above the roof.
6. A privy vault shall be constructed of watertight plastic, fiberglass, coated steel or monolithic concrete. Materials shall comply the intent with ILHR 83.20, Wis. Adm. Code. Counties may, by ordinance, establish minimum sealed vault sizes and type or construction within the guidelines of ILHR 83.20, Wis. Adm. Code.
7. The privy shall be kept clean and sanitary. The contents of the pit or vault shall be disposed in accordance with NR 113, Wis. Adm. Code.
8. This agreement shall be binding on the owner, their heirs and assignees. This document shall be recorded by the register of deeds in a manner which allows its existence to be determined by reference to the property where the privy is installed.

Printed Owner(s) Name(s):	Subscribed and sworn to before me on this date:
Owner(s) Signature:	Notary Public
	My commission expires on:

SBD-6432 (R. 05/91) NOTE: This document was drafted by the State Department of Industry, Labor and Human Relations, Bureau of Building Water Systems.

Wisconsin Department of Industry, Labor and Human Relations
Safety and Buildings Division

PRIVATE SEWAGE SYSTEMS
PLAN APPROVAL APPLICATION

Private Sewage Section
201 E. Washington Ave., Rm. 141
P.O. Box 7969, Madison, WI 53707
(608) 266-3815

INSTRUCTIONS: Please fill in all applicable data and submit this form with plans. Plans will not be reviewed until all fees are received. The reverse side of this form describes most of the required plan information. Further requirements may be contained in the Wisconsin Plumbing Code, which can be purchased from the Department of Administration, Document Sales and Distribution, 202 South Thornton Ave., P.O. Box 7840, Madison, WI 53707, Telephone (608) 266-3358.

1. PROJECT INFORMATION (Type or print clearly)

			Plan Review Appointment Date	Plan Identification Number
Name of Submitting Party (plans returned to same)			Project Name	
Street Address, P.O. Box # or Rural Route			Project Address or Legal Description	
City or Village	State	Zip Code	City ☐ Village ☐ of Town ☐	County
Telephone No. (include area code)				
Designer			Name of Owner	
Telephone No. (include area code)			Telephone No. (include area code)	
Street Address, P.O. Box # or Rural Route			Street Address, P.O. Box # or Rural Route	
City or Village	State	Zip Code	City or Village / State / Zip Code	

2. APPLICATION FOR:

☐ New Construction ☐ Replacement ☐ Revision
☐ Experimental ☐ Large System ☐ At-Grade ☐ Pressurized System
☐ Mound System ☐ Conventional Gravity System ☐ System in Fill ☐ System in Flood Plain (attach SBD-6698)
☐ Holding Tank ☐ Groundwater Monitoring ☐ Petition For Variance ☐ Other Alternatives

3. FEE COMPUTATIONS (include existing tanks)

MAKE ALL CHECKS PAYABLE TO SAFETY & BUILDINGS DIVISION.

			FEE SUBMITTED	FOR OFFICE USE
a.	750 - 1,500 gallon septic tank	$ 50.00		
b.	1,501 - 2,500 gallon septic tank	$ 60.00		
c.	2,501 - 5,000 gallon septic tank	$ 80.00		
d.	5,001 - 9,000 gallon septic tank	$ 100.00		
e.	9,001 - 15,000 gallon septic tank	$ 150.00		
f.	Over 15,000 gallon septic tank	$ 250.00		
g.	500 - 1,000 gallon dose chamber	$ 30.00		
h.	1,001 - 2,000 gallon dose chamber	$ 50.00		
i.	2,001 - 4,000 gallon dose chamber	$ 70.00		
j.	4,001 - 8,000 gallon dose chamber	$ 90.00		
k.	8,001 - 12,000 gallon dose chamber	$ 110.00		
l.	Over 12,000 gallon dose chamber	$ 150.00		
m.	500 - 5,000 gallon holding tank	$ 30.00		
n.	5,001 - 10,000 gallon holding tank	$ 55.00		
o.	Over 10,000 gallon holding tank	$ 100.00		
p.	Revisions	$ 20.00		
q.	Groundwater Monitoring - Per Site (other than a proposed subdivision)	$ 32.00		
r.	Petition For Variance: Setback	$ 25.00		
	Site Evaluation	$ 50.00		
	Subtotal:			
s.	Priority Plan Review: Enter same amount as Subtotal			
	Total Fee:			

NOTE: Appointments for plan review should be made prior to submittal. You may contact one of the offices listed below

Hayward Office P.O. Box 259 209 West First Street Hayward, WI 54843 Phone (715) 634-4870 Fax (715) 634-5150	LaCrosse Office 2226 rose Street LaCrosse, WI 54603 Phone (608) 785-9334 Fax (608) 785-9330	Madison Office P.O. Box 7969 201 E. Washington Ave. Madison, WI 53707 Phone (608) 267-5119 Fax (608) 267-0592	Shawano Office P.O. Box 434 1053A E. Green Bay Street Shawano, WI 54166 Phone (715) 524-3626 Fax (715) 524-3633	Waukesha Office 401 Pilot Court, Suite C Waukesha, WI 53188 Phone (414) 548-8605 Fax (414) 548-8614

SBD-6748 (R 07/91)

NOTE: Fees are pursuant to Wis. Adm. Code, Chapter Ind. 69, and are subject to change annually.

OVER →

The following information is required for plan review. An index page or each page of the plans must be signed, sealed and dated by the designer.

4. MOUNDS & IN-GROUND PRESSURE DISTRIBUTION SYSTEMS

a. County verification of soil conditions.
b. Soil data (115) photocopy by CST, including data for replacement system, if for new construction that will be served by an in-ground pressure system.
c. Plot plans drawn to scale showing lot size and all lateral distances from the system to buildings, wells, watercourses, etc. Show permanent reference points (benchmark). Direction and percent of slope or two foot contours must be included if drawn to scale. For in-ground pressure, show area for replacement if for new construction (TWO COPIES).
d. Plan view of system with observation pipes and permanent lateral markers (TWO COPIES).
e. System cross section - provide system elevation (TWO COPIES)
f. Pipe lateral layout (TWO COPIES)
g Construction detail of septic and dose tanks if site-constructed, or State approved manufacturer and size if prefabricated (TWO COPIES).
h. Dosing Chamber cross section - show manufacturer and size or construction details if site-constructed (TWO COPIES).
i. Pump or siphon model, performance curve, total dynamic head calculations and dose volume. (TWO COPIES)
j. If the site is suitable for a conventional onsite sewage system, item a. from this section is not generally required.
k. Provide all sizing information (TWO COPIES). This is not required for residential installations where the number of bedrooms is indicated on the plans

5. CONVENTIONAL PRIVATE SEWAGE SYSTEMS

a. Photocopy of soil data (115) by CST, including data for replacement system, if new construction.
b. Plot plan showing location of septic tank, soil absorption system and replacement area. Indicate lateral distances to any buildings, well, watercourses, lot lines, etc. The plot plan must also show the location of permanent horizontal and vertical reference points (benchmark). Also indicate ground slope with 2 foot contours in entire area if drawn to scale, extending 25 feet on all sides of initial and replacement systems
c. Plan view of soil absorption system showing all dimensions, pipe lengths, spacing, etc (TWO COPIES).
d Cross section of soil absorption system showing system elevation, aggregate,cover material, depths, etc. (TWO COPIES)
e. Construction detail of septic tank if site-constructed, or State approved manufacturer and size if prefabricated (TWO COPIES)
f. Detail of lift pump tank or automatic siphon, tank size, manufacturer, gpm, gallons per cycle, vertical lift, friction loss, etc. (TWO COPIES).
g. Provide all sizing information (TWO COPIES) This is not required for residential installations where the number of bedrooms is indicated on the plans

6. HOLDING TANKS

a. Photocopy of soil data (115) by CST. A full evaluation must be made to eliminate the possibility of any other system being installed.
b Photocopy of agreement document between owner and local unit of government, properly notarized and recorded in reference to the deed. This agreement must include a statement about the semi - annual pumping report and pumping contract.
c. Plot plan showing location of holding tank with lateral distances to any buildings, well, water service piping, watercourses, lot lines, etc Provide horizontal and vertical reference points. Include all-weather service road within ten feet of the service manhole (TWO COPIES).
d. Holding tank profile showing vent, manhole, alarm and State approved manufacturer and size if prefabricated. Provide complete construction details if site-constructed (TWO COPIES).
e. Provide all sizing information (TWO COPIES). This is not required for residential installations where the number of bedrooms is indicated on the plans.

7. SYSTEMS IN FILL

a. Systems in fill must include an onsite investigation form (SBD-6196), as well as all the appropriate items listed in section 5.

8. GROUNDWATER MONITORING

a. Soil data (115) photocopy.
b. Groundwater Monitoring Report (SBD-6412).
c. Verification of data and procedures from county (ONE COPY); copy of Notification of Intent to Monitor which was sent to county.
d. Precipitation data.

9. PETITION FOR VARIANCE

a. Petition For Variance form (SB-8), signed and properly notarized.

If any portion of a private sewage system is in a floodplain, form SBD-6698 is required.

Wisconsin Department of Industry, Labor and Human Relations
Safety and Buildings Division

COUNTY ONSITE SEWAGE PROGRAM AUDIT

(s. 145.20 (3) (b), Wis. Stats.)

Onsite Sewage Field Inspection and Investigation Unit
Onsite Sewage Section

Audit Period: January 1 - December 31, 19 _____ For County of _____

I. ORDINANCE AND PERSONNEL

A. COUNTY SANITARY ORDINANCE

1. Does the county ordinance comply with s. 59.065 Stats.? ..... ☐Y ☐N

a. If no, explain in the summary.

b. Describe any recommended changes in the summary.

B. INSPECTION AND SUPPORT STAFF

1. Number of inspection and support staff: ..... _____

2. Certified soil testers:

Name	Cert. No.	Exp. Date	Staff	Contract
_____	_____	_____	☐Y ☐N	☐Y ☐N
_____	_____	_____	☐Y ☐N	☐Y ☐N
_____	_____	_____	☐Y ☐N	☐Y ☐N
_____	_____	_____	☐Y ☐N	☐Y ☐N

3. Certified Inspectors:

Name	Cert. No.	Exp. Date	Cert. Type
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

II. COUNTY ADMINISTRATION

A. Does the county department responsible for the onsite sewage program administer other county or state programs? ..... ☐Y ☐N

B. Does the county participate in the Wisconsin Fund Grant Program? ..... ☐Y ☐N

C. Pursuant to s. 145.19 (4), Stats., is all revenue from sanitary permit issuance used to fund the onsite sewage system program? ..... ☐Y ☐N

D. Soil Test Reports:

1. Does the county review all soil test reports? ..... ☐Y ☐N

SBD-8267 (N. 09/89)

2. Are the reports field verified as necessary? ..... ☐Y ☐N

   a. Explain county onsite procedure in the summary.

   b. Provide a representative example of an onsite report.

3. Soil test report quality: ..... ☐VG ☐G ☐F ☐P

   a. Summarize and make recommendations regarding quality.

E. Onsite Sewage System Plans

1. Does the county review all onsite sewage plans? ..... ☐Y ☐N

2. Onsite sewage plan quality: ..... ☐VG ☐G ☐F ☐P

   a. Summarize and make recommendations regarding quality.

3. Pursuant to s.145.20 (2) (c), Stats., and ILHR 83.11, Wis. Adm. Code, does the county have a uniform policy for written disapproval of sanitary permit applications? ..... ☐Y ☐N

F. Inspection Reports

1. Does the county complete the approved inspection report form? ..... ☐Y ☐N

2. Inspection report quality: ..... ☐VG ☐G ☐F ☐P

   a. Summarize and make recommendations regarding quality.

III. SANITARY PERMITS

A. Sanitary Permit Issuance

1. Number of permits issued by the county: ..... _____

2. Number of permits issued by DILHR: ..... _____

3. Total Permits Issued: ..... _____

B. Provide a sequential list of permits issued:

_____ to _____ = _____ _____ to _____ = _____

_____ to _____ = _____ _____ to _____ = _____

_____ to _____ = _____ _____ to _____ = _____

_____ to _____ = _____ _____ to _____ = _____

_____ to _____ = _____ _____ to _____ = _____

C. Do county records correspond with DILHR records? ..... ☐Y ☐N

D. Sanitary Permit Fees: (Do not include Groundwater Surcharge Fee.)

Conventional ...	$ _____	Holding Tank	$ _____	Reconnection .	$ _____
IGP	$ _____	Privy	$ _____	Renewal	$ _____
At-grade	$ _____	Septic Tank Only ...	$ _____	Transfer	$ _____
Mound	$ _____	Soil Abs. Sys. Only ..	$ _____	Large System .	$ _____

IV. SYSTEM INSPECTIONS / INVESTIGATIONS

A. Was every system inspected prior to backfilling? ☐Y ☐N

1. Number of systems inspected: _____ of _____

B. Does the county require existing system inspections pursuant to s. 66.036, Stats., and ILHR 83.055, Wis Adm. Code? ☐Y ☐N

1. Provide one example of a completed sanitary permit application which includes documentation pursuant to ILHR 83.055, Wis. Adm. Code.

2. Is the county's onsite sewage program perceived to be adversely affected by other building permit issuing agents' administration of s. 66.036, Stats.? ☐Y ☐N

3. Include comments regarding Section B in the summary.

V. ENFORCEMENT ACTIONS

A. Does the county keep a record of enforcement actions? ☐Y ☐N

1. Does the county record enforcement compliance? ☐Y ☐N

B. Installation / Construction Orders

1. Number of orders issued: _____

2. Number of orders complied with: _____

3. Number of orders submitted to the DA, AG or Corporation Counsel for compliance: _____

4. Is the enforcement process effective in achieving compliance? ☐Y ☐N

a. If no, include comments or recommendations in the summary.

C. Failing Systems

1. Number of orders issued: _____

2. Number of orders complied with: _____

3. Number of orders submitted to the DA, AG or Corporation Counsel for compliance: _____

4. Is the enforcement process effective in achieving compliance? ☐Y ☐N

a. If no, include comments or recommendations in the summary.

D. Holding Tank Maintenance

1. Does the county receive all the reports required? ☐Y ☐N

2. Does the county have an effective method to identify noncompliance with reporting procedures? ☐Y ☐N

3. Number of orders issued for failure to report: _____

4. Number of orders complied with: _____

5. Number of orders referred to the DA or Corporation Counsel: ..... _____

6. Is the maintenance program effective? ..... ☐Y ☐N

a. Include comments in the summary.

7. List the governmental units that prohibit holding tanks for new construction:

_____ _____
_____ _____
_____ _____

VI. RANDOM FIELD AUDIT

A. Randomly inspect 5 systems (gravity distribution or holding tank) installed during the audit period. Three should be inspected prior to backfilling if possible and the remainder may be post construction inspections.

1. Provide inspection reports and comments in the summary.

B. Randomly select and inspect 10 percent or 5 systems, whichever is greater, of the in-ground pressure, at-grade or mounds installed during the audit year. Two should be inspected prior to backfilling if possible, and the remainder may be post construction inspections.

1. Provide inspection reports and comments in the summary.

VII. AUDIT REVIEW ACKNOWLEDGEMENT

_____ _____
County Program Manager Signature DILHR Auditor Signature

_____ _____
Date Signed Date Signed

A. Attach county comments (optional) to this audit document.

PETITION FOR VARIANCE APPLICATION

Wisconsin Department of Industry, Labor and Human Relations
Safety and Buildings Division
201 East Washington Avenue, P.O. Box 7969
Madison, Wisconsin 53707
608/266-3151

OFFICE USE ONLY	
Amount Paid	
Receipt No.	

OFFICE USE ONLY	
Petition No.	
E-Number	

Name of Owner/Petitioner	Building or Project	Agent, Architect or Engineering Firm
Company	Tenant Name, if any	Street & Number
Street & Number	Location, Street & Number	City State Zip Code
City State Zip Code	City County	Telephone Number
Telephone Number	Plan Number, if known	Name of Contact Person

1. The rule being petitioned reads as follows: (cite specific rule number and language)

2. The rule being petitioned cannot be entirely satisfied because:

3. The following alternative(s) and supporting information are proposed as a means of providing an equivalent degree of health, safety or welfare as addressed by the rule:

Note: Please attach any pictures, plans, sketches or required position statements.

VERIFICATION BY OWNER – PETITION IS VALID ONLY IF NOTARIZED AND ACCOMPANIED BY REVIEW FEE
See Section Ind 69.15 for complete fee information

Note: Petitioner must be the owner of the building or project. Tenants, agents, designers, contractors, attorneys, etc. may not sign petition unless a Power of Attorney is submitted with the Petition for Variance Application.

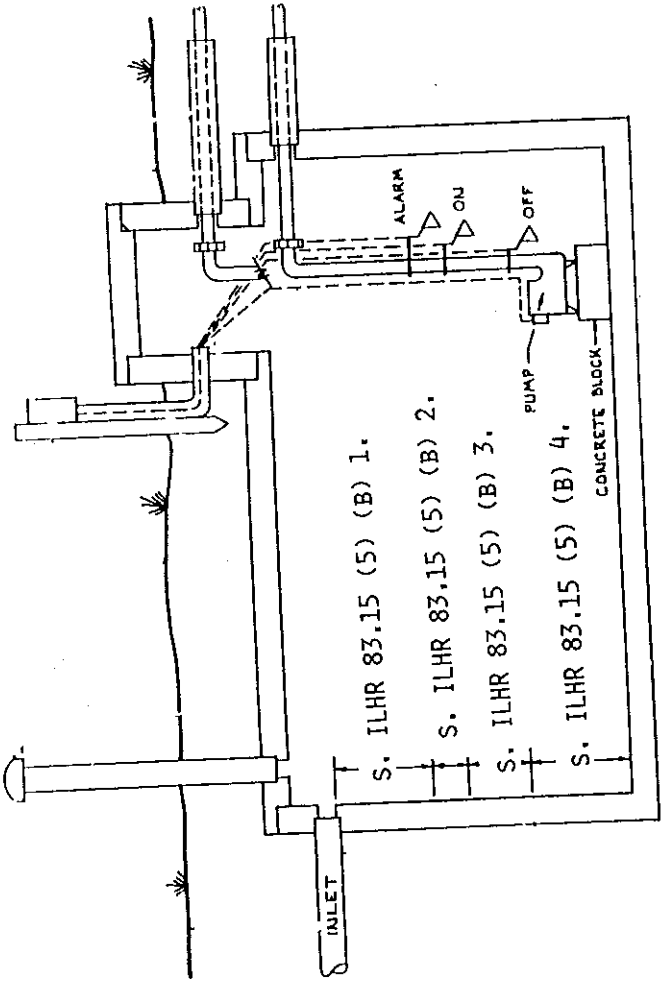
_____, being duly sworn, I state as petitioner that I have read the foregoing
(NAME OF PETITIONER, Please type/print)
petition, that I believe it to be true and I have significant ownership rights in the subject building or project.

_____ Subscribed and sworn to before me this date: _____
Signature of Petitioner

_____ My commission expires: _____
Notary Public

SB-8(R.09/88)

FIGURE 83.15-1. CAPACITY AND SIZING OF PUMP TANKS.



HOLDING TANK SERVICING CONTRACT

Contract Date

This contract is made between the

Holding Tank Owner(s) Name(s) and Pumper's Name

We acknowledge the installation of (a) holding tank(s) on the following property: (Provide legal description:)

1. The owner agrees to file a copy of this contract with the local governmental unit hereinafter called the "municipality", which has signed the pumping agreement required in Ch. ILHR 83.18 (4) (b), Wis. Adm. Code and

   with the County of _____

2. The owner agrees to have the holding tank(s) serviced by the pumper and guarantees to permit the pumper to have access and to enter upon the property for the purpose of servicing the holding tank(s). The owner agrees to maintain the all-weather access road or drive so that the pumper can service the holding tank(s) with the pumping equipment. The owner further agrees to pay the pumper for all charges incurred in servicing the holding tank(s) as mutually agreed upon by the owner and pumper.

3. The pumper agrees to submit to the municipality which has signed the pumping agreement required by s. ILHR 83.18 (4) (b), Wis. Adm. Code, and to the county, a report for the servicing of the holding tank(s) on a semiannual basis. The pumper further agrees to include the following in the semiannual report:

   a. The name and address of the person responsible for servicing the holding tank;
   b. The name of the owner of the holding tank;
   c. The location of the property on which the holding tank is installed;
   d. The sanitary permit number issued for the holding tank;
   e. The dates on which the holding tank was serviced;
   f. The volumes in gallons of the contents pumped from the holding tank for each servicing;
   g. The disposal sites to which the contents from the holding tank were delivered.

4. This agreement will remain in effect until the owner or pumper terminates this contract. In the event of a change in this contract, the owner agrees to file a copy of any changes to this service contract or a copy of a new service contract with the municipality and the County named above within ten (10) business days from the date of change to this service contract.

Owner(s) Name(s) (Print)	Owner's Signature(s)	Subscribed and sworn to before me on this date:
		_____
Pumper's Name (Print)	Pumper's Signature	Notary Public
		My commission expires:
Pumper's Registration Number		

590-7574 (R. 09/88)

This instrument was drafted by the State of Wisconsin Department of Industry, Labor and Human Relations

As the sanitary permit issuing agent in the county stated below, I hereby certify that the following described property is now served by either a public sewer or a septic tank — soil absorption system that complies with ch. ILHR 83, Wis. Adm. Code.

Note: This document is to be reordered in the Tract Index at the office of the Register of Deeds in the county indicated below.

CANCELLATION OF A HOLDING TANK AGREEMENT

As the sanitary permit issuing agent in the county stated below, I hereby certify that the following described property is now served by either a public sewer or a septic tank — soil absorption system that complies with ch. H 63, Wis. Adm. Code.

In addition, I understand that execution and recording of this document cancels a holding tank agreement between the _____ and _____ that was recorded on the ____ day of _____, 19___ in volume _____, page _____ as document number_____.

Witness my hand and seal this _____ day of _____, 19___.

County of _____

by _____ (include title)

STATE OF WISCONSIN

Personally came before me this _____day of _____, 19___.

the above named _____,

to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____
NOTARY PUBLIC

THIS INSTRUMENT DRAFTED BY:

MY COMMISSION EXPIRES:

_____ _____

DESIGN OF PRESSURE DISTRIBUTION NETWORKS FOR SOIL ABSORPTION FIELDS

To obtain uniform application of wastewater effluent over the entire infiltrative surface of a soil absorption field, pressure distribution systems are required. Section H 63.14 specifies the design criteria for pressure distribution systems. They are designed by balancing the headlosses such that the volume of water passing out each hole in the network will be equal. This is achieved by allowing 75 to 85 percent of the total headloss in the network to be lost when the water passes through the hole while only 10 to 15 percent of the total headloss occurs in delivering the water to each hole.

Since the design can become quite tedious, a simplified method has been developed by the use of the tables and nomographs in s. 63.14. With this method, only a straight edge and pencil is needed to complete the design. To demonstrate the use of the tables and nomographs, this example is given.

Example:

Design a pressure system for a soil absorption system consisting of 5 trenches, each 3 feet wide by 40 feet long. The trenches are to be spaced 9 feet on center.

Step 1: Select the desired distribution pipe length from the dimensions of the required soil absorption area. Two layouts would be suitable for this system. The distribution pipes in each trench may be fed by a manifold along one end of the trenches or by a central manifold. In the first design, 5 distribution pipes are used, each 40 feet long. In the second design, there are 8 distribution pipes, each 20 feet long. The first design will be used in this example.

Step 2: Select an appropriate distribution pipe diameter compatible with the chosen hole diameter and hole spacing from Table 5.

Holes in ¼-in diameter spaced every 2.5 feet will be used in this example, though other combinations would be just as suitable. From Table 5, either a 1 ¼-in or 1 ½-in distribution pipe is required for a 40 foot distribution pipe. Select the larger 1 ½-in diameter distribution pipe.

Step 3: Determine the total discharge rate of each distribution pipe and the number of holes required by using the nomograph in Table 6.

Place a straight edge on the nomograph in Table 6 aligning the 40 foot mark on the Distribution Pipe Length scale with the 2.5 ft mark on the Hole Spacing scale. Where the straight edge crosses the Number of Holes scale, read off the number of holes per distribution pipe; 16 in this example. To obtain the distribution pipe discharge rate, realign the straight edge to join the 16 mark on the Number of Holes scale with the ¼-in mark on the Hole Diameter scale. Where the straight edge crosses the Distribution Pipe Discharge scale, the discharge rate is given. In this example, it is nearly 20 gpm as shown.

Step 4: Select the appropriate manifold size based on the number, length and discharge rate of the distribution pipes from Table 7. For central manifold designs use the lower column headings and left

row headings. For end manifold designs, use the lower column headings and the right row headings. (If necessary, repeat steps 1 through 4 until an acceptable network is laid out.)

The manifold length is that length of pipe required to connect all the distribution pipes downstream from the manifold inlet. In this example, the inlet to the manifold is to be at one end. There are to be 5 distribution pipes spaced 9 feet apart requiring a manifold 36 feet long. Since an end manifold design is to be used, the flow per distribution pipe of 20 gpm (from step 3) is read on the right side of Table 7, the number of 5 read on the bottom under the manifold length at 35 feet. In this design, a 3-in manifold is sufficient (See Table 7.) (If the inlet had been in the center of the manifold, the manifold length would have been 18 feet serving 2 distribution pipes. In that case, the manifold could be 2-in diameter.)

Step 5: Determine the minimum dose volume required based on the total pipe volume from the nomograph in Table 11.

On the nomograph in Table 11, the straight edge is placed on 1½-in mark on the Distribution Pipe Diameter scale (from step 2), and the 40 mark on the Distribution Pipe Length scale. The volume of the distribution pipe is read off the Pipe Volume scale. In this example, it is approximately 3.7 gal. Next, turn the straight edge maintaining the point on the Pipe Volume scale and align it with 5 on the Number of Distribution Pipes scale. The minimum dose volume read off the Dose Volume scale is approximately 200 gal. However, the final dose volume selected may be larger than this minimum depending on the desired number of doses per day. (See s. ILHR 83.14 (6), Wis. Adm. Code).

Step 6: Determine the minimum pump or siphon discharge rate from the nomograph in Table 8.

Using the nomograph in Table 8, the dosage rate is read from the Dosing Rate scale by aligning the straight edge with 20 gpm on the Distribution Pipe Discharge Rate scale (step 3) with 5 on the Number of Distribution Pipes scale. The minimum rate is 100 gpm.

Step 7: Select the proper pump or siphon from the head-discharge characteristics described by the manufacturers.

The total dynamic head of the network must first be computed. For a pump system, this is equal to the elevation differences between the pump and the distribution pipe inverts, the friction loss in the pipe which delivers the liquid from the pump to the distribution system at the required rate, and 3 feet of head to compensate for losses in the distribution system. The pump able to pump the minimum discharge rate at the total dynamic head computed is selected.

Siphon selection is based on the manufacturer's stated average discharge rate. This rate is for free discharge. Therefore, to maintain this rate, the siphon discharge pipe invert must be elevated above the distribution pipe inverts a distance equal to the estimated distribution system. These losses included the friction loss in the delivery pipe from the siphon to the network at the minimum discharge rate determined in step 7 plus 3 feet of head to compensate for losses within the distribution system. Where

the delivery pipe is more than 50 feet long, its diameter should be one size larger than the siphon discharge diameter to facilitate air venting.

Assume the dosing tank is located 25 feet from the distribution system inlet, and the difference in elevation between the pump and the inverts of the distribution pipes is 5 feet. At a rate of 100 gpm the headloss in 100 feet of a 3-in plastic delivery pipe can be read from Table 9. Therefore, for 25 feet the headloss is 2.09 feet x 25 feet/100 ft = 0.52 ft. The total dynamic head of the system is 5 feet of elevation head plus 0.5 feet of friction head in the delivery pipe plus 3 feet of account for losses in the distribution system. Therefore, a pump should be selected which is able to pump at least 100 gpm against 8.5 feet of head.

If a siphon were used, its discharge invert would be elevated 0.5 feet plus 3 feet or a minimum of 3.5 feet above the distribution pipe inverts.

In summary, the final design consists of five 40 foot distribution pipes, each 1½-in. in diameter connected with a 3-in end manifold with the inlet from the dosing chamber at one end of the manifold. The inverts of the distribution pipes are perforated with ¼-in holes spaced every 2.5 feet. The first hole should be located one half of the hole spacing or 1.25 feet from the manifold. If the last hole is equal to or greater than half the hole spacing from the end of the distribution pipe, put another hole in the bottom of the cap or next to it.

(c) *Bidets.* Vitreous china bidets shall conform to the material requirements in ANSI A112.19.2M.

1. A bidet may not be located closer than 15 inches from its center to any side wall, partition, vanity or other obstruction, nor closer than 30 inches center to center from a water closet.

2. Bidets with submerged inlet fittings shall be protected by vacuum breakers which conform to ASSE 1001.

(d) *Dishwashing machines.* 1. Residential type dishwashing machines shall conform to ASSE 1006.

2. Commercial type dishwashing machines shall conform to ASSE 1004.

(e) *Drinking fountains.* 1. Drinking fountains and water coolers shall conform to ARI 1010 or ANSI A112.19.2M.

2. Drinking fountains may not be installed in toilet rooms.

3. The water supply for drinking fountains shall be provided with an adjustable valve fitted with a loose key or an automatic self-closing valve permitting regulation of the rate of flow of water. The water supply issuing from the nozzle shall be of sufficient volume and height so that persons using the fountain need not come in direct contact with the nozzle or orifice.

4. A drinking fountain may not have a waste outlet less than 1-1/4 inches in diameter.

(f) *Floor drains.* 1. Floor drains shall be provided with removable strainers of sufficient strength to carry the anticipated loads.

2. The floor drain shall be so constructed that it can be cleaned, and the drain inlet shall be accessible at all times.

3. Floor drains shall be of a size to efficiently serve the intended purpose. The floor drain outlet shall not be less than 2 inches in diameter.

(g) *Food waste grinders.* 1. Residential type food waste grinders shall conform to ASSE 1008. Commercial type food waste grinders shall conform to ASSE 1009.

2. Food waste grinders shall be connected to a drain of sufficient size to serve the unit, but not less than 1-1/2 inches in diameter.

3. Food waste grinders shall be connected to a drain and trapped separately from any other fixtures or sink compartments.

4. All food waste grinders shall be provided with an adequate supply of cold water at a sufficient flow rate to insure proper functioning of the unit.

(h) *Laundry trays.* Each compartment of a laundry tray shall be provided with a waste outlet not less than 1-1/2 inches in diameter.

(i) *Lavatories.* 1. a. Enameled cast iron lavatories shall conform to ANSI A112.19.1M.

b. Vitreous china lavatories shall conform to ANSI A112.19.2M.

c. Stainless steel lavatories shall conform to ANSI A112.19.3.

d. Porcelain enameled formed steel lavatories shall conform to ANSI A112.19.4.

e. Plastic lavatories shall conform to ANSI Z124.3.

2. Cultured marble vanity tops with an integral lavatory shall conform to ANSI Z124.3.

3. Lavatories shall have waste outlets not less than 1-1/4 inches in diameter.

(j) *Showers.* 1. Prefabricated plastic showers and shower compartments shall conform to ANSI Z124.2.

2. Water distribution piping from the shower valve to the shower head outlet shall be securely attached to the structure.

3. Except for combination bathtub-shower units, waste outlets serving showers shall be at least 2 inches in diameter and shall have removable strainers of sufficient strength for the anticipated loads.

4. Where a waste outlet serves more than one shower space or shower head, the waste outlet shall be at least 2 inches in diameter and the waste outlet shall be so located and the floor so pitched that waste water from one shower does not flow over the floor area serving another shower.

Note: Section ILHR 52.60 (5) (a) specifies slip-resistant requirements for shower rooms and compartments in public buildings and places of employment.

5. All shower compartments, regardless of shape, shall have a minimum finished interior of 900 square inches and shall be capable of encompassing a circle with a diameter of 30 inches. The minimum required area and dimension shall be measured in a horizontal plane 24 inches above the top of the threshold and may not extend beyond the centerline of the threshold. The minimum area and dimensions shall be maintained to a point 70 inches above the shower waste outlet with no protrusions other than the fixture valve or valves, showerheads, soap dishes and safety grab bars or rails.

Note: See Appendix for further explanatory materials.

(k) *Sinks.* 1. a. Enameled cast iron sinks shall conform to ANSI A112.19.1M.

b. Vitreous china sinks shall conform to ANSI A112.19.2M.

c. Stainless steel sinks shall conform to ANSI A112.19.3.

d. Porcelain enameled formed steel sinks shall conform to ANSI A112.19.4.

2. Sinks shall be provided with waste outlets not less than 1½ inches in diameter. Sinks on which a food grinder is installed shall have a waste opening not less than 3½ inches in diameter.

(l) *Urinals.* 1. Vitreous china urinals shall conform to ANSI A112.19.2M-90 and A112.19.6-90.

2. A urinal may not be located closer than 16 inches from its center to any side wall, partition, vanity or other obstruction, nor closer than 30 inches center to center, between urinals. When the space between stall

type urinals or a stall type urinal and a side wall is less than 12 inches, the space shall be filled flush with the front and top of the urinal with nonabsorbent material.

Note: See Appendix for further explanatory material.

3. Stall type urinals shall be set into the floor and the floor shall be pitched toward the fixture.

4. Automatic siphon urinal flush tanks may not be installed.

(m) *Water closets.* 1. a. Vitreous china water closets shall conform to either ANSI A112.19.2M-82 or ANSI A112.19.2M-90 and ANSI A112.19.6-90.

b. Plastic water closets shall conform to ANSI Z124.4.

2. Except as permitted in subd. 3., all water closets required to be provided in public buildings and places of employment shall be of an elongated bowl type, and provided with either:

a. Hinged, open-front seats without covers; or

b. Hinged, closed-front seats, without covers, which are encased with a continuous plastic sleeve capable of providing a clean surface for every user and for which a specific material approval under s. ILHR 50.19 has been issued.

3. Water closets which are required to be provided in day care centers or individual living units or sleeping units of residential occupancies within the scope of either ch. ILHR 57 or 61 may be of a round-bowl type with a hinged, closed front seat with or without a cover.

4. A water closet may not be located closer than 15 inches from its center to any side wall, partition, vanity, or other obstruction, nor closer than 30 inches center to center, between water closets. There shall be at least 24 inches clearance in front of a water closet to any wall, fixture or door.

Note: See Appendix for further explanatory material.

5. No person may install or maintain pan, plunger, offset washout, washout, long hopper, frostproof and other types of water closets having invisible seals or unventilated spaces or walls not thoroughly cleansed at each flushing.

6. Each water closet shall be individually equipped with a flushing device. All flushing devices shall be readily accessible for maintenance and repair. Ballcocks and fill valves shall be of the anti-siphon type and shall conform to ASSE 1002. The critical level mark on the ballcock and fill valve shall be located at least one inch above the full opening of the overflow pipe.

(n) *Water heaters.* 1. Listed equipment. All water heaters shall bear the label of a listing agency approved by the department. Listing agencies approved by the department shall include:

a. Underwriters Laboratories, Inc.;

b. American Gas Association; and

c. American Society of Mechanical Engineers.

2. Design. a. All pressurized water heaters and pressurized hot water storage tanks, except those bearing the label of the American Society of Mechanical Engineers, shall be designed and constructed to withstand a minimum test pressure of 150% of the maximum allowable working pressure of the heater or tank.

b. All pressurized water heaters and pressurized hot water storage tanks shall be rated for a minimum working pressure of 125 psig.

c. A drain valve shall be installed at the lowest point of each water heater and hot water storage tank. Drain valves shall conform to ASSE 1005.

3. Safety devices. a. Relief valves shall be listed by the American Gas Association, Underwriters Laboratories, Inc. or American Society of Mechanical Engineers when the heat input to a water heater is less than or equal to 200,000 Btu per hour.

b. Relief valves shall be listed by the American Society of Mechanical Engineers when the heat input to a water heater exceeds 200,000 Btu per hour.

c. Pressure relief valves shall be set to open at either the maximum allowable working pressure rating of the water heater or storage tank or 150 psig, whichever is smaller.

d. Temperature and pressure relief valves shall be set to open at a maximum of 210°F and in accordance with subpar. c.

4. Hot water dispensers. Nonpressurized point-of-use water heaters shall conform to ASSE 1023.

(o) *Water treatment devices.* 1. Water softeners shall conform to WQA S-100.

2. a. Except as provided in subpar. b., water treatment devices shall function and perform in accordance with the assertions submitted to the department under s. ILHR 84.10, relating to rendering inactive or removing contaminants.

b. A water treatment device which injects a water treatment compound into a water supply system shall maintain the compound concentration in the system over the working flow rate range and pressure range of the device.

3. Except as specified in subd. 4., water treatment compounds introduced into the water supply system by a water treatment device shall be listed as an acceptable drinking water additive by a listing agency approved by the department. Listing agencies approved by the department shall include:

a. United States environmental protection agency;

b. United States food and drug administration; and

c. National sanitation foundation.

4. A water supply system shall be protected from backflow when unlisted water treatment compounds, which may affect the potability of the water, are introduced into the system. The department shall determine the method of backflow protection. Water supply outlets for human

use or consumption may not be installed downstream of the introduction of an unlisted water treatment compound.

5. Water treatment devices designed for contaminated water supplies shall be labeled to identify the following information:

a. The name of the manufacturer of the device;

b. The device's trade name; and

c. The device's model number.

(p) *Other plumbing fixtures, appliances and equipment.* Plumbing fixtures, appliances and equipment not specifically covered in this subsection shall conform to the applicable performance standards of this chapter and chs. ILHR 82 and 83.

(6) FAUCETS, SPOUTS AND FIXTURE SUPPLY CONNECTORS. (a) Except for circular and semi-circular wash fountains, all faucets and showerheads shall conform to ANSI A112.18.1M.

(b) Circular and semi-circular wash fountains shall conform to the working pressure, burst pressure, discharge rate and product marking requirements of ANSI A112.18.1M.

(c) All fixture supply connectors shall be designed and constructed to withstand a minimum pressure of 100 psig at 180°F.

(d) Flexible hose and spray assemblies for residential sinks shall conform to ASSE 1025.

(e) Hand held showers shall conform to ASSE 1014.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; r. (5) (m) 2. to 5., cr. (5) (m) 2. and 3., renum. (5) (m) 7. and 8. to be (5) (m) 4. and 5., Register, March, 1991, No. 423, eff. 4-1-91; am. (5) (l) 1. and (m) 1. a., Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 84.30 Plumbing materials. (1) GENERAL. When selecting the material and size for a plumbing system, due consideration shall be given to the soil, liquid, and atmospheric environments that will eventually surround the plumbing system.

(a) The bending or offsetting of flexible or annealed pipe or tubing shall be in accordance with the applicable material standard or the instructions of the manufacturer of the pipe or tubing.

(b) Pipe or tubing with gouges, cuts or deep scratches may not be installed.

(c) Pipe or tubing which has been kinked may not be installed.

(d) The bending or offsetting of rigid pipe shall be prohibited.

(e) Nailing plates shall be installed to protect copper or plastic pipe or tubing from puncture.

Note: See s. ILHR 84.30 (4) (f) concerning the bending of polybutylene water distribution pipe and tubing.

(2) SANITARY DRAIN AND VENT SYSTEMS. Sanitary drain systems and vent systems shall be of such material and workmanship as set forth in this subsection.

(a) *Above ground drain and vent pipe.* Except as provided in s. ILHR 82.33 (2), drain pipe and vent pipe installed above ground shall conform to one of the standards listed in Table 84.30-1.

(b) *Underground drain and vent pipe.* Except as provided in par. (d), drain pipe and vent pipe installed underground shall conform to one of the standards listed in Table 84.30-2.

(c) *Sanitary building sewer pipe.* Sanitary building sewer pipe shall conform to one of the standards listed in Table 84.30-3.

(d) *Effluent piping.* 1. Nonperforated drain piping conveying effluent from a sewage treatment tank to the distribution piping of a nonpressurized soil absorption system shall conform to one of the standards listed in Table 84.30-3.

2. Perforated drain piping distributing septic tank effluent in a nonpressurized soil absorption system shall conform to one of the standards listed in Table 84.30-4.

3. Drain piping distributing septic tank effluent in a pressurized soil absorption system shall conform to one of the standards listed in Table 84.30-5 and shall be perforated in accordance with s. ILHR 83.14 (3) (c).

(e) *Pressurized drain pipe.* Except as provided in par. (d) 3, pressurized drain pipe shall conform to one of the standards listed in Table 84.30-5 and shall be rated for the working pressure and temperature to which it will be subjected for a specific installation.

(f) *Chemical drain and vent pipe.* Drain systems and vent systems for chemical wastes shall be of approved corrosion resistant material. The manufacturer of the pipe shall indicate to the department the material's suitability for the concentrations of chemicals involved.

(g) *Catch basins, interceptors and sumps.* Catch basins, interceptors and sumps shall be constructed in a watertight manner of precast reinforced concrete, reinforced monolithic concrete, cast iron, coated 12-gauge steel, vitrified clay, fiberglass, plastic or other approved materials.

(h) *Manholes.* Manholes shall be constructed in a watertight manner of precast reinforced concrete, reinforced monolithic concrete, brick or block, fiberglass or other approved materials. Fiberglass manholes may be approved for use in traffic areas if the top section of the manhole is not made of fiberglass.

(i) *Service suction lines.* A service suction line or pump discharge line serving a holding tank for cleaning purposes shall conform to one of the standards listed in Table 84.30-5. Joints and connections for suction lines shall conform to s. ILHR 84.40. The use of mechanical joints shall be in accordance with the recommendations and instructions specified by the manufacturer.

Table 84.30-1
ABOVE GROUND DRAIN AND VENT PIPE AND TUBING

Material	Standard
Acrylonitrile butadiene styrene (ABS)	ASTM D1527; ASTM D2661; ASTM F628
Brass	ASTM B43
Cast iron	ASTM A74; CISPI 301
Copper	ASTM B42; ASTM B88; ASTM B306
Galvanized steel	ASTM A53; ASTM A120
Lead	FS-WW-P-325B
Polyvinyl chloride (PVC)	ASTM D2665; ASTM D1785
Synthetic rubber hose[a]	AHAM DW-1

Note a: The installation of synthetic rubber hose is limited in use to indirect waste piping or local waste piping from dishwashers in accordance with s. ILHR 82.33 (9) (d).

Table 84.30-2
UNDERGROUND DRAIN AND VENT PIPE AND TUBING

Material	Standard
Acrylonitrile butadiene styrene (ABS)	ASTM D1527; ASTM D2661; ASTM F628
Cast iron	ASTM A74; CISPI 301
Concrete	ASTM C14; ASTM C76
Copper[a]	ASTM B42; ASTM B88
Polyvinyl chloride (PVC)	ASTM D2665; ASTM D1785
Vitrified clay	ASTM C700

Note a: Copper tubing, type M, may not be installed underground.

Table 84.30-3
SANITARY BUILDING SEWER PIPE AND TUBING

Material	Standard
Acrylonitrile butadiene styrene (ABS)[a]	ASTM D1527; ASTM D2661; ASTM D2751; ASTM F628
Acrylonitrile butadiene styrene (ABS) composite	ASTM D2680
Cast iron	ASTM A74; CISPI 301
Concrete	ASTM C14; ASTM C76
Copper[b]	ASTM B42; ASTM B88
Polyvinyl chloride (PVC)[a]	ASTM D2665; ASTM D3033; ASTM D3034 ASTM D1785
Vitrified clay	ASTM C700

Note a: Thermoplastic sewer pipe shall be installed in accordance with ASTM D2321.

Note b: Copper tubing, type M, may not be installed underground.

Table 84.30-4
PERFORATED EFFLUENT DISTRIBUTION PIPING FOR NONPRESSURIZED SOIL ABSORPTION SYSTEMS

Material	Standard
Polyethylene (PE)[a]	ASTM F405; ASTM F810
Polyvinyl chloride (PVC)	ASTM D2729
Styrene rubber (SR)	ASTM D3298

Note a: Polythylene (PE) pipe shall have 2 rows, and only 2 rows, of perforations parallel to the axis of the pipe and 120° ± 5° apart. The perforations shall be at the nominal 4 and 8 o'clock positions when the pipe is installed.

Table 84.30-5
PRESSURIZED DRAIN PIPE AND TUBING AND SERVICE SUCTION LINES

Material	Standard
Acrylonitrile butadiene styrene (ABS)[a]	ASTM D1527; ASTM D2282; ASTM D2661; ASTM F628
Acrylonitrile butadiene styrene (ABS) composite	ASTM D2680
Brass	ASTM B43
Cast iron	ASTM A74; ASTM A377; AWWA C115/A21.15; CISPI 301
Chlorinated polyvinyl chloride (CPVC)[a]	ASTM D2846; ASTM F441; ASTM F442; ASTM F443
Concrete	ASTM C14; ASTM C76
Copper[b]	ASTM B42; ASTM B88; ASTM B306
Ductile iron	ASTM A377; AWWA C115/A21.15; AWWA C151/A21.51
Polyvinyl chloride (PVC)[a]	ASTM D1785; ASTM D2241; ASTM D2665 ASTM D2672; ASTM D2740; AWWA C900
Stainless Steel	ANSI B36.19M; ASTM A270; ASTM A450

Note a: Thermoplastic sewer pipe shall be installed in accordance with ASTM D2321.

Note b: Copper tubing, type M, may not be installed underground.

(3) STORM AND CLEAR WATER DRAIN AND VENT SYSTEMS. Storm and clear water drain and vent systems shall be of such material and workmanship as set forth in this subsection.

(a) *Above ground drain and vent pipe.* Drain pipe and vent pipe installed above ground and inside a building shall conform to one of the standards listed in Table 84.30-1, except black steel pipe conforming to ASTM A53 or ASTM A120 may be used for storm water conductors. Black steel conductors may not be embedded in concrete or masonry.

(b) *Underground drain and vent pipe.* Drain pipe and vent pipe installed underground shall conform to one of the standards listed in Table 84.30-2.

(c) *Storm building sewer pipe.* Storm building sewer pipe shall conform to one of the standards listed in Table 84.30-6.

(d) *Subsoil drain pipe.* Subsoil drains shall be open jointed, horizontally split, or perforated pipe conforming to one of the standards listed in Table 84.30-7.

(e) *Roof drains.* 1. Roof drains shall be provided with removable strainers of sufficient strength to carry the anticipated loads.

2. Roof drains shall be so constructed that the drains can be cleaned and the drain inlets accessible at all time.

3. Roof drains shall be sized in accordance with s. ILHR 82.36 and the drain outlet shall not be less than 2½ inches in diameter.

Note: See s. ILHR 82.36 (18) for additional roof drain requirements.

(f) *Area drain inlets.* Area drain inlets shall be constructed in a watertight manner of precast concrete, reinforced monolithic concrete, brick or block, cast iron, coated 12 gauge steel, vitrified clay, fiberglass or other approved materials.

Table 84.30-6
STORM BUILDING SEWER PIPE AND TUBING

Material	Standard
Acrylonitrile butadiene styrene (ABS)[a]	ASTM D1527; ASTM D2661; ASTM D2751; ASTM F628
Acrylonitrile butadiene styrene (ABS) composite	ASTM D2680
Cast iron	ASTM A74; CISPI 301
Concrete	ASTM C14; ASTM C76
Copper[b]	ASTM B42; ASTM B88
Corrugated steel[c]	FS-WW-P-405a
Polyvinyl chloride (PVC)[a]	ASTM D2665; ASTM D3033; ASTM D3034; ASTM D1785
Vitrified clay	ASTM C700

Note a: Thermoplastic sewer pipe shall be installed in accordance with ASTM D2321.

Note b: Copper tubing, type M, may not be installed underground.

Note c: Corrugated steel pipe may be used for storm building sewers subject to the following conditions:

1. The pipe shall be sized according to ch. ILHR 82 with adjustments considered to allow for flow characteristics and configuration of the pipe; and

2. The pipe may not be installed closer than 10 feet from a building's exterior wall or foundation.

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1. Pipe saddles may be installed on private interceptor main sewers, building sewers, underground drain and vent pipe and tubing, and where otherwise approved by the department;

2. A saddle for drain piping shall have a radius in accordance with s. ILHR 82.30 (8) (a);

3. The material of the saddle shall be compatible with the materials of the pipes which are to be connected to the saddle;

4. The hole in the pipe which is to receive the saddle shall be drilled or cored to match the saddle outlet;

5. Straps or clamps which wrap around the pipe and saddle shall be provided by the manufacturer of the saddle;

6. Saddles shall be installed with straps or clamps which wrap around the pipe and saddle; and

7. Proper hangers or bedding shall be provided to maintain alignment between the opening in the pipe and the saddle.

Table 84.30-11
PIPE FITTINGS

Material	Standard
Acrylonitrile butadiene styrene (ABS)	ASTM D2465; ASTM D2468; ASTM D2469; ASTM D3311; ASTM F409
Cast bronze	ANSI B16.15; ANSI B16.24
Cast copper alloy	ANSI B16.18; ANSI B16.23; ANSI B16.26; ANSI B16.32
Cast iron	ANSI B16.4; ANSI B16.12; ANSI B16.1
Chlorinated polyvinyl chloride (CPVC)	ASTM F437; ASTM F438; ASTM F439
Copper	ANSI B16.22; ASNI B16.29; ANSI B16.43
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ANSI/AWWA C153/A21.53; ANSI B16.42
Malleable iron	ANSI B16.3
Polybutylene (PB)	ASTM D3309; ASTM F845
Polyethylene (PE)	ASTM D2609; ASTM D2683; ASTM D3197; ASTM D3261
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM D3036; ASTM D3311; ASTM F409
Stainless steel	ASTM A403
Steel[a]	ANSI B16.5; ANSI B16.9; ANSI B16.11; ANSI B16.28
Styrene-rubber (SR)	ASTM D2852

Note a: Steel fittings and mallable iron fittings to be used in a water supply system shall be galvanized-coated in accordance with ASTM A123.

Note b: See s. ILHR 84.30 (4) (intro.) concerning the maximum lead content for fittings.

(6) SPECIAL MATERIALS. (a) *Sheet lead.* Sheet lead for the following uses may not weigh less than indicated in subds. 1. to 3.

1. Safe pans, 4 pounds per square foot;

2. Site-fabricated flashings for vent pipes, 3 pounds per square foot; and

3. Prefabricated flashings for vent pipes, 2½ pounds per square foot.

(b) *Traps and fixture drain connection fittings.* Copper or tubular brass traps and fixture drain connections fittings shall be at least of 20 gage material.

(c) *Sheet copper.* Sheet copper for the following uses may not weigh less than indicated in subds. 1. and 2. and shall conform to ASTM B152.

1. Safe pans, 12 ounces per square foot;

2. Flashing for vent pipes, 8 ounces per square foot; and

3. Flush tank linings, 10 ounces per square foot.

(d) *Cleanout plugs.* Cleanout plugs shall be of brass or plastic. Brass cleanout plugs shall be used with metallic piping only and shall conform to ASTM A74. Plastic cleanout plugs shall conform to the requirements of sub. (5) (a).

(e) *Flush pipes and fittings.* Flush pipes and fittings shall be of nonferrous material and shall conform to ANSI A112.19.5.

(f) *Safing materials.* Safing materials made from chlorinated polyethylene shall conform to ASTM D4068.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; am. (4) (intro.), Register, August, 1988, No. 392, eff. 9-1-88; renum. (2) (e) to (g) to (f) to (h), cr. (2) (e), am. Table 84.30-4, r. and recr. Table 84.30-5, Register, August, 1991, No. 428, eff. 9-1-91; am. (2) (c), (d) 1. and (e), r. (2) (d) 3., renum. (2) (d) 4. to be (2) (d) 3., cr. (2) (i), Register, April, 1992, No. 436, eff. 5-1-92.

ILHR 84.40 Joints and connections. (1) GENERAL. (a) *Tightness.* Joints and connections in the plumbing system shall be watertight and gastight for the pressure required by test or the system design, whichever is greater, with the exception of perforated or open joint piping.

Note: The testing requirements for tightness are in s. ILHR 82.21.

(b) *Preparation of pipe ends.* Pipe ends shall be prepared in accordance with the applicable pipe standard or the pipe or fitting manufacturer's instructions.

(c) *Prohibited joints and connections.* Unless otherwise permitted in this chapter or ch. ILHR 82 or 83, the following types of joints and connections shall be prohibited:

1. Cement or concrete joints;

2. Mastic or hot poured bituminous joints;

3. Elastomeric rolling o-rings between different diameter pipes;

4. Solvent cement joints between different types of plastic pipe; and

5. Roll grooving of galvanized steel pipe.

(2) ABS PLASTIC PIPE. Joints between acrylonitrile butadiene styrene plastic pipe or fittings shall be installed in accordance with pars. (a) to (c).

(a) *Mechanical joints.* Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1. Drain and vent systems. Mechanical push-on joints for drain and vent systems shall conform to ASTM D3212.

an assumption of any responsibility for defects in design, construction, or performance of any plumbing material or product nor for any damages that may result.

(7) FEES. Fees for the review of a plumbing material or product under this section and any required on-site inspections shall be submitted in accordance with s. Ind 69.23 (5) (d) or (e), and (f).

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; correction in (7) made under s. 13.93 (2m) (b) 7, Stats., Register, August, 1988, No. 392.

ILHR 84.60 Incorporation of standards by reference. (1) CONSENT. Pursuant to s. 227.025, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of the standards listed in sub. (4).

(2) COPIES. Copies of the adopted standards are on file in the offices of the department, the secretary of state and the revisor of statutes. Copies may be purchased through the respective organizations listed in Tables 84.60-1 to 84.60-10.

(3) INTERIM AMENDMENTS. Interim amendments of the adopted standards shall have no effect in the state until such time as this section is correspondingly revised to reflect the changes.

(4) ADOPTION OF STANDARDS. The standards referenced in Tables 84.60-1 to 84.60-10 are hereby incorporated by reference into this chapter.

Table 84.60-1

AHAM	Association of Home Appliance Manufacturers 20 North Wacker Drive Chicago, Illinois 60606
Standard Reference Number	Title
DW-1-82	Household Dishwashers

Table 84.60-2

ANSI	American National Standards Institute, Inc. 1430 Broadway New York, New York 10018

	Standard Reference Number	Title
1.	A112.6.1M-79	Supports for Off-the-Floor Plumbing Fixtures for Public Use
2.	A112.14.1-75	Backwater Valves
3.	A112.18.1M-89	Plumbing Fixture Fittings
4.	A112.19.1M-79	Enameled Cast Iron Plumbing Fixtures
5.	A112.19.2M-82	Vitreous China Plumbing Fixtures
5m.	A112.19.2M-90	Vitreous China Plumbing Fixtures

	Standard Reference Number	Title
6.	A112.19.3-76	Stainless Steel Plumbing Fixtures (Designed for Residential Use)
7.	A112.19.4-77	Porcelain Enameled Formed Steel Plumbing Fixtures
8.	A112.19.5-79	Trim for Water Closet Bowls, Tanks and Urinals (Dimensional Standards)
8m.	A112.19.6-90	Hydraulic Requirements for Water Closets and Urinals
9.	A112.21.1M-80	Floor Drains
10.	A112.21.2-71	Roof Drains
11.	A112.26.1-84	Water Hammer Arrestors
12.	B1.20.1-83	Pipe Threads, General Purpose (Inch)
13.	B16.1-75	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
14.	B16.3-77	Malleable Iron Threaded Fittings, Class 150 and 300
15.	B16.4-77	Cast Iron Threaded Fittings, Class 125 and 250
16.	B16.5-81	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys
17.	B16.9-78	Factory-Made Wrought Steel Buttwelding Fittings
18.	B16.11-80	Forged Steel Fittings, Socket-Welded and Threaded
19.	B16.12-83	Cast Iron Threaded Drainage Fittings
20.	B16.15-78	Cast Bronze Threaded Fittings, Class 125 and 250
21.	B16.18-78	Cast Copper Alloy Solder-Joint Pressure Fittings
22.	B16.22-80	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
23.	B16.23-76	Cast Copper Alloy Solder Joint Drainage Fittings (DWV)
24.	B16.24-79	Bronze Pipe Flanges and Flanged Fittings, Class 150 and 300
25.	B16.26-83	Cast Copper Alloy Fittings for Flared Copper Tubes
26.	B16.28-78	Wrought Steel Buttwelding Short Radius Elbows and Returns
27.	B16.29-80	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings (DWV)
28.	B16.32-79	Cast Copper Alloy Solder Joint Fittings for Sovent Drainage Systems
29.	B16.42-79	Fittings, Class 150 and 300, Ductile Iron Pipe Flanges and Flanged
30.	B16.43-82	Wrought Copper and Copper Alloy Solder Joint Fittings for Sovent Drainage Systems
31.	B36.19M-85	Stainless Steel Pipe
32.	Z21.22-79	Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems

	Standard Reference Number	Title
33.	Z124.1-80	Plastic Bathtub Units
34.	Z124.2-80	Plastic Shower Receptors and Shower Stalls
35.	Z124.3-80	Plastic Lavatories
36.	Z124.4-83	Plastic Water Closet Bowls and Tanks

Table 84.60-3

ARI	Air-Conditioning and Refrigeration Institute 1815 North Fort Myer Drive Arlington, Virginia 22209

Standard Reference Number	Title
ARI-1010-82	Drinking-Fountains and Self-Contained, Mechanically-Refrigerated Drinking-Water Coolers

Table 84.60-4

ASSE	American Society of Sanitary Engineering P.O. Box 9712 Bay Village, Ohio 44140

	Standard Reference Number	Title
1.	1001-82	Pipe Applied Atmospheric Type Vacuum Breakers
2.	1002-79	Water Closet Flush Tank Ball Cocks
3.	1003-81	Water Pressure Reducing Valves for Domestic Water Supply Systems
4.	1004-67	Commercial Dishwashing Machines
5.	1005-67	Water Heater Drain Valves, ¾" Iron Pipe Size
6.	1006-79	Household Dishwashers
7.	1007-79	Home Laundry Equipment
8.	1008-79	Household Food Waste Disposer Units
9.	1009-70	Commercial Food Waste Disposer Units
10.	1010-82	Water Hammer Arrestors
11.	1011-81	Hose Connection Vacuum Breakers
12.	1012-78	Backflow Preventers with Intermediate Atmospheric Vent
13.	1013-80	Reduced Pressure Principle Backflow Preventers, Including Appendix
14.	1014-79	Handheld Showers
15.	1018-78	Trap Seal Primer Valves
16.	1019-78	Wall Hydrants, Frost Proof Automatic Draining, Anti-Backflow Types
17.	1023-79	Hot Water Dispensers, Household Storage Type, Electrical

	Standard Reference Number	Title
18.	1025-78	Diverters for Plumbing Faucets with Hose Spray, Anti-Siphon Type, Residential Applications
19.	1035-81	Laboratory Faucet Vacuum Breakers

Table 84.60-5

	ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, Pennsylvania 19103
	Standard Reference Number	Title
1.	A53-82	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless, Specification for
2.	A74-82	Cast Iron Soil Pipe and Fittings, Specification for
3.	A120-82	Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses, Specification for
4.	A123-78	Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates and Strip, Specification for
5.	A270-80	Seamless and Welded Austenitic Stainless Steel Sanitary Tubing, Specification for
6.	A377-79	Gray Iron and Ductile Iron Pressure Pipe, Specification for
7.	A403-82a	Wrought Austenitic Stainless Steel Piping Fittings, Specification for
8.	A450-82	General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes, Specification for
9.	B32-76	Solder Metal, Specification for
10.	B42-83	Seamless Copper Pipe, Standard Sizes, Specification for
11.	B43-80	Seamless Red Brass Pipe, Standard Sizes, Specification for
12.	B75-81a	Seamless Copper Tube, Specification for
13.	B88-83	Seamless Copper Water Tube, Specification for
14.	B152-83	Copper Sheet, Strip, Plate, and Rolled Bar, Specification for
15.	B251-81	General Requirements for Wrought Seamless Copper and Copper-Alloy Tube, Specification for
16.	B302-81	Threadless Copper Pipe, Specification for

Table 84.60-7

	AWWA	American Water Works Association Data Processing Department 6666 West Quincy Avenue Denver, Colorado 80235
	Standard Reference Number	Title
1.	C110/A21.10-82	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids
2.	C111/A21.11-80	American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
3.	C115/A21.15-83	American National Standard for Flanged Ductile-Iron and Gray-Iron Pipe with Threaded Flanges
4.	C151/A21.51-81	American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
5.	C153/A21.53-84	American National Standard for Ductile-Iron Compact Fittings, 3 in. through 12 in. for Water and Other Liquids
6.	C900-81	American National Standard for Pressure Pipe, 4 in. through 12 in. for Water, Polyvinyl Chloride (PVC)

Table 84.60-8

	CISPI	Cast Iron Soil Pipe Institute 1499 Chain Bridge Road, Suite 203 McLean, Virginia 22101
	Standard Reference Number	Title
1.	301-82	Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems, Specification for
2.	310-82	CISPI's Patented Joints for Use in Connection with Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems, Specification for

Table 84.60-9

	Federal Specifications* National Bureau of Standards Office of Engineering Standards U.S. Department of Commerce Washington, D.C. 20234
FS	*Standards are available from the Superintendent of Documents U.S. Government Printing Office, Washington, D.C. 20402
Standard Reference Number	Title
WW-P-325B	Pipe, Bends, Traps, Caps and Plugs; Lead (For Industrial Pressure, and Soil and Waste Applications), June 9, 1976
WW-P-405a	Corrugated Pipe (Iron or Steel, Zinc Coated), September 1968, with Amendment 1, September 1970

Table 84.60-10

	National Sanitation Foundation 3475 Plymouth Road P.O. Box 1468 Ann Arbor, Michigan 48106
NSF	
Standard Reference Number	Title
Standard 14-85	Plastic Piping Compounds and Related Materials

Table 84.60-11

Standard Reference Number	Title
	Water Quality Association 4151 Naperville Road Lisle, Illinois 60532
WQA	
Standard Reference Number	Title
S-100-85	Household, Commercial and Portable Exchange Water Softeners

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; am. Table 84.60-5, r. and recr. Table 84.60-9, Register, August, 1991, No. 428, eff. 9-1-91; am. Table 84.60-2, Register, April, 1992, No. 436, eff. 5-1-92.