

to be conducted away from residences, industrial establishments and public buildings. See domestic wastes.

(87) SEWERAGE SYSTEM (PUBLIC). All structures, conduits and pipe lines by which sewage is collected and disposed of, except plumbing inside and in connection with buildings and properties served, and service pipes from building to street main. See Ch. 144, Wis. Stats.

(88) SEWAGE SYSTEM (PRIVATE). (a) A system comprised of a septic tank and effluent absorption area designed for the purpose of processing sewage wherever public sewer facilities are not available.

1. Annular space. The area between the seepage pit chamber wall exterior and the unexcavated earth wall.

2. Bedrock. Any solid exposed rock or overlain by unconsolidated material.

3. Detailed soil map. A map prepared by a state or federal agency showing soil series, type and phases at a scale of not more than 2,000 feet to the inch.

4. Distribution pipe. A conduit of perforated clay tile, bituminous fiber, cement asbestos or short lengths of clay or concrete drain tile.

5. Effluent. Liquid flowing from a septic or treatment tank.

6. Flood plain. That portion of the land flooded by the highest known flood water elevation or that portion of the land that would be flooded by the regional flood elevation established by a state or federal agency.

7. High ground water. The upper limit of the portion of soil or underlying material that is saturated with water. (In some instances an upper or perched water table may be separated from a lower one by an impervious zone.)

8. High water level. 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.

9. Holding tank. An approved watertight receptacle for the retention of sewage.

10. Legal description. An accurate Metes and Bounds description or a lot and block number in a recorded subdivision or recorded assessor's plat or a public land survey description to the nearest 40 acres.

11. Percolation test. A method of testing absorption qualities of the soils.

12. Reservoir. A watertight receptacle basin or vault constructed above ground surface or underground for the storage of water intended for domestic use.

13. Seepage pit. An underground receptacle so constructed as to permit disposal of effluent or clear wastes by soil absorption through its walls.

14. Seepage bed. An excavated area similar to a seepage trench but larger than 3 feet in width and containing more than one distribution line.

15. Seepage trench. An area excavated 3 feet or less in width which contains a bedding of aggregate and a single distribution line.

16. Septic tank. A watertight tank which receives sewage.

17. Soil boring. A method of augering, boring or excavating through the ground surface to obtain samples of various stratum of earth to determine the characteristics and absorptive qualities of the soil, bedrock and ground water elevations.

18. **Vent cap.** An appurtenance of approved type used for covering the vent terminal of an effluent disposal system so as to avoid closure by mischief or debris and still permit circulation of air within the system.

(89) **SEWERS & DRAINS.** (a) *Sanitary.* 1. Building sewer. That part of the plumbing system beginning at the immediate outside foundation or proposed foundation wall to its connection with the main of a public sewer, private sewer, private sewage disposal system or other point of disposal.

2. Building drain. The lowest horizontal piping of a drainage system which receives the discharge of soil, waste and other drainage pipes inside any building and conveys same to the building sewer by gravity flow. See Wis. Adm. Code section H 62.08 (2) (c) sketch.

3. Building drain branch. That part of any drainage system which extends laterally at a slight grade, with or without horizontal change of direction from the building drain or subdrain. In this definition, horizontally means an angle less than 45 degrees with a horizontal plane and a rise not to exceed the inside diameter of the branch. See Wis. Adm. Code section H 62.08 (2) (c) sketch.

4. Building subdrain. The horizontal portion of a drainage system within a building which cannot flow by gravity to the building drain.

(b) *Storm.* 1. Building sewer. That part of the storm water system which receives the discharge from building storm drains and subdrains, parking lots, yard fountains and other permissive sources, and conveys such waters to a public storm water system, private storm water system or other approved point of disposal.

2. Building drain. The lowest horizontal piping which receives storm waters or other permissive water from roofs, area ways, court yards, canopies, enclosed parking ramps and other sources inside any building or structure and conveys same to the building storm sewer by gravity flow.

3. Building subdrain. Same as sanitary subdrain.

(90) **SEWER.** (a) *Private.* A privately owned building sewer serving a single building.

(b) *Private interceptor main sewer.* A privately owned building sewer not directly controlled by public authority. Privately owned means single ownership by an individual, firm or corporation, and approved by local authority and the department.

(91) **SEWER (PUBLIC).** A publicly owned sewer.

(92) **SUBSOIL DRAIN.** That part of a drainage system which conveys the ground or seepage water from the footings of walls or below the basement floor under buildings to the storm sewer or other point of disposal.

(93) **SHALL.** The word "shall" when used in this code is a mandatory requirement.

(94) **SHOULD.** "Should" is not mandatory but expresses the recommendation of the department.

(95) **SIPHONAGE.** A suction created by the flow of liquids in pipes.

(96) **SLIP-JOINT.** A connection in which one pipe slips into another, the joint of which is made tight with a compression type fitting.

(97) **SPECIAL WASTES.** Wastes which require special treatment before entry into the normal plumbing system.

(98) **SPECIAL WASTE PIPE.** Piping which conveys special wastes.

(99) **SPIGOT.** The end of a pipe which fits into a bell or hub.

(100) **STACKS & BRANCHES.** (a) *Stacks.* 1. Soil stack. Any pipe extending vertically which conveys the discharge of water closets, bedpan washers or like fixtures with or without other fixtures to a horizontal branch, building drain or building subdrain.

2. Waste stack. Any pipe extending vertically which receives only liquid wastes free from fecal matter and conveys same to a horizontal branch, the building drain or building subdrain.

(b) *Branches.* 1. Branch. A horizontal drain pipe extending from a soil or waste stack to which vertical sections or extensions may be connected which receive the discharge from one or more fixture drains.

2. Branch interval. A distance along a soil or waste stack corresponding in general to a story height but in no case less than 8 feet within which the horizontal branches from one story of a building are connected to the stack.

(101) **STERILIZERS.** (a) *Boiling type.* A non-pressure type device used for boiling instruments, utensils, and/or other equipment for disinfection purposes.

(b) *Pressure instrument washer-sterilizer.* A pressure vessel fixture designed to both wash and sterilize instruments during the operating cycle of the unit.

(c) *Pressure (autoclave).* A pressure vessel designed to use steam under pressure for sterilizing. Also called an autoclave.

(d) *Water.* A device used for sterilizing water and storing sterile water.

(102) **STILL.** A device used in distilling liquids.

(103) **SUMP.** A tank or pit which receives sewage or liquid wastes located below the normal grade of the gravity system and which must be emptied by mechanical means.

(104) **SUMP PUMP.** A mechanical device other than an ejector for removing liquid waste from a sump.

(105) **SUPPORTS.** Supports, hangers, anchors and other devices for supporting and securing pipes, or fixtures to walls, ceilings, floors or structural members of a building.

(106) **SWIMMING POOL.** Any structure, basin chamber or tank containing an artificial body of water for swimming, diving or recreational bathing having a depth of 2 feet or more at any point.

(107) **TERMINAL.** That part of a drainage or vent piping system which projects above the roof of the building or at the end of the building effluent disposal system.

(108) **TRAP.** A fitting or device so designed and constructed as to provide, when properly vented, a liquid seal which will prevent the back passage of sewer air without materially affecting the flow of sewage or waste through it.

(a) *Trap crown.* Where the trap connects to or becomes a part of the horizontal arm of the trap which is integral with the trap.

(b) *Trap seal.* Trap seal is indicated by the height of the water column measured between the overflow and the dip separating the inlet and outlet arms of the trap.

(109) **TURF SPRINKLER UNIT.** A system of piping, appurtenances and devices so installed as to distribute water for lawn or other similar irrigation purposes without plumbing fixtures or means of use for human consumption.

(110) **VACUUM BREAKER.** An atmospheric device, pipe installed and designed to protect a water supply against back-siphonage by entry of air to relieve vacuums in the water distribution system. (A vacuum breaker is not designed to protect the water supply under conditions of backflow or back-pressures.)

(111) **VENT PIPE.** Any pipe provided to ventilate a plumbing system.

(a) *Back vent.* A pipe that connects to a soil or waste pipe to vent a single fixture trap and connects to the vent system above the fixture served with no part of it below the fixture trap.

(b) *Branch vent.* That part of the vent piping which extends horizontally with or without lateral or vertical extensions and to which other vent pipes connect.

(c) *Circuit vent.* A vent pipe which serves 2 or more fixture traps which discharge to a nearly horizontal soil or waste branch and extends from the downstream side of the furthestmost upstream fixture trap to the main soil or waste vent or main vent so that a circuit is formed.

(d) *Continuous vent.* A vertical vent pipe that is a continuation of the vertical waste pipe to which it connects.

(e) *Loop vent.* Similar to a back vent except that part of it extends below the trap it serves before reconnecting to the vent piping system.

(f) *Main soil or waste vent.* That part of the stack above the highest installed fixture opening or branch connection. (Commonly referred to as a stack vent.)

(g) *Main vent.* A vent pipe connected to the base of a soil or waste stack below the lowest fixture branch extending vertically with or without change of direction and which serves as a terminal for other vent pipe connections and terminates through the roof or connects with the main soil or waste pipe at a point 2 feet or more above the highest soil or waste opening, but in no case less than 38 inches above the highest floor on which soil or waste openings are installed.

(h) *Relief vent.* The vent pipe connected to a soil or waste pipe close to the stack in a manner to equalize minus and plus pressures in the stack.

(i) *Stack venting.* A method of venting a fixture or group of fixtures through the soil or waste stack.

(j) *Sterilizer vent.* A separate pipe or stack connected indirectly to the building drainage system at the lowest terminal, which receives the vapors from non-pressure sterilizers or the exhaust vapors from pressure sterilizers and conducts the vapors directly to the outer air. (Commonly referred to as vapor, steam, atmospheric or exhaust vent.)

(k) *Unit vent.* One which denotes an installation so arranged that one pipe will serve traps from two identical fixtures at the same point when connected to a vertical soil or waste pipe.

(l) *Wet vent.* That portion of a vent pipe which receives the discharge from wastes other than water closets, kitchen fixtures or other sources containing like sewage or fecal matter.

(m) *Yoke vent.* A pipe connecting upward from a soil or waste stack into a main vent pipe in a manner to equalize pressures within the stacks.

(112) **WATER SOFTENER.** An appliance, appurtenance or device used for the purpose of ion exchange or demineralizing water.

(113) **WATER SUPPLY (PRIVATE).** Private water supply means one or more sources of ground water, including facilities for conveyance thereof, such as wells, springs and pumps, on one property, other than those serving a municipality or a group of 10 or more premises of mixed ownership.

(114) **WATER SERVICE.** 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.

(115) **WATER DISTRIBUTION SYSTEM.** Those pipes which convey water from the service pipe to the plumbing fixtures, appliances, appurtenances, equipment, devices or other systems which are to be served.

(116) **WIPED JOINT.** The fusion of metal with solder, smoothly finished with a wiping cloth and having a thickness of at least one-fourth inch at the point where the pipes are joined.

(117) **WORKMANSHIP.** Work of such character that will fully secure the results sought in all the sections of this code as intended for the safety, welfare and health protection of all individuals.

(118) **YARD DRAIN.** The horizontal piping and its branches which convey the surface drainage from areas, courts or yards outside the walls of a building to the storm water sewer.

(119) **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 960 Illuminating Building, Cleveland, Ohio 44113
A.S.T.M.	-----	American Society for Testing and Material 1916 Race St., Philadelphia, Pa. 19103
A.W.W.A.	-----	American Water Works Association 2 Park Avenue, New York, New York 10016
C.S.	-----	Commercial Standards, Supt. of Documents Government 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
420 Lexington Ave., New York, New York 10017
- N.S.F. -----National Sanitation Foundation
Testing Laboratory, Inc., P. O. Box 1468,
Ann Arbor, Michigan 48106
- U.L. -----Underwriters' Laboratories, Inc.
207 E. Ohio Street, Chicago, Illinois 60611
- W.C.F. -----Water Conditioning Foundation
1201 Waukegan Road, Glenview, Illinois 60025

History: 1-2-56; am. (8), (42) (b) and (c); (46) and (49), Register, February, 1957, No. 14, eff. 3-1-57; r. and recr. Register, October, 1970, No. 173, eff. 11-1-70; cr. (119), Register, October, 1971, No. 190, eff. 11-1-71; r. and recr. (70); (79) through (118) are renum. to be (80) through (119); (119) is renum. to be (79); am. (89) (a) 2. and 3. as renum., r. and recr. (90) as renum. Register, November, 1972, No. 203, eff. 12-1-72.

Table 32 (Continued)

Materials	See Limitations to Subsection H 62.19 (2) (a) Below	Standards and Specifications		
		ANSI	ASTM	Other
Malleable iron fittings.....		B16.3-1963		
Steel pipe flanges and fittings.....		B16.5-1968		
Nipples threaded.....				See section H 62.19 (1) (a) and (c), Wis. Adm. Code
Wrought seamless copper and copper alloy pipe and tube—general requirements.....	7		B251-68a	
Copper pipe—seamless.....	7		B42-66	
Copper pipe—threadless (TP).....			B302-66a	
Copper tube—seamless—types K-L-M.....	7		B88-66a	
Copper drainage tube—type DWV.....	7		B306-66a	
Copper tube—seamless.....	7		B75-68	
Cast bronze screwed fittings 125 & 250 lbs.....		B16.15-1964		
Cast bronze solder joint pressure fittings.....		B16.13-1963		
Cast bronze solder joint drainage fittings.....	8	B16.23-1969		
Bronze flanges & flanged fittings.....		B16.24-1962		
Wrought copper and bronze solder joint pressure fittings.....		B16.22-1963		
Wrought copper and bronze solder joint drainage fittings.....	8	B16.29-1966		
Seamless red brass pipe.....			B43-66	
Seamless brass tube.....			B135-67	
Brass fittings for flared copper tube.....		B16.26-1958		
Acrylonitrile-butadiene-styrene (ABS) Type I, Schedule 40, DWV and building sewer.....	9		D1783-68	NSF 14
			D2661-68	
Acrylonitrile-butadiene-styrene (ABS) (water service).....	10		D1527-68	NSF 14
			D2382-63	
Polybutylene (water service).....	10		D2662-63	NSF 14
			D2666-68T	
Polyethylene (PE) (water service).....	10		D2104-68	NSF 14
			D2239-68	
Polyvinyl chloride (PVC) (water service).....	10		D2241-69	NSF 14
			D1785-68	
Polyvinyl chloride (PVC).....	9		D2665-68	NSF 14
Schedule 40 unthreaded.....				
Schedule 80 can be threaded.....				
DWV and building sewer.....				

Table 32 (Continued)

Materials	See Limitations to Subsection H 62.19 (2) (a) Below	Standards and Specifications		
		ANSI	ASTM	Other
Solvent cement for acrylonitrile-butadiene-styrene (ABS) plastic pipe and fittings.....	9		D2235-67	
Solvent cement for polyvinyl chloride (PVC) plastic pipe and fittings.....	9		D2564-67	
Atmospheric vacuum breakers.....				ASSE 1001
Caulking materials (water).....				AWWA C600-64
Cement lining for cast iron pipe.....				AWWA C104-64
Coal tar enamel (protective coating).....				AWWA C203-66
Ferrous plugs, bushings and locknuts with pipe threads.....		B16.4-1963		
Galvanized iron and steel sheets.....			A525-71	
Gel-coated glass-fiber reinforced polyester resin bath units.....	11	Z124.1		
Gel-coated glass-fiber reinforced polyester resin shower units.....	11	Z124.2		
Plumbing fixtures—land use.....	15			F.S. WW-P-541b and interim amendments 4 and 6
Precast jointing material for clay pipe.....				See section H 62.19 (1) (a) and (c), Wis. Adm. Code
Rubber gasket for cast iron soil pipe and fittings.....	12		C564-68	
Sheet brass.....			B36-67	
Sheet copper.....			B152-66	
Sheet lead.....			B243-71	Min. weight—4 lb. per sq. ft.
Soft solder.....			B32-66T	See section H 62.19
Valves.....			A181-65	(1) (a) and (c), Wis. Adm. Code
Water hammer arrestors.....				ASSE 1003
Water heaters.....		C72.1-1949		ASSE 1010
		Z21.10.1-1966		
		Z21.10.2a-1963		
Manhole frames and covers.....				See section H 62.19 (1) (a) and (c), Wis. Adm. Code

3. The wall thickness of fittings and hubs shall correspond with that of the pipe of the same size and kind. Change of direction, 45° elbows, 45° Y and 1/8 bend or fittings producing a like radius may be used in lieu of the elbows listed.

4. Cast iron soil pipe fittings. Change in direction. When direction of flow changes from horizontal to vertical, the radius of bends shall be as follows: (All dimensions are given as inches.)

Size of pipe -----	2	3	4	5	6
Minimum radius -----	3	3 1/2	4	4 1/2	5

When direction of flow changes from vertical to horizontal or when it is at right angles and changes in the same horizontal plane, the radii of bends shall be as follows: (All dimensions are given as inches.)

Size of pipe -----	2	3	4	5	6
Minimum radius -----	3	3 1/2	9	9 1/2	10

5. Building sewer and drain application prohibited. See Wis. Adm. Code section H 62.24. ✓

6. Cast iron threaded drainage fittings. The face to center measurements for screw thread drainage fittings shall be as follows:

PIPE SIZE

1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
When change of direction is from horizontal to vertical:					
2 1/4"	2 1/2"	3 1/8"	3 1/4"	4 1/4"	5 1/8"
When change of direction is from vertical to horizontal or horizontal to horizontal:					
3"	3 1/2"	4"	4 1/2"	5 1/4"	6 1/4"

Change of direction, 45° elbows, 45° Y and 1/8 bend or fittings producing a like radius may be used in lieu of the elbows listed.

7. Copper water tube used for underground water lines may be soft or hard temper. Copper water tube used for interior aboveground water lines shall be hard temper, except concealed vertical tube may be soft temper for repair or replacement lines. Copper tube used for soil, waste and vent piping shall be hard temper. See Wis. Adm. Code sections H 62.05 (2) ✓, H 62.06 (4) ✓, H 62.07 (18) ✓, H 62.13 (2) (b) ✓ and H 62.13 (4) (b).

8. Copper, brass and bronze drainage fittings. Change of direction, 45° elbows, 45° Y and 1/8 bend or fittings producing a like radius may be used in lieu of the elbows listed.

The radii of wrought copper or cast brass or bronze waste fittings shall be as follows:

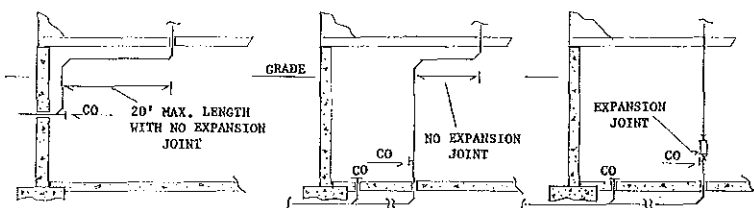
PIPE SIZE

1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
When change of direction is from horizontal to vertical:					
1 5/8"	1 7/8"	2 1/8"	3 1/8"	4 1/8"	
When change of direction is from vertical to horizontal or horizontal to horizontal:					
2 3/8"	2 7/8"	3 3/8"	4 5/8"	5 3/8"	

9. Plastic pipe and fittings—DWV. a. Plastic pipe and fittings shall not be embedded in masonry or concrete and shall be installed exposed or in frame partitions or in accessible tunnels, shafts or crawl spaces. For installations in excess of 3 stories or 35 feet, detailed plans and specifications shall be submitted to the department for approval prior to installation.

b. Schedule 40 plastic pipe and fittings shall not be threaded. When threaded construction is necessary, adapter fittings shall be used to make the transition. Only ABS-DWV socket type fittings shall be used with ABS pipe, and PVC-DWV socket type fittings with PVC pipe. The intermixing of the two type of plastic pipe and fittings is prohibited. The solvent cement for jointing shall meet the requirements of ASTM D-2235-67 for ABS plastic pipe and fittings, and ASTM D-2564-67 for PVC plastic pipe and fittings.

c. An approved plastic expansion joint shall be installed immediately above the cleanout in all vertical soil and waste stacks extending one or more floors in height. When the horizontal offset precedes the vertical rise, an expansion joint shall not be required. See following sketch.



All stacks or piping extending through the roof of the structure shall terminate with an approved expandable type roof terminal flashing or an approved no-caulk neoprene ring roof flashing.

d. All pipe and fitting materials are to be identified as set forth in ASTM Standards D 2661-68 and D 2265-68.

10. Plastic water service piping. a. Plastic water service piping may be installed for cold water only. The use of plastic water service piping from the water main in the street to the curb stop is subject to water department ordinances or local governmental acceptance. Plastic water service piping entering the building shall terminate within 5 feet inside the point of entering the building.

b. The plastic pipe, fittings and solvent cements shall be approved by the National Sanitation Foundation for potable water supply and bear the NSF seal of approval. They also shall comply with the applicable ASTM standards.

c. The plastic pipe and fittings shall have a pressure rating of no less than 160 pounds per square inch; pipe 2 inches and larger shall have a safety factor ratio of 4 to 1 and shall require approval by the department prior to installation. The pressure rating shall be marked on the pipe.

d. Electric grounding to water distribution systems which have utilized plastic water service piping is prohibited.

e. Plastic materials shall be installed according to manufacturer's recommendation or applicable ASTM Standards.

11. Gel-coated fiberglass bath and shower units. All units shall be approved by the department. All nonexposed areas, those not gel-coated, shall have an outer coating of self-extinguishing resin at least $\frac{3}{8}$ of an inch in thickness or shall be constructed entirely of self-extinguishing resin. The resin shall be rated self-extinguishing according to ASTM D 635-68. Domes or ceilings shall meet the same specifications. If wood or other materials are used for structure stability or sound deadening, the material used shall be completely enclosed with self-extinguishing resin. When urethane foam is used, it shall meet ASTM D 1692-68 rating as self-extinguishing.

12. See Wis. Adm. Code section H 62.18 (2) (e) 2. ✓

13. Corrugated steel pipe may be used for storm building sewers subject to the following conditions:

a. The pipe is sized according to tables 11, 11a, 11b and 12, Wis. Adm. Code section H 62.12, with adjustments considered to allow for flow characteristics and configuration of the pipe.

b. The connection from a building storm drain to a corrugated steel building storm sewer shall be made at least 10 feet outside the building wall or foundation.

14. Asbestos cement storm drainage pipe conforming to ASTM C663-70 may be installed for storm sewers from a point at least 10 feet outside the building wall or foundation.

15. Brass tubing. All brass tubing used for fixtures, traps and overflows between wall or floor and fixtures shall be made of seamless brass tube with a thickness of at least 0.0453 inch (No. 17 Brown and Sharpe gauge) and shall conform to A.S.T.M. "Standard Specifications for Seamless Brass Tubes," serial number B-135-67.

(b) *Miscellaneous materials.* 1. Backwater valves. Backwater valves shall have cast iron or brass bodies, noncorrosive bearings, seats and self-aligning disks, and shall be so constructed as to insure a positive mechanical seal and to remain closed, except when discharging wastes. Such valves shall remain sufficiently open during periods of low flows to avoid screening of solids and shall not restrict capacities or cause excessive turbulence during peak loads. Valve access covers shall be bolted type with gasket and each valve shall bear the manufacturer's name cast into the body.

2. Caulking ferrules. a. Caulking ferrules for lead pipe or copper tube to cast iron shall be of red brass, free from sand holes, flaws or other defects, uniform in thickness, and at least $4\frac{1}{2}$ inches long, of a size and weight as shown in table 33.

Table 33

Inside diameter, inches	Weight
1½	1 lb. 1 oz.
2	1 lb. 4 oz.
3	1 lb. 14 oz.
4	2 lb. 8 oz.
5	3 lb. 0 oz.
6	3 lb. 8 oz.

b. Caulking ferrules for connection between national taper pipe thread and cast iron pipe shall be brass or cast iron. Brass ferrules shall conform to section H 62.19 (2) (b) 2. a. as to materials. Cast

iron ferrules shall conform to Wis. Adm. Code section H 62.10 (5), table 7.

3. Cleanout ferrules and plugs. See Wis. Adm. Code section H 62.10 (5) (a) and (7).

4. Closet bolts, nuts and screws for floor outlet fixtures connecting to a floor flange shall be brass or copper. Bolts and nuts for wall outlet fixtures shall be brass or corrosive resistant plated steel.

5. Dishwasher air-gaps as approved by the department.

6. Floor flanges for water closets and similar fixtures shall be brass not less than $\frac{1}{8}$ inch thick, cast iron not less than $\frac{1}{4}$ inch thick or galvanized malleable iron, hard lead or other material approved by the department. Caulked-on flanges shall have a caulking depth of at least 2 inches.

7. Footing, foundation and groundwater collecting piping within a building shall be asbestos cement, bituminous fiber, cast iron, concrete, vitrified tile or other material approved by the department.

8. Lead soil, waste and vent piping shall be the best quality drawn lead pipe, having a minimum weight per foot as follows:

Inside diameter, inches	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	3	4
Weight per foot, pounds	2 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{3}{4}$	6	8

Lead traps and lead bends shall have a minimum wall thickness of $\frac{1}{8}$ inch. Lead water piping shall have minimum weights as indicated in table 34.

Table 34

Inside diameter, inches	Weight lbs. per foot	Wall thickness inches
$\frac{3}{8}$	2	
$\frac{1}{2}$	2	
$\frac{5}{8}$	3	
$\frac{3}{4}$	3 $\frac{1}{2}$.231
1	4 $\frac{1}{4}$.246
1 $\frac{1}{4}$	7 $\frac{3}{4}$.320
1 $\frac{1}{2}$	11 $\frac{1}{4}$.386
2	19 $\frac{1}{2}$.504

Sheet lead for saffing pans shall weigh not less than 4 pounds per square foot. Sheet lead for flashings and roof terminals shall weigh not less than 3 pounds per square foot.

9. Solder bushings shall be red brass with minimum weights as follows:

Pipe size inches	Minimum weight each
1 $\frac{1}{4}$	6 oz.
1 $\frac{1}{2}$	8 oz.
2	14 oz.
2 $\frac{1}{2}$	1 lb. 6 oz.
3	2 lb. 0 oz.
4	3 lb. 8 oz.

10. Sheet copper for the following uses: a. General use including safe pans—minimum 12 ounces per square foot.

b. Flashings for vent terminals—minimum 8 ounces per square foot.

11. Galvanized sheet iron or steel for vent terminal flashings shall not be lighter than number 28 Brown and Sharpe gauge.

Note: Copies of standards promulgated by the following technical societies, referred to above are on file in the offices of secretary of state, health and social services and revisor of statutes and may be obtained for personal use from the following addresses:

American National Standards Institute, Inc.
1430 Broadway, New York, New York 10018
American Society for Testing and Material
1916 Race St., Philadelphia, Pa. 19103
American Water Works Association
2 Park Avenue, New York, New York 10016
Cast Iron Soil Pipe Institute
2029 K Street, NW
Washington, D. C. 20006
National Sanitation Foundation
Testing Laboratory, Inc.
P. O. Box 1468
Ann Arbor, Michigan 48106
American Society of Sanitary Engineering
960 Illuminating Building
Cleveland, Ohio 44113

History: 1-2-56; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72.

H 62.20 Private domestic sewage treatment and disposal systems.
(1) **APPROVALS AND LIMITATIONS.** (a) *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 or likely to become available within a reasonable time. All domestic wastes shall enter the septic or treatment tank unless otherwise specifically exempted by the department or this section.

(b) *Public sewer connection.* Private domestic sewage treatment and disposal systems shall be discontinued when public sewers become available to the building served. The building sewer shall be disconnected from the private system and be connected to the public sewer. All abandoned septic tanks and seepage pits shall have the contents removed and shall be immediately filled with sand, gravel or similar material.

(c) *Plans and specifications.* 1. Public buildings. Complete plans and specifications shall be submitted to the department and written approval received before letting contracts or commencing work for all private domestic sewage treatment and disposal systems, and for the addition to or replacement of existing systems for all public buildings. Included as public buildings but not limited by enumeration herewith are:

- a. Theaters and assembly halls
- b. Schools and other places of instruction
- c. Apartment buildings, hotels and places of detention
- d. Factories, office and mercantile buildings
- e. Mobile home parks, camp grounds and camping resorts
- f. Parks

2. Local approval. The approval by county or other local governmental agency shall not exempt the requirements for state approval for the installation of sewage treatment and disposal systems serving public buildings.

3. Submission of plans and specifications. All plans and specifications shall be submitted in triplicate and shall include the following:

a. Detailed plan of the proposed septic tank or treatment tank and effluent disposal system showing building location with all lateral distances indicated, including distance from building served to system, from system to well, lot line, lake, stream or other watercourse.

b. Legal description of the property on which the system is to be installed.

c. Soil boring and percolation test data.

d. Ground slope and lot size.

e. Complete data relative to the expected use and occupancy of the building to be served.

4. Availability of plans. There shall be maintained at the project site one set of plans bearing the department's stamp of approval.

(d) *Specific limitations.* 1. Cesspools. Cesspools are prohibited.

2. Revised plans. Approved plans and specifications shall not be revised except with the written approval of the department.

3. Industrial wastes. When industrial wastes are intended to be disposed of by soil absorption, the department shall be consulted as to requirements.

4. Clear water. The discharge of surface, rain and other clear water into a private domestic sewage disposal system is prohibited.

(2) **SOIL TESTS AND SITE REQUIREMENTS.** (a) *Soil tests supervision.* Soil boring and percolation tests shall be made by or under the direction and control of a master plumber, or master plumber restricted licensed in Wisconsin to install private sewage disposal systems or an engineer, architect, surveyor or sanitarian registered in Wisconsin. Certification of the tests shall be signed by the person providing supervision and control on blank forms furnished by the department.

(b) *Percolation and boring tests.* 1. The size and design of each proposed soil absorption system shall be determined from the results of soil percolation tests and soil borings conducted in accordance with this section. At least 3 percolation tests shall be conducted with the holes located uniformly over the area and to the depth of the proposed absorption system. At least 3 soil borings shall be dug to a depth at least 3 feet below the bottom of the proposed system. The borings shall be distributed uniformly in the area of the proposed system.

2. When a property consists entirely of soils having very severe limitation for on-site liquid waste disposal as determined by use of a detailed soil map drawn at a scale of not more than 2,000 feet to the inch and interpretive data, prepared by the U.S.D.A. Soil Conservation Service or the University of Wisconsin, showing soil series, types and phases, that map and interpretive data may be used as a basis for denial of a state or local permit or approval of an on-site waste disposal system. Permits or approval can also be denied for properties comprised entirely of soils having severe limitations for on-site liquid waste disposal until appropriate action is taken to overcome that limitation. Nevertheless, in all cases the property owner shall be permitted to present evidence using soil percolation test data, bore hole data and topographic survey data to support the contention that a suitable site for an on-site liquid waste disposal system does exist.

(c) *Septic tank location.* No tank shall be located within 5 feet of any building or its appendage, 2 feet of any lot line, 10 feet of any cistern, 25 feet from any well, reservoir, swimming pool or the high

water mark of any lake, stream, pond or flowage. Where practicable, greater distances should be maintained.

(d) *Soil absorption site.* 1. Location. All soil absorption disposal systems should be located at a point lower than the surface grade of any nearby water well. The soil absorption system shall be located not less than 25 feet from any building, dwelling or cistern, 50 feet from any water well, reservoir or swimming pool, 5 feet of any lot line, 25 feet of any water service or 50 feet of the high water mark of any lake, stream or other watercourse. Where possible, greater distances should be maintained.

2. Percolation rate—trench or bed. A subsurface soil absorption system of the trench or bed type shall not be installed where the average percolation rate of the 3 tests for the site is slower than 60 minutes for water to fall one inch.

3. Percolation rate—seepage pit. For a seepage pit, percolation tests shall be made in each vertical stratum penetrated below the inlet pipe. Soil strata in which the percolation rates are slower than 30 minutes per inch shall not be included in computing the absorption area. The average of the results shall be used to determine the absorption area.

4. Flood plain. A soil absorption system shall not be installed in a flood plain.

5. Slope. The soil absorption system shall be constructed on that portion of the lot which does not exceed the slope here specified for the class. In addition, the soil absorption system shall be located at least 20 feet from the top of the slope.

Minutes Required for Water to Fall One Inch

Class	Minutes Required for Water to Fall One Inch		Slope
	Shallow Absorption Systems	Deep Absorption Systems	
1-----	Under 3	Under 2	20%
2-----	3 to 45	2 to 30	15%
3-----	45 to 60	30 to 60	10%

6. Filled area. A soil absorption system shall not be installed in a filled area unless written approval is received from the department.

7. Ground water and bedrock. There shall be at least 3 feet of soil between the bottom of the soil absorption system and high ground water or bedrock.

(3) PERCOLATION TEST PROCEDURE. (a) *Type of hole.* The hole shall be dug or bored. It shall have vertical sides and have a horizontal dimension of 4 to 12 inches.

(b) *Preparation of hole.* The bottom and sides of the hole shall be carefully scratched with a sharp pointed instrument to expose the natural soil interface. All loose material shall be removed from the bottom of the hole which shall then be covered with 2 inches of coarse sand or gravel when necessary to prevent scouring.

(c) *Test procedure, sandy soils.* For tests in sandy soils containing little or no clay, the hole shall be carefully filled with clear water to a minimum depth of 12 inches over the gravel and the time for this amount of water to seep away shall be determined. The procedure shall be repeated and if the water from the second filling of the hole

at least 12 inches above the gravel 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. 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. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested as in subsection (d) below.

(d) *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 gravel 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. The soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately following the soil swelling period, the percolation rate measurements shall be made as follows: Any soil which has sloughed into the hole shall be removed and water shall be adjusted to 6 inches over the gravel. 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 $\frac{1}{4}$ of an inch. The hole shall be filled with clear water to a point not more than 6 inches above the gravel 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.

(e) *Verification.* 1. Physical characteristics. Depth to high ground water and bedrock, ground slope and percolation test results shall be subject to verification by the department. Verification of high ground water shall include, but not be limited to, a morphological study of soil conditions with particular reference to soil color and sequence of horizons.

2. Filling. Where the natural soil condition has been altered by filling or other attempts to improve wet areas, verification may require observation of high ground water levels under saturated soil conditions.

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

(4) **TREATMENT TANKS.** (a) *Design.* 1. General requirements. a. Septic tanks shall be fabricated or constructed of welded steel, monolithic concrete or other materials approved by the department. All tanks shall be watertight and fabricated so as to constitute an individual structure.

b. The design of prefabricated septic tanks shall be approved by the department.

c. Plans for site-constructed concrete tanks shall be approved by the department prior to construction.

d. 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.

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

f. Cylindrical tanks shall have an inside diameter of not less than 48 inches.

g. Each prefabricated tank shall be clearly marked to show liquid capacity and the name and address or registered trademark of the manufacturer. The markings shall be inscribed into or embossed on 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 inscribed into or embossed on the outside wall of the tank immediately above the outlet opening.

h. Precast concrete tanks shall have a minimum wall thickness of 2 inches.

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

b. The floor and sidewalls of site-constructed concrete tanks 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 key way in the lower section of the joint. The width of the key way 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 one-half 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.

c. Joints between the 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, cement or bituminous compound.

d. 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 manner as to provide structural stability and watertightness. Steel tanks shall be coated, inside and outside, in compliance with the U. S. Department of Commerce Commercial Standard 177.

Note: Commercial standard CS 177-62 of the U. S. Department of Commerce is available for inspection at the office of the department of Health and Social Services, the Secretary of State and the Revisor of Statutes, or may be procured for personal use from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Any damage to the bituminous coating shall be repaired by recoating prior to installation of the tank. The gauge of the steel shall be as follows:

Septic Tank Capacity	Tank Component	Gauge of Steel
500 to 1,000 gallons.....	Bottom and sidewalls.....	14
	Cover.....	12
	Baffles.....	12
1,000 to 2,000 gallons.....	Complete tank.....	10
2,000 or more gallons.....	Complete tank.....	7

3. Tank accessories. a. The inlet and outlet openings shall contain a "boss," stop or other provision which will prevent the insertion of the sewer piping beyond the inside wall of the tank.

b. The inlet and outlet on all tanks or tank compartments shall be provided with open-end coated iron sanitary tees or baffles made of approved materials, so constructed as to distribute flow and retain scum in the tank or compartments. The tees or baffles shall extend at least 6 inches above and 9 inches below the liquid level, but not to exceed $\frac{1}{2}$ 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.

c. Each single compartment tank and each unit of a multicompartment tank shall be provided with at least one manhole opening no less than 24 inches square or 24 inches in diameter. Manholes shall terminate no more than 6 inches below the ground surface and be provided with a substantial, fitted, watertight concrete, steel or cast iron cover. Steel tanks shall have a collar for the manhole extensions permanently welded to the tank. The collar shall have a minimum height of 2 inches.

d. An airtight inspection opening shall be provided over the inlet baffle of all septic tanks which may be either a manhole or a cast iron pipe at least 4 inches in diameter. The upper end of the inspection pipe or manhole shall terminate not more than 6 inches below the ground surface.

(b) *Capacity and sizing.* 1. Minimum capacity. The capacity of a septic 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 500 gallons.

2. Multiple tanks. When increased capacity is to be provided by a multiple number of tanks, the capacity of any tank shall be a minimum of 500 gallons. When 2 or more 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.

3. Sizing of tank. a. The minimum liquid capacity for one and two family residences shall be as established in the following table:

Number of Bedrooms	Septic Tank Capacity One and Two Family Residences	
	Normal Plumbing Fixtures	With Food Waste Grinder, Automatic Washer, Dishwasher Singly or in Combination
2 or less.....	500	750
3.....	650	975
4.....	800	1200
5.....	950	1375
6.....	1100	1650
7.....	1250	1875
8.....	1400	2200

b. For buildings other than one and 2 family residences the liquid capacity shall be increased above the 500-gallon minimum as established in the following table. For 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.

Apartment buildings (per bedroom).....	150	gals.
Assembly hall (per person—no kitchen).....	2	“
Bars and cocktail lounges (per patron space).....	9	“
Bowling alley (per alley).....	125	“
Bowling alley with bar (per alley).....	225	“
Camp grounds and camping resort (per camp space).....	100	“
Camps, day use only—no meals served (per person).....	15	“
Camps, day and night (per person).....	40	“
Car wash—subject to state approval		
Churches—no kitchen (per person).....	3	“
Churches—with kitchen (per person).....	7.5	“
Country clubs—subject to state approval		
Dance halls (10 sq. ft. per person).....	3	“
Dining hall—kitchen and toilet waste (per meal served).....	10	“
Dining hall—kitchen waste only (per meal served).....	3	“
Drive-in restaurants (per car space).....	30	“
Drive-in theaters (per car space).....	5	“
Factories and offices, (per employee—total all shifts—exclusive of industrial wastes).....	20	“
Hospitals (per bed space).....	200	“
Hotels or motels and tourist rooming houses (per room 2 persons per room).....	100	“
Migrant labor camp, central bath house (per employee).....	30	“
Mobile home parks, homes with bathroom groups (per site)....	200	“
Nursing and rest homes (per bed space).....	100	“
Parks, toilet wastes (per person—75 persons per acre).....	5	“
Parks, with showers and toilet wastes (per person—75 persons per acre).....	10	“
Restaurant—kitchen and toilet wastes (per seating space).....	30	“
Retail store (per employee).....	20	“
Retail store—customers (10 sq. ft. per person).....	1.5	“
Schools (per classroom).....	450	“
Schools with meals served (per classroom).....	600	“
Schools with meals served and showers provided (per classroom).....	750	“
Self-service laundries (per machine, toilet wastes only).....	50	“
Service stations (per car).....	10	“
Swimming pool bath houses (per person).....	10	“

(c) *Installation.* 1. Location. Tanks shall not be installed within the interior foundation walls of a building nor shall a new building or addition to an existing building be constructed or located over, or within 5 feet of a tank.

2. Bedding. A 3-inch thick tamped bedding shall be provided for all septic 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.

3. Backfill. a. The backfill material for steel tanks shall be as specified for bedding and shall be tamped into place, care being taken to prevent damage to the coating.

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

4. Piping. The inlet and outlet piping between a septic or other sewage tank and the firm ground beyond the excavation made to install the tank shall be cast iron pipe or other pipe approved by the department for the specific purpose. The joints between pipe and tank openings shall be made with lead and oakum.

5. Manhole riser joints. a. All joints on steel risers shall be welded or flanged and bolted and be watertight. All manhole extensions shall be bituminous coated inside and outside.

b. All joints on concrete risers and manhole covers shall be tongue and groove or shiplap type and sealed watertight using neat cement, cement or bituminous compound.

(5) SOIL ABSORPTION SYSTEM. (a) *Disposal of tank effluent.* The effluent from septic tanks shall be disposed of by soil absorption systems or by such other manner approved by the department.

(b) *Sizing—residential.* The area required for a soil absorption system serving residential property shall be determined from the following table using soil percolation test data:

Percolation Rate Minutes Required for Water to Fall One Inch	Minimum Absorption Area in Square Feet Per Bedroom			
	Normal Plumbing Fixtures	With Garbage Grinder	With Automatic Washer	With Both Grinder and Automatic Washer
Less than 3.....	50	65	75	85
3 to 10.....	100	120	135	165
10 to 30.....	150	180	205	250
30 to 45.....	180	215	245	300
45 to 60.....	200	240	275	330

(c) *Sizing—Other.* The required area for a soil absorption system serving installations other than residential property shall equal the absorption area specified for normal plumbing fixtures according to the percolation test results multiplied by the applicable unit specified in column 2, multiplied by the applicable factor in column 3 of the following table:

Column 1 Building Classification	Column 2 Units	Column 3 Factor
Apartment buildings.....	1 per bedroom.....	1.0
Assembly hall—no kitchen.....	1 per person.....	0.02
Bar and cocktail lounge.....	1 per patron space.....	0.2
Bowling alley.....	1 per bowling lane.....	2.5
Bowling alley with bar.....	1 per bowling lane.....	4.6
Camps, day use only.....	1 per person.....	0.2
Camps, day and night.....	1 per person.....	0.45
Camp ground and camping resort.....	1 per camping space.....	0.9
Church—no kitchen.....	1 per person.....	0.04
Church—with kitchen.....	1 per person.....	0.09
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.....	0.1
Drive-in restaurant.....	1 per car space.....	0.6
Drive-in theater.....	1 per car space.....	0.1
Factories, office buildings, exclusive of industrial waste.....	1 per person.....	0.4
Hotels or motels and tourist rooming houses.....	1 per room.....	0.9
Hospital.....	1 per bed space.....	2.0
Migrant labor camp—central bath house.....	1 per employee.....	0.25
Mobile home park.....	1 per mobile home site.....	2.0
Nursing and rest homes.....	1 per bed space.....	1.0
Parks—toilet waste only.....	1 per acre.....	4.0
Parks—showers and toilets.....	1 per acre.....	8.0
Restaurant—kitchen and toilet.....	1 per seating space.....	0.6
Retail store.....	1 per employee.....	0.4
Retail store.....	1 per customer.....	0.03
Self-service laundry—toilet wastes only.....	1 per machine.....	1.0
Service station.....	1 per car served.....	0.15
Swimming pool bath house.....	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

(d) *Installation.* 1. Shallow system. a. A seepage trench or a seepage bed having a depth of 36 inches or less below final grade shall be termed a shallow absorption system.

b. The bottom of the seepage trench shall be level. Seepage trench excavations shall be from 1 to 3 feet in width. The absorption area of a seepage trench shall be computed by using the bottom area only. Trench excavations shall be spaced at least 10 feet apart. The individual laterals preferably should not be over 100 feet long.

c. Seepage beds shall meet the requirements of a seepage trench except that the excavation is more than 3 feet wide and has more than one distribution line. Distribution lines in a seepage bed shall be uniformly spaced no more than 6 feet apart and no less than 3 feet apart and no more than 3 feet from the sidewall.

d. Seepage trenches or beds shall not be excavated when the soil is excessively wet.

e. All smeared or compacted surfaces in the seepage trench or bed shall be scarified to the depth of the compaction and the loose material removed.

f. Distribution piping shall be perforated clay tile, bituminous fiber or cement asbestos or short lengths of clay or concrete drain pipe. In seepage trenches or beds the bottom of the distribution piping shall be laid 12 to 24 inches below the surface in continuous straight or curved lines. A slope of 2 to 4 inches per 100 feet shall be maintained. Drain pipe shall be spaced approximately $\frac{1}{4}$ inch apart and blinded at the top with tar paper.

g. Fresh air inlets of cast iron pipe shall be provided 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 ground surface and terminate with an approved vent cap. 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 lines may be served by one common 4-inch vent when interconnected by a common header pipe.

h. A minimum of 12 inches of clean, graded rock or similar aggregate ranging in size from 1 to 2½ inches shall be laid into the trench or bed below the distribution pipe and such aggregate shall extend at least 2 inches over the top of the distribution pipe. The aggregate shall be covered with untreated building paper or 2 inches of marsh hay or equal. The first 4 to 6 inches of soil backfill shall be hand tamped.

i. Where the total lineal feet of drain pipe in a seepage trench or bed exceeds 1,000 feet, discharge of septic tank effluent into the absorption system should preferably be regulated by an automatic siphon. The dosing tank in which the siphon is situated shall have a capacity equal to 75% of the combined volume of the distribution lines in the absorption system.

2. Deep system. a. A seepage trench, seepage bed or a seepage pit developed to a depth of more than 36 inches below the final grade shall be termed a deep absorption system.

b. The bottom of the distribution line shall be laid 12 to 48 inches below the surface in continuous straight or curved lines. Slope, spacing and venting shall be equal to section H 62.20 (5) (d) 1.

c. Credit may be given for the added absorption area provided for the depth that exceeds 12 inches of aggregate below the distribution line. Such credit shall be in accord with the following table which

establishes the percentage of length of a standard absorption trench. The standard absorption trench is one which the aggregate material extends 12 inches below the distribution pipe.

Percent of Length of Standard Trench				
Depth of Aggregate Below Distribution Line	Trench Width 12"	Trench Width 18"	Trench Width 24"	Trench Width 36"
12	100	100	100	100
18	76	78	80	83
24	60	64	66	71
30	50	54	57	62
36	43	47	50	55
42	37	41	44	50
48	33	37	40	45

d. The area of a seepage bed having aggregate to a depth that exceeds 12 inches below the distribution pipe may be computed as follows:

$$\text{Percent of standard bed area} = \frac{w + 2}{w + 1 + 2d} \times 100$$

w = width of bed in feet

d = depth of aggregate below distribution pipe in feet minus 6 inches

e. A seepage pit shall have a minimum inside diameter of 5 feet and shall consist of a chamber walled up with material such as a perforated precast concrete ring, concrete block, brick or other material approved by the department which allows effluent to percolate into the surrounding soil. Seepage pits shall be located 10 feet or more apart. The pit bottom shall be left open to the soil. Crushed rock or similar aggregate 1 to 2½ inches in size shall be placed into a 6-inch minimum annular space separating the outside wall of the chamber and sidewall excavation. Depth of the annular space shall be measured from the inlet pipe to the bottom of the walled-up chamber. Each seepage pit shall be provided with a 24-inch manhole extending within 6 inches of the ground surface and a 4-inch fresh air inlet which shall meet the requirements of sections H 62.20 (4) (a) and H 62.20 (5) (d). Excavation and scarifying shall be in accord with section H 62.20 (5) (d). The effective area of a seepage pit shall be the vertical wall area of the walled-up chamber for the depth below the inlet for all strata for which the percolation rates are lower than 30 minutes per inch. Six inches of annular opening outside the vertical wall area may be included for determination of effective area. The following table may be used for determining the effective sidewall area of circular seepage pits:

Effective Absorption Area Seepage Pit*

Inside Diameter of Walled-Up Chamber in Feet*	Depth 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

*The 6 inch annular opening credit is included.

(6) **MAINTENANCE AND SLUDGE DISPOSAL.** (a) *Maintenance.* Septic tanks shall be cleaned whenever the sludge and scum occupies $\frac{1}{2}$ of the tank volume. All sludge, scum, liquid and any other material removed from a private domestic sewage treatment and disposal system is hereafter referred to as sludge.

(b) *Sludge disposal.* Sludge shall be disposed of as follows:

1. Public sewer. By discharge into a public sewerage system when practical. The point and method of discharge into the system shall be subject to the requirements of the municipality.

2. Approved site. By discharge at a disposal site designated by the local governmental authority.

3. Other. In the absence of a public sewerage system or designated disposal site by one of the following methods:

a. By burial under 36 inches of earth on the premises on which produced at a distance of at least 50 feet from a well or if on other premises at a distance of at least 500 feet from a place of habitation provided that there is also at least 36 inches of soil between the buried sludge and the high ground water level or bedrock.

b. By spreading on land, not used for pasturing livestock or for growing vegetables, at a distance of at least 1,000 feet from a place of habitation or any stream, lake, pond or flowage.

4. Prohibited sites. The sludge shall not be disposed of by discharge into a lake, stream, ditch or dry run or be buried within 50 feet of such watercourses or in a flood plain.

(7) **HOLDING TANKS.** (a) *Approval.* Holding tanks shall be considered on an individual basis. Three complete sets of plans shall be submitted to the department for each request to install a holding tank. The installation of the holding tank shall be made in accord with the following criteria.

(b) *Installation.* 1. Materials. The tank shall be constructed of material approved by the department.

2. Location. Tanks shall be located in accord with section H 62.20 (2) (c) except the tanks shall be 20 feet from a building or its appendage.

3. Capacity. Tanks shall have a minimum 5-day holding capacity. Sizing shall be based in accord with section H 62.20 (4) (b).

4. Warning device. A high water warning device shall be installed. This device shall be either an audible or an illuminated alarm. If the latter, it shall be conspicuously mounted.

5. Manhole. Each tank shall be provided with a round manhole at least 24-inch inside diameter extending at least 6 inches above ground surface. Each manhole cover shall have an effective locking device.

6. Septic tank. If an approved septic tank is installed to serve as a holding tank, the inlet and outlet baffles shall be removed and the outlet sealed.

7. Vent. Each tank shall be provided with a minimum 2-inch fresh air inlet extending 12 inches above final grade terminating with a return bend fitting.

8. Servicing. Holding tanks shall be serviced in accord with chapter 146, Wis. Stats., Wis. Adm. Code chapter RD 13, and section H 62.20 (6).

History: 1-2-56; am. (1) (f), Register, June, 1956, No. 6, eff. 7-1-56; am. (2) (a), (2) (b), (2) (c) 2, Register, February, 1957, No. 14, eff. 3-1-57; am. (1) (b), (d) and (e), Register, April, 1962, No. 76, eff. 10-1-62; r. and rec. Register, November, 1969, No. 167, eff. 12-1-69; am. (5) (d) 2, e., Register, October, 1971, No. 190, eff. 11-1-71; r. and rec. (2) (b), Register, November, 1972, No. 203, eff. 12-1-72.

H 62.21 Hangers and supports. (1) **GENERAL.** All piping in a plumbing system shall be installed without undue strains and stresses and provision shall be made for expansion, contraction and structural settlement and backgrounds where necessary.

(2) **PIPE SUPPORTS.** (a) *Stacks.* All pipes shall be supported so that alignment is retained and the weight of the pipes shall not bear upon a caulked joint, except where the spigot end of one vertical pipe rests in the hub end of the next lower vertical pipe. All vertical stacks extending 3 floors or more in height shall be supported on concrete or masonry piers. All vertical piping shall be provided with an approved support at each floor or approximately every 10 feet.

(b) *Pipe supports—water distribution.* All piping shall be supported to prevent undue strains upon connections or fixtures and shall be so aligned and graded that the entire system or parts thereof can be controlled and drained. The formation of traps and/or sags in water piping shall be avoided where possible. When unavoidable, such sags, traps or inverts shall have provisions for properly draining same.

(3) **HANGERS.** (a) All horizontal piping above the floor shall be supported or anchored by approved wall brackets, copper, iron or steel hangers, concrete or masonry piers set at intervals not to exceed 10 feet. Cast iron pipe shall be supported at the joint and intervals not to exceed 5 feet. Copper tubing shall be supported at approximately 6 feet for piping $1\frac{1}{4}$ inches inside diameter and less, and at intervals not to exceed 10 feet for piping $1\frac{1}{2}$ inches inside diameter and larger. Lead pipe shall be supported in its entirety. Bracket, hanger and support materials in contact with the pipe or tubing shall be compatible. Plastic DWV piping shall be supported at intervals of not more than 4 feet, at the end of branches and change of direction or elevation. Supports shall allow free movement. Vertical piping shall be maintained in a straight alignment. Support trap arms in excess of 3 feet in length as close as possible to the trap. Closet rings shall be securely fastened with corrosive resistant fasteners to the floor. Closet bends or stubs shall be stabilized against all horizontal or vertical movement. Pipe exposed to damage by sharp surfaces shall be protected with grommets or sleeves of rubber or plastic. Hangers and straps shall not compress, distort, cut or abrade the piping and shall allow free movement of pipe. All horizontal piping exceeding 20 feet in length shall have an approved ABS or PVC expansion joint installed. See following sketch.

