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		B16.18-1963		
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 1, Schedule 40, DWV and building sewer	9		D1788-68 D2661-68	NSF 14
Acrylonitrile-butadiene-styrene (ABS) (water service)	10		D1527-68 D2282-68	NSF 14
Polybutylene (water service)	10		D2662-68 D2666-68T	NSF 14
Polyethylene (PE) (water service)	10		D2104-68 D2239-68	NSF 14
Polyvinyl chloride (PVC) (water service)	10		D2241-69 D1785-68	NSF 14
Polyvinyl chloride (PVC)	9		D2665-68	NSF 14
Schedule 40 unthreaded				
Schedule 80 can be threaded				
DWV and building sewer				
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

Table 32 (Continued)

Materials	See Limitations to Subsection H 62.19 (2) (a) Below	Standards and Specifications		
		ANSI	ASTM	Other
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			B248-71	
Soft solder				Min. weight—4 lb. per sq. ft.
Valves			B32-66T A181-65	
Water hammer arrestors				See section H 62.19 (1) (a) and (c), Wis. Adm. Code
Water heaters				ASSE 1003 ASSE 1010
Manhole frames and covers		C72.1-1949 Z21.10.1-1966 Z21.10.2a-1963		
Septic tanks - general design and accessories				See section H 62.19 (1) (a) and (c), Wis. Adm. Code
Precast concrete and site constructed	16			See section H 62.20 (4), Wis. Adm. Code
Steel septic tanks	17			Wis. Adm. Code
Glass-fiber reinforced polyester tanks	18			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 ⅛ 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	3½	4	4½	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	8	8½	9	9½	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

1¼″	1½″	2″	2½″	3″	4″

When change of direction is from horizontal to vertical:

2¼″	2½″	3 1/16″	3 11/16″	4¼″	5 3/16″

When change of direction is from vertical to horizontal or horizontal to horizontal:

3″	3½″	4″	4½″	5¼″	6¼″

Change of direction. 45° elbows, 45° Y and ⅛ 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 of 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 ⅛ 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

1¼″	1½″	2″	2½″	3″	4″

When change of direction is from horizontal to vertical:

1⅜″	1⅞″	2 7/16″		3 5/16″	4⅛″

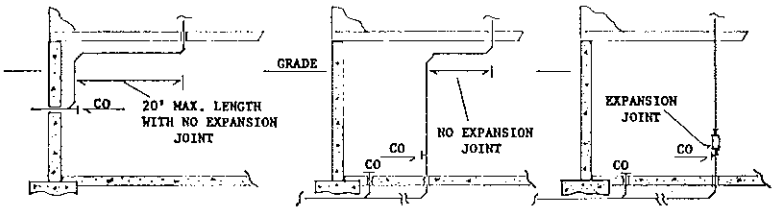
When change of direction is from vertical to horizontal or horizontal to horizontal:

2⅜″	2⅞″	3⅜″	4 5/16″	5 3/16″

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 or 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

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 chapter. The private domestic sewage treatment and disposal system of each building shall be entirely separate from and independent of that of any other building. Mobile home parks, campgrounds, sanitary districts, school districts, resorts and so forth with limited area or other limitations may with departmental approval use a common system.

(b) *Public sewer connection.* When public sewers approved by the department of natural resources become available to the premise served, the private domestic sewage treatment and disposal system shall be discontinued within that period of time required by local order but not to exceed one year. The building sewer shall be disconnected from the private 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 NR 113, Wis. Adm. Code, the tank or entire top shall be removed and the remaining portion of the tank or excavation shall be immediately filled with suitable fill material.

(c) *Plans and specifications.* 1. One- and two-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 domestic sewage treatment and disposal systems serving one- and two-family residences is not required. All applicable approvals and permits required by local government shall be obtained prior to the commencing of construction. The local authority may require plans and specifications prior to issuing permits or approval.

2. Public buildings — departmental approval. Complete plans and specifications shall be submitted in accord with section H 62.20 (1) (c) 4. and 6. and section H 62.25 and written approval received before commencing work on the initial installation of a private domestic sewage treatment and disposal system or for the addition to, modification or replacement of the system, if the system serves or will serve any public building. The owner shall submit a copy of the approved plans to the local authority. Included as public buildings but not limited by enumeration 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, campgrounds and camping resorts
f. Parks

3. Public buildings — local approval. The approval by the county or other local governmental agency having authority shall not eliminate the need for approval by the department for the installation of private

domestic sewage treatment and disposal systems serving public buildings. Departmental approval shall not eliminate the need for obtaining all required local permits and approvals.

4. Public buildings — submission of plans and specifications. All plans and specifications shall be submitted in triplicate and shall include the following:

a. 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 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 determine if limiting distances are a factor. All distances and dimensions required in section H 62.20 (1) (d) 2. shall be shown on this detailed plot plan.

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

c. A permanent elevation reference point.

d. Soil boring and percolation test data. Soil test data shall relate to the undisturbed and finished grade elevations and permanent elevation reference point or bench mark. See section H 62.20 (2) (b).

e. Ground slope with 2-foot contours for the finished grade elevation of the entire area of the soil absorption system and the area on all sides for a distance of 25 feet.

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

Note: All anticipated future growth plans should be considered.

g. Complete specifications of pumps and controls including a statement on volume of dosing and plans of dosing chambers and piping, including relative elevations of related units when dosing or dual system facilities are required or provided.

5. Public buildings — availability of plans. One set of plans bearing the department's stamp of approval shall be maintained at the project site during construction of any private sewage treatment and disposal system serving a public building.

6. Public buildings — revised plans. Approved plans and specifications shall not be revised except with the written approval of the department.

(d) *Local filing requirements.* 1. As-built plan. Every installer of an initial, modified, additional or replacement private domestic sewage treatment and disposal system shall submit a detailed as-built plan of the system to the local authority.

2. Dimension and scale of plan. The as-built plan shall be dimensioned or drawn to scale and shall show the location of the system and the dwelling served by such system. The recommended scale is one inch equals 40 feet, but in any case the scale used shall be sufficient to show clearly all the required dimensions and distances enumerated

below. The following dimensions and distances shall be shown on the plan: the dimensions of the lot or a sufficient portion such that all other required dimensions and distances may be shown; the dimensions of the dwelling to be served by the system; the location of the dwelling and all other buildings on the lot with distances from lot lines to said dwelling and buildings; the location of all septic tank and other treatment tank manholes and the distance and location of each manhole to the dwelling and to any other nearby reference points; the location and dimensions of all septic, holding or other treatment tanks, soil absorption systems and replacement disposal areas; and the location and distances from all buildings, wells, water services, water mains and other underground public utilities, reservoirs, swimming pools or high water marks of any lake, stream, pond or flowage located on the lot or on adjacent properties within 100 feet of the septic tanks, treatment tanks, sewage disposal systems or replacement disposal areas.

3. Plan examination. The local authority shall examine this plan to determine if it adequately shows the required locations, distances and dimensions. If it is determined that the plan meets the requirements of section H 62.20, then he shall accept and file the plan.

4. Acceptance. No private domestic sewage treatment and disposal system shall be used until an as-built plan for the system has been accepted and filed by the local authority.

5. File. The local authority shall establish a filing system which provides a system of retrieval of the as-built plans and may set by ordinances a filing fee. The local authority may require that additional information be included on the plan to aid in filing, indexing or retrieving plans.

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

2. Industrial wastes. The department of natural resources shall be contacted in regard to the treatment and disposal of all industrial wastes, including such combined with domestic waste.

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

4. Water softener backwash. Water softener discharge may be directed to the sewage disposal system or to the ground surface if a nuisance is not created.

(2) SOIL TESTS AND SITE REQUIREMENTS. (a) *General.* Soil boring and percolation tests shall be made by a soil tester certified by the department. Test data shall be signed by the certified soil tester on forms furnished by the department.

(b) *Percolation and boring tests.* 1. Number and location. 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 in the location and to the bottom 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. 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 soil permeability is limited to the maximum of the class used for design purposes and the soil condition is confirmed by the soil bore test data. The department reserves the right to 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. The borings shall be distributed uniformly in the area of the proposed system. If soil pits are constructed they shall be located immediately adjacent to the area.

2. 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. Nevertheless, in all cases the property owner shall be permitted to present evidence consisting of 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) *Replacement system area.* On each parcel of land being initially developed sufficient area of suitable soils based on soil tests and separation and site requirements contained in paragraphs (b) and (e) for one replacement system shall exist. 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.

(d) *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 of any well, reservoir, below ground swimming pool or the high water mark of any lake, stream, pond or flowage.

Note: Septic tanks should be located to provide accessibility for pumping and service vehicles.

(e) *Soil absorption site.* 1. Location. The surface grade of all soil absorption disposal 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, except that when this is not possible, the site shall be so located that surface water drainage from the site is not directly toward a well or reservoir and will bypass 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 from an aboveground swimming pool; 25 feet from any occupied or habitable building or dwelling, building with below grade foundation, public water main, below grade swimming pool or cistern; 50 feet from any water well or reservoir and 50 feet from the high water mark of any lake, stream or other watercourse. Effluent disposal systems in compacted areas such as parking lots and driveways are prohibited. Surface waters shall be diverted away from the soil absorption site.

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

[illegible] foll[illegible] dimensions and distances shall [illegible] the [illegible]dime[illegible] lot or [illegible] sufficient portion [illegible] that all [illegible]red[illegible] and di[illegible] may be shown [illegible] dimen-[illegible] serve[illegible] by the system; the [illegible] of the [illegible] buildings [illegible] distances from [illegible] buildings; the [illegible] of all [illegible] manholes and the [illegible] and location [illegible] and [illegible] any other [illegible] by reference [illegible], the [illegible] dimensions of [illegible] septic, holding [illegible] other treatment [illegible] absorption system and replacement disposal areas and the [illegible] distances from all buildings, wells, water service, water [illegible] public utilities, reservoirs, swimming [illegible] any lake, stream [illegible] or flowage [illegible] adjacent properties within [illegible] feet of the [illegible] tanks, sewage disposal systems or replacement [illegible]

[illegible]ation. The local authority shall examine this plan to [illegible] adequate, shows [illegible] required [illegible]ations, distances and [illegible]. [illegible] is determined that the plan meets the requirements [illegible] H [illegible], then he shall accept and file the plan.

[illegible] private domestic sewage treatment and disposal [illegible] until an as-built [illegible] for the system has been [illegible] filed by the local authority.

The local authority shall establish a filing [illegible] which [illegible] system of retrieval [illegible] the [illegible] plans and [illegible] by [illegible] a filing fee. The local authority may require [illegible] tion-[illegible] included on the p[illegible] in filing, indexing or [illegible] plan[illegible]

[illegible]cific [illegible]itations. [illegible]. Cesspools [illegible] prohibited.

[illegible] industrial [illegible]. The department of natural resources [illegible] be [illegible] in regard to the treatment [illegible] disposal of all industrial [illegible] including such combined with domestic waste.

[illegible] water. The discharge of [illegible] and other clear water [illegible] domestic sewage disposal systems is prohibited.

[illegible] softener [illegible] water softener discharge may be [illegible] sewage [illegible] system or to the ground surface if a [illegible]

[illegible] SITE REQUIREMENTS. [illegible] *General.* Soil boring and [illegible] be made by a [illegible] certified by the [illegible] shall be signed by [illegible] certified soil tester on [illegible] department.

[illegible] boring tests. 1. Number and location. The [illegible] proposed [illegible] absorption system shall be determined [illegible] soil percolation tests and soil borings conducted [illegible] this section. At least [illegible] percolation tests shall be [illegible] uniformly in the location and to the [illegible] proposed absorption system. At least [illegible] soil [illegible] depth [illegible] least [illegible] feet below the bottom of the [illegible]. [illegible] tests may not be required where a [illegible]oil map clearly indicates loamy sand or coarser material

3. Percolation rate—seepage pit. For a seepage pit, percolation tests shall be made in each 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 slowest percolation rate shall be used to determine the absorption area.

4. Floodplain. A soil absorption system shall not be installed in a floodway. Soil absorption systems in areas considered floodplains excluding the floodway shall not be installed unless written approval is received from the department. The department shall receive written local government approval for construction in and filling of the floodplain area prior to reviewing plans.

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 crown of any slope that is greater than the specified slope in its class.

Class of Slope	Minutes Required for Water to Fall One Inch	*Slope*
1	Under 3	20%
2	3 to 45	15%
3	45 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 except if filled prior to certification as a subdivision lot under chapter H 65, Wis. Adm. Code.

7. Groundwater, bedrock or slowly permeable soils. 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 at least 5 feet of soil over bedrock and above the high groundwater level.

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

(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

an 10 minutes, a shorter interval between measurements shall
ed, but in no case shall the water depth exceed 6 inches. The
vater level drop shall be used to calculate the percolation rate.
not meeting the above requirements shall be tested as in
aph (d) below.

Test procedure, other soils. The hole shall be carefully filled
lear water and a minimum water depth of 12 inches shall be
ained above the gravel for a 4-hour period by refilling whenever
ary or by use of an automatic siphon. Water remaining in the
fter 4 hours shall not be removed. Thereafter the soil shall be
d to swell not less than 16 hours nor more than 30 hours.
diately following the soil swelling period, the percolation rate
rements shall be made as follows: Any soil which has sloughed
ie hole shall be removed and water shall be adjusted to 6 inches
he gravel. Thereupon, from a fixed reference point, the water
hall be measured at 30-minute intervals for a period of 4 hours
2 successive water level drops do not vary by more than 1/16 of
h. At least 3 water level drops must be observed and recorded.
ole shall be filled with clear water to a point not more than 6
above the gravel whenever it becomes nearly empty. Adjust-
of the water level shall not be made during the last 3 measure-
periods except to the limits of the last measured water level
When the first 6 inches of water seeps away in less than 30
es, the time interval between measurements shall be 10 minutes
ie test run for one hour. The water depth shall not exceed 6
at any time during the measurement period. The drop that
during the final measurement period shall be used in calculat-
e percolation rate.

Verification. 1. Physical characteristics. Depth to high
dwater and bedrock, ground slope and percolation test results
ie subject to verification. Verification of high groundwater may
e, but not be limited to, a morphological study of soil conditions
articular reference to soil color and sequence of horizons.

Filling. Where the natural soil condition has been altered by
or other attempts to improve wet areas; the department may
e observation of high groundwater levels under saturated soil
ions.

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

SEPTIC TANKS AND OTHER TREATMENT TANKS. (a) *Design of septic*
1. Materials. Septic tanks shall be fabricated or constructed of
d steel, monolithic concrete, glass-fiber reinforced polyester or
materials approved by the department. All tanks shall be
ight and fabricated so as to constitute an individual structure.

Approval. a. The design of prefabricated septic tanks shall be
ved by the department.

Plans for site-constructed concrete tanks shall be approved by
partment prior to construction.

General. a. The liquid depth shall not be less than 3 feet nor
than an average of 6 feet. The total depth shall be at least 8
greater than the liquid depth.

b. 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 shall have an inside diameter of not less than 48 inches.

d. 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. For septic tank material and construction specifications, see section H 62.19 (2) table 32, Wis. Adm. Code Limitations 16, 17 and 18. For general septic tank design criteria, see section H 62.20 (4) (a) and (b), Wis. Adm. Code.

4. Tank accessories. a. 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.

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 1/3 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 multi-compartment 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, be of the same material as the tank and be provided with a substantial, fitted, watertight cover of concrete, steel, cast iron or other approved materials. Steel tanks shall have a minimum 2-inch collar for the manhole extensions permanently welded to the tank. The manhole extension on glass-fiber tanks shall be of the same material as the tank and an integral part of the tank. The collar shall have a minimum height of 2 inches.

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

(b) *Design of other treatment tanks.* 1. The design of other treatment tanks shall be considered on an individual basis. A complete description of the method of treatment to be performed in the treatment tank plus three complete sets of plans must be submitted to the department for each request for approval of the treatment tank. The installation of the tank shall be commenced only upon receipt of written approval by the department. The capacity, sizing

and installation of the tank shall be according to sections H 62.20 (4) (d) and H 62.20 (4) (e) unless the department specifies different sizing or installation requirements in its written approval of the treatment tank. The department may require such treatment tank to be preceded by a conventional septic tank. Credit will be given for the capacity of the septic tank in meeting the required capacity as listed in section H 62.20 (4) (c).

(c) *Capacity and sizing.* 1. 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 except a 500 gallon septic tank may be used to serve a one bedroom residence.

2. 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.

3. Sizing of tank. a. The minimum liquid capacity for one- and two-family residences is as follows:

Septic Tank Capacity One- and Two-Family Residences

Number of Bedrooms	Septic Tank
1	500
2	750
3	975
4	1200
5	1425
6	1650
7	1875
8	2100

b. For buildings other than one- and two-family residences the liquid capacity shall be increased above the 750-gallon minimum as stablished in the following table. For such buildings having kitchen nd/or laundry waste, the tank capacity shall be increased to receive he anticipated volume for a 24-hour period from the kitchen and/or aundry. The liquid capacities established in this table do not include mployes.

partment buildings (per bedroom)	200	gals.
ssembly hall (per person - no kitchen)	2	"
ars and cocktail lounges (per patron space)	9	"
eauty salons (per station)	140	"
owling alley (per alley)	125	"
owling alley with bar (per alley)	225	"
ampgrounds and camping resorts (per camp space)	100	"
ampground sanitary dump stations (per camp space) (omit camp spaces with sewer connection)	15	"
amps, day use only - no meals served (per person)	15	"
amps, day and night (per person)	40	"
ar wash (automatic) - subject to state approval		
ar wash (per car handwash)	50	"
atch basins - garages, service stations, etc. - (per basin floor clean up, etc.)	100	"
atch basins - truck washing (per truck)	100	"
hurches - no kitchens (per person)	3	"

Churches - with kitchen (per person)	7.5	gals.
Condominiums (per bedroom)	200	"
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	"
Dog kennels (per animal enclosure)	20	"
Drive-in restaurants - all paper service (per car space)	15	"
Drive-in restaurants - all paper service inside seating (per seat)	15	"
Drive-in theaters (per car space)	5	"
Employees - in all buildings, per employe - total all shifts	20	"
Hospitals (per bed space)	200	"
Hotels or motels and tourist rooming houses (per room - 2 persons per room)	100	"
Medical office buildings, clinics and dental offices		
Doctors, nurses, medical staff (per person)	75	"
Office personnel (per person)	20	"
Patients (per person)	10	"
Migrant labor camp, central bathhouse (per employee)	30	"
Mobile home parks, homes with bathroom groups (per site)	300	"
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	"
Restaurant (24-hr) - kitchen and toilet wastes (per seating space)	60	"
Restaurant - dishwasher and/or food waste disposer (per seat)	3	"
Restaurant (24-hr) - dishwasher and/or food waste disposer (per seat)	6	"
Retail store - customers (10 sq. ft. per person)	1.5	"
Schools (per classroom - 25 pupils per classroom)	450	"
Schools with meals served (per classroom - 25 pupils per classroom)	600	"
Schools with meals served and showers provided (per classroom)	750	"
Self-service laundries (toilet waste only, per machine)	50	"
Auto. washer, (apartments, service buildings, etc. - per machine)	300	"
Service stations (per car)	10	"
Swimming pool bathhouses (per person)	10	"

(d) *Installation of septic and other treatment tanks.* 1. Location. Septic and other treatment 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. Groundwater. If the tank is installed in groundwater adequate anchoring provisions shall be made.

3. 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 percent will pass a 1/2-inch screen.

4. Backfill. a. The backfill material for steel and glass fiber 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 percent of which shall pass a 4-inch screen and shall be tamped into place.

5. Piping. The inlet and outlet piping between a septic or other treatment tank and points 3 feet beyond the undisturbed ground surrounding the excavation made to install each tank and all piping connecting tanks shall be cast iron pipe or other pipe approved by the department for the specific purpose. The piping 3 feet beyond the undisturbed ground on the outlet side of the septic tank shall comply with the materials specified in section H 62.04 (2), Wis. Adm. Code.

ıe joints between pipe and tank openings shall be made with lead d oakum or other methods approved by the department.

6. Manhole riser joints. a. Concrete. All joints on concrete risers and anhole covers shall be tongue and groove or shiplap type and sealed ıtertight using neat cement, mortar or bituminous compound.

b. Steel. All joints on steel risers shall be welded or flanged and ılted and be watertight. All steel manhole extensions shall be tuminous coated inside and outside.

c. Glass-fiber. All methods of attaching glass-fiber risers shall be ıtertight and approved by the department.

(5) SOIL ABSORPTION SYSTEM - INITIAL INSTALLATION. (a) *Disposal of nk effluent.* The effluent from septic tanks and other approved eatment tanks shall be disposed of by soil absorption systems or by ıch other manner approved by the department and with the concurnce of the department of natural resources for the specific installaon.

(b) *Method of discharge.* For 6-bedroom one- or two-family redences or facilities having a daily effluent application of 1500 gallons less, flow from the septic or treatment tank to the soil absorption ystem may be gravity or pressure. For all other systems the tank ffluent must be discharged by pumping or by use of an automatic phon.

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

(c) *Dosing or pumping chamber - sizing and construction and umping equipment.* The working capacity of the dosing or pumping namber shall be sized to permit automatic discharge of the total aily sewage flow with discharge occurring no more than 4 times per 4 hours. Dosing or pumping chamber construction shall meet the ame general criteria as specified for septic tanks in relationship to naterials and fabrication. Dosing or pumping chambers shall be rovided with a minimum 4-inch vent extended at least 12 inches bove final grade and terminate with an approved vent cap and be a ıinimum of 25 feet from a door, window or fresh air intake. The utomatic siphons and pumping equipment shall be department approved.

(d) *Sizing - general.* For systems having a daily effluent application f 5000 gallons or less, sizing shall be in accord with subsections H 2.20 (5) (e) and (f) below. For systems receiving effluents in excess f 5000 gallons per day, subsections H 62.20 (5) (e) and (f) below hall apply except that 2 systems of equal size shall be required. Each ystem shall have a capacity of no less than 75 percent of the required rea. A suitable means of alternating waste application shall be rovided. The dual system shall be considered as one system.

(e) *Sizing - residential.* The bottom area for seepage trenches or beds r the side wall area for seepage pits required for a soil absorption ystem serving residential property shall be determined from the ollowing table using soil percolation test data and type of construcion:

Percolation Class	Percolation Rate Minutes Required for Water to Fall One Inch	Minimum Absorption Area in Square Feet			
		Public Buildings		Residential Property per bedroom	
		Seepage Trenches or Pits	Seepage Beds	Seepage Trenches or Pits	Seepage Beds
Class 1	0 to 10	110	140	165	205
" 2	10 to 30	165	205	250	315
" 3	30 to 45	200	250	300	375
" 4	45 to 60	220	280	330	415

(f) *Sizing - other.* The required bottom area for seepage trenches or beds or the side wall area for seepage pits for a soil absorption system serving public buildings shall equal the absorption area specified in section H 62.20 (5) (e) for public buildings according to the percolation test results and type of construction multiplied by the applicable unit specified in column 2, multiplied by the applicable factor in column 3 of the following table. The effluent disposal factor established in this table does not include employes.

Column 1 Building Classification	Column 2 Units	Column 3 Factor
Apartment building	1 per bedroom	1.0
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	0.2
Car wash (automatic)	Subject to state approval	
Car wash (per car handwash)	1 per car	1.0
Catch basin - garages, service stations, etc. (floor cleanup)	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	1.0
Dance hall	1 per person	0.06
Dining hall - kitchen and toilet	1 per meal served	0.3
Dining hall - kitchen only	1 per meal served	0.15
Dog kennel	1 per animal enclosure	0.4
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
Employees - in all buildings	1 per person	0.4
Hotel or motel and tourist rooming house	1 per room	0.9
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 employee	0.25
Mobile home park	1 per mobile home site	3.0
Nursing or rest homes	1 per bed space	1.0
Park - toilet waste only	1 per acre	4.0
Park - showers and toilets	1 per acre	8.0
Restaurant - kitchen and toilet	1 per seating space	0.6
Restaurant - (24-hr) kitchen and toilet	1 per seating space	1.2

aurant with dishwasher and/or food waste			
xer	1 per seating space		0.75
aurant - (24-hr) with dishwasher/disposer	1 per seating space		1.5
il store	1 per customer		0.03
service laundry - toilet wastes only	1 per machine		1.0
to washer (apartments, service bldgs., etc.)	1 per machine		6.0
ice station	1 per car served		0.15
ming pool bathhouse	1 per person		0.2
ol - no meals, no showers	1 per classroom		5.0
ol - meals served or showers	1 per classroom		6.7
ol - meals and showers	1 per classroom		8.0

g) *Installation - seepage trench or bed systems.* 1. A seepage nch or a seepage bed shall have a depth to the top of the tribution pipe of 12 to 42 inches measured from the finished grade.

lote: A shallow seepage trench system is preferred in all cases.

. The bottom of the seepage trench shall be level with seepage nch excavations from one to 5 feet in width. The absorption area of eepage trench shall be computed by using the bottom area only. nch excavations shall be spaced at least 6 feet apart. The distribu- n header shall be constructed of approved solid wall pipe and the tom area of the header excavation shall not be computed as sorption area. The individual seepage trenches should preferably be over 100 feet long. Equal distribution of effluents shall be de to all seepage trenches.

. Seepage beds shall be level and meet the requirements of a page trench except that the excavation is more than 5 feet wide l has more than one distribution pipe line. Distribution piping in a page bed shall be uniformly spaced no more than 6 feet and no less n 3 feet apart and no more than 3 feet or less than one foot from e sidewall. The distribution header shall be constructed of approved id wall pipe.

. Seepage trenches or beds shall not be excavated when the soil has lastic consistency at moist or wet conditions.

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

. Distribution piping for gravity systems shall be a minimum of 4- h I.D. approved perforated cement asbestos, concrete, clay tile, uminous fiber or plastic. The top of the distribution piping shall be d 12 to 42 inches below the surface in continuous straight or curved es at a slope of 2 to 4 inches per 100 feet.

. Fresh air inlets of cast iron shall be provided and connected to e perforated distribution pipe with an approved fitting or junction x and be placed so as to assure a free flow of air throughout the tire installation. The vent pipes shall be at least 4 inches in ameter and extend at least 12 inches above the final grade and rminate with an approved vent cap. Fresh air inlets shall be located least 25 feet from any window, door or air intake of any building ed for human habitation. A maximum of 4 distribution pipe lines ay be served by one common 4-inch vent when interconnected by a mmon header pipe.

. A minimum of 12 inches of washed, graded, hard rock or similar gregate ranging in size from 3/4 to 2-1/2 inches shall be laid into

the trench or bed below the distribution pipe elevation and such aggregate shall be evenly distributed a minimum of 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 filled.

9. Where dosing is required the siphon or pump shall discharge a minimum capacity equal to 75% of the combined volume of the distribution piping in the absorption system. See section H 62.20 (5) (d).

(h) 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 6 feet or more apart. The pit bottom shall be left open to the soil. Washed graded hard rock or similar aggregate 3/4 to 2-1/2 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 section H 62.20 (5) (g) 7. Excavation and scarifying shall be in accord with section H 62.20 (5) (g) 5. 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 less 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 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

* The 6-inch annular opening credit is included.

(6) SOIL ABSORPTION SYSTEM—REPLACEMENT. (a) *Approval.* 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 section.

(b) *Effluent disposal.* Alternates for the disposal of effluents emanating from existing structures may be accomplished by means other than outlined in this section 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 commencing the improvements or work on these systems.

(7) MAINTENANCE AND SLUDGE DISPOSAL. (a) *Maintenance.* Septic nks shall be cleaned whenever the sludge and scum occupies 1/3 of ie tank volume. All sludge, scum, liquid and any other material emoved from a private domestic sewage treatment and disposal ystem is hereafter referred to as sludge.

(b) *Sludge disposal.* See Wis. Adm. Code chapter NR 113.

(8) CHEMICAL RESTORATION. The chemical restoration of effluent isposal systems shall be approved by the department.

(9) HOLDING TANKS. (a) *Approval.* 1. Holding tanks shall be consid-ed on an individual basis. Three complete sets of plans, as required section H 62.20 (1) (c) 4., shall be submitted to the department for ach request to install a holding tank.

2. Sizing. a. The minimum liquid capacity of a holding tank for one-nd two-family residences is as follows:

Number of Bedrooms	Holding Tank
1	1000
2	1500
3	2000
4	2500
5	3000
6	3500
7	4000
8	4500

b. Public buildings shall have a minimum 5-day holding capacity ut not less than 1000 gallons. Sizing shall be based in accord with ection H 62.20 (4) (c) 3. b.

Note: The 750 gallon minimum referred to in section H 62.20 (4) (c) 3. b. does not apply holding tanks.

3. Agreement. A signed agreement between local government and wner to guarantee the pumping and transport of the holding tank ontents to a disposal site meeting the requirements of Wis. Adm. ode chapter NR 113, provided it becomes necessary to prevent or bate a nuisance as described in sections 146.13 and 146.14, Wis. tats., or if the owner does not pump and transport in response to rders from local government, shall be submitted to the department or review and approval. The agreement shall be binding on the wners, their heirs and assignees. The installation of the holding tank nall be made in accord with the following criteria.

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

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

3. Warning device. A high water warning device shall be installed. his device shall be either an audible or an indoor illuminated alarm. the latter, it shall be conspicuously mounted.

4. Manhole. Each tank shall be provided with a manhole opening no ss than 24 inches square or 24 inches in diameter extending to

ground surface. Each manhole cover shall have an effective locking device.

5. 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.

6. 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 and a minimum of 25 feet from a door, window or fresh air inlet.

7. Servicing. Holding tanks shall be serviced in accord with chapter 146, Wis. Stats., and Wis. Adm. Code chapters H 62 and NR 113.

8. Before any holding tank is purchased or installed a state septic tank permit shall be obtained in accord with section 144.03, Wis. Stats.

(10) SEVERABILITY. Should any section, paragraph, phrase, sentence, clause or word of this chapter be declared invalid or unconstitutional for any reason, the remainder of this chapter shall not be affected thereby.

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 recr. 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 recr. (2) (b), Register, November, 1972, No. 203, eff. 12-1-72; r. and recr. Register, July, 1976, No. 247, eff. 8-1-76.

H 62.21 Hangers and supports. (1) GENERAL. All piping in a plumbing system shall be installed without undue strains and stresses and provisions 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 1¼ inches inside diameter and less, and at intervals not to exceed 10 feet for piping 1½ 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