(d) *Backflow valves.* Building storm drains subject to backflow or backwater at the time of installation shall be provided with adequate backwater valves, installed to prevent interference with the flow and be readily accessible.

(4) AREA DRAINS. (a) *Window well drains.* All window well areas not exceeding 50 square feet shall be properly drained. This area drain may discharge to a subsoil or foundation drain through a minimum 2 inch diameter pipe or to the building storm drain. The drain inlet should be provided with a strainer.

(b) *Area drains.* An area drain shall be provided for open subsurface spaces 50 square feet or more in area. The drain shall discharge to the building storm drain, storm subdrain or storm sewer. If no storm sewer exists, the discharge shall be as specified in s. H 62.12 (1) (b). The area drain shall have a minimum inside diameter of 2 inches and shall not discharge into a subsoil, footing or foundation drain.

(5) RAINWATER CONNECTIONS. (a) All roof conductors placed within a building, interior court, ventilating pipe or shaft shall be installed as specified for soil, waste and vent pipes except black iron or steel pipe may be used. Black iron or steel roof conductors shall not be embedded in masonry or concrete.

(b) When rainwater conductors installed outside a building discharge to a storm sewer or drain, the horizontal portion extending 2 feet inside the exterior wall and the vertical portion outside the wall shall terminate with the hub above grade and shall be made of cast iron pipe.

(c) *Roof drains.* Roof drains shall be made of cast iron, copper, lead or other material approved by the department.

1. Storm water inlets for use on sun decks, parking decks, surface areas and similar areas may be of the flat surface type and shall have an available inlet area of not less than 2 times the required area of the conductor.

2. Roof drains, other than those specified in s. H 62.12 (5) (c) 1., shall be equipped with strainers extending not less than 4 inches above the surface of the roof immediately adjacent to the roof drain. Strainers shall have an available inlet area, above the roof, of not less than 1½ times the area of the conductor to which the drains connect.

(6) TRAPS FOR STORM AND CLEAR WATER WASTES. (a) Traps shall not be required for storm water conductors when the conductors extend to the roof of a building unless the drain inlet is within 8 feet of a door or openable window or within 20 feet of a fresh air inlet.

(b) Area drains will not require a trap unless such drain inlet is within 8 feet of a door, openable window or 20 feet from a fresh air intake. One or more drain inlets may be connected to a single trap which shall be located immediately inside the building.

(c) Footing, foundation and subsoil drains shall discharge into a trap or trapped drain tile receiver and be provided with a cleanout. A trap is not required with footing, foundation and subsoil drains discharge to a sump and pump which elevate the waste.

(d) Traps are required at all interior drain inlets receiving clear water wastes.

(e) Inlets of drains receiving clear water wastes shall terminate wherever possible at least 2 inches above the floor but in no case less than 1 inch.

(7) VENTS REQUIRED. (a) A trap receiving clear water wastes shall be supplied with a properly installed vent. Such vent or vents shall not connect to the sanitary plumbing system.

(b) Vents shall not be required for traps which receive storm water wastes exclusively.

(8) CLEANOUTS. (a) *Size.* Cleanouts shall conform to Wis. Adm. Code s. H 62.10 (5) and (7).

(b) *Storm drain.* A cleanout with a brass screw cover or other type approved by the department shall be provided at a point where the drain leaves the building. This cleanout shall be extended from the building drain with cast iron soil pipe to the surface of the finished floor or grade and wherever practical shall be not less than 2 inches above the finished floor or grade. An additional cleanout located 28 to 30 inches above the floor shall be provided in all roof conductors. Cleanouts will not be required in roof conductors in a one story building provided the roof conductor does not exceed 25 feet in length and does not have an offset greater than 45° from the vertical.

(c) *Storm drain branches.* Cleanouts shall be provided in all storm drain branches exceeding 25 feet in length.

(d) *Storm sewer access.* Building storm sewer cleanouts shall be installed as required in Wis. Adm. Code s. H 62.04 (4) (h).

(9) PROHIBITED CONNECTIONS. Rainwater conductors shall not be used as soil, waste or vent pipes; nor shall any soil, waste or vent pipes or clear water waste piping be used as rainwater conductors.

History: Cr. Register, November, 1972, No. 203, eff. 12-1-72.

H 62.13 Water distribution systems. (1) GENERAL REQUIREMENTS. Every building equipped with plumbing fixtures and used for human occupancy or habitation shall be provided with a potable supply of cold water. No water service shall pass under or through a building to serve another building. In residences and buildings serving the public and places of employment, hot water shall be provided.

(2) WATER SERVICE. (a) *Size.* The minimum inside diameter of a water service pipe shall be ¾-inch. The minimum size water service pipe may be increased by the local government or the utility by published ordinance or rule approved by the department. The size of the water service shall be determined by the requirements of H 62.13 (4) (b) or H 62.13 (4) (c). When H 62.13 (4) (c) is used, the minimum pressures specified in H 62.13 (4) (c) 1. g., shall be included in the calculations.

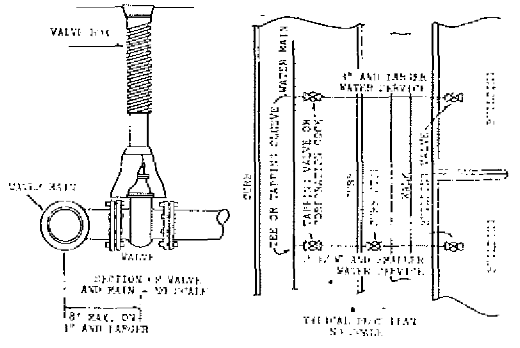
(b) *Materials.* The water service including pipe and fittings to any building shall be type K copper with copper or brass fittings, brass, cast iron, ductile iron, galvanized open hearth iron, galvanized steel, plastic, asbestos cement or other materials approved by the department. Any of the above materials used within bounds of, or beneath an area subject to easement for highway or street purposes or public service right-of-ways shall be subject to acceptance by the local government or the utility by published ordinance or rule approved by the department. See ss. H 62.19 and H 62.24, Wis. Adm. Code for material standards.

(c) *Valve controls.* Water service controls shall include a corporation cock or valve at the main, a curb stop at or near the property line and inside the wall of each building and on the water distribution side of the water meter.

Note: The water service terminates at the meter valve or within 3 feet where the pipe penetrates the building floor or wall.

1. The corporation cock or valve at the main shall be a ground key stop-cock. An approved gate valve may be used for services 3 inches or larger.

2. The curb stop shall be an approved gate valve, ground key stop-cock or a ball valve which shall be installed between the curb and the property line. When a private water supply serves more than one building a curb stop is required for each building. For a water service 3 inches or larger, one valve may serve as the shut off at the main and for the curb stop. See following sketch.



3. Building and meter valves. An approved valve shall be provided at the meter or at a point not more than 3 feet inside where the service penetrates the building floor or wall and another on the water distribution side of the meter. A valved bypass shall be provided for all 1-½-inch or larger water meters. The bypass may be a minimum of one nominal pipe size smaller than the water service. When parallel meters are installed, a bypass may not be required provided the other meter (s) adequately serve the building water distribution requirements.

4. Prohibited valves. Combination stop and waste valves shall not be installed underground in water service piping. Frostproof yard hydrants shall be approved by the department.

(d) *Separation of water service and building sewers.* 1. Except as permitted below, the underground water service pipe and building sewer shall not be less than 8 feet apart horizontally and shall be separated by undisturbed or compacted earth. The water service pipe may be placed in the same trench with the building sewer under the following conditions:

a. The water service and the building sewer are installed concurrently.

b. The bottom of the water service pipe at all points shall be at least 12 inches above the top of the sewer line.

c. The water service pipe shall be placed on the solid shelf excavated at one side of the common trench or the water service be installed at the side of the common trench with the 12 inches of bedding material meeting the following criteria. The initial backfill on the sides of the sewer pipe and to the 12-inch depth above the sewer shall be well tamped prior to installing the water service pipe. The bedding material shall be of medium to coarse sand, pea gravel or rock screenings.

d. The number of joints in the water service pipe shall be kept to a minimum.

e. The water service shall be located a minimum of 10 feet from a septic tank or soil absorption site.

f. The materials and joints of water service pipe shall be installed in such a manner and shall possess the necessary strength and durability to prevent the escape of liquids and gases therefrom under adverse conditions such as corrosion, strain due to temperature changes, settlement, vibrations and superimposed loads.

2. Where the building sewer is existing, the water service pipe shall be installed in a separated trench pursuant to s. H 62.13 (2) (d) 1., excepting a replaced water service may be installed pursuant to s. H 62.13 (2) (d) 1. b. and c.

(3) FIXTURE SUPPLY. (a) *Potable water.* Only potable water shall be used in the processing of food, medical or pharmaceutical products, serving plumbing fixtures, appliances and appurtenances.

(b) *Identification.* Where 2 or more distribution systems are installed, each system shall be identified either by color marking, metal tags or other methods as may be approved by the department. All valves shall be tagged potable or nonpotable water.

1. Color marking. When color marking is used, potable water lines should be painted green and nonpotable water lines should be painted yellow. This requirement may be met by painting 3-inch wide bands at intervals of not more than 25 feet and at points where piping passes through walls, floors or roofs, in which case the bands shall be applied to the piping on both sides of the walls and both above and below the floor or roof. Points of outlets for nonpotable water shall be marked with a tag or color coded.

2. Metal tags. When tags are used, potable waterlines and valves shall be identified by 3-inch diameter metal tags bearing the legend SAFE WATER in letters not less than ½-inch in height. Nonpotable water lines and valves shall be identified by firmly attached metal tags having the shape of a 4-inch equilateral triangle bearing the legend WATER UNSAFE in letters not less than 7/16-inch in height. As in the use of color bands, tags shall be attached to pipes at intervals of not more than 25 feet and at either side of points where pipes pass through walls and above and below points where pipes pass through floors or roofs.

(4) WATER SERVICE AND DISTRIBUTION DESIGN. (a) *Design.* Water distribution piping systems shall be designed and installed so the maximum velocity through the piping shall not exceed 8 feet per second. Sizing of the water service and distribution system may be calculated and designed in accord with section H 62.13 (4) (b) or (c), whichever is applicable. Where street main pressures fluctuate, the water service, water meter and building distribution shall be designed for the minimum pressure available.

(b) *Sizing the water service and water distribution system by tables.* 1. Limitations. Where the total developed length of the water service is 75 feet or less and the total developed length of the water service and water distribution piping is 250 feet or less and the quantity of the water supply demand in total water supply fixture units, as determined from table 13 does not exceed the fixture units listed in tables 13a, 13b or 13c, the minimum size of the water service shall be determined from table 13a, 13b or 13c.

2. The following information is required. a. Pressures and elevations.

1) Maximum and minimum pressure at the water main or other supply source. The minimum pressure at the main is used for design purposes. The maximum design pressure of the water distribution system is 80 p.s.i.g.

2) The difference in elevation between the street main or other source and the highest fixture or outlet and the pressure loss through any equipment such as a water conditioner, water meter, water heater, water filter, pressure regulator, pressure reducing valves, reduced pressure backflow preventer or similar devices.

b. Length. The total developed length of the piping from the water main or other source of supply to the furthermost fixture.

c. Supply demand. The number of total water supply fixture units (s.f.u.) for all fixtures and other water uses as specified in table 13.

Note: See s. H 62.13 (4) (b) 2. d., for sizing and water service and distribution when flush valves are installed.

d. Supply demand; Flush valves. Branches, mains and risers serving water closet or similar flush valves may be sized from table 13a, 13b or 13c, when the following values are assigned to each flushometer valve by beginning with the most remote valve on each branch.

First	flushometer	valve	40	fixture	units
Second	"	"	30	"	"
Third	"	"	20	"	"
Fourth	"	"	15	"	"
Fifth	"	"	10	"	"

Five fixture unit value flushometer valves may be computed at half the above values. After the fifth flushometer valve on any main, branch or riser, fixture loadings may be computed using the values given in table 13. No piping supplying a flushometer valve shall be less than the valve inlet.

3. Sizing the water service. a. Table selection. After determining the minimum water pressure at the source as specified in 2. a. 1), subtract ½

pound per square inch of pressure for each 1 foot of difference in elevation between the source and the highest fixture and any pressure loss through equipment as specified section H 62.13 (4) (b) 2. a. 2). Select table 13a, 13b or 13c with the pressure ranges that contain the calculated pressure.

b. Length column selection. Select the length column that is equal to or greater than the total developed length.

c. Size column selection. Follow down the column to a fixture unit value (s.f.u.) equal to or greater than the total number of fixture units required for the installation. The size of the water service will be found in the column labeled water service.

4. Sizing the water distribution system. Starting at the most remote fixture on the cold water supply and the hot water supply, apply the cold water or hot water fixture supply demand units as applicable from table 13 to the cold water or hot water supply adding the fixture units as additional fixtures are connected. Using table 13a, 13b or 13c, as selected in section H 62.13 (4) (b) 3. a., and the length column selected in section H 62.13 (4) (b) 3. b., select a horizontal line that meets or exceeds the fixture unit demand of that section of piping. Except for the minimum requirements in section H 62.13 (4) (c) 1. e., f. and table 15, the size of the water distribution main, water distribution branch, fixture supply branches and risers will be found in the column labeled building distribution. The water distribution main serving water heaters and the cold water demand shall be sized to deliver the above required hot water demand, plus all required cold water demands but in no case need the piping be larger than that required for the total building supply as computed in s. H 62.13 (4) (b) 4.

Table 13

WATER SUPPLY FIXTURE DEMAND UNITS

Fixture	Occupancy	Type Control	Weight in Fixture Units		
			Hot	Cold	Total
Water Closet	Public	FL. Valve		10.	10.
Water Closet	Public	FL. Tank		5.	5.
Urinal	Public	½" FL. Valve		5.	5.
Urinal	Public	¾" FL. Valve		5.	5.
Lavatory	Public	Faucet	1.5	1.5	2.
Bathtub or Shower Head	Public	Faucet	3.	3.	4.
Service Sink	Offices, etc.	Faucet	2.25	2.25	3.
Kitchen Sink	Hotels-Restaurants	Faucet	3.	3.	4.
Drinking Fountain	Offices, etc.	⅜ Valve		0.25	0.25
Water Closet	Private	FL. Valve		6.	6.
Water Closet	Private	FL. Tank		3.	3.
Lavatory	Private	Faucet	0.75	0.75	1.
Lavatory-Treatment or Clinical	Public	Faucet	1.	1.	1.5
Bathtub or Shower Head	Private	Mixing Valve	1.5	1.5	2.
Kitchen Sink	Private	Faucet	1.5	1.5	2.
Laundry Trays (1 to 3 compartments)	Private	Faucet	2.25	2.25	3.
Combination Fixture	Private	Faucet	2.25	2.25	3.
Dishwashing Machine	Private	Automatic	1.		1.
Emergency Eyewash	Public	Faucet		1.	1.
Laundry Machine (8 lb)	Private	Automatic	1.5	1.5	2.
Laundry Machine (8 lb)	Public or General	Automatic	2.25	2.25	3.

Fixture	Occupancy	Type Control	Weight in Fixture Units		
			Hot	Cold	Total
Laundry Machine (Large)	Refer to Manufacturer's Requirements				
Bathroom Group	Private	FL. Valve	2.25	8.25	9.
Bathroom Group	Private	FL. Tank	2.25	5.25	6.
Bidet	Public	Variable	3.00	3.00	4.
Coffee Urn Stand	Public	Variable		2.	2.
Food Waste Grinder	Public	Variable	Manufacturer's Require.		
Hose-Pre-Rinse	Public	Variable	2,5	2,5	3.
Hose Station	Public	Variable	3.0	3.0	4.
Ice Maker	Public	Variable		1.	1.
Sink - Baker's Pan	Public	Variable	2.5	2.5	3.
Sink - Back Bar	Public	Variable	1.5	1.5	2.
Sink - Barber and Shampoo	Public	Faucet	1.5	1.5	2.
Sink - Cook's	Public	Variable	2.5	2.5	3.
Sink - Cup	Public	Variable		1.	1.
Sink - Diet Kitchen	Public	Variable	1.5	1.5	2.
Sink - Laboratory	Public	Variable	1.5	1.5	2.
Sink - Laboratory and Trough	Public	Variable	1.5	2.5	3.
Sink - Meat Preparation	Public	Variable	2.5	2.5	3.
Sink - Pot and Pan (Per Faucet)	Public	Variable	3.	3.	4.
Sink - Salad Preparation	Public	Variable	2.5	2.5	3.
Sink - Silver Soak	Public	Variable	2.5	2.5	3.
Sink - Treatment or Exam	Public	Variable	1.5	1.5	2.
Sink - Vegetable	Public	Variable	2.5	2.5	3.
Ice Cuber & Flakers	Public	Variable		1.	1.
Hosebibb - Wall Hydrant	Public and Private	Variable		4.	4.
Wall Hydrant C.W. & H.W.	Public and Private	Variable	3.	3.	4.
Wash Fountain - Factory Wash-up (20" = 1 Lav Space)	Public	Variable	1.5	1.5	2.

"Private" fixtures are those in residential areas not freely accessible, such as in private homes, residential apartments, hotel guest rooms, private rooms or apartments in residential hotels, dormitories or executive suites and the like.

Table 13a

**MAXIMUM FIXTURE UNITS (s.f.u.)
WATER SERVICE AND DISTRIBUTION SIZING
CALCULATED PRESSURE RANGE 30 THROUGH 45 PSI**

Water Service Not to Exceed 75 Feet	Building Distribution	Maximum Total Developed Allowable Length In Feet				
		75	100	200	250	
¾"	¾"	20	18	15	12	9
¾"	1"	20	18	16	16	15
1"	1"	30	27	24	21	20
1"	1-¼"	39	36	32	30	28
1-¼"	1"	32	32	32	28	23
1-¼"	1-¼"	56	49	44	35	32
1-¼"	1-½"	56	56	56	51	48
1-½"	1-¼"	56	56	56	56	56
1-½"	1-½"	109	103	84	63	56

Water Service Not to Exceed 75 Feet	Building Distribution	Maximum Total Developed Allowable Length In Feet				
		75	100	150	200	250
1-½″	2″	127	123	111	103	86
2″	1-½″	111	111	111	78	66
2″	2″	275	264	186	175	146

Table 13b

MAXIMUM FIXTURE UNITS (s.f.u.)
WATER SERVICE AND DISTRIBUTION SIZING
CALCULATED PRESSURE RANGE 46 THROUGH 60 PSI

Water Service Not to Exceed 75 Feet	Building Distribution	Maximum Total Developed Allowable Length In Feet				
		75	100	150	200	250
¾″	¾″	20	18	18	18	16
¾″	1″	30	28	26	24	22
1″	1″	34	34	34	34	30
1″	1-¼″	58	56	54	49	46
1-¼″	1″	34	34	34	34	34
1-¼″	1-¼″	58	58	58	58	54
1-¼″	1-½″	111	95	86	78	69
1-½″	1-¼″	58	58	58	58	58
1-½″	1-½″	111	111	111	111	99
1-½″	2″	225	220	196	175	170
2″	1-½″	111	111	111	111	111
2″	2″	275	275	275	275	250

Table 13c

MAXIMUM FIXTURE UNITS (s.f.u.)
WATER SERVICE AND DISTRIBUTION SIZING
CALCULATED PRESSURE RANGE OVER 60 PSI
(but not to exceed 80 PSI)

Water Service Not to Exceed 75 Feet	Building Distribution	Maximum Total Developed Allowable Length In Feet				
		75	100	150	200	250
¾″	¾″	20	18	18	18	18
¾″	1″	34	32	30	28	26
1″	1″	34	34	34	34	34
1″	1-¼″	58	58	58	58	54
1-¼″	1″	34	34	34	34	34
1-¼″	1-¼″	58	58	58	58	58
1-¼″	1-½″	111	111	111	111	98
1-½″	1-¼″	58	58	58	58	58
1-½″	1-½″	111	111	111	111	111
1-½″	2″	275	275	250	235	215
2″	1-½″	111	111	111	111	111
2″	2″	275	275	275	275	275

(c) Friction loss method for sizing the water service and distribution system. 1. The supply demand in gallons per minute in the building water distribution system shall be determined on the basis of the load in terms of supply fixture units and of the relationship between load and supply demand as shown in tables 13 and 14. Water supply outlets for items not listed in table 13 shall be computed at their maximum demand but in no case less than:

Fixture	Number of Fixture Units	
	Private Use	Public Use
⅜-inch pipe	1	2
½-inch pipe	2	4
¾-inch pipe	3	6
1 inch pipe	6	10

a. For supply outlets likely to impose continuous demands, estimate continuous supply separately in gallons per minute and add to total demand in gallons per minute for fixtures.

b. The given weights in table 13 are for total demand and for fixtures with both hot and cold water supplies. The weights for maximum separate demands are taken as ¾ the listed total demand for the hot water supply and the cold water supply.

c. Compute flush valve demand separately.

d. Demand (GPM) Corresponding to Fixture Load (WSFU). To determine the demand in gallons per minute corresponding to any given load in water supply fixture units, reference must be made to table 14, Table for Estimating Demand.

Table 14

ESTIMATING DEMAND

Supply Systems Predominantly For Flush Tanks		Supply Systems Predominantly For Flush Valves	
Load (Water Supply Fixture Units)	Demand GPM	Load (Water Supply Fixture Units)	Demand GPM
6	5		
8	6.5		
10	8	10	27
12	9.2	12	28.6
14	10.4	14	30.2
16	11.6	16	31.8
18	12.8	18	33.4
20	14	20	35
25	17	25	38
30	20	30	41
35	22.5	35	43.8
40	24.8	40	46.5
45	27	45	49
50	29	50	51.5
60	32	60	55
70	35	70	58.5
80	38	80	62
90	41	90	64.8
100	43.5	100	67.5
120	48	120	72.5
140	52.5	140	77.5
160	57	160	82.5
180	61	180	87
200	65	200	91.5
225	70	225	97
250	75	250	101
275	80	275	105.5
300	85	300	110
400	105	400	126
500	125	500	142
750	170	750	178
1,000	208	1,000	208
1,250	240	1,250	240
1,500	267	1,500	267
1,750	294	1,750	294
2,000	321	2,000	321
2,250	348	2,250	348
2,500	375	2,500	375
2,750	402	2,750	402
3,000	432	3,000	432
4,000	525	4,000	525
5,000	593	5,000	593
6,000	643	6,000	643
7,000	685	7,000	685
8,000	718	8,000	718
9,000	745	9,000	745
10,000	769	10,000	769

e. Size. The diameter of any pipe serving more than one plumbing fixture or appliance shall not be less than ¾-inch inside diameter.

f. Minimum size. The minimum size of a water distribution branch serving no more than one fixture shall be as shown in table 15. The water distribution branch shall be extended to within at least 18 inches of the point of connection to the fixture.

Table 15

MINIMUM SIZES OF WATER DISTRIBUTION BRANCHES

Type of Fixture or device	I.D. Pipe Size (Inches)	Type of Fixture or device	I.D. Pipe Size (Inches)
Bathtubs	½	Shower (single head)	½
Combination sink and tray	½	Sinks (service, mop)	½
Drinking fountain	⅜ (1′ max)	Sinks (flushing rim)	¾
Dishwasher (domestic)	½	Urinal (direct flush valve)	¾
Electric drinking water cooler	⅜ (1′ max)	Urinal (direct flush valve)	½ (1′ max)
		Water closet (tank type)	⅜ (1′ max)
Kitchen sink, residential	½	Water closet (flush valve type)	1 (1′ max)
Kitchen sink, commercial	¾	Hose bibb	½
Lavatory	⅜ (1′ max)	Wall hydrant	½
Laundry tray 1, 2 or 3 compartments	½		

g. Minimum hydrostatic pressure. Based on the minimum hydrostatic pressure available, pipe sizes shall be selected so that under conditions of peak demand a minimum flow pressure at the point of discharge shall be not less than required to maintain minimum flow rates listed in table 16. Pipe sizes for flush valve water closets and urinals shall be adequate to maintain flow pressures of 20 pounds per square inch for blowout action and jet action fixtures. For fixtures other than those supplied by flush valves, a minimum pressure of 8 pounds per square inch at the highest fixture shall be included in the calculations.

Table 16

MINIMUM AND MAXIMUM FLOW RATES TO FIXTURES AND APPURTENANCES

Fixture	Flow Rate Minimum GPM	Flow Rate Maximum GPM
Lavatory - Residential		3
Lavatory - Public		1 after handle release
Sink	4	4
Bathtub	6	
Laundry tray	5	
Shower except for safety - each head		3
Water closets		
Tank type		4 gal. per flush
Blowout action		4 gal. per flush
Jet action		4 gal. per flush
Drinking fountain	0.75	
Wall hydrant	5	
Urinal		1.5 gal. per flush

h. Variable street pressures. Where street water main pressures fluctuate, the building water distribution system shall be designed for the minimum pressure available.

i. Location and size of water supply source. Location and size of the public water main, where available, should be obtained from the local water authority.

j. Elevations. The relative elevations of the source of water supply and the highest water supply outlets in the building must be determined. In the case of a public main, the elevation of the point where the water service connection is to be made to the public main must be obtained from the local water authority.

k. Maximum total developed length of system. Information shall be obtained regarding the total developed length of the water service piping from the source of water supply to the water service control valve of the building. Determine the total developed length of the distribution piping from the service control valve to the highest and most remote water outlet on the system.

l. Friction loss. Calculate the permissible uniform pressure loss for friction in the system. The amount of pressure available for dissipation as friction loss due to pipe, fittings, valves and appurtenances or devices in the system, must be divided by the maximum total developed length of the water service and water distribution system. This establishes the pipe friction limit for the circuit or system in terms of pressure loss, in psi, per foot of total pipe length. Multiply this value by 100 in order to express the pipe friction unit in terms of psi per 100 feet of length. If specifications for pressure loss due to fittings and valves are not furnished, add 50% of the maximum total developed length for friction loss.

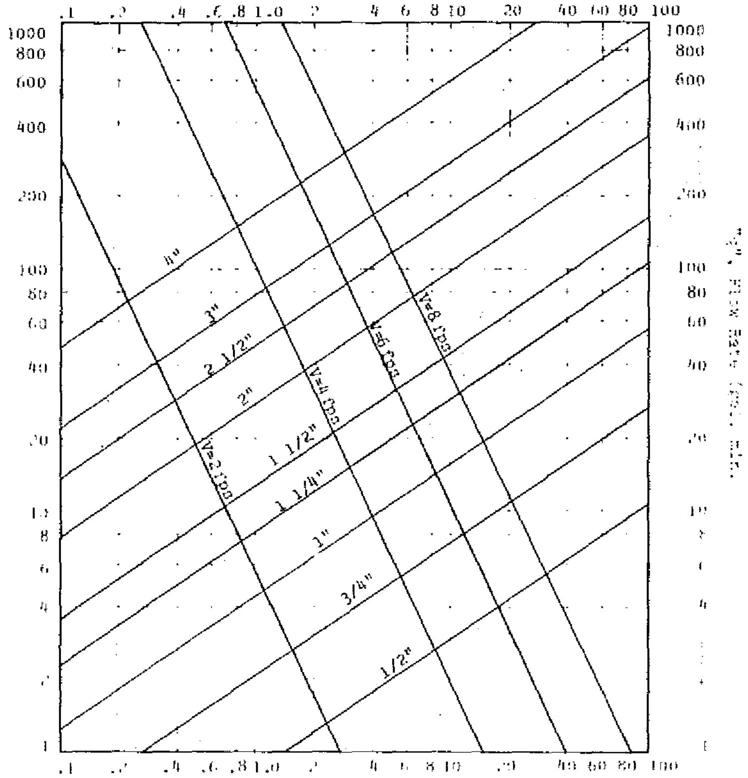
m. Size all parts of the basic design circuit or system, and all other main lines in accordance with tables 16a, 16b, 16c, 16d or 16e. The table selected shall correspond with the type of material approved for the water service, water distribution or both.

TABLE 16a

PRESSURE LOSS DUE TO FRICTION—COPPER WATER TUBE, TYPE K (ASTM B88)

Surface Condition: "Fairly Smooth"

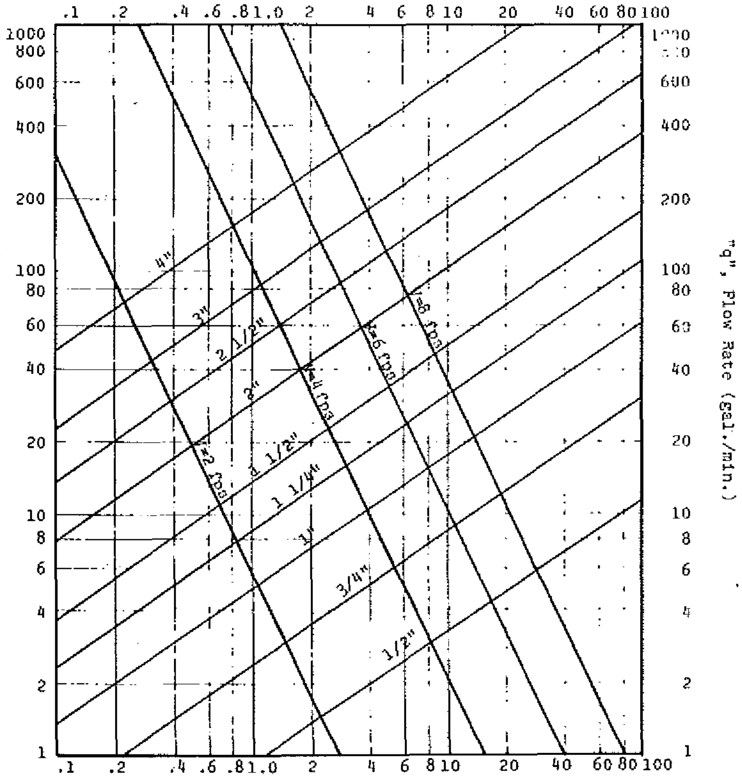
q = 4.57 p0.546 d2.64



"p", Pressure Loss Due To Friction (psi/100 ft. of pipe)

TABLE 16b

PRESSURE LOSS DUE TO FRICTION—
COPPER WATER TUBE, TYPE L (ASTM B88)
Surface Condition: "Fairly Smooth"
q = 4.57 p0.526 d2.64

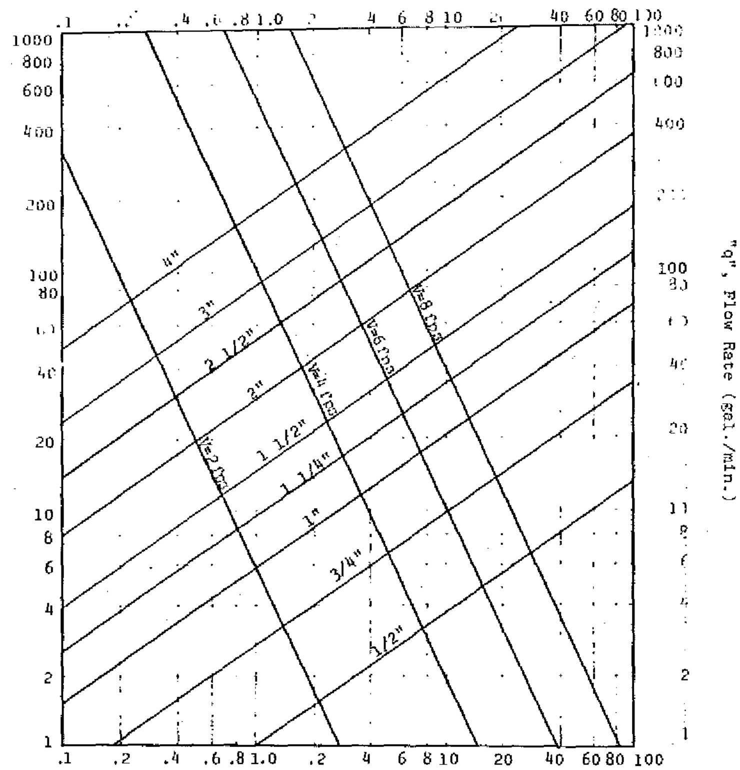


"p", Pressure Loss Due To Friction (psi/100 ft. of pipe)

TABLE 16c

PRESSURE LOSS DUE TO FRICTION—COPPER WATER TUBE, TYPE M (ASTM B88)
Surface Condition: "Fairly Smooth"

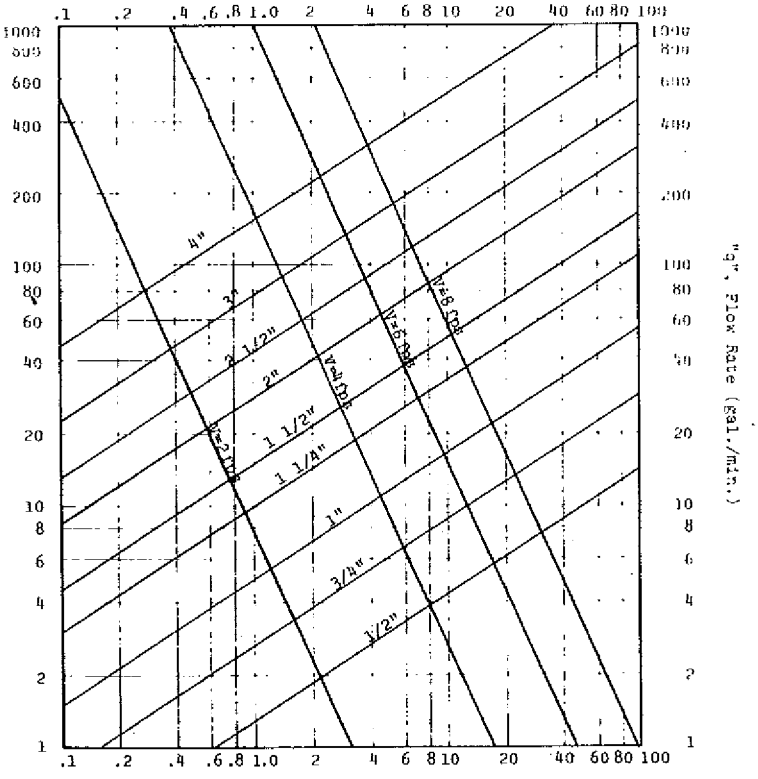
$q = 4.57\ p^{0.546}\ d^{2.64}$



"p", Pressure Loss Due To Friction (psi/100 ft. of pipe)

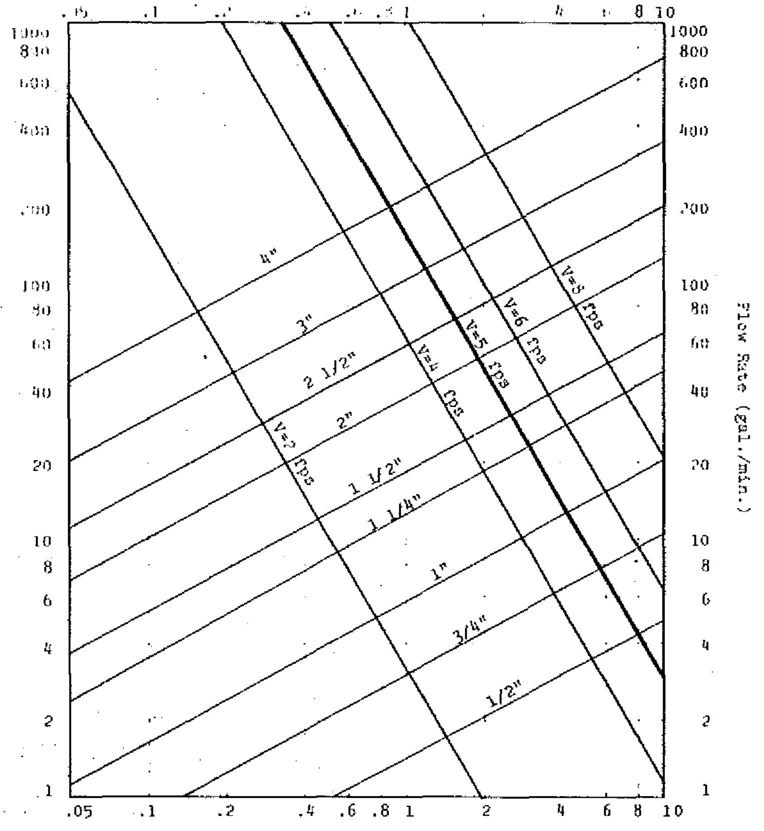
TABLE 16d

PRESSURE LOSS DUE TO FRICTION—
GALV. IRON & STEEL STANDARD WEIGHT PIPE
(ASTM A72, A120)
Surface Condition: "Fairly Rough"
q = 4.29 p0.521 d2.562



"p", Pressure Loss Due To Friction (psi/100 ft. of pipe)

TABLE 16e
FLOW DATA FOR THERMOPLASTIC PIPE
SCHEDULE 40



n. Hot water distribution. In residences, buildings serving the public and places of employment, hot water shall be supplied to all plumbing fixtures and equipment used for personal hygiene, bathing, washing, culinary purposes, cleansing, laundry or building maintenance.

2. Excessive pressures. Water pressure at any fixture, appliance or appurtenance shall not exceed 80 psi for a period not to exceed 60 minutes in any 24-hour period under no flow conditions. When the water pressure in a part of or the entire water distribution system serving a fixture(s), appliance(s), or appurtenance(s) exceeds 80 psi for a period of more than 60 consecutive minutes, an approved type pressure reducing valve, preceded by a strainer, shall be installed and the pressure reduced to 80 psi or less for that part or all of the system that serves a fixture(s), appliance(s) or an appurtenance(s). Outside wall hydrants, sill cocks, water supply directly to a water pressure booster system, elevated water gravity tank or to pumps provided in connection with a hydropneumatic or elevated gravity water supply system may be left at full pressure.

3. Design methods. The methods utilized in designing and sizing the water distribution system may vary and recognized engineering practices meeting the criteria established in sections H 62.01 (4) and H 62.13 (4) will be acceptable to the department. When submitting plans and specifications to the department for plan examination include all calculations and data relating to the sizing of the water distribution system.

(d) *Materials and installation.* 1. Materials. All water distribution pipes (within a building) shall be of galvanized steel, brass, or cast iron (piping) with brass or galvanized malleable iron fittings; type K, L or M copper water tube with copper or brass fittings or other materials approved by the department.

2. Frost protection. All water pipe, storage tanks, fixtures, appliances and appurtenances subject to low temperatures shall be, so far as practical, effectively protected against freezing.

3. Bending of pipe. Bending of water distribution piping except fixture supply tubing is prohibited. See section H 62.19 (2) (a) 7., Wis. Adm. Code.

(e) *Supports.* 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 or sags in water piping shall be avoided where possible. When unavoidable such sags, traps or inverts shall have provisions for properly draining same.

(f) *Water-temperature control - public buildings.* Temperature of mixed water to multiple or gang showers shall be controlled by a master thermostatic blender or such showers may be individually regulated by pressure balance mixing valves. Individual showers in commercial and public buildings shall have pressure balance mixing valves in addition to flow regulation as indicated in table 16.

1. Return circulation where required. Hot water supply risers in buildings 5 or more stories in height or in buildings where developed length of hot water piping from the source of the hot water supply to the farthest fixture exceeds 100 feet, shall be of the return circulation type and no uncirculated branch line shall exceed 25 feet in length. Valves shall be

provided on the inlet and outlet of all circulating return lines and on the inlet and outlet of the return circulation pump.

2. Insulation - storage tanks. Heat loss from unfired hot water storage tanks shall be limited to 15 BTU per hour per square foot of external tank surface area. The design ambient temperature shall be no higher than 65°F.

3. Insulation - piping. Piping heat loss for recirculation systems shall be limited to a maximum of 25 BTU per hour per square foot of external pipe surface for aboveground piping and a maximum of 35 BTU per hour per square foot of external pipe surface for underground piping. Maximum heat loss shall be determined at a Δ T equal to the maximum water temperature minus a design ambient temperature no higher than 65°F.

(g) *Water heaters and hot water storage tanks.* 1. General. All water heaters either for domestic or industrial use shall be of an approved type and shall connect to the water distribution system in an approved manner. All heaters except electric heaters shall be provided with a flue of rust resistant material connected to a chimney or gas vent stack. All water heaters shall be permanently marked with the rated input of the heater in B.T.U. or watts. Such marking shall be in an accessible position on the outside of the heater for inspection purposes.

2. Safety devices. All safety devices, except mixing valves, shall meet the current requirements of one or more of the following: American Gas Association, Underwriters Laboratories, Inc., American Society of Mechanical Engineers or National Board of Boiler and Pressure Vessel Inspectors. Test and certification by a laboratory in accordance with one of the above applicable standards shall also be considered acceptable. All water safety devices shall be of the temperature and pressure type installed in accordance with this code.

Note: The above standards are on file in the offices of health and social services, secretary of state, and revisor of statutes, and may also be obtained for personal use as follows:

1) Approval requirements for gas water heaters, volume I, Seventeenth Edition, 1965.

Approval requirements for gas water heaters, volume II, effective January 1, 1963.

Approval requirements for gas water heaters, volume III, third edition, 1965. Listing requirements for relief valves and automatic gas shutoff devices for hot water supply systems, effective January 1, 1965 and addenda effective January 1, 1966.

The above standards are available from American Gas Association, Inc., 605 Third Avenue, New York, New York 10016.

2) Standards for safety, household electric storage-tank water heaters, UL 174, third edition, May 1, 1970, and revision pages dated June 16, 1971, January 18, 1971.

The above standards are available from:

Underwriters' Laboratories, Inc.
207 E. Ohio Street, Chicago, IL 60611
333 Pfingsten Road, Northbrook, IL 60062
1655 Scott Boulevard, Santa Clara, CA 95050
1285 Walt Whitman Road, Melville, L.I., NY 11746

3) ASME Boiler and Pressure Vessel Codes, Heating Boilers, section IV, 1971, available from American Society of Mechanical Engineers, 29 West 39th Street, New York, NY 10018.

4) Relieving capacities of safety valves and relief valves, January 1, 1970.

The above standards are available from The National Board of Boiler and Pressure Vessel Inspectors, 1155 North High Street, Columbus, OH 43201.

3. Tank construction. Storage tanks for direct fired storage type water heaters shall be constructed to withstand a minimum of 300 psi test pressure without leakage or permanent distortion and shall bear the manufacturers' marking showing test and working pressure, except that in lieu thereof, pressure markings appearing on AGA or UL listed water heater units will be considered acceptable.

4. Hot water storage tank and heater drain valves. a. Location. A drain valve shall be installed at the lowest point of each hot water storage tank and be readily accessible.

b. The drain valve shall be hand-operable without the use of tools.

c. The drain valve inlet shall be a minimum ¾-inch nominal iron pipe size and the outlet end shall be equipped with a minimum standard ¾-inch hose thread.

5. Water heaters, storage tanks and boilers. a. Combination domestic water heating/space heating boilers. Space heating boilers shall not be used for service water heating from May 1 to September 30 unless the service water heating load equals or exceeds 30% of the net boiler load.

b. Temperature controls. Service water heating systems shall be equipped with automatic temperature controls capable of adjusting from the lowest to the highest acceptable temperature setting for the intended use.

c. Shut down. A separate means shall be provided to permit turning off the energy supplied to service water heating systems.

(h) *Relief valves.* 1. Pressure relief valves. Pressure relief valves shall meet the A.S.M.E. standards. The valves shall have a relief rating adequate to meet the pressure conditions in the equipment served. The relief valve shall be installed either directly in a top tank tapping or in the hot water outlet line close to the tank. In a tankless-type heater, the relief valve shall be installed in the hot water outlet line as close as possible to the unit. There shall be no shut-off valve between the pressure relief valve and the tank. The pressure relief valve must be set to open at not less than 25 p.s.i. above the street main pressure or not less than 25 p.s.i. above the setting of any building water pressure regulating valve. The setting shall not exceed the tank rated working pressure.

2. Temperature relief valves. Temperature relief valves shall be of adequate relief rating expressed in B.T.U./hr for the equipment served. They shall be installed so that the temperature sensing element is immersed within the top 6 inches of the tank. The valve shall be set to open when the stored water temperature is 210°F. (or less).

3. Combination pressure temperature relief valves. Combination pressure temperature relief valves shall comply with all the requirements of the separate pressure and temperature relief valves.

4. Energy cut-off devices. Energy cut-off devices shall be of adequate performance rating for the equipment served. Immersion type energy cut-off devices shall be located so that the temperature sensing element is immersed in the water within the tank and controls the temperature of the water within the top 6 inches of the tank. When approved by the department, contact types shall be installed so that the sensing element is responsive to the highest water temperature within the equipment

served and is securely fastened in place. When an energy cut-off device is used, it shall be factory applied by the heater manufacturer and comply fully with the appropriate standards of A.N.S.I. or U.L. They shall be installed in a manner that will isolate them from ambient flue gas temperatures and other conditions not indicative of the temperature of the water within the heater.

5. Installation of relief valve discharge. Every relief valve shall have a discharge pipe the same size as the outlet drain on the relief valve which shall terminate not more than 10 inches above the floor as close as possible to a drain properly connected to the building drain or sewer. Such discharge pipe shall be galvanized steel, copper or brass, installed with approved fittings. The relief valve discharge pipe shall be pointed and drained downward in such a manner to allow the drain and discharge pipe to drain dry. The base or end of such discharge pipe shall not be threaded. No discharge pipe shall terminate into an open fixture such as a sink, laundry tub, bathtub, bathtub overflow, urinal, fixture tailpiece or supply tank, etc., or installed in a freezing area. No check valve or shut-off valve shall be installed between any safety device and the hot water equipment used, nor shall there be any valve in the discharge pipe from the relief valve.

6. Vacuum relief valves. Where a hot water storage tank or direct or indirect water heater is located at an elevation of 20 feet from the bottom of the heater or more above the lowest fixture outlets in the hot water system, a vacuum relief valve shall be installed on the storage tank or heater.

7. Pressure marking of hot water storage tanks. Hot water storage tanks shall be permanently marked in an accessible place with the maximum allowable working pressure.

(i) *Water hammer suppressors.* 1. Water hammer suppressors. All water supply systems, water distribution systems and components connected thereto, subject to water hammer, shall be provided with approved shock absorbing devices located and sized to suppress water hammer. All appliances, devices, equipment, fixtures and appurtenances with quick closing valves or which may create water hammer, shall be provided with shock absorbing devices. When copper air chambers are used, the minimum size shall be ½" x 1" x 14".

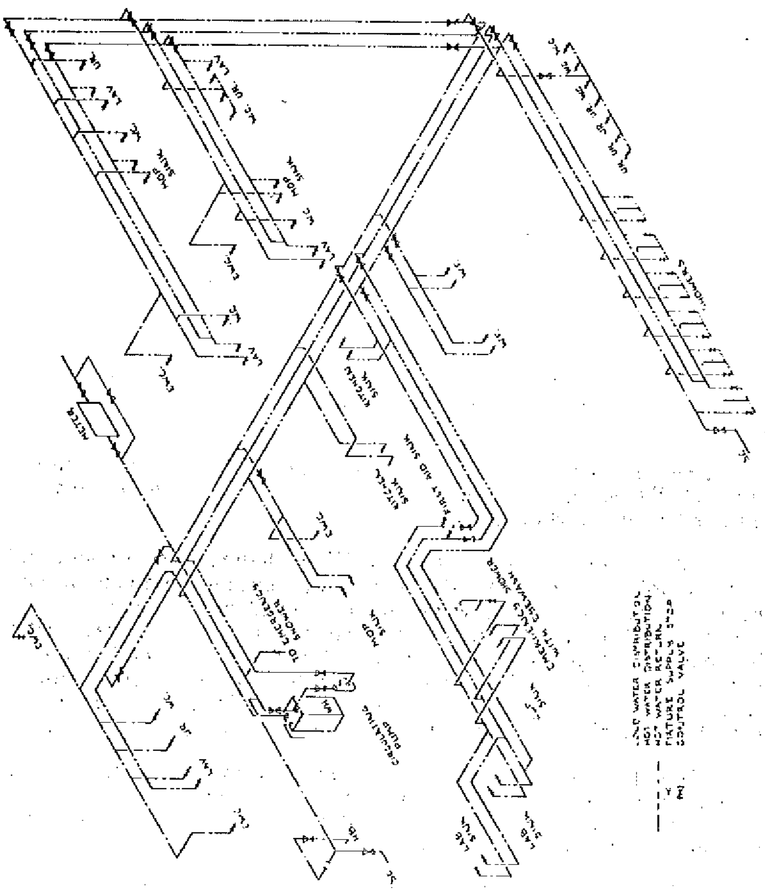
2. Mechanical suppressors. The size and location of the suppressors shall be in accord with the hydraulic design of the piping system served and to the manufacturer's recommendations. All mechanical water hammer suppressors shall be accessible.

Note: The water hammer suppressor may be eliminated provided the appliance, appurtenance, device, equipment or fixture has a slow closing or manually closed valve and does not create water hammer.

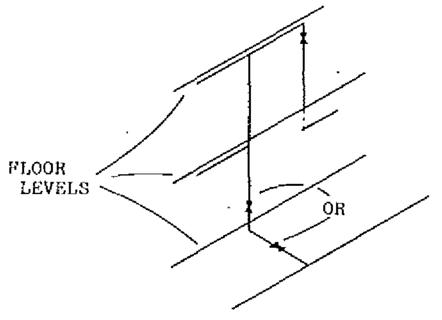
(j) *Water distribution control valves.* 1. Single family dwellings. Controls within a single family dwelling unit shall include a valve for each lawn sprinkler faucet, water heater, water closet, point of entrance of the water service, discharge side of the water meter and each appliance or appurtenance.

2. Multiple dwellings and public buildings. a. In all public buildings and multiple dwelling units, each hot and cold water distribution main,

riser and branch main shall be valved. All fixtures, appliances, appurtenances, lawn sprinkler faucets and wall hydrants shall be valved. The meter valve on the discharge side of the meter may serve as the water distribution main valve. See following sketch.



b. Riser valves. A valve shall be installed at the foot of each water supply riser or in the branch main serving a single riser. In buildings incorporating down feed risers a valve shall be installed at the top of each water supply down feed riser. See following sketch.



c. Water heating equipment valve. The cold water branch to each hot water storage tank or water heater shall be provided with a valve located in the same room near the equipment and serving only this equipment. Each tank or heater shall be equipped with an approved safety relief valve as specified in section H 62.13 (4) (g), (h).

d. Water conditioner bypass. All commercial water conditioners shall be provided with a valved bypass. The bypass may be a minimum of one nominal pipe size smaller than the water supply to the unit.

e. Valves location. All water supply control valves shall be placed so as to be accessible for service and maintenance.

f. Control valve design. Fixture supply valves shall have flow capacity, without reducing the pressure at the fixture to less than the minimum specified in this section, to provide the minimum flows as required in table 16. Line valves ¾-inch inside diameter and larger shall be the same size as the pipe being served and have a Cv factor not less than that specified in the following table for the particular pipe size.

I.D. Pipe Size	Minimum Cv Factor
¾	18
1	35.5
1-¼	61
1-½	107
2	175
3	255
4	340

Note: The Cv factor is defined as the flow coefficient for valves, expressing the flow rate in gallons per minute of 60° with a 1 psi pressure drop across the valve.

g. Tank controls. Supply lines from pressure or gravity tanks shall be valved in the same room at or near the tanks.

h. Hospital and nursing home valving requirements. See Wis. Adm. Code section H 62.15 [62.16] (10) (b).

(5) WATER PRESSURE BOOSTER SYSTEMS. (a) *Where required.* When the water pressure in the public water main or individual water supply system is insufficient to supply the probable peak demand flow to all plumbing fixtures and other water needs freely and continuously within the minimum pressures and quantities specified in section H 62.13 (4) (c), tables 13, 14, 15 and 16; or elsewhere in this section and in accordance with good practice, the rate of supply shall be supplemented by an elevated water tank, a hydropneumatic pressure booster system, or a water pressure booster pump.

(b) *Overflows for water supply tanks.* Each gravity or unpressurized water supply tank shall be provided with an overflow having a diameter not less than shown in table 17. The overflow outlet shall discharge above and within 6 inches of a roof drain or site drain which terminates in a storm sewer. The overflow outlet shall be covered by a corrosion resistant screen of not less than 16 x 20 mesh to the inch and by ¼ inch hardware cloth or shall terminate in a horizontal angle seat check valve. Drainage from overflow pipes shall be directed so as not to freeze on roof walkways.

Table 17

SIZES FOR OVERFLOW PIPES FOR WATER SUPPLY TANKS

Maximum Capacity of Water Supply Line of Tank	Diameter of Overflow Pipe (Inches ID)	Maximum Capacity of Water Supply Line to Tank	Diameter of Overflow Pipe (Inches ID)
0- 13 gpm	1½	356- 640 gpm	5
14- 55 gpm	2	641-1040	6
56-100 gpm	2½	over-1040 gpm	8
101-165 gpm	3		
166-355 gpm	4		

(c) *Covers.* All gravity and unpressurized water supply tanks shall have a locked overlapping cover. The covers of these tanks shall be vented with a return bend vent pipe having an area not less than the area of the down feed riser pipe and the vent shall be screened with corrosion resistant screening having not less than 14 and not more than 20 openings per linear inch.

(d) *Potable water inlet control and location.* Potable water inlets to gravity and unpressurized tanks shall be controlled by an automatic supply valve so installed as to prevent the tank from overflowing. The inlet shall be terminated so as to provide an approved air-gap, but in no case less than 6 inches above the overflow.

(e) *Tank drain pipes.* Each tank shall be provided at its lowest point with a valved pipe to permit emptying the tank which shall discharge as required for overflow pipes and not smaller in size than shown in table 18.

Table 18

SIZE OF DRAIN PIPES FOR NONPRESSURIZED WATER TANKS

Tank Capacity (gallons)	Drain Pipe (inches)	Tank Capacity (gallons)	Drain Pipe (inches)
Up to 750	1	3001 to 5000	2½
751 to 1500	1½	5001 to 7500	3
1501 to 3000	2	over 7500	4

(f) *Low pressure cut-off required on booster pumps.* When a booster pump is used on a water pressure booster system, there shall be installed a low pressure cut-off on the booster pump to prevent a pressure of less than 20 p.s.i.g. on the inlet side of the pump.

(g) *Pressure tanks, vacuum relief.* All elevated water pressure tanks 20 feet to the bottom of the tank or more above the lowest fixture shall be provided with a vacuum relief valve at the top of the tank which will operate up to a maximum water pressure of 200 p.s.i. and to maximum water temperatures of 200° F. The minimum size of such vacuum relief valves shall be ½ inch.

(6) DISINFECTION OF POTABLE WATER SYSTEM. (a) *Procedure.* New or repaired potable water systems should be disinfected prior to use. The method to be followed shall be as follows.

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

2. The system or part thereof shall be filled with a solution of water and chlorine containing at least 50 parts per million of chlorine and the system or part thereof shall be valved off and allowed to stand for 24 hours or the system or part thereof shall be filled with a solution of water and chlorine containing at least 200 parts per million of chlorine and allowed to stand for 3 hours.

3. Following the allowed standing time, the system shall be flushed with clean potable water until no chlorine remains in the water comin.g from the system.

4. The procedures shall be repeated if it is shown by a bacteriological examination that contamination still exists in the system.

(7) SPECIAL EQUIPMENT. (a) *Separate piping for each source.* A water supply that meets accepted standards for purity for human consumption shall be distributed through a piping system entirely independent of any piping system conveying another water supply.

(b) *Piping by plumber.* Only persons licensed by the department as a master, journeyman plumber or a registered plumber apprentice, under supervision, shall install water supply piping to any system designed for steam power, heating, temperature regulation, automatic fire protection, air-conditioning, comfort cooling, process piping, hydraulic power or for any special water usage for industrial or manufacturing purposes. All such piping for supplying water for any of the above listed uses shall be brought by the licensed plumber to a point within the building or structure and within 10 feet of the point of entry to any of the above systems where it shall terminate with an air-gap or other method approved by the department.

(c) *Piping by equipment installers.* Connection of systems specified in section H 62.13 (7) (b) to the water supply pipe and the discharge therefrom through an air-gap into a trap, fixture, receptacle or interceptor installed by the licensed plumber, as prescribed by rules and regulations, may be made by the person installing such systems.

History: 1-2-56; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72; r. and recr. Register, February, 1979, No. 278, eff. 3-1-79.

H 62.14 Back-siphonage, cross-connections and potability control. (1) Protection of potable water supply. (a) *General.* Potable water supply systems shall be designed, installed and maintained in such manner as to prevent contamination from non-potable liquids, solids or gases from being introduced into the potable water supply through cross-connections or any other piping connections to the system.

(b) *Interconnections.* Interconnections of water services between 2 or more public water systems, water distribution systems, or a private and public supply shall be permitted only with approval of the department.

(c) *Cross-connection control.* Cross-connections are prohibited except as approved by the department when suitable protective devices such as the reduced pressure zone backflow preventer or equal are installed, tested and maintained to insure proper operation on a continuing basis.

(d) *Water treatment.* All water treatment compounds approved by the department for introduction into the potable water distribution system shall be by a positive displacement pump.

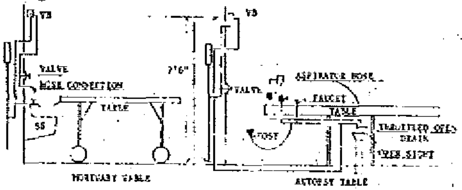
(e) *Painting of water tanks.* The interior surface of the potable water tank shall not be lined, coated, painted or repaired with any material which will affect either the taste, odor, color or potability of the water supply when the tank is placed in or returned to service.

(f) *Used piping.* Piping which has been used for any other purpose than conveying potable water shall not be used for conveying potable water.

(g) *Water supply to boilers.* Potable water supply to boilers or boiler feed water systems shall be through an air-gap or approved backflow preventer.

(h) *Prohibited connections to fixtures and equipment.* Connection to the potable water supply system for the following shall be protected against backflow or back-siphonage.

1. Operating, dissection, embalming and mortuary tables or similar equipment. In such installations the hose used for water supply shall terminate at least 12 inches away from every point of the table or attachments. See following sketch.



2. No closet bowl or other fixture equipped with a flushometer valve or with flushing tanks shall be installed with a side or rear spud located below the lower part of the flush rim of the bowl.

3. Seat acting water closets.

4. Bedpan washers.

5. Bidets.

6. Sterilizers with water supply connections.

7. Therapeutic baths with inlets below the rim of the fixture.

8. Water operated waste ejectors.

9. Bathtubs with inlets below the rim of the fixture.

10. Wash basins with inlets below the rim of the fixture.

11. Bar, soda fountain or other sinks with submerged inlets.

12. Laundry trays with faucets below the rim.

13. Sinks with faucets or water inlets below the rim and sinks with loose hose connections.

14. Dishwashing sinks or machines with water inlets below the rim.

15. Cuspidors with water supply connections.

16. Dental cuspidors with water supply connections.

17. Hospital appliances. See Wis. Adm. Code section H 62.15 [62.16].

18. Frostproof hydrants with underground bleed or an automatic livestock water device.

19. Industrial vats, tanks, etc., of a description which have an inverted water supply connection or a water supply connection below the top of the spill rim or in which a hose filler is used.

20. Industrial water supplied process appliance with direct water connections.

21. A rubber hose with hand control or self-closing faucets attached as used in connection with baths, industrial vats, canneries, etc.

22. Pressure water supplied sealing rings on sewage and sludge pumps.

23. Water supply for priming connections.

24. Water supply (hot or cold) to laundry equipment.

25. Condenser cooling connections for refrigeration and air-conditioning machinery.

26. Drains from fire sprinklers connected direct to sewer or waste.

27. Steam tables.

28. Condensers.

29. Stills.

30. Aspirators.

31. Chlorinators.

32. Photographic developing tanks.

33. Fixture inlets or valve outlets with hose attachments which may constitute a cross-connection shall be protected by an approved vacuum breaker installed at least 6 inches above the highest point of usage and located on the discharge side of the last valve. Manufactured fixtures with integral vacuum breakers shall be approved by the department.

34. Laboratory water faucets and cocks with serrated nipples or hose connections.

35. Lawn sprinkling faucets.

36. Any other fixture or installation creating a backflow or back-siphonage hazard.

(i) *Used water return prohibited.* Water used for cooling of equipment, space heating or other processes shall not be returned to the potable water system. Such water shall be discharged into a drainage system through an air-gap or may be used for non-potable purposes on written approval of the department.

(j) *Water outlets.* A potable water system shall be protected against the backflow and back-siphonage by providing at each water outlet:

1. An air-gap as specified herein between the potable water outlet and the flood level rim of the fixture it supplies or between the water outlet and any other source of contamination or,

2. Where an air-gap is impractical, a backflow preventer device or vacuum breaker approved by the department.

(k) *Minimum required air-gap.* Minimum required air-gap shall be measured vertically from the lowest end of a potable water outlet to the flood rim or line of the fixture or receptacle into which it is discharged. The minimum required air-gap shall be twice the effective opening of a potable water outlet unless the outlet is a distance less than 3 times the effective opening away from a wall or similar vertical surface in which case the minimum required air-gap shall be 3 times the effective opening of the outlet. In no case shall the minimum required air-gap be less than shown in table 19.

Table 19

MINIMUM AIR-GAPS FOR PLUMBING FIXTURES

Fixture	Minimum Air-Gap	
	When Not Affected By Near Wall (Inches)	When Affected By Near Wall (Inches)
Lavatories and other fixtures with effective opening not greater than 1/2 inch diameter	1	1½
Sink, laundry trays, goose-neck bath faucets and other fixtures with effective openings not greater than 3/4 inch diameter --------	1½	2¼
Over rim bath fillers and other fixtures with effective openings not greater than 1 inch diameter --	2	3
Drinking water fountains--single orifice not greater than 7/16 (0.437) inch diameter or multiple orifices having total area of 0.150 square inches (area of circle 7/16 inch diameter --------------------------------------	1	1½
Effective openings greater than one inch ----	2 x diameter of effective opening	3 x diameter of effective opening

(l) *Devices for the protection of potable water supply.* Approved backflow preventers or vacuum breakers shall be installed with any plumbing fixture or equipment, the potable water supply outlet of which may be submerged and which cannot be protected by a minimum air-gap.

(m) *Approval of devices.* Before any device for the prevention of backflow or back-siphonage is installed, it shall be approved by the department. In its determination, the department may use the results of a recognized testing laboratory. Devices installed in the building potable water supply distribution system for protection against backflow or back-siphonage shall be maintained in good working condition by the person or persons responsible for the maintenance of the system.

(n) *Protective devices required.* In the installation of the following list of fixtures and devices where an air-gap is not provided or is impractical, approved protective devices shall be installed in all supply lines according to table 20.

Table 20

CROSS-CONNECTIONS WHERE PROTECTIVE DEVICES ARE REQUIRED AND CRITICAL LEVEL (C-L) SETTINGS FOR BACKFLOW PREVENTERS[1]

Fixture or Equipment	Method of Installation
Aspirators and ejectors	C-L at least 6 inches above flood level of receptacle
Cup beverage vending machines	C-L at least 12 inches above flood level of machine
Dental units	On models without built-in vacuum breakers C-L at least 6 inches above flood level rim of bowl
Dishwashing machines	C-L at least 6 inches above flood level of machine
Flushometers (closet and urinal)	C-L at least 6 inches above top of fixture supplied
Garbage can cleaning machines	C-L at least 6 inches above flood level of machine
Hose outlets	C-L at least 6 inches above highest point on hose line
Laundry machines	C-L at least 6 inches above flood level of machine
Turf irrigation systems	C-L at least 12 inches above highest sprinkler or discharge outlet
Steam tables	C-L at least 6 inches above flood level
Tanks and vats	C-L at least 6 inches above flood level rim or line
Flush tanks	Equip with an approved ballcock. In all cases the ballcock should be located above the overflow level of the tank and the outlet terminated one inch above the overflow or provided with a backflow preventer located at least one inch above the overflow
Hose bibbs (where aspirators or ejectors could be connected)	C-L at least 6 inches above flood level of receptacle served

[1]Critical Level (C-L) is defined as the level to which the backflow preventer (vacuum breaker) may be submerged before backflow will occur. Where C-L marking is not shown on the preventer, the bottom of the device shall be taken as the C-L.

(o) *Connections subject to back pressure.* Where a potable water connection is made to a pipe line, fixture, tank, vat, pump or other equipment with a hazard of backflow or back-siphonage and where the water connection is subject to back pressure and an air-gap cannot be installed, the department shall require the use of an approved reduced pressure zone backflow preventer. A partial list of such connections is shown in Table 21.

Table 21

PARTIAL LIST OF CROSS-CONNECTIONS SUBJECT TO BACK PRESSURE

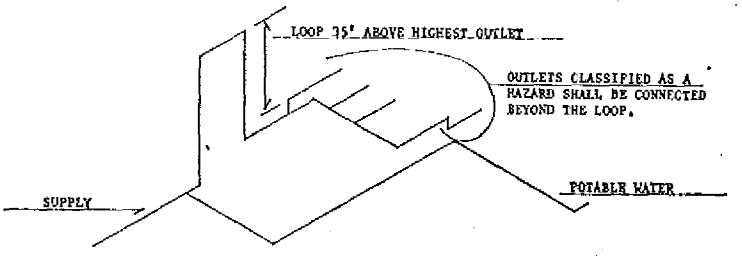
Chemical lines	Pumps
Cup beverage vending machines	Steam lines
Dock water outlets	Swimming pools
Individual water supplies	Tanks and vats—bottom inlets
Industrial process water lines	Hose bibbs
Pressure tanks	

(p) *Installation of devices.* 1. Vacuum breakers. Vacuum breakers shall be installed with the critical level at least 6 inches above the flood level rim of the fixture they serve and on the discharge side of the last control valve to the fixture. No shut-off valve or faucet shall be installed beyond the vacuum breaker.

2. Reduced pressure zone backflow preventer. A reduced pressure zone type backflow preventer may be installed subject to full static pressure.

3. Devices of all types. Backflow and back-siphonage preventing devices shall be accessibly located, preferably in the same room with the fixture they serve. Installation in utility or service spaces, provided they are readily accessible is also permitted.

4. Barometric loop. Water connections not subject to back pressure where an actual or potential backflow or back-siphonage hazard exists may in lieu of devices specified, be provided with a barometric loop. See following sketch.



(q) *Turf sprinklers*. Turf sprinkler systems, when connected to a potable water system, shall be installed in accordance with these regulations. Adequate and proper provisions shall be made for control and drainage and to prevent back-siphonage or backflow. Water shall not be turned on to any turf sprinkler system until it has been inspected and approved. Materials used in turf sprinkler systems shall be submitted for evaluation and approval prior to installation.

(2) IMPROPER LOCATION OF SEWERS AND DRAINS AND OTHER PIPING. (a) Sewer or drain pipes, wherever possible, shall not pass directly over areas where food, ice or potable liquids are prepared, handled, stored or displayed. Where building design requires that soil or drain pipes be located below the ceiling of such areas, the installation shall be made with the least possible number of joints and shall be installed so as to connect to a vertical stack at the nearest wall or vertical building support and the constuction shall be performed as follows:

1. All openings through floors over such areas shall be provided with sleeves securely bonded to the floor construction and projecting not less than ¾ inch above top of finished floor with space between sleeve and pipe or duct sealed.

2. Floor and shower drains installed above such areas shall be equipped with integral seepage pans.

3. Plumbing fixtures in rooms located above such areas shall be of the wall mounted type except bathtubs. Tubs shall have waste and overflow

connections made above the floor and piped to trap below floor. All connections through floor and to trap shall conform with all other provisions of this regulation. No floor openings other than sleeve for waste pipe will be permitted for tubs.

4. All other soil or drain pipes shall be galvanized steel or cast iron with screwed joints sealed with litharge and glycerine or copper tube with soldered joints. Cleanouts shall be extended through the floor construction above.

5. All soil and drain pipes located above such areas shall be subjected to a standing water test of not less than 25 feet.

6. All piping subject to operation at temperatures that will form condensation on the exterior of the pipe shall be thermally insulated.

7. Where pipes are run in ceilings above such areas, the ceiling shall be of the removable type, or shall be provided with access panels in order to form a ready access for inspection of piping unless a lath and plaster ceiling is provided.

8. In lieu of the above, other methods may be approved by the department.

(b) Exposed soil, waste and other drainage pipe lines in a pool or equipment room shall not pass over the pool, surge tank or open filter.

History: 1-2-56; r. (2) through (7), Register, October, 1971, No. 190, eff. 11-1-71; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72.

H 62.16 Health care and related facilities. (1) PLAN APPROVAL REQUIRED. Plans for plumbing and equipment for health care facilities shall be approved by the department.

(2) SCOPE. The scope of this section shall cover devices, fixtures and equipment which are installed and maintained in health care facilities such as hospitals, nursing or rest homes, homes for the aged, infirmaries, residential care facilities, orphanages, sanitariums, sanatoriums, clinics, mortuaries, and schools of medicine, surgery, dentistry, and research and testing laboratories whether enumerated or not. This section may also apply to offices of dentists and doctors.

(3) INTENT. The primary intent of the following minimum requirements is to protect public health by eliminating either potential health or safety hazards to patients and institutional personnel, and to promote the efficient use, operation and maintenance of the equipment used in the institution or establishment. Fixtures, devices and/or equipment in addition to those prescribed herein may be required dependent upon the type of occupancy, treatment, care or layout. Such additional facilities shall be installed in accord with the provisions of this chapter.

(4) PLUMBING IN MENTAL HOSPITALS. Special consideration shall be given to the design and installation of plumbing fixtures in areas where disturbed patients are housed. No pipes or traps shall be exposed and all fixtures shall be securely bolted through walls or floors.

(5) SPECIAL FIXTURES AND EQUIPMENT ACCEPTABILITY. (a) *Special fixtures.* Fixtures which are designed for any special use such as, therapy, special cleansing and/or disposal of waste materials shall be smooth, impervious, corrosion resistant materials and, if subject to temperatures in

excess of 180° F., shall be able to withstand without damage, higher temperatures as may be specified. Scrub-up sinks, lavatories and sinks in patient care areas, and fixtures used by medical and nursing staff, shall have the water supply spout terminate a minimum of 5 inches above the rim of the fixture. These fixtures shall be equipped with valves or faucets which can be operated without use of the hands.

(b) *Special equipment.* All devices, appurtenances, appliances and apparatus intended to serve a special function such as sterilization, distillation, processing, cooling, storage of ice or foods, etc., which may be connected to either the water supply distribution or drainage systems or both, shall be provided with protection against back-siphonage, backflow, flooding, fouling, or any possibility of contaminating any portion of the water supply system, or equipment, or the misuse of any drain.

(c) *Therapeutic equipment.* Therapeutic equipment shall not be counted as a patient bathing fixture to meet the required patient bath ratio.

(6) FIXTURE AND EQUIPMENT INSTALLATION. (a) *Clinic sinks.* Such fixtures shall have an integral trap in which the upper portion of a visible trap seal provides a water surface. The fixture shall be designed so as to permit complete removal of the contents by siphonic and/or blow-out action, and to reseal the trap in a single flushing operation. A flushing rim shall provide water to cleanse the interior surface. The fixtures shall have flushing and cleansing characteristics similar to a water closet.

(b) *Prohibited use of clinic sinks and service sinks.* A clinic sink shall not be used as a janitor's service sink. A janitor's service sink shall not be used for the disposal of urine, fecal matter, or other human wastes.

(c) *Special requirement for ice manufacture and storage.* 1. No machines for manufacturing ice, or any device for handling or storing ice, shall be located in a room containing a bedpan hopper, clinic sink, bedpan washer, or similar fixture. Machines for manufacturing ice, or devices for handling or storing ice intended for either human consumption or packs, shall be located in a clean utility room, a floor pantry, a diet kitchen, or in other similar locations.

2. Each drain serving an ice chest or box shall discharge into an indirect waste receptor. Each drain shall discharge through an air-break above the receptor. The end of the drain shall be covered with a removable 10 mesh per inch noncorrosive screen.

(7) STERILIZERS. (a) *Descaling prohibited.* The interior of water sterilizers, stills, or similar equipment shall not be descaled or otherwise treated by acid or other chemical solutions while the equipment is connected to the water and/or drainage systems.

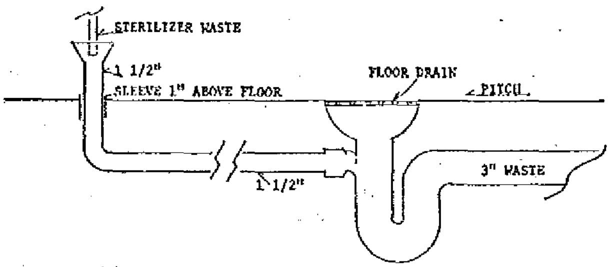
(b) *Compliance with boiler and unfired pressure vessel code.* Pressure sterilizers and pressure type instrument washer sterilizers installed after the effective date of this code shall be constructed and stamped in accordance with the provisions of Wis. Adm. Code section Ind 41.50 (1) (e). All pressure sterilizers and pressure type instrument washer sterilizers regardless of size shall be equipped with pressure relief devices in accordance with the provisions of Wis. Adm. Code section Ind 41.50 (1) (e).

(c) *Sterilizer piping.* The connecting piping and/or devices for sterilizers shall be accessible for inspection and maintenance.

(d) *Bedpan washers and clinic sinks.* Bedpan washers and clinic sinks shall be connected to the sanitary drainage system and vented in accordance with the requirements for water closets. Vapor vents serving bedpan washers shall not connect to the plumbing system.

(8) DRAINAGE AND VENTING. (a) *Sterilizer wastes.* 1. Indirect wastes required. All sterilizers shall be provided with individual and separate indirect wastes, with air-gaps of not less than 2 diameters of the waste tailpiece. The upper rim of the receptor, funnel, or basket type waste fitting shall be not less than 2 inches below the vessel or piping, whichever is lower. Except as provided in sections H 62.15 [62.16] (8) (a) 3. and 5., a "P" trap shall be installed on the discharge side of and immediately below the indirect waste connection serving each sterilizer.

2. Floor drain required. In any room containing the recessed, or concealed portions of sterilizers, not less than one acceptable floor drain, connecting to the drainage system, shall be installed in a manner to drain the entire floor area. The floor drain waste and trap shall be a minimum diameter of 3 inches. It shall receive the drainage from at least one sterilizer within the room to assure maintenance of the floor drain trap seal. The sterilizer drain may be installed on a branch taken off between the floor drain trap and the strainer. No individual sterilizer waste trap shall be required on this type of installation. See following sketch.



3. Battery assemblies. A battery assembly of not more than 3 sterilizer wastes may drain to one trap, provided the trap and waste are sized according to the combined fixture unit rating; the trap is located immediately below one of the indirect waste connections; the developed distance of a branch does not exceed 8 feet; and the branches change direction through a tee-wye or wye pattern fitting.

4. Bedpan steamers, additional trap required. A trap with a mimimum seal of 3 inches shall be provided in a bedpan steamer drain located between the fixture and the indirect waste connection.

5. Pressure sterilizer. Except when an exhaust condenser is used, a pressure sterilizer chamber drain may be connected to the exhaust drip tube before terminating at the indirect waste connection. If a vapor trap is used, it shall be designed and installed to prevent moisture being aspirated into the sterilizer chamber. The jacket steam condensate return, if not connected to a gravity steam condensate return, shall be separately

and indirectly wasted. If necessary to cool a high temperature discharge, a cooling receiver, trapped on its discharge side, may serve as the fixture trap.

6. Pressure sterilizer exhaust condensers. The drain from the condenser shall be installed with an indirect waste. If condensers are used on pressure sterilizers, the chamber drain shall have a separate indirect waste connection.

7. Water sterilizer. All water sterilizer drains, including tank, valve leakage, condenser, filter and cooling, shall be installed with indirect waste or according to section H 62.15 [62.16] (8) (a) 2.

8. Pressure instrument washer-sterilizer. The pressure instrument washer-sterilizer chamber drain and overflow may be interconnected. Also, they may be interconnected with the condenser.

(b) *Vapor vent material.* Material for vapor vents serving bedpan washers and sterilizer vents serving sterilizers shall be materials approved for vent piping.

(c) *Vent connections prohibited.* Connections between vapor vents serving bedpan washers, sterilizing apparatus, and/or normal sanitary plumbing systems, are prohibited.

(d) *Vapor vents and stacks.* 1. Bedpan washers shall be vented to the outer atmosphere above the roof by means of one or more vapor vents. The vapor vent for a bedpan washer shall be not less than a 2-inch diameter pipe. A vapor vent serving a single bedpan washer may drain to the fixture served.

2. Multiple installations. Where bedpan washers are located above each other on more than one floor, a vapor vent stack may be installed to receive the vapor vent on the various floors. Not more than 3 bedpan washers shall be connected to a 2-inch vapor vent stack, 6 to a 3-inch vapor vent stack, and 12 to a 4-inch vapor vent stack. In multiple installations, the connections between a bedpan washer vapor vent and a vapor vent stack shall be made by use of a tee or tee-wye sanitary pattern drainage fittings, installed in an upright position.

3. Trap required. The bottom of the vapor vent stack, except when serving only one bedpan washer, shall be drained by means of a trapped and vented waste connection to the plumbing sanitary drainage system. The trap and waste shall be the same size as the vapor vent stack.

4. Trap seal maintenance. A water supply of not less than ¼ inch minimum tubing shall be taken from the flush supply of each bedpan washer on the discharge or fixture side of the vacuum breaker, trapped to form not less than a 3-inch seal, and connected to the vapor vent stack on each floor. The water supply shall be so installed as to provide a supply of water to the vapor vent stack for cleansing and drain trap seal maintenance each time a bedpan washer is flushed.

(e) *Sterilizer vapor vent and stacks.* 1. Connections. Multiple installations of pressure and nonpressure sterilizers shall have their vent connections to the sterilizer vent stack made by means of inverted wye fittings. Such vent connections shall be accessible for inspection and maintenance.

2. Drainage. The connection between sterilizer vent and/or exhaust openings and the sterilizer vent stack shall be designed and installed to drain to the funnel or basket-type waste fitting. In multiple installations, the sterilizer vent stack shall be drained separately to the lowest sterilizer funnel or basket-type waste fitting or receptor.

(f) *Sterilizer vapor vent stack sizes.* 1. Bedpan steamers. The minimum size of a sterilizer vent serving a bedpan steamer shall be 1½ inches in diameter. Multiple installation shall be sized according to table 22.

Table 22

VAPOR VENT STACK SIZES FOR BEDPAN STEAMERS AND BOILING TYPE STERILIZERS
(Number of connections of various sizes permitted to various sized sterilizer vent stacks)

Stack size	Connection size 1½"	2"
1½-inch[1]	1 or	0
2-inch[1]	2 or	1
2-inch[2]	1 and	1
3-inch[1]	4 or	2
3-inch[2]	2 and	2
4-inch[1]	8 or	4
4-inch[2]	4 and	4

[1]Total of each size.
[2]Combination of sizes.

2. Boiling type sterilizers. The minimum size of a sterilizer vent stack shall be 2 inches in diameter when serving a utensil sterilizer, and 1½ inches in diameter when serving an instrument sterilizer. Combinations of boiling type sterilizer vent connections shall be based on table 22.

3. Pressure sterilizers. Sterilizer vent stacks shall be 2½ inches minimum; those serving combinations of pressure sterilizer exhaust connections shall be sized according to table 23.

Table 23

VAPOR VENT STACK SIZES FOR PRESSURE STERILIZERS
(Number of connections of various sizes permitted to various sized vent stacks)

Stack size	Connection size ¾"	1"	1¼"	1½"
1½-inch[1]	3 or	2 or	1	
1½-inch[2]	2 and	1		
2-inch[1]	6 or	3 or	2 or	1
2-inch[2]	3 and	2		
2-inch[2]	2 and	1 and	1	
2-inch[2]	1 and	1 and		1
3-inch[1]	15 or	7 or	5 or	3
3-inch[2]		1 and	2 and	2
3-inch[2]	1 and	5 and		1

[1]Combination of sizes.
[2]Total of each size.

4. Pressure instrument washer-sterilizer sizes. The minimum size of a sterilizer vent stack serving an instrument washer-sterilizer shall be 2

inches in diameter. Not more than 2 sterilizers shall be installed on a 2-inch stack, and not more than 4 on a 3-inch stack.

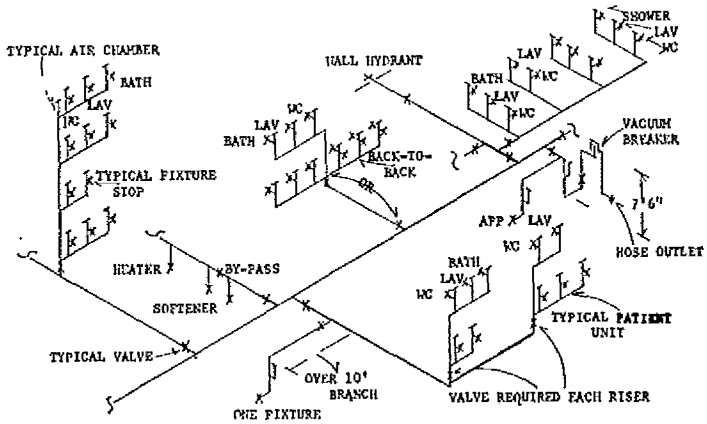
(9) FLOOR DRAINS PROHIBITED. Floor drains shall not be installed in operating or delivery rooms.

(10) WATER SUPPLY. (a) *Water services.* All hospitals shall be provided with at least 2 water service connections and whenever more than one street main is available, the connections shall be made to different street mains.

1. The water service pipe for all other health care facilities shall be of sufficient size to furnish water to the building in the quantities and at the pressures required in Wis. Adm. Code sections H 62.13 (4) (d) and (h) 3. [(4) and (5)] and H 62.15 [62.16] (10) (c).

2. Water services shall be in accord with the requirements of Wis. Adm. Code section H 62.13 (2).

(b) *Water distribution control valves.* 1. Four or less patient care units, containing not more than 2 persons per unit exclusive of intensive care coronary units, may be served with one branch control valve. All fixtures, appliances, appurtenances, lawn sprinkler faucets and wall hydrants shall be valved. See following sketch.



2. Control valves for risers, water heating equipment, water softeners and tank controls shall be in accord with Wis. Adm. Code section H 62.13 (4) (c), (d), (e) and (h) [(4) (j) 2. b. c. d. and g.]. Control valve accessibility and design shall be in accord with section H 62.13 (4) (f) and (g) [(4) (j) 2. e. and f.], Wis. Adm. Code. See above sketch.

(c) *Velocities and flow capacities.* Water supply piping shall be designed to provide service to upper floor installations at a minimum pressure of 15 (p.s.i.) pounds per square inch during maximum demand periods. Velocities shall not exceed 8 (f.p.s.) feet per second. Where static pressure exceeds 80 (p.s.i.) pounds per square inch, pressure reducing controls shall be installed to avoid fracture or other damage to the system. The supply demand in gallons per minute in the building water distribution system shall be determined on the basis of the load in terms of supply fixture units and of the relationship between load and supply demand as shown in table 24 and pertinent portions of tables 13 and 14.

Table 24
DATA FOR ESTIMATING WATER SUPPLY DEMAND AND WASTE REQUIREMENTS

Fixture	Fixture Units		Minimum Pipe Sizes, Inches					Remarks
	Water	Waste	Waste	Trap	Vent	Cold Water	Hot Water	
Water closet (tank)	6	6	3	2	2	⅜	½	H.W. required with bedpan
Water closet (flush value)	10	8	3	2	2	1	½	washer hose only
Lavatory	2	1	1½	1¼	1¼	½	½	
Urinal (tank)	3	4	2	2	1½	½	—	
Urinal (flush valve)	5	4	—	—	—	1	—	
Shower	4	2	3 FD	3	—	½	½	
Patient bath (public)	4	3	1½	1½	1½	½	½	
Patient bath (pvt.)	2	3	1½	1½	1½	½	½	
Drinking fountain	1	½	1¼	1¼	1¼	½	—	
Sitz bath	4	3	1½	1½	1½	½	½	
Clinical sink	10 CW	6	3	3	2	1	¾	
(Flushing rim)	4 HW	—	—	—	—	—	—	
Scrub sink	4	3	2	2	1½	¾	¾	2, 3 or 4 place sink
Single sink for misc. hospital use	3	3	1½	1½	1½	½	½	
Double sink for misc. hospital use	4	4	2	2	1½	¾	¾	
Laboratory sink	2	2	1½	1½	1½	½	½	
Ice machine	1	1	2 SD	2	1½	¾	—	
Plaster sink	6	4	2	2	1½	¾	¾	Use with plaster trap
X-ray tank	4	2	1½	1½	1½	½	½	Based on 18 x 30 x 22-inch tank
Bedpan sanitizer	10	6	3	2	2	1	—	½-inch STM connection
Autopsy table	4	4	1½	1½	1½	½	½	
Animal area sinks	4	4	2	2	1½	¾	¾	
Cup sink	1	1	1¼	1¼	1¼	½	—	

(d) *Piping insulation.* Circulating, hot, cold and chilled water piping shall be insulated. Cold and chilled water pipe insulation shall have an integral or separate vapor barrier.

(e) *Special piping systems.* Distilled water, ionized water, laboratory and other special piping systems shall be included in the plans submitted. The plans shall incorporate sufficient detail to clearly establish the installation proposed.

(f) *Water supply protection.* The installation of the water supply shall meet all the applicable requirements prescribed in Wis. Adm. Code sections H 62.13 and H 62.14, and as provided in table 25 including the corresponding reference number.

Table 25

Equipment	Protective Device	Location	Reference No.
Bath with shampoo nozzle	Vacuum breaker	6'0" above bottom of tub	1
Bedpan sanitizer	Vacuum breaker	Part of flush valve	1
Bedpan washer hose	Vacuum breaker	5'9" above floor	1
Hose and faucet at service sink	Vacuum breaker	6' above normal use of hose	1
Sterilizer condenser	Vacuum breaker	3' above unit	1
Flash washer	Vacuum breaker	6' above unit	1
Glove washer	Vacuum breaker	6' above unit	1
Stills	Air-gap	On discharge	5
Ultrasonic cleaner	Vacuum breaker	6" above unit	1
Developing tank	Vacuum breaker	6" above unit	1
Dental unit	Vacuum breaker	Part of unit	1
Hydrotherapy bath	Vacuum breaker	6" above unit	1
Radiology cooling coil (water bath)	Air-gap	On discharge	5
Pipette washer	Vacuum breaker	6" above unit	1
Laboratory spout	Vacuum breaker	At threaded discharge	2
Cage washer	Vacuum breaker	6" above unit	1
Tube washer	Vacuum breaker	Part of control valve	1
Bottle washer	Vacuum breaker	6" above unit	1
Food waste grinder	Vacuum breaker	6" above unit	1
Peeler	Air-gap	On supply	4
Dishwasher	Vacuum breaker	6" above unit	1
Can washer	Vacuum breaker	6" above unit	1
Ice machine	Air-gap	On discharge	5
Pot washer	Vacuum breaker	6" above unit	1
Coffee urn	Vacuum breaker	6" above unit	1
Glass washer	Vacuum breaker	6" above unit	1
Refrigeration condenser	Air-gap	On discharge	5
Clothes washer	Vacuum breaker	6" above unit	1
Soap and brine tanks	Vacuum breaker	6" above unit	1
Autopsy table	Vacuum breaker	6'0" above floor	1
Aspirator	Vacuum breaker	6'0" above floor	1
Hose station	Vacuum breaker	At threaded discharge	2
Flush rim floor drain	Vacuum breaker	5'9" above floor	1
Incinerator gas washer	Air-gap	On water supply	5
Lawn sprinklers	Vacuum breaker	Outdoor type	1
Wall hydrant	Vacuum breaker	At threaded discharge	2
Hose bibb	Vacuum breaker	At threaded discharge	2
Package air-conditioner	Air-gap	On discharge	5
Cooling tower	Backflow preventer	On water supply	3
Boiler make-up water	Backflow preventer	On water supply	3
Vacuum pumps and air washing	Air-gap	On water supply	4
Spray coil for air washing	Vacuum breaker	6" above unit	1
Expansion tank	Backflow preventer	On water supply	3

1. The designation "vacuum breaker" means a non-pressure, atmospheric type device. The installation elevation means the distance above the spill level of the fixture or equipment served, or the height to which a connected discharge may be raised to cause gravity back-flow to reach the device. The designated installation shall be measured from the bottom of the device, or the critical level marking if indicated on the device. The installation and elevation shall permit the vacuum breaker to drain and actuate each time the control valve is operated. No shut-off valve shall be permitted downstream from the vacuum breaker. The vacuum breaker shall not be installed in a manner so as to be under continuous pressure.

2. The location "at the threaded discharge" means the location where an aerator would normally be installed. The vacuum breaker is the in-line type and for the laboratory faucet the serrated nozzle is then screwed into the discharge end of the vacuum breaker. When this vacuum breaker is used with a hose bibb, it is threaded onto the male end and the hose is connected to the vacuum breaker.

3. The designation "backflow preventer" means the reduced pressure type backflow prreventer which includes two spring loaded check valves, a broken connection to a drain and usually two gate valves. The use of this device requires that adequate and rapid drainage be available.

4. An air-gap on the water supply means that the air-gap shall be located at the supply opening to the fixture or equipment it serves. An air-gap is the minimum vertical distance between the supply discharge orifice and the spill level of the receptor, fixture or equipment served. This minimum vertical distance shall be at least 2 diameters of the discharge orifice, or a minimum of one inch, whichever is the greatest.

5. An air-gap on the waste line means an indirect connection between the fixture or equipment and the waste receptor. The waste discharge orifice governs the minimum distance according to section H 62.15 [62.16] (10) (f) 4.

(g) *Hot water supply control.* Hot water supply to patients' showers, therapeutic equipment, and continuous baths shall be provided with control valves automatically regulating the temperature of the water supply to the fixture. The valve shall fail in a closed position when the tempered water supply to the fixture exceeds 110° F.

(h) *Hot water supply.* The water supply distribution system shall be designed to provide hot water at each applicable fixture at all times. The system shall be of a circulating type. The circulating pumps shall be arranged for continuous operation or shall be controlled by an aquastat in the circulating piping. See Wis. Adm. Code section H 62.13 (4) (i) 3 [62.13 (4) (f)].

(i) *Water heaters and tanks.* Storage tanks when provided shall be fabricated of non-corrosive metal or be lined with non-corrosive material. The water heating equipment shall have a sufficient capacity to supply water at the temperature and amounts in table 26.

Table 26

	Patient Areas	Clinical	Dietary	Laundry (2 gals. per lb. of laundry)
Gal/hr/bed	6½	6½	4	4½
Temp. °F. (Maximum)	110°	125°	180°	180°

(11) ASPIRATORS. The use of water aspirators shall be limited to those units approved by the department.

(12) SPOUTS AND ACTIONS—HOSPITAL AND NURSING HOME FIXTURES. (a) The selection of spouts and actions for hospital and nursing home plumbing fixtures shall comply with section H 62.15 [62.16] (12) (b) and table 27.

(b) Lavatories and sinks required in patient care areas shall have the water supply spout mounted so that its discharge point is a minimum distance of 5 inches above the rim of the fixture. All fixtures used by medical and nursing staff, and all lavatories used by patients and food handlers shall be trimmed with valves which can be operated without the use of hands. Where blade handles are used for this purpose they shall not exceed 4½ inches in length, except that handles on scrub sinks and clinical sinks shall be not less than 6 inches long.

Table 27

SPOUTS AND ACTIONS FOR HOSPITAL AND NURSING HOME FIXTURES

Location	Type of Spout	Type of Action Minimum
NURSING DEPARTMENT		
Patient toilet room	Gooseneck	Wrist
Patient toilet room—isolation	Gooseneck	Knee
Utility room	Gooseneck	Wrist
Treatment room	Gooseneck	Wrist
Medicine room	Gooseneck	Wrist
Lavatory in floor kitchen	Gooseneck	Wrist
Sink in floor kitchen	Sink faucet	Wrist
Nurses toilet room	Lavatory supply	Hand
Floor laboratory	Laboratory gooseneck	Vertical hand
NURSERY		
Nursery	Gooseneck	Wrist
Suspect nursery	Gooseneck	Wrist
Examination and treatment	Gooseneck	Wrist
Premature nursery	Gooseneck	Foot
Formula room	Gooseneck	Wrist
Labor room	Gooseneck	Wrist
SURGICAL		
Scrub room	Gooseneck with spray head	Knee
Sub-sterile room	Sink faucet	Wrist
Clean-up room	Sink faucet	Wrist
Frozen sections room	Laboratory gooseneck	Vertical hand
Surgical supply room	Gooseneck	Wrist
Work room	Sink faucet	Wrist
Cystoscopic room	Gooseneck with spray head	Knee
Fracture room	Sink faucet	Wrist
Recovery room	Gooseneck	Foot

Location	Type of Spout	Type of Action Minimum
CENTRAL SUPPLY		
Work room	Sink faucet	Wrist
Solutions room	Sink faucet	Wrist
Needle and syringe room	Sink faucet	Wrist
Glove room	Gooseneck	Wrist
Pharmacy	Laboratory gooseneck	Vertical hand
Manufacturing	Gooseneck	Wrist
EMERGENCY DEPARTMENT		
Observation bedroom	Gooseneck	Wrist
Utility room	Gooseneck	Wrist
Operating room	Gooseneck with spray head	Knee
D.O.A. room	Gooseneck	Wrist
Examination room	Gooseneck	Wrist
DIAGNOSTIC AND TREATMENT		
Occupational therapy	Gooseneck	Wrist
Hydro-therapy room	Gooseneck	Wrist
Examination room	Gooseneck	Wrist
Deep therapy	Gooseneck	Wrist
Superficial therapy	Gooseneck	Wrist
Radium treatment and exam	Gooseneck	Wrist
Toilet room	Gooseneck	Wrist
Dark room	Sink faucet	Hand
Autopsy	Gooseneck with spray head	Knee
Lavatory in autopsy shower room	Gooseneck	Wrist
Laboratories	Laboratory gooseneck	Vertical hand
OUTPATIENT DEPARTMENT		
Examination and treatment room	Gooseneck	Wrist
Dental operating	Gooseneck	Knee
Dental laboratory	Laboratory gooseneck	Vertical hand
Dental recovery	Gooseneck	Wrist
Surgical room	Gooseneck with spray head	Knee
Eye examination room	Gooseneck	Knee
Ear, nose and throat room	Gooseneck	Knee
SERVICE DEPARTMENT		
Lavatory in kitchen	Lavatory supply	Wrist

(13) RADIOACTIVE MATERIALS. See Wis. Adm. Code chapter H 57.

History: 1-2-56; am. (3) (4) and (5), Register, August, 1961, No. 68, eff. 9-1-61; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72; r. and recr., Register, February, 1979, No. 278, eff. 3-1-79.

H 62.16 Mobile homes. History: 1-2-56; r. and recr. (1) and (2), Register, August, 1961, No. 68, eff. 9-1-61; r. and recr. Register, November, 1972, No. 203, eff. 12-1-72; r. Register, February, 1979, No. 278, eff. 3-1-79.

H 62.17 Mobile home parks. (1) PLAN APPROVAL. (a) *Plans and specifications.* Complete plans and specifications shall be submitted to the department and written approval received before letting contracts or commencing work for all mobile home park sewerage, mobile home park water main and water services and for the addition to or replacement of existing systems.

(b) *Local approval.* The approval by county or other local governmental agency shall not exempt the requirements for state approval for the installation of sewerage and water systems serving mobile home parks.

(c) *Submission of plans and specifications.* All plans and specifications shall be submitted in triplicate and shall include the following:

1. Detailed plan of the proposed sewerage and water system showing mobile home site and service building location with all building sewers and water services indicated.

2. Legal description of the property on which the park is to be constructed.

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

4. Plans and specifications submitted for private sewage disposal systems shall meet the criteria set forth in Wis. Adm. Code section H 62.20.

(2) MOBILE HOME PARK SEWERAGE SYSTEM. (a) *General.* The park main sewerage system shall be constructed of materials approved by the department, and installed to limit infiltration of surface or subsoil waters. The infiltration of surface or subsurface waters shall not exceed 200 gallons per inch of diameter per mile per day. See Wis. Adm. Code section H 62.23 (2) (h).

(b) *Design and construction.* 1. Main sewer size and gradient. The main sewers shall be sized and graded in accordance with table 30. Main sewers 8 inches or larger shall be designed and contructed to give mean velocity, when flowing full, of not less than 2.0 feet per second, based on Kutter's formula using an "n" value of 0.013. Use of other practical "n" values may be permitted by the department, if deemed justifiable on the basis of research or field data presented.