Minnesota Plumbing Board

Proposed Permanent Rules Governing the Plumbing Code

4715.0100 DEFINITIONS.

[For text of subps 1 to 56, see M.R.]

Subp. 56a. **Gravity grease interceptor.** "Gravity grease interceptor" means a grease interceptor identified by volume, retention time, and gravity separation.

[For text of subp 57, see M.R.]

Subp. 57a. **Grinder pump.** A "grinder pump" is a specialized submersible pump designed for reducing sewage particulates and pumping the resulting slurry.

[For text of subps 58 to 60, see M.R.]

Subp. 60a. **Hydromechanical grease interceptor.** "Hydromechanical grease interceptor" means a grease interceptor that incorporates air entrainment, hydromechanical separation, interior baffling, and/or barriers in combination or separately.

[For text of subps 61 to 70, see M.R.]

Subp. 70a. **Macerating toilet system.** "Macerating toilet system" means a system consisting of a toilet and a sump with a macerating pump. The system is intended to receive and break waste from a toilet, bathtub, shower, or lavatory into pieces of fine slurry and pump to the building drainage.

[For text of subps 71 to 112, see M.R.]

Subp. 113. **Trap seal.** "Trap seal" means the vertical distance between the crown ~~wire~~ weir and the top dip of the trap.

[For text of subps 114 to 128, see M.R.]

4715.0420 STANDARDS FOR PLUMBING MATERIALS.

[For text of subp 1, see M.R.]

Subp. 2. **Abbreviations.** Abbreviations in this chapter refer to the following:

A. ASME, American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990;

~~A~~ B. ANSI, American National Standards Institute, ~~10 East 40th Street, New York, New York 10016~~ 1899 L Street, NW, 11th Floor, Washington, D.C. 20036;

~~B~~ C. ASTM, American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959;

~~C~~ D. AWWA, American Water Works Association, ~~2 Park Avenue, New York City, New York 10016~~ 6666 W. Quincy Avenue, Denver, CO 80235;

~~D~~ E. CSA, Canadian Standards Association, ~~178 Rexdale Boulevard, Rexdale (Toronto),~~ 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada ~~M9W 1R3~~ L4W 5N6;

~~E~~ F. CS, Commercial Standards available from: ~~Commodity Standards Division, Office of Industry and Commerce,~~ U. S. Department of Commerce, Bureau of Industry and Security, 14th Street & Constitution Avenue NW, Washington, D. C. ~~20234~~ 20230;

~~F~~ G. FS, Federal Specifications available from: Federal Supply Service, Standards Division, U.S. General Services Administration, One Constitution Square, 1275 - 1st Street NE, Washington, D. C. ~~20406~~ 20417;

~~G~~ H. NSF, NSF International 789 N. Dixboro Road, P.O. Box 130140, Ann Arbor, ~~Michigan 48106~~ MI 48113-0140;

~~H~~ I. FHA, Federal Housing ~~Authority~~ Administration, Architectural Standards Division, U.S. Department of Housing & Urban Development, 451 - 7th Street SW, Washington, D. C. 20410;

~~I~~ J. AASHTO, American Association of State and Highway Transportation Officials, 444 North Capital Street Northwest, Suite 249, Washington, D. C. 20001;

~~J~~ K. IAPMO, International Association of Plumbing and Mechanical Officials, ~~5001~~ 4755 E. Philadelphia St., Ontario, ~~California~~ CA 91761;

~~K~~ L. ASSE, American Society of Sanitary Engineering, 901 Canterbury ~~Road~~, Suite A, Westlake, ~~Ohio 44145-1480.~~ OH 44145;

M. ASPE, American Society of Plumbing Engineers, 2985 S. River Road, Des Plaines, IL 60018.

Subp. 3. **Standards for plumbing materials.**

	DESCRIPTION	ANSI	ASTM	FS	OTHER
I.	CAST IRON PIPE AND FITTINGS				
		A21.2			
		A21.6	A-74	WW-P-401C	CS188
1A	Cast Iron Pipe and Fittings Extra Heavy	A21.8			
1B	Cast Iron Pipe Centrifugally Cast Only and Fittings Service Weight	A21.6 A21.8	A-74	WW-P-401C	CS188
1C	Cast Iron Mechanical (Gland Type) Pipe	A21.11 A21.2 A21.6		WW-P-421a	
1D	Cast Iron Mechanical	A21.8			

		(Gland Type) Pipe	A21.4			
		Cement Lined	A21.2			
			A21.6			
			A21.8			
1E		Cast Iron Short Body Water Service Fittings (2"-12")	A21.10			AWWA C100
1F		Cast Iron Threaded Pipe	A40.5			
1G		High Silicon Pipe, Fittings Cast Iron				
1H		Cast Iron Threaded Fittings Black and Galvanized 125#	B16.4		WW-P-501	
1J		Cast Iron Drainage Fittings Black and Galvanized	B16.12		WW-P-491	
1K		Hubless Cast Iron Pipe and Fittings		A888-07a		CISPI Standard 301-05 CSA/CAN 3-B70
1L		Ductile Iron Pipe Flanged	A21.15			AWWA C115
1M		Ductile Iron Pipe Push-on Joints, Mechanical Joints	A21.51			AWWA C151
II.		STEEL AND WROUGHT IRON PIPE FITTINGS				

2A	Steel Pipe, Welded and Seamless Galvanized, Schedule 40 and Above	B36.1 B36.20	A53			WW-P-406 6(1)
2B	Wrought Iron Pipe, Galvanized Schedule 40 and Above	B36.2				
2C(a)	Stainless Steel Pipe	B36.19				
2C(b)	Stainless Steel Pipe	A112.3.1				
2D	Galvanized Malleable Fittings 150 psi and Above	B16.3	A197			
2E	Steel Unions, Galvanized			WW-V-531 C		
2F	Corrugated Steel Pipe, Aluminized and fittings (18- to 120-inch) (Storm only)		A760 A796			AASHTO M36
III.	COPPER AND COPPER BASE PIPE AND FITTINGS					
3A	Red Brass Pipe, Regular and Heavier	H27.1	B42B			
3B	Seamless Brass Tube	H36.1				
3C	Brass or Bronze Threaded Fittings 125 lbs. and Over	B16.15	B62	WW-P-460		

3D	Brass or Bronze Flare Fittings 125 lbs. and Over, Heavy Duty Long Collar Type		B62		
3E	Seamless Copper Tube Type K, Soft Temper	H23.1	B88		
3F	Seamless Copper Tube Type K, Hard Temper	H23.1	B88		
3G	Seamless Copper Tube Type L, Soft Temper	H23.1	B88		
3H	Seamless Copper Tube Type L, Hard Temper	H23.1	B88		
3H(a)	Welded Copper Alloy 194 Water, Tube, Type "Heavy," Hard Temper		B543-72		OFT194-101A Navfac TS-15400
3H(b)	Stainless Steel Water Tubing, Type SL, Copper Plated Coating (HWT-T439)		A-651		
3J	Seamless Copper Tube, Type M, Hard and Soft Temper	H23.1	B88		
3J(a)	Welded Copper Alloy 194 Water				OFT194-101A

		Tube, Type "Standard," Hard Temper		B543-72	Navfac TS-15400
	3J(b)	Stainless Steel Water Tubing, Type SM, Copper Plated Coating (HWT-T439)	A-268	A-651	
	3K	Seamless Copper Tube Type DWV	H23.3	B306	
	3L	Copper Pipe I.P.S.	H26.1	B42	
	3M	Copper Pipe, Threadless Type T P and Fittings	H26.2	B302	
	3N	Cast Bronze and Wrought Solder Joint Pressure Fitting	B16.22 H23.1 B16.18		
	3O	Cast Bronze and Wrought Solder Joint D W V Fittings	B16.23		
	3P	Copper Alloy Water Tube 1/2 Inch and 3/4 Inch		B447 B75	
	3Q	Welded Brass Water Tube 1/2 Inch and 3/4 Inch		B587	
	3R	Removable and Nonremovable Push-Fit Fittings for Copper Pipe (3/8 to 2 inches only)			NSF 61 ASSE 1061-06

IV.	LEAD PIPE AND FITTINGS				
4A	Lead Pipe AA		WW-P-325-44		
4B	Lead Pipe AAA		WW-P-325-44		
4C	Lead Bends and Traps		WW-P-325-44		
4D	Sheet Lead		QQ-L201d		
V.	SILICA AND EARTH PRODUCTS PIPE AND FITTINGS, NONMETALLIC				
5A	Asbestos-Cement Pressure Pipe and Fitting	C500 C296	SS-P351		
5B	Asbestos-Cement Water Pipe and Fittings	C500	SS-P-351	AWWA C400	
5C	Asbestos-Cement Nonpressure Pipe and Fittings	C428	XX-P-331		
5D	Asbestos-Cement Perforated Underdrain Pipe and Fittings	C508			
5E	Vitrified Clay Pipe, Standard Strength and Stronger Fittings	C13 C200			
5F	Unglazed Clay Pipe, Extra Strength and Fittings	C278			
5G	Perforated Clay Pipe and Fittings	C211			
5H	Borosilicate Glass Pipe and Fittings 60 psi				
5J	Nonreinforced Concrete Drain Tile	C412		AASHTO M178	

					AASHTO M86
5K	Nonreinforced Concrete Pipe	C14	SS-P-371	CSA-A257.1
5L	Perforated Concrete Pipe, Underdrainage	C444		
5M	Reinforced Concrete Pipe	C76	SS-P-375	CSA-A257.2
5N	Reinforced and Prestressed Concrete Pipe, Pressure Type and Fittings			
5O	Bituminized Fiber Drain and Sewer Pipe	D1860	SS-P-1540A	
5P	Perforated Bituminized Fiber Pipe for General Drainage	D2311	SS-P-1540A	
VI.	PLASTIC PIPE AND FITTINGS DRAIN, WASTE AND VENT			
6A	Acrylonitrile-Butadiene-Styrene (ABS)	D2661	L-P-322a FHA-MPS	NSF14 CSA-B181.1 CS270
	Type 1, Schedule 40 Cellular core	F628		
6B	(1) Polyvinyl Chloride (PVC)	D2665	L-P-320a	NSF14
	Schedule 40 Unthreaded		FHA-MPS	CS272
	Schedule 80 can be threaded			CSA-B181.2
	Cellular core	F891		
	Fabricated Fittings (8- to 24-inch)	D3311		
	Fabricated Fittings (8-inch and larger with mitered joints 4-inch and larger)	F1866		

	6B	(2) Polyvinyl Chloride (PVC) Schedule 30 (3-inch only)	D2949	L-P-001221	
	6B	(3) Polyvinyl Chloride (PVC) Schedule 40 (14- to 24-inch only) with ASTM D3311 fittings	D1785		
		Fabricated Fittings (8-inch and larger with mitered joints 4-inch and larger)	F1866		
	6B	(4) Polyvinyl Chloride (PVC) Schedule 40 and 80 SDR 21 and SDR 26 (6-inch and larger)	D2241		
	6B	(5) Corrugated Poly-vinyl Chloride (PVC) Schedule 40 (4- to 36-inch) with ASTM D3212 fittings (Storm only)	F949		
		BUILDING SEWER			
	6C	(1) Styrene – Rubber	D2852		CS228
	6C	(2) Polyvinyl Chloride (PVC)	D3034 F789	WW-P-00380a	CSA-B182.2
		(18- to 27-inch only)	F679		
		(18-inch and larger)	F794		
	6C	(3) Acrylonitrile-Butadiene-Styrene (ABS)	D2751		CSA-B182.1
	6C	(4) Corrugated High Density Polyethylene (Corrugated HDPE) (4- to 60-inch) with ASTM D3212 fittings (Storm only)			4- to 10-inch AASHTO M252 12- to 60-inch ASTM F2306

WATER SERVICE - Minimum working pressure rating shall be at least 150 psi for municipal water service and 100 psi for other service.

6D	Polyethylene (PE)	B72.1	D2239 D2737	LP-315a FHA-UM-31C	NSF14 CS255 CSA-B137.1
6E	Acrylonitrile-Butadiene-Styrene (ABS)	B72.3	D2282		NSF14 CS254
6F	Polyvinyl Chloride (PVC)	B72.2	D2241 D1785	L-P-1036 FHA UM-41	NSF14 NSF61 AWWA C900 CS256 CSA-B137.3
6G	Polybutylene		D2662 D2666		NSF14 CSA-B137.7
6I	Polyethylene/Aluminum/ Polyethylene (PE-AL-PE) Composite Pressure Pipe (up to 1 inch only)		F1282		NSF 14 NSF 61

WATER DISTRIBUTION - Polybutylene (PB) systems (PB tubing together with recommended fittings) and chlorinated polyvinyl chloride (CPVC) pipe together with fittings must be tested by the manufacturer at 150 psi and 210 degrees Fahrenheit for a period of not less than 48 hours by a qualified independent testing laboratory acceptable to the administrative authority. Cross-linked polyethylene (PEX) tubing systems together with approved fittings must be tested at 150 psi and 210 degrees Fahrenheit for a period of not less than 30 days by a qualified independent testing laboratory acceptable to the administrative authority.

Polypropylene (PP-R) pipe together with fittings must be tested by the manufacturer at 510 psi hoop stress and 203 degrees Fahrenheit for a period of not less than 40 days by a qualified independent testing laboratory acceptable to the administrative authority.

6K	Polybutylene		D3309	CSA-B137.8 (tubing)
6L	Chlorinated Polyvinyl Chloride (CPVC), Schedule 80 (2-1/2 to 6 inches)	119.1, 119.2	D2846 F441 F442	NSF14 FHA Bulletin #76 CSA-B137.6
6M	Cross-linked Polyethylene (PEX) Tubing		F876	NSF 14 NSF 61
6N	(1) Metal Insert Fittings Utilizing a Copper Crimp Ring for PEX Tubing		F1807	NSF 14 NSF 61
6N	(2) Cold Expansion Fittings with PEX Reinforcing Rings for Use with PEX Tubing		F1960	NSF 14 NSF 61
6N	(3) Cold Expansion Fittings with Metal Compressions Sleeves for Use with PEX Tubing		F2080	NSF 14 NSF 61
6N	(4) Stainless Steel Clamps for Securing PEX Tubing to Metal Insert Fittings		F2098-01	NSF 14 NSF 61

6N	(5) Plastic Insert Fittings Utilizing a Copper Crimp Ring for PEX Tubing	F2159			NSF 14 NSF 61
6N	(6) Cross-linked Polyethylene (PEX) Plastic Hot and Cold Water Distribution Systems	F877			NSF 14 NSF 61
6P	Polypropylene (PP-R)	F2389			NSF 14 NSF 61
	SPECIAL WASTES				
6S	Polyethylene	F1412	LP 315a		PS10-69 PS11-69 PS12-69
6T	Polypropylene	F1412			
6U	Polyvinylidene Fluoride (PVDF)	F1673			
6V	Chlorinated Polyvinyl Chloride (CPVC)				IAPMO IGC 210-2005a
	GENERAL DRAINAGE				
6W	Polyethylene (corrugated)	F405			
VII.	FIBERGLASS PIPE AND FITTINGS				
7A	Fiberglass pipe (reinforced thermosetting resin pipe) (one- to 16-inch) (18- to 48-inch must be manufactured in accordance with ASTM D2996)	D2996			NSF14 NSF61 AWWA C-950

4715.0510 WATER SERVICE PIPE.

The following materials may be used for water service pipe:

[For text of items A to F, see M.R.]

G. Plastic pipe 6D, 6E, 6F, 6G, and 6I may be used for water service pipe only up to the water meter or pressure tank and provided there is no more than two feet of such piping exposed within the building. These materials shall be installed in accordance with ASTM D ~~2774-72~~ 2774, except that plastic pipe meeting AWWA C900 must be installed according to AWWA C605. Particular care shall be taken to avoid sharp edges in contact with the pipe and to provide for expansion and contraction. Plastic pipe ~~6I~~ must be installed in accordance with the manufacturer's installation instructions.

[For text of items H and I, see M.R.]

4715.0640 FIXTURE MATERIALS.

Plumbing fixtures shall have smooth, impervious surfaces, be free from defects and concealed surfaces. All receptacles used as water closets, urinals, or otherwise, for the disposal of human excreta, shall be vitreous china, or other material acceptable to the administrative authority~~, except trough urinals may be cast iron, enameled on the inside~~. Drinking fountains shall be constructed of impervious nonoxidizing material and shall be so designed that they may be easily cleaned. Plumbing fixtures shall conform to the applicable commercial standards, where such standards exist.

4715.0900 FIXTURE TRAP REQUIREMENTS.

Each plumbing fixture, except those having an integral trap, shall be separately trapped by a water seal trap, installed as close to the fixture as possible, and in such a manner as to be ~~readily~~ accessible for cleaning and repairing.

A single trap may serve a two or three compartment sink or laundry tray. The trap shall be located not more than 30 inches horizontally from each compartment outlet. The

vertical distance between the fixture outlet and the trap weir shall be as short as possible, but in no case more than 24 inches in length.

No food waste disposal unit shall be installed in a set of restaurant, commercial, or industrial sinks, served by a single trap. Each such disposal unit shall be individually trapped and connected to a separate waste opening. Each trap shall have the manufacturer's name or identification stamped legibly thereon and each tubing trap shall show the gauge of the tubing used in its manufacture.

4715.1105 GREASE INTERCEPTORS.

Subpart 1. **Uniform Plumbing Code (UPC).** For the purposes of this part, "UPC" means the 2009 edition of the Uniform Plumbing Code as adopted by the International Association of Plumbing and Mechanical Officials (IAPMO), 5001 East Philadelphia Street, Ontario, CA 91761. Portions of this part reproduce text and tables from the UPC, with permission of IAPMO. The UPC is not subject to frequent change and a copy of the UPC is available in the office of the commissioner of labor and industry. The UPC is copyright 2009 by the IAPMO. All rights reserved.

Subp. 2. **General requirements.** A grease interceptor complying with this part shall be installed in waste lines leading from fixtures or equipment in establishments where grease may effect line stoppage as determined by the administrative authority. Only waste requiring separation may discharge to a grease interceptor. Food waste grinders and dishwashers may discharge to a gravity grease interceptor where permitted by the manufacturer and the administrative authority.

Each establishment for which a grease interceptor is required shall have an interceptor that serves only that establishment unless otherwise approved by the administrative authority. Grease interceptors must be installed in approved locations and must be readily accessible for inspection and maintenance. Grease interceptors shall be located as close as practical to the fixtures served. Each grease interceptor installation must preclude

siphoning and provide air relief. Each fixture discharging to a grease interceptor shall be trapped and vented according to this chapter.

A grease interceptor located outside the building that is a part of an individual sewage disposal system is not subject to the requirements of this chapter.

Subp. 3. **Hydromechanical grease interceptors.**

A. Hydromechanical grease interceptors shall comply with ASME Standard A112.14.3. Plumbing fixtures or equipment connected to a hydromechanical grease interceptor shall discharge through an approved type of flow control installed in a readily accessible and visible location. The total flow through the flow control device shall not be greater than the rated flow of the grease interceptor. No external flow control device having adjustable or removable parts shall be installed. Except for integral flow control devices, each flow control vent shall connect to the plumbing vent system. A vent shall be installed downstream of the grease interceptor according to this chapter.

B. Hydromechanical grease interceptors shall be sized using one of the following methods.

(1) When the flow rate of fixtures or appliances are unknown, the grease interceptor shall be sized based on the diameter of the drain discharging to the interceptor according to the following table:

Hydromechanical Interceptor Sizing Using Gravity Flow Rates

waste pipe diameter, in.	**min. interceptor size, gpm**
2	20
3	75
4	150
5	250
6	500

(2) Where fixture dimensions and flow rates of all connected fixtures and equipment are known, the interceptor must be sized as follows:

(a) calculate the volume of each connected fixture;

(b) multiply the volume of all connected fixtures by a fill factor of 0.75 to obtain the discharge volume;

(c) divide the fixture discharge volume by a drain period of one minute; and

(d) add flow rates of appliances, hydrants, and equipment.

The minimum grease interceptor size is the sum of all flow rates discharging to the interceptor.

C. Example for sizing using fixture capacity: Two compartments of a sink, a hose bibb, and an appliance will discharge to the interceptor.

(1) Calculate the volume of each fixture.

[Length, in.] x [Width, in.] x [Depth, in.]/231 = [Volume, gallons]
24" x 24" 12" x 2 compartments/231 = 59.8 gallons

(2) Calculate the discharge volume of each fixture.

[total volume] x 0.75 fill factor = [discharge volume]
59.8 gallons x 0.75 = 44.9 gallons

(3) Calculate the flow rate from each fixture.

[discharge volume]/[1-minute drainage period] = [flow rate]
44.9 gallons/1 minute = 44.9 gpm

(4) Add flow rates from appliances, equipment, and hydrants.

2 compartments of a sink	44.9 gpm
hose bibb	5 gpm

appliance	2 gpm
	51.9 gpm

(5) Minimum interceptor size.

The interceptor must be rated at 51.9 gpm or greater.

Subp. 4. **Gravity grease interceptors.** Gravity grease interceptors shall comply with IAPMO/ANSI Standard Z1001 or ASTM Standard C1613. Gravity grease interceptors shall provide for free air circulation through the interceptor and inlet and outlet pipes. Gravity grease interceptors shall be sized by the drainage fixture unit value for all connected fixtures according to the following table.

Drainage fixture units (A,B,C)	**Interceptor volume, gallons**
8	500
21	750
35	1,000
90	1,250
172	1,500
216	2,000
307	2,500
342	3,000
428	4,000
576	5,000
720	7,500
2112	10,000
2640	15,000

A. The maximum allowable drainage fixture units plumbed to the kitchen drain lines must be connected to the grease interceptor.

B. When the flow rate of directly connected fixtures or appliances have no assigned drainage fixture unit values, the additional grease interceptor volume shall be based on the known flow rate (gpm) multiplied by 30 minutes.

C. Drainage fixture unit values must be determined according to part 4715.2300.

Subp. 5. **Protective treatments.** Grease interceptors constructed of metal, concrete, or other materials subject to corrosion shall have protective treatment approved by the manufacturer.

Subp. 6. **Interceptors located outside of buildings.** A grease interceptor outside of the building must be installed to be protected from freezing. Buoyancy protection must be provided when required by the manufacturer's installation instructions. If installed in a nonpaved area, the landscape must be bermed to divert runoff. Accessways for exterior grease interceptors must be at least 20 inches square or a diameter to allow adequate access to tank interior for inspection and maintenance. Access to the inlet and outlet must be provided. The grease interceptor and covers must be protected from loadings that may lead to structural collapse and must be designed to withstand any anticipated traffic loadings. Exterior grease interceptors to be abandoned are subject to the requirements of the Minnesota Pollution Control Agency for abandoning septic tanks.

Subp. 7. **Labeling.** All grease interceptors must contain a clear and permanent product identification label listing the construction standard identified in subpart 3 or 4 and any additional labeling requirements of that standard.

Subp. 8. **Testing, maintenance, and records.** Each grease interceptor installation must pass a manometer test with one inch of water column for five minutes or a vacuum test with two inches of mercury for 60 minutes. Grease interceptors shall be inspected at least once every three months and shall be maintained in efficient operating condition by periodic removal of the accumulated grease and latent material. Records of inspection

and maintenance must be kept. The administrative authority shall set the exact frequency, duration, and availability of the inspection, cleaning, and record-keeping information.

4715.1240 BATHTUBS, WHIRLPOOL BATHTUBS, AND WHIRLPOOL PEDICURE TUBS.

Subpart 1. **General.** All bathtubs, whirlpool bathtubs, and whirlpool pedicure tubs must comply with the applicable material product standards. Bathtubs and whirlpool bathtubs with pressure-sealed doors must comply with ASME A112.19.15.

Subp. 1a. **Outlets.** Bathtubs and whirlpool bathtubs must have waste outlets and overflows at least one and one-half inches in diameter. The waste control device must be located at the tub outlet.

Subp. 2. **Whirlpool bathtubs.** Whirlpool bathtubs ~~and their installation~~ with pumps, air circulation, or both must comply with ~~ANSI 112.19.7 and ANSI 112.19.8.~~ ASME A112.19.7. Pipeless whirlpool bathtubs must comply with ASME A112.19.7 or IAPMO IGC 155. All whirlpool bathtub equipment must be provided with an access panel.

Subp. 2a. **Whirlpool pedicure tubs.** Whirlpool pedicure tubs must comply with general requirements and water retention sections of ASME A112.19.7 or IAPMO IGC 155.

Subp. 3. **Drop-in bathtubs.** Bathtubs which do not have a factory applied flange for installation against a wall are considered drop-in-type and must not be installed against a wall.

Subp. 4. **Hot water temperature control device for tubs.** Bathtubs and whirlpool tubs must be provided with water temperature limiting devices set at a maximum water temperature of 120 degrees Fahrenheit to reduce the risk of scalding, according to ASSE Standard 1070.

4715.1310 FOOD-WASTE GRINDER UNITS.

Domestic food-waste grinders shall be connected to a drain of not less than 1-1/2 inches in diameter.

Commercial food-waste grinders shall be connected to a drain of sufficient size to serve the unit, but in no case connected to a drain of less than two inches in diameter, and shall be connected, trapped, and vented separately from any other fixtures or compartments.

All food-waste grinders shall be provided with an adequate supply of water in sufficient flow rate to insure proper functioning of the unit. The water supply line to a commercial food waste grinder, which is equipped with a water rinsed funnel, shall be protected against back-siphonage by an air gap or vacuum breaker.

Except as provided in part 4715.1105, no food-waste grinders shall be connected so as to discharge through a grease interceptor.

4715.1380 SHOWERS.

Subpart 1. **Water supply riser.** Every water supply riser from the shower valve to the shower head outlet, whether exposed or not, shall be securely attached to the structure.

[For text of subps 2 to 4, see M.R.]

Subp. 5. **Anti-scald control devices.** A shower or combination shower-bath in a new or remodeled installation must be equipped with an ~~anti-scald type~~ individual shower control valve. The valve must be of the thermostatic ~~or~~, pressure-balancing, or combination thermostatic and pressure-balancing type in accordance with ~~ANSI/ASSE~~ ASSE Standard ~~1016-96~~ 1016.

The temperature of mixed water to multiple showers must be controlled by either a master ~~anti-scald type~~ thermostatic blender that provides scald and thermal shock protection according to ASSE 1069, or the showers must be individually equipped with ~~approved anti-scald type shower~~ control valves meeting ASSE Standard 1016.

4715.1410 URINALS.

Subpart 1. **Prohibited urinals.** ~~Floor-type~~ Trough urinals are prohibited.

[For text of subp 2, see M.R.]

4715.1420 WATER CLOSETS.

[For text of subps 1 to 3, see M.R.]

Subp. 4. **Water closet personal hygiene devices.** Water closet personal hygiene devices shall conform to ASME Standard A112.4.2.

4715.1430 HANGERS AND SUPPORTS.

[For text of subps 1 to 3, see M.R.]

Subp. 4. **Horizontal piping.** Horizontal piping shall be supported at sufficiently close intervals to keep it in alignment and prevent sagging:

A. cast-iron soil pipe, five-foot intervals except where ten-foot lengths of cast-iron soil pipe are used, ten-foot intervals between supports are acceptable.;

B. threaded pipe, 12-foot intervals.;

C. copper tubing (1-1/4 inch or less), six-foot intervals.;

D. copper tubing (1-1/2 inch or over), ten-foot intervals.;

E. lead pipe, on continuous metal or wood strips for its entire length.;

F. plastic pipe, 32-inch intervals except where conveying waste from dishwashers or similar hot water wastes it shall be supported on continuous metal or wood strips for its entire length. CPVC and PP-R nonreinforced water distribution pipe (1-1/4 inch or over), four-foot intervals; and

G. fiberglass reinforced pipe shall be installed with hangers and supports according to the manufacturer's installation instructions.

[For text of subps 5 to 7, see M.R.]

4715.1500 INDIRECT WASTE CONNECTIONS.

No cold storage room, walk-in cooler or freezer, refrigerator, display cooling case, cooling counter, compartment, receptacle, appurtenance, or device, which is used, designed, or intended to be used for the storage or holding of food or drink, shall have any drain pipe in connection therewith directly connected to any soil, waste, or vent pipe. Such equipment shall ~~be discharged~~ discharge indirectly to the drainage system ~~through an airbreak as defined in~~ according to part 4715.1570 or 4715.1580. Ice cream dipper wells, ice storage bins, and similar types of receptacles shall discharge into the drainage system through an air gap as defined in part 4715.1570.

The foregoing does not apply to a dishwashing or culinary sink in a food preparation room.

4715.1530 STERILIZERS.

Appliances, devices, equipment, or other apparatus such as stills, sterilizers, and similar equipment requiring water and waste shall ~~be indirectly connected, or provided with an air gap between the trap and the appliance~~ discharge to the drainage system by an air gap.

4715.1540 POTABLE CLEAR WATER WASTES.

Expansion tanks, cooling jackets, sprinkler systems, water conditioning equipment, water heater relief pipes, backflow preventer relief pipes, or any similar devices which are directly connected to the potable water system and which waste clear water only shall be discharged to the drainage system through an air gap.

4715.1590 RECEPTORS OR SUMPS.

Subpart 1. **Installment.** Except for clothes washers located in bathrooms of single-family dwellings or private use living units, waste receptors or sumps receiving

the indirect waste shall not be installed in any toilet room, nor in an inaccessible or unventilated space~~, such as a closet or storeroom~~.

[For text of subps 2 and 3, see M.R.]

Subp. 4. **Stand pipe receptors.** ~~The~~ Stand pipe ~~receptor for an automatic clothes washer~~ receptors shall be individually trapped and vented according to the requirements of this chapter. Each stand pipe receptor for clothes washers shall meet this requirement, except that multiple clothes washers in the same room may ~~be discharged~~ discharge to multiple standpipes that are manifolded together ~~and use~~ with a single trap. The stand pipe receptor for clothes washers shall extend not more than 30 inches, nor less than 18 inches above its trap, and the trap shall be installed at least six inches above the floor.

Subp. 5. [Repealed, 19 SR 590]

4715.2100 BACKFLOW PREVENTERS.

A. Atmospheric vacuum breaker (AVB):

(1) must be installed at least six inches above spill line (see special requirements in part 4715.2150);

(2) no possibility of back pressure permitted;

(3) only permitted on discharge side of last control valve; ~~and~~

(4) no more than eight hours of continuous line pressure permitted~~.~~; and

(5) must be listed to ASSE Standard 1001.

B. Pressure vacuum breaker assembly (PVB):

(1) must be installed at least 12 inches above spill line;

(2) no possibility of back pressure permitted; ~~and~~

(3) continuous line pressure permitted~~.~~; and

(4) must be listed to ASSE Standard 1020.

C. Spill-proof vacuum breaker (SVB):

(1) must be installed at least ~~six~~ 12 inches above spill line;

(2) no possibility of back pressure permitted;

(3) continuous line pressure permitted; ~~and~~

(4) field testable~~.~~; and

(5) must be listed to ASSE Standard 1056.

D. Hose connection vacuum breaker (Hose VB):

(1) required for threaded hose connections;

(2) back pressure not permitted;

(3) continuous line pressure not permitted; ~~and~~

(4) any new device must be field testable. Exception: a vacuum breaker installed as an integral part of a product, approved to ~~a~~ ASSE Standard 1011, and installed at the factory will not be required to be field testable~~.~~; and

(5) must be listed to ASSE Standard 1052. Wall hydrant vacuum breaker must be listed to ASSE Standard 1019.

E. Double-check valve with intermediate atmospheric vent (DCVIAV):

(1) permitted for low hazard with small pipe sizes;

(2) back pressure permitted; ~~and~~

(3) continuous line pressure permitted~~.~~;

(4) must be listed to ASSE Standard 1012; and

(5) device for beverage dispensing equipment must be listed to ASSE Standard 1022. For carbonated beverage machines, the additional requirements in part 4715.2163 apply.

F. Reduced pressure zone backflow preventer assembly (RPZ):

(1) any degree of hazard permitted;

(2) back pressure permitted; ~~and~~

(3) continuous line pressure permitted~~.~~;

(4) must be listed to ASSE Standard 1013; and

(5) fire sprinkler system backflow preventer must be listed to ASSE Standard 1013 or 1047.

G. Double-check valve assembly (DCVA):

(1) permitted only for nontoxic, low hazard installations with nuisance or aesthetic concern;

(2) back pressure permitted; ~~and~~

(3) continuous line pressure permitted~~.~~;

(4) must be listed to ASSE Standard 1015; and

(5) fire sprinkler systems must be listed to ASSE Standard 1015 or 1048.

H. Deck-mounted and equipment-mounted vacuum breakers and faucets with integral atmospheric or spill-proof vacuum breakers shall be installed according to the manufacturer's instructions with the critical level not less than one inch (25 mm) above the flood level rim. The vacuum breaker device must comply with ASSE Standard 1001.

4715.2110 TYPES OF DEVICES REQUIRED WHERE AN AIR GAP CANNOT BE PROVIDED.[1]

		Where back pressure is possible			Only allowed where no back pressure is possible		
		RPZ (any hazard)	DCV IAV (low hazard only)	DCVA (low hazard only)	SVB or PVB (control valve may be down-stream of device)	AVB (no control valve down-stream of device)	Hose VB (no control valve down-stream of device)
A.	Boiler, other than one- or two-family residential	X					
B.	Boiler, one- or two-family residential	X	X				
C.	Car wash	X			X	X	
D.	Carbonated beverage machine (postmix) (see part 4715.2163)		X				
E.	Chemical line	X					
F.	Chemical tank	X			X	X	
G.	Chiller	X					
H.	Cooling tower	X	~~X~~		X	X	
I.	Dental units (separate assembly required for each unit)[2]	X					
J.	Dishwasher, commercial				X	X	
K.	Fire sprinkler system[2] [3]	X	~~X~~	X			
L.	Flush tank (water closet, urinal, similar) (see part 4715.2150)	X			X	X	

M.	Flush valve (water closet, urinal, similar) (see part 4715.2150)	X			X	X	
N.	Food and beverage equipment or system	X	X	X	X	X	
O.	Garbage can washer	X			X	X	
P.	Glycol or other antifreeze system	X					
Q.	Lab equipment	X			X	X	
R.	Lab faucet					X	
S.	Laundry machine, commercial	X	~~X~~		X	X	
T.	Lawn, garden, or greenhouse sprinkler system	X			X	X	
U.	Operating, dissection, embalming, or mortuary table (see part 4715.1950)	X			X	X	
V.	Private potable water supply (where permitted by administrative authority)	X	X	X			
W.	Private nonpotable water supply (where permitted by administrative authority)	X					
X.	Process line	X	~~X~~				
Y.	Process tank	X			X	X	
Z.	RV dump station	X	~~X~~		X	X	
AA.	Sewage treatment	X			X	X	
BB.	Soap dispenser (see part 4715.2165)	X	~~X~~		X	X	
CC.	Swimming pool, fountain, pond, baptistry, aquarium or similar	X	~~X~~		X	X	

DD.	Threaded hose connections, including: hose bibbs, hydrants, service sinks, laundry trays			X	X[3]	X[4]
EE.	Truck fill	X		X	X	
FF.	Vacuum systems or aspirators	X		X	X	

1. For installations not listed in this part, review with the Administrative Authority.

2. If a dental water treatment system that has been cleared by the Food and Drug Administration (FDA) for marketing is to be installed, a single RPZ device shall be installed upstream of the dental water treatment system and not required on each branch line. The system shall be installed and maintained according to the treatment system manufacturer's instructions. Water lines of less than one-half inch are permitted downstream of the water treatment system when required by the manufacturer.

~~2~~ 3. Installations must comply with AWWA-M14, chapter 6 (1990) except that the following statement is deleted from section 6.3: At any time where the fire sprinkler piping is not an acceptable potable water system material, there shall be a backflow-prevention assembly isolating the fire sprinkler system from the potable water system.

~~3~~ 4. A vacuum breaker installed as an integral part of a product approved to a standard does not require additional backflow prevention on the hose threads; the product must be constructed so that if the integral backflow preventer is removed, the remaining threads will not be hose thread type. An unprotected threaded hose connection must be protected against backflow by addition of a backflow preventer complying with ASSE 1052.

4715.2150 CONNECTIONS NOT SUBJECT TO BACK PRESSURE.

[For text of subp 1, see M.R.]

Subp. 2. **Cross-connections where protective devices are required and critical level (C-L) settings for backflow preventers.** Critical level (C-L) is defined as the level to which the backflow preventer (vacuum breaker) may be submerged before backflow

will occur. Where the C-L is not shown on the preventer, the bottom of the device shall be taken as the C-L.

Fixture or Equipment	Method of Installation
Aspirators and Ejectors	C-L at least 6 inches above flood level of receptacle.
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. Install on both hot and cold water supply lines.
Flushometer (Closet & Urinal)	C-L at least 6 inches above top of fixture supplied.
Garbage can cleaning machine	C-L at least 6 inches above flood level of machine. Install on both hot and cold water supply lines.
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. Install on both hot and cold water supply lines.
Lawn sprinklers	C-L at least 12 inches above highest sprinkler or discharge outlet.
Steam tables	C-L at least 6 inches above flood level.
Tank and vats	C-L at least 6 inches above flood level rim or line.
~~Trough urinals~~	~~C-L at least 30 inches above perforated flush pipe.~~
Flush tanks	Equip with approved ball cock. Where ball cocks touch tank water equip with vacuum breaker with C-L at least 1 inch above overflow outlets. Where ball cock does not touch tank water, install ball cock outlet at least 1 inch above overflow outlet or provide vacuum breaker as specified above.
Hose bibbs (Where aspirators or ejectors could be connected)	C-L at least 6 inches above flood level of receptacle served.

4715.2300 LOAD ON DRAINAGE PIPING.

[For text of subps 1 to 2a, see M.R.]

Subp. 3. **Table of fixture unit values for various plumbing fixtures.**

Type of Fixture	Fixture Unit Value	Minimum Fixture and Trap Drain Size
Clothes washer (domestic use)	2	1-1/2
Clothes washer (single unit, discharge to standpipe)	2	2
Clothes washer (public use in groups of 3 or more)	6 each	
Bath tub with or without shower	2	1-1/2
Bidet	2	1-1/2
Dental unit or cuspidor	1	1-1/4
Drinking fountain	1	1-1/4
Dishwasher, domestic ~~(gravity drain)~~	2	1-1/2
Dishwasher, commercial	4	2
Floor drain with 2 inch waste	2	2
Floor drain with 3 inch waste	3	3
Floor drain with 4 inch waste	4	4
Lavatory (single) or hand sink	1	1-1/4
Laundry tray (1 or 2 compartment)	2	1-1/2
Shower stall, domestic	2	1-1/2
Shower (gang) per head	1	
SINKS:		
Classroom, with or without drinking fountain	2	1-1/2
~~Combination, sink and tray (with disposal unit)~~	~~3~~	~~1-1/2~~
~~Combination, sink and tray (with one trap)~~	~~2~~	~~1-1/2~~
~~Domestic~~	~~2~~	~~1-1/2~~
Domestic, with disposal unit and/or dishwasher	2	1-1/2
Surgeons	3	1-1/2
Laboratory~~,~~ cup sink	1	1-1/2
Flushrim or bedpan washer	6	3
Service	3	2

Pot or scullery	4	2
Soda fountain	2	1-1/2
Commercial~~,~~ (flat rim, bar, food prep, or counter sink)	3	1-1/2
Commercial (food-waste grinder or food prep sink with grinder)	4	2
Wash, circular, or multiple (per set of faucets)	2	1-1/2
URINAL pedestal, wall hung, with 3 inch trap (blowout and syphon jet)	6	3
Wall hung with 2 inch trap	3	2
Wall hung with 1-1/2 inch trap	2	1-1/2
~~Trough (per 6 foot section)~~	~~2~~	~~1-1/2~~
Stall	3	2
WATER CLOSET	6	3
Unlisted Fixture or Trap Size		
1-1/4 inch	1	
1-1/2 inch	2	
2 inch	3	
2-1/2 inch	4	
3 inch	5	
4 inch	6	

4715.2350 MINIMUM SIZE OF UNDERGROUND ~~DRAINAGE PIPING~~ GRAVITY DRAINS.

No portion of the gravity drainage system installed underground shall be less than two inches in diameter.

4715.2420 PROHIBITED FITTINGS AND CONNECTIONS.

Subpart 1. **General prohibitions.** No fittings having a hub in the direction opposite to flow, or straight tee branch shall be used as a drainage fitting. No fitting or connection which has an enlargement chamber or recess with a ledge or shoulder, or reduction in pipe area shall be used. No manhole shall be used to join drainage piping within a building. No drainage or vent piping shall be drilled, tapped, or welded unless otherwise permitted

by the administrative authority. Fittings used for back-to-back, wall outlet, blowout type water closet bowls shall have a baffle plate or other device to prevent the waste water from one water closet from entering the opposite water closet. No fixture or cleanout connection shall be made to a closet bend. No running threads, bands, or saddles shall be used. The short pattern fitting in a horizontal position is prohibited in underground work.

[For text of subps 2 to 4, see M.R.]

4715.2440 DESIGN OF SUMPS.

[For text of subp 1, see M.R.]

Subp. 2. **Discharge line.** The discharge line from such pumping equipment shall be provided with an accessible backwater valve and gate or full port ball valve, and if the gravity drainage line to which such discharge line connects is horizontal, the method of connection shall be from the top through a wye branch fitting. Except for grinder pumps and as provided in part 4715.2450, the minimum size of any pump or discharge pipe from a sump having a water closet connected thereto shall not be less than two inches. The grinder pump and its discharge line shall be a minimum of 1-1/4 inches in size. The calculated velocity in any sump discharge line shall not be less than two feet per second.

Subp. 3. **Sumps for buildings.** Building drains or building sewers receiving discharge from any pumping equipment shall be adequately sized to prevent overloading. In all buildings, other than single- and two-family dwellings, should three or more water closets discharge into the sump, duplicate pumping equipment shall be installed with controls that alternate the operation of each pump under normal conditions.

[For text of subp 4, see M.R.]

Subp. 5. ~~**Single-family dwellings**~~ **Capacity.** In a single-family ~~dwellings~~ dwelling, the minimum storage capacity from the pump suction inlet to the alarm level of a sump ~~shall be~~ other than a macerating toilet system is 18 gallons. For all facilities, the sump

basin storage volume and the pump capacity shall be adequate to prevent overloading and shall minimally meet the requirements in this subpart.

A. The pump and sump basin shall be able to accommodate the peak flow into the sump for a duration of five minutes.

B. The peak flow into the sump shall be approximated by calculating the peak water supply demand for the fixtures discharging to the sump as determined in part 4715.3700, and adding any flows from tanks or other equipment based on the maximum flow rates from the equipment. The maximum liquid level in the sump shall be calculated with the peak flow beginning at the highest design liquid level in the sump under normal operating conditions with one pump operating.

C. The calculated maximum liquid level in the sump must be less than the alarm level and must be below the sump inlet.

[For text of subps 6 and 7, see M.R.]

4715.2450 MACERATING TOILET SYSTEMS.

Subpart 1. **Macerating toilet systems.** Macerating toilet systems shall comply with ASME A112.3.4 and shall be installed according to the manufacturer's recommendations.

Subp. 2. **Location.** A macerating toilet system may only be installed in one- or two-family dwellings when gravity flow is not possible. Not more than one bathroom group, consisting of a toilet, a lavatory, and a shower or bathtub, may discharge into a macerating toilet system. Components of macerating toilet systems shall be accessible.

Subp. 3. **Discharge line.** The discharge line of a macerating toilet system shall not be less than three-fourths inch.

Subp. 4. **Sump vent.** If the macerating toilet system's vent connection is less than two inches, the vent shall transition to a minimum of two inches immediately after the connection to the system.

4715.2550 WET VENTING.

[For text of subps 1 to 3, see M.R.]

Subp. 4. **~~Basement and cellar~~ Water closet.** A ~~basement or cellar~~ lavatory may be connected to a properly installed vent from a floor-set~~, basement or cellar,~~ water closet~~, provided the vent is not less than two inches in diameter~~.

4715.2790 SIPHONIC ROOF DRAINAGE SYSTEM.

Subpart 1. **General requirements.** In lieu of sizing the storm drainage system from conventional methods as required in part 4715.2710, the roof drainage may be designed as an engineered siphonic roof drainage system when allowed by the administrative authority. The engineered siphonic roof drainage system must meet the requirements of subparts 2 and 3.

Subp. 2. **Design criteria.** The siphonic roof drainage system must be designed and certified by a professional engineer licensed in the state of Minnesota.

A. The system must be sized on the basis of a minimum rate of rainfall of four inches per hour.

B. The drainage system must be designed according to ASPE Standard 45, Siphonic Roof Drainage, and according to the manufacturer's recommendations and requirements. Manufacturer design software must be in accordance with ASPE Standard 45.

C. Roof drains must meet ASME A112.6.9, Siphonic Roof Drains.

D. When designed for water accumulation, the roof must be designed for the maximum possible water accumulation according to chapter 1305 and part 4715.2780, subpart 1, item C.

E. Minimum pipe size must be 1-1/2 inches. All pipe sizes and cleanouts in the drainage system must be designed and installed according to ASPE Standard 45.

F. Horizontal pipe size must not reduce in the direction of flow.

G. The plans and specifications for the drainage system shall indicate the siphonic roof drainage system as an engineered method used for the design.

H. The installed drainage system must be permanently and continuously marked as a siphonic roof drainage system at approved intervals and clearly at points where piping passes through walls and floors. Roof drains must be marked in accordance with ASME A112.6.9.

I. The transition locations from the siphonic roof drainage system to a gravity system must be determined by the design engineer at a location acceptable to the administrative authority. The design, sizing, and venting of the transition location must be in accordance with ASPE Standard 45. The velocity at the transition location to gravity shall be reduced to less than three feet per second. The gravity portion of the building storm sewer system receiving the siphonic roof drainage system must be sized for the design rate but no less than a rainfall rate of four inches per hour and in accordance with part 4715.2710.

J. All plans, specifications, and calculations must be submitted to the administrative authority and signed and sealed by the design engineer. The submitted calculations must include performance data for the drainage system for the required rainfall rate, including the minimum and maximum calculated operating pressures and velocities verifying that the design solution is within the operating parameters required by the design standard. All performance data must be reported as the extreme maximum and minimum calculations and shall not be presented with "averaged" data.

Subp. 3. **Proof of suitability.** Upon completion of the project, proper tests, inspections, and certification of the siphonic roof drainage system must be performed according to items A and B.

A. Testing must be performed according to ASPE Standard 45.

B. Prior to the final plumbing inspection, the design engineer must provide written certification to the administrative authority that the system has been visually inspected by the design engineer and the installation has been properly implemented according to the certified design, plans, calculations, and specifications. The submitted written certification must include any field modification from the initial design involving dimensions, location, or routing of the siphonic drainage system that must be reapproved and recertified by the design engineer and be accompanied by a final as-built design of the altered system and supported by calculated data to show that the overall system remains in accordance with ASPE Standard 45.

4715.2820 METHOD OF TESTING.

[For text of subp 1, see M.R.]

Subp. 2. **Rough plumbing.** The piping of plumbing drainage and venting systems shall be tested upon completion of the rough piping. The method of testing shall be specified by the designer and shall either be an air test or hydrostatic test as described in this subpart or an alternative test as approved by the administrative authority. The air test shall be made by attaching the air compressor or testing apparatus to any suitable opening and closing all other inlets and outlets to the system by means of proper testing plugs. Plaster of paris shall not be used in roof terminals. Air shall be forced into the system until there is a uniform pressure of five pounds per square inch on the portion of the system being tested. The pressure shall remain constant for 15 minutes without the addition of air. The pressure gauge scale shall not read more than 30 pounds per square inch and the gauge face shall not be less than 2-1/2 inches in diameter.

The hydrostatic test for thermoplastic piping materials shall be conducted by tightly closing all openings in the entire system to be tested except the highest opening. The system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest opening of the section

under test. Each section shall be filled with water, but a section shall not be tested with less than ten foot head of water. In testing successive sections, at least the upper ten feet of the next preceding section shall be tested, so that no joint or pipe in the building, except the uppermost ten feet of the system, is subjected to a test of less than ten foot head of water. The water shall be kept in the system or in the portion under test for at least 15 minutes before inspection begins. The system shall be tight at all points.

In lieu of five pound air test, concrete manholes and sewer lines may be tested by negative pressure in accordance with ASTM Standards C1214-92 and C1244-93.

Subp. 2a. **Exceptions.**

[For text of item A, see M.R.]

B. Building storm sewers may be tested in accordance with the Hydrostatic Test Method from the City Engineers Association of Minnesota, except that an air test may be required for any section of the building storm sewer that passes through contaminated soils or contaminated water. The Hydrostatic Test Method, provisions ~~H2~~ F2 and ~~H3~~ F3, as specified in Standard Utilities Specifications for Watermain and Service Line Installation and Sanitary Sewer and Storm Sewer Installation, written and published by the City Engineers Association of Minnesota, ~~1988~~ 1999 edition, is incorporated by reference, is not subject to frequent change, and is available in the office of the commissioner ~~of administration~~.

Subp. 3. **Finished plumbing.** After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proven gas and water tight by plugging the stack openings on the roof and the building drain where it leaves the building, and air introduced into the system equal to the pressure of a one inch water column. Such pressure shall remain constant for ~~the period of~~ 15 minutes or the duration of the inspection without the introduction of additional air.

[For text of subps 4 to 7, see M.R.]

REPEALER. Minnesota Rules, parts 4715.1110; and 4715.1115, are repealed.

EFFECTIVE DATE. The amendments to these rules are effective 180 days after filing with the secretary of state or five working days after publication of the notice of adoption in the State Register, whichever occurs later.