Department of Labor and Industry

Adopted Permanent Rules Relating to Plumbing Code and Plumbing Licensing and Registration

4715.0100 DEFINITIONS.

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

Subp. 2. **Administrative authority.** "Administrative authority" means the commissioner of labor and industry. (When a governmental subdivision adopts and maintains a comprehensive plumbing enforcement program that is conducted by personnel who are knowledgeable about plumbing installation requirements, and includes enforcement of all code provisions including materials, methods, inspection, and testing, the administrative authority shall be the governing body of the adopting unit of government, its agents, and employees; however, the commissioner of labor and industry retains the ultimate authority to enforce Minnesota Statutes, sections 326B.43 to 326B.49, and provisions of this chapter that are necessary to ensure compliance.)

Subp. 3. **Air break.** "Air break" means a piping arrangement in which a fixture, appliance, or device is protected from backflow by discharging at or below the flood level rim of another fixture or receptacle whose flood level rim is lower than the bottom of the protected fixture, appliance, or device.

Subp. 4. **Air gap.** "Air gap" when used in reference to the drainage system means the unobstructed vertical distance through the free atmosphere between the outlet of a waste pipe and the flood level rim of the fixture or receptacle into which it is discharging.

Subp. 5. **Air gap.** "Air gap" when used in reference to the water distribution system means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device, and the flood level rim of the receptacle.

[For text of subps 6 to 45, see M.R.]

Subp. 45a. **Factory-trained installer.** "Factory-trained installer" means a person who has received training from the manufacturer on installation of that manufacturer's specific plumbing product, and holds a valid certificate of competency issued by the manufacturer for the completion of that training.

[For text of subps 46 to 55, see M.R.]

Subp. 55a. **Fouling waste.** "Fouling waste" means waste that is harmful to the drainage system consisting of grease, dairy, heavy solids, animal matters, feathers, or similar waste that may settle out or deposit on pipes, reducing effective pipe diameter, or otherwise impeding flow.

[For text of subps 56 to 60, see M.R.]

Subp. 61. **Individual sewage disposal system.** "Individual sewage disposal system" means a system for disposal of sewage designed for use apart from a public sewer as regulated under rules administered by the Pollution Control Agency.

[For text of subps 62 to 67, see M.R.]

Subp. 67a. **Food establishment.** "Food establishment" as used in this chapter means a "food and beverage service establishment" as that term is defined in Minnesota Statutes, section 157.15, subdivision 5, or a "place of business" as that term is defined in Minnesota Statutes, section 28A.03, subdivision 4.

[For text of subps 68 to 70, see M.R.]

Subp. 71. **Main.** "Main" means the principal pipe artery to which branches may be connected.

[For text of subps 72 to 128, see M.R.]

4715.0200 BASIC PLUMBING PRINCIPLES.

This code is founded upon certain basic principles of environmental sanitation and safety through properly designed, acceptably installed and adequately maintained

plumbing systems. Some of the details of plumbing construction may vary but the basic sanitary and safety principles desirable and necessary to protect the health of the people are the same everywhere. As interpretations may be required, and as unforeseen situations arise which are not specifically covered in this code, the twenty three principles which follow shall be used to define the intent.

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

D. The building sewer in every building with installed plumbing fixtures and intended for human habitation, occupancy, or use when located on premises where the authority having jurisdiction has determined that a public sewer is available shall be connected to the public sewer.

[For text of items E to T, see M.R.]

U. If water closets or other plumbing fixtures are installed in a building where there is no public sewer available as determined by the authority having jurisdiction, suitable provision must be made for treatment of the building sewage by methods which meet the design criteria of the Minnesota Pollution Control Agency.

[For text of items V and W, see M.R.]

4715.0420 STANDARDS FOR PLUMBING MATERIALS.

Subpart 1. **Approved materials.** A material shall be considered approved if it meets one or more of the standards in subpart 3. All approved materials shall be certified to the listed standard by an independent accredited third-party certification agency. Certification reports shall be made available to the administrative authority when requested. Materials not listed in subpart 3 shall be used only as provided for in part 4715.0330, or as permitted elsewhere in this code.

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

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

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

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

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

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 (Gland Type) Pipe Cement Lined	A21.8 A21.4 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	A53			
		B36.20				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		A760		AASHTO M36	
	(18- to 120-inch) (Storm only)		A796			
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 Tube, Type "Standard," Hard Temper		B543-72			OFT194-101A 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 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. 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.]

4715.0520 WATER DISTRIBUTION PIPE.

The following materials may be used for water distribution pipe:

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

L. Cross-linked polyethylene (PEX) tubing 6M with fittings 6N(1), 6N(2), 6N(3), 6N(4), 6N(5), or 6N(6) shall be certified by an independent third-party certifier. The water distribution system shall be installed by a factory-trained installer in accordance with the manufacturer's installation instructions. Tubing and fittings must be marked with the appropriate ASTM designations by the manufacturer.

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

N. Polypropylene (PP-R) pipe 6P shall be certified by an independent third-party certifier. The water distribution system shall be installed by a factory-trained installer in accordance with the manufacturer's installation instructions.

4715.0530 BUILDING SEWERS.

The following materials may be used for building sewers:

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

G. Plastic 6A, 6B(1), 6B(3), 6B(4), 6C(1), 6C(2), and 6C(3) and corresponding fittings must be laid on a continuous granular bed. Installation must comply with ASTM D2321.

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

J. Ductile Iron 1L and 1M. Gravity installation must be from manhole to manhole or building to manhole with no change in direction, and must be in accordance with ASTM A746-03 and the manufacturer's recommendations and requirements.

4715.0610 SPECIAL WASTES.

For special wastes, the following materials may be used:

A. The following corrosion resistant materials are acceptable for chemical waste and vent systems: stainless steel 2C(b), chemically resistant glass pipe 5H, high silicon content cast iron 1G, and chemically resistant plastic pipe 6S, 6T, 6U, or 6V. The installation shall be in accordance with manufacturer's installation instructions. If 6S, 6T, 6U, or 6V is used, horizontal piping may not exceed 35 feet in total length; and stacks may not exceed 35 feet in total height unless an approved expansion and contraction joint is installed at intervals not to exceed 35 feet. Underground installation of chemically resistant plastic pipe shall comply with ASTM D2321.

B. Pressure wastes or nonpressure wastes which are completely exposed or accessible, and which discharge indirectly to the drainage system may be of any materials in part 4715.0420, subpart 3, with due regard to the type of liquid being wasted.

4715.0800 MECHANICAL JOINTS.

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

Subp. 2. **Mechanical joints in cast iron bell and spigot soil pipe.** Mechanical joints in cast iron soil pipe shall be made by means of a preformed molded rubber ring, secured by pulling the pipe and fittings together in such a way as to compress the molded rubber ring in a manner that will assure a gas and water tight joint. The rubber sealing ring shall conform to ASTM C 564 requirements.

Subp. 3. [Repealed by amendment, 9 SR 1557]

Subp. 4. **Mechanical joints in hubless cast iron soil pipe.** Mechanical joints for hubless cast iron soil pipe and fittings shall be made by using a neoprene sleeve and stainless steel retaining band as specified in CISPI standard 310, ASTM C 1277-06, or ASTM C 1540-04 and in accordance with the manufacturer's installation instructions, by using a transition fitting made of elastomeric material (ASTM C 425 and ASTM C 564) and 300 series stainless steel bands and bolts, or by using a two-part coupling whose housing is fabricated of grey-cast iron (ASTM A 48), with a coupling gasket made of neoprene rubber (ASTM C 564 or CSA/CAN 3-B70), and coupling bolts and nuts made of 18-8 stainless steel.

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

4715.0805 PUSH-ON JOINTS.

Subpart 1. **Water service joints.** Push-on joints may be used in cast iron and ductile iron water service pipe located underground outside the building, and must comply with ANSI-A21.11-85. Lead-tipped gaskets are prohibited.

Subp. 2. **Water distribution joints.** Removable and nonremovable push-fit fittings that comply with ASSE 1061-2006 may be used in copper pipe water distribution for aboveground installation. The installer must be certified by the manufacturer to install that manufacturer's fitting.

4715.0810 PLASTIC JOINTS.

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

Subp. 3. **Fusion welding.** Fusion-weld connections in polypropylene pipe shall include socket-fusion, butt-fusion, electro-fusion, and fusion outlet branch fittings. Fusion welding shall be in accordance with ASTM F2389.

4715.0850 USE OF JOINTS.

[For text of subps 1 to 5, see M.R.]

Subp. 6. **Copper water tube.** Joints in copper water tubing shall be made either by the appropriate use of approved brass or wrought copper water fittings properly soldered or brazed; by means of approved flared fittings as provided in part 4715.0770; by means of press type copper and copper alloy fittings on aboveground water distribution copper tubing, sizes 1/2-inch to 4-inch, installed in accordance with IAPMO Standard PS 117-2002; or by means of push-fit fittings for aboveground water distribution, installed in accordance with ASSE 1061-2006, which must not be embedded in concrete.

[For text of subps 7 to 9, see M.R.]

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.

4715.1000 LOCATION.

There shall be at least two cleanouts in the building drain, one at or near the base of the stack and one near the connection between the building drain and the building sewer. The cleanout at the outside wall may be inside or outside the building, and shall be made with a full "Y" branch fitting and shall extend at least two inches above grade

or finished floor, except that the administrative authority may grant permission to use a flush cover in traffic areas.

A cleanout which is easily accessible shall be provided at or near the foot of each vertical soil or waste stack and each vertical storm water leader.

Each horizontal branch drain pipe shall be provided with a cleanout at its upper terminal, except that a fixture trap or a fixture with an integral trap, readily removable without disturbing concealed piping, may be accepted as a cleanout equivalent for this purpose.

All floor-set fixture drains with concealed traps such as floor drains, trench drains, and similar fixtures installed in areas receiving fouling waste shall be provided with an integral cleanout or a cleanout installed as close as possible to the fixture on the horizontal fixture branch serving the fixture. This cleanout shall be the same nominal pipe size as the horizontal fixture branch.

A floor drain cleanout may be omitted if the floor drain or fixture branch line is less than five feet in length.

Floor drains used for shower drains, recessed slop, or similar receptors may have the full-sized cleanout installed on the individual vent pipe serving the fixture or on the fixture.

A trap opening from a lavatory, drinking fountain, urinal, sink, or similar fixture may serve as a cleanout for a horizontal branch drain up to two inches in size, if the drain opening is not more than one pipe size smaller than the horizontal branch drain.

A cleanout shall be provided on a common vertical fixture drain or common vent serving two fixture traps that connect to a vertical drain at the same level. The cleanout shall be the same nominal pipe size as the drain serving the fixtures. Where the vertical drain is accessible through the trap opening, the cleanout may be eliminated.

4715.1120 OIL AND FLAMMABLE LIQUIDS SEPARATOR.

Enclosed garages of over 1,000 square feet or housing more than four motor vehicles, repair garages, gasoline stations with grease racks, work or wash racks, auto washes,

and all buildings where oily and/or flammable liquid wastes are produced shall have a separator installed into which all oil, grease, and sand bearing and/or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal, when floor drains or trench drains are provided. The separator shall be located inside the building.

Exception: Private garages classified as Group U occupancies serving one- and two-family dwellings.

Each separator shall be of watertight construction and of not less than 35 cubic feet holding capacity, be provided with a water seal of not less than three inches on the inlet and not less than 18 inches on the outlet. The minimum depth below the invert of the discharge drain shall be three feet. The minimum size of the discharge drain shall be four inches. The separator may be constructed either: (i) of monolithic poured reinforced concrete with a minimum floor and wall thickness of six inches, (ii) of iron or steel of a minimum thickness of 3/16 inch, protected with an approved corrosion resistant coating on both the inside and the outside, or (iii) of fiberglass resins that comply with ASTM C-581 and meets IAPMO Material and Property Standard, PS 80-2003b, for clarifiers.

The separator must be provided with a nonperforated iron or steel cover and ring of not less than 24 inches in diameter, and the air space in the top of the tank must have a three-inch vent pipe, constructed of approved metallic material, extending separately to a point at least 12 inches above the roof of the building. Drains and piping from motor vehicle areas must be a minimum of three inches in size. Drains discharging to an interceptor must not be trapped and must be constructed so as not to retain liquids. In motor vehicle wash facilities, a sand interceptor which meets the requirements of part 4715.1130, subpart 1, except that no water seal is permitted, may be installed to receive wastes before discharging into a flammable waste separator.

No cleanout, mechanical joint, or backwater valve shall be installed inside the separator which could provide a bypass of the trap seal. Only wastes that require separation shall discharge into the separator, except that a water supplied and trapped sink

may be connected to the vent of the separator. Whenever the outlet branch drain serving a separator is more than 25 feet from a vented drain, such branch drain shall be provided with a two inch vent pipe. A backwater valve shall be installed in the outlet branch drain whenever in the judgment of the administrative authority backflow from the building drain could occur.

A separator must be installed to be readily accessible for service and maintenance, and must be maintained by periodic removal of accumulated liquids and solids from the separator.

4715.1210 REQUIRED MINIMUM NUMBER OF FIXTURES.

For all premises subject to this chapter, plumbing fixtures shall be provided for the type of building occupancy and in the minimum number listed in chapter 1305, Minnesota Building Code.

4715.1250 DISHWASHING EQUIPMENT.

Every dishwasher in a building for public use shall discharge to the drainage system through an air break or an air gap, except: (1) a domestic-type dishwasher installed under the counter in an employee break room or in any location other than a food establishment, may discharge into the sink tailpiece or food waste grinder if the discharge drain line is fastened as high as possible under the countertop; and (2) the dishwasher may be connected directly to the drainage system if a floor drain constructed without a backwater valve is installed on the individual dishwasher branch. The water supply to any dishwasher in which the supply opening is located below the spill line of the machine shall be protected with a vacuum breaker.

4715.1300 FLOOR DRAINS.

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

Subp. 4. **Venting of floor drains.** Floor drain fixture branches that are less than 25 feet in length and connect to a vented main or branch do not require an individual vent.

The following shall be vented in accordance with parts 4715.2520, subparts 5 and 6; 4715.2550, subpart 3; and 4715.2620, subpart 4: floor drains receiving liquid waste flows that could siphon the trap seal; trench drains and floor sinks used as a receptor; and floor drains used for shower drains, recessed slop, or similar receptors.

Subp. 5. [Repealed, 19 SR 590]

[For text of subp 6, see M.R.]

4715.1380 SHOWERS.

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

Subp. 2. **Shower waste outlet.** Waste outlets, other than those in bathtubs, serving a single shower shall be at least 1-1/2 inches in diameter and have removable strainers not less than three inches in diameter having strainer openings not less than one-fourth inch in minimum dimension. Waste outlets shall be securely fastened to the waste pipe making a watertight connection thereto. Waste outlets serving showers, except single-head showers, must be at least two inches in diameter and must have removable strainers not less than three inches in diameter. Where each shower space is not provided with an individual waste outlet, the waste outlet must be located and the floor pitched so that the water from one shower does not flow over the floor area serving another shower. The floor and waste outlet design must not require a shower user to stand in or walk across the wastewater flowing from another shower space.

[For text of subps 3 to 5, see M.R.]

4715.1390 SINKS.

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

Subp. 3. **Adjustable sink systems.** Adjustable tailpiece sink systems must comply with ASME Standard A 112.19.12-2006 Wall Mounted, Pedestal Mounted, Adjustable,

Elevating, Tilting, and Pivoting Lavatory, Sink, and Shampoo Bowl Carrier Systems and Drain Waste Systems. The tailpiece must be of rigid construction.

4715.1590 RECEPTORS OR SUMPS.

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

Subp. 2. **Design.** All plumbing receptors receiving the discharge of indirect waste pipes shall be of such shape and capacity to prevent splashing or flooding.

Subp. 3. **Domestic or culinary fixtures prohibited as receptors.** No plumbing fixture which is used for domestic or culinary purposes shall be used to receive the discharge of an indirect waste. Domestic use dishwashers may discharge into a sink, or discharge to a sink tailpiece or food-waste grinder if the discharge drain line is fastened as high as possible under the countertop.

[For text of subps 4 and 5, see M.R.]

4715.1700 WATER REQUIRED.

Every building equipped with plumbing fixtures and used for human occupancy or habitation shall be provided with a supply of potable water, which meets the standards of the Department of Health, in the amounts and at the pressures specified in this chapter. For permanent residences or buildings in which people are employed, hot water shall be provided to all plumbing fixtures requiring hot water for proper use.

Only potable water shall be accessible to plumbing fixtures supplying water for drinking, bathing, culinary use, or the processing of food, medical, or pharmaceutical products. Only potable water shall be supplied to emergency showers and eyewashes.

4715.1710 WATER SERVICE.

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

Subp. 2. **Separation of water service and building sewer.** Except as permitted in this subpart, the underground water service pipe and the building drain or building sewer

shall not be less than ten feet apart horizontally and shall be separated by undisturbed or compacted earth.

NOTE: See chapter 4725 relating to wells and borings regarding separation of buried sewers from wells.

The water service pipe may be placed in the same trench with the building drain and the building sewer provided approval is given by the administrative authority and the following conditions are met:

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

D. Where the provisions of items A and B cannot be met, the sewer pipe shall be of cast iron or plastic 6A, 6B, 6C(2), or 6C(3) and the water pipe of copper, ductile or cast iron, or plastic 6D, 6E, 6F, 6G, or 6I (part 4715.0420, subpart 3).

E. Where the water service pipe must cross the building sewer, the bottom of the water service pipe located within ten feet of the point of crossing shall be at least 12 inches above the top of the sewer, except where this is not feasible, the sewer shall be of cast iron or plastic 6A, 6B, 6C(2), 6C(3), or 6C(4) (part 4715.0420, subpart 3) for at least ten feet on either side of the crossing.

Subp. 3. **Water service near sources of pollution.** Potable water service pipes must not be located in, under, or above cesspools, septic tanks, septic tank drainage fields, seepage pits, soil treatment systems, sewer manholes, catch basins, buried tanks containing chemicals or petroleum products, or any other source of pollution that in the judgment of the administrative authority might contaminate the potable water supply. A horizontal separation of ten feet must be maintained between the outer edge of the water service pipe and the outer edge of the contamination source.

4715.1730 SIZE OF FIXTURE BRANCH.

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

Subp. 2. **Table of minimum sizes of fixture water branch lines.**

Type of fixture or device	Nominal pipe size (inches)
Bath tubs	1/2
Combination sink and tray	1/2
Cuspidor	1/2
Drinking fountain	1/2
Dishwasher (domestic)	1/2
Kitchen sink (res.)	1/2
Kitchen sink (com.)	3/4
Lavatory	1/2
Laundry tray	1/2
Sinks (service, slop)	1/2
Sinks flushing rim	3/4
Urinal (flush tank)	1/2
Urinal (direct flush valve)	3/4
Water closet (tank type)	1/2
Water closet (flush valve type)	1
Hose bibbs	3/4
Wall hydrant	3/4
Domestic clothes washer	1/2
Shower (single head)	1/2

4715.1740 WATER PRESSURE.

When street main pressure exceeds 80 psi, an approved pressure reducing valve shall be installed in the water service pipe near its entrance to the building to reduce water pressure to 80 psi or lower. Where street water main pressures fluctuate significantly, the building water distribution system shall be so designed for the minimum pressure available.

Whenever water pressure from the street main or other source of supply is insufficient to provide flow pressure at fixture outlets as required under part 4715.1770, a booster pump and pressure tank or other approved means shall be installed on the building water supply system. See part 4715.1810 for installation.

4715.1800 WATER SUPPLY CONTROL VALVES.

Subpart 1. **Stop and waste valves prohibited.** Combination stop and waste valves or cocks shall not be installed underground in water service piping unless approved by the administrative authority and located at least two feet above the water table and at least ten feet from any sewer.

[For text of subps 2 to 11, see M.R.]

Subp. 12. **Yard hydrants.** Freeze-resistant sanitary yard hydrants must comply with ASSE 1057.

4715.2120 LOCATION OF BACKFLOW PREVENTERS.

Backflow and back-siphonage preventing devices or assemblies must be located so as to be readily accessible, preferably in the same room with the fixture they serve. Installation in utility or service spaces, provided they are readily accessible, is also permitted.

The access area must provide enough space for testing and maintenance of the device. A backflow preventer must not be installed in a pit or other confined area subject to flooding. When a conductor pipe is provided from a backflow preventer drain, a visible air gap must be provided at the device. New installations of reduced pressure zone backflow preventers must be at least 12 inches, but not more than six feet, above the finished floor or ground level.

4715.2280 WATER METER INSTALLATION.

Water meters shall be located inside a building and installed at least 12 inches above the finished floor and shall be readily accessible. Water meters installed within five feet of

a plumbing fixture must be shielded from contamination. All water meter installations shall be rigidly supported with a permanent support in order to prevent the meter from vibrating when the water is passing through it. Water meter installations must also be approved by the authority having jurisdiction.

Exceptions: Where installation inside a building is not possible, the water meter may be installed in an enclosed structure not subject to flooding, high groundwater, or surface drainage runoffs, provided the meter is protected from freezing. Provision shall be made to install the meters above grade when possible. When installed below grade, the top of the structure shall be located at least 12 inches above the finished grade, be secured, and accessible. This structure shall not be connected to any storm or sanitary sewer system.

4715.2310 SELECTING SIZE OF GRAVITY DRAINAGE PIPING.

Subpart 1. **Determination of size.** Pipe sizes for gravity drains shall be determined from subparts 2 and 3 on the basis of drainage load computed from part 4715.2300, subparts 2 and 3.

Subp. 2. **Maximum loads for horizontal drains in fixture units.**

		Building Sewer*****, Building Drain and Building Drain Branches - from Stacks****			
		Slope			
Diameter of Drain	Horizontal Fixture Branch*-	1/16 in/ft.	1/8 in/ft.	1/4 in/ft.	1/2 in/ft.
(inches)	(f.u.)	(f.u.)	(f.u.)	(f.u.)	(f.u.)
1-1/4	1				
1-1/2	3				
2	6			21	26

2-1/2	12			24	31
3**	32***		36***	42***	50***
4	160		180	216	250
5	360		390	480	575
6	620		700	840	1,000
8	–	1,400	1,600	1,920	2,300
10	–	2,500	2,900	3,500	4,200
12	–	3,900	4,600	5,600	6,700
15	–	7,000	8,300	10,000	12,000

*Includes Horizontal Branches of the Building Drain.

**No water closet shall discharge into a drain less than 3 inches.

***Not over 2 Water Closets.

****Every building drain that receives the discharge of (3) or more water closets, shall not be less than 4 inches in diameter.

*****No building sewer shall be less than 4 inches in diameter.

[For text of subp 3, see M.R.]

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 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.]

4715.2430 DRAINS BELOW BUILDING SEWER.

Only drains that cannot be discharged to the sewer by gravity flow shall discharge into an approved watertight, gas-tight vented sump or receiving tank, so located as to receive the sewage or wastes by gravity. From the sump or receiving tank the sewage or other liquid wastes shall be lifted and discharged into the building gravity drain by approved automatic pumping equipment. The system or drainage piping entering the sump shall be installed and vented as required in this section for a gravity system.

4715.2520 VENT STACKS AND STACK VENTS.

Subpart 1. **Vent stack required.** For each sanitary building sewer, at least one three-inch vent stack (or stack vent) carried full size through the roof shall be installed as provided in part 4715.2330. A vent stack or main vent shall be installed with a soil or waste stack whenever individual vents, relief vents, or branch vents are required for stacks of three or more branch intervals.

[For text of subps 2 to 6, see M.R.]

4715.2580 COMMON VENTS.

Subpart 1. **Individual vent as common vent.** An individual vent, installed vertically, may be used as a common vent for not more than two traps serving a single fixture or two traps serving similar fixtures when both fixture drains connect independently with a vertical drain at the same level.

Subp. 2. **Fixtures connected to vertical drain at different levels.** Except for water closets or similar fixtures, a common vent may be used for two fixtures set on same floor level but connecting at different levels in the vertical drain, provided the vertical drain is one pipe diameter larger than the upper fixture drain but in no case smaller than the lower

fixture drain, whichever is the larger and that both drains conform to part 4715.2620, subpart 4. No more than two fixture traps shall be vented in this manner.

4715.2610 FIXTURES BACK-TO-BACK.

Two fixtures set back-to-back, within the distance allowed between a trap and its vent, may be served with one continuous soil or waste-vent pipe, provided that each fixture wastes separately into an approved double fitting, having inlet openings at the same level. (See part 4715.2580, subpart 1.)

4715.2620 FIXTURE VENTS.

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

Subp. 3. **Crown venting limitation.** No vent shall be installed within two drain pipe diameters of the trap weir.

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

4715.2710 SIZE OF BUILDING STORM DRAINS AND LEADERS.

[For text of subps 1 to 5, see M.R.]

Subp. 6. **Values for continuous flow.** If there is a continuous or semicontinuous discharge into the building storm drain or building storm sewer, as from a pump, ejector, or similar device, each gallon per minute of the discharge must be computed as being equivalent to 24 square feet of roof area, based upon a four-inch rainfall.

4715.2760 ROOF AND DECK DRAINS.

Subpart 1. **Roof drain strainers.** All roof areas, except those draining to hanging gutters, shall be equipped with roof drains having strainers extending not less than four inches above the surface of the roof immediately adjacent to the roof drain. Strainers shall be provided on all overflow roof drains and shall have an available inlet area, above roof level, equal to that of the conductor or leader to which the drain is connected.

Exceptions: For roof drains with integral overflow drains meeting Standard IAPMO IGC 187-05, a strainer with a minimum height of three inches shall be provided and the structural design of the roof for maximum ponding and the design of the engineered roof drain sumps shall be certified by a state-licensed professional structural engineer.

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

4715.2820 METHOD OF TESTING.

Subpart 1. **Testing.** The tests shall be applied to the plumbing drainage system in its entirety or in sections. Sections which are found satisfactory need not be retested after completion of the entire system unless considered necessary by the proper administrative authority.

[For text of subps 2 to 7, see M.R.]

4716.0010 DEFINITIONS.

Subpart 1. **Scope.** The terms used in this chapter have the meanings given them in this part, in part 4715.0100, and in Minnesota Statutes, sections 326B.01 and 326B.42.

Subp. 2. **Commissioner.** "Commissioner" means the commissioner of labor and industry or a duly designated representative of the commissioner who is either an employee of the Department of Labor and Industry or a person working under contract with the department.

4716.0020 EXAMINATION AND LICENSING OF PLUMBERS.

Subpart 1. **Examinations.** An applicant for a plumber's license, other than a restricted journeyman or restricted master plumber license, must satisfactorily pass an examination given by the commissioner. Examinations for journeyman and master plumber licenses shall be held in March and September of each year. Applications for

the March examination must be filed not later than February 15 and for the September examination not later than August 15.

A. An applicant for the master plumber examination must have:

(1) a current Minnesota journeyman plumber license and five years of practical plumbing experience;

(2) a current master plumber license from another state where the requirements of the licensing jurisdiction are equivalent to those of Minnesota, as determined by the commissioner; or

(3) a current Minnesota restricted master plumber license and five years of verifiable experience in business as a plumbing contractor in Minnesota.

B. An applicant for the journeyman examination:

(1) must be registered as a plumber's apprentice in Minnesota and must have at least four years of practical plumbing experience, as specified in subpart 2, item F;

(2) must have a current Minnesota restricted journeyman plumber license or restricted master plumber license and at least two years of practical plumbing experience gained while holding the restricted plumber license, as specified in subpart 2, item E; or

(3) must hold a current plumber's license from another state where the licensing jurisdiction requires at least four years of practical plumbing experience and an examination to qualify for licensure.

Subp. 2. **Experience.** This subpart applies to all practical plumbing experience described in subpart 1.

A. One year of practical plumbing experience consists of at least 1,750 hours.

B. The 1,750 hours necessary to gain one year of practical plumbing experience may be worked in more than one 12-month period; however, not more than 1,750 hours shall be credited for one calendar year.

C. Not more than two years of the practical plumbing experience from a state other than Minnesota shall be credited unless the applicant first obtains a plumber's license in the other state.

D. The applicant is responsible for verifying practical plumbing experience. The commissioner may require work records, time cards, pay records, or other documentation necessary to evaluate practical plumbing experience. The commissioner shall make the final determination about the adequacy and acceptability of an applicant's practical plumbing experience.

E. If the applicant is a licensed restricted journeyman plumber or a licensed restricted master plumber subitems (1) to (3) apply.

(1) The practical plumbing experience must include at least the following number of hours in the plumbing aspects specified in units (a) to (c). The remaining required hours of practical plumbing experience may be in any aspect of plumbing work included in the definition of plumbing in part 4715.0100; however, the applicant must include in the application the type of work and corresponding number of hours:

(a) water distribution system installation, 1,000 hours;

(b) drain, waste, and vent system installation, 1,000 hours; and

(c) fixture installation, 500 hours.

(2) The applicant must have been a licensed restricted journeyman or a licensed restricted master plumber at all times while obtaining the practical plumbing experience.

(3) The applicant must have completed the entire two years of practical plumbing experience within the four years before the applicant takes the examination.

F. If the applicant is a registered plumber's apprentice subitems (1) to (3) apply.

(1) The practical plumbing experience must include at least the following number of hours in the plumbing aspects specified in units (a) to (c). The remaining required hours of practical plumbing experience may be in any aspect of plumbing work included in the definition of plumbing in part 4715.0100; however, the applicant must include in the application the type of work and corresponding number of hours:

(a) water distribution system installation, 2,000 hours;

(b) drain, waste, and vent system installation, 2,000 hours; and

(c) fixture installation, 1,000 hours.

(2) Except for experience qualifying under subitem (3), the applicant must have been a registered plumber's apprentice at all times while obtaining the practical plumbing experience.

(3) Up to 24 months of practical plumbing experience gained before the effective date of the applicant's initial registration as a plumber's apprentice will be credited if the applicant gained some of the experience during the 12-month period immediately prior to the effective date of the applicant's initial registration and if:

(a) the applicant gained the plumbing experience during military service, and the applicant's military officer certifies the experience;

(b) the applicant gained the plumbing experience as part of a plumbing education class approved by the commissioner, and an authorized representative of the educational institution certifies the experience; or

(c) the applicant gained the plumbing experience as a plumber's apprentice in another state where the experience is verified by a state agency in that state or by a federal agency.

G. Except as provided in item F, subitem (3), all practical plumbing experience must be certified by the licensed plumber or plumbing contractor who is responsible for the work performed. A restricted master plumber cannot certify the restricted master plumber's own experience. The employer of a journeyman plumber, restricted master plumber, restricted journeyman plumber, or plumber's apprentice is responsible for:

(1) recording the practical plumbing experience worked by each such employee; and

(2) maintaining these records of practical plumbing experience for at least six years after the employee's last recorded experience.

4716.0030 LICENSE APPLICATIONS.

Subpart 1. **Examination applications.** Applications to take the journeyman or master plumber's examination must be submitted to the commissioner on forms prepared by the commissioner together with the required fee. The fee must be submitted with the application and is not refundable.

Subp. 2. **License applications.**

A. Any applicant who receives a passing grade on the journeyman plumber's examination may submit an application for a journeyman plumber's license.

B. Any applicant who receives a passing grade on the master plumber's examination may submit an application for a master plumber's license.

C. All initial applications for licensure must be on forms prepared by the commissioner, and must be accompanied by the required fee.

4716.0040 EXPIRATION OF LICENSES.

Subpart 1. **Issuance and expiration.** Initial and renewal journeyman and master plumber's licenses, and renewal restricted journeyman and restricted master plumber's licenses, shall be issued for the calendar year for which application is made and shall expire on December 31 of such year. Any journeyman plumber, master plumber, restricted journeyman plumber, or restricted master plumber who submits a renewal application after December 31 shall not work as a plumber until the person has submitted an application, fee, and penalty fee. Any licensed journeyman or master plumber who does not renew the license within two years is no longer eligible for renewal. The person must retake and pass the examination before a new license will be issued. Any licensed restricted journeyman or restricted master plumber who does not renew the license within 12 months will permanently forfeit the restricted license.

Subp. 2. **License renewals.** Applications for license renewal must be submitted to the commissioner on forms prepared by the commissioner no later than December 31 of the year preceding the year for which application is made. The application must be accompanied by the required fee. Journeyman and master plumbers who submit their license renewal applications after expiration of their license but within two years after expiration of the previously issued license must pay all past due renewal fees plus the required late fee. Restricted journeyman and restricted master plumbers who submit their license renewal applications after expiration of their license but within 12 months after expiration of the previously issued license must pay the past due renewal fee plus the required late fee.

4716.0050 REGISTRATION OF PLUMBER'S APPRENTICE.

Subpart 1. **Scope.** Subpart 2 shall not apply to registered plumber's apprentices under Minnesota Statutes, section 326B.47, subdivision 1, clause (1).

Subp. 2. **Registration requirements.** No person shall work as a plumber's apprentice until that person has submitted an application and fee for registration to the commissioner. Registration must be renewed annually and shall be for the period from July 1 of each year to June 30 of the following year. Applications for initial and renewal registration must be submitted to the commissioner before July 1 of each registration period on forms provided by the commissioner, and must be accompanied by the required fee. A plumber's apprentice who submits a registration application after July 1 in any year must pay the past due renewal fee plus the required late fee.

A. A plumber's apprentice must be at least 18 years of age or be a high school graduate, except that an apprentice employed and supervised by the apprentice's parent must be at least 16 years of age.

B. At the time of registration, an apprentice must provide a name, address, date of birth, Social Security number, and information about education and practical plumbing experience.

REPEALER. Minnesota Rules, parts 4715.3140; 4715.3150; 4715.3160; and 4715.3170, are repealed.