

1 Department of Administration

2

3 Adopted Permanent Rules Relating to the Minnesota State Building
4 Code

5

6 Rules as Adopted

7 4715.0100 DEFINITIONS.

8 [For text of subps 1 to 84, see M.R. 1989]

9 Subp. 84a. **Readily accessible.** "Readily accessible" means
10 capable of being reached safely and quickly for operation,
11 repair, or inspection without requiring those to whom ready
12 access is requisite to remove obstacles, panels, or similar
13 obstructions.

14 [For text of subps 85 to 128, see M.R. 1989]

15 4715.0200 BASIC PLUMBING PRINCIPLES.

16 This code is founded upon certain basic principles of
17 environmental sanitation and safety through properly designed,
18 acceptably installed and adequately maintained plumbing
19 systems. Some of the details of plumbing construction may vary
20 but the basic sanitary and safety principles desirable and
21 necessary to protect the health of the people are the same
22 everywhere. As interpretations may be required, and as
23 unforeseen situations arise which are not specifically covered
24 in this code, the twenty three principles which follow shall be
25 used to define the intent.

26 4715.0310 USE OF PUBLIC SEWER AND WATER SYSTEMS REQUIRED.

27 If a public sewer is accessible in a street or alley to a
28 building or premises and the connection is feasible, liquid
29 wastes from any plumbing system in that building must be
30 discharged into the public sewer unless otherwise prohibited by
31 this code or a local ordinance.

32 If a public water supply system is accessible, the water
33 distribution system must be connected to it unless otherwise
34 permitted by the administrative authority. A water well taken

1 out of service because a person is connecting to a public water
2 supply must either be maintained for a use such as irrigation,
3 or sealed and abandoned in accordance with the Minnesota Water
4 Well Construction Code. (Minnesota Rules, chapter 4725)

5 If either a public sewer or water supply system or both are
6 not available, an individual water supply or sewage disposal
7 system, or both, conforming to the published standards of the
8 administrative authority must be provided.

9 Every building must have its own independent connection
10 with a public or private sewer, except that a group of buildings
11 may be connected to one or more manholes which are constructed
12 on the premises, and connected to a public or private sewer.
13 These manholes must conform to the standards set by the local
14 sewer authority.

15 4715.0320 CONFORMANCE WITH CODE.

16 Subpart 1. **Scope.** As provided in Minnesota Statutes,
17 section 326.37, the Minnesota Plumbing Code applies to all new
18 plumbing installations, including additions, extensions,
19 alterations, and replacements connected to a water or sewage
20 disposal system owned or operated by or for a municipality,
21 institution, factory, office building, hotel, apartment
22 building, or other place of business regardless of location or
23 the population of the city or town in which it is located.

24 Subp. 2. **New buildings.** All plumbing materials and
25 plumbing systems or parts thereof must be installed to meet the
26 minimum provisions of this code.

27 Subp. 3. **Existing buildings.** In existing buildings or
28 premises in which plumbing installations are to be altered,
29 renovated, or replaced, the new materials and work must meet the
30 provisions of this code. If the administrative authority finds
31 that the full performance of bringing the work into compliance
32 with all requirements of this code would result in exceptional
33 or undue hardship by reason of excessive structural or
34 mechanical difficulty, or impracticability, a deviation may be
35 granted by the administrative authority only to the extent the

1 deviation can be granted without endangering the health and
2 safety of the occupants and the public.

3 4715.0420 STANDARDS FOR PLUMBING MATERIALS.

4 [For text of subps 1 and 2, see M.R. 1989]

5 Subp. 3. Standards for plumbing materials.

6	DESCRIPTION	ANSI	ASTM	FS	OTHER
7					
8	I. CAST IRON PIPE AND FITTINGS	A21.2			
9		A21.6	A-74	WW-P-401C	CS188
10					
11					
12	1A Cast Iron Pipe				
13	and Fittings	A21.8			
14	Extra Heavy				
15					
16	1B Cast Iron Pipe				
17	Centrifugally				
18	Cast Only and				
19	Fittings	A21.6	A-74	WW-P-401C	CS188
20	Service Weight	A21.8			
21					
22	1C Cast Iron				
23	Mechanical	A21.11			
24	(Gland Type)				
25	Pipe	A21.2		WW-P-421a	
26		A21.6			
27	1D Cast Iron				
28	Mechanical	A21.8			
29	(Gland Type)				
30	Pipe				
31	Cement Lined	A21.4			
32		A21.2			
33		A21.6			
34		A21.8			
35					
36	1E Cast Iron				
37	Short Body				
38	Water Service				
39	Fittings				
40	(2"-12")	A21.10			AWWA C100
41					
42	1F Cast Iron				
43	Threaded Pipe	A40.5			
44					
45	1G High Silicon				
46	Pipe, Fittings				
47	Cast Iron				
48					
49	1H Cast Iron				
50	Threaded				
51	Fittings	B16.4		WW-P-501	
52	Black and				
53	Galvanized				
54	125#				
55					
56	1J Cast Iron				
57	Drainage				
58	Fittings	B16.12		WW-P-491	
59	Black and				
60	Galvanized				
61					
62	1K Hubless Cast				
63	Iron Pipe and				
64	Fittings				
65	(Amended				

CISPI
Standard
301-69T

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8-31-72)
II. STEEL AND WROUGHT IRON PIPE FITTINGS

- 2A Steel Pipe,
Welded and
Seamless
Galvanized,
Schedule 40
and Above B36.1
B36.20 WW-P-406
6(1)
- 2B Wrought Iron
Pipe,
Galvanized B36.2
Schedule 40
and Above
- 2C Stainless
Steel Pipe B36.19
- 2D Galvanized
Malleable
Fittings B16.3 A197
150 psi and
Above
- 2E Steel Unions,
Galvanized WW-V-531 C

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

1	Alloy			OFT194-101A
2	194 Water,			
3	Tube, Type	B543-72		Navfac
4	"Heavy,"			TS-15400
5	Hard Temper			
6				
7	3H(b) Stainless			
8	Steel Water			
9	Tubing, Type			
10	SL, Copper			
11	Plated Coating			
12	(HWT-T439)	A-651		
13				
14	3J Seamless Copper			
15	Tube, Type M,			
16	Hard and Soft			
17	Temper	H23.1	B88	
18				
19	3J(a) Welded Copper			
20	Alloy 194 Water			OFT194-101A
21	Tube, Type			
22	"Standard,"			
23	Hard Temper	B543-72		Navfac
24				TS-15400
25	3J(b) Stainless			
26	Steel Water	A-268		
27	Tubing, Type			
28	SM, Copper			
29	Plated Coating			
30	(HWT-T439)	A-651		
31				
32	3K Seamless Copper			
33	Tube Type DWV	H23.3	B306	
34				
35	3L Copper Pipe			
36	I.P.S.	H26.1	B42	
37				
38	3M Copper Pipe,			
39	Threadless			
40	Type T P and			
41	Fittings	H26.2	B302	
42				
43	3N Cast Bronze			
44	and Wrought	B16.22		
45	Solder Joint			
46	Pressure			
47	Fitting	H23.1		
48		B16.18		
49				
50	3O Cast Bronze			
51	and Wrought			
52	Solder Joint			
53	D W V Fittings	B16.23		
54				
55	3P Copper Alloy			
56	Water Tube			
57	1/2 Inch and	B447		
58	3/4 Inch	B75		
59				
60	3Q Welded Brass		B587	
61	Water Tube			
62	1/2 Inch and			
63	3/4 Inch			
64				
65				
66	IV. LEAD PIPE AND FITTINGS			
67				
68	4A Lead Pipe AA		WW-P-325-44	
69				
70	4B Lead Pipe AAA		WW-P-325-44	
71				

1	4C	Lead Bends			
2		and Traps		WW-P-325-44	
3					
4	4D	Sheet Lead		QQ-L201d	
5					
6	V.	SILICA AND EARTH PRODUCTS PIPE AND FITTINGS,			
7		NONMETALLIC			
8					
9	5A	Asbestos-Cement	C500	SS-P351	
10		Pressure Pipe			
11		and Fitting	C296		
12					
13	5B	Asbestos-Cement			
14		Water Pipe and			
15		Fittings	C500	SS-P-351	AWWA C400
16					
17	5C	Asbestos-Cement			
18		Nonpressure			
19		Pipe and Fittings	C428	XX-P-331	
20					
21	5D	Asbestos-Cement			
22		Perforated Underdrain			
23		Pipe and Fittings	C508		
24					
25	5E	Vitrified Clay Pipe,			
26		Standard Strength	C13		
27		and Stronger Fittings	C200		
28					
29	5F	Unglazed Clay Pipe,			
30		Extra Strength and			
31		Fittings	C278		
32					
33	5G	Perforated Clay Pipe			
34		and Fittings	C211		
35					
36	5H	Borosilicate Glass			
37		Pipe and Fittings			
38		60 psi			
39					
40	5J	Nonreinforced			
41		Concrete Drain tile	C412		AASHO M178
42					
43	5K	Nonreinforced			
44		Concrete Pipe	C14	SS-P-371	AASHO M86
45					
46	5L	Perforated Concrete			
47		Pipe, Underdrainage	C444		
48					
49	5M	Reinforced Concrete			
50		Pipe	C76	SS-P-375	
51					
52	5N	Reinforced and			
53		Prestressed Concrete			
54		Pipe, Pressure Type			
55		and Fittings			
56					
57	5O	Bituminized Fiber			
58		Drain and Sewer Pipe	D1860	SS-P-1540A	(Amended
59					8-31-72)
60					
61	5P	Perforated Bituminized			
62		Fiber Pipe for General			
63		Drainage	D2311	SS-P-1540A	(Amended
64					8-31-72)
65					
66	VI.	PLASTIC PIPE AND FITTINGS			
67					
68		DRAIN, WASTE AND VENT			
69					
70		6A to 6E [Unchanged.]			

1	6F	Polyvinyl				
2		Chloride (PVC)	B72.2	D2241	L-P-1036	NSF14
3				D1785	FHA UM-41	CS256
4						
5	6G	Polybutylene		D2662		NSF14
6				D2666		
7						
8		SPECIAL WASTES (Amended 12-26-72)				
9						
10	6H	Polyethylene		D2239	LP 315a	PS10-69
11						PS11-69
12						PS12-69
13						
14	6J	Polypropylene		D2146		
15		(Type II 24308)				
16		WATER DISTRIBUTION - Polybutylene (PB) systems (PB tubing				
17		together with recommended fittings) and chlorinated polyvinyl				
18		chloride (cpvc) pipe together with fittings must be tested by				
19		the manufacturer at 150 psi and 210 degrees Fahrenheit for a				
20		period of not less than 48 hours by an independent testing				
21		laboratory acceptable to the administrative authority.				
22	6K	Polybutylene		D3309		
23						
24	6L	Chlorinated	119.1,	D2846		NSF14
25		polyvinyl	119.2			FHA
26		chloride (CPVC)				Bulletin
27						#76
28						
29		GENERAL DRAINAGE	ASTM	<u>ASTM</u>		
30						
31	6M	Polyethylene		F405		
32		(corrugated)				

33 4715.0500 WATER SUPPLY SYSTEMS.

34 When selecting the material and size for water service
 35 pipe, tubing, or fittings, due consideration shall be given to
 36 the action of the water on the interior of the pipe and of the
 37 soil, fill, or other material on the exterior of the pipe.

38 Pipe and fitting materials for water service and
 39 distribution must be of a type specifically permitted by parts
 40 4715.0510 and 4715.0520, and must be verified to contain no more
 41 than eight percent lead.

42 4715.0520 WATER DISTRIBUTION PIPE.

43 The following materials may be used for water distribution
 44 pipe:

45 [For text of items A to E, see M.R. 1989]

46 F. Copper tube 3H, 194 water tube 3H(a), or stainless
 47 water tubing 3H(b) with 3N fittings except that this material
 48 may not be buried under or embedded in a concrete slab.

1 [For text of items G to I, see M.R. 1989]

2 J. Plastic tubing 6K with fittings. Installation
3 must be in accordance with International Association of Plumbing
4 and Mechanical Officials (IAPMO) Installation Standard 22-84.

5 K. Plastic pipe 6L and corresponding fittings.
6 Installation must be in accordance with International
7 Association of Plumbing and Mechanical Officials (IAPMO)
8 Installation Standards 20-84.

9 4715.0580 SOIL AND WASTE PIPING ABOVE GROUND.

10 For soil and waste piping, except special wastes, above
11 ground, the following materials may be used:

12 [For text of items A to C, see M.R. 1989]

13 D. Copper 3F, 3H, 3J (hard temper only), and 3K with
14 30 fittings except these materials shall not be used to receive
15 the wastes from urinals nor wastes from water closets in
16 battery. These materials are not recommended for use in
17 buildings served by septic tank sewage disposal systems.

18 [For text of items E and F, see M.R. 1989]

19 4715.0620 SUBSOIL DRAINS.

20 All materials listed in part 4715.0570 plus asbestos cement
21 5D, clay 5G, cement 5J, and cement 5L, perforated bituminized
22 fiber pipe for general drainage 5P, and plastic 6A, 6B, 6C, and
23 6M.

24 4715.0800 MECHANICAL JOINTS.

25 [For text of subps 1 to 4, see M.R. 1989]

26 Subp. 5. **Mechanical pipe couplings and fittings.**

27 Couplings must be made with the housing fabricated in two or
28 more parts of malleable iron castings in accordance with Federal
29 Specification QQ-I-666c, Grand 11, or with ASTM A47 or ASTM
30 A339. The coupling gasket must be molded synthetic rubber, per
31 ASTM D-735-61, Grade No. R615BZ. Coupling bolts must be oval
32 neck track head type with hexagonal heavy nuts, per
33 ASTM-A-183-60, or ASTM A325.

34 Pipe fittings used with these pipe couplings must be

1 fabricated or malleable iron castings in accordance with Federal
2 Specifications QQ-I-666c, Grade 11, or with ASTM A47; ductile
3 iron ASTM A339; segweld steel ASTM53 or A106.

4 These couplings and fittings may be used above ground, for
5 storm drains and leaders, and for water distribution
6 pipe provided exposed parts in contact with water are
7 galvanized, and may be used below ground for water distribution
8 if couplings and fittings are galvanized and the exposed grooves
9 are coal tar enamel coated and wrapped.

10 All grooving of galvanized pipe must be by the cut groove
11 method.

12 Subp. 6. **Extracted mechanical joint.** An extracted
13 mechanical joint in copper water distribution pipe must be made
14 by drilling through copper pipe and on retraction must extract a
15 cup shaped extruded collar. The height of the collar must be at
16 least three times the thickness of the copper tube wall and the
17 radius of the extruded collar must be the same thickness as the
18 copper tube wall from which it is being extruded. The joining
19 branch tube must be contour-notched and a retaining dimple must
20 be made before insertion into the extracted collar or another
21 acceptable method must be used to provide proper insertion
22 depth. The joint must be brazed with a brazing material meeting
23 the requirements of part 4715.0820. The joint may be used above
24 ground only.

25 Subp. 6a. **Field formed coupling for copper tubing.** A
26 field formed coupling in copper water distribution pipe must be
27 made by first annealing the area of the tubing where expansion
28 is desired, and then using a hand tube expander to expand the
29 tube end to accept tubing of the same type and size. Joint
30 clearances must be from .001 to .005 inches, and suitable for
31 the brazing filler metal used. The depth of the expanded area
32 must be as recommended by the tube expander manufacturer, but in
33 all cases must be at least four times the wall thickness of the
34 tubing. All joints must be brazed in accordance with the
35 requirements of part 4715.0820. The couplings must be used
36 above ground only.

1 [For text of subp 7, see M.R. 1989]

2 4715.0805 PUSH-ON JOINTS.

3 Push-on joints may be used in cast iron and ductile iron
4 water service pipe located underground outside the building, and
5 must comply with ANSI-A21.11-85.

6 4715.0810 PLASTIC JOINTS.

7 Subpart 1. Joint methods. Every joint in plastic piping
8 must be made with approved fittings using solvent welded
9 connections, fusion welded connections, insert fittings with
10 metal clamps and screws of corrosion-resistant material or
11 approved crimp rings, threaded joints according to accepted
12 standards, or special IAPMO listed fittings of other types.
13 Large diameter water service pipe may have approved
14 elastomeric-gasket push-on type joints. All solvent materials
15 must meet approved recognized standards. Expansion and
16 contraction joint materials and dimensions must conform to ASTM
17 D 2661 or ASTM D 2665 and shall be of an approved type.

18 Subp. 2. Primer. Solvent weld joints in PVC and CPVC pipe
19 must include use of a primer of contrasting color to the pipe
20 and cement. Primers must comply with the National Sanitation
21 Foundation (NSF) Standard Number 14. A mechanical method of
22 preparing PVC or CPVC pipe for solvent cement is not acceptable
23 in lieu of using a primer.

24 4715.0820 SOLDERED OR BRAZED JOINTS.

25 Joints with copper tube with solder joint fittings must be
26 soldered or brazed. Copper tubing must be reamed out to the
27 full interior tubing dimension before soldered or brazed joints
28 are made. Surfaces to be soldered or brazed must be thoroughly
29 cleaned. Joints to be soldered must be properly fluxed with
30 noncorrosive paste type flux. Solder and flux used in potable
31 water systems must not contain more than 0.2 percent lead.
32 Solder used for joints must have a nominal composition of 50
33 percent tin and 50 percent lead, 95 percent tin and five percent
34 antimony, or 96 percent tin and four percent silver, conforming

1 to ASTM Standard Specification for soft solder metal B32-76,
 2 except that 50 percent tin and 50 percent lead solder must not
 3 be used in potable water systems. Alternative solders may be
 4 used ~~only if shown-to-be-suitable-by-a-recognized-testing~~
 5 ~~laboratory-or-listing-agency-acceptable-to-the-administrative~~
 6 ~~authority,-and-the-material-is~~ specifically approved by the
 7 administrative authority after review of testing laboratory or
 8 listing agency documentation. Brazing must be done
 9 using ~~methods-and~~ a brazing filler metal ~~suitable-for-the~~
 10 ~~application-and-in-accordance-with-industry-standards~~ which is
 11 manufactured for the particular application, and using methods
 12 specified by the filler metal manufacturer.

13 4715.0860 SPECIAL JOINTS.

14 [For text of subps 1 to 5, see M.R. 1989]

15 Subp. 6. Transition couplings. A transition coupling is
 16 one which is to be used when pipes made of different materials
 17 are to be joined. A transition coupling may be made of
 18 elastomeric materials (ASTM C 425 and ASTM C 564) and 300 series
 19 stainless steel bands and bolts, except that an exterior
 20 corrosion-resistant shield to prevent outward expansion of the
 21 coupling must be included on above-ground installations. Any
 22 transition coupling joining plastic to plastic, copper to
 23 copper, or galvanized to galvanized, must be approved by the
 24 administrative authority.

25 [For text of subp 7, see M.R. 1989]

26 4715.1220 INSTALLATION OF FIXTURES.

27 Subpart 1. Fixtures. Fixtures must be set level and in
 28 proper alignment with reference to adjacent walls. No water
 29 closet may be set closer than 15 inches from its center to any
 30 side wall or partition nor closer than 30 inches, center to
 31 center, between toilets. At least a 24-inch clearance must be
 32 provided in front of water closets.

33 No urinal may be set closer than 15 inches from the center
 34 to any side wall or partition, nor closer than 24 inches, center
 35 to center, between urinals.

1 Wall-hung water closet bowls must be rigidly supported by a
2 concealed metal hanger which is attached to the building
3 structural members so that no strain is transmitted to the
4 closet connector or any other part of the plumbing system.

5 Plumbing fixtures must be so installed as to afford easy
6 access for cleaning both the fixture and the area about it.
7 Where practical, all pipes from fixtures must be run to the
8 nearest wall.

9 [For text of subps 2 and 3, see M.R. 1989]

10 4715.1240 BATHTUBS.

11 Subpart 1. **Outlets.** Bathtubs must have waste outlets and
12 overflows at least one and one-half inches in diameter. The
13 waste control device must be located at the tub outlet.

14 Subp. 2. **Whirlpool bathtubs.** Whirlpool bathtubs and their
15 installation must comply with International Association of
16 Plumbing and Mechanical Officials (IAPMO) standard PS 32-84.

17 4715.1260 DRINKING FOUNTAINS.

18 Drinking fountains must be constructed of impervious
19 nonoxidizing material and must be so designed that they may be
20 easily cleaned. The water should be carried to the fixture in
21 an independent pipe, and no part of the fixture must be used in
22 conveying water to the jet. The design of the fixture must be
23 such that no part of the supply pipe can be submerged in the
24 fixture, or in the waste pipe from the fixture. The jet must be
25 slanting and the orifice of the jet must be protected in such a
26 manner that it cannot be contaminated by droppings from the
27 mouth or by splashing from the basin. The orifice of the jet
28 must be at least one-half inch above the rim of the basin. All
29 fountains should be so designed that their proper use is
30 self-evident.

31 Installation of a combined cold water faucet and drinking
32 fountain bubbler is prohibited for public use. If a drinking
33 fountain bubbler is provided at a public use sink, it must have
34 at least an 18-inch separation from any other faucet spout.

1 4715.1300 FLOOR DRAINS.

2 [For text of subps 1 to 4, see M.R. 1989]

3 Subp. 5. **Enclosed garages.** A floor drain in an enclosed
4 garage must discharge to the sanitary sewer if a municipal
5 sanitary sewer is available. Oil and flammable liquid
6 separators must be provided if required by part 4715.1120 or the
7 state building code.

8 4715.1305 ELEVATOR PIT DRAIN.

9 An elevator pit drain must discharge to the sanitary sewer
10 using an indirect connection that precludes the possibility of
11 sewage backup into the pit. If a sump is used, it must be
12 outside the pit with a dry pan drain flowing to it.

13 4715.1380 SHOWERS.

14 [For text of subps 1 to 4, see M.R. 1989]

15 Subp. 5. **Anti-scald devices.** A shower or combination
16 shower-bath in a new or remodeled installation must be equipped
17 with an anti-scald type shower control valve. The valve must be
18 of the thermostatic or pressure-balancing type in accordance
19 with ANSI/ASSE standard 1016-79.

20 The temperature of mixed water to multiple showers must be
21 controlled by a master anti-scald type thermostatic blender, or
22 the showers must be individually equipped with approved
23 anti-scald type shower control valves.

24 4715.1440 PROTECTION OF PLASTIC PIPE.

25 All plastic and copper pipe and tubing passing through
26 studs or plates that are within one and one-fourth inches of the
27 outside of the stud or plate must be protected by the provision
28 of steel plates, at least 1/16 inch thick, attached to the
29 outside of the stud or plate.

30 4715.1590 RECEPTORS OR SUMPS.

31 [For text of subps 1 to 3, see M.R. 1989]

32 Subp. 4. **Stand pipe receptors.** The stand pipe receptor
33 for an automatic clothes washer shall be individually trapped
34 and vented, except that multiple clothes washers in the same

1 room may be discharged to multiple standpipes that are
2 manifolded together and use a single trap. The stand pipe shall
3 extend not more than 30 inches, nor less than 18 inches above
4 its trap, and the trap shall be installed at least six inches
5 above the floor.

6 [For text of subp 5, see M.R. 1989]

7 4715.1930 TOXIC MATERIALS AND USED PIPE.

8 Piping conveying potable water shall be constructed of
9 nontoxic material.

10 No material or substances that could produce either toxic
11 conditions, taste, odor, or discoloration in a potable water
12 system shall be introduced into or used in such systems.

13 The interior surface of a potable water tank shall not be
14 lined, painted, or repaired with any material which will affect
15 either the taste, odor, color, or potability of the water supply
16 when the tank is placed in or returned to service.

17 Piping which has been used for any other purpose than
18 conveying potable water shall not be used for conveying potable
19 water.

20 4715.1940 POTABLE WATER CONNECTIONS TO HEATING OR COOLING
21 SYSTEMS.

22 Potable water connections to boiler feed water systems,
23 cooling systems, or other liquid systems, in which water
24 conditioning chemicals may be introduced shall be made through
25 an air gap or provided with an approved backflow preventer
26 located in the potable water line before the point where such
27 chemicals may be introduced. Where a system is filled with an
28 antifreeze or toxic solution a permanent tag will be placed in
29 plain view stating "Caution, this system contains
30 antifreeze/toxic solution."

31 4715.1941 HEAT EXCHANGERS.

32 [For text of subps 1 and 2, see M.R. 1989]

33 Subp. 3. Single-wall heat exchanger. A single-wall heat
34 exchanger may be used if it satisfies all of the following

1 conditions:

2 [For text of item A, see M.R. 1989]

3 B. Except where steam is used as the heat transfer
4 medium, the pressure of the heat transfer medium must be less
5 than the normal minimum operating pressure of the potable water
6 system, and the system must be fitted with devices arranged to
7 function automatically to maintain the pressure of the heat
8 transfer medium entering the exchanger at a level below that of
9 the potable water leaving the exchanger.

10 C. The equipment is permanently labeled to specify
11 all constituents of the heat transfer medium, to indicate that
12 only additives recognized as safe by the United States Food and
13 Drug Administration may be used, and to show the hazards and
14 reasons for not using another type of medium.

15 4715.2020 DEVICES FOR THE PROTECTION OF THE POTABLE WATER SUPPLY.

16 Approved devices to protect against backflow and
17 back-siphonage must be installed at any plumbing fixture or
18 equipment where backflow or back-siphonage may occur and where a
19 minimum air gap cannot be provided between the water outlet to
20 the fixture or equipment and its flood level rim.

21 4715.2100 BACKFLOW PREVENTERS.

22 A. Atmospheric vacuum breaker (AVB):

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

25 (2) no possibility of back pressure permitted;

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

28 (4) no more than eight hours of continuous line
29 pressure permitted.

30 B. Pressure vacuum breaker (PVB):

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

33 (2) no possibility of back pressure permitted;

34 and

35 (3) continuous line pressure permitted.

- 1 C. Hose connection vacuum breaker (Hose VB):
- 2 (1) required for threaded hose connections;
- 3 (2) back pressure not permitted; and
- 4 (3) continuous line pressure not permitted.
- 5 D. Double-check valve with intermediate atmospheric
- 6 vent (DCVIAV):
- 7 (1) permitted for low or moderate hazard with
- 8 small pipe sizes;
- 9 (2) back pressure permitted; and
- 10 (3) continuous line pressure permitted.
- 11 E. Reduced pressure zone backflow preventer (RPZ):
- 12 (1) any degree of hazard permitted;
- 13 (2) back pressure permitted; and
- 14 (3) continuous line pressure permitted.
- 15 F. Double-check valve assembly (DCVA):
- 16 (1) permitted only for nontoxic, low hazard
- 17 installations with nuisance or aesthetic concern;
- 18 (2) back pressure permitted; and
- 19 (3) continuous line pressure permitted.

20 4715.2110 TYPES OF DEVICES REQUIRED WHERE AN AIR GAP CANNOT BE
 21 PROVIDED. 1.

22 Only allowed
 23 where no
 24 back pressure
 25 is possible

		DCV		Hose			
		RPZ	IAV	DCVA	PVB	AVB	VB
28	<u>A.</u> Boiler, commercial		X				
29	<u>B.</u> Boiler, residential (R-3 occupancy)	X	X				
30	<u>C.</u> Car wash		X		X	X	
31	<u>D.</u> Carbonated beverage machine		X				
32	(postmix) (see part 4715.2163)						
33	<u>E.</u> Chemical line		X				
34	<u>F.</u> Chemical tank		X		X	X	

1	<u>G.</u> Chiller	X				
2	<u>H.</u> Cooling tower	X	X		X	X
3	<u>I.</u> Dental units	X	X		X	X
4	<u>J.</u> Dishwasher, commercial				X	X
5	<u>K.</u> Fire sprinkler system <u>2.</u>	X	X	X		
6	<u>L.</u> Flush tank (water closet, urinal,	X			X	X
7	similar) (see part 4715.2150)					
8	<u>M.</u> Flush valve (water closet, urinal, X				X	X
9	similar) (see part 4715.2150)					
10	<u>N.</u> Food and beverage equipment or	X	X	X	X	X
11	system					
12	<u>O.</u> Garbage can washer	X			X	X
13	<u>P.</u> Glycol or other antifreeze system	X				
14	<u>Q.</u> Lab equipment	X			X	X
15	<u>R.</u> Lab faucet					X
16	<u>S.</u> Laundry machine, commercial	X	X		X	X
17	<u>T.</u> Lawn, garden or greenhouse	X			X	X
18	sprinkler system					
19	<u>U.</u> Operating, dissection, embalming	X			X	X
20	or mortuary table (see part 4715.1950)					
21	<u>V.</u> Private potable water supply	X	X	X		
22	(where permitted by administrative					
23	authority)					
24	<u>W.</u> Private nonpotable water supply	X				
25	(w-p-b-a-a-) (where permitted					
26	by administrative authority)					
27	<u>X.</u> Process line	X	X			
28	<u>Y.</u> Process tank	X			X	X
29	<u>Z.</u> RV dump station	X	X		X	X
30	<u>AA.</u> Sewage treatment	X			X	X
31	<u>BB.</u> Soap dispenser	X	X		X	X
32	<u>CC.</u> Swimming pool, fountain, pond,	X	X		X	X
33	baptistry, aquarium or similar					
34	<u>DD.</u> Threaded hose connections, including:					X
35	including: hose bibbs, hydrants, service					
36	sinks, laundry trays					

1	<u>EE.</u> Truck fill	X	X	X
2	<u>FF.</u> Vacuum systems or aspirators	X	X	X

3

4 1. For installations not listed above, review with the
5 Administrative Authority.

6 2. Installations must comply with AWWA-M14, section 6.3,
7 1966.

8 4715.2120 LOCATION OF BACKFLOW PREVENTERS.

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

14 The access area must provide enough space for testing and
15 maintenance of the device. A backflow preventer must not be
16 installed in a pit or other confined area subject to recurrent
17 flooding. When a conductor pipe is provided from a backflow
18 preventer drain, a visible air gap must be provided at the
19 device.

20 4715.2163 CARBONATED BEVERAGE MACHINES.

21 Postmix type carbonated beverage machines must have an
22 approved double-check valve with an intermediate atmospheric
23 vent type backflow preventer in the water line preceding the
24 carbonator. There must be no copper tubing in the system down
25 line of the backflow preventer.

26 4715.2190 COMBINATION WATER AND SPACE HEATING EQUIPMENT.

27 Equipment used for heating domestic or service hot water
28 and for space heating must be installed with a mixing valve to
29 permit the user to control the temperature of the domestic or
30 service hot water regardless of the space heating demand.

31 The installation must include a drainage port and isolation
32 valve to permit the user to purge the heating coils to waste
33 after the nonheating season, or the system must be designed to
34 automatically prevent stagnation.

1 The water heater must be specifically approved designated
2 by the manufacturer for use as a combination hot water and space
3 heater.

4 All pipes, joints, and appurtenances in the system must be
5 of a type approved for potable water distribution. This
6 provision is not intended to address the wall thickness of
7 heating coils, which must be the responsibility of the
8 manufacturer.

9 4715.2230 TANKLESS AND INSTANTANEOUS TYPE HEATERS.

10 Tankless and instantaneous type water heaters require
11 pressure relief valves only. Instantaneous electric water
12 heaters that have Underwriters Laboratory approval for use
13 without a relief valve, and that have space containing the
14 heating element of less than three inches in diameter, may be
15 installed without a pressure relief valve.

16 4715.2260 INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTERS.

17 Subpart 1. **Notification of installation.** The
18 administrative authority must be notified before installation of
19 a reduced pressure backflow preventer.

20 Subp. 2. **Testing and maintenance.** The installation of
21 reduced pressure backflow preventers shall be permitted only
22 when a periodic testing and inspection program conducted by
23 qualified personnel will be provided by an agency acceptable to
24 the administrative authority. Inspection intervals shall not
25 exceed one year, and overhaul intervals shall not exceed five
26 years. They shall be inspected frequently after initial
27 installation to assure that they have been properly installed
28 and that debris resulting from the piping installation has not
29 interfered with the functioning of the device.

30 Subp. 3. **Inspection and records.** A test and inspection
31 tag must be affixed to the device. The tester shall date and
32 sign the tag and include the tester's backflow preventer tester
33 identification number. Written records of testing and
34 maintenance must be maintained and submitted to the
35 administrative authority.

1 4715.2440 DESIGN OF SUMPS.

2 [For text of subps 1 to 3, see M.R. 1989]

3 Subp. 4. Covers. Sumps and receiving tanks must be
4 provided with gastight metal covers, except that float control
5 or switch rods must operate without binding. The cover must be
6 of a bolt and gasket type or equivalent manhole opening to
7 permit access for inspection, repairs, and cleaning. Covers
8 must be metal or other structurally-sound material that is
9 water-resistant and impervious to moisture, and must be adequate
10 to support anticipated loads in the area of use.

11 [For text of subps 5 to 7, see M.R. 1989]

12

13 REVISOR'S INSTRUCTION. In the next and subsequent editions
14 of Minnesota Rules, the revisor of statutes shall give the parts
15 listed in Column A the new numbers listed in Column B and
16 correct all cross-references to the renumbered parts.

17 Column A	Column B
18 4715.0210, first paragraph	4715.0200, item A
19 4715.0210, second paragraph	4715.0200, item B
20 4715.0210, third paragraph	4715.0200, item C
21 4715.0210, fourth paragraph	4715.0200, item D
22 4715.0220, first paragraph	4715.0200, item E
23 4715.0220, second paragraph	4715.0200, item F
24 4715.0220, third paragraph	4715.0200, item G
25 4715.0220, fourth paragraph	4715.0200, item H
26 4715.0220, fifth paragraph	4715.0200, item I
27 4715.0220, sixth paragraph	4715.0200, item J
28 4715.0230, first paragraph	4715.0200, item K
29 4715.0230, second paragraph	4715.0200, item L
30 4715.0230, third paragraph	4715.0200, item M
31 4715.0230, fourth paragraph	4715.0200, item N
32 4715.0240, first paragraph	4715.0200, item O
33 4715.0240, second paragraph	4715.0200, item P
34 4715.0240, third paragraph	4715.0200, item Q
35 4715.0240, fourth paragraph	4715.0200, item R
36 4715.0240, fifth paragraph	4715.0200, item S
37 4715.0250, first paragraph	4715.0200, item T
38 4715.0250, second paragraph	4715.0200, item U
39 4715.0260	4715.0200, item V
40 4715.0270	4715.0200, item W
41 4715.1930	4715.1911
42 4715.1970	4715.1912
43 4715.2260	4715.2161
44 4715.2270	4715.2162

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47 REPEALER. Minnesota Rules, parts 4715.2130; 4715.2140;
48 4715.3900; and 4715.4000, are repealed.