BC Plumbing Code
Instruction Sheet/Checklist

VERSION 1.02

Remove the pages listed in the second column and replace them with the pages listed in the third column.
This update includes all revisions from Revision 7 effective December 19, 2014.

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Part 1
Compliance

Section 1.1. General

1.1.1. Application of this Code

1.1.1.1. Application of this Code

1) This Code applies to the design, installation, extension, alteration, renewal or repair of *plumbing systems* <in and for buildings in the circumstances described in Section 1.1. of Division A of Book I (General) of this Code>.

2) This Code specifies the minimum requirements for

a) *drainage systems* for water-borne wastes and *storm water* for *buildings* to the point of connection with public services,

b) *venting systems*,

c) *water service pipes*, and

d) *water distribution systems.*

3) Plumbing facilities in *buildings* shall be provided in accordance with Part 7 of Division B of Book I (General) of this Code.

1.1.2. <Internal References to this Code

1.1.2.1. Book II (Plumbing Systems) of the Code

1) This is the second of two Books, Book I (General) and Book II (Plumbing Systems), that together form the British Columbia Building Code.

1.1.2.2. Internal References to the Code

1) Unless a Book is specified, references to "the British Columbia Building Code," "the Code," "this Code" and the like shall be read as references to the Book in which they appear.

1.1.3. Appendices and Annotations

1.1.3.1. Appendices and References to Appendices have No Legal Effect

1) The appendices to this Code have no legal effect.

1.1.3.2. Angle Brackets have No Legal Effect

1) This Code does not include angle brackets.

2) Any angle brackets inserted into the published version of this Code have no legal effect.>

Section 1.2. Compliance

1.2.1. Compliance with this Code

1.2.1.1. Compliance with this Code

1) Compliance with this Code shall be achieved by

a) complying with the applicable acceptable solutions in Division B (see Appendix A), or

b) <using alternative solutions, accepted by the *authority having jurisdiction* under Section 2.3. of Division C, that will achieve at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the applicable acceptable solutions (see Appendix A).>

2) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b), the objectives and functional statements attributed to the acceptable solutions in Division B shall be the objectives and functional statements referred to in Subsection 1.1.2. of Division B.

3) <Despite Clause 1.2.1.1.(1)(b), an alternative solution shall not be used in place of an acceptable solution if the acceptable solution expressly requires conformance to a provincial enactment other than Book I (General) or Book II (Plumbing Systems) of the British Columbia Building Code.>

1.2.1.2. **<Responsibility of Owner**

1) Unless otherwise specified in this Code, the owner of a *building* shall be the person responsible for carrying out the provisions of this Code in relation to *plumbing systems* for that *building*.

2) The owner of a *building* is in no way relieved of full responsibility for complying with this Code by the *authority having jurisdiction*

a) granting the building permit,

b) approving drawings or specifications, or

c) carrying out inspections.>

1.2.2. Materials, Systems and Equipment

1.2.2.1. **Characteristics of Materials, Systems and Equipment**

1) All materials, systems and equipment installed to meet the requirements of this Code shall be free of defects and possess the necessary characteristics to perform their intended functions when installed.

1.2.2.2. **Used Materials and Equipment**

1) Used materials and equipment, including *fixtures*, shall not be reused unless they meet the requirements of this Code for new materials and equipment and are otherwise satisfactory for their intended use.

1.2.3. <Installation

1.2.3.1. **Personnel Performing Plumbing Work**

1) Personnel performing the installation, extension, alteration, renewal or repair of a *plumbing system* shall

a) possess a <Canadian> tradesman's qualification certification as a plumber,

b) be an indentured apprentice supervised by a journeyman who meets the criteria set out in Clause (a), or

c) be the registered owner and occupant or intended occupant of the single family dwelling in which the plumbing work will occur.>

Section 1.3. Divisions A, B and C of this Code

1.3.1. General

1.3.1.1. **Scope of Division A**

1) Division A contains the compliance and application provisions, objectives and functional statements of this Code.

1.3.1.2. **Scope of Division B**

1) Division B contains the acceptable solutions of this Code.

1.3.1.3. **Scope of Division C**

1) Division C contains the administrative provisions of this Code.

1.3.1.4. **Internal Cross-references**

1) Where the Division of a referenced provision is not specified in this Code, it shall mean that the referenced provision is in the same Division as the referencing provision.

1.3.2. Application of Division A

1.3.2.1. **Application of Parts 1, 2 and 3**

1) Parts 1, 2 and 3 of Division A apply to all *plumbing systems* covered in this Code. (See Article 1.1.1.1.)

1.3.3. Application of Division B

1.3.3.1. **Application of Parts 1 and 2**

1) Parts 1 and 2 of Division B apply to all *plumbing systems* covered in this Code. (See Article 1.1.1.1.)

Part 1
General

Part 1
General

Section 1.1. General

1.1.1. Application

1.1.1.1. Application

1) This Part applies to all *plumbing systems* covered in this Code. (See Article 1.1.1.1. of Division A.)

1.1.2. Objectives and Functional Statements

1.1.2.1. Attribution to Acceptable Solutions

1) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b) of Division A, the objectives and functional statements attributed to the acceptable solutions in Division B shall be the objectives and functional statements identified in Section 2.8. (See Appendix A.)

Section 1.2. Terms and Abbreviations

1.2.1. Definitions of Words and Phrases

1.2.1.1. Non-defined Terms

1) Words and phrases used in Division B that are not included in the list of definitions in Article 1.4.1.2. of Division A shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

2) Where objectives and functional statements are referred to in Division B, they shall be the objectives and functional statements described in Parts 2 and 3 of Division A.

3) Where acceptable solutions are referred to in Division B, they shall be the provisions stated in Part 2.

1.2.1.2. Defined Terms

1) The words and terms in italics in Division B shall have the meanings assigned to them in Article 1.4.1.2. of Division A.

1.2.2. Symbols and Other Abbreviations

1.2.2.1. Symbols and Other Abbreviations

1) The symbols and other abbreviations in Division B shall have the meanings assigned to them in Article 1.4.2.1. of Division A and Article 1.3.2.1.

Section 1.3. Referenced Documents and Organizations

1.3.1. Referenced Documents

1.3.1.1. Effective Date

1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions, reaffirmations, reapprovals, addenda and supplements effective to 30 September 2009.

1.3.1.2. Applicable Editions

1) Where documents are referenced in this Code, they shall be the editions designated in Table 1.3.1.2. (See Appendix A.)

Table 1.3.1.2.
Documents Referenced in <Book II (Plumbing Systems) of the British Columbia Building Code 2012>
Forming part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
ANSI/CSA	ANSI Z21.22-1999/ CSA 4.4-M99 <(including Addenda 1 and 2)>	Relief Valves for Hot Water Supply Systems	2.2.10.11.(1)
<ASME/CSA	ASME A112.18.1-2012/ CAN/CSA-B125.1-12	Plumbing Supply Fittings	2.2.10.6.(1) 2.2.10.7.(1)>
<ASME/CSA	ASME A112.18.2-2011/ CAN/CSA-B125.2-11	Plumbing Waste Fittings	2.2.3.3.(1) 2.2.10.6.(2)>
<ASME/CSA>	<ASME A112.19.1-08/ CSA B45.2-08>	<Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures>	<2.2.2.2.(3)> <2.2.2.2.(4)>
<ASME/CSA>	<ASME A112.19.2-08/ CSA B45.1-08>	<Ceramic Plumbing Fixtures>	<2.2.2.2.(2)>
<ASME/CSA>	<ASME A112.19.3-08/ CSA B45.4-08>	<Stainless Steel Plumbing Fixtures>	<2.2.2.2.(5)>
<ASME/CSA	ASME A112.19.7-2012/CSA B45.10-12	Hydromassage Bathtub Systems	2.2.2.2.(7)>
<ASME	B16.3-2011	Malleable Iron Threaded Fittings, Classes 150 and 300	2.2.6.6.(1)>
<ASME	B16.4-2011	Gray Iron Threaded Fittings, Classes 125 and 250	2.2.6.5.(1)>
<ASME	B16.12-2009	Cast Iron Threaded Drainage Fittings	2.2.6.3.(1)>
<ASME	B16.15-2011	Cast Copper Alloy Threaded Fittings: Classes 125 and 250	2.2.7.3.(1)>
<ASME	B16.18-2012	Cast Copper Alloy Solder-Joint Pressure Fittings	2.2.7.6.(1) 2.2.7.6.(2)>
ASME	B16.22-2001	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings	2.2.7.6.(1)
<ASME	B16.23-2011	Cast Copper Alloy Solder Joint Drainage Fittings: DWV	2.2.7.5.(1)>
<ASME	B16.24-2011	Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500, and 2500	2.2.7.2.(1)>
<ASME	B16.26-2011	Cast Copper Alloy Fittings for Flared Copper Tubes	2.2.7.7.(1) 2.2.7.7.(2)>
ASME	B16.29-<2007>	Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings – DWV	2.2.7.5.(1)
ASSE	<ANSI/ASSE> 1010-2004	Water Hammer Arresters	2.2.10.15.(1)
<ASSE	1051-2009G	Individual and Branch Type Air Admittance Valves (AAVs) for Sanitary Drainage Systems	2.2.10.16.(1)>
<ASTM	A 53/A 53M-10	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	2.2.6.7.(4)>
ASTM	A 518/A 518M-99	Corrosion-Resistant High-Silicon Iron Castings	2.2.8.1.(1)
ASTM	B 32-<08>	Solder Metal	2.2.9.2.(1)
<ASTM	B 42-10	Seamless Copper Pipe, Standard Sizes	2.2.7.1.(1)>

Table 1.3.1.2.
Documents Referenced in <Book II (Plumbing Systems) of the British Columbia Building Code 2012>
Forming part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
<ASTM	B 43-09	Seamless Red Brass Pipe, Standard Sizes	2.2.7.1.(2)>
<ASTM	B 88-09	Seamless Copper Water Tube	2.2.7.4.(1)>
<ASTM	B 306-09	Copper Drainage Tube (DWV)	2.2.7.4.(1)>
<ASTM	B 813-10	Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	2.2.9.2.(3)>
ASTM	B 828-02	Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings	2.3.2.4.(1)
ASTM	C 1053-00	Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications	2.2.8.1.(1)
ASTM	D 2466-<06>	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	2.2.5.8.(2)
ASTM	D 2467-<06>	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	2.2.5.8.(2)
<ASTM	D 3261-10a	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	2.2.5.5.(3)>
ASTM	F 628-<08>	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core	2.2.5.10.(1) 2.2.5.12.(1)
<ASTM	F 714-10	Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter	2.2.5.6.(1)>
<AWS	ANSI/AWS A5.8:2011	Specification for Filler Metals for Brazing and Braze Welding	2.2.9.2.(4)>
<AWWA>	<ANSI/AWWA C104/A21.4-08>	<Cement-Mortar Lining for Ductile-Iron Pipe and Fittings>	<2.2.6.4.(2)>
<AWWA	ANSI/AWWA C110/A21.10-12	Ductile-Iron and Gray-Iron Fittings	2.2.6.4.(3)>
<AWWA>	<C111/A21.11-2007>	<Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings>	<2.2.6.4.(4)>
<AWWA	ANSI/AWWA C151/A21.51-09	Ductile-Iron Pipe, Centrifugally Cast, for Water	2.2.6.4.(1)>
<BC>		<Book I (General) of the British Columbia Building Code 2012>	<1.1.1.1.(1)[3]> <1.1.1.1.(3)[3]> <1.4.1.2.(1)[3]> <2.1.3.1.(1)> <2.2.3.1.(1)[4]> <2.2.5.12.(2)> <2.2.5.12.(3)> <2.2.6.7.(3)> <2.4.3.1.(1)> <2.4.10.4.(1)>
<BC>		<British Columbia Fire Code 2012>	<2.5.5.2.>
<BC>	<R.S.B.C. 1996, c. 323>	<Local Government Act >	<2.2.1.1.(1)[4]>
<BC>	<R.S.B.C. 1996, c. 293>	<Mines Act>	<1.4.1.2.(1)[3]>
CGSB	CAN/CGSB-34.1-94	Asbestos-Cement Pressure Pipe	2.2.5.2.(1)

Table 1.3.1.2.
Documents Referenced in <Book II (Plumbing Systems) of the British Columbia Building Code 2012>
Forming part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
CGSB	CAN/CGSB-34.9-94	Asbestos-Cement Sewer Pipe	2.2.5.1.(2)
CGSB	CAN/CGSB-34.22-94	Asbestos-Cement Drain Pipe	<2.2.5.1.(1)>
CGSB	CAN/CGSB-34.23-94	Asbestos-Cement House Connection Sewer Pipe	2.2.5.1.(2)
CSA	A60.1-M1976	Vitrified Clay Pipe	2.2.5.4.(1)
CSA	A60.3-M1976	Vitrified Clay Pipe Joints	2.2.5.4.(2)
<CSA	CAN/CSA-A257.1-09	Non-Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings	2.2.5.3.(1)>
<CSA	CAN/CSA-A257.2-09	Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings	2.2.5.3.(1)>
<CSA	CAN/CSA-A257.3-09	Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections, and Fittings Using Rubber Gaskets	2.2.5.3.(2)>
<CSA	CAN/CSA-A257.4-09	Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings	2.2.5.3.(5)>
CSA	CAN/CSA-B45 Series-02	Plumbing Fixtures	2.2.2.2.(1)
<CSA	CSA B45.5-11/IAPMO Z124-2011	Plastic Plumbing Fixtures	2.2.2.2.(6)>
CSA	CAN/CSA-B45.9-02	Macerating Systems and Related Components	2.2.2.2.(8)
<CSA	B64.0-11	Definitions, General Requirements, and Test Methods for Vacuum Breakers and Backflow Preventers	2.2.10.10.(1)>
<CSA	B64.1.1-11	Atmospheric Vacuum Breakers (AVB)	2.2.10.10.(1)>
<CSA	B64.1.2-11	Pressure Vacuum Breakers (PVB)	2.2.10.10.(1)>
<CSA	B64.2-11	Hose Connection Vacuum Breakers (HCVB)	2.2.10.10.(1)>
<CSA	B64.2.1-11	Hose Connection Vacuum Breakers (HCVB) with Manual Draining Feature	2.2.10.10.(1)
<CSA	B64.2.2-11	Hose Connection Vacuum Breakers (HCVB) with Automatic Draining Feature	2.2.10.10.(1)>
<CSA	B64.3-11	Dual Check Valve Backflow Preventers with Atmospheric Port (DCAP)	2.2.10.10.(1)>
<CSA	B64.4-11	Reduced Pressure Principle Backflow Preventers (RP)	2.2.10.10.(1)>
<CSA	B64.4.1-11	Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF)	2.6.2.4.(2) 2.6.2.4.(4)>
<CSA	B64.5-11	Double Check Valve (DCVA) Backflow Preventers	2.2.10.10.(1)>
<CSA	B64.5.1-11	Double Check Valve Backflow Preventers for Fire Protection Systems (DCVAF)	2.6.2.4.(2)>
<CSA	B64.6-11	Dual Check Valve (DuC) Backflow Preventers	2.2.10.10.(1)>
<CSA	B64.6.1-11	Dual Check Valve Backflow Preventers for Fire Protection Systems (DuCF)	2.6.2.4.(2)>

Table 1.3.1.2.
Documents Referenced in <Book II (Plumbing Systems) of the British Columbia Building Code 2012>
Forming part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
<CSA	B64.7-11	Laboratory Faucet Vacuum Breakers (LFVB)	2.2.10.10.(1)>
<CSA	B64.8-11	Dual Check Valve Backflow Preventers with Intermediate Vent (DuCV)	2.2.10.10.(1)<
<CSA	B64.9-11	Single Check Valve Backflow Preventers for Fire Protection Systems (SCVAF)	2.6.2.4.(2)>
<CSA	B64.10-11	Selection and Installation of Backflow Preventers	2.6.2.1.(3)>
<CSA	B70-12	Cast Iron Soil Pipe, Fittings, and Means of Joining	2.2.6.1.(1) 2.4.6.4.(2)>
<CSA	B125.3-12	Plumbing Fittings	2.2.10.6.(1) 2.2.10.7.(2) 2.2.10.10.(2)>
CSA	<CAN/CSA->B127.1-99	Asbestos Cement Drain, Waste and Vent Pipe and Pipe Fittings	2.2.5.1.(1) 2.2.6.2.(1)
CSA	B127.2-M1977	Components for Use in Asbestos Cement Building Sewer Systems	2.2.5.1.(2) 2.2.6.2.(1)
<CSA>	<CAN/CSA-B128.1-06>	<Design and Installation of Non-Potable Water Systems>	<2.7.4.1.(1)>
<CSA	CAN/CSA-B137.1-09	Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services	2.2.5.5.(1)>
<CSA	CAN/CSA-B137.2-09	Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications	2.2.5.8.(3)>
<CSA	CAN/CSA-B137.3-09	Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications	2.2.5.8.(1)>
<CSA	CAN/CSA-B137.5-09	Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications	2.2.5.7.(1)>
<CSA	CAN/CSA-B137.6-09	Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot- and Cold-Water Distribution Systems	2.2.5.9.(1)>
<CSA	CAN/CSA-B137.9-09	Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems	2.2.5.13.(1)>
<CSA	CAN/CSA-B137.10-09	Crosslinked Polyethylene/Aluminum/ Crosslinked Polyethylene <(PEX-AL-PEX)> Composite Pressure-Pipe Systems	2.2.5.13.(4) 2.2.5.14.(1)>
<CSA	CAN/CSA-B137.11-09	Polypropylene (PP-R) Pipe and Fittings for Pressure Applications	2.2.5.15.(1)>
CSA	B158.1-1976	Cast Brass Solder Joint Drainage, Waste and Vent Fittings	2.2.10.1.(1)
<CSA	CAN/CSA-B181.1-11	Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings	2.2.5.10.(1) 2.2.5.11.(1) 2.2.5.12.(1) 2.4.6.4.(2)>
<CSA	CAN/CSA-B181.2-11	Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings	2.2.5.10.(1) 2.2.5.11.(1) 2.2.5.12.(1) 2.4.6.4.(2)>

Table 1.3.1.2.
Documents Referenced in <Book II (Plumbing Systems) of the British Columbia Building Code 2012>
Forming part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number(1)	Title of Document(2)	Code Reference
<CSA	CAN/CSA-B181.3-11	Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems	2.2.8.1.(1)>
<CSA	CAN/CSA-B182.1-11	Plastic Drain and Sewer Pipe and Pipe Fittings	2.2.5.10.(1) 2.4.6.4.(2)>
<CSA	CAN/CSA-B182.2-11	PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings	2.2.5.10.(1)>
<CSA	CAN/CSA-B182.4-11	Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings	2.2.5.10.(1)>
<CSA	CAN/CSA-B182.6-11	Profile Polyethylene (PE) Sewer Pipe and Fittings For Leak-Proof Sewer Applications	2.2.5.10.(1)>
CSA	B242-<05>	Groove- and Shoulder-Type Mechanical Pipe Couplings	2.2.10.4.(1)
CSA	B272-93	Prefabricated Self-Sealing Roof Vent Flashings	2.2.10.14.(2)
<CSA	CAN/CSA-B356-10	Water Pressure Reducing Valves for Domestic Water Supply Systems	2.2.10.12.(1)>
<CSA	CAN/CSA-B602-10	Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe	2.2.10.4.(2)>
<CSA	CAN/CSA-F379 Series-09 (excluding CAN/CSA-F379S1-11)	Packaged Solar Domestic Hot Water Systems (Liquid-to-Liquid Heat Transfer)	2.2.10.13.(1)>
<CSA	CAN/CSA-F383-08	Installation of Packaged Solar Domestic Hot Water Systems	2.6.1.8.(1)>
CSA	<CAN/CSA->G401-<071>	Corrugated Steel Pipe Products	2.2.6.8.(1)
<NFPA	13D-2010	Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes	2.6.3.1.(3)>
ULC	CAN/<ULC>-S114-<05>	Test for Determination of Non-Combustibility in Building Materials	1.4.1.2.(1)<(3)>

Notes to Table 1.3.1.2.:
(1) Some documents may have been reaffirmed or reapproved. Check with the applicable issuing agency for up-to-date information.
(2) Some titles have been abridged to omit superfluous wording.
(3) Code reference is in Division A.
(4) Code reference is in Division C.

1.3.1.3. Priority of the British Columbia Code

1) In case of conflict between the provisions of this Code and those of a referenced document, the provisions of this Code shall govern.

1.3.2. Organizations

1.3.2.1. Abbreviations of Proper Names

1) The abbreviations of proper names in this Code shall have the meanings assigned to them in this Article (the appropriate addresses of the organizations are shown in brackets).

ANSI ..... American National Standards Institute (25 West 43rd Street, 4th Floor, New York, New York 10036 U.S.A.; www.ansi.org)

ASHRAE ..... American Society of Heating, Refrigerating and Air-Conditioning Engineers (1791 Tullie Circle, N.E., Atlanta, Georgia 30329 U.S.A.; www.ashrae.org)

ASME ..... American Society of Mechanical Engineers (Three Park Avenue,

New York, New York 10016-5990 U.S.A.; www.asme.org)

ASPE ..... American Society of Plumbing Engineers (8614 Catalpa Avenue, Suite 1007, Chicago, Illinois 60656-1116 U.S.A.; www.aspe.org)

ASSE ..... American Society of Sanitary Engineering (A-901 Canterbury Road, West Lake, Ohio 44145 U.S.A.; www.asse-plumbing.org)

ASTM ..... American Society for Testing and Materials International (100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959 U.S.A.; www.astm.org)

AWS ..... American Welding Society (550 N.W. LeJeune Road, Miami, Florida 33126 U.S.A.; www.aws.org)

AWWA ..... American Water Works Association (6666 West Quincy Avenue, Denver, Colorado 80235 U.S.A.; www.awwa.org)

CCBFC ..... Canadian Commission on Building and Fire Codes (National Research Council of Canada, Ottawa, Ontario KIA 0R6; **<**www.nationalcodes.nrc.gc.ca**>**)

CGSB ..... Canadian General Standards Board (Place du Portage, Phase III, 6B1, 11 Laurier Street, Gatineau, Quebec K1A 1G6; www.pwgsc.gc.ca/cgsb)

CSA ..... Canadian Standards Association (5060 Spectrum Way, Suite 100, Mississauga, Ontario L4W 5N6; www.csa.ca)

NBC ..... National Building Code of Canada 2010 (see CCBFC)

NFPA ..... National Fire Protection Association (1 Batterymarch Park, Quincy, Massachusetts 02169-7471 U.S.A.; www.nfpa.org)

NIST ..... National Institute of Standards and Technology (100 Bureau Drive, Stop 1070, Gaithersburg, Maryland 20899-1070 U.S.A.; www.nist.gov)

NPC ..... National Plumbing Code of Canada 2010 (see CCBFC)

NRC ..... National Research Council of Canada (Ottawa, Ontario K1A 0R6; www.nrc-cnrc.gc.ca)

NRC-IRC ..... Institute for Research in Construction (National Research Council of Canada, Ottawa, Ontario K1A 0R6; irc.nrc-cnrc.gc.ca)

ULC ..... Underwriters' Laboratories of Canada (7 Underwriters Road, Toronto, Ontario M1R 3B4; www.ulc.ca)

Part 2
Plumbing Systems

Part 2
Plumbing Systems

Section 2.1. General

2.1.1. Application

2.1.1.1. Application

1) This Part applies to all *plumbing systems* covered in this Code. (See Article 1.1.1.1. of Division A.)

2.1.2. Service Connections

2.1.2.1. Sanitary Drainage Systems

1) <Except as provided in Subsection 2.7.4.,> every *sanitary drainage system* shall be connected to a public *sanitary sewer*, a public *combined sewer* or a *private sewage disposal system*.

2) A *combined building drain* shall not be installed. (See Appendix A.)

2.1.2.2. Storm Drainage Systems

1) <Except as provided in Subsection 2.7.4.,> every *storm drainage system* shall be connected to a public *storm sewer*, a public *combined sewer* or a designated *storm water* disposal location.

2.1.2.3. Water Distribution Systems

1) <Except as provided in Subsection 2.7.4.,> every *water distribution system* shall be connected to a public water main or a *potable private water supply system*.

2.1.2.4. Separate Services

1) Piping in any *building* connected to the public services shall be connected separately from piping of any other *building*, except that an ancillary *building* on the same property may be served by the same service. (See Appendix A.)

2.1.3. Location of Fixtures

2.1.3.1. Lighting and Ventilation Requirements

1) Plumbing *fixtures* shall not be installed in a room that is not lighted and ventilated in accordance with the appropriate requirements in Parts 3, 6 and 9 of Division B of <Book I (General) of this Code>.

2.1.3.2. Accessibility

1) Every *fixture*, appliance, *interceptor*, *cleanout*, valve, device or piece of equipment shall be located so that it is readily accessible for use, cleaning and maintenance.

Section 2.2. Materials and Equipment

2.2.1. General

2.2.1.1. Exposure of Materials

1) Where unusual conditions exist, such as excessively corrosive soil or water, only materials suited for use in such locations shall be used.

2) Materials and equipment used in a *drainage system* where excessively corrosive wastes are present shall be suitable for the purpose.

2.2.1.2. Restrictions on Re-Use

1) Materials and equipment that have been used for a purpose other than the distribution of *potable* water shall not be subsequently used in a *potable water system*.

2.2.1.3. Identification

1) Every length of pipe and every fitting shall

a) have cast, stamped or indelibly marked on it the maker's name or mark and the weight or class or quality of the product, or

b) be marked in accordance with the relevant standard.

2) Markings required in Sentence (1) shall be visible after installation.

2.2.1.4. Pipe or Piping

1) Where the term pipe or piping is used, it shall also apply to tube or tubing unless otherwise stated.

2.2.1.5. Withstanding Pressure

1) Piping, fittings and joints used in pressure sewer, forcemain or sump pump discharge applications shall be capable of withstanding at least one and one-half times the maximum potential pressure.

2.2.1.6. Working Pressure of a Water Service Pipe

1) The working pressure rating of a *water service pipe* shall not be less than the maximum water main pressure at their point of connection as established by the water supply authority.

2.2.2. Fixtures

2.2.2.1. Surface Requirements

1) Every *fixture* shall have a smooth, hard, corrosion-resistant surface free of flaws and blemishes that may interfere with cleaning.

2.2.2.2. Conformance to Standards

1) Every *fixture* shall conform to CAN/CSA-B45 Series, "Plumbing Fixtures."

2) Every vitreous china *fixture* shall conform to ASME A112.19.2/CSA B45.1, "Ceramic Plumbing Fixtures."

3) Every enamelled cast-iron *fixture* shall conform to ASME A112.19.1/CSA B45.2, "Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures."

4) Every porcelain-enamelled steel *fixture* shall conform to ASME A112.19.1/CSA B45.2, "Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures."

5) Every stainless steel *fixture* shall conform to ASME A112.19.3/CSA B45.4, "Stainless Steel Plumbing Fixtures."

6) Every plastic *fixture* shall conform to <CSA-B45.5/IAPMO Z124, "Plastic Plumbing Fixtures."**>**

7) Every hydromassage bathtub shall conform to <ASME A112.19.7/CSA B45.10, "Hydromassage Bathtub Systems."**>**

8) Macerating toilet systems shall conform to CAN/CSA-B45.9, "Macerating Systems and Related Components."

2.2.2.3. Showers

1) Every shower receptor shall be constructed and arranged so that water cannot leak through the walls or floor.

2) Not more than 6 shower heads shall be served by a single shower drain.

3) Where 2 or more shower heads are served by a shower drain, the floor shall be sloped and the drain located so that water from one head cannot flow over the area that serves another head. (See Appendix A.)

4) Except for column showers, when a battery of shower heads is installed, the horizontal distance between 2 adjacent shower heads shall be not less than 750 mm.

2.2.2.4. Concealed Overflows

1) A dishwashing sink and a food preparation sink shall not have concealed overflows. (See Appendix A.)

2.2.2.5. Water Closets in Public Washrooms

1) When a water closet is installed in a washroom for *public use*, it shall be of the elongated type and provided with a seat of the open front type.

2.2.3. Traps and Interceptors

2.2.3.1. Traps

1) Except as provided for in Sentence (2), every *trap* shall
a) have a *trap seal depth* of not less than 38 mm,
b) be so designed that failure of the seal walls will cause exterior leakage, and
c) have a water seal that does not depend on the action of moving parts.

(See Appendix A.)

2) The *trap seal depth* on *fixtures* draining to an acid waste system shall be a minimum of 50 mm.

3) <Except for a floor-mounted service sink,> every *trap* that serves a lavatory, a sink or a laundry tray shall
a) be provided with a *cleanout* plug located at the lowest point of the *trap* and of the same material as the *trap*, except that a cast-iron *trap* shall be provided with a brass *cleanout* plug, or
b) be designed so that part of the *trap* can be removed for cleaning purposes.

(See Appendix A.)

4) A bell *trap* shall not be installed in a *drainage system*. (See Appendix A.)

5) A drum *trap* shall not be used as a *fixture trap* unless required to serve as an *interceptor* and access for servicing is provided.

2.2.3.2. Interceptors

1) Every *interceptor* shall be designed so that it can be readily cleaned.

2) Every grease *interceptor* shall
a) be designed so that it does not become air bound, and
b) not have a water jacket.

2.2.3.3. Tubular Traps

1) Tubular metal or plastic *traps* conforming to <ASME A112.18.2/CSA B125.2, "Plumbing Waste Fittings,"> shall be used only in accessible locations.

2.2.4. Pipe Fittings

2.2.4.1. T and Cross Fittings

(See Appendix A.)

1) A T fitting shall not be used in a *drainage system*, except to connect a *vent pipe*.

2) A cross fitting shall not be used in a *drainage system*.

2.2.4.2. Sanitary T Fittings

(See Appendix A.)

1) A single or double sanitary T fitting shall not be used in a *nominally horizontal soil-or-waste pipe*, except that a single sanitary T fitting may be used to connect a *vent pipe*.

2) A double sanitary T fitting shall not be used to connect the *trap arms* of
a) back outlet water closets installed back-to-back, or
b) 2 urinals where no *cleanout* fitting is provided above the connection.

2.2.4.3. 90° Elbows

1) Except as permitted in Sentence (2), 90° elbows of 4 inch *size* or less whose centre-line radius is less than the *size* of the pipe shall not be used to join 2 *soil-or-waste pipes*.

2) For *sanitary drainage systems* of 4 inch *size* or less, 90° elbows <described in Sentence (1)> shall only be permitted
a) to change the direction of piping from horizontal to vertical, in the direction of flow,
b) where a *trap arm* enters a wall, or
c) to connect *trap arms* as permitted by Sentence 2.5.6.3.(2).

2.2.5. Non-Metallic Pipe and Fittings

(For a summary of pipe applications, see A-2.2.5., 2.2.6. and 2.2.7. in Appendix A.)

2.2.5.1. Asbestos-Cement Drainage Pipe and Fittings

1) Except as provided in Sentence (2), asbestos-cement pipe and its fittings for use in a drain, waste or vent system shall conform to

a) CAN/CGSB-34.22, "Asbestos-Cement Drain Pipe," or

b) CAN/CSA-B127.1, "Asbestos Cement Drain, Waste and Vent Pipe and Pipe Fittings."

2) Asbestos-cement pipe and its fittings for use in a drain, waste or vent system that are used underground either outside a *building* or under a *building* shall conform to Sentence (1) or to

a) CAN/CGSB-34.9, "Asbestos-Cement Sewer Pipe,"

b) CAN/CGSB-34.23, "Asbestos-Cement House Connection Sewer Pipe," or

c) CSA B127.2-M, "Components for Use in Asbestos Cement Building Sewer Systems."

2.2.5.2. Asbestos-Cement Water Pipe and Fittings

1) Asbestos-cement water pipe, couplings and bends shall conform to CAN/CGSB-34.1, "Asbestos-Cement Pressure Pipe."

2) Asbestos-cement water pipe shall not be used above ground.

2.2.5.3. Concrete Pipe and Fittings

1) Concrete pipe shall conform to

a) CAN/CSA-A257.1, "Non-Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings," or

b) CAN/CSA-A257.2, "Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings."

2) Joints with internal elastomeric gaskets shall conform to CAN/CSA-A257.3, "Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections, and Fittings Using Rubber Gaskets."

3) Concrete fittings fabricated on the site from lengths of pipe shall not be used. (See Appendix A.)

4) Concrete pipe shall not be used above ground inside a *building*.

5) Precast reinforced circular concrete manhole sections, catch basins and fittings shall conform to CAN/CSA-A257.4, "Precast Reinforced Circular Concrete Manhole Sections, Catch Basins, and Fittings."

2.2.5.4. Vitrified Clay Pipe and Fittings

1) Vitrified clay pipe and fittings shall conform to CSA A60.1-M, "Vitrified Clay Pipe."

2) Couplings and joints for vitrified clay pipe shall conform to CSA A60.3-M, "Vitrified Clay Pipe Joints."

3) Vitrified clay pipe and fittings shall not be used except for an underground part of a *drainage system*.

2.2.5.5. Polyethylene Pipe and Fittings

1) Polyethylene water pipe, tubing and fittings shall conform to Series 160 of CAN/CSA-B137.1, "Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services."

2) Polyethylene water pipe shall not be used except for a *water service pipe*.

3) Butt fusion fittings for polyethylene pipe shall conform to ASTM D 3261, "Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing."

2.2.5.6. Polyethylene Pipe Used Underground

1) Polyethylene pipe used underground outside a *building* for the rehabilitation of existing *drainage systems* using trenchless technology shall conform to ASTM F 714, "Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter," and shall be HDPE 3408 and SDR 11 or heavier. (See Appendix A.)

2.2.5.7. Crosslinked Polyethylene Pipe and Fittings

1) Crosslinked polyethylene pipe and its associated fittings used in hot and cold *potable water systems* shall conform to CAN/CSA-B137.5, "Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications." (See Appendix A.)

2.2.5.8. PVC Pipe and Fittings

1) PVC water pipe, fittings and solvent cement shall

a) conform to CAN/CSA-B137.3, "Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications," and

b) have a pressure rating of not less than 1 100 kPa.

2) PVC water pipe fittings shall conform to

a) ASTM D 2466, "Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40," or

b) ASTM D 2467, "Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80."

3) PVC injection-moulded gasketed fittings shall conform to CAN/CSA-B137.2, "Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications."

4) PVC water pipe and fittings referred to in Sentences (1), (2) and (3) shall not be used in a hot *water system*.

2.2.5.9. CPVC Pipe, Fittings and Solvent Cements

1) CPVC hot and cold water pipe, fittings and solvent cements shall conform to CAN/CSA-B137.6, "Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot- and Cold-Water Distribution Systems."

2) The design temperature and design pressure of a CPVC piping system shall conform to Table 2.2.5.9.

Table 2.2.5.9.
Maximum Permitted Pressure for CPVC Piping at Various Temperatures
Forming part of Sentence 2.2.5.9.(2)

Maximum Temperature of Water, °C	Maximum Permitted Pressures, kPa
10	3 150
20	2 900
30	2 500
40	2 100
50	1 700
60	1 300
70	1 000
80	700
90	500
100	400

2.2.5.10. Plastic Pipe, Fittings and Solvent Cement Used Underground

(See A-2.2.5.10. to 2.2.5.12. in Appendix A.)

1) Plastic pipe, fittings and solvent cement used underground outside a *building* or under a *building* in a *drainage system* shall conform to

a) ASTM F 628, "Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core,"

b) CAN/CSA-B181.1, "Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings,"

c) CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings,"

d) CAN/CSA-B182.1, "Plastic Drain and Sewer Pipe and Pipe Fittings," with a pipe stiffness not less than 320 kPa,

e) CAN/CSA-B182.2, "PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings," with a pipe stiffness not less than 320 kPa,

f) CAN/CSA-B182.4, "Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings," with a pipe stiffness not less than 320 kPa, or

g) CAN/CSA-B182.6, "Profile Polyethylene (PE) Sewer Pipe and Fittings For Leak-Proof Sewer Applications," with a pipe stiffness of not less than 320 kPa.

2.2.5.11. Transition Solvent Cement

(See A-2.2.5.10. to 2.2.5.12. in Appendix A.)

1) Solvent cement for transition joints shall conform to

a) CAN/CSA-B181.1, "Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings," or

b) CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings."

2) Transition solvent cement shall only be used for joining an ABS *drainage system* to a PVC *drainage system*.

2.2.5.12. Plastic Pipe, Fittings and Solvent Cement Used in Buildings

(See A-2.2.5.10. to 2.2.5.12. in Appendix A.)

1) Plastic pipe, fittings and solvent cement used inside or under a *building* in a *drainage* or *venting system* shall conform to

a) ASTM F 628, "Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core,"

b) CAN/CSA-B181.1, "Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings," or

c) CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings."

2) Requirements for *combustible* piping in relation to fire safety shall conform to Sentences 3.1.5.16.(1) and 9.10.9.6.(3) to (11), and Articles 3.1.9.4. and 9.10.9.7. of Division B of <Book I (General) of this Code>.

3) Where *noncombustible* piping pierces a *fire separation* or a fire stop, the requirements of fire stopping of Subsection 3.1.9., Sentence 9.10.9.6.(1) and Article 9.10.16.4. of Division B of <Book I (General) of this Code> shall apply.

2.2.5.13. Polyethylene/Aluminum/Polyethylene Composite Pipe and Fittings

1) PE/AL/PE composite pipe and fittings shall conform to CAN/CSA-B137.9, "Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems." (See Appendix A.)

2) <Except as provided in Sentences (3) and (4), PE/AL/PE pipe and fittings shall not be used in hot *water systems*.>

3) <PE/AL/PE pipe with a pressure rating of 690 kPa or greater at 82°C shall be permitted for hot *water systems*.>

4) <PE/AL/PE pipe with a pressure rating of 690 kPa or greater at 82°C shall be used with fittings that conform to CAN/CSA-B137.10, "Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Composite Pressure-Pipe Systems," in hot *water systems*.>

2.2.5.14. Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe and Fittings

1) PEX/AL/PEX composite pipe and fittings used in hot and cold *potable water systems* shall conform to CAN/CSA-B137.10, "Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Composite Pressure-Pipe Systems." (See Appendix A.)

2.2.5.15. Polypropylene Pipe and Fittings

1) Polypropylene pipe and fittings used for hot and cold *potable water systems* shall conform to CAN/CSA-B137.11, "Polypropylene (PP-R) Pipe and Fittings for Pressure Applications." (See Appendix A.)

2.2.6. Ferrous Pipe and Fittings

(For a summary of pipe applications, see A-2.2.5., 2.2.6. and 2.2.7. in Appendix A.)

2.2.6.1. Cast-Iron Drainage and Vent Pipe and Fittings

1) Drainage piping, vent piping and fittings made of cast iron shall conform to CSA B70, "Cast Iron Soil Pipe, Fittings, and Means of Joining."

2) Cast-iron soil pipe and fittings shall not be used in a *water system*.

2.2.6.2. Cast-Iron Fittings for Asbestos-Cement Drainage Pipe

1) Cast-iron fittings designed for use with asbestos-cement pipe for drainage purposes shall conform to the applicable requirements of

a) CAN/CSA-B127.1, "Asbestos Cement Drain, Waste and Vent Pipe and Pipe Fittings," or

b) CSA B127.2-M, "Components for Use in Asbestos Cement Building Sewer Systems."

2.2.6.3. Threaded Cast-Iron Drainage Fittings

1) Threaded cast-iron drainage fittings shall conform to ASME B16.12, "Cast Iron Threaded Drainage Fittings."

2) Threaded cast-iron drainage fittings shall not be used in a *water system*.

2.2.6.4. Cast-Iron Water Pipes

1) Cast-iron water pipes shall conform to ANSI/AWWA C151/A21.51, "Ductile-Iron Pipe, Centrifugally Cast, for Water."

2) Cement mortar lining for cast-iron water pipes shall conform to ANSI/AWWA C104/A21.4, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings."

3) Cast-iron fittings for cast-iron or ductile-iron water pipes shall conform to ANSI/AWWA C110/A21.10, "Ductile-Iron and Gray-Iron Fittings."

4) Rubber gasket joints for cast-iron and ductile-iron pressure pipe for water shall conform to AWWA C111/A21.11, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings."

2.2.6.5. Screwed Cast-Iron Water Fittings

1) Screwed cast-iron water fittings shall conform to ASME B16.4, "Gray Iron Threaded Fittings, Classes 125 and 250."

2) Screwed cast-iron water fittings used in a *water system* shall be cement-mortar lined or galvanized.

3) Screwed cast-iron water fittings shall not be used in a *drainage system*.

2.2.6.6. Screwed Malleable Iron Water Fittings

1) Screwed malleable iron water fittings shall conform to ASME B16.3, "Malleable-Iron Threaded Fittings, Classes 150 and 300."

2) Screwed malleable iron water fittings used in a *water system* shall be cement-mortar lined or galvanized.

3) Screwed malleable iron water fittings shall not be used in a *drainage system*.

2.2.6.7. Steel Pipe

1) Except as provided in Sentences (2) and (3), welded and seamless steel pipe shall not be used in a *plumbing system*.

2) Galvanized steel pipe is permitted to be used in a *drainage system* or a *venting system* above ground inside a *building*.

3) Galvanized steel pipe and fittings shall not be used in a *water distribution system* except

a) in *buildings* of industrial *occupancy* as described in <Book I (General) of this Code>, or

b) for the repair of existing galvanized steel piping systems.

(See Appendix A.)

4) Galvanized steel pipe and fittings shall conform to ASTM A 53/A 53M, "Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless."

2.2.6.8. Corrugated Steel Pipe and Couplings

1) Corrugated steel pipe and couplings shall conform to CAN/CSA-G401, "Corrugated Steel Pipe Products."

2) Corrugated steel pipe shall only be used underground outside a *building* in a *storm drainage system*.

3) Couplings for corrugated steel pipe shall be constructed so that when installed they shall

a) maintain the pipe alignment,

b) resist the separation of adjoining lengths of pipe,

c) prevent root penetration, and

d) prevent the infiltration of surrounding material.

2.2.6.9. Sheet Metal Leaders

1) A sheet metal *leader* shall not be used except above ground outside a *building*.

2.2.7. Non-Ferrous Pipe and Fittings

(For a summary of pipe applications, see A-2.2.5., 2.2.6. and 2.2.7. in Appendix A.)

2.2.7.1. Copper and Brass Pipe

1) Copper pipe shall conform to ASTM B 42, "Seamless Copper Pipe, Standard Sizes."

2) Brass pipe shall conform to ASTM B 43, "Seamless Red Brass Pipe, Standard Sizes."

2.2.7.2. Brass or Bronze Pipe Flanges and Flanged Fittings

1) Brass or bronze pipe flanges and flanged fittings shall conform to ASME B16.24, "Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500, and 2500."

2.2.7.3. Brass or Bronze Threaded Water Fittings

1) Brass or bronze threaded water fittings shall conform to ASME B16.15, "Cast Copper Alloy Threaded Fittings, Classes 125 and 250."

2) Brass or bronze threaded water fittings shall not be used in a *drainage system*.

2.2.7.4. Copper Tube

1) Copper tube shall conform to

a) ASTM B 88, "Seamless Copper Water Tube," or

b) ASTM B 306, "Copper Drainage Tube (DWV)."

2) Except as provided in Sentence (3), the use of copper tube shall conform to Table 2.2.7.4.

3) Copper tube shall not be used for the *fixture drain* or the portion of the *vent pipe* below the *flood level rim* of a flush-valve-operated urinal.

Table 2.2.7.4.
Permitted Use of Copper Tube and Pipe
Forming part of Sentence 2.2.7.4.(2)

Type of Copper Tube or Pipe	Plumbing Purposes							
	Water Service Pipe	*Water Distribution System*		*Building Sewer*	*Drainage System*		*Venting System*	
		Under-ground	Above-ground		Under-ground	Above-ground	Under-ground	Above-ground
K & L hard temper	N	N	P	P	P	P	P	P
K & L soft temper	P	P	P	N	N	N	N	N
M hard temper	N	N	N	N	N	P	N	P
M soft temper	N	N	N	N	N	N	N	N
DWV	N	N	N	N	N	P	N	P
P = Permitted N = Not Permitted								

2.2.7.5. Solder-Joint Drainage Fittings

1) Solder-joint fittings for *drainage systems* shall conform to

a) ASME B16.23, "Cast Copper Alloy Solder Joint Drainage Fittings: DWV," or

b) ASME B16.29, "Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings – DWV."

2) Solder-joint fittings for *drainage systems* shall not be used in a *water system*.

2.2.7.6. Solder-Joint Water Fittings

1) Except as provided in Sentence (2), solder-joint fittings for *water systems* shall conform to

a) ASME B16.18, "Cast Copper Alloy Solder-Joint Pressure Fittings," or

b) ASME B16.22, "Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings."

2) Solder-joint fittings for *water systems* not made by casting or the wrought process shall conform to the applicable requirements of ASME B16.18, "Cast Copper Alloy Solder-Joint Pressure Fittings."

2.2.7.7. Flared-Joint Fittings for Copper Water Systems

1) Flared-joint fittings for copper tube *water systems* shall conform to ASME B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes."

2) Flared-joint fittings for copper tube *water systems* not made by casting shall conform to the applicable requirements of ASME B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes."

2.2.7.8. Lead Waste Pipe and Fittings

1) Lead *waste pipe* and fittings shall not be used in a *water system* or as a *building sewer*.

2) When there is a change in *size* of a lead closet bend, the change shall be in the vertical section of the bend or made in a manner that prevents the retention of liquid in the bend.

2.2.8. Corrosion-Resistant Materials

2.2.8.1. Pipes and Fittings

1) Pipes and fittings to be used for drainage and venting of acid and corrosive wastes shall conform to
a) ASTM A 518/A 518M, "Corrosion-Resistant High-Silicon Iron Castings,"
b) ASTM C 1053, "Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications," or
c) CAN/CSA-B181.3, "Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems."

2.2.9. Jointing Materials

2.2.9.1. Cement Mortar

1) Cement mortar shall not be used for jointing.

2.2.9.2. Solders and Fluxes

1) Solders for solder joint fittings shall conform to ASTM B 32, "Solder Metal."

2) Solders and fluxes having a lead content in excess of 0.2% shall not be used in a *potable water system*.

3) Fluxes for soldered joints shall conform to ASTM B 813, "Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube."

4) <Brazing alloys shall conform to ANSI/AWS A5.8, "Specification for Filler Metals for Brazing and Braze Welding," BCuP range.>

2.2.10. Miscellaneous Materials

2.2.10.1. Brass Floor Flanges

1) Brass floor flanges shall conform to CSA B158.1, "Cast Brass Solder Joint Drainage, Waste and Vent Fittings."

2.2.10.2. Screws, Bolts, Nuts and Washers

1) Every screw, bolt, nut and washer shall be of corrosion-resistant materials when used
a) to connect a water closet to a water closet flange,
b) to anchor the water closet flange to the floor, or
c) to anchor the water closet to the floor.

2.2.10.3. Cleanout Fittings

1) Every plug, cap, nut or bolt that is intended to be removable from a ferrous fitting shall be of a non-ferrous material.

2) A *cleanout* fitting that, as a result of normal maintenance operations, cannot withstand the physical stresses of removal and reinstallation or cannot ensure a gas-tight seal shall not be installed.

2.2.10.4. Mechanical Couplings

1) Groove and shoulder type mechanical couplings for pressure applications shall conform to CSA B242, "Groove- and Shoulder-Type Mechanical Pipe Couplings."

2) Mechanical couplings for non-pressure applications shall conform to CAN/CSA-B602, "Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe."

2.2.10.5. Saddle Hubs

1) A saddle hub or fitting shall not be installed in *drainage*, *venting* or *water systems.* (See Appendix A.)

2.2.10.6. Supply and Waste Fittings

1) Supply fittings shall conform to
a) <ASME A112.18.1/CSA B125.1, "Plumbing Supply Fittings," or>
b) <CSA B125.3, "Plumbing Fittings.">

2) <Waste fittings shall conform to ASME A112.18.2/CSA B125.2, "Plumbing Waste Fittings.">

2.2.10.7. <Water Temperature Control
(See Appendix A.)

1) Except as provided in Sentence (2), all valves supplying fixed-location shower heads shall be individual pressure-balanced or thermostatic-mixing valves conforming to <ASME A112.18.1/CSA B125.1, "Plumbing Supply Fittings.">

2) Individual pressure-balanced or thermostatic-mixing valves shall not be required for showers having a single tempered water supply that is controlled by a master thermostatic-mixing valve conforming to <CSA B125.3, "Plumbing Fittings.">

3) All mixing valves supplying shower heads shall be of the pressure-balanced, thermostatic, or combination pressure-balanced/thermostatic type capable of

a) maintaining a water outlet temperature that does not exceed 49°C, and

b) limiting thermal shock.

4) The temperature of water discharging into a bathtub shall not exceed 49°C.>

2.2.10.8. Direct Flush Valves

1) Every direct flush valve shall

a) open fully and close positively under service pressure,

b) complete its cycle of operation automatically,

c) be provided with a means of regulating the volume of water that it discharges, and

d) be provided with a *vacuum breaker* unless the *fixture* is designed so that *back-siphonage* cannot occur.

2.2.10.9. Drinking Fountain Bubblers

1) The orifice of every drinking fountain bubbler shall

a) be of the shielded type, and

b) direct the water upward at an angle of approximately 45°.

2) Every drinking fountain bubbler shall include a means of regulating the flow to the orifice.

3) Bubblers shall be installed only on drinking fountains. (See Appendix A.)

2.2.10.10. Back-Siphonage Preventers and Backflow Preventers

1) Except as provided in Sentence (2), *back-siphonage preventers* and *backflow preventers* shall conform to

a) <CSA B64.0, "Definitions, General Requirements, and Test Methods for Vacuum Breakers and Backflow Preventers,">

b) <CSA B64.1.1, "Atmospheric Vacuum Breakers (AVB),">

c) <CSA B64.1.2, "Pressure Vacuum Breakers (PVB),">

d) <CSA B64.2, "Hose Connection Vacuum Breakers (HCVB),">

e) <CSA B64.2.1, "Hose Connection Vacuum Breakers (HCVB) with Manual Draining Feature,">

f) <CSA B64.2.2, "Hose Connection Vacuum Breakers (HCVB) with Automatic Draining Feature,">

g) <CSA B64.3, "Dual Check Valve Backflow Preventers with Atmospheric Port (DCAP),">

h) <CSA B64.4, "Reduced Pressure Principle Backflow Preventers (RP),">

i) <CSA B64.5, "Double Check Valve (DCVA) Backflow Preventers,">

j) <CSA B64.6, "Dual Check Valve (DuC) Backflow Preventers,">

k) <CSA B64.7, "Laboratory Faucet Vacuum Breakers (LFVB),"> or

l) <CSA B64.8, "Dual Check Valve Backflow Preventers with Intermediate Vent (DuCV).">

2) *Back-siphonage preventers* for tank-type water closets (anti-siphon <fill valves>) shall conform to <CSA B125.3, "Plumbing Fittings.">

2.2.10.11. Relief Valves

1) Temperature-relief, pressure-relief, combined temperature- and pressure-relief, and vacuum-relief valves shall conform to ANSI Z21.22/CSA 4.4-M, "Relief Valves for Hot Water Supply Systems."

2.2.10.12. Reducing Valves

1) Direct-acting water-pressure-reducing valves for domestic water supply systems shall conform to CAN/CSA-B356, "Water Pressure Reducing Valves for Domestic Water Supply Systems."

2.2.10.13. Solar Domestic Hot Water

1) Equipment for solar heating of *potable* water shall conform to <CAN/CSA-F379 Series, "Packaged Solar Domestic Hot Water Systems (Liquid-to-Liquid Heat Transfer)," excluding CAN/CSA-F379S1.>

2.2.10.14. Vent Pipe Flashing

1) Flashing fabricated on-site for *vent pipes* shall be fabricated from

a) copper sheet not less than 0.33 mm thick,

b) aluminum sheet not less than <0.48 mm> thick,

c) *alloyed zinc* sheet not less than 0.35 mm thick,

d) lead sheet not less than <1.73 mm> thick,

e) galvanized steel sheet not less than <0.33 mm> thick, or

f) polychloroprene (neoprene) not less than 2.89 mm thick.

2) Prefabricated flashing for *vent pipes* shall conform to CSA B272, "Prefabricated Self-Sealing Roof Vent Flashings." (See Article 2.5.6.5. for location of *vent pipe* terminals.)

2.2.10.15. Water Hammer Arresters

1) Water hammer arresters shall conform to ANSI/ASSE 1010, "Water Hammer Arresters."

2.2.10.16. Air Admittance Valves

1) *Air admittance valves* shall conform to <ASSE 1051, "Individual and Branch Type Air Admittance Valves (AAVs) for Sanitary Drainage Systems."> (See Appendix A.)

Section 2.3. Piping

2.3.1. Application

2.3.1.1. General

1) This Section applies to the construction and use of joints and connections, and the arrangement, protection, support and testing of piping.

2.3.2. Construction and Use of Joints

2.3.2.1. Caulked Lead Drainage Joints

1) Caulked lead drainage joints shall not be used except for cast-iron pipe in a *drainage system* or *venting system*, or between such pipe and

a) other ferrous pipe,

b) brass and copper pipe,

c) a caulking ferrule, or

d) a *trap standard*.

2) Every caulked lead drainage joint shall be firmly packed with oakum and tightly caulked with lead to a depth of not less than 25 mm.

3) No paint, varnish or other coating shall be applied on the lead until after the joint has been tested.

4) A length of hub and spigot pipe and pipe fittings in a *drainage system* shall be installed with the hub at the upstream end.

2.3.2.2. Wiped Joints

1) Wiped joints shall not be used except for sheet lead or lead pipe, or between such pipe and copper pipe or a ferrule.

2) Every wiped joint in straight pipe shall

a) be made of solder,

b) have an exposed surface on each side of the joint at least 19 mm wide, and

c) be not less than 10 mm thick at the thickest part.

3) Every wiped flanged joint shall be reinforced with a lead flange that is not less than 19 mm wide.

2.3.2.3. Screwed Joints

1) In making a screwed joint, the ends of the pipe shall be reamed or filed out to the size of the bore and all chips and cuttings shall be removed.

2) No pipe-joint cement or paint shall be applied to the internal threads.

2.3.2.4. Soldered Joints

1) Soldered joints shall be made in accordance with ASTM B 828, "Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings."

2.3.2.5. Flared Joints

1) In making a flared joint, the pipe shall be expanded with a proper flaring tool.

2) Flared joints shall not be used for hard (drawn) copper tube.

2.3.2.6. Mechanical Joints

1) Mechanical joints shall be made with compounded elastomeric rings that are held in compression by

a) stainless steel or cast-iron clamps, or

b) groove and shoulder type mechanical couplings.

(See Appendix A.)

2.3.2.7. Cold-Caulked Joints

1) Cold-caulked joints shall not be used except for bell and spigot pipe in a *water system*, a *drainage system* or a *venting system*.

2) Caulking compound used in cold-caulked joints shall be applied according to the manufacturer's directions.

3) Every cold-caulked joint in a *drainage system* shall be firmly packed with oakum and tightly caulked with cold caulking compound to a depth of not less than 25 mm.

2.3.3. Joints and Connections

2.3.3.1. Drilled and Tapped Joints

1) Drilled and tapped joints shall not be made in a *soil-or-waste pipe* or *vent pipe* and fittings unless suitable provision has been made for drilling and tapping.

2.3.3.2. Extracted Tees

1) Tees may be extracted from the wall thickness of Types K and L copper tube used in a *water distribution system* provided that

a) a tool specifically designed for the purpose is used,

b) the branch is at least one *size* smaller than the tube in which the tee is formed,

c) the end of the branch incorporates a means to prevent it from penetrating into the run and thereby obstructing flow, and

d) the joint at the tee is brazed with a filler metal having a melting point not below 540°C.

2.3.3.3. Prohibition of Welding of Pipes and Fittings

1) Cast-iron soil pipe and fittings shall not be welded.

2) Galvanized steel pipe and fittings shall not be welded.

2.3.3.4. Unions and Slip Joints

(See A-2.2.3.1.(1) and (3) in Appendix A.)

1) Running thread and packing nut connections and unions with a gasket seal shall not be used downstream of a *trap weir* in a *drainage system* or in a *venting system*.

2) A slip joint shall not be used

a) in a *venting system*, or

b) in a *drainage system*, except to connect a *fixture trap* to a *fixture drain* in an accessible location.

2.3.3.5. Increaser or Reducer

1) Every connection between 2 pipes of different *size* shall be made with an increaser or a reducer fitting installed so that it will permit the system to be completely drained.

2.3.3.6. Dissimilar Materials

1) Adaptors, connectors or mechanical joints used to join dissimilar materials shall be designed to accommodate the required transition.

2.3.3.7. Connection of Roof Drain to Leader

1) Every *roof drain* shall be securely connected to a *leader* and provision shall be made for expansion.

2.3.3.8. Connection of Floor Outlet Fixtures

1) Every pedestal urinal, floor-mounted water closet or S-*trap standard* shall be connected to a *fixture drain* by a floor flange, except that a cast-iron *trap standard* may be caulked to a cast-iron pipe.

2) Except as provided in Sentence (3), every floor flange shall be brass.

3) Where cast-iron or plastic pipe is used, a floor flange of the same material may be used.

4) Every floor flange shall be securely set on a firm base and bolted to the *trap* flange of the *fixture*.

5) Every joint in a floor flange shall be sealed with a resilient watertight and gas-tight seal.

6) Where a lead water-closet stub is used, the length of the stub below the floor flange shall be not less than 75 mm.

2.3.3.9. Expansion and Contraction
(See Appendix A.)

1) The design and installation of every piping system shall include means to accommodate its expansion and contraction caused by temperature changes, movement of the soil, *building* shrinkage or structural settlement. (See Appendix A.)

2.3.3.10. Copper Tube

1) Types M and DWV copper tube shall not be bent.

2.3.3.11. Indirect Connections

1) Where a *fixture* or device is *indirectly connected*, the connections shall be made by terminating the *fixture drain* above the *flood level rim* of a *directly connected fixture* to form an *air break*.

2) The size of the *air break* shall at least equal the *size* of the *fixture drain*, *branch* or pipe that terminates above the *directly connected fixture*, and it shall be not less than 25 mm. (See Appendix A.)

2.3.3.12. <Copper Joints Used Underground>

1) Except as provided in Sentence (2), joints in copper tubes installed underground shall be made with either flared or compression fittings, or be brazed using a brazing alloy within the American Welding Society's AWS-BCuP range.

2) Compression fittings shall not be used underground under a *building*.

2.3.4. Support of Piping

2.3.4.1. Capability of Support

1) Piping shall be provided with support that is capable of keeping the pipe in alignment and bearing the weight of the pipe and its contents.

2) Every floor- or wall-mounted water-closet bowl shall be securely attached to the floor or wall by means of a flange and shall be stable.

3) Every wall-mounted *fixture* shall be supported so that no strain is transmitted to the piping.

2.3.4.2. Independence of Support

1) Piping, *fixtures*, tanks or devices shall be supported independently of each other.

2.3.4.3. Insulation of Support

1) Where a hanger or support for copper tube or brass or copper pipe is of a material other than brass or copper, it shall be suitably separated and electrically insulated from the pipe.

2.3.4.4. Support for Vertical Piping

1) Except as provided in Sentence (2), vertical piping shall be supported at its base and at the floor level of alternate *storeys* by rests, each of which can bear the weight of pipe that is between it and the rest above it.

2) The maximum spacing of supports shall be 7.5 m.

2.3.4.5. Support for Horizontal Piping

1) *Nominally horizontal* piping that is inside a *building* shall be braced to prevent swaying and buckling and to control the effects of thrust.

2) *Nominally horizontal* piping shall be supported as stated in Table 2.3.4.5.

Table 2.3.4.5.
Support for Nominally Horizontal Piping
Forming part of Sentence 2.3.4.5.(2)

Piping Material	Maximum Horizontal Spacing of Supports, m	Additional Support Conditions
Galvanized iron or steel pipe		
• diameter ≥ 6 inches	3.75	
• diameter < 6 inches	2.5	
Lead pipe	Throughout length of pipe	
Cast-iron pipe	3	At or adjacent to each hub or joint
Cast-iron pipe with mechanical joints that is ≤ 300 mm long between adjacent fittings	1	
Asbestos-cement pipe	2(1)	
Asbestos-cement pipe that is ≤ 300 mm long between adjacent fittings	1	
ABS or PVC plastic pipe	1.2	At the end of *branches* or *fixture drains* and at changes in direction and elevation
ABS or PVC plastic *trap arm* or *fixture drain* pipe > 1 m long	n/a	As close as possible to the *trap*
CPVC pipe	1	
Copper tube or copper and brass pipe, hard temper, diameter > 1 inch	3	
Copper tube or copper and brass pipe, hard temper, diameter ≤ 1 inch	2.5	
Copper tube, soft temper	2.5	
PE/AL/PE composite pipe	1	
PEX/AL/PEX composite pipe	1	
PEX plastic pipe	0.8	
PP-R plastic pipe	1	At the end of *branches* and at changes in direction and elevation

Notes to Table 2.3.4.5.:
(1) As an alternative, asbestos-cement pipe, which is typically manufactured in 4 m lengths, may have 2 supports per length of pipe.

3) Where PVC, CPVC or ABS plastic pipe is installed
a) the pipe shall be aligned without added strain on the piping,
b) the pipe shall not be bent or pulled into position after being welded, and
c) hangers shall not compress, cut or abrade the pipe.

4) Where PEX, PP-R, PE/AL/PE or PEX/AL/PEX plastic pipe is installed, hangers shall not compress, cut or abrade the pipe.

5) Where hangers are used to support *nominally horizontal* piping, the hangers shall be

a) <supported by> metal rods of not less than

i) 6 mm diam to support piping 2 inches or less in *size*,

ii) 8 mm diam to support piping 4 inches or less in *size*, and

iii) 13 mm diam to support piping over 4 inches in *size*, or

b) solid or perforated metal straps of not less than

i) 0.6 mm nominal thickness and 12 mm wide to support piping 2 inches or less in *size*, and

ii) 0.8 mm nominal thickness and 18 mm wide to support piping 4 inches or less in *size*.

6) Where a hanger is attached to concrete or masonry, it shall be fastened by metal or expansion-type plugs that are inserted or built into the concrete or masonry.

2.3.4.6. Support for Underground Horizontal Piping

1) Except as provided in Sentence (2), *nominally horizontal* piping that is underground shall be supported on a base that is firm and continuous under the whole of the pipe. (See Appendix A.)

2) *Nominally horizontal* piping installed underground that is not supported as described in Sentence (1) may be installed using hangers fixed to a foundation or structural slab provided that the hangers are capable of

a) keeping the pipe in alignment, and

b) supporting the weight of

i) the pipe,

ii) its contents, and

iii) the fill over the pipe.

2.3.4.7. Support for Vent Pipe above a Roof

1) Where a *vent pipe* that may be subject to misalignment terminates above the surface of a roof, it shall be supported or braced. (See Article 2.5.6.5. for location of *vent pipe* terminals.)

2.3.5. Protection of Piping

2.3.5.1. Backfilling of Pipe Trench

1) Where piping is installed underground, the backfill shall be

a) carefully placed and tamped to a height of 300 mm over the top of the pipe, and

b) free of stones, boulders, cinders and frozen earth. (See Appendix A.)

2.3.5.2. Protection of Non-Metallic Pipe

1) Where asbestos-cement drainage pipe or vitrified clay is located less than 600 mm below a basement floor and the floor is constructed of other than 75 mm or more of concrete, the pipe shall be protected by a 75-mm layer of concrete installed above the pipe. (See Appendix A.)

2.3.5.3. Isolation from Loads

1) Where piping passes through or under a wall, it shall be installed so that the wall does not bear on the pipe.

2.3.5.4. Protection from Frost

1) Where piping may be exposed to freezing conditions, it shall be protected from the effects of freezing.

2.3.5.5. Protection from Mechanical Damage

1) Plumbing, piping and equipment exposed to mechanical damage shall be protected.

2.3.5.6. Protection from Condensation

1) Piping used as an internal *leader*, which may be subject to condensation, shall be installed in a manner that limits the risk of damage to the *building* due to condensation.

2.3.6. Testing of Drainage or Venting Systems

2.3.6.1. Tests and Inspection of Drainage or Venting Systems

1) Except in the case of an external *leader*, after a section of a *drainage system* or a *venting system* has been roughed in, and before any *fixture* is installed or piping is covered, a water pressure test or an air pressure test shall be conducted.

2) After every *fixture* is installed and before any part of the *drainage system* or *venting system* is placed in operation, a final test shall be carried out when requested.

3) Where a prefabricated system is assembled off the *building* site in such a manner that it cannot be inspected and tested on site, off-site inspections and tests shall be conducted.

4) Where a prefabricated system is installed as part of a *drainage system* or *venting system*, all other plumbing work shall be tested and inspected and a final test shall be carried out on the complete system when requested.

5) When requested, a ball test shall be made to any pipe in a *drainage system*.

2.3.6.2. Tests of Pipes in Drainage Systems

1) Every pipe in a *drainage system*, except an external *leader* or *fixture outlet pipe*, shall be capable of withstanding without leakage a water pressure test, air pressure test and final test.

2) Every pipe in a *drainage system* shall be capable of meeting a ball test.

2.3.6.3. Tests of Venting Systems

1) Every *venting system* shall be capable of withstanding without leakage a water pressure test, air pressure test and final test.

2.3.6.4. Water Pressure Tests

1) A water pressure test shall consist in applying a water column of at least 3 m to all joints.

2) In making a water pressure test,

a) every opening except the highest shall be tightly closed with a testing plug or a screw cap, and

b) the system or the section shall be kept filled with water for 15 min.

2.3.6.5. Air Pressure Tests

1) Air pressure tests shall be conducted in accordance with the manufacturer's instructions for each piping material, and

a) air shall be forced into the system until a pressure of 35 kPa is created, and

b) this pressure shall be maintained for at least 15 min without a drop in pressure.

2.3.6.6. Final Tests

1) Where a final test is made

a) every *trap* shall be filled with water,

b) the bottom of the system being tested shall terminate at a *building trap*, test plug or cap,

c) except as provided in Sentence (2), smoke from smoke-generating machines shall be forced into the system,

d) when the smoke appears from all roof terminals they shall be closed, and

e) a pressure equivalent to a 25 mm water column shall be maintained for 15 min without the addition of more smoke.

2) The smoke referred to in Clauses (1)(c) and (d) may be omitted provided the roof terminals are closed and the system is subjected to an air pressure equivalent to a 25 mm water column maintained for 15 min without the addition of more air.

2.3.6.7. Ball Tests

1) Where a ball test is made, a hard ball dense enough not to float shall be rolled through the pipe.

2) The diameter of the ball shall be not less than

a) 50 mm where the *size* of the pipe is 3 inches or more, or

b) 25 mm where the *size* of the pipe is less than 3 inches.

2.3.7. Testing of Potable Water Systems

2.3.7.1. Application of Tests

1) After a section of a *potable water system* has been completed, and before it is placed in operation, a water pressure test shall be conducted, except that an air pressure test may be used in freezing conditions.

2) A pressure test may be applied to each section of the system or to the system as a whole.

3) Where a prefabricated system is assembled off the *building* site in such a manner that it cannot be inspected and tested on site, off-site inspections and pressure tests shall be conducted.

4) Where a prefabricated system is installed as part of a *water system*,

a) all other plumbing work shall be tested and inspected, and

b) the complete system shall be pressure tested when requested.

2.3.7.2. Pressure Tests of Potable Water Systems

1) Except as required in Sentence (2), every *potable water system* shall be able to withstand

a) without leaking, a water pressure that is at least equal to the maximum in-service pressure, or

b) an air pressure of not less than 700 kPa for at least 2 h without a drop in pressure.

2) If a manufacturer states that an air pressure test is not recommended, a water pressure test shall be performed. (See Appendix A.)

2.3.7.3. Water Pressure Tests

1) Where a water pressure test is made, all air shall be expelled from the system before *fixture* control valves or faucets are closed.

2) *Potable* water shall be used to test a *potable water system*.

Section 2.4. Drainage Systems

2.4.1. Application

2.4.1.1. General

1) This Section applies to *sanitary drainage systems*, *storm drainage systems*, *combined building drains* or *combined building sewers*.

2.4.2. Connections to Drainage Systems

2.4.2.1. Connections to Sanitary Drainage Systems

1) Every *fixture* shall be *directly connected* to a *sanitary drainage system*, except that

a) drinking fountains may be

i) *indirectly connected* to a *sanitary drainage system*, or

ii) connected to a *storm drainage system* provided that where the system is subject to *backflow*, a *backwater valve* is installed in the fountain *waste pipe* (see Appendix A),

b) drainage pans on heating/cooling units may be connected to a *storm drainage system* provided that where the system is subject to *backflow*, a *backwater valve* is installed,

c) a floor drain may be connected to a *storm drainage system* provided it is located where it can receive only *clear-water waste* or *storm water*,

d) *fixtures* or appliances that discharge only *clear-water waste* may be connected to a *storm drainage system* or be drained onto a roof, and

e) the following devices shall be *indirectly connected* to a *drainage system:*

i) a device for the display, storage, preparation or processing of food or drink,

ii) a sterilizer,

iii) a device that uses water as a cooling or heating medium,

iv) a water operated device,

v) a water treatment device, or

vi) a drain or overflow from a *water system* or a heating system (see Appendix A).

2) The connection of a *soil-or-waste pipe* to a *nominally horizontal soil-or-waste pipe* or to a *nominally horizontal offset* in a *soil-or-waste stack* shall be not less than 1.5 m measured horizontally from the bottom of a *soil-or-waste stack* or from the bottom of the upper vertical section of the *soil-or-waste stack* that

a) receives a discharge of 30 or more *fixture units*, or

b) receives a discharge from *fixtures* located on 2 or more *storeys*.

(See Appendix A.)

3) No other *fixture* shall be connected to a lead bend or stub that serves a water closet.

4) <Where a change in direction of more than 45º occurs in> a *soil-or-waste pipe* that serves more than one clothes washer, and in which pressure zones are created by detergent suds, <no other *soil-or-waste pipe* shall be connected to it within a length less than>

a) <40 times the *size* of the *soil-or-waste pipe* or 2.44 m maximum vertical, whichever is less, before changing direction, and>

b) <10 times the *size* of the *nominally horizontal soil-or-waste pipe* after changing direction.>

(See Appendix A.)

5) <Where a *vent pipe* is connected into the suds pressure zone referred to in Sentence (4), no other *vent pipe* shall be connected to that *vent pipe* within the height of the suds pressure zone. (See Appendix Note Appendix Note A-2.4.2.1.(4) in Appendix A.)>

2.4.2.2. Connection of Overflows from Rainwater Tanks

1) An overflow from a rainwater tank shall not be *directly connected* to a *drainage system*.

2.4.2.3. Direct Connections

1) Two or more *fixture outlet pipes* that serve outlets from a single *fixture* that is listed in Clause 2.4.2.1.(1)(e) may be *directly connected* to a *branch* that

a) has a *size* of not less than 1.25 inches, and

b) is terminated above the *flood level rim* of a *directly connected fixture* to form an *air break*.

2) *Fixture drains* from *fixtures* that are listed in Subclauses (e)(i) and (ii) may be *directly connected* to a pipe that

a) is terminated to form an *air break* above the *flood level rim* of a *fixture* that is *directly connected* to a *sanitary drainage system*, and

b) is extended through the roof when *fixtures* on 3 or more *storeys* are connected to it (see A-2.4.2.1.(1)(a)(ii) and (e)(vi) in Appendix A).

3) *Fixture drains* from *fixtures* that are listed in Subclauses (e)(iii) to (vi) may be *directly connected* to a pipe that

a) is terminated to form an *air break* above the *flood level rim* of a *fixture* that is *directly connected* to a *storm drainage system*, and

b) is extended through the roof when *fixtures* on 3 or more *storeys* are connected to it.

2.4.3. Location of Fixtures

2.4.3.1. Urinals

1) Urinals shall not be installed adjacent to wall and floor surfaces that are pervious to water. (See Article 3.7.2.6. of Division B of <Book I (General) of this Code>.)

2.4.3.2. Restricted Locations of Indirect Connections and Traps

1) Indirect connections or any *trap* that may overflow shall not be located in a crawl space or any other unfrequented area.

2.4.3.3. Equipment Restrictions Upstream of Grease Interceptors

1) Except as provided in Sentence (2), equipment discharging waste with organic solids shall not be located upstream of a grease *interceptor*. (See Appendix A.)

2) An organic solids *interceptor* may be installed upstream of a grease *interceptor*.

2.4.3.4. Fixtures Located in Chemical Storage Locations

1) A floor drain or other *fixture* located in an oil transformer vault, a high voltage room or any room where flammable, dangerous or toxic chemicals are stored or handled shall not be connected to a *drainage system*.

2.4.3.5. Macerating Toilet Systems

1) A macerating toilet system shall only be installed where no connection to a gravity *sanitary drainage system* is available.

2.4.3.6. Drains Serving Elevator Pits

1) Where a drain is provided in an elevator pit

a) it shall be connected directly to a sump located outside the elevator pit, and

b) the drain pipe that connects the sump to the *drainage system* shall have a *backwater valve*.

2.4.4. Treatment of Sewage and Wastes

2.4.4.1. Sewage Treatment

1) Where a *fixture* or equipment discharges *sewage* or waste that may damage or impair the *sanitary drainage system* or the functioning of a public or *private sewage disposal system*, provision shall be made for treatment of the *sewage* or waste before it is discharged to the *sanitary drainage system*.

2.4.4.2. Cooling of Hot Water or Sewage

1) Where a *fixture* discharges sewage or *clear-water waste* that is at a temperature above 75°C, provision shall be made for cooling of the waste to 75°C or less before it is discharged to the *drainage system*.

2.4.4.3. Interceptors

1) Where a *fixture* discharges *sewage* that includes fats, oils or grease and is located in a public kitchen, in a restaurant or in a *care or detention occupancy*, it shall discharge through a grease *interceptor*. (See Appendix A.)

2) Where the discharge from a *fixture* may contain oil or gasoline, an oil *interceptor* shall be installed. (See Article 2.5.5.2. for venting requirements for oil *interceptors*.)

3) Where a *fixture* discharges sand, grit or similar materials, an *interceptor* designed for the purpose of trapping such discharges shall be installed.

4) Every *interceptor* shall have sufficient capacity to perform the service for which it is provided.

2.4.4.4. Neutralizing and Dilution Tanks

1) Where a *fixture* or equipment discharges corrosive or acid waste, it shall discharge into a neutralizing or dilution tank that is connected to the *sanitary drainage system* through

a) a *trap*, or

b) an indirect connection.

(See Appendix A.)

2) Each neutralizing or dilution tank shall have a method for neutralizing the liquid.

2.4.5. Traps

2.4.5.1. Traps for Sanitary Drainage Systems

1) Except as provided in Sentences (2), (3), (4) and (5) and in Article 2.4.5.2., every *fixture* shall be protected by a separate *trap*.

2) One *trap* may protect

a) all the trays or compartments of a 2- or 3-compartment sink,

b) a 2-compartment laundry tray, or

c) 2 similar single compartment *fixtures* located in the same room.

(See Appendix A.)

3) One *trap* may serve a group of floor drains or shower drains, a group of washing machines or a group of laboratory sinks if the *fixtures*

a) are in the same room, and

b) are not located where they can receive food or other organic matter.

(See Appendix A.)

4) An *indirectly connected fixture* that can discharge only *clear-water waste* other than a drinking fountain need not be protected by a *trap*. (See Clause 2.4.2.1.(1)(e) for indirect connections.)

5) An *interceptor* with an effective water seal of not less than 38 mm may serve as a *trap.* (See Appendix A.)

6) Where a domestic dishwashing machine equipped with a drainage pump discharges through a direct connection into the *fixture outlet pipe* of an adjacent kitchen sink or disposal unit, the pump discharge line shall rise as high as possible to just under the counter and connect

a) on the inlet side of the sink *trap* by means of a Y fitting, or

b) to the disposal unit.

2.4.5.2. Traps for Storm Drainage Systems

1) Where a *storm drainage system* is connected to a *combined building sewer* or a public *combined sewer*, a *trap* shall be installed between any opening in the system and the sewer, except that no *trap* is required if the opening is the upper end of a *leader* that terminates

a) at a roof that is used only for weather protection,

b) not less than 1 m above or not less than 3.5 m in any other direction from any air inlet, openable window or door, and

c) not less than 1.8 m from a property line.

(See Appendix A.)

2) A floor drain that drains to a *storm drainage system* shall be protected by a *trap* that

a) is located between the floor drain and a *leader*, *storm building drain* or *storm building sewer*,

b) may serve all floor drains located in the same room, and

c) need not be protected by a *vent pipe*.

3) Where freezing conditions could cause *storm drainage systems* to freeze due to air circulation within the piping, a *trap* with a *cleanout* shall be installed in a heated location.

2.4.5.3. Connection of Subsoil Drainage Pipe to a Sanitary Drainage System

1) Where a *subsoil drainage pipe* is connected to a *sanitary drainage system*, the connection shall be made on the upstream side of a *trap* with a *cleanout* or a trapped sump. (See Appendix A.)

2.4.5.4. Location and Cleanout for Building Traps

1) Where a *building trap* is installed it shall

a) be provided with a *cleanout* fitting on the upstream side of and directly over the *trap*,

b) be located upstream of the *building cleanout*, and

c) be located

i) inside the *building* as close as practical to the place where the *building drain* leaves the *building*, or

ii) outside the *building* in a manhole.

(See Appendix A.)

2.4.5.5. Trap Seals

1) Provision shall be made for maintaining the *trap* seal of a floor drain by

a) the use of a *trap* seal primer,

b) using the drain as a receptacle for an *indirectly connected* drinking fountain, or

c) other equally effective means.

(See Appendix A.)

2.4.6. Arrangement of Drainage Piping

2.4.6.1. Separate Systems

1) No vertical *soil-or-waste pipe* shall conduct both *sewage* and *storm water*.

2) A *combined building drain* shall not be installed. (See A-2.1.2.1.(2) in Appendix A.)

3) There shall be no unused open ends in a *drainage system* and *dead ends* shall be so graded that water will not collect in them.

2.4.6.2. Location of Soil-or-Waste Pipes

1) A *soil-or-waste pipe* shall not be located directly above

a) non-pressure *potable* water storage tanks,

b) manholes in pressure *potable* water storage tanks, or

c) food-handling or food-processing equipment.

2.4.6.3. Sumps or Tanks

(See Appendix A.)

1) Piping that is too low to drain into a *building sewer* by gravity shall be drained to a sump or receiving tank.

2) Where the sump or tank receives *sewage*, it shall be water- and air-tight and shall be vented.

3) Equipment such as a pump or ejector that can lift the contents of the sump or tank and discharge it into the *building drain* or *building sewer* shall be installed.

4) Where the equipment does not operate automatically, the capacity of the sump shall be sufficient to hold at least a 24 h accumulation of liquid.

5) Where there is a *building trap*, the discharge pipe from the equipment shall be connected to the *building drain* downstream of the *trap*.

6) The discharge pipe from every pumped sump shall be equipped with a union, a **<***backwater valve***>** and a shut-off valve installed in that sequence in the direction of discharge.

7) The discharge piping from a pump or ejector shall be sized for optimum flow velocities at pump design conditions.

2.4.6.4. Protection from Backflow

1) Except as permitted in Sentence (2), a *backwater valve* or a gate valve that would prevent the free circulation of air shall not be installed in a *building drain* or in a *building sewer*. (See Appendix A.)

2) A *backwater valve* may be installed in a *building drain* provided that

a) it is a "normally open" design conforming to

i) CSA B70, "Cast Iron Soil Pipe, Fittings, and Means of Joining,"

ii) CAN/CSA-B181.1, "Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings,"

iii) CAN/CSA-B181.2, "Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings," or

iv) CAN/CSA-B182.1, "Plastic Drain and Sewer Pipe and Pipe Fittings," and

b) it does not serve more than one *dwelling unit*.

3) Except as provided in Sentences (4), (5) and (6), where a *building drain* or a *branch* may be subject to *backflow*, a gate valve or a *backwater valve* shall be installed on every *fixture drain* connected to them when the *fixture* is located below the level of the adjoining street.

4) Where the *fixture* is a floor drain, a removable screw cap may be installed on the upstream side of the *trap*.

5) Where more than one *fixture* is located on a *storey* and all are connected to the same *branch*, the gate valve or *backwater valve* may be installed on the *branch*.

6) A *subsoil drainage pipe* that drains into a *sanitary drainage system* that is subject to surcharge shall be connected in such a manner that *sewage* cannot back up into the *subsoil drainage pipe*. (See Appendix A.)

2.4.6.5. Mobile Home Sewer Service

1) A *building sewer* intended to serve a mobile home shall be

a) not less than 4 inches in *size*,

b) terminated above ground,

c) provided with

i) a tamperproof terminal connection that is capable of being repeatedly connected, disconnected and sealed,

ii) a protective concrete pad, and

iii) a means to protect it from frost heave, and

d) designed and constructed in accordance with good engineering practice.

2.4.7. Cleanouts

2.4.7.1. Cleanouts for Drainage Systems

1) Every *sanitary drainage system* and *storm drainage system* shall be provided with *cleanouts* that will permit cleaning of the entire system. (See Appendix A.)

2) A *cleanout* fitting shall be provided on the upstream side and directly over every running *trap*.

3) Every interior *leader* shall be provided with a *cleanout* fitting at the bottom of the *leader* or not more than 3 m upstream from the bottom of the *leader*.

4) Where a *cleanout* is required on a *building sewer* 8 inches or larger in *size*, it shall be a manhole.

5) A *building sewer* shall not change direction or slope between the *building* and public sewer or between *cleanouts*, except that pipes not more than 6 inches in *size* may change direction

a) by not more than 5° every 3 m, or

b) by the use of fittings with a cumulative change in direction of not more than 45°.

6) Every *building drain* shall be provided with a *cleanout* fitting that is located as close as practical to the place where the *building drain* leaves the *building*. (See Appendix A.)

7) Every *soil-or-waste stack* shall be provided with a *cleanout* fitting

a) at the bottom of the stack,

b) not more than 3 m upstream of the bottom of the stack, or

c) on a Y fitting connecting the stack to the *building drain* or *branch*.

8) A *cleanout* shall be provided to permit the cleaning of the piping downstream of an *interceptor*.

9) *Cleanouts* shall be installed so that the cumulative change in direction is not more than 90° between *cleanouts* in a drip pipe from a food receptacle or in a *fixture drain* serving a kitchen sink. (See Appendix A.)

2.4.7.2. Size and Spacing of Cleanouts

1) Except as provided in Sentences (2) and (3), the *size* and spacing of *cleanouts* in *nominally horizontal* pipes of a *drainage system* shall conform to Table 2.4.7.2.

Table 2.4.7.2.
Permitted Size and Spacing of Cleanouts
Forming part of Sentence 2.4.7.2.(1)

Size of Drainage Pipe, inches	Minimum *Size* of *Cleanout*, inches	Maximum Spacing, m	
		One-Way Rodding	Two-Way Rodding
less than 3	Same *size* as drainage pipe	7.5	15
3 and 4	Same *size* as drainage pipe	15	30
over 4	4	26	52

2) The spacing between manholes serving a *building sewer*

a) 24 inches or less in *size* shall not exceed 90 m, and

b) over 24 inches in *size* shall not exceed 150 m.

3) The *developed length* of a *building sewer* between the *building* and the first manhole to which the *building sewer* connects shall not exceed 75 m.

4) Where a *building sewer* connects to another *building sewer* other than by a manhole, the *developed length* between the *building* and the *building sewer* to which it connects shall not exceed 30 m.

5) *Cleanouts* that allow rodding in one direction only shall be installed to permit rodding in the direction of flow.

2.4.7.3. Manholes

1) A manhole including the cover shall be designed to support all loads imposed upon it.

2) A manhole shall be provided with

a) a cover that provides an airtight seal if located within a *building*,

b) a rigid ladder of a corrosion-resistant material where the depth exceeds 1 m, and

c) a vent to the exterior if the manhole is located within a *building*.

3) A manhole shall have a minimum horizontal dimension of 1 m, except that the top 1.5 m may be tapered from 1 m down to a minimum of 600 mm at the top.

4) A manhole in a *sanitary drainage system* shall be channeled to direct the flow of effluent.

2.4.7.4. Location of Cleanouts

1) *Cleanouts* and access covers shall be located so that their openings are readily accessible for drain cleaning purposes.

2) A *cleanout* shall not be

a) located in a floor assembly in a manner that may constitute a hazard, or

b) used as a floor drain.

3) There shall be no change of direction between a *cleanout* fitting and the *trap* that it serves.

4) The piping between a *cleanout* fitting and the drainage piping or vent piping that it serves shall not change direction by more than 45°.

5) *Cleanouts* serving *fixtures* in health care facilities, mortuaries, laboratories and similar *occupancies*, where contamination by body fluids is likely, shall be located a minimum of 150 mm above the *flood level rim* of the *fixture*.

2.4.8. Minimum Slope and Length of Drainage Pipes

2.4.8.1. Minimum Slope

1) Except as provided in Articles 2.4.10.8. and 2.4.10.9., every drainage pipe that has a *size* of 3 inches or less shall have a downward slope in the direction of flow of at least 1 in 50. (See Appendix A.)

2.4.8.2. Length of Fixture Outlet Pipes

1) Except for *fixture outlet pipes* installed in conformance with Sentence 2.4.5.1.(3), the *developed length* of every *fixture outlet pipe* shall not exceed 1 200 mm. (See Appendix A.) (See also A-2.4.5.1.(2) in Appendix A.)

2.4.9. Size of Drainage Pipes

2.4.9.1. No Reduction in Size

1) A *soil-or-waste pipe* shall be of a *size* not less than the *size* of

a) a *vent pipe* that is connected to it, or

b) the largest *soil-or-waste pipe* that drains into it.

2.4.9.2. Serving Water Closets

1) The *size* of every drainage pipe that serves a water closet shall be not less than 3 inches.

2) The *size* of every *branch* or *building drain* downstream of the third water closet *fixture drain* connection shall be not less than 4 inches.

3) The *size* of every *soil-or-waste stack* that serves more than 6 water closets shall be not less than 4 inches.

4) The *size* of discharge pipe serving a macerating toilet <system> shall be not less than ¾ inch.

2.4.9.3. Size of Fixture Outlet Pipes

1) Except as provided in Sentence (2), the *size* of every *fixture outlet pipe* shall conform to Table 2.4.9.3.

2) The part of the *fixture outlet pipe* that is common to 3 compartments of a sink shall be one *size* larger than the largest *fixture outlet pipe* of the compartments that it serves. (See Appendix A.)

Table 2.4.9.3.
Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures(1)
Forming part of Sentences 2.4.9.3.(1) and 2.4.10.2.(1)

Fixture	Minimum *Size* of *Fixture Outlet Pipe*, inches	Hydraulic Load, *fixture units*
Autopsy table	1½	2
Bathroom group		
(a) with flush tank	n/a	6
(b) with direct flush valve	n/a	8
Bathtub (with or without shower)	1½	1½
Bath: foot, sitz or slab	1½	1½
Beer cabinet	1½	1½
Bidet	1¼	1
Clothes washer		
(a) domestic(1)	n/a	<2 with 2-in.> *trap*
(b) commercial	n/a	2 with <2-in.> *trap*
Dental unit or cuspidor	1¼	1
Dishwasher		
(a) domestic type	1½	1½ no load when connected to garbage grinder or domestic sink
(b) commercial type	2	3
Drinking fountain	1¼	½
Floor drain(2)	2	2 with 2-in. *trap*
		3 with 3-in. *trap*
Garbage grinder, commercial type	2	3
Icebox	1¼	1
Laundry tray		
(a) single or double units or 2 single units with common *trap*	1½	1½
(b) 3 compartments	1½	2
Lavatory		
(a) barber or beauty parlor	1½	1½
(b) dental	1¼	1
(c) domestic type, single or	1¼	1 with 1¼-in. *trap*
2 single with common *trap*		1½ with 1½-in. *trap*
(d) multiple or industrial type	1½	according to Table 2.4.10.2.
<Macerating toilet system>	<¾>	<4>
Potato peeler	2	3
Shower drain		
(a) from 1 head	1½	1½
(b) from 2 or 3 heads	2	3
(c) from 4 to 6 heads	3	6

Table 2.4.9.3.
Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures(1)
Forming part of Sentences 2.4.9.3.(1) and 2.4.10.2.(1)

Fixture	Minimum *Size* of *Fixture Outlet Pipe*, inches	Hydraulic Load, *fixture units*
Sink		
(a) domestic and other small types with or without garbage grinders, single, double or 2 single with a common *trap*	1½	1½
(b) Other sinks	1½	1½ with 1½-in. *trap*
		2 with 2-in. *trap*
		3 with 3-in. *trap*
Urinal		
(a) pedestal, siphon-jet or blowout type	2	4
(b) stall, washout type	2	2
(c) wall		
(i) washout type	1½	1½
(ii) other types	2	3
Water closet		
(a) with flush tank	3	4
(b) with direct flush valve	3	6

Notes to Table 2.4.9.3.:
(1) See Appendix A.
(2) No hydraulic load for *emergency floor drains*.

3) Where clothes washers do not drain to a laundry tray, the *trap* inlet shall be fitted with a vertical standpipe that is not less than 600 mm long measured from the *trap weir* and terminates above the *flood level rim* of the clothes washer. (See Appendix A.)

2.4.9.4. Size of Building Drain and Building Sewer

1) The *size* of every *building drain* and *building sewer* connected to the public sewer system downstream of the main *cleanout* (see Sentence 2.4.7.1.(6)) shall be not less than 4 inches.

2.4.9.5. Offset in Leaders

1) No change in the *size* of a *leader* with a *nominally horizontal offset* is required if the *offset*
a) is located immediately under the roof,
b) is not more than 6 m long, and
c) has a slope of not less than 1 in 50.

2) If the horizontal *offset* is more than 6 m long, the *leader* shall conform to Table 2.4.10.9.

2.4.10. Hydraulic Loads

(See Appendix A for determination of hydraulic loads and drainage pipe *sizes*.)

2.4.10.1. Total Load on a Pipe

1) The hydraulic load on a pipe is the total load from
a) every *fixture* that is connected to the system upstream of the pipe,
b) every *fixture* for which provision is made for future connection upstream of the pipe, and
c) all roofs and paved surfaces that drain into the system upstream of the pipe.

2.4.10.2. Hydraulic Loads for Fixtures

1) The hydraulic load from a *fixture* that is listed in Table 2.4.9.3. is the number of *fixture units* set forth in the Table.

2) Except as provided in Sentence (1), the hydraulic load from a *fixture* that is not listed in Table 2.4.9.3. is the number of *fixture units* set forth in Table 2.4.10.2. for the *trap* of the *size* that serves the *fixture*.

Table 2.4.10.2.
Permitted Hydraulic Load from a Fixture Based on Size of Trap
Forming part of Sentence 2.4.10.2.(2)

Size of *trap*, inches	Hydraulic Load, *fixture units*
1¼	1
1½	2
2	3
2½	4
3	5
4	6

2.4.10.3. Hydraulic Loads from Fixtures with a Continuous Flow

1) Except as provided in Sentence (2), the hydraulic load from a *fixture* that produces a continuous flow, such as a pump or an air-conditioning *fixture*, is 31.7 *fixture units* for each litre per second of flow.

2) Where a *fixture* or equipment that produces a continuous or semi-continuous flow drains to a *combined sewer* or to a *storm sewer*, the hydraulic load from the *fixture* is 900 L for each litre per second of flow.

2.4.10.4. Hydraulic Loads from Roofs or Paved Surfaces

1) Except as provided in Sentence (2), the hydraulic load in litres from a roof or paved surface is the maximum 15 min rainfall determined in conformance with Subsection 1.1.3. of Division B of <Book I (General) of this Code>, multiplied by the sum of

a) the area in square metres of the horizontal projection of the surface drained, and

b) one-half the area in square metres of the largest adjoining vertical surface.

(See Appendix A.)

2) *Flow control roof drains* may be installed provided

a) the maximum drain down time does not exceed 24 h,

b) the roof structure is designed to carry the load of the stored water,

c) one or more scuppers are installed <not more than 30 m apart along the perimeter of the *building* so that>

i) <up to 200% of the 15-minute rainfall intensity can be handled, and>

ii) <the maximum depth of controlled water is limited to 150 mm,>

d) they are located not more than 15 m from the edge of the roof and not more than 30 m from adjacent drains, and

e) there is at least one drain for each 900 m^2.

3) Hydraulic loads in litres per second for *flow control roof drains* and restricted paved area drains shall be determined according to rain intensity-duration frequency curves as compiled by Environment Canada using 25-year frequencies.

4) <Where the height of the parapet is more than 150 mm or exceeds the height of the adjacent wall flashing,

a) emergency roof overflows or scuppers described in Clause (2)(c) shall be provided, and

b) there shall be a minimum of 2 *roof drains*.>

2.4.10.5. Conversion of Fixture Units to Litres

1) Except as provided in Sentence 2.4.10.3.(2), where the hydraulic load is to be expressed in litres, *fixture units* shall be converted as follows:

a) when the number of *fixture units* is 260 or fewer, the load is 2 360 L, and

b) when the number of *fixture units* exceeds 260, the load is 9.1 L for each *fixture unit*.

2.4.10.6. Hydraulic Loads to Soil-or-Waste Pipes

1) Except as provided in Sentence (2), the hydraulic load that is drained to every *soil-or-waste stack* shall conform to Table 2.4.10.6.A.

2) Where the *nominally horizontal offset* in a *soil-or-waste stack* is 1.5 m or more, the hydraulic load that is served by it shall conform to Table 2.4.10.6.B or Table 2.4.10.6.C, whichever is the less restrictive.

Table 2.4.10.6.A
Maximum Permitted Hydraulic Load Drained to a Soil-or-Waste Stack
Forming part of Sentence 2.4.10.6.(1)

Size of Stack, inches	Maximum Hydraulic Load, *fixture units*	Maximum *Fixture Units* Drained from any 1 *Storey*
1¼	2	2
1½	8	2
2	24	6
3	102	18
4	540	100
5	1 400	250
6	2 900	500
8	7 600	830
10	15 000	2 700
12	26 000	4 680
15	50 000	9 000

Table 2.4.10.6.B
Maximum Permitted Hydraulic Load Drained to a Branch
Forming part of Sentence 2.4.10.6.(2) and Article 2.4.10.7.

Size of *Branch*, inches	Maximum Hydraulic Load, *fixture units*
1¼	2
1½	3
2	6
2½	12
3	27
4	180
5	390
6	700
8	1 600
10	2 500
12	3 900

Table 2.4.10.6.C
Maximum Permitted Hydraulic Load Drained to a Sanitary Building Drain or Sewer
Forming part of Sentence 2.4.10.6.(2) and Article 2.4.10.8.

Size of Drain or Sewer, inches	Maximum Hydraulic Load, *fixture units*					
	Slope					
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 50	1 in 25
3	—	—	—	—	27	36
4	—	—	—	180	240	300
5	—	—	380	390	480	670
6	—	—	600	700	840	1 300
8	—	1 400	1 500	1 600	2 250	3 370
10	—	2 500	2 700	3 000	4 500	6 500
12	2 240	3 900	4 500	5 400	8 300	13 000
15	4 800	7 000	9 300	10 400	16 300	22 500

2.4.10.7. Hydraulic Loads on Branches

1) The hydraulic load that is drained to a *branch* shall conform to Table 2.4.10.6.B.

2.4.10.8. Hydraulic Loads on Sanitary Building Drains or Sewers

1) The hydraulic load that is drained to a *sanitary building drain* or a *sanitary building sewer* shall conform to Table 2.4.10.6.C.

2.4.10.9. Hydraulic Loads on Storm or Combined Building Drains or Sewers

1) The hydraulic load that is drained to a *storm building drain*, a *storm building sewer* or a *combined building sewer* shall conform to Table 2.4.10.9.

Table 2.4.10.9.
Maximum Permitted Hydraulic Load Drained to a Storm Building Drain or Sewer or a Combined Building Sewer
Forming part of Article 2.4.10.9.

Size of Drain or Sewer, inches	Maximum Hydraulic Load, L						
	Slope						
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 68	1 in 50	1 in 25
3	—	—	—	—	<—>	2 770	3 910
4	—	—	—	4 220	5 160	5 970	8 430
5	—	—	6 760	7 650	9 350	10 800	15 300
6	—	—	10 700	12 400	15 200	17 600	24 900
8	—	18 900	23 200	26 700	32 800	37 800	53 600
10	—	34 300	41 900	48 500	59 400	68 600	97 000
12	37 400	55 900	68 300	78 700	96 500	112 000	158 000
15	71 400	101 000	124 000	143 000	175 000	202 000	287 000

2.4.10.10. Hydraulic Loads to Roof Gutters

1) The hydraulic load that is drained to a *roof gutter* shall conform to Table 2.4.10.10.

Table 2.4.10.10.
Maximum Permitted Hydraulic Load Drained to a Roof Gutter
Forming part of Article 2.4.10.10.

Size of Gutter, inches	Area of Gutter, cm^2	Maximum Hydraulic Load, L			
		Slope			
		1 in 200	1 in 100	1 in 50	1 in 25
3	22.8	406	559	812	1 140
4	40.5	838	1 190	1 700	2 410
5	63.3	1 470	2 080	2 950	4 170
6	91.2	2 260	3 200	4 520	6 530
7	124.1	3 250	4 600	6 500	9 190
8	162.1	4 700	6 600	9 400	13 200
10	253.4	8 480	12 000	17 000	23 600

2.4.10.11. Hydraulic Loads on Leaders

1) The hydraulic load that is drained to a *leader* shall conform to Table 2.4.10.11.

Table 2.4.10.11.
Maximum Permitted Hydraulic Load Drained to a Leader
Forming part of Article 2.4.10.11.

Circular *Leader*		Non-Circular *Leader*	
Size of *Leader*, inches	Maximum Hydraulic Load, L	Area of *Leader*, cm^2	Maximum Hydraulic Load, L
2	1 700	20.3	1 520
2½	3 070	31.6	2 770
3	5 000	45.6	4 500
4	10 800	81.1	9 700
5	19 500	126.6	17 600
6	31 800	182.4	28 700
8	68 300	324.3	61 500

2.4.10.12. Hydraulic Loads from Fixtures with a Semi-continuous Flow

1) The hydraulic load from a *fixture* or equipment that produces a semi-continuous flow shall conform to Table 2.4.10.12.

Table 2.4.10.12.
Maximum Permitted Hydraulic Load from Fixtures with a Semi-continuous Flow
Forming part of Sentence 2.4.10.12.(1)

Trap Size, inches	Flow, L/s	Hydraulic Load, *fixture units*
1½	0.00 - 0.090	3
2	0.091 - 0.190	6
3	0.191 - 0.850	27
4	0.851 - 5.700	180

2.4.10.13. Design of Storm Sewers

1) Except as provided in Sentences 2.4.10.4.(1) and (2), and Article 2.4.10.9., *storm sewers* may be designed in accordance with good engineering practice.

Section 2.5. Venting Systems

2.5.1. Vent Pipes for Traps

2.5.1.1. Venting for Traps

1) Except as provided in Sentences (3) and (4), every *trap* shall be protected by a *vent pipe*.

2) *Drainage systems* may require additional protection as provided in Subsections 2.5.4. and 2.5.5. by the installation of

a) *branch vents*,

b) *vent stacks*,

c) *stack vents*,

d) *vent headers*,

e) *fresh air inlets*,

f) *relief vents*,

g) *circuit vents*,

h) *yoke vents*,

i) *offset relief vents*,

j) *additional circuit vents*,

k) *wet vents*,

l) *individual vents*,

m) *dual vents*, or

n) *continuous vents*.

3) A *trap* that serves a floor drain need not be protected where

a) the *size* of the *trap* is not less than 3 inches,

b) the length of the *fixture drain* is not less than 450 mm, and

c) the fall on the *fixture drain* does not exceed its *size*.

(See Appendix A.)

4) A *trap* need not be protected by a *vent pipe*

a) where it serves

i) a *subsoil drainage pipe*, or

ii) a *storm drainage system*, or

b) where it forms part of an indirect *drainage system*. (See also Clause 2.4.2.3.(2)(b).)

(See Appendix A.)

2.5.2. Wet Venting

2.5.2.1. Wet Venting

(See Appendix A.)

1) A *soil-or-waste pipe* may serve as a *wet vent* provided that

a) the hydraulic load is in accordance with Table 2.5.8.1.,

b) the number of wet-vented water closets does not exceed 2,

c) where 2 water closets are installed, they are connected at the same level by means of a double sanitary T fitting if the *vent pipe* is vertical and by means of a double Y fitting if the *vent pipe* is horizontal,

d) the water closets are installed downstream of all other *fixtures*,

e) *trap arms* and *fixture drains* connected to the *wet vent* do not exceed 2 inches in *size*, except for connections from *emergency floor drains* in accordance with Sentence 2.5.1.1.(3),

f) the total hydraulic load on the *wet vent* does not exceed the limits stated in Table 2.5.8.1. when separately vented *branches* or *fixture drains* in the same *storey*, having a total hydraulic load not greater than 2 *fixture units*, are connected to the *wet vent* or a wet-vented water closet *trap arm*,

g) the hydraulic load <of separately vented *fixtures* that drain into the *wet vent* are not included when sizing the *continuous vent* that serves the *wet vent*,>

h) where a *wet vent* extends through more than one *storey*, the total discharge from any one *storey* above the first *storey* does not exceed 4 *fixture units*,

i) there is not more than one *nominally horizontal offset* in the *wet vent*, and

   i) the *offset* does not exceed 1.2 m for pipes 2 inches or less in *size*, or

   ii) the *offset* does not exceed 2.5 m for pipes larger than 2 inches in *size*,

j) the wet-vented portion is not reduced in *size* except for the portion that is upstream of *emergency floor drains* in accordance with Sentence 2.5.1.1.(3), and

k) the length of the *wet vent* is not limited.

2.5.3. Circuit Venting

2.5.3.1. Circuit Venting

(See Appendix A.)

1) A section of horizontal *branch* may be circuit-vented provided

a) a *circuit vent* is connected to it,

b) all *fixtures* served by the *circuit vent* are located in the same *storey*, and

c) no *soil-or-waste stack* is connected to it upstream of a circuit-vented *fixture*.

2) *Fixtures* with *fixture outlet pipes* less than 2 inches in *size* shall be separately vented or separately circuit-vented.

3) Except as provided in Sentences (4) and (5), a *relief vent* shall be connected to the *branch* that forms part of a circuit-vented system, downstream of the connection of the most downstream circuit-vented *fixture*.

4) A *soil-or-waste pipe* having a hydraulic load not greater than 6 *fixture units* may act as a *relief vent* for a *branch* that is circuit-vented.

5) A symmetrically connected *relief vent* may serve as a combined *relief vent* for a maximum of 2 *branches* that are circuit-vented, provided there are not more than 8 circuit-vented *fixtures* connected between the combined *relief vent* and each *circuit vent*.

6) *Additional circuit vents* shall be required

a) where each cumulative horizontal change in direction of a *branch* served by a *circuit vent* exceeds 45° between *vent pipe* connections, or

b) where more than 8 circuit-vented *fixtures* are connected to a *branch* between *vent pipe* connections.

7) A *soil-or-waste pipe* may serve as an *additional circuit vent* in accordance with Sentence (6) provided that the *soil-or-waste pipe* is sized as a *wet vent* in conformance with Article 2.5.8.1. and is not less than 2 inches in *size*.

8) Connections to *circuit vents* and *additional circuit vents* in accordance with Sentence (6) shall conform to Sentence 2.5.4.5.(1).

9) A circuit-vented *branch*, including the *fixture drain* downstream of the *circuit vent* connection, shall be sized in accordance with Article 2.4.10.7., except that it shall be not less than

a) 2 inches, where *traps* less than 2 inches in *size* are circuit-vented, or

b) 3 inches, where *traps* 2 inches in *size* or larger are circuit-vented.

10) *Additional circuit vents* shall be sized in accordance with Table 2.5.7.1. and Sentence 2.5.7.3.(1).

11) The hydraulic load on a *circuit vent* shall include the hydraulic load from *fixtures* connected to the *branch* served by the *circuit vent*, but shall not include the hydraulic load from *fixtures* permitted by Sentences (3), (4) and (5).

2.5.4. Vent Pipes for Soil-or-Waste Stacks

2.5.4.1. Stack Vents

1) The upper end of every *soil-or-waste stack* shall terminate in a *stack vent*.

2.5.4.2. Vent Stacks

1) Except as provided in Sentence (2), every *soil-or-waste stack* <draining *fixtures* from more than 4 *storeys*> shall have a *vent stack*.

2) A *soil-or-waste stack* that serves as a *wet vent* does not require a *vent stack*.

3) The *vent stack* required by Sentence (1) shall be connected to a vertical section of the *soil-or-waste stack* at or immediately below the lowest *soil-or-waste pipe* connected to the *soil-or-waste stack*.

4) *Fixtures* may be connected to a *vent stack* provided

a) the total hydraulic load of the connected *fixtures* does not exceed 8 *fixture units*,

b) at least one *fixture* is connected to a vertical portion of the *vent stack* and upstream of any other *fixtures*,

c) no other *fixture* is connected downstream of a water closet,

d) all *fixtures* are located in the lowest *storey* served by the *vent stack*, and

e) the section of the *vent pipe* that acts as a *wet vent* conforms to the requirements regarding *wet vents*.

2.5.4.3. Yoke Vents

(See Appendix A.)

1) Except as provided in Sentence (4), where a *soil-or-waste stack* receives the discharge from *fixtures* located on more than 11 *storeys*, a *yoke vent* shall be installed

a) for each section of 5 *storeys* or part thereof counted from the top down, and

b) at or immediately above each *offset* or double *offset*.

2) The *yoke vent* shall be connected to the *soil-or-waste stack* by means of a drainage fitting at or immediately below the lowest *soil-or-waste pipe* from the lowest *storey* of the sections described in Sentence (1).

3) The *yoke vent* shall connect to the *vent stack* at least 1 m above the floor level of the lowest *storey* in the section described in Sentence (1).

4) A *yoke vent* need not be installed provided the *soil-or-waste stack* is interconnected with the *vent stack* in each *storey* of the section in which *fixtures* are located by means of a *vent pipe* equal in *size* to the *branch* or *fixture drain* or 2 inches in *size*, whichever is smaller.

2.5.4.4. Offset Relief Vents

1) A *soil-or-waste stack* that has a *nominally horizontal offset* more than 1.5 m long and above which the upper vertical portion of the stack passes through more than 2 *storeys* and receives a hydraulic load of more than 100 *fixture units* shall be vented by an *offset relief vent* connected to the vertical section immediately above the *offset* and by another *offset relief vent*

a) connected to the lower vertical section at or above the highest *soil-or-waste pipe* connection, or

b) extended as a vertical continuation of the lower section.

(See Appendix A.)

2.5.4.5. Fixtures Draining into Vent Pipes

1) The *trap arm* of a *fixture* that has a hydraulic load of not more than 1½ *fixture units* may be connected to the vertical section of a *circuit vent*, *additional circuit vent*, *offset relief vent* or *yoke vent*, provided that

a) not more than 2 *fixtures* are connected to the *vent pipe*,

b) where 2 *fixtures* are connected to the *vent pipe*, the connection is made by means of a double sanitary T fitting, and

c) the section of the *vent pipe* that acts as a *wet vent* conforms to the requirements regarding *wet vents*.

(See Appendix A.)

2.5.5. Miscellaneous Vent Pipes

2.5.5.1. Venting of Sewage Sumps

1) Every sump that receives *sewage* shall be provided with a *vent pipe* that is connected to the top of the sump. (See Article 2.5.7.7. for sizing of these vents.)

2.5.5.2. Venting of Oil Interceptors

<(See Appendix A.) (See also Article 4.3.5.2. of Division B of the British Columbia Fire Code.)>

1) Every oil *interceptor* shall be provided with 2 *vent pipes* that

a) connect to the *interceptor* at opposite ends,

b) extend independently to outside air, and

c) terminate not less than 2 m above ground and at elevations differing by at least 300 mm.

2) Adjacent compartments within every oil *interceptor* shall be connected to each other by a vent opening.

3) Where a secondary receiver for oil is installed in conjunction with an oil *interceptor*, it shall be vented in accordance with the manufacturer's recommendations, and the *vent pipe* shall

a) in no case be less than 1½ inches in *size*,

b) extend independently to outside air, and

c) terminate not less than 2 m above ground.

4) The *vent pipes* referred to in Sentence (1) are permitted to be one *size* smaller than the largest connected drainage pipe but not less than 1¼ inches in *size*, or can be sized in accordance with the manufacturer's recommendations.

5) Every *vent pipe* that serves an <oil *interceptor*> and is located outside a *building* shall be not less than 3 inches in *size* in areas where it may be subject to frost closure.

2.5.5.3. Venting of Drain Piping and Dilution Tanks for Corrosive Waste

1) *Venting systems* for drain piping or dilution tanks conveying corrosive waste shall extend independently and terminate in outside air. (See Article 2.5.7.7. for sizing of these vents.)

2.5.5.4. Fresh Air Inlets

1) Where a *building trap* is installed, a *fresh air inlet* not less than 4 inches in *size* shall be connected upstream and within 1.2 m of the *building trap* and downstream of any other connection. (See A-2.4.5.4.(1) in Appendix A.)

2.5.5.5. Provision for Future Installations

1) Where provision is made for a *fixture* to be installed in the future, the *drainage system* and *venting system* shall be sized accordingly and provision shall be made for the necessary future connections.

2) Except as required in Sentence 2.5.7.7.(2), where a *plumbing system* is installed in a *building*, every *storey* in which plumbing is or may be installed, including the basement of a single-family dwelling, shall have extended into it or passing through it a *vent pipe* that is at least 1½ inches in *size* for the provision of future connections.

2.5.6. Arrangement of Vent Pipes

2.5.6.1. Drainage of Vent Pipes

1) Every *vent pipe* shall be installed without depressions in which moisture can collect.

2.5.6.2. Vent Pipe Connections

1) Every *vent pipe* shall be installed in a *nominally vertical* position where it is practical to do so.

2) Except for *wet vents*, where a *vent pipe* is connected to a *nominally horizontal soil-or-waste pipe*, the connection shall be above the horizontal centre line of the *soil-or-waste pipe*. (See Appendix A.)

3) Unused *vent pipes* installed for future connections shall be permanently capped with an end *cleanout* or an adapter and plug.

2.5.6.3. Location of Vent Pipes

1) Except as provided in Sentences (2) and (3), a *vent pipe* that protects a *fixture trap* shall be located so that

a) the *developed length* of the *trap arm* is not less than twice the *size* of the *fixture drain*,

b) the total fall of the *trap arm* is not greater than its inside diameter, and

c) the *trap arm* does not have a cumulative change in direction of more than 135°.

(See Appendix A.)

2) The *trap arm* of water closets, of S-*trap standards* or of any other *fixture* that also discharges vertically and depends on siphonic action for its proper functioning shall not have a cumulative change in direction of more than 225°. (See Appendix A.)

3) A *vent pipe* that protects a water closet or any other *fixture* that also depends on siphonic action for its proper functioning shall be located so that the distance between the connections of the *fixture drain* to the *fixture* and the *vent pipe* does not exceed

a) 1 m in the vertical plane, and

b) 3 m in the horizontal plane.

(See Appendix A.)

4) The maximum length of every *trap arm* shall conform to Table 2.5.6.3.

Table 2.5.6.3.
Length of Trap Arm
Forming part of Sentence 2.5.6.3.(4)

Size of *Trap* Served, inches	Maximum Length of *Trap Arm*, m	Minimum Slope
1¼	1.5	1/50
1½	1.8	1/50
2	2.4	1/50
3	3.6	1/50
4	9.8	1/100

2.5.6.4. Connection of Vents above Fixtures Served

1) Except for a *wet vent*, every *vent pipe* shall extend above the *flood level rim* of every *fixture* that it serves before being connected to another *vent pipe*.

2) No *vent pipe* shall be connected in such a manner that a blockage in a *soil-or-waste pipe* would cause waste to drain through the *vent pipe* to the *drainage system*.

2.5.6.5. Terminals

1) Except as provided in Sentence (3), the upper end of every *vent pipe* that is not terminated in outside air shall be connected to a *venting system* that terminates through a roof to outside air.

2) The upper end of every *vent pipe* that is terminated in outside air, other than a *vent pipe* that serves an oil *interceptor* or a *fresh air inlet*, shall be extended above the roof.

3) A *vent pipe* may be erected outside a *building*, provided that

a) no single change in direction of the *vent pipe* exceeds 45°,

b) all parts of the *vent pipe* are *nominally vertical*,

c) in areas where the *vent pipe* may be subject to frost closure, it is increased to not less than 3 inches in *size* before penetrating a wall or roof, and

d) where the *building* is 4 *storeys* or less in height, the *vent pipe* terminates above the roof of the *building*.

4) Except for a *fresh air inlet*, where a *vent pipe* is terminated in outside air, the terminal shall be located

a) not less than 1 m above or not less than 3.5 m in any other direction from every air inlet, openable window or door,

b) not less than 2 m above or not less than 3.5 m in any other direction from a roof that supports an *occupancy*,

c) not less than 2 m above ground, and

d) not less than 1.8 m from every property line.

(See Appendix A.)

5) Where a *vent pipe* passes through a roof, it shall

a) be terminated high enough to prevent the entry of roof drainage but not less than 150 mm above the roof or above the surface of *storm water*, which could pond on the roof (see A-2.5.6.5.(4) in Appendix A), and

b) be provided with flashing to prevent the entry of water between the *vent pipe* and the roof (see Article 2.2.10.14.).

6) Where a *vent pipe* passes through a roof and may be subject to frost closure, it shall be protected from frost closure by

a) increasing its diameter at least one *size*, but not less than 3 inches in *size*, immediately before it penetrates the roof,

b) insulating the pipe, or

c) protecting it in some other manner.

(See Article 2.3.4.7.)

2.5.7. Minimum Size of Vent Pipes

2.5.7.1. General

1) The *size* of every *vent pipe* shall conform to Table 2.5.7.1.

Table 2.5.7.1.
Minimum Permitted Size of Vent Pipe Based on Size of Trap Served
Forming part of Sentences 2.5.7.1.(1) and 2.5.8.2.(1)

Size of *Trap* Served, inches	Minimum *Size* of *Vent Pipe*, inches
1¼	1¼
1½	1¼
2	1½
3	1½
4	1½
5	2
6	2

2.5.7.2. Size Restriction

1) The *size* of a *branch vent*, *stack vent*, *vent stack* or *vent header* shall be not less than the *size* of the *vent pipe* to which it is connected.

2.5.7.3. Additional Circuit Vents and Relief Vents

1) Except as provided in Article 2.5.7.1. and in Sentence 2.5.3.1.(7), the minimum *size* of an *additional circuit vent* or *relief vent* installed in conjunction with a *circuit vent* is permitted to be one *size* smaller than the required *size* of the *circuit vent*, but need not be larger than 2 inches.

2) The *size* of the *soil-or-waste pipe* acting as a *relief vent* in accordance with Sentence 2.5.3.1.(4) shall be in conformance with <Tables 2.4.10.6.A, 2.4.10.6.B or 2.5.8.1.,> and Article 2.5.7.1., whichever *size* is the largest considering the hydraulic load drained into the *soil-or-waste pipe*.

2.5.7.4. Offset Relief Vents

1) Except as provided in Article 2.5.7.1., the minimum *size* of an *offset relief vent* is permitted to be one *size* smaller than the *size* of the *stack vent*.

2.5.7.5. Yoke Vents

1) *Yoke vents* required by Sentence 2.5.4.3.(1) are permitted to be one *size* smaller than the *size* of the smallest pipe to which they are connected.

2.5.7.6. Vent Pipes for Manholes

1) The minimum *size* of a *vent pipe* that serves a manhole within a *building* shall be 2 inches.

2.5.7.7. Vents for Sewage Sumps, Dilution Tanks and Macerating Toilet Systems

1) Except as provided in Sentences (2) and (3), the minimum *size* of the *vent pipe* for a *sewage* sump or dilution tank shall be one *size* smaller than the *size* of the largest *branch* or *fixture drain* draining to the sump.

2) The *size* of every *vent pipe* for a *sewage* sump or dilution tank shall be not less than 2 inches, but need not be greater than 4 inches.

3) The *size* of a *vent pipe* for a macerating toilet system with a sump shall be not less than 1½ inches.

2.5.8. Sizing of Vent Pipes

(See Appendix A for an explanation on the sizing of *vent pipes*.)

2.5.8.1. Hydraulic Loads Draining to Wet Vents

1) The hydraulic load that drains to a *wet vent* shall conform to Table 2.5.8.1.

2) When determining the *size* of a *wet vent*, the hydraulic load from the most downstream *fixture* or symmetrically connected *fixtures* shall not be included. (See Appendix A.)

Table 2.5.8.1.
Maximum Permitted Hydraulic Loads Drained to a Wet Vent
Forming part of Sentence 2.5.8.1.(1)

Size of *Wet Vent*, inches	Maximum Hydraulic Load, *fixture units*	
	Not Serving Water Closets	*Fixtures*, Other Than Water Closets, That Serve Not More Than 2 Water Closets
1½	2	—
2	4	3
3	12	8
4	36	14
5	—	18
6	—	23

2.5.8.2. Individual Vents and Dual Vents

1) The *size* of *individual vents* and *dual vents* shall be determined using Table 2.5.7.1. based on the largest *trap* served.

2) When sizing an *individual vent* or a *dual vent*, the length is not taken into consideration.

2.5.8.3. Branch Vents, Vent Headers, Continuous Vents and Circuit Vents

(See A-2.5.8.3. and 2.5.8.4. in Appendix A.)

1) *Branch vents*, *vent headers*, *circuit vents* and *continuous vents* shall be sized in accordance with Table 2.5.8.3.**<**, unless they are *individual vents* or *dual vents*.**>**

2) For the purposes of Table 2.5.8.3., the length of a *branch vent* shall be its *developed length* from the most distant *soil-or-waste pipe* connection to a *vent stack*, *stack vent*, *vent header* or outside air.

3) For the purposes of Table 2.5.8.3., the length of a *vent header* shall be its *developed length* from the most distant *soil-or-waste pipe* connection to outside air.

4) For the purposes of Table 2.5.8.3., the length of a *circuit vent* shall be its *developed length* from the horizontal *soil-or-waste pipe* connection to a *vent stack*, *stack vent*, *vent header* or outside air.

5) For the purposes of Table 2.5.8.3., the length of a *continuous vent* shall be its *developed length* from the vertical *soil-or-waste pipe* connection to a *vent stack*, *stack vent*, *vent header* or outside air.

Table 2.5.8.3.
Sizing of Branch Vents, Vent Headers, Circuit Vents and Continuous Vents
Forming part of 2.5.8.3.

Total Hydraulic Load Served by *Vent Pipe*, *fixture units*	*Size* of *Vent Pipe*, inches							
	1¼	1½	2	3	4	5	6	8
	Maximum Length of *Vent Pipe*, m							
2	9							
8	9	30	61					
20	7.5	15	46			Not Limited		
24	4.5	9	30					
42		9	30					
60		4.5	15	120				
100			11	79	305			
200			9	76	275			
500			6	55	215			
1 100				15	61	215		
1 900				6	21	61	215	
2 200		Not Permitted			9	27	105	335
3 600					7.5	18	76	245
5 600						7.5	18	76

2.5.8.4. Vent Stacks or Stack Vents

(See A-2.5.8.3. and 2.5.8.4. in Appendix A.)

1) A *vent stack* or *stack vent* shall be sized in accordance with Table 2.5.8.4. based on

a) the length of the *vent stack* or *stack vent*, and

b) the total hydraulic load that is drained to the lowest section of *soil-or-waste stack* or stacks served by the *vent pipe*, plus any additional vent loads connected to the *vent stack* or *stack vent*.

2) For the purposes of Table 2.5.8.4., the length of a *stack vent* or *vent stack* shall be its *developed length* from its lower end to outside air.

3) The minimum *size* of a *vent stack* or *stack vent* shall be one-half the *size* of the *soil-or-waste stack* at its base.

4) A *stack vent* serving a *wet vent* stack that is over 4 *storeys* high shall extend the full *size* of the *wet vent* to outside air.

5) Every <*sanitary building drain*> shall be provided with at least one vent that is not less than 3 inches in *size*.

Table 2.5.8.4.
Size and Developed Length of Stack Vents and Vent Stacks
Forming part of Sentences 2.5.8.4.(1) and (2)

Size of *Soil-or-waste stack*, inches[1]	Total Hydraulic Load Being Vented, *fixture units*	*Size* of *Stack Vent* or *Vent Stack*, inches									
		1¼	1½	2	3	4	5	6	8	10	12
		Maximum Length of *Stack Vent* or *Vent Stack*, m									
1¼	2	9									
1½	8	15	46								
2	12	9	23	61							
	<24>	8	15	46							
3	10		13	46	317						
	21		10	33.5	247			Not Limited			
	53		8	28.5	207						
	102		7.5	26	189						
4	43			10.5	76	299					
	140			8	61	229					
	320			7	52	195					
	540			6.5	46	177					
5	190				25	97.5	302				
	490				19	76	232				
	940				16	64	204				
	1 400				15	58	180				
6	500				10	39.5	122	305			
	1 100				8	30.5	94.5	238			
	2 000				6.5	25.5	79	201			
	2 900				6	23.5	73	183			
8	1 800					9.5	29	73	287		
	3 400					7	22	58	219.5		
	5 600					6	19	49	186		
	7 600					5.5	17	43	170.5		
10	4 000						9.5	24	94.5	292.5	
	7 200						7	18	73	225.5	
	11 000						6	15.5	61	192	
	15 000						5.5	14	55	174	
12	7 300							9.5	36.5	116	287
	13 000							7	28.5	91	219.5
	20 000		Not Permitted					6	24	76	186
	26 000							5.5	22	70	152
15	15 000								12	39.5	94.5
	25 000								9.5	29	73
	38 000								8	24.5	61
	50 000								7	22.5	55

Notes to Table 2.5.8.4.:
(1) <*Soil-or-waste stacks* shall be sized using Table 2.4.10.6.A>

2.5.8.5. Lengths of Other Vent Pipes

1) When sizing an *additional circuit vent*, *offset relief vent*, *relief vent*, *yoke vent*, and the *vent pipe* for an *interceptor*, dilution tank, *sewage* tank, sump, or manhole, length is not taken into consideration.

2.5.9. Air Admittance Valves

(See A-2.2.10.16.(1) in Appendix A.)

2.5.9.1. Air Admittance Valve as a Vent Terminal

1) *Individual vents* may terminate with a connection to an *air admittance valve* as provided in Articles 2.5.9.2. and 2.5.9.3. (See also Sentence 2.2.10.16.(1).)

2.5.9.2. Air Admittance Valves

1) *Air admittance valves* shall only be used to vent

a) *fixtures* located in island counters,

b) *fixtures* that may be affected by frost closure of the vent due to local climatic conditions,

c) *fixtures* in one- and two-family dwellings undergoing renovation, or

d) installations where connection to a vent may not be practical.

2) *Air admittance valves* shall be located

a) not less than 100 mm above the *fixture drain* being vented,

b) within the maximum *developed length* permitted for the vent, and

c) not less than 150 mm above insulation materials.

2.5.9.3. Installation Conditions

1) *Air admittance valves* shall not be installed in supply or return air plenums, or in locations where they may be exposed to freezing temperatures.

2) *Air admittance valves* shall be installed in accordance with the manufacturer's installation instructions.

3) *Air admittance valves* shall be rated for the *size* of *vent pipe* to which they are connected.

4) Installed *air admittance valves* shall be

a) accessible, and

b) located in a space that allows air to enter the valve.

5) Every *drainage system* shall have <at least> one vent that terminates to the outdoors in conformance with <Sentence 2.5.6.5.(1)>.

Section 2.6. Potable Water Systems

2.6.1. Arrangement of Piping

2.6.1.1. Design

1) Every *fixture* supplied with separate hot and cold water controls shall have the hot water control on the left and the cold on the right.

2) In a hot *water distribution system* of a *developed length* of more than 30 m or supplying more than 4 *storeys*, the water temperature shall be maintained by

a) recirculation, or

b) a self-regulating heat tracing system.

2.6.1.2. Drainage

1) A *water distribution system* shall be installed so that the system can be drained or blown out with air.

2.6.1.3. Shut-off Valves

1) Every *water service pipe* shall be provided with an accessible shut-off valve located as close as possible to where the *water service pipe* enters the *building*.

2) Every pipe that conveys water from a gravity water tank or from a *private water supply system* shall be fitted with a shut-off valve at the source of supply.

3) Except for *risers* that serve only one *dwelling unit*, every *riser* shall be provided with a shut-off valve located at the source of supply.

4) Every water closet shall be provided with a shut-off valve on its water supply pipe.

5) In *buildings* of residential *occupancy* that contain more than one *dwelling unit*, a shut-off valve shall be installed where the water supply enters each *dwelling unit*, so that, when the water supply to one *suite* is shut off, the water supply to the remainder of the *building* is not interrupted. (See Appendix A.)

6) In *buildings* of other than residential *occupancy*, shut-off valves shall be provided on the water supply to
a) every *fixture*, or
b) any group of *fixtures* in the same room, except as provided in Sentence (4).

7) Every pipe that supplies water to a hot water tank shall be provided with a shut-off valve located close to the tank.

2.6.1.4. Protection for Exterior Water Supply

1) Every pipe that passes through an exterior wall to supply water to the exterior of the *building* shall be provided with
a) a frost-proof hydrant, or
b) a stop-and-waste cock located inside the *building* and close to the wall.

2.6.1.5. Check Valves

1) A *check valve* shall be installed at the *building* end of a *water service pipe* where the pipe is made of plastic that is suitable for cold water use only.

2.6.1.6. Flushing Devices

1) Every flushing device that serves a water closet or one or more urinals shall have sufficient capacity and be adjusted to deliver at each operation a volume of water that will thoroughly flush the *fixture* or *fixtures* that it serves.

2) Where a manually operated flushing device is installed it shall serve only one *fixture*.

2.6.1.7. Relief Valves

1) In addition to the requirements in Sentence (2), every hot water tank of a *storage-type service water heater* shall be equipped with a pressure-relief valve
a) designed to open when the water pressure in the tank reaches the rated working pressure of the tank, and
b) so located that the pressure in the tank shall not exceed the pressure at the relief valve by more than 35 kPa under any condition of flow within the distribution system.

2) Every hot water tank of a *storage-type service water heater* shall be equipped with a temperature-relief valve with a temperature-sensing element
a) located within the top 150 mm of the tank, and
b) designed to open and discharge sufficient water from the tank to keep the temperature of the water in the tank from exceeding 99°C under all operating conditions.

3) A pressure-relief valve and temperature-relief valve may be combined where Sentences (1) and (2) are complied with.

4) Every *indirect service water heater* shall be equipped with
a) a pressure-relief valve, and
b) a temperature-relief valve on every storage tank that forms part of the system.

5) Every pipe that conveys water from a temperature-relief, pressure-relief or combined temperature- and pressure-relief valve shall
a) be of a *size* at least equal to the *size* of the outlet of the valve,
b) be rigid, slope downward from the valve, and terminate with an indirect connection above a floor drain, sump, or other safe location, with an *air break* of not more than 300 mm,
c) have no thread at its outlet, and
d) be capable of operating at a temperature of not less than 99°C.

(See Appendix A.)

6) The temperature-relief valve required in Clause (4)(b) shall
a) have a temperature-sensing element located within the top 150 mm of the tank, and
b) be designed to open and discharge sufficient water to keep the temperature of the water in the tank from exceeding 99°C under all operating conditions.

7) No shut-off valve shall be installed on the pipe between any tank and the relief valves or on the discharge lines from such relief valves.

8) A vacuum-relief valve shall be installed when any tank may be subject to *back-siphonage*.

9) A *storage-type service water heater* that is located in a ceiling or roof space, or over a floor of wood construction, shall be installed within a corrosion-resistant watertight drain pan, as described in Sentence (10).

10) The drain pan shall
a) be not less than 50 mm larger than the tank and have side walls not less than 25 mm high,
b) be drained by a pipe two *sizes* larger than the relief valve discharge pipe, and
c) have a drain that is located directly under the relief valve discharge pipe and that discharges directly to a floor drain or other acceptable location.

2.6.1.8. Solar Domestic Hot Water Systems

1) Systems for solar heating of *potable* water shall be installed in conformance with <CAN/CSA-F383, "Installation of Packaged Solar Domestic Hot Water Systems.">

2.6.1.9. Water Hammer

1) Provision shall be made to protect the *water distribution system* from the adverse effects of water hammer. (See Appendix A.)

2.6.1.10. Mobile Home Water Service

1) A *water service pipe* intended to serve a mobile home shall
a) be not less than ¾ inch in *size*,
b) terminate above ground, and
c) be provided with
i) a tamperproof terminal connection that is capable of being repeatedly connected, disconnected and sealed,
ii) a protective concrete pad,
iii) a means to protect it from frost heave, and
iv) a curb stop and a means of draining that part of the pipe located above the frost line when not in use.

2.6.1.11. Thermal Expansion

1) Protection against thermal expansion shall be required when a *check valve* is required by Article 2.6.1.5., a *backflow preventer* by Article 2.6.2.6., or a pressure-reducing valve by Article 2.6.3.3. (See Appendix A.)

2.6.1.12. <Service Water Heaters

1) Thermostat controls for electric *storage-type service water heaters* shall be set at a temperature of 60°C. (See Appendix A.)>

2.6.2. Protection from Contamination

2.6.2.1. Connection of Systems

1) Except as provided in Sentence (2), connections to *potable water systems* shall be designed and installed so that non-*potable* water or substances that may render the water non-*potable* cannot enter the system.

2) A water treatment device or apparatus shall not be installed unless it can be demonstrated that the device or apparatus will not introduce substances into the system that may endanger health.

3) *Backflow preventers* shall be selected and installed in conformance with CSA B64.10, "Selection and Installation of Backflow Preventers." (See Appendix A.)

2.6.2.2. Back-Siphonage

1) *Potable* water connections to *fixtures*, tanks, vats or other devices not subject to pressure above atmospheric and containing other than *potable* water shall be installed so as to prevent *back-siphonage* in conformance with Sentence (2).

2) Except as provided in Sentence 2.6.2.10.(2), *back-siphonage* shall be prevented by the installation of
a) an *air gap*,
b) an atmospheric *vacuum breaker*,
c) a pressure *vacuum breaker*,
d) a hose connection *vacuum breaker*,
e) a dual *check valve backflow preventer* with atmospheric port,

f) a double *check valve* assembly,

g) a reduced pressure principle *backflow preventer*,

h) a dual *check valve backflow preventer*,

i) a laboratory faucet type *vacuum breaker*, or

j) a dual *check valve backflow preventer* with vent.

2.6.2.3. Backflow Caused by Back Pressure

1) *Potable* water connections to *fixtures*, tanks, vats, boilers or other devices containing other than *potable* water and subject to pressure above atmospheric shall be arranged to prevent *backflow* caused by *back pressure* in conformance with Sentences (2) and (3).

2) Except as provided in Article 2.6.2.4., *backflow* caused by *back pressure* of non-toxic substances into a *potable water system* shall be prevented by the installation of

a) an *air gap*,

b) a dual *check valve backflow preventer* with atmospheric port,

c) a dual *check valve backflow preventer*,

d) a dual *check valve backflow preventer* with vent,

e) a double *check valve* assembly, or

f) a reduced pressure principle *backflow preventer*.

3) *Backflow* caused by *back pressure* of toxic substances into a *potable water system* shall be prevented by the installation of

a) an *air gap*, or

b) a reduced pressure principle *backflow preventer*.

2.6.2.4. Backflow from Fire Protection Systems

1) A *backflow preventer* shall not be required in *residential full flow-through fire sprinkler/standpipe systems* in which the pipes and fittings are constructed of *potable water system* materials.

2) Except as required by Sentence (4), *potable water system* connections to fire sprinkler and standpipe systems shall be protected against *backflow* caused by *back-siphonage* or *back pressure* in conformance with Clauses (a) to (f):

a) *residential partial flow-through fire sprinkler/standpipe systems* in which the pipes and fittings are constructed of *potable water system* materials shall be protected by a dual *check valve backflow preventer* conforming to <CSA B64.6.1, "Dual Check Valve Backflow Preventers for Fire Protection Systems (DuCF),">

b) *Class 1 fire sprinkler/standpipe systems* shall be protected by a single *check valve backflow preventer* conforming to <CSA B64.9, "Single Check Valve Backflow Preventers for Fire Protection Systems (SCVAF),"> provided that the systems do not use antifreeze or other additives of any kind and that all pipes and fittings are constructed of *potable water system* materials,

c) *Class 1 fire sprinkler/standpipe systems* not covered by Clause (b) as well as *Class 2* and *Class 3 fire sprinkler/standpipe systems* shall be protected by a double *check valve backflow preventer* conforming to <CSA B64.5.1, "Double Check Valve Backflow Preventers for Fire Protection Systems (DCVAF),"> provided that the systems do not use antifreeze or other additives of any kind,

d) *Class 1*, *Class 2* and *Class 3 fire sprinkler/standpipe systems* in which antifreeze or other additives are used shall be protected by a reduced pressure principle *backflow preventer* conforming to <CSA B64.4.1, "Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF),"> installed on the portion of the system that uses the additives and the balance of the system shall be protected as required by Clauses (b) or (c),

e) *Class 4* and *Class 5 fire sprinkler/standpipe systems* shall be protected by a reduced pressure principle *backflow preventer* conforming to <CSA B64.4.1, "Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF),"> or

f) *Class 6 fire sprinkler/standpipe systems* shall be protected

i) by a double *check valve backflow preventer* conforming to <CSA B64.5.1, "Double Check Valve Backflow Preventers for Fire Protection Systems (DCVAF),"> or

ii) where a potentially severe health hazard may be caused by *backflow*, by a reduced pressure principle *backflow preventer* conforming to <CSA B64.4.1, "Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF),">

(See Appendix A.)

3) *Backflow preventers* required by Sentence (2) shall be installed upstream of the fire department pumper connection. (See Appendix A.)

4) Where a reduced pressure principle *backflow preventer* is required on a *water service pipe* at a fire service connection located on the same premises as the *fire service pipe* in *Class 3*, *4*, *5* and *6 fire sprinkler/standpipe systems*, a reduced pressure principle *backflow preventer* conforming to <CSA B64.4.1, "Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF),"> shall also be required on the fire service connection.

2.6.2.5. Separation of Water Supply Systems

1) No *private water supply system* shall be interconnected with a public water supply system.

2.6.2.6. Premise Isolation

1) In addition to the *backflow preventer* required by this Subsection for *buildings* or facilities where a potentially severe health hazard may be caused by *backflow*, the *potable water system* shall be provided with premise isolation by the installation of a reduced pressure principle *backflow preventer*. (See Appendix A.)

2.6.2.7. Hose Bibb

1) Where a hose bibb is installed outside a *building*, inside a garage or in an area where there is an identifiable risk of contamination, the *potable water system* shall be protected against *backflow* through the hose bibb.

2.6.2.8. Cleaning of Systems

1) A newly installed part of a *potable water system* shall be cleaned and then flushed with *potable* water before the system is put into operation.

2.6.2.9. Air Gap

1) An *air gap* shall not be located in a noxious environment.

2) Every *air gap* shall be not less than 25 mm high and at least twice the diameter of the opening of the water supply outlet in height. (See Appendix A.)

2.6.2.10. Vacuum Breakers

1) Where the *critical level* is not marked on an atmospheric *vacuum breaker* or pressure *vacuum breaker*, the *critical level* shall be taken as the lowest point on the device.

2) Where an atmospheric *vacuum breaker* is installed, it shall be located on the downstream side of the *fixture* control valve or faucet so that it will be subject to water supply pressure

a) only when the valve or faucet is open, and

b) for periods of continuous use not exceeding 12 h.

(See Appendix A.)

3) An atmospheric *vacuum breaker* shall be installed so that the *critical level* is at least the distance specified by the manufacturer at which the device will operate safely but not less than 25 mm above

a) the *flood level rim* of a *fixture* or tank, or

b) the highest point open to atmosphere in an irrigation system.

4) A pressure *vacuum breaker* shall be installed so that the *critical level* is not less than 300 mm above

a) the *flood level rim* of a *fixture* or tank, or

b) the highest point open to atmosphere in an irrigation system.

2.6.2.11. Tank-Type Water Closets

1) Tank-type water closets shall be provided with a *back-siphonage preventer* in conformance with Sentence 2.2.10.10.(2).

2.6.2.12. Backflow Preventers

1) No bypass piping or other device capable of reducing the effectiveness of a *backflow preventer* shall be installed in a water supply system.

2.6.3. Size and Capacity of Pipes

(See Appendix A.)

2.6.3.1. Design, Fabrication and Installation

<(See Appendix A.)>

1) Every *water distribution system* shall be designed to provide peak demand flow when the flow pressures at the supply openings conform to <the plumbing supply fitting manufacturer's specifications.>

2) *Potable water systems* shall be designed, fabricated and installed in accordance with good engineering practice, such as that described in the ASHRAE Handbooks and ASPE Data Books. (See Appendix A.)

3) <In one- and two-family *dwelling units* and manufactured homes, multi-purpose systems that combine *potable water systems* and residential fire sprinkler systems shall be designed, fabricated and installed in accordance with NFPA 13D, "Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes.">

2.6.3.2. Hydraulic Load

1) Except as provided in Sentence (3), the hydraulic load of a *fixture* or device that is listed in Table 2.6.3.2.A shall be the number of *fixture units* given in the Table.

2) Except as provided in Sentences (1) and (3), the hydraulic load of a *fixture* that is not listed in Table 2.6.3.2.A is the number of *fixture units* listed in Table 2.6.3.2.D.

3) Where *fixtures* are supplied with both hot and cold water, the hydraulic loads for maximum separate demands shall be 75% of the hydraulic load of the *fixture units* given in Tables 2.6.3.2.A and 2.6.3.2.D when using a detailed engineering design method.

4) <The hydraulic load of urinals and water closets with direct flush valves shall be the number of *fixture units* listed in Tables 2.6.3.2.B and C. (See Appendix A.)

Table 2.6.3.2.A
Sizing of Water Distribution Systems(1)(2)
Forming part of Sentences 2.6.3.2.(1), (2) and (3), and 2.6.3.4.(2), (3) and (5)

Fixture or Device	Minimum *Size* of Supply Pipe, inches	*Private Use* Hydraulic Load, *fixture units*			*Public Use* Hydraulic Load, *fixture units*		
		Cold	Hot	Total	Cold	Hot	Total
Bathroom group with 6 LPF flush tank(3)	n/a	2.7	1.5	3.6	-	-	-
Bathroom group with greater than 6 LPF flush tank(3)	n/a	4	3	6	-	-	-
Bathroom group with more than 3 *fixtures*	-	-	-	(4)	-	-	-
Bathtub with or without shower head	½	1	1	1.4	3	3	4
Bathtub with ¾ inch spout	¾	7.5	7.5	10	7.5	7.5	10
Bedpan washer	1	-	-	-	7.5	7.5	10
Bidet	⅜	1.5	1.5	2	-	-	-
Clothes washer 3.5 kg	½	1	1	1.4	2.25	2.25	3
Clothes washer 6.8 kg	½	-	-	-	3	3	4
Clothes washer, commercial(5)	-	-	-	-	-	-	-
Dental lavatory	⅜	-	-	-	1.5	1.5	2
Dental unit, cuspidor	⅜	-	-	-	1	-	1
Dishwasher, commercial(5)	-	-	-	-	-	-	-
Dishwasher, domestic	⅜	-	1.4	1.4	-	-	-
Drinking fountain or water cooler	⅜	-	-	-	0.25	-	0.25
Hose bibb	½	2.5	-	2.5	2.5	-	2.5

Table 2.6.3.2.A
Sizing of Water Distribution Systems(1)(2)
Forming part of Sentences 2.6.3.2.(1), (2) and (3), and 2.6.3.4.(2), (3) and (5)

Fixture or Device	Minimum *Size* of Supply Pipe, inches	*Private Use* Hydraulic Load, *fixture units*			*Public Use* Hydraulic Load, *fixture units*		
		Cold	Hot	Total	Cold	Hot	Total
Hose bibb	¾	3	-	3	6	-	6
Hose bibb, combination hot and cold	½	1.9	1.9	2.5	1.9	1.9	2.5
Lavatory, 8.3 LPM or less	⅜	0.5	0.5	0.7	1.5	1.5	2
Lavatory, greater than 8.3 LPM	⅜	0.75	0.75	1	1.5	1.5	2
Sink, bar	⅜	0.75	0.75	1	1.5	1.5	2
Sink, clinic service faucet	½	-	-	-	2.25	2.25	3
Sink, clinic service with direct flush valve	1	-	-	-	6	-	6
Sink, kitchen commercial, per faucet	½	-	-	-	3	3	4
Sink, kitchen domestic, 8.3 LPM	⅜	1	1	1.4	1	1	1.4
Sink, kitchen domestic, greater than 8.3 LPM	⅜	1.5	1.5	2	1.5	1.5	2
Sink, laboratory	⅜	-	-	-	1.5	1.5	2
Sink, laundry (1 or 2 compartments)	⅜	1	1	1.4	1	1	1.4
Sink, service or mop basin	½	-	-	-	2.25	2.25	3
Sink, washup, per faucet	½	-	-	-	1.5	1.5	2
Shower head, 9.5 LPM or less per head	½	1	1	1.4	3	3	4
Shower head, greater than 9.5 LPM per head	½	1.5	1.5	2	3	3	4
Shower, spray, multi-head, *fixture unit* per head	(5)	1	1	1.4	3	3	4
Urinal, with direct flush valve	¾	(6)	-	(6)	(6)	-	(6)
Urinal, with flush tank	⅜	3	-	3	3	-	3
Urinal, with self-closing metering valve	½	2	-	2	4	_	4
Water closet, 6 LPF or less with flush tank	⅜	2.2	-	2.2	2.2	-	2.2
Water closet, greater than 6 LPF with flush tank	⅜	3	-	3	5	-	5
Water closet, with direct flush valve	1	(6)	-	(6)	(6)	-	(6)

Notes to Table 2.6.3.2.A:

(1) The *fixture unit* values in this Table are not applicable in certain assembly *occupancies* because of surges in use by the occupants. For such *occupancies*, refer to specific design information.
(2) For *fixtures* not indicated in this Table, refer to Table 2.6.3.2.D.
(3) *Bathroom group* is based on a ½-inch *size* bathtub supply pipe.
(4) Add additional *fixture* to the *fixture* load for *bathroom group*.
(5) Refer to manufacturer's recommendations.
(6) For *fixture unit* values for *fixtures* with direct flush valves, see Sentence 2.6.3.2.(4) and Tables 2.6.3.2.B and 2.6.3.2.C.

Table 2.6.3.2.B
Sizing of Water Distribution Systems for Urinals with Direct Flush Valves
Forming part of Sentences 2.6.3.2.(4) and 2.6.3.4.(5)

Number of Valves	Individual *Fixture Unit* Assigned in Decreasing Values	*Fixture Units* in Accumulative Values(1)
1	20	20
2	15	35
3	10	45
4	8	53
5 or more	5 each	58, plus 5 for each additional *fixture* in excess of 5

Notes to Table 2.6.3.2.B:
(1) The accumulative *fixture unit* values are the total values to be used in conjunction with Table 2.6.3.2.A.

Table 2.6.3.2.C
Sizing of Water Distribution Systems for Water Closets with Direct Flush Valves
Forming part of Sentences 2.6.3.2.(4) and 2.6.3.4.(5)

Number of Valves	Individual *Fixture Unit* Assigned in Decreasing Values	*Fixture Units* in Accumulative Values(1)
1	40	40
2	30	70
3	20	90
4	15	105
5 or more	10 for each *public use* and 6 for each *private use*	115, plus 10 for each *public use* additional *fixture* in excess of 5 and 111, plus 6 for each *private use* additional *fixture* in excess of 5>

Notes to Table 2.6.3.2.C:
(1) The accumulative *fixture unit* values are the total values to be used in conjunction with Table 2.6.3.2.A.

Table 2.6.3.2.D
Hydraulic Loads of Fixtures Not Listed in Table 2.6.3.2.A.
Forming part of Sentences 2.6.3.2.(2) and (3) and 2.6.3.4.(5)

Size of Supply Pipe, inches	Hydraulic Load, *fixture units*	
	Private Use	*Public Use*
⅜	1	2
½	2	4
¾	3	6
1	6	10

2.6.3.3. Static Pressure

1) Where the static pressure at any *fixture* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

2.6.3.4. Size

1) Every *water service pipe* shall be sized according to the peak demand flow but shall not be less than ¾ inch *size*.

2) Except as provided in Sentence (3), the *size* of a <supply pipe that serves> a *fixture* shall conform to <Table 2.6.3.2.A>

3) <For *fixtures* listed in Table 2.6.3.2.A that have a permitted supply pipe *size* of 3/8 inch,> a connector not more than 750 mm long and not less than <6.3 mm> inside diameter may be used to supply water to the *fixture*.

4) <Reserved.>

5) <Where both hot and cold water is supplied to *fixtures* in residential *buildings* containing one or two *dwelling units* or row houses with separate *water service pipes*, the *water system* may be sized in accordance with Table 2.6.3.4., where

a) the hydraulic loads for maximum separate demands on *water distribution system* piping are not less than 100% of the total hydraulic load of the *fixture units* given in Tables 2.6.3.2.A, B, C or D for *private use*,

b) the minimum water pressure at the entry to the *building* is 200 kPa, and

c) the total maximum length of *water system* is 90 m.

(See Appendix A.)>

Table 2.6.3.4.
<Water Pipe Sizing for Buildings Containing One or Two Dwelling Units or Row Houses with Separate Water Service Pipes
Forming part of Sentence 2.6.3.4.(5)

Size of Water Pipe, inches	Water Velocity, m/s(1)		
	3.0	2.4	1.5
	Hydraulic Load, *fixture units*		
½	8	7	4
¾	21	16	9
1	43	31	18
1¼	83	57	30>

Notes to Table 2.6.3.4.:
(1) Table 2.6.3.4. is not intended to limit water velocities that are permitted by Sentence 2.6.3.5.(1).

2.6.3.5. <Velocity

1) The maximum permitted water velocities shall be those recommended by the pipe and fitting manufacturer.>

Section 2.7. Non-Potable Water Systems

2.7.1. Connection

2.7.1.1. Not Permitted

1) A non-*potable water system* shall not be connected to a *potable water system*.

2.7.2. Identification

2.7.2.1. Markings Required

1) <The location of non>-*potable* water <discharge and non-*potable* water> piping shall be identified by markings that are permanent, distinct and easily recognized.

2.7.3. Location

2.7.3.1. Pipes

1) Non-*potable* water piping shall not be located

a) where food is prepared in a food-processing plant,

b) above food-handling equipment,

c) above a non-pressurized *potable* water tank, or

d) above a cover of a pressurized *potable* water tank.

2.7.3.2. Outlets

1) An outlet from a non-*potable water system* shall not be located where it can discharge into

a) a sink or lavatory,

b) a *fixture* into which an outlet from a *potable water system* is discharged, or

c) a *fixture* that is used for the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

(See Appendix A.)

2.7.4. <Design>

2.7.4.1. <Non-potable Water System Design
(See Appendix A.)>

1) <Non-*potable water systems* shall be designed, fabricated and installed in accordance with good engineering practice, such as that described in the ASHRAE Handbooks, ASPE Handbooks and CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems.">

2) Reserved.

Section 2.8. Objectives and Functional Statements

2.8.1. Objectives and Functional Statements

2.8.1.1. Attribution to Acceptable Solutions

1) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b) of Division A, the objectives and functional statements attributed to the acceptable solutions in this Part shall be the objectives and functional statements listed in Table 2.8.1.1. (See A-1.1.2.1.(1) in Appendix A.)

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.1.2.1. Sanitary Drainage Systems	
(1)	[F72–OH2.1]
(2)	[F72–OH2.1]
	[F72–OP5]
2.1.2.2. Storm Drainage Systems	
(1)	[F72–OP5]
2.1.2.3. Water Distribution Systems	
(1)	[F46–OH2.2]
2.1.2.4. Separate Services	
(1)	[F71–OH2.1,OH2.3] [F70–OH2.1]
2.1.3.1. Lighting and Ventilation Requirements	
(1)	[F30–OS3.1] Applies to the requirement for lighting.
	[F40–OH1.1] Applies to the requirement for ventilation.
2.1.3.2. Accessibility	
(1)	[F82–OH2.1,OH2.2,OH2.3,OH2.4] Applies to the need for maintenance.
	[F40–OH2.1] [F41–OH2.4] [F71–OH2.3]
	[F71–OH2.3] [F81–OH2.4]
	[F81–OP5]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.1.1. Exposure of Materials	
(1)	[F80–OH2.1,OH2.2,OH2.3,OH2.4]
	[F80–OP5]
(2)	[F80–OH2.1]
	[F80–OP5]
2.2.1.2. Restrictions on Re-Use	
(1)	[F70–OH2.2]
2.2.1.5. Withstanding Pressure	
(1)	[F20–OP5]
	[F20,F81–OH2.1,OH2.3] [F46–OH2.2]
2.2.1.6. Working Pressure of a Water Service Pipe	
(1)	[F20–OP5]
	[F20,F81–OH2.3]
2.2.2.1. Surface Requirements	
(1)	[F41–OH2.4]
2.2.2.2. Conformance to Standards	
(1)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(2)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(3)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(4)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(5)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(6)	[F80–OH2.1,OH2.4]
	[F80–OS3.1]
(7)	[F71,F80–OS3.1]
	[F80,F41–OH2.1,OH2.4]
(8)	[F41,F71,F80–OH2.1,OH2.3,OH2.4]
2.2.2.3. Showers	
(1)	[F80–OH2.1]
	[F80–OP5]
(2)	[F40–OP5]
	[F80–OH2.1]
(3)	[F45–OH2.1]
(4)	[F45–OH2.1]
2.2.2.4. Concealed Overflows	
(1)	[F41,F81–OH2.1,OH2.4]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.2.5. Water Closets in Public Washrooms	
(1)	[F30–OH2.1,OH2.4]
2.2.3.1. Traps	
(1)	[F81,F40–OH1.1]
(2)	[F81–OH1.1]
(3)	[F81–OH2.1,OH2.3,OH2.4]
	[F81–OP5]
(4)	[F81–OH1.1]
(5)	[F81–OH1.1]
2.2.3.2. Interceptors	
(1)	[F81–OH2.1,OH2.3,OH2.4]
(2)	[F81–OH2.1,OH2.3,OH2.4] [F46–OH2.2]
2.2.3.3. Tubular Traps	
(1)	[F82–OH2.1,OH2.4]
	[F82–OP5]
2.2.4.1. T and Cross Fittings	
(1)	[F81–OH2.1,OH2.4]
(2)	[F81–OH2.1,OH2.4]
2.2.4.2. Sanitary T Fittings	
(1)	[F81–OH2.1,OH2.4]
(2)	[F81–OH2.1,OH2.4]
	[F81–OP5]
2.2.4.3. 90° Elbows	
(1)	[F81–OH2.1,OH2.4]
(2)	[F81–OH2.1,OH2.4]
2.2.5.1. Asbestos-Cement Drainage Pipe and Fittings	
(1)	[F20–OH2.1,OH2.4]
(2)	[F20–OH2.1,OH2.4]
2.2.5.2. Asbestos-Cement Water Pipe and Fittings	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(2)	[F20–OP5]
2.2.5.3. Concrete Pipe and Fittings	
(1)	[F20–OH2.1]
(2)	[F20–OH2.1]
(3)	[F20–OH2.1]
(4)	[F20–OH2.1]
(5)	[F20–OH2.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.5.4. Vitrified Clay Pipe and Fittings	
(1)	[F20–OH2.1]
(2)	[F20–OH2.1]
(3)	[F20–OH2.1]
2.2.5.5. Polyethylene Pipe and Fittings	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(2)	[F20–OP5]
(3)	[F20–OP5]
2.2.5.6. Polyethylene Pipe Used Underground	
(1)	[F72–OH2.1,OH2.3.]
2.2.5.7. Crosslinked Polyethylene Pipe and Fittings	
(1)	[F20–OH2.2]
	[F20–OP5]
2.2.5.8. PVC Pipe and Fittings	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(2)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(3)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(4)	[F20–OP5]
2.2.5.9. CPVC Pipe, Fittings and Solvent Cements	
(1)	[F20–OH2.2,OH2.3.,OH2.4]
	[F20–OP5]
(2)	[F20–OP5]
2.2.5.10. Plastic Pipe, Fittings and Solvent Cement Used Underground	
(1)	[F20,F80,F81–OH2.1,OH2.3]
2.2.5.11. Transition Solvent Cement	
(1)	[F20,F80,F81–OH2.1,OH2.3]
(2)	[F20,F80,F81–OH2.1,OH2.3]
2.2.5.12. Plastic Pipe, Fittings and Solvent Cement Used in Buildings	
(1)	[F20,F80,F81–OH2.1,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.5.13. Polyethylene/Aluminum/Polyethylene Composite Pipe and Fittings	
(1)	[F20,F80,F81–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(2)	[F20–OP5]
	<[F20–OH2.1,OH2.2,OH2.3]>
<(3)>	<[F20–OH2.1,OH2.2,OH2.3]>
	<[F20–OP5]>
<(4)>	<[F20–OH2.1,OH2.2,OH2.3]>
	<[F20–OP5]>
2.2.5.14. Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe and Fittings	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
2.2.5.15. Polypropylene Pipe and Fittings	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
2.2.6.1. Cast-Iron Drainage and Vent Pipe and Fittings	
(1)	[F20–OH2.1,OH2.3]
(2)	[F20–OH2.2]
2.2.6.2. Cast-Iron Fittings for Asbestos-Cement Drainage Pipe	
(1)	[F20–OH2.1,OH2.3]
2.2.6.3. Threaded Cast-Iron Drainage Fittings	
(1)	[F20–OH2.1,OH2.3]
(2)	[F20–OP5]
2.2.6.4. Cast-Iron Water Pipes	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
(2)	[F80–OH2.2]
(3)	[F20–OP5]
(4)	[F20–OP5]
2.2.6.5. Screwed Cast-Iron Water Fittings	
(1)	[F20–OP5]
(2)	[F80–OH2.2]
(3)	[F81–OH2.1,OH2.3]
2.2.6.6. Screwed Malleable Iron Water Fittings	
(1)	[F81–OP5]
(2)	[F80–OH2.2]
(3)	[F81–OH2.1,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.6.7. Steel Pipe	
(1)	[F80–OH2.1,OH2.3] [F46–OH2.2]
(3)	[F46–OH2.2]
(4)	[F80–OH2.1,OH2.3]
	[F80–OP5]
2.2.6.8. Corrugated Steel Pipe and Couplings	
(1)	[F80–OP5]
(2)	[F81–OP5]
(3)	[F81–OP5]
2.2.6.9. Sheet Metal Leaders	
(1)	[F80–OP5]
2.2.7.1. Copper and Brass Pipe	
(1)	[F80–OH2.1,OH2.3] Applies to *drainage systems* and *venting systems*. [F46–OH2.2] Applies to *water systems*.
	[F80–OP5]
(2)	[F80–OH2.1,OH2.3] Applies to *drainage systems* and *venting systems*. [F46–OH2.2] Applies to *water systems*.
	[F80–OP5]
2.2.7.2. Brass or Bronze Pipe Flanges and Flanged Fittings	
(1)	[F80–OH2.1,OH2.3] Applies to *drainage systems* and *venting systems*. [F46–OH2.2] Applies to *water systems*.
	[F80–OP5]
2.2.7.3. Brass or Bronze Threaded Water Fittings	
(1)	[F80–OP5]
(2)	[F80–OH2.1,OH2.3]
2.2.7.4. Copper Tube	
(1)	[F80–OH2.1,OH2.3] Applies to *drainage systems* and *venting systems*. [F46–OH2.2] Applies to *water systems*.
	[F80–OP5]
(2)	[F80–OH2.1,OH2.2,OH2.3]
(3)	[F80–OH2.1,OH2.4]
2.2.7.5. Solder-Joint Drainage Fittings	
(1)	[F80–OH2.1,OH2.4]
(2)	[F20–OP5]
2.2.7.6. Solder-Joint Water Fittings	
(1)	[F20–OP5]
(2)	[F20–OP5]
2.2.7.7. Flared-Joint Fittings for Copper Water Systems	
(1)	[F20–OP5]
(2)	[F20–OP5]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.7.8. Lead Waste Pipe and Fittings	
(1)	[F46,F20–OH2.2,OH2.3]
(2)	[F81–OH2.1,OH2.3,OH2.4]
2.2.8.1. Pipes and Fittings	
(1)	[F80,F81–OH2.1]
	[F80,F81–OS3.2,OS3.4]
2.2.9.1. Cement Mortar	
(1)	[F80–OH2.1,OH2.3]
	[F80–OP5]
2.2.9.2. Solders and Fluxes	
(1)	[F80–OH2.1,OH2.3]
	[F80–OP5]
(2)	[F46–OH2.2]
(3)	[F80–OH2.1,OH2.3]
(4)	[F20,F80,F81–OH2.1,OH2.3]
2.2.10.1. Brass Floor Flanges	
(1)	[F80–OH2.1]
2.2.10.2. Screws, Bolts, Nuts and Washers	
(1)	[F80–OH2.1,OH2.3]
2.2.10.3. Cleanout Fittings	
(1)	[F80–OH2.1,OH2.3] Applies to *drainage systems*. [F46–OH2.2] Applies to *water systems*.
(2)	[F80–OH2.1]
2.2.10.4. Mechanical Couplings	
(1)	[F80–OP5]
(2)	[F80–OH2.1,OH2.3]
2.2.10.5. Saddle Hubs	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
2.2.10.6. Supply and Waste Fittings	
<(1)**>**	**<**[F80–OP5]**>**
<(2)**>**	**<**[F80–OH2.1,OH2.3]**>**
2.2.10.7. Shower Valves	
(1)	[F80–OS3.2]
<(3)**>**	**<**(a) [F31–OS3.2]**>**
	<(b) [F30–OS3.1]**>**
(4)	[F31–OS3.2]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.2.10.8. Direct Flush Valves	
(1)	(a) and (b) [F80,F81–OP5]
	(c) and (d) [F80–OH2.1][F81–OH2.4]
2.2.10.9. Drinking Fountain Bubblers	
(1)	[F40,F46–OH2.4]
(2)	[F41,F46–OH2.2]
(3)	[F41,F46–OH2.2]
2.2.10.10. Back-Siphonage Preventers and Backflow Preventers	
(1)	[F46–OH2.2]
(2)	[F46–OH2.2]
2.2.10.11. Relief Valves	
(1)	[F31–OP5]
	[F31–OS3.2]
2.2.10.12. Reducing Valves	
(1)	[F81–OP5]
2.2.10.13. Solar Domestic Hot Water	
(1)	[F46–OH2.2]
	[F80,F81–OP5]
	[F81–OS3.2]
2.2.10.14. Vent Pipe Flashing	
(1)	[F80,F81–OP5]
(2)	[F80,F81–OP5]
2.2.10.15. Water Hammer Arresters	
(1)	[F20,F80–OP5]
2.2.10.16. Air Admittance Valves	
(1)	[F81–OH1.1]
2.3.2.1. Caulked Lead Drainage Joints	
(1)	[F80–OH2.1,OH2.3]
(2)	[F80–OH2.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
2.3.2.2. Wiped Joints	
(1)	[F80,F81–OH2.1]
	[F80,F81–OP5]
(2)	[F80,F81–OH2.1,OH2.2,OH2.3]
(3)	[F80,F81–OH2.1,OH2.2,OH2.3]
2.3.2.3. Screwed Joints	
(1)	[F80,F81–OH2.1,OH2.2,OH2.3]
(2)	[F70–OH2.2]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.3.2.4. Soldered Joints	
(1)	[F20,F81–OH2.1,OH2.2,OH2.3]
2.3.2.5. Flared Joints	
(1)	[F20,F81–OH2.1,OH2.2,OH2.3]
	[F20,F81–OP5]
(2)	[F20,F81–OH2.1,OH2.2,OH2.3]
	[F20,F81–OP5]
2.3.2.6. Mechanical Joints	
(1)	[F20–OH2.1,OH2.2,OH2.3]
	[F20–OP5]
2.3.2.7. Cold-Caulked Joints	
(1)	[F20,F81–OH1.1] Applies to bell and spigot joints in *venting systems*.
	[F20,F81–OH2.1,OH2.3] Applies to bell and spigot joints in *drainage systems* or *venting systems*.
	[F20,F81–OP5]
(2)	[F20,F81–OH1.1]
	[F20,F81–OH2.1,OH2.2,OH2.3]
	[F20,F81–OP5]
(3)	[F20–OH2.1,OH2.3]
2.3.3.1. Drilled and Tapped Joints	
(1)	[F20,F81–OH2.2,OH2.3]
	[F81–OH1.1]
2.3.3.2. Extracted Tees	
(1)	[F20–OP5]
	[F81–OH2.1,OH2.3]
2.3.3.3. Prohibition of Welding of Pipes and Fittings	
(1)	[F20–OH1.1]
	[F20–OH2.1,OH2.2,OH2.3]
(2)	[F80–OH2.2]
	[F80–OP5]
2.3.3.4. Unions and Slip Joints	
(1)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
(2)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
2.3.3.5. Increaser or Reducer	
(1)	[F70,F80–OH2.2]
	[F81–OH1.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.3.3.6. Dissimilar Materials	
(1)	[F80–OH1.1]
	[F80–OH2.1]
	[F80–OP5]
2.3.3.7. Connection of Roof Drain to Leader	
(1)	[F21,F81–OP5]
2.3.3.8. Connection of Floor Outlet Fixtures	
(1)	[F80–OH2.1,OH2.3]
(2)	[F80–OH2.1]
(4)	[F20–OH2.1]
	[F20–OS3.1]
(5)	[F81–OH2.1]
(6)	[F21–OH2.1]
2.3.3.9. Expansion and Contraction	
(1)	[F21–OH1.1]
	[F21–OH2.1]
	[F21–OP5]
2.3.3.10. Copper Tube	
(1)	[F20–OH1.1]
	[F20–OP5]
2.3.3.11. Indirect Connections	
(1)	[F81–OH2.2,OH2.4]
(2)	[F81–OH2.2,OH2.4]
2.3.3.12. Copper Joints Used Underground	
(1)	[F20,F80–OP5]
(2)	[F20,F80–OP5]
2.3.4.1. Capability of Support	
(1)	[F20–OH2.1,OH2.4]
	[F20–OP5]
	[F20–OS3.1]
(2)	[F20–OH2.1,OH2.3]
	[F20–OS3.1]
(3)	[F20–OH2.1,OH2.3]
	[F20–OS3.1]
2.3.4.2. Independence of Support	
(1)	[F20–OH2.1,OH2.3]
	[F20–OP5]
	[F20–OS3.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.3.4.3. Insulation of Support	
(1)	[F80–OH2.1,OH2.3]
	[F80–OP5]
	[F80–OS3.1]
2.3.4.4. Support for Vertical Piping	
(1)	[F20–OH2.1]
	[F20–OS3.1]
(2)	[F20–OH2.1]
	[F20–OP5]
	[F20–OS3.1]
2.3.4.5. Support for Horizontal Piping	
(1)	[F20–OH2.1,OH2.3]
	[F20–OP5]
	[F20–OS3.1]
(2)	[F20–OH2.1]
	[F20–OP5]
	[F20–OS3.1]
(3)	[F20–OH2.1]
	[F20–OP5]
	[F20,F81–OS3.1]
(4)	[F81–OP5]
	[F81–OS3.1]
(5)	[F20–OH2.1]
	[F20–OS3.1]
	[F20,F21–OP5]
(6)	[F20–OH2.1]
	[F20–OP5]
	[F20–OS3.1]
2.3.4.6. Support for Underground Horizontal Piping	
(1)	[F20–OP5]
	[F81–OH2.1]
2.3.4.7. Support for Vent Pipe above a Roof	
(1)	[F81–OP5]
	[F81–OS3.1]
2.3.5.1. Backfilling of Pipe Trench	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
2.3.5.2. Protection of Non-Metallic Pipe	
(1)	[F81–OH2.1,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.3.5.3. Isolation from Loads	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
2.3.5.4. Protection from Frost	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
2.3.5.5. Protection from Mechanical Damage	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
2.3.5.6. Protection from Condensation	
(1)	[F81–OP5]
2.3.6.1. Tests and Inspection of Drainage or Venting Systems	
(1)	[F81–OH1.1] Applies to *venting systems*.
	[F81–OH2.1,OH2.3] Applies to *drainage systems*.
(2)	[F81–OH1.1] Applies to *venting systems*.
	[F81–OH2.1,OH2.3] Applies to *drainage systems*.
(3)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
(4)	[F81–OH1.1] Applies to *venting systems*.
	[F81–OH2.1,OH2.3] Applies to *drainage systems*.
(5)	[F81–OH2.1,OH2.3]
2.3.6.2. Tests of Pipes in Drainage Systems	
(1)	[F81–OH2.1,OH2.3]
(2)	[F81–OH2.1,OH2.3]
2.3.6.3. Tests of Venting Systems	
(1)	[F81–OH1.1]
2.3.6.4. Water Pressure Tests	
(1)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
(2)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
2.3.6.5. Air Pressure Tests	
(1)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
2.3.6.6. Final Tests	
(1)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]
(2)	[F81–OH1.1]
	[F81–OH2.1,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.3.6.7. Ball Tests	
(1)	[F81–OH2.1,OH2.3]
(2)	[F81–OH2.1,OH2.3]
2.3.7.1. Application of Tests	
(1)	[F81–OP5]
(3)	[F81–OP5]
(4)	[F81–OP5]
2.3.7.2. Pressure Tests of Potable Water Systems	
(1)	[F20–OP5]
(2)	[F20,F81–OS3.1]
2.3.7.3. Water Pressure Tests	
(1)	[F81–OP5]
(2)	[F70–OH2.2]
2.4.2.1. Connections to Sanitary Drainage Systems	
(1)	(a) [F81–OH2.2]
	(b) [F81–OH2.2]
	(c) [F81–OH2.1]
	(d) [F81–OH2.1]
	(e) [F81–OH2.1]
	[F72–OH2.1] Applies to *fixtures* that are *directly connected* to *sanitary drainage systems*.
(2)	[F81–OH1.1]
(3)	[F81–OH1.1]
(4)	[F81–OH1.1]
(5)	[F81–OH1.1]
2.4.2.2. Connection of Overflows from Rainwater Tanks	
(1)	[F81–OH2.2]
2.4.2.3. Direct Connections	
(1)	[F81–OH2.2]
(2)	[F81–OH2.1,OH2.4]
(3)	[F81–OH2.4]
2.4.3.1. Urinals	
(1)	[F81–OH2.4]
2.4.3.2. Restricted Locations of Indirect Connections and Traps	
(1)	[F81–OH2.1,OH2.4]
2.4.3.3. Equipment Restrictions Upstream of Grease Interceptors	
(1)	[F81–OH2.1]
2.4.3.4. Fixtures Located in Chemical Storage Locations	
(1)	[F43–OH5]
	[F81–OS1.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.4.3.5. Macerating Toilet Systems	
(1)	[F72–OH2.1]
2.4.3.6. Drains Serving Elevator Pits	
(1)	[F62–OP5]
2.4.4.1. Sewage Treatment	
(1)	[F81–OH2.1]
2.4.4.2. Cooling of Hot Water or Sewage	
(1)	[F81–OH2.1]
2.4.4.3. Interceptors	
(1)	[F81–OH2.1]
(2)	[F43–OH5]
	[F81–OS1.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
2.4.4.4. Neutralizing and Dilution Tanks	
(1)	[F80–OS3.4]
(2)	[F43–OH5]
	[F80–OH2.1]
2.4.5.1. Traps for Sanitary Drainage Systems	
(1)	[F81–OH1.1]
(6)	[F81–OH1.1]
	[F81–OP5]
2.4.5.2. Traps for Storm Drainage Systems	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
(3)	[F81–OP5]
2.4.5.3. Connection of Subsoil Drainage Pipe to a Sanitary Drainage System	
(1)	[F81–OH2.1]
2.4.5.4. Location and Cleanout for Building Traps	
(1)	[F81–OH2.1]
2.4.5.5. Trap Seals	
(1)	[F81–OH1.1]
2.4.6.1. Separate Systems	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH1.1]
2.4.6.2. Location of Soil-or-Waste Pipes	
(1)	[F81–OH2.2]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.4.6.3. Sumps or Tanks	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1] Applies to the watertightness of sumps or tanks.
	[F81–OH1.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
(5)	[F81–OH2.1]
(6)	[F81–OH2.1]
(7)	[F81–OH2.1]
2.4.6.4. Protection from Backflow	
(1)	[F81–OH1.1]
	[F81–OH2.1]
(2)	[F81–OH1.1]
(3)	[F81–OH2.1]
(6)	[F81–OH2.1]
2.4.6.5. Mobile Home Sewer Service	
(1)	[F81–OH2.1]
2.4.7.1. Cleanouts for Drainage Systems	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
(5)	[F81–OH2.1]
(6)	[F81–OH2.1]
(7)	[F81–OH2.1]
(8)	[F81–OH2.1]
(9)	[F81–OH2.1]
2.4.7.2. Size and Spacing of Cleanouts	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
(5)	[F81–OH2.1]
2.4.7.3. Manholes	
(1)	[F20–OS3.1]
(2)	(a) and (c) [F81–OH1.1]
	(a) and (c) [F81–OS1.1]
	(b) [F20–OS3.1]
(3)	[F30–OS3.1]
(4)	[F81–OH2.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.4.7.4. Location of Cleanouts	
(1)	[F81–OH2.1]
(2)	(a) [F81–OS3.1]
	(b) [F81–OH2.1]
(3)	[F81–OH2.1]
(4)	[F81–OH1.1] Applies to vent piping.
	[F81–OH2.1] Applies to drainage piping.
(5)	[F43–OH2.1]
2.4.8.1. Minimum Slope	
(1)	[F81–OH2.1]
2.4.8.2. Length of Fixture Outlet Pipes	
(1)	[F81–OH1.1]
2.4.9.1. No Reduction in Size	
(1)	[F81–OH1.1]
	[F81–OH2.1]
2.4.9.2. Serving Water Closets	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH2.1]
(4)	[F81–OH2.1]
2.4.9.3. Size of Fixture Outlet Pipes	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH1.1]
	[F81–OP5]
2.4.9.4. Size of Building Drain and Building Sewer	
(1)	[F81–OH2.1]
2.4.9.5. Offset in Leaders	
(1)	[F81–OH2.1,OH2.3]
(2)	[F81–OH2.1]
2.4.10.1. Total Load on a Pipe	
(1)	[F81–OH2.1]
2.4.10.2. Hydraulic Loads for Fixtures	
(2)	[F81–OH2.1]
2.4.10.3. Hydraulic Loads from Fixtures with a Continuous Flow	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.4.10.4. Hydraulic Loads from Roofs or Paved Surfaces	
(1)	[F81–OP5]
	[F20,F81–OS2.1]
(2)	(a), (d) and (e) [F41,F81–OH2.4]
	(b) and (c) [F20,F81–OS2.1]
	[F20,F81–OP5]
(3)	[F20,F81–OP5]
	[F20,F81–OS2.1]
(4)	[F21,F81–OP5]
	[F20,F81–OS2.1]
2.4.10.5. Conversion of Fixture Units to Litres	
(1)	[F81–OH2.1]
2.4.10.6. Hydraulic Loads to Soil-or-Waste Pipes	
(1)	[F72–OH2.1,OH2.3]
(2)	[F72–OH2.1,OH2.3]
2.4.10.7. Hydraulic Loads on Branches	
(1)	[F72–OH2.1,OH2.3]
2.4.10.8. Hydraulic Loads on Sanitary Building Drains or Sewers	
(1)	[F81–OH2.1,OH2.3]
2.4.10.9. Hydraulic Loads on Storm or Combined Building Drains or Sewers	
(1)	[F81–OH2.1,OH2.3]
2.4.10.10. Hydraulic Loads to Roof Gutters	
(1)	[F81–OP5]
2.4.10.11. Hydraulic Loads on Leaders	
(1)	[F81–OP5]
2.4.10.12. Hydraulic Loads from Fixtures with a Semi-continuous Flow	
(1)	[F81–OP5]
2.4.10.13. Design of Storm Sewers	
(1)	[F81–OH2.1]
2.5.1.1. Venting for Traps	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
2.5.2.1. Wet Venting	
(1)	[F40,F81–OH1.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.5.3.1. Circuit Venting	
(1)	[F40,F81–OH1.1]
(2)	[F40,F81–OH1.1]
(3)	[F40,F81–OH1.1]
(4)	[F40,F81–OH1.1]
(5)	[F40,F81–OH1.1]
(6)	[F40,F81–OH1.1]
(7)	[F40,F81–OH1.1]
(8)	[F40,F81–OH1.1]
(9)	[F40,F81–OH1.1]
(10)	[F40,F81–OH1.1]
(11)	[F40,F81–OH1.1]
2.5.4.1. Stack Vents	
(1)	[F40,F81–OH1.1]
2.5.4.2. Vent Stacks	
(1)	[F40,F81–OH1.1]
(3)	[F40,F81–OH1.1]
(4)	[F40,F81–OH1.1]
2.5.4.3. Yoke Vents	
(1)	[F40,F81–OH1.1]
(2)	[F40,F81–OH1.1]
(3)	[F40,F81–OH1.1]
(4)	[F40,F81–OH1.1]
2.5.4.4. Offset Relief Vents	
(1)	[F40,F81–OH1.1]
2.5.4.5. Fixtures Draining into Vent Pipes	
(1)	[F40,F81–OH1.1]
2.5.5.1. Venting of Sewage Sumps	
(1)	[F40,F81–OH1.1]
2.5.5.2. Venting of Oil Interceptors	
(1)	[F40,F81–OH1.1]
	[F40,F81–OS1.1]
	[F72,F81–OH2.1,OH2.3]
(2)	[F40,F81–OH1.1]
	[F40,F81–OS1.1]
(3)	[F40,F81–OS1.1]
(4)	[F40,F81–OS1.1]
(5)	[F40,F81–OS1.1]
2.5.5.3. Venting of Drain Piping and Dilution Tanks for Corrosive Waste	
(1)	[F80,F81–OS3.4]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.5.5.4. Fresh Air Inlets	
(1)	[F81–OH1.1]
2.5.5.5. Provision for Future Installations	
(1)	[F81–OH1.1] Applies to *venting systems*.
	[F81–OH2.1,OH2.3] Applies to *drainage systems*.
(2)	[F40,F81–OH1.1]
2.5.6.1. Drainage of Vent Pipes	
(1)	[F81–OH1.1]
	[F81–OS1.1]
2.5.6.2. Vent Pipe Connections	
(1)	[F81–OS1.1]
(2)	[F81–OH1.1]
(3)	[F40,F81–OH1.1]
2.5.6.3. Location of Vent Pipes	
(1)	[F81–OH1.1]
(2)	[F81–OH2.1,OH2.3]
(3)	[F81–OH1.1]
(4)	[F40,F81–OH1.1]
2.5.6.4. Connection of Vents above Fixtures Served	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
2.5.6.5. Terminals	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
(3)	[F81–OH1.1]
(4)	[F81–OH1.1]
(5)	[F81–OH1.1]
(6)	[F81–OH1.1]
2.5.7.1. General	
(1)	[F81–OH1.1]
2.5.7.2. Size Restriction	
(1)	[F81–OH1.1]
2.5.7.3. Additional Circuit Vents and Relief Vents	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
2.5.7.4. Offset Relief Vents	
(1)	[F81–OH1.1]
2.5.7.5. Yoke Vents	
(1)	[F81–OH2.1]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.5.7.6. Vent Pipes for Manholes	
(1)	[F81–OH2.1]
2.5.7.7. Vents for Sewage Sumps, Dilution Tanks and Macerating Toilet Systems	
(1)	[F81–OH2.1]
(2)	[F81–OH2.1]
(3)	[F81–OH1.1]
2.5.8.1. Hydraulic Loads Draining to Wet Vents	
(1)	[F81–OH1.1]
(2)	[F81–OH1.1]
2.5.8.2. Individual Vents and Dual Vents	
(1)	[F81–OH1.1]
2.5.8.3. Branch Vents, Vent Headers, Continuous Vents and Circuit Vents	
(1)	[F81–OH1.1]
2.5.8.4. Vent Stacks or Stack Vents	
(3)	[F81–OH1.1]
(4)	[F81–OH1.1]
(5)	[F81–OH1.1]
2.5.9.2. Air Admittance Valves	
(1)	[F40,F81–OH1.1]
(2)	[F40,F81–OH1.1]
2.5.9.3. Installation Conditions	
(1)	[F40,F81–OH1.1]
(2)	[F40,F81–OH1.1]
(3)	[F40,F81–OH1.1]
(4)	[F40,F81–OH1.1]
(5)	[F40,F81–OH1.1]
2.6.1.1. Design	
(1)	[F31–OS3.2]
(2)	[F71–OH2.3]
2.6.1.2. Drainage	
(1)	[F81–OP5]
2.6.1.3. Shut-off Valves	
(1)	[F81–OP5]
(2)	[F81–OP5]
(3)	[F81–OP5]
(4)	[F81–OP5]
(5)	[F70,F72–OH2.1,OH2.3]
(6)	[F70,F72–OH2.1,OH2.3]
(7)	[F70,F81–OH2.1,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.6.1.4. Protection for Exterior Water Supply	
(1)	[F81–OP5]
2.6.1.5. Check Valves	
(1)	[F20,F81–OP5]
2.6.1.6. Flushing Devices	
(1)	[F72–OH2.1]
(2)	[F72–OH2.1]
2.6.1.7. Relief Valves	
(1)	[F31,F81–OS3.2]
(2)	[F81–OS3.1,OS3.2]
(4)	(a) [F31–OS3.2] [F81–OS1.1] (b) [F81–OS3.1,OS3.2]
(5)	(b) [F81–OH2.2] Applies to the size of *air breaks*.
	[F31–OS3.2]
(6)	[F31–OS3.2]
(7)	[F31–OS3.2]
(8)	[F81–OS3.2]
(9)	[F81–OP5]
(10)	[F81–OP5]
2.6.1.8. Solar Domestic Hot Water Systems	
(1)	[F31–OS3.2] [F81–OS3.4]
	[F70–OH2.2]
2.6.1.9. Water Hammer	
(1)	[F20,F81–OP5]
	[F20,F81–OS3.2]
2.6.1.10. Mobile Home Water Service	
(1)	[F71,F70,F46–OH2.2,OH2.3]
2.6.1.11. Thermal Expansion	
(1)	[F20,F81,F46–OP5]
<2.6.1.12. Service Water Heaters>	
<(1)>	<[F40–OS3.4]>
2.6.2.1. Connection of Systems	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(2)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(3)	[F70,F81,F82–OH2.2,OH2.3]
2.6.2.2. Back-Siphonage	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(2)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.6.2.3. Backflow Caused by Back Pressure	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(2)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(3)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.4. Backflow from Fire Protection Systems	
(2)	[F46,F70,F81–OH2.1,OH2.2,OH2.3]
(3)	[F46,F70,F81–OH2.1,OH2.2,OH2.3]
(4)	[F46,F70,F81–OH2.1,OH2.2,OH2.3]
2.6.2.5. Separation of Water Supply Systems	
(1)	[F70,F81,F46-OH2.1,OH2.2,OH2.3]
2.6.2.6. Premise Isolation	
(1)	[F70,F81,F82–OH2.1,OH2.2,OH2.3]
2.6.2.7. Hose Bibb	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.8. Cleaning of Systems	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.9. Air Gap	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(2)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.10. Vacuum Breakers	
(2)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(3)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
(4)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.11. Tank-Type Water Closets	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
2.6.2.12. Backflow Preventers	
(1)	[F70,F81,F46–OH2.1,OH2.2,OH2.3]
<2.6.3.1. Design, Fabrication and Installation	
(1)	[F71,F72–OH2.1,OH2.3]
(2)	[F72–OH2.1][F70–OH2.2][F71–OH2.3]
(3)	[F70,F71–OH2.1,OH2.3]
	[F81–OP5]
	[F81–OS1.4]>
2.6.3.2. Hydraulic Load	
(1)	[F71,F72–OH2.1,OH2.3]
(2)	[F71,F72–OH2.1,OH2.3]
(3)	[F71,F72–OH2.1,OH2.3]
(4)	[F81–OH2.1,OH2.2]

Table 2.8.1.1.
Objectives and Functional Statements Attributed to the Acceptable Solutions in Part 2
Forming part of Sentence 2.8.1.1.(1)

Acceptable Solutions	Objectives and Functional Statements[1]
2.6.3.3. Static Pressure	
(1)	[F81–OS3.2]
2.6.3.4. Size	
(1)	[F71,F72–OH2.1,OH2.3]
(2)	[F71,F72–OH2.1,OH2.3]
(3)	[F71,F72–OH2.1,OH2.3]
(4)	<Reserved.>
(5)	[F71,F72–OH2.1,OH2.3]
2.6.3.5. Velocity	
(1)	[F81–OH2.1,OH2.3]
	[F81–OP5]
	[F81–OS3.1]
2.7.1.1. Not Permitted	
(1)	[F46–OH2.2]
2.7.2.1. Markings Required	
(1)	[F46–OH2.2]
2.7.3.1. Pipes	
(1)	[F46–OH2.2]
2.7.3.2. Outlets	
(1)	[F46–OH2.2]
2.7.4.1. Non-potable Water System Design	
(1)	[F81–OH2.1]
(2)	<Reserved.>

Notes to Table 2.8.1.1.:
(1) See Parts 2 and 3 of Division A.

Appendix A
Explanatory Material

A-1.1.2.1.(1) Objectives and Functional Statements Attributed to Acceptable Solutions The objectives and functional statements attributed to each Code provision are shown in Table 2.8.1.1. at the end of Division B.

Many provisions in Division B serve as modifiers of or pointers to other provisions or serve other clarification or explanatory purposes. In most cases, no objectives and functional statements have been attributed to such provisions, which therefore do not appear in the above-mentioned table.

For provisions that serve as modifiers of or pointers to other referenced provisions and that do not have any objectives and functional statements attributed to them, the objectives and functional statements that should be used are those attributed to the provisions they reference.

A-1.3.1.2.(1) Referenced Documents Where documents are referenced in the Appendices of this Code, they shall be the editions designated in Table A-1.3.1.2.(1)

Table A-1.3.1.2.(1)
Documents Referenced in the Appendices of <Book II (Plumbing Systems) of the British Columbia Building Code 2012>

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
<ASHRAE>	<2009>	<ASHRAE Handbook of Fundamentals>	<A-2.6.3.1.(2)>
<ASHRAE	2011	ASHRAE Handbook – HVAC Applications	A-2.6.3.1.(2)>
<ASME	B16.3-2011	Malleable-Iron Threaded Fittings: Classes 150 and 300	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASME	B16.4-2011	Gray Iron Threaded Fittings: Classes 125 and 250	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASME	B16.15-2011	Cast Copper Alloy Threaded Fittings: Classes 125 and 250	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASME	B16.18-2012	Cast Copper Alloy Solder Joint Pressure Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASME>	B16.22-2001	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.
<ASME	B16.23-2011	Cast Copper Alloy Solder Joint Drainage Fittings: DWV	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASME>	B16.29-<2007>	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV	Table A-2.2.5., 2.2.6. and 2.2.7.
<ASPE	2010	ASPE Plumbing Engineering Design Handbook	A-2.6.3.1.(2)>
ASPE	<2008>	Data Book – Volume 4, Chapter 8, Grease Interceptors	A-2.4.4.3.(1)
<ASTM	A 53/A 53M-10	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASTM	B 42-10	Seamless Copper Pipe, Standard Sizes	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASTM	B 43-09	Seamless Red Brass Pipe, Standard Sizes	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASTM	B 88-09	Seamless Copper Water Tube	Table A-2.2.5., 2.2.6. and 2.2.7.>
<ASTM	B 306-09	Copper Drainage Tube (DWV)	Table A-2.2.5., 2.2.6. and 2.2.7.>

Table A-1.3.1.2.(1)
Documents Referenced in the Appendices of <Book II (Plumbing Systems) of the British Columbia Building Code 2012>

Issuing Agency	Document Number(1)	Title of Document(2)	Code Reference
ASTM	D 2466<-06>	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Table A-2.2.5., 2.2.6. and 2.2.7.
ASTM	D 2467<-06>	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	Table A-2.2.5., 2.2.6. and 2.2.7.
ASTM	D 3138<-04>	Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Non-Pressure Piping Components	A-2.2.5.10. to 2.2.5.12.
ASTM	F 628<-08>	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core	Table A-2.2.5., 2.2.6. and 2.2.7.
<ASTM	F 714-10	Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter	Table A-2.2.5., 2.2.6. and 2.2.7.>
AWWA	<M14->2004	<Recommended Practice for Backflow Prevention and Cross-Connection Control>	Table A-2.6.2.4.(2)
<AWWA	ANSI/AWWA C151/A21.51-2009	Ductile-Iron Pipe, Centrifugally Cast, for Water	Table A-2.2.5., 2.2.6. and 2.2.7.>
<BC>	<S.B.C. 2003, c. 53>	<Environmental Management Act>	<A-2.7.4.1.>
<CCBFC>	<NRCC 35951>	<Guidelines for Application of Part 3 of theNational Building Code of Canada to Existing Buildings>	<A-1.1.1.1.(1)>
<CCBFC>	<NRCC 40383>	<User's Guide – NBC 1995, Fire Protection, Occupant Safety and Accessibility (Part 3)>	<A-1.1.1.1.(1)>
<CCBFC>	<NRCC 43963>	<User's Guide – NBC 1995, Application of Part 9 to Existing Buildings>	<A-1.1.1.1.(1)>
<CCBFC>	<NRCC 53301>	<National Building Code of Canada 2010>	<Table A-2.2.5., 2.2.6. and 2.2.7. A-2.4.10. A-2.4.10.4.(1)>
<CCBFC>	<NRCC 53543>	<User's Guide – NBC 2010, Structural Commentaries (Part 4 of Division B)>	<A-1.1.1.1.(1)>
CGSB	CAN/CGSB-34.1-94	Asbestos-Cement Pressure Pipe	Table A-2.2.5., 2.2.6. and 2.2.7.
CGSB	CAN/CGSB-34.9-94	Asbestos-Cement Sewer Pipe	Table A-2.2.5., 2.2.6. and 2.2.7.
CGSB	CAN/CGSB-34.22-94	Asbestos-Cement Drain Pipe	Table A-2.2.5., 2.2.6. and 2.2.7.
CGSB	CAN/CGSB-34.23-94	Asbestos-Cement House Connection Sewer Pipe	Table A-2.2.5., 2.2.6. and 2.2.7.
CSA	A60.1-M1976	Vitrified Clay Pipe	Table A-2.2.5., 2.2.6. and 2.2.7.
<CSA	CAN/CSA-A257.1-09	Non-Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-A257.2-09	Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe, and Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>

Table A-1.3.1.2.(1)
Documents Referenced in the Appendices of <Book II (Plumbing Systems) of the British Columbia Building Code 2012>

Issuing Agency	Document Number[1]	Title of Document[2]	Code Reference
<CSA	B64.4.1-11	Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF)	Table A-2.6.2.4.(2)>
<CSA	B64.5.1-11	Double Check Valve Backflow Preventers for Fire Protection Systems (DCVAF)	Table A-2.6.2.4.(2)>
<CSA	B64.6.1-11	Dual Check Valve Backflow Preventers for Fire Protection Systems (DuCF)	Table A-2.6.2.4.(2)>
<CSA	B64.9-11	Single Check Valve Backflow Preventers for Fire Protection Systems (SCVAF)	Table A-2.6.2.4.(2)>
<CSA	B64.10.1-11	Maintenance and Field Testing of Backflow Preventers	A-2.6.2.1.(3)>
<CSA	B70-12	Cast Iron Soil Pipe, Fittings, and Means of Joining	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	B125.3-12	Plumbing Fittings	A-2.6.1.11.(1)>
CSA	<CAN/CSA->B127.1-99	Asbestos Cement Drain, Waste and Vent Pipe and Pipe Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.
CSA	B127.2-M1977	Components for Use in Asbestos Cement Building Sewer Systems	Table A-2.2.5., 2.2.6. and 2.2.7.
<CSA	CAN/CSA-B137.1-09	Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B137.2-09	Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B137.3-09	Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B137.5-09	Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.7.(1)>
<CSA	CAN/CSA-B137.6-09	Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot- and Cold-Water Distribution Systems	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.10. to 2.2.5.12.>
<CSA	CAN/CSA-B137.9-09	Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.13.(1)>
<CSA	CAN/CSA-B137.10-09	Crosslinked Polyethylene/Aluminum/ Crosslinked Polyethylene (PEX-AL-PEX) Composite Pressure-Pipe Systems	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.14.(1)>
<CSA	CAN/CSA-B137.11-09	Polypropylene (PP-R) Pipe and Fittings for Pressure Applications	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.15.(1)>
<CSA	CAN/CSA-B181.1-11	Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.10. to 2.2.5.12.>
<CSA	CAN/CSA-B181.2-11	Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings	Table A-2.2.5., 2.2.6. and 2.2.7. A-2.2.5.10. to 2.2.5.12.>
<CSA	CAN/CSA-B181.3-11	Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems	Table A-2.2.5., 2.2.6. and 2.2.7.>

Table A-1.3.1.2.(1)
Documents Referenced in the Appendices of <Book II (Plumbing Systems) of the British Columbia Building Code 2012>

Issuing Agency	Document Number(1)	Title of Document(2)	Code Reference
<CSA	CAN/CSA-B182.1-11	Plastic Drain and Sewer Pipe and Pipe Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B182.2-11	PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B182.4-11	Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings	Table A-2.2.5., 2.2.6. and 2.2.7.>
<CSA	CAN/CSA-B182.6-11	Profile Polyethylene (PE) Sewer Pipe and Fittings For Leak-Proof Sewer Applications	Table A-2.2.5., 2.2.6. and 2.2.7.>
CSA	<CAN/CSA->G401-<07>	Corrugated Steel Pipe Products	Table A-2.2.5., 2.2.6. and 2.2.7.
McGraw-Hill	<2006>	<International Plumbing Codes Handbook>	A-2.6.3.
NIST	Building Materials and Structures Report BMS-79, 1941	Water-Distributing Systems for Buildings	A-2.6.3.

Notes to Table A-1.3.1.2.(1):
(1) Some documents may have been reaffirmed or reapproved. Check with the applicable issuing agency for up-to-date information.
(2) Some titles have been abridged to omit superfluous wording.

A-2.1.2.1.(2) Combined Building Drains Combined building drains may have proven acceptable on the basis of past performance in some localities and their acceptance under this Code may be warranted.

A-2.1.2.4.(1) Service Piping The layout as shown in Figure A-2.1.2.4.(1)(c) may require special legal arrangements in some jurisdictions to ensure that access can be provided to all parts of the service pipes.

A-2.6.1.11.(1) Thermal Expansion To accommodate the increase in pressure caused by thermal expansion within a closed water distribution system, one of the following should be installed:

- a suitably sized diaphragm expansion tank designed for use within a potable water system,
- an auxiliary thermal expansion relief valve (T.E.R. valve) conforming to <CSA B125.3, "Plumbing Fittings,"> set at a pressure of 550 kPa or less and designed for repeated use, or
- other means acceptable to the authority having jurisdiction.

<A-2.6.1.12.(1) Service Water Heaters Storing hot water at temperatures below 60°C in the hot water tank or in the delivery system may lead to the growth of legionella bacteria. Contemporary electric water heater tanks experience temperature stratification and thus tend to have legionella bacteria in the lower parts of the tank. Article 2.6.1.12. specifies a thermostat setting of 60°C, which addresses the concern over the growth of legionella bacteria in electric hot water storage tanks and is enforceable without introducing unnecessary complications. The growth of legionella bacteria is not a concern for other types of water heaters with different designs that use different fuels.

Electrically heated water heaters are shipped with the thermostat set at 60°C. Article 2.6.1.12. is included in Book II (Plumbing Systems) of this Code to formalize this de facto temperature setting as a requirement. The thermostats have graduated temperature markings to allow such a setting, which is not the case with gas- or oil-heated water heaters.>

A-2.6.2.1.(3) Backflow Preventers CSA B64.10.1, "Maintenance and Field Testing of Backflow Preventers," is considered to represent good practice as regards procedures for the maintenance and field testing of backflow preventers.

A-2.6.2.4.(2) Backflow from Fire Protection Systems The following document is considered to be good engineering practice when selecting a backflow preventer for installation on a fire protection system: AWWA M14, "Recommended Practice for Backflow Prevention and Cross-Connection Control."

Table A-2.6.2.4.(2)
Selection Guide for Backflow Prevention Devices on Fire Sprinkler and Standpipe Systems
Forming part of Sentence 2.6.2.4.(2)

CSA Standard Number	Type of Device(1)	Systems Made with Potable Water System Materials		Systems Not Made with Potable Water System Materials	
		Minor Hazard — Residential Partial Flow-Through System	Minor Hazard — Class 1 System	Moderate Hazard — Class 1, 2, 3 and 6 Systems	Severe Hazard — Any Class of System in which Antifreeze or Other Additives Are Used
<CSA B64.6.1>	DuCF	P	NP	NP	NP
<CSA B64.9>	SCVAF	P	P	NP	NP
<CSA B64.5.1>	DCVAF	P	P	P	NP
<CSA B64.4.1>	RPF	P	P	P	P
NP = Not permitted P = Permitted					

Notes to Table A-2.6.2.4.(2):
(1) The "F" indicates that the product is only recommended for use on fire sprinkler and standpipe systems.

A-2.6.2.4.(3) Fire Department Pumper Connection and Backflow Protection

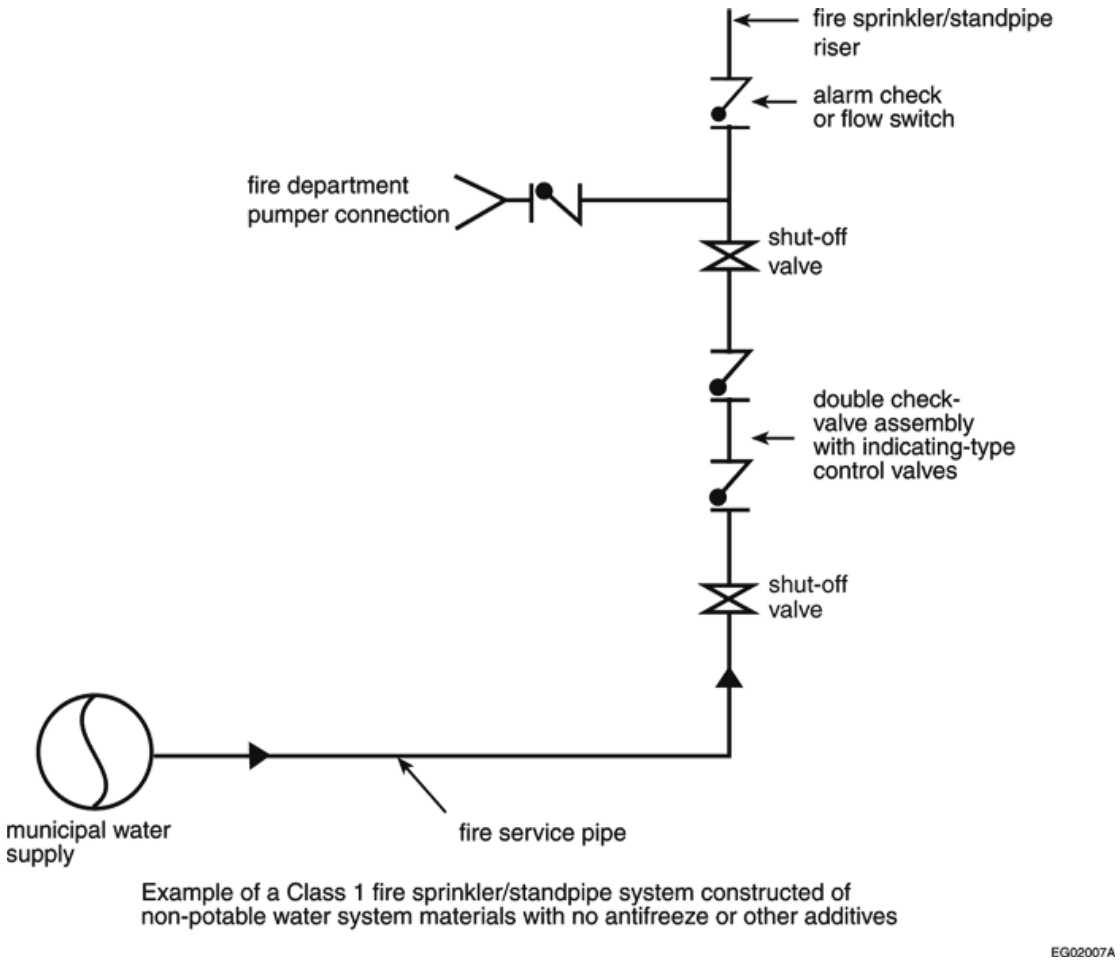

Figure A-2.6.2.4.(3)
Fire Department Pumper Connection and Backflow Protection

A-2.6.2.6.(1) Locations Requiring Premise Isolation The following list is a guide to locations where premise isolation may be required:

- hospital buildings with operating, mortuary or laboratory facilities
- radioactive material processing plants
- petroleum processing facilities
- premises where inspection is restricted
- sewage treatment plants
- commercial laundries (excluding laundromats)
- plating or chemical plants
- docks and dockside facilities
- food and beverage processing plants
- steam plants
- trackside facilities for trains

An assessment of the hazard must be carried out to determine the need, if any, for a backflow prevention device.

A-2.6.2.9.(2) Installation of Air Gaps

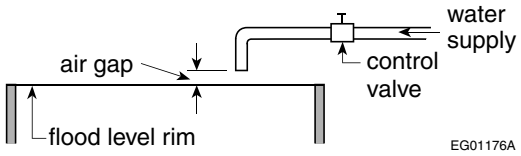

Figure A-2.6.2.9.(2)
Installation of Air Gaps

A-2.6.2.10.(2) Installation of Atmospheric Vacuum Breakers

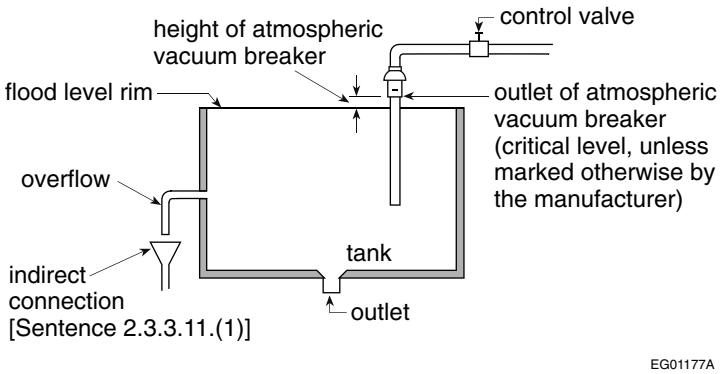

Figure A-2.6.2.10.(2)
Installation of Atmospheric Vacuum Breakers

A-2.6.3. Water Systems This Subsection contains performance requirements for water systems. Two widely used references for the design of water systems are:

- NIST Building Materials and Structures Report BMS-79, "Water-Distributing Systems for Buildings," United States Department of Commerce, National Bureau of Standards, Washington, D.C., and
- McGraw-Hill 2006, "International Plumbing Codes Handbook," edited by V.T. Manas, McGraw-Hill Book Company, New York, U.S.A.

A-2.6.3.1. Water Quality Water destined for use as potable water can originate from a variety of sources that are generally classified as surface waters or well waters, such as lakes, rivers, streams and aquifers. In some localities, there may be seasonal variations in the water supply, and surface and well waters may be blended at times.

Water composition is the primary consideration in determining the cause of corrosion in potable water systems. If the water has corrosive characteristics, water treatment may be necessary to control its corrosiveness: this may be as straightforward as adjusting the pH of the water at the treatment plant, or it may involve more extensive corrosion-control treatment methods. Water purveyors normally consult treatment specialists to develop methods suitable for specific conditions. The treatment of water from private wells may also require expert consultation.

The past performance of plumbing materials and products in different localities often provides insight into what can be expected with new installations. In areas where water-related corrosion is known to occur, adjustment of water chemistry may be sufficient or it may be necessary to select alternative piping and fitting materials or more robust products.

It is important to note that not all corrosion can be attributed to water conditions: the improper design and installation of potable water systems may result in erosion corrosion, galvanic corrosion, fatigue cracking, and so forth.

A-2.6.3.1.(2) Potable Water Systems The design procedures contained in the following documents are considered good engineering practice in the field of potable water systems:

- <ASHRAE 2011, "ASHRAE Handbook - HVAC Applications,"> chapter on Service Water Heating,
- ASHRAE 2009, "ASHRAE Handbook of Fundamentals," chapter on Pipe Sizing,
- ASPE 2005, "ASPE Plumbing Engineering Design Handbook," chapter on Cold Water Systems, and
- ASPE 2005, "ASPE Plumbing Engineering Design Handbook," chapter on Domestic Water Heating Systems.

Alternatively, the following methods, which apply to both public and private water supplies, may be used in determining the size of each section of the water system using Table A-2.6.3.1.(2)A (Small Commercial Building Method) and Table A-2.6.3.1.(2)F (Average Pressure Loss Method). Where these methods are considered an alternative to a detailed engineering design method, the hydraulic loads shall be the sum of the total fixture units given in Tables 2.6.3.2.A, B, C and D.

Method for Small Commercial Buildings

Information required if using this method:

(a) The developed length:
  (i) from the property line or private water supply system when located outside the building to the water service entry point to the building, and
  (ii) from the water service entry point to the building to the most remote water outlet.
(b) Minimum static pressure:
  (i) the minimum static pressure available at the property line or other water source (private water supply system), or
  (ii) where there is a wide fluctuation of pressure in the main throughout the day, the minimum static pressure available.
(c) Pressure losses:
  (i) losses for meters, pressure-reducing valves, backflow preventers, water treatment systems, and any other devices, and
  (ii) losses or gains due to changes in elevation.
(d) The number of fixture units (FU) as determined by using the sum of the total values given in Tables 2.6.3.2.A, B, C and D.
(e) The maximum velocities permitted in accordance with the manufacturer's recommendations for the pipe and fittings chosen for the installation.

Note that a private water supply system must be capable of meeting the demands of the water distribution system.

Pipe Sizing Procedures

(see Figure A-2.6.3.1.(2)-A)Step 1: Water Service Piping (see Table A-2.6.3.1.(2)B)

(a) Obtain the total fixture units required for the installation using the sum of the total values given in Tables 2.6.3.2.A, B, C and D and consider all other demands on the water supply.
(b) Determine the minimum static pressure available at the property line or private water supply system and consider all pressure losses for the water service.
(c) Select the pressure range group in Table A-2.6.3.1.(2)A that is consistent with the minimum static pressure available including any other losses.
(d) Select the length column in Table A-2.6.3.1.(2)A that is equal to or greater than the developed length from the property line or private water supply system to the water service entry point to the building.
(e) In that column, find the fixture unit value that is equal to or greater than the fixture unit demand for the installation and follow the row back to the first column to locate the water service pipe size.
(f) To establish the adjusted static pressure available where the water service enters the building for sizing the water distribution system, subtract the actual static pressure losses for the water service from the minimum static pressure available at the property line.
(g) The adjusted static pressure available where a private water supply system is installed should be the static pressure available from such a system at the entry to the building.

Step 2: Hot Water Piping (see Table A-2.6.3.1.(2)C)

(a) Start with the most remote outlet in the most distant occupancy that requires hot water.
(b) Use the sum of the total fixture unit values given in Tables 2.6.3.2.A, B, C and 2.6.3.2.D and work back toward the service water heater, adding in the fixture unit values as they occur.
(c) Select the pressure range group in Table A-2.6.3.1.(2)A that is consistent with the minimum static pressure available at the water service entry and any other losses (e.g. elevation or devices such as backflow preventers, etc.). Use this pressure range group for all portions (hot and cold) of the water distribution system.
(d) Select the length column that is equal to or greater than the developed length from the water service entry point to the building to the most remote outlet served with either hot or cold water.
(e) In that column, find the fixture unit value that is equal to or greater than the fixture unit demand at each pipe and follow the row back to the second column to locate the water distribution system pipe size.

Step 3: Cold Water Piping (see Table A-2.6.3.1.(2)D)

(a) Start with the most remote outlet on the cold water piping using the established total developed length column and pressure range group in Table A-2.6.3.1.(2)A and work through Steps 2(c), (d) and (e) for hot water piping.
(b) Use the sum of the total fixture unit values given in Tables 2.6.3.2.A, B, C and 2.6.3.2.D and work back toward the water service entry.
(c) Where the service water heater distribution pipe occurs, add in the fixture unit demand of the fixtures served only with hot water and those that have not yet been added in as served to the cold water side of the most remote fixtures requiring both a hot and cold water supply.
(d) Continue by sizing the cold water main between the service water heater distribution pipe and the water service entry.
(e) Add in the fixtures served with cold water only from the main within the most remote occupancy as they occur and all common distribution piping serving hot and cold water to other occupancies as they occur.
(f) Complete by sizing all distribution piping served by the main within the most remote occupancy and then the other occupancies not yet sized using the previously established total developed length and pressure range group in Table A-2.6.3.1.(2)A.