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PREFACE

The Canadian Plumbing Code contains the requirements for the design and installation of plumbing systems.

Where changes or additions to the previous (1977) edition of this document have been made, the paragraphs affected have been indicated by vertical lines in the margins.

The requirements contained in this Code are supported by explanatory material and diagrams contained in Appendix A, thus leaving the body of the Code consisting of regulatory material only. The first line of each item in the Appendix contains in bold-face type a reference to the definition or requirement to which the explanatory material is applicable. These references have been placed in alphabetical or numerical order to ensure that they are easily found when they are referred to in the text.

The Code is drafted in such a way that it may be adopted or enacted for legal use by any jurisdictional authority in Canada. It is divided into seven Sections, each Section being self-sufficient with a minimum of cross references. A decimal numbering system has been used throughout the Code. The first number indicates the Section of the Code, the second the Subsection in the Section, the third the Article and the fourth the Sentence in the Article. A Sentence (indicated by numbers in brackets) may be further divided into Clauses and Subclauses. These are illustrated as follows:

4.	Section
4.6	Subsection
4.6.5.	Article
4.6.5.(1)	Sentence
4.6.5.(1)(c)	Clause
4.6.5.(1)(c)(i)	Subclause

This edition has been converted to SI units where this is feasible, except for pipe sizes which continue to be expressed in inches. These are nominal dimensions by which pipe is known in the trade and the exact dimension may vary with different pipe materials. Until there is general acceptance of a uniform nominal size for such piping, the pipe size is expressed in inches to avoid confusion. Metric sizes are based on those which appeared in the metric supplement to the 1977 edition. The metric sizes are not shown as changes. Imperial equivalents to the metric values are listed in Appendices B and C. These have been calculated for informational purposes only and not as legal equivalents.

The Canadian Plumbing Code is published by the National Research Council of Canada and is prepared under the auspices of the Associate Committee on the National Building Code.

It is one of a special code series published separately from but referenced in the National Building Code of Canada. It can thus be adopted for legal use by a municipality or provincial body jointly with or separately from the National Building Code.

Enquiries regarding this document should be directed to: The Secretary, Associate Committee on the National Building Code, National Research Council of Canada, Ottawa, Ontario K1A 0R6.

Ce document est disponible en français.

SECTION 1 GENERAL REQUIREMENTS AND ADMINISTRATION

SUBSECTION 1.1 APPLICATION

1.1.1. This Code applies to the design, construction, extension, alteration, renewal or repair of *plumbing systems*.

1.1.2. In addition to the administrative requirements of this Code, the appropriate requirements in Part 2 of the National Building Code of Canada 1980 shall apply.

SUBSECTION 1.2 SCOPE

Scope

1.2.1. 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 or other *approved* disposal point, (b) venting systems, (c) *water service pipes,* and (d) *water distribution systems.*

SUBSECTION 1.3 DEFINITIONS AND ABBREVIATIONS

Definitions

1.3.1. Definitions of words and phrases used in this Code that are not included in the list of definitions in this Section shall have the meanings which are commonly assigned to them in the context in which they are used in this Code, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

1.3.2. The words and terms in italics in this Code shall have the following meanings:

Air break means the unobstructed distance between the lowest point of an indirect *drainage system* and the *flood level rim* of the *fixture* into which it discharges. (See Appendix A explaining Sentence 3.3.11.(2).)

Air gap means the unobstructed vertical distance through air between the lowest point of a water supply outlet and the *flood level rim* of the *fixture* or device into which the outlet discharges. (See Appendix A explaining Sentence 6.2.3.(2).)

Alloyed zinc means an alloy of zinc having the corrosion resistance and physical properties of an alloy containing 0.15 per cent titanium, 0.74 per cent copper and 99.11 per cent zinc, and so tempered as to be capable of being formed into the shape required for a watertight joint.

Appropriate authority having jurisdiction means the departments of the provincial governments and agents thereof that have authority over the subject that is regulated.

Approved means approved by the *authority having jurisdiction* or the *appropriate authority having jurisdiction.*

Authority having jurisdiction means

(a) with respect to the proclamation and amendment of this Code and the creation of a Board of Appeal, the adopting governmental body, or

(b) with respect to the administration of this Code, the person (designated official) appointed by the adopting governmental body and any person authorized by him to administer this Code.

Backflow means a flowing back or reversal of the normal direction of the flow.

Backflow preventer means a device or a method that prevents *backflow.* (See Appendix A.)

Back-siphonage means *backflow* caused by atmospheric pressure. (See Appendix A.)

Back-siphonage preventer (or vacuum breaker) means a device or a method that prevents *back-siphonage*. (See Appendix A.)

Backwater valve means a *check valve* designed for use in a gravity *drainage system*.

Branch means a *soil-or-waste pipe* connected at its upstream end to the junction of 2 or more *soil-or-waste pipes* or to a *soil-or-waste stack*, and connected at its downstream end to another *branch*, a sump, a *soil-or-waste stack* or a *building drain*. (See Appendix A explaining definition for drainage system.)

Branch vent means a *vent pipe* that is connected at its lower end to the junction of 2 or more *vent pipes*, and is connected at its upper end either to a *stack vent*, *vent stack* or *header*, or is terminated in open air. (See Appendix A.)

Building means any structure used or intended for supporting or sheltering any use or *occupancy*.

Building drain means the horizontal piping, including any vertical *offset* that conducts *sewage*, *clear-water waste* or *storm water* to a *building sewer*. (See Appendix A explaining definition for drainage system.)

Building sewer means a pipe that is connected to a *building drain* 1 m outside a wall of a *building* and that leads to a public sewer or *private sewage disposal system*.

Building trap means a *trap* that is installed in a *building drain* or *building sewer* to prevent circulation of air between a *drainage system* and a public sewer. (See Appendix A explaining Sentence 4.5.4.(1).)

Check valve means a valve that permits flow in one direction but prevents a return flow.

Circuit vent means a *vent pipe* that serves a number of *fixtures* and connects to the *fixture drain* of the most upstream *fixture*. (See Appendix A.)

Cleanout means an access provided in *drainage* and *venting systems* to provide for cleaning and inspection services.

Clear-water waste means waste water that does not contain *sewage* or *storm water*. (See Appendix A.)

Combined building drain means a *building drain* that is intended to conduct *sewage* and *storm water*.

Combined building sewer means a *building sewer* that is intended to conduct *sewage* and *storm water*.

Combined sewer means a sewer that is intended to conduct *sewage* and *storm water*.

Combustible (as applying to an elementary building material) means that such material fails to conform to CAN4-S114-78, "Standard Method of Test for Determination of Non-combustibility in Building Materials."

Continuous vent means a *vent pipe* that is an extension of a vertical section of a *branch* or *fixture drain*.

Critical level means the level of submergence at which the *back-siphonage preventer* ceases to prevent *back-siphonage*.

Dead end means a pipe that terminates with a closed fitting.

Developed length means the length along the centre line of the pipe and fittings. (See Appendix A explaining Sentence 5.6.3.(1).)

Directly connected means physically connected in such a way that water or gas cannot escape from the connection.

Drainage system means an assembly of pipes, fittings, *fixtures*, *traps* and appurtenances that is used to convey *sewage*, *clear-water waste* or *storm water* to a public sewer or a *private sewage disposal system*, but does not include *subsoil drainage pipes*. (See Appendix A.)

Dual vent means a *vent pipe* that serves 2 *fixtures* and connects at the junction of the *fixture drains*. (See Appendix A explaining definition for *drainage system*.)

Dwelling unit means a *suite* operated as a housekeeping unit used or intended to be used as a domicile by 1 or more persons and usually containing cooking, eating, living, sleeping and sanitary facilities.

Fire separation means a construction assembly that acts as a barrier against the spread of fire, and may not be required to have a fire-resistance rating or a fire-protection rating.

Fire stop means a draft-tight barrier within or between construction assemblies that acts to retard the passage of smoke and flame.

Fixture means a receptacle, appliance, apparatus or other device that discharges *sewage* or *clear-water waste*, and includes a floor drain.

Fixture drain means the pipe that connects a *trap* serving a *fixture* to another part of a *drainage system*. (See Appendix A.)

Fixture outlet pipe means a pipe that connects the waste opening of a *fixture* to the *trap* serving the *fixture*. (See Appendix A.)

Fixture unit (as applying to *drainage systems*) means the unit of measure based on the rate of discharge, time of operation and frequency of use of a *fixture* that expresses the hydraulic load that is imposed by that *fixture* on the *drainage system*.

Fixture unit (as applying to *water distribution systems*) means the unit of measure based on the rate of supply, time of operation and frequency of use of a *fixture* or outlet that expresses the hydraulic load that is imposed by that *fixture* or outlet on the supply system.

Flood level rim means the top edge at which water can overflow from a *fixture* or device. (See Appendix A explaining definition for back-siphonage.)

Flow control roof drain means a *roof drain* that restricts the flow of *storm water* into the *storm drainage system*.

Fresh air inlet means a *vent pipe* that is installed in conjunction with a *building trap* and terminates outdoors. (See Appendix A explaining Sentence 4.5.4.(1).)

Header means a *vent pipe* that connects 2 or more *vent stacks* or *stack vents* to outdoors. (See Appendix A.)

Indirect service water heater (see *Service water heater, indirect).*

Indirectly connected means not *directly connected*. (See Appendix A explaining Sentence 3.3.11.(2).)

Individual vent means a *vent pipe* that serves 1 *fixture*.

Interceptor means a receptacle that is installed to prevent oil, grease, sand or other materials from passing into a *drainage system*.

Leader means a pipe that is installed to carry *storm water* from a roof to a *storm building drain* or *sewer* or other place of disposal.

Loop vent (see *Circuit vent).* (See Appendix A explaining definition for drainage system.)

Nominally horizontal means at an angle of less than 45° with the horizontal. (See Appendix A.)

Nominally vertical means at an angle of not more than 45° with the vertical. (See Appendix A.)

Noncombustible (as applying to an elementary building material) means that such material conforms to CAN4-S114-78, "Standard Method of Test for Determination of Non-combustibility in Building Materials."

Occupancy means the use or intended use of a *building* or part thereof for the shelter or support of persons, animals or property.

Offset means the piping that connects the ends of 2 pipes that are parallel. (See Appendix A.)

Owner means any person, firm or corporation controlling the property under consideration.

Permit means permission or authorization in writing by the *authority having jurisdiction* to perform work regulated by this Code and, in the case of an occupancy permit, to occupy any *building* or part thereof.

Plumbing contractor means a person, corporation or firm that undertakes to construct, extend, alter, renew or repair any part of a *plumbing system.*

Plumbing system means a *drainage system,* a *venting system* and a *water system* or parts thereof. (See Appendix A.)

Potable means safe for human consumption.

Private sewage disposal system means a privately owned plant for the treatment and disposal of *sewage* (such as a septic tank with an absorption field).

Private water supply system means an assembly of pipes, fittings, valves, equipment and appurtenances that supplies water from a private source to a *water distribution system.*

Relief vent means an auxiliary vent which provides additional circulation of air between *drainage systems* and *venting systems.*

Riser means a water distribution pipe that extends through at least 1 full *storey.*

Roof drain means a fitting or device that is installed in the roof to permit *storm water* to discharge into a *leader.*

Roof gutter means an exterior channel installed at the base of a sloped roof to convey *storm water.*

Sanitary building drain means a *building drain* that conducts *sewage.*

Sanitary building sewer means a *building sewer* that conducts *sewage.*

Sanitary drainage system means a *drainage system* that conducts *sewage.*

Sanitary sewer means a sewer that conducts *sewage.*

Service water heater means a device for heating water for plumbing services.

Service water heater, indirect means a *service water heater* that derives its heat from a heating medium such as warm air, steam or hot water.

Service water heater, storage type means a *service water heater* with an integral hot water storage tank.

Sewage means liquid waste that contains animal, mineral or vegetable matter.

Size means the nominal diameter by which a pipe, fitting, *trap* or other similar item is commercially designated.

Soil-or-waste pipe means a pipe in a *sanitary drainage system.*

Soil-or-waste stack means a vertical *soil-or-waste pipe* that passes through 1 or more *storeys,* and includes any *offset* that is part of the stack.

Stack vent means a *vent pipe* that connects the top of a *soil-or-waste stack* to a *header* or open air. (See Appendix A explaining definition for drainage system.)

Storage-type service water heater (see *service water heater, storage type).*

Storey means the interval between 2 successive floor levels including mezzanine floors that contain plumbing fixtures or between a floor level and roof.

Storm building drain means a *building drain* that conveys *storm water.*

Storm building sewer means a *building sewer* that conveys *storm water.*

Storm drainage system means a *drainage system* that conveys *storm water.*

Storm sewer means a sewer that conveys *storm water.*

Storm water means water that is discharged from a surface as a result of rainfall or snowfall.

Subdrainage system means a *drainage system* that does not drain by gravity to the *building sewer.*

Subsoil drainage pipe means a pipe that is installed underground to intercept and convey subsurface water.

Suite means a single room or series of rooms of complementary use, operated under a single tenancy and includes *dwelling units*, individual guest rooms in motels, hotels, boarding houses, rooming houses and dormitories as well as individual stores and individual or complementary rooms for business and personal services occupancies.

Trap means a fitting or device that is designed to hold a liquid seal that will prevent the passage of gas but will not materially affect the flow of a liquid.

Trap arm means that portion of a *fixture drain* between the *trap weir* and the *vent pipe* fitting. (See Appendix A explaining Sentence 5.6.3.(1).)

Trap dip means the lowest part of the upper interior surface of a *trap*.

Trap seal depth means the vertical distance between the *trap dip* and the *trap weir*. (See Appendix A explaining Sentence 2.3.1.(1).)

Trap standard means the *trap* for a *fixture* that is integral with the support for the *fixture*.

Trap weir means the highest part of the lower interior surface of a *trap*. (See Appendix A explaining Sentences 2.3.1.(1) and (2).)

Vacuum breaker (see *back-siphonage preventer*).

Vent pipe means a pipe that is a part of a *venting system*.

Vent stack means a *vent pipe* that is connected at its upper end to a *header* or is terminated in open air and that is used to limit pressure differential in a *soil-or-waste stack*. (See Appendix A explaining definition for drainage system.)

Venting system means an assembly of pipes and fittings that connects a *drainage system* with outside air for circulation of air and the protection of *trap seals* in the *drainage system*. (See Appendix A explaining definition for drainage system.)

Waste pipe (see *Soil-or-waste pipe*).

Water distribution system means an assembly of pipes, fittings, valves and appurtenances that conveys water from the *water service pipe* or *private water supply system* to water supply outlets, *fixtures*, appliances and devices.

Water service pipe means a pipe that conveys water from a public water main or private water source to the inside of the *building*.

Water system means a *private water supply system*, a *water service pipe*, a *water distribution system* or parts thereof.

Wet vent means a *soil-or-waste pipe* that also serves as a *vent pipe*. (See Appendix A explaining Article 5.8.1.)

Yoke vent means a *vent pipe* that is connected at its lower end to a *soil-or-waste stack* and at its upper end to a *vent stack* or a *branch vent* that is connected to a *vent stack*.

Abbreviations

1.3.3. Abbreviations in this Code for the names of organizations or authorities have the following meanings:

ACNBC ..... Associate Committee on the National Building Code
(National Research Council of Canada
Ottawa, Ontario K1A 0R6)

ANSI ..... American National Standards Institute
(1430 Broadway, New York, New York 10018 U.S.A.)

ASHRAE ..... American Society of Heating, Refrigerating and
Air-Conditioning Engineers
(345 East 47th Street, New York, New York 10017 U.S.A.)

ASPE ..... American Society of Plumbing Engineers
(16161 Ventura Blvd., Suite 107, Encino, California 91436
U.S.A.)

ASTM ..... American Society for Testing and Materials
(1916 Race Street, Philadelphia, Pa. 19103 U.S.A.)

CGSB ..... Canadian Government Specifications Board
(c/o Department of Supply and Services
11 Laurier Street, Hull, Quebec K1A 0S5)

CSA ..... Canadian Standards Association
(178 Rexdale Blvd., Rexdale, Ontario M9W 1R3)

NBC ..... National Building Code of Canada
(National Research Council of Canada
Ottawa, Ontario K1A 0R6)

1.3.4. Abbreviations of words and phrases in this Code have the following meanings:

ABS ..... acrylonitrile-butadiene-styrene
cm^2 ..... square centimetre(s)
CPVC ..... chlorinated poly (vinyl chloride)
° ..... degree(s)
°C ..... degree(s) Celsius
diam ..... diameter
h ..... hour(s)
in. ..... inch(es)
Kg/m^2 ..... kilograms per square metre
kPa ..... kilopascel(s)
L ..... litre(s)
L/s ..... litres per second
m ..... metre(s)
m^2 ..... square metre(s)
max. ..... maximum
min. ..... minimum
min ..... minute(s)
mm ..... millimetre(s)
No. ..... number(s)
PVC ..... poly (vinyl chloride)
temp. ..... temperature

SUBSECTION 1.4 EQUIVALENTS

1.4.1. Any *owner* desirous of using a material or method of design as an equivalent to the requirement of this Code shall submit to the *authority having jurisdiction* sufficient evidence to satisfy the *appropriate authority having jurisdiction* that the proposed equivalent will provide the level of performance required by this Code.

SUBSECTION 1.5 PLUMBING FACILITIES

1.5.1. Plumbing facilities shall be provided in accordance with Subsection 3.6.4. of Part 3 and Section 9.32 of Part 9 of the National Building Code of Canada 1980.

SUBSECTION 1.6 SERVICE CONNECTIONS

Sanitary drainage systems

1.6.1.(1) 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 unless *approved*.

Storm drainage systems

1.6.2. Every *storm drainage system* shall be connected to a public *storm sewer*, a public *combined sewer* or as designated by the *authority having jurisdiction*.

Water distribution systems

1.6.3. Every *water distribution system* shall be connected to a public water main, a *private potable water supply system* or other *approved* source of water.

Separate services

1.6.4. Piping in any *building* shall be connected to the public services 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.)

SUBSECTION 1.7 LOCATION OF FIXTURES

Location of fixtures

1.7.1.(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 and 9 of the National Building Code of Canada 1980.

(2) When a water closet is installed in a public washroom it shall be provided with a seat of the open front type.

Accessibility

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

SUBSECTION 1.8 PERMITS

Permits required

1.8.1.(1) Except as provided in Sentence (2), a *plumbing system* shall not be constructed, extended, altered, renewed or repaired or a connection made to a sewer unless a *permit* to do so has been obtained.

(2) A *permit* is not required when a valve, faucet, *fixture* or *service water heater* is repaired or replaced, a stoppage cleared or a leak repaired if no change to the piping is required.

(3) An application for a *permit* shall be made to the *authority having jurisdiction*.

(4) A *permit* shall be issued only to a home *owner* to do work on a single family *dwelling unit* owned and occupied or to be occupied by himself, or to a *plumbing contractor* who meets the qualifications that are prescribed in . . .*

Application for permit

1.8.2.(1) An application for a *permit* shall be made on the form that is provided by the *authority having jurisdiction.*

(2) Every application shall be accompanied by

(a) the fee that is set forth in . . .*, and

(b) a specification or description of the proposed work.

(3) When required by the *authority having jurisdiction,* the application shall also be accompanied by

(a) a plan that shows the location and *size* of every *building drain,* and of every *trap* and *cleanout* fitting that is on a *building drain,*

(b) a sectional drawing that shows the *size* and location of every *soil-or-waste pipe, trap* and *vent pipe,* and

(c) a plan that shows a layout of the *potable water distribution system* including pipe *sizes* and valves.

(4) Where a *permit* has been issued, no departure shall be made from the specification, description, plan or sectional drawing unless written permission is obtained from the *authority having jurisdiction.*

SUBSECTION 1.9 INSPECTION AND TESTING

Inspection and testing

1.9.1.(1) Where a *permit* is required as described in Subsection 1.8, the system shall not be put into use until it has been inspected and tested to the satisfaction of the *authority having jurisdiction.*

(2) A piping system that has been fabricated off the site and that has been *approved* need not be retested except as may be required by Sentence 1.9.2.(1), Sentence 3.6.1.(3) and Sentence 3.7.1.(3).

(3) The *plumbing contractor* shall notify the *authority having jurisdiction* when the work is complete and ready to be inspected or tested.

(4) The *plumbing contractor* shall furnish any equipment, material, power or labour that is necessary for inspection or testing.

(5) If any part of a *plumbing system* is covered before it has been inspected and *approved,* it shall be uncovered if the *authority having jurisdiction* so directs.

(6) If any part of a *plumbing system* is not *approved* after it has been inspected or tested, the *owner* or *plumbing contractor* shall make any alteration or replacement that is necessary and the work shall be subjected to further inspection or testing.

Reinspection of existing systems

1.9.2.(1) The *authority having jurisdiction* may inspect an existing *plumbing system,* and where there is reason to suspect that the system is not satisfactory, order it to be tested.

(2) If any part of the system has become or is in a condition that it may become dangerous or injurious to health, the *owner* shall make any alteration or replacement ordered in writing by the *authority having jurisdiction.*

Certificate of approval

1.9.3. When a *plumbing system* has been completed and has been *approved,* the *authority having jurisdiction,* when requested, shall issue a certificate of approval to the *owner* and to the *plumbing contractor.*

Sentences marked (*) will vary with local practice and space is left for the appropriate reference.

1.9.4. The granting of a *permit*, the approval of a specification or plan or an inspection or test that is made by the *authority having jurisdiction* does not in any way relieve the *owner* or his agent of full responsibility for carrying out work on a *plumbing system* in complete accordance with this Code. Responsibility

SECTION 2 MATERIALS AND EQUIPMENT

SUBSECTION 2.1 GENERAL

2.1.1. All materials and equipment shall be free from defects that affect their usefulness for their intended purposes. Defects in products and materials

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

2.1.3.(1) Materials and equipment including *fixtures* shall not be re-used unless the written consent of the *authority having jurisdiction* has been received. Restriction on re-use

(2) 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.*

2.1.4. Every length of pipe and every fitting shall 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 it shall be marked in accordance with the relevant standard, and such markings shall be visible after installation. Identification

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

SUBSECTION 2.2 FIXTURES

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

2.2.2.(1) Every vitreous china *fixture* shall conform to CSA B45.1-1973, "Vitreous China Plumbing Fixtures."

(2) Every enamelled cast iron *fixture* shall conform to CSA B45.2-1975, "Enamelled Cast Iron Plumbing Fixtures."

(3) Every porcelain enamelled steel *fixture* shall conform to CSA B45.3-1977, "Porcelain Enamelled Steel Plumbing Fixtures."

(4) Every stainless steel *fixture* shall conform to CSA B45.4-1975, "Stainless Steel Plumbing Fixtures."

(5) Every plastic *fixture* shall conform to CSA B45.5-1976, "Plastic Plumbing Fixtures."

2.2.3.(1) Concrete laundry trays shall Laundry trays

(a) be strong and dense,
(b) be moulded in 1 piece,
(c) have rounded corners,
(d) have a wall thickness of at least 28 mm at the top and 31 mm at the bottom, and
(e) have a bottom thickness of at least 31 mm.

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

(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 at least 750 mm.

Construction of water closet bowl

2.2.5. Every water closet bowl or urinal made of other than vitreous china shall comply with the applicable requirements of CSA B45.1-1973, "Vitreous China Plumbing Fixtures."

Construction of overflow

2.2.6.(1) Except as provided in Sentences 2.2.2.(1) and (5), an overflow on a *fixture* shall be constructed so that

(a) the area of the overflow and the overflow pipe or passage is at least ½ the area of the *fixture outlet pipe*,
(b) the overflow pipe or passage is connected to the *fixture outlet pipe*, and
(c) the overflow pipe can be readily and effectively cleaned.

(2) A dishwashing sink and a food preparation sink shall not have an overflow. (See Appendix A.)

SUBSECTION 2.3 TRAPS AND INTERCEPTORS

Traps

2.3.1.(1) Every *trap* shall

(a) have a *trap seal depth* of at least 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) 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 completely removed by screwed connections for cleaning purposes. (See Appendix A.)

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

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

Interceptors

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

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

SUBSECTION 2.4 PIPE FITTINGS

T and cross fittings

2.4.1.(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*. (See Appendix A.)

2.4.2.(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 single or double sanitary T fitting shall not be used to change the direction of flow in *nominally horizontal* drainage piping.

(3) 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. (See Appendix A.)

2.4.3. The *size* of the major leg of a double Y or a double combination Y and ⅛th bend fitting used in a *nominally horizontal soil-or-waste pipe* shall be at least 2 in. (See Appendix A.) Double Y fitting

2.4.4. A bend of 4 in. *size* or less that has a centre-line radius that is less than the *size* of the pipe shall not be used to join 2 *soil-or-waste pipes.* Quarter bend

2.4.5. A sisson fitting shall not be installed in a *nominally horizontal soil-or-waste pipe.* Sisson fitting

SUBSECTION 2.5 NON-METALLIC PIPE AND FITTINGS

(For a summary of pipe applications see Appendix A.)

2.5.1.(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 Asbestos-cement drainage pipe and fittings

(a) CGSB 34-GP-22M (1976), "Pipe, Asbestos Cement, Drain," or
(b) CSA B127.1-M1977, "Components for Use in Asbestos Cement Drain, Waste and Vent Systems."

(2) Asbestos-cement pipe and fittings used underground either outside a *building* or under a *building* shall conform to Sentence (1) or to

(a) CGSB 34-GP-9M (1975), "Pipe, Asbestos Cement, Sewer,"
(b) CGSB 34-GP-23M (1976), "Pipe, Asbestos Cement, Sewer, House Connection," or
(c) CSA B127.2-M1977, "Components for Use in Asbestos Cement Building Sewer Systems."

2.5.2.(1) Asbestos-cement water pipe, couplings and bends shall conform to CGSB 34-GP-1M(1976), "Pipe, Asbestos Cement, Pressure." Asbestos-cement water pipe and fittings

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

2.5.3.(1) Concrete pipe shall conform to CSA A257.1-1974, "Concrete Sewer, Storm Drain and Culvert Pipe" or CSA A257.2-1974, "Reinforced Concrete Culvert, Storm Drain and Sewer Pipe" of CSA Series A257-1974, "Standards for Concrete Pipe." Concrete pipe

(2) Gasketed joints shall conform to CSA A257.3-1974, "Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gaskets" of CSA Series A257-1974, "Standards for Concrete Pipe."

(3) Where joints are required in concrete pipe under a *building*, they shall be gasketed.

(4) Concrete fittings fabricated on the site from lengths of pipe shall not be used unless *approved.*

(5) Concrete pipe shall not be used inside a *building.*

2.5.4.(1) Vitrified clay pipe and fittings shall conform to CSA A60.1-M1976, "Vitrified Clay Pipe."

(2) Couplings and joints for vitrified clay pipe shall conform to CSA A60.3-M1976, "Vitrified Clay Pipe Joints."

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

2.5.5.(1) Polyethylene water pipe shall conform to CSA B137.1-1970, "Polyethylene Pipe for Cold Water Services." Plastic pipe and fittings

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

(3) Insert fittings for use with polyethylene pipe shall conform to ASTM D2609-74, "Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe."

(4) Butt fusion fittings for polyethylene pipe shall conform to ASTM D3261-73 (1978), "Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing."

2.5.6.(1) PVC water pipe shall conform to CSA B137.3-1972, "Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications."

(2) PVC water pipe fittings shall conform to ASTM D2466-78, "Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40" or ASTM D2467-76a, "Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80."

(3) PVC solvent cements shall conform to ASTM D2564-78a, "Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings."

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

2.5.7.(1) CPVC hot and cold water pipe, fittings and solvent cements shall conform to CSA B137.6-1971, "Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Piping for Hot and Cold Water Distribution Systems."

(2) The design temperature and design pressure of a CPVC piping system shall conform to Table 2.5.A.

Table 2.5.A.
Forming Part of Sentence 2.5.7.(2)

MAXIMUM PERMITTED PRESSURE FOR CPVC PIPING AT VARIOUS TEMPERATURES	
Maximum Temperature of Water, °C	Maximum Permitted Pressures, kPa
10	3 350
20	2 900
30	2 500
40	2 100
50	1 700
60	1 300
70	1 000
80	700
90	500
100	400
Column 1	2

2.5.8. Polybutylene pipe and its associated fittings shall conform to CSA B137.8-M1977, "Polybutylene (PB) Piping for Hot and Cold Water Distribution Systems."

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

(a) CSA B181.1-1973, "Acrylonitrile-Butadiene-Styrene Drain, Waste and Vent (ABS-DWV) Pipe and Pipe Fittings,"
(b) CSA B181.2-1973, "Poly (Vinyl Chloride) Drain, Waste and Vent Pipe and Pipe Fittings," or
(c) CSA B182.1-M1977, "Plastic Drain and Sewer Pipe and Pipe Fittings."

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

(a) CSA B181.1-1973, "Acrylonitrile-Butadiene-Styrene Drain, Waste and Vent (ABS-DWV) Pipe and Pipe Fittings," or

(b) CSA B181.2-1973, "Poly (Vinyl Chloride) Drain, Waste and Vent Pipe and Pipe Fittings."

(2) Requirements for *combustible* piping in relation to fire safety shall conform to Sentences 3.1.4.5.(5) and 3.1.7.2.(2) of Part 3 and Articles 9.10.9.10. and 9.10.9.26. of Part 9 of the National Building Code of Canada 1980.

(3) Where *noncombustible* piping pierces a *fire separation* or a *fire stop,* the requirements for fire stopping of Article 3.1.9.1. of Part 3 and Articles 9.10.9.9. and 9.10.16.7. of Part 9 of the National Building Code of Canada 1980 shall apply.

SUBSECTION 2.6 FERROUS PIPE AND FITTINGS

(For summary of pipe applications see Appendix A.)

Cast-iron soil pipe and fittings

2.6.1.(1) Drainage piping, vent piping and fittings made of cast iron shall conform to CSA B70-M1978, "Cast Iron Soil Pipe, Fittings and Methods of Joining."

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

2.6.2. Cast-iron fittings designed for use with asbestos-cement pipe for drainage purposes shall conform to the applicable requirements of CSA B70-M1978, "Cast Iron Soil Pipe, Fittings and Methods of Joining."

Threaded cast-iron drainage fittings

2.6.3.(1) Threaded cast-iron drainage fittings shall conform to ANSI B16.12-1977, "Cast-Iron Threaded Drainage Fittings."

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

Cast-iron water pipe

2.6.4.(1) Cast-iron water pipe shall conform to

(a) CSA B131.5-1976, "Cast-Iron Pipe Centrifugally Cast in Metal Molds, for Water or Other Liquids," or

(b) CSA B131.13-1977, "Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids."

(2) Cement mortar lining for cast-iron water pipe shall conform to CSA B131.4-1975, "Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water."

(3) Cast-iron fittings for cast-iron water pipe shall conform to CSA B131.9-1978, "Gray-Iron and Ductile-Iron Fittings, 3-in. Through 48-in. for Water and Other Liquids."

(4) Rubber gasket joints for cast-iron and ductile-iron pressure pipe for water piping shall conform to CSA B131.10-1973, "Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings."

Cast-iron screwed water fittings

2.6.5.(1) Screwed cast-iron water fittings shall conform to ANSI B16.4-1977, "Cast-Iron Threaded Fittings, 125 and 250 lb."

(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.*

Malleable iron screwed water fittings

2.6.6.(1) Screwed malleable iron water fittings shall conform to ANSI B16.3-1977, "Malleable-Iron Threaded Fittings 150 and 300 lb."

(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.*

Steel pipe

2.6.7.(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 may be used in a *drainage system* or a *venting system* above ground inside a *building.*

(3) Galvanized steel pipe shall not be used in a *water distribution system*, except
(a) in *buildings* of industrial occupancy as described in the National Building Code of Canada 1980,
(b) for the repair of existing galvanized steel piping systems, or
(c) where *approved*.

(4) Galvanized steel pipe shall conform to CSA B63-1966, "Welded and Seamless Steel Pipe."

Corrugated steel pipe

2.6.8.(1) Corrugated steel pipe and couplings shall be made from material conforming to ASTM A444-78, "Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process for Culverts and Underdrains."

(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.

Sheet metal leader

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

SUBSECTION 2.7 NON-FERROUS PIPE AND FITTINGS

(For summary of pipe applications see Appendix A.)

Copper and brass pipe

2.7.1.(1) Copper pipe shall conform to ASTM B42-78, "Seamless Copper Pipe, Standard Sizes."

(2) Brass pipe shall conform to ASTM B43-79, "Seamless Red Brass Pipe, Standard Sizes."

Brass or bronze flanges and flanged fittings

2.7.2. Brass or bronze pipe flanges and flanged fittings shall conform to ANSI B16.24-1971, "Bronze Flanges and Flanged Fittings, 150 and 300 lb."

Brass or bronze threaded water fittings

2.7.3.(1) Brass or bronze threaded water fittings shall conform to ANSI B16.15-1978, "Cast Bronze Threaded Fittings, Class 125 and 250."

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

Copper tube

2.7.4.(1) Copper tube shall conform to
(a) ASTM B88-78, "Seamless Copper Water Tube," or
(b) ASTM B306-78, "Copper Drainage Tube (DWV)."

(2) The use of copper tube shall conform to Table 2.7.A.

Solder-joint drainage fittings

2.7.5.(1) Solder-joint fittings for *drainage systems* shall conform to
(a) CSA B158.1-1976, "Cast Brass Solder Joint Drainage, Waste and Vent Fittings," or
(b) ANSI B16.29-1973, "Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings."

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

Solder-joint water fittings

2.7.6.(1) Except as provided in Sentence (2), solder-joint fittings for *water systems* shall conform to
(a) ANSI B16.18-1978, "Cast Copper Alloy Solder-Joint Pressure Fittings," or

Table 2.7.A.
Forming Part of Article 2.7.4.

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	P	P	P	P	P	P	P	P
K & L soft	P	P	P	N	N	N	N	N
M hard	N	N	P	N	N	P	N	P
M soft	N	N	N	N	N	N	N	N
DWV	N	N	N	N	N	P	N	P
Column 1	2	3	4	5	6	7	8	9

P—Permitted N—Not Permitted

(b) ANSI B16.22-1973, "Wrought Copper and Bronze 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 ANSI B16.18-1978, "Cast Copper Alloy Solder-Joint Pressure Fittings."

2.7.7.(1) Flared-joint fittings for copper tube *water systems* shall conform to ANSI B16.26-1978, "Cast Copper Alloy Fittings for Flared Copper Tubes." Flared-joint water fittings

(2) Flared-joint fittings for copper tube *water systems* not made by casting shall conform to the applicable requirements of ANSI B16.26-1978, "Cast Copper Alloy Fittings for Flared Copper Tubes."

2.7.8.(1) Lead *waste pipe* and fittings shall conform to CSA B67-1972, "Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories." Lead waste pipe and bends

(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 such a manner that there shall be no retention of liquid in the bend.

(3) Lead *waste pipe* and fittings shall not be used in a *water system* or for a *building sewer.*

SUBSECTION 2.8 JOINTING MATERIALS

2.8.1. Cement mortar for jointing shall be a mixture of equal parts of clean, sharp mortar sand and portland cement. Cement jointing mortar

2.8.2. Cold caulking compounds shall conform to CGSB 77-GP-1M(1977), "Caulking Compound, Cementitious Type, Cold Applied, for Pipe Joints."

2.8.3.(1) Wiping solder and caulking lead shall conform to CSA B67-1972, "Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories." Solder and caulking lead

(2) Solders for solder joint fittings shall conform to ASTM B32-76, "Solder Metal" in accordance with the recommended use.

SUBSECTION 2.9 MISCELLANEOUS MATERIALS

2.9.1. Brass floor flanges shall conform to CSA B158.1-1976, "Cast Brass Solder Joint Drainage, Waste and Vent Fittings." Brass floor flanges

Bolts, nuts, etc.

2.9.2.(1) Every screw, bolt, nut and washer shall be of brass 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.

Cleanout fittings

2.9.3.(1) Every plug, cap, nut or bolt that is intended to be removable from a ferrous fitting shall be of an *approved* 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.

2.9.4.(1) Groove and shoulder type mechanical pipe couplings shall conform to CSA B242-1971, "Groove and Shoulder Type Mechanical Pipe Couplings."

(2) Groove and shoulder type mechanical pipe couplings shall be provided with an elastomeric seal and shall be housed with a metal clamp which shall interlock with a groove or shoulder on the pipe ends.

Saddle hub

2.9.5.(1) A saddle hub shall not be installed in a *drainage system* or *venting system.*

(2) A saddle hub shall not be installed in a *water system* unless *approved.*

Supply and waste fittings

2.9.6. Supply and waste fittings shall conform to CSA B125-1975, "Plumbing Fittings."

Direct flush valve

2.9.7.(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.*

Drinking fountain bubblers

2.9.8.(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 except when otherwise *approved.*

Back-siphonage preventers

2.9.9. *Back-siphonage preventers* and *backflow preventers* shall conform to CSA B64 Series-1976, "CSA Standards on Vacuum Breakers and Backflow Preventers."

Relief valves

2.9.10. Temperature relief, pressure relief or combined temperature and pressure relief valves shall conform to ANSI Z21.22-1979, "Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems."

Vent pipe flashings

2.9.11.(1) Flashing fabricated on-site for *vent pipes* shall be fabricated from
(a) copper sheet at least 0.33 mm thick,
(b) aluminum sheet at least 0.61 mm thick,
(c) *alloyed zinc* sheet at least 0.35 mm thick,
(d) lead sheet at least 2.16 mm thick,
(e) galvanized steel sheet, when approved, at least 0.41 mm thick, or
(f) polychloroprene (neoprene) at least 2.89 mm thick.

(2) Prefabricated flashing for *vent pipes* shall conform to CSA B272-M1978, "Prefabricated Self-Sealing Vent Flashings."
(See Article 5.6.5. for location of vent pipe terminals.)

SECTION 3 PIPING

SUBSECTION 3.1 APPLICATION

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

SUBSECTION 3.2 CONSTRUCTION AND USE OF JOINTS

Caulked lead drainage joints

3.2.1.(1) Every caulked lead drainage joint shall be firmly packed with oakum and tightly caulked with lead to a depth of at least 25 mm.

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

(3) 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*.

(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.

3.2.2.(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 at least 10 mm thick at the thickest part.

(3) Every wiped flanged joint shall be reinforced with a lead flange that is at least 19 mm wide.

Screwed joints

3.2.3.(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.

Soldered joints

3.2.4.(1) In making a soldered joint the surface to be soldered shall be cleaned bright and the joint shall be properly fluxed, made with solder and thoroughly cleaned of all residue.

Flared joints

3.2.5.(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.

Hot-poured joints

3.2.6.(1) Hot-poured joints shall be caulked tightly with twisted oakum and rammed, and a hot-poured caulking compound shall be placed to a depth of at least 25 mm all around the pipe.

(2) Hot-poured joints shall not be used except for vitrified clay or concrete pipe, or between either of such pipes and ferrous pipe.

Cement joints

3.2.7.(1) Cement joints in pipe that has a *size* of 6 in. or less shall be made by completely filling the annular space between the bell and the spigot with cement mortar.

(2) Every cement joint in pipe that has a *size* of more than 6 in. shall be made by

(a) ramming into the annular space between the bell and the spigot a gasket of closely twisted hemp or oakum at least equal in length to the circumference of the pipe, and
(b) filling the remaining annular space with mortar.

(3) The exterior of every cement joint shall be carefully shaped from the outside of the bell to the barrel of the pipe at an angle of approximately 45°.

(4) After every joint is made the interior of the pipe shall be thoroughly swabbed and cleaned.

(5) Cement joints shall not be used except for vitrified clay or concrete pipe or between either of such pipes and ferrous pipe.

Burned lead joints

3.2.8.(1) In making a burned lead joint the lead shall be lapped and fused to form a weld that is at least 1½ times as thick as the wall of the pipe.

(2) In lead pipe the width of the weld shall be at least
(a) 13 mm where the *size* of the pipe is less than 3 in.,
(b) 16 mm where the *size* of the pipe is 3 in., or
(c) 19 mm where the *size* of the pipe is 4 in.

(3) In sheet lead the width of the weld shall be as specified in Table 3.2.A.

Table 3.2.A.
Forming Part of Sentence 3.2.8.(3)

Weight of Sheet Lead, Kg/m²	Minimum Width of Weld, mm
12.2 to 14.6	6
19.5 to 24.4	10
29.3 to 39.1	20
48.8 to 58.6	25
58.6 to 146.5	32
Column 1	2

Mechanical joints

3.2.9. Mechanical joints shall be made with *approved* compounded elastomeric couplings or rings held by stainless steel or cast-iron clamps or contained within a compression connection or groove and shoulder type mechanical coupling.

Cold caulked joints

3.2.10.(1) Cold-caulked joints shall not be used except for bell and spigot pipe in a *water system* or a *drainage system*. The caulking compound shall be applied according to the manufacturer's directions.

(2) 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 at least 25 mm.

(3) Every cold-caulked joint in a *water system* shall be made by tightly caulking the entire depth of the socket with caulking compound.

SUBSECTION 3.3 JOINTS AND CONNECTIONS

Drilled and tapped

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

Welded joints

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

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

Unions and slip joints

3.3.3.(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. (See Appendix A explaining Sentences 2.3.1.(1). and 2.3.1.(2).)

Increaser or reducer

3.3.4. 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.

Burned lead

3.3.5. Every joint in hard lead shall be made with a burned lead joint.

Dissimilar connections

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

(2) Products not meeting an *approved* standard shall not be used unless *approved.*

(3) Other methods of joining dissimilar materials shall not be used unless *approved.*

Connection of roof drain to leader

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

Connection of floor outlet fixtures

3.3.8.(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 Sentences (3), every floor flange shall be of 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,* and every joint shall be sealed with a natural rubber, synthetic rubber or asbestos graphite gasket, or with a closet setting compound.

(5) Where a lead water closet stub is used, the length of the stub below the floor flange shall be at least 75 mm.

3.3.9. The design and installation of every piping system shall, where necessary, include means to accommodate expansion and contraction of the piping system caused by temperature change or movement of the soil.

3.3.10. Types M and DWV copper tube shall not be bent.

Making indirect connections

3.3.11.(1) Where a *fixture* or device is *indirectly connected,* the connection 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 at least 25 mm. (See Appendix A.)

SUBSECTION 3.4 SUPPORT OF PIPING

Capability of support

3.4.1.(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.

Independence of support

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

Insulation of support

3.4.3. 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.

Support for vertical piping

3.4.4.(1) Except as provided in Sentences (2) and (3), vertical piping shall be supported at its base and at the floor level of alternate *storeys* by metal rests, each of which can bear the weight of pipe that is between it and the metal rest above it.

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

(3) Where hub and spigot cast-iron pipe is used, each hub shall rest on a support.

Support for horizontal piping

3.4.5.(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 so that

(a) galvanized iron or steel pipe is supported at intervals not exceeding
  (i) 3.75 m if the pipe *size* is 6 in. or more, and
  (ii) 2.5 m if the pipe *size* is less than 6 in.,
(b) lead pipe is supported throughout its length,
(c) cast-iron pipe is supported
  (i) at or adjacent to each hub or joint,
  (ii) at intervals not exceeding 1.6 m, and
  (iii) at intervals not exceeding 1 m if the pipe has mechanical joints and the length of pipe between adjacent fittings is 300 mm or less,
(d) asbestos-cement pipe is supported
  (i) at intervals not exceeding 2 m or have 2 supports for every 4 m length of pipe, and
  (ii) at intervals not exceeding 1 m where the length of pipe between adjacent fittings is 300 mm or less,
(e) ABS or PVC plastic pipe is supported
  (i) at intervals not exceeding 1.2 m,
  (ii) at the ends of *branches*,
  (iii) at changes of direction or elevation, and
  (iv) if the pipe is a *fixture drain* that is more than 1 m in length, as close as possible to the *trap*,
(f) CPVC or polybutylene plastic pipe is supported at intervals not exceeding 1 m, and
(g) copper tube and copper and brass pipe is supported at intervals not exceeding
  (i) 3 m if the tube or pipe is hard temper and larger than 1 in. in *size*,
  (ii) 2.5 m if the tube or pipe is hard temper and 1 in. in *size* or less, and
  (iii) 2.5 m if the tube is soft temper.

(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 hangers are used to support *nominally horizontal* piping they shall be

(a) metal rods of at least 9.5 mm diam for pipe over 4 in. in *size*, and
(b) solid or perforated metal strap hangers for pipe 4 in. or less in *size*.

(5) 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.

Support for underground horizontal piping

3.4.6. *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.)

Support of vent pipe above roof

3.4.7. Where a *vent pipe* terminates above the surface of a roof it shall be supported or braced to prevent misalignment.
(See Article 5.6.5. for location of vent pipe terminals.)

SUBSECTION 3.5 PROTECTION OF PIPING

Backfill

3.5.1. Where piping is installed underground, the backfill shall be carefully placed and tamped to a height of 300 mm over the top of the pipe and shall be free of stones, boulders, cinders and frozen earth. (See Appendix A.)

Protection of non-metallic pipes

3.5.2. Where asbestos-cement drainage pipe or vitrified clay pipe 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.)

Isolation from loads

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

Protection from frost

3.5.4. Where piping may be exposed to freezing conditions it shall be protected from frost.

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

SUBSECTION 3.6 TESTING OF DRAINAGE AND VENTING SYSTEMS

3.6.1.(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 or an air test shall be conducted to the satisfaction of the *authority having jurisdiction.*

(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 by the *authority having jurisdiction.*

(3) Where a prefabricated system is installed as part of a *drainage* and *venting system* and has been *approved,* all other plumbing work shall be tested and inspected and a final test shall be carried out on the complete system when requested by the *authority having jurisdiction.*

(4) When requested by the *authority having jurisdiction,* a ball test shall be made to any pipe in a *drainage system.*
(See Subsection 1.9 for additional requirements for inspection and testing.)

Tests of drainage system

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

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

Tests of venting system

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

Water test

3.6.4.(1) Where a water test is made it shall be applied to
(a) the system as a whole, or

(b) sections of the system, each of which is at least 3 m high and includes at least 1.5 m of the section below.

(2) In making a water 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.

Air test

3.6.5.(1) Where an air test is made

(a) every opening in the system shall be closed,

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

(c) this pressure shall be maintained for 15 min without the addition of more air.

Final Test

3.6.6.(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) When *approved* the smoke referred to in Clauses 3.6.6.(1)(c) and (d) may be omitted, the roof terminals closed and an air pressure equivalent to a 25 mm water column shall be maintained for 15 min without the addition of more air.

Ball test

3.6.7.(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 in. or more, or

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

SUBSECTION 3.7 TESTING OF POTABLE WATER SYSTEMS

(See Subsection 1.9 for additional requirements for inspection and testing.)

Application of tests

3.7.1.(1) After a section of a *potable water system* has been completed and before it is placed in operation, a water test shall be conducted to the satisfaction of the *authority having jurisdiction*, except that an air test may be used in freezing conditions.

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

(3) Where a prefabricated system is installed as part of a *water system* and has been *approved*, all other plumbing work shall be tested and inspected and the complete system shall be pressure tested when requested by the *authority having jurisdiction*.

Tests of water systems

3.7.2.(1) Every *potable water system* shall be capable of

(a) withstanding without leakage a water pressure that is at least equal to the maximum pressure to which it may be subject in service, or

(b) withstanding for at least 2 h without a drop in pressure an air pressure that is at least 700 kPa.

Water tests

3.7.3.(1) Where a water 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 4 DRAINAGE SYSTEMS

SUBSECTION 4.1 APPLICATION

4.1.1. This Section applies to a *sanitary drainage system*, a *storm drainage system*, a *combined building drain* or a *combined building sewer*.

SUBSECTION 4.2 CONNECTIONS TO DRAINAGE SYSTEMS

Connection to sanitary drainage systems

4.2.1.(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 *check valve* is installed in the fountain waste pipe, (see Appendix A),
(b) where approved, 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*,
(c) *fixtures* or appliances that discharge only *clear-water waste* may be connected to a *storm drainage system* or be drained onto a roof,
(d) 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),
(e) *fixtures* that have a hydraulic load of not more than 1½ *fixture units* may be connected to a vertical section of a *circuit vent* provided
  (i) the *fixtures* are located in the same *storey* as the *fixtures* served by the *vent pipes*,
  (ii) not more than 2 *fixtures* are connected to the *vent pipe*,
  (iii) where 2 *fixtures* are connected to the *vent pipe*, the connection is by means of a double sanitary T fitting, and
  (iv) the section of the *vent pipe* that becomes a *wet vent* conforms to the requirements for *wet vents* (see Appendix A),
(f) *fixtures* that have a hydraulic load of not more than 1½ *fixture units* may be connected to the vertical section of a *yoke vent* provided
  (i) not more than 2 *fixtures* are connected to the *vent pipe*,
  (ii) where 2 *fixtures* are connected to the *vent pipe*, the connection is by means of a double sanitary T fitting, and
  (iii) the section of the *vent pipe* that becomes a *wet vent* conforms to the requirements for *wet vents*, and (see Appendix A)
(g) *fixtures* may be connected to a *vent stack* provided
  (i) the total hydraulic load of the connected *fixtures* does not exceed 8 *fixture units*,
  (ii) at least 1 *fixture* is connected to a vertical portion of the *vent stack* and upstream of any other *fixtures*,
  (iii) no other *fixture* is connected downstream of a water closet,
  (iv) all *fixtures* are located in the lowest *storey* served by the *vent stack*, and
  (v) the section of the *vent pipe* that becomes a *wet vent* conforms to the requirements for *wet vents*. (See Appendix A.)

(2) The connection of a *soil-or-waste pipe* to a *nominally horizontal offset* in a *soil-or-waste stack* shall be at least 1.5 m measured horizontally from the bottom of the upper vertical section of the *soil-or-waste stack* where such upper vertical section

(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) The connection of a *soil-or-waste pipe* to a *nominally horizontal soil-or-waste pipe* shall be at least 1.5 m measured horizontally from the bottom of a *soil-or-waste stack* that

(a) receives a discharge of 30 or more *fixture units*, or
(b) receives the discharge from *fixtures* located on 2 or more *storeys*. (See Appendix A.)

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

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

4.2.3.(1) Two or more *fixture outlet pipes* that serve outlets from a single *fixture* that is listed in Clause 4.2.1.(1)(d) may be *directly connected* to a *branch* that

(a) has a *size* of at least 1⅛ in., 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 (i) and (ii) of Clause 4.2.1.(1)(d) 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* that are on 3 or more *storeys* are connected to it. (See Appendix A explaining Clauses 4.2.1.(1)(a) and (d).)

(3) *Fixture drains* from *fixtures* that are listed in Subclauses (iii) to (vi) of Clause 4.2.1.(1)(d) 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* that are on 3 or more *storeys* are connected to it.

SUBSECTION 4.3 LOCATION OF FIXTURES

Stall urinal

4.3.1.(1) Every stall urinal shall be installed so that water from the urinal cannot run onto the walls or floor beneath the *fixture*.

(2) A stall urinal shall not be installed adjacent to walls and floors that are pervious to water.

Restricted locations

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

Garbage grinders

4.3.3. Garbage grinders, potato peelers and other similar types of equipment shall not be located upstream of an *interceptor*.

4.3.4. 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*.

SUBSECTION 4.4 TREATMENT OF SEWAGE AND WASTES

Sewage treatment

4.4.1. Where a *fixture* or equipment discharges *sewage* or waste that in the opinion of the *authority having jurisdiction* 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*.

Cooling of hot wastes or sewage

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

Grease interceptors

4.4.3.(1) Where a *fixture* that discharges *sewage* that includes grease is located in a public kitchen or restaurant or in an institution, a grease *interceptor* shall be installed when and where required by the *authority having jurisdiction*.

Oil or gasoline interceptors

(2) Where the discharge from a *fixture* may contain oil or gasoline, an oil *interceptor* shall be installed.

Grit interceptors

(3) Where a *fixture* discharges sand, grit or similar materials, an appropriate *interceptor* shall be installed.

Capacity of interceptors

(4) Every *interceptor* shall have sufficient capacity to perform the service for which it is provided.
(See Article 5.5.2. for venting requirements for oil interceptors.)

SUBSECTION 4.5 TRAPS

4.5.1.(1) Except as provided in Sentences (2), (3), (4) and (5) and in Article 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 type 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 4.2.1.(1)(d) for indirect connections.)

(5) An *interceptor* with an effective water seal of at least 38 mm may serve as a *trap*. (See Appendix A.)

Traps for storm drainage system

4.5.2.(1) Where a *storm drainage system* is connected to a *combined building drain*, a *combined building sewer* or a public *combined sewer*, a *trap* shall be installed between any opening in the system and the drain or 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, and
- (b) at least 900 mm above or at least 3.5 m in any other direction from any air inlet, openable window or door, and at least 1.8 m from a property line. (See Appendix A.)

(2) A floor drain which drains to a *storm drainage system* shall be protected by a *trap* which
- (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,

(c) need not be protected by a *vent pipe*, and
(d) need not be provided with a *trap seal* primer.

4.5.3. 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.)

Location and cleanout for building traps

4.5.4.(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*,
(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.)

Trap seals

4.5.5. Provision shall be made for maintaining the trap seal of a floor drain by the use of trap seal primer, by using the drain as a receptacle for an *indirectly connected* drinking fountain or by equally effective means. (See Appendix A.)

SUBSECTION 4.6 ARRANGEMENT OF DRAINAGE PIPING

Separate systems

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

Combined building drains

(2) A *combined building drain* shall not be installed unless *approved* by the *authority having jurisdiction*.

(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.

Location of piping

4.6.2.(1) A *soil-or-waste pipe* shall not be located above
(a) non-pressure *potable* water storage tanks,
(b) manholes in pressure *potable* water storage tanks, or
(c) food-handling or processing equipment.

Sumps or tanks

4.6.3.(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 *size* 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 *sewage* sump shall be equipped with a union, a *check valve* and a shut-off valve installed in that sequence in the direction of discharge. (See Appendix A.)

4.6.4.(1) A *backwater valve* or a gate valve shall not be installed in a *building drain* or in a *building sewer* unless the installation is *approved*.

Protection from backflow

(2) Except as provided in Sentences (3), (4) and (5), 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.

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

(4) Where more than 1 *fixture* is located in 1 room and all are connected to the same *branch*, the gate valve or *backwater valve* may be installed on the *branch*.

(5) 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.)

Mobile home sewer service

4.6.5.(1) A *building sewer* intended to serve a mobile home shall
- (a) be not less than 4 in. in *size*,
- (b) be terminated above ground,
- (c) be 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) be designed and constructed in accordance with good engineering practice.

SUBSECTION 4.7 CLEANOUTS

Cleanouts for sanitary drainage systems

4.7.1.(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 *storm building sewer* that exceeds 25 m in length shall be provided with *cleanouts*.

(4) 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*.

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

(6) 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 in. 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°.

(7) 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*.

(8) 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*.

(9) A *cleanout* fitting shall be located immediately downstream of an oil *interceptor*.

(10) *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.

Size and spacing of cleanouts

4.7.2.(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 4.7.A.

Table 4.7.A.
Forming part of Sentence 4.7.2.(1)

Size of Drainage Pipe, in.	Minimum *Size* of *Cleanout*, in.	Maximum Spacing, m	
		One Way Rodding	Two Way Rodding
2½ or less	Same *size* as drainage pipe	7.5	15
3 and 4	3	15	30
over 4	4	26	52
Column 1	2	3	4

(2) The spacing between manholes serving a *building sewer*
(a) 24 in. or less in *size* shall not exceed 90 m, and
(b) over 24 in. 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* capable of rodding in 1 direction only shall be installed to rod in the direction of flow.

Manholes

4.7.3.(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 which shall provide 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 1.0 m, except that the top 1.5 m may be tapered from 1.0 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.

Location of cleanouts

4.7.4.(1) *Cleanouts* and access covers shall be located so that the openings are readily accessible for rodding and cleaning purposes.

(2) A *cleanout* shall not be located in a floor assembly in a manner that may constitute a hazard and shall not be 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° unless *approved.*

SUBSECTION 4.8 MINIMUM SLOPE AND LENGTH OF DRAINAGE PIPES

Minimum slope

4.8.1. Except as provided in Articles 4.10.8. and 4.10.9., every drainage pipe that has a *size* of 3 in. or less, and every *fixture drain* shall have a downward slope in the direction of flow of at least 1 in 50. (See Appendix A.)

4.8.2. Except for *fixture outlet pipes* installed in conformance with Sentence 4.5.1.(3), the *developed length* of every *fixture outlet pipe* shall not exceed 900 mm (see Appendix A explaining Sentence 4.5.1.(2)). Length of fixture outlet pipes

SUBSECTION 4.9 SIZE OF DRAINAGE PIPES

4.9.1.(1) A *soil-or-waste pipe* shall be of a *size* not less than the *size* of No reduction in size
(a) a *vent pipe* that is connected to it, or
(b) the largest *soil-or-waste pipe* that drains into it.

4.9.2.(1) The *size* of every drainage pipe that serves a water closet shall be at least 3 in. Serving water closets

(2) The *size* of every *branch* or *building drain* downstream of the third water closet *fixture drain* connection shall be at least 4 in. when it has 3 or more water closet *fixture drains directly connected* to it.

(3) The *size* of every *soil-or-waste stack* that serves more than 6 water closets shall be at least 4 in.

4.9.3.(1) Except as provided in Sentences (2) and (3), the *size* of every *fixture outlet pipe* shall conform to Table 4.9.A.

(2) The part of the *fixture outlet pipe* that is common to 3 compartments of a sink shall be 1 *size* larger than the largest *fixture outlet pipe* of the compartments that it serves. (See Appendix A.)

(3) The *size* of every *fixture outlet pipe* not listed in Table 4.9.A. shall be *approved.*

Table 4.9.A.
Forming Part of Sentences 4.9.3.(1) and 4.10.2.(1)

Fixture	Min. *Size* of *Fixture Outlet Pipe*, in.	Hydraulic Load, *fixture units*
Autopsy table	1½	2
Bathroom group		
(a) with flush tank		6
(b) with direct flush valve		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	NA	1½ with 1½ *trap*
(b) commercial	NA	2 with 1½ *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
Column 1	2	3

Table 4.9.A. (Cont'd)
Forming Part of Sentences 4.9.3.(1)
and 4.10.2.(1)

Fixture	Min. *Size* of *Fixture Outlet Pipe*, in.	Hydraulic Load, *fixture units*
Drinking fountain	1¼	½
Floor drain	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 two 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 2 single with common *trap*	1¼	1 with 1¼ in. *trap* 1½ with 1½ in. *trap*
(d) multiple or industrial type	1½	according to Table 4.10.A.
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
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
Column 1	2	3

SUBSECTION 4.10 HYDRAULIC LOADS

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

Total loads

4.10.1.(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.

Hydraulic loads from fixtures

4.10.2.(1) The hydraulic load from a *fixture* that is listed in Table 4.9.A. is the number of *fixture units* set forth in the Table.

Hydraulic loads from fixtures not in Table 4.9.A.

(2) Except as provided in Sentence (1), the hydraulic load from a *fixture* that is not listed in Table 4.9.A. is the number of *fixture units* set forth in Table 4.10.A. for the *trap* of the *size* that serves the *fixture*.

Table 4.10.A.
Forming Part of Sentence 4.10.2.(2)

Size of *Trap*, in.	Hydraulic Load, *fixture units*
1¼	1
1½	2
2	3
2½	4
3	5
4	6
Column 1	2

Hydraulic loads from fixtures with continuous flows

4.10.3.(1) Except as provided in Sentence (2), the hydraulic load from a *fixture* that produces a continuous or semi-continuous flow such as a pump or an air-conditioning *fixture* is 26.4 *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.

Hydraulic loads from roofs or paved surfaces

4.10.4.(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 2.3.1. of Part 2 of the National Building Code of Canada 1980, multiplied by the sum of

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

(b) one-half the area in square metres of the largest adjacent vertical surface, except when otherwise *approved*. (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 has been designed to carry the load of the stored water,

(c) one or more scuppers are installed so that the maximum depth of water on the roof cannot exceed 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 1 drain for each 900 m².

Conversion of fixture units to square feet

4.10.5.(1) Except as provided in Sentence 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.*

4.10.6.(1) Except as provided in Sentence (2), the hydraulic load that is drained to every *soil-or-waste stack* shall conform to Table 4.10.B.

(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 4.10.C. or Table 4.10.D., whichever is the less restrictive.

Table 4.10.B.
Forming Part of Sentence 4.10.6.(1)

Size of Stack, in.	Maximum Load on *Soil-or-Waste Stack, fixture units*		
	Maximum load on stack that passes through 3 *storeys* or less	Maximum load on stack that passes through more than 3 *storeys*	Maximum load to be drained to stack of more than 3 *storeys* from any 1 *storey*
1¼	2	2	2
1½	5	8	2
2	10	24	6
2½	20	42	9
3	60	60	16
4	240	500	90
5	540	1,100	200
6	960	1,900	350
8	2,200	3,600	600
10	3,800	5,600	1,000
12	6,000	8,400	1,500
Column 1	2	3	4

Hydraulic loads on branches

4.10.7. The hydraulic load that is drained to a *branch* shall conform to Table 4.10.C.

Table 4.10.C.
Forming Part of Article 4.10.7. and Sentence 4.10.6.(2)

Size of *Branch*, in.	Maximum Load on *Branch, 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
Column 1	2

4.10.8. The hydraulic load that is drained to a *sanitary building drain* or a *sanitary building sewer* shall conform to Table 4.10.D.

Hydraulic loads on sanitary building drains or sewers

Table 4.10.D.
Forming Part of Article 4.10.8. and Sentence 4.10.6.(2)

Size of Drain or Sewer, in.	Maximum Load on Drain or Sewer, *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
Column 1	2	3	4	5	6	7

4.10.9. The hydraulic load that is drained to a *storm building drain*, a *storm building sewer, a combined building drain* or *a combined building sewer* shall conform to Table 4.10.E.

Hydraulic loads on storm or combined building drains or sewers

Table 4.10.E.
Forming Part of Article 4.10.9.

Size of Drain or Sewer, in.	Maximum Load on Drain or Sewer, L						
	Slope						
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 68	1 in 50	1 in 25
3	—	—	—	—	2 390	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
Column 1	2	3	4	5	6	7	8

4.10.10. The hydraulic load that is drained to a roof gutter shall conform to Table 4.10.F.

4.10.11. The hydraulic load that is drained to a *leader* shall conform to Table 4.10.G.

Hydraulic loads on leaders

Table 4.10.F.
Forming Part of Article 4.10.10.

Size of Gutter, in.	Area of Gutter, cm^2	Maximum Load on Gutter, L			
		Slope of Gutter			
		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	24.9	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	4 600	6 500	9 190
8	162.1	700 8	6 600	9 400	13 200
10	253.4	480	12 000	17 000	23 600
Column 1	2	3	4	5	6

Table 4.10.G.
Forming Part of Article 4.10.11.

Circular *Leader*		Non-Circular *Leader*	
Size of *Leader*, in.	Max. Load(1), L	Area of *Leader*, cm^2	Max. 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
Column 1	2	3	4

SECTION 5 VENTING SYSTEMS

SUBSECTION 5.1 VENT PIPES FOR TRAPS

Venting for traps

5.1.1.(1) Except as provided in Sentences (2) and (3), a *trap* shall be protected by a *vent pipe*.

Exception for floor drains

(2) A *trap* that serves a floor drain need not be protected where
(a) the *size* of the *trap* is at least 3 in.,
(b) the length of the *fixture drain* is at least 450 mm, and
(c) the fall on the *fixture drain* does not exceed its *size*. (See Appendix A.)

Exceptions

(3) A *trap* need not be protected by a *vent pipe* where it serves
(a) a *subsoil drainage pipe*,
(b) a *storm drainage system*, or
(c) where it forms part of an indirect *drainage system*. (See Appendix A.)

SUBSECTION 5.2 SINGLE STOREY WET VENTING

Single Storey wet venting

5.2.1.(1) A *soil-or-waste pipe* that is extended as a *stack vent* or a *continuous vent* may serve as a single *storey wet vent* provided that
(a) all *fixtures* served by the *wet vent* are in the same *storey*,

(b) the number of wet vented *fixtures* does not exceed 4,
(c) the number of wet vented water closets does not exceed 2,
(d) when 2 water closets are installed they are connected at the same level by means of an *approved* double fitting,
(e) where the water closet *trap arm* is connected to a vertical pipe, it shall be connected downstream of all other *fixtures*, and
(f) the *fixture drains* are connected separately and directly into the *soil-or-waste pipe*.

5.2.2.(1) A section of a *branch* or *building drain* may serve as a single *storey wet vent* provided that
(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 wet vented *fixture*. (See Appendix A.)

(2) A *relief vent* shall be connected to the *branch* or *building drain* that forms part of a circuit vented system
(a) downstream of the connection for the circuit vented *fixture* that is farthest downstream when the *soil-or-waste pipe* to which the wet vented system is connected receives a hydraulic load of more than 6 *fixture units* upstream of that connection,
(b) so that the cumulative horizontal change in direction in the *branch* or *building drain* between *vent pipes* does not exceed 45°, and
(c) so that there are not more than 8 wet vented *fixtures* connected to the *branch* or *building drain* between *vent pipe* connections. (See Appendix A.)

(3) A *soil-or-waste pipe* that is extended as a *continuous vent* may serve as a *relief vent* provided the *soil-or-waste pipe* is sized as a *wet vent* in conformance with Articles 5.7.3. and 5.8.1. (See Appendix A.)

(4) A *relief vent* may serve as a combined *relief vent* for 2 or more *circuit vented branches* providing that there are not more than 8 wet vented *fixtures* connected between the combined *relief vent* and the *circuit vents*. (See Appendix A.)

SUBSECTION 5.3 MULTI-STOREY WET VENTING

5.3.1.(1) A *soil-or-waste stack* may serve as a multi-storey *wet vent* provided that
(a) *trap arms* connected to the stack do not exceed 2 in. in *size* except as provided in Sentence (2),
(b) *trap arms* are separately and *directly connected* to the *soil-or-waste stack*,
(c) when the *soil-or-waste stack* extends through more than 2 *storeys*, the total discharge from any 1 *storey* above the second *storey* does not exceed 4 *fixture units*,
(d) there is not more than 1 *nominally horizontal offset* in the *soil-or-waste stack* and the *offset*
  (i) does not exceed 1.2 m for pipe *sizes* 2 in. or less,
  (ii) does not exceed 2.5 m for pipe *sizes* larger than 2 in., and
  (iii) is at least 150 mm above the *flood level rim* of any fixture that drains to the *soil-or-waste stack* below the *offset*,
(e) no *soil-or-waste pipe* connects to an *offset*, and
(f) the wet vented portion of the *soil-or-waste stack* is the same *size* from its base to the highest *fixture* connection.

(2) Water closets shall be connected below all other *fixtures*.

(3) Where 2 water closets are installed they shall be connected by a double fitting.

SUBSECTION 5.4 VENT PIPES FOR SOIL-OR-WASTE STACKS

Stack vents

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

Stack venting

(2) A *stack vent* may serve as the *vent pipe* for 1 or 2 *fixtures* connecting at the same level. (See Appendix A.)

Vent stacks

5.4.2.(1) A *vent stack* shall be installed to protect the base of every *soil-or-waste stack,* other than a *soil-or-waste stack* that serves as a multi-*storey wet vent,* that has *fixtures* draining to it on more than 4 *storeys.*

(2) The *vent stack* shall be connected to the *soil-or-waste stack* at or below the lowest *soil-or-waste pipe* connection, or at the junction of the *soil-or-waste stack* with a *branch* or *building drain.* (See Appendix A.)

Yoke vents

5.4.3.(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 on which *fixtures* are located other than the top and bottom 5 *storeys,* 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 section described in Sentence (1).

(3) The *yoke vent* shall be connected 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 required *yoke vent* need not be installed provided the *soil-or-waste stack* is interconnected to the *vent stack* in each *storey* of the section in which *fixtures* are located by means of a *fixture* or a group of vented *fixtures* installed in accordance with Subsection 5.2.

5.4.4. A *soil-or-waste stack,* other than a multi-*storey wet vent,* 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 a *relief vent* connected to the vertical section immediately above the *offset* and another *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.)

SUBSECTION 5.5 MISCELLANEOUS VENT PIPES

Venting of sewage sumps

5.5.1. Every sump that receives *sewage* shall be provided with a *vent pipe* that is connected to the top of the sump.

Venting of oil interceptors

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

(a) connect to the *interceptor* at opposite ends,
(b) extend independently to open air, and
(c) terminate 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.

Fresh air inlets

5.5.3. Where a *building trap* is installed, a *fresh air inlet* not less than 4 in. in *size* shall be connected upstream and within 1.2 m of the *building trap* and downstream of any other connection. (See Appendix A explaining Sentence 4.5.4.(1).)

5.5.4. 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 made for the necessary future connections.

SUBSECTION 5.6 ARRANGEMENT OF VENT PIPES

Drainage of vent pipes

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

Vent pipe connections

5.6.2.(1) Every *vent pipe* shall be connected as directly as possible from its lower end to outside air, and where it is practicable to do so the pipe shall be installed in a *nominally vertical* position.

(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.)

Location of vent pipes

5.6.3.(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
  (i) not less than twice the *size* of the *fixture drain*, and
  (ii) not more than 1.5 m,
(b) the total fall of the *trap arm* is not greater than the *size* of the *fixture drain*, and
(c) the *trap arm* does not have a cumulative change of direction of more than 135°. (See Appendix A.)

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

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

(a) 1 m in the vertical plane, and
(b) 3 m in the horizontal plane. (See Appendix A.)

Vents to connect above fixtures they serve

5.6.4.(1) An *individual vent, dual vent, continuous vent, circuit vent* or *relief vent* 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 to a *branch vent* or a *vent stack* 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*.

Terminals

5.6.5.(1) The upper end of every *vent pipe* that is not terminated in open air shall be connected to a *venting system* that is terminated in open air.

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

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

(a) at least 1 m above or at least 3.5 m in any other direction from every air inlet, openable window or door,
(b) at least 2 m above or at least 3.5 m in any other direction from a roof that supports an *occupancy*,
(c) at least 2 m above ground, and
(d) at least 1.8 m from every property line. (See Appendix A.)

(4) Where a *vent pipe* passes through a roof it shall

(a) terminate high enough to prevent the entry of roof drainage but at least 25 mm above the roof, and
(b) be flashed to prevent the entry of water between the *vent pipe* and the roof. (See Article 2.9.11. for *vent pipe* flashings.)

(5) Where a *vent pipe* passes through a roof and may be subject to frost closure it shall be protected from frost closure
(a) by keeping its height to a minimum,
(b) by being increased at least 1 *size* immediately before penetrating the roof,
(c) by being insulated, or
(d) by being protected in some other manner acceptable to the *authority having jurisdiction.*

SUBSECTION 5.7 MINIMUM SIZE OF VENT PIPES

General

5.7.1. The *size* of every *vent pipe* shall conform to Table 5.7.A.

Table 5.7.A.
Forming Part of Article 5.7.1.

Size of *Trap* Served, in.	Minimum *Size* of *Vent Pipe*, in.
1¼	1¼
1½	1¼
2	1½
2½	1½
3	1½
4	1½
5	2
6	2
Column 1	2

5.7.2. A *branch vent, stack vent, vent stack* or *header* shall be of a *size* not less than the *size* of a *vent pipe* that is connected to it.

Relief vents

5.7.3.(1) Except as provided in Article 5.7.1., the minimum *size* of a *relief vent* installed in conjunction with a *circuit vent* shall be 1 *size* smaller than the required *size* of the *circuit vent.*

(2) Except as provided in Article 5.7.1., the minimum *size* of a *relief vent* installed in conjunction with an *offset* in a *soil-or-waste stack* shall be 1 *size* smaller than the *stack vent.*

Yoke vents

5.7.4. Except as provided in Article 5.7.1., the minimum *size* of a *yoke vent* shall be 1 *size* smaller than the *size* of the smaller pipe to which it is connected.

5.7.5. The minimum *size* of a *vent pipe* that serves a manhole within a *building* shall be 2 in.

Sewage sump vents

5.7.6.(1) Except as provided in Sentence (2), the minimum *size* of the *vent pipe* for a *sewage* sump shall be 1 *size* smaller than the *size* of the largest inlet pipe to the sump.

(2) The minimum *size* of every *vent pipe* for a *sewage* sump shall be 2 in., but the *vent pipe* need not be larger than 4 in.

Oil interceptors

5.7.7. The minimum *size* of every *vent pipe* that serves an oil *interceptor* shall be 2 in.

SUBSECTION 5.8 SIZING OF VENT PIPES

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

5.8.1.(1) The hydraulic load that drains to a single *storey wet vent* shall conform to Table 5.8.A. (See Appendix A.)

Table 5.8.A.
Forming part of Article 5.8.1.

Size of *Wet Vent*, in.	Maximum Hydraulic Load Connected to a Single *Storey Wet Vent, fixture units*
1¼	1
1½	2
2	5
2½	8
3	27
4	120
Column 1	2

(2) The hydraulic load that drains to a multi *storey wet vent* shall conform to Table 5.8.B. (See Appendix A.)

Table 5.8.B.
Forming Part of Sentence 5.8.1.(2)

Size of *Wet Vent* Portion of *Soil-or-Waste Stack*, in.	Maximum Hydraulic Load, *Fixture Units*		
	Not Serving Water Closets	Serving Water Closets	
		Fixtures Other than Water Closets	Water Closets
1½	2	—	—
2	4	3	8
2½	6	4	8
3	12	6	8
4	36	14	8
5	NA	18	8
6	NA	23	8
Column 1	2	3	4

5.8.2.(1) A *circuit vent*, a *branch vent*, a *header* and a *continuous vent*, other than one that is an *individual vent* or a *dual vent*, shall be sized in conformance with Table 5.8.C.

(2) The length of a *continuous vent* for the purpose of Table 5.8.C. shall be its *developed length* from the vertical *soil-or-waste pipe* to a *vent stack, stack vent, header* or open air.

(3) The length of a *circuit vent* for the purpose of Table 5.8.C. shall be its *developed length* from the horizontal *soil-or-waste pipe* to a *vent stack, stack vent, header* or open air.

(4) The length of a *branch vent* for the purpose of Table 5.8.C. shall be the *developed length* of vent piping from the most distant *soil-or-waste pipe* connection to a *vent stack, stack vent, header* or open air.

(5) The length of a *header* for the purpose of Table 5.8.C. shall be the *developed length* of vent piping from the most distant *soil-or-waste pipe* connection to open air. (See Appendix A.)

Table 5.8.C.
Forming Part of Sentence 5.8.2.(1)

Maximum Load Served, *fixture units*	*Size* of Vent Pipe, in.								
	1¼	1½	2	2½	3	4	5	6	8
	Maximum Length of Vent Pipe, m								
2	9.0								
8	9.0	30.0							
20	7.5	15.0	46.0				NOT LIMITED		
40	4.5	9.0	30.0	91.0					
60		4.5	15.0	24.0	120.0				
100			9.0	21.0	55.0	215.0			
1,100				6.0	15.0	61.0	215.0		
1,900		NOT PERMITTED			6.0	21.0	61.0	215.0	
3,600						7.5	18.0	76.0	245.0
5,600							7.5	18.0	76.0
Column 1	2	3	4	5	6	7	8	9	10

Stack vents and vent stacks

5.8.3.(1) A *stack vent* or *vent stack* shall be sized in accordance with Table 5.8.D.

(2) The length of a *stack vent* or a *vent stack* for the purpose of Table 5.8.D. shall be its *developed length* from its lower end to open air. (See Appendix A.)

Table 5.8.D.
Forming Part of Sentence 5.8.3.(1)

Size of Soil-or-Waste Stack, in.	Total Hydraulic Load Served by Vent, *fixture units*	Size of *Stack Vent* or *Vent Stack*, in.								
		1¼	1½	2	2½	3	4	5	6	8
		Maximum Length of Vent Pipe, m								
1¼	0-2	9.0								
1½	0-8	15.0	46.0							
2	0-8	9.0	23.0	61.0						
2	9-20	7.5	15.0	46.0			NOT LIMITED			
2	21-24	4.5	9.0	30.0						
2½	0-20		14.0	46.0	120.0					
2½	21-42		9.0	30.0	91.0					
3	0-10		9.0	30.0	61.0	185.0				
3	11-30		4.5	18.0	61.0	150.0				
3	31-60		4.5	15.0	24.0	120.0				
4	0-100			11.0	30.0	79.0	305.0			
4	101-200			9.0	27.0	76.0	275.0			
4	201-500			6.0	21.0	55.0	215.0			
5	0-200				11.0	24.0	105.0	305.0		
5	201-500				9.0	21.0	91.0	275.0		
5	501-1,100				6.0	15.0	61.0	215.0		
6	0-350				7.5	15.0	61.0	120.0	395.0	
6	351-620				4.5	9.0	38.0	91.0	335.0	
6	621-960					7.5	30.0	76.0	305.0	
6	961-1,900					6.0	21.0	61.0	215.0	
8	0-600						15.0	46.0	150.0	395.0
8	601-1,400						12.0	30.0	120.0	365.0
8	1,401-2,200	NOT PERMITTED					9.0	27.0	105.0	335.0
8	2,201-3,600						7.5	18.0	76.0	245.0
10	0-1,000							23.0	38.0	305.0
10	1,001-2,500							15.0	30.0	150.0
10	2,501-3,300							9.0	24.0	105.0
10	3,301-5,600							7.5	18.0	76.0
Column 1	2	3	4	5	6	7	8	9	10	11

SECTION 6 POTABLE WATER SYSTEMS

SUBSECTION 6.1 ARRANGEMENT OF PIPING

6.1.1.(1) *Potable water systems* shall be designed, fabricated and installed in accordance with good engineering practice. (See Appendix A.)

Hot and cold faucets

(2) 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.

Drainage of piping

6.1.2. A *water distribution system* shall be installed so that the system can be drained and, if it is not practicable to avoid a *trap* or sag in a pipe, provision shall be made to drain it.

Shut-off valve

6.1.3.(1) Every *water service pipe* shall be provided with a shut-off valve where the pipe enters the *building*.

(2) Every pipe that is supplied with water from a gravity water tank or a tank of a *private water supply system* shall be provided with a shut-off valve located close to the tank.

Valves on risers

6.1.4. Except for a single-family house, every *riser* shall be provided with a shut-off valve at the source of supply.

Shut-off valves for water closets

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

6.1.6. Except for a single-family house, shut-off valves shall be installed in every *suite* in a *building* of residential occupancy as defined in the National Building Code of Canada 1980 as may be necessary to ensure that when the supply to one *suite* is shut off the supply to the remainder of the *building* is not interrupted.

Shut-off valves for other buildings

6.1.7.(1) In *buildings* other than those described in Article 6.1.6., shut-off valves shall be provided on the water supply to

(a) every *fixture* or device, or

(b) group of *fixtures* or devices in the same room except as provided in Article 6.1.5.

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

Stop-and-waste cocks for exterior supply

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

Check valves

6.1.10. 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.

6.1.11.(1) Every flushing device that serves a water closet or 1 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 1 *fixture*.

Pressure relief valves for storage type service water heaters

6.1.12.(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 designed to open when the water pressure in the tank reaches the rated working pressure of the tank, and 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.

Temperature relief valves

(2) Every hot water tank of a *storage-type service water heater* shall be equipped with

(a) a temperature relief valve with a temperature sensing element located within the top 150 mm of the tank and 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, or

(b) a device that — Temperature limit control
  (i) is designed to shut off the supply of electricity or fuel to the heater,
  (ii) is not connected to and operates independently of the thermostatic control that determines the temperature of the water in the tank, and
  (iii) is located and maintained on or within the top 150 mm of the tank so that the maximum temperature of the water in the tank shall not exceed 99°C under all operating conditions.

(3) Every tank equipped as specified in Clause 6.1.12.(2)(b) shall bear the information in a clearly visible location that it is so equipped.

(4) A pressure relief valve and a temperature relief valve may be combined where Sentences (1) and (2) are complied with. — Combination pressure and temperature relief valves

(5) Every pipe that conveys water from a temperature relief, pressure relief or a combined temperature and pressure relief valve which is installed on a hot water tank shall — Relief valve pipe discharge
(a) have a *size* at least equal to the *size* of the outlet of the valve, and
(b) terminate above a floor drain, sump or *fixture* or other *approved* safe location.

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

(7) A *backflow preventer* shall be installed when requested by the *authority having jurisdiction.* — Backflow preventer
λ(See Article 6.2.3. to 6.2.5. which give methods of meeting this requirement.)

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

6.1.14.(1) A *water service pipe* intended to serve a mobile home shall — Mobile home water service
(a) be not less than ¼ in. in *size,*
(b) be terminated 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.

SUBSECTION 6.2 PROTECTION FROM CONTAMINATION

6.2.1.(1) Except as provided in Sentence (2), connections to *potable water systems* shall be designed so that non-potable water, foreign matter, foreign chemicals or substances that may render the water non-potable cannot enter the system. — Connection of systems

(2) A water treatment device or apparatus may only be installed with the written permission of the *authority having jurisdiction.*

(3) The use of an *approved* assembly of differential valves and *check valves* including an automatically opened spillage port to the atmosphere designed to prevent *backflow* is permitted in installations where it is desirable to zone or isolate a multiple of openings or connections.

(4) No *private water supply system* shall be interconnected with a public water supply system.

(5) No *potable* water pipe shall be connected to an ejector unless provided with an *approved vacuum breaker.*

(6) Aspirators shall not be *directly connected* to a *waste pipe* that is connected to a sewer, but may be indirectly connected to the inlet side of a *trap,* and shall be equipped with an *approved vacuum breaker* installed at least 150 mm above the aspirator unit.

(7) Except as provided in Sentence (6), no water operated equipment shall be installed without the written approval of the *authority having jurisdiction.* (See Appendix A.)

Cleaning of systems

6.2.2. A newly installed part of a *water system* shall be cleaned before the system is put into operation and, where required, shall be flushed and chlorinated.

Air gap or back-siphonage preventer

6.2.3.(1) Except for a *fixture* in which the water surface may be exposed to a pressure greater than atmospheric, a water supply outlet shall be

(a) located so as to provide an *air gap,* or

(b) provided with a *back-siphonage preventer.*

Height of air gap

(2) Every *air gap* shall be at least 25 mm in height, and

(a) at least twice the diameter of the opening of the water supply outlet in height, or

(b) of a design that will preclude the return of water to the *potable water system* when the water level in the *fixture* or device is at its maximum height and a negative pressure of 50 kPa exists in the water supply pipe.

6.2.4.(1) Where the *critical level* is not marked on a *back-siphonage preventer,* the *critical level* shall be taken as the lowest point on the *back-siphonage preventer.*

(2) Where a *back-siphonage preventer* 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 only when the valve or faucet is open. (See Appendix A explaining Sentence 6.2.4.(2).)

(3) A *back-siphonage preventer* shall be installed so that the *critical level* is at least 25 mm above the *flood level rim* of a *fixture* or maximum water level in a tank.

Protection of devices under pressure

6.2.5. Where a water supply pipe is connected to a device which may be subjected to a pressure in excess of atmospheric, the pipe shall be protected by an *approved backflow preventer.* (See Appendix A explaining *backflow preventer.*)

6.2.6. Where a water supply serves both *potable* and fire protection systems, the fire protection system shall be isolated by an *approved* means of preventing *backflow.*

SUBSECTION 6.3 SIZE AND CAPACITY OF PIPES

(See Appendix A.)

Design

6.3.1. Every *water distribution system* shall be designed to provide peak demand flow when the flow pressures at the supply openings conform to Table 6.3.A.

Hydraulic load

6.3.2.(1) Except as provided in Sentence (3), the hydraulic load of a *fixture* or device that is listed in Table 6.3.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 6.3.A. is the number of *fixture units* listed in Table 6.3.B.

(3) Where *fixtures* are supplied with both hot and cold water, the hydraulic loads for maximum separate demands shall be 75 per cent of the hydraulic load of the *fixture units* given in Tables 6.3.A. and 6.3.B.

Table 6.3.A.
Forming Part of Subsection 6.3

Fixture or Device	Minimum *Size* of Supply Pipe, in.	Min. Flow Pressure,[1] kPa (gauge)	Hydraulic Load, *Fixture Units*	
			Private	Public
Bathroom group				
(a) with flush tank	NA	NA	6	—
(b) with direct flush valve	NA	NA	8	—
Bathtub (with or without shower)	½	50	2	4
Clothes washer	½	100	3	—
Dishwasher, domestic	½	100	3	—
Drinking fountain	⅜	100	½	1
Hose bib	½	100	[2]	[2]
Lavatory	⅜	50	1	2
Sink				
(a) kitchen, domestic	½	50	2	—
(b) kitchen, commercial	¾	50	—	4
(c) service	½	50	—	3
(d) service with direct flush valve	¾	100	—	5
Shower head	½	50	2	4
Urinal				
(a) with flush tank	½	50	—	3
(b) with direct flush valve	¾	100	—	5
Water closet				
(a) with flush tank	⅜	50	3	5
(b) with direct flush valve	1	100	6	10
Column 1	2	3	4	5

Notes to Table 6.3.A.:
[1] Measured immediately upstream of faucet or supply valve.
[2] A continuous load of 0.38 L/s.

Table 6.3.B.
Forming Part of Sentence 6.3.2.(2)

Size of Supply Pipe, in.	Hydraulic Load, *Fixture Units*	
	Private	Public
⅜	1	2
½	2	4
¾	3	6
1	6	10
Column 1	2	3

Static pressure

6.3.3. Where the static pressure may exceed 550 kPa, a pressure reducing valve shall be installed to limit the maximum static pressure to not more than 550 kPa in areas that may be occupied.

Size

6.3.4.(1) Every *water service pipe* shall be sized according to the peak demand flow but shall be not less than ¾ in.

(2) Except as provided in Sentence (3), the size of a pipe that supplies a *fixture* or device shall conform to Column 2 of Table 6.3.A.

(3) A tail piece or connector not more than 750 mm in length and not less than ¼ in. inside diameter may be used to supply water to a *fixture* or device.

SECTION 7 NON-POTABLE WATER SYSTEMS

SUBSECTION 7.1 CONNECTION

7.1.1. A non-*potable water system* shall not be connected to a *potable water system.*

SUBSECTION 7.2 IDENTIFICATION

7.2.1. Non-*potable* water piping shall be identified by markings that are permanent, distinct and easily recognized.

SUBSECTION 7.3 LOCATION

Location of pipe

7.3.1. 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.

Location of outlets

7.3.2. Unless *approved* 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 a purpose related to the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

APPENDIX A

EXPLANATORY MATERIAL for the Canadian Plumbing Code 1980

(This Appendix contains notes, explanations and diagrams that apply to the requirements of this Code. The bold-face reference numbers that introduce each item apply to the requirements in the main body of the Code to which the explanatory material is applicable. The bold-face captions following these reference numbers describe the subjects to which the references apply.)

SYMBOLS AND ABBREVIATIONS

The following symbols and abbreviations have been used in the diagrams:

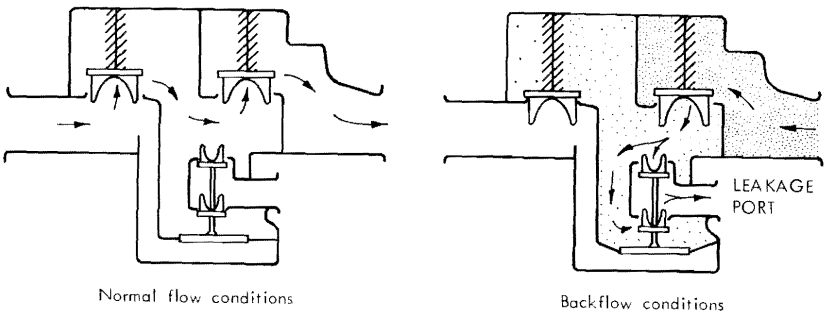
Water and drainage pipe ——————

Subsoil drains —·—

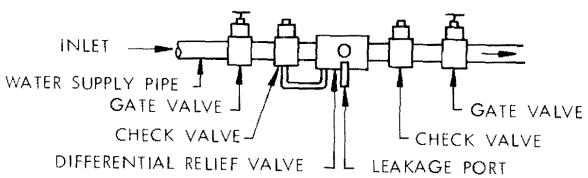
Vent pipe - - - - - - - - - - - - - - -

BG	Bathroom group	KS	Kitchen sink
BT	Bathtub	LAV	Lavatory
CO	Cleanout	LT	Laundry tray
DF	Drinking fountain	RD	Roof drain
FD	Floor drain	UR	Urinals
FS	Floor sink	WC	Water closet

Definition for *Backflow preventer*

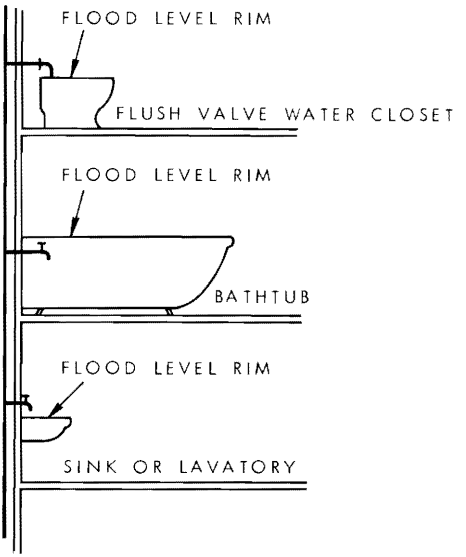


(a) Reduced pressure backflow preventer



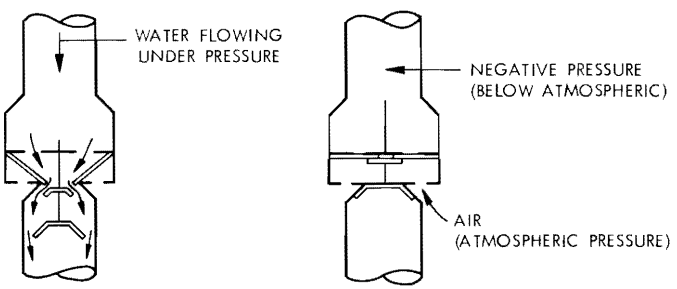
(b) Assembly of differential valves and check valves used as a backflow preventer

Definition for *Back-siphonage*



This diagram shows a situation that is fairly common in old buildings. If the bathtub is filled to a level above the faucet outlet, or if the flush valve of the water closet is faulty, and if the faucet at the sink or lavatory on the lower floor is opened, water can be drawn (siphoned) from the bathtub or the water closet into the water system when the pressure in the water system is low or the water supply has been shut off.

Definition for *Back-siphonage preventer*

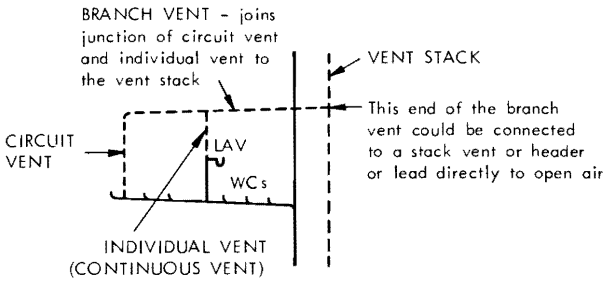


(a) Normal operation with valve open

(b) No backflow - valve closed by atmospheric pressure

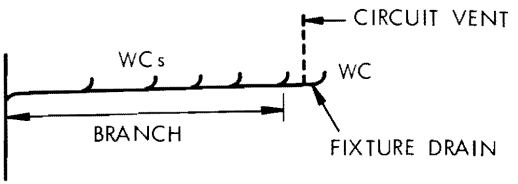
Back-siphonage can be prevented in the above situations by providing an air gap or a back-siphonage preventer (see Subsection 6.2 of this Code).

Definition for *Branch vent*



(See also explanation for definitions for header and drainage system.)

Definition for *Circuit vent*

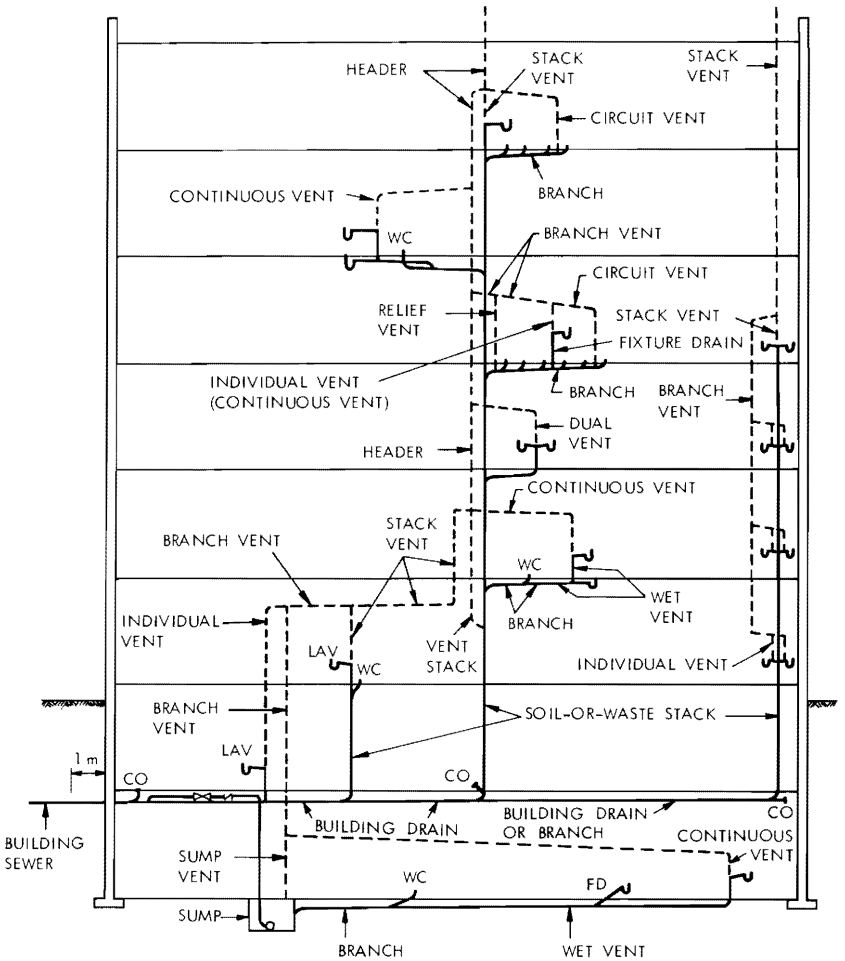


(See also explanation for definition for *drainage system.*)

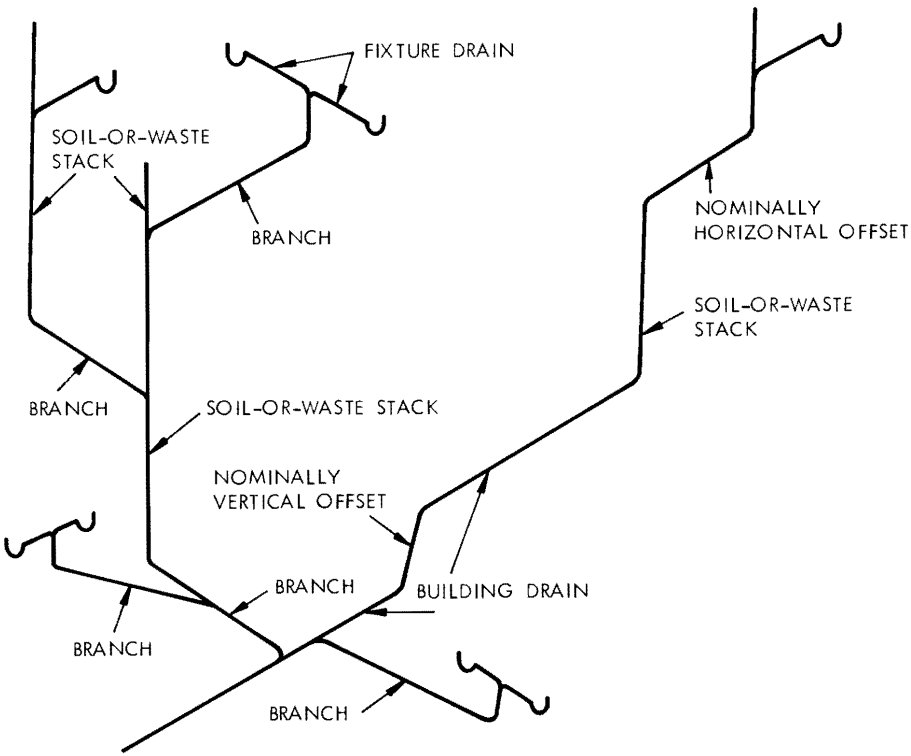
Definition for *Clear-water waste*

Examples of clear-water waste are the waste waters discharged from a drinking fountain, cooling jacket, air conditioner or relief valve outlet.

Definition for *Drainage system* DRAINAGE AND VENTING SYSTEMS

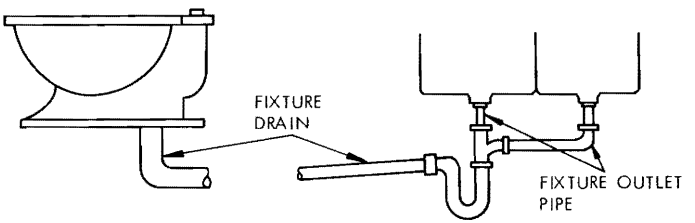


Definition for *Drainage system* (Cont'd.) **PARTIAL DRAINAGE SYSTEM (ISOMETRIC VIEW IGNORING VENTS)**

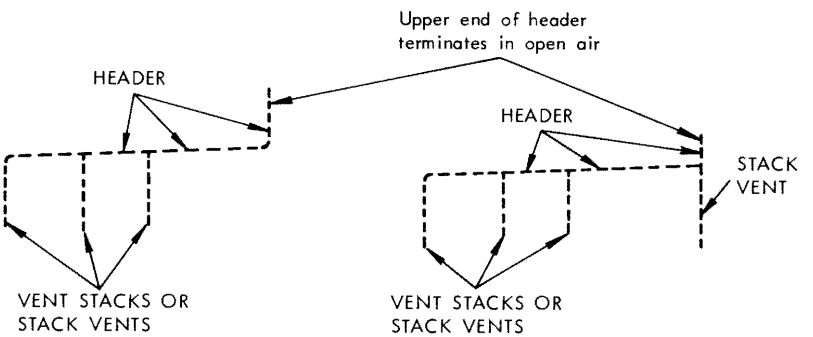


Partial Drainage System
(Isometric View)

Definitions for *Fixture drain and Fixture outlet pipe*

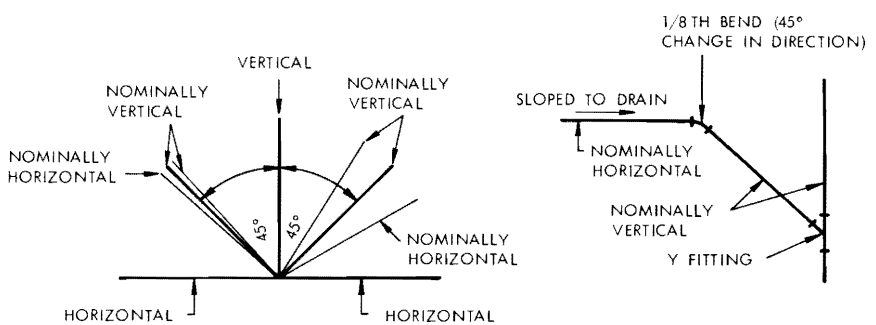


Definition for *Header*

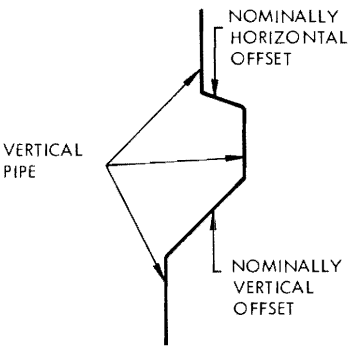


Although a header is similar to a branch vent, it serves the special purpose of connecting the tops of stack vents or vent stacks. To make certain that it is adequate for that purpose it is made larger than a branch vent. The developed length used to determine its size is the total length from the most distant soil-or-waste pipe to open air, rather than the shorter length used to size a branch vent.

Definitions for *Nominally horizontal* and *Nominally vertical*

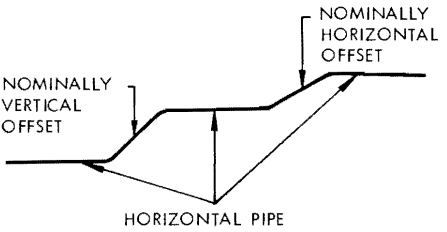


Definition for *Offset*



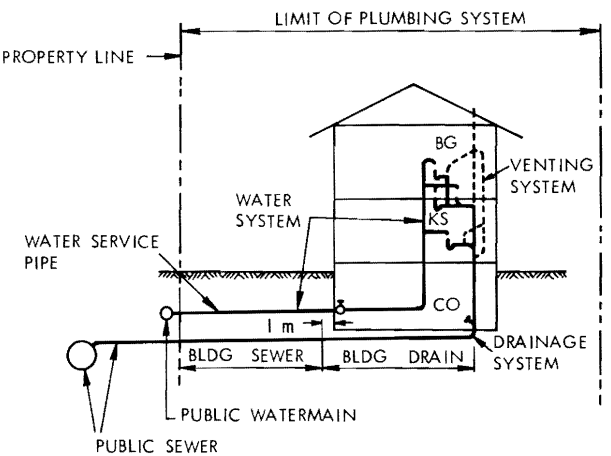
(a) Elevation view of vertical pipe

(b) Plan view of horizontal pipe

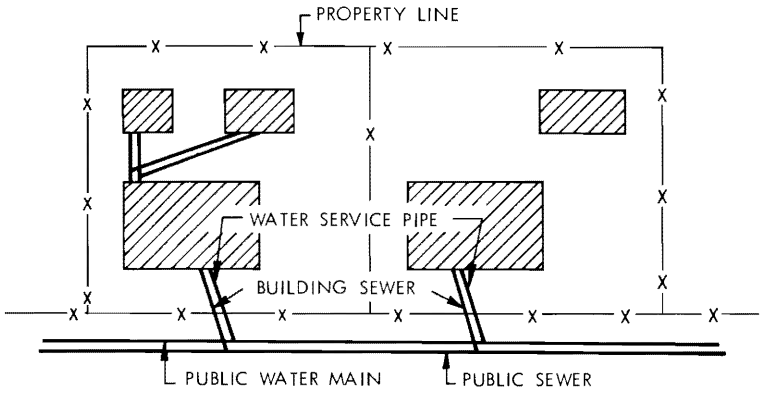


(c) Elevation view of horizontal pipe

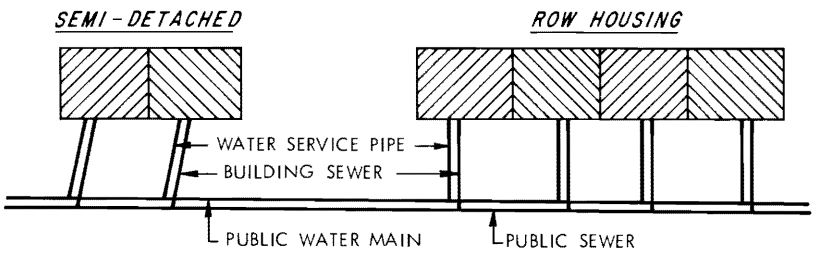
Definition for *Plumbing system*



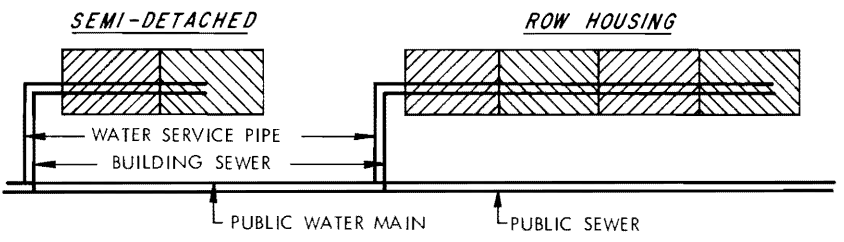
Article 1.6.4. SERVICE PIPING



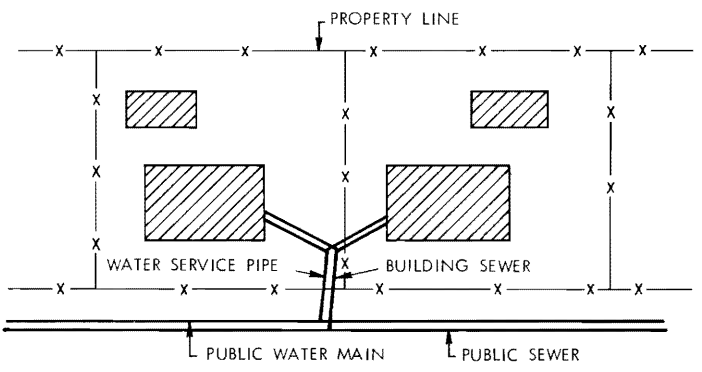
(a) Permitted



(b) Permitted



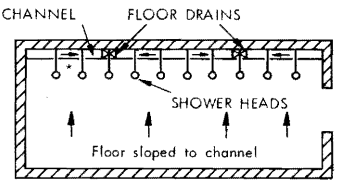
(c) Permitted



(d) Not permitted

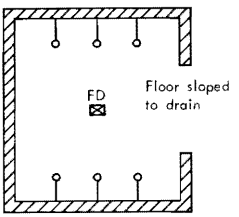
The layout as shown in diagram (c) above may require special legal arrangements in some jurisdictions to ensure that access can be provided to all parts of the service pipes.

Sentence 2.2.4.(3) Shower Drainage, Plan View



(a) Permitted

* Minimum distance between shower heads - 750 mm

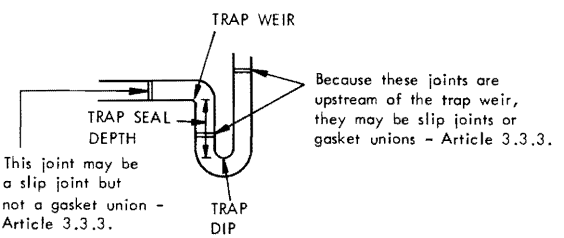


(b) Not permitted

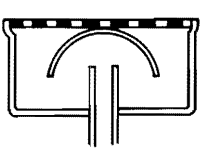
Article 2.2.6.

This does not preclude the use of a standing waste.

Sentences 2.3.1.(1) and 2.3.1.(2) Trap Seal Depth and Trap Connections

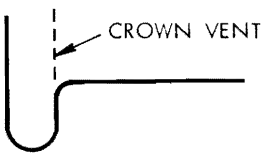


Sentence 2.3.1.(3) Prohibited Traps



(a) Bell trap

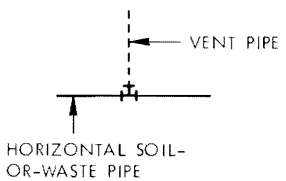
(b) S trap



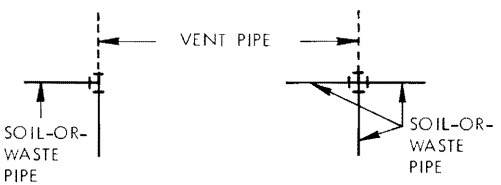
(c) Crown vented trap

Except for an S-trap standard, the S trap shown in diagram (c) above is prohibited by Clause 5.1.1.(2)(c) which limits the fall on fixture drains. Crown vented traps shown in diagram (d) are prohibited by Clause 5.6.3.(1)(a) which requires that the distance from the trap weir to the vent be not less than twice the size of the fixture drain.

Article 2.4.1. T Fittings in Drainage Systems



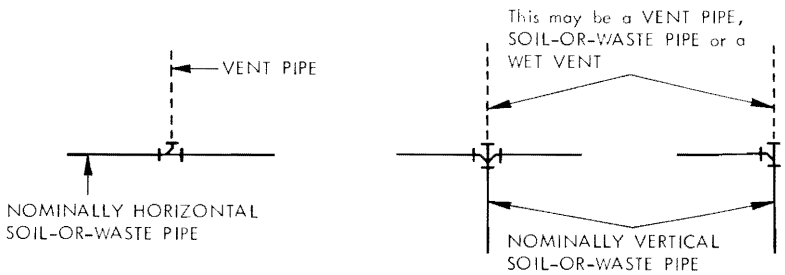
(a) Permitted



(b) Not Permitted

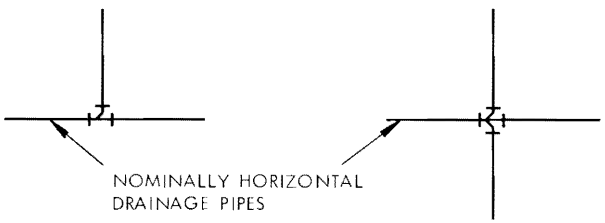
This prohibits the use of a cross fitting in a drainage system, but such fitting may be used in a venting system to connect 4 vent pipes. In a drainage system a T fitting can only be used as shown in diagram (a), and cannot be used as shown in diagram (b) because the T or cross fitting would change the direction of flow in the drainage system.

Article 2.4.2. Sanitary T Fittings in Drainage Systems



(a) Permitted

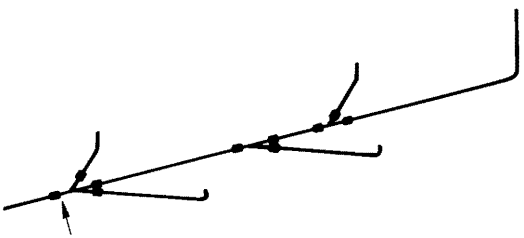
(b) Permitted

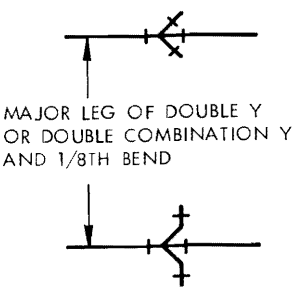


(c) Not Permitted (Use Combination Y and 1/8th bend)

A Sanitary T fitting may be used to change the direction of flow in a drainage system from horizontal to vertical, but may not be used to change the direction of flow in a nominally horizontal drainage system. A combination Y and 1/8th bend fitting may also be used as shown in Figure (b).

Article 2.4.3. Double Y Fittings





Subsections 2.5, 2.6 and 2.7 SUMMARY OF PIPE APPLICATIONS

Type of Piping	Code Reference	Use of Piping[1]							
		Drainage System			Venting System		Water System		
		Above ground inside building	Underground inside building	Building Sewer	Above ground	Underground	Above ground	Underground inside building	Underground outside building
Asbestos-cement DWV pipe	2.5.1.	P	P	P	P	P	N	N	N
Asbestos-cement sewer pipe	2.5.1.	N	P	P	N	N	N	N	N
Asbestos-cement water pipe	2.5.2.	N	N	N	N	N	N	P	P
Concrete sewer pipe	2.5.3.	N	P	P	N	N	N	N	NA
Vitrified clay pipe	2.5.4.	N	P	P	N	N	N	N	N
Polyethylene water pipe	2.5.5.	N	N	N	N	N	N	(2)	(2)
Poly (vinyl chloride) (PVC) water pipe	2.5.6.	N	N	N	N	N	(5)	(5)	(5)
Chlorinated poly (vinyl chloride) (CPVC) water pipe	2.5.7.	N	N	N	N	N	(3),(4)	P	P
Polybutylene water pipe	2.5.8.	N	N	N	N	N	(3),(4)	P	P
Plastic sewer pipe	2.5.9.	N	N	P	N	N	N	N	N
Acrylonitrile-butadiene-styrene (ABS) DWV Pipe	2.5.10.	(3),(4)	P	P	(3),(4)	P	NA	NA	NA
Poly (vinyl chloride) (PVC) DWV Pipe	2.5.10.	(3),(4)	P	P	(3),(4)	P	N	N	N
Cast-iron soil pipe	2.6.1.	P	P	P	P	P	NA	NA	NA
Cast-iron water pipe	2.6.4.	P	P	P	P	P	P	P	P
Welded and seamless steel, galvanized pipe	2.6.7.	P	N	N	P	N	(6)	(6)	(6)
Corrugated steel, galvanized pipe	2.6.8.	N	N	(7)	NA	N	NA	N	N
Sheet metal pipe	2.6.9.	(8)	N	N	N	N	N	N	N
Copper and brass pipe	2.7.1.	P	P	P	P	P	P	P	P
Copper tube—Types K and L hard	2.7.4.	P	P	P	P	P	P	P	P
Copper tube—Types K and L soft	2.7.4.	N	N	N	N	N	P	P	P
Copper tube—Type M hard	2.7.4.	P	N	N	P	N	P	N	N
—Type M soft	2.7.4.	N	N	N	N	N	N	N	N
Copper tube—Type DWV	2.7.4.	P	N	N	P	N	N	N	N
Lead waste pipe	2.7.8.	(3),(4)	P	N	(3),(4)	P	N	N	N
Column 1	2	3	4	5	6	7	8	9	10

Notes to Table:

N—Not permitted P—Permitted NA—Not applicable

(1) Where fire stops are pierced by pipes, the integrity of the fire stop must be maintained.

(2) Permitted only for water service pipe.

(3) Combustible piping in noncombustible construction is subject to the requirements of Article 3.1.4.5.(5) of the NBC 1980.

(4) Combustible piping that penetrates a fire separation is subject to the requirements in Articles 3.1.7.7., 9.10.9.10. and 9.10.9.26. of the NBC 1980.

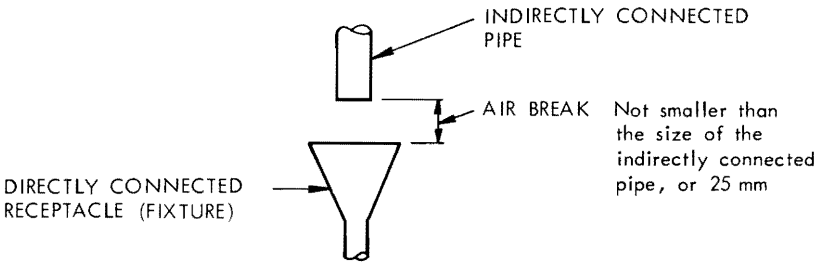
(5) Not permitted in hot water systems.

(6) Unless approved, not permitted except for industrial occupancies or repair of existing galvanized steel piping systems.

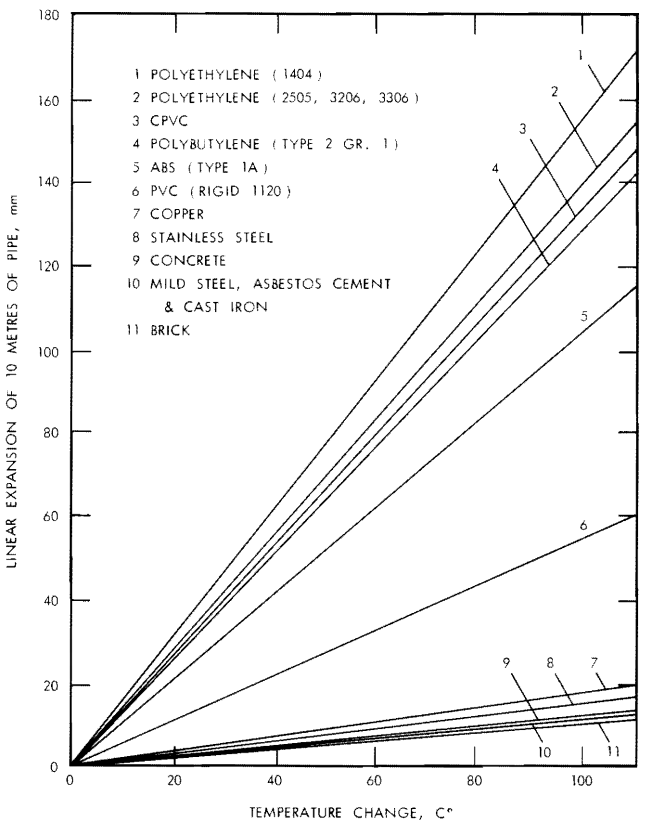
(7) Permitted only underground in a storm drainage system.

(8) Permitted only for an external leader.

Sentence 3.3.11.(2) Air Break



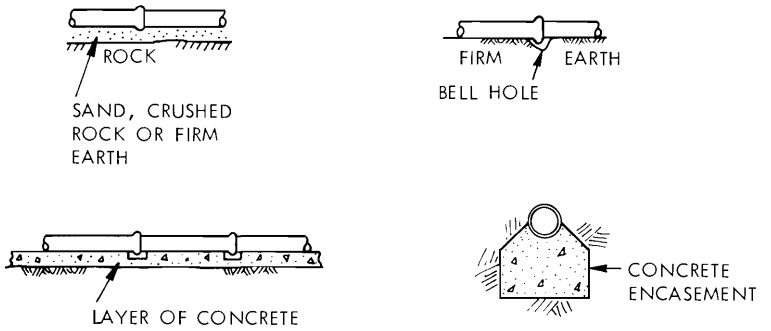
Article 3.3.9. Linear Expansion



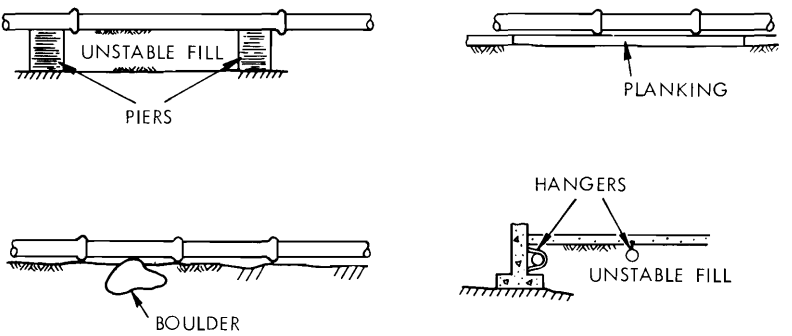
Example: To determine the expansion of 20 m of ABS pipe for a temperature change from 10°C to 60°C.

—Temperature change = 60 – 10 = 50 C°,
—Enter the chart at 50 C°, read up to ABS line, and then across to the mm scale = 53 mm/10 m of pipe,
—∴ change in length of 20 m of pipe = $\frac{20}{10} \times 53 = 106$ mm.

Article 3.4.6. Support for Underground Piping



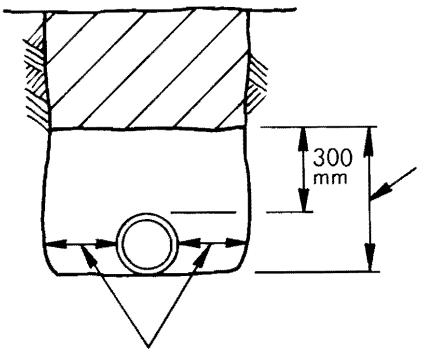
(a) Permitted



(b) Not permitted

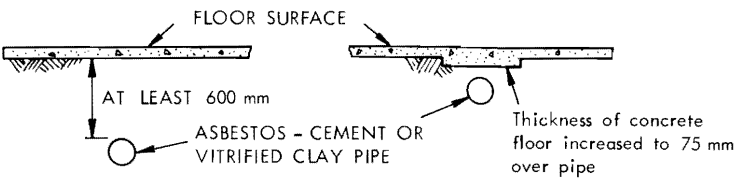
See explanation for Subsection 3.5 for additional protection required for underground pipes. Permitted installations are shown in diagram (a). The methods of support shown in diagram (b) are not permitted because the base does not provide firm and continuous support for the pipe.

Article 3.5.1. Backfilling of Pipe Trench

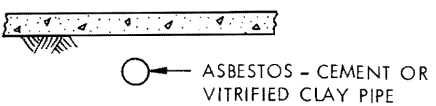


Stronger pipes may be required in deep fill or under driveways, parking lots, etc., and compaction for the full depth of the trench may be necessary.

Article 3.5.2. Protection of Underground Non-Metallic Pipes

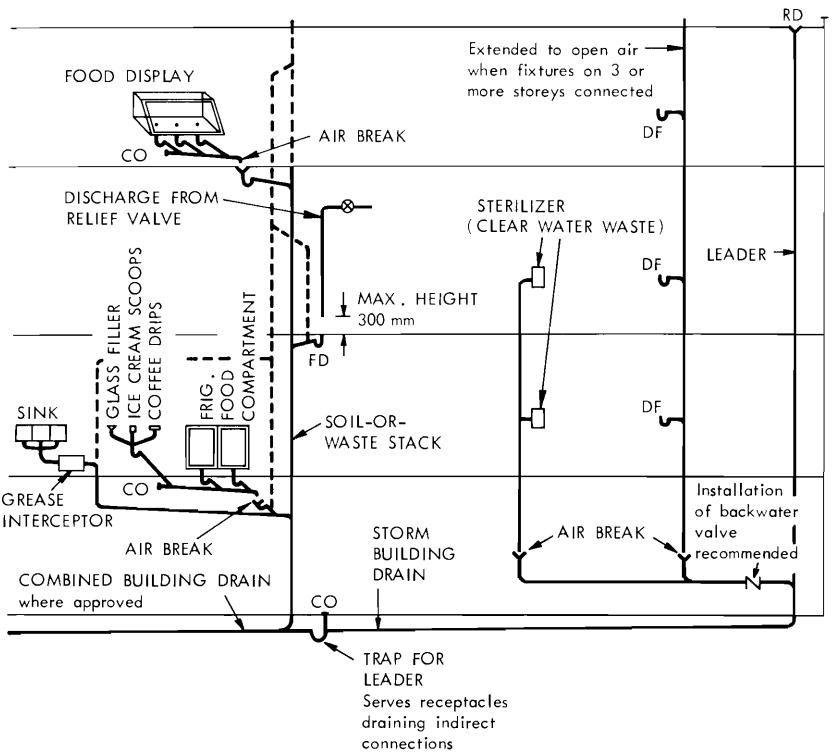


(a) Concrete floors less than 75 mm thick



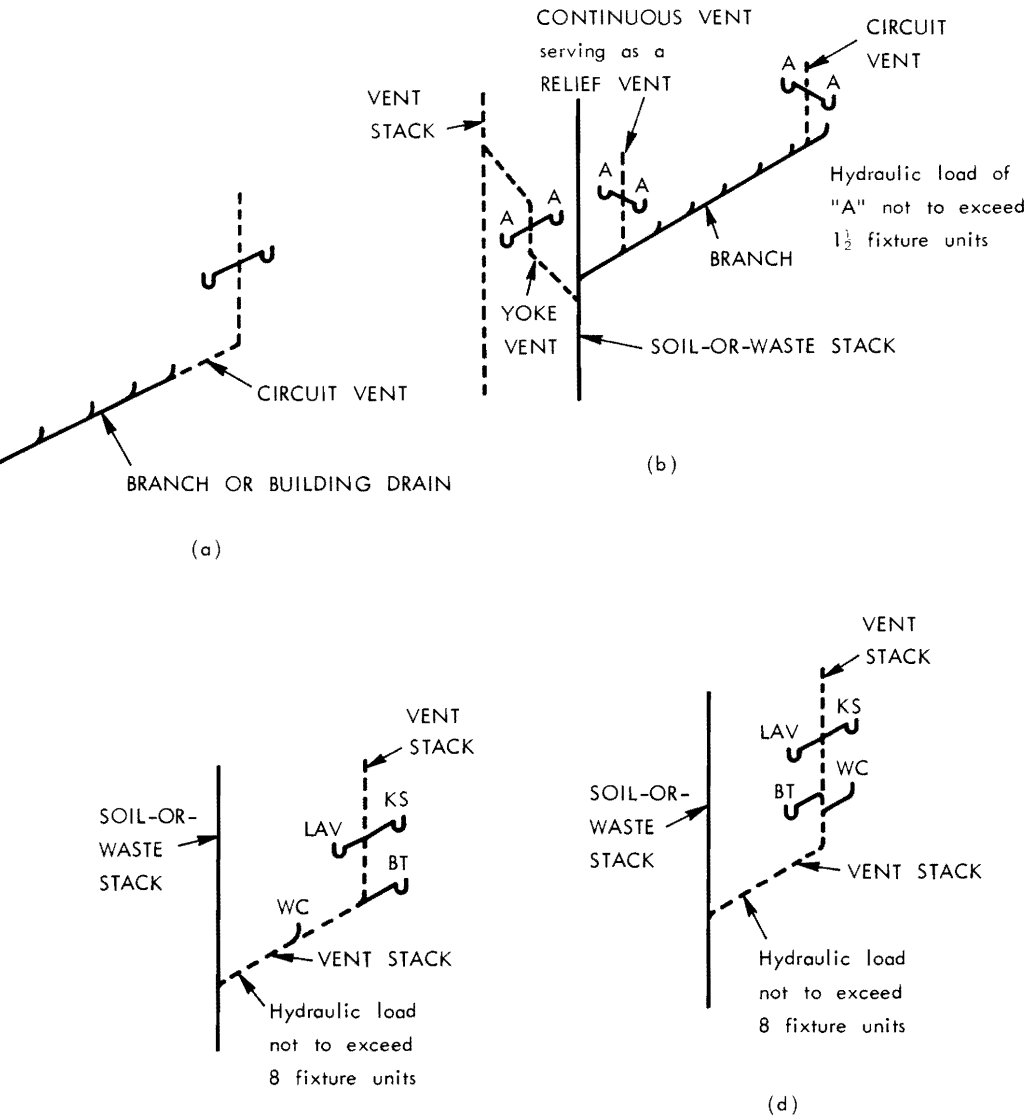
(b) Concrete floor 75 mm or more in thickness (no protection required)

Clauses 4.2.1.(1)(a) and (d) INDIRECT CONNECTIONS



See Sentence 4.5.1.(4) for trapping requirements for indirectly connected fixtures.
See Sentence 4.7.1.(10) for cleanouts on drip pipes for food receptacles or display cases.

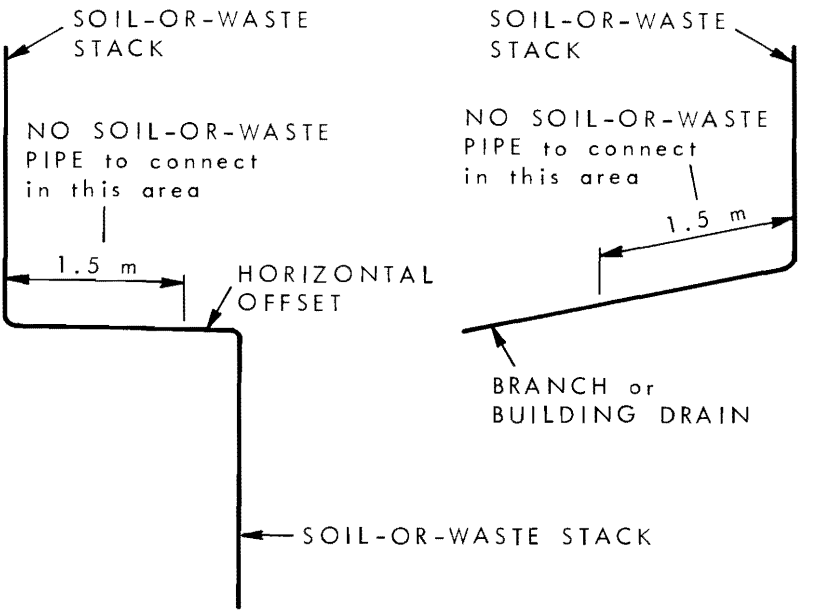
Clauses 4.2.1.(1)(e), (f) and (g) FIXTURE CONNECTIONS TO VENT PIPES



When 1 or more fixture drains are connected to a vent pipe, the vent pipe becomes a wet vent. It must then conform to all the requirements that can apply to it as a drainage pipe and a vent pipe.

See Appendix material on Sentences 5.2.2.(1), (2) and (3) for further information regarding Clause 4.2.1.(1)(e).

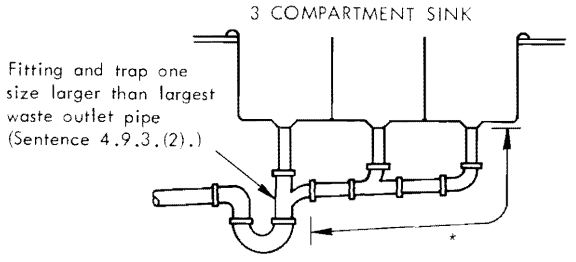
Sentences 4.2.1.(2) and (3) SOIL-OR-WASTE PIPE CONNECTIONS



(a) Connection to nominally horizontal offset

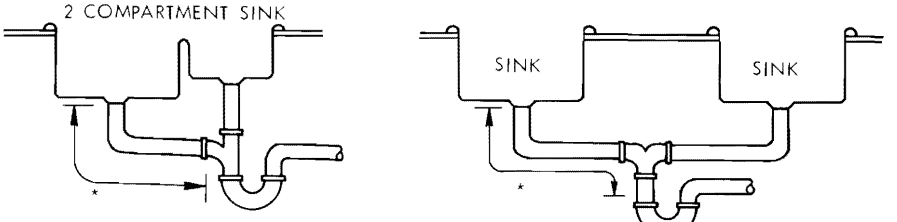
(b) Connection to nominally horizontal soil-or-waste pipe

Sentence 4.5.1.(2) Trapping of Sinks and Laundry Trays



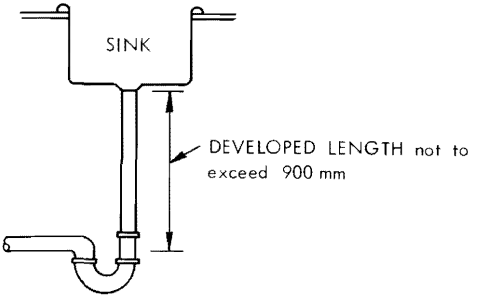
(a)

* DEVELOPED LENGTH not to exceed 900 mm (Article 4.8.2.)



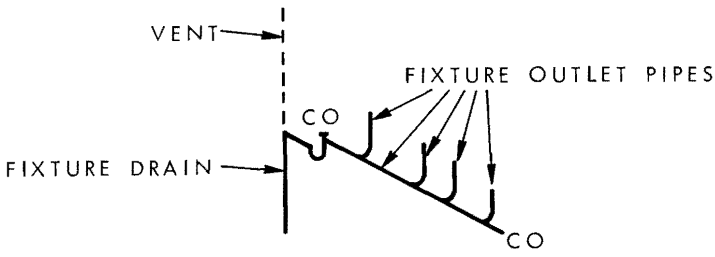
* DEVELOPED LENGTH not to exceed 900 mm (Article 4.8.2.)

(b)

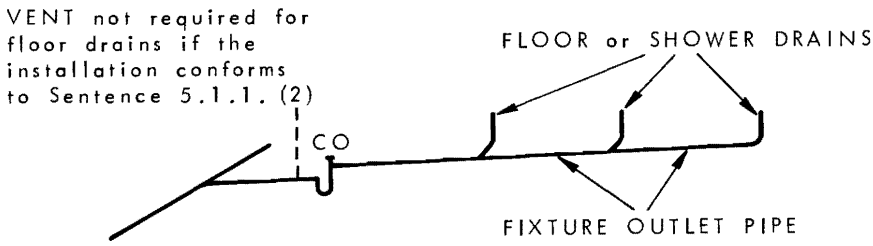


(c)

Sentence 4.5.1.(3) SINGLE TRAPS FOR FIXTURE GROUPS

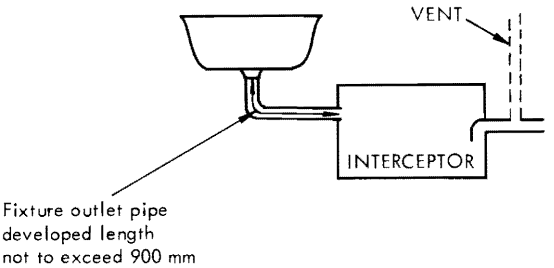


(a) Laboratory sinks or washing machines



(b) Floor drains and shower drains

Sentence 4.5.1.(5) Location of Trap or Interceptor

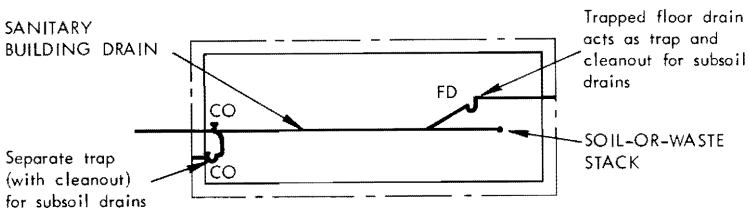


An interceptor that replaces a trap must be vented in the same way as the trap it replaces. (See explanation for Clauses 4.2.1.(1)(a) and (d). Where an interceptor other than an oil interceptor serves a group of fixtures requiring more than one trap, each fixture must be properly trapped and vented. (See Article 5.5.2. for venting of oil interceptors.)

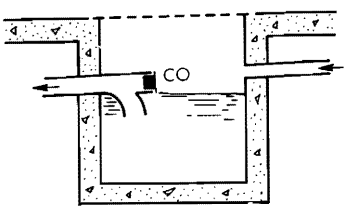
Sentence 4.5.2.(1)

When an untrapped leader drains to a combined building sewer, clearance requirements are the same as for vent terminals. (See explanation for Sentence 5.6.5.(3).)

Article 4.5.3. Subsoil Drainage Connections



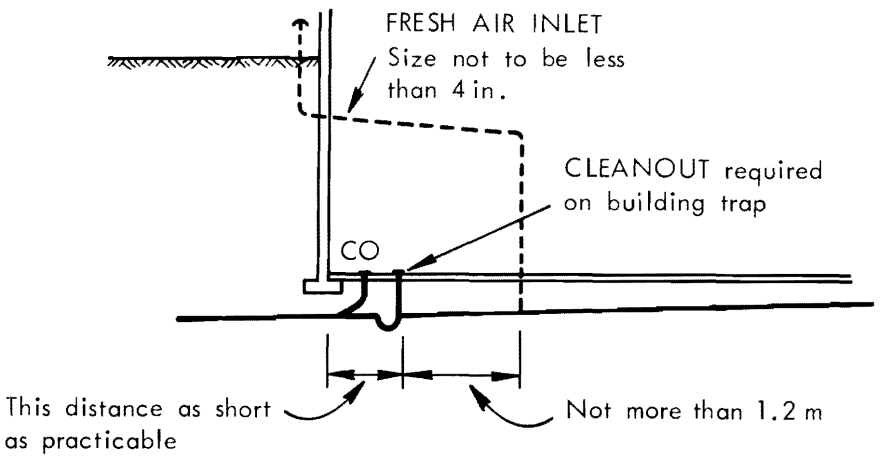
(a) Connections to sanitary drainage system (Plan View)



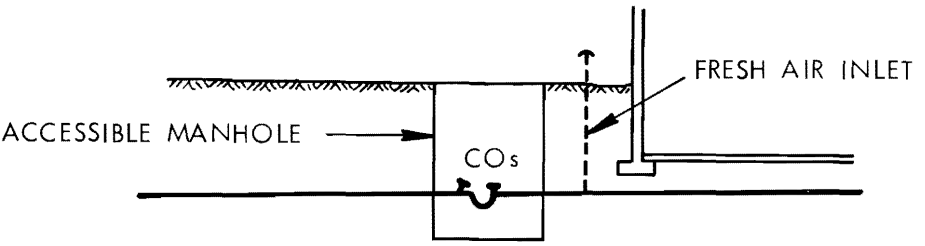
(b) Trapped sump

This Code does not regulate the installation of subsoil drainage pipes, but does regulate the connection of such pipes to the plumbing system. The intent of this Article is to place a trap between the subsoil drainage pipe and the sanitary drainage system. The cleanout must be installed in accordance with Sentence 4.7.1.(2). A trap or sump may be provided specifically for the subsoil drains, or advantage may be taken of the trap of a floor drain or storm water sump as shown above.

Sentence 4.5.4.(1) LOCATION OF BUILDING TRAPS

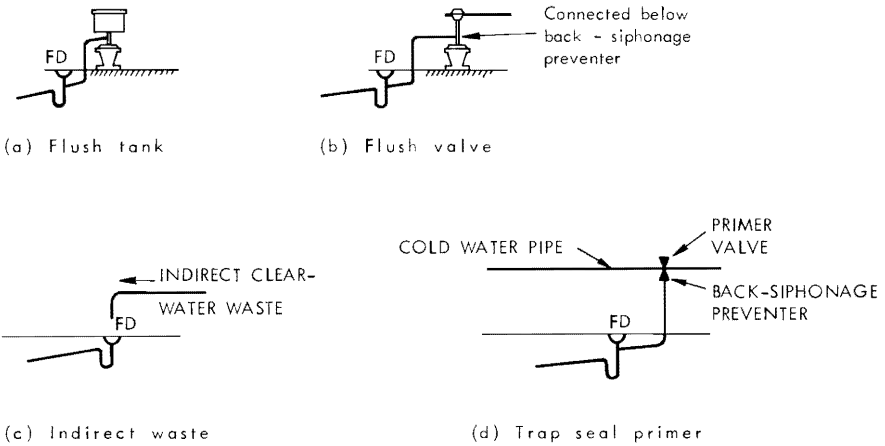


(a) Building trap inside building



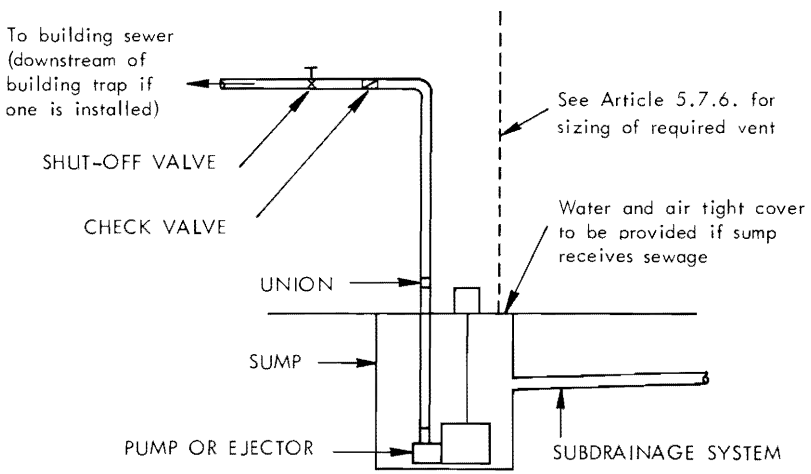
(b) Building trap outside building

Article 4.5.5. Maintaining Trap Seals



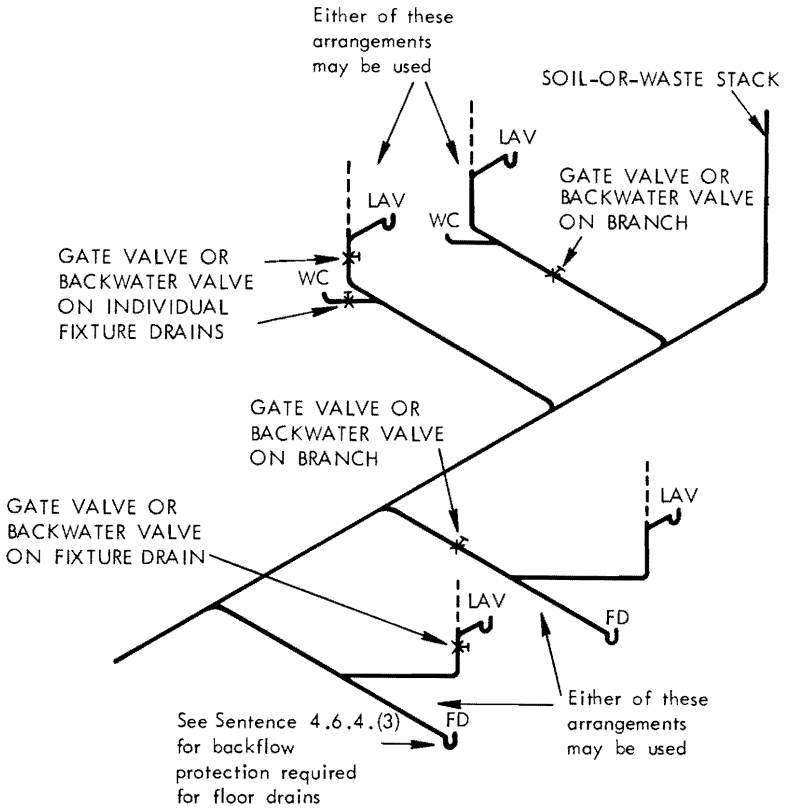
Periodic manual replenishment of the water in a trap is considered to be an equally effective means of maintaining the trap seal in floor drains in residences.

Article 4.6.3. Arrangement of Piping at Sump



In most installations controls will be installed in conjunction with a float to automatically empty the sump. If such controls are not provided, the capacity of the sump should equal the maximum inflow to the sump that is expected to occur during any 24 h period.

Article 4.6.4. PROTECTION FROM BACKFLOW CAUSED BY SURCHARGE

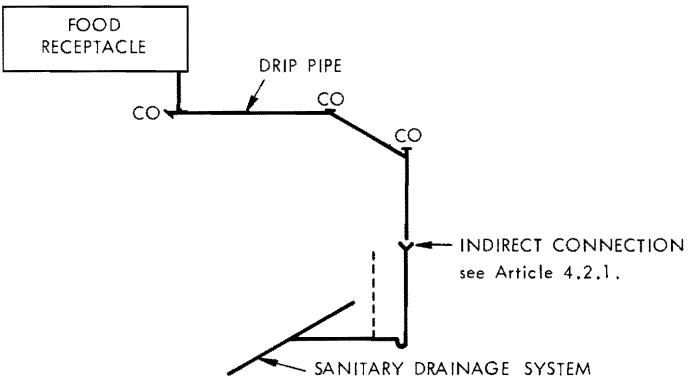


These requirements are intended to apply when in the opinion of the authority having jurisdiction there is danger of backup from a public sewer.

Sentence 4.7.1.(1)

A trap cleanout plug is not acceptable as a cleanout for the fixture drain, hence either a separate cleanout or a trap with a removeable trap dip must be installed.

Sentence 4.7.1.(10) Cleanouts for Food Receptacle Drip Pipes



Article 4.8.1.

Although slopes below 1 in 100 are permitted for pipes 4 in. and over, it is recommended that they be used only where necessary. Steeper slopes and higher velocities will help to keep pipes clean by moving heavier solids that might tend to clog the pipes.

Sentence 4.9.3.(2)

Fixture outlet pipes that are common to 2 or 3 compartments or fixtures are sometimes referred to as continuous wastes and are not considered to be branches. (See also explanation for Sentence 4.5.1.(2).)

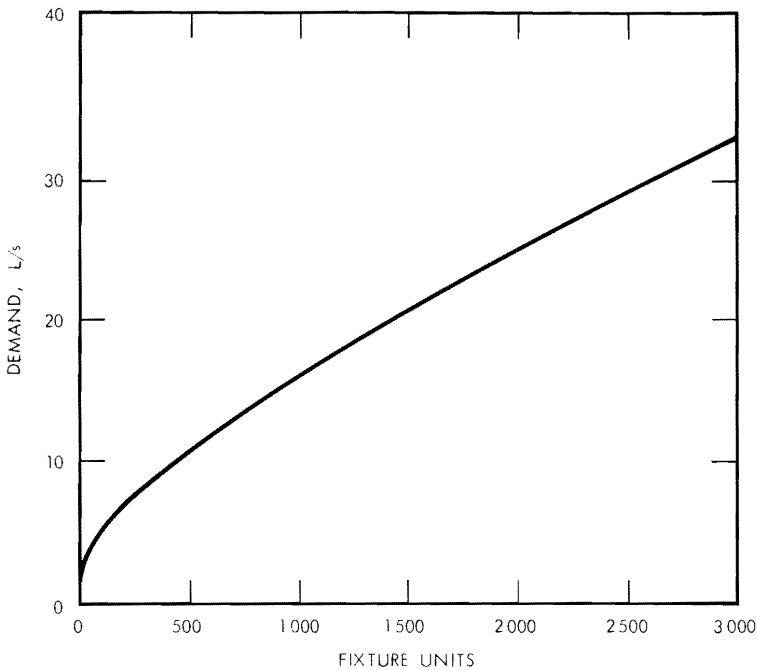
Subsection 4.10 Determination of Hydraulic Loads and Drainage Pipe Sizes

Hydraulic Loads

The hydraulic load that is imposed by a fixture is represented by a factor called a fixture unit. Fixture units are dimensionless and take into account the rate of discharge, time of discharge and frequency of discharge of the fixture.

Confusion often arises when attempts are made to convert fixture units to litres per second because there is no straightforward relationship between the two. The proportion of the total number of fixtures that can be expected to discharge simultaneously in a large system is smaller than in a small system. For example, doubling the number of fixtures in a system will not double the peak flow that the system must carry, although of course the flow will be increased somewhat. The following curve shows the relationship that was used in constructing the tables of capacities of stacks, branches, sanitary building drains and sanitary building sewers (Tables 4.10.B. to 4.10.D.).

Subsection 4.10 (Cont'd.)



Although the above curve was used to prepare Code tables, it was not included in the Canadian Plumbing Code. Instead, a single approximate conversion factor is given in the Code so that a continuous flow from a fixture may be converted from litres per second to fixture units in order to determine the total hydraulic load on the sanitary drainage system. The conversion factor which is given in Sentence 4.10.3.(1) is 26.4 fixture units per litres per second. The discharge from a continuous flow fixture in litres per second when multiplied by 26.4 gives the hydraulic load in fixture units, and that load is added to the fixture unit load from other fixtures to give the total load that the sanitary drainage pipe must carry.

The hydraulic load that is produced by storm water runoff depends both on the size of the area that is drained and local rainfall intensity. The capacities of storm drainage pipes and combined sewers in Tables 4.10.E. to 4.10.G. have been expressed in terms of the number of litres that they can carry when the local rainfall intensity is 1 mm in 15 min. The hydraulic load for a particular location is obtained by simply multiplying the rainfall intensity figure given in Chapter 1 of the "Supplement to the NBC 1980" by the actual area drained as specified in Sentence 4.10.4.(1).

When plumbing fixtures are connected to a combined sewer, the hydraulic load from the fixtures must be converted from fixture units to litres or, in the case of continuous flow, from litres per second to litres so that these loads can be added to the hydraulic loads from roofs and paved surfaces. As already pointed out, the relationship between fixture units and litres per second and, consequently, the relationship between fixture units and litres is not straightforward, and an approximate conversion factor has been adopted. The conversion factor which is given in Sentence 4.10.5.(1) is 9.1 L/fixture unit, except where the load is less than 260 fixture units when a round figure of 2 360 L is to be used. In the case of contin-

Subsection 4.10 (Cont'd.)

uous flow fixtures that are connected to combined sewers or storm sewers, the conversion factor given in Sentence 4.10.3.(2) is 900 L per L/s. This conversion factor is not an approximation but is an exact calculation.

It should be noted carefully that the conversion factors given in Sentences 4.10.3.(1) and 4.10.5.(1) are designed to convert in 1 direction only, and must not be used to convert from fixture units to litres per second in the one instance nor from litres to fixture units in the other instance.

In summary it should be noted that
(a) in sanitary drainage systems all hydraulic loads are converted to fixture units, and
(b) in storm drainage systems or combined drainage systems all hydraulic loads are converted to litres.

Procedure for Selecting Pipe Sizes

The following is an outline, with examples, of the procedures to be followed in determining the size of each section of drainage piping.

1. Sanitary drainage pipes, for example, branches, stacks, building drains or building sewers
   (a) Determine the load in fixture units from all fixtures except continuous flow fixtures,
   (b) Determine the load in litres per second from all continuous flow fixtures and multiply the number of litres per second by 26.4 to obtain the number of fixture units,
   (c) Add loads (a) and (b) to obtain the total hydraulic load on pipe in fixture units, and
   (d) Consult the appropriate table from Tables 4.10.B., 4.10.C. or 4.10.D. and select the pipe size.
   (Note that no pipe size can be smaller than that permitted in Subsection 4.9.)

2. Storm drainage pipes, for example, gutters, leaders, horizontal pipes, building drains or building sewers
   (a) Determine the area in square metres of roofs and paved surfaces according to Sentence 4.10.9.,
   (b) Determine the local rainfall intensity (15 min rainfall) from Chapter 1 of the "Supplement to the NBC 1980,"
   (c) Multiply (a) by (b) to obtain the hydraulic load in litres,
   (d) If a fixture discharges a continuous flow to the storm system, multiply its load in litres per second by 900 to obtain the hydraulic load in litres,
   (e) Add loads (c) and (d) to obtain the total hydraulic load on the pipe in litres, and
   (f) Consult the appropriate table from Tables 4.10.E., 4.10.F. or 4.10.G. and select pipe or gutter size.
   (Note that no pipe size can be smaller than that permitted in Subsection 4.9.)

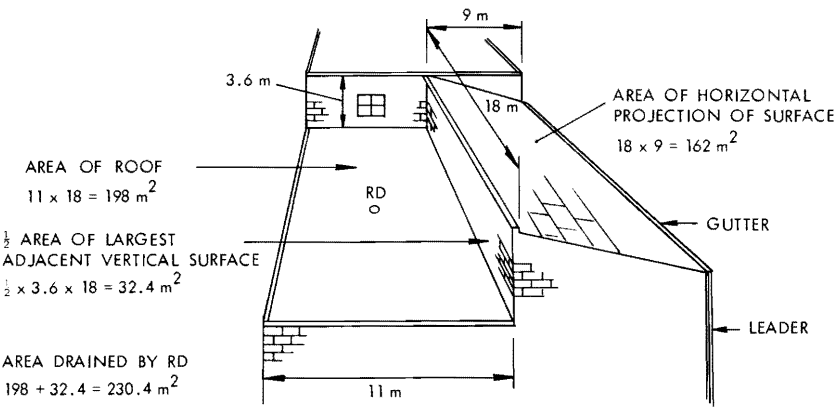
3. Combined drainage pipes, for example, building drains or building sewers
   (a) Determine the total load in fixture units from all fixtures except continuous flow fixtures,
   (b) If the fixture unit load exceeds 260, multiply it by 9.1 to determine the equivalent hydraulic load in litres. If the fixture unit load is 260 or fewer fixture units, the hydraulic load is 2 360 L,
   (c) Obtain the hydraulic load from roofs and paved surfaces in the same manner as for storm drains (see 2(a), (b) and (c)),
   (d) Obtain the hydraulic load in litres from any continuous flow source that is connected to the sanitary or storm drainage system in the same manner as for storm drainage pipes (see 2 (d)),
   (e) Add hydraulic loads (b), (c) and (d) to obtain the total hydraulic load on pipe in litres, and
   (f) Consult Table 4.10.E. and select the pipe size.
   (Note that no pipe can be smaller than that permitted in Subsection 4.9.)

Subsection 4.10 (Cont'd.)

Examples

Example I: Determination of the size of storm drainage components for building shown in the following 2 diagrams:

Storm Drainage Areas (Example I)



Step No. 1 Determine the hydraulic load from the roofs.

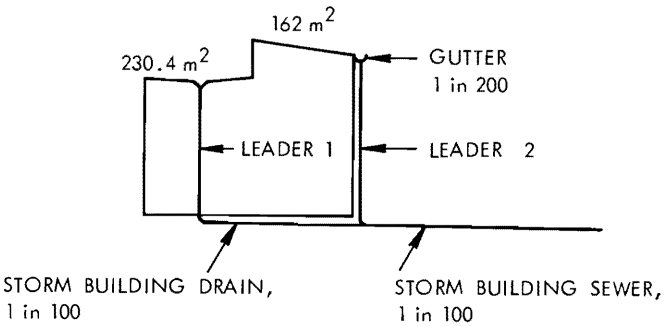
Area drained by gutter 162 m²
Area drained by roof drain 230.4 m²
If the local rainfall intensity is 25 mm
the load on the gutter (leader No. 2)
is (25 x 162) ..... 4 050 L
the load on the roof drain (leader No. 1)
is (25 x 230.4) ..... 5 760 L
If the local rainfall intensity is 15 mm
the load on the gutter (leader No. 2)
is (15 x 162) ..... 2 430 L
the load on the roof drain (leader No. 1)
is (15 x 230.4) ..... 3 456 L

Subsection 4.10 (Cont'd.)

Step No. 2 Determine the size of storm drainage components.

Using the appropriate hydraulic loads, the size of storm drainage components can be determined from Tables 4.10.E., 4.10.F. and 4.10.G. These values are tabulated in the Table below for rainfall intensities of 25 mm and 15 mm in 15 min.

Storm Drainage Components (Example I) (Elevation View)



Storm Drainage Pipe Sizes (Example I)

	Area Drained, m^2	15 min Rainfall Intensity, mm				Reference Table No.
		25		15		
		Hydraulic Load, L	*Size*, in.	Hydraulic Load, L	*Size*, in.	
Roof drain leader	230.4	5 760	4	3 456	3	4.10.G.
Gutter	162	4 050	8	2 430	7	4.10.F.
Gutter leader	162	4 050	3	2 430	2½	4.10.G.
Storm building drain	230.4	5 760	5	3 456	4	4.10.E.
Storm building sewer	395.8	9 895	6	5 936	5	4.10.E.
Column 1	2	3	4	5	6	7

Subsection 4.10 (Cont'd.)

Example II: Determination of Size of Drainage Pipes for Buildings.

The following diagram represents an office building with washrooms for men and women, a drinking fountain and cleaner's closet on each typical floor. The equipment room with facilities is located in the basement. The building is 18 m by 30 m and is to be built in Kitchener, Ontario.

A. Hydraulic Load per Typical Floor

5 WC @ 6	=	30 fixture units
2 UR @ 1½	=	3 fixture units
4 LAV @ 1½	=	6 fixture units
2 FD @ 3	=	6 fixture units
1 FS @ 3	=	3 fixture units
1 DF @ 1	=	1 fixture units
		49 fixture units

The reader is left to calculate the size of the branches, one of which must be 4 in. and another 3 in. (see Subsection 4.9). Therefore the smallest part of the stack must be 4 in.

B. Hydraulic Load on Stack

5 storeys @ 49 fixture units		
	=	245 fixture units

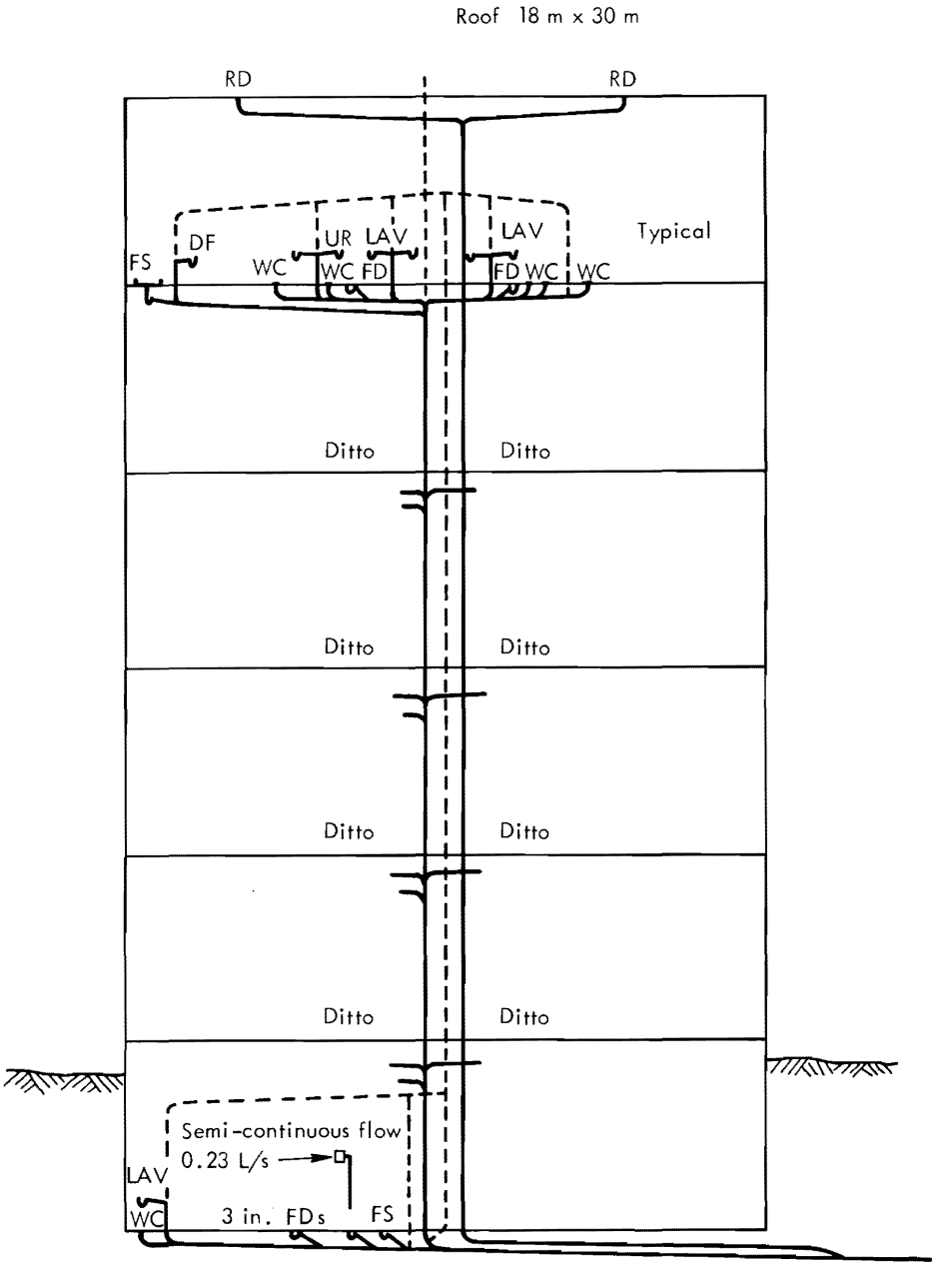
Table 4.10.B. Column 3 permits 4 in. pipe. Use 4 in. pipe

C. Hydraulic Load on Basement Branch

1 WC @ 6	=	6 fixture units
1 LAV @ 1	=	1 fixture unit
2 FD @ 3	=	6 fixture units
1 FS @ 3	=	3 fixture units
Semi-Continuous Flow		
0.23 L/s x 26.4	=	6 fixture units
		22 fixture units

Table 4.10.C. Column 2 permits 3 in. pipe. Use 3 in. pipe

Subsection 4.10 (Cont'd.) **BUILDING DRAINAGE SYSTEM (EXAMPLE II.)**



Subsection 4.10 (Cont'd.)

D. Hydraulic Load on Building Drain

From soil-or-waste stack	245 fixture units
From basement branch	22 fixture units
	267 fixture units

Table 4.10.D. Column 6 @ 1 in 50, a 4 in. pipe will carry 240 fixture units
Table 4.10.D. Column 7 @ 1 in 25, a 4 in. pipe will carry 300 fixture units
For practical reasons use a 4 in. pipe at a slope of not less than 1 in 32.

E. Storm Load

Area of roof 18 x 30 = 540 m^2

Rainfall intensity for Kitchener from Chapter 1 of the "Supplement to the NBC 1980" is 28 mm in 15 min.
Total hydraulic storm load = 28 x 540 = 15 120 L
Storm load on each roof drain 15 120/2 = 7 560 L

F. Size of Horizontal Leaders

Table 4.10.E. Column 8 @ 1 in 25, a 4 in. pipe will carry a load of 8 430 L
Table 4.10.E. Column 7 @ 1 in 100, a 5 in. pipe will carry a load of 7 650 L
Table 4.10.E. Column 4 @ 1 in 133, a 6 in. pipe will carry a load of 10 700 L
Therefore use a 5 in. pipe at a slope of 1 in 100.

G. Size of Vertical leader

Table 4.10.G. Column 2 would permit a 5 in. pipe (19 500 L) but they are not readily available. For practical reasons use a 6 in. pipe.

H. Size of Storm Building Drains

Since a drainage pipe cannot be smaller than any upstream pipes, the storm building drain must be at least 6 in. Referring again to Table 4.10.E., we see that a 6 in. pipe will carry a hydraulic load of 17 600 L at a slope of 1 in 50. Therefore use a 6 in. pipe at a slightly higher slope.

I. Size of Combined Building Sewer

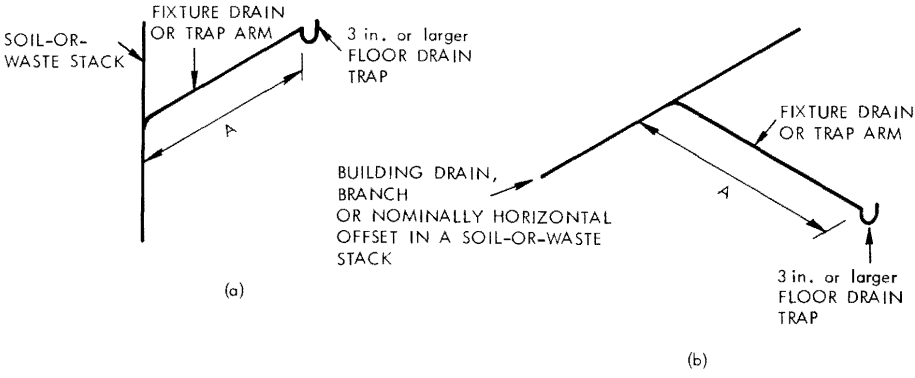
(a)	Total sanitary load excluding semi-continuous flow 261 fixture units converted to litres (Clause 4.10.5(1)(b)) x 9.1 =	2 375 L
(b)	Semi-continuous flow 0.23 L/s converted to litres (Sentence 4.10.3(2)) x 900 =	207 L
(c)	Storm load	17 820 L
	Total hydraulic load	20 402 L

Referring to Table 4.10.E. @ 1 in 50, a 6 in. pipe will carry 17 600 L
Referring to Table 4.10.E. @ 1 in 25, a 6 in. pipe will carry 24 900 L
Therefore use a 6 in. pipe at a slope of not less than 1 in 32.

Sentence 4.10.4.(1)

Climate information on rainfall intensities for various cities may be found in Chapter 1 of the "Supplement to the NBC 1980."

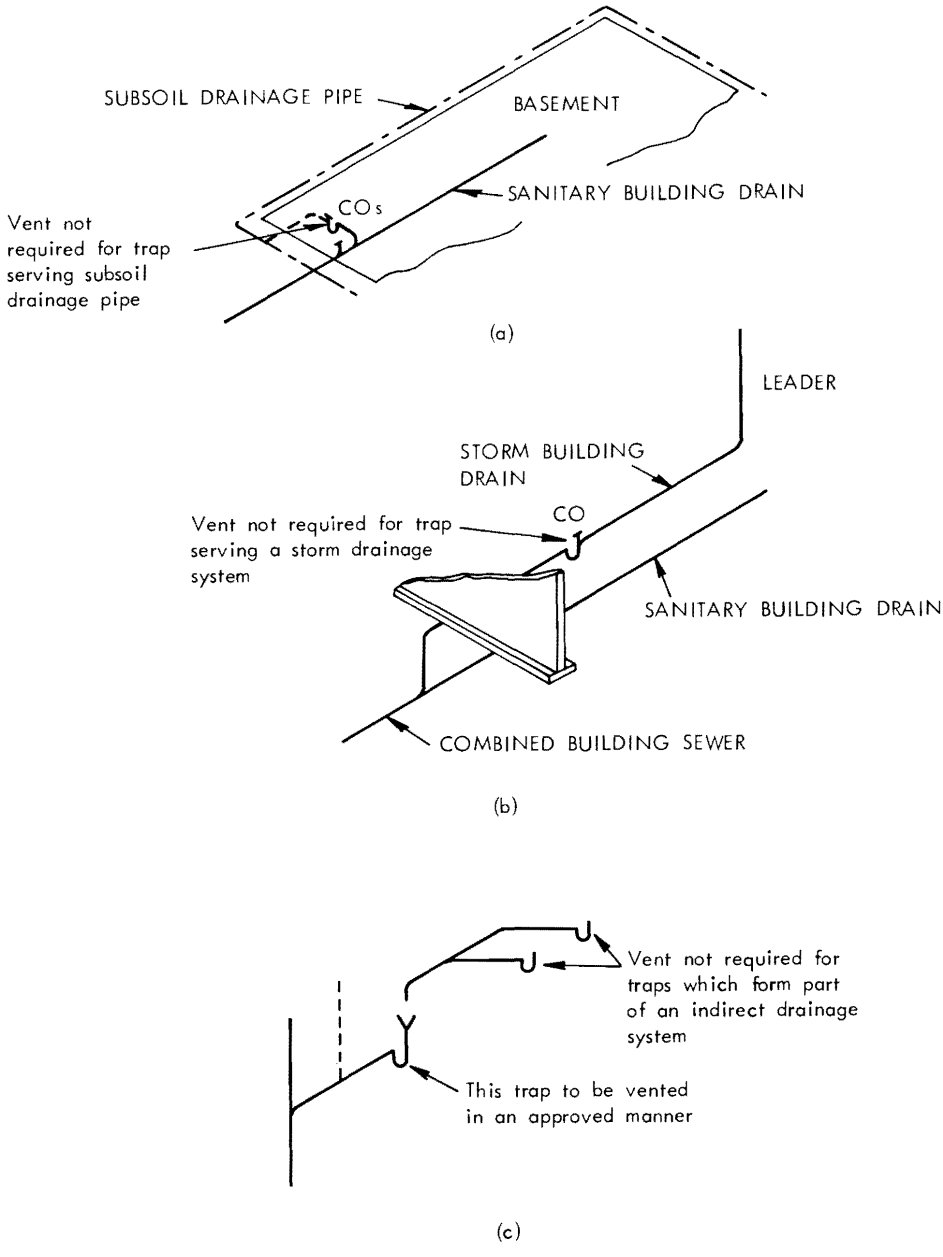
Sentence 5.1.1.(2) TRAPPING OF FLOOR DRAINS



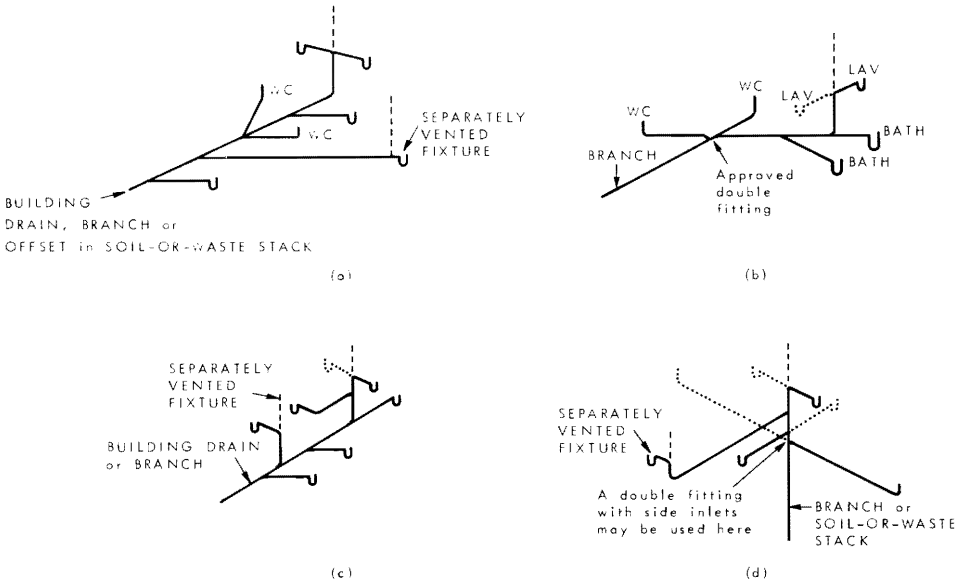
Length of "A" must be at least 450 mm and its fall shall not exceed the size of the pipe

See also explanation of Sentence 5.6.3. (1) for fall on fixture drain

Sentence 5.1.1.(3) VENTING NOT REQUIRED



Article 5.2.1. SINGLE STOREY WET VENTING

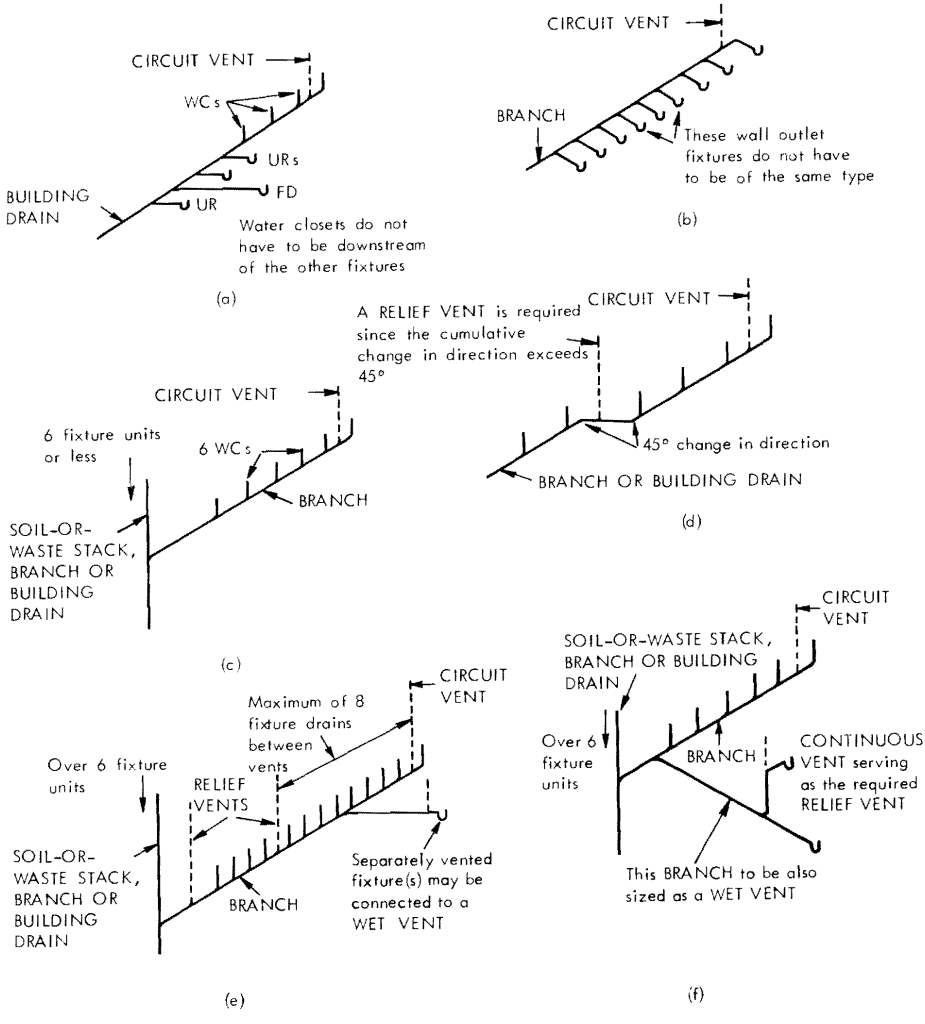


Each section of a single storey wet vent is sized according to the total load it serves (see Article 5.8.1.). Separately vented fixtures may connect to a wet vent.

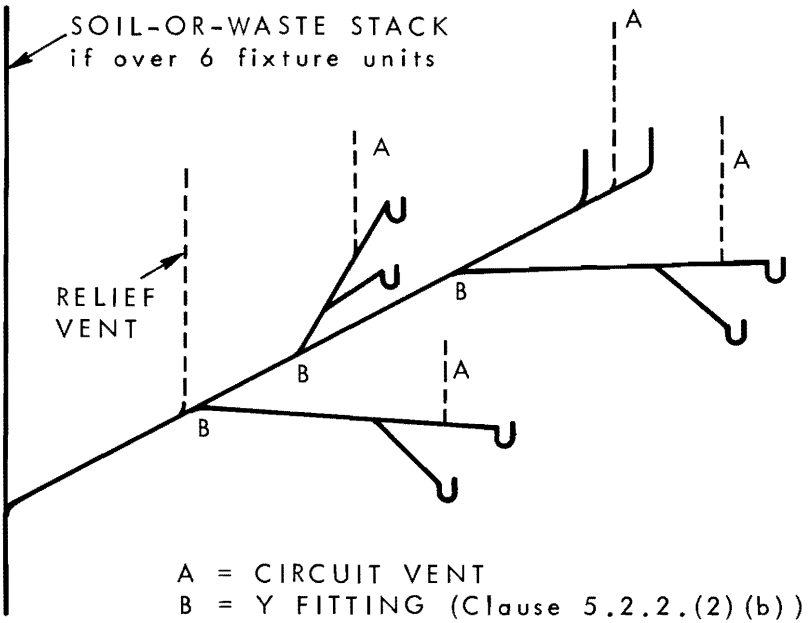
Fixture drains are connected separately and directly into the branch or soil-or-waste stack in conformance with Article 5.6.3.

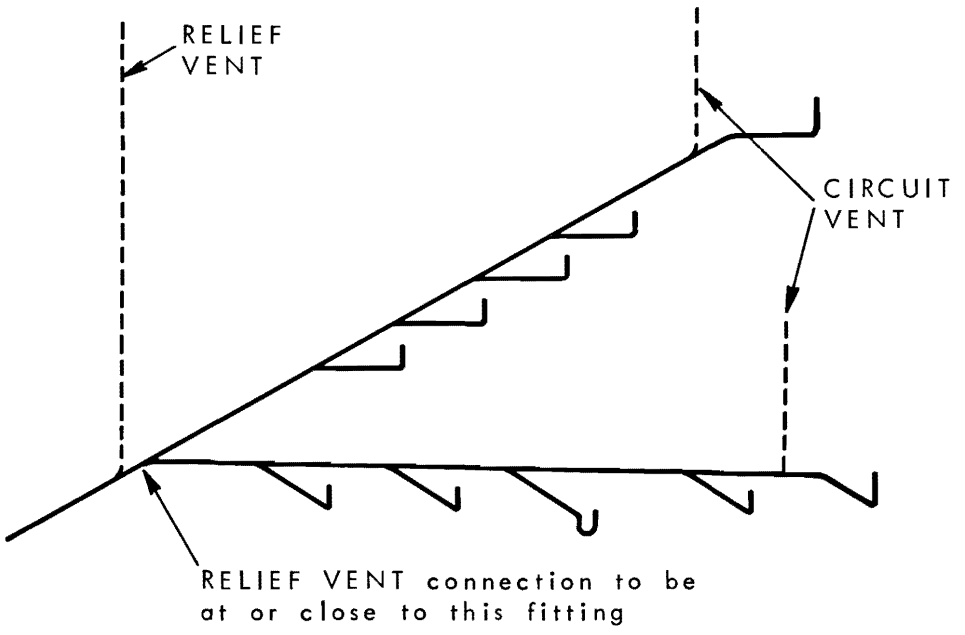
Figure (d) shows that water closets are connected downstream of all other fixtures when connected to a vertical pipe.

Sentences 5.2.2.(1), (2) and (3) SINGLE STOREY WET VENTING WITH CIRCUIT VENTS

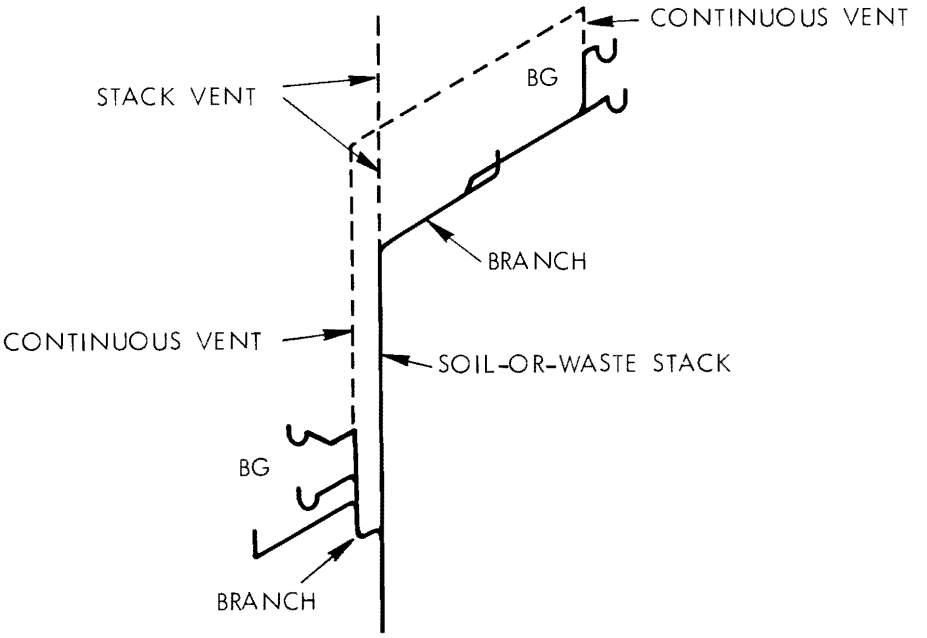


Sentence 5.2.2.(4) **SINGLE STOREY WET VENTING WITH COMBINED RELIEF VENTS**

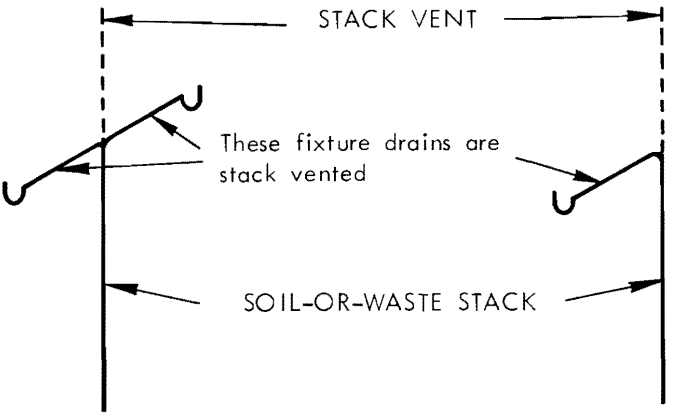




Article 5.4.1. STACK VENTS

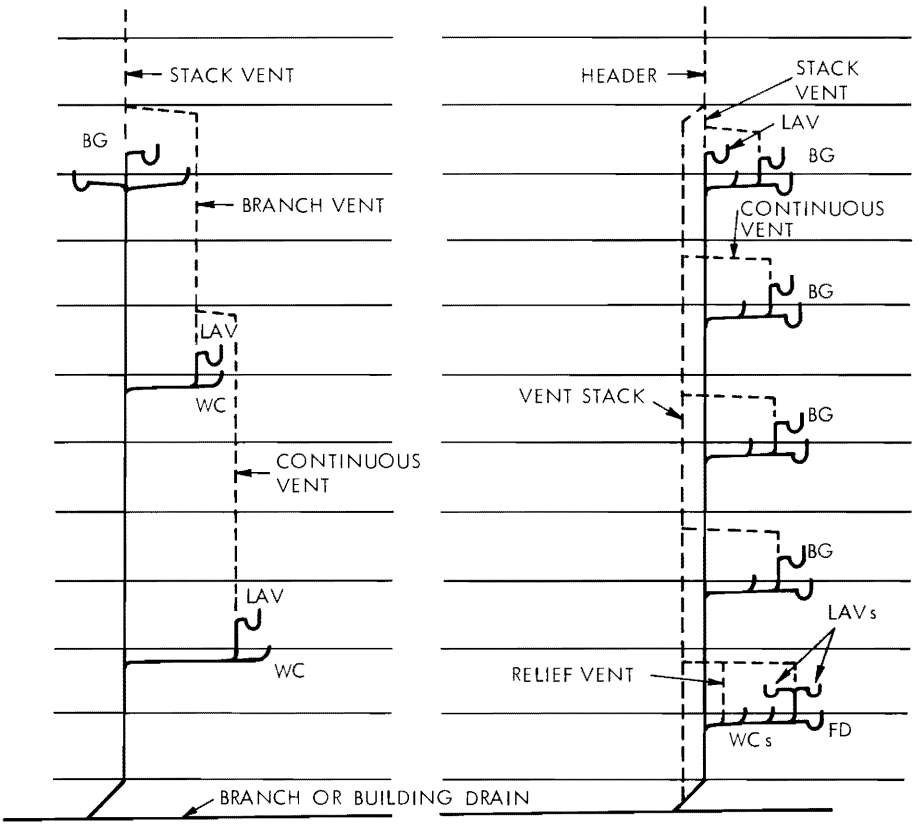


(a)



(b)

Article 5.4.2. VENT STACKS

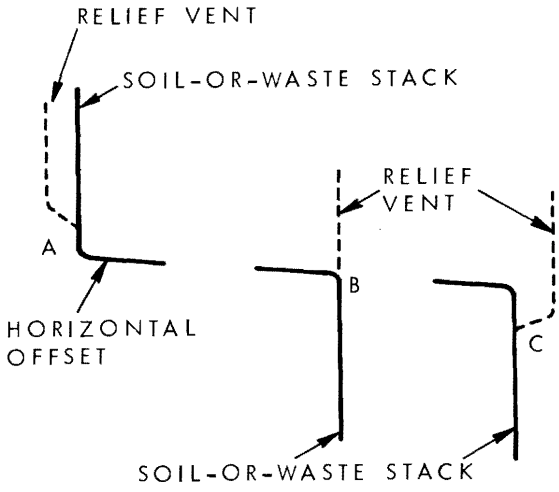


No vent stack required. (Fixtures draining to the soil-or-waste stack from 3 storeys only)

Vent stack required. (Fixtures draining to the soil-or-waste stack from more than 4 storeys)

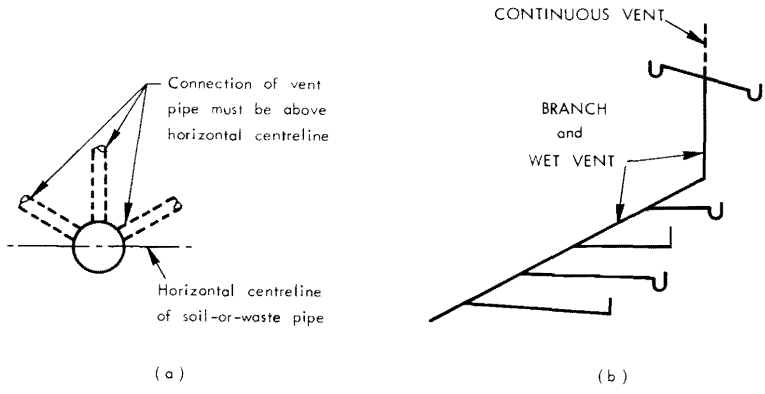
Vent stack may terminate at the lowest soil-or-waste connection or immediately below it or it may terminate at the junction of soil-or-waste stack and branch or building drain. The vent stack may also be connected at its lower end to the soil-or-waste stack below the lowest soil-or-waste pipe connection.

Article 5.4.4. Relief Vents for Offsets



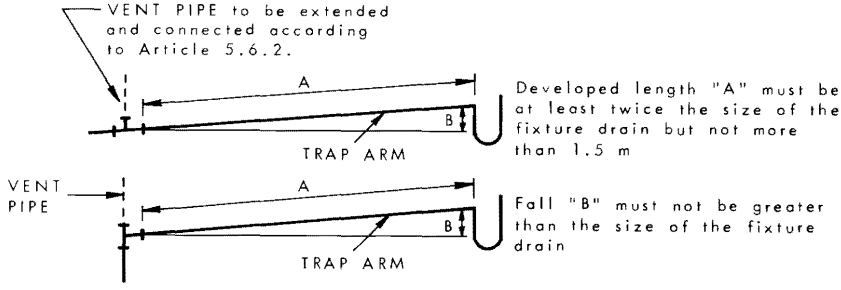
When an offset is greater than 1.5 m, the offset must be sized as a branch or building drain (see Sentence 4.10.6.(2)). A relief vent is required at A and at B or C.

Sentence 5.6.2.(2) VENT PIPE CONNECTIONS

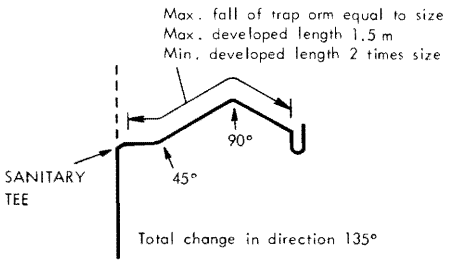


Fittings used to connect vent pipes to nominally horizontal soil-or-waste pipes are specified in Subsection 2.4.

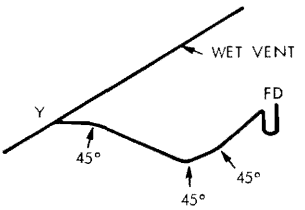
Sentence 5.6.3.(1) VENT CONNECTIONS



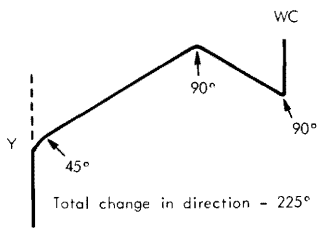
Clause 5.6.3.(1)(c) and Sentence 5.6.3.(2) LOCATION OF VENT PIPES



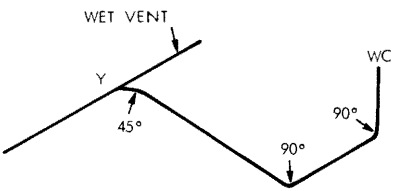
(a)



(b)

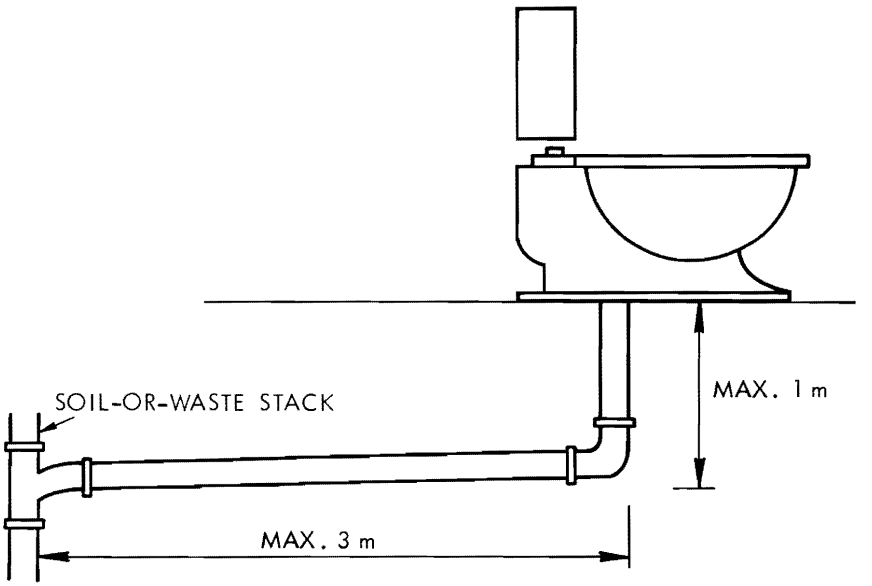


(c)

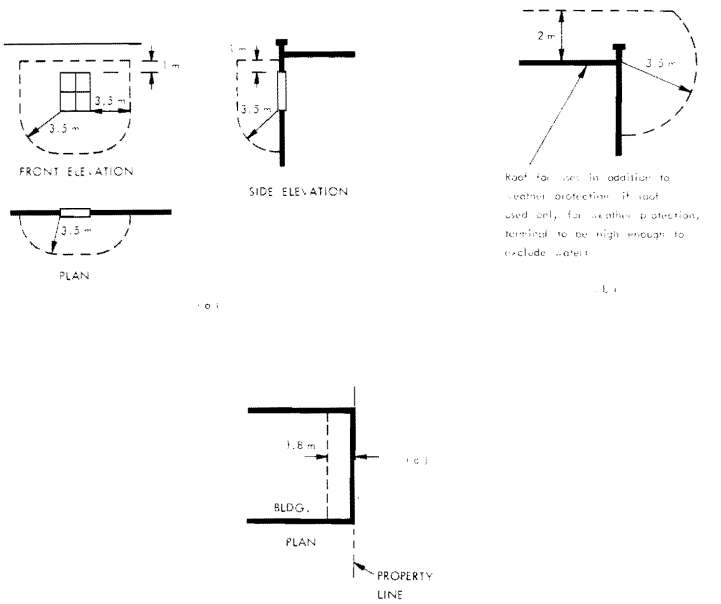


(d)

Sentence 5.6.3.(3) Length of WC Fixture Drain

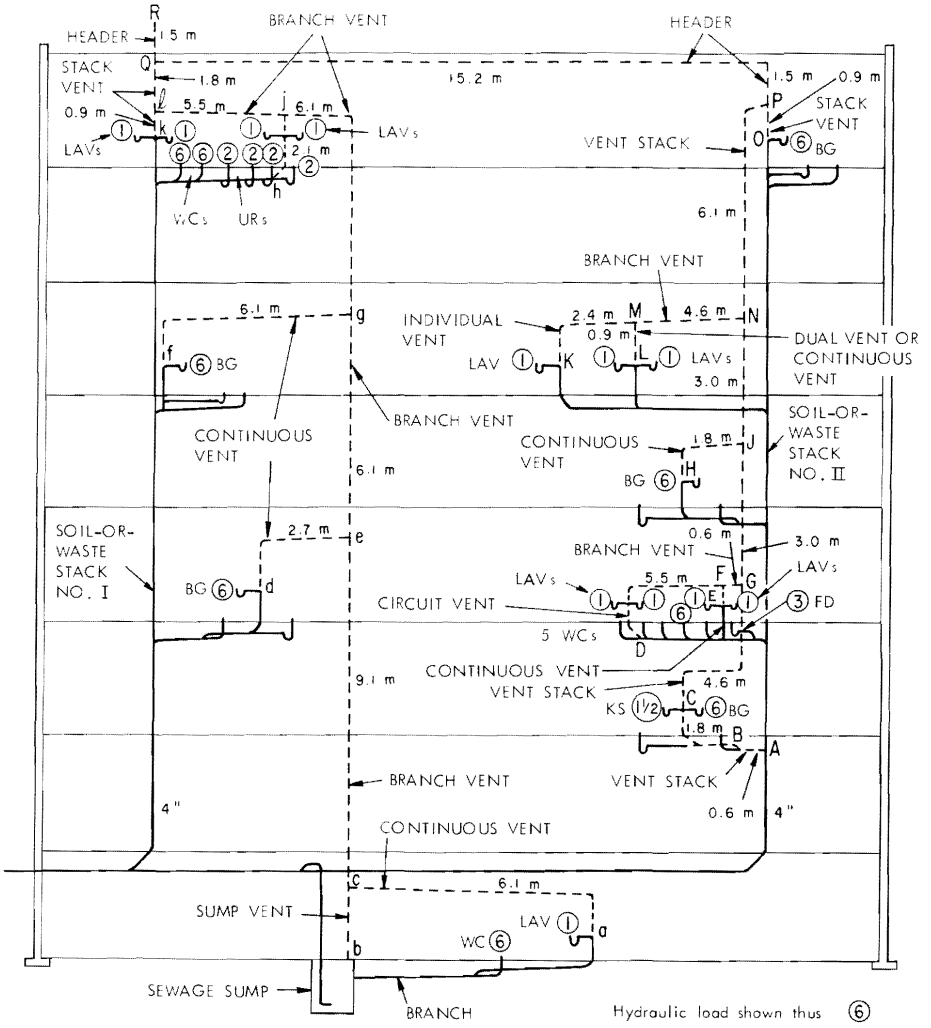


Sentence 5.6.5.(3) Vent Terminals



No vent pipe other than a fresh air inlet may terminate within the limits indicated.

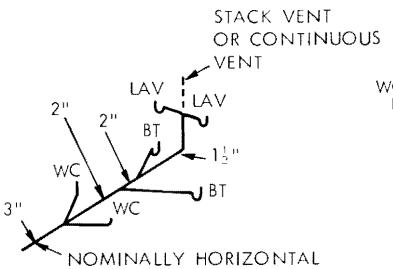
Subsection 5.8 SIZING OF BUILDING VENTING SYSTEMS



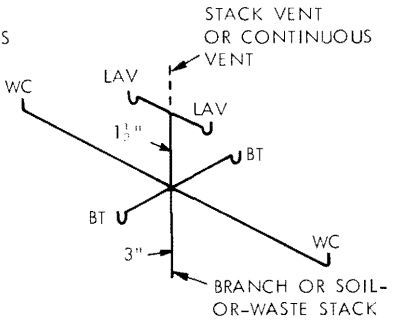
Subsection 5.8 (Cont'd.) TABLE OF VENT PIPE SIZES

Vent Pipe	Developed Length Used to Determine Size, m	Hydraulic Load Used to Determine Size, fixture units	Code Reference to be Considered	Minimum Size, in.
Continuous vent (ac)	32.9 (acegjl)	7	5.7.1. 5.8.2.(2) 5.8.2.(1)	2
Sump vent (bc)	N/A	7	5.7.6.	2½
Branch vent (ce)	32.9 (acegjl)	7	5.7.1. 5.8.2.(1) 5.7.2. 5.8.2.(4)	2½
Continuous vent (de)	20.4 (degjl)	6	5.7.1. 5.8.2.(2) 5.8.2.(1)	1½
Branch vent (eg)	32.9 (acegjl)	13	5.7.1. 5.8.2.(1) 5.7.2. 5.8.2.(4)	2½
Continuous vent (fg)	17.7 (fgjl)	6	5.7.1. 5.8.2.(2) 5.8.2.(1)	1½
Branch vent (gj)	32.9 (acegjl)	19	5.7.1. 5.8.2.(1) 5.7.2. 5.8.2.(4)	2½
Circuit vent (hj)	7.6 (hjl)	22	4.2.1.(1)(e) 5.8.2.(1) 5.7.1. 5.8.2.(3) 5.8.1.	1½
Branch vent (jl)	32.9 (acegjl)	41	5.7.1. 5.8.2.(4) 5.8.2.(1)	3
Stack vent (kl)	4.2 (klQR)	36	5.7.1. 5.8.3.(2) 5.8.3.(1)	2
Stack vent (lQ)	4.2 (klQR)	43	5.7.1. 5.8.3.(1) 5.7.2. 5.8.3.(2)	3
Vent Stack Section (ABCGJNP)	37.3 (ABCGJNPQR)	59½	4.2.1.(1)(g) 5.8.1.(1) 4.9.1. 5.8.3.(1) 5.7.1. 5.8.3.(2)	3
Circuit vent (DF)	6.1 (DFG)	32	4.2.1.(1)(e) 5.8.2.(1) 5.7.1. 5.8.2.(3) 5.8.1.(1)	1½
Continuous vent (EF)	N/A	34	4.2.1.(1)(c) 5.7.1. 5.2.2.(3) 5.7.3.	1½
Branch vent (FG)	6.1 (DFG)	34	5.7.1. 5.8.2.(4) 5.8.2.(1)	1½
Continuous vent (HJ)	1.8 (HJ)	6	5.7.1. 5.8.2.(2) 5.8.2.(1)	1½
Individual vent (KM)	N/A	1	5.7.1.	1¼
Dual vent (LM)	N/A	2	5.7.1.	1¼
Branch vent (MN)	7.0 (KMN)	3	5.7.1. 5.8.2.(4) 5.8.2.(1)	1¼
Stack vent (OP)	19.1 (OPQR)	59½	5.7.1. 5.8.3.(2) 5.8.3.(1)	2½
Header (PQ)	37.3 (ABCGJNPQR)	59½	5.7.1. 5.8.2.(5) 5.8.2.(1)	3
Header (QR)	37.3 (ABCGJNPQR)	102½	5.7.1. 5.8.2.(5) 5.8.2.(1)	4
Column 1	2	3	4	5

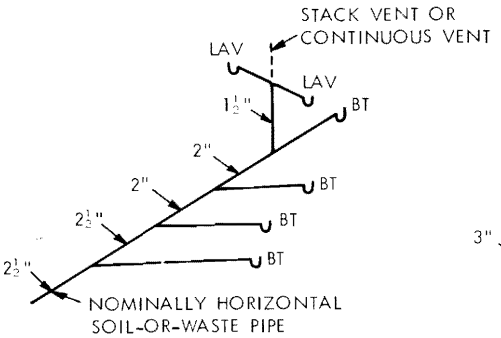
Article 5.8.1. Sizing of Single Storey Wet Vent Systems



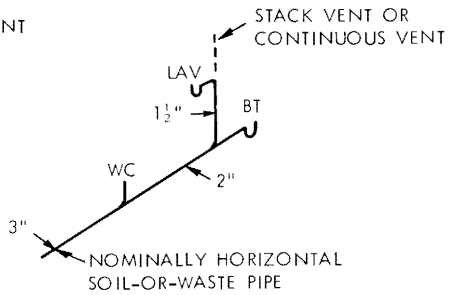
(a)



(b)

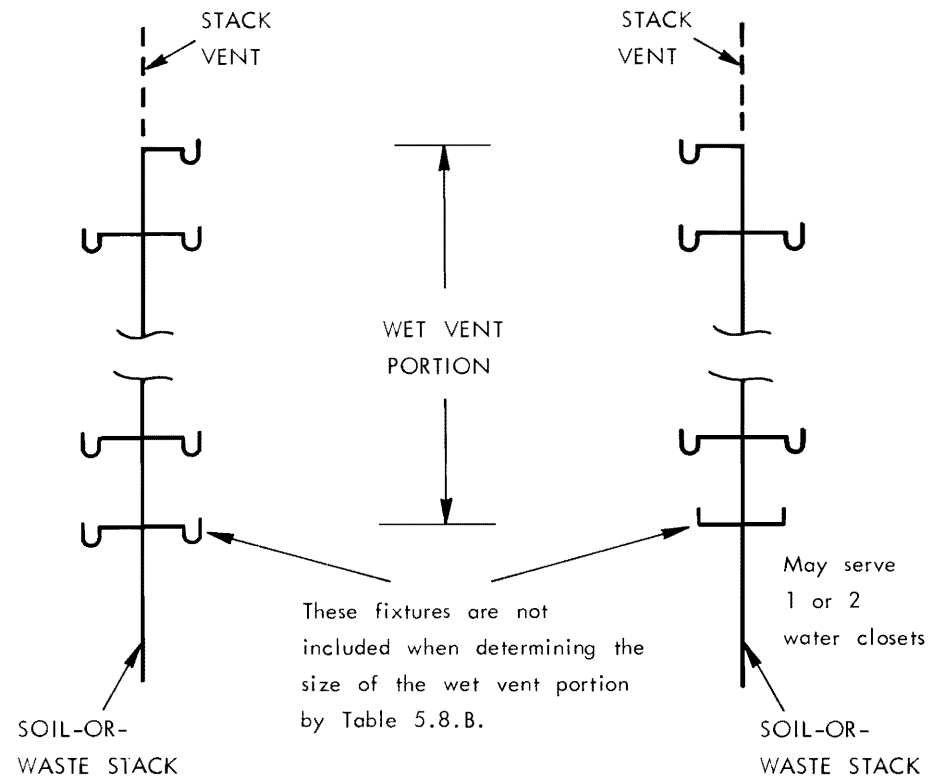


(c)



(d)

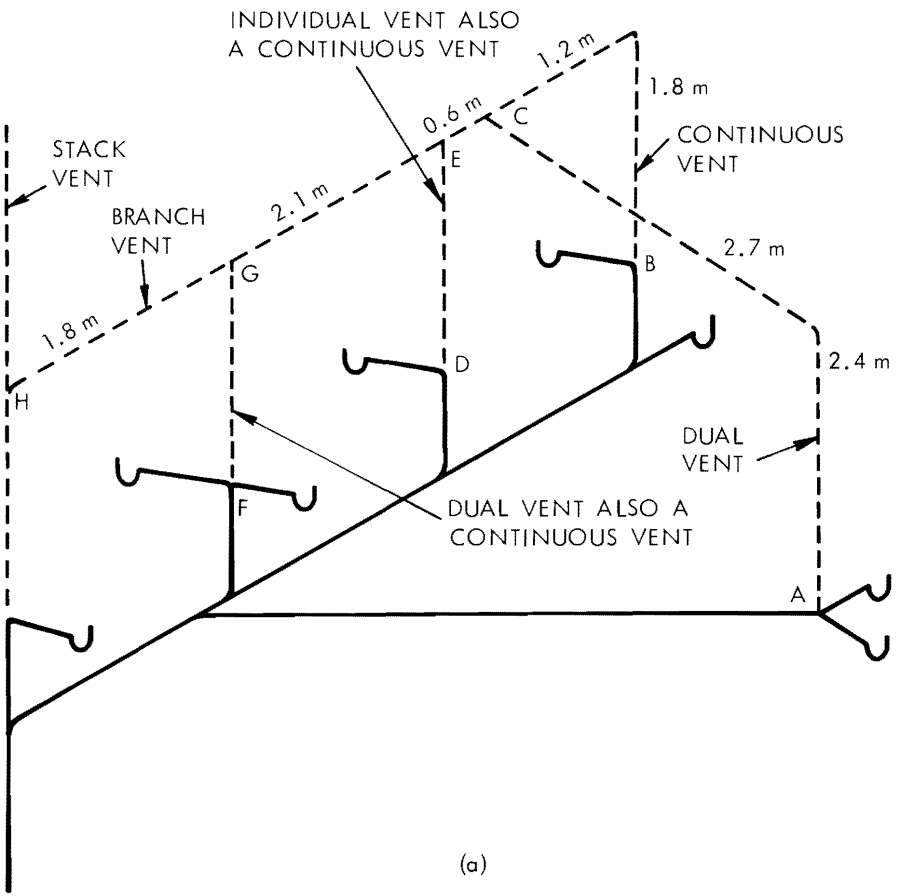
Sentence 5.8.1.(2) SIZING OF MULTI-STOREY WET VENT SYSTEMS



(a)
Not serving water closets

(b)
Serving water closets

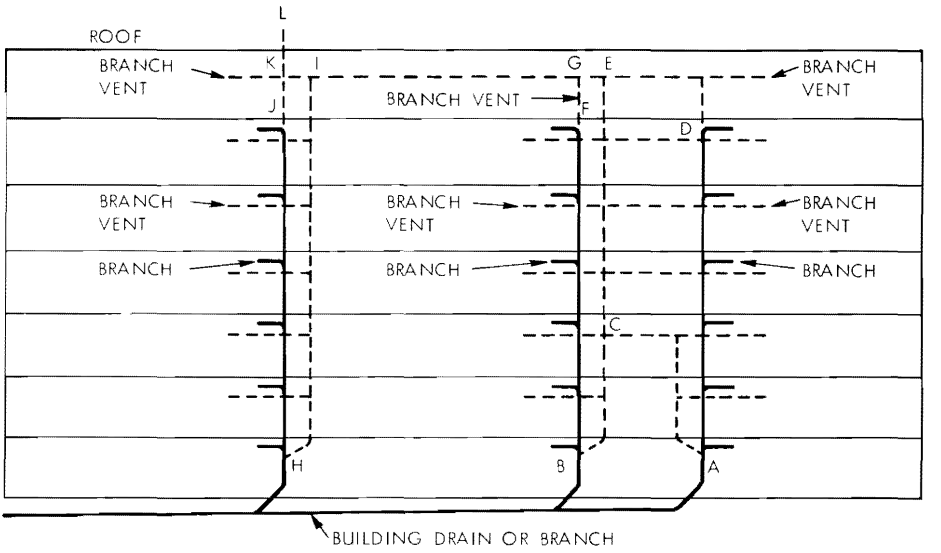
Articles 5.8.2. and 5.8.3. LENGTHS TO BE CONSIDERED WHEN SIZING VENT PIPES



(a)

VENT	LENGTH TO BE CONSIDERED	REFERENCE
Dual vent AC	N/A	5.8.2.(1)
Continuous vent BC	BCEGH 1.8 + 1.2 + 0.6 + 2.1 + 1.8 = (7.5)	5.8.2.(2)
Individual vent DE	N/A	5.8.2.(1)
Dual vent FG	N/A	5.8.2.(1)
Branch vent CEGH	ACEGH 2.4 + 2.7 + 0.6 + 2.1 + 1.8 = (9.6)	5.8.2.(4)

Articles 5.8.2. and 5.8.3. (Cont'd)



(b)

VENT PIPE	LENGTH TO BE CONSIDERED	REFERENCE
Vent stack (AC)	ACEGIKL	5.8.3.(2)
Vent stack (BC)	BCEGIKL	5.8.3.(2)
Vent stack (HI)	HIKL	5.8.3.(2)
Stack vent (DE)	DEGIKL	5.8.3.(2)
Stack vent (FG)	FGIKL	5.8.3.(2)
Stack vent (JK)	JKL	5.8.3.(2)
Header (CEGIKL) (or any section of it)	ACEGIKL	5.8.2.(5)

Sentence 6.1.1.(1) Potable Water Systems

The design procedures contained in Chapter 35 of the "ASHRAE Guide and Data Book 1970," in Chapter 37 of the "ASHRAE Handbook, 1976 Systems," in ASPE 1975-76, Data Book, Volume 1, "Basic Plumbing Design" and in ASPE 1977-78, Data Book, Volume II, "Special Plumbing Systems Design" are considered good engineering practice in the field of potable water systems.

Article 6.1.13. WATER HAMMER PREVENTION

Water hammer is a build up of pressure in a length of horizontal or vertical pipe which occurs when a valve or faucet is closed suddenly. The longer the pipe and the greater the water velocity the greater is the pressure exerted on the pipe, which can be many times the normal static water pressure and be sufficient to burst the pipe. Ordinary kitchen and bathroom faucets can be closed quickly enough to cause water hammer even with relatively low water pressure in the pipe.

Means of preventing water hammer should be installed wherever there are valves or faucets, particularly where they are at the end of long lengths of pipes. This may be done by installing either water hammer arresters which are manufactured for the purpose or air chambers installed vertically that are fabricated from pieces of piping with a closed upper end and connected to the end of the horizontal or vertical run of pipe.

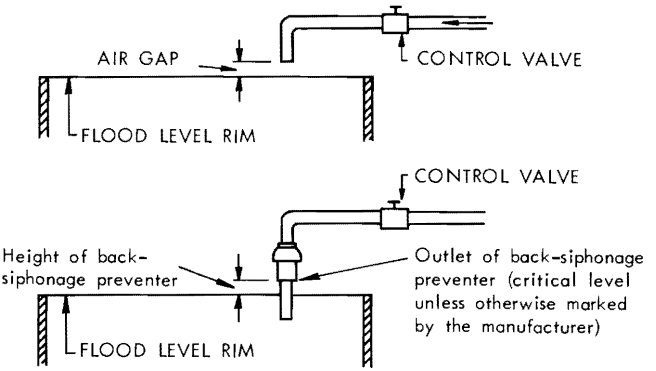
The air chamber should be 300 to 450 mm long if made from the same size pipe as the water pipe it serves. If the chamber is made from a pipe with larger diameter than the water pipe, its length can be reduced accordingly.

Air chambers should be accessible if they are the manufactured type with top air valve and a stop-and-waste valve or are of the diaphragm type. If made from piping, air chambers may become ineffective because of waterlogging, in which case provision should be made to drain that portion of the system. During the drainage operation fresh air is introduced into the chamber through the open faucet. After such draining, the valve or faucet should be closed before refilling the system with water, to ensure that the air chamber contains the maximum amount of air under pressure.

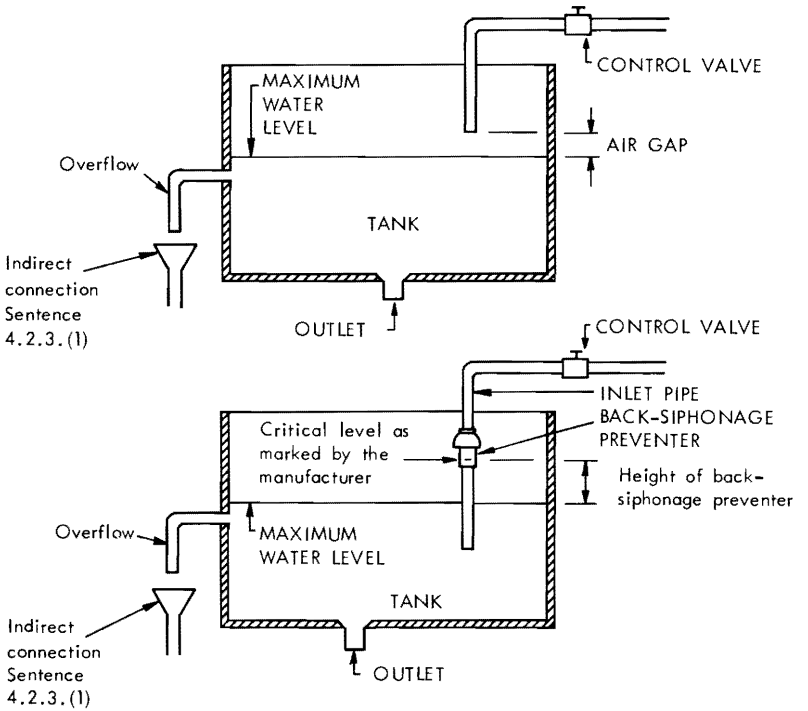
Article 6.2.1.

Examples of equipment to which these requirements apply are residential or industrial space heating boilers to which chemicals may be added, or a sprinkler system to which antifreeze may be added. To be effective, every device installed in a potable water system for protection against backflow must be maintained in good working condition. See explanation for definition for backflow preventer and for back-siphonage preventer (vacuum breaker).

Sentence 6.2.4.(2) **INSTALLATION OF AIR GAPS AND BACK-SIPHONAGE PREVENTERS**



(a) Above flood level rim



(b) In tank

Subsection 6.3

This Subsection contains performance requirements for water systems. Two widely used references for the design of water systems are:

"Water-Distributing Systems for Buildings" by R. B. Hunter, Building Materials and Structures Report BMS 79, United States Department of Commerce, National Bureau of Standards, Washington, D.C., 1941, and

"National Plumbing Code Handbook" edited by V. T. Manas, McGraw-Hill Book Company, New York, U.S.A. 1957.

APPENDIX B

EQUIVALENT IMPERIAL VALUES

EQUIVALENT IMPERIAL VALUES

Code Reference	Metric Values	Imperial Values	Remarks
Definition for *Building sewer*	1 m	39 in.	
2.2.3.(1)(d)	28 mm	1⅛ in.	
2.2.3.(1)(d)	31 mm	1¼ in.	
2.2.3.(1)(e)	31 mm	1¼ in.	
2.2.4.(4)	750 mm	30 in.	
2.3.1.(1)(a)	38 mm	1½ in.	
2.9.11.(1)(a)	0.33 mm	0.013 in.	
2.9.11.(1)(b)	0.61 mm	0.024 in.	
2.9.11.(1)(c)	0.35 mm	0.014 in.	
2.9.11.(1)(d)	2.16 mm	0.085 in.	
2.9.11.(1)(e)	0.41 mm	0.016 in.	
2.9.11.(1)(f)	2.89 mm	0.114 in.	
3.2.1.(1)	25 mm	1 in.	
3.2.2.(2)(b)	19 mm	¾ in.	
3.2.2.(2)(c)	10 mm	⅜ in.	
3.2.2.(3)	19 mm	¾ in.	
3.2.6.(1)	25 mm	1 in.	
3.2.8.(2)(a)	13 mm	½ in.	
3.2.8.(2)(b)	16 mm	⅝ in.	
3.2.8.(2)(c)	19 mm	¾ in.	
Table 3.2.A.	—	—	See Appendix C
3.2.10.(2)	25 mm	1 in.	
3.3.8.(5)	75 mm	2.95 in.	
3.3.11.(2)	25 mm	1 in.	
3.4.4.(2)	7.5 m	24 ft 7 in.	
3.4.5.(2)(a)(i)	3.75 m	12 ft 4 in.	
3.4.5.(2)(a)(ii)	2.5 m	8 ft 2 in.	
3.4.5.(2)(c)(ii)	1.6 m	5 ft 4 in.	
3.4.5.(2)(c)(iii)	1 m	3 ft 4 in.	
3.4.5.(2)(c)(iii)	300 mm	12 in.	
3.4.5.(2)(d)(ii)	2 m	6 ft 7 in.	
3.4.5.(2)(d)(iii)	1 m	3 ft 4 in.	
3.4.5.(2)(d)(iii)	300 mm	12 in.	
3.4.5.(2)(e)(i)	1.2 m	3 ft 11 in.	
3.4.5.(2)(f)	1 m	3 ft 4 in.	
3.4.5.(2)(g)(i)	3 m	9 ft 10 in.	
3.4.5.(2)(g)(ii)	2.5 m	8 ft 2 in.	
3.4.5.(2)(g)(iii)	2.5 m	8 ft 2 in.	
3.4.5.(4)(a)	9.5 m	⅜ in.	
3.5.1.	300 mm	12 in.	
3.5.2	600 mm	24 in.	
3.5.2	75 mm	3 in.	
3.5.2.	75 mm	3 in.	
3.6.4.(1)(b)	3 m	9 ft 10 in.	
3.6.4.(1)(b)	1.5 m	4 ft 11 in.	
3.6.5.(1)(b)	35 kPa	5.08 psi	
3.6.6.(1)(e)	25 mm	1 in.	
3.6.6.(2)	25 mm	1 in.	

Code Reference	Metric Values	Imperial Values	Remarks
3.6.7.(2)(a)	50 mm	2 in.	
3.6.7.(2)(b)	25 mm	1 in.	
3.7.2.(1)(b)	700 kPa	102 psi	
4.2.1.(2)	1.5 m	4 ft 11 in.	
4.2.1.(3)	1.5 m	4 ft 11 in.	
4.4.2.	75°C	167°F	
4.5.1.(5)	38 mm	1½ in.	
4.5.2.(1)(b)	900 mm	36 in.	
4.5.2.(1)(b)	3.5 m	11 ft 6 in.	
4.5.2.(1)(b)	1.8 m	5 ft 11 in.	
4.7.1.(3)	25 m	82 ft	
4.7.1.(4)	3 m	9 ft 10 in.	
4.7.1.(6)(a)	3 m	9 ft 10 in.	
4.7.1.(8)(b)	3 m	9 ft 10 in.	
Table 4.7.A.	—	—	See Appendix C
4.7.2.(2)(a)	90 m	295 ft	
4.7.2.(2)(b)	150 m	492 ft	
4.7.2.(3)	75 m	246 ft	
4.7.2.(4)	30 m	98 ft 5 in.	
4.7.3.(2)(b)	1.0 m	39 in.	
4.7.3.(3)	1.0 m	39 in.	
4.7.3.(3)	1.5 m	4 ft 11 in.	
4.7.3.(3)	600 mm	24 in.	
4.8.1.	1:48	¼ in./ft	
4.8.2.	900 mm	2 ft 11 in.	
4.10.3.(1)	0.45 fixture units for each litre	2 fixture units for each gallon	
4.10.3.(2)	0.6 m^2 for each litre	29 sq ft for each gallon	
4.10.4.(1)	metres	feet	
4.10.4.(2)(c)	150 mm	6 in.	
4.10.4.(2)(d)	15 m	49 ft 3 in.	
4.10.4.(2)(d)	30 m	98 ft 5 in.	
4.10.4.(2)(e)	900 m^2	9,688 sq ft	
4.10.5.(1)	metres	feet	
4.10.5.(1)(a)	92 m^2	990 sq ft	
4.10.5.(1)(b)	0.36 m^2	4 sq ft	
4.10.6.(2)	1.5 m	4 ft 11 in.	
Table 4.10.E.	—	—	See Appendix C
Table 4.10.F.	—	—	See Appendix C
Table 4.10.G.	—	—	See Appendix C
5.1.1.(2)(b)	450 mm	18 in.	
5.3.1.(1)(d)(i)	1.2 m	3 ft 11 in.	
5.3.1.(1)(d)(ii)	2.5 m	8 ft 2 in.	
5.3.1.(1)(d)(iii)	150 mm	6 in.	
5.4.3.(3)	1 m	39 in.	
5.4.4.	1.5 m	4 ft 11 in.	
5.5.2.(1)(c)	300 mm	12 in.	
5.5.3.	1.2 m	3 ft 11 in.	
5.6.3.(1)(a)(ii)	1.5 m	4 ft 11 in.	

Code Reference	Metric Values	Imperial Values	Remarks
5.6.3.(3)(a)	1 m	3 ft 4 in.	
5.6.3.(3)(b)	3 m	9 ft 10 in.	
5.6.5.(3)(a)	1 m	3 ft 4 in.	
5.6.5.(3)(b)	2 m	6 ft 7 in.	
5.6.5.(3)(b)	3.5 m	11 ft 6 in.	
5.6.5.(3)(c)	2 m	6 ft 7 in.	
5.6.5.(3)(d)	1.8 m	5 ft 11 in.	
5.6.5.(4)(a)	25 mm	1 in.	
Table 5.8.C.	—	—	See Appendix C
Table 5.8.D.	—	—	See Appendix C
6.1.12.(1)	35 kPa	5.1 psi	
6.1.12.(2)(a)	150 mm	6 in.	
6.1.12.(2)(a)	99°C	210°F	
6.1.12.(2)(b)(iii)	150 mm	6 in.	
6.1.12.(2)(b)(iii)	99°C	210°F	
6.2.1.(6)	150 mm	6 in.	
6.2.3.(2)	25 mm	1 in.	
6.2.3.(2)(b)	50 kPa	8.7 psi	
6.2.4.(3)	25 mm	1 in.	
6.3.3.	550 kPa	80 psi	
6.3.4.(3)	750 mm	30 in.	
Table 6.3.A.	—	—	See Appendix C

APPENDIX C

EQUIVALENT IMPERIAL VALUES OF TABULAR MATTER

EQUIVALENT IMPERIAL VALUES OF TABULAR MATTER

Table 2.5.A.
Forming Part of Sentence 2.5.7.(2)

MAXIMUM PERMITTED PRESSURE FOR CPVC PIPING AT VARIOUS TEMPERATURES	
Maximum Temperature of Water, °F	Maximum Permitted Pressures, psi
50	486
68	421
86	363
104	305
122	247
140	189
158	145
176	102
194	73
212	58

Table 3.2.A.
Forming Part of Sentence 3.2.8.(3)

Weight of Sheet Lead, lb/sq ft	Minimum Width of Weld, in.
2½ to 3	¼
4 to 5	⅜
6 to 8	¾
10 to 12	1
12 to 30	1¼
Column 1	2

Table 4.7.A.
Forming Part of Sentence 4.7.2.(1)

Size of Drainage Pipe, in.	Minimum *Size* of *Cleanout*, in.	Maximum Spacing, ft	
		One Way Rodding	Two Way Rodding
2½ or less	Same *size* as drainage pipe	25	49
3 and 4	3	49	98
over 4	4	85	171
Column 1	2	3	4

Table 4.10.E.
Forming Part of Article 4.10.9.

Size of Drain or Sewer, in.	Maximum Load on Drain or Sewer, sq ft						
	Slope						
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 68	1 in 50	1 in 25
3	—	—	—	—	1,012	1,173	1,658
4	—	—	—	1,787	2,185	2,530	3,574
5	—	—	2,863	3,240	3,961	4,575	6,469
6	—	—	4,553	5,264	6,448	7,438	10,538
8	—	8,019	9,817	11,302	13,885	16,038	22,712
10	—	14,531	17,760	20,559	25,188	29,063	41,118
12	16,684	23,681	2,8955	33,368	40,903	47,254	66,844
15	30,247	42,840	52,420	60,601	74,163	85,681	121,632
Column 1	2	3	4	5	6	7	8

Table 4.10.F.
Forming Part of Article 4.10.10.

Size of Gutter, in.	Area of Gutter, sq in	Maximum Load of Gutter, sq ft			
		Slope of Gutter			
		1 in 200	1 in 100	1 in 50	1 in 25
3	3.53	172	237	344	483
4	6.28	355	504	720	1,021
5	9.82	623	881	1,250	1,769
6	14.14	958	1,356	1,915	2,767
7	19.24	1,377	1,949	2,755	3,894
8	25.13	1,992	2,797	3,983	5,594
10	39.27	3,594	5,085	7,204	10,001
Column 1	2	3	4	5	6

Table 4.10.G.
Forming Part of Article 4.10.11.

Circular *Leader*		Non-Circular *Leader*	
Size of *Leader*, in.	Max. Load, sq ft	Area of *Leader*, sq in	Max. Load, sq ft
2	721	3.14	646
2½	1,302	4.90	1,173
3	2,120	7.07	1,905
4	4,564	12.57	4,112
5	8,277	19.63	7,449
6	13,455	28.27	12,163
8	28,955	50.26	26,049
Column 1	2	3	4

Table 5.8.C.
Forming Part of Sentence 5.8.2.(1)

Maximum Load Served, *fixture units*	*Size* of *Vent Pipe*, in.								
	1¼	1½	2	2½	3	4	5	6	8
	Maximum Length of *Vent Pipe*, ft								
2	30								
8	30	98							
20	25	49	151						
40	15	30	98	299					
60		15	49	79	394				
100			30	69	180	705			
1,100				20	49	200	705		
1,900					20	69	200	705	
3,600						25	59	249	804
5,600							25	59	249
Column 1	2	3	4	5	6	7	8	9	10

NOT PERMITTED

NOT LIMITED

Table 5.8.D.
Forming Part of Sentence 5.8.3.(1)

Size of *Soil-or-Waste Stack*, in.	Total Hydraulic Load Served by Vent, *fixture units*	*Size* of *Stack Vent* or *Vent Stack*, in.								
		1¼	1½	2	2½	3	4	5	6	8
		Maximum Length of *Vent Pipe*, ft								
1¼	0-2	30								
1½	0-8	49	151							
2	0-8	30	75	200						
2	9-20	25	49	151			NOT LIMITED			
2	21-24	15	30	98						
2½	0-20		46	151	394					
2½	21-42		30	98	299					
3	0-10		30	98	200	606				
3	11-30		15	59	200	492				
3	31-60		15	49	79	394				
4	0-100			36	98	259	1,001			
4	101-200			30	89	249	902			
4	201-500			20	69	180	705			
5	0-200				36	79	344	1,001		
5	201-500				30	69	299	902		
5	501-1,100				20	49	200	705		
6	0-350				25	49	200	394	1,296	
6	351-620				15	30	125	299	1,099	
6	621-960					25	98	249	1,001	
6	961-1,900					20	69	200	705	
8	0-600						49	151	492	1,296
8	601-1,400						39	98	394	1,198
8	1,401-2,200			NOT PERMITTED			30	90	344	1,099
8	2,201-3,600						25	59	249	804
10	0-1,000							75	125	1,001
10	1,001-2,500							49	98	492
10	2,501-3,300							30	79	344
10	3,301-5,600							25	59	249
Column 1	2	3	4	5	6	7	8	9	10	11

Table 6.3.A.
Forming Part of Sentence 6.3.1.(1)

Fixture or Device	Minimum *Size* of Supply Pipe, in.	Min. Flow Pressure,(1) psi (gauge)	Hydraulic Load, *Fixture Units*	
			Private	Public
Bathroom group				
(a) with flush tank	NA	NA	6	—
(b) with direct flush valve	NA	NA	8	—
Bathtub (with or without shower)	½	7.25	2	4
Clothes washer	½	14.5	3	—
Dishwasher, domestic	½	14.5	3	—
Drinking fountain	⅜	14.5	½	1
Hose bib	½	14.5	(2)	(2)
Lavatory	⅜	7.25	1	2
Sink				
(a) kitchen, domestic	½		2	—
(b) kitchen, commercial	¾	7.25	—	4
(c) service	½	7.25	—	3
(d) service with direct flush valve	¾	7.25	—	5
Shower head	½	14.5	2	4
Urinal		7.25		
(a) with flush tank	½	7.25	—	3
(b) with direct flush valve	¾	14.5	—	5
Water closet				
(a) with flush tank	⅜	7.25	3	5
(b) with direct flush valve	1	14.5	6	10
Column 1	2	3	4	5

Notes to Table 6.3.A.:

(1) Measured upstream of faucet or supply valve.
(2) A continuous load of 5 gpm.

APPENDIX D

STANDARDS REFERENCED IN THE CANADIAN PLUMBING CODE 1980

STANDARDS REFERENCED IN THE CANADIAN PLUMBING CODE 1980

Standard Issuing Agency	Standard Number	Title of Standard	Code Reference	Page
ANSI	B16.3-1977	Malleable-Iron Threaded Fittings, 150 and 300 lb	2.6.6.(1)	13
ANSI	B16.4-1977	Cast-Iron Threaded Fittings, 125 and 250 lb	2.6.5.(1)	13
ANSI	B16.12-1977	Cast-Iron Threaded Drainage Fittings	2.6.3.(1)	13
ANSI	B16.15-1978	Cast Bronze Threaded Fittings, Class 125 and 250	2.7.3.(1)	14
ANSI	B16.18-1978	Cast Copper Alloy Solder-Joint Pressure Fittings	2.7.6.(1) 2.7.6.(2)	14 15
ANSI	B16.22-1973	Wrought Copper and Bronze Solder, Joint Pressure Fittings	2.7.6.(1)	15
ANSI	B16.24-1971	Bronze Flanges and Flanged Fittings, 150 and 300 lb	2.7.2.	14
ANSI	B16.26-1975	Cast Copper Alloy Fittings for Flared Copper Tubes	2.7.7.(1) 2.7.7.(2)	15 15
ANSI	B16.29-1973	Wrought Copper and Wrought Copper Alloy Solder, Joint Drainage Fittings	2.7.5.(1)	14
ANSI	Z21.22-1971	Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems	2.9.10.	16
ASTM	A444-78	Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Culverts and Underdrains	2.6.8.(1)	14
ASTM	B32-76	Solder Metal	2.8.3.(2)	15
ASTM	B42-78	Seamless Copper Pipe, Standard Sizes	2.7.1.(1)	14
ASTM	B43-79	Seamless Red Brass Pipe, Standard Sizes	2.7.1.(2)	14
ASTM	B88-78	Seamless Copper Water Tube	2.7.4.(1)	14
ASTM	B306-78	Copper Drainage Tube (DWV)	2.7.4.(1)	14
ASTM	D2466-78	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	2.5.6.(2)	12

Standard Issuing Agency	Standard Number	Title of Standard	Code Reference	Page
ASTM	D2467-76a	Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	2.5.6.(2)	12
ASTM	D2564-78a	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	2.5.6.(3)	12
ASTM	D2609-74	Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	2.5.5.(3)	11
ASTM	D3261-73 (1978)	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	2.5.5.(4)	12
CGSB	34-GP-1M April 1976	Pipe, Asbestos Cement, Pressure	2.5.2.(1)	11
CGSB	34-GP-9M December 1975	Pipe, Asbestos Cement, Sewer	2.5.1.(2)	11
CGSB	34-GP-22M April 1976	Pipe, Asbestos Cement, Drain	2.5.1.(1)	11
CGSB	34-GP-23M January 1976	Pipe, Asbestos Cement, Sewer, House Connection	2.5.1.(2)	11
CGSB	77-GP-1M February 1977	Caulking Compound, Cementitious Type, Cold Applied, for Pipe Joints	2.8.2.	15
CSA	A60.1-M76	Vitrified Clay Pipe	2.5.4.(1)	11
CSA	A60.3-M76	Vitrified Clay Pipe Joints	2.5.4.(2)	11
CSA	A257-1974	Standards for Concrete Pipe	2.5.3.(1) 2.5.3.(2)	11
CSA	B45.1-1973	Vitreous China Plumbing Fixtures	2.2.2.(1) 2.2.5.	9 10
CSA	B45.2-1975	Enamelled Cast Iron Plumbing Fixtures	2.2.2.(2)	9
CSA	B45.3-1977	Porcelain Enamelled Steel Plumbing Fixtures	2.2.2.(3)	9
CSA	B45.4-1975	Stainless Steel Plumbing Fixtures	2.2.2.(4)	9
CSA	B45.5-1976	Plastic Plumbing Fixtures	2.2.2.(5)	9
CSA	B63-1966	Welded and Seamless Steel Pipe (Reaffirmed 1971)	2.6.7.(4)	14

Standard Issuing Agency	Standard Number	Title of Standard	Code Reference	Page
CSA	B64-Series-1976	CSA Standards on Vacuum Breakers and Backflow Preventers	2.9.9.	16
CSA	B67-1972	Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories	2.7.8.(1) 2.8.3.(1)	15 15
CSA	B70-M78	Cast Iron Soil Pipe, Fittings and Methods of Joining	2.6.1.(1) 2.6.2.	13 13
CSA	B125-1975	Plumbing Fittings	2.9.6.	16
CSA	B127.1-M77	Components for Use in Asbestos Cement, Drain, Waste and Vent Systems	2.5.1.(1)	11
CSA	B127.2-M77	Components for Use in Asbestos Cement Building Sewer Systems	2.5.1.(2)	11
CSA	B131.4-1975	Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water	2.6.4.(2)	13
CSA	B131.5-1976	Cast-Iron Pipe Centrifugally Cast in Metal Molds, for Water or Other Liquids	2.6.4.(1)	13
CSA	B131.9-1978	Gray-Iron and Ductile-Iron Fittings, 2 in. Through 48 in., for Water and Other Liquids	2.6.4.(3)	13
CSA	B131.10-1973	Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings	2.6.4.(4)	13
CSA	B131.13-1977	Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids	2.6.4.(1)	13
CSA	B137.1-1970	Polyethylene Pipe for Cold Water Services	2.5.5.(1)	11

Standard Issuing Agency	Standard Number	Title of Standard	Code Reference	Page
CSA	B137.3-1972	Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications	2.5.6.(1)	12
CSA	B137.6-1971	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Piping for Hot and Cold Water Distribution Systems	2.5.7.(1)	12
CSA	B137.8-M77	Polybutylene (PB) Piping for Hot and Cold Water Distribution Systems	2.5.8.	12
CSA	B158.1-1976	Cast Brass Solder Joint Drainage, Waste and Vent Fittings	2.7.5.(1) 2.9.1.	14 16
CSA	B181.1-1973	Acrylonitrile-Butadiene-Styrene Drain, Waste and Vent (ABS-DWV) Pipe and Pipe Fittings	2.5.9.(1) 2.5.10.(1)	12 12
CSA	B181.2-1973	Poly (Vinyl Chloride) Drain, Waste and Vent Pipe and Pipe Fittings	2.5.9.(1) 2.5.10.(1)	12 13
CSA	B182.1-M77	Plastic Drain and Sewer Pipe and Pipe Fittings	2.5.9.(1)	12
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