

2024

**Building Code
COMPENDIUM**

VOLUME 1



Ontario 

November 4, 2024

TO: BUILDING CODE USERS

Enclosed please find the 2024 Building Code Compendium Edition¹ (O. Reg. 163/24) effective January 1, 2025. The Building Code is a regulation made under the *Building Code Act, 1992*.

This edition contains recent changes to the Building Code. In particular, the 2024 Building Code Compendium is further amended by:

- O. Reg. 447/24 (Ontario Amendments to the National Building Code of Canada 2020, October 8, 2024)
 - new technical provisions in Part 3 of Division B that allow for buildings up to 18 storeys high made of Encapsulated Mass Timber Construction (EMTC)
 - revisions to referenced standards in Table 1.3.1.2. of Division B related to
 - EMTC provisions
 - CSA B52, “Mechanical Refrigeration Code” updated to 2023 edition
 - CAN/CSA-F383, “Installation of packaged solar domestic hot water systems” substituted in Sentence 7.6.2.8.(1) of Division B
 - CSA Z271, “Design of suspended access equipment” substituted in Sentence 4.4.5.1.(2) of Division B
- Revisions to Supplementary Standards and Appendix A
 - SA-1 changes corresponding to EMTC provisions
 - Appendix A changes corresponding to EMTC provisions and other housekeeping items

Changes to the Code are identified on the amendment pages by a unique symbol and a corresponding effective date. These pages should be inserted in your Code for January 1, 2025.

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Director

¹ The Compendium is not an official copy of the Act and Code. Official copies of the legislation can be accessed from www.ontario.ca/laws.

2024 Building Code Compendium

Volume 1

**November 4, 2024 Update
(Containing O. Reg. 447/24)**

COMMENCEMENT

Ontario Regulation 163/24 and 203/24 come into force on the 1st day of January 2025.

- r1 Amending Ontario Regulation 447/24 comes into force on the 1st day of January 2025.

EDITORIAL

- e1 Editorial correction issued for January 1st, 2025.

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Preface

Introduction

The Building Code is a regulation made under the Building Code Act, 1992. This edition of the Building Code Compendium amalgamates Ontario Regulation 447/24 which adopts the 2020 National Building Code together with the document “Ontario Amendments to the National Building Code of Canada 2020”. This Compendium also contains the Supplementary Standards referenced by the Building Code and additional explanatory material in Appendix Notes which are prepared for purposes of convenience only. The 2024 Building Code is effective January 1, 2025.

The Building Code sets out technical requirements for construction (including renovation) of buildings, change of use of existing buildings where the change would result in an increase in hazard and for maintenance and operation of on-site sewage systems. The technical requirements of the Building Code do not have application to existing buildings other than the maintenance and operation of on-site sewage systems and buildings that undergo a change of use where the change would result in an increase in hazard. The Building Code also contains administrative requirements for demolition of buildings.

The Building Code is essentially a set of minimum provisions respecting the safety of buildings with reference to public health, fire protection, accessibility, structural sufficiency, energy efficiency and environmental integrity. It is not intended to be a textbook on building design, advice on which should be sought from professional sources. Its primary purpose is the promotion of public safety through the application of appropriate uniform building standards. The Building Code is also written in an objective-based format, which is intended to promote innovation and flexibility in design and construction.

It is assumed that the requirements of the Building Code would be interpreted and enforced by reasonable people using good judgement based on experience and an understanding of the safety and technical issues involved. This fact is especially important in the application to an existing building when owners and tenants are faced with situations which may not be specifically covered in the Building Code, or in which alternative design solutions are proposed that could not have been envisaged by the code writers and committees responsible for the original requirements.

Many of these judgments are difficult to make because there is often insufficient factual knowledge to equate the relative safety of one set of conditions to another set. In the evaluation of any major project or unusual building, situations arise in which judgments must be made, because the Code can never cover all possible situations. The Building Code is constantly under review and is revised as experience is gained from its use and additional knowledge is gained through research.

The Building Code does not list acceptable proprietary building products. It establishes the criteria that building materials, products, systems, designs, and assemblies must meet. Some of these criteria are explicitly stated in the Building Code, while others are incorporated by reference to material or product standards published by standards development organizations. Only those technical portions of the referenced standards that are related to the objectives and functional statements of the Building Code apply only to the extent that the provisions relate to the construction of buildings.

The provisions of the Building Code for fire protection features installed in buildings are intended to provide a minimum acceptable level of public safety. It is intended that all fire protection features of a building, whether required or not, would be designed in conformance with good fire protection engineering practice and would meet the appropriate installation requirements in relevant standards. Good design is necessary to ensure that the level of public safety established by the Building Code requirements would not be reduced by a voluntary installation.

Similarly, for voluntary installations of other building elements such as grab bars or guards, there is a public expectation that these installations would meet their intended function and conform to the Building Code as unexpected failure would place public safety at risk.

The 2024 Building Code supersedes the previous edition of the 2012 Building Code. Many of the changes introduced into the 2024 Building Code increase the level of harmonization between Ontario’s Building Code and the National Construction Codes as well as with other provincial and territorial construction codes.

The Building Code and the Model National Construction Codes

In March 2022, the Canadian Commission on Building and Fire Codes (CCBFC), which has now been replaced by the Canadian Board for Harmonized Construction Codes supported by the National Research Council of Canada (NRC), released 2020 editions of the National Building Code, National Plumbing Code, National Fire Code and National Energy Code for Buildings (i.e., NBC, NPC, NFC, NECB). These construction codes have no legal status unless adopted by a province or territory.

Ontario's 2024 Building Code applies throughout Ontario and is based in large measure on the 2020 NBC, 2020 NPC, 2015 NECB and in some cases, the 2020 NFC as well as the 1995 National Farm Building Code. However, variations and exceptions between the National Construction Codes and Ontario's Building Code exist. Ontario's 2024 Building Code has variations in areas such as accessibility, energy efficiency and secondary suites. Ontario exceptions which also consolidate construction requirements from other provincial legislation into the Building Code, includes Ontario-only provisions such as those related to on-site sewage systems, public pools, public spas, food premises, private sewers, and private water supplies, rapid transit stations and renovation of existing buildings.

Objective-Based Code Format

The 2024 Building Code is Ontario's third edition of the Building Code published in an objective-based format. The objective-based format augments specific technical requirements by identifying the underlying objectives and sub-objectives of those requirements (see table). Each technical requirement that is an acceptable solution in Division B is linked to one or more of the objectives, as well as functional statements, through the Attribution Tables in Supplementary Standard SA-1. Some objectives were developed jointly by the NRC and Canadian provincial/territorial jurisdictions.

The objective-based format is intended to assist Building Code users to understand the "why" behind Code requirements, as well as the "what". This new format is more flexible and more responsive to innovation, as it should provide Code users with more information to evaluate construction equivalents and acceptable alternatives to the requirements of the Code.

The objective-based framework establishes a framework for evaluating "alternative solutions" against the performance achieved by the "acceptable solutions" set out in the Code.

Objectives

Every technical requirement that is an acceptable solution in Division B is linked to at least one objective as defined in Section 2.2. of Division A, which explains the objective which the requirement is intended to achieve.

They serve to define the boundaries of the subject areas the Building Code addresses. However, the Building Code does not address all the issues that might be considered to fall within those boundaries.

The objectives describe undesirable situations and their consequences, which the Building Code aims to prevent from occurring in buildings. The wording of most of the definitions of the objectives includes two key phrases: "limit the probability" and "unacceptable risk." The phrase "limit the probability" is used to acknowledge that the Building Code cannot entirely prevent those undesirable situations from happening. The phrase "unacceptable risk" acknowledges that the Building Code cannot eliminate all risk: the "acceptable risk" is the risk remaining once compliance with the Building Code has been achieved.

The objectives are entirely qualitative and are not intended to be used on their own in the design, construction and approval processes.

The objectives attributed to the requirements or portions of requirements in Division B are listed for each Part in Tables contained in Supplementary Standard SA-1.

OBJECTIVES AND SUB-OBJECTIVES OF THE BUILDING CODE

Objective	Sub-Objective
Safety	Fire Safety
	Structural Safety
	Safety in Use
	Resistance to Unwanted Entry
Health	Indoor Conditions
	Sanitation
	Noise Protection
	Vibration and Deflection Limitation
	Hazardous Substances Containment
	Privacy*
	View to the Outdoors*
Accessibility	Barrier-Free Path of Travel
	Barrier-Free Facilities
Fire, Structural Water and Sewage Protection of Buildings	Fire Protection of the Building
	Structural Sufficiency of the Building
	Protection of Adjacent Buildings from Fire
	Protection of Adjacent Buildings from Structural Damage
	Water and Sewage Protection of Buildings and Facilities
Resource Conservation*	Water and Energy Conservation*
	Infrastructure Capacity*
Environmental Integrity*	Air Quality
	Water and Soil Quality
Conservation of Buildings*	N/A

*Ontario-specific objectives are highlighted in grey.

Functional Statements

Functional Statements describe what the design and construction of the building (or a component of the building) must do to achieve the objectives. At least one functional statement is linked to each technical requirement that is an acceptable solution in Division B as listed in Section 3.2. of Division A.

The functional statements are more detailed than the objectives. They describe conditions in the building that help satisfy the objectives. The functional statements and the objectives are interconnected. There may be several functional statements related to any one objective, and a given functional statement may describe a function of the building (or a component of the building) that serves to achieve more than one objective.

Like objectives, functional statements are entirely qualitative and are not intended to be used on their own in the design, construction, and approval processes.

The functional statements attributed to the requirements or portions of requirements in Division B are listed for each Part in Tables contained in Supplementary Standard SA-1.

Intent Statements

Intent statements explain the basic thinking behind each Building Code provision contained in Division B. Intent statements, each of which is unique to the provision with which it is associated, explain how requirements help to achieve their attributed objectives and functional statements. Like the objectives, the intent statements are expressed in terms of risk avoidance and expected performance. They offer insight into what the Building Code provisions are intended to achieve.

The intent statements serve explanatory purposes only and do not form an integral part of the Building Code provisions. As such, they are similar in function to the Appendix A explanatory notes. Intent statement for Ontario-only provisions are under development. Intent statements for Ontario's Building Code provisions that are harmonized with the National Construction Code provisions may be obtained from separate electronic documents entitled "Supplement to the NBC 2020: Intent Statements", "Supplement to the NPC 2020: Intent Statements" and "Supplement to the NECB 2020: Intent Statements", which are posted on the NRC's website.

All this additional information—objectives, functional statements, and intent statements—is intended to facilitate the implementation of the Code in two ways:

- **Clarity of intent:** The objectives, functional statements and intent statements linked to a Code requirement clarify the reasoning behind that requirement and facilitate understanding of what must be done to satisfy that requirement. This added information may also help avoid disputes between practitioners and building officials over these types of issues.
- **Flexibility:** The additional information allows for flexibility in Code compliance. A person seeking to propose a new method or material not described or covered in the Code would be able to use the added information to understand the expected level of performance that their alternative solution must achieve to satisfy the Code.

Structure of the Objective-Based Code

The Building Code is divided into three Divisions, which are further subdivided into Parts.

Division A Compliance, Objectives and Functional Statements

Part 1 Compliance and General

- Organization and application
- Compliance
- Interpretation
- Defined terms, symbols and abbreviations
- List of applicable law for the purposes of obtaining a permit under Sections 8 and 10 of the Act

Part 2 Objectives

Part 3 Functional Statements

Division B Acceptable Solutions

The term “acceptable solutions” refers to the technical requirements contained in Division B of the Building Code. It reflects the principle that building codes establish an acceptable level of risk or performance and underlines the fact that a code cannot describe all possible valid design and construction options. Acceptable solutions represent the minimum level of performance that will satisfy the Ontario’s Building Code objectives and that is acceptable to the principle authority.

Most of the requirements in Division B—the acceptable solutions—are linked to at least one objective and functional statement found in Division A. These linkages play an important role in allowing objective-based codes to accommodate innovation.

It is expected that the majority of Code users would primarily follow the acceptable solutions presented in Division B and that they would consult Division A only when seeking clarification on the application of Division B requirements to a particular situation, when considering an alternative solution, or when looking up the definition of selected terms in the context of the Building Code.

Part 1 General

Part 1 addresses climatic and seismic values for design of buildings, provides editions of referenced standards and lists information regarding standards organizations.

Part 2 Farm Buildings

Part 2, Farm Buildings, has been added to introduce technical requirements for large farm buildings into the Building Code, including requirements related to fire protection and occupant safety, structural loads and procedures, and HVAC.

Part 3 Fire Protection, Occupant Safety and Accessibility

Part 3 contains the requirements with respect to health and fire safety, which depend on the use of a building and its type of occupancy. For example, the first Section 3.1. contains material relating to occupancy classification and occupancy and fire safety within floor areas, exit requirements, requirements for service spaces and health requirements. Section 3.8. contains requirements for those buildings required to be accessible to persons with physical or sensory disabilities. Section 3.11. includes requirements for the design of public pools.

Part 4 Structural Design

Part 4 is made up of four Sections. The first deals with the loads to be used in design calculations and the methods of design to be followed. Section 4.2. regulates foundation design and construction. Section 4.3. deals with design in wood, masonry, concrete, steel, aluminum and glass. Section 4.4. deals with the design of air-supported structures, parking structures and guards over retaining walls. Section 4.3. and parts of Section 4.4. contain performance requirements referring to the design methods outlined in detail in the relevant Canadian Standards.

Part 5 Environmental Separation

Part 5 includes requirements for the design of building elements to control groundwater, condensation and the penetration of wind and rain.

Part 6 Heating, Ventilating and Air-Conditioning

Part 6 provides for the safe functioning of heating, ventilating and air-conditioning equipment installed in a building. The requirements deal mainly with installation standards for design.

Part 7 Plumbing

Part 7 governs the design, construction and installation of plumbing systems within properties. It also addresses the required material to be in compliance with a testing standard.

Part 8 Sewage Systems

Part 8 governs the design, construction, operation and maintenance of various class of sewage systems located within properties. It addresses sewage systems up to 10,000 litres capacity serving one lot. Systems larger than 10,000 litres/day and off-lot (communal) sewage systems are regulated under the Ontario Water Resources Act, with approvals issued by the Ministry of the Environment, Conservation and Parks. MECP also regulates waste approvals for the hauling of sewage and land application sites under Part V of the Environmental Protection Act.

Part 9 Housing and Small Buildings

Part 9 provides detailed requirements for the construction of houses and small buildings up to 600 m² per floor and 3 storeys in height, and applies to all occupancies except assembly which includes restaurants, care or detention and high hazard industrial.

Part 10 Change of Use

Part 10 governs the requirements with respect to a change in major occupancy without any proposed construction to the buildings.

Part 11 Renovation

Part 11 provides for flexibility in meeting life safety requirements when renovating existing buildings, with or without changes in major occupancies of the buildings or parts of the buildings. This flexibility allows, subject to certain conditions, the use of alternate methods of compliance to requirements contained in Parts 3, 4, 6, 8, 9, or 12, for all existing buildings or any major occupancies.

Part 12 Resource Conservation

Part 12 regulates the mandatory and enabling energy efficiency requirements, and insulation in residential and non-residential buildings.

Division C Administrative Provisions

Part 1 General

Part 1 contains several administrative provisions relating to matters such as professional design requirements, permits, occupancy, inspections and building permit fees.

Part 2 Alternative Solutions, Disputes, Rulings and Interpretations

Part 2 contains administrative provisions related to the Building Code Commission, the Building Materials Evaluation Commission, Minister's Rulings, Minister's Interpretations, and documentation of alternative solutions.

Part 3 Qualifications

Part 3 contains qualification requirements for chief building officials, inspectors, registered code agencies, designers and on-site sewage installers.

Appendix A Explanatory Information

Appendix A contains additional non-regulatory explanatory information to assist Building Code users in understanding the intent of the requirements contained in Divisions A, B and C.

Appendix B Imperial Conversion

Appendix B contains Imperial conversion factors for metric values used in the Building Code. It is not a regulatory section of the 2024 Building Code.

Supplementary Standards

Supplementary Standards with the SA prefix are referenced by Division A of the Building Code. They include the Attribution Tables which relate objectives and functional statements of Division A to acceptable solutions of Division B.

Supplementary Standards with the SB prefix are referenced by Division B of the Building Code. They include MMAH SB-1, “Climatic and Seismic Data”, MMAH SB-2, “Fire Performance Ratings” and others.

Supplementary Standards with the SC prefix are referenced by Division C of the Building Code. They include administrative provisions (e.g., MMAH SC-1, “Code of Conduct for Registered Code Agencies”).

Additional Information

Metric Conversion

For the most part, the official units of measurement in the Building Code are based on the metric system. Some of the metric values in the Building Code have been converted and rounded from imperial values. A conversion table of imperial equivalents for the most common units used in building design and construction is located in Appendix B.

For plumbing provisions in Part 7 of Division B, pipe sizes are expressed in nominal pipe size dimensions in inches by which pipe is known in the trade and the exact dimension may vary with different pipe materials.

Numbering System

A decimal numbering system has been used to identify particular requirements. The first number indicates the Part of the Code, the second, the Section in the Part, the third, the Subsection and the fourth, the Article in the Subsection. An Article may be further broken down into Sentences (indicated by numbers in brackets), and the Sentence further divided into Clauses and Subclauses. These are illustrated as follows:

3	Part
3.6.	Section
3.6.2.	Subsection
3.6.2.3.	Article
3.6.2.3.(1)	Sentence
3.6.2.3.(1)(f)	Clause
3.6.2.3.(1)(f)(i)	Subclause
3.6.2.3.(1)(f)(i)(A)	Sub-subclause
3.6.2.3.(1)1.	Paragraph
3.6.2.3.(1)1.i.	Sub-paragraph

Meaning of the Words “and” and “or” between Clauses, Subclauses, Sub-subclauses, Paragraphs and Sub-paragraphs contained in Sentences

Multiple Clauses, Subclauses, Sub-subclauses, Paragraphs and Sub-paragraphs are connected by the word “and” or “or” at the end of the second last Clause, Subclause, Sub-subclause, Paragraph or Sub-paragraph in the series. Although this connecting word appears only once, it is meant to apply to all the preceding Clauses, Subclauses, Sub-subclauses, Paragraphs and Sub-paragraphs within that series.

For example, in a series of five Clauses—(a) to (e)—in a Sentence, the appearance of the word “and” at the end of Clause (d) means that all Clauses in the Sentence are connected to each other with the word “and”. Similarly, in a series of five Clauses—(a) to (e)—in a Sentence, the appearance of the word “or” at the end of Clause (d) means that all Clauses in the Sentence are connected to each other with the word “or”.

In all cases, it is important to note that a Clause, Subclause, Sub-subclause, Paragraph and Sub-paragraph (if any) must always be read in conjunction with its introductory text appearing at the beginning of the Sentence. Moreover, the connecting words “and” and “or” must be read in the context of the Sentence.

In particular, the use of the word “and” as a connecting word does not necessarily mean that all Clauses, Subclauses, Sub-subclauses, Paragraphs and Sub-paragraphs are applicable for compliance with the Sentence.

Amending Change Indication

As a courtesy to Building Code users, efforts are made to identify editorial and technical changes relative to amendments issued to this regulation. Where an editorial revision or a regulatory revision or addition has been made, changes to the Compendium are identified on the amendment pages by a unique symbol and a corresponding effective date. In most cases no change indication is provided for deleted content.

Relationship of the Building Code to Standards Development and Conformity Assessment

The development of many provisions in the National Building Code and the Building Code and the assessment of conformity to those provisions are supported by several of the member organizations of Canada’s National Standards System (NSS).

The NSS is a network of accredited organizations concerned with standards development, certification, testing and inspection that is established under the auspices of the Standards Council of Canada Act. Activities of the NSS are coordinated by the Standards Council of Canada (SCC), which accredits standards development organizations, certification bodies, testing and calibration laboratories, and inspection bodies, among others.

The SCC is a non-profit federal Crown corporation responsible for the coordination of voluntary standardization in Canada. It also coordinates Canadian participation in voluntary international standardization activities.

Canadian Standards

Many of the standards referenced in the National Building Code and Building Code are published by standards development organizations accredited in Canada. As part of the accreditation requirements, these organizations adhere to the principle of consensus, which generally means substantial majority agreement of a committee comprising a balance of producer, user and general interest members, and the consideration of all negative comments. The standards development organizations also have formal procedures for the balloting and second-level review of standards prepared under their oversight.

The following organizations are accredited as standards development organizations in Canada:

- Air-Conditioning, Heating and Refrigeration Institute (AHRI)
- ASTM International
- Bureau de normalisation du Québec (BNQ)
- Canadian General Standards Board (CGSB)
- CSA Group
- International Association of Plumbing and Mechanical Officials (IAPMO)
- ULC Standards
- Underwriters' Laboratories Inc. (UL)

Tables 1.3.1.2. of Division B and Table 1.1.2. in Supplementary Standard SB-2 list the standards referenced in the Building Code. Standards proposed to be referenced in the National Building Code are reviewed to ensure that their content is compatible with the Code. Thereafter, referenced standards are reviewed as needed during each Code cycle.

Standards development organizations are asked to provide information on any changes in the status of their standards referenced in the Building Code—withdrawals, amendments, new editions, etc. This information is passed on to the Canadian Board for Harmonized Construction Codes, its committees, and interested stakeholders, all of whom are given the opportunity to identify any problems associated with the changes. These bodies do not necessarily review in detail the revised standards; rather, the approach relies on the consensus process involved in the maintenance of the standards and on the extensive knowledge and experience of committee members, provincial or territorial staff, NRC staff, and consulted stakeholders to identify changes in the standards that might create problems in the Code. Referenced Standards unique to the Building Code generally undergo a similar review through public consultation and MMAH Technical Advisory Committee review.

Non-Canadian Standards

A number of subject areas for which the standards development organizations accredited in Canada have not developed standards are covered in the Building Code. In these cases, the Building Code often references standards developed by organizations in other countries, such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the National Fire Protection Association (NFPA). These standards are developed using processes that may differ from those used by the standards development organizations accredited in Canada; nevertheless, the standards have been reviewed by the relevant NRC standing committees or MMAH Technical Advisory Committees and found to be acceptable.

Conformity Assessment

Testing

The SCC accredits testing and calibration laboratories that are capable of reliably testing products to specified standards. The test results produced by these organizations can be used in the certification, evaluation and qualification of products for compliance with Code provisions. The SCC's website (www.scc.ca) lists accredited testing and calibration laboratories, along with their scope of accreditation.

Certification

Certification is the confirmation by an independent organization that a product, process, service or system meets a requirement. Certification may entail physical examination, testing as specified in appropriate standards, an initial plant inspection, and/or follow-up unannounced plant inspections. This procedure leads to the issuing of a formal assurance or declaration, by means of a certification mark or certificate, that the product, process, service or system is in full conformity with specified provisions.

In some cases, a product for which no standard exists can be certified using procedures and criteria developed by an accredited certification body and specifically designed to measure the performance of that product.

Certification bodies publish lists of certified products and companies. The SCC's website (www.scc.ca) lists accredited certification bodies, along with their scope of accreditation. Several organizations, including the Canadian Construction Materials Centre (CCMC) at the NRC, offer product certification services.

Evaluation

An evaluation is a written opinion by an independent professional organization that a product will perform its intended function. An evaluation is often done to determine the ability of an innovative product, for which no standards exist, to satisfy the intent of a Code requirement. Follow-up plant inspections are not normally part of the evaluation process.

Qualification

Qualification evaluates the ability of a product to perform its intended function by verifying that it meets the requirements of a standard. Qualification normally includes some follow-up plant inspection. Some organizations publish lists of qualified products that meet the specified requirements. Some organizations qualify product manufacturing and/or testing facilities for compliance with the Code and relevant standards.

Enforcement of the Building Code

Enforcement of the Building Code Act and the Building Code is a local responsibility, primarily in the hands of municipalities, boards of health or conservation authorities or a registered code agency (i.e., principal authority). These responsibilities include reviewing drawings, issuing building permits, performing inspections, and issuing orders.

Rulings and Interpretations

Building Code Commission

The Building Code Commission (BCC) is an adjudicative agency whose legislative authority is set out in the Building Code Act. Its membership is comprised of technical experts experienced in the different areas of construction, engineering, design, building materials and the Building Code and Act.

The BCC has a mandate to resolve disputes between proponents of construction projects and local enforcement officials. The Building Code Act sets out three types of disputes that can be heard by the BCC, those related to:

1. the sufficiency of compliance with the technical requirements of the Building Code;
2. compliance with the prescribed time frames for permit processing, and
3. compliance with the prescribed time frames site inspections.

In addition to these disputes a judge may refer question(s) respecting the interpretation of the technical requirements of the Building Code or the sufficiency of compliance with the technical requirements of the Building Code to the BCC for a hearing and report to the judge.

The BCC makes its decisions independently and impartially of the government.

Building Materials Evaluation Commission

The Building Materials Evaluation Commission (BMEC) is an arm's length regulatory agency whose legislative authority is set out in the Building Code Act. Its membership is comprised of technical experts experienced in the different areas of construction, engineering, design, building materials and the Building Code and Act.

The BMEC has a mandate to evaluate and authorize, subject to conditions, any innovative construction material, system or building design for use in construction in Ontario. Additionally, the BMEC also has the power to conduct research on, and examine, construction materials, systems and building designs or cause such research to be conducted and examinations to be undertaken. The BMEC has the authority to make recommendations to the Minister of Municipal Affairs and Housing respecting changes to the Act or the Building Code.

The BMEC makes its decisions independently and impartially of the government and bases its decisions on the minimum health and safety requirements set out in the Building Code for the use of new and innovative construction materials, systems and building designs in Ontario.

Rulings by the Minister

The Building Code Act also provides the Minister of Municipal Affairs and Housing with the authority to make rulings on the use of innovative materials, systems or building designs that were evaluated by a materials evaluation designated in the Building Code.

Currently, the only evaluation body designated in the Building Code is the Canadian Construction Materials Centre.

CCMC approvals are valid for most Canadian provinces and territories; however, in Ontario, an approved CCMC product may not be used without a Minister's Ruling. A manufacturer may apply to obtain a Minister's Ruling at the Ministry for the use of a product in Ontario.

Harmonization / New Code Development Process

In 2019, under the Canadian Free Trade Agreement (CFTA), the Regulatory Reconciliation and Cooperation Table initiated development of a Construction Codes Reconciliation Agreement (Agreement) between Canada and the Provinces and Territories, in alignment with broader CFTA goals to address barriers to trade or investment within Canada. The province and territories have committed to reducing variations between the model National Construction Codes and provincial and territorial construction codes, transforming the National Codes Development System, and making effective the updated National Construction Codes in a timely manner.

These changes are expected to reduce barriers related to the manufacturing of products, design of buildings, mobility of labour and education and training of trades people, design professionals and building officials related to variations between Construction Codes across Canada.

New Governance System for Harmonized and National Construction Code Development System

Canadian Table for Harmonized Construction Codes

Governance

The Canadian Table for Harmonized Construction Codes (Table) comprises deputy minister-level representatives from the federal, provincial, and territorial governments. The goal of the Table is to build national consensus and provide strategic policy direction and oversight for development of the model National Construction Codes. The Table is co-chaired by a representative from the National Research Council of Canada (NRC) on behalf of the federal government and by a representative from the provinces and territories.

Canadian Board for Harmonized Construction Codes

Code System Management and Development

The Canadian Board for Harmonized Construction Codes (Board) comprises federal, provincial and territorial representatives. The Board is responsible for developing, approving and maintaining the National Model Codes based on the strategic priorities set by the Table. The Board is co-chaired by a representative from the NRC on behalf of the federal government and by a representative from the provinces and territories.

Development Groups

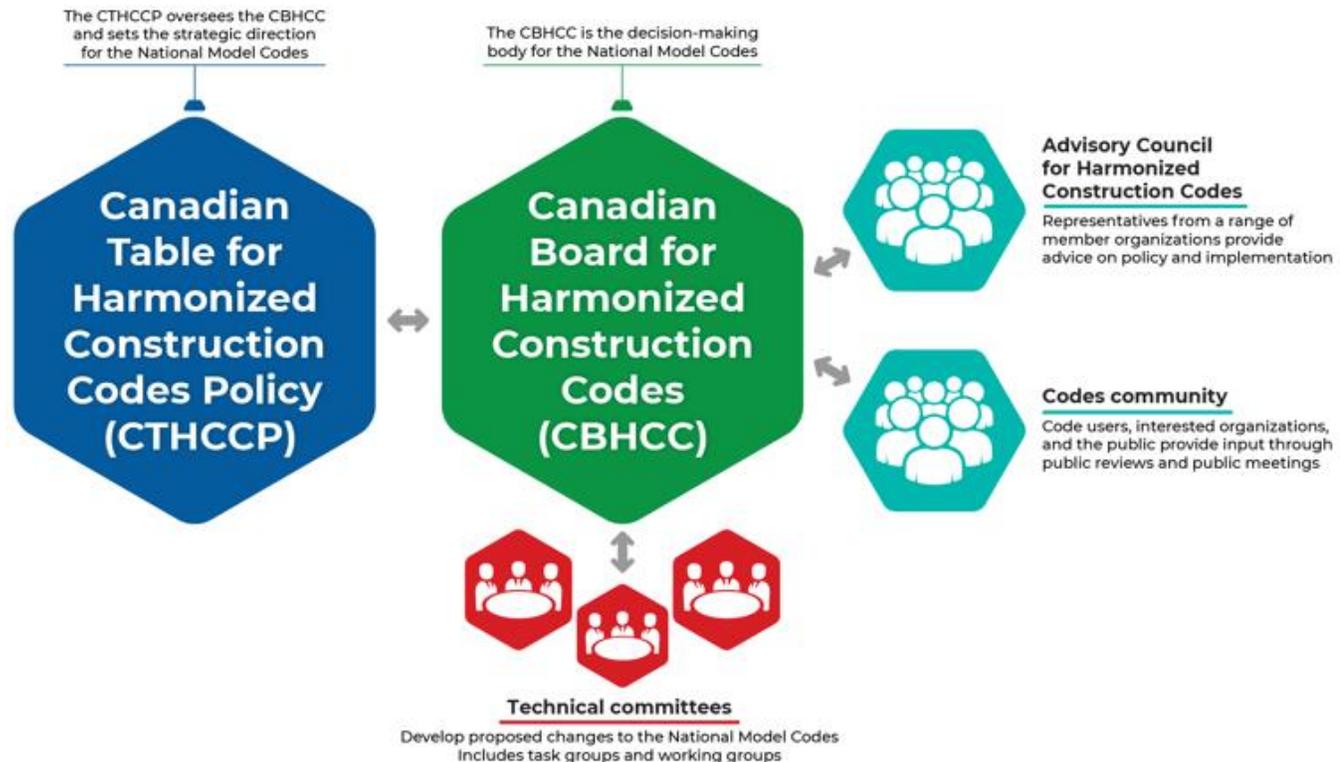
Development Groups include committees working under the Board. These are Technical Committees and each committee has task groups and may also have working groups. The Standing Coordination Committee is tasked to coordinate the work among the committees and task groups. The Board may also establish a Policy Committee and task the Committee with the review of new policy matters.

Code Development and Content

The development groups provide support to the Board in forming proposed code changes. They focus on specific code development areas and tasks simultaneously throughout the code development cycle. The development groups are made up of technical subject matter experts. Technical Committees prepare the final Proposed Code Change forms.

Advisory Council for Harmonized Construction Codes

The Advisory Council for Harmonized Construction Codes is made up of industry, the regulatory community, emergency responders and other organizations with an interest in the regulation of building construction and operation through codes. It provides the Board with policy input and advice.



Development of the National Construction Codes

The National Code Development System, with support from Codes Canada, an administrative unit within the Construction Research Centre of the National Research Council Canada, operates the code development process.

The process begins with the Canadian Table for Harmonized Construction Codes Policy (Table) setting strategic priority areas that focus code development activities for the upcoming code development cycle.

The Canadian Board for Harmonized Construction Codes (Board) then operationalizes the strategic direction by developing a work plan that responds to the strategic priority areas and integrates code change requests from the code community, and considers required code maintenance. Anyone can submit a code change request for consideration.

The work plan is executed through the development of changes to the National Construction Codes. Changes are developed by subject matter experts with input from stakeholders through a consensus-based process.

Broad input is also obtained through public review of proposed changes. The national public consultation allows anyone with an interest in the Construction Codes to provide comments for consideration before approval of changes by the Board. Efforts are being made to better coordinate provincial and territorial public reviews with the national public review.

New editions of the National Codes and related guides, incorporating changes developed and approved over the code cycle, are published by the National Research Council Canada approximately every five years. Published National Construction Codes can be made effective by authorities having jurisdiction over construction.

How to Submit Code Change Requests

Code users are encouraged to participate in the National Construction Codes development process.

As Ontario works towards further increasing the harmonization of the Construction Codes, the National Construction Codes development process, including making submissions and engaging in the National process is an important opportunity for the code user to have input on the future of the National Construction Codes and provide comment on the proposed changes that Ontario intend to adopt in its Building Code.

How to Submit Code Change Requests for Harmonized Code Provisions

Requests for changes to the National Construction Codes are welcome from anyone at any time and can be made by completing a code change request form.

The National Construction Codes improve with each edition thanks to contributors such as building officials, designers, suppliers, contractors, researchers, instructors, and other stakeholders including the public. You do not need to be a subject-matter expert to submit a request. Code change requests can be submitted by anyone with an interest in the Codes.

Requests should clearly articulate the situation that you feel should be addressed. For more information, guidelines, the code change request form and to submit a code change request, please visit the website (cbhcc-cchcc.ca) or (<https://cbhcc-cchcc.ca/en/code-change-requests/#s4>).

Guidelines for Submitting Code Change Requests for Ontario-Only Provisions

Submit a Code Change Request to Ontario-Only Provisions found in Ontario Regulation 447/24 “Ontario Amendments to the National Building Code of Canada 2020”

Ontario’s Building Code improves with each edition thanks to the contributions of building officials, designers, builders, contractors, product manufacturers, researchers, building owners and the public. Typical changes accommodate new materials, systems and building design, clarify requirements, or update references to standards.

The Building Code is a regulation made under the Building Code Act, 1992. Given the joint Federal/Provincial/Territorial Code development process, changes developed by the Canadian Commission on Building and Fire Codes (CCBFC) for the National Building Code (NBC) and the National Plumbing Code (NPC) are considered for inclusion in Ontario’s Building Code. Suggestions for changes to provisions unique to Ontario’s Building Code made by members of the public may also be considered. Potential changes to the Building Code are generally developed following a public consultation process and review by a Building Code technical committee. However, new code change requests and requests related to subject matters already addressed by the National Codes, are intended to be processed by the new joint National Code Development System.

Suggestions to improve Ontario’s Building Code with respect to subject matters unique to Ontario, may be submitted to the Building and Development Branch of the Ministry of Municipal Affairs and Housing. The following points should be considered in developing a request for a Building Code change:

Clarity

Code change requests should clearly identify the specific change being proposed, current Code provisions that would be affected by the change, and the rationale for proposing the change. Proposed language for new Code provisions is helpful.

Supporting Documentation

Code change requests should be accompanied by sufficient documentation to support the need for the change. Documentation may include research, testing results, statistics, case studies, etc.

Cost/Benefit Analysis

Code change requests should include information on implementation costs and the benefits likely to be achieved.

Assessment of Conformance

Code change requests may not be viable if there are no practical means of assessing conformance with the proposed new requirement. Requests should consider whether there are existing tools or models that can be used to assess the conformance of designs or construction with the requirements of the proposed Code change.

Requests also need to consider whether the implementation of Code changes would have implications for enforcement bodies.

Timing

Although requests for changes to the Building Code can be made at any time, it is likely that most changes will be considered for inclusion in the next edition the Building Code. However, “interim” Code changes to the Building Code are possible.

Objectives

The objectives of the Building Code’s requirements (“acceptable solutions”) are set out in Division A. Code change requests should link proposed changes to at least one of the Code’s stated objectives. The addition of a provision that cannot be linked to one of the currently stated objectives would require the addition of new objectives.

Focus on Generic/Widespread Issues

The Building Code’s standards are of general application and it is therefore impractical for the Building Code to deal with specific products or with situations that arise only rarely.

However, innovative products that are not yet covered by standards or mentioned in the Codes are not necessarily excluded from use. Current administrative procedures to enable the use of innovative products are listed in Division C, and include Alternative Solutions, the Building Code Commission, the Building Materials Evaluation Commission and Minister’s Rulings.

Code Change Request Form

Electronic copies of the Building Code change request form may be obtained from the Building Code website at: www.ontario.ca/buildingcode. The code change request form should accompany requested changes. Where the form does not provide sufficient space for the information you wish to include, you are encouraged to attach additional pages as necessary.

Building Code Development Process

Ontario’s Building Code is based on the National Building Code but includes some variations from the NBC that are determined by Ontario-specific priorities such as additional provisions to deal with specific building types and elements such as public pools and public spas, onsite sewage systems, rapid transit stations and Part 11 to address renovations to existing buildings.

New editions of Ontario’s Building Code generally follow the cycle of the NBC and may include technical and editorial changes throughout the Code. Proposed changes are typically provided on the government’s Regulatory Registry and or Environmental Registry websites for public consultation by either posting the proposals or referring to the National website.

The Building Code may be amended at any time and each edition of the Code may be amended several times during the life of that edition. However, the Code is not amended each time an individual Code Change Request is submitted to the Ministry. All Code Change Requests are logged on receipt and may be considered for the next edition or in some instances, they may be considered as part of a general amendment package once sufficient proposals are received. All public consultations and material contained within are subject to government direction.

Present only one change request per form. Duplicate the form as necessary. You may attach additional pages or use any other format to submit your request as long as all of the information indicated below is included. If you are unable to submit your request via the website, please send the completed form to address below.

Personal information submitted on this form is collected under the authority of the Building Code Act, 1992 and will be used for the purpose of Building Code development. Please direct any questions about the collection of personal information to the following address:

2024 CODE CHANGE REQUEST FOR <u>ONTARIO-ONLY</u> PROVISIONS	
<p>Manager, Code Development and Advisory Services Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay Street, 12th Floor Toronto, Ontario M7A 2J3 Email: Codeinfo@ontario.ca</p>	
I am submitting this on behalf of:	<input type="checkbox"/> Myself <input type="checkbox"/> Organization (By selecting organization you are confirming that you are authorized to submit this request on behalf of the organization)
Organization Name	
Your Title	
Your Name	
Address	
City	
Province	
Postal Code	
Telephone	
Email	
Please state your role in relation to this request (check all that apply)	<input type="checkbox"/> Builder / Contractor <hr/> <input type="checkbox"/> Building Official / Principle Authority <hr/> <input type="checkbox"/> Building Owner / Manager <hr/> <input type="checkbox"/> Designer / Architect / Engineer <hr/> <input type="checkbox"/> Home Owner / General Public <hr/> <input type="checkbox"/> Supplier / Manufacturer <hr/> <input type="checkbox"/> Other

State your role if "Other" is checked	
---------------------------------------	--

2024 CODE CHANGE REQUEST FOR ONTARIO-ONLY PROVISIONS

Have you submitted this change to the Canadian Commission on Building and Fire Codes as a proposed amendment to the National Building or Plumbing Codes?

- YES
- NO

Do you consent to share all information on this form with Building Code Review Committees and the Canadian Commission on Building and Fire Codes for the purposes of code development?

I agree:

- YES
- NO

Will your proposal increase/decrease harmonization with the National Construction Codes?

- Increase
 - Decrease
 - I do not know
- Same proposal submitted for NBCC

Is your code change request:

- Changing an existing Building Code provision, appendix note, supplementary standard
- Adding a new Building Code provision, appendix note, supplementary standard

Enter Code Reference of the Requested Change: Division, Part, Section, Subsection, Article, Sentence
(Example: Div. B, 3.17.1.1.(2))

REQUESTED CHANGE/ADDITION:
What is your proposed wording for the change/addition? (Write existing code provision and show changes. Strikethrough for deletion and underlining for new text. Example: "...~~indoor~~ all pools")

ISSUE/GENERAL BACKGROUND:
Why should the existing provision be revised? If requesting an addition to the Building Code, why is it needed?

JUSTIFICATION/EXPLANATION:
How does the requested change address the issue?

2024 CODE CHANGE REQUEST FOR <u>ONTARIO-ONLY</u> PROVISIONS	
OBJECTIVE(S): Which of the Building Code’s objectives does the requested change address? (See Part 2 of Division A of the Building Code for the list of objectives.)	
COST(S): Will the change bring any added construction costs, including labour, and any other costs? (Please provide detailed information to support your proposal)	
BENEFIT(S): Will it provide benefits and/or savings? (Please provide detailed information to support your proposal)	
ENFORCEMENT: Are there any enforcement issues regarding this change/addition? Will its enforcement require an increase in resources?	
ADDITIONAL CONSIDERATIONS: Who will the change impact? How will the requested change/addition impact code users? (Example: building officials, home owners, designers, builders/contractors, engineers, architects, manufacturers, building/business owners, general public.)	
OTHER COMMENTS: For example, identify other Building Code requirements and other Regulations/Standards that might be impacted by the requested change/addition.	
ATTACH SUPPORTING MATERIAL: (Example: research, test results, statistics, case studies that supports the issues, justification, costs, benefits and other information referred above.)	
Submission Date	

Building Code History

The first Ontario Building Code was issued in 1975. The 1975 and subsequent editions of the Building Code have been issued as follows:

Building Code Edition	Date Filed	Effective Date
O. Reg. 925/75 (1975 Building Code)	November 24, 1975	December 31, 1975
O. Reg. 583/83 (1983 Building Code)	September 15, 1983	November 30, 1983
O. Reg. 419/86 (1986 Building Code)	July 18, 1986	October 20, 1986
O. Reg. 413/90 (1990 Building Code)	July 30, 1990	October 1, 1990
O. Reg. 403/97 (1997 Building Code)	November 3, 1997	April 6, 1998
O. Reg. 350/06 (2006 Building Code)	June 28, 2006	December 31, 2006
O. Reg. 332/12 (2012 Building Code)	November 2, 2012	January 1, 2014
O. Reg. 163/24 (2024 Building Code)	April 10, 2024	January 1, 2025

The following Table lists the amendments to the 2024 Building Code made since the filing of O. Reg. 163/24.

Regulatory Amendments to the 2024 Building Code – Ontario Regulation 163/24			
Amendment	Date Filed	Effective Date	Nature of Amendment
O. Reg. 203/24	May 29, 2024	January 1, 2025	Housekeeping changes
O. Reg. 447/24	November 4, 2024	January 1, 2025	18 storey encapsulated mass timber construction, housekeeping changes

Building Code Act, 1992

S.O. 1992, Chapter 23

as amended by:	S.O. 1997	c. 24, s. 224 except s. 224(17) in force June 17, 1998
	S.O. 1997	c. 30, Schedule B, s. 1-20 in force April 6, 1998
	S.O. 1999	c. 12, Schedule M, s. 1-11 in force December 22, 1999
	S.O. 2000	c. 5, s. 7 in force January 1, 2001
	S.O. 2000	c. 26, Schedule K, s. 1 in force December 6, 2000
	S.O. 2002	c. 9, s. 5, 6(1), (2), 16, 24, 25, 27, 31(1), 34, 40(1), 41(1), 43, 51(6), (9), (11)-(15), 53(3), 54, 55 in force September 1, 2003
	S.O. 2002	c. 9, s. 1-4, 6(3), 7-15, 17-19, 20(1), (2), 21-23, 26, 28-30, 31(2), 32, 33, 35-39, 40(2), (3), 41(2), 42, 44-50, 51(1), (2), (4), (5), (7), (8), (10), 52, 53(1), (2) in force July 1, 2005
	S.O. 2002	c. 17, Schedule C, s. 1-6 in force July 1, 2005
	S.O. 2002	c. 17, Schedule F, Table in force January 1, 2003
	S.O. 2005	c. 33, s. 1 in force December 15, 2005
	S.O. 2006	c. 19, Schedule O, s. 1 in force June 22, 2006
	S.O. 2006	c. 21, Schedule F, s. 104, 136(1) in force July 25, 2007
	S.O. 2006	c. 22, s. 112 in force July 3, 2007
	S.O. 2006	c. 32, Schedule C, s. 3 in force January 1, 2007
	S.O. 2006	c. 33, Schedule Z.3, s. 4 in force January 1, 2009
	S.O. 2006	c. 35, Schedule C, s. 8 in force August 20, 2007
	S.O. 2009	c. 12, Schedule J in force May 14, 2009
	S.O. 2009	c. 33, Schedule 6, s. 43 in force June 1, 2011
	S.O. 2009	c. 33, Schedule 21, s. 2(1) in force December 15, 2009
	S.O. 2009	c. 33, Schedule 21, s. 2(4), (7), (8) and (9) in force July 1, 2010
	S.O. 2009	c. 33, Schedule 21, s. 2(2), (3), (5) and (6) in force January 1, 2011
	S.O. 2010	c. 19, Schedule 2, s. 1, s. 2(1), (2) in force April 1, 2011
	S.O. 2014	c. 7, Schedule 3, s. 1 in force July 23, 2014
	S.O. 2015	c. 28, Schedule 1, s. 147 in force January 1, 2018
	S.O. 2017	c. 10, Schedule 4, s. 1 in force May 30, 2017
	S.O. 2017	c. 33, Sched 1, s. 88(1) and (2) in force February 1, 2021
	S.O. 2017	c. 34, Sched. 2, s. 1, 2(1)-(3), 3, 4(1), (2), 5, 6(1), (2), 7, 8(1), (2), 9, 10, 11, 12(1)-(3), 13(1)-(3), 14, 15, 16(1), (2), 17(1), (2), 18 (1), 20, 21(1)-(3), 22, 24(1), (5), (6), 25(1), (2) in force December 14, 2017
	S.O. 2019	c. 14, Sched. 14, s. 1-3 in force December 10, 2019
	S.O. 2020	c. 16, Sched. 1 TBD
	S.O. 2020	c. 18, Sched. 1, s. 1-3 in force July 21, 2020
	S.O. 2023	c. 10, Sched. 1, s. 1 in force June 8, 2023

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Interpretation

Definitions

1(1) In this Act,

“building” means,

- (a) a structure occupying an area greater than ten square metres consisting of a wall, roof and floor or any of them or a structural system serving the function thereof including all plumbing, works, fixtures and service systems appurtenant thereto,
- (b) a structure occupying an area of ten square metres or less that contains plumbing, including the plumbing appurtenant thereto,
- (c) plumbing not located in a structure,
- (c.1) a sewage system, or
- (d) structures designated in the building code; (“bâtiment”)

“building code” means regulations made under section 34; (“code du bâtiment”)

“building condition evaluation” means an evaluation conducted under a building condition evaluation program; (“évaluation de l’état du bâtiment”)

“building condition evaluation program” means a program established under subsection 34(2.3); (“programme d’évaluation de l’état des bâtiments”)

“building owner” means, in respect of a building,

- (a) the registered owner of the land on which the building is located or, if the building is owned separately from the land on which the building is located, the owner of the building, unless the person is a person prescribed in the building code,
- (b) the person that is responsible for maintaining the building or part of the building subject to a building condition evaluation program, unless the person is a person prescribed in the building code, and
- (c) such other persons as may be prescribed; (“propriétaire du bâtiment”)

“change certificate” means a certificate prescribed under the building code or approved by the Minister as a change certificate; (“certificat de modification”)

“chief building official” means a chief building official appointed or constituted under section 3 or 4; (“chef du service du bâtiment”)

“code of conduct” means a code of conduct described in section 7.1; (“code de conduite”)

“construct” means to do anything in the erection, installation, extension or material alteration or repair of a building and includes the installation of a building unit fabricated or moved from elsewhere and “construction” has a corresponding meaning; (“construire”, “construction”, “travaux de construction”)

“demolish” means to do anything in the removal of a building or any material part thereof and “demolition” has a corresponding meaning; (“démolir”, “démolition”, “travaux de démolition”)

“director” means the person appointed as director under section 2; (“directeur”)

“final certificate” means a certificate prescribed under the building code or approved by the Minister as a final certificate; (“certificat définitif”)

“inspector” means an inspector appointed under section 3, 3.1, 4, 6.1 or 6.2; (“inspecteur”)

“maintenance inspection” means an inspection conducted under a maintenance inspection program; (“inspection d’entretien”)

“maintenance inspection program” means a program established under clause 7(1)(b.1) or subsection 34(2.2); (“programme d’inspections d’entretien”)

“Minister” means the Minister of Municipal Affairs and Housing; (“ministre”)

“municipality” means a local municipality; (“municipalité”)

“officer” means a property standards officer who has been assigned the responsibility of administering and enforcing by-laws passed under section 15.1; (“agent”)

“planning board” means a planning board established under section 9 or 10 of the *Planning Act*; (“conseil d’aménagement”)

“plans review certificate” means a certificate prescribed under the building code or approved by the Minister as a plans review certificate; (“certificat d’examen des plans”)

“plumbing” means a drainage system, a venting system and a water system or parts thereof; (“installation de plomberie”)

“principal authority” means,

- (a) the Crown,
- (b) the council of a municipality,
- (c) an upper-tier municipality that has entered into an agreement under subsection 3(5), 6.1(1) or 6.2(1),
- (d) a board of health that has been prescribed for the purposes of subsection 3.1(1) or has entered into an agreement under subsection 6.1(2) or (3) or 6.2(2),
- (e) a planning board that has been prescribed for the purposes of subsection 3.1(1), or
- (f) a conservation authority that has been prescribed for the purposes of subsection 3.1(1) or has entered into an agreement under subsection 6.2(2); (“autorité principale”)

“registered code agency” means a person that has the qualifications and meets the requirements described in subsection 15.11(4); (“organisme inscrit d’exécution du code”)

“regulations” means regulations made under this Act. (“règlements”) 1992, c. 23, s. 1(1); 1997, c. 24, s. 224(1, 2); 1997, c. 30, Sched. B, s. 1; 1999, c. 12, Sched. M, s. 1; 2002, c. 9, s. 2(1-3); 2002, c. 17, Sched. C, s. 1(1); 2002, c. 17, Sched. F, Table; 2006, c. 19, Sched. O, s. 1(1); 2006, c. 21, Sched. F, s. 104(1-3); 2006, c. 22, s. 112(1); 2017, c. 34, Sched. 2, s. 1.

Interpretation

(1.1) Except as provided in subsection (1.2), a reference to “this Act” in any provision of this Act shall be deemed to be a reference to this Act excluding sections 15.1 to 15.8. 1997, c. 24, s. 224(3).

Same

(1.2) A reference to “this Act” in subsection 1(1) and sections 2, 16, 19, 20, 21, 27, 31, 36 and 37 includes a reference to sections 15.1 to 15.8. 1997, c. 24, s. 224(3).

Chief Building Official

(1.3) A reference to the “chief building official” in this Act, other than in subsections 1(1), 3(2), (3) and (6) and section 4, includes an inspector who has the same powers and duties as the chief building official,

- (a) in relation to sewage systems by virtue of subsections 3.1(3) or 6.2(4); and
- (b) in relation to plumbing by virtue of subsection 6.1(5). 2002, c. 9, s. 2(4).

Exclusion

(2) This Act does not apply to structures used directly in the extraction of ore from a mine. 1992, c. 23, s. 1(2).

Role of Various Persons

1.1(1) It is the role of every person who causes a building to be constructed,

- (a) to cause the building to be constructed in accordance with this Act and the building code and with any permit issued under this Act for the building;
- (b) to ensure that construction does not proceed unless any permit required under this Act has been issued by the chief building official; and
- (c) to ensure that construction is carried out only by persons with the qualifications and insurance, if any, required by this Act and the building code. 2002, c. 9, s. 3.

Role of Designers

(2) It is the role of a designer,

- (a) if the designer’s designs are to be submitted in support of an application for a permit under this Act, to provide designs which are in accordance with this Act and the building code and to provide documentation that is sufficiently detailed to permit the design to be assessed for compliance with this Act and the building code and to allow a builder to carry out the work in accordance with the design, this Act and the building code;
- (b) to perform the role described in clause (a) in respect of only those matters for which the designer has the qualifications, if any, required by this Act and the building code; and
- (c) if the building code requires that all or part of the design or construction of a building be under general review, to perform the general review in respect of only those matters for which the designer has the qualifications, if any, required by this Act and the building code. 2002, c. 9, s. 3.

Role of Builders

(3) It is the role of a builder,

- (a) to ensure that construction does not proceed unless any permit required under this Act has been issued by the chief building official;
- (b) to construct the building in accordance with the permit;
- (c) to use appropriate building techniques to achieve compliance with this Act and the building code; and
- (d) when site conditions affect compliance with the building code, to notify the designer and an inspector or the registered code agency, as appropriate. 2002, c. 9, s. 3.

Role of Manufacturers, etc.

(4) It is the role of manufacturers, suppliers and retailers of products that are intended for use in Ontario in the construction of a building for a purpose that is regulated by this Act or the building code to ensure that the products comply with the standards established under this Act and the building code. 2002, c. 9, s. 3.

Role of Building Owners

(4.1) It is the role of a building owner,

- (a) to ensure that the building or part of the building is maintained, repaired and evaluated in accordance with this Act and the building code; and
- (b) to ensure documents, records and other information about the building are kept and provided in accordance with this Act and the building code. 2017, c. 34, Sched. 2, s. 2(1).

Role of Persons Conducting Building Condition Evaluations

(4.2) It is the role of a person who conducts a building condition evaluation,

- (a) to carry out the responsibilities of that person under a building condition evaluation program in accordance with this Act and the building code; and
- (b) to perform the role described in clause (a) in respect of only those matters for which the person has the qualifications, if any, required by this Act and the building code. 2017, c. 34, Sched. 2, s. 2(1).

Role of Registered Code Agencies

(5) It is the role of a registered code agency,

- (a) to exercise powers and perform duties under this Act and the building code in connection with reviewing plans, issuing certificates, inspecting construction and performing other functions in accordance with this Act and the building code; and
- (b) to carry out the duties of a registered code agency under this Act and the building code in respect of only those matters for which the registered code agency is qualified under this Act and the building code. 2002, c. 9, s. 3.

Role of Chief Building Officials

(6) It is the role of a chief building official,

- (a) to establish operational policies for the enforcement of this Act and the building code within the applicable jurisdiction;
- (b) to co-ordinate and oversee the enforcement of this Act and the building code within the applicable jurisdiction;

- (c) to exercise powers and perform the other duties assigned to him or her under this Act and the building code; and
- (d) to exercise powers and perform duties in an independent manner and in accordance with the standards established by the applicable code of conduct. 2002, c. 9, s. 3; 2017, c. 34, Sched. 2, s. 2(2).

Role of Inspectors

(7) It is the role of an inspector,

- (a) to exercise powers and perform duties under this Act and the building code in connection with reviewing plans, inspecting construction, conducting maintenance inspections and issuing orders in accordance with this Act and the building code;
- (b) to exercise powers and perform duties in respect of only those matters for which he or she has the qualifications required by this Act and the building code; and
- (c) to exercise powers and perform duties in an independent manner and in accordance with the standards established by the applicable code of conduct. 2002, c. 9, s. 3; 2006, c. 22, s. 112(2); 2017, c. 34, Sched. 2, s. 2(3).

Limitation

(8) Nothing in this section relieves any person from the duty to comply with any part of this Act or the building code or affects the rights or duties of a person not mentioned in this section in respect of the construction of a building. 2002, c. 9, s. 3; 2006, c. 19, Sched. O, s. 1(2).

Enforcement Authorities**Administration**

2(1) The Minister is responsible for the administration of this Act. 1992, c. 23, s. 2(1).

Director

(2) There shall be a director of the Building and Development Branch of the Ministry of Municipal Affairs and Housing who is appointed by the Lieutenant Governor in Council for the purposes of this Act. 2002, c. 9, s. 5.

Acting Director

(3) The director may designate in writing a public servant employed under Part III of the *Public Service of Ontario Act, 2006* who works in the Ministry of Municipal Affairs and Housing to exercise the powers and perform the duties of the director in his or her absence or if he or she is unable to act. 2009, c. 33, Sched. 21, s. 2(1).

Delegation

(4) The director may delegate in writing any of his or her powers or duties to one or more public servants employed under Part III of the *Public Service of Ontario Act, 2006* who work in the Ministry of Municipal Affairs and Housing, and may impose conditions or restrictions with respect to the delegation. 2009, c. 33, Sched. 21, s. 2(1).

Enforcement by Municipalities

3(1) The council of each municipality is responsible for the enforcement of this Act in the municipality, except where otherwise provided by this Act. 2002, c. 9, s. 6(1).

Chief Building Official, Inspectors

(2) The council of each municipality shall appoint a chief building official and such inspectors as are necessary for the enforcement of this Act in the areas in which the municipality has jurisdiction. 1992, c. 23, s. 3(2).

(2.1) REPEALED: 2002, c. 9, s. 6(2).

Joint Enforcement

(3) The councils of two or more municipalities may enter into an agreement,

- (a) providing for the joint enforcement of this Act within their respective municipalities;
- (b) providing for the sharing of costs incurred in the enforcement of this Act within their respective municipalities; and
- (c) providing for the appointment of a chief building official and inspectors. 1992, c. 23, s. 3(3).

Joint Jurisdiction

(4) If an agreement under subsection (3) is in effect, the municipalities have joint jurisdiction in the area comprising the municipalities. 1992, c. 23, s. 3(4).

Enforcement by Upper-Tier

(5) The council of an upper-tier municipality and of one or more municipalities in the upper-tier municipality may enter into an agreement for the enforcement by the upper-tier municipality of this Act in the municipalities and for charging the municipalities the whole or part of the cost. 2002, c. 17, Sched. F, Table.

Power of Upper-Tier

(6) If an agreement under subsection (5) is in effect, the upper-tier municipality has jurisdiction for the enforcement of this Act in the municipalities that are parties to the agreement and shall appoint a chief building official and such inspectors as are necessary for that purpose. 2002, c. 17, Sched. F, Table.

(7) REPEALED: 2002, c. 17, Sched. F, Table.

Certificate

(8) The clerk of the municipality or upper-tier municipality shall issue a certificate of appointment bearing the clerk's signature or a facsimile of it to the chief building official and each inspector appointed by the municipality or upper-tier municipality. 1992, c. 23, s. 3(8); 2002, c. 17, Sched. F, Table.

Records

(9) Every municipality and every upper-tier municipality that has jurisdiction for the enforcement of this Act shall retain such records as may be prescribed by regulation for the prescribed period of time. 2002, c. 9, s. 6(3); 2002, c. 17, Sched. C, s. 2(1).

Enforcement, Boards of Health

3.1(1) A board of health, a planning board or a conservation authority prescribed in the building code is responsible for the enforcement of the provisions of this Act and the building code related to sewage systems in the municipalities and territory without municipal organization prescribed in the building code. 1997, c. 30, Sched. B, s. 3; 1999, c. 12, Sched. M, s. 2(1).

Inspectors

(2) The board of health, planning board or conservation authority shall appoint such sewage system inspectors as are necessary for the enforcement of this Act in the areas in which the board of health, planning board or conservation authority has jurisdiction under subsection (1). 1997, c. 30, Sched. B, s. 3; 1999, c. 12, Sched. M, s. 2(2).

Powers

(3) A sewage system inspector appointed under this section in an area of jurisdiction or, if there is more than one inspector in the area of jurisdiction, the inspector designated by the board of health, planning board or conservation authority has the same powers and duties in relation to sewage systems as does the chief building official in respect of buildings. 1997, c. 30, Sched. B, s. 3; 1999, c. 12, Sched. M, s. 2(3).

Jurisdiction

(4) A board of health, planning board or conservation authority prescribed for the purposes of subsection (1) has jurisdiction for the enforcement of this Act in the prescribed municipalities and territory without municipal organization. 1997, c. 30, Sched. B, s. 3; 1999, c. 12, Sched. M, s. 2(4).

Responsibility

(5) If sewage system inspectors have been appointed under this section, the chief building official and inspectors appointed under section 3 or 4 shall not exercise their powers under this Act in respect of sewage systems. 1997, c. 30, Sched. B, s. 3.

Certificate

(6) The medical officer of health or the secretary-treasurer of a planning board or conservation authority shall issue a certificate of appointment bearing his or her signature, or a facsimile of it, to each sewage system inspector appointed by the board of health, planning board or conservation authority. 1997, c. 30, Sched. B, s. 3; 1999, c. 12, Sched. M, s. 2(5).

Records

(7) Every board of health, planning board and conservation authority prescribed for the purposes of subsection (1) shall retain such records as may be prescribed by regulation for the prescribed period of time. 2002, c. 9, s. 7.

Provincial Enforcement

4(1) Subject to section 3.1, Ontario is responsible for the enforcement of this Act in a territory without municipal organization. 1992, c. 23, s. 4(1); 1997, c. 30, Sched. B, s. 4.

Agreements

(2) The council of a municipality and the Crown in right of Ontario represented by the Minister may enter into an agreement providing for the enforcement of this Act in the municipality by Ontario subject to such payment in respect of costs as is set out in the agreement. 1992, c. 23, s. 4(2).

Idem

(3) If an agreement under subsection (2) is in effect, Ontario has jurisdiction for the enforcement of this Act in the municipality. 1992, c. 23, s. 4(3).

Inspectors

(4) The Deputy Minister of Municipal Affairs and Housing shall appoint inspectors necessary for the enforcement of this Act in the areas in which Ontario has jurisdiction. 2023, c. 10, Sched. 1, s. 1.

Chief Building Official

(5) The director is the chief building official for the areas in which Ontario has jurisdiction. 1992, c. 23, s. 4(5).

Certificate

(6) The Deputy Minister of Municipal Affairs and Housing shall issue a certificate of appointment bearing his or her signature or a facsimile of it to the director and each inspector appointed under subsection (4). 1992, c. 23, s. 4(6); 1997, c. 24, s. 224(5).

Enforcement by Registered Code Agency Appointed by a Principal Authority

4.1(1) Subject to this Act and the building code, a principal authority may enter into agreements with registered code agencies authorizing the agency to perform the functions specified in the agreement in respect of the construction of any building or class of building specified in the agreement. 2002, c. 9, s. 8.

Appointment

(2) After entering into the agreement with the registered code agency, the principal authority may appoint the agency to perform specified functions in respect of the construction of a building or class of buildings. 2002, c. 9, s. 8.

Delegation of Power to Appoint

(3) The principal authority may delegate, in writing, to the chief building official the authority to make appointments described in subsection (2), and may impose conditions or restrictions with respect to the delegation. 2002, c. 9, s. 8; 2020, c. 18, Sched. 1, s. 1.

Same

(4) Unless otherwise provided in the building code, an appointment of a registered code agency may authorize the agency to perform all of the applicable functions described in section 15.15,

- (a) before a permit is issued under section 8;
- (b) after a permit is issued under section 8; or
- (c) both before and after a permit is issued under section 8. 2002, c. 9, s. 8.

Conflicts

(5) A registered code agency shall not accept an appointment in the circumstances set out in the building code or if it would have a conflict of interest as determined in accordance with the building code. 2002, c. 9, s. 8.

Effect of Appointment

(6) A registered code agency shall perform the functions specified in the appointment for the construction of a specified building or class of buildings and subject to the restrictions set out in this Act and the building code, and shall do so in the manner and subject to the restrictions, if any, set out in the building code. 2002, c. 9, s. 8.

Same

(7) The duty of the registered code agency to perform those functions begins when the appointment is made and ends when the appointment expires as described in section 15.19 or is terminated in accordance with section 15.20. 2002, c. 9, s. 8.

Notice to the Director

(8) A principal authority that appoints a registered code agency shall give the director such information as may be prescribed by regulation. 2002, c. 9, s. 8.

Enforcement by Registered Code Agency Appointed by an Applicant

4.2(1) This section applies only if a principal authority authorizes it, by regulation, by-law or resolution, as the case may be, to apply within the jurisdiction of the principal authority. 2002, c. 9, s. 8.

Appointment

(2) Subject to this Act and the building code, a prescribed person who is entitled to apply for a permit under section 8 of this Act may appoint a registered code agency to perform all of the functions described in section 15.15 in respect of the construction of a building. 2002, c. 9, s. 8.

Exception

- (3) Subsection (2) does not apply,
- (a) if a registered code agency has been appointed by a principal authority to perform any function in respect of the construction; or
 - (b) if an inspector has begun to perform any function in respect of the construction. 2002, c. 9, s. 8.

Manner of Appointment

(4) The appointment must be made in writing in the prescribed manner and is subject to the prescribed conditions and restrictions. 2002, c. 9, s. 8.

Conflicts

(5) A registered code agency shall not accept an appointment in the circumstances set out in the building code or if it would have a conflict of interest as determined in accordance with the building code. 2002, c. 9, s. 8.

Effect of Appointment

(6) A registered code agency shall perform its functions for the specified building subject to the restrictions set out in this Act and the building code and shall do so in the manner and subject to the restrictions, if any, set out in the building code. 2002, c. 9, s. 8.

Same

(7) The duty of the registered code agency to perform those functions begins when the appointment is made and ends when the appointment expires as described in section 15.19 or is terminated in accordance with section 15.20. 2002, c. 9, s. 8.

Replacement Agency

(8) A person who has appointed a registered code agency under subsection (2) in respect of the construction of a building cannot replace the agency after it has begun to perform any function in respect of the construction unless the appointment of that agency has expired as described in section 15.19 or has been terminated in accordance with section 15.20. 2002, c. 9, s. 8.

Notice to Director

(9) The person who appoints a registered code agency under this section shall give the director such information as may be prescribed by regulation. 2002, c. 9, s. 8.

Notice to Chief Building Official

(10) The person who appoints a registered code agency under this section shall give the chief building official such information as may be prescribed by regulation. 2002, c. 9, s. 8.

Agreements re Enforcement

5(1) The council of a municipality and the Crown in right of Ontario represented by the Minister may enter into an agreement providing for the enforcement of this Act by the municipality in such part of the territory without municipal organization and subject to such payment in respect of costs as is set out in the agreement. 1992, c. 23, s. 5(1); 2017, c. 34, Sched. 2, s. 3.

Area of Municipal Jurisdiction

(2) The municipality has jurisdiction for the enforcement of this Act in the area designated in the agreement. 1992, c. 23, s. 5(2).

Application

(3) An agreement under this section may apply to the enforcement of all or any part of this Act or the building code. 1997, c. 30, Sched. B, s. 5.

Agreement re Review of Plans

- 6(1) Two or more principal authorities may enter into an agreement providing for,
- (a) the review by a principal authority for compliance with the building code of plans and specifications for the construction of a building within its area of jurisdiction;

- (b) an expedited review by another principal authority for compliance with the building code of plans and specifications for the construction of substantially similar buildings;
- (c) the allocation of responsibility for reviews for compliance with the building code of plans and specifications for the construction of buildings;
- (d) the resolution of disagreements about whether plans and specifications comply with the building code;
- (e) indemnification; and
- (f) such other matters as may be necessary to give effect to the agreement. 2002, c. 9, s. 9.

Delegation

(2) A principal authority may delegate to the chief building official the authority to make such decisions under an agreement as may be necessary for its implementation. 2002, c. 9, s. 9.

Agreement re Plumbing

6.1(1) Despite any other provision of this Act, the council of an upper-tier municipality and of one or more municipalities in the upper-tier municipality may enter into an agreement for the enforcement by the upper-tier municipality of the provisions of this Act and the building code related to plumbing in the municipalities and for charging the municipalities the whole or part of the cost. 2002, c. 17, Sched. C, s. 3(1).

Delegation to Health Unit

(2) If an agreement under subsection (1) is in effect, the council of an upper-tier municipality may by agreement delegate its powers under subsection (1) to a board of health having jurisdiction in the municipalities that are parties to the agreement. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(2).

Delegation by Municipality

(3) A municipality that is not a party to an agreement under subsection (1) may enter into an agreement with the board of health having jurisdiction in the municipality for the enforcement of the provisions of this Act and the building code relating to plumbing. 2002, c. 9, s. 10.

Plumbing Inspectors

(4) The council of an upper-tier municipality or the board of health may appoint plumbing inspectors for the purpose of this section. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(3).

Powers

(5) A plumbing inspector appointed under this section or, if there is more than one inspector in the area of jurisdiction, the senior plumbing inspector has the same powers and duties in relation to plumbing as does the chief building official in respect of buildings other than the issuance of conditional permits. 2002, c. 9, s. 10.

Responsibility

(6) If plumbing inspectors have been appointed under this section, the chief building official and inspectors appointed under section 3 or 4 shall not exercise their powers under this Act in respect of plumbing. 2002, c. 9, s. 10.

Application

(7) Subsections 3(8) and (9) and section 7 apply with necessary modifications to the council of an upper-tier municipality or a board of health that has assumed responsibility for plumbing under this section. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(4).

Transition, Plumbing

(8) If, on July 1, 1993, an upper-tier municipality was carrying out plumbing inspections under the *Ontario Water Resources Act* in the municipalities that formed part of the upper-tier municipality, the upper-tier municipality shall enforce the provisions of this Act and the building code related to plumbing in all of the municipalities forming part of the upper-tier municipality until the council of the upper-tier municipality by by-law determines otherwise, whereupon section 3 applies. 2002, c. 17, Sched. C, s. 3(5).

Same

(9) Subsections (4) to (7) apply with necessary modifications to an upper-tier municipality that has assumed responsibility for plumbing under subsection (8). 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(6).

Interpretation

(10) For the purpose of subsection (8), an upper-tier municipality that has been deemed to be a county by any general or special Act for the purposes of section 76 of the *Ontario Water Resources Act*, as it read on June 30, 1993, shall be deemed to be an upper-tier municipality that was carrying out plumbing inspections under the *Ontario Water Resources Act* in the municipalities that formed part of the upper-tier municipality for municipal purposes on July 1, 1993. 2002, c. 17, Sched. C, s. 3(7).

Agreement re Sewage Systems

6.2(1) Despite any other provision of this Act, the council of an upper-tier municipality and of one or more municipalities in the upper-tier municipality may enter into an agreement for the enforcement by the upper-tier

municipality of the provisions of this Act and the building code related to sewage systems in the municipalities and for charging the municipalities the whole or part of the cost. 2002, c. 17, Sched. C, s. 3(8).

Delegation

(2) A municipality that is not a party to an agreement under subsection (1) may enter into an agreement with a board of health or a conservation authority having jurisdiction in the municipality for the enforcement of the provisions of this Act and the building code related to sewage systems. 2002, c. 9, s. 10.

Inspectors

(3) The council of an upper-tier municipality, board of health or conservation authority may appoint sewage system inspectors for the purposes of this section. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(9).

Powers

(4) A sewage system inspector appointed under this section in an area of jurisdiction or, if there is more than one inspector in the area of jurisdiction, the inspector designated by the council of an upper-tier municipality, board of health or conservation authority has the same powers and duties in relation to sewage systems as does the chief building official in respect of buildings. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(10).

Responsibility

(5) If sewage system inspectors have been appointed under this section, the chief building official and inspectors appointed under section 3 or 4 shall not exercise their powers under this Act in respect of sewage systems. 2002, c. 9, s. 10.

Application

(6) Subsections 3(8) and (9) and section 7 apply with necessary modifications to the council of an upper-tier municipality, board of health or conservation authority that has assumed responsibility for sewage systems under this section. 2002, c. 9, s. 10; 2002, c. 17, Sched. C, s. 3(11).

By-Laws, Resolutions, Regulations

7(1) The council of a municipality or of an upper-tier municipality that has entered into an agreement under subsection 3(5) or a board of health prescribed for the purposes of section 3.1 may pass by-laws, a planning board prescribed for the purposes of section 3.1 may pass resolutions and a conservation authority prescribed for the purposes of section 3.1 or the Minister may make regulations, applicable to the matters for which and in the area in which the municipality, upper-tier municipality, board of health, planning board, conservation authority or

the Province of Ontario, respectively, has jurisdiction for the enforcement of this Act,

- (a) prescribing classes of permits under this Act, including permits in respect of any stage of construction or demolition;
- (b) providing for applications for permits and requiring the applications to be accompanied by such plans, specifications, documents and other information as is prescribed;
- (b.1) subject to the regulations made under subsection 34(2.1), establishing and governing a program to enforce standards prescribed under clause 34(2)(b), in addition to any programs established under subsection 34(2.2);
- (b.2) subject to the regulations made under subsection 34(2.2), governing a program established under subsection 34(2.2);
- (c) requiring the payment of fees and prescribing the amounts of the fees,
 - (i) on application for and on issuance of permits,
 - (ii) for maintenance inspections,
 - (iii) for providing documentation, records or other information under section 15.10.4, and
 - (iv) for providing information under subsection 15.10.6(2);
- (c.1) requiring the payment of interest and other penalties, including payment of collection costs, when fees are unpaid or are paid after the due date;
- (d) providing for refunds of fees under such circumstances as are prescribed;
- (e) requiring a person specified in the building code to give notice to the chief building official or an inspector or to a registered code agency if one is appointed, of any of the stages of construction specified in the building code, in addition to the stages of construction prescribed under subsection 10.2(1) and prescribing the period of time after such notice is given during which an inspection may be carried out;
- (f) prescribing forms respecting permits and applications for permits and providing for their use;
- (g) enabling the chief building official to require that a set of plans of a building or any class of buildings as constructed be filed with the chief building official on completion of the construction under such conditions as may be prescribed in the building code;
- (h) providing for the transfer of permits when land changes ownership;

- (i) requiring the person to whom a permit is issued to erect and maintain fences to enclose the site of the construction or demolition within such areas of the municipality as may be prescribed;
- (j) prescribing the height and description of the fences required under clause (i). 1992, c. 23, s. 7; 1997, c. 30, Sched. B, s. 6; 1999, c. 12, Sched. M, s. 3; 2002, c. 9, s. 11(1); 2002, c. 17, Sched. F, Table; 2006, c. 19, Sched. O, s. 1(5); 2006, c. 22, s. 112(3-5); 2017, c. 34, Sched. 2, s. 4(1); 2020, c. 18, Sched. 1, s. 2.

Fees

(2) The total amount of the fees authorized under clause (1)(c) must not exceed the anticipated reasonable costs of the principal authority to administer and enforce this Act in its area of jurisdiction. 2002, c. 9, s. 11(2).

Reduction in Fees

(3) A regulation, by-law or resolution establishing fees under subclause (1)(c)(i) must provide for reduced fees to be payable in respect of the construction of a building for which a registered code agency is appointed under section 4.2. 2002, c. 9, s. 11(2); 2017, c. 34, Sched. 2, s. 4(2).

Report on Fees

(4) Every 12 months, each principal authority shall prepare a report that contains such information as may be prescribed about any fees authorized under clause (1)(c) and costs of the principal authority to administer and enforce this Act in its area of jurisdiction. 2002, c. 9, s. 11(2).

Same

(5) The principal authority shall make its report available to the public in the manner required by regulation. 2002, c. 9, s. 11(2).

Change in Fees

(6) If a principal authority proposes to change any fee imposed under clause (1)(c), the principal authority shall,

- (a) give notice of the proposed changes in fees to such persons as may be prescribed; and
- (b) hold a public meeting concerning the proposed changes. 2002, c. 9, s. 11(2); 2006, c. 22, s. 112(6).

Same, Notice

(7) The notice of proposed changes in fees must contain the prescribed information, including information about the public meeting, and must be given in the prescribed manner. 2002, c. 9, s. 11(2).

Same, Public Meeting

(8) The public meeting concerning proposed changes in fees must be held within the period specified by regulation before the regulation, by-law or resolution to implement the proposed changes is made. 2002, c. 9, s. 11(2).

Fees May be Added to Tax Roll

(8.1) Section 398 of the *Municipal Act, 2001* or section 264 of the *City of Toronto Act, 2006*, as the case may be, applies, with necessary modifications, to fees established by a municipality or local board under clause (1)(c) and, with the approval of the treasurer of a local municipality, to fees established under clause (1)(c) by a conservation authority whose area of jurisdiction includes any part of the local municipality. 2006, c. 22, s. 112(7).

Forms

(9) The power to prescribe forms under clause (1)(f) does not include the power to prescribe a form for a particular purpose where there is a form for that purpose prescribed in the building code or approved by the Minister. 2002, c. 9, s. 11(2); 2006, c. 21, Sched. F, s. 104(4).

Code of Conduct

7.1(1) A principal authority shall establish and enforce a code of conduct for the chief building official and inspectors. 2002, c. 9, s. 12.

Purposes

- (2) The following are the purposes of a code of conduct:
1. To promote appropriate standards of behaviour and enforcement actions by the chief building official and inspectors in the exercise of a power or the performance of a duty under this Act or the building code.
 2. To prevent practices which may constitute an abuse of power, including unethical or illegal practices, by the chief building official and inspectors in the exercise of a power or the performance of a duty under this Act or the building code.
 3. To promote appropriate standards of honesty and integrity in the exercise of a power or the performance of a duty under this Act or the building code by the chief building official and inspectors. 2002, c. 9, s. 12.

Contents

(3) A code of conduct must provide for its enforcement and include policies or guidelines to be used when responding to allegations that the code has been breached and disciplinary actions that may be taken if the code is breached. 2002, c. 9, s. 12.

Public Notice

(4) The principal authority shall ensure that the code of conduct is brought to the attention of the public. 2002, c. 9, s. 12.

Construction and Demolition**Building Permits**

8(1) No person shall construct or demolish a building or cause a building to be constructed or demolished unless a permit has been issued therefor by the chief building official. 1992, c. 23, s. 8(1); 1997, c. 30, Sched. B, s. 7(1).

Application for Permit

(1.1) An application for a permit to construct or demolish a building may be made by a person specified by regulation and the prescribed form or the form approved by the Minister must be used and be accompanied by the documents and information specified by regulation. 2002, c. 9, s. 14(1); 2006, c. 21, Sched. F, s. 104(5).

Issuance of Permits

(2) The chief building official shall issue a permit referred to in subsection (1) unless,

- (a) the proposed building, construction or demolition will contravene this Act, the building code or any other applicable law;
- (b) the applicant is a builder or vendor as defined in subsection 1(1) of the *New Home Construction Licensing Act, 2017* and is not licensed under that Act;
- (b.1) the *Architects Act* or the *Professional Engineers Act* requires that the proposed construction of the building be designed by an architect or a professional engineer or a combination of both and the proposed construction is not so designed;
- (c) a person who prepared drawings, plans, specifications or other documents or gave an opinion concerning the compliance of the proposed building or construction with the building code does not have the applicable qualifications, if any, set out in the building code or does not have the insurance, if any, required by the building code;
- (d) the plans review certificate, if any, required for the application does not contain the prescribed information;
- (e) the application for the permit is not complete; or
- (f) any fees due have not been paid. 2002, c. 9, s. 14(2); 2014, c. 7, Sched. 3, s. 1; 2015, c. 28, Sched. 1, s. 147; 2017, c. 33, Sched. 1, s. 88(1).

Restriction

(2.1) If the application includes a plans review certificate that contains the prescribed information, the chief building official is not entitled to refuse to issue the permit on the grounds that the proposed construction of the building to which the certificate relates does not comply with the building code. 2002, c. 9, s. 14(2).

Decision

(2.2) If an application for a permit meets the requirements prescribed by regulation, the chief building official shall, unless the circumstances prescribed by regulation apply, decide within the period prescribed by regulation whether to issue the permit or to refuse to issue it. 2009, c. 33, Sched. 21, s. 2(2).

Same, Reasons for Refusal

(2.3) If the chief building official refuses to issue the permit, he or she shall inform the applicant of all of the reasons for the refusal of the permit and shall do so within the period prescribed by regulation. 2002, c. 9, s. 14(2).

Conditional Permit

(3) Even though all requirements have not been met to obtain a permit under subsection (2), the chief building official may issue a conditional permit for any stage of construction if,

- (a) compliance with by-laws passed under sections 34 and 38 of the *Planning Act* and with such other applicable law as may be set out in the building code has been achieved in respect of the proposed building or construction;
- (b) the chief building official is of the opinion that unreasonable delays in the construction would occur if a conditional permit is not granted; and
- (c) the applicant and such other person as the chief building official determines agree in writing with the municipality, upper-tier municipality, board of health, planning board, conservation authority or the Crown in right of Ontario to,
 - (i) assume all risk in commencing the construction,
 - (ii) obtain all necessary approvals in the time set out in the agreement or, if none, as soon as practicable,
 - (iii) file plans and specifications of the complete building in the time set out in the agreement,
 - (iv) at the applicant's own expense, remove the building and restore the site in the manner specified in the agreement if approvals are not obtained or plans filed in the time set out in the agreement, and

- (v) comply with such other conditions as the chief building official considers necessary, including the provision of security for compliance with subclause (iv). 1992, c. 23, s. 8(3); 1997, c. 30, Sched. B, s. 7(2); 1999, c. 12, Sched. M, s. 5(1); 2002, c. 17, Sched. F, Table.

Delegation re Conditional Permits

(3.1) A principal authority may, in writing, delegate to the chief building official the power to enter into agreements described in clause (3)(c) and may impose conditions or restrictions with respect to the delegation. 2002, c. 9, s. 14(3).

Criteria

(4) In considering whether a conditional permit should be granted, the chief building official shall, among other matters, have regard to the potential difficulty in restoring the site to its original state and use if required approvals are not obtained. 1992, c. 23, s. 8(4).

Registration

(5) Any agreement entered into under clause (3)(c) may be registered against the land to which it applies and the municipality, upper-tier municipality, board of health, planning board, conservation authority or the Province of Ontario, as the case may be, is entitled to enforce its provisions against the registered owner and, subject to the Registry Act and the Land Titles Act, any person acquiring any interest in the land subsequent to the registration of the agreement. 1999, c. 12, Sched. M, s. 5(2); 2002, c. 17, Sched. F, Table; 2017, c. 34, Sched. 2, s. 5.

Enforcement of Agreement

(6) If the chief building official determines that a building has not been removed or a site restored as required by an agreement under clause (3)(c), the chief building official may cause the building to be removed and the site restored and for this purpose the chief building official, an inspector and their agents may enter upon the land and into the building governed by the agreement at any reasonable time without a warrant. 1992, c. 23, s. 8(6).

Lien

(7) If the building is in a municipality, the municipality shall have a lien on the land for the amount spent on the removal of the building and restoration of the site under subsection (6) and the amount shall have priority lien status as described in section 1 of the *Municipal Act, 2001* or section 3 of the *City of Toronto Act, 2006*, as the case may be. 2002, c. 17, Sched. F, Table; 2006, c. 32, Sched. C, s. 3(1).

Deemed Taxes

(8) If the building is in territory without municipal organization, the amount spent on the removal of the building and restoration of the site under subsection (6) is a debt owing to the Crown and may be collected under the *Provincial Land Tax Act, 2006* as if it was tax imposed under that Act. 1992, c. 23, s. 8(8); 2006, c. 33, Sched. Z.3, s. 4(1).

Disclosure of Prescribed Information

(8.1) The chief building official shall, within the period and in the manner prescribed by regulation, give to the corporation designated under section 2 of the *Ontario New Home Warranties Plan Act* the information prescribed by regulation relating to permits issued under this section and the applications for those permits. 2009, c. 33, Sched. 21, s. 2(3).

Referral of Plans, etc.

(9) Upon reasonable grounds, the chief building official or registered code agency may refer drawings, plans or specifications accompanying applications for permits or the reports arising out of the general review of the construction of a building to the Association of Professional Engineers of Ontario or the Ontario Association of Architects for the purpose of determining if the *Professional Engineers Act* or the *Architects Act* is being contravened. 2002, c. 9, s. 14(4).

Same

(9.1) At the request of the Association of Professional Engineers of Ontario or the Ontario Association of Architects, the chief building official shall refer documents and information described in subsection (9) to those associations for the purpose of determining if the *Professional Engineers Act* or the *Architects Act* is being contravened. 2002, c. 9, s. 14(4).

Revocation of Permits

- (10) Subject to section 25, the chief building official may revoke a permit issued under this Act,
- (a) if it was issued on mistaken, false or incorrect information;
 - (b) if, after six months after its issuance, the construction or demolition in respect of which it was issued has not, in the opinion of the chief building official, been seriously commenced;
 - (c) if the construction or demolition of the building is, in the opinion of the chief building official, substantially suspended or discontinued for a period of more than one year;
 - (d) if it was issued in error;

- (e) if the holder requests in writing that it be revoked; or
- (f) if a term of the agreement under clause (3)(c) has not been complied with. 1992, c. 23, s. 8(10).

Prohibition

(11) No person shall construct or demolish a building or cause a building to be constructed or demolished except in accordance with this Act and the building code. 1992, c. 23, s. 8(11).

Notice of Change

(12) No person shall make a material change or cause a material change to be made to a plan, specification, document or other information on the basis of which a permit was issued without notifying, filing details with and obtaining the authorization of the chief building official. 1992, c. 23, s. 8(12).

Prohibition

(13) No person shall construct or demolish a building or cause a building to be constructed or demolished except in accordance with the plans, specifications, documents and any other information on the basis of which a permit was issued or any changes to them authorized by the chief building official. 1992, c. 23, s. 8(13).

Restriction

(14) If a request for authorization referred to in subsection (12) or (13) is accompanied by a change certificate that contains the prescribed information, the chief building official is not entitled to refuse to authorize the change on the grounds that the construction of the building to which the certificate relates does not comply with the building code. 2002, c. 9, s. 14(5).

9 REPEALED: 2009, c. 33, Sched. 21, s. 2(4).

Change of Use

(10) Even though no construction is proposed, no person shall change the use of a building or part of a building or permit the use to be changed if the change would result in an increase in hazard, as determined in accordance with the building code, unless a permit has been issued by the chief building official. 2002, c. 9, s. 16.

Permit

- (2) The chief building official shall issue a permit under subsection (1), unless,
- (a) the building if used as proposed would result in a contravention of this Act or the building code or any other applicable law;

- (b) the application for it is incomplete; or
- (c) any fees due are unpaid. 1992, c. 23, s. 10(2).

Prohibition re Sewage Systems

10.1 No person shall operate or maintain a sewage system or permit a sewage system to be operated or maintained except in accordance with this Act and the building code. 1997, c. 30, Sched. B, s. 9.

Notice of Readiness for Inspection

10.2(1) At each stage of construction specified in the building code, the prescribed person shall notify the chief building official or the registered code agency, if any, that the construction is ready to be inspected. 2002, c. 9, s. 17.

Inspection

(2) After the notice is received, an inspector or the registered code agency, as the case may be, shall carry out the inspection required by the building code within the prescribed period. 2002, c. 9, s. 17.

Occupancy or Use After Completion

11(1) Except as authorized by the building code, a person shall not occupy or use a building or part of a building that is newly erected or installed or permit it to be occupied or used until the requirements set out in this section are met. 2002, c. 9, s. 18.

Notice of Date of Completion

(2) Notice of the date of completion of the building or part must be given to the chief building official or the registered code agency, if any. 2002, c. 9, s. 18.

Final Certificate

(3) If a registered code agency has been appointed for the building or part of the building by a principal authority to perform the functions described in clause 4.1(4)(b) or (c) or has been appointed under section 4.2, a final certificate that contains the prescribed information must be issued. 2002, c. 9, s. 18.

Inspection, etc.

- (4) If subsection (3) does not apply,
- (a) either the building or part must be inspected or 10 days must elapse after notice of the date of completion is served on the chief building official; and
 - (b) any order made under section 12 must be complied with. 2002, c. 9, s. 18.

Inspection of Buildings and Building Sites

12(1) An inspector may enter upon land and into buildings at any reasonable time without a warrant for the purpose of inspecting the building or site to determine whether or not the following are being complied with:

1. This Act.
2. The building code.
3. An order made under this Act. 2017, c. 34, Sched. 2, s. 6(1).

Order

(2) An inspector who finds a contravention of this Act or the building code may make an order directing compliance with this Act or the building code and may require the order to be carried out immediately or within such time as is specified in the order. 1992, c. 23, s. 12(2).

Service

(3) The order shall be served on the person whom the inspector believes is contravening this Act or the building code. 1992, c. 23, s. 12(3).

Form and Contents

(4) The prescribed form or the form approved by the Minister must be used for the order and it must contain sufficient information to specify the nature of the contravention and its location and the nature of the compliance that is required. 2002, c. 9, s. 19; 2006, c. 21, Sched. F, s. 104(6).

Posting and Making Information Available

(5) A copy of an order made under subsection (2) may be,

- (a) posted on the site of the construction or demolition in a location visible to the public;
- (b) made available to the public by,
 - (i) posting the copy of the order on the website of the principal authority, or
 - (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- (c) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 6(2).

Registration

(6) If an order made under subsection (2) is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 6(2).

Discharge

(7) When the requirements of an order described in subsection (6) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 6(2).

Same

(8) In the case of an order that has been made available to the public in accordance with clause (5)(b), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 6(2).

Order Not to Cover

13(1) An inspector may make an order prohibiting the covering or enclosing of any part of a building pending inspection. 1992, c. 23, s. 13(1).

Form of Order

(1.1) The prescribed form or the form approved by the Minister must be used for an order made under this section. 2002, c. 9, s. 20(1); 2006, c. 21, Sched. F, s. 104(7).

Service

(2) The order shall be served on the person to whom the permit is issued, if any, and on such other persons affected thereby as the inspector determines. 1992, c. 23, s. 13(2).

Posting and Making Information Available

(3) A copy of an order made under this section may be,

- (a) posted on the site of the construction or demolition in a location visible to the public;
- (b) made available to the public by,
 - (i) posting the copy of the order on the website of the principal authority, or
 - (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- (c) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 7.

Registration

(3.1) If an order made under this section is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 7.

Discharge

(3.2) When the requirements of an order described in subsection (3.1) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 7.

Same

(3.3) In the case of an order that has been made available to the public in accordance with clause (3)(b), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 7.

Inspection

(4) An inspection shall be made within a reasonable time after the person to whom the order is made has given notice that the part of the building is ready for inspection. 1992, c. 23, s. 13(4).

Service

(5) Section 27 does not apply to a notice under subsection (4). 1992, c. 23, s. 13(5).

Order to Uncover

(6) A chief building official or registered code agency who has reason to believe that part of a building that is covered or enclosed has not been constructed in compliance with this Act or the building code may order the persons responsible for the construction to uncover the part at their own expense for the purpose of an inspection if,

- (a) the part was covered or enclosed contrary to an order made under subsection (1);
- (b) a notice required to be given to the chief building official, registered code agency or inspector before the part was covered or enclosed under a by-law, resolution or regulation made under clause 7(e) was not given, or a notice required under section 10.2 was not received;
- (c) in cases where a notice required under section 10.2 is received, the period prescribed under subsection 10.2(2) did not elapse before the part was covered or enclosed;
- (d) in cases where a notice required by a by-law, resolution or regulation made under clause 7(e) is given,
 - (i) the inspection period prescribed under clause 7(e) did not elapse before the part was covered or enclosed, or

- (ii) if an inspection period is not prescribed under clause 7(e), a reasonable period of time after the notice was given did not elapse before the part was covered or enclosed; or

- (e) the part has been constructed without a permit being issued. 2006, c. 19, Sched. O, s. 1(6).

Stop Work Order

14(1) If an order made under section 12 or 13 is not complied with within the time specified in it, or where no time is specified, within a reasonable time, the chief building official or registered code agency, as the case may be, may order that all or any part of the construction or demolition cease. 1992, c. 23, s. 14(1); 2002, c. 9, s. 21(1).

Form of Order

(1.1) The prescribed form or the form approved by the Minister must be used for the order. 2002, c. 9, s. 21(2); 2006, c. 21, Sched. F, s. 104(8).

Service

(2) The order shall be served on such persons affected thereby as the chief building official or registered code agency determines and a copy shall be posted on the site of the construction or demolition in a location visible to the public. 1992, c. 23, s. 14(2); 2002, c. 9, s. 21(3); 2017, c. 34, Sched. 2, s. 8(1).

Timing

(3) The order is effective from the time it is posted under subsection (2). 1992, c. 23, s. 14(3).

Making Information Available

(3.1) A copy of an order made under subsection (1) may be,

- (a) made available to the public by,
 - (i) posting the copy of the order on the website of the principal authority, or
 - (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- (b) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 8(2).

Registration

(3.2) If an order made under subsection (1) is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 8(2).

Discharge

(3.3) When the requirements of an order described in subsection (3.2) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 8(2).

Same

(3.4) In the case of an order that has been made available to the public in accordance with clause (3.1)(a), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 8(2).

Effect of Order

(4) If an order to cease construction or demolition is made, no person shall perform any act in the construction or demolition of the building in respect of which the order is made other than work necessary to carry out the order made under section 12 or 13. 1992, c. 23, s. 14(4).

Referral to Chief Building Official

(5) When a registered code agency makes an order under this section, the agency shall refer the matter to the chief building official as soon as practicable. 2002, c. 9, s. 21(4).

Same

(6) The referral must be made in the prescribed manner. 2002, c. 9, s. 21(4).

Effect of Referral

(7) After making the referral, the registered code agency shall take no further steps in respect of the matter to which the order refers and the principal authority that issued the permit is responsible for the enforcement of this Act in respect of the matter. 2002, c. 9, s. 21(4).

Powers of Chief Building Official

(8) The chief building official may amend or rescind any order made by the registered code agency in respect of the matter. 2002, c. 9, s. 21(4).

15 REPEALED: 2002, c. 9, s. 22.

Property Standards**Municipal Property Standards**

15.1(1) In sections 15.1 to 15.8 inclusive,

“committee” means a property standards committee established under section 15.6; (“comité”)

“occupant” means any person or persons over the age of 18 years in possession of the property; (“occupant”)

“owner” includes,

- (a) the person for the time being managing or receiving the rent of the land or premises in connection with which the word is used, whether on the person’s own account or as agent or trustee of any other person, or who would receive the rent if the land and premises were let, and
- (b) a lessee or occupant of the property who, under the terms of a lease, is required to repair and maintain the property in accordance with the standards for the maintenance and occupancy of property; (“propriétaire”)

“property” means a building or structure or part of a building or structure, and includes the lands and premises appurtenant thereto and all mobile homes, mobile buildings, mobile structures, outbuildings, fences and erections thereon whether heretofore or hereafter erected, and includes vacant property; (“bien”)

“repair” includes the provision of facilities, the making of additions or alterations or the taking of any other action that may be required to ensure that a property conforms with the standards established in a by-law passed under this section. (“réparation”) 1997, c. 24, s. 224(8).

Adoption of Policy

(2) Where there is no official plan in effect in a municipality, the council of a municipality may, by by-law approved by the Minister, adopt a policy statement containing provisions relating to property conditions. 1997, c. 24, s. 224(8).

Standards for Maintenance and Occupancy

(3) The council of a municipality may pass a by-law to do the following things if an official plan that includes provisions relating to property conditions is in effect in the municipality or if the council of the municipality has adopted a policy statement as mentioned in subsection (2):

1. Prescribing standards for the maintenance and occupancy of property within the municipality or within any defined area or areas and for prohibiting the occupancy or use of such property that does not conform with the standards.

2. Requiring property that does not conform with the standards to be repaired and maintained to conform with the standards or the site to be cleared of all buildings, structures, debris or refuse and left in graded and levelled condition. 1997, c. 24, s. 224(8).

No Distinction on the Basis of Relationship

(4) The authority to pass a by-law under subsection (3) does not include the authority to pass a by-law that sets out requirements, standards or prohibitions that have the effect of distinguishing between persons who are related and persons who are unrelated in respect of the occupancy or use of a property, including the occupancy or use as a single housekeeping unit. 1997, c. 24, s. 224(8).

Provision of No Effect

(5) A provision in a by-law is of no effect to the extent that it contravenes the restrictions described in subsection (4). 1997, c. 24, s. 224(8).

Inspection of Property Without Warrant

15.2(1) Where a by-law under section 15.1 is in effect, an officer may, upon producing proper identification, enter upon any property at any reasonable time without a warrant for the purpose of inspecting the property to determine,

- (a) whether the property conforms with the standards prescribed in the by-law; or
- (b) whether an order made under subsection (2) has been complied with. 1997, c. 24, s. 224(8).

Contents of Order

(2) An officer who finds that a property does not conform with any of the standards prescribed in a by-law passed under section 15.1 may make an order,

- (a) stating the municipal address or the legal description of the property;
- (b) giving reasonable particulars of the repairs to be made or stating that the site is to be cleared of all buildings, structures, debris or refuse and left in a graded and levelled condition;
- (c) indicating the time for complying with the terms and conditions of the order and giving notice that, if the repair or clearance is not carried out within that time, the municipality may carry out the repair or clearance at the owner's expense; and
- (d) indicating the final date for giving notice of appeal from the order. 1997, c. 24, s. 224(8).

Service and Posting of Order

(3) The order shall be served on the owner of the property and such other persons affected by it as the officer determines and a copy of the order may be posted on the property in a location visible to the public. 1997, c. 24, s. 224(8); 2017, c. 34, Sched. 2, s. 9.

Registration of Order

(4) The order may be registered in the proper land registry office and, upon such registration, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served under subsection (3) and, when the requirements of the order have been satisfied, the clerk of the municipality shall forthwith register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 1997, c. 24, s. 224(8).

Appeal of Order

15.3(1) An owner or occupant who has been served with an order made under subsection 15.2(2) and who is not satisfied with the terms or conditions of the order may appeal to the committee by sending a notice of appeal by registered mail to the secretary of the committee within 14 days after being served with the order. 1997, c. 24, s. 224(8).

Confirmation of Order

(2) An order that is not appealed within the time referred to in subsection (1) shall be deemed to be confirmed. 1997, c. 24, s. 224(8).

Duty of Committee

(3) The committee shall hear the appeal. 2002, c. 9, s. 24.

Powers of Committee

(3.1) On an appeal, the committee has all the powers and functions of the officer who made the order and the committee may do any of the following things if, in the committee's opinion, doing so would maintain the general intent and purpose of the by-law and of the official plan or policy statement:

1. Confirm, modify or rescind the order to demolish or repair.
2. Extend the time for complying with the order. 2002, c. 9, s. 24.

Appeal to Court

(4) The municipality in which the property is situate or any owner or occupant or person affected by a decision under subsection (3.1) may appeal to the Superior Court of Justice by notifying the clerk of the municipality in writing and by applying to the court within 14 days after a copy of the decision is sent. 2002, c. 9, s. 24.

Appointment

(5) The Superior Court of Justice shall appoint, in writing, a time and place for the hearing of the appeal and may direct in the appointment the manner in which and the persons upon whom the appointment is to be served. 2002, c. 9, s. 24.

Judge's Powers

(6) On the appeal, the judge has the same powers and functions as the committee. 1997, c. 24, s. 224(8).

Effect of Decisions

(7) An order that is deemed to be confirmed under subsection (2) or that is confirmed or modified by the committee under subsection (3) or a judge under subsection (6), as the case may be, shall be final and binding upon the owner and occupant who shall carry out the repair or demolition within the time and in the manner specified in the order. 1997, c. 24, s. 224(8).

Power of Municipality if Order Not Complied With

15.4(1) If an order of an officer under section 15.2(2) is not complied with in accordance with the order as deemed confirmed or as confirmed or modified by the committee or a judge, the municipality may cause the property to be repaired or demolished accordingly. 1997, c. 24, s. 224(8).

Warrantless Entry

(2) For the purpose of subsection (1), employees or agents of the municipality may enter the property at any reasonable time without a warrant in order to repair or demolish the property. 1997, c. 24, s. 224(8).

No Liability

(3) Despite subsection 31(2), a municipal corporation or a person acting on its behalf is not liable to compensate the owner, occupant or any other person by reason of anything done by or on behalf of the municipality in the reasonable exercise of its powers under subsection (1). 1997, c. 24, s. 224(8).

Lien

(4) The municipality shall have a lien on the land for the amount spent on the repair or demolition under

subsection (1) and the amount shall have priority lien status as described in section 1 of the *Municipal Act, 2001* or section 3 of the *City of Toronto Act, 2006*, as the case may be. 2002, c. 17, Sched. F, Table; 2006, c. 32, Sched. C, s. 3(2).

Administrative Penalties

15.4.1(1) A municipality may require a person, subject to such conditions as the municipality considers appropriate, to pay an administrative penalty if the municipality is satisfied that the person has failed to comply with,

- (a) a by-law of the municipality passed under section 15.1; or
- (b) an order of an officer under subsection 15.2(2) as deemed confirmed or as confirmed or modified by the committee or a judge under section 15.3. 2017, c. 34, Sched. 2, s. 10.

Purpose of Administrative Penalties

(2) The purpose of a system of administrative penalties established by a municipality under this section shall be to assist the municipality in promoting compliance with a by-law under section 15.1 or an order under subsection 15.2(2). 2017, c. 34, Sched. 2, s. 10.

Monetary Limit

(3) The amount of an administrative penalty established by a municipality,

- (a) shall not be punitive in nature; and
- (b) shall not exceed the amount reasonably required to promote compliance with a by-law under section 15.1 or an order under subsection 15.2(2). 2017, c. 34, Sched. 2, s. 10.

Effect on Offences

(4) If a person is required by a municipality to pay an administrative penalty under subsection (1) in respect of a contravention, the person shall not be charged with an offence in respect of the same contravention. 2017, c. 34, Sched. 2, s. 10.

Regulations

(5) The Lieutenant Governor in Council may make regulations providing for any matters which, in the opinion of the Lieutenant Governor in Council, are necessary or desirable for the purposes of this section, including,

- (a) granting a municipality powers with respect to requiring that persons pay administrative penalties and with respect to other matters necessary for a system of administrative penalties;
- (b) imposing conditions and limitations on a municipality's powers with respect to administrative penalties. 2017, c. 34, Sched. 2, s. 10.

Debt

15.4.2(1) An administrative penalty imposed by a municipality on a person under section 15.4.1 constitutes a debt of the person to the municipality. 2017, c. 34, Sched. 2, s. 10.

Amount Owing Added to Tax Roll

(2) If an administrative penalty imposed under section 15.4.1 is not paid within 15 days after the day that it becomes due and payable, the treasurer of the municipality may add the administrative penalty to the tax roll for any property in the municipality for which all of the registered owners are responsible for paying the administrative penalty, and collect it in the same manner as municipal taxes. 2017, c. 34, Sched. 2, s. 10.

Certificate of Compliance

15.5(1) An officer who, after inspecting a property, is of the opinion that the property is in compliance with the standards established in a by-law passed under section 15.1 may issue a certificate of compliance to the owner. 1997, c. 24, s. 224(8).

Request for Certificate

(2) An officer shall issue a certificate to an owner who requests one and who pays the fee set by the council of the municipality in which the property is located. 1997, c. 24, s. 224(8).

Fee for Certificate

(3) A council of a municipality may set a fee for the issuance of a certificate. 1997, c. 24, s. 224(8).

Property Standards Committee

15.6(1) A by-law passed under section 15.1 shall provide for the establishment of a committee composed of such persons, not fewer than three, as the council considers advisable to hold office for such term and on such conditions as the by-law may establish. 1997, c. 24, s. 224(8).

Filling of Vacancies

(2) The council of the municipality shall forthwith fill any vacancy that occurs in the membership of the committee. 1997, c. 24, s. 224(8).

Compensation

(3) The members of the committee shall be paid such compensation as the council may provide. 1997, c. 24, s. 224(8).

Chair

(4) The members shall elect a chair from among themselves; when the chair is absent through illness or otherwise, the committee may appoint another member as acting chair. 1997, c. 24, s. 224(8).

Quorum

(5) A majority of the members constitutes a quorum for transacting the committee's business. 1997, c. 24, s. 224(8).

Secretary

(6) The members shall provide for a secretary for the committee. 1997, c. 24, s. 224(8).

Duty of Secretary

(7) The secretary shall keep on file the records of all official business of the committee, including records of all applications and minutes of all decisions respecting those applications, and section 253 of the *Municipal Act, 2001* or section 199 of the *City of Toronto Act, 2006*, as the case may be, applies with necessary modifications to the minutes and records. 2002, c. 17, Sched. F, Table; 2006, c. 32, Sched. C, s. 3(3).

Rules of Procedure and Oaths

(8) The committee may, subject to subsection (9), adopt its own rules of procedure and any member may administer oaths. 1997, c. 24, s. 224(8).

Where Committee Required to Give Notice

(9) The committee shall give notice or direct that notice be given of the hearing of an appeal to such persons as the committee considers advisable. 1997, c. 24, s. 224(8).

Emergency Order re Dangerous Non-Conformity With Standards

15.7(1) If upon inspection of a property the officer is satisfied that there is non-conformity with the standards in a by-law passed under section 15.1 to such extent as to pose an immediate danger to the health or safety of any person, the officer may make an order containing particulars of the non-conformity and requiring remedial repairs or other work to be carried out immediately to terminate the danger. 1997, c. 24, s. 224(8).

Service

(2) The order shall be served on the owner of the property and such other persons affected thereby as the officer determines and a copy shall be posted on the property. 1997, c. 24, s. 224(8).

Emergency Powers

(3) After making an order under subsection (1), the officer may, either before or after the order is served, take any measures necessary to terminate the danger and, for this purpose, the municipality may, through its employees and agents, at any time enter upon the property in respect of which the order was made without a warrant. 1997, c. 24, s. 224(8).

No Liability

(4) Despite subsection 31(2), a municipal corporation or a person acting on its behalf is not liable to compensate the owner, occupant or any other person by reason of anything done by or on behalf of the municipality in the reasonable exercise of its powers under subsection (3). 1997, c. 24, s. 224(8).

Service

(5) If the order was not served before measures were taken to terminate the danger, the officer shall serve copies of the order in accordance with subsection (2) as soon as practicable after the measures have been taken, and each copy of the order shall have attached to it a statement by the officer describing the measures taken by the municipality and providing details of the amount expended in taking the measures. 1997, c. 24, s. 224(8).

Service of Statement

(6) If the order was served before the measures were taken, the officer shall serve a copy of the statement mentioned in subsection (5) in accordance with subsection (2) as soon as practicable after the measures have been taken. 1997, c. 24, s. 224(8).

Application to Court

(7) As soon as practicable after the requirements of subsection (5) or (6) have been complied with, the officer shall apply to a judge of the Superior Court of Justice for an order confirming the order made under subsection (1) and the judge shall hold a hearing for that purpose. 1997, c. 24, s. 224(8); 2002, c. 9, s. 25.

Powers of Judge

(8) The judge in disposing of an application under subsection (7) shall,

- confirm, modify or rescind the order; and
- determine whether the amount spent on measures to terminate the danger may be recovered in whole, in part or not at all. 1997, c. 24, s. 224(8).

Order Final

(9) The disposition under subsection (8) is final. 1997, c. 24, s. 224(8).

Lien

(10) The amount determined by the judge to be recoverable shall be a lien on the land and shall have priority lien status as described in section 1 of the *Municipal Act, 2001* or section 3 of the *City of Toronto Act, 2006*, as the case may be. 2002, c. 17, Sched. F, Table; 2006, c. 32, Sched. C, s. 3(4).

Inspection Powers of Officer

15.8(1) For the purposes of an inspection under section 15.2, an officer may,

- require the production for inspection of documents or things, including drawings or specifications, that may be relevant to the property or any part thereof;
- inspect and remove documents or things relevant to the property or part thereof for the purpose of making copies or extracts;
- require information from any person concerning a matter related to a property or part thereof;
- be accompanied by a person who has special or expert knowledge in relation to a property or part thereof;
- alone or in conjunction with a person possessing special or expert knowledge, make examinations or take tests, samples or photographs necessary for the purposes of the inspection; and
- order the owner of the property to take and supply at the owner's expense such tests and samples as are specified in the order. 1997, c. 24, s. 224(8).

Samples

(2) A sample taken under clause (1)(e) shall be divided into two parts, and one part shall be delivered to the person from whom the sample is taken, if,

- the person requests that the sample be divided at the time it is taken and provides the necessary facilities; and
- it is technically feasible to divide the sample. 2017, c. 34, Sched. 2, s. 11.

Same

(3) If an officer takes a sample under clause (1)(e) and has not divided the sample into two parts, a copy of any report on the sample shall be given to the person from whom the sample was taken. 1997, c. 24, s. 224(8).

Receipt

(4) An officer shall provide a receipt for any document or thing removed under clause (1)(b) and shall promptly return them after the copies or extracts are made. 1997, c. 24, s. 224(8).

Evidence

(5) Copies of or extracts from documents and things removed under this section and certified as being true copies of or extracts from the originals by the person who made them are admissible in evidence to the same extent as and have the same evidentiary value as the originals. 1997, c. 24, s. 224(8).

Unsafe Buildings**Inspection of Unsafe Buildings**

15.9(1) An inspector may enter upon land and into buildings at any reasonable time without a warrant for the purpose of inspecting a building to determine,

- whether the building is unsafe; or
- whether an order made under subsection (4) has been complied with. 2002, c. 9, s. 26.

Interpretation

(2) A building is unsafe if the building is,

- structurally inadequate or faulty for the purpose for which it is used; or
- in a condition that could be hazardous to the health or safety of persons in the normal use of the building, persons outside the building or persons whose access to the building has not been reasonably prevented. 2002, c. 9, s. 26.

Sewage Systems

(3) In addition to the criteria set out in subsection (2), a sewage system is unsafe if it is not maintained or operated in accordance with this Act and the building code. 2002, c. 9, s. 26.

Order

(4) An inspector who finds that a building is unsafe may make an order setting out the reasons why the building is unsafe and the remedial steps necessary to render the building safe and may require the order to be carried out within the time specified in the order. 2002, c. 9, s. 26.

Service and Posting

(5) The order under subsection (4) shall be served on the registered owner and each person apparently in possession of the building and such other persons affected by the order as the chief building official determines and a copy of the order may be posted on the site of the building in a location visible to the public. 2017, c. 34, Sched. 2, s. 12(1).

Form of Order

(5.1) The prescribed form or the form approved by the Minister must be used for an order made under this section. 2017, c. 34, Sched. 2, s. 12(1).

Making Information Available

(5.2) A copy of an order made under this section may be,

- made available to the public by,
 - posting the copy of the order on the website of the principal authority, or
 - allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 12(1).

Registration

(5.3) If an order made under this section is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 12(1).

Discharge

(5.4) When the requirements of an order described in subsection (5.2) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 12(1).

Same

(5.5) In the case of an order that has been made available to the public in accordance with clause (5.2)(a), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 12(1).

Order Respecting Occupancy

(6) If an order of an inspector under subsection (4) is not complied with within the time specified in it, or where no time is specified, within a reasonable time, the chief building official,

- may by order prohibit the use or occupancy of the building; and
- may cause the building to be renovated, repaired or demolished to remove the unsafe condition or take such other action as he or she considers necessary for the protection of the public. 2002, c. 9, s. 26.

Power of Entry

(7) For the purpose of clause (6)(b), the chief building official, an inspector and their agents may enter upon land and into buildings at any reasonable time without a warrant. 2002, c. 9, s. 26.

Service

(8) The order under clause (6)(a) shall be served on the registered owner and each person apparently in possession of the building and such other persons affected thereby as the chief building official determines and a copy of the order shall be posted on the site of the building in a location visible to the public. 2002, c. 9, s. 26; 2017, c. 34, Sched. 2, s. 12(2).

Timing

(9) The order under clause (6)(a) is effective from the time it is posted. 2002, c. 9, s. 26.

Lien

(10) If the building is in a municipality, the municipality shall have a lien on the land for the amount spent on the renovation, repair, demolition or other action under clause (6)(b) and the amount shall have priority lien status as described in section 1 of the *Municipal Act, 2001* or section 3 of the *City of Toronto Act, 2006*, as the case may be. 2002, c. 17, Sched. C, s. 4(1); 2006, c. 32, Sched. C, s. 3(5).

Deemed Taxes

(11) If the building is in territory without municipal organization, the amount spent on the renovation, repair, demolition or other action under clause (6)(b) is a debt owing to the Crown and may be collected under the *Provincial Land Tax Act, 2006* as if it was tax imposed under that Act. 2002, c. 9, s. 26; 2006, c. 33, Sched. Z.3, s. 4(2).

Where Matters Addressed Under Building Condition Evaluation Programs

(12) No order may be made under this section if an order may be made under subsection 15.10.3(2) respecting the same building or part of a building and the same subject matter. 2017, c. 34, Sched. 2, s. 12(3).

Emergency Order Where Immediate Danger

15.10(1) If upon inspection of a building an inspector is satisfied that the building poses an immediate danger to the health or safety of any person, the chief building official may make an order containing particulars of the dangerous conditions and requiring remedial repairs or other work to be carried out immediately to terminate the danger. 2002, c. 9, s. 26.

Service

(2) The order shall be served on the registered owner and each person apparently in possession of the building and such other persons affected thereby as the chief building official determines and a copy shall be posted on the site of the building in a location visible to the public. 2002, c. 9, s. 26; 2017, c. 34, Sched. 2, s. 13(1).

Making Information Available

- (2.1) A copy of an order made under subsection (1) may be,
- (a) made available to the public by,
 - (i) posting the copy of the order on the website of the principal authority, or
 - (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
 - (b) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 13(2).

Registration

(2.2) If an order made under subsection (1) is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 13(2).

Discharge

(2.3) When the requirements of an order described in subsection (2.2) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 13(2).

Same

(2.4) In the case of an order that has been made available to the public in accordance with clause (2.1)(a), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 13(2).

Emergency Powers

(3) After making an order under subsection (1), the chief building official may, either before or after the order is served, take any measures necessary to terminate the danger and, for this purpose, the chief building official, an inspector and their agents may at any time enter upon the land and into the building in respect of which the order was made without a warrant. 2002, c. 9, s. 26.

No Liability

(4) Despite subsection 31(2), the Crown, a municipality, an upper-tier municipality, a board of health, a planning board or a conservation authority or a person acting on behalf of any of them is not liable to compensate the registered owner, occupant or any other person by reason of anything done by or on behalf of the chief building official or an inspector in the reasonable exercise of his or her powers under subsection (3). 2002, c. 9, s. 26; 2002, c. 17, Sched. C, s. 5(1); 2017, c. 34, Sched. 2, s. 13(3).

Service

(5) If the order was not served before measures were taken to terminate the danger, the chief building official shall serve copies of the order in accordance with subsection (2) as soon as practicable after the measures have been taken and each copy of the order shall have attached to it a statement by the chief building official describing the measures taken and providing details of the amount spent in taking the measures. 2002, c. 9, s. 26.

Service of Statement

(6) If the order was served before the measures were taken, the chief building official shall serve a copy of the statement mentioned in subsection (5) in accordance with subsection (2) as soon as practicable after the measures have been taken. 2002, c. 9, s. 26.

Application to Court

(7) As soon as practicable after subsections (5) and (6) have been complied with, the chief building official shall apply to the Superior Court of Justice for an order confirming the order made under subsection (1) and the court shall hold a hearing for that purpose. 2002, c. 9, s. 26.

Powers of Court

(8) In disposing of an application under subsection (7), the court shall,

- (a) confirm, modify or rescind the order; and
- (b) determine whether the amount spent on measures to terminate the danger may be recovered in whole, in part or not at all. 2002, c. 9, s. 26.

Order Final

(9) The disposition under subsection (8) is final. 2002, c. 9, s. 26.

Lien

(10) If the building is in a municipality, the amount determined by the judge to be recoverable shall be a lien on the land and shall have priority lien status as described in section 1 of the *Municipal Act, 2001* or section 3 of the *City*

of Toronto Act, 2006, as the case may be. 2002, c. 17, Sched. C, s. 5(2); 2006, c. 32, Sched. C, s. 3(6).

Deemed Taxes

(11) If the building is in territory without municipal organization, the amount determined by the judge to be recoverable is a debt owing to the Crown and may be collected under the *Provincial Land Tax Act, 2006* as if it was tax imposed under that Act. 2002, c. 9, s. 26; 2006, c. 33, Sched. Z.3, s. 4(3).

Maintenance Inspection Programs**Maintenance Inspections**

15.10.1(1) An inspector may enter upon land and into buildings at any reasonable time without a warrant for the purpose of conducting a maintenance inspection. 2006, c. 22, s. 112(8).

Order

(2) An inspector who finds a contravention of this Act or the building code may make an order directing compliance with this Act or the building code and may require the order to be carried out immediately or within such time as is specified in the order. 2006, c. 22, s. 112(8).

Service

(3) The order shall be served on the person whom the inspector believes is contravening this Act or the building code. 2006, c. 22, s. 112(8).

Form and Contents

(4) The prescribed form or the form approved by the Minister must be used for the order and it must contain sufficient information to specify the nature of the contravention and its location and the nature of the compliance that is required. 2006, c. 22, s. 112(8).

Posting

(5) The inspector may post a copy of the order on the site of the maintenance inspection. 2006, c. 22, s. 112(8).

Making Information Available

(6) A copy of an order made under subsection (2) may be,

- (a) made available to the public by,
 - (i) posting the copy of the order on the website of the principal authority, or
 - (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- (b) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 14.

Registration

(7) If an order made under subsection (2) is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 14.

Discharge

(8) When the requirements of an order described in subsection (7) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 14.

Same

(9) In the case of an order that has been made available to the public in accordance with clause (6)(a), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 14.

Building Condition Evaluation Programs**Application**

15.10.2(1) This section applies in respect of buildings and parts of buildings that are prescribed as subject to a building condition evaluation program under the regulations made under clause 34(2.3)(a). 2017, c. 34, Sched. 2, s. 15.

Maintenance of Buildings

(2) A building owner shall maintain and operate a building or part of a building to which this section applies in accordance with this Act and the building code. 2017, c. 34, Sched. 2, s. 15.

Evaluation

(3) A building owner shall ensure that a building or part of a building to which this section applies is evaluated in accordance with this Act and the building code. 2017, c. 34, Sched. 2, s. 15.

Building Information

(4) The building owner shall, in accordance with this Act and the building code, keep all prescribed documentation, records or other information respecting the building or part of the building to which this section applies. 2017, c. 34, Sched. 2, s. 15.

Same

(5) The building owner shall, in accordance with this Act and the building code, provide a copy of the documentation, records or other information described in subsection (4) to the chief building official upon request and to such other persons as may be prescribed. 2017, c. 34, Sched. 2, s. 15.

Inspection of Buildings Subject to Program

15.10.3(1) An inspector may enter upon land and into buildings at any reasonable time without a warrant for the purpose of,

- (a) inspecting a building or part of a building that is prescribed as subject to a building condition evaluation program;
- (b) determining whether an order made under subsection (2) or clause (8)(a) has been complied with; or
- (c) conducting a building condition evaluation or causing a building condition evaluation to be conducted where the building owner has failed to ensure that an evaluation was conducted in accordance with the regulations. 2017, c. 34, Sched. 2, s. 15.

Order

(2) An inspector who, upon entering upon land or into buildings under subsection (1), finds a contravention of this Act or the building code may make an order directing compliance with this Act or the building code and may require the order to be carried out within such time as is specified in the order. 2017, c. 34, Sched. 2, s. 15.

Form and Contents

(3) The prescribed form or the form approved by the Minister must be used for the order and it must contain sufficient information to specify the nature of the contravention and its location and the nature of the compliance that is required. 2017, c. 34, Sched. 2, s. 15.

Service, Posting And Making Information Available

- (4) An order made under this section shall be,
- (a) served on the registered owner and each person apparently in possession of the building and such other persons affected by the order as the chief building official determines;
 - (b) posted on the site of the building in a location visible to the public;
 - (c) made available to the public by,
 - (i) posting a copy of the order on the website of the principal authority, or

- (ii) allowing members of the public, during normal business hours, to inspect and copy the order at their own expense; and
- (d) registered in the proper land registry office. 2017, c. 34, Sched. 2, s. 15.

Registration

(5) If an order made under this section is registered in the proper land registry office, any person acquiring any interest in the land subsequent to the registration of the order shall be deemed to have been served with the order on the day on which the order was served. 2017, c. 34, Sched. 2, s. 15.

Discharge

(6) When the requirements of an order described in subsection (5) have been satisfied, the chief building official shall register in the proper land registry office a certificate that such requirements have been satisfied, which shall operate as a discharge of the order. 2017, c. 34, Sched. 2, s. 15.

Same

(7) In the case of an order that has been made available to the public in accordance with clause (4)(c), when the requirements of the order have been satisfied, an inspector shall indicate on the copy of the order, or by such other means as may be prescribed by regulation, that the requirements of the order have been satisfied. 2017, c. 34, Sched. 2, s. 15.

Order Respecting Occupancy

(8) If an order made under subsection (2) is not complied with within the time specified in it, or where no time is specified, within a reasonable time, the chief building official,

- (a) may by order prohibit the use or occupancy of the building; and
- (b) may cause the building to be renovated, repaired or demolished to achieve compliance with this Act or the building code or take such other action as he or she considers necessary for the protection of the public. 2017, c. 34, Sched. 2, s. 15.

Power of Entry

(9) For the purpose of clause (8)(b), the chief building official, an inspector and their agents may enter upon land and into buildings at any reasonable time without a warrant. 2017, c. 34, Sched. 2, s. 15.

Timing

(10) The order under clause (8)(a) is effective from the time it is posted. 2017, c. 34, Sched. 2, s. 15.

Lien

(11) If the building is in a municipality, the municipality shall have a lien on the land for the amount spent on the renovation, repair, demolition or other action under clause (8)(b) and the amount shall have priority lien status as described in section 1 of the Municipal Act, 2001 or section 3 of the City of Toronto Act, 2006, as the case may be. 2017, c. 34, Sched. 2, s. 15.

Deemed Taxes

(12) If the building is in territory without municipal organization, the amount spent on the renovation, repair, demolition or other action under clause (8)(b) is a debt owing to the Crown and may be collected under the Provincial Land Tax Act, 2006 as if it was tax imposed under that Act. 2017, c. 34, Sched. 2, s. 15.

Request for Information re Buildings

Subject to Program

15.10.4 Upon receiving a request from a prescribed person, a principal authority shall, in accordance with this Act and the building code, provide prescribed documentation, records or other information respecting a building or part of a building prescribed as subject to a building condition evaluation program. 2017, c. 34, Sched. 2, s. 15.

Complaints Policy re Program

15.10.5(1) A principal authority shall adopt and maintain a written policy with respect to,

- (a) how a person may submit a complaint to the principal authority respecting,
 - (i) the maintenance, operation or evaluation of a building or part of a building prescribed as subject to a building condition evaluation program, and
 - (ii) such other matters as may be prescribed respecting a building or a part of building mentioned in subclause (i);
- (b) the circumstances and manner in which the principal authority will respond to a complaint described in clause (a); and
- (c) how the principal authority will record complaints and other information described in subsection 15.10.6(1). 2017, c. 34, Sched. 2, s. 15.

Purposes

- (2) The following are the purposes of a complaints policy:
1. To inform persons about how information may be brought to the attention of a chief building official or inspector respecting a matter mentioned in clause (1)(a).
 2. To clarify the types of circumstances in which the principal authority considers it appropriate to submit a complaint. 2017, c. 34, Sched. 2, s. 15.

Contents

(3) A complaints policy shall include the prescribed provisions and provisions respecting the prescribed matters. 2017, c. 34, Sched. 2, s. 15.

Public Notice

- (4) The principal authority shall bring the complaints policy to the attention of the public by,
- posting a copy of the policy on the website of the principal authority; or
 - allowing members of the public, during normal business hours, to inspect and copy the policy at their own expense. 2017, c. 34, Sched. 2, s. 15.

Record of Complaints re Program

15.10.6(1) A principal authority shall, in accordance with this Act and the building code, maintain a record of,

- complaints described in clause 15.10.5(1)(a) that are submitted to the principal authority; and
- any enforcement action taken in response to the complaint or, if no enforcement action is taken, the reasons for not taking action. 2017, c. 34, Sched. 2, s. 15.

Information About Complaints

(2) The principal authority shall provide prescribed information about complaints and enforcement described in subsection (1) in the circumstances and in the manner prescribed. 2017, c. 34, Sched. 2, s. 15.

Qualifications**Qualifications for Various Positions**

15.11(1) A person is not eligible to be appointed as a chief building official unless he or she has the qualifications set out in the building code for the position. 2002, c. 9, s. 27.

Same

(2) Subsection (1) also applies to every inspector who has the same powers and duties as a chief building official in relation to sewage systems or to plumbing, to the extent of those powers and duties. 2002, c. 9, s. 27.

Qualifications for Inspectors

(3) A person is not eligible to be appointed as an inspector under this Act unless he or she has the qualifications set out in the building code for the position. 2002, c. 9, s. 27.

Qualifications for Registered Code Agencies

(4) A person is not eligible to be appointed as a registered code agency under this Act unless the person has the qualifications and meets the requirements set out in the building code. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(7).

Qualifications for Designers

(5) A person is not eligible to engage in any of the following activities unless he, she or it has the qualifications and meets the requirements set out in the building code to be a designer:

- Prepare a design or give other information or opinion concerning whether a building or part of a building complies with the building code, if the design, information or opinion is to be submitted to a chief building official in connection with,
 - an application for a permit,
 - a request for the authorization referred to in subsection 8(12) or (13), or
 - a report described in paragraph 2.
- If a general review of the construction of a building or part of a building is required by the building code, prepare a written report based on the general review. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(7).

Same

(6) In subsection (5),

“design” includes a plan, specification, sketch, drawing or graphic representation respecting the construction of a building. 2002, c. 9, s. 27.

Persons Conducting Building Condition Evaluations

(6.1) A person is not eligible to conduct a building condition evaluation under this Act unless the person has the qualifications and meets the requirements set out in the building code. 2017, c. 34, Sched. 2, s. 16(1).

Prohibition

(7) No person shall represent, directly or indirectly, that he, she or it has the qualifications or meets the requirements established under this section if the person does not have those qualifications or does not meet those requirements. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(7).

Non Application

(8) Subsections (5) and (6.1) do not apply to a holder of any licence or certificate issued under the *Architects Act* or the *Professional Engineers Act*. 2014, c. 7, Sched. 3, s. 2; 2017, c. 34, Sched. 2, s. 16(2).

Qualifications re Sewage Systems

15.12(1) No person shall engage in the business of constructing on site, installing, repairing, servicing, cleaning or emptying sewage systems unless the person has the qualifications set out in the building code and is registered in accordance with the building code. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(8); 2017, c. 34, Sched. 2, s. 17(1).

Prohibition

(2) No person shall represent, directly or indirectly, that the person has the qualifications or is registered as specified in this section if the person does not have those qualifications or is not registered as specified. 2017, c. 34, Sched. 2, s. 17(2).

Duty to Notify the Chief Building Official

(3) If any part of the construction of a building will be undertaken by a person described in subsection (1) (a “specified person”), no person shall begin or continue the construction of a sewage system, or cause it to begin or continue, unless the person has given the chief building official the prescribed information about the specified person. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(8).

Duty to Have Insurance

15.13(1) Every registered code agency, every person referred to in subsections 15.11 (5) and (6.1) and such other persons as may be specified in the building code who construct buildings are required to have the insurance coverage specified by the building code. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(9); 2017, c. 34, Sched. 2, s. 18(1).

Exception

(2) Subsection (1) does not apply to a person who is a builder or vendor as defined in subsection 1(1) of the *New Home Construction Licensing Act, 2017* in respect of the construction of a building. 2017, c. 33, Sched. 1, s. 88(2).

Prohibition

(3) No person shall represent, directly or indirectly, that he, she or it has the insurance coverage required by subsection (1) if the person does not have that insurance coverage. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(10).

Qualification or Requirement

(4) If the building code so provides, the insurance coverage constitutes a qualification or requirement for the purposes of a position referred to in section 15.11. 2002, c. 9, s. 27.

Duty to Notify the Chief Building Official

(5) If any part of the construction of a building will be undertaken by a person who is required by subsection (1) to have insurance (a “specified person”), no person shall begin or continue the construction, or cause it to begin or continue, unless the person has given the chief building official the prescribed information about the specified person and the insurance coverage of the specified person. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(10).

Powers and Duties of Registered Code Agencies**Notice to Chief Building Official**

15.14(1) Every registered code agency shall give the chief building official such information as may be prescribed by regulation. 2002, c. 9, s. 28.

Notice to the Director

(2) Every registered code agency shall give the director such information as may be prescribed by regulation. 2002, c. 9, s. 28.

Functions of Registered Code Agencies

15.15 The following are the functions that a registered code agency may be appointed to perform in respect of the construction of a building:

1. Review designs and other materials to determine whether the proposed construction of a building complies with the building code.
2. Issue plans review certificates.
3. Issue change certificates.
4. Inspect the construction of a building for which a permit has been issued under this Act.
5. Issue final certificates.
6. Perform such other functions as may be authorized under this Act or in the building code. 2002, c. 9, s. 28.

Scope of Agency's Powers

15.16(1) A registered code agency may exercise the powers and perform the duties specified in this Act and the building code in respect only of the functions and the building specified in a particular appointment. 2002, c. 9, s. 28.

Confidentiality

(2) A registered code agency shall not collect, use or disclose information except in accordance with the building code. 2002, c. 9, s. 28.

Persons Acting on Behalf of an Agency

15.17(1) A registered code agency may authorize, in writing, one or more prescribed persons to exercise powers and perform its functions under this Act, subject to such conditions as may be prescribed by regulation. 2002, c. 9, s. 28.

Certificate of Authorization

(2) The registered code agency shall issue a certificate of authorization containing the prescribed information to the authorized person. 2002, c. 9, s. 28.

Powers and Duties of Inspector

(3) The authorized person may exercise the powers and perform the duties of an inspector under any of the following provisions, in respect of the construction of a building for which the agency is appointed under this Act:

1. Section 12 (inspection).
2. Section 13 (order not to cover).
3. Section 16 (entry to dwellings).
4. Section 18 (powers of inspector). 2002, c. 9, s. 28.

Duties re Certificates and Orders

15.18(1) When a registered code agency makes an order under this Act, the agency shall give a copy of the order within the period prescribed by regulation to the chief building official. 2002, c. 9, s. 28.

Certificates

(2) A registered code agency shall issue such certificates and use such forms as may be required by the building code and shall include in them or provide such information as may be prescribed. 2002, c. 9, s. 28.

Same

(3) A certificate issued under this Act by a registered code agency must be in the prescribed form or the form approved by the Minister. 2002, c. 9, s. 28; 2006, c. 21, Sched. F, s. 104(9).

Expiry of an Agency's Appointment

15.19(1) The appointment of a registered code agency expires when the agency has performed the functions for which it was appointed in respect of construction of the specified building. 2002, c. 9, s. 28.

Same, by Virtue of Circumstances

(2) The appointment of a registered code agency that has not performed all of the functions for which it is appointed in respect of the construction expires if either of the following events occurs:

1. The chief building official refuses to issue a permit for construction of the specified building.
2. The permit for construction of the building is revoked. 2002, c. 9, s. 28.

Termination of an Agency's Appointment

15.20(1) The appointment of a registered code agency shall not be terminated except in accordance with this section and the building code. 2002, c. 9, s. 28.

Same

(2) The building code may specify that the consent of the director to the termination of an appointment is required. 2002, c. 9, s. 28.

Effect of Termination, Appointment by Principal Authority

(3) If the registered code agency was appointed by a principal authority, upon the termination of the appointment the principal authority becomes responsible to ensure that the remaining functions of the agency are performed by the principal authority or another registered code agency. 2002, c. 9, s. 28.

Same, Appointment by Applicant

(4) If the registered code agency was appointed under section 4.2, upon the termination of the appointment the person who made the appointment becomes responsible to ensure that the remaining functions of the agency are performed by another registered code agency or, with the prior written agreement of the principal authority, by the principal authority or to ensure that work on the construction is halted. 2002, c. 9, s. 28.

Powers of the Director

(5) When the appointment of a registered code agency is terminated, the director may give directions to anyone described in subsection (6) in order to facilitate the transfer of the agency's functions. 2002, c. 9, s. 28.

Same

(6) Directions may be given to the person who made the appointment that has been terminated, to the registered code agency whose appointment has been terminated and to a transferee registered code agency. 2002, c. 9, s. 28.

Duties

(7) The person to whom directions are given shall comply with them. 2002, c. 9, s. 28.

Order to Suspend Construction

15.21(1) The chief building official may, by order, suspend all or part of the construction of the building to which the appointment of a registered code agency relates,

- (a) if the chief building official has reason to believe that the registered code agency has ceased to perform the functions specified in the appointment; and
- (b) if the appointment of the registered code agency has not expired or been terminated. 2002, c. 9, s. 28.

Same

(2) If the appointment of a registered code agency under section 4.2 is terminated, the chief building official shall, by order, suspend the construction of the applicable building until,

- (a) another registered code agency is appointed to perform the remaining functions of the original registered code agency; or
- (b) the principal authority agrees, in writing, to perform the remaining functions of the original registered code agency. 2002, c. 9, s. 28.

Delegation

(3) A principal authority may delegate to the chief building official the power to agree to perform the remaining functions of a registered code agency appointed under section 4.2 whose appointment is terminated and may impose conditions and restrictions on the delegation. 2002, c. 9, s. 28.

Effect of Order

(4) If an order is issued under this section, no person shall perform any act in the construction of the building in respect of which the order is made, other than work necessary to secure the safety and security of the building and of the construction site. 2002, c. 9, s. 28.

Procedural Matters

(5) Subsections 14(2) and (3) apply with respect to an order under this section. 2002, c. 9, s. 28.

Conflict Between Appointment and Act, etc.

15.22 This Act and the building code prevail over the terms of an appointment of a registered code agency. 2002, c. 9, s. 28.

General Powers of Inspection and Enforcement**Duty to Carry Identification**

15.23 The chief building official, inspectors and persons authorized by a registered code agency to exercise powers and perform functions on its behalf shall carry their certificate of appointment or authorization, as the case may be, when performing their duties and shall produce them for inspection upon request. 2002, c. 9, s. 29.

Entry to Dwellings

16(1) Despite sections 8, 12, 15, 15.2, 15.4, 15.9, 15.10.1 and 15.10.3, an inspector or officer shall not enter or remain in any room or place actually being used as a dwelling unless,

- (a) the consent of the occupier is obtained, the occupier first having been informed that the right of entry may be refused and entry made only under the authority of a warrant issued under this Act;
- (a.1) a warrant issued under this Act is obtained;
- (b) the delay necessary to obtain a warrant or the consent of the occupier would result in an immediate danger to the health or safety of any person;
- (c) the entry is necessary to terminate a danger under subsection 15.7(3) or 15.10(3); or
- (d) the requirements of subsection (2) are met and the entry is necessary to remove a building or restore a site under subsection 8(6), to remove an unsafe condition under clause 15.9(6)(b) or to repair or demolish under subsection 15.4(1). 1992, c. 23, s. 16(1); 1997, c. 24, s. 224(9, 10); 2002, c. 9, s. 30; 2006, c. 19, Sched. O, s. 1(11); 2006, c. 22, s. 112(9); 2017, c. 34, Sched. 2, s. 20.

Notice

(2) Within a reasonable time before entering the room or place for a purpose described in clause (1)(d), the inspector or officer shall serve the occupier with notice of his or her intention to enter it. 1992, c. 23, s. 16(2); 1997, c. 24, s. 224(11).

17 REPEALED: 2002, c. 9, s. 31(2).

Recovery of Expenditures for Repairs, etc.

17.1(1) This section applies if money is spent by a board of health, planning board or conservation authority or, in the circumstances described in subsection (2), by the Crown or an upper-tier municipality or, in the circumstances described in subsection (4), by a municipality,

- (a) to carry out a removal and restoration under subsection 8(6);
- (b) to carry out a renovation, repair, demolition or other action under clause 15.9(6)(b) or 15.10.3(8)(b); or
- (c) to perform remedial or other work under subsection 15.10(1) where the amount spent is determined to be recoverable by a judge under subsection 15.10(8). 1999, c. 12, Sched. M, s. 8; 2002, c. 9, s. 32(1); 2002, c. 17, Sched. F, Table; 2017, c. 34, Sched. 2, s. 21(1).

In Municipalities

- (2) If the building in respect of which money was spent is in a municipality,
- (a) the upper-tier municipality, board of health, planning board, conservation authority or the Crown may instruct the municipality to recover the amount spent;
 - (b) subsection 8(7), 15.9(10), 15.10(10) or 15.10.3(11), as the case may be, applies to the collection of the amount; and
 - (c) the money collected, less the costs reasonably attributable to the collection, shall be paid by the municipality to the upper-tier municipality, board of health, planning board, conservation authority or the Crown. 1999, c. 12, Sched. M, s. 8; 2002, c. 9, s. 32(2); 2002, c. 17, Sched. F, Table; 2017, c. 34, Sched. 2, s. 21(2).

Not Interest of the Crown

- (3) Where the Crown instructs the municipality under clause (2)(a) to recover the amount spent, the lien referred to in subsection 8(7), 15.9(10), 15.10(10) or 15.10.3(11) is not an estate or interest of the Crown within the meaning of clause 379(7)(b) of the Municipal Act, 2001 or clause 350(7)(b) of the City of Toronto Act, 2006, as the case may be. 1999, c. 12, Sched. M, s. 8; 2002, c. 9, s. 32(3); 2002, c. 17, Sched. F, Table; 2006, c. 32, Sched. C, s. 3(7); 2017, c. 34, Sched. 2, s. 21(3).

In Territory Without Municipal Organization

- (4) If the building in respect of which money was spent is located in territory without municipal organization,
- (a) the municipality, board of health, planning board or conservation authority may give the Minister of Finance written notice of the amount that was spent, requesting the collection of the amount under the *Provincial Land Tax Act, 2006*;
 - (b) the amount may be collected under that Act as if it was tax imposed under it; and

- (c) the Minister of Finance shall pay the amount collected under that Act, less the costs reasonably attributable to the collection, to the municipality, board of health, planning board or conservation authority. 2006, c. 33, Sched. Z.3, s. 4(4).

Powers of Inspector

18(1) For the purposes of an inspection under this Act, an inspector may,

- (a) require the production for inspection of documents or things, including drawings or specifications, that may be relevant to the building or any part thereof;
- (b) inspect and remove documents or things relevant to the building or part thereof for the purpose of making copies or extracts;
- (c) require information from any person concerning a matter related to a building or part thereof;
- (d) be accompanied by a person who has special or expert knowledge in relation to a building or part thereof;
- (e) alone or in conjunction with a person possessing special or expert knowledge, make examinations or take tests, samples or photographs necessary for the purposes of the inspection; and
- (f) order any person to take and supply at that person's expense such tests and samples as are specified in the order. 1992, c. 23, s. 18(1); 1997, c. 30, Sched. B, s. 11.

Samples

- (2) A sample taken under clause (1)(e) shall be divided into two parts, and one part shall be delivered to the person from whom the sample is taken, if,
- (a) the person requests that the sample be divided at the time it is taken and provides the necessary facilities; and
 - (b) it is technically feasible to divide the sample. 2017, c. 34, Sched. 2, s. 22.

Idem

- (3) If an inspector takes a sample under clause (1)(e) and has not divided the sample into two parts, a copy of any report on the sample shall be given to the person from whom the sample was taken. 1992, c. 23, s. 18(3).

Receipt

- (4) An inspector shall provide a receipt for any document or thing removed under clause (1)(b) and shall promptly return them after the copies or extracts are made. 1992, c. 23, s. 18(4).

Evidence

(5) Copies of or extracts from documents and things removed under this section and certified as being true copies of or extracts from the originals by the person who made them are admissible in evidence to the same extent as and have the same evidentiary value as the originals. 1992, c. 23, s. 18(5).

Form of Order

(6) The prescribed form or the form approved by the Minister must be used for an order under subsection (1). 2002, c. 9, s. 33; 2006, c. 21, Sched. F, s. 104(10).

18.1 REPEALED: 2002, c. 9, s. 34.

Obstruction of Inspector, etc.

19(1) No person shall hinder or obstruct, or attempt to hinder or obstruct, a chief building official, inspector, officer or a person authorized by a registered code agency in the exercise of a power or the performance of a duty under this Act. 1997, c. 24, s. 224(13); 2002, c. 9, s. 35(1).

Occupied Dwellings

(2) A refusal of consent to enter or remain in a place actually used as a dwelling is not hindering or obstructing within the meaning of subsection (1) unless the inspector, officer or authorized person is acting under a warrant issued under this Act or in the circumstances described in clause 16(1)(b), (c) or (d). 1997, c. 24, s. 224(13); 2002, c. 9, s. 35(2).

Assistance

(3) Every person shall assist any entry, inspection, examination, testing or inquiry by an inspector, chief building official, officer or a person authorized by a registered code agency in the exercise of a power or performance of a duty under this Act. 1997, c. 24, s. 224(13); 2002, c. 9, s. 35(3).

Same

(4) No person shall neglect or refuse,

- (a) to produce any documents, drawings, specifications or things required under clause 15.8(1)(a) or (e) by an officer or under clause 18(1)(a) or (e) by an inspector or by a person authorized by a registered code agency; or
- (b) to provide any information required under clause 15.8(1)(c) by an officer or under clause 18(1)(c) by an inspector or by a person authorized by a registered code agency. 2002, c. 9, s. 35(4).

Obstruction or Removal of Order

20 No person shall obstruct the visibility of an order and no person shall remove a copy of an order posted under this Act unless authorized to do so by an inspector, officer or registered code agency. 1997, c. 24, s. 224(14); 2002, c. 9, s. 36.

Warrant for Entry and Search

21(1) A provincial judge or justice of the peace may at any time issue a warrant in the prescribed form authorizing a person named in the warrant to enter and search a building, receptacle or place if the provincial judge or justice of the peace is satisfied by information on oath that there is reasonable ground to believe that,

- (a) an offence under this Act has been committed; and
- (b) the entry into and search of the building, receptacle or place will afford evidence relevant to the commission of the offence. 1992, c. 23, s. 21(1).

Seizure

(2) In a search warrant, the provincial judge or justice of the peace may authorize the person named in the warrant to seize anything that there is reasonable ground to believe will afford evidence relevant to the commission of the offence. 1992, c. 23, s. 21(2).

Same

(3) Anyone who seizes something under a search warrant shall,

- (a) give a receipt for the thing seized to the person from whom it was seized; and
- (b) bring the thing seized before the provincial judge or justice of the peace issuing the warrant or another provincial judge or justice to be dealt with according to law. 1992, c. 23, s. 21(3).

Expiry of Warrant

(4) A search warrant shall state the date on which it expires, which date shall be not later than fifteen days after the warrant is issued. 1992, c. 23, s. 21(4).

Time for Execution

(5) A search warrant may be executed only between 6 a.m. and 9 p.m. unless it provides otherwise. 1992, c. 23, s. 21(5).

Application

(6) Sections 159 and 160 of the *Provincial Offences Act* apply with necessary modifications in respect of any thing seized under this section. 1992, c. 23, s. 21(6).

Dispute Resolution, Reviews and Appeals

Review of Inspector's Order

22(1) The chief building official may review and amend or rescind an order made by an inspector. 1992, c. 23, s. 22(1).

Powers

(2) A chief building official may exercise any of the powers or perform any of the duties of an inspector. 1992, c. 23, s. 22(2).

Building Code Commission

23(1) The Building Code Commission is continued under the name Building Code Commission in English and Commission du code du bâtiment in French and shall be composed of those persons appointed by the Lieutenant Governor in Council. 1992, c. 23, s. 23(1).

Chair

(2) The Lieutenant Governor in Council may designate one of the members as chair and one or more of the members as vice-chair. 1992, c. 23, s. 23(2).

Eligibility

(3) A person is not eligible to be a member of the Commission if the person is,

- (a) a deputy minister of a ministry;
- (b) a public servant employed under Part III of the *Public Service of Ontario Act, 2006*;
- (c) an employee of a municipality; or
- (d) in a prescribed relationship to a registered code agency. 2006, c. 35, Sched. C, s. 8(2).

Remuneration

(4) The members of the Commission shall receive such remuneration and expenses as the Lieutenant Governor in Council may determine. 1992, c. 23, s. 23(4).

Quorum

(5) Three members of the Commission constitute a quorum. 1992, c. 23, s. 23(5).

Dispute Resolution

24(1) This section applies if there is a dispute,

- (a) between an applicant for a permit, a holder of a permit or a person to whom an order is given and the chief building official, a registered code agency or an inspector concerning the sufficiency of compliance with the technical requirements of the building code;

- (b) between an applicant for a permit and the chief building official concerning whether the official complied with subsection 8(2.2) or (2.3); or
- (c) between a holder of a permit and the chief building official, a registered code agency or an inspector concerning whether the requirements of subsection 10.2(2) have been met. 2002, c. 9, s. 39.

Application for Dispute Resolution

(1.1) A party to the dispute may apply to the Building Code Commission to resolve the issue. 2002, c. 9, s. 39.

Hearing

(2) The Building Code Commission shall hold a hearing to decide the dispute and shall give the parties to the dispute notice of the hearing. 2002, c. 9, s. 39.

Same

(2.1) A hearing to decide a dispute described in clause (1)(b) or (c) must be held within the prescribed period. 2002, c. 9, s. 39.

Powers

(3) The Building Code Commission shall, by order, determine a dispute described in clause (1)(a) and, for that purpose, may substitute its opinion for that of the chief building official, registered code agency or inspector. 2002, c. 9, s. 39.

Same

(3.1) The Building Code Commission shall, by order, determine a dispute described in clause (1)(b) or (c) and, for that purpose, may require the chief building official, registered code agency or inspector, as the case may be, to comply with the applicable subsection of the Act. 2002, c. 9, s. 39.

Decision Final

(4) The decision of the Building Code Commission is final. 1992, c. 23, s. 24(4).

Restrictions on Members

(5) Members of the Building Code Commission holding a hearing shall not,

- (a) take part before the hearing in any investigation or consideration of the subject-matter of the hearing; or
- (b) communicate directly or indirectly in relation to the subject-matter of the hearing with any person unless all parties are given notice and allowed to participate. 1992, c. 23, s. 24(5).

Independent Advice

(6) Despite subsection (5), members of the Building Code Commission may seek independent legal or technical advice but the nature of the advice shall be made known to the parties in order that they may make submissions. 1992, c. 23, s. 24(6).

Evidence

(7) The findings of fact at a hearing shall be based exclusively on evidence admissible or matters that may be noticed under sections 15 and 16 of the *Statutory Powers Procedure Act*. 1992, c. 23, s. 24(7).

Restriction

(8) Members of the Building Code Commission shall not participate in a decision of the Commission pursuant to a hearing unless they were present throughout the hearing. 1992, c. 23, s. 24(8).

Idem

(9) Except with the consent of the parties, no decision of the Building Code Commission shall be given unless all members present throughout the hearing participate in the decision. 1992, c. 23, s. 24(9).

Release of Evidence

(10) Documents and things put in evidence at the hearing shall, upon the request of the person who produced them, be released by the Building Code Commission to that person within a reasonable time after the matter in issue has been finally determined. 1992, c. 23, s. 24(10).

Appeal to Court

25(1) A person who considers themselves aggrieved by an order or decision made by the chief building official, a registered code agency or an inspector under this Act (except a decision under subsection 8(3) not to issue a conditional permit) may appeal the order or decision to the Superior Court of Justice within 20 days after the order or decision is made. 2002, c. 9, s. 40(2).

Extension of Time

(2) A judge to whom an appeal is made may, upon such conditions as the judge considers appropriate, extend the time for making the appeal before or after the time set out in subsection (1), if the judge is satisfied that there is reasonable grounds for the appeal and for applying for the extension. 1992, c. 23, s. 25(2).

Effect of Appeal

(3) If an appeal is made under this section in respect of a matter in which a question is pending before the Building Code Commission, the proceeding before the Commission is terminated. 1992, c. 23, s. 25(3).

Powers of Judge

(4) On an appeal, a judge may affirm or rescind the order or decision and take any other action that the judge considers the chief building official, registered code agency or inspector ought to take in accordance with this Act and the regulations and, for those purposes, the judge may substitute his or her opinion for that of the official, agency or inspector. 2002, c. 9, s. 40(3).

Reference to Commission

(5) A judge may refer a question respecting the interpretation of the technical requirements of the building code or the sufficiency of compliance with the technical requirements of the building code to the Building Code Commission for a hearing and report to the judge. 1992, c. 23, s. 25(5).

Procedure

(6) The procedure on the reference shall be the same as on an application under section 24. 1992, c. 23, s. 25(6).

Stay of Order or Decision

(7) An appeal under subsection (1) does not stay the operation of the order or decision appealed from but a judge may, on such terms as are just, stay the operation of the order or decision until the disposition of the appeal. 2000, c. 26, Sched. K, s. 1.

Further Appeal

26(1) A party to the hearing before the Superior Court of Justice under section 25 may appeal from the decision to the Divisional Court. 1992, c. 23, s. 26(1); 2002, c. 9, s. 41(1).

Minister Represented

(2) The Minister is entitled to be heard, by counsel or otherwise, upon the argument of an appeal under this section. 1992, c. 23, s. 26(2).

Powers of Divisional Court

(3) An appeal under this section may be made on any question that is not a question of fact alone and the Divisional Court may,

- (a) confirm or alter the decision of the judge;
- (b) direct the chief building official, registered code agency or inspector to take any action that the official, agency or inspector is authorized to take under this Act;
- (c) refer the matter back to the judge for reconsideration; or
- (d) substitute its opinion for that of the chief building official, registered code agency, inspector or judge. 2002, c. 9, s. 41(2).

Service

27(1) A notice or order required by this Act to be served may be served personally, by email to the last known email address of the person to whom service is required to be made or by registered mail sent to the last known address of the person to whom notice is to be given or to that person's agent for service. 1992, c. 23, s. 27(1); 2019, c. 14, Sched. 14, s. 1(1).

Idem

(2) If a notice or order is served by registered mail, the service shall be deemed to have been made on the fifth day after the day of mailing unless the person to whom the notice or order is given or that person's agent for service establishes that, acting in good faith, through absence, accident, illness or other unintentional cause the notice was not received until a later date. 1992, c. 23, s. 27(2); 1997, c. 24, s. 224(15).

Same

(3) If a notice or order is served by email, the service shall be deemed to have been made on the day of sending unless,

- (a) the document was sent after 5 p.m., in which case service shall be deemed to have been made on the following day; or
- (b) the person to whom the notice or order is given or that person's agent for service establishes that, acting in good faith, through absence, accident, illness or other unintentional cause, the notice was not received until a later date. 2019, c. 14, Sched. 14, s. 1(2).

Authorizations and Rulings**Building Materials Evaluation Commission**

28(1) The Building Materials Evaluation Commission is continued under the name Building Materials Evaluation Commission in English and Commission d'évaluation des matériaux de construction in French and shall be composed of those persons appointed by the Lieutenant Governor in Council. 1992, c. 23, s. 28(1).

Chair

(2) The Lieutenant Governor in Council may designate one of the members as chair and one of the members as vice-chair. 1992, c. 23, s. 28(2).

Remuneration

(3) The members of the Commission shall receive such remuneration and expenses as the Lieutenant Governor in Council may determine. 1992, c. 23, s. 28(3).

Powers and Duties

(4) The Building Materials Evaluation Commission may,

- (a) conduct research on, and examine, construction materials, systems and building designs or cause such research to be conducted and examinations to be undertaken;
- (b) upon application therefor, authorize the use, subject to any conditions that may be set out, of any innovative material, system or building design in respect of any building or part thereof; and
- (c) make recommendations to the Minister respecting changes in this Act or the building code. 1992, c. 23, s. 28(4); 2002, c. 9, s. 43.

Innovative Materials

(5) The use of any innovative material, system or building design in the manner approved by the Commission shall be deemed not to be a contravention of the building code. 1992, c. 23, s. 28(5).

Binding Interpretations by the Minister

28.1(1) The Minister may issue a written interpretation of any provision of the building code, and the Minister's interpretation is binding on any person exercising a power or performing a duty under this Act and on any person who is subject to this Act. 2002, c. 9, s. 44.

Public Notice

(2) A statement setting out the Minister's interpretation of a provision of the building code shall be made available to the public in the prescribed manner. 2002, c. 9, s. 44.

Legislation Act, 2006, Part III

(3) The Minister's interpretation of a provision of the building code is not a regulation within the meaning of Part III (Regulations) of the *Legislation Act, 2006*. 2002, c. 9, s. 44; 2006, c. 21, Sched. F, s. 136(1).

Delegation

(4) The Minister may delegate his or her power under subsection (1) to the director. 2002, c. 9, s. 44.

Rulings by Minister

29(1) The Minister may, subject to such conditions as the Minister in his or her discretion considers appropriate, make rulings,

- (a) approving the use of innovative materials, systems or building designs evaluated by a materials evaluation body designated in the building code;
- (b) adopting an amendment to a code, formula, standard, guideline, protocol or procedure that has been adopted by reference in the building code; or
- (c) approving the use of alternative materials, systems and building designs which, in the opinion of the

Minister, will achieve the level of performance required by the building code. 1997, c. 30, Sched. B, s. 14(1); 1999, c. 12, Sched. M, s. 9(1); 2002, c. 9, s. 45(1).

Delegation

(2) The Minister may by order delegate the power to make rulings to the director. 1992, c. 23, s. 29(2).

Status

(3) A ruling is not a regulation within the meaning of Part III (Regulations) of the *Legislation Act, 2006*. 1992, c. 23, s. 29(3); 2006, c. 21, Sched. F, s. 136(1).

Publication

(4) Notice of a ruling shall be published at least once in *The Ontario Gazette* and made available, upon request, to members of the public. 1992, c. 23, s. 29(4).

Application

(5) A ruling of the Minister under clause (1)(a) or (c) entitles a person to use the approved material, system or building design in all of Ontario unless the ruling states otherwise. 1999, c. 12, Sched. M, s. 9(2).

Approved Materials

(6) The use of an approved material, system or building design in the manner approved in a ruling under clause (1)(a) or (c) shall be deemed not to be a contravention of the building code. 1999, c. 12, Sched. M, s. 9(2).

Conflicts

(7) In the event of a conflict between an authorization of the Building Materials Evaluation Commission and a ruling of the Minister under clause (1)(a) or (c), the ruling prevails. 1992, c. 23, s. 29(7); 1997, c. 30, Sched. B, s. 14(4); 2002, c. 9, s. 45(2).

Restriction

(8) If a materials evaluation body designated in the building code has examined or has expressed its intention to examine an innovative material, system or building design, the Building Materials Evaluation Commission shall not exercise its power under subsection 28(4) in respect of that material, system or building design. 1992, c. 23, s. 29(8).

Inquiry

30(1) If it appears to the Minister that there is or may be a failure in construction or demolition standards or in the enforcement of this Act or the building code, the Minister may designate a person to conduct an inquiry into the failure. 1992, c. 23, s. 30(1).

Application of *Public Inquiries Act, 2009*

(2) Section 33 of the *Public Inquiries Act, 2009* applies to the inquiry. 2009, c. 33, Sched. 6, s. 43.

General

Immunity From Action

31(1) No action or other proceeding for damages shall be instituted against the director, a member of the Building Code Commission or the Building Materials Evaluation Commission, or anyone acting under their authority, a person conducting an inquiry under section 30, a chief building official, an inspector or an officer for any act done in good faith in the execution or intended execution of any power or duty under this Act or the regulations or for any alleged neglect or default in the execution in good faith of that power or duty. 1992, c. 23, s. 31(1); 1997, c. 24, s. 224(16).

Liability

(2) Subsection (1) does not relieve the Crown, a municipality, an upper-tier municipality, a board of health, a planning board or a conservation authority of liability in respect of a tort committed by their respective chief building official or inspectors to which they would otherwise be subject and the Crown, municipality or upper-tier municipality, board of health, planning board or conservation authority is liable for any such tort as if subsection (1) were not enacted. 2002, c. 17, Sched. F, Table.

Immunity re Registered Code Agencies

(3) The Crown, a municipality, an upper-tier municipality, a board of health, a planning board or a conservation authority is not liable for any harm or damage resulting from any act or omission by a registered code agency or by a person authorized by a registered code agency under subsection 15.17(1) in the performance or intended performance of any function set out in section 15.15. 2002, c. 9, s. 47; 2002, c. 17, Sched. C, s. 6(1).

Same

(4) The Crown, a municipality, an upper-tier municipality, a board of health, a planning board or a conservation authority is not liable for any harm or damage resulting from any act or omission in the execution or intended execution of any power or duty under this Act or the regulations by their respective chief building official or inspectors if the act was done or omitted in reasonable reliance on a certificate issued or other information given under this Act by a registered code agency or by a person authorized by a registered code agency under subsection 15.17(1). 2002, c. 9, s. 47; 2002, c. 17, Sched. C, s. 6(2).

32 REPEALED: 2002, c. 9, s. 48.

32.1 REPEALED: 2002, c. 9, s. 49.

33 REPEALED: 2002, c. 9, s. 50.

Regulations

34(0.1) The Minister may make such regulations as are desirable governing standards for the construction and demolition of buildings. 2020, c. 18, Sched. 1, s. 3(1).

Same

(1) Without limiting the generality of subsection (0.1), the Minister may make regulations,

1. designating structures that are to be defined as buildings under subsection 1(1);
- 1.0.1 prescribing persons for the purposes of the definition of “building owner” in subsection 1(1);
- 1.1 prescribing the functions for which a registered code agency may be appointed under subsection 4.1(4);
- 1.2 prescribing the information that a principal authority is required to give to the director under subsection 4.1(8);
- 1.3 prescribing the persons who may appoint a registered code agency under subsection 4.2(2);
- 1.4 prescribing the manner in which the appointment of a registered code agency under section 4.2 may be made and prescribing conditions and restrictions with respect to each appointment;
- 1.5 prescribing the information that a person who appoints a registered code agency is required to give to the director under subsection 4.2(9) or to the chief building official under subsection 4.2(10);
2. prescribing the conditions under which “as constructed plans” may be required by a chief building official under clause 7(g);
- 2.1 prescribing the information about the fees and costs to be included in a report under subsection 7(4) and the manner in which the report is to be made available to the public;
- 2.2 prescribing the persons to whom notice of proposed changes in fees is to be given under subsection 7(6), the information to be included in the notice and the manner in which the notice is to be given;
- 2.3 prescribing the period within which the public meeting referred to in subsection 7(6) must be held;
- 2.4 prescribing the records to be maintained by a principal authority and the period for which the records must be retained;
3. governing the manner of construction and types and quality of materials used therein;

3.1 establishing objectives governing the standards for the construction and demolition of buildings;

3.2 prescribing the persons who may apply for a permit under section 8 and the information to be provided with an application for a permit under section 8;

3.3 prescribing the information that a plans review certificate must contain for the purposes of clause 8(2)(d);

3.4 prescribing requirements and circumstances for the purposes of subsection 8(2.2) and prescribing the period within which the chief building official is required to make a decision under subsection 8(2.2) and the manner of determining when the period begins;

3.4.1 prescribing the period within which the chief building official is required to inform an applicant under subsection 8(2.3) and the manner of determining when the period begins;

3.5 prescribing the information that a plans review certificate must contain under subsection 8(2.1) and a change certificate must contain under subsection 8(14);

4. setting out the applicable laws with which compliance must be achieved before a conditional permit may be issued under subsection 8(3);

4.1 prescribing the information that a chief building official is required to give under subsection 8(8.1) and prescribing the period within which and the manner in which the chief building official shall give the information;

5. governing the design of buildings and the use to which they may be put;

6. REPEALED: 2009, c. 33, Sched. 21, s. 2(7).

7. setting out rules and policies to be observed in the interpretation of the building code by any person exercising a power or discretion conferred under the Act or the building code;

8. determining an increase in hazard for the purposes of section 10;

9. REPEALED: 2020, c. 18, Sched. 1, s. 3(3).

9.1 requiring any part of the construction of a building described in clauses 11(3)(a) and (b) of the *Architects Act* or subsection 12(4) and clause 12(5)(a) of the *Professional Engineers Act* to be designed by an architect or a professional engineer or a combination of both;

10. requiring any part of the design, construction or demolition of a building to be under the general review of an architect or a professional engineer or a combination of both and that copies of reports arising from the general review be provided to the chief building official or to a registered code agency;

11. designating organizations to test prefabricated building units to the standards prescribed by the building code and providing for the placing of their label on units that conform to the standards;
12. requiring the approval of an inspector or a registered code agency in respect of any method, matter or thing;
13. requiring the posting on buildings or sites of construction or demolition of such documents or information as is prescribed;
14. requiring such documents, information, records, drawings or specifications as are prescribed to be kept on the site of construction or demolition;
- 14.1 prescribing the records to be kept by any person and the returns of information and reports to be made by any person and providing for the inspection and examination of the records;
15. requiring notice to be given to the chief building official, an inspector or a registered code agency respecting any matter in the course of construction, including notice of readiness for inspection at the stages of construction of a building, and specifying the person required to give the notices;
- 15.1 prescribing the type and manner of inspections for the purposes of subsection 10.2(2) (readiness for inspection) and prescribing the period within which the inspections must be carried out;
- 15.2 prescribing the information that must be given to the chief building official about a person who is required by subsection 15.12(3) to have certain qualifications or to meet certain requirements or both;
- 15.3 prescribing the information that must be given to the chief building official under subsection 15.13(5) about any person required to have insurance coverage and about the coverage;
- 15.4 prescribing the manner in which a referral to the chief building official under subsection 14(5) must be made;
16. requiring notice to be given to the chief building official respecting the change in prescribed classes of use made of a building;
17. requiring the chief building official to transmit to the director such returns or reports as are prescribed;
- 17.1 prescribing documentation, records or other information for purposes of section 15.10.4, the manner in which the documentation, records or other information is to be provided and the persons to whom the documentation, records or other information is to be given;
- 17.2 prescribing matters for the purpose of subclause 15.10.5(1)(a)(ii);
- 17.3 prescribing provisions and matters relating to policies described in subsection 15.10.5(1);
- 17.4 governing the recording of complaints and enforcement action for the purpose of subsection 15.10.6(1);
- 17.5 prescribing information about complaints and enforcement action to be provided under subsection 15.10.6(2) and the circumstances and the manner in which the information is to be provided;
- 17.6 prescribing other means for indicating that the requirements of an order have been satisfied for the purpose of subsections 12(8), 13(3.3), 14(3.4), 15.9(5.5), 15.10(2.4), 15.10.1(9) and 15.10.3(7);
18. prescribing conditions under which a building or any part of a building may be occupied, including requiring notice to be given to a chief building official or registered code agency and requiring permission to be received from the official or agency before the building or part may be occupied;
19. exempting any building or person or class thereof from compliance with all or any part of this Act and the regulations and prescribing conditions for the exemption;
20. prescribing the form of a warrant and the form in which the information upon oath will be taken under section 21;
21. requiring the alteration of any part of an existing building where construction in relation to the building affects that part;
22. requiring the payment of fees in respect of applications to the Building Materials Evaluation Commission and prescribing the amounts thereof;
- 22.1 prescribing the manner in which the Minister's written interpretations under section 28.1 are to be made available to the public;
23. designating materials evaluation bodies for the purposes of section 29;
24. establishing criteria to be followed by the Minister in respect of a ruling under section 29;
25. prescribing procedures of the Building Code Commission and the Building Materials Evaluation Commission;
26. prescribing the persons to whom notice shall be given of the issuance of a permit, the time for giving the notice and the class of buildings for which notice is required;
27. defining, for the purposes of this Act and the building code, any word or expression not defined in this Act, and in so doing may define a word or expression differently for different provisions;
28. prescribing forms and providing for their use or requiring that forms provided by the Minister or the director be used, and prescribing the information that must be contained in the forms;
29. prescribing boards of health, planning boards and conservation authorities that are responsible for

- the enforcement of the provisions of this Act related to sewage systems and the municipalities and territory without municipal organization in which they will have jurisdiction to carry out the enforcement;
30. permitting chief building officials or registered code agencies, subject to such conditions as are set out in the building code, to allow the use of materials, systems and building designs other than those prescribed in the building code with respect to the construction of buildings;
 31. governing the location of sewage systems;
 32. designating areas in which any class of sewage system may not be established;
 33. prescribing qualifications for chief building officials, inspectors, registered code agencies, designers and other persons referred to in section 15.12 and related matters including,
 - i. requiring different qualifications for different classes of officials, inspectors, agencies, designers and other persons,
 - ii. requiring assessments or examinations in connection with obtaining or maintaining the required qualifications,
 - iii. establishing one or more registers identifying persons with qualifications and such other information as the regulation may require, and
 - iv. requiring fees to be paid in connection with the qualifications;
 34. establishing certification, registration or licensing schemes for chief building officials, inspectors, registered code agencies, designers and other persons referred to in sections 15.11 (qualifications) and 15.12 (qualifications re sewage systems) which may include provision for,
 - i. the eligibility or ineligibility of classes of persons to obtain certification, registration or a licence,
 - ii. categories or classes of certification, registration or licence,
 - iii. application for the issuance, amendment or renewal of a certificate, registration or a licence,
 - iv. the issuance, amendment or renewal of a certificate, registration or a licence or the refusal to do so,
 - v. suspension, revocation or cancellation of a certificate, registration or a licence,
 - vi. the imposition of conditions relating to a certificate, registration or licence, including conditions relating to the qualifications of directors, officers, partners, employees and others associated with the holder of the certificate, registration or licence, conditions relating to the manner in which specified persons carry out activities under this Act and the building code and conditions relating to insurance coverage, including the kinds and amounts of insurance and the circumstances in which a person will be considered to be covered by insurance,
 - vii. the establishment and maintenance of one or more registers containing information about the holders of certificates, registrations or licences and containing such information as may be given to the director under paragraph 35.1, and
 - viii. fees payable in connection with certification, registration or licensing;
 35. prescribing an appeal to a prescribed tribunal from a refusal to issue or renew a certificate, registration or licence or a suspension, revocation or cancellation of a certificate, registration or licence, prescribing the circumstances in which the decision appealed from takes effect immediately despite the appeal, and prescribing the circumstances in which the tribunal may stay the decision pending the outcome of the appeal;
 - 35.1 requiring the Ontario Association of Architects and the Association of Professional Engineers of Ontario to give the prescribed information to the director;
 - 35.2 prescribing fees payable to the Crown by the Ontario Association of Architects and the Association of Professional Engineers of Ontario in connection with the registers referred to in paragraphs 33 and 34 and in respect of the development of training materials for a purpose described in paragraph 33 or 34;
 - 35.3 prescribing the persons who are required under subsection 15.13(1) to have insurance coverage and prescribing the kinds and amounts of insurance that are required and the circumstances in which the person will be considered to be covered by insurance;
 - 35.4 prescribing additional functions that registered code agencies may perform;
 - 35.5 prescribing the manner in which registered code agencies and persons authorized by them under subsection 15.17(1) are required to perform any of their functions;
 - 35.6 prescribing the manner in which a registered code agency is authorized to collect, use and disclose information;
 - 35.7 prescribing circumstances in which a registered code agency may be appointed in respect of a building even though an inspector or another registered code agency has already carried out a function described in section 15.15;
 - 35.8 prescribing circumstances in which a registered code agency cannot be appointed, including

- circumstances that would constitute a conflict of interest for a registered code agency;
- 35.9 prescribing the information that a registered code agency is required to give to the director or to the chief building official;
- 35.10 prescribing the classes of persons that may be authorized by a registered code agency under subsection 15.17(1), the conditions to which the authorization may be subject and the information that must be included in a certificate of authorization;
- 35.11 prescribing certificates and the form of certificates referred to in subsection 15.18(2), the information that the certificates are required to contain and the circumstances and manner in which registered code agencies are permitted to issue them;
- 35.12 prescribing the circumstances in which the appointment of a registered code agency may be terminated and the conditions that must be met before the termination of an appointment, including,
- i. requiring the consent of the director and authorizing the director to impose conditions and restrictions in connection with the consent, and
 - ii. authorizing an appeal to a person specified in the regulations from a decision of the director or conditions imposed by the director;
36. designating persons, specifying powers of a chief building official or inspector that those designated persons may exercise to enforce this Act and the building code in relation to the qualifications of persons described in sections 15.11 and 15.12 and the requirement in section 15.13 for insurance coverage, and establishing conditions for the exercise of the specified powers;
37. prescribing any transitional matters necessary for the regulation of sewage systems, including matters relating to,
- i. licensing and certification and the qualifications of inspectors and persons described in subsection 15.12(1),
 - ii. certificates of approval and orders issued under the *Environmental Protection Act*,
 - iii. enforcement issues,
 - iv. matters commenced under the *Environmental Protection Act*, including appeals,
 - v. records and documents to be kept or transferred and the payment of associated costs,
 - vi. certification of records and their use in courts,
 - vii. the continuation of matters commenced under the *Environmental Protection Act*, and
 - viii. the transfer of responsibilities involving any municipality or any board of health, conservation authority or planning board prescribed under section 3.1;
38. permitting the Building Code Commission to sit in one or more divisions simultaneously upon such conditions as may be prescribed in the regulation;
39. authorizing one member of the Building Code Commission, with the approval of the chair or vice-chair, to hear and determine any matter and deeming the member to constitute the commission for that purpose, under such conditions as may be prescribed in the regulation;
- 39.1 prescribing relationships for the purposes of clause 23(3)(d) (eligibility to be a member of the Commission);
- 39.2 prescribing the period within which the Building Code Commission must hold a hearing in respect of a dispute described in clause 24(1)(b) or (c);
- 39.3 providing for transitional provisions relating to the effect of a repeal or re-enactment of any provision of this Act;
- 39.4 prescribing provisions of the building code for the purposes of section 97.1 of the *Municipal Act, 2001* and section 108.1 of the *City of Toronto Act, 2006*;
- 39.5 prescribing conditions and limits for the purposes of section 97.1 of the *Municipal Act, 2001* and section 108.1 of the *City of Toronto Act, 2006*;
- 39.6 providing for the approval of an inspector who is the chief of the fire department of a municipality respecting fire safety matters and prescribing circumstances under which approval of the inspector may be required;
40. prescribing any matter referred to in this Act as prescribed. 1992, c. 23, s. 34(1); 1997, c. 30, Sched. B, s. 17(1-4); 1999, c. 12, Sched. M, s. 11; 2002, c. 9, s. 51(1, 2, 4-14); 2006, c. 19, Sched. O, s. 1(12-17); 2006, c. 35, Sched. C, s. 8(3); 2009, c. 33, Sched. 21, s. 2(5-7); 2014, c. 7, Sched. 3, s. 3; 2017, c. 10, Sched. 4, s. 1; 2017, c. 34, Sched. 2, s. 24(1, 5); 2020, c. 18, Sched. 1, s. 3(2, 3).

Adoption by Reference

(1.1) The Minister may make regulations adopting by reference any of the following documents, in whole or in part, with such changes as the Minister considers necessary, and requiring compliance with any provision of a document so adopted:

1. The National Building Code of Canada 2015, the National Plumbing Code of Canada 2015, the National Energy Code of Canada for Buildings 2017, the National Farm Building Code of Canada 1995 or any subsequent versions of those codes.

2. A code, formula, standard, guideline, protocol or procedure that requires any part of the construction of a building to be designed by an architect or a professional engineer or a combination of both.
3. Any other code, formula, standard, guideline, protocol or procedure. 2020, c. 18, Sched. 1, s. 3(4).

Standards for Existing Buildings

(2) The Minister may make regulations to establish standards that existing buildings must meet even though no construction is proposed, including regulations,

- (a) prescribing any or all of the matters set out in subsections (0.1) and (1) as applicable to existing buildings;
- (b) establishing standards for maintenance, retrofit, operation, occupancy and repair;
- (c) prescribing standards related to resource conservation and environmental protection; and
- (d) prescribing standards, methods and equipment for the inspection, cleaning, disinfecting and emptying of sewage systems. 1992, c. 23, s. 34(2); 1997, c. 30, Sched. B, s. 17(5); 2006, c. 22, s. 112 (10); 2020, c. 18, Sched. 1, s. 3(5, 6).

Discretionary Maintenance Inspection Programs

(2.1) The Minister may make regulations governing programs established under clause 7(1)(b.1), including regulations,

- (a) governing the classes of buildings and area affected by a program;
- (b) governing the type and manner of inspections that are conducted under a program and the frequency of the inspections;
- (c) authorizing the principal authority that establishes a program, as an alternative to conducting an inspection, to accept a certificate, in a form approved by the Minister, that is signed by a person who belongs to a class of persons specified by the regulations and that confirms that the person has conducted an inspection and is of the opinion that the building that was inspected complies with the standards prescribed under clause (2)(b) that are enforced by the program. 2006, c. 22, s. 112 (11); 2020, c. 18, Sched. 1, s. 3(5).

Sewage System Maintenance Inspection Programs

(2.2) The Minister may make regulations establishing and governing programs to enforce standards prescribed under clause (2)(b) in relation to sewage systems, including regulations,

- (a) governing the classes of sewage systems affected by the program;
- (b) requiring a principal authority that has jurisdiction in the area affected by the program to administer the program for that area and to conduct inspections under the program;
- (c) governing the type and manner of inspections that are conducted under the program and the frequency of the inspections;
- (d) authorizing the principal authority that administers the program, as an alternative to conducting an inspection, to accept a certificate, in a form approved by the Minister, that is signed by a person who belongs to a class of persons specified by the regulations and that confirms that the person has conducted an inspection and is of the opinion that the sewage system that was inspected complies with the standards prescribed under clause (2)(b) that are enforced by the program. 2006, c. 22, s. 112 (11); 2020, c. 18, Sched. 1, s. 3(5).

Building Condition Evaluation Programs

(2.3) The Minister may make regulations establishing and governing programs to enforce standards prescribed under clause (2)(b) in relation to buildings other than sewage systems, including regulations,

- (a) governing the classes of buildings and area affected by or subject to the programs;
- (b) requiring a principal authority that has jurisdiction in an area affected by a program to administer the program for that area;
- (c) requiring building condition evaluations to be conducted by persons who belong to a specified class of persons, which may include a holder of any licence or certificate issued under the *Architects Act* or the *Professional Engineers Act* or a class of such holders;
- (d) governing the type and manner of building condition evaluations that are conducted under a program, the frequency of the evaluations or the manner for determining when evaluations are required;

- (e) authorizing a chief building official or inspector to require a building condition evaluation be conducted and governing the circumstances in which he or she may do so;
- (f) requiring a person described in clause (c) who conducts a building condition evaluation to prepare a report in a form approved by the Minister, that is signed by that person and that contains and confirms the prescribed information;
- (g) requiring a person described in clause (c) who prepares a report described in clause (f) to, in the prescribed circumstances and within the prescribed period, provide a copy of the report to the building owner, chief building official and other prescribed persons;
- (h) requiring a person described in clause (c) to notify the building owner, chief building official and other prescribed persons within a prescribed period if the person is of the opinion the building is unsafe within the meaning of subsection 15.9(2) or poses an immediate danger to the health or safety of persons;
- (i) requiring such documents, records or other information as may be prescribed to be kept as prescribed by any person and providing for their production to, or inspection and examination by, prescribed persons. 2017, c. 34, Sched. 2, s. 24(6); 2020, c. 18, Sched. 1, s. 3(5).

Application

(3) A regulation made under this section applies to buildings whether erected before or after the coming into force of this Act. 1992, c. 23, s. 34(3).

Limited Application

(4) Any regulation made under this section may be limited in its application territorially or to any class of activity, matter, person or thing. 1997, c. 30, Sched. B, s. 17(6).

Same

(4.1) A class under this Act may be defined with respect to any attribute, quality or characteristic and may be defined to consist of, include or exclude any specified member whether or not with the same attributes, qualities or characteristics. 1997, c. 30, Sched. B, s. 17(6).

Retroactive

(4.2) A regulation made under paragraph 37 of subsection (1) may be retroactive. 1997, c. 30, Sched. B, s. 17(6).

Purposes

(5) The purposes of the regulations made under this section are,

- (a) to establish standards for public health and safety, fire protection, structural sufficiency, conservation, including, without limitation, energy and water conservation, and environmental integrity, and to establish barrier-free requirements, with respect to buildings; and
- (b) to establish processes for the enforcement of the standards and requirements. 2002, c. 9, s. 51(15); 2009, c. 12, Sched. J, s. 1(1).

(6) REPEALED: 2019, c. 14, Sched. 14, s. 2.

(7) REPEALED: 2019, c. 14, Sched. 14, s. 2.

34.1 REPEALED: 2019, c. 14, Sched. 14, s. 3.

Municipal By-Laws

35(1) This Act and the building code supersede all municipal by-laws respecting the construction or demolition of buildings. 1992, c. 23, s. 35(1).

Different Treatments

(2) In the event that this Act or the building code and a municipal by-law treat the same subject-matter in different ways in respect to standards for the use of a building described in section 10 or standards for the maintenance or operation of a sewage system, this Act or the building code prevails and the by-law is inoperative to the extent that it differs from this Act or the building code. 1992, c. 23, s. 35(2); 1997, c. 30, Sched. B, s. 18(1).

Interpretation

(3) For the purpose of this section, a municipal by-law includes a by-law of an upper-tier municipality and a local board as defined in the *Municipal Affairs Act*. 2002, c. 17, Sched. F, Table.

Status of Conservation Authority Regulations

35.1 A regulation made by a conservation authority under this Act is not a regulation within the meaning of Part III (Regulations) of the *Legislation Act, 2006*. 2002, c. 9, s. 52; 2006, c. 21, Sched. F, s. 136(1).

Offences

- 36(1)** A person is guilty of an offence if the person,
- (a) knowingly furnishes false information in any application under this Act, in any certificate required to be issued or in any statement or return required to be furnished under this Act or the regulations;
 - (b) fails to comply with an order, direction or other requirement made under this Act; or
 - (c) contravenes this Act, the regulations or a by-law passed under section 7. 1992, c. 23, s. 36(1); 1997, c. 30, Sched. B, s. 19; 2002, c. 9, s. 53(1); 2009, c. 33, Sched. 21, s. 2(8).

Idem

- (2) Every director or officer of a corporation who knowingly concurs in the furnishing of false information, the failure to comply or the contravention under subsection (1) is guilty of an offence. 1992, c. 23, s. 36(2).

Penalties

- (3) A person who is convicted of an offence is liable to a fine of not more than \$50,000 for a first offence and to a fine of not more than \$100,000 for a subsequent offence. 2005, c. 33, s. 1.

Corporations

- (4) If a corporation is convicted of an offence, the maximum penalty that may be imposed upon the corporation is \$500,000 for a first offence and \$1,500,000 for a subsequent offence and not as provided in subsection (3). 2005, c. 33, s. 1; 2017, c. 34, Sched. 2, s. 25(1).

Subsequent Offence

- (5) For the purposes of subsections (3) and (4), an offence is a subsequent offence if there has been a previous conviction under this Act. 1992, c. 23, s. 36(5).

Continuing Offence

- (6) Every person who fails to comply with an order made by a chief building official under subsection 14(1) or clause 15.9(6)(a) or 15.10.3(8)(a) is guilty of an offence and on conviction, in addition to the penalties mentioned in subsections (3) and (4), is liable to a fine of not more than \$10,000 per day for every day the offence continues after the time given for complying with the order has expired. 1992, c. 23, s. 36(6); 2002, c. 9, s. 53(2); 2017, c. 34, Sched. 2, s. 25(2).

Power to Restrain

- (7) If this Act or the regulations are contravened and a conviction is entered, in addition to any other remedy and to any penalty imposed by this Act, the court in which the conviction is entered, and any court of competent jurisdiction thereafter, may make an order prohibiting the continuation or repetition of the offence by the person convicted. 1992, c. 23, s. 36(7).

Limitation Period

- (8) No proceeding under this section shall be commenced more than one year after the facts on which the proceeding is based first came to the knowledge of,
- (a) an officer, where the proceeding is in respect of the enforcement of by-laws passed under section 15.1; or
 - (b) the chief building official, in any other case. 2009, c. 33, Sched. 21, s. 2(9).

Same

- (8.1) Subsection (8), as it read immediately before the day subsection 2(9) of Schedule 21 to the *Good Government Act, 2009* comes into force, continues to apply where the subject-matter of the proceeding arose more than one year before that day. 2009, c. 33, Sched. 21, s. 2(9).

Proceeds of Fines

- (9) If an offence under this section has been committed within a municipality, the proceeds of a fine imposed under this section shall be paid to the treasurer of that municipality, and section 2 of the *Administration of Justice Act* and section 4 of the *Fines and Forfeitures Act* do not apply in respect of the fine. 1992, c. 23, s. 36(9).

Same, Sewage System Offences

- (10) Despite subsection (9), if an offence under this section concerns the provisions of this Act and the building code related to sewage systems and if it is committed in a municipality or territory without municipal organization that is prescribed under subsection 3.1(1), the proceeds of a fine imposed under this section shall be paid to the applicable board of health, planning board or conservation authority prescribed under subsection 3.1(1), and section 2 of the *Administration of Justice Act* and section 4 of the *Fines and Forfeitures Act* do not apply in respect of the fine. 2002, c. 9, s. 53(3).

Proof of Directions, Orders, etc.

37(1) In any prosecution for an offence under this Act, a copy of a direction or order purporting to have been made under this Act or the regulations and purporting to have been signed by the person authorized by this Act to make the direction or order is, in the absence of evidence to the contrary, proof of the direction or order without proof of the signature or authority. 1992, c. 23, s. 37(1).

Same

(2) A statement as to any matter of record in an office of the chief building official or an officer purporting to be certified by the chief building official or the officer is, without proof of the office or signature of the chief building official or officer, receivable in evidence as proof, in the absence of evidence to the contrary, of the facts stated therein in any civil proceeding or proceeding under the *Provincial Offences Act*. 1997, c. 24, s. 224(18).

Restraining Order

38(1) Where it appears to a chief building official that a person does not comply with this Act, the regulations or an order made under this Act, despite the imposition of any penalty in respect of the non-compliance and in addition to any other rights he or she may have, the chief building official may apply to the Superior Court of Justice for an order directing that person to comply with the provision. 1992, c. 23, s. 38(1); 2002, c. 9, s. 54.

Idem

(2) Upon the application under subsection (1), the judge may make the order or such other order as the judge thinks fit. 1992, c. 23, s. 38(2).

Appeal

(3) An appeal lies to the Divisional Court from an order made under subsection (1). 1992, c. 23, s. 38(3).

Suspension of Licence

38.1(1) If a person is in default of payment of a fine imposed upon conviction for an offence under this Act or the regulations, on the application of a prescribed person, an order may be made under subsection 69(2) of the *Provincial Offences Act* directing that one or more of the licences of the person who is in default be suspended and no licence be issued to that person until the fine is paid. 1997, c. 30, Sched. B, s. 20.

Duty of Prescribed Person

(2) A prescribed person shall,

- (a) on being informed of an order referred to in subsection (1), suspend the licence in accordance with the order; and
- (b) on being informed that the fine and any applicable prescribed administrative fee for the reinstatement of the licence are paid, reinstate the licence. 1997, c. 30, Sched. B, s. 20.

No Reinstatement

(3) The prescribed person shall not reinstate a licence under clause (2)(b) if he or she is informed that,

- (a) there is another outstanding order referred to in subsection (1) directing that the licence be suspended; or
- (b) the licence is suspended under any other order or under another statute. 1997, c. 30, Sched. B, s. 20.

Definition

(4) In this section,

“licence” means a licence, certification or registration under the building code. 2002, c. 9, s. 55.

Note: Despite the repeal of the *Building Code Act* (R.S.O. 1990, c. B.13) by the Statutes of Ontario, 1992, chapter 23, subsection 42(1),

- (a) a permit issued under subsection 5(1) of that Act is continued as a permit issued under subsection 8(1) of this Act;
- (b) an order made under that Act is continued as an order made under the corresponding provision of this Act;
- (c) an agreement under section 3 of that Act is continued as an agreement under section 3 of this Act.

See: 1992, c. 23, s. 42.

BUILDING CODE

Division A

Compliance, Objectives and Functional Statements

Part 1

Compliance

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Part 1

Compliance

Section 1.1 General

1.1.1. Application of this Code

1.1.1.1. Application of this Code

- e1 (1) This Code applies to the *construction, demolition*, change of use and *occupancy of buildings*.
- (2) This Code applies to both site-built and factory-constructed *buildings*. (See Note A-1.1.1.1.(2))

Section 1.2. Compliance

1.2.1. Compliance with this Code

1.2.1.1. Compliance with this Code

- (1) Compliance with this Code shall be achieved by
- (a) complying with the applicable *acceptable solutions* in Division B (See Note A-1.2.1.1.(1)(a)), or
 - (b) using *alternative solutions* that will achieve at least the minimum level of performance required by the applicable *acceptable solutions* in respect of the *objectives* and *functional statements* attributed to the applicable *acceptable solutions* in MMAH Supplementary Standard SA-1, “Objectives and Functional Statements Attributed to the Acceptable Solutions.” (See Note A-1.2.1.1.(1)(b))
- (2) For the purposes of Clause (1)(b), the level of performance in respect of a *functional statement* refers to the performance of the *functional statement* as it relates to the *objective* with which it is associated in MMAH Supplementary Standard SA-1, “Objectives and Functional Statements Attributed to the Acceptable Solutions.”

1.2.2. Materials, Appliances, Systems and Equipment

1.2.2.1. Characteristics of Materials, Appliances, Systems and Equipment

- (1) All materials, *appliances*, systems and equipment installed to meet the requirements of this Code shall possess the necessary characteristics to perform their intended functions when installed in a *building*.

1.2.2.2. Reserved

1.2.2.3. Used Materials, Appliances and Equipment

(1) Unless otherwise specified, recycled materials in *building* products may be used, and used materials, *appliances* and equipment are permitted to be reused when they meet the requirements of this Code for new materials and are satisfactory for the intended use.

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

1.3.1. General

1.3.1.1. Scope of Division A

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

1.3.1.2. Scope of Division B

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

1.3.1.3. Scope of Division C

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

1.3.1.4. Internal Cross-References

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

1.3.2. Application of Division A

1.3.2.1. Application of Parts 1, 2 and 3

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

1.3.3. Application of Division B (See Note A-1.3.3.)

1.3.3.1. Application of Parts 1, 7 and 12

(1) Part 1 of Division B applies to all *buildings* covered in this Code. (See Article 1.1.1.1.)

(2) Subject to Article 1.3.3.3B., Parts 7 and 12 of Division B apply to all *buildings* covered in this Code.

1.3.3.1A. Application of Part 2

(1) Part 2 of Division B applies to all *farm buildings* covered in this Code.

1.3.3.2. Application of Parts 3, 4, 5 and 6

- (1) Subject to Articles 1.3.3.1A., 1.3.3.3B., Parts 3, 4, 5, and 6 of Division B apply to all *buildings* described in Article 1.1.1.1. and
 - (a) classified as *post-disaster buildings*,
 - (b) used for *major occupancies* classified as
 - (i) Group A, *assembly occupancies*,
 - (ii) Group B, *care, care and treatment or detention occupancies*, or
 - (iii) Group F, Division 1, *high-hazard industrial occupancies*, or
 - (c) exceeding 600 m² in *building area* or exceeding 3 *storeys* in *building height* used for *major occupancies* classified as
 - (i) Group C, *residential occupancies*,
 - (ii) Group D, *business and personal services occupancies*,
 - (iii) Group E, *mercantile occupancies*, or
 - (iv) Group F, Divisions 2 and 3, *medium- and low-hazard industrial occupancies*.
- (2) Subject to Articles 1.3.3.1A. and 1.3.3.3B., Part 4 of Division B applies to
 - (a) a retaining wall exceeding 1 000 mm in exposed height adjacent to
 - (i) public property,
 - (ii) access to a *building*, or
 - (iii) private property to which the public is admitted,
 - (b) a pedestrian bridge appurtenant to a *building*,
 - (c) a crane runway,
 - (d) an exterior storage tank and its supporting structure that is not regulated by the *Technical Standards and Safety Act, 2000*,
 - (e) signs regulated by Section 3.15. of Division B that are not structurally supported by a *building*,
 - (f) a structure that supports a wind turbine generator having a rated output of more than 3 kW,
 - (g) an *outdoor pool* that has a water depth greater than 3.5 m at any point, and
 - (h) a *permanent solid nutrient storage facility* with supporting walls exceeding 1 000 mm in exposed height.
- (3) Section 3.11. of Division B applies to *public pools*.
- (4) Section 3.12. of Division B applies to *public spas*.
- (5) Section 3.15. of Division B applies to signs.
- (6) Section 3.17. of Division B applies to *demountable stages* and *demountable support structures*.

1.3.3.2A. Application of Part 8

- (1) Subject to Article 1.3.3.3B., Part 8 of Division B applies to the design, *construction*, operation and maintenance of all *sewage systems* and to the *construction* of *buildings* in the vicinity of *sewage systems*.

1.3.3.3. Application of Part 9

- (1) Subject to Article 1.3.3.3B., Part 9 of Division B applies to all *buildings* described in Article 1.1.1.1. of 3 *storeys* or less in *building height*, having a *building area* not exceeding 600 m², and used for *major occupancies* classified as
 - (a) reserved,
 - (b) Group C, *residential occupancies* other than *buildings* used for *retirement homes*, (See Note A-9.1.1.1.(1) of Division B)
 - (c) Group D, *business and personal services occupancies*,
 - (d) Group E, *mercantile occupancies*, or
 - (e) Group F, Divisions 2 and 3, *medium- and low-hazard industrial occupancies*.

1.3.3.3A. Application of Part 10

- (1) Part 10 of Division B applies to existing *buildings* requiring a permit under section 10 of the Act.

1.3.3.3B. Application of Part 11

- (1) Except as provided in Sentence (2), Part 11 of Division B applies to the design and *construction* of existing *buildings*, or parts of existing *buildings*, that have been in existence for at least five years.
- (2) If a *building* has been in existence for at least five years but includes an addition that has been in existence for less than five years, Part 11 of Division B applies to the entire *building*.

1.3.3.3C. Existing Buildings (See Note A-1.3.3.3C.)

- (1) Except as provided in Section 3.18. of Division B, Section 9.41. of Division B and Part 11 of Division B, if an existing *building* is extended or is subject to material alteration or repair, this Code applies only to the design and *construction* of the extensions and those parts of the *building* that are subject to the material alteration or repair.
- (2) If an existing previously occupied *building* is moved from its original location to be installed elsewhere, or is dismantled at its original location and moved to be reconstituted elsewhere, this Code applies only to changes to the design and *construction* of the *building* required as a result of moving the *building*.

1.3.3.4. Building Size Determination

- (1) Where a *firewall* divides a *building*, each portion of the *building* that is divided shall be considered as a separate *building*, except for the purposes of
- (a) a determination of *gross area* in Section 1.2. of Division C,
 - (b) a fire alarm and detection system in Sentence 3.2.4.2.(1) of Division B or Article 9.10.18.1. of Division B, and
 - (c) a *plumbing system* interconnected through a *firewall*.
- (2) Except as permitted in Sentence (3), where portions of a *building* are completely separated by a vertical *fire separation* that has a *fire-resistance rating* of not less than 1 h and extends through all *storeys* and *service spaces* of the separated portions, each separated portion is permitted to be considered as a separate *building* for the purpose of determining *building height*, provided
- (a) each separated portion is not more than 3 *storeys* in *building height* and is used only for *residential occupancies* other than a *retirement home*, and
 - (b) the unobstructed path of travel for a firefighter from the nearest street to one entrance of each separated portion is not more than 45 m.
- (See Note A-1.3.3.4.(2))
- (3) The vertical *fire separation* referred to in Sentence (2) may terminate at the floor assembly immediately above a *basement* provided the *basement* conforms to Article 3.2.1.2. of Division B.

1.3.3.5. Designated Structures

- (1) The following structures are designated for the purposes of clause (d) of the definition of *building* in subsection 1 (1) of the Act:
- (a) a retaining wall exceeding 1 000 mm in exposed height adjacent to
 - (i) public property,
 - (ii) access to a building, or
 - (iii) private property to which the public is admitted,
 - (b) a pedestrian bridge appurtenant to a *building*,
 - (c) a crane runway,

- (d) an exterior storage tank and its supporting structure that is not regulated by the *Technical Standards and Safety Act, 2000*,
- (e) signs regulated by Section 3.15. of Division B that are not structurally supported by a *building*,
- (f) a solar collector that is mounted on a *building* and has a face area equal to or greater than 5 m²,
- (g) a structure that supports a wind turbine generator having a rated output of more than 3 kW,
- (h) a dish antenna that is mounted on a *building* and has a face area equal to or greater than 5 m²,
- (i) an *outdoor pool*,
- (j) an *outdoor public spa*,
- (k) a *permanent solid nutrient storage facility* with supporting walls exceeding 1 000 mm in exposed height,
- (l) a *demountable stage*, and
- (m) a *demountable support structure*.

1.3.4. Application of Division C

1.3.4.1. Application of Parts 1, 2 and 3

- (1) Parts 1 and 2 of Division C apply to all *buildings* covered in this Code. (See Article 1.1.1.1.)
- (2) Part 3 prescribes qualifications of persons for the purpose of Section 15.11 of the Act.

Section 1.4. Terms and Abbreviations

1.4.1. Definitions of Words and Phrases

1.4.1.1. Non-defined Terms

- (1) Words and phrases used in this Code that are not included in the list of definitions in Articles 1.4.1.2., 1.4.1.3. and 1.4.1.4. and are not defined in another provision of this Code shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.
- (2) Where *objectives* and *functional statements* are referred to in this Code, they shall be the *objectives* and *functional statements* described in Parts 2 and 3.
- (3) Where *acceptable solutions* are referred to in this Code, they shall be the provisions stated in Parts 2 to 12 of Division B.
- (4) Where *alternative solutions* are referred to in this Code, they shall be the *alternative solutions* mentioned in Clause 1.2.1.1.(1)(b).

1.4.1.2. Defined Terms

- (1) The words and terms in italics in this Code shall have the following meanings:
 - (a) the same meaning as in subsection 1(1) of the Act, if not defined in Clause (b) or (c),
 - (b) the same meaning as in each of the following provisions for the purposes described in the provision:
 - (i) Sentences 1.4.1.3.(1) and (2) of Division A, and
 - (ii) Sentences 3.13.1.2.(1), 7.1.1A.1.(1), 8.1.1.2.(1) and 11.1.1.2.(1) of Division B, or
 - (c) the following meaning for the purposes of this Code:

Absorption trench means an excavation in *soil*, as defined in Part 8 of Division B, or in *leaching bed fill*, being part of a *leaching bed*, in which a *distribution pipe* or *leaching chamber* is laid that allows infiltration of the *effluent* into the *soil*, as defined in Part 8 of Division B, or *leaching bed fill*.

Acceptable solution means a requirement stated in Parts 2 to 12 of Division B.

Accessible means, when applied to a *fixture*, connection, *plumbing appliance*, valve, *cleanout* or equipment, to be accessible with or without having to first remove an access panel, door or similar obstruction, but a *fixture*, connection, *plumbing appliance*, valve, *cleanout* or equipment is not accessible if access can be gained only by cutting or breaking materials.

Access to exit means that part of a *means of egress* within a *floor area* that provides access to an *exit* serving the *floor area*.

Adaptable seating means a fixed seat or seats designed to facilitate a side transfer from a wheelchair. (See Note A-1.4.1.2.(1))

Additional circuit vent means a *vent pipe* that is installed between a *circuit vent* and a *relief vent* to provide additional air circulation.

Adfreezing means the adhesion of *soil* to a *foundation unit* resulting from the freezing of *soil* water. (Also referred to as “frost grip.”)

Agricultural occupancy (Group G) means the *occupancy* of a *building* or part thereof that is located on land that is associated with and devoted to the practice of farming, and is used for the purpose of producing crops, raising farm animals, or preparing, marketing, storing or processing agricultural products. (See Note A-1.4.1.2.(1))

Agricultural occupancy with no human occupants (Group G, Division 4) means an *agricultural occupancy* that is not intended to be occupied by persons under normal use and is generally used for the storage of agricultural materials and by-products. (See Note A-1.4.1.2.(1))

Air admittance valve means a one-way valve designed to allow air to enter the *drainage system* when the pressure in the *plumbing system* is less than the atmospheric pressure.

Air barrier system means the assembly installed to provide a continuous barrier to the movement of air.

Air break means the unobstructed vertical distance between the lowest point of an *indirectly connected waste pipe* and the *flood level rim* of the *fixture* into which it discharges.

Air-conditioning means the process of treating air in a space to control simultaneously its temperature, humidity, cleanliness, and distribution to meet the comfort requirements of the occupants of the space.

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.

Air-supported structure means a structure consisting of a pliable membrane that achieves and maintains its shape and support by internal air pressure.

Alarm signal means an audible signal transmitted throughout a zone or zones or throughout a *building* to advise occupants that a fire emergency exists.

Alert signal means an audible signal to advise designated persons of a fire emergency.

Allowable bearing pressure means the maximum pressure that may be safely applied to a *soil* or *rock* by the *foundation unit* considered in design under expected loading and subsurface conditions.

Allowable load means the maximum load that may be safely applied to a *foundation unit* considered in design under expected loading and subsurface conditions.

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

Alternative solution means a substitute for an *acceptable solution*.

- Apparent sound transmission class (ASTC)* means a single number rating of the airborne sound attenuation of *building* assemblies separating two adjoining spaces, taking into account both the direct and flanking sound transmission paths. (See Note A-1.4.1.2.(1)) (See also Note A-9.11. of Division B)
- Appliance* means a device to convert fuel into energy and includes all components, controls, wiring and piping required to be part of the device by the applicable standard referred to in this Code.
- Architect* means the holder of a licence, a certificate of practice or a temporary licence under the *Architects Act*.
- Area affected by a significant drinking water threat* means an area described in Clause 1.10.2.3.(2)(b) of Division C.
- Artesian groundwater* means a confined body of water under pressure in the ground.
- As constructed plans* means *construction* plans and specifications that show the *building* and the location of the *building* on the property as the *building* has been constructed.
- Assembly occupancy (Group A)* means the *occupancy* or the use of a *building* or part thereof by a gathering of persons for civic, political, travel, religious, social, educational, recreational or like purposes, or for the consumption of food or drink.
- Attic or roof space* means the space between the roof and the ceiling of the top *storey* or between a dwarf wall and a sloping roof.
- Auxiliary water supply* means, when applied to premises, any water supply on or available to the premises other than the primary *potable* water supply for the premises.
- 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* in a *water distribution system*.
- Back pressure* means pressure means pressure higher than the supply pressure.
- Back-siphonage* means *backflow* caused by a negative pressure in the supply system.
- Back-siphonage preventer* means a device or a method that prevents *back-siphonage* in a *water distribution system*.
- Back vent* means a pipe that is installed to vent a *trap* off the horizontal section of a *fixture* drain or the *vertical leg* of a water closet or other *fixture* that has an integral siphonic flushing action and “*back vented*” has a corresponding meaning.
- Backwater valve* means a *check valve* designed for use in a *gravity drainage system*.
- Barrier-free* means, when applied to a *building* and its facilities, that the *building* and its facilities can be approached, entered and used by persons with physical or sensory disabilities.
- Basement* means a *storey* or *storeys* of a *building* located below the *first storey*.
- Bathroom group* means a group of plumbing *fixtures* installed in the same room, consisting of one domestic-type lavatory, one water closet and either one bathtub, with or without a shower, or one one-headed shower.
- Bearing surface* means the contact surface between a *foundation unit* and the *soil* or *rock* upon which it bears.
- Boarding, lodging or rooming house* means a *building*
- that has a *building height* not exceeding three *storeys* and a *building area* not exceeding 600 m²,
 - in which lodging is provided for more than four persons in return for remuneration or for the provision of services or for both, and
 - in which the lodging rooms do not have both bathrooms and kitchen facilities for the exclusive use of individual occupants.
- Boiler* means an *appliance* intended to supply hot water or steam for space heating, processing or power purposes.
- Bottle trap* means a *trap* that retains water in a closed chamber and that seals the water by submerging the inlet pipe in the liquids or by a partition submerged in the liquids.
- Braced wall band* means an imaginary continuous straight band extending vertically and horizontally through the *building* or part of the *building*, within which *braced wall panels* are constructed.

Braced wall panel means a portion of a wood-frame wall where bracing, sheathing, cladding or interior finish is designed and installed to provide the required resistance to lateral loads due to wind or earthquake.

Branch means a *sanitary drainage pipe* that is connected at its upstream end to the junction of two or more *sanitary drainage pipes* or to a *stack* connected at its downstream end to another *branch*, a sump, a *stack* or a *building drain*.

Branch vent means a *vent pipe* that is connected at its lower end to the junction of two or more *vent pipes* and at its upper end either to another *branch vent*, or to a *stack vent*, *vent stack* or *vent header*, or terminates in *open air*.

Breeching means a *flue pipe* or chamber for receiving *flue* gases from one or more *flue* connections and for discharging these gases through a single *flue* connection.

Building area means the greatest horizontal area of a *building* above *grade* within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of *firewalls*.

Building Code website means the website at www.ontario.ca/buildingcode.

Building control valve means the valve on a *water system* that controls the flow of *potable water* from the *water service pipe* to the *water distribution system*.

Building drain means the lowest horizontal piping, including any vertical *offset*, that conducts *sewage*, *clear water waste* or storm water by gravity to a *building sewer*.

Building height (in *storeys*) means the number of *storeys* contained between the roof and the floor of the *first storey*.

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 *sanitary building sewer* to prevent the circulation of air between the *sanitary drainage system* and a public sewer.

Business and personal services occupancy (Group D) means the *occupancy* or use of a *building* or part thereof for the transaction of business or the provision of professional or personal services.

Caisson (see *Pile*).

Camp for housing of workers means a camp in which *buildings* or other structures or premises are used to accommodate five or more employees.

Campground means land or premises used as an overnight camping facility that is not a *recreational camp*.

Canopy means a roof-like structure projecting more than 300 mm from the exterior face of the *building*.

Carbon dioxide equivalent means a measure used to compare the impact of various greenhouse gases based on their global warming potential.

Carbon monoxide alarm means a carbon monoxide detection device with an integral audible alarm device designed to sound an alarm within the room, *suite* or space in which it is located when the concentration of airborne carbon monoxide exceeds a pre-determined level and duration.

Care and treatment occupancy (Group B, Division 2) means an *occupancy* in which persons receive special care and treatment.

Care occupancy (Group B, Division 3) means an *occupancy*, other than a *retirement home*, in which special care is provided by a facility, directly through its staff or indirectly through another provider, to residents of the facility

- who require special care because of cognitive or physical limitations, and
- who, as a result of those limitations, would be incapable of evacuating the *occupancy*, if necessary, without the assistance of another person. (See Note A-1.4.1.2.(1))

Cavity wall means a construction of masonry units laid with a cavity between the wythes. The wythes are tied together with metal ties or bonding units, and are relied on to act together in resisting lateral loads.

Certificate for the occupancy of a building described in Sentence 1.3.3.4.(3) of Division C means a certificate described in Sentence 3.7.4.3.(6) of Division C.

Certificate for the occupancy of a building described in Sentence 1.3.3.5.(1) of Division C means a certificate described in Sentence 3.7.4.3.(7) of Division C.

- Certificate for the occupancy of a building not fully completed* means a certificate described in Sentence 3.7.4.3.(5) of Division C.
- Chamber* means a structure in a *shallow buried trench* that is constructed with an open bottom and that contains a pressurized *distribution pipe*.
- Check valve* means a valve that permits flow in only one direction and prevents a return flow.
- Child care centre* means a child care centre as defined in subsection 2 (1) of the *Child Care and Early Years Act, 2014*.
- Chimney* means a primarily vertical shaft enclosing at least one *flue* for conducting *flue* gases to the outdoors.
- Chimney liner* means a conduit containing a *chimney flue* used as a lining of a *masonry or concrete chimney*.
- Circuit vent* means a *vent pipe* that serves a number of *fixtures* and connects to the *fixture drain* of the most upstream *fixture*, and “*circuit vented*” has a corresponding meaning.
- Class 1 fire sprinkler/standpipe system* means an assembly of pipes and fittings that conveys water from the *water service pipe* or *fire service main* to the sprinkler/standpipe system’s outlets, is *directly connected* to the public water supply main only, has no pumps or reservoirs and in which the sprinkler drains discharge to the atmosphere, to dry wells or to other safe outlets.
- Class 2 fire sprinkler/standpipe system* means a *Class 1 fire sprinkler/standpipe system* that includes a booster pump in its connection to the public water supply main.
- Class 3 fire sprinkler/standpipe system* means an assembly of pipes and fittings that conveys *potable* water from the *water service pipe* or *fire service main* to the sprinkler/standpipe system’s outlets and that is *directly connected* to the public water supply main as well as to one or more of the following storage facilities, which are filled from the public water supply main only: elevated water storage, fire pumps supplying water from aboveground covered reservoirs or pressure tanks. The water in this sprinkler/standpipe system must be maintained in potable condition.
- Class 4 fire sprinkler/standpipe system* means an assembly of pipes and fittings that conveys water from the *water service pipe* or *fire service main* to the sprinkler/standpipe system’s outlets and is *directly connected* to the public water supply main (similar to *Class 1* and *Class 2 fire sprinkler/standpipe systems*) and to an *auxiliary water supply* dedicated to fire department use that is located within 520 m of a pumper connection.
- Class 5 fire sprinkler/standpipe system* means an assembly of pipes and fittings that conveys water from the *water service pipe* or *fire service main* to the sprinkler/standpipe system’s outlets, is *directly connected* to the public water supply main and also interconnected with an *auxiliary water supply*.
- Class 6 fire sprinkler/standpipe system* means an assembly of pipes and fittings that conveys water from the *water service pipe* or *fire service main* to the sprinkler/standpipe system’s outlets and acts as a combined industrial water supply and fire protection system that is supplied from the public water supply main only, with or without gravity storage or pump suction tanks.
- Cleanout* means a fitting access in a *drainage system* or *venting system* that is installed to provide access for cleaning and inspection and that is provided with a readily replaceable air tight cover.
- Clean water* means water that has passed through a *recirculation system*.
- Clear-water waste* means waste water with impurity levels that will not be harmful to health and may include cooling water and condensate drainage from refrigeration and *air-conditioning* equipment and cooled condensate from steam heating systems, but does not include storm water.
- Closed container* means a container so sealed by means of a lid or other device that neither liquid nor vapour will escape from it at ordinary temperatures.
- Closure* means a device or assembly for closing an opening through a *fire separation* or an exterior wall, such as a door, a shutter, a damper, wired glass or glass block, and includes all components such as hardware, closing devices, frames and anchors.
- Combustible* means that a material fails to meet the acceptance criteria of CAN/ULC-S114, “Standard Method of Test for Determination of Non-Combustibility in Building Materials.”
- Combustible construction* means that type of construction that does not meet the requirements for *noncombustible construction* or *encapsulated mass timber construction*.

Combustible dusts means dusts and particles that are ignitable and liable to produce an explosion.

Combustible fibres means finely divided, combustible vegetable or animal fibres and thin sheets or flakes of such materials which, in a loose, unbaled condition, present a flash fire hazard, including cotton, wool, hemp, sisal, jute, kapok, paper and cloth.

Combustible liquid means a liquid having a *flash point* at or above 37.8°C and below 93.3°C.

Compliance alternative means a substitute for a requirement in another Part of Division B that is listed in Part 10 or 11 of Division B, and “C.A.” has a corresponding meaning.

Compressed gas means

- (a) any contained mixture or material having a vapour pressure exceeding one or both of the following
 - (i) 275.8 kPa (absolute) at 21°C, or
 - (ii) 717 kPa (absolute) at 54°C, or
- (b) any liquid having a vapour pressure exceeding 275.8 kPa (absolute) at 37.8°C.

Computer room means a room

- (a) that contains electronic computer or data processing equipment such as main frame type,
- (b) that is separated from the remainder of the *building* for the purpose of controlling the air quality in the room by a self-contained climate control system, and
- (c) that has an *occupant load* of not more than one person for each 40 m² of the room.

Conditioned space means any space within a *building*, the temperature of which is controlled to limit variation in response to the exterior ambient temperature by the provision, either directly or indirectly, of heating or cooling over substantial portions of the year.

Construction index means a level on a scale of 1 to 8 determined in accordance with Table 11.2.1.1.-A of Division B designating the expected *performance level* of the *building* structure with respect to the type of *construction* and fire protection of an existing *building*, and “C.I.” has a corresponding meaning.

Contained use area means a supervised area containing one or more rooms in which occupant movement is restricted to a single room by security measures not under the control of the occupant.

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

Cooktop means a cooking surface having one or more burners or heating elements.

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

Dangerous goods means products, materials or substances that are

- (a) regulated by TC SOR/2001-286, “Transportation of Dangerous Goods Regulations (TDGR)”, or (See Table 3.2.7.1. of Division B of CCBFC NRCC-CONST-56437E, “National Fire Code of Canada”)
- (b) classified as controlled products under HC SOR/2015-17, “Hazardous Products Regulations”. (See Note A-Table 3.2.7.1. of Division B of CCBFC NRCC-CONST-56437E, “National Fire Code of Canada”) (See Note A-1.4.1.2.(1))

Day camp means a camp or resort that admits persons for a continuous period not exceeding 24 hours.

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

Dead load means the weight of all permanent structural and non-structural components of a *building*.

Deep foundation means a *foundation unit* that provides support for a *building* by transferring loads either by end-bearing to *soil* or *rock* at considerable depth below the *building*, or by adhesion or friction, or both, in the *soil* or *rock* in which it is placed. *Piles* are the most common type of *deep foundation*.

Demountable stage means a structure that

- (a) consists of one or more platforms together with any wall, roof or other structures attached to or located on any of the platforms,
- (b) is intended to be used for public or private performances or events, other than performances or events associated with movie or television productions,
- (c) is intended to be erected, assembled or installed for a limited specified time,
- (d) is capable of being dismantled at its location and moved to be reconstituted elsewhere or is erected for one-time use,

- (e) is not located inside a fully enclosed *building*,
- (f) is primarily for use by performers and workers, and
- (g) may or may not be mounted on wheels.

Demountable support structure means any structure that

- (a) is capable of supporting banners, stage sets, props, sound equipment, lighting equipment or other equipment,
- (b) is intended to be used for public or private performances or events, other than performances or events associated with movie or television productions,
- (c) is intended to be erected, assembled or installed for a limited specified time,
- (d) is capable of being dismantled at its location and moved to be reconstituted elsewhere or is erected for one-time use,
- (e) is not attached to or located on a *demountable stage*,
- (f) is not located inside a fully enclosed *building*,
- (g) is primarily for use by performers and workers, and
- (h) may or may not be mounted on wheels.

Design activities means the activities described in subsection 15.11(5) of the Act.

Design bearing pressure means the pressure applied by a *foundation unit* to *soil* or *rock*, which pressure is not greater than the *allowable bearing pressure*.

Design capacity means, in the definition of *sewage system*, the total daily design *sanitary sewage* flow determined in accordance with Article 8.2.1.3. of Division B.

Designer means the person responsible for the design.

Design load means the load applied to a *foundation unit*, which load is not greater than the *allowable load*.

Detention occupancy (Group B, Division 1) means the *occupancy* by persons who are restrained from or are incapable of evacuating to a safe location without the assistance of another person because of security measures not under their control.

Developed length means, the length along the centre line of the pipe and fittings.

Direct-vented (as applying to a fuel-fired space- or water-heating *appliance*) means an *appliance* and its venting system in which all the combustion air is supplied directly from the outdoors and the products of combustion are vented directly to the outdoors via independent, totally enclosed passageways connected directly to the *appliance*.

Directly connected means physically connected in such a way that neither water or gas can escape from the connection.

Distilled beverage alcohol means a beverage that is produced by fermentation and contains more than 20% by volume of water-miscible alcohol.

Distillery means a *process plant* where *distilled beverage alcohols* are produced, concentrated or otherwise processed, and includes facilities on the same site where the concentrated products may be blended, mixed, stored or packaged.

Distributing pipe means a pipe or piping in a *water distribution system*.

Distribution box means a device for ensuring that *effluent* from a *treatment unit* is distributed in equal amounts to each line of *distribution pipe* or *leaching chamber* in a *leaching bed*.

Distribution pipe means a line or lines of perforated or open jointed pipe or tile installed in a *leaching bed* for the purpose of distributing *effluent* from a *treatment unit* to the *soil*, as defined in Part 8 of Division B, or *leaching bed fill* in the *leaching bed*.

Diving board means a flexible board.

Diving platform means a rigid platform that is not a *starting platform*.

Drainage system means an assembly of pipes, fittings, *fixtures* and appurtenances on a property that is used to convey *sewage* and *clear water waste* to a main sewer or a *private sewage disposal system*, and includes a *private sewer*, but does not include *subsoil drainage piping*.

Drinking water system has the same meaning as in subsection 2(1) of the *Safe Drinking Water Act, 2002*.

Drum trap means a *trap* whose inlet and outlet are in the sides of the cylindrical body of the *trap*.

Dual vent means a *vent pipe* that serves two *fixtures* and connects at the junction of the *trap arms*.

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

Earth pit privy means a latrine consisting of an excavation in the ground surmounted by a superstructure.

Effluent means *sanitary sewage* that has passed through a *treatment unit*.

Electric space heating means an electric energy source that provides more than 10 percent of the heating capacity provided for a *building* and includes

- (a) electric resistance unitary baseboard heating,
- (b) electric resistance unitary cabinet heating,
- (c) electric resistance ceiling cable or floor cable heating,
- (d) electric resistance central furnace heating,
- (e) electric hot water space heating, and
- (f) air source heat pumps in combination with electric resistance backup heating.

Encapsulated mass timber construction means that type of construction in which a degree of fire safety is attained by the use of encapsulated mass timber elements with an *encapsulation rating* and minimum dimensions for structural members and other *building assemblies*.

Encapsulation rating means the time in minutes that a material or assembly of materials will delay the ignition and combustion of encapsulated mass timber elements when it is exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed by this Code.

Excavation means the space created by the removal of *soil*, *rock* or *fill* for the purposes of construction.

Exhaust duct means a duct through which air is conveyed from a room or space to the outdoors.

Exit means that part of a *means of egress*, including doorways, that leads from the *floor area* it serves to a separate *building*, an open public thoroughfare, or an exterior open space protected from fire exposure from the *building* and having access to an open public thoroughfare. (See Note A-1.4.1.2.(1))

Exit level means the level of an *exit* stairway at which an exterior *exit* door or *exit* passageway leads to the exterior.

Exit storey (as applying to Subsection 3.2.6. of Division B) means a *storey* having an exterior *exit* door.

Exposing building face means that part of the exterior wall of a *building* that faces one direction and is located between ground level and the ceiling of its top *storey* or, where a *building* is divided into *fire compartments*, the exterior wall of a *fire compartment* that faces one direction.

Exterior cladding means those components of a *building* that are exposed to the outdoor environment and are intended to provide protection against wind, water or vapour.

Factory-built chimney means a *chimney* consisting entirely of factory-made parts, each designed to be assembled with the other without requiring fabrication on site.

Farm building means a *building* or part thereof that contains an *agricultural occupancy*. (See Note A-1.4.1.2.(1))

Fill means *soil*, *rock*, rubble, industrial waste such as slag, organic material or a combination of these that is transported and placed on the natural surface of *soil* or *rock* or organic terrain. It may or may not be compacted.

Fire block means a material, component or system that restricts the spread of fire within a concealed space or from a concealed space to an adjacent space.

Fire compartment means an enclosed space in a *building* that is separated from all other parts of the *building* by enclosing construction providing a *fire separation* having a required *fire-resistance rating*.

Fire damper means a *closure* consisting of a damper that is installed in an air distribution system or a wall or floor assembly and that is normally held open but designed to close automatically in the event of a fire in order to maintain the integrity of the *fire separation*.

Fire detector means a device that detects a fire condition and automatically initiates an electrical signal to actuate an *alert signal* or *alarm signal* and includes *heat detectors* and *smoke detectors*.

Fire load (as applying to an *occupancy*) means the *combustible* contents of a room or *floor area* expressed in terms of the average weight of *combustible* materials per unit area, from which the potential heat liberation may be calculated based on the calorific value of the materials, and includes the furnishings, finished floor, wall and ceiling finishes, trim and temporary and movable *partitions*.

Fire-protection rating means the time in minutes or hours that a *closure* will withstand the passage of flame when exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed in this Code.

Fire-resistance rating means the time in minutes or hours that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in this Code. (See Sentence 1.2.1.(2) in MMAH Supplementary Standard SB-2)

Fire-retardant-treated wood means wood or a wood product that has had its surface-burning characteristics, such as flame spread, rate of fuel contribution and density of smoke developed, reduced by impregnation with fire-retardant chemicals.

Fire separation means a construction assembly that acts as a barrier against the spread of fire. (See Note A-1.4.1.2.(1))

Fire service main means a pipe and its appurtenances that are connected to a source of water and that are located on a property

- (a) between the source of water and the base of the riser of a water-based fire protection system,
- (b) between the source of water and inlets to foam making systems,
- (c) between the source of water and the base elbow of private hydrants or monitor nozzles,
- (d) as fire pump suction and discharge piping not within a *building*, or
- (e) beginning at the inlet side of the check valve on a gravity or pressure tank.

Fire service pipe means a pipe that conveys water from a public water main or private water source to the inside of a *building* for the purpose of supplying the fire sprinkler or standpipe systems.

Firestop means a system consisting of a material, component and means of support used to fill gaps between *fire separations* or between *fire separations* and other assemblies, or used around items that wholly or partially penetrate a *fire separation*.

Fire stop flap means a device intended for use in horizontal assemblies required to have a *fire-resistance rating* and incorporating protective ceiling membranes that operates to close off a duct opening through the membrane in the event of a fire.

Firewall means a type of *fire separation* of *noncombustible construction* that subdivides a *building* or separates adjoining *buildings* to resist the spread of fire and that has a *fire-resistance rating* as prescribed in this Code and has structural stability to remain intact under fire conditions for the required fire-rated time.

First storey means the *storey* that has its floor closest to *grade* and its ceiling more than 1.8 m above *grade*.

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*.

Fixture outlet pipe means a pipe that connects the waste opening of a *fixture* to the *trap* serving the *fixture*.

Fixture unit, as applying to a *drainage system*, 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.

Flame-spread rating means an index or classification indicating the extent of spread-of-flame on the surface of a material or an assembly of materials as determined in a standard fire test as prescribed in this Code.

Flammable liquid means a liquid having a *flash point* below 37.8°C and having a vapour pressure not more than 275.8 kPa (absolute) at 37.8°C as determined by ASTM D323, “Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method).”

Flash point means the minimum temperature at which a liquid within a container gives off vapour in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Flight means a series of steps between landings. (See Note A-1.4.1.2.(1))

Flood level rim means the top edge at which water can overflow from a *fixture* or device.

Floor area means the space on any *storey* of a *building* between exterior walls and required *firewalls*, including the space occupied by interior walls and *partitions*, but not including *exits*, *vertical service spaces*, and their enclosing assemblies.

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

Flue means an enclosed passageway for conveying *flue* gases.

Flue collar means the portion of a fuel-fired *appliance* designed for the attachment of the *flue pipe* or *breeching*.

Flue pipe means the pipe connecting the *flue collar* of an *appliance* to a *chimney*.

Food premises means a *floor area* where food or drink for human consumption, or an ingredient of food or drink for human consumption, is manufactured, processed, prepared, stored, displayed, handled, served, distributed, sold or offered for sale, but does not include

- (a) a private residence,
- (b) a boarding house that provides meals for fewer than 10 boarders,
- (c) a *building* to which Ontario Regulation 502/17 (Camps in Unorganized Territory) or Ontario Regulation 503/17 (Recreational Camps) made under the *Health Protection and Promotion Act* applies,
- (d) a plant, as defined in the *Milk Act*, that is required to be operated under the authority of a licence issued under that Act,
- (e) premises where a licensed activity, as defined in the *Food Safety and Quality Act, 2001*, is carried on by a person who is required to hold a licence issued under that Act,
- (f) an egg-grading station or an egg-processing station, as defined in subsection 1(1) of Ontario Regulation 171/10 (Eggs and Processed Egg), made under the *Food Safety and Quality Act, 2001*,
- (g) a *floor area* occupied by a church, service club or fraternal organization for the purpose of
 - (i) preparing meals for special events for its members and personally invited guests, or
 - (ii) conducting bake sales, or
- (h) a *farm building*.

Forced-air furnace means a *furnace* equipped with a fan that provides the primary means for the circulation of air.

Force main means a *sanitary drainage pipe* through which *sanitary sewage* is conveyed by mechanical or pneumatic propulsion.

Foundation means a system or arrangement of *foundation units* through which the loads from a *building* are transferred to supporting *soil* or *rock*.

Foundation unit means one of the structural members of the *foundation* of a *building* such as a footing, raft or *pile*.

Fresh air inlet means a *vent pipe* that is installed in conjunction with a *building trap* and terminates *outdoors*.

Frost action means the phenomenon that occurs when

- (a) water in *soil* is subjected to freezing which, because of the water ice phase change or ice lens growth, results in a total volume increase or the build-up of expansive forces under confined conditions or both, and
- (b) the subsequent thawing leads to loss of *soil* strength and increased compressibility.

Functional statement means a function set out in Article 3.2.1.1. that a *building* or an element of a *building* is intended to perform.

Furnace means a *space-heating appliance* using warm air as the heating medium and usually having provision for the attachment of ducts.

Gaming premises means premises that are a gaming site as defined in the *Ontario Lottery and Gaming Corporation Act, 1999*.

Gas vent means that portion of a venting system designed to convey vent gases to the outdoors

- (a) from the *vent connector* of a gas-fired *appliance*, or
- (b) directly from the *appliance* when a *vent connector* is not used.

Grade means the average level of proposed or finished ground adjoining a *building* at all exterior walls.

Graded lumber means lumber that has been graded and stamped to indicate its grade, as determined by the NLGA, “Standard Grading Rules for Canadian Lumber”.

Greenhouse agricultural occupancy (Group G, Division 3) means an *agricultural building* or part thereof that is primarily constructed of roofs and walls designed to transmit natural light.

Greywater means *sanitary sewage* of domestic origin that is derived from *fixtures* other than *sanitary units*.

Gross area means the total area of all floors above *grade* measured between the outside surfaces of exterior walls or between the outside surfaces of exterior walls and the centre line of *firewalls*, except that, in any *occupancy* other than a *residential occupancy*, where an access or a *building* service penetrates a *firewall*, measurements shall not be taken to the centre line of such *firewall*.

Ground water means, when applied to a *sewage system*, water below the surface of the ground that occupies a zone of the earth’s mantle that is saturated with water.

Ground water table means, when applied to a *sewage system*, the elevation of the upper surface of the *ground water* existing in the area of the *sewage system*.

Groundwater means a free standing body of water in the ground.

Groundwater level (groundwater table) means the top surface of a free standing body of water in the ground.

Guard means a protective barrier, with or without openings through it, that is around openings in floors or at the open sides of stairs, landings, balconies, *mezzanines*, galleries, raised *walkways* or other locations to prevent accidental falls from one level to another.

Hauled sewage means *sanitary sewage* that

- (a) is not finally disposed of at the site where it is produced and is not conveyed by a sewer to *sewage works*, and
- (b) is stored or retained at the site where it is produced for periodic collection, handling, treatment, transportation, storage or processing prior to final disposal at a place other than where it was produced,

and includes *sanitary sewage* that is removed from a *sewage system* for the purpose of cleaning or maintaining the system.

Hauled sewage system means works, installations, equipment, operations and land used in connection with the collection, handling, treatment, transportation, storage, processing and disposal of *hauled sewage*, as regulated under the *Environmental Protection Act*.

Hazard index means a level on a scale of 1 to 8 determined in accordance with Tables 11.2.1.1.-B to 11.2.1.1.-N of Division B, designating the life safety hazard to occupants of a *building* based on

- (a) use and *occupancy*,
- (b) *occupant load*,
- (c) the use and function of floor spaces,
- (d) the difficulty of egress,
- (e) the *fire load* of contents, finishes and furnishings,
- (f) the configuration or compartmentation of floor spaces, and
- (g) the size of the *building*,

and “*H.I.*” has a corresponding meaning.

Hazardous classroom means a classroom

- (a) that is supplied with flammable gas,
- (b) that contains hazardous substances such as chemicals or explosive dusts,
- (c) that contains large quantities of *combustible* materials, or
- (d) where cooking equipment is used.

Hazardous extraction means a process to remove or separate a substance from a solution or mixture that involves the use of *flammable liquids*, *combustible liquids* or flammable gases as solvents in the process.

Hazardous room means a room containing sufficient quantities of a substance that, because of its chemical nature, may create an atmosphere or condition of imminent hazard to health.

Header means a *vent pipe* that connects two or more *vent stacks* or *stack vents* to *open air*.

Header line means a line of pipe with watertight joints installed in a *sewage system* for the purpose of distributing *effluent* from a *treatment unit* to the *distribution pipe* in a *leaching bed*.

Heat detector means a *fire detector* designed to operate at a predetermined temperature or rate of temperature rise.

Heavy timber construction means that type of *combustible construction* in which a degree of fire safety is attained

- (a) by placing limitations on the sizes of wood structural members and on the thickness and composition of wood floors and roofs, and
- (b) by the avoidance of concealed spaces under floors and roofs.

Heritage building means a *building* or part thereof,

- (a) that is identified, or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value or interest;
- (b) that has been set apart as a National Historic Site of Canada by the Minister of the Environment for Canada under the *Canada National Parks Act* (Canada);
- (c) that has been marked or commemorated as a historic place having national historic interest or significance under the *Historic Sites and Monuments Act* (Canada); or
- (d) that is listed on an inventory of property forming part of the cultural and natural heritage of a place inscribed on the United Nations Educational, Scientific and Cultural Organisation's World Heritage List of sites under the *Convention Concerning the Protection of the World Cultural and Natural Heritage*. (See Note A-1.4.1.2.(1))

High ground water table means the highest elevation at which there is physical evidence that the *soil*, as defined in Part 8 of Division B, or the *leaching bed fill* has been saturated with water.

High-hazard agricultural occupancy (Group G, Division 1) means an *agricultural occupancy* containing sufficient quantities of highly *combustible* and flammable or explosive materials which, because of their inherent characteristics, constitute a special fire hazard.

High-hazard industrial occupancy (Group F, Division 1) means an *industrial occupancy* containing sufficient quantities of highly *combustible* and flammable or explosive materials which, because of their inherent characteristics, constitute a special fire hazard.

Holding tank means a tank designed to totally retain all *sanitary sewage* discharged into it and requiring periodic emptying.

Home for special care means a home for the care of persons requiring nursing, residential or sheltered care.

Horizontal branch means that part of a *waste pipe* that is horizontal and installed to convey the discharge from more than one *fixture*.

Horizontal exit means an *exit* from one *building* to another by means of a doorway, vestibule, *walkway*, bridge or balcony.

Horizontal service space means a space such as an attic, duct, ceiling, roof or crawl space

- (a) that is oriented essentially in a horizontal plane,
- (b) that is concealed and generally inaccessible, and
- (c) through which *building* service facilities such as pipes, ducts and wiring may pass.

Hotel means *floor areas*, a *floor area* or part of a *floor area* that contains four or more *suites* and that provides sleeping accommodation for the travelling public or for recreational purposes.

Hub drain means a drain opening for indirect liquid wastes

- (a) that does not serve as a floor drain,
- (b) that has the same pipe *size*, material and venting requirements as a floor drain,
- (c) that has a *flood level rim* above the floor in which it is installed, and
- (d) that receives wastes that are discharged directly into the drain opening.

Impeded egress zone means a supervised area in which occupants have free movement but require the release, by security personnel, of security doors at the boundary before they are able to leave the area, but does not include a *contained use area*.

Indirectly connected means not *directly connected*.

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

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

Indoor pool means a *public pool* where the pool and *pool deck* are totally or partially covered by a roof.

Industrial occupancy (Group F) means the *occupancy* or use of a *building* or part thereof for the assembling, fabricating, manufacturing, processing, repairing or storing of goods and materials.

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

Interconnected floor space means superimposed *floor areas* or parts of *floor areas* in which floor assemblies that are required to be *fire separations* are penetrated by openings that are not provided with *closures*.

Lake Simcoe shoreline has the same meaning as in the Lake Simcoe Protection Plan established under the *Lake Simcoe Protection Act, 2008* and dated July, 2009.

Lake Simcoe watershed has the same meaning as in section 2 of the *Lake Simcoe Protection Act, 2008*.

Leaching means dispersal of liquid by downward or lateral drainage or both into permeable *soil*, as defined in Part 8 of Division B, or *leaching bed fill*.

Leaching bed means an absorption system constructed as *absorption trenches* or as a filter bed, located wholly in ground or raised or partly raised above ground, as required by local conditions, to which *effluent* from a *treatment unit* is applied for treatment and disposal and that is composed of

- (a) the *soil*, as defined in Part 8 of Division B, *leaching bed fill* or other filter media that is contained between the surface on which the *sanitary sewage* is applied and the bottom of the bed,
- (b) the *leaching chamber* or the *distribution pipe* and the stone or gravel layer in which the *distribution pipe* is located, and
- (c) the backfill above the *distribution pipe* or the *leaching chamber*, including the topsoil and sodding or other anti-erosion measure, and the side slopes of any portion elevated above the natural ground elevation.

Leaching bed fill means unconsolidated material suitable for the *construction* of a *leaching bed*, placed in the area of the *leaching bed* in order to obtain the required unsaturated zone below the *distribution pipes* or *leaching chambers* and the required lateral extent such that the *effluent* is absorbed.

Leaching chamber means a formed structure with an open bottom and permeable sidewalls installed in a *leaching bed* for the purpose of distributing *effluent* from a *treatment unit* to the *soil*, as defined in Part 8 of Division B, or *leaching bed fill* in the *leaching bed*.

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.

Limiting distance means the distance from an *exposing building face* to a property line, the centre line of a *street*, lane or public thoroughfare, or to an imaginary line between 2 *buildings* or *fire compartments* on the same property, measured at right angles to the *exposing building face*.

Listed means equipment or materials included in a list published by a certification organization accredited by the Standards Council of Canada.

Liquid manure means manure having a dry matter content of less than 18 per cent or a slump of more than 150 millimetres using the Test Method for the Determination of Liquid Waste (slump test) set out in Schedule 9 to Regulation 347 of the Revised Regulations of Ontario, 1990 (General — Waste Management) made under the *Environmental Protection Act*.

Live load means a variable load due to the intended use and *occupancy* that is to be assumed in the design of the structural members of a *building*. It includes loads due to cranes and the pressure of liquids in containers.

Live/work unit means a *dwelling unit* having an area of not more than 200 m² that contains a subsidiary *business and personal services occupancy* or a subsidiary *low-hazard industrial occupancy*, and which is used and operated by one or more persons of a single household.

Loadbearing (as applying to a *building element*) means subjected to or designed to carry loads in addition to its own *dead load*, excepting a wall element subjected only to wind or earthquake loads in addition to its own *dead load*.

Loading rate means the volume in litres of *effluent* per square metre applied in a single day to *soil*, as defined in Part 8 of Division B, or *leaching bed fill*.

Low-hazard industrial occupancy (Group F, Division 3) means an *industrial occupancy* in which the *combustible* content is not more than 50 kg/m² or 1 200 MJ/m² of *floor area*.

Low human occupancy means, when applied to a *farm building*, an *occupancy* in which the *occupant load* is not more than one person per 40 m² of *floor area* during normal use.

Major occupancy means the principal *occupancy* for which a *building* or part thereof is used or intended to be used, and shall be deemed to include the subsidiary *occupancies* that are an integral part of the principal *occupancy*. The *major occupancy* classifications used in this Code are as follows:

Group A, Division 1 – *Assembly occupancies* intended for the production and viewing of the performing arts

Group A, Division 2 – *Assembly occupancies* not elsewhere classified in Group A

Group A, Division 3 – *Assembly occupancies* of the arena type

Group A, Division 4 – *Assembly occupancies* in which the occupants are gathered in the open air

Group B, Division 1 – *Detention occupancies* in which persons are under restraint or are incapable of self-preservation because of security measures not under their control

Group B, Division 2 – *Care and treatment occupancies*

Group B, Division 3 – *Care occupancies*

Group C – *Residential occupancies*

Group D – *Business and personal services occupancies*

Group E – *Mercantile occupancies*

Group F, Division 1 – *High-hazard industrial occupancies*

Group F, Division 2 – *Medium-hazard industrial occupancies*

Group F, Division 3 – *Low-hazard industrial occupancies*

Group G, Division 1 – *High-hazard agricultural occupancies*

Group G, Division 2 – *Agricultural occupancies* not elsewhere classified in Group G

Group G, Division 3 – *Greenhouse agricultural occupancies*

Group G, Division 4 – *Agricultural occupancies with no human occupants*

Make-up water means water added to a *public pool* from an external source.

Marquee means a *canopy* over an entrance to a *building*.

Masonry or concrete chimney means a *chimney* of brick, stone, concrete or masonry units constructed on site.

Means of egress means a continuous path of travel provided for the escape of persons from any point in a *building* or contained open space to a separate *building*, an open public thoroughfare, or an exterior open space protected from fire exposure from the *building* and having access to an open public thoroughfare. *Means of egress* includes *exits* and *access to exits*.

Mechanically vented (as applying to a fuel-fired space- or water-heating *appliance*) means an *appliance* and its combustion venting system in which the products of combustion are entirely exhausted to the outdoors by a mechanical device, such as a fan, blower or aspirator, upstream or downstream from the combustion zone of the *appliance*, and the portion of the combustion venting system that is downstream of the fan, blower or aspirator is sealed and does not include draft hoods or draft control devices. (See Note A-1.4.1.2.(1))

Medium-hazard industrial occupancy (Group F, Division 2) means an *industrial occupancy* in which the *combustible* content is more than 50 kg/m² or 1 200 MJ/m² of *floor area* and not classified as a *high-hazard industrial occupancy*.

Mercantile occupancy (Group E) means the *occupancy* or use of a *building* or part thereof for the displaying or selling of retail goods, wares or merchandise.

Mezzanine means an intermediate floor assembly between the floor and ceiling of any room or *storey* and includes an interior balcony.

Mobility assistive device means a mobility assistive device as defined in section 2 of Ontario Regulation 191/11 (Integrated Accessibility Standards) made under the *Accessibility for Ontarians with Disabilities Act, 2005*.

Modified pool means a *public pool* that has a basin-shaped floor sloping downward and inward toward the interior from the rim.

Modified stack venting means a *stack venting* arrangement in which the *stack vent* above the connection of the highest *stack vented fixture* is reduced in diameter.

Municipal drinking water system has the same meaning as in subsection 2(1) of the *Safe Drinking Water Act, 2002*.

Nominally horizontal means at an angle of less than 45° with the horizontal.

Nominally vertical means at an angle of not more than 45° with the vertical.

Nominal pipe size (NPS) means the nominal diameter by which a pipe, fitting, *trap* or other similar item is commercially designated.

Noncombustible means that a material meets the acceptance criteria of CAN/ULC-S114, “Standard Method of Test for Determination of Non-Combustibility in Building Materials.”

Noncombustible construction means that type of construction in which a degree of fire safety is attained by the use of *noncombustible* materials for structural members and other *building* assemblies.

e1 *Objective* means an objective set out in Article 2.2.1.1.

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

Occupant load means the number of persons for which a *building* or part thereof is designed.

e1 *Offset* means the piping that connects the ends of two pipes that are parallel.

Offset relief vent means a *relief vent* that provides additional air circulation upstream and downstream of an *offset* in a *stack*.

Open air means the atmosphere outside a *building*.

Open-air storey means a *storey* in which at least 25% of the total area of its perimeter walls is open to the outdoors in a manner that will provide cross-ventilation to the entire *storey*.

Outdoor pool means a *public pool* that is not an *indoor pool*.

Pail privy means a latrine in which the receptacle for human waste consists of a removable container surmounted by a superstructure.

Partition means an interior wall 1 *storey* or part-*storey* in height that is not *loadbearing*.

Party wall means a wall

- (a) that is jointly owned and jointly used by two parties under an easement agreement or by a right in law, and
- (b) that is erected at or upon a line separating two parcels of land each of which is, or is capable of being, a separate real estate entity.

Perched groundwater means a free standing body of water in the ground extending to a limited depth.

Percolation time means the average time in minutes that is required for water to drop one centimetre during a percolation test or as determined by a *soil* evaluation or analysis.

Performance level means the level of performance under which all or part of an existing *building* functions with respect to its *building systems*.

Permanent solid nutrient storage facility has the same meaning as in subsection 1(1) of Ontario Regulation 267/03 (General) made under the *Nutrient Management Act, 2002*.

Pharmacy means the premises in a *building* or the part of the premises in which prescriptions are compounded and dispensed for the public or in which drugs are sold by retail.

Pile means a slender *deep foundation unit* made of materials such as wood, steel or concrete or a combination thereof, that is either premanufactured and placed by driving, jacking, jetting or screwing, or cast-in-place in a hole formed by driving, excavating or boring. (Cast-in-place bored *piles* are often referred to as *caissons* in Canada.)

Plenum means a chamber forming part of an air duct system.

Plumbing appliance means a receptacle or equipment that receives or collects water, liquids or *sewage* and discharges water, liquid or *sewage* directly or indirectly to a *plumbing system*.

Plumbing system means a system of connected piping, fittings, valves, equipment, *fixtures* and appurtenances contained in *plumbing*.

Point of entry treatment unit has the same meaning as in subsection 1(1) of Ontario Regulation 170/03 (Drinking Water Systems) made under the *Safe Drinking Water Act, 2002*.

Pool deck means the area immediately surrounding a *public pool*.

Portable privy means a portable latrine in which the receptacle for human body waste and the superstructure are combined structurally into one unit.

Post-disaster building means a *building* that is necessary for the provision of essential services to the general public in the event of a disaster and includes

- hospitals, emergency treatment facilities and blood banks,
- telephone exchanges,
- power generating stations and electrical substations,
- control centres for natural gas distribution,
- control centres for air, land and marine transportation,
- water treatment facilities,
- water storage facilities,
- water and sewage pumping stations,
- sewage treatment facilities, and
- *buildings* of the following types, unless exempted from this designation by the *principle authority*:
 - emergency response facilities,
 - fire, rescue and police stations and housing for vehicles, aircraft or boats used for such purposes, and
 - communications facilities, including radio and television stations. (See Note A-1.4.1.2.(1))

e1 *Potable* means fit for human consumption.

Potable water system means the *plumbing* that conveys *potable* water.

Pressurized distribution system means a *leaching bed* in which the *effluent* is distributed through the use of pressurized *distribution pipes*.

r1 *Private sewage disposal system* means a *sewage system* or a *sewage works* that is not owned and operated by the Crown, a municipality or an organization acceptable to the Director responsible for issuing an environmental compliance approval required under section 53 of the *Ontario Water Resources Act*.

Private sewer means a sewer other than a *building sewer* that

- (a) is not owned or operated by a municipality, the Ministry of the Environment, Conservation and Parks or another public agency,
- (b) receives drainage from more than one *sanitary building drain* either directly or through more than one *sanitary building sewer* or receives drainage from more than one *storm building drain* either directly or through one or more *storm building sewers*, and connects to a main sewer, or
- (c) serves as a place of disposal on the property,

but does not include

- (d) a sewer that carries only the sanitary waste or *storm sewage* from semi-detached houses each containing not more than two *dwelling units*,
- (e) a sewer that carries only the sanitary waste or *storm sewage* from one main *building* that is of *care, care and treatment, detention*, commercial or *industrial occupancy* and one ancillary *building*, or
- (f) a sewer that carries only the sanitary waste or *storm sewage* from a row housing complex having five or fewer *dwelling units*.

Private use means, when applied to plumbing *fixtures, fixtures* in residences and apartments, in private bathrooms of *hotels*, and in similar installations in other *buildings* for a single household or an individual.

Private water supply means piping that serves as a source of supply on the property to more than one *water service pipe*.

- Private water supply system* means an assembly of pipes, fittings, valves, equipment and appurtenances that supplies water from a private source to a *potable water system*.
- Privy vault* means a latrine in which the receptacle for human waste consists of a constructed vault from which the waste is periodically removed.
- Process plant* means an *industrial occupancy* where materials, including *flammable liquids*, *combustible liquids* or gases, are produced or used in a process.
- Professional engineer* means a person who holds a licence or a temporary licence under the *Professional Engineers Act*.
- Protected floor space* means that part of a *floor area* protected from the effects of fire and used as part of a *means of egress* from an *interconnected floor space*.
- Public corridor* means a corridor that provides *access to exit* from more than one *suite*. (See Note A-1.4.1.2.(1))
- Public heritage building* means a *heritage building* where the *occupancy* in whole or in part includes viewing of the *building* by the public provided that displays in it are limited to those relevant to the heritage significance of the *building*.
- Public pool* means a structure, basin, chamber or tank containing or intended to contain an artificial body of water for swimming, water sport, water recreation or entertainment, but does not include
- (a) pools operated in conjunction with less than six *dwelling units*, *suites* or single family residences or any combination of them,
 - (b) pools that are used only for commercial display and demonstration purposes,
 - (c) wading pools,
 - (d) hydro-massage pools, or
 - (e) pools that serve only as receiving basins for persons at the bottom of water slides.
- Public spa* means a hydro-massage pool that contains an artificial body of water, that is intended primarily for therapeutic or recreational use, that is not drained, cleaned or refilled before use by each individual and that utilizes hydrojet circulation, air induction bubbles, current flow or a combination of them over the majority of the pool area, but does not include
- (a) wading pools, or
 - (b) spas operated in conjunction with less than six *dwelling units*, *suites* or single family residences, or any combination of them, for the use of occupants or residents and their visitors.
- Public use* means, when applied to plumbing *fixtures*, *fixtures* in general washrooms of schools, gymnasiums, *hotels*, bars, public comfort stations and other installations in which *fixtures* are installed so that their use is unrestricted.
- Public way* means a sidewalk, *street*, highway, square or other open space to which the public has access, as of right or by invitation, expressed or implied.
- Rainwater* means *storm sewage* runoff that is collected from a roof or the ground, but not from accessible patios and driveways.
- Ramp* means a path of travel having a slope steeper than 1 in 20.
- Recirculation system* means a system
- (a) that maintains the circulation of water through a *public pool* by pumps, and
 - (b) that provides continuous treatment of the water, including filtration and chlorination or bromination and any other process that may be necessary for the treatment of the water.
- Recreational camp* means a camp for recreational activities consisting of one or more *buildings* or other structures established or maintained as living quarters, with or without charge, for the temporary *occupancy* of 10 or more persons for five or more days.
- Relief vent* means a *vent pipe* that is used in conjunction with a *circuit vent* to provide additional air circulation between a *drainage system* and a *venting system*.
- Repair garage* means a *building* or part thereof where facilities are provided for the repair or servicing of motor vehicles.
- Residential full flow-through fire sprinkler/standpipe system* means an assembly of pipes and fittings installed in the residential portions of a *building* containing one or two-family *dwelling units* that conveys water from the *water service*

pipe to outlets in the sprinkler and standpipe systems and is fully integrated into the *potable water system* to ensure a regular flow of water through all parts of both systems.

Residential occupancy (Group C) means an *occupancy* in which sleeping accommodation is provided to residents who are not harboured for the purpose of receiving special care or treatment and are not involuntarily detained and includes an *occupancy* in which sleeping accommodation is provided to residents of a *retirement home*.

Residential partial flow-through sprinkler/standpipe system means an assembly of pipes and fittings installed in the residential portions of a *building* containing one or two family *dwelling units* that conveys water from the *water service pipe* to outlets in the sprinkler and standpipe systems and in which flow occurs during inactive periods of the sprinkler and standpipe systems only through the main header to the water closet located at the farthest point of the two systems.

Retirement home means a *building* or part of a *building* that is a retirement home as defined in subsection 2(1) of the *Retirement Homes Act, 2010*.

Return duct means a duct for conveying air from a space being heated, ventilated or air-conditioned back to the heating, ventilating or *air-conditioning appliance*.

Rim joist means the outermost member in floor framing, other than blocking, be it parallel, perpendicular or on an angle to the floor joists. (See Note A-1.4.1.2.(1))

Riser means a water *distributing pipe* that extends through at least one full *storey*, as defined in Part 7 of Division B.

Rock means that portion of the earth's crust that is consolidated, coherent and relatively hard and is a naturally formed, solidly bonded, mass of mineral matter that cannot readily be broken by hand.

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*.

Run means the horizontal distance between two adjacent tread nosings on a stair. (See Figure A-9.8.4.-B in Note A-9.8.4. of Division B.)

Sanitary building drain means a *building drain* that conducts *sewage* to a *building sewer* from the most upstream *stack*, *branch* or *fixture drain* serving a water closet.

Sanitary building sewer means a pipe that is connected to a *sanitary building drain* 1 000 mm outside a wall of a *building* and that conducts *sewage* to a public sewer or *private sewage disposal system*.

Sanitary drainage pipe means all piping that conveys *sanitary sewage* to a place of disposal, including the *sanitary building drain*, *sanitary building sewer*, *soil pipe*, *soil stack*, *waste stack* and *waste pipe* but not the main sewer or piping in a *sewage* treatment plant.

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

Sanitary sewage means

- (a) liquid or water borne waste
 - (i) of industrial or commercial origin, or
 - (ii) of domestic origin, including human body waste, toilet or other bathroom waste, and shower, tub, culinary, sink and laundry waste, or
- (b) liquid or water borne waste discharged from a *public pool* to a drain.

Sanitary sewer means a sewer that conducts *sewage*.

Sanitary unit means a water closet, urinal, bidet or bedpan washer.

Secondary suite means a self-contained *dwelling unit* located in a *building* or portion of a *building* of only *residential occupancy* that contains only one other *dwelling unit* and common spaces, and where both *dwelling units* constitute a single real estate entity. (See Note A-1.4.1.2.(1))

Self-service storage building means a *building* that is used to provide individual storage spaces to the public and that is open to the public only for those purposes.

Septic tank means a watertight vault in which *sanitary sewage* is collected for the purpose of removing scum, grease and solids from the liquid without the addition of air and in which solids settling and anaerobic digestion of the *sanitary sewage* takes place.

Service room means a room provided in a *building* to contain equipment associated with *building* services. (See Note A-1.4.1.2.(1))

Service space means space provided in a *building* to facilitate or conceal the installation of *building* service facilities such as chutes, ducts, pipes, shafts or wires.

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

Sewage means *sanitary sewage* or *storm sewage*.

Sewage system means

- (a) a chemical toilet, an incinerating toilet, a recirculating toilet, a self-contained portable toilet and all forms of privy, including a *portable privy*, an *earth pit privy*, a *pail privy*, a *privy vault* and a composting toilet system,
- (b) a *greywater* system,
- (c) a cesspool,
- (d) a *leaching bed* system, or
- (e) a system that requires or uses a *holding tank* for the retention of *hauled sewage* at the site where it is produced before its collection by a *hauled sewage system*,

where these

- (f) have a *design capacity* of 10,000 litres per day or less,
- (g) have, in total, a *design capacity* of 10,000 litres per day or less, where more than one of these are located on a lot or parcel of land, and
- (h) are located wholly within the boundaries of the lot or parcel of land on which is located the *building* or *buildings* they serve.

Sewage works means sewage works as defined in subsection 1(1) of the *Ontario Water Resources Act*.

Sewer lateral extension means the portion of a *storm building sewer* or *sanitary building sewer* that extends from the public sewer up to 1.5 m into the property.

Shallow buried trench means an *absorption trench* that contains a *chamber* or *leaching chamber*.

Shallow foundation means a *foundation unit* that derives its support from *soil* or *rock* located close to the lowest part of the *building* that it supports.

Shelf and rack storage system means a self-contained structural system within a *building*, having one or more elevated platforms or walkway levels for personnel access that may also support conveyors and other material handling, storage and distribution equipment.

Significant drinking water threat has the same meaning as in subsection 2(1) of the *Clean Water Act, 2006*.

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

Smoke alarm means a combined *smoke detector* and audible alarm device designed to sound an alarm within the room or *suite* in which it is located upon the detection of smoke within that room or *suite*.

Smoke detector means a *fire detector* designed to operate when the concentration of airborne combustion products exceeds a predetermined level.

Soil means, except for the purposes of Part 8 of Division B, a portion of the earth's crust that is fragmentary or such that individual particles of a dried sample may be readily separated by agitation in water, and includes boulders, cobbles, gravel, sand, silt, clay and organic matter.

Soil pipe means a *sanitary drainage pipe* that carries the discharge of a *sanitary unit*, with or without the discharge from any other *fixture*.

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

Solid masonry means a single wythe or multi-wythe construction made of *solid masonry units* or semi-solid, cored, or hollow masonry units, the cells of which may or may not be filled with mortar or grout. In multi-wythe masonry construction, the space between the wythes consists of a mortar-filled collar joint or grout-filled space and the wythes may or may not be constructed of the same masonry materials.

Solid masonry unit means a concrete block or brick unit, a clay brick unit, or a calcium silicate brick unit whose net solid area is at least 75% of its gross area. (See Note A-1.4.1.2.(1))

Sound transmission class (STC) means a single number rating of the airborne sound attenuation of a *building* assembly separating two adjoining spaces, taking into account the direct sound transmission path. (See Note A-1.4.1.2.(1)) (See also Note A-9.11. of Division B)

Source protection area has the same meaning as in subsection 2(1) of the *Clean Water Act, 2006*.

Source protection plan has the same meaning as in subsection 2(1) of the *Clean Water Act, 2006*.

Space heater means a *space-heating appliance* for heating the room or space within which it is located, without the use of ducts.

Space-heating appliance means an *appliance* intended for the supplying of heat to a room or space directly, such as a *unit heater*, or to rooms or spaces of a *building* through a heating system such as a central *furnace* or *boiler*.

Sprinklered (as applying to a *building* or part thereof) means that the *building* or part thereof is equipped with a system of automatic sprinklers.

Stack vent means a *vent pipe* that connects the top of a *soil stack* or *waste stack* to a *header* or *open air* and “*stack vented*” has a corresponding meaning.

Stack venting means, when used with reference to *fixtures*, an arrangement such that the connections of the drainage piping from the *stack vented fixtures* to the stack provide venting to the *fixture traps* so that no additional *vent pipe* is required.

Stage means a space that is designed primarily for theatrical performances with provision for quick change scenery and overhead lighting, including environmental control for a wide range of lighting and sound effects and that is traditionally, but not necessarily, separated from the audience by a proscenium wall and curtain opening.

Starting platform means a rigid platform located entirely on a *pool deck* that consists of a top that, if projected horizontally over the water surface, would be less than 1 000 mm in vertical height above the surface and that is designed to be used by a swimmer to dive from at the start of a swimming race.

Storage garage means a *building* or part thereof intended for the storage or parking of motor vehicles and containing no provision for the repair or servicing of such vehicles. (See Note A-1.4.1.2.(1))

Storey means, except for the purposes of Part 7 of Division B, the portion of a *building*

- (a) that is situated between the top of any floor and the top of the floor next above it, or
- (b) that is situated between the top of the floor and the ceiling above the floor, if there is no floor above it.

Storm building drain means a *building drain* that conducts storm water and is connected at its upstream end to a *leader*, sump or catch basin, and at its downstream end to a *building sewer* or a designated storm water disposal location.

Storm building sewer means a *building sewer* that conveys *storm sewage* to a place of disposal and commences 1 000 mm from the *building*.

Storm drainage pipe means all the connected piping that conveys *storm sewage* to a place of disposal and includes the *storm building drain*, *storm building sewer*, rain water *leader*, catch basin and area drain installed to collect water from the property and the piping that drains water from a swimming pool, other than a *public pool*, or from water cooled *air-conditioning* equipment, but does not include

- (a) a subsoil drainage pipe, or
- (b) a private sewage treatment and disposal facility designed for the treatment or retention of storm sewage prior to discharge to the natural environment.

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

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

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

Stove means an *appliance* intended for cooking or space heating or both.

Street means any highway, road, boulevard, square or other improved thoroughfare that is 9 m or more in width, that has been dedicated or deeded for public use and that is accessible to fire department vehicles and equipment.

Subsoil drainage pipe means a pipe that is installed underground to intercept and convey subsurface water, and includes foundation drain pipes.

Subsurface investigation means the appraisal of the general subsurface conditions at a *building* site by analysis of information gained by such methods as geological surveys, in situ testing, sampling, visual inspection, laboratory testing of samples of the subsurface materials and *groundwater* observations and measurements.

Suite means a single room or series of rooms of complementary use, operated under a single tenancy, and includes

- (a) *dwelling units*,
 - (b) individual guest rooms in motels, *hotels*, boarding houses, rooming houses and dormitories, and
 - (c) individual stores and individual or complementary rooms for *business and personal services occupancies*.
- (See Note A-1.1.4.2.(1))

Supply duct means a duct for conveying air from a heating, ventilating or *air-conditioning appliance* to a space to be heated, ventilated or air-conditioned.

Surface water means water on the surface of the ground.

Tapered tread means a tread with non-parallel edges that increases or decreases its *run* uniformly over its width.

Tarion Warranty Corporation means Tarion Warranty Corporation as designated under section 2 of the *Ontario New Home Warranties Plan Act*.

Theatre means a place of public assembly intended for the production and viewing of the performing arts or the screening and viewing of motion pictures, and consisting of an auditorium with permanently fixed seats intended solely for a viewing audience.

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.

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*.

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*.

Treatment unit means a device that, when designed, installed and operated in accordance with its design specifications, provides a specific degree of *sanitary sewage* treatment to reduce the contaminant load from that of *sanitary sewage* to a given *effluent* quality.

Tribunal means the Licence Appeal Tribunal established under the *Licence Appeal Tribunal Act, 1999*.

Type A dispersal bed means a *leaching bed* that receives *effluent* from a Level IV *treatment unit* as described in Table 8.6.2.2. of Division B and that is comprised of a stone layer or *leaching chambers* installed over an unsaturated sand layer as described in Subsection 8.7.7. of Division B.

Type B dispersal bed means a *leaching bed* comprised of a *pressurized distribution system* that uniformly distributes *effluent* from a Level IV *treatment unit* as described in Table 8.6.2.2. of Division B to the underlying *soil*, as defined in Part 8 of Division B, through a set of *distribution pipes* installed in a bed comprised of septic stone.

Underpinning means the process of strengthening the *foundation* or lowering the level of a *foundation* of an existing *building*.

Unit heater means a suspended *space heater* with an integral air-circulating fan.

Unprotected opening means, when applied to an *exposing building face*

- (a) a doorway, window or opening, other than one equipped with a closure having the required *fire-protection rating*, or
- (b) any part of a wall forming part of the *exposing building face* that has a *fire-resistance rating* less than required for the *exposing building face*.

Unstable liquid means a liquid, including *flammable liquids* and *combustible liquids*, that is chemically reactive to the extent that it will vigorously react or decompose at or near normal temperature and pressure conditions or that is chemically unstable when subjected to impact.

Vacuum breaker means *back-siphonage preventer*.

Vapour barrier means the elements installed to control the diffusion of water vapour. (See Note A-1.4.1.2.(1))

Vent connector (as applying to heating or cooling systems) means the part of a venting system that conducts the *flue* gases or vent gases from the *flue collar* of a *gas appliance* to the *chimney* or *gas vent*, and may include a draft control device.

Vent pipe means a pipe that is 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*.

Venting system means an assembly of pipes and fittings that connects a *drainage system* with *open air* for circulation of air and the protection of *trap* seals in the *drainage system*.

Vertical leg means the vertical portion of a *fixture* drain and includes the portion of a drain from the outlet of a water closet bowl to the point where the connecting piping changes to horizontal.

Vertical service space means a shaft oriented essentially vertically that is provided in a *building* to facilitate the installation of *building* services including mechanical, electrical and plumbing installations and facilities such as elevators, refuse chutes and linen chutes.

Vulnerable area has the same meaning as in subsection 2(1) of the *Clean Water Act, 2006*.

Walkway means a *covered* or *roofed pedestrian thoroughfare* used to connect 2 or more buildings.

Waste pipe means a *sanitary drainage pipe* that carries the discharge from a *fixture* directly to a *waste stack*, *soil stack*, *sanitary building drain*, *branch* or *sewage system*.

Waste stack means a vertical *waste pipe* that passes through one or more *storeys* and includes any offset that is part of the stack that conducts liquid waste from *fixtures* other than *sanitary units*.

Water distribution system means an assembly of pipes, fittings, valves and appurtenances that conveys *potable water* to water supply outlets, *fixtures*, *plumbing appliances* and devices from the *water service pipe* or from a *point of entry treatment unit* located in the *building*.

Water purveyor means the owner or operator of a *drinking water system*.

Water service pipe means a pipe on the property that conveys *potable water* from a *drinking water system* or a *private water supply* to the inside of the *building*.

Water system means a *water service pipe*, a *private water supply*, a *water distribution system*, a *fire service main* or any part of any of them.

Wave action pool means a *public pool* equipped with a means for inducing wave motion in the water.

Wet vent means a *waste pipe* that also serves as a *vent pipe*.

Working capacity means the volume of liquid that a *treatment unit* or *holding tank* is capable of holding without overflowing while it is in its working position, but does not include the volume of liquid contained in a compartment in which a pump or siphon is installed.

X-ray equipment includes x-ray imaging systems, processing equipment and equipment directly related to the production of images for diagnosis or directly related to irradiation with x-rays for therapy.

X-ray machine means an electrically-powered device producing x-rays

- (a) for the irradiation of a human being or an animal for a therapeutic or diagnostic purpose, or
- (b) for industrial use.

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*.

(2) Where a word or term that is defined in Sentence (1) is used, it shall be read as if it has the same meaning as in that Sentence, unless the context requires otherwise.

1.4.1.3. Definition of Applicable Law

- (1) For the purposes of clause 8(2)(a) of the Act, *applicable law* means,
- (a) the statutory requirements in the following provisions with respect to the following matters:
- (i) section 3 of the Building Transit Faster Act, 2020 with respect to the issuance of a permit under that section,
 - (ii) section 14 of Ontario Regulation 137/15 (General) made under the *Child Care and Early Years Act, 2014* with respect to the approval of plans for a new *building* to be erected or an existing *building* to be used, altered or renovated for use as a *child care centre* or for alterations or renovations to be made to premises used by a *child care centre*,
 - (iii) section 114 of the *City of Toronto Act, 2006* with respect to the approval by the City of Toronto or the Ontario Land Tribunal of plans and drawings,
 - (iv) section 59 of the *Clean Water Act, 2006* with respect to the issuance of a notice by the risk management official for the *construction* of a *building*,
 - (v) section 28 of the *Conservation Authorities Act* with respect to the prohibition of development activities,
 - (vi) sections 28.1, 28.1.1 and 28.1.2 of the *Conservation Authorities Act* with respect to a permit issued for the *construction* of a *building* or structure or for any change to a *building* or structure that would increase its size, alter its use or increase the number of *dwelling units*,
 - (vii) section 194 of the *Education Act* with respect to the approval of the Minister for the *demolition* of a *building*,
 - (viii) section 17.2 of the *Environmental Assessment Act* with respect to the approval of the Minister or the Ontario Land Tribunal to proceed with a project,
 - (ix) section 46 of the *Environmental Protection Act* with respect to the approval of the Minister to use land or land covered by water that has been used for the disposal of waste,
 - (x) section 47.3 of the *Environmental Protection Act* with respect to the issuance of a renewable energy approval,
 - (xi) section 168.3.1 of the *Environmental Protection Act* with respect to the *construction* of a *building* to be used in connection with a change of use of a property,
 - (xii) paragraph 2 of subsection 168.6(1) of the *Environmental Protection Act* if a certificate of property use has been issued in respect of the property under subsection 168.6(1) of that Act,
 - (xiii) section 14 of the *Milk Act* with respect to the permit from the Director for the *construction* or alteration of any *building* intended for use as a plant,
 - (xiv) section 11.1 of Ontario Regulation 267/03 (General), made under the *Nutrient Management Act, 2002*, with respect to a proposed *building* or structure to house farm animals or store nutrients if that Regulation requires the preparation and approval of a nutrient management strategy before *construction* of the proposed *building* or structure,
 - (xv) subsection 30(2) of the *Ontario Heritage Act* with respect to a consent of the council of a *municipality* to the alteration or *demolition* of a *building* where the council of the *municipality* has given a notice of intent to designate the *building* under subsection 29 (3) of that Act,
 - (xvi) section 33 of the *Ontario Heritage Act* with respect to the consent of the council of a *municipality* for the alteration of property,
 - (xvii) section 34 of the *Ontario Heritage Act* with respect to the consent of the council of a *municipality* for the *demolition* of a *building*,
 - (xviii) section 34.5 of the *Ontario Heritage Act* with respect to the consent of the Minister to the alteration or *demolition* of a designated *building*,
 - (xix) subsection 34.7(2) of the *Ontario Heritage Act* with respect to a consent of the Minister to the alteration or *demolition* of a *building* where the Minister has given a notice of intent to designate the *building* under section 34.6 of that Act,
 - (xx) section 42 of the *Ontario Heritage Act* with respect to the permit given by the council of a *municipality* for the erection, alteration or *demolition* of a *building*,
 - (xxi) section 17.4 of the *Ontario New Home Warranties Plan Act* with respect to the provision of a confirmation by the Registrar for the *construction* of a residential condominium conversion project,
 - (xxii) section 14 of the *Ontario Planning and Development Act, 1994* with respect to any conflict between a development plan made under that Act and a zoning by-law that affects the proposed *building* or structure,
 - (xxiii) section 37 of the *Planning Act*
 - (A) with respect to the payment of money or making arrangements satisfactory to the council of a *municipality* for the payment of money, where the payment is required by a community benefits charge by-law passed under subsection 37(2) of the *Planning Act*, and

- (B) with respect to the provision of facilities, services or matters in accordance with subsection 37(6) of the *Planning Act* or making arrangements satisfactory to the council of a *municipality* for their provision,
- (xxiv) section 41 of the *Planning Act* with respect to the approval by the council of the *municipality* or the Ontario Land Tribunal of plans and drawings,
- (xxv) section 42 of the *Planning Act* with respect to the payment of money or making arrangements satisfactory to the council of a *municipality* for the payment of money, where the payment is required under subsection 42(6) of that Act,
- (xxvi) section 2 of Ontario Regulation 239/13 (Activities on Public Lands and Shore Lands — Work Permits and Exemptions), made under the *Public Lands Act*, with respect to the work permit authorizing the *construction* or placement of a *building* on public land,
- (xxvii) section 5 of Ontario Regulation 239/13 with respect to the exemption from the requirement to obtain a work permit authorizing the *construction* or placement of a *building* within an unpatented mining claim,
- (xxviii) section 34 or 38 of the *Public Transportation and Highway Improvement Act* with respect to the permit from the Minister for the placement, erection or alteration of any *building* or other structure or the use of land,
- ei (b) the following provisions of Acts and regulations:
- (i) subsection 102(3) of the *City of Toronto Act, 2006*,
 - (ii) sections 28 and 53 of the *Development Charges Act, 1997*,
 - (iii) sections 257.83 and 257.93 of the *Education Act*,
 - (iv) subsection 17.2(5) of the *Environmental Assessment Act*,
 - (v) subsection 133(4) of the *Municipal Act, 2001*,
 - (vi) subsection 24(3) of the *Niagara Escarpment Planning and Development Act*,
 - (vii) subsection 27(9) of the *Ontario Heritage Act*,
 - (viii) section 33 of the *Planning Act* except where, in the case of the *demolition* of a residential property, a permit to *demolish* the property is obtained under that section,
 - (ix) section 46 of the *Planning Act*,
- (c) by-laws made by a *municipality* under an agreement entered into under section 5.81 of the *Aeronautics Act* (Canada),
- (d) regulations made by a conservation authority under clause 28(1)(c) of the *Conservation Authorities Act* as it read immediately before its repeal by section 25 of Schedule 4 to the *Building Better Communities and Conserving Watersheds Act, 2017*, with respect to permission of the authority for the *construction* of a *building* or structure if, in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development,
- (e) by-laws made under section 108 of the *City of Toronto Act, 2006*, but only with respect to the issuance of a permit for the *construction* of a green roof if the *construction* of the roof is prohibited unless a permit is obtained,
- (f) by-laws made under section 40.1 of the *Ontario Heritage Act*,
- (g) by-laws made under section 34 or 38 of the *Planning Act*,
- (h) subject to clause (i), by-laws made under Ontario Regulation 173/16 (Community Planning Permits) made under the *Planning Act*,
- (i) by-laws referred to in clause (h) in relation to the development of land, but only with respect to the issuance of a development permit if the development of land is prohibited unless a development permit is obtained,
- (j) by-laws made under Ontario Regulation 246/01 (Development Permits) made under the *Planning Act* which continue in force despite the revocation of that Regulation by reason of section 19 of Ontario Regulation 173/16 (Community Planning Permits) made under that Act,
- (k) orders made by the Minister under section 34.1 or 47 of the *Planning Act* or subsection 17(1) of the *Ontario Planning and Development Act, 1994*, and
- (l) by-laws made under any private Act that prohibit the proposed *construction* or *demolition* of the *building* unless the by-law is complied with.
- (2) For the purposes of clause 10(2)(a) of the Act, *applicable law* means any general or special Act, and all regulations and by-laws enacted under them that prohibit the proposed use of the *building* unless the Act, regulation or by-law is complied with.

1.4.1.4. Other Definitions for the Purposes of the Act

(1) For the purposes of the Act, *architect, as constructed plans* and *professional engineer* have the same meaning as that set out in Clause 1.4.1.2.(1)(c).

1.4.2. Symbols and Other Abbreviations**1.4.2.1. Symbols and Other Abbreviations**

(1) In this Code, a symbol or abbreviation listed in Column 1 of Table 1.4.2.1. has the meaning listed opposite it in Column 2.

Table 1.4.2.1.
Symbols and Abbreviations
Forming Part of Sentence 1.4.2.1.(1)

Symbol or Abbreviation	Meaning
1 in 2	slope of 1 vertical to 2 horizontal
ASWG	American Steel Wire Gage
ABS	acrylonitrile-butadiene-styrene
Bq	becquerel(s)
CBOD ₅	the five day carbonaceous biochemical oxygen demand
cd	candela(s)
CFU	colony forming units
cm	centimetre(s)
cm ²	square centimetre(s)
CO _{2e}	carbon dioxide equivalent
CPVC	chlorinated poly (vinyl chloride)
dB(A)	A-weighted sound level
°	degree(s)
°C	degree(s) Celsius
diam	diameter
DWV	drain, waste and vent
EIFS	Exterior Insulation and Finish Systems
ft	foot (feet)
g	gram(s)
ga	gauge
gal	imperial gallon(s)
gal/min	imperial gallon(s) per minute
h	hour(s)
HDD	heating degree-day(s)

Table 1.4.2.1. (Cont'd)
Symbols and Abbreviations
 Forming Part of Sentence 1.4.2.1.(1)

Symbol or Abbreviation	Meaning
HVAC	heating, ventilating and <i>air-conditioning</i>
Hz	hertz
in.	inch(es)
J	joule(s)
K	degree(s) Kelvin
kg	kilogram(s)
kg/m ²	kilograms per square metre
kN	kilonewton(s)
kPa	kilopascal(s)
kV	kilovolt(s)
kW	kilowatt(s)
L	litre(s)
L/min	litre(s) per minute
L/s	litre(s) per second
LPF	litres per flush
lx	lux
m	metre(s)
M	metric nomenclature for reinforcing bars
m ²	square metre(s)
m ³	cubic metre(s)
m/s	metre(s) per second
max.	maximum
mg/L	milligram(s) per litre
min	minute(s)
min.	minimum
MJ	megajoule(s)
mm	millimetre(s)
MPa	megapascal(s)
N	newton
n/a	not applicable
ng	nanogram(s)
No.	number(s)
nom.	nominal

Table 1.4.2.1. (Cont'd)
Symbols and Abbreviations
 Forming Part of Sentence 1.4.2.1.(1)

Symbol or Abbreviation	Meaning
o.c.	on centre
OSB	oriented strandboard
Pa	pascal(s)
PB	polybutylene
PE	polyethylene
PE/AL/PE	polyethylene/aluminum/polyethylene
PEX	crosslinked polyethylene
PEX/AL/PEX	crosslinked polyethylene/aluminum/crosslinked polyethylene
PVC	poly (vinyl chloride)
R	thermal resistance value (imperial unit)
RSI	thermal resistance, International System of Units
s	second(s)
temp.	temperature
T&G	tongue and groove
V	volt(s)
W	watt(s)
wt	weight
%	percent
µg	microgram(s)
µm	micron
U-value	overall thermal transmittance

Section 1.5. Referenced Documents and Organizations

1.5.1. Referenced Documents

1.5.1.1. Application of Referenced Documents

- (1) The provisions of documents referenced in this Code, and of any documents referenced within those documents, apply only to the extent that they relate to
- buildings*, and
 - the *objectives* and *functional statements* attributed to the applicable *acceptable solutions* in Division B where the documents are referenced. (See Note A-1.5.1.1.(1))

1.5.1.2. Conflicting Requirements

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

1.5.1.3. Applicable Editions

(1) Where documents are referenced in this Code, they shall be the editions designated in Subsection 1.3.1. of Division B.

1.5.2. Organizations**1.5.2.1. Abbreviations of Proper Names**

(1) The abbreviations of proper names in this Code shall have the meanings assigned to them in Article 1.3.2.1. of Division B.

Part 2

Objectives

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Part 2

Objectives

Section 2.1. Application

2.1.1. Application

2.1.1.1. Application

- (1) This Part applies to all *buildings* covered in this Code. (See Article 1.1.1.1.)

2.1.1.2. Application of Objectives

- (1) The objectives described in this Part apply
 - (a) to all *buildings* covered in this Code, and (See Article 1.1.1.1.)
 - (b) only to the extent that they relate to compliance with this Code as required in Article 1.2.1.1.

Section 2.2. Objectives

2.2.1. Objectives

2.2.1.1. Objectives

- (1) The objectives of this Code are as follows: (See Note A-2.2.1.1.(1))

OS Safety

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in or adjacent to the *building* will be exposed to an unacceptable risk of injury.

OS1 Fire Safety

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in or adjacent to the *building* will be exposed to an unacceptable risk of injury due to fire. The risks of injury due to fire addressed in this Code are those caused by—

OS1.1 – fire or explosion occurring

OS1.2 – fire or explosion impacting areas beyond its point of origin

OS1.3 – collapse of physical elements due to a fire or explosion

OS1.4 – fire safety systems failing to function as expected

OS1.5 – persons being delayed in or impeded from moving to a safe place during a fire emergency

OS2 Structural Safety

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in or adjacent to the *building* will be exposed to an unacceptable risk of injury due to structural failure. The risks of injury due to structural failure addressed in this Code are those caused by—

OS2.1 – loads bearing on the *building* elements that exceed their *loadbearing* capacity

OS2.2 – loads bearing on the *building* that exceed the *loadbearing* properties of the supporting medium

OS2.3 – damage to or deterioration of *building* elements

OS2.4 – vibration or deflection of *building* elements

OS2.5 – instability of the *building* or part thereof

OS2.6 – collapse of the *excavation*

OS3 Safety in Use

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in or adjacent to the *building* will be exposed to an unacceptable risk of injury due to hazards. The risks of injury due to hazards addressed in this Code are those caused by—

OS3.1 – tripping, slipping, falling, contact, drowning or collision

OS3.2 – contact with hot surfaces or substances

OS3.3 – contact with energized equipment

OS3.4 – exposure to hazardous substances

OS3.5 – exposure to high levels of sound from fire alarm systems

OS3.6 – persons becoming trapped in confined spaces

OS3.7 – persons being delayed in or impeded from moving to a safe place during an emergency
(See Note A-2.2.1.1.(1))

OS4 Resistance to Unwanted Entry

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be exposed to an unacceptable risk of injury due to the *building's* low level of resistance to unwanted entry. The risks of injury due to unwanted entry addressed in this Code are those caused by—

OS4.1 – intruders being able to force their way through locked doors or windows

OS4.2 – occupants being unable to identify potential intruders as such

OH Health

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person will be exposed to an unacceptable risk of illness.

OH1 Indoor Conditions

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be exposed to an unacceptable risk of illness due to indoor conditions. The risks of illness due to indoor conditions addressed in this Code are those caused by —

OH1.1 – inadequate indoor air quality

OH1.2 – inadequate thermal comfort

OH1.3 – contact with moisture

OH2 Sanitation

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be exposed to an unacceptable risk of illness due to unsanitary conditions. The risks of illness due to unsanitary conditions addressed in this Code are those caused by—

OH2.1 – exposure to human or domestic waste

OH2.2 – consumption of contaminated water

OH2.3 – inadequate facilities for personal hygiene

OH2.4 – contact with contaminated surfaces

OH2.5 – contact with vermin and insects

OH2.6 – unsanitary conditions caused by exposure to human or domestic waste

OH3 Noise Protection

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be exposed to an unacceptable risk of illness due to high levels of sound originating in adjacent spaces in the *building*. The risks of illness due to high levels of sound addressed in this Code are those caused by—

OH3.1 – exposure to airborne sound transmitted through assemblies separating *dwelling units* from adjacent spaces in the *building*.

OH4 Vibration and Deflection Limitation

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be exposed to an unacceptable risk of illness due to high levels of vibration or deflection of *building* elements.

OH5 Hazardous Substances Containment

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, the public will be exposed to an unacceptable risk of illness due to the release of hazardous substances from the *building*.

OH6 Privacy

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, a person in the *building* will be provided with an unacceptable level of privacy.

OH7 View to the Outdoors

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person in the *building* will be unable to experience a view to the outdoors.

OA Accessibility

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person with a physical or sensory limitation will be unacceptably impeded from accessing or using the *building* or its facilities.

OA1 Barrier-Free Path of Travel

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person with a physical or sensory limitation will be unacceptably impeded from accessing the *building* or circulating within it.

OA2 Barrier-Free Facilities

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, a person with a physical or sensory limitation will be unacceptably impeded from using the *building's* facilities.

OP Fire, Structural, Water and Sewage Protection of Buildings

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, the *building* or adjacent *buildings* will be exposed to an unacceptable risk of damage due to fire or structural insufficiency, or the *building* or part thereof will be exposed to an unacceptable risk of loss of use also due to structural insufficiency.

OP1 Fire Protection of the Building

An objective of this Code is to limit the probability that, as a result of its design or *construction*, the *building* will be exposed to an unacceptable risk of damage due to fire. The risks of damage due to fire addressed in this Code are those caused by—

OP1.1 – fire or explosion occurring

OP1.2 – fire or explosion impacting areas beyond its point of origin

OP1.3 – collapse of physical elements due to a fire or explosion

OP1.4 – fire safety systems failing to function as expected

OP2 Structural Sufficiency of the Building

An objective of this Code is to limit the probability that, as a result of its design or *construction*, the *building* or part thereof will be exposed to an unacceptable risk of damage or loss of use due to structural failure or lack of structural serviceability. The risks of damage and of loss of use due to structural failure or lack of structural serviceability addressed in this Code are those caused by—

OP2.1 – loads bearing on the *building* elements that exceed their *loadbearing* capacity

OP2.2 – loads bearing on the *building* that exceed the *loadbearing* properties of the supporting medium

OP2.3 – damage to or deterioration of *building* elements

OP2.4 – vibration or deflection of *building* elements

OP2.5 – instability of the *building* or part thereof

OP2.6 – instability or movement of the supporting medium

OP3 Protection of Adjacent Buildings from Fire

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, adjacent *buildings* will be exposed to an unacceptable risk of damage due to fire. The risks of damage to adjacent *buildings* due to fire addressed in this Code are those caused by—

OP3.1 – fire or explosion impacting areas beyond the *building* of origin

OP4 Protection of Adjacent Buildings from Structural Damage

An objective of this Code is to limit the probability that, as a result of the design or *construction* of the *building*, adjacent *buildings* will be exposed to an unacceptable risk of structural damage. The risks of structural damage to adjacent *buildings* addressed in this Code are those caused by—

OP4.1 – settlement of the medium supporting adjacent *buildings*

OP4.2 – collapse of the *building* or portion thereof onto adjacent *buildings*

OP4.3 – impact of the *building* on adjacent *buildings*

OP4.4 – collapse of the *excavation*

OP5 Water and Sewage Protection of Buildings and Facilities

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, a *building* will be exposed to unacceptable risk of damage due to leakage of service water or *sewage*.

OR Resource Conservation

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, a resource will be exposed to an unacceptable risk of depletion or the capacity of the infrastructure supporting the use, treatment or disposal of the resource will be exposed to an unacceptable risk of being exceeded.

OR1 Water and Energy Conservation

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, a resource will be exposed to an unacceptable risk of depletion. The risks of resource depletion addressed in this Code are those caused by—

OR1.1 – the consumption of water

OR1.2 – the consumption of energy

OR2 Infrastructure Capacity

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building* the capacity of the infrastructure supporting the use, treatment or disposal of a resource will be exposed to an unacceptable risk of being exceeded. The risks of exceeding capacity addressed in this Code are those caused by—

OR2.1 – excessive demand on the infrastructure

OE Environmental Integrity

An objective of this Code is to limit the probability that, as a result of the design or *construction* or operation of the *building*, the natural environment will be exposed to an unacceptable risk of degradation

OE1 Air Quality

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, the natural environment will be exposed to an unacceptable risk of degradation due to emissions of greenhouse gases into the air. The risks of degradation addressed in this Code are those caused by—

OE1.1 – emissions of greenhouse gases into the air

OE1.2 – the release of contaminants, other than greenhouse gases, into the air

OE2 Water and Soil Quality

An objective of this Code is to limit the probability that, as a result of the design or *construction* of a *building*, the natural environment will be exposed to an unacceptable risk of degradation due to excessive release of contaminants into water or *soil*.

OC Conservation of Buildings

An objective of this Code is to limit the probability that, as a result of the extension, material alteration or repair of an existing *building* or a change in use of an existing *building*, the existing *building* cannot be acceptably conserved.

Part 3

Functional Statements

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Part 3

Functional Statements

Section 3.1. Application

3.1.1. Application

3.1.1.1. Application

(1) This Part applies to all buildings covered in this Code. (See Article 1.1.1.1.)

3.1.1.2. Application of Functional Statements

- (1) The functional statements described in this Part apply
- (a) to all *buildings* covered in this Code, and (See Article 1.1.1.1.)
 - (b) only to the extent that they relate to compliance with this Code as required in Article 1.2.1.1.

Section 3.2. Functional Statements

3.2.1. Functional Statements

3.2.1.1. Functional Statements

(1) The objectives of this Code are achieved by measures, such as those described in the acceptable solutions in Division B, that are intended to allow the building or its elements to perform the following functions: (See Note A-3.2.1.1.(1))

- | | |
|-----|---|
| F01 | To minimize the risk of accidental ignition. |
| F02 | To limit the severity and effects of fire or explosions. |
| F03 | To retard the effects of fire on areas beyond its point of origin. |
| F04 | To retard failure or collapse due to the effects of fire. |
| F05 | To retard the effects of fire on emergency egress facilities. |
| F06 | To retard the effects of fire on facilities for notification, suppression and emergency response. |
| F10 | To facilitate the timely movement of persons to a safe place in an emergency. |
| F11 | To notify persons, in a timely manner, of the need to take action in an emergency. |
| F12 | To facilitate emergency response. |
| F13 | To notify emergency responders, in a timely manner, of the need to take action in an emergency. |

- F20 To support and withstand expected loads and forces.
F21 To limit or accommodate dimensional change.
F22 To limit movement under expected loads and forces.
F23 To maintain equipment in place during structural movement.
- F30 To minimize the risk of injury to persons as a result of tripping, slipping, falling, contact, drowning or collision.
F31 To minimize the risk of injury to persons as a result of contact with hot surfaces or substances.
F32 To minimize the risk of injury to persons as a result of contact with energized equipment.
F33 To limit the level of sound of a fire alarm system.
F34 To resist or discourage unwanted access or entry.
F35 To facilitate the identification of potential intruders.
F36 To minimize the risk that persons will be trapped in confined spaces.
- F40 To limit the level of contaminants.
F41 To minimize the risk of generation of contaminants.
F42 To resist the entry of vermin and insects.
F43 To minimize the risk of release of hazardous substances.
F44 To limit the spread of hazardous substances beyond their point of release.
F45 To minimize the risk of the spread of diseases through communal shower facilities.
F46 To minimize the risk of contamination of potable water.
- F50 To provide air suitable for breathing.
F51 To maintain appropriate air and surface temperatures.
F52 To maintain appropriate relative humidity.
F53 To maintain appropriate indoor/outdoor air pressure differences.
F54 To limit drafts.
F55 To resist the transfer of air through environmental separators.
F56 To limit the transmission of airborne sound into a *dwelling unit* from spaces elsewhere in the *building*.
- F60 To control the accumulation and pressure of water on and in the ground.
F61 To resist the ingress of precipitation, water or moisture from the exterior or from the ground.
F62 To facilitate the dissipation of water and moisture from the *building*.
F63 To limit moisture condensation.
- F70 To provide potable water.
F71 To provide facilities for personal hygiene.
F72 To provide facilities for the sanitary disposal of human and domestic wastes.
F73 To facilitate access to and circulation in the *building* and its facilities by persons with physical or sensory limitations.
F74 To facilitate the use of the *building's* facilities by persons with physical or sensory limitations
- F80 To resist deterioration resulting from expected service conditions.
F81 To minimize the risk of malfunction, interference, damage, tampering, lack of use or misuse.
F82 To minimize the risk of inadequate performance due to improper maintenance or lack of maintenance.
- F101 To limit unwanted visual exposure.
F102 To provide a view to the outdoors in *buildings*.
- F110 To control the release of contaminants into *soil, groundwater, surface water, and air*.
F111 To minimize the risk of malfunction, damage or failure of a *sewage system*.
F112 To provide adequate treatment of *sanitary sewage and effluent*.
F113 To minimize the risk of injury as a result of contact with *sanitary sewage* or partially treated *effluent*.

- F120 To minimize the risk of injury to persons entering or exiting the pool, as a result of unfamiliarity with the pool.
- F121 To minimize the risk of injury to persons using the pool, as a result of unfamiliarity with the pool.
- F122 To minimize the risk of contamination of pool water.
- F123 To facilitate timely response to incapacitated pool users.
- F124 To minimize the risk of entrapment or injury to a person within the pool, as a result of water, air or vacuum action.

- F130 To limit excessive water consumption.
- F131 To limit excessive energy consumption.
- F132 To limit excessive demand on the infrastructure.
- F133 To limit excessive peak demand on the infrastructure.

- F140 To facilitate the reuse and material alteration and repair of existing *buildings*.

- F150 To limit excessive emissions of greenhouse gases into the air.
- F151 To limit the excessive release of contaminants, other than greenhouse gases, into the air.

Division B

Acceptable Solutions

Part 1

General

1.1. General		1.3. Referenced Documents and Organizations	
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Part 1

General

Section 1.1. General

1.1.1. Application

1.1.1.1. Application

(1) This Part applies to all *buildings* covered in this Code.

1.1.2. Reserved

1.1.3. Climatic and Seismic Data

1.1.3.1. Climatic and Seismic Values

(1) The climatic and seismic values required for the design of *buildings* under this Code shall be in conformance with the climatic and seismic values provided in MMAH Supplementary Standard SB-1, “Climatic and Seismic Data”.

(2) The outside winter design temperatures determined from MMAH Supplementary Standard SB-1, “Climatic and Seismic Data”, shall be those listed for the January 2.5% values. (See Note A-1.1.3.1.(2))

1.1.3.2. Depth of Frost Penetration

(1) Depth of frost penetration shall be established on the basis of local experience.

1.1.4. Reserved

Section 1.2. Definitions

1.2.1. Definitions

1.2.1.1. Non-defined Terms

(1) Words and phrases used in Division B that are not included in the list of definitions in Articles 1.4.1.2., 1.4.1.3. and 1.4.1.4. of Division A and are not defined in another provision of this Code shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

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

(3) Where *acceptable solutions* are referred to in Division B, they shall be the provisions stated in Parts 2 to 12.

1.2.1.2. Defined Terms

(1) Words that appear in italics are defined in Article 1.4.1.2. of Division A and in the *Building Code Act, 1992*.

1.2.2. Symbols and Other Abbreviations

1.2.2.1. Symbols and Other Abbreviations

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

Section 1.3. Referenced Documents and Organizations

1.3.1. Referenced Documents

1.3.1.1. Effective Date

(1) Unless otherwise specified in this Code, the documents referenced in this Code shall include all amendments, revisions, reaffirmations, reapprovals, addenda and supplements effective to July 15, 2019.

1.3.1.2. Applicable Editions

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

Table 1.3.1.2.
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ACGIH	2013, 28th Edition	Industrial Ventilation: A Manual of Recommended Practice for Design	2.4.2.5.(1) 6.2.1.1.(1) 6.3.2.14.(2)
ACI	355.2-19	Qualification of Post-Installed Mechanical Anchors in Concrete (ACI 355.2-19) and Commentary	4.1.8.18.(7)
ACI	355.4M-19	Qualification of Post-Installed Adhesive Anchors in Concrete (ACI 355.4M-19) and Commentary	4.1.8.18.(7)
AISI	S201-12	North American Standard for Cold Formed Steel Framing – Product Data 2012 Edition	9.24.1.2.(1)
ANSI	A135.6-2012	Engineered Wood Siding	Table 5.9.1.1. 9.27.9.1.(1)
ANSI	A208.1-2009	Particleboard	9.23.15.2.(3) 9.29.9.1.(1) 9.30.2.2.(1)
ANSI	E1.21-2013	Entertainment Technology - Temporary Structures Used for Technical Production of Outdoor Entertainment Events	3.17.2.8.(1)
ANSI/ASHRAE	62.1-2016	Ventilation for Acceptable Indoor Air Quality	6.3.1.1.(2) 6.3.1.1.(3) 6.3.2.2.(1) 6.3.2.10.(15)
ANSI/CSA	ANSI Z21.22-2015 / CSA 4.4-2015	Relief Valves for Hot Water Supply Systems	7.2.10.11.(1)
APA	ANSI/APA PRG 320-2018	Standard for Performance-Rated Cross-Laminated Timber	3.1.6.3.(3)
APHA/AWWA/WEF	2023, 24th Edition	Standard Methods for the Examination of Water and Wastewater	8.9.2.4.(1)
ASCE	ASCE/SEI 49-12	Wind Tunnel Testing for Buildings and Other Structures	4.1.7.14.(1)
ASHRAE	2021	Fundamentals	5.2.1.3.(1) 6.2.1.1.(1) 6.3.2.12.(1) 7.6.3.1.(2) 7.7.3.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) 9.33.6.2.(8) 9.33.6.7.(2)
ASHRAE	2023	HVAC Applications	6.2.1.1.(1) 6.3.2.12.(1) 7.6.3.1.(2) 7.7.3.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) 9.33.6.2.(8) 9.33.6.7.(2)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASHRAE	2020	HVAC Systems and Equipment	6.2.1.1.(1) 6.3.2.12.(1) 7.6.3.1.(2) 7.7.3.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) 9.33.6.2.(8) 9.33.6.7.(2)
ASHRAE	2022	Refrigeration	6.2.1.1.(1) 6.3.2.12.(1) 7.6.3.1.(2) 7.7.3.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) 9.33.6.2.(8) 9.33.6.7.(2)
ASHRAE	Guideline 12-2000	Minimizing the Risk of Legionellosis Associated with Building Water Systems	6.2.1.1.(1) 6.3.2.15.(9) 6.3.2.16.(1)
ASME	A112.19.8-2007	Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs	3.12.4.1.(9)
ASME	B16.3-2016	Malleable Iron Threaded Fittings: Classes 150 and 300	7.2.6.6.(1)
ASME	B16.4-2016	Gray Iron Threaded Fittings: Classes 125 and 250	7.2.6.5.(1) Table 7.2.11.2.
ASME	B16.5-2017	Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard	7.2.6.12.(1)
ASME	B16.9-2018	Factory-Made Wrought Buttwelding Fittings	7.2.6.11.(1) 7.2.6.14.(1)
ASME	B16.12-2009	Cast Iron Threaded Drainage Fittings	7.2.6.3.(1)
ASME	B16.15-2018	Cast Copper Alloy Threaded Fittings: Classes 125 and 250	7.2.7.3.(1)
ASME	B16.18-2018	Cast Copper Alloy Solder Joint Pressure Fittings	7.2.7.6.(1) 7.2.7.6.(2) Table 7.2.11.2.
ASME	B16.22-2018	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings	7.2.7.6.(1) Table 7.2.11.2.
ASME	B16.23-2016	Cast Copper Alloy Solder Joint Drainage Fittings: DWV	7.2.7.5.(1)
ASME	B16.24-2016	Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500 and 2500	7.2.7.2.(1)
ASME	B16.26-2013	Cast Copper Alloy Fittings for Flared Copper Tubes	7.2.7.7.(1) 7.2.7.7.(2) Table 7.2.11.2.
ASME	B16.29-2018	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV	7.2.7.5.(1)
ASME	ANSI/ASME B18.6.1-1981	Wood Screws (Inch Series)	Table 5.9.1.1.

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASME	B31.9-2017	Building Services Piping	7.3.2.8.(1)
ASME	B36.19M-2018	Stainless Steel Pipe	7.2.6.10.(1)
ASME/CSA	ASME A17.1-2016 / CSA B44-16	Safety Code for Elevators and Escalators	3.5.2.2.(1) Table 4.1.5.11. Table 4.1.8.18. 7.4.3.6.(1)
ASME/CSA	ASME A112.3.4-2018 / CSA B45.9-18	Macerating Toilet Systems and Waste-Pumping Systems for Plumbing Fixtures	7.2.2.2.(1)
ASME/CSA	ASME A112.4.2-2015/CSA B45.16-15	Personal hygiene devices for water closets	7.2.2.2.(1)
ASME/CSA	ASME A112.4.14-2017/CSA B125.14-17	Manually Operated Valves for Use in Plumbing Systems	7.2.10.6.(7)
ASME/CSA	ASME A112.18.1-2018 / CSA B125.1-18	Plumbing Supply Fittings	7.2.10.6.(1) 7.2.10.7.(1) 7.2.10.7B.(1)
ASME/CSA	ASME A112.18.2-2015 / CSA B125.2-15	Plumbing Waste Fittings	7.2.3.3.(1) 7.2.10.6.(6)
ASME/CSA	ASME A112.18.6-2017/CSA B125.6-17	Flexible water connectors	7.2.10.18.(1)
ASME/CSA	ASME A112.19.1-2018 / CSA B45.2-18	Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures	7.2.2.2.(1)
ASME/CSA	ASME A112.19.2-2018 / CSA B45.1-18	Ceramic Plumbing Fixtures	7.2.2.2.(1)
ASME/CSA	ASME A112.19.3-2017 / CSA B45.4-17	Stainless Steel Plumbing Fixtures	7.2.2.2.(1)
ASME/CSA	ASME A112.19.7-2012 / CSA B45.10-12	Hydromassage Bathtub Systems	7.2.2.2.(1)
ASPE	ASPE Plumbing Engineering Design Handbook - Volume 1 2021	Fundamentals of Plumbing Engineering	7.6.3.1.(2) 7.7.3.1.(1)
ASPE	ASPE Plumbing Engineering Design Handbook - Volume 2 2022	Plumbing Systems	7.6.3.1.(2) 7.7.3.1.(1)
ASPE	ASPE Plumbing Engineering Design Handbook -Volume 3 2023	Special Plumbing Systems	7.6.3.1.(2) 7.7.3.1.(1)
ASPE	ASPE Plumbing Engineering Design Handbook - Volume 4 2020	Plumbing Components and Equipment	7.6.3.1.(2) 7.7.3.1.(1)
ASSE	ANSI/ASSE 1010-2004	Water Hammer Arresters	7.2.10.15.(1)
ASSE	1051-2009	Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems	7.2.10.16.(1)
ASSE/ASME/CSA	ASSE 1002-2015/ASME A112.1002-2015/CSA B125.12-15	Anti-siphon fill valves for water closet tanks	7.2.10.10.(2)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASSE/ASME/CSA	ASSE 1016-2017/ASME A112.1016-2017/CSA B125.16-17	Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	7.2.10.7.(1)
ASSE/ASME/CSA	ASSE 1037-2015/ASME A112.1037-2015/CSA B125.37-15	Performance requirements for pressurized flushing devices for plumbing fixtures	7.2.10.8.(1)
ASSE/ASME/CSA	ASSE 1070-2015/ASME A112.1070-2015/CSA B125.70-15	Performance requirements for water temperature limiting devices	7.2.10.7.(2)
ASTM	A53 / A53M-18	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless	7.2.6.7.(4)
ASTM	A123 / A123M-17	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products	Table 5.9.1.1. Table 9.20.16.1.
ASTM	A153 / A153M-16a	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware	Table 5.9.1.1. Table 9.20.16.1. 9.23.2.4.(2)
ASTM	A182 / A182M-19	Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service	7.2.6.12.(1) 7.2.6.13.(1)
ASTM	A252-10	Standard Specification for Welded and Seamless Steel Pipe Piles	4.2.3.8.(1)
ASTM	A269-15a	Seamless and Welded Austenitic Stainless Steel Tubing for General Service	7.2.6.14.(1)
ASTM	A283 / A283M-18	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates	4.2.3.8.(1)
ASTM	A312 / A312M-18a	Standard Specification for Seamless, Welded, and Heavily Cold Worked Stainless Steel Pipes	7.2.6.10.(1)
ASTM	A351 / A351M-18	Standard Specification for Castings, Austenitic, for Pressure-Containing Parts	7.2.6.13.(1)
ASTM	A403 / A403M-19	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings	7.2.6.11.(1)
ASTM	A518 / A518M-99	Standard Specification for Corrosion-Resistant High-Silicon Iron Castings	7.2.8.1.(1)
ASTM	A653 / A653M-18	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process	Table 5.9.1.1. 9.3.3.2.(1) 9.23.2.4.(1)
ASTM	A792 / A792M-10	Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process	9.3.3.2.(1)
ASTM	A1008 / A1008M-18	Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable	4.2.3.8.(1)
ASTM	A1011 / A1011M-18a	Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength	4.2.3.8.(1)
ASTM	B32-08	Standard Specification for Solder Metal	7.2.9.2.(1)
ASTM	B42-15a	Standard Specification for Seamless Copper Pipe, Standard Sizes	7.2.7.1.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASTM	B43-15	Standard Specification for Seamless Red Brass Pipe, Standard Sizes	7.2.7.1.(2)
ASTM	B68 / B68M-19	Standard Specification for Seamless Copper Tube, Bright Annealed	7.2.7.4.(4)
ASTM	B88-16	Standard Specification for Seamless Copper Water Tube	7.2.7.4.(1) 7.2.7.4.(4) Table 7.2.11.2.
ASTM	B306-13	Standard Specification for Copper Drainage Tube (DWV)	7.2.7.4.(1)
ASTM	B813-16	Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	7.2.9.2.(3)
ASTM	B828-16	Standard Specification for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings	7.3.2.4.(1)
ASTM	C4-04	Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C27-98	Standard Specification for Fireclay and High-Alumina Refractory Brick	9.21.3.4.(1)
ASTM	C73-17	Standard Specification for Calcium Silicate Brick (Sand-Lime Brick)	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C126-13	Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C212-17	Standard Specification for Structural Clay Facing Tile	Table 5.9.1.1. 9.20.2.1.(1)
ASTM	C260 / C260M-10a	Standard Specification for Air-Entraining Admixtures for Concrete	9.3.1.8.(1)
ASTM	C411-19	Standard Specification for Hot-Surface Performance of High-Temperature Thermal Insulation	3.6.5.4.(4) 3.6.5.5.(1) 9.33.8.2.(2)
ASTM	C412M-15	Standard Specification for Concrete Drain Tile (Metric)	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C444M-17	Standard Specification for Perforated Concrete Pipe (Metric)	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C494 / C494M-17	Standard Specification for Chemical Admixtures for Concrete	9.3.1.8.(1)
ASTM	C553-13	Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications	Table 5.9.1.1.
ASTM	C612-14	Standard Specification for Mineral Fiber Block and Board Thermal Insulation	Table 5.9.1.1.
ASTM	C700-18	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated	Table 5.9.1.1. 9.14.3.1.(1)
ASTM	C726-17	Standard Specification for Mineral Wool Roof Insulation Board	Table 5.9.1.1. 9.25.2.2.(1)
ASTM	C834-17	Standard Specification for Latex Sealants	Table 5.9.1.1. 9.27.4.2.(2)
r1 ASTM	C840-18b	Standard Specification for Application and Finishing of Gypsum Board	3.1.6.6.(6) Table 5.9.1.1. 9.29.5.1.(3)
ASTM	C920-18	Standard Specification for Elastomeric Joint Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C954-18	Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness	9.24.1.4.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASTM	C991-16	Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings	Table 5.9.1.1.
ASTM	C1002-07	Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs	Table 5.9.1.1. 9.24.1.4.(1) 9.29.5.7.(1)
ASTM	C1053-00	Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste and Vent (DWV) Applications	7.2.8.1.(1)
ASTM	C1177 / C1177M-17	Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. Table 9.23.17.2-A
ASTM	C1178 / C1178M-18	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel	3.1.5.14.(6) 3.1.5.15.(4) Table 5.9.1.1. 9.29.5.2.(1)
ASTM	C1184-18e1	Standard Specification for Structural Silicone Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C1280-13	Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing	Table 5.9.1.1.
ASTM	C1311-14	Standard Specification for Solvent Release Sealants	Table 5.9.1.1. 9.27.4.2.(2)
ASTM	C1330-18	Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants	Table 5.9.1.1. 9.27.4.2.(3)
r1 ASTM	C1396 / C1396M-17	Standard Specification for Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) 3.1.6.6.(2) 3.1.6.6.(3) 3.1.6.6.(4) 3.1.6.6.(5) 3.1.6.15.(1) Table 5.9.1.1. Table 9.23.17.2.-A 9.29.5.2.(1) Table 9.29.5.3.
ASTM	C1658 / C1658M-18	Standard Specification for Glass Mat Gypsum Panels	3.1.5.14.(6) Table 5.9.1.1.
ASTM	D323-15a	Standard Specification for Vapor Pressure of Petroleum Products (Reid Method)	1.4.1.2.(1) of Division A
ASTM	D374-99 / D374M-16	Standard Test Methods for Thickness of Solid Electrical Insulation	3.15.4.1.(1)
ASTM	D635-22	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position	3.15.4.1.(1)
ASTM	D1227 / D1227M-13	Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2)
ASTM	D2178 / D2178M-13a	Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing	Table 5.9.1.1.
ASTM	D2466-17	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	7.2.5.7.(2)
ASTM	D2467-15	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	7.2.5.7.(2)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
r1 ASTM	D2898-10	Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing	3.1.4.8.(3) 3.1.5.5.(3) 3.1.5.24.(1) 3.1.6.9.(8) 3.2.3.7.(4)
ASTM	D3019 / D3019M-17	Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered	Table 5.9.1.1. 9.13.3.2.(2) Table 9.27.2.1.-B
ASTM	D3261-16	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	7.2.5.4.(3)
ASTM	D3679-17	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding	9.27.12.1.(1)
ASTM	D3801-20a	Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position	3.15.4.1.(1)
ASTM	D4477-16	Standard Specification for Rigid (Unplasticized) Poly(Vinyl Chloride) (PVC) Soffit	9.27.12.1.(3)
ASTM	D4479 / D4479M-07e1	Standard Specification for Asphalt Roof Coatings - Asbestos-Free	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D4637 / D4637M-15	Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D4811 / D4811M-16	Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D5456-19	Standard Specification for Evaluation of Structural Composite Lumber Products	3.1.11.7.(5)
ASTM	D6878 / D6878M-11a	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
ASTM	D7254-17	Standard Specification for Polypropylene (PP) Siding	9.27.13.1.(1)
ASTM	D7793-17	Standard Specification for Insulated Vinyl Siding	9.27.12.1.(2)
ASTM	E90-09	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements	5.8.1.2.(1) 5.8.1.4.(1) 9.11.1.2.(1)
ASTM	E96 / E96M-16	Standard Test Methods for Water Vapor Transmission of Materials	5.5.1.2.(3) 9.13.2.2.(2) 9.25.4.2.(1) 9.25.4.2.(2) 9.25.5.1.(1)
ASTM	E283-04	Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	5.9.3.4.(2)
ASTM	E331-00	Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference	5.9.3.5.(2)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ASTM	E336-11	Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings	5.8.1.2.(2) 5.8.1.4.(7) 9.11.1.2.(2)
ASTM	E413-16	Classification for Rating Sound Insulation	5.8.1.2.(1) 5.8.1.2.(2) 5.8.1.4.(7) 5.8.1.5.(3) 9.11.1.2.(1) 9.11.1.2.(2)
ASTM	E547-00	Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference	5.9.3.5.(2)
ASTM	E130016	Standard Practice for Determining Load Resistance of Glass in Buildings	4.3.6.1.(1)
ASTM	E2190-19	Standard Specification for Insulating Glass Unit Performance and Evaluation	Table 5.9.1.1. 9.6.1.2.(1)
ASTM	E2307-15b	Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus	3.1.8.3.(4) 9.10.9.2.(4)
ASTM	F476-14	Standard Test Methods for Security of Swinging Door Assemblies	9.7.5.2.(2)
ASTM	F628-12e2	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core	7.2.5.9.(1) 7.2.5.11.(1) 7.2.5.11.(1.1)
ASTM	F714-13	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PP) Based on Outside Diameter	7.2.5.5.(1)
ASTM	F1667-18a	Standard Specification for Driven Fasteners: Nails, Spikes and Staples	9.23.3.1.(1) 9.26.2.3.(1) 9.29.5.6.(1)
ASTM	F3128-19	Standard Specification for Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core	7.2.5.16.(1)
AWS	ANSI/AWS A5.8M / A5.8: 2011	Specification for Filler Metals for Brazing and Braze Welding	7.2.9.2.(4)
AWWA	ANSI/AWWA C104 / A21.4-13	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings	7.2.6.4.(2) Table 7.2.11.2.
AWWA	ANSI/AWWA C110 / A21.10-12	Ductile-Iron and Gray-Iron Fittings	7.2.6.4.(3) Table 7.2.11.2.
AWWA	ANSI/AWWA C111 / A21.11-12	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings	7.2.6.4.(4) Table 7.2.11.2.
AWWA	ANSI/AWWA C151 / A21.51-09	Ductile-Iron Pipe, Centrifugally Cast	7.2.6.4.(1) Table 7.2.11.2.
AWWA	ANSI/AWWA C228-08	Stainless-Steel Pipe Flanges For Water Service - Sizes 2 in. through 72 in. (50 mm through 1,800 mm)	7.2.6.12.(1)
BCMOH	Version 2, 21st Sept, 2007	Sewerage System Standard Practice Manual	8.7.8.3.(2) 8.7.8.3.(3)
BNQ	BNQ 3624-115-2016	Polyethylene (PE) Pipe and Fittings - Flexible Pipes for Drainage - Characteristics and Test Methods	Table 5.9.1.1. 9.14.3.1.(1)
BNQ	CAN/BNQ 3680-600-2023	Onsite Residential Wastewater Treatment Technologies	8.6.2.2.(5) Table 8.6.2.2.

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
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Issuing Agency	Document Number	Title of Document	Code Reference
CCBFC	NRCC 38726 1995	National Building Code of Canada	2.1.2.3.(3) 2.1.2.3.(5)
CCBFC	NRCC 38732 1995	National Farm Building Code of Canada	2.1.2.3.(1) 2.1.2.3.(2) 2.1.2.3.(3) 2.1.2.3.(5)
e1 CCBFC	NRCC-CONST-56435E 2020	National Building Code of Canada	2.4.2.1.(2) of Division C
CCBFC	NRCC-CONST-56436E 2020	National Plumbing Code of Canada	2.4.2.1.(2) of Division C
CCBFC	NRCC-CONST-56437E 2020	National Fire Code of Canada	1.4.1.2.(1) of Division A 2.2.6.11.(1) 2.2.8.1.(1) 2.2.8.1.(4) 2.2.8.7.(1) 2.4.2.3.(4) 3.1.13.1.(1) 3.3.1.2.(1) 3.3.5.2.(1) 3.7.5.2.(1) 6.9.1.2.(1)
CGSB	CAN/CGSB-1.501-M89	Method of Permeance of Coated Wallboard	5.5.1.2.(2) 9.25.4.2.(7)
CGSB	CAN/CGSB-7.2-94	Adjustable Steel Columns	9.17.3.4.(1)
CGSB	CAN/CGSB-10.3-92	Air Setting Refractory Mortar	9.21.3.4.(2) 9.21.3.9.(1) 9.22.2.2.(2)
CGSB	CAN/CGSB-11.3-M87	Hardboard	Table 5.9.1.1. 9.29.7.1.(1) 9.30.2.2.(1)
CGSB	CAN/CGSB-12.1-2017	Safety Glazing	3.3.1.20.(3) 3.3.2.17.(1) 3.3.2.17.(2) 3.4.6.15.(1) 3.4.6.15.(3) 3.7.4.10.(1) Table 5.9.1.1. 9.6.1.2.(1) 9.6.1.4.(1) 9.6.1.4.(6) 9.8.8.7.(1)
CGSB	CAN/CGSB-12.2-M91	Flat, Clear Sheet Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.3-M91	Flat, Clear Float Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.4-M91	Heat Absorbing Glass	Table 5.9.1.1. 9.6.1.2.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
CGSB	CAN/CGSB-12.5-M86	Mirrors, Silvered	9.6.1.2.(3)
CGSB	CAN/CGSB-12.8-97	Insulating Glass Units	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.9-M91	Spandrel Glass	Table 5.9.1.1. 9.6.1.2.(1)
CGSB	CAN/CGSB-12.10-M76	Glass, Light and Heat Reflecting	9.6.1.2.(1)
CGSB	CAN/CGSB-12.11-M90	Wired Safety Glass	3.3.1.20.(3) 3.4.6.15.(1) 3.4.6.15.(3) 9.6.1.2.(1) 9.6.1.4.(1) 9.8.8.7.(1)
CGSB	CAN/CGSB-12.20-M89	Structural Design of Glass for Buildings	4.3.6.1.(1)
CGSB	CAN/CGSB-19.22-M89	Mildew Resistant Sealing Compound for Tubs and Tiles	9.29.10.5.(1)
CGSB	37-GP-9Ma-1983	Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-A
CGSB	CAN/CGSB-37.50-M89	Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-37.51-M90	Application for Hot-Applied Rubberized Asphalt for Roofing and Waterproofing	9.26.15.1.(1)
CGSB	CAN/CGSB-37.54-95	Polyvinyl Chloride Roofing and Waterproofing Membrane	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	37-GP-55M-1979	Application of Sheet Applied Flexible Polyvinyl Chloride Roofing Membrane	9.26.16.1.(1)
CGSB	37-GP-56M-1985	Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing	9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-37.58-M86	Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CGSB	CAN/CGSB-51.25-M87	Thermal Insulation, Phenolic, Faced	Table 9.23.17.2.-A 9.25.2.2.(1)
CGSB	51-GP-27M-1979	Thermal Insulation, Polystyrene, Loose Fill	9.25.2.2.(1)
CGSB	CAN/CGSB-51.32-M77	Sheathing, Membrane, Breather Type	Table 5.9.1.1. 9.20.13.9.(1) Table 9.26.2.1.-A 9.27.3.2.(1)
CGSB	CAN/CGSB-51.33-M89	Vapour Barrier, Sheet, Excluding Polyethylene, for Use in Building Construction	Table 5.9.1.1. 9.25.4.2.(5)
CGSB	CAN/CGSB-51.34-M86	Vapour Barrier, Polyethylene Sheet for Use in Building Construction	Table 5.9.1.1. 9.13.2.2.(2) 9.13.4.2.(1.2) 9.18.6.2.(1) 9.25.3.2.(2) 9.25.4.2.(4)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
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Issuing Agency	Document Number	Title of Document	Code Reference
CGSB	CAN/CGSB-51.71-2005	Depressurization Test	9.32.3.8.(7)
CGSB	CAN/CGSB-82.6-M86	Doors, Mirrored Glass, Sliding or Folding, Wardrobe	9.6.1.2.(2)
CGSB	CAN/CGSB-93.1-M85	Sheet, Aluminum Alloy, Prefinished Residential	Table 5.9.1.1. 9.27.11.1.(3)
CGSB	CAN/CGSB-93.2-M91	Prefinished Aluminum Siding, Soffits and Fascia for Residential Use	3.2.3.6.(5) Table 5.9.1.1. 9.10.14.5.(12) 9.27.11.1.(2)
CSA	CAN/CSA-6.19-01	Residential carbon monoxide alarming devices	6.9.4.4.(1) 9.32.3.9.(2) 9.32.3.9C.(1)
CSA	A23.1:19	Concrete materials and methods of concrete construction	4.2.3.6.(1) 4.2.3.9.(1) Table 5.9.1.1. 9.3.1.1.(1) 9.3.1.1.(4) 9.3.1.3.(1) 9.3.1.4.(1) 9.40.1.4.(1)
CSA	A23.3:19	Design of concrete structures	Table 4.1.8.9. 4.1.8.18.(7) 4.3.3.1.(1)
CSA	A60.1-M1976	Vitrified Clay Pipe	7.2.5.3.(1)
CSA	A60.3-M1976	Vitrified Clay Pipe Joints	7.2.5.3.(2)
CSA	CAN/CSA-A82-14	Fire masonry brick made from clay or shale	Table 5.9.1.1. 9.20.2.1.(1)
r1 CSA	CAN/CSA-A82.27-M91	Gypsum Board	3.1.5.14.(6) 3.1.5.15.(4) 3.1.6.6.(2) 3.1.6.6.(3) 3.1.6.6.(4) 3.1.6.6.(5) 3.1.6.15.(1) 9.29.5.2.(1)
CSA	A82.30-M1980	Interior Furring, Lathing and Gypsum Plastering	9.29.4.1.(1)
CSA	A82.31-M1980	Gypsum Board Application	3.2.3.6.(5) 9.10.9.2.(5) 9.10.12.4.(3) 9.10.14.5.(12) 9.29.5.1.(2)
CSA	CAN3-A93-M82	Natural Airflow Ventilators for Buildings	Table 5.9.1.1. 9.19.1.2.(5)
CSA	CAN/CSA-A123.2-03	Asphalt Coated Roofing Sheets	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	A123.3-05	Asphalt Saturated Organic Roofing Felt	Table 5.9.1.1. Table 9.26.2.1.-B

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
CSA	CAN/CSA-A123.4-04	Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems	Table 5.9.1.1. 9.13.2.2.(2) 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	A123.5:16	Asphalt shingles made from glass felt and surfaced with mineral granules	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	CAN/CSA-A123.16:04	Asphalt-coated glass-base sheets	Table 5.9.1.1. Table 9.26.2.1.-B
CSA	A123.17-05	Asphalt Glass Felt Used in Roofing and Waterproofing	Table 5.9.1.1. 9.13.3.2.(2) Table 9.26.2.1.-B
CSA	CAN/CSA-A123.21:14	Standard test method for the dynamic wind uplift resistance of membrane-roofing systems	5.2.2.2.(4)
CSA	A123.22-08	Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection	Table 9.26.2.1.-B
CSA	A123.23-15	Product specification for polymer-modified bitumen sheet, prefabricated and reinforced	Table 5.9.1.1. Table 9.26.2.1.-B
CSA	A123.51-14	Asphalt shingle application on roof slopes 1:6 and steeper	Table 5.9.1.1. 9.26.1.3.(1)
CSA	A165.1-14	Concrete block masonry units	Table 5.9.1.1. 9.15.2.2.(1) 9.17.5.1.(1) 9.20.2.1.(1) 9.20.2.6.(1)
CSA	A165.2-14	Concrete brick masonry units	Table 5.9.1.1. 9.20.2.1.(1)
CSA	A165.3-14	Prefaced concrete masonry units	Table 5.9.1.1. 9.20.2.1.(1)
CSA	CAN/CSA-A179-14	Mortar and Grout for Unit Masonry	Table 5.9.1.1. 9.15.2.2.(3) 9.20.3.1.(1)
CSA	CAN/CSA-A220 Series-06	Concrete Roof Tiles	Table 5.9.1.1. Table 9.26.2.1.-B 9.26.17.1.(1)
CSA	A257.1:19	Non-reinforced circular concrete culvert, storm drain, sewer pipe, and fittings	7.2.5.2.(1)
CSA	A257.2:19	Reinforced circular concrete culvert, storm drain, sewer pipe, and fittings	7.2.5.2.(1)
CSA	A257.3:19	Joints for circular concrete sewer and culvert pipe, manhole sections, and fittings using rubber gaskets	7.2.5.2.(2)
CSA	A257.4:19	Precast reinforced circular concrete manhole sections, catch basins, and fittings	7.2.5.2.(5)
CSA	A277-16	Procedure for certification of prefabricated buildings, modules, and panels	9.1.1.9.(1) 1.12.1.1.(1) of Division C 3.1.1.1.(2) of Division C 3.2.4.1.(3) of Division C
CSA	CAN/CSA-A324-M88	Clay Flue Liners	9.21.3.3.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
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Issuing Agency	Document Number	Title of Document	Code Reference
CSA	CAN/CSA-A371-14	Masonry Construction for Buildings	Table 5.9.1.1. 9.15.2.2.(3) 9.20.3.2.(7) 9.20.15.2.(1)
CSA	CAN/CSA-A405-M87	Design and Construction of Masonry Chimneys and Fireplaces	9.21.3.5.(1) 9.22.1.4.(1) 9.22.5.2.(2)
CSA	AAMA/WDMA/CSA 101/I.S.2/A440-17	NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights	5.9.2.2.(1) Table 9.7.3.3. 9.7.4.1.(1) 9.7.4.2.(1) 9.7.5.1.(1) 9.7.5.3.(1)
CSA	A440S1:19	Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights	5.9.2.2.(1) 5.9.3.5.(3) 9.7.4.2.(1) 9.7.4.3.(1)
CSA	A440.2-14	Fenestration Energy Performance	12.3.1.2.(1)
CSA	A440.2:19 / A440.3:19	Fenestration Energy Performance / user Guide to CSA A440.2-14, Fenestration energy performance	Table 9.7.3.3.
CSA	CAN/CSA-A440.4:19	Window, door, and skylight installation	9.7.6.1.(1)
CSA	A660-10	Certification of manufacturers of steel building systems	4.3.4.3.(1)
CSA	A3001-18	Cementitious Materials for Use in Concrete	Table 5.9.1.1. 9.3.1.2.(1) 9.28.2.1.(1)
CSA	B52:23	Mechanical refrigeration code	6.3.1.5.(4)
CSA	B64.0-11	Definitions, general requirements, and test methods for vacuum breakers and backflow preventers	7.2.10.10.(1)
CSA	B64.1.1-11	Atmospheric vacuum breakers (AVB)	7.2.10.10.(1)
CSA	B64.1.2-11	Pressure vacuum breakers (PVB)	7.2.10.10.(1)
CSA	B64.1.3-11	Spill-resistant pressure vacuum breakers (SRPVB)	7.2.10.10.(1)
CSA	B64.1.4-11	Vacuum breaker, air space type (ASVB)	7.2.10.10.(1)
CSA	B64.2-11	Hose connection vacuum breakers (HCVB)	7.2.10.10.(1)
CSA	B64.2.1-11	Hose connection vacuum breakers (HCVB) with manual draining feature	7.2.10.10.(1)
CSA	B64.2.1.1-11	Hose connection dual check vacuum breakers (HCDVB)	7.2.10.10.(1)
CSA	B64.2.2-11	Hose connection vacuum breakers (hcvb) with automatic draining feature	7.2.10.10.(1)
CSA	B64.3-11	Dual check valve backflow preventers with atmospheric port (DCAP)	7.2.10.10.(1) 7.6.2.5A.(4)
CSA	B64.3.1-11	Dual check valve backflow preventers with atmospheric port for carbonators (DCAPC)	7.2.10.10.(1)

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Table 1.3.1.2. (Cont'd)
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Issuing Agency	Document Number	Title of Document	Code Reference
CSA	B64.4-11	Reduced Pressure Principle (RP) backflow preventers	7.2.10.10.(1) 7.6.2.4.(2)
CSA	B64.4.1-11	Reduced pressure principle backflow preventers for fire protection systems (RPF)	7.2.10.10.(1) 7.6.2.4.(2) 7.6.2.4.(4)
CSA	B64.5-11	Double check valve (DCVA) backflow preventers	7.2.10.10.(1) 7.6.2.4.(2)
CSA	B64.5.1-11	Double check valve backflow preventers for fire protection systems (DCVAF)	7.2.10.10.(1) 7.6.2.4.(2)
CSA	B64.6-11	Dual check valve (DuC) backflow preventers	7.2.10.10.(1) 7.6.2.4.(2) 7.6.2.6.(3) 7.7.1.1.(6)
CSA	B64.6.1-11	Dual check valve backflow preventers for fire protection systems (DuCF)	7.2.10.10.(1) 7.6.4.2.(2)
CSA	B64.7-11	Laboratory faucet vacuum breakers (LFVB)	7.2.10.10.(1)
CSA	B64.8-11	Dual check valve backflow preventers with intermediate vent (DuCV)	7.2.10.10.(1)
CSA	B64.9-11	Single check valve backflow preventers for fire protection systems (SCVAF)	7.2.10.10.(1) 7.6.2.4.(2)
CSA	B64.10-17	Selection and installation of backflow preventers	7.2.10.10.(1) 7.6.2.3.(1) 7.6.2.6.(1)
CSA	B66-21	Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks	8.2.2.2.(1) 8.2.2.2.(2) 8.2.2.3.(7) 8.2.2.3.(11)
CSA	B70-12	Cast iron soil pipe, fittings and means of joining	7.2.6.1.(1) 7.4.6.4.(2)
CSA	B70.1-03	Frames and Covers for Maintenance Holes and Catchbasins	7.2.6.2.(1)
CSA	B111-1974	Wire Nails, Spikes and Staples	9.23.3.1.(1) 9.26.2.3.(1) 9.29.5.6.(1)
CSA	B125.3-18	Plumbing fittings	7.2.10.6.(1) 7.2.10.7.(2) 7.2.10.7.(3) 7.2.10.7B.(2)
CSA	CAN/CSA-B126.0-13	General requirements and methods of testing for water cisterns	7.7.2.4.(6)
CSA	CAN/CSA-B126.1-13	Installation of water cisterns	7.7.2.4.(6)
CSA	CAN/CSA-B127.3-18	Fibrocement drain, waste, and vent pipe and pipe fittings	7.2.5.1.(1)
CSA	CAN/CSA-B128.1-06	Design and installation of non-potable water systems	7.7.1.2.(1) 7.7.3.1.(1)
CSA	B137.1-17	Polyethylene (PE) pipe, tubing and fittings for cold water pressure services	7.2.5.4.(1) Table 7.2.11.2.
CSA	B137.2-17	Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications	7.2.5.7.(3) 7.2.5.9.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
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Issuing Agency	Document Number	Title of Document	Code Reference
CSA	B137.3-17	Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications	7.2.5.7.(1) 7.2.5.9.(1) Table 7.2.11.2.
CSA	B137.5-17	Crosslinked polyethylene (PEX) tubing systems for pressure applications	7.2.5.6.(1) Table 7.2.11.2.
CSA	B137.6-17	Chlorinated polyvinylchloride (CPVC) pipe, tubing, and fittings for hot- and cold-water distribution systems	7.2.5.8.(1) Table 7.2.11.2.
CSA	B137.9-17	Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pressure-pipe systems	7.2.5.12.(1) Table 7.2.11.2.
CSA	B137.10-17	Crosslinked polyethylene/aluminum crosslinked polyethylene (PEX-AL-PEX) composite pressure-pipe systems	7.2.5.12.(4) 7.2.5.13.(1) Table 7.2.11.2.
CSA	B137.11-17	Polypropylene (PP-R) pipe and fittings for pressure applications	7.2.5.14.(1)
CSA	B137.18-17	Polyethylene of raised temperature resistance (PE-RT) tubing systems for pressure applications	7.2.5.15.(1)
CSA	B158.1-1976	Cast Brass Solder Joint Drainage, Waste and Vent Fittings	7.2.10.1.(1)
CSA	B181.1-18	Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings	7.2.5.9.(1) 7.2.5.10.(1) 7.2.5.11.(1) 7.2.5.11.(1.1) 7.2.10.1.(2) 7.4.6.4.(2)
CSA	B181.2-18	Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings	7.2.5.9.(1) 7.2.5.10.(1) 7.2.5.11.(1) 7.2.5.11.(1.1) 7.2.5.16.(1) 7.2.5.16.(2) 7.2.10.1.(3) 7.4.6.4.(2)
CSA	B181.3-18	Polyolefin and polyvinylidene fluoride (PVDF) laboratory drainage systems	7.2.8.1.(1)
CSA	B182.1-18	Plastic drain and sewer pipe and pipe fittings	Table 5.9.1.1. 7.2.5.9.(1) 7.2.5.11.(1.1) 7.4.6.4.(2) 9.14.3.1.(1)
CSA	B182.2-18	PSM type polyvinylchloride (PVC) sewer pipe and fittings	7.2.5.9.(1) 7.2.5.11.(1.1)
CSA	B182.4-18	Profile polyvinylchloride (PVC) sewer pipe and fittings	7.2.5.9.(1)
CSA	B182.6-18	Profile polyethylene (PE) sewer pipe and fittings for leak-proof sewer applications	7.2.5.9.(1)
CSA	B182.8-18	Profile polyethylene (PE) storm sewer and drainage pipe and fittings	7.2.5.9.(1)
CSA	B214-16	Installation code for hydronic heating systems	6.2.1.1.(1) 6.2.1.5.(6) 9.33.4.2.(1)
CSA	B242-05	Groove- and Shoulder-Type Mechanical Pipe Couplings	7.2.10.4.(1)

Table 1.3.1.2. (Cont'd)
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Issuing Agency	Document Number	Title of Document	Code Reference
CSA	B272-93	Prefabricated Self-Sealing Roof Vent Flashings	7.2.10.14.(2)
CSA	B355:19	Platform lifts and stair lifts for barrier-free access	3.8.3.5.(1)
CSA	CAN/CSA-B356-10	Water pressure reducing valves for domestic water supply systems	7.2.10.12.(1)
CSA	B365-17	Installation code for solid-fuel-burning appliances and equipment	6.2.1.5.(1) 6.2.1.5.(5) 9.21.1.4.(1) 9.22.10.2.(1) 9.33.5.3.(1)
CSA	B366.1-11	Solid-Fuel-Fired Central Heating Appliances	6.2.1.5.(2)
CSA	B415.1-10	Performance Testing of Solid-Fuel-Burning Heating Appliances	6.2.1.5.(7) 9.33.5.3.(2)
CSA	B481.0-12	Material, design, and construction requirements for grease interceptors	7.2.3.2.(3)
CSA	B481.1-12	Testing and Rating of Grease Interceptors Using Lard	7.2.3.2.(4) 8.1.3.1.(8)
CSA	B481.2-12	Testing and Rating of Grease Interceptors Using Oil	7.2.3.2.(4) 8.1.3.1.(8)
CSA	B481.3-12	Sizing, Selection, Location, and Installation of Grease Interceptors	7.2.3.2.(3)
CSA	B481.4-12	Maintenance of Grease Interceptors	8.9.3.3.(1)
CSA	B365-17	Installation code for solid-fuel-burning appliances and equipment	6.2.1.5.(1) 6.2.1.5.(5) 9.21.1.4.(1) 9.22.10.2.(1) 9.33.5.3.(1)
CSA	B366.1-11	Solid-Fuel-Fired Central Heating Appliances	6.2.1.5.(2)
CSA	B415.1-10	Performance Testing of Solid-Fuel-Burning Heating Appliances	6.2.1.5.(7) 9.33.5.3.(2)
CSA	B481.0-12	Material, design, and construction requirements for grease interceptors	7.2.3.2.(3)
CSA	B481.1-12	Testing and Rating of Grease Interceptors Using Lard	7.2.3.2.(4) 8.1.3.1.(8)
CSA	B481.2-12	Testing and Rating of Grease Interceptors Using Oil	7.2.3.2.(4) 8.1.3.1.(8)
CSA	B481.3-12	Sizing, Selection, Location, and Installation of Grease Interceptors	7.2.3.2.(3)
CSA	B481.4-12	Maintenance of Grease Interceptors	8.9.3.3.(1)
CSA	CAN/CSA-B483.1-07	Drinking Water Treatment Systems	7.2.10.17.(1)
CSA	B602-16	Mechanical couplings for drain, waste, and vent pipe and sewer pipe	7.2.10.4.(2)
CSA	B651-18	Accessible design for the built environment	3.8.3.1.(7) 3.8.3.1.(8)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference	
CSA	C22.2 No. 0.3-09	Test methods for electrical wires and cables	3.1.4.3.(1) 3.1.4.3.(3) 3.1.5.21.(1) 3.1.5.21.(3) 3.1.5.25.(1) 3.1.5.25.(2) 9.34.1.5.(1)	
CSA	C22.2 No.113-10	Fans and Ventilators	9.32.3.10.(7)	
CSA	C22.2 No. 141:15	Emergency lighting equipment	3.2.7.4.(2) 3.4.5.1.(3) 9.9.11.3.(3) 9.9.12.3.(7)	
CSA	C22.2 No. 211.0-03	General Requirements and Methods of Testing for Nonmetallic Conduit	3.1.5.23.(1)	
CSA	CAN/CSA-C22.2 No. 262-04	Optical Fiber Cable and Communication Cable Raceway Systems	3.1.5.23.(1)	
CSA	CAN/CSA-C22.3 No. 1-20	Overhead Systems	3.1.20.1.(2)	
CSA	CAN/CSA-C88-M90	Power Transformers and Reactors	3.6.2.7.(10)	
CSA	CAN/CSA-C260-M90	Rating for the Performance of Residential Mechanical Ventilating Equipment	9.32.3.10.(1) 9.32.3.10.(2) Table 9.32.3.10.-B	
CSA	C282-15	Emergency electrical power supply for buildings	3.2.7.5.(1)	
CSA	CAN/CSA-C439-09	Standard laboratory methods of test for rating the performance of heat/energy-recovery ventilators	9.32.3.10.(4) 9.32.3.10.(5)	
CSA	CAN/CSA-C448.1-13	Design and Installation of Earth Energy Systems for Commercial and Institutional Buildings	6.2.1.5.(4) 9.33.5.2.(2)	
CSA	CAN/CSA-C448.2-13	Design and Installation of Earth Energy Systems for Residential and Other Small Buildings	6.2.1.5.(3) 9.33.5.2.(1)	
CSA	F280-12	Determining the required capacity of residential space heating and cooling appliances	9.33.4.1.(1) 9.33.5.1.(3)	
CSA	CAN/CSA-F326-M91	Residential Mechanical Ventilation Systems	9.32.3.1.(1) 9.33.4.1.(1)	
CSA	CAN/CSA-F379 Series-09 (excluding Supplement F379S1-11)	Packaged solar domestic hot water systems (liquid-to-liquid heat transfer)	7.2.10.13.(1)	
CSA	CAN/CSA-F379.1-09	Packaged solar domestic hot water systems (liquid-to-liquid heat transfer) for All Season Use	7.6.1.8.(1) 7.6.2.5A.(3) 7.6.2.5A.(4)	
r1	CSA	CAN/CSA-F383-08	Installation of packaged solar domestic hot water systems	7.6.1.8.(1)
CSA	G30.18-09	Carbon steel bars for concrete reinforcement	9.3.1.1.(4) 9.40.1.3.(1)	
CSA	G40.21-13	Structural quality steel	4.2.3.8.(1) Table 5.9.1.1. 9.23.4.3.(2)	
CSA	CAN/CSA-G164-M92	Hot Dip Galvanizing of Irregularly Shaped Articles	4.4.5.1.(4)	

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
CSA	CAN/CSA-G401-14	Corrugated steel pipe products	Table 5.9.1.1. 7.2.6.8.(1) 9.14.3.1.(1)
CSA	CAN/CSA-O80 Series-15	Wood preservation	3.1.4.5.(1) 4.2.3.2.(1) Table 5.9.1.1.
CSA	CAN/CSA-O80.0-15	General requirements for wood preservation	4.2.3.2.(2)
CSA	CAN/CSA-O80.1-15	Specification of treated wood	4.2.3.2.(1) 9.3.2.9.(5)
CSA	CAN/CSA-O80.2-15	Processing and treatment	4.2.3.2.(1)
CSA	CAN/CSA-O80.3-15	Preservative formulations	4.2.3.2.(1)
CSA	O86:19	Engineering design in wood	Table 4.1.8.9. 4.3.1.1.(1)
CSA	O118.1-08	Western Red Cedar Shakes and Shingles	Table 5.9.1.1. Table 9.26.2.1.-B 9.27.7.1.(1)
CSA	O118.2-08	Eastern White Cedar Shingles	Table 5.9.1.1. Table 9.26.2.1.-B 9.27.7.1.(1)
CSA	O121-17	Douglas fir plywood	Table 5.9.1.1. Table 9.23.12.3.-A Table 9.23.12.3.-B Table 9.23.12.3.-C Table 9.23.17.2.-A 9.23.15.2.(1) 9.23.16.2.(1) 9.27.8.1.(1) 9.30.2.2.(1)
CSA	CAN/CSA-O122-16	Structural glued-laminated timber	Table 9.23.4.2.-K Table 9.23.12.3.-D
CSA	CAN/CSA-O132.2 Series-90	Wood Flush Doors	9.7.4.3.(4)
CSA	O141:05	Softwood Lumber	Table 5.9.1.1. 9.3.2.6.(1)
CSA	O151-17	Canadian softwood plywood	Table 5.9.1.1. Table 9.23.12.3.-A Table 9.23.12.3.-B Table 9.23.12.3.-C 9.23.15.2.(1) 9.23.16.2.(1) Table 9.23.17.2.-A 9.27.8.1.(1) 9.30.2.2.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
CSA	O153-13	Poplar plywood	Table 5.9.1.1. 9.23.15.2.(1) 9.23.16.2.(1) Table 9.23.17.2.-A 9.27.8.1.(1) 9.30.2.2.(1)
CSA	O177-06	Qualification Code for Manufacturers of Structural Glued-Laminated Timber	4.3.1.2.(1) Table 9.23.4.2.-K Table 9.23.12.3.-D
CSA	O325-16	Construction sheathing	Table 5.9.1.1. Table 9.23.12.3.-A Table 9.23.12.3.-B Table 9.23.12.3.-C Table 9.23.13.6. 9.23.15.2.(1) 9.23.15.4.(2) 9.23.16.2.(1) 9.23.16.3.(2) Table 9.23.16.7.-B Table 9.23.17.2.-A Table 9.23.17.2.-B 9.29.9.1.(2) 9.29.9.2.(5)
CSA	O437.0-93	OSB and Waferboard	Table 5.9.1.1. Table 9.23.12.3.-A Table 9.23.12.3.-B Table 9.23.12.3.-C 9.23.15.2.(1) 9.23.15.4.(2) 9.23.16.2.(1) 9.23.16.3.(2) Table 9.23.17.2.-A 9.27.10.1.(1) 9.29.9.1.(2) 9.30.2.2.(1)
CSA	S16-19	Design of Steel Structures	Table 4.1.8.9. 4.3.4.1.(1)
CSA	S37-18	Antennas, Towers, and Antenna-Supporting Structures	4.1.6.15.(1) 4.1.7.11.(1)
CSA	S136-16	North American specification for the design of cold formed steel structural members (using the Appendix B provisions applicable to Canada)	4.1.8.1.(5) Table 4.1.8.9. 4.3.4.2.(1)
CSA	S157-17 / S157.1-17	Strength design in aluminum / Commentary on CSA S157-17, Strength design in aluminum	4.3.5.1.(1)
CSA	S304-14	Design of masonry structures	Table 4.1.8.9. 4.3.2.1.(1)
CSA	S367-12	Air-, cable-, and frame-supported membrane structures	4.4.1.1.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
CSA	S406-16	Specification of permanent wood foundations for housing and small buildings	9.13.2.7.(1) 9.15.2.4.(1) 9.16.5.1.(1)
CSA	S413-14	Parking structures	4.4.2.1.(1)
CSA	S478-19	Durability in buildings	5.1.4.2.(3) Table 5.9.1.1.
CSA	Z32-15	Electrical safety and essential electrical systems in health care facilities	3.2.7.3.(4) 3.2.7.6.(1) 3.7.5.1.(1)
CSA	Z240 MH Series-16	Manufactured homes	3.1.1.1.(2) of Division C 3.2.4.1.(3) of Division C
CSA	Z240.2.1-16	Structural requirements for manufactured homes	9.1.1.9.(1) 9.12.2.2.(6) 9.15.1.3.(1)
CSA	Z240.10.1-19	Site preparation, foundation, and installation of buildings	9.15.1.3.(1) 9.23.6.3.(1)
CSA	CAN/CSA-Z241 Series-18	Park model trailers	9.39.1.1.(1) 9.39.2.1.(1) 3.1.1.1.(2) of Division C 3.2.4.1.(3) of Division C
CSA	CSA Z271:20	Design of suspended access equipment	4.4.5.1.(2)
CSA	CAN/CSA-Z317.2-15	Special requirements for heating, ventilation and air conditioning (HVAC) systems in health care facilities	6.2.1.1.(1) 6.2.3.15.(6)
CSA	CAN/CSA-Z662-15	Oil and gas pipeline systems	3.2.3.22.(1)
CSA	Z7396.1-17	Medical gas piping systems - Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems	3.7.5.2.(1)
CSA / IAPMO	CSA B45.5-17 / IAPMO Z124-2017	Plastic plumbing fixtures	7.2.2.2.(1)
CSA / ICC	CSA B805-18 / ICC 805-2018	Rainwater harvesting systems	7.7.2.4.(4)
CSSBI	23M-2016	Standard for Residential Steel Cladding	9.27.11.1.(1)
CWC	2014	Engineering Guide for Wood Frame Construction	9.4.1.1.(1) 9.23.13.1.(2) 9.23.13.2.(2) 9.23.13.3.(2)
DBR	Technical Paper No. 194, May 1965	Fire Endurance of Protected Steel Columns and Beams	Table 11.5.1.1.-A Table 11.5.1.1.-B Table 11.5.1.1.-C Table 11.5.1.1.-D/E Table 11.5.1.1.-F
DBR	Technical Paper No. 207, October 1965	Fire Endurance of Unit Masonry Walls	Table 11.5.1.1.-A Table 11.5.1.1.-B Table 11.5.1.1.-C Table 11.5.1.1.-D/E Table 11.5.1.1.-F

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Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
DBR	Technical Paper No. 222, June 1966	Fire Endurance of Light-Framed and Miscellaneous Assemblies	Table 11.5.1.1.-A Table 11.5.1.1.-B Table 11.5.1.1.-C Table 11.5.1.1.-D/E Table 11.5.1.1.-F
EPA	625/R-92/016 (1994)	Radon Prevention in the Design and Construction of Schools and Other Large Buildings	6.2.1.1.(1)
FINA	2021	Rules and Regulations - FINA Facilities Rules 2021-2025 - FR3 Diving	3.11.4.1.(17)
HC	SOR/2015-17	Hazardous Products Regulations	1.4.1.2.(1) of Division A
HI	2005	Hydronics Institute Manuals	6.2.1.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1) 9.33.6.7.(2)
HPVA	ANSI/HPVA HP-1-2009	American National Standard for Hardwood and Decorative Plywood	Table 5.9.1.1. 9.27.8.1.(1) 9.30.2.2.(1)
HRAI	2017 Edition	HRAI Digest	6.2.1.1.(1) 9.32.2.3.(4) 9.32.3.2.(1) 9.33.4.1.(1)
HUD	Rehabilitation Guidelines 2000	Guideline on Fire Ratings of Archaic Materials and Assemblies	Table 11.5.1.1.-A Table 11.5.1.1.-B Table 11.5.1.1.-C Table 11.5.1.1.-D/E Table 11.5.1.1.-F
HVI	HVI 915-2013	Loudness Testing and Rating Procedure	9.32.3.10.(2) Table 9.32.3.10.-B
HVI	HVI 916-2013	Airflow Test Procedure	9.32.3.10.(1)
IAPMO	PS 63-2014	Plastic Leaching Chambers	8.7.2.3.(3)
ISO	3864-1:2011	Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings	3.4.5.1.(2) 9.9.11.3.(2)
ISO	7010:2011	Graphical symbols - Safety colours and safety signs - Registered safety signs	3.4.5.1.(2) 9.9.11.3.(2)
ISO	8201:2017	Acoustics - audible emergency evacuation signal	3.2.4.18.(2)
ISO	10848-1:2017	Acoustics - Laboratory measurement of the flanking transmission of airborne and impact sound between adjoining rooms	5.8.1.4.(2) 5.8.1.4.(3) 5.8.1.5.(2) 5.8.1.5.(3)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ISO	15712-1:2005	Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms	5.8.1.4.(1) 5.8.1.4.(2) 5.8.1.4.(4) 5.8.1.4.(5) 5.8.1.4.(6) 5.8.1.5.(1) 5.8.1.5.(2) 5.8.1.5.(5) 5.8.1.5.(6)
ISO	23599:2019	Assistive products for blind and vision-impaired persons – Tactile walking surface indicators	3.8.3.18.(1)
r1 MMAH	Supplementary Standard SA-1, September 9, 2024	Objectives and Functional Statements Attributed to the Acceptable Solutions	1.2.1.1.(1) of Division A 1.2.1.1.(2) of Division A
MMAH	Supplementary Standard SB-1, January 1, 2024	Climatic and Seismic Data	1.1.2.1.(1) 1.1.2.1.(2) 2.1.2.3.(4) 2.1.2.3.(5) 3.2.6.2.(2) 3.2.8.4.(1) 3.3.1.7.(1) 5.2.1.1.(1) 5.2.1.1.(2) 6.2.1.2.(1) 7.4.10.4.(1) 9.4.1.1.(3) 9.4.2.2.(1) Tables 9.6.1.3.-A to 9.6.1.3.-G Table 9.32.3.4. 9.33.3.2.(1) 9.33.4.1.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
r1 MMAH	Supplementary Standard SB-2, January 1, 2024	Fire Performance Ratings	2.2.1.10.(2) 3.1.4.8.(4) 3.1.5.5.(4) 3.1.5.6.(2) 3.1.5.29.(1) 3.1.6.9.(6) 3.1.6.10.(2) 3.1.7.1.(2) 3.1.8.16.(2) 3.1.9.5.(1) 3.1.12.1.(3) 3.2.3.12.(1) 3.2.3.13.(4) 3.6.1.5.(1) 3.13.2.1.(11) 3.13.3.5.(1) 3.13.3.6.(2) 3.13.4.2.(7) 9.10.3.1.(1) 9.10.3.2.(1) 9.10.5.1.(3) 9.10.9.11.(1)
MMAH	Supplementary Standard SB-3, January 1, 2024	Fire and Sound Resistance Tables	5.8.1.3.(1) 5.8.1.3.(2) 9.10.3.1.(1) 9.10.5.1.(3) 9.11.1.3.(1) 9.11.1.3.(2) Table 9.11.1.4. 9.29.5.9.(5)
MMAH	Supplementary Standard SB-4, January 1, 2024	Measures for Fire Safety in High Buildings	3.2.6.2.(1) 3.2.6.2.(7) 3.2.6.5.(3) 3.2.6.9.(1) 3.13.3.6.(5) Table 11.5.1.1.-C Table 11.5.1.1.-D/E Table 11.5.1.1.-F
MMAH	Supplementary Standard SB-6, January 1, 2024	Percolation Times and Soil Descriptions	8.2.1.2.(2)
MMAH	Supplementary Standard SB-7, January 1, 2024	Guards for Housing and Small Buildings	9.8.8.2.(6)
MMAH	Supplementary Standard SB-8, January 1, 2024	Design, Construction and Installation of Anchorage Systems for Fixed Access Ladders	3.6.1.6.(1)
MMAH	Supplementary Standard SB-9, January 1, 2024	Requirements for Soil Gas Control	9.13.4.1.(3) 9.13.4.2.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
MMA	Supplementary Standard SB-10, December 22, 2016	Energy Efficiency Requirements	Table 9.7.3.3. 12.2.1.2.(2) 12.2.2.1.(1) 12.2.3.1.(1)
MMAH	Supplementary Standard SB-11, January 1, 2024	Construction of Farm Buildings	2.1.2.3.(5)
MMA	Supplementary Standard SB-12, July 7, 2016	Energy Efficiency for Housing	Table 9.7.3.3. Table 11.5.1.1.-C 12.2.1.2.(3)
MMAH	Supplementary Standard SB-13, January 1, 2024	Glass in Guards	3.1.21.1.(1)
MMAH	Supplementary Standard SC-1, January 1, 2024	Code of Conduct for Registered Code Agencies	3.7.4.1.(2) of Division C
MOE	PIBS 6879 2008	Design Guidelines for Sewage Works	7.1.2.5.(1)
MOE	PIBS 6881e 2008	Design Guidelines for Drinking-Water Systems	7.1.2.5.(2)
NFPA	2023 Publication	National Fire Codes	6.2.1.1.(1)
NFPA	13-2019	Standard for the Installation of Sprinkler Systems	3.1.9.1.(4) 3.2.4.8.(2) 3.2.4.15.(1) 3.2.5.12.(1) 3.2.5.12.(9) 3.2.8.2.(5) 3.2.8.3.(2) 3.3.2.14.(3) 3.16.1.1.(3) 3.16.1.1.(4) 3.16.1.6.(2) 3.16.1.6.(8) 3.16.1.7.(2) 3.16.2.1.(1) 3.16.2.2.(1) 3.16.3.1.(1) 9.10.9.9.(4)
NFPA	13D-2016	Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes	3.2.4.1.(2) 3.2.5.12.(3) 3.2.7.9.(4)
NFPA	13R-2019	Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies	3.2.5.12.(2)
NFPA	14-2013	Standard for the Installation of Standpipe and Hose Systems	3.2.5.9.(1) 3.2.5.10.(1)
NFPA	20-2016	Standard for the Installation of Stationary Pumps for Fire Protection	3.2.4.9.(4) 3.2.5.18.(1)
NFPA	24-2013	Standard for the Installation of Private Fire Service Mains and Their Appurtenances	7.2.11.1.(1)
NFPA	68-2013	Standard on Explosion Protection by Deflagration Venting	3.3.6.3.(1) 3.3.6.4.(2) 3.3.6.4.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
NFPA	72-2019	National Fire Alarm and Signaling Code	3.2.4.20.(17) 6.9.4.4.(3) 9.10.19.1.(2) 9.10.19.3.(4)
NFPA	80-2013	Standard for Fire Doors and Other Opening Protectives	3.1.8.5.(2) 3.1.8.12.(2) 3.1.8.16.(1) 3.1.9.1.(5) 3.13.3.1.(2) 9.10.9.9.(5) 9.10.13.1.(1)
NFPA	82-2014	Standard on Incinerators and Waste and Linen Handling Systems and Equipment	6.2.2.1.(1) 9.10.10.5.(2)
NFPA	91-2015	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists and Noncombustible Particulate Solids	6.3.4.3.(1)
NFPA	96-2014	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations	3.2.4.8.(2) 3.6.3.5.(1) 6.3.1.6.(1)
NFPA	105-2013	Standard for Smoke Door Assemblies and other Opening Protectives	3.1.8.5.(3) 3.1.8.5.(7)
NFPA	130-2023	Standard for Fixed Guideway Transit and Passenger Rail Systems	3.13.7.1.(1)
NFPA	211-2019	Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances	6.3.3.2.(2) 6.3.3.3.(1)
NFPA	701-2023	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	3.14.1.6.(1) 3.14.2.5.(1) 3.17.2.5.(1)
NFRC	100-2014	Procedure for Determining Fenestration Product U-Factors	12.3.1.2.(1)
NFRC	200-2014	Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence	12.3.1.2.(1)
NLGA	2017	Standard Grading Rules for Canadian Lumber	1.4.1.2.(1) of Division A 9.3.2.1.(1) Table 9.3.2.1. Tables 9.23.4.2.-A to 9.23.4.3.-J
NSF	NSF/ANSI 46-2010	Evaluation of Components and Devices Used in Wastewater Treatment Systems	8.6.2.1.(2)
NSF	NSF/ANSI 61-2013	Drinking Water System Components - Health Effects	7.2.10.7C.(1)
SMACNA	ANSI/SMACNA 006-2006	HVAC Duct Construction Standards - Metal and Flexible	9.33.6.5.(2) 9.33.6.7.(9) 9.33.6.7.(10)
SPRI	ANSI/GRHC/SPRI VR-1-2018	Procedure for Investigating Resistance to Root or Rhizome Penetration on Vegetative Roofs	5.6.1.2.(2)
TPIC	2019	Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses	9.23.14.11.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
UL	ANSI/CAN/UL/ULC 300-2019	Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment	6.9.1.3.(1)
UL	ANSI/UL-1784-2015	Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives	3.1.8.4.(4)
UL	UL 2034-2008	Single and Multiple Station Carbon Monoxide Alarms	9.33.3.9C.(1)
ULC	CAN/ULC-S101-14	Standard Method of Fire Endurance Tests of Building Construction and Materials	2.2.1.8.(4) 2.2.1.10.(1) 3.1.5.7.(2) 3.1.5.14.(5) 3.1.5.14.(6) 3.1.5.15.(3) 3.1.5.15.(4) 3.1.7.1.(1) 3.1.11.7.(1) 3.2.3.8.(1) 9.10.16.3.(1)
ULC	CAN/ULC-S102-10	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies	3.1.5.24.(1) 3.1.12.1.(1) Table 5.9.1.1. Table 9.23.17.2.-A 9.29.5.2.(1)
ULC	CAN/ULC-S102.2-18	Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies	3.1.12.1.(2) 3.1.13.4.(1) 9.27.12.1.(4) 9.27.13.1.(2)
ULC	CAN/ULC-S102.3-2018	Standard Method of Fire Test of Light Diffusers and Lenses	3.1.13.4.(1)
ULC	CAN/ULC-S102.4-17	Standard Method of Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways	3.1.4.3.(2) 3.1.5.21.(2) 3.1.5.23.(2)
ULC	CAN/ULC-S104-15	Standard Method for Fire Tests of Door Assemblies	3.1.8.4.(1) 3.2.6.5.(3)
ULC	CAN/ULC-S105-16	Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104	9.10.13.6.(1)
ULC	CAN/ULC-S106-15	Standard Methods for Fire Tests of Window and Glass Block Assemblies	3.1.8.4.(1)
ULC	CAN/ULC-S107-19	Standard Methods for Fire Tests of Roof Coverings	3.1.15.1.(1)
ULC	CAN/ULC-S109-14	Standard Method for Flame Tests of Flame-Resistant Fabrics and Films	2.2.1.14.(1) 3.1.16.1.(1) 3.6.5.2.(2) 3.6.5.3.(1) 3.14.1.6.(1) 3.14.2.5.(1) 3.17.2.5.(1) 9.33.6.3.(1)
ULC	CAN/ULC-S110-13	Standard Methods of Test for Air Ducts	3.6.5.1.(2) 3.6.5.1.(5) 9.33.6.2.(2) 9.33.6.2.(4)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	CAN/ULC-S111-13	Standard Method of Fire Tests for Air Filter Units	6.2.3.13.(1) 9.33.6.14.(1)
ULC	CAN/ULC-S112-10	Standard Method of Fire Test of Fire-Damper Assemblies	3.1.8.4.(1)
ULC	CAN/ULC-S112.1-10	Standard for Leakage Rated Dampers for Use in Smoke Control Systems	3.1.8.4.(3) 6.3.2.7.(3)
ULC	CAN/ULC-S112.2-07	Standard Method of Fire Test of Ceiling Firestop Flap Assemblies	3.1.9.4.(2) 3.6.4.3.(2) 9.10.13.14.(1)
ULC	CAN/ULC-S113:2016	Standard Specification for Wood Core Doors Meeting the Performance Required by CAN/ULC-S104 for Twenty Minute Fire Rated Closure Assemblies	9.10.13.2.(1)
ULC	CAN/ULC-S114:2018	Standard Method of Test for Determination of Non-Combustibility in Building Materials	1.4.1.2.(1) of Division A
ULC	CAN/ULC-S115-11	Standard Method of Fire Tests of Firestop Systems	3.1.5.19.(3) 3.1.8.3.(3) 3.1.9.1.(1) 3.1.9.1.(2) 3.1.9.1.(3) 3.1.9.1.(6) 3.1.9.1.(7) 3.1.9.3.(1) 3.1.9.3.(2) 3.1.9.3.(4) 3.1.9.4.(4) 3.1.9.4.(7) 9.10.9.2.(3) 9.10.9.6.(1) 9.10.9.6.(2) 9.10.9.8.(1) 9.10.9.8.(6)
ULC	CAN/ULC-S124-06	Standard Method of Test for the Evaluation of Protective Coverings for Foamed Plastic	3.1.5.15.(2)
ULC	CAN/ULC-S126-14	Standard Method of Test for Fire Spread Under Roof-Deck Assemblies	3.1.14.1.(1) 3.1.14.2.(1)
ULC	CAN/ULC-S134-13	Standard Method of Fire Test of Exterior Wall Assemblies	3.1.5.5.(1) 9.10.15.5.(2)
ULC	ULC-S135-04	Standard Test Method for the Determination of Combustibility Parameters of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter)	3.1.5.1.(2)
ULC	CAN/ULC-S136:2021	Standard Method for Fire Test of Sprinkler Protected Window Systems	3.1.8.20.(1)
ULC	CAN/ULC-S138-06	Standard Method of Test for Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration	3.1.5.7.(1) 3.1.5.7.(3)
ULC	CAN/ULC-S139:17	Standard for Fire Test for Evaluation of Integrity of Electrical Power, Data and Optical Fibre Cables	3.2.6.5.(6) 3.2.7.10.(2) 3.2.7.10.(3)
ULC	CAN/ULC-S143-14	Standard Method of Fire Tests for Non-Metallic Electrical and Optical Fibre Cable Raceway Systems	3.1.5.23.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	CAN/ULC-S144-12	Standard Method of Fire Resistance Test - Grease Duct Assemblies	3.6.3.5.(2)
ULC	CAN/ULC-S146-19	Standard Method of Test for the Evaluation of Encapsulation Materials and Assemblies of Materials for the Protection of Structural Timber Elements	3.1.6.5.(1)
ULC	S505-1974	Standard for Fusible Links for Fire Protection Service	3.1.8.10.(2)
ULC	CAN/ULC-S524:2019	Standard for Installation of Fire Alarm Systems	3.1.8.11.(3) 3.1.8.14.(3) 3.2.4.5.(1) 3.2.4.20.(10) 3.2.4.20.(15) 9.10.19.4.(3) 9.10.19.6.(2)
ULC	CAN/ULC-S531:2019	Standard for Smoke Alarms	3.2.4.20.(2) 9.10.19.1.(1)
ULC	CAN/ULC-S537:2019	Standard for Verification of Fire Alarm Systems	3.2.4.5.(2) 3.2.4.20.(10)
ULC	CAN/ULC-S540-13	Standard for Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance	3.2.4.21.(1) 9.10.19.8.(1)
ULC	CAN/ULC-S553-14	Standard for the Installation of Smoke Alarms	3.2.4.20.(13) 9.10.19.3.(2)
ULC	CAN/ULC-S561-13	Standard for Installation and Services for Fire Signal Receiving Centres and Systems	3.2.4.7.(4) 3.13.5.4.(1)
ULC	CAN/ULC-S572:2017	Standard for Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems	3.4.5.1.(4.1) 9.9.11.3.(3)
ULC	CAN/ULC-S610:2018	Standard for Factory-Built Fireplace Systems	9.22.8.1.(1)
ULC	ULC-S628-93	Standard for Fireplace Inserts	9.22.10.1.(1)
ULC	CAN/ULC-S629:2016	Standard for 650°C Factory-Built Chimneys	9.21.1.3.(1)
ULC	CAN/ULC-S639-M87	Standard for Steel Liner Assemblies for Solid Fuel-Burning Masonry Fireplaces	9.22.2.3.(1)
ULC	CAN/ULC-S701.1:2017	Standard for Thermal Insulation, Polystyrene Boards	Table 5.9.1.1. Table 9.23.17.1.-A 9.25.2.2.(1) 9.25.2.2.(4)
ULC	CAN/ULC-S702.1-14	Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification	3.1.6.3.(4) Table 5.9.1.1. 9.10.9.8.(3) Table 9.23.17.2.-A 9.25.2.2.(1)
ULC	CAN/ULC-S703-09	Standard for Cellulose Fibre Insulation (CFI) for Buildings	Table 5.9.1.1. 9.25.2.2.(1)
ULC	CAN/ULC-S704.1:2017	Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced	Table 5.9.1.1. Table 9.23.17.2.A 9.25.2.2.(1)
ULC	CAN/ULC-S705.1:2018	Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density - Material – Specification	Table 5.9.1.1. 9.25.2.2.(1)

Table 1.3.1.2. (Cont'd)
Documents Referenced in the Building Code
 Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number	Title of Document	Code Reference
ULC	CAN/ULC-S705.2-05	Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Application	Table 5.9.1.1. 9.25.2.5.(1)
ULC	CAN/ULC-S706.1:2016	Standard for Wood Fibre Insulating Boards for Buildings	Table 5.9.1.1. 9.23.16.7.(3) Table 9.23.17.2.-A 9.25.2.2.(1) 9.29.8.1.(1)
ULC	CAN/ULC-S710.1:2019	Standard for Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification	Table 5.9.1.1.
ULC	CAN/ULC-S711.1:2019	Standard for Bead-Applied Two Component Polyurethane Air Sealant Foam, Part 1: Material Specification	Table 5.9.1.1.
ULC	CAN/ULC-S716.1-12	Standard for Exterior Insulation and Finish Systems (EIFS) – Materials and Systems	5.9.4.1.(1) 9.27.14.1.(1) 9.27.14.2.(1)
ULC	CAN/ULC-S716.2-12	Standard for Exterior Insulation and Finish Systems (EIFS) – Installation of EIFS Components and Water Resistive Barrier	9.27.14.3.(2)
ULC	CAN/ULC-S716.3-12	Standard for Exterior Insulation and Finish Systems (EIFS) – Design Application	9.27.14.3.(1)
ULC	CAN/ULC-S717.1:2017	Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties	Table 5.9.1.1. 9.15.4.1.(1)
ULC	CAN/ULC-S741-08	Standard for Air Barrier Materials – Specification	5.4.1.2.(2)
ULC	CAN/ULC-S742-11	Standard for Air Barrier Assemblies – Specification	5.4.1.2.(1) 5.4.1.2.(2)
ULC	CAN/ULC-S1001-11	Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems	3.2.9.1.(1) 9.10.1.2.(1)
ULC	ULC/ORD-C199P-02	Combustible Piping for Sprinkler Systems	3.2.5.13.(2) 3.2.5.13.(5)
ULC	ULC/ORD-C1254.6-95	Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units	6.9.1.3.(1)
USDA	October 1993	Soil Survey Manual	8.2.1.2.(2)
WT	October 20, 2016	Port Lands Flood Protection and Enabling Infrastructure Due Diligence Report	1.3.3.6.(4) of Division C

1.3.2. Abbreviations

1.3.2.1. Abbreviations of Proper Names (See Note A-1.3.2.1.(1))

- (1) The abbreviations of proper names in this Code shall have the meanings assigned to them in Table 1.3.2.1.

Table 1.3.2.1.
Abbreviations of Proper Names
 Forming Part of Sentence 1.3.2.1.(1)

Abbreviation	Meaning
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
AHRI	Air-Conditioning, Heating and Refrigeration Institute
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	The Engineered Wood Association
APHA	American Public Health Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	The American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BCMOH	British Columbia Ministry of Health
BNQ	Bureau de Normalisation du Québec
CAN	National Standard of Canada designation The number or name following the CAN designation represents the agency under whose auspices the standard is issued. CAN1 designates CGA, CAN2 designates CGSB, CAN3 designates CSA, and CAN4 designates ULC.
CCBFC	Canadian Commission on Building and Fire Codes
CGSB	Canadian General Standards Board
CHC	Canadian Hydronics Council
CSA	CSA Group, formerly called Canadian Standards Association
CWC	Canadian Wood Council
DBR	Division of Building Research, known as the Institute for Research in Construction since 1985
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
FINA	Fédération Internationale de Natation
GRHC	Green Roofs for Healthy Cities
HC	Health Canada
HI	Hydronics Institute
HPVA	Hardwood Plywood & Veneer Association

Table 1.3.2.1. (Cont'd)
Abbreviations of Proper Names
 Forming Part of Sentence 1.3.2.1.(1)

Abbreviation	Meaning
HRAI	Heating, Refrigerating and Air-Conditioning Institute of Canada
HUD	U.S. Department of Housing and Urban Development
HVI	Home Ventilating Institute
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ISO	International Organization for Standardization
MMA	Ontario Ministry of Municipal Affairs
MMAH	Ontario Ministry of Municipal Affairs and Housing
MOE	Ontario Ministry of the Environment
NFPA	National Fire Protection Association
NLGA	National Lumber Grades Authority
NRCan	Natural Resources Canada
NSF	National Sanitation Foundation International, formerly called National Sanitation Federation
SEI	Structural Engineering Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association Inc.
SPRI	Single Ply Roofing Industry
TC	Transport Canada
TPIC	Truss Plate Institute of Canada
UL	Underwriters Laboratories Inc.
ULC	Underwriters' Laboratories of Canada
USDA	United States Department of Agriculture
WEF	World Environment Federation
WT	Waterfront Toronto

Part 2

Farm Buildings

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Part 2

Farm Buildings

(See Note A-2)

Section 2.1. General

2.1.1. Scope

2.1.1.1. Scope

(1) This Part is concerned with the fire, structural, heating, ventilating and *air-conditioning* performance of *farm buildings*, as well as processes and operations carried out therein that involve a risk of explosion, high flammability or related conditions that create a hazard to life safety. (See Note A-2.1.1.1.(1))

2.1.2. Application

2.1.2.1. Application

- (1) Except as provided in Sentences (2) and (3), this Part applies to all *farm buildings*
 - (a) that are
 - (i) more than 600 m² in *building area* or more than 3 *storeys* in *building height* used for *major occupancies* classified as Group G, Division 1, 2 or 3 *agricultural occupancies*, or
 - (ii) used for *major occupancies* classified as Group G, Division 4, *agricultural occupancies with no human occupants*, and
 - (b) described in Sentence 2.1.2.2.(1).
- (2) Subsections 2.2.6. and 2.2.7. do not apply to Group G, Division 4 *major occupancies*.
- (3) *Farm buildings* not described in Sentence (1) shall conform to the requirements of Article 2.1.2.3.

2.1.2.2. Classification of Buildings Containing Agricultural Occupancies

(See Note A-3.1.2.)

- (1) *Buildings* or parts of *buildings* containing an *agricultural occupancy* that has an *occupant load* of not more than one person per 40 m² shall be classified according to their *major occupancy* as belonging to Group G, Division 1, 2, 3 or 4.
- (2) *Buildings* or parts of *buildings* containing an *agricultural occupancy* that has an *occupant load* of more than one person per 40 m² shall be classified according to their *major occupancy* as belonging to one of the Groups and Divisions listed in Table 3.1.2.1. of Division B.

(3) For the purposes of Sentences (1) and (2), the *occupant load* shall be determined based on the *floor area* or the part of the floor area that contains the *agricultural occupancy*.

(4) A *building* intended for use by more than one *major occupancy* shall be classified according to all the *major occupancies* for which it is used or intended to be used.

2.1.2.3. Small Farm Buildings

(1) Except as provided in Sentences (2) to (6), *farm buildings* not more than 3 *storeys* in *building height* and not more than 600 m² in *building area* used for *major occupancies* classified as Group G, Division 1, 2, or 3 *agricultural occupancies* shall conform to the requirements in the CCBFC NRCC 38732 “National Farm Building Code of Canada.”

(2) Articles 1.1.1.2. and 3.1.8.1. and Subsections 3.1.4. and 4.1.4. in the CCBFC NRCC 38732 “National Farm Building Code of Canada” do not apply to *farm buildings*.

(3) Except as provided in Sentence (4), in the CCBFC NRCC 38732 National Farm Building Code of Canada, references in Articles 1.1.1.3., 2.2.2.1., 2.2.2.2., 2.3.1.1., 2.3.2.1., 3.1.1.1., 3.1.1.2., 3.1.2.1. and 3.1.6.1. to the CCBFC NRCC 38726 “National Building Code of Canada,” are deemed to be references to Ontario Regulation 403/97 (Building Code), as it read on December 30, 2006.

(4) The climatic values required for the design of *farm buildings* shall be in conformance with the climatic values provided in MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”

(5) A *farm building* of *low human occupancy* having a *building area* not exceeding 600 m² and not more than three *storeys* in *building height* is deemed to comply with the structural requirements of CCBFC NRCC 38732 “National Building Code of Canada,” if it is designed and constructed in conformance with MMAH Supplementary Standard SB-11, “Construction of Farm Buildings.”

(6) Where a *floor area* or portion of a *floor area* within a *farm building* is intended to contain a *hazardous extraction* operation involving cannabis, the *floor area* or portion of the *floor area* shall conform to the requirements of Article 2.2.8.9.

2.1.3. Definitions

2.1.3.1. Defined Terms

(1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

2.1.4. Classification of Farm Buildings by Major Occupancy

(See Note A-3.1.2.)

2.1.4.1. Classification

(1) Every *farm building* or part of a *farm building* shall be classified according to its *major occupancy* as belonging to one of the Divisions of Group G described in Table 2.1.4.1. (See Note A-2.1.4.1.(1)) (See also Note A-2.2.8.3.)

Table 2.1.4.1.
Classification of Agricultural Major Occupancies
 Forming Part of Sentence 2.1.4.1.(1)

Group	Division	Description of <i>Agricultural Occupancies</i>
G	1	<i>High-hazard agricultural occupancies</i>
G	2	<i>Agricultural occupancies not elsewhere classified in Group G</i>
G	3	<i>Greenhouse agricultural occupancies</i>
G	4	<i>Agricultural occupancies with no human occupants</i>

Section 2.2. Fire Protection and Occupant Safety

2.2.1. General

2.2.1.1. Classification

- (1) Every *farm building* or part of a *farm building* shall be classified in accordance with Subsection 2.1.4.
- (2) Portions of *farm buildings* that do not contain Group G, Division 1, 2, 3 or 4 *major occupancies* shall be classified according to their *major occupancy* as belonging to one of the Groups or Divisions described in Table 3.1.2.1. and those portions shall conform to the requirements in Part 3. (See Note A-2.2.1.1.(2))

2.2.1.2. Prohibition of Occupancy Combinations

- (1) *Buildings* classified as a Group G, Division 1 or 4 *major occupancy* shall not contain a Group A, B or C *occupancy*.
- (2) *Buildings* classified as a Group G, Division 2 or 3 *major occupancy* shall not contain a Group A, Division 1 or 3, or Group B *occupancy*.

2.2.1.3. Exceptions for Major Occupancies

- (1) In a *farm building* in which the aggregate area of all *major occupancies* in a particular Group or Division is not more than 10% of the *floor area* of the *storey* in which they are located, these *major occupancies* need not be considered as *major occupancies* for the purposes of Subsection 2.2.2., provided they are not classified as Group F, Division 1 or Group G, Division 1 *occupancies*.

2.2.1.4. Separation of Occupancies

- (1) Except as provided in Sentence (2), *major occupancies* shall be separated from adjoining *major occupancies* by *fire separations* having *fire-resistance ratings* conforming to Table 2.2.1.4.
- (2) If one *major occupancy* is located above another *major occupancy*, the *fire-resistance rating* of the floor assembly between the *major occupancies* shall be determined on the basis of the requirements of this Section for the lower *major occupancy*.

(3) *Occupancies* other than *major occupancies* shall be separated from adjoining *occupancies* belonging to a different Group or Division by *fire separations* having *fire-resistance ratings* that conform to Table 2.2.1.4., but need not be more than 1 h.

Table 2.2.1.4.
Major Occupancy Fire Separations⁽¹⁾
Forming Part of Sentences 2.2.1.4.(1) and (3)

Major Occupancy	Minimum Fire-Resistance Rating of Fire Separation, h			
	Adjoining Major Occupancy			
	G-1	G-2	G-3	G-4
A-1	(2)	(3)	(3)	(2)
A-2	(2)	1	1	(2)
A-3	(2)	(3)	(3)	(2)
A-4	(2)	1	1	(2)
B	(2)	(3)	(3)	(2)
C	(2)	1	1	(2)
D	1	–	–	–
E	1	–	–	–
F-1	–	2	2	–
F-2	–	–	–	–
F-3	–	–	–	–
G-1	–	2	2	–
G-2	2	–	–	–
G-3	2	–	–	–
G-4	–	–	–	–

Notes to Table 2.2.1.4.:

- (1) Article 2.2.1.9. contains requirements for other *fire separations* that are in addition to the requirements for the separation of *major occupancies*.
 (2) See Sentence 2.2.1.2.(1).
 (3) See Sentence 2.2.1.2.(2).

2.2.1.5. Fire Separations and Closures (See Note A-2.2.1.5.)

- (1) Any wall, *partition* or floor assembly required to be a *fire separation* shall
 (a) except as permitted by Sentence (2), be constructed as a continuous element, and
 (b) as required in this Section, have a fire-resistance rating as specified. (See Note A-3.1.8.1.(1)(b))
- (2) Openings in a *fire separation* shall be protected with *closures*, shafts or other means in conformance with Articles 3.1.8.3. to 3.1.8.19.

2.2.1.6. Penetrations in Fire Separations and Fire-Rated Assemblies

- (1) Penetrations of a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* shall conform to Articles 3.1.9.1. to 3.1.9.4.

2.2.1.7. Firewalls

- (1) A *firewall* that separates a *building* or *buildings* with *floor areas* containing a Group G, Division 1 *major occupancy* shall be constructed as a *fire separation* of *noncombustible construction* having a *fire-resistance rating* not less than 4 h.
- (2) A *firewall* that separates a *building* or *buildings* with *floor areas* containing a Group G *major occupancy* and a *major occupancy* prohibited by Article 2.2.1.2. shall be constructed as a *fire separation* of *noncombustible construction* having a *fire-resistance rating* not less than 4 h.
- (3) *Firewalls* shall conform to the requirements of Articles 3.1.10.1. and 3.1.10.3. to 3.1.10.7., and Sentence 3.1.10.2.(3).

2.2.1.8. Fire Blocks

- (1) Concealed spaces in interior wall, ceiling and crawl spaces shall be separated from concealed spaces in exterior walls and *attic* or *roof spaces* by *fire blocks*. (See Note A-2.2.1.8.(1))
- (2) Concealed spaces in walls and *partitions* shall be separated by *fire blocks* into compartments not more than 3 m in height and 20 m in length.
- (3) Horizontal concealed spaces within a floor assembly or roof assembly of *combustible construction*, in which sprinklers are not installed, shall be separated by *fire blocks* into compartments not more than 900 m² in area.
- (4) Except as permitted by Sentence (5), *fire blocks* shall be constructed of materials that will remain in place and prevent the passage of flames for not less than 15 min when subjected to the standard fire exposure in CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”
- (5) *Fire blocks* need not be tested in conformance with Sentence (4) if they are constructed of not less than
 - (a) 0.38 mm sheet steel,
 - (b) 12.7 mm gypsum board,
 - (c) 12.5 mm plywood, OSB or waferboard, with joints backed with similar material,
 - (d) two layers of lumber, each not less than 19 mm thick, with joints staggered, or
 - (e) 38 mm lumber.

2.2.1.9. Additional Fire Separations

- (1) Except as permitted by Sentence (2) and required by Sentence (3), fuel-fired *appliances* shall be installed in *service rooms* separated from the remainder of the *farm building* by
 - (a) a *fire separation* having a *fire-resistance rating* not less than 45 min in a *floor area* that is not *sprinklered* throughout, or
 - (b) a *fire separation* not required to have a *fire-resistance rating* in a *floor area* that is *sprinklered* throughout.
- (2) A fuel-fired *appliance* that serves only one room is not required to be installed in a *service room* separated from the remainder of the *farm building*.
- (3) Incinerators shall be installed in *service rooms* that
 - (a) do not contain other fuel-fired *appliances*, and
 - (b) are separated from the remainder of the *farm building* by a *fire separation* having a *fire-resistance rating* not less than
 - (i) 2 h, where the *service room* is adjacent to a Group G, Division 1 *major occupancy* in a *floor area* that is not *sprinklered* throughout,
 - (ii) 1 h, where the *service room* is adjacent to a Group G, Division 1 *major occupancy* in a *floor area* that is *sprinklered* throughout,

- (iii) 1 h, where the *service room* is adjacent to a Group G, Division 2 or 3 *major occupancy* in a *floor area* that is not *sprinklered* throughout, or
- (iv) 30 min, where the *service room* is adjacent to a Group G, Division 2 or 3 *major occupancy* in a *floor area* that is *sprinklered* throughout.

(4) A room containing a device that produces open flames, heat or sparks and used for crop drying shall be separated from the remainder of the *farm building* by

- (a) a *fire separation* having a *fire-resistance rating* not less than 45 min in a *floor area* that is not *sprinklered* throughout, or
- (b) a *fire separation* not required to have a *fire-resistance rating* in a *floor area* that is *sprinklered* throughout.

(5) A room intended to be used for repairing farm machinery shall be separated from the remainder of the *farm building* by a *fire separation* having a *fire-resistance rating* not less than

- (a) 1 h, in a *floor area* that is not *sprinklered* throughout, or
- (b) 30 min, in a *floor area* that is *sprinklered* throughout.

(6) Storage areas for *dangerous goods* shall be separated from the remainder of the *farm building* in accordance with Sentences 3.3.6.2.(1) and (2).

2.2.1.10. Determination of Fire-Resistance Ratings

(1) Except as permitted by Sentence (2), the rating of a material, assembly of materials, or structural member that is required to have a *fire-resistance rating* shall be determined on the basis of the results of tests conducted in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”

(2) A material, assembly of materials, or structural member is permitted to be assigned a *fire-resistance rating* on the basis of MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

2.2.1.11. Determination of Flame-Spread Ratings

(1) *Flame-spread ratings* shall be determined in accordance with Article 3.1.12.1.

2.2.1.12. Flame-Spread Rating

(1) Except as provided in Sentences (2) and (3), the *flame-spread rating* of interior wall and ceiling finishes, including glazing and skylights, shall be not more than 150.

(2) The *flame-spread rating* of interior wall and ceiling finishes in *exits* shall conform to Sentence 3.1.13.2.(1).

(3) Subject to the requirement of Article 2.2.1.13., the *flame-spread rating* on any exposed surface of foamed plastic insulation, and on any surface that would be exposed by cutting through the insulation in any direction, shall be not more than 500.

2.2.1.13. Foamed Plastics

(1) Foamed plastics installed in farm buildings shall be protected in conformance with Sentence 3.1.4.2.(1).

2.2.1.14. Fabrics and Films

(1) Fabrics and films used in connection with tents and *air-supported structures* shall conform to CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.”

2.2.1.15. Electrical Wiring and Equipment (See Note A-2.2.1.15.)

- (1) Reserved.
- (2) Electrical wiring installed in a concealed space shall be enclosed in rigid conduit or otherwise protected against damage. (See Note A-2.2.1.15.(2))

2.2.1.16. Wires and Cables

- (1) Wires and cables installed in *farm buildings* shall conform to Article 3.1.4.3.

2.2.1.17. Occupant Load

- r1 (1) If a *floor area* or part of a *floor area* has been designed for an *occupant load* other than that prescribed in Sentence 2.1.2.2.(1) or elsewhere in this Part, a permanent sign indicating that *occupant load* shall be posted in a conspicuous location.

2.2.2. Building Size and Construction Relative to Major Occupancy**2.2.2.1. Farm Buildings with Multiple Agricultural Major Occupancies**

- (1) In a *farm building* containing more than one *agricultural major occupancy* classified in more than one Division, the *building height* and *building area* of the entire *farm building* shall be used in determining the construction requirements and the fire safety requirements for each of the *major occupancies*.

2.2.2.2. Exceptions in Determining Building Height

- (1) The space above a *mezzanine* need not be considered as a *storey*, provided the conditions of Sentence 3.2.1.1.(3), (4), (5) or (7) are met.
- (2) Platforms conforming to Sentence 3.2.1.1.(6) need not be considered as a *storey*.

2.2.2.3. Group G, Division 1, up to 3 Storeys, Limited Area, Sprinklered

- (1) A *building* classified as Group G, Division 1 is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided
 - (a) the *building* is *sprinklered* throughout,
 - (b) the *building* is not more than 3 *storeys* in *building height*,
 - (c) the *building* has a *building area* not more than
 - (i) 4 800 m², if 1 *storey* in *building height*,
 - (ii) 2 400 m², if 2 *storeys* in *building height*, or
 - (iii) 1 600 m², if 3 *storeys* in *building height*,
 - (d) floor assemblies, including the floor assembly immediately above a *basement*, are *fire separations* with a *fire-resistance rating* not less than 45 min, and
 - (e) *loadbearing* walls, columns and arches have a *fire-resistance rating* not less than that required for the supported assembly.

2.2.2.4. Group G, Division 1, One Storey

- (1) A *building* classified as Group G, Division 1 is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided
- (a) it is not more than 1 *storey* in *building height*, and
 - (b) except as provided in Sentence (2), it has a *building area* not more than 2 400 m².
- (2) Where the *building* referred to in Sentence (1) is a *farm building* housing livestock with a below-floor storage area for *liquid manure*, the *building* is permitted to have a *building area* of any size.

2.2.2.5. Group G, Division 2, Any Height, Any Area, Sprinklered

- (1) A *building* classified as Group G, Division 2 of any *building height* or *building area* is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided
- (a) the *building* is *sprinklered* throughout,
 - (b) floor assemblies are *fire separations* with a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches have a *fire-resistance rating* not less than that required for the supported assembly.

2.2.2.6. Group G, Division 2, up to 3 Storeys, Any Area

- (1) A *building* classified as Group G, Division 2 of any *building area* is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided the *building* is not more than 3 *storeys* in *building height*.

2.2.2.7. Group G, Division 3, One Storey, Any Area

- (1) A *building* classified as Group G, Division 3 of any *building area* is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided the *building* is not more than 1 *storey* in *building height*.

2.2.2.8. Group G, Division 4, Any Height, Any Area

- (1) A *building* classified as Group G, Division 4 of any *building height* or *building area* is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination.

2.2.3. Fire Alarm and Detection Systems

2.2.3.1. Determination of Requirement for a Fire Alarm System

- (1) A fire alarm system complying with Sentence (2) shall be installed in a *building* that is not *sprinklered* throughout and that
- (a) contains a Group G, Division 1 *major occupancy* with an *occupant load* more than 25, or
 - (b) contains a Group G, Division 2 or 3 *major occupancy*
 - (i) with an *occupant load* more than 150,
 - (ii) in a *building* more than 1 *storey* in *building height*, or
 - (iii) in a *building* with a *basement* used for a purpose other than the housing of service equipment.
- (2) Except as otherwise provided in this Section, the fire alarm system required by Sentence (1) shall comply with Articles 3.2.4.2., 3.2.4.4., 3.2.4.5. and 3.2.4.17. and Sentences 3.2.4.9.(1) and (4).

2.2.3.2. Types of Fire Alarm Systems

- (1) The fire alarm system required by Sentence 2.2.3.1.(1) shall be
 - (a) a single-stage system in a Group G, Division 1 *major occupancy*, and
 - (b) a single- or 2-stage system in a Group G, Division 2 or 3 *major occupancy*.

2.2.3.3. Design of Fire Alarm Systems

- (1) Where a fire alarm system is required by Sentence 2.2.3.1.(1),
 - (a) the air-handling system, where provided, shall be designed to prevent the circulation of smoke upon a signal from a duct-type *smoke detector* if the air-handling system serves more than 1 *storey*, and
 - (b) a manual station shall be installed in every *floor area* near every *exit*.

2.2.3.4. Fire Alarm Signals

- (1) Except as provided in Sentence (3), the fire alarm system required by Sentence 2.2.3.1.(1) shall include
 - (a) audible signal devices conforming to Sentences 3.2.4.18.(1) to (4), (7) and (11),
 - (b) an audible *alarm signal* device with a sound pressure level not less than 110 dBA installed on the exterior of the *farm building*, and
 - (c) visible signal devices installed in any *floor area* in which
 - (i) the ambient noise level is more than 87 dBA,
 - (ii) the occupants use ear protection devices, or
 - (iii) the occupants are located in sound-insulating enclosures.
- (2) The visible signal devices required by Clause (1)(c) shall be installed so that the signal from at least one device is visible throughout the *floor area* or portion thereof in which they are installed. (See Note A-3.2.4.19.(3))
- (3) The audible *alarm signal* devices referred to in Clauses (1)(a) and (b) need not be provided in areas where animals are present, provided that visible signal devices are installed in accordance with Sentence (2).

2.2.3.5. Silencing of Alarm Signals

- (1) The fire alarm system required by Sentence 2.2.3.1.(1) shall
 - (a) be designed so that when an alarm signal is actuated, it cannot be silenced automatically before a period of time has elapsed that is not less than 20 min, and
 - (b) not incorporate manual silencing switches other than those installed inside the fire alarm control unit.

2.2.3.6. Electrical Supervision

- (1) Where an automatic sprinkler system is provided, it shall be electrically supervised to indicate a supervisory signal on a fire alarm system annunciator or a sprinkler system annunciator for each condition described in Sentence 3.2.4.9.(3).

2.2.3.7. Fire Detectors

- (1) Where a fire alarm system is required in a *farm building* in accordance with Sentence 2.2.3.1.(1), *fire detectors* shall be
 - (a) except as provided in Sentence (2), installed throughout the *farm building*, and
 - (b) connected to the fire alarm system.
- (2) The *fire detectors* referred to in Sentence (1) need not be provided within *floor areas* that are *sprinklered*.

2.2.4. Provisions for Firefighting

2.2.4.1. Fire Department Access to Buildings

- (1) Access for fire department equipment shall be provided to each *farm building* by means of a *street*, private roadway or yard.
- (2) Where access to a *farm building* as required in Sentence (1) is provided by means of a roadway or yard, the design and location of such roadway or yard shall take into account connection with public thoroughfares, weight of firefighting equipment, width of roadway, radius of curves, overhead clearance, location of fire hydrants, location of fire department connections and vehicular parking.

2.2.4.2. Automatic Sprinkler Systems

- (1) Where an automatic sprinkler system is provided, it shall conform to Article 3.2.5.12.
- (2) Where a fire pump is installed as part of the automatic sprinkler system referred to in Sentence (1), it shall conform to Article 3.2.5.18.
- (3) The automatic sprinkler system referred to in Sentence (1) shall be equipped with waterflow-detecting devices that are
 - (a) installed in accordance with Sentence 3.2.4.15.(1), and
 - (b) connected to
 - (i) the fire alarm system, where provided, so that, upon its actuation, an *alert signal* or an *alarm signal* is initiated, or
 - (ii) an audible signal device, where a fire alarm system is not provided.

2.2.4.3. Portable Fire Extinguishers

- (1) Portable extinguishers shall be provided and installed in accordance with the provisions of Part 6 of Division B of the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

2.2.5. Emergency Lighting

2.2.5.1. Minimum Lighting Requirements

- (1) Where lighting is provided in a *farm building*, emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor or tread level in
 - (a) *exits*, and
 - (b) principal routes providing *access to exit* in open *floor areas* and in *service rooms*.
- (2) The minimum value of the illumination required by Sentence (1) shall be 1 lx.
- e1 (3) An emergency power supply shall be
 - (a) provided to maintain the emergency lighting required by Sentence (1) from a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the *farm building* is interrupted, and
 - (b) designed and installed such that, upon failure of the regular power, it will assume the electrical load automatically for a period of 30 min.

2.2.6. Safety within Farm Buildings

2.2.6.1. Means of Egress

- (1) *Means of egress* complying with this Subsection shall be provided from every *floor area* containing a Group G, Division 1, 2 or 3 *major occupancy*.
- (2) If a platform or contained open space is provided, egress requirements shall conform to the appropriate requirements of Article 2.2.6.2. for rooms.
- (3) *Means of egress* from roofs shall be provided in accordance with Sentence 3.3.1.3.(3).
- (4) *Means of egress* from rooftop enclosures shall be provided in accordance with Sentences 3.3.1.3.(5) and (6).

2.2.6.2. Egress Doorways

- (1) Except as provided in Sentence (2), at least one egress doorway shall be provided from every room.
- (2) A minimum of 2 egress doorways located so that one doorway could provide egress from the room as required by Article 2.2.6.3. if the other doorway becomes inaccessible to the occupants due to a fire originating in the room, shall be provided for every room
 - (a) that is used for a Group G, Division 1 *major occupancy*, other than one housing livestock with a below-floor storage area for *liquid manure*, where the area of the room is more than
 - (i) 15 m², in a *floor area* that is not *sprinklered* throughout, or
 - (ii) 30 m², in a *floor area* that is *sprinklered* throughout,
 - (b) in a *floor area* that is not *sprinklered* throughout and contains a Group G, Division 1 *major occupancy* housing livestock with a below-floor storage area for *liquid manure* or a Group G, Division 2 or 3 *major occupancy*, where
 - (i) the area of the room is more than 200 m², or
 - (ii) the travel distance within the room to the nearest egress doorway is more than 15 m, or
 - (c) in a *floor area* that is *sprinklered* throughout and contains a Group G, Division 1 *major occupancy* housing livestock with a below-floor storage area for *liquid manure* or a Group G, Division 2 or 3 *major occupancy*, where
 - (i) the area of the room is more than 300 m², or
 - (ii) the travel distance within the room to the nearest egress doorway is more than 25 m.
- (3) Where 2 egress doorways are required by Sentence (2), they shall be placed at a distance from one another equal to or greater than one third of the maximum overall diagonal dimension of the area to be served, measured as the shortest distance that smoke would have to travel between the nearest required egress doorways.

2.2.6.3. Travel Distance

- (1) If more than one egress doorway is required from a room referred to in Sentence 2.2.6.2.(2), the travel distance within the room to the nearest egress doorway shall not exceed the maximum travel distance specified in Article 2.2.7.5. for *exits*.

2.2.6.4. Headroom Clearance

- (1) Except within a *service space*, the minimum headroom clearance in every *access to exit* shall conform to the requirements of Article 3.4.3.4. for *exits*.

2.2.6.5. Access to Exits

- (1) The minimum width of an *access to exit*, including obstructions, shall be 750 mm.

- (2) A fuel-fired *appliance* shall not be installed in a corridor serving as an *access to exit*.

2.2.6.6. Door Swing

- (1) Except as provided in Sentence (2), a door that provides *access to exit* from a room shall
- (a) be a sliding door, or
 - (b) swing on its vertical axis.
- (2) A door that opens into a facility providing *access to exit* from a room that is used for a Group G, Division 1 *major occupancy*, other than one housing livestock with a below-floor storage area for *liquid manure*, shall swing on a vertical axis in the direction of travel to the *exit*.

2.2.6.7. Doors and Door Hardware

- (1) A door that provides *access to exit* from a room shall
- (a) provide a clear opening of not less than 750 mm if there is only one door leaf,
 - (b) in a doorway with multiple leaves, have the active leaf providing a clear opening of not less than 750 mm,
 - (c) not open onto a step, and
 - (d) except as provided in Sentence (2), have a threshold not more than 13 mm higher than the surrounding finished floor surface.
- (2) The door referred to in Sentence (1) is permitted to have a threshold not more than 100 mm higher than the surrounding finished floor surface, where the threshold is used to confine
- (a) the spillage of liquids classified as *dangerous goods* within a room, or
 - (b) animal litter within an animal containment area.
- (3) Door release hardware shall conform to Article 2.2.7.8.

2.2.6.8. Ramps and Stairways

- (1) Except as permitted by Sentence (3), *ramps* and stairways that do not serve as *exits* shall
- (a) be not less than 750 mm wide, and
 - (b) conform to Articles 3.3.1.16., 3.4.3.4., 3.4.6.1. to 3.4.6.3., 3.4.6.8. and 3.4.6.9.
- (2) Except as permitted by Sentence (3), the maximum slope of a *ramp* shall be 1 in 6.
- (3) *Ramps* and stairways need not comply with Sentences (1) and (2), provided
- (a) they are intended only
 - (i) for occasional use for servicing equipment and machinery, or
 - (ii) for use as animal handling ramps, and
 - (b) they do not serve as *exits*.

2.2.6.9. Floor Openings

- (1) Except as provided in Article 2.2.6.10., floor openings shall be provided with a cover at floor level that is capable of resisting the loads specified in Section 2.3. for the adjacent area of floor.
- (2) Openings through the cover required by Sentence (1) shall be of a size that prevents the passage of a spherical object whose diameter is more than 100 mm.

2.2.6.10. Guards

- (1) Except as provided in Sentence (3), a *guard* not less than 1 070 mm high shall be provided
 - (a) around floor openings, where provision of a cover in accordance with Sentence 2.2.6.9.(1) is not practical, and
 - (b) at locations where the difference in elevation between two adjacent surfaces is more than 600 mm.
- (2) The *guard* required by Sentence (1) shall consist of
 - (a) a top railing,
 - (b) an intermediate rail located at the mid-height of the *guard*, and
 - (c) where tools or other objects could fall from an upper floor surface onto a person on an adjacent lower surface, a toe board extending not less than 125 mm above the upper floor surface.
- (3) Sentence (1) does not apply
 - (a) to vehicle repair pits,
 - (b) to loading docks, or
 - (c) where access is provided for maintenance purposes only.

2.2.6.11. Signage

- (1) Warning signs shall be installed in accordance with Subsection 2.14.2. of Division B B of the NRCC-CONST-56437E 2020, “National Fire Code of Canada.”

2.2.6.12. Transparent Doors and Panels

- (1) A glass or transparent door shall be designed and constructed so that the existence and position of the door is readily apparent, by attaching visually contrasting hardware, bars or other permanent fixtures to it.
- (2) Transparent doors and panels shall conform to Sentences 3.3.1.20.(2), (3) and (6).
- (3) Transparent panels used in a door that provides *access to exit* that, because of their physical configuration or design, could be mistaken as a *means of egress* shall be made inaccessible by barriers or railings.

2.2.7. Exits

2.2.7.1. Exit Facilities

- (1) *Exit* facilities complying with this Subsection shall be provided from every *floor area* containing a Group G, Division 1, 2 or 3 *major occupancy*. (See Note A-2.2.7.1.(1))

2.2.7.2. Types of Exits (See Note A-2.2.7.2.)

- (1) An *exit* from any *floor area* shall be one of the following:
 - (a) an exterior doorway conforming to Sentences 2.2.7.6.(1) and (2) and Articles 2.2.7.7., 2.2.7.8. and 3.4.6.11.,
 - (b) an openable window or panel conforming to Sentence 2.2.7.6.(3), or
 - (c) an *exit* facility listed in Article 3.4.1.4. that conforms to Articles 3.4.1.5., 3.4.1.6. and 3.4.6.10., Sentence 3.4.2.2.(1) and Subsection 3.4.4.

2.2.7.3. Minimum Number of Exits

- (1) Except as provided by Sentences (2) and (3), every *floor area* shall be served by at least 2 *exits*.

- (2) A *floor area* classified as a Group G, Division 1 *major occupancy* is permitted to be served by a single *exit*, provided the *floor area* is not more than
- (a) 10 m², where the *floor area* is not *sprinklered* throughout, or
 - (b) 20 m², where the *floor area* is *sprinklered* throughout.
- (3) A *floor area* classified as a Group G, Division 2 or 3 *major occupancy* is permitted to be served by a single *exit*, provided the *floor area* is not more than
- (a) 200 m², where the *floor area* is not *sprinklered* throughout, or
 - (b) 300 m², where the *floor area* is *sprinklered* throughout.

2.2.7.4. Distance Between Exits

- (1) The minimum distance between 2 *exits* from a *floor area* shall be one half the maximum diagonal dimension of the *floor area*.

2.2.7.5. Location of Exits

- (1) Except as permitted by Sentence (2), the travel distance to at least one *exit* shall be not more than
- (a) 30 m, in a *floor area* that contains a Group G, Division 1 *major occupancy*, other than one housing livestock with a below-floor storage area for *liquid manure*,
 - (b) 60 m, in a *floor area* that contains a Group G, Division 1 *major occupancy* housing livestock with a below-floor storage area for *liquid manure*,
 - (c) 60 m, in a *floor area* that contains a Group G, Division 2 or 3 *major occupancy* and that is not *sprinklered* throughout, and
 - (d) 90 m, in a *floor area* that contains a Group G, Division 2 or 3 *major occupancy* and that is *sprinklered* throughout.
- (2) A *floor area* containing a Group G, Division 3 *major occupancy* need not comply with Sentence (1), provided
- (a) *exits* are placed not more than 60 m apart along the perimeter of the *floor area*, and
 - (b) each main aisle in the *floor area*
 - (i) leads directly to an *exit* in at least two opposite directions, and
 - (ii) a minimum width of 750 mm.
- (3) *Exits* shall be located and arranged in conformance with Sentence 3.4.2.5.(3).

2.2.7.6. Width and Height of Exits

- (1) The minimum clear width of an exterior doorway used as an *exit* shall be 750 mm.
- (2) Except as provided in Sentence (3), the minimum headroom clearance in every *exit* shall conform to Article 3.4.3.4.
- (3) An openable window or panel used as an *exit* shall have
- (a) an opening not less than 900 mm by 550 mm, and
 - (b) a fire escape or stair, where required by Article 2.2.7.9.

2.2.7.7. Direction of Exit Door Swing

- (1) Except as permitted by Sentence (2), every *exit* door shall
- (a) open in the direction of *exit* travel, and
 - (b) swing on its vertical axis.
- (2) *Exit* doors that serve a Group G, Division 2 *major occupancy* housing animals need not conform to Clause (1)(a).

2.2.7.8. Exit Door Hardware

- (1) Door release hardware on *exit* doors shall
 - (a) be operable with one hand,
 - (b) permit the door to be readily opened from the inside with not more than one releasing operation and without requiring keys, special devices or specialized knowledge of the door-opening mechanism, and
 - (c) be installed not more than 1 200 mm above the finished floor.

2.2.7.9. Exit Stairs and Fire Escapes

- (1) Where an exterior doorway used as an *exit* is more than 300 mm above adjacent ground level, a stair or fire escape shall be provided.
- (2) Where the bottom of an openable window or panel used as an *exit* is more than 2 500 mm above adjacent ground level, a stair or fire escape shall be provided.
- (3) Fire escapes required by Sentences (1) and (2) shall conform to Articles 3.4.7.2. and 3.4.7.4. to 3.4.7.7.
- (4) *Exit* stairs shall conform to Clause 3.4.6.1.(1)(a) and Articles 3.4.6.3. to 3.4.6.6. and 3.4.6.8.
- (5) The minimum width of *exit* stairs shall be 900 mm.

2.2.7.10. Exit Signs

- (1) *Farm buildings* shall comply with the requirements for *exit* signs stated in Subsection 3.4.5.

2.2.8. Hazardous Substances, Processes and Equipment

2.2.8.1. General

- (1) Except as provided in Sentences (2) to (4), the storage, handling and use of hazardous substances shall be in conformance with
 - (a) the Fire Code made under the Fire Protection and Prevention Act, 1997, or
 - (b) the NRCC-CONST-56437E 2020, “National Fire Code of Canada., in the absence of regulations referred to in Clause (a).(See Note A-3.3.1.2.(1))
- (2) *Farm buildings* or parts of *farm buildings* used for the storage, handling, use and processing of *dangerous goods* shall comply with Articles 3.3.6.1. to 3.3.6.7.
- (3) The production, handling, storage and utilization of biogas shall be in conformance with ANSI/CSA-B149.6, “Code for digester gas, landfill gas, and biogas generation and utilization.”
- (4) Where Article 3.2.9.1. of Division B of the NRCC-CONST-56437E 2020, “National Fire Code of Canada” applies due to the quantity and nature of the stored product, *farm buildings* used for the storage of ammonium nitrate shall
 - (a) be classified as Group G, Division 2 *major occupancies*, and
 - (b) comply with Sentence 3.3.6.6.(1).
- (5) Systems for the ventilation of cooking equipment that is used in processes producing grease-laden vapours shall be designed and installed in conformance with Articles 3.6.3.5., 6.3.1.6. and 6.9.1.3. (See Note A-3.3.1.2.(2))

2.2.8.2. Exhaust Ventilation and Explosion Venting

- (1) Except as provided in Sentence (3), an exhaust ventilation system designed in conformance with the appropriate requirements of Section 2.4. shall be provided in a *farm building* or part of a *farm building* in which dust, fumes, gases, vapours or other impurities or contaminants have the potential to create a fire or explosion hazard.
- (2) Except as provided in Sentence (3), *farm buildings* shall comply with Sentence 3.3.1.21.(3).
- (3) *Farm buildings* housing livestock with a below-floor storage area for *liquid manure* need not comply with Sentences (1) and (2), provided they comply with Article 2.2.8.3. (See Note A-2.2.8.2.(3))

2.2.8.3. Below-Floor Storage Areas for Liquid Manure (See Note A-2.2.8.3.)

- (1) *Farm buildings* housing livestock with a below-floor storage area for *liquid manure* shall be provided with a ventilation system conforming to Subsection 2.4.2.
- (2) Where the ventilation system required by Sentence (1) relies on electrical power for normal operation, it shall be provided with an emergency power supply conforming to Sentence (3).
 - (3) The emergency power supply required by Sentence (2) shall be
 - (a) supplied from a generator, batteries or a combination thereof,
 - (b) equipped with audible and visible trouble indicators,
 - (c) capable of operating the trouble indicators for not less than 24 h,
 - (d) capable of operating the ventilation system under full load for not less than 2 h, and
 - (e) designed so that, in the event of a failure of the normal power source to the *farm building*, there is an immediate automatic transfer to emergency power.
- (4) Where a fuel-fired engine or turbine for the emergency power supply required by Sentence (2) is dependent on a fuel supply located outside the *farm building*, the fuel supply shall be provided with a shut-off valve in conformance with Article 3.2.7.7.
- (5) Where exhaust piping for the emergency power supply required by Sentence (2) penetrates a required *fire separation*, the piping shall be enclosed in a *service space* that is separated from the remainder of the *farm building* by a *fire separation* having a *fire-resistance rating* not less than that of the penetrated *fire separation*, but not less than 45 min.

2.2.8.4. Welding and Cutting

- (1) Except as provided in Sentence (2), welding and cutting operations shall be carried out in a room conforming to Sentence 3.3.1.26.(1). (See Note A-2.2.8.4.(1))
- (2) Sentence (1) need not apply to *agricultural occupancies* where the welding and cutting operations do not present a fire or explosion hazard to adjacent areas.

2.2.8.5. Liquid Manure Storage Tanks and Piping Systems

- (1) This Article does not apply to below-floor storage areas for *liquid manure*.
- (2) Access covers for *liquid manure* storage tanks shall be designed in accordance with Section 2.3. to support the imposed loads.
- (3) Access covers for *liquid manure* storage tanks that weigh less than 20 kg shall be equipped with locking devices.
- (4) Ladders shall not be installed on closed *liquid manure* storage tanks.

- (5) *Liquid manure* storage tanks without a cover that are located outdoors shall be surrounded by a permanent safety fence or wall that
- (a) extends not less than 1.5 m above adjacent ground level,
 - (b) is adequately secured at ground level, and
 - (c) has gates with latches.
- (6) Where an access point for filling, agitation, emptying or a similar operation is provided for a *liquid manure* storage tank described in Sentence (5), a curb or barrier shall be installed between the access point and the storage tank that is
- (a) not less than 450 mm high, or
 - (b) of sufficient height to prevent unintended vehicle entry.

2.2.8.6. Gas Traps or Valves (See Note A-2.2.8.6.)

- (1) Except as permitted by Sentence (2), where storage tanks for liquids capable of releasing hazardous gases or vapours are connected to a *farm building* by a piping system, a gas trap or valve shall be installed in the piping system to prevent such gases or vapours from entering the *farm building*.
- (2) Where storage tanks for *liquid manure* are connected to a *farm building* by a piping system, a pull plug is permitted to be installed in the piping system to prevent hazardous gases and vapours from entering the *farm building*.

2.2.8.7. Dangerous Goods Storage

- (1) The storage of *dangerous goods* in packages or containers in *farm buildings* or parts of *farm buildings* shall comply with Parts 3 and 4 of Division B of NRCC-CONST-56437E 2020, “National Fire Code of Canada.”

2.2.8.8. Pesticide Storage Areas

- (1) In addition to the requirements of Article 2.2.8.7., pesticide storage areas in *farm buildings* shall be designed in conformance with this Article.
- (2) Pesticide storage areas shall be
- (a) ventilated with outdoor air in accordance with Subsection 2.4.2. by dedicated natural or mechanical means at a rate sufficient to prevent the accumulation of *dangerous goods* classified as toxic or flammable gases,
 - (b) accessible only from the outdoors, and
 - (c) secured against unauthorized entry.
- (3) Floors of pesticide storage areas shall
- (a) be constructed of concrete or other impervious material,
 - (b) not have a floor drain, and
 - (c) be provided with a curb at the perimeter of the storage area that is
 - (i) designed to contain accidental spillage of the largest container in the storage area, and
 - (ii) not less than 50 mm high.
- (4) Pesticide storage areas shall be separated from
- (a) food, feed and water supplies,
 - (b) other *occupancies* by a *fire separation* having a *fire-resistance rating* not less than 1 h, and
 - (c) other *buildings* by a *limiting distance* not less than 6 m.

2.2.8.9. Hazardous Extraction Operation Involving Cannabis

- (1) Where a *floor area* or portion of a *floor area* within a *farm building* is intended to contain a *hazardous extraction* operation involving cannabis, the *floor area* or portion of the *floor area* shall be designed and constructed to comply with,

- (a) the requirements for locking, latching and other fastening devices for doors set out in Article 2.7.2.2. of Division B of the Fire Code made under the *Fire Protection and Prevention Act, 1997*,
- (b) the ventilation requirements set out in Articles 4.1.7.2. to 4.1.7.6. of Division B of the Fire Code, where the *hazardous extraction* operation is intended to involve the use of *flammable liquids* or *combustible liquids*, and
- (c) the ventilation requirements set out in Clauses 5.1.4.2.(1)(a) to (d) and (g) of Division B of the Fire Code, where the *hazardous extraction* operation is intended to involve the use of flammable gases.

Section 2.3. Structural Loads and Procedures

2.3.1. Structural Design Requirements

2.3.1.1. General

- (1) Except as otherwise provided in this Section, the structural design of *farm buildings* shall conform to Part 4. (See Note A-2.3.1.1.(1))
- (2) Except as provided in Sentence (3), *farm buildings* shall be classified in the Low Importance Category as described in Table 4.1.2.1.
- (3) *Liquid manure* storage tanks shall be classified in the Normal Importance Category as described in Table 4.1.2.1.
- (4) In lieu of the requirements of Article 4.2.2.1., a *subsurface investigation* of the *farm building* site is permitted to be carried out by a suitably qualified person prior to or during construction.

2.3.2. Loads Due to Use and Occupancy

2.3.2.1. Loads Supported on a Floor or Suspended from a Ceiling

- (1) In addition to the requirements of Article 4.1.5.3., the specified *live load* supported on a floor or suspended from a ceiling shall be not less than the applicable value listed in Table 2.3.2.1.

Table 2.3.2.1.
Minimum Specified Live Loads on a Floor or Ceiling
 Forming Part of Sentence 2.3.2.1.(1)

Type of Load	Minimum Specified <i>Live Load</i> on Area of Floor or Ceiling, kPa	Minimum Specified <i>Live Load</i> on Floor Slats, kN/m
Cattle	5.0	4.5
Sheep	2.5	2.0
Swine	3.5	2.5
Horses	5.0	-
Poultry	2.0	-
Greenhouses	2.5	-

2.3.2.2. Poultry Manure

- (1) Areas designed for the accumulation of poultry manure, such as solid floors and dropping pits under a wire floor, slotted floor or cage, shall be designed for a specified *live load* of not less than 1 kPa for each 100 mm depth of manure.
- (2) Where machinery or vehicles not exceeding 1 000 kg in gross weight are used for manure clean-out in a poultry barn, the barn floor shall be designed for a specified two-wheel *live load* of not less than 6 kN in addition to the specified *live load* prescribed in Sentence (1).

2.3.2.3. Stored Products

- (1) Floors supporting stored products shall be designed for the specified *live load* due to their intended use and *occupancy*, but not for less than 5 kPa. (See Note A-2.3.2.3.(1))

2.3.2.4. Farm Machinery and Vehicles

- (1) The specified uniformly distributed *live load* on an area of floor used for farm machinery or vehicles shall be
 - (a) for farm machinery and vehicles not exceeding 4 000 kg in gross weight, not less than 2.4 kPa,
 - (b) for farm machinery and vehicles exceeding 4 000 kg but not exceeding 9 000 kg in gross weight, not less than 6 kPa, and
 - (c) for farm machinery and vehicles exceeding 9 000 kg in gross weight, not less than 12 kPa.
- (2) The specified *live load* due to possible concentrations of load resulting from the use of an area of floor for farm machinery or vehicles shall comply with Article 4.1.5.9.
- (3) Where an area of floor is used for processing or for loading or unloading of vehicles, the minimum specified *live loads* prescribed in Sentences (1) and (2) shall be increased by 50% for the area.

2.3.2.5. Liquid Manure Storage Tanks

(0.1) *Liquid manure* storage tanks shall be constructed of steel, reinforced concrete or prestressed concrete.

- (1) Tops of *liquid manure* storage tanks that are accessible to vehicular traffic or used as a floor in a *farm building* shall be designed for the loads due to their intended use and *occupancy*.
- (2) Tops of *liquid manure* storage tanks that are located outdoors but not exposed to vehicular traffic shall be designed for the *dead load* plus the snow and rain loads prescribed in Subsection 4.1.6. or for the *dead load* plus 2 kPa, whichever produces the most critical effect.
- (3) Walls and partitions of *liquid manure* storage tanks shall be designed for
 - (a) an internal lateral pressure based on an equivalent fluid density of 10 kN/m³ for liquid manure, and
 - (b) the anticipated internal lateral ice pressure. (See Note A-2.3.2.5.(3))
- (4) Vertical external walls of *liquid manure* storage tanks located below ground level shall be designed for
 - (a) the anticipated lateral earth pressure, which shall not be used to reduce the effects of the internal lateral pressures specified in Sentence (3), and (See Note A-2.3.2.5.(4)(a))
 - (b) a lateral surcharge load of 5 kPa, applied uniformly below ground level, where earth within 1.5 m of the walls is subject to vehicular loads.
- (5) Concrete for *liquid manure* storage tanks shall
 - (a) be made from HS or HSb cement,
 - (b) have a 28-day strength of at least 32 MPa, and
 - (c) have a water/cement materials ratio of not more than 0.45.

(6) *Liquid manure* storage tank walls, bases and appurtenances, including piping for the conveyance of *liquid manure* and associated connections and joints, shall be designed and constructed to minimize leakage of *liquid manure*. (See Note A-2.3.2.5.(6))

(7) *Liquid manure* storage tanks shall be placed on undisturbed soil free of any organic, deleterious and extraneous materials and capable of supporting the superimposed design loads from the tanks.

(8) Where granular *fills* are used between the bases of *liquid manure* storage tanks and the undisturbed *soil*, the granular *fills* shall be compacted to a Standard Proctor density of not less than 95%.

2.3.3. Loads Due to Snow

2.3.3.1 Unobstructed Slippery Roofs

(1) For unobstructed slippery roofs of *farm buildings* with a roof slope, α , greater than 15° but not greater than 60° from the horizontal, where snow and ice can slide completely off the roof, the slope factor, C_s , shall be calculated as follows:

$$C_s = \frac{60^\circ - \alpha}{53^\circ}$$

(See Note A-2.3.3.1.(1))

2.3.3.2. Roof Areas of Greenhouses

(1) In a *farm building* classified as a Group G, Division 3 *major occupancy* where heating and drainage systems are installed to prevent the accumulation of snow and water, the supporting structure for the light-transmitting roof areas is permitted to be designed for a specified roof snow load of not less than 1 kPa, provided

- (a) the heating system is capable of maintaining a minimum interior temperature of 10°C throughout the *farm building*, and
- (b) an emergency power supply is provided that
 - (i) is supplied from a power source such as batteries, a generator, or a combination thereof, and
 - (ii) will continue to supply power to the heating system in the event that the regular power supply to the farm building is interrupted.

2.3.4. Loads Due to Earthquakes (See Note A-2.3.4.)

2.3.4.1. Application Limitation

- (1) *Farm buildings* need not be designed for loads due to earthquakes in accordance with Subsection 4.1.8. where
 - (a) the Seismic Category is SC1, or
 - (b) the Seismic Category is SC2, and the R_dR_o value of the seismic force resisting system (SFRS) is equal to or greater than 3.0. (See Note A-2.3.4.1.(1)(b))
- (2) For the purpose of Sentence (1), the Seismic Category is permitted to be determined on the basis of $I_{ES}(0.2)$ alone.
- (3) For the purpose of Sentences (1) and (2), the Seismic Category is permitted to be determined by assigning Site Class D without carrying out a *subsurface investigation*.

Section 2.4. Heating, Ventilating and Air-Conditioning

2.4.1. General

2.4.1.1. Application

- (1) Except as provided in Sentence (2), and except as otherwise provided in this Section, systems and equipment for heating, ventilating and air-conditioning services in *farm buildings* shall conform to Part 6.
- (2) *Farm buildings* need not comply with Articles 6.3.1.3. and 6.4.1.1. and Sentences 6.3.2.8.(3) and 6.3.2.10.(13).

2.4.2. Ventilation

2.4.2.1. Required Ventilation

- (1) Except as provided in Sentence (2), the rates at which outdoor air is supplied in *farm buildings* by ventilation systems shall be in accordance with good engineering practice as described in Article 6.2.1.1. (See Note A-2.4.2.1.(1))
- (2) Except as otherwise provided in this Subsection, *farm buildings* containing a Group G, Division 4 *major occupancy* need not comply with Sentence (1).

2.4.2.2. Greenhouses

- (1) Except as provided in Sentence (2), where a fuel-fired *appliance* is installed in a *farm building* containing a Group G, Division 3 *major occupancy*, separate combustion air and *flue* systems shall be provided.
- (2) Sentence (1) need not apply where the fuel-fired *appliance*
 - (a) is specifically designed as a generator of carbon dioxide for enrichment of the atmosphere in the *farm building*, and
 - (b) conforms to CSA B149.1, “Natural gas and propane installation code.”

2.4.2.3. Controlled-Atmosphere Storage Areas (See Note A-2.4.2.3.)

- (1) This Article applies to controlled-atmosphere storage areas that, during storage periods, contain an atmosphere with an oxygen content less than 19.5% or more than 23% by volume.
- (2) During storage periods, controlled-atmosphere storage areas need not comply with Sentence 2.4.2.1.(1).
- (3) Prior to a controlled-atmosphere storage area being accessed after a storage period and while the storage area is accessible between storage periods, the ventilation system of the storage area shall
 - (a) supply outdoor air to the storage area at a rate in accordance with Sentence 2.4.2.1.(1), and
 - (b) ensure that the atmosphere in the storage area has an oxygen content not less than 19.5% and not more than 23% by volume.
- (4) A warning sign shall be provided at each entrance to a controlled-atmosphere storage area in accordance with Sentence 2.14.2.1.(5) of Division B of the NRCC-CONST-56437E 2020, “National Fire Code of Canada.”

2.4.2.4. Silos and Grain Storage Bins

- (1) Where an enclosed tower silo, horizontal silo, or grain storage bin is connected to an adjacent feed room, mechanical exhaust ventilation shall be provided to remove air from the lowest floor level of the feed room to the outdoors at a rate not less than 3 air changes per hour.
- (2) The ventilation system of the *farm building* in which the feed room referred to in Sentence (1) is located shall be designed to prevent airflow from the feed room to any other part of the *floor area* of the *farm building*.
- (3) Enclosed horizontal silos shall be ventilated by
 - (a) openings at roof or eave level with an area not less than 1% of the *floor area* of the silo that consist of
 - (i) a continuous ridge opening,
 - (ii) openings in both gable ends, or
 - (iii) openings in the eaves on each side of the roof, and
 - (b) openings at floor level with an area not less than 1% of the *floor area* of the silo. (See Note A-2.4.2.4.(3)(b))
(See Note A-2.4.2.4.(3))

2.4.2.5. Below-Floor Storage of Liquid Manure (See Note A-2.4.2.5.) (See also Note A-2.2.8.3.)

- (1) *Farm buildings* housing livestock with below-floor storage of *liquid manure* shall be provided with a ventilation system that supplies outdoor air at a rate that is
 - (a) sufficient to limit the concentrations of *dangerous goods* classified as flammable gases to not more than 25% of their lower explosive limit,
 - (b) sufficient to limit the concentrations of *dangerous goods* classified as toxic gases to those permitted in the ACGIH's "Industrial Ventilation: A Manual of Recommended Practice for Design," and
 - (c) not less than 2 air changes per hour.
(See Note A-2.4.2.5.(1))

2.4.3. Heating Appliances

2.4.3.1. Location of Appliances

- (1) Fuel-fired heating *appliances* shall be located and separated from the remainder of the *farm building* in conformance with Article 2.2.1.9.

Part 3

Fire Protection, Occupant Safety and Accessibility

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Part 3

Fire Protection, Occupant Safety and Accessibility (See Note A-3)

Section 3.1. General

3.1.1. Scope and Definitions

3.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

3.1.1.2. Defined Words

- (1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

3.1.1.3. Reserved

3.1.1.4. Reserved

3.1.1.5. Radon

- (1) In addition to all other requirements, a *building* in the following designated areas shall be designed and constructed so that the annual average concentration of radon 222 does not exceed 200 Bq/m³ of air and the annual average concentration of the short lived daughters of radon 222 does not exceed 0.02 working levels inside the *building*:
 - (a) the City of Elliot Lake in the Territorial District of Algoma,
 - (b) the Township of Faraday in the County of Hastings, and
 - (c) the geographic Township of Hyman in the Territorial District of Sudbury.

3.1.1.6. Building in Flood Plains

- (1) *Buildings* constructed on flood plains shall
 - (a) be designed and constructed in accordance with good engineering practice to withstand anticipated vertical and horizontal hydrostatic pressures acting on the structure, and
 - (b) incorporate floodproofing measures that will preserve the integrity of *exits* and *means of egress* during times of flooding.

3.1.2. Classification of Buildings or Parts of Buildings by Major Occupancy (See Note A-3.1.2.)

3.1.2.1. Classification of Buildings

(1) Except as permitted by Articles 3.1.2.3. to 3.1.2.7., every *building* or part thereof shall be classified according to its *major occupancy* as belonging to one of the Groups or Divisions described in Table 3.1.2.1. (See Note A-3.1.2.1.(1))

(2) A *building* intended for use by more than one *major occupancy* shall be classified according to all *major occupancies* for which it is used or intended to be used.

Table 3.1.2.1.
Major Occupancy Classification
Forming Part of Sentences 3.1.2.1.(1), 3.1.2.2.(1) and 3.11.2.1.(3)

Group	Division	Description of <i>Major Occupancies</i>
A	1	<i>Assembly occupancies</i> intended for the production and viewing of the performing arts
A	2	<i>Assembly occupancies</i> not elsewhere classified in Group A
A	3	<i>Assembly occupancies</i> of the arena type
A	4	<i>Assembly occupancies</i> in which occupants are gathered in the open air
B	1	<i>Detention occupancies</i>
B	2	<i>Care and treatment occupancies</i>
B	3	<i>Care occupancies</i>
C	---	<i>Residential occupancies</i>
D	---	<i>Business and personal services occupancies</i>
E	---	<i>Mercantile occupancies</i>
F	1	<i>High-hazard industrial occupancies</i>
F	2	<i>Medium-hazard industrial occupancies</i>
F	3	<i>Low-hazard industrial occupancies</i>

3.1.2.2. Occupancies of the Same Classification

(1) Any *building* is deemed to be occupied by a single *major occupancy*, notwithstanding its use for more than one *major occupancy*, provided that all *occupancies* are classified as belonging to the same Group classification or, where the Group is divided into Divisions, as belonging to the same Division classification described in Table 3.1.2.1.

3.1.2.3. Arena-Type Buildings

- e1 (1) An arena-type *building* intended for occasional use for trade shows and similar exhibition purposes shall be classified as Group A, Division 3 *occupancy*.

3.1.2.4. Police Stations

(1) A police station with detention quarters is permitted to be classified as a Group B, Division 2 *major occupancy* provided the station is not more than 1 *storey* in *building height* and 600 m² in *building area*.

3.1.2.5. Group B, Division 3 Occupancies

(1) Group B, Division 3 *occupancies* are permitted to be classified as Group C *major occupancies* within the application of Part 3 provided

- (a) the occupants live as a single housekeeping unit in a *suite* with sleeping accommodation for not more than 10 persons, and
- (b) not more than two occupants require assistance in evacuation in case of an emergency.

3.1.2.6. Storage of Combustible Fibres

(1) *Buildings* or parts of thereof used for the storage of baled *combustible fibres* shall be classified as *medium-hazard industrial occupancies*.

3.1.2.7. Restaurants

(1) A restaurant is permitted to be classified as a Group E *major occupancy* within the application of Part 3 provided the restaurant is designed to accommodate not more than 30 persons consuming food or drink.

3.1.3. Multiple Occupancy Requirements

3.1.3.1. Separation of Major Occupancies

(1) Except as permitted by Sentences (2) and (3), *major occupancies* shall be separated from adjoining *major occupancies* by *fire separations* having *fire-resistance ratings* conforming to Table 3.1.3.1.

(2) In a *building* not more than 3 *storeys* in *building height*, if not more than two *dwelling units* are contained together with a Group E *major occupancy*, the *fire-resistance rating* of the *fire separation* between the two *major occupancies* need not be more than 1 h.

(3) In a *building* conforming to the requirements of Articles 3.2.8.2. to 3.2.8.8., the requirements of Sentence (1) for *fire separations* between *major occupancies* do not apply at the vertical plane around the perimeter of an opening through the horizontal *fire separation*.

r1

Table 3.1.3.1.
Major Occupancy Fire Separations⁽¹⁾
 Forming Part of Sentence 3.1.3.1.(1)

Major Occupancy	Minimum Fire-Resistance Rating of Fire Separation, h												
	Adjoining Major Occupancy												
	A-1	A-2	A-3	A-4	B-1	B-2	B-3	C	D	E	F-1	F-2	F-3
A-1	—	1	1	1	2	2	2	1	1	2	⁽²⁾	2	1
A-2	1	—	1	1	2	2	2	1 ⁽³⁾	1 ⁽⁴⁾	2	⁽²⁾	2	1
A-3	1	1	—	1	2	2	2	1	1	2	⁽²⁾	2	1
A-4	1	1	1	—	2	2	2	1	1	2	⁽²⁾	2	1
B-1	2	2	2	2	—	2	2	2	2	2	⁽²⁾	2	2
B-2	2	2	2	2	2	—	1	2	2	2	⁽²⁾	2	2
B-3	2	2	2	2	2	1	—	2	2	2	⁽²⁾	2	2
C	1	1 ⁽³⁾	1	1	2	2	2	—	1	2 ⁽⁵⁾	⁽²⁾	2 ⁽⁶⁾	1
D	1	1 ⁽⁴⁾	1	1	2	2	2	1	—	—	3	—	—
E	2	2	2	2	2	2	2	2 ⁽⁵⁾	—	—	3	—	—
F-1	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	3	3	—	2	2
F-2	2	2	2	2	2	2	2	2 ⁽⁶⁾	—	—	2	—	—
F-3	1	1	1	1	2	2	2	1	—	—	2	—	—

r1 **Notes to Table 3.1.3.1.:**

- (1) Section 3.3. contains requirements for the separation of *occupancies* and tenancies that are in addition to the requirements for the separation of *major occupancies*.
- (2) See Sentence 3.1.3.2.(1).
- (3) Where the *building* or part thereof is constructed in accordance with Article 3.2.2.51., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group C and Group A, Division 2 *major occupancies*.
- (4) Where the *building* or part thereof is constructed in accordance with Article 3.2.2.60., a *fire separation* with a 2 h *fire-resistance rating* is required between the Group D and Group A, Division 2 *major occupancies*.
- (5) See Sentence 3.1.3.1.(2).
- (6) See Sentence 3.1.3.2.(2).

3.1.3.2. Prohibition of Occupancy Combinations

- (1) No *major occupancy* of Group F, Division 1 shall be contained within a *building* with any *occupancy* classified as Group A, B or C.
- (2) Except as provided in Sentence (4) and Sentence 3.10.2.4.(9), not more than one *suite of residential occupancy* shall be contained within a *building* classified as a Group F, Division 2 *major occupancy*.
- (3) A sleeping room or sleeping area shall not open directly into a room or area where food is intended to be stored, prepared, processed, distributed, served, sold or offered for sale. (See Note A-3.1.3.2.(3))

- (4) A Group F, Division 2 *major occupancy* is permitted in a *building* containing only *live/work units* if the *occupancy* is for the exclusive use of the occupants of the *live/work units*.
- (5) A *building* within the scope of Article 3.2.2.51. or 3.2.2.60. shall not contain a *retirement home*.

3.1.4. Combustible Construction

3.1.4.1. Combustible Materials Permitted

- (1) A *building* permitted to be of *combustible construction* is permitted to be constructed of *combustible* materials, with or without *noncombustible* components. (See Note A-3.1.4.1.(1))

3.1.4.2. Protection of Foamed Plastics (See Note A-3.1.4.2.)

- (1) Except as permitted in Sentence (2), foamed plastics that form part of a wall or ceiling assembly in *combustible construction* shall be protected from adjacent spaces in the *building*, other than adjacent concealed spaces within *attic or roof spaces*, crawl spaces, and wall and ceiling assemblies,
- (a) by one of the interior finishes described in Subsections 9.29.4. to 9.29.9.,
- (b) provided the *building* does not contain a Group A, Group B or Group C *major occupancy*, by sheet metal
- (i) mechanically fastened to the supporting assembly independent of the insulation,
 - (ii) not less than 0.38 mm thick, and
 - (iii) with a melting point not below 650°C, or
- (c) any thermal barrier that meets the requirements of Sentence 3.1.5.15.(2). (See Note A-3.1.4.2.(1)(c))
- (See Note A-3.1.4.2.(1))

(1.1) The *flame-spread rating* on any exposed surface of *combustible* insulation, or any surface that would be exposed by cutting through it in any direction, shall be not more than 500.

- (2) A walk-in cooler or freezer consisting of factory-assembled wall, floor or ceiling panels containing foamed plastics is permitted to be used in a *building* permitted to be of *combustible construction*, provided the panels
- (a) are protected on both sides by sheet metal not less than 0.38 mm thick having a melting point not less than 650°C,
- (b) do not contain an air space, and
- (c) when a sample panel with an assembled joint typical of field installation is subjected to the applicable test described in Subsection 3.1.12., have a *flame-spread rating* not more than that permitted for the space in which they are located, the space that they bound, as applicable.
- (See Note A-3.1.4.2.(2) and 3.1.5.7.(3))

- (3) The *flame-spread rating* of doors containing foamed plastics shall comply with Sentences 3.1.13.2.(1) to (3).

3.1.4.3. Wires and Cables

- (1) Except as required by Sentence (2), optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes installed in a *building* permitted to be of *combustible construction* shall
- (a) not convey flame or continue to burn for more than 1 min when tested in conformance with the Vertical Flame Test (FT1 rating) in CSA C22.2 No. 0.3, “Test Methods for Electrical Wires and Cables,” or
- (b) be located in
- (i) totally enclosed *noncombustible* raceways, (See Note A-3.1.4.3.(1)(b)(i))
 - (ii) masonry walls,
 - (iii) concrete slabs, or
 - (iv) totally enclosed non-metallic raceways conforming to Clause 3.1.5.23.(1)(b).
- (See Note A-3.1.4.3.(1)) (See also Sentence 3.6.4.3.(1))

(2) Except as permitted in Sentences (3) and (4), optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and are installed in a *plenum* in a *building* permitted to be of *combustible construction* shall exhibit the following characteristics when tested in conformance with CAN/ULC-S102.4, “Standard Method of Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways,” (FT6 rating):

- (a) a horizontal flame distance of not more than 1.5 m,
- (b) an average optical smoke density of not more than 0.15, and
- (c) a peak optical smoke density of not more than 0.5.

(3) Except as permitted in Sentence (4), where totally enclosed *noncombustible* raceways are used in a *plenum*, exposed components of wiring systems with *combustible* insulation, jackets or sheathes, including optical fibre cables and electrical wires and cables that are used for the transmission of voice, sound or data, that are installed in the *plenum* or that extend not more than 9 m from the *plenum*, including drop down to the floor level, are permitted, provided they exhibit a vertical char of not more than 1.5 m when tested in conformance with the Vertical Flame Test – Cables in Cable Trays (FT4 rating) in CSA C22.2 No. 0.3, “Test Methods for Electrical Wires and Cables.”

(4) Cables or wires within *plenums* that are used for the transmission of signals in fire alarm systems need not comply with the requirements of Sentence (2).

3.1.4.4. Non-metallic Raceways

(1) Totally enclosed non-metallic raceways used in a *plenum* in a *building* permitted to be of *combustible construction* shall meet the requirements of Clause 3.1.5.23.(1)(a).

3.1.4.5. Fire-Retardant-Treated Wood

- (1) If *fire-retardant-treated wood* is specified in this Part, the wood shall
- (a) be pressure impregnated with fire-retardant chemicals in conformance with CAN/CSA-O80 Series, “Wood preservation,” and
 - (b) have a *flame-spread rating* not more than 25.

3.1.4.6. Heavy Timber Construction Alternative

(1) If *combustible construction* is permitted and is not required to have a *fire-resistance rating* more than 45 min, *heavy timber construction* is permitted to be used.

(2) If *heavy timber construction* is permitted, it shall conform to Article 3.1.4.7.

3.1.4.7. Heavy Timber Construction

(1) Wood elements in *heavy timber construction* shall be arranged in heavy solid masses and with essentially smooth flat surfaces to avoid thin sections and sharp projections.

(2) Except as permitted by Sentences (3) to (6) and (12), the minimum dimensions of wood elements in *heavy timber construction* shall conform to Table 3.1.4.7.

(3) Where splice plates are used at splices of roof arches supported on the tops of walls or abutments, roof trusses, roof beams and roof girders in *heavy timber construction*, they shall be not less than 64 mm thick.

(4) Floors in *heavy timber construction* shall be of glued-laminated or solid sawn plank not less than

- (a) 64 mm thick, splined or tongued and grooved, or
- (b) 38 mm wide and 89 mm deep set on edge and well-spiked together.

Table 3.1.4.7.
Heavy Timber Dimensions
 Forming Part of Sentence 3.1.4.7.(2)

Supported Assembly	Structural Element	Solid Sawn (width × depth), mm × mm	Glued-Laminated (width × depth), mm × mm	Round (diam), mm
Roofs only	Columns	140 × 191	130 × 190	180
	Arches supported on the tops of walls or abutments	89 × 140	80 × 152	---
	Beams, girders and trusses	89 × 140	80 × 152	---
	Arches supported at or near the floor line	140 × 140	130 × 152	---
Floors, floors plus roofs	Columns	191 × 191	175 × 190	200
	Beams, girders, trusses and arches	140 × 241 or 191 × 191	130 × 228 or 175 × 190	---

- (5) Floors in *heavy timber construction* shall be laid
 - (a) so that no continuous line of end joints will occur except at points of support, and covered with
 - (i) tongued and grooved flooring not less than 19 mm thick laid crosswise or diagonally, or
 - (ii) tongued and grooved phenolic-bonded plywood, strandboard or waferboard not less than 12.5 mm thick, and
 - (b) not closer than 15 mm to the walls to provide for expansion, with the gap covered at the top or bottom.

- (6) Roofs in *heavy timber construction* shall be of tongued and grooved phenolic-bonded plywood, strandboard or waferboard not less than 28 mm thick, or glued-laminated or solid sawn plank that is
 - (a) not less than 38 mm thick, splined or tongued and grooved, or
 - (b) not less than 38 mm wide and 64 mm deep set on edge and laid so that no continuous line of end joints will occur except at the points of support.

- (7) Wood columns in *heavy timber construction* shall be continuous or superimposed throughout all *storeys*.

- (8) Superimposed wood columns in *heavy timber construction* shall be connected by
 - (a) reinforced concrete or metal caps with brackets,
 - (b) steel or iron caps with pintles and base plates, or
 - (c) timber splice plates fastened to the columns by metal connectors housed within the contact faces.

- (9) Where beams and girders in *heavy timber construction* enter masonry, wall plates, boxes of the self-releasing type or hangers shall be used.

- (10) Wood girders and beams in *heavy timber construction* shall be closely fitted to columns, and adjoining ends shall be connected by ties or caps to transfer horizontal loads across the joints.

- (11) In *heavy timber construction*, intermediate wood beams used to support a floor shall be supported on top of the girders or on metal hangers into which the ends of the beams are closely fitted.

- (12) Roof arches supported on the tops of walls or abutments, roof trusses, roof beams and roof girders in *heavy timber construction* are permitted to be not less than 64 mm wide provided
 - (a) where two or more spaced members are used, the intervening spaces are
 - (i) blocked solidly throughout, or
 - (ii) tightly closed by a continuous wood cover plate not less than 38 mm thick secured to the underside of the members, or
 - (b) the underneath of the roof deck or sheathing is *sprinklered*.

3.1.4.8. Cladding

- (1) Except as provided in Sentence (2), not less than 90% of the exterior cladding on each exterior wall of *buildings* conforming to Article 3.2.2.51. or 3.2.2.60. shall consist of
 - (a) *noncombustible* cladding, or
 - (b) except as provided in Sentence (4), a wall assembly that satisfies the criteria of Clause 3.1.5.5.(1)(b).
(See Note A-3.1.4.8.(1)) (See also Notes A-3.1.5.5.(1)(b)(i) and A-3.1.5.5.(1)(b)(ii))
- (2) Where a *building* is considered to face 1 *street* in accordance with Clause 3.2.2.10.(3)(b), the exterior cladding on each exterior wall of *buildings* conforming to Article 3.2.2.51. or 3.2.2.60. shall consist of
 - (a) *noncombustible* cladding, or
 - (b) except as provided in Sentence (4), a wall assembly that satisfies the criteria of Clause 3.1.5.5.(1)(b).
- (3) A wall assembly conforming to Clause (1)(b) or (2)(b) that includes *combustible* cladding made of *fire-retardant-treated wood* shall be tested for fire exposure after the cladding has been subjected to the accelerated weathering test specified in ASTM D2898, “Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.”
- (4) An exterior wall assembly constructed in conformance with Section 6 of MMAH Supplementary Standard SB-2, “Fire Performance Ratings” is deemed to satisfy the criteria of Clause (1)(b) and (2)(b).

3.1.5. Noncombustible Construction

3.1.5.1. Noncombustible Materials (See Note A-3.1.4.1.(1))

- (1) Except as permitted by Sentences (2) to (4) and Articles 3.1.5.2. to 3.1.5.29., 3.1.13.4. and 3.2.2.16., a *building* or part of a *building* required to be of *noncombustible construction*, shall be constructed with *noncombustible* materials. (See also Subsection 3.1.13. for the requirements regarding the *flame-spread rating* of interior finishes.)
- (2) Notwithstanding the definition of *noncombustible* materials stated in Article 1.4.1.2. of Division A, a material is permitted to be used in *noncombustible construction* provided that, when tested in accordance with ULC S135, “Standard Test Method for the Determination of Combustibility Parameters of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter)”, at a heat flux of 50 kW/m²,
 - (a) its average total heat release is not more than 3 MJ/m²,
 - (b) its average total smoke extinction area is not more than 1.0 m², and
 - (c) the test duration is extended beyond the time stipulated in the referenced standard until it is clear that there is no further release of heat or smoke.
- (3) If a material referred to in Sentence (2) consists of a number of discrete layers and testing reveals that the surface layer or layers protect the underlying layers such that complete combustion of the underlying layers does not occur, the test shall be repeated by removing the outer layers sequentially until all layers have been exposed during testing, or until complete combustion has occurred.
- (4) The acceptance criteria for a material tested in accordance with Sentence (3) shall be based on the cumulative emissions from all layers, which must not exceed the criteria stated in Clauses (2)(a) and (b).

3.1.5.2. Minor Combustible Components

- (1) The following minor *combustible* components are permitted in a *building* required to be of *noncombustible construction*:
 - (a) paint, (See also Clause 3.1.13.1.(2)(b))
 - (b) self-adhesive tapes, mastics and caulking materials including foamed plastic air sealants, applied to provide a seal between the major components of exterior wall construction, (See also Article 3.6.4.3. for limits on the use of *combustible* materials in *plenum* spaces),

- (c) *firestops* and *fire blocks* conforming to Sentence 3.1.9.1.(1) Article 3.1.11.7.,
- (d) tubing for pneumatic controls provided it has an outside diameter not more than 10 mm,
- (e) adhesives, *vapour barriers* and sheathing papers,
- (f) electrical outlet and junction boxes,
- (g) wood blocking intended for the attachment of window elements within exterior wall assemblies,
- (h) wood blocking within wall assemblies intended for the attachment of handrails, fixtures, and similar items mounted on the surface of the wall, and
- (i) similar minor components.

3.1.5.3. Combustible Roofing Materials

- (1) *Combustible* roof covering that has an A, B or C classification determined in conformance with Subsection 3.1.15. is permitted on a *building* required to be of *noncombustible construction*.
- (2) *Combustible* roof sheathing and roof sheathing supports installed above a concrete deck are permitted on a *building* required to be of *noncombustible construction* provided
 - (a) the concrete deck is not less than 50 mm thick,
 - (b) the height of the roof space above the deck is not more than 1 m,
 - (c) the roof space is divided into compartments by *fire blocks* in conformance with Article 3.1.11.5.,
 - (d) openings through the concrete deck, other than for *noncombustible roof drains* and plumbing piping, are protected by masonry or concrete shafts
 - (i) constructed as *fire separations* having a *fire-resistance rating* not less than 1 h, and
 - (ii) extending from the concrete deck to not less than 150 mm above the adjacent roof sheathing,
 - (e) the perimeter of the roof is protected by a *noncombustible* parapet extending from the concrete deck to not less than 150 mm above the adjacent sheathing, and
 - (f) except as permitted by Clause (d), the roof space does not contain any *building services*.
- (3) *Combustible* cant strips, roof curbs, nailing strips and similar components used in the installation of roofing are permitted on a *building* required to be of *noncombustible construction*.
- (4) Wood nailer facings to parapets that are not more than 610 mm high are permitted on a *building* required to be of *noncombustible construction*, provided the facings and any roof membranes covering the facings are protected by sheet metal.

3.1.5.4. Combustible Windows, Glazing and Skylights

- (1) *Combustible* skylight assemblies are permitted in a *building* required to be of *noncombustible construction* if the assemblies have a *flame-spread rating* not more than
 - (a) 150 provided the assemblies
 - (i) have an individual area not more than 9 m²,
 - (ii) have an aggregate horizontal projected area of the openings through the ceiling not more than 25% of the area of the ceiling of the room or space in which they are located, and
 - (iii) are spaced not less than 2.5 m from adjacent assemblies and 1 200 mm from required *fire separations*, or
 - (b) 75 provided the assemblies
 - (i) have an individual area not more than 27 m²,
 - (ii) have an aggregate horizontal projected area of the openings through the ceiling not more than 33% of the area of the ceiling of the room or space in which they are located, and
 - (iii) are spaced not less than 1.2 m from adjacent assemblies and from required *fire separations*.(See Note A-3.1.5.4.(1))
- (2) *Combustible* vertical glazing installed no higher than the second *storey* is permitted in a *building* required to be of *noncombustible construction*.
- (3) Except as permitted by Sentence (4), the *combustible* vertical glazing permitted by Sentence (2) shall have a *flame-spread rating* not more than 75.

- (4) The *flame-spread rating* of *combustible* glazing is permitted to be not more than 150 if the aggregate area of glazing is not more than 25% of the wall area of the *storey* in which it is located, and
- (a) the glazing is installed in a *building* not more than 1 *storey* in *building height*,
 - (b) the glazing in the *first storey* is separated from the glazing in the second *storey* in accordance with the requirements of Article 3.2.3.17. for opening protection, or
 - (c) the *building* is *sprinklered* throughout.
- (5) *Combustible* window sashes and frames are permitted in a *building* required to be of *noncombustible construction*, provided they are vertically non-contiguous between *storeys*.

3.1.5.5. Combustible Cladding on Exterior Walls

- (1) Except as provided in Sentences (2) and (3), *combustible* cladding is permitted to be used on an exterior wall assembly in a *building* required to be of *noncombustible construction*, provided
- (a) the *building* is
 - (i) not more than 3 *storeys* in *building height*, or
 - (ii) *sprinklered* throughout, and
 - (b) except as provided in Sentence (4), when tested in accordance with CAN/ULC-S134, “Standard Method of Fire Test of Exterior Wall Assemblies,” the wall assembly satisfies the following criteria for testing and conditions of acceptance: (See Note A-3.1.5.5.(1)(b))
 - (i) flaming on or in the wall assembly does not spread more than 5 m above the opening, and (See Note A-3.1.5.5.(1)(b)(i))
 - (ii) the heat flux during the flame exposure on the wall assembly is not more than 35 kW/m² measured at 3.5 m above the opening. (See Note A-3.1.5.5.(1)(b)(ii))
- (2) Except as permitted by Articles 3.2.3.10. and 3.2.3.11., where the *limiting distance* in Tables 3.2.3.1.-B to 3.2.3.1.-E permits an area of *unprotected openings* of not more than 10% of the *exposing building face*, the construction requirements of Table 3.2.3.7. shall be met.
- (3) A wall assembly permitted by Sentence (1) that includes *combustible* cladding of *fire-retardant-treated wood* shall be tested for fire exposure after the cladding has been subjected to an accelerated weathering test as specified in ASTM D2898, “Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.”
- (4) Exterior wall assemblies constructed in accordance with Section 6 of MMAH Supplementary Standard SB-2, “Fire Performance Ratings” are deemed to comply with Clause (1)(b).

3.1.5.6. Combustible Components in Exterior Walls

- (1) *Combustible* components, other than those permitted by Article 3.1.5.5. and Sentence 3.1.5.7.(2), are permitted to be used in an exterior wall assembly of a *building* required to be of *noncombustible construction*, provided
- (a) the *building* is
 - (i) not more than 3 *storeys* in *building height*, or
 - (ii) *sprinklered* throughout, and
 - (b) the wall assembly
 - (i) except as provided in Sentence (2), satisfies the criteria of Clause 3.1.5.5.(1)(b), or
 - (ii) is protected by masonry or concrete cladding not less than 25 mm thick.(See Note A-3.1.5.5.(1)(b))
- (2) Exterior wall assemblies constructed in accordance with Section 6 of MMAH Supplementary Standard SB-2, “Fire Performance Ratings” are deemed to comply with Subclause (1)(b)(i).

3.1.5.7. Factory-Assembled Panels

- (1) Except as provided in Sentence (2), factory-assembled wall and ceiling panels containing foamed plastic insulation with a *flame-spread rating* not more than 500 are permitted to be used in a *building* required to be of *noncombustible construction*, provided
- (a) the *building*
 - (i) is *sprinklered*,
 - (ii) is not more than 18 m high, measured from *grade* to the underside of the roof, and
 - (iii) does not contain a Group A, Group B or Group C *major occupancy*, and
 - (b) the panels
 - (i) do not contain an air space,
 - (ii) when tested in accordance with CAN/ULC-S138, “Standard Method of Test for Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration,” meet the criteria defined therein, and
 - (iii) when a sample panel with an assembled joint typical of field installation is subjected to the applicable test described in Subsection 3.1.12., have a *flame-spread rating* not more than that permitted for the room or space that they bound.
- (2) Factory-assembled exterior wall panels containing thermosetting foamed plastic insulation are permitted to be used in a *building* required to be of *noncombustible construction*, provided
- (a) the *building*
 - (i) is not more than 18 m high, measured from *grade* to the underside of the roof, and
 - (ii) does not contain a Group B or Group C *major occupancy*, and
 - (b) the wall panels
 - (i) do not contain an air space,
 - (ii) are protected on both sides by sheet steel not less than 0.38 mm thick,
 - (iii) remain in place for not less than 10 min when tested in accordance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials,” where the exposed surface includes typical vertical and horizontal joints, and
 - (iv) when a sample panel with an assembled joint typical of field installation is subjected to the applicable test described in Subsection 3.1.12., have a *flame-spread rating* not more than that permitted for the room or space that they bound.
- (3) A walk-in cooler or freezer consisting of factory-assembled wall, floor or ceiling panels containing foamed plastic insulation with a *flame-spread rating* not more than 500 is permitted to be used in a *building* required to be of *noncombustible construction*, provided
- (a) the *building* is *sprinklered*, and
 - (b) the panels
 - (i) are protected on both sides by sheet metal not less than 0.38 mm thick with a melting point not less than 650°C,
 - (ii) do not contain an air space,
 - (iii) when tested in accordance with CAN/ULC-S138, “Standard Method of Test for Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration,” meet the criteria defined therein, and
 - (iv) when a sample panel with an assembled joint typical of field installation is subjected to the applicable test described in Subsection 3.1.12., have a *flame-spread rating* not more than that permitted for the space in which they are located or the space that they bound, as applicable.

(See Note A-3.1.4.2.(2) and 3.1.5.7.(3))

3.1.5.8. Nailing Elements

- (1) Wood nailing elements attached directly to or set into a continuous *noncombustible* backing for the attachment of interior finishes are permitted in a *building* required to be of *noncombustible construction* provided the concealed space created by the wood elements is not more than 50 mm thick.

3.1.5.9. Combustible Millwork

(1) *Combustible* millwork, including interior trim, doors and door frames, show windows together with their frames, aprons and backing, handrails, shelves, cabinets and counters, is permitted in a *building* required to be of *noncombustible construction*.

3.1.5.10. Combustible Flooring Elements

(1) *Combustible stage* flooring supported on *noncombustible* structural members is permitted in a *building* required to be of *noncombustible construction*.

(2) Wood members more than 50 mm but not more than 300 mm high applied directly to or set into a *noncombustible* floor slab are permitted for the construction of a raised platform in a *building* required to be of *noncombustible construction* provided the concealed spaces created are divided into compartments by *fire blocks* in conformance with Sentence 3.1.11.3.(2).

(3) The floor system for the raised platform referred to in Sentence (2) is permitted to include *combustible* subfloor and *combustible* finished flooring.

(4) *Combustible* finished flooring is permitted in a *building* required to be of *noncombustible construction*.

3.1.5.11. Combustible Stairs in Dwelling Units

(1) *Combustible* stairs are permitted in a *dwelling unit* in a *building* required to be of *noncombustible construction*.

3.1.5.12. Combustible Interior Finishes

(1) Except permitted in Sentences (2) and (3), *combustible* interior wall and ceiling finishes referred to in Clause 3.1.13.1.(2)(b) that are not more than 1 mm thick are permitted in a *building* required to be of *noncombustible construction*.

(2) *Combustible* interior wall finishes, other than foamed plastics, that are not more than 25 mm thick are permitted in a *building* required to be of *noncombustible construction*, provided they have a *flame-spread rating* not more than 150 on any exposed surface or any surface that would be exposed by cutting through the material in any direction.

(3) Except as provided in Sentence (4), *combustible* interior ceiling finishes, other than foamed plastics, that are not more than 25 mm thick are permitted in a *building* required to be of *noncombustible construction*, provided they have a *flame-spread rating* not more than 25 on any exposed surface or on any surface that would be exposed by cutting through the material in any direction, except that not more than 10% of the ceiling area within each *fire compartment* is permitted to have a *flame-spread rating* not more than 150.

(4) *Combustible* interior ceiling finishes made of *fire-retardant-treated wood* are permitted in a *building* required to be of *noncombustible construction*, provided they are not more than 25 mm thick or are exposed *fire-retardant-treated wood* battens.

3.1.5.13. Gypsum Board

(1) Gypsum board with a tightly adhering paper covering not more than 1 mm thick is permitted in a *building* required to be of *noncombustible construction* provided the *flame-spread rating* of the surface is not more than 25.

3.1.5.14. Combustible Insulation (See Notes A-3.1.4.2. and A-3.1.4.2.(1))

(1) Foamed plastic insulation shall conform to Article 3.1.5.15.

- (2) *Combustible* insulation with a *flame-spread rating* not more than 25 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in a *building* required to be of *noncombustible construction*.
- (3) *Combustible* insulation is permitted to be installed above roof decks, outside of *foundation* walls below ground level and beneath concrete slabs-on-ground of *buildings* required to be of *noncombustible construction*.
- (4) Except as provided in Sentences (5) and (6), *combustible* insulation with a *flame-spread rating* more than 25 but not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in a *building* required to be of *noncombustible construction*, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) not less than 12.7 mm thick gypsum board mechanically fastened to a supporting assembly independent of the insulation,
 - (b) lath and plaster, mechanically fastened to a supporting assembly independent of the insulation,
 - (c) masonry, or
 - (d) concrete.
- (5) *Combustible* insulation with a *flame-spread rating* more than 25 but not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in the exterior walls of a *building* required to be of *noncombustible construction* that is not *sprinklered* and is more than 18 m high, measured from *grade* to the underside of the roof, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) gypsum board not less than 12.7 mm thick, mechanically fastened to a supporting assembly independent of the insulation and with all joints either backed or taped and filled,
 - (b) lath and plaster, mechanically fastened to a supporting assembly independent of the insulation,
 - (c) masonry or concrete not less than 25 mm thick, or
 - (d) any thermal barrier that, when tested in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials,” will not develop an average temperature rise more than 140°C or a maximum temperature rise more than 180°C at any point on its unexposed face within 10 min. (See Note A-3.1.5.14.(5)(d)) (See also Article 3.2.3.7.)
- (6) *Combustible* insulation with a *flame-spread rating* more than 25 but not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in the interior walls, within ceilings and within roof assemblies of a *building* required to be of *noncombustible construction* that is not *sprinklered* and is more than 18 m high, measured from *grade* to the underside of the roof, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) Type X gypsum board not less than 15.9 mm thick, mechanically fastened to a supporting assembly independent of the insulation and with all joints either backed or taped and filled, conforming to
 - (i) ASTM C1177 / C1177M, “Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing,”
 - (ii) ASTM C1178 / C1178M, “Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel,”
 - (iii) ASTM C1396 / C1396M, “Standard Specification for Gypsum Board,”
 - (iv) ASTM C1658 / C1658M, “Standard Specification for Glass Mat Gypsum Panels,” or
 - (v) CAN/CSA-A82.27-M, “Gypsum Board,”
 - (b) of non-loadbearing masonry or concrete not less than 50 mm thick,
 - (c) loadbearing masonry or concrete not less than 75 mm thick, or
 - (d) any thermal barrier that, when tested in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials,”
 - (i) does not develop an average temperature rise more than 140°C or a maximum temperature rise more than 180°C at any point on its unexposed face within 20 min, and
 - (ii) remains in place for not less than 40 min.

3.1.5.15. Foamed Plastic Insulation (See Notes A-3.1.4.2. and A-3.1.4.2.(1))

- (1) Foamed plastic insulation is permitted to be installed above roof decks, outside of *foundation* walls below ground level and beneath concrete slabs-on-ground of a *building* required to be of *noncombustible construction*.
- (2) Except as provided in Sentences (3), (4) and 3.1.5.7.(1), foamed plastic insulation with a *flame-spread rating* not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in a *building* required to be of *noncombustible construction*, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) not less than 12.7 mm thick gypsum board mechanically fastened to a supporting assembly independent of the insulation,
 - (b) lath and plaster, mechanically fastened to a supporting assembly independent of the insulation,
 - (c) masonry,
 - (d) concrete, or
 - (e) any thermal barrier that meets the requirements of classification B when tested in conformance with CAN/ULC-S124, “Standard Method of Test for the Evaluation of Protective Coverings for Foamed Plastic”.
- (3) Foamed plastic insulation with a *flame-spread rating* more than 25 but not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in the exterior walls of a *building* required to be of *noncombustible construction* that is not *sprinklered* and is more than 18 m high, measured from *grade* to the underside of the roof, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) gypsum board not less than 12.7 mm thick, mechanically fastened to a supporting assembly independent of the insulation and with all joints either backed or taped and filled,
 - (b) lath and plaster, mechanically fastened to a supporting assembly independent of the insulation,
 - (c) masonry or concrete not less than 25 mm thick, or
 - (d) any thermal barrier that, when tested in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials,” does not develop an average temperature rise more than 140°C or a maximum temperature rise more than 180°C at any point on its unexposed face within 10 min. (See Note A-3.1.5.14.(5)(d)) (See also Article 3.2.3.7.)
- (4) Foamed plastic insulation with a *flame-spread rating* more than 25 but not more than 500 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, is permitted in the interior walls, within ceilings and within roof assemblies of a *building* required to be of *noncombustible construction* that is not *sprinklered* and is more than 18 m high, measured from *grade* to the underside of the roof, provided the insulation is protected from adjacent space in the *building*, other than adjacent concealed spaces within wall assemblies, by a thermal barrier consisting of
- (a) Type X gypsum board not less than 15.9 mm thick, mechanically fastened to a supporting assembly independent of the insulation and with all joints either backed or taped and filled, conforming to
 - (i) ASTM C1177 / C1177M, “Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing,”
 - (ii) ASTM C1178 / C1178M, “Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel,”
 - (iii) ASTM C1396 / C1396M, “Standard Specification for Gypsum Board,” or
 - (iv) CAN/CSA-A82.27-M, “Gypsum Board,”
 - (b) non-loadbearing masonry or concrete not less than 50 mm thick,
 - (c) loadbearing masonry or concrete not less than 75 mm thick, or
 - (d) any thermal barrier that, when tested in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials,”
 - (i) does not develop an average temperature rise more than 140°C or a maximum temperature rise more than 180°C at any point on its unexposed face within 20 min, and
 - (ii) remains in place for not less than 40 min.

3.1.5.16. Combustible Elements in Partitions

- (1) Except as permitted by Sentence (2), solid lumber *partitions* not less than 38 mm thick and wood framing in *partitions* located in a *fire compartment* not more than 600 m² in area are permitted to be used in a *building* required to be of *noncombustible construction* in a *floor area* that is not *sprinklered* provided the *partitions*
 - (a) are not required *fire separations*, and
 - (b) are not located in a *care, care and treatment* or *detention occupancy* or in a *retirement home*.
- (2) *Partitions* installed in a *building* of *noncombustible construction* are permitted to contain wood framing provided
 - (a) the *building* is not more than 3 *storeys* in *building height*,
 - (b) the *partitions* are not located in a *care, care and treatment* or *detention occupancy* or in a *retirement home*, and
 - (c) the *partitions* are not installed as enclosures for *exits* or *vertical service spaces*.
- (3) Solid lumber *partitions* not less than 38 mm thick and *partitions* that contain wood framing are permitted to be used in a *building* required to be of *noncombustible construction* provided
 - (a) the *floor area* containing the *partitions* is *sprinklered* throughout, and
 - (b) the *partitions* are not
 - (i) located in a *care, care and treatment* or *detention occupancy* or in a *retirement home*,
 - (ii) installed as enclosures for *exits* or *vertical service spaces*, or
 - (iii) used to satisfy the requirements of Clause 3.2.8.1.(1)(a).

3.1.5.17. Storage Lockers in Residential Buildings

- (1) Except in a *retirement home*, storage lockers in storage rooms are permitted to be constructed of wood in a *building* of *residential occupancy* required to be of *noncombustible construction*.

3.1.5.18. Combustible Ducts

- (1) Except as required by Sentence 3.6.4.3.(1), *combustible* ducts, including *plenums* and duct connectors, are permitted to be used in a *building* required to be of *noncombustible construction* provided these ducts and duct connectors are used only in horizontal runs.
- (2) *Combustible* duct linings, duct coverings, duct insulation, vibration isolation connectors, duct tape, pipe insulation and pipe coverings are permitted to be used in a *building* required to be of *noncombustible construction* provided they conform to the appropriate requirements of Subsection 3.6.5.
- (3) In a *building* required to be of *noncombustible construction*, *combustible* ducts need not comply with the requirements of Sentences 3.6.5.1.(1) and (2) provided the ducts are
 - (a) part of a duct system conveying only ventilation air, and
 - (b) contained entirely within a *dwelling unit*.

3.1.5.19. Combustible Piping Materials

- (1) Except as permitted by Clause 3.1.5.2.(1)(d) and Article 3.1.5.25. and Sentences (2) and (3), *combustible* piping and tubing and associated adhesives are permitted to be used in a *building* required to be of *noncombustible construction* provided that, except when concealed in a wall or concrete floor slab, they
 - (a) have a *flame-spread rating* not more than 25, and
 - (b) if used in a *building* described in Subsection 3.2.6., have a smoke developed classification not more than 50.
- (2) *Combustible* sprinkler piping is permitted to be used within a *sprinklered floor area* in a *building* required to be of *noncombustible construction*. (See also Article 3.2.5.13.)

- (3) Polypropylene pipes and fittings are permitted to be used for drain, waste and vent piping for the conveyance of highly corrosive materials and for piping used to distribute distilled or dialyzed water in laboratory and hospital facilities in a *building* required to be of *noncombustible construction*, provided
- (a) the *building* is *sprinklered* throughout,
 - (b) the piping is not located in a vertical shaft, and
 - (c) piping that penetrates a *fire separation* is sealed at the penetration by a *firestop* that has an FT rating not less than the *fire-resistance rating* of the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side.

3.1.5.20. Combustible Plumbing Fixtures

- (1) *Combustible plumbing fixtures* including wall and ceiling enclosures that form part of the *plumbing fixture*, are permitted in a *building* required to be of *noncombustible construction* provided they are constructed of material having a *flame-spread rating* and smoke developed classification not more than that permitted for the wall surface of the room or space in which they are installed.

3.1.5.21. Wires and Cables

- (1) Except as permitted by Sentence (2) and Articles 3.1.5.22. and 3.1.5.25., optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes are permitted in a *building* required to be of *noncombustible construction*, provided
- (a) the wires and cables exhibit a vertical char of not more than 1.5 m when tested in conformance with the Vertical Flame Test – Cables in Cable Trays (FT4 rating) in CSA C22.2 No. 0.3, “Test methods for electrical wires and cables,”
 - (b) the wires and cables are located in
 - (i) totally enclosed *noncombustible* raceways, (See Note A-3.1.4.3.(1)(b)(i))
 - (ii) masonry walls,
 - (iii) concrete slabs,
 - (iv) a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h, or
 - (v) totally enclosed non-metallic raceways conforming to Clause 3.1.5.23.(1)(b), or
 - (c) the wires and cables are communication cables used at the service entry to a *building* and are not more than 3 m long.
- (See Note A-3.1.5.21.(1))

- (2) Except as permitted in Sentences (3) and (4), optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and are not located in totally enclosed *noncombustible* raceways are permitted to be installed in a *plenum* in a *building* required to be of *noncombustible construction*, provided the wires and cables exhibit a horizontal flame distance of not more than 1.5 m, an average optical smoke density of not more than 0.15, and a peak optical smoke density of not more than 0.5 when tested in conformance with CAN/ULC-S102.4, “Standard Method of Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways,” (FT6 rating).

- (3) Except as permitted in Sentence (4), where totally enclosed *noncombustible* raceways are used in a *plenum*, exposed components of wiring systems with *combustible* insulation, jackets or sheathes, including optical fibre cables and electrical wires and cables that are used for the transmission of voice, sound or data, that are installed in the *plenum* or that extend not more than 9 m from the *plenum* including drop down to the floor level, are permitted provided they exhibit a vertical char of not more than 1.5 m when tested in conformance with the Vertical Flame Test – Cables in Cable Trays (FT4 rating) in CSA C22.2 No. 0.3, “Test methods for electrical wires and cables.”

- (4) Cables or wires within *plenums* that are used for the transmission of signals in fire alarm systems need not comply with the requirements of Sentences (2) and (3).

3.1.5.22. Combustible Travelling Cables for Elevators

- (1) *Combustible* travelling cables are permitted on elevating devices in a *building* required to be of *noncombustible construction*.

3.1.5.23. Non-metallic Raceways

- (1) Except as required in Sentence (2), subject to the limits on the size of elements that penetrate *fire separations* when complying with Article 3.1.9.2., within a *fire compartment* of a *building* required to be of *noncombustible construction*, totally enclosed non-metallic raceways not more than 175 mm in outside diameter, or of an equivalent rectangular area, are permitted to be used to enclose optical fibre cables and electrical wires and cables, provided
- (a) where the wires and cables in the raceways meet or exceed the requirements of Clause 3.1.5.21.(1)(a), the non-metallic raceways meet the requirements for at least an FT4 rating in,
- (i) CAN/CSA-C22.2 No. 262, “Optical Fiber Cable and Communication Cable Raceway Systems,” or
 - (ii) CAN/ULC-S143, “Standard Method of Fire Tests for Non-Metallic Electrical and Optical Fibre Cable Raceway Systems,” and
- (b) where the wires and cables in the raceways do not meet or exceed the requirements of Clause 3.1.5.21.(1)(a), the non-metallic raceways exhibit a vertical char of not more than 1.5 m when tested in conformance with the Vertical Flame Test (FT4) – Conduit or Tubing on Cable Tray in Clause 6.16 of CSA C22.2 No. 211.0, “General Requirements and Methods of Testing for Nonmetallic Conduit.”
- (2) Totally enclosed non-metallic raceways used in a *plenum* in a *building* required to be of *noncombustible construction* shall exhibit a horizontal flame distance of not more than 1.5 m, an average optical smoke density of not more than 0.15, and a peak optical smoke density of not more than 0.5 when tested in conformance with CAN/ULC-S102.4, “Standard Method of Test for Fire and Smoke Characteristics of Electrical Wiring, Cables and Non-Metallic Raceways,” (FT6 rating).

3.1.5.24. Wood Decorative Cladding

- (1) On *buildings* required to be of *noncombustible construction*, decorative wood cladding is permitted to be used on the exterior fascias and soffits of *marquees* or canopies on the *building* face of a *storey* having direct access to a *street* or access route, provided the wood cladding is *fire-retardant-treated wood* that has been conditioned in conformance with ASTM D2898, “Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing,” before being tested in accordance with CAN/ULC-S102, “Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.”

3.1.5.25. Wires in Computer Room Floors

- (1) Optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes, located in the space below a raised floor in a *computer room*, are permitted in a *building* required to be of *noncombustible construction* provided they do not convey flame or continue to burn for more than 1 min when tested in conformance with the Vertical Flame Test in Clause 4.11.1. of CSA C22.2 No. 0.3, “Test methods for electrical wires and cables,” (FT1 Rating).
- (2) The requirement in Sentence (1) is considered to be met where the wires and cables
- (a) exhibit a vertical char of not more than 1.5 m when tested in conformance with the Vertical Flame Test – Cables in Cabletrough in Clause 4.11.4. of CSA C22.2 No. 0.3, “Test methods for electrical wires and cables,” (FT4 Rating), or
- (b) exhibit a flame-spread of not more than 1.5 m, a smoke density of not more than 0.5 at peak optical density and a smoke density not more than 0.15 at average optical density when tested in conformance with the Flame and Smoke Test in the Appendix to CSA C22.2 No. 0.3, “Test methods for electrical wires and cables,” (FT6 Rating).

3.1.5.26. Combustible Components in Public Pools and Public Spas

(1) *Combustible* fittings and components in a *public pool* or *public spa*, including main drains, piping, skimmers, return inlets, steps, ladder rungs and liners, are permitted in a *building* required to be of *noncombustible construction*.

3.1.5.27. Combustible Mezzanines

(1) In a *building* required to be of *noncombustible construction*, a *mezzanine* located within a *live/work unit* is permitted to be of *combustible construction*, provided the area of the *mezzanine* is not more than 25% of the *floor area* of the *live/work unit* or 20 m², whichever is less, and has no obstructions more than 1 070 mm above the floor.

3.1.5.28. Combustible Solar Collector Systems

(1) A *combustible* solar collector system is permitted to be installed above the roof of a *building* required to be of *noncombustible construction*.

3.1.5.29. Marquees Having Combustible Elements

(1) Except as permitted in Sentence (2), exterior *marquees*, not greater than 7.5 m from ground level to the top of the *marquee*, having *combustible* elements, other than fabrics or films conforming to Sentence 3.1.16.1.(1), are permitted on a *building* required to be of *noncombustible construction*, provided every opening in the exposed wall of the *building* above the *marquee* is protected with wired glass in accordance with MMAH Supplementary Standard SB-2, “Fire Performance Ratings” where these openings are within,

- (a) 4.5 m horizontally of the *marquee*, and
- (b) 9 m vertically above the *marquee*.

(2) The protection required by Sentence (1) is permitted to be waived if the *building* is *sprinklered*.

3.1.6. Encapsulated Mass Timber Construction (See Note A-3.1.6.)

3.1.6.1. Scope

(1) *Encapsulated mass timber construction* permitted in this Part shall conform to this Subsection.

3.1.6.2. Materials Permitted

(1) Except as otherwise provided in this Part and Sentence 6.4.3.1.(1), materials used in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* shall conform to Subsection 3.1.5.

3.1.6.3. Structural Mass Timber Elements (See Note A-3.1.6.3.)

(1) Except as otherwise provided in this Subsection and Articles 3.2.2.16. and 3.2.3.19., a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* is permitted to include structural mass timber elements, including beams, columns, arches and wall, floor and roof assemblies, provided they comply with Sentences (2) and (3).

- (2) Structural mass timber elements referred to in Sentence (1) shall
 - (a) except as provided in Sentence (4), be arranged in heavy solid masses containing no concealed spaces,
 - (b) have essentially smooth flat surfaces with no thin sections or sharp projections, and
 - (c) except as provided in Sentence 3.1.6.17.(1), conform to the minimum dimensions stated in Table 3.1.6.3.

- (3) Adhesives used in structural mass timber elements referred to in Sentence (1) that are constructed of cross-laminated timber shall conform to the elevated temperature performance requirements in ANSI/APA PRG 320, “Standard for Performance-Rated Cross-Laminated Timber.”
- (4) Concealed spaces are permitted within structural mass timber elements referred to in Sentence (2) and need not conform to Sentence 3.1.6.4.(1) provided the concealed spaces are,
- sprinklered* and divided into compartments by *fire blocks* in conformance with Subsection 3.1.11.,
 - completely filled with rock or slag fibre insulation conforming to CAN/ULC-S702.1 “Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification,” and having a density not less than 32 kg/m³,
 - if horizontal, lined with not less than a single layer of 12.7 mm thick Type X gypsum board or *noncombustible* material providing an *encapsulation rating* of not less than 25 min, or
 - if vertical, lined with not less than a single layer of 12.7 mm thick Type X gypsum board or *noncombustible* material providing an *encapsulation rating* of not less than 25 min and vertically divided into compartments by *fire blocks* in conformance with Subsection 3.1.11.

Table 3.1.6.3.
Minimum Dimensions of Structural Mass Timber Elements in Encapsulated Mass Timber Construction
 Forming Part of Sentences 3.1.6.3.(2), 3.1.6.8.(1) and 3.1.6.17.(1)

Structural Wood Elements	Minimum Thickness, mm	Minimum Width x Depth, mm x mm
Walls that are not <i>fire separations</i> or exterior walls (1-sided fire exposure)	96	—
Walls that require a <i>fire-resistance rating</i> , but are not <i>fire separations</i> (2-sided fire exposure)	192	—
Floors ⁽¹⁾ and roofs (1-sided fire exposure)	96	—
Beams, columns and arches (2- or 3-sided fire exposure)	—	192 x 192
Beams, columns and arches (4-sided fire exposure)	—	224 x 224

Notes to Table 3.1.6.3.:

- (1) The minimum dimensions for floor assemblies are also applicable to *mezzanines* and exterior balconies.

3.1.6.4. Encapsulation of Mass Timber Elements (See Note A-3.1.6.3.)

- r1** (1) Except as provided in Sentences (3) to (9), 3.1.6.3.(4), 3.1.6.16.(2) and 3.1.6.17.(2), and Articles 3.1.6.7. and 3.1.6.12., the exposed surfaces of structural mass timber elements conforming to Article 3.1.6.3. shall be protected from adjacent spaces in the *building*, including adjacent concealed spaces within wall, floor and roof assemblies, by a material or assembly of materials conforming to Sentence (2) that provides an *encapsulation rating* that
- is not less than 50 min in a *building* or part thereof constructed in conformance with Article 3.2.2.48. or 3.2.2.57., or
 - conforms to the minimum values stated in Table 3.2.2.93. for the applicable *major occupancy* and *building height*. (See Note A-3.1.6.4.(1))
- (2) Except as provided in Sentence 3.1.6.11.(1), the material or assembly of materials referred to Sentence (1) shall consist of
- gypsum board,
 - gypsum concrete,
 - noncombustible* materials,
 - materials that conform to Sentences 3.1.5.1.(2) to (4), or
 - any combination of materials listed in Clauses (a) to (d).

- r1** (3) Except as provided in Sentences (5) and (7), the exposed surfaces of mass timber beams, columns and arches within a *suite* or *fire compartment* in a *building* or part thereof constructed in conformance with Article 3.2.2.48. or 3.2.2.57. or permitted by Article 3.2.2.93. to have a 50 min *encapsulation rating* need not be protected in accordance with Sentence (1), provided
- (a) their aggregate exposed surface area does not exceed 35% of the total wall area of the perimeter of the *suite* or *fire compartment* in which they are located, and
 - (b) the *flame-spread rating* on any exposed surface is not more than 150.
- (See Note A-3.1.6.4.(3) to (8))
- r1** (4) Except as provided in Sentences (5) to (7), the exposed surfaces of mass timber walls within a *suite* in a *building* or part thereof constructed in conformance with Article 3.2.2.48. or 3.2.2.57. or permitted by Article 3.2.2.93. to have a 50 min *encapsulation rating* need not be protected in accordance with Sentence (1), provided
- (a) all portions of the exposed surfaces,
 - (i) face the same direction, or
 - (ii) are separated by a horizontal distance of not less than 4.5 m, and
 - (b) the *flame-spread rating* on any exposed surface is not more than 150.
- (See Notes A-3.1.6.4.(4) and A-3.1.6.4.(3) to (8))
- r1** (5) Except as provided in Sentence (7), the aggregate exposed surface area of mass timber elements within a *suite* permitted in Sentences (3) and (4) shall not exceed 35% of the total wall area of the perimeter of the *suite*. (See Note A-3.1.6.4.(3) to (8))
- r1** (6) Except as provided in Sentence (7), the exposed surfaces of mass timber ceilings within a *suite* or *fire compartment*, other than an *exit* and *public corridor*, in a *building* or part thereof constructed in conformance with Article 3.2.2.48. or 3.2.2.57. or permitted by Article 3.2.2.93. to have a 50 min *encapsulation rating* need not be protected in accordance with Sentence (1), provided the aggregate surface area does not exceed
- (a) 10% of the total ceiling area of the *suite* or *fire compartment*, where the *flame-spread rating* on any exposed surface is not more than 150, or
 - (b) 25% of the total ceiling area of the *suite* or *fire compartment*, where the *flame-spread rating* on any exposed surface of a mass timber wall or ceiling is not more than 75.
- (See Note A-3.1.6.4.(3) to (8))
- r1** (7) The exposed surfaces of mass timber ceilings within a *suite* in a *building* or part thereof constructed in conformance with Article 3.2.2.48. or 3.2.2.57. or permitted by Article 3.2.2.93. to have a 50 min *encapsulation rating* need not be protected in accordance with Sentence (1) or (6), provided
- (a) the aggregate surface area of any exposed mass timber beams, columns and arches does not exceed 20% of the total wall area of the perimeter of the *suite* in which they are located,
 - (b) all surface of the mass timber walls are,
 - (i) protected in accordance with Sentence (1), or
 - (ii) mass timber walls that are not otherwise permitted to be exposed in accordance with Sentence (5) are protected by a material or assembly of materials conforming to Sentence (2) that provides an *encapsulation rating* of not less than 80 min, and
 - (c) the *flame spread rating* on any exposed mass timber wall or ceiling is not more than 75.
- (See Note A-3.1.6.4.(3) to (8))
- r1** (8) Structural mass timber elements in a *building* or part thereof permitted by Article 3.2.2.93. to have a 0 min *encapsulation rating* need not be protected in accordance with Sentence (1), provided
- (a) mass timber walls and ceilings within *vertical service spaces*, *public corridors*, and *exits* are protected on the interior side with a material or assembly of materials conforming to Sentence (2) that provides an *encapsulation rating* of not less than 25 min, and
 - (b) concealed spaces are protected in conformance with Sentence 3.1.6.3.(4).
- (See Note A-3.1.6.4.(3) to (8))
- (9) In a *building* or part thereof required by Clause 3.1.6.4.(1)(b) to have a minimum *encapsulation rating* of 70 min, the upper side of a mass timber floor or roof assembly is permitted to be encapsulated by a material or assembly of materials conforming to Sentence 3.1.6.4.(2) that provides an *encapsulation rating* of 50 min.

3.1.6.5. Determination of Encapsulation Ratings

(1) Except as provided in Article 3.1.6.6., the rating of a material or assembly of materials that is required to have an *encapsulation rating* shall be determined on the basis of the results of the tests conducted in conformance with CAN/ULC-S146, “Standard Method of Test for the Evaluation of Encapsulation Materials and Assemblies of Materials for the Protection of Structural Timber Elements.”

3.1.6.6. Encapsulation Materials (See Note A-3.1.6.6.)

(1) Gypsum-concrete topping and concrete not less than 38 mm thick are deemed to have an *encapsulation rating* of 50 min when installed on the upper side of a mass timber floor or roof assembly.

- r1 (2) One layer of Type X gypsum board conforming to ASTM C1396/C1396M, “Standard Specification for Gypsum Board,” or CAN/CSA-A82.27-M, “Gypsum Board,” not less than 12.7 mm thick, are deemed to have an *encapsulation rating* of 25 min when installed on a mass timber element in accordance with Sentence (6).
- r1 (3) Two layers of Type X gypsum board conforming to ASTM C1396/C1396M, “Standard Specification for Gypsum Board,” or CAN/CSA-A82.27-M, “Gypsum Board,” each not less than 12.7 mm thick, are deemed to have an *encapsulation rating* of 50 min when installed on a mass timber element in accordance with Sentence (6).
- r1 (4) Two layers of Type X gypsum board conforming to ASTM C1396/C1396M, “Standard Specification for Gypsum Board,” or CAN/CSA-A82.27-M, “Gypsum Board,” each not less than 15.9 mm thick, are deemed to have an *encapsulation rating* of 70 min when installed on a mass timber element in accordance with Sentence (6).
- r1 (5) Three layers of Type X gypsum board conforming to ASTM C1396/C1396M, “Standard Specification for Gypsum Board,” or CAN/CSA-A82.27-M, “Gypsum Board,” each not less than 12.7 mm thick, are deemed to have an *encapsulation rating* of 80 min when installed on a mass timber element in accordance with Sentence (6).
- r1 (6) The gypsum board described in Sentences (2) to (5) shall be
- (a) fastened with a minimum of two rows of screws in each layer
 - (i) directly to the mass timber element with screws of sufficient length to penetrate not less than 20 mm into the mass timber element that are spaced not more than 400 mm o.c. and 20 mm to 38 mm from the boards’ edges, or
 - (ii) to wood furring or resilient metal or steel furring channels not more than 25 mm thick spaced not more than 400 mm o.c. on the mass timber element,
 - (b) for multiple layer systems, installed with the joints in each layer staggered from those in the adjacent layer, and
 - (c) installed in conformance with ASTM C840, “Standard Specification for Application and Finishing of Gypsum Board,” except that, for multiple layer systems, their joints need not be taped and finished.
- (See Note A-3.1.6.6.(6))

3.1.6.7. Combustible Roofing Materials

(1) Wood roof sheathing and roof sheathing supports that do not conform to Articles 3.1.6.3. and 3.1.6.4. are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided they are installed

- (a) above a concrete deck in accordance with Sentence 3.1.5.3.(2), or
- (b) above a deck of *encapsulated mass timber construction*, where
 - (i) said deck is permitted to be encapsulated between the roof sheathing supports by a material or assembly of materials conforming to Sentence 3.1.6.4.(2) that provides an *encapsulation rating* of not less than 50 min,
 - (ii) the height of the roof space is not more than 1 m,
 - (iii) the roof space is divided into compartments by *fire blocks* in conformance with Article 3.1.11.5.,
 - (iv) openings through the deck other than for *noncombustible* roof drains and plumbing piping are protected by shafts constructed as *fire separations* having a *fire-resistance rating* not less than 1 h that extend from the deck to not less than 150 mm above the adjacent sheathing, and
 - (v) except as permitted by Subclause (b)(iv), the roof space does not contain any *building* services.

(2) *Combustible* cant strips, roof curbs, nailing strips and similar components used in the installation of roofing are permitted on a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.

(3) Wood nailer facings to parapets that are not more than 610 mm high are permitted on a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided the facings and any roof membranes covering the facings are protected by sheet metal.

3.1.6.8. Combustible Window Sashes and Frames

(1) *Combustible* window sashes and frames are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided

- (a) each window in an exterior wall face is an individual unit separated from every other opening in the wall by *noncombustible* wall construction or mass timber wall construction conforming to the dimensions stated in Table 3.1.6.3.,
- (b) windows in exterior walls in contiguous *storeys* are separated by not less than 1 m of *noncombustible* wall construction or mass timber wall construction conforming to the dimensions stated in Table 3.1.6.3., and
- (c) the aggregate area of openings in an exterior wall face of a *fire compartment* is not more than 40% of the area of the wall face.

r1 3.1.6.9. Exterior Cladding

(1) Except as provided in Sentences (2) to (5) and (8), cladding on an exterior wall assembly of a *building* or part thereof permitted to be of *encapsulated mass timber construction* shall be

- (a) *noncombustible*,
 - (b) a material or combination of materials that satisfy the criteria of Sentence 3.1.5.1.(2),
 - (c) except as provided in Sentence (6), a wall assembly that satisfies the criteria of Clause 3.1.5.5.(1)(b), or
 - (d) a combination of the cladding described in Clauses (a) to (c).
- (See Note A-3.1.6.9.(1), (2), (4) and (5))

(2) Except as provided in Sentences (3) to (5) and (7), cladding on an exterior wall assembly of a *building* or part thereof permitted to be of *encapsulated mass timber construction* that is not more than 12 *storeys* in *building height* is permitted to consist of

- (a) *combustible* cladding that
 - (i) is not contiguous over more than 4 *storeys*,
 - (ii) represents not more than 10% of the cladding on each exterior wall of each *storey*,
 - (iii) is not more than 1.2 m in width,
 - (iv) has a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction,
 - (v) is separated from other portions of *combustible* cladding on adjacent *storeys* by a horizontal distance of not less than 2.4 m, and
 - (vi) is separated from other portions of *combustible* cladding by a horizontal distance of not less than 1.2 m,
 - (b) *combustible* cladding that
 - (i) is not contiguous across adjacent *storeys*,
 - (ii) represents not more than 10% of the cladding on each exterior wall of each *storey*,
 - (iii) has a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, and
 - (iv) is separated from other portions of *combustible* cladding on adjacent *storeys* by a horizontal distance of not less than 2.4 m,
 - (c) *combustible* cladding representing up to 100% of the cladding on exterior walls of the *first storey*, provided all portions of the cladding can be directly accessed and are located not more than 15 m from a *street* or access route conforming to Article 3.2.5.6., measured horizontally from the face of the *building*, or
 - (d) a combination of cladding described in Sentence (1) and the cladding described in Clauses (a) to (c).
- (See Note A-3.1.6.9.(1), (2), (4) and (5))

- (3) The permitted area of *combustible* cladding referred to in Clause (2)(a) or (b) shall not exceed 5% of the cladding on each exterior wall of each *storey* where firefighting facilities cannot reach the *building* within 10 min of the alarm being received.
- (4) Except as provided in Sentences (5) and (7), cladding on an exterior wall assembly of a *building* or part thereof permitted to be of *encapsulated mass timber construction* that is not more than 6 *storeys* in *building height* is permitted to consist of
- (a) *combustible* cladding that
 - (i) represents not more than 10% of the cladding on each exterior wall of each *storey*, and
 - (ii) has a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, or
 - (b) a combination of the cladding described in Clause (a) and the cladding described in Sentence (1) and Clause (2)(c). (See Note A-3.1.6.9.(1), (2), (4) and (5))
- (5) Except as provided in Sentence (7), cladding on an exterior wall assembly of a *building* or part thereof permitted to be of *encapsulated mass timber construction* and not more than 4 *storeys* in *building height* is permitted to consist of *combustible* material with a *flame-spread rating* not more than 75 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction. (See Note A-3.1.6.9.(1), (2), (4) and (5).)
- (6) An exterior wall assembly constructed in conformance with Section 6 of MMAH Supplementary Standard SB-2, “Fire Performance Ratings” is deemed to satisfy the criteria of Clause (1)(c).
- (7) Except as provided in Article 3.2.3.10., where the *limiting distance* in Table 3.2.3.1.-D or Table 3.2.3.1.-E permits an area of *unprotected openings* of not more than 10% of the *exposing building face*, the construction requirements of Table 3.2.3.7. shall be met.
- (8) A wall assembly conforming to Clause (1)(c) that includes *combustible* cladding made of *fire-retardant-treated wood* shall be tested for fire exposure after the cladding has been subjected to the accelerated weathering test specified in ASTM D2898, “Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.”
- (9) Where *combustible* cladding conforming to Clauses (2)(a), (b) or (4)(a) on an exterior wall of a *fire compartment* is exposed to *combustible* cladding conforming to Clause (2)(a), (b) or (4)(b) on an exterior wall of the same *fire compartment* or of another *fire compartment*, and the planes of the two walls are parallel or at an angle less than 135° measured from the exterior of the *building*, the different portions of *combustible* cladding shall
- (a) be separated by a horizontal distance of not less than 3 m, and
 - (b) not be contiguous over more than 2 *storeys*.

3.1.6.10. Combustible Components in Exterior Walls

- r1 (1) Except as provided in Sentence (2), *combustible* components, other than those permitted by Article 3.1.6.9., are permitted to be used in an exterior wall assembly of a *building* or part thereof permitted to be of *encapsulated mass timber construction* provided the wall assembly satisfies the criteria described in Clause 3.1.5.5.(1)(b).
- (2) An exterior wall assembly constructed in conformance with Section 6 in MMAH Supplementary Standard SB-2, “Fire Performance Ratings” is deemed to satisfy the criteria of Sentence (1).
- (3) Non-loadbearing wood elements permitted in Article 3.1.5.6. need not conform to Article 3.1.6.3. in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.

3.1.6.11. Nailing Elements

- (1) Wood nailing elements are permitted to be used for the attachment of a material or assembly of materials to provide an *encapsulation rating* in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided the concealed space created by the wood nailing elements is not more than 25 mm deep.
- (2) Except as permitted by Sentence 3.1.6.16.(2) and Article 3.1.6.6., wood nailing elements are permitted to be used for the attachment of interior finishes in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided the concealed space created by the wood nailing elements is not more than 50 mm deep and
 - (a) exposed surfaces in the concealed space have a *flame-spread rating* not more than 25, or
 - (b) the concealed space is filled with *noncombustible* insulation.

3.1.6.12. Combustible Flooring Elements

- (1) Wood members that are more than 50 mm but not more than 300 mm high are permitted to be used for the construction of a raised platform in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, and they need not conform to Articles 3.1.6.3. and 3.1.6.4., provided
 - (a) the concealed spaces created by the wood members are divided into compartments by *fire blocks* in conformance with Sentence 3.1.11.3.(4), and
 - (b) the wood members are
 - (i) applied directly to or set into a *noncombustible* floor slab, or
 - (ii) applied directly to a mass timber floor assembly that conforms to the requirements of Article 3.1.6.3.
- (2) The upper surface of the mass timber floor assembly referred to in Subclause (1)(b)(ii) is permitted to be encapsulated only between the wood members by a material or assembly of materials conforming to Sentences 3.1.6.4.(1) and (2).
- (3) The floor system for the raised platform referred to in Sentence (1) is permitted to include a *combustible* subfloor and *combustible* finished flooring.

3.1.6.13. Combustible Stairs

- (1) Wood stairs and landings conforming to the requirements for floor assemblies in Article 3.1.6.3. and Sentences 3.1.6.4.(1) and (2) are permitted in an *exit* stairwell in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.
- (2) Wood stairs in a *suite* in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* need not conform to Articles 3.1.6.3. and 3.1.6.4.

3.1.6.14. Combustible Interior Finishes

- (1) Except as provided in Sentences (2) and (3), *combustible* interior wall and ceiling finishes referred to in Clause 3.1.13.1.(2)(b) that are not more than 1 mm thick are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.
- r1 (2) Except as provided in Sentences 3.1.6.4.(3), (4), (7) and (8), *combustible* interior wall finishes, other than foamed plastics, that are not more than 25 mm thick are permitted in a *building* or part thereof permitted to be of *encapsulated mass timber construction*, provided they have a *flame-spread rating* not more than 150 on any exposed surface or any surface that would be exposed by cutting through the material in any direction.
- r1 (3) Except as provided in Sentences (4) and 3.1.6.4.(3), (6), (7) and (8), *combustible* interior ceiling finishes, other than foamed plastics, that are not more than 25 mm thick are permitted in a *building* or part thereof permitted to be of *encapsulated mass timber construction*, provided they have a *flame-spread rating* not more than 25 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, except that not more than 10% of the ceiling area within each *fire compartment* is permitted to have a *flame-spread rating* not more than 150. (See Note A-3.1.11.3.(3))
- (4) *Combustible* interior ceiling finishes made of *fire-retardant-treated wood* are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided they are not more than 25 mm thick or are exposed *fire-retardant-treated wood* battens.

3.1.6.15. Combustible Elements in Partitions

- (1) Solid lumber *partitions* not less than 38 mm thick and *partitions* containing wood framing that do not conform to Article 3.1.6.3. are permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, provided the *partitions* are

- (a) protected on each face with not less than
 - (i) a single layer of 12.7 mm thick Type X gypsum board, with all joints either backed or taped and filled, conforming to ASTM C1396 / C1396M, “Standard Specification for Gypsum Board,” or CAN/CSA-A82.27-M, “Gypsum Board,”
 - (ii) a single layer of 19 mm thick *fire-retardant-treated wood*, on solid lumber *partitions*, or
 - (iii) a single layer of 19 mm thick *fire-retardant-treated wood*, on *partitions* containing wood framing, with wood stud cavities filled with *noncombustible* insulation, and
- (b) not installed as enclosures for *exits* or *vertical service spaces*.

3.1.6.16. Exposed Construction Materials and Components in Concealed Spaces

- (1) Except as provided in Sentence (2) and Article 3.1.11.7., and except as otherwise provided in this Subsection, only construction materials and components permitted in *noncombustible construction* shall be permitted to have exposed surfaces in concealed spaces within floor, roof and wall assemblies permitted in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*.
- (2) Exposed surfaces are permitted in a concealed space created by the attachment of a material or assembly of materials conforming to Sentence 3.1.6.4.(1), provided the concealed space is not more than 25 mm deep.

3.1.6.17. Penetration by Outlet Boxes

- (1) The minimum dimensions stated in Table 3.1.6.3. need not apply at cutouts in vertical or horizontal structural mass timber elements where outlet boxes are installed in accordance with Article 3.1.9.3. (See also Note A-3.1.9.2.(1))
- (2) The exposed surfaces of the cutouts described in Sentence (1) need not be protected in accordance with Sentence 3.1.6.4.(1).
- (3) Outlet boxes on opposite sides of a structural mass timber element having a *fire-resistance rating* shall be separated by a distance of not less than 600 mm.

3.1.7. Fire-Resistance Ratings

3.1.7.1. Determination of Ratings

- (1) Except as permitted by Sentence (2) and Articles 3.1.7.2. and 3.6.3.5., the rating of a material, assembly of materials or a structural member that is required to have a *fire-resistance rating*, shall be determined on the basis of the results of tests conducted in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”
- (2) A material, assembly of materials or a structural member is permitted to be assigned a *fire-resistance rating* on the basis of MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

3.1.7.2. Exception for Exterior Walls

- (1) The limit on the rise of temperature on the unexposed surface of an assembly as required by the tests referred to in Sentence 3.1.7.1.(1) shall not apply to an exterior wall that has a *limiting distance* of 1.2 m or more, provided correction is made for radiation from the unexposed surface in accordance with Sentence 3.2.3.1.(9).

3.1.7.3. Exposure Conditions for Rating

- (1) Floor, roof and ceiling assemblies shall be rated for exposure to fire on the underside.
- (2) *Firewalls* and interior vertical *fire separations* shall be rated for exposure to fire on each side.

- (3) Exterior walls shall be rated for exposure to fire from inside the *building*.

3.1.7.4. Minimum Fire-Resistance Rating

- (1) The use of materials or assemblies having a greater *fire-resistance rating* than required shall impose no obligation to exceed in whole or in part the minimum *fire-resistance ratings* required by this Part.

3.1.7.5. Rating of Supporting Construction

- r1 (1) Except as permitted by Sentence (2) and by Articles 3.2.2.20. to 3.2.2.93. for mixed types of construction, all *loadbearing* walls, columns and arches in the *storey* immediately below a floor or roof assembly required to have a *fire-resistance rating* shall have a *fire-resistance rating* not less than that required for the supported floor or roof assembly.
- (2) *Loadbearing* walls, columns and arches supporting a *service room* or *service space* need not conform to Sentence (1).
- (3) Except as provided in Sentence (4) and except for *noncombustible* roof assemblies required by Clauses 3.2.2.51.(2)(c) and 3.2.2.60.(2)(c), if an assembly is required to be of *noncombustible construction* and have a *fire-resistance rating*, it shall be supported by *noncombustible construction*.
- (4) Except for portions of a *building* constructed in accordance with Article 3.2.2.7. that are required to be of *noncombustible construction*, assemblies of *noncombustible construction* in *buildings* or portions of *buildings* permitted to be of *encapsulated mass timber construction* are permitted to be supported by *encapsulated mass timber construction*.

3.1.8. Fire Separations and Closures

3.1.8.1. General Requirements

- (1) Any wall, *partition* or floor assembly required to be a *fire separation* shall
- (a) except as permitted by Sentence (2), be constructed as a continuous element in conformance with Article 3.1.8.3., and
- (b) as required in this Part, have a *fire-resistance rating* as specified. (See Note A-3.1.8.1.(1)(b))
- (2) Openings in a *fire separation* shall be protected with *closures*, shafts or other means in conformance with Articles 3.1.8.4. to 3.1.8.20. and Subsections 3.1.9. and 3.2.8. (See Note A-3.1.8.1.(2))

3.1.8.2. Combustible Construction Support

- (1) *Combustible construction* that abuts on or is supported by a *noncombustible fire separation* shall be constructed so that its collapse under fire conditions will not cause the collapse of the *fire separation*.

3.1.8.3. Continuity of Fire Separations

- (1) Except as permitted by Sentence 3.6.4.2.(2), a *horizontal service space* or other concealed space located above a required vertical *fire separation*, including the walls of a vertical shaft, shall be divided at the *fire separation* by an equivalent *fire separation* within the *service space*.
- (2) Except as provided in Sentence (5), the continuity of a *fire separation* having a *fire-resistance rating* that abuts another *fire separation*, a floor, a ceiling, or a roof shall be maintained by a *firestop* conforming to Sentence (3). (See Note A-3.1.8.3.(2))

(3) The *firestop* required in Sentence (2) shall have an FT rating not less than the *fire-resistance rating* of the abutting *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems.”

(4) Except as provided in Sentence (5), joints located in a horizontal plane between a floor and an exterior wall shall be sealed by a *firestop* that, when subjected to the fire test method in ASTM E2307, “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus,” has an F rating not less than the *fire-resistance rating* of the horizontal *fire separation*.

(5) Joints between ceilings and walls, between floors and walls, and between walls at corners need not comply with Sentences (2) and (4) where such joints consist of gypsum board that is attached to framing members and arranged so as to restrict the passage of flame and smoke through the joints. (See Note A-3.1.8.3.(5))

3.1.8.4. Determination of Ratings and Classifications

(1) Except as permitted by Sentences (2) and 3.1.8.16.(1), the *fire-protection rating* of a *closure* shall be determined in accordance with

- (a) CAN/ULC-S104, “Standard Method for Fire Tests of Door Assemblies,”
 - (b) CAN/ULC-S106, “Standard Method for Fire Tests of Window and Glass Block Assemblies,” or
 - (c) CAN/ULC-S112, “Standard Method for Fire Test of Fire Damper Assemblies.”
- (See Articles 3.1.8.17. to 3.1.8.19. for additional requirements for *closures*.)

(2) Except as permitted by Sentence 3.1.8.12.(1), the *fire-protection rating* of a *closure* shall conform to Table 3.1.8.4. for the required *fire-resistance rating* of the *fire separation*.

(3) The leakage rate of smoke dampers and combination smoke/*fire dampers* shall

- (a) be determined in accordance with the applicable provisions in CAN/ULC-S112.1, “Standard for Leakage Rated Dampers for Use in Smoke Control Systems,” and
- (b) conform to Class I, II or III of that standard.

(4) The leakage rate of a door assembly shall be determined in accordance with ANSI/UL-1784, “Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.”

Table 3.1.8.4.
Fire-Protection Rating of Closures
Forming Part of Sentence 3.1.8.4.(2)

<i>Fire-Resistance Rating of Fire Separation</i>	<i>Minimum Fire-Protection Rating of Closure</i>
30 min	20 min
45 min	45 min
1 h	45 min
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

3.1.8.5. Installation of Closures

- (1) Except where *fire dampers*, window assemblies and glass block are used as *closures*, *closures* of the same *fire-protection rating* installed on opposite sides of the same opening are deemed to have a *fire-protection rating* equal to the sum of the *fire-protection ratings* of the *closures*. (See Note A-3.1.8.1.(2))
- (2) Except as otherwise specified in this Part, every door, *fire damper*, window assembly or glass block used as a *closure* in a required *fire separation* shall be installed in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives.” (See Note A-3.1.8.1.(2))
- (3) Except as otherwise specified in this Part, every smoke damper or combination smoke/*fire damper* used as a *closure* in a required *fire separation* shall be installed in conformance with NFPA 105, “Standard for Smoke Door Assemblies and Other Opening Protectives.”
- (4) If a door is installed so that it could damage the integrity of a *fire separation* if its swing is unrestricted, door stops shall be installed to prevent the damage.
- (5) Reserved.
- (6) A leakage-rated door assembly complying with Sentence 3.1.8.4.(4) shall be installed in
 - (a) *fire separations* in protected *floor areas* described in Clause 3.3.1.7.(1)(b),
 - (b) *fire separations* in *care* or *care and treatment occupancies* referred to in Sentence 3.3.3.5.(4) and installed in *fire separations* in *retirement homes* referred to in Sentence 3.3.4.11.(4),
 - (c) except as provided in Sentence (8), *fire separations* of *public corridors* serving *dwelling units* in *storeys* that are not *sprinklered*, and
 - (d) *firewalls* that are a *horizontal exit* referred to in Sentence 3.3.3.5.(3).
- (7) Leakage-rated door assemblies required by Sentence (6) shall be installed in accordance with NFPA 105, “Standard for Smoke Door Assemblies and Other Opening Protectives.”
- (8) A leakage-rated door assembly need not be installed where a *dwelling unit* served by a *public corridor* has
 - (a) a second and separate *means of egress*, or
 - (b) an open-air balcony that is sized to accommodate the number of occupants for which the *dwelling unit* is intended.

3.1.8.6. Maximum Openings

- (1) The size of an opening in an interior *fire separation* required to be protected with a *closure* shall be not more than 11 m², with no dimension more than 3.7 m, if a *fire compartment* on either side of the *fire separation* is not *sprinklered*.
- (2) The size of an opening in an interior *fire separation* required to be protected with a *closure* shall be not more than 22 m², with no dimension more than 6 m, provided the *fire compartments* on both sides of the *fire separation* are *sprinklered*.

3.1.8.7. Location of Fire Dampers and Smoke Dampers

- (1) Except as provided in Article 3.1.8.8., a *fire damper* having a *fire-protection rating* conforming to Sentence 3.1.8.4.(2) shall be installed in conformance with Article 3.1.8.10. in ducts or air-transfer openings that penetrate an assembly required to be a *fire separation*.
- (2) Except as provided in Article 3.1.8.9., a smoke damper or a combination smoke/*fire damper* shall be installed in conformance with Article 3.1.8.11. in ducts or air-transfer openings that penetrate an assembly required to be a *fire separation*, where the *fire separation*
 - (a) separates a *public corridor*,
 - (b) contains an egress door referred to in Sentence 3.4.2.4.(2),

- (c) serves an *assembly, care, care and treatment, detention or residential occupancy*, or
- (d) is installed to meet the requirements of Clause 3.3.1.7.(1)(b) or Sentence 3.3.3.5.(4). or 3.3.4.11.(4).

3.1.8.8. Fire Dampers Waived

- (1) Except as provided in Sentences (2) to (4), the requirement for *fire dampers* stated in Sentence 3.1.8.7.(1) is permitted to be waived for
 - (a) ducts that serve commercial cooking equipment, (See also Article 6.3.1.6.)
 - (b) continuous *noncombustible* ducts having a melting point above 760°C that penetrate a vertical *fire separation* required by Sentence 3.3.1.1.(1) between *suites of assembly, mercantile, low-hazard industrial, medium-hazard industrial or high-hazard industrial occupancy*,
 - (c) ducts or air-transfer openings that penetrate a vertical *fire separation* not required to have a *fire-resistance rating*, or
 - (d) *noncombustible* ducts or air-transfer openings that penetrate a horizontal *fire separation* not required to have a *fire-resistance rating*.
- (2) The requirement for *fire dampers* stated in Sentence 3.1.8.7.(1) is permitted to be waived for *noncombustible* branch ducts having a melting point above 760°C that penetrate a *fire separation*,
 - (a) provided the ducts
 - (i) have a cross-sectional area not more than 0.013 m² and serve only *air-conditioning* units or combined *air-conditioning* and heating units discharging air not more than 1.2 m above the floor, or
 - (ii) extend not less than 500 mm inside *exhaust duct* risers that are under negative pressure and in which the airflow is upward as required by Article 3.6.3.4., or
 - (b) where the *fire separation* separates a *vertical service space* from the remainder of the *building*, provided each individual duct exhausts directly to the outdoors at the top of the *vertical service space*.
- (3) In elementary and secondary schools, a continuous *noncombustible* duct having a melting point above 760°C that pierces a *fire separation* having a *fire-resistance rating* of 30 min need not be equipped with a *fire damper* at the *fire separation*.
- (4) In a Group B, Division 3 *occupancy* which contains sleeping accommodation for not more than 10 persons, which has not more than six occupants who require assistance in evacuation in case of an emergency and which is equipped with a fire alarm system, a duct need not be equipped with a *fire damper* at a *fire separation*, provided duct-type *smoke detectors* have been installed to control smoke circulation as described in Article 3.2.4.12.

3.1.8.9. Smoke Dampers Waived

- (1) Except as provided in Sentence (2), the requirement for smoke dampers or combination smoke/*fire dampers* stated in Sentence 3.1.8.7.(2) is permitted to be waived for ducts
 - (a) that serve commercial cooking equipment, (See also Article 6.3.1.6.)
 - (b) in which all inlet and outlet openings serve not more than one *fire compartment*,
 - (c) that penetrate a vertical *fire separation* referred to in Clause 3.3.1.7.(1)(b) or in Sentence 3.3.3.5.(4) or 3.3.4.11.(4), provided,
 - (i) the movement of air is continuous, and
 - (ii) the configuration of the air-handling system prevents the recirculation of exhaust or return air under fire emergency conditions, or
 - (d) that penetrate a vertical *fire separation* not required to have a *fire-resistance rating* and located within the *fire compartment* required in Sentence 3.3.3.5.(2).
- (2) The requirement for smoke dampers or combination smoke/*fire dampers* stated in Sentence 3.1.8.7.(2) is permitted to be waived for *noncombustible* branch ducts having a melting point above 760°C that penetrate a *fire separation*,
 - (a) provided the ducts
 - (i) have a cross-sectional area not more than 0.013 m² and serve only *air-conditioning* units or combined *air-conditioning* and heating units discharging air not more than 1.2 m above the floor,
 - (ii) extend not less than 500 mm inside *exhaust duct* risers that are under negative pressure and in which the airflow is upward as required by Article 3.6.3.4., or

- (iii) are required to function as part of an air handling system used to provide make-up air in accordance with Sentence 3.2.6.2.(6), or any other system used to limit smoke movement, or
- (b) where the *fire separation* separates a *vertical service space* from the remainder of the *building*, provided each individual duct exhausts directly to the outdoors at the top of the *vertical service space*.

3.1.8.10. Installation of Fire Dampers

- (1) A *fire damper* shall be installed in the plane of the *fire separation* so as to stay in place should the duct become dislodged during a fire. (See Note A-3.1.8.10.(1))
- (2) A *fire damper* shall be arranged so as to close automatically upon the operation of a fusible link conforming to ULC-S505, “Standard for Fusible Links for Fire Protection Services,” or other heat-actuated or smoke-actuated device.
- (3) A heat-actuated device referred to in Sentence (2) shall
 - (a) be located where it is readily affected by an abnormal rise of temperature in the duct, and
 - (b) have a temperature rating approximately 30°C above the maximum temperature that would exist in the system either with the system in operation or shut down.
- (4) A *fire damper* tested in the vertical or horizontal position shall be installed in the position in which it was tested.
- (5) A tightly fitted access door shall be installed for each *fire damper* to provide access for the inspection of the damper and the resetting of the release device. (See Note A-3.1.8.10.(5))

3.1.8.11. Installation of Smoke Dampers

- (1) Where smoke dampers are used as a *closure* in an air-transfer opening, they shall be installed in the plane of the *fire separation*.
- (2) Where combination smoke/*fire dampers* are used as a *closure* in a duct, they shall be installed within 610 mm of the plane of the *fire separation*, provided there is no inlet or outlet opening between the *fire separation* and the damper.
- (3) Except as required by a smoke control system, smoke dampers and combination smoke/*fire dampers* shall be configured so as to close automatically upon a signal from an adjacent *smoke detector* located as described in CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems,” within 1.5 m horizontally of the duct or air-transfer opening in the *fire separation*
 - (a) on both sides of the air-transfer opening, or
 - (b) in the duct downstream of the smoke damper or combination smoke/*fire damper*.
- (4) Smoke dampers or combination smoke/*fire dampers* shall be installed in the vertical or horizontal position in which they were tested.
- (5) A tightly fitted access door shall be installed for each smoke damper and combination smoke/*fire damper* to provide access for their inspection and the resetting of the release device. (See Note A-3.1.8.10.(5))

3.1.8.12. Twenty-Minute Closures

- (1) A door assembly having a *fire-protection rating* not less than 20 min is permitted to be used as a *closure* in
 - (a) a *fire separation* not required to have a *fire-resistance rating* more than 1 h, located between
 - (i) a *public corridor* and a *suite*,
 - (ii) a corridor and adjacent sleeping rooms, or
 - (iii) a corridor and adjacent classrooms, offices and libraries in Group A, Division 2 *major occupancies*, or
 - (b) a *fire separation* not required to have a *fire-resistance rating* more than 45 min, located in a *building* not more than 3 storeys in *building height*.

- (2) The requirements for *noncombustible* sills and *combustible* floor coverings in NFPA 80, “Standard for Fire Doors and Other Opening Protectives,” do not apply to a door described in Sentence (1).
- (3) A door described in Sentence (1) shall have clearances of not more than 6 mm at the bottom and not more than 3 mm at the sides and top.
- (4) In elementary and secondary schools, a door assembly conforming to Articles 9.10.13.2. and 9.10.13.3. is permitted to be used as a *closure* in a *fire separation* having a *fire-resistance rating* of 30 min.

3.1.8.13. Self-Closing Devices

- (1) Except as provided in Sentences (3) to (5) and 3.3.3.2.(5), every door in a *fire separation*, other than doors to freight elevators and dumbwaiters, shall be equipped with a self-closing device designed to return the door to the closed position after each use.
- (2) Reserved.
- (3) In a *building* that is not more than 3 *storeys* in *building height*, a self-closing device is not required on a door that is located between a classroom and a corridor providing *access to exit* from the classroom, except that a self-closing device is required on a door between a *hazardous classroom* and the corridor in an elementary or secondary school.
- (4) In a *building* that is not more than 3 *storeys* in *building height*, a self-closing device is not required on a door between a *public corridor* and an adjacent room or *suite* of *business and personal services occupancy* if the door is not located in,
 - (a) a dead-end portion of the corridor, or
 - (b) a corridor that serves a *hotel*.
- (5) Within a *fire compartment* in a hospital or long-term care home that complies with the requirements of Article 3.3.3.5., a self-closing device is not required on a door that is located between
 - (a) a patient’s or resident’s sleeping room and a corridor serving the patient’s or resident’s sleeping room, or
 - (b) a patient’s or resident’s sleeping room and an adjacent room that serves the patient’s or resident’s sleeping room.

3.1.8.14. Hold-Open Devices

- (1) Except as provided in Sentences 3.1.8.10.(2) and 3.1.8.11.(3), a hold-open device is permitted to be used on a *closure* in a required *fire separation*, other than on an *exit* stair door in a *building* more than 3 *storeys* in *building height* and on a door for a vestibule required by Article 3.3.5.7., provided the device is designed to release the *closure* in conformance with this Article.
- (2) Except as provided in Sentences (5) and (6), where the *building* is provided with a fire alarm system, a hold-open device permitted by Sentence (1) shall release
 - (a) in a single-stage system, upon any signal from the fire alarm system, and
 - (b) in a 2-stage system,
 - (i) upon any *alert signal* from the fire alarm system, or
 - (ii) upon actuation of any adjacent *smoke detectors*.
- (3) Where the *building* is provided with a fire alarm system, a hold-open device permitted by Sentence (1) shall release upon a signal from a *smoke detector* connected to the fire alarm system and located as described in CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems,” where the hold-open device is used on
 - (a) an *exit* door,
 - (b) a door opening into a *public corridor*,
 - (c) an egress door referred to in Sentence 3.4.2.4.(2),
 - (d) a *closure* serving an *assembly, care, care and treatment, detention, or residential occupancy*,
 - (e) a door in a *fire separation* referred to in Clause 3.3.1.7.(1)(b) or Sentence 3.3.3.5.(4) or 3.3.4.11.(4), or
 - (f) a door required to function as part of a smoke control system.

(4) Where the *building* is not provided with a fire alarm system, a hold-open device permitted by Sentence (1) shall release upon a signal from a *smoke alarm* located on either side of the *fire separation* at ceiling level within 1.5 m horizontally of the *closure* opening in the *fire separation*, where the hold-open device is used on *closures* described in Clauses (3)(a) to (e).

(5) Where a hold-open device is used on *closures* other than those described in Sentences (3) and (4), it is permitted to be released upon actuation of a heat-actuated device.

(6) A hold-open device used on a door located between a corridor used by the public and an adjacent sleeping room in a *care and treatment occupancy* need not release automatically as stated in Sentence (2).

3.1.8.15. Door Latches

(1) Except as permitted by Sentence 3.3.3.2.(5) and Article 3.3.3.5., a swing-type door in a *fire separation* shall be equipped with a positive latching mechanism designed to hold the door in the closed position after each use.

3.1.8.16. Wired Glass and Glass Block

(1) Except as permitted by Articles 3.1.8.18. and 3.1.8.19. for the separation of *exits*, an opening in a *fire separation* having a *fire-resistance rating* not more than 1 h is permitted to be protected with fixed wired glass assemblies or glass blocks installed in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives.” (See also Article 3.3.2.17.)

(2) Wired glass assemblies permitted by Sentence (1) and described in MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” are permitted to be used as *closures* in vertical *fire separations* without being tested in accordance with Sentence 3.1.8.4.(1).

(3) Glass blocks permitted by Sentence (1) shall be installed in accordance with Subsection 4.3.2. and reinforced with steel reinforcement in each horizontal joint.

3.1.8.17. Temperature Rise Limit for Doors

(1) Except as permitted by Article 3.1.8.19., the maximum temperature rise on the opaque portion of the unexposed side of a door used as a *closure* in a *fire separation* in a location shown in Table 3.1.8.17. shall conform to the Table when tested in conformance with Sentence 3.1.8.4.(1).

Table 3.1.8.17.
Restrictions on Temperature Rise and Glazing for Closures
 Forming Part of Articles of 3.1.8.17. and 3.1.8.18.

Location	Minimum Required Fire-Protection Rating of Door	Maximum Temperature Rise on Opaque Portion of Unexposed Side of Door, °C	Maximum Aggregate Area of Wired Glass or Safety Glazing in a Door, m ²	Maximum Aggregate Area of Glass Block, Wired Glass or Safety Glazing Panels Not in a Door, m ²
Between a dead-end corridor and an adjacent <i>occupancy</i> where the corridor provides the only <i>access to exit</i> and is required to have a <i>fire-resistance rating</i>	Less than 45 min	No limit	No limit	No limit
	45 min	250 after 30 min	0.0645	0.0645
Between an <i>exit</i> enclosure and the remainder of the <i>floor area</i> in <i>buildings</i> not more than 3 <i>storeys</i> in <i>building height</i>	All ratings	No limit	0.8	0.8
Between an <i>exit</i> enclosure and the remainder of the <i>floor area</i> (except as permitted above)	45 min	250 after 30 min	0.0645	0.0645
	1.5 h	250 after 1 h	0.0645	0.0645
	2 h	250 after 1 h	0.0645	0.0645
In a <i>firewall</i>	45 min	250 after 30 min	0.0645	0
	1.5 h	250 after 30 min	0.0645	0
	3 h	250 after 1 h	0	0

3.1.8.18. Area Limits for Wired Glass, Glass Block and Safety Glazing

- (1) Except as permitted by Article 3.1.8.19., the maximum aggregate area of wired glass or safety glazing in a door used in the locations shown in Table 3.1.8.17. shall conform to the Table. (See Note A-3.1.8.18.(1))
- (2) Except as permitted by Article 3.1.8.19., the maximum aggregate area of glass block, wired glass or safety glazing panels not in a door used in the locations shown in Table 3.1.8.17. shall conform to the Table.

3.1.8.19. Temperature Rise and Area Limits Waived

- (1) The temperature rise limits and glass area limits required by Articles 3.1.8.17. and 3.1.8.18. are waived for a *closure* between an *exit* enclosure and an enclosed vestibule or corridor, provided
- the vestibule or corridor is separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 45 min,
 - the *fire separation* required by Clause (a) contains no wired glass, glass block or safety glazing within 3 m of the *closure* into the *exit* enclosure, and
 - the vestibule or corridor contains no *occupancy*.
- (See Note A-3.1.8.19.(1))

3.1.8.20. Sprinkler Protected Glazed Wall Assembly

- (1) A sprinkler protected glazed wall assembly shall be constructed in accordance with the requirements of CAN/ULC-S136, “Standard Method of Fire Test of Sprinkler Protected Window Systems.”
- (2) A sprinkler protected glazed wall assembly shall not be installed in
- fire separations* requiring a *fire-resistance rating* of more than 2 h,
 - a *firewall*,

- (c) a *high-hazard industrial occupancy*, or
 - (d) any part of an *exit* serving
 - (i) a *floor area* subject to the requirements of Subsection 3.2.6.,
 - (ii) a *care occupancy*,
 - (iii) a *care and treatment occupancy*,
 - (iv) a *detention occupancy*, or
 - (v) a *residential occupancy*.
- (3) Where a sprinkler protected glazed wall assembly is installed in an *exit fire separation* permitted in Sentence (2),
- (a) the *building* shall be *sprinklered* throughout, and
 - (b) the *exits* protected with the sprinkler protected glazed wall assemblies shall not comprise more than one-half of the required number of *exits* from any *floor area*.

3.1.9. Penetrations in Fire Separations and Fire-Rated Assemblies

(See Note A-3.1.9.)

3.1.9.1. Firestops

- (1) Except as provided in Sentences (2) to (7) and Article 3.1.9.3., penetrations of a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* shall be
- (a) sealed by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the required *fire-resistance rating* of the *fire separation*, or
 - (b) cast-in-place, where the item penetrating the *fire separation* is steel, ferrous, copper, concrete or masonry. (See Note A-3.1.9.1.(1)(b))
- (See also Article 3.1.9.4. for requirements regarding penetrations by *combustible* drain, waste and vent piping.)
- (2) Except as permitted in Sentence (6), penetrations of a *firewall* or a horizontal *fire separation* that is required to have a *fire-resistance rating* in conformance with Article 3.2.1.2. shall be sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* for the *fire separation*.
- (3) Except as permitted in Sentences (6) and (7), penetrations of a *fire separation* in conformance with Sentence 3.6.4.2.(2) shall be sealed by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* for the *fire separation* of the assembly.
- (4) Sprinklers are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of Sentences (1) to (3), provided the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (5) Unless specifically designed with a *firestop*, *fire dampers* are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of Sentences (1) to (3), provided the *fire damper* is installed in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives.”
- (6) Service equipment penetrations through a horizontal *fire separation* having a *fire-resistance rating* as described in Sentences (2) and (3) that are contained within the cavity of a wall above and below the horizontal *fire separation* are permitted to be sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the *fire-resistance rating* for the *fire separation*.

(7) Service equipment penetrations through a horizontal *fire separation* having a *fire-resistance rating* as described in Sentence (3) are permitted to be sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the *fire-resistance rating* for the *fire separation*, provided the penetration

- (a) is contained within the concealed space of a floor or ceiling assembly having a *fire-resistance rating*,
- (b) is located above a ceiling membrane that is a horizontal *fire separation*, or
- (c) is contained within a *horizontal service space* conforming to Subsection 3.6.4. that is directly above or below the floor.

3.1.9.2. Service Equipment Penetrations

(1) Ducts, electrical outlet boxes, pipes, totally enclosed raceways, optical fibre cables, electrical wires and cables, and other similar service equipment are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating*, provided they are protected at the penetration with a *firestop* conforming to Sentence 3.1.9.1.(1). (See Note A-3.1.9.2.(1))

(2) *Combustible* totally enclosed raceways that are embedded in a concrete floor slab are permitted in an assembly required to have a *fire-resistance rating*, provided the concrete cover between the raceway and the bottom of the slab is not less than 50 mm.

3.1.9.3. Penetration by Outlet Boxes (See Note A-3.1.9.3.) (See also Note A-3.1.9.2.(1))

(1) Except as provided in Sentence (3), outlet boxes are permitted to penetrate the membrane of an assembly required to have a *fire-resistance rating*, provided they are sealed at the penetration by a *firestop* that has an FT rating not less than the *fire-resistance rating* of the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems.”

(2) *Combustible* outlet boxes are permitted to penetrate the membrane of an assembly required to have a *fire-resistance rating*, provided they are sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* for the *fire separation*.

(3) Except as provided in Sentences 3.1.9.1.(2) and (3), *noncombustible* outlet boxes that penetrate a vertical *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* need not conform to Sentence (1), provided

- (a) they do not exceed,
 - (i) 0.016 m² in area, and
 - (ii) an aggregate area of 0.065 m² in any 9.3 m² of surface area, and
- (b) the annular space between the membrane and *noncombustible* electrical outlet boxes does not exceed 3 mm.

(4) Outlet boxes on opposite sides of a vertical *fire separation* having a *fire-resistance rating* shall be separated by

- (a) a horizontal distance of not less than 600 mm,
- (b) a *fire block* conforming to Article 3.1.11.7., or
- (c) a *firestop* installed on each outlet box that has an FT rating not less than the *fire-resistance rating* of the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems.”

3.1.9.4. Combustible Piping Penetrations

(1) *Combustible* sprinkler piping is permitted to penetrate a *fire separation* provided the *fire compartments* on each side of the *fire separation* are *sprinklered*.

(2) *Combustible* water distribution piping is permitted to penetrate a *fire separation* that is required to have a *fire-resistance rating*, provided the piping is protected at the penetration with a *firestop* in conformance with Clause (4)(a) or (b).

- (3) Except as permitted by Sentences (4), (5), (7) and (8), *combustible* piping shall not be used in a drain, waste and vent piping system if any part of that system penetrates
- (a) a *fire separation* required to have a *fire-resistance rating*, or
 - (b) a membrane that forms part of an assembly required to have a *fire-resistance rating*.
- (4) *Combustible* drain, waste and vent piping is permitted to penetrate a *fire separation* required to have a *fire-resistance rating* or a membrane that forms part of an assembly required to have a *fire-resistance rating*, provided
- (a) except as provided in Clause (b), the piping is sealed at the penetration by a *firestop* that has an F rating not less than the *fire-resistance rating* required for the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,”
 - (b) in *buildings* more than 3 *storeys* in *building height*, the piping is sealed at the penetration by a *firestop* that has an F rating not less than the *fire-resistance rating* required for the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, and
 - (c) the piping is not located in a *vertical service space*.
- (5) *Combustible* drain, waste and vent piping is permitted on one side of a vertical *fire separation* provided it is not located in a *vertical service space*.
- (6) *Combustible* piping for central vacuum systems is permitted to penetrate a *fire separation*, provided the installation conforms to the requirements that apply to *combustible* drain, waste and vent piping specified in Sentence (4).
- (7) Except as provided in Sentence (8), penetrations of a *fire separation* that incorporate transitions between *combustible* and *noncombustible* drain, waste and vent piping shall be sealed by a *firestop* that has an F rating not less than the *fire-resistance rating* required for the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side.
- (8) Transitions between vertical *noncombustible* drain, waste and vent piping and *combustible* branches for drain, waste and vent piping are permitted on either side of a *fire separation*, provided they are not located in a *vertical service space*. (See Note A-3.1.9.4.(8))
- (9) *Combustible* piping not more than 25 mm in diameter containing chlorine gas is permitted to penetrate a *fire separation* between a chlorine gas *service room* built in conjunction with a *public pool* or *public spa* and the remainder of the *building*, provided the piping is sealed at the penetration by a *firestop* in conformance with Clause 3.1.9.1.(1)(a).

3.1.9.5. Openings Through a Membrane Ceiling

- (1) A membrane ceiling forming part of an assembly assigned a *fire-resistance rating* on the basis of MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” is permitted to be penetrated by openings leading into ducts within the ceiling space provided
- (a) the ducts are sheet steel, and
 - (b) the number of openings and their protection conform to the requirements of MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”
- (2) *Fire stop flaps* in ceiling membranes required in Sentence (1) shall conform to CAN/ULC-S112.2, “Standard Method of Fire Test of Ceiling Firestop Flap Assemblies.”

3.1.9.6. Plenums

- (1) A ceiling assembly used as a *plenum* shall conform to Article 3.6.4.3.

3.1.10. Firewalls

3.1.10.1. Prevention of Firewall Collapse

- (1) Except as permitted by Sentence (2), the connections and supports for structural framing members that are connected to or supported on a *firewall* and have a *fire-resistance rating* less than that required for the *firewall*, shall be designed so that the failure of the framing systems during a fire will not affect the integrity of the *firewall* during the fire.
- (2) Sentence (1) does not apply to a *firewall* consisting of two separate wall assemblies each tied to its respective *building* frame but not to each other, provided each wall assembly is
 - (a) a *fire separation* having one-half of the *fire-resistance rating* required for the *firewall* by Sentences 3.1.10.2.(1) and (2), and
 - (b) designed so that the collapse of one wall assembly will not cause collapse of the other.
- (3) A *firewall* is permitted to be supported on the structural frame of a *building* of *noncombustible construction* provided the supporting frame has a *fire-resistance rating* not less than that required for the *firewall*.
- (4) Piping, ducts and totally enclosed *noncombustible* raceways shall be installed so that their collapse will not cause collapse of the *firewall*.

3.1.10.2. Rating of Firewalls

- (1) A *firewall* that separates a *building* or *buildings* with *floor areas* containing a Group E or a Group F, Division 1 or 2 *major occupancy* shall be constructed as a *fire separation* of *noncombustible construction* having a *fire-resistance rating* not less than 4 h, except that where the upper portion of a *firewall* separates *floor areas* containing other than Group E or Group F, Division 1 or 2 *major occupancies*, the *fire-resistance rating* of the upper portion of the *firewall* is permitted to be not less than 2 h.
- (2) A *firewall* that separates a *building* or *buildings* with *floor areas* containing *major occupancies* other than Group E or Group F, Division 1 or 2 shall be constructed as a *fire separation* of *noncombustible construction* having a *fire-resistance rating* not less than 2 h.
- (3) Except as permitted by Sentence (4), the required *fire-resistance rating* of a *firewall*, except for *closures*, shall be provided by masonry or concrete.
- (4) A *firewall* permitted to have a *fire-resistance rating* not more than 2 h need not be constructed of masonry or concrete provided
 - (a) the assembly providing the *fire-resistance rating* is protected against damage that would compromise the integrity of the assembly,
 - (b) the design conforms to Article 4.1.5.17.,
 - (c) the level of performance of the *firewall* is not less than of masonry or concrete in the areas of
 - (i) performance during fire conditions,
 - (ii) mechanical damage during the normal use of the *building*, and
 - (iii) resistance to damage from moisture,
 - (d) the *firewall* separates *buildings* or *buildings* with *floor areas* that do not contain
 - (i) a Group B, Division 1 *major occupancy*, or
 - (ii) a Group B, Division 2 *major occupancy*, and
 - (e) the *firewall* does not separate a *building* regulated by the provisions of Subsection 3.2.6. or a *building* within the scope of Article 3.2.2.51. or 3.2.2.60. from another *building* unless the *buildings* on both sides of the *firewall* are *sprinklered*.(See Note A-3.1.10.2.(4))

3.1.10.3. Continuity of Firewalls

- (1) A *firewall* shall extend from the ground continuously through, or adjacent to, all *storeys* of a *building* or *buildings* so separated, except that a *firewall* located above a *basement storage garage* conforming to Article 3.2.1.2. is permitted to commence at the floor assembly immediately above the *storage garage*. (See also Sentence 3.1.10.1.(3))
- (2) A *firewall* is permitted to terminate on the underside of a reinforced concrete roof slab provided
 - (a) the roof slab on both sides of the *firewall* has a *fire-resistance rating* not less than
 - (i) 1 h if the *firewall* is required to have a *fire-resistance rating* not less than 2 h, or
 - (ii) 2 h if the *firewall* is required to have a *fire-resistance rating* not less than 4 h, and
 - (b) there are no concealed spaces within the roof slab in that portion immediately above the *firewall*.

3.1.10.4. Parapets

- (1) Except as permitted by Sentences (2) and 3.1.10.3.(2), a *firewall* shall extend above the roof surface to form a parapet not less than
 - (a) 150 mm high for a *firewall* required to have a *fire-resistance rating* not less than 2 h, and
 - (b) 900 mm high for a *firewall* required to have a *fire-resistance rating* not less than 4 h.
- (2) A *firewall* that separates 2 *buildings* with roofs at different elevations need not extend above the upper roof surface to form a parapet, provided the difference in elevation between the roofs is more than 3 m.

3.1.10.5. Maximum Openings

- (1) Openings in a *firewall* shall conform to the size limits described in Article 3.1.8.6.
- (2) The aggregate width of openings in a *firewall* within a *storey* shall be not more than 25% of the entire length of the *firewall*.

3.1.10.6. Exposure Protection for Adjacent Walls

- (1) The requirements of Article 3.2.3.14. shall apply to the external walls of 2 *buildings* that meet at a *firewall* at an angle less than 135°.

3.1.10.7. Combustible Projections

- (1) *Combustible* material shall not extend across the end of a *firewall* but is permitted to extend across a roof above a *firewall* that is terminated in conformance with Sentence 3.1.10.3.(2).
- (2) If *buildings* are separated by a *firewall*, *combustible* projections on the exterior of one *building*, including balconies, platforms, *canopies*, eave projections and stairs, that extend outward beyond the end of the *firewall*, shall not be permitted within 2.4 m of *combustible* projections and window or door openings of the adjacent *building*. (See also Article 3.2.3.6.)

3.1.11. Fire Blocks in Concealed Spaces

3.1.11.1. Separation of Concealed Spaces

- (1) Concealed spaces in interior wall, ceiling and crawl spaces shall be separated from concealed spaces in exterior walls and *attic or roof spaces* by *fire blocks* conforming to Article 3.1.11.7.

3.1.11.2. Fire Blocks in Wall Assemblies

- (1) Except as permitted by Sentence (2), *fire blocks* conforming to Article 3.1.11.7. shall be provided to block off concealed spaces within a wall assembly
 - (a) at every floor level,
 - (b) at every ceiling level where the ceiling forms part of an assembly required to have a *fire-resistance rating*, and
 - (c) so that the maximum horizontal dimension is not more than 20 m and the maximum vertical dimension is not more than 3 m.
- (2) *Fire blocks* conforming to Sentence (1) are not required provided
 - (a) the wall space is filled with insulation,
 - (b) the exposed construction materials and any insulation within the wall space are *noncombustible*,
 - (c) the exposed materials within the wall space, including insulation but not including wiring, piping or similar services, have a *flame-spread rating* not more than 25 on any exposed surface, or on any surface that would be exposed by cutting through the material in any direction, and *fire blocks* are installed so that the vertical distance between them is not more than 10 m, or
 - (d) the insulated wall assembly contains not more than one concealed air space, and the horizontal thickness of that air space is not more than 25 mm.

3.1.11.3. Fire Blocks Between Nailing and Supporting Elements

- (1) In a *building* required to be of *noncombustible construction*, a concealed space in which there is an exposed ceiling finish with a *flame-spread rating* more than 25, shall be provided with *fire blocks* conforming to Article 3.1.11.7. between wood nailing elements, so that the maximum area of the concealed space is not more than 2 m².
- (2) In a *building* required to be of *noncombustible construction*, *fire blocks* conforming to Article 3.1.11.7. shall be provided in the concealed spaces created by the wood members permitted by Sentence 3.1.5.10.(2), so that the maximum area of a concealed space is not more than 10 m².
- (3) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, a concealed space in which there is an exposed ceiling finish with a *flame-spread rating* more than 25 shall be provided with *fire blocks* conforming to Article 3.1.11.7. between wood nailing elements so that the maximum area of the concealed space is not more than 2 m². (See Note A-3.1.11.3.(3))
- (4) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, *fire blocks* conforming to Article 3.1.11.7. shall be provided in the concealed spaces created by the wood members permitted by Sentence 3.1.6.12.(1) so that the maximum area of a concealed space is not more than 10 m².

3.1.11.4. Fire Blocks Between Vertical and Horizontal Spaces

- (1) *Fire blocks* conforming to Article 3.1.11.7. shall be provided
 - (a) at all interconnections between concealed vertical and horizontal spaces in interior coved ceilings, drop ceilings and soffits in which the exposed construction materials within the space have a *flame-spread rating* more than 25, and
 - (b) at the end of each run and at each floor level in concealed spaces between stair stringers in which the exposed construction materials within the space have a *flame-spread rating* more than 25.

3.1.11.5. Fire Blocks in Horizontal Concealed Spaces

- (1) Except for crawl spaces conforming to Sentence 3.1.11.6.(1) and as required in Sentence (3), horizontal concealed spaces within a floor assembly or roof assembly of *combustible construction*, in which sprinklers are not installed, shall be separated by construction conforming to Article 3.1.11.7. into compartments
 - (a) not more than 600 m² in area with no dimension more than 60 m, if the exposed construction materials within the space have a *flame-spread rating* not more than 25, and

(b) not more than 300 m² in area with no dimension more than 20 m, if the exposed construction materials within the space have a *flame-spread rating* more than 25.

(See Note A-3.1.11.5.(1))

(2) A concealed space in an exterior cornice, a mansard style roof, a balcony or a *canopy* in which exposed construction materials within the space have a *flame-spread rating* more than 25, shall be separated by construction conforming to Article 3.1.11.7.

- (a) at locations where the concealed space extends across the ends of required vertical *fire separations*, and
- (b) so that the maximum dimension in the concealed space is not more than 20 m.

(3) Except as provided by Sentence (5), in *buildings* or parts thereof conforming to Article 3.2.2.51. or 3.2.2.60., horizontal concealed spaces within a floor assembly or roof assembly of *combustible construction* shall be separated by construction conforming to Article 3.1.11.7. into compartments that are

- (a) not more than 600 m² in area with no dimension more than 60 m, if the exposed construction materials within the space have a *flame-spread rating* not more than 25, and
- (b) not more than 300 m² in area with no dimension more than 20 m, if the exposed construction materials within the space have a *flame-spread rating* more than 25.

(See Note A-3.1.11.5.(3) and (4))

r1 (4) Except for crawl spaces conforming to Sentence 3.1.11.6.(1) and except as provided in Sentence (5), in *buildings* or parts thereof conforming to Article 3.2.2.48., 3.2.2.57. or 3.2.2.93., horizontal concealed spaces within a floor assembly or roof assembly of *encapsulated mass timber construction* shall be separated by construction conforming to Article 3.1.11.7. into compartments that are

- (a) not more than 600 m² in area with no dimension more than 60 m, if the exposed construction materials within the space have a *flame-spread rating* not more than 25, and
- (b) not more than 300 m² in area with no dimension more than 20 m, if the exposed construction materials within the space have a *flame-spread rating* more than 25.

(See Note A-3.1.11.5.(3) and (4))

(5) *Fire blocks* conforming to Sentences (3) and (4) are not required where the horizontal concealed space within the floor or roof assembly is entirely filled with *noncombustible* insulation such that any air gap between the top of the insulation and the floor or roof deck does not exceed 50 mm.

3.1.11.6. Fire Blocks in Crawl Spaces

(1) A crawl space that is not considered as a *basement* by Article 3.2.2.9. and in which sprinklers are not installed shall be separated by construction conforming to Article 3.1.11.7. into compartments not more than 600 m² in area with no dimension more than 30 m.

3.1.11.7. Fire Block Materials

(1) Except as permitted by Sentences (2) to (5) and (8), *fire blocks* shall remain in place and prevent the passage of flames for not less than 15 min when subjected to the standard fire exposure in CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”

(2) Gypsum board not less than 12.7 mm thick and sheet steel not less than 0.38 mm thick need not be tested in conformance with Sentence (1) provided all joints have continuous support.

(3) In a *building* required to be of *noncombustible construction*, wood nailing elements described in Article 3.1.5.8. need not be tested in conformance with Sentence (1).

(4) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, wood nailing elements referred to in Article 3.1.6.11. need not be tested in conformance with Sentence (1).

- (5) In a *building* permitted to be of *combustible construction*, in a *combustible* roof system permitted by Sentences 3.1.5.3.(2) and 3.1.6.7.(1), and in a raised platform permitted by Sentence 3.1.5.10.(2) or 3.1.6.12.(1), *fire blocks* are permitted to be
- (a) solid lumber or a structural composite lumber product conforming to ASTM D5456, “Standard Specification for Evaluation of Structural Composite Lumber Products,” not less than 38 mm thick,
 - (b) phenolic bonded plywood, OSB, waferboard or oriented strandboard not less than 12.5 mm thick with joints supported, or
 - (c) two thicknesses of lumber or a structural composite lumber product conforming to ASTM D5456, “Standard Specification for Evaluation of Structural Composite Lumber Products,” each not less than 19 mm thick with joints staggered, where the width or height of the concealed space requires more than one piece of lumber or structural composite lumber product not less than 38 mm thick to block off the space.
- (6) Openings through materials referred to Sentences (1) to (5) shall be protected to maintain the integrity of the construction.
- (7) Where materials referred to Sentences (1) to (5) are penetrated by construction elements or by service equipment, a *firestop* shall be used to seal the penetration. (See Note A-3.1.11.7.(7))
- (8) In *buildings* permitted to be of *combustible construction*, semi-rigid fibre insulation board produced from glass, rock or slag is permitted to be used to block the vertical space in a double stud wall assembly formed at the intersection of the floor assembly and the walls, provided the width of the vertical space does not exceed 25 mm and the insulation board
- (a) has a density not less than 45 kg/m³,
 - (b) is securely fastened to one set of studs,
 - (c) extends from below the bottom of the top plates in the lower *storey* to above the top of the bottom plate in the upper *storey*, and
 - (d) completely fills the portion of the vertical space between the headers and between the wall plates.
- (See Note A-3.1.11.7.(8))

3.1.12. Flame-Spread Rating and Smoke Developed Classification

3.1.12.1. Determination of Ratings

- (1) Except as required by Sentence (2) and as permitted by Sentence (3), the *flame-spread rating* and smoke developed classification of a material, assembly, or structural member shall be determined on the basis of not less than three tests conducted in conformance with CAN/ULC-S102, “Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.”
- (2) The *flame-spread rating* and smoke developed classification of a material or assembly shall be determined on the basis of not less than three tests conducted in conformance with CAN/ULC-S102.2, “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies,” if the material or assembly
- (a) is designed for use in a relatively horizontal position with only its top surface exposed to air,
 - (b) cannot be tested in conformance with Sentence (1) without the use of supporting material that is not representative of the intended installation, or
 - (c) is thermoplastic.
- (3) A material, assembly, or structural member is permitted to be assigned a *flame-spread rating* and smoke developed classification on the basis of MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

3.1.13. Interior Finish

3.1.13.1. Interior Finishes, Furnishings and Decorative Materials

- (1) Except as otherwise provided in this Subsection, interior finishes, furnishings and decorative materials shall conform to
 - (a) the Fire Code made under the Fire Protection and Prevention Act, 1997, or
 - (b) Section 2.3. of Division B of the CCBFC NRC-CONST-56437E, “National Fire Code of Canada”, in the absence of regulations referred to in Clause (a).

- (2) Interior finish material shall include any material that forms part of the interior surface of a floor, wall, *partition* or ceiling, including
 - (a) interior cladding of plaster, wood or tile,
 - (b) surfacing of fabric, paint, plastic, veneer or wallpaper,
 - (c) doors, windows and trim,
 - (d) lighting elements, such as light diffusers and lenses forming part of the finished surface of the ceiling, and
 - (e) carpet material that overlies a floor that is not intended as the finished floor.

3.1.13.2. Flame-Spread Rating

- (1) Except as otherwise required or permitted by this Subsection, the *flame-spread rating* of interior wall and ceiling finishes, including glazing and skylights, shall be not more than 150 and shall conform to Table 3.1.13.2.

- (2) Except as permitted by Sentence (3), doors, other than those in Group A, Division 1 *occupancies*, need not conform to Sentence (1) provided they have a *flame-spread rating* not more than 200. (See Note A-3.1.13.2.(2))

- (3) Doors within a *dwelling unit* need not conform to Sentences (1) and (2).

Table 3.1.13.2.
Flame-Spread Ratings
Forming Part of Sentence 3.1.13.2.(1)

Occupancy, Location or Element	Maximum <i>Flame-Spread Rating</i> for Walls and Ceilings	
	<i>Sprinklered</i>	<i>Not Sprinklered</i>
Group A, Division 1 <i>occupancies</i> , including doors, skylights, glazing and light diffusers and lenses	150	75
Group B <i>occupancies</i>	150	75
<i>Exits</i> ⁽¹⁾	25	25
Lobbies described in Sentence 3.4.4.2.(2)	25	25
Covered vehicular passageways, except for roof assemblies of <i>heavy timber construction</i> in the passageways	25	25
<i>Vertical service spaces</i>	25	25

Notes to Table 3.1.13.2.:

- (1) See Articles 3.1.13.8. and 3.1.13.10.

(4) Up to 10% of the total wall area and 10% of the total ceiling area of a wall or ceiling finish that is required by Sentence (1) to have a *flame-spread rating* less than 150 is permitted to have a *flame-spread rating* not more than 150, except that up to 25% of the total wall area of lobbies described in Sentence 3.4.4.2.(2) is permitted to have a *flame-spread rating* not more than 150.

(5) Except in the case of Group A, Division 1 *occupancies*, *combustible* doors, skylights, glazing and light diffusers and lenses shall not be considered in the calculation of wall and ceiling areas described in Sentence (4).

3.1.13.3. Bathrooms in Residential Suites

(1) The *flame-spread rating* of interior wall and ceiling finishes for a bathroom within a *suite* of *residential occupancy* shall be not more than 200.

(2) *Plumbing fixtures* shall have a *flame-spread rating* not more than 200.

3.1.13.4. Light Diffusers and Lenses

(1) The *flame-spread rating* of *combustible* light diffusers and lenses in all *occupancies* other than Group A, Division 1 is permitted to be more than the *flame-spread rating* limits required elsewhere in this Subsection, provided the light diffusers and lenses

- (a) have a *flame-spread rating* not more than 250 and a smoke developed classification not more than 600 when tested in conformance with CAN/ULC-S102.2, “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies,”
- (b) fall to the bottom of the test apparatus before igniting when tested in conformance with CAN/ULC-S102.3, “Standard Method of Fire Test of Light Diffusers and Lenses,”
- (c) are not prevented from falling from the ceiling by construction located beneath the elements, and
- (d) are not used in a corridor that is required to be separated from the remainder of the *building* by a *fire separation* or in an *exit* shaft unless individual diffusers or lenses are not more than 1 m² in area and are not less than 1.2 m apart.

3.1.13.5. Skylights

(1) Individual *combustible* skylights in a corridor that is required to be separated from the remainder of the *building* by a *fire separation* shall be not more than 1 m² in area and not less than 1.2 m apart.

3.1.13.6. Corridors

(1) Except as permitted by Sentences (2) and (3), the *flame-spread rating* shall be not more than 75 for the interior wall finish of

- (a) a *public corridor*,
- (b) a corridor used by the public in,
 - (i) an *assembly occupancy*, or
 - (ii) a *care, care and treatment* or *detention occupancy*,
- (c) a corridor serving classrooms, or
- (d) a corridor serving sleeping rooms in a *care, care and treatment* or *detention occupancy*.

(2) The *flame-spread rating* for corridors specified in Sentence (1) is permitted to be waived, provided the *flame-spread rating* is not more than

- (a) 25 on the upper half of the wall, and
- (b) 150 on the lower half of the wall.

(3) Where the *floor area* is *sprinklered* throughout, the *flame-spread ratings* for corridors specified in Sentences (1) and (2) shall be not more than 150.

- (4) The *flame-spread ratings* specified in Sentences (1), (2) and (3) apply to *occupancies* in the corridor as well as to the corridor itself.
- (5) Except as provided in Sentence (6), the interior ceiling finish of corridors and *occupancies* referred to in Sentences (1) and (4) shall have a *flame-spread rating* not more than 25.
- (6) Where the *floor area* is *sprinklered* throughout, the *flame-spread rating* of the interior ceiling finish of corridors and *occupancies* referred to in Sentences (1) and (4) shall be not more than 150.

3.1.13.7. High Buildings

- (1) Except as permitted by Sentences (2) to (4), the interior wall, ceiling and floor finishes in a *building* regulated by the provisions of Subsection 3.2.6. shall conform to the *flame-spread rating* requirements in Articles 3.1.13.2. to 3.1.13.6. and 3.1.13.11. and to the *flame-spread rating* and smoke developed classification values in Table 3.1.13.7.
- (2) Except for a *building* of Group B *major occupancy* and elevator cars, the *flame-spread rating* and smoke developed classification of interior wall, floor and ceiling finishes need not conform to the values in Table 3.1.13.7., provided the *building* is *sprinklered*.
- (3) Trim and millwork in an *exit* stairway, a vestibule to an *exit* stairway, a lobby described in Sentence 3.4.4.2.(2), or a corridor not within a *suite* need not conform to the *flame-spread rating* and smoke developed classification requirements of Sentence (1), provided they have
 - (a) a *flame-spread rating* not more than 150,
 - (b) a smoke developed classification not more than 300, and
 - (c) an aggregate area not more than 10% of the area of the wall or ceiling on which they occur.

Table 3.1.13.7.
Flame-Spread Rating and Smoke Developed Classification in High Buildings
 Forming Part of Sentences 3.1.13.7.(1) and (2)

Location or Element	Maximum <i>Flame-Spread Rating</i>			Maximum Smoke Developed Classification		
	Wall Surface	Ceiling Surface ⁽¹⁾	Floor Surface	Wall Surface	Ceiling Surface ⁽¹⁾	Floor Surface
<i>Exit</i> stairways, vestibules to <i>exit</i> stairs and lobbies described in Sentence 3.4.4.2.(2)	25	25	25	50	50	50
Corridors not within <i>suites</i>	(2)	(2)	300	100	50	500
Elevator cars	75	75	300	450	450	450
Elevator vestibules	25	25	300	100	100	300
<i>Service spaces</i> and <i>service rooms</i>	25	25	25	50	50	50
Other locations and elements	(2)	(2)	No limit	300	50	No limit

Notes to Table 3.1.13.7.:

- (1) See Sentence 3.1.13.4.(1) for lighting elements.
- (2) Other requirements of this Part apply.

- (4) A door serving an *exit* stairway, a vestibule to an *exit* stairway, a lobby described in Sentence 3.4.4.2.(2), or a corridor not within a *suite* need not conform to the *flame-spread rating* and smoke developed classification requirements of Sentence (1) provided
- (a) it has a *flame-spread rating* not more than 200,
 - (b) it has a smoke developed classification not more than 300, and
 - (c) the aggregate area of all doors is not more than 10% of the area of the wall in which they are located.
- (5) Except as permitted in Sentences (6) to (8), *plumbing fixtures* in a *building* regulated by the provisions of Subsection 3.2.6. shall have a smoke developed classification not more than 300.
- (6) A *plumbing fixture* that is not located in a Group B *occupancy* need not comply with Sentence (5) if the *building* is *sprinklered* throughout.
- (7) A *plumbing fixture* may have a smoke developed classification more than 300 but not more than 500 if,
- (a) it is in a room where the wall surfaces have a smoke developed classification not more than 200, and
 - (b) it is located in,
 - (i) a Group C *occupancy*, or
 - (ii) a Group B *occupancy* and the *building* is *sprinklered* throughout.
- (8) A therapeutic bathing system in a Group B *occupancy* need not comply with Sentence (5) if the room in which it is located,
- (a) does not open directly into patients' or residents' sleeping rooms, and
 - (b) is *sprinklered*.

3.1.13.8. Noncombustible Construction

- (1) In a *building* required to be of *noncombustible construction*,
- (a) the *flame-spread ratings* required by Subsection 3.1.5. shall apply in addition to the requirements in this Subsection, and
 - (b) the *flame-spread ratings* for *exits* in this Subsection shall also apply to any surface in the *exit* that would be exposed by cutting through the material in any direction, except that this requirement does not apply to doors, *heavy timber construction* in a *sprinklered building* and *fire-retardant-treated wood*.

3.1.13.9. Underground Walkways

- (1) Except for paint, the interior wall and ceiling finishes of an underground *walkway* shall be of *noncombustible* materials.

3.1.13.10. Exterior Exit Passageway

- (1) The wall and ceiling finishes of an exterior *exit* passageway that provides the only *means of egress* from the rooms or *suites* it serves, including the soffit beneath and the *guard* on the passageway, shall have a *flame-spread rating* not more than 25, except that a *flame-spread rating* not more than 150 is permitted for up to 10% of the total wall area and for up to 10% of the total ceiling area.

3.1.13.11. Elevator Cars

- (1) The wall and ceiling surfaces of elevator cars shall have a *flame-spread rating* not more than 75.
- (2) The wall, ceiling and floor surfaces of elevator cars shall have a smoke developed classification not more than 450.

3.1.13.12. Encapsulated Mass Timber Construction

- (1) In a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*,
 - (a) the *flame-spread ratings* required by Subsection 3.1.6. shall apply in addition to the requirements in this Subsection, and
 - (b) the *flame-spread ratings* for *exits* required by this Subsection shall also apply to any surface in the *exit* that would be exposed by cutting through the material in any direction, except that this requirement does not apply to doors, structural mass timber elements conforming to Sentence 3.1.6.4.(3), *heavy timber construction* and *fire-retardant-treated wood*.

3.1.14. Roof Assemblies

3.1.14.1. Fire-Retardant-Treated Wood Roof Systems

- (1) If a *fire-retardant-treated wood* roof system is used to comply with the requirements of Subsection 3.2.2., the roof deck assembly shall meet the conditions of acceptance of CAN/ULC-S126, “Standard Method of Test for Fire Spread Under Roof-Deck Assemblies.”
- (2) Supports for the roof deck assembly referred to in Sentence (1) shall consist of
 - (a) *fire-retardant-treated wood*,
 - (b) *heavy timber construction*,
 - (c) *noncombustible construction*, or
 - (d) a combination thereof.

3.1.14.2. Metal Roof Deck Assemblies

- (1) Except as permitted by Sentence (2), a metal roof deck assembly shall meet the conditions of acceptance of CAN/ULC-S126, “Standard Method of Test for Fire Spread Under Roof-Deck Assemblies,” if
 - (a) it supports a *combustible* material above the deck that could propagate a fire beneath the roof deck assembly, and
 - (b) the deck is used to comply with the requirements of Sentences 3.2.2.25.(2), 3.2.2.32.(2), 3.2.2.62.(2), 3.2.2.68.(2), 3.2.2.78.(2) and 3.2.2.85.(2) for *noncombustible construction*.
- (2) The requirements of Sentence (1) are waived provided
 - (a) the *combustible* material above the roof deck is protected by not less than 12.7 mm thick gypsum board, mechanically fastened to a supporting assembly if located beneath the roof deck, or by a thermal barrier conforming to one of Clauses 3.1.5.15.(2)(c) to (e) that is located
 - (i) on the underside of the *combustible* material, or
 - (ii) beneath the roof deck,
 - (b) the *building* is *sprinklered* throughout, or
 - (c) the roof assembly has a *fire-resistance rating* not less than 45 min.

3.1.15. Roof Covering

3.1.15.1. Roof Covering Classification

- (1) A roof covering classification shall be determined in conformance with CAN/ULC-S107, “Standard Method of Fire Tests of Roof Coverings.” (See Note A-3.1.15.1.(1))

3.1.15.2. Roof Coverings

- (1) Except as provided by Sentences (2) to (4), every roof covering shall have a Class A, B or C classification as determined in accordance with Article 3.1.15.1.
 - (2) A roof covering is not required to have a Class A, B or C classification for
 - (a) a tent,
 - (b) an *air-supported structure*,
 - (c) a *building* of Group A, Division 2 *occupancy* not more than 2 *storeys* in *building height* and not more than 1 000 m² in *building area*, provided the roof covering is underlaid with *noncombustible* material, or
 - (d) a steel *building* system described in Article 4.3.4.3., provided the roof covering consists of brick, masonry, concrete, metal sheets or metal shingles.
 - (3) Except as provided in Sentence (5), roof coverings on *buildings* conforming to Article 3.2.2.51. or 3.2.2.60. shall have a Class A classification where the roof height is greater than 25 m measured from the floor of the first storey to the highest point of the roof.
 - (4) Except as provided in Sentence (5), roof coverings in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction* shall have a Class A classification if the roof height is greater than 25 m measured from the floor of the *first storey* to the highest point of the roof.
- r1 (5) Where *buildings* or parts thereof conforming to Article 3.2.2.48., 3.2.2.51., 3.2.2.57., 3.2.2.60. or 3.2.2.93. include non-contiguous roof assemblies at different elevations, the roof coverings referred to in Sentences (3) and (4) are permitted to be evaluated separately to determine the roof covering classification required.

3.1.16. Fabrics

3.1.16.1. Fabric Awnings, Canopies and Marquees

- (1) Fabrics used as part of an awning, *canopy* or *marquee* that is located within or attached to a *building* of any type of construction shall conform to CAN/ULC-S109, “Standard Method of Flame Tests of Flame-Resistant Fabrics and Films.”

3.1.17. Occupant Load

3.1.17.1. Occupant Load Determination

- (1) The *occupant load* of a *floor area* or part of a *floor area*, shall be based on
 - (a) the number of seats in an *assembly occupancy* having fixed seats,
 - (b) 2 persons per sleeping room in a *dwelling unit*, or
 - (c) the number of persons for which the area is designed, but not less than that determined from Table 3.1.17.1. for *occupancies* other than those described in Clauses (a) and (b), unless it can be shown that the area will be occupied by fewer persons.
- (2) If a *floor area* or part thereof it has been designed for an *occupant load* other than that determined from Table 3.1.17.1., a permanent sign indicating that *occupant load* shall be posted in a conspicuous location.
- (3) For the purposes of this Article, *mezzanines*, tiers and balconies shall be regarded as part of the *floor area*.
- (4) If a room or group of rooms is intended for different *occupancies* at different times, the value to be used from Table 3.1.17.1. shall be the value that gives the greatest number of persons for the *occupancies* concerned.

Table 3.1.17.1.
Occupant Load
Forming Part of Article 3.1.17.1.

Type of Use of <i>Floor Area</i> or Part Thereof	Area per Person, m ²
Assembly uses	
space with fixed seats	(1)
space with non-fixed seats	0.75
<i>stages</i> for theatrical performances	0.75
space with non-fixed seats and tables	0.95
standing space	0.40
stadia and grandstands	0.60
bowling alleys, pool and billiard rooms	9.30
classrooms	1.85
school shops and vocational rooms	9.30
reading or writing rooms or lounges	1.85
dining, beverage and cafeteria space	1.20
laboratories in schools	4.60
Care, care and treatment or detention uses	
B-1 : detention quarters	11.60
B-2 : treatment and sleeping areas	10.00
B-3 : sleeping room areas (See also Article 3.7.1.3.)	10.00
Residential uses	
<i>dwelling units</i>	(2)
dormitories	4.60
Business and personal services uses	
personal service shops	4.60
offices	9.30
Mercantile uses	
<i>basements and first storeys</i>	3.70
second <i>storeys</i> having a principal entrance from a pedestrian thoroughfare or a parking area	3.70
other <i>storeys</i>	5.60
Industrial uses	
manufacturing or process rooms	4.60
<i>storage garages</i>	46.00
storage spaces (warehouse)	28.00
aircraft hangars	46.00
Other uses	
cleaning and repair goods	4.60
kitchens	9.30
storage	46.00
<i>public corridors</i> intended for <i>occupancies</i> in addition to pedestrian travel	3.70 ⁽³⁾

Notes to Table 3.1.17.1.:

- (1) See Clause 3.1.17.1.(1)(a).
- (2) See Clause 3.1.17.1.(1)(b)
- (3) See Note A-3.3.

3.1.17.2. Public Pools

- (1) The *occupant load* of a *public pool*, except a *wave action pool*, shall be determined by the following formula:

$$\text{occupant load} = \frac{D}{2.5} + \frac{S}{1.4}$$

where,

D = the water surface area in square metres of the part of the pool that is deeper than 1 350 mm; and

S = the water surface area in square metres of the part of the pool that is 1 350 mm in depth or less.

- (2) The *occupant load* of a *wave action pool* shall be determined by the following formula:

$$\text{occupant load} = \frac{D}{2.5} + \frac{S}{1.1}$$

where,

D = the water surface area in square metres of the part of the pool where the still water depth is greater than 1 000 mm; and

S = the water surface area in square metres of the part of the pool where the still water depth is 1 000 mm or less.

3.1.18. Reserved**3.1.19. Drainage and Grades****3.1.19.1. Drainage**

- (1) The *building* shall be located and the *building* site graded so that water will not accumulate at or near the *building* and will not adversely affect any adjacent properties.

3.1.20. Above Ground Electrical Conductors**3.1.20.1. Clearance to Buildings**

- (1) A *building* shall not be located beneath existing above ground electrical conductors.
- (2) The horizontal clearance measured from the maximum conductor swing to the *building*, including balconies, fire escapes, flat roofs or other accessible projections beyond the face of the *building*, shall,
- be not less than 1 m, for electrical conductors carrying voltages 750 V or less, except where necessary to connect to the electrical wiring of the *building*,
 - be not less than 3 m, for electrical conductors carrying voltages greater than 750 V but not exceeding 46 kV,
 - be not less than 3.7 m, for electrical conductors carrying voltages greater than 46 kV but not exceeding 69 kV, or
 - conform to the requirements of CAN/CSA-C22.3 No.1, "Overhead Systems," for electrical conductors carrying voltages greater than 69 kV.
- (3) Where the swing of an above ground electrical conductor not owned or operated by an electrical supply authority is not known, a swing of not less than 1.8 m shall be used.
- (4) Sentences (1) to (3) do not apply to a *building* containing electrical equipment and electrical installations used exclusively in the generation, transformation or transmission of electrical power or energy intended for sale or distribution to the public.

3.1.21. Glass in Guards

3.1.21.1. Glass

- (1) Except as provided in Sentence 3.3.4.7.(2), glass in *guards* shall conform to MMAH Supplementary Standard SB-13, “Glass in Guards.”

Section 3.2. Building Fire Safety

3.2.1. General

3.2.1.1. Exceptions in Determining Building Height

- (1) A rooftop enclosure provided for elevator machinery, a stairway or a *service room* used for no purpose other than for service to the *building*, shall not be considered as a *storey* in calculating the *building height*.
- (2) Space under tiers of seats in a *building* of the arena type shall not be considered as adding to the *building height* provided the space is used only for dressing rooms, concession stands and similar purposes incidental to the *major occupancy* of the *building*.
- (3) Except as required by Sentence (5), the space above a *mezzanine* need not be considered as a *storey* in calculating *building height* provided
 - (a) the aggregate area of *mezzanines* that are not superimposed does not exceed 40% of the open area of the room in which they are located, and (See Note A-3.2.1.1.(3)(a))
 - (b) except as permitted in Sentences (7) and 3.3.2.13.(3) the space above the *mezzanine* is used as an open area without *partitions* or subdividing walls higher than 1 070 mm above the *mezzanine* floor.
- (4) Except as required by Sentence (5), the space above a *mezzanine* need not be considered as a *storey* in calculating the *building height* provided
 - (a) the aggregate area of *mezzanines* that are not superimposed and do not meet the conditions of Sentence (3) does not exceed 10% of the *floor area* in which they are located, and
 - (b) the area of a *mezzanine* in a *suite* does not exceed 10% of the area of that *suite*.
- (5) Except as permitted by Sentence (6), each level of *mezzanine* that is partly or wholly superimposed above the first level of *mezzanine* shall be considered as a *storey* in calculating the *building height*.
- (6) Platforms intended solely for periodic inspection and elevated maintenance catwalks need not be considered as floor assemblies or *mezzanines* for the purpose of calculating *building height*, provided
 - (a) they are not used for storage, and
 - (b) they are constructed with *noncombustible* materials unless the *building* is permitted to be of *combustible construction*.
- (7) The space above a *mezzanine* conforming to Sentence (3) is permitted to include an enclosed space whose area does not exceed 10% of the open area of the room in which the *mezzanine* is located, provided the enclosed space does not obstruct visual communication between the open space above the *mezzanine* and the room in which it is located. (See Note A-3.2.1.1.(3)(a))
- (8) A *service space* in which facilities are included to permit a person to enter and to undertake maintenance and other operations pertaining to *building* services from within the *service space* need not be considered a *storey* if it conforms to Articles 3.2.5.14. and 3.3.1.25., and Sentences 3.2.4.18.(11), 3.2.7.3.(2), 3.3.1.3.(7), 3.4.2.4.(3) and 3.4.4.4.(9). (See Note A-3.2.1.1.(8))

3.2.1.2. Storage Garage Considered as a Separate Building

- (1) A *basement* used primarily as a *storage garage* is permitted to be considered as a separate *building* for the purposes of Subsection 3.2.2. and Sentences 3.2.5.12.(2) and (3), provided the floor and roof assemblies above the *basement* and the exterior walls of the *basement* above the adjoining ground level are constructed as *fire separations* of *noncombustible construction* having a *fire-resistance rating* not less than 2 h and protected in conformance with Clause 3.1.10.2.(4)(a), except as permitted by Sentence (2). (See Notes A-3.1.10.2.(4) and A-3.2.5.12.(2))
- (2) The exterior wall of a *basement* that is required to be a *fire separation* with a *fire-resistance rating* in accordance with Sentence (1) is permitted to be penetrated by openings that are not protected by *closures* provided
- (a) the *storage garage* is *sprinklered* throughout,
 - (b) every opening in the exterior wall is separated from *storeys* above the opening by a projection of the floor or roof assembly above the *basement*, extending not less than
 - (i) 1 m beyond the exterior face of the *storage garage* if the upper *storeys* are required to be of *noncombustible construction*, or
 - (ii) 2 m beyond the exterior face of the *storage garage* if the upper *storeys* are permitted to be of *combustible construction* or *encapsulated mass timber construction*, or
 - (c) the exterior walls of any *storeys* located above the floor or roof assembly referred to in Sentence (1) are recessed behind the outer edge of the assembly by not less than
 - (i) 1 m if the upper *storeys* are required to be of *noncombustible construction*, or
 - (ii) 2 m if the upper *storeys* are permitted to be of *combustible construction* or *encapsulated mass timber construction*.
- (3) The floor or roof assembly projection referred to in Clause (2)(b) shall have a *fire-resistance rating* not less than 2 h and shall have no openings within the projection.

3.2.1.3. Roof Considered as a Wall

- (1) For the purposes of this Section any part of a roof that is pitched at an angle of 60° or more to the horizontal and is adjacent to a space intended for *occupancy* within a *building* shall be considered as part of an exterior wall of the *building*.

3.2.1.4. Floor Assembly Over Basement

- r1 (1) Except as permitted by Sentence 3.2.2.47.(3), 3.2.2.49.(3), 3.2.2.50.(3), 3.2.2.52.(3), 3.2.2.53.(3), 3.2.2.54.(3), 3.2.2.55.(3) or 3.2.2.93.(3), a floor assembly immediately above a *basement* shall be constructed as a *fire separation* having a *fire-resistance rating* conforming to the requirements of Articles 3.2.2.20. to 3.2.2.93. for a floor assembly, but not less than 45 min
- (2) All *loadbearing* walls, columns and arches supporting a floor assembly immediately above a *basement* shall have a *fire-resistance rating* not less than that required by Sentence (1) for the floor assembly.

3.2.1.5. Fire Containment in Basements

- (1) Except as permitted by Sentences (2) and 3.2.2.15.(3), in a *building* in which an automatic sprinkler system is not required to be installed by Articles 3.2.2.18., every *basement* shall
- (a) be *sprinklered* throughout, or
 - (b) be subdivided into *fire compartments* not more than 600 m² in area by a *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly immediately above the *basement*.
- (2) An *open-air storey* need not conform to Sentence (1).

3.2.1.6. Mezzanines

- r1 (1) The floor assembly of a *mezzanine* that is required to be considered as a *storey* in calculating the *building height* shall be constructed in conformance with the *fire separation* requirements for floor assemblies in Articles 3.2.2.20. to 3.2.2.93.

3.2.2. Building Size and Construction Relative to Occupancy

3.2.2.1. Application

- (1) Except as permitted by Article 3.2.2.3., a *building* shall be constructed in conformance with this Subsection to prevent fire spread and collapse caused by the effects of fire. (See Subsection 3.1.3. for *fire separations* between *major occupancies*.)

3.2.2.2. Special and Unusual Structures

- r1 (1) A structure that cannot be identified with the characteristics of a *building* in Articles 3.2.2.20. to 3.2.2.93. shall be protected against fire spread and collapse in conformance with good fire protection engineering practice. (See Note A-3.2.2.2.(1)) (See also Notes A-3 and A-3.2.5.12.(1))

3.2.2.3. Exceptions to Structural Fire Protection

- (1) Fire protection is not required for
- (a) steel lintels above openings not more than 2 m wide in *loadbearing* walls and not more than 3 m wide in non-*loadbearing* walls,
 - (b) steel lintels above openings more than 2 m wide in *loadbearing* walls and more than 3 m wide in non-*loadbearing* walls provided the lintels are supported at intervals of not more than 2 m by structural members with the required *fire-resistance rating*,
 - (c) the bottom flanges of shelf angles and plates that are not a part of the structural frame,
 - (d) steel members for framework around elevator hoistway doorways, steel for the support of elevator and dumbwaiter guides, counterweights and other similar equipment, that are entirely enclosed in a hoistway and are not a part of the structural frame of the *building*,
 - (e) steel members of stairways and escalators that are not a part of the structural frame of a *building*,
 - (f) steel members of porches, exterior balconies, exterior stairways, fire escapes, cornices, *marquees* and other similar appurtenances, provided they are outside an exterior wall of a *building*, and
 - (g) *loadbearing* steel or concrete members wholly or partly outside a *building* face in a *building* not more than 4 *storeys* in *building height* and classified as Group A, B, C, D or F, Division 3 *major occupancy* provided the members are
 - (i) not less than 1 m away from any *unprotected opening* in an exterior wall, or
 - (ii) shielded from heat radiation in the event of a fire within the *building* by construction that will provide the same degree of protection that would be necessary if the member was located inside the *building*, with the protection extending on either side of the member a distance equal to the projection of the member from the face of the wall.

(See also Article 3.2.3.9.)

3.2.2.4. Buildings with Multiple Major Occupancies

- (1) The requirements restricting fire spread and collapse for a *building* of a single *major occupancy* classification are provided in this Subsection according to its *building height* and *building area*.
- (2) If a *building* contains more than one *major occupancy*, classified in more than one Group or Division, the requirements of this Subsection concerning *building* size and construction relative to *major occupancy* shall apply according to Articles 3.2.2.5. to 3.2.2.8.

(3) For the purposes of Sentences (1) and (2), a *retirement home* is deemed to be a separate *major occupancy*.

3.2.2.5. Applicable Building Height and Area

(1) In determining the fire safety requirements of a *building* in relation to each of the *major occupancies* contained therein, the *building height* and *building area* of the entire *building* shall be used.

(2) For the purposes of Sentence (1), a *retirement home* is deemed to be a separate *major occupancy*.

3.2.2.6. Multiple Major Occupancies

r1 (1) Except as permitted by Articles 3.2.2.7. and 3.2.2.8., and Sentences 3.2.2.48.(4), 3.2.2.51.(5), 3.2.2.57.(3) and 3.2.2.60.(4) and 3.2.2.93.(5) to (7), in a *building* containing more than one *major occupancy*, the requirements of this Subsection for the most restricted *major occupancy* contained shall apply to the whole *building*.

(2) For the purposes of Sentence (1), a *retirement home* is deemed to be a separate *major occupancy*.

r1 (3) In a *building* or part thereof constructed in conformance with Article 3.2.2.48., 3.2.2.57. or 3.2.2.93. containing more than one *major occupancy*, the most restrictive encapsulation requirements of Article 3.1.6.4. and Table 3.2.2.93. for any *major occupancy* contained within a *storey* shall apply to the encapsulation required on the interior of a *public corridor* or *exit* within that *storey*.

3.2.2.7. Superimposed Major Occupancies

r1 (1) Except as permitted in Article 3.2.2.8. and Sentences 3.2.2.18.(2), 3.2.2.48.(4), 3.2.2.51.(5), 3.2.2.57.(3), 3.2.2.60.(4) and 3.2.2.93.(5) to (7), in a *building* in which one *major occupancy* is located entirely above another *major occupancy*, the requirements in this Subsection for each portion of the *building* containing a *major occupancy* shall apply to that portion as if the entire *building* were of that *major occupancy*.

(2) If one *major occupancy* is located above another *major occupancy*, the *fire-resistance rating* of the floor assembly between the *major occupancies* shall be determined on the basis of the requirements of this Subsection for the lower *major occupancy*. (See also Article 3.1.3.1.)

(3) For the purposes of Sentences (1) and (2), a *retirement home* is deemed to be a separate *major occupancy*.

r1 (4) In a *building* or part thereof constructed in conformance with Article 3.2.2.48., 3.2.2.57. or 3.2.2.93., if one *major occupancy* is located above another *major occupancy*,

(a) the most restrictive encapsulation requirements of Article 3.1.6.4. and Table 3.2.2.93. for any *major occupancy* contained within the *building* shall apply to the encapsulation required on the interior of *vertical service spaces* and *exit stairs*, and

(b) the encapsulation requirements of Article 3.1.6.4. and Table 3.2.2.93. for a mass timber floor assembly between the *major occupancies* shall be determined on the basis of the requirements for,

(i) the upper *major occupancy* for the encapsulation of the upper surface of the mass timber floor assembly, and

(ii) the lower *major occupancy* for the encapsulation of the underside of the mass timber floor assembly.

3.2.2.8. Exceptions for Major Occupancies

(1) In a *building* in which the aggregate area of all *major occupancies* in a particular Group or Division is not more than 10% of the *floor area* of the *storey* in which they are located, these *major occupancies* need not be considered as *major occupancies* for the purposes of this Subsection, provided they are not classified as Group F, Division 1 or 2 *occupancies*.

(2) For the purposes of Sentence (1), a *retirement home* is deemed to be a separate *major occupancy*.

(3) A helicopter landing area on the roof of a *building* need not be considered a *major occupancy* for purposes of Subsection 3.2.2. where such landing area is not more than 10% of the area of the roof.

3.2.2.9. Crawl Spaces

(1) For the purposes of Articles 3.1.11.6., 3.2.1.4. and 3.2.1.5., a crawl space shall be considered as a *basement* if it is

- (a) more than 1.8 m high between the lowest part of the floor assembly and the ground or other surface below,
- (b) used for any *occupancy*,
- (c) used for the passage of *flue pipes*, or
- (d) used as a *plenum* in *combustible construction*.

(2) A floor assembly immediately above a crawl space is not required to be constructed as a *fire separation* and is not required to have a *fire-resistance rating* provided the crawl space is not required to be considered as a *basement* by Sentence (1).

3.2.2.10. Streets

(1) Every *building* shall face a *street* located in conformance with the requirements of Articles 3.2.5.4 and 3.2.5.5 for access routes.

(2) For the purposes of Subsections 3.2.2. and 3.2.5. an access route conforming to Subsection 3.2.5. is permitted to be considered as a *street*.

(3) A *building* conforming to Article 3.2.2.51. or 3.2.2.60. is considered to face one *street*, where

- (a) not less than 25% of the *building* perimeter is located within 15 m of a *street* or *streets*, or
- (b) not less than 10% of the *building* perimeter is located within 15 m of a *street* or *streets*, provided the exterior cladding conforms to Sentence 3.1.4.8.(2).

(4) A *building* is considered to face 2 *streets* provided not less than 50% of the *building* perimeter is located within 15 m of the *street* or *streets*.

(5) A *building* is considered to face 3 *streets* provided not less than 75% of the *building* perimeter is located within 15 m of the *street* or *streets*.

(6) Enclosed spaces, tunnels, bridges and similar structures, even though used for vehicular or pedestrian traffic, are not considered as *streets* for the purpose of this Part.

3.2.2.11. Exterior Balconies

r1 (1) Except as provided in Sentence (2), an exterior balcony shall be constructed in accordance with the type of construction required by Articles 3.2.2.20. to 3.2.2.93., as applicable to the *occupancy* classification of the *building*.

r1 (2) The floor assembly of an exterior balcony in a *building* or part thereof conforming to Article 3.2.2.48., 3.2.2.57. or 3.2.2.93. shall

- (a) be of *noncombustible construction*, or
- (b) be constructed in accordance with Article 3.1.6.3., but need not comply with Sentence 3.1.6.4.(1).

3.2.2.12. Exterior Passageways

r1 (1) An elevated exterior passageway used as part of a *means of egress* shall conform to the requirements of Articles 3.2.2.20. to 3.2.2.93. for *mezzanines*.

3.2.2.13. Occupancy on Roof

- r1 (1) A portion of a roof that supports an *occupancy* shall be constructed in conformance with the *fire separation* requirements of Articles 3.2.2.20. to 3.2.2.93. for floor assemblies.

3.2.2.14. Rooftop Enclosures

- r1 (1) A rooftop enclosure for elevator machinery or for a *service room* shall be constructed in accordance with the type of construction required by Articles 3.2.2.20. to 3.2.2.93.
- (2) A rooftop enclosure for elevator machinery or for a *service room*, not more than 1 *storey* high, is not required to have a *fire-resistance rating*.
- r1 (3) A rooftop enclosure for a stairway shall be constructed in accordance with the type of construction required by Articles 3.2.2.20. to 3.2.2.93.
- (4) A rooftop enclosure for a stairway need not have a *fire-resistance rating* nor be constructed as a *fire separation*.

3.2.2.15. Storeys Below Ground

- (1) If a *building* is erected entirely below the adjoining finished ground level and does not extend more than one *storey* below that ground level, the minimum precautions against fire spread and collapse shall be the same as are required for *basements* under a *building* of 1 *storey* in *building height* having the same *occupancy* and *building area*.
- (2) If any portion of a *building* is erected entirely below the adjoining finished ground level and extends more than 1 *storey* below that ground level, the following minimum precautions against fire spread and collapse shall be taken:
- (a) except as permitted by Sentence (3), the *basements* shall be *sprinklered* throughout,
 - (b) a floor assembly below the ground level shall be constructed as a *fire separation* with a *fire-resistance rating* not less than
 - (i) 3 h if the *basements* are used as Group E or Group F, Division 1 or 2 *occupancies*, or
 - (ii) 2 h if the *basements* are not used as Group E or Group F, Division 1 or 2 *occupancies*, and
 - (c) all *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the construction that they support.
- (3) If the *first storey* of a *building* is not required to be *sprinklered*, sprinklers are not required in the *storey* immediately below the *first storey*, provided the *storey* below
- (a) contains only *residential occupancies*, and
 - (b) has at least one unobstructed access opening conforming to Sentence 3.2.5.1.(2) installed on that *storey* for each 15 m of wall length in at least one wall required by this Subsection to face a *street*.

3.2.2.16. Heavy Timber Roof Permitted

- r1 (1) Unless otherwise permitted by Articles 3.2.2.20. to 3.2.2.93., a roof assembly in a *building* up to 2 *storeys* in *building height* is permitted to be of *heavy timber construction* regardless of *building area* or type of construction required, provided the *building* is *sprinklered* throughout.
- (2) If Sentence (1) permits a roof assembly to be of *heavy timber construction*, structural members in the *storey* immediately below the roof assembly are permitted to be of *heavy timber construction*.

3.2.2.17. Roof Assemblies and Mezzanines in Gymnasiums, Swimming Pools, Arenas and Rinks

- (1) The requirements for a roof assembly to have a *fire-resistance rating* stated in Articles 3.2.2.25., 3.2.2.30. and 3.2.2.32. are permitted to be waived for gymnasiums, swimming pools, arenas, and rinks, provided
- the roof carries no loads other than normal roof loads, including permanent access walks, and ventilating, sound and lighting equipment, and
 - except as provided in Sentence (3), no part of the roof assembly is less than 6 m above the main floor or balcony.
- (See Note A-3.2.2.17.(1))
- (2) The requirements for a mezzanine to have a *fire-resistance rating* stated in Articles 3.2.2.25., 3.2.2.30. and 3.2.2.32. are permitted to be waived for gymnasiums, swimming pools, arenas, and rinks, provided
- the *mezzanine* is not required to be considered as a *storey* as per Sentences 3.2.1.1.(3) to (5),
 - the *mezzanine* is used only for ventilating, sound and lighting equipment, and
 - except as provided in Sentence (3), no part of the *mezzanine* is less than 6 m above the main floor or balcony.
- (3) The restrictions concerning minimum distance stated in Clauses (1)(b) and (2)(c) shall not apply to
- an inclined and stepped floor ascending from the main floor that is used for seating purposes only, or
 - a balcony used for seating purposes only.

3.2.2.18. Automatic Sprinkler System Required

- r1 (1) Except as permitted by Sentence (2), an automatic sprinkler system conforming to the requirements of Articles 3.2.4.7., 3.2.4.8., 3.2.4.9. and 3.2.5.12. shall be installed throughout a *building* regulated by one or more of Articles 3.2.2.20., 3.2.2.21., 3.2.2.22., 3.2.2.23., 3.2.2.24., 3.2.2.26., 3.2.2.27., 3.2.2.29., 3.2.2.31., 3.2.2.33., 3.2.2.36., 3.2.2.37., 3.2.2.38., 3.2.2.39., 3.2.2.40., 3.2.2.41., 3.2.2.42., 3.2.2.43., 3.2.2.44., 3.2.2.45., 3.2.2.46., 3.2.2.47., 3.2.2.48., 3.2.2.49., 3.2.2.51., 3.2.2.52., 3.2.2.55., 3.2.2.55A., 3.2.2.55B., 3.2.2.55C., 3.2.2.55D., 3.2.2.55E., 3.2.2.56., 3.2.2.57., 3.2.2.59., 3.2.2.60., 3.2.2.61., 3.2.2.63., 3.2.2.65., 3.2.2.66., 3.2.2.67., 3.2.2.69., 3.2.2.71., 3.2.2.72., 3.2.2.73., 3.2.2.74., 3.2.2.76., 3.2.2.77., 3.2.2.79., 3.2.2.81., 3.2.2.82., 3.2.2.84., 3.2.2.86., 3.2.2.88., 3.2.2.90. and 3.2.2.93.
- r1 (2) If a *storey* in a *building* or a *floor area* is required to have an automatic sprinkler system installed throughout in accordance with one or more of Articles 3.2.2.20. to 3.2.2.93. or Section 3.3., the automatic sprinkler system shall also be installed throughout all lower *storeys* in the *building* notwithstanding permission in Articles 3.2.2.20. to 3.2.2.93. to construct one or more of those *storeys* without installing automatic sprinkler protection. (See Note A-3.2.2.18.(2))

3.2.2.19. Buildings Containing Impeded Egress Zones

- r1 (1) A *building* containing an *impeded egress zone* and conforming to the appropriate requirements of Articles 3.2.2.20. to 3.2.2.93. is not required to conform to the requirements of Articles 3.2.2.36. and 3.2.2.37. for a Group B, Division 1 *major occupancy* provided
- the *building* is *sprinklered* throughout,
 - it is not more than 1 *storey* in *building height*,
 - it does not include
 - a *contained use area*,
 - sleeping accommodation,
 - a *high-hazard industrial occupancy*, or
 - a *mercantile occupancy*,
 - the *building area* is not more than 6 400 m² if the *building* includes a *medium-hazard industrial occupancy*,
 - the *impeded egress zone* does not extend beyond the boundaries of the *fire compartment* in which it is located, and
 - the *occupant load* of the *impeded egress zone* is not more than 100.

3.2.2.20. Group A, Division 1, Any Height, Any Area, Sprinklered

- (1) Except as permitted by Articles 3.2.2.21. and 3.2.2.22., a *building* classified as Group A, Division 1 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.21. Group A, Division 1, One Storey, Limited Area, Sprinklered

- (1) A *building* classified as Group A, Division 1 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*,
 - (c) it has less than 40% of the area of the *building* as 2 *storeys* for the purpose of
 - (i) development of productions including preparation of scenery and costumes and rehearsal of performers,
 - (ii) organization of performers, scenery and sound equipment,
 - (iii) preparation by performers for a performance,
 - (iv) managerial functions, or
 - (v) toilets, rest rooms and similar public facilities,
 - (d) it has no *occupancy* above or below the auditorium other than one which serves it or is dependent on it,
 - (e) it is not more than 600 m² in *building area*, and
 - (f) the *occupant load* is not more than 600.
- (2) The *building* referred to in Sentence (1) is permitted to be of *heavy timber construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations*
 - (i) with a *fire-resistance rating* not less than 45 min, or
 - (ii) of *heavy timber construction*, and
 - (b) *loadbearing* walls, columns and arches shall
 - (i) have a *fire-resistance rating* not less than that required for the supported assembly, or
 - (ii) be of *heavy timber construction*.

3.2.2.22. Group A, Division 1, One Storey, Sprinklered

- (1) A *building* classified as Group A, Division 1 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*,
 - (c) no part of an auditorium floor is more than 5 m above or below *grade*,
 - (d) no *occupancy* is above or below the auditorium other than one which serves it or is dependent on it, and
 - (e) the *occupant load* of the auditorium floor is not more than 300.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*, and
 - (d) *loadbearing* walls, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the *fire separation*.

3.2.2.23. Group A, Division 2, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.24. to 3.2.2.28. and 3.2.2.93., a *building* classified as Group A, Division 2 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.24. Group A, Division 2, up to 6 Storeys, Any Area, Sprinklered

- (1) A *building* classified as Group A, Division 2, that is not limited by *building area*, is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), *the building* is *sprinklered* throughout, and
 - (b) it is not more than 6 *storeys* in *building height*.

- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) all *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.25. Group A, Division 2, up to 2 Storeys

- (1) A *building* classified as Group A, Division 2 is permitted to conform to Sentence (2) provided
 - (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.25.

Table 3.2.2.25.
Maximum Building Area, Group A, Division 2, up to 2 Storeys
 Forming Part of Sentence 3.2.2.25.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 600	2 000	2 400
2	800	1 000	1 200

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) except as permitted by Article 3.2.2.17., *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) except as permitted by Article 3.2.2.17., roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that in a *building* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided the roof assembly is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1., and the *building area* is not more than
 - (i) 800 m² if facing one *street*,
 - (ii) 1 000 m² if facing 2 *streets*, or
 - (iii) 1 200 m² if facing 3 *streets*, and
 - (d) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.26. Group A, Division 2, up to 2 Storeys, Increased Area, Sprinklered

- (1) A *building* classified as Group A, Division 2 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 4 800 m² if 1 *storey* in *building height*, or
 - (ii) 2 400 m² if 2 *storeys* in *building height*.

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.27. Group A, Division 2, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group A, Division 2 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 2 400 m² if 1 *storey* in *building height* with no *basement*,
 - (ii) 1 200 m² if 1 *storey* in *building height*, or
 - (iii) 600 m² if 2 *storeys* in *building height*.

3.2.2.28. Group A, Division 2, One Storey

- (1) A *building* classified as Group A, Division 2 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, provided
- (a) it is not more than 1 *storey* in *building height*, and
 - (b) except as permitted by Sentence (2), it has a *building area* not more than
 - (i) 400 m² if facing one *street*,
 - (ii) 500 m² if facing 2 *streets*, or
 - (iii) 600 m² if facing 3 *streets*.

(2) In a *building* referred to in Sentence (1) without a *basement*, the *building area* limits of Sentence (1) are permitted to be doubled provided a *fire separation* with a *fire-resistance rating* not less than 1 h is used to separate the *building* into *fire compartments*, each one of which does not exceed the area limits of Clause (1)(b).

3.2.2.29. Group A, Division 3, Any Height, Any Area, Sprinklered

- (1) Except as permitted by Articles 3.2.2.30. to 3.2.2.34., a *building* classified as Group A, Division 3 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.30. Group A, Division 3, up to 2 Storeys

- (1) A *building* classified as Group A, Division 3 is permitted to conform to Sentence (2) provided
- (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.30.

Table 3.2.2.30.
Maximum Building Area, Group A, Division 3, up to 2 Storeys
Forming Part of Sentence 3.2.2.30.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	4 000	5 000	6 000
2	2 000	2 500	3 000

- (2) Except as permitted by Clauses (c) and (d), the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) except as permitted by Article 3.2.2.17., *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (c) except as permitted by Article 3.2.2.17., roof assemblies shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *heavy timber construction*, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly, except that arches and structural members within the *storey* immediately below a roof assembly are permitted to be of *heavy timber construction*.
- (3) If intended for occasional use for trade shows and similar exhibition purposes, the *building* referred to in Sentence (1) that is more than 1 500 m² in *building area* shall be *sprinklered* throughout.

3.2.2.31. Group A, Division 3, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group A, Division 3 is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 12 000 m² if 1 *storey* in *building height*, or
 - (ii) 6 000 m² if 2 *storeys* in *building height*.
- (2) Except as permitted by Clause (c) and Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly, except that arches are permitted to be of *heavy timber construction*.

3.2.2.32. Group A, Division 3, One Storey, Increased Area

- (1) A *building* classified as Group A, Division 3 is permitted to conform to Sentence (2) provided
- (a) it is not more than 1 *storey* in *building height*, and
 - (b) it has a *building area* not more than
 - (i) 2 400 m² if facing one *street*,
 - (ii) 3 000 m² if facing 2 *streets*, or
 - (iii) 3 600 m² if facing 3 *streets*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) except as permitted by Article 3.2.2.17., *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,

- (b) except as permitted by Article 3.2.2.17., roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that the *fire-resistance rating* is permitted to be waived provided the roof assembly is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1., and the *building area* is not more than
 - (i) 1 200 m² if facing one *street*,
 - (ii) 1 500 m² if facing 2 *streets*, or
 - (iii) 1 800 m² if facing 3 *streets*, and
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.
- (3) If intended for occasional use for trade shows and similar exhibition purposes, the *building* referred to in Sentence (1) that is more than 1 500 m² in *building area* shall be *sprinklered* throughout.

3.2.2.33. Group A, Division 3, One Storey, Sprinklered

- (1) A *building* classified as Group A, Division 3 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, provided,
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*, and
 - (c) it has a *building area* not more than 7 200 m².

3.2.2.34. Group A, Division 3, One Storey

- (1) A *building* classified as Group A, Division 3 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, provided
 - (a) it is not more than 1 *storey* in *building height*, and
 - (b) it has a *building area* not more than
 - (i) 1 000 m² if facing one *street*,
 - (ii) 1 250 m² if facing 2 *streets*, or
 - (iii) 1 500 m² if facing 3 *streets*.

3.2.2.35. Group A, Division 4

- (1) Except as permitted by Sentences (2) and (3), a *building* classified as Group A, Division 4 shall be of *noncombustible construction*.
- (2) Roof assemblies and supporting arches and columns are permitted to be of *heavy timber construction*.
- (3) A *building* classified as Group A, Division 4 is permitted to be of *combustible construction* provided
 - (a) the *occupant load* is less than 1 500, and
 - (b) the *building* has a *limiting distance* not less than 6 m.
- (4) Sprinklers shall be installed in all spaces below tiers of seats in a *building* classified as Group A, Division 4 if those spaces are used for *occupancy*. (See Note A-3.2.2.35.(4))

3.2.2.36. Group B, Division 1, Any Height, Any Area, Sprinklered

- (1) Except as permitted by Article 3.2.2.37., a *building* classified as Group B, Division 1 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,

- (c) *mezzanines* shall have a *fire-resistance rating* not less 1 h, and
- (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.37. Group B, Division 1, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group B, Division 1 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area*
 - (i) that is not limited if the *building* is not more than 1 *storey* in *building height*,
 - (ii) not more than 12 000 m² if 2 *storeys* in *building height*, or
 - (iii) not more than 8 000 m² if 3 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.38. Group B, Division 2, Any Height, Any Area, Sprinklered

- (1) Except as permitted by Articles 3.2.2.39. to 3.2.2.41., a *building* classified as Group B, Division 2 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.39. Group B, Division 2, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group B, Division 2 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area*,
 - (i) that is not limited if the *building* is not more than 1 *storey* in *building height*,
 - (ii) not more than 12 000 m² if 2 *storeys* in *building height*, or
 - (iii) not more than 8 000 m² if 3 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.40. Group B, Division 2, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group B, Division 2 is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 2 400 m² if 1 *storey* in *building height*, or
 - (ii) 1 600 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.41. Group B, Division 2, One Storey, Sprinklered

- (1) A *building* classified as Group B, Division 2 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*, and
 - (c) it has a *building area* not more than 500 m².

3.2.2.42. Group B, Division 3, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.43. to 3.2.2.46. and 3.2.2.93., a *building* classified as Group B, Division 3 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.43. Group B, Division 3, Up to 3 Storeys, (Noncombustible), Sprinklered

- (1) A *building* classified as Group B, Division 3 is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area*
 - (i) that is not limited if the *building* is not more than 1 *storey* in *building height*,
 - (ii) not more than 12 000 m² if 2 *storeys* in *building height*, or
 - (iii) not more than 8 000 m² if 3 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.44. Group B, Division 3, Up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group B, Division 3 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 5 400 m² if 1 *storey* in *building height*,
 - (ii) 2 700 m² if 2 *storeys* in *building height*, or
 - (iii) 1 800 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.45. Group B, Division 3, Up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group B, Division 3 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 2 400 m² if 1 *storey* in *building height*, or
 - (ii) 1 600 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.46. Group B, Division 3, One Storey, Sprinklered

- (1) A *building* classified as Group B, Division 3 is permitted to be of *combustible construction* or *noncombustible construction*, used singly or in combination, provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*, and
 - (c) it has a *building area* not more than 600 m².

3.2.2.47. Group C, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.48. to 3.2.2.55. and 3.2.2.93., a *building* classified as Group C other than a *retirement home* shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, which are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

ri 3.2.2.48. Group C, up to 12 Storeys, Sprinklered, Encapsulated Mass Timber Construction

(1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2), provided

- (a) it is *sprinklered* throughout,
- (b) it is not more than 12 *storeys* in *building height*,
- (c) it has a height of not more than 42 m measured between the floor of the *first storey* and the uppermost floor level that does not serve as a rooftop enclosure for elevator machinery, a stairway or a *service room* used only for service to the *building*, and
- (d) it has a *building area* not more than 6 000 m².

(2) Except as provided in Article 3.2.2.16., the *building* referred to in Sentence (1) is permitted to be of *encapsulated mass timber construction* or *noncombustible construction* used singly or in combination, and,

- (a) except as provided in Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
- (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
- (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units* shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

(4) Group A, Division 2 *major occupancies*, Group E *major occupancies* and *storage garages* located in a *building* or part of a *building* within the scope of this Article are permitted to be constructed in accordance with this Article, provided

- (a) the Group A, Division 2 *major occupancy* is located below the fourth *storey*,
- (b) the Group E *major occupancy* is located below the third *storey*, and
- (c) the *storage garage* is located below the fifth *storey*. (See also Article 4.4.2.1.)

ei (See Note A-3.2.2.48.(4), 3.2.2.57.(3) and 3.2.2.93.(5) to (7))

3.2.2.49. Group C, up to 6 Storeys, Sprinklered, Noncombustible Construction

(1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided

- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
- (b) it is not more than 6 *storeys* in *building height*, and
- (c) it has a *building area*

- (i) that is not limited if the *building* is not more than 2 *storeys* in *building height*,
- (ii) not more than 12 000 m² if 3 *storeys* in *building height*,
- (iii) not more than 9 000 m² if 4 *storeys* in *building height*,
- (iv) not more than 7 200 m² if 5 *storeys* in *building height*, or
- (v) not more than 6 000 m² if 6 *storeys* in *building height*.

(2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and

- (a) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
- (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
- (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, which are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

3.2.2.50. Group C, up to 4 Storeys, Noncombustible Construction

- (1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided
- (a) it is not more than
- (i) 3 *storeys* in *building height*, or
 - (ii) 4 *storeys* in *building height* provided there is not more than one *dwelling unit* above another *dwelling unit*, and vertical *fire separations* of adjacent *dwelling units* conform to Sentence (4), and
- (b) it has a *building area* not more than the value in Table 3.2.2.50.

Table 3.2.2.50.
Maximum Building Area, Group C, up to 4 Storeys
Forming Part of Sentence 3.2.2.50.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	not limited	not limited	not limited
2	6 000	not limited	not limited
3	4 000	5 000	6 000
4	3 000	3 750	4 500

- (2) The *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
- (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
- (c) roof assemblies shall have a *fire-resistance rating* not less than 1 h, and
- (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- (3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, which are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.
- (4) The *dwelling units* described in Subclause (1)(a)(ii) shall be separated by continuous vertical *fire separations* that extend through all *storeys* and *service spaces* of the separated portions.

3.2.2.51. Group C, up to 6 Storeys, Sprinklered, Combustible Construction

- (1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided
- (a) it is *sprinklered* throughout,
- (b) it is not more than 6 *storeys* in *building height*,
- (c) it has a height of not more than 18 m, measured between the floor of the *first storey* and the uppermost floor level that does not serve a rooftop enclosure for elevator machinery, a stairway or a *service room* used only for service to the *building*, and
- (d) it has a *building area* of not more than
- (i) 9 000 m² if 1 *storey* in *building height*,
 - (ii) 4 500 m² if 2 *storeys* in *building height*,
 - (iii) 3 000 m² if 3 *storeys* in *building height*,

- (iv) 2 250 m² if 4 storeys in building height,
- (v) 1 800 m² if 5 storeys in building height, or
- (vi) 1 500 m² if 6 storeys in building height.

(2) Buildings referred to in Sentence (1) are permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and

- (a) except as permitted by Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
- (b) roof assemblies shall have a *fire-resistance rating* not less than 1 h,
- (c) except as provided by Sentence (4), where the roof assembly has a height greater than 25 m measured from the floor of the *first storey* to the highest point of the roof assembly, the roof assembly shall be constructed of *noncombustible construction*, or *fire-retardant-treated wood* conforming to Article 3.1.4.5.,
- (d) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
- (e) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including those over *basements*, which are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

(4) Where *buildings* conforming to Sentence (2) include non-contiguous roof assemblies at different elevations, the roof assemblies are permitted to be evaluated separately to determine which ones are required to be constructed in accordance with Clause (2)(c).

(5) Group A, Division 2 *major occupancies*, Group E *major occupancies* and *storage garages* located in a *building* or part thereof within the scope of this Article are permitted to be constructed in accordance with this Article, provided

- (a) the Group A, Division 2 *major occupancy* and Group E *major occupancy* are located below the third *storey*, and
 - (b) the *storage garage* is located below the fourth *storey*. (See also Article 4.4.2.1.)
- (See Note A-3.2.2.51.(5) and 3.2.2.60.(4))

3.2.2.52. Group C, up to 4 Storeys, Sprinklered

(1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided

- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
- (b) it is not more than 4 *storeys* in *building height*, and
- (c) it has a *building area* not more than
 - (i) 7 200 m² if 1 *storey* in *building height*,
 - (ii) 3 600 m² if 2 *storeys* in *building height*,
 - (iii) 2 400 m² if 3 *storeys* in *building height*, or
 - (iv) 1 800 m² if 4 *storeys* in *building height*.

(2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and

- (a) except as permitted by Sentences (3) and (4), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
- (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
- (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

(4) In a *building* in which there is no *dwelling unit* above another *dwelling unit*, the *fire-resistance rating* for floor assemblies entirely within the *dwelling unit* is waived.

3.2.2.53. Group C, up to 3 Storeys, Increased Area

- (1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided
 - (a) it is not more than 3 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.53.

Table 3.2.2.53.
Maximum Building Area, Group C up to 3 Storeys, Increased Area
 Forming Part of Sentence 3.2.2.53.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	2 400	3 000	3 600
2	1 200	1 500	1 800
3	800	1 000	1 200

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) except as permitted by Sentences (3) and (4), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (c) roof assemblies shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

(3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.

(4) In a *building* in which there is no *dwelling unit* above another *dwelling unit*, the *fire-resistance rating* for floor assemblies entirely within the *dwelling unit* is waived.

3.2.2.54. Group C, up to 3 Storeys

- (1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided
 - (a) it is not more than 3 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.54.

Table 3.2.2.54.
Maximum Building Area, Group C, up to 3 Storeys
 Forming Part of Sentence 3.2.2.54.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 800	2 250	2 700
2	900	1 125	1 350
3	600	750	900

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) except as permitted by Sentences (3) and (4), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- (3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 45 min but need not be constructed as *fire separations*.
- (4) In a *building* in which there is no *dwelling unit* above another *dwelling unit*, the *fire-resistance rating* for floor assemblies entirely within the *dwelling unit* is waived.

3.2.2.55. Group C, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group C, other than a *retirement home*, is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 5 400 m² if 1 *storey* in *building height*,
 - (ii) 2 700 m² if 2 *storeys* in *building height*, or
 - (iii) 1 800 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) except as permitted by Sentences (3) and (4), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction* a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- (3) In a *building* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units*, shall have a *fire-resistance rating* not less than 45 min but need not be constructed as *fire separations*.
- (4) In a *building* in which there is no *dwelling unit* above another *dwelling unit*, the *fire-resistance rating* for floor assemblies entirely within the *dwelling unit* is waived.

3.2.2.55A. Group C, Retirement Home, Any Height, Any Area, Sprinklered

- (1) Except as permitted by Articles 3.2.2.55B. to 3.2.2.55E., a *retirement home* shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.55B. Group C, Retirement Home, up to 4 Storeys, Sprinklered, Increased Area

- (1) A retirement home is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 12 000 m² if 1 *storey* in *building height*,
 - (ii) 6 000 m² if 2 *storeys* in *building height*,
 - (iii) 4 000 m² if 3 *storeys* in *building height*, or
 - (iv) 3 000 m² if 4 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and,
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.55C. Group C, Retirement Home, up to 4 Storeys, Sprinklered

- (1) A retirement home is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 6 600 m² if 1 *storey* in *building height*,
 - (ii) 3 300 m² if 2 *storeys* in *building height*,
 - (iii) 2 200 m² if 3 *storeys* in *building height*, or
 - (iv) 1 650 m² if 4 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.55D. Group C, Retirement Home, up to 3 Storeys, Sprinklered, Noncombustible Construction

- (1) A retirement home is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* that is
 - (i) not limited if the *building* is not more than 1 *storey* in *building height*,
 - (ii) not more than 12 000 m² if 2 *storeys* in *building height*, or
 - (iii) not more than 8 000 m² if 3 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) is required to be of *noncombustible construction*, and,
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.55E. Group C, Retirement Home, up to 3 Storeys, Sprinklered, Combustible Construction

- (1) A *retirement home* is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 4 800 m² if 1 *storey* in *building height*,
 - (ii) 2 400 m² if 2 *storeys* in *building height*, or
 - (iii) 1 600 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.56. Group D, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.57. to 3.2.2.65. and 3.2.2.93., a *building* classified as Group D shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

r1 3.2.2.57. Group D, up to 12 Storeys, Sprinklered, Encapsulated Mass Timber Construction

- (1) A *building* classified as Group D is permitted to conform to Sentence (2), provided
 - (a) it is *sprinklered* throughout,
 - (b) it is not more than 12 *storeys* in *building height*,
 - (c) it has a height of not more than 42 m measured between the floor of the *first storey* and the uppermost floor level that does not serve as a rooftop enclosure for elevator machinery, a stairway or a *service room* used only for service to the *building*, and
 - (d) it has a *building area* not more than 7 200 m².
 - (2) Except as provided in Article 3.2.2.16., the *building* referred to in Sentence (1) is permitted to be of *encapsulated mass timber construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
 - (3) Group A, Division 2 *major occupancies*, Group E *major occupancies*, Group F, Division 2 and 3 *major occupancies* and *storage garages* located in a *building* or part thereof within the scope of this Article are permitted to be constructed in accordance with this Article, provided
 - (a) the Group A, Division 2 *major occupancy* is located below the fourth *storey*,
 - (b) the Group E *major occupancy* and Group F, Division 2 or 3 *major occupancy* are located below the third *storey*, and
 - (c) the *storage garage* is located below the fifth *storey*. (See also Article 4.4.2.1.)
- e1 (See Note A-3.2.2.48.(4), 3.2.2.57.(3), and 3.2.2.93.(5) to (7))

3.2.2.58. Group D, up to 6 Storeys

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) it is not more than 6 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.58.

Table 3.2.2.58.
Maximum Building Area, Group D, up to 6 Storeys
 Forming Part of Sentence 3.2.2.58.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	not limited	not limited	not limited
2	7 200	not limited	not limited
3	4 800	6 000	7 200
4	3 600	4 500	5 400
5	2 800	3 600	4 320
6	2 400	3 000	3 600

- (2) The *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (c) roof assemblies shall have a *fire-resistance rating* not less than 1 h, except that in a *building* not more than 1 *storey* in *building height* this requirement is waived, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.59. Group D, up to 6 Storeys, Sprinklered, Noncombustible Construction

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 6 *storeys* in *building height*, and
 - (c) it has a *building area*
 - (i) that is not limited if the *building* is not more than 2 *storeys* in *building height*,
 - (ii) not more than 14 400 m² if 3 *storeys* in *building height*,
 - (iii) not more than 10 800 m² if 4 *storeys* in *building height*,
 - (iv) not more than 8 640 m² if 5 *storeys* in *building height*, or
 - (v) not more than 7 200 m² if 6 *storeys* in *building height*.

- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.60. Group D, up to 6 Storeys, Sprinklered

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) it is *sprinklered* throughout,

- (b) it is not more than 6 storeys in building height,
 - (c) it has a height of not more than 18 m measured between the floor of the first storey and the uppermost floor level that does not serve a rooftop enclosure for elevator machinery, a stairway or a service room used only for service to the building, and
 - (d) it has a building area of not more than
 - (i) 18 000 m² if 1 storey in building height,
 - (ii) 9 000 m² if 2 storeys in building height,
 - (iii) 6 000 m² if 3 storeys in building height,
 - (iv) 4 500 m² if 4 storeys in building height,
 - (v) 3 600 m² if 5 storeys in building height, or
 - (vi) 3 000 m² if 6 storeys in building height.
- (2) The building referred to in Sentence (1) is permitted to be of combustible construction or noncombustible construction used singly or in combination, and
- (a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
 - (b) roof assemblies shall have a fire-resistance rating not less than 1 h,
 - (c) except as provided by Sentence (3), where the roof assembly has a height greater than 25 m measured from the floor of the first storey to the highest point of the roof assembly, the roof assembly shall be constructed of noncombustible construction or fire-retardant-treated wood conforming to Article 3.1.4.5.,
 - (d) mezzanines shall have a fire-resistance rating not less than 1 h, and
 - (e) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.
- (3) Where buildings conforming to Sentence (2) include non-contiguous roof assemblies at different elevations, the roof assemblies are permitted to be evaluated separately to determine which ones are required to be constructed in accordance with Clause (2)(c).
- (4) Group A, Division 2 major occupancies, Group E major occupancies, Group F, Division 2 and 3 major occupancies and storage garages located in a building or part thereof within the scope of this Article are permitted to be constructed in accordance with this Article, provided
- (a) the Group A, Division 2 major occupancy, Group E major occupancy and Group F, Division 2 or 3 major occupancy are located below the third storey, and
 - (b) storage garages are located below the fourth storey. (See also Article 4.4.2.1.)
- (See Note A-3.2.2.51.(5) and 3.2.2.60.(4))

3.2.2.61. Group D, up to 4 Storeys, Sprinklered

- (1) A building classified as Group D is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the building is sprinklered throughout,
 - (b) it is not more than 4 storeys in building height, and
 - (c) it has a building area not more than 3 600 m².
- (2) The building referred to in Sentence (1) is permitted to be of combustible construction or noncombustible construction used singly or in combination, and
- (a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 h,
 - (b) mezzanines shall have a fire-resistance rating not less than 1 h, and
 - (c) loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly.

3.2.2.62. Group D, up to 3 Storeys

- (1) A building classified as Group D is permitted to conform to Sentence (2) provided
- (a) it is not more than 3 storeys in building height, and
 - (b) it has a building area not more than the value in Table 3.2.2.62.

Table 3.2.2.62.
Maximum Building Area, Group D, up to 3 Storeys
 Forming Part of Sentence 3.2.2.62.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	4 800	6 000	7 200
2	2 400	3 000	3 600
3	1 600	2 000	2 400

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that in a *building* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided the roof assembly is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1., and the *building area* is not more than
 - (i) 2 400 m² if facing one *street*,
 - (ii) 3 000 m² if facing 2 *streets*, or
 - (iii) 3 600 m² if facing 3 *streets*, and
 - (d) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.63. Group D, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 14 400 m² if 1 *storey* in *building height*,
 - (ii) 7 200 m² if 2 *storeys* in *building height*, or
 - (iii) 4 800 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.64. Group D, up to 2 Storeys

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.64.

Table 3.2.2.64.
Maximum Building Area, Group D, up to 2 Storeys
 Forming Part of Sentence 3.2.2.64.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 000	1 250	1 500
2	800	1 000	1 200

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.65. Group D, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group D is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 3 000 m² if 1 *storey* in *building height*, or
 - (ii) 2 400 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.66. Group E, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.67. to 3.2.2.71. and 3.2.2.93., a *building* classified as Group E shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.67. Group E, up to 4 Storeys, Sprinklered

- (1) A *building* classified as Group E is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than 1 800 m².

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.68. Group E, up to 3 Storeys

- (1) A *building* classified as Group E is permitted to conform to Sentence (2) provided
 - (a) it is not more than 3 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.68.

Table 3.2.2.68.
Maximum Building Area, Group E, up to 3 Storeys
 Forming Part of Sentence 3.2.2.68.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 500	1 500	1 500
2	1 200	1 500	1 500
3	800	1 000	1 500

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) roof assemblies shall have a *fire-resistance rating* not less than 45 min, except that in a *building* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided the roof assembly is of *noncombustible construction* or is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1.,
 - (d) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*, and
 - (e) *loadbearing* walls, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the *fire separation*.

3.2.2.69. Group E, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group E is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 7 200 m² if 1 *storey* in *building height*,
 - (ii) 3 600 m² if 2 *storeys* in *building height*, or
 - (iii) 2 400 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,

- (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*, and
- (d) *loadbearing* walls, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the *fire separation*.

3.2.2.70. Group E, up to 2 Storeys

- (1) A *building* classified as Group E is permitted to conform to Sentence (2) provided
 - (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.70.

Table 3.2.2.70.
Maximum Building Area, Group E, up to 2 Storeys
 Forming Part of Sentence 3.2.2.70.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 000	1 250	1 500
2	600	750	900

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.71. Group E, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group E is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 3 000 m² if 1 *storey* in *building height*, or
 - (ii) 1 800 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.72. Group F, Division 1, up to 4 Storeys, Sprinklered

- (1) Except as permitted by Articles 3.2.2.73. to 3.2.2.75., a *building* classified as Group F, Division 1 shall conform to Sentence (2) provided
 - (a) it is not more than 4 *storeys* in *building height*, and
 - (b) it has a *building area* not more than
 - (i) 9 000 m² if 1 *storey* in *building height*,
 - (ii) 4 500 m² if 2 *storeys* in *building height*,
 - (iii) 3 000 m² if 3 *storeys* in *building height*, or
 - (iv) 2 250 m² if 4 *storeys* in *building height*.

- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.73. Group F, Division 1, up to 3 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 1 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 3 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 3 600 m² if 1 *storey* in *building height*,
 - (ii) 1 800 m² if 2 *storeys* in *building height*, or
 - (iii) 1 200 m² if 3 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *heavy timber construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.74. Group F, Division 1, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 1 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 2 400 m² if 1 *storey* in *building height*, or
 - (ii) 1 200 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.75. Group F, Division 1, One Storey

- (1) A *building* classified as Group F, Division 1 is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination provided
 - (a) it is not more than 1 *storey* in *building height*, and
 - (b) it has a *building area* not more than 800 m².

3.2.2.76. Group F, Division 2, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.77. to 3.2.2.81. and 3.2.2.93., a *building* classified as Group F, Division 2 shall conform to Sentence (2).

- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.77. Group F, Division 2, up to 4 Storeys, Increased Area, Sprinklered

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 18 000 m² if 1 *storey* in *building height*,
 - (ii) 9 000 m² if 2 *storeys* in *building height*,
 - (iii) 6 000 m² if 3 *storeys* in *building height*, or
 - (iv) 4 500 m² if 4 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.78. Group F, Division 2, up to 3 Storeys

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided
- (a) it is not more than 3 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.78.

Table 3.2.2.78.
Maximum Building Area, Group F, Division 2, up to 3 Storeys
 Forming Part of Sentence 3.2.2.78.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 500	1 500	1 500
2	1 500	1 500	1 500
3	1 070	1 340	1 500

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that in a *building* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided the roof assembly is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1.,
 - (d) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*, and

- (e) *loadbearing* walls, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.79. Group F, Division 2, up to 4 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 9 600 m² if 1 *storey* in *building height*,
 - (ii) 4 800 m² if 2 *storeys* in *building height*,
 - (iii) 3 200 m² if 3 *storeys* in *building height*, or
 - (iv) 2 400 m² if 4 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*, and
 - (d) *loadbearing* walls, columns and arches supporting a *fire separation* shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.80. Group F, Division 2, up to 2 Storeys

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided
 - (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.80.

Table 3.2.2.80.
Maximum Building Area, Group F, Division 2, up to 2 Storeys
 Forming Part of Sentence 3.2.2.80.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 000	1 250	1 500
2	600	750	900

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.81. Group F, Division 2, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 2 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.28.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and

- (c) it has a *building area* not more than
- (i) 4 500 m² if 1 *storey* in *building height*, or
 - (ii) 1 800 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
- (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.82. Group F, Division 3, Any Height, Any Area, Sprinklered

- r1 (1) Except as permitted by Articles 3.2.2.83. to 3.2.2.93., a *building* classified as Group F, Division 3 shall conform to Sentence (2).
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
- (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* shall be *sprinklered* throughout,
 - (b) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h, except that floor assemblies are permitted to be *fire separations* with a *fire-resistance rating* not less than 1 h in a *storage garage* with all *storeys* constructed as *open-air storeys*,
 - (c) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (d) if the *building* is not *sprinklered*, roof assemblies shall have a *fire-resistance rating* not less than 1 h, and
 - (e) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.83. Group F, Division 3, up to 6 Storeys

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) it is not more than 6 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.83.

Table 3.2.2.83.
Maximum Building Area, Group F, Division 3, up to 6 Storeys
 Forming Part of Sentence 3.2.2.83.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	not limited	not limited	not limited
2	7 200	9 000	10 800
3	4 800	6 000	7 200
4	3 600	4 500	5 400
5	2 880	3 600	4 320
6	2 400	3 000	3 600

- (2) The *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h,
 - (c) roof assemblies shall have a *fire-resistance rating* not less than 1 h, and
 - (d) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.84. Group F, Division 3, up to 6 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 6 *storeys* in *building height*, and
 - (c) it has a *building area*
 - (i) that is not limited if the *building* is not more than 1 *storey* in *building height*,
 - (ii) not more than 21 600 m² if 2 *storeys* in *building height*,
 - (iii) not more than 14 400 m² if 3 *storeys* in *building height*,
 - (iv) not more than 10 800 m² if 4 *storeys* in *building height*,
 - (v) not more than 8 640 m² if 5 *storeys* in *building height*, or
 - (vi) not more than 7 200 m² if 6 *storeys* in *building height*.
- (2) Except as permitted by Article 3.2.2.16., the *building* referred to in Sentence (1) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - (c) *loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.

3.2.2.85. Group F, Division 3, up to 4 Storeys

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) it is not more than 4 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.85.

Table 3.2.2.85.
Maximum Building Area, Group F, Division 3, up to 4 Storeys
 Forming Part of Sentence 3.2.2.85.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	4 800	6 000	7 200
2	2 400	3 000	3 600
3	1 600	2 000	2 400
4	1 200	1 500	1 800

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min,
 - (c) roof assemblies shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, except that in a *building* not more than 1 *storey* in *building height*, the *fire-resistance rating* is permitted to be waived provided

the roof assembly is constructed as a *fire-retardant-treated wood* roof system conforming to Article 3.1.14.1., and the *building area* is not more than

- (i) 2 400 m² if facing one *street*,
- (ii) 3 000 m² if facing 2 *streets*, or
- (iii) 3 600 m² if facing 3 *streets*, and
- (d) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.86. Group F, Division 3, up to 4 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 4 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 14 400 m² if 1 *storey* in *building height*,
 - (ii) 7 200 m² if 2 *storeys* in *building height*,
 - (iii) 4 800 m² if 3 *storeys* in *building height*, or
 - (iv) 3 600 m² if 4 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min,
 - (b) *mezzanines* shall have, if of *combustible construction*, a *fire-resistance rating* not less than 45 min, and
 - (c) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.87. Group F, Division 3, up to 2 Storeys

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) it is not more than 2 *storeys* in *building height*, and
 - (b) it has a *building area* not more than the value in Table 3.2.2.87.

Table 3.2.2.87.
Maximum Building Area, Group F, Division 3, up to 2 Storeys
 Forming Part of Sentence 3.2.2.87.(1)

No. of Storeys	Maximum Area, m ²		
	Facing 1 Street	Facing 2 Streets	Facing 3 Streets
1	1 600	2 000	2 400
2	800	1 000	1 200

- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.88. Group F, Division 3, up to 2 Storeys, Sprinklered

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 2 *storeys* in *building height*, and
 - (c) it has a *building area* not more than
 - (i) 7 200 m² if 1 *storey* in *building height*, or
 - (ii) 2 400 m² if 2 *storeys* in *building height*.
- (2) The *building* referred to in Sentence (1) is permitted to be of *combustible construction* or *noncombustible construction* used singly or in combination, and
 - (a) floor assemblies shall be *fire separations* and, if of *combustible construction*, shall have a *fire-resistance rating* not less than 45 min, and
 - (b) *loadbearing* walls, columns and arches supporting an assembly required to have a *fire-resistance rating* shall
 - (i) have a *fire-resistance rating* not less than 45 min, or
 - (ii) be of *noncombustible construction*.

3.2.2.89. Group F, Division 3, One Storey

- (1) A *building* classified as Group F, Division 3 is permitted to be of *heavy timber construction* or *noncombustible construction* used singly or in combination provided
 - (a) it is not more than 1 *storey* in *building height*, and
 - (b) it has a *building area* not more than
 - (i) 5 600 m² if facing one *street*,
 - (ii) 7 000 m² if facing 2 *streets*, or
 - (iii) 8 400 m² if facing 3 *streets*.

3.2.2.90. Group F, Division 3, One Storey, Sprinklered

- (1) A *building* classified as Group F, Division 3 is permitted to be of *heavy timber construction* or *noncombustible construction* used singly or in combination provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - (b) it is not more than 1 *storey* in *building height*, and
 - (c) it has a *building area* not more than 16 800 m².

3.2.2.91. Group F, Division 3, One Storey, Any Area, Low Fire Load Occupancy

- (1) A *building* classified as Group F, Division 3 is permitted to conform to Sentence (2) provided it is
 - (a) not more than 1 *storey* in *building height*,
 - (b) used solely for low *fire load occupancies* such as
 - (i) power generating plants, or
 - (ii) plants for the manufacture or storage of *noncombustible* materials, and
 - (c) not limited in *building area*.
- (2) The *building* referred to in Sentence (1) shall be of *noncombustible construction*.

3.2.2.92. Group F, Division 3, Storage Garages up to 22 m High

- (1) A *building* used as a *storage garage* with all *storeys* constructed as *open-air storeys* and having no other *occupancy* above it is permitted to have its floor, wall, ceiling and roof assemblies constructed without a *fire-resistance rating* provided it is
- of *noncombustible construction*,
 - not more than 22 m high, measured between *grade* and the ceiling level of the top *storey*,
 - not more than 10 000 m² in *building area*, and
 - designed so that every portion of each *floor area* is within 60 m of an exterior wall opening.

r1 3.2.2.93. Encapsulated Mass Timber Construction, Various Occupancies, Heights and Areas, Sprinklered

- (1) A *building* that is classified as Group A, Division 2, Group B, Division 3, Group C other than a *retirement home*, Group D, Group E, or Group F, Division 2 or 3, is permitted to conform to Sentence (2) provided
- except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2), the *building* is *sprinklered* throughout,
 - the *building* has a *building height* not exceeding the number of *storeys* shown in Table 3.2.2.93. for the applicable *major occupancy* and minimum *encapsulation rating*,
 - the *building* has a maximum height that conforms to the value shown in Table 3.2.2.93. for the applicable *major occupancy* and minimum *encapsulation rating* that is measured between the floor of the *first storey* and the uppermost floor level that does not serve a rooftop enclosure for elevator machinery, a stairway or a *service room* used only for service to the *building*,
 - the *building* has a maximum *building area* that conforms to the value shown in Table 3.2.2.93. for the applicable *major occupancy*, and
 - except as provided in Sentences 3.1.6.3.(4) and 3.1.6.7.(1) and Article 3.1.6.4., the *encapsulation rating* conforms to the value shown in Table 3.2.2.93. for the applicable *major occupancy* and maximum *building height*.
- (See Note A-3.2.2.93.(1) and Table 3.2.2.93. See also Articles 3.2.2.48. and 3.2.2.57.)
- (2) Except as provided in Article 3.2.2.16., the *building* referred to in Sentence (1) is permitted to be of *encapsulated mass timber construction* or *noncombustible construction* used singly or in combination, and,
- except as provided in Sentence (3), floor assemblies shall be *fire separations* with a *fire-resistance rating* not less than 2 h,
 - mezzanines* shall have a *fire-resistance rating* not less than 1 h, and
 - loadbearing* walls, columns and arches shall have a *fire-resistance rating* not less than that required for the supported assembly.
- (3) In a *building* classified as a Group C *major occupancy* that contains *dwelling units* that have more than one *storey*, subject to the requirements of Sentence 3.3.4.2.(3), the floor assemblies, including floors over *basements*, that are entirely contained within these *dwelling units* shall have a *fire-resistance rating* not less than 1 h but need not be constructed as *fire separations*.
- (4) In *buildings* referred to in Sentence (1) where the roof assembly of an *exit* stairway or *vertical service space* used as an elevator hoistway has a height greater than 55 m measured from *grade* to the highest point of the roof assembly, the enclosure for the stairway or hoistway shall be of *encapsulated mass timber construction* or constructed of concrete.
- (5) Group E *major occupancies* and *storage garages* located in a *building* or part thereof within the scope of this Article are permitted to be constructed in accordance with this Article and the corresponding Group A, Division 2, Group C, or Group D *major occupancy* requirements contained in Table 3.2.2.93., provided
- the Group E *major occupancy* is located below the third *storey*, and
 - the *storage garage* is located below the fifth *storey*. (See also Article 4.4.2.1.)
- (See Note A-3.2.2.48.(4), 3.2.2.57.(3) and 3.2.2.93.(5) to (7))

(6) Group A, Division 2 *major occupancies* located in a *building* or part of a *building* within the scope of this Article are permitted to be constructed in accordance with this Article and the corresponding Group C, or Group D *major occupancy* requirements contained in Table 3.2.2.93., provided they are located below the fourth *storey*.
(See Note A-3.2.2.48.(4), 3.2.2.57.(3) and 3.2.2.93.(5) to (7))

(7) Group F, Division 2 and 3 *major occupancies* located in a *building* or part thereof within the scope of this Article are permitted to be constructed in accordance with this Article and the corresponding Group D *major occupancy* requirements contained in Table 3.2.2.93., provided they are located below the third *storey*.
(See Note A-3.2.2.48.(4), 3.2.2.57.(3) and 3.2.2.93.(5) to (7))

Table 3.2.2.93.
Encapsulated Mass Timber Construction, Various Occupancies, Heights and Areas, Sprinklered⁽¹⁾⁽²⁾
Forming Part of Sentences 3.2.2.93.(1), (5), (6) and (7)

Major Occupancy	Maximum Building Height, Storeys	Maximum Height, m	Maximum Building Area, m ²	Minimum Encapsulation Rating, min
Group A, Division 2	18	76	7200	70
	12	51		50
	6	26		0
Group B, Division 3	10	42	8000	70
	6	26		50
	4	17		0
Group C	18	76	6000	70
	8	34		0
Group D	18	76	7200	70
	9	38		0
Group E	12	51	6000	70
	8	34		50
	6	26		0
Group F, Division 2	10	42	4500	70
	7	30		50
	5	21		0
Group F, Division 3	12	51	7200	70
	8	34		50
	5	21		0

Notes to Table 3.2.2.93.:

- (1) See Sentences (5) to (7) and Articles 3.2.2.4. to 3.2.2.8. for information pertaining to multiple *major occupancies*.
- (2) Linear interpolation is not permitted in using Table 3.2.2.93.

3.2.3. Spatial Separation and Exposure Protection (See Note A-3.2.3.)**3.2.3.1. Limiting Distance and Area of Unprotected Openings**

- (1) Except as permitted by Articles 3.2.3.10. to 3.2.3.12., the area of *unprotected openings* in an *exposing building face* for the applicable *limiting distance* shall be not more than the value determined in accordance with
- (a) Table 3.2.3.1.-B or Table 3.2.3.1.-C for an *exposing building face* conforming to Article 3.2.3.2. of a *building* or *fire compartment* which is not *sprinklered*, or
 - (b) Table 3.2.3.1.-D or Table 3.2.3.1.-E for an *exposing building face* conforming to Article 3.2.3.2. of a *sprinklered fire compartment* that is part of a *building* which is *sprinklered* in conformance with Section 3.2.

(See Note A-3)

(See also Article 3.1.18.3.)

- (2) The area of the *unprotected openings* in an *exposing building face* shall be the aggregate area of *unprotected openings* expressed as a percentage of the area of the *exposing building face* in Table 3.2.3.1.-B, 3.2.3.1.-C, 3.2.3.1.-D or 3.2.3.1.-E. (See Sentence 3.2.3.2.(1))

- (3) For the purpose of determining the type of construction and cladding and the *fire-resistance rating* of an exterior wall,

- (a) the *exposing building face* shall be taken as the projection of the exterior wall onto a vertical plane located so that no portion of the exterior wall of the *building* or of a *fire compartment*, if the *fire compartment* complies with the requirements of Article 3.2.3.2., is between the vertical plane and the line to which the *limiting distance* is measured, and
- (b) the area of *unprotected openings* shall be determined from Table 3.2.3.1.-B, 3.2.3.1.-C, 3.2.3.1.-D or 3.2.3.1.-E.

- (4) For the purpose of determining the actual percentage of *unprotected openings* permitted in an exterior wall, the location of the *exposing building face* is permitted to be taken at a vertical plane located so that there are no *unprotected openings* between the vertical plane and the line to which the *limiting distance* is measured. (See Note A-3.2.3.1.(4))

- (5) Except for *buildings* that are *sprinklered*, where the *limiting distance* is 2 m or less, individual *unprotected openings* in an *exposing building face* shall be no greater than

- (a) the area stated in Table 3.2.3.1.-A, or
- (b) where the *limiting distance* equal to or greater than 1.2 m, the area calculated by

$$\text{Area} = 0.24 [(2 \times \text{LD}) - 1.2]^2$$

where

Area = area of the *unprotected opening*, and

LD = *limiting distance*.

Table 3.2.3.1.-A
Maximum Concentrated Area of Unprotected Openings
 Forming Part of Sentence 3.2.3.1.(5)

<i>Limiting Distance, m</i>	<i>Maximum Area of Individual Unprotected Openings, m²</i>
1.2	0.35
1.5	0.78
2.0	1.88

- (6) The spacing between individual *unprotected openings* described in Sentence (5) that serve a single room or space described in Sentence (7) shall not be less than
- (a) 2 m horizontally of another *unprotected opening* that is on the same *exposing building face* and serves the single room or space, or
 - (b) 2 m vertically of another *unprotected opening* that serves the single room or space, or another room or space on the same *storey*.
- (7) For the purpose of Sentence (6), “single room or space” means a room or space that
- (a) is not divided by a wall,
 - (b) is divided by
 - (i) a wall that extends less than 1.5 m from the interior face of the exterior wall, or
 - (ii) a partial height wall, or
 - (c) consists of two or more stacked spaces that are on the same *storey*.
- (8) If a *building* has any *storey* that is not *sprinklered* and firefighting facilities cannot reach it within 10 min of the alarm being received, the required *limiting distance* shall be doubled.
- (9) If the surface temperature on the unexposed surface of a wall assembly exceeds the temperature limit of a standard fire test as permitted by Article 3.1.7.2., an allowance shall be made for the radiation from the hot unexposed wall surface by adding an equivalent area of *unprotected opening* to the area of actual openings as follows:

$$A_C = A + (A_F \times F_{EO})$$

where

- A_C = corrected area of *unprotected openings* including actual and equivalent openings,
- A = actual area of *unprotected openings*,
- A_F = area of exterior surface of the *exposing building face*, exclusive of openings, on which the temperature limit of the standard test is exceeded, and
- F_{EO} = an equivalent opening factor derived from the following expression:

$$F_{EO} = \frac{(T_u + 273)^4}{(T_e + 273)^4}$$

- T_u = average temperature in degrees Celsius of the unexposed wall surface at the time the required *fire-resistance rating* is reached under test conditions,
- T_e = 892°C for a *fire-resistance rating* not less than 45 min, 927°C for a *fire-resistance rating* not less than 1 h, and 1 010°C for a *fire-resistance rating* not less than 2 h.

- (10) Unless a *closure* used to protect an opening in an *exposing building face* has a protective performance equivalent to that required for the wall assembly in which it is located, an equivalent area of *unprotected opening*, determined in accordance with the procedures of Sentence (9) shall be added to the greater of
- (a) the actual area of *unprotected openings*, or
 - (b) the corrected area of *unprotected openings*.
- (11) The required *limiting distance* for an *exposing building face* is permitted to be measured to a point beyond the property line that is not the centre line of a *street*, lane or public thoroughfare if
- (a) the owners of the properties on which the *limiting distance* is measured and the *municipality* enter into an agreement in which such owners agree that,
 - (i) each owner covenants that, for the benefit of land owned by the other covenantors, the owner will not *construct a building* on his or her property unless the *limiting distance* for *exposing building faces* in respect of the proposed *construction* is measured in accordance with the agreement,
 - (ii) the covenants contained in the agreement are intended to run with the lands, and the agreement shall be binding on the parties and their respective heirs, executors, administrators, successors and assigns,
 - (iii) the agreement shall not be amended or deleted from title without the consent of the *municipality*, and
 - (iv) they will comply with such other conditions as the *municipality* considers necessary, including indemnification of the *municipality* by the other parties, and
 - (b) the agreement referred to in Clause (a) is registered against the title of the properties to which it applies.
- (12) Where an agreement referred to in Sentence (11) is registered against the title of a property, the *limiting distance* for *exposing building faces* shall be measured to the point referred to in the agreement.

Table 3.2.3.1.-B
Unprotected Opening Limits for a Building or Fire Compartment that is not Sprinklered Throughout
 Forming Part of Article 3.2.3.1.

Exposing Building Face		Area of Unprotected Openings for Groups A, C, D, and F, Division 3 Occupancies, %																									
Maximum Area, m ²	Ratio (L/H or H/L) ⁽¹⁾	Limiting Distance, m																									
		0	1.2	1.5	2	2.5	3	4	5	6	7	8	9	10	11	12	13	14	16	18	20	25	30	35	40	45	50
10	Less than 3:1	0	8	10	18	29	46	91	100																		
	3:1 to 10:1	0	8	12	21	33	50	96	100																		
	over 10:1	0	11	18	32	48	68	100																			
15	Less than 3:1	0	7	9	14	22	33	63	100																		
	3:1 to 10:1	0	8	10	17	25	37	67	100																		
	over 10:1	0	10	15	26	39	53	87	100																		
20	Less than 3:1	0	7	9	12	18	26	49	81	100																	
	3:1 to 10:1	0	8	10	15	21	30	53	85	100																	
	over 10:1	0	9	14	23	33	45	72	100																		
25	Less than 3:1	0	7	8	11	16	23	41	66	98	100																
	3:1 to 10:1	0	8	9	13	19	26	45	70	100																	
	over 10:1	0	9	13	21	30	39	62	90	100																	
30	Less than 3:1	0	7	8	11	15	20	35	56	83	100																
	3:1 to 10:1	0	7	9	12	17	23	39	61	88	100																
	over 10:1	0	8	12	19	27	36	56	79	100																	
40	Less than 3:1	0	7	8	10	13	17	28	44	64	89	100															
	3:1 to 10:1	0	7	8	11	15	20	32	48	69	93	100															
	over 10:1	0	8	11	17	24	31	47	66	88	100																
50	Less than 3:1	0	7	8	9	12	15	24	37	53	72	96	100														
	3:1 to 10:1	0	7	8	10	14	18	28	41	57	77	100															
	over 10:1	0	8	10	15	21	28	41	57	76	97	100															
60	Less than 3:1	0	7	8	9	11	14	21	32	45	62	81	100														
	3:1 to 10:1	0	7	8	10	13	16	25	36	49	66	85	100														
	over 10:1	0	8	10	14	20	25	38	51	67	85	100															
80	Less than 3:1	0	7	7	8	10	12	18	26	36	48	62	79	98	100												
	3:1 to 10:1	0	7	8	9	11	14	21	29	40	52	67	84	100													
	over 10:1	0	8	9	13	17	22	32	44	56	70	86	100														
100	Less than 3:1	0	7	7	8	9	11	16	22	30	40	51	65	80	97	100											
	3:1 to 10:1	0	7	8	9	11	13	18	25	34	44	56	69	84	100												
	over 10:1	0	7	9	12	16	20	29	39	49	61	74	89	100													
150	Less than 3:1	0	7	7	8	9	10	13	17	22	29	37	46	56	67	79	93	100									
	3:1 to 10:1	0	7	7	8	10	11	15	20	26	33	41	50	60	71	84	97	100									
	over 10:1	0	7	8	11	13	17	24	31	39	48	57	68	79	91	100											
250	Less than 3:1	0	7	7	7	8	9	10	13	16	20	25	30	36	43	51	59	68	87	100							
	3:1 to 10:1	0	7	7	8	9	10	12	15	19	24	28	34	40	47	55	63	72	92	100							
	over 10:1	0	7	8	9	11	14	19	24	30	36	43	50	57	65	73	82	92	100								
350	Less than 3:1	0	7	7	7	8	8	9	11	14	16	20	24	28	33	38	44	50	64	81	99	100					
	3:1 to 10:1	0	7	7	8	9	9	11	13	16	19	23	27	32	37	42	48	55	69	85	100						
	over 10:1	0	7	8	9	10	12	16	21	25	30	36	41	47	53	59	66	73	88	100							
500	Less than 3:1	0	7	7	7	7	8	9	10	12	14	16	19	22	25	29	33	37	47	59	71	100					
	3:1 to 10:1	0	7	7	7	8	8	10	12	14	16	19	22	25	29	33	37	41	52	63	76	100					
	over 10:1	0	7	7	8	9	11	14	18	22	25	30	34	38	43	48	53	58	70	82	96	100					
1 000	Less than 3:1	0	7	7	7	7	8	9	9	10	12	13	14	16	18	20	22	27	33	39	58	82	100				
	3:1 to 10:1	0	7	7	7	8	8	9	10	11	12	14	15	17	19	21	23	26	31	37	43	63	86	100			
	over 10:1	0	7	7	8	8	9	11	13	16	19	21	24	27	30	33	36	39	46	53	60	82	100				
2 000	Less than 3:1	0	7	7	7	7	7	8	8	9	9	10	11	12	13	14	15	17	20	23	33	44	58	74	93	100	
	3:1 to 10:1	0	7	7	7	7	8	8	9	10	11	12	13	14	15	16	17	20	23	27	37	49	63	79	97	100	
	over 10:1	0	7	7	7	8	8	9	11	12	14	16	18	19	21	23	25	27	32	36	40	53	66	82	99	100	

Notes to Table 3.2.3.1.-B:

- (1) Apply whichever is greater,
 L = Length of exposing building face
 H = Height of exposing building face

Table 3.2.3.1.-C
Unprotected Opening Limits for a Building or Fire Compartment that is not Sprinklered Throughout
 Forming Part of Article 3.2.3.1.

Exposing Building Face		Area of Unprotected Openings for Groups E and F, Division 1 and 2 Occupancies, %																															
Maximum Area, m ²	Ratio (L/H or H/L) ⁽¹⁾	Limiting Distance, m																															
		0	1.2	1.5	2	2.5	3	4	5	6	7	8	9	10	11	12	13	14	16	18	20	25	30	35	40	45	50	55	60	65	70		
10	Less than 3:1	0	4	5	9	15	23	46	77	100																							
	3:1 to 10:1	0	4	6	10	17	25	48	79	100																							
	over 10:1	0	5	9	16	24	34	58	91	100																							
15	Less than 3:1	0	4	5	7	11	16	32	53	79	100																						
	3:1 to 10:1	0	4	5	8	13	18	34	55	82	100																						
	over 10:1	0	5	8	13	19	26	43	66	93	100																						
20	Less than 3:1	0	4	4	6	9	13	25	40	61	85	100																					
	3:1 to 10:1	0	4	5	7	11	15	27	43	63	87	100																					
	over 10:1	0	5	7	11	17	22	36	53	74	99	100																					
25	Less than 3:1	0	4	4	6	8	11	20	33	49	69	92	100																				
	3:1 to 10:1	0	4	5	7	9	13	22	35	51	71	94	100																				
	over 10:1	0	4	6	10	15	20	31	45	62	82	100																					
30	Less than 3:1	0	4	4	5	7	10	18	28	42	58	77	100																				
	3:1 to 10:1	0	4	4	6	9	12	20	30	44	60	80	100																				
	over 10:1	0	4	6	10	14	18	28	40	54	71	91	100																				
40	Less than 3:1	0	4	4	5	6	8	14	22	32	44	59	76	94	100																		
	3:1 to 10:1	0	4	4	6	8	10	16	24	34	47	61	78	97	100																		
	over 10:1	0	4	5	8	12	15	23	33	44	57	72	89	100																			
50	Less than 3:1	0	4	4	5	6	7	12	18	26	36	48	61	76	93	100																	
	3:1 to 10:1	0	4	4	5	7	9	14	20	29	38	50	63	79	95	100																	
	over 10:1	0	4	5	8	11	14	21	29	38	48	61	74	90	100																		
60	Less than 3:1	0	4	4	4	5	7	11	16	23	31	40	52	64	78	94	100																
	3:1 to 10:1	0	4	4	5	6	8	12	18	25	33	43	54	66	81	96	100																
	over 10:1	0	4	5	7	10	13	19	26	34	43	53	64	77	92	100																	
80	Less than 3:1	0	4	4	4	5	6	9	13	18	24	31	40	49	60	71	84	98	100														
	3:1 to 10:1	0	4	4	5	6	7	10	15	20	26	33	42	51	62	74	86	100															
	over 10:1	0	4	5	6	9	11	16	22	28	35	43	52	62	73	85	98	100															
100	Less than 3:1	0	4	4	4	5	5	8	11	15	20	26	32	40	48	58	68	79	100														
	3:1 to 10:1	0	4	4	4	5	6	9	13	17	22	28	35	42	51	60	70	81	100														
	over 10:1	0	4	4	6	8	10	14	19	25	31	37	44	52	61	71	81	92	100														
150	Less than 3:1	0	4	4	4	4	5	6	8	11	14	18	23	28	33	40	46	54	70	89	100												
	3:1 to 10:1	0	4	4	4	5	6	8	10	13	16	20	25	30	36	42	49	56	73	92	100												
	over 10:1	0	4	4	5	7	8	12	16	20	24	29	34	39	46	52	59	67	84	100													
250	Less than 3:1	0	4	4	4	4	4	5	7	8	10	12	15	18	22	25	29	34	44	55	68	100											
	3:1 to 10:1	0	4	4	4	4	5	6	8	10	12	14	17	20	24	27	32	36	46	57	70	100											
	over 10:1	0	4	4	5	6	7	9	12	15	18	21	25	28	32	37	41	46	56	68	81	100											
350	Less than 3:1	0	4	4	4	4	4	5	6	7	8	10	12	14	16	19	22	25	32	40	49	77	100										
	3:1 to 10:1	0	4	4	4	4	4	5	7	8	10	12	14	16	18	21	24	27	34	43	52	79	100										
	over 10:1	0	4	4	4	5	6	8	10	13	15	18	21	23	26	30	33	36	44	53	62	90	100										
500	Less than 3:1	0	4	4	4	4	4	4	5	6	7	8	9	11	13	14	16	19	24	29	36	55	78	100									
	3:1 to 10:1	0	4	4	4	4	4	5	6	7	8	9	11	13	14	16	18	21	26	31	38	57	80	100									
	over 10:1	0	4	4	4	5	5	7	9	11	13	15	17	19	21	24	26	29	35	41	48	68	92	100									
1 000	Less than 3:1	0	4	4	4	4	4	4	4	5	5	6	6	7	8	9	10	11	14	16	20	29	41	55	71	89	100						
	3:1 to 10:1	0	4	4	4	4	4	4	5	5	6	7	8	9	10	11	12	13	15	18	22	31	43	57	73	91	100						
	over 10:1	0	4	4	4	4	4	5	6	7	8	9	11	12	13	15	16	18	20	23	26	30	41	53	68	84	100						
2 000	Less than 3:1	0	4	4	4	4	4	4	4	4	4	5	5	5	6	6	7	7	9	10	12	16	22	29	37	46	56	68	80	94	100		
	3:1 to 10:1	0	4	4	4	4	4	4	4	4	4	5	5	5	6	6	7	7	8	9	10	12	13	18	24	31	39	49	59	70	83	96	100
	over 10:1	0	4	4	4	4	4	5	5	6	7	8	9	10	11	12	13	14	16	18	20	26	33	41	50	59	70	81	94	100			

Notes to Table 3.2.3.1.-C:

- (1) Apply whichever is greater,
 L = Length of exposing building face
 H = Height of exposing building face

Table 3.2.3.1.-D
Unprotected Opening Limits for a Building or Fire Compartment that is Sprinklered Throughout
 Forming Part of Sentence 3.1.6.9.(5) and Article 3.2.3.1.

Exposing Building Face	Area of Unprotected Opening for Groups A, B, C, D and F, Division 3 Occupancies, %											
	Limiting Distance, m											
	0	1.2	1.5	2	2.5	3	4	5	6	7	8	9
Maximum Area, m ²												
10	0	16	24	42	66	100						
15	0	16	20	34	50	74	100					
20	0	16	20	30	42	60	100					
25	0	16	18	26	38	52	90	100				
30	0	14	18	24	34	46	78	100				
40	0	14	16	22	30	40	64	96	100			
50	0	14	16	20	28	36	56	82	100			
60	0	14	16	20	26	32	50	72	98	100		
80	0	14	16	18	22	28	42	58	80	100		
100	0	14	16	18	22	26	36	50	68	88	100	
150 or more	0	14	14	16	20	22	30	40	52	66	82	100

Table 3.2.3.1.-E
Unprotected Opening Limits for a Building or Fire Compartment that is Sprinklered Throughout
 Forming Part of Sentence 3.1.6.9.(5) and Article 3.2.3.1.

Exposing Building Face	Area of Unprotected Opening for Groups E and F, Division 1 and 2 Occupancies, %																	
	Limiting Distance, m																	
	0	1.2	1.5	2	2.5	3	4	5	6	7	8	9	10	11	12	13	14	15
Maximum Area, m ²																		
10	0	8	12	20	34	50	96	100										
15	0	8	10	16	26	36	68	100										
20	0	8	10	14	22	30	54	86	100									
25	0	8	10	14	18	26	44	70	100									
30	0	8	8	12	18	24	40	60	88	100								
40	0	8	8	12	16	20	32	48	68	94	100							
50	0	8	8	10	14	18	28	40	58	76	100							
60	0	8	8	10	12	16	24	36	50	66	86	100						
80	0	8	8	10	12	14	20	30	40	52	66	84	100					
100	0	8	8	8	10	12	18	26	34	44	56	70	84	100				
150	0	8	8	8	10	12	16	20	26	32	40	50	60	72	84	98	100	
200 or more	0	8	8	8	8	10	14	18	22	28	34	42	50	60	68	80	92	100

3.2.3.2. Area of Exposing Building Face

(1) Except as permitted by Sentences (2) and (3), the area of an *exposing building face* shall be calculated as the total area of exterior wall facing in one direction on any side of a *building* measured from the finished ground level to the uppermost ceiling.

(2) If a *building* is divided by *fire separations* into *fire compartments*, the area of *exposing building face* is permitted to be calculated for each *fire compartment* provided the *fire separations* have a *fire-resistance rating* not less than 45 min.

(3) In a *building* that is *sprinklered* throughout and contains an *interconnected floor space*, the area of the *exposing building face* for the *interconnected floor space* is permitted to be determined by considering each *storey* as a separate *fire compartment* notwithstanding openings through the floor assemblies.

3.2.3.3. Wall Enclosing Attic or Roof Space

(1) An exterior wall enclosing an *attic or roof space* and located above an *exposing building face*, shall be constructed in conformance with the requirements for the *exposing building face*.

3.2.3.4. Reserved

3.2.3.5. Wall With Limiting Distance Less Than 1.2 m

(1) Openings in a wall that has a *limiting distance* less than 1.2 m shall be protected by *closures* whose *fire-protection rating* is in conformance with the *fire-resistance rating* required for the wall.

(2) Wired glass or glass block shall not be used for a *closure* referred to in Sentence (1).

3.2.3.6. Combustible Projections

(1) Except for a *building* containing one or two *dwelling units* only, *combustible* projections on the exterior of a wall that could expose an adjacent *building* to fire spread and are more than 1 m above ground level, including balconies, platforms, *canopies* and stairs, shall not be permitted within

- (a) 1.2 m of a property line or the centre line of a *public way*, or
- (b) 2.4 m of a *combustible* projection on another *building* on the same property.

(2) Except as provided in Sentence (4), where the *exposing building face* has a *limiting distance* of not more than 0.45 m, projecting roof soffits shall not be *constructed* above the *exposing building face*. (See Note A-3.2.3.6.(2))

(3) Except as provided in Sentence (4), where the *exposing building face* has a *limiting distance* of more than 0.45 m, the face of roof soffits above the *exposing building face* shall not project to less than 0.45 m from the property line. (See Note A-3.3.4.6.(2))

(4) The face of a roof soffit is permitted to project to the property line, where it faces a *public way*. (See Note A-9.10.14.5.(11) and 9.10.15.5.(10))

(5) Where roof soffits project to less than 1.2 m from the centre line of a *public way*, or from an imaginary line between two *buildings* or *fire compartments* on the same property, they shall

- (a) have no openings, and
- (b) be protected by
 - (i) not less than 0.38 mm thick sheet steel,
 - (ii) unvented aluminum conforming to CAN/CGSB-93.2-M, “Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use,”
 - (iii) not less than 12.7 mm thick gypsum soffit board or gypsum ceiling board installed according to CSA A82.31-M, “Gypsum Board Application,”
 - (iv) not less than 11 mm thick plywood,
 - (v) not less than 12.5 mm thick OSB or waferboard, or
 - (vi) not less than 11 mm thick lumber.

(6) For *buildings* of *combustible construction*, materials installed to provide the required protection of soffits may be covered with a *combustible* or *noncombustible* finish material.

3.2.3.7. Construction of Exposing Building Face

(1) Except as provided by Sentences (3) and (4) and Articles 3.2.3.10. and 3.2.3.11., the *fire-resistance rating*, construction and cladding for *exposing building faces* of *buildings* or *fire compartments* of Group A, B, C, D or Group F, Division 3 *occupancy* classification shall comply with Table 3.2.3.7.

Table 3.2.3.7.
Minimum Construction Requirements for Exposing Building Faces
 Forming Part of Sentences 3.1.6.9.(5) and 3.2.3.7.(1) to (4)

Occupancy Classification of Building or Fire Compartment	Maximum Area of <i>Unprotected Openings</i> Permitted, % of <i>Exposing Building Face Area</i>	Minimum Required <i>Fire-Resistance Rating</i>	Type of Construction Required	Type of Cladding Required
Group A, B, C, D, or Group F, Division 3	0 to 10	1 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	1 h	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	45 min	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	45 min	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Combustible or Noncombustible</i> ⁽¹⁾⁽²⁾
Group E, or Group F, Division 1 or 2	0 to 10	2 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	2 h	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	1 h	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	1 h	<i>Combustible, Encapsulated Mass Timber Construction, or Noncombustible</i>	<i>Combustible or Noncombustible</i>

Notes to Table 3.2.3.7.:

- (1) The cladding on Group C *buildings* within the scope of Article 3.2.2.51. and on Group D *buildings* within the scope of Article 3.2.2.60. shall be *noncombustible* or consist of a wall that satisfies the requirements of Article 3.1.4.8.
- r1 (2) The cladding on *buildings* or parts thereof conforming to Article 3.2.2.48., 3.2.2.57. or 3.2.2.93. shall conform to Article 3.1.6.9. or be *noncombustible*.

(2) Except as provided in Sentences (3) and (4) and Article 3.2.3.10., the *fire-resistance rating*, construction and cladding for *exposing building faces* of *buildings* or *fire compartments* of Group E or Group F, Division 1 or 2 *occupancy* classification shall comply with Table 3.2.3.7.

(3) Except as provided in Articles 3.1.4.8. and 3.1.6.9., the requirement in Table 3.2.3.7. for *noncombustible* cladding for *buildings* or *fire compartments* where the maximum permitted area of *unprotected openings* is more than 10% of the *exposing building face* is permitted to be waived for exterior wall assemblies that comply with Article 3.1.5.5. or 3.1.5.6.

(4) Except as provided by Articles 3.1.4.8. and 3.1.6.9., the requirement in Table 3.2.3.7. for *noncombustible* cladding for *buildings* or *fire compartments* where the maximum permitted area of *unprotected openings* is more than 25% but not more than 50% of the *exposing building face* is permitted to be waived where

- (a) the *limiting distance* is greater than 5 m,
- (b) the *building* or *fire compartment* and all *combustible attic or roof spaces* are *sprinklered* throughout,
- (c) the cladding
 - (i) conforms to Subsection 9.27.6., 9.27.7., 9.27.8., 9.27.9. or 9.27.10.,
 - (ii) is installed without furring members, or on furring not more than 25 mm thick, over gypsum sheathing at least 12.7 mm thick or over masonry, and
 - (iii) after conditioning in conformance with ASTM D2898, “Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing,” has a *flame-spread rating* not greater than 25 on the exterior face when tested in accordance with Sentence 3.1.12.1.(1),

- (d) the cladding
 - (i) conforms to Subsection 9.27.12.,
 - (ii) is installed with or without furring members over gypsum sheathing at least 12.7 mm thick or over masonry,
 - (iii) has a *flame-spread rating* not greater than 25 when tested in accordance with Sentence 3.1.12.1.(2), and
 - (iv) does not exceed 2 mm in thickness exclusive of fasteners, joints and local reinforcements, or (See Note A-3.2.3.7.(4)(d)(iv))
 - (e) the exterior wall assembly complies with Article 3.1.5.5. or 3.1.5.6.
- (5) The construction requirements for the *exposing building face* stated in Sentences (1) and (2) shall be satisfied before increasing the *unprotected opening* area as permitted by Sentence 3.2.3.12.(1).

3.2.3.8. Protection of Exterior Building Face

- (1) Except as permitted by Sentence (3) and in addition to the requirements of Sentences 3.2.3.7.(1) and (2) and where the maximum permitted area of *unprotected openings* is greater than 10% of the *exposing building face*, foamed plastic insulation used in an exterior wall of a *building* more than 3 *storeys* in *building height* shall be protected on its exterior surface by
- (a) concrete or masonry not less than 25 mm thick, or
 - (b) *noncombustible* material that complies with the criteria for testing and conditions of acceptance stated in Sentence (2) when tested in conformance with CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”
- (2) The criteria for testing and the conditions of acceptance for a wall assembly to satisfy the requirements of Clause (1)(b) are that
- (a) the fire exposed area of the wall assembly shall be not less than 9.3 m² and have no dimension less than 2.75 m,
 - (b) the exposed surface shall include typical vertical and horizontal joints,
 - (c) the test shall be continued for not less than 15 min and the standard time/temperature curve of the referenced standard shall be followed,
 - (d) the *noncombustible* protective material will remain in place and no through openings should develop that are visible when viewed normal to the face of the material, and
 - (e) the *noncombustible* protective material will not disintegrate in a manner that would permit fire to propagate along the surface of the test assembly.
- (3) The requirements of Sentence (1) are waived for wall assemblies that comply with the requirements of Article 3.1.5.5. (See Note A-3.1.4.1.(1))

3.2.3.9. Protection of Structural Members

- r1 (1) Structural members, including beams, columns and arches, placed wholly or partly outside the exterior face of a *building* and are less than 3 m from the property line or the centre line of a public thoroughfare shall be protected from exterior fire exposure by fire protection having a *fire-resistance rating* not less than that required for their protection from interior fire exposure, as stated in Articles 3.2.2.20. to 3.2.2.93., but not less than 1 h.
- (2) Structural members of *heavy timber construction*, including beams, columns and arches, that are placed wholly or partly outside an exterior face of a *building* and are 3 m or more from the property line or the centre line of a public thoroughfare need not be covered with *noncombustible* cladding.

3.2.3.10. Unlimited Unprotected Openings

- (1) An *exposing building face* in a *storage garage* with all *storeys* constructed as *open-air storeys* is permitted to have unlimited *unprotected openings* provided it has a *limiting distance* not less than 3 m.
- (2) The *exposing building face* of a *storey* that faces a *street* and is at the same level as the *street* is permitted to have unlimited *unprotected openings* if the *limiting distance* is not less than 9 m.

3.2.3.11. Low Fire Load, One Storey Building

- (1) An *exposing building face* of a *building* of *low-hazard industrial occupancy* conforming to Article 3.2.2.91. is permitted to be of *noncombustible construction* without a *fire-resistance rating* provided
- it is not a *loadbearing wall*, and
 - the *limiting distance* is not less than 3 m.

3.2.3.12. Area Increase for Unprotected Openings

- (1) Except as required by Sentence 3.2.3.7.(5), the maximum area of *unprotected openings* in any *exposing building face* of a *building* that is not *sprinklered* is permitted to be doubled if the openings are glazed with
- glass block conforming to the requirements of Article 3.1.8.16., or
 - wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”
- (See Note A-3.2.3.12.(1)) (See A-2.3.15. of SB-2)

3.2.3.13. Protection of Exit Facilities

- (1) Except as required by Sentence (3) and as permitted by Sentence 3.4.4.3.(1), if the plane of an exterior wall of an *exit* enclosure forms an angle less than 135° with the plane of an exterior wall of the *building* it serves, and an opening in the exterior wall of the *exit* enclosure could be exposed to fire from an opening in the exterior wall of the *building*, the opening in either the exterior wall of the *exit* or the exterior wall of the *building* shall be protected in conformance with the requirements of Sentence (4) where the opening in the exterior wall of the *building* is within 3 m horizontally and
- less than 10 m below an opening in the exterior wall of the *exit*, or
 - less than 2 m above an opening in the exterior wall of the *exit*.
- (See Note A-3.2.3.14.(1))

- (2) If an unenclosed exterior *exit* stair or *ramp* could be exposed to fire from an opening in the exterior wall of the *building* it serves, the opening in the exterior wall of the *building* shall be protected in conformance with the requirements of Sentence (4) where the opening in the exterior wall of the *building* is within 3 m horizontally and
- less than 10 m below the *exit* stair or *ramp*, or
 - less than 5 m above the *exit* stair or *ramp*.

- (3) Except as permitted by Sentence 3.4.4.3.(1), if an exterior *exit* door in one *fire compartment* is within 3 m horizontally of an opening in another *fire compartment* and the exterior walls of these *fire compartments* intersect at an exterior angle of less than 135°, the opening shall be protected in conformance with the requirements of Sentence (4).

- (4) The opening protection referred to in Sentences (1) to (3) shall consist of
- glass block conforming to the requirements of Article 3.1.8.16.,
 - a wired glass assembly conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” or
 - a *closure* conforming to the requirements of Subsection 3.1.8. and Articles 3.2.3.1. and 3.2.3.14.

3.2.3.14. Wall Exposed to Another Wall (See Note A-3.2.3.14.)

- (1) Except as required by Sentences (3) and 3.2.3.13.(1) or as permitted by Sentence 3.2.3.19.(5), if an *unprotected opening* in an exterior wall of a *fire compartment* is exposed to an *unprotected opening* in the exterior wall of another *fire compartment*, and the planes of the 2 walls are parallel or at an angle less than 135°, measured from the exterior of the *building*, the *unprotected openings* in the 2 *fire compartments* shall be separated by a distance not less than D_o where

$$D_o = 2D - \left(\frac{\theta}{90} \times D \right)$$

but in no case less than 1 m, and

D = the greater required *limiting distance* for the *exposing building faces* of the 2 *fire compartments*, and

θ = the angle made by the intersecting planes of the *exposing building faces* of the 2 *fire compartments* (in the case where the exterior walls are parallel and face each other, $\theta = 0^\circ$).

(See Note A-3.2.3.14.(1).)

(2) The exterior wall of each *fire compartment* referred to in Sentence (1) within the distance, D_0 , shall have a *fire-resistance rating* not less than that required for the interior vertical *fire separation* between the *fire compartment* and the remainder of the *building*.

(3) Sentence (1) does not apply to *unprotected openings* of *fire compartments* within a *building* that is *sprinklered* throughout, but shall apply to,

- (a) *unprotected openings* of *fire compartments* on opposite sides of a *firewall*, and
- (b) exposure from *unprotected openings* of a *fire compartment* that is not protected by an automatic sprinkler system.

3.2.3.15. Wall Exposed to Adjoining Roof

(1) Except as permitted by Sentence 3.2.3.19.(5), if a wall in a *building* is exposed to a fire hazard from an adjoining roof of a separate *fire compartment* that is not *sprinklered* in the same *building*, and the exposed wall contains windows within 3 *storeys* vertically and 5 m horizontally of the roof, the roof shall contain no skylights within 5 m of the exposed wall.

3.2.3.16. Protection of Soffits

(1) Except as permitted by Sentences (3) and (4), where there is a common *attic or roof space* above more than two *suites* of *residential occupancy* or above more than two patients' or residents' sleeping rooms in a Group B, Division 2 or 3 *occupancy*, and the common *attic or roof space* projects beyond the exterior wall of the *building*, the soffit, and any opening in the soffits or other surface of the projection located within 2 500 mm of a window or door opening, shall be protected by

- (a) *noncombustible material*
 - (i) not less than 0.38 mm thick, and
 - (ii) having a melting point not below 650°C,
- (b) plywood not less than 11 mm thick,
- (c) strandboard or waferboard not less than 12.5 mm thick, or
- (d) lumber not less than 11 mm thick.

(2) The soffit protection required by Sentence (1) shall extend the full width of the opening and to not less than 1 200 mm on either side of it, and shall apply to all openings through the soffit within this limit.

(3) If an eave overhang is completely separated from the remainder of the *attic or roof space* by the use of *fire blocks*, the requirements of Sentence (1) do not apply.

(4) The protection required by Sentence (1) for projections is permitted to be omitted if

- (a) the *fire compartments* behind the window and door openings are *sprinklered* in accordance with Article 3.2.5.12., and
- (b) all rooms, including closets and bathrooms, having openings in the wall beneath the soffit are *sprinklered*, notwithstanding exceptions permitted in the standards referenced in Article 3.2.5.12. for the installation of automatic sprinkler systems.

3.2.3.17. Canopy Protection for Vertically Separated Openings

- (1) Except as permitted by Sentences (2) and (3), if a *storey* classified as a Group E or Group F, Division 1 or 2 *major occupancy* is required to be separated from the *storey* above by a *fire separation*,
 - (a) every opening in the exterior wall of the lower *storey* that is located vertically below an opening in the *storey* above shall be separated from the *storey* above by a *canopy* projecting not less than 1 m from the face of the *building* at the intervening floor level, and
 - (b) the *canopy* required by Clause (a) shall have a *fire-resistance rating* not less than that required for the floor assembly but need not be more than 1 h, except as required elsewhere in this Subsection.
- (2) Except as permitted by Sentence (3), the *canopy* required by Sentence (1) is permitted to be omitted if the exterior wall of the upper *storey* is recessed not less than 1 m behind the exterior wall containing the opening in the lower *storey*.
- (3) The requirements of Sentences (1) and (2) are permitted to be waived if the *building* is *sprinklered* throughout.

3.2.3.18. Covered Vehicular Passageway

- (1) A covered vehicular passageway designed as a receiving or shipping area shall be separated from every *building* or part of a *building* adjoining it by a *fire separation* having a *fire-resistance rating* not less than 1.5 h.
- (2) A covered vehicular passageway constructed below *grade* shall be of *noncombustible construction*.

3.2.3.19. Walkway Between Buildings

- (1) Except as required by Sentence 3.2.3.20.(2), if *buildings* are connected by a *walkway*, each *building* shall be separated from the *walkway* by a *fire separation* with a *fire-resistance rating* not less than 45 min.
- (2) Except as permitted by Sentence (4), a *walkway* connected to a *building* required to be of *noncombustible construction* shall also be of *noncombustible construction*.
- (3) Except as provided in Sentence (4), a *walkway* connected to a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* shall be of *noncombustible construction* or *encapsulated mass timber construction*.
- (4) A *walkway* connected to a *building* required to be of *noncombustible construction* or to a *building* or part of a *building* permitted to be of *encapsulated mass timber construction* is permitted to be of *heavy timber construction* provided
 - (a) not less than 50% of the area of any enclosing perimeter walls is open to the outdoors, and
 - (b) the *walkway* is at ground level.
- (5) A *walkway* of *noncombustible construction* used only as a pedestrian thoroughfare need not conform to the requirements of Articles 3.2.3.14. and 3.2.3.15.
- (6) A *walkway* between *buildings* shall be not more than 9 m wide

3.2.3.20. Underground Walkway

- (1) An underground *walkway* shall not be designed or used for any purpose other than pedestrian travel unless
 - (a) the purpose is permitted, and
 - (b) sprinklers are installed in any space in the *walkway* containing an *occupancy*.
- (2) *Buildings* connected by an underground *walkway* shall be separated from the *walkway* by a *fire separation* with a *fire-resistance rating* not less than 1 h.

- (3) An underground *walkway* shall be of *noncombustible construction* suitable for an underground location.
- (4) In an underground *walkway*
 - (a) smoke barrier doors shall be installed at intervals of not more than 100 m, or
 - (b) the travel distance from the door of an adjacent room or space to the nearest *exit* shall be not more than one and a half times the least allowable travel distance to an *exit* for any of the adjacent *occupancies* as permitted by Sentence 3.4.2.5.(1).
- (5) An underground *walkway* between *buildings* shall be not more than 9 m wide.

3.2.3.21. Reserved

3.2.3.22. Service Lines Under Buildings

- (1) A *building* shall not be constructed over an existing buried flammable gas main unless the gas main is encased in a gas-tight conduit in conformance with CAN/CSA-Z662, “Oil and gas pipeline systems.”

3.2.4. Fire Alarm and Detection Systems (See Note A-3.2.4.)

3.2.4.1. Determination of Requirement for a Fire Alarm System

- (1) Except as permitted in Sentences (2) and (3), a fire alarm system shall be installed in *buildings* in which an automatic sprinkler system is installed.
- (2) *Buildings* in which a sprinkler system is installed in accordance with NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,” need not comply with Sentence (1).
- (3) *Buildings* that contain fewer than 9 sprinklers conforming to Sentence 3.2.5.12.(4) need not comply with Sentence (1).
- (4) Except as permitted by Sentences (5), (6) and 3.2.4.2.(4), a fire alarm system shall be installed in a *building* that is not *sprinklered* throughout and that contains
 - (a) a *contained use area*,
 - (b) an *impeded egress zone*,
 - (c) more than 3 *storeys*, including *storeys* below the *first storey*,
 - (d) a total *occupant load* more than 300, other than in open air seating areas,
 - (e) an *occupant load* more than 150 above or below the *first storey*, other than in open air seating areas,
 - (f) a school, college or child care facility, including a day care facility, with an *occupant load* more than 40,
 - (g) a licensed beverage establishment or a licenced restaurant, with an *occupant load* more than 150,
 - (h) a *low-hazard industrial occupancy* with an *occupant load* more than 75 above or below the *first storey*,
 - (i) a *medium-hazard industrial occupancy* with an *occupant load* more than 75 above or below the *first storey*,
 - (j) a *residential occupancy* with sleeping accommodation for more than 10 persons,
 - (k) a *high-hazard industrial occupancy* with an *occupant load* more than 25,
 - (l) an *occupant load* more than 300 below an open air seating area,
 - (m) a *care and treatment occupancy* for more than 10 persons receiving care or treatment, or
 - (n) a *care occupancy* for more than 10 persons receiving care.
- (4.1) A fire alarm system is not required in a *hotel* 3 *storeys* or less in *building height* provided each *suite* has direct access to an exterior *exit* facility leading to ground level.
- (5) A fire alarm system is not required in a *residential occupancy* that is not *sprinklered*, where
 - (a) not more than 4 *suites* share a common *means of egress*, or
 - (b) each *suite* has direct access to an exterior *exit* facility leading to ground level.

(6) A fire alarm system is not required in a *storage garage* conforming to Article 3.2.2.92. that is contained in a *building* that is not *sprinklered* provided there are no other *occupancies* in the *building*.

3.2.4.2. Continuity of Fire Alarm System

- (1) Except as permitted by Sentence (6), if there are openings through a *firewall*, other than those for piping, tubing, wiring and totally enclosed *noncombustible* raceways, the requirements in this Subsection shall apply to the *floor areas* on both sides of the *firewall* as if they were in the same *building*.
- (2) Except as permitted by Sentence (4), if a *building* contains more than one *major occupancy* and a fire alarm system is required, a single system shall serve all *occupancies*.
- (3) Except as permitted by Sentence (4), if a fire alarm system is required in any portion of a *building*, it shall be installed throughout the *building*.
- (4) Except as required by Sentence (5), the requirements in this Subsection are permitted to be applied to each portion of a *building* not more than 3 *storeys* in *building height*, in which a vertical *fire separation* having a *fire-resistance rating* not less than 1 h separates the portion from the remainder of the *building* as if it were a separate *building*, provided there are no openings through the *fire separation*, other than those for piping, tubing, wiring and totally enclosed *noncombustible* raceways.
- (5) The permission in Sentence (4) to consider separated portions of a *building* as separate *buildings* does not apply to *service rooms* and storage rooms.
- (6) *Buildings* interconnected by *walkways* permitted in Articles 3.2.3.19. and 3.2.3.20. or by vestibules provided in conformance with Article 3.2.6.3. shall be treated as separate *buildings* for the purpose of fire alarm installation required by this Subsection.

3.2.4.3. Types of Fire Alarm Systems

- (1) A fire alarm system shall be
 - (a) a single-stage system in a Group F, Division 1 *occupancy*,
 - (b) except as permitted in Clause (c), a 2-stage system in a Group B *occupancy*,
 - (c) a single- or 2-stage system in a Group B, Division 3 *occupancy* where the *building* is 3 *storeys* or less in *building height*,
 - (d) a single-stage system in elementary and secondary schools, except for a special needs facility, and
 - (e) a single- or 2-stage system in all other cases.

3.2.4.4. Description of Fire Alarm Systems

- (1) A single-stage fire alarm system shall, upon the operation of any manual station, waterflow detecting device, or *fire detector*, cause an *alarm signal* to sound on all audible signal devices in the system. (See Note A-3.2.4.4.(1))
 - (2) A 2-stage fire alarm system shall
 - (a) cause an *alert signal* to sound upon the operation of any manual station, waterflow detecting device, or *fire detector*,
 - (b) except for a Group B, Division 2 *occupancy*, automatically cause an *alarm signal* to sound if the *alert signal* is not acknowledged within 5 min of its initiation,
 - (c) have manual stations, each of which is equipped so that the use of a key or other similar device causes an *alarm signal* to sound that continues to sound upon removal of the key or similar device from the manual station, and (See Note A-3.2.4.4.(2)(c))
 - (d) in a *building* containing a *hotel*,
 - (i) cause an *alarm signal* to sound in the initiating fire zone in the *hotel*, and
 - (ii) cause an *alert signal* to sound throughout the *hotel* and such parts of the *building* as is necessary to alert *hotel* staff.
- (See Note A-3.2.4.4.(2))

- (3) A 2-stage fire alarm system is permitted to be zone coded so that, upon the operation of any manual station, waterflow detecting device, or *fire detector*,
- (a) a coded *alert signal* is sounded indicating the zone of alarm initiation,
 - (b) the coded *alert signal* is repeated in its entirety not less than 4 times, and
 - (c) a continuous *alert signal* is sounded upon completion of the coded signals referred to in Clause (b) and Sentence (4).
- (4) If a second manual station, waterflow detecting device, or *fire detector* is operated in a fire alarm system with zone coding as permitted by Sentence (3), in a zone other than that for which the first *alert signal* was sounded, the coded *alert signal* for the first zone shall be completed before the coded *alert signal* for the second zone is repeated not less than 4 times.

3.2.4.5. Installation and Verification of Fire Alarm Systems

- (1) Fire alarm systems, including those with voice communication capability where provided, shall be installed in conformance with CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems.”
- (2) Fire alarm systems shall be verified in conformance with CAN/ULC-S537, “Verification of Fire Alarm Systems,” to ensure satisfactory operation.

3.2.4.6. Silencing of Alarm Signals

- (1) Except as permitted by Sentence (3), a fire alarm system shall be designed so that when an *alarm signal* is actuated, it cannot be silenced automatically before a period of time has elapsed that is not less than
- (a) 5 min for a *building* not required to be equipped with an annunciator, and
 - (b) 20 min for any other *building*.
- (2) Except as permitted by Sentences 3.2.4.18.(8) and Sentences 3.2.4.22.(2) and (3), a fire alarm system shall not incorporate manual silencing switches other than those installed inside the fire alarm control unit. (See Note A-3.2.4.6.(2))
- (3) Except as provided by Clause 3.2.4.22.(3)(a), in a *care and treatment occupancy* an *alert signal* is permitted to be silenced automatically after 1 min.

3.2.4.7. Signals to Fire Department

- (1) A single-stage fire alarm system shall be designed to notify the fire department in conformance with Sentence (4) that an *alarm signal* has been initiated in
- (a) a *building* of a Group A *occupancy* having an *occupant load* more than 300, or
 - (b) a *retirement home*.
- (2) A fire alarm system that includes waterflow indicating devices shall be designed to notify the fire department in conformance with Sentence (4), when an alarm is initiated.
- (3) A 2-stage fire alarm system shall be designed to notify the fire department, in conformance with Sentence (4), that an *alert signal* has been initiated.
- (4) Notification of the fire department, as required by Sentences (1) to (3), shall be provided in conformance with CAN/ULC-S561, “Standard for Installation and Services for Fire Signal Receiving Centres and Systems.” (See Note A-3.2.4.7.(4))
- (5) Where a single-stage fire alarm system is installed in a *building* that is not *sprinklered* throughout and Sentence (1) does not apply, a legible notice that is not easily removed shall be affixed to the wall near each manual station stating
- (a) that the fire department is to be notified in the event of a fire emergency, and
 - (b) the emergency telephone number for the municipality or for the fire department. (See Note A-3.2.4.7.(5)(b))

- (6) Helicopter landing areas on roofs shall be provided with telephone extensions or means to notify the fire department.

3.2.4.8. Annunciator and Zone Indication

- (1) Except as permitted by Sentences (3) to (5), an annunciator shall be installed in close proximity to a *building* entrance that faces a *street* or an access route for fire department vehicles that complies with Sentence 3.2.5.5.(1).
- (2) Except as permitted by Sentence (6), the annunciator required by Sentence (1) shall have separate zone indication of the actuation of the alarm initiating devices in each
- (a) *floor area* so that the area of coverage for each zone in a *building* that is not *sprinklered* is not more than 2 000 m²,
 - (b) *floor area* so that the area of coverage for each zone is neither
 - (i) more than one *storey*, nor
 - (ii) more than the system area limits as specified in NFPA 13, “Standard for the Installation of Sprinkler Systems,”
 - (c) shaft required to be equipped with *fire detectors*,
 - (d) air-handling system required to be equipped with *smoke detectors*,
 - (e) fire extinguishing system required by NFPA 96, “Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,”
 - (f) *contained use area*,
 - (g) *impeded egress zone*, and
 - (h) *fire compartment* required by Sentence 3.3.3.5.(2) or Sentence 3.3.4.11.(2).
(See Note A-3.2.4.8.(2))
- (3) An annunciator need not be provided for a fire alarm system if not more than one zone indicator is required in Sentence (2).
- (4) If an annunciator is not installed as part of a fire alarm system in conformance with Sentence (1), a visible and audible trouble signal device shall be provided inside the main entrance of the *building*.
- (5) The requirements in Sentence (1) are waived in a *building*
- (a) in which an automatic sprinkler system is not installed,
 - (b) that has an aggregate area for all *storeys* of not more than 2 000 m², and
 - (c) that is not more than 3 *storeys* in *building height*.
- (6) The area limits of Clause (2)(a) are waived for an interior undivided open space used as an arena, a rink or a swimming pool provided that other spaces in the *building* that are separated from the open space are individually zoned in accordance with the requirements of Sentence (2).
- (7) A fire alarm control unit installed in close proximity to a *building* entrance that faces a *street* or an access route for fire department vehicles that complies with Sentence 3.2.5.5.(1), is deemed to satisfy the requirement for an annunciator provided all indicators required for an annunciator or trouble signal device are included on the control unit. (See Note A-3.2.4.8.(7))
- (8) In a *building* containing a *hotel* in which a trouble signal sounding device has a silencing switch, a trouble light shall be installed in
- (a) the main reception area serving the *hotel*, or
 - (b) another continually-supervised location.
- (9) In a long-term care home, a remote audiovisual fire alarm trouble signal shall be located at the main nursing station.

3.2.4.9. Electrical Supervision

- (1) Electrical supervision shall be provided for a fire alarm system.

- (2) If a fire alarm system in a *building* is required to have an annunciator by Sentence 3.2.4.8.(1), except for hose valves, all valves controlling water supplies in a standpipe system, shall be equipped with an electrically supervised switch for transmitting a trouble signal to the annunciator in the event of movement of the valve handle.
- (3) An automatic sprinkler system shall be electrically supervised to indicate a supervisory signal on the *building* fire alarm system annunciator for each of the following:
- (a) movement of a valve handle that controls the supply of water to sprinklers,
 - (b) loss of excess water pressure required to prevent false alarms in a wet pipe system,
 - (c) loss of air pressure in a dry pipe system,
 - (d) loss of air pressure in a pressure tank,
 - (e) a significant change in water level in any water storage container used for firefighting purposes,
 - (f) loss of power to any automatically starting fire pump, and (See Note A-3.2.4.9.(3)(f))
 - (g) a temperature approaching the freezing point in any dry pipe valve enclosure or water storage container used for firefighting purposes.
- (4) A fire pump shall be electrically supervised as stipulated in NFPA 20, “Standard for the Installation of Stationary Pumps for Fire Protection.”
- (5) Electrical supervision shall be provided to indicate, on the fire alarm system annunciator, a loss of power to a heat tracing cable that is installed to heat
- (a) a standpipe riser,
 - (b) a sprinkler line as part of a fire suppression system, or
 - (c) an *exit* or *means of egress* to keep it free of ice and snow.
- (6) Indication of a supervisory signal in accordance with Sentences (3) and (5) shall be transmitted to the fire department in conformance with Sentence 3.2.4.7.(4).

3.2.4.10. Fire Detectors

- (1) *Fire detectors* required by this Code shall be connected to the fire alarm system.
- (2) Except as permitted by Sentence (3), if a fire alarm system is required in a *building* that is not *sprinklered*, *fire detectors* shall be installed in the following spaces:
- (a) storage rooms not within *dwelling units*,
 - (b) *service rooms* not within *dwelling units*,
 - (c) janitors’ rooms,
 - (d) rooms in which hazardous substances are to be used or stored, (See Note A-3.3.1.2.(1)),
 - (e) elevator hoistways or dumbwaiter shafts,
 - (f) laundry rooms in *buildings* of *residential occupancy*, but not those within *dwelling units*, and
 - (g) *hazardous classrooms* and change rooms in elementary or secondary schools.
- (3) *Fire detectors* required by Sentence (2) need not be provided within *floor areas* that are *sprinklered*.
- (4) *Fire detectors* required by Sentence (2) shall be installed in elevator hoistways and dumbwaiter shafts where a sprinkler system is not installed within the hoistway or shaft.

3.2.4.11. Smoke and Heat Detectors

- (1) If a fire alarm system is installed, *smoke detectors* shall be installed in
- (a) each sleeping room and each corridor serving as part of a *means of egress* from sleeping rooms in portions of a *building* classified as Group B *major occupancy*,
 - (b) each room in a *contained use area* and corridors serving those rooms,
 - (c) each corridor in portions of a *building* classified as Group A, Division 1 *major occupancy*,
 - (d) each *public corridor* in portions of a *building* classified as Group C *major occupancy*,

- (e) each *exit* stair shaft, other than those serving only a Group A, Division 4 *major occupancy* or an open *storage garage*,
 - (f) the vicinity of draft stops required by Article 3.2.8.6.,
 - (g) each elevator machine room, and
 - (h) each corridor serving classrooms in elementary and secondary schools.
- (See Note A-3.2.4.11.(1))
- (2) In a *floor area* containing a *hotel*, where a fire alarm system is installed and the *floor area* is not *sprinklered*, *heat detectors* shall be installed in every room in a *suite* and in every room not located in a *suite* other than washrooms within a *suite*, saunas, refrigerated areas and swimming pools.
- (3) *Smoke detectors* required in sleeping rooms of a *care, care and treatment* or *detention occupancy* shall, upon actuation, provide an audible and visible signal to staff serving those rooms so that the room or location containing the *smoke detector* can be easily identified. (See Note A-3.2.4.11.(3))
- (4) *Smoke detectors* required in Clause (1)(g) shall, upon actuation, recall the elevators served by the elevator machine room in which the *smoke detector* is installed.
- (5) Except as permitted in Sentences (6) and (7), *smoke detectors* installed in *buildings* required to be equipped with a fire alarm system shall be located near the entrance to *walkways* described in Articles 3.2.3.19. and 3.2.3.20. or vestibules provided in conformance with Article 3.2.6.3.
- (6) *Smoke detectors* installed at the entrance to the *walkways* in conformance with Article 3.1.8.14. shall be deemed to meet the requirements of Sentence (5).
- (7) *Smoke detectors* required by Sentence (5) may be replaced with *fire detectors* in Group F *occupancies* where the *smoke detectors* may be subjected to false alarms due to the activities within the *building*.

3.2.4.12. Prevention of Smoke Circulation

- (1) If a fire alarm system is installed, an air-handling system shall be designed to prevent the circulation of smoke upon a signal from a duct-type *smoke detector* if the air handling system
- (a) serves more than one *storey*,
 - (b) serves more than one *suite* in a *storey*,
 - (c) serves more than one *fire compartment* required by Sentence 3.3.3.5.(2) or Sentence 3.3.4.11.(2), or
 - (d) is not provided with *fire dampers* as permitted by Sentence 3.1.8.8.(4).

3.2.4.13. Vacuum Cleaning System Shutdown

- (1) A central vacuum cleaning system serving more than one *suite* or *storey* in a *building* equipped with a fire alarm system shall be designed to shut down upon actuation of the fire alarm system.

3.2.4.14. Elevator Emergency Return

- (1) Except as permitted by Sentence (3), in a *building* having elevators that serve *storeys* above the *first storey* and that are equipped with an automatic emergency recall feature, *smoke detectors* shall be installed in the elevator lobbies on the recall level so that when these *smoke detectors* are actuated, the elevators will automatically return directly to an alternate floor level.
- (2) *Smoke detectors* required by Sentence (1) shall be designed as part of the *building* fire alarm system.
- (3) The alternate floor recall feature required by Sentence (1) is not required if the *floor area* containing the recall level is *sprinklered* throughout.

3.2.4.15. System Monitoring

- (1) An automatic sprinkler system shall be equipped with waterflow detecting devices and, if an annunciator is required by Article 3.2.4.8., shall be installed so that each device serves
 - (a) not more than one *storey*, and
 - (b) an area on each *storey* that is not more than the system area limits as specified in NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (2) Waterflow detecting devices required by Sentence (1) shall be connected to the fire alarm system so that, upon its actuation, an *alert signal* or an *alarm signal* is initiated.
- (3) The actuation of each waterflow detecting device required by Sentence (1) shall be indicated separately on the fire alarm system annunciator.

3.2.4.16. Manual Stations

- (1) Except as permitted by Sentences (2) and (3), where a fire alarm system is installed, a manual station shall be installed in every *floor area* near
 - (a) every principal entrance to the *building*, and
 - (b) every *exit*.(See Note A-3.2.4.16.(1))
- (2) In a *building* that is *sprinklered* throughout, a manual station is not required at an exterior egress doorway from a *suite* that does not lead to an interior shared *means of egress* in a *hotel* not more than 3 *storeys* in *building height*, provided each *suite* is served by an exterior *exit* facility leading directly to ground level.
- (3) In a *building* that is *sprinklered* throughout, a manual station is not required at an exterior egress doorway from a *dwelling unit* that does not lead to an interior shared *means of egress* in a *building* not more than 3 *storeys* in *building height* containing only *dwelling units*, provided each *dwelling unit* is served by an exterior *exit* facility leading directly to ground level.
- (4) In a *building* referred to in Sentence (2) or (3), manual stations shall be installed near doorways leading from shared interior corridors to the exterior.
- (5) Where a fire alarm system is installed, a manually operated fire alarm station shall be installed on the roof at each *exit* from a helicopter landing area.
- (6) In a *building* containing a *hotel*, a manual station shall be installed in the main reception area serving the *hotel*.
- (7) Except as permitted by Sentence (3), in Group C apartment *buildings* other than *retirement homes*, if a manual station is not installed on a *floor area* in accordance with Sentence (1) or (4),
 - (a) a manual station shall be installed in every *dwelling unit* in the *floor area* near each egress door leading from the *dwelling unit*,
 - (b) *smoke detectors* shall be installed in the *floor area* in *public corridors* and stairwells, and
 - (c) *fire detectors* shall be installed in the *floor area* in all common public areas and in rooms not located within *dwelling units*.
- (8) In *floor areas* where the manual stations are located in *dwelling units*, a legible sign stating **FIRE ALARM MANUAL STATIONS LOCATED IN APARTMENT UNITS** shall be posted near every *exit* in a *public corridor*.
- (9) Key switch activated manual stations are permitted in an *impeded egress zone* and a *contained use area* in Group B, Division 1 and 2 *occupancies*.

3.2.4.17. Alert and Alarm Signals

- (1) In a 2-stage fire alarm system described in Sentence 3.2.4.4.(2), the same audible signal devices are permitted to be used to sound the *alert signals* and the *alarm signals*.
- (2) If audible signal devices with voice reproduction capabilities are intended for paging and similar voice message use, other than during a fire emergency, they shall be installed so that *alert signals* and *alarm signals* take priority over all other signals.
- (3) Audible signal devices forming part of a fire alarm or voice communication system shall not be used for playing music or background noise.

3.2.4.18. Audibility of Alarm Systems (See Note A-3.2.4.18.)

- (1) Except as permitted by Sentence 3.2.4.19.(2) and except as required by Clause 3.2.4.4.(2)(d), audible signal devices forming part of a fire alarm system shall be installed in a *building* so that
 - (a) *alarm signals* are clearly audible throughout the *floor area*, and
 - (b) *alert signals* are clearly audible in continuously staffed locations, and where there are no continuously staffed locations, throughout the *floor area*.(See Note A-3.2.4.18.(1))
- (2) The sound pattern of an *alarm signal* shall conform to the temporal pattern defined in Clause 4.2 of ISO 8201, “Acoustics — Audible emergency evacuation signal.” (See Note A-3.2.4.18.(2))
- (3) The sound patterns of *alert signals* shall be significantly different from the temporal patterns of *alarm signals*. (See Note A-3.2.4.18.(3))
- (4) In all normally occupied spaces, the fire *alarm signal* sound pressure level
 - (a) shall be not more than 110 dBA when measured at a distance of 3 m from the device, or
 - (b) is permitted to be more than 100 dBA provided the sound pressure level measured 2 000 mm above floor level is not more than 100 dBA.(See Note A-3.2.4.18.(4))
- (5) The sound pressure level in a sleeping room from a fire alarm audible signal device shall be not less than 75 dBA in a *building of residential occupancy* when any intervening doors between the device and the sleeping room are closed. (See Note A-3.2.4.18.(5))
- (6) Audible signal devices in sleeping rooms in a *building of residential or care occupancy* shall emit a low frequency signal. (See Note A-3.2.4.18.(6))
- (7) Except as required by Sentence (5), the sound pressure level from a fire alarm system's audible signal device within a *floor area* shall be not less than 10 dBA above the ambient noise level and not less than 65 dBA, when any intervening doors between the device and the rest of the *floor area* are closed.
- (8) Except as permitted by Sentence (12), audible signal devices located within a *dwelling unit* shall include a means for them to be manually silenced for a period of not more than 10 min, after which time the devices shall restore themselves to normal operation. (See Note A-3.2.4.18.(8))
- (9) Audible signal devices within a *dwelling unit* or a *suite of residential occupancy* shall be connected to the fire alarm system
 - (a) in a manner such that a single open circuit at one device will not impair the operation of other audible signal devices on that same circuit that serve the other *dwelling units* or *suites of residential occupancy*, or
 - (b) on separate signal circuits that are not connected to the devices in any other *dwelling unit, public corridor* or *suite of residential occupancy*.(See Note A-3.2.4.18.(9) and (10))

- ei** (10) In a *building* or part thereof classified as a *residential occupancy*,
- (a) separate circuits shall be provided for audible signal devices on each *floor area*, and
 - (b) audible signal devices within *dwelling units* or *suites* of *residential occupancy* shall be wired on separate signal circuits from those not within *suites* of *residential occupancy* or *dwelling units*.
- (See Note A-3.2.4.18.(9) and (10))
- (11) Audible signal devices shall be installed in a *service space* referred to in Sentence 3.2.1.1.(8) and shall be connected to the fire alarm system.
- (12) Audible signal devices within *dwelling units* that are wired on separate signal circuits in accordance with Clause (10)(b) need not include a means for manual signal silencing as required by Sentence (8), provided the fire alarm system includes a provision for the automatic signal silence within *dwelling units*, where
- (a) the automatic signal silence cannot occur within the first 60 s of operation or within the zone of initiation,
 - (b) a subsequent alarm elsewhere in the *building* will reactuate the silenced audible signal devices within *dwelling units*,
 - (c) after a period of not more than 10 min, the silenced audible signal devices will be restored to continuous audible signal if the alarm is not acknowledged, and
 - (d) the voice communication systems referred to in Article 3.2.4.22. and 3.2.4.23. has a provision to override the automatic signal silence to allow the transmission of voice messages through silenced audible signal device circuits that serve the *dwelling units*.
- (See Note A-3.2.4.18.(12))
- (13) If a 2-stage fire alarm system has been installed with an automatic signal silence as described in Sentence (12), the system shall be designed so that any silenced audible signal devices serving *dwelling units* are reactuated whenever an *alarm signal* is required to be transmitted as part of the second stage. (See Note A-3.2.4.18.(8))

3.2.4.19. Visible Signals

- (1) Except as permitted by Sentence (4), where a fire alarm system is installed, visible signal devices shall be installed in addition to alarm signal devices
- (a) in a *building* or portions thereof intended for use primarily by persons with a hearing impairment,
 - (b) in *assembly occupancies* in which music and other sounds associated with performances could exceed 100 dBA,
 - (c) in any *floor area* in which the ambient noise level is more than 87 dBA,
 - (d) in any *floor area* in which the occupants
 - (i) use ear protection devices,
 - (ii) are located in an audiometric booth, or
 - (iii) are located in sound-insulating enclosures,
 - (e) in *public corridors* serving a Group A, B, C, D or E *major occupancy*,
 - (f) in a corridor used by the public and in a *floor area* or part of a *floor area* where the public may congregate in a Group A *occupancy*,
 - (g) in not less than 10% of the *suites* of a *hotel* or *motel*, (See Note A-3.2.4.19.(1)(g))
 - (h) in washrooms for *public use* described in Sentence 3.8.2.3.(2), (3), (4) or (6), and
 - (i) in living spaces in a *suite* of *residential occupancy* in a Group C *major occupancy* apartment *building*.
- (2) Visible signal devices are permitted to be installed in lieu of audible signal devices in the compartments referred to in Article 3.3.3.6. (See Note A-3.2.4.19.(2))
- (3) Visible signal devices required by Sentence (1) shall be installed so that the signal from at least one device is visible throughout the *floor area* or portion thereof in which they are installed. (See Note A-3.2.4.19.(3))
- (4) Visible signal devices required by Clauses (1)(e) and (f) are not required in
- (a) a classroom, and
 - (b) a Group B, Division 3 *occupancy* that contains sleeping accommodation for not more than 10 persons and not more than six occupants require assistance in evacuation in case of an emergency.

3.2.4.20. Smoke Alarms

- (1) Except as provided in Article 3.2.4.21., *smoke alarms* shall be installed in accordance with this Article.
- (2) Except as permitted by Sentence (10), *smoke alarms* conforming to CAN/ULC-S531, “Standard for Smoke Alarms,” shall be installed in each *dwelling unit* and, except for *care, care and treatment* or *detention occupancies* required to have a fire alarm system, in each sleeping room not within a *dwelling unit*.
- (3) At least one *smoke alarm* shall be installed on each *storey* and *mezzanine* of a *dwelling unit*.
- (4) On any *storey* of a *dwelling unit* containing sleeping rooms, a *smoke alarm* shall be installed
 - (a) in each sleeping room, and
 - (b) in a location between the sleeping rooms and the remainder of the *storey*, and if the sleeping rooms are served by a hallway, the *smoke alarm* shall be located in the hallway.
- (5) Reserved.
- (6) A *smoke alarm* shall be installed on or near the ceiling.
- (7) Reserved.
- (8) Reserved.
- (9) Except as permitted by Sentence (10), *smoke alarms* referred in Sentence (2) shall
 - (a) be installed with permanent connections to an electrical circuit,
 - (b) have no disconnect switch between the overcurrent device and the *smoke alarm*, and
 - (c) in case the regular power supply to the *smoke alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *smoke alarm* for a period of not less than 7 days in the normal condition, followed by 4 minutes of alarm.(See Note A-3.2.4.20.(9))
- (10) *Suites* of *residential occupancy* are permitted to be equipped with *smoke detectors* in lieu of *smoke alarms*, provided the *smoke detectors*
 - (a) are capable of independently sounding audible signals with a sound pressure level between 75 dBA and 110 dBA within the individual *suites*, (See also Note A-3.2.4.18.(4))
 - (b) except as permitted by Sentence (11), are installed in conformance with CAN/ULC-S524, “Standard for the Installation of Fire Alarm Systems,” and verified in conformance with CAN/ULC-S537, “Standard for the Verification of Fire Alarm Systems,”
 - (c) form part of the fire alarm system, and
 - (d) are equipped with visual signalling components that meet the requirements of Sentences (17) to (19).(See Note A-3.2.4.20.(10))
- (11) *Smoke detectors* permitted to be installed in lieu of *smoke alarms* as stated in Sentence (10) are permitted to sound localized alarms within individual *suites*, and need not sound an alarm throughout the rest of the *building*.
- (12) If more than one *smoke alarm* is required in a *dwelling unit*, the *smoke alarms* shall be interconnected so that the actuation of one *smoke alarm* will cause all *smoke alarms* within the *dwelling unit* to sound.
- (13) A *smoke alarm* required by Sentence (2) shall be installed in conformance with CAN/ULC-S553, “Standard for Installation of Smoke Alarms.”
- (14) Except as permitted in Sentence (15), a manually operated silencing device shall be incorporated within the circuitry of a *smoke alarm* installed in a *dwelling unit* so that it will silence the signal emitted by the *smoke alarm* for a period of not more than 10 min, after which the *smoke alarm* will reset and again sound the alarm if the level of smoke in the vicinity is sufficient to reactuate the *smoke alarm*.

(15) *Suites* of residential occupancy equipped with *smoke detectors* installed in conformance with CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems,” as part of the fire alarm system in lieu of *smoke alarms* as permitted by Sentence (10), need not incorporate the manually operated silencing device required by Sentence (14). (See Note A-3.2.4.20.(10))

(16) The sound patterns of *smoke alarms* shall

- (a) meet the temporal patterns of *alarm signals*, or (See Note A-3.2.4.18.(2))
- (b) be a combination of temporal pattern and voice relay.

(17) *Smoke alarms* required by Sentence (2) shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, “National Fire Alarm and Signaling Code.” (See Note A-3.2.4.20.(17))

(18) The visual signalling component required by Sentence (17) need not

- (a) be integrated with the *smoke alarm* provided it is interconnected to it,
- (b) be on battery backup, or
- (c) have synchronized flash rates, when installed in a *dwelling unit*.

(19) The luminous intensity for visual signalling components required by Sentence (17) that are installed in sleeping rooms shall be a minimum of 175 cd.

(20) *Smoke alarms* required in *suites* in a *retirement home* or *smoke detectors* permitted to be installed in lieu of *smoke alarms* as provided in Sentence (10) shall upon actuation provide an audible and visual signal to staff serving those *suites*, so that the *suite* containing the actuated *smoke alarm* or *smoke detector* can be easily identified.

3.2.4.21. Residential Fire Warning Systems

(1) Except where a fire alarm system is installed or required in a *building*, *smoke detectors* forming part of a residential fire warning system installed in conformance with CAN/ULC-S540, “Standard for Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance,” are permitted to be installed in lieu of all *smoke alarms* required by Article 3.2.4.20., provided that the system is

- (a) capable of sounding audible signals in accordance with Sentences 3.2.4.20.(12) and (16),
- (b) provided with a visual signalling component in accordance with Sentences 3.2.4.22.(17) to (19),
- (c) powered in accordance with Sentence 3.2.4.20.(9), and
- (d) provided with a silencing device in accordance with Sentences 3.2.4.20.(14) and (15).

3.2.4.22. Two-Way Voice Communication Systems

(1) A voice communication system required by Subsection 3.2.6., Clause 3.3.2.4.(14)(f) or Sentence 3.3.4.11.(12) shall

- (a) consist of a two-way means of communication with the central alarm and control facility and to the mechanical control centre from each *floor area*, and
- (b) be capable of broadcasting pre-recorded, synthesized or live messages from the central alarm and control facility that are audible and intelligible in all parts of the *building*, except elevator cars. (See Note A-3.2.4.22.(1)(b))

(2) The voice communication system referred to in Sentence (1) shall include a means to silence the *alarm signal* in a single-stage fire alarm system while voice instructions are being transmitted, but only after the *alarm signal* has initially sounded for not less than 30 s.

(3) The voice communication system referred to in Sentence (1) shall include a means to silence the *alert signal* and the *alarm signal* in a 2-stage fire alarm system while voice instructions are being transmitted, but only after the *alert signal* has initially sounded for not less than

- (a) 10 s in hospitals that have supervisory personnel on duty for twenty-four hours each day, or
- (b) 30 s for all other *occupancies*.

- (4) The voice communication system referred to in Clause (1)(b) shall be designed so that the *alarm signal* in a 2-stage fire alarm system can be selectively transmitted to any zone or zones while maintaining an *alert signal* or selectively transmitting voice instructions to any other zone or zones in the *building*.
- (5) The 2-way communication system referred to in Clause (1)(a) shall be installed so that emergency telephones are located in each *floor area* near *exit* stair shafts.
- (6) Visible signal devices required by Sentence 3.2.4.19.(1) shall continue to emit a visible signal while voice instructions are being transmitted.
- (7) Where the facility is not equipped with staff trained to provide instructions over the loudspeakers, a pre-recorded message shall be provided.

3.2.4.23. One-Way Voice Communication Systems

- (1) Except for Group B, Division 1 and Group F, Division 1 *major occupancies*, where a fire alarm system is required under Subsection 3.2.4., a one-way voice communication system shall be installed in *buildings* where a 2-stage fire alarm system is installed and whose *occupant load* exceeds 1 000.
- (2) The one-way voice communication system required by Sentence (1) shall consist of loudspeakers that are
 - (a) operated from the central alarm and control facility or, in the absence of a central alarm and control facility, from a designated area, and
 - (b) except in elevator cars, designed and located so that transmitted messages are audible and intelligible in all parts of the *building*. (See Note A-3.2.4.22.(1)(b))
- (3) Where the facility is not equipped with staff trained to provide instructions over the loudspeakers, a pre-recorded message shall be provided.
- (4) The voice communication system required by Sentence (1) shall meet the silencing and transmission requirements of Sentences 3.2.4.22.(2) to (4) and (6).

3.2.5. Provisions for Firefighting (See Note A-3)

3.2.5.1. Access to Above Grade Storeys

- (1) Except for *storeys* below the *first storey*, direct access for firefighting shall be provided from the outdoors to every *storey* that is not *sprinklered* throughout and whose floor level is less than 25 m above *grade*, by at least one unobstructed window or access panel for each 15 m of wall in each wall required to face a *street* by Subsection 3.2.2.
- (2) An opening for access required by Sentence (1) shall
 - (a) have a sill no higher than 900 mm above the inside floor, and
 - (b) be not less than 1 100 mm high by not less than
 - (i) 550 mm wide for a *building* not designed for the storage or use of *dangerous goods*, or
 - (ii) 750 mm wide for a *building* designed for the storage or use of *dangerous goods*.
- (3) Access panels above the *first storey* shall be readily openable from both inside and outside, or the opening shall be glazed with plain glass.

3.2.5.2. Access to Basements

- (1) Direct access from at least one *street* shall be provided from the outdoors in a *building* that is not *sprinklered* to each *basement* having a horizontal dimension more than 25 m.

- (2) The access required by Sentence (1) is permitted to be provided by
 - (a) doors, windows or other means that provide an opening not less than 1 100 mm high and 550 mm wide, with a sill no higher than 900 mm above the inside floor, or
 - (b) an interior stairway immediately accessible from the outdoors.

3.2.5.3. Roof Access

- (1) On a *building* more than 3 *storeys* in *building height* where the slope of the roof is less than 1 in 4, all main roof areas shall be provided with direct access from the *floor areas* immediately below, either by
 - (a) a stairway, or
 - (b) a hatch not less than 550 mm by 900 mm with a fixed ladder.
- (2) Clearance and access around roof signs or other obstructions shall provide
 - (a) a passage not less than 900 mm wide by 1 800 mm high, clear of all obstructions except for necessary horizontal supports not more than 600 mm above the roof surface,
 - (i) around every roof sign, and
 - (ii) through every roof sign at locations not more than 15 m apart, and
 - (b) a clearance of not less than 1 200 mm between any portion of a roof sign and any opening in the exterior wall face or roof of the *building* in which it is erected.

3.2.5.4. Access Routes

- (1) A *building* which is more than 3 *storeys* in *building height* or more than 600 m² in *building area* shall be provided with access routes for fire department vehicles
 - (a) to the *building* face having a principal entrance, and
 - (b) to each *building* face having access openings for firefighting as required by Articles 3.2.5.1. and 3.2.5.2.(See Note A-3.2.5.4.(1))

3.2.5.5. Location of Access Routes

- (1) Access routes required by Article 3.2.5.4. shall be located so that the principal entrance and every access opening required by Articles 3.2.5.1. and 3.2.5.2. are located not less than 3 m and not more than 15 m from the closest portion of the access route required for fire department use, measured horizontally from the face of the *building*.
- (2) Access routes shall be provided to a *building* so that
 - (a) for a *building* provided with a fire department connection, a fire department pumper vehicle can be located adjacent to the hydrants referred to in Article 3.2.5.15.,
 - (b) for a *building* not provided with a fire department connection, a fire department pumper vehicle can be located so that the length of the access route from a hydrant to the vehicle plus the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 90 m, and
 - (c) the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 45 m.
- (3) The unobstructed path of travel for the firefighter required by Sentence (2) from the vehicle to the *building* shall be measured from the vehicle to the fire department connection provided for the *building*, except that if no fire department connection is provided, the path of travel shall be measured to the principal entrance of the *building*.
- (4) If a portion of a *building* is completely cut off from the remainder of the *building* so that there is no access to the remainder of the *building*, the access routes required by Sentence (2) shall be located so that the unobstructed path of travel from the vehicle to one entrance of each portion of the *building* is not more than 45 m.

3.2.5.6. Access Route Design

- (1) A portion of a roadway or yard provided as a required access route for fire department use shall
 - (a) have a clear width not less than 6 m, unless it can be shown that lesser widths are satisfactory,

- (b) have a centre line radius not less than 12 m,
 - (c) have an overhead clearance not less than 5 m,
 - (d) have a change of gradient not more than 1 in 12.5 over a minimum distance of 15 m,
 - (e) be designed to support the expected loads imposed by firefighting equipment and be surfaced with concrete, asphalt or other material designed to permit accessibility under all climatic conditions,
 - (f) have turnaround facilities for any dead-end portion of the access route more than 90 m long, and
 - (g) be connected with a public thoroughfare.
- (See Note A-3.2.5.6.(1))

(2) For *buildings* conforming to Article 3.2.2.51. or 3.2.2.60., no portion of the access route described in Sentence 3.2.2.10.(3) shall be more than 20 m below the uppermost floor level.

3.2.5.7. Water Supply (See Note A-3.2.5.7.)

- (1) Every *building* shall be provided with an adequate water supply for firefighting.

3.2.5.8. Standpipe Systems

- (1) Except as permitted by Sentence (2), a standpipe system shall be installed in a *building* that is
 - (a) more than 3 *storeys* in *building height*,
 - (b) more than 14 m high measured between *grade* and the ceiling of the top *storey*, or
 - (c) not more than 14 m high measured between *grade* and the ceiling of the top *storey* but has a *building area* exceeding the area shown in Table 3.2.5.8. for the applicable *building height* unless the *building* is *sprinklered* throughout.

Table 3.2.5.8.
Building Limits without Standpipe Systems
 Forming Part of Sentence 3.2.5.8.(1)

Occupancy Classification	Building Area, m ²		
	1 storey	2 storeys	3 storeys
Group A	2 500	2 000	1 500
Group C	2 000	1 500	1 000
Group D	4 000	3 000	2 000
Group F, Division 2	1 500	1 500	1 000
Group F, Division 3	3 000	2 000	1 000

- (2) A standpipe system need not be installed in a *storage garage* conforming to Article 3.2.2.92., provided the *building* is not more than 15 m high.
- (3) A standpipe system is not required to be installed in a *building* classified as Group C *major occupancy*,
 - (a) that is not more than 4 *storeys* above *grade*,
 - (b) that does not contain a *public corridor* or other common areas,
 - (c) where each *dwelling unit*,
 - (i) is completely cut off from the remainder of the *building* so that there is no access to the remainder of the *building*,
 - (ii) has direct access to its interior by means of an exterior doorway located not more than 1 500 mm above or below adjacent finished ground level, and
 - (d) that conforms to the requirements of Article 3.2.2.50. or Article 3.2.2.52.

3.2.5.9. Standpipe System Design

- (1) Except as provided in Sentences (2) to (5), Articles 3.2.5.10. and 3.2.5.11., and Sentence 3.2.4.9.(2), the design, construction, installation and testing of a standpipe system shall conform to NFPA 14, “Standard for the Installation of Standpipe and Hose Systems.”
- (2) A dry standpipe that is not connected to a water supply shall not be considered as fulfilling the requirements of this Article.
- (3) If more than one standpipe is provided, the total water supply need not be more than 30 L/s.
- (4) The residual water pressure at the design flow rate at the topmost hose connection of a standpipe system that is required to be installed in a *building* is permitted to be less than 690 kPa provided
 - (a) the *building* is *sprinklered* throughout,
 - (b) the water supply at the base of the sprinkler riser is capable of meeting, without a fire pump, the design flow rate and pressure demand of the sprinkler system, including the inside and outside hose allowance, and
 - (c) fire protection equipment is available to deliver, by means of the fire department connection, the full demand flow rate at a residual water pressure of 690 kPa at the topmost hose connection of the standpipe system. (See Note A-3.2.5.9.(4)(c))
- (5) A fire department connection shall be provided for every standpipe system.

3.2.5.10. Hose Connections

- (1) Hose connections shall be located in *exits*, in accordance with NFPA 14, “Standard for the Installation of Standpipe and Hose Systems.”
- (2) Hose connections are not required within a *floor area*.
- (3) Hose connections shall be provided with sufficient clearance to permit the use of a standard fire department hose key.
- (4) Except as permitted by Sentence (5), 64 mm diam hose connections shall be installed in a standpipe system.
- (5) Hose connections for 64 mm diam hose are not required in a *building* that is not more than 25 m high, measured between *grade* and the ceiling level of the top *storey* and in which an automatic sprinkler system is not installed.

3.2.5.11. Hose Stations

- (1) Hose stations for 38 mm diam hose shall be installed for a standpipe system in a *building* that is not *sprinklered* throughout.
- (2) Hose stations for a 38 mm diam hose shall be installed for a standpipe system within every *floor area* that is not *sprinklered* throughout. (See Note A-3.2.5.11.(2))
- (3) Hose stations shall be located in the *floor area* within 5 m of *exits* and at other locations to provide coverage of the entire *floor area*.
- (4) A hose station located on one side of a *horizontal exit* shall be considered to serve only the *floor area* on that side of the *horizontal exit*.
- (5) A hose cabinet shall be located so that its door, when fully opened, will not obstruct the required width of a *means of egress*.

(6) Where a *building* or part thereof is used as a *distillery* and the *building* is *sprinklered* in conformance with Article 3.2.5.12., small hose (38 mm) stations are permitted to be supplied from interior sprinkler piping.

(7) Where a hose station is provided in grain handling and storage facilities in which *combustible dusts* are produced in quantities or concentrations that create an explosion or fire hazard, fog and fine spray nozzles shall be used instead of nozzles that discharge a solid stream of water to prevent *combustible dusts* from being raised into suspension.

3.2.5.12. Automatic Sprinkler Systems

(1) Except as provided by Sentences (2) to (4) and (9), an automatic sprinkler system shall be designed, constructed, installed and tested in conformance with NFPA 13, “Standard for the Installation of Sprinkler Systems.” (See Note A-3.2.5.12.(1))

(2) Instead of the requirements of Sentence (1), NFPA 13R, “Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies,” is permitted to be used for the design, construction, installation and testing of an automatic sprinkler system installed

- (a) in a *building* of *residential occupancy* throughout that is not more than 4 *storeys* in *building height* and conforms to Article 3.2.2.47., 3.2.2.49., 3.2.2.51., 3.2.2.52. or 3.2.2.55.,
- (b) in a *building* of Group B, Division 3 *occupancy* that contains sleeping accommodation for not more than 10 persons and not more than six occupants require assistance in evacuation in case of an emergency,
- (c) in a *building* that contains a *retirement home* constructed in accordance with Article 3.2.2.55D., or
- (d) in a *building* that contains a *retirement home* constructed in accordance with Article 3.2.2.55E., where the *fire separation* required by Sentence 3.3.4.11.(2) on the *storey* immediately below the roof assembly is continuous to the underside of the roof deck.

(See Note A-3.2.5.12.(2))

(3) Instead of the requirements of Sentence (1), NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,” is permitted to be used for the design, construction and installation of an automatic sprinkler system installed

- (a) in a *building* of *residential occupancy* throughout that contains not more than two *dwelling units*,
- (b) reserved,
- (c) in a *building* of *residential occupancy* throughout that contains more than two *dwelling units*, provided
 - (i) except for a *secondary suite*, no *dwelling unit* is located above another *dwelling unit*,
 - (ii) all *suites* are separated by a vertical *fire separation* having a *fire-resistance rating* of not less than 1 h that provides continuous protection from the top of the footing to the underside of the roof deck, with any space between the top of the wall and the roof deck tightly filled with mineral wool or *noncombustible* material,
 - (iii) each *dwelling unit* has its own sprinkler water supply provided in accordance with NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,”
 - (iv) a passive purge sprinkler system design is used as described in NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,” and
 - (v) where the sprinkler system is taken into consideration for the reduction of *limiting distance*, all rooms, including closets, bathrooms and attached garages, that adjoin an *exposing building face* are *sprinklered*, notwithstanding any exemption stated in NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes.”

(See Note A-3.2.5.12.(2))

(4) If a *building* contains fewer than 9 sprinklers, the water supply for these sprinklers is permitted to be supplied from the domestic water system for the *building* provided the required flow for the sprinklers can be met by the domestic system.

(5) If a water supply serves both an automatic sprinkler system and a system serving other equipment, control valves shall be provided so that either system can be shut off independently.

- (6) Notwithstanding the requirements of the standards referenced in Sentences (1) and (2) for the installation of automatic sprinkler systems, sprinklers shall not be omitted in any room or closet in the *storey* immediately below a roof assembly. (See Note A-3.2.5.12.(6))
- r1 (7) Notwithstanding the requirements of the standards referenced in Sentences (1) and (2) regarding the installation of automatic sprinkler systems, in *buildings* conforming to Article 3.2.2.48., 3.2.2.51., 3.2.2.57., 3.2.2.60. or 3.2.2.93., sprinklers shall be provided for all balconies and decks, other than,
- (a) balconies or decks that are not more than 610 mm in depth measured perpendicular to the exterior wall of the *building*, or
 - (b) decks on the uppermost roof of the *building*.
- (See Note A-3.2.5.12.(7))
- (8) Sprinklers in elevator machine rooms shall have a temperature rating not less than that required for an intermediate temperature classification and shall be protected against physical damage. (See Note A-3.2.5.12.(8))
- (9) Except as provided in Subsection 3.2.8., closely spaced sprinklers and associated draft stops need not be installed around floor openings in conformance with NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (10) The sprinkler system described in Sentence (3) shall be provided with a minimum 20 min water supply when installed in a *retirement home*.

3.2.5.13. Combustible Sprinkler Piping

- (1) *Combustible* sprinkler piping shall be used only for sprinkler systems in *residential occupancies* and other light-hazard *occupancies*. (See Note A-3.2.5.13.(1))
- (2) *Combustible* sprinkler piping shall meet the requirements of ULC/ORD-C199P, “Combustible Piping for Sprinkler Systems.”
- (3) Except as permitted by Sentence (5), *combustible* sprinkler piping shall be separated from the area served by the sprinkler system, and from any other *fire compartment*, by ceilings, walls, or soffits consisting of, as a minimum,
- (a) lath and plaster,
 - (b) gypsum board not less than 9.5 mm thick,
 - (c) plywood not less than 13 mm thick, or
 - (d) a suspended membrane ceiling with
 - (i) steel suspension grids, and
 - (ii) lay-in panels or tiles having a mass not less than 1.7 kg/m².
- (4) Except as permitted by Sentence (5), *combustible* sprinkler piping may be located above a ceiling, provided that the distance between the edge of any ceiling opening that is not protected in conformance with Sentence (3) and the nearest sprinkler is not more than 300 mm.
- (5) Where *combustible* sprinkler piping has been tested in conformance with ULC/ORD-C199P, “Combustible Piping for Sprinkler Systems,” and has been shown to meet the requirements therein without additional protection, conformance to Sentences (3) and (4) is not required.

3.2.5.14. Sprinklered Service Space

- (1) An automatic sprinkler system shall be installed in a *service space* referred to in Sentence 3.2.1.1.(8) if flooring for access within the *service space* is other than catwalks.
- (2) The sprinkler system required by Sentence (1) shall be equipped with waterflow detecting devices, with each device serving not more than 1 *storey*.

- (3) The waterflow detecting devices required by Sentence (2) shall be connected to the fire alarm system, to
 - (a) initiate an *alert signal* in a 2-stage system or an *alarm signal* in a single-stage system, and
 - (b) indicate separately on the fire alarm system annunciator the actuation of each device.
- (4) If a *building* is *sprinklered*, sprinkler protection need not be provided in the space below a raised floor in a *computer room*
 - (a) if the optical fibre cables and electrical wires and cables in this space conform to the test requirements in Article 3.1.5.25.,
 - (b) if the *building* is of *noncombustible construction* and other *combustible* components are limited to those permitted in Subsection 3.1.5.,
 - (c) if this space is used to circulate conditioned air and the air handling system is designed to prevent the circulation of smoke upon a signal from a *smoke detector*,
 - (d) if all of this space is easily accessible by providing access sections or panels in the raised floor, and
 - (e) if the *computer room* is more than 2 000 m² and the annunciator has separate zone indicators of the actuation of *smoke detectors* located in this space so that the coverage for each zone is not more than 2 000 m².

3.2.5.15. Fire Department Connections

- (1) The fire department connection for a standpipe system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.
- (2) The fire department connection for an automatic sprinkler system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.

3.2.5.16. Portable Fire Extinguishers

- (1) Portable extinguishers shall be provided and installed in all *buildings*, except within *dwelling units*, in conformance with the provisions of Division B of the Fire Code made under the *Fire Protection and Prevention Act, 1997*.
- (2) In a Group B, Division 1 *major occupancy*, portable fire extinguishers are permitted to be located in secure areas, or in lockable cabinets provided
 - (a) identical keys for all cabinets are located at all supervisory or security stations, or
 - (b) electrical remote release devices are provided and are connected to an emergency power supply.

3.2.5.17. Protection from Freezing

- (1) Equipment forming part of a fire protection system shall be protected from freezing if
 - (a) it could be adversely affected by freezing temperatures, and
 - (b) it is located in an unheated area.

3.2.5.18. Fire Pumps

- (1) If a fire pump is installed, it shall be installed in accordance with the requirements of NFPA 20, “Standard for the Installation of Stationary Pumps for Fire Protection.” (See Note A-3.2.5.18.(1))

3.2.6. Additional Requirements for High Buildings (See Note A-3.2.6.)

3.2.6.1. Application

- (1) Except as provided in Sentence (2), this Subsection applies to a *building*
 - (a) of Group A, D, E or F *major occupancy* classification that is more than
 - (i) 36 m high, measured between *grade* and the floor level of the top *storey*, or

- (ii) 18 m high, measured between *grade* and the floor level of the top *storey*, and in which the cumulative or total *occupant load* on or above any *storey* above *grade*, other than the *first storey*, divided by 1.8 times the width in metres of all *exit* stairs at that *storey*, exceeds 300,
 - (b) containing a Group B *major occupancy* in which the floor level of the highest *storey* of that *major occupancy* is more than 18 m above *grade*,
 - (c) containing a *floor area* or part of a *floor area* located above the third *storey* designed or intended as a Group B, Division 2 or 3 *occupancy*,
 - (d) containing a Group C *major occupancy* in which the floor level of the highest *storey* of that *major occupancy* is more than 18 m above *grade*, or
 - (e) containing a *retirement home*, where the floor level of the highest *storey* of the *retirement home* is more than 18 m above *grade*.
- r1 (2) Except as required by Clause 3.2.6.1.(1)(c), this Subsection applies to a *building* or part thereof constructed in conformance with Article 3.2.2.57. or 3.2.2.93. in which the floor level of the highest *storey* is more than 18 m above *grade*.

3.2.6.2. Limits to Smoke Movement

- (1) A *sprinklered building* shall be designed in accordance with Sentences (2) to (6) and MMAH Supplementary Standard SB-4, “Measures for Fire Safety in High Buildings,” to limit the danger to occupants and firefighters from exposure to smoke in a *building* fire.
- (2) A *building* referred to in Sentence (1), shall be designed so that, during a period of 2 h after the start of a fire, each *exit* stair serving *storeys* below the lowest *exit level* will not contain more than 1% by volume of contaminated air from the fire floor, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in conformance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”
- (3) Each stairway that serves *storeys* above the lowest *exit level* shall have a vent to the outdoors, at or near the bottom of the stair shaft, that
- (a) has an openable area of 0.05 m² for every door between the stair shaft and a *floor area*, but not less than 1.8 m²,
 - (b) opens directly to the outdoors or into a vestibule that has a similar opening to the outdoors, and
 - (c) has a door or *closure* that
 - (i) is openable manually, and
 - (ii) can remain in the open position during a fire emergency.
- (4) Measures shall be taken to limit movement of smoke from a fire in a *floor area* below the lowest *exit storey* into upper *storeys*.
- (5) Except for exhaust fans in kitchens, washrooms and bathrooms in *dwelling units*, and except for fans used for smoke venting as required by Article 3.2.6.6., air moving fans in a system that serves more than 2 *storeys* shall be designed and installed so that in the event of a fire these fans can be stopped by means of a manually operated switch at the central alarm and control facility.
- (6) Except as provided in Article 3.2.4.12. or where there is a conflict with other smoke control measures in the *building*, air-handling systems used to provide make-up air to *public corridors* serving *suites* in a Group C *major occupancy* shall not shut down automatically upon activation of the fire alarm so as to maintain corridor pressurization.
- (7) A *building* that is not *sprinklered* shall be designed in accordance with MMAH Supplementary Standard SB-4, “Measures for Fire Safety in High Buildings,” to limit the danger to occupants and firefighters from exposure to smoke in a *building* fire.

3.2.6.3. Connected Buildings

- (1) If a *building* described in Article 3.2.6.1. is connected to any other *building*, measures shall be taken to limit movement of contaminated air from one *building* into another during a fire. (See Note A-3.2.6.3.(1))

3.2.6.4. Emergency Operation of Elevators

- (1) Manual emergency recall shall be provided for all elevators serving *storeys* above the *first storey*.
- (2) Key-operated switches for emergency recall described by Sentence (1) shall be provided in a conspicuous location at
 - (a) each elevator lobby on the recall level, and
 - (b) the central alarm and control facility required by Article 3.2.6.7.
- (3) In-car emergency service switches shall be provided in all elevator cars.
- (4) Keys to operate the switches required by Sentences (2) and (3) shall be
 - (a) provided in a suitably identified box conspicuously located on the outside of an elevator hoistway near the central alarm and control facility required by Article 3.2.6.7., and
 - (b) kept at the central alarm and control facility.
- (5) In a *building* that is not *sprinklered*, automatic emergency recall operation shall be provided for all elevators serving *storeys* above the *first storey*.
- (6) The automatic emergency recall feature in Sentence (5) shall be actuated by
 - (a) *smoke detectors* installed in each elevator lobby on each *storey*, or (See Note A-3.2.6.4.(6)(a))
 - (b) the *building* fire alarm system.
- (7) *Smoke detectors* in Sentence (6) shall be designed as part of the *building* fire alarm system.

3.2.6.5. Elevator for Use by Firefighters

- (1) At least one elevator shall be provided for use by firefighters in conformance with Sentences (2) to (6).
- (2) The elevator referred to in Sentence (1) shall have a useable platform area not less than 2.2 m² and shall be capable of carrying a load of 900 kg to the top floor that it serves from a landing on the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5. within 1 min.
- (3) Except where Measure K of MMAH Supplementary Standard SB-4, “Measures for Fire Safety in High Buildings,” is used, each elevator for use by firefighters shall
 - (a) be provided with a *closure* at each shaft opening so that the interlock mechanism remains mechanically engaged and electrical continuity is maintained in the interlock circuits and associated wiring for a period of not less than 1 h when the assembly is subjected to the standard fire exposure described in CAN/ULC-S104, “Standard Method for Fire Tests of Door Assemblies,”
 - (b) be protected with a vestibule containing no *occupancy* and separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 45 min, or
 - (c) be protected with a corridor containing no *occupancy* and separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (4) Except as permitted by Sentence (5), an elevator referred to in Sentence (1) shall be capable of providing transportation from the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5. to every floor that is above *grade* in the *building* and that is normally served by the elevator system.
- (5) If it is necessary to change elevators to reach any floor referred to in Sentence (4), the system shall be designed so that not more than one change of elevator is required when travelling to any floor in the *building* from the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5.

- (6) Electrical conductors for the operation of the elevator referred to in Sentence (1) shall
 - (a) be installed in *service spaces* conforming to Section 3.6. that do not contain other *combustible* material, or
 - (b) conform to CAN/ULC-S139, “Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables,” including the hose stream application, to provide a circuit integrity rating of not less than 1 h. (See Note A-3.2.6.5.(6)(b))

3.2.6.6. Venting to Aid Firefighting

- (1) Means of venting each *floor area* to the outdoors shall be provided by windows, wall panels, smoke shafts or, except as provided by Sentence (5), the *building* exhaust system.
- (2) Fixed glass windows shall not be used for the venting required by Sentence (1) if the breaking of the windows could endanger pedestrians below.
- (3) Openable windows used for the venting required by Sentence (1) shall be permanently marked so that they are easily identifiable.
- (4) Elevator hoistways shall not be designed for the venting required by Sentence (1).
- (5) In a *building* that is not *sprinklered*, venting of *floor areas* required in Sentence (1) shall not be provided by the *building* exhaust system.

3.2.6.7. Central Alarm and Control Facility

- (1) A central alarm and control facility shall be provided on the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5. in a location that
 - (a) is readily accessible to firefighters entering the *building*, and
 - (b) takes into account the effect of background noise likely to occur under fire emergency conditions, so that the facility can properly perform its required function under such conditions.
- (2) The central alarm and control facility required in Sentence (1) shall include
 - (a) means to control the voice communication system required by Article 3.2.6.8., so that messages can be sent to
 - (i) all loudspeakers simultaneously,
 - (ii) individual *floor areas*, and
 - (iii) *exit* stairwells,
 - (b) means to indicate audibly and visually *alert signals* and *alarm signals* and a switch to
 - (i) silence the audible portion of these signals, and
 - (ii) indicate visually that the audible portion has been silenced,
 - (c) means to indicate visually that elevators are on emergency recall,
 - (d) an annunciator conforming to Article 3.2.4.8.,
 - (e) means to transmit *alert signals* and *alarm signals* to the fire department in conformance with Article 3.2.4.7.,
 - (f) means to release hold-open devices on doors to vestibules,
 - (g) means to manually actuate *alarm signals* in the *building* selectively to any zone or zones,
 - (h) means to silence the *alarm signals* referred to in Clause (g) in conformance with Sentences 3.2.4.22.(2) and (3),
 - (i) means, as appropriate to the measure for fire safety provided in the *building*, to
 - (i) actuate auxiliary equipment identified in Articles 3.2.6.2., 3.2.6.3. and 3.2.6.6., or
 - (ii) communicate with a continually staffed auxiliary equipment control centre,
 - (j) means for two-way communications with every elevator car,
 - (k) means to indicate visually, individual sprinkler system waterflow signals,
 - (l) means to indicate audibly and visually, sprinkler and standpipe system supervisory signals and trouble signals,
 - (m) a switch to silence the audible portion of a supervisory signal or a trouble signal, and
 - (n) visual indication that the audible portion of a supervisory signal or a trouble signal has been silenced.

3.2.6.8. Voice Communication System

- (1) A voice communication system conforming to Article 3.2.4.22. shall be provided in a *building* if
 - (a) the floor of the top *storey* is more than 36 m above *grade*,
 - (b) a *floor area* or part of a *floor area* located above the third *storey* is designed or intended for use as a Group B, Division 2 or 3 *occupancy*, or
 - (c) a *floor area* or part of a *floor area* located more than 18 m above *grade* is designed or intended for use as a *retirement home* regulated under the *Retirement Homes Act, 2010* that is a Group C *occupancy*.

3.2.6.9. Testing

- (1) The systems for control of smoke movement and mechanical venting required by Articles 3.2.6.2. and 3.2.6.6. shall be tested to ensure satisfactory operation in accordance with the procedures described in MMAH Supplementary Standard SB-4, “Measures for Fire Safety in High Buildings.”

3.2.7. Lighting and Emergency Power Systems

3.2.7.1. Minimum Lighting Requirements

- (1) An *exit*, a *public corridor*, a corridor providing *access to exit* for the public, a corridor serving patients or residents in a Group B, Division 2 or 3 *occupancy*, a corridor serving classrooms, an electrical equipment room, a transformer vault and a hoistway pit shall be equipped to provide illumination to an average level not less than 50 lx at floor or tread level and at all points such as angles and intersections at changes of level where there are stairs or *ramps*.
- (2) The minimum level of the illumination required by Sentence (1) shall be 10 lx.
- (3) Rooms and spaces used by the public shall be equipped to provide illumination as described in Sentences (4) to (7) and Article 9.34.2.7.
- (4) The minimum level of illumination over the entire length of escalators and moving walks shall be not less than 100 lx at the level of the treads and walking surfaces.
- (5) Except as provided in Sentence (6) and except for light switches and internally illuminated controls, the minimum level of illumination at controls required by Article 3.8.1.5. shall be not less than 100 lx.
- (6) Where visual information is provided at controls referred to in Sentence (5), the minimum level of illumination at the controls shall be not less than 200 lx, except where the visual information is internally illuminated.
- (7) Except for internally illuminated signs, the minimum level of illumination at signs displaying visual information required by Clauses 3.4.6.10.(5)(b) and 3.4.6.16.(5)(g), Sentence 3.4.6.18.(3), Clause 3.4.6.18.(4)(a) and Articles 3.4.6.19. and 3.8.3.1. shall be not less than 200 lx.
- (8) Lighting outlets in a *building of residential occupancy* shall be provided in conformance with Subsection 9.34.2.
- (9) Elevator machine rooms shall be equipped to provide illumination to an average level of not less than 100 lx at floor level.
- (10) Every place of assembly intended for the viewing of motion pictures or the performing arts, shall be equipped to provide an average level of illumination at floor level in the aisles of not less than 2 lx during the viewing.
- (11) Every area where food is intended to be processed, prepared or manufactured and where equipment or utensils are intended to be cleaned shall be equipped to provide illumination to a level of not less than 500 lx measured at the floor level.

(12) Every storage room, dressing room, sanitary facility, service area and corridor serving the areas in Sentence (11) shall be equipped to provide illumination to a level of not less than 300 lx measured at the floor level.

3.2.7.2. Recessed Lighting Fixtures

(1) A recessed lighting fixture shall not be located in an insulated ceiling unless the fixture is designed for this type of installation.

3.2.7.3. Emergency Lighting

- (1) Emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor or tread level in
- (a) *exits*,
 - (b) principal routes providing *access to exit* in open *floor areas* and in *service rooms*,
 - (c) corridors used by the public,
 - (d) corridors serving patients' or residents' sleeping rooms in a Group B, Division 2 or 3 *occupancy*,
 - (e) reserved,
 - (f) corridors serving classrooms,
 - (g) underground *walkways*,
 - (h) *public corridors*,
 - (i) *floor areas* or parts of thereof where the public may congregate
 - (i) in Group A, Division 1 *occupancies*, or
 - (ii) in Group A, Divisions 2 and 3 *occupancies* having an *occupant load* of 60 or more,
 - (j) *floor areas* or parts of thereof in day care centres where persons are cared for,
 - (k) food preparation areas in commercial kitchens,
 - (l) washrooms with *fixtures* for *public use*,
 - (m) locations where doors are equipped with an electromagnetic lock as described in Clauses 3.4.6.16.(5)(k),
 - (n) universal washrooms required by Article 3.8.3.12. and universal shower rooms required by Article 3.8.3.13.,
 - (o) principal routes providing *access to exit* in a *floor area* that is not subdivided into rooms or *suites* of rooms served by corridors in a *business and personal services occupancy*, a *mercantile occupancy* or an *industrial occupancy*, and
 - (p) internal corridors or aisles serving as principal routes to *exits* in a *business and personal services occupancy*, a *mercantile occupancy* or an *industrial occupancy* that is subdivided into rooms or *suites* of rooms, and is not served by a *public corridor*.
- (2) Emergency lighting to provide an average level of illumination of not less than 10 lx at floor or catwalk level shall be included
- (a) in a *service space* referred to in Sentence 3.2.1.1.(8), and
 - (b) on a *shelf and rack storage system*, in locations described in Sentence 3.16.1.5.(2).
- (3) The minimum value of the illumination required by Sentences (1) and (2) shall not be less than 1 lx.
- (4) In addition to the requirements of Sentences (1) to (3), the installation of battery-operated emergency lighting in health care facilities shall conform to the appropriate requirements of CSA Z32, "Electrical safety and essential electrical systems in health care facilities."

3.2.7.4. Emergency Power for Lighting

- (1) An emergency power supply shall be
- (a) provided to maintain the emergency lighting required by this Subsection from a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the *building* is interrupted, and
 - (b) so designed and installed that upon failure of the regular power it will assume the electrical load automatically for a period of
 - (i) 2 h for a *building* within the scope of Subsection 3.2.6.,
 - (ii) 1 h for a *building* of Group B *major occupancy* classification that is not within the scope of Subsection 3.2.6.,

- (ii.1) 1 h for a *building* that contains a Group C *major occupancy retirement home* and that is not within the scope of Subsection 3.2.6.,
 - (iii) 1 h for a *building* within the scope of Article 3.2.2.51. or 3.2.2.60, and
 - (iv) 30 min for a *building* of any other *occupancy*.
- (See Note A-3.2.7.4.(1))
- (2) If self-contained emergency lighting units are used, they shall conform to CSA C22.2 No. 141, “Emergency lighting equipment.”

3.2.7.5. Emergency Power Supply Installation

- (1) Except as required by Articles 3.2.7.6. and 3.2.7.7., an emergency electrical power supply system shall be installed in conformance with CSA C282, “Emergency electrical power supply for buildings.” (See Sentence 3.2.7.8.(1) for emergency electrical power supply for voice communication systems.)
- (2) Every emergency power supply shall be equipped with an emergency audible and visual trouble indication.

3.2.7.6. Emergency Power for Hospitals

- (1) Except as required by Article 3.2.7.7., an emergency electrical power supply system for emergency equipment required by this Part for health care facilities shall be installed in conformance with CSA Z32, “Electrical safety and essential electrical systems in health care facilities.” (See Note A-3.2.7.6.(1))

3.2.7.7. Fuel Supply Shut-Off Valves and Exhaust Pipes

- (1) If a liquid or gas fuel-fired engine or turbine for an emergency electric power supply is dependent on a fuel supply from outside the *building*, the fuel supply shall be provided with a suitably-identified separate shut-off valve outside the *building*.
- (2) Where pipes for exhaust gases from emergency power systems penetrate required *fire separations*, they shall be enclosed in a separate *service space* having a *fire-resistance rating* equal to that of the penetrated floor assembly, but not less than 45 min.

3.2.7.8. Emergency Power for Fire Alarm Systems

- (1) Fire alarm systems, including those incorporating a voice communication system, shall be provided with an emergency power supply conforming to Sentences (2) to (4).
- (2) The emergency power supply required by Sentence (1) shall be supplied from
- (a) a generator,
 - (b) batteries, or
 - (c) a combination thereof.
- (3) The emergency power supply required by Sentence (1) shall be capable of providing
- (a) supervisory power for not less than 24 h, and
 - (b) immediately following that period, emergency power under full load for not less than
 - (i) 2 h for a *building* within the scope of Subsection 3.2.6.,
 - (ii) 1 h for a *building* classified as Group B *major occupancy* that is not within the scope of Subsection 3.2.6.,
 - (ii.1) 1 h for a *building* that contains a Group C *major occupancy retirement home* and that is not within the scope of Subsection 3.2.6.,
 - (iii) 1 h for a *building* within the scope of Article 3.2.2.51. or 3.2.2.60.,
 - (iv) 5 min for a *building* not required to be equipped with an annunciator, and
 - (v) 30 min for any other *building*.
- (See Note A-3.2.7.8.(3))

(4) The emergency power supply required by Sentence (1) shall be designed so that, in the event of a failure of the normal power source, there is an immediate automatic transfer to emergency power with no loss of information.

3.2.7.9. Emergency Power for Building Services

(1) An emergency power supply capable of operating under a full load for not less than 2 h shall be provided by an emergency generator for

- (a) every elevator serving *storeys* above the *first storey* in a *building* that is more than 36 m high measured between *grade* and the floor level of the top *storey* and every elevator for firefighters in conformance with Sentence (2),
- (b) except as provided in Sentence (4), equipment that supplies water for fire suppression as required by Articles 3.2.5.7. and 3.2.5.8. and Sentences 3.2.5.12.(1) and (2) and 3.2.5.18.(1), if the supply depends solely on electrical power supplied to the *building*,
- (c) fans and other electrical equipment that are installed to maintain the air quality specified in Articles 3.2.6.2. and 3.3.3.6.,
- (d) fans required for venting by Article 3.2.6.6., and
- (e) fans required by Clause 3.2.8.4.(1)(c) and Article 3.2.8.7. in *buildings* within the scope of Subsection 3.2.6. (See Note A-3.2.7.9.(1))

(2) Except as permitted by Sentence (3), the emergency power supply for elevators required by Clause (1)(a) shall be capable of operating all elevators for firefighters plus one additional elevator simultaneously.

(3) Sentence (2) does not apply if the time to recall all elevators under emergency power supply is not more than 5 min, each from its most remote *storey* to

- (a) the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4 and 3.2.5.5., or
- (b) to a transfer lobby.

(4) The emergency power supply required by Clause (1)(b) for the equipment that supplies water for fire suppression need not be provided for sprinkler systems conforming to NFPA 13D, “Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes.”

3.2.7.10. Protection of Electrical Conductors

(1) The protection of electrical and emergency conductors referred to in Clauses (a) to (c) shall conform to the requirements stated in Sentences (2) to (11):

- (a) electrical conductors located within *buildings* identified in Article 3.2.6.1. serving
 - (i) fire alarms,
 - (ii) emergency lighting, or
 - (iii) emergency equipment within the scope of Articles 3.2.6.2. to 3.2.6.8.,
- (b) emergency conductors serving fire pumps required to be installed under Article 3.2.5.18., and
- (c) emergency conductors serving mechanical systems serving
 - (i) areas of refuge identified in Clause 3.3.3.6.(1)(b), or
 - (ii) *contained use areas* referred to in Clauses 3.3.3.7.(4)(a) and (b).

(2) Except as otherwise required by Sentence (3) and permitted by this Article, electrical conductors that are used in conjunction with systems identified in Sentence (1) shall

- (a) conform to CAN/ULC-S139, “Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables,” including the hose stream application, to provide a circuit integrity rating of not less than 1 h, or (See Note A-3.2.7.10.(2)(a) and (3)(a)) (See also Clause 3.2.6.5.(6)(b))
- (b) be located in a *service space* that is separated from the remainder of the *building* by a *fire separation* that has a *fire-resistance rating* of not less than 1 h.

(3) Electrical conductors identified in Clause (1)(c) shall

- (a) conform to CAN/ULC-S139, “Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables,” including the hose stream application, to provide a circuit integrity rating of not less than 2 h, or (See Note A-3.2.7.10.(2)(a) and (3)(a))

- (b) be located in a *service space* that is separated from the remainder of the *building* by a *fire separation* that has a *fire-resistance rating* of not less than 2 h.
- (4) The *service spaces* referred to in Clause (2)(b) and (3)(b) shall not contain any *combustible* materials other than the electrical conductors being protected.
- (5) Except as permitted by Sentences (7) and (9), the electrical conductors referred to in Sentence (1) are those that extend from the source of emergency power to
 - (a) the equipment served, or
 - (b) the distribution equipment supplying power to the equipment served, if both are in the same room.
(See Note A-3.2.7.10.(5)(b))
- (6) If a fire alarm transponder or annunciator located in one *fire compartment* is connected to a central processing unit or another transponder or annunciator located in a different *fire compartment*, the electrical conductors connecting them shall be protected in accordance with Sentence (2).
- (7) Fire alarm system branch circuits within a *storey* that connect transponders and individual devices need not conform to Sentence (2). (See Note A-3.2.7.10.(7))
- (8) Except as permitted in Sentence (9), if a distribution panel supplies power to emergency lighting, the power supply conductors leading up to the distribution panel shall be protected in accordance with Sentence (2).
- (9) Conductors leading from a distribution panel referred to in Sentence (8) to emergency lighting units in the same *storey* need not conform to Sentence (2).
- (10) Distribution panels serving emergency lighting units located on other *storeys* shall be installed in a *service room* separated from the *floor area* by a *fire separation* having a *fire-resistance rating* of at least 1 h.
- (11) Conductors leading from a distribution panel to emergency lighting units located on other *storeys* shall be protected in accordance with Sentence (2) between the distribution panel and the *floor area* where the emergency lighting units are located.

3.2.8. Mezzanines and Openings Through Floor Assemblies

3.2.8.1. Application

- (1) Except as permitted by Article 3.2.8.2. and Sentence 3.3.4.2.(3), the portions of a *floor area* or a *mezzanine* that do not terminate at an exterior wall, a *firewall* or a vertical shaft shall
 - (a) terminate at a vertical *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly and extending from the floor assembly to the underside of the floor or roof assembly above, or
 - (b) be protected in conformance with the requirements of Articles 3.2.8.3. to 3.2.8.8.
- (2) The penetration of a floor assembly by an *exit* or a *vertical service space* shall conform to the requirements of Sections 3.4., 3.5. and 3.6.
- (3) A *floor area* containing sleeping rooms in a *building* of Group B, Division 2 *major occupancy* shall not be constructed as part of an *interconnected floor space*.

3.2.8.2. Exceptions to Special Protection

- (1) A *mezzanine* need not terminate at a vertical *fire separation* nor be protected in conformance with the requirements of Articles 3.2.8.3. to 3.2.8.8. provided the *mezzanine*
 - (a) serves a Group A, Division 1 *major occupancy*,
 - (b) serves a Group A, Division 3 *major occupancy* in a *building* not more than 2 *storeys* in *building height*, or

- (c) serves a Group A, C, D, E or F *major occupancy* and
 - (i) is 500 m² or less in area, and
 - (ii) conforms to Sentence 3.2.1.1.(3) or (4).
- (2) Except for floors referred to in Sentence 3.1.10.3.(1) and Article 3.2.1.2., openings through a horizontal *fire separation* for vehicular *ramps* in a *storage garage* are not required to be protected with *closures* and need not conform to this Subsection.
- (3) If a *closure* in an opening in a *fire separation* would disrupt the nature of a manufacturing process, such as a continuous flow of material from *storey to storey*, the *closure* for the opening is permitted to be omitted provided precautions are taken to offset the resulting hazard. (See Note A-3.2.8.2.(3))
- (4) An *interconnected floor space* in a Group B, Division 1 *occupancy* need not conform to the requirements of Articles 3.2.8.3. to 3.2.8.8. provided the *interconnected floor space* does not interconnect more than 2 adjacent *storeys*.
- (5) Except as permitted by Sentence (6), openings for escalators and inclined moving walks need not conform to the requirements in Articles 3.2.8.3. to 3.2.8.8. provided
 - (a) the opening for each escalator or walk does not exceed 10 m²,
 - (b) the *building* is *sprinklered* throughout,
 - (c) closely spaced sprinklers and associated draft stops are installed around the openings in conformance with NFPA 13, “Standard for the Installation of Sprinkler Systems,” and
 - (d) the *interconnected floor space* contains only Group A, Division 1, 2 or 3, Group D or Group E *occupancies*. (See Note A-3.2.8.2.(6)(c))
- (6) An *interconnected floor space* need not conform to the requirements of Articles 3.2.8.3. to 3.2.8.8. provided
 - (a) it consists of the first *storey* and the *storey* next above or below it, but not both,
 - (b) it is *sprinklered* throughout or, where the *building area* is not more than one-half of the area permitted by Subsection 3.2.2., the openings through the floor are used only for stairways, escalators or moving walks, and (See Note A-3.2.8.2.(6)(b))
 - (c) it contains only Group A, Division 1, 2 or 3, Group D, Group E, or Group F, Division 2 or 3 *major occupancies*. (See Note A-3.2.8.2.(6)(c))

3.2.8.3. Sprinklers

- (1) A *building* containing an *interconnected floor space* shall be *sprinklered* throughout.
- (2) Except for large floor openings as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems,” closely spaced sprinklers and associated draft stops shall be installed around floor openings in conformance with NFPA 13.

3.2.8.4. Vestibules

- (1) An *exit* opening into an *interconnected floor space* shall be protected at each opening into the *interconnected floor space* by a vestibule
 - (a) with doorways that are not less than 1.8 m apart,
 - (b) that is separated from the remainder of the *floor area* by a *fire separation* that is not required to have a *fire-resistance rating*, and (See Note A-3.1.8.1.(1)(b))
 - (c) that is designed to limit the passage of smoke so that the *exit* stair shaft does not contain more than 1% by volume of contaminated air from the fire floor, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in accordance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.” (See Note A-3.2.8.4.(1)(c))
- (2) An *exit* opening into an *interconnected floor space* shall conform to Sentence 3.4.3.2.(6).

(3) If an elevator hoistway opens into an *interconnected floor space* and into *storeys* above the *interconnected floor space*, either the elevator doors opening into the *interconnected floor space* or the elevator doors opening into the *storeys* above the *interconnected floor space* shall be protected by vestibules conforming to Sentence (1).

3.2.8.5. Protected Floor Space

- (1) A *protected floor space* used to satisfy the requirements of Clause 3.4.3.2.(6)(b) shall
- (a) be separated from the *interconnected floor space* by a *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly of the *storey* in which it is located,
 - (b) have all openings in the vertical *fire separation* between a *protected floor space* and the adjacent *interconnected floor space* protected by vestibules conforming to Sentence 3.2.8.4.(1), and
 - (c) be designed so that it is not necessary to enter the *interconnected floor space* to reach an *exit*.

3.2.8.6. Draft Stops

(1) A draft stop shall be provided at each floor level within an *interconnected floor space*, immediately adjacent to and surrounding the opening, and shall be not less than 500 mm deep measured from ceiling level down to the underside of the draft stop.

3.2.8.7. Mechanical Exhaust System

- (1) A mechanical exhaust system shall be provided to remove air from an *interconnected floor space* at a rate of 4 air changes per hour. (See Note A-3.2.8.7.(1))
- (2) The mechanical exhaust system required by Sentence (1) shall be actuated by a switch located on the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5. near the annunciator for the fire alarm system.

3.2.8.8. Combustible Content Limits

(1) An *interconnected floor space* shall be designed so that the *combustible* contents, excluding interior finishes, in those parts of a *floor area* in which the ceiling is more than 8 m above the floor, are limited to not more than 16 g of *combustible* material for each cubic metre of volume of the *interconnected floor space*.

3.2.9. Testing of Integrated Fire Protection and Life Safety Systems

3.2.9.1. Testing

(1) Where fire protection and life safety systems, and systems with fire protection and life safety functions, are integrated with each other, the systems shall be tested as a whole in accordance with CAN/ULC-S1001, “Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems”, to verify that they have been properly integrated. (See Note A-3.2.9.1.(1))

Section 3.3. Safety Within Floor Areas (See Note A-3.3.)

3.3.1. All Floor Areas

3.3.1.1. Separation of Suites

- (1) Except as permitted by Sentences (2) and (3), each *suite* in other than *business and personal services occupancies* shall be separated from adjoining *suites* by a *fire separation* having a *fire-resistance rating* not less than 1 h. (See also Subsection 3.3.3. for *care, care and treatment* or *detention occupancies*, Article 3.3.4.2. for *residential occupancies*, and Article 3.1.8.7. for *fire dampers*.)
- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
 - (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) *Occupancies* that are served by *public corridors* conforming to Clause 3.3.1.4.(4)(b) in a *building* that is *sprinklered* throughout, are not required to be separated from one another by *fire separations* provided the *occupancies* are
 - (a) *suites* of *business and personal services occupancy*,
 - (b) fast food vending operations that do not provide seating for customers,
 - (c) *suites* of *mercantile occupancy*, or
 - (d) any combination of these *occupancies*.

3.3.1.2. Hazardous Substances, Equipment and Processes

- (1) Except as provided in Subsections 3.3.5. and 3.3.6., the storage, handling and use of the hazardous substances shall be in conformance with
 - (a) the Fire Code made under the *Fire Protection and Prevention Act, 1997*, or
 - (b) the CCBFC NRCC-CONST-56437E, “National Fire Code of Canada,” in the absence of regulations referred to in Clause (a).(See Note A-3.3.1.2.(1))
- (2) Systems for the ventilation of cooking equipment that is not within a *dwelling unit* and is used in processes producing grease-laden vapours shall be designed and installed in conformance with Articles 3.6.3.5., 6.3.1.6. and 6.9.1.3. (See Note A-3.3.1.2.(2))
- (3) A fuel-fired *appliance* shall not be installed in a corridor serving as an *access to exit*.

3.3.1.3. Means of Egress

- (1) *Access to exit* within *floor areas* shall conform to Subsections 3.3.2. to 3.3.5., in addition to the requirements of this Subsection.
- (2) If a podium, terrace, platform or contained open space is provided, egress requirements shall conform to the appropriate requirements of Sentence 3.3.1.5.(1) for rooms and *suites*.
- (3) *Means of egress* shall be provided from every roof that is intended for *occupancy*, and from every podium, terrace, platform or contained open space.
- (4) At least two separate *means of egress* shall be provided from a roof, used or intended for an *occupant load* more than 60, to stairs designed in conformance with the requirements regarding *exit* stairs stated in Section 3.4.

- (5) A rooftop enclosure shall be provided with an *access to exit* that leads to an *exit*
 - (a) at the roof level, or
 - (b) on the *storey* immediately below the roof.
- (6) A rooftop enclosure which is more than 200 m² in area shall be provided with at least 2 *means of egress*.
- (7) Two points of egress shall be provided for a *service space* referred to in Sentence 3.2.1.1.(8) if
 - (a) the area is more than 200 m², or
 - (b) the travel distance measured from any point in the *service space* to a point of egress is more than 25 m.
- (8) Except as required by Sentence 3.3.4.4.(8) and permitted by Sentences 3.3.4.4.(5) and (6), each *suite* in a *floor area* that contains more than one *suite* shall have
 - (a) an exterior *exit* doorway, or
 - (b) a doorway,
 - (i) into a *public corridor*, or
 - (ii) to an exterior passageway.
- (9) Except as permitted by this Section and by Sentence 3.4.2.1.(2), at the point where a doorway referred to in Sentence (8) opens onto a *public corridor* or exterior passageway, it shall be possible to go in opposite directions to each of 2 separate *exits*.
- (10) *Means of egress* from a roof for personnel servicing roof top equipment or for a below ground *service room* that is not normally occupied, is permitted to be provided by stairways or fixed ladders.

3.3.1.4. Public Corridor Separations

- (1) Except as otherwise required by this Part or as permitted by Sentence (4), a *public corridor* shall be separated from the remainder of the *storey* by a *fire separation*.
- (2) Except as permitted by Sentence (3) and Clauses (4)(a) and (b), the *fire separation* between a *public corridor* and the remainder of the *storey* shall have a *fire-resistance rating* not less than 45 min.
- (3) If a *storey* is *sprinklered* throughout, no *fire-resistance rating* is required for a *fire separation* between a *public corridor* and the remainder of the *storey*, provided the corridor does not serve a *care, care and treatment, detention or residential occupancy*. (See Note A-3.1.8.1.(1)(b))
- (4) No *fire separation* is required in a *sprinklered floor area* between a *public corridor* and
 - (a) except as required by Sentences 3.3.3.5.(9) and 3.3.4.2.(1) and notwithstanding Sentence 3.4.2.4.(2), the remainder of a *storey*, provided the travel distance from any part of the *floor area* to an *exit* is not more than 45 m.,
 - (b) a room or *suite*, provided the *public corridor* complies with Sentence 3.3.1.9.(4) and Clause 3.4.2.5.(1)(d), or
 - (c) a space containing *plumbing fixtures* required by Subsection 3.7.4. provided the space and the *public corridor* are separated from the remainder of the *storey* by a *fire separation* having a *fire-resistance rating* not less than that required between the *public corridor* and the remainder of the *storey*.

3.3.1.5. Egress Doorways

- (1) Except for *dwelling units*, a minimum of 2 egress doorways located so that one doorway could provide egress from the room or *suite* as required by Article 3.3.1.3. if the other doorway becomes inaccessible to the occupants due to a fire that originates in the room or *suite*, shall be provided for every room and every *suite*
 - (a) whose area is more than 15 m² and is used for
 - (i) a *high-hazard industrial occupancy*, or
 - (ii) a *hazardous room*,
 - (b) intended for an *occupant load* more than 60,

- (c) in a *floor area* that is not *sprinklered* throughout and
- (i) the area of a room or *suite* is more than the value in Table 3.3.1.5.-A, or
 - (ii) the travel distance within the room or *suite* to the nearest egress doorway, is more than the value in Table 3.3.1.5.-A,
- (d) in a *floor area* that is *sprinklered* throughout and does not contain a *high-hazard industrial occupancy* and
- (i) the travel distance to an egress doorway is more than 25 m, or
 - (ii) the area of the room or *suite* is more than the value in Table 3.3.1.5.-B, or
- (e) where the area of the room is more than 100 m² and it is a *hazardous classroom* in elementary or secondary school.
- (2) Where 2 egress doorways are required by Sentence (1), they shall be placed at a distance from one another equal to or greater than one third of the maximum overall diagonal dimension of the area to be served, measured as the shortest distance that smoke would have to travel between the nearest required egress doors.

Table 3.3.1.5.-A
Egress in Floor Area Not Sprinklered Throughout
 Forming Part of Sentence 3.3.1.5.(1)

<i>Occupancy of Room or Suite</i>	Maximum Area of Room or <i>Suite</i> , m ²	Maximum Distance to Egress Doorway, m
Group A	150	15
Group C	100 ⁽¹⁾	15 ⁽¹⁾
Group D	200	25
Group E	150	15
Group F, Division 2	150	10
Group F, Division 3	200	15

Notes to Table 3.3.1.5.-A:

- (1) See Article 3.3.4.4. for *dwelling units*.

Table 3.3.1.5.-B
Egress in Floor Area Sprinklered Throughout
 Forming Part of Sentence 3.3.1.5.(1)

<i>Occupancy of Room or Suite</i>	Maximum Area of Room or <i>Suite</i> , m ²
Group A	200
Group B, Division 1	100
Group B, Division 2 or 3	
sleeping rooms	100
other than sleeping rooms	200
Group C	150 ⁽¹⁾
Group D	300
Group E	200
Group F, Division 2	200
Group F, Division 3	300

Notes to Table 3.3.1.5.-B:

- (1) See Article 3.3.4.4. for *dwelling units*.

- (3) Every room containing an *assembly occupancy* serving a *hotel*, and located in the *building* containing the *hotel*, shall be provided with no fewer than
 - (a) three separate egress doorways from the room where the *occupant load* is more than 600 persons, and
 - (b) four separate egress doorways from the room where the *occupant load* is more than 1 000 persons
- (4) Each egress doorway in Sentence (4) shall be considered as contributing not more than,
 - (a) one-third of the required width where three egress doorways are required, and
 - (b) one-fourth of the required width where four egress doorways are required.

3.3.1.6. Travel Distance

- (1) If more than one egress doorway is required from a room or *suite* referred to in Article 3.3.1.5., the travel distance within the room or *suite* to the nearest egress doorway shall not exceed the maximum travel distances specified in Clauses 3.4.2.5.(1)(a), (b), (c) and (f) for *exits*.

3.3.1.7. Protection on Floor Areas with a Barrier-Free Path of Travel

- (1) Except as provided in Sentences (1.1) and (1.2), every *floor area* above or below the *first storey* that has a *barrier-free* path of travel shall
 - (a) be served by an elevator
 - (i) conforming to Sentences 3.2.6.5.(4) to (6),
 - (ii) protected against fire in conformance with Clause 3.2.6.5.(3)(b) or (c), and
 - (iii) in a *building* over 3 *storeys* in *building height*, protected against smoke movement so that the hoistway will not contain more than 1% by volume of contaminated air from a fire floor during a period of 2 h after the start of a fire, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in conformance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data,” or
 - (b) be divided into at least 2 zones by *fire separations* conforming to Sentences (2) and (3) and 3.1.8.5.(6) so that, (See Note A-3.3.1.7.(1)(b))
 - (i) persons with physical disabilities can be accommodated in each zone,
 - (ii) the travel distance from any point in one zone to a doorway leading to another zone shall be not more than the value for travel distance permitted by Sentence 3.4.2.5.(1) for the *occupancy* classification of the zone, and
 - (iii) a *barrier-free* path of travel is provided to an *exit*.

(See Note A-3.3.1.7.(1))

(1.1) In *residential occupancies*, the requirements of Sentence (1) are waived if a balcony conforming to Sentence (4) is provided for each *suite*, except for *suites* on the *storey* containing the *barrier-free* entrance described in Article 3.8.1.2.

(1.2) The requirements of Sentences (1) and (1.1) are waived when the *building* is *sprinklered* throughout.

(2) Except as permitted by Sentence (3), the *fire separations* referred to in Clause (1)(b) shall have a *fire-resistance rating* not less than 1 h.

(3) The *fire-resistance rating* of the *fire separations* referred to in Clause (1)(b) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for

- (a) the floor assembly above the *floor area*, or
- (b) the floor assembly below the *floor area*, if there is no floor assembly above.

(4) A balcony required by Sentence (1.1) shall

- (a) be provided with a doorway having a clear width of not less than 800 mm when the door is in the open position,
- (b) have no projection above the walking surface more than 13 mm,
- (c) be not less than 1.5 m deep from the outside face of the exterior wall to the inside edge of the balcony, and
- (d) provide not less than 0.5 m² for each occupant of the *suite*.

3.3.1.8. Headroom and Protruding Objects

- (1) Except within the *floor area* of a *storage garage*, the minimum headroom clearance in every *access to exit* shall conform to the requirements of Article 3.4.3.4. for *exits*. (See also Sentence 3.3.5.4.(5))
- (2) Except as permitted by Sentence (3) and except for paths of travel in *service rooms* and *dwelling units*, protruding *building* elements located within 1 980 mm of the floor shall not project more than 100 mm horizontally into paths of travel in a manner that would create a hazard. (See Note A-3.3.1.8.(2) and (3))
- (3) The horizontal projection of a protruding *building* element referred to in Sentence (2) is permitted to be more than 100 mm, provided the clearance between the protruding element and the floor is less than 680 mm. (See Note A-3.3.1.8.(2) and (3))

3.3.1.9. Corridors

- (1) The minimum width of a *public corridor* shall be 1 100 mm.
- (2) Except as required by Sentences 3.3.3.3.(2) and (3), the minimum unobstructed width shall be 1 100 mm for every
 - (a) corridor used by the public,
 - (b) corridor serving classrooms, and
 - (c) corridor in a Group B, Division 2 or 3 *occupancy* where the corridor
 - (i) serves a *service room*,
 - (ii) serves an administrative area,
 - (iii) will not be used by non-ambulatory outpatients, or
 - (iv) will not be used by non-ambulatory residents.
- (3) If a corridor contains an *occupancy*, the *occupancy* shall not reduce the unobstructed width of the corridor to less than its required width.
- (4) If a *public corridor* conforming to Clause 3.4.2.5.(1)(d) contains an *occupancy*,
 - (a) the *occupancy* shall be located so that for pedestrian travel there is an unobstructed width not less than 3 m at all times adjacent and parallel to all rooms and *suites* that front onto the *public corridor*, and
 - (b) the combined area of all *occupancies* in the *public corridor* shall be not more than 15% of the area of the *public corridor*.
- (5) Except as provided in Sentence 3.3.3.3.(1), a dead-end corridor shall conform to Sentences (6) to (12).
- (6) A dead-end corridor is permitted in an *assembly occupancy* where there is a second and separate egress doorway from each room or *suite* not leading into a dead-end corridor.
- (7) Except as provided in Sentence 3.3.4.11.(10) and except for corridors served by a single *exit* as described in Sentence 3.3.4.4.(6), a dead-end *public corridor* is permitted in a *residential occupancy* provided it is not more than 6 m long.
- (8) Dead-end corridors in Sentence (9) shall contain no door openings to *service rooms* containing fuel-fired *appliances* or rooms that may be considered a hazard.
- (9) A dead-end *public corridor* is permitted in a *business and personal services occupancy* where
 - (a) the dead-end corridor
 - (i) serves an *occupant load* of not more than 30 persons,
 - (ii) is not more than 9 m long, and
 - (iii) is provided with doors having self-closing devices, or
 - (b) there is a second and separate egress doorway from each room or *suite* not leading into a dead-end corridor.

- (10) A dead-end corridor is permitted in a *mercantile occupancy* where
- (a) the dead-end corridor
 - (i) serves an *occupant load* of not more than 30 persons,
 - (ii) is not more than 9 m long, and
 - (iii) is provided with doors having self-closing devices, or
 - (b) there is a second and separate egress doorway from each room or *suite* not leading into a dead-end corridor.
- (11) A dead-end corridor is permitted in a *low- or medium-hazard industrial occupancy* where
- (a) the dead-end corridor
 - (i) serves an *occupant load* of not more than 30 persons,
 - (ii) is not more than 9 m long, and
 - (iii) is provided with doors having self-closing devices, or
 - (b) there is a second and separate egress doorway from each room or *suite* not leading into a dead-end corridor.
- (12) A dead-end corridor is permitted in a *high-hazard industrial occupancy* where there is a second and separate egress doorway from each room or *suite* not leading into a dead-end corridor.

3.3.1.10. Aisles

- (1) Except as otherwise required by this Section, aisles shall be provided in conformance with the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

3.3.1.11. Door Swing

- (1) Except as permitted by Sentence (5) and Article 3.3.1.12., a door that opens into a corridor or other facility providing *access to exit* from a *suite* or room not located within a *suite*, shall swing on a vertical axis.
- (2) Except as permitted by Article 3.3.1.12., a door that opens into a corridor or other facility providing *access to exit* from a room or *suite* shall swing in the direction of travel to the *exit* if the room or *suite* is used or intended for
- (a) an *occupant load* more than 60,
 - (b) a *high-hazard industrial occupancy*, or
 - (c) a *hazardous classroom* in an elementary or secondary school.
- (3) Every door that divides a corridor that is not wholly contained within a *suite* shall swing on a vertical axis in the direction of travel to the *exit* where the corridor provides *access to exit* for
- (a) an *occupant load* more than 60,
 - (b) a *high-hazard industrial occupancy*,
 - (c) a *hazardous classroom* in an elementary or secondary school,
 - (d) a Group B, Division 2 or 3 *occupancy*, or
 - (e) a *retirement home*.
- (4) If a pair of doors is installed in a corridor that provides *access to exit* in both directions, the doors shall swing in opposite directions, with the door on the right hand side swinging in the direction of travel to the *exit*.
- (5) Doors that serve individual storage spaces not more than 28 m² in area in *self-service storage buildings* need not conform to Sentence (1).

3.3.1.12. Sliding Doors

- (1) Except as permitted by Sentences (2) and 3.3.1.11.(5), a sliding door provided in the locations described in Article 3.3.1.11. shall
- (a) be designed and installed to swing on the vertical axis in the direction of travel to the *exit* when pressure is applied, and
 - (b) be identified as a swinging door by means of a label or decal affixed to it.

(2) In a Group B, Division 1 *occupancy*, or in an *impeded egress zone* in other *occupancies*, sliding doors used in an *access to exit* need not conform to Sentence (1) and Article 3.3.1.11.

(3) Movable *partitions* used to separate a *public corridor* from an adjacent *business and personal services occupancy* or a *mercantile occupancy* need not conform to Sentence (1) and Sentences 3.3.1.11.(1) and (2) provided the *partitions* are not located in the only *means of egress*. (See Note A-3.3.1.12.(3))

3.3.1.13. Doors and Door Hardware (See also Sentence 3.8.3.6.(17))

(1) Except as required by Article 3.3.3.4. and Sentences 3.3.4.11.(11), 3.8.3.3.(1) and (2), a door that opens into or is located within a *public corridor* or other facility that provides *access to exit* from a *suite* shall

- (a) provide a clear opening of not less than 850 mm, if there is only one door leaf,
- (b) in a doorway with multiple leaves, have the active leaf providing a clear opening of not less than 850 mm,
- (c) not open onto a step, and
- (d) have a threshold not more than 13 mm higher than the floor surface, except where
 - (i) the threshold is used to contain spillage, or
 - (ii) the doorway provides access to an exterior balcony, other than a balcony required by Sentence 3.3.1.7.(2).

(2) Except as provided in Sentences (6) and (7), a door in an *access to exit* shall be readily openable in travelling to an *exit* without requiring keys, special devices or specialized knowledge of the door opening mechanism.

(3) Except as permitted by Sentence (4), door release hardware shall be operable by one hand and the door shall be openable with not more than one releasing operation. (See also Sentence 3.8.3.6.(4))

(4) Except in a *retirement home*, an egress door from an individual *dwelling unit* or from a *suite of residential occupancy* is permitted to be provided with additional devices that require a releasing operation additional to the main door release hardware, provided the devices are readily operable from the inside without the use of keys, special devices or specialized knowledge. (See Note A-3.3.1.13.(4))

(5) Door release hardware shall be installed not more than 900 mm and 100 mm above the finished floor.

(6) An egress door in an *access to exit* serving a *contained use area* or an *impeded egress zone* is permitted to be equipped with locking devices, provided they can be released either locally or remotely in conformance with Sentence (8) or (9). (See Note A-3.3.1.13.(6))

(7) A door in an *access to exit* is permitted to be equipped with an electromagnetic locking device conforming to Sentence 3.4.6.16.(5), except that this permission does not apply to a door

- (a) in an elementary or secondary school,
- (b) a door leading from a Group F, Division 1 *occupancy*, or
- (c) except as provided in Sentence (11), requiring a latch release device by Article 3.3.2.6.

(8) Local locking devices permitted by Sentence (6) shall be operable by a key from both sides of the door.

(9) Controls for the remote release of door locking devices permitted by Sentence (6) shall be located in an area readily available to security personnel.

(10) Locking devices permitted by Sentence (6) that are electrically operated shall be

- (a) designed to operate on emergency power, and
- (b) capable of manual release by security personnel.

(11) A door in an *access to exit* in a *gaming premise* is permitted to be equipped with an electromagnetic locking device conforming to Sentences 3.4.6.16.(5) and (8).

3.3.1.14. Ramps and Stairways

- (1) Except as permitted by Sentence (2), Article 3.3.4.7. and Subsection 3.3.2., *ramps* and stairways that do not serve as *exits* shall conform to the requirements for *exit ramps* and stairways stated in Sentence 3.4.3.2.(8) and Articles 3.4.3.4., and 3.4.6.1. to 3.4.6.9.
- (2) *Ramps* and stairways that serve *service rooms*, *service spaces* or *industrial occupancies* need not comply with Sentence (1), provided
 - (a) they are intended only for occasional use for servicing equipment and machinery, and
 - (b) they do not serve as *exits*.

3.3.1.15. Exterior Passageways

- (1) An exterior passageway leading to a required *exit* shall conform to the requirements of Section 3.4. for exterior *exit* passageways.

3.3.1.16. Tapered Treads in a Curved Flight

- (1) *Flights* of stairs shall consist solely of
 - (a) straight *flights*, or
 - (b) curved *flights* complying with Sentence (2).
- (2) *Tapered treads* in a curved *flight* that is not required as an *exit* shall have
 - (a) a minimum *run* of 150 mm,
 - (b) a *run* not less than 280 mm when measured at a point 300 mm from the centre line of the handrail at the narrow end of the tread, and
 - (c) a riser conforming to Sentence 3.4.6.8.(2).
- (3) *Tapered treads* shall have a consistent angle and uniform *run* and rise dimensions in accordance with the construction tolerances described in Article 3.4.6.8. when measured at a point 300 mm from the centre line of the handrail at the narrow end of the tread.
- (4) All *tapered treads* within a *flight* shall turn in the same direction.

3.3.1.17. Capacity of Access to Exits (See Article 3.3.1.9. for minimum widths of corridors.)

- (1) The capacity of an *access to exit* shall be based on the *occupant load* of the portion of the *floor area* served.
- (2) In an *access to exit* the required width of *ramps* with a slope not more than 1 in 8, doorways, and corridors shall be based on not less than 6.1 mm per person.
- (3) In an *access to exit* the required width of a *ramp* with a slope more than 1 in 8 shall be based on not less than 9.2 mm per person.
- (4) In an *access to exit* from a *floor area* used or intended to be used for patients or residents in a Group B, Division 2 or Division 3 *occupancy*, the required width of corridors, doorways, and *ramps* shall be based on not less than 18.4 mm per person.
- (5) The capacity of stairs in an *access to exit* shall conform to the requirements for stairs in Sentences 3.4.3.2.(1) to (3).
- (6) In a *building* that is not *sprinklered* throughout in accordance with Sentence 3.2.5.12.(1), an *access to exit* that is part of the principal entrance serving a dance hall or a licensed beverage establishment with an *occupant load* more than 250 shall be at least one-half of the required *exit* width.

3.3.1.18. Guards

- (1) Except as provided in Sentences (5) and (6) and Articles 3.3.2.9. and 3.3.4.7., a *guard* not less than 1 070 mm high shall be provided
- (a) around each roof to which access is provided for other than maintenance,
 - (b) at openings into smoke shafts referred to in Subsection 3.2.6. that are less than 1 070 mm above the floor, and
 - (c) at each raised floor, *mezzanine*, balcony, gallery, interior or exterior vehicular *ramp*, and at other locations where (See Note A-9.8.8.1.)
 - (i) the difference in level is more than 600 mm between the walking surface and the adjacent surface, or
 - (ii) the adjacent surface within 1.2 m of the walking surface has a slope of more than 1 in 2, and
 - (d) except as provided in Sentence (6), around each skylight located in a portion of a roof that is intended to be occupied.

- (2) Except as provided in Sentences (3) and 3.3.2.9.(4), openings through any *guard* that is required by Sentence (1) shall be of a size that will prevent the passage of a sphere having a diameter more than 100 mm unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

(2.1) Except as permitted by Sentence 3.3.5.10.(1), openings through any *guard* that is required by Sentence (1) and that is installed in a *building of industrial occupancy* shall be of a size which will prevent the passage of a sphere having a diameter more than 200 mm unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

- (3) Openings through any *guard* that is not required by Sentence (1) and that serves a *building of other than industrial occupancy*, shall be of a size that
- (a) will prevent the passage of a sphere having a diameter more than 100 mm, or
 - (b) will permit the passage of a sphere having a diameter more than 200 mm unless it can be shown that the location and size of openings that exceed these limits do not represent a hazard.
- (See Note A-9.8.8.5.(4))

(4) Unless it can be shown that the location and size of openings do not present a hazard, a *guard* shall be designed so that no member, attachment or opening located between 140 mm and 900 mm above the level protected by the *guard* will facilitate climbing.

- (5) Sentence (1) does not apply
- (a) to the front edges of *stages*,
 - (b) to loading docks,
 - (c) to floor pits in *repair garages*, or
 - (d) where access is provided for maintenance purposes only.

- (6) Clause (1)(d) does not apply to a skylight that
- (a) is designed to support the loads specified in Part 4, or
 - (b) is provided with a skylight screen that
 - (i) has openings not more than 100 mm wide, and
 - (ii) can resist a concentrated load of 1.3 kN applied perpendicular at any point on the screen, without the deflection from this loading resulting in the breakage of the skylight glazing.

3.3.1.19. Tactile Walking Surface Indicators

- (1) Except as provided in Sentence (2), tactile attention indicators conforming to Article 3.8.3.18., shall be installed
- (a) at the top of *flights* of stairs that are unenclosed, and
 - (b) at drop-off edges with a change in elevation greater than 300 mm that are unprotected by a *guard*.
- (See Note A-3.3.1.19.(1))

(2) Sentence (1) does not apply to *service spaces*, bleachers addressed in Subsection 3.3.2., *stages*, loading docks, *industrial occupancies*, within *dwelling units*, and to stairs and drop-off edges serving not more than two *dwelling units*.

3.3.1.20. Transparent Doors and Panels

- (1) Except for *dwelling units* and as permitted by Sentence (5), a glass or transparent door shall be designed and constructed so that the existence and position of the door is readily apparent, by attaching visually contrasting hardware, bars or other permanent fixtures to it.
- (2) Fully glazed transparent doors, and fully glazed transparent sidelights and panels with widths greater than 300 mm, shall be marked in conformance with Sentence 3.8.3.3.(15).
- (3) A glass door shall be constructed of
 - (a) laminated or tempered safety glazing conforming to CAN/CGSB-12.1, “Safety Glazing,” or
 - (b) wired glass conforming to CAN/CGSB-12.11-M, “Wired Safety Glass.”
- (4) Except as permitted by Sentence (5), transparent panels used in an *access to exit* that, because of their physical configuration or design, could be mistaken as a *means of egress* shall be made inaccessible by barriers or railings.
- (5) Sliding glass *partitions* that separate a *public corridor* from an adjacent *occupancy* and that are open during normal working hours need not conform to Sentences (1) and (4), provided the *partitions* are suitably marked in conformance with Sentence (2) to indicate their existence and position.
- (6) Glass in a vision panel in a door or in a transparent sidelight shall conform to Sentence 3.8.3.3.(14).
- (7) Glass in doors and glass sidelights that could be mistaken for doors, within or at the entrances to *dwelling units* and in public areas, shall conform to the requirements of Article 9.6.1.4.
- (8) A window in a public area that extends to less than 1 000 mm above the floor and is located above the second *storey* in a *building of residential occupancy*, shall be protected by a barrier or railing from the floor to not less than 1 070 mm above the floor, or the window shall be non-openable and designed to withstand the lateral design loads for balcony *guards* required by Article 4.1.5.14.

3.3.1.21. Exhaust Ventilation and Explosion Venting

- (1) Except as provided in Sentence (2), an exhaust ventilation system designed in conformance with the appropriate requirements of Part 6 shall be provided in a *building* or part of a *building* in which dust, fumes, gases, vapour or other impurities or contaminants have the potential to create a fire or explosion hazard. (See also Article 4.2.4.13.)
- (2) Where a *fire separation* required to have a *fire-resistance rating* is penetrated by a ventilation system required by Sentence (1) for power-ventilated enclosures in laboratories, the ducts shall be
 - (a) continuously enclosed from the first penetrated *fire separation* to any subsequent *fire separations* or concealed spaces and all the way through to the outdoors so that the highest *fire-resistance rating* of all the penetrated *fire separations* is maintained, and
 - (b) exempted from the requirement to be equipped with a *fire damper*, smoke damper and combination smoke/*fire damper* as stated in Article 3.1.8.7.
- (3) Explosion relief devices, vents or other protective measures conforming to Subsection 6.3.1. and Article 6.9.1.2. shall be provided for a space in which substances or conditions that have the potential to create an explosion hazard are present as a result of the principal use of a *building*.

3.3.1.22. Janitors' Rooms

- (1) Except as permitted by Sentences (2) and (3), a room or space within a *floor area* for the storage of janitorial supplies shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
- (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) The *fire separation* required by Sentence (1) is not required to have a *fire-resistance rating* if the *floor area* in which the room or space is located is *sprinklered* throughout.

3.3.1.23. Common Laundry Rooms

- (1) Except as permitted by Sentences (2) and (3), in a *building of residential occupancy*, a laundry room in a *floor area* that is not within a *dwelling unit* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
- (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) The *fire separation* required by Sentence (1) is not required to have a *fire-resistance rating* if the *floor area* in which the laundry room is located is *sprinklered* throughout.

3.3.1.24. Obstructions

- (1) No obstruction shall be permitted in any *occupancy* that would restrict the width of a normal *means of egress* from any part of a *floor area* to less than 750 mm unless an alternative *means of egress* is provided adjacent to, accessible from, and plainly visible from the obstructed *means of egress*. (See Note A-3.3.1.24.(1))

3.3.1.25. Signs in Service Spaces

- (1) Illuminated signs conforming to Sentence 3.4.5.1.(2) and (6) shall be provided to indicate the direction to egress points in a *service space* referred to in Sentence 3.2.1.1.(8).

3.3.1.26. Welding and Cutting

- (1) Except as provided in Sentence (2), welding and cutting operations shall be carried out in a room
- (a) separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h, or
 - (b) protected by an automatic fire extinguishing system.
- (2) Sentence (1) shall not apply to *industrial occupancies* where the welding and cutting operations do not present a fire or explosion hazard to adjacent areas.

3.3.2. Assembly Occupancy

3.3.2.1. Scope

- (1) This Subsection applies to *assembly occupancies* and to outdoor places of assembly.

3.3.2.2. Fire Separations

- (1) Except as permitted by Sentence (2), the seating area of a Group A, Division 1 *occupancy* shall be separated from adjacent *occupancies* in the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 1 h if the *occupant load* in the seating area exceeds 200.
- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
 - (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) If usable space exists under tiers of seats in arena-type *buildings*, a *fire separation* with a *fire-resistance rating* not less than 45 min shall be provided between the space and the seats or the space shall be *sprinklered*.
- (4) Except as required in Sentences (5) to (7), in an elementary or secondary school, a *hazardous classroom* shall be separated from the remainder of the *building* by a *fire-separation* having a *fire-resistance rating* not less than
 - (a) 1 h where the *building* is not *sprinklered*, or
 - (b) 30 min where the *building* is *sprinklered* throughout.
- (5) Except as provided in Sentence (6), in an elementary or secondary school, a *hazardous classroom* containing an auto repair shop shall be separated from the remainder of the *building* by a *fire-separation* having a *fire-resistance rating* not less than
 - (a) 2 h where the *building* is not *sprinklered*, or
 - (b) 1 h where the *building* is *sprinklered* throughout.
- (6) In an elementary or secondary school, if there is a group of *hazardous classrooms* or a group of *hazardous classrooms* and ancillary rooms of a complementary use, the *fire separation* required by Sentence (4) or (5) need not be provided within the group but the *fire separation* is required between the group and the remainder of the *building*.
- (7) In an elementary or secondary school, a *hazardous classroom* containing a spray painting operation shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than
 - (a) 2 h, or
 - (b) 1 h where the spray painting operation is separated from the classroom by a *fire-separation* having a *fire-resistance rating* not less than 1 h.
- (8) Except as required in Sentence (9), in an elementary or secondary school, where the *occupant load* of a room exceeds 200 persons, the room and any ancillary rooms of a complementary use shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than
 - (a) 1 h where the *building* is not *sprinklered*, or
 - (b) 30 min where the *building* is *sprinklered* throughout.
- (9) A kitchen shall not be located within the *fire compartment* required in Sentence (8).

3.3.2.3. Reserved

3.3.2.4. Fixed Seats

- (1) Except for the requirements of Article 3.3.2.8. for bench-type seats and except as required or permitted by Sentence (2) and Articles 3.3.2.11. and 3.3.2.12., fixed seats in places of assembly shall be
 - (a) attached or secured to the floor, platform or platform riser,
 - (b) provided with arms and back, and
 - (c) arranged in rows having an unobstructed passage not less than 400 mm wide measured horizontally between plumb lines from the backs of the seats in one row and the edges of the furthest forward projection of the seats in the next row in the unoccupied position.

(2) For fixed seats with backs and with folding tablet arms, the value of 400 mm required by Clause (1)(c) shall be measured when the tablet arms are in the use position, but is permitted to be measured in the stored position provided

- (a) there are not more than 7 seats between any seat and the nearest aisle,
 - (b) the seats are located in a lecture hall or an auditorium used for instructional purposes, and
 - (c) the tablet arm, when raised manually to a vertical position, falls by the force of gravity to the stored position.
- (See Note A-3.3.2.4.(2))

(3) Except as permitted by Sentences (4) and (5), aisles shall be located so that there are not more than 7 seats with backs or 20 seats without backs between any seat and the nearest aisle.

(4) The requirements of Sentence (3) do not apply if

- (a) egress doorways are provided to serve both ends of rows of seats,
- (b) each doorway referred to in Clause (a) serves not more than 3 rows of seats, and
- (c) each row contains not more than 100 seats.

(5) The requirements of Sentence (3) do not apply if

- (a) there are not more than 7 seats between any seat and the nearest aisle, where the seats are served by a single aisle,
- (b) there are not more than 20 seats between any seat and the nearest aisle, where the seats are served by two aisles,
- (c) each row has an unobstructed passage with minimum width of 400 mm plus 6.1 mm for each additional seat above 16 seats in the row, and
- (d) the travel distance is not more than 45 m measured along the path of travel from any seat to an *exit* or to an egress doorway.

(6) Seating arrangements that do not conform to the requirements of Sentences (3) to (5) are permitted provided the standard of safety is not reduced and the time required for egress is not increased.

3.3.2.5. Aisles

(1) Except as required by Articles, 3.3.2.11. and 3.3.2.12., aisles leading to egress doors or *exits* shall be provided in conformance with Sentences (2) to (27) in places of assembly that contain fixed seats.

(2) In this Subsection, a converging aisle is an aisle into which the occupants of two or more aisles converge in travelling to an *exit*.

(3) An aisle shall terminate at

- (a) a converging aisle,
- (b) an egress doorway from the seating area, or
- (c) an *exit* from the seating area.

(4) A converging aisle shall terminate at

- (a) an egress doorway from the seating area, or
- (b) an *exit* from the seating area.

(5) The minimum clear width of aisles shall be not less than 1 100 mm, except that the width is permitted to be reduced to not less than

- (a) 750 mm if serving not more than 60 seats, and
- (b) 900 mm if serving seats on one side only.

(6) The minimum clear width of each aisle shall be measured at the point in the aisle furthest from

- (a) an egress doorway referred to in Clause (15)(a),
- (b) an *exit* referred to in Clause (15)(b), or
- (c) an *exit* referred to in Sentence (16).

- (7) Except for an aisle serving bleacher seats, where rows of seats discharge into an aisle, the minimum clear width required by Sentence (5) shall be increased by 25 mm for each metre of length of the aisle measured in the direction towards an *exit*.
- (8) The width of a converging aisle shall be not less than the required width of the widest aisle plus 50% of the total required width of the remaining aisles that it serves.
- (9) If rows of seats discharge directly into the converging aisle, the width required by Sentence (8) shall be increased by 25 mm for each metre of length of the aisle where the rows of seats discharge into the aisle.
- (10) The width of an egress doorway or an *exit* leading directly from the seating area shall be not less than the required width of the widest aisle or converging aisle plus 50% of the total required width of the remaining aisles and converging aisles that it serves.
- (11) The requirements in Sentences (5) to (10) and (17) do not apply if
- the minimum clear width of an aisle is in accordance with Article 3.3.1.17., but is not less than 900 mm if serving seats on one side only,
 - the minimum clear width of an aisle is in accordance with Article 3.3.1.17., but is not less than 1 200 mm if serving seats on both sides,
 - the minimum clear width of a converging aisle is in accordance with Article 3.3.1.17., but not less than the width of the widest aisle leading to the converging aisle,
 - the minimum clear width of an *exit* leading directly from the seating area is in accordance with Article 3.4.3.2.,
 - except as provided in Clause (f), the minimum clear width of an egress doorway leading directly from the seating area is in accordance with Article 3.3.1.17., but not less than the required width of the aisle or the converging aisle leading to the doorway, and
 - if more than one vomitory is provided
 - the minimum total clear width of the egress doorways leading from one vomitory is not less than the required width of the aisle or the converging aisle leading to the doorways, and
 - the minimum clear width of egress doorways from additional vomitories is in accordance with Article 3.3.1.17.
- (12) Except as provided in Sentences (13) and (14), dead-end aisles shall be not more than 6 m long.
- (13) Dead-end aisles are permitted to be more than 6 m long, but not more than 10 m long if
- the seating area is separated from other seating areas and adjacent *occupancies*, including a corridor serving any seating area, by a *fire separation* in accordance with Sentences 3.3.2.2.(1) and (2),
 - the travel distance is not more than 25 m measured along the path of travel from any seat to an *exit*, to an egress doorway or to an opening into a vomitory,
 - at least one *means of egress*, comprising not less than 30 percent of the required *exit* capacity, is through an exterior *exit*, an *exit* stairway or a corridor not containing an *occupancy*,
 - each row served by the dead-end aisle has a minimum unobstructed width of 400 mm plus 6.1 mm for each additional seat above seven seats in a row, but not more than 550 mm,
 - the minimum ceiling height above the seating area is 3 m,
 - the activation of a *fire detector* or a sprinkler head in the seating area will
 - cause the shutdown of the projection system serving the seating area, and
 - turn on the normal lighting in the seating area, and
 - the *floor area* is *sprinklered*.
- (14) Dead-end aisles are permitted to be more than 10 m long, but not more than 13 m long if
- the seating area is separated from other seating areas and adjacent *occupancies*, including a corridor serving any seating area, by a *fire separation* in accordance with Sentences 3.3.2.2.(1) and (2),
 - the travel distance is not more than 25 m measured along the path of travel from any seat to an *exit*, to an egress doorway or to an opening into a vomitory,
 - at least one *means of egress*, comprising not less than 30 percent of the required *exit* capacity, is through an exterior *exit*, an *exit* stairway or a corridor not containing an *occupancy*,

- (d) each row served by a dead-end aisle has a minimum unobstructed width of 400 mm plus 6.1 mm for each additional seat above seven seats in a row, but not more than 550 mm,
 - (e) the activation of a *fire detector* or a sprinkler head in the seating area will
 - (i) cause the shutdown of the projection system serving the seating area, and
 - (ii) turn on the normal lighting in the seating area,
 - (f) a voice communication system is installed in conformance with Article 3.2.4.22.,
 - (g) a smoke control system is installed to control movement of smoke in the seating area or a smoke exhaust system is provided so that, in the event of detection of smoke by a *smoke detector* in the seating area, air handling equipment is activated to extract air directly from the seating area at the rate of at least six air changes per hour, and
 - (h) the *floor area* is *sprinklered*.
- (15) Where a seating area is separated as required by Sentences 3.3.2.2.(1) and (2) or 3.3.2.2.(8), the length of travel by any aisle shall be not more than 45 m measured from the most remote point of the aisle to
- (a) an egress doorway in the required separation, or
 - (b) an *exit* leading directly from the seating area.
- (16) Where a seating area is not required to be separated by Sentences 3.3.2.2.(1) and (2) or 3.3.2.2.(8), the travel distance shall be not more than 45 m measured from the most remote point of the aisle to an *exit*.
- (17) Side aisles shall be not less than 1 100 mm wide if seating is provided in conformance with Sentence 3.3.2.3.(4).
- (18) An aisle that has a slope not more than 1 in 8 shall not be stepped.
- (19) An aisle that slopes more than 1 in 8 shall be stepped.
- (20) The passageway between rows of seats served by a stepped aisle shall be level at right angles to the line of travel.
- (21) The riser of a step in an aisle shall be
- (a) not less than 110 mm high, and
 - (b) not more than 200 mm high.
- (22) Variations are permitted in riser height provided
- (a) the height of adjacent risers does not vary by more than 6 mm, and
 - (b) the depth of a tread or a platform in the direction of travel is not less than 430 mm.
- (23) Steps in an aisle shall
- (a) have a *run* not less than 230 mm exclusive of nosings,
 - (b) have a tread depth not less than 250 mm,
 - (c) extend to the adjacent rows of seats in a manner that will not create a hazard from tripping, and
 - (d) have a finish on the treads conforming to Sentence 3.4.6.1.(1).
- (24) The location of every riser in an aisle shall be made apparent from both directions of travel by strategically placed lighting or contrasting marking stripes.
- (25) A platform in an aisle shall be level, except that a slope not more than 1 in 50 is permitted for a platform that is not less than 430 mm deep in the direction of *exit* travel.
- (26) If a step is used at the entry to a row of seats from a stepped aisle, an unobstructed platform not less than 800 mm square shall be provided adjacent to the aisle.
- (27) The finish of the surface of a platform in or adjacent to a stepped aisle shall conform to Sentence 3.4.6.1.(1).

3.3.2.6. Corridors

- (1) Except as permitted by Sentences (2) to (4), a corridor used by the public in an *assembly occupancy* as an *access to exit* shall be separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
 - (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) The *fire-resistance rating* required by Sentence (1) is permitted to be waived if the *floor area* in which the corridor is located is *sprinklered* throughout.
- (4) The requirement for a *fire separation* stated in Sentence (1) is permitted to be waived if the distance from any point in the *floor area* to an *exit* measured along the path of travel to the *exit* does not exceed the travel distance permitted by Article 3.4.2.5.

3.3.2.7. Doors

- (1) A door equipped with a latching mechanism in an *access to exit* from a room or *suite of assembly occupancy* containing an *occupant load* more than 100 shall be equipped with a device that complies with Sentence 3.4.6.16.(3).

3.3.2.8. Fixed Bench-Type Seats Without Arms

- (1) If fixed bench-type seats without arms are provided, the seat width per person shall be assumed to be 450 mm.
- (2) The centre-to-centre spacing between rows of bench-type seats shall be not less than 760 mm if back rests are provided, and not less than 550 mm if back rests are not provided.
- (3) A clear space of not less than 300 mm shall be provided between the back of each seat and the front of the seat immediately behind it.

3.3.2.9. Guards

- (1) Except as required by Sentences (2) to (4) for bleacher seats, *guards* shall be installed in outdoor and indoor places of assembly with fixed seats so that
 - (a) at the fascia of every box, balcony or gallery where the seats extend to the edge, the height of *guards* is not less than
 - (i) 760 mm in front of the seats, and
 - (ii) 920 mm if located at the end of aisles or at the foot of steps,
 - (b) the height of *guards* along every cross aisle other than those adjacent to the fascia of every box, balcony or gallery is not less than 660 mm, except that *guards* need not be provided if the backs of the seats along the front side of the aisle are not less than 600 mm above the floor of the aisle, and
 - (c) where the seating is arranged in successive tiers and the height of rise between platforms is more than 450 mm, the height of *guards* is not less than 660 mm along the entire row of seats at the edge of the platform.
- (2) The backs and ends of bleacher seats more than 1 200 mm above the ground or floor that are not adjacent to a wall shall be protected with a *guard*
 - (a) not less than 1 070 mm high above an adjacent aisle surface or foot rest, and
 - (b) not less than 920 mm high above the centre of an adjacent seat board.
- (3) If the front of a bleacher is more than 600 mm above the ground or floor, it shall be protected with a *guard* not less than 840 mm high above the front foot rest.

(4) The size of any opening in a *guard* required by Sentences (2) and (3) shall not allow the passage of a sphere whose diameter is more than 300 mm.

3.3.2.10. Handrails in Aisles with Steps (See Note A-3.3.2.10.)

- (1) Handrails shall be provided in aisles with steps in conformance with Table 3.3.2.10.
- (2) Handrails installed along aisle centre lines as required by Table 3.3.2.10. shall
 - (a) comply with Sentences 3.4.6.5.(5) to (7) and (14),
 - (b) have gaps not less than 560 mm and not more than 915 mm wide, measured horizontally, at intervals not exceeding five rows,
 - (c) comply with Sentence 3.4.6.5.(11) at terminations and required gaps, and
 - (d) have an intermediate rail located 305 mm below the principal handrail.

Table 3.3.2.10.
Types and Location of Handrails in Aisles with Steps
Forming Part of Sentences 3.3.2.10.(1) and (2)

Aisle Width	Aisle Serving Seating on One Side	Aisle Serving Seating on Both Sides
	Handrail Requirements	
Less than 1 100 mm	A continuous handrail located on the side of the aisle opposite the seats that conforms to Sentences 3.4.6.5.(5) to (8), (11), (13) and (14).	A handrail located on one side at the end of each row of seats that conforms to Sentences 3.4.6.5.(5) to (8), (11), (13) and (14).
1 100 mm or more	A centre line handrail that conforms to Sentence (2), or A continuous handrail located on the side of the aisle opposite the seats that conforms to Sentences 3.4.6.5.(5) to (8), (11), (13) and (14), plus a handrail located at the end of each row of seats that conforms to Sentences 3.4.6.5.(5) to (8), (11), (13) and (14).	A centre line handrail that conforms to Sentence (2).

3.3.2.11. Outdoor Places of Assembly

- (1) A Group A, Division 4 *occupancy* and each tier or balcony that has a capacity of more than
 - (a) 1 000 persons shall have no fewer than three separate *exits*, or
 - (b) 4 000 persons shall have no fewer than four separate *exits*.
- (2) In a Group A, Division 4 *occupancy*, every seat shall be located so that the travel distance is not more than 45 m measured along the path of travel from the seat to
 - (a) the ground,
 - (b) an *exit*,
 - (c) an opening to a passageway leading from the seating area, or
 - (d) a portal, a vomitory or any other opening through the seating deck structure.
- (3) *Exits* from outdoor stadia or grandstands shall be located not more than 25 m apart.
- (4) The capacity of a *means of egress* for a Group A, Division 4 *occupancy* shall conform to the requirements of Sentence 3.4.3.2.(3).
- (5) Aisles in a Group A, Division 4 *occupancy* shall
 - (a) be located so that there are not more than 20 seats between any seat and the nearest aisle, and
 - (b) be not less than 1 200 mm wide, except that an aisle serving less than 60 persons is permitted to be 750 mm wide.

3.3.2.12. Bleachers

- (1) Steps provided in aisles of bleachers of the telescopic type shall
 - (a) have risers not more than 250 mm high, and
 - (b) have treads with a *run* not less than 280 mm.
- (2) If the vertical distance between seating platforms in bleachers is more than 280 mm, an intermediate step shall be provided the full width of the aisle and proportioned to provide 2 equal risers between platforms.
- (3) If the vertical distance between seating platforms in bleachers is more than 450 mm, 2 intermediate steps shall be provided the full width of the aisle so that there are 3 equal risers between platforms.
- (4) If the passageway between rows of seats is not a closed deck, footboards shall be provided so that
 - (a) the total width of the footboards shall be not less than three-quarters of the centre-to-centre spacing between rows of seats, and
 - (b) the spacing between footboard members shall be not more than 25 mm.
- (5) Openings above footboards and below the seats in rows of bleacher seats shall be provided with intermediate construction so that there is no opening that would permit the passage of a sphere of more than 100 mm in diameter.

3.3.2.13. Libraries

- (1) Except as permitted by Sentence (2), a library book storage room that is not normally accessible to the public shall be separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 2 h if it
 - (a) is more than 250 m² in area, or
 - (b) contains book stacks that
 - (i) are more than 10 m high, or
 - (ii) penetrate more than one floor assembly.
- (2) The *fire separation* required by Sentence (1) is not required if the book storage room is *sprinklered*.
- (3) Open book shelves are permitted above and below a *mezzanine* floor in a library *building* provided the height of the shelves is not more than 2.1 m but not more than 75% of the floor-to-ceiling height of the space above or below the *mezzanine* floor assembly.

3.3.2.14. Stages for Theatrical Performances

- (1) A *stage* for theatrical performances and ancillary spaces, including workshops, dressing rooms and storage areas, shall be *sprinklered*.
- (2) A *fire separation* with a *fire-resistance rating* not less than 1 h shall be provided between a *stage* for theatrical performances and ancillary spaces, including workshops, dressing rooms and storage areas.
- (3) Except as permitted by Sentence (6), a *stage* for theatrical performances and ancillary spaces, including workshops, dressing rooms and storage areas, shall be separated from the seating area by a *fire separation* having a *fire-resistance rating* not less than 1 h, except for a proscenium opening protected with
 - (a) a sprinkler deluge system conforming to the requirements of NFPA 13 “Standard for the Installation of Sprinkler Systems,”
 - (b) an unframed fire curtain if the opening is not more than 20 m wide, or
 - (c) a semi-rigid fire curtain if the opening is more than 20 m wide.
- (4) A fire curtain required by Sentence (3) shall be of a type acceptable to the *principal authority* and designed to close
 - (a) automatically upon the actuation of the sprinkler system,
 - (b) automatically upon actuation of the fire alarm system, and
 - (c) manually by remote control devices located at the curtain control panel and at each side of the *stage*.

(5) At least 2 vents for the purpose of venting fire and smoke to the outside of a *building* shall be provided above a *stage* designed for theatrical performances and shall

- (a) have an aggregate area not less than one-eighth of the area of the *stage* behind the proscenium opening, and
- (b) be arranged to open automatically upon actuation of the sprinkler system.

(6) The *fire separation* referred to in Sentence (3) is not required between a *stage* and a seating area in a *floor area* that is *sprinklered*, provided a sprinkler deluge system is installed at the boundary between the *stage* and the seating area.

3.3.2.15. Risers for Stairs

(1) In a Group A, Division 2 *occupancy* used for the serving of food and beverages, an interior *flight* of stairs with fewer than 3 risers is permitted provided it

- (a) is not less than 900 mm wide,
- (b) is illuminated at all times that occupants are on the premises, and
- (c) has a handrail on each side.

3.3.2.16. Storage Rooms

(1) A room intended for the storage of *flammable liquids* or *combustible liquids* required by the Fire Code made under the *Fire Protection and Prevention Act, 1997* shall not be located above or below the *first storey* of the *building*.

3.3.2.17. Safety Glazing

(1) Except as permitted in Sentence (3), glazing in all fixed and operable panels of doors shall conform to Class A of CAN/CGSB-12.1, "Safety Glazing."

(2) Except as permitted in Sentence (4), glazing in all fixed and operable panels of windows shall conform to Class A of CAN/CGSB-12.1, "Safety Glazing."

(3) Glazing in individual fixed or operable panels of a door need not comply with Sentence (1), where

- (a) the bottom exposed edge of the glazing is located more than 1 525 mm above the walking surface on each side of the door, or
- (b) the glazed opening in the door does not permit the passage of a sphere whose diameter is more than 75 mm.

(4) Glazing in individual fixed or operable panels of a window need not comply with Sentence (2), where

- (a) the bottom exposed edge of the glazing is located more than 1 525 mm above the walking surface on each side of the window, or
- (b) the glazing is located more than 915 mm away from the walking surface on each side of the window measured perpendicular to the plane of the glazing.

3.3.3. Care, Care and Treatment or Detention Occupancy

3.3.3.1. Scope

(1) This Subsection applies to *care occupancies*, *care and treatment occupancies* and *detention occupancies*. (See Note A-3.3.3.1.(1))

3.3.3.2. Fire Separations

(1) The *fire separation* required by Sentence 3.3.5.5.(1) between a *care*, *care and treatment* or *detention occupancy* and a *repair garage* shall have no openings.

- (2) Except as permitted by Sentence (4), in a Group B, Division 3 *occupancy*, walls between sleeping rooms and adjacent rooms shall be constructed as *fire separations* having a *fire-resistance rating* not less than 1 h, except that the *fire-resistance rating* need not be more than 45 min where the floor assembly is not required to be more than 45 min.
- (3) Except as permitted by Sentence (4), in a Group B, Division 3 *occupancy*, walls separating corridors serving sleeping rooms from adjacent rooms shall be constructed as *fire separations* having a *fire-resistance rating* not less than 1 h, except that the *fire-resistance rating* need not be more than 45 min where the floor assembly is not required to be more than 45 min.
- (4) The walls separating sleeping rooms from adjacent rooms and corridors in those parts of a *floor area* classified as a Group B, Division 3 *occupancy* shall be constructed as *fire separations* but are not required to have a *fire-resistance rating* if
- (a) those parts of the *floor area* contain sleeping accommodation for not more than 10 persons, and
 - (b) not more than 6 occupants require assistance in evacuation in case of an emergency.
- (5) The door in the *fire-separation* required in Sentence (4) is permitted to be equipped with a roller latch and need not be provided with a self-closing device.

3.3.3.3. Corridors

- (1) A corridor used by the public or serving patients or residents shall have no dead-end portion unless the area served by the dead-end portion has a second and separate *means of egress*.
- (2) A corridor serving patients in a hospital shall be not less than 2 400 mm wide.
- (3) Except as permitted in Sentence (5), a corridor serving residents who are not ambulatory in a Group B, Division 2 or 3 *occupancy* shall be not less than 1 650 mm wide.
- (4) Paired doors in a corridor serving patients or residents shall
- (a) swing in opposite directions, the right hand door swinging in the direction of travel, and
 - (b) be not less than 1 100 mm wide.
- (5) A corridor in a Group B, Division 3 *occupancy* that contains sleeping accommodation for not more than 10 persons and not more than 6 occupants require assistance in evacuation in case of an emergency need not comply with Sentence (3).

3.3.3.4. Doorway Width

- (1) In a Group B, Division 2 or 3 *occupancy*, the minimum clear width of doorways through which it is necessary to move a patient or resident in a bed shall be 1 050 mm. (See Note A-3.3.3.4.(1))

3.3.3.5. Hospitals and Long-Term Care Homes

- (1) *Floor areas* containing patients' or residents' sleeping rooms in a hospital or long-term care home shall conform to Sentences (2) to (12). (See Note 3.3.3.5.(1))
- (2) Except as permitted by Sentence (3), a *floor area* containing patients' or residents' sleeping rooms in a hospital or long-term care home shall be divided into no fewer than two *fire compartments*, each not more than 1 000 m² in area.
- (3) The *floor area* on either side of a *horizontal exit* conforming to Article 3.4.6.10. is permitted to be considered as a *fire compartment* in applying the requirements of this Article.
- (4) Except as permitted by Sentence (5), *fire separations* separating *fire compartments* required by Sentence (2) shall have a *fire-resistance rating* not less than 1 h.

- (5) The *fire-resistance rating* of a *fire separation* referred to in Sentence (4) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
- the floor assembly above the *floor area*, or
 - the floor assembly below the *floor area*, if there is no floor assembly above.
- (6) Reserved.
- (7) The travel distance from any point within each *fire compartment* referred to in Sentence (2) to a door to an adjoining *fire compartment* shall be not more than 45 m.
- (8) Each *fire compartment* referred to in Sentence (2) shall be capable of accommodating, in addition to its own occupants, the occupants of the largest adjacent *fire compartment* based on a clear floor space of 2.5 m² per patient or resident in the adjacent *fire compartment*.
- (9) Except as permitted by Sentences (10) and (11), walls between patients' or residents' sleeping rooms and the remainder of the *floor area* shall be constructed as *fire separations* but are not required to have a *fire-resistance rating* unless a *fire-resistance rating* is required by other provisions in this Part.
- (10) The *fire separation* requirements of Sentence (9) do not apply to walls within a group of intercommunicating patients' or residents' rooms, provided the group of rooms does not
- contain more than 5 patients or residents, or
 - include storage, bathing or toilet facilities serving persons not occupying the group of rooms.
- (See Note A-3.3.3.5.(10))
- (11) A door in a *fire separation* required by Sentence (9) is permitted to be equipped with a roller latch.
- (12) A *fire separation* required by Sentence (9) shall not contain any grilles, louvres or other openings.

3.3.3.6. Protection for Special Care and Treatment Facilities

- (1) Compartments containing rooms such as operating rooms, recovery rooms, delivery rooms, intensive care units and critical care units, from which it is impracticable to move patients in an emergency, shall be
- separated from adjacent spaces by *fire separations* having a *fire-resistance rating* not less than 1 h, and
 - provided with a mechanical air supply so that during a period of 2 h after the start of a fire in another space, the compartments will not contain more than 1% by volume of contaminated air from the fire area.

3.3.3.7. Contained Use Areas

- (1) A *contained use area* shall conform to Sentences (2) to (5).
- (2) A *contained use area* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (3) Except as permitted by Sentence (4), a *building* that includes a *contained use area* shall be *sprinklered* throughout.
- ri (4) A *contained use area*, in a *building* for which Articles 3.2.2.20. to 3.2.2.93. do not require the installation of an automatic sprinkler system, is not required to be *sprinklered* as required by Sentence (3) provided
- the *building* is designed so that during a period of 2 h after the start of a fire in the *contained use area*, other *fire compartments* will not contain more than 1% by volume of contaminated air from the *contained use area*,
 - the *building* is designed so that during a period of 2 h after the start of a fire in another part of the *building*, the *contained use area* will not contain more than 1% by volume of contaminated air from the other part of the *building*,
 - all doors are designed to be remotely released in conformance with Sentence 3.3.1.13.(6), and
 - the *contained use area* does not contain any rooms lined with *combustible padding*.

(5) A corridor serving a *contained use area* shall have no dead-end portion unless the area served by the dead-end portion has a second and separate *means of egress*.

3.3.3.8. Handrails

(1) Corridors and *ramps* used by residents in a long-term care home shall be equipped with handrails on each side conforming to Sentences 3.4.6.5.(5) to (7) and (11) to (13).

3.3.4. Residential Occupancy

3.3.4.1. Scope

(1) This Subsection applies to *residential occupancies*.

3.3.4.2. Fire Separations

- (1) Except as permitted by Sentences (2) and 3.2.2.9.(2), *suites of residential occupancy* shall be separated from each other and the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (2) The *fire-resistance rating* of the *fire separation* required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
- (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (3) Floor assemblies within a *dwelling unit* need not be constructed as *fire separations* provided
- (a) the distance between the lowest floor level and the uppermost floor level within the *dwelling unit* is not more than 6 m, and
 - (b) the *dwelling unit* is separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than
 - (i) 1 h if the *building* is not *sprinklered* throughout,
 - (ii) 45 min if the *building* is *sprinklered* throughout and it is not more than 3 *storeys* in *building height*, or
 - (iii) 1 h if the *building* is *sprinklered* throughout and it is more than 3 *storeys* in *building height*.
- (4) Except in a *retirement home*, the *fire-resistance rating* of the *fire separation* located between a *dwelling unit* and an attached *storage garage* need not conform to that required by Sentence 3.3.5.6.(1) provided
- (0.a) the *storage garage* contains not more than five vehicles,
 - (a) the *dwelling unit* and the attached *storage garage* are *sprinklered*,
 - (b) the *dwelling unit* is separated from the remainder of the *building* in conformance with Sentences (1) to (3),
 - (c) there are no air duct systems connecting the *storage garage* and the *dwelling unit*,
 - (d) the construction between the *storage garage* and the *dwelling unit* provides an effective barrier to gas and exhaust fumes, and
 - (e) every door between the *storage garage* and the *dwelling unit* is
 - (i) tight fitting and weather-stripped to provide an effective barrier against the passage of gas and exhaust fumes,
 - (ii) fitted with a self-closing device, and
 - (iii) not located in a room intended for sleeping.
- (5) Except in a *retirement home*, the *fire separation* required by Sentence 3.3.5.6.(1) is not required between a *dwelling unit* and an attached *storage garage*, serving that *dwelling unit* only, provided
- (a) the *dwelling unit* and its attached *storage garage* are separated from the remainder of the *building* in conformance with Sentences (1) to (3),
 - (b) there are no air duct systems connecting the *storage garage* and the *dwelling unit*,
 - (c) the construction between the *storage garage* and the *dwelling unit* provides an effective barrier to gas and exhaust fumes, and

- (d) every door between the *storage garage* and the *dwelling unit* is
 - (i) tight fitting and weather-stripped to provide an effective barrier against the passage of gas and exhaust fumes,
 - (ii) fitted with a self-closing device, and
 - (iii) not located in a room intended for sleeping.

3.3.4.3. Storage Rooms

- (1) Sprinklers shall be installed in a storage room provided for the use of tenants in a *residential occupancy* within a *floor area* but not contained within a *suite*.
- (2) Except as permitted by Sentence (3), a storage room referred to in Sentence (1) shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (3) The *fire-resistance rating* of the *fire separation* required by Sentence (2) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
 - (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (4) Except where located within a *dwelling unit*, a room intended for the storage of *flammable liquids* or *combustible liquids* required by the Fire Code made under the *Fire Protection and Prevention Act, 1997* shall not be located above or below the *first storey* of the *building*.

3.3.4.4. Egress from Dwelling Units

- (1) Except as required by Sentence (8), single *storey dwelling units* in an apartment *building* need not lead to a *public corridor* or exterior passageway on the same *storey* provided the *dwelling units* are served by private stairways leading directly to a *public access to exit* on the *storey*
 - (a) immediately above, and
 - (b) immediately below.
 (See Note A-3.3.4.4.(1))
- (2) Except as required by Sentence (8) and as permitted by Sentences (3) and (4), a *dwelling unit* containing more than one *storey* shall have an *exit* door or an egress door opening directly into a *public access to exit* from the uppermost *storey* and from the lowest *storey* of the *dwelling unit* so that each of these *storeys* is served by an *exit* or egress door located not more than 1.5 m above or below its floor level.
- (3) A single *exit* is permitted from a *dwelling unit* provided the *exit* is an exterior doorway not more than 1.5 m above adjacent ground level and
 - (a) it is not necessary to travel up or down more than one *storey* to reach the *exit* door, or
 - (b) the uppermost floor level opens to a balcony not more than 6 m above adjacent ground level.
- (4) An egress door from either the uppermost *storey* or the lowest *storey* in a *dwelling unit*, as required by Sentence (2), need not be provided
 - (a) except as required by Sentence (8), if that *storey* is served by a stairway that
 - (i) leads to a *public access to exit*,
 - (ii) has no direct access to any other *storey* in the *dwelling unit*, and
 - (iii) is separated from the other *storeys* in the *dwelling unit* by a *fire separation* having a *fire-resistance rating* of not less than 45 min,
 - (b) on the uppermost *storey* in the *dwelling unit* if the *dwelling unit* has not more than 2 *storeys* above the *first storey* of the *building*,
 - (c) if it is not necessary to travel either more than 18 m or more than 1 *storey* up or down within the *dwelling unit* to reach the egress door, or
 - (d) if that *storey* is
 - (i) provided with a balcony conforming to Sentence (7),
 - (ii) not more than 2 *storeys* above or below the *dwelling unit* egress door, and
 - (iii) in a *building* that is not more than 6 *storeys* in *building height*.

- (5) In a *building of residential occupancy* not more than 3 storeys in *building height*, a doorway from a *dwelling unit* is permitted to open directly into an *exit* stairway provided the *dwelling unit* has a second and separate *means of egress*.
- (6) If a *dwelling unit* has a second and separate *means of egress*, one *means of egress* from a *dwelling unit* is permitted to pass through
- (a) an interior corridor served by a single *exit*,
 - (b) an exterior balcony served by a single *exit* stairway, or
 - (c) an exterior passageway served by a single *exit* stairway.
- (7) Where a balcony is provided to meet the requirements of Sentence (3) or (4), the balcony shall have
- (a) a solid floor having a *fire-resistance rating* not less than that required for a floor assembly between *suites*, and
 - (b) an area providing not less than 1.5 m² per *suite* occupant, based on *occupant load*, and a minimum dimension of 1 200 mm.
- (8) Each *dwelling unit* in a *building* conforming to Subclause 3.2.2.50.(1)(a)(ii) shall be served by
- (a) a direct *exit* that is an exterior doorway located not more than 1.5 m above adjacent ground level, or
 - (b) a stairway that
 - (i) leads to an exterior doorway not more than 1.5 m above adjacent ground level,
 - (ii) has no access to another *dwelling unit*, and
 - (iii) is separated from the remainder of the *building* with a *fire separation* having a *fire-resistance rating* not less than 1 h.

3.3.4.5. Automatic Locking Prohibition

- (1) Except for *hotels*, a door opening onto a *public corridor* that provides *access to exit* from a *suite* shall be designed not to lock automatically. (See Note A-3.3.4.5.(1))

3.3.4.6. Sound Transmission

- (1) *Buildings* containing *dwelling units* shall be constructed so that airborne noise is controlled in conformance with Section 5.8.

3.3.4.7. Stairs, Ramps, Landings, Handrails and Guards for Dwelling Units

- (1) Except as required in Article 3.3.4.8., stairs, *ramps*, landings, handrails and interior *guards* within a *dwelling unit* shall conform to the applicable requirements in Section 9.8.
- (2) Except as provided in Sentence (3), exterior stairs, *ramps*, landings, handrails and *guards* serving a single *dwelling unit* shall conform to the applicable requirements in Sentence 3.1.21.1.(1) and Section 9.8.
- (3) Loads on exterior *guards* serving a *single dwelling unit* shall comply with Part 4.

3.3.4.8. Protection of Openable Windows

- (1) Except as provided in Sentence (2), openable windows in *suites of residential occupancy* shall be protected by
- (a) a *guard* with a minimum height of 1 070 mm constructed in accordance with Article 3.3.1.18., or
 - (b) a mechanism that can only be released with the use of tools or special knowledge to control the free swinging or sliding operation of the openable part of the window so as to limit any clear unobstructed opening to not more than 100 mm measured either vertically or horizontally.
- (2) Windows need not be protected in accordance with Sentence (1) where
- (a) the only opening having greater dimensions than those allowed by Clause (1)(b) is located higher than 1 070 mm above the finished floor, or

- (b) the bottom edge of the openable portion of the window is located less than 1 800 mm above the floor or ground on the other side of the window.

3.3.4.9. Stud Wall Reinforcement

- (1) If wood wall studs or sheet steel wall studs enclose the main bathroom in a *dwelling unit*, reinforcement shall be installed to permit the future installation of the following:
 - (a) for a water closet, a grab bar described in Clauses 3.8.3.8.(3)(a) and a grab bar described in Clause 3.8.3.8.(3)(c),
 - (b) for a shower, grab bars described in Clause 3.8.3.13.(2)(g), and
 - (c) for a bathtub, grab bars described in Clause 3.8.3.13.(7)(e).(See Note A-3.3.4.9.(1))

3.3.4.10. Resistance to Forced Entry

- (1) Resistance to forced entry into *dwelling units* shall conform to the applicable requirements in Articles 9.7.5.2. and 9.7.5.3.

3.3.4.11. Retirement Homes

- (1) *Floor areas* containing residents' sleeping rooms in a *retirement home* shall conform to Sentences (2) to (12).
- (2) Except as permitted by Sentence (3), a *floor area* containing residents' sleeping rooms in a *retirement home* where sleeping accommodation is provided for more than 10 residents shall be divided into no fewer than 2 *fire compartments*, each not more than 1 000 m² in area.
- (3) The *floor area* on either side of a *horizontal exit* conforming to Article 3.4.6.10. is permitted to be considered as a *fire compartment* in applying the requirements of this Article.
- (4) Except as permitted by Sentence (5), *fire separations* separating *fire compartments* required by Sentence (2) shall have a *fire-resistance rating* not less than 1 h.
- (5) The *fire-resistance rating* of a *fire separation* referred to in Sentence (4) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for
 - (a) the floor assembly above the *floor area*, or
 - (b) the floor assembly below the *floor area*, if there is no floor assembly above.
- (6) A *closure* in a *fire separation* between *fire compartments* referred to in Sentence (2) shall be weather-stripped or otherwise designed and installed to retard the passage of smoke.
- (7) The travel distance from any point within each *fire compartment* referred to in Sentence (2) to a door to an adjoining *fire compartment* shall be not more than 45 m.
- (8) Each *fire compartment* referred to in Sentence (2) shall be capable of accommodating, in addition to its own occupants, the occupants of the largest adjacent *fire compartment* based on a clear floor space of 1.5 m² per resident in the adjacent *fire compartment*.
- (9) The *fire separation* required by Sentence 3.3.5.5.(1) between a *retirement home* and a *repair garage* shall have no openings.
- (10) In a *retirement home*, a dead-end *public corridor* is permitted provided it is not more than 3 m long.
- (11) The minimum clear width of doorways serving residents in a *retirement home* shall be 850 mm.
- (12) A voice communication system conforming to Article 3.2.4.22. shall be provided in a *retirement home*.

3.3.5. Industrial Occupancy

3.3.5.1. Scope

- (1) This Subsection applies to *industrial occupancies*.

3.3.5.2. Fire Extinguishing Systems

- (1) In addition to other requirements in this Division for the installation of automatic fire extinguishing systems, an appropriate fire extinguishing system shall be installed in every *industrial occupancy floor area* to provide protection if required by
 - (a) the Fire Code made under the *Fire Protection and Prevention Act, 1997*, or
 - (b) the CCBFC NRCC-CONST-56437E, “National Fire Code of Canada,” in the absence of provisions referred to in Clause (a).

3.3.5.3. Basements

- (1) A *basement* shall not be used for the storage, manufacture or handling of volatile solids, liquids or gases that generate explosive air-vapour mixtures or for processes that involve explosive dusts.
- (2) Entrances and *exits* to a *basement* and to rooms containing *building services* shall be separate from the remainder of the *building* in a *building* in which
 - (a) the storage, manufacture or handling of volatile materials can generate explosive air-vapour mixtures, or
 - (b) processes occur that produce explosive dusts.
- (3) *Basements* and rooms referred to in Sentence (2) shall be separated from the remainder of the *building* with a vapour-tight separation.

3.3.5.4. Repair and Storage Garages (See Note A-3.3.5.4.)

- (1) If access is provided from a *storage garage* to a stair tower or elevator serving *occupancies* above the level of the *storage garage*, the access shall be through a vestibule conforming to Sentence 3.3.5.7.(4).
- (2) Treads and landings in interior stairs that extend to the roof of a *storage garage* shall be designed to be free of accumulations of ice and snow.
- (3) A mechanical *storage garage* not more than 4 *storeys* in *building height*, in which no persons other than parking attendants are permitted above the *street* floor level, need not have a *fire separation* between the *exits* and the remainder of the *building*.
- (4) A *storage garage* or *repair garage* shall be provided with natural or mechanical ventilation in conformance with the requirements of Subsection 6.3.1. and Article 6.9.1.2. to prevent excessive accumulation of carbon monoxide, exhaust fumes or flammable and toxic vapours.
- (5) Except as required by Sentence 3.8.2.2.(2), the clear height in a *storage garage* shall be not less than 2 m.
- (6) Where *storage garage* or *repair garage* floors or *ramps* are 600 mm or more above the adjacent ground or floor level, every opening through such floors and the perimeter of such floors and *ramps* shall be provided with
 - (a) a continuous curb not less than 140 mm high, a *guard* not less than 1 070 mm high and a vehicle guardrail not less than 500 mm high conforming to Sentence (7), or
 - (b) a full-height wall conforming to Sentence (7).

(7) Vehicle guardrails and full-height walls required in Sentence (6) shall be designed and constructed to withstand the loading values specified in Sentence 4.1.5.15.(1).

(8) Except for *open-air storeys*, every *storey* of a *storage garage* or *repair garage* located below *grade* shall be *sprinklered*.

3.3.5.5. Repair Garage Separation

(1) A *repair garage* and any ancillary spaces serving it, including waiting rooms, reception rooms, tool and parts storage areas and supervisory office space, shall be separated from other *occupancies* by a *fire separation* having a *fire-resistance rating* not less than 2 h.

3.3.5.6. Storage Garage Separation

(1) Except as permitted by Sentences 3.3.4.2.(4) and (5), a *storage garage* shall be separated from other *occupancies* by a *fire separation* with a *fire-resistance rating* not less than 1.5 h.

3.3.5.7. Vestibules

(1) If access is provided through a *fire separation* between a *storage garage* and a Group A, Division 1 or Group B *occupancy* or a *retirement home*, the access shall be through a vestibule conforming to Sentence (4).

(2) Reserved.

(3) In a *building* more than 3 *storeys* in *building height*, access through a *fire separation* between a *storage garage* and a Group A, Division 2, 3 or 4, or a Group C *occupancy*, shall be through a vestibule conforming to Sentence (4).

(4) If access is provided through a vestibule, as required by Sentences (1), (3) and 3.3.5.4.(1), the vestibule shall

(a) be not less than 1.8 m long,

(b) be ventilated

(i) naturally to outside air by a vent that has an unobstructed area of not less than 0.1 m² for each door that opens into the vestibule but not less than 0.4 m², or

(ii) mechanically at a rate of 14 m³/h for each square metre of vestibule floor surface area, and

(c) have openings between the vestibule and an adjoining *occupancy* provided with self-closing doors with no hold-open devices.

3.3.5.8. Reserved

3.3.5.9. Reserved

3.3.5.10. Guards

(1) Except where they serve *storage garages*, *guards* in *industrial occupancies* are permitted to consist of

(a) a top rail, and

(b) one or more intermediate rails spaced such that the openings through the *guard* are of a size that prevents the passage of a spherical object whose diameter is 535 mm.

3.3.5.11. Toe-Boards Required

(1) Where tools or other objects could fall from the floor of an upper level to a lower level in a room or space intended for use as a Group F *occupancy*, the edge of the floor at the upper level shall be provided with a toe-board extending from the floor surface to a height at least 125 mm above the floor surface.

3.3.6. Design of Hazardous Areas

3.3.6.1. Application

- (1) This Subsection applies to design and fire protection requirements for *buildings* or parts of *buildings* intended for the storage, handling, use and processing of
- (a) *dangerous goods*,
 - (b) materials that involve a risk of explosion or high flammability, and
 - (c) materials that are highly reactive.
- (See Note A-3.3.6.1.(1))

3.3.6.2. Storage of Dangerous Goods

- (1) Solid and liquid *dangerous goods* classified as oxidizers or organic peroxides shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.
- (2) Reactive materials shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h. (See Note A-3.3.6.2.(2))
- (3) The design and *construction* of *buildings* or part of a *building* intended for the storage of *dangerous goods* classified as explosives shall conform to the *Explosives Act* (Canada) and the regulations made under that Act.

3.3.6.3. Indoor Storage of Compressed Gases

- (1) Except as provided by Sentence (3), where required by the Fire Code made under the *Fire Protection and Prevention Act, 1997*, a room intended for the indoor storage of cylinders containing flammable *compressed gases* shall meet the following requirements:
- (a) it is separated from the remainder of the *building* by a gas-tight *fire separation* having a *fire-resistance rating* of not less than 2 h,
 - (b) it is located on an exterior wall of the *building*,
 - (c) it can be entered from the exterior,
 - (d) it is ventilated in conformance with Sentence (4),
 - (e) it is constructed so that an exterior wall provides explosion venting
 - (i) in the ratio of 0.2 m² for each cubic metre of room volume, or
 - (ii) in the ratio computed in accordance with NFPA 68, “Standard on Explosion Protection by Deflagration Venting,” but in no case less than 0.065 m² of vent area for each cubic metre of room volume,
 - (f) it is not intended to contain fuel-fired equipment or high temperature heating elements, and
 - (g) it is not intended to be used for a purpose other than the storage of *compressed gas*.
- (2) Where a *closure* is installed in the *fire separation* separating the room from the remainder of the *building* in accordance with Clause (1)(a), it shall be
- (a) equipped with a self-closing device that keeps the *closure* closed when not in use, and
 - (b) constructed so as to prevent the migration of gases from the room into other parts of the *building*.
- (3) Where required by the Fire Code made under the *Fire Protection and Prevention Act, 1997*, a room intended for the storage of not more than three cylinders of flammable *compressed gases* that are heavier than air and that have an aggregate capacity not exceeding 100 kg shall be
- (a) separated from the remainder of the *building* by a gas-tight *fire separation* having a *fire-resistance rating* of not less than 45 min,
 - (b) located at or above *grade*, and
 - (c) ventilated in conformance with Sentence (4).

- (4) A room described in Sentence (1) or (3) shall be
- (a) mechanically vented to the outside so as to ensure at least one air change per hour, or
 - (b) naturally vented to the outside so as to ensure cross ventilation through non-closable louvered openings with
 - (i) at least one opening having an aggregate free opening area of at least 0.2 m² per 100 m² of the *floor area* located not more than 300 mm from the ceiling, and
 - (ii) at least one opening having an aggregate free opening area of at least 0.2 m² per 100 m² of the *floor area* located not more than 300 mm from the floor.
- (5) Except as permitted by Sentences (6) and (7), where required by the Fire Code made under the *Fire Protection and Prevention Act, 1997*, an area intended for the storage of cylinders containing *compressed gases* that may react with one another shall be divided into separate *fire compartments* having a *fire-resistance rating* of not less than 1 h.
- (6) Separate *fire compartments* required by Sentence (5) need not be provided, if the area intended for the storage of cylinders containing *compressed gases* that are lighter than air is separated by a concrete or masonry wall having a height of at least 2.0 m and projecting at least 1.0 m, measured horizontally, beyond the cylinders.
- (7) Separate *fire compartments* required by Sentence (5) need not be provided, if the area intended for the storage of cylinders containing *compressed gases* that are heavier than air is separated by a concrete or masonry wall having a height of at least 1.5 m and projecting such that the minimum distance that vapour can travel between two cylinders of gas that may react with each other is not less than 15 m, measured horizontally.

3.3.6.4. Storage and Dispensing Rooms for Flammable Liquids and Combustible Liquids

- (1) A room intended for the storage of *flammable liquids* and *combustible liquids* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* in conformance with the Fire Code made under the *Fire Protection and Prevention Act, 1997*.
- (2) Except as provided by Sentences (3) and (4), a room intended for the storage or dispensing of Class IA or Class IB liquids in open containers shall be designed to prevent critical structural and mechanical damage from an internal explosion in accordance with good engineering practice, such as that described in NFPA 68, “Standard on Explosion Protection by Deflagration Venting.” (See Note A-3.3.6.4.(2))
- (3) Sentence (2) does not apply to a room intended for the storage of *distilled beverage alcohol*.
- (4) A room in an *occupancy* or facility covered by Regulation 851 of the Revised Regulations of Ontario, 1990 (Industrial Establishments), made under the *Occupational Health and Safety Act*, or Ontario Regulation 67/93 (Health Care and Residential Facilities), made under that Act, where Class IA liquids are intended to be stored in *closed containers* or Class I liquids are intended to be dispensed or stored in open containers, shall be designed to prevent critical structural and mechanical damage from an internal explosion in accordance with good engineering practice, such as that described in NFPA 68, “Standard on Explosion Protection by Deflagration Venting.”
- (5) A dispensing room in an *occupancy* or facility described in Sentence (4) which has an area greater than 15 m² or in which the travel distance from any point to the nearest egress door is more than 4.5 m shall
- (a) be located in a *floor area* that has at least two *exits*, and
 - (b) have at least two egress doors.
- (6) An egress door serving a room described in Sentence (5) shall
- (a) be equipped with a self-closing device, and
 - (b) swing on a vertical axis in the direction of travel to the *exit*.
- (7) The minimum distance between the egress doors described in Clause (5)(b) shall be not less than three-quarters of the maximum diagonal dimension of the room.

- (8) The travel distance within the room to the nearest egress door described in Clause (5)(b) shall be not more than 23 m.

3.3.6.5. Tire Storage

- (1) A tire storage area intended for the storage of more than 375 m³ of tires shall be separated from the remainder of the building by a fire separation having a fire-resistance rating of not less than 2 h. (See Note A-3.3.6.5.(1))

3.3.6.6. Ammonium Nitrate Storage

- (1) Where the Fire Code made under the *Fire Protection and Prevention Act, 1997* applies due to the quantity and nature of the stored product, a building intended for the storage of ammonium nitrate shall
- (a) be not more than one storey in building height,
 - (b) not contain a basement or a crawl space,
 - (c) not contain open floor drains, tunnels, elevator pits or other pockets that might trap molten ammonium nitrate,
 - (d) have noncombustible flooring materials in storage areas,
 - (e) be designed to prevent the ammonium nitrate from coming into contact with building materials that
 - (i) will cause the ammonium nitrate to become unstable,
 - (ii) may corrode or deteriorate by reason of contact with the ammonium nitrate, or
 - (iii) will become impregnated with the ammonium nitrate, and
 - (f) have not less than 0.007 m² of vent area for each square metre of storage area, unless mechanical ventilation is provided.
- (See Note A-3.3.6.6.(1))

3.3.6.7. Flooring Materials

- (1) Floors in areas where dangerous goods are stored shall be constructed of impermeable materials to prevent the absorption of chemicals.

3.3.6.8. Fire Separations in Process Plants

- (1) In process plants, areas where unstable liquids are handled or where small-scale unit chemical processes occur shall be separated from the remainder of the building by a fire separation having a fire-resistance rating of not less than 2 h.

3.3.6.9. Basements and Pits

- (1) Process plants where Class I and II flammable liquids and combustible liquids are handled shall not be constructed with basements or covered pits.

Section 3.4. Exits

3.4.1. General

3.4.1.1. Scope

- (1) Exit facilities complying with this Section shall be provided from every floor area that is intended for occupancy.

3.4.1.2. Separation of Exits

- (1) Except as permitted by Sentence (2), if more than one *exit* is required from a *floor area*, each *exit* shall be separate from every other *exit* leading from that *floor area*.
- (2) If more than 2 *exits* are provided from a *floor area*, *exits* are permitted to converge in conformance with Sentence 3.4.3.1.(2), provided the cumulative capacity of the converging *exits* does not contribute more than 50% of the total required *exit* width for the *floor area*.

3.4.1.3. Access to Exits

- (1) *Access to exits* shall conform to Section 3.3.

3.4.1.4. Types of Exit

- (1) Subject to the requirements of this Section, an *exit* from any *floor area* shall be one of the following, used singly or in combination:
 - (a) an exterior doorway,
 - (b) an exterior passageway,
 - (c) an exterior *ramp*,
 - (d) an exterior stairway,
 - (e) a fire escape (conforming to Subsection 3.4.7.),
 - (f) a *horizontal exit*,
 - (g) an interior passageway,
 - (h) an interior *ramp*, or
 - (i) an interior stairway.

3.4.1.5. Exterior Exit Passageways

- (1) Access to an exterior *exit* passageway from a *floor area* shall be through *exit* doors at the floor level.
- (2) Every exterior *exit* passageway that has a drop of more than 500 mm on any side shall have *guards* on the open sides not less than 1 070 mm high.

3.4.1.6. Restricted Use of Horizontal Exits

- (1) Except as permitted by Sentence (2), *horizontal exits* shall not comprise more than one-half of the required number of *exits* from any *floor area*.
- (2) In a hospital or long-term care home, *horizontal exits* serving patients' or residents' sleeping rooms shall comprise not more than two-thirds of the required number of *exits* from any *floor area*. (See Note A-3.4.1.6.(2))
- (3) Where an elementary or secondary school is subdivided by a *firewall*, a *horizontal exit* shall not serve as an *exit* but is permitted to serve as an *access to exit*.

3.4.1.7. Slide Escapes

- (1) A slide escape shall not be erected on any *building* as a required *exit*, but is permitted to be provided as an additional egress facility if unusual hazards are foreseen.

3.4.1.8. Transparent Doors and Panels

(1) Glass and transparent panels in an *exit* shall conform to the appropriate requirements of Article 3.3.1.20. for glass and transparent panels in an *access to exit*.

3.4.1.9. Mirrors Near Exits

(1) No mirror shall be placed in or adjacent to any *exit* in a manner that would confuse the direction of *exit*.

3.4.1.10. Combustible Glazing in Exits

(1) *Combustible* glazing is not permitted in wall or ceiling assemblies or in *closures* used to *construct* an *exit* enclosure.

3.4.1.11. Exterior Stairway for Long-Term Care Homes

(1) No open exterior stairway shall serve as a *means of egress* for residents above the second floor of a long-term care home.

3.4.2. Number and Location of Exits from Floor Areas**3.4.2.1. Minimum Number of Exits**

- (1) Except as permitted by Sentences (2) to (4), every *floor area* intended for *occupancy* shall be served by at least 2 *exits*.
- (2) A *floor area* in a *building* not more than 2 *storeys* in *building height*, is permitted to be served by one *exit* provided the total *occupant load* served by the *exit* is not more than 60, and
- (a) in a *floor area* that is not *sprinklered* throughout, the *floor area* and the travel distance are not more than the values in Table 3.4.2.1.-A, or
- (b) in a *floor area* that is *sprinklered* throughout,
- (i) the travel distance is not more than 25 m, and
 - (ii) the *floor area* is not more than the value in Table 3.4.2.1.-B.

Table 3.4.2.1.-A
Criteria for One Exit (Floor Area not Sprinklered Throughout)
 Forming Part of Sentence 3.4.2.1.(2)

Occupancy of Floor Area	Maximum Floor Area, m ²	Maximum Travel Distance, m
Group A	150	15
Group C	100	15
Group D	200	25
Group E	150	15
Group F, Division 2	150	10
Group F, Division 3	200	15

Table 3.4.2.1.-B
Criteria for One Exit (Floor Area Sprinklered Throughout)
 Forming Part of Sentence 3.4.2.1.(2)

<i>Occupancy of Floor Area</i>	<i>Maximum Floor Area, m²</i>
Group A	200
Group B	100
Group C	150
Group D	300
Group E	200
Group F, Division 2	200
Group F, Division 3	300

- (3) Except as permitted by Sentence (4), if Sentence (2) permits a single *exit* from a *floor area* classified as Group B or Group C *occupancy*, the *exit* shall be an exterior doorway not more than 1.5 m above adjacent ground level.
- (4) The requirements of Sentences (1) and (2) are permitted to be waived for *dwelling units* having *access to exit* conforming to Sentences 3.3.4.4.(1) to (4) and (8).
- (5) *Exits* are not required directly from rooftop enclosures that are provided with *access to exits* in conformance with Sentences 3.3.1.3.(5) and (6).

3.4.2.2. Means of Egress from Mezzanines

- (1) Except as permitted by Sentences (2) and (3), the space above a *mezzanine* shall be served by *means of egress* leading to *exits* accessible at the *mezzanine* level on the same basis as *floor areas*.
- (2) The *means of egress* from a *mezzanine* need not conform to Sentence (1), provided
- the *mezzanine* is not required to terminate at a vertical *fire separation*, as permitted in Sentence 3.2.8.2.(1),
 - the *occupant load* of the *mezzanine* is not more than 60,
 - the area of the *mezzanine* does not exceed the area limits stated in Table 3.4.2.2., and
 - the distance limits stated in Table 3.4.2.2. measured along the path of travel are not exceeded from any point on the *mezzanine* to
 - an egress door serving the space that the *mezzanine* overlooks, if the space is served by a single egress door, or
 - the egress stairway leading to an *access to exit* in the space below if that space is required to be served by 2 or more egress doorways in conformance with Sentence 3.3.1.5.(1).
- (3) At least half of the required *means of egress* from a *mezzanine* shall comply with Sentence (1) if the *mezzanine* is not required to terminate at a *fire separation* as permitted by Sentence 3.2.8.2.(1).

Table 3.4.2.2.
Criteria for Egress from Mezzanine Space
 Forming Part of Sentence 3.4.2.2.(2)

Occupancy of Space	Maximum Area, m ²	Distance Limits, m
Assembly occupancy	150	15
Residential occupancy	100	15
Business and personal services occupancy	200	25
Mercantile occupancy	150	15
Medium-hazard industrial occupancy	150	10
Low-hazard industrial occupancy	200	15

3.4.2.3. Distance Between Exits

- (1) Except as provided in Sentence (2), the least distance between 2 required *exits* from a *floor area* shall be
 - (a) one-half the maximum diagonal dimension of the *floor area*, but need not be more than 9 m for a *floor area* having a *public corridor*, or
 - (b) one-half the maximum diagonal dimension of the *floor area*, but not less than 9 m for all other *floor areas*.
 (See Note A-3.4.2.3.(1))
- (2) *Exits* need not comply with Sentence (1) where
 - (a) the *floor area* is divided so that not less than one-third of the *floor area* is on each side of a *fire separation*, and
 - (b) it is necessary to pass through the *fire separation* to travel from one *exit* to another *exit*.
- (3) The minimum distance between *exits* referred to in Sentence (1) shall be the shortest distance that smoke would have to travel between the *exits*, assuming that the smoke will not penetrate an intervening *fire separation*.
- (4) The distance between 2 exterior discharges leading from two or more *exit* stairs serving the same *floor area* shall be
 - (a) not less than 9 m, or
 - (b) not less than 6 m, where
 - (i) the *building* is *sprinklered* throughout, and
 - (ii) the 2 exterior discharges are located within 15 m of a *street*.

3.4.2.4. Travel Distance

- (1) Except as permitted by Sentence (2), for the purposes of this Subsection, travel distance means the distance from any point in the *floor area* to an *exit* measured along the path of travel to the *exit*.
- (2) The travel distance from a *suite* or a room not within a *suite* is permitted to be measured from an egress door of the *suite* or room to the nearest *exit*, provided
 - (a) the *suite* or room is separated from the remainder of the *floor area* by a *fire separation*
 - (i) having a *fire-resistance rating* not less than 45 min in a *floor area* that is not *sprinklered* throughout, or
 - (ii) that is not required to have a *fire-resistance rating*, in a *floor area* that is *sprinklered* throughout, and
 - (b) the egress door opens onto
 - (i) an exterior passageway,
 - (ii) a corridor used by the public that is separated from the remainder of the *floor area* in conformance with the requirements in Article 3.3.1.4. for the separation of *public corridors*, or
 - (iii) a *public corridor* that is separated from the remainder of the *floor area* in conformance with Article 3.3.1.4.
 (See Note A-3.1.8.1.(1)(b))

(3) Travel distance to an *exit* shall be not more than 50 m from any point in a *service space* referred to in Sentence 3.2.1.1.(8).

(4) If there is a *firewall* in an elementary or secondary school, the travel distance shall not be measured to a door in the *firewall*, but shall be measured to an exterior *exit* door or an *exit* door to a stairway.

3.4.2.5. Location of Exits

(1) Except as permitted by Sentences (2) and 3.3.2.5.(13) to (16), if more than one *exit* is required from a *floor area*, the *exits* shall be located so that the travel distance to at least one *exit* shall be not more than

- (a) 25 m in a *high-hazard industrial occupancy*,
- (b) 40 m in a *business and personal services occupancy*,
- (c) 45 m in a *floor area* that contains an *occupancy* other than a *high-hazard industrial occupancy*, provided it is *sprinklered* throughout,
- (d) 105 m in any *floor area*, served by a *public corridor*, in which rooms and *suites* are not separated from the remainder of the *floor area* by a *fire separation*, provided
 - (i) the *public corridor* is not less than 9 m wide,
 - (ii) the ceiling height in the *public corridor* is not less than 4 m above all floor surfaces,
 - (iii) the *building* is *sprinklered* throughout, and
 - (iv) not more than one-half of the required egress doorways from a room or *suite* open into the *public corridor* if the room or *suite* is required to have more than one egress doorway,
- (e) 60 m in any *storage garage* that conforms to the requirements of Article 3.2.2.92., and
- (f) 30 m in any *floor area* other than those referred to in Clauses (a) to (e).

(2) Except for a *high-hazard industrial occupancy*, Sentence (1) need not apply if *exits* are placed along the perimeter of the *floor area* and are not more than 60 m apart, measured along the perimeter, provided each main aisle in the *floor area* leads directly to an *exit*.

(3) *Exits* shall be located and arranged so that they are clearly visible or their locations are clearly indicated and they are accessible at all times.

3.4.2.6. Principal Entrance

(1) For the purposes of this Section, at least one door at every principal entrance to a *building* providing access from the exterior at ground level shall be designed in accordance with the requirements for *exits*.

(2) In a *building* that is not *sprinklered* throughout in accordance with Sentence 3.2.5.12.(1), the principal entrance serving a dance hall or a licensed beverage establishment with an *occupant load* more than 250 shall provide at least one-half of the required *exit* width.

3.4.3. Width and Height of Exits

3.4.3.1. Exit Width Based on Occupant Load

(1) For the purpose of determining the aggregate width of *exits*, the *occupant load* of every room or *floor area* shall be determined in conformance with Subsection 3.1.17.

(2) Except as permitted by Sentence 3.4.3.2.(4), the required *exit* width shall be cumulative if 2 or more *exits* converge.

3.4.3.2. Exit Width

- (1) Except as permitted by Sentence (3), the minimum aggregate required width of *exits* serving *floor areas* intended for *assembly occupancies, residential occupancies, business and personal services occupancies, mercantile occupancies, and industrial occupancies* shall be determined by multiplying the *occupant load* of the area served by
 - (a) 6.1 mm per person for *ramps* with a slope of not more than 1 in 8, doorways, corridors and passageways,
 - (b) 8 mm per person for a stair consisting of steps whose rise is not more than 180 mm and whose *run* is not less than 280 mm, or
 - (c) 9.2 mm per person for
 - (i) *ramps* with a slope of more than 1 in 8, or
 - (ii) stairs, other than stairs conforming to Clause (b).
- (2) The minimum aggregate width of *exits* serving *floor areas* intended for a *care, care and treatment or detention occupancy* shall be determined by multiplying the *occupant load* of the area served by 18.4 mm per person.
- (3) The minimum aggregate width of *means of egress* serving a Group A, Division 4 *occupancy* shall be determined by multiplying the *occupant load* of the area served by
 - (a) 1.8 mm per person for
 - (i) aisles,
 - (ii) stairs other than *exit* stairs, and
 - (iii) *ramps* and passageways in vomitories and *exits*, and
 - (b) 2.4 mm per person for *exit* stairs.
- (4) Except as required by Sentences 3.4.3.2.(5) and (6), the required *exit* width need not be cumulative in an *exit* serving 2 or more *floor areas* located one above the other.
- (5) The required *exit* width for an *exit* stair in an assembly hall or *theatre* serving more than one balcony level shall conform to Sentence (6).
- (6) The required *exit* width for *exit* stairs that serve *interconnected floor space* designed in accordance with Articles 3.2.8.3. to 3.2.8.8. shall be cumulative, unless
 - (a) the stairs provide not less than 0.3 m² of area of treads and landings for each occupant of the *interconnected floor space*, or (See Note A-3.4.3.2.(6)(a))
 - (b) *protected floor spaces* conforming to Article 3.2.8.5. are provided at each floor level and the *protected floor space* on a floor level has not less than 0.5 m² of space for each occupant of that floor level of the *interconnected floor space*.
 (See Note A-3.4.3.2.(6))
- (7) If more than one *exit* is required, every *exit* shall be considered as contributing not more than one-half of the required *exit* width.
- (8) The minimum widths of *exits* shall conform to Tables 3.4.3.2.-A and 3.4.3.2.-B.

Table 3.4.3.2.-A
Minimum Widths of Exit Corridors, Passageways, Ramps, Stairs and Doorways in
Group A, Group B, Division 1, and Groups C, D, E and F Occupancies
 Forming Part of Sentence 3.4.3.2.(8)

Occupancy Classification	Exit Corridors and Passageways, mm	Ramps, mm	Stairs, mm	Doorways, mm
Group A, Group B, Division 1, Group C, Group D, Group E, Group F	1 100	1 100	900 ⁽¹⁾ 1 100 ⁽²⁾	850

Notes to Table 3.4.3.2.-A:

- (1) Serving not more than 2 *storeys* above the lowest *exit level* or not more than 1 *storey* below the lowest *exit level*.
- (2) Serving more than 2 *storeys* above the lowest *exit level* or more than 1 *storey* below the lowest *exit level*.

Table 3.4.3.2.-B
Minimum Widths of Exit Corridors, Passageways, Ramps, Stairs and Doorways in
Group B, Division 2 and Division 3 Occupancies
 Forming Part of Sentence 3.4.3.2.(8)

Occupancy Classification	Exit Corridors and Passageways, mm	Ramps, mm		Stairs, mm		Doorways, mm	
		Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾	Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾	Not serving patients' or residents' sleeping rooms ⁽¹⁾	Serving patients' or residents' sleeping rooms ⁽¹⁾
Group B, Division 2	1 100	1 100	1 650	900 ⁽²⁾ 1 100 ⁽³⁾	1 650	850	1 050
Group B, Division 3	1 100	1 100	1 650	900 ⁽²⁾ 1 100 ⁽³⁾	1 650	850	1 050

Notes to Table 3.4.3.2.-B:

- (1) Minimum widths of *ramps*, stairs and doorways do not apply within individual *suites of care occupancy*.
- (2) Serving not more than 2 *storeys* above the lowest *exit level* or not more than 1 *storey* below the lowest *exit level*.
- (3) Serving more than 2 *storeys* above the lowest *exit level* or more than 1 *storey* below the lowest *exit level*.

3.4.3.3. Exit Width Reduction

- (1) Except as permitted by Sentences (2) to (4), no fixture, turnstile or construction shall project into or be fixed within the required width of an *exit*.
- (2) Swinging doors in their swing shall not reduce the required width of *exit* stairs or landings to less than 750 mm or reduce the width of an *exit* passageway to less than the minimum required width.
- (3) *Exit* doors shall be installed so that, when open, they shall neither diminish nor obstruct the required width of the *exit* by more than 50 mm for each door leaf.
- (4) Handrails and construction below handrails, including handrail supports and stair stringers, are permitted to project into the required width of *means of egress* but the projections shall be not more than 100 mm on each side of the required width.
- (5) In an elementary or secondary school, where a stair lift is installed in an *exit* stair, an intermediate handrail shall be installed between the path of travel of the stair lift and the remainder of the stair to ensure that the stair lift will not reduce the required width of the *exit* stair.

3.4.3.4. Headroom Clearance (See Note 3.4.3.4.)

- (1) Except as provided by Sentences (2), (4) and (5), every *exit* shall have a clear height over the clear width of the *exit* of not less than 2 100 mm.
- (2) The clear height of stairways shall be measured vertically, over the clear width of the stairway, from a straight line tangent to the tread and landing nosings to the lowest point above, and shall not be less than 2 050 mm. (See Note A-9.8.7.4.)
- (3) The clear height of landings shall be measured within the clear width of the landing vertically to the lowest element above.
- (4) Except as permitted by Sentence (5), the clear height of doorways shall not be less than 2 030 mm.

- (5) No door closer or other device shall be installed so as to reduce the clear height of a doorway to less than 1 980 mm.

3.4.4. Fire Separation of Exits

3.4.4.1. Fire-Resistance Rating of Exit Separations

- (1) Except as provided by Sentences (2) and (4) and Sentences 3.3.5.4.(3), 3.4.4.2.(2), 3.4.4.3.(1) and 3.13.3.1.(3), every *exit* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than that required by Subsection 3.2.2., but not less than 45 min, for
- (a) the floor assembly above the *storey*, or
 - (b) the floor assembly below the *storey*, if there is no floor assembly above.
- (2) The *fire-resistance rating* of the *fire separation* referred to in Sentence (1) need not be more than 2 h.
- (3) If an *exit* stair in an assembly hall or *theatre* serves more than one balcony level, the *exit* stair shall be separated from the remainder of the *building* in conformance with Sentence (1).
- (4) The path of *exit* travel may lead from an *exit* door or *exit* enclosure through *open air* parking that is located below a roof or floor assembly that is part of the *building* served by the *exit* door or *exit* enclosure, where
- (a) the portion of the path of *exit* travel that leads through the *open air* parking is not more than 9 m in length measured from the *exit* door to a point at ground level at the perimeter of the *building*,
 - (b) measures are taken to prevent vehicles intended to park in spaces adjacent to the path of *exit* travel from encroaching on the path of *exit* travel, and
 - (c) an alternate *means of egress* not leading through the *open air* parking is available from the interior side of the door opening onto the path of *exit* travel through the *open air* parking area.

3.4.4.2. Exits Through Lobbies

- (1) Except as permitted by Sentence (2), no *exit* from a *floor area* above or below the *first storey* shall lead through a lobby.
- (2) Not more than one *exit* from a *floor area* is permitted to lead through a lobby, provided
- (a) the lobby floor is not more than 4.5 m above *grade*,
 - (b) the path of travel through the lobby to the outdoors is not more than 15 m,
 - (c) the adjacent rooms or premises having direct access to the lobby do not contain a *residential occupancy* or an *industrial occupancy*, except that *dwelling units* may open directly onto the lobby, where
 - (i) from the interior of the *exit* stair that opens onto the lobby there is alternate *means of egress* not leading through the lobby and such *means of egress* is entirely within the same *storey* as the lobby, or
 - (ii) the *floor area* is *sprinklered*,
 - (d) except as required by Clause (g), the lobby is not located within an *interconnected floor space* other than as described in Sentence 3.2.8.2.(6),
 - (e) the lobby conforms to the requirements for *exits*, except that
 - (i) rooms other than *service rooms* and storage rooms are permitted to open onto the lobby,
 - (ii) the *fire separation* between the lobby and a room used for the sole purpose of control and supervision of the *building* need not have a *fire-resistance rating*,
 - (iii) the *fire separation* between the lobby and adjacent *occupancies* that are permitted to open onto the lobby need not have a *fire-resistance rating* provided the lobby and adjacent *occupancies* are *sprinklered*, and
 - (iv) passenger elevator entrances are permitted to open onto the lobby provided the elevator entrance doors are designed to remain closed except while loading and unloading,
- (See Note A-3.4.4.2.(2)(e))
- (f) a *fire separation*, constructed in accordance with Sentence 3.4.4.1.(1), is maintained between the lobby and any *exit* permitted by this Sentence to lead through the lobby, and
- (g) that if the *exit* serves a *hotel*, the lobby is not located within an *interconnected floor space*.

3.4.4.3. Exterior Passageway Exceptions

- (1) The requirements of Sentences 3.4.4.1.(1) and 3.2.3.13.(1) and (3) do not apply to an exterior *exit* passageway provided
 - (a) not less than 50% of the exterior side is open to the outdoors, and
 - (b) an *exit* stair is provided at each end of the passageway.

3.4.4.4. Integrity of Exits

- (1) A *fire separation* that separates an *exit* from the remainder of the *building* shall have no openings except for
 - (a) standpipe and sprinkler piping,
 - (b) electrical wires and cables, totally enclosed *noncombustible* raceways and *noncombustible* piping that serve only the *exit*,
 - (c) openings required by the provisions of Subsection 3.2.6.,
 - (d) *exit* doorways,
 - (e) wired glass and glass block permitted by Article 3.1.8.16., and
 - (f) a sprinkler protected glazed wall assembly conforming to Article 3.1.8.20.
- (2) *Exits* within scissors stairs and other contiguous *exit* stairways shall be separated from each other by a smoke-tight *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly through which they pass.
- (3) *Fire separations* separating contiguous stairs described in Sentence (2) shall not be pierced by doorways, ductwork, piping or any other openings that affect the continuity of the separation.
- (4) A fuel-fired *appliance* shall not be installed in an *exit*.
- (5) An *exit* shall not be used as a *plenum* for a heating, ventilating or *air-conditioning* system.
- (6) An *exit* shall be designed for no purpose other than for exiting, except that an *exit* is permitted also to be designed to serve as an access to a *floor area*.
- (7) A *service room* shall not open directly into an *exit*.
- (8) Storage rooms, washrooms, toilet rooms, laundry rooms and similar ancillary rooms shall not open directly into an *exit*.
- (9) *Service spaces* referred to in Sentence 3.2.1.1.(8) shall not open directly into an *exit*.
- (10) In elementary and secondary schools, an *exit* shall be designed so that it does not serve as an access from one portion of a *floor area* to another portion of the same *floor area*.

3.4.5. Exit Signs

3.4.5.1. Exit Signage

- (1) Except as provided by Sentences (9) and (10), every *exit* door shall have an *exit* sign providing visual information placed over or adjacent to it if the *exit* serves
 - (a) a *building* more than 2 *storeys* in *building height*,
 - (b) a *building* having an *occupant load* of more than 150, or
 - (c) a room or *floor area* that has a fire escape as part of a required *means of egress*.

- (2) Except as provided by Sentence (7), every *exit* sign providing visual information shall
- (a) be visible on approach to the *exit*,
 - (b) consist of a green and white or lightly tinted graphical symbol meeting the colour specifications referred to in ISO 3864-1, “Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings,” and
 - (c) conform to ISO 7010, “Graphical symbols – Safety colours and safety signs – Registered safety signs,” for the following symbols:
 - (i) E001 emergency exit left,
 - (ii) E002 emergency exit right,
 - (iii) E005 90-degree directional arrow, and
 - (iv) E006 45-degree directional arrow.(See Note A-3.4.5.1.(2)(c))
- (3) Internally illuminated *exit* signs shall
- (a) be continuously illuminated, and
 - (b) where illumination of the sign is powered by an electrical circuit, be constructed in conformance with CSA C22.2 No. 141, “Emergency Lighting Equipment.”
- (4) Externally illuminated *exit* signs shall be continuously illuminated by a light fixture supplied by an electrical circuit.
- (4.1) Photoluminescent and self-luminous *exit* signs shall
- (a) conform to CAN/ULC-S572, “Photoluminescent and Self-Luminous Signs and Path Marking Systems,”
 - (b) be labelled in accordance with the time duration for which they have been tested and *listed*,
 - (c) be so installed that upon failure of the regular power they will continue to be illuminated for the applicable time duration specified in Clause 3.2.7.4.(1)(b), and
 - (d) be continuously illuminated if reliant on an external energy source to energize the reflective coating of the sign.
- (See Note A-3.4.5.1.(4.1))
- (5) If illumination of an *exit* sign is provided from an electrical circuit, that circuit shall
- (a) serve no equipment other than emergency lighting in the area where *exit* signs are installed, and
 - (b) be connected to an emergency power supply as described in Sentence 3.2.7.4.(1).
- (6) Where no *exit* is visible from a *public corridor*, from a corridor used by the public in a Group A or B *major occupancy* or from principal routes serving an open *floor area* having an *occupant load* of more than 150, an *exit* sign conforming to Clauses (2)(b) and (c) with an arrow or other indicator pointing at the direction of egress shall be provided.
- (7) Except for egress doorways described in Sentence 3.3.2.4.(4), an *exit* sign conforming to Sentences (2) to (5) shall be placed over or adjacent to every egress doorway from rooms with an *occupant load* more than 60 in Group A, Division 1 *occupancies*, dance halls, licensed beverage establishments and other similar *occupancies* that, when occupied, have lighting levels below the level that would provide easy identification of the egress doorway.
- (8) Except for *suite* doors opening directly to the exterior, every *exit* serving a *hotel* shall have an *exit* sign placed over or adjacent to it.
- (9) An *exit* sign is not required within a *suite* containing a Group B, Division 3 *occupancy* if the following requirements are met:
- (a) the *suite* contains sleeping accommodation for not more than 10 persons, and
 - (b) not more than 6 occupants require assistance in evacuation in case of an emergency.

3.4.5.2. Exit Signs with Tactile Information

- (1) An *exit* sign displaying the word “EXIT” in tactile form that complies with Article 3.8.3.1. shall be mounted on the approach side of *exit* doors described in Sentence 3.4.5.1.(1), in the direction of travel to the *exit*.

3.4.5.3. Signs for Stairs and Ramps at Exit Level

- (1) In a *building* more than 2 *storeys* in *building height*, any part of an *exit ramp* or stair that continues up or down past the lowest *exit level* shall be clearly marked by a sign indicating that it does not lead to an *exit*.
- (2) An *exit* stair serving a *building* more than 6 *storeys* in *building height* shall be clearly marked by signs indicating that it does not lead to an *exit* at the roof level. (See Note A-3.4.5.3.(2))

3.4.6. Types of Exit Facilities (See Note A-3.4.6.)**3.4.6.1. Surface Finish of Ramps and Stairs**

- (1) The surfaces of *ramps*, landings and treads shall
 - (a) have a finish that is slip-resistant, and
 - (b) if accessible to the public, have a colour contrast or a distinctive visual pattern to demarcate
 - (i) the leading edge of the tread,
 - (ii) the leading edge of the landing, and
 - (iii) the beginning and end of a *ramp*.
- (1.1) A tactile attention indicator conforming to Article 3.8.3.18. shall be installed
 - (a) at the top of the stairs, starting one tread depth back from the edge of the top stair, and
 - (b) at the leading edge of landings where a doorway opens onto stairs, starting one tread depth back from the edge of the landing.
 (See Note A-3.4.6.1.(1.1))
- (2) Treads and landings of exterior *exit* stairs shall be designed to be free of ice and snow accumulations if the stairs
 - (a) are more than 10 m high, or
 - (b) serve a *hotel*.

3.4.6.2. Minimum Number of Risers

- (1) Except as permitted by Sentence 3.3.2.15.(1), every *flight* of interior stairs shall have not less than 3 risers.

3.4.6.3. Maximum Vertical Rise of Stair Flights and Required Landings

- (1) No *flight* of stairs shall have a vertical rise of more than 3.7 m between floors or landings, except that a *flight* of stairs serving as an *exit* in a Group B, Division 2 or 3 *occupancy* shall have a vertical rise not more than 2.4 m between floors or landings.
- (2) Except as provided in Sentence (3), a landing shall be provided
 - (a) at the top and bottom of each *flight* of interior and exterior stairs,
 - (b) at the top and bottom of every section of *ramp*,
 - (c) where a doorway opens onto a stair or *ramp*,
 - (d) where a *ramp* opens onto a stair, and
 - (e) where a stair opens onto a *ramp*.
- (3) A landing may be omitted at the bottom of an exterior stair or *ramp*, provided there is no gate, door or fixed obstruction within the lesser of
 - (a) the width of the stair or *ramp*, or
 - (b) 1 100 mm.

3.4.6.4. Dimensions of Landings (See Note A-3.4.6.4.)

- (1) Except as provided in Sentences (2) and (6), a landing shall be at least as wide and as long as the width of the stairway in which it occurs.
- (2) In a straight stairway and in a stairway that turns less than 90°, the length of the landing need not be more than the lesser of
 - (a) the required width of the stair or *ramp*, or
 - (b) 1 100 mm.
- (3) The length of a landing shall be measured perpendicular to the nosing of adjacent steps, at a distance equal to half the length required in Sentence (2), from the narrow edge of the landing.
- (4) Where a doorway or stairway empties onto a *ramp* through a side wall, there shall be a level area extending across the full width of the *ramp*, and for a distance of 300 mm on either side of the wall opening, except one side if it abuts on an end wall.
- (5) Where a doorway or stairway empties onto a *ramp* through an end wall, there shall be a level area extending across the full width of the *ramp* and along its length for not less than 900 mm.
- (6) Where the direction of *exit* travel changes at a landing, the landing is permitted to be chamfered or curved in plan, provided the required width of the stair is maintained where measured perpendicular to the direction of *exit* travel across the landing.

3.4.6.5. Handrails

- (1) One handrail shall be provided on stairs that are less than 1 100 mm in width.
- (2) One handrail shall be provided on each side of
 - (a) stairs that are 1 100 mm or more in width,
 - (b) curved *flights* of any width, and
 - (c) *ramps*.
- (3) In addition to Sentence (2), intermediate handrails shall be provided so that
 - (a) a handrail is reachable within 825 mm of all portions of the required *exit* width, and
 - (b) at least one portion of the stair or *ramp* between two handrails is the required *exit* width for stairs or *ramps* as described in Sentences 3.4.3.2.(8) and 3.4.3.4.(4).
- (4) Where a stair or *ramp* is wider than its required *exit* width, handrails shall be located along the most direct path of travel. (See Note A-3.4.6.5.(4))
- (5) Handrails shall be continuously graspable along their entire length, be free of any sharp or abrasive elements, and have
 - (a) a circular cross-section with an outside diameter not less than 30 mm and not more than 50 mm, or
 - (b) a non-circular cross-section with a perimeter not less than 100 mm and not more than 160 mm and whose largest cross-sectional dimension is not more than 57 mm.
- (6) The height of handrails on stairs, on aisles with steps and on *ramps* shall be measured vertically from the top of the handrail to
 - (a) a straight line drawn tangent to the tread nosings of the stair or aisle step served by the handrail, or
 - (b) the surface of the *ramp*, floor or landing served by the handrail.
- (7) Except as provided in Sentence (8) and Clause 3.8.3.4.(1)(e), the height of handrails on stairs, on aisles with steps and on *ramps* shall be
 - (a) not less than 865 mm, and
 - (b) not more than 1070 mm.

- (8) Handrails installed in addition to required handrails need not comply with Sentence (7).
- (9) Required handrails shall be continuous throughout the length of
- (a) a *ramp*, and
 - (b) a *flight*, from the bottom riser to the top riser.
(See Note A-9.8.7.2.)
- (10) Except as required by Sentence (16) and except where interrupted by doorways or newels at changes in direction, at least one handrail shall be continuous throughout the length of a stair or *ramp*, including at landings. (See Note A-3.4.6.5.(10))
- (11) Handrails shall be terminated in a manner that will not obstruct pedestrian travel or create a hazard. (See Note A-3.4.6.5.(11))
- (12) At least one handrail shall,
- (a) in the case of a stair,
 - (i) extend horizontally at the required height, not less than 300 mm beyond the top riser, and
 - (ii) continue to slope for a depth of one tread beyond the bottom riser followed by a 300 mm horizontal extension, and
 - (b) in the case of a *ramp*, extend horizontally at the required height, not less than 300 mm beyond the top and bottom edges of the incline.
- (13) The clearance between a handrail and any surface behind it shall be not less than
- (a) 60 mm, if the surface behind the handrail is rough or abrasive, or
 - (b) 50 mm, in all other cases.
- (14) Handrails and their supports shall be designed and constructed to withstand the loading values specified in Sentence 4.1.5.14.(7).
- (15) A *ramp* shall have handrails on both sides.
- (16) In a long-term care home, a Group B, Division 3 *occupancy* and a *retirement home*, a continuous handrail shall be provided on both sides of a stair throughout the length of the stair, including landings, except where a handrail is interrupted by doorways or newels at changes in direction.

3.4.6.6. Guards

- (1) Every *exit* shall have a wall or a well-secured *guard* on each side, where
- (a) the difference in elevation is more than 600 mm between the walking surface and the adjacent surface, or
 - (b) the adjacent surface within 1.2 m of the walking surface has a slope of more than 1 in 2.
(See Note A-9.8.8.1.)
- (2) Except as required by Sentence (4), the height of *guards* for *exit* stairs and *exit ramps*, as well as their landings, shall be not less than 1 070 mm.
- (3) The height of *guards* shall be measured vertically to the top of the *guard* from
- (a) a line drawn through the outside edges of the stair nosings, or
 - (b) the surface of the *ramp* or landing.
- (4) The height of *guards* for exterior stairs and landings more than 10 m above adjacent ground level shall be not less than 1 500 mm measured vertically to the top of the *guard* from the surface of the landing or a line drawn through the outside edges of the stair nosings.

(5) Except as provided in Sentence (5.1), openings through any *guard* that is required by Sentence (1) shall be of a size that will prevent the passage of a sphere having a diameter more than 100 mm unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

(5.1) Openings through any *guard* that is required by Sentence (1) and that is installed in a *building of industrial occupancy* shall be of a size that will prevent the passage of a sphere having a diameter more than 200 mm unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

(6) In a stairway, a window for which the distance measured vertically between the bottom of the window and a line drawn through the outside edges of the stair nosings is less than 900 mm, or a window that extends to less than 1 070 mm above the landing, shall

- (a) be protected by a *guard* that is
 - (i) located approximately 900 mm above a line drawn through the outside edges of the stair nosings, or
 - (ii) not less than 1 070 mm high measured to the top of the *guard* from the surface of the landing, or
- (b) be fixed in position and designed to resist the lateral design loads specified for *guards* and walls in Articles 4.1.5.14. and 4.1.5.16.

(7) Unless it can be shown that the location and size of openings do not present a hazard, a *guard* shall be designed so that no member, attachment or opening located between 140 mm and 900 mm above the level being protected by the *guard* will facilitate climbing.

3.4.6.7. Ramp Slope (See also Article 3.8.3.5.)

(1) Except as provided in Sentence (2) and as provided for aisles in Article 3.3.2.5., *ramps* shall have a uniform slope along their length and a maximum slope of 1 in 12.

(2) Except as provided in Section 3.8., *ramps* in *industrial occupancies* shall have a uniform slope along their length and a maximum slope of

- (a) 1 in 6 for interior *ramps*, and
- (b) 1 in 10 for exterior *ramps*.

3.4.6.8. Treads and Risers (See Note A-9.8.4.)

(1) Except as permitted for *dwelling units* and by Sentence 3.4.7.5.(1) for fire escapes, steps in *flights* shall have a *run* of not less than 280 mm and not more than 355 mm between successive steps.

(2) Steps for stairs referred to in Sentence (1) shall have a rise between successive treads not less than 125 mm and not more than 180 mm.

(3) Except as provided in Article 3.3.4.7. and except for fire escape stairs, stairs that are principally used for maintenance and service, and stairs that serve *industrial occupancies* other than *storage garages*, steps for stairs shall have no open risers.

(4) Except in fire escape stairs and where an exterior stair adjoins a *walkway* as permitted in Sentence 3.4.6.3.(3), risers, measured as the vertical nosing-to-nosing distance, shall be of uniform height in any one *flight*, with a maximum tolerance of

- (a) 5 mm between adjacent treads or landings, and
- (b) 10 mm between the tallest and shortest risers in a *flight*.

(5) Except in fire escape stairs, treads shall have a uniform *run* with a maximum tolerance of

- (a) 5 mm between adjacent treads, and
- (b) 10 mm between the deepest and shallowest treads in a *flight*.

(6) Treads and risers shall not differ significantly in *run* and rise in successive *flights* in any stair system. (See Note A-3.4.6.8.(6))

- (7) The slope of treads or landings shall not exceed 1 in 50.
- (8) Except as permitted by Sentence (10), the top of the nosing of stair treads shall have a rounded or bevelled edge extending not less than 6 mm and not more than 13 mm measured horizontally from the front of the nosing.
- (9) The front edge of stair treads in *exits* and public *access to exits* shall be at right angles to the direction of *exit* travel.
- (10) If resilient material is used to cover the nosing of a stair tread, the minimum rounded or beveled edge required by Sentence (8) is permitted to be reduced to 3 mm.

3.4.6.9. Curved Flights in Exits

- (1) *Exit* stair *flights* shall consist solely of
 - (a) straight *flights*, or
 - (b) curved *flights* complying with Sentence (2).
- (2) A curved *flight* used as an *exit* shall have
 - (a) a handrail on each side,
 - (b) a minimum *run* of 240 mm,
 - (c) treads with a *run* that conforms to Article 3.4.6.8. when measured at a point 300 mm from the centre line of the inside handrail at the narrow end of the tread, and
 - (d) an inside radius that is not less than twice the stair width.
- (3) *Tapered treads* shall have a consistent angle and uniform *run* and rise dimensions in accordance with the construction tolerances described in Article 3.4.6.8. when measured at a point 300 mm from the centre line of the handrail at the narrow end of the tread.
- (4) All *tapered treads* within a *flight* shall turn in the same direction.

3.4.6.10. Horizontal Exits

- (1) Except in an elementary or secondary school that is subdivided by a *firewall*, the *floor area* on each side of a *horizontal exit* shall be sufficient to accommodate the occupants of both *floor areas*, allowing not less than 0.5 m² of clear floor space per person, except that 1.5 m² shall be provided for each person in a wheelchair and 2.5 m² for each bedridden patient.
- (2) If vestibules, enclosed balconies or bridges are used as parts of a *horizontal exit*, their clear width shall be not less than that of the *exit* doorways opening into them, except that handrails are not permitted to project into this clear width more than 100 mm.
- (3) In a *horizontal exit* where there is a difference in level between the connected *floor areas*, slopes not more than those specified for *ramps* in Article 3.4.6.7. are permitted to be used.
- (4) No stairs or steps shall be used at a *horizontal exit*.
- (5) If 2 doors are provided in a *horizontal exit* that comprises a part of the required number of *exits* from the *floor areas* on both sides of the *exit*
 - (a) the doors shall be mounted adjacent to each other with the door on the right side in the direction of travel through the *horizontal exit* swinging in the direction of travel through the *horizontal exit*, and
 - (b) signs shall be provided on each side of the *horizontal exit* to indicate the door that swings in the direction of travel from that side.(See Note A-3.4.6.10.(5))
- (6) If a *horizontal exit* utilizes bridges between *buildings* or outside balconies, the bridges or balconies shall conform to Article 3.2.3.19.

- (7) Any change in floor level from one side of a *horizontal exit* to the other side shall not exceed 2 000 mm.

3.4.6.11. Doors (See also Sentence 3.8.3.6.(17))

- (1) The distance between a stair riser and the leading edge of a door during its swing shall be not less than 300 mm.
- (2) Except as provided in Sentence (3) and where a threshold is used to contain spillage, a threshold for a doorway in an *exit* shall be not more than 13 mm higher than the surrounding finished floor surface.
- (3) No *exit* door shall open directly onto a step except that, if there is danger of blockage from ice or snow, an *exit* door is permitted to open onto not more than one step which shall be not more than 150 mm high.
- (4) *Exit* doors shall be clearly identifiable. (See Note A-3.4.6.11.(4))
- (5) No door leaf in an *exit* doorway with more than one leaf shall be less than 610 mm wide.
- (6) Where an *exit* door leading directly to the outside is subject to being obstructed by parked vehicles or storage because of its location, a visible sign or a physical barrier prohibiting such obstructions shall be installed on the exterior side of the door.

3.4.6.12. Direction of Door Swing

- (1) Except for doors serving a single *dwelling unit* and except as permitted by Sentences (2) and (3) and Article 3.4.6.14., every *exit* door shall
- (a) open in the direction of *exit* travel, and
 - (b) swing on its vertical axis.
- (2) Except in a *high-hazard industrial occupancy*, an *exit* door need not swing in the direction of *exit* travel where it serves
- (a) a room, *suite* or *floor area* having an *occupant load* of not more than 60 persons, or
 - (b) as part of a *means of egress* from more than one *floor area* and the *floor areas* so served have a total *occupant load* of not more than 60 persons.
- (3) *Exit* doors need not conform to Sentence (1) where they serve
- (a) *storage garages* serving not more than one *dwelling unit*,
 - (b) accessory *buildings* serving not more than one *dwelling unit*, or
 - (c) storage *suites* not more than 28 m² in area that are on the *first storey* of a warehouse and open directly outdoors at ground level.

3.4.6.13. Self-Closing Devices

- (1) An *exit* door that is normally required to be kept closed
- (a) shall be provided with a self-closing mechanism, and
 - (b) shall not be secured in an open position except as permitted by Sentence 3.1.8.14.(1).

3.4.6.14. Sliding Doors

- (1) Except as permitted by Sentences (2) and 3.4.6.12.(2), an *exit door* leading directly to outdoors at ground level is permitted to be a sliding door provided it conforms to Sentence 3.3.1.12.(1).
- (2) An *exit* door serving a Group B, Division 1 *occupancy*, or an *impeded egress zone* in other *occupancies*, is permitted to be a sliding door that does not conform to Sentence 3.3.1.12.(1) provided it is designed to be released in conformance with Article 3.3.1.13.

3.4.6.15. Revolving Doors

- (1) Except as permitted by Sentence (3), a revolving door, if used, shall
 - (a) be collapsible,
 - (b) have hinged doors providing equivalent exiting capacity located adjacent to it,
 - (c) be used as an *exit* from the ground floor level only,
 - (d) be not less than 3 m from the foot of any stairway, and
 - (e) have all glass in door leaves and enclosure panels conforming to
 - (i) CAN/CGSB-12.1, “Safety Glazing,” or
 - (ii) CAN/CGSB-12.11-M, “Wired Safety Glass.”
- (2) Except as permitted by Sentence (3), a revolving door shall not be considered to have an exiting capacity for more than 45 persons.
- (3) An electrically powered revolving door is not required to conform to Sentences (1) and (2) provided
 - (a) the door leaves will collapse and stop automatic rotation of the door system and not obstruct the doorway if a force not more than that specified in Sentence 3.4.6.16.(2) is applied at the centre of a door leaf,
 - (b) the door leaves are capable of being opened from inside the *building* without requiring keys, special devices, or specialized knowledge of the door opening mechanism,
 - (c) the allowable exiting capacity is based on the clear width of passage through the door enclosure when the doors are fully collapsed,
 - (d) a permanent sign, whose centre line is between 1 000 mm and 1 500 mm above the floor, is placed on each face of each door leaf indicating the method for collapsing the door leaf in an emergency, and
 - (e) glass used for door leaves and enclosure panels is safety glazing conforming to
 - (i) CAN/CGSB-12.1, “Safety Glazing,” or
 - (ii) CAN/CGSB-12.11-M, “Wired Safety Glass.”

3.4.6.16. Door Release Hardware

- (1) Except for *dwelling units*, except for devices on doors serving a *contained use area* or an *impeded egress zone* designed to be released in conformance with Article 3.3.1.13., and except as permitted by Sentence (5), locking, latching and other fastening devices on every *exit* door shall permit the door to be readily opened from the inside with not more than one releasing operation and without requiring keys, special devices or specialized knowledge of the door opening mechanism. (See Note A-3.4.6.16.(1))
- (2) If a door is equipped with a latching mechanism, a device complying with Sentence (3) shall be installed on
 - (a) every *exit* door from a *floor area* containing an *assembly occupancy* having an *occupant load* more than 100,
 - (b) every door leading to an *exit* lobby from an *exit* stair shaft, and every exterior door leading from an *exit* stair shaft in a *building* having an *occupant load* more than 100, and
 - (c) every *exit* door from a *floor area* containing a *high-hazard industrial occupancy*.
- (3) The device required in Sentence (2) shall
 - (a) extend across not less than one-half of the width of the door,
 - (b) release the latch, and
 - (c) allow the door to swing wide open when a force not more than that specified in Sentence 3.8.3.3.(7) is applied to the device in the direction of travel to the *exit*.
- (4) Except as required by Sentence 3.8.3.3.(7), every *exit* door shall be designed and installed so that, when the latch is released, the door will open under a force of not more than 90 N, applied at the knob or other latch releasing device.
- (5) Except as permitted by Sentence 3.3.1.13.(6), electromagnetic locks that do not incorporate latches, pins or other similar devices to keep the door in the closed position are permitted to be installed on *exit* doors other than doors described in Sentence (6) provided
 - (a) the *building* is equipped with a fire alarm system conforming to Subsection 3.2.4.,

- (b) the locking device, and all similar devices in the *access to exit* leading to the *exit* door, are installed as ancillary devices to the fire alarm system and release immediately upon activation of
 - (i) the *alarm signal* where a single-stage fire alarm system is installed,
 - (ii) except as provided in Subclause (iii), the *alert signal* where a 2-stage fire alarm system is installed, or
 - (iii) the *alarm signal* of a 2-stage fire alarm system installed in a *care, care and treatment* or *detention occupancy* or in a *retirement home*,
- (c) the locking device releases immediately upon loss of power controlling the electromagnetic locking mechanism and its associated auxiliary controls,
- (d) the locking device releases immediately upon actuation of a manually operated switch readily accessible only to authorized personnel and located near the main entrance of the *building* or in the central alarm and control facility of Sentence 3.2.6.7.(1),
- (e) the locking device releases immediately upon a fault being detected in the electrical circuit between the fire alarm control panel and the controller of the locking device,
- (f) the locking device releases immediately upon the operation of a manual station for the fire alarm system located on the wall not more than 600 mm from the door,
- (g) a visual information sign complying with Article 3.8.3.1. that displays the words **EMERGENCY EXIT UNLOCKED BY FIRE ALARM** is permanently mounted on the door,
- (h) a tactile information sign complying with Article 3.8.3.1. that displays the words **EMERGENCY EXIT UNLOCKED BY FIRE ALARM** is permanently mounted near the door,
- (i) upon release, the locking device must be reset manually by the actuation of the switch referred to in Clause (d),
- (j) the operation of any by-pass switch, where provided for testing of the fire alarm system, causes an audible signal and a visual signal to be indicated at the fire alarm annunciator panel and at the monitoring station referred to in Sentence 3.2.4.8.(4),
- (k) emergency lighting conforming to 3.2.7.3.(1) is provided, and
- (l) where they are installed on doors providing emergency crossover access to *floor areas* from *exit* stairs in accordance with Article 3.4.6.18.,
 - (i) the locking device releases immediately upon the operation of a manual station for the fire alarm system located on the wall on the *exit* stair side not more than 600 mm from the door,
 - (ii) a visual information sign displaying the words **RE-ENTRY DOOR UNLOCKED BY FIRE ALARM** that complies with Article 3.8.3.1. is permanently mounted on the door on the *exit* stair side, and
 - (iii) a tactile information sign displaying the words **RE-ENTRY DOOR UNLOCKED BY FIRE ALARM** that complies with Article 3.8.3.1. is permanently mounted near the door on the *exit* stair side.

(See Note A-3.4.6.16.(5))

(6) Reserved.

(7) Door release hardware for the operation of the doors referred to in this Section shall be installed between 900 mm and 1 100 mm above the finished floor.

(8) Except as permitted by Sentences (9) and (10), electromagnetic locks are not permitted to be installed on *exit* doors

- (a) described in Clause (2)(a), (b) or (c),
- (b) serving an elementary or secondary school, or
- (c) leading directly from a *high-hazard industrial occupancy*.

(9) Electromagnetic locks are permitted to be installed on an exterior door leading from an *exit* stairway in a *building* containing only a Group B, Division 2 *major occupancy*, a Group B, Division 3 *major occupancy* or a *retirement home*.

(10) Electromagnetic locks are permitted to be installed on an *exit* door that serves only a *gaming premises* if

- (a) the *gaming premises* is located within a *sprinklered floor area*,
- (b) *smoke detectors* are installed in each room and each corridor accessible to the public,
- (c) a force of not more than 90 N applied to the door opening hardware initiates an irreversible process that will release the locking device within 15 s and not relock until the door has been opened, and
- (d) a legible sign conforming with Clauses (5)(g) and (h) is permanently mounted on the *exit* door to indicate that the locking device will release within 15 s of applying pressure to the door release hardware.

3.4.6.17. Reserved

3.4.6.18. Emergency Crossover Access to Floor Areas

- (1) Except as permitted in Sentence (2), doors providing access to *floor areas* from *exit* stairs shall not have locking devices to prevent entry into any *floor area* from which the travel distance up or down to an unlocked door is more than 2 *storeys*.
- (2) Doors referred to in Sentence (1) are permitted to be equipped with electromagnetic locks provided they comply with Sentences 3.4.6.16.(5) and (8).
- (3) Doors referred to in Sentence (1) shall be identified by visual and tactile information signs complying with Article 3.8.3.1. mounted on the stairway side to indicate that they are openable from that side.
- (4) Locked doors intended to prevent entry into a *floor area* from an *exit* stair shall
 - (a) be identified by visual and tactile information signs complying with Article 3.8.3.1. mounted on the stairway side to indicate the location of the nearest unlocked door in each direction of travel, and
 - (b) be openable with a master key that fits all locking devices and is kept in a designated location accessible to firefighters or be provided with a wired glass panel not less than 0.0645 m² in area and located not more than 300 mm from the door opening hardware.
- (5) Where access to a *floor area* through unlocked doors is required by Sentence (1), it shall be possible for a person entering the *floor area* to have access through unlocked doors within the *floor area* to at least one other *exit*.
- (6) In a *building* not more than 6 *storeys* in *building height*, doors providing access from *exit* stairs to a *floor area* containing a *hotel* are permitted to have locking devices to prevent entry into the *floor area* provided the requirements in Clause (4)(b) are complied with.

3.4.6.19. Floor Numbering and Identification of Stair Shafts

- (1) Arabic numerals indicating the assigned floor number in both visual and tactile forms in accordance with Article 3.8.3.1. shall, be mounted permanently on the wall on the stair side and on the floor side at the latch side of doors to *exit* stair shafts.
- (2) Upper case letters indicating the designation assigned to each *exit* stair shaft in both visual and tactile forms in accordance with Article 3.8.3.1. shall mounted permanently on the wall on the stair side and on the floor side at the latch side of doors to *exit* stair shafts.

3.4.7. Fire Escapes

3.4.7.1. Scope

- (1) Except as permitted by Sentence (2), fire escapes shall not be erected on a *building*.
- (2) If it is impracticable to provide one or more of the *exit* facilities listed in Article 3.4.1.4., fire escapes conforming to Articles 3.4.7.2. to 3.4.7.7. are permitted to serve *floor areas* in an existing *building* provided the *floor areas* served are
 - (a) not in an elementary or secondary school or a *retirement home*,
 - (b) not more than 2 *storeys* above ground level in *care, care and treatment* or *detention occupancies*, and
 - (c) not more than 5 *storeys* above ground level in other *occupancies*.

3.4.7.2. Fire Escape Construction

(1) Fire escapes shall be of metal or concrete, of the stair type extending to ground level, constructed throughout in a strong substantial manner and securely fixed to the *building*, except that wooden fire escapes are permitted to be used on *buildings of combustible construction* if all posts and brackets are not less than 89 mm in their least dimension and all other woodwork is not less than 38 mm in its least dimension.

3.4.7.3. Access to Fire Escapes

(1) Access to fire escapes shall be from corridors through doors at floor level, except that access from a *dwelling unit* is permitted to be through a casement window having an unobstructed opening not less than 1 100 mm high by 550 mm wide with a sill height of not more than 900 mm above the inside floor.

(2) The clear area of a fire escape balcony onto which a door opens, shall be not less than 1 m².

3.4.7.4. Protection of Fire Escapes

(1) If a fire escape serves any *storey* above the second, openings located in a zone described in Sentence (2), including access doorways in the exterior walls of the *building* to which the fire escape is attached, shall be protected by *closures* conforming to Subsection 3.1.8.

- (2) The zone referred to in Sentence (1) extends from any balcony, platform or stairway of a fire escape to a distance
- (a) 3 m horizontally,
 - (b) 10 m below, and
 - (c) 1.8 m above.

3.4.7.5. Stairs

(1) Stairs shall be inclined at an angle of not more than 45° with the horizontal, and their steps shall have risers not more than 210 mm high and treads not less than 220 mm wide exclusive of nosing.

(2) Stairway headroom shall be not less than 1 950 mm plus the height of one riser measured vertically above the nosing of any tread or platform.

(3) The width of a fire escape shall conform to Articles 3.4.3.1. to 3.4.3.3., except that the width is permitted to be reduced to 550 mm provided the fire escape serves

- (a) not more than 3 *storeys*, and
- (b) not more than 15 persons.

(4) If a *flight* of stairs leading to the ground at the foot of a fire escape is not fixed in position, it shall

- (a) be held in the raised position without a latch or locking device,
- (b) be fitted with a counterbalancing device,
- (c) be easily and quickly brought into position for use, and
- (d) reach the ground in the lowered position.

3.4.7.6. Guards and Railings

(1) The open sides of every platform, balcony and stairway forming part of a fire escape shall be protected by *guards* not less than 920 mm high measured vertically above the nosing of any tread or platform.

(2) The top rail of a *guard* is permitted to serve as a handrail if it is free from obstructions that could break a handhold.

(3) A wall handrail shall be installed if the fire escape is more than 550 mm wide.

(4) Openings through any *guard* that is required by Sentence (1) shall be of a size that will prevent the passage of a sphere having a diameter more than 100 mm unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

(5) Unless it can be shown that the location and size of an opening do not present a hazard, a *guard* for a fire escape shall be designed so that no member, attachment or opening located between 140 mm and 900 mm above a platform or the nosing of any tread will facilitate climbing.

3.4.7.7. Landings

(1) Platforms for a fire escape shall be provided in conformance with the requirements for stair landings in Articles 3.4.6.3. and 3.4.6.4.

Section 3.5. Vertical Transportation

3.5.1. General

3.5.1.1. Scope

(1) This Section applies to vertical transportation facilities installed in a *building*, including elevators, escalators and dumbwaiters.

(2) Elevators in a *building* within the scope of Subsection 3.2.6. shall conform to Articles 3.2.6.4. and 3.2.6.5.

3.5.2. Elevator Requirements

3.5.2.1. Required Elevator

(1) Except as provided in Sentence (2), in a Group B, Division 2 or 3 *occupancy*, if sleeping rooms or patient or resident services are provided on more than one floor level and the floor levels are not connected by *ramps* conforming to Article 3.8.3.4., such floor levels shall be served by at least one elevator that is large enough to accommodate a stretcher in a horizontal position.

(2) Sentence (1) does not apply to those parts of a *floor area* classified as a Group B, Division 3 *occupancy* if

- (a) those portions of the *floor area* contain sleeping accommodation for not more than 10 persons, and
- (b) not more than six occupants require assistance in evacuating in the case of an emergency.

3.5.2.2. Barrier-Free Design

(1) Passenger elevators shall conform to Appendix E of ASME A17.1 / CSA B44, "Safety Code for Elevators and Escalators."

3.5.3. Fire Separations

3.5.3.1. Fire Separations for Elevator Hoistways

(1) Except as permitted by Sentence (2), a *vertical service space* used as an elevator hoistway shall be separated from all other portions of each adjacent *storey* by a *fire separation* having a *fire-resistance rating* conforming to Table 3.5.3.1. for the *fire-resistance rating* required by Subsection 3.2.2. for

- (a) the floor assembly above the *storey*, or
 - (b) the floor assembly below the *storey*, if there is no floor assembly above.
- (2) Passenger elevators, other than those provided for firefighters in accordance with Article 3.2.6.5., are permitted to be located within *interconnected floor space* without being enclosed in a hoistway separated from the remainder of the *building*, provided the elevator machinery is located in a room separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than that required for hoistways by Sentence (1).

Table 3.5.3.1.
Fire Separation for Vertical Transportation Space
 Forming Part of Sentences 3.5.3.1.(1) and 3.5.3.2.(1)

<i>Fire-Resistance Rating of Fire Separation Required for Floor Assembly</i>	<i>Minimum Fire-Resistance Rating of Vertical Service Space for Elevator Hoistway</i>	<i>Minimum Fire-Resistance Rating of Vertical Service Space for Dumbwaiters</i>
less than 45 min	45 min	---
45 min	45 min	45 min
1 h	1 h	45 min
1.5 h	1 h	1 h
2 h or more	1.5 h	1 h

3.5.3.2. Vertical Service Spaces for Dumbwaiters

- (1) A *vertical service space* containing a dumbwaiter shall be separated from all other portions of each adjacent *storey* by a *fire separation* having a *fire-resistance rating* conforming to Table 3.5.3.1. for the *fire-resistance rating* required by Subsection 3.2.2. for
- (a) the floor assembly above the *storey*, or
 - (b) the floor assembly below the *storey*, if there is no floor assembly above.

3.5.3.3. Fire Separations for Elevator Machine Rooms

- (1) Except as permitted by Sentence (2), a room containing elevator machinery shall be separated from all other parts of the *building* by a *fire separation* having a *fire-resistance rating* not less than that required for the *vertical service space* containing the elevator hoistway.
- (2) A room containing elevator machinery need not be separated from the elevator hoistway that it serves provided the room and the hoistway are separated from all other parts of the *building* by a *fire separation* having a *fire-resistance rating* not less than that required for the *vertical service space* containing the elevator hoistway.

3.5.4. Dimensions and Signs

3.5.4.1. Elevator Car Dimensions

- (1) Except as provided in Sentence (2), if an elevator is installed to conform to the requirements of Article 3.3.1.7., or if one or more elevators are provided in a *building* more than three *storeys* in *building height*, each *storey* having elevator service shall be served by at least one elevator that has inside dimensions that will accommodate and provide adequate access for a patient stretcher 2 010 mm long and 610 mm wide in the prone position. (See Note A-3.5.4.1.(1))
- (2) The inside dimensions stipulated in Sentence (1) do not apply to limited-use/limited-application elevators designed and installed in accordance with ASME A17.1 / CSA B44, “Safety Code for Elevators and Escalators.”

(3) An elevator satisfying the requirements of Sentence (1) shall be clearly identified on the main entrance level of the *building*.

Section 3.6. Service Facilities

3.6.1. General

3.6.1.1. Scope

(1) The provisions of this Section apply to *horizontal service spaces*, *vertical service spaces*, *attic or roof spaces*, ducts, crawl spaces, shaft spaces, *service rooms*, and mechanical penthouses, and facilities contained therein.

3.6.1.2. Reserved

3.6.1.3. Reserved

3.6.1.4. Storage Use Prohibition

(1) *Service spaces* shall not be designed to facilitate subsequent use as storage space.

3.6.1.5. Appliances Installed Outside a Building

(1) A fuel-fired *appliance* installed on the roof of a *building* or in another location outside the *building* shall be installed not less than

- (a) 1.2 m from a property line, measured horizontally, and
- (b) 3 m from an adjacent wall of the same *building* if that wall contains any opening within 3 *storeys* above and 5 m horizontally from the *appliance*, unless every opening within these limits is protected by
 - (i) a *closure* having a *fire-protection rating* not less than 45 min determined in accordance with Article 3.1.8.4., or
 - (ii) a wired glass assembly permitted for use in a vertical *fire separation* and described in Article 2.3.15. of MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

3.6.1.6. Fixed Access Ladders

(1) If a fixed ladder is installed to provide access to a roof of a *building*, the design and installation of the attachment and anchorage system for the ladder shall be as described in MMAH Supplementary Standard SB-8, “Design, Construction and Installation of Anchorage System for Fixed Access Ladders.”

3.6.2. Service Rooms

3.6.2.1. Fire Separations Around Service Rooms

(1) Except as permitted by Sentences (2), (8), (9) and (10), fuel-fired *appliances* shall be installed in *service rooms* separated from the remainder of the *building* by *fire separations* having a *fire-resistance rating* not less than 1 h. (See Note A-3.6.2.1.(1))

(2) Except as required by Sentence (3), a fuel-fired *appliance* that serves only one room or *suite* is not required to be installed in a *service room* separated from the remainder of the *building*.

- (3) A solid-fuel-burning *appliance* shall not be located in a *repair garage*, a *storage garage*, or any other location where it could be exposed to flammable vapours or gases unless
- (a) it is enclosed in a *service room* that is separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h,
 - (b) it is supplied with combustion air directly from outside the *building*, and
 - (c) the heat that it generates is supplied indirectly to the space served by means of ducts or piping.
- (4) A *service room* containing an incinerator shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 2 h.
- (5) Equipment that uses a liquid having a *flash point* below 93.3°C shall be installed in a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (6) Electrical equipment that is required to be located in a *service room* by a regulation made under the *Electricity Act, 1998*, shall be installed in a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (7) Except as permitted by Sentence (8), in a *storey* that is not *sprinklered* throughout, a *service room* that contains service equipment other than that addressed by Sentences (1) to (6), shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (8) Where a *service room* contains a limited quantity of service equipment, and the service equipment neither constitutes a fire hazard nor is essential to the operation of fire safety systems in the *building*, the requirements for a *fire separation* shall not apply.
- (9) A *fire separation* is not required between a fireplace and the space it serves.
- (10) A *fire separation* is not required between a rooftop *appliance* and the *building* it serves.
- (11) The *fire separation* provisions for a fuel-fired *appliance* in a portable classroom shall conform to Article 3.9.3.7.

3.6.2.2. Service Rooms Under Exits

- (1) A *service room* containing service equipment subject to possible explosion, such as *boilers* operating in excess of 100 kPa (gauge) and some types of refrigerating machinery and transformers, shall not be located directly under a required *exit*.

3.6.2.3. Service Equipment

- (1) A *service room* containing space heating, space cooling and service water heating *appliances* is permitted to contain other service equipment such as electrical service equipment.

3.6.2.4. Incinerator Rooms

- (1) A *service room* containing an incinerator shall not contain other fuel-fired *appliances*.

3.6.2.5. Storage of Combustible Refuse and Recycling

- (1) Except as required by Sentence 3.6.3.3.(9), a room for the temporary storage of *combustible* refuse and materials for recycling shall be
- (a) separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 1 h, except that a *fire separation* with a *fire-resistance rating* not less than 45 min is permitted where the *fire-resistance rating* of the floor assembly is not required to exceed 45 min, and
 - (b) *sprinklered*.
- (See Note A-3.6.2.5.(1))

3.6.2.6. Door Swing for Service Rooms

(1) A swing-type door from a *service room* containing a *boiler* or incinerator shall swing outward from the room, except that the door shall swing inward if the door opens onto a corridor or any room used for an *assembly occupancy*. (See also Sentence 3.4.4.4.(7))

3.6.2.7. Electrical Equipment Vaults

(1) Where an electrical equipment vault is required by the Electrical Safety Code adopted under Ontario Regulation 164/99 (Electrical Safety Code) made under the *Electricity Act, 1998*, the electrical equipment vault shall be totally enclosed by a *fire separation* of *solid masonry* or concrete construction having a *fire-resistance rating* of not less than 3 h if the vault is not provided with an automatic fire extinguishing system and not less than 2 h if the vault is so protected.

(2) Where a *building* is required to be *sprinklered* throughout, the electrical equipment vault described in Sentence (1) need not be *sprinklered* provided

(a) the vault is designed for no purpose other than to contain the electrical equipment, and

(b) a *smoke detector* is provided in the vault that will actuate the *building* fire alarm system in the event of a fire in the vault.

(3) A vault, that is part of a *building* and houses electrical equipment indoors, shall have

(a) roofs or ceilings consisting of reinforced concrete of adequate strength for the conditions and not less than 150 mm thick, and

(b) floors consisting of reinforced concrete of adequate strength for the conditions and not less than 150 mm thick, except that floors that are at excavation level are permitted to be of reinforced concrete not less than 100 mm thick.

(4) Walls, roofs or ceilings, and floors shall be adequately anchored together in a manner designed to resist dislodgement by explosion.

(5) Only pipes or ducts necessary for fire protection or the proper operation of the electrical installation shall penetrate the *fire separations* surrounding the electrical equipment vault.

(6) A ventilation duct or opening, that penetrates the *fire separation* to the outdoors, need not be protected by a *closure* at the penetration.

(7) Each door to an electrical equipment vault shall be provided with a substantial lock or padlock.

(8) Explosion-relief devices and vents or other protective measures shall be provided for every electrical equipment vault containing dielectric liquid-filled electrical equipment in conformance with Sentence 3.3.1.21.(3). (See Note A-3.6.2.7.(8))

(9) Every electrical equipment vault shall be provided with a ventilation system designed in conformance with Part 6 to prevent the ambient temperature in the vault from exceeding 40°C.

(10) Where the vault ventilation system in Sentence (9) is directly from an outdoor area by natural ventilation without the use of ducts, and where the electrical equipment is the principal source of heat, the combined net area of inlet and outlet openings shall be not less than 0.002 m²/kVa of electrical equipment capacity with a minimum of 0.093 m², except that

(a) where equipment in the power class as described in CAN/CSA-C88-M, “Power Transformers and Reactors” is installed, ventilation requirements are permitted to be based on the actual full-load losses, or

(b) where the equipment is installed for emergency purposes only and is not normally energized, it need not be considered in determining the ventilation requirements.

(11) In the vault ventilation system in Sentence (10), the inlet for fresh air shall lead from an outdoor area and shall terminate at a point not more than 1 000 mm above the floor level of the vault.

(12) Where the vault ventilation system in Sentence (9) is a mechanical system, it shall be separate from the system for the remainder of the *building* and shall be designed so that

- (a) the vault temperature is thermostatically controlled,
- (b) the fan is located so that it may be serviced without danger to personnel,
- (c) a high temperature alarm is provided in the vault,
- (d) the system is automatically shut off in the event of a fire in the vault, and
- (e) a filter is provided in the air inlet if there is a possibility of dirt being drawn in.

(13) All ventilation openings shall be protected in conformance with Sentences 6.3.2.9.(4) and (5) and the protection shall be installed in such a manner that it cannot be removed from the outside by the use of common tools and it is tamperproof.

(14) Except as permitted in Sentence (15), the floor of an electrical equipment vault referred to in Sentences (1) and (2) shall be liquid tight and surrounded by liquid tight walls and sills of sufficient height to confine within the vault all of the liquid from the largest item of electrical equipment, but to a height of not less than 100 mm.

(15) The floor of the electrical equipment vault described in Sentences (1) and (2) may be provided with a floor drain connected to a covered sump capable of holding all of the liquid from the largest item of electrical equipment, and the connection shall have a *noncombustible trap* to prevent the spread of fire from the vault to the sump.

(16) Where the electrical equipment vault is located in a hazardous location classified as Class II, Division 1 in accordance with the Electrical Safety Code adopted under Ontario Regulation 164/99 (Electrical Safety Code) made under the *Electricity Act, 1998*, it shall have

- (a) no vent opening except to the exterior of the *building*, and
- (b) suitable pressure-relief openings communicating only with the air outside the *building*.

(17) Where doors are provided between the vault described in Sentence (16) and the rest of the *building*, they shall have suitable seals such as weatherstripping to minimize the entrance of dust into the vault.

(18) Every electrical equipment vault shall be provided with

- (a) adequate lighting, controlled by one or more switches located near the entrance,
- (b) luminaires located so that they may be relamped without danger to personnel, and
- (c) a grounded receptacle located in a convenient location inside the vault, near the entrance.

3.6.2.8. Emergency Power Installations

(1) Where a generator intended to supply emergency power for lighting, fire safety and life safety systems is located in a *building*, except where such *building* is used solely for the purpose of housing the generator and its ancillary equipment, it shall be located in a room that

- (a) is separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 2 h, and
- (b) contains only the generating set and equipment that is related to the emergency power supply system.

3.6.2.9. Storage of Oxygen Containers

(1) In a Group B, Division 2 or 3 *occupancy* or in a *retirement home*, a room for the storage of oxygen containers shall be

- (a) separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h,
- (b) designed for the storage of oxygen containers only,
- (c) vapour tight,
- (d) lined with *noncombustible* finish,
- (e) separately exhausted to the exterior, and
- (f) equipped with racks to store the containers.

3.6.3. Vertical Service Spaces and Service Facilities

3.6.3.1. Fire Separations for Vertical Service Spaces

- (1) Except as provided in Articles 3.6.3.3. and 3.6.3.5. and Section 3.5., a *vertical service space* shall be separated from all other portions of each adjacent *storey* by a *fire separation* having a *fire-resistance rating* conforming to Table 3.6.3.1. for the *fire-resistance rating* required by Subsection 3.2.2. for
- (a) the floor assembly above the *storey*, or
 - (b) the floor assembly below the *storey*, if there is no floor assembly above.
- (See Note A-3.6.3.1.(1))

Table 3.6.3.1.
Fire Separations for Vertical Service Space
Forming Part of Sentence 3.6.3.1.(1)

Fire-Resistance Rating of Fire Separation Required for Floor Assembly	Minimum Fire-Resistance Rating of Vertical Service Space
less than 45 min	---
45 min	45 min
1 h	45 min
1.5 h	1 h
2 h or more	1 h

- (2) A *vertical service space* that does not extend through the roof of a *building* shall be enclosed at the top with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.
- (3) A *vertical service space* that does not extend to the bottom of a *building* shall be enclosed at the lowest level with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.
- (4) A vent from a *vertical service space* not extending to the roof shall be enclosed within the *building* with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.
- (5) Only openings that are necessary for the use of the *vertical service space* shall be permitted through a *vertical service space* enclosure.

3.6.3.2. Foamed Plastic Protection

- (1) Foamed plastic insulation in a *vertical service space* shall be protected in conformance with Article 3.1.5.15.

3.6.3.3. Linen and Refuse Chutes

- (1) A linen chute or refuse chute shall
- (a) be impervious to moisture,
 - (b) have a smooth internal surface,
 - (c) be corrosion-resistant,
 - (d) be constructed of *noncombustible* material, and
 - (e) be located in a shaft in which there are no services other than *noncombustible* drain, waste and vent piping or *noncombustible* water piping.

- (2) A shaft containing a linen chute or refuse chute shall have a *fire-resistance rating* conforming to Sentence 3.6.3.1.(1), but not less than
- (a) 1 h if the chute outlet for the discharge room is protected by an automatic, self-latching *closure* held open by a fusible link, or
 - (b) 2 h if no *closure* is provided at the chute outlet into the discharge room.
- (3) An interior linen chute or refuse chute shall extend not less than 1 m above the roof and shall be vented above the roof with a vent which
- (a) has an unobstructed area not less than the cross-sectional area of the chute, and
 - (b) is equipped with a cover that will open automatically, or that can be opened manually, in the event of a fire in the chute.
- (4) Intake openings for a linen chute or a refuse chute shall
- (a) have an area not more than 60% of the cross-sectional area of the chute, and
 - (b) be fitted with *closures* designed to close automatically and latch after use.
- (5) Intake openings for a linen chute or a refuse chute shall be located in rooms or compartments that
- (a) have no dimension less than 750 mm,
 - (b) are separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 45 min,
 - (c) are designed for no other purpose, and
 - (d) do not open directly into an *exit*.
- (6) Sprinklers shall be installed at the top of each linen chute or refuse chute, at alternate floor levels and in the room or bin into which the chute discharges.
- (7) The room into which a linen chute discharges shall be separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 1 h.
- (8) A refuse chute shall be equipped at the top with spray equipment for washing-down purposes.
- (9) A refuse chute shall discharge only into a room or bin separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 2 h.
- (10) The room or bin into which a refuse chute discharges shall be of sufficient size to contain the refuse between normal intervals of emptying, be impervious to moisture and be equipped with a water connection and floor drain for washing-down purposes.
- (11) A room into which a refuse chute discharges shall contain no service equipment that is not related to refuse handling and disposal.

3.6.3.4. Exhaust Duct Negative Pressure

- (1) If a *vertical service space* contains an *exhaust duct* that serves more than one *fire compartment*, the duct shall have a fan located at or near the exhaust outlet to ensure that the duct is under negative pressure.

3.6.3.5. Grease Duct Enclosures (See Note A- 3.6.3.5.)

- (1) Except as provided in Sentence (2), *fire separations* enclosing grease ducts for commercial cooking operations shall conform to NFPA 96, “Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.”
- (2) The *fire-resistance rating* of field-applied and factory-built grease duct enclosure assemblies shall be determined in conformance with CAN/ULC-S144, “Standard Method of Fire Resistance Test - Grease Duct Assemblies.”

3.6.4. Horizontal Service Spaces and Service Facilities

3.6.4.1. Scope

(1) This Subsection applies to *horizontal service spaces* and service facilities, including ceiling spaces, duct spaces, crawl spaces and *attic or roof spaces*.

3.6.4.2. Fire Separations for Horizontal Service Spaces

(1) Except as provided in Article 3.6.3.5., a *horizontal service space* that penetrates a required vertical *fire separation* shall be separated from the remainder of the *building* it serves in conformance with Sentence (2).

(2) If a *horizontal service space* or other concealed space is located above a required vertical *fire separation* other than a vertical shaft, this space need not be divided at the *fire separation* as required by Article 3.1.8.3. provided the construction between this space and the space below is a *fire separation* with a *fire-resistance rating* equivalent to that required for the vertical *fire separation*, except that the *fire-resistance rating* is permitted to be not less than 30 min if the vertical *fire separation* is not required to have a *fire-resistance rating* more than 45 min. (See Note A-3.6.4.2.(2))

3.6.4.3. Plenum Requirements

(1) A concealed space used as a *plenum* within a floor assembly or within a roof assembly need not conform to Sentence 3.1.5.18.(1) and Article 3.6.5.1. provided

(a) all materials within the concealed space have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50, except for

(i) tubing for pneumatic controls,

(ii) optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and conform to Sentences 3.1.4.3.(2) and 3.1.5.21.(2),

(iii) totally enclosed non-metallic raceways with an FT6 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* required to be of *noncombustible construction* or in *buildings* or parts of *buildings* permitted to be of *encapsulated mass timber construction*, and

(iv) totally enclosed non-metallic raceways with an FT4 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* permitted to be of *combustible construction*, and,

(b) the supports for the ceiling membrane are of *noncombustible* material having a melting point not below 760°C.

(2) If a concealed space referred to in Sentence (1) is used as a return-air *plenum* and incorporates a ceiling membrane that forms part of the required *fire-resistance rating* of the assembly, every opening through the membrane shall be protected by a *fire stop flap* that

(a) stops the flow of air into the concealed space in the event of a fire,

(b) is supported in a manner that will maintain the integrity of the ceiling membrane for the duration of time required to provide the required *fire-resistance rating*,

(c) conforms to CAN/ULC-S112.2, “Standard Method Fire Test of Ceiling Firestop Flap Assemblies,” and

(d) activates at a temperature approximately 30°C above the normal maximum temperature that occurs in the return-air *plenum*, whether the air duct system is operating or shut down.

3.6.4.4. Attic or Roof Space Access

(1) An *attic or roof space* more than 600 mm high shall be provided with access from the floor immediately below by a hatchway not less than 550 mm by 900 mm or by a stairway.

3.6.4.5. Horizontal Service Space Access

(1) A *horizontal service space*, consisting of ceiling and duct spaces, that is more than 1 200 mm high and 600 mm wide shall have inspection doors not less than 300 mm in both horizontal and vertical dimensions placed so that the entire interior of the duct or space can be viewed.

3.6.4.6. Crawl Space Access

(1) A crawl space shall have at least one access opening not less than 550 mm by 900 mm.

3.6.5. Air Duct and Plenum Systems

3.6.5.1. Duct Materials

(1) Except as permitted by Sentences (2) to (5) and Article 3.6.4.3., all ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of steel, aluminum alloy, copper, clay or other *noncombustible* material.

(2) Except as permitted by Sentence (3), ducts, associated fittings and *plenums* are permitted to contain *combustible* material provided they

- (a) conform to the appropriate requirements for Class 1 duct materials in CAN/ULC-S110, “Standard Methods of Test for Air Ducts,”
- (b) conform to Article 3.1.5.18. in a *building* required to be of *noncombustible construction* or in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*,
- (c) conform to Subsection 3.1.9.,
- (d) are used only in horizontal runs in a *building* required to be of *noncombustible construction* or in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*,
- (e) are not used in vertical runs serving more than 2 *storeys* in a *building* permitted to be of *combustible construction*, and
- (f) are not used in air duct systems in which the air temperature could be more than 120°C.

(3) *Combustible* ducts which are part of a duct system conveying only ventilation air and are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) and (2).

(4) Duct sealants shall have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50.

(5) Duct connectors that contain *combustible* materials and that are used between ducts and air outlet units shall

- (a) conform to the appropriate requirements for Class 1 air duct materials in CAN/ULC-S110, “Standard Methods of Test for Air Ducts,”
- (b) be not more than 4 m long,
- (c) be used only in horizontal runs, and
- (d) not penetrate a required *fire separation*.

3.6.5.2. Vibration Isolation Connectors

(1) Except as permitted by Sentence (2), vibration isolation connectors in air duct systems shall be *noncombustible*.

(2) *Combustible* fabric vibration isolation connectors are permitted provided they

- (a) are not more than 250 mm long,
- (b) comply with the flame-resistance requirements of CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films,” and
- (c) are not used in a location where they are exposed to heated air or radiation from heat sources that could cause the exposed surface temperature to be more than 120°C.

3.6.5.3. Tape

(1) Tape used to seal joints in air ducts, *plenums* and other parts of air duct systems shall meet the flame-resistance requirements for fabric in CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.”

3.6.5.4. Coverings, Linings, Adhesives and Insulation

(1) Coverings, linings and associated adhesives and insulation for air ducts, *plenums* and other parts of air duct systems that would have an exposed surface temperature more than 120°C when exposed to heated air or radiation from heat sources shall be of *noncombustible* material.

(2) Except as permitted by Sentence (3), *combustible* coverings and linings, including associated adhesives and insulation, shall have

- (a) a *flame-spread rating* not more than 25 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction, and
- (b) a smoke developed classification not more than 50.

(3) The outer covering of ducts, *plenums* and other parts of air duct systems used within an assembly of *combustible construction* is permitted to have

- (a) an exposed surface *flame-spread rating* not more than 75, and
- (b) a smoke developed classification not more than 50.

(4) *Combustible* coverings and linings referred to in Sentences (2) and (3) shall not flame, glow, smoulder or smoke when tested in accordance with the method of test in ASTM C411, “Standard Specification for Hot-Surface Performance of High-Temperature Thermal Insulation,” at the maximum temperature to which the coverings and linings are to be exposed in service.

(5) Except as permitted by Sentence (6), foamed plastic insulation shall not be used as part of an air duct system or for insulating an air duct.

(6) Foamed plastic insulation is permitted to be installed in a ceiling space that is used as a return air *plenum* provided the foamed plastic insulation is protected from exposure to the *plenum* in accordance with Article 3.1.5.15.

(7) *Combustible* coverings and linings of ducts, including associated adhesives and insulation, shall be interrupted where the duct penetrates a *fire separation* and at the immediate area of operation of heat sources in a duct system, including electric resistance heaters or fuel-burning heaters or *furnaces*.

3.6.5.5. Insulation and Coverings

(1) Insulation and coverings on pipes in which the temperature of the fluid exceeds 120°C shall

- (a) be made of *noncombustible* material, or
- (b) not flame, glow, smoulder or smoke when tested in accordance with ASTM C411, “Standard Specification for Hot-Surface Performance of High-Temperature Thermal Insulation,” at the maximum temperature to which the insulation or covering is to be exposed in service.

(2) Except as permitted by Sentence (5), where *combustible* insulation is used on piping in a *horizontal service space* or a *vertical service space*, the insulation and coverings on that piping shall have a *flame-spread rating*, on any exposed surface and on any surface that would be exposed by cutting through the material in any direction,

- (a) not more than 25 in a *building* required to be of *noncombustible construction* or in a *building* or part of a *building* permitted to be of *encapsulated mass timber construction*, or
- (b) not more than 75 in a *building* permitted to be of *combustible construction*.

- (3) Except as permitted by Sentence (5), insulation and coverings on piping located in rooms and spaces other than the *service spaces* described in Sentence (2) shall have a *flame-spread rating* not more than that required for the interior finish of the ceiling of the room or space.
- (4) Except as permitted by Sentence (5), *combustible* insulation and covering used on piping in a *building* within the scope of Subsection 3.2.6. shall have a smoke developed classification not more than 100.
- (5) No *flame-spread rating* or smoke developed classification limits are required for *combustible* insulation and coverings used on piping located within a
- (a) concealed space in a wall,
 - (b) floor slab, or
 - (c) *noncombustible* enclosure.

3.6.5.6. Clearance of Ducts and Plenums

- (1) The clearance of *furnace plenums* from *combustible* material shall conform to the requirements of the appropriate standards referenced in Sentence 6.2.1.5.(1).
- (2) If the *plenum* clearance required in accordance with Sentence (1) is not more than 75 mm, the clearance between a *supply duct* and *combustible* material shall be not less than
- (a) the required *plenum* clearance within a horizontal distance of 450 mm from the *plenum*, and
 - (b) 12 mm at a horizontal distance of 450 mm or more from the *plenum*, except that this clearance is permitted to be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.
- (See Note A-3.6.5.6.(2))
- (3) If the *plenum* clearance required in accordance with Sentence (1) is more than 75 mm but not more than 150 mm, the clearance between a *supply duct* and *combustible* material shall be not less than
- (a) the required *plenum* clearance within a horizontal distance of 1 800 mm from the *plenum*, and
 - (b) 12 mm at a horizontal distance of 1 800 mm or more from the *plenum*, except that this distance is permitted to be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.
- (See Note A-3.6.5.6.(3))
- (4) If the *plenum* clearance required in accordance with Sentence (1) is more than 150 mm, the clearance between a *supply duct* and *combustible* material shall be not less than
- (a) the required *plenum* clearance within a horizontal distance of 1 000 mm from the *plenum*,
 - (b) 150 mm within a horizontal distance between 1 000 mm and 1 800 mm from the *plenum*, and
 - (c) 25 mm at a horizontal distance of 1 800 mm or more from the *plenum*, except that this distance is permitted to be reduced to 8 mm beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.
- (See Note A-3.6.5.6.(4))
- (5) If a register is installed in a floor directly over a pipeless *furnace*, a double-walled register box with not less than 100 mm between walls, or a register box with the warm-air passage completely surrounded by the cold-air passage, shall be permitted instead of the clearances listed in Sentences (2) to (4).

3.6.5.7. Supply, Return, Intake and Exhaust-Air Openings

- (1) *Combustible* grilles, diffusers and other devices for supply, return, and exhaust-air openings in rooms shall conform to the *flame-spread rating* and smoke developed classification requirements for the interior finish of the surface on which they are installed.

3.6.5.8. Return-Air System

- (1) Except as required by Sentences (2) and (3), *return ducts* shall be constructed of material having a *flame-spread rating* not more than 150.
- (2) If any part of a *return duct* will be exposed to radiation from the *furnace* heat exchanger or other radiating part within the *furnace*, that part of a *return duct* directly above or within 600 mm of the outside *furnace* casing shall be *noncombustible*.
- (3) *Return ducts* serving solid-fuel-burning *furnaces* shall be constructed of *noncombustible* material.
- (4) *Combustible return ducts* shall be lined with *noncombustible* material
 - (a) below floor registers,
 - (b) at the bottom of vertical ducts, and
 - (c) under *furnaces* having a bottom return.

Section 3.7. Health Requirements

3.7.1. Height and Area of Rooms

3.7.1.1. Room and Space Height

- (1) The height of every room and space shall be sufficient so that the ceiling or ceiling fixtures do not obstruct movement or activities below.
- (2) The unobstructed height in *dwelling units* and sleeping rooms in Group C *occupancies* shall conform to Subsection 9.5.3.

3.7.1.2. Residential Room Dimensions

- (1) The areas of rooms in *dwelling units*, dormitories, boarding houses and rooming houses shall conform to Part 9.

3.7.1.3. Sleeping Areas in Group B and Child Care Facilities

- (1) Except as provided in Sentence (2), a sleeping area in a Group B *occupancy* shall provide not less than 4.7 m² per person in a room having
 - (a) an area not less than 7 m²,
 - (b) a horizontal dimension not less than 2 000 mm, and
 - (c) a ceiling height not less than 2 300 mm.
- (2) Sleeping rooms for residents in long-term care homes shall have, exclusive of space provided for washrooms and for built-in or portable clothes closets, a floor space not less than
 - (a) 10.22 m² in a single-bed unit,
 - (b) 16.72 m² in a two-bed unit,
 - (c) 25.08 m² in a three-bed unit, and
 - (d) 29.73 m² in a four-bed unit.
- (3) A child care facility shall provide sleeping accommodation having not less than 0.93 m² of floor surface area for each child with not less than 2 300 mm ceiling height over the entire room area.

3.7.1.4. Sleeping Areas in Camps

- (1) *Recreational camps* shall have an area in the sleeping quarters of not less than 3.72 m² per camper or, if double or triple tier bunk units are used, 2.79 m² per camper.
- (2) A *camp for housing of workers* shall have an area of not less than 3.72 m² per employee in every room used for sleeping purposes.

3.7.2. Windows

3.7.2.1. Window Areas

- (1) Except as provided in Sentences (2) and (3) or otherwise permitted, every room used for sleeping in any *building*, and every principal room such as living room, dining room or combination of them in *dwelling units* shall be provided with windows having areas conforming to Part 9, except that Article 9.9.10.1. does not apply. (See Note A-3.7.2.1.(1))
- (2) Long-term care homes shall have,
 - (a) in an activity room, a sitting room or a lounge, one or more windows with a total unobstructed glass area, exclusive of skylights, of not less than 10% of the area of the room, and
 - (b) in a residents' sleeping room, one or more windows that
 - (i) have a total unobstructed glass area, exclusive of skylights, of not less than 10% of the area of the room,
 - (ii) open to the outdoors and have a total unobstructed glass area, exclusive of skylights, of not less than 5% of the area of the room, and
 - (iii) are installed with the bottom edge of the glass of every window not more than 660 mm above the floor.
- (3) Play activity rooms in a child care facility and work areas in *live/work units* shall have one or more windows that conform to Clause (2)(a).

3.7.3. Reserved

3.7.4. Plumbing Facilities

3.7.4.1. Plumbing and Drainage Systems

- (1) Except as provided in Sentence (3), each *building* situated on property that abuts on a *street* in which a public or municipal water main is located shall be provided with or have accessible to its occupants a *plumbing system* including a *potable* water supply, a *sanitary drainage system* and *plumbing fixtures*.
- (2) When the installation of a *sanitary drainage system* is not possible because of the absence of a water supply, sanitary privies, chemical closets or other means for the disposal of human waste shall be provided.
- (3) *Plumbing fixtures* need not be provided in a *building* that is not normally occupied by persons where such installations are impractical and other *fixtures* are available in nearby *buildings* when the subject *building* is in use.

3.7.4.2. Plumbing Fixtures, General

- (1) Except as provided in Sentence (2), for the purposes of this Subsection, the *occupant load* shall be determined in accordance with the provisions in Subsection 3.1.17. except that in a Group D *occupancy*, the area per person shall be 14 m². (See Note A-3.7.4.2.(1))

- (2) For the purpose of this Subsection, the *occupant load* for *floor areas* that are classified as an *industrial occupancy* is permitted to be based solely on the total number of staff for which the *floor area* is designed, where the *floor area* is only intermittently occupied or where the presence of occupants is transitory. (See Note A-3.7.4.2.(2))
- (3) Except as permitted by this Subsection, water closets shall be provided for each sex assuming that the *occupant load* is equally divided between males and females, unless the proportion of each sex expected in the *building* can be determined with reasonable accuracy. (See Note A-3.7.4.2.(3))
- (4) Except as provided in Sentence (5), urinals are permitted to be substituted for water closets required by this Subsection for males and may be counted as water closets provided the number of urinals is not more than
- (a) one-fifth of the required number of water closets in hospitals and long-term care homes, and
 - (b) two-thirds of the required number of water closets in any other *occupancy*.
- (5) If only two water closets are required for males, one urinal is permitted to be substituted for one of the water closets.
- (6) Except as required in this Subsection, at least one lavatory shall be provided in a room containing one or two water closets or urinals, and at least one additional lavatory shall be provided for each additional two water closets or urinals. (See Note A-3.7.4.2.(6))
- (7) Wash fountains in circular or straight trough form are permitted to be provided in lieu of required lavatories provided each 500 mm of circumference or trough length is considered to be the equivalent of one lavatory.
- (8) The water closet and lavatory provided in the universal washroom described in Sentence 3.8.3.12.(1) may be counted as part of the *plumbing fixtures* required for males and females in this Subsection if
- (a) more than one water closet is required for males, and
 - (b) more than one water closet is required for females.
- (9) Where one water closet is required for males and one water closet is required for females, the following may be provided in lieu of the water closets otherwise required by this Subsection:
- (a) one universal washroom conforming to Sentence 3.8.3.12.(1), and
 - (b) one washroom containing one water closet that is permitted to be used by both sexes provided the door to the room can be locked from the inside.
- (See Note A-3.7.4.2.(9))
- (10) Both sexes are permitted to be served by a single water closet if the *occupant load* is not more than 10 persons in an *assembly occupancy* referred to in Article 3.7.4.3. except for
- (a) elementary and secondary schools,
 - (b) child care facilities,
 - (c) places of worship, and
 - (d) undertaking premises.
- (11) Any shelf or projection above a lavatory shall be located so that it will not be a hazard.
- (12) Except for *dwelling units*, lavatories required by Sentence (6) shall be equipped with faucets that
- (a) operate automatically, or
 - (b) have a manual control that
 - (i) has a lever type handle or is otherwise operable with a closed fist,
 - (ii) does not require the application of continuous force to maintain water flow, and
 - (iii) where metered, provides at least 10 s of water flow.

3.7.4.3. Plumbing Fixtures for Assembly Occupancies

- (1) Except as provided by Sentences (2) to (16) and Sentence 3.7.4.2.(10), the number of water closets required for *assembly occupancies* shall conform to Table 3.7.4.3.-A.

Table 3.7.4.3.-A
Water Closets for Assembly Occupancies
 Forming Part of Sentence 3.7.4.3.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets for Males	Minimum Number of Water Closets for Females
1 - 25	1	1
26 - 50	1	2
51 - 75	2	3
76 - 100	2	4
101 - 125	3	5
126 - 150	3	6
151 - 175	4	7
176 - 200	4	8
201 - 250	5	9
251 - 300	5	10
301 - 350	6	11
351 - 400	6	12
Over 400	7 plus 1 for each additional increment of 200 males in excess of 400	13 plus 1 for each additional increment of 100 females in excess of 400

(2) Except for motion picture *theatres*, the number of water closets required for Group A, Division 1 *occupancies* shall conform to Table 3.7.4.3.-B.

Table 3.7.4.3.-B
Water Closets for Assembly Occupancies
 Forming Part of Sentence 3.7.4.3.(2)

Number of Persons of Each Sex	Minimum Number of Water Closets for Males	Minimum Number of Water Closets for Females
1 to 50	1	2
51 to 75	2	3
76 to 100	2	4
101 to 125	3	5
126 to 150	3	6
151 to 175	4	7
176 to 200	4	8
201 to 250	5	9
251 to 300	5	10
301 to 350	6	11
351 to 400	6	12
over 400	7 plus 1 for each additional increment of 200 males in excess of 400	13 plus 1 for each additional increment of 100 females in excess of 400

- (3) The number of water closets required shall conform to Table 3.7.4.3.-C for
- (a) motion picture *theatres*,
 - (b) Group A, Division 3 *occupancies*,
 - (c) Group A, Division 4 *occupancies*, and
 - (d) *outdoor pools*.

Table 3.7.4.3.-C
Water Closets for Assembly Occupancies
 Forming Part of Sentences 3.7.4.3.(3) and 3.11.9.1.(4)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
1 to 50	1
51 to 150	2
151 to 250	3
251 to 375	4
376 to 500	5
over 500	6 plus 1 for each additional increment of 150 persons of each sex in excess of 500

- (4) Except as provided in Sentences (6) and (7), the number of water closets required for dining rooms, restaurants and cafeteria shall conform to Table 3.7.4.3.-D.

Table 3.7.4.3.-D
Water Closets for Assembly Occupancies
 Forming Part of Sentences 3.7.4.3.(4) and (7)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
1 to 20	1
21 to 70	2
71 to 105	3
106 to 135	4
136 to 165	5
166 to 195	6
196 to 225	7
226 to 275	8
276 to 325	9
326 to 375	10
376 to 425	11
over 425	12 plus 1 for each additional increment of 50 persons of each sex in excess of 425

- (5) The number of water closets required for establishments used primarily for the consumption of alcoholic beverages that provide limited or no food service shall conform to Table 3.7.4.3.-E.

Table 3.7.4.3.-E
Water Closets for Assembly Occupancies
 Forming Part of Sentences 3.7.4.3.(5) and 3.14.1.8.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
1 to 50	2
51 to 70	3
71 to 90	4
91 to 110	5
111 to 140	6
141 to 180	7
181 to 220	8
221 to 260	9
over 260	10 plus 1 for each additional increment of 40 persons of each sex in excess of 260

(6) In every dining room, restaurant, cafeteria and alcoholic beverage establishment having more than 40 seats, separate sanitary facilities shall be provided for employees, in addition to facilities provided for patrons, and the number of water closets and lavatories required shall conform to Table 3.7.4.3.-F.

Table 3.7.4.3.-F
Plumbing Fixtures for Assembly Occupancies
 Forming Part of Sentence 3.7.4.3.(6)

Number of Employees of Each Sex	Minimum Number of Water Closets and Lavatories for Males	Minimum Number of Water Closets and Lavatories for Females
1 to 9	1	1
10 to 24	2	2
25 to 49	3	3
50 to 74	4	4
75 to 100	5	5
over 100	6 plus 1 for each additional increment of 30 male employees in excess of 100	6 plus 1 for each additional increment of 30 female employees in excess of 100

(7) Except as provided in Sentence (8), in every dining room, restaurant, cafeteria and alcoholic beverage establishment having not more than 40 seats, employees are permitted to share the sanitary facilities provided for patrons, and the minimum number of water closets shall conform to Table 3.7.4.3.-D based on

- (a) a male *occupant load* of 50% of the number of seats plus the number of male employees, and
- (b) a female *occupant load* of 50% of the number of seats plus the number of female employees.

(8) Where a separate employee washroom is provided, the same room may be used by both female and male employees provided that

- (a) the total number of employees is not more than 5, and
- (b) the door to the room can be locked from the inside.

(9) The number of employees in Sentences (6) to (8) shall be the maximum number of employees who are normally present on the premises at one time and shall include only those who are present for more than 25 per cent of the working day.

- (10) For a parking lot that is part of a restaurant where patrons are intended to eat in vehicles parked on the lot, the number of water closets required shall conform to,
- (a) Table 3.7.4.3.-G where food service by employees is not provided on the parking lot, or
 - (b) Table 3.7.4.3.-H where employees serve food on the parking lot.
- (11) The number of water closets required for drive-in *theatres* shall conform to Table 3.7.4.3.-H.
- (12) The number of water closets required for dance halls and recreational establishments shall be at least one fixture for each 100 males and one fixture for each 75 females.
- (13) In a child care facility the maximum number of children per water closet and lavatory shall conform to Table 3.7.4.3.-I.
- (14) The number of water closets required for elementary and secondary schools shall be at least one fixture for each 30 males and one fixture for each 26 females.
- (15) The number of water closets required for non-residential college *buildings* shall be at least one fixture for each 100 males and one fixture for each 75 females.
- (16) The number of water closets required for places of worship and undertaking premises shall be at least one fixture for each 150 persons of each sex.

Table 3.7.4.3.-G
Water Closets for Assembly Occupancies
 Forming part of Sentence 3.7.4.3.(10)

Number of Parking Spaces	Minimum Number of Water Closets for Each Sex
1 to 20	1
21 to 70	2
71 to 105	3
106 to 135	4
136 to 165	5
166 to 195	6
196 to 225	7
226 to 275	8
276 to 325	9
326 to 375	10
376 to 425	11
over 425	12 plus 1 for each additional increment of 50 parking spaces in excess of 425

Table 3.7.4.3.-H
Water Closets for Assembly Occupancies
 Forming part of Sentences 3.7.4.3.(10) and (11)

Number of Parking Spaces	Minimum Number of Water Closets for Each Sex
1 to 40	1
41 to 140	2
141 to 210	3
211 to 270	4
271 to 330	5
331 to 390	6
391 to 450	7
451 to 550	8
551 to 650	9
651 to 750	10
751 to 850	11
over 850	12 plus 1 for each additional increment of 100 parking spaces in excess of 850

Table 3.7.4.3.-I
Plumbing Fixtures for a Child Care Facility
 Forming Part of Sentence 3.7.4.3.(13)

Age of Children	Maximum Number of Children per Water Closet and Lavatory
under 2	10 without regard to number of each sex
2 to 5	10 without regard to number of each sex
6 to 9	15 for males; 15 for females
over 9	30 for males; 26 for females

3.7.4.4. Plumbing Fixtures for Care, Care and Treatment or Detention Occupancies

- (1) The number of water closets and lavatories required for Group B, Division 1 *occupancies* shall be determined on the basis of the special needs of these *occupancies*.
- (2) In a Group B, Division 2 or 3 *occupancy*, washrooms shall be provided so that each washroom
 - (a) serves not more than four patients or residents,
 - (b) is accessible from patients' or residents' sleeping rooms,
 - (c) contains one water closet, and
 - (d) contains one lavatory.
- (3) The number of water closets required for employees in Group B, Division 2 or 3 *occupancies* shall conform to Table 3.7.4.4.

Table 3.7.4.4.
Water Closets in Group B, Division 2 or 3 Occupancies
 Forming Part of Sentence 3.7.4.4.(3)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
up to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	6 plus 1 for each additional increment of 30 persons of each sex in excess of 100

3.7.4.5. Plumbing Facilities for Dwelling Units

- (1) A *dwelling unit* where a piped water supply is available shall be provided with a
- kitchen sink,
 - lavatory,
 - water closet or drainless composting water closet, and
 - bathtub or shower stall.

3.7.4.6. Plumbing Fixtures for Other Residential Occupancies

- (1) Except for *dwelling units* and as provided in Sentence (2), the number of water closets required for *residential occupancies* shall conform to Table 3.7.4.6.

Table 3.7.4.6.
Water Closets For Residential Occupancies
 Forming Part of Sentence 3.7.4.6.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
Up to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	6 plus 1 for each additional increment of 30 persons of each sex in excess of 100

- (2) At least one water closet or privy shall be provided for every
- 10 campers of each sex in a *recreational camp*, and
 - 10 employees of each sex in a *camp for housing of workers*.
- (3) In *recreational camps* and *camps for housing of workers*, no fewer than two lavatories or provision for a pail or other portable container of sound construction shall be provided for each of the water closets or privies required in Sentence (2).

- (4) A camp for housing of workers shall include
 - (a) at least one shower or other area of bathing, and
 - (b) provisions for at least one washing machine or laundry tub for every 15 beds.

3.7.4.7. Plumbing Fixtures for Business and Personal Services Occupancies

- (1) Except as provided in Sentence (2), the number of water closets required for *business and personal services occupancies* shall conform to Table 3.7.4.7.
- (2) Not more than one water closet to serve both sexes need be provided in a Group D *occupancy* having an *occupant load* of not more than 10 persons.

Table 3.7.4.7.
Water Closets for Business and Personal Services Occupancies
 Forming Part of Sentence 3.7.4.7.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
up to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	6 plus 1 for each additional increment of 30 persons of each sex in excess of 100

3.7.4.8. Plumbing Fixtures for Mercantile Occupancies

- (1) Except as provided in this Article, the number of water closets required for employees in *mercantile occupancies* shall conform to Table 3.7.4.8.
- (2) Except as provided in Sentence (4), the number of water closets required for the public in *mercantile occupancies* shall be at least one fixture for each 300 males and one fixture for each 150 females, except that
 - (a) water closets provided for employees are permitted to be counted as part of those required for the public when these water closets are made accessible to the public, and
 - (b) where the total area of the *mercantile occupancy*, excluding *basements*, is not more than 600 m², not more than one water closet for each sex need be provided.

Table 3.7.4.8.
Water Closets for Mercantile Occupancies
 Forming Part of Sentence 3.7.4.8.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets for Each Sex
up to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	6 plus 1 for each additional increment of 30 persons of each sex in excess of 100

- (3) Not more than one water closet to serve both sexes need be provided in a Group E *occupancy* where
- the *occupant load* is not more than nine persons, or
 - where the total area of the *occupancy*, excluding *basements*, is not more than 300 m².
- (4) For a restaurant classified as *mercantile occupancy*, the number of water closets and lavatories required shall conform to Article 3.7.4.3.

3.7.4.9. Plumbing Fixtures for Industrial Occupancies

- (1) Except as provided in Sentence (2), the number of water closets and lavatories required for *industrial occupancies* shall conform to Table 3.7.4.9.
- (2) Not more than one water closet to serve both sexes need be provided in a Group F *occupancy* where,
- the *occupant load* is not more than 10 persons, or
 - the total area of the *occupancy*, excluding *basements*, is not more than 300 m².

Table 3.7.4.9.
Plumbing Fixtures for Industrial Occupancies
 Forming Part of Sentence 3.7.4.9.(1)

Number of Persons of Each Sex	Minimum Number of Water Closets and Lavatories for Each Sex
up to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	6 plus 1 for each additional increment of 30 persons of each sex in excess of 100

3.7.4.10. Glazing

- (1) Glazing used for a shower or bathtub enclosure shall conform to Class A of CAN/CGSB 12.1, “Safety Glazing.”

3.7.4.11. Surface Protection

- (1) Wall and floor surfaces below the uppermost surfaces of urinals shall be protected from deterioration by impervious and durable material for a distance from the urinal to a point not less than 900 mm from the projected outline of the urinal on to the wall or floor.
- (2) Floor surfaces around a water closet shall be protected from deterioration by impervious and durable material for a distance not less than 900 mm from the projected outline of the water closet on to the floor.

3.7.4.12. Floor Drains

- (1) A floor drain shall be installed in a washroom for *public use* that contains a urinal or a water closet equipped with an automatic flushing device. (See Note A-3.7.4.12.(1))

3.7.4.13. Grab Bar Installation

- (1) Grab bars that are installed shall resist a minimum load of 1.3 kN applied vertically or horizontally.

3.7.4.14. Clearances for Water Closets

(1) Except in a *dwelling unit* and except as required by Section 3.8., a minimum clearance of 380 mm shall be provided in front of a water closet. (See Note A-3.7.4.14.(1))

3.7.4.15. Privacy

(1) If a room contains not more than 1 water closet, the doorway to the room shall be provided with a full height door that is capable of being locked from the inside.

(2) Except in a room for *private use*, water closets, urinals, showers and bathtubs shall not be visible from the entrance to the room where it contains at least

- (a) two water closets,
- (b) one water closet and one urinal,
- (c) one shower stall, or
- (d) one bathtub.

3.7.4.16. Water Temperature Control

(1) A *water distribution system* supplying hot water to *plumbing fixtures* shall conform to the requirements in Subsection 7.2.10.

3.7.4.17. Drinking Water

(1) On every floor where work will be performed and within 100 m of any area where work will be performed, *potable* water shall be provided from

- (a) a fountain with an upward jet,
- (b) a tap from a piped water supply, or
- (c) a tap from a covered vessel.

3.7.4.18. Pharmacies

(1) Every *pharmacy* shall be provided with a sink with hot and cold *potable* water for washing utensils used in the preparation, service or storage of drugs.

3.7.4.19. Plumbing Fixtures for Mobile Home Facilities

(1) If mobile homes do not have individual plumbing facilities connected to a central water supply and drainage system, a service *building* shall be provided for public use.

(2) The service *building* required by Sentence (1) shall contain

- (a) at least one water closet for each sex if the service *building* facilities serve not more than 10 mobile homes, and
- (b) an additional water closet for each sex for each additional 10 mobile homes.

(3) If a service *building* is required by Sentence (1) it shall contain lavatories as required by Sentence 3.7.4.2.(5) and at least

- (a) one laundry tray or similar facility, and
- (b) one bathtub or shower for each sex.

3.7.5. Health Care Facility Systems

3.7.5.1. Electrical Systems

(1) In anaesthetizing locations, electrical systems shall be designed, constructed, installed and tested in conformance with CSA Z32, “Electrical Safety and Essential Electrical Systems in Health Care Facilities.”

3.7.5.2. Medical Gas Piping

- (1) All medical gas piping systems shall be designed, constructed, installed and tested in conformance with
- (a) CSA Z7396.1, “Medical gas piping systems - Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems,” and
 - (b) the provisions of the Fire Code made under the *Fire Protection and Prevention Act, 1997* or, in the absence of such provisions, Part 3 of Division B of the CCBFC NRCC-CONST-56437E, “National Fire Code of Canada.”

3.7.5.3. Shielding of X-Ray Equipment

(1) Every installation of an *x-ray machine* or of *x-ray equipment* in a *building* shall be shielded to protect any person who could be exposed to radiation inside and outside the *building*. (See Note A-3.7.5.3.(1))

3.7.6. Food Premises

3.7.6.1. Application

(1) The requirements of this Subsection apply to all *food premises*.

3.7.6.2. Room Finishes

- (1) Except as provided in Sentence (2), floors and floor coverings shall be tight, smooth and non-absorbent in rooms where
- (a) food or drink for human consumption, or an ingredient of food or drink for human consumption, is manufactured, processed, prepared, stored, displayed, handled, served, distributed, sold or offered for sale,
 - (b) utensils are washed, or
 - (c) washing *fixtures* or toilet *fixtures* are located.
- (2) Carpeting may be used in areas where food is served.
- (3) Wall and ceiling finishes of rooms and passageways shall be easy to clean.

3.7.6.3. Location of Plumbing Fixtures

- (1) A room containing a water closet shall be located where
- (a) it does not open directly into any room or area where food or drink for human consumption, or an ingredient of food or drink for human consumption, is intended to be stored, prepared, processed, distributed, served, sold or offered for sale, and
 - (b) it is not necessary for the public to go through the food preparation areas to gain access to the *plumbing fixtures*.
- (2) Except as permitted in Sentence (3), a room containing *plumbing fixtures* for the public and employees in a restaurant shall be located in the restaurant.

- (3) A room containing *plumbing fixtures* for the public in Sentence (2) need not be located in the restaurant if
 - (a) the room is located in the *building* containing the restaurant, and
 - (b) the distance of travel between the restaurant and the room is not more than 45 m.

3.7.6.4. Lavatories, Appliances and Sinks

- (1) A separate lavatory for the handwashing of employees shall be constructed in a location convenient for employees in each manufacturing, processing and preparation area.
- (2) If equipment and facilities for the cleaning and sanitizing of utensils are provided, they shall consist of
 - (a) mechanical equipment, or
 - (b) drainage racks of corrosion-resistant materials and
 - (i) a three-compartment sink or three sinks, or
 - (ii) a two-compartment sink or two sinks, where the first compartment or sink can be used effectively for washing and rinsing and the second compartment or sink can be used effectively for sanitizing.
- (3) A retail *food premises* is exempt from compliance with this Article if its eating and drinking area does not exceed 56 m² and any one or more of the following applies:
 - (a) it is designed to sell only cold drinks in or from the original container,
 - (b) it is designed to sell only frozen confections in the original package or wrapper,
 - (c) it is designed to prepare and sell only hot beverages,
 - (d) it is designed to prepare and sell only popped corn, roasted nuts or french-fried potatoes,
 - (e) it is designed to sell only food or drink for human consumption that
 - (i) is pre-packaged at a premises other than the *food premises* at which it is being offered for sale, and
 - (ii) is not capable of supporting the growth of pathogenic organisms or the production of the toxins of such organisms.

3.7.6.5. Hot and Cold Water Supply

- (1) A hot and cold water supply shall be provided to
 - (a) every *plumbing appliance* and *fixture* required by Article 3.7.6.4.,
 - (b) every area where food or drink for human consumption, or an ingredient of food or drink for human consumption, is manufactured, processed or prepared, and
 - (c) every area where utensils are washed.
- (2) This Article does not apply to a retail *food premises* described in Sentence 3.7.6.4.(3).

3.7.6.6. Employee Facilities

- (1) In a *food premises*, where dressing rooms are provided for employees, there shall be separate dressing rooms for males and females that
 - (a) are large enough for the employees to change and store their clothing, and
 - (b) are equipped with lockers or other facilities suitable for storing the clothing of the employees.
- (2) Every room containing *sanitary units* for employees shall have a floor area not less than 2.3 m².

3.7.6.7. Sleeping Quarters

- (1) A room or space intended to be used as sleeping quarters shall not open directly into any room where food or drink for human consumption, or an ingredient of food or drink for human consumption, is manufactured, processed, prepared, stored, displayed, handled, served, distributed, sold or offered for sale.

Section 3.8. Barrier-Free Design (See Note 3.8.)

3.8.1. General

3.8.1.1. Application (See Note A-3.8.)

- (1) The requirements of this Section apply to all *buildings* except
 - (a) detached houses, semi-detached houses, houses with a *secondary suite*, duplexes, triplexes, townhouses, row houses and boarding or rooming houses with fewer than 8 boarders or roomers, (See Note A-1.4.1.2.(1) of Division A, Secondary Suite)
 - (b) *buildings* of Group F, Division 1 *major occupancy*, (See Note A-3.8.1.1.(1)(b))
 - (c) *buildings* that are not intended to be occupied on a daily or full time basis, including automatic telephone exchanges, pumphouses and substations, and
 - (d) *camps for housing of workers*. (See Note A-3.8.1.1.(1)(d))

3.8.1.2. Entrances (See Note A-3.8.1.2.)

- (1) Except as provided in Sentence 3.13.8.1.(2) and except for service entrances, all pedestrian entrances to a *barrier-free storey* of a *building* referred to in Sentence 3.8.1.1.(1) shall be *barrier-free* and shall connect to a *barrier-free* exterior path of travel complying with Sentence 3.8.2.2.(1).
- (2) In addition to the *barrier-free* entrances required by Sentence (1), a *suite of assembly occupancy, business and personal services occupancy or mercantile occupancy* that is located in the *first storey* of a *building* or in a *storey* to which a *barrier-free* path of travel is provided, and that is separated from the remainder of the *building* so that there is no access to the remainder of the *building*, shall have at least one *barrier-free* entrance.
- (3) A *barrier-free* entrance shall
 - (a) be designed in accordance with Article 3.8.3.3., and
 - (b) lead from
 - (i) the outdoors at sidewalk level, or
 - (ii) a *ramp* that conforms to Article 3.8.3.4. and leads from a sidewalk.
- (4) At a *barrier-free* entrance that includes more than one doorway, only one of the doorways is required to be designed in accordance with Article 3.8.3.3.
- (5) If a *walkway* or pedestrian bridge connects two *barrier-free storeys* in different *buildings*, the path of travel from one *storey* to the other *storey* by means of the *walkway* or bridge shall be *barrier-free*.

3.8.1.3. Barrier-Free Path of Travel

- (1) Except as required in Sentence (4) and except as permitted in Subsection 3.8.3., every *barrier-free* path of travel shall provide an unobstructed width of at least 1 100 mm for the passage of wheelchairs.
- (2) Interior and exterior walking surfaces that are within a *barrier-free* path of travel shall
 - (a) have no opening that will permit the passage of a sphere more than 13 mm in diam,
 - (b) have any elongated openings oriented approximately perpendicular to the direction of travel,
 - (c) be stable, firm and slip-resistant,
 - (d) be bevelled at a maximum slope of 1 in 2 at changes in level not more than 13 mm, and
 - (e) be provided with sloped floors or *ramps* at changes in level more than 13 mm.(See Note A-3.8.1.3.(2))
- (3) A *barrier-free* path of travel is permitted to include *ramps*, passenger elevators or other platform equipped passenger elevating devices to overcome a difference in level.

- (4) Every *barrier-free* path of travel less than 1 600 mm in width shall be provided with an unobstructed space not less than 1 800 mm in width and 1 800 mm in length located not more than 30 m apart. (See Note A-3.8.1.3.(4))
- (5) Where the headroom of an area in a *barrier-free* path of travel is reduced to less than 1 980 mm, a guardrail or other barrier with its leading edge at or below 680 mm from the finished floor shall be provided. (See Note A-3.8.1.3.(5) and (6)(b))
- (6) A normally occupied *floor area* that is not required by Article 3.8.2.1. to have a *barrier-free* path of travel shall meet the following requirements:
- (a) interior walking surfaces throughout the normally occupied *floor area* shall comply with Clauses (2)(a) to (e), and
 - (b) where the headroom of an area in a corridor or aisle in the normally occupied *floor area* is reduced to less than 1 980 mm, a guardrail or other barrier with its leading edge at or below 680 mm from the finished floor shall be provided. (See Note A-3.8.1.3.(5) and (6)(b))

3.8.1.4. Escalators and Moving Walks

- (1) In a *building* in which an escalator or inclined moving walk provides access to any floor level above or below the entrance floor level, an interior *barrier-free* path of travel shall be provided to that floor level. (See Note A-3.8.1.4.(1))
- (2) The route from the escalator or inclined moving walk to the *barrier-free* path of travel required by Sentence (1) shall be clearly indicated by appropriate signs.
- (3) In a *building* in which a moving walk provides access between areas on the same floor level, a *barrier-free* path of travel shall be provided between the areas served by the moving walk.

3.8.1.5. Controls

- (1) Except as required by Sentences 3.5.2.2.(1) and 3.8.3.5.(1) for elevators and Sentence 3.8.3.3.(17) for power door operator controls, controls for the operation of *building* services or safety devices, including electrical switches, thermostats and intercom switches, intended to be operated by the occupant and located in a *barrier-free* path of travel shall
- (a) be mounted
 - (i) 1 200 mm above the finished floor, in the case of a thermostat or a manual station, and
 - (ii) not less than 900 mm and not more than 1 100 mm above the finished floor, in the case of all other controls, and
 - (b) be located so as to be adjacent to and centred on either the length or the width of a clear floor space of 810 mm by 1 370 mm, and
 - (c) be operable
 - (i) using one hand, without requiring tight grasping, pinching with fingers or twisting of the wrist, and with a force of not more than 22.2 N, in the case of a manual station, and
 - (ii) using a closed fist and with a force of not more than 22.2 N, in the case of all other controls.
- (See Note A-3.8.1.5.(1))

- (2) A signal intended for the public to indicate the operation of a *building* security system that controls access to a *building* shall consist of an audible and visual signal.

3.8.1.6. Illumination

- (1) All portions of a *barrier-free* path of travel shall be equipped to provide a level of illumination in accordance with Sentence 3.2.7.1.(1).

3.8.2. Occupancy Requirements

3.8.2.1. Areas Requiring Barrier-Free Path of Travel

- e1 (1) Except as permitted by Sentence (3), a *barrier-free* path of travel from the entrances required by Sentences 3.8.1.2.(1) and (2) to be *barrier-free* shall be provided
- (a) throughout the entrance *storey*, and
 - (b) within all normally occupied *floor areas* and rooftop amenity spaces, unless as permitted by Sentence (2).
(See Note A-3.8.2.1.(b)) (See Article 3.3.1.7. for additional requirements regarding *floor areas* above or below the *first storey* to which a *barrier-free* path of travel is required).
(See Note A.3.8.2.1.(1))
- (2) A *barrier-free* path of travel described in Clause (1)(b) is not required to extend
- (a) to *floor areas* or portions of *floor areas* containing a Group B, Division 2 or 3 *occupancy* that are not required by Article 3.5.2.1. to be connected by a *ramp* or served by an elevator,
 - (b) to *floor areas* containing Group C or Group D *occupancies* that are located in a *building* that
 - (i) is three or fewer *storeys* in *building height*, and
 - (ii) has a *building area* not exceeding 600 m²,
(See Note A.3.8.2.1.(2)(b))
 - (c) to portions of restaurants and licensed beverage establishments where the same amenities and uses are provided on other *floor areas* that have a *barrier-free* path of travel, or
 - (d) to portions of child care facilities that have all entrance doors at floor levels that do not have a *barrier-free* path of travel.
(See Note A-3.8.2.1.(2))
- (3) A *barrier-free* path of travel described in Sentence (1) is not required
- (a) into *service rooms*,
 - (b) into elevator machine rooms,
 - (c) into janitors' rooms,
 - (d) into *service spaces*,
 - (e) into crawl spaces,
 - (f) into *attic or roof spaces*,
 - (g) into *high-hazard industrial occupancies*,
 - (h) within portions of a *floor area* with fixed seats in an *assembly occupancy* where these portions are not part of the *barrier-free* path of travel to
 - (i) spaces designated for wheelchair use,
 - (ii) seats designated for *adaptable seating*, or
 - (iii) spaces for the storage of wheelchairs and *mobility assistive devices*,
 - (i) to *suites* of *residential occupancy* that are in *storeys* other than the entrance *storey* and that have all entrance doors at floor levels that are not required to have a *barrier-free* path of travel,
 - (j) except as required by Sentence (5), on the inside of a *suite* of *residential occupancy*,
 - (k) to portions of a *floor area* that are not at the same level as the entry level, provided amenities and uses provided on any raised or sunken level are accessible on the entry level by means of a *barrier-free* path of travel,
 - (l) within a parking level with no *barrier-free* parking spaces, or
 - (m) to the floor level above or below the entrance level in *buildings* no more than 2 *storeys* in *building height* or in 2-*storey suites*, unless the floor level above or below
 - (i) is served by a passenger elevator, a platform-equipped passenger-elevating device, an escalator or an inclined moving walk,
 - (ii) is 600 m² or more in *floor area*,
 - (iii) contains facilities that are not contained on the entrance level, but that are integral to the principal function of the entrance level, or
 - (iv) contains an *assembly occupancy* more than 100 m² in *floor area*.
(See Note A-3.8.2.1.(3)(m))
(See Note A-3.8.2.1.(3))

- (4) In an *assembly occupancy* with fixed seats, the minimum number of spaces designated for wheelchair use and the minimum number of fixed seats designated for *adaptable seating* shall conform to Table 3.8.2.1. (See Note A-3.8.2.1.(4))

Table 3.8.2.1.
Designated Wheelchair Spaces and Adaptable Seating
 Forming Part of Sentence 3.8.2.1.(4)

Number of Fixed Seats in Seating Area	Minimum Number of Spaces Designated for Wheelchairs	Minimum Number of Fixed Seats Designated for <i>Adaptable Seating</i>
Up to 20	2	1
21 to 40	2	2
41 to 60	2	3
61 to 80	2	4
81 to 100	3	5
Over 100	3% of the seating capacity	The greater of 5 seats or 5% of the aisle seating capacity

- (5) In a Group C *major occupancy* apartment *building*, not less than 15% of all *suites* of *residential occupancy* shall be provided with a *barrier-free* path of travel from the *suite* entrance door into the following rooms and spaces that shall be located at the same level as the *barrier-free* path of travel:

- (a) at least one bedroom, (See Note A-3.8.2.1.(5)(a) and (b))
 - (b) at least one bathroom conforming to Sentence (6), (See Note A-3.8.2.1.(5)(a) and (b))
 - (c) a kitchen or kitchen space, and
 - (d) a living room or space.
- (See Note A-3.8.2.1.(5))

- (6) Bathrooms required by Clause (5)(b) shall

- (a) contain a lavatory,
 - (b) contain a water closet,
 - (c) contain a bathtub or a shower,
 - (d) have wall reinforcement installed in conformance with Sentence 3.3.4.9.(1), and
 - (e) be designed to permit a wheelchair to turn in an open space not less than 1 500 mm in diameter.
- (See Note A-3.8.2.1.(6))

- (7) The number of *suites* described in Sentence (5) having 1, 2 or 3 or more bedrooms shall be in proportion to the number of *suites* of *residential occupancy* having 1, 2 or 3 or more bedrooms in the remainder of the *building*. (See Note A-3.8.2.1.(7))

- (8) The *suites* described in Sentence (5) shall be distributed among *storeys* that are required by Article 3.8.2.1. to have a *barrier-free* path of travel, having regard to the height of the *suite* above *grade*.

3.8.2.2. Barrier-Free Paths of Travel to Building Entrances, Exterior Passenger Loading Zones, and Access to Parking Areas (See Note A-3.8.2.2.)

- (1) A direct *barrier-free* path of travel shall be provided between a *barrier-free* entrance referred to in Article 3.8.1.2. to
 - (a) a designated *barrier-free* parking area, where provided,
 - (b) an exterior passenger-loading zone, where provided, and
 - (c) a public thoroughfare.
 (See Note A-3.8.2.2.(1) and (4))

- (2) The vehicular entrance to and egress from any parking level described in Sentence (1) and all areas intended to be used by wheelchair accessible vehicles to gain access to a parking space on that level shall have a vertical clearance of not less than 2 100 mm.
- (3) If an exterior passenger loading zone is provided, it shall have
- (a) an access aisle not less than 2 440 mm wide and 7 400 mm long adjacent and parallel to the vehicle pull-up space,
 - (b) a curb *ramp*, where there are curbs between the access aisle and the vehicle pull-up space, and
 - (c) a clearance height of not less than 3 600 mm at the vehicle pull-up space and along the vehicle access and egress routes.
- (4) In *storage garages*, a *barrier-free* path of travel shall be provided between each parking level with *barrier-free* parking and all other parts of the *building* required to be provided with *barrier-free* access that are served by that *storage garage*. (See Note A-3.8.2.2.(1) and (4))

3.8.2.3. Washrooms Required to be Barrier-Free (See Note A-3.8.2.3.)

- (1) A *barrier-free* path of travel shall be provided to *barrier-free* washrooms designed to accommodate persons with disabilities in conformance with the requirements in Articles 3.8.3.8. to 3.8.3.12.
- (2) The number of universal washrooms conforming to Article 3.8.3.12. provided in a *building* in which a washroom is required by Subsection 3.7.4. shall conform to Table 3.8.2.3.-A. (See Note A-3.8.2.3.(2))

Table 3.8.2.3.-A
Minimum Number of Universal Washrooms per Building
 Forming Part of Sentence 3.8.2.3.(2)

Number of Storeys in <i>Building</i>	Minimum Number of Universal Washrooms per <i>Building</i>
1 to 3	1
4 to 6	2
Over 6	3, plus 1 for each additional increment of 3 <i>storeys</i> in excess of 6 <i>storeys</i>

- (3) Where a washroom required by Subsection 3.7.4. is provided in a *storey* that is required by Article 3.8.2.1. to have a *barrier-free* path of travel,
- (a) the washroom shall conform to Articles 3.8.3.8. to 3.8.3.11., and
 - (b) the number of *barrier-free* water closet stalls or enclosures provided in the washroom shall conform to Table 3.8.2.3.-B.
- (See Note A-3.8.2.3.(3))
- (4) Except as permitted in Sentence (5), where washrooms in excess of those required by Subsection 3.7.4. are provided in a *storey* that is required by Article 3.8.2.1. to have a *barrier-free* path of travel, the additional washrooms shall be designed to accommodate persons with disabilities in conformance with the requirements of
- (a) Articles 3.8.3.8. to 3.8.3.11., or
 - (b) Article 3.8.3.12.
- (5) Washrooms need not conform to Sentence (4) provided
- (a) they are located within *suites of residential occupancy*,
 - (b) other *barrier-free* washrooms are provided on the same floor level within 45 m, or (See Note A-3.8.2.3.(5)(b))
 - (c) they are located in an individual *suite* that is
 - (i) used for a *business and personal services occupancy*, a *mercantile occupancy* or an *industrial occupancy*,
 - (ii) less than 300 m² in area, and
 - (iii) completely separated from, and without access to, the remainder of the *building*.

Table 3.8.2.3.-B
Minimum Number of Water Closet Stalls or Enclosures Required to be Barrier-Free
 Forming Part of Sentence 3.8.2.3.(3)

Number of Water Closets per Washroom	Minimum Number of <i>Barrier-Free</i> Water Closet Stalls or Enclosures per Washroom
1 to 3	0, where a universal washroom is provided on the same floor level within 45 m of the washroom, or 1, where a universal washroom is not provided on the same floor level within 45 m of the washroom
4 to 9	1
10 to 16	2
17 to 20	3
21 to 30	4
Over 30	5, plus 1 for each additional increment of 10 water closets per washroom in excess of 30 water closets per washroom

- (6) Where a washroom required by Subsection 3.7.4. is provided in a *storey* that is not required by Article 3.8.2.1. to have a *barrier-free* path of travel, the washroom shall
- (a) conform to Article 3.8.3.9. and Sentences 3.8.3.10.(4) and 3.8.3.11.(5), and
 - (b) be provided with at least one ambulatory water closet stall or enclosure conforming to Sentence 3.8.3.8.(10).
- (See Note A-3.8.2.3.(6))

3.8.2.4. Hotels

- (1) Except as permitted in Sentence (2), at least 10% of the *suites* of a *hotel* shall
- (a) have a *barrier-free* path of travel extending to
 - (i) the inside of each room, and
 - (ii) a balcony where required by Sentence 3.3.1.7.(2), and
 - (b) be distributed among *storeys* that are required by Article 3.8.2.1. to have a *barrier-free* path of travel, having regard to the height of the *suite* above *grade*.
- (See Note A-3.8.2.4.(1))
- (2) Not more than 20 *suites* need comply with Sentence (1).
- (3) A *suite* having a *barrier-free* path of travel required by Sentence (1) shall have a bathroom that
- (a) conforms to Clauses 3.8.3.12.(1)(a) to (h) and (j),
 - (b) has an unobstructed area at least 1 200 mm in diameter extending the full height of the room, except that a door is permitted to open on the inside if it does not reduce the unobstructed area, and
 - (c) has a bathtub or shower that conforms to Article 3.8.3.13.
- (4) Except as required by Sentence 3.8.3.3.(17) for power door operator controls, controls for the operation of *building* services or safety devices, including electrical switches, thermostats and intercom switches, intended to be operated by the occupant and located within a *suite* having a *barrier-free* path of travel required by Sentence (1) shall conform to Sentence 3.8.1.5.(1).

- (5) An entrance door to a *suite* having a *barrier-free* path of travel required by Sentence (1) shall have
 - (a) a power door operator conforming to Article 3.8.3.3., and
 - (b) a door viewer located at a height no higher than 1 100 mm above the finished floor.
- (6) Where a door is provided between a *suite* having a *barrier-free* path of travel required by Sentence (1) and an adjoining *suite*, the door shall conform to Sentences 3.8.3.3.(1) and (3).
- (7) Where an emergency power supply is supplied by a generator, it shall supply at least one emergency power receptacle in at least one of the *suites* having a *barrier-free* path of travel required by Sentence (1). (See Note A-3.8.2.4.(7))
- (8) The emergency power receptacle described in Sentence (7) shall be identified with a legible sign having the words **EMERGENCY POWER OUTLET** permanently mounted on the wall beside the receptacle.

3.8.3. Design Standards

3.8.3.1. Accessibility Signs (See Note A-3.8.3.1.)

- (1) Signs providing visual information shall be installed to indicate the location of
 - (a) *barrier-free* entrances,
 - (b) *ramps* located in a required *barrier-free* path of travel serving that entrance,
 - (c) an exterior passenger loading zone conforming to Sentence 3.8.2.2.(3), if one is provided,
 - (d) *barrier-free* washrooms,
 - (e) *barrier-free* showers,
 - (f) *barrier-free* elevators,
 - (g) *barrier-free* parking spaces, and
 - (h) assistive listening systems or adaptive technologies.
- (2) Where a washroom, elevator, telephone or parking area is required to accommodate persons with disabilities, it shall be identified by a sign consisting of the International Symbol of Access or the International Symbol of Access for Hearing Loss and appropriate graphical or textural information that clearly indicates the type of facilities available.
- (3) Where a washroom is not designed to accommodate persons with physical disabilities in a *storey* to which a *barrier-free* path of travel is required by Article 3.8.2.1., signs providing visual and tactile information shall be installed to indicate the location of *barrier-free* facilities.
- (4) Signs incorporating the International Symbol of Access shall be installed where necessary to indicate the location of a *barrier-free means of egress*.
- (5) Directional signs shall be provided with visual information.
- (6) Except for doors that serve *service spaces* or are located within a *suite*, signs installed at or near doors shall provide the same information in both visual and tactile forms.
- (7) Tactile information sign required by Subsections 3.4.5. and 3.4.6. and this Article shall
 - (a) have Braille and tactile characters in accordance with Clauses 4.5.6.2. and 4.5.6.3. of CSA B651, “Accessible design for the built environment,”
 - (b) be installed on the wall closest to the latch side of the door or on the nearest wall in the right side of the door, where there is no wall at the latch side, and
 - (c) be centred 1500 mm above the finished floor with the edge of the sign located not more than 300 mm from the door. (See Note A-3.8.3.1.(7) and (8))
- (8) Visual information signs required by Subsections 3.4.5. and 3.4.6. and this Article shall comply with Clauses 4.5.2., 4.5.3. and 4.5.4. of CSA B651, “Accessible design for the built environment.” (See Note A-3.8.3.1.(7) and (8))

3.8.3.2. Exterior Walks

- (1) Except as provided in Sentence (2), exterior walks that form part of a *barrier-free* path of travel shall
- (a) be provided by means of a continuous plane not interrupted by steps or abrupt changes in level,
 - (b) have a permanent, firm and slip-resistant surface,
 - (c) except as required in Sentence 3.8.1.3.(4), have an uninterrupted width of not less than 1 100 mm and a gradient not exceeding 1 in 20,
 - (d) be designed as a *ramp* where the gradient is greater than 1 in 20,
 - (e) have not less than 1 600 mm wide surface of a different texture to that surrounding it, where the line of travel is level and even with adjacent walking surfaces,
 - (f) be free from obstructions for the full width of the walk to a minimum height of 1 980 mm, except that handrails are permitted to project not more than 100 mm from either side into the clear area,
 - (g) have a level area adjacent to the entrance doorway conforming to Clause 3.8.3.4.(1)(c), and
 - (h) have a tactile attention indicator conforming to Article 3.8.3.18. that is located to identify an entry into a vehicular route or area where no curbs or any other element separate the vehicular route or area from a pedestrian route. (See Note A-3.8.3.2.(1)(h))
- (2) Where a difference in elevation between levels in a walkway is not more than 200 mm, a curb *ramp* conforming to Sentences (3) and (4) may be provided.
- (3) The curb *ramp* permitted by Sentence (2) shall
- (a) have a running slope conforming to Table 3.8.3.2.,
 - (b) have a width of not less than 1 500 mm exclusive of flared sides,
 - (c) have a surface including flared sides that shall,
 - (i) be slip-resistant,
 - (ii) have a detectable warning surface that is colour- and texture-contrasted with the adjacent surfaces, and
 - (iii) have a smooth transition from the *ramp* and adjacent surfaces, and
 - (d) have flared sides with a slope of not more than 1:10 where pedestrians are likely to walk across them.
- (4) Curb *ramps* described in Sentence (3) do not require handrails or *guards*.

Table 3.8.3.2.
Ramp Rise and Slope
Forming Part of Sentence 3.8.3.2.(3)

Vertical Rise Between Surfaces, mm	Slope
75 to 200	1:10 to 1:12
less than 75	1:8 to 1:10

3.8.3.3. Doorways and Doors

- (1) Every doorway that is located in a *barrier-free* path of travel shall have a clear width of not less than 850 mm when the door is in the open position. (See Note A-3.8.3.3.(1))
- (2) Except as provided in Sentence 3.3.4.11.(11) and except where no bathroom within the *suite* is at the level of the *suite* entrance door to which a *barrier-free* path of travel is provided in accordance with Sentence 3.8.2.1.(1), the doorway to at least one bathroom and to each bedroom at the same level as such bathroom within a *suite of residential occupancy* shall have, when the door is in the open position, a clear width of not less than
- (a) 760 mm where the door is served by a corridor or space not less than 1 060 mm wide, and
 - (b) 810 mm where the door is served by a corridor or space less than 1 060 mm wide.
- (See Note A-3.8.3.3.(2))

- (3) Door opening devices that are the only means of operation shall
- (a) be designed to be operable using a closed fist, and
 - (b) be mounted not less than 900 mm and not more than 1 100 mm above the finished floor.
- (See Note A-3.8.3.3.(3))
- (4) Except as permitted by Sentence (12), every door that provides a *barrier-free* path of travel through a *barrier-free* entrance referred to in Article 3.8.1.2. shall be equipped with a power door operator. (See Note A-3.8.3.3.(4))
- (4.1) Except as permitted by Sentence (12), doors equipped with a self-closing device shall be equipped with power door operators where doors are located in a *barrier-free* path of travel, between the entrance referred to Article 3.8.1.2., including the interior doors of a vestibule, and the entrance doors to *suites* or rooms served by a *public corridor* or a corridor used by the public. (See Note A-3.8.3.3.(4.1))
- (5) Except as permitted by Sentence (12), where a *barrier-free* entrance referred to in Article 3.8.1.2. incorporates a vestibule, a door leading from the vestibule into the *floor area* shall be equipped with a power door operator.
- (6) A door shall be equipped with a power door operator where the door serves
- (a) a washroom for *public use* required to be *barrier-free*, or
 - (b) a Group A *occupancy* within a Group C *major occupancy* apartment building.
- (7) Except as permitted in Sentence (8), and except for doors with power operators, closers for doors in a *barrier-free* path of travel shall be designed to permit doors to open when a force of not more than 38 N is applied to the handles, push plates or latch-releasing devices in the case of exterior doors and 22 N in the case of interior doors.
- (8) Sentence (7) does not apply to doors at the entrances to *dwelling units*, or where greater forces are required in order to close and latch the doors against prevailing differences in air pressures on opposite sides of the doors. (See Note A-3.8.3.3.(8))
- (9) Except for doors at the entrances to *dwelling units*, closers for interior doors in a *barrier-free* path of travel shall have a closing period of not less than 3 seconds measured from when the door is in an open position of 70° to the doorway, to when the door reaches a point 75 mm from the closed position, measured from the leading edge of the latch side of the door. (See Note A-3.8.3.3.(9))
- (10) Unless equipped with a power door operator, a door in a *barrier-free* path of travel shall have a clear space on the latch side extending the height of the doorway and not less than
- (a) 600 mm beyond the edge of the door opening if the door swings toward the approach side,
 - (b) 300 mm beyond the edge of the door opening if the door swings away from the approach side, and
 - (c) 300 mm beyond both sides of a sliding door.
- (See Note A-3.8.3.3.(10))
- (11) Vestibules located in a *barrier-free* path of travel
- (a) shall be arranged to allow the movement of wheelchairs between doors, and
 - (b) shall provide
 - (i) where the doors into the vestibule are in series, a distance between the doors of at least 1 500 mm plus the width of any door that swings into the space in the path of travel from one door to another, and
 - (ii) where the doors into the vestibule are not aligned, a turning diameter of 1 500 mm within the vestibule clear of any door swing.
- (See Note A-3.8.3.3.(11)(b))
- (12) Only the active leaf in a multiple leaf door in a *barrier-free* path of travel need conform to the requirements of this Article.

- (13) Except as provided in Clause 3.8.3.4.(1)(c), the floor surface on each side of a door in a *barrier-free* path of travel shall be level within a rectangular area
- (a) as wide as the door plus the clearance required on the latch side by Sentence (10), and
 - (b) whose dimension perpendicular to the closed door is not less than the width of the *barrier-free* path of travel but need not exceed 1 500 mm.
- (14) Where a vision panel is provided in a door in a *barrier-free* path of travel, such panel shall be at least 75 mm in width and be located so that
- (a) the bottom of the panel is not more than 900 mm above the finished floor, and
 - (b) the edge of the panel closest to the latch is not more than 250 mm from the latch side of the door.
- (15) A door in a *barrier-free* path of travel consisting of a sheet of glass shall be marked with a continuous opaque strip that
- (a) shall be colour and brightness contrasted to the background of the door,
 - (b) shall be at least 50 mm wide,
 - (c) shall be located across the width of the door at a height of 1 350 mm to 1 500 mm above the finished floor, and
 - (d) may incorporate a logo or symbol provided such logo or symbol does not diminish
 - (i) the opacity of the strip,
 - (ii) the width of the strip,
 - (iii) the colour and brightness contrast of the strip to the background of the door, and
 - (iv) the continuity of the strip across the width of the door.
- (16) Reserved.
- (17) Except where a proximity scanning device is installed in conformance with Sentence (18), the control for a power door operator required by Sentence (4), (5) or (6) shall
- (a) have a face dimension of not less than
 - (i) 150 mm in diameter where the control is circular, or
 - (ii) 50 mm by 100 mm where the control is rectangular,
 - (b) be operable using a closed fist,
 - (c) be located so that
 - (i) its centre is located not less than 900 mm and not more than 1 100 mm from the finished floor or ground, or
 - (ii) it extends from not more than 200 mm to not less than 900 mm above the finished floor or ground,(See Note A-3.8.3.3.(17)(c))
 - (d) be located not less than 600 mm and not more than 1 500 mm beyond the door swing where the door opens towards the control,
 - (e) be located to allow persons to activate the opening of the door from either direction of travel,
 - (f) be located so that the path of travel is not obstructed,
 - (g) be located in a clearly visible position, and
 - (h) contain a sign incorporating the International Symbol of Access.
- (18) A proximity scanning device that activates a power door shall be capable of detecting a person in a wheelchair. (See Note A-3.8.3.3.(18))
- (19) A normally occupied *floor area* that is not required by Article 3.8.2.1. to have a *barrier-free* path of travel shall comply with the following requirements:
- (a) all doorways in *public corridors* in the normally occupied *floor area* shall comply with Sentence (1),
 - (b) door opening devices that are the only means of operation on doors in the normally occupied *floor area* shall comply with Sentence (3), (See Note A-3.8.3.3.(19)(b))
 - (c) where a vision panel is provided in a door in the normally occupied *floor area*, the panel shall comply with Sentence (14),
 - (d) doors consisting of a sheet of glass in the normally occupied *floor area* shall comply with Sentence (15), and
 - (e) where a power door operator is installed for doors in the normally occupied *floor area*, the control for the power door operator shall comply with Sentence (17).

3.8.3.4. Ramps

- (1) A *ramp* located in a *barrier-free* path of travel shall
- (a) have a minimum width not less than 1 000 mm between handrails, (See Note A-3.4.3.4.)
 - (b) have a maximum gradient of 1 in 12, (See Note A-3.8.3.3.(1)(b))
 - (c) have a level area of at least 1 700 mm by 1 700 mm at the top and bottom of a *ramp* and where a door is located in a *ramp*, so that the level area extends at least 600 mm beyond the latch side of the door opening, except that where the door opens away from the *ramp*, the area extending beyond the latch side of the door opening may be reduced to 300 mm, (See Note A-3.8.3.4.(1)(c))
 - (d) have a level area at least 1 700 mm long and at least the same width as the *ramp*
 - (i) at intervals of not more than 9 m along its length, and
 - (ii) where there is a change of 90° or more in the direction of the *ramp*,
 - (e) except as provided in Sentence (2), be equipped with handrails on both sides that shall
 - (i) be continuously graspable along their entire length and have circular cross-section with an outside diameter not less than 30 mm and not more than 40 mm, or any non-circular shape with a graspable portion that has a perimeter not less than 100 mm and not more than 155 mm and whose largest cross-sectional dimension is not more than 57 mm,
 - (ii) be not less than 865 mm and not more than 965 mm high, measured vertically from the surface of the *ramp*, except that handrails not meeting these requirements are permitted provided they are installed in addition to the required handrail,
 - (iii) be terminated in a manner that will not obstruct pedestrian travel or create a hazard,
 - (iv) extend horizontally not less than 300 mm beyond the top and bottom of the *ramp*,
 - (v) be provided with a clearance that conforms to Sentence 3.4.6.5.(13), and
 - (vi) be designed and constructed such that handrails and their supports will withstand the loading values obtained from the nonconcurrent application of a concentrated load not less than 0.9 kN applied at any point and in any direction for all handrails and a uniform load not less than 0.7 kN/m applied in any direction to the handrail,
 - (f) except as provided in Sentence (2), have a wall or a *guard* on both sides and where a *guard* is provided the *guard* shall
 - (i) be not less than 1 070 mm measured vertically to the top of the *guard* from the *ramp* surface, and
 - (ii) be designed so that no member, attachment or opening located between 140 mm and 900 mm above the *ramp* surface being protected by the *guard* will facilitate climbing,
 - (g) be provided
 - (i) with a curb at least 50 mm high on any side of the *ramp* where no solid enclosure or solid *guard* is provided, or
 - (ii) with horizontal railings which are located or other barriers that extend to within 50 mm of the finished *ramp*, and
 - (h) except as provided in Sentence (2), where the *ramp* is wider than 2 200 mm, have an intermediate handrail with a clear width of 900 mm between the intermediate handrail and one of the handrails described in Clause (e).
- (2) Where a *ramp* serves as an aisleway for fixed seating, the requirements for handrails in Clauses (1)(e) and (h) and for walls or *guards* in Clause (1)(f) need not apply. (See Note A-3.8.3.4.(2))
- (3) Floors or walks in a *barrier-free* path of travel having a slope steeper than 1 in 20 shall be designed as *ramps*. (See Note A-3.8.3.4.(3))

3.8.3.5. Passenger Elevating Devices

- (1) A passenger elevating device referred to in Article 3.8.2.1. located in a *barrier-free* path of travel shall
- (a) conform to CSA B355, “Platform lifts and stair lifts for barrier-free access,”
 - (b) have a clear floor space not less than 1 500 mm long by 1 000 mm wide, and
 - (c) have entry doors or gates
 - (i) providing a clear width not less than 850 mm in the open position if located on the short side of the passenger elevating device, or
 - (ii) providing a clear width not less than 1 000 mm in the open position if located at either end of the long side of the passenger-elevating device.

3.8.3.6. Wheelchair Spaces and Adaptable Seating

- (1) Spaces designated for wheelchair use required by Sentence 3.8.2.1.(4) shall be
 - (a) clear and level or level with removable seats,
 - (b) not less than 900 mm wide and not less than
 - (i) 1 525 mm long where designed to permit a wheelchair to enter from a side approach, and
 - (ii) 1 220 mm long where designed to permit a wheelchair to enter from the front or rear of the space,
 - (c) arranged so that
 - (i) at least two of the designated spaces are side by side, and
 - (ii) at least one fixed seat for a companion is located beside
 - (A) each group of designated spaces, if two or more designated spaces are arranged side by side in a group, and
 - (B) each designated space that is not part of a group described in Sub-subclause (A),(See Note A-3.8.3.6.(1)(c))
 - (d) located adjoining a *barrier-free* path of travel without infringing on egress from any row of seating or any aisle requirements, and
 - (e) situated, as part of the designated seating plan, to provide a choice of viewing location and a clear view of the event taking place.
- (2) Fixed seats designated for *adaptable seating* required by Sentence 3.8.2.1.(4) shall be
 - (a) located adjoining a *barrier-free* path of travel without infringing on egress from any row of seating or any aisle requirements,
 - (b) equipped with a movable or removable armrest on the side of the seat adjoining the *barrier-free* path of travel, and
 - (c) situated, as part of the designated seating plan, to provide a choice of viewing location and a clear view of the event taking place.
- (3) In an *assembly occupancy* with fixed seats, space shall be provided for the storage of wheelchairs and *mobility assistive devices* in accordance with the following requirements:
 - (a) at least one storage space not less than 810 mm by 1 370 mm shall be provided where the *assembly occupancy* has not more than 200 fixed seats and at least two such storage spaces shall be provided where the *assembly occupancy* has more than 200 fixed seats, and
 - (b) the storage space or spaces shall be located on the same level and in proximity to the spaces designated for wheelchair use and seats designated for *adaptable seating*.

3.8.3.7. Assistive Listening Systems

- (1) In *buildings of assembly occupancy*, all classrooms, auditoria, meeting rooms and *theatres* with an area of more than 100 m² shall be equipped with an assistive listening system encompassing the entire seating area. (See Note A-3.8.3.7.(1))
- (2) In each location where information, goods or services are provided to the public at service counters in *buildings of assembly occupancy*, at least one of the service counters shall be equipped with:
 - (a) an assistive listening system or adaptive technology, and
 - (b) an amplification system, where there is a barrier to communication, such as a glass screen.(See Note A-3.8.3.7.(2))
- (3) Assistive listening systems or adaptive technologies required by Sentence (2) shall provide for the clear communication required for the exchange of information, goods, and services.

3.8.3.8. Water Closet Stalls and Enclosures

- (1) Every *barrier-free* water closet stall or enclosure in a washroom described in Sentence 3.8.2.3.(3) or (4) shall
 - (a) have a clear turning space within the stall or enclosure of at least 1 500 mm in diameter, (See Note A-3.8.3.8.(1)(a))
 - (b) have a clear floor space in front of the stall or enclosure of at least 1 500 mm in diameter,

- (c) be equipped with a door that
 - (i) is capable of being latched from the inside with a mechanism conforming to Subclause 3.8.1.5.(1)(c)(ii),
 - (ii) in an open position, has a clear opening of at least 850 mm wide,
 - (iii) swings outward, unless 820 mm by 1 440 mm clear floor area is provided within the stall to permit the door to be closed without interfering with the wheelchair, (See Note A-3.8.3.8.(1)(c)(iii))
 - (iv) is self-closing so that, when at rest, the door remains open not more than 50 mm beyond the jamb,
 - (v) is provided with a horizontal, D-shaped, visually contrasting door pull on both sides of the door, mounted on the vertical centre line of the door, located at a height not less than 800 mm and not more than 1 000 mm above the finished floor, (See Note A-3.8.3.8.(1)(c)(v))
 - (vi) is aligned with a clear transfer space required by Subclause (2)(a)(ii) or Clause (2)(b), and
 - (vii) is capable of having the latch required by Subclause (i) released from the outside in case of an emergency,
 - (d) be equipped with a water closet conforming to Article 3.8.3.9. that is located in accordance with Clause (2)(a) or (b),
 - (e) be equipped with a coat hook mounted not more than 1 200 mm above the finished floor on a side wall and projecting not more than 50 mm from the wall,
 - (f) have a clearance of at least 1 700 mm between the outside of the stall face and the face of an in-swinging washroom door and 1 400 mm between the outside of the stall face and any wall-mounted fixture or other obstruction, and (See Note A-3.8.3.8.(1)(f))
 - (g) be equipped with a toilet paper dispenser mounted on the side wall closest to the water closet so that
 - (i) the dispenser is located below the grab bar,
 - (ii) the closest edge of the dispenser is 300 mm from the front of the water closet seat, and
 - (iii) the bottom of the dispenser is 600 mm to 800 mm above the finished floor.
- (2)** A water closet described in Clause (1)(d) shall be
- (a) located so that
 - (i) the centre line of the water closet is not less than 460 mm and not more than 480 mm from one side wall, and
 - (ii) a clear transfer space at least 900 mm wide and 1 500 mm deep is provided on the other side of the water closet, or
 - (b) located so that a clear transfer space at least 900 mm wide and 1 500 mm deep is provided on each side of the water closet. (See Note A-3.8.3.8.(2)(b))
- (3)** Where a water closet is located in accordance with Clause (2)(a),
- (a) a grab bar conforming to Sentences (5) and (7) shall be provided on the side wall referred to in Subclause (2)(a)(i),
 - (b) a fold-down grab bar may be provided and, if one is provided, it shall conform to Sentence (8) and be provided on the side of the water closet opposite the grab bar described in Clause (a), and
 - (c) a grab bar conforming to Sentences (6) and (7) shall be provided on the wall behind the water closet.
- (See Note A-3.8.3.8.(3))
- (4)** Where a water closet is located in accordance with Clause (2)(b),
- (a) a fold-down grab bar conforming to Sentence (8) shall be provided on each side of the water closet, and
 - (b) a grab bar conforming to Sentences (6) and (7) shall be provided on the wall behind the water closet.
- (See Note A-3.8.3.8.(3))
- (5)** A grab bar described in Clause (3)(a) shall
- (a) be continuous L-shaped with 750 mm long horizontal and vertical components, and
 - (b) be wall mounted with the horizontal component 750 mm above the finished floor and the vertical component 150 mm in front of the water closet.
- (See Note A-3.8.3.8.(3) and Note A-3.8.3.8.(5))
- (6)** A grab bar described in Clause (3)(c) or (4)(b) shall
- (a) be at least 600 mm in length, and
 - (b) be wall mounted horizontally from 840 mm to 920 mm above the finished floor and, where the water closet has a water tank, be wall mounted 150 mm above the tank.
- (See Note A-3.8.3.8.(3))

- (7) A grab bar described in Clause (3)(a) or (c) or (4)(b) shall
- (a) be installed to resist a load of at least 1.3 kN applied vertically or horizontally,
 - (b) be not less than 30 mm and not more than 40 mm in diameter,
 - (c) have a clearance of not less than 38 mm and not more than 50 mm from the wall to the inside surface of the grab bar, and
 - (d) have a slip-resistant surface.
- (See Note A-3.8.3.8.(3))
- (8) A fold-down grab bar described in Clause (3)(b) or (4)(a) shall
- (a) be mounted on the wall behind the water closet
 - (i) with the horizontal component 750 mm above the finished floor, and
 - (ii) not less than 390 mm and not more than 410 mm from the centre line of the water closet,
 - (b) not require a force of more than 22.2 N to pull it down,
 - (c) be at least 750 mm in length,
 - (d) be installed to resist a load of at least 1.3 kN applied vertically or horizontally,
 - (e) be not less than 30 mm and not more than 40 mm in diameter, and
 - (f) have a slip-resistant surface.
- (See Note A-3.8.3.8.(3) and Note A-3.8.3.8.(8))
- (9) A fold-down grab bar installed in accordance with Sentence (8) is permitted to encroach into
- (a) the clear turning space described in Clause (1)(a), or
 - (b) a clear transfer space described in Subclause (2)(a)(ii) or Clause (2)(b).
- (See Note A-3.8.3.8.(3))
- (10) Where an ambulatory water closet stall or enclosure is required by Sentence 3.8.2.3.(6), it shall
- (a) be at least 1 500 mm in depth and be not less than 890 mm and not more than 940 mm in width,
 - (b) be equipped with a door that shall
 - (i) be capable of being latched from the inside with a mechanism that is operable using a closed fist,
 - (ii) when the door is in an open position, have a clear opening of at least 810 mm,
 - (iii) swing outward, unless the minimum dimensions in Clause (a) are not located within the door swing,
 - (iv) be provided with spring-type or gravity hinges so that the door closes automatically,
 - (v) be provided with a door pull on both sides of the door, near the latch side of the door, located at a height not less than 900 mm and not more than 1 100 mm above the finished floor, and
 - (vi) be capable of having the latch required by Subclause (i) released from the outside in the case of an emergency,
 - (c) be equipped with a water closet conforming to Article 3.8.3.9. and located so that its centre line is centred between the partition walls,
 - (d) be equipped on each side of the water closet with grab bars conforming to Clause (3)(a), and
 - (e) be equipped with a coat hook conforming to Clause (1)(e).
- (See Note A-3.8.3.8.(10))

3.8.3.9. Water Closets (See Note A-3.8.3.9.)

- (1) A water closet described in Clause 3.8.3.8.(1)(d) or (10)(c) or 3.8.3.12.(1)(d) shall
- (a) be equipped with a seat located at not less than 430 mm and not more than 485 mm above the finished floor,
 - (b) flush automatically or be equipped with a flushing control that
 - (i) is located between 500 mm and 900 mm above the finished floor,
 - (ii) is operable from the transfer side, and
 - (iii) is operable using a closed fist and with a force of not more than 22.2 N, and
 - (c) be equipped with a back support where there is no seat lid or tank. (See Note A-3.8.3.9.(1)(c))
- (See Note A-3.8.3.9.(1))

3.8.3.10. Urinals (See Note A-3.8.3.10.)

- (1) Where more than one urinal is provided in a washroom described in Sentence 3.8.2.3.(3) or (4), at least one urinal shall
- (a) be mounted with the rim located not more than 430 mm above the finished floor,
 - (b) have a clear floor space at least 800 mm wide that is perpendicular to, and centred on, the urinal and is unobstructed by privacy screens, and
 - (c) have no step in front of it.
- (2) A urinal described in Sentence (1) shall
- (a) flush automatically or be equipped with a flushing control that is
 - (i) located between 900 mm and 1 100 mm above the finished floor, and
 - (ii) operable using a closed fist and with a force of not more than 22.2 N, and
 - (b) have installed on each side, a vertically mounted grab bar that
 - (i) complies with Article 3.8.3.8.(7),
 - (ii) is not less than 600 mm long, with its centre line 1 000 mm above the finished floor, and
 - (iii) is located not more than 380 mm from the centre line of the urinal.
- (3) Where privacy screens are installed for a urinal described in Sentence (1), they shall
- (a) be mounted a minimum of 460 mm from the centre line of the urinal, and
 - (b) have a clearance of at least 50 mm from the grab bars required by Clause (2)(b).
- (4) Where more than one urinal is provided in a washroom described in Sentence 3.8.2.3.(6), at least one urinal conforming to Sentences (1) to (3) shall be provided in the washroom.

3.8.3.11. Lavatories, Mirrors and Washroom Accessories (See Note A-3.8.3.11.)

- (1) A washroom described in Sentence 3.8.2.3.(2), (3) or (4) shall be provided with a lavatory that shall
- (a) be located so that the distance between the centre line of the lavatory and the side wall is not less than 460 mm,
 - (b) have a rim height not more than 865 mm above the finished floor,
 - (c) have a clearance beneath the lavatory not less than
 - (i) 920 mm wide,
 - (ii) 735 mm high at the front edge,
 - (iii) 685 mm high at a point 200 mm back from the front edge, and
 - (iv) 350 mm high over the distance from a point 280 mm to a point 430 mm back from the front edge,
 (See Note A-3.8.3.11.(1)(c))
 - (d) have insulated pipes where they would otherwise present a burn hazard or have water supply temperature limited to a maximum of 43°C, (See Note A-3.8.3.11.(1)(d))
 - (e) be equipped with faucets that
 - (i) operate automatically or comply with 3.7.4.2.(12)(b)(i) and (ii), and
 - (ii) are located so that the distance from the centre line of the faucet to the edge of the basin or, where the basin is mounted in a vanity, to the front edge of the vanity, is not more than 485 mm,
 - (f) have a minimum 1 370 mm deep floor space to allow for a forward approach, of which a maximum of 500 mm can be located under the lavatory, (See Note A-3.8.3.11.(1)(f))
 - (g) have a soap dispenser that
 - (i) operates automatically or is operable using a closed fist and with a force of not more than 22.2 N, and
 - (ii) is located not more than 1 100 mm above the finished floor, within 500 mm from the front of the lavatory, and
 - (h) have a towel dispenser or other hand drying equipment that is
 - (i) located to be accessible to persons in wheelchairs,
 - (ii) located so that the dispensing height is not more than 1 200 mm above the finished floor,
 - (iii) operable with one hand, and
 - (iv) located not more than 610 mm, measured horizontally, from the edge of the lavatory.

- (2) If mirrors are installed in a washroom described in Sentence 3.8.2.3.(2), (3) or (4), at least one mirror shall be
 - (a) installed above a lavatory required by Sentence (1), and
 - (b) mounted with its bottom edge not more than 1 000 mm above the finished floor or inclined to the vertical to be usable by a person in a wheelchair.
- (3) If dispensing or hand-operated washroom accessories, other than those located in water closet stalls or enclosures and those described in Clause (1)(g), are provided, they shall be mounted so that
 - (a) the dispensing height is not less than 900 mm and not more than 1 200 mm above the finished floor,
 - (b) the controls or operating mechanisms are mounted not less than 900 mm and not more than 1 200 mm above the finished floor, and
 - (c) a minimum 1 370 mm deep floor space is provided in front of the controls or operating mechanisms to allow for a front approach.
- (4) Where a shelf is installed above a lavatory required by Sentence (1), it shall
 - (a) be located not more than 200 mm above the top of the lavatory and not more than 1 100 mm above the finished floor, and
 - (b) project not more than 100 mm from the wall.
- (5) A washroom described in Sentence 3.8.2.3.(6) shall be provided with a lavatory conforming to Clauses (1)(e), (g) and (h).

3.8.3.12. Universal Washrooms

- (1) A universal washroom room shall
 - (a) be served by a *barrier-free* path of travel,
 - (b) have a door that
 - (i) complies with Article 3.8.3.3.,
 - (ii) has a graspable latch-operating mechanism that is
 - (A) operable using a closed fist and with a force of not more than 22.2 N, and
 - (B) located between 900 mm and 1 000 mm above the finished floor, and
 - (iii) is capable of being locked from the inside and released from the outside in case of emergency,
 - (c) have one lavatory conforming to Sentences 3.8.3.11.(1), (3) and (4),
 - (d) have one water closet conforming to Article 3.8.3.9. that is located in accordance with Clause 3.8.3.8.(2)(a) or (b), (See Note A-3.8.3.12.(1)(d))
 - (e) have grab bars conforming to
 - (i) Sentence 3.8.3.8.(3), if the water closet is located in accordance with Clause 3.8.3.8.(2)(a), or
 - (ii) Sentence 3.8.3.8.(4), if the water closet is located in accordance with Clause 3.8.3.8.(2)(b),
 - (f) have no internal dimension between walls that is less than 1 700 mm,
 - (g) have a coat hook that conforms to Clause 3.8.3.8.(1)(e) and a shelf that is located not more than 1 100 mm above the finished floor and projects not more than 100 mm from the wall,
 - (h) be designed to permit a wheelchair to turn in an open space not less than 1 700 mm in diameter,
 - (i) be provided with a door equipped with a power door operator,
 - (j) be provided with a mirror
 - (i) installed above a lavatory described in Clause (1)(c), and
 - (ii) mounted with its bottom edge not more than 1 000 mm above the finished floor or inclined to the vertical to be usable by a person in a wheelchair, and
 - (k) have lighting controlled by a motion sensor conforming to Sentence 12.2.4.1.(2).
(See Note A-3.8.3.12.(1))
- (2) A universal washroom shall have
 - (a) an emergency call system that consists of audible and visual signal devices inside and outside of the washroom that are activated by a control device inside the washroom, and
 - (b) an emergency sign that contains the words **IN THE EVENT OF AN EMERGENCY PUSH EMERGENCY BUTTON AND AUDIBLE AND VISUAL SIGNAL WILL ACTIVATE** in letters at least 25 mm high with a 5 mm stroke and that is posted above the emergency button.
(See Note A-3.8.3.12.(2))

- (3) A clear space not less than 810 mm wide and 1 830 mm long shall be provided in each universal washroom for an adult-size change table. (See Note A-3.8.3.12.(3))
- (4) Where the clear space provided for an adult-size change table is adjacent to a wall, reinforcement shall be installed in the wall to permit the future installation of the change table.
- (5) Where an adult-size change table is installed, it shall
- (a) when fully loaded, have a surface height above the finished floor that can be adjusted from between 450 mm and 500 mm at the low range to between 850 mm and 900 mm at the high range,
 - (b) be designed to carry a minimum load of 1.33 kN,
 - (c) have a clear floor space parallel to the long side of the table not less than 760 mm wide and 1 500 mm long, and
 - (d) in the case of a fold-down table,
 - (i) be installed so that it does not encroach into a clear transfer space described in Clause 3.8.3.8.(2)(a) or (b), and
 - (ii) have no operating mechanisms higher than 1 200 mm.
- (6) A universal washroom need not conform to Sentences (3) and (4) if
- (a) it is located in an individual *suite* that
 - (i) is used for an *assembly occupancy*, a *business and personal services occupancy*, a *mercantile occupancy* or an *industrial occupancy*, and
 - (ii) meets one of the following requirements,
 - (A) it is located in a *building* that is less than 300 m² in *building area*, or
 - (B) it is less than 300 m² in area, if located in a *building* that is at least 300 m² in *building area*, or
 - (b) another universal washroom conforming to this Article is provided on the same floor level within 45 m.
- (See Note A-3.8.3.12.(6))

3.8.3.13. Showers and Bathtubs

- (1) Except within a *suite* of *residential occupancy*, if showers are provided in a *building*, the number of *barrier-free* showers shall conform to Table 3.8.3.13. (See Note A-3.8.3.13.(1))

Table 3.8.3.13.
Minimum Number of Barrier-Free Showers
 Forming Part of Sentence 3.8.3.13.(1)

Number of Showers Provided in a Group	Minimum Number of Showers Required to be <i>Barrier-Free</i>
1	0
2 to 7	1
Over 7	1, plus 1 for each additional increment of 7 showers in a group

- (2) A *barrier-free* shower required by Sentence (1) shall
- (a) be not less than 1 500 mm wide and 900 mm deep,
 - (b) have a clear floor space at the entrance to the shower not less than 900 mm deep and the same width as the shower, except that fixtures are permitted to project into that space provided they do not restrict access to the shower, (See Note A-3.8.3.13.(2)(b))
 - (c) have no doors that obstruct the shower controls or the clear floor space described in Clause (b),
 - (d) have a slip-resistant floor surface,
 - (e) have a threshold that is level with the adjacent finished floor or a bevelled threshold not more than 13 mm higher than the adjacent finished floor,

- (f) have a hinged seat, other than a spring-loaded hinged seat, or a fixed seat that shall
 - (i) be not less than 450 mm wide and 400 mm deep,
 - (ii) be mounted on the same side wall as the vertical grab bar between 460 mm and 480 mm above the finished floor,
 - (iii) be designed to carry a minimum load of 1.3 kN,
 - (iv) be located so that the edge of the seat is within 500 mm of the shower controls, and
 - (v) have a smooth and slip-resistant surface and no rough edges,(See Note A-3.8.3.13.(2)(f))
 - (g) have two grab bars
 - (i) that conform to Sentence 3.8.3.8.(7) and do not obstruct the use of the shower controls,
 - (ii) one of which is 1 000 mm long vertically located on the side wall between 50 mm and 80 mm from the adjacent clear floor area, and with the lower end between 600 mm and 650 mm above the finished floor, and
 - (iii) one of which is L-shaped, located on the wall opposite the entrance to the shower, with a 1 000 mm long horizontal component mounted between 750 mm and 870 mm above the finished floor and a 750 mm long vertical component mounted between 400 mm and 500 mm from the side wall on which the vertical grab bar described in Subclause (ii) is mounted,(See Note A-3.8.3.13.(2)(g))
 - (h) have a pressure-equalizing or thermostatic mixing valve that
 - (i) is operable using a closed fist and with a force of not more than 22.2 N,
 - (ii) is mounted on the wall opposite the entrance to the shower no more than 1 200 mm above the finished floor, and
 - (iii) is located within reach of the seat,
 - (i) have a hand-held shower head with not less than 1 800 mm of flexible hose located so that it
 - (i) can be reached from a seated position,
 - (ii) can be used in a fixed position at a height of 1 200 mm and 2 030 mm from the finished floor, and
 - (iii) does not obstruct the use of the grab bars, and
 - (j) have fully recessed soap holders that can be reached from the seated position.
- (3) All other controls installed in a shower described in Sentence (2) shall comply with Subclauses (2)(h)(i) to (iii).
- (4) At each location where a showering facility is provided for use by the general public or customers, or as part of a common-use area for employees, at least one universal dressing and shower room shall be provided. (See Note A-3.8.3.13.(4))
- (5) A universal dressing and shower room required by Sentence 3.8.3.13.(4) shall
- (a) be located in a barrier-free path of travel,
 - (b) have a door capable of being locked from the inside and released from the outside in the event of an emergency,
 - (c) have a lavatory and a mirror conforming to Article 3.8.3.11.,
 - (d) have a shower conforming to Sentence (2),
 - (e) have a bench that is at least 1 830 mm long by 760 mm wide and 480 mm to 520 mm high,
 - (f) have a clear transfer space adjacent to the long side of the bench that is 900 mm wide and as long as the bench, and (See Note A-3.8.3.13.(5)(f))
 - (g) have a coat hook mounted not more than 1 200 mm above the floor on a side wall and projecting not more than 50 mm from the wall.
- (6) Individual showers that are provided for use by patients or residents in *buildings* of Group B, Division 2 or 3 *occupancy* shall conform to Sentence (2).
- (7) Individual bathtubs that are provided for the use of patients or residents in *buildings* of Group B, Division 2 or 3 *occupancy* shall
- (a) be located in a room with a clear floor space not less than 1 500 mm in diameter,
 - (b) be not less than 1 500 mm long,
 - (c) be capable of being accessed along the full length of the bathtub with no tracks mounted on the bathtub rim,

- (d) have faucets that
 - (i) are operable using a closed fist and with a force of not more than 22.2 N, and
 - (ii) are located on the centre line of the bathtub or between the centre line of the bathtub and the exterior edge of the bathtub rim, at a maximum height of 450 mm above the rim,
 - (e) unless the bathtub is free-standing, have three grab bars
 - (i) conforming to Sentence 3.8.3.8.(7),
 - (ii) that are not less than 1 200 mm long,
 - (iii) two of which are located vertically at each end of the bathtub, mounted between 80 mm and 280 mm above the bathtub rim, and
 - (iv) one of which is located horizontally along the full length of the bathtub, mounted between 80 mm and 280 mm above the bathtub rim,
 - (f) have a slip-resistant bottom surface, and
 - (g) be equipped with a hand-held shower head with not less than 1 800 mm of flexible hose that can be used in a fixed position at a height of 1 200 mm and 2 030 mm and does not obstruct the use of the grab bars.
- (See Note A-3.8.3.13.(7))

(8) Where a *barrier-free* bathtub is provided, a clear floor space at least 900 mm wide and 1 500 mm long shall be provided along the full length of the bathtub.

3.8.3.14. Service Counters

- (1) Where a service counter is provided, at least one section of the service counter shall comply with Sentence (2). (See Note A-3.8.3.14.(1))
- (2) A section of a service counter required to be *barrier-free* shall
- (a) be not less than 800 mm long centred over a knee space conforming to Clause (c),
 - (b) have a surface not more than 865 mm above the floor, and
 - (c) where forward-facing interaction with a person or a device is required, have a knee space underneath it that is
 - (i) not less than 800 mm wide,
 - (ii) not less than 685 mm high, and
 - (iii) not less than 485 mm deep.
- (See Note A-3.8.3.14.(2)(c))

3.8.3.15. Shelves or Counters for Telephones (See Note A-3.8.3.15.)

- (1) Where more than one telephone is provided for public use, a built-in shelf or counter shall be provided for at least one telephone.
- (2) A shelf or counter described in Sentence (1) shall
- (a) be level,
 - (b) be not less than 500 mm wide and 350 mm deep, and
 - (c) have, for each telephone provided, a clear space that
 - (i) is not less than 810 mm wide and 1 370 mm deep, centred on the telephone, and
 - (ii) has no obstruction within 250 mm above the surface.
- (3) The top surface of a section of the shelf or counter described in Sentence (1) shall
- (a) be located not less than 775 mm and not more than 875 mm from the finished floor, and
 - (b) have a knee space not less than 740 mm high.
- (4) Where a wall-hung telephone is provided above the shelf or counter section described in Sentence (3), it shall be located so that the receiver and coin or card slot are not more than 1 200 mm from the finished floor.
- (5) Where more than one telephone is provided for public use in a normally occupied *floor area* that is not required by Article 3.8.2.1. to have a *barrier-free* path of travel, a built-in shelf or counter that conforms to Sentences (2), (3) and (4) shall be provided for at least one telephone.

3.8.3.16. Drinking Fountains (See Note A-3.8.3.16.)

- (1) Where more than one drinking fountain is provided, at least one shall be a *barrier-free* fountain that conforms to Sentences (2) and (3).
- (2) A *barrier-free* drinking fountain shall
 - (a) have a spout located near the front of the unit not more than 915 mm above the finished floor,
 - (b) be equipped with controls that are easily operated from a wheelchair using one hand with a force of not more than 22 N or operates automatically,
 - (c) project the water at least 100 mm high,
 - (d) provide the water stream at a vertical angle of up to
 - (i) 30°, where the spout is located less than 75 mm from the front of the fountain, or
 - (ii) 15°, where the spout is located not less than 75 mm and not more than 125 mm from the front of the fountain,
 - (e) be detectable by a cane at a level at or below 680 mm from the finished floor, and
 - (f) where the drinking fountain is cantilevered, meet the following requirements:
 - (i) be mounted not more than 915 mm above the finished floor,
 - (ii) provide a clearance height under the fountain of not less than 735 mm above the finished floor,
 - (iii) have a clear depth under the fountain of not less than 450 mm,
 - (iv) have a clear width under the fountain of not less than 760 mm,
 - (v) have a toe clearance height under the fountain of at least 350 mm above the finished floor from a point 300 mm back from the front edge to the wall, and
 - (vi) have a depth at the base of the fountain of at least 700 mm.
- (3) A *barrier-free* drinking fountain required by Sentence (1) shall have a clear floor space in front of, or adjacent to, the fountain that is a minimum of 810 mm deep and 1 370 mm wide.
- (4) Where more than one drinking fountain is provided in a normally occupied *floor area* that is not required by Article 3.8.2.1. to have a *barrier-free* path of travel, at least one shall be a *barrier-free* fountain that conforms to Sentences (2) and (3).

3.8.3.16A. Water-Bottle Filling Stations

- (1) Where one or more water-bottle filling stations are provided at each location, at least one shall be equipped with controls that
 - (a) activate automatically, or
 - (b) comply with Clause 3.8.1.5.(1)(c).
- (2) Water-bottle filling stations required by Sentence (1) that are located in a *storey* where a *barrier-free* path of travel is required shall
 - (a) be located along the *barrier-free* path of travel,
 - (b) have a clear floor space of 800 mm by 1 350 mm in front of them, (See Note A-3.8.3.16A.(2)(b))
 - (c) where they have frontal access, provide a knee clearance in accordance with Clause 3.8.3.11.(1)(c),
 - (d) be operable at a height of not more than 1 200 mm above the floor, and (See Note A-3.8.3.16A.(2)(d))
 - (e) be equipped with controls that
 - (i) activate automatically, or
 - (ii) comply with Sentence 3.8.1.5.(1).

(See Sentences 3.3.1.8.(2) and (3) on horizontal projections.)

3.8.3.17. Platforms

- (1) A tactile attention indicator conforming to Article 3.8.3.18. shall be installed along any edge of a platform that is
 - (a) not protected by a *guard*, and
 - (b) higher than 250 mm above the finished floor or ground or sloped steeper than 1 in 3.
- (2) Sentence (1) does not apply to the front edges of *stages*.

3.8.3.18. Tactile Attention Indicators

- r1
- (1) Where a tactile attention indicator is required, it shall conform to Sentence (2) and Clauses 5.1.1. and 5.1.2. of ISO 23599, “Assistive Products for Blind and Vision-Impaired Persons – Tactile Walking Surface Indicators.”
 - (2) The depth of the tactile attention indicator shall be not less than 300 mm and not more than 610 mm.

Section 3.9. Portable Classrooms

3.9.1. Scope

3.9.1.1. Application

- (1) Except as provided in this Section, the requirements in this Division apply to portable classrooms.

3.9.1.2. Heating Systems

- (1) Heating systems and equipment in a portable classroom shall be designed and installed in accordance with Section 6.2.

3.9.2. Interior Finish

3.9.2.1. Flame-Spread Ratings

- (1) Interior finish material used on a wall or ceiling of a portable classroom shall have a *flame-spread rating* of 150 or less.

3.9.3. Application (See Note A-3.9.3.)

3.9.3.1. Building Areas

- (1) A single portable classroom shall be not more than 100 m² in *building area*, and not more than 1 *storey* in *building height*.
- (2) For the purposes of Subsection 3.2.2., where the horizontal distance between portable classrooms is less than 6 m, a group of portable classrooms may be considered as a single *building* with a *building area* equal to the aggregate area of the portable classrooms.

3.9.3.2. Spatial Separations

- (1) The requirements in Subsection 3.2.3. need not be provided between individual portable classrooms where the distance between the classrooms is 6 m or more.
- (2) The requirements in Subsection 3.2.3. need not be provided between individual portable classrooms within a group where
 - (a) the portable classrooms are in groups where
 - (i) the distance between the classrooms is less than 6 m,
 - (ii) the number of classrooms in a group is not more than six, and
 - (iii) the distance between groups of classrooms is 12 m or more, or

- (b) the portable classrooms are in groups where
 - (i) the *means of egress* for each classroom within a group is by a common corridor or passageway,
 - (ii) the number of portable classrooms in a group is not more than six, and
 - (iii) the distance between groups of portable classrooms is 12 m or more.

3.9.3.3. Fire Alarm Systems

- (1) Except as provided in Sentences (2) and (3), the fire alarm system in the main school *building* shall be extended to the portable classrooms with a separate zone indicator on the annunciator.
- (2) The requirements in Sentence (1) need not be provided where there are not more than 12 portables on a site and where
 - (a) the distance between portable classrooms is less than 6 m and the requirements of Subsection 3.2.3. are applied between the classrooms, or
 - (b) the portable classrooms are in groups where
 - (i) the distance between the classrooms is less than 6 m,
 - (ii) the number of classrooms in a group does not exceed six,
 - (iii) within a group of classrooms, the facing walls have a *fire-resistance rating* of 45 min, rated from inside the classroom, and
 - (iv) the distance between groups of classrooms is 12 m or more.
- (3) The requirements in Sentence (1) need not be provided where the distance between portable classrooms is 6 m or more.

3.9.3.4. Provisions for Firefighting

- (1) The requirements in Articles 3.2.2.10. and 3.2.5.1. to 3.2.5.7. need not be provided where there are not more than 12 portable classrooms on a site and where
 - (a) the distance between portable classrooms is 6 m or more,
 - (b) the distance between portable classrooms is less than 6 m and the requirements of Subsection 3.2.3. are applied between the classrooms, or
 - (c) the portable classrooms are in groups conforming with either Clause 3.9.3.2.(2)(a) or (b).

3.9.3.5. Portable Fire Extinguishers

- (1) A fire extinguisher, in accordance with Article 3.2.5.16., shall be installed in each portable classroom.

3.9.3.6. Means of Egress

- (1) Except as required in Sentence 3.9.3.7.(1), a portable classroom shall be provided with *means of egress* conforming to Sections 3.3. and 3.4.

3.9.3.7. Fuel-Fired Appliances

- (1) Where there is only one egress door from a portable classroom, a fuel-fired *appliance* shall be separated from the remainder of the classroom by a *fire separation* with a *fire-resistance rating* of not less than 45 min.
- (2) Except as provided in Sentences (3) and (4), if a portable classroom contains a fuel-fired *appliance*, the *appliance* shall be separated from the remainder of the classroom by a *fire separation* having a *fire-resistance rating* not less than
 - (a) 1.5 h where the horizontal distance between portable classrooms is 1.5 m or less, and
 - (b) 45 min where the horizontal distance between portable classrooms is more than 1.5 m.

- (3) If the horizontal distance between portable classrooms is 6 m or more, a fuel-fired *appliance* need not be separated from the remainder of the classroom by a *fire separation* provided
- (a) there is not more than one *appliance* per portable classroom, and
 - (b) the *appliance* is located not less than 4.5 m from an egress doorway or an *exit* from the portable classroom.
- (4) Fuel-fired *appliances* with sealed combustion located in a portable classroom are not required to be separated from the remainder of the classroom
- (a) if there are not more than four portable classrooms in a group, and
 - (b) if the *appliance* is located not less than 4.5 m from an egress doorway or an *exit* from the portable classroom.

3.9.3.8. Washroom Facilities

- (1) Washroom facilities need not be provided in a portable classroom where the facilities in the main school *building* comply with the requirements of Subsection 3.7.4. for the total *occupant load* of the main school *building* and the portable classrooms.

3.9.3.9. Barrier-Free Access

- (1) The requirements of Section 3.8. for *barrier-free* access need not be provided for a portable classroom provided that the main school *building* complies with the requirements of Section 3.8.

Section 3.10. Self-Service Storage Buildings

3.10.1. Scope

3.10.1.1. Application

- (1) Except as provided in this Section, the requirements in this Division apply to *self-service storage buildings*.

3.10.2. Requirements for All Buildings

3.10.2.1. Occupancy Classification

- (1) A *self-service storage building*
- (a) shall comply with the requirements for a Group F, Division 2 *major occupancy*, and
 - (b) shall not contain a Group F, Division 1 *occupancy*.

3.10.2.2. Occupant Load

- (1) The requirements based on *occupant load* shall not apply.

3.10.2.3. Structural Fire Protection

- (1) Except as provided in Sentence 3.10.4.2.(1), the requirements in Subsections 3.2.1. and 3.2.2. shall apply.
- (2) The *first storey* shall be subdivided into areas not more than 500 m² by a masonry or reinforced concrete *fire separation* having a *fire-resistance rating* not less than 1 h, or it shall be *sprinklered*.

3.10.2.4. Safety Requirements Within Floor Areas

- (1) Except as provided in Sentences (2) to (12), the requirements in Section 3.3. shall apply.
- (2) A corridor need not be constructed as a *public corridor* where the travel distance, measured from inside the rental space to the nearest *exit*, is not more than 15 m provided that the corridor walls
 - (a) are of *noncombustible construction*,
 - (b) have no openings other than doors and the doors are of solid construction, and
 - (c) are continuous from the floor to the underside of the floor above, the ceiling or the roof.
- (3) Where the *building* is *sprinklered* throughout, doors in a *public corridor* do not require to be equipped with self-closing devices and latches provided that the travel distance is measured from inside the rental space to the nearest *exit*.
- (4) Egress doors from a rental space are not required to swing in the direction of *exit* travel or swing on a vertical axis provided
 - (a) the area of the rental space is not more than 50 m², and
 - (b) the distance of travel within the rental space is not more than 10 m.
- (5) Where egress doors from a rental space open onto a corridor and swing in the direction of *exit* travel, the corridor shall be not less than 1 500 mm wide, and the doors shall be not more than 914 mm wide.
- (6) Where egress doors from a rental space open onto a corridor and do not swing in the direction of *exit* travel, the corridor shall be not less than 1 100 mm in width.
- (7) Dead-end corridors are not permitted.
- (8) Corridors shall be provided with
 - (a) natural lighting that shall be uniformly distributed and be at least 4% of the corridor area, or
 - (b) emergency lighting, conforming to Sentences 3.2.7.4.(1) and (2), that shall provide average levels of illumination not less than 10 lx at floor level.
- (9) Not more than two *dwelling units* shall be contained within one of the *buildings* on the property.
- (10) Except as provided in Sentence (11), *dwelling units* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 2 h.
- (11) A *fire separation* is not required between a *dwelling unit* and an office where the office is not more than 50 m² in area.
- (12) The *fire separations* required in Sentence 3.3.1.1.(1) need not be provided between individual rental spaces.

3.10.2.5. Exit Requirements

- (1) Except as provided in Sentences (2) and (3), the requirements in Section 3.4. shall apply.
- (2) The clear width of an *exit* stair shall be not less than 1 100 mm.
- (3) *Exit* doors from rental spaces are not required to swing on a vertical axis provided
 - (a) the area of the rental space is not more than 50 m², and
 - (b) the travel distance within the rental space is not more than 10 m.

3.10.2.6. Service Facilities

- (1) Except as provided in Sentence (2), the requirements in Section 3.6. shall apply.

(2) Except where located in and serving only the *dwelling units*, a fuel-fired *appliance* shall be located in a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

3.10.2.7. Sanitary Facilities

(1) Except as provided in Sentence (2), the requirements in Subsection 3.7.4. shall apply.

(2) Except as permitted in Sentences 3.7.4.1.(2) and (3), two washrooms, each containing a water closet and a lavatory, shall be provided within one of the *buildings* on the property.

3.10.3. Additional Requirements for Buildings Containing More than 1 Storey

3.10.3.1. Application

(1) The requirements in this Subsection apply to all *buildings* except a 1 *storey building* that does not contain a *basement* or *mezzanine*.

3.10.3.2. Spatial Separations

(1) Except as provided in Sentence (2), the requirements in Subsection 3.2.3. shall apply.

(2) The distance between *buildings* shall be not less than 9 m.

3.10.3.3. Fire Alarm Systems

(1) Except as provided in Sentences (2) and (3), the requirements in Subsection 3.2.4. shall apply.

(2) A fire alarm system shall be installed.

(3) Within the *first storey*, manual stations are required only in corridors.

3.10.3.4. Provisions for Firefighting

(1) Except as provided in Sentences (2) and (3), the requirements in Subsection 3.2.5. shall apply.

(2) Access routes for fire department vehicles shall be provided and shall be not less than 9 m wide.

(3) Hydrants shall be located in the access routes required in Sentence (2) so that

- (a) for a *building* provided with a fire department connection for a standpipe system or a sprinkler system,
- (i) a fire department pumper vehicle can be located adjacent to a hydrant, and
 - (ii) the unobstructed path of travel for the firefighter from the vehicle to the fire department connection is not more than 45 m, and

(b) for a *building* that is not *sprinklered* throughout, a fire department pumper vehicle can be located in the access route so that the unobstructed path of travel for the firefighter is not more than

- (i) 45 m from the hydrant to the vehicle, and
- (ii) 45 m from the vehicle to every opening in the *building*.

3.10.3.5. Standpipe Systems

(1) Except as provided in Sentence (2), the requirements in Articles 3.2.5.8. to 3.2.5.11. shall apply.

- (2) Hose stations are not required in the *first storey*.

3.10.4. Additional Requirements for 1 Storey Buildings

3.10.4.1. Application

- (1) The requirements in this Subsection apply to 1 *storey buildings* that do not contain a *basement* or *mezzanine*.

3.10.4.2. Building Area

- (1) For the purposes of Subsection 3.2.2., *building area* means
 - (a) the *building area* of each *building*,
 - (b) the total of the *building areas* of all *buildings* as a group, or
 - (c) the total of the *building areas* of any number or group of *buildings*.

3.10.4.3. Spatial Separations

- (1) Except as provided in Sentences (2) to (4), the requirements in Subsection 3.2.3. shall apply.
- (2) Where the *building area* conforms to Clause 3.10.4.2.(1)(b), the *limiting distance* requirements shall not apply between individual *buildings*.
- (3) Where the *building area* conforms to Clause 3.10.4.2.(1)(c),
 - (a) the *limiting distance* requirements shall apply between each group of *buildings*, but not between individual *buildings* within a group, and
 - (b) the distance between each group of *buildings* shall be not less than 9 m.
- (4) The distance between individual *buildings* within a group shall be not less than 6 m.

3.10.4.4. Fire Alarm Systems

- (1) Except as provided in Sentence (2), the requirements in Subsection 3.2.4. shall not apply.
- (2) The requirements for *smoke alarms* in Article 3.2.4.20. shall apply to a *dwelling unit*.

3.10.4.5. Provisions for Firefighting

- (1) Except as provided in Sentences (2) to (7), the requirements in Subsection 3.2.5. shall not apply.
- (2) Access routes for fire department vehicles shall be provided and shall be not less than 9 m wide.
- (3) Hydrants shall be located in the access routes required in Sentence (2) so that the locations conform to Sentence 3.10.3.4.(3).
- (4) The access routes required in Sentence (2) shall conform to the requirements in Sentence 3.2.5.6.(1).
- (5) An adequate water supply for firefighting shall be provided for every *building*.
- (6) Where a sprinkler system is installed, the system shall conform to the requirements in Articles 3.2.5.12., 3.2.5.15. and 3.2.5.17.
- (7) Where *combustible* sprinkler piping is installed, it shall conform to the requirements in Article 3.2.5.13.

Section 3.11. Public Pools

3.11.1. General

3.11.1.1. Application

- (1) This Section applies to every *public pool*.
- (2) This Section applies to the design and construction of site assembled and manufactured pools that are intended for use as *public pools*.
- (3) Where material alterations to a *public pool* or the equipment installed in a *public pool* affect the bottom slope, the water volume or the capacity of the *recirculation system*, the adversely affected portions shall comply with the requirements of this Division.
- (4) Where material alterations or repairs concern any pool fitting passing water and/or air in or out of the pool tank, the affected fitting shall comply with Sentences 3.11.8.1.(14) to (20).

3.11.2. Designations of Public Pools

3.11.2.1. Pool Designations

- (1) Every *public pool* shall be designated as being either a Class A pool or a Class B pool in accordance with Sentence (2) or (3).
- (2) A Class A pool is a *public pool* to which the general public is admitted or that is
 - (a) operated in conjunction with or as a part of a program of an educational, instructional, physical fitness or athletic institution or association, supported in whole or in part by public funds or public subscription, or
 - (b) operated on the premises of a *recreational camp*, for use by campers and their visitors and camp personnel.
- (3) A Class B pool is a *public pool* that is
 - (a) operated in conjunction with six or more *dwelling units, suites*, single family residences, or any combination of them for the use of occupants or residents and their visitors,
 - (b) operated in conjunction with a mobile home park for the use of residents or occupants and their visitors,
 - (c) operated on the premises of a *hotel* for the use of its guests and their visitors,
 - (d) operated on the premises of a *campground* for the use of its tenants and their visitors,
 - (e) operated in conjunction with a club for the use of its members and their visitors, or
 - (f) operated in conjunction with an establishment or institution classified in Table 3.1.2.1. as
 - (i) Group B, Division 1, *major occupancy*, or
 - (ii) Group B, Division 2 or 3, *major occupancy*, for the use of residents or occupants and their visitors.

3.11.3. Pool and Pool Deck Design and Construction Requirements for All Class A and Class B Pools

3.11.3.1. Construction Requirements

- (1) Except as otherwise required in Subsections 3.11.4., 3.11.5., 3.11.6. and 3.11.7. or otherwise exempted in Sentences (2) and (3), Class A pools and Class B pools shall be designed and constructed to comply with Sentences (2) to (28) and Articles 3.11.3.2. and 3.11.3.3.

- (2) Where a Class B pool is constructed for use solely in conjunction with a club, child care facility, *day camp* or establishment or institution for the care of persons who are infirm, aged or in custodial care, the pool shall be exempt from the requirements of Clause (9)(a) and Sentences (13) and (14).
- (3) Where a Class B pool is constructed for use solely in conjunction with an establishment or institution for the treatment of persons with disabilities or persons who are ill, the pool shall be exempt from the requirements of Sentences (6) and (7), Clause (9)(a) and Sentences (13) and (14).
- (4) A *public pool* shall be constructed to have a water depth of not less than 750 mm except for
- (a) a *modified pool*,
 - (b) a *wave action pool*,
 - (c) a pool for therapeutic use,
 - (d) a beach entry *ramp*, and
 - (e) a pool described in Sentence 3.11.5.2.(1).
- (5) The beach entry *ramp* permitted in Clause (4)(d) shall be protected with permanent barriers between 900 mm to 1 200 mm along the *pool deck* to prevent entry into the pool until the minimum water pool depth is 750 mm.
- (6) Except for a *modified pool*, a *wave action pool* and a pool used exclusively for scuba diving, the slope of the bottom of any portion of a *public pool* shall not exceed
- (a) 8% where the water depth is 1 350 mm or less,
 - (b) 33% where the water depth is more than 1 350 mm and less than 2 000 mm, and
 - (c) 50% where the water depth is 2 000 mm or more.
- (7) Except for a *modified pool* and *wave action pool*, where the slope of any portion of the bottom of a *public pool* is more than 8%, the walls of the pool shall be equipped with recessed fittings to which a safety line supported by buoys can be attached across the surface of the water and the recessed fittings shall be installed at a horizontal distance of at least 300 mm measured from the vertical projection of the top of the slope in the direction of the shallow end of the pool.
- (8) Except for a *modified pool*, *wave action pool* and a pool described in Sentence 3.11.5.2.(1), the side and end walls of a *public pool* shall be vertical from the top of the walls to within 150 mm of the bottom except at steps or recessed ladders or in water depths of 1 350 mm or more.
- (9) Except for a *modified pool* and *wave action pool* and except as provided in Sentence (11), a *public pool* shall be surrounded by a hard-surfaced *pool deck* that shall
- (a) except for a pool described in Sentence 3.11.5.2.(1), be not less than 1 800 mm wide with at least 1 100 mm of that width being a *barrier-free* path of travel described in Article 3.8.1.3., (See Note A-3.11.3.1.(9)(a))
 - (b) in the case of an *outdoor pool*, be sloped away from the pool to waste drains or to adjacent lower ground at a slope of between 2% and 4%, and
 - (c) in the case of an *indoor pool*, be impervious and sloped away from the pool to waste drains at a slope of between 1% and 4%.
- (10) Where a *public pool* is constructed with a ledge, the ledge shall
- (a) be placed only in parts of the pool where the water depth is 1 350 mm or more,
 - (b) be not more than 200 mm wide,
 - (c) be at least 1 000 mm below the water surface,
 - (d) where located on the side of the pool, be gradually tapered towards the shallow end of the pool in such a manner as to prevent a harmful obstruction, and
 - (e) have a band of contrasting colour along the entire juncture of the side and top of the ledge.
- (11) Notwithstanding Sentences (12) to (17), where a *public pool* is constructed on any level surface with walls rising above that surface and has a constant water depth not exceeding 1 100 mm and a water surface area not exceeding 100 m², the *pool deck* may be an elevated platform surrounding the pool if it has
- (a) an unobstructed width of not less than 900 mm,
 - (b) a height of at least 75 mm above grade or pavement elevation,
 - (c) 6 mm wide openings for drainage, and
 - (d) a non-slip surface that is capable of being kept clean and disinfected.

- (12) Except for a *modified pool* and *wave action pool*, where a *pool deck* projects over the water surface, the projection shall not exceed 50 mm.
- (13) Except for a *modified pool* and *wave action pool*, the *pool deck* shall be separated from any adjacent spectator area or gallery and from any spectator access to such area or gallery by a gate or other barrier.
- (14) Except for a *modified pool* and *wave action pool*, the perimeter of the *pool deck* shall be clearly delineated by a tactile attention indicator conforming to Article 3.8.3.18. and located where any area contiguous to the *pool deck* may be confused with the deck. (See Note A-3.11.3.1.(14))
- (15) Except for a *modified pool* and *wave action pool*, the perimeter of the *pool deck* shall be clearly delineated by painted lines or other means where any area contiguous to the *pool deck* may be confused with the deck.
- (16) Perimeter drainage shall be provided where necessary to prevent surface run-off from draining onto the *pool deck*.
- (17) Except for a *modified pool*, one or more hose bibbs shall be installed near the perimeter of the *pool deck* in locations convenient for flushing the *pool deck*.
- (18) Except for a *modified pool* and *wave action pool*, where access to the pool enclosure is over any surface that is not subject to regular cleaning and sanitizing, a foot spray to wash feet by means of a spray running freely to waste shall be provided at each such access.
- (19) Except for a *modified pool* and *wave action pool*, at least
- one ladder or set of steps shall be provided in both the deep and shallow areas of a *public pool* for entry into and egress from the pool water, and
 - one *barrier-free* access shall be provided for entry into and egress from the water of a *public pool* as required by Article 3.11.3.3.
- (20) The *pool deck*, the submerged parts of a *public pool*, the walls or partitions adjacent to a *pool deck* and the pavement or floor adjacent to a *pool deck* shall have surfaces that permit thorough cleaning.
- (21) Except for markings for safety or competition purposes, submerged surfaces in *public pools* shall be finished white or light in colour.
- (22) Except in a *modified pool*, a black disc 150 mm in diameter on a white background shall be affixed to the bottom of a *public pool* within the area of its greatest depth.
- (23) A *public pool* shall be equipped with lockable doors or other barriers capable of preventing public access to the *pool deck*.
- (24) Except for a *modified pool*, *wave action pool* or a pool installed at a *recreational camp*, a Class A pool shall be provided with,
- where the water surface area is greater than 150 m² but not greater than 230 m², at least one lifeguard control station, and
 - where the water surface area is greater than 230 m², at least two lifeguard control stations.
- (25) Except for a *modified pool*, every *public pool* shall display on the deck clearly marked figures, not less than 100 mm high, that set out
- the water depths indicating the deep points, the breaks between gentle and steep bottom slopes and the shallow points,
 - the words **SHALLOW AREA** at one or more appropriate locations, and
 - where the water depth exceeds 2 500 mm, the words **DEEP AREA** at one or more appropriate locations.
- (26) Except for a *modified pool* and a pool to which Sentence 3.11.5.2.(2) applies, every *public pool* having a maximum water depth of 2 500 mm or less shall display a warning notice posted in a location clearly visible to divers on which are

printed in letters at least 150 mm high the words **CAUTION — AVOID DEEP DIVES** or **SHALLOW WATER — NO DIVING**.

(27) Except where no space is provided between ladder treads and the pool wall, the space between the pool wall and submerged portions of any treads of a ladder for entry into and egress from the water shall be not more than 150 mm and not less than 75 mm.

(28) If a set of steps is provided for entry into and egress from *public pools* in Sentence (19), the steps shall

- (a) be equipped with a handrail,
- (b) have a non-slip surface, and
- (c) have a band of contrasting colour along the entire juncture of the side and top of the edges

3.11.3.2. Barrier-Free Path of Travel for Outdoor Pool Deck

(1) Where an *outdoor pool* is provided, a *barrier-free* path of travel shall be provided to and throughout the normally occupied portions of the *pool deck*. (See Note A-3.11.3.2.(1))

3.11.3.3. Access into Public Pools

(1) Access for entry into and egress from the water of a *public pool* provided in a *storey* that is required by Article 3.8.2.1. to have a *barrier-free* path of travel shall be *barrier-free* and shall be provided by

- (a) a *ramp* conforming to
 - (i) Article 3.11.5.1., and
 - (ii) Article 3.11.5.2., in the case of a pool described in Sentence 3.11.5.2.(1), or
- (b) a pool lift conforming to the manufacturer's specifications and installation instructions and conforming to Sentences (2) to (6).

(2) Except where the entire pool depth is greater than 1 220 mm, where a pool lift is installed, at least one lift shall be located where the water level does not exceed 1 220 mm.

(3) The centre line of the seat for the pool lift shall be located over the deck and a minimum of 400 mm from the edge of the pool when in the raised position.

(4) A clear deck space located parallel with the seat for the pool lift and on the side of the seat opposite the water shall

- (a) be at least 915 mm wide, and
 - (b) extend forward not less than 1 220 mm from a line located 305 mm behind the rear edge of the seat.
- (See Note A-3.11.3.3.(4))

(5) The pool lift shall be

- (a) designed to be operable without assistance from both the deck and water, and
- (b) designed so that, when in use, its controls and operating mechanisms are unobstructed.

(6) The pool lift shall

- (a) have a weight capacity of at least 135 kg, and
- (b) be capable of sustaining a static load of at least 1.5 times the rated load.

3.11.4. Public Pools Equipped with Diving Boards or Diving Platforms

3.11.4.1. Diving Boards or Platforms

(1) No *diving board* or *diving platform* shall be installed in a *public pool* unless the requirements of Sentences (5) to (17) are met but the requirements for a *diving platform* do not apply to a *starting platform*.

(2) No *diving board* or *diving platform* shall be installed in a *modified pool* or a *wave action pool*.

- (3) Where a *public pool* is equipped with a *diving board* or a *diving platform*, the board or platform shall have a non-slip surface.
- (4) Where a *diving board* or a *diving platform* in a *public pool* is more than 600 mm above the water surface, the board or platform shall be equipped with one or more adjacent handrails.
- (5) Where a *public pool* is equipped with a *diving board* or a *diving platform* not more than 3 m in height above the water surface, the pool shall be designed and constructed in conformance with Sentences (6) to (15).
- (6) The depth of water in the area directly below a horizontal semi-circle in front of a *diving board* or *diving platform* having a radius of 3 m measured from any point on the front end of the board or platform shall not be less than
- 2 750 mm, where a board is 600 mm or less in height above the water surface,
 - 3 m, where a board or platform is greater than 600 mm but not more than 1 000 mm in height above the water surface, and
 - 3.65 m, where a board or platform is greater than 1 000 mm but not more than 3 m in height above the water surface.
- (7) Except as permitted in Sentence (8), the water depth in a *public pool* shall be at least 1 350 mm at the horizontal arc having a radius of 9 m measured from any point on the front end of the *diving board* or *diving platform* and intersecting the vertical projections of the walls of the pool.
- (8) Where a Class B pool is equipped with a *diving board* 600 mm or less in height above the water
- the water depth shall be at least 1 350 mm at the horizontal arc having a radius of 7.5 m measured from any point on the front end of the *diving board*, and
 - a warning notice, on which is printed in letters at least 150 mm high, the words **DANGER — AVOID DEEP OR LONG DIVES**, shall be posted in a location clearly visible to divers.
- (9) The slope of the bottom of a *public pool* having a *diving board* or *diving platform* shall not change by more than 17% where the water depth is less than the applicable depth set out in Sentence (6) and greater than the depth set out in Sentence (7) or (8), as applicable.
- (10) The horizontal distance between the vertical projection of the centre line of a *diving board* or *diving platform* and the vertical projection of the centre line of another board or platform shall be at least 2 750 mm.
- (11) The horizontal distance between the centre line of a *diving board* or *diving platform* and the vertical projection of the closest side or any ledge on the closest side of a *public pool* shall be at least
- 3 m, where a *diving board* or *diving platform* is 1 000 mm or less in height above the water surface, and
 - 3.6 m, where a *diving board* or *diving platform* is greater than 1 000 mm in height above the water surface.
- (12) A *diving board* or a *diving platform* 600 mm or less in height above the water surface shall project over the water a horizontal distance of at least 900 mm from the vertical projection of a pool wall under it.
- (13) A *diving board* greater than 600 mm in height above the water surface shall project over the water a horizontal distance of at least 1 500 mm from the vertical projection of the pool wall under it.
- (14) A *diving platform* greater than 600 mm in height above the water surface shall project a horizontal distance of at least 1 200 mm from the vertical projection of the pool wall under it.
- (15) The space above a *diving board* or *diving platform* shall be unobstructed and shall consist of at least
- a space having a width of 2 500 mm on each side of the centre line of the board or platform, a length equal to the sum of the horizontal distance the board or platform projects over the water plus 3 m, and a height of,
 - 3.65 m above a *diving board* 3.65 m or less in length,
 - 5 m above a *diving board* greater than 3.65 m in length, or
 - 3 m above a *diving platform*, and
 - the space below the planes originating from the front and sides of the uppermost horizontal plane of the space determined under Clause (a) and sloping downwards at 30° from the horizontal.

(16) A *diving board* or *diving platform* greater in height than 3 m above the water surface shall be equipped with a gate, barrier or other device capable of preventing access to the *diving board* or *diving platform*.

(17) Where a *public pool* is to be equipped with *diving boards* or *diving platforms* greater than 3 m in height above the water surface, the design of the *diving boards* or *diving platforms* and the corresponding water depths and clearances shall be in accordance with FINA, “Rules and Regulations - FINA Facilities Rules 2021-2025 – FR3 Diving Facilities.”

3.11.5. Ramps into Public Pools

3.11.5.1. Ramps into Public Pools

- (1) Where *barrier-free* access for entry into and egress from the water of a *public pool* is provided by a *ramp* as required by Clause 3.11.3.3.(1)(a), the pool shall be designed and constructed in accordance with Sentences (2) to (4).
- (2) A *ramp* shall have
- (a) along each side a handrail that
 - (i) has a height of not less than 865 mm and not more than 965 mm, and
 - (ii) runs parallel to the slope of the *ramp*,
 - (b) a width of at least 1 100 mm,
 - (c) a curb or other means to prevent a wheelchair from falling off the side of the *ramp*,
 - (d) surface finishes capable of being kept clean, sanitary and free from slipperiness, and
 - (e) a landing at the bottom at least 1 500 mm in length and the same width as the *ramp*.
- (3) Where a *ramp* that is not submerged is adjacent to the pool wall and is used for access to the water, the pool shall be constructed so that
- (a) the landing at the bottom of the *ramp* is at least 450 mm but not more than 550 mm below the top of the wall separating the *ramp* from the pool,
 - (b) the landing is equipped with a floor drain at its lowest point,
 - (c) the top of the wall between the pool and the *ramp* is at least 250 mm and not more than 300 mm in width,
 - (d) the *pool deck* is capable of accommodating a movable barrier separating the deck from the *ramp*,
 - (e) the water depth at the landing is accurately and clearly marked at the landing in figures at least 100 mm high on the top of the wall separating the pool from the *ramp*, and
 - (f) the *ramp* has a slope not exceeding 1 in 12.
- (4) Where a submerged *ramp* is adjacent to the pool wall and is used for access to the water, the pool shall be constructed so that
- (a) the water depth at the bottom of the *ramp* is at least 600 mm and not greater than 900 mm,
 - (b) a hard-surfaced area that is at least 900 mm wide is contiguous to the entire length of the part of the submerged *ramp* that pierces any part of the deck, (See Note A-3.11.5.1.(4)(b))
 - (c) the area described in Clause (b) is capable of accommodating a movable barrier separating the area from the deck,
 - (d) the finishes in submerged portions of the *ramps* and curbs are different in colour or shade from each other and from that of the pool walls and bottom, and
 - (e) the submerged *ramp* has a slope not exceeding 1 in 9.

3.11.5.2. Public Pools in Group B, Division 2 or 3 Major Occupancies

(1) Despite Sentences 3.11.3.1.(4) and (8) and Clause 3.11.3.1.(9)(a), where a *public pool* is constructed in a *building* containing a Group B, Division 2 or 3 *major occupancy* and has a water depth not exceeding 1 500 mm and a water surface area not exceeding 100 m², the *pool deck* contiguous to not more than 50% of the total perimeter of the pool may be replaced by one or more *ramps* that will permit a bather seated in a wheelchair to enter the water with or without the wheelchair.

- (2) Despite Sentence 3.11.3.1.(26), a warning notice, on which are printed in letters at least 150 mm high the words **CAUTION — NO DIVING**, shall be posted conspicuously on each wall or fence line enclosing a pool described in Sentence (1).
- (3) There shall be a curb along the perimeter of a pool described in Sentence (1) except at steps, ladders and *ramp* entrances.
- (4) The curb required by Sentence (3) shall have
- (a) a height of 50 mm,
 - (b) rounded edges,
 - (c) a coved base, and
 - (d) a raised nosing at the top to serve as a fingerhold for a bather in the water.

3.11.6. Modified Pools

3.11.6.1. Construction Requirements

- (1) A *modified pool* is exempt from Sentences 3.11.3.1.(4) to (9), (12), (13), (14), (17), (18), (19), (22), (24), (25) and (26), Sentence 3.11.8.1.(12) and Article 3.11.3.3.
- (2) A *modified pool* shall be designed and constructed to comply with Sentences (3) to (9).
- (3) A *modified pool* and its *pool deck* shall be constructed of hard-surfaced material that permits thorough cleaning.
- (4) The slope of the bottom of any portion of a *modified pool* shall not exceed 1 in 12.
- (5) The depth of the water in any portion of a *modified pool* shall not be more than 1 800 mm.
- (6) A *modified pool* shall be surrounded on all sides by a hard-surfaced *pool deck* that shall
- (a) be at least 3 m wide,
 - (b) have a continuous crest surrounding the pool at least 100 mm above the pool water surface, and
 - (c) be sloped to shed water from the crest to the outer perimeter of the *pool deck*.
- (7) A *modified pool* shall be provided with two or more drain fittings covered with protective grilles with openings having an aggregate area of at least 10 times the internal cross-sectional area of the outlet pipe or pipes connected to the *recirculation system* that is capable of completely draining the pool.
- (8) Provision shall be made for lifeguard control stations adjacent to the edge of the water at intervals of not more than 60 m.
- (9) The bottom of a *modified pool* shall be marked with continuous black contour lines
- (a) 150 mm wide located where the water depth is 600 mm, and
 - (b) 300 mm wide located where the water depth is 1 200 mm.

3.11.7. Wave Action Pools

3.11.7.1. Construction Requirements

- (1) A *wave action pool* is exempt from Sentences 3.11.3.1.(4) to (9), (12), (13), (14), (18), (19) and (24), Sentence 3.11.8.1.(12) and Article 3.11.3.3.
- (2) A *wave action pool* shall be designed and constructed to comply with Sentences (3) to (11).

- (3) The slope of the bottom of any portion of a *wave action pool*
 - (a) shall not exceed 1 in 12 where the still water depth is less than 1 000 mm, and
 - (b) shall not exceed 1 in 9 where the still water depth is 1 000 mm or more.
- (4) The walls of a *wave action pool* shall be vertical from the water surface to within 150 mm of the bottom.
- (5) There shall be a hard-surfaced *pool deck* at least 3 m wide immediately adjacent to the pool wall at the shallow end of the pool and at least 1 500 mm wide immediately adjacent to all walls of the pool.
- (6) Provision shall be made for two or more lifeguard control stations on each side of the *pool deck* adjacent to which the still water depth exceeds 1 000 mm.
- (7) Sets of steps or ladders recessed into pool side walls and having continuous vertical grab bars on each side of them shall be located at intervals of not more than 7.5 m along portions of the pool where the still water depth exceeds 1 000 mm, except that no steps or ladders shall be located within 3 m of the corners at the deep end of the pool.
- (8) Except at recessed steps or ladders, the *pool deck* along each side of a *wave action pool* adjacent to which the water depth is 2 300 mm or less shall be equipped with a barrier supported by posts or a wall that
 - (a) is 1 000 mm in height,
 - (b) is located 1 000 mm or less from the side of the pool, and
 - (c) has warning notices affixed to the barrier or wall at intervals not exceeding 7.5 m signifying clearly that jumping and diving are prohibited along the sides of the pool.
- (9) Skimming devices shall be designed and suitably located to remove surface film when no waves are induced in a *wave action pool*.
- (10) A system capable of deactivating the wave-making equipment shall be installed with readily accessible push buttons located on the *pool deck* not more than 30 m apart, adjacent to each side and the deep end of the pool.
- (11) A *wave action pool* shall be equipped with a first-aid room located within 50 m of the pool.

3.11.8. Recirculation for Public Pools

3.11.8.1. Recirculation Systems

- (1) Every *public pool* shall be equipped with a *recirculation system*.
- (2) For the purposes of this Subsection, the water in a *public pool* and its *recirculation system* is deemed not to be *potable* water.
- (3) The water in a *public pool* and its *recirculation system* shall be separated from the *potable* water supply and from the sewer or drainage system into which it drains by *air gaps* or other devices that prevent
 - (a) the water in the pool or its *recirculation system* from flowing back into the *potable* water supply, and
 - (b) the water in the sewer or *drainage system* from flowing back into the pool or its *recirculation system*.
- (4) The *recirculation system* of a *public pool* shall be designed, constructed and equipped to comply with Sentences (5) to (20).
- (5) The *recirculation system* of a *public pool* shall be capable of filtering, disinfecting and passing through the pool each day a volume of water of at least
 - (a) in the case of a Class A pool, other than a *modified pool* or a *wave action pool*, six times the total water volume of the pool,
 - (b) in the case of a Class B pool, other than a *wave action pool*, four times the total water volume of the pool,
 - (c) in the case of a *modified pool*, three times the total water volume of the pool, and
 - (d) in the case of a *wave action pool*, six times the total water volume of the pool.

- (6) A *recirculation system* shall be equipped with a flow meter registering the rate of water flow.
- (7) All pools shall be provided with automatic *make-up water* devices and provided with water meters to register the volume of all *make-up water* added to a *public pool* or its *recirculation system*.
- (8) Equipment shall be installed to continuously disinfect the water in a *public pool* by means of
- (a) a chlorination or hypochlorination system provided with a chemical controller for regulating the dosage of chlorine and capable of providing not less than,
- (i) in the case of an *outdoor pool*, other than a *wave action pool*, 300 g of chlorine per day per 10 000 L of total pool capacity,
 - (ii) in the case of an *indoor pool*, other than a *wave action pool*, 200 g of chlorine per day per 10 000 L of total pool capacity,
 - (iii) in the case of an outdoor *wave action pool*, 1 200 g of chlorine per day per 10 000 L of total pool capacity, and
 - (iv) in the case of an indoor *wave action pool*, 800 g of chlorine per day per 10 000 L of total pool capacity, or
- (b) a bromination system capable of maintaining in the pool water a total bromine residual of 3 mg/L.
- (9) Chlorination equipment for a *public pool* shall contain a mechanism whereby the chlorine feed shall automatically terminate whenever the *recirculation system* ceases to supply *clean water* to the pool.
- (10) All exposed *potable* water piping and chlorine piping within a *public pool* water treatment *service room* shall be colour coded by means of
- (a) painting the entire outer surface of the piping, or
- (b) coloured bands at least 25 mm in width that are spaced along the piping at intervals of not more than 1 200 mm.
- (11) The colour coding referred to in Sentence (10) shall be yellow for chlorine and green for *potable* water.
- (12) Except for a *modified pool* and *wave action pool*, a *public pool* shall be equipped with overflow gutters or surface skimmers connected to the *recirculation system* that are capable of removing surface film from the surface of the water and withdrawing each day and discharging to the waste drains up to 15% of the total volume of pool water.
- (13) A *public pool* shall be equipped with *clean water* inlets arranged in conjunction with surface skimmers or overflow gutters to provide uniform distribution and circulation of *clean water*.
- (14) Except as permitted in Sentence (19), all fittings at or below the water surface that allow water and/or air to be passed to or from the *public pool* shall
- (a) have a maximum opening of 7 mm in one direction, and
- (b) be securely held in place by corrosion resistance fastening that require a tool for removal and are galvanically compatible with the fittings and grilles or covers.
- (15) Except as provided in Sentence 3.11.6.1.(7) for a *modified pool*, all fittings below the water surface that provide suction or gravity flow in a *public pool* shall
- (a) be provided with a minimum of two suction or gravity outlets interconnected to a full size manifold, and
- (b) be separated by a clear distance of not less than 1 200 mm.
- (16) Except as provided in Sentence 3.11.6.1.(7) for a *modified pool*, water in all *public pools* shall be capable of being emptied through the pool drains in 12 hours or less.
- (17) Except as provided in Sentence 3.11.6.1.(7) for a *modified pool*, openings in suction or gravity fittings shall
- (a) be such that the flow of water does not exceed 0.45 m/s and the velocity is calculated assuming all possible sources of suction flow are present at one time, and
- (b) be such that every suction fitting located within 1 000 mm of the water surface, except for skimmers and gutter fittings, contain openings with a minimum aggregate area of 0.2 m².
- (18) Except for skimmers and gutters, all submerged suction and gravity fittings shall be clearly and permanently marked with a 50 mm wide band in a contrasting colour.

(19) Fittings returning water and/or air to the pool tank that are located within 300 mm of the water surface are permitted to have openings with one dimension more than 7 mm but shall contain no openings more than 25 mm in diameter.

(20) Submerged skimmer equalizer fittings and vacuum fittings are not permitted in *public pools*.

3.11.9. Dressing Rooms, Locker Facilities and Plumbing Facilities for All Public Pools

3.11.9.1. Dressing Rooms and Sanitary Facilities

(1) Except as otherwise permitted in Sentences (2) and (3), every *public pool* shall be equipped with dressing rooms, locker rooms, shower heads, water closets, urinals, lavatories and drinking fountains that shall be designed, constructed and equipped to comply with Sentences (4) to (14).

(2) Where a Class A pool is installed on the premises of a *recreational camp*, dressing rooms, locker rooms, shower heads, water closets, urinals, lavatories and drinking fountains are not required if

- (a) dressing, water closet and shower facilities are conveniently available for bathers elsewhere on the premises, and
- (b) foot sprays are provided in accordance with Sentence 3.11.3.1.(18).

(3) Where a Class B pool is installed, dressing rooms, locker rooms, shower heads, lavatories, water closets, drinking fountains and urinals are not required if

- (a) dressing, water closet and shower facilities are conveniently available elsewhere on the premises for bathers when the pool is open for use, and
- (b) foot sprays are provided in accordance with Sentence 3.11.3.1.(18).

(4) The minimum number of water closets, urinals and lavatories shall be determined from Article 3.7.4.3. and Table 3.7.4.3.-C for an *occupant load* based on

- (a) the formula in Sentence 3.1.17.3.(1) for all *public pools*, except a *wave action pool*, or
- (b) the formula in Sentence 3.1.17.3.(2) for a *wave action pool*.

(5) A minimum of one shower head shall be provided for every 40 bathers.

(6) Where dressing and locker rooms, water closets and urinals are provided in conjunction with a *public pool*, they shall be located in such a manner that bathers, after using them, shall pass through or by a shower area to reach the *pool deck*.

(7) All shower heads shall be supplied with *potable* water at a pressure of at least 140 kPa.

(8) The shower water system shall have one or more tempering devices capable of being adjusted to ensure that water supplied to shower heads does not exceed 40°C.

(9) Floors in washrooms, shower areas and passageways used by bathers shall slope to waste drains at not less than 1% and shall be of hard surfaced materials that do not become slippery when wet.

(10) Joints between floors and walls shall be coved in areas described in Sentence (9) and in dressing and locker rooms.

(11) Hose bibbs shall be provided in safe locations convenient for flushing down the walls and floors in washrooms, shower areas and passageways used by bathers.

(12) *Partitions* or walls shall be provided to ensure privacy of dressing rooms, washrooms and shower areas.

(13) The bottom of interior *partitions* in dressing rooms and washrooms shall be between 250 mm and 350 mm above the floor.

(14) Dressing and locker room floors shall have non-slip surfaces that permit convenient and thorough cleaning and disinfecting.

3.11.10. Emergency Provisions for All Public Pools

3.11.10.1. Lighting and Emergency Provisions

(1) Except as provided in Sentences (2) and (3), rooms and spaces used by the public in conjunction with a *public pool* shall be capable of illumination to levels in compliance with Subsection 3.2.7.

(2) Dressing rooms, locker rooms, shower rooms, washrooms and passageways shall have an illumination level of at least 200 lx at floor level.

(3) An *indoor pool* or an *outdoor pool* that is intended to be open for use after sundown shall be equipped with a lighting system

(a) that will maintain at any point on the *pool deck* and on the pool water surface an illumination level of at least

(i) 200 lx in the case of an *indoor pool*, and

(ii) 100 lx in the case of an *outdoor pool*, and

(b) that makes the underwater areas of the pool clearly visible from any point on the *pool deck*.

(4) An *outdoor pool* that is intended to be open for use after sundown and an *indoor pool* shall be equipped with an independent emergency lighting system that automatically operates whenever the normal electrical power supply to a *public pool* lighting system fails.

(5) The independent emergency lighting system required in Sentence (4) shall be capable of illuminating the *pool deck*, washroom, shower, locker areas, pool water surface and all means of egress to a level of at least 10 lx.

(6) An emergency power supply for the emergency lighting system required in Sentence (4) shall comply with Sentences 3.2.7.4.(1) and 3.2.7.7.(1) and Article 3.2.7.5.

(7) An emergency telephone directly connected to an emergency service or to the local telephone utility shall be installed adjacent to the *pool deck* of every Class A pool.

(8) A telephone accessible for emergency use shall be installed for every Class B pool within 30 m of the pool.

(9) Every *wave action pool* shall have a public address system that shall be clearly audible in all portions of the pool.

(10) Every *wave action pool* shall have a communication system for the use of persons engaged in supervision or operation of the pool that shall be interconnected with each lifeguard control station, the first-aid room and the bather admission control centre.

(11) The public address system and the communication system described in Sentences (9) and (10) shall be interconnected.

(12) All recirculating pumps used in a *public pool* shall be capable of being deactivated by an emergency stop button clearly labelled and located at

(a) a Class A pool beside the telephone that is required in Sentence (7), and

(b) a Class B pool on the deck area.

(13) The emergency stop button in Sentence (12) shall, when used, activate an audible and a visual signal located by the emergency stop.

(14) An emergency sign containing the words **IN THE EVENT OF AN EMERGENCY PUSH EMERGENCY STOP BUTTON AND USE EMERGENCY PHONE, AUDIBLE AND VISUAL SIGNAL WILL ACTIVATE** shall be in letters at least 25 mm high with a 5 mm stroke and posted above the emergency stop button.

3.11.11. Service Rooms and Storage for All Public Pools

3.11.11.1. Service Rooms and Storage Facilities

- (1) In addition to the requirements of this Subsection, *service rooms* shall comply with the requirements of Sentences 3.6.2.1.(5), 3.6.2.1.(7) and 3.6.2.1.(8) and Articles 3.5.3.3. and 3.6.2.2.
- (2) Where compressed chlorine gas is used as a pool water disinfectant, the cylinders or containers of gas shall be located in a *service room* that
 - (a) except as provided in Sentences 3.1.9.4.(4), (5) and (7) to (9), is separated from the remainder of the *building* by a 1 h *fire separation* that is substantially gas tight,
 - (b) is designed for the sole purpose of containing all installed pressurized chlorine gas apparatus and piping and storing all chlorine gas containers or chlorine gas cylinders that are individually secured against toppling,
 - (c) is located at or above ground level,
 - (d) is provided with an *exit* door opening to the outdoors,
 - (e) has screened openings to the outdoors with at least one opening located within 150 mm from the floor and at least one opening located within 150 mm from the ceiling, each opening being 2% of the area of the floor,
 - (f) is equipped with emergency mechanical ventilation capable of producing at least 30 air changes per hour, taking suction at a maximum of 900 mm above the floor level and discharging at least 2 500 mm above ground level directly to the outdoors, and
 - (g) contains a platform weigh scale of at least 135 kg capacity for each chlorine cylinder in use.
- (3) Storage facilities shall be provided for the safe storage of all chemicals required in pool operations.
- (4) The storage facilities shall be ventilated and shall be equipped with a water hose connection and a floor drain.
- (5) *Service rooms* and storage facilities, including rooms and facilities that contain electrical or mechanical equipment or chemicals or chemical feeders, shall be equipped with a secure locking device.

Section 3.12. Public Spas

3.12.1. General

3.12.1.1. Application

- (1) This Section applies to the design and *construction* of site-assembled *public spas* and factory-built *public spas*.
- (2) If material alterations to a *public spa* or the equipment installed in a *public spa* affect the bottom slope, the water volume or the capacity of the water circulation system, the adversely affected portions shall comply with the requirements of this Division.
- (3) Except as provided in Sentence (4), if material alterations or repairs concern any pool fitting that passes water or air, or both, in or out of the pool tank, the affected fitting shall comply with Sentences 3.11.8.1.(20) and 3.12.4.1.(4) to (10).
- (4) If the material alterations or repairs concern a fitting cover or grille, the affected fitting cover or grille shall comply with Sentences 3.12.4.1.(7) to (10).
- (5) For the purposes of this Section, every reference to a *public pool* or a *recirculation system* in a definition in Article 1.4.1.2. of Division A, or a Sentence or Clause in Section 3.11. that is made applicable to *public spas* by this Section, is deemed to be a reference to a *public spa* or water circulation system, respectively.

3.12.2. Public Spa and Deck Design and Construction Requirements

3.12.2.1. Construction Requirements

- (1) In addition to the requirements of this Subsection, *public spas* shall comply with the requirements of Sentences 3.11.3.1.(13) to (18), (20), (21) and (23) and Clause 3.11.3.1.(25)(a).
- (2) A *public spa* shall be constructed to have a water depth of not more than 1 200 mm.
- (3) The slope of the bottom of any portion of a *public spa* shall not exceed 8%.
- (4) A *public spa* shall be surrounded by a hard-surfaced *pool deck* that
 - (a) shall have a minimum clear deck space of not less than 1.8 m at the main entrance point,
 - (b) shall have a clear deck space of 900 mm on all sides, except as required by Clause (a) and permitted by Sentence (5),
 - (c) shall be sloped away from the pool to waste drains or to adjacent lower ground at a slope of between 2% and 4%, in the case of an outdoor *public spa*, and
 - (d) shall be impervious and sloped away from the pool to waste drains at a slope of between 1% and 4%, in the case of an indoor *public spa*.
- (5) One section of the hard-surfaced *pool deck* that does not exceed 25% of the perimeter of the *public spa* may have a minimum clear deck space of not more than 300 mm if
 - (a) the *public spa* has an area less than 6 m², and
 - (b) the *public spa* has no interior dimension more than 2.5 m.
- e1 (6) The maximum depth of water to a seat or bench in a *public spa* shall be 600 mm.
- (7) If a set of steps is provided for entry into and egress from the *public spa* water, the steps
 - (a) shall be equipped with a handrail,
 - (b) shall have a non-slip surface, and
 - (c) shall have a band of contrasting colour along the entire juncture of the side and top of the edges.
- (8) Every *public spa* shall be provided with dressing rooms, water closets and shower facilities that are conveniently available on the premises.
- (9) Except where no space is provided between ladder treads and the spa wall, the space between the spa wall and submerged portions of any treads of a ladder for entry into and egress from the water shall be not more than 150 mm and not less than 75 mm.

3.12.3. Ramps and Access into Public Spas

3.12.3.1. Ramps into Public Spas

- (1) Not more than 50% of the total perimeter of a *public spa* may be replaced by one or more *ramps* that permit a bather seated in a wheelchair to enter the water with or without the wheelchair.
- (2) If a *public spa* has one or more *ramps* described in Sentence (1), the *public spa* shall comply with Article 3.11.5.1. and Sentences 3.11.5.2.(3) and (4).

3.12.3.2. Access into Public Spas

- (1) Where more than one *public spa* is provided within a *suite* located on a *storey* that is required by Article 3.8.2.1. to have a *barrier-free* path of travel, a *barrier-free* access described in Sentence (2) shall be provided to at least one *public spa*.
- (2) *Barrier-free* access for entry into and egress from a *public spa* shall be provided by
- (a) a *ramp* conforming to Article 3.12.3.1.,
 - (b) a pool lift conforming to the manufacturer's specifications and installation instructions and conforming to Sentences 3.11.3.3.(2) to (6), or
 - (c) a transfer wall conforming to Sentences (3) to (5).
- (3) A transfer wall providing *barrier-free* access for entry into and egress from a *public spa* shall
- (a) have a height not less than 405 mm and not more than 485 mm measured from the *pool deck*,
 - (b) have a depth of at least 300 mm and not more than 400 mm,
 - (c) be slip-resistant and have edges that are rounded, and
 - (d) have at least one grab bar that
 - (i) is perpendicular to the pool and extends the full depth of the transfer wall,
 - (ii) is located not less than 100 mm and not more than 150 mm above the transfer wall,
 - (iii) has a clearance of at least 610 mm on both sides,
 - (iv) complies with Clauses 3.8.3.8.(7)(a) and (b), and
 - (v) is made of a slip-resistant material.
- (See Note A-3.13.4.3.(3) and (4))
- (4) The deck area required to make a lateral transfer to the transfer wall shall
- (a) be outside and adjacent to the *barrier-free* path of travel described in Sentence (1),
 - (b) have no obstructions at the side of the transfer wall serving the transfer space,
 - (c) have a clear space of 900 mm by 2 200 mm, and
 - (d) have a slope less than 2% provided at the base of the transfer wall surface.
- (See Note A-3.13.4.3.(3) and (4))
- (5) The deck area described in Clause (4)(c) shall be centred on
- (a) the grab bar where one grab bar is provided, or
 - (b) the clear space between the grab bars where more than one grab bar is provided.

3.12.4. Water Circulation for Public Spas

3.12.4.1. Water Circulation Systems

- (1) In addition to the requirements of this Subsection, the water circulation system of a *public spa* shall comply with the requirements of Sentences 3.11.8.1.(2), (3), (6), (7), (9), (10), (11), (13) and (20).
- (2) A *public spa* shall be equipped with a water circulation system that is capable of filtering, disinfecting and passing the *public spa* water through the *public spa* with a turnover period of not more than
- (a) 30 minutes for a *public spa* with a volume of water that exceeds 6 m³,
 - (b) 20 minutes for a *public spa* with a volume of water that exceeds 4 m³ but does not exceed 6 m³, or
 - (c) 15 minutes for a *public spa* with a volume of water that does not exceed 4 m³.
- (3) If cartridge-type filters are used for a *public spa*, the filters shall be a surface-type that is designed for a maximum flow rate of 0.27 L/s/m² effective filter area.

- (4) Except as provided in Sentence (6), every circulation system in a *public spa* shall be served by a minimum of two suction or gravity outlets
- (a) that are interconnected to a full-size manifold, and
 - (b) except as provided in Sentence (5), that are separated by a clear distance of not less than 900 mm.
- (5) If compliance with Clause (4)(b) is impracticable because of dimensional restrictions at the bottom of the *public spa*, the outlets may be located on two different planes of the *public spa* if
- (a) at least one of the outlets through which the *public spa* can be emptied to a full-size manifold is located on the bottom of the *public spa*, and
 - (b) the bottom of all outlets, other than skimmers, are not more than 75 mm from the floor of the *public spa*.
- (6) A circulation system in a factory-built *public spa* may be served by a built-in suction or gravity outlet with multiple openings that are connected to a full-size manifold.
- (7) All fittings at or below the water surface that allow water or air or both to be passed to or from the *public spa* shall be securely held in place by corrosion resistant fastening that requires a tool for removal and is galvanically compatible with the fittings and grilles or covers.
- (8) Except as provided in Sentence (9), all suction or gravity fittings installed at or below the water line of a *public spa* shall
- (a) have a maximum opening of 7 mm in one direction, and
 - (b) be designed so that the flow of water through the openings does not exceed 0.45 m/s.
- (9) Sentence (8) does not apply to suction and gravity outlets that are equipped with anti-entrapment covers that comply with the requirements of ASME A112.19.8, “Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.”
- (10) The calculation of water velocities for the purposes of Clause (8)(b) and Sentences (11) and (12) and the calculation of water flow rates for the purposes of Sentence (9) shall be based on the assumption that all possible sources of suction flow are present at the same time.
- (11) The water velocity in a suction pipe shall not exceed 1.8 m/s.
- (12) The water velocity in a pressure pipe shall not exceed
- (a) 3.0 m/s for plastic piping, and
 - (b) 1.8 m/s for copper piping.
- (13) Every suction system that serves a *public spa* shall be equipped with a vacuum relief mechanism that shall include
- (a) a vacuum release system,
 - (b) a vacuum limit system, or
 - (c) other engineered systems that are designed, constructed and installed to conform to good engineering practice appropriate to the circumstances.
- (14) Equipment shall be installed to continuously disinfect the water in a *public spa* by means of a chlorination, hypochlorination or bromination system that is capable of regulating the dosage of chlorine or bromine.
- (15) If a two-speed pump is utilized for a *public spa*, the filter and heater shall be sized to accommodate the maximum pump output, without exceeding the manufacturer’s design flow rate of the filter element or heater and without by-passing the filter element.
- (16) A *public spa* equipped with hydro-massage jet fittings shall be provided with a timing device
- (a) that controls the period of operation of the jet pump, and
 - (b) that is placed in a location where the user must exit the *public spa* to reset the timer.

- (17) A *public spa* water heater shall be equipped with an upper limit cut-off device,
- (a) that is independent of the normal *public spa* water temperature thermostat, and
 - (b) that limits the maximum water temperature of the *public spa* to 40°C.

(18) A *public spa* shall be equipped with a water circulation system that is capable of both completely and partially draining and refilling the *public spa* water.

3.12.5. Emergency Provisions for All Public Spas

3.12.5.1. Lighting and Emergency Provisions

- (1) In addition to the requirements of this Subsection, *public spas* shall comply with the requirements of Sentences 3.11.10.1.(1) to (6).
- (2) An emergency telephone directly connected to an emergency service or to the local telephone utility shall be installed within 30 m of the *public spa*.
- (3) All pumps used in a *public spa* shall be capable of being deactivated by an emergency stop button that is
- (a) clearly labelled, and
 - (b) located at a point that is
 - (i) readily accessible to and within sight of persons using the *public spa*, and
 - (ii) within 15 m of the *public spa*.
- (4) The emergency stop button required in Sentence (3) shall
- (a) be a switch separate from the *public spa*'s timing device,
 - (b) activate an audible and a visual signal when used, and
 - (c) have an emergency sign conforming to Sentence 3.11.10.1.(14).
- (5) If a *public spa* and *public pool* are located in the same room or space, the emergency stop buttons required in Sentences (3) and 3.11.10.1.(12) shall deactivate all pumps serving the *public spa* and *public pool*.

3.12.6. Service Rooms and Storage for All Public Spas

3.12.6.1. Service Rooms and Storage Facilities

- (1) *Service rooms* and storage facilities for all *public spas* shall comply with the requirements of Article 3.11.11.1.

Section 3.13. Rapid Transit Stations

3.13.1. Scope and Definitions

3.13.1.1. Scope

- (1) Except as provided in this Section the requirements in this Division apply to *rapid transit stations*.

3.13.1.2. Definitions

- (1) In this Section:

Ancillary space means the rooms or spaces in the station used only by the transit agency to house or contain operating, maintenance or support equipment and functions, but does not include booths and kiosks used by the transit agency or *service rooms*.

Central supervising station means the operations centre where the transit agency controls and co-ordinates the system-wide movement of passengers and vehicles and from which communication is maintained with supervisory and operating personnel of the transit agency and with participating agencies when required.

Crush load means the total of the seating capacity and the standing capacity of a car where

- (a) the seating capacity is the number of seats in a car, and
- (b) the standing capacity is 0.2 m² per person for the standing area which is measured 300 mm in front of the seats.

Egress capacity means the number of people able to travel from or through a type of egress facility in a specified period of time.

Entraining load means the number of passengers boarding the train at a station.

Fare-paid area means that portion of a *rapid transit station* to which access is gained by a pass or by paying a fare.

Fare-paid area control means the point where passengers enter or leave the *fare-paid area*.

Link load means the number of passengers on board the train(s) travelling between two stations.

Maximum calculated train load means the *crush load* per car multiplied by the maximum number of cars per train in the peak period.

Peak direction means, for each route, the direction of train travel having the largest passenger flow volume based on the sum of the incoming *link load* plus the *entraining load* per peak hour.

Protected route means that portion of a *means of egress* that starts at the point where passengers would not be vulnerable to exposure from a train fire and that leads to the exterior of the station or through an *exit* to an adjacent *building*.

Public area means the public circulation areas in a *rapid transit station* providing pedestrian access to and from trains.

Rapid transit station means a *building* or part thereof used for the purpose of loading and unloading passengers of a *rapid transit system* but does not include open air shelters at street level.

Rapid transit system means an electrified transportation system, utilizing guidance methods involving positive mechanical contact with the fixed way operating on a right-of-way for the mass movement of passengers.

3.13.2. Construction Requirements

3.13.2.1. Requirements for Stations

- (1) Except as provided in this Subsection, the requirements in Subsections 3.2.1. and 3.2.2. do not apply to a *rapid transit station*.
- (2) The requirements in Sentence (3) shall apply to
 - (a) a *rapid transit station* erected entirely below the adjoining finished ground level, and
 - (b) the underground portion of a *rapid transit station*.
- (3) Except as permitted in Sentence (4), an underground station or an underground portion of a station in Sentence (2) shall be of *noncombustible construction*, and
 - (a) floor assemblies shall be *fire separations* having a *fire-resistance* rating not less than 2 h,
 - (b) roof assemblies below ground level, shall have a *fire-resistance* rating not less than 2 h, but a *fire-resistance* rating is not required where steel tunnel liners are left in place to form part of the assembly and the tunnel liners are in direct contact with *soil*, and
 - (c) all *loadbearing* walls, columns and arches shall have a *fire-resistance* rating not less than that required for the supported assembly.
- (4) An interior stair extending to street level is permitted to be protected by a *combustible* roof.
- (5) Where a *rapid transit station* is erected above and below the adjoining finished ground level, the above ground portion of the station shall be of *noncombustible construction* and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance* rating not less than 2 h.
 - (b) *mezzanines* shall have a *fire-resistance* rating not less than 1 h,
 - (c) roof assemblies shall have a *fire-resistance* rating not less than 1 h, and
 - (d) all *loadbearing* walls, columns and arches shall have a *fire-resistance* rating not less than that required for the supported assembly.
- (6) Except as permitted by Sentence (7), where a *rapid transit station* is erected entirely above the adjoining finished ground level and is a stand-alone *building*, the station shall be of *noncombustible construction* and
 - (a) floor assemblies shall be *fire separations* with a *fire-resistance* rating not less than 1 h,
 - (b) *mezzanines* shall have a *fire-resistance* rating not less than 1 h,
 - (c) roof assemblies shall have a *fire-resistance* rating not less than 1 h, and
 - (d) all *loadbearing* walls, columns and arches shall have a *fire-resistance* rating not less than that required for the supported assembly.
- (7) A *building* classified as Group A, Division 2 *occupancy* that is not more than 1 *storey* in *building height*, and that has a *building area* not more than 3 200 m² if not *sprinklered* throughout or not more than 6 400 m² if *sprinklered* throughout, is permitted to be constructed with a roof and columns of *heavy timber construction*.
- (8) An *interconnected floor space* is permitted in a *public area* of a *rapid transit station*.
- (9) Stairs, escalators and elevators used by passengers are permitted to be included in the *interconnected floor space* in a *rapid transit station*.
- (10) Passenger elevators within or adjacent to an *interconnected floor space* need not be enclosed in a hoistway separated from the remainder of the *interconnected floor space* provided the elevator machinery is located in a room separated from the remainder of the *building* by a *fire separation* having a *fire-resistance* rating not less than
 - (a) 1.5 h, where the floor of the machine room is below *grade*, or
 - (b) 45 min, where the floor of the machine room is located above *grade*.
- (11) Elevator shafts that are not within or adjacent to an *interconnected floor space* are permitted to penetrate the *fire separations* required in Sentences (2) to (6) provided they are enclosed by
 - (a) a *fire separation* having a *fire-resistance* rating not less than 1 h, or
 - (b) wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings”.

3.13.3. Safety Requirements Within Stations

3.13.3.1. Application

- (1) Except as provided in this Subsection and Subsection 3.13.4., the requirements in Subsections 3.3.1. and 3.6.2. apply to a *rapid transit station*.
- (2) A door in a *fire separation* is permitted to be equipped with pivot hinges in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives.”
- (3) The requirements in Subsection 3.4.4. for *fire separation* of *exits* do not apply in a *rapid transit station*.
- (4) Except as provided in Sentence (5), the requirements in Sentence 3.4.6.16.(1) for doors to be readily opened from the inside apply to required *exit* doors in a *rapid transit station*.
- (5) Where a group of two or more doors serves as a single *exit* facility, only one door in the group is required to comply with Sentence 3.4.6.16.(1).
- (6) A door that is required to be readily opened in Sentence (4) or (5) shall have a sign attached to it that
 - (a) displays the words **EMERGENCY EXIT** with the letters not less than 25 mm high, and
 - (b) is visible from the *exit* approach.

3.13.3.2. Booths and Kiosks

- (1) Booths and kiosks that are not more than 20 m² in area and are used only by the transit agency for fare collection, dissemination of information or similar non-mercantile *occupancies* shall be of *noncombustible construction* and are not required to be separated from the remainder of the *floor area* by a *fire separation*.
- (2) Booths and kiosks that are more than 20 m² in area and are used only by the transit agency for fare collection, dissemination of information or similar non-mercantile *occupancies* shall be
 - (a) *sprinklered*, and
 - (b) separated from the remainder of the *floor area* by a *fire separation* of *noncombustible construction* that is not required to have a *fire-resistance rating*.
- (3) A door acting as a *closure* in the *fire separation* in Sentence (2) is not required to be equipped with a self-closing device.

3.13.3.3. Service Rooms and Ancillary Spaces

- (1) An *ancillary space* in a *rapid transit station* shall be separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 1 h.
- (2) Except as provided in Sentence (3), a door opening from a *service room* onto a *means of egress* in a *rapid transit station* shall be located not less than 5 m from an escalator balustrade and from the top and bottom riser of a *flight* used as a *means of egress* from the *rapid transit station*.
- (3) The requirements in Sentence (2) do not apply where
 - (a) the *service room* is *sprinklered*, or
 - (b) there is a vestibule between the *service room* and the *means of egress*.
- (4) Where a door from a *service room* opens onto a *means of egress* less than 5 m wide
 - (a) the *service room* shall be *sprinklered*, or
 - (b) there shall be a vestibule between the *service room* and the *means of egress*.

3.13.3.4. Leased Areas

- (1) All leased areas within a *rapid transit station* shall be
 - (a) *sprinklered*, and
 - (b) separated from the remainder of the *floor area* by a *fire separation of noncombustible construction* that is not required to have a *fire-resistance rating*.
- (2) A door acting as a *closure* in the *fire separation* in Clause (1)(b) is not required to be equipped with a self-closing device.
- (3) Where leased areas are located on opposite sides of a *means of egress*, the width of the *means of egress* shall not be reduced to less than 5 m.
- (4) Except as provided in Sentence (5), where the leased area on any floor level exceeds 15% of the *public area* on that level, the *public area* shall be *sprinklered*.
- (5) In a *rapid transit station* that is erected entirely above the adjoining finished ground level and is a stand-alone *building*, where the leased area on any floor level exceeds 20% of the *public area* on that level, the *public area* shall be *sprinklered*.
- (6) In determining the leased area in Sentences (4) and (5), it is not necessary to include a leased area that is separated from the *public area* by a *fire separation* having a *fire-resistance rating* not less than
 - (a) 2 h where the leased area contains a *mercantile* or *medium-hazard industrial occupancy*, or
 - (b) 1 h where the leased area contains any other *occupancy*.
- (7) A leased area is permitted on a platform level provided it is
 - (a) located not less than 5 m from the platform edge,
 - (b) located not less than 5 m from an egress facility, and
 - (c) not located in a dead-end portion of the platform.

3.13.3.5. Vehicle Terminal

- (1) Where an enclosed terminal serves vehicles powered by combustible fuels, and the terminal has direct access to a *rapid transit station*
 - (a) the terminal shall be *sprinklered*, and
 - (b) the terminal shall be separated from the *rapid transit station*
 - (i) by a *fire separation* having a *fire-resistance rating* not less than 1 h, or
 - (ii) by wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” with wired glass doors equipped with self-closing devices.
- (2) Doors in the *fire separation* or in the wired glass assembly in Clause (1)(b) are not required to have latches where close spaced sprinkler protection is provided on the station side.

3.13.3.6. Access to Adjacent Building

- (1) Where an access is provided between a *rapid transit station* and an adjacent *building*, the station and the *building* shall be separated by a *fire separation* having a *fire-resistance rating* not less than 2 h.
- (2) The access in Sentence (1) shall be through a vestibule that is separated from the station and from the *building*
 - (a) by a *fire separation* having a *fire-resistance rating* not less than 1 h, or
 - (b) by wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” with wired glass doors equipped with self-closing devices.

- (3) The vestibule doors in Sentence (2)
 - (a) are not required to be equipped with latches, and
 - (b) shall swing in the direction of travel from the *rapid transit station*.
- (4) Close spaced sprinkler protection shall be provided on each side of all vestibule doors.
- (5) The vestibule
 - (a) shall not contain an *occupancy*, and
 - (b) shall be protected against the passage of smoke in accordance with Measure N of MMAH Supplementary Standard SB-4, “Measures for Fire Safety in High Buildings.”
- (6) Where an access is provided between a *rapid transit station* and an adjacent *building* that is regulated by the provisions of Subsection 3.2.6. or 3.2.8., the requirements of this Article do not apply to the *rapid transit station*, except for the following:
 - (a) the access shall be through a vestibule that is separated from the station and from the *building*, and
 - (b) the vestibule shall comply with Sentence (5).

3.13.3.7. Emergency Lighting

- (1) Emergency lighting shall be provided to average levels not less than 10 lx at floor or tread level in *public areas* in a *rapid transit station*.
- (2) An emergency power supply conforming to Subsection 3.2.7. shall be provided to maintain the emergency lighting required in Sentence (1) for a period of 30 min after a power failure.

3.13.3.8. Guards for Rapid Transit Stations

- (1) *Guards* are not required at the guideway side of a platform in a *rapid transit station*.

3.13.4. Means of Egress

3.13.4.1. Occupant Load

- (1) The *occupant load* for *public areas* within a *rapid transit station* shall be
 - (a) determined in conformance with this Subsection, and
 - (b) based on peak hour patronage as projected for design of the transit system.
- (2) The platform *occupant load* for each platform in a *rapid transit station* shall be the greater of the a.m. or p.m. peak period loads calculated in accordance with Sentences (3) to (5).
- (3) The a.m. and the p.m. peak period *occupant loads* for each platform shall be based on the simultaneous evacuation of the *entraining load* and the *link load* for that platform.
- (4) The *entraining load* for each platform shall be the sum of the *entraining loads* for each track serving that platform and the *entraining load* for each track shall be based on the *entraining load* per train headway multiplied by
 - (a) a factor of 1.3 to account for surges, and
 - (b) in the *peak direction* for each route, an additional factor of 2 to account for a missed headway.
- (5) The *link load* for each platform shall be the sum of the *link loads* for each track serving that platform and, except as provided in Sentence (6), the *link load* for each track shall be based on the *link load* per train headway multiplied by
 - (a) a factor of 1.3 to account for surges, and
 - (b) in the *peak direction* for each route, an additional factor of 2 to account for a missed headway.

- (6) The maximum *link load* at each track shall be the *maximum calculated train load*.

3.13.4.2. General Requirements

- (1) Except as provided in Sentence (2), escalators conforming to the requirements of Sentences 3.13.4.5.(3) and 3.13.4.6.(1) shall be acceptable as part of a required *means of egress* in a *rapid transit station*.
- (2) Escalators forming part of a required *means of egress* shall not comprise more than one-half of the required *egress capacity* from any one level.
- (3) *Horizontal exits* conforming to Sentence (4) may provide all of the required *egress capacity* from a *rapid transit station*.
- (4) *Horizontal exits* to any one *building* shall not comprise more than one-half of the required *egress capacity* from any area within a *rapid transit station*.
- (5) A *protected route* shall be provided with emergency ventilation conforming to Subsection 3.13.7.
- (6) In an aboveground unenclosed station, the *protected route* is permitted to begin at the point of leaving the platform.
- (7) In an enclosed or underground station, the protection for the *protected route* shall consist of
- (a) a *fire separation* having a *fire-resistance rating* not less than 1 h,
 - (b) construction having a *fire-resistance rating* not less than 1 h, or
 - (c) wired glass assemblies conforming to MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

3.13.4.3. Number and Location of Means of Egress

- (1) Each platform in a *rapid transit station* shall be served by no fewer than two *means of egress* that are independent of and remote from each other from the platform to the exterior of the station.
- (2) Where a continuous level walking surface is provided between two adjacent platforms, they may be considered as one platform for the purpose of conforming to this Subsection.
- (3) At the platform level, the distance separating the egress facilities in Sentences (1) and (2) shall be the greater of one car length or 25 m.
- (4) Except as required in Sentence (1), two or more *means of egress* are permitted to converge in conformance with Sentence 3.13.4.4.(6).
- (5) *Means of egress* from platforms shall be located so that the travel time from the most remote point on a platform to a *protected route* does not exceed 4 min based on travel speeds of
- (a) 38 m/min for horizontal travel, and
 - (b) 21 m/min for vertical rise.

3.13.4.4. Egress Capacity

- (1) For a *rapid transit station*, the required aggregate *egress capacity* from each platform shall be determined by dividing the platform occupant load determined in accordance with Sentences 3.13.4.1.(2) to (6) by the required platform clearance time determined in accordance with Sentence (3).
- (2) Where two platforms are considered as one platform as provided in Sentence 3.13.4.3.(2), the required *egress capacity* for each platform shall be determined separately.

- (3) The required platform clearance time shall be 4 min less the travel time between the platform and the entry into the *protected route* based on travel speeds of
- (a) 38 m/min for horizontal travel, and
 - (b) 21 m/min or vertical rise.
- (4) For each *means of egress*, the required *egress capacity* at the platform shall be maintained for the entire length of the *means of egress*.
- (5) Except as provided in Sentence (6), where two or more *means of egress* converge, the required *egress capacity* beyond that point shall be cumulative.
- (6) The *egress capacity* in Sentence (5) need not be cumulative after converging where it can be shown that the platform clearance time in Sentence (3) is not exceeded.

3.13.4.5. Width of Means of Egress

- (1) Except as otherwise required in this Subsection, the required width of *means of egress* serving platforms in a *rapid transit station* shall be determined based on
- (a) the required *egress capacity* determined in conformance with Article 3.13.4.4., and
 - (b) the pedestrian flow rate for the type of *means of egress* facility listed in Table 3.13.4.5.
- (2) In calculating the required width of corridors and *ramps* with a grade of less than 4%, 300 mm at each sidewall shall be added to the width determined based on required *egress capacity*.
- (3) In calculating the required width of egress routes, one escalator at each level in a *rapid transit station* is deemed to be out of service and not available for egress purposes.
- (4) Except as provided in Sentence (5), the minimum width of *means of egress* facilities serving platforms shall be
- (a) 1 750 mm for corridors and *ramps*,
 - (b) 1 750 mm for stairs,
 - (c) 600 mm nominal width for escalators, and
 - (d) 900 mm for a door leaf.
- (5) A second *means of egress* as required by Sentence 3.13.4.3.(1) is permitted to be not less than 1 100 mm wide.
- (6) The minimum width of platforms shall be
- (a) 3.2 m for side platforms, and
 - (b) 6.4 m for island platforms.
- (7) The minimum unobstructed width of platforms measured from the platform edge shall be 2.5 m.
- (8) The minimum clear width for fare collection equipment providing *means of egress* from *public areas* in *rapid transit stations* shall be
- (a) 420 mm for turnstiles,
 - (b) 455 mm for fare collection gates with a height of 1 000 mm or less, and
 - (c) 530 mm for fare collection gates with a height of more than 1 000 mm.

Table 3.13.4.5.
Pedestrian Flow Rates
 Forming Part of Sentence 3.13.4.5.(1)

Type of Egress Facility	Flow Rate, pedestrians per minute	Flow Rate, pedestrians per minute per metre width
Platforms	n/a	80
Corridors	n/a	80
Doorways	n/a	80
Gates	n/a	80
Ramps not more than 4%	n/a	80
Ramps more than 4%	n/a	55 ⁽¹⁾
Stairs	n/a	55 ⁽¹⁾
Escalators moving in direction of egress travel, nominal width		
: 1 200 mm	100	n/a
: 800 mm	80	n/a
: 600 mm	60	n/a
Turnstiles, height of bar		
: not more than 900 mm	45	n/a
: more than 900 mm	25	n/a

Notes to Table 3.13.4.5.:

(1) Flow rate is applied vertically.

3.13.4.6. Egress Facilities

- (1) Escalators forming part of a required *means of egress* shall
 - (a) where equipped to run reverse to the direction of egress travel, be capable of being stopped remotely and locally, and
 - (b) have a vertical rise not more than 12 m between floors or landings.
- (2) Where electrically operated gates or turnstiles used for fare collection are intended to be used as part of a required *means of egress* from a *rapid transit station*, provision shall be made to release the gates or turnstiles in accordance with Sentence (4) to allow them to operate freely in the direction of egress travel.
- (3) Where locked doors that prevent entry into a *fare-paid area* are to be used as part of a required *means of egress* from a *rapid transit station*, provision shall be made to release the doors in accordance with Sentence (4) to allow them to operate freely in the direction of egress travel.
- (4) The release device required in Sentences (2) and (3) shall be installed as an ancillary device to the fire alarm system and shall release immediately
 - (a) upon activation of the fire *alarm signal*,
 - (b) in the event of a power failure or ground fault, or
 - (c) upon actuation of a manually operated switch accessible to authorized personnel and located in
 - (i) a fare collector's booth or kiosk at the station, or
 - (ii) the *central supervising station*.

(5) After release, the gates or turnstiles in Sentence (2) or the doors in Sentence (3) shall be capable of reactivation only by manual actuation of the switch in Clause (4)(c).

3.13.5. Fire Safety Provisions

3.13.5.1. Fire Alarm System

(1) Except as provided in this Subsection, a fire alarm system conforming to Subsection 3.2.4. shall be installed in a *rapid transit station*.

3.13.5.2. Exceptions

- (1) Manual stations need not be installed in a *rapid transit station*.
- (2) Audible signal appliances need not be installed in a *rapid transit station*.

3.13.5.3. Fire Detectors

(1) Except where the area is *sprinklered*, *fire detectors* shall be installed in every *service room*, *ancillary space*, leased space, booth and kiosk.

3.13.5.4. Central Supervising Station

(1) Each *rapid transit station* shall be monitored by a *central supervising station* conforming to CAN/ULC-S561, “Standard for Installation and Services for Fire Signal Receiving Centres and Systems.”

3.13.5.5. Annunciators

- (1) An annunciator shall be installed
 - (a) in a location that is readily accessible to firefighters entering the *building*, and
 - (b) in the *rapid transit station*
 - (i) in a designated collector’s booth, or
 - (ii) within viewing distance of a designated collector’s booth.

3.13.5.6. Annunciator Indication

- (1) All fire alarm, *fire detectors*, valve switches and water flow indicator signals when activated in a *rapid transit station* shall be indicated on the annunciator at the station.
- (2) The annunciator at a *rapid transit station* shall be monitored simultaneously at the *central supervising station*.
- (3) Where a *means of egress* from a *rapid transit station* leads through an adjoining *building*, any *alarm signal* originating in the *building* within 2 *storeys* above a connection to the station shall
 - (a) be indicated on the *rapid transit station* annunciator, and
 - (b) cause a message to flash a warning on a sign located in conformance with Sentence (4), that the *means of egress* shall not be used as an *exit* from the station.
- (4) A sign required in Clause (3)(b) shall be located
 - (a) at the doors from the *rapid transit station* to the adjoining *building*, and
 - (b) in the *means of egress* to the adjoining *building*, at the last point where there is a choice of direction to travel to at least one other *exit*.

3.13.5.7. Emergency Power

- (1) An emergency power supply conforming to Article 3.2.7.8. shall be provided for the fire alarm system.

3.13.5.8. Communication Systems

- (1) In a *rapid transit station*, a public address system shall be installed and shall include loudspeakers that
 - (a) can be operated from the *central supervising station*,
 - (b) can be operated from the *rapid transit station* in which they are located, and
 - (c) designed and located so that voice messages can be heard intelligibly throughout the *public area* in a *rapid transit station*.
- (2) A two-way communication system shall be installed in each *rapid transit station* with telephones located at
 - (a) the collector's booth, and
 - (b) at each end of each platform.
- (3) The telephones in Sentence (2) shall be provided with connections to the *central supervising station*.

3.13.5.9. Emergency Reporting Devices

- (1) Emergency reporting devices shall be located on passenger platforms and throughout a *rapid transit station* such that the distance of travel from any point in the *public area* to such a device is not more than 90 m.
- (2) The emergency reporting devices required in Sentence (1) are permitted to be public telephones with an emergency no charge capability and their location shall be plainly indicated by appropriate signs.

3.13.5.10. Sprinkler Systems

- (1) Sprinkler systems shall conform with the requirements of Articles 3.2.5.12 to 3.2.5.15.
- (2) There shall be identification on a fire department connection for a sprinkler system in a *rapid transit station* to indicate that the connection is part of the station system.

3.13.5.11. Standpipe and Hose Systems

- (1) A standpipe and hose system conforming to the requirements of Articles 3.2.5.8. to 3.2.5.11. be installed in a *rapid transit station*, except as otherwise required or permitted in this Article.
- (2) Where a *rapid transit station* includes more than one standpipe riser there shall be a cross-connection pipe having a diameter not less than 100 mm between each standpipe riser so that supplying of water through any fire department connection will furnish water throughout each riser.
- (3) There shall be identification on a fire department connection for a standpipe system in a *rapid transit station* to indicate that the connection is part of the station system.
- (4) Hose stations shall be located so that every portion of the *rapid transit station* can be reached by a hose stream and is within 3 m of a hose nozzle when the hose is extended.
- (5) In addition to the requirements in Sentence (4), hose stations shall be located in each tunnel not more than 20 m from the end of the platform.
- (6) Each hose station shall have a 38 mm hose connection and a 65 mm hose connection.
- (7) All supply piping shall have a diameter not less than 100 mm.

3.13.6. Required Sanitary Facilities

3.13.6.1. Application

- (1) Except as provided in this Subsection, Subsection 3.7.4. applies to a *rapid transit station*.

3.13.6.2. Washrooms Required

- (1) Except as provided in Sentences (2) and (3), a washroom for each sex, containing at least one water closet and one lavatory, shall be provided in each *rapid transit station* for use by employees.
- (2) Where the number of employees in a *rapid transit station* is not more than five, a washroom containing one water closet and one lavatory is permitted to be used by both sexes provided the door to the room can be locked from the inside.
- (3) Where a *rapid transit station* is not staffed during operating hours, a washroom is not required in the station.
- (4) In each *rapid transit station* located at the end of a line, a washroom for each sex, containing no fewer than three water closets and two lavatories, shall be provided for use by the public.

3.13.7. Emergency Ventilation

3.13.7.1. Application

- (1) Every *rapid transit station* shall be provided with an emergency ventilation system conforming to NFPA 130, “Standard for Fixed Guideway Transit and Passenger Rail Systems.”

3.13.8. Barrier-Free Design

3.13.8.1. Application

- (1) Except as provided in this Subsection, the requirements in Section 3.8. apply to *rapid transit stations*.
- (2) A *rapid transit station* need not be provided with more than one *barrier-free* entrance described in Article 3.8.1.2.
- (3) At least one *barrier-free* path of travel shall be provided from a *barrier-free* entrance
 - (a) into the *fare-paid area*, and
 - (b) to each platform.

3.13.8.2. Exception

- (1) Where an elevator is used to comply with the requirements of Article 3.3.1.7., the provisions of Clause 3.3.1.7.(1)(a) do not apply where the elevator system complies with Article 3.13.8.3.

3.13.8.3. Elevator Requirements

- (1) Except as provided in Sentence (2), the elevator described in Article 3.13.8.2. shall be capable of providing transportation from each platform to a *barrier-free* entrance described in Article 3.8.1.2.

- (2) Where it is necessary to change elevators to reach the entrance described in Sentence (1), the elevator system shall be designed so that not more than one change of elevator is required between
 - (a) a platform and a *fare-paid area control*, and
 - (b) the *fare-paid area control* and the entrance.

3.13.8.4. Emergency Operation of Elevators

- (1) Manual emergency recall operation shall be provided for all elevators.
- (2) Key-operated switches for emergency recall described in Sentence (1) shall be provided and shall be located on the outside of each elevator shaft at the level of the *fare-paid area control*.
- (3) In-car emergency service switches shall be provided in all elevator cars.
- (4) Keys to operate the switches required in Sentences (2) and (3) shall be located at
 - (a) the annunciator required in Clause 3.13.5.5.(1)(a), and
 - (b) the collector's booth designated in Clause 3.13.5.5.(1)(b).

3.13.8.5. Washrooms Required to be Barrier-Free

- (1) A *barrier-free* path of travel shall be provided to the washrooms required in Article 3.13.6.2.
- (2) Where a washroom required in Sentence 3.13.6.2.(1) contains only one water closet and one lavatory, the washroom shall be designed in conformance with the requirements in Article 3.8.3.12.
- (3) Where a washroom required in Sentence 3.13.6.2.(1) contains more than one water closet, the washroom shall be designed in conformance with the requirements in Articles 3.8.3.8. to 3.8.3.11.
- (4) The washroom required in Sentence 3.13.6.2.(2) shall be designed in conformance with the requirements in Article 3.8.3.12.
- (5) The washrooms required in Sentence 3.13.6.2.(4) shall be designed in conformance with the requirements in Articles 3.8.3.8. to 3.8.3.11.

Section 3.14. Tents and Air-Supported Structures

(See Note A-3.14.)

3.14.1. Tents

3.14.1.1. Application

- (1) Except as provided in this Subsection, tents are exempt from complying with the requirements of this Division.

3.14.1.2. General

- (1) Except as provided in Sentence (2), the requirements of this Subsection shall apply to all tents.
- (2) Articles 3.14.1.3., 3.14.1.7. and 3.14.1.8. do not apply to tents that
 - (a) do not exceed 225 m² in ground area,
 - (b) do not exceed 225 m² in aggregate ground area and are closer than 3 m apart,
 - (c) do not contain bleachers, and
 - (d) are not enclosed with sidewalls.

3.14.1.3. Means of Egress

- (1) Except as provided in Sentences (2) and (3), tents shall conform to Sections 3.3. and 3.4.
- (2) A tent need not conform to Article 3.4.6.12. except where swing type doors are provided.
- (3) Where the area between adjacent tents or a tent and the property line is used as a *means of egress*, the minimum width between stake lines shall be the width necessary for *means of egress*, but not less than 3 m.

3.14.1.4. Clearance to Other Structures

- (1) Tents shall not be erected closer than 3 m to the property line.
- (2) Except as provided in Sentences (3) to (6), tents shall not be erected closer than 3 m to other tents or structures on the same property.
- (3) A *walkway* between a *building* and a tent occupied by the public is permitted provided
 - (a) the tent is not closer than 3 m from the *building*, and
 - (b) the *walkway* conforms to Article 3.2.3.19.
- (4) Tents not occupied by the public need not be separated from one another, and are permitted to be erected less than 3 m from other structures on the same property, where such closer spacing does not create a hazard to the public.
- (5) Tents located on fair grounds or similar open spaces, need not be separated from one another provided such closer spacing does not create a hazard to the public.
- (6) Where a tent is to be constructed in proximity to existing above ground electrical conductors, the tent shall be constructed in accordance with Article 3.1.20.1.

3.14.1.5. Clearances to Flammable Material

- (1) The ground enclosed by a tent and for not less than 3 m outside of such structure shall be cleared of all flammable or *combustible* material or vegetation that will carry fire.

3.14.1.6. Flame Resistance

- (1) Every tent, and tarpaulins, decorative materials, fabrics and films used in connection with tents, shall be certified to CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films,” or NFPA 701, “Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.”

3.14.1.7. Bleachers

- (1) Where bleachers are provided in tents, they shall be designed in conformance with Articles 3.3.2.9., 3.3.2.12. and Subsection 4.1.5.

3.14.1.8. Sanitary Facilities

- (1) Except as provided in Sentence (3), the minimum number of water closets for tents shall be determined in accordance with Table 3.7.4.3.-E.
- (2) Article 3.7.4.16. applies to sanitary facilities in Sentence (1).

- (3) Sanitary privies, chemical closets or other means for the disposal of human waste may be provided in lieu of toilet fixtures.

3.14.1.9. Provision for Firefighting

- (1) Access shall be provided to all tents for the purpose of firefighting.

3.14.1.10. Electrical Systems

- (1) The electrical system and equipment in a tent, including electrical fuses and switches, shall be inaccessible to the public.
- (2) Cables on the ground in areas used by the public in a tent shall be placed in trenches or protected by covers to prevent damage from traffic.

3.14.2. Air-Supported Structures

3.14.2.1. Application

- (1) Except as provided in this Subsection, the requirements of this Division apply to *air-supported structures*.

3.14.2.2. General

- (1) *Air-supported structures* shall not be used for Groups B, C or Group F, Division 1 *major occupancies* or for classrooms.
- (2) Except where no *fire separation* is required between *major occupancies*, *air-supported structures* shall contain not more than one *major occupancy*.
- r1 (3) Except as provided in Sentence (5), *air-supported structures* are exempt from complying with Articles 3.2.2.20. to 3.2.2.93., except for maximum *building* size.
- (4) *Air-supported structures* may be designed with interior walls, *mezzanines*, or similar *construction*.
- r1 (5) Interior construction contained within *air-supported structures* must meet the construction requirements of Articles 3.2.2.20. to 3.2.2.93.

3.14.2.3. Spatial Separation

- (1) Except as provided in Sentences (2) to (5), *air-supported structures* shall not be erected closer than 3 m to other structures on the same property or to the property line.
- (2) *Air-supported structures* not occupied by the public need not be separated from one another, and are permitted to be erected closer than 3 m from other structures on the same property where such closer spacing does not create a hazard to the *building* occupants or the public.
- (3) Except as provided in Sentence (4), an *air-supported structure* is permitted to be attached to another *building* provided the *building* to which it is attached
- (a) conforms to the requirements of other Parts of this Division based on the total *building areas* of the *air-supported structure* and the attached *building*,
 - (b) is *sprinklered* throughout, and
 - (c) is separated from the *air-supported structure* by a *fire separation* having a *fire-resistance rating* of not less than 1 h.

- (4) An *air-supported structure* is permitted to be attached to another *building* provided the *building* to which it is attached
- (a) has a *building area* not more than 200 m²,
 - (b) conforms to the requirements of other Parts of the Code based on the *building area* of the attached *building*, and
 - (c) is *sprinklered* or separated from the *air-supported structure* by a *fire separation* having a *fire-resistance rating* of not less than 1 h.
- (5) Where an *air-supported structure* is to be constructed in proximity to existing above ground electrical conductors, the *air-supported structure* shall be constructed in accordance with Article 3.1.20.1.

3.14.2.4. Clearances to Flammable Material

- (1) The ground enclosed by an *air-supported structure* and for not less than 3 m outside of such structure shall be clear of all flammable or *combustible* material or vegetation that will carry fire.

3.14.2.5. Flame Resistance

- (1) *Air-supported structures* shall be constructed of material conforming to CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films,” or NFPA 701, “Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.”
- (2) Materials for fabrics used in connection with *air-supported structures* are exempt from compliance with the requirements for *flame-spread ratings* for interior finishes in Subsection 3.1.13.

3.14.2.6. Emergency Air Supply

- (1) An *air-supported structure* designed for an *assembly occupancy* with an *occupant load* of more than 200 persons shall have either an automatic emergency engine-generator set capable of powering one blower continuously for 4 h, or a supplementary blower powered by an automatic internal combustion engine.

3.14.2.7. Electrical Systems

- (1) The electrical system and equipment in an *air-supported structure*, including electrical fuses and switches, shall be inaccessible to the public.
- (2) Cables on the ground in areas used by the public in an *air-supported structure* shall be placed in trenches or protected by covers to prevent damage from traffic.

Section 3.15. Signs

3.15.1. Scope

3.15.1.1. Application

- (1) Except as provided otherwise in Article 3.15.1.2. this Section shall apply to the erection of all signs.

3.15.1.2. Exceptions

- (1) The following signs shall not be subject to the provisions of this Section
- (a) signs for regulating traffic or similar devices, legal notices or warnings at railroad crossings,

- (b) signs in display windows including writing, representation, painting or lettering directly on the surface of any window or door, or other signs not affixed to the *building* interior,
- (c) small signs displayed for the direction of the public including signs that identify rest rooms, freight entrances and such other similar directional signs,
- (d) signs painted directly on a *building*, and
- (e) incidental signs or other signs subject to municipal approval.

3.15.2. Alterations

3.15.2.1. Exceptions for Alterations

- (1) The changing of movable parts of signs that are designed for changes, or the repainting of display matter shall not be deemed to be alterations.

3.15.3. Structural Requirements

3.15.3.1. Structural Design

- (1) Except as provided in this Section, all sign structures shall be designed in accordance with Part 4.

3.15.4. Plastic Sign Facing Materials

3.15.4.1. Combustible Sign Faces

- (1) Plastic materials used in the construction of sign faces shall
 - (a) have an average burning rate not greater than
 - (i) 65 mm/min in sheets 1.5 mm thick when tested in accordance with ASTM D635, “Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position”, or
 - (ii) 140 mm/min when tested in accordance with ASTM D3801, “Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position,” and
 - (b) have a measurement of material thickness in accordance with Method B-Machinists’ Micrometer Without Ratchet of ASTM D374 / D374M, “Standard Test Methods for Thickness of Solid Electrical Insulation.”
- (2) Except as provided in Sentence (3), where the *exterior cladding* of a wall is required to be *noncombustible*, a plastic sign face or a group of contiguous plastic sign faces may be placed over such cladding provided each such sign face or group of contiguous sign faces
 - (a) does not exceed 30% of the wall area of the *storey* on which it is installed,
 - (b) does not exceed 15 m² in area or 1 200 mm in height at each *storey*, and
 - (c) when located above the *first storey*, is vertically separated from other plastic sign faces by 1 200 mm of *noncombustible construction* unless separated by a horizontal *noncombustible* projection such as a *canopy*, extending the full width of, and projecting at least 900 mm beyond the exterior sign face.
- (3) Where a plastic exterior sign is mounted as a face on a metal sign box that is at least 200 mm in depth, the requirements of Sentence (2) need not apply provided the sign box is mounted on a *noncombustible* exterior wall.
- (4) Notwithstanding the requirements of Sentence (5), the plastic portion of an interior sign placed over or forming part of an interior wall surface in corridors, covered or enclosed *walkways* at or above *grade* in *buildings* shall
 - (a) not exceed 15% of the wall area in, or over which it may be installed,
 - (b) be supported by a device that will not detrimentally affect the *fire-resistance rating* of the interior wall to which it is attached or of which it may form a part, and encase the edges of the plastic sign face in metal,
 - (c) not be positioned or sized in such a manner that it is less than 600 mm from the vertical line separating two adjacent premises,

- (d) be placed so that there is at least 600 mm vertical separation of *noncombustible* material between the top of the plastic sign surface and the ceiling surface,
 - (e) be permitted to have an increase of 100% in area required in Clause (a) and a decrease of 50% of the separation distances required in Clauses (c) and (d) if the area is *sprinklered*, and
 - (f) have a *flame-spreading rating* not more than 250.
- (5) Signs in *exits* and underground *walkways* shall have a *flame-spread rating* not more than 25.

3.15.5. Location Restrictions

3.15.5.1. Obstructions not Permitted

- (1) A sign shall not be located so as to obstruct openings required for light and ventilation, any required *means of egress* or required access for firefighting in accordance with Sentence 3.2.5.3.(2).

3.15.5.2. Clearance for Exterior Signs

- (1) An exterior sign shall not be located so as to overhang a sidewalk or other pedestrian *walkway* unless the vertical distance, measured from the bottom of the overhanging portion of the sign to the surface of the sidewalk, is at least 2 400 mm.
- (2) Except as provided in Sentence (3), a sign face shall not be located within 600 mm of the vehicular travelled portion of a private lane or roadway, or of a motor vehicle parking area, unless the minimum vertical distance between *grade* and the bottom of the overhanging sign face is at least 4.25 m.
- (3) Where the height of all vehicles using any private road or parking area is permanently restricted, the vertical distance in Sentence (2) may be reduced to the amount of the actual height restriction, for as long as the said height restriction is in existence on the premises.
- (4) A sign shall not be located in proximity to existing above ground electrical conductors, unless the sign meets the clearance requirements of Article 3.1.20.1.

Section 3.16. Shelf and Rack Storage Systems

3.16.1. Scope

3.16.1.1. Application

- (1) The requirements of this Section apply to a *shelf and rack storage system*.
- (2) The requirements of Subsection 3.2.8. do not apply to a *shelf and rack storage system* conforming to this Section.
- (3) The requirements of Subsection 3.16.2. apply to a *shelf and rack storage system* for the storage of Class I, II, III and IV commodities as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (4) The requirements of Subsection 3.16.3. apply to a *shelf and rack storage system* for the storage of Group A, B and C plastics and rubber tires as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”

3.16.1.2. General

- (1) A *shelf and rack storage system* shall not be designed for production, manufacturing, assembling, disassembling or ancillary administrative functions.
- (2) A *shelf and rack storage system* may be designed for the storage, accessing, retrieval, packing and distribution of commodities.
- (3) A *high-hazard industrial occupancy* shall not contain a *shelf and rack storage system*.
- (4) Except as required by Sentence 3.16.3.2.(3), a *shelf and rack storage system* shall not exceed 24 m in height.

3.16.1.3. Construction

- (1) All structural components of a *shelf and rack storage system*, including posts, beams, decks, walkways, connections and their supports such as concrete slabs and *foundations*, shall be designed in accordance with Part 4.
- (2) Except as required by Sentence 3.16.3.2.(2), platform and walkway levels shall be of
 - (a) solid construction consisting of steel plate or steel roof decking with a top substrate that forms a serviceable floor area, or
 - (b) open construction consisting of steel grating or open steel floor planking.
- (3) *Guards* and toe-boards shall be provided in accordance with Articles 3.3.1.18. and 3.3.5.11.
- (4) Every platform or walkway level shall be provided with fire extinguishers installed in conformance with the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

3.16.1.4. Signs

- (1) A permanent sign shall be posted in a conspicuous location to indicate the maximum permissible *design loads* for each *shelf and rack storage system*.
- (2) Permanent signs shall be posted in conspicuous locations with
 - (a) the words **NO SMOKING** in black lettering not less than 50 mm high with a stroke not less than 12 mm on a yellow background, or
 - (b) a non-smoking symbol having a size not less than 150 mm by 150 mm.

3.16.1.5. Lighting

- (1) Walkways and platforms shall be equipped to provide illumination to an average level not less than 50 lx at floor or tread level and at angles and intersections at changes of level where there are stairs or *ramps*.
- (2) Emergency lighting on walkways, platforms, unenclosed egress stairs and *exits* providing *means of egress* shall conform to not less than
 - (a) the illumination level in Sentences 3.2.7.3.(2) and (3), and
 - (b) the duration in Sentence 3.2.7.4.(1).

3.16.1.6. Sprinkler System

- (1) An automatic sprinkler system conforming to this Article shall be installed in a *floor area* containing a *shelf and rack storage system*.

- (2) The automatic sprinkler system shall be designed, constructed, installed and tested in conformance with NFPA 13, “Standard for the Installation of Sprinkler Systems” or the appropriate NFPA sprinkler standard for the most severe hazard to which the storage system is exposed.
- (3) Sprinkler protection shall be provided under all platforms and walkways.
- (4) Except where the platforms or walkways are of open construction, any openings for egress stairs shall be protected by *noncombustible* draft stops not less than 450 mm below the floors above.
- (5) The automatic sprinkler system shall be electrically supervised to indicate a trouble signal on the *building* fire alarm system annunciator or where the *building* does not have a fire alarm system, to notify the person controlling the operation of the *building* for each of the situations listed in Sentence 3.2.4.9.(3).
- (6) The automatic sprinkler system shall be designed to notify the fire department that a waterflow switch has been activated.
- (7) The notification to the person controlling the *building* and the fire department referred to in Sentences (5) and (6) shall be provided in accordance with Sentence 3.2.4.7.(4).
- (8) A permanent sign shall be posted, at or near the sprinkler control valve, containing
 - (a) the word **NOTICE** in contrasting letters,
 - (b) a description of the commodity class as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems,” and
 - (c) the sprinkler design criteria used for the *shelf and rack storage system*.

3.16.1.7. Exits and Means of Egress

- (1) Except as permitted in Sentences (2) and (3), every walkway or platform level shall be provided with no fewer than two *exits* conforming to Section 3.4.
- (2) An *access to exit* from an elevated platform level may be provided by means of open unenclosed stairs serving
 - (a) not more than four platform levels, the highest of which shall be not more than 12 m above the main floor, where the *shelf and rack storage system* is intended for the storage of Class I, II, III and IV commodities, as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems,” and
 - (b) not more than two platform levels, where the *shelf and rack storage system* is intended for the storage of Group A, B and C plastics and rubber tires, as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (3) Any single platform or walkway in a *shelf and rack storage system* may be served by a single unenclosed stair leading to the platform or walkway level immediately below provided
 - (a) the platform or walkway does not exceed 200 m² in area,
 - (b) the travel distance on the platform or walkway to the level below, including the travel distance along the single unenclosed egress stair, does not exceed 25 m, and
 - (c) the platform or walkway below is provided with two separate egress stairs or *exits*.
- (4) The maximum travel distance on an elevated platform to the ground floor level, including the travel distance along unenclosed stairs, shall not exceed 45 m.
- (5) The maximum travel distance on an elevated platform to an *exit* serving that platform shall not exceed 45 m.
- (6) Except as permitted in Sentence (7), the maximum travel distance from the bottom of an unenclosed stair to an *exit* along a main aisle on the ground floor level shall not exceed 45 m.

- (7) Where the travel distance in Sentence (6) exceeds 45 m
- (a) an egress system serving the *shelf and rack storage system* shall be designed on the basis of a time-based egress analysis using the following criteria:
- (i) occupant egress speed of 1 m/sec shall be used for horizontal egress routes within the *shelf and rack storage system*,
 - (ii) occupant egress speed of 0.6 m/sec shall be used for vertical egress routes within the *shelf and rack storage system*, measured on the diagonal along the nosing of the stairs,
 - (iii) occupant egress speed of 1.3 m/sec shall be used for horizontal egress routes along a main aisle on the ground floor level,
 - (iv) each lift-gate shall be accorded an egress time of 10 seconds,
 - (v) each at-level conveyor cross-over shall be accorded a time of 5 seconds, and
 - (vi) a safety factor of 1.5 shall be used in calculating the total egress time,
- (b) the total egress time shall be calculated using the following formula:
- $$\text{Total Egress Time} = (H_p + V_p/0.6 + H_m/1.3 + 10N_{lg} + 5N_{lc}) \cdot 1.5 \text{ (in seconds)}$$
- where:
- H_p = horizontal travel distance on the *shelf and rack storage system*, in metres,
 - V_p = vertical travel distance on the *shelf and rack storage system*, in metres,
 - H_m = horizontal travel distance on the main floor, in metres,
 - N_{lg} = number of lift gates in the *means of egress*,
 - N_{lc} = number of at-level cross overs in the *means of egress*,
- (c) the total egress time from any point in the *shelf and rack storage system* shall be a maximum of 4 minutes,
- (d) a fire alarm and detection system conforming to Subsection 3.2.4. shall be installed in the *building*,
- (e) *smoke detectors* shall be provided under all solid decking and walkways,
- (f) clearly identified and easily accessible pull stations shall be provided at egress stairs, conveyor cross-overs or lift-gates located along egress paths, and
- (g) the *occupant load* on each level of the *shelf and rack storage system* shall not exceed 10 persons per egress stair. (See Note A-3.16.1.7.(7))
- (8) A dead-end aisle shall not exceed 9 m where the platform or walkway is provided with two or more egress facilities.
- (9) An aisle serving a *shelf and rack storage system* shall have a clear-aisle width of not less than 760 mm.
- (10) Conveyors, trolleys, tracks or any other similar mode of product transportation within the aisle or walkway shall not reduce the clear-aisle width required in Sentence (9).
- (11) Where *exits* are provided to comply with Sentence 3.4.2.5.(2), main aisles serving the *shelf and rack storage system* on the ground floor, leading from egress stairs directly to an *exit*, shall be clearly demarcated and have a minimum unobstructed, clear-aisle width of 2.4 m.
- (12) Where a lift-gate is incorporated along an egress route,
- (a) a maximum of two lift-gates may be within a single egress route,
 - (b) each lift-gate shall be equipped with a positive lock when open, and
 - (c) it shall be designed to automatically stop the conveyor belt that it serves when the lift-gate is open.

- (13) Where an at-level conveyor cross-over is incorporated along an egress route,
- (a) not more than two at-level conveyor cross-overs shall be within a single egress route,
 - (b) handrails spaced not more than 1 m apart and parallel to the direction of egress shall be provided on both sides of the at-level cross-over,
 - (c) flat, metal inserts shall be placed between each roller over the required egress width at each at-level conveyor cross-over to provide a walking surface,
 - (d) at least two inserts not less than 100 mm wide shall be arranged symmetrically between the handrails serving the at-level cross-over,
 - (e) inserts shall be sized to support loads specified in Part 4,
 - (f) a clearly identified and easily accessible switch that will stop the conveyor shall be located at each at-level cross-over, and
 - (g) stairs approaching at-level conveyor cross-overs shall be marked to indicate that they are readily identifiable as part of the egress route.

3.16.2. Storage of Class I, II, III and IV Commodities

3.16.2.1. Application

- (1) The requirements in this Subsection apply to a *shelf and rack storage system* intended for the storage of Class I, II, III and IV commodities as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”

3.16.2.2. Construction

- (1) Where the height of a *shelf and rack storage system*, measured from the floor supporting the system to the topmost portion of the shelf, exceeds 18 m,
- (a) a fire alarm and detection system conforming to Subsection 3.2.4. shall be installed with
 - (i) manual stations located at all *exit* doors including *exit* doors serving elevated decks and walkways, and
 - (ii) *smoke detectors* located, at the ceiling of all rooms and areas containing the *shelf and rack storage system*, within *exit* stair enclosures at the top, and at every third level of elevated deck or walkway, and
 - (b) the fire alarm and detection system required by Clause (a), shall be designed to notify the fire department upon activation, and
 - (c) the *shelf and rack storage system* shall be designed only for the storage of Class I, II and III commodities as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”

3.16.3. Storage of Group A, B and C Plastics and Rubber Tires

3.16.3.1. Application

- (1) The requirements in this Subsection apply to a *shelf and rack storage system* intended for the storage of Group A, B and C plastics and rubber tires as defined in NFPA 13, “Standard for the Installation of Sprinkler Systems.”

3.16.3.2. Construction

- (1) A *shelf and rack storage system* intended for the storage of rubber tires shall conform to
- (a) Article 3.3.6.5., and
 - (b) the Fire Code made under the *Fire Protection and Prevention Act, 1997*.
- (2) Platform and walkway levels shall not be of open construction.
- (3) A *shelf and rack storage system* shall not exceed 7 m in height.

Section 3.17. Demountable Stages and Demountable Support Structures

3.17.1. Scope

3.17.1.1. Application

- (1) This Section applies to the design, erection, assembly and installation of a *demountable stage* where
 - (a) the aggregate area of all platforms of the *demountable stage* is more than 60 m² and any part of its platforms is more than 3 m in height above adjacent ground level,
 - (b) the aggregate area of all platforms of the *demountable stage* is more than 225 m², or
 - (c) any part of the platforms or any roof, wall or structure attached to or located on any of the platforms of the *demountable stage* is 5 m or more in height above adjacent ground level.
- (2) This Section applies to the design, erection, assembly and installation of a *demountable support structure* where the *demountable support structure*
 - (a) is more than 3 m in height above adjacent ground level,
 - (b) is designed to carry a superimposed specified load greater than 115 kg, or
 - (c) would create a hazard to the public.
- (3) Except as provided in this Section, *demountable stages* and *demountable support structures* are exempt from complying with the requirements of this Division.

3.17.2. Construction

3.17.2.1. Occupant Load

- (1) A *demountable stage* shall be considered a *floor area* for the purpose of determining the *occupant load* in accordance with Clause 3.1.17.1.(1)(c).

3.17.2.2. Means of Egress

- (1) A platform of a *demountable stage* shall be considered a *floor area* for purposes of this Article.
- (2) Except as provided in Sentence (3), access to at least two *means of egress* shall be provided from every platform of a *demountable stage*.
- (3) A platform of a *demountable stage* may be served by one *means of egress* where
 - (a) the total *occupant load* of the *demountable stage* is less than 60 persons, and
 - (b) the aggregate area of the *demountable stage* is less than 150 m² or the travel distance from any point on the platform to the *exit* is less than 30 m.
- (4) Except as provided in Sentence (5), where at least two *means of egress* are required from a platform of a *demountable stage*, the maximum travel distance to an *exit* shall be not more than 45 m.
- (5) Sentence (4) need not apply where *exits* are located at not more than 60 m apart, measured along the perimeter of the platform.
- (6) The least distance between two required *exits* on a platform of a *demountable stage* shall be one-half the maximum diagonal dimension of the platform.

(7) Except as provided in Sentence (8) and unless it can be shown that they do not present a hazard, stairs, *ramps* and handrails in an *exit* from a platform of a *demountable stage* shall conform to the dimensional and slip-resistance requirements in Section 3.4.

(8) The maximum slope of a fixed *ramp* serving a platform of a *demountable stage* shall be 1 in 6.

3.17.2.3. Guards

(1) Except as provided in Sentences (2) and (3) and unless it can be shown that the platform does not present a hazard, a *guard* not less than 1 070 mm high shall be provided for a platform of a *demountable stage* where the difference in elevation between the platform and the adjacent surface is more than 1 500 mm.

(2) Sentence (1) need not apply at the edges of a platform of a *demountable stage* that face an audience.

(3) The height of *guards* for stairs shall be,

- (a) not less than 920 mm measured vertically to the top of the *guard* from a line drawn through the outside edges of the stair nosings, and
- (b) not less than 1 070 mm around landings.

(4) *Guards* shall be designed to withstand loads specified in Part 4.

(5) Required *guards* shall be provided with a top rail and one or more intermediate rails spaced such that openings through the *guard* are of a size that prevents the passage of a spherical object having a diameter of 535 mm.

3.17.2.4. Clearance to Other Structures

(1) Except as provided in Sentence (2), a *demountable stage* shall not be erected, assembled or installed closer than 3 m to,

- (a) another *demountable stage*, or
- (b) another structure, other than a *demountable support structure*.

(2) Sentence (1) need not apply to *demountable stages* that are located on fair grounds or similar open spaces provided it can be shown that such closer spacing does not create a hazard to the public.

3.17.2.5. Flame Resistance

(1) Tarpaulins, decorative materials, fabrics and films attached to *demountable stages* or *demountable support structures* shall conform to CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films” or NFPA 701, “Standard Method for Fire Tests for Flame Propagation of Textiles and Films.”

3.17.2.6. Provision for Firefighting

(1) Access shall be provided to *demountable stages* for the purpose of firefighting.

3.17.2.7. Electrical Systems

(1) The electrical system and equipment associated with a *demountable stage* or a *demountable support structure*, including electrical fuses and switches, shall be inaccessible to the public.

(2) Cables on the ground in areas used by the public and adjacent to a *demountable stage* or *demountable support structure* shall be placed in trenches or protected by covers to prevent damage from traffic.

(3) Where a *demountable stage* or *demountable support structure* is to be erected, assembled or installed in proximity to existing above ground electrical conductors, the *demountable stage* or *demountable support structure* shall be erected, assembled or installed in accordance with Article 3.1.20.1.

3.17.2.8. Structural Provisions

(1) Except as provided in Sentences (2) and (4), *demountable stages* and *demountable support structures* and their structural members shall be designed, erected, assembled and installed

- (a) in conformance with Part 4, or
- (b) to conform to good engineering practice appropriate to the circumstances such as that described in ANSI E1.21, “Entertainment Technology - Temporary Structures Used for Technical Production of Outdoor Entertainment Events.”

(2) The reference velocity pressure shall be the appropriate value determined in conformance with Subsection 1.1.2. based on a probability of being exceeded in any one year of 1-in-10 with a 2.5 gust factor.

(3) For purposes of Clause (1)(a), *demountable stages* and *demountable support structures* shall be assigned a Normal Importance Category as described in Table 4.1.2.1.

(4) Footings shall be designed in accordance with Clause 9.4.4.1.(1)(b).

3.17.2.9. Barrier-Free Design

(1) If a *demountable stage* is intended for limited public occupancy, a *barrier-free* path of travel conforming to Articles 3.8.1.3. and 3.8.3.4. shall be provided to and throughout at least one platform of the *demountable stage*.

Section 3.18. Additional Requirements for Existing Buildings

3.18.1. Scope

3.18.1.1. Application

(1) This Section applies where proposed *construction*

(a) in respect of an existing *building* will result in any of the following changes of use of all or part of the *building*:

- (i) a change of the *major occupancy* of all or part of a *building* that is designated with a “Y” in Table 1.3.1.4. of Division C,
- (ii) a *suite* of a Group C *major occupancy* is converted into more than one *suite* of a Group C *major occupancy*,
- (iii) a *suite* or part of a *suite* of a Group A, Division 2 or a Group A, Division 4 *major occupancy* is converted to a *gaming premises*,
- (iv) a *farm building* or part of a *farm building* is changed to a *major occupancy*,
- (v) a *building* or part of a *building* is changed to a *post-disaster building*,
- (vi) a *building* or part of a *building* is changed to a *retirement home*, or
- (vii) the use of a *building* or part of a *building* is changed and the previous *major occupancy* of the *building* or part of the *building* cannot be determined, or

(b) in respect of an existing *building* of *combustible construction* will extend the *building* by adding a *storey* or *storeys* such that the extended *building* will be more than four *storeys* in *building height*.

(2) For the purposes of this Section and Sentences 11.4.2.1.(1) and 11.4.2.5.(4), the changes of use set out in Subclauses (1)(a)(ii) to (iv) and (vi) shall also be deemed to constitute a change in *major occupancy*.

(3) The requirements of this Section are in addition to the requirements of other Parts of this Division as they apply to the proposed *construction*.

3.18.2. Additional Construction

3.18.2.1. Change of Use and Compensating Construction

(1) Where proposed *construction* will result in a change of use described in Subclauses 3.18.1.1.(1)(a)(i) to (iv) and (vi), additional *construction* shall be required in order that the *building* or part of a *building* subject to the change of use conforms to the requirements of Subsection 3.2.6. and Sections 3.7., 3.11. and 3.12. as they apply to the new *major occupancy* that the *building* or part of a *building* is to support.

(2) For the purposes of this Article, existing *buildings* shall be classified as to their *construction* and *occupancy* as provided for in Sentence 11.2.1.1.(1).

3.18.2.2. Performance Level and Compensating Construction

(1) The *performance level* of a *building* after *construction* shall not be less than the *performance level* of the *building* prior to *construction*.

(2) For the purposes of Sentence (1), reduction of *performance level* shall be determined in accordance with Articles 11.4.2.1., 11.4.2.3., 11.4.2.5. and 11.4.2.6.

(3) Where proposed *construction* would reduce the *performance level* of an existing *building*, compensating *construction* shall be required in conformance with Articles 11.4.3.1., 11.4.3.2., 11.4.3.4., 11.4.3.6. and 11.4.3.7.

(4) Section 11.5. applies in respect of the requirements of Sentences 11.4.3.4.(1), (3) and (4).

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Part 4

Structural Design

Section 4.1. Structural Loads and Procedures

4.1.1. General

4.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

4.1.1.2. Definitions

- (1) Words that appear in italics in this Part are defined in Article 1.4.1.2. of Division A.

4.1.1.3. Design Requirements

- (1) *Buildings* and their structural members and connections, including formwork and falsework, shall be designed to have sufficient structural capacity and structural integrity to safely and effectively resist all loads, effects of loads and influences that may reasonably be expected, having regard to the expected service life of *buildings*, and shall in any case satisfy the requirements of this Section. (See Note A-4.1.1.3.(1))
- (2) *Buildings* and their structural members shall be designed for serviceability, in accordance with Articles 4.1.3.4., 4.1.3.5. and 4.1.3.6. (See Note A-4.1.1.3.(2))
- (3) All permanent and temporary structural members, including the formwork and falsework of a *building*, shall be protected against loads exceeding the specified loads during the *construction* period except when, as verified by analysis or test, temporary overloading of a structural member would result in no impairment of that member or any other member.
- (4) Reserved.
- (5) Precautions shall be taken during all phases of *construction* to ensure that the *building* is not damaged or distorted due to loads applied during *construction*.

4.1.1.4. Reserved

4.1.1.5. Design Basis

- (1) Except as provided in Sentence (2), *buildings* and their structural members shall be designed in conformance with the procedures and practices provided in this Part.

(2) Provided the design is carried out by a person especially qualified in the specific methods applied and provided the design demonstrates a level of safety and performance in accordance with the requirements of this Part, *buildings* and their structural components falling within the scope of this Part that are not amenable to analysis using a generally established theory may be designed by,

- (a) evaluation of a full-scale structure or a prototype by a loading test, or
- (b) studies of model analogues.

(See Note A-4.1.1.5.(2))

4.1.2. Specified Loads and Effects

4.1.2.1. Loads and Effects (See Note A-4.1.2.1.)

(1) Except as provided in Article 4.1.2.2., the following categories of loads, specified loads and effects shall be taken into consideration in the design of a *building* and its structural members and connections:

- D *dead load* – a permanent load due to the weight of *building* components, as specified in Subsection 4.1.4.,
- E earthquake load and effects – a rare load due to an earthquake, as specified in Subsection 4.1.8.,
- H a permanent load due to lateral earth pressure, including *groundwater*,
- L *live load* – a variable load due to intended use and *occupancy* (including loads due to cranes and the pressure of liquids in containers), as specified in Subsection 4.1.5.,
- L_{XC} *live load* exclusive of crane loads,
- C *live load* due to cranes including self weight,
- C_d self weight of all cranes positioned for maximum effects,
- C₇ crane bumper impact load,
- P permanent effects caused by pre-stress,
- S variable load due to snow, including ice and associated rain, as specified in Article 4.1.6.2., or due to rain, as specified in Article 4.1.6.4.,
- T effects due to contraction, expansion, or deflection caused by temperature changes, shrinkage, moisture changes, creep, ground settlement, or a combination thereof, and (See Note A-4.1.2.1.(1))
- W wind load – a variable load due to wind, as specified in Subsection 4.1.7.,

where

- (a) load means the imposed deformations (i.e. deflections, displacements or motions that induce deformations and forces in the structure), forces and pressures applied to the *building* structure,
- (b) permanent load is a load that changes very little once it has been applied to the structure, except during repair,
- (c) variable load is a load that frequently changes in magnitude, direction or location, and
- (d) rare load is a load that occurs infrequently and for a short time only.

(2) Minimum specified values of the loads described in Sentence (1), as set forth in Subsections 4.1.4. to 4.1.8., shall be increased to account for dynamic effects where applicable.

(3) For the purpose of determining specified loads **S**, **W** or **E** in Subsections 4.1.6., 4.1.7. and 4.1.8., *buildings* shall be assigned an Importance Category based on intended use and *occupancy*, in accordance with Table 4.1.2.1. (See Note A-4.1.2.1.(3))

Table 4.1.2.1.
Importance Categories for Buildings⁽¹⁾
 Forming Part of Sentence 4.1.2.1.(3)

Type of Building	Importance Category
A Low Importance Category <i>building</i> is a <i>building</i> that represents a low direct or indirect hazard to human life in the event of structural failure.	Low
A Normal Importance Category <i>building</i> is a <i>building</i> that does not meet the criteria for a Low Importance Category <i>building</i> , High Importance Category <i>building</i> or <i>post-disaster building</i> .	Normal
A High Importance Category <i>building</i> is a <i>building</i> that provides a greater degree of safety to human life than a Normal Importance Category <i>building</i> . Community centres and elementary, middle and secondary schools are High Importance Category <i>buildings</i> .	High
A <i>post-disaster building</i> .	Post-disaster

Notes to Table 4.1.2.1.

(1) See Note A-Table 4.1.2.1.

4.1.2.2. Loads Not Listed

(1) Where a *building* or structural member can be expected to be subjected to loads, forces or other effects not listed in Article 4.1.2.1., such effects shall be taken into account in the design based on the most appropriate information available. (See Note A-4.1.2.2.(1))

4.1.3. Limit States Design (See Note A-4.1.3.)

4.1.3.1. Definitions

- (1) In this Subsection, the term,
- (a) “limit states” means those conditions of a *building* structure that result in the *building* ceasing to fulfill the function for which it was designed. (Those limit states concerning safety are called ultimate limit states (ULS) and include exceeding the load-carrying capacity, overturning, sliding and fracture; those limit states that restrict the intended use and *occupancy* of the *building* are called serviceability limit states (SLS) and include deflection, vibration, permanent deformation and local structural damage such as cracking; and those limit states that represent failure under repeated loading are called fatigue limit states),
 - (b) “specified loads” (C, D, E, H, L, P, S, T and W) means those loads defined in Article 4.1.2.1.,
 - (c) “principal load” means the specified variable load or rare load that dominates in a given load combination,
 - (d) “companion load” means a specified variable load that accompanies the principal load in a given load combination,
 - (e) “service load” means a specified load used for the evaluation of a serviceability limit state,
 - (f) “principal-load factor” means a factor applied to the principal load in a load combination to account for the variability of the load and load pattern and the analysis of its effects,
 - (g) “companion-load factor” means a factor that, when applied to a companion load in the load combination, gives the probable magnitude of a companion load acting simultaneously with the factored principal load,
 - (h) “importance factor, I,” means a factor applied in Subsections 4.1.6., 4.1.7. and 4.1.8. to obtain the specified load and take into account the consequences of failure as related to the limit state and the use and *occupancy* of the *building*,
 - (i) “factored load” means the product of a specified load and its principal-load factor or companion-load factor,
 - (j) “effects” refers to forces, moments, deformations or vibrations that occur in the structure,
 - (k) “nominal resistance, R,” of a member, connection or structure, is based on the geometry and on the specified properties of the structural materials,
 - (l) “resistance factor, ϕ ,” means a factor applied to a specified material property or to the resistance of a member, connection or structure, and that, for the limit state under consideration, takes into account the variability of dimensions and material properties, workmanship, type of failure and uncertainty in the prediction of resistance, and
 - (m) “factored resistance, ΦR ,” means the product of nominal resistance and the applicable resistance factor.

4.1.3.2. Strength and Stability

- (1) A *building* and its structural components shall be designed to have sufficient strength and stability so that the factored resistance, ΦR , is greater than or equal to the effect of factored loads, which shall be determined in accordance with Sentence (2).
- (2) Except as provided in Sentence (3), the effect of factored loads for a *building* or structural component shall be determined in accordance with the requirements of this Article and the following load combination cases, the applicable combination being that which results in the most critical effect:
- (a) for load cases without crane loads, the load combinations listed in Table 4.1.3.2.-A, and
- (b) for load cases with crane loads, the load combinations listed in Table 4.1.3.2.-B.
- (See Note A-4.1.3.2.(2))
- (3) Other load combinations that must also be considered are the principal loads acting with the companion loads taken as zero.
- (4) Where the effects due to lateral earth pressure, H , restraint effects from pre-stress, P , and imposed deformation, T , affect the structural safety, they shall be taken into account in the calculations, with load factors of 1.5, 1.0 and 1.25 assigned to H , P and T respectively. (See Note A-4.1.3.2.(4))
- (5) Except as provided in Sentence 4.1.8.16.(2), the counteracting factored *dead load*— $0.9D$ in load combination cases 2, 3 and 4 and $1.0D$ in load combination case 5 in Table 4.1.3.2.-A, and $0.9D$ in load combination cases 1 to 5 and $1.0D$ in load combination case 6 in Table 4.1.3.2.-B—shall be used when the *dead load* acts to resist overturning, uplift, sliding, failure due to stress reversal, and to determine anchorage requirements and the factored resistance of members. (See Note A-4.1.3.2.(5))
- (6) The principal-load factor 1.5 for *live loads* L in Table 4.1.3.2.-A and L_{XC} in Table 4.1.3.2.-B may be reduced to 1.25 for liquids in tanks.

Table 4.1.3.2.-A
Load Combinations Without Crane Loads for Ultimate Limit States
 Forming Part of Sentences 4.1.3.2.(2), (5) to (10) and 4.2.4.1.(3)

Case	Load Combination ⁽¹⁾	
	Principal Loads	Companion Loads
1	$1.4D^{(2)}$	—
2	$(1.25D^{(3)} \text{ or } 0.9D^{(4)}) + 1.5L^{(5)}$	$1.0S^{(6)} \text{ or } 0.4W$
3	$(1.25D^{(3)} \text{ or } 0.9D^{(4)}) + 1.5S$	$1.0L^{(6)(7)} \text{ or } 0.4W$
4	$(1.25D^{(3)} \text{ or } 0.9D^{(4)}) + 1.4W$	$0.5L^{(7)} \text{ or } 0.5S$
5	$1.0D^{(4)} + 1.0E^{(8)}$	$0.5L^{(6)(7)} + 0.25S^{(6)}$

Notes to Table 4.1.3.2.-A:

- (1) See Sentences 4.1.3.2.(2) to (4).
- (2) See Sentence 4.1.3.2.(9).
- (3) See Sentence 4.1.3.2.(8).
- (4) See Sentence 4.1.3.2.(5).
- (5) See Sentence 4.1.3.2.(6).
- (6) See Article 4.1.5.5.
- (7) See Sentence 4.1.3.2.(7).
- (8) See Sentence 4.1.3.2.(10).

Table 4.1.3.2.-B
Load Combinations With Crane Loads for Ultimate Limit States
 Forming Part of Sentences 4.1.3.2.(2), (5) to (8) and (10)

Case	Load Combination ⁽¹⁾	
	Principal Loads	Companion Loads
1	$(1.25D^{(2)} \text{ or } 0.9D^{(3)}) + (1.5C + 1.0L_{xc})$	$1.0S^{(4)} \text{ or } 0.4W$
2	$(1.25D^{(2)} \text{ or } 0.9D^{(3)}) + (1.0C + 1.5L_{xc}^{(5)})$	$1.0S^{(4)} \text{ or } 0.4W$
3	$(1.25D^{(2)} \text{ or } 0.9D^{(3)}) + 1.5S$	$1.0C + 1.0L_{xc}^{(4)(6)}$
4	$(1.25D^{(2)} \text{ or } 0.9D^{(3)}) + 1.4W$	$1.0C^{(7)} + 0.5L_{xc}^{(4)(6)}$
5	$(1.25D^{(2)} \text{ or } 0.9D^{(3)}) + C_7$	—
6	$1.0D^{(3)} + 1.0E^{(8)}$	$1.0C_d + 0.5L_{xc}^{(4)(6)} + 0.25S^{(4)}$

Notes to Table 4.1.3.2.-B:

- (1) See Sentences 4.1.3.2.(2) to (4).
- (2) See Sentence 4.1.3.2.(8).
- (3) See Sentence 4.1.3.2.(5).
- (4) See Article 4.1.5.5.
- (5) See Sentence 4.1.3.2.(6).
- (6) See Sentence 4.1.3.2.(7).
- (7) Side thrust due to cranes need not be combined with full wind load.
- (8) See Sentence 4.1.3.2.(10).

(7) The companion-load factor for *live loads* **L** in Table 4.1.3.2.-A and **L_{xc}** in Table 4.1.3.2.-B shall be increased by 0.5 for storage areas and equipment areas and *service rooms* referred to in Table 4.1.5.3.

(8) Except as provided in Sentence (9), the load factor 1.25 for *dead load*, **D**, for *soil*, superimposed earth, plants and trees given in Tables 4.1.3.2.-A and 4.1.3.2.-B shall be increased to 1.5, except that when the *soil* depth exceeds 1.2 m, the factor may be reduced to $1 + 0.6/h_s$ but not less than 1.25, where h_s is the depth of *soil*, in m, supported by the structure.

(9) A principal-load factor of 1.5 shall be applied to the weight of saturated *soil* used in load combination case 1 of Table 4.1.3.2.-A.

(10) Earthquake load, **E**, in load combination cases 5 of Table 4.1.3.2.-A and 6 of Table 4.1.3.2.-B includes horizontal earth pressure due to earthquake determined in accordance with Sentence 4.1.8.16.(7).

(11) Provision shall be made to ensure adequate stability of the structure as a whole and adequate lateral, torsional and local stability of all structural parts.

(12) Sway effects produced by vertical loads acting on the structure in its displaced configuration shall be taken into account in the design of *buildings* and their structural members.

4.1.3.3. Fatigue

(1) A *building* and its structural components, including connections, shall be checked for fatigue failure under the effect of cyclical loads, as required in the standards listed in Section 4.3. (See Note A-4.1.3.3.(1))

(2) Where vibration effects, such as resonance and fatigue resulting from machinery and equipment, are likely to be significant, a dynamic analysis shall be carried out. (See Note A-4.1.3.3.(2))

4.1.3.4. Serviceability

- (1) A *building* and its structural components shall be checked for serviceability limit states as defined in Clause 4.1.3.1.(1)(a) under the effect of service loads for serviceability criteria specified or recommended in Articles 4.1.3.5. and 4.1.3.6. and in the standards listed in Section 4.3. (See Note A-4.1.3.4.(1))
- (2) The effect of service loads on the serviceability limit states shall be determined in accordance with this Article and the load combinations listed in Table 4.1.3.4., the applicable combination being that which results in the most critical effect.
- (3) Other load combinations that must also be considered are the principal loads acting with the companion loads taken as zero.
- (4) Deflections calculated for load types **P**, **T** and **H**, if present, with load factors of 1.0 shall be included with the calculated deflections due to principal loads.
- (5) The determination of the deflection shall consider the following:
- for materials that result in increased deformations over time under sustained loads, the deflection calculation shall consider the portion of live load, **L**, that is sustained over time, **L_s**, and the portion that is transitory, **L_t**, and
 - the calculated deflection due to dead load, **D**, and sustained live load, **L_s**, shall be increased by a creep factor as specified in the standards listed in Section 4.3. to obtain the additional long-term deflection.
- (6) The determination of the long-term settlement of *foundations* shall consider the following:
- for *foundation soil* types that result in increased settlement over time under sustained loads, the additional long-term settlements shall be determined for the portion of *live load*, **L**, that is sustained over time, **L_s**, and the portion that is transitory, **L_t**, and
 - the additional long-term settlements due to *dead load*, **D**, and sustained *live loads*, **L_s**, shall be calculated from the *foundation soil* properties provided by a qualified professional geotechnical engineer.

Table 4.1.3.4.
Loads and Load Combinations for Serviceability
 Forming Part of Sentence 4.1.3.4.(2)

Limit State	Structural Parameter	Load Case	Load Combinations	
			Principal Loads	Companion Loads
Deflection for materials not subject to creep	Deflection of the structure or of components of the structure ⁽¹⁾	1	$1.0D + 1.0L$	$0.3W$ or $0.35S$
		2	$1.0D + 1.0W$	$0.35L^{(2)}$ or $0.35S$
		3	$1.0D + 1.0S$	$0.3W$ or $0.35L^{(2)}$
Deflection for materials subject to creep	Total deflection of the structure or of components of the structure ⁽³⁾	1	$1.0D + 1.0L_s^{(4)} + 1.0L_t^{(5)}$	$0.3W$ or $0.35S$
		2	$1.0D + 1.0W$	$0.35L^{(2)}$ or $0.35S$
		3	$1.0D + 1.0S$	$0.3W$ or $0.35L^{(2)}$
Vibration serviceability	Acceleration		(6)	

Notes to Table 4.1.3.4.:

- The calculated deflection due to *dead load*, **D**, is permitted to be excluded where specified in the standards listed in Section 4.3.
- The companion load factor of 0.35 for *live load*, **L**, shall be increased to 0.5 for storage areas, equipment areas and *service rooms*.
- The calculated immediate deflection due to *dead load*, **D**, is permitted to be excluded where specified in the standards listed in Section 4.3.
- L_s** = sustained portion of the *live load*, **L**.
- L_t** = transitory portion of the *live load*, **L**.
- See Note A-Table 4.1.3.4.

4.1.3.5. Deflection

- (1) In proportioning structural members to limit serviceability problems resulting from deflections, consideration shall be given to
- the intended use of the *building* or member,
 - limiting damage to non-structural members made of materials whose physical properties are known at the time of design,
 - limiting damage to the structure itself, and
 - creep, shrinkage, temperature changes and prestress.
- (See Note A-4.1.3.5.(1))

(2) The lateral deflection of *buildings* due to service wind and gravity loads shall be checked to ensure that structural elements and non-structural elements whose nature is known at the time the structural design is carried out, will not be damaged.

(3) Except as provided in Sentence (4), the total drift per *storey* under service wind and gravity loads shall not exceed 1/500 of the *storey* height unless other drift limits are specified in the design standards referenced in Section 4.3. (See Note A-4.1.3.5.(3))

(4) The deflection limits required in Sentence (3) do not apply to industrial *buildings* or sheds if experience has proven that greater movement will have no significant adverse effects on the strength and function of the *building*.

(5) The *building* structure shall be designed for lateral deflection due to **E**, in accordance with Article 4.1.8.13.

4.1.3.6. Vibration

(1) Floor systems susceptible to vibration shall be designed so that vibrations will have no significant adverse effects on the intended *occupancy* of the *building*. (See Note A-4.1.3.6.(1))

(2) Where floor vibrations caused by resonance with operating machinery or equipment are anticipated, dynamic analysis of the floor system shall be carried out. (See Note A-4.1.3.6.(2))

(3) Where the fundamental vibration frequency of a structural system supporting an *assembly occupancy* used for rhythmic activities, such as dancing, concerts, jumping exercises or gymnastics, is less than 6 Hz, the effects of resonance shall be investigated by means of a dynamic analysis. See Note A-4.1.3.6.(3))

(4) A *building* susceptible to lateral vibration under wind load shall be designed in accordance with Article 4.1.7.1. so that the vibrations will have no significant adverse effects on the intended use and *occupancy* of the *building*. (See Note A-4.1.3.6.(4))

4.1.4. Dead Loads

4.1.4.1. Dead Loads

- (1) The specified *dead load* for a structural member consists of,
- the weight of the member itself,
 - the weight of all materials of construction incorporated into the *building* to be supported permanently by the member,
 - the weight of *partitions*,
 - the weight of permanent equipment, and
 - the vertical load due to *soil*, superimposed earth, plants and trees

- (2) In areas of a *building* for which *partitions* are shown on the drawings, the weight of *partitions* referred to in Clause (1)(c) shall be taken as the actual weight of such *partitions*. (See Note A-4.1.4.1.(2))
- (3) In areas of a *building* for which *partitions* are not shown on the drawings, the weight of *partitions* referred to in Clause (1)(c) shall be a *partition* weight allowance determined from the anticipated weight and position of the *partitions*, but shall not be less than 1 kPa over the area of floor being considered. (See Note A-4.1.4.1.(3))
- (4) *Partition* loads used in design shall be shown on the drawings.
- (5) Where the *partition* weight allowance referred to in Sentence (3) is counteractive to other loads, it shall not be included in the design calculations.
- (6) Except for structures where the *dead load* of *soil* is part of the load-resisting system, where the *dead load* due to *soil*, superimposed earth, plants and trees is counteractive to other loads, it shall not be included in the design calculations. (See Note A-4.1.4.1.(6))

4.1.5. Live Loads Due to Use and Occupancy

4.1.5.1. Loads Due to Use of Floors and Roofs

- (1) Except as provided in Sentence (2), the specified *live load* on an area of floor or roof depends on the intended use and *occupancy*, and shall not be less than either the uniformly distributed load patterns listed in Article 4.1.5.3., the loads due to the intended use and *occupancy*, or the concentrated loads listed in Article 4.1.5.9., whichever produces the most critical effect. (See Note A-4.1.5.1.(1))
- (2) For *buildings* in the Low Importance Category as described in Table 4.1.2.1., a factor of 0.8 may be applied to the *live load*.

4.1.5.2. Uses Not Stipulated

- (1) Except as provided in Sentence (2), where the use of an area of floor or roof is not provided for in Article 4.1.5.3., the specified *live loads* due to the use and *occupancy* of the area shall be determined from an analysis of the loads resulting from the weight of,
- (a) the probable assembly of persons,
 - (b) the probable accumulation of equipment and furnishings, and
 - (c) the probable storage of materials.
- (2) For *buildings* in the Low Importance Category as described in Table 4.1.2.1., a factor of 0.8 may be applied to the *live load*.

4.1.5.3. Full and Partial Loading

- (1) The uniformly distributed *live load* shall be not less than the value listed in Table 4.1.5.3., which may be reduced as provided in Article 4.1.5.8., applied uniformly over the entire area or on any portions of the area, whichever produces the most critical effects in the members concerned.

Table 4.1.5.3.
Specified Uniformly Distributed Live Loads on an Area of Floor or Roof
 Forming Part of Sentence 4.1.5.3.(1)

Use of Area of Floor or Roof	Minimum Specified Load, kPa
Assembly Areas	4.8
(a) Except for the areas listed under (b), (c), (d) and (e), assembly areas with or without fixed seats including	
Arenas ⁽¹⁾ (areas without fixed seats that have backs)	
Auditoria	
Churches (areas without fixed seats that have backs)	
Dance floors	
Dining areas ⁽²⁾	
Foyers and entrance halls	
Grandstands ⁽¹⁾ (areas without fixed seats that have backs), reviewing stands and bleachers	
Gymnasias	
Lecture halls ⁽¹⁾ (areas without fixed seats that have backs)	
Museums	
Promenades	
Rinks	
Stadia ⁽¹⁾ (areas without fixed seats that have backs)	
Stages	
Theatres (areas without fixed seats that have backs)	
Other areas with similar uses	
(b) Classrooms and courtrooms with or without fixed seats ⁽¹⁾	2.4
(c) Portions of assembly areas with fixed seats that have backs for the following uses:	2.9
Arenas ⁽¹⁾	
Grandstands ⁽¹⁾	
Stadia ⁽¹⁾	2.4
(d) Portions of assembly areas with fixed seats that have backs for the following uses:	
Churches	
Lecture halls ⁽¹⁾	
Theatres	
(e) Vomitories, exits, lobbies and corridors ⁽¹⁾	4.8
Attics ⁽¹⁾	
Accessible by a stairway in residential occupancies only	1.4
Having limited accessibility so that there is no storage of equipment or material	0.5
Balconies	
Exterior	4.8
Interior and mezzanines that could be used by an assembly of people as a viewing area ⁽¹⁾	4.8
Interior and mezzanines other than above	(3)

Table 4.1.5.3. (Cont'd)
Specified Uniformly Distributed Live Loads on an Area of Floor or Roof
 Forming Part of Sentence 4.1.5.3.(1)

Use of Area of Floor or Roof	Minimum Specified Load, kPa
Corridors, lobbies and aisles ⁽¹⁾	
Other than those listed below	4.8
Not more than 1 200 mm in width and all upper floor corridors of residential areas only of apartments, <i>hotels</i> and motels (that cannot be used by an assembly of people as a viewing area)	⁽³⁾
In a Group B, Division 3 <i>occupancy</i> that contains sleeping accommodation for not more than 10 persons and not more than 6 occupants require assistance in evacuation in case of an emergency	2.4
Equipment areas and <i>service rooms</i> including	
Generator rooms	3.6 ⁽⁴⁾
Mechanical equipment exclusive of elevators	
Machine rooms	
Pump rooms	
Transformer vaults	
Ventilating or <i>air-conditioning</i> equipment	
<i>Exits</i> and fire escapes	4.8
Factories	6.0 ⁽⁴⁾
Footbridges	4.8
Garages for	
Vehicles not exceeding 4 000 kg gross weight	2.4
Vehicles exceeding 4 000 kg but not exceeding 9 000 kg gross weight	6.0
Vehicles exceeding 9 000 kg gross weight ⁽¹⁾	12.0
Kitchens (other than residential)	4.8
Libraries	
Stack rooms	7.2
Reading and study rooms	2.9
Office areas ⁽¹⁾ (not including record storage and computer rooms) located in	
<i>Basement</i> , and floors, including <i>mezzanines</i> , with direct access to the exterior at ground level	4.8
Other floors	2.4
Operating rooms and laboratories	3.6
Patients' bedrooms	1.9
Recreation areas that cannot be used for assembly purposes including	
Billiard rooms	3.6
Bowling alleys	
Pool rooms	
Residential areas (within the scope of Article 1.3.3.2. of Division A)	
Sleeping and living quarters in apartments, <i>hotels</i> , motels, boarding schools and colleges	1.9
Work areas within <i>live/work units</i>	2.4
Residential areas (within the scope of Article 1.3.3.2. of Division A)	
Bedrooms and other areas	1.9
Other areas	
Stairs within dwelling units	
Retail and wholesale areas	4.8
Roofs ⁽¹⁾	1.0 ⁽⁵⁾

Table 4.1.5.3. (Cont'd)
Specified Uniformly Distributed Live Loads on an Area of Floor or Roof
Forming Part of Sentence 4.1.5.3.(1)

Use of Area of Floor or Roof	Minimum Specified Load, kPa
Sidewalks and driveways over areaways and <i>basements</i> ⁽¹⁾	12.0 ⁽⁵⁾
Storage areas, including locker rooms in apartment <i>buildings</i>	4.8 ⁽⁴⁾
Toilet areas	2.4
Underground slabs with earth cover	⁽⁵⁾
Warehouses	4.8 ⁽⁴⁾

Notes to Table 4.1.5.3.:

- (1) See Note A-Table 4.1.5.3.
- (2) See Article 4.1.5.6.
- (3) See Article 4.1.5.4.
- (4) See Sentence 4.1.5.1.(1).
- (5) See Article 4.1.5.5.

4.1.5.4. Loads for Occupancy Served

- (1) The following shall be designed to carry not less than the specified load required for the *occupancy* they serve, provided they cannot be used by an assembly of people as a viewing area:
 - (a) corridors, lobbies and aisles not more than 1 200 mm wide,
 - (b) all corridors above the *first storey* of residential areas of apartments, *hotels* and motels, and
 - (c) interior balconies and *mezzanines*.

4.1.5.5. Loads on Exterior Areas (See Note A-4.1.5.5.)

- (1) Exterior areas accessible to vehicular traffic shall be designed for their intended use, including the weight of firefighting equipment, but not for less than the snow and rain loads prescribed in Subsection 4.1.6.
- (2) Except as provided in Sentences (3) and (4), roofs shall be designed for either the uniform *live loads* specified in Table 4.1.5.3., the concentrated *live loads* listed in Table 4.1.5.9., or the snow and rain loads prescribed in Subsection 4.1.6., whichever produces the most critical effect.
- (3) Exterior areas accessible to pedestrian traffic, but not vehicular traffic, shall be designed for their intended use, but not for less than the greater of,
 - (a) the *live load* prescribed for assembly areas in Table 4.1.5.3., or
 - (b) the snow and rain loads prescribed in Subsection 4.1.6.
- (4) Roof parking decks and exterior areas accessible to vehicular traffic shall be designed
 - (a) for the appropriate load combination listed in Sentence 4.1.3.2.(2) with a *live load*, L, consisting of either a uniformly distributed *live load* as specified in Table 4.1.5.3. or a concentrated *live load* as listed in Table 4.1.5.9., whichever produces the most critical effect, and a companion snow load, S, as prescribed in Subsection 4.1.6., but with the companion-load factor reduced to 0.2, and
 - (b) such that the load combination in Clause (a) is not less than the snow and rain loads prescribed in Subsection 4.1.6. with the *live load* taken as zero.
- (5) Roof parking decks that are used for the long-term storage of vehicles shall be designed for the appropriate load combination listed in Sentence 4.1.3.2.(2) with a *live load*, L, consisting of either a uniformly distributed *live load* as specified in Table 4.1.5.3. or a concentrated *live load* as listed in Table 4.1.5.9., whichever produces the most critical effect, and a snow load, S, as prescribed in Subsection 4.1.6.

4.1.5.6. Loads for Dining Areas

(1) The minimum specified live load listed in Table 4.1.5.3. for dining areas may be reduced to 2.4 kPa for areas in buildings that are being converted to dining areas, provided that the floor area does not exceed 100 m² and the dining area will not be used for other assembly purposes, including dancing.

4.1.5.7. More Than One Occupancy

(1) Where an area of floor or roof is intended for 2 or more *occupancies* at different times, the value to be used from Table 4.1.5.3. shall be the greatest value for any of the *occupancies* concerned.

4.1.5.8. Variation With Tributary Area (See Note A-4.1.5.8.)

(1) One- and two-way floor slabs shall have no reduction for tributary area applied to *live load*.

(2) An area used for *assembly occupancies* designed for a *live load* of less than 4.8 kPa and roofs designed for the minimum loading specified in Table 4.1.5.3. shall have no reduction for tributary area.

(3) Where a structural member supports a tributary area of a floor or a roof, or a combination thereof, that is greater than 80 m² and either used for *assembly occupancies* designed for a *live load* of 4.8 kPa or more, or used for storage, manufacturing, retail stores, garages or as a footbridge, the specified *live load* due to use and *occupancy* is the load specified in Article 4.1.5.3. multiplied by

$$0.5 + \sqrt{20/A}$$

where A is the tributary area in square metres for this type of use and *occupancy*.

(4) Where a structural member supports a tributary area of a floor or a roof, or a combination thereof, that is greater than 20 m² and used for any use or *occupancy* other than those indicated in Sentences (2) and (3), the specified *live load* due to use and *occupancy* is the load specified in Article 4.1.5.3. multiplied by

$$0.3 + \sqrt{9.8/B}$$

where B is the tributary area in square metres for this type of use and *occupancy*.

(5) Where the specified *live load* for a floor is reduced in accordance with Sentence (3) or (4), the structural drawings shall indicate that a *live load* reduction factor for tributary area has been applied and which structural elements are impacted by this factor.

4.1.5.9. Concentrated Loads

(1) The specified *live load* due to possible concentrations of load resulting from the use of an area of floor or roof shall not be less than that listed in Table 4.1.5.9. applied over the loaded area noted and located so as to cause maximum effects, except that for *occupancies* not listed in Table 4.1.5.9., the concentrations of load shall be determined in accordance with Article 4.1.5.2.

Table 4.1.5.9.
Specified Concentrated Live Loads on an Area of Floor or Roof
 Forming Part of Sentence 4.1.5.9.(1)

Area of Floor or Roof	Minimum Specified Concentrated Load, kN	Loaded Area, mm x mm
Roof surfaces	1.3	200 x 200
Floors of classrooms	4.5	750 x 750
Floors of offices, manufacturing <i>buildings</i> , hospital wards and <i>stages</i>	9.0	750 x 750
Floors and areas used by vehicles not exceeding 4000 kg gross weight	18	120 x 120
Floors and areas used by vehicles exceeding 4000 kg but not exceeding 9000 kg gross weight	36	120 x 120
Floors and areas used by vehicles exceeding 9000 kg gross weight	54 ⁽¹⁾	250 x 600 ⁽¹⁾
Driveways and sidewalks over areaways and <i>basements</i>	54 ⁽¹⁾	250 x 600 ⁽¹⁾

Notes to Table 4.1.5.9.:

(1) See Note A-Table 4.1.5.9.

4.1.5.10. Sway Forces in Assembly Occupancies

(1) The floor assembly and other structural elements that support fixed seats in any *building* used for *assembly occupancies* accommodating large numbers of people at one time, such as grandstands, stadia and *theatre* balconies, shall be designed to resist a horizontal force equal to not less than 0.3 kN for each metre length of seats acting parallel to each row of seats, and not less than 0.15 kN for each metre length of seats acting at right angles to each row of seats, based on the assumption that these forces are acting independently of each other.

4.1.5.11. Crane-Supporting Structures and Impact of Machinery and Equipment

(See Note A-4.1.5.11.)

(1) The minimum specified load due to equipment, machinery or other objects that may produce impact shall be the sum of the weight of the equipment or machinery and its maximum lifting capacity, multiplied by an appropriate factor listed in Table 4.1.5.11.

(2) Crane-supporting structures shall be designed for the appropriate load combinations listed in Article 4.1.3.2.

Table 4.1.5.11.
Factors for the Calculation of Impact Loads
 Forming Part of Sentence 4.1.5.11.(1)

Cause of Impact	Factor
Operation of cab or radio-operated cranes	1.25
Operation of pendant or hand-operated cranes	1.10
Operation of elevators	(1)
Supports for light machinery, shaft or motor-driven	1.20
Supports for reciprocating machinery (e.g. compressors)	1.50
Supports for power-driven units (e.g. piston engines)	1.50

Notes to Table 4.1.5.11.:

(1) See ASME A17.1 / CSA B44, "Safety Code for Elevators and Escalators."

- (3) Crane runway structures shall be designed to resist a horizontal force applied normal to the top of the rails equal to not less than 20% of the sum of the weights of the lifted load and the crane trolley (excluding other parts of the crane).
- (4) The force described in Sentence (3) shall be equally distributed on each side of the runway and shall be assumed to act in either direction.
- (5) Crane runway structures shall be designed to resist a horizontal force applied parallel to the top of the rails equal to not less than 10% of the maximum wheel loads of the crane.

4.1.5.12. Bleachers

- (1) Bleacher seats shall be designed for a uniformly distributed *live load* of 1.75 kN for each linear metre or for a concentrated load of 2.2 kN distributed over a length of 0.75 m, whichever produces the most critical effect on the supporting members.
- (2) Bleachers shall be checked by the erector after erection to ensure that all structural members, including bracing specified in the design, have been installed.
- (3) Telescopic bleachers shall be provided with locking devices to ensure stability while in use.

4.1.5.13. Helicopter Landing Areas

- (1) Helicopter landing areas on roofs shall be constructed in conformance with the requirements for heliports contained in Part III of the *Canadian Aviation Regulations* made under the *Aeronautics Act* (Canada).

4.1.5.14. Loads on Guards and Handrails (See Note A-4.1.5.14. and A-4.1.5.15.(1))

- (1) The minimum horizontal specified *live load* applied outward at the minimum required height of every required *guard* shall be
 - (a) 3.0 kN/m for open viewing stands without fixed seats and for *means of egress* in grandstands, stadia, bleachers and arenas,
 - (b) 1.0 kN applied at any point, so as to produce the most critical effect, for access ways to equipment platforms, contiguous stairs and similar areas where the gathering of many people is improbable, and
 - (c) 0.75 kN/m or 1.0 kN applied at any point so as to produce the most critical effect, whichever governs for locations other than those described in Clauses (a) and (b).
- (2) The minimum horizontal specified *live load* applied inward at the minimum required height of every required *guard* shall be half that specified in Sentence (1).
- (3) Individual elements within the *guard*, including solid panels and pickets, shall be designed for a horizontal specified *live load* of 0.5 kN applied outward over an area of 100 mm by 100 mm located at any point on the element or elements so as to produce the most critical effect.
- (4) The size of the opening between any two adjacent vertical elements within a *guard* shall not exceed the limits required by Part 3 when each of these elements is subjected to a horizontal specified *live load* of 0.1 kN applied in opposite directions in the in-plane direction of the *guard* so as to produce the most critical effect.
- (5) The specified *live loads* required in Sentence (3) need not be considered to act simultaneously with the loads provided for in Sentences (1), (2), (6) and (7).
- (6) The minimum specified *live load* applied vertically at the top of every required *guard* shall be 1.5 kN/m and need not be considered to act simultaneously with the horizontal specified *live load* provided for in Sentences (1), (3) and (7).

- (7) Handrails and their supports shall be designed and constructed to withstand the following minimum specified *live loads*, which need not be considered to act simultaneously:
- (a) 0.9 kN applied at any point and in any direction for all handrails, and
 - (b) 0.7 kN/m applied in any direction for handrails not located within *dwelling units*.

4.1.5.15. Loads on Vehicle Guardrails

- (1) Vehicle guardrails shall be designed for a concentrated load of 22 kN applied horizontally outward at any point 500 mm above the floor surface so as to produce the most critical effect. (See Note A-4.1.5.14. and A-4.1.5.15.(1))
- (2) The loads required in Sentence (1) need not be considered to act simultaneously with the loads provided for in Article 4.1.5.14.

4.1.5.16. Loads on Walls Acting As Guards

- (1) Where the floor elevation on one side of a wall, including a wall around a shaft, is more than 600 mm higher than the elevation of the floor or ground on the other side, the wall shall be designed to resist the appropriate outward lateral design loads prescribed elsewhere in Subsection 4.1.5. or 0.5 kPa acting outward, whichever produces the more critical effect.

4.1.5.17. Firewalls (See Note A-4.1.5.17.)

- (1) *Firewalls* shall be designed to resist the maximum effect due to,
- (a) the appropriate lateral design loads prescribed elsewhere in this Section, or
 - (b) a factored lateral load of 0.5 kPa under fire conditions, as described in Sentence (2).
- (2) Under fire conditions, where the *fire-resistance rating* of the structure is less than that of the *firewall*,
- (a) lateral support shall be assumed to be provided by the structure on one side only, or
 - (b) another structural support system capable of resisting the loads imposed by a fire on either side of the *firewall* shall be provided.

4.1.6. Loads Due to Snow and Rain

4.1.6.1. Specified Load Due to Rain or to Snow and Associated Rain

- (1) The specified load on a roof or any other *building* surface subject to snow and associated rain shall be the snow load specified in Article 4.1.6.2., or the rain load specified in Article 4.1.6.4., whichever produces the more critical effect. (See Note A-4.1.6.1.(1))

4.1.6.2. Specified Snow Load (See Note A-4.1.6.2.)

- (1) The specified load, *S*, due to snow and associated rain accumulation on a roof or any other *building* surface subject to snow accumulation shall be calculated from the formula,

$$S = I_s [S_s (C_b C_w C_s C_a) + S_r]$$

where

- I_s = importance factor for snow load as provided in Table 4.1.6.2.-A,
- S_s = 1-in-50-year ground snow load, in kPa, determined in accordance with Subsection 1.1.3.,
- C_b = basic roof snow load factor in Sentence (2),
- C_w = wind exposure factor in Sentences (3) and (4),
- C_s = slope factor in Sentences (5) to (7),

C_a = accumulation factor in Sentence (8), and

S_r = 1-in-50-year associated rain load, in kPa, determined in accordance with Subsection 1.1.3., but not greater than $S_s(C_b C_w C_s C_a)$.

Table 4.1.6.2.-A
Importance Factor for Snow Load, I_s
Forming Part of Sentence 4.1.6.2.(1)

Importance Category	Importance Factor, I_s	
	ULS	SLS
Low	0.8	0.9
Normal	1	0.9
High	1.15	0.9
Post-disaster	1.25	0.9

- (2) The basic roof snow load factor, C_b , shall
(a) be determined as follows:
(i)

$$C_b = 0.8 \text{ for } l_c \leq \left(\frac{70}{C_w^2}\right), \text{ and}$$

(ii)

$$C_b = \frac{1}{C_w} \left[1 - (1 - 0.8C_w) \exp\left(-\frac{l_c C_w^2 - 70}{100}\right) \right] \text{ for } l_c > \left(\frac{70}{C_w^2}\right)$$

where

l_c = characteristic length of the upper or lower roof, defined as $2w - w^2/l$, in m,

w = smaller plan dimension of the roof, in m, and

l = larger plan dimension of the roof, in m, or

- (b) conform to Table 4.1.6.2.-B, using linear interpolation for intermediate values of $l_c C_w^2$.
(c) be taken as equal to 1 for any roof structure with a mean height of less than $1 + S_s/\gamma$, in m, above *grade*, where γ is the specific weight of snow determined in accordance with Article 4.1.6.13.
(See Note A-4.1.6.2.(2))

(3) Except as provided for in Sentence (4), the wind exposure factor, C_w , shall be 1.0.

(4) For *buildings* in the Low and Normal Importance Categories as set out in Table 4.1.2.1., the wind exposure factor, C_w , given in Sentence (3) may be reduced to 0.75 for rural areas only, or to 0.5 for exposed areas north of the treeline, where

- (a) the *building* is exposed on all sides to wind over open terrain as defined in Clause 4.1.7.3.(5)(a), and is expected to remain so during its life,
(b) the area of roof under consideration is exposed to the wind on all sides with no significant obstructions on the roof, such as parapet walls, within a distance of at least 10 times the difference between the height of the obstruction and $C_b C_w S_s/\gamma$ in m, where γ is the unit weight of snow on roofs as specified in Article 4.1.6.13., and
(c) the loading does not involve the accumulation of snow due to drifting from adjacent surfaces.

(5) Except as provided for in Sentences (6) and (7), the slope factor, C_s , shall be,

- (a) 1.0 where the roof slope, α , is equal to or less than 30° ,
(b) $(70^\circ - \alpha)/40^\circ$ where α is greater than 30° but not greater than 70° , and
(c) 0 where α exceeds 70° .

- (6) The slope factor, C_s , for unobstructed slippery roofs where snow and ice can slide completely off the roof shall be
 - (a) 1.0 where the roof slope, α , is equal to or less than 15° ,
 - (b) $(60^\circ - \alpha)/45^\circ$ where α is greater than 15° but not greater than 60° , and
 - (c) 0 where α exceeds 60° .

(7) Unless otherwise stated in this Subsection, the slope factor, C_s , shall be 1.0 when used in conjunction with accumulation factors for increased snow loads.

Table 4.1.6.2.-B
Basic Roof Snow Load Factor for $I_c > (70/C_w^2)$
 Forming Part of Sentence 4.1.6.2.(2)

Value of $I_c C_w^2$	Value of C_w		
	1.0	0.75	0.5
	Value of C_b		
70	0.80	0.80	0.80
80	0.82	0.85	0.91
100	0.85	0.94	1.11
120	0.88	1.01	1.27
140	0.90	1.07	1.40
160	0.92	1.12	1.51
180	0.93	1.16	1.60
200	0.95	1.19	1.67
220	0.96	1.21	1.73
240	0.96	1.24	1.78
260	0.97	1.25	1.82
280	0.98	1.27	1.85
300	0.98	1.28	1.88
320	0.98	1.29	1.90
340	0.99	1.30	1.92
360	0.99	1.30	1.93
380	0.99	1.31	1.95
400	0.99	1.31	1.96
420	0.99	1.32	1.96
440	1.00	1.32	1.97
460	1.00	1.32	1.98
480	1.00	1.32	1.98
500	1.00	1.33	1.98
520	1.00	1.33	1.99
540	1.00	1.33	1.99
560	1.00	1.33	1.99
580	1.00	1.33	1.99
600	1.00	1.33	1.99
620	1.00	1.33	2.00

- (8) The accumulation factor, C_a , shall be 1.0, which corresponds to the uniform snow load case, except that where appropriate for the shape of the roof, it shall be assigned other values that account for,
- increased non-uniform snow loads due to snow drifting onto a roof that is at a level lower than other parts of the same *building* or at a level lower than another *building* within 5 m of it horizontally, as prescribed in Articles 4.1.6.5., 4.1.6.6. and 4.1.6.8.,
 - increased non-uniform snow loads on areas adjacent to roof projections, such as penthouses, large *chimneys* and equipment, as prescribed in Articles 4.1.6.7. and 4.1.6.8.,
 - non-uniform snow loads on gable, arch or curved roofs and domes, as prescribed in Articles 4.1.6.9. and 4.1.6.10.,
 - increased snow or ice loads due to snow sliding as prescribed in Article 4.1.6.11.,
 - increased snow loads in roof valleys, as prescribed in Article 4.1.6.12., and
 - increased snow or ice loads due to meltwater draining from adjacent *building* elements and roof projections.
- (9) For shapes not addressed in Sentence (8), C_a corresponding to the non-uniform snow load case shall be established based on applicable field observations, special analyses including local climatic effects, appropriate model tests or a combination of these methods.

4.1.6.3. Full and Partial Loading

- (1) A roof or other *building* surface and its structural members subject to loads due to snow accumulation shall be designed for the specified load given in Sentence 4.1.6.2.(1), distributed over the entire loaded area.
- (2) In addition to the distribution mentioned in Sentence (1), flat roofs and shed roofs, gable roofs of 15° slope or less, and arch or curved roofs shall be designed for the specified uniform snow load indicated in Sentence 4.1.6.2.(1), which shall be calculated using the accumulation factor $C_a = 1.0$, distributed on any one portion of the loaded area and half of this load on the remainder of the loaded area, in such a way as to produce the most critical effects on the member concerned. (See Note A-4.1.6.3.(2))

4.1.6.4. Specified Rain Load

- (1) Except as provided in Sentence (4), the specified load, S , due to the accumulation of rainwater on a surface whose position, shape and deflection under load make such an accumulation possible, is that resulting from the one-day rainfall determined in conformance with Subsection 1.1.3. and applied over the horizontal projection of the surface and all tributary surfaces. (See Note A-4.1.6.4.(1))
- (2) The provisions of Sentence (1) apply whether or not the surface is provided with a means of drainage, such as rainwater leaders.
- (3) Except as provided in Sentence 4.1.6.2.(1), loads due to rain need not be considered to act simultaneously with loads due to snow. (See Note A-4.1.6.4.(3))
- (4) Where scuppers are provided as secondary drainage systems and where the position, shape and deflection of the loaded surface make an accumulation of rainwater possible, the loads due to rain shall be the lesser of either the one-day rainfall determined in conformance with Subsection 1.1.3. or a depth of rainwater equal to 30 mm above the bottom of the scuppers, applied over the horizontal projection of the surface and tributary areas.

4.1.6.5. Multi-Level Roofs

- (1) The drifting load of snow on a roof adjacent to a higher roof shall be taken as trapezoidal, as shown in Figure 4.1.6.5.-A, and the accumulation factor, C_a , shall be determined as follows:

$$C_a = C_{a0} - (C_{a0} - 1)(x/x_d), \text{ for } 0 \leq x \leq x_d$$

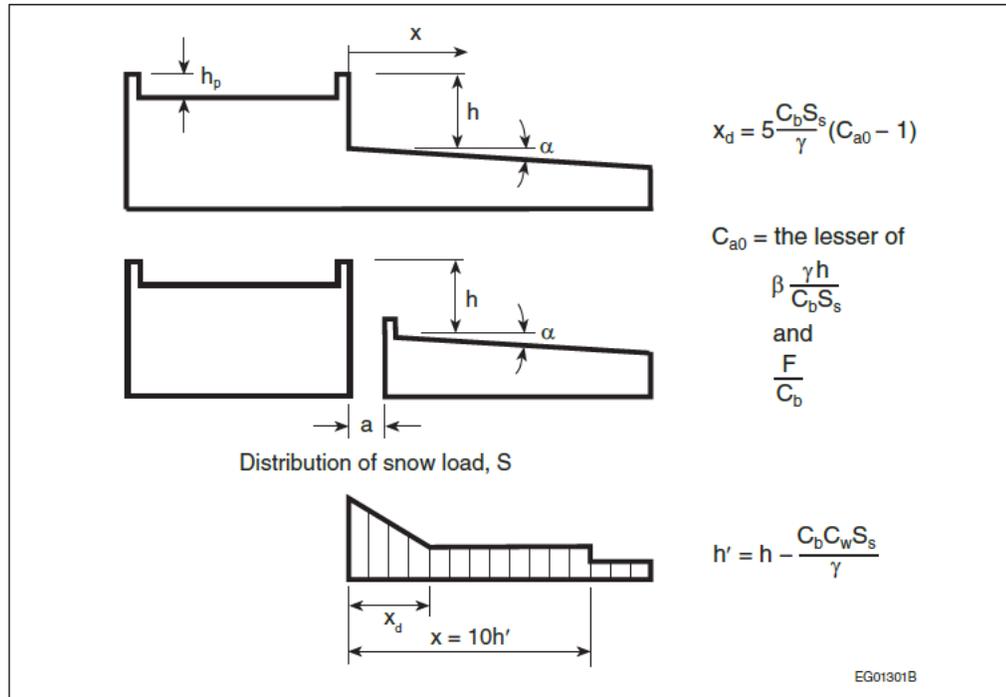
or

$$C_a = 1.0, \text{ for } x > x_d$$

where

- C_{a0} = peak value of C_a at $x = 0$ as specified in Sentences (3) and (4) and as shown in Figure 4.1.6.5.A.,
- x = distance from roof step as shown in Figure 4.1.6.5.-A, and
- x_d = length of drift as specified in Sentence (2) and as shown in Figure 4.1.6.5.-A.

Figure 4.1.6.5.-A
Snow Load Factors for Lower Level Roofs
 Forming Part of Sentences 4.1.6.5.(1) and (3), Table 4.1.6.5.-A and Sentence 4.1.6.6.(1)



Notes to Figure 4.1.6.5.-A:

- (1) If $a > 5$ m or $h \leq 0.8S_s/\gamma$, drifting from the higher roof need not be considered.
- (2) If $h \geq 5$ m, the value of C_{a0} for Case I is permitted to be determined in accordance with Sentence 4.1.6.5.(4).

Table 4.1.6.5.-A
Wind Exposure, Slope and Accumulation Factors in Figure 4.1.6.5.-A

Distance from Roof Step, x	Factors		
	C_w	$C_s^{(1)}$	C_a
0	1.0	$f(\alpha)$	C_{a0}
$0 < x \leq x_d$	1.0	$f(\alpha)$	$C_{a0} - (C_{a0} - 1)(x/x_d)$
$x_d < x \leq 10h'$	1.0	$f(\alpha)$	1.0
$x > 10h'$	1.0 for unexposed roof areas 0.75 for exposed roof areas 0.5 for exposed roof areas north of tree line	$f(\alpha)$	1.0

Notes to Table 4.1.6.5.-A:

- (1) For lower roofs with parapets, $C_s = 1.0$; otherwise, C_s varies as a function of slope, α , as defined in Sentences 4.1.6.2.(5) and (6).

- (2) The length of the drift, x_d , shall be calculated as follows:

$$x_d = 5 \frac{C_b S_s}{\gamma} (C_{a0} - 1)$$

where

γ = specific weight of snow as specified in Article 4.1.6.13.

- (3) Except as provided in Sentence (4), the value of C_{a0} for each of Cases I, II and III shall be the lesser of

$$C_{a0} = \beta \frac{\gamma h}{C_b S_s} \text{ and}$$

$$C_{a0} = \frac{F}{C_b}$$

where

β = 1.0 for Case I and 0.67 for Cases II and III,

h = difference in elevation between the lower roof surface and the top of the parapet on the upper roof as shown in Figure 4.1.6.5.-A, and

$$F = 0.35\beta \sqrt{\frac{\gamma(l_{cs} - 5h'_p)}{S_s}} + C_b, \text{ but } F \leq 5 \text{ for } C_{ws} = 1.0$$

where

C_{ws} = value for C_w applicable to the source of drifting,

l_{cs} = characteristic length of the source area for drifting, defined as, $l_{cs} = 2w_s - \frac{w_s^2}{l_s}$, where w_s and l_s are respectively the shorter and longer dimensions of the relevant source areas for snow drifting shown in Figure 4.1.6.5.-B for Cases I, II and III, and

$$h'_p = h_p - \left(\frac{0.8S_s}{\gamma}\right), \text{ but } 0 \leq h'_p \leq \left(\frac{l_{cs}}{5}\right)$$

where

h_p = height of the roof perimeter parapet of the source area, to be taken as zero unless all the roof edges of the source area have parapets.

- (4) Where $h \geq 5$ m, the value of C_{a0} for Case I is permitted to be taken as

$$C_{a0} = \left(\frac{25 - h}{20}\right) \left(\frac{F}{C_b} - 1\right) + 1 \text{ for } 5 \text{ m} \leq h \leq 25 \text{ m, and}$$

$$C_{a0} = 1 \text{ for } h > 25 \text{ m}$$

- (5) The value of C_{a0} shall be the highest of Cases I, II and III, considering the different roof source areas for drifting snow, as specified in Sentences (3) and (4) and Figure 4.1.6.5.-B.

Figure 4.1.6.5.-B
Snow Load Cases I, II and III for Lower Level Roofs
 Forming Part of Sentences 4.1.6.5.(1), (3) and (5), and Table 4.1.6.5.-B

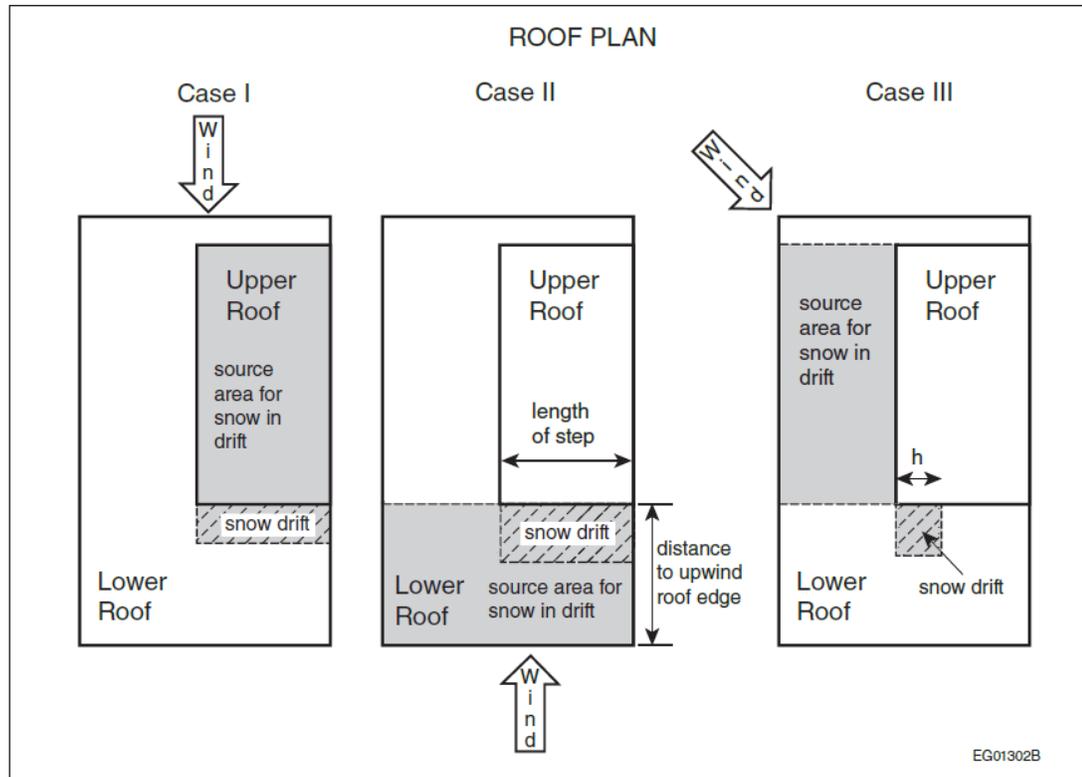


Table 4.1.6.5.-B
Parameters for Snow Load Cases in Figure 4.1.6.5.-B

Parameter	Case I	Case II	Case III
β	1.0	0.67	0.67
h_p	parapet height of upper-roof source area	parapet height of lower-roof source area	parapet height of lower-roof source area
$l_{cs} = 2w_s - \frac{w_s^2}{l_s}$	with w_s and l_s being the shorter and longer dimensions of the upper roof	with w_s and l_s being the shorter and longer dimensions of the source area on the lower roof for upwind-facing step	with w_s and l_s being the shorter and longer dimensions of the source area on the lower roof for downwind-facing step

4.1.6.6. Horizontal Gap Between a Roof and a Higher Roof

(1) Where the roof of one *building* is separated by a distance, a , from an adjacent *building* with a higher roof as shown in Figure 4.1.6.5.-A, the influence of the adjacent *building* on the value of the accumulation factor, C_a , for the lower roof shall be determined as follows:

- (a) if $a > 5$ m, the influence of the adjacent *building* on C_a for the lower roof can be ignored, and
- (b) if $a \leq 5$ m, C_a for the lower roof shall be calculated in accordance with Article 4.1.6.5. for values of $x \geq a$.

4.1.6.7. Areas Adjacent to Roof Projections

(1) Except as provided in Sentences (2) and (3), the accumulation factor, C_a , for areas adjacent to roof-mounted vertical projections shall be calculated in accordance with Sentence 4.1.6.5.(1) using the following values for the peak accumulation factor, C_{a0} , and the drift length, x_d :

(a) C_{a0} shall be taken as the lesser of,

$$0.67 \frac{\gamma h}{C_b S_s} \text{ and } \frac{\gamma l_0}{7.5 C_b S_s} + 1, \text{ and}$$

(b) x_d shall be taken as the lesser of $3.35h$ and $(2/3)l_0$, where h = height of the projection, and l_0 = longest horizontal dimension of the projection. (See Note A-4.1.6.7.(1))

(2) C_a is permitted to be calculated in accordance with Article 4.1.6.5. for larger projections. (See Note A-4.1.6.7.(2))

(3) Where the longest horizontal dimension of the roof projection, l_0 , is less than 3 m, the drift surcharge adjacent to the projection need not be considered.

4.1.6.8. Snow Drift at Corners

(1) The drift loads on the lower level roof against the two faces of an outside corner of an upper level roof or roof obstruction shall be extended radially around the corner as shown in Figure 4.1.6.8.-A and may be taken as the least severe of the drift loads lying against the two faces of the corner.

(2) The drift loads on the lower level roof against the two faces of an inside corner of an upper level roof or a parapet shall be calculated for each face and the higher of the two loads shall be applied where the drifts overlap as shown in Figure 4.1.6.8.-B.

Figure 4.1.6.8.-A
Snow Load at Outside Corner
Forming Part of Sentence 4.1.6.8.(1)

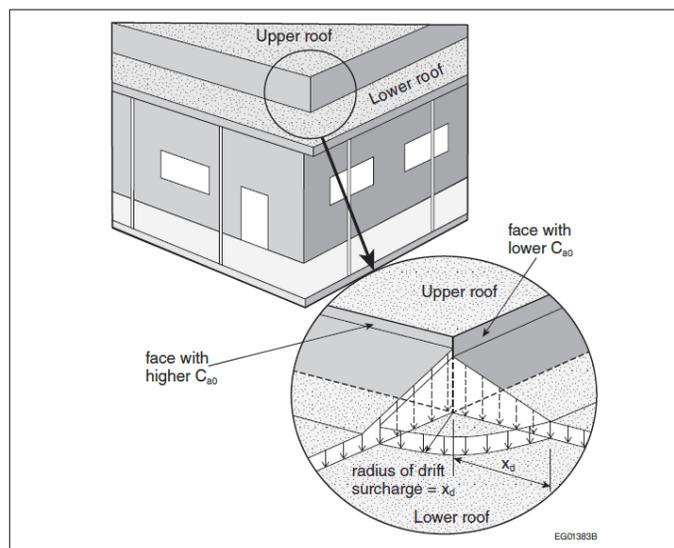
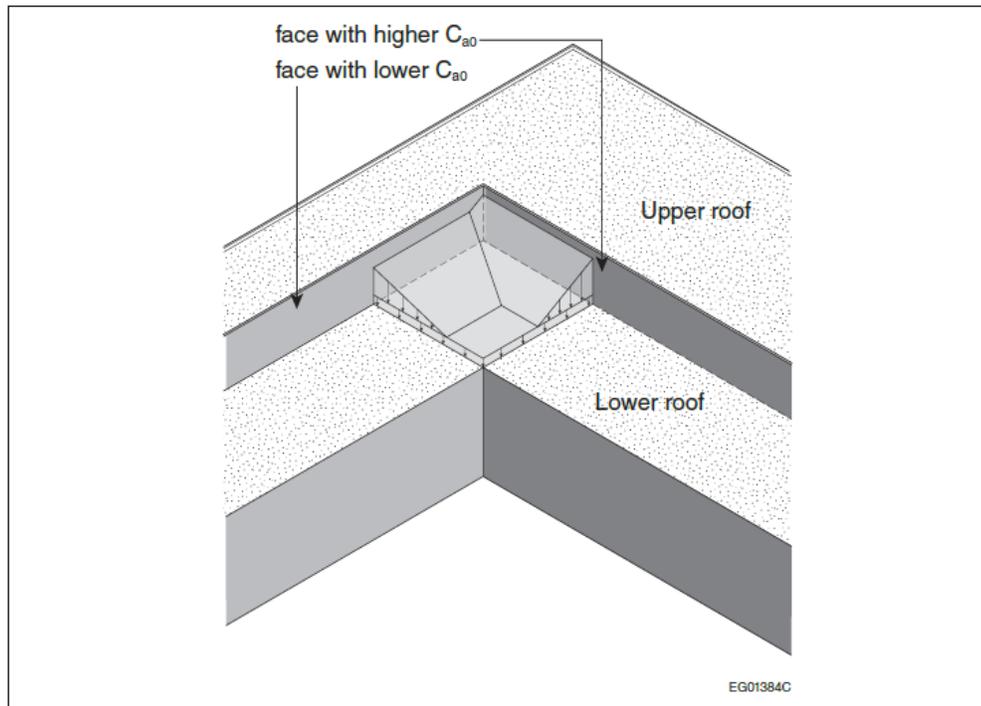


Figure 4.1.6.8.-B
Snow Load at Inside Corner
Forming Part of Sentence 4.1.6.8.(2)



4.1.6.9. Gable Roofs (See Note A-4.1.6.9.)

- (1) For all gable roofs, the full and partial load cases defined in Article 4.1.6.3. shall be considered.
- (2) For gable roofs with a slope of $\alpha > 15^\circ$, the unbalanced load case shall also be considered by setting the values of the accumulation factor, C_a , as follows:
 - (a) on the upwind side of the roof peak, C_a shall be taken as 0, and
 - (b) on the downwind side of the roof peak, C_a shall be taken as,
 - (i) $0.25 + \alpha/20$, where $15^\circ \leq \alpha \leq 20^\circ$, and
 - (ii) 1.25, where $20^\circ < \alpha \leq 90^\circ$.
- (3) For all gable roofs, the slope factor, C_s , shall be as prescribed in Sentences 4.1.6.2.(5) and (6).
- (4) For all gable roofs, the wind exposure factor, C_w , shall be
 - (a) as prescribed in Sentences 4.1.6.2.(3) and (4) for the full and partial load cases, and
 - (b) 1.0 for the unbalanced load case referred to in Sentence (2).

4.1.6.10. Arch Roofs, Curved Roofs and Domes

- (1) For all arch roofs, curved roofs and domes, the full and partial load cases defined in Article 4.1.6.3. shall be considered.
- (2) For arch roofs, curved roofs and domes with rise-to-span ratio $h/b > 0.05$ (See Figure 4.1.6.10.-A), the load cases provided in Sentences (3) to (7) shall also be considered.

- (3) For arch roofs with a slope at the edge $\alpha_e \leq 30^\circ$ (See Figure 4.1.6.10.-A and Table 4.1.6.10.), C_a shall be
 - (a) taken as 0 on the upwind side of the peak, and
 - (b) on the downwind side of the peak, taken as

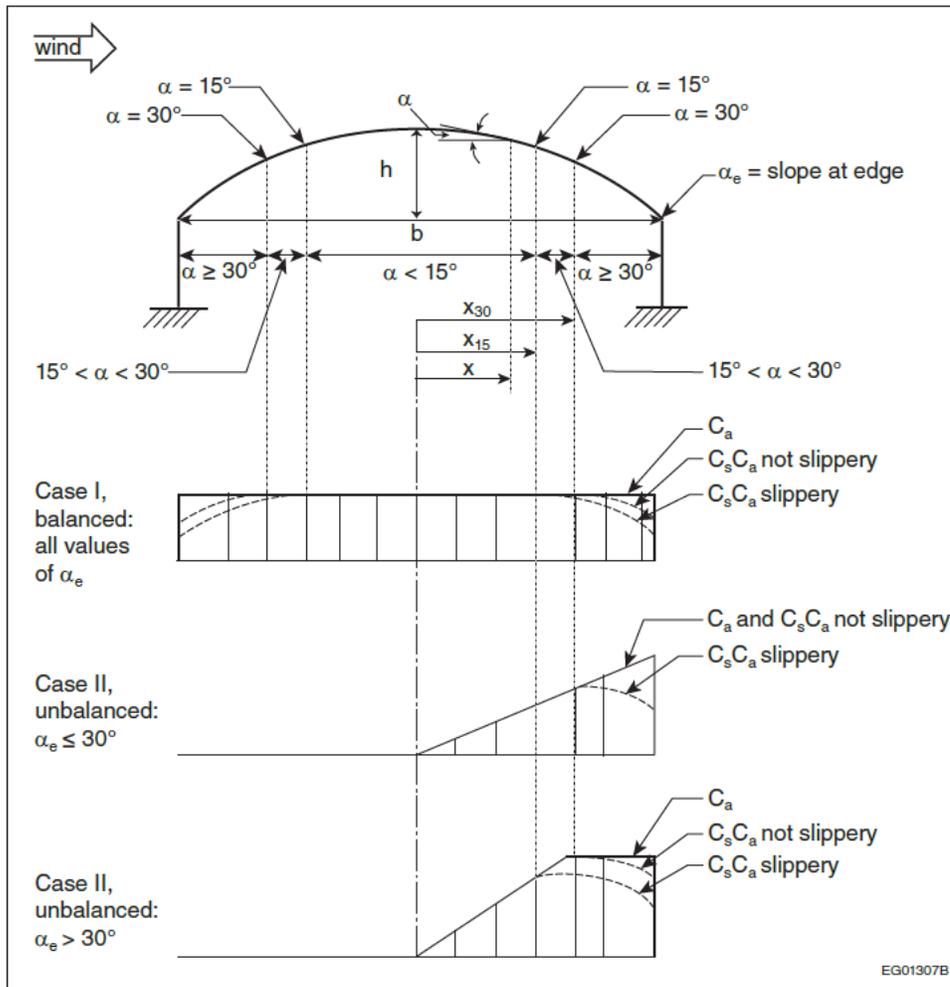
$$C_a = \frac{xh}{0.03C_b b^2} \text{ for } 0.05 < \frac{h}{b} \leq 0.12 \text{ and}$$

$$C_a = \frac{4x}{C_b b} \text{ for } \frac{h}{b} > 0.12$$

where

- x = horizontal distance from the roof peak,
- h = height of arch, and
- b = width of arch.

Figure 4.1.6.10.-A
Accumulation Factors for Arch Roofs and Curved Roofs
 Forming Part of Sentences 4.1.6.10.(2) to (4)



Notes to Figure 4.1.6.10.-A:

- (1) Refer to Table 4.1.6.10. for applicable values of C_w and Sentences 4.1.6.2.(5) and (6) for applicable values of C_s .

Table 4.1.6.10.
Load Cases for Arch Roofs, Curved Roofs and Domes
 Forming Part of Sentences 4.1.6.10.(3), (4) and (9)

Load Case	Range of Application	Factors			
		Arch Roofs, Curved Roofs and Domes	Arch and Curved Roofs		Domes
		C_w	C_a Upwind Side	C_a Downwind Side	C_a Downwind Side
Case I	All values of h/b	As stated in 4.1.6.2.(3) and (4)	1.0	1.0	1.0
Case II	Slope at edge $\leq 30^\circ$ $h/b > 0.05$ all values of x	1.0	0.0	$C_a = \frac{xh}{0.03C_b b^2}$ for $\frac{h}{b} \leq 0.12$ $C_a = \frac{4x}{C_b b}$ for $\frac{h}{b} > 0.12$	$C_a(x, y) = C_a(x, 0) \left(1 - \frac{y}{r}\right)$
	Slope at edge $> 30^\circ$ $h/b > 0.05$ $0 < x < x_{30}$	1.0	0.0	$C_a = \frac{xh}{0.06C_b x_{30} b}$ for $\frac{h}{b} \leq 0.12$ $C_a = \frac{2x}{C_b x_{30}}$ for $\frac{h}{b} > 0.12$	
	Slope at edge $> 30^\circ$ $h/b > 0.05$ $x \geq x_{30}$	1.0	0.0	$C_a = \frac{h}{0.06C_b b}$ for $\frac{h}{b} \leq 0.12$ $C_a = \frac{2}{C_b}$ for $\frac{h}{b} > 0.12$	

- (4) For arch roofs with a slope at the edge $\alpha_e > 30^\circ$ (See Figure 4.1.6.10.-A and Table 4.1.6.10.), C_a shall be
- (a) taken as 0 on the upwind side of the peak, and
 - (b) on the downwind side of the peak,
 - (i) for the part of the roof between the peak and point where the slope $\alpha = 30^\circ$, taken as,

$$C_a = \frac{xh}{0.06C_b x_{30} b} \text{ for } 0.05 < \frac{h}{b} \leq 0.12, \text{ and}$$

$$C_a = \frac{2x}{C_b x_{30}} \text{ for } \frac{h}{b} > 0.12$$

where

x, h, b = as specified in Sentence (2), and
 x_{30} = value of x where the slope $\alpha = 30^\circ$, and

- (ii) for the part of the roof where the slope $\alpha > 30^\circ$, taken as,

$$C_a = \frac{h}{0.06C_b b} \text{ for } 0.05 < \frac{h}{b} \leq 0.12, \text{ and}$$

$$C_a = \frac{2}{C_b} \text{ for } \frac{h}{b} > 0.12$$

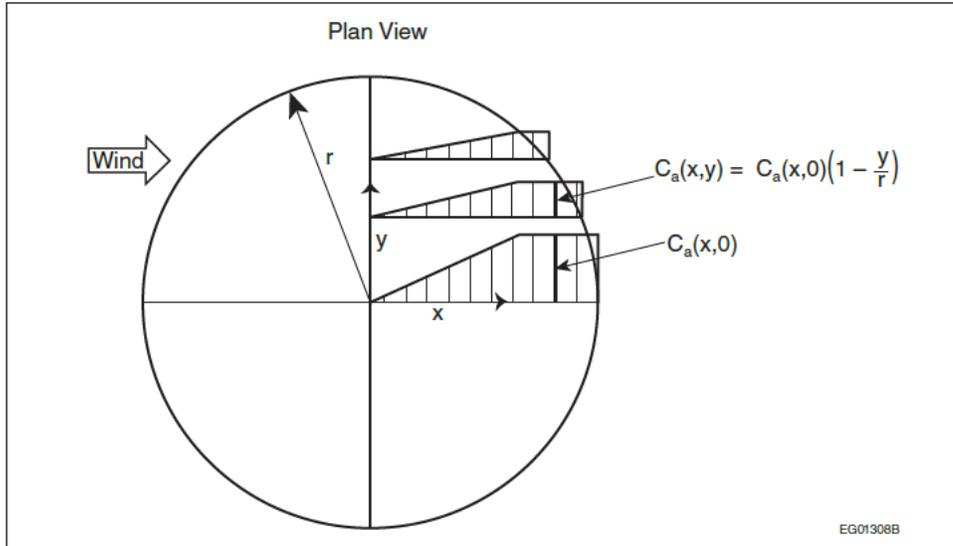
- (5) Except as provided in Sentence (6), C_a for curved roofs shall be determined in accordance with the requirements for arch roofs stated in Sentences (3) and (4).
- (6) Where the slope, α , of a curved roof at its peak is greater than 10° , C_a shall be determined in accordance with the requirements for gable roofs stated in Article 4.1.6.9. using a slope equal to the mean slope of the curved roof.
- (7) For domes of circular plan form (see Figure 4.1.6.10.-B), C_a shall
- along the central axis parallel to the wind, vary in the same way as for an arch roof with the same rise-to-span ratio, h/b , and
 - off this axis, vary according to

$$C_a(x,y) = C_a(x,0) \left(1 - \frac{y}{r}\right)$$

where

- $C_a(x,y)$ = value of C_a at location (x,y) ,
- $C_a(x,0)$ = value of C_a on the central axis parallel to the wind,
- x = distance along the central axis parallel to the wind,
- y = horizontal coordinate normal to the x direction, and
- r = radius of dome.

Figure 4.1.6.10.-B
Unbalanced Snow Accumulation Factor on a Circular Dome
 Forming Part of Sentence 4.1.6.10.(7)



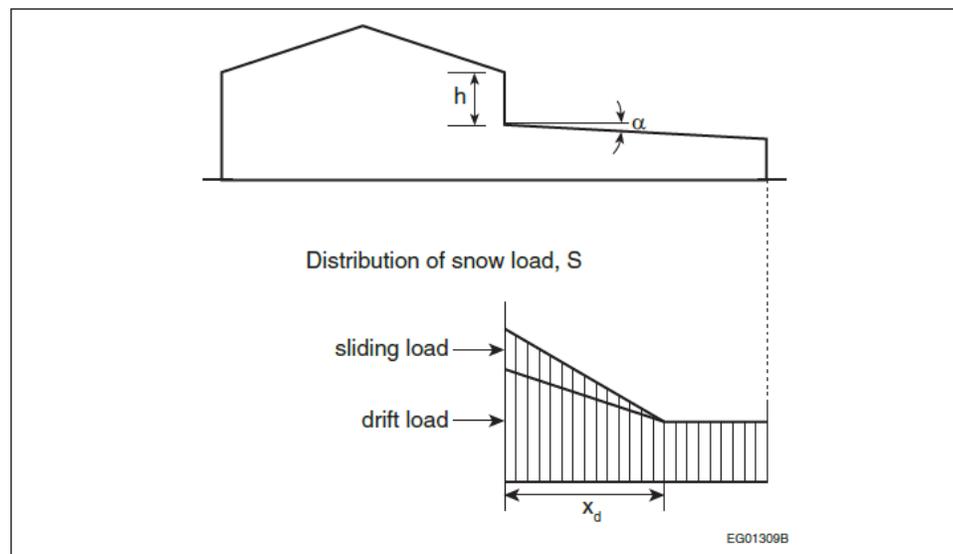
Notes to Figure 4.1.6.10.-B:

- Refer to Table 4.1.6.10. for applicable values of C_w and Sentences 4.1.6.2.(5) and (6) for applicable values of C_s .
 - Refer to Sentences 4.1.6.10.(3) and (4) for the calculation of $C_a(x,0)$.
- (8) For all arch roofs, curved roofs and domes, the slope factor, C_s , shall be as prescribed in Sentences 4.1.6.2.(5) and (6).
- (9) For all arch roofs, curved roofs and domes, the wind exposure factor, C_w , shall be as prescribed in Table 4.1.6.10.

4.1.6.11. Snow Loads Due to Sliding

- (1) Except as provided in Sentence (2), where an upper roof, or part thereof, slopes downwards with a slope $\alpha > 0$ towards a lower roof, the snow load, S , on the lower roof, determined in accordance with Articles 4.1.6.2. and 4.1.6.5., shall be augmented in accordance with Sentence (3) to account for the additional load resulting from sliding snow.
- (2) Sentence (1) need not apply where
- snow from the upper roof is prevented from sliding by a parapet or other effective means, or
 - the upper roof is not considered slippery and has a slope less than 20° .
- (3) The total weight of additional snow resulting from sliding shall be taken as half the total weight of snow resulting from the uniform load case prescribed in Article 4.1.6.2. with
- the accumulation factor $C_a = 1.0$ for the relevant part of the upper roof,
 - the slope factor, C_s , based on the slope of the lower roof, as prescribed in Sentences 4.1.6.2.(5) and (6), and
 - the sliding snow distributed on the lower roof such that it is a maximum for $x = 0$ and decreases linearly to 0 at $x = x_d$, as shown in Figure 4.1.6.11., where x and x_d are as defined in Article 4.1.6.5.

Figure 4.1.6.11.
Snow Distribution on Lower Roof with Sloped Upper Roof
 Forming Part of Sentence 4.1.6.11.(3)



4.1.6.12. Valleys in Curved or Sloped Roofs

- (1) For valleys in curved or sloped roofs with a slope $\alpha > 10^\circ$, in addition to the full and partial load cases defined in Article 4.1.6.3., the non-uniform load Cases II and III presented in Sentences (2) and (3) shall be considered to account for sliding, creeping and movement of meltwater.
- (2) For Case II (See Figure 4.1.6.12.), the accumulation factor, C_a , shall be calculated as follows:

$$C_a = \frac{1}{C_b} \text{ for } 0 < x \leq \frac{b}{4}, \text{ and}$$

$$C_a = \frac{0.5}{C_b} \text{ for } \frac{b}{4} < x \leq \frac{b}{2}$$

where

x = horizontal distance from the bottom of the valley, and

b = twice the horizontal distance between the bottom of the valley and the peak of the roof surface in question.

(3) For Case III (See Figure 4.1.6.12.), C_a shall be calculated as follows:

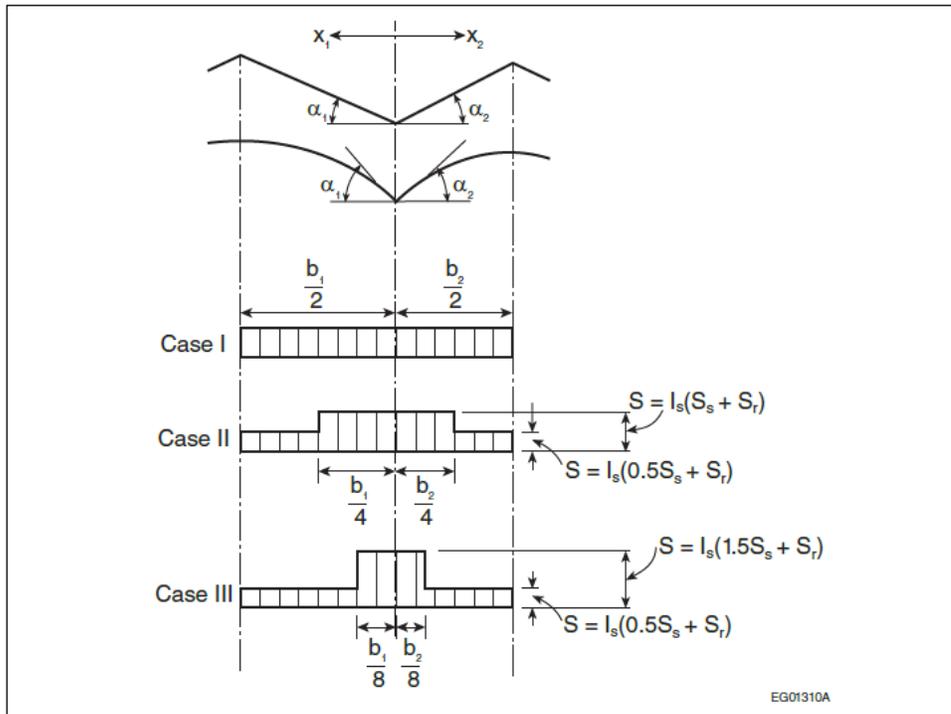
$$C_a = \frac{1.5}{C_b} \text{ for } 0 < x \leq \frac{b}{8}, \text{ and}$$

$$C_a = \frac{0.5}{C_b} \text{ for } \frac{b}{8} < x \leq \frac{b}{2}$$

where

x, b = as specified in Sentence (2).

Figure 4.1.6.12.
Snow Loads in Valleys of Sloped or Curved Roofs
 Forming Part of Sentences 4.1.6.12.(2) and (3)



Notes to Figure 4.1.6.12.:

- (1) $C_w = 1.0$, as per Sentence 4.1.6.2.(3).
- (2) $C_s = 1.0$, as per Sentence 4.1.6.2.(7).

4.1.6.13. Specific Weight of Snow

- (1) For the purposes of calculating snow loads in drifts, the specific weight of snow, γ , shall be taken as 4.0 kN/m^3 or $0.43S_s + 2.2 \text{ kN/m}^3$, whichever is lesser.

4.1.6.14. Snow Removal

- (1) Snow removal by mechanical, thermal, manual or other means shall not be used as a rationale to reduce design snow loads.

4.1.6.15. Ice Loading of Structures

- (1) For lattice structures connected to the *building*, and other *building* components or appurtenances involving small width elements subject to significant ice accretion, the weight of ice accretion and the effective area presented to wind shall be as prescribed in CAN/CSA-S37, “Antennas, towers, and antenna-supporting structures.”

4.1.6.16. Roofs with Solar Panels (See Note A-4.1.6.16.)

- (1) Where solar panels are installed on a roof, the snow loads, S , shall be determined in accordance with Sentences (2) to (6) or with the requirements for roofs without solar panels, whichever produces the most critical effect.
- (2) For the purposes of this Article, solar panels shall be classified as
- (a) Parallel Flush, where the panels are installed parallel to the roof surface with their upper surface less than or equal to $C_b C_w S_s / \gamma$ above the roof surface,
 - (b) Parallel Raised, where the panels are installed parallel to the roof surface with their upper surface greater than $C_b C_w S_s / \gamma$ above the roof surface, or
 - (c) Tilted, where the panels are installed at an angle to the roof surface with their highest edge greater than $C_b C_w S_s / \gamma$ above the roof surface.
- (3) For sloped roofs with solar panels, the snow loads, S , shall be determined in accordance with the requirements for roofs without solar panels, except that the slope factor, C_s , shall be
- (a) taken as 1.0 for roof areas extending upslope from the downslope edge of a panel or array of panels at an angle of 45° from each side edge of the panel or array, and
 - (b) as specified in Sentences 4.1.6.2.(5) to (7) for all other roof areas.
(See Note A-4.1.6.16.(3))
- (4) For sloped roofs with Parallel Flush solar panels, the snow loads, S , shall be determined in accordance with the requirements for roofs without solar panels, except that
- (a) C_s shall be determined in accordance with Sentence (3),
 - (b) where the gap width, w_g , between the panels along the roof slope is greater than or equal to the panel width, w_p , along the roof slope, the accumulation factor, C_a , shall be taken as
 - (i) 0.0 for the panels,
 - (ii) 2.0 for roof areas within a distance of w_p downslope from a downslope panel edge, and
 - (iii) 1.0 for all other roof areas, and (See Note A-4.1.6.16.(4)(b))
 - (c) where the gap width, w_g , between the panels along the roof slope is less than the panel width, w_p , along the roof slope, C_a shall be taken as
 - (i) 0.0 for panel areas within a distance of w_g downslope from an upslope panel edge,
 - (ii) 1.0 for other panel areas,
 - (iii) 2.0 for roof areas in gaps between the panels, and
 - (iv) 1.0 for all other roof areas.
(See Note A-4.1.6.16.(4)(c))

- (5) For roofs with Parallel Raised solar panels, the snow loads, S , shall be determined in accordance with the requirements for roofs without solar panels, except that
- (a) where the roof is flat, C_a shall be taken as
 - (i) 1.0 for the panels,
 - (ii) 1.0 for roof areas not under the panels,
 - (iii) 1.0 for roof areas under the panels within a distance of $\min(2h_g, 2w_g)$ from a panel edge, where h_g is the gap height between the lower surface of the panels and the roof surface, and w_g is the gap width between the panels, and
 - (iv) 0.0 for other roof areas under the panels, and
 (See Note A-4.1.6.16.(5)(a))
 - (b) where the roof is sloped, the snow loads, S , derived from Clause (a) shall be used, except that
 - (i) C_s shall be determined in accordance with Sentence (3),
 - (ii) S shall be taken as 0.0 on the panels, and
 - (iii) S for all roof areas shall be taken as the sum of S on the panels, as derived from Subclause (a)(i) and shifted by a distance of w_p downslope onto the roof, where w_p is the panel width along the roof slope, and S on the roof areas, as derived from Subclauses (a)(ii) to (a)(iv).
 (See Note A-4.1.6.16.(5)(b))

- (6) For flat roofs with Tilted solar panels, the snow loads, S , shall be determined in accordance with the requirements for roofs without solar panels, except that
- (a) C_a shall be taken as 0.0 for the panels,
 - (b) C_a shall be taken as 1.0 for roof areas beyond a distance of $5(h - C_b C_w S_s / \gamma)$ from the lowest edge of the panels, where h is the height of the highest edge of the panels above the roof surface,
 - (c) except as provided in Clauses (d) and (e), for roof areas within a distance of $5(h - C_b C_w S_s / \gamma)$ from the lowest edge of the panels, C_a shall be taken as
 - (i) 1.25 for $(h_g - C_b C_w S_s / \gamma) \leq 0.3$ m, where h_g is the gap height between the lowest edge of the panels and the roof surface,
 - (ii) $1.294 - 0.1471(h_g - C_b C_w S_s / \gamma)$ for $0.3 < (h_g - C_b C_w S_s / \gamma) \leq 2.0$ m, and
 - (iii) 1.0 for $(h_g - C_b C_w S_s / \gamma) > 2.0$ m,
 (See Note A-4.1.6.16.(6)(c))
 - (d) except as provided in Clause (e), C_a shall be taken as 2.0 for roof areas within a distance of w_{ph} beyond the lowest edge of the panels, where w_{ph} is the horizontal projection of the panel width, w_p , along the sloped panel edges, and
 - (e) where the panels, panel supports or back plates obstruct snow from sliding under the panels, the load of the increased volume of snow in the gaps between the panels shall be considered to be uniformly distributed.
- (See Note A-4.1.6.16.(6))

4.1.7. Wind Load

4.1.7.1. Specified Wind Load

- (1) The specified wind loads for a *building* and its components shall be determined using the Static, Dynamic or Wind Tunnel Procedure as stated in Sentences (2) to (5).
- (2) For the design of *buildings* that are not dynamically sensitive, as defined in Sentence 4.1.7.2.(1), one of the following procedures shall be used to determine the specified wind loads:
- (a) the Static Procedure described in Article 4.1.7.3.,
 - (b) the Dynamic Procedure described in Article 4.1.7.8., or
 - (c) the Wind Tunnel Procedure described in Article 4.1.7.14.
- (3) For the design of *buildings* that are dynamically sensitive, as defined in Sentence 4.1.7.2.(2), one of the following procedures shall be used to determine the specified wind loads:
- (a) the Dynamic Procedure described in Article 4.1.7.8., or
 - (b) the Wind Tunnel Procedure described in Article 4.1.7.14.

- (4) For the design of *buildings* that may be subject to wake buffeting or channelling effects from nearby *buildings*, or that are very dynamically sensitive, as defined in Sentence 4.1.7.2.(3), the Wind Tunnel Procedure described in Article 4.1.7.14., shall be used to determine the specified wind loads.
- (5) For the design of cladding and secondary structural members, one of the following procedures shall be used to determine the specified wind loads:
- the Static Procedure described in Article 4.1.7.3., or
 - the Wind Tunnel Procedure described in Article 4.1.7.14.
- (6) Computational fluid dynamics shall not be used to determine the specified wind loads for a *building* and its components. (See Note A-4.1.7.1.(6))

4.1.7.2. Classification of Buildings (See Note A-4.1.7.2.)

- (1) Except as provided in Sentences (2) and (3), a *building* is permitted to be classified as not dynamically sensitive.
- (2) A *building* shall be classified as dynamically sensitive if
- its lowest natural frequency is less than 1 Hz and greater than 0.25 Hz,
 - its height is greater than 60 m, or
 - its height is greater than 4 times its minimum effective width considering all wind directions, where the effective width, w , of a *building* shall be taken as,

$$w = \frac{\sum h_i w_i}{\sum h_i}$$

where the summations are over the height of the *building* for a given wind direction, h_i is the height above *grade* to level i , and w_i is the width normal to the wind direction at height h_i ; the minimum effective width is the lowest value of the effective width considering all wind directions.

- (3) A *building* shall be classified as very dynamically sensitive if
- its lowest natural frequency is less than or equal to 0.25 Hz, or
 - it contains a human occupancy, and its height is more than 6 times its minimum effective width as defined in Clause (2)(c).

4.1.7.3. Static Procedure

- (1) The specified external pressure or suction due to wind on part or all of a surface of a *building* shall be calculated as follows:

$$p = I_w q C_e C_t C_g C_p$$

where

- p = specified external pressure acting statically and in a direction normal to the surface, considered positive when the pressure acts towards the surface and negative when it acts away from the surface,
- I_w = importance factor for wind load, as provided in Table 4.1.7.3.,
- q = reference velocity pressure, as provided in Sentence (4),
- C_e = exposure factor, as provided in Sentences (5) and (7),
- C_t = topographic factor, as provided in Article 4.1.7.4.,
- C_g = gust effect factor, as provided in Sentence (8), and
- C_p = external pressure coefficient, as provided in Articles 4.1.7.5. and 4.1.7.6.

Table 4.1.7.3.
Importance Factor for Wind Load, I_w
 Forming Part of Sentence 4.1.7.3.(1) and 4.1.7.8.(4)

Importance Category	Importance Factor, I_w	
	ULS	SLS
Low	0.8	0.75
Normal	1.0	0.75
High	1.15	0.75
Post-disaster	1.25	0.75

(2) The net wind load for the *building* as a whole shall be the algebraic difference of the loads on the windward and leeward surfaces, and in some cases, may be calculated as the sum of the products of the external pressures or suctions and the areas of the surfaces over which they are averaged as provided in Sentence (1).

(3) The net specified pressure due to wind on part or all of a surface of a *building* shall be the algebraic difference, such as to produce the most critical effect, of the external pressure or suction calculated in accordance with Sentence (1) and the specified internal pressure or suction due to wind calculated as follows:

$$p_i = I_w q C_{ei} C_t C_{gi} C_{pi}$$

where

p_i = specified internal pressure acting statically and in a direction normal to the surface, either as a pressure directed toward the surface or as a suction directed away from the surface,

I_w, q, C_t = as defined in Sentence (1),

C_{ei} = exposure factor for internal pressure, as provided in Sentence (7),

C_{gi} = internal gust effect factor, as provided in Sentence (10), and

C_{pi} = internal pressure coefficient, as provided in Article 4.1.7.7.

- (4) The reference velocity pressure, q , shall be the appropriate value determined in conformance with Subsection 1.1.3. based on a probability of being exceeded in any one year of 1 in 50.
- (5) The exposure factor C_e , shall be based on the reference height, h , determined in accordance with Sentence (6) for the surface or part of the surface under consideration and shall be
- $(h/10)^{0.2}$ but not less than 0.9 for open terrain, where open terrain is level terrain with only scattered *buildings*, trees or other obstructions, open water or shorelines thereof,
 - $0.7(h/12)^{0.3}$ but not less than 0.7 for rough terrain, where rough terrain is suburban, urban or wooded terrain extending upwind from the *building* uninterrupted for at least 1 km or 20 times the height of the *building*, whichever is greater, or
 - an intermediate value between the two exposures defined in Clauses (a) and (b) in cases where the site is less than 1 km or 20 times the height of the *building* from a change in terrain conditions, whichever is greater, provided an appropriate interpolation method is used. (See Note A-4.1.7.3.(5)(c))
- (6) The reference height, h , shall be determined as follows:
- for *buildings* with height less than or equal to 20 m and less than the smaller plan dimension, h shall be the mid-height of the roof above *grade*, but shall not be less than 6 m,
 - for other *buildings*, h shall be,
 - the actual height above *grade* of the point on the windward wall for which external pressures are being calculated,
 - the mid-height of the roof for pressures on surfaces parallel to the wind direction, and
 - the mid-height of the *building* for pressures on the leeward wall, and
 - for any structural element exposed to wind, h shall be the mid-height of the element above the ground.

- (7) The exposure factor for internal pressure, C_{ei} , shall be determined as follows:
- (a) for *buildings* whose height is greater than 20 m and that have a dominant opening, C_{ei} shall be equal to the exposure factor for external pressures, C_e , calculated at the mid-height of the dominant opening, and
 - (b) for other *buildings*, C_{ei} shall be the same as the exposure factor for external pressures, C_e , calculated for a reference height, h , equal to the mid-height of the *building* or 6 m, whichever is greater.
- (8) Except as provided in Sentences (9) and 4.1.7.6.(1), the gust effect factor, C_g , shall be one of the following values:
- (a) 2.0 for the *building* as a whole and main structural members, or
 - (b) 2.5 for external pressures and suctions on secondary structural members including cladding.
- (9) For cases where C_g and C_p are combined into a single product, $C_g C_p$, the values of C_g and C_p need not be independently specified. (See Article 4.1.7.6.)
- (10) The internal gust effect factor, C_{gi} , shall be 2.0, except it is permitted to be calculated using the following equation for large structures enclosing a single large unpartitioned volume that does not have numerous overhead doors or openings:

$$C_{gi} = 1 + \frac{1}{\sqrt{1 + \frac{V_0}{6950A}}}$$

where

V_0 = internal volume in m^3 , and

A = total area of all exterior openings of the volume in m^2 .

(See Note A-4.1.7.3.(10))

4.1.7.4. Topographic Factor

- (1) Except as provided in Sentence (2), the topographic factor, C_t , shall be taken as 1.0.
- (2) For *buildings* on hills or escarpments with slope, $H_h/(2L_h)$, greater than 0.1 (See Figure 4.1.7.4.), the topographic factor, C_t , shall be calculated as follows:

$$C_t = \left(1 + \frac{\Delta S}{C_g}\right) (1 + \Delta S)$$

where

$$\Delta S = \Delta S_{\max} \left(1 - \frac{|x|}{kL_h}\right) \exp(-\alpha z/L_h)$$

where

ΔS_{\max} = applicable value from Table 4.1.7.4.,

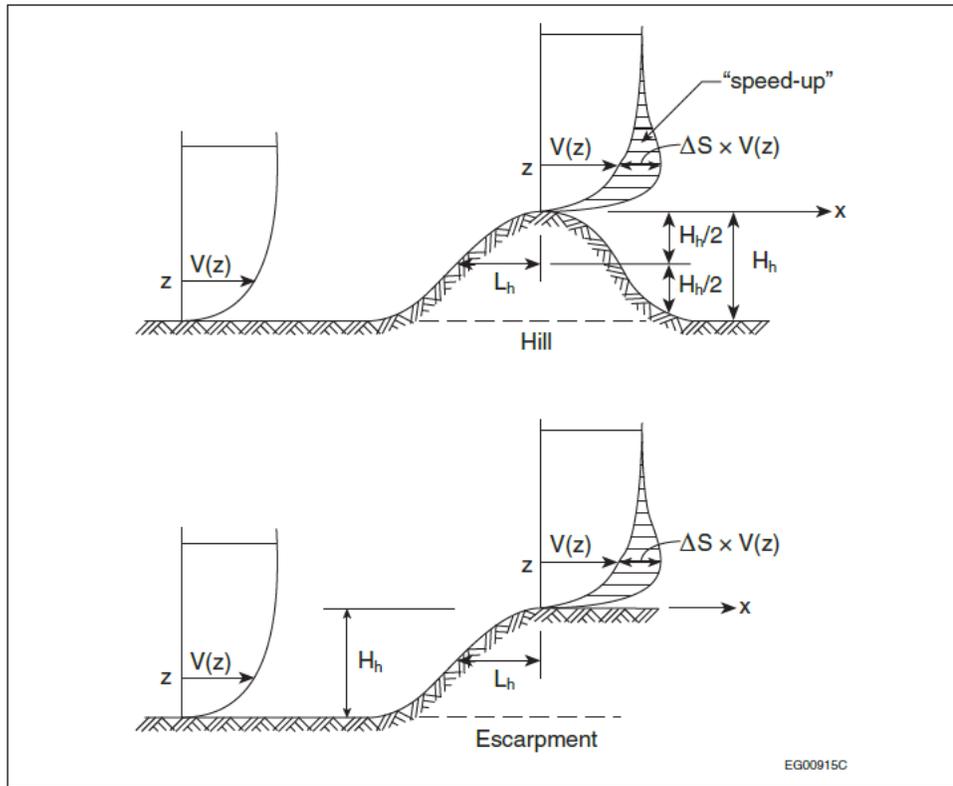
x = horizontal distance from the peak of the hill or escarpment,

L_h = horizontal distance upwind from the peak to the point where the ground surface lies at half the height of the hill or escarpment, or $2H_h$ (where H_h is the height of the hill or escarpment), whichever is greater,

Z = height above ground, and

k and α = applicable constants from Table 4.1.7.4. based on shape of hill or escarpment.

Figure 4.1.7.4.
Speed-up of Mean Velocity on a Hill or Escarpment
Forming Part of Sentence 4.1.7.4.(2)



Notes to Figure 4.1.7.4.:

- (1) $V(z)$ = wind speed.

Table 4.1.7.4.
Parameters for Maximum Speed-up Over Hills and Escarpments
Forming Part of Sentence 4.1.7.4.(2)

Shape of Hill or Escarpment	$\Delta S_{max}^{(1)}$	α	k, where $x < 0$	k, where $x \geq 0$
2-dimensional hill	$2.2 H_h/L_h$	3	1.5	1.5
2-dimensional escarpment	$1.3 H_h/L_h$	2.5	1.5	4
3-dimensional axi-symmetrical hill	$1.6 H_h/L_h$	4	1.5	1.5

Notes to Table 4.1.7.4.:

- (1) For $H_h/L_h > 0.5$, assume $H_h/L_h = 0.5$ and substitute $2H_h$ for L_h in the equation for ΔS .

4.1.7.5. External Pressure Coefficients

- (1) Applicable values of external pressure coefficients, C_p , are provided in
 - (a) Sentences (2) to (9), and
 - (b) Article 4.1.7.6. for certain shapes of low buildings.

(2) For the design of the main structural system, the value of C_p shall be established as follows, where H is the height of the *building* and D is the width of the *building* parallel to the wind direction:

- (a) on the windward face,
 $C_p = 0.6$ for $H/D < 0.25$
 $= 0.27(H/D + 2)$ for $0.25 \leq H/D < 1.0$
 $= 0.8$ for $H/D \geq 1.0$,
- (b) on the leeward face,
 $C_p = -0.3$ for $H/D < 0.25$
 $= -0.27(H/D + 0.88)$ for $0.25 \leq H/D < 1.0$, and
 $= -0.5$ for $H/D \geq 1.0$, and
- (c) on the walls parallel to the wind, $C_p = -0.7$.

(See Note A-4.1.7.5.(2) and (3))

(3) For the design of roofs, the value of C_p shall be established as follows, where x is the distance from the upwind edge of the roof:

- (a) for $H/D \geq 1.0$, $C_p = -1.0$, and
- (b) for $H/D < 1.0$,
 $C_p = -1.0$ for $x \leq H$
 $= -0.5$ for $x > H$

(See Note A-4.1.7.5.(2) and (3))

(4) For the design of the cladding and of secondary structural elements supporting the cladding, the value of C_p shall be established as follows, where W and D are the widths of the *building*:

- (a) on walls, C_p shall be taken as ± 0.9 , except that within a distance equal to the larger of $0.1D$ and $0.1W$ from a building corner, the negative value of C_p shall be taken as -1.2 ,
- (b) on walls where vertical ribs deeper than 1 m are placed on the facade, C_p shall be taken as ± 0.9 , except that, within a distance equal to the larger of $0.2D$ and $0.2W$ from a building corner, the negative value of C_p shall be taken as -1.4 , and
- (c) on roofs, C_p shall be taken as -1.0 , except that
- within a distance equal to the larger of $0.1D$ and $0.1W$ from a roof edge, C_p shall be taken as -1.5 ,
 - in a zone that is within a distance equal to the larger of $0.2D$ and $0.2W$ from a roof corner, C_p shall be taken as -2.3 but is permitted to be taken as -2.0 for roofs with perimeter parapets that are higher than 1 m, and
 - on lower levels of flat stepped roofs, positive pressure coefficients established for the walls of the steps apply for a distance b . (See Figure 4.1.7.6.-D for the definition of b)

(See Note A-4.1.7.5.(4))

(5) Except as provided in Sentence (6), for the design of balcony *guards*, the internal pressure coefficient, C_{pi} , shall be taken as zero and the value of C_p shall be taken as ± 0.9 , except that, within a distance equal to the larger of $0.1D$ and $0.1W$ from a *building* corner, C_p shall be taken as ± 1.2 .

(6) Where the top of the balcony *guard* is 2.0 m or less below the roof surface, the values of C_p shall be taken as equal to those determined for parapets in Sentences (7) and (8).

(7) To determine the contribution from parapets to the wind loads on the main structural system, the values of C_p shall be taken as

- (a) on the outer faces, equal to those on the walls below,
- (b) on the inner face of the windward parapet, equal to that on the upwind edge of a roof surface at the level of the top of the parapet, and
- (c) on the inner faces of the other parapets, zero.

(8) For the structural design of parapets themselves, the values of C_p shall be taken as equal to those specified in Sentence (7), except that the value of C_p on the inner face of the leeward parapet shall be taken as equal to that on the outer face of the windward parapet.

(9) For the design of cladding on parapets, the values of C_p shall be taken as

- (a) on the outer vertical surfaces, equal to those on the cladding on the walls below, and
- (b) on the inner and top surfaces, equal to those on the cladding of a roof surface at the level of the top of the parapet.

4.1.7.6. External Pressure Coefficients for Low Buildings

(1) For the design of *buildings* with a height, H, that is less than or equal to 20 m and less than the smaller plan dimension, the values of the product of the pressure coefficient and gust factor, $C_g C_p$, provided in Sentences (2) to (9) are permitted to be used.

(2) For the design of the main structural system of the *building*, which is affected by wind pressures on more than one surface as shown in Figure 4.1.7.6.-A, the values of $C_g C_p$ are provided in Table 4.1.7.6.

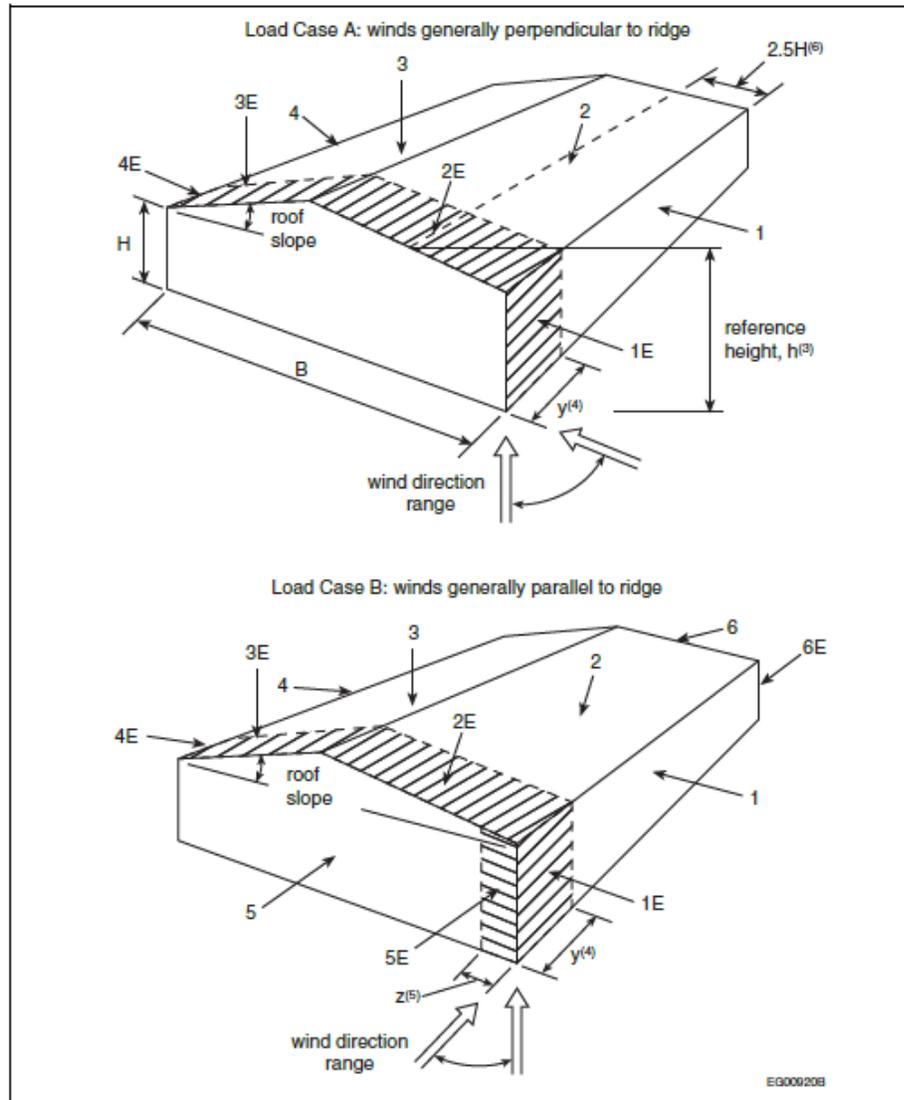
Table 4.1.7.6.
External Peak Values of $C_g C_p$ in Figure 4.1.7.6.-A
Forming Part of Sentence 4.1.7.6.(2)

Load Case	Roof Slope	External Peak Values of $C_g C_p$ ⁽¹⁾⁽²⁾											
		Building Surfaces											
		1	1E	2	2E	3	3E	4	4E	5	5E	6	6E
A	0° to 5°	0.75	1.15	-1.3	-2.0	-0.7	-1.0	-0.55	-0.8	-	-	-	-
	20°	1.0	1.5	-1.3	-2.0	-0.9	-1.3	-0.8	-1.2	-	-	-	-
	30° to 45°	1.05	1.3	0.4	0.5	-0.8	-1.0	-0.7	-0.9	-	-	-	-
	90°	1.05	1.3	1.05	1.3	-0.7	-0.9	-0.7	-0.9	-	-	-	-
B	0° to 90°	-0.85	-0.9	-1.3	-2.0	-0.7	-1.0	-0.85	-0.9	0.75	1.15	-0.55	-0.8

Notes to Table 4.1.7.6.:

- (1) For values of roof slope not shown, the coefficient $C_g C_p$ can be interpolated linearly.
- (2) Positive coefficients denote forces toward the surface, whereas negative coefficients denote forces away from the surface.
- (3) For the design of individual walls and wall cladding, the values of $C_g C_p$ are provided in Figure 4.1.7.6.-B.
- (4) For the design of roofs with a slope less than or equal to 7°, the values of $C_g C_p$ are provided in Figure 4.1.7.6.-C.
- (5) For the design of flat roofs with steps in elevation, the values of $C_g C_p$ are provided in Figure 4.1.7.6.-D.
- (6) For the design of gabled or hipped, single-ridge roofs with a slope greater than 7°, the values of $C_g C_p$ are provided in Figure 4.1.7.6.-E.
- (7) For the design of gabled, multi-ridge roofs, the values of $C_g C_p$ are provided in
 - (a) Figure 4.1.7.6.-C for roofs with a slope less than or equal to 10°, and
 - (b) Figure 4.1.7.6.-F for roofs with a slope greater than 10°.
- (8) For monosloped roofs, the values of $C_g C_p$ are provided in
 - (a) Figure 4.1.7.6.-C for roofs with a slope less than or equal to 3°, and
 - (b) Figure 4.1.7.6.-G for roofs with a slope greater than 3° and less than or equal to 30°.
- (9) For sawtooth roofs, the values of $C_g C_p$ are provided in
 - (a) Figure 4.1.7.6.-C for roofs with a slope less than or equal to 10°, and
 - (b) Figure 4.1.7.6.-H for roofs with a slope greater than 10°.
- (10) The wind loads on balcony *guards* on low *buildings* shall be as specified in Sentences 4.1.7.5.(5) and (6).
- (11) The wind loads on parapets on low *buildings* shall be as specified in Sentences 4.1.7.5.(7) to (9).

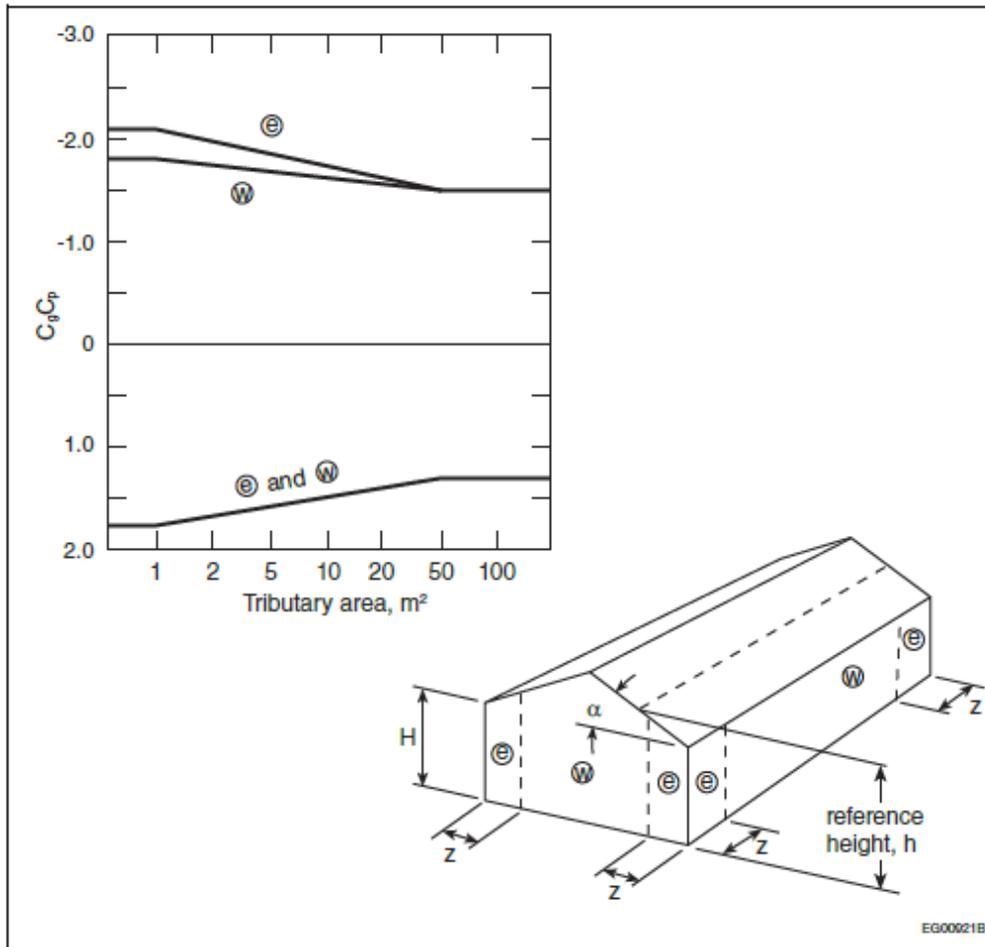
Figure 4.1.7.6.-A
Primary Structural Actions Arising from Wind Load Acting Simultaneously on All Surfaces of Low Buildings ($H \leq 20$ m)
 Forming Part of Sentence 4.1.7.6.(2) and Table 4.1.7.6.



Notes to Figure 4.1.7.6.-A:

- (1) The *building* must be designed for all wind directions. Each corner must be considered in turn as the windward corner shown in the sketches. For all roof slopes, Load Case A and Load Case B are required as two separate loading conditions to generate the wind actions, including torsion, to be resisted by the structural system.
- (2) For the design of *foundations*, exclusive of anchorages to the frame, only 70% of the effective load is to be considered.
- (3) The reference height, h , for pressures is the mid-height of the roof or 6 m, whichever is greater. The eave height, H , may be substituted for the mid-height of the roof if the roof slope is less than 7° .
- (4) End-zone width y should be the greater of 6 m or $2z$, where z is the width of the gable-wall end zone defined for Load Case B below. Alternatively, for buildings with frames, the end-zone width y may be the distance between the end and the first interior frame.
- (5) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (6) For $B/H > 5$ in Load Case A, the negative coefficients listed for surfaces 2 and $2E$ in Table 4.1.7.6. should only be applied on an area whose width is $2.5H$ measured from the windward eave. The pressures on the remainder of the windward roof should be reduced to the pressures for the leeward roof.

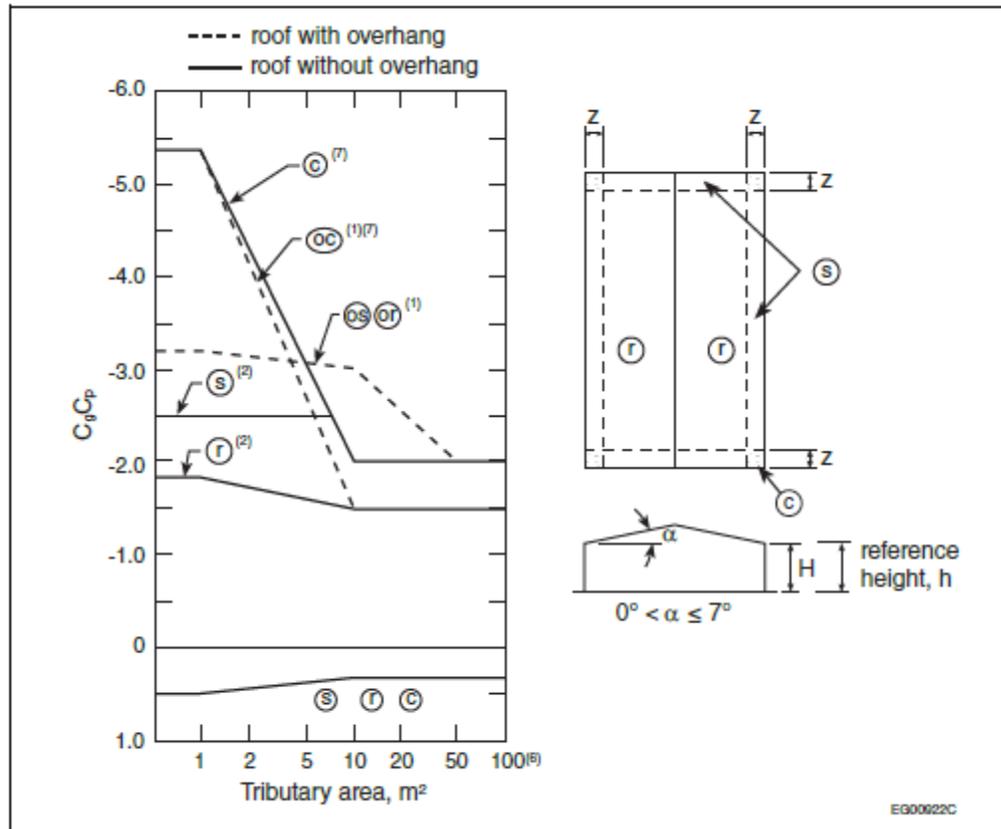
Figure 4.1.7.6.-B
External Peak Values of $C_p C_g$ on Individual Walls for the Design of Cladding and Secondary Structural Members
Forming Part of Sentence 4.1.7.6.(3)



Notes to Figure 4.1.7.6.-B:

- (1) These coefficients apply for any roof slope, α .
- (2) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (3) Combinations of external and internal pressures must be evaluated to obtain the most severe loading.
- (4) Positive coefficients denote forces toward the surface, whereas negative coefficients denote forces away from the surface. Each structural element must be designed to withstand forces of both signs.
- (5) Pressure coefficients generally apply for facades with architectural features; however, where vertical ribs deeper than 1 m are placed on a facade, a local $C_p C_g$ of -2.8 applies to zone e.

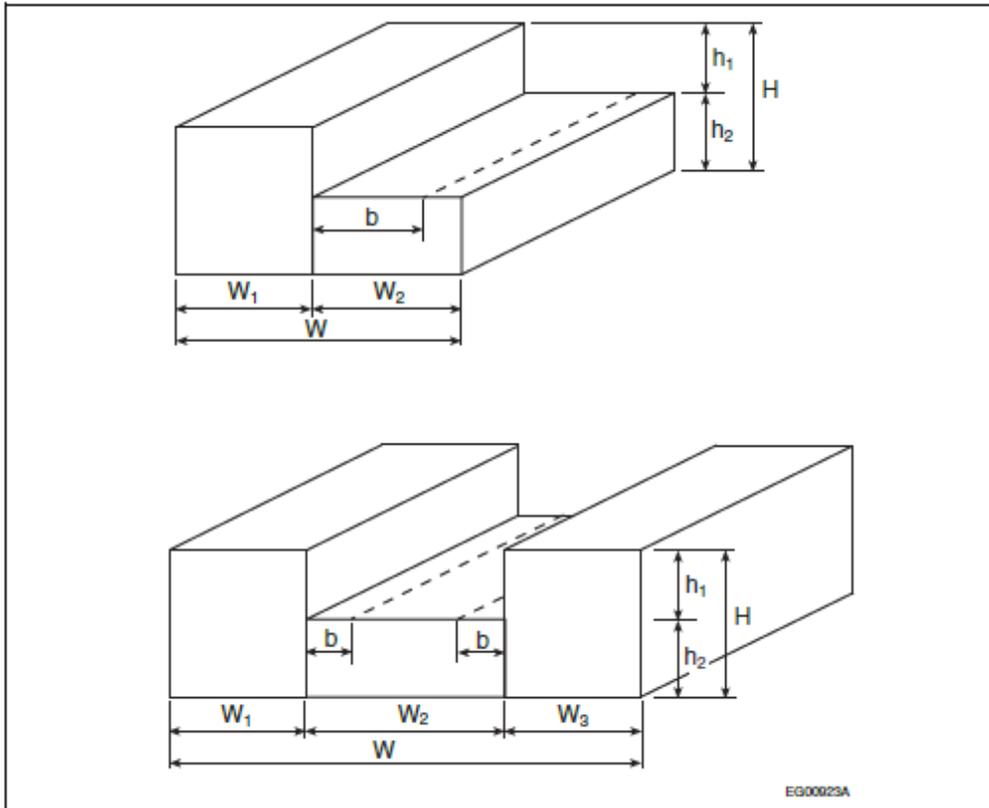
Figure 4.1.7.6.-C
 External Peak Values of $C_p C_g$ on Roofs with a Slope of 7° or Less for the Design of Structural Components and Cladding
 Forming Part of Sentences 4.1.7.6.(4), (7), (8), and (9)



Notes to Figure 4.1.7.6.-C:

- (1) Coefficients for overhanging roofs have the prefix “o” and refer to the same roof areas as referred to by the corresponding symbol without a prefix. They include contributions from both upper and lower surfaces. In the case of overhangs, the walls are inboard of the roof outline.
- (2) s and r apply to both roofs and upper surfaces of canopies.
- (3) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H, but not less than 4% of the least horizontal dimension or 1 m.
- (4) Combinations of external and internal pressures must be evaluated to obtain the most severe loading.
- (5) Positive coefficients denote forces toward the surface, whereas negative coefficients denote forces away from the surface. Each structural element must be designed to withstand forces of both signs.
- (6) For calculating the uplift forces on tributary areas larger than 100 m² on unobstructed nearly-flat roofs with low parapets, and where the centre of the tributary area is at least twice the height of the *building* from the nearest edge, the value of $C_p C_g$ may be reduced from -1.5 to -1.1 at $x/H = 2$ and further reduced linearly to -0.6 at $x/H = 5$, where x is the distance to the nearest edge and H is the height of the *building*.
- (7) For roofs having a perimeter parapet with a height of 1 m or greater, the corner coefficients $C_p C_g$ for tributary areas less than 1 m² can be reduced from -5.4 to -4.4 .

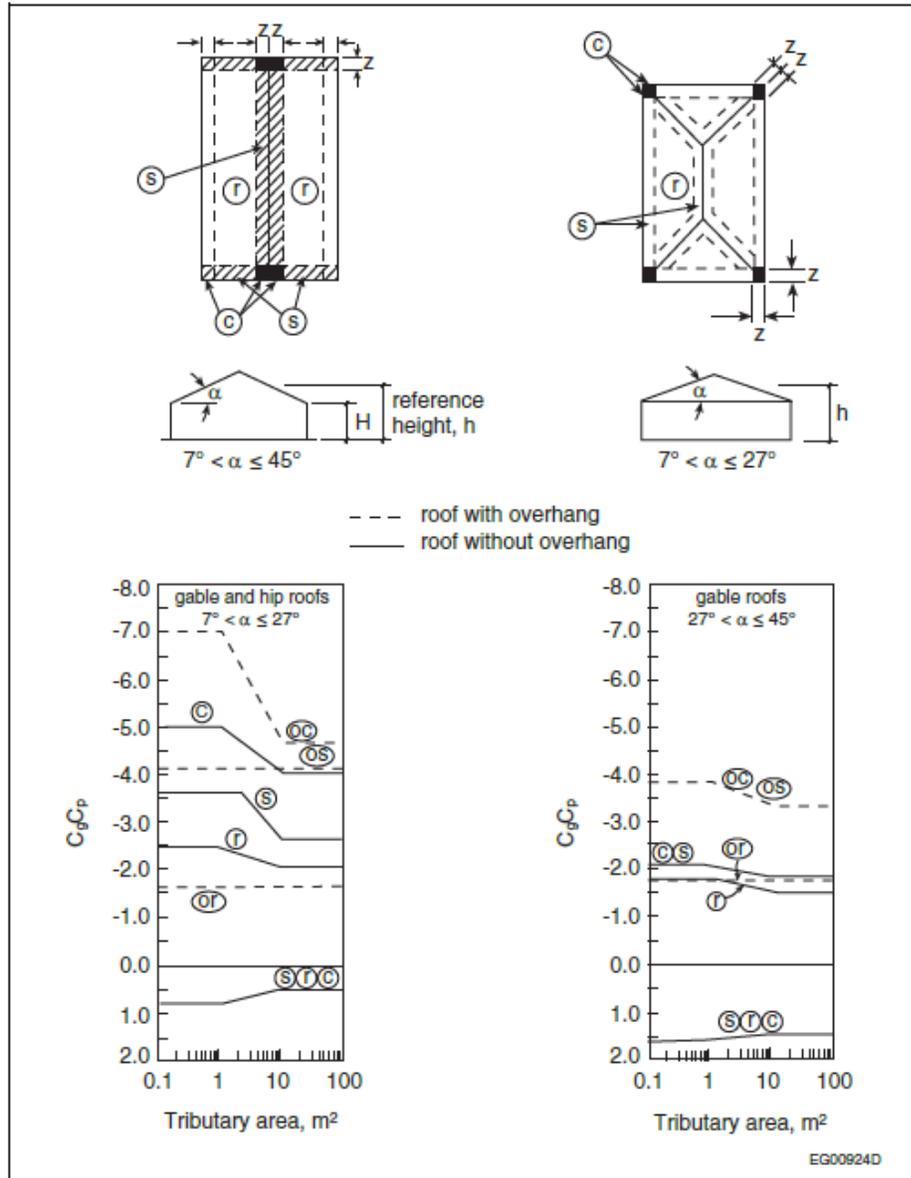
Figure 4.1.7.6.-D
 External Peak Values of $C_p C_g$ for the Design of the Structural Components and Cladding of Buildings with Stepped Roofs
 Forming Part of Sentence 4.1.7.6.(5)



Notes to Figure 4.1.7.6.-D:

- (1) The zone designations, pressure-gust coefficients and notes provided in Figure 4.1.7.6.-C apply on both the upper and lower levels of flat stepped roofs, except that on the lower levels, positive pressure-gust coefficients equal to those in Figure 4.1.7.6.-B for walls apply for a distance, b , where b is equal to $1.5h_1$ but not greater than 30 m. For all walls in Figure 4.1.7.6.-D, zone designations and pressure coefficients provided for walls in Figure 4.1.7.6.-B apply.
- (2) Note (1) above applies only when the following conditions are met: $h_1 \geq 0.3H$, $h_1 \geq 3$ m, and W_1 , W_2 or W_3 is greater than $0.25W$ but not greater than $0.75W$.

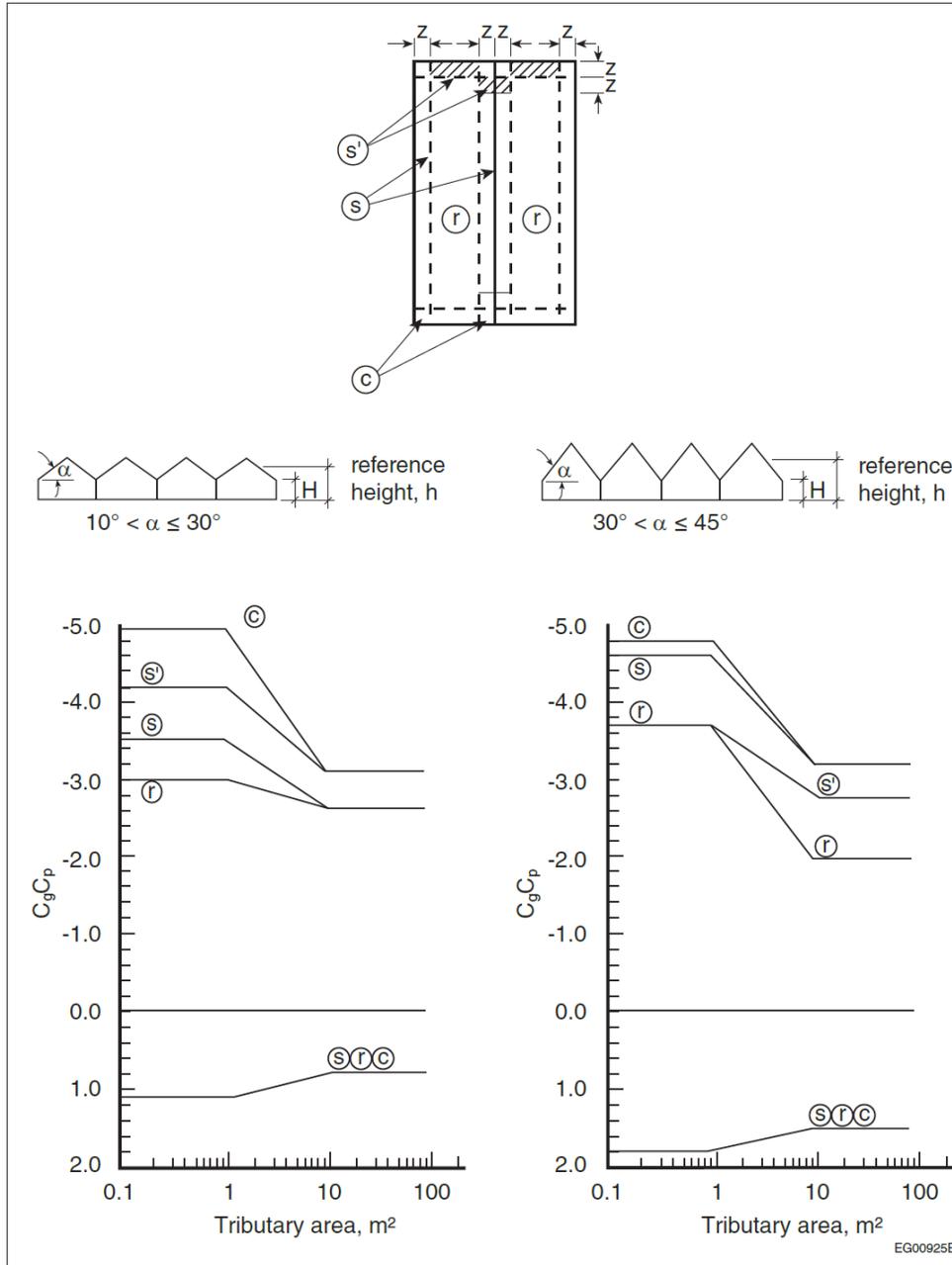
Figure 4.1.7.6.-E
 External Peak Values of $C_p C_g$ on Single-Span Gabled and Hipped Roofs with a Slope Greater than 7° for the Design of Structural Components and Cladding
 Forming Part of Sentence 4.1.7.6.(6)



Notes to Figure 4.1.7.6.-E:

- (1) Coefficients for overhanging roofs have the prefix "o" and refer to the same roof areas as referred to by the corresponding symbol without a prefix. They include contributions from both upper and lower surfaces.
- (2) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (3) Combinations of external and internal pressures must be evaluated to obtain the most severe loading.
- (4) Positive coefficients denote forces towards the surface, whereas negative coefficients denote forces away from the surface. Each structural element must be designed to withstand forces of both signs.
- (5) For hipped roofs with $7^\circ < \alpha \leq 27^\circ$, edge/ridge strips and pressure-gust coefficients for ridges of gabled roofs apply along each hip.

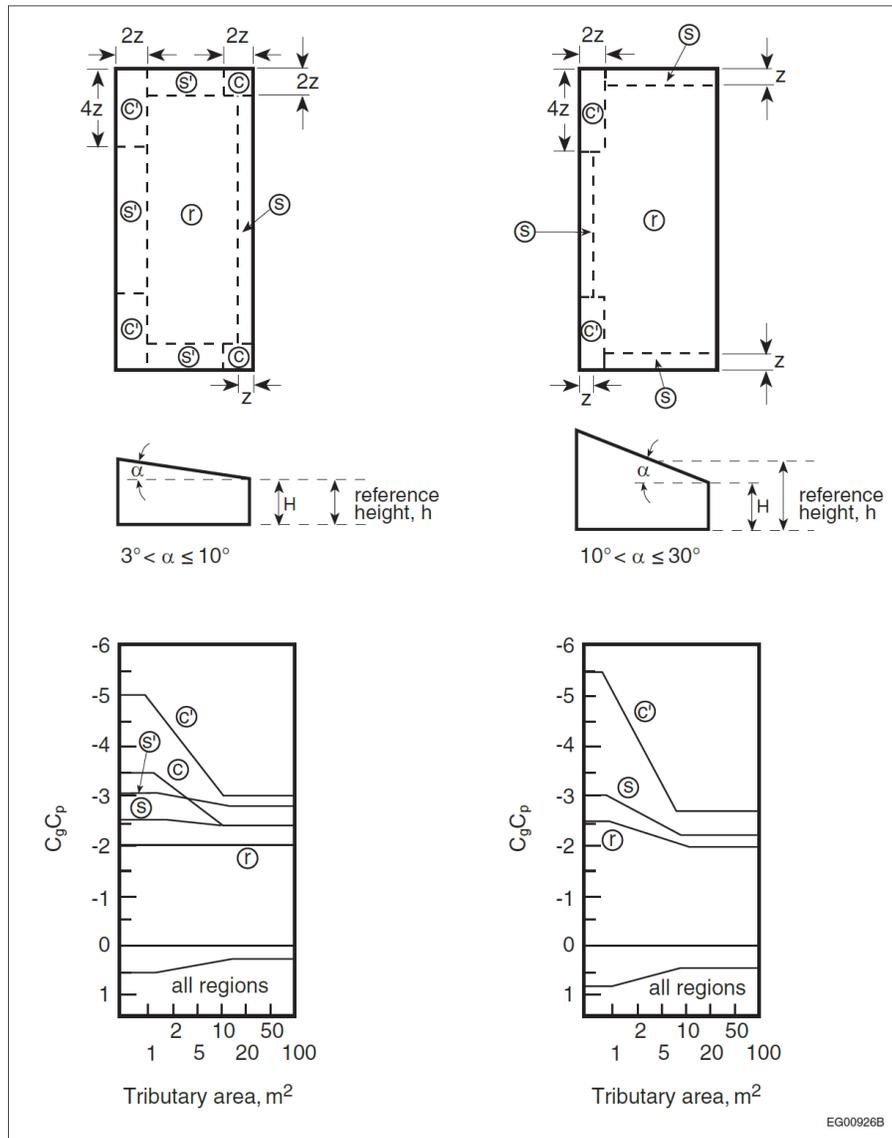
Figure 4.1.7.6.-F
External Peak Values of $C_p C_g$ on Multi-Span Gabled (Folded) Roofs with a Slope Greater than 10° for the Design of Structural Components and Cladding
 Forming Part of Sentence 4.1.7.6.(7)



Notes to Figure 4.1.7.6.-F:

- (1) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (2) Combinations of external and internal pressures must be evaluated to obtain the most severe loading.
- (3) Positive coefficients denote forces towards the surface, whereas negative coefficients denote forces away from the surface. Each structural element must be designed to withstand forces of both signs.
- (4) For $\alpha \leq 10^\circ$, the coefficients given in Figure 4.1.7.6.-C apply, but for cases where $\alpha > 7^\circ$, use $\alpha = 7^\circ$.

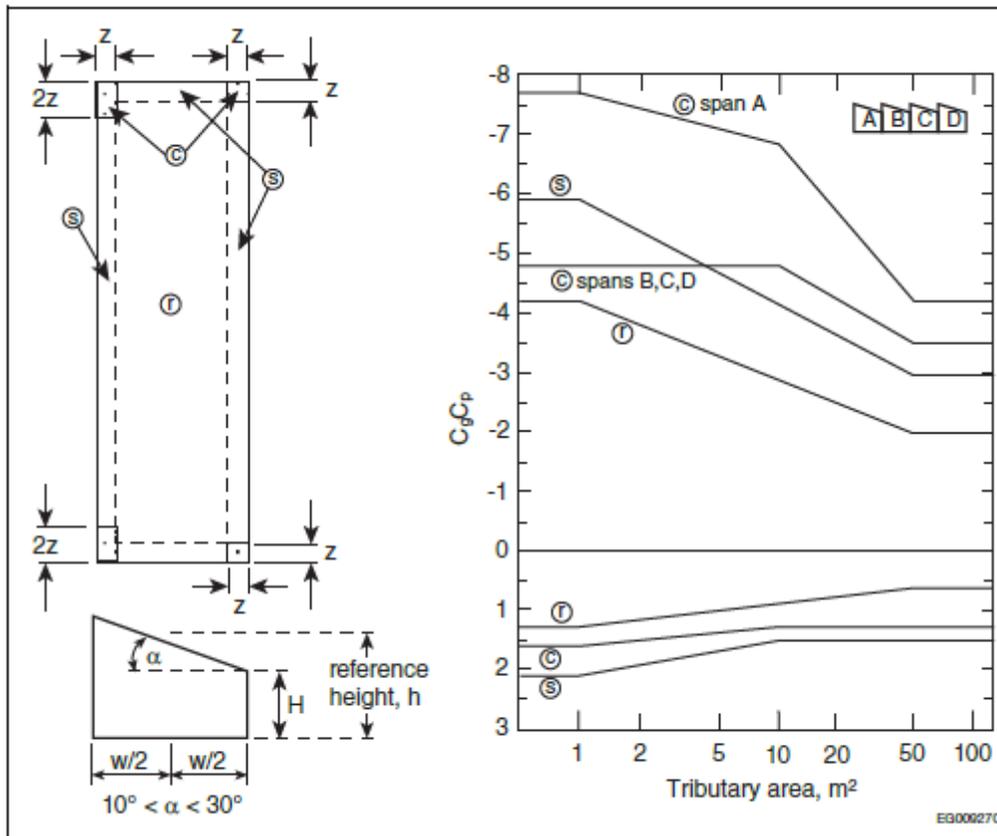
Figure 4.1.7.6-G
External Peak Values of $C_p C_g$ on Monoslope Roofs for the Design of Structural Components and Cladding
 Forming Part of Sentence 4.1.7.6.(8)



Notes to Figure 4.1.7.6.-G:

- (1) End-zone width, z , is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (2) Combinations of external and internal pressures shall be evaluated to obtain the most severe loading.
- (3) Positive coefficients denote forces toward the surface, whereas negative coefficients denote forces away from the surface. Each structural element shall be designed to withstand forces of both signs.
- (4) Where $\alpha \leq 3^\circ$, the coefficients given in Figure 4.1.7.6.-C apply.

Figure 4.1.7.6.-H
 External Peak Values of $C_p C_g$ on Sawtooth Roofs with a Slope Greater than 10° for the
 Design of Structural Components and Cladding
 Forming Part of Sentence 4.1.7.6.(9)



Notes to Figure 4.1.7.6.-H:

- (1) End-zone width z is the lesser of 10% of the least horizontal dimension and 40% of height, H , but not less than 4% of the least horizontal dimension or 1 m.
- (2) Combinations of external and internal pressures must be evaluated to obtain the most severe loading.
- (3) Positive coefficients denote forces towards the surface, whereas negative coefficients denote forces away from the surface. Each structural element must be designed to withstand forces of both signs.
- (4) Negative coefficients on the corner zones of Span A differ from those on Spans B, C and D.
- (5) For $\alpha \leq 10^\circ$, the coefficients given in Figure 4.1.7.6.-C apply, but for cases where $\alpha > 7^\circ$, use $\alpha = 7^\circ$.

4.1.7.7. Internal Pressure Coefficient

- (1) The internal pressure coefficient, C_{pi} , for *buildings* shall be as prescribed in Table 4.1.7.7.
- (2) The internal pressure coefficient, C_{pi} , for cladding on parapets shall be -0.70 to $+0.70$. (See Note A-4.1.7.7.(2))

Table 4.1.7.7.
Internal Pressure Coefficients
 Forming Part of Sentence 4.1.7.7.(1)

Building Openings	Values for C_{pi}
Uniformly distributed small openings amounting to less than 0.1% of the total surface area of the building	-0.15 to 0.0
Non-uniformly distributed openings of which none is significant or significant openings that are wind-resistant and closed during storms	-0.45 to $+0.30$
Large openings likely to remain open during storms	-0.70 to $+0.70$

4.1.7.8. Dynamic Procedure

(1) For the application of the Dynamic Procedure, the provisions of Article 4.1.7.3. shall be followed, except that the exposure factor, C_e , shall be as prescribed in Sentences (2) and (3), and the gust effect factor, C_g , shall be as prescribed in Sentence (4), when determining the wind loads on the main structural system.

(2) For *buildings* in open terrain, as defined in Clause 4.1.7.3.(5)(a), the value of C_e for the design of the main structural system shall be calculated as follows:

$$C_e = \left(\frac{h}{10}\right)^{0.28}, \text{ but } 1.0 \leq C_e \leq 2.5$$

(See Note A-4.1.7.8.(2) and (3))

(3) For *buildings* in rough terrain, as defined in Clause 4.1.7.3.(5)(b), the value of C_e for the design of the main structural system shall be calculated as follows:

$$C_e = 0.5 \left(\frac{h}{12.7}\right)^{0.50}, \text{ but } 0.5 \leq C_e \leq 2.5$$

(See Note A-4.1.7.8.(2) and (3))

(4) For the design of the main structural system, C_g shall be calculated as follows:

$$C_g = 1 + g_p \frac{\sigma}{\mu}$$

where

g_p = peak factor calculated as $\sqrt{2 \ln(vT)} + \frac{0.577}{\sqrt{2 \ln(vT)}}$, and

$$\sigma / \mu = \sqrt{\frac{K}{C_{eH}} \left(B + \frac{sF}{\beta} \right)},$$

where

$$v = \text{average fluctuation rate calculated as } f_{nD} \sqrt{\frac{sF}{sF + \beta B}},$$

$$T = 3\,600 \text{ s,}$$

$$K = 0.08 \text{ for open terrain and } 0.10 \text{ for rough terrain,}$$

$$C_{eH} = \text{exposure factor evaluated at reference height } h = H,$$

$$B = \text{background turbulence factor, a function of } w/H \text{ determined from Figure 4.1.7.8.,}$$

$$s = \text{size reduction factor calculated as } \frac{\pi}{3} \left[\frac{1}{1 + \frac{8f_{nD}H}{3V_H}} \right] \left[\frac{1}{1 + \frac{10f_{nD}W}{V_H}} \right],$$

$$F = \text{gust energy ratio calculated as } \frac{x_0^2}{(1+x_0^2)^{4/3}}, \text{ where } x_0 = (1\,220f_{nD}/V_H), \text{ and}$$

$$\beta = \text{damping ratio, which shall be determined by a rational method or may be taken to be } 0.01 \text{ for steel structures, } 0.02 \text{ for concrete structures and } 0.015 \text{ for composite structures,}$$

where

$$f_{nD} = \text{natural frequency of vibration of the } \textit{building} \text{ in the along-wind direction, in Hz,}$$

$$f_n = \text{lowest natural frequency of the } \textit{building}, \text{ in Hz, as described in Sentences 4.1.7.2.(2) and (3),}$$

$$H = \text{height of the } \textit{building},$$

$$w = \text{effective width of windward face of the } \textit{building} \text{ calculated as } \frac{\sum h_i w_i}{\sum h_i}, \text{ where } w_i = \text{width normal to wind direction at height } h_i, \text{ and}$$

$$V_H = \text{mean wind speed at the top of the structure, in m/s, calculated as } \bar{V} \sqrt{C_{eH}},$$

where,

$$\bar{V} = \text{reference wind speed at a height of } 10 \text{ m, in m/s, calculated as } \sqrt{\frac{2I_w q}{\rho}},$$

where

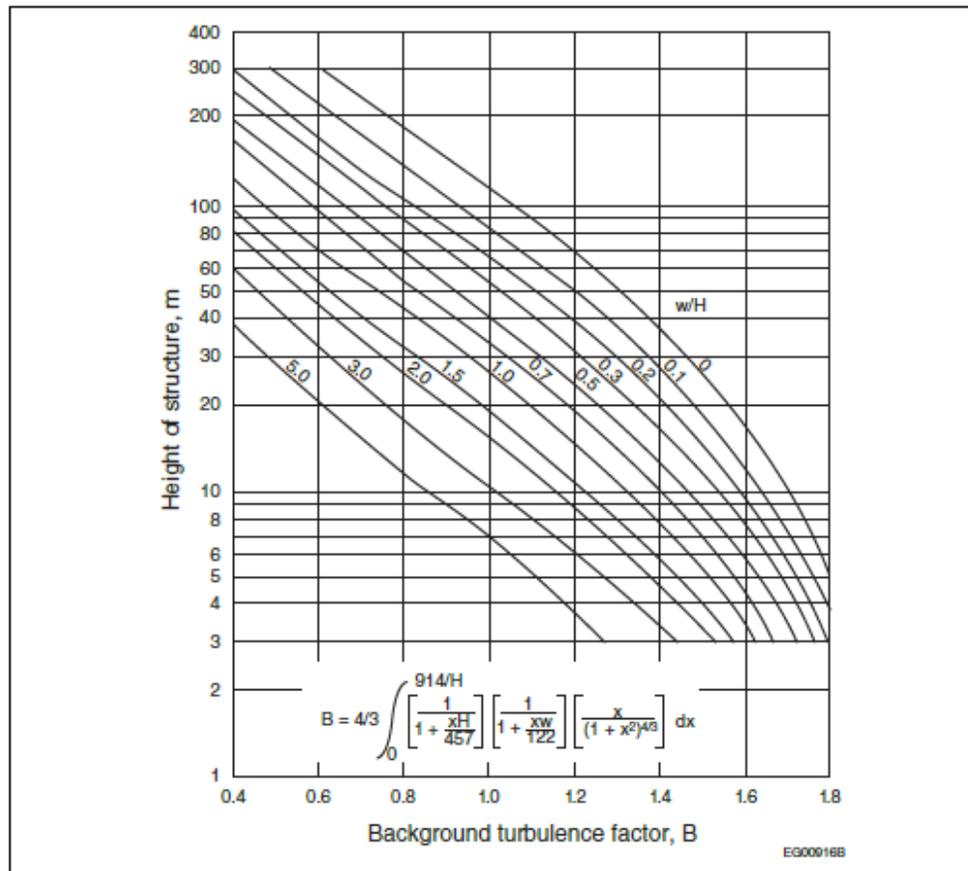
$$I_w = \text{importance factor for wind load, as provided in Table 4.1.7.3.,}$$

$$q = \text{reference velocity pressure, in Pa, and}$$

$$\rho = \text{air density} = 1.2929 \text{ kg/m}^3.$$

(See Note A-4.1.7.8.(4))

Figure 4.1.7.8.
Background Turbulence Factor, B
Forming Part of Sentence 4.1.7.8.(4)



4.1.7.9. Full and Partial Wind Loading

- (1) Except where the wind loads are derived from the combined $C_g C_p$ values determined in accordance with Article 4.1.7.6., *buildings* and structural members shall be capable of withstanding the effects of the following loads:
 - (a) the full wind loads acting along each of the 2 principal horizontal axes considered separately,
 - (b) 75% of the wind loads described in Clause (a) but offset from the central geometric axis of the *building* by 15% of its width normal to the direction of the force to produce the worst load effect,
 - (c) 75% of the wind loads described in Clause (a) but with both axes considered simultaneously, and
 - (d) 56% of the wind loads described in Clause (a) but with both axes considered simultaneously and offset from the central geometric axis of the *building* by 15% of its width normal to the direction of the force.
- (See Note A-4.1.7.9.(1))

4.1.7.10. Interior Walls and Partitions

- (1) In the design of interior walls and *partitions*, due consideration shall be given to differences in air pressure on opposite sides of the wall or *partition* which may result from
 - (a) pressure differences between the windward and leeward sides of a *building*,
 - (b) stack effects due to a difference in air temperature between the exterior and interior of the *building*, and
 - (c) air pressurization by the mechanical services of the *building*.

4.1.7.11. Exterior Ornamentations, Equipment and Appendages (See Note A-4.1.7.11.)

- (1) The effects of wind loads on exterior ornamentations, equipment and appendages, including the increase in exposed area as a result of ice buildup as prescribed in CAN/CSA-S37, “Antennas, towers, and antenna-supporting structures,” shall be considered in the structural design of the connections and the *building*.
- (2) Where there are a number of similar components, the net increase in force is permitted to be based on the total area for all similar components as opposed to the summation of forces of individual elements.

4.1.7.12. Attached Canopies on Low Buildings with a Height $H \leq 20$ m

(See Note A-4.1.7.12.)

- (1) For the purposes of this Article, “attached canopy” shall mean a horizontal canopy with a maximum slope of 2% that is attached to a *building* wall at any height, h_c , above ground level.
- (2) The specified external wind pressure, p , and the specified net external wind pressure, p_{net} , for attached canopies on exterior walls of low *buildings* with a height $H \leq 20$ m shall be determined as follows:

$$p = I_w q C_e C_t C_g C_p, \text{ and}$$

$$p_{net} = I_w q C_e C_t (C_g C_p)_{net}$$

where

p = specified external wind pressure acting statically and in a direction normal to the upper or lower surface of the canopy, considered positive when acting towards the surface and negative when acting away from the surface,

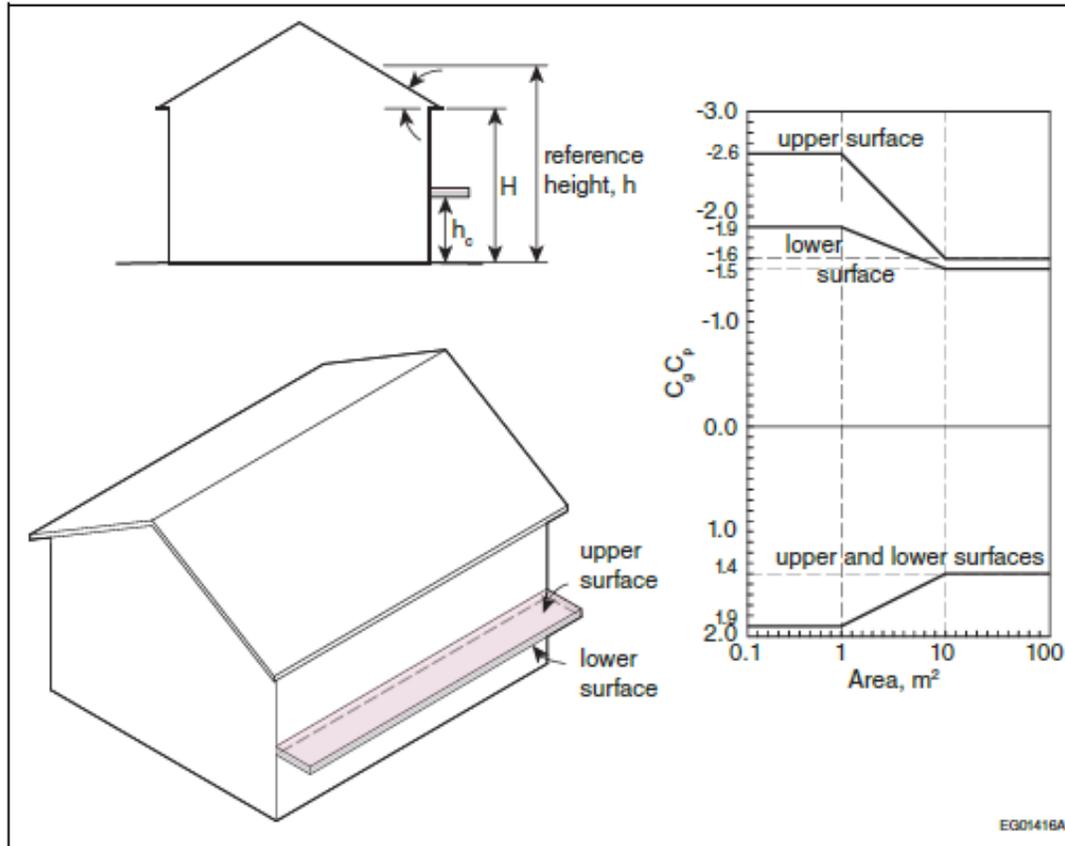
p_{net} = specified net external wind pressure acting statically on the canopy, considered positive when acting in a downward direction and negative when acting in an upward direction,

I_w, q, C_e, C_t = as defined in Sentence 4.1.7.3.(1),

$C_g C_p$ = gust pressure coefficient on the upper or lower surface of the canopy, as given in Figure 4.1.7.12.-A, and

$(C_g C_p)_{net}$ = net gust pressure coefficient on the canopy, considering simultaneous contributions from the upper and lower surfaces of the canopy, as given in Figure 4.1.7.12.-B.

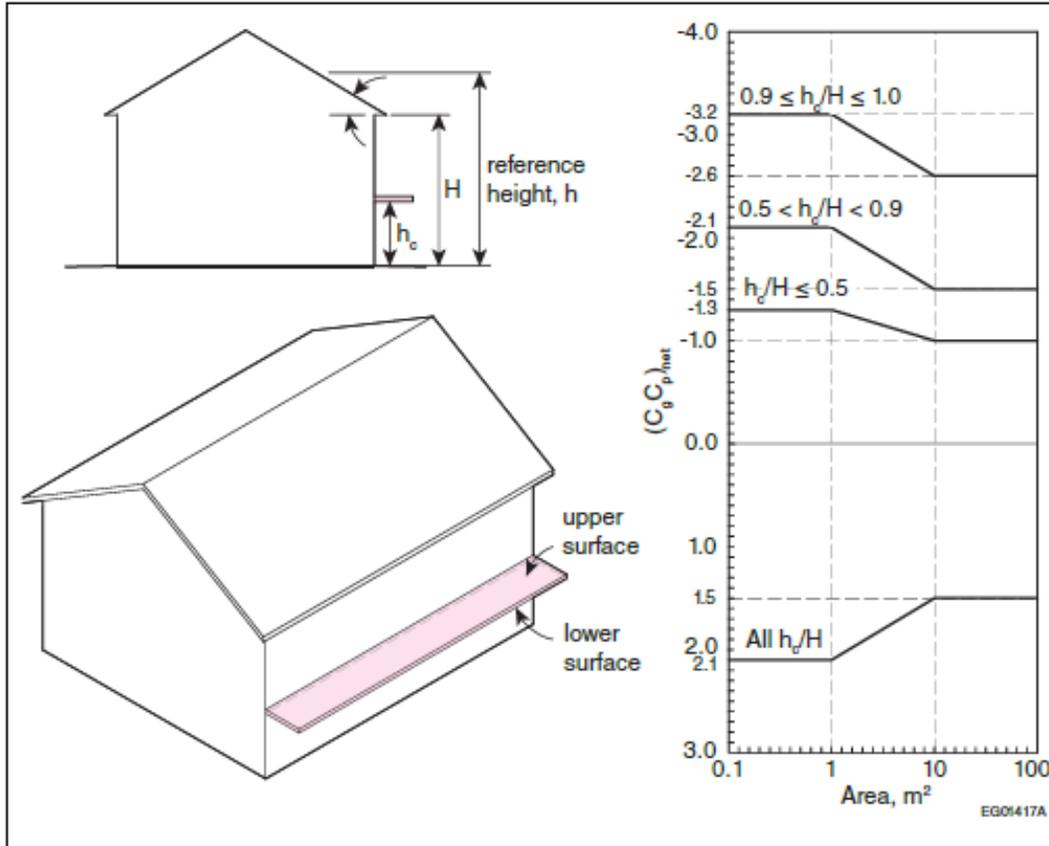
Figure 4.1.7.12.-A
 Gust Pressure Coefficients on the Upper and Lower Surfaces of Attached Canopies
 With no Gap Between the Canopy and the Building
 Forming Part of Sentence 4.1.7.12.(2)



Notes to Figure 4.1.7.12.-A:

- (1) The coefficients apply for any roof slope, α .
- (2) The reference height, h , is the mid-height of the roof or 6 m, whichever is greater.
- (3) Positive $C_g C_p$ values denote forces acting towards the upper or lower surface of the canopy, whereas negative $C_g C_p$ values denote forces acting away from the surface. Each structural element must be designed to resist both the positive and negative forces.

Figure 4.1.7.12.-B
 Net Gust Pressure Coefficients on Attached Canopies, Considering Simultaneous Contributions from the Upper and Lower Surfaces of the Canopy
 Forming Part of Sentence 4.1.7.12.(2)



Notes to Figure 4.1.7.12.-B:

- (1) The coefficients apply for any roof slope, α .
- (2) The reference height, h , is the mid-height of the roof or 6 m, whichever is greater.
- (3) Positive $(C_g C_p)_{net}$ values denote net forces acting in a downward direction on the canopy, whereas negative $(C_g C_p)_{net}$ values denote net forces acting in an upward direction on the canopy. The canopy must be designed to resist both the positive and negative net forces.

4.1.7.13. Roof-Mounted Solar Panels on Buildings of Any Height (See Note A-4.1.7.13.)

(1) Where solar panels are installed on a roof, the roof wind loads shall account for the wind loads on the solar panels, as determined in accordance with Sentences (2) to (7), or shall be determined in the same way as for the roof without solar panels, whichever approach results in the most critical effect.

(2) For an array of solar panels where the panels are installed close and parallel to the roof surface with their upper surface not more than 250 mm above the roof surface and with gaps around the panels of not less than 6 mm, the net positive or negative pressure difference between the upper and lower surfaces of a panel or the array shall be calculated as follows:

$$p = I_w q C_e C_t C_g C_p E \gamma_a$$

where

$I_w, q, C_e, C_t, C_g, C_p$ = as defined in Sentence 4.1.7.3.(1), determined in the same manner as for the roof cladding,

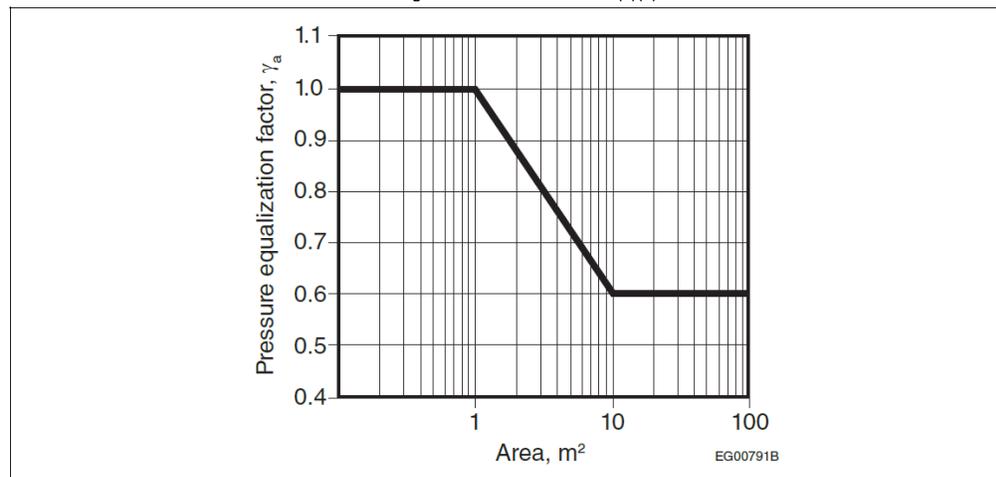
E = edge factor, as provided in Sentence (4), and

γ_a = pressure equalization factor, as provided in Sentence (3).

(3) The pressure equalization factor, γ_a , in Sentence (2) shall be

- (a) for a panel or an array where the panel chord length, L_p , is greater than 2 m or for a panel or an array that is within a distance of $2h_2$ from the roof edge or ridge, where h_2 is the height of the panel's highest point above the roof surface, taken as 1.0, and
- (b) for other panels or arrays, determined from Figure 4.1.7.13.-A based on the area of the panel or array over which the wind load is being calculated.

Figure 4.1.7.13.-A
 Pressure Equalization Factor, γ_a , for Solar Panels or Arrays Mounted on Roofs of Buildings of Any Height
 Forming Part of Clause 4.1.7.13.(3)(b)



(4) The edge factor, E , in Sentence (2) shall be taken as

- (a) 1.5 within a distance of $1.5L_p$ from an exposed edge of the array of solar panels, as defined in Sentence (5), and
- (b) 1.0 elsewhere.

- (5) For the purposes of Clause (4)(a), an exposed edge of the array of solar panels shall be considered to occur
- where the distance to the next row of panels or the distance across a gap in the same row of panels exceeds $4h_2$ or 1.2 m, whichever is greater, or
 - where the distance to the roof edge exceeds $4h_2$ or 1.2 m, whichever is greater, and exceeds $0.5h$, where h is the reference height of the roof.
- (6) For an array of solar panels mounted on a roof with a slope, α , less than or equal to 7° , where the panels are tilted relative to the roof surface, have a chord length, L_p , not greater than 2 m, and are installed such that the height of their lowest point above the roof surface, h_1 , is not greater than 0.6 m, the height of their highest point above the roof surface, h_2 , is not greater than 1.2 m, and their tilt angle relative to the roof surface, ω , is not greater than 35° , or where the panels are installed parallel to the roof surface with their upper surface greater than 250 mm above the roof surface and with gaps not less than 6 mm between the panels, the net positive or negative pressure difference between the upper and the lower surfaces of a panel or the array shall be calculated as follows:

$$p_{\text{net}} = I_W q C_e C_t (C_g C_p)_{\text{net}}$$

where

I_W, q, C_e, C_t = as defined in Sentence 4.1.7.3.(1), determined in the same manner as for the roof cladding, and
 $(C_g C_p)_{\text{net}}$ = net gust pressure coefficient, as provided in Sentence (7).

- (7) The net gust pressure coefficient, $(C_g C_p)_{\text{net}}$, in Sentence (6) shall be calculated as follows:

$$(C_g C_p)_{\text{net}} = \pm \gamma_p \gamma_c E (C_g C_p)_n$$

where

γ_p = parapet factor, determined as the lesser of 1.2 and $(0.9 + h_{pt}/h)$,

γ_c = chord factor, determined as the greater of $(0.6 + 0.2L_p)$ and 0.8,

E = as defined in Sentence (2), and

$(C_g C_p)_n$ = normalized gust pressure coefficient, determined from Figure 4.1.7.13.-B based on ω and A_N ,

where

h_{pt} = height of the parapet above the roof surface, in m, h = reference height of the roof, in m,

L_p = panel chord length, in m,

ω = panel tilt angle relative to the roof surface, and

A_N = normalized panel or array area, calculated as $A_N = \frac{1000A}{\max(L_b^2, 25)}$

where

A = panel or array area over which the wind load is being calculated, in m^2 , and

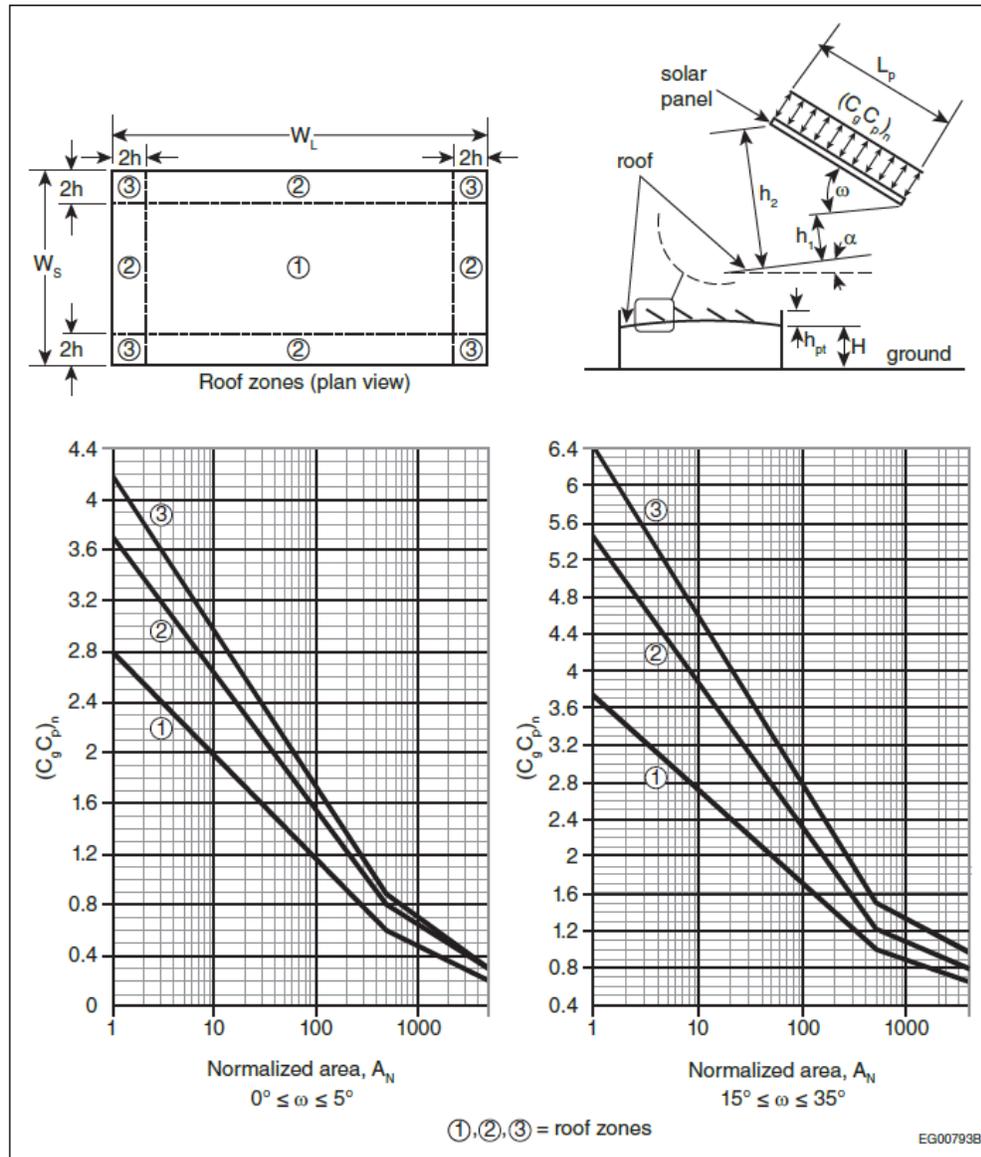
L_b = normalized *building* length, in m, determined as the lesser of $(0.4\sqrt{hW_L})$, h and W_S ,

where

W_L = longest horizontal dimension of the *building*, in m, and

W_S = smallest horizontal dimension of the *building*, in m.

Figure 4.1.7.13.-B
 Normalized Gust Pressure Coefficient, $(C_g C_p)_N$, for Solar Panels or Arrays Mounted on
 Low-Sloped Roofs of Buildings of Any Height
 Forming Part of Sentence 4.1.7.13.(7)



Notes to Figure 4.1.7.13.-B:

- (1) H = height of the *building*.
- (2) h = reference height of the roof.
- (3) $(C_g C_p)_N$ values are for both positive and negative values.
- (4) For panels with $5^\circ < \omega < 15^\circ$, linear interpolation is permitted.

4.1.7.14. Wind Tunnel Procedure

(1) Except as provided in Sentences (2) and (3), wind tunnel tests on scale models to determine wind loads on *buildings* shall be conducted in accordance with ASCE/SEI 49, “Wind Tunnel Testing for Buildings and Other Structures.”

- (2) Where an adjacent *building* provides substantial sheltering effect, the wind loads for the main structural system shall be no lower than 80% of the loads determined from tests referred to in Sentence (1) with the effect of the sheltering *building* removed as applied to
- the base shear force for *buildings* with ratio of height to minimum effective width, as described in Sentence 4.1.7.2.(2), less than or equal to 1.0, or
 - the base moment for *buildings* with a ratio of height to minimum effective width greater than 1.0.
- (3) For the design of cladding and secondary structural members, the exterior wind loads determined from the wind tunnel tests shall be no less onerous than those determined by analysis in accordance with Article 4.1.7.3. using the following assumptions:
- $C_g = 2.5$ and $C_p = \pm 0.72$, where the *building's* height is greater than 20 m or greater than its minimum effective width, and
 - $C_g C_p = 80\%$ of the values for zones w and r provided in Article 4.1.7.6., where the *building's* height is less than or equal to 20 m and no greater than its minimum effective width.

4.1.8. Earthquake Load and Effects

4.1.8.1. Analysis

- (1) Except as permitted in Sentence (2), the deflections and specified loading due to earthquake motions shall be determined according to the requirements of Articles 4.1.8.2. to 4.1.8.23.
- (2) Where $I_E F_s S_a(0.2, X_{450})$ and $I_E F_s S_a(2.0, X_{450})$ are less than 0.16 and 0.03 respectively, the deflections and specified loading due to earthquake motions are permitted to be determined in accordance with Sentences (3) to (15), where
- I_E is the earthquake importance factor and has a value of 0.8, 1.0, 1.3 and 1.5 for buildings in the Low, Normal, High and Post-disaster Importance Categories respectively,
 - F_s is the site coefficient based on the average \bar{N}_{60} or \bar{s}_u , as defined in Article 4.1.8.2., for the top 30 m of *soil* below the footings, *pile caps* or *mat foundations* and has a value of
 - 1.0 for *rock sites* or when $\bar{N}_{60} > 50_{60}$ or $\bar{s}_u > 100$ kPa,
 - 1.6 when $15 \leq \bar{N}_{60} \leq 50$ or $50 \text{ kPa} \leq \bar{s}_u \leq 100$ kPa, and
 - 2.8 for all other cases, and
 - $S_a(T, X_{450})$ is the 5%-damped spectral acceleration value at period T for site designation X_{450} , as defined in Article 4.1.8.2., determined in accordance with Subsection 1.1.3. and corresponding to a 2% probability of exceedance in 50 years.
- (3) The structure shall have a clearly defined
- seismic force resisting system (SFRS) to resist the earthquake loads and their effects, and
 - load path (or paths) that will transfer the inertial forces generated in an earthquake to the supporting ground.
- (4) An unreinforced masonry SFRS shall not be permitted where
- I_E is greater than 1.0, or
 - the height above *grade* is greater than or equal to 30 m.
- (5) The height above *grade* of an SFRS designed in accordance with CSA S136, "North American Specification for the Design of Cold-Formed Steel Structural Members (using the Appendix B provisions applicable to Canada)," shall be less than 15 m.
- (6) Earthquake forces shall be assumed to act horizontally and independently about any two orthogonal axes.
- (7) The specified lateral earthquake force, V_s , at the base of the structure in the direction under consideration shall be calculated as follows:

$$V_s = F_s S_a(T_s, X_{450}) I_E W / R_s$$

where,

$S_a(T, X_{450})$ = value of $S_a(T, X_{450})$ determined by linear interpolation between the values of $S_a(0.2, X_{450})$, $S_a(0.5, X_{450})$ and $S_a(1.0, X_{450})$,

= $S_a(0.2, X_{450})$ for $T_s \leq 0.2$ s, and

= $S_a(1.0, X_{450})$ for $T_s \geq 1.0$ s,

W = sum of W_i over the height of the *building*, where W_i is defined in Article 4.1.8.2., and

R_s = 1.5, except $R_s = 1.0$ for structures where the *storey* strength is less than that in the *storey* above and for an unreinforced masonry SFRS,

where

T_s = fundamental lateral period of vibration of the *building*, as defined in Article 4.1.8.2.,

= $0.085(h_n)^{3/4}$ for steel moment frames,

= $0.075(h_n)^{3/4}$ for concrete moment frames,

= 0.1N for other moment frames,

= $0.025h_n$ for braced frames, and

= $0.05(h_n)^{3/4}$ for shear walls and other structures,

where

h_n = height, in m, above the base to level n, as defined in Article 4.1.8.2., and

N = total number of *storeys* above exterior *grade* to level n, as defined in Article 4.1.8.2.,

except that, in cases where $R_s = 1.5$, V_s need not be greater than $F_s S_a(0.5, X_{450}) I_E W / R_s$.

(8) The total lateral earthquake design force, V_s , shall be distributed over the height of the *building* in accordance with the following formula:

$$F_x = V_s W_x h_x / \left(\sum_{i=1}^n w_i h_i \right)$$

where,

F_x = force applied through the centre of mass at level x,

W_x, W_i = portion of W that is located at or is assigned to level x or i respectively, and

h_x, h_i = height, in m, above the base to level x or i respectively, as defined in Article 4.1.8.2.

(9) Accidental torsional effects applied concurrently with F_x shall be considered by applying torsional moments about the vertical axis at each level for each of the following cases considered separately:

(a) $+0.1D_{nx}F_x$, and

(b) $-0.1D_{nx}F_x$.

(10) Deflections obtained from a linear analysis shall include the effects of torsion and be multiplied by R_s/I_E to get realistic values of expected deflections.

(11) The deflections referred to in Sentence (10) shall be used to calculate the largest interstorey deflection, which shall not exceed

(a) $0.01h_s$ for *post-disaster buildings*,

(b) $0.02h_s$ for High Importance Category *buildings*, and

(c) $0.025h_s$ for all other *buildings*,

where h_s is the interstorey height as defined in Article 4.1.8.2.

(12) When earthquake forces are calculated using $R_s = 1.5$, the following elements in the SFRS shall have their design forces due to earthquake effects increased by 33%:

- (a) diaphragms and their chords, connections, struts and collectors,
- (b) tie downs in wood or drywall shear walls,
- (c) connections and anchor bolts in steel- and wood-braced frames,
- (d) connections in precast concrete, and
- (e) connections in steel moment frames.

(13) Except as provided in Sentence (14), where cantilever parapet walls, other cantilever walls, exterior ornamentation and appendages, towers, chimneys or penthouses are connected to or form part of a *building*, they shall be designed, along with their connections, for a lateral force, V_{sp} , distributed according to the distribution of mass of the element and acting in the lateral direction that results in the most critical loading for design using the following equation:

$$V_{sp} = 0.9S_a(0.2, X_{450})F_s I_E W_p$$

where

W_p = weight of a portion of a structure as defined in Article 4.1.8.2.

(14) The value of V_{sp} shall be doubled for unreinforced masonry elements.

(15) Structures designed in accordance with this Article need not comply with the seismic requirements stated in the applicable design standard referenced in Section 4.3.

4.1.8.2. Notation

(1) In this Subsection,

A_r = element or component force amplification factor to account for type of attachment, as defined in Sentence 4.1.8.18.(1),

A_x = height factor at level x to account for variation of response of an element or component with elevation within the *building*, as defined in Sentence 4.1.8.18.(1),

B_x = ratio at level x used to determine torsional sensitivity, as defined in Sentence 4.1.8.11.(10),

B = maximum value of B_x , as defined in Sentence 4.1.8.11.(10),

C_p = seismic coefficient for an element or component, as defined in Sentence 4.1.8.18.(1),

D_{nx} = plan dimension of the *building* at level x perpendicular to the direction of seismic loading being considered,

e_x = distance measured perpendicular to the direction of earthquake loading between centre of mass and centre of rigidity at the level being considered, (See Note A-4.1.8.2.(1))

F_a = acceleration-based site coefficient for application in standards referenced in Subsection 4.1.8., as defined in Sentence 4.1.8.4.(7),

F_s = site coefficient as defined in Sentence 4.1.8.1.(2) for application in Article 4.1.8.1.,

F_t = portion of V to be concentrated at the top of the structure, as defined in Sentence 4.1.8.11.(7),

F_v = velocity-based site coefficient for application in standards referenced in Subsection 4.1.8., as defined in Sentence 4.1.8.4.(7),

F_x = lateral force applied to level x , as defined in Sentence 4.1.8.11.(7),

h_i, h_n, h_x = height, in m, above the base ($i = 0$) to level i, n , or x respectively, where the base of the structure is the level at which horizontal earthquake motions are considered to be imparted to the structure,

h_s = *interstorey* height ($h_i - h_{i-1}$),

- I_E = earthquake importance factor of the structure, as described in Sentence 4.1.8.5.(1),
- J = numerical reduction coefficient for base overturning moment, as defined in Sentence 4.1.8.11.(6),
- J_x = numerical reduction coefficient for overturning moment at level x , as defined in Sentence 4.1.8.11.(8),
- Level i = any level in the *building*, $i = 1$ for first level above the base,
- Level n = level that is uppermost in the main portion of the structure,
- Level x = level that is under design consideration,
- M_v = factor to account for higher mode effects on base shear, as defined in Sentence 4.1.8.11.(6),
- M_x = overturning moment at level x , as defined in Sentence 4.1.8.11.(8),
- N = total number of *storeys* above exterior *grade* to level n ,
- \bar{N}_{60} = average standard penetration resistance, in blows per 0.3 m, in the top 30 m of *soil*, corrected to a rod energy efficiency of 60% of the theoretical maximum,
- PGA(X) = peak ground acceleration, expressed as a ratio to gravitational acceleration, for site designation X, as defined in Sentence 4.1.8.4.(1),
- PGV(X) = peak ground velocity, in m/s, for site designation X, as defined in Sentence 4.1.8.4.(1),
- PI = plasticity index for *soil*,
- R_d = ductility-related force modification factor reflecting the capability of a structure to dissipate energy through reversed cyclic inelastic behaviour, as defined in Article 4.1.8.9.,
- R_o = overstrength-related force modification factor accounting for the dependable portion of reserve strength in a structure designed according to these provisions, as defined in Article 4.1.8.9.,
- R_p = element or component response modification factor, as defined in Sentence 4.1.8.18.(1),
- R_s = combined overstrength and ductility-related modification factor, as defined in Sentence 4.1.8.1.(7), for application in Article 4.1.8.1.,
- $S_a(T,X)$ = 5%-damped spectral acceleration, expressed as a ratio to gravitational acceleration, at period T for site designation X, as defined in Sentence 4.1.8.4.(1),
- SC = Seismic Category assigned to a *building* based on its Importance Category and the design spectral acceleration values at periods of 0.2 s and 1.0 s, as defined in Article 4.1.8.5.,
- SFRS = seismic force resisting system, that part of the structural system that has been considered in the design to provide the required resistance to the earthquake forces and effects defined in Subsection 4.1.8.,
- S_p = horizontal force factor for part or portion of a *building* and its anchorage, as given in Sentence 4.1.8.18.(1),
- $S(T)$ = design spectral acceleration, expressed as a ratio to gravitational acceleration, at period T , as defined in Sentence 4.1.8.4.(6),
- \bar{s}_u = average undrained shear strength, in kPa, in the top 30 m of *soil*,
- T = period, in s,
- T_a = fundamental lateral period of vibration of the *building* or structure, in s, in the direction under consideration, as defined in Sentence 4.1.8.11.(3),
- TDD = total design displacement of any point in a seismically isolated structure, within or above the isolation system, obtained by calculating the mean + ($I_E \times$ the standard deviation) of the peak horizontal displacements from all sets of ground motion time histories analyzed, but not less than $\sqrt{I_E} \times$ the mean, where the peak horizontal displacement is based on the vector sum of the two orthogonal horizontal displacements considered for each time step,
- T_s = fundamental lateral period of vibration of the *building* or structure, in s, in the direction under consideration, as defined in Sentence 4.1.8.1.(7),
- T_x = floor torque at level x , as defined in Sentence 4.1.8.11.(11),

- V = specified lateral earthquake force at the base of the structure, as determined in Article 4.1.8.11.,
- V_d = specified lateral earthquake force at the base of the structure, as determined in Article 4.1.8.12.,
- V_e = lateral earthquake elastic force at the base of the structure, as determined in Article 4.1.8.12.,
- V_{ed} = adjusted lateral earthquake elastic force at the base of the structure, as determined in Article 4.1.8.12.,
- V_p = specified lateral earthquake force on an element or component, as determined in Article 4.1.8.18.,
- V_s = specified lateral earthquake force at the base of the structure, as determined in Sentence 4.1.8.1.(7), for application in Article 4.1.8.1.,
- V_{s30} = average shear wave velocity, in m/s, in the top 30 m of *soil* or *rock*,
- W = specified *dead load*, as defined in Article 4.1.4.1., except that the minimum *partition* weight as defined in Sentence 4.1.4.1.(3) need not exceed 0.5 kPa, plus 25% of the specified snow load as defined in Subsection 4.1.6., plus 60% of the storage load for areas used for storage, except that *storage garages* need not be considered storage areas, and the full contents of any tanks, (See Note A-4.1.8.2.(1))
- W_i, W_x = portion of W that is located at or is assigned to level i or x respectively,
- W_p = weight of a part or portion of a structure, e.g., cladding, *partitions* and appendages,
- X = site designation, either X_v or X_s ,
- X_S = site designation in terms of Site Class, where S is the Site Class determined in accordance with Sentence 4.1.8.4.(3),
- X_V = site designation in terms of V_{s30} , where V is the V_{s30} value calculated from in situ measurements of shear wave velocity,
- X_{450} = site designation X_V with $V_{s30} = 450$ m/s,
- δ_{ave} = average displacement of the structure at level x , as defined in Sentence 4.1.8.11.(10), and
- δ_{max} = maximum displacement of the structure at level x , as defined in Sentence 4.1.8.11.(10).

4.1.8.3. General Requirements

- (1) The *building* shall be designed to meet the requirements of this Subsection and of the design standards referenced in Section 4.3.
- (2) Structures shall be designed with a clearly defined load path, or paths, that will transfer the inertial forces generated in an earthquake to the supporting ground.
- (3) The structure shall have a clearly defined SFRS, as defined in Article 4.1.8.2.
- (4) The SFRS shall be designed to resist 100% of the earthquake loads and their effects. (See Note A-4.1.8.3.(4))
- (5) All structural framing elements not considered to be part of the SFRS must be investigated and shown to behave elastically or to have sufficient non-linear capacity to support their gravity loads while undergoing earthquake-induced deformations calculated from the deflections determined in Article 4.1.8.13.
- (6) Stiff elements that are not considered part of the SFRS, such as concrete, masonry, brick or precast walls or panels, shall be
 - (a) separated from all structural elements of the *building* such that no interaction takes place as the *building* undergoes deflections due to earthquake effects as calculated in this Subsection, or
 - (b) made part of the SFRS and satisfy the requirements of this Subsection.
 (See Note A-4.1.8.3.(6))
- (7) Stiffness imparted to the structure from elements not part of the SFRS, other than those described in Sentence (6), shall not be used to resist earthquake deflections but shall be accounted for

- (a) in calculating the period of the structure for determining forces if the added stiffness decreases the fundamental lateral period by more than 15%,
- (b) in determining the irregularity of the structure, except the additional stiffness shall not be used to make an irregular SFRS regular or to reduce the effects of torsion, and (See Note A-4.1.8.3.(7)(b) and (c))
- (c) in designing the SFRS if inclusion of the elements not part of the SFRS in the analysis has an adverse effect on the SFRS. (See Note A-4.1.8.3.(7)(b) and (c))

(8) Structural modeling shall be representative of the magnitude and spatial distribution of the mass of the *building* and of the stiffness of all elements of the SFRS, including stiff elements that are not separated in accordance with Sentence 4.1.8.3.(6), and shall account for

- (a) the effect of cracked sections in reinforced concrete and reinforced masonry elements,
 - (b) the effect of the finite size of members and joints,
 - (c) sway effects arising from the interaction of gravity loads with the displaced configuration of the structure, and
 - (d) other effects that influence the lateral stiffness of the *building*.
- (See Note A-4.1.8.3.(8))

4.1.8.4. Site Properties

(1) For site designation X, as determined in accordance with Sentence (2) or (3), the peak ground acceleration, PGA(X), the peak ground velocity, PGV(X), and the 5%-damped spectral acceleration values, $S_a(T,X)$, at periods T of 0.2 s, 0.5 s, 1.0 s, 2.0 s, 5.0 s and 10.0 s shall

- (a) except as provided in Sentence (4), be determined in accordance with Subsection 1.1.3., and
- (b) except as provided in Article 4.1.8.23., correspond to a 2% probability of exceedance in 50 years.

(2) Except as provided in Sentence (3), the site designation referred to in Sentence (1) shall be determined using the average shear wave velocity, V_{s30} , calculated from in situ measurements of shear wave velocity, as follows:

- (a) for the ground profiles described in Table 4.1.8.4.-A, the site designation shall be determined in accordance with the Table, and
 - (b) for all other ground profiles, the site designation shall be X_V , where V is the value of V_{s30} .
- (See Note A-4.1.8.4.(2) and (3))

Table 4.1.8.4.-A
Exceptions for Site Designation Using V_{s30} Calculated from In Situ Measurements
 Forming Part of Sentence 4.1.8.4.(2)

Ground Profile Characteristics		Site Designation
Average Shear Wave Velocity in Top 30 m, V_{s30} , Calculated from In Situ Measurements, in m/s	Additional Characteristics	
$V_{s30} > 760$	Ground profile contains more than 3 m of softer materials between <i>rock</i> and the underside of footing or mat foundations	X_{760}
$V_{s30} > 140$	Ground profile contains more than 3 m of <i>soil</i> with all the following characteristics: <ul style="list-style-type: none"> • plasticity index, $PI > 20$, • moisture content, $w \geq 40\%$, and • undrained shear strength, $s_u < 25$ kPa 	X_E
$V_{s30} > 140$	Ground profile contains <ul style="list-style-type: none"> • liquefiable <i>soil</i>, quick and highly sensitive clay, collapsible weakly cemented <i>soil</i>, or other <i>soil</i> susceptible to failure or collapse under seismic loading, • more than 3 m of peat and/or highly organic clay, • more than 8 m of highly plastic <i>soil</i> (with $PI > 75$), or • more than 30 m of soft to medium-stiff clay 	X_F
$V_{s30} \leq 140$	n/a	X_F

(3) Where V_{s30} calculated from in situ measurements is not available, the site designation referred to in Sentence (1) shall be X_S , where S is the Site Class determined using the energy-corrected average standard penetration resistance, \bar{N}_{60} , or the average undrained shear strength, \bar{s}_u , in accordance with Table 4.1.8.4.-B, \bar{N}_{60} and \bar{s}_u being calculated based on rational analysis. (See Notes A-4.1.8.4.(3) and A-4.1.8.4.(2) and (3))

(4) Site-specific geotechnical evaluation is required to determine the values of $PGA(X_F)$, $PGV(X_F)$ and $S_a(T, X_F)$ for site designation X_F .

(5) Where structures on liquefiable *soils* have a fundamental lateral period, T_a , of 0.5 s or less, the site designation X and the corresponding values of $S_a(T, X)$ and $PGA(X)$ are permitted to be determined in accordance with Sentence (1) by assuming that the *soils* are not liquefiable.

(6) The design spectral acceleration, $S(T)$, shall be determined in accordance with Table 4.1.8.4.-C, using log-log or linear interpolation for intermediate values of T . (See Note A-4.1.8.4.(6))

(7) Where required for the application of a standard referenced in this Subsection, the acceleration-based site coefficient, F_a , for site designation X shall be taken as $S(0.2)/S_a(0.2, X_{450})$ and the velocity-based site coefficient, F_v , for site designation X shall be taken as $S(1.0)/S_a(1.0, X_{450})$.

Table 4.1.8.4.-B
Site Classes, S, for Site Designation X_S
Forming Part of Sentence 4.1.8.4.(3)

Site Class, S	Ground Profile	Ground Profile Characteristics		
		Average Shear Wave Velocity in Top 30 m, V_{s30} , in m/s ⁽¹⁾	Average Standard Penetration Resistance in Top 30 m, \bar{N}_{60} , in Blows per 0.3 m	Average Undrained Shear Strength in Top 30 m, \bar{s}_u , in kPa
A	Hard rock ⁽²⁾	$V_{s30} > 1\ 500$	n/a	n/a
B	Rock ⁽²⁾	$760 < V_{s30} \leq 1\ 500$	n/a	n/a
C	Very dense soil and soft rock	$360 < V_{s30} \leq 760$	$\bar{N}_{60} > 50$	$\bar{s}_u > 100$
D	Stiff soil	$180 < V_{s30} \leq 360$	$15 < \bar{N}_{60} \leq 50$	$50 < \bar{s}_u \leq 100$
E	Soft soil	$140 < V_{s30} \leq 180$	$10 < \bar{N}_{60} \leq 15$	$40 < \bar{s}_u \leq 50$
		Any ground profile other than Site Class F that contains more than 3 m of soil with all the following characteristics: <ul style="list-style-type: none"> • plasticity index, $PI > 20$, • moisture content, $w \geq 40\%$, and • undrained shear strength, $s_u < 25$ kPa 		
F	Other soils ⁽³⁾	$V_{s30} \leq 140$	$\bar{N}_{60} \leq 10$	$\bar{s}_u \leq 40$
		Any ground profile that contains <ul style="list-style-type: none"> • liquefiable soil, quick and highly sensitive clay, collapsible weakly cemented soil, or other soil susceptible to failure or collapse under seismic loading, • more than 3 m of peat and/or highly organic clay, • more than 8 m of highly plastic soil (with $PI > 75$), or • more than 30 m of soft to medium-stiff clay 		

Notes to Table 4.1.8.4.-B:

- (1) See Note A-4.1.8.4.(2) and (3).
- (2) Site designations X_A and X_B , corresponding to Site Classes A and B, are not to be used in cases where the ground profile contains more than 3 m of softer materials between rock and the underside of footing or mat foundations. The appropriate site designation for such cases is X_{760} .
- (3) Site-specific geotechnical evaluation is required.

Table 4.1.8.4.C.
Design Spectral Acceleration
 Forming Part of Sentence 4.1.8.4.(6)

Period, T, in s	Design Spectral Acceleration, S(T)
≤ 0.2	$S_a(0.2,X)$ or $S_a(0.5,X)$, whichever is greater
0.5	$S_a(0.5,X)$
1.0	$S_a(1.0,X)$
2.0	$S_a(2.0,X)$
5.0	$S_a(5.0,X)$
10.0	$S_a(10.0,X)$

4.1.8.5. Importance Factor and Seismic Category

- (1) The earthquake importance factor, I_E , shall be determined according to Table 4.1.8.5.-A.
- (2) *Buildings* shall be assigned a Seismic Category in accordance with Table 4.1.8.5.-B.

Table 4.1.8.5.-A
Importance Factor for Earthquake Loads and Effects, I_E
 Forming Part of Sentence 4.1.8.5.(1)

Importance Category	Importance Factor, I_E	
	ULS	SLS ⁽¹⁾
Low	0.8	(2)
Normal	1.0	
High	1.3	
Post-disaster	1.5	

Notes to Table 4.1.8.5.-A:

- (1) See Article 4.1.8.13.
- (2) See Appendix A.

Table 4.1.8.5.-B
Seismic Categories for Buildings
 Forming Part of Sentence 4.1.8.5.(2)

Seismic Category ⁽¹⁾	$I_E S(0.2)$	$I_E S(1.0)$
SC1	$I_E S(0.2) < 0.2$	$I_E S(1.0) < 0.1$
SC2	$0.2 \leq I_E S(0.2) < 0.35$	$0.1 \leq I_E S(1.0) < 0.2$
SC3	$0.35 \leq I_E S(0.2) \leq 0.75$	$0.2 \leq I_E S(1.0) \leq 0.3$
SC4	$I_E S(0.2) > 0.75$	$I_E S(1.0) > 0.3$

Notes to Table 4.1.8.5.-B:

- (1) The Seismic Category of a *building* shall be taken as the more severe of the categories determined on the basis of $I_E S(0.2)$ and $I_E S(1.0)$, irrespective of the fundamental lateral period of the *building*, T_a .

4.1.8.6. Structural Configuration

- (1) Structures having any of the features listed in Table 4.1.8.6. shall be designated irregular.
- (2) Structures not classified as irregular according to Sentence (1) may be considered regular.
- (3) Except as required by Article 4.1.8.10., where the Seismic Category is SC3 or SC4, structures designated as irregular must satisfy the provisions referenced in Table 4.1.8.6.

Table 4.1.8.6.
Structural Irregularities⁽¹⁾⁽²⁾
 Forming Part of Sentences 4.1.8.6.(1) and (3), Clause 4.1.8.7.(1)(c) and Article 4.1.8.10.

Type	Irregularity Type and Definition	Notes
1	Vertical Stiffness Irregularity For concrete and masonry shear walls, vertical stiffness irregularity shall be considered to exist where the lateral stiffness of the SFRS in any storey is less than 70% of the stiffness in an adjacent storey, or less than 80% of the average stiffness in the three storeys above or below. For all other types of SFRS, vertical stiffness irregularity shall be considered to exist where the interstorey deflection under lateral earthquake forces divided by the interstorey height, h_s , of any storey is greater than 130% of that of an adjacent storey.	(3)(4)(5)
2	Weight (mass) Irregularity Weight irregularity shall be considered to exist where the weight, W_i , of any storey is more than 150% of the weight of an adjacent storey. A roof that is lighter than the floor below need not be considered.	(3)
3	Vertical Geometric Irregularity Vertical geometric irregularity shall be considered to exist where the horizontal dimension of the SFRS in any storey is more than 130% of that in an adjacent storey.	(3)(4)(6)
4	In-Plane Discontinuity in Vertical Lateral-Force-Resisting Element Except for braced frames and moment-resisting frames, an in-plane discontinuity shall be considered to exist where there is an offset of a lateral-force-resisting element of the SFRS or a reduction in lateral stiffness of the resisting element in the storey below.	(3)(4)(6)
5	Out-of-Plane Offsets Discontinuities in a lateral force path, such as out-of-plane offsets of the vertical elements of the SFRS.	(3)(4)(6)
6	Discontinuity in Capacity – Weak Storey A weak storey is one in which the storey shear strength is less than that in the storey above. The storey shear strength is the total strength of all seismic-resisting elements of the SFRS sharing the storey shear for the direction under consideration.	(3)(4)
7	Torsional Sensitivity (to be considered when diaphragms are not flexible) Torsional sensitivity shall be considered to exist when the ratio B calculated according to Sentence 4.1.8.11.(10) exceeds 1.7.	(3)(4)(7)
8	Non-orthogonal Systems A non-orthogonal system irregularity shall be considered to exist when the SFRS is not oriented along a set of orthogonal axes.	(3)(8)
9	Gravity-Induced Lateral Demand Irregularity Gravity-induced lateral demand irregularity on the SFRS shall be considered to exist where the ratio Δ calculated in accordance with Sentence 4.1.8.10.(7) exceeds 0.1 for an SFRS with self-centering characteristics and 0.03 for other systems.	(3)(4)(8)
10	Sloped Column Irregularity Sloped column irregularity shall be considered to exist where a vertical member that is inclined more than 2° from the vertical supports a portion of the weight of the building in axial compression.	(4)

Notes to Table 4.1.8.6.:

- (1) One-storey penthouses with a weight of less than 10% of the level below need not be considered in the application of this Table.
- (2) See Note A-Table 4.1.8.6.
- (3) See Article 4.1.8.7.
- (4) See Article 4.1.8.10.
- (5) Increased stiffness in storeys below grade need not be considered in the determination of vertical stiffness irregularity.
- (6) See Article 4.1.8.15.
- (7) See Sentences 4.1.8.11.(10) and (11), and 4.1.8.12.(4).
- (8) See Article 4.1.8.8.

4.1.8.7. Methods of Analysis

- (1) Analysis for earthquake actions shall be carried out in accordance with the Dynamic Analysis Procedure described in Article 4.1.8.12. (See Note A-4.1.8.7.(1)), except that the Equivalent Static Force Procedure described in Article 4.1.8.11. may be used for structures that meet any of the following criteria:
- (a) where the Seismic Category is SC1 or SC2,
 - (b) regular structures that are less than 60 m in height and have a fundamental lateral period, T_a , less than 2 s in each of two orthogonal directions as defined in Article 4.1.8.8., or
 - (c) structures with a structural irregularity of Type 2, 3, 4, 5, 6 or 8 as defined in Table 4.1.8.6. that are less than 20 m in height and have a fundamental lateral period, T_a , less than 0.5 s in each of two orthogonal directions as defined in Article 4.1.8.8.

4.1.8.8. Direction of Loading

- (1) Earthquake forces shall be assumed to act in any horizontal direction, except that the following shall be considered to provide adequate design force levels in the structure:
- (a) where components of the SFRS are oriented along a set of orthogonal axes, independent analyses about each of the principal axes of the structure shall be performed,
 - (b) where the components of the SFRS are not oriented along a set of orthogonal axes and the Seismic Category is SC1 or SC2, independent analyses about any two orthogonal axes is permitted, or
 - (c) where the components of the SFRS are not oriented along a set of orthogonal axes and the Seismic Category is SC3 or SC4, analysis of the structure independently in any two orthogonal directions for 100% of the specified earthquake loads applied in one direction plus 30% of the specified earthquake loads in the perpendicular direction, with the combination requiring the greater element strength being used in the design.

4.1.8.9. Force Reduction Factors, System Overstrength Factors, and General Restrictions

- (1) Except as provided in Articles 4.1.8.20. and 4.1.8.22., the values of R_d and R_o and the corresponding system restrictions shall conform to Table 4.1.8.9. and the requirements of this Subsection.
- (2) When a particular value of R_d is required by this Article, the corresponding R_o shall be used.
- (3) For combinations of different types of SFRS acting in the same direction in the same *storey*, $R_d R_o$ shall be taken as the lowest value of $R_d R_o$ corresponding to these systems.
- (4) For vertical variations of $R_d R_o$, excluding rooftop structures not exceeding two *storeys* in height whose weight is less than the greater of 10% of W and 30% of W_i of the level below, the value of $R_d R_o$ used in the design of any *storey* shall be less than or equal to the lowest value of $R_d R_o$ used in the given direction for the *storeys* above, and the requirements of Sentence 4.1.8.15.(6) must be satisfied. (See Note A-4.1.8.9.(4))
- (5) If it can be demonstrated through testing, research and analysis that the seismic performance of a structural system is at least equivalent to one of the types of SFRS defined in Table 4.1.8.9., then such a structural system will qualify for values of R_d and R_o corresponding to the equivalent type in that Table. (See Note A-4.1.8.9.(5))

Table 4.1.8.9.
SFRS Ductility-Related Force Modification Factors, R_d ,
Overstrength-Related Force Modification Factors, R_o , and General Restrictions⁽¹⁾
 Forming Part of Sentences 4.1.8.9.(1) and (5), 4.1.8.10.(5) and (6), 4.1.8.11.(12), 4.1.8.15.(9) and 4.1.8.20.(8)

Type of SFRS	R_d	R_o	Restrictions ⁽²⁾			
			Seismic Category			
			SC1	SC2	SC3	SC4
Steel Structures Designed and Detailed According to CSA S16 ⁽³⁾⁽⁴⁾						
Ductile moment-resisting frames	5.0	1.5	NL	NL	NL	NL
Moderately ductile moment-resisting frames	3.5	1.5	NL	NL	NL	NL
Limited ductility moment-resisting frames	2.0	1.3	NL	NL	60	30
Moderately ductile truss moment-resisting frames	3.5	1.6	NL	NL	50	30
Moderately ductile concentrically braced frames						
Tension-compression braces	3.0	1.3	NL	NL	40	40
Tension only braces	3.0	1.3	NL	NL	20	20
Limited ductility concentrically braced frames						
Tension-compression braces	2.0	1.3	NL	NL	60	60
Tension only braces	2.0	1.3	NL	NL	40	40
Ductile buckling-restrained braced frames	4.0	1.2	NL	NL	40	40
Ductile eccentrically braced frames	4.0	1.5	NL	NL	NL	NL
Ductile plate walls	5.0	1.6	NL	NL	NL	NL
Moderately ductile plate walls	3.5	1.3	NL	NL	40	40
Limited ductility plate walls	2.0	1.5	NL	NL	60	60
Conventional construction of moment-resisting frames, braced frames or plate walls						
<i>Assembly occupancies</i>	1.5	1.3	NL	NL	15	15
<i>Other occupancies</i>	1.5	1.3	NL	NL	60	40
Other steel SFRS(s) not defined above	1.0	1.0	15	15	NP	NP
Concrete Structures Designed and Detailed According to CSA A23.3						
Ductile moment-resisting frames	4.0	1.7	NL	NL	NL	NL
Moderately ductile moment-resisting frames	2.5	1.4	NL	NL	60	40
Ductile coupled walls	4.0	1.7	NL	NL	NL	NL
Moderately ductile coupled walls	2.5	1.4	NL	NL	NL	60
Ductile partially coupled walls	3.5	1.7	NL	NL	NL	NL
Moderately ductile partially coupled walls	2.0	1.4	NL	NL	NL	60
Ductile shear walls	3.5	1.6	NL	NL	NL	NL
Moderately ductile shear walls	2.0	1.4	NL	NL	NL	60
Conventional construction						
Moment-resisting frames	1.5	1.3	NL	NL	20	10 ⁽⁵⁾⁽⁶⁾
Shear walls	1.5	1.3	NL	NL	40	30
Two-way slabs without beams	1.3	1.3	20	15	NP	NP
Tilt-up Construction						
Moderately ductile walls and frames	2.0	1.3	30	25	25	25
Limited ductility walls and frames	1.5	1.3	30	25	20	20 ⁽⁷⁾
Conventional walls and frames	1.3	1.3	25	20	NP	NP
Other concrete SFRS(s) not listed above	1.0	1.0	15	15	NP	NP

Table 4.1.8.9. (Cont'd)
SFRS Ductility-Related Force Modification Factors, R_d ,
Overstrength-Related Force Modification Factors, R_o , and General Restrictions⁽¹⁾
 Forming Part of Sentences 4.1.8.9.(1) and (5), 4.1.8.10.(5) and (6), 4.1.8.11.(12), 4.1.8.15.(9) and 4.1.8.20.(8)

Type of SFRS	R_d	R_o	Restrictions ⁽²⁾			
			Seismic Category			
			SC1	SC2	SC3	SC4
Timber Structures Designed and Detailed According to CSA O86						
Shear walls						
Nailed shear walls: wood-based panel	3.0	1.7	NL	NL	30	20
Shear walls: wood-based and gypsum panels in combination	2.0	1.7	NL	NL	20	20
Moderately ductile cross-laminated timber shear walls: platform-type construction	2.0	1.5	30	30	30	20
Limited ductility cross-laminated timber shear walls: platform-type construction	1.0	1.3	30	30	30	20
Braced or moment-resisting frames with ductile connections						
Moderately ductile	2.0	1.5	NL	NL	20	20
Limited ductility	1.5	1.5	NL	NL	15	15
Other wood- or gypsum-based SFRS(s) not listed above	1.0	1.0	15	15	NP	NP
Masonry Structures Designed and Detailed According to CSA S304						
Ductile shear walls	3.0	1.5	NL	NL	60	40
Moderately ductile shear walls	2.0	1.5	NL	NL	60	40
Conventional construction						
Shear walls	1.5	1.5	NL	60	30	15
Moment-resisting frames	1.5	1.5	NL	30	NP	NP
Unreinforced masonry	1.0	1.0	30	15	NP	NP
Other masonry SFRS(s) not listed above	1.0	1.0	15	NP	NP	NP
Cold-Formed Steel Structures Designed and Detailed According to CSA S136						
Shear walls						
Screw-connected shear walls - wood-based panels	2.5	1.7	20	20	20	20
Screw-connected shear walls - wood-based and gypsum panels in combination	1.5	1.7	20	20	20	20
Diagonal strap concentrically braced walls						
Limited ductility	1.9	1.3	20	20	20	20
Conventional construction	1.2	1.3	15	15	NP	NP
Other cold-formed SFRSs not listed above	1.0	1.0	15	15	NP	NP

Notes to Table 4.1.8.9.:

- (1) See Article 4.1.8.10.
- (2) NP = system is not permitted.
 NL = system is permitted and not limited in height as an SFRS.
 Numbers in this Table are maximum height limits above *grade*, in m.
 Height may be limited in other Parts of the Code.
 The most stringent requirement governs.
- (3) Higher design force levels are prescribed in CSA S16 for some heights of *buildings*.
- (4) See Note A-Table 4.1.8.9.
- (5) Frames are limited to a maximum of 2 *storeys*.
- (6) The maximum height limit is permitted to be increased to 15 m where $I_e S(1.0) \leq 0.3$.
- (7) Frames are limited to a maximum of 3 *storeys*.

4.1.8.10. Additional System Restrictions

(1) Except as required by Clause (2)(b), structures with a Type 6 irregularity, Discontinuity in Capacity - Weak Storey, as described in Table 4.1.8.6., are not permitted unless the Seismic Category is SC1 and the forces used for design of the SFRS are multiplied by $R_d R_o$.

(2) *Post-disaster buildings* shall

- (a) not have Type 1, 3, 4, 5, 7, 9 or 10 irregularities as described in Table 4.1.8.6., where the Seismic Category is SC3 or SC4,
- (b) not have a Type 6 irregularity as described in Table 4.1.8.6.,
- (c) have an SFRS with an R_d of 2.0 or greater,
- (d) where they are constructed with concrete or masonry shear walls, have no *storey with a lateral* stiffness that is less than that of the *storey* above it, and
- (e) where they are constructed with other types of SFRS, have no *storey* for which the *interstorey* deflection under lateral earthquake forces divided by the *interstorey* height, h_s , is greater than that of the *storey* above it.

(3) *High Importance Category buildings* shall

- (a) not have Type 1, 3, 4, 5, 7, 9 or 10 irregularities as described in Table 4.1.8.6., where the Seismic Category is SC4,
- (b) not have a Type 6 irregularity as described in Table 4.1.8.6.,
- (c) have an SFRS with an R_d of at least
 - (i) 2.0 where the Seismic Category is SC4, and
 - (ii) 1.5 otherwise,
- (d) where they are constructed with concrete or masonry shear walls, have no *storey with a lateral* stiffness that is less than that of the *storey* above it, and
- (e) where they are constructed with other types of SFRS, have no *storey* for which the *interstorey* deflection under lateral earthquake forces divided by the *interstorey* height, h_s , is greater than that of the *storey* above it.

(4) Where the fundamental lateral period, T_a , is greater than or equal to 1.0 s and $I_{ES}(1.0)$ is greater than 0.25, shear walls that are other than wood-based and form part of the SFRS shall be continuous from their top to the *foundation* and shall not have Type 4 or 5 irregularities as described in Table 4.1.8.6.

(5) For *buildings* in Seismic Category SC3 or SC4 that are constructed with more than 4 *storeys* of continuous wood construction, timber SFRSs consisting of shear walls with wood-based panels or of braced or moment-resisting frames as defined in Table 4.1.8.9. within the continuous wood construction shall not have Type 4 or 5 irregularities as described in Table 4.1.8.6. (See Note A-4.1.8.10.(5) and (6))

(6) For *buildings* in Seismic Category SC3 or SC4 that are constructed with more than 4 *storeys* of continuous wood construction, timber SFRSs consisting of moderately ductile or limited ductility cross-laminated timber shear walls, platform-type construction, as defined in Table 4.1.8.9. within the continuous wood construction shall not have Type 4, 5, 6, 8, 9 or 10 irregularities as described in Table 4.1.8.6. (See Note A-4.1.8.10.(5) and (6))

(7) The ratio α for a Type 9 irregularity as described in Table 4.1.8.6. shall be determined independently for each orthogonal direction using the following equation:

$$\alpha = Q_G / Q_y$$

where,

Q_G = gravity-induced lateral demand on the SFRS at the critical level of the yielding system, and

Q_y = the resistance of the yielding mechanism required to resist the earthquake loads, which need not be taken as less than R_o multiplied by the specified lateral earthquake force as determined in Article 4.1.8.11. or 4.1.8.12., as appropriate.

(See Note A-4.1.8.10.(7))

(8) For *buildings* with a Type 9 irregularity as described in Table 4.1.8.6. and where $I_{ES}(0.2)$ is equal to or greater than 0.5, deflections determined in accordance with Article 4.1.8.13. shall be multiplied by 1.2.

- (9) For *buildings* where the value of α , as determined in accordance with Sentence (7), exceeds twice the appropriate limit specified in Table 4.1.8.6. for a Type 9 irregularity and where $I_{ES}(0.2)$ is equal to or greater than 0.5, a Non-linear Dynamic Analysis of the structure shall be carried out in accordance with Article 4.1.8.12. and the following criteria:
- (a) the analysis shall account for the effects of the vertical response of the *building* mass,
 - (b) the analysis shall account for the effects of the vertical response of *building* components that undergo a vertical displacement when displaced laterally,
 - (c) the analysis shall use vertical ground motion time histories that are compatible with horizontal ground motion time histories scaled to the target response spectrum and that are applied concurrently with the horizontal ground motion time histories,
 - (d) the largest interstorey deflection at any level of the *building* as determined from the analysis shall not be greater than 60% of the appropriate limit stated in Sentence 4.1.8.13.(3), and
 - (e) the results of an analysis using the ground motion time histories in Clause (c) multiplied by 1.5 shall satisfy the non-linear acceptance criteria.

(See Note A-4.1.8.10.(9))

(10) The design of *buildings* in Seismic Category SC3 or SC4 with a Type 10 irregularity as described in Table 4.1.8.6. shall satisfy the following requirements:

- (a) the structure shall be designed to resist the additional earthquake forces due to the vertical accelerations of the mass supported by inclined vertical members, and (See Note A-4.1.8.10.(10)(a))
- (b) the effects of the horizontal and vertical movements of inclined vertical members, while undergoing earthquake-induced deformations, on the floor systems they support shall be considered in the design of the building and accounted for in the application of Sentence 4.1.8.3.(5).

4.1.8.11. Equivalent Static Force Procedure for Structures Satisfying the Conditions of Article 4.1.8.7.

- (1) The static loading due to earthquake motion shall be determined according to the procedures given in this Article.
- (2) Except as provided in Sentence (12), the specified lateral earthquake force, V , shall be calculated using the following formula:

$$V = S (T_a) M_v I_E W / (R_d R_o)$$

except,

- (a) for walls, coupled walls and wall-frame systems, V shall not be less than,

$$S (4.0) M_v I_E W / (R_d R_o)$$

- (b) for moment-resisting frames, braced frames and other systems, V shall not be less than,

$$S (2.0) M_v I_E W / (R_d R_o), \quad \text{and}$$

- (c) for *buildings* located on a site designated as other than X_F and having an SFRS with an R_d equal to or greater than 1.5, V need not be greater than the larger of

$$(2/3) S (0.2) I_E W / (R_d R_o), \quad \text{and}$$

$$S (0.5) I_E W / (R_d R_o)$$

- (3) Except as provided in Sentence (4), the fundamental lateral period, T_a , in the direction under consideration in Sentence (2) shall be determined as:
- (a) for moment-resisting frames that resist 100% of the lateral earthquake forces and where the frame is not enclosed by or adjoined by more rigid elements that would tend to prevent the frame from resisting lateral forces, and where h_n is in metres:
 - (i) $0.085(h_n)^{3/4}$ for steel moment frames,
 - (ii) $0.075(h_n)^{3/4}$ for concrete moment frames, or
 - (iii) 0.1N for other moment frames,
 - (b) $0.025h_n$ for braced frames,
 - (c) $0.05(h_n)^{3/4}$ for shear wall and other structures, or
 - (d) other established methods of mechanics using a structural model that complies with the requirements of Sentence 4.1.8.3.(8), except that
 - (i) for moment-resisting frames, T_a shall not be taken as greater than 1.5 times that determined in Clause (a),
 - (ii) for braced frames, T_a shall not be taken as greater than 2.0 times that determined in Clause (b),
 - (iii) for shear wall structures, T_a shall not be taken as greater than 2.0 times that determined in Clause (c),
 - (iv) for other structures, T_a shall not be taken as greater than that determined in Clause (c), and
 - (v) for the purpose of calculating the deflections, the period without the upper limit specified in Subclauses (d)(i) to (d)(iv) may be used, except that, for walls, coupled walls and wall-frame systems, T_a shall not exceed 4.0 s, and for moment-resisting frames, braced frames, and other systems, T_a shall not exceed 2.0 s.

(See Note A-4.1.8.11.(3))

- (4) For single-storey buildings with steel deck or wood roof diaphragms, the fundamental lateral period, T_a , in the direction under consideration is permitted to be taken as,
- (a) $0.05(h_n)^{3/4} + 0.004L$ for shear walls,
 - (b) $0.035h_n + 0.004L$ for steel moment frames and steel braced frames, or
 - (c) the value obtained from methods of mechanics using a structural model that complies with the requirements of Sentence 4.1.8.3.(8), except that T_a shall not be greater than 1.5 times the value determined in Clause (a) or (b), as applicable,

where L is the shortest length of the diaphragm, in m, between adjacent vertical elements of the SFRS in the direction perpendicular to the direction under consideration.

- (5) The weight, W , of the building shall be calculated using the following formula:

$$W = \sum_{i=1}^n W_i$$

- (6) The higher mode factor, M_v , and its associated base overturning moment reduction factor, J , shall conform to Table 4.1.8.11.

- (7) The specified lateral earthquake force, V , shall be distributed such that
- (a) a portion, F_t , is concentrated at the top of the building, where F_t is equal to $0.07T_a V$ but need not exceed $0.25V$ and may be considered as zero where the fundamental lateral period, T_a , does not exceed 0.7 s, and
 - (b) the remainder, $V - F_t$, is distributed along the height of the building, including the top level, in accordance with the following formula:

$$F_x = (V - F_t) W_x h_x / \left(\sum_{i=1}^n W_i h_i \right)$$

Table 4.1.8.11.
Higher Mode Factor, M_v , and Base Overturning Reduction Factor, J ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾
 Forming Part of Sentence 4.1.8.11.(6)

S(0.2)/S(5.0)	M_v For $T_a \leq 0.5$	M_v For $T_a = 1.0$	M_v For $T_a = 2.0$	M_v For $T_a \geq 5.0$	J For $T_a \leq 0.5$	J For $T_a = 1.0$	J For $T_a = 2.0$	J For $T_a \geq 5.0$
Moment-Resisting Frames								
5	1	1	1	(5)	1	1	0.95	(5)
20	1	1	1	(5)	1	0.97	0.88	(5)
40	1	1	1	(5)	1	0.90	0.79	(5)
70	1	1	1	(5)	0.98	0.88	0.70	(5)
Coupled Walls ⁽⁶⁾								
5	1	1	1	1 ⁽⁷⁾	1	1	0.95	0.80 ⁽⁸⁾
20	1	1	1	1.09 ⁽⁷⁾	1	0.97	0.88	0.66 ⁽⁸⁾
40	1	1	1	1.33 ⁽⁷⁾	1	0.90	0.79	0.52 ⁽⁸⁾
70	1	1	1	1.90 ⁽⁷⁾	0.98	0.88	0.70	0.40 ⁽⁸⁾
Braced Frames								
5	1	1	1	(5)	1	0.98	0.93	(5)
20	1	1	1	(5)	1	0.91	0.80	(5)
40	1	1	1	(5)	0.91	0.82	0.72	(5)
70	1	1	1.19	(5)	0.91	0.77	0.61	(5)
Walls, Wall-Frame Systems								
5	1	1	1	1.30 ⁽⁷⁾	1	1	0.85	0.59 ⁽⁸⁾
20	1	1	1.18	2.50 ⁽⁷⁾	1	0.80	0.60	0.35 ⁽⁸⁾
40	1	1.25	1.85	4.10 ⁽⁷⁾	0.80	0.59	0.42	0.23 ⁽⁸⁾
70	1	1.25	2.30	6.40 ⁽⁷⁾	0.80	0.56	0.30	0.18 ⁽⁸⁾
Other Systems								
5	1	1	1	(5)	1	1	0.85	(5)
20	1	1	1.18	(5)	1	0.80	0.60	(5)
40	1	1.25	1.85	(5)	0.80	0.59	0.44	(5)
70	1	1.37	2.30	(5)	0.80	0.56	0.30	(5)

Notes to Table 4.1.8.11.:

- (1) For intermediate values of the spectral ratio S(0.2)/S(5.0), M_v and J shall be obtained by linear interpolation. For spectral ratios less than 5, M_v and J shall be obtained by linear interpolation with their values at a spectral ratio of 0 taken as equal to 1. For spectral ratios greater than 70, M_v and J shall be taken as equal to their values at a spectral ratio of 70.
- (2) For intermediate values of the fundamental lateral period, T_a , in cases where S(T_a) is obtained by log-log interpolation, M_v shall be obtained by linear interpolation using the values of M_v obtained in accordance with Note (1). In cases where S(T_a) is obtained by linear interpolation, the product S(T_a) M_v shall be obtained by linear interpolation using the values of M_v obtained in accordance with Note (1).
- (3) For intermediate values of the fundamental lateral period, T_a , J shall be obtained by linear interpolation using the values of J obtained in accordance with Note (1).
- (4) For a combination of different SFRSs not given in Table 4.1.8.11. that are in the same direction under consideration, use the highest M_v factor of all the SFRSs and the corresponding value of J.

Notes to Table 4.1.8.11.: (Cont'd)

- (5) For fundamental lateral periods, T_a , greater than 2.0 s, use the 2.0 s values obtained in accordance with Note (1). See Clause 4.1.8.11.(2)(b).
- (6) A “coupled” wall is a wall system with coupling beams, where at least 66% of the base overturning moment resisted by the wall system is carried by the axial tension and compression forces resulting from shear in the coupling beams.
- (7) For fundamental lateral periods, T_a , greater than 4.0 s, use the 4.0 s values of $S(T_a)M_v$ obtained by interpolation between 2.0 s and 5.0 s using the value of M_v obtained in accordance with Note (1). See Clause 4.1.8.11.(2)(a).
- (8) For fundamental lateral periods, T_a , greater than 4.0 s, use the 4.0 s values of J obtained by interpolation between 2.0 s and 5.0 s using the value of J obtained in accordance with Note (1). See Clause 4.1.8.11.(2)(a).
- (8) The structure shall be designed to resist overturning effects caused by the earthquake forces determined in Sentence (7) and the overturning moment at level x , M_x , shall be determined using the following equation:

$$M_x = J_x \sum_{i=x}^n F_i (h_i - h_x)$$

where,

$$J_x = 1.0 \text{ for } h_x \geq 0.6h_n, \text{ and}$$

$$J_x = J + (1 - J)(h_x / 0.6h_n) \text{ for } h_x < 0.6h_n$$

where,

$$J = \text{base overturning moment reduction factor conforming to Table 4.1.8.11.}$$

- (9) Torsional effects that are concurrent with the effects of the forces determined in Sentence (7) and are caused by the simultaneous actions of the following torsional moments shall be considered in the design of the structure according to Sentence (11):
- torsional moments introduced by eccentricity between the centres of mass and resistance and their dynamic amplification, and
 - torsional moments due to accidental eccentricities.
- (10) Torsional sensitivity shall be determined by calculating the ratio B_x for each level x according to the following equation for each orthogonal direction determined independently:

$$B_x = \delta_{\max} / \delta_{\text{ave}}$$

where,

B = maximum of all values of B_x in both orthogonal directions, except that the B_x for one-storey penthouses with a weight less than 10% of the level below need not be considered,

δ_{\max} = maximum storey displacement at the extreme points of the structure at level x in the direction of the earthquake induced by the forces determined in Sentence (7) acting at distances $\pm 0.10 D_{nx}$ from the centres of mass at each floor, and

δ_{ave} = average of the displacements at the extreme points of the structure at level x produced by the forces determined in Sentence (7).

(11) Torsional effects shall be accounted for as follows:

- for a *building* with $B \leq 1.7$ or in Seismic Category SC1 or SC2, by applying torsional moments about a vertical axis at each level throughout the *building*, derived for each of the following load cases considered separately:
 - $T_x = F_x(e_x + 0.10 D_{nx})$, and
 - $T_x = F_x(e_x - 0.10 D_{nx})$

where F_x is determined in accordance with Sentence (7) and where each element of the *building* is designed for the most severe effect of the above load cases, or

- (b) for a *building* with $B > 1.7$ in Seismic Category SC3 or SC4, by a Dynamic Analysis Procedure as specified in Article 4.1.8.12.

(12) Where the fundamental lateral period, T_a , is determined in accordance with Clause (3)(d) and the *building* is constructed with more than 4 *storeys* of continuous wood construction and has a timber SFRS consisting of shear walls with wood-based panels or of braced or moment-resisting frames as defined in Table 4.1.8.9., the specified lateral earthquake force, V , as determined in Sentence (2) shall be multiplied by 1.2 but need not exceed the value determined by using Clause (2)(c). (See Note A-4.1.8.10.(5) and (6))

4.1.8.12. Dynamic Analysis Procedure

- (1) Except as provided in Articles 4.1.8.19. and 4.1.8.21., the Dynamic Analysis Procedure shall be in accordance with one of the following methods:
- (a) Linear Dynamic Analysis by either the Modal Response Spectrum Method or the Numerical Integration Linear Time History Method using a structural model that complies with the requirements of Sentence 4.1.8.3.(8), or (See Note A-4.1.8.12.(1)(a))
- (b) Non-linear Dynamic Analysis, in which case a special study shall be performed. (See Note A-4.1.8.12.(1)(b))
- (2) The spectral acceleration values used in the Modal Response Spectrum Method shall be the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(6).
- (3) The ground motion time histories used in the Numerical Integration Linear Time History Method shall be compatible with a response spectrum constructed from the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(6). (See Note A-4.1.8.12.(3).)
- (4) The effects of accidental torsional moments acting concurrently with the lateral earthquake forces that cause them shall be accounted for by the following methods:
- (a) the static effects of torsional moments due to $(\pm 0.10D_{nx})F_x$ at each level x , where F_x is either determined from the elastic dynamic analysis or determined from Sentence 4.1.8.11.(7) multiplied by R_dR_o/I_E , shall be combined with the effects determined by dynamic analysis, or (See Note A-4.1.8.12.(4)(a))
- (b) if B , as defined in Sentence 4.1.8.11.(10), is less than 1.7, it is permitted to use a three-dimensional dynamic analysis with the centres of mass shifted by a distance of $-0.05D_{nx}$ and $+0.05D_{nx}$.
- (5) Except as provided in Sentence (6), the adjusted elastic base shear, V_{ed} , shall be equal to the elastic base shear, V_e , obtained from a Linear Dynamic Analysis.
- (6) For structures located on a site designated as other than X_F that have an SFRS with R_d equal to or greater than 1.5, the elastic base shear obtained from a Linear Dynamic Analysis may be multiplied by the larger of the following factors to obtain the design elastic base shear, V_{ed} :

$$(2/3)S(0.2)/S(T_a) \leq 1.0 \quad \text{and}$$

$$S(0.5)/S(T_a) \leq 1$$

- (7) The design elastic base shear, V_{ed} , shall be multiplied by the importance factor, I_E , as determined in Article 4.1.8.5., and shall be divided by R_dR_o , as determined in Article 4.1.8.9., to obtain the design base shear, V_d .
- (8) Except as required by Sentence (9) or (12), if the base shear, V_d , obtained in Sentence (7), is less than 80% of the lateral earthquake design force, V , of Article 4.1.8.11., V_d shall be taken as $0.8V$.
- (9) For irregular structures requiring dynamic analysis in accordance with Article 4.1.8.7., V_d shall be taken as the larger of V_d , determined in Sentence (7), and 100% of V .

(10) Except as required by Sentence (11), the values of elastic *storey* shears, *storey* forces, member forces, and deflections obtained from the Linear Dynamic Analysis, including the effect of accidental torsion determined in Sentence (4), shall be multiplied by V_d/V_e to determine their design values, where V_d is the base shear.

(11) For the purpose of calculating deflections, it is permitted to use a value of V based on the value of T_a determined in Clause 4.1.8.11.(3)(d) to obtain V_d in Sentences (8) and (9).

(12) For *buildings* constructed with more than 4 *storeys* of continuous wood construction, having a timber SFRS consisting of shear walls with wood-based panels or braced or moment-resisting frames as defined in Table 4.1.8.9., and whose fundamental lateral period, T_a , is determined in accordance with Clause 4.1.8.11.(3)(d), the design base shear, V_d , shall be taken as the larger of V_d , determined in Sentence (7), and 100% of V . (See Note A-4.1.8.10.(5) and (6))

4.1.8.13. Deflections and Drift Limits

(1) Except as provided in Sentences (5) and (6), lateral deflections of a structure shall be calculated in accordance with the loads and requirements defined in this Subsection.

(2) Lateral deflections obtained from a linear elastic analysis using the methods given in Articles 4.1.8.11. and 4.1.8.12. and incorporating the effects of torsion, including accidental torsional moments, shall be multiplied by $R_d R_o / I_E$ and increased as required in Sentences 4.1.8.10.(8) and 4.1.8.16.(1) to give realistic values of anticipated deflections.

(3) Based on the lateral deflections calculated in Sentences (2), (5) and (6), the largest *interstorey* deflection at any level shall be limited to $0.01h_s$ for *post-disaster buildings*, $0.02h_s$ for High Importance Category *buildings*, and $0.025h_s$ for all other *buildings*.

(4) The deflections calculated in Sentence (2) shall be used to account for sway effects as required by Sentence 4.1.3.2.(12). (See Note A-4.1.8.13.(4))

(5) The lateral deflections of a seismically isolated structure shall be calculated in accordance with Article 4.1.8.20.

(6) The lateral deflections of a structure with supplemental energy dissipation shall be calculated in accordance with Article 4.1.8.22.

4.1.8.14. Structural Separation

(1) Adjacent structures shall be,

- (a) separated by a distance equal to at least the square root of the sum of the squares of their individual deflections calculated in Sentence 4.1.8.13.(2), or
- (b) connected to each other.

(2) The method of connection required in Sentence (1) shall take into account the mass, stiffness, strength, ductility and anticipated motion of the connected *buildings* and the character of the connection.

(3) Rigidly connected *buildings* shall be assumed to have the lowest $R_d R_o$ value of the *buildings* connected.

(4) *Buildings* with non-rigid or energy-dissipating connections require special studies.

4.1.8.15. Design Provisions

(1) Except as provided in Sentences (2) and (3), diaphragms, collectors, chords, struts and connections shall be designed so as not to yield, and the design shall account for the shape of the diaphragm, including openings, and for the forces generated in the diaphragm due to the following cases, whichever one governs:

- (a) forces determined in Article 4.1.8.11. or 4.1.8.12. applied to the diaphragm are increased to reflect the lateral load capacity of the SFRS, plus forces in the diaphragm due to the transfer of forces between elements of the SFRS associated with the lateral load capacity of such elements and accounting for discontinuities and changes in stiffness in these elements, or
- (b) a minimum force corresponding to the design-based shear divided by N for the diaphragm at level x .
(See Note A-4.1.8.15.(1))
- (2) Steel deck roof diaphragms in *buildings* of less than 4 *storeys* or wood diaphragms that are designed and detailed according to the applicable referenced design standards to exhibit ductile behaviour shall meet the requirements of Sentence (1), except that they may yield and the forces shall be
- (a) for wood diaphragms acting in combination with vertical wood shear walls, equal to the lateral earthquake design force,
- (b) for wood diaphragms acting in combination with other SFRSs, not less than the force corresponding to $R_d R_o = 2.0$, and
- (c) for steel deck roof diaphragms, not less than the force corresponding to $R_d R_o = 2.0$.
- (3) Where diaphragms are designed in accordance with Sentence (2), the struts shall be designed in accordance with Clause (1)(a), and the collectors, chords and connections between the diaphragms and the vertical elements of the SFRS shall be designed for forces corresponding to the capacity of the diaphragms in accordance with the applicable CSA standards. (See Note A-4.1.8.15.(3))
- (4) For single-storey *buildings* with steel deck or wood roof diaphragms designed with a value of R_d greater than 1.5 and where the calculated maximum relative deflection, Δ_D , of the diaphragm under lateral loads exceeds 50% of the average *storey* drift, Δ_B , of the adjoining vertical elements of the SFRS, dynamic magnification of the inelastic response due to the in-plane diaphragm deformations shall be accounted for in the design as follows:
- (a) the vertical elements of the SFRS shall be designed and detailed to any one of the following:
- (i) to accommodate the anticipated magnified lateral deformations taken as $R_o R_d (\Delta_B + \Delta_D) - R_o \Delta_D$,
 - (ii) to resist the forces magnified by $R_d (1 + \Delta_D / \Delta_B) / (R_d + \Delta_D / \Delta_B)$, or
 - (iii) by a special study, and
- (b) the roof diaphragm and chords shall be designed for in-plane shears and moments determined while taking into consideration the inelastic higher mode response of the structure.
(See Note A-4.1.8.15.(4))
- (5) Where the Seismic Category is SC3 or SC4, the elements supporting any discontinuous wall, column or braced frame shall be designed for the lateral load capacity of the components of the SFRS they support. (See Note A-4.1.8.15.(5).)
- (6) Where structures have vertical variations of $R_d R_o$ satisfying Sentence 4.1.8.9.(4), the elements of the SFRS below the level where the change in $R_d R_o$ occurs shall be designed for the forces associated with the lateral load capacity of the SFRS above that level. (See Note A-4.1.8.15.(6))
- (7) Where earthquake effects can produce forces in a column or wall due to lateral loading along both orthogonal axes, account shall be taken of the effects of potential concurrent yielding of other elements framing into the column or wall from all directions at the level under consideration and as appropriate at other levels. (See Note A-4.1.8.15.(7))
- (8) The design forces associated with the lateral capacity of the SFRS need not exceed the forces determined in accordance with Sentence 4.1.8.7.(1) with $R_d R_o$ taken as 1.0, unless otherwise provided by the applicable referenced design standards for elements, in which case the design forces associated with the lateral capacity of the SFRS need not exceed the forces determined in accordance with Sentence 4.1.8.7.(1) with $R_d R_o$ taken as less than or equal to 1.3. (See Note A-4.1.8.15.(8))
- (9) *Foundations* need not be designed to resist the lateral load overturning capacity of the SFRS, provided the design and the R_d and R_o for the type of SFRS used conform to Table 4.1.8.9. and that the *foundation* is designed in accordance with Sentence 4.1.8.16.(4).
- (10) *Foundation* displacements and rotations shall be considered as required by Sentence 4.1.8.16.(1).

4.1.8.16. Foundation Provisions

- (1) The increased displacements of the structure resulting from *foundation* movement shall be shown to be within acceptable limits for both the SFRS and the structural framing elements not considered to be part of the SFRS. (See Note A-4.1.8.16.(1).)
- (2) Except as provided in Sentences (3) and (4), *foundations* shall be designed to have factored shear and overturning resistances greater than the lateral load capacity of the SFRS. (See Note A-4.1.8.16.(2))
- (3) The shear and overturning resistances of the *foundation* determined using a bearing stress equal to 1.5 times the factored bearing strength of the *soil* or *rock* and all other resistances equal to 1.3 times the factored resistances need not exceed the design forces determined in Sentence 4.1.8.7.(1) using $R_dR_o = 1.0$, except that the factor of 1.3 shall not apply to the portion of the resistance to uplift or overturning resulting from gravity loads.
- (4) A *foundation* is permitted to have a factored overturning resistance less than the lateral load overturning capacity of the supported SFRS, provided the following requirements are met:
- (a) neither the *foundation* nor the supported SFRS are constrained against rotation, and
 - (b) the design overturning moment of the *foundation* is
 - (i) not less than 75% of the overturning capacity of the supported SFRS, and
 - (ii) not less than that determined in Sentence 4.1.8.7.(1) using $R_dR_o = 2.0$. (See Note A-4.1.8.16.(4))
- (5) The design of *foundations* shall be such that they are capable of transferring earthquake loads and effects between the *building* and the ground without exceeding the capacities of the *soil* and *rock*.
- (6) Where the Seismic Category is SC3 or SC4, the following requirements shall be satisfied:
- (a) *piles* or *pile caps*, drilled piers, and *caissons* shall be interconnected by continuous ties in not less than two directions (See Note A-4.1.8.16.(6)(a)),
 - (b) *piles*, drilled piers, and *caissons* shall be embedded a minimum of 100 mm into the *pile cap* or structure, and
 - (c) *piles*, drilled piers, and *caissons*, other than wood *piles*, shall be connected to the *pile cap* or structure for a minimum tension force equal to 0.15 times the factored compression load on the *pile*.
- (7) Where the Seismic Category is SC3 or SC4, *basement* walls shall be designed to resist earthquake lateral pressures from backfill or natural ground. (See Note A-4.1.8.16.(7).)
- (8) Where the Seismic Category is SC4, the following requirements shall be satisfied:
- (a) *piles*, drilled piers, or *caissons* shall be designed and detailed to accommodate cyclic inelastic behaviour when the design moment in the element due to earthquake effects is greater than 75% of its moment capacity, and (See Note A-4.1.8.16.(8)(a))
 - (b) spread footings founded on *soil* designated as X_V , where V_{s30} is less than or equal to 180 m/s, X_E or X_F shall be interconnected by continuous ties in not less than two directions.
- ei (9) Each segment of a tie between elements that is required by Clause (6)(a) or (8)(b) shall be designed to carry by tension or compression a horizontal force at least equal to the greatest factored *pile cap* or column vertical load in the elements it connects, multiplied by a factor of $0.1I_{ES}(0.2)$, unless it can be demonstrated that equivalent restraints can be provided by other means. (See Note A-4.1.8.16.(9))
- (10) The potential for liquefaction of the *soil* and its consequences, such as significant ground displacement and loss of *soil* strength and stiffness, shall be evaluated based on the ground motion parameters referenced in Subsection 1.1.3., as modified by Article 4.1.8.4., and shall be taken into account in the design of the structure and its *foundations*. (See Note A-4.1.8.16.(10))

4.1.8.17. Site Stability

(1) The potential for slope instability and its consequences, such as slope displacement, shall be evaluated based on site-specific material properties and ground motion parameters referenced in Subsection 1.1.3. as modified by Article 4.1.8.4., and shall be taken into account in the design of the structure and its *foundations*. (See Note A-4.1.8.17.(1).)

4.1.8.18. Elements of Structures, Non-Structural Components and Equipment

(See Note A-4.1.8.18.)

(1) Except as provided in Sentences (2), (7) and (16), elements and components of *buildings* described in Table 4.1.8.18. and their connections to the structure shall be designed to accommodate the *building* deflections calculated in accordance with Article 4.1.8.13. and the element or component deflections calculated in accordance with Sentence (9), and shall be designed for a specified lateral earthquake force, V_p , distributed according to the distribution of mass:

$$V_p = 0.3S(0.2)I_E S_p W_p$$

where

$S(0.2)$ = design spectral acceleration value at a period of 0.2 s, as defined in Sentence 4.1.8.4.(6),

I_E = earthquake importance factor for the building, as defined in Article 4.1.8.5.,

S_p = $C_p A_r A_x / R_p$ (the maximum value of S_p shall be taken as 4.0 and the minimum value of S_p shall be as 0.7), where

C_p = element or component factor from Table 4.1.8.18.,

A_r = element or component force amplification factor from Table 4.1.8.18.,

A_x = height factor $(1 + 2h_x/h_n)$,

R_p = element or component response modification factor from Table 4.1.8.18., and

W_p = weight of the component or element.

(2) For *buildings* in Seismic Category SC1 or SC2, other than *post-disaster buildings*, *seismically isolated buildings*, and *buildings* with supplemental energy dissipation systems, the requirements of Sentence (1) need not apply to Categories 6 through 22 of Table 4.1.8.18.

(3) For the purpose of applying Sentence (1) for Categories 11 and 12 of Table 4.1.8.18., elements or components shall be assumed to be flexible or flexibly connected unless it can be shown that the fundamental period of the element or component and its connection is less than or equal to 0.06 s, in which case the element or component is classified as being rigid and rigidly connected.

(4) The weight of access floors shall include the *dead load* of the access floor and the weight of permanent equipment, which shall not be taken as less than 25% of the floor *live load*.

(5) When the mass of a tank plus its contents or the mass of a flexible or flexibly connected piece of machinery, fixture or equipment is greater than 10% of the mass of the supporting floor, the lateral forces shall be determined by rational analysis.

(6) Forces shall be applied in the horizontal direction that results in the most critical loading for design, except for Category 6 of Table 4.1.8.18., where the forces shall be applied up and down vertically.

Table 4.1.8.18.
Elements of Structures and Non-Structural Components and Equipment⁽¹⁾
 Forming Part of Sentences 4.1.8.18.(1) to (3), (6), (7) and (16), and Clauses 4.1.8.23.(2)(c) and (3)(c)

Category	Part or Portion of <i>Building</i>	C _p	A _r	R _p
Architectural and Structural Components				
1	All exterior and interior walls, and cladding panels, except those in Category 2 or 3	1.00	1.00	2.50
2	Cantilever parapet and other cantilever walls, including cantilever cladding panels, except retaining walls	1.00	2.50	2.50
3	Exterior and interior ornamentalations and appendages	1.00	2.50	2.50
4	Floors and roofs acting as diaphragms ⁽²⁾	---	---	---
5	Towers, <i>chimneys</i> , smokestacks and penthouses when connected to or forming part of a <i>building</i>	1.00	2.50	2.50
6	Horizontally cantilevered floors, balconies, beams, etc.	1.00	1.00	2.50
7	Suspended ceilings, light fixtures and other attachments to ceilings with independent vertical support	1.00	1.00	2.50
8	Masonry veneer connections	1.00	1.00	1.50
9	Access floors	1.00	1.00	2.50
10	Masonry or concrete fences more than 1.8 m tall	1.00	1.00	2.50
Mechanical and Electrical Components				
11	Machinery, fixtures, equipment and tanks (including contents)			
	that are rigid and rigidly connected	1.00	1.00	1.25
	that are flexible or flexibly connected	1.00	2.50	2.50
12	Machinery, fixtures, equipment and tanks (including contents) containing toxic or explosive materials, materials having a <i>flash point</i> below 38°C or firefighting fluids			
	that are rigid and rigidly connected	1.50	1.00	1.25
	that are flexible or flexibly connected	1.50	2.50	2.50
13	Flat bottom tanks (including contents) attached directly to a floor at or below <i>grade</i> within a <i>building</i>	0.70	1.00	2.50
14	Flat bottom tanks (including contents) attached directly to a floor at or below <i>grade</i> within a <i>building</i> containing toxic or explosive materials, materials having a <i>flash point</i> below 38°C or firefighting fluids	1.00	1.00	2.50
15	Pipes, ducts (including contents)	1.00	1.00	3.00
16	Pipes, ducts (including contents) containing toxic or explosive materials	1.50	1.00	3.00
17	Electrical cable trays, bus ducts, conduits	1.00	2.50	5.00
Other System Components				
18	Rigid components with ductile material and connections	1.00	1.00	2.50
19	Rigid components with non-ductile material or connections	1.00	1.00	1.00
20	Flexible components with ductile material and connections	1.00	2.50	2.50
21	Flexible components with non-ductile material or connections	1.00	2.50	1.00
22	Elevators and escalators ⁽³⁾	1.00	1.00	1.25
	machinery and equipment	As per Category 11		
	elevator rails	1.00	1.00	2.50
23	Floor-mounted steel pallet storage racks ⁽⁴⁾	1.00	2.50	2.50
24	Floor-mounted steel pallet storage racks on which are stored toxic or explosive materials or materials having a <i>flash point</i> below 38°C ⁽⁴⁾	1.50	2.50	2.50

Notes to Table 4.1.8.18.:

- (1) See Note A-Table 4.1.8.18.
- (2) See Sentence (8).
- (3) See also ASME A17.1 / CSA B44, "Safety Code for Elevators and Escalators."
- (4) See Sentence (13) and Note A-Table 4.1.8.18.

- (7) Connections to the structure of elements and components listed in Table 4.1.8.18. shall be designed to support the component or element for gravity loads, shall conform to the requirements of Sentence (1), and shall also satisfy these additional requirements:
- (a) except as provided in Sentence (17), friction due to gravity loads shall not be considered to provide resistance to earthquake forces,
 - (b) R_p for non-ductile connections, such as adhesives or power-actuated fasteners, shall be taken as 1.0,
 - (c) R_p for shallow post-installed mechanical, post-installed adhesive, and cast-in-place anchors in concrete shall be 1.5, where shallow anchors are those with a ratio of embedment length to diameter of less than 8,
 - (d) post-installed mechanical, drop-in and adhesive anchors in concrete shall be pre-qualified for seismic applications by cyclic load testing in accordance with
 - (i) CSA A23.3, “Design of concrete structures,” and
 - (ii) ACI 355.2, “Qualification of Post-Installed Mechanical Anchors in Concrete (ACI 355.2-19) and Commentary,” or ACI 355.4, “Qualification of Post-Installed Adhesive Anchors in Concrete (ACI 355.4-19) and Commentary,” as applicable,
 - (e) post-installed mechanical and adhesive anchors in masonry and post-installed mechanical anchors in structural steel shall be pre-qualified for seismic applications by cyclic tension load testing, (See Note A-4.1.8.18.(7)(e))
 - (f) power-actuated fasteners shall not be used for cyclic tension loads,
 - (g) connections for non-structural elements or components of Category 1, 2 or 3 of Table 4.1.8.18. attached to the side of a *building* and above the first level above *grade* shall satisfy the following requirements:
 - (i) for connections where the body of the connection is ductile, the body shall be designed for values of C_p , A_r and R_p given in Table 4.1.8.18., and all of the other parts of the connection, such as anchors, welds, bolts and inserts, shall be capable of developing 2.0 times the nominal yield resistance of the body of the connection, and
 - (ii) connections where the body of the connection is not ductile shall be designed for values of $C_p = 2.0$, $R_p = 1.0$ and A_r given in Table 4.1.8.18., and
 - (h) a ductile connection is one where the body of the connection is capable of dissipating energy through cyclic inelastic behaviour.
- (8) Floors and roofs acting as diaphragms shall satisfy the requirements for diaphragms stated in Article 4.1.8.15.
- (9) Lateral deflections of elements or components shall be based on the loads defined in Sentence (1) and lateral deflections obtained from an elastic analysis shall be multiplied by R_p/I_E to give realistic values of the anticipated deflections.
- (10) The elements or components shall be designed so as not to transfer to the structure any forces unaccounted for in the design, and rigid elements such as walls or panels shall satisfy the requirements of Sentence 4.1.8.3.(6).
- (11) Seismic restraint for suspended equipment, pipes, ducts, electrical cable trays, etc. shall be designed to meet the force and displacement requirements of this Article and be constructed in a manner that will not subject hanger rods to bending.
- (12) Isolated suspended equipment and components, such as pendent lights, may be designed as a pendulum system provided that adequate chains or cables capable of supporting 2.0 times the weight of the suspended component are provided and the deflection requirements of Sentence (10) are satisfied.
- (13) Free-standing steel pallet storage racks are permitted to be designed to resist earthquake effects using rational analysis, provided the design achieves the minimum performance level required by Subsection 4.1.8. (See Note A-4.1.8.18.(13) and 4.4.3.1.(1).)

(14) Except as provided in Sentence (15), the relative displacement of glass in glazing systems, D_{fallout} , shall be equal to the greater of

(a) $D_{\text{fallout}} \geq 1.25I_E D_p$, where

D_{fallout} = relative displacement at which glass fallout occurs, and

D_p = relative earthquake displacement that the component must be designed to accommodate, calculated in accordance with Article 4.1.8.13. and applied over the height of the glass component, or

(b) 13 mm.

(See Note A-4.1.8.18.(14) and (15))

(15) Glass need not comply with Sentence (14), provided at least one of the following conditions is met:

(a) the Seismic Category is SC1 or SC2,

(b) the glass has sufficient clearance from its frame such that $D_{\text{clear}} \geq 1.25D_p$ calculated as follows:

$$D_{\text{clear}} = 2C_1(1 + h_p C_2 / (b_p C_1))$$

where

D_{clear} = relative horizontal displacement measured over the height of the glass panel, which causes initial glass-to-frame contact,

C_1 = average of the clearances on both sides between the vertical glass edges and the frame,

h_p = height of the rectangular glass panel,

C_2 = averages of the top and bottom clearances between the horizontal glass edges and the frame, and

b_p = width of the rectangular glass panel,

(c) the glass is fully tempered, monolithic, installed in a non-*post-disaster building*, and no part of the glass is located more than 3 m above a walking surface, or

(d) the glass is annealed or heat-strengthened laminated glass in a single thickness with an interlayer no less than 0.76 mm and captured mechanically in a wall system glazing pocket with the perimeter secured to the frame by a wet, glazed, gunable, curing, elastomeric sealant perimeter bead of 13 mm minimum glass contact width.

(See Note A-4.1.8.18.(14) and (15))

(16) For structures with supplemental energy dissipation, elements and components of *buildings* described in Table 4.1.8.18. and their connections to the structure shall be designed for a specified lateral earthquake force, V_p , determined at each floor level as follows:

$$V_p = S_{\text{sed}} I_E (C_p A_r / R_p) W_p$$

where

S_{sed} = peak spectral acceleration, $S_a(T, X)$, in the period range of $T = 0$ s to $T = 0.5$ s determined from the mean 5%-damped floor spectral acceleration values by averaging the individual 5%-damped floor response spectra at the centroid of the floor area at that floor level determined using Non-linear Dynamic Analysis, and

I_E, C_p, A_r, R_p, W_p = as defined in Sentence (1).

(See Note A-4.1.8.18.(16))

- (17) For a ballasted array of interconnected solar panels mounted on a roof, where $I_{ES}(0.2)$ is less than or equal to 1.0, friction due to gravity loads is permitted to be considered to provide resistance to seismic forces, provided
- (a) the roof is not normally occupied,
 - (b) the roof is surrounded by a parapet extending from the roof surface to not less than the greater of
 - (i) 150 mm above the centre of mass of the array, and
 - (ii) 400 mm above the roof surface,
 - (c) the height of the centre of mass of the array above the roof surface is less than the lesser of
 - (i) 900 mm, and
 - (ii) one half of the smallest plan dimension of the supporting base of the array,
 - (d) the roof slope at the location of the array is less than or equal to 3° ,
 - (e) the factored friction resistance calculated using the kinetic friction coefficient determined in accordance with Sentence (18) and a resistance factor of 0.7 is greater than or equal to the specified lateral earthquake force, V_p , on the array determined in accordance with Sentence (1) using values of $A_r = 1.0$, $A_x = 3.0$, $C_p = 1.0$, and $R_p = 1.25$,
 - (f) the minimum clearance between the array and other arrays or fixed objects is the greater of
 - (i) 225 mm, and
 - (ii) $1\,500(I_{ES}(0.2) - 0.4)^2$, in mm, and
 - (g) the minimum clearance between the array and the roof parapet is the greater of
 - (i) 450 mm, and
 - (ii) $3\,000(I_{ES}(0.2) - 0.4)^2$, in mm.
- (18) For the purpose of Clause (17)(e), the kinetic friction coefficient shall be determined in accordance with ASTM G115, “Standard Guide for Measuring and Reporting Friction Coefficients,” through experimental testing that
- (a) is carried out by an accredited laboratory on a full-scale array or a prototype of the array,
 - (b) models the interface between the supporting base of the array and the roof surface, and
 - (c) accounts for the adverse effects of anticipated climatic conditions on the friction resistance.
- (See Note A-4.1.8.18.(18))

4.1.8.19. Seismic Isolation

- (1) For the purposes of this Article and Article 4.1.8.20., the following terms shall have the meanings stated herein:
- (a) “seismic isolation” is an alternative seismic design concept that consists of installing an isolation system with low horizontal stiffness, thereby substantially increasing the fundamental period of the structure;
 - (b) “isolation system” is a collection of structural elements at the level of the isolation interface that includes all individual isolator units, all structural elements that transfer force between elements of the isolation system, all connections to other structural elements, and may also include a wind-restraint system, energy-dissipation devices, and a displacement restraint system;
 - (c) “seismically isolated structure” includes the upper portion of the structure above the isolation system, the isolation system, and the portion of the structure below the isolation system;
 - (d) “isolator unit” is a structural element of the isolation system that permits large lateral deformations under lateral earthquake forces and is characterized by vertical-load-carrying capability combined with increased horizontal flexibility and high vertical stiffness, energy dissipation (hysteretic or viscous), self-centering capability, and lateral restraint (sufficient elastic stiffness) under non-seismic service lateral loads;
 - (e) “isolation interface” is the boundary between the isolated upper portion of the structure above the isolation system and the lower portion of the structure below the isolation system; and
 - (f) “wind-restraint system” is the collection of structural elements of the isolation system that provides restraint of the seismically isolated structure for wind loads and is permitted to be either an integral part of the isolator units or a separate device.
- (2) Every seismically isolated structure and every portion thereof shall be analyzed and designed in accordance with
- (a) this Article and Article 4.1.8.20.,
 - (b) other applicable requirements of this Subsection, and
 - (c) appropriate engineering principles and current engineering practice.
- (See Note A-4.1.8.19.(2))

- (3) For the analysis and modeling of the seismically isolated structure, the following criteria shall apply:
- (a) a three-dimensional Non-linear Dynamic Analysis of the structure shall be performed in accordance with Article 4.1.8.12., (See Note A-4.1.8.19.(3)(a))
 - (b) unless verified from rational analysis, the inherent equivalent viscous damping—excluding the hysteretic damping provided by the isolation system or supplemental energy dissipation devices—used in the analysis shall not be taken as more than 2.5% of the critical damping at the significant modes of vibration,
 - (c) all individual isolator units shall be modeled with sufficient detail to account for their non-linear force-deformation characteristics, including effects of the relevant loads, and with consideration of variations in material properties over the design life of the structure, and
 - (d) except for elements of the isolation system, other components of the seismically isolated structure shall be modeled using elastic material properties in accordance with Sentence 4.1.8.3.(8).
- (4) The ground motion time histories used in Sentence (3) shall be
- (a) appropriately selected and scaled following good engineering practice,
 - (b) compatible with
 - (i) a response spectrum derived from the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(6) for site designations X_V , where V_{s30} is greater than 360 m/s, X_A , X_B and X_C , and
 - (ii) a 5%-damped response spectrum based on a site-specific evaluation for site designations X_V , where V_{s30} is less than or equal to 360 m/s, X_D , X_E and X_F , and
 - (c) amplitude-scaled in an appropriate manner over the period range of $0.2T_1$ to $1.5T_1$, where T_1 is the period of the isolated structure determined using the post-yield stiffness of the isolation system in the horizontal direction under consideration, or the period specified in Sentence 4.1.8.20.(1) if the post-yield stiffness of the isolation system is not well defined.
- (See Note A-4.1.8.19.(4) and 4.1.8.21.(5))

4.1.8.20. Seismic Isolation Design Provisions

- (1) The period of the isolated structure, determined using the post-yield stiffness of the isolation system in the horizontal direction under consideration, shall be greater than three times the period of the structure above the isolation interface calculated as a fixed base.
- (2) The isolation system shall be configured to produce a restoring force such that the lateral force at the TDD at the centre of mass of the isolated structure above the isolation interface is at least $0.025W_b$ greater than the lateral force at 50% of the TDD at the same location, in each horizontal direction, where W_b is the portion of W above the isolation interface.
- (3) The values of *storey* shears, *storey* forces, member forces, and deflections used in the design of all structural framing elements and components of the isolation system shall be obtained from analysis conforming to Sentence 4.1.8.19.(3) using one of the following values, whichever produces the most critical effect:
- (a) mean plus I_E times the standard deviation of results of all Non-linear Dynamic Analyses, or
 - (b) $\sqrt{I_E}$ times the mean of the results of all Non-linear Dynamic Analyses.
- (4) The force-deformation and damping characteristics of the isolation system used in the analysis and design of seismically isolated structures shall be validated by testing at least two full-size specimens of each predominant type and size of isolator unit of the isolation system, which shall include
- (a) the individual isolator units,
 - (b) separate supplemental damping devices, if used, and
 - (c) separate sacrificial wind-restraint systems, if used.
- (5) The force-deformation characteristics and damping value of a representative sample of the isolator units installed in the *building* shall be validated by tests prior to their installation.
- (6) A diaphragm or horizontal structural elements shall provide continuity immediately above the isolation interface to transmit forces due to non-uniform ground motions from one part of the structure to another.

- (7) All structural framing elements shall be designed for the forces described in Sentence (3) with $R_d R_o = 1.0$, except
 - (a) for structures with $I_E < 1.5$, all SFRSs shall be detailed in accordance with the requirements for $R_d \geq 1.5$ and the applicable referenced design standards, and
 - (b) for structures with $I_E = 1.5$, all SFRSs shall be detailed in accordance with the requirements for $R_d \geq 2.0$ and the applicable referenced design standards.
- (8) The height restrictions noted in Table 4.1.8.9. need not apply to seismically isolated structures.
- (9) All isolator units shall be
 - (a) designed for the forces described in Sentence (3), and
 - (b) able to accommodate the TDD determined at the specific location of each isolator unit.
- (10) The isolation system, including a separate wind-restraint system if used, shall limit lateral displacement due to wind loads across the isolation interface to a value equal to that required for the least *storey* height in accordance with Sentence 4.1.3.5.(3).

4.1.8.21. Supplemental Energy Dissipation

- (1) For the purposes of this Article and Article 4.1.8.22., the following terms shall have the meanings stated herein:
 - (a) “supplemental energy dissipation device” is a dedicated structural element of the supplemental energy dissipation system that dissipates energy due to relative motion of each of its ends or by alternative means, and includes all pins, bolts, gusset plates, brace extensions and other components required to connect it to the other elements of the structure; a device may be classified as either displacement-dependent or velocity-dependent, or a combination thereof, and may be configured to act in either a linear or non-linear manner; and
 - (b) “supplemental energy dissipation system” is a collection of energy dissipation devices installed in a structure that supplement the energy dissipation of the SFRS.
- (2) Every structure with a supplemental energy dissipation system and every portion thereof shall be designed and constructed in accordance with
 - (a) this Article and Article 4.1.8.22.,
 - (b) other applicable requirements of this Subsection, and
 - (c) appropriate engineering principles and current engineering practice.(See Note A-4.1.8.21.(2))
- (3) Where supplemental energy dissipation devices are used across the isolation interface of a seismically isolated structure, displacements, velocities, and accelerations shall be determined in accordance with Article 4.1.8.20.
- (4) For the analysis and modeling of structures with supplemental energy dissipation devices, the following criteria shall apply:
 - (a) a three-dimensional Non-linear Dynamic Analysis of the structure shall be performed in accordance with Article 4.1.8.12., (See Note A-4.1.8.21.(4)(a))
 - (b) for an SFRS with $R_d > 1.0$, the non-linear hysteretic behaviour of the SFRS shall be explicitly—with sufficient detail—accounted for in the modeling and analysis of the structure,
 - (c) unless verified from rational analysis, the inherent equivalent viscous damping—excluding the damping provided by the supplemental energy dissipation devices—used in the analysis shall not be taken as more than 2.5% of the critical damping at the significant modes of vibration,
 - (d) all supplemental energy dissipation devices shall be modeled with sufficient detail to account for their non-linear force deformation characteristics, including effects of the relevant loads, and with consideration of variations in their properties over the design life of the structure, and
 - (e) except for the SFRS and elements of the supplemental energy dissipation system, other components of the structure shall be modeled using elastic material properties in accordance with Sentence 4.1.8.3.(8).

- (5) The ground motion time histories used in Sentence (4) shall be
 - (a) appropriately selected and scaled following good engineering practice,
 - (b) compatible with a 5%-damped response spectrum derived from the design spectral acceleration values, $S(T)$, defined in Sentence 4.1.8.4.(6), and
 - (c) amplitude-scaled in an appropriate manner over the period range of $0.2T_1$ to $1.5T_1$, where T_1 is the fundamental lateral period of the structure with the supplemental energy dissipation system.(See Note A-4.1.8.19.(4) and 4.1.8.21.(5))

4.1.8.22. Supplemental Energy Dissipation Design Considerations

- (1) The values of *storey* shears, *storey* forces, member forces, and deflections for the design of all structural framing elements and all supplemental energy dissipation devices shall be obtained from analysis conforming to Sentence 4.1.8.21.(4) using one of the following values, whichever produces the most critical effect:
 - (a) mean plus I_E times the standard deviation of the results of all Non-linear Dynamic Analyses, or
 - (b) $\sqrt{I_E}$ times the mean of the results of all Non-linear Dynamic Analyses.
- (2) The largest inter*storey* deflection at any level of the structure as determined in accordance with Sentence (1) shall conform to the limits stated in Sentence 4.1.8.13.(3).
- (3) The force-deformation and force-velocity characteristics of the supplemental energy dissipation devices used in the analysis and design of structures with supplemental energy dissipation systems shall be validated by testing at least two full-size specimens of each type of supplementary energy dissipation device.
- (4) The force-deformation and force-velocity characteristics and damping values of a representative sample of the supplemental energy dissipation devices installed in the *building* shall be validated by tests prior to their installation.
- (5) All components of a supplemental energy dissipation device, except that portion of the device that dissipates energy, shall be designed to remain elastic.
- (6) All structural framing elements shall be designed
 - (a) for an SFRS with $R_d = 1.0$, using the forces referred to in Sentence (1) with $R_d R_o = 1.0$, except that the SFRS shall be detailed in accordance with the requirements for $R_d \geq 1.5$ and the applicable referenced design standards, or
 - (b) for an SFRS with $R_d > 1.0$, using the forces referred to in Sentence (1) with $R_d R_o = 1.0$, except that the SFRS shall be detailed in accordance with the requirements for the selected R_d and the applicable referenced design standards.
- (7) Supplemental energy dissipation devices and other components of the supplemental energy dissipation system shall be designed in accordance with Sentence (1) with consideration of the following:
 - (a) low-cycle, large-displacement degradation due to seismic loads,
 - (b) high-cycle, small-displacement degradation due to wind, thermal, or other cyclic loads,
 - (c) forces or displacements due to gravity loads,
 - (d) adhesion of device parts due to corrosion or abrasion, biodegradation, moisture, or chemical exposure,
 - (e) exposure to environmental conditions, including, but not limited to, temperature, humidity, moisture, radiation (e.g., ultraviolet light), and reactive or corrosive substances (e.g., salt water),
 - (f) devices subject to failure due to low-cycle fatigue must resist wind forces without slip, movement, or inelastic cycling,
 - (g) the range of thermal conditions, device wear, manufacturing tolerances, and other effects that cause device properties to vary during the design life of the device, and
 - (h) connection points of devices must provide sufficient articulation to accommodate simultaneous longitudinal, lateral, and vertical displacements of the supplemental energy dissipation system.
- (8) Means of access for inspection and removal for replacement of all supplemental energy dissipation devices shall be provided.

4.1.8.23. Additional Performance Requirements for Post-disaster Buildings, High Importance Category Buildings, and a Subset of Normal Importance Category Buildings

- (1) *Buildings* designed in accordance with Articles 4.1.8.19. to 4.1.8.22. need not comply with this Article.
- (2) The design of *post-disaster buildings* in Seismic Category SC2, SC3 or SC4 shall be verified using 5%-damped spectral acceleration values based on a 5% probability of exceedance in 50 years and shall satisfy the following requirements:
 - (a) the *building* shall be shown to behave elastically for a specified lateral earthquake force, V , determined in accordance with Sentence 4.1.8.11.(2) using $I_E = 1.0$ and $R_dR_o = 1.3$,
 - (b) the largest *interstorey* deflection at any level of the *building*, as determined in accordance with Sentence 4.1.8.13.(2) using $I_E = 1.0$ and $R_dR_o = 1.0$, shall not exceed $0.005h_s$, and
 - (c) the connections of elements and components of the *building* described in Table 4.1.8.18. with $R_p > 1.5$ shall be shown to behave elastically for a specified lateral earthquake force, V_p , determined in accordance with Sentence 4.1.8.18.(1) using $R_p = 1.5$.
- (3) The design of High Importance Category *buildings* in Seismic Category SC3 or SC4 shall be verified using 5%-damped spectral acceleration values based on a 10% probability of exceedance in 50 years and shall satisfy the following requirements:
 - (a) the *building* shall be shown to behave elastically for a specified lateral earthquake force, V , determined in accordance with Sentence 4.1.8.11.(2) using $I_E = 1.0$ and $R_dR_o = 1.3$,
 - (b) the largest *interstorey* deflection at any level of the *building*, as determined in accordance with Sentence 4.1.8.13.(2) using $I_E = 1.0$ and $R_dR_o = 1.0$, shall not exceed $0.005h_s$, and
 - (c) the connections of elements and components of the *building* described in Table 4.1.8.18. with $R_p > 1.3$ shall be shown to behave elastically for a specified lateral earthquake force, V_p , determined in accordance with Sentence 4.1.8.18.(1) using $R_p = 1.3$.
- (4) For Normal Importance Category *buildings* in Seismic Category SC4 with a height above *grade* of more than 30 m, the structural framing elements not considered to be part of the SFRS shall be designed to behave elastically for a specified lateral earthquake force, V , determined in accordance with Sentence 4.1.8.11.(2) using spectral acceleration values based on a 10% probability of exceedance in 50 years and $R_dR_o = 1.3$.
- (5) For the purposes of applying Sentences (2) to (4), torsional moments due to accidental eccentricities need not be considered if B , as determined in accordance with Sentence 4.1.8.11.(10), does not exceed 1.7.
- (6) For the purposes of applying Sentences (2) to (4), elements of the SFRS and structural framing elements not considered to be part of the SFRS, when included in the analysis, shall be modeled in accordance with Sentence 4.1.8.3.(8) using elastic properties.
- (7) All other requirements of Articles 4.1.8.2. to 4.1.8.18. shall be satisfied in meeting the additional requirements of this Article.

Section 4.2. Foundations

4.2.1. General

4.2.1.1. Application

- (1) This Section applies to *excavations* and *foundation* systems for *buildings*.

4.2.2. Subsurface Investigations, Drawings and Reviews

4.2.2.1. Subsurface Investigation

(1) A *subsurface investigation*, including *groundwater* conditions, shall be carried out by or under the direction of a professional engineer having knowledge and experience in planning and executing such investigations to a degree appropriate for the *building* and its use, the ground and the surrounding site conditions. (See Note A-4.2.2.1.(1))

4.2.2.2. Reserved

4.2.2.3. Field Review

(1) A field review shall be carried out by the *designer* or by another suitably qualified person to ascertain that the subsurface conditions are consistent with the design and that *construction* is carried out in accordance with the design and good engineering practice. (See Note A-4.2.2.3.(1))

(2) The review required by Sentence (1) shall be carried out

(a) on a continuous basis

(i) during the *construction* of all *deep foundation units* with all pertinent information recorded for each *foundation unit*,

(ii) during the installation and removal of retaining structures and related backfilling operations, and

(iii) during the placement of engineered *fills* that are to be used to support the *foundation units*, and

(b) as required, unless otherwise directed by the *chief building official*,

(i) in the *construction* of all shallow foundation units, and

(ii) in excavating, dewatering and other related works.

4.2.2.4. Altered Subsurface Condition

(1) If, during *construction*, the *soil*, *rock* or *groundwater* is found not to be of the type or in the condition used in design and as indicated on the drawings, the design shall be reassessed by the *designer*.

(2) If, during *construction*, climatic or any other conditions change the properties of the *soil*, *rock* or *groundwater*, the design shall be reassessed by the *designer*.

4.2.3. Materials Used in Foundations

4.2.3.1. Wood

(1) Wood used in *foundations* or in support of *soil* or *rock* shall conform with the appropriate requirements of Subsection 4.3.1.

4.2.3.2. Preservation Treatment of Wood

(1) Wood exposed to *soil*, *rock* or air above the lowest anticipated *groundwater* table shall be treated with preservative in conformance with CAN/CSA-O80 Series, “Wood preservation,” and the requirements of the appropriate standard as follows:

(a) CAN/CSA-O80.1, “Specification of treated wood,”

(b) CAN/CSA-O80.2, “Processing and treatment,” or

(c) CAN/CSA-O80.3, “Preservative formulations.”

(2) Wood treated as required in Sentence (1) shall be cared for as provided in Clause 4 of CAN/CSA-O80.0, “General requirements for wood preservation.”

4.2.3.3. Plain and Reinforced Masonry

(1) Plain or reinforced masonry used in *foundations* or in support of *soil* or *rock* shall conform with the requirements of Subsection 4.3.2.

4.2.3.4. Prevention of Deterioration of Masonry

(1) Where plain or reinforced masonry in *foundations* or in structures supporting *soil* or *rock* may be subject to conditions conducive to deterioration, protection shall be provided to prevent such deterioration.

4.2.3.5. Concrete

(1) Plain, reinforced or pre-stressed concrete used in *foundations* or in support of *soil* or *rock* shall conform with the requirements of Subsection 4.3.3.

4.2.3.6. Protection Against Chemical Attack

(1) Where concrete in *foundations* may be subject to chemical attack, it shall be treated in conformance with the requirements in CSA A23.1, “Concrete materials and methods of concrete construction.”

4.2.3.7. Steel

(1) Steel used in *foundations* or in support of *soil* or *rock* shall conform with the appropriate requirements of Subsection 4.3.3. or 4.3.4., unless otherwise specified in this Section.

4.2.3.8. Steel Piles

(1) Where steel *piles* are used in *deep foundations* and act as permanent load-carrying members, the steel shall conform with one of the following standards:

- (a) ASTM A252, “Standard Specification for Welded and Seamless Steel Pipe Piles,”
- (b) ASTM A283/A283M, “Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates,”
- (c) ASTM A1008/A1008M, “Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable,”
- (d) ASTM A1011/A1011M, “Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength,” or
- (e) CSA G40.21, “Structural quality steel.”

4.2.3.9. High Strength Steel Tendons

(1) Where high strength steel is used for tendons in anchor systems used for the permanent support of a *foundation* or in the erection of temporary support of *soil* or *rock* adjacent to an *excavation*, it shall conform with the requirements of CSA A23.1, “Concrete materials and methods of concrete construction.”

4.2.3.10. Corrosion of Steel

(1) Where conditions are corrosive to steel, adequate protection of exposed steel shall be provided. (See Article 1.2.1.1. of Division A for use of other materials.)

4.2.4. Design Requirements

4.2.4.1. Design Basis

- (1) The design of *foundations*, *excavations* and *soil-* and *rock-*retaining structures shall be based on a *subsurface investigation* carried out in conformance with the requirements of this Section, and on any of the following, as appropriate:
 - (a) application of generally accepted geotechnical and civil engineering principles by a *professional engineer* especially qualified in this field of work, as provided in this Section and other Sections of Part 4,
 - (b) established local practice, where such practice includes successful experience both with *soils* and *rocks* of similar type and condition and with a *foundation* or *excavation* of similar type, construction method, size and depth, or
 - (c) in situ testing of *foundation units*, such as the load testing of *piles*, anchors or footings, carried out by a person competent in this field of work.(See Note A-4.2.4.1.(1))
- (2) The *foundations* of a *building* shall be capable of resisting all the loads stipulated in Section 4.1., in accordance with limit states design in Subsection 4.1.3.
- (3) For the purpose of the application of the load combinations given in Table 4.1.3.2.-A, the geotechnical components of loads and the factored geotechnical resistances at ULS shall be determined by a suitably qualified and experienced *professional engineer*. (See Note A-4.2.4.1.(3))
- (4) Geotechnical components of service loads and geotechnical reactions for SLS shall be determined by a suitably qualified and experienced *professional engineer*.
- (5) The *foundation* of a *building* shall be designed to satisfy SLS requirements within the limits that the *building* is designed to accommodate, including total settlement and differential settlement, heave, lateral movement, tilt or rotation. (See Note A-4.2.4.1.(5))
- (6) Communication, interaction and coordination between the *designer* and the *professional engineer* responsible for the geotechnical aspects of the project shall take place to a degree commensurate with the complexity and requirements of the project.

4.2.4.2. Subsurface Investigation

- (1) A *subsurface investigation* shall be carried out to the depth and extent to which the *building* or *excavation* will significantly change the stress in the *soil* or *rock*, or to such a depth and extent as to provide all the necessary information for the design and *construction* of the *excavation* or the *foundations*.

4.2.4.3. Identification

- (1) The identification and classification of *soil*, *rock* and *groundwater* and descriptions of their engineering and physical properties shall be in accordance with a widely accepted system.

4.2.4.4. Depth of Foundations

- (1) Except as permitted in Sentence (2), the *bearing surface* of a *foundation* shall be below the level of potential damage, including damage resulting from *frost action*, and the *foundation* shall be designed to prevent damage resulting from *adfreezing* and frost jacking. (See Note A-4.2.4.4.(1))
- (2) The *bearing surface* of a *foundation* need not be below the level of potential damage from frost where the *foundation*
 - (a) is designed against *frost action*, or
 - (b) overlies material not susceptible to *frost action*.

4.2.4.5. Sloping Ground

(1) Where a *foundation* is to rest on, in or near sloping ground, this particular condition shall be provided for in the design.

4.2.4.6. Eccentric and Inclined Loads

(1) Where there is eccentricity or inclination of loading in *foundation units*, this effect shall be fully investigated and provided for in the design.

4.2.4.7. Dynamic Loading

(1) Where dynamic loading conditions apply, the effects shall be assessed by a special investigation of these conditions and provided for in the design.

4.2.4.8. Hydrostatic Uplift

(1) Where a *foundation* or any part of a *building* is subject to hydrostatic uplift, the effects shall be provided for in the design.

4.2.4.9. Groundwater Level Change

(1) Where proposed construction will result in a temporary or permanent change in the *groundwater level*, the effects of this change on adjacent *buildings* shall be fully investigated and provided for in the design.

4.2.4.10. Permafrost

(1) Where conditions of permafrost are encountered or proven to exist, the design of the *foundation* shall be based upon analysis of these conditions by a person especially qualified in that field of work.

4.2.4.11. Swelling and Shrinking Soils

(1) Where swelling or shrinking *soils*, in which movements resulting from moisture content changes may be sufficient to cause damage to a structure, are encountered or known to exist, such a condition shall be fully investigated and provided for in the design.

4.2.4.12. Expanding and Deteriorating Rock

(1) Where *rock* that expands or deteriorates when subjected to unfavourable environmental conditions or to stress release is known to exist, this condition shall be fully investigated and provided for in the design.

4.2.4.13. Construction on Fill

- (1) *Buildings* may be placed on *fill* if it can be shown by *subsurface investigation* that
- (a) the *fill* is or can be made capable of safely supporting the *building*,
 - (b) detrimental movement of the *building* or services leading to the *building* will not occur, and
 - (c) explosive gases can be controlled or do not exist.

4.2.4.14. Structural Design

(1) The structural design of the *foundation* of a *building*, the procedures and construction practices shall conform with the appropriate Sections of this Code unless otherwise specified in this Section.

4.2.5. Excavations

4.2.5.1. Design of Excavations

(1) The design of *excavations* and of supports for the sides of *excavations* shall conform with Subsection 4.2.4. and with this Subsection. (See Note A-4.2.5.1.(1))

4.2.5.2. Excavation Construction

(1) Every *excavation* shall be undertaken in such a manner as to prevent movement that would cause damage to adjacent *buildings* at all phases of *construction*.

(2) Material shall not be placed nor shall equipment be operated or placed in or adjacent to an *excavation* in a manner that may endanger the integrity of the *excavation* or its supports.

4.2.5.3. Supported Excavations

(1) The sides of an *excavation* in *soil* or *rock* shall be supported by a retaining structure conforming with the requirements of Articles 4.2.5.1. and 4.2.5.2., except as permitted in Article 4.2.5.4.

4.2.5.4. Unsupported Excavations

(1) The sides of an *excavation* in *soil* or *rock* may be unsupported where a design is prepared in conformance with the requirements of Articles 4.2.5.1. and 4.2.5.2.

4.2.5.5. Control of Water Around Excavations

(1) Surface water, all *groundwater*, *perched groundwater* and in particular *artesian groundwater* shall be kept under control at all phases of *excavation* and *construction*.

4.2.5.6. Loss of Ground

(1) At all phases of *excavation* and *construction*, loss of ground due to water or any other cause shall be prevented.

4.2.5.7. Protection and Maintenance at Excavations

(1) All sides of an *excavation*, supported and unsupported, shall be continuously maintained and protected from possible deterioration by construction activity or by the action of frost, rain and wind.

4.2.5.8. Backfilling

- (1) Where an *excavation* is backfilled, the backfill shall be placed so as to
- (a) provide lateral support to the *soil* adjacent to the *excavation*, and
 - (b) prevent detrimental movements.

(2) The material used as backfill or *fill* supporting a footing, *foundation* or a floor on *grade* shall be of a type that is not subject to detrimental volume change with changes in moisture content and temperature.

4.2.6. Shallow Foundations

4.2.6.1. Design of Shallow Foundations

(1) The design of *shallow foundations* shall be in conformance with Subsection 4.2.4. and the requirements of this Subsection. (See Note A-4.2.6.1.(1))

4.2.6.2. Support of Shallow Foundations

(1) Where a *shallow foundation* is to be placed on *soil* or *rock*, the *soil* or *rock* shall be cleaned of loose and unsound material and shall be adequate to support the *design load* taking into account temperature, precipitation, *construction* activities and other factors that may lead to changes in the properties of *soil* or *rock*.

4.2.6.3. Incorrect Placement of Shallow Foundations

- (1) Where a *shallow foundation unit* has not been placed or located as indicated on the drawings,
- the error shall be corrected, or
 - the design of the *foundation unit* shall be recalculated for the altered conditions by the *designer*.

4.2.6.4. Damaged Shallow Foundations

- (1) Where a *shallow foundation unit* is damaged,
- it shall be repaired, or
 - the *design* of the *foundation unit* shall be recalculated for the damaged condition by the *designer*.

4.2.7. Deep Foundations

4.2.7.1. General

(1) A *deep foundation* shall provide support for a *building* by transferring loads by end-bearing to a competent stratum at considerable depth below the structure, or by mobilizing resistance by adhesion or friction, or both, in the *soil* or *rock* in which it is placed. (See Note A-4.2.7.1.(1))

4.2.7.2. Design for Deep Foundations

- (1) *Deep foundations* shall be designed in conformance with Subsection 4.2.4. and this Subsection. (See Note A-4.2.7.2.(1))
- (2) Where *deep foundation units* are load tested, as required in Clause 4.2.4.1.(1)(c), the determination of the number and type of load test and the interpretation of the results shall be carried out by a professional engineer especially qualified in this field of work. (See Note A-4.2.7.2.(2))
- (3) The design of *deep foundations* shall be determined on the basis of geotechnical considerations taking into account
- the method of installation,
 - the degree of inspection,
 - the spacing of *foundation units* and group effects,
 - other requirements in this Subsection, and
 - the appropriate structural requirements in Section 4.1. and Subsections 4.3.1., 4.3.3. and 4.3.4.

(4) The portion of a *deep foundation unit* permanently in contact with *soil* or *rock* shall be structurally designed as a laterally supported compression member.

(5) The portion of a *deep foundation unit* that is not permanently in contact with *soil* or *rock* shall be structurally designed as a laterally unsupported compression member.

(6) The structural design of prefabricated *deep foundation units* shall allow for all stresses resulting from driving, handling and testing.

4.2.7.3. Tolerance in Alignment and Location

(1) Permissible deviations from the design alignment and the location of the top of *deep foundation units* shall be determined by design analysis and shall be indicated on the drawings.

4.2.7.4. Incorrect Alignment and Location

(1) Where a *deep foundation unit* has not been placed within the permissible deviations referred to in Article 4.2.7.3., the condition of the *foundation* shall be assessed by the *designer*.

4.2.7.5. Installation of Deep Foundations

- (1) *Deep foundation units* shall be installed in such a manner as not to impair
- (a) the strength of the *deep foundation units* and the properties of the *soil* or *rock* on or in which they are placed beyond the calculated or anticipated limits,
 - (b) the integrity of previously installed *deep foundation units*, or
 - (c) the integrity of neighbouring *buildings*.

4.2.7.6. Damaged Deep Foundation Units

- (1) Where inspection shows that a *deep foundation unit* is damaged or not consistent with design or good engineering practice,
- (a) such a unit shall be reassessed by the *designer*, and
 - (b) any necessary changes shall be made and action taken as required.

4.2.8. Special Foundations

4.2.8.1. General

(1) Where special *foundation* systems are used, such systems shall conform to Subsection 4.2.4., Sentence 4.1.1.5.(2) and Article 1.2.1.1. of Division A.

4.2.8.2. Use of Existing Foundations

(1) Existing *foundations* may be used to support new or altered *buildings* provided they comply with all pertinent requirements of this Section.

Section 4.3. Design Requirements for Structural Materials

4.3.1. Wood

4.3.1.1. Design Basis for Wood

(1) *Buildings* and their structural members made of wood shall conform to CSA O86, “Engineering design in wood.”

4.3.1.2. Glue-Laminated Members

(1) Glued-laminated members shall be fabricated in plants conforming to CSA O177, “Qualification Code for Manufacturers of Structural Glued-Laminated Timber.”

4.3.1.3. Termites

(1) In areas known to be infested by termites, the requirements in Articles 9.3.2.9., 9.12.1.1. and 9.15.5.1. shall apply.

4.3.2. Plain and Reinforced Masonry

4.3.2.1. Design Basis for Plain and Reinforced Masonry

(1) *Buildings* and their structural members made of plain and reinforced masonry shall conform to CSA S304, “Design of masonry structures.”

4.3.3. Plain, Reinforced and Pre-stressed Concrete

4.3.3.1. Design Basis for Plain, Reinforced and Pre-stressed Concrete

(1) *Buildings* and their structural members made of plain, reinforced and pre-stressed concrete shall conform to CSA A23.3, “Design of concrete structures.” (See Note A-4.3.3.1.(1))

4.3.4. Steel

4.3.4.1. Design Basis for Structural Steel

(1) *Buildings* and their structural members made of structural steel shall conform to CSA S16, “Design of steel structures.” (See Note A-4.3.4.1.(1))

4.3.4.2. Design Basis for Cold-Formed Steel

(1) *Buildings* and their structural members made of cold-formed steel shall conform to CSA S136, “North American Specification for the Design of Cold-Formed Steel Structural Members (using the Appendix B provisions applicable to Canada).” (See Note A-4.3.4.2.(1))

4.3.4.3. Steel Building Systems

(1) Steel *building* systems shall be manufactured by companies certified in accordance with the requirements of CSA A660, “Certification of manufacturers of steel building systems.”

4.3.5. Aluminum

4.3.5.1. Design Basis for Aluminum

(1) *Buildings* and their structural members made of aluminum shall conform to CSA S157/S157.1, “Strength design in aluminum/Commentary on CSA S157-17, Strength design in aluminum,” using the loads stipulated in Section 4.1., in accordance with limit states design in Subsection 4.1.3.

4.3.6. Glass

4.3.6.1. Design Basis for Glass

- (1) Glass used in *buildings* shall be designed in conformance with
- (a) CAN/CGSB-12.20-M, “Structural Design of Glass for Buildings,” using an adjustment factor on the wind load, W , of not less than 0.75, or
 - (b) ASTM E1300, “Standard Practice for Determining Load Resistance of Glass in Buildings,” using an adjustment factor on the wind load, W , of not less than 1.0.
- (See Note A-4.3.6.1.(1))

Section 4.4. Design Requirements for Special Structures

4.4.1. Air-, Cable- and Frame-Supported Membrane Structures

4.4.1.1. Design Basis for Air-, Cable- and Frame-Supported Membrane Structures

(1) The structural design of *air-supported structures* or cable- and frame-supported membrane structures shall conform to CSA S367, “Air-, cable-, and frame-supported membrane structures” using the loads stipulated in Section 4.1., in accordance with limit states design in Subsection 4.1.3.

4.4.2. Parking Structures

4.4.2.1. Design Basis for Storage Garages and Repair Garages

(1) *Storage garages* and *repair garages*, including associated ramps and pedestrian areas, shall be designed in conformance with the performance requirements of CSA S413, “Parking structures.” (See Note A-4.4.2.1.(1))

4.4.3. Storage Racks

4.4.3.1. Design Basis for Storage Racks

(1) Storage racks, including anchorage of racks, shall be designed for loads in accordance with this Part. (See Note A-4.1.8.18.(13) and 4.4.3.1.(1).)

4.4.4. Guards Over Retaining Walls

4.4.4.1. Guards Over Retaining Walls

(1) Every retaining wall that is designated in Sentence 1.3.1.1.(1) of Division A shall be protected by *guards* on all open sides where the public has access to open space at the top of the retaining wall.

4.4.5. Anchor Systems on Building Exterior

4.4.5.1. Anchor Systems on Building Exterior

(1) Where suspended maintenance and window cleaning operations are intended to be carried out on the exterior of a *building* described in Article 1.1.2.2. of Division A, anchor systems shall be provided where any portion of the roof is more than 8 m above adjacent ground level.

†1 (2) Except as provided in Sentence (3), the anchor systems in Sentence (1) shall be designed, installed and tested in conformance with CSA Z271, “Design of suspended access equipment.”

(3) Other anchor systems may be used where such systems provide an equal level of safety.

(4) The anchor system material shall be made of stainless steel, or other corrosion resistant base material, or from steel that is hot dipped galvanized, in accordance with CSA G164, “Hot dip galvanizing of irregularly shaped articles.”

Part 5

Environmental Separation

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Part 5

Environmental Separation (See Note A-5)

Section 5.1. General

5.1.1. Scope

5.1.1.1. Scope

- (1) This Part is concerned with
 - (a) the control of condensation
 - (i) in *building* components and assemblies, and
 - (ii) on *building* materials, components and assemblies, and
 - (b) the transfer of heat, air, moisture and sound through
 - (i) *building* materials, components and assemblies, and
 - (ii) interfaces between *building* materials, components and assemblies.

(See Note A-5.1.1.1.(1))

5.1.2. Application

5.1.2.1. Exposure to Exterior Space or the Ground and Separation of Dissimilar Environments

- (1) This Part applies to
 - (a) building materials, components and assemblies exposed to exterior space or the ground, including those separating interior space from exterior space or separating interior space from the ground,
 - (b) building materials, components and assemblies separating environmentally dissimilar interior spaces, and (See Note A-5.8.)
 - (c) site materials, components, assemblies and grading that may affect environmental loads on building materials, components and assemblies exposed to exterior space or the ground.

(See Note A-5.1.2.1.(1))

5.1.3. Definitions

5.1.3.1. Defined Words

- (1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

5.1.4. Resistance to Loads and Deterioration

5.1.4.1. Structural and Environmental Loads (See Note A-5.1.4.1.)

- (1) *Building* materials, components and assemblies that separate dissimilar environments or are exposed to the exterior shall be designed and constructed to provide sufficient capacity and integrity to resist or accommodate
- all environmental loads, and effects of those loads, that may reasonably be expected having regard to,
 - the intended use of the *building*, and
 - the environment to which the materials, components and assemblies are subject, and
 - all structural loads, and effects of those loads, that may be reasonably expected.
- (2) Where *building* materials, components or assemblies perform more than one function, they shall satisfy the requirements of all of those functions. (See Note A-5.1.4.1.(2))
- (3) Compliance with Clause (1)(a) shall be demonstrated by design complying with Subsection 5.2.1. and construction conforming to that design.
- (4) Compliance with Clause (1)(b) shall be demonstrated by design complying with Subsection 5.2.2., and construction conforming to that design, with regard to
- materials, components and assemblies, and associated loads, that are identified in Part 4,
 - air pressure loads imposed on *air barrier systems*,
 - wind up-lift imposed on roofing, and
 - hydrostatic pressure imposed on the means of protection from moisture in the ground.
- (5) For materials, components, assemblies and loads to which Sentence (4) does not apply, compliance with Clause (1)(b) shall be demonstrated
- by design complying with Subsection 5.2.2. for individual applicable loads and construction conforming to that design, or
 - in the case of common materials, components and assemblies, and their installation, by proven past performance over a period of several years for individual applicable loads.
- (See Note A-5.1.4.1.(5))
- (6) Materials, components and assemblies separating dissimilar environments and assemblies exposed to the exterior, including their connections, that are subject to structural loads as defined in Article 5.2.2.1. shall
- transfer such loads to the *building* structure without adverse effects on the performance of other materials, components or assemblies,
 - not deflect to a degree that adversely affects the performance of other materials, components or assemblies, and (See Note A-5.1.4.1.(6)(b) and (c))
 - be designed, and constructed according to that design, to accommodate, (See Note A-5.1.4.1.(6)(b) and (c))
 - the maximum relative structural movement that may reasonably be expected, and
 - construction tolerances that may be reasonably expected. (See Article 4.1.3.5., Sentence 4.1.3.3.(2) and Subsection 4.1.8. for information on different types of structural movements.)
- (See Note A-5.1.4.1.)

5.1.4.2. Resistance to Deterioration (See Note A-5.1.4.2.)

- (1) Except as provided in Sentence (2), materials used in *building* components and assemblies that separate dissimilar environments, or in assemblies exposed to the exterior, shall be
- compatible with adjoining materials, and
 - resistant to any mechanisms of deterioration that may reasonably be expected given,
 - the nature and function of the materials,
 - the exposure of the materials, and
 - the climatic conditions in which the materials will be installed.

- (2) Material compatibility and deterioration resistance are not required where it can be shown that incompatibility or uncontrolled deterioration will not adversely affect any of,
 - (a) the health or safety of *building* users,
 - (b) the intended use of the *building*, or
 - (c) the operation of *building* services.
- (3) Design and construction of assemblies separating dissimilar environments and assemblies exposed to the exterior shall be in accordance with good practice, such as described in CSA S478, “Durability in buildings,” except that the prescribed minimum design service life of a *building* and the prescribed minimum design service life of *building* elements need not comply with Table 1 and Table 2 of that Standard.
- (4) The design service life of a *building* and the design service life of a *building* element shall be considered by the designer in consultation with the *building* owner.

5.1.5. Other Requirements

5.1.5.1. Requirements in Other Parts of the Code

- (1) Structural and fire safety requirements in other Parts of the Code shall apply.

Section 5.2. Loads and Procedures

5.2.1. Environmental Loads and Design Procedures

5.2.1.1. Exterior Environmental Loads

- (1) Above ground climatic loads shall be determined according to MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”
- (2) Except as provided in Sentence (3), below ground exterior environmental loads not described in MMAH Supplementary Standard SB-1, “Climatic and Seismic Data,” shall be determined from existing geological and hydrological data or from site tests.
- (3) Where local design and construction practice has shown *soil* temperature analysis to be unnecessary, *soil* temperatures need not be determined. (See Note A-5.2.1.1.(3))

5.2.1.2. Interior Environmental Loads

- (1) Interior environmental loads shall be determined in accordance with good engineering practice as described in Sentence 6.2.1.1.(1) based on the intended use of the space. (See Note A-5.2.1.2.(1))

5.2.1.3. Environmental Load and Transfer Calculations

- (1) Calculations related to the transfer of heat, air and moisture and the transmission of sound shall conform to good engineering practice such as that described in the ASHRAE Handbooks.
- (2) For the purposes of any analysis conducted to indicate conformance to the thermal resistance levels required in Article 5.3.1.2., *soil* temperatures shall be determined based on annual average *soil* temperature, seasonal amplitude of variation and attenuation of variation with depth.
- (3) Wind load calculations shall conform to Subsection 4.1.7.

5.2.2. Structural Loads and Design Procedures

5.2.2.1. Determination of Structural Loads and Effects

- (1) Where materials, components or assemblies that separate dissimilar environments or are exposed to the exterior, or their connections, are required to be designed for structural loads, these loads shall be determined in accordance with Part 4.
- (2) Except as provided in Article 4.1.8.18., the structural loads referred to in Sentence (1) and their related effects shall include,
 - (a) *dead loads* transferred from structural elements,
 - (b) wind, snow, rain, hydrostatic and earth pressures,
 - (c) earthquake effects for *post-disaster buildings*, depending on their intended function, (See Note A-5.2.2.1.(2)(c))
 - (d) *live loads* due to use and *occupancy*, and
 - (e) loads due to thermal or moisture-related expansion and contraction, deflection, deformation, creep, shrinkage, settlement, and differential movement.
- (3) Where materials, components or assemblies that separate dissimilar environments or are exposed to the exterior, or their connections, can be expected to be subject to loads or other effects not otherwise described in this Subsection or in Part 4, such loads or other effects shall be taken into account in the design based on the most current and applicable information available.

5.2.2.2. Determination of Wind Load (See Note A-5.2.2.2.)

- (1) This Article applies to the determination of wind load to be used in the design of materials, components and assemblies, including their connections, that separate dissimilar environments or are exposed to the exterior, where these are,
 - (a) subject to wind load, and
 - (b) required to be designed to resist wind load.
- (2) Except as provided in Sentence (3), the wind load referred to in Sentence (1) shall be 100% of the specified wind load determined in accordance with Article 4.1.7.1.
- (3) Where it can be shown by test or analysis that a material, component, assembly or connection referred to in Sentence (1) will be subject to less than 100% of the specified wind load, the wind load referred to in Sentence (1) shall be not less than the load determined by test or analysis.
- (4) Except as provided in Sentence (5), the wind uplift resistance of membrane roofing assemblies shall be determined in accordance with the requirements of CAN/CSA A123.21, “Standard test method for the dynamic wind uplift resistance of membrane-roofing systems.” (See Note A-5.2.2.2.(4))
- (5) Membrane roofing assemblies with proven past performance for the anticipated wind loads need not comply with Sentence (4). (See Note A-5.1.4.1.(5))

5.2.2.3. Design Procedures

- (1) Structural design shall be carried out in accordance with Subsection 4.1.3. and other applicable requirements in Part 4.

Section 5.3. Heat Transfer (See Note A-5.3.)

5.3.1. Thermal Resistance of Assemblies

5.3.1.1. Required Resistance to Heat Transfer (See Note A-5.3.1.1.)

- (1) Except as provided in Sentence (2), where a *building* component or assembly will be subjected to an intended temperature differential, the component or assembly shall include materials to resist heat transfer or a means to dissipate transferred heat in accordance with the remainder of this Subsection.
- (2) The installation of materials to resist heat transfer in accordance with this Subsection is not required where it can be shown that uncontrolled heat transfer will not adversely affect any of
 - (a) the health or safety of *building* users,
 - (b) the intended use of the *building*, or
 - (c) the operation of *building* services.

5.3.1.2. Properties to Resist Heat Transfer or Dissipate Heat (See Note A-5.3.1.2.)

- (1) Taking into account the conditions on either side of the environmental separator, materials and components installed to provide the required resistance to heat transfer or the means implemented to dissipate heat shall provide sufficient resistance or dissipation,
 - (a) to minimize surface condensation on the warm side of the component or assembly,
 - (b) in conjunction with other materials and components in the assembly, to minimize condensation within the component or assembly,
 - (c) in conjunction with systems installed for space conditioning, to meet the interior design thermal conditions for the intended *occupancy*, and
 - (d) to minimize ice damming on sloped roofs.(See Note A-5.3.1.2.(1))

5.3.1.3. Location and Installation of Materials Providing Thermal Resistance

- (1) Where a material required by Article 5.3.1.1. is intersected by a *building* assembly, penetrated by a high conductance component or interrupted by expansion, control or construction joints, and where condensation is likely to occur at these intersections, penetrations or interruptions, sufficient thermal resistance shall be provided so as to minimize condensation at these locations.
- (2) Materials providing required thermal resistance shall have sufficient inherent resistance to airflow or be positioned in the assembly so as to prevent convective airflow through and around the material. (See Note A-5.3.1.3.(2))

Section 5.4. Air Leakage

5.4.1. Air Barrier Systems (See Note A-5.4.1.)

5.4.1.1. Required Resistance to Air Leakage (Note A-5.4.1.1.)

- (1) Where a *building* component or assembly separates interior *conditioned space* from exterior space, interior space from the ground, or environmentally dissimilar interior spaces, the properties and position of the materials and components in those components or assemblies shall be such that they control air leakage or permit venting to the exterior so as to

- (a) provide acceptable conditions for the *building* occupants,
 - (b) maintain appropriate conditions for the intended use of the *building*,
 - (c) minimize the accumulation of condensation in and the penetration of precipitation into the *building* component or assembly,
 - (d) control heat transfer to roofs where ice damming can occur,
 - (e) minimize the ingress of airborne radon and other *soil* gases from the ground with an aim to controlling the indoor concentrations of these gases to an acceptable level, and
 - (f) not compromise the operation of *building* services.
- (2) Except as provided in Sentence (7), an *air barrier system* shall be designed and constructed to provide the principal resistance to air leakage to meet the requirements of Sentence (1).
- (3) The *air barrier system* shall incorporate air barrier assemblies that meet the appropriate Performance Class as defined in Table 5.4.1.1. (See Note A-5.4.1.1.(3))

Table 5.4.1.1.
Maximum Air Leakage Rates for Air Barrier Assemblies
 Forming Part of Sentences 5.4.1.1.(3) and (6) and 5.4.1.2.(1) and (2)

Performance Class	Maximum Air Leakage Rate, L / (s × m ²), at a Pressure Differential of 75 Pa
1	0.05
2	0.10
3	0.15
4	0.20
5	0.50

- (4) The *air barrier system* shall be designed and constructed to be continuous
- (a) across construction, control and expansion joints,
 - (b) across junctions between different air barrier assemblies, and
 - (c) around penetrations through air barrier assemblies.
- (See Note A-5.4.1.1.(4))
- (5) The structural design of air barrier assemblies, including junctions between air barrier assemblies, subject to air pressure loads shall comply with Article 5.1.4.1. and Subsection 5.2.2.
- (6) The maximum air leakage rates specified in Table 5.4.1.1. are permitted to be increased where it can be shown that the higher rate will not adversely affect any of
- (a) the health or safety of the *building* users,
 - (b) the intended use of the *building*, or
 - (c) the operation of *building* services.
- (7) An *air barrier system* is not required where it can be shown that uncontrolled air leakage will not adversely affect any of
- (a) the health or safety of *building* users,
 - (b) the intended use of the *building*, or
 - (c) the operation of *building* services.
- (See Note A-5.4.1.1.(7))

5.4.1.2. Air Barrier Assemblies

- (1) Except as provided in Sentences (2) and (3), air barrier assemblies not in contact with the ground shall
 - (a) conform with CAN/ULC-S742, “Standard for Air Barrier Assemblies – Specification,” and
 - (b) meet the selected Performance Class of Table 5.4.1.1.(See Note A-5.4.1.2.(1))
- (2) Air barrier assemblies not evaluated in accordance with CAN/ULC-S742, “Standard for Air Barrier Assemblies – Specification,” shall be designed and constructed
 - (a) to meet or exceed the selected Performance Class of Table 5.4.1.1., and
 - (b) with at least one air barrier material intended to provide the primary resistance to air leakage that meets the requirements of CAN/ULC-S741, “Standard for Air Barrier Materials – Specification.”(See Note A-5.4.1.2.(2))
- (3) Air barrier assemblies covered in Subsections 5.9.2., 5.9.3. and 5.9.4. shall meet the air barrier performance criteria defined in those Subsections.
- (4) Below-grade air barrier assemblies in contact with the ground shall minimize the ingress of airborne radon and other soil gases. (See Note A-5.4.1.2.(4))

Section 5.5 Vapour Diffusion

5.5.1. Vapour Barriers

5.5.1.1. Required Resistance to Vapour Diffusion (See Note A-5.5.1.1.)

- (1) Where a *building* component or assembly is subjected to differentials in temperature and water vapour pressure, the properties and position of the materials and components in those components or assemblies shall be such that they control vapour diffusion or permit venting to the exterior so as to minimize accumulation of condensation in the *building* component or assembly.
- (2) Except as provided in Sentence (3), a *vapour barrier* shall be installed to provide the principal resistance to water vapour diffusion.
- (3) A *vapour barrier* is not required where it can be shown that uncontrolled vapour diffusion will not adversely affect any of
 - (a) the health or safety of *building* users,
 - (b) the intended use of the *building*, or
 - (c) the operation of *building* services.

5.5.1.2. Vapour Barrier Properties and Installation (See Note A-5.3.1.2.)

- (1) The *vapour barrier* shall have sufficiently low permeance and shall be positioned in the *building* component or assembly so as to
 - (a) minimize moisture transfer by diffusion, to surfaces within the assembly that would be cold enough to cause condensation at the design temperature and humidity conditions, or
 - (b) reduce moisture transfer by diffusion, to surfaces within the assembly that would be cold enough to cause condensation at the design temperature and humidity conditions, to a rate that will not allow sufficient accumulation of moisture to cause deterioration or otherwise adversely affect any of,
 - (i) the health or safety of *building* users,
 - (ii) the intended use of the *building*, or
 - (iii) the operation of *building* services.

(See Note A-5.5.1.2.(1))

(2) Coatings applied to gypsum wallboard to provide required resistance to vapour diffusion shall conform to the requirements of Sentence (1) when tested in accordance with CAN/CGSB-1.501-M, “Method for Permeance of Coated Wallboard.”

(3) Coatings applied to materials other than gypsum wallboard to provide required resistance to vapour diffusion shall conform to the requirements of Sentence (1) when tested in accordance with ASTM E96/E96M, “Standard Test Methods for Water Vapor Transmission of Materials,” by the desiccant method (dry cup).

Section 5.6. Precipitation

5.6.1. Protection from Precipitation

5.6.1.1. Required Protection from Precipitation (See Note A-5.6.1.1.)

(1) Except as provided in Sentence (2), where a *building* component or assembly is exposed to precipitation, the component or assembly shall

- (a) minimize ingress of precipitation into the component or assembly, and
- (b) prevent ingress of precipitation into interior space.

(2) Protection from ingress of precipitation is not required where it can be shown that such ingress will not adversely affect any of

- (a) the health or safety of *building* users,
- (b) the intended use of the *building*, or
- (c) the operation of *building* services.

5.6.1.2. Installation of Protective Materials

(1) Where protective materials are applied to assemblies to provide the required protection from precipitation, they shall be installed so as to shed precipitation or otherwise minimize its entry into the assembly and prevent its penetration through the assembly. (See Note A-5.6.1.2.(1)) (See also Clause 5.3.1.2.(1)(d))

(2) Where protective materials described in Sentence (1) are part of a vegetative roofing system, they shall be resistant to root and rhizome penetration when tested in accordance with ANSI/GRHC/SPRI VR-1, “Procedure for Investigating Resistance to Root or Rhizome Penetration on Vegetative Roofs.” (See Note A-5.6.1.2.(2))

5.6.2. Sealing, Drainage, Accumulation and Disposal

5.6.2.1. Sealing and Drainage (See Note A-5.6.2.1.)

(1) Except as provided in Sentence (2), materials, components, assemblies, joints in materials, junctions between components and junctions between assemblies exposed to precipitation shall be

- (a) sealed to prevent ingress of precipitation, or
- (b) drained to direct precipitation to the exterior.

(2) Sealing or drainage are not required where it can be shown that the omission of sealing and drainage will not adversely affect any of,

- (a) the health or safety of *building* users,
- (b) the intended use of the *building*, or
- (c) the operation of *building* services.

5.6.2.2. Accumulation and Disposal

- (1) Where water, snow or ice can accumulate on a *building*, provision shall be made to minimize the likelihood of hazardous conditions arising from such accumulation.
- (2) Where precipitation can accumulate on sloped or horizontal assemblies, provision shall be made for drainage conforming with Section 7.4.
- (3) Where downspouts are provided and are not connected to a sewer, provisions shall be made to,
 - (a) divert the water from the *building*, and
 - (b) prevent *soil* erosion.
- (4) Junctions between vertical assemblies, and sloped or horizontal assemblies, shall be designed and constructed to minimize the flow of water from the sloped or horizontal assembly onto the vertical assembly.

5.6.2.3. Solar Collector Systems

- (1) A solar collector system is permitted to be installed above roofing materials conforming to Table 5.9.1.1.

Section 5.7. Surface and Ground Water (See Note A-5.7.)

5.7.1. Site Factors

5.7.1.1. Application

- (1) This Subsection applies to the location of *buildings*, the grading of *building* sites, the directing of surface water away from *building* assemblies and the provision of means for drainage.

5.7.1.2. Required Protection

- (1) The *building* shall be located, the *building* site shall be graded, or surface water shall be directed away from *building* assemblies so as to
 - (a) minimize the accumulation of surface water against the *building* in a manner that does not adversely affect adjacent *buildings* or properties, or
 - (b) accommodate the accumulation of surface water on the property in a manner that does not adversely affect the *building* or adjacent *buildings* or properties.
- (2) Drainage shall be provided to direct surface water away from *building* assemblies separating interior space from the ground, except,
 - (a) where the *building* assembly is designed in accordance with Subsection 5.7.2. to withstand continuous hydrostatic pressure, or
 - (b) where it can be shown that the lack of drainage will not adversely affect any of
 - (i) the health or safety of *building* users,
 - (ii) the intended use of the *building*, or
 - (iii) the operation of *building* services.

(See Note A-5.7.1.2.(2))

5.7.2. Protection Against Hydrostatic Pressure

5.7.2.1. Application

(1) This Subsection applies to waterproofing materials, components, assemblies and systems applied to *building* assemblies that separate dissimilar environments and are subjected to hydrostatic pressure.

5.7.2.2. Design of Building Elements under Hydrostatic Loads

(1) Waterproofing materials, components, assemblies and systems described in Article 5.7.2.1. shall be designed in accordance with Subsection 5.1.4.

(2) Hydrostatic design loads shall be determined in accordance with Subsection 5.2.2.

5.7.2.3. Required Protection

(1) Waterproofing materials, components, assemblies and systems described in Article 5.7.2.1. shall comply with Article 5.7.3.2.

5.7.3. Protection Against Ground Water

5.7.3.1. Application

(1) This Subsection applies to the protection of *building* assemblies that separate interior space from the ground.

5.7.3.2. Required Protection

(1) Except as provided in Sentence (2) and Article 5.7.3.4., *building* assemblies described in Article 5.7.3.1. shall be protected by waterproofing in accordance with Article 5.7.3.3. so as to minimize the ingress of water into the *building* or the accumulation of water against the *building*.

(2) Waterproofing is not required where it can be shown that

- (a) a *building* is designed to accommodate the ingress or accumulation of ground water, or
- (b) the ingress or accumulation of ground water will not negatively affect
 - (i) the health or safety of *building* users,
 - (ii) the intended use of the *building*, or
 - (iii) the operation of *building* services.

5.7.3.3. Waterproofing

(1) Waterproofing materials, components, assemblies, or systems installed to provide the required protection shall form a continuous and impervious barrier to the ingress of ground water and be capable of accommodating,

- (a) imperfections, construction joints, control joints and expansion joints, (See Note A-5.7.3.3.(1)(a))
- (b) junctions between different *building* assemblies, and
- (c) elements penetrating *building* assemblies.

5.7.3.4. Where Dampproofing is Permitted

- (1) Vertical *building* assemblies that separate interior space from the ground are permitted to be dampproofed where,
 - (a) such assemblies are not subjected to hydrostatic pressure,
 - (b) the substrate is cast-in-place concrete, and
 - (c) a drainage layer is installed between the *building* assembly and the *soil*.

(See Note A-5.7.3.4.(1))

- (2) Joints, junctions and penetrations shall be designed and constructed to maintain the continuity of the dampproofing.

Section 5.8. Sound Transmission (See Note A-5.8.)

5.8.1. Protection from Airborne Noise

5.8.1.1. Required Protection

- (1) Except as provided in Sentence (2), a *dwelling unit* shall be separated from every other space in a *building* in which noise may be generated by
 - (a) a separating assembly and adjoining constructions, which, together, provide an *apparent sound transmission class (ASTC)* rating not less than 47, or
 - (b) a separating assembly that provides a *sound transmission class (STC)* rating of not less than 50 and adjoining constructions that conform to Article 9.11.1.4.
- (2) Construction separating a *dwelling unit* from an elevator shaft or a refuse chute shall have an *STC* rating not less than 55.

5.8.1.2. Determination of Sound Transmission Ratings (See Note A-5.8.1.2.)

- (1) The *STC* ratings of separating assemblies shall be determined in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the results from measurements carried out in accordance with ASTM E90, “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.”
- (2) The *ASTC* ratings of separating assemblies and adjoining constructions shall be
 - (a) determined in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the results from measurements carried out in accordance with ASTM E336, “Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings,” or
 - (b) calculated in accordance with
 - (i) the detailed method described in Article 5.8.1.4., or
 - (ii) the simplified method described in Article 5.8.1.5.

5.8.1.3. Compliance with Required Ratings

- (1) Compliance with the required *STC* ratings shall be demonstrated through
 - (a) measurements carried out in accordance with Sentence 5.8.1.2.(1), or
 - (b) the construction of separating assemblies conforming to Table 1 or 2 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance of Building Assemblies” as applicable.

- (2) Compliance with the required *ASTC* ratings shall be demonstrated through
 - (a) measurements or calculations carried out in accordance with Sentence 5.8.1.2.(2), or
 - (b) the construction of separating assemblies conforming to Table 1 or 2 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance of Building Assemblies,” as applicable, that have an *STC* rating not less than 50 in conjunction with flanking assemblies constructed in accordance with Article 9.11.1.4.

5.8.1.4. Detailed Method for Calculating *ASTC* (See Note 5.8.1.4.)

(0.1) This Article sets out the detailed method for calculating the *ASTC* ratings of separating assemblies and adjoining construction referred to in Subclause 5.8.1.2.(2)(b)(i).

(1) The sound transmission loss measured in accordance with ASTM E90, “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements,” shall be used in lieu of the sound reduction index required in ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms.”

- (2) The vibration reduction index for the junctions between separating assemblies shall be
 - (a) determined using the equations presented in Annex E of ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms,” or
 - (b) measured in accordance with Parts 1 to 4 of ISO 10848-1, “Acoustics – Laboratory measurement of the flanking transmission of airborne and impact sound between adjoining rooms - Part 1: Frame document.”

(3) The normalized flanking level difference shall be measured in accordance with Parts 1 to 4 of ISO 10848, “Acoustics – Laboratory measurement of the flanking transmission of airborne and impact sound between adjoining rooms.”

(4) The direct sound reduction index for the separating assembly in situ shall be determined from sound transmission loss in accordance with Clause (a) or (b), depending on the type of construction:

- (a) for a lightweight separating wall or floor assembly with wood or steel framing, the index shall be taken as equal to the sound transmission loss, without correction;
- (b) for a heavyweight separating wall or floor assembly of concrete or masonry, the index shall be determined in accordance with the detailed method for structure-borne transmission presented in ISO 15712-1, “Building Acoustics – Estimation of Acoustic Performance of Buildings From the Performance of Elements – Part 1: Airborne Sound Insulation Between Rooms.” (See Note A-5.8.1.4.(4)(b))

(5) The flanking sound reduction index for each flanking path at each edge of the separating assembly shall be determined in accordance with Clause (a), (b) or (c), depending on the type of construction:

- (a) for a lightweight separating wall or floor assembly with wood or steel framing and connected lightweight flanking assemblies with wood or steel framing, the index shall be taken as equal to the normalized flanking level difference re-normalized for the *ASTC* field situation in accordance with Annex F of ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms,”
- (b) for a heavyweight separating wall or floor assembly of concrete and masonry and connected flanking assemblies of concrete and masonry, the index shall be determined in accordance with the detailed method for structure-borne transmission presented in ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms”. (See Note A-5.8.1.4.(4)(b))
- (c) for a mixture of lightweight framed assemblies and heavyweight concrete or masonry assemblies, the index shall be determined in accordance with Clause (a) or (b). (See Note A-5.8.1.4.(4)(b))

(6) Once the pertinent indices and measurements referred to in Sentences (1) to (5) have been determined based on the type of construction, the apparent sound reduction index shall then be determined in accordance with ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms.”

(7) The *ASTC* rating shall be calculated in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the apparent sound reduction index determined in Sentence (6), which shall be treated as equivalent to the values of apparent sound transmission loss measured in accordance with ASTM E336, “Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings.”

5.8.1.5. Simplified Method for Calculating *ASTC* (See Note A-5.8.1.4.)

(0.1) This Article sets out the simplified method for calculating *ASTC* ratings of separating assemblies and adjoining construction referred to in Subclause 5.8.1.2(2)(b)(ii).

(1) The *STC* rating shall be used in lieu of the weighted sound reduction index required in ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms.”

(2) The vibration reduction index for the junctions between separating assemblies shall be,

(a) determined using the equations presented in Annex E of ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms,” or

(b) measured in accordance with Parts 1 to 4 of ISO 10848, “Acoustics – Laboratory Measurement of the Flanking Transmission of Airborne and Impact Sound Between Adjoining Rooms – Part 1: Frame document.”

(3) The weighted normalized flanking level difference shall be determined in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the results from measurements carried out in accordance with Parts 1 to 4 of ISO 10848, “Acoustics – Laboratory Measurement of the Flanking Transmission of Airborne and Impact Sound Between Adjoining Rooms – Part 1: Frame document.”

(4) The direct weighted sound reduction index for the separating assembly shall be taken as equal to the *STC*, without correction.

(5) The weighted flanking sound reduction index for each flanking path at each edge of the separating assembly shall be determined in accordance with Clause (a) or (b), depending on the type of construction:

(a) for a lightweight separating wall or floor assembly with wood or steel framing and connected lightweight flanking assemblies with wood or steel framing, the index shall be taken as equal to the weighted normalized flanking level difference re-normalized for the *ASTC* field situation in accordance with Annex F of ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms”;

(b) for a heavyweight separating wall or floor assembly of concrete or masonry and connected flanking assemblies of concrete or masonry, the index shall be determined in accordance with the simplified method for structure-borne transmission presented in ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms”. (See Note A-5.8.1.4.(4)(b))

(6) Once the pertinent indices and measurements referred to in Sentences (1) to (5) have been determined based on the type of construction, the *ASTC* shall then be calculated in accordance with ISO 15712-1, “Building Acoustics - Estimation of Acoustic Performance of Buildings From the Performance of Elements - Part 1: Airborne Sound Insulation Between Rooms.”

Section 5.9. Standards

5.9.1. Applicable Standards

5.9.1.1. Compliance with Applicable Standards

(1) Except as provided in Sentence (2) and elsewhere in this Part, materials and components, and their installation, shall conform to the requirements of the applicable standards in Table 5.9.1.1. where those materials or components are

- (a) incorporated into environmental separators or assemblies exposed to the exterior, and
- (b) installed to fulfill the requirements of this Part.

(See Note A-5.9.1.1.(1))

(2) The requirements for *flame-spread ratings* contained in thermal insulation standards shall be applied only as required in Part 3.

Table 5.9.1.1.
Standards Applicable to Environmental Separators and Assemblies Exposed to the Exterior
Forming Part of Sentence 5.9.1.1.(1)

Issuing Agency	Document Number	Title of Document
ANSI	A135.6	Engineered Wood Siding
ASME	B18.6.1	Wood Screws (Inch Series)
ASTM	A123 / A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM	A153 / A153M	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM	A653 / A653M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM	C4	Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile
ASTM	C73	Standard Specification for Calcium Silicate Brick (Sand-Lime Brick)
ASTM	C126	Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
ASTM	C212	Standard Specification for Structural Clay Facing Tile
ASTM	C412M	Standard Specification for Concrete Drain Tile
ASTM	C444M	Standard Specification for Perforated Concrete Pipe
ASTM	C553	Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
ASTM	C612	Standard Specification for Mineral Fiber Block and Board Thermal Insulation
ASTM	C700	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM	C726	Standard Specification for Mineral Wool Roof Insulation Board
ASTM	C834 ⁽¹⁾	Standard Specification for Latex Sealants
ASTM	C840	Standard Specification for Application and Finishing of Gypsum Board
ASTM	C920 ⁽¹⁾	Standard Specification for Elastomeric Joint Sealants
ASTM	C991	Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings
ASTM	C1002	Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
ASTM	C1177 / C1177M	Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
ASTM	C1178 / C1178M	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
ASTM	C1184 ⁽¹⁾	Standard Specification for Structural Silicone Sealants
ASTM	C1280	Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing
ASTM	C1311 ⁽¹⁾	Standard Specification for Solvent Release Sealants

Table 5.9.1.1. (Cont'd)
Standards Applicable to Environmental Separators and Assemblies Exposed to the Exterior
 Forming Part of Sentence 5.9.1.1.(1)

Issuing Agency	Document Number	Title of Document
ASTM	C1330 ⁽¹⁾	Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants
ASTM	C1396 / C1396M ⁽²⁾	Standard Specification for Gypsum Board
ASTM	C1658 / C1658M ⁽³⁾	Standard Specification for Glass Mat Gypsum Panels
ASTM	D1227 / D1227M	Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
ASTM	D2178 / D2178M	Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
ASTM	D3019 / D3019M ⁽⁴⁾	Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, and Fibered
ASTM	D4479 / D4479M	Standard Specification for Asphalt Roof Coatings – Asbestos-Free
ASTM	D4637 / D4637M	Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane
ASTM	D4811 / D4811M	Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing
ASTM	D6878 / D6878M	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing
ASTM	E2190	Standard Specification for Insulating Glass Unit Performance and Evaluation
BNQ	BNQ 3624-115	Polyethylene (PE) Pipe and Fittings for Soil and Foundation Drainage
CGSB	CAN/CGSB-11.3-M	Hardboard
CGSB	CAN/CGSB-12.1	Safety Glazing
CGSB	CAN/CGSB-12.2-M	Flat, Clear Sheet Glass
CGSB	CAN/CGSB-12.3-M	Flat, Clear Float Glass
CGSB	CAN/CGSB-12.4-M	Heat Absorbing Glass
CGSB	CAN/CGSB-12.8	Insulating glass units
CGSB	CAN/CGSB-12.9-M	Spandrel glass
CGSB	37-GP-9Ma	Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing
CGSB	CAN/CGSB-37.50-M	Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing
CGSB	CAN/CGSB-37.54	Polyvinyl Chloride Roofing and Waterproofing Membrane
CGSB	CAN/CGSB-37.58-M	Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing
CGSB	CAN/CGSB-51.32-M	Sheathing, Membrane, Breather Type
CGSB	CAN/CGSB-51.33-M	Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction
CGSB	CAN/CGSB-51.34-M	Vapour Barrier, Polyethylene Sheet for Use in Building Construction
CGSB	CAN/CGSB-93.1-M	Sheet, Aluminum Alloy, Prefinished, Residential
CGSB	CAN/CGSB-93.2-M	Prefinished Aluminum Siding, Soffits, and Fascia, for Residential Use
CSA	A23.1	Concrete materials and methods of concrete construction
CSA	CAN/CSA-A82	Fired masonry brick made from clay or shale
CSA	CAN3-A93-M	Natural Airflow Ventilators for Buildings
CSA	CAN/CSA-A123.2	Asphalt-Coated Roofing Sheets
CSA	A123.3	Asphalt Saturated Organic Roofing Felt
CSA	CAN/CSA-A123.4	Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems
CSA	A123.5	Asphalt shingles made from glass felt and surfaced with mineral granules
CSA	CAN/CSA-A123.16	Asphalt-coated glass-base sheets
CSA	A123.17	Asphalt Glass Felt Used in Roofing and Waterproofing
CSA	A123.23	Product specification for polymer-modified bitumen sheet, prefabricated and reinforced
CSA	A123.51	Asphalt shingle application on roof slopes 1:6 and steeper

Table 5.9.1.1. (Cont'd)
Standards Applicable to Environmental Separators and Assemblies Exposed to the Exterior
 Forming Part of Sentence 5.9.1.1.(1)

Issuing Agency	Document Number	Title of Document
CSA	A165.1	Concrete block masonry units
CSA	A165.2	Concrete brick masonry units
CSA	A165.3	Prefaced concrete masonry units
CSA	CAN/CSA-A179	Mortar and Grout for Unit Masonry
CSA	CAN/CSA-A220 Series	Concrete Roof Tiles
CSA	CAN/CSA-A371	Masonry Construction for Buildings
CSA	A3001	Cementitious Materials for Use in Concrete
CSA	B182.1	Plastic drain and sewer pipe and pipe fittings
CSA	G40.21	Structural quality steel
CSA	CAN/CSA-G401	Corrugated steel pipe products
CSA	CAN/CSA-O80 Series	Wood preservation
CSA	O118.1	Western Red Cedar Shakes and Shingles
CSA	O118.2	Eastern White Cedar Shingles
CSA	O121	Douglas fir plywood
CSA	O141	Softwood Lumber
CSA	O151	Canadian softwood plywood
CSA	O153	Poplar plywood
CSA	O325	Construction sheathing
CSA	O437.0	OSB and Waferboard
CSA	S478	Durability in buildings
HPVA	ANSI/HPVA HP-1	American National Standard for Hardwood and Decorative Plywood
ULC	CAN/ULC-S701.1	Standard for Thermal Insulation, Polystyrene Boards
ULC	CAN/ULC-S702.1	Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification
ULC	CAN/ULC-S703	Standard for Cellulose Fibre Insulation (CFI) for Buildings
ULC	CAN/ULC-S704.1	Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
ULC	CAN/ULC-S705.1	Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification
ULC	CAN/ULC-S705.2	Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Application
ULC	CAN/ULC-S706.1	Standard for Wood Fibre Insulating Boards for Buildings
ULC	CAN/ULC-S710.1	Standard for Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification
ULC	CAN/ULC-S711.1	Standard for Bead-Applied Two Component Polyurethane Air Sealant Foam, Part 1: Material Specification
ULC	CAN/ULC-S717.1	Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties

Notes to Table 5.9.1.1.:

- (1) See Note A-Table 5.9.1.1.
- (2) The *flame-spread rating* of gypsum board shall be determined in accordance with CAN/ULC-S102, "Test for Surface Burning Characteristics of Building Materials and Assemblies," in lieu of ASTM E84 "Surface Burning Characteristics of Building Materials", as indicated in ASTM C1396 / C1396M "Gypsum Board."
- (3) The *flame-spread rating* of glass mat gypsum panels shall be determined in accordance with CAN/ULC-S102 "Test for Surface Burning Characteristics of Building Materials and Assemblies," in lieu of ASTM E84, "Surface Burning Characteristics of Building Materials," as indicated in ASTM C1658 / C1658M "Glass Mat Gypsum Panels."
- (4) For the purpose of compliance with Part 5, ASTM D3019 / D3019M, "Lap Cement used with Asphalt Roll Roofing, Non-Fibered, Asbestos-Fibered, and Non-Asbestos-Fibered," applies only with respect to non-fibered and non-asbestos-fibered (Types I and II) of asphalt roll roofing.

5.9.2. Windows, Doors and Skylights

5.9.2.1. General

- (1) This Subsection applies to windows, doors and skylights, including their components, that separate
 - (a) interior space from exterior space, or
 - (b) environmentally dissimilar interior spaces.
- (2) For the purpose of this Subsection, the term “skylight” refers to unit skylights, roof windows and tubular daylighting devices.
- (3) Where a wired glass assembly is installed in a required *fire separation*, it need not conform to the requirements of this Subsection. (See Note A-5.9.2.1.(3))

5.9.2.2. Applicable Standards (See Note 5.9.2.2.)

- (1) Windows, doors and skylights shall conform to the requirements in
 - (a) AAMA/WDMA/CSA 101/I.S.2/A440, “North American Fenestration Standard/Specification for windows, doors, and skylights” (Harmonized Standard), and
 - (b) CSA A440S1, “Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, North American Fenestration Standard/Specification for windows, doors, and skylights.”
- (2) Performance grades for windows, doors and skylights shall be selected according to the Canadian Supplement referenced in Clause (1)(b) so as to be appropriate for the conditions and geographic location in which the window, door or skylight will be installed.
- (3) Windows, doors and skylights shall conform to the performance grades selected in Sentence (2) when tested in accordance with the Harmonized Standard referenced in Clause (1)(a).

5.9.2.3. Structural Loads, Air Leakage and Water Penetration

- (1) Windows, doors, skylights and their components shall be designed and constructed in accordance with
 - (a) Article 5.1.4.1., Section 5.4. and Section 5.6., where they are not covered in the scope of the standards listed in Sentence 5.9.2.2.(1), or
 - (b) Article 5.9.2.2., where they are covered in the scope of the standards listed in Sentence 5.9.2.2.(1).(See Note A-5.9.2.3.(1))

5.9.2.4. Heat Transfer

- (1) Windows, doors and skylights shall meet the heat transfer performance requirements stated in Section 5.3. (See Note A-5.3.1.2.))
- (2) Except as provided in Sentence (3), all metal-framed glazed assemblies separating interior *conditioned space* from interior unconditioned space or exterior space shall incorporate a thermal break to minimize condensation.
- (3) Metal-framed glazed assemblies need not comply with Sentence (2) where these assemblies are
 - (a) storm windows or doors, or
 - (b) windows or doors that are required to have a *fire-protection rating*.(See Note A-5.9.2.4.(3))

5.9.3. Other Fenestration Assemblies (See Note A-5.9.3.)

5.9.3.1. Definition

(1) In this Subsection, “other fenestration assemblies” means curtain walls, window walls, storefronts and glazed architectural structures. (See Note A-5.9.3.1.(1))

5.9.3.2. Structural and Environmental Loads

(1) Other fenestration assemblies and their components shall be designed and constructed in accordance with Article 5.1.4.1. (See Note A-5.9.3.2.(1))

5.9.3.3. Heat Transfer

(1) Other fenestration assemblies and their components shall meet the heat transfer performance requirements stated in Section 5.3. (See Note A-5.9.3.3.(1))

(2) Other fenestration assemblies using metal framing that separate interior *conditioned space* from interior unconditioned space or exterior space shall incorporate a thermal break to minimize condensation.

5.9.3.4. Air Leakage

(1) *Other fenestration assemblies* and their components shall be designed and constructed in accordance with Section 5.4.

(2) Except as provided in Sentence (3), *other fenestration assemblies* and their components shall have an air leakage characteristic, measured at an air pressure difference of 75 Pa, when tested in accordance with ASTM E283, “Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen,” that is not greater than

- (a) $0.2 \text{ L}/(\text{s}\times\text{m}^2)$ for fixed portions, including any opaque portions, and
- (b) $1.5 \text{ L}/(\text{s}\times\text{m}^2)$ for operable portions.

(See Note A-5.9.3.4.(2))

(3) The following systems need not comply with Sentence (2):

- (a) interior windows and interior doors that do not serve as environmental separators,
- (b) vehicular access doors (garage doors),
- (c) storm windows and storm doors,
- (d) commercial entrance systems,
- (e) revolving doors,
- (f) smoke and relief air vents,
- (g) site-built door systems, and
- (h) commercial steel doors.

(See Note A-5.9.3.4.(3))

5.9.3.5. Water Penetration

(1) *Other fenestration assemblies* and their components shall be designed and constructed in accordance with Section 5.6.

- (2) Except as provided in Sentence (4), *other fenestration assemblies* and their components not covered in Article 5.9.2.2. shall resist water penetration when tested in accordance with
- (a) ASTM E331, “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference,” or
 - (b) ASTM E547, “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.”
- (See Note A-5.9.3.5.(2))
- (3) Tests referred to in Sentence (2) shall be carried out at the driving rain wind pressure as calculated in accordance with CSA A440S1, “Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, North American Fenestration Standard/Specification for windows, doors, and skylights.” (See Note A-5.9.3.5.(3))
- (4) The following systems need not comply with Sentence (2):
- (a) interior windows and interior doors,
 - (b) vehicular access doors (garage doors),
 - (c) storm windows and storm doors,
 - (d) commercial entrance systems,
 - (e) revolving doors,
 - (f) smoke and relief air vents,
 - (g) site-built door systems, and
 - (h) commercial steel doors.
- (See Note A-5.9.3.5.(4))

5.9.4. Exterior Insulation Finish Systems

5.9.4.1. Structural Loads, Heat Transfer, Air Leakage, Vapour Diffusion and Water Penetration

- (1) Exterior insulation finish systems and their components shall comply with
- (a) Subsection 5.1.4. and Sections 5.3. to 5.6., and
 - (b) CAN/ULC-S716.1, “Standard for Exterior Insulation and Finish Systems (EIFS) - Materials and Systems,” where covered in the scope of that standard.
- (See Note A-5.9.4.1.(1))

Part 6

Heating, Ventilating and Air-Conditioning

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Part 6

Heating, Ventilating and Air-Conditioning

Section 6.1. General

6.1.1. Application

6.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.
- (2) Where the method of operation of an existing heating, ventilating or *air-conditioning* system is altered, the repair or component replacements that change the capacity or extent of safety of the system shall conform to this Code. (See Note A-6.1.1.1.(2))

6.1.1.2. Application

- (1) This Part applies to systems and equipment for heating, ventilating and *air-conditioning* services.

6.1.2. Definitions

6.1.2.1. Defined Terms

- (1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

Section 6.2. Design and Installation

6.2.1. General

6.2.1.1. Good Engineering Practice (See Note A-6.2.1.1.)

- (1) Heating, ventilating and *air-conditioning* systems, including mechanical refrigeration equipment, shall be designed, constructed and installed in conformance with good engineering practice such as that described in, but not limited to,
 - (a) the ASHRAE Handbooks and Standards,
 - (b) the HRAI Digest,
 - (c) the Hydronics Institute Manuals,
 - (d) the NFPA Standards,
 - (e) the SMACNA Manuals,
 - (f) the ACGIH manual entitled “Industrial Ventilation: A Manual of Recommended Practice for Design,”
 - (g) CSA B214, “Installation code for hydronic heating systems,”

- (h) CAN/CSA-Z317.2, “Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities.”
- (i) EPA 625/R-92/016, “Radon Prevention in the Design and Construction of Schools and Other Large Buildings,” and
- (j) ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems.”

6.2.1.1A. Design Indoor Air Temperatures

- (1) *Buildings* classified as Group B, Division 2 or 3 *occupancies* or Group C *residential occupancies* that are intended for use in the winter months on a continuing basis shall be insulated and be equipped with heating facilities that are capable of maintaining an indoor air temperature of 22°C at the outside winter design temperature referred to in Article 6.2.1.2.
- (2) All other *buildings* intended for occupancy in the winter months on a continuing basis should be insulated and shall be equipped with heating facilities to maintain a minimum indoor air temperature of 18°C or commensurate with the use of the *building* at the outside winter design temperature described in Article 6.2.1.2.

6.2.1.2. Outdoor Design Conditions

- (1) The outdoor conditions to be used in designing heating, ventilating and *air-conditioning* systems shall be determined in conformance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”

6.2.1.3. Expansion, Contraction and System Pressure

- (1) Heating and cooling systems shall be designed to allow for expansion and contraction of the heat transfer fluid and to maintain the system pressure within the rated working pressure limits of all components of the system.

6.2.1.4. Structural Movement (See Note A-6.2.1.4.)

- (1) Mechanical systems and equipment shall be designed and installed to accommodate the maximum relative structural movement provided for in the *construction* of the *building*.

6.2.1.5. Installation Standards

- (1) The installation of solid fuel-burning *appliances* for central heating systems shall comply with CSA B365, “Installation code for solid-fuel-burning appliances and equipment” and the manufacturer’s installation instructions.
- (2) The solid fuel-fired *appliances* in Sentence (1) shall conform to CSA B366.1, “Solid-fuel-fired central heating appliances.”
- (3) The design and installation of earth energy systems shall conform to CAN/CSA-C448.2, “Design and installation of earth energy systems for residential and other small buildings,” where such systems use groundwater, submerged heat exchangers or ground heat exchangers to serve,
 - (a) a house with or without a *secondary unit*, or,
 - (b) a *building*, a house with or without a *secondary unit*, where the *conditioned space* is not more than 1 400 m².
- (4) Except for a house with or without a *secondary unit*, the design and installation of earth energy systems shall conform to CAN/CSA-C448.1, “Design and installation of earth energy systems for commercial and institutional buildings,” where such systems use groundwater, submerged heat exchangers or ground heat exchangers to condition a floor space area more than 1 400 m².
- (5) The design and installation of solid fuel-burning *stoves*, ranges and *space heaters*, including the requirements for combustion air, shall conform to the requirements of CSA B365, “Installation code for solid-fuel-burning appliances and equipment” and the manufacturer’s installation instructions.

- (6) The design and installation of hydronic heating systems shall conform to
 - (a) CSA B214, “Installation code for hydronic heating systems,” or
 - (b) good engineering practice appropriate to the circumstances such as described in Article 6.2.1.1.
- (7) Solid fuel-burning *stoves, furnaces* and hydronic heating systems designed to burn solid fuels, other than coal, shall conform to the particulate emission limits of,
 - (a) CSA B415.1, “Performance Testing of Solid-Fuel-Burning Heating Appliances,” or
 - (b) the “Standards of Performance for New Residential Wood Heaters,” set out in Subpart AAA of Part 60 of Title 40 of the Code of Federal Regulations, published by the United States Environmental Protection Agency, as it read on March 16, 2015.

6.2.1.6. Installation – General

- (1) Equipment requiring periodic maintenance and forming part of a heating, ventilating or *air-conditioning* system shall be installed with provision for access for inspection, maintenance, repair and cleaning. (See Note A-6.2.1.6.(1))
- (2) Mechanical equipment shall be provided with *guards* so as to prevent injury.
- (3) Heating, ventilating or *air-conditioning* systems shall be protected from freezing if they may be adversely affected by freezing temperatures.

6.2.1.7. Asbestos

- (1) Asbestos shall not be used in heating, ventilating or *air-conditioning* systems or equipment.

6.2.1.8. Combustible Tubing

- (1) *Combustible* tubing for pneumatic controls may be used in *buildings* required to be of *noncombustible construction* provided it has an outside diameter not exceeding 10 mm.

6.2.2. Incinerators

6.2.2.1. Applicable Standard

- (1) The design, construction, installation and material alteration of every indoor incinerator shall conform to NFPA 82, “Standard on Incinerators and Waste and Linen Handling Systems and Equipment.”

6.2.3. Solid Fuel Storage

6.2.3.1. Solid Fuel Storage Bins

- (1) A storage bin for solid fuel shall not be located above a sewer opening or drain opening.
- (2) Storage bins for solid fuel shall be designed and constructed so that the air temperature in the bin or the surface temperature of any part of the floor or walls is below 50°C.

Section 6.3. Ventilation Systems

6.3.1. Ventilation

6.3.1.1. Required Ventilation

- (1) Except as provided in Sentence (4), all *buildings* shall be ventilated in accordance with this Section.
- e1 (2) Except in *storage garages* and *repair garages* covered by Article 6.3.1.3., outdoor air shall be supplied to *buildings* for ventilation purposes in accordance with one of the following Sections of ANSI/ASHRAE 62.1, “Ventilation for Acceptable Indoor Air Quality,”
 - (a) Section 6.2, Ventilation Rate Procedure, excluding the exception stated in Section 6.2.7.1.2 and note H of Table 6.2.2.1,
 - (b) Section 6.3, Indoor Air Quality Procedure, or
 - (c) Section 6.4, Natural Ventilation Procedure, excluding *residential occupancies*.
- (3) Except in *storage garages* and *repair garages* covered by Article 6.3.1.3., exhaust ventilation shall be provided in accordance with Section 6.5, Exhaust Ventilation, of ANSI/ASHRAE 62.1, “Ventilation for Acceptable Indoor Air Quality,” as a minimum.
- (4) Self-contained heating-season mechanical ventilation systems serving only one *dwelling unit* shall comply with Subsection 9.32.3.
- (5) *Live/work units* shall be mechanically ventilated in accordance with the requirements of Sentence (1).

6.3.1.1A. Natural Ventilation

- (1) Except as permitted by Sentence (2), the ventilation required by Article 6.3.1.1. shall be provided by mechanical ventilation except that it can be provided by natural ventilation or a combination of natural and mechanical ventilation in
 - (a) *buildings* of other than *residential occupancy* having an *occupant load* of not more than one person per 40 m² during normal use,
 - (b) *buildings* of *industrial occupancy* where the nature of the process contained in them permits or requires the use of large openings in the building envelope even during the winter, or
 - (c) seasonal *buildings* not intended to be occupied during the winter.
- (2) Where climatic conditions permit, *buildings* containing *occupancies* other than *residential occupancies*, may be ventilated by natural ventilation methods in lieu of mechanical ventilation where engineering data demonstrates that such a method will provide the required ventilation for the type of *occupancy*.

6.3.1.2. Crawl Spaces and Attic or Roof Spaces

- (1) Unconditioned and unoccupied crawl spaces and *attic or roof spaces* shall be ventilated by natural or mechanical means as required by Part 5. (See Note A-6.3.1.2.(1))

6.3.1.3. Ventilation of Storage and Repair Garages

- (1) Except as provided in Sentences (4) and (6), an enclosed *storage garage* for five or more motor vehicles shall have a mechanical ventilation system designed to
 - (a) limit the concentration of carbon monoxide to not more than 100 parts per million parts of air,
 - (b) limit the concentration of nitrogen dioxide to not more than 3 parts per million parts of air, where the majority of the vehicles stored are powered by diesel-fuelled engines, or

- (c) provide, during operating hours, a continuous supply of outdoor air at a rate of not less than 3.9 L/s for each square metre of *floor area* (see Article 3.3.1.21.).
(See Note A-6.3.1.3.(1)) (See also Sentence 3.3.5.4.(4))
- (2) Mechanical ventilation systems provided in accordance with Clause (1)(a) shall be controlled automatically by carbon monoxide monitoring devices, and systems provided in accordance with Clause (1)(b) shall be controlled by nitrogen dioxide or other acceptable monitoring devices. (See Note A-6.3.1.3.(2))
- (3) Mechanical ventilation systems provided in accordance with Sentence (1) shall be designed such that the pressure in the *storage garage* is less than the pressure in adjoining *buildings* of other *occupancy*, or in adjacent portions of the same *building* having a different *occupancy*.
- (4) In *storage garages* subject to the requirements of Sentence (1), where motor vehicles are parked by mechanical means, the ventilation requirements may be reduced by one half.
- (5) Except as provided in Sentence (6), ticket and attendant booths of *storage garages* shall be pressurized with a supply of uncontaminated air.
- (6) The requirements of Sentences (1) to (5) shall not apply to *open-air storeys* in a *storage garage*.
- (7) A *repair garage* shall have a mechanical ventilation system designed to limit the exposure of workers to,
(a) carbon monoxide to below the time weighted average concentration of 25 parts per million for a normal 8 hour workday or 40 hour work week, and
(b) nitrogen dioxide from diesel powered vehicles to below 0.72 parts per million for a normal 8 hour workday or 40 hour work week.
- (8) In a *repair garage*, when a repair bay is not immediately adjacent to an outside garage door opening, a system capable of providing continuous general ventilation of not less than 700 L/s per internal bay shall be provided.
- (9) The general ventilation system described in Sentence (8) shall be designed to,
(a) operate continuously, or
(b) be controlled automatically by carbon monoxide monitoring devices, located so as to provide full protection throughout the *repair garage*.
- (10) The general ventilation system described in Sentence (8) is not required when tail pipes of vehicles are directly connected to local mechanical exhaust systems that terminate outdoors.

6.3.1.4. Heat Recovery Ventilators

- (1) Heat recovery ventilators with rated capacities of not less than 25 L/s and not more than 200 L/s shall be installed in accordance with Subsection 9.32.3.

6.3.1.5. Indoor Air Contaminants (See Note A-6.3.1.5.)

- (1) Air contaminants of concern within *buildings* shall
(a) be removed insofar as is possible at their points of origin, and
(b) not be permitted to accumulate in concentrations greater than those permitted by good engineering practice such as that described in the publications listed in Sentence 6.2.1.1.(1), measured using the methodology described therein.
- (2) Systems serving spaces that contain sources of contamination and systems serving other occupied parts of the *building* but located in or running through spaces that contain sources of contamination shall be designed in such a manner as to prevent the spread of such contamination to other occupied parts of the *building*.
- (3) Heating, ventilating and *air-conditioning* systems shall be designed to minimize the growth and spread of bio-contaminants.

(4) Mechanical rooms containing refrigeration equipment shall be ventilated in accordance with CSA B52, “Mechanical refrigeration code”.

6.3.1.6. Commercial Cooking Equipment

(1) Except as provided in Article 3.6.3.5., all commercial cooking equipment shall be provided with ventilation systems designed, constructed and installed to conform to NFPA 96, “Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.”

6.3.2. Air Duct Systems

6.3.2.1. Application

(1) This Subsection applies to the design, construction and installation of air duct distribution systems serving heating, ventilating and *air-conditioning* systems other than those in *dwelling units* covered by Part 9.

6.3.2.2. Drain Pans (See Note A-6.3.2.2.)

- (1) HVAC systems that generate condensate or introduce liquid water into the airstream in the ducts shall be equipped with drain pans that are
- (a) designed in accordance with Section 5.10, Drain Pans, of ANSI/ASHRAE 62.1, “Ventilation for Acceptable Indoor Air Quality,”
 - (b) provided with an outlet that is piped to the outside of the airstream in a location where condensate can be safely disposed of,
 - (c) installed so that water does not stagnate and drains from the pan, and
 - (d) provided with a drain line that is *indirectly connected* to a *drainage system* in accordance with Article 7.4.2.1.

6.3.2.3. Materials in Air Duct Systems

- (1) All ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of materials as described in Article 3.6.5.1.
- (2) Ducts that are used in a location where they may be subjected to excessive moisture shall have no appreciable loss of strength when wet and shall be resistant to moisture-induced corrosion.
- (3) All ductwork and fittings shall be constructed and installed as recommended in SMACNA Manuals and ASHRAE Standards.
- (4) All duct materials shall be suitable for exposure to the temperature and humidity of the air being carried and shall be resistant to corrosion caused by contaminants in the air being conveyed in the duct.

6.3.2.4. Connections in Air Duct Systems

(1) Air duct systems shall have tight-fitting connections throughout.

6.3.2.5. Duct Coverings, Linings, Adhesives and Insulation (See Note A-6.3.2.5.)

- (1) Coverings, linings and associated adhesives and insulation used in air ducts, *plenums* and other parts of air duct systems shall comply with Article 3.6.5.4.
- (2) Duct linings shall be installed so that they will not interfere with the operation of volume or balancing dampers or of *fire dampers*, *fire stop flaps* and other *closures*.

6.3.2.6. Clearance of Ducts and Plenums

- (1) The clearance of ducts and *plenums* from *combustible* materials shall comply with Article 3.6.5.6.

6.3.2.6A. Construction and Installation of Ducts and Plenums

- (1) Rectangular panels in *plenums* and ducts more than 300 mm wide shall be shaped to provide sufficient stiffness.
- (2) Where the installation of heating *supply ducts* in walls and floors creates a space between the duct and construction material, the space shall be fire stopped with *noncombustible* material at each end.
- (3) Ducts shall be securely supported by metal hangers, straps, lugs or brackets, except that where zero clearance is permitted, wooden brackets may be used.
- (4) All round duct joints shall be tight-fitting and lapped not less than 25 mm.
- (5) Rectangular duct connections shall be made with S and drive cleats.
- (6) Trunk *supply ducts* shall not be nailed directly to wood members.
- (7) Branch ducts shall be supported at suitable spacings to maintain alignment and prevent sagging.
- (8) Ducts in or beneath concrete slabs-on-ground shall be watertight, corrosion-, decay- and mildew-resistant.
- (9) Where a *supply* or *return duct* is not protected by an insulated exterior wall or where the duct is exposed to an unheated space it shall be insulated to prevent condensation.

6.3.2.7. Interconnection of Systems

- (1) In a *residential occupancy*, air from one *suite* shall not be circulated to any other *suite* or to a *public corridor*.
- (2) Except as permitted by Sentences (3) and 6.3.2.10.(6), air duct systems serving *storage garages* shall not be directly interconnected with other parts of the *building*.
- (3) *Exhaust ducts* referred to in Sentence 6.3.2.10.(10) are permitted to exhaust through an enclosed *storage garage* prior to exhausting to the outdoors, provided
 - (a) the *storage garage* exhaust system runs continuously,
 - (b) the capacity of the *storage garage* exhaust system is equal to or exceeds the volume of the exhaust entering the garage, and
 - (c) a leakage rate 1 smoke/fire damper rated in accordance with CAN/ULC-S112.1, “Standard for Leakage Rated Dampers for Use in Smoke Control Systems,” is provided near the duct outlet location in the *storage garage* to prevent air from the *storage garage* from entering the exhaust ductwork system in the event the *building's* exhaust fan is shut down.
- (4) Except for corridors conforming to Sentence 3.3.1.4.(4) or as permitted in Sentences (5) and (6), a *public corridor* or corridor serving the public shall not be used as a portion of a supply, return or exhaust air system serving adjoining areas, other than as part of a supply air system serving toilet rooms, bathrooms, shower rooms and similar auxiliary spaces opening directly to the *public corridor* or corridor used by the public.
- (5) A *public corridor* may be used as part of an engineered smoke control system.
- (6) Infiltration due to corridor pressurization is permitted into a *residential occupancy* from a *public corridor*.

6.3.2.8. Makeup Air (See Note A-6.2.1.1.)

- (1) In ventilating systems that exhaust air to the outdoors, provision shall be made for the admission of a supply of makeup air in sufficient quantity so that the operation of the exhaust system and other exhaust equipment or combustion equipment is not adversely affected.
- (2) Makeup air facilities required by Sentence (1) shall be interlocked with the exhaust devices they serve so that both operate together.
- (3) Where makeup air facilities are intended to introduce air directly from the outdoors to occupied parts of the *building* in winter, they shall incorporate means of tempering that air to maintain the indoor design temperature.

6.3.2.9. Supply, Return, Intake and Exhaust Air Openings

- (1) Supply, return and exhaust air openings located less than 2 m above the floor in rooms or spaces in *buildings* shall be protected by grilles having openings of a size that will not allow the passage of a 15 mm diam sphere.
- (2) Outdoor air intakes shall be located so that
 - (a) the quality of the air entering the *building* complies with Sentences 6.2.1.2.(2) and (3), and
 - (b) they are separated a minimum distance from sources of contaminants in accordance with Table 6.3.2.9.
- (3) Outdoor air intakes shall be installed not less than 0.3 m above roofs, landscape grades or other surfaces, taking into account anticipated snow accumulation levels.
- (4) Exterior openings for outdoor air intakes and exhaust outlets shall be shielded from the entry of snow and rain and shall be fitted with corrosion-resistant screens of mesh having openings not larger than 15 mm, except where experience has shown that climatic conditions require larger openings to prevent the screen openings from icing over.
- (5) Screens required in Sentence (4) shall be accessible for maintenance.
- (6) *Combustible* grilles, diffusers and other devices covering supply, return, intake and exhaust openings shall comply with Article 3.6.5.7.

Table 6.3.2.9.
Minimum Distances of Air Intakes from Sources of Contaminants
 Forming Part of Sentence 6.3.2.9.(2)

Source of Contaminants	Minimum Distance of Outdoor Air Intake, m
Garage entry of a garage for 5 or more motor vehicles, automobile loading area and drive-in queue	4.5
Truck loading area or dock, and bus parking	7.6
Driveway, parking space, lane, road and similar locations that carry a low volume of traffic	1.5
Thoroughfare, arterial road, freeway, highway and similar locations that carry a high volume of traffic	7.6
Garbage storage/pick-up area and dumpsters	4.5
Discharge from evaporative heat rejection systems	7.6
Sanitary vent	3.5
Kitchen exhaust outlet	3.0
Vent for combustion products from solid fuel-burning <i>appliances</i>	3.0

6.3.2.10. Exhaust Ducts and Outlets

- (1) Except as provided in Sentence (2), *exhaust ducts* of non-mechanical ventilating systems serving separate rooms or spaces shall not be combined.
- (2) *Exhaust ducts* of non-mechanical ventilating systems serving similar *occupancies* may be combined immediately below the point of final delivery to the outdoors, such as at the base of a roof ventilator.
- (3) *Exhaust ducts* of ventilating systems shall have provision for the removal of condensation where this may be a problem.
- (4) Exhaust outlets shall be designed to prevent back draft under wind conditions.
- (5) Except as permitted in Sentence (6), exhaust systems shall discharge directly to the outdoors. (See Note A-6.3.2.10.(5) and (6))
- (6) Exhaust systems are permitted to exhaust into a *storage garage*, provided
 - (a) they serve rooms that are accessible only from that *storage garage*,
 - (b) the exhaust contains no contaminants that would adversely affect the air quality in the *storage garage*, and (See Note A-6.3.2.10.(6)(b))
 - (c) they are designed in accordance with Sentence 6.3.2.7.(3).
(See Note A-6.3.2.10.(5) and (6))
- (7) *Exhaust ducts* connected to laundry drying equipment shall be,
 - (a) independent of other *exhaust ducts*,
 - (b) designed and installed so that the entire duct can be cleaned, and
 - (c) constructed of smooth corrosion-resistant material.
(See Note A-6.3.2.10.(7) and (8))
- (8) Where collective venting of multiple installations of laundry-drying equipment is used, the ventilation system shall
 - (a) be connected to a common *exhaust duct* that is vented by one central exhaust fan,
 - (b) include an interlock to activate the central exhaust fan when laundry-drying equipment is in use, and
 - (c) be provided with make-up air. (See Note A-6.3.2.10.(7) and (8))
- (9) *Exhaust ducts* or vents connected to laundry-drying equipment shall discharge directly to the outdoors.
- (10) Except as provided in Sentence (12) and except for self-contained systems serving individual *dwelling units*, *exhaust ducts* serving rooms containing water closets, urinals, basins, showers or slop sinks shall be independent of other *exhaust ducts*.
- (11) Except as provided in Sentence (12) and except for self-contained systems serving individual *dwelling units*, *exhaust ducts* serving rooms containing residential cooking equipment shall be independent of other *exhaust ducts*.
- (12) Two or more exhaust systems described in Sentences (10) and (11) may be interconnected or connected with *exhaust ducts* serving other areas of the *building*, provided
 - (a) the connections are made at the inlet of an exhaust fan, and all interconnected systems are equipped with suitable back pressure devices to prevent the passage of odours from one system to another when the fan is not in operation, or
 - (b) the *exhaust ducts* discharge to a shaft that is served by an exhaust fan having a capacity that is equal to or greater than the combined capacity of the exhaust fans discharging to the *plenum* multiplied by the operation diversity factor, provided that the exhaust fan serving the shaft operates continuously. (See Note A-6.3.2.10.(12)(b))
- (13) Where *exhaust ducts* containing air from *conditioned spaces* pass through or are adjacent to unconditioned spaces, the ducts shall be constructed to prevent condensation from forming on the inside or outside of the ducts.

(14) Except as provided in Sentence (15), exhaust air shall be provided at a rate not less than 24 L/s for each water closet, urinal, shower or slop sink.

(15) Except as provided in Sentence 6.3.1.1.(4), exhaust air shall be provided for *fixtures* in *dwelling units* in accordance with ANSI/ASHRAE 62.1, “Ventilation for Acceptable Indoor Air Quality.”

(16) Except for wash basins (lavatories), sanitary facilities in a *food premises* shall be mechanically ventilated and shall be capable of exhausting air at the rate of not less than 24 L/s for each sanitary fixture listed in Sentence (17).

(17) The mechanical ventilation described in Sentence (16) applies to rooms containing water closets, urinals, basins, showers or slop sinks.

6.3.2.11. Return-Air System

(1) Return-air systems shall comply with Article 3.6.5.8.

(2) Where a ceiling space is used as a return-air *plenum*, the requirements of Article 3.6.4.3. shall apply.

(3) A *public corridor* or *exit* shall not be used as a return-air *plenum*.

(4) The return-air system shall be designed to handle the entire air supply.

(5) The return-air system shall be designed so that the negative pressure from the circulating fan cannot affect the *furnace* combustion air supply nor draw combustion products from joints or openings in the *furnace* or *flue pipe*.

(6) Return-air inlets shall not be installed in an enclosed room or crawl space that provides combustion air to a fuel-fired *appliance*.

6.3.2.12. Underground Ducts

(1) Underground ducts shall

(a) be constructed and installed to provide interior drainage from and access to all low points,

(b) not be connected directly to a sewer, and

(c) be installed and constructed of materials recommended by ASHRAE and SMACNA Standards and HRAI Manuals.

(2) A clean-out or pump-out connection shall be provided in an underground duct system at every low point of the duct system.

6.3.2.13. Filters

(1) Air filters for air duct systems shall conform to the requirements for Class 2 air filter units as described in CAN/ULC-S111, “Standard Method of Fire Tests for Air Filter Units.”

(2) When electrostatic-type filters are used, they shall be installed so as to ensure that the electric circuit is automatically de-energized when filter access doors are opened or, in *dwelling units*, when the *furnace* circulation fan is not operating.

6.3.2.14. Cleaning Devices

r1 (1) Reserved.

(2) Where contaminants of concern are present in the outdoor air of the local area of the *building* site, ventilation required by Sentence 6.3.1.1.(1) shall be provided by a ventilation system designed to include devices that reduce the concentrations of contaminants to those permitted in the ACGIH's "Industrial Ventilation: A Manual of Recommended Practice for Design" prior to the introduction of outdoor air to indoor occupied spaces.

6.3.2.15. Evaporative Heat Rejection Systems

- (1) Evaporative heat rejection systems shall
 - (a) incorporate a drift eliminator or other means to minimize the dispersion of entrained water droplets, and
 - (b) have a design discharge velocity that does not exceed the maximum discharge velocity recommended by the manufacturer.
- (2) Evaporative heat rejection systems shall be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating.
- (3) Evaporative heat rejection systems and their components shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms and that are compatible with disinfectants, biocides and other cleaning agents.
- (4) Evaporative heat rejection systems shall be installed such that
 - (a) no discharge air bypasses the drift eliminator or other means referred to in Clause (1)(a), and
 - (b) the systems are accessible for cleaning, inspection and maintenance.
- (5) Except as provided in Sentence (6), air discharged from evaporative heat rejection systems shall discharge away from the *building*, so as to not re-enter it, to a distance not less than
 - (a) 2.15 m above sidewalks and driveways,
 - (b) 7.6 m from outdoor air intakes,
 - (c) 3 m horizontally or vertically from exterior doors and operable windows, and
 - (d) 3 m horizontally or vertically from occupiable outdoor spaces, excluding maintenance spaces.(See Note A-6.3.2.15.(5) and (6))
- (6) Air discharged from evaporative heat rejection systems in health care facilities shall discharge away from the *building* in compliance with CAN/CSA-Z317.2, "Special requirements for heating, ventilation, and *air-conditioning* (HVAC) systems in health care facilities." (See Note A-6.3.2.15.(5) and (6))
- (7) Air intakes of evaporative heat rejection systems shall incorporate protective measures to minimize the entrainment of vegetation and other organic matter.
- (8) Make-up water connections shall be equipped with backflow prevention devices that conform to Article 7.6.2.1. (See Note A-6.3.2.15.(8) and (9))
- (9) Water treatment systems and equipment for controlling the proliferation of disease-causing micro-organisms shall
 - (a) be provided in accordance with Section 7.6.2. of ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems," and
 - (b) include means for drainage, dilution, cleaning, and application of chemicals for the control of scale, corrosion and biological contamination.(See Note A-6.3.2.15.(8) and (9))
- (10) Drains, overflows and blow-downs shall be connected to the building's drainage system in accordance with Clause 7.4.2.1.(1)(d).
- (11) Evaporative heat rejection systems shall be provided with access openings, service platforms, fixed ladders and fall-restraint connections to allow inspection, maintenance and testing.

6.3.2.16. Evaporative Air Coolers, Misters, Atomizers, Air Washers and Humidifiers

- (1) Evaporative air coolers, misters, atomizers, air washers and humidifiers shall be designed in accordance with Sections 8 and 9 of ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems.”
- (2) Systems referred to in Sentence (1) shall
 - (a) be designed so that water continuously circulates through all parts of the system that are normally wetted when the system is operating, and
 - (b) incorporate a method of preventing water stagnation within the system itself and the internal plumbing when the system is not operating.(See Note A-6.3.2.16.(2))
- (3) All components of systems referred to in Sentence (1), including filters and evaporation media, shall be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.
- (4) Associated sumps shall
 - (a) be constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms,
 - (b) include auxiliary drains to prevent the overflow of water into ductwork, and
 - (c) be installed so that they can be flushed, drained, cleaned and disinfected.
- (5) Where misters, atomizers or air washers are used in ductwork, the affected duct section shall be
 - (a) designed to ensure drainage of unevaporated and accumulated water, and
 - (b) constructed of corrosion-resistant, non-porous materials that do not promote the proliferation of disease-causing micro-organisms.
- (6) Make-up water connections shall be equipped with *backflow* prevention devices that conform to Article 7.6.2.1. (See Note A-6.3.2.16.(6))

6.3.2.17. Fans and Associated Air-Handling Equipment

- (1) Fans for heating, ventilating and *air-conditioning* systems shall be located and installed so that their operation
 - (a) does not adversely affect the draft required for proper operation of fuel-fired *appliances*, and
 - (b) does not allow the air in the duct system to be contaminated by air or gases from the *boiler* room or *furnace* room.
- (2) Fans and associated air-handling equipment, such as air washers, filters and heating and cooling units, when installed on the roof or elsewhere outside the *building*, shall be of a type designed for outdoor use.

6.3.2.18. Vibration Isolation Connectors

- (1) Vibration isolation connectors in air duct systems shall comply with Article 3.6.5.2.

6.3.2.19. Tape

- (1) Tape used for sealing joints in air ducts, *plenums* and other parts of air duct systems shall comply with Article 3.6.5.3.

6.3.3. Chimneys and Venting Equipment

6.3.3.1. Requirement for Venting

- (1) Except as provided in Articles 6.3.3.2. and 6.3.3.3., the products of combustion from oil-, gas and solid-fuel-burning *appliances* shall be vented in conformance with the requirements in the applicable *appliance* installation standard listed in Article 6.2.1.5.
- (2) Except as provided in Article 6.2.1.5., vented products of combustion, other than those referred to in Sentence (1), shall be discharged away from the *building*, so as not to re-enter it, to a distance not less than
 - (a) 2.15 m above sidewalks and driveways,
 - (b) 3 m from outdoor air intakes,
 - (c) 3 m horizontally or vertically from doors and operable windows, and
 - (d) 3 m horizontally or vertically from occupiable outdoor spaces, excluding maintenance spaces.(See Note A-6.3.3.1.(2))

6.3.3.2. Masonry or Concrete Chimneys

- (1) Rectangular *masonry or concrete chimneys* not more than 12 m in height shall conform to Part 9 if they serve
 - (a) *appliances* with a combined total rated heat output of 120 kW or less, or
 - (b) fireplaces.
- (2) *Masonry or concrete chimneys* other than those described in Sentence (1) shall be designed and installed in conformance with the appropriate requirements in NFPA 211, “Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances.”

6.3.3.3. Metal Smoke Stacks

- (1) Single wall metal smoke stacks shall be designed and installed in conformance with NFPA 211, “Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances.”

6.3.3.4. Access Ladders

- (1) Access ladders for *chimneys*, when provided, shall consist of steel or bronze rungs, built into the walls of the *chimneys*.
- (2) Rungs for external ladders shall begin at not less than 2.5 m from ground level.

6.3.4. Ventilation for Laboratories

6.3.4.1. Application

- (1) This Subsection applies to laboratories where *dangerous goods*, including *flammable liquids* and *combustible liquids*, are used in normal laboratory operations in quantities or in a manner that creates a fire or explosion hazard.

6.3.4.2. General Ventilation

- (1) A laboratory shall be provided with continuous mechanical ventilation designed to ensure that *dangerous goods* vapours and particles
 - (a) do not accumulate in the laboratory,
 - (b) are prevented from migrating to other parts of the *building*,
 - (c) do not accumulate in the ventilation system,
 - (d) are exhausted to the outdoors, and
 - (e) are not returned to the *building*.
- (2) A ventilation system required by this Subsection shall be provided with monitoring devices to
 - (a) indicate that the ventilation system is in operation, and
 - (b) sound an alarm if the ventilation system is malfunctioning.
- (3) A ventilation system required by this Subsection shall be maintained in conformance with Section 4.12. of the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

6.3.4.2.A. Power-Ventilated Enclosure

- (1) A power-ventilated enclosure required by the Fire Code made under the *Fire Protection and Prevention Act, 1997* shall be designed and constructed to conform to Articles 6.3.4.3. and 6.2.4.4.

6.3.4.3. Enclosure Exhaust Ventilation

- (1) The ventilation system for a power-ventilated enclosure referred to in Article 6.3.4.2A. shall
 - (a) conform to NFPA 91, “Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids,”
 - (b) provide continuous exhaust ventilation at an air velocity sufficient to prevent the accumulation of *combustible* or reactive deposits in the power-ventilated enclosure and its *exhaust duct* system,
 - (c) confine *dangerous goods* vapours and particles to the area where they are generated and exhaust them to the outdoors,
 - (d) not return the exhausted air to the *building*, and
 - (e) be provided with well identified control switches that are
 - (i) located outside the power-ventilated enclosure, and
 - (ii) readily accessible in case of an emergency.

6.3.4.4. Enclosure Construction

- (1) The power-ventilated enclosure referred to in Article 6.3.4.2A. and its *exhaust duct* system shall
 - (a) except as provided in Sentences (2) and (3), be constructed of *noncombustible* materials compatible with and chemically resistant to the *dangerous goods* vapours and particles being exhausted, and
 - (b) be provided with access doors to permit inspection and maintenance of the fan assembly and *exhaust ducts*.
- (2) *Combustible* materials are permitted in the power-ventilated enclosure described in Sentence (1) and its *exhaust duct* systems if
 - (a) such materials are required by the corrosive or reactive properties of the *dangerous goods* being used, and
 - (b) their *flame-spread rating* is not more than 25.
- (3) The *flame-spread rating* required by Sentence (2) is permitted to be greater than 25 if an automatic fire suppression system is provided inside the power-ventilated enclosure and its *exhaust duct* system.

Section 6.4. Heating Appliances

6.4.1. Heating Appliances, General

6.4.1.1. Location of Appliances

(1) Except for *appliances* installed in *dwelling units*, fuel-fired heating *appliances* shall be located, enclosed or separated from the remainder of the *building* in conformance with Section 3.6. (See also Subsection 9.10.10.)

6.4.1.2. Appliances Installed Outside the Building

- (1) Fuel-fired *appliances* installed outside a *building* shall be
- (a) designed and constructed for outdoor use,
 - (b) installed not less than 1 200 mm from the property line, measured horizontally, and
 - (c) installed not less than 3 m from an adjacent wall of the same *building* when such wall contains an opening or openings within 3 *storeys* above and 5 m horizontally from the *appliance*, unless such openings are protected by a *closure* assembly having a 45 min *fire-protection rating* determined in conformance with Article 3.1.8.4., or by wired glass conforming to Article 3.1.8.14.

6.4.2. Unit Heaters

6.4.2.1. Clearances

(1) Every *unit heater* using either steam or hot water as the heating medium shall be installed such that the clearances between the *appliance* and adjacent *combustible* material conform to Table 6.7.1.2.

6.4.3. Radiators and Convectors

6.4.3.1. Lining or Backing

- (1) A *noncombustible* lining or backing shall be provided for every steam or hot water radiator and convector
- (a) located in a recess or concealed space, or
 - (b) attached to the face of a wall of *combustible construction* or *encapsulated mass timber construction*.

(2) Every steam or hot water radiator and convector shall be installed so as to conform to the clearance requirements of Table 6.7.1.2.

Section 6.5. Thermal Insulation Systems

6.5.1. Insulation

6.5.1.1. Insulation and Coverings (See Note A-6.3.2.5.)

- (1) Insulation and coverings on pipes shall comply with Article 3.6.5.5.
- (2) Insulation and coverings on pipes shall be composed of material that will withstand deterioration from softening, melting, mildew and mould at the operating temperature of the system.

(3) Exposed piping or equipment subject to human contact shall be insulated so that the temperature of the exposed surface does not exceed 52°C. (See Note A-6.5.1.1.(3))

Section 6.6. Refrigeration and Cooling Systems

6.6.1. Refrigerating Systems and Equipment for Air-Conditioning

6.6.1.1. Cooling Units

- (1) Where a cooling unit is combined with a fuel-fired *furnace* in the same duct system, the cooling unit shall be installed
- (a) in parallel with the heating *furnace*,
 - (b) upstream of the *furnace* provided the *furnace* is designed for such application, or
 - (c) downstream of the *furnace* provided the cooling unit is designed to prevent excessive temperature or pressure in the refrigeration system.

Section 6.7. Piping Systems

6.7.1. Piping for Heating and Cooling Systems

6.7.1.1. Piping Materials and Installation

- (1) Piping shall be made from materials designed to withstand the effects of temperatures and pressures that may occur in the system. (See Articles 3.1.5.19., 3.1.9.1., 9.10.9.6. and 9.10.9.7. for fire safety requirements.)
- (2) Every pipe used in a heating or *air-conditioning* system shall be installed to allow for expansion and contraction due to temperature changes.
- (3) Supports and anchors for piping in a heating or *air-conditioning* system shall be designed and installed to ensure that undue stress is not placed on the supporting structure.

6.7.1.2. Clearances

- (1) Clearances between *combustible* material and bare pipes carrying steam or hot water shall conform to Table 6.7.1.2.

Table 6.7.1.2.
Clearance Between Steam or Hot Water Pipes and Combustible Material
 Forming Part of Article 6.4.2.1., Sentence 6.4.3.1.(2) and Article 6.7.1..2.

Steam or Water Temperature, °C	Minimum Clearance, mm
Up to 95	No clearance
above 95 to 120	15
above 120	25

6.7.1.3. Surface Temperature

(1) The exposed surface temperature of a steam or hot water radiator shall not exceed 70°C unless precautions are taken to prevent human contact. (See Note A-6.5.1.1.(3))

6.7.1.4. Protection

(1) Where a pipe carrying steam or hot water at a temperature above 120°C passes through a *combustible* floor, ceiling or wall, the construction shall be protected by a sleeve of metal or other *noncombustible* material not less than 50 mm larger in diameter than the pipe.

6.7.1.5. Piping in Shafts

(1) Where piping for heating or *air-conditioning* systems is enclosed in a shaft, the requirements of Article 3.6.3.1. for shafts shall apply.

6.7.2. Storage Bins

6.7.2.1. Storage Bins

(1) Service pipes passing through a storage bin for solid fuel shall be protected or so located as to avoid damage to the pipes.

(2) Except for fuel-thawing pipes, every pipe designed to operate at a temperature of 50°C or above shall be located where fuel cannot be stored in contact with it.

Section 6.8. Equipment Access

6.8.1. Openings

6.8.1.1. Access Openings

(1) Any covering of an access opening through which a person could enter shall be openable from the inside without the use of keys where there is a possibility of the opening being accidentally closed while the system or equipment is being serviced.

6.8.1.2. Openings in Air Duct Systems

(1) Air duct systems shall have no openings other than those required for the proper operation and maintenance of the system.

(2) Access openings shall be provided in duct systems to allow the removal of material that may accumulate in *plenums* and ducts.

6.8.1.3. Odour Removal Equipment

- (1) When odour removal equipment of the adsorption type is used, it shall be
 - (a) installed to allow access so that adsorption material can be reactivated or renewed, and
 - (b) protected from dust accumulation by air filters installed on the inlet side.
- (2) Facilities for flushing and drainage shall be provided where filters are designed to be washed in place.

Section 6.9. Fire Safety Systems

6.9.1. General

6.9.1.1. Fire Safety Requirements

- (1) The fire safety characteristics of heating, ventilating and *air-conditioning* systems shall comply with Subsection 3.6.5.
- (2) Characteristics referred to in Sentence (1) include but are not limited to
 - (a) use of *combustible* materials in duct systems,
 - (b) *flame-spread ratings* and smoke-developed ratings of duct and pipe materials and coverings,
 - (c) installation of equipment relative to property lines, and
 - (d) requirements for *fire dampers* and *fire stop flaps*.

6.9.1.2. Hazardous Gases, Dusts or Liquids

- (1) Except as provided in Subsection 6.3.4., systems serving spaces that contain hazardous gases, dusts or liquids shall be designed, constructed and installed in conformance with the provisions of the Fire Code made under the *Fire Protection and Prevention Act, 1997*, or in the absence of requirements pertinent to such systems in the Fire Code, to good engineering practice such as that described in the publications of the National Fire Protection Association and in the CCBFC NRCC-CONST-56437E, "National Fire Code of Canada. (See Note A-6.9.1.2.(1))
- (2) When indoor piping for Class I *flammable liquids* is installed in a trench, the trench shall be
 - (a) provided with positive ventilation to the outdoors, or
 - (b) designed to prevent the accumulation of flammable vapours.

6.9.1.3. Commercial Cooking Equipment

- (1) Fire protection systems for commercial cooking equipment referred to in Sentence 6.3.1.6.(1) using vegetable oil or animal fat shall conform to
 - (a) ANSI/CAN/UL/ULC 300, "Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment," or
 - (b) ULC/ORD-C1254.6, "Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units."

6.9.2. Dampers and Ductwork

6.9.2.1. Fire Dampers

- (1) *Fire dampers* shall conform to Article 3.1.8.10.

6.9.2.2. Smoke Detectors

- (1) Air handling systems shall incorporate *smoke detectors* where and as required by Article 3.2.4.12.

6.9.2.3. Exhaust Ducts and Outlets

- (1) Where an *exhaust duct* system is used for smoke removal in a high *building*, the requirements of Article 3.2.6.6. shall apply.
- (2) Where *exhaust duct* systems from more than one *fire compartment* are connected to an *exhaust duct* in a *vertical service space*, the requirements of Article 3.6.3.4. shall apply.

6.9.2.4. Ducts in Exits

- (1) Where ducts penetrate *fire separations* separating *exits* from the remainder of the *building*, they shall be in accordance with Article 3.4.4.4.
- (2) Duct penetration of *fire separations* separating *exits* from the remainder of the *building* is permitted if the duct
 - (a) is designed for the purposes of Subsection 3.2.6., or
 - (b) only serves the *exit* from a dedicated rooftop air make-up unit.

6.9.3. Carbon Monoxide Alarms

6.9.3.1. Application

- (1) Article 6.9.3.2. applies to every *building* that
 - (a) contains a *residential occupancy*, a *care occupancy* with individual *suites*, or a *care occupancy* containing sleeping rooms not within a *suite*, and contains a *fuel-burning appliance* or a *storage garage*, or
 - (b) contains a *residential occupancy* and is served by a forced-air fuel-burning *appliance* not contained within the *building*.
- (2) Articles 6.9.3.3. and 6.9.3.4. apply to every *building*.

6.9.3.2. Location of Carbon Monoxide Alarms

- (1) A *carbon monoxide alarm* shall be installed in a *suite* of *residential occupancy* or *care occupancy* where
 - (a) a fuel-burning *appliance* or a *flue* is installed in the *suite*,
 - (b) a forced-air fuel-burning *appliance* provides heated air directly to the *suite*,
 - (c) a fuel-burning *appliance* or a *flue* is located in a room, *suite* or area that shares a common wall or floor or ceiling assembly with the *suite*, or
 - (d) a *storage garage* shares a common wall or floor or ceiling assembly with the *suite*.
- (2) Where a *carbon monoxide alarm* is required by Sentence (1) to be installed in a *suite* of *residential occupancy* or *care occupancy*, other than a *suite* that consists of a combined living and sleeping area, a *carbon monoxide alarm* shall be installed
 - (a) adjacent to each sleeping room in the *suite*, and
 - (b) on each *storey* without a sleeping room in the *suite*.
- (3) Where a *carbon monoxide alarm* is required by Sentence (1) to be installed in a *suite* of *residential occupancy* or *care occupancy* that consists of a combined living and sleeping area, a *carbon monoxide alarm* shall be installed in the combined living and sleeping area.

- (4) In addition to the *carbon monoxide alarms* required to be installed in a *suite* of *residential occupancy* or *care occupancy* in accordance with Sentence (2), a *carbon monoxide alarm* shall be installed in each sleeping room within the *suite* where the sleeping room
- (a) contains a fuel-burning *appliance* or a *flue*, or
 - (b) shares a common wall or floor or ceiling assembly with
 - (i) a room, *suite* or area that is located outside the *suite* and contains a fuel-burning *appliance* or a *flue*, or
 - (ii) a *storage garage*.
- (5) *Carbon monoxide alarms* shall be installed in public corridors serving *suites* of *residential occupancy* where the corridor is directly heated by a forced-air fuel-burning *appliance*.
- (6) Where *carbon monoxide alarms* are required by Sentence (5) to be installed in a public corridor, the *carbon monoxide alarms* shall be installed such that
- (a) there is at least one *carbon monoxide alarm* in each portion of a divided corridor, and
 - (b) each *carbon monoxide alarm* in an undivided portion of a corridor is spaced not more than 25 m apart.

6.9.3.3. Location of Carbon Monoxide Alarms in All Buildings

- (1) A *carbon monoxide alarm* shall be installed in *service rooms* or other areas of a *building* where the *service room* or other area
- (a) contains a fuel-burning *appliance* used for *building* services or laundry drying equipment, and
 - (b) is not located within a *suite* of *residential occupancy*.

6.9.3.4. Installation and Conformance to Standards

- (1) The *carbon monoxide alarms* required by Articles 6.9.3.2. and 6.9.3.3. shall
- (a) except as permitted in Sentence (2), be permanently connected to an electrical circuit and shall have no disconnect switch between the overcurrent device and the *carbon monoxide alarm*,
 - (b) in case the regular power supply to the *carbon monoxide alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *carbon monoxide alarm* for a period of not less than 8 h in the standby condition, followed by the operation of the *carbon monoxide alarm* for an alarm signal for at least 12 h,
 - (c) be wired so that
 - (i) activation of one carbon monoxide alarm within a *suite* of residential occupancy will activate all carbon monoxide alarms within the *suite*, and
 - (ii) activation of one carbon monoxide alarm located in a public corridor serving *suites* of residential occupancy will activate all carbon monoxide alarms within the corridor,
 - (d) be audible within sleeping rooms when the intervening doors are closed, where located adjacent to a sleeping room in a *suite* of *residential occupancy*, and
 - (e) conform to
 - (i) CAN/CSA-6.19, “Residential Carbon Monoxide Alarming Devices”, or
 - (ii) UL 2034, “Single and Multiple Station Carbon Monoxide Alarms”.
- (2) Where the *building* is not supplied with electrical power, *carbon monoxide alarms* are permitted to be battery operated.
- (3) Except as permitted in Sentence (4), the *carbon monoxide alarms* required by Articles 6.9.4.2. and 6.9.4.3. shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, “National Fire Alarm and Signaling Code”.
- (4) Where the *building* is not supplied with electrical power, *carbon monoxide alarms* need not have a visual signalling component.

- (5) The luminous intensity for visual signalling components required by Sentence (3) that are installed in sleeping rooms or combined living and sleeping areas shall be a minimum of 175 cd.
- (6) The visual signalling component required by Sentence (3) need not
 - (a) be integrated with the *carbon monoxide alarm* provided it is interconnected to it,
 - (b) be on battery backup, or
 - (c) have synchronized flash rates, when installed in a *dwelling unit*.
- (7) The *carbon monoxide alarms* required by Articles 6.9.3.2. and 6.9.3.3. shall be installed
 - (a) at the manufacturer's recommended height, or
 - (b) in the absence of specific instructions, on or near the ceiling.

6.9.4. Ash Storage

6.9.4.1. Ash Storage Bins

- (1) Every ash storage bin shall be constructed of *noncombustible* material.
- (2) Every opening in an ash storage bin shall be protected by a tight-fitting metal door with metal frame securely fastened to the bin.

6.9.4.2. Fireplaces

- (1) Fireplaces shall conform to the requirements of Section 9.22.

Part 7

Plumbing

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Part 7

Plumbing

Section 7.1. General

7.0.1. Scope

7.0.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

7.1.1. Application

7.1.1.1. Application

- (1) Except as provided in Sentence (2), this Part applies to the design and *construction of plumbing*.
- (2) This Part does not apply to industrial process systems unless the industrial process system is interconnected with the *plumbing system*, in which case the interconnection shall be so designed and installed so that the *plumbing system* is protected against contamination or malfunction that may be caused by the industrial system.

7.1.1A. Definitions

7.1.1A.1. Definitions

- (1) Except as provided in Sentence (2), words that appear in italics are defined in Article 1.4.1.2. of Division A and in the *Building Code Act, 1992*.
- (2) In this Part,
Storey means the interval between two successive floor levels including *mezzanine* floors that contain *plumbing fixtures* or between a floor level and roof.

7.1.1B. Plumbing Facilities

7.1.1B.1. Facilities Required

- (1) *Plumbing* facilities shall be provided in accordance with Subsection 3.7.4. and Section 9.31.

7.1.1B.2. Floor Drains

- (1) Where gravity drainage to a *sanitary drainage system* is possible, a floor drain shall be installed in a *basement* forming part of a *dwelling unit*.
- (2) Where gravity drainage to a *sanitary drainage system* is not possible, the floor drain required by Sentence (1) may be connected to a *storm drainage system*, dry well or drainage ditch provided it is located where it can receive only *clear water waste* or *storm sewage*.
- (3) A floor drain shall be provided in a public laundry room, garbage room, incinerator room, *boiler* or heating room that is not located within a *dwelling unit*.

7.1.2. Service Connections

7.1.2.1. Sanitary Drainage Systems

- r1
- (1) Except as provided in Section 7.7., *sanitary drainage systems* shall be connected to a public *sanitary sewer*, a public *combined sewer* or a *private sewage disposal system*.
 - (2) A combined *building drain* or a combined *building sewer* shall not be installed. (See Note A-7.1.2.1.(2))

7.1.2.2. Storm Drainage Systems

- r1
- (1) Except as provided in Section 7.7., *storm drainage systems* and *private sewers* conveying *storm sewage* shall be connected to a public *storm sewer*, a public *combined sewer* or a designated *storm water* disposal location.

7.1.2.3. Water Distribution Systems

- r1
- (1) Except as provided in Section 7.7. and Sentences (2) and (3), *water distribution systems* shall be connected to a public water main, *drinking water system* or a *potable private water supply system*.
 - (2) *Storm sewage* or *greywater* that is free of solids and treated to conform to Article 7.7.4.1. is permitted to be used as a water supply for
 - (a) water closets,
 - (b) urinals,
 - (c) sub-surface irrigation, or
 - (d) the priming of *traps*.
 - (3) *Rainwater* that is free of solids and treated to conform to Article 7.7.4.1. is permitted to be used as a water supply for
 - (a) clothes washers,
 - (b) laundry trays,
 - (c) mop sinks,
 - (d) bedpan washers,
 - (e) water closets,
 - (f) urinals,
 - (g) hose bibbs,
 - (h) sub-surface irrigation, or
 - (i) the priming of *traps*.
 - (4) Piping conveying the non-*potable* water described in Sentence (2) shall be installed in conformance with Section 7.7.

7.1.2.4. Separate Services

- (1) Except as provided in Sentences (2) and (3), piping in any *building* connected to the public services shall be connected separately from piping of any other *building*, except that an ancillary *building* on the same property may be served by the same service. (See Note A-7.1.2.4.(1))
- (2) No *plumbing* serving a *dwelling unit* shall be installed in or under another unit of the *building* unless the piping is located in a tunnel, pipe corridor, common *basement* or parking garage, so that the piping is *accessible* for servicing and maintenance throughout its length without encroachment on any private living space, but this Sentence does not prevent *plumbing* serving a unit located above another unit from being installed in or under the lower unit.
- (3) *Water service pipes* or *building sewers* serving *buildings* located on the same property may connect into a *private water supply* or a *private sewer* conforming to Article 7.1.2.5.

7.1.2.5. Private Sewers and Private Water Supply

- (1) *Private water supply* pipes shall be designed and installed according to MOE PIBS 6881e, “Design Guidelines for Drinking-Water Systems”.
- (2) *Private sewers* shall be designed and installed according to MOE PIBS 6879, “Design Guidelines for Sewage Works”.

7.1.3. Location of Fixtures

7.1.3.1. Lighting and Ventilation Requirements

- (1) *Plumbing fixtures* shall not be installed in a room that is not lighted and ventilated in accordance with the appropriate requirements in Parts 3, 6 and 9.

7.1.3.2. Accessibility

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

7.1.3A. Accommodating Movement

7.1.3A.1. Structural Movement

- (1) *Plumbing* shall be designed and installed to accommodate the maximum relative structural movement provided for in the *construction* of the *building*.

7.1.4. Seismic Design

7.1.4.1. Seismic Restraints and Design

- (1) *Plumbing systems* in *buildings* constructed in accordance with Part 3 shall be designed and installed to accommodate the seismic forces addressed in Subsection 4.1.8. (See Note A-7.1.4.1.(1))

Section 7.2. Materials and Equipment

7.2.1. General

7.2.1.1. Exposure of Materials

- (1) Where unusual conditions exist such as excessively corrosive *soil* or water, only materials suited for use in such locations shall be used.
- (2) Materials and equipment used in a *drainage system* where excessively corrosive wastes are present shall be suitable for the purpose.

7.2.1.2. Restrictions on Re-Use

- (1) Materials and equipment that have been used for a purpose other than the distribution of *potable* water shall not be subsequently used in a *potable water system*.
- (2) Used materials and equipment, including *fixtures*, shall not be reused unless they meet the requirements of this Part for new materials and equipment and are otherwise satisfactory for their intended use.

7.2.1.3. Identification

- (1) Every length of pipe and every fitting shall
 - (a) have cast, stamped or indelibly marked on it the maker's name or mark and the weight or class or quality of the product, or
 - (b) be marked in accordance with the relevant standard.
- (2) Markings required in Sentence (1) shall be visible after installation.
- (3) The lack of certification markings on a product or *plumbing* component shall be regarded as proof, in the absence of evidence to the contrary, that no certification exists.
- (4) If a component of a *plumbing system* is required to be certified to a standard, the certification shall be made by a testing agency accredited for that purpose by the Standards Council of Canada.

7.2.1.4. Pipe or Piping

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

7.2.1.5. Withstanding Pressure

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

7.2.1.6. Working Pressure of a Water Service Pipe

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

7.2.2. Fixtures

7.2.2.1. Surface Requirements

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

7.2.2.2. Conformance to Standards

- (0.1) Water closets and urinals shall conform to the requirements in Article 7.6.1.6.

- (1) Except as provided in Article 7.2.2.3.,
 - (a) reserved,
 - (b) vitreous china fixtures shall conform to ASME A112.19.2 / CSA B45.1, “Ceramic Plumbing Fixtures,”
 - (c) enamelled cast-iron *fixtures* shall conform to ASME A112.19.1 / CSA B45.2, “Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures,”
 - (d) porcelain-enamelled steel *fixtures* shall conform to ASME A112.19.1 / CSA B45.2, “Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures,”
 - (e) stainless steel *fixtures* shall conform to ASME A112.19.3 / CSA B45.4, “Stainless Steel Plumbing Fixtures,”
 - (f) plastic *fixtures* shall conform to CSA B45.5 / IAPMO Z124, “Plastic plumbing fixtures,”
 - (g) hydromassage bathtubs shall conform to ASME A112.19.7 / CSA B45.10, “Hydromassage Bathtub Systems,”
 - (h) macerating toilet systems shall conform to ASME A112.3.4 / CSA B45.9, “Macerating Toilet Systems and Waste-Pumping Systems for Plumbing Fixtures,” and
 - (i) personal hygiene devices for water closets shall conform to ASME A112.4.2 / CSA B45.16, “Personal hygiene devices for water closets.”

7.2.2.3. Showers

- (1) Shower receptors shall be constructed and arranged so that water cannot leak through the walls or floor. (See Note A-7.2.2.3.(1))
- (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.
- (4) Except for column showers, when a battery of shower heads is installed, the horizontal distance between 2 adjacent shower heads shall be not less than 750 mm.

7.2.2.4. Concealed Overflows

- (1) A dishwashing sink and a food preparation sink shall not have concealed overflows. (See Note A-7.2.2.4.(1))

7.2.2.5. Water Closets in Public Washrooms

- (1) Except for Eastern-Style toilets, where a water closet is installed in a washroom for *public use* it shall be of the elongated type and provided with a seat of the open front type.

7.2.2.6. Lavatories

- (1) A lavatory that does not have an overflow shall be equipped with a centre outlet waste fitting. (See Note A-7.2.2.6.(1))

7.2.2.7. Trough Urinals

- (1) No trough urinal shall be used as part of a *plumbing system*.

7.2.3. Traps and Interceptors

7.2.3.1. Traps

- (1) Except as provided for in Sentence (2), *traps* shall
 - (a) have a *trap seal depth* of not less than 38 mm,
 - (b) be so designed that failure of the seal walls will cause exterior leakage, and
 - (c) have a water seal that does not depend on the action of moving parts.(See Note A-7.2.3.1.(1) and (3))
- (2) The *trap seal depth* on *fixtures* draining to an acid waste system shall be a minimum of 50 mm.
- (3) Except for a floor-mounted service sink, every *trap* that serves a lavatory, a sink or a laundry tray shall
 - (a) be provided with a *cleanout* plug located at the lowest point of the *trap* and of the same material as the *trap*, except that a cast iron *trap* shall be provided with a brass *cleanout* plug, or
 - (b) be designed so that part of the *trap* can be removed for cleaning purposes.(See Note A-7.2.3.1.(1) and (3))
- (4) A bell *trap* shall not be installed in a *drainage system*.
- (5) A drum *trap* shall not be installed in a *drainage system*.
- (6) Except as permitted in Sentence (7), no *bottle trap* shall be used in a *plumbing system*.
- (7) A *bottle trap* may be used on a laboratory sink or other *fixture* equipped with corrosion resistant fittings.
- (8) No running *trap* shall be installed in a *plumbing system* unless an *accessible* handhole is provided for cleaning of the *trap*, and where the *trap* is too small to accommodate a handhole, a *cleanout* shall be provided.

7.2.3.2. Interceptors

- (1) *Interceptors* shall be designed so that they can be readily cleaned.
- (2) Grease *interceptors* shall be designed so that they do not become air bound.
- (3) Grease *interceptors* shall be selected and installed in conformance with
 - (a) CSA B481.0, “Material, design, and construction requirements for grease interceptors,” and
 - (b) CSA B481.3, “Sizing, selection, location, and installation of grease interceptors.”(See Note A-7.2.3.2.(3))
- (4) Where a grease *interceptor* is required by Sentence 7.4.4.3.(1), the *interceptor* shall conform to
 - (a) CSA B481.1, “Testing and rating of grease interceptors using lard,” or
 - (b) CSA B481.2, “Testing and rating of grease interceptors using oil.”

7.2.3.3. Tubular Traps

- (1) Tubular metal or plastic *traps* that conform to ASME A112.18.2 / CSA B125.2, “Plumbing Waste Fittings” shall be used only in *accessible* locations.

7.2.4. Pipe Fittings

7.2.4.1. T and Cross Fittings

- (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*.

7.2.4.2. Sanitary T Fittings

- (1) A double sanitary T fitting shall not be used to connect the *fixture drains* of two urinals where no *cleanout* fitting is provided above the connection.
- (2) No pipe fitting, joint or connection that would tend to intercept solids or reduce the flow through a pipe by more than 10 percent shall be used in a *plumbing system*.

7.2.4.3. 90° Elbows

- (1) Except as permitted in Sentences (2) and (3), 90° elbows of *NPS* 4 or less whose centre-line radius that is less than the *NPS* of the pipe shall not be used to join 2 *sanitary drainage pipes*.
- (2) For *sanitary drainage systems* of *NPS* 4 or less, 90° elbows described in Sentence (1) shall only be permitted
 - (a) to change the direction of piping from horizontal to vertical, in the direction of flow,
 - (b) where a *trap arm* enters a wall, or
 - (c) to connect *trap arms* as permitted by Sentence 7.5.6.3.(2).
- (3) A 90° elbow that is part of the pre-engineered wastewater heat recovery system is permitted to have a centre-line radius that is less than the *size* of the pipe.

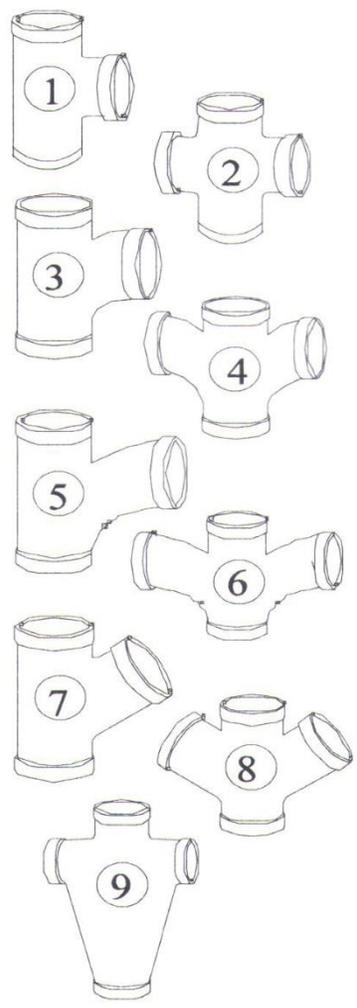
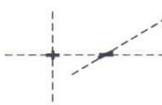
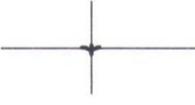
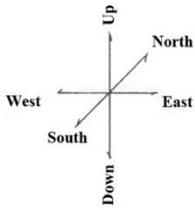
7.2.4.4. Fittings Restricted in Use

- (1) No double Y, double TY, double T or double waste fitting shall be installed in a *nominally horizontal soil or waste pipe*.

7.2.4.5. Assembled Pipe or Tubing

- (1) Pipe or tubing assembled to comprise a standard drain waste and venting system shall be connected with drain, waste and vent fittings in conformance with Table 7.2.4.5.

Table 7.2.4.5.
Pipe Arrangement for DWV Fittings
 Forming Part of Sentence 7.2.4.5.(1)

Pipe Arrangement	Fittings	
	Acceptable	Type
	①③⑤⑦	
	②④⑥⑧⑨	
	①③⑤⑦	
	③⑤⑦	
	④*⑥⑧⑨*	
	⑤⑦	
 <p>LEGEND (DWV BRANCH FITTINGS) Vent pipe ----- Drainage pipe _____ * Acceptable only if vertical run is of 3 inches size or larger and horizontal branches are of 1 1/4, 1 1/2, or 2 inches size</p>		
1. Straight T 2. Double T or Cross 3. Sanitary T or Short Turn TY 4. Double Sanitary T or Short Turn Double TY 5. Combination Y & 1/8 Bend or Long Turn TY	6. Double Combination Y & 1/8 Bend or Double Long Turn TY 7. Y 8. Double Y 9. Double Waste Fitting	

7.2.5. Non-Metallic Pipe and Fittings

7.2.5.1. Fibrocement Pipe and Fittings

- (1) Fibrocement pipe and fittings for use in a drain, waste or vent system shall conform to CAN/CSA-B127.3, “Fibrocement drain, waste, and vent pipe and pipe fittings.”

7.2.5.2. Concrete Pipe and Fittings

- (1) Concrete pipe shall conform to
 - (a) CSA A257.1, “Non-reinforced circular concrete culvert, storm drain, sewer pipe, and fittings,” or
 - (b) CSA A257.2, “Reinforced circular concrete culvert, storm drain, sewer pipe, and fittings.”
- (2) Joints with internal elastomeric gaskets shall conform to CSA A257.3, “Joints for circular concrete sewer and culvert pipe, manhole sections, and fittings using rubber gaskets.”
- (3) Concrete fittings fabricated on the site from lengths of pipe shall not be used. (See Note A-7.2.5.2.(3))
- (4) Concrete pipe shall not be used above ground inside a *building*.
- (5) Precast reinforced circular concrete manhole sections, catch basins and fittings shall conform to CSA A257.4, “Precast reinforced circular concrete manhole sections, catch basins, and fittings.”

7.2.5.3. Vitrified Clay Pipe and Fittings

- (1) Vitrified clay pipe and fittings shall be certified to CSA A60.1-M, “Vitrified Clay Pipe.”
- (2) Couplings and joints for vitrified clay pipe shall be certified to CSA A60.3-M, “Vitrified Clay Pipe Joints.”
- (3) Vitrified clay pipe and fittings shall not be used except for an underground part of a *drainage system*.

7.2.5.4. Polyethylene Pipe and Fittings

- (1) Polyethylene water pipe, tubing and fittings shall conform to, and have a pressure rating meeting the requirements of, Series 160 or a higher series of CSA B137.1, “Polyethylene (pe) pipe, tubing and fittings for cold water pressure services.”
- (2) Except as permitted in Sentence 7.2.5.6.(1), polyethylene water pipe shall not be used except for a *water service pipe*.
- (3) Butt fusion fittings for polyethylene pipe shall conform to ASTM D3261, “Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.”

7.2.5.5. Polyethylene Pipe Used Underground

- (1) Polyethylene pipe used underground in a *drainage system* for rehabilitation of existing systems using trenchless technology shall conform to ASTM F714, “Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter” and shall be HDPE 3408, SDR 17 or heavier. (See Note A-7.2.5.5.(1))

7.2.5.6. Crosslinked Polyethylene Pipe and Fittings

(1) Crosslinked polyethylene pipe and manufacturer-approved fittings used in hot and cold *potable water systems* shall conform to CSA B137.5, “Crosslinked polyethylene (PEX) tubing systems for pressure applications.” (See Note A-7.2.5.6.(1))

7.2.5.7. PVC Pipe and Fittings

- (1) PVC water pipe, fittings and solvent cement shall
 - (a) conform to CSA B137.3, “Rigid Polyvinylchloride (PVC) pipe and fittings for pressure applications” or CSA B137.2, “Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications,” and
 - (b) a pressure rating of not less than 1 100 kPa.
- (2) PVC water pipe fittings shall conform to
 - (a) ASTM D2466, “Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40,” or
 - (b) ASTM D2467, “Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.”

r1 (3) PVC water pipe and fittings in Sentences (1) and (2) shall not be used in a hot *water system*.

7.2.5.8. CPVC Pipe, Fittings and Solvent Cements

- (1) CPVC hot and cold water pipe, fittings and solvent cements shall conform to CSA B137.6, “Chlorinated polyvinylchloride (CPVC) pipe, tubing and fittings for hot and cold water distribution systems.”
- (2) The design temperature and design pressure of a CPVC piping system shall conform to Table 7.2.5.8.

Table 7.2.5.8.
Maximum Permitted Pressure for CPVC Piping at Various Temperatures
 Forming Part of Sentence 7.2.5.8.(2)

Maximum Temperature of Water, °C	Maximum Permitted Pressures, kPa
10	3150
20	2900
30	2500
40	2100
50	1700
60	1300
70	1000
82	690

7.2.5.9. Plastic Pipe, Fittings and Solvent Cement Used Underground

(See Note A-7.2.5.9. to 7.2.5.11.)

- (1) Plastic pipe, fittings and solvent cement used underground outside a *building* or under a *building* in a *drainage system* shall conform to
 - (a) ASTM F628, “Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core,”
 - (b) CSA B181.1, “Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings,”
 - (c) CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings,”
 - (d) CSA B182.1, “Plastic drain and sewer pipe and pipe fittings,”
 - (e) CSA B182.2, “PSM type polyvinylchloride (PVC) sewer pipe and fittings,”
 - (f) CSA B182.4, “Profile polyvinylchloride (PVC) sewer pipe and fittings,”
 - (g) CSA B182.6, “Profile polyethylene (PE) sewer pipe and fittings for leak-proof sewer applications,” or

- (h) CSA B182.8, “Profile polyethylene (PE) storm sewer and drainage pipe and fittings,” for Type 1 joints and non-perforated pipes,”
 - (i) CSA B137.2, “Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications”, or
 - (j) CSA B137.3, “Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications”.
- (2) Except as permitted in Clauses (i) and (j), plastic pipe used as described in Sentence (1) shall have a stiffness equal or greater than 320 kPa.

7.2.5.10. Transition Solvent Cement (See Note A-7.2.5.9. to 7.2.5.11.)

- (1) Solvent cement for transition joints shall conform to
 - (a) CSA B181.1, “Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings,” or
 - (b) CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings.”
- (2) Transition solvent cement shall only be used for joining an ABS *drainage system* to a PVC *drainage system*.

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

(See Note A-7.2.5.9. to 7.2.5.11)

- (1) Plastic pipe, fittings and solvent cement used inside or under a *building* in a *sanitary drainage system* or *venting system* shall conform to
 - (a) ASTM F628, “Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core,”
 - (b) CSA B181.1, “Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings,” or
 - (c) CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings.”
- (1.1) Plastic pipe, fittings and solvent cement used inside a *building* in a *storm drainage system* shall conform to
 - (a) ASTM F628, “Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core,”
 - (b) CSA B181.1, “Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings,”
 - (c) CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings,”
 - (d) CSA B182.1, “Plastic drain and sewer pipe and pipe fittings,” or
 - (e) CSA B182.2, “PSM type polyvinylchloride (PVC) sewer pipe and fittings.”
- (1.2) Plastic pipe used as described in Sentence (2) shall have a pipe stiffness equal or greater than 320 kPa.
- (2) Requirements for *combustible* piping in relation to fire safety shall conform to Sentences 3.1.5.19.(1) and 9.10.9.8.(3), (5) and (6), and Articles 3.1.9.4., 9.10.9.7. and 9.10.9.9.
- (3) Where *noncombustible* piping pierces a *fire separation* or a *fire block*, the requirements for fire stopping of Subsection 3.1.9., Sentence 9.10.9.6.(1) and Article 9.10.16.4. shall apply.

7.2.5.12. Polyethylene/Aluminum/Polyethylene Composite Pipe and Fittings

- (1) PE/AL/PE composite pipe and fittings used for *potable water systems* shall conform to CSA B137.9, “Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pressure-pipe systems.” (See Note A-7.2.5.12.(1))
- (2) Except as provided in Sentences (3) and (4), PE/AL/PE pipe and fittings shall not be used in hot *water systems*.
- (3) PE/AL/PE pipe with a pressure rating of 690 kPa or greater at 82°C shall be permitted for hot *water systems*.

(4) PE/AL/PE pipe with a pressure rating of 690 kPa or greater at 82°C shall be used with fittings that conform to CSA B137.10, “Crosslinked polyethylene/aluminum/crosslinked polyethylene (PEX-AL-PEX) composite pressure-pipe systems,” in hot *water systems*.

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

(1) PEX/AL/PEX composite pipe and fittings used in hot and cold potable water systems shall conform to CSA B137.10, “Crosslinked polyethylene/aluminum/crosslinked polyethylene (PEX-AL-PEX) composite pressure-pipe systems.” (See Note A-7.2.5.13.(1))

7.2.5.14. Polypropylene Pipe and Fittings

(1) Polypropylene pipe and fittings used for hot and cold *potable water systems* shall conform to CSA B137.11, “Polypropylene (PP-R) pipe and fittings for pressure applications.” (See Note A-7.2.5.14.(1))

7.2.5.15. Polyethylene of Raised Temperature Tube and Fittings

(1) Polyethylene of raised temperature (PE-RT) tube and manufacturer-approved fittings used in hot and cold *potable water systems* shall conform to CSA B137.18, “Polyethylene of raised temperature resistance (PE-RT) tubing systems for pressure applications.” (See Note A-7.2.5.15.(1))

(2) The use of PE-RT tube shall conform to Table 7.2.5.15.

Table 7.2.5.15.
Permitted Uses of Polyethylene of Raised Temperature (PE-RT) Tube
Forming Part of Sentence 7.2.5.15.(2)

Type of Tube	Plumbing Purposes ⁽¹⁾								
	Drainage System		Building Sewer	Venting System		Potable Water System			
	Aboveground inside building	Underground under building		Above-ground	Under-ground	Cold	Hot	Under building	Outside building
PE-RT	N	N	N	N	N	P	P	P	P

Notes to Table 7.2.5.15.:

(1) P = permitted and N = not permitted.

7.2.5.16. Cellular Core PVC Pipe and Fittings

- (1) Cellular core PVC pipe shall
 - (a) conform to ASTM F3128, “Standard Specification for Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core,” and
 - (b) be light grey, as specified in CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings.”
- (2) Fittings and solvent cements for cellular core PVC pipe shall conform to CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings.”
- (3) Cellular core PVC pipe shall only be used in residential *buildings* containing 1 or 2 *dwelling units* and in row houses that do not exceed 3 *storeys* in height.

7.2.6. Ferrous Pipe and Fittings

7.2.6.1. Cast-Iron Drainage and Vent Pipe and Fittings

- (1) Drainage piping, vent piping and fittings made of cast iron shall conform to CSA B70, “Cast iron soil pipe, fittings, and means of joining.”
- (2) Cast-iron *soil pipe* and fittings shall not be used in a *water system*.

7.2.6.2. Maintenance Holes and Catch Basins

- (1) Cast-iron frames and covers for maintenance holes and catch basins shall conform to CSA B70.1, “Frames and Covers for Maintenance Holes and Catchbasins.”

7.2.6.3. Threaded Cast-Iron Drainage Fittings

- (1) Threaded cast-iron drainage fittings shall conform to ASME B16.12, “Cast Iron Threaded Drainage Fittings.”
- (2) Threaded cast-iron drainage fittings shall not be used in a *water system*.

7.2.6.4. Cast-Iron Water Pipes

- (1) Cast-iron water pipes shall conform to ANSI/AWWA C151 / A21.51, “Ductile-Iron Pipe, Centrifugally Cast.”
- (2) Cement mortar lining for cast-iron water pipes shall conform to ANSI/AWWA C104 / A21.4, “Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.”
- (3) Cast-iron fittings for cast-iron or ductile-iron water pipes shall conform to ANSI/AWWA C110 / A21.10, “Ductile-Iron and Gray-Iron Fittings.”
- (4) Rubber gasket joints for cast-iron and ductile-iron pressure pipe for water shall conform to ANSI/AWWA C111 / A21.11, “Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.”

7.2.6.5. Screwed Cast-Iron Water Fittings

- (1) Screwed cast-iron water fittings shall conform to ASME B16.4, “Gray Iron Threaded Fittings: Classes 125 and 250.”
- (2) Screwed cast-iron water fittings used in a *water system* shall be cement-mortar lined or galvanized.
- (3) Screwed cast iron water fittings shall not be used in a *drainage system*.

7.2.6.6. Screwed Malleable-Iron Water Fittings

- (1) Screwed malleable-iron water fittings shall conform to ASME B16.3, “Malleable Iron Threaded Fittings: Classes 150 and 300.”
- (2) Screwed malleable-iron water fittings used in a *water system* shall be cement-mortar lined or galvanized.
- (3) Screwed malleable-iron water fittings shall not be used in a *drainage system*.

7.2.6.7. Steel Pipe

- (1) Except as provided in Sentences (2) and (3), welded and seamless steel pipe shall not be used in a *plumbing system*.
- (2) Galvanized steel pipe is permitted to be used in a *drainage system* or a *venting system* above ground inside a *building*.
- (3) Galvanized steel pipe and fittings shall not be used in a *water distribution system* except
 - (a) in *buildings* of *industrial occupancy*, or
 - (b) for the repair of existing galvanized steel piping systems.(See Note A-7.2.6.7.(3))
- (4) Galvanized steel pipe and fittings shall conform to ASTM A53 / A53M, “Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated Welded and Seamless.”
- (5) Where galvanized steel pipe is used in a *drainage system*, it shall be used with drainage fittings.
- (6) All steel pipe of *NPS* 4 and smaller shall be Schedule 40 or heavier and fittings of less than *NPS* 2 shall be galvanized screw fittings.

7.2.6.8. Corrugated Steel Pipe and Couplings

- (1) Corrugated steel pipe and couplings shall conform to CAN/CSA-G401, “Corrugated steel pipe products”.
- (2) Corrugated steel pipe shall only be used underground outside a *building* in a *storm drainage system*.
- (3) Couplings for corrugated steel pipe shall be constructed so that when installed they shall
 - (a) maintain the pipe alignment,
 - (b) resist the separation of adjoining lengths of pipe,
 - (c) prevent root penetration, and
 - (d) prevent the infiltration of surrounding material.

7.2.6.9. Sheet Metal Leaders

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

7.2.6.10. Stainless Steel Pipe

- (1) Stainless steel pipe shall conform to
 - (a) ASME B36.19M, “Stainless Steel Pipe,” and
 - (b) ASTM A312 / A312M, “Standard Specification for Seamless, Welded, and Heavily Cold Worked Stainless Steel Pipes.”
- (2) Only grade 304/304L or 316/316L stainless steel pipe shall be used.

7.2.6.11. Stainless Steel Butt Weld Pipe Fittings

- (1) Stainless steel butt weld pipe fittings shall conform to
 - (a) ASME B16.9, “Factory-Made Wrought Buttwelding Fittings,” and
 - (b) ASTM A403 / A403M, “Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings”.
- (2) Stainless steel butt weld pipe fittings shall be made of a material that matches the grade of the pipe material used.

7.2.6.12. Stainless Steel Pipe Flanges

- (1) Stainless steel pipe flanges shall conform to ASME B16.5, “Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard,” and
 - (a) ASTM A182 / A182M, “Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service,” or
 - (c) ANSI/AWWA C228, “Stainless-Steel Pipe Flanges For Water Service – Sizes 2 in. through 72 in. (50 mm through 1,800 mm).”
- (2) Stainless steel pipe flanges shall be made of a material that matches the grade of the pipe material used.

7.2.6.13. Stainless Steel Threaded Fittings

- (1) Stainless steel threaded fittings shall be Schedule 40 or greater conforming to
 - (a) ASTM A182 / A182M, “Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service,” or
 - (b) ASTM A351 / A351M, “Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.”
- (2) Stainless steel threaded fittings shall be made of a material that matches the grade of the pipe material used.

7.2.6.14. Stainless Steel Tube

- (1) Stainless steel tube shall conform to
 - (a) ASME B16.9, “Factory-Made Wrought Butt Welding Fittings,” and
 - (b) ASTM A269, “Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.”
- (2) Only grade 304/304L or 316/316L stainless steel tubes shall be used.

7.2.6.15. Stainless Steel Pipe and Tube

- (1) The use of stainless steel pipe and tube shall conform to Table 7.2.6.15.

Table 7.2.6.15.
Permitted Use of Stainless Steel Pipe and Tube
 Forming Part of Sentence 7.2.6.15.(1)

Stainless Steel Pipe or Tube	Plumbing Purposes ⁽¹⁾						
	Water Distribution System		Building Sewer	Drainage System		Venting System	
	Underground	Aboveground		Underground	Aboveground	Underground	Aboveground
Stainless steel pipe	P	P	P	P	P	P	P
Stainless steel tube	P	P	N	N	N	N	N

Notes to Table 7.2.6.15.:

- (1) P = Permitted and N = Not Permitted

7.2.7. Non-Ferrous Pipe and Fittings

7.2.7.1. Copper and Brass Pipe

- (1) Copper pipe shall conform to
 - (a) ASTM B42, “Standard Specification for Seamless Copper Pipe, Standard Sizes,” and
 - (b) Table 7.2.7.4.
- (2) Brass pipe shall conform to ASTM B43, “Standard Specification for Seamless Red Brass Pipe, Standard Sizes.”

7.2.7.2. Brass or Bronze Pipe Flanges and Flanged Fittings

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

7.2.7.3. Brass or Bronze Threaded Water Fittings

- (1) Brass or bronze threaded water fittings shall conform to ASME B16.15, “Cast Copper Alloy Threaded Fittings: Classes 125 and 250.”
- (2) Brass or bronze threaded water fittings shall not be used in a *drainage system*.

7.2.7.4. Copper Tube

- (1) Copper tube shall conform to,
 - (a) ASTM B88, “Standard Specification for Seamless Copper Water Tube,” or
 - (b) ASTM B306, “Standard Specification for Copper Drainage Tube (DWV).”
- (2) Except as provided in Sentence (3), the use of copper tube shall conform to Table 2.2.7.4.

Table 7.2.7.4.
Permitted Use of Copper Tube and Pipe
 Forming Part of Sentences 7.2.7.1.(1) and 7.2.7.4.(2)

Type of Copper Tube or Pipe	Water Distribution System		Building Sewer	Drainage System		Venting System	
	Underground	Above-ground		Underground	Above-ground	Underground	Above-ground
K & L hard temper	N	P	P	P	P	P	P
K & L soft temper	P	P	N	N	N	N	N
M hard temper	N	P	N	N	P	N	P
M soft temper	N	N	N	N	N	N	N
DWV	N	N	N	N	P	N	P

Notes to Table 7.2.7.4.:

- (1) P = Permitted and N = Not Permitted.

- (3) Copper tube shall not be used for the *fixture drain* or the portion of the *vent pipe* below the *flood level rim* of a urinal.
- (4) Copper tube used in a *plumbing appliance* shall conform to
 - (a) ASTM B88, “Standard Specification for Seamless Copper Water Tube,” or
 - (b) ASTM B68 / B68M, “Standard Specification for Seamless Copper Tube, Bright Annealed.”
- (5) Type K or L copper tube shall be used for the *potable* water side of a heat exchanger in a pre-engineered wastewater seat recovery system.

7.2.7.5. Solder-Joint Drainage Fittings

- (1) Solder-joint fittings for *drainage systems* shall conform to
 - (a) ASME B16.23, “Cast Copper Alloy Solder Joint Drainage Fittings: DWV,” or
 - (b) ASME B16.29, “Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV.”
- (2) Solder-joint fittings for *drainage systems* shall not be used in a *water system*.

7.2.7.6. Solder-Joint Water Fittings

- (1) Except as provided in Sentence (2), solder-joint fittings for *water systems* shall conform to
 - (a) ASME B16.18, “Cast Copper Alloy Solder Joint Pressure Fittings,” or
 - (b) ASME B16.22, “Wrought Copper and Copper Alloy Solder Joint Pressure Fittings”.
- (2) Solder-joint fittings for *water systems* not made by casting or the wrought process shall conform to the applicable requirements of ASME B16.18, “Cast Copper Alloy Solder Joint Pressure Fittings.”

7.2.7.7. Flared-Joint Fittings for Copper Tube Water Systems

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

7.2.7.8. Lead Waste Pipe and Fittings

- (1) Lead *waste pipe* and fittings shall not be used in a *water system* or as a *building sewer*.
- (2) When there is a change in *nominal pipe size (NPS)* of a lead water closet bend, the change shall be in the vertical section of the bend or made in a manner that prevents the retention of liquid in the bend.

7.2.8. Corrosion-Resistant Materials

7.2.8.1. Pipe and Fittings

- (1) Pipes and fittings to be used for drainage and venting of acid and corrosive wastes shall conform to
 - (a) ASTM A518 / A518M, “Standard Specification for Corrosion-Resistant High-Silicon Iron Castings,”
 - (b) ASTM C1053, “Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications,” or
 - (c) CSA B181.3, “Polyolefin and polyvinylidene fluoride (PVDF) laboratory drainage systems.”

7.2.9. Jointing Materials

7.2.9.1. Cement Mortar

- (1) Cement mortar shall not be used for jointing.

7.2.9.2. Solder and Fluxes

- (1) Solders for solder joint fittings shall conform to ASTM B32, “Standard Specification for Solder Metal.”
- (2) Solders and fluxes having a lead content in excess of 0.2% shall not be used in a *potable water system*.
- (3) Fluxes for soldered joints shall conform to ASTM B813, “Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.”
- (4) Brazing alloys shall conform to ANSI/AWS A5.8M / A5.8, “Specification for Filler Metals for Brazing and Brazed Welding,” BCuP range.

7.2.10. Miscellaneous Materials

7.2.10.1. Floor Flanges

- (1) Brass floor flanges shall conform to CSA B158.1, “Cast Brass Solder Joint Drainage, Waste and Vent Fittings.”
- (2) ABS floor flanges shall conform to CSA B181.1, “Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings.”
- (3) PVC floor flanges shall conform to CSA B181.2, “Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings.”
- (4) Cast iron, copper and aluminum floor flanges shall be suitable for the purpose.

7.2.10.2. Screws, Bolts, Nuts and Washers

- (1) Every screw, bolt, nut and washer shall be of corrosion-resistant materials when used
 - (a) to connect a water closet to a floor flange,
 - (b) to anchor the floor flange to the floor,
 - (c) to anchor the water closet to the floor, or
 - (d) to hold *cleanout* covers or floor drain grates.

7.2.10.3. Cleanout Fittings

- (1) Every plug, cap, nut or bolt that is intended to be removable from a ferrous fitting shall be of a non-ferrous material.
- (2) A *cleanout* fitting that as a result of normal maintenance operations cannot withstand the physical stresses of removal and reinstallation or cannot ensure a gas-tight seal shall not be installed.
- (3) A screw cap or test cap shall not be used as a *cleanout* plug or cover.

7.2.10.4. Mechanical Couplings

- (1) Groove- and shoulder-type mechanical pipe couplings shall conform to CSA B242, “Groove- and Shoulder-Type Mechanical Pipe Couplings.”
- (2) Mechanical couplings for DWV and Sewer Pipe shall conform to CSA B602, “Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe.”

7.2.10.5. Saddle Hubs

- (1) Except as provided in Sentence (2), a saddle hub or fitting shall not be installed in *drainage, venting or water systems*. (See Note A-7.2.10.5.(1))
- (2) A saddle hub or saddle clamp may be installed in a *building drain or building sewer* of nominal diameter not less than 8 in. and that is in service provided that the connecting *branch* is at least two pipe *sizes* smaller than the run of the *building drain or building sewer* to which it is connected.

7.2.10.6. Valves, Supply and Waste Fittings

- (1) Supply fittings shall conform to
 - (a) ASME A112.18.1 / CSA B125.1, “Plumbing Supply Fittings,” or
 - (b) CSA B125.3, “Plumbing Fittings.”
- (2) Except for lavatories in healthcare facilities, emergency eye washes, and emergency showers, supply fittings and individual shower heads shall have an integral means of limiting the maximum water flow rate to that specified in Table 7.2.10.6. (See Note A-7.2.10.6.(2))

Table 7.2.10.6.
Water Flow Rates from Supply Fittings
 Forming Part of Sentence 2.2.10.6.(2)

Supply Fittings	Maximum Water Flow Rate, LPM
Lavatory supply fittings	
private	5.7
public	1.9
Kitchen supply fittings (except those in industrial, commercial or institutional kitchens)	8.3
Shower heads	7.6

- (2.1) Sentence (2) does not apply to a *fixture* located in a *heritage building*.
- (3) Reserved.
- (4) Reserved.
- (5) Reserved.
- (6) Waste fittings shall conform to ASME A112.18.2 / CSA B125.2, “Plumbing Waste Fittings.”

(7) Manually operated valves of *NPS* 4 or less for use in *plumbing systems* shall conform to ASME A112.4.14 / CSA B125.14, “Manually Operated Valves for Use in Plumbing Systems.” (See Note A-7.2.10.6.(7))

7.2.10.7. Water Temperature Control (See Note A-7.2.10.7.)

- (1) Except as provided in Sentences (2) and (3), water supplied to shower heads or bathtubs shall be controlled by an automatic compensating valve conforming to
- ASME A112.18.1 / CSA B125.1, “Plumbing Supply Fittings,” or
 - ASSE 1016 / ASME A112.1016 / CSA B125.16, “Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations.”
- (2) The requirement in Sentence (1) is permitted to be waived where hot water supplied only to bathtubs is controlled by
- an automatic compensating valve conforming to CSA B125.3, “Plumbing fittings,” or
 - a temperature-limiting device conforming to ASSE 1070 / ASME A112.1070 / CSA B125.70, “Performance requirements for water temperature limiting devices.”

(3) The requirement in Sentence (1) is permitted to be waived where the water is supplied by a single tempered water line controlled by an automatic compensating valve conforming to CSA B125.3, “Plumbing fittings.”

r1 (4) Except as provided in Sentences (5) and (6) and 7.2.10.7A.(1), the temperature of water discharging from a shower head or into a bathtub shall not exceed 49°C.

(5) In healthcare facilities and *retirement homes*, the temperature of water discharging from a shower head or into a bathtub shall

- not exceed 43°C, and
- be adjusted at the shower or bathtub controls.

(6) Sentence (4) does not apply to hot water supplied to installed dishwashers or clothes washers.

7.2.10.7A. Temperature Control Devices

- r1 (1) A *water distribution system* supplying hot water to any bathtub, shower or hand basin that is accessible to a patient or resident in a Group B, Division 2 or 3 *occupancy* or a resident of a group home, *home for special care* or residence for adults with developmental disabilities, or children within child care facilities shall have one or more temperature gauges and control devices that are
- accessible only to supervisory staff, and
 - capable of being adjusted to ensure that the temperature of the water supplied to the *fixtures* does not exceed 43°C.

7.2.10.7B. Showers

(1) Except as provided for in Sentences (2) and (3), all valves supplying fixed location shower heads, shall be individually pressure-balanced or thermostatic-mixing valves, conforming to ASME A112.18.1 / CSA B125.1, “Plumbing Supply Fittings.”

(2) An individually pressure-balanced or thermostatic-mixing valve is not required for shower heads having a single tempered water supply that is controlled by an automatic compensating valve conforming to CSA B125.3, “Plumbing fittings.”

(3) Deck-mounted, hand-held, flexible-hose spray attachments are exempt from the thermal shock requirements of Sentences (1) and (4).

- (4) Pressure-balanced, thermostatic-mixing or combination pressure-balanced and thermostatic-mixing type valves shall be
 - (a) capable of limiting thermal shock, and
 - (b) designed so that the outlet temperature does not exceed 49°C or equipped with high-limit stops which shall be adjusted to a maximum hot water setting of 49°C.

7.2.10.7C. Linings and Coatings of Water Storage Tanks

- (1) Linings and coatings of water storage tanks that come into contact with *potable water* and are not within a *secondary suite* or an individual *dwelling unit* shall conform to NSF/ANSI 61, “Drinking Water System Components - Health Effects.”

7.2.10.8. Direct Flush Valves

- (1) Every direct flush valve shall
 - (a) open fully and close positively under service pressure,
 - (b) complete their cycle of operation automatically,
 - (c) be provided with a means of regulating the volume of water that they discharge, and
 - (d) be provided with a *vacuum breaker* unless the *fixture* is designed so that *back-siphonage* cannot occur, and
 - (e) conform to ASSE 1037 / ASME A112.1037 / CSA B125.37, “Performance requirements for pressurized flushing devices for plumbing fixtures.”

7.2.10.9. Drinking Fountain Bubblers

- (1) The orifice of drinking fountain bubblers shall
 - (a) be of the shielded type, and
 - (b) direct the water upward to an angle of approximately 45°.
- (2) Drinking fountain bubblers shall include a means of regulating the flow to the orifice.

7.2.10.10. Back-Siphonage Preventers and Backflow Preventers

- (1) Except as provided in Sentence (2), *back-siphonage preventers* and *backflow preventers* shall conform to
 - (a) CSA B64.0, “Definitions, general requirements and test methods for vacuum breakers and backflow preventers,”
 - (b) CSA B64.1.1, “Atmospheric vacuum breakers (AVB),”
 - (c) CSA B64.1.2, “Pressure vacuum breakers (PVB),”
 - (d) CSA B64.1.3, “Spill-resistant pressure vacuum breakers (SRPVB),”
 - (d.1) CSA B64.1.4, “Vacuum breaker, air space type (ASVB),”
 - (e) CSA B64.2, “Hose connection vacuum breakers (HCVB),”
 - (f) CSA B64.2.1, “Hose connection vacuum breakers (HCVB) with manual draining feature,”
 - (f.1) CSA B64.2.1.1, “Hose connection dual check vacuum breakers (HCDVB),”
 - (g) CSA B64.2.2, “Hose connection vacuum breakers (HCVB) with automatic draining feature,”
 - (h) CSA B64.3, “Dual check valve backflow preventers with atmospheric port (DCAP),”
 - (h.1) CSA B64.3.1, “Dual check valve backflow preventers with atmospheric port for carbonators (DCAPC),”
 - (i) CSA B64.4, “Reduced pressure principle (RP) backflow preventers,”
 - (j) CSA B64.5, “Double check valve (DCVA) backflow preventers,”
 - (k) CSA B64.5.1, “Double check valve backflow preventers for fire protection systems (DCVAF),”
 - (l) CSA B64.6, “Dual check valve (DuC) backflow preventers,”
 - (m) CSA B64.6.1, “Dual check valve backflow preventers for fire protection systems (DuCF),”
 - (n) CSA B64.7, “Laboratory faucet vacuum breakers (LFVB),”
 - (o) CSA B64.8, “Dual check valve backflow preventers with intermediate vent (DuCV),”
 - (p) CSA B64.9, “Single check valve backflow preventers for fire protection systems (SCVAF),” or
 - (q) CSA B64.10, “Selection and installation of backflow preventers.”

(2) *Back-Back-siphonage preventers* for tank-type water closets (anti-siphon fill valves) shall conform to ASSE 1002 / ASME A112.1002 / CSA B125.12, “Anti-siphon fill valves for water closet tanks.”

7.2.10.11. Relief Valves

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

7.2.10.12. Reducing Valves

(1) Direct-acting water-pressure-reducing valves for domestic water supply systems shall conform to CAN/CSA-B356, “Water pressure reducing valves for domestic water supply systems.”

7.2.10.13. Solar Domestic Hot Water

(1) Equipment for solar heating of *potable* water shall conform to CAN/CSA-F379 SERIES, “Packaged solar domestic hot water systems (liquid-to-liquid heat transfer).”

7.2.10.14. Vent Pipe Flashing

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

- (a) copper sheet not less than 0.33 mm thick,
- (b) aluminum sheet not less than 0.48 mm thick,
- (c) *alloyed zinc* sheet not less than 0.35 mm thick,
- (d) lead sheet not less than 1.73 mm thick,
- (e) galvanized steel sheet not less than 0.33 mm thick, or
- (f) polychloroprene (neoprene) not less than 2.89 mm thick.

(2) Prefabricated flashing for *vent pipes* shall conform to CSA B272, “Prefabricated Self-Sealing Roof Vent Flashings.” (See Article 7.5.6.5. for location of *vent pipe* terminals.)

7.2.10.15. Water Hammer Arresters

(1) Factory built water hammer arresters shall conform to ANSI/ASSE 1010, “Water Hammer Arresters.”

7.2.10.16. Air Admittance Valves

(1) *Air admittance valves* shall conform to ASSE 1051, “Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems.” (See Note A-7.2.10.16.(1))

7.2.10.17. Drinking Water Treatment Systems

(1) A drinking water treatment system or device shall conform to CAN/CSA-B483.1, “Drinking Water Treatment Systems.”

7.2.10.18. Flexible Water Connectors

(1) Flexible water connectors exposed to continuous pressure shall conform to ASME A112.18.6 / CSA B125.6, “Flexible water connectors.”

7.2.11. Water Service Pipes and Fire Service Mains

7.2.11.1. Design, Construction, Installation and Testing

(1) Except as provided in Articles 7.2.11.2. to 7.2.11.4., and 7.3.7.2, the design, construction, installation and testing of *fire service mains* and *water service pipe* combined with *fire service mains* shall be in conformance with NFPA 24, “Installation of Private Fire Service Mains and Their Appurtenances.”

7.2.11.2. Certification or Conformance

(1) *Water service pipes* and *fire service mains* shall conform to the standards for the materials listed in Table 7.2.11.2.

Table 7.2.11.2.
Water Service Pipe and Fire Service Main Materials
 Forming Part of Sentence 7.2.11.2.(1)

Material	Standard	Limitations
Polyethylene pipe and fittings	Conform to Series 160 or a higher series of CSA B137.1, "Polyethylene (PE) Pipe, tubing and fittings for cold water pressure services"	
Crosslinked polyethylene pressure pipe or tube and fittings	Conform to CSA B137.5, "Crosslinked polyethylene (PEX) tubing systems for pressure applications"	
PVC pipe and fittings	Conform to CSA B137.3, "Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications", or certified to CSA B137.2, "Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications"	Pipe and fittings must have a rated working pressure of 1 100 kPa or more
CPVC pipe and fittings	Conform to CSA B137.6, "Chlorinated polyvinylchloride (CPVC) pipe, tubing and fittings for hot and cold water distribution systems"	The design temperature and pressure shall conform to the requirements of the CSA B137.6, "Chlorinated polyvinylchloride (CPVC) pipe, tubing and fittings for hot and cold water distribution systems"
Cast-iron water pipe	Conform to ANSI/AWWA C151 / A21.51, "Ductile-Iron Pipe, Centrifugally Cast"	Pipe shall have a cement-mortar lining conforming to ANSI/AWWA C104 / A21.4, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings"
Iron fittings for cast-iron or ductile-iron water pipes	Conform to ANSI/AWWA C110 / A21.10, "Ductile-Iron and Gray-Iron Fittings"	Pipe shall have a cement-mortar lining conforming to ANSI/AWWA C104 / A21.4, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings"
Rubber gasket joints for cast-iron and ductile-iron water pipes	Conform to ANSI/AWWA C111 / A21.11, "Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"	
Screwed cast-iron water fittings	Conform to ASME B16.4, "Gray Iron Threaded Fittings: Classes 125 and 250"	Screwed cast-iron water fittings shall be cement-mortar lined or galvanized
Type K soft copper tube	Certified to ASTM B88, "Standard Specification for Seamless Copper Water Tube"	
Solder-joint fittings for copper water systems	Conform to ASME B16.18, "Cast Copper Alloy Solder Joint Pressure Fittings", or conform to ASME B16.22, "Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings"	Solder-joint fittings not made by casting or the wrought process shall conform to the applicable requirements of ASME B16.18, "Cast Copper Alloy Solder-Joint Pressure Fittings"
Flared-joint fittings for copper water systems	Conform to ASME B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes"	Flared-joint fittings not made by casting shall conform to ASME B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes"
PE/AL/PE pipe and fittings	Conform to CSA B137.9, "Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pressure-pipe systems"	
PEX/AL/PEX pipe and fittings	Conform to CSA B137.10, "Crosslinked polyethylene/aluminum/crosslinked polyethylene (PEX-AL-PEX) composite pressure-pipe systems"	

7.2.11.3. Tracer Wire

- (1) Except as provided in Sentence (2), every non-metallic *water service pipe* or *fire service main* shall have attached to it
 - (a) a 14 gauge TW solid copper light coloured plastic coated tracer wire, or
 - (b) a 12 gauge copper clad steel light coloured plastic coated tracer wire.
- (2) Where a *water service pipe* or *fire service main* is detectable without the tracer wire referenced in Sentence (1), the tracer wire may be omitted.

7.2.11.4. Required Check Valve

- (1) Where a *water service pipe* is supplied with water by more than one *drinking water system*, a *check valve* shall be installed at each connection with a *drinking water system*.
- (2) Where a *fire service main* is supplied with water by more than one source, a *check valve* shall be installed at each connection with a source of water.

Section 7.3. Piping

7.3.1. Application

7.3.1.1. General

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

7.3.2. Construction and Use of Joints

7.3.2.1. Caulked Lead Drainage Joints

- (1) Caulked lead drainage joints shall not be used except for cast-iron pipe in a *drainage system* or *venting system*, or between such pipe and
 - (a) other ferrous pipe,
 - (b) brass and copper pipe,
 - (c) a caulking ferrule, or
 - (d) a *trap standard*.
- (2) Every caulked lead drainage joint shall be firmly packed with oakum and tightly caulked with lead to a depth of not less than 25 mm.
- (3) No paint, varnish or other coating shall be applied on the lead until after the joint has been tested.
- (4) A length of hub and spigot pipe and pipe fittings in a *drainage system* shall be installed with the hub at the upstream end.

7.3.2.2. Wiped Joints

- (1) Wiped joints shall not be used except for sheet lead or lead pipe, or between such pipe and copper pipe or a ferrule.
- (2) Every wiped joint in straight pipe shall
 - (a) be made of solder,
 - (b) have an exposed surface on each side of the joint at least 19 mm wide, and
 - (c) be not less than 10 mm thick at the thickest part.
- (3) Every wiped flanged joint shall be reinforced with a lead flange that is not less than 19 mm wide.

7.3.2.3. Screwed Joints

- (1) In making a screwed joint, the ends of the pipe shall be reamed or filed out to the size of the bore and all chips and cuttings shall be removed.
- (2) No pipe-joint cement or paint shall be applied to the internal threads.

7.3.2.4. Solder Joints

- (1) Soldered joints shall be made in accordance with ASTM B828, “Standard Specification for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.”

7.3.2.5. Flared Joints

- (1) In making a flared joint, the pipe shall be expanded with a proper flaring tool.
- (2) Flared joints shall not be used for hard (drawn) copper tube.

7.3.2.6. Mechanical Joints

- (1) Mechanical joints shall be made with compounded elastomeric couplings or rings that are held in compression by
 - (a) stainless steel or cast-iron clamps, or
 - (b) contained within a compression connection or groove- and shoulder-type mechanical couplings.(See Note A-7.3.2.6.(1))

7.3.2.7. Cold-Caulked Joints

- (1) Cold-caulked joints shall not be used except for bell and spigot pipe in a *water system*, a *drainage system* or a *venting system*.
- (2) The caulking compound used in cold-caulked joints shall be applied according to the manufacturer’s directions.
- (3) Every cold-caulked joint in a *drainage system* shall be firmly packed with oakum and tightly caulked with cold caulking compound to a depth of not less than 25 mm.

7.3.2.8. Stainless Steel Welded Joints

- (1) Stainless steel welded joints shall conform to ASME B31.9, “Building Services Piping.”
- (2) Butt weld pipe fittings shall be at least as thick as the wall of the pipe used.

7.3.3. Joints and Connections

7.3.3.1. Drilled and Tapped Joints

- (1) Drilled and tapped joints shall not be made in a *sanitary drainage pipe* or *vent pipe* and fittings unless suitable provision has been made for drilling and tapping.
- (2) A copper water *distributing pipe* of *NPS* 1 or larger may be mechanically swaged to permit the joining of other copper pipe of equal *size*.
- (3) A drainage pipe or fitting may be drilled or tapped
 - (a) to provide for the connection of a *trap* seal primer line,
 - (b) to connect a device designed to dispense germicidal or odour control chemicals or *trap* seal water to a floor drain downstream of a *vacuum breaker* or flush valve in a flush tube connected to a *sanitary unit*,
 - (c) to provide a hole for a *branch* connection to a drainage pipe, where the *branch* connection is made with a saddle hub as permitted by Article 7.2.10.5. and where the hole is drilled to provide a smooth clean hole of the required *size* and orientation, or
 - (d) to provide for the connection of pipe or fittings to metal or rigid plastic pipe and fittings where the pipe or fittings are thick enough to be threaded or are bossed for tapping.
- (4) No pipe adaption shall be made by the use of a bushing that leaves a square edge or shoulder on the inside of the pipe or fitting.

7.3.3.2. Extracted Tees

- (1) Tees may be extracted from the wall thickness of Types K and L copper tube used in a *water distribution system*, provided that
 - (a) a tool specifically designed for the purpose is used,
 - (b) the branch is at least one *NPS* smaller than the tube in which the tee is formed,
 - (c) the end of the branch incorporates a means to prevent it from penetrating into the run and thereby obstructing flow, and
 - (d) the joint at the tee is brazed with a filler metal having a melting point not below 540°C.

7.3.3.3. Prohibition of Welding of Pipes and Fittings

- (1) Cast-iron *soil pipe* and fittings shall not be welded.
- (2) Galvanized steel pipe and fittings shall not be welded.

7.3.3.4. Unions and Slip Joints (See Note A-7.2.3.1.(1) and (3))

- (1) Except as provided in Sentence 7.4.6.3.(6), 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) Slip joints 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.

7.3.3.5. Increaser or Reducer

- (1) Connections between 2 pipes of different *nominal pipe sizes* shall be made with an increaser or a reducer fitting installed so that it permits the system to be completely drained.

7.3.3.6. Dissimilar Materials

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

7.3.3.7. Connection of Roof Drain to Leader

- (1) *Roof drains* shall be securely connected to a *leader* and provision shall be made for expansion.

7.3.3.8. Connection of Floor or Wall Outlet Fixtures

- (1) Pedestal urinals, floor-mounted water closets or *S-trap standards* shall be connected to a *fixture drain* by a floor flange or other means of connection, except that a cast-iron *trap standard* may be caulked to a cast-iron pipe.
- (2) Except as provided in Sentence (3), floor flanges shall be brass.
- (3) Where cast-iron or plastic pipe is used, a floor flange of the same material is permitted to be used.
- (4) Floor flanges and *fixtures* shall be securely set on a firm base and fastened to the floor or *trap flange* of the *fixture*.
- (5) Water-closet bowls shall be securely attached to the floor flange, floor or wall carrier.
- (6) Joints in a floor flange or between a *fixture* and the *drainage system* shall be sealed with a resilient, watertight and gas-tight seal.
- (7) Where a lead water-closet stub is used, the length of the stub below the floor flange shall be not less than 75 mm.

7.3.3.9. Expansion and Contraction

- (1) 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 *building shrinkage*. (See Note A-7.3.3.9.(1))

7.3.3.10. Copper Tube

- (1) Types M and DWV copper tube shall not be bent.
- (2) Bends in copper tubing of soft or bending temper shall be made with tools manufactured and sized for the purpose.

7.3.3.11. Indirect Connections

- (1) Where a *fixture* or device is *indirectly connected*, the connections shall be made by terminating the *fixture drain* above the *flood level rim* of a *directly connected fixture* to form an *air break*.
- (2) The size of the *air break* shall be not less than 25 mm.

7.3.3.12. Copper Joints Used Underground

- (1) Except as provided in Sentence (2), joints in copper tubes installed underground shall be made with either flared or compression fittings, or be brazed using a brazing alloy within the American Welding Society's AWS-BCuP range.
- (2) Compression fittings shall not be used underground under a *building*.

7.3.4. Support of Piping

7.3.4.1. Capability of Support

- (1) Piping shall be provided with support that is capable of keeping the pipe in alignment and bearing the weight of the pipe and its contents.
- (2) Wall mounted *fixtures* shall be supported so that no strain is transmitted to the piping.
- (3) 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.

7.3.4.2. Independence of Support

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

7.3.4.3. Insulation of Support

- (1) Where a hanger or support for copper tube or brass or copper pipe is of a material other than brass or copper, it shall be suitably separated and electrically insulated from the pipe or tube to prevent galvanic action.
- (2) Where a hanger or support for stainless steel pipe or tube is of a material other than stainless steel, it shall be suitably separated and electrically insulated from the pipe or tube.

7.3.4.4. Support for Vertical Piping

- (1) Except as provided in Sentence (2), vertical piping shall be supported at its base and at the floor level of alternate *storeys* by rests, each of which can bear the weight of pipe that is between it and the rest above it.
- (2) The maximum spacing of supports shall be 7.5 m.

7.3.4.5. Support for Horizontal Piping

- (1) *Nominally horizontal* piping that is inside a *building* shall be braced to prevent swaying and buckling and to control the effects of thrust.
- (2) *Nominally horizontal* piping shall be supported as stated in Table 2.3.4.5.
- (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 or joined, and
 - (c) hangers shall not compress, cut or abrade the pipe.
- (4) Where PEX, PE-RT, PP-R, PE/AL/PE or PEX/AL/PEX plastic pipe or tube is installed, hangers shall not compress, cut or abrade the pipe.
- (5) Where hangers are used to support *nominally horizontal* piping, the hangers shall be
 - (a) supported by metal rods of not less than
 - (i) 6 mm diam to support piping of *NPS* 2 or less,
 - (ii) 8 mm diam to support piping of *NPS* 4 or less, and
 - (iii) 13 mm diam to support piping over *NPS* 4, or

- (b) solid or perforated metal straps not less than
- (i) 0.6 mm thick and 12 mm wide to support piping of *NPS* 2 or less, and
 - (ii) 0.8 mm thick and 18 mm wide to support piping of *NPS* 4 or less.
- (6) Where a hanger is attached to concrete or masonry, it shall be fastened by metal or expansion-type plugs that are inserted or built into the concrete or masonry.

Table 7.3.4.5.
Support for Nominally Horizontal Piping
 Forming Part of Sentence 7.3.4.5.(2)

Piping Material	Maximum Horizontal Spacing of Supports, m	Additional Support Conditions
ABS or PVC plastic pipe	1.2	At the end of <i>branches</i> or <i>fixture drains</i> and at changes in direction and elevation
ABS or PVC plastic trap arm or fixture drain pipe > 1 m long	n/a	As close as possible to the <i>trap</i>
Cast-iron pipe	3.0	At or adjacent to each hub or joint
Cast-iron pipe with mechanical joints that is ≤ 300 mm long between adjacent fittings	1.0	None
Copper tube or copper and brass pipe, hard temper		
• diameter > <i>NPS</i> 1	3.0	None
• diameter ≤ <i>NPS</i> 1	2.5	
Copper tube, soft temper	2.5	None
CPVC pipe	1.0	None
Galvanized iron or steel pipe		
• diameter ≥ <i>NPS</i> 6	3.75	None
• diameter < <i>NPS</i> 6	2.5	
Lead pipe	Throughout length of pipe	None
PE/AL/PE composite pipe	1.0	None
PEX/AL/PEX composite pipe	1.0	None
PEX plastic pipe	0.8	None
PE-RT tube	0.8	None
PP-R plastic pipe	1.0	At the end of <i>branches</i> and at changes in direction and elevation
Stainless steel pipe		
• diameter ≥ <i>NPS</i> 1	3.0	None
• diameter < <i>NPS</i> 1	2.5	
Stainless steel tube		
• diameter ≥ <i>NPS</i> 1	3.0	None
• diameter < <i>NPS</i> 1	2.5	

7.3.4.6. Support for Underground Horizontal Piping

- (1) Except as provided in Sentence (2), *nominally horizontal* piping that is underground shall be supported on a base that is firm and continuous under the whole of the pipe. (See Note A-7.3.4.6.(1))
- (2) *Nominally horizontal* piping installed underground that is not supported as described in Sentence (1) may be installed using hangers fixed to a *foundation* or structural slab provided that the hangers are capable of
 - (a) keeping the pipe in alignment, and
 - (b) supporting the weight of
 - (i) the pipe,
 - (ii) its contents, and
 - (iii) the fill over the pipe.

7.3.4.7. Support for Vent Pipe Above a Roof

- (1) Where a *vent pipe* that may be subject to misalignment terminates above the surface of a roof, it shall be supported or braced. (See Article 7.5.6.5. for location of *vent pipe* terminals.)

7.3.4.8. Compression Fittings

- (1) No compression fitting connecting to plain end pipe or tube shall be used in a *plumbing system* unless the pipe or tube and fittings are sufficiently stayed, clamped, anchored or buttressed so as to prevent separation during normal service of the system allowing for surge pressures.

7.3.4.9. Thrust Restraint of Water Service Pipes (See Note A-7.3.4.9.)

- (1) Pipe clamps and tie-rods, thrust blocks, locked mechanical or push-on joints, mechanical joints utilizing set screw retainer glands, or other suitable means of thrust restraint shall be provided at each change of direction of a *water service pipe* NPS 4 or more and at all tees, plugs, caps and bends.
- (2) Backing for underground *water service pipes* shall be placed
 - (a) between undisturbed earth and the fitting to be restrained and shall be of sufficient bearing area to provide adequate resistance to the thrust to be encountered, and
 - (b) so that the joints will be *accessible* for inspection and repair.
- (3) Concrete thrust blocks shall have a minimum compressive strength of not less than 10 MPa after 28 days.
- (4) Thrust blocks shall not be used to restrain vertical pipe.

7.3.5. Protection of Piping

7.3.5.1. Protection of Piping

- (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 Note A-7.3.5.1.(1))

7.3.5.1A. Protection of Non-Metallic Pipe

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

7.3.5.2. Isolation from Loads

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

7.3.5.3. Protection Against Freezing

- (1) Where piping may be exposed to freezing conditions, it shall be protected from the effects of freezing. (See Note A-7.3.5.3.(1))

7.3.5.4. Protection from Mechanical Damage

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

7.3.5.5. Protection from Condensation

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

7.3.5.6. Spatial Separation (See Note A-7.3.5.6.)

- (1) Except as permitted in Sentences (2) and (3), a buried *water service pipe* shall be separated from the *building drain*, *building sewer* and a *private sewage disposal system*, by not less than 2 440 mm measured horizontally, of undisturbed or compacted earth.
- (2) The *water service pipe* may be closer than 2 440 mm or be placed in the same trench with the *building drain* or *building sewer* if,
- (a) the following conditions are met:
- (i) the bottom of the *water service pipe* at all points is at least 500 mm above the top of the *building drain* or *building sewer*, and
 - (ii) when in a common trench with the *building drain* or *building sewer*, the *water service pipe* is placed on a shelf at one side of the common trench,
- (b) the *water service pipe* is constructed of a single run of pipe with no joints or fittings between the street line or source of supply on the property and the inside face of the *building*, or
- (c) the *building drain* or *building sewer* is constructed of piping which is pressure tested in accordance with Subsection 7.3.7. at 345 kPa.
- (3) A buried *water service pipe* may pass under a *building drain* or *building sewer* if,
- (a) a vertical separation of not less than 500 mm is provided between the invert of the *building drain* or *building sewer* and the crown of the *water service pipe*,
- (b) adequate structural support is provided for the *building drain* or *building sewer* to prevent excessive deflection of joints and settling, and
- (c) the length of the *water service pipe* is located so that there are no joints within 2 440 mm measured horizontally from the intersection with the *building drain* or *building sewer*.
- (4) A buried *water service pipe* shall be constructed of a single run of pipe with no joints or fittings between the street line or source of supply on the property and the inside face of the *building* if the *water service pipe* is less than 15 m from,
- (a) a *private sewage disposal system*, or
- (b) a source of pollution other than a *private sewage disposal system*.

7.3.6. Testing of Drainage and Venting Systems

7.3.6.1. Tests and Inspection of Drainage or Venting Systems

- (1) Except in the case of an external *leader*, after a section of *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.
- (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 *chief building official*.
- (3) Where a prefabricated system is assembled off the *building site* in such a manner that it cannot be inspected and tested on site, off-site inspections and tests shall be conducted.
- (4) Where a prefabricated system is installed as part of a *drainage system* or *venting system*, all other *plumbing work* shall be tested and inspected and a final test shall be carried out on the complete system when requested.
- (5) A ball test shall be carried out on a *sanitary building drain*, *sanitary building sewer*, *storm building drain* and a *storm building sewer* buried underground.
- (6) A *sewer lateral extension* need not be tested and inspected if the *sewer lateral extension* was constructed, tested and inspected at the time of the installation of the public sewer.

7.3.6.2. Tests of Pipes in Drainage Systems

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

7.3.6.3. Tests of Venting Systems

- (1) *Venting systems* shall be capable of withstanding without leakage a water pressure test, air test and final test.

7.3.6.4. Water Pressure Tests

- (1) A water pressure test shall consist in applying a water column of at least 3 m to all joints.
- (2) In making a water pressure test,
 - (a) every opening except the highest shall be tightly closed with a testing plug or a screw cap, and
 - (b) the system or the section shall be kept filled with water for 15 min.

7.3.6.5. Air Pressure Tests

- (1) Air pressure tests shall be conducted in accordance with the manufacturer's instructions for the piping materials, and,
 - (a) air shall be forced into the system until a gauge pressure of 35 kPa is created, and
 - (b) this pressure shall be maintained for at least 15 min without a drop in pressure.(See Note A-7.3.6.5.(1))

7.3.6.6. Final Tests

- (1) Where a final test is made,
 - (a) every *trap* shall be filled with water,
 - (b) the bottom of the system being tested shall terminate at the *building trap*, test plug or cap,
 - (c) except as provided in Sentence (2), smoke from smoke-generating machines shall be forced into the system,
 - (d) when the smoke appears from all roof terminals they shall be closed, and
 - (e) a pressure equivalent to a 25 mm water column shall be maintained for 15 min without the addition of more smoke.
- (2) The smoke referred to in Clauses (1)(c) and (d) is permitted to be omitted provided the roof terminals are closed and the system is subjected to an air pressure equivalent to a 25 mm water column maintained for 15 min without the addition of more air.

7.3.6.7. Ball Tests

- (1) Where a ball test is made, a hard ball dense enough not to float shall be rolled through the pipe.
- (2) The diameter of the ball shall be not less than
 - (a) 50 mm where the size of the pipe is *NPS 3* or more, or
 - (b) 25 mm where the size of the pipe is less than *NPS 3*.

7.3.7. Testing of Potable Water Systems

7.3.7.1. Application of Tests

- (1) After a section of a *potable water system* has been completed, and before it is placed in operation, a water pressure test or an air pressure test shall be conducted.
- (2) A pressure test may be applied to each section of the system or to the system as a whole.
- (3) Where a prefabricated system is assembled off the *building* site in such a manner that it cannot be inspected and tested on site, off-site inspections and pressure tests shall be conducted.
- (4) Where a prefabricated system is installed as part of a *water system*,
 - (a) all other *plumbing* work shall be tested and inspected, and
 - (b) the complete system shall be pressure tested when requested.

7.3.7.2. Pressure Tests of Potable Water Systems

- (1) Every *potable water system* shall be capable of
 - (a) withstanding without leakage a water pressure that is at least 1 000 kPa for at least 1 h, or
 - (b) withstanding for at least 2 h without a drop in pressure an air pressure that is at least 700 kPa.

7.3.7.3. Water Pressure Tests

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

Section 7.4. Drainage Systems

7.4.1. Application

7.4.1.1. General

- (1) This Section applies to *sanitary drainage systems* and *storm drainage systems*.

7.4.2. Connections to Drainage Systems

7.4.2.1. Connections to Sanitary Drainage Systems

- (1) *Fixtures* shall be directly connected to a *sanitary drainage system*, except that
- (a) drinking fountains are permitted to be
 - (i) *indirectly connected* to a *sanitary drainage system*, or
 - (ii) connected to a *storm drainage system*, provided that where the system is subject to *backflow*, a *backwater valve* is installed in the fountain *fixture drain*,
 - (b) drainage pans on heating/cooling units are permitted to be connected to a *storm drainage system*, provided that where the system is subject to *backflow*, a *backwater valve* is installed,
 - (c) a floor drain is permitted to be connected to a *storm drainage system*, provided it is located where it can receive only *clear-water waste* or *storm water*,
 - (d) *fixtures* or *appliances* that discharge only *clear water waste* are permitted to be connected to a *storm drainage system* or be drained onto a roof, and,
 - (e) the following devices shall be *indirectly connected* to a *drainage system*:
 - (i) a device for the display, storage, preparation or processing of food or drink,
 - (ii) a sterilizer,
 - (iii) a device that uses water as a cooling or heating medium,
 - (iv) a water operated device,
 - (v) a water treatment device,
 - (vi) a drain or overflow from a *water system* or a heating system.
- (2) The connection of a *soil* or *waste pipe* to a *nominally horizontal soil* or *waste pipe* or to a *nominally horizontal offset* in a *soil* or *waste stack* shall be respectively at least 1.5 m measured horizontally from the bottom of a *soil* or *waste stack* or from the bottom of the upper vertical section of the *soil* or *waste stack* that,
- (a) receives a discharge of 30 or more *fixture units*, or
 - (b) receives a discharge from *fixtures* located on 2 or more *storeys*.
- (3) No other *fixture* shall be connected to a lead bend or stub that serves a water closet.
- (4) Where a change in direction of more than 45° occurs in a *soil* or *waste pipe* that serves more than one clothes washer, and in which pressure zones are created by detergent suds, no other *soil* or *waste pipe* shall be connected to it within a length less than
- (a) 40 times the *nominal pipe size* of the *soil* or *waste pipe* or 2.44 m maximum vertical, whichever is less, before changing direction, and
 - (b) 10 times the *nominal pipe size* of the *nominally horizontal soil* or *waste pipe* after changing direction.
- (See Note A-7.4.2.1.(4))
- (5) Where a *vent pipe* is connected into a suds pressure zone referred to in Sentence (4), no other *vent pipe* shall be connected to that *vent pipe* within the height of the suds pressure zone. (See Note A-7.4.2.1.(4))

7.4.2.2. Connection of Overflows from Rainwater Tanks

- (1) Where an overflow from a *rainwater* tank is connected to a *storm drainage system*, it shall be connected by
 - (a) an *air break*, or
 - (b) a *backwater valve* installed on the *storm drainage pipe* before the connection to the *storm building drain*.

7.4.2.3. Direct Connections

- (1) Two or more *fixture outlet pipes* that serve outlets from a single *fixture* that is listed in Clause 7.4.2.1.(1)(d) may be *directly connected* to a *branch* that
 - (a) has a *nominal pipe size* of not less than NPS 1¼, and
 - (b) is terminated above the *flood level rim* of a *directly connected fixture* with a minimum diameter waste of 1½ in. to form an *air break*.
- (2) *Fixture drains* from *fixtures* that are listed in Subclauses 7.4.2.1.(1)(e)(i) and (ii) may be *directly connected* to a pipe that
 - (a) is terminated to form an *air break* above the *flood level rim* of a *fixture* that is *directly connected* to a *sanitary drainage system*, and
 - (b) is extended through the roof when *fixtures* that are on 3 or more *storeys* are connected to it.
- (3) *Fixture drains* from *fixtures* that are listed in Subclauses 7.4.2.1.(1)(d)(iii) to (vi) may be *directly connected* to a pipe that,
 - (a) is terminated to form an *air break* above the *flood level rim* of a *fixture* that is *directly connected* to a *storm drainage system*, and
 - (b) is extended through the roof when *fixtures* that are on 3 or more *storeys* are connected to it.
- (4) Every *waste pipe* carrying waste from a device for the display, storage, preparation or processing of food or drink shall be trapped and have a minimum diameter equal to the diameter of the drain outlet from the device.

7.4.3. Location of Fixtures

7.4.3.1. Plumbing Fixtures

- (1) *Sanitary units*, bathtubs and shower baths shall not be installed adjacent to wall and floor surfaces that are pervious to water.

7.4.3.2. Restricted Locations of Indirect Connections and Traps

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

7.4.3.3. Equipment Restrictions Upstream of Grease Interceptors

- (1) Except as provided in Sentence (2), equipment discharging waste with organic solids shall not be located upstream of an *interceptor*. (See Note A-7.4.3.3.(1))
- (2) If a food scrap *interceptor* has been installed upstream of the grease *interceptor*, equipment discharging waste with organic solids may discharge through a grease *interceptor*.

7.4.3.4. Fixtures Located in Chemical Storage Locations

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

7.4.3.5. Macerating Toilet System

- (1) A maceration toilet system shall only be installed
 - (a) where no connection to a gravity *sanitary drainage system* is available, and
 - (b) in accordance with the manufacturer's instructions.

7.4.3.6. Drains Serving Elevator Pits

(1) If a floor drain is provided in an elevator pit, it shall be installed in accordance with Section 2.2. of ASME A17.1 / CSA B44, "Safety Code for Elevators and Escalators."

7.4.4. Treatment of Sewage and Wastes

7.4.4.1. Sewage Treatment

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

7.4.4.2. Cooling of Hot Water or Sewage

(1) Where a *fixture* discharges *sewage* or *clear-water waste* that has been heated, the *drainage system* shall be suitable for the temperature of the *sewage* or *clear-water waste* being discharged. (See Note A-7.4.4.2.(1))

7.4.4.3. Interceptors

(1) Except for *suites of residential occupancy*, where a *fixture* discharges *sewage* that includes fats, oils or grease and is located in an area where food is cooked, processed or prepared, it shall discharge through a grease *interceptor*. (See Note A-7.4.4.3.(1))

- (2) Except as provided in Sentence (3), oil *interceptors* shall be provided as follows:
 - (a) service stations, repair shops and garages or any establishment where motor vehicles are repaired, lubricated or maintained shall be provided with an oil *interceptor*, and
 - (b) establishments which use oily or *flammable liquids* or have such wastes as a result of an industrial process shall be provided with an engineered oil *interceptor*.

(2.1) Oil *interceptors* are not required for a drain in a hydraulic elevator pit, parking lot, car wash or a garage used exclusively as a motor vehicle parking area.

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

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

(5) An on-site constructed *interceptor* shall be constructed to the requirements of a manufactured *interceptor*.

(6) A grease *interceptor* shall be located as close as possible to the *fixture* or *fixtures* it serves.

(7) The flow rate through a grease *interceptor* shall not exceed its rated capacity and the flow rate shall be determined using the following:

$$Q = \left(\sum_1^N \left(0.75 \frac{V}{DDT} \right) \right) + PD$$

where:

Q is the flow rate to a grease *interceptor* in L/s.

V is the volume of the *fixture* in L.

DDT is the drain down time, 60 or 120 seconds.

PD is any pump discharge in L/s.

N is the number of *fixtures* to go through the *interceptor*.

(8) All grease and oil *interceptors* shall have an internal flow control and, where the head will exceed five feet, a secondary flow control shall be required.

(9) Floor drains that conform to Sentence 7.4.5.1.(3) are not required to be separately trapped and vented, and may be gang trapped when discharging through an oil *interceptor*.

7.4.4.4. Neutralizing and Dilution Tanks

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

- (a) a *trap*, or
- (b) an *indirect connection*.

(See Note A-7.4.4.4.(1))

(2) Neutralizing or dilution tanks shall have a method for neutralizing the liquid.

7.4.5. Traps

7.4.5.1. Traps for Sanitary Drainage Systems

(1) Except as provided in Sentences (2) to (5) and Article 7.4.5.2., *fixtures* shall be protected by a separate *trap*.

(2) One *trap* is permitted to protect

- (a) all the trays or compartments of a 2- or 3- compartment sink,
- (b) a 2- or 3- compartment laundry tray, or
- (c) 2 similar type single compartment *fixtures* located in the same room.

(3) One *trap* is permitted to serve a group of floor drains and *hub drains*, a group of 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.

(4) Reserved.

(5) An *interceptor* with an effective water seal of not less than 38 mm is permitted to serve as a *trap*. (See Note A-7.4.5.1.(5))

- (6) Where a domestic dishwashing machine equipped with a drainage pump discharges through a direct connection into the *fixture outlet pipe* of an adjacent kitchen sink or disposal unit, the pump discharge line shall rise as high as possible to just under the counter and connect
- (a) on the inlet side of the sink *trap* by means of a Y fitting, or
 - (b) to the disposal unit.

7.4.5.2. Traps for Storm Drainage Systems

- (1) Where a *storm drainage system* is connected to a *combined building sewer* or a public *combined sewer*, a *trap* shall be installed between any opening in the system and the 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,
 - (b) not less than 1 m above or not less than 3.5 m in any other direction from any air inlet, openable window or door, and
 - (c) not less than 1.8 m from a property line.
- (See Note A-7.4.5.2.(1))
- (2) A floor drain that drains to a *storm drainage system* shall be protected by a *trap* that
- (a) is located between the floor drain and a *leader*, *storm building drain* or *storm building sewer*,
 - (b) may serve all floor drains located in the same room, and
 - (c) need not be protected by a *vent pipe*.

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

- (1) Where a *subsoil drainage pipe* is connected to a *sanitary drainage system*, the connection shall be made on the upstream side of a *trap* with a *cleanout* or a trapped sump.
- (2) Except as permitted in Sentence (3), no foundation drain or *subsoil drainage pipe* shall connect to a *sanitary drainage system*.
- (3) Where a *storm drainage system* is not available or *soil* conditions prevent drainage to a culvert or dry well, a foundation drain or *subsoil drainage pipe* may connect to a *sanitary drainage system*.

7.4.5.4. Location and Cleanout for Building Traps

- (1) Where a *building trap* is installed, it shall
- (a) be provided with a *cleanout* fitting on the upstream side of and directly over the *trap*,
 - (b) be located upstream of the *building cleanout*, and
 - (c) be located
 - (i) inside the *building* as close as practical to the place where the *building drain* leaves the *building*, or
 - (ii) outside the *building* in a manhole.

7.4.5.5. Trap Seals

- (1) Provision shall be made for maintaining the *trap* seal of a floor drain or a *hub drain* by
- (a) the use of a *trap* seal primer,
 - (b) using the drain as a receptacle for an *indirectly connected* drinking fountain, or
 - (c) other equally effective means.
- (2) Where a mechanical device is installed to furnish water to a *trap*, the pipe or tube conveying water from the device to the *trap* shall be at least $\frac{3}{8}$ in. inside diameter.

7.4.6. Arrangement of Drainage Piping

7.4.6.1. Separate Systems

- (1) No vertical *sanitary drainage pipe* shall conduct both *sanitary sewage* and *storm sewage*.
- (2) Reserved.
- (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.

7.4.6.2. Location of Sanitary Drainage Pipes

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

7.4.6.3. Sumps or Tanks (See Note A-7.4.6.3.)

- (1) Only 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 *sanitary sewage*, it shall be water- and air-tight and shall be vented.
- (3) Where the sump or tank receives subsurface water from a *subsoil drainage pipe*, it shall be provided with a water- and air-tight cover.
- (4) Equipment such as a pump or ejector that can lift the contents of the sump or tank and discharge it into the *sanitary building drain* or *sanitary building sewer* shall be installed.
- (5) Where the equipment does not operate automatically, the capacity of the sump shall be sufficient to hold at least a 24 hour accumulation of liquid.
- (6) Where there is a *building trap*, the discharge pipe from the equipment shall be connected to the *sanitary building drain* downstream of the *trap*.
- (7) The discharge pipe from every pumped sump shall be equipped with a union, a *backwater valve* and a shut-off valve installed in that sequence in the direction of discharge.
- (8) The discharge piping from a pump or ejector shall be sized for optimum flow velocities at pump design conditions.
- (9) The discharge pipe from every pumped *storm sewage* sump shall be equipped with
 - (a) a union and a *check valve* installed in that sequence in the direction of discharge and pumped to above grade level, or
 - (b) a union, a *check valve* and a shut-off valve installed in that sequence in the direction of discharge.

7.4.6.4. Protection from Backflow (See Note A-7.4.6.4.)

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

- (2) A *backwater valve* may be installed in a *building drain* provided that,
 - (a) it is a “normally open” design conforming to,
 - (i) CAN/CSA-B70, “Cast Iron Soil Pipe, Fittings, and Means of Joining”,
 - (ii) CAN/CSA-B181.1, “Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings”,
 - (iii) CAN/CSA-B181.2, “Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings”, or
 - (iv) CAN/CSA-B182.1, “Plastic Drain and Sewer Pipe and Pipe Fittings”, and
 - (b) it does not serve more than one *dwelling unit*.
- (3) Except as provided in Sentences (4) and (5), where a *building drain* or a *branch* may be subject to *backflow*,
 - (a) a *backwater valve* shall be installed on every *fixture drain* connected to it when the *fixture* is located below the level of the adjoining street, or
 - (b) a *backwater valve* shall be installed to protect *fixtures* which are below the upstream sanitary manhole cover when a *residential building* is served by a public *sanitary sewer*.
- (4) Where more than one *fixture* is located on a *storey* and all are connected to the same *branch*, the *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*.

7.4.6.5. Mobile Home Sewer Service

- (1) A *building sewer* intended to serve a mobile home shall be
 - (a) not less than *NPS 4*,
 - (b) terminated above ground,
 - (c) provided with
 - (i) a tamperproof terminal connection that is capable of being repeatedly connected, disconnected and sealed,
 - (ii) a protective concrete pad, and
 - (iii) a means to protect it from frost heave, and
 - (d) designed and constructed in accordance with good engineering practice.

7.4.6.6. Building Drain Ends

- (1) Where a *building drain* enters a *building* above the elevation of the bottom of the wall of a *building*, the *building drain* may be deemed to terminate at the first point that the drainage pipe changes direction from the horizontal to the vertical.

7.4.7. Cleanouts

7.4.7.1. Cleanouts for Drainage Systems

- (1) *Sanitary drainage systems* and *storm drainage systems* shall be provided with *cleanouts* that will permit cleaning of the entire system. (See Note A-7.4.7.1.(1))
- (2) A *cleanout* fitting shall be provided on the upstream side and directly over every running *trap*.
- (3) Interior *leaders* shall be provided with a *cleanout* fitting at the bottom of the *leader* or not more than 1 m upstream from the bottom of the *leader*.
- (4) Where a *cleanout* is required on a *building sewer* of *NPS 8* or larger, it shall be a manhole.

- (5) A *building sewer* shall not change direction or slope between the *building* and public sewer or between *cleanouts*, except that pipes not more than *NPS* 6 may change direction
- by not more than 5° every 3 m, or
 - by the use of fittings with a cumulative change in direction of not more than 45°.
- (6) *Building drains* shall be provided with a *cleanout* fitting of *NPS* 4 or larger that is located as close as practical to the place where the *building drain* leaves the *building*. (See Note A-7.4.7.1.(6))
- (7) Stacks shall be provided with a *cleanout* fitting
- at the bottom of the stack,
 - not more than 3 m upstream of the bottom of the stack, or
 - on a Y fitting connecting the stack to the *building drain* or *branch*.
- (8) A *cleanout* shall be provided to permit the cleaning of the piping immediately downstream of an *interceptor*.
- (9) Every indirect drainage pipe carrying waste from a food receptacle shall have a *cleanout* access at every change of direction of more than 45°.
- (10) A *cleanout* shall be installed on a *trap arm* serving a kitchen sink as close as practical to the *trap* outlet and shall be readily *accessible*.

7.4.7.2. Size and Spacing of Cleanouts

- (1) Except as provided in Sentences (2), (3) and 7.4.7.1.(6), the *nominal pipe size* and spacing of *cleanouts* in *nominally horizontal* pipes of a *drainage system* shall conform to Table 7.4.7.2.

Table 7.4.7.2.
Permitted Size and Spacing of Cleanouts
 Forming Part of Sentence 7.4.7.2.(1)

Nominal Pipe Size of Drainage Pipe, <i>NPS</i>	Minimum Nominal Pipe Size of Cleanout, <i>NPS</i>	Maximum Spacing, m	
		One-Way Rodding	Two-Way Rodding
less than 3	Same <i>NPS</i> as drainage pipe	7.5	15
3 and 4	3	15	30
over 4	4	26	52

- (2) The spacing between manholes serving a *building sewer*
- of *NPS* 24 or less shall not exceed 90 m, and
 - over *NPS* 24 shall not exceed 150 m.
- (3) The *developed length* of a *building sewer* between the *building* and the first manhole to which the *building sewer* connects shall not exceed 75 m.
- (4) Where a *building sewer* connects to another *building sewer* other than by a manhole, the *developed length* between the *building* and the *building sewer* to which it connects shall not exceed 30 m.
- (5) *Cleanouts* that allow rodding in one direction only shall be installed to permit rodding in the direction of flow.
- (6) Manholes shall be located at all junctions and all changes in grade, *size* or alignment (except for curvilinear alignment) on a *sanitary building sewer* that is *NPS* 8 or larger.

(7) Manholes shall be located at changes of grade, *size* or alignment (except for curvilinear alignment) on a *storm building sewer* or exterior *storm drainage pipe* that is *NPS 8* or larger.

7.4.7.3. Manholes

- (1) A manhole, including the cover shall be designed to support all loads imposed upon it.
- (2) A manhole shall be provided with
 - (a) a cover that provides an airtight seal if located within a *building*,
 - (b) a rigid ladder of a corrosion-resistant material where the depth exceeds 1 m, and
 - (c) a vent to the exterior if the manhole is located within a *building*.
- (3) A manhole shall have a minimum horizontal dimension of 1.2 m, except that the top 1.5 m may be tapered from 1.2 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.

7.4.7.4. Location of Cleanouts

- (1) *Cleanouts* and access covers shall be located so that their openings are readily *accessible* for drain cleaning purposes.
- (2) A *cleanout* shall not be
 - (a) located in a floor assembly in a manner that may constitute a hazard, and
 - (b) used as a floor drain.
- (3) Reserved.
- (4) Each change of direction of the piping between a *cleanout* fitting and the drainage piping or *vent piping* that it serves shall be accomplished by using 45° bends.
 - (4.1) A *cleanout* shall be provided to serve vertical drainage piping from a wall hung urinal and shall extend above the *flood level rim* of the *fixture*.
- (5) *Cleanouts* serving *fixture drains* in healthcare facilities, mortuaries, laboratories and similar *occupancies*, where contamination by hazardous waste is likely, shall be located a minimum of 150 mm above the *flood level rim* of the *fixture*.

7.4.8. Minimum Slope and Length of Drainage Pipes

7.4.8.1. Minimum Slope

- (1) Except as provided in Sentences (2) and (3) and Articles 7.4.10.8. and 7.4.10.9., drainage pipes that are *NPS 3* or less shall have a downward slope in the direction of flow of at least 1 in 50. (See Note A-7.4.8.1.(1))
- (2) Sentence (1) does not apply to a *force main*.
- (3) Where it is not possible to comply with Sentence (1), a lesser slope may be used if it will produce a gravity flow of not less than 0.6 m per second.

7.4.8.2. Length of Fixture Outlet Pipes

(1) Except for *fixture outlet pipes* installed in conformance with Sentence 7.4.5.1.(3), the *developed length* of *fixture outlet pipes* shall not exceed 1 200 mm.

7.4.9. Size of Drainage Pipes

7.4.9.1. No Reduction in Size

(1) Except as permitted in Sentence (3), no drainage pipe that is of minimum *size* required by this Part for the purpose for which it is installed shall be so connected as to drain to other drainage pipe of lesser *size*.

(2) Where a *building drain* connects to a stack through a wall or floor, the drain shall retain its full *size* through the wall or floor.

(3) A *sanitary drainage pipe* may be connected to a pre-engineered waste water heat recovery system that incorporates piping of a lesser *size* than required by Sentence (1) provided that it does not convey *sewage*

- (a) from a *sanitary unit*, or
- (b) that contains solids.

7.4.9.2. Serving Water Closets

(1) Drainage pipes that serve a water closet shall be not less than *NPS* 3.

(2) *Branch* and *building drains* downstream of the third water-closet *fixture drain* connection shall be not less than *NPS* 4.

(3) Stacks that serve more than 6 water closets shall be not less than *NPS* 4.

(4) Discharge pipes serving a macerating toilet system shall be not less than *NPS* $\frac{3}{4}$.

(5) No *vertical leg* of the drainage pipe from a water closet or other *fixture* that has an integral siphonic flushing action shall exceed 1 000 mm.

7.4.9.3. Size of Fixture Outlet Pipes

(1) Except as provided in Sentence (2), the *nominal pipe size* of *fixture outlet pipes* shall conform to Table 7.4.9.3.

(2) The part of the *fixture outlet pipe* that is common to 3 compartments of a sink shall be one *NPS* larger than the largest *fixture outlet pipe* of the compartments that it serves. (See Note A-7.4.9.3.(2))

(3) Where clothes washers do not drain to a laundry tray, the *trap* inlet shall be not less than *NPS* 2 and be fitted with a vertical standpipe that is not less than 600 mm long measured from the *trap weir* and terminates above the *flood level rim* of the clothes washer. (See Note A-7.4.9.3.)

(4) In an individual *dwelling unit*, where multiple shower heads are served by one shower receptacle, the *fixture outlet pipe* shall be not less than *NPS* 2.

Table 7.4.9.3.
Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures⁽¹⁾
 Forming Part of Sentences 7.4.9.3.(1) and 7.4.10.2.(1)

<i>Fixture</i>	<i>Minimum Nominal Pipe Size of Fixture Outlet Pipe, NPS</i>	<i>Hydraulic Load, fixture units</i>
Autopsy table	1½	2
Bathroom group		
(a) with flush tank	n/a	6
(b) with direct flush valve	n/a	8
Bathtub (with or without shower)	1½	1½
Bath: foot, sitz or slab	1½	1½
Beer cabinet	1½	1½
Bidet	1¼	1
Chinese range	1½	3
Clothes washer		
(a) domestic ⁽¹⁾	n/a	1½ with NPS 2 trap
(b) commercial	n/a	2 with NPS 2 trap
Cup Sinks	1¼	½
Dental unit or cuspidor	1¼	1
Dishwasher		
(a) domestic type	1½	1 (no load when connected to garbage grinder or domestic sink)
(b) commercial type	2	3
Drinking fountain	1¼	½
Fish tank or tray	1½	1½
Floor drain ⁽²⁾	2	2 with NPS 2 trap 3 with NPS 3 trap
Garbage grinder, commercial type	2	3
Icebox	1¼	1
Laundry tray		
(a) single or double units or 2 single units with common trap	1½	1½
(b) 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 NPS 1¼ trap 1½ with NPS 1½ trap
(d) multiple or industrial type	1½	According to Table 7.4.10.2.
Macerating Toilet System	¾	4
Potato Peeler	2	3

Table 7.4.9.3. (Cont'd)
 Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures⁽¹⁾
 Forming Part of Sentences 7.4.9.3.(1) and 7.4.10.2.(1)

Fixture	Minimum Nominal Pipe Size of Fixture Outlet Pipe, NPS	Hydraulic Load, fixture units
Shower drain Total volume of discharge from all shower heads and body sprays:		
(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 NPS 1½ trap
		2 with NPS 2 trap
		3 with NPS 3 trap
Urinal		
(a) pedestal, siphon jet or blowout type	2	4
(b) stall, washout type	2	2
(c) wall		
(i) washout type	1½	1½
(ii) other types	2	3
Water closet		
(a) with flush tank	3	4
(b) with direct flush valve	3	6

Notes to Table 7.4.9.3.:

- (1) See Note A-Table 7.4.9.3.
 (2) No hydraulic load for *emergency floor drains*.

7.4.9.4. Minimum Size of Building Drain and Sewer

- (1) *Building drains* and *building sewers* connected to the public sewer system downstream of the main *cleanout* (see Sentence 7.4.7.1.(6)) shall be not less than NPS 4.
 (2) *Storm building drains* and *storm building sewers* shall be not less than NPS 4.

7.4.9.5. Offset in Leaders

- (1) No change in the *nominal pipe size* of a *leader* with a *nominally horizontal offset* is required if the *offset*
 (a) is located immediately under the roof,
 (b) is not more than 6 m long, and
 (c) has a slope of not less than 1 in 50.
 (2) If the horizontal *offset* is more than 6 m long, the *leader* shall conform to Table 7.4.10.9.

7.4.10. Hydraulic Loads

7.4.10.1. Total Load on a Pipe

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

7.4.10.2. Hydraulic Loads for Fixtures

- (1) The hydraulic load from a *fixture* that is listed in Table 7.4.9.3. is the number of *fixture units* set forth in the Table.
- (2) Except as provided in Sentence (1), the hydraulic load from a *fixture* that is not listed in Table 7.4.9.3. is the number of *fixture units* set forth in Table 7.4.10.2. for the *nominal pipe size* of the *trap* that serves the *fixture*.

Table 7.4.10.2.
Permitted Hydraulic Load from a Fixture Based on Size of Trap
 Forming Part of Sentence 7.4.10.2.(2)

Nominal Pipe Size of Trap, NPS	Hydraulic Load, <i>fixture units</i>
1¼	1
1½	2
2	3
2½	4
3	5
4	6

7.4.10.3. Hydraulic Loads from Fixtures with a Continuous Flow

- (1) Except as provided in Sentence (2), the hydraulic load from a *fixture* that produces a continuous flow, such as a pump or an *air-conditioning fixture*, is 31.7 *fixture units* for each litre per second of flow.
- (2) Where a *fixture* or equipment that produces a continuous or semi-continuous flow drains to a *combined sewer* or to a *storm sewer*, the hydraulic load from the *fixture* is 900 L for each litre per second of flow.

7.4.10.4. Hydraulic Loads from Roofs or Paved Surfaces

- (1) Except as provided in Sentence (2), the hydraulic load in litres from a roof or paved surface is the maximum 15 min rainfall determined in conformance with MMAH Supplementary Standard SB-1, “Climatic and Seismic Data,” multiplied by the sum of
 - (a) the area in square metres of the horizontal projection of the surface drained, and
 - (b) one-half the area in square metres of the largest adjoining vertical surface.
 (See Note A-7.4.10.4.(1))
- (2) *Flow control roof drains* may be installed, provided
 - (a) the maximum drain down time does not exceed 24 h,
 - (b) the roof structure is designed to carry the load of the stored water,

- (c) one or more scuppers are installed not more than 30 m apart along the perimeter of the *building* so that
 - (i) up to 200% of the 15-minute rainfall intensity can be handled, and
 - (ii) the maximum depth of controlled water is limited to 150 mm,
 - (d) they are located not more than 15 m from the edge of the roof and not more than 30 m from adjacent drains, and
 - (e) there is at least one drain for each 900 m².
- (3) Reserved.
- (4) Where the height of the parapet is more than 150 mm or exceeds the height of the adjacent wall flashing,
- (a) emergency roof overflows or scuppers described in Clause (2)(c) shall be provided, and
 - (b) there shall be a minimum of 2 *roof drains*.

7.4.10.5. Conversion of Fixture Units to Litres and Gal/min

- (1) Except as provided in Sentence 7.4.10.3.(2), where the hydraulic load is to be expressed in litres, *fixture units* shall be converted as follows:
- (a) when the number of *fixture units* is 260 or fewer, the load is 2 360 L, and
 - (b) when the number of *fixture units* exceeds 260, the load is 9.1 L for each *fixture unit*.
- (2) Where the hydraulic load is to be expressed in gal/min, *fixture units* shall be converted in accordance with Table 7.4.10.5.

Table 7.4.10.5.⁽¹⁾
 Maximum Probable Drainage Rate, gal/min
 Forming Part of Sentence 7.4.10.5.(2)

<i>Fixture Units</i> in Service	<i>Fixture Units</i>	<i>Fixture Units</i>	<i>Fixture Units</i>
	Col. 1	Col. 1 × 10	Col. 1 × 100
100	53	174	900
90	51	164	835
80	49	153	750
70	47	140	680
60	44	128	600
50	41	115	520
40	38	102	435
30	33	88	350
20	27	72	262
10	21	53	174

Notes to Table 7.4.10.5.:

- (1) See Note A-Table 7.4.10.5.

7.4.10.6. Hydraulic Loads to Soil or Waste Pipes

- (1) Except as provided in Sentence (2), the hydraulic load that is drained to every *stack* shall conform to Table 7.4.10.6.-A.
- (2) Where the *nominally horizontal offset* in a *stack* is 1.5 m or more, the hydraulic load that is served by it shall conform to Table 7.4.10.6.-B or Table 7.4.10.6.-C, whichever is the less restrictive.
- (3) Vertical *sanitary drainage pipe* shall be designed to carry no more than 29% of its full capacity.

Table 7.4.10.6.-A
Maximum Permitted Hydraulic Load Drained to a Stack
 Forming Part of Sentences 7.4.10.6.(1) and 7.5.7.3.(2) and Table 7.5.8.4.

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

Table 7.4.10.6.-B
Maximum Permitted Hydraulic Load Drained to a Branch
 Forming Part of Sentences 7.4.10.6.(2), 7.4.10.7.(1) and 7.5.7.3.(2)

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

Table 7.4.10.6.-C⁽¹⁾
Maximum Permitted Hydraulic Load Drained to a Sanitary Building Drain or Sewer
 Forming Part of Sentence 7.4.10.6.(2) and Article 7.4.10.8.

Nominal Pipe Size of Drain or Sewer, NPS	Maximum Hydraulic Load, fixture units					
	Slope ⁽²⁾					
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 50	1 in 25
3	n/a	n/a	n/a	n/a	27	36
4	n/a	n/a	n/a	180	240	300
5	n/a	n/a	380	390	480	670
6	n/a	n/a	600	700	840	1 300
8	n/a	1 400	1 500	1 600	2 250	3 370
10	n/a	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

Notes to Table 7.4.10.6.-C:

- (1) See Note A-Table 7.4.10.6.-C.
 (2) Slope is the ratio of rise to run, in whatever measurement units are chosen.

7.4.10.7. Hydraulic Loads on Branches

- (1) The hydraulic load that is drained to a *branch* shall conform to Table 7.4.10.6.-B.

7.4.10.8. Hydraulic Loads on Sanitary Building Drains or Sewers

- (1) Except as permitted by Article 7.4.10.7., the hydraulic load that is drained to a *sanitary building drain* or a *sanitary building sewer* shall conform to Table 7.4.10.6.-C.
 (2) Horizontal *sanitary drainage pipe* shall be designed to carry no more than 65% of its full capacity.

7.4.10.9. Hydraulic Loads on Horizontal Storm Drains

- (1) The hydraulic load that is drained to a *storm building drain*, a *storm building sewer* or a *combined building sewer* shall conform to Table 7.4.10.9.

Table 7.4.10.9.
Maximum Permitted Hydraulic Load Drained to a Storm Building Drain or Sewer, or a Combined Building Sewer
 Forming Part of Sentence 7.4.9.5.(2) and Article 7.4.10.9.

Nominal Pipe Size of Drain or Sewer, NPS	Maximum Hydraulic Load, L						
	Slope ⁽¹⁾						
	1 in 400	1 in 200	1 in 133	1 in 100	1 in 68	1 in 50	1 in 25
3	n/a	n/a	n/a	n/a	n/a	2 770	3 910
4	n/a	n/a	n/a	4 220	5 160	5 970	8 430
5	n/a	n/a	6 760	7 650	9 350	10 800	15 300
6	n/a	n/a	10 700	12 400	15 200	17 600	24 900
8	n/a	18 900	23 200	26 700	32 800	37 800	53 600
10	n/a	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

Notes to Table 7.4.10.9.:

- (1) Slope is the ratio of rise to run, in whatever measurement units are chosen.

7.4.10.10. Hydraulic Loads to Roof Gutters

(1) The hydraulic load that is drained to a *roof gutter* shall conform to Table 7.4.10.10.

Table 7.4.10.10.
Maximum Permitted Hydraulic Load Drained to a Roof Gutter
 Forming Part of Article 7.4.10.10.

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

7.4.10.11. Hydraulic Loads on Leaders

(1) The hydraulic load that is drained to a leader shall conform to Table 7.4.10.11.

Table 7.4.10.11.
Maximum Permitted Hydraulic Load Drained to a Leader
 Forming Part of Sentence 7.4.10.11.(1)

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

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

(1) The hydraulic load from a *fixture* or equipment that produces a semi-continuous flow shall conform to Table 7.4.10.12.

Table 7.4.10.12.
Maximum Permitted Hydraulic Load from Fixtures with a Semi-continuous Flow
Forming Part of Sentence 7.4.10.12.(1)

Nominal Pipe Size of Trap, NPS	Flow, L/s	Hydraulic Load, fixture units
1½	0.000 - 0.090	3
2	0.091 - 0.190	6
3	0.191 - 0.850	27
4	0.851 - 5.700	180

7.4.10.13. Reserved.

Section 7.5. Venting Systems

7.5.1. Vent Pipes for Traps

7.5.1.1. Venting for Traps

- (1) Except as provided in Sentences (3) and (4), *traps* shall be protected by a *vent pipe*.
- (2) *Drainage systems* may require additional protection as provided in Subsections 7.5.4. and 7.5.5. by the installation of
 - (a) *branch vents*,
 - (b) *vent stacks*,
 - (c) *stack vents*,
 - (d) *vent headers*,
 - (e) *fresh air inlets*,
 - (f) *relief vents*,
 - (g) *circuit vents*,
 - (h) *yoke vents*,
 - (i) *offset relief vents*,
 - (j) *additional circuit vents*,
 - (k) *wet vents*,
 - (l) *individual vents*,
 - (m) *dual vents*, or
 - (n) *continuous vents*.
- (3) A *trap* that serves a floor drain or *hub drain* need not be protected by a *vent pipe* separately where
 - (a) the *nominal pipe size* of the *trap* is not less than NPS 3,
 - (b) the length of the *fixture drain* is not less than 450 mm,
 - (c) the fall on the *fixture drain* does not exceed its *nominal pipe size*.
- (4) A *trap* need not be protected by a *vent pipe*
 - (a) where it serves
 - (i) a *subsoil drainage pipe*, or
 - (ii) a *storm drainage system*, or
 - (b) where it forms part of an indirect *drainage system*. (See also Clause 7.4.2.3.(2)(b))

7.5.2. Wet Venting

7.5.2.1. Wet Venting

- (1) A *sanitary drainage pipe* is permitted to serve as a *wet vent*, provided
 - (a) the hydraulic load is in accordance with Table 7.5.8.1.,
 - (b) the number of wet-vented water closets does not exceed 2,
 - (c) where 2 water closets are installed, they are connected at the same level by means of a double sanitary T fitting if the *vent pipe* is vertical and by means of a double Y fitting if the *vent pipe* is horizontal,
 - (d) the water closets are installed downstream of all other *fixtures*,
 - (e) *trap arms* and *fixture drains* connected to the *wet vent* do not exceed *NPS 2*, except for connections from *emergency floor drains* in accordance with Sentence 7.5.1.1.(3),
- (f) the total hydraulic load on the *wet vent* does not exceed the limits stated in Table 7.5.8.1. when separately vented *branches* or *fixture drains* in the same *storey*, having a total hydraulic load not greater than 2 *fixture units*, are connected to the *wet vent* or a wet-vented water-closet *trap arm*,
- (g) the hydraulic load of separately vented *fixtures* that drain into the *wet vent* are not included when sizing the *continuous vent* that serves the *wet vent*,
- (h) where a *wet vent* extends through more than one *storey*, the total discharge from any one *storey* above the first *storey* does not exceed 4 *fixture units*,
- (i) there is not more than one *nominally horizontal offset* in the *wet vent*, and
 - (i) the *offset* does not exceed 1.2 m for pipes of *NPS 2* or less, or
 - (ii) the *offset* does not exceed 2.5 m for pipes larger than *NPS 2*,
- (j) the wet vented portion is not reduced in *size* except for the portion that is upstream of floor drains in accordance with Sentence 7.5.1.1.(3),
- (k) the length of the *wet vent* is not limited.

7.5.3. Circuit Venting

7.5.3.1. Circuit Venting

- (1) A section of *horizontal branch* may be circuit-vented provided
 - (a) a *circuit vent* is connected to it,
 - (b) all *fixtures* served by the *circuit vent* are located in the same *storey*,
 - (c) no *stack* is connected to it upstream of a circuit-vented *fixture*.
- (2) *Fixtures* with *fixture outlet pipes* less than *NPS 2* shall be separately vented or separately circuit-vented.
- (3) Except as provided in Sentences (4) and (5), a *relief vent* shall be connected to the *branch* that forms part of a circuit-vented system, downstream of the connection of the most downstream circuit-vented *fixture*.
- (4) A *sanitary drainage pipe* having a hydraulic load not greater than 6 *fixture units* is permitted to act as a *relief vent* for a *branch* that is circuit-vented.
- (5) A symmetrically connected *relief vent* is permitted to serve as a combined *relief vent* for a maximum of 2 *branches* that are circuit-vented, provided there are not more than 8 circuit-vented *fixtures* connected between the combined *relief vent* and each *circuit vent*.
- (6) *Additional circuit vents* shall be required
 - (a) where each cumulative horizontal change in direction of a *branch* served by a *circuit vent* exceeds 45° between *vent pipe* connections, or
 - (b) where more than 8 circuit-vented *fixtures* are connected to a *branch* between *vent pipe* connections.

- (7) A *sanitary drainage pipe* is permitted to serve as an *additional circuit vent* in accordance with Sentence (6), provided the *sanitary drainage pipe* is sized as a *wet vent* in conformance with Article 7.5.8.1. and is not less than *NPS 2*.
- (8) Connections to *circuit vents* and *additional circuit vents* in accordance with Sentence (6) shall conform to Sentence 7.5.4.5.(1).
- (9) A circuit-vented *branch*, including the *fixture drain* downstream of the *circuit vent* connection, shall be sized in accordance with Articles 7.4.10.7. and 7.10.4.8., except that it shall be not less than
- (a) *NPS 2*, where *traps* less than *NPS 2* are circuit-vented, or
 - (b) *NPS 3*, where *traps* of *NPS 2* or larger are circuit-vented.
- (10) *Additional circuit vents* shall be sized in accordance with Table 7.5.7.1. and Sentence 7.5.7.3.(1).
- (11) The hydraulic load on a *circuit vent* shall include the hydraulic load from *fixtures* connected to the *branch* served by the *circuit vent*, but shall not include the hydraulic load from *fixtures* permitted by Sentences (3), (4) and (5).

7.5.4. Vent Pipes for Stacks

7.5.4.1. Stack Vents

- (1) The upper end of every *stack* shall terminate in a *stack vent* and the *stack vent* shall terminate in *open air* outside the *building*, or connect directly or through a *header* to another *stack vent* or *vent stack* that does terminate in *open air* outside the *building*.

7.5.4.2. Vent Stacks

- (1) Except as provided in Sentence (2), every *stack* that drains *fixtures* from more than 4 *storeys* containing plumbing *fixtures* shall have a *vent stack*.
- (2) A *stack* that serves as a *wet vent* does not require a *vent stack*.
- (3) The *vent stack* required by Sentence (1) shall be connected to a vertical section of the *stack* at or immediately below the lowest *sanitary drainage pipe* connected to the *stack*.
- (4) *Fixtures* are permitted to be connected to a *vent stack*, provided
- (a) the total hydraulic load of the connected *fixtures* does not exceed 8 *fixture units*,
 - (b) at least one *fixture* is connected to a vertical portion of the *vent stack* and upstream of any other *fixtures*,
 - (c) no other *fixture* is connected downstream of a water closet,
 - (d) all *fixtures* are located in the lowest *storey* served by the *vent stack*, and
 - (e) the section of the *vent pipe* that acts as a *wet vent* conforms to the requirements regarding *wet vents*.

7.5.4.3. Yoke Vents

- (1) Except as provided in Sentence (4), where a *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 of them counted from the top down, and
 - (b) at or immediately above each *offset* or double *offset*.
- (2) The *yoke vent* shall be connected to the *stack* by means of a drainage fitting at or immediately below the lowest *sanitary drainage pipe* from the lowest *storey* of the sections described in Sentence (1).
- (3) The *yoke vent* shall connect to the *vent stack* at least 1 m above the floor level of the lowest *storey* in the section described in Sentence (1).

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

7.5.4.4. Offset Relief Vents

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

- connected to the lower vertical section at or above the highest *sanitary drainage pipe* connection, or
- extended as a vertical continuation of the lower section.

7.5.4.5. Fixtures Draining into Vent Pipes

(1) The *trap arm* of a *fixture* that has a hydraulic load of not more than $1\frac{1}{2}$ *fixture units* may be connected to the vertical section of a *circuit vent*, *additional circuit vent*, *offset relief vent* or *yoke vent*, provided

- not more than 2 *fixtures* are connected to the *vent pipe*,
- where 2 *fixtures* are connected to the *vent pipe*, the connection is made by means of a double sanitary T fitting, and
- the section of the *vent pipe* that acts as a *wet vent* is not less than *NPS 2*.

(See Note A-7.5.4.5.(1))

7.5.5. Miscellaneous Vent Pipes

7.5.5.1. Venting of Sanitary Sewage Sumps

(1) Every sump or tank that receives *sanitary sewage* shall be provided with a *vent pipe* that is connected to the top of the sump or tank. (See Article 7.5.7.7. for sizing of these vents.)

7.5.5.2. Venting of Interceptors

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

- connect to the *interceptor* at opposite ends,
- extend independently to *open air*,
- terminate not less than 2 m above ground and at elevations differing by at least 300 mm, and
- do not connect to each other or any other *vent pipe*.

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

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

- in no case be less than *NPS 1½*,
- extend independently to *open air*, and
- terminate not less than 2 m above ground.

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

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

- (6) Every grease *interceptor* inlet pipe shall be provided with a *vent pipe*
 - (a) within 1 500 mm of the inlet to the grease *interceptor*,
 - (b) not less than *NPS* 1½ for inlet pipes up to *NPS* 4, but not larger than *NPS* 2, and
 - (c) complete with a *cleanout* to provide cleaning of the *vent pipe*.

(7) Where an acid waste dilution tank is installed, it shall be provided with a *vent pipe* connected at the top of the tank and that is sized in accordance with Article 7.5.7.7.

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

(1) *Venting systems* for drain piping, neutralizing tanks, or dilution tanks conveying corrosive waste shall extend independently and terminate outdoors. (See Article 7.5.7.7. for sizing of these vents.)

7.5.5.4. Fresh Air Inlets

(1) Where a *building trap* is installed, a *fresh air inlet* not less than *NPS* 4 shall be connected upstream and within 1.2 m of the *building trap* and downstream of any other connection.

7.5.5.5. Provision for Future Installations

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

(2) Except as required in Sentence 7.5.7.7.(2), where a *plumbing system* is installed in a *building*, every *storey* in which *plumbing* is or may be installed, including the *basement* of a *building*, shall have extended into it or passing through it a *vent pipe* that is at least *NPS* 1½ for the provision of future connections.

7.5.6. Arrangement of Vent Pipes

7.5.6.1. Drainage of Vent Pipes

- (1) *Vent pipes* shall be installed without depression in which moisture can collect.
- (2) *Waste pipes* shall be installed and *back vented* at the same time.

7.5.6.2. Vent Pipe Connections (See Note A-7.5.6.2.)

(1) *Vent pipes* in a *plumbing system* shall be installed so as to be direct as possible to a *vent stack* or *open air*, as the case may be, and so that any horizontal run below the flood level of the *fixture* to which the *vent pipe* is installed is eliminated where structurally possible.

(2) Except for *wet vents*, where a *vent pipe* is connected to a *nominally horizontal sanitary drainage pipe*, the connection shall be above the horizontal centre line of the *sanitary drainage pipe*.

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

7.5.6.3. Location of Vent Pipes

- (1) Except as provided in Sentences (2) and (3), *vent pipes* that protects a *fixture trap* shall be located so that
 - (a) the *developed length* of the *trap arm* is not less than twice the *NPS* of the *fixture drain*,

- (b) the total fall of the *trap arm* is not greater than its inside diameter, and
 - (c) the *trap arm* does not have a cumulative change in direction of more than 135°.
- (2) The *trap arm* of water closets, of *S-trap standards* or of any other *fixture* that also discharges vertically and depends on siphonic action for its proper functioning shall not have a cumulative change in direction of more than 225°.
- (3) A *vent pipe* that protects a water closet or any other *fixture* that also depends on siphonic action for its proper functioning shall be located so that the distance between the connections of the *fixture drain* to the *fixture* and the *vent pipe* does not exceed
- (a) 1 m in the vertical plane, and
 - (b) 3 m in the horizontal plane.
- (4) The maximum length of every *trap arm* shall conform to Table 7.5.6.3.

Table 7.5.6.3.
Length of Trap Arm
 Forming Part of Sentence 7.5.6.3.(4)

Nominal Pipe Size of Trap Served, NPS	Maximum Length of Trap Arm, m	Minimum Slope
1¼	1.5	1 in 50
1½	1.8	1 in 50
2	2.4	1 in 50
3	3.6	1 in 50
4	4.9	1 in 50
4	9.8	1 in 100

7.5.6.4. Connection of Vents Above Fixtures Served

- (1) Except for a *wet vent*, every *vent pipe* shall extend above the *flood level rim* of every *fixture* that it serves before being connected to another *vent pipe*.
- (2) No *vent pipe* shall be connected in such a manner that a blockage in a *soil* or *waste pipe* would cause waste to drain through the *vent pipe* to the *drainage system*.

7.5.6.5. Terminals

- (1) Except as provided in Sentence (3), the upper end of every *vent pipe* that is not terminated in *open air* shall be connected to a *venting system* that terminates through a roof to *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 above the roof.
- (3) A *vent pipe* is permitted to be erected outside a *building*, provided that
- (a) no single change of direction of the *vent pipe* exceeds 45°,
 - (b) all parts of the *vent pipe* are *nominally vertical*,
 - (c) in areas where the *vent pipe* may be subject to frost closure, it is increased to not less than *NPS 3* before penetrating a wall or roof, and
 - (d) where the *building* is 4 *storeys* or less in height, the *vent pipe* terminates above the roof of the *building*.

- (4) Except for a *fresh air inlet*, where a *vent pipe* is terminated in *open air*, the terminal shall be located
- not less than 1 m above and not less than 3.5 m in any other direction from every air inlet, openable window or door,
 - not less than 2 m above and not less than 3.5 m in any other direction from a roof that supports an *occupancy*,
 - not less than 2 m above ground, and
 - not less than 1.8 m from every property line.
- (5) Where a *vent pipe* passes through a roof, it shall
- be terminated high enough to prevent the entry of roof drainage but not less than 150 mm above the roof or above the surface of *storm water*, which could pond on the roof, and
 - be provided with flashing to prevent the entry of water between the *vent pipe* and the roof. (See Article 7.2.10.14.)
- (6) Where a *vent pipe* passes through a roof and may be subject to frost closure, it shall be protected from frost closure by
- increasing its diameter at least one *NPS*, but not less than *NPS* 3, immediately before it penetrates the roof,
 - insulating the pipe, or
 - protecting it in some other manner.
- (See Article 7.3.4.7.)
- (7) Where a *vent pipe* is located 2 m or more above a roof, it shall be so constructed as to be stable and secure.
- (8) Flashing shall be of material specified in Article 7.2.10.14. and on a shingled roof shall have a minimum dimension of 500 mm by 500 mm.
- (9) Where a sleeve flashing is installed on a flat roof, it shall extend at least 150 mm above the flood level and on a sloped roof shall be at least 150 mm high on the short side.
- (10) No bore of a *vent stack* or *stack vent* shall be reduced or obstructed by the installation of a flashing.

7.5.7. Minimum Size of Vent Pipes

7.5.7.1. General

- (1) The *nominal pipe size* of every *vent pipe* shall conform to Table 7.5.7.1.

Table 7.5.7.1.
Minimum Permitted Size of Vent Pipe Based on Size of Trap Served
 Forming Part of Sentences 2.5.7.1.(1) and 2.5.8.2.(1)

<i>Nominal Pipe Size of Trap Served, NPS</i>	<i>Minimum Nominal Pipe Size of Vent Pipe, NPS</i>
1¼	1¼
1½	1¼
2	1½
3	1½
4	1½
5	2
6	2

7.5.7.2. Size Restriction

- (1) The *nominal pipe size* of a *branch vent*, *stack vent*, *vent stack* or *vent header* shall be not less than the *nominal pipe size* of the *vent pipe* to which it is connected.
- (2) *Sanitary building drains* shall be provided with at least one vent that is not less than *NPS 3*.
- (3) A vent referred to in Sentence (2) shall be a *soil stack* if one is available and may be a *vent stack* or *waste stack* that provides at least *NPS 3 stack vent* and that goes to *open air* above the roof, either directly or through a *header*.

7.5.7.3. Additional Circuit Vents and Relief Vents

- (1) Except as provided in Article 7.5.7.1. and Sentence 7.5.3.1.(7), the minimum *nominal pipe size* of an *additional circuit vent* or *relief vent* installed in conjunction with a *circuit vent* is permitted to be one *NPS* smaller than the required *nominal pipe size* of the *circuit vent*, but need not be larger than *NPS 2*.
- (2) The *nominal pipe size* of the *sanitary drainage pipe* acting as a *relief vent* in accordance with Sentence 7.5.3.1.(4) shall be in conformance with Table 7.4.10.6.-A, 7.4.10.6.-B or 7.5.8.1., and Article 7.5.7.1., whichever *nominal pipe size* is the largest considering the hydraulic load drained into the *sanitary drainage pipe*.

7.5.7.4. Offset Relief Vents

- (1) Except as provided in Article 7.5.7.1., the minimum *nominal pipe size* of an *offset relief vent* is permitted to be one *NPS* smaller than the *NPS* of the *stack vent*.

7.5.7.5. Yoke Vents

- (1) *Yoke vents* required by Sentence 7.5.4.3.(1) are permitted to be one *NPS* smaller than the *NPS* of the smallest pipe to which they are connected

7.5.7.6. Vent Pipes for Manholes

- (1) The minimum *nominal pipe size* of a *vent pipe* that serves a manhole within a *building* shall be *NPS 2*.

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

- (1) Except as provided in Sentences (2) and (3), the minimum *nominal pipe size* of the *vent pipe* for a *sewage sump* or *neutralizing* or *dilution tank* shall be one *NPS* smaller than the *NPS* of the largest *branch* or *fixture drain* draining to the sump.
- (2) The *nominal pipe size* of every *vent pipe* for a *sewage sump* or *neutralizing* or *dilution tank* shall be not less than *NPS 2*, but need not be greater than *NPS 4*.
- (3) The *nominal pipe size* of a *vent pipe* for a *macerating toilet system* with a sump shall be not less than *NPS 1½*.

7.5.8. Sizing of Vent Pipes

7.5.8.1. Hydraulic Loads Draining to Wet Vents

- (1) The hydraulic load that drains to a *wet vent* shall conform to Table 7.5.8.1.
- (2) When determining the *nominal pipe size* of a *wet vent*, the hydraulic load from the most downstream *fixture* or symmetrically connected *fixtures* shall not be included.

Table 7.5.8.1.
Maximum Permitted Hydraulic Loads Drained to a Wet Vent
Forming Part of Sentences 7.5.7.3.(2) and 7.5.8.1.(1)

Nominal Pipe Size of Wet Vent, NPS	Maximum Hydraulic Load, <i>Fixture Units</i>	
	Not Serving Water Closets	<i>Fixtures, Other Than Water Closets, That Serve Not More Than 2 Water Closets</i>
1½	2	n/a
2	4	3
3	12	8
4	36	14
5	n/a	18
6	n/a	23

7.5.8.2. Individual Vents and Dual Vents

- (1) The *nominal pipe size* of *individual vents* and *dual vents* shall be determined using Table 7.5.7.1. based on the largest *trap* served.
- (2) When sizing an *individual vent* or a *dual vent*, the length is not taken into consideration.

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

- (1) *Branch vents, vent headers, circuit vents* and *continuous vents* shall be sized in accordance with Table 7.5.8.3., unless they are *individual vents* or *dual vents*.
- (2) For the purposes of Table 7.5.8.3., the length of a *branch vent* shall be its *developed length* from the most distant *sanitary drainage pipe* connection to a *vent stack, stack vent, header* or *open air*.
- (3) For the purposes of Table 7.5.8.3., the length of a *vent header* shall be its *developed length* from the most distant *sanitary drainage pipe* connection to *open air*.
- (4) For the purposes of Table 7.5.8.3., the length of a *circuit vent* shall be its *developed length* from the horizontal *sanitary drainage pipe* connection to a *vent stack, stack vent, vent header* or *open air*.
- (5) For the purposes of Table 7.5.8.3., the length of a *continuous vent* shall be its *developed length* from the vertical *sanitary drainage pipe* connection to a *vent stack, stack vent, vent header* or *open air*.

Table 7.5.8.3.
Sizing of Branch Vents, Vent Headers, Circuit Vents and Continuous Vents⁽¹⁾
 Forming Part of Article 7.5.8.3.

Total Hydraulic Load Served by Vent Pipe, fixture units	Nominal Pipe Size of Vent Pipe, NPS							
	1¼	1½	2	3	4	5	6	8
	Maximum Length of Vent Pipe, m							
2	9	NL	NL	NL	NL	NL	NL	NL
8	9	30	61	NL	NL	NL	NL	NL
20	7.5	15	46	NL	NL	NL	NL	NL
24	4.5	9	30	NL	NL	NL	NL	NL
42	NP	9	30	NL	NL	NL	NL	NL
60	NP	4.5	15	120	NL	NL	NL	NL
100	NP	NP	11	79	305	NL	NL	NL
200	NP	NP	9	76	275	NL	NL	NL
500	NP	NP	6	55	215	NL	NL	NL
1 100	NP	NP	NP	15	61	215	NL	NL
1 900	NP	NP	NP	6	21	61	215	NL
2 200	NP	NP	NP	NP	9	27	105	335
3 600	NP	NP	NP	NP	7.5	18	76	245
5 600	NP	NP	NP	NP	NP	7.5	18	76

Notes to Table 7.5.8.3.:

(1) NP = not permitted and NL = not limited

7.5.8.4. Vent Stacks or Stack Vents

- (1) A vent stack or stack vent shall be sized in accordance with Table 7.5.8.4. based on
 - (a) the length of the vent stack or stack vent, and
 - (b) the total hydraulic load that is drained to the lowest section of a stack served by the vent pipe, plus any additional vent loads connected to the vent stack or stack vent.
- (2) For the purposes of Table 7.5.8.4., the length of a stack vent or vent stack shall be its developed length from its lower end to open air.
- (3) The minimum nominal pipe size of a vent stack or stack vent shall be one-half the NPS of the stack at its base.
- (4) A stack vent serving a wet vent stack that is over 4 storeys high shall extend the full size of the wet vent to open air.
- (5) Sanitary building drains shall be provided with at least one vent that is not less than NPS 3.

Table 7.5.8.4.
Size and Developed Length of Stack Vents and Vent Stacks⁽¹⁾
 Forming Part of Sentences 7.5.8.4.(1) and (2)

Nominal Pipe Size of Stack, NPS ⁽²⁾	Total Hydraulic Load Being Vented, fixture units	Water Occupied Area	Nominal Pipe Size of Stack Vent or Vent Stack, NPS									
			1¼	1½	2	3	4	5	6	8	10	12
			Maximum Length of Stack Vent or Vent Stack, m									
1¼	2	0.29	9	NL	NL	NL	NL	NL	NL	NL	NL	NL
1½	8	0.25	15	46	NL	NL	NL	NL	NL	NL	NL	NL
2	12	0.25	9	23	61	NL	NL	NL	NL	NL	NL	NL
	24	0.29	8	15	46	NL	NL	NL	NL	NL	NL	NL
3	10	0.15	NP	13	46	317	NL	NL	NL	NL	NL	NL
	21	0.20	NP	10	33.5	247	NL	NL	NL	NL	NL	NL
	53	0.25	NP	8	28.5	207	NL	NL	NL	NL	NL	NL
	102	0.29	NP	7.5	26	189	NL	NL	NL	NL	NL	NL
4	43	0.15	NP	NP	10.5	76	299	NL	NL	NL	NL	NL
	140	0.20	NP	NP	8	61	229	NL	NL	NL	NL	NL
	320	0.25	NP	NP	7	52	195	NL	NL	NL	NL	NL
	540	0.29	NP	NP	6.5	46	177	NL	NL	NL	NL	NL
5	190	0.15	NP	NP	NP	25	97.5	302	NL	NL	NL	NL
	490	0.20	NP	NP	NP	19	76	232	NL	NL	NL	NL
	940	0.25	NP	NP	NP	16	64	204	NL	NL	NL	NL
	1400	0.29	NP	NP	NP	15	58	180	NL	NL	NL	NL
6	500	0.15	NP	NP	NP	10	39.5	122	305	NL	NL	NL
	1 100	0.20	NP	NP	NP	8	30.5	94.5	238	NL	NL	NL
	2 000	0.25	NP	NP	NP	6.5	25.5	79	201	NL	NL	NL
	2 900	0.29	NP	NP	NP	6	23.5	73	183	NL	NL	NL
8	1 800	0.15	NP	NP	NP	NP	9.5	29	73	287	NL	NL
	3 400	0.20	NP	NP	NP	NP	7	22	58	219.5	NL	NL
	5 600	0.25	NP	NP	NP	NP	6	19	49	186	NL	NL
	7 600	0.29	NP	NP	NP	NP	5.5	17	43	170.5	NL	NL
10	4 000	0.15	NP	NP	NP	NP	NP	9.5	24	94.5	292.5	NL
	7 200	0.20	NP	NP	NP	NP	NP	7	18	73	225.5	NL
	11 000	0.25	NP	NP	NP	NP	NP	6	15.5	61	192	NL
	15 000	0.29	NP	NP	NP	NP	NP	5.5	14	55	174	NL
12	7 300	0.15	NP	NP	NP	NP	NP	NP	9.5	36.5	116	287
	13 000	0.20	NP	NP	NP	NP	NP	NP	7	28.5	91	219.5
	20 000	0.25	NP	NP	NP	NP	NP	NP	6	24	76	186
	26 000	0.29	NP	NP	NP	NP	NP	NP	5.5	22	70	152
15	15 000	0.15	NP	NP	NP	NP	NP	NP	NP	12	39.5	94.5
	25 000	0.20	NP	NP	NP	NP	NP	NP	NP	9.5	29	73
	38 000	0.25	NP	NP	NP	NP	NP	NP	NP	8	24.5	61
	50 000	0.29	NP	NP	NP	NP	NP	NP	NP	7	22.5	55

Notes to Table 7.5.8.4.:

- (1) NP = not permitted and NL = not limited.
 (2) Stacks shall be sized using Table 7.4.10.6.-A.

7.5.8.5. Lengths for Other Vent Pipes

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

7.5.9. Air Admittance Valves

7.5.9.1. Air Admittance Valve as a Vent Terminal

(1) *Individual vents* and *dual vents* are permitted to terminate with a connection to an *air admittance valve* as provided in Articles 7.5.9.2. and 7.5.9.3. (See also Sentence 7.2.10.16.(1))

7.5.9.2. Air Admittance Valves

- (1) *Air admittance valves* shall only be used to vent
 - (a) *fixtures* in *buildings* undergoing renovation, and
 - (b) installations where connection to a *vent* may not be practical.
- (2) *Air admittance valves* shall be located
 - (a) not less than 100 mm above the *fixture drain* being vented,
 - (b) within the maximum *developed length* permitted for the *vent*, and
 - (c) not less than 150 mm above insulation materials.
- (3) *Air admittance valves* shall
 - (a) only vent *fixtures* located on the same *storey*, and
 - (b) be connected to the horizontal *fixture drain*.

7.5.9.3. Installation Conditions

- (1) *Air admittance valves* shall not be installed in supply or return air *plenums*, or in locations where they may be exposed to freezing temperatures.
- (2) *Air admittance valves* shall be installed in accordance with the manufacturer's installation instructions.
- (3) *Air admittance valves* shall be rated for the *nominal pipe size* of *vent pipe* to which they are connected..
- (4) Installed *air admittance valves* shall be
 - (a) *accessible*, and
 - (b) located in a space that allows air to enter the valve.
- (5) *Drainage systems* shall have at least one vent that terminates to the outdoors in conformance with Sentence 7.5.6.5.(1).

Section 7.6. Potable Water Systems

7.6.1. Arrangement of Piping

7.6.1.1. Design

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

(1.1) Where hot and cold water are mixed and the temperature is regulated by a single, unmarked, manual control, a movement to the left shall increase the temperature and a movement to the right shall decrease the temperature.

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

- (a) recirculation, or
- (b) a self-regulating heat tracing system.

7.6.1.2. Drainage

(1) A *water distribution system* shall be installed so that the system can be drained or blown out with air and outlets for this purpose shall be provided.

7.6.1.3. Control and Shut-Off Valves

(1) A *building control valve* shall be provided

- (a) on every *water service pipe* at the location where the *water service pipe* enters the *building*, or
- (b) on the *water distribution system* at a location immediately downstream of the *point of entry treatment unit*, where the *building* is served by a *point of entry treatment unit* located in the *building*.

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

(2.1) Except as provided in Sentence (2.2), a drain port shall be provided on the *water distribution system* immediately downstream of the *building control valve* required by Sentence (1) and if there is a meter, the drain port shall be installed immediately downstream of the meter on the *water distribution system*.

(2.2) Where the *building control valve* required by Sentence (1) is of *NPS* 1 or smaller, the drain port may be an integral part of the *building control valve* in the form of a stop and waste valve and the drain port shall be located on the *water distribution system* side of the stop and waste valve.

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

(4) Water closets shall be provided with a shut-off valve on their water supply pipe.

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

(6) In *buildings* of other than *residential occupancy*, shut-off valves shall be provided on the water supply to

- (a) every *fixture*, or
- (b) any group of *fixtures* in the same room, except as provided in Sentence (4).

- (7) Pipes that supply water to a hot water tank shall be provided with a shut-off valve located close to the tank.
- (8) Where the water supply is to be metered, the installation of the meter, including the piping that is part of the meter installation and the valving arrangement for the meter installation, shall be according to the *water purveyor's* requirements.
- (9) For the purpose of identifying the pipe material where plastic water pipe is used underground for a service pipe, the end of the pipe inside the *building* shall be brought above ground for a distance not less than 300 mm and not greater than 450 mm.

7.6.1.3A. Public Washrooms

- (1) The water supply to each *fixture* in a washroom for *public use* shall be individually valved and each valve shall be *accessible*.

7.6.1.3B. Tanks

- (1) Every water pipe that supplies a hot water tank, pressure vessel, *plumbing appliance* or water using device shall be provided with a shut-off valve located close to the tank, pressure vessel, *plumbing appliance* or water using device.

7.6.1.4. Protection for Exterior Water Supply

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

7.6.1.5. Check Valves

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

7.6.1.6. Flushing Devices

- (1) Flushing devices that serve water closets or 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* they serve.
- (2) Where a manually operated flushing device is installed, it shall serve only one *fixture*.
- (3) Except as provided in Sentence (4), water closets and urinals shall have an integral means of limiting the maximum amount of water used in each flush cycle to that specified in Table 7.6.1.6.-A.
- (4) In *buildings* classified as Group C *occupancy*, the flush cycle for each *fixture* that is a water closet or urinal shall not exceed the maximum water used in each flush cycle listed for that *fixture* in Table 7.6.1.6.-B.
- (4.1) Sentences (3) and (4) do not apply to a *fixture* located in an existing *building* where the *chief building official* is satisfied that compliance with the requirement is impracticable because of maintenance or operational difficulties. (See Note A- 7.6.1.6.(4.1))
- (5) Flush-tank-type urinals shall be equipped with a device capable of preventing flush cycles when they are not in use.

Table 7.6.1.6.-A
Water Usage per Flush Cycle
 Forming Part of Sentence 7.6.1.6.(3)

<i>Fixtures</i>	Maximum Water Usage per Flush Cycle, LPF
Water Closet (Tank Type)	6.0
Water Closet (Direct Flush)	6.0
Urinal (Tank Type)	1.9
Urinal (Direct Flush)	1.9

Table 7.6.1.6.-B
Water Usage per Flush Cycle for Sanitary Fixtures in a Group C Occupancy
 Forming Part of Sentence 7.6.1.6.(4)

<i>Fixtures</i>	Maximum Water Usage per Flush Cycle, LPF
Water Closet (Tank Type)	4.8 ⁽¹⁾
Water Closet (Direct Flush)	4.8
Urinal (Tank Type)	1.9
Urinal (Direct Flush)	1.9

Notes to Table 7.6.1.6.-B:

(1) Water closets which provide a dual flush cycle option of both 4.1 LPF or less and 6.0 LPF are deemed to comply.

7.6.1.7. Relief Valves (See Note A-7.6.1.7.)

(1) Every pressure vessel that is part of a *plumbing system* or connected to a *plumbing system* 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 1 100 kPa or one-half the maximum test pressure sustained by the tank, whichever is the lesser.

(2) The hot water tank of a *storage-type service water heater* shall be equipped with a temperature-relief valve with a temperature-sensing element

- (a) located within the top 150 mm of the tank, and
- (b) designed to open and discharge sufficient water from the tank to keep the temperature of the water in the tank from exceeding 99°C under all operating conditions.

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

(4) *Indirect service water heaters* shall be equipped with

- (a) a pressure-relief valve, and
- (b) a temperature-relief valve on every storage tank that forms part of the system.

(5) Pipes that convey water from a temperature-relief, pressure-relief, or a combined temperature- and pressure-relief valve shall

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

(See Note A-7.6.1.7.(5))

- (6) The temperature-relief valve required in Clause (4)(b) shall
 - (a) have a temperature-sensing element located within the top 150 mm of the tank, and
 - (b) be designed to open and discharge sufficient water to keep the temperature of the water in the tank from exceeding 99°C under all operating conditions.
- (7) No shut-off valve shall be installed on the pipe between any tank and the relief valves or on the discharge lines from such relief valves.

7.6.1.8. Solar Domestic Hot Water Systems

- r1 (1) Systems for solar heating of *potable water* shall be installed in conformance with CAN/CSA-F383, “Installation of packaged solar domestic hot water systems.”

7.6.1.9. Water Hammer

- (1) Provision shall be made to protect the *water distribution system* from the adverse effects of water hammer. (See Note A-7.6.1.9.(1))

7.6.1.10. Mobile Home Water Service

- (1) A *water service pipe* intended to serve a mobile home shall
 - (a) be not less than *NPS* $\frac{3}{4}$,
 - (b) terminate above ground, and
 - (c) be provided with
 - (i) a tamperproof terminal connection that is capable of being repeatedly connected, disconnected and sealed,
 - (ii) a protective concrete pad,
 - (iii) a means to protect it from frost heave, and
 - (iv) a curb stop and a means of draining that part of the pipe located above the frost line when not in use.

7.6.1.11. Thermal Expansion

- (1) Where thermal expansion can occur, protection shall be provided for
 - (a) *check valves* required by Article 7.6.1.5.,
 - (b) *backflow preventers* required by Sentence 7.6.2.1.(3), and
 - (c) pressure-reducing valves required by Article 2.6.3.3.(See Note A-7.6.1.11.(1))

7.6.2. Protection from Contamination

7.6.2.1. Connection of Systems

- (1) Connections to *potable water systems* shall be designed and installed so that non-*potable* water or substances that may render the water non-*potable* cannot enter the system.
- (2) Reserved.
- (3) *Backflow preventers* shall be selected and installed in conformance with CSA B64.10, “Selection and installation of backflow preventers.”
- (3.1) No connection shall be made between a *potable water system* supplied with water from a *drinking water system* and any other *potable water system* without the consent of the *water purveyor*.

7.6.2.2. Back-Siphonage

- (1) Every *potable water system* that supplies a *fixture* or tank that is not subject to pressures above atmospheric shall be protected against *back-siphonage* by a *backflow preventer*.
- (2) Where a *potable water supply* is connected to a boiler, tank, cooling jacket, lawn sprinkler system or other device where a *non-potable* fluid may be under pressure that is above atmospheric or the water outlet may be submerged in the *non-potable* fluid, the water supply shall be protected against *backflow* by a *backflow preventer*.

7.6.2.3. Backflow Caused by Back Pressure

- (1) Except as provided in Sentence (3) and Articles 7.6.2.4. to 7.6.2.6., where a *backflow preventer* is required by this Subsection, the *backflow preventer* shall be selected, installed and tested in conformance with CSA B64.10, "Selection and installation of backflow preventers."
- (2) *Backflow preventers* shall be provided in conformance with Sentence 7.2.10.10.(1).
- (3) Tank-type water closet valves shall be provided with a *back-siphonage preventer* in conformance with Sentence 7.2.10.10.(2).

7.6.2.4. Backflow from Fire Protection Systems

- (1) A *backflow preventer* shall not be required in *residential full flow-through fire sprinkler/standpipe systems* in which the pipes and fittings are constructed of *potable water system* materials.
- (2) Except as required by Sentence (4), *potable water system* connections to fire sprinkler and standpipe systems shall be protected against *backflow* caused by *back-siphonage* or *back pressure* in conformance with Clauses (a) to (g), as applicable:
 - (a) *residential partial flow-through fire sprinkler/standpipe systems* in which the pipes and fittings are constructed of *potable water system* materials shall be protected by a dual *check valve backflow preventer* conforming to
 - (i) CSA B64.6, "Dual check valve (DuC) backflow preventers," or
 - (ii) CSA B64.6.1, "Dual check valve backflow preventers for fire protection systems (DuCF),"
 - (b) provided that the systems do not use antifreeze or other additives of any kind and that all pipes and fittings are constructed of *potable water system* materials, *Class 1 fire sprinkler/standpipe systems* shall be protected by a single or dual *check valve backflow preventer* conforming to
 - (i) CSA B64.6, "Dual check valve (DuC) backflow preventers," or
 - (ii) CSA B64.9, "Single check valve backflow preventers for fire protection systems (SCVAF),"
 - (c) provided that the systems do not use antifreeze or other additives of any kind, *Class 1 fire sprinkler/standpipe systems* not covered by Clause (b) as well as *Class 2* and *Class 3 fire sprinkler/standpipe systems* shall be protected by a double *check valve backflow preventer* conforming to
 - (i) CSA B64.5, "Double check valve (DCVA) backflow preventers," or
 - (ii) CSA B64.5.1, "Double check valve backflow preventers for fire protection systems (DCVAF),"
 - (d) *Class 1, Class 2* or *Class 3 fire sprinkler/standpipe systems* in which antifreeze or other additives are used shall be protected by a reduced pressure principle *backflow preventer* conforming to
 - (i) CSA B64.4, "Reduced pressure principle (RP) backflow preventers," or
 - (ii) CSA B64.4.1, "Reduced pressure principle backflow preventers for fire protection systems (RPF),"installed on the portion of the system that uses the additives and the balance of the system shall be protected as required by Clause (b) or (c),
 - (e) *Class 4* and *Class 5 fire sprinkler/standpipe systems* shall be protected by a reduced pressure principle *backflow preventer* conforming to
 - (i) CSA B64.4, "Reduced pressure principle (RP) backflow preventers," or
 - (ii) CSA B64.4.1, "Reduced pressure principle backflow preventers for fire protection systems (RPF),"

- (f) *Class 6 fire sprinkler/standpipe systems* shall be protected by a double *check valve backflow preventer* conforming to
 - (i) CSA B64.5, “Double check valve (DCVA) backflow preventers,” or
 - (ii) CSA B64.5.1, “Double check valve backflow preventers for fire protection systems (DCVAF).”
 - (g) where a potentially severe health hazard may be caused by *backflow*, *Class 6 fire sprinkler/standpipe systems* shall be protected by a reduced pressure principle *backflow preventer* conforming to
 - (i) CSA B64.4, “Reduced pressure principle (RP) backflow preventers,” or
 - (ii) CSA B64.4.1, “Reduced pressure principle backflow preventers for fire protection systems (RPF).”
- (3) *Backflow preventers* required by Sentence (2) shall be installed upstream of the fire department pumper connection.
- (4) Where a reduced pressure principle *backflow preventer* is required on a *water service pipe* at a fire service connection located on the same premises as the *fire service pipe* in *Class 3, 4, 5 and 6 fire sprinkler/standpipe systems*, a reduced pressure principle *backflow preventer* conforming to CSA B64.4.1, “Reduced pressure principle backflow preventers for fire protection systems (RPF),” shall also be required on the fire service connection.

7.6.2.5A. Backflow from Buildings with a Solar Domestic Hot Water System

(See Note A-7.6.2.5A.)

- (1) Except as permitted by Sentence (2) and as provided in Sentences (3) and (4), a *potable water system* shall be protected against *backflow* where the heat transfer loop of a solar domestic hot water system is *directly connected* to the *potable water system*.
- (2) Where the heat transfer loop of the solar domestic hot water system consists of direct flow-through of *potable water* only, protection against *backflow* is not required.
- (3) A *potable water system* that is *directly connected* to the heat transfer loop of a solar domestic hot water system that serves a *residential occupancy* within the scope of Part 9 shall be provided with a *backflow preventer* selected in accordance with CAN/CSA-F379.1, “Packaged solar domestic hot water systems (liquid-to-liquid heat transfer) for all-season use.”
- (4) Where a solar domestic hot water system includes a single wall heat exchanger and contains only a relatively harmless heat transfer fluid as described in CAN/CSA-F379.1, “Packaged solar domestic hot water systems (liquid-to-liquid heat transfer) for all-season use”, the *backflow* prevention required in Sentence (1) is permitted to be a dual *check valve backflow preventer* conforming to CSA B64.3, “Dual Check valve backflow preventers with atmospheric port (DCAP)”.

7.6.2.6. Premise Isolation (See Note A-7.6.2.6.)

- (1) *Buildings* or facilities where a moderate hazard or severe hazard may be caused by *backflow* shall be provided with premise isolation of the *potable water system* by the installation of a *backflow preventer* selected in accordance with Clauses 5.3.4.2.(b) and (c) of CSA B64.10, “Selection and installation of backflow preventers.”
- (2) *Buildings* of *residential occupancy* within the scope of Part 9 are not required to be isolated unless they have access to an *auxiliary water supply*.
- (3) Except as provided in Sentence (1), where no direct connection exists between the *auxiliary water supply* and the *potable water system*, premise isolation shall be provided by a dual *check valve backflow preventer* conforming to CSA B64.6, “Dual check valve (DuC) backflow preventers.”

7.6.2.7. Hose Bibb

- (1) Where a hose bibb is installed outside a *building*, inside a garage or in an area where there is an identifiable risk of contamination, the *potable water system* shall be protected against *backflow* through the hose bibb.

7.6.2.8. Cleaning of Systems

(1) A newly installed part of a *potable water system* shall be cleaned and then flushed with *potable* water before the system is put into operation. (See Note A-7.6.2.8.(1))

7.6.2.9. Air Gap

(1) An *air gap* shall not be located in a noxious environment.

(2) *Air gaps* shall be not less than 25 mm high and at least twice the diameter of the opening of the water supply outlet in height.

7.6.2.10. Vacuum Breakers

(1) Where the *critical level* is not marked on an atmospheric *vacuum breaker*, pressure *vacuum breaker* or spill-resistant pressure *vacuum breaker*, the *critical level* shall be taken as the lowest point on the device.

(2) Where an atmospheric *vacuum breaker* is installed, it shall be located on the downstream side of the *fixture* control valve or faucet so that it will be subject to water supply pressure

- (a) only when the valve or faucet is open, and
- (b) for periods of continuous use not exceeding 12 h.

(3) An atmospheric *vacuum breaker* shall be installed so that the *critical level* is at least the distance specified by the manufacturer for safe operation of the device, but not less than 25 mm above

- (a) the *flood level rim* of a *fixture* or tank, or
- (b) the highest point open to the atmosphere in an irrigation system.

(4) A pressure *vacuum breaker* or spill-resistant pressure *vacuum breaker* shall be installed so that the *critical level* is not less than 300 mm above

- (a) the *flood level rim* of a *fixture* or tank, or
- (b) the highest point open to the atmosphere in an irrigation system.

7.6.2.11. Tank-Type Water Closets

(1) Tank-type water closets shall be provided with a *back-siphonage preventer* in conformance with Sentence 7.2.10.10.(2).

7.6.3. Size and Capacity of Pipes (See Note A-7.6.3.)

7.6.3.1. Design, Fabrication and Installation (See Note A-7.6.3.1.)

- (1) *Water distribution systems* shall be designed to provide peak demand flow when the flow pressures at the supply openings conform to the plumbing supply fitting manufacturer's specifications.
- (2) *Potable water systems* shall be designed, fabricated and installed in accordance with good engineering practice, such as that described in the ASHRAE Handbooks and ASPE Plumbing Engineering Design Handbooks.
- (3) Reserved.
- (4) Pipes that supply a *fixture* shall have a capacity that will produce a flow in the *fixture* that will flush the *fixture* and keep it in a sanitary condition.

7.6.3.2. Hydraulic Load

- (1) Except as provided in Sentence (3), the hydraulic load of a *fixture* or device that is listed in Table 7.6.3.2.-A shall be the number of *fixture units* given in the Table.
- (2) Except as provided in Sentences (1) and (3), the hydraulic load of a *fixture* that is not listed in Table 7.6.3.2.-A is the number of *fixture units* listed in Table 7.6.3.2.-D.
- (3) Where *fixtures* are supplied with both hot and cold water, the hydraulic loads for maximum separate demands shall be 75% of the hydraulic load of the *fixture units* given in Tables 7.6.3.2.-A and 7.6.3.2.-D when using a detailed engineering design method.
- (4) The hydraulic load of urinals and water closets with direct flush valves shall be the number of *fixture units* listed in Tables 7.6.3.2.-B and 7.6.3.2.-C. (See Note A- 7.6.3.2.(4))

Table 7.6.3.2.-A
Sizing of Water Distribution Systems⁽¹⁾⁽²⁾
 Forming Part of Sentences 7.6.3.2.(1), (2) and (3) and 7.6.3.4.(2), (3) and (5)

Fixture or Device	Minimum Nominal Pipe Size of Supply Pipe, NPS	Private Use Hydraulic Load, fixture units			Public Use Hydraulic Load, fixture units		
		Cold	Hot	Total	Cold	Hot	Total
Bathroom group with 6 LPF flush tank ⁽³⁾	n/a	2.7	1.5	3.6	n/a	n/a	n/a
Bathroom group with greater than 6 LPF flush tank ⁽³⁾	n/a	4	3	6	n/a	n/a	n/a
Bathroom group with more than 3 fixtures	n/a	n/a	n/a	⁽⁴⁾	n/a	n/a	n/a
Bathtub with or without shower head	1/2	1	1	1.4	3	3	4
Bathtub with NPS 3/4 spout	3/4	7.5	7.5	10	7.5	7.5	10
Bedpan washer	1	n/a	n/a	n/a	7.5	7.5	10
Bidet	3/8	1.5	1.5	2	n/a	n/a	n/a
Clothes washer, 3.5 kg	1/2	1	1	1.4	2.25	2.25	3
Clothes washer, 6.8 kg	1/2	n/a	n/a	n/a	3	3	4
Clothes washer, commercial ⁽⁵⁾	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dental lavatory	3/8	n/a	n/a	n/a	1.5	1.5	2
Dental unit, cuspidor	3/8	n/a	n/a	n/a	1	n/a	1
Dishwasher, commercial ⁽⁵⁾	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dishwasher, domestic	3/8	n/a	1.4	1.4	n/a	n/a	n/a
Drinking fountain or water cooler	3/8	n/a	n/a	n/a	0.25	n/a	0.25
Hose bibb	1/2	2.5	n/a	2.5	2.5	n/a	2.5
Hose bibb	3/4	3	n/a	3	6	n/a	6
Hose bibb, combination hot and cold	1/2	1.9	1.9	2.5	1.9	1.9	2.5
Lavatory, 8.3 LPM or less	3/8	0.5	0.5	0.7	1.5	1.5	2
Lavatory, greater than 8.3 LPM	3/8	0.75	0.75	1	1.5	1.5	2
Shower head, 9.5 LPM or less per head	1/2	1	1	1.4	3	3	4
Shower head, greater than 9.5 LPM per head	1/2	1.5	1.5	2	3	3	4
Shower, spray, multi-head, fixture unit per head	⁽⁵⁾	1	1	1.4	3	3	4
Sink, bar	3/8	0.75	0.75	1	1.5	1.5	2
Sink, clinic service faucet	1/2	n/a	n/a	n/a	2.25	2.25	3
Sink, clinic service with direct flush valve	1	n/a	n/a	n/a	6	n/a	6
Sink, kitchen, commercial, per faucet	1/2	n/a	n/a	n/a	3	3	4
Sink, kitchen, domestic, 8.3 LPM or less	3/8	1	1	1.4	1	1	1.4
Sink, kitchen, domestic, greater than 8.3 LPM	3/8	1.5	1.5	2	1.5	1.5	2
Sink, laboratory	3/8	n/a	n/a	n/a	1.5	1.5	2
Sink, laundry (1 or 2 compartments)	3/8	1	1	1.4	1	1	1.4
Sink, service or mop basin	1/2	n/a	n/a	n/a	2.25	2.25	3
Sink, washup, per faucet	1/2	n/a	n/a	n/a	1.5	1.5	2

Table 7.6.3.2.-A (Cont'd)
Sizing of Water Distribution Systems⁽¹⁾⁽²⁾
 Forming Part of Sentences 7.6.3.2.(1), (2) and (3) and 7.6.3.4.(2), (3) and (5)

Fixture or Device	Minimum Nominal Pipe Size of Supply Pipe, NPS	Private Use Hydraulic Load, fixture units			Public Use Hydraulic Load, fixture units		
		Cold	Hot	Total	Cold	Hot	Total
Urinal, with direct flush valve	3/4	(6)	n/a	(6)	(6)	n/a	(6)
Urinal, with flush tank	3/8	3	n/a	3	3	n/a	3
Urinal, with self-closing metering valve	1/2	2	n/a	2	4	n/a	4
Water closet, 6 LPF or less with flush tank	3/8	2.2	n/a	2.2	2.2	n/a	2.2
Water closet, greater than 6 LPF with flush tank	3/8	3	n/a	3	5	n/a	5
Water closet, with direct flush valve	1	(6)	n/a	(6)	(6)	n/a	(6)

Notes to Table 7.6.3.2.-A:

- (1) The *fixture unit* values in this Table are not applicable in certain *assembly occupancies* because of surges in use by the occupants. For such *occupancies*, refer to specific design information.
- (2) For *fixtures* not indicated in this Table, refer to Table 7.6.3.2.-D.
- (3) *Bathroom group* is based on NPS 1/2 bathtub supply pipe.
- (4) Add additional *fixture* to the *fixture load* for *bathroom group*.
- (5) Refer to the manufacturer's recommendations.
- (6) For *fixture unit* values for *fixtures* with direct flush valves, see Sentence 7.6.3.2.(4) and Tables 7.6.3.2.-B and 7.6.3.2.-C.

Table 7.6.3.2.-B
Sizing of Water Distribution Systems for Urinals with Direct Flush Valves
 Forming Part of Sentences 7.6.3.2.(4) and 7.6.3.4.(5)

Number of Valves	Individual <i>Fixture Units</i> Assigned in Decreasing Values	<i>Fixture Units</i> in Accumulative Values ⁽¹⁾
1	20	20
2	15	35
3	10	45
4	8	53
5 or more	5 each	58, plus 5 for each additional <i>fixture</i> in excess of 5

Notes to Table 7.6.3.2.-B:

- (1) The accumulative *fixture unit* values are the total values to be used in conjunction with Table 7.6.3.2.-A.

Table 7.6.3.2.-C
Sizing of Water Distribution Systems for Water Closets with Direct Flush Valves
 Forming Part of Sentences 7.6.3.2.(4) and 7.6.3.4.(5)

Number of Valves	Individual <i>Fixture Units</i> Assigned in Decreasing Values	<i>Fixture Units</i> in Accumulative Values ⁽¹⁾
1	40	40
2	30	70
3	20	90
4	15	105
5 or more	10 for each <i>public use</i> , and 6 for each <i>private use</i>	115, plus 10 for each <i>public use</i> additional <i>fixture</i> in excess of 5, and 111, plus 6 for each <i>private use</i> additional <i>fixture</i> in excess of 5

Notes to Table 7.6.3.2.-C:

(1) The accumulative *fixture unit* values are the total values to be used in conjunction with Table 7.6.3.2.-A.

Table 7.6.3.2.-D
Hydraulic Loads of Fixtures Not Listed in Table 7.6.3.2.-A
 Forming Part of Sentences 7.6.3.2.(2) and (3) and 7.6.3.4.(5)

Nominal Pipe Size of Supply Pipe, NPS	Hydraulic Load, <i>fixture units</i>	
	<i>Private Use</i>	<i>Public Use</i>
$\frac{3}{8}$	1	2
$\frac{1}{2}$	2	4
$\frac{3}{4}$	3	6
1	6	10

7.6.3.3. Static Pressure

(1) Where the static pressure at any *fixture* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

7.6.3.4. Size

- (1) *Water service pipes* shall be sized according to the peak demand flow but shall not be less than NPS $\frac{3}{4}$.
- (2) Except as provided in Sentence (3), the *nominal pipe size* of a supply pipe that serves a *fixture* shall conform to Table 7.6.3.2.-A.
- (3) For *fixtures* listed in Table 7.6.3.2.-A that are permitted to have an NPS $\frac{3}{8}$ supply pipe, a connector not more than 750 mm long and not less than NPS $\frac{1}{4}$ may be used to supply water to the *fixture*.
- (4) No *water system* between the point of connection with the *water service pipe* or the water meter and the first water distribution pipe that supplies a water heater that serves more than one *fixture* shall be sized less than NPS $\frac{3}{4}$.

- (5) Except as permitted in Sentence (6), where both hot and cold water is supplied to *fixtures* in residential *buildings* containing one or two *dwelling units* or row houses with separate *water service pipes*, the *water system* may be sized in accordance with Table 7.6.3.4., where
- (a) the hydraulic loads for maximum separate demands on *water distribution system* piping are not less than 100% of the total hydraulic load of the *fixture units* given in Table 7.6.3.2.-A, 7.6.3.2.-B, 7.6.3.2.-C or 7.6.3.2.-D for *private use*,
 - (b) the minimum water pressure at the entry to the *building* is 200 kPa, and
 - (c) the total maximum length of the *water system* is 90 m.
- (See Note A-7.6.3.4.(5))
- (6) Where both hot and cold water is supplied to *fixtures* in a house containing only one *dwelling unit*, the *water service pipe* is permitted to be a minimum of *NPS ¾* in provided,
- (a) a minimum *NPS ¾* water supply piping located in the *basement* or lower level is extended to the base of every hot and cold *riser* that serves a maximum of one *bathroom group* and to the last water supply branch serving any *basement bathroom group, fixture supply* or hose bibb, and
 - (b) the total hydraulic load is not more than 26 *fixture units*, using the values given in Table 7.6.3.2.-A.

Table 7.6.3.4.
Water Pipe Sizing for Buildings Containing One or Two Dwelling Units or Row Houses with Separate Water Service Pipes
 Forming Part of Sentence 7.6.3.4.(5)

Nominal Pipe Size of Water Pipe, NPS	Water Velocity m/s ⁽¹⁾		
	3.0	2.4	1.5
	Hydraulic Load, <i>fixture units</i>		
½	8	7	4
¾	21	16	9
1	43	31	18
1¼	83	57	30

Notes to Table 7.6.3.4.:

- (1) Table 2.6.3.4. is not intended to limit water velocities that are permitted by Sentence 7.6.3.5.(1).

7.6.3.5. Velocity

- (1) The maximum permitted water velocities shall be those recommended by the pipe and fitting manufacturer.

7.6.4. Water Efficiency

7.6.4.1. Water Supply Fittings

- (1) Each lavatory in a washroom with *fixtures* for *public use* shall be equipped with a device capable of automatically shutting off the flow of water when the lavatory is not in use. (See Note A-7.6.4.1.(1) and (3))
- (2) An automatic compensating valve serving an individual shower head shall have a manufacturer’s minimum-rated water flow rate equal to or less than the shower head it serves. (See Note A-7.6.4.1.(2))
- (3) Where multiple shower heads installed in a public showering facility are served by one temperature control, each shower head shall be equipped with a device capable of automatically shutting off the flow of water when the shower head is not in use. (See Note A-7.6.4.1.(1) and (3))

Section 7.7. Non-Potable Water Systems

7.7.1. Non-Potable Water Systems

7.7.1.1. General (See Note A-7.7.1.1.)

- (1) Non-*potable water systems* shall be designed, fabricated and installed in accordance with this Subsection and good engineering practice. (See Note A-7.7.1.1.(1))
- (2) Except as provided in Sentence (3) and Subsection 7.7.2., non-*potable water systems* shall only be used to supply water closets, urinals, *trap* seal primers, and *directly connected* underground irrigation systems that only dispense water below the surface of the ground.
- (3) Non-*potable water systems* shall not be used to supply *fixtures* in healthcare facilities.
- (4) Where a non-*potable water system* is supplied by a *potable water system*, the *potable water system* shall be protected in accordance with Article 7.6.2.1.
- (5) Where the static pressure at any *fixture* in a non-*potable water system* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.
- (6) Where a clothes washer is supplied by a *rainwater system* and a *potable water system*, the *potable water system* shall be protected by dual *check valve backflow preventers* conforming to CSA B64.6, “Dual check valve (DuC) backflow preventers” for
 - (a) area isolation, and
 - (b) premise isolation.

7.7.1.2. Identification and Marking

- (0.1) Non-*potable water* piping shall be identified by markings that are permanent, distinct and easily recognized.
- (1) Non-*potable water* piping and outlets shall be identified and marked in accordance with CAN/CSA-B128.1, “Design and Installation of Non-Potable Water Systems.”
- (2) A sign containing the words **NON-POTABLE WATER, DO NOT DRINK** shall be in letters at least 25 mm high with a 5 mm stroke and posted immediately above a *fixture* that is permitted to receive non-*potable water*.

7.7.1.3. Location of Pipes

- (1) Non-*potable water* piping shall not be located directly above
 - (a) areas where food, drink or products that are intended for human consumption are prepared, handled, dispensed or stored,
 - (b) a non-pressurized or pressurized *potable water* tank, or
 - (c) food-handling equipment.

7.7.1.4. Location of Outlets

- (1) Except as permitted in Sentence 7.1.5.3.(3), an outlet from a non-*potable water system* shall not be located where it can discharge into,
 - (0.a) a sink or lavatory,
 - (a) a *fixture* into which an outlet from a *potable water system* is discharged, or

- (b) 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.

7.7.2. Non-Potable Rainwater Harvesting Systems

7.7.2.1. General

- (1) For the purposes of this Subsection, rainwater shall mean *storm water* discharged from an above-ground roof surface. (See Note A-7.7.2.1.(1))
- (2) For the purposes of this Subsection, a *non-potable* rainwater harvesting system shall mean a storage tank, a pump, pipes, fittings and other plumbing appurtenances used to collect and distribute rainwater, but shall not include a rain barrel not connected to a *plumbing system*.

7.7.2.2. Permitted Applications

- (1) *Non-potable* rainwater harvesting systems are only permitted to supply
 - (a) water closets and urinals,
 - (b) clothes washers,
 - (c) floor-mounted service sinks and laundry trays,
 - (d) *trap* primers,
 - (e) irrigation systems,
 - (f) hydronic systems,
 - (g) make-up water systems for heat rejection systems, or
 - (h) any other application where the harvested rainwater is not expected to be ingested or inhaled.

7.7.2.3. Roof Design

- (1) Roof surfaces that supply rainwater to a *non-potable* rainwater harvesting system shall be inaccessible to vehicular and pedestrian traffic. (See Note A-7.7.2.3.(1))
- (2) Roofing components and conveyance systems in contact with rainwater that is supplied to a *non-potable* rainwater harvesting system shall be constructed of materials that will not introduce substances into the rainwater that could adversely affect its intended end use. (See Note A-7.7.2.3.(2))

7.7.2.4. Non-Potable Rainwater Harvesting System Design

- (1) *Non-potable* rainwater harvesting systems and their connections shall be designed, fabricated and installed in accordance with this Subsection and good engineering practice. (See Note A-7.7.2.4.(1))
- (2) *Non-potable* rainwater harvesting systems shall not collect water discharged from an evaporative heat rejection system.
- (3) *Non-potable* rainwater harvesting systems shall be provided with a means to treat the harvested rainwater in such a manner that the quality of the delivered *non-potable* water conforms to appropriate provincial or territorial requirements or, in the absence of such requirements, the systems shall conform to Sentence (4). (See Note A-7.7.2.4.(3) and (4))

- (4) Except as provided in Sentence (3), non-*potable* rainwater harvesting systems shall be provided with
- (a) a water treatment system consisting of
 - (i) a debris screen with a mesh size of not more than 6 mm ahead of the storage tank inlet,
 - (ii) a first-flush diversion system with a capacity of not less than 0.3 L/m² of roof area ahead of the storage tank inlet,
 - (iii) a calming inlet or settling chamber ahead of the storage tank inlet,
 - (iv) a device to prevent the entrainment of sediment into the pump, and
 - (v) where the harvested rainwater is used for an indoor application, a filter with a mesh size of not more than 50 µm ahead of the storage tank inlet, or
 - (b) a means to treat the harvested rainwater in such a manner that the delivered non-*potable* water contains not more than the maximum acceptable levels of contaminants stated in CSA B805 / ICC 805, “Rainwater harvesting systems.”
- (See Note A-7.7.2.2.(1) and 7.7.2.4.(3) and (4))
- (5) Where the static pressure at any *fixture* in a non-*potable* rainwater harvesting system may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.
- (6) Storage tanks in non-*potable* rainwater harvesting systems shall be designed and installed in accordance with
- (a) CAN/CSA-B126.0, “General requirements and methods of testing for water cisterns,” and
 - (b) CAN/CSA-B126.1, “Installation of water cisterns.”
- (7) Storage tanks in non-*potable* rainwater harvesting systems shall be equipped with an overflow that directs excess rainwater to
- (a) a public *storm sewer*,
 - (b) a public *combined sewer*,
 - (c) a *storm water* management system, or
 - (d) a designated *storm water* disposal location.
- (8) Where the storage tank outlet is located below the level of the adjoining street, the storage tank overflow required by Sentence (7) shall
- (a) with an indirect connection that is not located within the *building*, or
 - (b) be equipped with a *backwater valve*.
- (9) Make-up water connections to non-*potable* rainwater harvesting systems shall
- (a) be equipped with a reduced pressure principle *backflow preventer*, or
 - (b) have an *air gap*.
- (10) Where a *fixture* combines water from a non-*potable* rainwater harvesting system and *potable* water at the *fixture* supply fitting, the *potable water system* shall be protected by a *backflow preventer* as described in Sentence 7.6.2.1.(3).

7.7.3. Non-Potable Water Systems for Re-use Purposes

7.7.3.1. Conformance to Standards

- (1) Except as provided in Article 7.7.2.4., non-*potable water systems* for re-use purposes shall be designed, constructed and installed to conform to good engineering practice appropriate to the circumstances such as described in
- (a) the ASHRAE Handbooks,
 - (b) ASPE Data Books, or
 - (c) CAN/CSA-B128.1, “Design and Installation of Non-Potable Water Systems.”

Part 8

Sewage Systems

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Part 8**Sewage Systems****Section 8.1. General****8.1.1. Scope****8.1.1.1. Scope**

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

8.1.1.2. Definitions

- (1) Except as provided in Sentence (2), words that appear in *italics* are defined in Article 1.4.1.2. of Division A and in the *Building Code Act, 1992*.

- (2) In this Part,

Soil means in-situ, naturally occurring, unconsolidated mineral or organic material, at the earth's surface that is at least 100 mm thick and capable of supporting plant growth, and includes material compacted or cemented by soil forming processes, but does not include displaced materials such as gravel dumps, mine spoils, or like deposits.

8.1.2. Application**8.1.2.1. Classification of Systems**

- (1) All *sewage systems* shall be classed as one of the following:
- (a) Class 1 — a chemical toilet, an incinerating toilet, a recirculating toilet, a self-contained portable toilet and all forms of privy including a *portable privy*, an *earth pit privy*, a *pail privy*, a *privy vault* and a composting toilet system,
 - (b) Class 2 — a *greywater* system,
 - (c) Class 3 — a cesspool,
 - (d) Class 4 — a *leaching bed* system, or
 - (e) Class 5 — a system that requires or uses a *holding tank* for the retention of *hauled sewage* at the site where it is produced prior to its collection by a *hauled sewage system*.

8.1.2.2. Operation and Maintenance

- (1) Operation and maintenance of *sewage systems* shall comply with Section 8.9.

8.1.3. Limitations**8.1.3.1. Discharge**

- (1) Except as provided in Sentences (2) to (6), the *sewage system* shall be designed and *constructed* to receive only *sanitary sewage* of domestic origin. (See Note A-8.1.3.1.(1))

- (2) Where laundry waste is not more than 20% of the total daily design *sanitary sewage* flow, it may discharge to a *sewage system*.
- (3) Where industrial process waste water is treated to the contaminant levels found in domestic *sanitary sewage*, it may discharge to a *leaching bed* provided the *treatment unit* and *sewage system* are designed in accordance with good engineering practice. (See Note A-8.1.3.1.(3))
- (4) Where kitchen waste water from a restaurant has passed through an operating grease *interceptor*, it may discharge to a *leaching bed* provided the *sewage system* has been designed in accordance with good engineering practice.
- (5) Waste water from a kitchen equipped with a garbage grinder may be directed to the *sewage system* provided the system has been designed to accept such waste water.
- (6) Water softener and iron filter discharge may be directed to the *sewage system* provided the system has been designed to accept such discharges.
- (7) *Storm sewage* shall not be discharged into a *sewage system*.
- (8) The *interceptor* required in Sentence (4) shall
 - (a) have a minimum flow rate as required by Sentence 7.4.4.3.(8) using a 60 second drain down time, and
 - (b) conform to,
 - (i) CSA B481.1, “Testing and rating of grease interceptors using lard,” or
 - (ii) CSA B481.2, “Testing and rating of grease interceptors using oil.”

Section 8.2. Design Standards

8.2.1. General Requirements

8.2.1.1. Scope

- (1) This Subsection applies to the design of *sewage systems*.

8.2.1.2. Site Evaluation

- (1) A site evaluation shall be conducted on every site where a new or replacement *sewage system* is to be installed. (See Note A-8.2.1.2.(1))
- (2) The *percolation time* shall be determined by
 - (a) conducting percolation tests, or
 - (b) classifying the *soil* according to one of the following methods,
 - (i) the Unified Soil Classification System as described in MMAH Supplementary Standard SB-6, “Percolation Time and Soil Descriptions,” or
 - (ii) the Soil Texture Classification as described in Chapter 3 of USDA, “Soil Survey Manual.”(See Note A-8.2.1.2.(2))
- (3) Where the *percolation time* is determined by a percolation test, there shall be a minimum of 3 locations selected, suitably spaced to accurately evaluate the *leaching bed* area, with the highest *percolation time* of the tests being used. (See Note A-8.2.1.2.(3))

8.2.1.3. Sewage System Design Flows

- (1) For *residential occupancies*, the total daily design *sanitary sewage* flow shall be at least the value determined in accordance with Table 8.2.1.3.-A. (See Note A-8.2.1.3.(1) and (2))
- (2) For all other *occupancies*, the total daily design *sanitary sewage* flow shall be at least the value determined in accordance with Table 8.2.1.3.-B. (See Note A-8.2.1.3.(1) and (2))
- (3) Where a *building* contains more than one establishment, the total daily design *sanitary sewage* flow shall be the sum of the total daily design *sanitary sewage* flow for each establishment.
- (4) Where an *occupancy* is not listed in Table 8.2.1.3.-B, the highest of metered flow data from at least 3 similar establishments shall be acceptable for determining the total daily design *sanitary sewage* flow.

**Table 8.2.1.3.-A
Residential Occupancy
Forming Part of Sentence 8.2.1.3.(1)**

<i>Residential Occupancy</i>	Volume, litres
Apartments, Condominiums, Other Multi-family Dwellings - per person ⁽¹⁾	275
Boarding Houses	
(a) Per person,	
(i) with meals and laundry facilities, or,	200
(ii) without meal or laundry facilities, and	150
(b) Per non-resident staff per 8 hour shift	40
Boarding School - per person	300
Dwellings	
(a) 1 bedroom dwelling	750
(b) 2 bedroom dwelling	1 100
(c) 3 bedroom dwelling	1 600
(d) 4 bedroom dwelling	2 000
(e) 5 bedroom dwelling	2 500
(f) Additional flow for ⁽²⁾	
(i) each bedroom over 5,	500
(ii) (A) each 10 m ² (or part of it) over 200 m ² up to 400 m ² ⁽³⁾ ,	100
(B) each 10 m ² (or part of it) over 400 m ² up to 600 m ² ⁽³⁾ , and	75
(C) each 10 m ² (or part of it) over 600 m ² ⁽³⁾ , or	50
(iii) each fixture unit over 20 fixture units	50
Hotels and Motels (excluding bars and restaurants)	
(a) Regular, per room	250
(b) Resort hotel, cottage, per person	500
(c) Self service laundry, add per machine	2 500
Work Camp/Construction Camp, semi-permanent per worker	250

Notes to Table 8.2.1.3.-A:

- (1) The *occupant load* shall be calculated using Subsection 3.1.17.
- (2) Where multiple calculations of *sanitary sewage* volume is permitted, the calculation resulting in the highest flow shall be used in determining the design daily *sanitary sewage* flow.
- (3) Total finished area, excluding the area of the finished *basement*.

Table 8.2.1.3.-B
Other Occupancies
 Forming Part of Sentence 8.2.1.3.(2)

Establishments ⁽¹⁾	Volume, litres
Airports, Bus Terminals, Train Stations, Dock/Port Facilities (Food Services excluded)	
(a) Per passenger, and	20
(b) Per employee per 8 hour shift	40
Assembly Hall - per seat	
(a) No food service, or	8
(b) Food service provided	36
Barber Shop/Beauty Salon - per service chair	650
Bowling Alleys (Food Service not included) - per lane	400
Churches and Similar Places of Worship - per seat	
(a) No kitchen facilities, or	8
(b) Kitchen facilities provided	36
Country Club (excluding Food Service)	
(a) Per resident,	375
(b) Per employee per 8 hour shift, and	50
(c) Per member or patron	40
Day Care Facility per person (staff and children)	75
Dentist Office	
(a) Per wet service chair, and	275
(b) Per dry service chair	190
Doctors Office	
(a) Per practitioner, and	275
(b) Per employee per 8 hour shift	75
Factory (excluding process or cleaning waters) - per employee per 8 hour shift	
(a) No showers, or	75
(b) Including showers	125
Flea Markets ⁽²⁾ (open not more than 3 days per week)	
(a) Per non-food service vendor space,	60
(b) Per food service establishment / 9.25 m ² of floor space, and	190
(c) Per limited food service outlet	95
Food Service Operations	
(a) Restaurant (not 24 hour), per seat	125
(b) Restaurant (24 hour), per seat	200
(c) Restaurant on controlled-access highway, per seat	400
(d) Paper service restaurant, per seat	60
(e) Donut shop, per seat	400
(f) Bar and cocktail lounge, per seat	125
(g) Drive-in restaurant per parking space	60
(h) Take-out restaurant (no seating area)	
(i) per 9.25 m ² of floor area, and	190
(ii) per employee per 8 hour shift	75

Table 8.2.1.3.-B (Cont'd)
Other Occupancies
Forming Part of Sentence 8.2.1.3.(2)

Establishments ⁽¹⁾	Volume, litres
(i) Cafeteria - per meal	12
(j) Food outlet	
(i) excluding delicatessen, bakery and meat department, per 9.25 m ² of floor space,	40
(ii) per 9.25 m ² of delicatessen floor space,	190
(iii) per 9.25 m ² of bakery floor space,	190
(iv) per 9.25 m ² of meat department floor space, and	380
(v) per water closet	950
Hospitals - per bed	
(a) Including laundry facilities, or	750
(b) Excluding laundry facilities	550
Long-Term Care Homes, etc. - per bed	450
Office Building ⁽³⁾	
(a) Per employee per 8 hour shift, or	75
(b) Per each 9.3 m ² of floor space	75
Public Parks	
(a) With toilets only per person, or	20
(b) With bathhouse, showers, and toilets per person	50
Recreational Vehicle or Campground Park	
(a) Per site without water or sewer hook-up, or	275
(b) Per site with water and sewer hook-up	425
Schools - per student	
(a) Day school,	30
(b) With showers,	30
(c) With cafeteria, and	30
(d) Per non-teaching employee per 8 hour shift	50
Service Stations (no vehicle washing) ⁽³⁾	
(a) Per water closet, and	950
(i) per fuel outlet ⁽⁴⁾ , or	560
(ii) per vehicle served	20
Shopping Centre (excluding food and laundry) - per 1.0 m ² of floor space	5
Stadiums, Race Tracks, Ball Parks - per seat	20
Stores ⁽³⁾	
(a) Per 1.0 m ² of floor area, or	5
(b) Per water closet	1 230
Swimming and Bathing Facilities (Public) - per person	40
Theatres	
(a) Indoor, auditoriums per seat,	20
(b) Outdoor, drive-ins per space, or	40
(c) Movie theatres per seat	15

Table 8.2.1.3.-B (Cont'd)
Other Occupancies
 Forming Part of Sentence 8.2.1.3.(2)

Establishments ⁽¹⁾	Volume, litres
Veterinary Clinics	
(a) Per practitioner,	275
(b) Per employee per 8 hour shift, and	75
(c) Per stall, kennel or cage if floor drain connected	75
Warehouse	
(a) Per water closet, and	950
(b) Per loading bay	150

Notes to Table 8.2.1.3.-B:

- (1) The *occupant load* shall be calculated using Subsection 3.1.17.
- (2) Flea markets open more than 3 days per week shall be assessed using the volumes stated under the heading “Stores”.
- (3) Where multiple calculations of *sanitary sewage* volume is permitted, the calculation resulting in the highest flow shall be used in determining the design daily *sanitary sewage* flow.
- (4) The number of fuel outlets is considered the maximum number of fuel nozzles that could be in use at the same time

8.2.1.4. Clearances (See Note A-8.2.1.4.)

- (1) Unless it can be shown to be unnecessary, where the *percolation time* is 10 min or greater, the location of all components within a *sewage system* shall be in conformance with the clearances listed in Article 8.2.1.5. or 8.2.1.6.
- (2) Unless it can be shown to be unnecessary, where the *percolation time* is less than 10 min, the clearances listed in Articles 8.2.1.5. and 8.2.1.6. for wells, lakes, ponds, reservoirs, rivers, springs or streams shall be increased to compensate for the lower *percolation time*.
- (3) No *building* shall be *constructed* closer to any part of a *sewage system* than the clearances listed in Article 8.2.1.5. or 8.2.1.6.
- (4) If more than one *sewage system* is located on a lot or parcel of land, there shall be no overlap of any part of the systems.

8.2.1.5. Clearance Distances for Class 1, 2 and 3 Sewage Systems

- (1) Except as provided in Sentences 8.2.1.4.(1) and (2), no Class 1, 2 or 3 *sewage system* shall have a horizontal distance of less than that permitted by Table 8.2.1.5.

Table 8.2.1.5.
Clearance Distances for Class 1, 2 and 3 Sewage Systems
 Forming Part of Sentence 8.2.1.5.(1)

Sewage System	Minimum horizontal distance in metres from a well with watertight casing to a depth of at least 6 m	Minimum horizontal distance in metres from a spring used as a source of <i>potable</i> water or well other than a well with a watertight casing to a depth of at least 6 m	Minimum horizontal distance in metres from a lake, river, pond, stream, reservoir, or a spring not used as a source of <i>potable</i> water	Minimum horizontal distance in metres from a property line
Earth Pit Privy	15	30	15	3
Privy Vault Pail Privy	10	15	10	3
Greywater System	10	15	15	3
Cesspool	30	60	15	3

8.2.1.6. Clearances for a Class 4 or 5 Sewage System

(1) Except as provided in Sentences 8.2.1.4.(1) and (2), a *treatment unit* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.-A.

Table 8.2.1.6.-A
Minimum Clearances for Treatment Units
 Forming Part of Sentence 8.2.1.6.(1)

Object	Minimum Clearance, m
Structure	1.5
Well	15
Lake	15
Pond	15
Reservoir	15
River	15
Spring	15
Stream	15
Property Line	3

(2) Except as provided in Sentences 8.2.1.4.(1) and (2), the centre line of a *distribution pipe* or *leaching chamber* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.-B and these distances shall be increased when required by Sentence 8.7.4.2.(11).

(3) Except as provided in Sentences 8.2.1.4.(1) and (2), a *holding tank* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.-C.

Table 8.2.1.6.-B
Minimum Clearances for Distribution Piping and Leaching Chambers
 Forming Part of Sentence 8.2.1.6.(2)

Object	Minimum Clearance, m
Structure	5
Well with a watertight casing to a depth of at least 6 m	15
Any other well	30
Lake	15
Pond	15
Reservoir	15
River	15
Spring not used as a source of <i>potable</i> water	15
Stream	15
Property Line	3

Table 8.2.1.6.-C
Minimum Clearances for Holding Tanks
 Forming Part of Sentence 8.2.1.6.(3)

Object	Minimum Clearance, m
Structure	1.5
Well with a watertight casing to a depth of at least 6 m	15
Any other well	15
Spring	15
Property Line	3

8.2.2. Treatment and Holding Tanks

8.2.2.1. Application

(1) This Subsection applies to any tank used in a *sewage system* for collecting, treating, holding or storing *sanitary sewage*.

8.2.2.2. Tanks

(1) A tank that is used as a *treatment unit* in a Class 4 *sewage system* or a *holding tank* in a Class 5 *sewage system* shall conform to the requirements of CSA B66, “Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks.”

(2) Material standards, access and construction methods and practices for a tank used for other Classes of *sewage systems* shall conform to the requirements of CSA B66, “Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks.”

(3) Sentence (2) does not apply to a tank that is an integral part of a prefabricated Class 1 *sewage system*.

- (4) Access openings shall be located to facilitate the pumping of all compartments and the servicing of the inlet and outlet of each compartment not accessible by removal of the tank top or part of it.
- (5) A tank shall not be covered by *soil* or *leaching bed fill* having a depth greater than the maximum depth of burial that the tank is designed to withstand.
- (6) A tank shall be securely anchored when located in an area subject to flooding or where *ground water* levels may cause hydrostatic pressures.

8.2.2.3. Septic Tanks

- (1) The minimum *working capacity* of a *septic tank* shall be the greater of 3 600 L and
 - (a) in *residential occupancies*, twice the daily design *sanitary sewage* flow, or
 - (b) in *non-residential occupancies*, three times the daily design *sanitary sewage* flow.
- (2) Every *septic tank* shall be constructed in such a manner that any *sanitary sewage* flowing through the tank will pass through at least 2 compartments.
- (3) The *working capacity* of the compartments required in Sentence (2) shall be sized such that
 - (a) the first compartment is at least 1.3 times the daily design *sanitary sewage* flow but in no case less than 2 400 L, and
 - (b) each subsequent compartment shall be at least 50% of the first compartment.
- (4) Where multiple tanks are to be used to meet the requirements of Sentences (2) and (3), the tanks shall be connected in series such that
 - (a) the first tank in the series shall have at least a capacity as calculated in Clause (3)(a), however at no time shall a tank having a *working capacity* of less than 3 600 L be used,
 - (b) all additional tanks after the first tank, excluding pump or dosing tanks shall have at least a *working capacity* equal to the volume required by Clause (3)(b),
 - (c) the pipe between the outlet of one tank and the inlet of the next tank in the series shall have a minimum slope of 2 percent,
 - (d) there shall be no partitions in the tank except where a partition is required to maintain the structural integrity of the tank, in which case openings within the partition shall be provided to allow the free movement of *sanitary sewage* throughout the tank, and
 - (e) all piping between tanks shall be continuous and shall be connected to the tank through the use of flexible watertight seals that will permit differential movement between the tanks.
- (5) Partitions separating the *septic tank* into compartments shall extend at least 150 mm above the liquid level at the outlet, and there shall be one or more openings through or above the partition.
- (6) The openings required between compartments referred to in Sentence (2) shall have a total cross-sectional area of at least three times the area of the inlet pipe and be located between the top and a level 150 mm above the liquid level at the outlet to provide for the free flow of air between compartments.
- (7) *Sanitary sewage* shall pass from one compartment to another of the *septic tank* as follows:
 - (a) by means of a device similar to that described in CSA B66, “Design, Material, and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks” for outlet devices, or
 - (b) through two or more openings through the partition located in a horizontal line, and evenly spaced across the width of the partition, centred at approximately 40% of the liquid depth below the surface of the liquid, and having a total area of between three and five times that of the cross-sectional area of the inlet pipe.
- (8) A *septic tank* shall be of such design and construction as will permit the collection and holding of *sanitary sewage* in it to a depth of not less than 1 000 mm, except that a depth of not less than 900 mm is permitted where the excavation is in rock, or to avoid rupture or displacement of the tank due to *ground water* pressure.
- (9) Except as provided in Sentences (10) and (11), every *septic tank* shall be installed in such a manner that the access openings are located not more than 300 mm below the ground surface.

(10) Where the top of the *septic tank* is located more than 300 mm below the ground surface, it shall be equipped with risers that extend from the access opening of the *septic tank* to within 300 mm of the ground surface.

(11) Where risers are used they shall conform to the requirements of CSA B66, “Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks,” and shall have adequate access openings to allow for regular maintenance of the *septic tank*.

8.2.2.4. Holding Tanks

(1) All *holding tanks* shall be of such design and construction as will allow the complete removal of solid matter that can be expected to settle in the *holding tank* through an apparatus or device suitable for allowing the contents of the *holding tank* to be removed from the *holding tank*.

(2) A *holding tank* shall have a *working capacity* of not less than 9 000 L.

(3) Where two or more tanks are used to meet the requirement of Sentence (2), they shall be deemed to be one *holding tank* provided they are connected in such a manner as will allow the *sanitary sewage* contained in them to flow between the tanks.

(4) The *working capacity* of the tanks described in Sentence (3) shall not include any portion of any tank that cannot be completely drained due to the manner in which the connections are made.

Section 8.3. Class 1 Sewage Systems

8.3.1. General Requirements

8.3.1.1. Scope

(1) This Section applies to the *construction* of a Class 1 *sewage system*.

8.3.1.2. Application

(1) Except as provided in Sentence (2), a Class 1 *sewage system* shall be designed to receive only human body waste for disposal.

(2) Where the *sewage system* is specifically designed for the biological decomposition of non-waterborne biodegradable kitchen wastes or requires the addition of small quantities of plant matter to improve the decomposition of human body waste, it may receive such wastes in addition to human body waste.

(3) Where the *sewage system* is designed with a drain for the removal of excess liquid, then the *sewage system* shall drain to a Class 3, 4, or 5 *sewage system*.

8.3.2. Superstructure Requirements

8.3.2.1. Construction Requirements

- (1) A privy as described in Subsections 8.3.3. to 8.3.5. shall be enclosed with a superstructure that
 - (a) is *constructed* of strong durable weatherproof materials,
 - (b) has a solid floor supported by a sill *constructed* of treated timber, masonry or other material of at least equal strength and durability,

- (c) is easily sanitized,
- (d) unless it is equipped solely as a urinal, is equipped with one or more seats each having a cover and being supported by an enclosed bench or riser that is lined with an impervious material on all interior vertical surfaces,
- (e) is equipped with a self-closing door,
- (f) has one or more openings for purposes of ventilation, all of which are screened,
- (g) has a ventilation duct that is screened at the top end and that extends from the underside of the bench or riser to a point above the roof of the superstructure, and
- (h) shall not have any openings for the reception of human body waste, other than urinals and those *constructed* in accordance with Clause (d).

8.3.3. Earth Pit Privy

8.3.3.1. Construction Requirements

- (1) An *earth pit privy* shall be *constructed* in the following manner:
 - (a) the bottom of the pit shall be at least 900 mm above the *high ground water table*,
 - (b) the sides of the pit shall be reinforced so as to prevent their collapse,
 - (c) the pit shall be surrounded on all sides and on its bottom by not less than 600 mm of *soil or leaching bed fill*, and
 - (d) the *soil or leaching bed fill* around the base of the sides of the superstructure of the *earth pit privy* shall be raised or mounded to a height of at least 150 mm above ground level.

8.3.4. Privy Vaults and Pail Privy

8.3.4.1. Construction Requirements

- (1) A *privy vault* or a *pail privy* shall be *constructed* in the following manner:
 - (a) the container or structure that is to be used for the holding or storage of *sanitary sewage* shall be watertight and made of a material that can be easily cleaned,
 - (b) the *soil or leaching bed fill* around the base of the sides of the superstructure shall be raised or mounded to a height of at least 150 mm above ground level, and
 - (c) the surface of the ground in the area of the *privy vault* or *pail privy* shall be so graded that surface drainage will be diverted away from the privy.

8.3.5. Portable Privy

8.3.5.1. Construction Requirements

- (1) A *portable privy* shall be *constructed* in the following manner:
 - (a) the *portable privy* shall have a watertight receptacle that shall be suitable for the holding and storage of any *sanitary sewage* deposited in it,
 - (b) the receptacle for the holding and storage of sewage shall be designed and *constructed* in such a manner as to allow it to be easily emptied and cleaned, and
 - (c) the *portable privy* shall be *constructed* of such material and in such a manner that it can withstand the stresses to which it will be subjected during its transportation to and from sites where it is to be used and during loading and unloading from vehicles used for the transportation of the *portable privy* to and from sites where it is to be used.

Section 8.4. Class 2 Sewage Systems

8.4.1. General Requirements

8.4.1.1. Scope

- (1) This Section applies to the *construction* of a Class 2 *sewage system*.

8.4.1.2. Application (See Note A-8.4.1.2.)

- (1) A Class 2 *sewage system* shall be designed only for the treatment and disposal of *greywater*.
- (2) The total daily design flow for a Class 2 *sewage system* shall be calculated based on the *fixtures* discharging to the system as follows:
 - (a) 200 L per *fixture unit* where there is a supply of pressurized water, and
 - (b) 125 L per *fixture unit* where there is no supply of pressurized water.

8.4.2. Design and Construction Requirements

8.4.2.1. Construction Requirements

- (1) The bottom of the pit shall be at least 900 mm above the *high ground water table*.
- (2) The pit shall be *constructed* in such a manner as to prevent the collapse of its sidewalls.
- (3) Any material used to support or form the sidewalls of the pit shall be an open jointed material of a type that will permit *leaching* from the pit.
- (4) The pit shall be provided with a tight, strong cover that shall remain over the pit except when it is necessary to remove it for purposes of adding *greywater* to or removing *greywater* from the pit or for purposes of maintenance of the pit.
- (5) The earth around the perimeter of the pit shall be raised or mounded to a height of at least 150 mm above ground level.
- (6) The surface of the ground in the area of the pit shall be so graded that surface drainage in the area will be diverted away from the pit.
- (7) The pit shall be surrounded on all sides and on its bottom by at least 600 mm of *soil* having a *percolation time* of less than 50 min.

8.4.2.2. Maximum Sewage Flow

- (1) A Class 2 *sewage system* shall not be *constructed* where the daily design *greywater* flow to the system exceeds 1 000 L/day.

8.4.2.3. Sizing

(1) A Class 2 *sewage system* shall be designed and *constructed* so that the loading rate to the side walls shall be not more than the value calculated using the formula,

$$L_R = 400/T$$

where,

L_R = *loading rate* of the sidewalls in litres per day/m², and

T = *percolation time*.

Section 8.5. Class 3 Sewage Systems

8.5.1. General Requirements

8.5.1.1. Scope

(1) This Section applies to the *construction* of a Class 3 *sewage system*.

8.5.1.2. Application

(1) A Class 3 *sewage system* shall not be *constructed* where the daily design *sanitary sewage* flow to the system exceeds 1 000 L/day.

(2) A Class 3 *sewage system* shall be designed to receive only the contents of a Class 1 *sewage system* or *effluent* from a Class 1 *sewage system* for disposal.

8.5.2. Design and Construction Requirements

8.5.2.1. Construction Requirements

(1) The bottom of the cesspool shall be at least 900 mm above the *high ground water table*.

(2) The cesspool shall be *constructed* in such a manner as to prevent the collapse of its sidewalls.

(3) Any material used to support or form the sidewalls of the cesspool shall be an open jointed material of a type that will permit *leaching* from the cesspool.

(4) The cesspool shall be provided with a tight strong cover that shall remain over the cesspool except when it is necessary to remove it for the purposes of adding *sanitary sewage* to or removing *sanitary sewage* from the cesspool or for purposes of maintenance of the cesspool.

(5) Where the cesspool extends to the ground surface, the cover required in Sentence (4) shall be lockable.

(6) The *soil* or *leaching bed fill* around the perimeter of the cesspool shall be raised or mounded to a height of at least 150 mm above ground level.

(7) The surface of the ground in the area of the cesspool shall be graded such that surface drainage in the area will be diverted away from the cesspool.

- (8) The cesspool shall be surrounded on all sides and on its bottom by at least 600 mm of *soil* or *leaching bed fill*, except the top where the cesspool extends to the surface of the ground.

Section 8.6. Class 4 Sewage Systems

8.6.1. General Requirements

8.6.1.1. Scope

- (1) This Section applies to the *construction* of a Class 4 *sewage system*.

8.6.1.2. General Requirements

- (1) The *treatment unit* shall be connected to a *leaching bed constructed* in accordance with the requirements of Section 8.7.

8.6.1.3. Pumps and Siphons

- (1) Where the total length of *distribution pipe* or *leaching chamber* required is 150 m or more, the *sewage system* shall have at least one pump or a siphon contained in a dosing tank that may be a separate compartment within the tank structure, for distribution of the *effluent*.
- (2) Where the total length of *leaching chamber* is 150 m or more, a *distribution pipe* shall be installed at the centre line of the *leaching chamber* and extend the total length of *leaching chamber* to allow for dosing of the *effluent*.
- (3) Alternating siphons shall not be installed in a *sewage system*.
- (4) Where 2 or more pumps are employed within a dosing tank, the pumps shall be designed such that the pumps alternate dosing, and dosing shall continue in the event that one pump fails.
- (5) Where a pump or siphon is required, the pump or siphon shall be designed to discharge a dose of at least 75% of the internal volume of the *distribution pipe* within a time period not exceeding 15 min.
- (6) Where a pump or siphon is required, the pump or siphon shall be equipped with a device that shall produce an audible and visual alarm signal that indicates a high water level in the pump or siphon chamber.

8.6.2. Treatment Units

8.6.2.1. Septic Tank Systems

- (1) An *effluent filter* shall be installed in the outlet flow path of every *septic tank* that discharges *effluent* to a *leaching bed*.
- (2) The *septic tank effluent filter* required by Sentence (1) shall,
- conform to the requirements of NSF/ANSI 46, "Evaluation of Components and Devices Used in Wastewater Treatment Systems,"
 - be sized to filter particles of 1.6 mm,
 - have a minimum area of 550 cm², and
 - be installed in accordance with the manufacturer's recommendations.

(3) A secured access opening to allow for regular maintenance of the *effluent* filter shall be provided at the ground surface.

8.6.2.2. Other Treatment Units (See Note A-8.6.2.2.)

(1) Except as provided in Sentence (2), a *treatment unit*, other than a *septic tank*, shall be designed such that the *effluent* does not exceed, for the level of the *treatment unit* set out in Column 1 of Table 8.6.2.2., the maximum concentrations set out opposite it in Columns 2 and 3 of Table 8.6.2.2.

Table 8.6.2.2.
Other Treatment Unit Effluent Quality Criteria
 Forming Part of Sentences 8.6.2.2.(1) and (2)

Classification of <i>Treatment Unit</i> ⁽¹⁾	Suspended Solids ⁽²⁾	CBOD ₅ ⁽²⁾
Level II	30	25
Level III	15	15
Level IV	10	10
Column 1	2	3

Notes to Table 8.6.2.2.:

- (1) The classifications of *treatment units* specified in Column 1 correspond to the levels of treatment described in CAN/BNQ 3680-600, “Onsite Residential Wastewater Treatment Technologies.”
- (2) Maximum concentration in mg/L based on a 30 day average.

(2) A *treatment unit* that is used in conjunction with a *leaching bed constructed as a shallow buried trench, Type A dispersal bed* or *Type B dispersal bed* shall be designed such that the *effluent* does not exceed the maximum concentrations set out opposite a Level IV *treatment unit* in Columns 2 and 3 of Table 8.6.2.2.

(3) All *treatment units* referred to in Sentences (1) and (2) that contain mechanical components shall be equipped with an audible and visual warning alarm so located to warn the occupants of the *building* served or the operator of the *treatment unit* of a malfunction in the operation of the *treatment unit*.

(4) All *treatment units* referred to in Sentences (1) and (2) shall permit the sampling of the *effluent*.

(5) A *treatment unit* is deemed to comply with Sentences (1) and (2) if it has been certified to CAN/BNQ 3680-600, “Onsite Residential Wastewater Treatment Technologies” using a temperature condition listed under option a) or b) of Clause 8.2.2. of that standard. (See Note A-8.6.2.2.(5))

(6) Every operator of a *treatment unit* shall obtain, from the manufacturer or distributor of the *treatment unit*, literature that describes the unit in detail and provides complete instructions regarding the operation, servicing, and maintenance requirements of the unit and its related components necessary to ensure the continued proper operation in accordance with the original design and specifications.

Section 8.7. Leaching Beds

8.7.1. General Requirements

8.7.1.1. Scope

(1) This Section applies to the *construction of leaching beds*.

8.7.1.2. Limitation on Installation

- (1) The design and installation of a *shallow buried trench*, *Type A dispersal bed* or *Type B dispersal bed* shall be carried out by a person competent in this field of work.

8.7.2. Design and Construction Requirements

8.7.2.1. General Requirements

- (1) A *leaching bed* shall not be located
 - (a) in an area that has an average slope that exceeds one unit vertically to four units horizontally,
 - (b) in *soil* or *leaching bed fill* having a *percolation time of*,
 - (i) less than 1 min, or greater than 125 min if *constructed* as a *shallow buried trench*, or
 - (ii) less than 1 min, or greater than 50 min for all other *leaching beds*, or
 - (c) in or on an area that is subject to flooding that may be expected to cause damage to the *leaching bed* or impair the operation of the *leaching bed*.
- (2) A *leaching bed* shall not be covered with any material having a hydraulic conductivity less than 0.01 m/day.
- (3) The surface of the *leaching bed* shall be shaped to shed water and together with the side slopes of any raised portion, shall be protected against erosion in such a manner as to not inhibit the evaporation and transpiration of waters from the *soil* or *leaching bed fill*, and to not cause plugging of the *distribution pipe*.
- (4) No part of a *leaching bed* shall be sloped steeper than 1 unit vertically to 4 units horizontally.
- (5) A *leaching bed* shall be designed to be protected from compaction or any stress or pressure that may result in,
 - (a) the impairment or destruction of any pipe in the *leaching bed*, or
 - (b) the smearing of the *soil* or *leaching bed fill*.

8.7.2.2. Distribution Pipes within Leaching Beds

- (1) Sentence (2) applies to the design and *construction* of a *leaching bed* with *distribution pipes* used within the *leaching bed*.
- (2) The *header line* and *distribution pipes* within a *leaching bed* shall be designed and *constructed* so that they can be detected by
 - (a) magnetic means,
 - (b) means of a 14 gauge TW solid copper light coloured plastic coated tracer wire, or
 - (c) other means of subsurface detection.

8.7.2.3. Leaching Chambers within Leaching Beds

- (1) *Leaching chambers* are permitted for use in conjunction with an *absorption trench*, *shallow buried trench*, filter bed or *Type A dispersal bed*.
- (2) *Leaching chambers* shall comply with the dimension requirements for either a Type I or Type II *leaching chamber* listed in Table 8.7.2.3.
- (3) *Leaching chambers* shall conform to the requirements of IAPMO PS 63, “Plastic Leaching Chambers”.

- (4) The header line and leaching chambers within a leaching bed shall be designed and constructed so that they can be detected by
- (a) magnetic means,
 - (b) means of a 14 gauge TW solid copper light coloured plastic coated tracer wire,
 - (c) means of a 12 gauge copper clad steel light coloured plastic coated tracer wire, or
 - (d) other means of subsurface detection.

Table 8.7.2.3.
Leaching Chamber Dimensions
 Forming Part of Sentence 8.7.2.3.(2)

Type of Leaching Chamber	Width, mm	Height, mm
Type I	380 to 410	280 to 305
Type II	555 to 575	300 to 320

8.7.3. Absorption Trench Construction

8.7.3.1. Length of Distribution Pipe

- (1) The total length of *distribution pipe* shall
- (a) not be less than 30 m when constructed as a *shallow buried trench*, or
 - (b) not be less than 40 m for any other *absorption trench*.
- (2) Except as provided in Sentences (1), (3), and (4) every *leaching bed* constructed by means of *absorption trenches* shall have a total length of *distribution pipe* not less than the value determined by the formula,

$$L = QT/200$$

where,

- L = total length of *distribution pipe* in metres,
- Q = the total daily design *sanitary sewage* flow in litres, and
- T = the design *percolation time*.

- (3) Except as provided in Sentence (1), where a *leaching bed* receives *effluent* from a Level II, Level III or Level IV *treatment unit* as described in Table 8.6.2.2., the *leaching bed* may have a total length of *distribution pipe* not less than the value determined by the formula,

$$L = QT/300$$

where,

- L = total length of *distribution pipe* in metres,
- Q = the total daily design *sanitary sewage* flow in litres, and
- T = the design *percolation time*.

(4) Except as provided in Sentence (1), where the *leaching bed* is constructed as a *shallow buried trench*, the total length of the *distribution pipe* shall not be less than the value determined by Table 8.7.3.1.

Table 8.7.3.1.
Length of Distribution Pipe in Shallow Buried Trench
 Forming Part of Sentence 8.7.3.1.(4)

<i>Percolation Time, (T) of Soil, min</i>	<i>Length of Distribution Pipe, m</i>
$1 < T \leq 20$	$Q/75$
$20 < T \leq 50$	$Q/50$
$50 < T < 125$	$Q/30$

where,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the design *percolation time*.

8.7.3.2. Length of Leaching Chamber

- (1) The total length of *leaching chamber* shall
- not be less than 30 m when constructed as a *shallow buried trench*, or
 - not be less than 40 m for any other *absorption trench*.

(2) Except as provided in Sentences (1) and (3), the total length of *leaching chamber* shall not be less than the value determined by the formula,

$$L = QT/200, \text{ for a Type I } \textit{leaching chamber}, \text{ or}$$

$$L = QT/300, \text{ for a Type II } \textit{leaching chamber},$$

where,

L = total length of *leaching chamber* in metres,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the design *percolation time*.

(3) When a *treatment unit* described in Article 8.6.2.2. is used in conjunction with a *leaching chamber*, the total length of *leaching chamber* shall not be less than the value determined by the formula,

$$L = QT/300$$

where,

L = total length of *leaching chamber* in metres,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the design *percolation time*.

(4) Except as provided in Sentence (1), where the *leaching bed* is constructed as a *shallow buried trench*, the total length of *leaching chamber* shall not be less than the value determined by Table 8.7.3.2.

Table 8.7.3.2.
Length of Leaching Chamber in Shallow Buried Trench
Forming Part of Sentence 8.7.3.2.(4)

Percolation Time, (T) of Soil, min	Length of Leaching Chamber, m
$1 < T \leq 20$	Q/75
$20 < T \leq 50$	Q/50
$50 < T < 125$	Q/30

where,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the design *percolation time*.

8.7.3.3. Absorption Trenches

- (1) Except as provided in Sentence (2), *absorption trenches* shall be
 - (a) approximately the same length and not more than 30 m in length,
 - (b) not less than 500 mm and not more than 1 000 mm in width,
 - (c) not less than 600 mm and not more than 900 mm in depth,
 - (d) centred not less than,
 - (i) 1 600 mm apart where used in conjunction with
 - (A) a *distribution pipe*,
 - (B) a Type I *leaching chamber*, or
 - (C) a Type II *leaching chamber* constructed in *leaching bed fill*, or
 - (ii) 2 400 mm apart where used in conjunction with a Type II *leaching chamber*, other than a Type II *leaching chamber* constructed in *leaching bed fill*,
 - (e) located so that the bottom of the *absorption trench* is not less than 900 mm above the *high ground water table*, rock or *soil* with a *percolation time* of more than 50 min, and
 - (f) backfilled, after the installation of the *distribution pipe* or *leaching chamber* with *leaching bed fill*, so as to ensure that after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.
- (2) *Absorption trenches* constructed as a *shallow buried trench* shall be
 - (a) approximately the same length and not more than 30 m in length,
 - (b) not less than 300 mm and not more than 600 mm in width,
 - (c) not less than 300 mm and not more than 600 mm in depth,
 - (d) centred not less than 2 000 mm apart,
 - (e) not less than 900 mm at all points on the bottom of the *absorption trench* above the *high ground water table* or rock, and
 - (f) backfilled, after the installation of the *distribution pipe* with *leaching bed fill*, so as to ensure that after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.

8.7.3.4. Distribution Pipe

- (1) Except for a *shallow buried trench*, the *distribution pipe* used in the *construction* of a *leaching bed* shall be
 - (a) not less than 3 in. trade *size* for gravity flow systems,
 - (b) installed with a uniform downward slope from the inlet with a drop of not less than 30 mm and not more than 50 mm for each 10 m of *distribution pipe* for gravity flow systems, and
 - (c) installed within a layer of stone conforming to Sentence (5).

- (2) Prior to backfilling, the stone layer required by Clause (1)(c) shall be protected in such a manner so as to prevent *soil* or *leaching bed fill* from entering the stone by completely covering it with
 - (a) untreated building paper, or
 - (b) a permeable geo-textile fabric.
- (3) Every pressurized *distribution pipe* shall be self-draining so as to prevent freezing of its contents.
- (4) Every pressurized *distribution pipe* shall,
 - (a) be not less than 1 in. trade *size*, and
 - (b) have orifices of at least 3 mm in diameter, spaced equally along the length of the pipe to provide even distribution of the *effluent*.
- (5) The stone layer required by Clause (1)(c) shall
 - (a) be comprised of washed septic stone, free of fine material, with gradation conforming to Table 8.7.3.4.,
 - (b) be not less than 500 mm in width,
 - (c) extend not less than 150 mm below the *distribution pipe*, and
 - (d) extend not less than 50 mm above the *distribution pipe*.
- (6) This Article does not apply to a *distribution pipe* within a *leaching chamber*.

Table 8.7.3.4.
Gradation of Septic Stone
 Forming Part of Sentences 8.7.3.4.(5) and 8.7.8.2.(6)

Particle Size	Percent Passing
53 mm	100
19 mm	0 - 5
75 µm	0 - 1

8.7.3.5. Leaching Chamber

- (1) Prior to backfilling, the *leaching chamber* shall be
 - (a) installed level over the length of the *absorption trench*,
 - (b) securely connected together, section to section,
 - (c) free of structural damage, uncut and used full length,
 - (d) equipped with end caps installed on both ends,
 - (e) equipped with an integrated splash plate at the inlet end of each line of *leaching chamber*, to prevent soil scouring, and
 - (f) protected in such a manner so as to prevent *soil* or *leaching bed fill* from entering the *leaching chamber*.
- (2) Except for a *shallow buried trench*, the *distribution pipe* within a *leaching chamber* shall be not less than 3 in. trade *size* for dosed systems.
- (3) Every pressurized *distribution pipe* within a *leaching chamber* shall
 - (a) extend over the entire length of the *leaching chamber*,
 - (b) be not less than 1½ in. trade *size*,
 - (c) have orifices of at least 6 mm in diameter, spaced equally along the length of the pipe to provide even distribution of the *effluent*,
 - (d) be supported,
 - (e) be self-draining so as to prevent freezing of its contents, and
 - (f) have cleanouts installed at the downstream end of each line of *leaching chamber* to allow for servicing of the system.

8.7.4. Fill Based Absorption Trenches

8.7.4.1. Loading Requirements

(1) The area described in Sentence 8.7.4.2.(1) shall be designed such that the *loading rate* does not exceed, for *soil* having a *percolation time* set out in Column 1 of Table 8.7.4.1., the maximum value set out opposite it in Column 2 of Table 8.7.4.1.

Table 8.7.4.1.
Loading Rates for Fill Based Absorption Trenches and Filter Beds
 Forming Part of Sentences 8.7.4.1.(1) and 8.7.5.2.(2)

Percolation Time (T) of Soil, min	Loading Rates, (L/m ²)/day
1 < T ≤ 20	10
20 < T ≤ 35	8
35 < T ≤ 50	6
T > 50	4
Column 1	2

8.7.4.2. Construction Requirements

- (1) Except for a *shallow buried trench*, a *leaching bed* comprised of *absorption trenches* may be *constructed* in *leaching bed fill*, if *unsaturated soil* or *leaching bed fill* complying with Subclause 8.7.2.1.(1)(b)(ii) extends
- (a) to a depth of at least 250 mm over the area covered by the *leaching bed fill*, and
 - (b) for at least 15 m beyond the centre lines of the outer *distribution pipes* or *leaching chambers* in any direction in which the *effluent* entering the *soil* or *leaching bed fill* will move horizontally.
- (2) If the *unsaturated soil* or *leaching bed fill* described in Sentence (1) has a *percolation time* greater than 15 min, any additional *leaching bed fill* added to it to form the *leaching bed* shall have a *percolation time* not less than 75% of the *percolation time* of the *unsaturated soil* or *leaching bed fill* to which it is added.
- (3) *Leaching bed fill* that does not meet the requirements of Sentence (2) may be used to form the *leaching bed* if
- (a) the distance from the bottom of the *absorption trench* to the underlying *soil* is not less than 900 mm, or
 - (b) where the distance from the bottom of the *absorption trench* to the underlying *soil* is less than 900 mm, the *percolation time* of the least permeable *soil* or *leaching bed fill* within 900 mm from the bottom of the *absorption trench* is used to calculate the length of the *distribution pipe* under Article 8.7.3.1. or the length of the *leaching chamber* under Article 8.7.3.2.
- (4) Sentence (2) does not apply to any *leaching bed fill* added as backfill above the stone layer in which the *distribution pipe* is located.
- (5) All *leaching bed fill* added shall be stabilized against erosion.
- (6) The site to which the *leaching bed fill* is added shall be generally clear of vegetation.
- (7) The *leaching bed fill* that is added shall be compacted in layers in such a manner as to avoid uneven settlement of the *distribution pipes* or *leaching chambers*.
- (8) Any *distribution boxes*, *header lines*, *absorption trenches*, *distribution pipes* or *leaching chambers* shall be installed only after the *leaching bed fill* has been compacted in accordance with Sentence (7).
- (9) Except as provided in Sentence (10), the sides of the added *leaching bed fill* shall be sloped to ensure stability, but shall not be steeper than one unit vertically to four units horizontally.

(10) The side slope of the *leaching bed fill* may be increased up to one unit vertically to three units horizontally if measures are taken to prevent erosion and ensure stability of the *leaching bed fill*.

(11) The distances set out in Column 2 of Table 8.2.1.6.B. shall be increased by twice the height that the *leaching bed* is raised above the original grade.

8.7.5. Filter Beds

8.7.5.1. Application

- (1) The total daily design *sanitary sewage* flow shall not exceed
 - (a) 5 000 L where the *treatment unit* is a *septic tank*, or
 - (b) 10 000 L where the *treatment unit* is a Level II, Level III or Level IV *treatment unit* as described in Table 8.6.2.2.

8.7.5.2. Loading Requirements

- (1) The effective area of the surface of the filter medium in each filter bed shall be at least 10 m² and not more than 50 m².
- (2) The area described in Sentence 8.7.4.2.(1) shall be designed such that the *loading rate* does not exceed, for *soil* having a *percolation time* set out in Column 1 of Table 8.7.4.1., the maximum value set out opposite it in Column 2 of Table 8.7.4.1.
- (3) Except as provided in Sentence (5), where the total daily design *sanitary sewage* flow does not exceed 3 000 L, the effective area shall be such that the loading on the surface of the filter medium does not exceed 75 L/m² per day.
- (4) Except as provided in Sentence (5), where the total daily design *sanitary sewage* flow exceeds 3 000 L
 - (a) the effective area shall be such that the loading on the surface of the filter medium does not exceed 50 L/m² per day, and
 - (b) the *leaching bed* shall be comprised of more than one filter bed, each of similar size and adjacent to each other.
- (5) Where a Level II, Level III or Level IV *treatment unit* as described in Table 8.6.2.2. is used in conjunction with a filter bed, the effective area shall be such that the loading on the surface of the filter medium does not exceed 100 L/m² per day.

8.7.5.3. Construction Requirements

- (1) Sentences 8.7.4.2.(1), (2) and (4) to (11) apply to the *construction* of a filter bed.
- (2) The lines of *distribution pipes* or *leaching chambers* shall be evenly spaced over the surface of the filter medium to which the *sanitary sewage* is applied, with the outer most *distribution pipe* or *leaching chamber* not more than 600 mm from the perimeter of that area with a maximum spacing between the centre lines of the *distribution pipes* or *leaching chambers* in accordance with Table 8.7.5.3.
- (3) The filter medium shall have a minimum depth of 750 mm below the stone layer or bottom of the *leaching chambers* and shall be clean sand comprised of particles ranging in size between the limits of,
 - (a) an effective size of 0.25 mm with a uniformity coefficient not less than 3.5,
 - (b) an effective size of 2.5 mm with a uniformity coefficient not greater than 1.5, and
 - (c) having a uniformity coefficient not greater than 4.5.

Table 8.7.5.3.
Maximum Spacing Between Centre Lines of Distribution Pipes or Leaching Chambers
 Forming Part of Sentence 8.7.5.3.(2)

Distribution Method	Maximum Spacing Between Centre Lines, mm
<i>Distribution pipes</i>	1 200
Type I <i>leaching chambers</i>	900
Type II <i>leaching chambers</i>	1 000

- (4) The filter medium shall be unsaturated for its entire depth.
- (5) Where there is more than one filter bed in a *leaching bed*, the filter beds shall be separated by at least 5 m between the *distribution pipes* or *leaching chambers* of the filter beds.
- (6) The base of the filter medium shall extend to a thickness of at least 250 mm over an area meeting the requirements of the following formula:

$$A = QT/850$$

where,

A = the area of contact in square metres between the base of the filter medium and the underlying *soil*,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the lesser of 50 and the *percolation time* of the underlying *soil*.

(See Note A-8.7.5.3.(6) and (7))

- (7) The stone layer or bottom of the *leaching chambers* shall be not less than 900 mm above the *high ground water table*, rock or *soil* with a *percolation time* of more than 50 min. (See Note A-8.7.5.3.(6) and (7))

8.7.6. Shallow Buried Trench

8.7.6.1. Construction Requirements (See Note A-8.7.6.1.)

- (1) The *treatment unit* used in conjunction with a *leaching bed constructed as a shallow buried trench* shall provide an *effluent* quality that does not exceed the maximum concentrations set out opposite a Level IV *treatment unit* in Columns 2 and 3 of Table 8.6.2.2.
- (2) The *effluent* shall be distributed through a *pressurized distribution system* having a pressure head of not less than 600 mm when measured to the most distant point from the pump.
- (3) The pump chamber shall be sized to provide sufficient storage volume so that the *effluent* is evenly dosed on an hourly basis over a 24-hour period.
- (4) A *shallow buried trench* shall not be *constructed* unless the *soil* or *leaching bed fill* is sufficiently dry to resist compaction and smearing during excavation.
- (5) Every *chamber* or *leaching chamber* shall be as wide as the *shallow buried trench* in which it is contained, and the cross-sectional height of the *chamber* or *leaching chamber* at its centre point shall not be less than half the width of the trench.
- (6) Every *chamber* or *leaching chamber* shall contain only one *pressurized distribution pipe*.

8.7.7. Type A Dispersal Beds

8.7.7.1. Construction Requirements

(1) The *treatment unit* used in conjunction with a *leaching bed constructed* as a *Type A dispersal bed* shall provide an *effluent* quality that does not exceed the maximum concentrations set out opposite a Level IV *treatment unit* in Columns 2 and 3 of Table 8.6.2.2.

(2) A *Type A dispersal bed* shall be backfilled with *leaching bed fill* so as to ensure that, after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.

(3) The combined thickness of the sand layer and the stone layer if utilized of a *Type A dispersal bed* shall not be less than 500 mm.

(4) Except as provided in Sentence (5), the sand layer shall

- (a) be comprised of sand that has
 - (i) a *percolation time* of at least 6 and not more than 10 min, and
 - (ii) not more than 5% fines passing through a 0.074 mm (No. 200) sieve,
- (b) have a minimum thickness of 300 mm, and
- (c) have an area that is not less than the lesser of
 - (i) the area of the stone layer determined in accordance with Sentence (6) or, if *leaching chambers* are used, the area over which the *leaching chambers* are spaced determined in accordance with Sentence (7), and
 - (ii) the value determined by the formula,

$$A = QT/850$$

where,

A = the area of contact in square metres between the base of the sand and the underlying *soil*,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the lesser of 50 and the *percolation time* of the underlying *soil*.

(5) Where the underlying *soil* has a *percolation time* of more than 15 min, the sand layer referred to in Sentence (4) shall be extended using unsaturated *soil* or *leaching bed fill* having a *percolation time* of not more than 15 min and a depth of at least 300 mm

- (a) to at least 15 m beyond the perimeter of the *treatment unit*, or the centre lines of the outer *distribution pipes* or *leaching chambers* if utilized, in any direction in which the *effluent* entering the *soil* or *leaching bed fill* will move horizontally, and
- (b) over an area that is not less than the value determined by the formula,

$$A = QT/400$$

where,

A = the area of contact in square metres between the combined sand layer and extension and the underlying *soil*, or *leaching bed fill* if utilized,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the lesser of 50 and the *percolation time* of the underlying *soil*.

(See Note A-8.7.7.1.(5))

(6) Where a stone layer is used, the stone layer shall

- (a) be rectangular in shape with the long dimension parallel to the site contours,
- (b) have a minimum thickness of 200 mm,
- (c) be protected in the manner described in Sentence 8.7.3.4.(2), and

- (d) be *constructed* such that the bottom of the stone layer is at least 600 mm above the *high ground water table*, rock or *soil* with a *percolation time* of 1 min or less or greater than 50 min.
- (e) have a minimum area not less than the value determined by the formula,

$$A = Q/B$$

where,

A = the area of the stone layer in square metres,

B = the following amount,

- (i) 50, if the total daily design *sanitary sewage* flow exceeds 3 000 litres, or
- (ii) 75, if the total daily design *sanitary sewage* flow does not exceed 3 000 litres, and

Q = the total daily design *sanitary sewage* flow in litres.

(7) Where *leaching chambers* are used

- (a) the *Type A dispersal bed* shall be rectangular in shape with the long dimension parallel to the site contours, and
- (b) the *leaching chambers* shall

- (i) be evenly spaced over the area calculated in Subclause (iv), with a maximum distance of 200 mm between the exterior edges of the lines of *leaching chamber*,
- (ii) be protected in the manner described in Clause 8.7.3.5.(1)(f),
- (iii) be *constructed* such that the bottom of the *leaching chambers* is at least 600 mm above the *high ground water table*, rock or *soil* with a *percolation time* of 1 min or less or greater than 50 min, and
- (iv) have a minimum area not less than the value determined by the formula,

$$A = Q/B$$

where,

A = the area over which the *leaching chambers* are spaced, in square metres,

B = the following amount,

- (i) 50, if the total daily design *sanitary sewage* flow exceeds 3 000 litres, or
- (ii) 75, if the total daily design *sanitary sewage* flow does not exceed 3 000 litres, and

Q = the total daily design *sanitary sewage* flow in litres.

(8) *Leaching bed fill* with a *percolation time* not exceeding 15 min may be used to satisfy the vertical separation requirements of Clause (6)(d) or Subclause (7)(b)(iii), provided that the *leaching bed fill* conforms to the requirements specified in Sentence (5) regardless of the *percolation time* of the underlying *soil*.

(9) Where a stone layer is used, the *effluent* shall be evenly distributed within the stone layer to within 600 mm of the perimeter of the stone layer. (See Note A-8.7.7.1.(9))

(10) Where *leaching chambers* are used, the *effluent* shall be evenly distributed within the area over which the *leaching chambers* are spaced to within 600 mm of the perimeter of that area.

(11) The stone layer or area over which the *leaching chambers* are spaced shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.B. and these distances shall be increased when required by Sentence 8.7.4.2.(11).

8.7.8. Type B Dispersal Beds

8.7.8.1. General Requirements

- (1) Except as provided in Sentence (2) and Sentence 8.7.8.2.(2), a *Type B dispersal bed* shall conform to the requirements of Article 8.7.2.1.
- (2) A *Type B dispersal bed* shall not be located in an area that has an average slope that exceeds one unit vertically to seven units horizontally.

8.7.8.2. Construction Requirements

- (1) The *treatment unit* used in conjunction with a *leaching bed constructed as a Type B dispersal bed* shall provide an *effluent* quality that does not exceed the maximum concentrations set out opposite a Level IV *treatment unit* in Columns 2 and 3 of Table 8.6.2.2.
- (2) A *Type B dispersal bed* shall be
 - (a) rectangular in shape with the long dimension parallel to the site contours,
 - (b) not more than 1 000 mm in depth measured from the bottom of the stone layer to the finished grade when installed in *soil* with a *percolation time* that exceeds 15 min, and
 - (c) backfilled with *leaching bed fill* so as to ensure that, after the *leaching bed fill* settles, the surface of the *leaching bed* will not form any depressions.
- (3) The bottom of the stone layer shall be at least 600 mm above the *high ground water table*, rock or *soil* with a *percolation time* greater than 50 min.
- (4) The *effluent* shall be distributed over the *Type B dispersal bed* through a *pressurized distribution system* having a pressure head of not less than 600 mm when measured to the most distant point from the pump.
- (5) The *distribution pipes* shall
 - (a) be self-draining so as to prevent freezing of their contents, and
 - (b) have orifices of at least 3 mm in diameter, spaced equally along the length of the pipes.
- (6) The stone layer containing the *distribution pipes* shall
 - (a) be comprised of washed septic stone, free of fine material, with gradation conforming to Table 8.7.3.4.,
 - (b) extend not less than 250 mm below the *distribution pipe*, and
 - (c) extend not less than 50 mm above the *distribution pipe*.
- (7) The *distribution pipes* shall be spaced not more than 1.2 m apart with the outermost pipe spaced not more than 600 mm from the edge of the bed.
- (8) The pump chamber shall be sized to provide sufficient storage volume so that the *effluent* is evenly dosed on an hourly basis over a 24-hour period.
- (9) When there is more than one *Type B dispersal bed* in a *leaching bed*, the *Type B dispersal beds* shall be separated by at least 5 m measured from the edge of the stone layers.
- (10) A *Type B dispersal bed* shall not be located closer than the minimum horizontal distances set out in Table 8.2.1.6.B. and these distances shall be increased when required by Sentence 8.7.4.2.(11).

8.7.8.3. Design Requirements (See Note A-8.7.8.3.)

- (1) The area of a *Type B dispersal bed* shall not be less than the minimum area determined in accordance with Clause (2)(a) or (b).

- (2) For the purposes of Sentence (1), the minimum area is either of the following:
- (a) the area calculated based on the *loading rates* for Type 2 effluent set out in the Column headed “Type 2” found in Table 2-8 of the BCMOH, “Sewerage System Standard Practice Manual,” or
 - (b) the value determined by the formula,

$$A = QT/400$$

where,

A = the area of contact in square metres between the stone layer and the underlying *soil*,

Q = the total daily design *sanitary sewage* flow in litres, and

T = the *percolation time* of the underlying *soil*.

- (3) The linear *loading rates* of the underlying *soil* shall not be greater than
- (a) the linear *loading rates* set out in Table 2-11 of BCMOH, “Sewerage System Standard Practice Manual,” where the area of the *Type B dispersal bed* is determined in accordance with Clause (2)(a), or
 - (b) the following linear *loading rate*, where the area of the *Type B dispersal bed* is determined in accordance with Clause (2)(b)
 - (i) 40 L/m, for *soil* having a *percolation time* equal to or greater than 24 min, or
 - (ii) 50 L/m, for *soil* having a *percolation time* less than 24 min.
- (4) The width of a *Type B dispersal bed* shall not exceed 4 m.

Section 8.8. Class 5 Sewage Systems

8.8.1. Application

8.8.1.1. Prohibited Installation

- (1) Except as provided in Article 8.8.1.2., a Class 5 *sewage system* shall not be installed.

8.8.1.2. Acceptable Installation

- (1) A Class 5 *sewage system* may be installed in the following circumstances:
- (a) where the proposed use of the *sewage system* is for a temporary operation, excluding seasonal recreational use, not exceeding 12 months in duration,
 - (b) to remedy an unsafe *sewage system* where the remediation of the unsafe condition by the installation of a Class 4 *sewage system* is impracticable,
 - (c) to upgrade a *sewage system* serving an existing *building*, where upgrading through the use of a Class 4 *sewage system* is not possible due to lot size, site slope or clearance limitations, or
 - (d) as an interim measure for a lot or parcel of land until municipal sewers are available, provided that the municipality undertakes to ensure the continued operation of an approved *hauled sewage system* until the municipal sewers are available.
- (2) Where a Class 5 *sewage system* is installed, a written agreement for the disposal of *sanitary sewage* from the *sewage system* shall be entered into with a *hauled sewage system* operator.

8.8.2. General Requirements

8.8.2.1. Construction Requirements

- (1) All Class 5 *sewage systems* shall be equipped with a device that shall produce an audible and visual warning alarm so located to warn that the *sewage system* is nearing capacity.
- (2) The device required in Sentence (1) shall be designed to provide suitable advance warning to the *building* occupants considering
 - (a) the total daily design *sanitary sewage* flow,
 - (b) the location of the Class 5 *sewage system*, and
 - (c) the response time of the *hailed sewage system* contractor.
- (3) Except as provided in Sentence (4), all *holding tanks* shall be provided with a vent that
 - (a) is not less than 3 in. trade *size*,
 - (b) terminates at least,
 - (i) 300 mm above finished grade with a vent cap, or
 - (ii) 600 mm above finished grade with a vent cap when the *holding tank* is located in an area subject to flooding, and
 - (c) terminates at least 3.5 m away from any air inlet, window, or door.
- (4) A vent from a *holding tank* may connect into the *venting system* of the *building* served by the *holding tank* provided that,
 - (a) the vent is not less than 3 in. trade *size*, and
 - (b) the installation of the vent shall conform to the requirements in Part 7.

8.8.2.2. Sizing of Holding Tanks

- (1) All *holding tanks* used in residential dwellings shall have a minimum 7 day holding capacity based on the total daily design *sanitary sewage* flow.

Section 8.9. Operation and Maintenance

8.9.1. General

8.9.1.1. Scope

- (1) This Section applies to the operation and maintenance of all *sewage systems*.

8.9.1.2. General Requirements for Operation and Maintenance

- (1) Every *sewage system* shall be operated and maintained so that
 - (a) the *sewage system* or any part of it shall not emit, discharge or deposit *sanitary sewage* or *effluent* onto the surface of the ground,
 - (b) *sanitary sewage* or *effluent* shall not emit, discharge, seep, leak or otherwise escape from the *sewage system* or any part of it other than from a place or part of the *sewage system* where the system is designed or intended to discharge the *sanitary sewage* or *effluent*, and
 - (c) except as provided in Sentence (2), *sanitary sewage* or *effluent* shall not emit, discharge, seep, leak or otherwise escape from the *sewage system* or any part of it into a piped water supply, well water supply, a watercourse, *ground water* or *surface water*.

(2) Clause (1)(c) does not apply to the use of a *sewage system* designed and operated such that properly treated *effluent* is discharged into *soil*.

8.9.2. Operation

8.9.2.1. Scope

(1) The requirements of this Subsection are in addition to the requirements of Subsection 8.9.1.

8.9.2.2. General

- (1) Every *sewage system* shall be operated in accordance with
- the basis on which the *construction* and use of the *sewage system* was approved or required under the Act or predecessor legislation, as the case may be, and
 - the requirements of the manufacturer of the *sewage system*.

8.9.2.3. Class 4 Sewage Systems

- (1) Every Class 4 *sewage system* shall be operated in accordance with the literature required by Sentence 8.6.2.2.(6).
- (2) No person shall operate a *treatment unit* other than a *septic tank* unless the person has entered into an agreement whereby servicing and maintenance of the *treatment unit* and its related components will be carried out by a person who
- possesses a copy of the literature required by Sentence 8.6.2.2.(6), and
 - is authorized by the manufacturer to service and maintain that type of *treatment unit*.
- (3) The person authorized by the manufacturer to service and maintain the *treatment unit* and who has entered into the agreement referred to in Sentence (2) with the person operating the *treatment unit* shall notify the *chief building official* if,
- the agreement is terminated, or
 - access for service and maintenance of the *treatment unit* is denied by the person operating the *treatment unit*.

8.9.2.4. Sampling of Treatment Units

- (1) Every person operating a *treatment unit* that is used in conjunction with a *leaching bed constructed as a shallow buried trench, Type A dispersal bed or Type B dispersal bed* shall
- take a grab sample of the *effluent* to determine the level of CBOD₅ and suspended solids in the *effluent*,
 - carry out the sampling required by Clause (1)(a) in accordance with the methods described in the APHA/AWWA/WEF, “Standard Methods for the Examination of Water and Wastewater,” and
 - promptly submit the results of the sampling required by Clause (a) to the *chief building official*.
- (2) Except as provided in Sentence (4), the sampling required by Sentence (1) shall be conducted
- initially, once during the first 12 months after the *sewage system* was put into use, and
 - thereafter, once during every 12 month period, at least 10 months and not more than 18 months after the previous sampling has been completed.
- (3) The concentration of CBOD₅ and suspended solids in the grab sample described in Sentences (1) and (4) is deemed to comply with the maximum concentration requirements set out in Table 8.6.2.2. when it does not exceed 20 mg/L for each of these parameters.
- (4) If the results of the sampling required by Sentence (1) do not comply with Sentence (3), the person operating the *treatment unit* shall
- resample the *effluent* in accordance with Clauses (1)(a) and (b) within 6 months after the previous sampling has been completed, and
 - promptly submit the results of the resampling required by Clause (a) to the *chief building official*.

8.9.2.5. Class 5 Sewage Systems

- (1) Every Class 5 *sewage system* shall be operated in accordance with the agreement referred to in Sentence 8.8.1.2.(2).
- (2) No Class 5 *sewage system* shall be operated once it is filled with *sanitary sewage* until such time as the *sanitary sewage* is removed from the *sewage system*.

8.9.3. Maintenance

8.9.3.1. Scope

- (1) The requirements of this Subsection are in addition to the requirements of Subsection 8.9.1.

8.9.3.2. General

- (1) Every *sewage system* shall be maintained so that
 - (a) the *construction* of the *sewage system* remains in accordance with
 - (i) the basis on which the *construction* and use of the *sewage system* was approved or required under the Act or predecessor legislation, as the case may be, and
 - (ii) the requirements of the manufacturer of the *sewage system*, and
 - (b) all components of the *sewage system* function in their intended manner.
- (2) The land in the vicinity of a *sewage system* shall be maintained in a condition that will not cause damage to, or impair the functioning of, the *sewage system*.

8.9.3.3. Interceptors

- (1) Every grease *interceptor* referred to in Article 8.1.3.1. shall be maintained in accordance with CSA B481.4, “Maintenance of grease interceptors.”

8.9.3.4. Class 4 Sewage Systems

- (1) *Septic tanks* and other *treatment units* shall be cleaned whenever sludge and scum occupy one-third of the *working capacity* of the tank.

8.9.3.5. Pressurized Distribution Systems

- (1) The pressure head at the furthest point from the pump in all *distribution pipes* shall be checked for compliance with Articles 8.7.6.1. and 8.7.8.2. and the design specification at least every 36 months.

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Housing and Small Buildings

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Part 9

Housing and Small Buildings

Section 9.1. General

9.1.1. Application

9.1.1.1. Application

- (1) The application of this Part shall be as described in Subsection 1.3.3. of Division A.

9.1.1.2. Signs

- (1) Signs shall conform to the requirements in Section 3.15.

9.1.1.3. Self-Service Storage Buildings

- (1) *Self-service storage buildings* shall conform to the requirements in Section 3.10.

9.1.1.4. Tents and Air-Supported Structures

- (1) Tents shall conform to the requirements in Subsection 3.14.1.
- (2) *Air-supported structures* shall conform to the requirements in Subsection 3.14.2.

9.1.1.5. Proximity to Existing Above Ground Electrical Conductors

- (1) Where a *building* is constructed in close proximity to existing above ground electrical conductors, the requirements of Subsection 3.1.20. shall apply.

9.1.1.6. Food Premises

- (1) The requirements of Subsection 3.7.6. apply to all *food premises*.

9.1.1.7. Radon

- (1) In addition to all other requirements, a *building* in the following designated areas shall be designed and constructed so that the annual average concentration of radon 222 does not exceed 200 Bq/m³ of air and the annual average concentration of the short lived daughters of radon 222 does not exceed 0.02 working levels inside the *building* for,
- the City of Elliot Lake in the Territorial District of Algoma,
 - the Township of Faraday in the County of Hastings, and
 - the geographic Township of Hyman in the Territorial District of Sudbury.

9.1.1.8. Building in Flood Plains

- (1) *Buildings* constructed on flood plains shall,
 - (a) be designed and constructed in accordance with good engineering practice to withstand anticipated vertical and horizontal hydrostatic pressures acting on the structure, and
 - (b) incorporate floodproofing measures that will preserve the integrity of *exits* and *means of egress* during times of flooding.

9.1.1.9. Site Assembled and Factory-Built Buildings (See Note A-9.1.1.9.)

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- (1) Except as provided in Sentence (2) and in Sentence 12.2.1.2.(2), a manufactured *building* is deemed to comply with this Code if it is designed and constructed in compliance with,
 - (a) CSA Z240.2.1, “Structural requirements for manufactured homes,” if the *building* is constructed in sections not wider than 4.88 m, or
 - (b) CSA A277, “Procedure for certification of prefabricated buildings, modules, and panels.”
 - (2) The requirements of this Code shall apply to,
 - (a) *building* components designed and constructed outside the place of manufacture, and
 - (b) site installation of such *buildings*.

9.1.1.10. Public Pools and Public Spas

- (1) *Public pools* shall conform to the requirements of Section 3.11. and *public spas* shall conform to the requirements of Section 3.12.

9.1.1.11. Shelf and Rack Storage Systems

- (1) *Shelf and rack storage systems* shall conform to the requirements of Section 3.16.

Section 9.2. Definitions

9.2.1. General

9.2.1.1. Defined Words

- (1) Words in italics are defined in Article 1.4.1.2. of Division A.

Section 9.3. Materials, Systems and Equipment

9.3.1. Concrete

9.3.1.1. General

- (1) Except as provided in Sentence (2) and Articles 9.3.1.6. and 9.3.1.7., unreinforced and nominally reinforced concrete shall be designed, mixed, placed, cured and tested in accordance with the requirements for “R” class concrete stated in Section 9 of CSA A23.1, “Concrete materials and methods of concrete construction.”

- (2) Unreinforced and nominally reinforced site-batched concrete shall be designed, mixed, placed and cured in accordance with Articles 9.3.1.2. to 9.3.1.9.
- (3) Except as provided in Sentence (4), Subsection 9.15.4. and Section 9.40., reinforced concrete shall be designed to conform to the requirements of Part 4.
- (4) For flat insulating concrete form walls not exceeding 2 storeys in *building height* and having a maximum floor to floor height of 3 m, in *buildings* of light-frame construction, the concrete and reinforcing shall comply with Part 4 or
 - (a) the concrete shall conform to CSA A23.1, “Concrete materials and methods of concrete construction,” with a maximum aggregate size of 19 mm, and
 - (b) the reinforcing shall,
 - (i) conform to CSA G30.18, “Carbon steel bars for concrete reinforcement”,
 - (ii) have a minimum specified yield strength of 400 MPa, and
 - (iii) be lapped a minimum of 450 mm for 10M bars and 650 mm for 15M bars. (See also Articles 9.15.4.5. and 9.20.17.2. to 9.20.17.4.)

9.3.1.2. Cement

- (1) Cement shall meet the requirements of CSA A3001, “Cementitious materials for use in concrete.”

9.3.1.3. Concrete in Contact With Sulfate Soil

- (1) Concrete in contact with sulphate *soil*, which is deleterious to normal cement, shall conform to the requirements in Clause 4.1.1.6 of CSA A23.1, “Concrete materials and methods of concrete construction.”

9.3.1.4. Aggregates

- (1) Aggregates shall
 - (a) consist of sand, gravel, crushed rock, crushed air-cooled blast furnace slag, expanded shale or expanded clay conforming to CSA A23.1, “Concrete materials and methods of concrete construction,” and
 - (b) be clean, well-graded and free of injurious amounts of organic and other deleterious material.

9.3.1.5. Water

- (1) Water shall be clean and free of injurious amounts of oil, organic matter, sediment or any other deleterious material.

9.3.1.6. Compressive Strength

(See also Article 9.12.4.1., Sentence 9.15.4.2.(1) and Article 9.18.6.1.)

- (1) Except as provided elsewhere in this Part, the compressive strength of unreinforced concrete after 28 days shall be not less than,
 - (a) 32 MPa for garage floors, carport floors and all exterior flatwork,
 - (b) 20 MPa for interior floors other than those for garages and carports, and
 - (c) 15 MPa for all other applications.
- (2) Site-batched concrete used for garage floors, carport floors and exterior flatwork shall have air entrainment of 5 to 8%.

9.3.1.7. Concrete Mixes (See Note A-9.3.1.7.)

- (1) For pre-mixed concrete and for the site-batched concrete mixes described in Table 9.3.1.7., the maximum ratio of water to cementing materials measured by weight shall not exceed
- 0.45 for garage floors, carport floors and all exterior flatwork,
 - 0.65 for interior floors other than those for garages and carports, and
 - 0.70 for all other applications.
- (2) The size of aggregate in unreinforced site-batched concrete mixes referred to in Sentence (1) shall not exceed,
- 1/5 the distance between the sides of vertical forms, or
 - 1/3 the thickness of flatwork.

Table 9.3.1.7.
Site-Batched Concrete Mixes
 Forming Part of Sentence 9.3.1.7.(1)

Maximum Size of Coarse Aggregate, mm	Materials, volume					
	Cementing Material		Fine Aggregate (damp average coarse sand)		Coarse Aggregate (gravel or crushed stone)	
	Parts ⁽¹⁾	L	Parts	L	Parts	L
14	1	28	1.75	49	2	56
20	1	28	1.75	49	2.5	70
28	1	28	2	56	3	84
40	1	28	2	56	3.5	98

Notes to Table 9.3.1.7.:

- (1) 1 part cementing material = 1 × 40 kg bag

9.3.1.8. Admixtures

- (1) Admixtures shall conform to ASTM C260 / C260M, “Standard Specification for Air-Entraining Admixtures for Concrete,” or ASTM C494 / C494M, “Standard Specification for Chemical Admixtures for Concrete,” as applicable.

9.3.1.9. Cold Weather Requirements

- (1) When the air temperature is below 5°C, concrete shall be
- kept at a temperature of not less than 10°C or more than 25°C while being mixed and placed, and
 - maintained at a temperature of not less than 10°C for 72 h after placing.
- (2) No frozen material or ice shall be used in concrete described in Sentence (1).

9.3.2. Lumber and Wood Products**9.3.2.1. Grade Marking**

- (1) Lumber for joists, rafters, trusses and beams and for the uses listed in Table 9.3.2.1. shall be identified by a grade stamp to indicate its grade as determined by the NLGA, “Standard Grading Rules for Canadian Lumber.” (See Note A-9.3.2.1.(1))

Table 9.3.2.1.
Minimum Lumber Grades for Specific End Uses
 Forming Part of Sentences 9.3.2.1.(1) and 9.3.2.2.(1)

Use	Boards ⁽¹⁾			Framing
	Paragraph in the NLGA Grading Rules Under Which Boards are Graded			All Species
	All Species		Eastern White Pine & Red Pine	
	Para 113	Para 114	Para 118	
Stud wall framing (<i>loadbearing</i> members)	—	—	—	Stud, Standard, No. 2
Stud wall framing (<i>non-loadbearing</i> members)	—	—	—	Stud, Utility, No. 3
Plank frame construction (<i>loadbearing</i> members)	No. 3 Common	—	No. 3 Common	No. 2
Plank frame construction (<i>non-loadbearing</i> members)	No. 5 Common	—	No. 5 Common	Economy, No. 3
Post and beams less than 114 mm in thickness	—	—	—	Standard, No.2
Post and beams not less than 114 mm in thickness	—	—	—	Standard
Roof sheathing	No. 3 Common	Standard	No. 4 Common	—
Subflooring	No. 3 Common	Standard	No. 3 Common	—
Wall sheathing when required as a nailing base	No. 4 Common	Utility	No. 4 Common	—
Wall sheathing not required as a nailing base	No. 5 Common	Economy	No. 5 Common	—

Notes to Table 9.3.2.1.:

(1) See Note A-Table 9.3.2.1.

9.3.2.2. Lumber Grades

(1) Except for joists, rafters, trusses and beams, visually graded lumber shall conform to the grades in Table 9.3.2.1. (See Article 9.23.4.2. for joists, rafters and beams and Article 9.23.14.11. for trusses.)

9.3.2.3. Machine Stress Rated Lumber

(1) Machine stress rated lumber shall conform to the requirements of Subsection 4.3.1.

9.3.2.4. OSB, Waferboard and Plywood Marking

(1) OSB, waferboard and plywood used for roof sheathing, wall sheathing and subflooring shall be legibly identified on the face of the material indicating,

- (a) the manufacturer of the material,
- (b) the standard to which it is produced, and
- (c) that the material is of an exterior type.

9.3.2.5. Moisture Content

(1) Moisture content of lumber shall be not more than 19% at the time of installation.

9.3.2.6. Lumber Dimensions

- (1) Lumber dimensions referred to in this Part are actual dimensions determined in conformance with CSA O141, “Softwood Lumber.”

9.3.2.7. Panel Thickness Tolerances

- (1) The thicknesses specified in this Part for plywood, hardboard, particleboard, OSB and waferboard shall be subject to the tolerances permitted in the standards referenced for these products unless specifically indicated herein.

9.3.2.8. Undersized Lumber

- (1) Joist, rafter, lintel and beam members up to 5% less than the actual Canadian standard sizes are permitted to be used provided the allowable spans for the grade and species of lumber under consideration are reduced 5% from those shown in the Span Tables for full size members. (See Note A-9.3.2.8.(1))

9.3.2.9. Termite and Decay Protection

- (1) In localities where termites are known to occur,
- (a) clearance between structural wood elements and the finished ground level directly below them shall be not less than 450 mm and, except as provided in Sentence (2), all sides of the supporting elements shall be visible to permit inspection, or
 - (b) structural wood elements, supported by elements in contact with the ground or exposed over bare soil, shall be pressure-treated with a chemical that is toxic to termites.
- (See Note A-9.3.2.9.(1))

- (2) In localities where termites are known to occur and *foundations* are insulated or otherwise finished in a manner that could conceal a termite infestation,

- (a) a metal or plastic barrier shall be installed through the insulation and any other separation or finish materials above finished ground level to control the passage of termites behind or through the insulation, separation or finish materials, and
- (b) all sides of the finished supporting assembly shall be visible to permit inspection.

- (3) Structural wood elements shall be pressure-treated with a preservative to resist decay where the vertical clearance between structural wood elements and the finished ground level is less than 150 mm. (See Note A-9.3.2.9.(3))

(3.1) In localities where termites are known to occur and where windows or other openings at or below *grade* contain wood elements, the bottom of window wells or adjacent ground shall be at least 150 mm below the nearest wood unless the wood is pressure-treated with a chemical toxic to termites.

- (4) Structural wood elements used in retaining walls and cribbing shall be pressure-treated with a preservative to resist decay, where

- (a) the retaining wall or cribbing supports ground that is critical to the stability of *building foundations*, or
- (b) the retaining wall or cribbing is greater than 1.2 m in height.

(See Note A-9.3.2.9.(4))

- (5) Where wood is required by this Article to be treated to resist termites or decay, such treatment shall be in accordance with Table 2, “Use Categories for Specific Products, Uses, and Exposures,” of CAN/CSA-O80.1, “Specification of treated wood,” as follows:

- (a) Use Category 1 (UC1), where the wood member is used in
 - (i) interior construction,
 - (ii) above-ground applications, and
 - (iii) applications where the wood member remains dry,

- (b) Use Category 2 (UC2), where the wood member is used in
 - (i) interior construction,
 - (ii) above-ground applications, and
 - (iii) applications where the wood member may be subjected to occasional sources of moisture,
 - (c) Use Category 3.2 (UC3.2), where the wood member is used in
 - (i) exterior construction,
 - (ii) above-ground applications, and
 - (iii) applications where the wood member is uncoated or is used in a configuration conducive to moisture accumulation,
 - (d) Use Category 4.1 (UC4.1), where
 - (i) the wood member is used in contact with the ground,
 - (ii) the wood member is used in contact with fresh water, or
 - (iii) the vertical clearance between the wood element and the finished ground level is less than 150 mm and the wood elements are not separated from permeable supporting materials by a moisture barrier, or
 - (e) Use Category 4.2 (UC4.2), where the wood member is used in critical structural components, including permanent wood *foundations*.
- (6) Where wood is protected in accordance with UC1 or UC2 using an inorganic boron preservative, the wood shall be
- (a) protected from direct exposure to water during and after the completion of construction, and
 - (b) separated from permeable supporting materials by a moisture barrier that is resistant to all expected mechanisms of deterioration in the service environment if the vertical clearance to the ground is less than 150 mm.
- (7) Wood that is required by this Article to be treated to resist termites or decay shall be identified by a mark to indicate the type of preservative used and conformance to the relevant required Use Category.

9.3.3. Metal

9.3.3.1. Sheet Metal Thickness

- (1) Minimum thicknesses for sheet metal material that are stated in this Part refer to the actual minimum base metal thicknesses measured at any point of the material, and in the case of galvanized steel described in Sentence 9.3.3.2.(1), include the thickness of the galvanizing coating unless otherwise indicated.

9.3.3.2. Galvanized Sheet Steel

- (1) Where sheet steel is required to be galvanized, it shall be metallic-coated with zinc or an alloy of 55% aluminum-zinc meeting the requirements of
- (a) ASTM A653 / A653M, “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process,” or
 - (b) ASTM A792 / A792M, “Standard Specification for Sheet Steel, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.”
- (2) Where galvanized sheet steel is intended for use in locations exposed to the weather or as a flashing material, it shall have a zinc coating not less than the G90 (Z275) coating designation or an aluminum-zinc alloy coating not less than the AZM150 coating designation, as referred to in Sentence (1).

Section 9.4. Structural Requirements

9.4.1. Structural Design Requirements and Application Limitations

9.4.1.1. General (See Note A-9.4.1.1.)

- (1) Subject to the application limitations defined elsewhere in this Part, structural members and their connections shall
 - (a) conform to requirements provided elsewhere in this Part,
 - (b) be designed according to good engineering practice such as provided in the CWC 2014, “Engineering Guide for Wood Frame Construction,” or
 - (c) be designed according to Part 4 using the loads and deflection and vibration limits specified in,
 - (i) this Part, or
 - (ii) Part 4.
- (2) Where floor framing is designed in accordance with Clause (1)(b) or (c) and where supporting wall framing and fastenings, or footings, are designed according to Clause (1)(a), the maximum specified *live load* on the floor according to Table 4.1.5.3. shall not exceed 2.4 kPa.
- (3) Location-specific information for structural design, including snow and wind loads and seismic spectral response accelerations, shall be determined according to MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.” (See Note A-9.4.1.1.(3))

9.4.2. Specified Loads

9.4.2.1. Application (See Note A-9.4.2.1. and 9.4.2.2.)

- (1) This Subsection applies to light-frame construction whose wall, floor and roof planes are generally comprised of frames of small repetitive structural members, and where
 - (a) the roof and wall planes are clad, sheathed or braced on at least one side,
 - (b) the small repetitive structural members are spaced not more than 600 mm o.c.,
 - (c) the clear span of any structural member does not exceed 12.2 m,
 - (d) the maximum deflection of the structural roof members conforms to Article 9.4.3.1.,
 - (e) the maximum total roof area, notwithstanding any separation of adjoining *buildings* by *firewalls*, is 4 550 m², and
 - (f) for flat roofs, there are no significant obstructions on the roof, such as parapet walls, spaced closer than the distance calculated by

$$D_o = 10(H_o - 0.8 S_s / \gamma)$$

where

D_o = minimum distance between obstructions, m,

H_o = height of the obstruction above the roof, m,

S_s = ground snow load, kPa, and

γ = specific weight of snow taken as 4.0 kN/m³ or 0.43 S_s + 2.2 kN/m³, whichever is lesser.

9.4.2.2. Specified Snow Loads (See Note A-9.4.2.1. and 9.4.2.2.)

- (1) Except as provided in Sentences (2) and (4), specified snow loads shall be not less than those calculated using the following formula:

$$S = C_b S_s + S_r$$

where

S = specified snow load,

C_b = basic snow load roof factor, which is 0.45 where the entire width of a roof does not exceed 4.3 m and 0.55 for all other roofs,

S_s = 1-in-50 year ground snow load in kPa, determined according to MMAH Supplementary Standard SB-1, “Climatic and Seismic Data,” and

S_r = associated 1-in-50 year rain load in kPa, determined according to MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”

- (2) In no case shall the specified snow load be less than 1 kPa.
- (3) Bow string, arch or semi-circular roof trusses having an unsupported span greater than 6 m shall be designed in conformance with the snow load requirements in Subsection 4.1.6.
- (4) Where the height of a roof step at the intersection of an upper level roof and a lower level roof is greater than 2 m, and the upper level roof has a slope less than 1 in 6 and an area greater than 600 m², the specified snow load on the lower level roof shall be
 - (a) for distances from the roof step that are less than or equal to the drift length, x_d , calculated in accordance with Sentence (5), not less than 1.5 times the specified snow load, S , calculated using the formula in Sentence (1) with C_b equal to 0.55, and
 - (b) for distances from the roof step that are greater than the drift length, x_d , calculated in accordance with Sentence (5), as specified in Sentence (1).
- (5) For the purposes of Sentence (4), the drift length, x_d , in m, shall be calculated as follows:

$$x_d = 5 \left(h - \frac{0.55S_s}{\gamma} \right)$$

where

h = height of the roof step, in m, and

γ = specific weight of snow as specified in Clause 9.4.2.1.(1)(f).

9.4.2.3. Platforms Subject to Snow and Occupancy Loads

- (1) Balconies, decks and other accessible exterior platforms intended for an *occupancy* and subject to snow loads shall be designed to carry the specified roof snow load or 1.9 kPa, whichever is greater, where the platform, or each segregated area of the platform, serves a single *dwelling unit*. (See Note A-9.4.2.3.(1))

9.4.2.4. Attics and Roof Spaces

- (1) Ceiling joists or truss bottom chords in residential *attic or roof spaces* having limited accessibility that precludes the storage of equipment or material shall be designed for a total specified load of not less than 0.35 kPa, where the total specified load is the sum of the specified *dead load* plus the specified *live load* of the ceiling. (See Note A-9.4.2.4.(1))

9.4.3. Deflections

9.4.3.1. Deflections

- (1) The maximum deflection of structural members shall conform to Table 9.4.3.1.
- (2) *Dead loads* need not be considered in computing deflections referred to in Sentence (1).

Table 9.4.3.1.
Maximum Deflections
 Forming Part of Sentence 9.4.3.1.(1)

Structural Members	Type of Ceiling Supported	Max. Allowable Deflection as an Expressed Ratio of the Clear Span
Roof rafters, roof joists and roof beams	No ceiling	1/180
	Other than plaster or gypsum board	1/240
	Plaster or gypsum board	1/360
Ceiling joists	Other than plaster or gypsum board	1/240
	Plaster or gypsum board	1/360
Floor beams, floor joists and floor decking	All cases	1/360
Beams, joists and decking for balconies, decks and other accessible exterior platforms	Serving a single <i>dwelling unit</i>	1/240
	Other	1/360

9.4.4. Foundation Conditions

9.4.4.1. Allowable Bearing Pressures

- (1) Footing sizes for *shallow foundations* shall be
- determined in accordance with Section 9.15., or
 - designed in accordance with Section 4.2. using,
 - the maximum *allowable bearing pressures* in Table 9.4.4.1., or
 - allowable bearing pressures* determined from *subsurface investigation*.
- (2) The design procedures described in Section 4.2. are permitted to be used in lieu of the design procedures in this Subsection.

Table 9.4.4.1.
Allowable Bearing Pressure for Soil or Rock
 Forming Part of Sentence 9.4.4.1.(1)

Type and Condition of Soil or Rock	Maximum Allowable Bearing Pressure, kPa
Dense or compact sand or gravel ⁽¹⁾	150
Loose sand or gravel ⁽¹⁾	50
Dense or compact silt ⁽¹⁾	100
Stiff clay ⁽¹⁾	150
Firm clay ⁽¹⁾	75
Soft clay ⁽¹⁾	40
Till	200
Clay shale	300
Sound rock	500

Notes to Table 9.4.4.1.:

- (1) See Note A-Table 9.4.1.1.

- (3) The design procedures described in Section 4.2. shall be used where,
 - (a) *deep foundations* are used,
 - (b) the footing size falls outside the scope of this Section, or
 - (c) the *foundation* is constructed on peat, filled ground or on sensitive clays as described in Article 9.15.1.1.

9.4.4.2. Foundation Capacity in Weaker Soil and Rock

(1) Where a *soil* or *rock* within a distance equal to twice the footing width below the *bearing surface* has a lower *allowable bearing pressure* than that at the *bearing surface* as shown in Article 9.4.4.1., the design capacity of the *foundation* shall not be greater than would cause the weakest *soil* or *rock* to be stressed beyond its *allowable bearing pressure*.

(2) In calculating subsurface pressures referred to in Sentence (1), the loads from the footings shall be assumed to be distributed uniformly over a horizontal plane within a frustum extending downward from the footing at an angle of 60° to the horizontal.

9.4.4.3. High Water Table

(1) Where a *foundation* bears on gravel, sand or silt, and the water table is within a distance below the *bearing surface* equal to the width of the *foundation*, the *allowable bearing pressure* shall be 50% of that determined in Article 9.4.4.1.

9.4.4.4. Soil Movement

(1) Where a *foundation* is located in an area where *soil* movement caused by changes in *soil* moisture content, freezing, or chemical-microbiological oxidation is known to occur to the extent that it will damage a *building*, measures shall be taken to preclude such movement or to reduce the effects on the *building* so that the *building's* stability and the performance of assemblies will not be adversely affected. (See Note A-9.4.4.4.(1))

9.4.4.5. Reserved

9.4.4.6. Walls Supporting Drained Earth (See Note A-9.4.4.6. and 9.15.1.1.)

- (1) Except where constructed in accordance with Section 9.15., walls supporting drained earth shall be designed
 - (a) for a pressure equivalent to that exerted by a fluid with a density of not less than 480 kg/m³ and a depth equal to that of the retained earth, or
 - (b) in accordance with Section 4.2. so as to be able to resist the loads and effects described in Article 4.1.2.1.
- (2) Walls supporting other than drained earth shall be designed
 - (a) for the pressure described in Clause (1)(a) plus the fluid pressure of the surcharge, or
 - (b) in accordance with Section 4.2. so as to be able to resist the loads and effects described in Article 4.1.2.1.

Section 9.5. Design of Areas, Spaces and Doorways

9.5.1. General

9.5.1.0A. Application

(1) Except as otherwise specified in this Part, this Section applies only to *dwelling units* that are intended for use on a continuing or year-round basis as the principal residence of the occupant.

9.5.1.1. Method of Measurement

(1) Except as otherwise specified in this Part, the areas, dimensions and heights of rooms or spaces shall be measured between finished wall surfaces and between finished floor and ceiling surfaces.

9.5.1.1A. Floor Areas

(1) Minimum floor areas specified in this Section do not include closets or built-in bedroom cabinets unless otherwise indicated.

9.5.1.2. Combination Rooms (See Note A-9.5.1.2.)

(1) Two or more areas may be considered as a combination room if the opening between the areas occupies the larger of 3 m² or 40% or more of the wall measured on the side of the dependent area.

(2) Where the dependent area is a bedroom, direct passage shall be provided between the two areas.

(3) The opening required in Sentence (1) shall not contain doors or windows.

9.5.1.3. Lesser Areas and Dimensions

(1) Areas of rooms and spaces are permitted to be less than required in this Section provided it can be shown that the rooms and spaces are adequate for their intended use, such as by the provision of built-in furniture to compensate for reduced sizes.

9.5.2. Barrier-Free Design

9.5.2.1. General

(1) Except as provided in Sentence (2) and Article 3.8.1.1., every *building* shall be designed in conformance with Section 3.8.

(2) The requirements of Section 3.8. need not be provided for detached houses, semi-detached houses, houses with a *secondary suite*, duplexes, triplexes, row houses and boarding or rooming houses with fewer than eight boarders or roomers.

9.5.2.2. Protection on Floor Areas With a Barrier-Free Path of Travel

(1) Where a *barrier-free* path of travel required in Article 9.5.2.1. is provided to any *storey* above the *first storey*, the requirements in Article 3.3.1.7. shall apply.

9.5.2.3. Reserved

9.5.2.4. Stud Wall Reinforcement

(1) If wood wall studs or sheet steel wall studs enclose the main bathroom in a *dwelling unit*, reinforcement shall be installed to permit the future installation of the following:

- (a) for a water closet, a grab bar described in Clauses 3.8.3.8.(3)(a) and a grab bar described in Clause 3.8.3.8.(3)(c),
- (b) for a shower, a grab bar described in Clause 3.8.3.13.(2)(g), and
- (c) for a bathtub, a grab bar described in Clause 3.8.3.13.(7)(e).

(See Note A-9.5.2.4.(1))

9.5.3. Ceiling Heights

9.5.3.1. Ceiling Heights of Rooms or Spaces

- (1) Except as provided in Sentences (2) and (3), the ceiling heights and clear heights in rooms or spaces in *residential occupancies* and *live/work units* shall conform to Table 9.5.3.1.
- (2) Ceiling heights in *secondary suites* shall be not less than 1.95 m.
- (3) Clear heights under beams and ducting in *secondary suites* shall be not less than 1.85 m.
- (4) Areas in rooms or spaces over which ceiling height and clear height are not less than the minimum specified in Table 9.5.3.1. or Sentence (2) or (3) shall be contiguous with the entry or entries to those rooms or spaces.

Table 9.5.3.1.
Room Ceiling Heights
Forming Part of Sentences 9.5.3.1.(1) and (4)

Room or Space	Minimum Heights ⁽¹⁾
Living room or space, dining room or space, kitchen or kitchen space	2 300 mm over at least 75% of the required floor area with a clear height of 2 100 mm at any point over the required area
Bedroom or bedroom space	2 300 mm over at least 50% of the required area or 2 100 mm over all of the required floor area. Any part of the floor having a clear height of less than 1 400 mm shall not be considered in computing the required floor area
<i>Basement</i> space	2 100 mm over at least 75% of the <i>basement</i> area except that under beams and ducts the clearance is permitted to be reduced to 1 950 mm
Bathroom, water closet room or laundry area above <i>grade</i>	2 100 mm in any area where a person would normally be in a standing position
Passage, hall or main entrance vestibule and finished rooms not specifically mentioned above	2 100 mm

Notes to Table 9.5.3.1.:

- (1) Area of the space shall be measured at floor level.

9.5.3.2. Mezzanines

- (1) The ceiling height above and below a *mezzanine* floor assembly in all *occupancies* shall be not less than 2.1 m.

9.5.3.3. Storage Garages

- (1) The clear height in a *storage garage* shall be not less than 2 m.

9.5.3A. Living Rooms or Spaces Within Dwelling Units

9.5.3A.1. Areas of Living Rooms and Spaces

- (1) Living areas within *dwelling units*, either as separate rooms or in combination with other spaces, shall have an area not less than 13.5 m².

(2) Where the area of a living space is combined with a kitchen and dining area, the living area alone in a *dwelling unit* that contains sleeping accommodation for not more than two persons shall be not less than 11 m².

9.5.3B. Dining Rooms or Spaces Within Dwelling Units

9.5.3B.1. Area of Dining Rooms or Spaces

- (1) A dining space in combination with other space shall have an area of not less than 3.25 m².
- (2) Dining rooms not combined with other space shall have a minimum area of 7 m².

9.5.3C. Kitchens Within Dwelling Units

9.5.3C.1. Kitchen Areas

(1) Kitchen areas within *dwelling units* either separate from or in combination with other spaces, shall have an area of not less than 4.2 m² including the area occupied by the base cabinets, except that in *dwelling units* containing sleeping accommodation for not more than two persons, the minimum area shall be 3.7 m².

9.5.3D. Bedrooms or Spaces in Dwelling Units and Dormitories

9.5.3D.1. Areas of Bedrooms

(1) Except as provided in Articles 9.5.3D.2. and 9.5.3D.3., bedrooms in *dwelling units* shall have an area not less than 7 m² where built-in cabinets are not provided and not less than 6 m² where built-in cabinets are provided.

9.5.3D.2. Areas of Master Bedrooms

(1) Except as provided in Article 9.5.3D.3., at least one bedroom in every *dwelling unit* shall have an area of not less than 9.8 m² where built-in cabinets are not provided and not less than 8.8 m² where built-in cabinets are provided.

9.5.3D.3. Areas of Combination Bedrooms

(1) Bedroom spaces in combination with other spaces in *dwelling units* shall have an area not less than 4.2 m².

9.5.3D.4. Areas of Other Sleeping Rooms

(1) Sleeping rooms other than in *dwelling units* shall have an area not less than 7 m² per person for single *occupancy* and 4.6 m² per person for multiple *occupancy*.

9.5.3D.5. Recreational Camps

(1) *Recreational camps* shall have an area in the sleeping quarters of at least 3.72 m² per camper or, if double or triple tier bunk units are used, 2.79 m² per camper.

9.5.3D.6. Camps for Housing Workers

(1) A *camp for housing of workers* shall have a minimum area of 3.72 m² per employee in every room used for sleeping purposes.

9.5.3E. Combined Spaces

9.5.3E.1. Combined Living, Dining, Bedroom and Kitchen Spaces

(1) Despite Subsections 9.5.3A. to 9.5.3D., where living, dining, bedroom and kitchen spaces are combined in a *dwelling unit* that contains sleeping accommodation for not more than two persons, the area of the combined spaces shall be not less than 13.5 m².

9.5.3F. Bathrooms and Water Closet Rooms

9.5.3F.1. Space to Accommodate Fixtures

(1) In every *dwelling unit* an enclosed space of sufficient size shall be provided to accommodate a water closet, lavatory and bathtub or shower stall.

9.5.3F.2. Doors to Rooms Containing Water Closets

(1) A door shall be provided to each room containing a water closet within a *dwelling unit*.

9.5.4. Hallways

9.5.4.1. Hallway Width

- (1) The unobstructed width of a hallway within a *dwelling unit* shall be not less than 860 mm, except that the hallway width is permitted to be 710 mm where
- (a) there are only bedrooms and bathrooms at the end of the hallway furthest from the living area, and
 - (b) a second *exit* is provided
 - (i) in the hallway near the end furthest from the living area, or
 - (ii) in each bedroom served by the hallway.

9.5.5. Doorway Sizes

9.5.5.1. Doorway Opening Sizes

- (1) Except as provided in Sentence (2) and Articles 9.5.5.3., 9.9.6.2. and 9.9.6.3., doorway openings within *dwelling units* and within houses with a *secondary suite* including their common spaces shall be designed to accommodate at least the door sizes given in Table 9.5.5.1. for swing-type and folding doors.
- (2) Doorway openings within *secondary suites* shall be designed to accommodate swing-type and folding doors not less than 1 890 mm high where the ceiling height complies with Sentence 9.5.3.1.(2).

Table 9.5.5.1.
Minimum Door Sizes
 Forming Part of Sentence 9.5.5.1.(1)

At Entrance to:	Minimum Width, mm	Minimum Height, mm
<i>Dwelling unit</i> or house with a <i>secondary suite</i> including common spaces (required entrance) Vestibule or entrance hall	810	1 980
Stairs to a floor level that contains a finished space All doors in at least one line of passage from the exterior to the <i>basement</i> Utility rooms	810	1 980
Walk-in closet	610	1 980
Bathroom, water-closet room, shower room ⁽¹⁾	610	1 980
Rooms located off hallways that are permitted to be 710 mm wide	610	1 980
Rooms not mentioned above, exterior balconies	760	1 980

Notes to Table 9.5.5.1.:

(1) See Article 9.5.5.3.

9.5.5.2. Doors to Public Water-Closet Rooms

(1) Doors to public water closet rooms shall be not less than 810 mm wide and 2 030 mm high.

9.5.5.3. Doors to Bathrooms

(1) Where a *barrier-free* path of travel conforming to Section 3.8. is provided into a *suite of residential occupancy* and where a bathroom within the *suite* is at the level of the *suite* entrance door, the doorway to such bathroom and to each bedroom at the same level as such bathroom shall have, when the door is in the open position, a clear width of not less than,

- (a) 760 mm where the door is served by a corridor or space not less than 1 060 mm wide, and
- (b) 810 mm where the door is served by a corridor or space less than 1 060 mm wide.

Section 9.6. Glass

9.6.1. General

9.6.1.1. Application

- (1) This Section applies to
 - (a) glass in
 - (i) interior doors and interior windows and their sidelights,
 - (ii) clothes closets,
 - (iii) site-built exterior windows, doors and skylights,
 - (iv) shower or bathtub enclosures,
 - (v) glazed panels and *partitions*, and
 - (b) the protection of glass.

9.6.1.2. Material Standards for Glass

- (1) Glass shall conform to
 - (a) CAN/CGSB-12.1, “Safety Glazing,”
 - (b) CAN/CGSB-12.2-M, “Flat, Clear Sheet Glass,”
 - (c) CAN/CGSB-12.3-M, “Flat, Clear Float Glass,”
 - (d) CAN/CGSB-12.4-M, “Heat Absorbing Glass,”
 - (e) CAN/CGSB-12.8, “Insulating glass units,”
 - (f) CAN/CGSB-12.9, “Spandrel glass,”
 - (g) CAN/CGSB-12.10-M, “Glass, Light and Heat Reflecting,”
 - (h) CAN/CGSB-12.11-M, “Wired Safety Glass,” or
 - (i) ASTM E2190, “Standard Specification for Insulating Glass Unit Performance and Evaluation.”

- (2) Mirrored glass doors are only permitted to be used only at the entrance to clothes closets and shall conform to the requirements of CAN/CGSB-82.6-M, “Doors, Mirrored Glass, Sliding or Folding, Wardrobe.” (See Note A-9.6.1.2.(2))

- (3) Mirrored glass doors reinforced with a film backing shall meet the impact resistance requirements specified in CAN/CGSB-12.5-M, “Mirrors, Silvered.”

9.6.1.3. Structural Sufficiency of Glass

- (1) Except as provided in Sentence (2), glass shall be designed in conformance with Article 4.3.6.1.

- (2) Where the *building* has an essentially uniform distribution of paths for air leakage, including operable openings, but no large openings that would permit wind gusts to rapidly enter the *building* and the *building* is not in an exceptionally exposed location such as a hilltop, the maximum area of individual panes of glass for windows shall conform to
 - (a) Tables 9.6.1.3.-A to 9.6.1.3.-C, where the *building* has a height from *grade* to the uppermost roof of 12 m or less, and is located in a built-up area, no less than 120 m away from the boundary between this area and open terrain, or
 - (b) Tables 9.6.1.3.-D to 9.6.1.3.-F.
 (See Note A-9.6.1.3.(2))

- (3) The maximum area of individual panes of glass for doors shall conform to Table 9.6.1.3.-G.

Table 9.6.1.3.-A
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 0.55 kPa⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(a)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.58	0.96	1.47	2.04	2.84	4.74	6.65	9.74
Factory-sealed insulated glass (IG) units ⁽²⁾	1.02	1.71	2.68	3.74	5.24	7.93	9.92	13.92
Heat-strengthened or tempered	1.24	1.93	2.60	3.18	3.99	5.55	6.99	9.74
Wired	0.27	0.45	0.68	0.93	1.31	2.15	3.07	5.03

Notes to Table 9.6.1.3.-A:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm.

Table 9.6.1.3.-B
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 0.75 kPa⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(a)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.42	0.68	1.02	1.42	2.04	3.34	4.70	7.65
Factory-sealed insulated glass (IG) units ⁽²⁾	0.72	1.19	1.85	2.56	3.64	6.01	8.35	11.83
Heat-strengthened	0.88	1.46	2.21	2.71	3.39	4.73	5.92	8.29
Tempered	1.18	1.64	2.21	2.71	3.39	4.73	5.92	8.29
Wired	0.20	0.32	0.50	0.68	0.94	1.55	2.19	3.60

Notes to Table 9.6.1.3.-B:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data."
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm.

Table 9.6.1.3.-C
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 1.00 kPa⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(a)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.30	0.50	0.77	1.05	1.45	2.40	3.40	5.62
Factory-sealed insulated glass (IG) units ⁽²⁾	0.52	0.86	1.31	1.86	2.57	4.30	6.10	9.89
Heat-strengthened	0.65	1.04	1.63	2.26	2.92	4.07	5.10	7.14
Tempered	1.01	1.42	1.90	2.33	2.92	4.07	5.10	7.14
Wired	0.16	0.26	0.38	0.52	0.71	1.15	1.63	2.69

Notes to Table 9.6.1.3.-C:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data."
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm.

Table 9.6.1.3.-D
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 0.55 kPa –
Open Terrain⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(b)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.46	0.75	1.16	1.60	2.25	3.76	5.32	8.70
Factory-sealed insulated glass (IG) units ⁽²⁾	0.80	1.34	2.11	2.93	4.10	6.90	9.66	12.53
Heat-strengthened	0.98	1.74	2.33	2.86	3.59	5.00	6.26	8.78
Tempered	1.25	1.74	2.33	2.86	3.59	5.00	6.26	8.78
Wired	0.22	0.36	0.55	0.76	1.05	1.75	2.47	4.09

Notes to Table 9.6.1.3.-D:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data."
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm.

Table 9.6.1.3.-E
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 0.75 kPa –
Open Terrain⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(b)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.33	0.54	0.83	1.14	1.61	2.67	3.75	6.14
Factory-sealed insulated glass (IG) units ⁽²⁾	0.57	0.94	1.47	2.04	2.85	4.75	6.72	10.97
Heat-strengthened	0.70	1.15	1.79	2.44	3.06	4.36	5.34	7.47
Tempered	1.06	1.48	1.99	2.44	3.06	4.36	5.34	7.47
Wired	0.16	0.26	0.40	0.55	0.76	1.24	1.77	2.93

Notes to Table 9.6.1.3.-E:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data."
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm.

Table 9.6.1.3.-F
Maximum Glass Area for Windows in Areas for which the 1-in-50 Hourly Wind Pressure (HWP) is Less than 1.00 kPa –
Open Terrain⁽¹⁾
 Forming Part of Clause 9.6.1.3.(2)(b)

Type of Glass	Maximum Glass Area, m ²							
	Glass Thickness, mm							
	2.5	3	4	5	6	8	10	12
Annealed	0.25	0.40	0.62	0.84	1.17	1.94	2.75	4.50
Factory-sealed insulated glass (IG) units ⁽²⁾	0.42	0.68	1.04	1.46	2.05	3.41	4.87	7.92
Heat-strengthened	0.51	0.84	1.30	1.79	2.52	3.69	4.60	6.44
Tempered	0.92	1.28	1.72	2.10	2.63	3.69	4.60	6.44
Wired	0.12	0.20	0.30	0.41	0.57	0.94	1.31	2.18

Notes to Table 9.6.1.3.-F:

- (1) The maximum hourly wind pressure with one chance in fifty of being exceeded in any one year, as provided in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data."
- (2) Maximum glass area values apply to IG units of two identical lites (annealed, heat-strengthened or tempered) spaced at 12.7 mm

Table 9.6.1.3.-G
Glass Area for Doors
 Forming Part of Sentence 9.6.1.3.(3)

Glass Thickness, mm	Maximum Glass Area, m ²⁽¹⁾						
	Type of Glass						
	Annealed	Annealed, Multiple-Glazed, Factory-Sealed Units	Laminated	Wired	Heat-Strengthened	Fully Tempered	Fully Tempered, Multiple-Glazed, Factory-Sealed
3	0.50	0.70	(2)	(2)	1.00	1.00	2.00
4	1.00	1.50	(2)	(2)	1.50	4.00	4.00
5	1.50	1.50	(2)	(2)	1.50	No limit	No limit
6	1.50	1.50	1.20	1.00	1.50	No limit	No limit

Notes to Table 9.6.1.3.-G:

- (1) See Note A-Table 9.6.1.3.-G.
- (2) Not generally available.

9.6.1.4. Types of Glass and Protection of Glass

- (1) Glass sidelights greater than 500 mm wide that could be mistaken for doors, glass in storm doors and glass in sliding doors within or at every entrance to a *dwelling unit* and in public areas shall be
 - (a) safety glazing of the tempered or laminated type conforming to CAN/CGSB-12.1, "Safety Glazing," or
 - (b) wired glass conforming to CAN/CGSB-12.11-M, "Wired Safety Glass."

- (2) Except as provided in Sentence (4), glass in entrance doors to *dwelling units* and in public areas, other than the entrance doors described in Sentence (1), shall be safety glazing or wired glass of the type described in Sentence (1) where the glass area exceeds 0.5 m² and extends to less than 900 mm from the bottom of the door.
- (3) Except as provided in Sentence (4), transparent panels that could be mistaken as a *means of egress* shall be protected by barriers or railings.
- (4) Sliding glass *partitions* that separate a *public corridor* from an adjacent *occupancy* and that are open during normal working hours need not conform to Sentences (2), (3) and (5), except that such *partitions* shall be suitably marked to indicate their existence and position.
- (5) Except as provided in Sentence (4), every glass or transparent door accessible to the public shall be equipped with hardware, bars or other permanent fixtures designed so that the existence and position of such doors is readily apparent.
- (6) Glazing used for a shower or bathtub enclosure shall conform to Class A of CAN/CGSB-12.1, “Safety Glazing.”

Section 9.7. Windows, Doors and Skylights

9.7.1. General

9.7.1.1. Application

- (1) This Section applies to
 - (a) windows, doors and skylights separating *conditioned space* from unconditioned space or the exterior, and
 - (b) main entrance doors.
- (2) For the purpose of this Section, the term “skylight” refers to unit skylights, roof windows and tubular daylighting devices.
- (3) For the purpose of this Section, the term “doors” includes glazing in doors and sidelights for doors.

9.7.2. Required Windows, Doors and Skylights

9.7.2.1. Entrance Doors

- (1) A door shall be provided at each entrance to a *dwelling unit*.
- (2) Main entrance doors to *dwelling units* shall be provided with
 - (a) a door viewer or transparent glazing in the door, or
 - (b) a sidelight.

9.7.2.2. Other Requirements for Windows, Doors and Skylights

- (1) Minimum sizes of doorways and doors within a *barrier-free* path of travel shall conform to Section 9.5.
- (2) The protection of window and door openings to protect persons from falling through them shall conform to Article 9.8.8.1.
- (3) Properties of windows and doors within *exits* shall conform to Section 9.9.

- (4) Windows and doors installed to provide the required *means of egress* from bedrooms shall conform to Subsection 9.9.10.
- (5) The location and protection of windows, doors and skylights in order to control the spread of fire shall conform to Subsection 9.10.12.
- (6) Doors between *dwelling units* and attached garages shall conform to Article 9.10.13.15.
- (7) The surface *flame-spread rating* for doors and skylights shall conform to Article 9.10.17.1.
- (8) Windows and doors installed to provide the required access to a *building* for firefighting purposes shall conform to Subsection 9.10.20.
- (9) Windows and skylights installed to provide required non-heating season ventilation shall conform to Article 9.32.2.2.

9.7.2.3. Minimum Window Areas

- (1) Except as required in Article 9.9.10.1. and Sentence (3), the minimum window glass areas for rooms in *buildings of residential occupancy* or rooms that are used for sleeping shall conform to Table 9.7.2.3.
- (2) The unobstructed glass area of a door or skylight is considered equivalent to that of a window.
- (3) Work areas in *live/work units* shall conform to Clause 3.7.2.1.(2)(a).
- (4) Where rooms with different requirements for window glass area are combined as described in Sentence 9.5.1.4.(1), the more restrictive requirement shall govern.

Table 9.7.2.3.
Glass Areas for Rooms of Residential Occupancy
 Forming Part of Sentence 9.7.2.3.(1)

Location	Minimum Unobstructed Glass Area With No Electric Lighting	Minimum Unobstructed Glass Area With Electric Lighting
Laundry, <i>basement</i> recreation room, unfinished <i>basement</i>	4% of area served	Windows not required
Water-closet room	0.37 m ²	Windows not required
Kitchen, kitchen space, kitchen alcove	10% of area served	Windows not required
Living rooms and dining rooms	10% of area served	10% of area served
Bedrooms and other finished rooms not mentioned above	5% of area served ⁽¹⁾	5% of area served ⁽¹⁾

Notes to Table 9.7.2.3.:

(1) See Subsection 9.9.10.

9.7.3. Performance of Windows, Doors and Skylights

9.7.3.1. General Performance Criteria

- (1) Except as provided in Sentences (2) to (4), windows, doors and skylights and their components separating *conditioned space* from unconditioned space or the exterior shall be designed, constructed and installed so that, when in the closed position, they
 - (a) resist the ingress of precipitation into interior space, (See Note A-9.7.4.2.(1))
 - (b) resist wind loads,
 - (c) control air leakage,
 - (d) resist the ingress of insects and vermin,
 - (e) where required, resist forced entry, and
 - (f) are easily operable when not intended to be fixed.
- (2) Skylights and their components shall be designed, constructed and installed so that, when in the closed position, they resist snow loads.
- (3) Main entrance doors and their components shall be designed, constructed and installed so that, when in the closed position, they
 - (a) control air leakage,
 - (b) resist the ingress of insects and vermin,
 - (c) resist forced entry, and
 - (d) are easily operable.
- (4) Storm doors, sliding doors and their components shall be designed, constructed and installed so that, when in the closed position, they
 - (a) resist wind loads,
 - (b) control air leakage to a minimum allowable 5 m³h/m and a maximum allowable 8.35 m³h/m,
 - (c) resist the ingress of insects and vermin, and
 - (d) are easily operable.
- (5) Compliance with the performance requirements described in Sentences (1) to (4) shall be demonstrated by
 - (a) complying with the requirements in
 - (i) Subsection 9.7.4. or 9.7.5., and
 - (ii) Subsection 9.7.6., or
 - (b) design and construction conforming to Part 5.

9.7.3.2. Heat Transfer Performance

- (1) Windows, doors and skylights described in Clause 9.7.1.1.(1)(a) and their components shall be designed, constructed and installed to
 - (a) minimize surface condensation on the warm side of the component, and (See Note A-9.7.3.2.(1)(a))
 - (b) ensure comfortable conditions for occupants.
- (2) Compliance with the heat transfer performance requirements described in Sentence (1) shall be demonstrated by
 - (a) complying with the requirements in Article 9.7.3.3., or
 - (b) design and construction conforming to Part 5.

9.7.3.3. Thermal Characteristics of Windows, Doors and Skylights

- (1) Metal frames and sash of windows, doors and skylights shall incorporate a thermal break.

- (2) Windows and doors described in Sentence (1) do not require a thermal break where they are installed as
- vehicular access doors,
 - storm windows and doors, or
 - windows and doors that are required to have a *fire-resistance rating*.
- (3) Windows, doors and skylights with or without storm doors or sash that are installed in *buildings* where the intended use of the interior space will not result in high moisture generation shall have a maximum thermal transmittance (U-value) or minimum temperature index (I) in accordance with Table 9.7.3.3.
- (4) Windows, doors and skylights, with or without storm doors or sash that are installed in portions of *buildings* where the intended use of the interior space will result in high moisture generation shall be designed in conformance with Subsection 5.3. (See Note A-9.25.5.2.)

Table 9.7.3.3.
Maximum U-value or Minimum Temperature Index (I) for Windows, Doors and Skylights⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.7.3.3.(3)

Component	2.5% January Design Temperature			
	Between -15°C and -30°C		Colder than -30°C	
	max. U-value, W/m ² K	min. I	max. U-value, W/m ² K	min. I
Windows and Doors	2.0	68	1.7	77
Skylights	3.0	(2)	2.7	(2)

Notes to Table 9.7.3.3.:

- U-values for specific products can be determined according to measures referenced in AAMA/WDMA/CSA 101/I.S.2/A440, "NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights." Temperature index (I) is determined according to the physical test procedure given in CSA A440.2/A440.3, "Fenestration energy performance/User guide to CSA A440.2-19, Fenestration energy performance."
- There is no appropriate test procedure available for testing the condensation resistance of sloped glazing.
- Where the U-value in this Table differs from the U-value provided in MMA Supplementary Standard SB-10, "Energy Efficiency Requirements" or MMA Supplementary Standard SB-12, "Energy Efficiency for Housing", the most restrictive U-value shall apply.

9.7.4. Manufactured Windows, Doors and Skylights

9.7.4.1. Application

- (1) This Subsection applies to windows, doors and skylights covered in the scope of AAMA/WDMA/CSA 101/I.S.2/A440, "North American Fenestration Standard/Specification for windows, doors, and skylights" (Harmonized Standard).

9.7.4.2. General

- Manufactured and pre-assembled windows, doors and skylights and their installation shall conform to
 - AAMA/WDMA/CSA 101/I.S.2/A440, "North American Fenestration Standard/Specification for windows, doors, and skylights" (Harmonized Standard),
 - CSA A440S1, "Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, North American Fenestration Standard/Specification for windows, doors, and skylights,"
 - the remainder of this Subsection, and
 - the applicable requirements in Subsection 9.7.6.
 (See Note A-9.7.4.2.(1))

9.7.4.3. Performance Requirements

- (1) Performance grades for windows, doors and skylights shall be selected according to CSA A440S1, “Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, North American Fenestration Standard/Specification for windows, doors, and skylights” so as to be appropriate for the conditions and geographic location in which the window, door or skylight will be installed.
- (2) Windows, doors and skylights shall conform to the performance grades selected under Sentence (1) when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, “North American Fenestration Standard/Specification for windows, doors, and skylights” (Harmonized Standard).
- (3) The minimum level of performance required for windows, doors and skylights shall be that of the Performance Class R.
- (4) Exterior wood doors shall conform to CAN/CSA-O132.2 Series, “Wood Flush Doors,” and shall have legibly indicated on them
 - (a) the name of the manufacturer,
 - (b) the standard to which they were produced, and
 - (c) that they are of an exterior type.

9.7.5. Site-Built Windows, Doors and Skylights

9.7.5.1. Application and Compliance

- (1) Materials, design, construction and installation of windows, doors and skylights that separate *conditioned space* from unconditioned space or the exterior but that are not within the scope of AAMA/WDMA/CSA 101/I.S.2/A440, “North American Fenestration Standard/Specification for windows, doors, and skylights,” shall conform
 - (a) to
 - (i) the remainder of this Subsection or Subsection 9.7.4., and
 - (ii) the applicable requirements in Subsection 9.7.6., or
 - (b) to Part 5.
- (2) Glass for site-built windows, doors, sidelights for doors, and skylights shall comply with Section 9.6.

9.7.5.2. Resistance to Forced Entry for Doors

- (1) Except for exterior doors to garages and to other ancillary spaces, this Article applies to
 - (a) swinging entrance doors to *dwelling units*,
 - (b) swinging doors between *dwelling units* and attached garages or other ancillary spaces, and
 - (c) swinging doors that provide access directly or indirectly from a *storage garage* to a *dwelling unit*.(See Note A-9.7.5.2.(1))
- (2) Doors, frames and hardware that conform to a security level of at least Grade 10 as described in the Annex to ASTM F476, “Standard Test Methods for Security of Swinging Door Assemblies,” are not required to conform to Sentences (3) to (7). (See Note A-9.7.5.2.(2))
- (3) Except as permitted in Sentence (2), wood doors as described in Sentence (1) shall
 - (a) be solid core or stile-and-rail type,
 - (b) be not less than 45 mm thick, and
 - (c) if of the stile-and-rail type, have a panel thickness of not less than 19 mm, with a total panel area not more than half of the door area.

- (4) Except as permitted in Sentence (2), doors described in Sentence (1) shall be provided with
- a deadbolt lock with a cylinder having no fewer than 5 pins, and
 - a bolt throw not less than 25 mm long, protected with a solid or hardened free-turning ring or beveled cylinder housing.
- (See Article 9.9.6.7.)
- (5) Except as permitted in Sentence (2), an inactive leaf in double doors used in locations specified in Sentence (1) shall be provided with heavy-duty bolts top and bottom having an engagement of not less than 15 mm.
- (6) Except as permitted in Sentence (2), hinges for doors described in Sentence (1) shall be fastened
- to wood doors with wood screws not less than 25 mm long and to wood frames with wood screws such that at least 2 screws per hinge penetrate not less than 30 mm into solid wood, or
 - to metal doors and metal frames with machine screws not smaller than No. 10 and not less than 10 mm long.
- (See Note A-9.7.5.2.(6))
- (7) Strikeplates for deadbolts described in Sentence (4) shall be fastened
- to wood frames with wood screws that penetrate not less than 30 mm into solid wood, or
 - to metal frames with machine screws not smaller than No. 8 and not less than 10 mm long.
- (See Note A-9.7.5.2.(6))
- (8) Except for storm doors or screen doors, doors described in Sentence (1) that swing outward shall be provided with hinges or pins so that the doors cannot be removed when they are in the closed position. (See Note A-9.7.5.2.(8))
- (9) Solid blocking shall be provided on both sides at the lock height between the jambs for doors described in Sentence (1) and the structural framing so that the jambs will resist spreading by force.

9.7.5.3. Resistance to Forced Entry for Windows

- (1) In *dwelling units*, windows, any part of which is located within 2 m of adjacent ground level, shall conform to the requirements for resistance to forced entry as described in Clause 5.3.6 of AAMA/WDMA/CSA 101/I.S.2/A440, “North American Fenestration Standard/Specification for windows, doors, and skylights.” (See Note A-9.7.5.3.(1))

9.7.6. Installation

9.7.6.1. Installation of Windows, Doors and Skylights

- (1) The installation of windows, doors and skylights shall conform to CSA A440.4, “Window, door, and skylight installation,” except that
- shims used to support windows, doors and skylights are permitted to be made of treated plywood, and
 - protection from precipitation for walls incorporating windows or doors and for roofs incorporating skylights, and the interfaces of these walls with windows or doors and of roofs with skylights, shall also conform to Section 9.27.
- (2) The installation of manufactured and pre-assembled windows, doors and skylights and the field assembly of manufactured window and door combination units shall conform to the manufacturer’s instructions.
- (3) Windows, doors and skylights shall be sealed to air barriers.

9.7.6.2. Sealants, Trim and Flashing

- (1) The sealing compound used to seal the glass component of an insulating glazing unit to the sash component shall be compatible with the sealing compound used to edge seal the glass component.
- (2) Flashing used to protect openings shall conform to Articles 9.27.3.7. and 9.27.3.8.

- (3) Sealants shall be applied between window frames or trim and the exterior cladding or masonry in conformance with Subsection 9.27.4.
- (4) All unfinished portions of the frame and other components of aluminum windows, doors or skylights in contact with the edges of masonry, concrete, stucco or plaster shall be protected with an alkali-resistant coating.

Section 9.8. Stairs, Ramps, Handrails and Guards

9.8.1. Application

9.8.1.1. General

- (1) This Section applies to the design and construction of interior and exterior stairs, steps, *ramps*, landings, handrails and *guards*.

9.8.1.2. Stairs, Ramps, Landings, Handrails and Guards in Garages

- (1) Except as provided in Sentence 9.8.6.2 (3), stairs, *ramps*, landings, handrails and *guards* in a garage that serves a single *dwelling unit* or a house with a *secondary suite* shall conform to the requirements for stairs, *ramps*, landings, handrails and *guards* within a *dwelling unit*.

9.8.1.3. Exit Stairs, Ramps and Landings

- (1) Where a stair, *ramp* or landing forms part of an *exit*, the appropriate requirements in Sections 9.9. and 9.10. shall also apply.

9.8.1.4. Escalators and Moving Walks

- (1) Escalators and moving walks shall conform to the appropriate requirements in Part 3.

9.8.2. Stair Dimensions

9.8.2.1. Stair Width

- (1) Except as provided in Sentence (2) and Article 9.8.4.7., required *exit* stairs and public stairs serving *buildings* of *residential occupancy* shall have a width of not less than 900 mm.
- (2) *Exit* stairs serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces shall have a width of not less than 860 mm.
- (3) Except as provided in Article 9.8.4.7., required *exit* stairs and public stairs serving *buildings* of other than *residential occupancy* shall have a width of not less than the greater of
 - (a) 900 mm, or
 - (b) 8 mm per person based on the *occupant load* limits specified in Table 3.1.17.1.
- (4) Except as provided in Article 9.8.4.7., at least one stair between each floor level within a *dwelling unit*, and exterior stairs serving a single *dwelling unit* except required *exit* stairs, shall have a width of not less than 860 mm.

9.8.2.2. Height Over Stairs

- (1) The clear height over stairs shall be measured vertically, over the clear width of the stair, from a straight line tangent to the tread and landing nosings to the lowest point above. (See Note A-3.4.3.4.)
- (2) Except as provided in Sentences (3) and (4) and Article 9.8.4.7., the clear height over stairs shall not be less than 2 050 mm.
- (3) Except as provided in Article 9.8.4.7., the clear height over stairs serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces shall not be less than 1 950 mm.
- (4) The clear height over stairs that are located under beams and ducting in *secondary suites* shall not be less than 1 850 mm.

9.8.3. Stair Configurations

9.8.3.1. Straight and Curved Runs in Stairs (See Notes A-9.8.3.1. and A-9.8.4.)

- (1) Except as permitted in Sentence (2), stairs shall consist of
 - (a) straight *flights*,
 - (b) curved *flights*, or
 - (c) spiral stairs.
- (2) Stairs within *dwelling units* and houses with a *secondary suite*, including their common spaces, shall consist of
 - (a) straight *flights*,
 - (b) except as provided in Sentence (4), curved *flights*,
 - (c) except as provided in Sentence 9.8.4.7.(2), spiral stairs,
 - (d) *flights* with rectangular treads and winders, or
 - (e) *flights* with a mix of rectangular and tapered treads.
- (3) Curved *flights* in *exits* shall comply with Sentence 3.4.6.9.(2).
- (4) Spiral stairs shall comply with Article 9.8.4.7.

9.8.3.2. Minimum Number of Risers

- (1) Except for stairs within a *dwelling unit*, at least three risers shall be provided in interior *flights*.

9.8.3.3. Maximum Height of Stairs

- (1) The vertical height of any *flight* of stairs shall not exceed 3.7 m.

9.8.4. Step Dimensions (See Note A-9.8.4.)

9.8.4.1. Dimensions for Risers (See Note A-9.8.4.)

- (1) Except as provided in Article 9.8.4.7., the rise, which is measured as the vertical nosing-to-nosing distance, shall conform to Table 9.8.4.1.

Table 9.8.4.1.
Rise for Rectangular Treads, Tapered Treads and Winders and Run for Rectangular Treads
 Forming Part of Sentences 9.8.4.1.(1) and 9.8.4.2.(1)

Stair Type	Max. Rise, mm, for All Steps	Min. Rise, mm, for All Steps	Max. <i>Run</i> , mm, for Rectangular Treads	Min. <i>Run</i> , mm, for Rectangular Treads
Private stairs ⁽¹⁾	200	125	355	255
Public stairs ⁽²⁾	180	125	no limit	280
Service stairs ⁽³⁾	no limit	125	355	no limit
Stairs to unoccupied attic space ⁽⁴⁾	no limit	125	355	no limit
Stairs to crawl spaces	no limit	125	355	no limit
Stairs that serve <i>mezzanines</i> not exceeding 20 m ² within <i>live/work units</i>	no limit	125	355	no limit

Notes to Table 9.8.4.1.:

- (1) Private stairs are:
 - (a) interior stairs within a house with a *secondary suite* or an individual *dwelling unit*,
 - (b) exterior stairs serving a house with a *secondary suite* or an individual *dwelling unit*, and
 - (c) exterior stairs serving a garage that serves a house with a *secondary suite* or an individual *dwelling unit*.
- (2) Public stairs are all stairs not described as service stairs or private stairs.
- (3) Service stairs are stairs that serve areas used only as *service rooms* or *service spaces*.
- (4) Stairs to unoccupied attic space are stairs that serve attics containing no storage or living space.

9.8.4.2. Dimensions for Rectangular Treads (See Note A-9.8.4.)

- (1) The *run* for rectangular treads shall conform with Table 9.8.4.1.
- (2) The depth of a rectangular tread shall be not less than its *run* and not more than its *run* plus 25 mm.

9.8.4.3. Dimensions of Tapered Treads (See Note A-9.8.4.)

- (1) Except as provided in Sentence (2) and Articles 9.8.4.6. and 9.8.4.7., *tapered treads* shall have a *run* that
 - (a) is not less than 150 mm at the narrow end of the tread, and
 - (b) complies with the dimensions for rectangular treads stated in Table 9.8.4.1. when measured at a point 300 mm from the centre line of the handrail at the narrow end of the tread.
- (2) *Tapered treads* in required *exit* stairs shall conform to the requirements in Article 3.4.6.9.
- (3) The depth of a *tapered tread* shall be not less than its *run* at any point and not more than its *run* at any point plus 25 mm.

9.8.4.4. Uniformity and Tolerances for Risers, Runs and Treads

- (1) Except as provided in Sentence (2), risers shall be of uniform height in any one *flight* with a maximum tolerance of
 - (a) 5 mm between adjacent treads or landings, and
 - (b) 10 mm between the tallest and shortest risers in a *flight*.
- (2) Except for required *exit* stairs, where the top or bottom riser in a stair adjoins a sloping finished walking surface such as a garage floor, driveway or sidewalk, the height of the riser across the stair shall vary by not more than 1 in 12.

- (3) Rectangular treads shall have a uniform *run* with a maximum tolerance of
 - (a) 5 mm between adjacent treads, and
 - (b) 10 mm between the deepest and shallowest treads in a *flight*.
- (4) *Tapered treads* in a *flight* shall have a uniform *run* in accordance with the construction tolerances stipulated in Sentence (3) when measured at a point 300 mm from the centre line of the handrail as described in Sentence 9.8.7.1.(5).
- (5) The slope of treads shall not exceed 1 in 50.

9.8.4.5. Uniformity of Runs in Flights with Mixed Treads within Dwelling Units

- (1) Except as provided in Sentence (2) and Article 9.8.4.6., where a *flight* of stairs consists of both *tapered treads* and rectangular treads, all the treads shall have a uniform *run* when measured at a point 300 mm from the centre line of the inside handrail.
- (2) Where *tapered treads* are located at the bottom of a mixed-tread *flight*, the *run* of the *tapered treads* when measured at a point 300 mm from the centre line of the inside handrail is permitted to exceed the *run* of the rectangular treads.

9.8.4.6. Winders (See Note A-9.8.4.6.)

- (1) Stairs within *dwelling units* are permitted to contain winders that converge to a centre point provided
 - (a) the winders turn through an angle of not more than 90°,
 - (b) individual treads turn through an angle of not less than 30° or not more than 45°, and
 - (c) adjacent winders turn through the same angle.
- (2) Where more than one set of winders described in Sentence (1) is provided in a single stairway between adjacent floor levels, such winders shall be separated in plan by at least 1 200 mm.

9.8.4.7. Spiral Stairs (See Note A-9.8.4.7.)

- (1) Spiral stairs shall have
 - (a) handrails on both sides, the outer handrail being not less than 1 070 mm high,
 - (b) a clear width not less than 660 mm between handrails,
 - (c) risers that are not more than 240 mm high,
 - (d) treads that
 - (i) are a minimum of 190 mm deep at a point 300 mm from the centre line of the handrails at the narrower edge,
 - (ii) have a consistent angle and uniform dimension, and
 - (iii) turn in the same direction, and
 - (e) not less than 1 980 mm clear height.
- (2) Spiral stairs conforming to Sentence (1) are permitted to be used as the only *means of egress* where they serve not more than 3 persons.
- (3) Except as permitted by Sentence (2), spiral stairs shall not serve as an *exit*.

9.8.4.8. Tread Nosings (See Notes A-9.8.4.8. and A-9.8.4.)

- (1) Except as permitted by Sentence (2), the top of the nosings of stair treads shall have a rounded or beveled edge extending not less than 6 mm and not more than 14 mm measured horizontally from the front of the nosing.
- (2) If resilient material is used to cover the nosing of a stair tread, the minimum extension of the rounded or beveled edge required by Sentence (1) is permitted to be reduced to 3 mm.

9.8.4.9. Open Risers

- (1) Except as provided in Sentence (2), stairs shall have no open risers.
- (2) Open risers are permitted in
 - (a) interior and exterior stairs that serve a single *dwelling unit* or a house with a *secondary suite*,
 - (b) fire escape stairs,
 - (c) stairs that are principally used for maintenance,
 - (d) stairs that serve *service rooms*, and
 - (e) stairs that serve *industrial occupancies* other than *storage garages*.

9.8.4.10. Interior Stairs Extending Through the Roof

- (1) Interior stairways extending through the roof of a *building* shall be protected from ice and snow.

9.8.5. Ramps

9.8.5.1. Application

- (1) This Subsection applies to pedestrian *ramps* except *ramps* in a *barrier-free* path of travel.
- (2) *Ramps* in a *barrier-free* path of travel shall conform to the requirements in Article 3.8.3.4.

9.8.5.2. Ramp Width (See also Article 9.9.3.2.)

- (1) Except as provided in Sentence (2), *ramps* shall not be less than 1 100 mm wide.
- (2) *Ramps* serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces shall be not less than 860 mm wide

9.8.5.3. Height Over Ramps

- (1) Except as permitted by Sentence (2), the clear height over *ramps* shall be not less than 2 050 mm.
- (2) The clear height over *ramps* serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces shall be not less than 1 950 mm.

9.8.5.4. Ramp Slope

- (1) The slope of *ramps* shall be not more than
 - (a) 1 in 10 for exterior *ramps*,
 - (b) 1 in 10 for interior *ramps* serving *residential occupancies*,
 - (c) 1 in 6 for *industrial occupancies*, and
 - (d) 1 in 8 for all other *occupancies*.

9.8.5.5. Maximum Rise

- (1) Where the slope of the *ramp* is greater than 1 in 12, the maximum rise between floors or landings shall be 1 500 mm.

9.8.6. Landings

9.8.6.1. Application

- (1) This Subsection applies to landings, except landings for *ramps* in a *barrier-free* path of travel.
- (2) Landings for *ramps* in a *barrier-free* path of travel shall conform to the requirements in Article 3.8.3.4.
- (3) Finished floors, and ground surfaces with a slope not exceeding 1 in 50, at the top and bottom of stairs or *ramps* shall be considered as landings.

9.8.6.2. Required Landings

- (1) Except as provided in Sentences (2) to (4) and Sentence 9.9.6.6.(2), a landing shall be provided
 - (a) at the top and bottom of each *flight* of interior and exterior stairs, including stairs in garages,
 - (b) at the top and bottom of every *ramp* with a slope greater than 1 in 50, and
 - (c) where a doorway opens onto a stair or *ramp*.
 - (2) Where a door at the top of a stair within a *dwelling unit* swings away from the stair, no landing is required between the doorway and the stair. (See Note A-9.8.6.2.(2))
 - (3) A landing may be omitted at the top of an exterior *flight* serving a secondary entrance to a single *dwelling unit* or a house with a *secondary suite*, provided
 - (a) the stair does not contain more than three risers,
 - (b) the principal door is a sliding door or swings away from the stair, and
 - (c) only a storm or screen door, if any, swings over the stair and is equipped with hardware to hold it open.
- (3.1) Sentence (3) does not apply to an exterior stair serving a secondary entrance to a house with a *secondary suite* that is also a main entrance to a *dwelling unit* in the house.
- (4) A landing may be omitted at the bottom of an exterior stair or *ramp* provided there is no obstruction, such as a gate or door, within the lesser of the width of the stair or *ramp* or
 - (a) 900 mm for stairs or *ramps* serving a single *dwelling unit*, and
 - (b) 1 100 mm for stairs or *ramps* not serving a single *dwelling unit*.

9.8.6.3. Dimensions of Landings

(See Note A-3.4.6.4.) (See also Articles 9.9.6.1. and 9.9.6.6. regarding landings in exits)

- (1) Except as provided in Sentences (2) to (7), landings shall be at least as wide and as long as the width of the stair or *ramp* in which they occur.
- (2) Where the landing in a stairway or *ramp* does not turn or turns less than 90°, the length of the landing need not be more than the lesser of
 - (a) the required width of the stair or *ramp*, or
 - (b) 1 100 mm.
- (3) The length of a landing shall be measured perpendicular to the nosings of adjacent steps or to the end of the *ramp*, at a distance equal to half the length required in Sentence (2) from the narrow edge of the landing.
- (4) Where stair *flights* or *ramps* of different widths adjoin a single landing, the minimum width of the landing shall be
 - (a) where one or more of the stair or *ramp* widths do not exceed their respective required widths, not less than the greater required stair or *ramp* width, or
 - (b) where all of the widths of the stairs or *ramps* exceed their respective required widths, not less than the lesser actual stair or *ramp* width.

- (5) Where a door swings toward a stair, the full arc of the swing shall be over the landing.
- (6) The slope of landings shall not exceed 1 in 50.
- (7) Where a doorway or stairway opens onto the side of a *ramp*, the landing shall extend for a distance of not less than 300 mm on either side of the doorway or stairway, except on a side abutting an end wall.

9.8.6.4. Height Over Landings

- (1) Except as permitted by Sentence (2), the clear height over landings shall be not less than 2 050 mm.
- (2) The clear height over landings serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces shall be not less than 1 950 mm.

9.8.7. Handrails

9.8.7.1. Required Handrails

- (1) Except as provided in Sentences (2) to (4), handrails shall be installed on stairs and *ramps* in conformance with Table 9.8.7.1.
- (2) Where a stair or *ramp* is required to be at least 2 200 mm wide due to the *occupant load*, a handrail shall be installed such that no position on the stair or *ramp* is more than 825 mm from a handrail. (See Note A-9.8.7.1.(2))
- (3) Handrails are not required for stairs and *ramps* serving a single *dwelling unit*, where
 - (a) interior stairs have not more than 2 risers,
 - (b) exterior stairs have not more than 3 risers, or
 - (c) *ramps* rise not more than 400 mm.
- (4) Only one handrail is required on exterior stairs having more than 3 risers provided such stairs serve not more than one *dwelling unit* or a house with a *secondary suite*.
- (5) Except for stairs with winders, where a *flight* of stairs within a *dwelling unit* consists of *tapered treads*, or a mix of *tapered treads* and rectangular treads, one handrail shall be installed along the narrow end of the treads.

Table 9.8.7.1.
Number of Sides of Stair or Ramp Required to Have a Handrail
 Forming Part of Sentence 9.8.7.1.(1)

Location of Stair or Ramp	Handrails Serving Stairs			Handrails Serving Ramps	
	Stairs < 1 100 mm Wide		Stairs ≥ 1 100 mm Wide	Ramps < 1 100 mm Wide	Ramps ≥ 1 100 mm Wide
	Straight	Curved	All	Straight or Curved	All
	Number of Sides Required to have a Handrail				
Within a <i>dwelling unit</i> or a house with a <i>secondary suite</i>	1	1	1	1	2
All other locations	1	2	2	2	2

9.8.7.2. Continuity of Handrails (See Note A-9.8.7.2.)

- (1) Except as provided in Sentence (3), required handrails shall be continuously graspable throughout the length of
 - (a) *ramps*, and
 - (b) *flights* of stairs, from the bottom riser to the top riser.
- (2) Except for stairs or *ramps* serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces, at least one required handrail shall be continuous throughout the length of the stair or *ramp*, including at the landing except where interrupted by doorways. (See Note A-3.4.6.5.(11))
- (3) For stairs or *ramps* serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces, a handrail is permitted to start from a newel post or volute installed on the bottom tread.

9.8.7.3. Termination of Handrails

- (1) Handrails shall be terminated in a manner that will not obstruct pedestrian travel or create a hazard. (See Note A-9.8.7.3.(1))
- (2) Except for stairs and *ramps* serving only one *dwelling unit* or a house with a *secondary suite* including their common spaces, at least one handrail at the sides of a stair or *ramp* shall extend horizontally not less than 300 mm beyond the top and bottom of each *flight* or *ramp*. (See Note A-9.8.7.3.(2))

9.8.7.4. Height of Handrails (See Note A-9.8.7.4.)

- (1) The height of handrails on stairs and *ramps* shall be measured vertically from the top of the handrail to
 - (a) a straight line drawn tangent to the tread nosings of the stair served by the handrail, or
 - (b) the surface of the *ramp*, floor or landing served by the handrail.
- (2) Except as provided in Sentence (3), Clause 3.8.3.4.(1)(e) and Sentence 9.8.4.7.(1), required handrails shall be 865 mm to 1 070 mm high.
- (3) Handrails installed in addition to required handrails need not comply with Sentence (2).

9.8.7.5. Ergonomic Design

- (1) The clearance between a handrail and any surface behind it shall be not less than
 - (a) 60 mm, if the surface behind the handrail is rough or abrasive, or
 - (b) 50 mm, in all other cases.
- (2) All handrails shall be constructed so as to be continually graspable along their entire length with no obstruction on or above them to break a handhold. (See Note A-9.8.7.5.(2))

9.8.7.6. Projections into Stairs and Ramps

- (1) Handrails and projections below handrails, including handrail supports and stair stringers, shall not project more than 100 mm into the required width of a stair or *ramp*. (See also Articles 9.8.2.1. and 9.8.5.2.)

9.8.7.7. Design and Attachment of Handrails (See Note A-9.8.7.7.)

- (1) Handrails and their supports shall be designed and constructed to withstand the following loads, which need not be considered to act simultaneously:
 - (a) a concentrated load of not less than 0.9 kN applied at any point and in any direction for all handrails, and
 - (b) for handrails other than those serving a single *dwelling unit*, a uniform load of not less than 0.7 kN/m.

- (2) Where exterior or interior handrails serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces are attached to wood studs or blocking, the attachment shall be deemed to comply with Sentence (1), where
- (a) the attachment points are spaced not more than 1.2 m apart measured on the horizontal plane,
 - (b) the first attachment point at either end is located not more than 300 mm from the end of the handrail, and
 - (c) the fasteners consist of no fewer than 2 No. 8 wood screws at each point, penetrating not less than 32 mm into solid wood.

9.8.8. Guards

9.8.8.1. Required Guards (See Note A-9.8.8.1.)

(1) Except as provided in Sentence (2) and except at the leading edge at the top of a *flight*, every surface to which access is provided, including but not limited to *flights* of steps and *ramps*, exterior landings, porches, balconies, *mezzanines*, galleries and raised *walkways*, shall be protected by a *guard* on each side that is not protected by a wall for the length where the difference in elevation is more than 600 mm between the walking surface and the adjacent surface within 1.2 m.

(2) *Guards* are not required

- (a) at loading docks,
- (b) at floor pits in *repair garages*, or
- (c) where access is provided for maintenance purposes only.

(3) Doors in *buildings of residential occupancy*, where the finished floor on one side of the door is more than 600 mm above the floor or other constructed surface or ground level on the other side of the door, shall be protected by

- (a) a *guard*, or
- (b) a mechanism capable of controlling the free swinging or sliding of the door so as to limit any clear unobstructed opening to not more than 100 mm.

(4) Except as provided in Sentence (5), openable windows in *buildings of residential occupancy* shall be protected by

- (a) a *guard*, or
- (b) a mechanism that can only be released with the use of tools or special knowledge to control the free swinging or sliding operation of the openable part of the window so as to limit any clear unobstructed opening to not more than 100 mm measured either vertically or horizontally.

(See Note A-9.8.8.1.(4))

(5) Windows need not be protected in accordance with Sentence (4), where the bottom edge of the openable portion of the window is located

- (a) more than 900 mm above the finished floor, or
- (b) less than 1 800 mm above the floor or ground on the other side of the window.

(See Note A-9.8.8.1.(4))

(6) Except as provided in Sentence (7), glazing installed over stairs, *ramps* and landings that extends to less than 1 070 mm above the surface of the treads, *ramp* or landing shall be

- (a) protected by *guards* in accordance with this Subsection, or
- (b) non-openable and designed to withstand the specified lateral loads for *guards* as provided in Article 4.1.5.14.

(7) In *dwelling units*, glazing installed over stairs, *ramps* and landings that extends to less than 900 mm above the surface of the treads, *ramp* or landing shall be

- (a) protected by *guards* in accordance with this Subsection, or
- (b) non-openable and designed to withstand the specified lateral loads for *guards* as provided in Article 4.1.5.14.

- (8) Glazing installed in public areas that extends to less than 1 m from the floor and is located above the second *storey* in *buildings of residential occupancy* shall be
- protected by *guards* in accordance with this Subsection, or
 - non-openable and designed to withstand the specified lateral loads for *guards* as provided in Article 4.1.5.14.

9.8.8.2. Loads on Guards (See Note A-9.8.8.2.)

(1) Except as provided in Sentences (2), (3), (5) and (6), *guards* shall be designed to resist the specified loads prescribed in Table 9.8.8.2.

(2) The size of the opening between any two adjacent vertical elements within a *guard* shall not exceed the limits required by Sentence 9.8.8.5.(1) when each of these elements is subjected to a specified *live load* of 0.1 kN applied in opposite directions in the in-plane direction of the *guard* so as to produce the most critical effect.

(3) For *guards* within *dwelling units* and within houses with a *secondary suite* including their common spaces and for exterior *guards* serving not more than two *dwelling units*, where the width and spacing of balusters are such that three balusters can be engaged by a load imposed over a 300 mm width, the load shall be imposed so as to engage three balusters.

(4) None of the specified loads specified in Table 9.8.8.2. need be considered to act simultaneously.

(5) For *guards* within *dwelling units* and within houses with a *secondary suite* including their common spaces and for exterior *guards* serving not more than two *dwelling units*, Table 9.8.8.2. need not apply where the *guard* construction used has been demonstrated to provide effective performance.

(6) *Guards* constructed in accordance with the requirements in MMAH Supplementary Standard SB-7, “Guards for Housing and Small Buildings” shall be deemed to satisfy the requirements of Sentence (1).

Table 9.8.8.2.
Specified Loads for Guards
Forming Part of Sentence 9.8.8.2.(1)

Location of <i>Guard</i>	Minimum Specified Loads		
	Horizontal Load Applied Inward or Outward at any Point at the Minimum Required Height of the <i>Guard</i>	Horizontal Load Applied Outward on Elements Within the <i>Guard</i> , Including Solid Panels and Balusters	Evenly Distributed Vertical Load Applied at the Top of the <i>Guard</i>
<i>Guards</i> within <i>dwelling units</i> and exterior <i>guards</i> serving not more than 2 <i>dwelling units</i>	0.5 kN/m or concentrated load of 1.0 kN applied at any point ⁽¹⁾	0.5 kN applied over a maximum width of 300 mm and a height of 300 mm ⁽²⁾	1.5 kN/m
<i>Guards</i> serving access ways to equipment platforms and similar areas where the gathering of many people is improbable	Concentrated load of 1.0 kN applied at any point	Concentrated load of 0.5 kN applied over an area of 100 mm by 100 mm located at any point on the element or elements so as to produce the most critical effect	1.5 kN/m
All other <i>guards</i>	0.75 kN/m or concentrated load of 1.0 kN applied at any point ⁽¹⁾	Concentrated load of 0.5 kN applied over an area of 100 mm by 100 mm located at any point on the element or elements so as to produce the most critical effect	1.5 kN/m

Notes to Table 9.8.8.2.:

- The load that creates the most critical condition shall apply.
- See Sentence (3).

9.8.8.3. Height of Guards (See Note A-9.8.3.3.)

- (1) Except as provided in Sentences (2) to (3.1), all *guards* shall be not less than 1 070 mm high.
- (2) All *guards* within *dwelling units* or within houses with a *secondary suite* including their common spaces shall be not less than 900 mm high.
- (3) Exterior *guards* serving not more than one *dwelling unit* or a house with a *secondary suite* including their common spaces shall be not less than 900 mm high where the walking surface served by the *guard* is not more than 1 800 mm above the finished ground level.
- (3.1) The height of *guards* for exterior stairs and landings more than 10 m above adjacent ground level shall be not less than 1 500 mm.
- (4) The height of *guards* for *flights* of steps shall be measured vertically from the top of the *guard* to a line drawn through the tread nosing served by the *guard*.

9.8.8.4. Guards for Floors and Ramps in Garages

- (1) Except for floors of garages referred to in Section 9.35., where garage floors or *ramps* are 600 mm or more above the adjacent ground or floor level, every opening through a garage floor and the perimeter of floors and *ramps* that have no exterior walls shall be provided with
 - (a) a continuous curb not less than 140 mm in height, and
 - (b) a *guard* not less than 1 070 mm above the floor level.
- (2) Vehicle guardrails shall be designed and constructed to withstand the loading values stipulated in Sentence 4.1.5.15.(1). (See Note A-4.1.5.14. and 4.1.5.15.(1))

9.8.8.5. Openings in Guards

- (1) Except as permitted in Sentences (3) and (4), openings through *guards* shall be of a size that prevents the passage of a spherical object having a diameter of 100 mm. (See Note A-9.8.8.5.(1) and (3))
- (2) Except for *guards* that serve *industrial occupancies*, the triangular openings formed by stair risers, stair treads and the bottom element of a required *guard* shall be of a size that prevents the passage of a 150 mm diam sphere.
- (3) Except where they serve *storage garages*, *guards* in *industrial occupancies* are permitted to consist of
 - (a) a top railing, and
 - (b) one or more horizontal intermediate rails spaced such that the size of the openings through the *guard* prevents the passage of a spherical object having a diameter of 535 mm.(See Note A-9.8.8.5.(1) and (3))
- (4) Openings through any *guard* that is not required by Article 9.8.8.1. and that serves an *occupancy* other than *industrial occupancy*, shall be of a size that
 - (a) prevents the passage of a spherical object having a diameter of 100 mm, or
 - (b) permits the passage of a spherical object having a diameter of 200 mm.(See Note A-9.8.8.5.(4))

9.8.8.6. Guards Designed Not to Facilitate Climbing

(1) *Guards* required by Article 9.8.8.1., except those in *industrial occupancies* and where it can be shown that the location and size of openings do not represent a hazard, shall be designed so that no member, attachment or opening located between 140 mm and 900 mm above the floor or walking surface protected by the *guard* will facilitate climbing. (See Note A-9.8.8.6.(1))

9.8.8.7. Glass in Guards

- (1) Glass in *guards* shall be
- (a) safety glass of the laminated or tempered type conforming to CAN/CGSB-12.1, “Safety Glazing,” or
 - (b) wired glass conforming to CAN/CGSB-12.11-M, “Wired Safety Glass.”

9.8.9. Construction

9.8.9.1. Loads on Stairs and Ramps

- (1) Except as specified in Articles 9.8.9.4. and 9.8.9.5., stairs and *ramps* shall be designed for strength and rigidity under uniform loading criteria to support specified loads of
- (a) 1.9 kPa for stairs and *ramps* serving not more than one *dwelling unit* or a house with a *secondary suite* including their common spaces, and
 - (b) 4.8 kPa for other stairs and *ramps*.

9.8.9.2. Exterior Concrete Stairs

- (1) Exterior concrete stairs with more than 2 risers and 2 treads shall be
- (a) supported on unit masonry or concrete walls or piers not less than 150 mm in cross-section, or
 - (b) cantilevered from the main *foundation* wall.
- (2) Stairs described in Sentence (1), when cantilevered from the *foundation* wall, shall be constructed and installed in conformance with Subsection 9.8.10.
- (3) The depth below ground level for *foundations* for exterior steps shall conform to the requirements in Section 9.12.

9.8.9.3. Exterior Wood Steps

- (1) Exterior wood steps shall not be in direct contact with the ground unless suitably treated with a wood preservative.

9.8.9.4. Wooden Stair Stringers

- (1) Wooden stair stringers shall
- (a) have a minimum effective depth of 90 mm, measured perpendicularly to the bottom of the stringer at the point of minimum cross-section, and an overall depth of not less than 235 mm,
 - (b) be supported and secured top and bottom,
 - (c) be not less than 25 mm actual thickness if supported along their length and 38 mm actual thickness if unsupported along their length, and
 - (d) except as permitted in Sentence (2), be spaced not more than 900 mm o.c. in stairs serving not more than one *dwelling unit* or a house with a *secondary suite* including their common spaces, and 600 mm o.c. in other stairs.
- (2) For stairs serving not more than one *dwelling unit* or a house with a *secondary suite* including their common spaces, where risers support the front portion of the tread, the space between stringers shall be not more than 1 200 mm.

9.8.9.5. Treads

- (1) Stair treads of lumber, plywood or O-2 grade OSB within *dwelling units* shall be not less than 25 mm actual thickness, except that, if open risers are used and the distance between stringers exceeds 750 mm, the treads shall be not less than 38 mm actual thickness.
- (2) Stair treads of plywood or OSB, that are not continuously supported by the riser shall have their face grain or direction of face orientation at right angles to the stringers.

9.8.9.6. Finish for Treads, Landings and Ramps (See Note A-9.8.9.6.)

- (0.1) Except as required by Sentence (2), the finish for treads, landings and *ramps* shall be
 - (a) wear-resistant,
 - (b) slip-resistant, and
 - (c) smooth, even and free from open defects.
- (1) The finish for treads and landings of interior stairs in *dwelling units*, other than stairs to unfinished *basements*, shall consist of hardwood, vertical grain softwood, resilient flooring or other material providing equivalent performance.
- (2) Treads and landings of interior and exterior stairs and *ramps*, other than those within *dwelling units* or within houses with a *secondary suite* including their common spaces, shall have a slip-resistant finish or be provided with slip-resistant strips that extend not more than 1 mm above the surface.
- (3) Stairs and *ramps*, except those serving a house with a *secondary suite*, an individual *dwelling unit*, *service rooms* or *service spaces*, shall have a colour contrast or a distinctive visual pattern to demarcate
 - (a) the leading edge of the treads,
 - (b) the leading edge of the landing, and
 - (c) the beginning and end of a *ramp*.
- (4) Except for stairs serving a house with a *secondary suite*, an individual *dwelling unit*, *service rooms* or *service spaces*, a tactile attention indicator conforming to Article 3.8.3.18. shall be installed
 - (a) at the top of the stairs, starting one tread depth back from the edge of the top stair, and
 - (b) at the leading edge of landings where a doorway opens onto stairs, starting one tread depth back from the edge of the landing.

9.8.10. Cantilevered Precast Concrete Steps

9.8.10.1. Design

- (1) Exterior concrete steps and their anchorage system that are cantilevered from a *foundation* wall shall be designed and installed to support the loads to which they may be subjected.

9.8.10.2. Anchorage

- (1) Cantilevered concrete steps referred to in Article 9.8.10.1. shall be anchored to concrete *foundation* walls not less than 200 mm thick.

9.8.10.3. Prevention of Damage Due to Frost

- (1) Suitable precautions shall be taken during backfilling and grading operations to ensure that subsequent freezing of the *soil* will not cause uplift forces on the underside of cantilevered concrete steps to the extent that the steps or the walls to which they are attached will be damaged.

Section 9.9. Means of Egress

9.9.1. General

9.9.1.1. Application

(1) Stairways, handrails and *guards* in a *means of egress* shall conform to the requirements in Section 9.8. as well as to the requirements in this Section.

9.9.1.2. Fire Protection

(1) In addition to the fire protection requirements provided in Subsection 9.9.4., *flame-spread ratings*, *fire-resistance ratings* and *fire-protection ratings* for *means of egress* shall conform to Section 9.10.

9.9.1.3. Occupant Load

- (1) The *occupant load* of a *floor area* or part of a *floor area* shall be based on
- (a) two persons per sleeping room or sleeping area in a *dwelling unit* or *suite*, and
 - (b) for *occupancies* other than as described in Clause (a), the number of persons
 - (i) for which the area is designed, or
 - (ii) determined from Table 3.1.17.1.

9.9.2. Types and Purpose of Exits

9.9.2.1. Types of Exits

- (1) Except as otherwise provided in this Section, an *exit* from any *floor area* shall be one of the following used singly or in combination:
- (a) an exterior doorway,
 - (b) an exterior passageway,
 - (c) an exterior *ramp*,
 - (d) an exterior stairway,
 - (e) a fire escape,
 - (f) a *horizontal exit*,
 - (g) an interior passageway,
 - (h) an interior *ramp*, or
 - (i) an interior stairway.

(2) Fire escapes shall only be used as *exits* on existing *buildings* and shall be designed and installed in conformance with Subsection 3.4.7.

(2.1) Fire escapes shall not be installed on any new *building*.

(3) Where a *horizontal exit* is used, it shall conform to Sentence 3.4.1.6.(1) and Article 3.4.6.10.

9.9.2.2. Purpose of Exits

(1) An *exit* shall be designed for no purpose other than for exiting, except that an *exit* may also serve as an access to a *floor area*.

9.9.2.3. Elevators, Slide Escapes and Windows as Means of Egress

- (1) Elevators, slide escapes or windows shall not be considered as part of a required *means of egress*.
- (2) Except for *floor areas of mercantile occupancy*, casement windows not less than 1 060 mm high, 560 mm wide, with a sill height not more than 900 mm above the inside floor, are permitted to be considered part of a required *means of egress* to provide access to fire escapes, when fire escapes are permitted.

9.9.2.4. Principal Entrances

- (1) Except for doors serving a single *dwelling unit* or a house with a *secondary suite* including their common spaces, at least one door at every principal entrance to a *building* providing access from the exterior at ground level shall be designed in accordance with the requirements for *exits*.

9.9.2.5. Front Edge of Stair Treads

- (1) Except for curved stairs, the front edge of stair treads in *exits* and *access to exits* shall be at right angles to the direction of *exit* travel.

9.9.2.6. Exterior Exit Stairs That Serve a Hotel

- (1) Treads and landings of exterior *exit* stairs that serve a *hotel* shall be designed to be free from ice and snow accumulation.

9.9.3. Dimensions of Means of Egress

9.9.3.1. Application

- (1) This Subsection applies to every *means of egress* except
 - (a) *exits* that serve not more than one *dwelling unit* or a house with a *secondary suite* including their common spaces, and
 - (b) *access to exits* within *dwelling units* and within houses with a *secondary suite* including their common spaces.

9.9.3.2. Exit Width

- (1) Except for doors and corridors, the width of every *exit* facility shall be not less than 900 mm. (See Article 9.9.6.3. for doors, Article 9.8.2.1. for stairs, and Article 9.8.5.2. for *ramps*.)

9.9.3.3. Width of Corridors

- (1) The width of every *public corridor*, corridor used by the public, and *exit* corridor shall be not less than 1 100 mm. (See also Subsection 9.9.5. for obstructions in corridors.)

9.9.3.4. Clear Height

- (1) Except for stairways, doorways and *storage garages*, the minimum clear height in *exits* and *access to exits* shall be 2.1 m. (See Article 9.8.2.2. for stairs, Article 9.8.5.3. for *ramps*, Article 9.8.6.4. for landings and Article 9.9.6.2. for doorways.)
- (2) The clear height in *exits* and *access to exits* in a *storage garage* shall be not less than 2 m.

9.9.4. Fire Protection of Exits

9.9.4.1. Application

(1) Except as provided in Articles 9.9.4.4. and 9.9.4.6., this Subsection applies to the fire protection of all *exits* except *exits* serving not more than one *dwelling unit*.

9.9.4.2. Fire Separation for Exits

(1) Except as provided in Sentence (5) and Article 9.9.8.5., every *exit* other than an *exit* doorway shall be separated from each adjacent *floor area* or from another *exit* by a *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly above the *floor area*.

(2) Where there is no floor assembly above, the *fire-resistance rating* required in Sentence (1) shall not be less than that required by Subsection 9.10.8. for the floor assembly below, but in no case shall the *fire-resistance rating* be less than 45 min.

(3) A *fire separation* common to 2 *exits* shall be smoke-tight and not be pierced by doorways, duct work, piping or any other opening that may affect the continuity of the separation.

(4) A *fire separation* that separates an *exit* from the remainder of the *building* shall have no openings except those for electrical wiring, *noncombustible* conduit and *noncombustible* piping that serve only the *exit*, and for standpipes, sprinkler piping, *exit* doorways and wired glass and glass block permitted in Article 9.9.4.3.

(5) The requirements in Sentence (1) do not apply to an exterior *exit* passageway provided the passageway has at least 50% of its exterior sides open to the outdoors and is served by an *exit* stair at each end of the passageway.

9.9.4.3. Wired Glass or Glass Block (See Note A-3.1.8.19.(1))

(1) This Article applies to wired glass in doors, and wired glass or glass block in sidelights, where these are installed in *fire separations* between *exit* enclosures and *floor areas*.

(2) Except as provided in Sentence (3), the combined area of glazing in doors and sidelights shall not exceed 0.8 m².

(3) Where an *exit* enclosure connects with a *floor area* through an enclosed vestibule or corridor separated from the *floor area* by *fire separations* having not less than a 45 min *fire-resistance rating*, the glazed areas described in Sentence (1) need not be limited as required in Sentence (2).

9.9.4.4. Openings Near Unenclosed Exterior Exit Stairs and Ramps

(1) Where an unenclosed exterior *exit* stair or *ramp* provides the only *means of egress* from a *suite*, and is exposed to fire from openings in the exterior walls of another *fire compartment*, the openings in the exterior walls of the *building* shall be protected with wired glass in fixed steel frames or glass block conforming to Articles 9.10.13.5. and 9.10.13.7. when the openings in the exterior walls of the *building* are within 3 m horizontally and less than 10 m below or less than 5 m above the *exit* stair or *ramp*.

9.9.4.5. Openings in Exterior Walls of Exits

(1) Either openings in exterior walls of an *exit* or openings in adjacent exterior walls of the *building* the *exit* serves shall be protected with wired glass in fixed steel frames or glass block installed in accordance with Articles 9.10.13.5. and 9.10.13.7., where

(a) the *exit* enclosure has exterior walls that intersect the exterior walls of the *building* at an angle of less than 135° measured on the outside of the *building*, and

- (b) the openings in the exterior walls of the *building* are within 3 m horizontally and less than 2 m above the openings in the exterior walls of the *exit*.
(See Note A-9.9.4.5.(1))

9.9.4.6. Openings Near Exit Doors

- (1) This Article applies to
- (a) *exit* doors serving other than an individual *dwelling unit*, and
 - (b) *exit* doors serving an individual *dwelling unit* where there is no second and separate *exit* from the *dwelling unit*.
- (2) Where an exterior *exit* door described in Sentence (1) in one *fire compartment* is within 3 m horizontally of an *unprotected opening* in another *fire compartment* and the exterior walls of these *fire compartments* intersect at an exterior angle of less than 135°, the opening shall be protected with wired glass in fixed steel frames or glass block conforming to Articles 9.10.13.5. and 9.10.13.7. or with a rated *closure* conforming to Table 9.10.13.1. with respect to the rating of the *fire separation* between the two compartments.

9.9.4.7. Stairways in Group D or E Buildings

- (1) Notwithstanding the requirements of Sentences 9.9.4.2.(1), 9.9.8.2.(1) and Article 9.10.9.5., where a *suite* of Group D or E *occupancy* is located partly on the *first storey* and partly on the second *storey* or partly on the second *storey* and partly on the third *storey*, stairways serving the *suite* need not be constructed as *exit* stairs provided
- (a) the *building* is not greater than 3 *storeys* in *building height*,
 - (b) the *suite* is separated from other *occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 45 min,
 - (c) the area occupied by the *suite* is not greater than 100 m² per *storey*, other than the *exit level storey*,
 - (d) the maximum travel distance from any point in the *suite* to an exterior *exit* is not greater than 25 m,
 - (e) the floor assemblies have a *fire-resistance rating* of not less than 45 min or are of *noncombustible construction*,
 - (f) the *basement* and *first storey* are separated by a *fire separation* having a *fire-resistance rating* of not less than 45 min, and
 - (g) a *smoke alarm* is installed on each floor of the *suite*, including the *basement*, in accordance with Subsection 9.10.19.

9.9.5. Obstructions and Hazards in Means of Egress

9.9.5.1. Application

- (1) This Subsection applies to obstructions and hazards in every *means of egress* except those within a *dwelling unit* or serving not more than one *dwelling unit*.

9.9.5.2. Occupancies in Corridors

- (1) Where a corridor contains an *occupancy*, the *occupancy* shall not reduce the unobstructed width of the corridor to less than the required width of the corridor.

9.9.5.3. Obstructions in Public Corridors

- (1) Except as permitted in Sentence (2), obstructions located within 1 980 mm of the floor shall not project horizontally more than 100 mm into *exit* passageways, corridors used by the public or *public corridors* in a manner that would create a hazard for visually impaired persons travelling adjacent to walls.
- (2) The horizontal projection of an obstruction referred to in Sentence (1) is permitted to exceed 100 mm where the obstruction extends to less than 680 mm above the floor. (See Note A-3.3.1.8.(2) and (3))

9.9.5.4. Obstructions in Exits

(1) Except as permitted in Subsection 9.9.6. and Article 9.8.7.6., no fixture, turnstile or construction shall project within the required width of an *exit*.

9.9.5.5. Obstructions in Means of Egress

(1) No obstructions such as posts or turnstiles shall be placed so as to restrict the width of a required *means of egress* from a *floor area* or part of a *floor area* to less than 750 mm unless an alternate unobstructed *means of egress* is provided adjacent to and plainly visible from the restricted egress.

(2) Except as provided in Sentence (3), no obstructions, such as counter gates, that do not meet the requirements for *exit* doors, shall be placed in a required *means of egress* from a *floor area* or part of a *floor area* unless an alternate unobstructed *means of egress* is provided adjacent to and plainly visible from the restricted egress.

(3) Obstructions, such as counter gates, that do not satisfy Sentence (2), are permitted to be placed in a required *means of egress* from a part of a *floor area* in *mercantile occupancies* and *business and personal services occupancies*, provided that the part of the *floor area* served by the obstructed *means of egress* is not generally accessible to the public.

9.9.5.6. Mirrors or Draperies

(1) No mirror shall be placed in or adjacent to any *exit* so as to confuse the direction of *exit*, and no mirror or draperies shall be placed on or over *exit* doors.

9.9.5.7. Fuel-Fired Appliances

(1) Fuel-fired *appliances* shall not be installed in an *exit* or corridor serving as an *access to exit*.

9.9.5.8. Service Rooms

(1) *Service rooms* containing equipment subject to possible explosion, such as *boilers* designed to operate at a pressure in excess of 100 kPa, and certain types of refrigerating and transformer equipment, shall not be located under required *exits*.

9.9.5.9. Ancillary Rooms

(1) Except in houses with a *secondary suite*, ancillary rooms such as storage rooms, washrooms, toilet rooms, laundry rooms and *service rooms* shall not open directly into an *exit*.

9.9.6. Doors in a Means of Egress

9.9.6.1. Obstructions by Doors

(1) Except as provided in Sentence (4), swinging doors in their swing shall conform to Sentences (2) and (3)

- (a) at *exit* doors,
- (b) at doors that open into or are located within a *public corridor*, and
- (c) at doors that open into or are located within another facility that provides *access to exit* from a *suite*.

(2) When fully open, doors described in Sentence (1) shall not decrease the required *exit* width by more than

- (a) 100 mm in *exit* corridors, and
- (b) 50 mm for other *exit* facilities.

- (3) The swing of doors described in Sentence (1) shall not reduce the width of the path of travel to less than
 - (a) the required *exit* width in *exit* corridors and passageways, and
 - (b) 750 mm on *exit* stairs or landings.
- (4) Doors serving a single *dwelling unit* or a house with a *secondary suite* need not comply with Sentences (2) and (3).

9.9.6.2. Clear Opening Height at Doorways

- (1) Except as provided in Sentences (2) and (3), the clear opening height of doorways shall be not less than 2 030 mm high at
 - (a) *exit* doors,
 - (b) doors that open into or are located within a *public corridor*, and
 - (c) doors that open into or are located within another facility that provides *access to exit* from a *suite*.
- (2) The clear opening height under door closers and other devices in doorways described in Sentence (1) shall be not less than 1 980 mm.
- (3) Doorways serving a single *dwelling unit* or a house with a *secondary suite* need not comply with Sentences (1) and (2). (See also Article 9.5.5.1.)

9.9.6.3. Clear Opening Width at Doorways

- (1) Except as provided in Sentence (4), the clear opening width of doorways shall comply with Sentence (2) at
 - (a) *exit* doors, and
 - (b) doors that open into or are located within a *public corridor* or other facility that provides *access to exit* from a *suite*.
- (2) Doorways described in Sentence (1) shall be
 - (a) not less than 800 mm wide where there is only one door leaf,
 - (b) not less than 800 mm wide where multiple-leaf doors are installed with only one active leaf having a latching mechanism described in Article 9.9.6.7., and
 - (c) not less than 1 210 mm wide where multiple-leaf doors are installed with two active leaves.
- (3) In doorways described in Sentence (1) that have multiple-leaf doors installed,
 - (a) no active leaf shall be less than 810 mm wide where only one leaf is active, and
 - (b) no single leaf shall be less than 610 mm wide where two leaves are active.
- (4) Doorways serving a single *dwelling unit* or a house with a *secondary suite* need not comply with Sentence (2). (See also Article 9.5.5.1.)

9.9.6.4. Door Action

- (1) Except as provided in Sentences (4) and (5), required *exit* doors and doors in required *means of egress*, except doors in *means of egress* within *dwelling units*, shall swing on the vertical axis.
- (2) Except as provided in Sentence (5), breakaway sliding doors, installed as required *exit* doors or required doors in *means of egress*, shall be identified as swinging doors by means of a label or decal affixed to the door.
- (3) Revolving doors shall comply with Article 3.4.6.15.
- (4) Movable *partitions* used to separate a *public corridor* from an adjacent *business and personal services occupancy* or a *mercantile occupancy* need not conform to Sentence (1), provided the partitions are not located in the only *means of egress*. (See Note A-3.3.1.12.(3))

- (5) *Exit* doors need not conform to Sentence (1) or (2), where
 - (a) the doors serve accessory *buildings* where life safety is not adversely affected,
 - (b) the doors serve *storage garages* or other accessory *buildings* serving not more than one *dwelling unit*, or
 - (c) the doors
 - (i) serve storage *suites* of not more than 28 m² in *gross area* that are in warehousing *buildings* of not more than one *storey*, and
 - (ii) open directly to the exterior at ground level.

9.9.6.5. Direction of Door Swing

- (1) Except as permitted by Sentence (1.1) and except for doors serving single *dwelling unit* or a house with a *secondary suite*, *exit* doors that are required to swing shall swing in the direction of *exit* travel.
 - (1.1) An *exit* door need not swing in the direction of *exit* travel where it serves
 - (a) a room, *suite* or *floor area* having an *occupant load* of not more than 60 persons, or
 - (b) as part of a *means of egress* from more than one *floor area* and the *floor areas* so served have a total *occupant load* of not more than 60 persons..
- (2) Doors that open onto a corridor or other facility that provides *access to exit* from a room or *suite* having an *occupant load* of more than 60 persons shall swing on the vertical axis in the direction of *exit* travel.
- (3) Doors that divide a corridor that is not wholly contained within a *suite* shall swing in the direction of *exit* travel.
- (4) Where a pair of doors is installed in a corridor that provides *access to exit* in both directions, the doors shall
 - (a) swing in opposite directions, with the door on the right hand-side swinging in the direction of *exit* travel, or
 - (b) swing in both directions.

9.9.6.6. Nearness of Doors to Stairs

- (1) Except as provided in Sentence (2), the distance between a stair riser and the leading edge of a door during its swing, except for doors serving a single *dwelling unit* or a house with a *secondary suite*, shall be not less than 300 mm.
- (2) Where there is a danger of blockage from ice or snow, an *exit* door, including doors serving a single *dwelling unit*, may open onto not more than one step, provided the riser of such a step does not exceed 150 mm.

9.9.6.7. Door Latching, Locking and Opening Mechanisms

- (1) Principal entrance doors, *exit* doors and doors to *suites*, including exterior doors of *dwelling units*, and other doors in an *access to exit* shall
 - (a) be openable from the inside or in travelling to an *exit* without requiring keys, special devices or specialized knowledge of the door-opening mechanism, or
 - (b) be controlled by electromagnetic locking mechanisms in accordance with Sentence 3.4.6.16.(5).
- (2) Except for doors serving a single *dwelling unit* or a house with a *secondary suite*, and doors to accessory *buildings* and to garages serving a single *dwelling unit*, door release hardware on doors in a *means of egress* shall be operable with one hand and the door shall be openable with not more than one releasing operation. (See also Sentence 3.8.3.6.(4) and Note A-3.3.1.13.(4))
- (3) Door release hardware on doors in a *means of egress* shall be installed 900 mm to 1 100 mm above the finished floor.
- (4) Except for *hotels*, a door opening onto a *public corridor* that provides *access to exit* from *suites* shall be designed not to lock automatically when such doors are equipped with an automatic self-closing device. (See Note A-3.3.4.5.(1))

9.9.6.8. Effort Required to Open

(1) Except as required by Sentence 3.8.3.3.(7), every *exit* door, except doors serving a single *dwelling unit* or a house with a *secondary suite*, shall be designed and installed so that when the latch is released the door will open in the direction of *exit* travel under a force of not more than 90 N applied to the door release hardware. (See Sentence 3.8.3.6.(8) for door opening forces in a *barrier-free* path of travel.)

9.9.7. Access to Exits

9.9.7.1. Egress from Roof Area, Podiums, Terraces, Platforms and Contained Open Spaces

- (1) An *access to exit* shall be provided from every roof intended for *occupancy* and from every podium, terrace, platform or contained open space.
- (2) Where a roof is intended for an *occupant load* of more than 60 persons, at least 2 separate *means of egress* shall be provided from the roof to stairs designed in conformance with the requirements for *exit* stairs and located remote from each other.
- (3) Where a podium, terrace, platform or contained open space is provided, egress requirements shall conform to the appropriate requirements for rooms or *suites* in Article 9.9.7.4.

9.9.7.2. Means of Egress from Suites

- (1) Except as required in Sentence 9.9.9.3.(1), each *suite* in a *floor area* occupied by more than one *suite* shall have
 - (a) an exterior *exit* doorway,
 - (b) a doorway to a *public corridor*, or
 - (c) a doorway to an exterior passageway.
- (2) Except as provided in Sentences 9.9.7.3.(1) and 9.9.8.2.(2), from the point where a doorway described in Clause(1)(b) or (c) enters the *public corridor* or exterior passageway, it shall be possible to go in opposite directions to each of 2 separate *exits*.

9.9.7.3. Dead-End Corridors

- (1) A dead-end *public corridor* is permitted in an *occupancy* shown in Table 9.9.7.3., where
 - (a) the dead-end corridor
 - (i) does not exceed the distance of travel measured from the most remote point of the dead-end to a point where it is possible to go in opposite directions to each of two separate *exits*, and
 - (ii) is provided with doors equipped with self-closing devices, or
 - (b) there is a second and separate egress doorway from each room or *suite* not leading into the dead-end corridor.
- (2) Dead-end *public corridors* in *residential occupancies* and *business and personal services occupancies* shall contain only *suite* door openings arranged so that not more than two such doors have to be passed to reach the nearest *exit*.
- (3) The area of wired glass in doors required by Sentence (2) shall not exceed 645 cm².

Table 9.9.7.3.
Dead-End Public Corridors
 Forming Part of Sentence 9.9.7.3.(1)

<i>Occupancy</i>	Maximum Length of Dead-End <i>Public Corridor</i> , m	Maximum <i>Occupant Load</i> or <i>Suites Served</i> by Dead-End <i>Public Corridor</i>
Group C	6	4 <i>suites</i>
Group D	6	30
Group E	9	30
Group F	9	30

9.9.7.4. Number and Spacing of Egress Doors

- (1) Except for *dwelling units*, at least two egress doors shall be provided where
 - (a) the area of a room or *suite* exceeds 200 m² in a Group D, E, F2 and F3 *occupancy*, or 150 m² in a Group C *occupancy*, or
 - (b) the distance measured from any point within a room or *suite* to the nearest egress door exceeds 25 m.
- (2) Doors required in Sentence (1) shall be spaced so that in the event one door is made inaccessible by a fire within such a room or *suite*, the other door will provide safe egress.

9.9.7.5. Independent Access to Exit

- (1) Required *access to exit* from *suites* shall not be through any other *dwelling unit*, *service room* or other *occupancy*.

9.9.7.6. Travel Distance Within Rooms and Suites

- (1) Except for *dwelling units*, the travel distance from any point within the room or *suite* to the nearest egress door shall not exceed the maximum travel distance in Article 9.9.8.2.

9.9.8. Exits from Floor Areas

9.9.8.1. Measurement of Travel Distance

- (1) Except as provided in Sentences (2) and (3), for the purposes of this Subsection, travel distance means the distance from any point in the *floor area* to an *exit* measured along the path of *exit* travel.
- (2) Where a room or *suite* is separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* of at least 45 min or, in a *sprinklered building*, by a *fire separation* which is not required to have a *fire-resistance rating*, the travel distance may be measured from an egress door of the room or *suite* to the nearest *exit*.
- (3) Where a *public corridor* is not less than 9 m wide and conforms to Subclauses 3.4.2.5.(1)(d)(i) to (d)(iv), the travel distance may be determined in accordance with those Subclauses.

9.9.8.2. Number of Required Exits

- (1) Except as provided in Sentences (2) and (3) and Subsection 9.9.9., at least 2 *exits* shall be provided from every *floor area*, spaced so that the travel distance to the nearest *exit* is not more than
 - (a) 40 m in the case of *business and personal services occupancies*,
 - (b) 45 m for all *occupancies* where the *floor area* is *sprinklered*, and
 - (c) 30 m for all other *occupancies*.

(2) Except as provided in Subsection 9.9.9., a single *exit* is permitted from each *storey* in *buildings* of 1 and 2 *storeys* in *building height* provided the *floor area* and travel distance requirements conform to those required in Article 9.9.7.4. and the total *occupant load* served by an *exit* facility does not exceed 60 persons.

(3) In *boarding, lodging or rooming houses*,

(a) where sleeping accommodation is provided for not more than eight persons, a single *exit* is permitted from each *floor area*, or

(b) where sleeping accommodation is not provided in the *basement*, a single *exit* is permitted from the *basement floor area*.

9.9.8.3. Contribution of Each Exit

(1) Where more than one *exit* is required from a *floor area*, each *exit* shall be considered as contributing not more than half the required *exit* width.

9.9.8.4. Location of Exits

(1) Where more than one *exit* is required from a *floor area*, at least 2 *exits* shall be independent of each other and be placed remote from each other along the path of travel between them. (See Note A-9.9.8.4.(1))

9.9.8.5. Exiting Through a Lobby

(1) Not more than one *exit* from a *floor area* is permitted to lead through a lobby.

(2) The lobby referred to in Sentence (1) shall be not more than 4.5 m above *grade*, and the path of travel through the lobby to the outdoors shall not exceed 15 m.

(3) The lobby referred to in Sentence (1) shall conform in all respects to the requirements for *exits*, except that rooms other than *service rooms*, storage rooms and rooms of *residential* or *industrial occupancy* are permitted to open directly onto such lobby.

(3.1) Except as provided in Sentence (6), an *exit* is permitted to lead through a lobby referred to in Sentence (1) provided the lobby is not located within an *interconnected floor space* other than as described in Sentence 3.2.8.2.(6).

(4) Where the lobby referred to in Sentence (1) and adjacent *occupancies* that are permitted to open into the lobby are *sprinklered*, the *fire separation* between such *occupancies* and the lobby need not have a *fire-resistance rating*. (See Note A-3.4.4.2.(2)(e))

(5) Passenger elevators are permitted to open onto the lobby referred to in Sentence (1) provided the elevator doors are designed to remain closed except while loading and unloading passengers.

(6) An *exit* that serves a *hotel* is permitted to lead through a lobby referred to in Sentence (1) provided the lobby is not located within an *interconnected floor space*.

9.9.8.6. Mezzanine Means of Egress

(1) Except as provided by Sentences (2) and (3), the space above a *mezzanine* shall be served by at least two *means of egress* leading to *exits* accessible at the *mezzanine* level on the same basis as *floor areas*.

(2) One *means of egress* from a *mezzanine* is permitted, where

(a) the *mezzanine* is not required to terminate at a vertical *fire separation*, as permitted by Sentence 9.10.12.1.(2),

(b) the *occupant load* of the *mezzanine* is not more than 60,

- (c) the area of the *mezzanine* does not exceed the area limits of Clause 9.9.7.4.(1)(a), and
 - (d) the distance limits of Clause 9.9.7.4.(1)(b) measured along the path of travel, are not exceeded from any point on the *mezzanine* to
 - (i) an egress door serving the space that the *mezzanine* overlooks if the space is served by a single egress door, or
 - (ii) an egress stairway leading to an *access to exit* in the space below if that space is required to be served by two or more egress doorways in conformance with Sentence 9.9.7.4.(1).
- (3) One of the *means of egress* from a *mezzanine* that is not required to terminate at a *fire separation* as permitted by Sentence 9.10.12.1.(2) and that exceeds the limits of Sentence (2), is permitted to lead through the room in which the *mezzanine* is located provided all other *means of egress* from that *mezzanine* lead to *exits* accessible at the *mezzanine* level.
- (4) Except as provided in Sentence (2), the maximum travel distance from any point on a *mezzanine* to the nearest *exit* shall be not more than
- (a) 40 m in a *business and personal services occupancy*,
 - (b) 45 m in a *floor area* that is *sprinklered* throughout, provided it does not contain a *high-hazard industrial occupancy*, or
 - (c) 30 m in any *floor area* not referred to in Clause (a) or (b).

9.9.9. Egress from Dwelling Units

9.9.9.1. Travel Limit to Exits or Egress Doors

- (1) Except as provided in Sentences (2) and (3), every *dwelling unit* containing more than 1 *storey* shall have *exits* or egress doors located so that it shall not be necessary to travel up or down more than 1 *storey* to reach a level served by
 - (a) an egress door to a *public corridor*, enclosed *exit* stair or exterior passageway, or
 - (b) an *exit* doorway not more than 1.5 m above adjacent ground level.
- (2) Where a *dwelling unit* is not located above or below another *suite*, the travel limit from a floor level in the *dwelling unit* to an *exit* or egress door may exceed 1 *storey* where that floor level is served by an openable window or door
 - (a) providing an unobstructed opening of not less than 1 m in height and 0.55 m in width, and
 - (b) located so that the sill is not more than
 - (i) 1 m above the floor, and
 - (ii) 7 m above adjacent ground level.
- (3) The travel limit from a floor level in a *dwelling unit* to an *exit* or egress door may exceed 1 *storey* where that floor level has direct access to a balcony.

9.9.9.2. Two Separate Exits

- (1) Except as provided in Sentence 9.9.7.3.(1) and except for *dwelling units* in a house with a *secondary suite*, where an egress door from a *dwelling unit* opens onto a *public corridor* or exterior passageway it shall be possible from the location where the egress door opens onto the corridor or exterior passageway to go in opposite directions to 2 separate *exits* unless the *dwelling unit* has a second and separate *means of egress*.

9.9.9.3. Shared Egress Facilities

- (1) Except for *dwelling units* in a house with a *secondary suite*, a *dwelling unit* shall be provided with a second and separate *means of egress* where an egress door from the *dwelling unit* opens onto
 - (a) an *exit* stairway serving more than one *suite*,
 - (b) a *public corridor*
 - (i) serving more than one *suite*, and
 - (ii) served by a single *exit*,

- (c) an exterior passageway
 - (i) serving more than one *suite*,
 - (ii) served by a single *exit* stairway or *ramp*, and
 - (iii) more than 1.5 m above adjacent ground level, or
- (d) a balcony
 - (i) serving more than one *suite*,
 - (ii) served by a single *exit* stairway or *ramp*, and
 - (iii) more than 1.5 m above adjacent ground level.

(2) Where a *dwelling unit* is located above another *dwelling unit* or common space in a house with a *secondary suite*, the upper *dwelling unit* shall be provided with as second and separate *means of egress* where an egress door from that *dwelling unit* opens onto an exterior passageway that

- (a) has a floor assembly with a *fire-resistance rating* less than 45 min,
- (b) is served by a single *exit* stairway or *ramp*, and
- (c) is located more than 1.5 m above adjacent ground level.

9.9.10. Egress from Bedrooms

9.9.10.1. Egress Windows or Doors for Bedrooms

(1) Except where a door on the same floor level as the bedroom provides direct access to the exterior, every floor level containing a bedroom in a *suite* shall be provided with at least one outside window that

- (a) is openable from the inside without the use of tools,
 - (b) provides an individual, unobstructed open portion having a minimum area of 0.35 m² with no dimension less than 380 mm, and
 - (c) maintains the required opening described in Clause (b) without the need for additional support.
- (See Note A-9.9.10.1.(1))

(2) Except for *basement* areas, the window required in Sentence (1) shall have a maximum sill height of 1 000 mm above the floor. (See Note A-9.9.10.1.(2))

(3) Where a window required in Sentence (1) opens into a window well, a clearance of not less than 550 mm shall be provided in front of the window. (See Note A-9.9.10.1.(3))

(4) Where the sash of a window referred to in Sentence (3) swings towards the window well, the operation of the sash shall not reduce the clearance in a manner that would restrict escape in an emergency.

(5) Where a protective enclosure is installed over the window well referred to in Sentence (3), the enclosure shall be openable from the inside without the use of keys, tools or special knowledge of the opening mechanism.

(6) When sliding windows are used, the minimum dimension described in Sentence (1) shall apply to the openable portion of the window.

(7) Where the sleeping area within a *live/work unit* is on a *mezzanine* with no obstructions more than 1 070 mm above the floor, the window required in Sentence (1) may be provided on the main level of the *live/work unit* provided the *mezzanine* is not more than 25% of the area of the *live/work unit* or 20 m², whichever is less, and an unobstructed direct path of travel is provided from the *mezzanine* to this window.

9.9.11. Signs

9.9.11.1. Application

- (1) This Subsection applies to all *exits* except those serving not more than one *dwelling unit* or a house with a *secondary suite*.

9.9.11.2. Visibility of Exits

- (1) *Exits* shall be located so as to be clearly visible or their locations shall be clearly indicated.
- (2) Where an *exit* door leading directly to the outside is subject to being obstructed by a parked vehicle or storage because of its location, a visible sign prohibiting such obstructions shall be permanently mounted on the exterior side of the door.

9.9.11.3. Exit Signs

- (1) Except as required in Sentence (7), every *exit* door shall have an *exit* sign placed over it or adjacent to it if the *exit* serves
 - (a) a *building* that is 3 *storeys* in *building height*,
 - (b) a *building* having an *occupant load* of more than 150, or
 - (c) a room or *floor area* that has a fire escape as part of a required *means of egress*.
- (2) Except as required in Sentence (6), every *exit* sign shall
 - (a) be visible on approach to the *exit*,
 - (b) consist of a green pictogram and a white or lightly tinted graphical symbol meeting the colour specifications referred to in ISO 3864-1, “Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings,” and
 - (c) conform to ISO 7010, “Graphical symbols – Safety colours and safety signs – Registered safety signs,” for the following symbols: (See Note A-3.4.5.1.(2)(c))
 - (i) E001 emergency exit left,
 - (ii) E002 emergency exit right,
 - (iii) E005 90-degree directional arrow, and
 - (iv) E006 45-degree directional arrow.
- (3) Internally illuminated *exit* signs shall be continuously illuminated, and
 - (a) where illumination of the sign is powered by an electrical circuit, be constructed in conformance with CSA C22.2 No. 141, “Emergency lighting equipment,” or
 - (b) where illumination of the sign is not powered by an electrical circuit, be
 - (i) constructed in conformance with CAN/ULC-S572, “Standard for Photoluminescent and Self-Luminous Exit Signs and Path Marking Systems,” and
 - (ii) labelled in accordance with the time duration for which they have been tested and *listed*.
- (4) Externally illuminated *exit* signs shall be continuously illuminated at all times by a light fixture supplied by an electrical circuit.
- (5) The circuitry serving lighting for externally and internally illuminated *exit* signs shall
 - (a) serve no equipment other than emergency lighting in the area where the *exit* signs are installed, and
 - (b) be connected to an emergency power supply as described in Sentences 9.9.12.3.(2), (3) and (7).

- (6) An *exit* sign conforming to Clauses (2)(b) and (c) with an arrow or other indicator pointing at the direction of egress shall be provided where no *exit* is visible from
- (a) a *public corridor*,
 - (b) a corridor used by the public, or
 - (c) a principal route serving an open *floor area* having an *occupant load* of more than 150.
- (7) Except for *suite* doors opening directly to the exterior, every *exit* serving a *hotel* shall have an *exit* sign placed over it or adjacent to it.

9.9.11.4. Signs for Stairs and Ramps at Exit Level

- (1) In *buildings* that are 3 *storeys* in *building height*, any part of an *exit ramp* or stairway that continues up or down past the lowest *exit level* shall be clearly marked to indicate that it does not lead to an *exit* if the portion below *exit level* may be mistaken as the direction of *exit* travel.

9.9.11.5. Floor Numbering

- (1) Arabic numerals indicating the assigned floor number shall be
- (a) except in *hotels*, mounted permanently on the stair side of the wall at the latch side of doors to *exit* stair shafts,
 - (b) in *hotels*, mounted permanently on each side of the *exit* doors to the *exit* stair shaft,
 - (c) not less than 60 mm high, raised approximately 0.8 mm above the surface,
 - (d) located 1 500 mm from the finished floor and not more than 300 mm from the door, and
 - (e) contrasting in colour with the surface on which they are applied. (See Note A-9.9.11.5.(1)(e))

9.9.12. Lighting

9.9.12.1. Application

- (1) This Subsection applies to the lighting of all *means of egress* except those within *dwelling units* or a house with a *secondary suite*.

9.9.12.2. Required Lighting in Egress Facilities

- (1) Every *exit*, *public corridor* or corridor providing *access to exit* for the public shall be equipped to provide illumination to an average level of not less than 50 lx at floor or tread level and at all points such as angles and intersections at changes of level where there are stairs or *ramps*.
- (2) The minimum value of the illumination required by Sentence (1) shall be not less than 10 lx.

9.9.12.3. Emergency Lighting

- (1) Emergency lighting shall be provided in
- (a) *exits*,
 - (b) principal routes providing *access to exit* in an open *floor area*,
 - (c) corridors used by the public,
 - (d) underground *walkways*, and
 - (e) *public corridors*.
- (2) Emergency lighting required in Sentence (1) shall be provided from a source of energy separate from the electrical supply for the *building*.
- (3) Lighting required in Sentence (1) shall be designed to be automatically actuated for a period of at least 30 min when the electric lighting in the affected area is interrupted.

- (4) Illumination from lighting required in Sentence (1) shall be provided to average levels of not less than 10 lx at floor or tread level.
- (5) The minimum value of the illumination required by Sentence (4) shall be not less than 1 lx.
- (6) Where incandescent lighting is provided, lighting equal to 1 W/m² of *floor area* shall be considered to meet the requirement in Sentence (4).
- (7) Where self-contained emergency lighting units are used, they shall conform to CSA C22.2 No. 141, “Emergency lighting equipment.”

Section 9.10. Fire Protection

9.10.1. Definitions and Application

9.10.1.1. Sloped Roofs

- (1) For the purposes of this Section, roofs with slopes of 60° or more to the horizontal and that are adjacent to a room or space intended for *occupancy* shall be considered as a wall.

9.10.1.2. Testing of Integrated Fire Protection and Life Safety Systems

- (1) Where life safety and fire protection systems and systems with fire protection and life safety functions are integrated with each other, they shall be tested as a whole in accordance with CAN/ULC-S1001, “Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems,” to verify that they have been properly integrated. (See Note A-3.2.9.1.(1))
- (2) Sentence (1) does not apply to a *building* that contains only *dwelling units* and has no *dwelling unit* above another *dwelling unit*.

9.10.1.3. Items Under Part 3 Jurisdiction

- (1) Tents, *air-supported structures*, transformer vaults, *walkways*, elevators and escalators shall conform to Part 3.
- (2) Where rooms or spaces are intended for an *assembly occupancy*, such rooms or spaces shall conform to Part 3.
- (3) *Basements* containing more than 1 *storey* or exceeding 600 m² in area shall conform to Part 3.
- (4) Where rooms or spaces are intended for the storage, manufacture or use of hazardous or explosive material, such rooms or spaces shall conform to Part 3.
- (5) Reserved.
- (6) Openings through floors that are not protected by shafts or *closures* shall be protected in conformance with Subsection 3.2.8. (See also Sentence 9.9.4.7.(1))
- (7) Chutes and shafts shall conform to Subsection 3.6.3. except where they are entirely contained within a *dwelling unit*.
- (8) Sprinkler systems shall be designed, constructed and installed in conformance with Articles 3.2.5.12. to 3.2.5.15. and 3.2.5.17. (See Note A-9.10.1.3.(8) and (9))

(9) Standpipe and hose systems shall be designed, constructed and installed in conformance with Articles 3.2.5.8. to 3.2.5.11. and 3.2.5.17. (See Note A-9.10.1.3.(8) and (9))

(10) Fire pumps shall be installed in conformance with Articles 3.2.5.17. and 3.2.5.18.

(11) Where fuel-fired appliances are installed on a roof, such *appliances* shall be installed in conformance with Article 3.6.1.5.

9.10.1.4. Items Under Part 6 Jurisdiction

(1) In kitchens containing commercial cooking equipment used in processes producing grease-laden vapours, the equipment shall be designed and installed in conformance with Article 6.3.1.6. (See Note A-9.10.1.4.(1))

9.10.2. Occupancy Classification

9.10.2.1. Occupancy Classification

(1) Every *building* or part of it shall be classified according to its *major occupancy* as belonging to one of the groups or divisions described in Table 9.10.2.1.

Table 9.10.2.1.
Occupancy Classifications
Forming Part of Sentence 9.10.2.1.(1)

Group	Division	Description of <i>Major Occupancies</i> ⁽¹⁾
C	—	<i>Residential occupancies</i>
D	—	<i>Business and personal services occupancies</i>
E	—	<i>Mercantile occupancies</i>
F	2	<i>Medium-hazard industrial occupancies</i>
F	3	<i>Low-hazard industrial occupancies</i> (Does not include <i>storage garages</i> serving houses or individual dwelling units)

Notes to Table 9.10.2.1.:

(1) See Note A-3.1.2.1.(1).

9.10.2.2. Reserved

9.10.2.3. Major Occupancies Above Other Major Occupancies

(1) Except as permitted in Article 9.10.2.4., in any *building* containing more than one *major occupancy* in which one *major occupancy* is located entirely above another, the requirements of Article 9.10.8.1. for each portion of the *building* containing a *major occupancy* shall be applied to that portion as if the entire *building* was of that *major occupancy*.

9.10.2.4. Buildings Containing More Than One Major Occupancy

(1) In a *building* containing more than one *major occupancy*, where the aggregate area of all *major occupancies* in a particular group or division does not exceed 10% of the *floor area* on the *storey* on which they are located, they need not be considered as *major occupancies* for the purposes of Articles 9.10.2.3. and 9.10.8.1. provided they are not classified as Group F, Division 2 *occupancies*.

9.10.3. Ratings

9.10.3.1. Fire-Resistance and Fire-Protection Ratings

- (1) Where a *fire-resistance rating* or a *fire-protection rating* is required in this Section for an element of a *building*, such rating shall be determined in conformance with
- (a) the test methods described in Part 3,
 - (b) MMAH Supplementary Standard SB-2, "Fire Performance Ratings," or
 - (c) MMAH Supplementary Standard SB-3, "Fire and Sound Resistance Tables."
- (See Note A-9.10.3.1.(1))

9.10.3.2. Flame-Spread Rating

- (1) Where a *flame-spread rating* is required in this Section for an element of a *building*, such rating shall be determined in accordance with the test methods described in Part 3, or in accordance with MMAH Supplementary Standard SB-2, "Fire Performance Ratings."
- (2) Unless the *flame-spread rating* is referred to in this Part as a "surface *flame-spread rating*", it shall apply to any surface of the element being considered that would be exposed by cutting through it as well as to the exposed surface of the element.

9.10.3.3. Fire Exposure

- (1) Floor, roof and ceiling assemblies shall be rated for exposure to fire on the underside.
- (2) Exterior walls shall be rated for exposure to fire from inside the *building*, except that such walls need not comply with the temperature rise limitations required by the standard tests referred to in Article 9.10.3.1. if such walls have a *limiting distance* of not less than 1.2 m, and due allowance is made for the effects of heat radiation in accordance with the requirements in Part 3.
- (3) *Firewalls* and interior vertical *fire separations* required to have *fire-resistance ratings* shall be rated for exposure to fire on each side.

9.10.3.4. Suspended Membrane Ceiling

- (1) Where a ceiling construction has a suspended membrane ceiling with lay-in panels or tiles that contribute to the required *fire-resistance rating*, hold down clips or other means shall be provided to prevent the lifting of such panels or tiles in the event of a fire.

9.10.4. Building Size Determination

9.10.4.1. Mezzanines Not Considered as Storeys

- (1) Except as required by Sentences (2) and 9.10.4.2.(1), the space above a *mezzanine* is permitted to be excluded from the calculation of *building height*, provided
- (a) the aggregate area of *mezzanines* that are not superimposed does not exceed 10% of the *floor area* of the *building* in which they are located, and
 - (b) the area of *mezzanine* in a *suite* does not exceed 10% of the area of that *suite* on the *storey* on which it is located.

- (2) Except as required by Sentence 9.10.4.2.(1), the space above a *mezzanine* is permitted to be excluded from the calculation of *building height*, provided
- (a) the aggregate area of *mezzanines* that are not superimposed does not exceed 40% of the open area of the room in which they are located, and (See Note A-3.2.1.1.(3)(a))
 - (b) except as permitted in Sentence (3), the space above the *mezzanine* floor is used as an open area without *partitions* or subdividing walls higher than 1 070 mm above the *mezzanine* floor.
- (3) The space above a *mezzanine* conforming to Sentence (2) is permitted to include an enclosed space whose area does not exceed 10% of the open area of the room in which the *mezzanine* is located, provided the enclosed space does not obstruct visual communication between the open space above the *mezzanine* and the room in which it is located.
- (4) For the purpose of determining *occupant load*, the areas of *mezzanines* that are not considered as *storeys* shall be added to the *floor area* of the *storey* on which they are located. (See Note A-9.10.4.1.(4))
- (5) Platforms and catwalks intended solely for periodic inspection and maintenance need not be considered as floor assemblies or *mezzanines* for the purpose of calculating *building height*, provided
- (a) they are not used for storage, and
 - (b) they are constructed with *noncombustible* materials, unless the *building* is permitted to be of *combustible construction*.

9.10.4.2. More Than One Level of Mezzanine

- (1) Where more than one level of *mezzanine* is provided in a *storey*, each level additional to the first shall be considered as a *storey*.

9.10.4.3. Basement Storage Garages

- (1) Where a *basement* is used primarily as a *storage garage*, the *basement* is permitted to be considered as a separate *building* for the purposes of this Section provided the floor above the *basement* and the exterior walls of the *basement* above the adjoining ground level are constructed as *fire separations* of masonry or concrete having a *fire-resistance rating* of not less than 2 h.

9.10.4.4. Rooftop Enclosures

- (1) Rooftop enclosures provided for elevator machinery, stairways or *service rooms*, used for no purpose other than for service to the *building*, shall not be considered as a *storey* in calculating the *building height*.

9.10.5. Permitted Openings in Wall and Ceiling Assemblies

9.10.5.1. Permitted Openings in Wall and Ceiling Membranes

- (1) Except as permitted in Sentences (2) and (3), a membrane forming part of an assembly required to have a *fire-resistance rating* shall not be pierced by openings into the assembly unless the assembly has been tested and rated for such openings.
- (2) A wall or ceiling membrane forming part of an assembly required to have a *fire-resistance rating* is permitted to be pierced by openings for electrical and similar service outlet boxes, provided such outlet boxes and the penetrations conform to Article 9.10.9.8.
- (2.1) Where boxes referred to in Sentence (2) are located on both sides of walls required to provide a *fire-resistance rating*, they shall be offset where necessary to maintain the integrity of the *fire separation*.

(3) A membrane ceiling forming part of an assembly assigned a *fire-resistance rating* on the basis of Table 2 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance Tables,” is permitted to be pierced by openings leading to ducts within the ceiling space provided the ducts, the amount of openings and their protection conform to Sentence 9.10.13.14.(1) and the requirements in MMAH Supplementary Standard SB-2, “Fire Performance Ratings.”

9.10.6. Construction Types

9.10.6.1. Combustible Elements in Noncombustible Construction

(1) Where a *building* or part of a *building* is required to be of *noncombustible construction*, *combustible* elements shall be limited in conformance with the requirements in Subsection 3.1.5.

9.10.6.2. Heavy Timber Construction

(1) *Heavy timber construction* shall be considered to have a 45 min *fire-resistance rating* when it is constructed in accordance with the requirements for *heavy timber construction* in Article 3.1.4.7.

9.10.7. Steel Members

9.10.7.1. Protection of Steel Members

(1) Except as permitted in Article 3.2.2.3., structural steel members used in construction required to have a *fire-resistance rating* shall be protected to provide the required *fire-resistance rating*.

9.10.8. Fire-Resistance and Combustibility in Relation to Occupancy, Height and Supported Elements

9.10.8.1. Fire-Resistance Ratings for Floors and Roofs

(1) Except as otherwise provided in this Subsection, the *fire-resistance ratings* of floors and roofs shall conform to Table 9.10.8.1. (See Subsection 9.10.2. for mixed *occupancies* and Subsection 9.10.21. for construction camps.)

Table 9.10.8.1.
Fire Resistance Ratings for Floors and Roofs
Forming Part of Sentence 9.10.8.1.(1)

Major Occupancy	Maximum Building Height, Storeys	Minimum Fire-Resistance Rating by Building Element, min		
		Floors Except Floors over Crawl Spaces	Mezzanine Floors	Roofs
Residential (Group C)	3	45	45	—
All other occupancies	2	45	—	—
	3	45	45	45

9.10.8.2. Fire-Resistance Ratings in Sprinklered Buildings

- (1) Except for roofs that support an *occupancy*, the requirements in Table 9.10.8.1. for roof assemblies to have a *fire-resistance rating* are permitted to be waived in *sprinklered buildings* where
- (a) the sprinkler system is electrically supervised in conformance with Sentence 3.2.4.9.(3), and
 - (b) the operation of the sprinkler system will cause a signal to be transmitted to the fire department in conformance with Sentence 3.2.4.7.(4).

9.10.8.3. Fire-Resistance Ratings for Walls, Columns and Arches

- (1) Except as otherwise provided in this Subsection, all *loadbearing* walls, columns and arches in the *storey* immediately below a floor or roof assembly shall have a *fire-resistance rating* of not less than that required for the supported floor or roof assembly.
- (2) Light-frame walls, columns, arches and beams as well as *loadbearing* steel elements that support floors between *dwelling units* in a house with a *secondary suite* including their common spaces shall be protected by not less than 15.9 mm thick Type-X gypsum board. (See Note A-9.10.8.3.(2))

9.10.8.4. Support of Noncombustible Construction

- (1) Where an assembly is required to be of *noncombustible construction* and to have a *fire-resistance rating*, it shall be supported by *noncombustible construction*.

9.10.8.5. Service Rooms

- (1) Construction supporting a *service room* need not conform to Article 9.10.8.3.

9.10.8.6. Mezzanines

- (1) *Mezzanines* required to be counted as *storeys* in Articles 9.10.4.1. and 9.10.4.2. shall be constructed in conformance with the requirements for “Floors Except Floors over Crawl Spaces” in Table 9.10.8.1.

9.10.8.7. Roofs Supporting an Occupancy

- (1) Where a portion of a roof supports an *occupancy*, that portion shall be constructed as a *fire separation* having a *fire-resistance rating* conforming to the rating for “Floors Except Floors over Crawl Spaces” in Table 9.10.8.1.

9.10.8.8. Floors of Exterior Passageways

- (1) Except as provided in Sentences (2) and (3), the floor assembly of every exterior passageway used as part of a *means of egress* shall have a *fire-resistance rating* of not less than 45 min or be of *noncombustible construction*.
- (2) No *fire-resistance rating* is required for floors of exterior passageways serving *buildings* of Group D, E or F *major occupancy* that are not more than 2 *storeys* in *building height*.
- (3) No *fire-resistance rating* is required for floors of exterior passageways serving
- (a) a house with a *secondary suite*, or
 - (b) a single *dwelling unit* where no *suite* is located above or below the *dwelling unit*. (See also Sentence 9.9.9.3.(2))

9.10.8.9. Crawl Spaces

(1) Where a crawl space exceeds 1.8 m in height or is used for any *occupancy* or as a *plenum* in *combustible construction* or for the passage of *flue pipes*, it shall be considered as a *basement* in applying the requirements in Article 9.10.8.1.

9.10.8.10. Non-Application to Houses

- (1) Table 9.10.8.1. does not apply to
- (a) a *dwelling unit* that has no other *dwelling unit* above or below it,
 - (b) houses with a *secondary suite*, where the floor framing is protected on the underside by a continuous smoke-tight barrier of not less than 15.9 mm thick Type X gypsum board, or
 - (c) a *dwelling unit* that is not above or below another *major occupancy*.

9.10.8.11. Part 3 as an Alternative

(1) The *fire-resistance ratings* of floors, roofs, *loadbearing* walls, columns and arches need not conform to this Subsection if such assemblies conform in all respects to the appropriate requirements in Section 3.2.

9.10.9. Fire Separations and Smoke-tight Barriers between Rooms and Spaces within Buildings

9.10.9.1. Application

- (1) This Subsection applies to
- (a) *fire separations* required between rooms and spaces in *buildings*, and
 - (b) smoke-tight barriers required in houses with a *secondary suite* including their common spaces.

9.10.9.2. Continuous Barrier

- (1) Except as permitted in Article 9.10.9.3., a wall or floor assembly required to be a *fire separation* shall be constructed as a continuous barrier against the spread of fire and retard the passage of smoke.
- (2) Except as permitted in Article 9.10.9.3., a wall or floor assembly required to be a smoke-tight barrier shall be constructed as a continuous barrier against the spread of smoke. (See Note A-9.10.9.2.(2) and (3))
- (3) Except as provided in Sentence (6), the continuity of a *fire separation* where it abuts another *fire separation* or smoke-tight barrier, a floor, a ceiling, or a roof shall be maintained by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* for the abutting *fire separation*. (See Note A-9.10.9.2.(2) and (3)) (See also Note A-3.1.8.3.(2))
- (4) Except as provided in Sentence (6), joints located in a horizontal plane between a floor and an exterior wall shall be sealed by a *firestop* that, when subjected to the fire test method in ASTM E2307, “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus,” has an F rating not less than the *fire-resistance rating* for the horizontal *fire separation*.
- (5) Except as provided in Sentence (6), all gypsum board joints in the assemblies described in Sentences (1) and (2) shall conform to CSA A82.31-M, “Gypsum Board Application,” to maintain the integrity of the smoke-tight barrier over the entire surface.
- (6) Joints between ceilings and walls, between floors and walls, and between walls at corners need not comply with Sentences (3) to (5) where such joints consist of gypsum board that is attached to framing members and arranged so as to restrict the passage of flame and smoke through the joints.

9.10.9.3. Openings to be Protected With Closures

(1) Except as permitted in Articles 9.10.9.5. to 9.10.9.8., openings in required *fire separations* shall be protected with *closures* conforming to Subsection 9.10.13.

9.10.9.4. Floor Assemblies

(1) Except as permitted in Sentences (2) to (4), all floor assemblies shall be constructed as *fire separations*.

(2) Floor assemblies contained within *dwelling units* need and within houses with a *secondary suite* need not be constructed as *fire separations*.

(3) Floor assemblies for which no *fire-resistance rating* is required by Subsection 9.10.8. and floors of *mezzanines* not required to be counted as *storeys* in Articles 9.10.4.1. and 9.10.4.2. need not be constructed as *fire separations*.

(4) Where a crawl space is not required by Article 9.10.8.9. to be constructed as a *basement*, the floor above it need not be constructed as a *fire separation*.

9.10.9.5. Interconnected Floor Spaces

(1) Except as permitted in Article 9.9.4.7., *interconnected floor spaces* shall conform to the requirements of Subsection 3.2.8.

9.10.9.6. General Requirements for Penetrations of Fire Separations

(1) Except as required by Sentence (2) and Articles 9.10.9.7. and 9.10.9.8. and as permitted by Article 9.10.9.9., penetrations of a required *fire separation* or a membrane forming part of an assembly required to be a *fire separation* shall be

- (a) sealed by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the required *fire-resistance rating* for the *fire separation*,
- (b) tightly fitted or cast in place, provided the penetrating item is made of steel, ferrous, copper, concrete or masonry, or
- (c) sealed to maintain the integrity of the *fire separation*.

(See Note A-9.10.9.6.(1))

(2) Penetrations of a firewall shall be sealed at the penetration by a *firestop* that, when subjected to the fire test method in “CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* for the *fire separation*.

9.10.9.7. Piping Penetrations (See Note 3.1.9.)

(1) Except as provided in Sentences (2) and (5), piping for drain, waste, vent and central vacuum systems that is not located in a vertical shaft is permitted to penetrate a *fire separation* required to have a *fire-resistance rating* or a membrane that forms part of an assembly required to have a *fire-resistance rating*, provided the penetration is protected in accordance with Clause 9.10.9.6.(1)(a) or (b).

(2) Drain piping leading directly from a water closet through a concrete floor slab is permitted to penetrate a horizontal *fire separation* or a membrane that contributes to the required *fire-resistance rating* of a horizontal *fire separation*, provided

- (a) the piping is *noncombustible* and the penetration is protected in accordance with Sentence 9.10.9.6.(1), or
- (b) the piping is *combustible* and the penetration is sealed by a *firestop* conforming to Clause 9.10.9.6.(1)(a).

(3) *Combustible* drain, waste and vent piping is permitted on one side of a vertical *fire separation*, provided it is not located in a vertical shaft.

- (4) In *buildings* containing two *dwelling units* only, *combustible* drain, waste and vent piping is permitted on one side of a horizontal *fire separation*.
- (5) Water distribution piping is permitted to partly or wholly penetrate a *fire separation* required to have a *fire-resistance rating*, provided
- (a) the piping is *noncombustible* and the penetration is protected in accordance with Sentence 9.10.9.6.(1), or
 - (b) the piping is *combustible* and is not located in a vertical shaft, and the penetration is sealed by a *firestop* conforming to Clause 9.10.9.6.(1)(a).

9.10.9.8. Penetrations by Outlet Boxes or Service Equipment in Concealed Spaces

- (1) Except as provided in Sentences (2) to (5), outlet boxes are permitted to penetrate the membrane of an assembly required to have a *fire-resistance rating*, provided they are sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the *fire-resistance rating* of the *fire separation*. (See Note A-9.10.9.8.(1))
- (2) Except as provided in Sentence 9.10.9.6.(2), *noncombustible* outlet boxes that penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* need not conform to Sentence (1), provided
- (a) they do not exceed
 - (i) 0.016 m² in area, and
 - (ii) an aggregate area of 0.065 m² in any 9.3 m² of surface area, and
 - (b) the annular space between the membrane and the *noncombustible* outlet boxes does not exceed 3 mm.
- (3) Except as provided in Sentence 9.10.9.6.(2), *combustible* outlet boxes that penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* need not conform to Sentence (1), provided
- (a) the outlet boxes are
 - (i) separated from the remainder of the space within the assembly by an enclosure of not more than 0.3 m² in area made of *fire block* material conforming to Article 9.10.16.3., or (See Note A-9.10.9.8.(3)(a)(i))
 - (ii) located in a space within the assembly that is filled with preformed fibre insulation processed from rock or slag conforming to CAN/ULC-S702.1, “Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification,” and having a mass per unit area of not less than 1.22 kg/m² of wall surface such that the exposed sides and back of the outlet box are encapsulated by the *noncombustible* insulation, and
 - (b) the outlet boxes do not exceed an aggregate area of 0.016 m² in any individual enclosure as described in Subclause (a)(i) or any individual insulated space as described in Subclause (a)(ii).
- (4) *Noncombustible* outlet boxes conforming to Sentence (2) are permitted to be located on opposite sides of a vertical *fire separation* having a *fire-resistance rating* and need not conform to Sentence (1), provided they are
- (a) separated from each other by a horizontal distance of not less than 600 mm,
 - (b) separated from each other and the remainder of the wall space by an enclosure conforming to Subclause (3)(a)(i), or
 - (c) located in an insulated wall space in accordance with Subclause (3)(a)(ii).
- (5) *Combustible* outlet boxes conforming to Sentence (3) are permitted to be located on opposite sides of a vertical *fire separation* having a *fire-resistance rating* and need not conform to Sentence (1).
- (6) Service equipment is permitted to penetrate a horizontal *fire separation* conforming to Sentence 9.10.9.12.(2), provided the penetration is sealed by
- (a) a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an FT rating not less than the required *fire-resistance rating* for the *fire separation*,
 - (b) a *firestop* conforming to Clause 9.10.9.6.(1)(a), where the service equipment is located entirely within the cavity of a wall assembly above and below the horizontal *fire separation* having a required *fire-resistance rating*, or
 - (c) a *firestop* conforming to Clause 9.10.9.6.(1)(a), where the penetration is
 - (i) contained within the concealed space of a floor or ceiling assembly having a *fire-resistance rating*,
 - (ii) located above a ceiling membrane providing a horizontal *fire separation*, or
 - (iii) contained within a horizontal service space conforming to Sentence 9.10.9.12.(2) that is directly above or below a floor or ceiling.

9.10.9.9. Penetrations by Raceways, Sprinklers and Fire Dampers

- (1) *Combustible* totally enclosed raceways that are embedded in a concrete floor slab are permitted in an assembly required to have a *fire-resistance rating*, provided the concrete cover between the raceway and the bottom of the slab is not less than 50 mm.
- (2) Totally enclosed raceways are permitted to penetrate a *fire separation*, provided they are sealed at the penetration by a *firestop* conforming to Clause 9.10.9.6.(1)(a).
- (3) Sprinkler piping is permitted to penetrate a *fire separation*, provided the *fire compartments* on each side of the *fire separation* are *sprinklered*.
- (4) Sprinklers are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of Article 9.10.9.6. and Clause 9.10.9.8.(6)(a), provided the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, “Standard for the Installation of Sprinkler Systems.”
- (5) *Fire dampers* are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of Sentence 9.10.9.6.(1), provided the *fire damper* is
 - (a) installed in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives,”
 - (b) specifically designed with a *firestop*, or
 - (c) provided in conformance with Sentence 9.10.5.1.(3).(See also Note A-3.1.9.2.(1).)

9.10.9.10. Collapse of Combustible Construction

- (1) *Combustible construction* that abuts on or is supported by a *noncombustible fire separation* shall be constructed so that its collapse under fire conditions will not cause collapse of the *fire separation*.

9.10.9.11. Reduction in Thickness of Fire Separation by Beams and Joists

- (1) Where pockets for the support of beams or joists are formed in a masonry or concrete *fire separation*, the remaining total thickness of solid masonry and/or grout and/or concrete shall be not less than the required equivalent thickness shown for Type S monolithic concrete in Table 2.1.1. of MMAH Supplementary Standard SB-2, “Fire Performance Ratings,” for the required *fire-resistance rating*.

9.10.9.12. Concealed Spaces Above Fire Separations

- (1) Except as provided in Sentence (2), a *horizontal service space* or other concealed space located above a required vertical *fire separation* shall be divided at the *fire separation* by an equivalent *fire separation* within the space.
- (2) Where a *horizontal service space* or other concealed space is located above a required vertical *fire separation* other than a vertical shaft, such space need not be divided as required in Sentence (1) provided the construction between such space and the space below is constructed as a *fire separation* having a *fire-resistance rating* not less than that required for the vertical *fire separation*, except that where the vertical *fire separation* is not required to have a *fire-resistance rating* greater than 45 min, the *fire-resistance rating* of the ceiling is permitted to be reduced to 30 min.

9.10.9.13. Separation of Residential Occupancies

- (1) Except as provided in Sentences (2) and (4), *residential occupancies* shall be separated from all other *major occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 1 h.

(2) Except as provided in Sentence (3), a *major occupancy* classified as a *residential occupancy*, including *live/work units*, shall be separated from other *major occupancies* classified as *mercantile* or *medium hazard industrial occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.

(3) Where not more than two *dwelling units* or *live/work units* are located in a *building* containing a *mercantile occupancy*, such *mercantile occupancy* shall be separated from the *dwelling units* or *live/work units* by a *fire separation* having not less than 1 h *fire-resistance rating*.

(4) The requirement for *fire separations* between *major occupancies* in Sentence (1) is waived for the *occupancies* allowed within *live/work units*.

9.10.9.14. Residential Suites in Industrial Buildings

(1) Except as provided in Sentence (2), not more than one *suite* of *residential occupancy* shall be contained within a *building* classified as a Group F, Division 2 *major occupancy*.

(2) Except where a Group F Division 2 *major occupancy* is directly related to *live/work units*, not more than one *suite* of *residential occupancy* shall be contained within a *building* classified as Group F, Division 2 *major occupancy*.

9.10.9.15. Separation of Suites

(1) Except as required in Article 9.10.9.16. and as permitted by Sentence (2), each *suite* in other than *business and personal services occupancies* shall be separated from adjoining *suites* by a *fire separation* having a *fire-resistance rating* of not less than 45 min.

(2) In *sprinklered buildings*, *suites* of *business and personal services occupancy* and *mercantile occupancy* that are served by *public corridors* conforming with Clause 3.3.1.4.(4)(b) are not required to be separated from each other by *fire separations*.

9.10.9.16. Separation of Residential Suites

(1) Except as provided in Sentences (2) and (3) and Article 9.10.21.2., *suites* in *residential occupancies* shall be separated from adjacent rooms and *suites* by a *fire separation* having a *fire-resistance rating* of not less than 45 min.

(2) Sleeping rooms in *boarding, lodging or rooming houses* where sleeping accommodation is provided for not more than 8 boarders or lodgers need not be separated from the remainder of the *floor area* as required in Sentence (1) where the sleeping rooms form part of the proprietor's residence and do not contain cooking facilities.

(3) Except as provided in Sentences (4) and (5), *dwelling units* that contain 2 or more *storeys* including *basements* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 1 h. (See Note A-3.3.4.4.(1))

- e1 (4) Walls and floor-ceiling framing in a house with a *secondary suite* that separate *dwelling units* from each other or *dwelling units* from ancillary spaces and common spaces need not comply with Sentence (1), where the walls and floor-ceiling framing are protected by a continuous smoke-tight barrier of not less than 15.9 mm thick Type X gypsum board installed on
- (a) both sides of walls, and
 - (b) the underside of floor-ceiling framing.
- (5) The *fire-resistance rating* of the *fire separation* required in Sentence (4) is permitted to be waived where the house with a *secondary suite* is *sprinklered*.

9.10.9.17. Separation of Public Corridors

- (1) Except as otherwise required by this Part and as provided in Sentences (2) to (5), *public corridors* shall be separated from the remainder of the *building* by a *fire separation* having not less than a 45 min *fire-resistance rating*.
- (2) In other than *residential occupancies*, no *fire-resistance rating* is required for *fire separations* between a *public corridor* and the remainder of the *building* if
 - (a) the *floor area* is *sprinklered*,
 - (b) the sprinkler system is electrically supervised in conformance with Sentence 3.2.4.9.(3), and
 - (c) the operation of the sprinkler system will cause a signal to be transmitted to the fire department in conformance with Sentence 3.2.4.7.(4).
- (3) In other than *residential occupancies*, no *fire separation* is required between a *public corridor* and the remainder of the *building* if
 - (a) the *floor area* is *sprinklered*,
 - (b) the sprinkler system is electrically supervised in conformance with Sentence 3.2.4.9.(3),
 - (c) the operation of the sprinkler system will cause a signal to be transmitted to the fire department in conformance with Sentence 3.2.4.7.(4), and
 - (d) the corridor exceeds 5 m in width.
- e1 (4) Where a *public corridor* is located in a house with a *secondary suite*, a continuous smoke-tight barrier of not less than 15.9 mm thick Type X gypsum board shall be installed on
 - (a) both sides of walls separating the corridor from the remainder of the *building*, and
 - (b) the underside of floor-ceiling framing separating the corridor from the remainder of the *building*.
- (5) No *fire separation* is required in a *sprinklered floor area* between a *public corridor* and a space containing plumbing fixtures required by Article 3.7.4.2. and Section 9.31., provided
 - (a) the space and the *public corridor* are separated from the remainder of the *storey* by a *fire separation* having a *fire-resistance rating* not less than that required between the *public corridor* and the remainder of the *storey*, and
 - (b) the *plumbing fixtures* are not located within a *dwelling unit* or *suite*.

9.10.9.18. Separation of Storage Garages

- (1) Except as provided in Sentences (2) and (3), a *storage garage* shall be separated from other *occupancies* by a *fire separation* having not less than a 1.5 h *fire-resistance rating*.
- (2) Except as permitted in Sentence (3), *storage garages* containing 5 motor vehicles or fewer shall be separated from other *occupancies* by a *fire separation* of not less than 1 h.
- (3) Where a *storage garage* serves only the *dwelling unit* to which it is attached or in which it is built, it shall be considered as part of that *dwelling unit* and the *fire separation* required in Sentence (2) need not be provided between the garage and the *dwelling unit*.
- (4) Except as provided in Sentence (5), where a *storage garage* is attached to or built into a *building* of *residential occupancy*
 - (a) an *air barrier system* conforming to Subsection 9.25.3. shall be installed between the garage and the remainder of the *building* to provide an effective barrier to gas and exhaust fumes, and
 - (b) every door between the garage and the remainder of the *building* shall conform to Article 9.10.13.15.
(See Note A-9.10.9.18.(4))
- (5) Where membrane materials are used to provide the required airtightness in the *air barrier system*, all joints shall be sealed and structurally supported.

9.10.9.19. Separation of Repair Garages

- (1) Except as provided in Sentences (2) and (3), a *repair garage* shall be separated from other *occupancies* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.
- (2) Ancillary spaces directly serving a *repair garage*, including waiting rooms, reception rooms, tool and parts storage areas and supervisory office space, need not be separated from the *repair garage* but shall be separated from other *occupancies* as required in Sentence (1).
- (3) The *fire separation* referred to in Sentence (1) shall have a *fire-resistance rating* of not less than 1 h, where
 - (a) the *building* is not more than one *storey* in *building height*,
 - (b) the *building* is operated as a single *suite*, and
 - (c) the only *occupancy* other than the *repair garage* is a *mercantile occupancy*.
- (4) Except as provided in Sentence (5), where a *building* containing a *repair garage* also contains a *dwelling unit*, an *air barrier system* conforming to Subsection 9.25.3. shall be installed between the *dwelling unit* and the *suite* containing the garage to provide an effective barrier to gas and exhaust fumes. (See Note A-9.10.9.18.(4))
- (5) Where membrane materials are used to provide the required airtightness in the *air barrier system*, all joints shall be sealed and structurally supported.

9.10.9.20. Exhaust Ducts Serving More Than One Fire Compartment

- (1) Where a *vertical service space* contains an *exhaust* duct that serves more than one *fire compartment*, the duct shall have a fan located at or near the exhaust outlet to ensure that the duct is under negative pressure.
- (2) Individual *fire compartments* referred to in Sentence (1) shall not have fans that exhaust directly into the duct in the *vertical service space*.

9.10.9.21. Central Vacuum Systems

- (1) Except as permitted by Sentence 9.10.18.7.(1), a central vacuum system shall serve not more than one *suite*.

9.10.10. Service Rooms

9.10.10.1. Application

- (1) This Subsection applies to *service rooms* in all *buildings* except rooms located within a *dwelling unit*.

9.10.10.2. Service Room Floors

- (1) The *fire-resistance rating* requirements in this Subsection do not apply to the floor assembly immediately below a *service room*.

9.10.10.3. Separation of Service Rooms

- (1) Except as provided in Sentence (2) and Articles 9.10.10.5. and 9.10.10.6., *service rooms* shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 1 h when the *floor area* containing the *service room* is not *sprinklered*.
- (2) Where a room contains a limited quantity of service equipment and the service equipment does not constitute a fire hazard, the requirements in Sentence (1) shall not apply.

9.10.10.4. Locations of Fuel-Fired Appliances

- (1) Except as provided in Sentences (2) and (3) and Article 9.10.10.5., fuel-fired *appliances* shall be located in a *service room* separated from the remainder of the *building* by a *fire separation* having not less than a 1 h *fire-resistance rating*.
- e1 (2) Except as required in the *appliance* installation standards referenced in Sentences 6.2.1.5.(1) and 9.33.5.3.(1), fuel-fired *space-heating appliances*, *space-cooling appliances* and *service water heaters* need not be separated from the remainder of the *building* as required in Sentence (1),
- (a) where the *appliances* serve
 - (i) not more than one room or *suite*, or
 - (ii) a *building* with a *building area* of not more than 400 m² and a *building height* of not more than 2 *storeys*, or
 - (b) where the *appliances*
 - (i) serve a house with a *secondary suite* including their common spaces, and
 - (ii) are located in a *service room* where both sides of any wall assemblies and the underside of any floor-ceiling framing separating this room from both *dwelling units* or their common spaces are protected by a continuous smoke-tight barrier consisting of not less than 15.9 mm thick Type X gypsum board.
- (3) Sentence (1) does not apply to fireplaces and cooking *appliances*.

9.10.10.5. Incinerators

- (1) *Service rooms* containing incinerators shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* of not less than 2 h.
- (2) The design, construction, installation and alteration of each indoor incinerator shall conform to NFPA 82, “Standard on Incinerators and Waste and Linen Handling Systems and Equipment.”
- (3) Every incinerator shall be connected to a *chimney flue* conforming to the requirements in Section 9.21. and serving no other *appliance*.
- (4) An incinerator shall not be located in a room with other fuel-fired *appliances*.

9.10.10.6. Storage Rooms

- (1) Rooms for the temporary storage of *combustible* refuse and materials for recycling in all *occupancies* or for public storage in *residential occupancies* shall be separated from the remainder of the *building* by a *fire separation* having not less than a 1 h *fire-resistance rating*, except that a *fire separation* with a *fire-resistance rating* of not less than 45 min is permitted where
- (a) the *fire-resistance rating* of the floor assembly is not required to exceed 45 min, or
 - (b) the room is *sprinklered*.

9.10.10.7. Emergency Power Installation

- (1) Where a generator intended to supply emergency power for lighting, fire safety and life safety systems is located in a *building*, it shall be located in a room that,
- (a) is separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than
 - (i) 1 h, if the floor assembly is not required to have a *fire-resistance rating* of more than 1 h, and
 - (ii) 2 h, if the floor assembly is required to have a *fire-resistance rating* of more than 1 h, and
 - (b) contains only the generating set and equipment that is related to the emergency power supply system.

9.10.11. Firewalls

9.10.11.1. Required Firewalls

(1) Except as provided in Articles 9.10.11.2., a *party wall* on a property line shall be constructed as a *firewall*. (See Note A-3.2.3.4.(1))

9.10.11.2. Firewalls Not Required

(1) A *party wall* on a property line of a *building* of *residential occupancy* need not be constructed as a *firewall*, provided it is constructed as a *fire separation* having not less than a 1 h *fire-resistance rating*, where the *party wall* separates

- (a) two *dwelling units* where there is no *dwelling unit* above another *dwelling unit*,
- (b) a *dwelling unit* and a house with a *secondary suite* including their common spaces, or
- (c) two houses with a *secondary suite* including their common spaces.

(2) Reserved.

(3) The wall described in Sentence (1) shall provide continuous protection from the top of the footings to the underside of the roof deck.

(4) Any space between the top of the wall described in Sentence (1) and the roof deck shall be tightly filled with mineral wool or *noncombustible* material.

9.10.11.3. Construction of Firewalls

(1) Where *firewalls* are used, the requirements in Part 3 shall apply.

9.10.11.4. Firewalls in Detached Garages

(1) Where a garage is detached from the *dwelling unit* it serves but attached to another garage on the adjacent property, the *party wall* so formed shall be constructed as a *fire separation* having a *fire-resistance rating* of not less than 45 min.

9.10.12. Prevention of Fire Spread at Exterior Walls and Between Storeys

9.10.12.1. Termination of Floors or Mezzanines

(1) Except as provided in Sentence (2) and in Articles 9.10.1.3. and 9.10.9.5., the portions of a *floor area* or *mezzanine* that do not terminate at an exterior wall, a *firewall* or a vertical shaft, shall terminate at a vertical *fire separation* having a *fire-resistance rating* not less than that required for the floor assembly that terminates at the separation.

(2) A *mezzanine* need not terminate at a vertical *fire separation* where the *mezzanine* is not required to be considered as a *storey* in Articles 9.10.4.1. and 9.10.4.2.

9.10.12.2. Location of Skylights

(1) Where a wall in a *building* is exposed to a fire hazard from an adjoining roof of a separate *fire compartment* that is not *sprinklered* in the same *building*, the roof shall contain no skylights within a horizontal distance of 5 m of the windows in the exposed wall.

9.10.12.3. Exterior Walls Meeting at an Angle

- (1) Except as provided in Article 9.9.4.5., where exterior walls of a *building* meet at an external angle of 135° or less, the horizontal distance from an *unprotected opening* in one exterior wall to an *unprotected opening* in the other exterior wall shall be not less than 1.2 m, where these openings are
- in different *fire compartments*, or
 - in different *dwelling units*, ancillary spaces or common spaces in a house with a *secondary suite*.
- (2) Except as provided in Sentence (3), the exterior wall of each *fire compartment* referred to in Sentence (1) within the 1.2 m distance shall have a *fire-resistance rating* not less than that required for the interior vertical *fire separation* between the compartment and the remainder of the *building*.
- (3) Where interior walls between *dwelling units*, ancillary spaces or common spaces in a house with a *secondary suite* are not constructed as *fire separations*, the exterior wall of each *dwelling unit*, ancillary space or common space referred to in Sentence (1) within the 1.2 m distance shall be finished on the interior with not less than 15.9 mm thick Type X gypsum board.

9.10.12.4. Protection of Soffits

- (1) This Article applies to the portion of any soffit enclosing a projection that is
- less than 2.5 m vertically above a window or door, and
 - less than 1.2 m from either side of the window or door.
- (See Note A-9.10.12.4.(1))
- (2) Except as provided in Sentences (4) and (5), the construction described in Sentence (1) shall have no *unprotected openings* and shall be protected in accordance with Sentence (3), where the soffit encloses
- a common *attic or roof space* that spans more than 2 *suites* of *residential occupancy* and projects beyond the exterior wall of the *building*,
 - a floor space where an upper *storey* projects beyond the exterior wall of a lower *storey* and
 - a *fire separation* is required at the floor between the two, or
 - the floor separates *dwelling units* from each other or a *dwelling unit* from an ancillary space or a common space in a house with a *secondary suite*, or
 - a floor space where an upper *storey* projects beyond the exterior wall of a lower *storey*, and the projection is continuous across
 - a vertical *fire separation* separating two *suites*, or
 - a wall separating *dwelling units* from each other or a *dwelling unit* from an ancillary space or a common space in a house with a *secondary suite*.
- (3) Protection required by Sentence (2) shall be provided by
- noncombustible* material having a minimum thickness of 0.38 mm and a melting point not below 650°C,
 - not less than 12.7 mm thick gypsum soffit board or gypsum wallboard installed according to CSA A82.31-M, “Gypsum Board Application,”
 - not less than 11 mm thick plywood,
 - not less than 12.5 mm thick OSB or waferboard, or
 - not less than 11 mm thick lumber.
- (See Note A-9.10.12.4.(3))
- (4) In the case of a soffit described in Sentence (1) that is at the edge of an *attic or roof space*, and completely separated from the remainder of the *attic or roof space* by *fire blocks*, the requirements in Sentence (2) do not apply.
- (5) Where all *suites* spanned by a common *attic or roof space* or situated above or below the projecting floor are *sprinklered*, the requirements in Sentence (2) do not apply provided that all rooms, including closets and bathrooms, having openings in the wall beneath the soffit are *sprinklered*, notwithstanding any exceptions in the sprinkler standards referenced in Article 3.2.5.12.

9.10.13. Doors, Dampers and Other Closures in Fire Separations

9.10.13.1. Closures

(1) Except as provided in Article 9.10.13.2., openings in required *fire separations* shall be protected with a *closure* conforming to Table 9.10.13.1. and shall be installed in conformance with NFPA 80, “Standard for Fire Doors and Other Opening Protectives,” unless otherwise specified in this Part. (See also Article 9.10.3.1.)

Table 9.10.13.1.
Fire-Protection Ratings for Closures
Forming Part of Sentence 9.10.13.1.(1)

Required <i>Fire-Resistance Rating</i> of <i>Fire Separation</i>	Required <i>Fire-Protection Rating</i> of <i>Closure</i>
30 or 45 min	20 min ⁽¹⁾
1 h	45 min ⁽¹⁾
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

Notes to Table 9.10.13.1.:

(1) See Article 9.10.13.2.

9.10.13.2. Solid Core Wood Door as a Closure

(1) A 45 mm thick solid core wood door is permitted to be used where a minimum *fire-protection rating* of 20 min is permitted or between a *public corridor* and a *suite* provided the door conforms to CAN/ULC-S113, “Standard Specification for Wood Core Doors Meeting the Performance Required by CAN/ULC-S104 for Twenty Minute Fire Rated Closure Assemblies.” (See Note A-9.10.13.2.(1))

(2) Doors described in Sentence (1) shall have not more than a 6 mm clearance beneath and not more than 3 mm at the sides and top.

9.10.13.3. Unrated Wood Door Frames

(1) Doors required to provide a 20 min *fire-protection rating* or permitted to be 45 mm solid core wood shall be mounted in a wood frame of at least 38 mm thickness where the frame has not been tested and rated.

9.10.13.4. Doors as a Means of Egress

(1) Doors forming part of an *exit* or a *public means of egress* shall conform to Subsection 9.9.6. in addition to this Subsection.

9.10.13.5. Wired Glass as a Closure

(1) Wired glass conforming to Article 9.6.1.2. that has not been tested in accordance with Article 9.10.3.1. is permitted as a *closure* in a vertical *fire separation* required to have a *fire-resistance rating* of not more than 1 h provided such glass is not less than 6 mm thick and is mounted in conformance with Sentence (2).

(2) Wired glass described in Sentence (1) shall be mounted in fixed steel frames having a metal thickness of not less than 1.35 mm and a glazing stop of not less than 20 mm on each side of the glass.

(3) Individual panes of glass described in Sentence (1) shall not exceed 0.8 m² in area or 1.4 m in height or width, and the area of glass not structurally supported by mullions shall not exceed 7.5 m².

9.10.13.6. Steel Door Frames

(1) Steel door frames forming part of a *closure* in a *fire separation*, including anchorage requirements, shall conform to CAN/ULC-S105, “Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.”

9.10.13.7. Glass Block as a Closure

(1) Glass block that has not been tested in accordance with Article 9.10.3.1. is permitted as a *closure* in a *fire separation* required to have a *fire-resistance rating* of not more than 1 h.

9.10.13.8. Maximum Size of Opening

(1) The size of an opening in an interior *fire separation*, even where protected with a *closure*, shall not exceed 11 m², with no dimension greater than 3.7 m, if a *fire compartment* on either side of the *fire separation* is not *sprinklered*.

(2) The size of an opening in an interior *fire separation*, even where protected with a *closure*, shall not exceed 22 m², with no dimension greater than 6 m, when the *fire compartments* on both sides of the *fire separation* are *sprinklered*.

9.10.13.9. Door Latch

(1) Every swing type door in a *fire separation* shall be equipped with a latch.

9.10.13.10. Self-Closing Device

(1) Except as described in Sentence (2), every door in a *fire separation* shall have a self-closing device.

(2) Self-closing devices are not required between *public corridors* and *suites* in *business and personal services occupancies*, except in dead-end corridors or a corridor that serves a *hotel*.

9.10.13.11. Hold-Open Devices

(1) Where hold-open devices are used on doors in required *fire separations*, they shall be installed in accordance with Article 3.1.8.14.

9.10.13.12. Service Room Doors

(1) Swing-type doors shall open into *service rooms* containing fuel-fired equipment where such doors lead to *public corridors* or rooms used for assembly but shall swing outward from such rooms in all other cases.

9.10.13.13. Fire Dampers

- (1) Except as permitted in Sentences (2) to (5), 9.10.5.1.(3) and 9.10.9.9.(5), a duct that penetrates an assembly required to be a *fire separation* with a *fire-resistance rating* shall be equipped with a *fire damper* in conformance with Articles 3.1.8.4. and 3.1.8.10.
- (2) A *fire damper* is not required where a *noncombustible* branch duct pierces a required *fire separation* provided the duct
 - (a) has a melting point not below 760°C,
 - (b) has a cross-sectional area less than 130 cm², and
 - (c) supplies only *air-conditioning* units or combined *air-conditioning* and heating units discharging air at not more than 1.2 m above the floor.
- (3) A *fire damper* is not required where a *noncombustible* branch duct pierces a required *fire separation* around an *exhaust duct* riser in which the air flow is upward provided
 - (a) the melting point of the branch duct is not below 760°C,
 - (b) the branch duct is carried up inside the riser at least 500 mm, and
 - (c) the *exhaust duct* is under negative pressure as described in Article 9.10.9.20.
- (4) *Noncombustible* ducts that penetrate a *fire separation* separating a *vertical service space* from the remainder of the *building* need not be equipped with a *fire damper* at the *fire separation* provided
 - (a) the ducts have a melting point above 760°C, and
 - (b) each individual duct exhausts directly to the outside at the top of the *vertical service space*.
- (5) A duct serving commercial cooking equipment and piercing a required *fire separation* need not be equipped with a *fire damper* at the *fire separation*.

9.10.13.14. Fire Stop Flaps

- (1) *Fire stop flaps* in ceiling membranes required in Sentence 9.10.5.1.(3) shall
 - (a) conform to CAN/ULC-S112.2, “Standard Method of Fire Test of Ceiling Firestop Flap Assemblies,” and
 - (b) activate at a temperature approximately 30°C above the normal maximum temperature that occurs in the ducts, whether the air duct system is operating or shut down.

9.10.13.15. Doors Between Garages and Dwelling Units

- (1) A door between an attached or built-in garage and a *dwelling unit* shall be tight-fitting and weather-stripped to provide an effective barrier against the passage of gases and exhaust fumes and shall be fitted with a self-closing device.
- (2) A doorway between an attached or built-in garage and a *dwelling unit* shall not be located in a room intended for sleeping.

9.10.13.16. Door Stops

- (1) Where a door is installed so that it may damage the integrity of a *fire separation* if its swing is unrestricted, door stops shall be installed to prevent such damage.

9.10.14. Spatial Separation Between Buildings

9.10.14.1. Application

- (1) This Subsection applies to *buildings* other than those to which Subsection 9.10.15. applies.
- (2) This Subsection does not apply to a house with a *secondary suite*.

9.10.14.2. Area and Location of Exposing Building Face

- (1) The area of an *exposing building face* shall be
 - (a) taken as the exterior wall area facing in one direction on any side of a *building*, and
 - (b) calculated as,
 - (i) the total area measured from the finished ground level to the uppermost ceiling, or
 - (ii) the area for each *fire compartment*, where a *building* is divided into *fire compartments* by *fire separations* with *fire-resistance ratings* not less than 45 min.
- (2) For the purpose of using Table 9.10.14.4.-A to determine the maximum aggregate area of *unprotected openings* permitted in an irregularly-shaped or skewed exterior wall, the location of the *exposing building face* shall be taken as a vertical plane located so that there are no *unprotected openings* between the vertical plane and the line to which *limiting distance* is measured. (See Note A-3.2.3.1.(4))
- (3) For the purpose of using Table 9.10.14.5. to determine the required type of construction, cladding and *fire-resistance rating* for an irregularly-shaped or skewed exterior wall,
 - (a) the *exposing building face* is permitted to be divided into any number of portions and the *fire-resistance rating*, type of cladding and percentage of *unprotected openings* limitations is permitted to be determined individually for each portion based on the *limiting distance* for each portion so divided,
 - (b) the *exposing building face* shall be taken as the projection of the exterior wall onto a vertical plane located so that no portion of the exterior wall of the *building* is between the vertical plane and the line to which the *limiting distance* is established in Clause (a), and
 - (c) for the purpose of determining the actual area of *unprotected openings* permitted in an exterior wall, the *unprotected openings* shall be projected onto the vertical plane established in Clause (b).
- (4) The required *limiting distance* for an *exposing building face* is permitted to be measured to a point beyond the property line that is not the centre line of a *street*, lane or public thoroughfare if
 - (a) the owners of the properties on which the *limiting distance* is measured and the *municipality* enter into an agreement in which such owners agree that,
 - (i) each owner covenants that, for the benefit of land owned by the other covenantors, the owner will not *construct a building* on his or her property unless the *limiting distance* for *exposing building faces* in respect of the proposed *construction* is measured in accordance with the agreement,
 - (ii) the covenants contained in the agreement are intended to run with the lands, and the agreement shall be binding on the parties and their respective heirs, executors, administrators, successors and assigns,
 - (iii) the agreement shall not be amended or deleted from title without the consent of the *municipality*, and
 - (iv) they will comply with such other conditions as the *municipality* considers necessary, including indemnification of the *municipality* by the other parties, and
 - (b) the agreement referred to in Clause (a) is registered against the title of the properties to which it applies.
- (5) Where an agreement referred to in Sentence (4) is registered against the title of a property, the *limiting distance* for *exposing building faces* in respect of the *construction* of any *buildings* on the property shall be measured to the point referred to in the agreement.

9.10.14.3. Reserved

9.10.14.3A. Inadequate Firefighting Facilities

(1) Where there is no fire department or where a fire department is not organized, trained and equipped to meet the needs of the community, the required *limiting distance* determined from Sentences 9.10.14.4.(2), (5) and (6) and Sentence 9.10.14.5.(6), shall be doubled for a *building* that is not *sprinklered*.

9.10.14.4. Openings in Exposing Building Face

(1) Except as provided in Sentences (6) to (10) and Sentence 9.10.14.6.(1), the maximum aggregate area of *unprotected openings* in an *exposing building face* shall

- (a) conform to Table 9.10.14.4.,
- (b) conform to Subsection 3.2.3., or
- (c) where the *limiting distance* is not less than 1.2 m, be equal to or less than
 - (i) the *limiting distance* squared, for *residential occupancies, business and personal services occupancies and low-hazard industrial occupancies*, and
 - (ii) half the *limiting distance* squared, for *mercantile occupancies and medium-hazard industrial occupancies*.

Table 9.10.14.4.
Maximum Aggregate Area of Unprotected Openings in Exterior Walls
 Forming Part of Sentence 9.10.14.4.(1)

Occupancy Classification of Building	Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of <i>Unprotected Openings</i> , % of <i>Exposing Building Face Area</i>													
		<i>Limiting Distance</i> , m													
		Less than 1.2	1.2	1.5	2	2.5	3	4	6	8	10	12	16	20	25
<i>Residential, business and personal services, and low-hazard industrial</i>	10	0	8	12	21	33	55	96	100	100	100	100	100	100	100
	15	0	8	10	17	25	37	67	100	100	100	100	100	100	100
	20	0	8	10	15	21	30	53	100	100	100	100	100	100	100
	25	0	8	9	13	19	26	45	100	100	100	100	100	100	100
	30	0	7	9	12	17	23	39	88	100	100	100	100	100	100
	40	0	7	8	11	15	20	32	69	100	100	100	100	100	100
	50	0	7	8	10	14	18	28	57	100	100	100	100	100	100
	100	0	7	8	9	11	13	18	34	56	84	100	100	100	100
Over 100	0	7	7	8	9	10	12	19	28	40	55	92	100	100	
<i>Mercantile and medium-hazard industrial</i>	10	0	4	6	10	17	25	48	100	100	100	100	100	100	100
	15	0	4	5	8	13	18	34	82	100	100	100	100	100	100
	20	0	4	5	7	11	15	27	63	100	100	100	100	100	100
	25	0	4	5	7	9	13	22	51	94	100	100	100	100	100
	30	0	4	4	6	9	12	20	44	80	100	100	100	100	100
	40	0	4	4	6	8	10	16	34	61	97	100	100	100	100
	50	0	4	4	5	7	9	14	29	50	79	100	100	100	100
	100	0	4	4	4	5	6	9	17	28	42	60	100	100	100
	Over 100	0	4	4	4	4	5	6	10	14	20	27	46	70	100

- (2) Except as provided in Sentence 9.10.14.6.(1), openings in a wall having a *limiting distance* of less than 1.2 m shall be protected by *closures*, of other than wired glass or glass block, whose *fire protection rating* is in conformance with the *fire-resistance rating* required for the wall.
- (3) Reserved.
- (4) Reserved.
- (5) Reserved.
- (6) The maximum aggregate area of *unprotected openings* is permitted to be up to twice the area determined according to Sentence (1), where the *unprotected openings* are glazed with
- (a) wired glass in steel frames as described in Article 9.10.13.5., or
 - (b) glass blocks, as described in Article 9.10.13.7.
- (7) Where the *building* is *sprinklered*, the maximum aggregate area of *unprotected openings* is permitted to be up to twice the area determined according to Sentence (1), provided all rooms, including closets and bathrooms, that are adjacent to the *exposing building face* and that have *unprotected openings* are *sprinklered*, notwithstanding any exemptions in the sprinkler standards referenced in Article 3.2.5.12.
- (8) The maximum aggregate area of *unprotected openings* in an *exposing building face* of a *storage garage* need not comply with Sentence (1), where
- (a) all *storeys* are constructed as *open-air storeys*, and
 - (b) the *storage garage* has a *limiting distance* of not less than 3 m.
- (9) The maximum aggregate area of *unprotected openings* in an *exposing building face* of a *storey* that faces a *street* and is the same level as the *street* need not comply with Sentence (1) where the *limiting distance* is not less than 9 m.
- (10) Except as provided in Sentence (11), for garages or accessory *buildings* that serve a single *dwelling unit* only and are detached from any *building*, the maximum aggregate area of glazed openings shall comply with the requirements for *unprotected openings*.
- (11) The limits on the area of glazed openings need not apply to the *exposing building face* of a detached garage or accessory *building* facing a *dwelling unit*, where
- (a) the detached garage or accessory *building* serves only one *dwelling unit*,
 - (b) the detached garage or accessory *building* is located on the same property as that *dwelling unit*, and
 - (c) the *dwelling unit* served by the detached garage or accessory *building* is the only *major occupancy* on the property.

9.10.14.5. Construction of Exposing Building Face and Walls Above Exposing Building Face

- (1) Except as provided in Sentences (4) to (14), each *exposing building face* and any exterior wall located above an *exposing building face* that encloses an *attic or roof space* shall be constructed in conformance with Table 9.10.14.5. and Subsection 9.10.8. (See Note A-9.10.14.5.(1))
- (2) Cladding on *exposing building faces* and exterior walls located above *exposing building faces* need not conform to the type of cladding required by Table 9.10.14.5. where
- (a) the *exposing building face* is constructed with no *unprotected openings*,
 - (b) the *limiting distance* is not less than 0.6 m, and
 - (c) the cladding
 - (i) conforms to Subsection 9.27.12.,
 - (ii) is installed without furring members over not less than 12.7 mm thick gypsum sheathing or over masonry,
 - (iii) has a *flame-spread rating* not more than 25 when tested in accordance with Sentence 3.1.12.1.(2), and
 - (iv) is not more than 2 mm in thickness exclusive of fasteners, joints and local reinforcements.

Table 9.10.14.5.
Minimum Construction Requirements for Exposing Building Faces
 Forming Part of Sentence 9.10.14.5.(1)

Occupancy Classification of Building	Maximum Area of <i>Unprotected Openings</i> Permitted, % of <i>Exposing Building Face Area</i>	Minimum Required <i>Fire-Resistance Rating</i>	Type of Construction Required	Type of Cladding Required
<i>Residential, business and personal services, and low-hazard industrial</i>	0 - 10	1 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	>10 but ≤25	1 h	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	>25 but <100	45 min	<i>Combustible or noncombustible</i>	<i>Combustible or noncombustible</i>
<i>Mercantile and medium-hazard industrial</i>	0 - 10	2 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	>10 but ≤25	2 h	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	>25 but <100	1 h	<i>Combustible or noncombustible</i>	<i>Combustible or noncombustible</i>

(3) Reserved.

(4) Except as provided in Sentence (5), where a garage or accessory *building* serves one *dwelling unit* only and is detached from any *building*, the *exposing building face*

- (a) need not conform to the minimum required *fire-resistance rating* stated in Table 9.10.14.5., where the *limiting distance* is 0.6 m or more,
- (b) shall have a *fire-resistance rating* of not less than 45 min where the *limiting distance* is less than 0.6 m, and
- (c) need not conform to the type of cladding and type of construction required by Table 9.10.14.5., regardless of the *limiting distance*.

(5) The requirements regarding *fire-resistance rating*, type of construction and type of cladding need not apply to the *exposing building face* of a detached garage or accessory *building* facing a *dwelling unit*, where

- (a) the detached garage or accessory *building* serves only one *dwelling unit*,
- (b) the detached garage or accessory *building* is located on the same property as that *dwelling unit*, and
- (c) the *dwelling unit* served by the detached garage or accessory *building* is the only *major occupancy* on the property.

(6) Except for *buildings* containing one or two *dwelling units* only, *combustible* projections on the exterior of a wall that are more than 1 m above ground level and that could expose an adjacent *building* to fire spread shall not be permitted within

- (a) 1.2 m of a property line or the centre line of a *public way*, or
- (b) 2.4 m of a *combustible* projection on another *building* on the same property.

(7) Reserved.

(8) Reserved.

(9) Reserved.

(10) Reserved.

(11) Reserved.

- (12) Where roof soffits project to less than 1.2 m from the property line, the centre line of a public way, or an imaginary line between two *buildings* or *fire compartments* on the same property, they shall
- (a) have no openings, and
 - (b) be protected by
 - (i) not less than 0.38 mm thick sheet steel,
 - (ii) unvented aluminum conforming to CAN/CGSB-93.2-M, “Prefinished Aluminum Siding, Soffits, and Fascia, for Residential Use,”
 - (iii) not less than 12.7 mm thick gypsum soffit board or gypsum ceiling board installed according to CSA A82.31-M, “Gypsum Board Application,”
 - (iv) not less than 11 mm thick plywood,
 - (v) not less than 12.5 mm thick OSB or waferboard, or
 - (vi) not less than 11 mm thick lumber.

(See Note A-3.2.3.6.(2))

(13) Heavy timber and steel columns need not conform to the requirements of Sentence (1) provided the *limiting distance* is not less than 3 m.

- (14) Non-loadbearing wall components need not have a minimum *fire-resistance rating*, where the *building*
- (a) is 1 storey in *building height*,
 - (b) is of *noncombustible construction*,
 - (c) is classified as *low-hazard industrial occupancy* and is used only for *low fire load occupancies* such as power generating plants or plants for the manufacture or storage of *noncombustible materials*, and
 - (d) has a *limiting distance* of 3 m or more.

9.10.14.6. Minor Openings in Exposing Building Face

- (1) An opening in an *exposing building face* not more than 130 cm² shall not be considered an *unprotected opening*.

9.10.15. Spatial Separation Between Houses

9.10.15.1. Application

- (1) This Subsection applies to
- (a) *buildings* that contain only *dwelling units* and have no *dwelling unit* above another *dwelling unit*, and
 - (b) houses with a *secondary suite* including their common spaces.
- (See Note A-9.10.15.1.(1))

9.10.15.2. Area and Location of Exposing Building Face

- (1) The area of an *exposing building face* shall be
- (a) taken as the exterior wall area facing in one direction on any side of a *building*, and
 - (b) calculated as
 - (i) the total area measured from the finished ground level to the uppermost ceiling,
 - (ii) the area for each *fire compartment*, where a *building* is divided into *fire compartments* by *fire separations* with *fire-resistance ratings* not less than 45 min, or
 - (iii) where Table 9.10.15.4. is used to determine the maximum aggregate area of glazed openings, the area of any number of individual portions of the *exposing building face*. (See Note A-9.10.15.4.(2))

(2) Reserved.

(3) For the purpose of using Table 9.10.15.4. to determine the maximum aggregate area of glazed openings in an irregularly shaped or skewed exterior wall, the location of the *exposing building face* shall be taken as a vertical plane located so that there are no glazed openings between the vertical plane and the line to which the *limiting distance* is measured. (See Note A-3.2.3.1.(4))

- (4) In determining the required cladding-sheathing assembly and *fire-resistance rating* for an irregularly shaped or skewed exterior wall, the location of the *exposing building face* shall be taken as a vertical plane located so that no portion of the actual *exposing building face* is between the vertical plane and the line to which the *limiting distance* is measured. (See Article 9.10.15.5. and Note A-3.2.3.1.(4).)
- (5) The required *limiting distance* for an *exposing building face* is permitted to be measured to a point beyond the property line that is not the centre line of a *street*, lane or public thoroughfare if,
- (a) the owners of the properties on which the *limiting distance* is measured and the *municipality* enter into an agreement in which such owners agree that,
- (i) each owner covenants that, for the benefit of land owned by the other covenantors, the owner will not *construct a building* on his or her property unless the *limiting distance* for *exposing building faces* in respect of the proposed *construction* is measured in accordance with the agreement,
 - (ii) the covenants contained in the agreement are intended to run with the lands, and the agreement shall be binding on the parties and their respective heirs, executors, administrators, successors and assigns,
 - (iii) the agreement shall not be amended or deleted from title without the consent of the *municipality*, and
 - (iv) they will comply with such other conditions as the *municipality* considers necessary, including indemnification of the *municipality* by the other parties, and
- (b) the agreement referred to in Clause (a) is registered against the title of the properties to which it applies.
- (6) Where an agreement referred to in Sentence (5) is registered against the title of a property, the *limiting distance* for *exposing building faces* in respect of the *construction* of any *buildings* on the property shall be measured to the point referred to in the agreement.

9.10.15.3. Reserved

9.10.15.3A. Inadequate Firefighting Facilities

- (1) Where there is no fire department or where a fire department is not organized, trained and equipped to meet the needs of the community, the required *limiting distance* determined from Sentences 9.10.15.4.(2) and (5) and Sentence 9.10.15.5.(6), shall be doubled for a *building* that is not *sprinklered* throughout.

9.10.15.4. Glazed Openings in Exposing Building Face

- (1) Except as provided in Sentences (6) to (9), the maximum area of glazed openings in an *exposing building face* shall
- (a) conform to Table 9.10.15.4.,
 - (b) conform to Subsection 3.2.3. as if the glazed openings were *unprotected openings*, or
 - (c) where the *limiting distance* is not less than 1.2 m, be equal to or less than the *limiting distance* squared.
- (2) Where the limits on the area of glazed openings are determined for individual portions of the *exposing building face*, as described in Subclause 9.10.15.2.(1)(b)(iii), the maximum aggregate area of glazed openings for any portion shall be determined using the values in Table 9.10.15.4. corresponding to
- (a) the maximum total area of *exposing building face*, which is equal to the sum of all portions of the *exposing building face*, and
 - (b) the *limiting distance* of each portion.
- (See Note A-9.10.15.4.(2))
- (3) Reserved.
- (4) Reserved.
- (5) Reserved

Table 9.10.15.4.
Maximum Area of Glazed Openings in Exterior Walls of Houses
 Forming Part of Subclause 9.10.15.2.(1)(b)(iii) and Sentences 9.10.15.4.(1) and (2)

Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of Glazed Openings, % of Exposing Building Face Area													
	Limiting Distance, m													
	Less than 1.2	1.2	1.5	2	2.5	3	4	6	8	10	12	16	20	25
10	0	8	12	21	33	55	96	100	100	100	100	100	100	100
15	0	8	10	17	25	37	67	100	100	100	100	100	100	100
20	0	8	10	15	21	30	53	100	100	100	100	100	100	100
25	0	8	9	13	19	26	45	100	100	100	100	100	100	100
30	0	7	9	12	17	23	39	88	100	100	100	100	100	100
40	0	7	8	11	15	20	32	69	100	100	100	100	100	100
50	0	7	8	10	14	18	28	57	100	100	100	100	100	100
100	0	7	8	9	11	13	18	34	56	84	100	100	100	100
Over 100	0	7	7	8	9	10	12	19	28	40	55	92	100	100

- (6) The limits on the area of glazed openings shall not apply to the *exposing building face* of a *dwelling unit* facing a detached garage or accessory *building*, where
- the detached garage or accessory *building* serves only one *dwelling unit*,
 - the detached garage or accessory *building* is located on the same property as that *dwelling unit*, and
 - the *dwelling unit* served by the detached garage or accessory *building* is the only *major occupancy* on the property.

- (7) The maximum aggregate area of glazed openings in an *exposing building face* is permitted to be up to twice the area determined in accordance with Sentence (1), where
- the glazed openings consist of glass blocks, as described in Article 9.10.13.7., or
 - the *building* is *sprinklered*, provided all rooms, including closets, bathrooms and attached garages, that are adjacent to the *exposing building face* and that have glazed openings are *sprinklered*, notwithstanding any exemptions in the sprinkler standards referenced in Article 3.2.5.12.

- (8) Except as provided in Sentence (9), openings in a wall having a *limiting distance* of less than 1.2 m shall be protected by *closures*, of other than wired glass or glass block, whose *fire-protection rating* is in conformance with the *fire-resistance rating* required for the wall.

- (9) An opening in an *exposing building face* not more than 130 cm² need not be protected by a *closure*.

9.10.15.5. Construction of Exposing Building Face of Houses

- (1) Except as provided in Sentences (1.1), (2), (4) and (6), each *exposing building face* and any exterior wall located above an *exposing building face* that encloses an *attic or roof space* shall be constructed in conformance with Subsection 9.10.8.,
- for the *exposing building face* as a whole, or
 - for any number of separate portions of the *exposing building face*.

(1.1) Sentence (1) does not apply where

- the *limiting distance* is not less than 1.2 m,
- the *limiting distance* is less than 1.2 m but not less than 0.6 m, provided that the *exposing building face* has a *fire-resistance rating* of not less than 45 min, or
- the *limiting distance* is less than 0.6 m, provided that the *exposing building face* has a *fire-resistance rating* of not less than 45 min and is clad with *noncombustible* material.

- (2) Except as provided in Sentences (4) and (5), where the *limiting distance* is less than 0.6 m, the *exposing building face* and exterior walls located above the *exposing building face* that enclose an *attic or roof space* shall have a *fire-resistance rating* of not less than 45 min, and
- (a) the cladding shall be metal or *noncombustible* cladding installed in accordance with Section 9.20., 9.27. or 9.28., (See Note A-9.10.14.5.(1)),
 - (b) the cladding shall
 - (i) conform to Subsection 9.27.12.,
 - (ii) be installed without furring members over gypsum sheathing at least 12.7 mm thick or over masonry,
 - (iii) has a *flame-spread rating* not more than 25 when tested in accordance with Sentence 3.1.12.1.(2), and
 - (iv) not exceed 2 mm in thickness exclusive of fasteners, joints and local reinforcements, or
 - (c) the wall assembly shall comply with Clause 3.1.5.5.(1)(b) when tested in conformance with CAN/ULC-S134, “Standard Method of Fire Test of Exterior Wall Assemblies.”
- (3) Reserved.
- (4) The requirements for *fire-resistance rating* and type of cladding-sheathing assembly shall not apply to the *exposing building face* or projections from an *exposing building face* of a *dwelling unit* facing a detached garage or accessory *building*, or a garage or accessory *building* facing a *dwelling unit*, where
- (a) the detached garage or accessory *building* serves only one *dwelling unit*,
 - (b) the detached garage or accessory *building* is located on the same property as that *dwelling unit*, and
 - (c) the *dwelling unit* served by the detached garage or accessory *building* is the only *major occupancy* on the property.
- (5) Except for *buildings* containing 1 or 2 only, *combustible* projections on the exterior of a wall that are more than 1 m above ground level and that could expose an adjacent *building* to fire spread shall not be permitted within
- (a) 1.2 m of a property line or the centre line of a *public way*, or
 - (b) 2.4 m of a *combustible* projection on another *building* on the same property.
- (6) Reserved.
- (7) Reserved.
- (8) Reserved.
- (9) Reserved.
- (10) Reserved.
- (11) Reserved.
- (12) Reserved.
- (13) Heavy timber and steel columns need not conform to the requirements of Sentence (1) provided the *limiting distance* is not less than 3 m.

9.10.16. Fire Blocks

9.10.16.1. Required Fire Blocks in Concealed Spaces

- (1) Concealed spaces in interior walls, ceilings, floors and crawl spaces shall be separated by *fire blocks* from concealed spaces in exterior walls and *attic or roof spaces*.
- (2) Reserved.

- (3) *Fire blocks* shall be provided at all interconnections between concealed vertical and horizontal spaces in interior coved ceilings, drop ceilings and soffits where the exposed construction materials within the concealed spaces have a surface *flame-spread rating* greater than 25.
- (4) *Fire blocks* shall be provided at the top and bottom of each run of stairs where they pass through a floor containing concealed space in which the exposed construction materials within the space have a surface *flame-spread rating* greater than 25.
- (5) Where not *sprinklered*, concealed spaces of *combustible construction* created by a ceiling, roof space or unoccupied attic space shall be separated by *fire blocks* into compartments
- (a) not more than 60 m in greatest dimension, and
 - (b) where such space contains exposed construction materials having a surface *flame-spread rating* greater than 25, not more than 300 m² in area.
- (6) No dimension of the compartment described in Clause (5)(b) shall exceed 20 m.
- (7) Concealed spaces in mansard or gambrel style roofs, exterior cornices, balconies and canopies of *combustible construction* in which the exposed construction materials within the space have a surface *flame-spread rating* exceeding 25 shall have vertical *fire blocks* at intervals of not more than 20 m and at points where such concealed spaces extend across the ends of required vertical *fire separations*.

9.10.16.2. Required Fire Blocks in Wall Assemblies

- (1) Except as permitted in Sentence (2), *fire blocks* shall be provided to block off concealed spaces within wall assemblies, including spaces created by furring,
- (a) at each floor level,
 - (b) at each ceiling level where the ceiling contributes to part of the required *fire-resistance rating*, and
 - (c) at other locations within the wall, so that the distance between *fire blocks* does not exceed 20 m horizontally and 3 m vertically.
- (2) *Fire blocks* described in Sentence (1) are not required, provided
- (a) the insulated wall assembly contains not more than one concealed air space whose horizontal thickness is not more than 25 mm,
 - (b) the exposed construction materials within the space are *noncombustible*, or
 - (c) the exposed construction materials within the space, including insulation, but not including wiring, piping or similar services, have a *flame-spread rating* of not more than 25, or
 - (d) the concealed wall space is filled with insulation.

9.10.16.3. Fire Block Materials

- (1) Except as permitted in Sentences (2) and (3), *fire blocks* shall be constructed of materials that will remain in place and prevent the passage of flames for not less than 15 min when subjected to the standard fire exposure in CAN/ULC-S101, “Standard Method of Fire Endurance Tests of Building Construction and Materials.”
- (2) *Fire blocks* are deemed to comply with Sentence (1) if they are constructed of not less than,
- (a) 0.38 mm sheet steel,
 - (b) 12.7 mm gypsum board,
 - (c) 12.5 mm plywood, OSB or waferboard, with joints having continuous supports,
 - (d) two layers of lumber, each not less than 19 mm thick, with joints staggered, or
 - (e) 38 mm lumber.

(3) In a *building* permitted to be of *combustible construction*, semi-rigid fibre insulation board produced from glass, rock or slag, is permitted to be used to block the vertical space in a double-frame wall assembly formed at the intersection of the floor assembly and the walls, provided the width of the vertical space does not exceed 25 mm and the insulation board

- (a) has a density not less than 45 kg/m³,
- (b) is securely fastened to one set of studs,
- (c) extends from below the bottom of the top plates in the lower *storey* to above the top of the bottom plate in the upper *storey*, and
- (d) completely fills the portion of the vertical space between the headers and between the wall plates.

(See Note A-3.1.11.7.(8))

9.10.16.4. Penetration of Fire Blocks

(1) Where *fire blocks* are pierced by pipes, ducts or other elements, the effectiveness of the *fire blocks* shall be maintained around such elements.

9.10.17. Flame Spread Limits

9.10.17.1. Flame-Spread Rating of Interior Surfaces

(1) Except as otherwise provided in this Subsection, the exposed surface of every interior wall and ceiling, including skylights and glazing, shall have a surface *flame-spread rating* of not more than 150.

(2) Except as permitted in Sentence (3), doors need not conform to Sentence (1) provided they have a surface *flame-spread rating* of not more than 200.

(3) Doors within *dwelling units*, other than garage doors, need not conform to Sentences (1) and (2).

9.10.17.2. Ceilings in Exits or Public Corridors

(1) At least 90% of the exposed surface of every ceiling in an *exit* or ceiling that is not *sprinklered* in a *public corridor* shall have a surface *flame-spread rating* of not more than 25.

9.10.17.3. Walls in Exits

(1) Except as provided in Sentence (2), at least 90% of the exposed surfaces of every wall in an *exit* shall have a surface *flame-spread rating* of not more than 25.

(2) At least 75% of the wall surface of a lobby used as an *exit* in Article 9.9.8.5. shall have a surface *flame-spread rating* of not more than 25.

9.10.17.4. Exterior Exit Passageways

(1) Where an exterior *exit* passageway provides the only *means of egress* from the rooms or *suites* it serves, the wall and ceiling finishes of that passageway, including the soffit beneath and the *guard* on the passageway, shall have a surface *flame-spread rating* of not more than 25, except that up to 10% of the total wall area and 10% of the total ceiling area is permitted to have a surface *flame-spread rating* of not more than 150.

9.10.17.5. Walls in Public Corridors

(1) At least 90% of the total wall surface in any *public corridor* that is not *sprinklered* shall have a surface *flame-spread rating* of not more than 75, or at least 90% of the upper half of such walls shall have a surface *flame-spread rating* of not more than 25. (See Article 9.10.17.6.)

9.10.17.6. Calculation of Wall and Ceiling Areas

(1) Skylights, glazing, *combustible* doors, and *combustible* light diffusers and lenses shall not be considered in the calculation of wall and ceiling areas in this Subsection.

9.10.17.7. Corridors Containing an Occupancy

(1) Where a *public corridor* or a corridor used by the public contains an *occupancy*, the interior finish materials used on the walls or ceiling of such *occupancy* shall have a surface *flame-spread rating* in conformance with that required for *public corridors*.

9.10.17.8. Light Diffusers and Lenses

(1) Light diffusers and lenses having *flame-spread ratings* that exceed those permitted for the ceiling finish, shall conform to the requirements of Sentence 3.1.13.4.(1).

9.10.17.9. Combustible Skylights

(1) Individual *combustible* skylights in corridors required to be separated from the remainder of the *building* by *fire separations* shall not exceed 1 m² in area and shall be spaced not less than 1.2 m apart.

9.10.17.10. Protection of Foamed Plastics

(1) Except as provided in Sentences (2) and (3), foamed plastics that form part of a wall or ceiling assembly shall be protected from adjacent space in the *building*, other than adjacent concealed spaces within *attic or roof spaces*, crawl spaces, wall assemblies and ceiling assemblies

- (a) by one of the interior finishes described in Subsections 9.29.4. to 9.29.9.,
 - (b) provided the *building* does not contain a Group C *major occupancy*, by sheet metal that
 - (i) is mechanically fastened to the supporting assembly independent of the insulation,
 - (ii) is not less than 0.38 mm thick, and
 - (iii) has a melting point not less than 650°C, or
 - (c) any thermal barrier that meets the requirements of Sentence 3.1.5.15.(2).
- (See Note A-3.1.4.2.(1)(c))

(2) A walk-in cooler or freezer consisting of factory-assembled wall, floor or ceiling panels containing foamed plastics is permitted to be used, provided the panels

- (a) are protected on both sides by sheet metal not less than 0.38 mm thick having a melting point not less than 650°C,
- (b) do not contain an air space, and
- (c) have a *flame-spread rating*, determined by subjecting a sample panel with an assembled joint typical of field installation to the applicable test described in Subsection 3.1.12., that is not more than that permitted for the room or space in which they are located or that they bound.

(3) Thermosetting foamed plastic insulation having a *flame-spread rating* of not more than 200 is permitted to be used in factory-assembled doors in *storage garages* serving *buildings* of *residential occupancy* provided that

- (a) the insulation is covered on the interior with a metallic foil,
- (b) the assembly has a surface *flame-spread rating* of not more than 200, and
- (c) the assembly incorporates no air spaces.

9.10.17.11. Walls and Ceilings in Bathrooms

(1) The interior finish of walls and ceilings in bathrooms within *suites of residential occupancy* shall have a surface *flame-spread rating* of not more than 200.

9.10.17.12. Coverings or Linings of Ducts

(1) Where a covering or a lining is used with a duct, such lining or covering shall have a *flame-spread rating* conforming to Article 3.6.5.4. or 9.33.6.4.

9.10.18. Alarm and Detection Systems**9.10.18.1. Access Provided Through a Firewall**

(1) Where access is provided through a *firewall*, the requirements in this Subsection shall apply to the *floor areas* on both sides of the *firewall* as if they were in the same *building*.

9.10.18.2. Fire Alarm System Required

(1) Reserved.

- (2) Except as provided in Sentence (5), a fire alarm system shall be installed
- (a) in every *building* that contains more than 3 *storeys*, including *storeys* below the *first storey*,
 - (b) where the total *occupant load* exceeds 300, or
 - (c) when the *occupant load* for any *major occupancy* in Table 9.10.18.2. is exceeded.

(3) Reserved.

(4) Reserved.

(5) A fire alarm system is not required in a *residential occupancy* where an *exit* or *public corridor* serves not more than 4 *suites* or where each *suite* has direct access to an exterior *exit* facility leading to ground level.

Table 9.10.18.2.
Maximum Occupant Load for Buildings Without Fire Alarm Systems
Forming Part of Sentence 9.10.18.2.(2)

<i>Major Occupancy Classification</i>	<i>Occupant Load Above which Fire Alarm System is Required</i>
<i>Residential</i>	10 (sleeping accommodation)
<i>Business and personal services, mercantile</i>	150 above or below the <i>first storey</i>
<i>Low- or medium-hazard industrial</i>	75 above or below the <i>first storey</i>

9.10.18.3. Design and Installation Requirements

(1) Except as provided in Sentence (2), and as required by this Subsection, where fire alarm, fire detection and smoke detection devices and systems are installed, these devices and systems and their installation shall conform to Subsection 3.2.4., 3.2.7.8. and 3.2.7.10. (See Note A-9.10.18.3.(1))

(2) The following Articles in Subsection 3.2.4. regarding fire alarm systems do not apply to Part 9 *buildings*: Articles 3.2.4.1., 3.2.4.10., 3.2.4.11., 3.2.4.12., 3.2.4.13., 3.2.4.20. and 3.2.4.22.

9.10.18.4. Rooms and Spaces Requiring Heat Detectors or Smoke Detectors

- (1) Where a fire alarm system is required, every *public corridor* in *buildings of residential occupancy* and every *exit stair shaft* shall be provided with *smoke detectors*.
- (2) Except as provided in Sentence (3), if a fire alarm system is required in a *building* that is not *sprinklered*, *fire detectors* shall be installed in the following spaces:
 - (a) storage rooms not within *dwelling units*,
 - (b) *service rooms* not within *dwelling units*,
 - (c) janitors' rooms,
 - (d) rooms in which hazardous substances are to be used or stored, (See Note A-3.3.1.2.(1))
 - (e) elevator hoistways, chutes and dumbwaiter shafts, and
 - (f) laundry rooms in *buildings of residential occupancy*, except those within *dwelling units*.
- (3) Except as required in Sentence (4), *heat detectors* and *smoke detectors* described in Sentence (2), are not required in *dwelling units* or in *sprinklered buildings* in which the sprinkler system is electrically supervised and equipped with a water flow alarm.
- (4) Where a fire alarm system is required in a *hotel*, *heat detectors* shall be installed in every room in a *suite* and in every room not located in a *suite* in a *floor area* containing a *hotel*, other than washrooms within a *suite*, saunas, refrigerated areas and swimming pools.

9.10.18.5. Smoke Detectors in Recirculating Air Handling Systems

- (1) Except for a recirculating air system serving not more than one *dwelling unit*, where a fire alarm system is required to be installed, every recirculating air handling system shall be designed to prevent the circulation of smoke upon a signal from a duct-type *smoke detector* where such system supplies more than one *suite* on the same floor or serves more than 1 *storey*.

9.10.18.6. Portions of Buildings Considered as Separate Buildings

- (1) Except as provided in Sentence (2), where a vertical *fire separation* having a *fire-resistance rating* of at least 1 h separates a portion of a *building* from the remainder of the *building* and there are no openings through the *fire separation* other than those for piping, tubing, wiring and conduit, the requirements for fire alarm and detection systems may be applied to each portion so separated as if it were a separate *building*.
- (2) The permission in Sentence (1) to consider separated portions of a *building* as separate *buildings* does not apply to *service rooms* and storage rooms.

9.10.18.7. Central Vacuum Systems

- (1) Central vacuum cleaning systems serving more than one *suite* or *storey* in a *building* equipped with a fire alarm system shall be designed to shut down upon activation of the fire alarm system.

9.10.18.8. Open-Air Storage Garages

- (1) A fire alarm system is not required in a *storage garage* conforming to Article 3.2.2.92. provided there are no other *occupancies* in the *building*.

9.10.18.9. Fire Alarm System in a Hotel

- (1) If a fire alarm system is required in a *building* containing a *hotel*, a single stage fire alarm system shall be provided.

9.10.18.10. Commissioning of Life Safety and Fire Protection Systems

- (1) Where fire protection and life safety systems, and systems with fire protection and life safety functions, are integrated with each other, the systems shall be tested as a whole in accordance with CAN/ULC-S1001, “Integrated Systems Testing of Fire Protection and Life Safety Systems,” to verify that the systems have been properly integrated.
- (2) Sentence (1) does not apply to a *building* that contains only *dwelling units* and has no *dwelling unit* above another *dwelling unit*.

9.10.19. Smoke Alarms

9.10.19.1. Required Smoke Alarms (See Note A-9.10.19.1. and A-9.10.19.3.)

- (1) Except as permitted by Article 9.10.19.8., *smoke alarms* conforming to CAN/ULC-S531, “Standard for Smoke Alarms,” shall be installed in
 - (a) each *dwelling unit*,
 - (b) each sleeping room not within a *dwelling unit*, and
 - (c) ancillary spaces and common spaces not in *dwelling units* in a house with a *secondary suite*.
- (2) *Smoke alarms* required in Sentence (1) shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, “National Fire Alarm and Signaling Code.”
- (3) The visual signalling component required in Sentence (2) need not
 - (a) be integrated with the *smoke alarm* provided it is interconnected to it,
 - (b) be on battery backup, or
 - (c) have synchronized flash rates, when installed in a house with a *secondary suite* or an individual *dwelling unit*.
- (4) The luminous intensity for visual signalling components required in Sentence (2) that are installed in sleeping rooms shall be a minimum of 175 cd.

9.10.19.2. Sound Patterns of Smoke Alarms

- (1) The sound patterns of *smoke alarms* shall
 - (a) meet the temporal patterns of *alarm signals*, or (See Note A-3.2.4.18.(2))
 - (b) be a combination of temporal pattern and voice relay.

9.10.19.3. Location of Smoke Alarms (See Note A-9.10.19.1. and A-9.10.19.3.)

- (1) Except as permitted in Article 9.10.19.8., within *dwelling units*, sufficient *smoke alarms* shall be installed so that
 - (a) there is at least one *smoke alarm* installed on each *storey*, including *basements*, and
 - (b) on any *storey* of a *dwelling unit* containing sleeping rooms, a *smoke alarm* is installed
 - (i) in each sleeping room, and
 - (ii) in a location between the sleeping rooms and the remainder of the *storey*, and if the sleeping rooms are served by a hallway, the *smoke alarm* shall be located in the hallway.

(See Note A-9.10.19.3.(1))

(1.1) Except as permitted in Article 9.10.19.8., within a house with a *secondary suite* that contains an interior shared *means of egress* or common area, a *smoke alarm* shall be installed in each shared *means of egress* and common area.

(2) A *smoke alarm* required in Sentences (1) and (1.1) shall be installed in conformance with CAN/ULC-S553, “Standard for Installation of Smoke Alarms.”

(3) *Smoke alarms* required in Article 9.10.19.1. and Sentences (1) and (1.1) shall be installed on or near the ceiling.

- (4) A *smoke alarm* required in Sentences (1) and (1.1) shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, “National Fire Alarm and Signaling Code.”
- (5) The visual signalling component required in Sentence (4) need not
- (a) be integrated with the *smoke alarm* provided it is interconnected to it,
 - (b) be on battery backup, or
 - (c) have synchronized flash rates, when installed in a house with a *secondary suite* or an individual *dwelling unit*.
- (6) The luminous intensity for visual signalling components required in Sentence (4) that are installed in sleeping rooms shall be a minimum of 175 cd.

9.10.19.4. Power Supply

- (1) Except as provided in Sentences (2) and (3), *smoke alarms* described in Sentence 9.10.19.1.(1) and 9.10.19.3.(1.1) shall
- (a) be installed with permanent connections to an electrical circuit, (See Note A-3.2.4.20.(9)(a))
 - (b) have no disconnect switch between the overcurrent device and the *smoke alarm*, and
 - (c) in case the regular power supply to the *smoke alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *smoke alarm* for a period of not less than 7 days in the normal condition, followed by 4 minutes of alarm.
- (2) Where the *building* is not supplied with electrical power, *smoke alarms* are permitted to be battery-operated.
- (3) *Suites* of *residential occupancy* are permitted to be equipped with *smoke detectors* in lieu of *smoke alarms*, provided the *smoke detectors*
- (a) are capable of independently sounding audible signals with a sound pressure level between 75 dBA and 110 dBA within the individual *suites*, (See also Note A-3.2.4.18.(4))
 - (b) except as permitted in Sentence (4), are installed in conformance with CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems,” and
 - (c) form part of the fire alarm system.
- (See Note A-3.2.4.20.(10))
- (4) *Smoke detectors* permitted to be installed in lieu of *smoke alarms* as stated in Sentence (3) are permitted to sound localized alarms within individual *suites*, and need not sound an alarm throughout the rest of the *building*.

9.10.19.5. Interconnection of Smoke Alarms

- (1) Where more than one *smoke alarm* is required in a *dwelling unit*, the *smoke alarms* shall be wired so that the activation of one alarm will cause all alarms within the *dwelling unit* to sound.
- (2) *Smoke alarms* in a house with a *secondary suite* shall be wirelessly interconnected or interconnected by hard-wiring so that the activation of any one *smoke alarm* causes all *smoke alarms* within the house with a *secondary suite* to sound. (See Note A-9.10.19.5.(2))

9.10.19.6. Silencing of Smoke Alarms

- (1) Except as permitted in Sentence (2), a manually operated device shall be incorporated within the circuitry of a *smoke alarm* installed in a *dwelling unit* so that the signal emitted by the *smoke alarm* can be silenced for a period of not more than 10 min, after which the *smoke alarm* will reset and sound again if the level of smoke in the vicinity is sufficient to re-actuate it.
- (2) *Suites* of *residential occupancy* equipped with *smoke detectors* installed to CAN/ULC-S524, “Standard for Installation of Fire Alarm Systems,” which are part of the fire alarm system in lieu of *smoke alarms* as permitted in Sentence 9.10.19.4.(3), need not incorporate the manually operated device required in Sentence (1).

9.10.19.7. Instructions for Maintenance and Care

(1) Where instructions are necessary to describe the maintenance and care required for *smoke alarms* to ensure continuing satisfactory performance, they shall be posted in a location where they will be readily available to the occupants for reference.

9.10.19.8. Residential Fire Warning Systems

(1) Except where a fire alarm system is installed or required in a *building*, *smoke detectors* forming part of a residential fire warning system installed in conformance with CAN/ULC-S540 “Standard for Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance,” are permitted to be installed in lieu of all *smoke alarms* required by Articles 9.10.19.1. and 9.10.19.3., provided that the fire warning system

- (a) is capable of sounding audible signals in accordance with Articles 9.10.19.2. and 9.10.19.5.,
- (b) is powered in accordance with Article 9.10.19.4., and
- (c) is equipped with a silencing device conforming to Article 9.10.19.6.

9.10.20. Firefighting

9.10.20.1. Windows or Access Panels Required

(1) Except as provided in Sentence (3), a window or access panel providing an opening not less than 1 100 mm high and 550 mm wide and having a sill height of not more than 900 mm above the floor shall be provided on the second and third *storeys* of every *building* in at least one wall facing on a *street* if such *storeys* are not *sprinklered*.

(2) Access panels required in Sentence (1) shall be readily openable from both inside and outside or be glazed with plain glass.

(3) Access panels required in Sentence (1) need not be provided in

- (a) *buildings* containing only *dwelling units* where there is no *dwelling unit* above another *dwelling unit*, or
- b) houses with a *secondary suite*.

9.10.20.2. Access to Basements

(1) Except in *basements* in houses with a *secondary suite* or *basements* serving not more than one *dwelling unit*, each *basement* that is not *sprinklered* that exceeds 25 m in length or width shall be provided with direct access to the outdoors to at least one *street*.

(2) Access required in Sentence (1) may be provided by a door, window or other means that provides an opening not less than 1 100 mm high and 550 mm wide, the sill height of which shall not be more than 900 mm above the floor.

(3) Access required in Sentence (1) may also be provided by an interior stair accessible from the outdoors.

9.10.20.3. Fire Department Access to Buildings

(1) Access for fire department equipment shall be provided to each *building* by means of a *street*, private roadway or yard. (See Notes A-9.10.20.3.(1) and A-3.2.5.6.(1))

(2) Where access to a *building* as required in Sentence (1) is provided by means of a roadway or yard, the design and location of such roadway or yard shall take into account connection with public thoroughfares, weight of firefighting equipment, width of roadway, radius of curves, overhead clearance, location of fire hydrants, location of fire department connections and vehicular parking.

9.10.20.4. Portable Extinguishers

(1) Portable extinguishers shall be installed in all *buildings*, except within *dwelling units*, in conformance with the provisions of the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

9.10.20.5. Freeze Protection for Fire Protection Systems

(1) Equipment forming part of a fire protection system that may be adversely affected by freezing temperatures and that is located in an unheated area shall be protected from freezing.

9.10.21. Fire Protection for Construction Camps

9.10.21.1. Requirements for Construction Camps

(1) Except as provided in Articles 9.10.21.2. to 9.10.21.9., *camp for housing of workers* in construction camps shall conform to Subsections 9.10.1. to 9.10.20.

9.10.21.2. Separation of Sleeping Rooms

(1) Except for sleeping rooms within *dwelling units*, sleeping rooms in a *building* in a *camp for housing of workers* shall be separated from each other and from the remainder of the *building* by a *fire separation* having not less than a 30 min *fire-resistance rating*.

9.10.21.3. Floor Assemblies Between the First and Second Storey

(1) Except in a *dwelling unit*, a floor assembly in a *building* in a *camp for housing of workers* separating the *first storey* and the second *storey* shall be constructed as a *fire separation* having not less than a 30 min *fire-resistance rating*.

9.10.21.4. Walkways Connecting Buildings

(1) *Walkways* of *combustible construction* connecting *buildings* shall be separated from each connected *building* by a *fire separation* having not less than a 45 min *fire-resistance rating*.

9.10.21.5. Spatial Separations

(1) *Buildings* in a *camp for housing of workers* shall be separated from each other by a distance of not less than 10 m unless otherwise permitted in Subsection 9.10.14.

9.10.21.6. Flame-Spread Ratings

(1) Except in *dwelling units* and except as provided in Sentence (2), the surface *flame-spread rating* of wall and ceiling surfaces in corridors and *walkways*, exclusive of doors, shall not exceed 25 over not less than 90% of the exposed surface area and not more than 150 over the remaining surface area.

(2) Except within *dwelling units*, corridors that provide *access to exit* from sleeping rooms and that have a *fire-resistance rating* of not less than 45 min shall have a *flame-spread rating* conforming to the appropriate requirements in Subsection 9.10.17.

9.10.21.7. Smoke Detectors

(1) Except in *dwelling units*, corridors providing *access to exit* from sleeping rooms in every *building* in a *camp for housing of workers* with sleeping accommodation for more than 10 persons shall have a *smoke detector* connected to the *building* alarm system.

9.10.21.8. Portable Fire Extinguishers

(1) Each *building* in a *camp for housing of workers* shall be provided with portable fire extinguishers in conformance with the provisions of the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

9.10.21.9. Hose Stations

(1) Every *building* in a *camp for housing of workers* providing sleeping accommodation for more than 30 persons shall be provided with a hose station that is protected from freezing and equipped with a hose of sufficient length so that every portion of the *building* is within the range of a hose stream.

(2) Hose stations required in Sentence (1) shall be located near an *exit*.

(3) Hoses referred to in Sentence (1) shall be not less than 19 mm inside diam and shall be connected to a central water supply or to a storage tank having a capacity of not less than 4 500 L with a pumping system capable of supplying a flow of not less than 5 L/s at a gauge pressure of 300 kPa.

9.10.22. Fire Protection for Gas, Propane and Electric Cooktops and Ovens (See Note A-9.10.22.)

9.10.22.1. Installation of Cooktops and Ovens

(1) Reserved.

(2) Clearances for and protection around gas, propane and electric ranges shall be not less than those provided in Articles 9.10.22.2. and 9.10.22.3.

9.10.22.2. Vertical Clearances Above Cooktops

(1) Except as provided in Sentence (2), framing, finishes and cabinetry installed directly above the location of the *cooktop* shall be not less than 750 mm above the level of *cooktop* burners or elements.

(2) The vertical clearance described in Sentence (1) for framing, finishes and cabinets located directly above the location of the *cooktop* is permitted to be reduced to 600 mm above the level of the elements or burners provided the framing, finishes and cabinets

(a) are *noncombustible*, or

(b) are protected by a metal hood that projects 125 mm beyond the framing, finishes and cabinets.

9.10.22.3. Protection Around Cooktops

(1) Except as provided in Sentences (2) and (3), *combustible* wall framing, finishes or cabinets within 450 mm of the area where the *cooktop* is to be located shall be protected above the level of the heating elements or burners by

(a) gypsum board not less than 9.5 mm thick, or

(b) any material providing a *fire-resistance rating* of not less than 10 min and a *flame-spread rating* of not more than 25.

- (2) Countertop splash boards or back plates that extend above the level of the heating elements or burners need not be protected as described in Sentence (1).
- (3) Except for cabinetry described in Article 9.10.22.2., cabinetry located not less than 450 mm above the level of the heating elements or burners need not be protected as described in Sentence (1).

Section 9.11. Sound Transmission (See Note A-9.11.)

9.11.1. Protection from Airborne Noise

9.11.1.1. Required Protection

- (1) Except as provided in Sentence (3), a *dwelling unit* and a *suite* in *hotels* shall be separated from every other space in a *building* in which noise may be generated by
 - (a) a separating assembly and adjoining constructions, which, together, provide an *apparent sound transmission class (ASTC)* rating of not less than 47, or
 - (b) a separating assembly that provides a *sound transmission class (STC)* rating of at least 50 and adjoining constructions that conforms to Article 9.11.1.4.
(See Note A-9.11.1.4.)
- (2) Reserved.
- (3) Construction separating a *dwelling unit* or *suite* in a *hotel* from an elevator shaft or refuse chute shall have an *STC* rating of not less than 55.

9.11.1.2. Determination of Sound Transmission Ratings

- (1) The *STC* ratings shall be determined in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the results from measurements carried out in accordance with ASTM E90, “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.”
- (2) The *ASTC* ratings shall be
 - (a) determined in accordance with ASTM E413, “Classification for Rating Sound Insulation,” using the results from measurements carried out in accordance with ASTM E336, “Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings,” or
 - (b) calculated in accordance with Article 5.8.1.4. or Article 5.8.1.5.

9.11.1.3. Compliance with Required Ratings

- (1) Compliance with the required *STC* ratings shall be demonstrated through
 - (a) measurements carried out in accordance with Sentence 9.11.1.2.(1), or
 - (b) the construction of separating assemblies conforming to Table 1 or 2 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance Tables,” as applicable.
- (2) Compliance with the required *ASTC* ratings shall be demonstrated through
 - (a) measurements or calculations carried out in accordance with Sentence 9.11.1.2.(2), or
 - (b) the construction of separating assemblies conforming to Table 1 or 2 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance Tables,” as applicable, that have an *STC* rating of not less than 50 in conjunction with flanking assemblies constructed in accordance with Article 9.11.1.4. (See Note A-9.11.1.3.(2)(b))

9.11.1.4. Adjoining Constructions (See Note A-9.11.1.4.)

- (1) This Article applies where the required protection is provided in accordance with Clause 9.11.1.1.(1)(b) and compliance is demonstrated in accordance with Clause 9.11.1.3.(2)(b).
- (2) Flanking wall assemblies connected to a separating floor or ceiling assembly shall be constructed with
- concrete or concrete block having a mass per area greater than 200 kg/m², or
 - gypsum board finish that
 - is supported on wood or steel framing, and
 - ends or is interrupted where it meets the structure of the separating floor or ceiling assembly.
- (3) Flanking wall and ceiling assemblies connected to a separating wall assembly shall be constructed with
- concrete or concrete block having a mass per area greater than 300 kg/m², or
 - gypsum board finish that
 - is supported on wood or steel framing, and
 - ends or is interrupted where it meets the structure of the separating wall assembly or, for double-stud walls, where it meets the space between the two lines of studs.
- (4) Flanking floor assemblies connected to a separating wall assembly shall be
- constructed
 - with concrete having a mass per area greater than 300 kg/m², or
 - in accordance with Section 9.16., or
 - supported on joists or trusses that are not continuous across the junction and are covered with floor treatments in accordance with Table 9.11.1.4. for the applicable wall construction.

Table 9.11.1.4.
Floor Treatments for Flanking Wood-Framed Floor Assemblies in Horizontally Adjoining Spaces
 Forming Part of Sentence 9.11.1.4.(4)

Type of Separating Wall Assembly with $STC \geq 50$ from MMAH Supplementary Standard SB-3, "Fire and Sound Resistance Tables"	Minimum Requirements for Floor Treatments Applied over Subfloor of Wood-Framed Flanking Floor Assemblies on Both Sides of Floor/Wall Junction
W5, W6, W10, W12 (staggered studs)	<ul style="list-style-type: none"> • wood strip flooring not less than 16 mm thick aligned parallel to separating wall, or • one layer OSB or plywood not less than 15.5 mm thick plus finished flooring, or • one additional material layer plus finished flooring having a combined mass per area not less than 8 kg/m²⁽¹⁾
W4, W11 (staggered studs)	<ul style="list-style-type: none"> • one layer of OSB or plywood not less than 12.5 mm thick plus hardwood strip flooring not less than 19 mm thick aligned parallel to separating wall, or • one additional material layer plus finished flooring having a combined mass per area not less than 16 kg/m²⁽¹⁾
W8, W9 (staggered studs)	<ul style="list-style-type: none"> • concrete or gypsum concrete topping not less than 19 mm thick bonded to the subfloor plus finished flooring, or • one additional material layer plus finished flooring having a combined mass per area not less than 32 kg/m²⁽¹⁾

Table 9.11.1.4. (Cont'd)
Floor Treatments for Flanking Wood-Framed Floor Assemblies in Horizontally Adjoining Spaces
 Forming Part of Sentence 9.11.1.4.(4)

Type of Separating Wall Assembly with <i>STC</i> ≥ 50 from MMAH Supplementary Standard SB-3, “Fire and Sound Resistance Tables”	Minimum Requirements for Floor Treatments Applied over Subfloor of Wood-Framed Flanking Floor Assemblies on Both Sides of Floor/Wall Junction
W13, W14, W15 (double stud walls)	<ul style="list-style-type: none"> • where a continuous subfloor or other rigid materials at the floor/wall junction provide structural connection between the two rows of studs in the separating wall: <ul style="list-style-type: none"> • hardwood strip flooring not less than 16 mm thick aligned parallel to separating wall, or • one layer OSB or plywood not less than 15.5 mm thick plus finished flooring, or • one additional material layer plus finished flooring having a combined mass per area not less than 8 kg/m²(1) • any finished flooring where the subfloor and other rigid materials are not connected at the floor/wall junction and where there are no structural connections between the two rows of studs in the separating wall
B1 to B10	<ul style="list-style-type: none"> • any finished flooring

Notes to Table 9.11.1.4.:

(1) See Note A-Table 9.11.1.4.

Section 9.12. Excavation

9.12.1. General

9.12.1.1. Removal of Topsoil and Organic Matter

- (1) The topsoil and vegetable matter in all unexcavated areas under a *building* shall be removed.
- (2) In localities where termite infestation is known to be a problem, all stumps, roots and other wood debris shall be removed from the *soil* to a depth of not less than 300 mm in unexcavated areas under a *building*.
- (3) The bottom of every *excavation* shall be free of all organic material.

9.12.1.2. Standing Water

- (1) *Excavations* shall be kept free of standing water.

9.12.1.3. Protection from Freezing

- (1) The bottom of *excavations* shall be kept from freezing throughout the entire construction period.

9.12.1.4. Precautions During Excavation

- (1) Every *excavation* shall be undertaken in such a manner to prevent damage to adjacent property, existing structures, utilities, roads and sidewalks at all stages of construction.

(2) Material shall not be placed nor shall equipment be operated or placed in or adjacent to an *excavation* in a manner that may endanger the integrity of the *excavation* or its supports.

9.12.2. Depth

9.12.2.1. Excavation to Undisturbed Soil

(1) *Excavations* for *foundations* shall extend to undisturbed *soil*.

9.12.2.2. Minimum Depth of Foundations

(1) Except as provided in Sentences (4) to (7), the minimum depth of *foundations* below finished ground level shall conform to Table 9.12.2.2.

Table 9.12.2.2.
Minimum Depths of Foundations
Forming Part of Sentence 9.12.2.2.(1)

Type of Soil	Minimum Depth of <i>Foundation</i> Containing Heated <i>Basement</i> or <i>Crawl Space</i> ⁽¹⁾		Minimum Depth of <i>Foundation</i> Containing No Heated Space ⁽²⁾	
	Good <i>Soil Drainage</i>	Poor <i>Soil Drainage</i>	Good <i>Soil Drainage</i>	Poor <i>Soil Drainage</i>
Rock	No limit	No limit	No limit	No limit
Coarse grained <i>soils</i>	No limit	No limit	No limit	Below the depth of frost penetration
Silt	No limit	No limit	Below the depth of frost penetration ⁽³⁾	Below the depth of frost penetration
Clay or <i>soils</i> not clearly defined ⁽⁴⁾	1.2 m ⁽³⁾	1.2 m	1.2 m but not less than the depth of frost penetration ⁽³⁾	1.2 m but not less than the depth of frost penetration

Notes to Table 9.12.2.2.:

- (1) *Foundation* not insulated to reduce heat loss through the footings.
 (2) Including *foundations* insulated to reduce heat loss through the footings.
 (3) Good *soil drainage* to not less than the depth of frost penetration.
 (4) See Note A-Table 9.12.2.2.

(2) Where a *foundation* is insulated in a manner that will reduce the heat flow to the *soil* beneath the footings, the *foundation* depth shall conform to that required for *foundations* containing no heated space. (See Note A-9.12.2.2.(2))

(3) The minimum depth of *foundations* for exterior concrete steps with more than 2 risers shall conform to Sentences (1), (2) and (5).

(4) Concrete steps with 1 and 2 risers are permitted to be laid on ground level.

(5) The *foundation* depths required in Sentence (1) are permitted to be decreased where experience with local *soil* conditions shows that lesser depths are satisfactory, or where the *foundation* is designed for lesser depths.

(6) The *foundation* depths required in Sentence (1) do not apply to *foundations* for

- (a) *buildings*
- (i) that are not of masonry or masonry veneer construction, and
 - (ii) whose superstructure conforms with the requirements of the deformation resistance test in CSA Z240.2.1, “Structural requirements for manufactured homes,” or

- (b) accessory *buildings*
 - (i) that are not of masonry or masonry veneer construction,
 - (ii) not more than 1 *storey* in *building height*,
 - (iii) not more than 55 m² in *building area*, and
 - (iv) where the distance from finished ground to the underside of the floor joists is not more than 600 mm.

- (7) The *foundation* depths required by Sentence (1) do not apply to *foundations* for decks and other accessible exterior platforms
 - (a) of not more than 1 *storey*,
 - (b) not more than 55 m² in area,
 - (c) where the distance from finished ground to the underside of the floor joists is not more than 600 mm,
 - (d) not supporting a roof, and
 - (e) not attached to another structure, unless it can be demonstrated that differential movement will not adversely affect the performance of that structure.

9.12.3. Backfill

9.12.3.1. Placement of Backfill

- (1) Backfill shall be placed to avoid damaging the *foundation* wall, the drainage tile, drainage layer, externally applied thermal insulation, waterproofing and dampproofing of the wall.

9.12.3.2. Grading of Backfill

- (1) Backfill shall be graded to prevent drainage towards the *foundation* after settling.

9.12.3.3. Deleterious Debris and Boulders

- (1) Backfill that is within 600 mm of the *foundation* shall be free of deleterious debris and boulders larger than 250 mm diam. (See Note A-9.12.3.3.(1))

- (2) Except as permitted in Sentence (3), backfill shall not contain pyritic material or material that is susceptible to ice lensing in concentrations that will damage the *building* to a degree that would adversely affect its stability or the performance of assemblies separating dissimilar environments. (See Note A-9.4.4.4.(1))

- (3) Backfill with material of any concentration that is susceptible to ice lensing is permitted where *foundation* walls are
 - (a) cast-in-place concrete,
 - (b) concrete block insulated on the exterior, or
 - (c) concrete block protected from the backfill by a material that serves as a slip plane.(See Note A-9.4.4.4.(1))

9.12.3.4. Lateral Support of Foundation Wall

- (1) Where the height of *foundation* wall is such that lateral support is required, or where the required concrete strength of the wall has not been reached, the wall shall be braced or laterally supported before backfilling.

9.12.4. Trenches Beneath Footings

9.12.4.1. Support of Footings

- (1) The *soil* in trenches beneath footings for sewers and watermains shall be compacted by tamping up to the level of the footing base, or shall be filled with concrete having a strength not less than 10 MPa to support the footing.

Section 9.13. Dampproofing, Waterproofing and Soil Gas Control

9.13.1. General

9.13.1.1. Scope and Application

- (1) This Section presents measures to control the ingress of water, moisture and *soil* gas.
- (2) Subsection 9.13.2. applies to below-ground walls and floors-on-ground where drainage is provided in accordance with Section 9.14. over and along the entire below-ground portion of the *foundation* wall.
- (3) Subsection 9.13.3. applies to below-ground walls, floors-on-ground and roofs of underground structures that are subject to hydrostatic pressure.
- (4) Subsection 9.13.4. applies to walls, roofs and floors that are in contact with the ground.

9.13.2. Dampproofing

9.13.2.1. Required Dampproofing

- (1) Except as provided in Sentence (4) and Article 9.13.3.1., where the exterior finished ground level is at a higher elevation than the ground level inside the *foundation* walls, exterior surfaces of *foundation* walls below ground level shall be dampproofed.
- (2) Except as provided in Sentence (3) and Article 9.13.3.1., floors-on-ground shall be dampproofed.
- (3) Floors in garages, floors in unenclosed portions of *buildings* and floors installed over granular *fill* in conformance with Article 9.16.2.1. need not be dampproofed.
- (4) Dampproofing in Sentence (1) is not required where the exterior surfaces of *foundation* walls below ground level are waterproofed.

9.13.2.2. Dampproofing Materials

- (1) Materials installed to provide required dampproofing shall be
 - (a) capable of protecting assemblies against moisture transfer from the ground,
 - (b) compatible with adjoining materials, and
 - (c) resistant to mechanisms of deterioration that may reasonably be expected, given the nature, function and exposure of the materials.
- (2) Except as otherwise specified in this Section, materials used for exterior dampproofing shall
 - (a) conform to one of the following standards:
 - (i) ASTM D1227 / D1227M, "Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing," Type III, Class I,
 - (ii) ASTM D4479 / D4479M, "Asphalt Roof Coatings - Asbestos-Free," Type III,
 - (iii) CAN/CGSB-51.34-M, "Vapour Barrier, Polyethylene Sheet for Use in Building Construction," or
 - (iv) CAN/CSA-A123.4, "Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems," or

- (b) have a water vapour permeance of not more than $43 \text{ ng}/(\text{Pa}\times\text{s}\times\text{m}^2)$ when tested in accordance with Procedure A (wet cup) of ASTM E96 / E96M, “Standard Test Methods for Water Vapor Transmission of Materials,” and consist of one of the following material types:
 - (i) a vapour-resistant coating,
 - (ii) a cold-fluid-applied or hot-rubberized bituminous dampproofing membrane,
 - (iii) a liquid-applied or spray-applied asphalt-based emulsion dampproofing, or
 - (iv) a Type III hot-applied asphalt.

9.13.2.3. Preparation of Surface

- (1) The area in which dampproofing is to be carried out shall be kept free of water during the application and curing of the dampproofing system.
- (2) The surface to be dampproofed shall be prepared in accordance with the instructions of the dampproofing material manufacturer.
- (3) Where the dampproofing material is to be applied on insulating concrete form (ICF) walls, the instructions of the ICF wall manufacturer shall be followed.
- (4) Unit masonry walls to be dampproofed shall be parged on the exterior face below ground level with not less than 6 mm of mortar conforming to Section 9.20. covered over the footing.
- (5) Concrete walls to be dampproofed shall have holes and recesses sealed with cement mortar or a mastic or sealant that is suitable for vertical applications and compatible with the dampproofing material.
- (6) The surface required to be dampproofed shall be clean and dry and free of ice, snow, frost, dust, dirt, oil, grease, cracks, projections, depressions, loose particles and debris that could be detrimental to the performance of the membrane to be applied.

9.13.2.4. Application of Dampproofing Material

- (1) Exterior dampproofing shall be applied from finished ground level to the top of the exterior of the footing.
- (2) Unless otherwise stated in this Subsection, dampproofing shall be installed in accordance with the manufacturer’s instructions with regard to
 - (a) surface priming,
 - (b) conditions during application,
 - (c) application quantity and rate, and
 - (d) curing times.
- (3) Joints, cracks and penetrations shall be sealed to maintain the continuity of the dampproofing, where the dampproofing material is not capable of bridging such discontinuities.

9.13.2.5. Moisture Protection for Interior Finishes (See Note A-9.13.2.5.)

- (1) The interior surface of *foundation* walls below ground level shall be protected by means that minimize the ingress of moisture from the *foundation* wall into interior spaces, where
 - (a) a separate interior finish is applied to a concrete or unit masonry wall that is in contact with the *soil*, or
 - (b) wood members are placed in contact with such walls for the installation of insulation or finish.
- (2) Except as provided in Sentence (3), where the protection of interior finishes required in Sentence (1) consists of membranes or coatings,
 - (a) the membrane or coating shall extend from the *basement* floor surface up to the highest extent of the interior insulation or finish, but not higher than the exterior finished ground level, and

- (b) no membrane or coating with a permeance less than $170 \text{ ng}/(\text{Pa}\times\text{s}\times\text{m}^2)$ shall be applied to the interior surface of the *foundation* wall above ground level between the insulation and the *foundation* wall.
- (3) Where insulation functions as both moisture protection for interior finishes and as a *vapour barrier* in accordance with Subsection 9.25.4., it shall be applied over the entire interior surface of the *foundation* wall.

9.13.2.6. Dampproofing of Floors-on-Ground

- (1) Where dampproofing is installed below the floor, it shall consist of
 - (a) polyethylene not less than 0.15 mm thick with joints lapped not less than 100 mm,
 - (b) Type S roll roofing with joints lapped not less than 100 mm, or
 - (c) rigid extruded/expanded polystyrene with sealed or shiplapped joints that has
 - (i) sufficient compressive strength to support the floor assembly, and
 - (ii) a water vapour permeance complying with Clause 9.13.2.2.(2)(a).

(See Note A-9.13.2.6.(1))

- (2) Where dampproofing is installed between a floor-on-ground and a finished floor, it shall consist of
 - (a) rigid extruded/expanded polystyrene with sealed or shiplapped joints that has
 - (i) sufficient compressive strength to support the floor assembly, and
 - (ii) a water vapour permeance complying with Clause 9.13.2.2.(2)(b), or
 - (b) polyethylene not less than 0.05 mm thick with joints lapped not less than 100 mm.

9.13.2.7. Dampproofing of Preserved Wood Foundation Walls

- (1) Preserved wood *foundation* walls shall be dampproofed as described in CSA S406, “Specification of permanent wood foundations for housing and small buildings.”

9.13.3. Waterproofing

9.13.3.1. Required Waterproofing

- (1) Where hydrostatic pressure occurs, waterproofing is required for assemblies separating interior space from the ground to prevent the ingress of water into *building* assemblies and interior spaces.
- (2) Waterproofing is required for roofs of underground structures to prevent the ingress of water into *building* assemblies and interior spaces.

9.13.3.2. Waterproofing Materials

- (1) Materials installed to provide required waterproofing shall be
 - (a) compatible with adjoining materials, and
 - (b) resistant to mechanisms of deterioration that may reasonably be expected, given the nature, function and exposure of the materials.
- (2) Materials used for exterior waterproofing shall conform to
 - (a) ASTM D1227 / D1227M, “Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing,” in which case, they shall be installed in accordance with Sentence 9.13.3.3.(3),
 - (b) ASTM D3019 / D3019M, “Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, and Fibered,” where non-fibered and non-asbestos-fibered (Types I and III) asphalt roll roofing are permitted,
 - (c) ASTM D4479 / D4479M, “Standard Specification for Asphalt Roof Coatings - Asbestos-Free,” in which case, they shall be installed in accordance with Sentence 9.13.3.3.(3) and with reinforcing material,
 - (d) ASTM D4637 / D4637M, “Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane,”

- (e) ASTM D4811 / D4811M, “Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing,”
- (f) ASTM D6878 / D6878M, “Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing,”
- (g) CGSB 37-GP-9Ma, “Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing,” where a primer is required,
- (h) CAN/CGSB-37.50-M, “Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing,”
- (i) CAN/CGSB-37.54, “Polyvinyl Chloride Roofing and Waterproofing Membrane,”
- (j) CGSB 37-GP-56M, “Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing”,
- (k) CAN/CGSB-37.58-M, “Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing,”
- (l) CAN/CSA-A123.2, “Asphalt-Coated Roofing Sheets,”
- (m) CAN/CSA-A123.4, “Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems,” in which case, they shall be installed with reinforcing material, or
- (n) CSA A123.17, “Asphalt Glass Felt Used in Roofing and Waterproofing.”

9.13.3.3. Preparation of Surface

- (1) Surfaces to be waterproofed shall be prepared in accordance with the instructions of the waterproofing material manufacturer.
- (2) Where the waterproofing material is to be applied on ICF walls, the instructions of the ICF wall manufacturer shall be followed.
- (3) Unit masonry walls that are to be waterproofed shall be parged on exterior surfaces below ground level with not less than 6 mm of mortar conforming to Section 9.20. covered over the footing.
- (4) Concrete walls that are to be waterproofed shall have all holes and recesses sealed with mortar or waterproofing material.
- (5) Surfaces required to be waterproofed shall be clean and dry and free of ice, snow, frost, dust, dirt, oil, grease, cracks, projections and depressions, loose particles and debris that could be detrimental to the performance of the waterproofing material.

9.13.3.4. Application of Waterproofing Membranes

- (1) Unless otherwise stated in this Subsection, waterproofing shall be installed in accordance with the manufacturer’s instructions with regard to
 - (a) surface priming,
 - (b) conditions during application,
 - (c) the required number of layers of reinforcing fabric on *foundations*, footings, floors, walls and structural slabs,
 - (d) application quantity and rate, and
 - (e) curing times.
- (2) Waterproofing shall be continuous across joints and at junctions between different *building* elements.
- (3) The waterproofed surface shall be protected with a suitable material to minimize mechanical damage during backfilling.
- (4) The area in which the waterproofing is to be carried out shall be kept free of water during the application and curing of the waterproofing system.

9.13.3.5. Floor Waterproofing System

(1) *Basement* floors-on-ground to be waterproofed shall have a system of membrane waterproofing provided between 2 layers of concrete, each of which shall be not less than 75 mm thick, with the floor membrane made continuous with the wall membrane to form a complete seal.

9.13.4. Soil Gas Control (See Note A-9.13.4.)

9.13.4.1. Application and Scope

- (1) This Subsection applies to
 - (a) wall, roof and floor assemblies separating *conditioned space* from the ground, and
 - (b) the rough-in to allow the future protection of *conditioned space* that is separated from the ground by a wall, roof or floor assembly.
- (2) This Subsection addresses the leakage of *soil* gas from the ground into the *building*.
- (3) In areas of the province where radon gases are known to be a problem, the *building* shall be designed and constructed to meet the radon limitations in Article 9.1.1.7.

9.13.4.2. Protection from Soil Gas Ingress

r1 (1) Except as provided in Sentence (1.1), all wall, roof and floor assemblies in contact with the ground shall be constructed to resist the leakage of *soil* gas from the ground into the *building* in accordance with Subsection 9.25.3. or MMAH Supplementary Standard SB-9, “Requirements for Soil Gas Control.”

(1.1) Construction to resist leakage of *soil* gas into the *building* is not required for garages and unenclosed portions of *buildings*.

(1.2) Where polyethylene is used to provide a barrier to *soil* gas ingress through floors-on-ground, it shall conform to CAN/CGSB-51.34-M, “Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.”

(2) Unless the space between the *air barrier system* and the ground is designed to be accessible for the future installation of a subfloor depressurization system, *dwelling units* and *buildings* containing *residential occupancies* shall be provided with the rough-in for a radon extraction system conforming to Article 9.13.4.3.

(3) Where *buildings* are used for *occupancies* other than those described in Sentence (2), protection from radon ingress and the means to address high radon concentrations in the future shall conform to

- (a) Article 9.13.4.3., or
 - (b) Parts 5 and 6. (See Article 5.4.1.1. and 6.2.1.1.)
- (See Note A-9.13.4.2.(3))

9.13.4.3. Providing for the Rough-in for a Subfloor Depressurization System

(See Note A-9.13.4.3.)

- (1) Floors-on-ground shall be provided with a rough-in for subfloor depressurization consisting of
 - (a) a gas-permeable layer, an inlet and an outlet as described in Sentence (2), or
 - (b) clean granular material and a pipe as described in Sentence (3).
- (2) The rough-in referred to in Clause (1)(a) shall include
 - (a) a gas-permeable layer installed in the space between the air barrier and the ground to allow the depressurization of that space,
 - (b) an inlet that allows for the effective depressurization of the gas-permeable layer, and (See Note A-9.13.4.3.(2)(b) and (3)(b)(i))

- (c) an outlet in the *conditioned space* that
 - (i) permits connection to depressurization equipment,
 - (ii) is sealed to maintain the integrity of the *air barrier system*, and
 - (iii) is clearly labeled to indicate that it is intended only for the removal of radon from below the floor-on-ground.
- (3) The rough-in referred to in Clause (1)(b) shall include
 - (a) clean granular material installed below the floor-on-ground in accordance with Sentence 9.16.2.1.(1), and
 - (b) pipe not less than 100 mm in diameter installed through the floor, such that
 - (i) its bottom end opens into the granular layer required in Clause (a) at or near the centre of the floor and not less than 100 mm of granular material projects beyond the terminus of the pipe measured along its axis, (See Note A-9.13.4.3.(2)(b) and (3)(b)(i))
 - (ii) its top end permits connection to depressurization equipment and is provided with an airtight cap, and
 - (iii) the pipe is clearly labeled near the cap and, if applicable, every 1.8 m and at every change in direction to indicate that it is intended only for the removal of radon from below the floor-on-ground.

Section 9.14. Drainage

9.14.1. Scope

9.14.1.1. Application

- (1) This Section applies to subsurface drainage and to surface drainage.

9.14.1.2. Crawl Spaces

- (1) Drainage for crawl spaces shall conform to Section 9.18.

9.14.1.3. Floors-on-Ground

- (1) Drainage requirements beneath floors-on-ground shall conform to Section 9.16.

9.14.2. Foundation Drainage

9.14.2.1. Foundation Wall Drainage

- (1) Unless it can be shown to be unnecessary, drainage shall be provided at the bottom of every *foundation* wall that contains the *building* interior.

(1.1) Except as provided in Sentences (3) and (4), where the insulation on a *foundation* wall extends to more than 900 mm below the adjacent exterior ground level

- (a) a drainage layer shall be installed adjacent to the exterior surface of a *foundation* wall consisting of
 - (i) not less than 19 mm mineral fibre insulation with a density of not less than 57 kg/m³, or
 - (ii) not less than 100 mm of free draining granular material, or
 - (b) a system shall be installed that can be shown to provide equivalent performance to that provided by the materials described in Clause (a).
- (See Note A-9.14.2.1.(1.1))

- (2) Where mineral fibre insulation, crushed *rock* backfill or other drainage layer medium is provided adjacent to the exterior surface of a *foundation* wall,
 - (a) the insulation, backfill or other drainage layer medium shall extend to the footing level to facilitate drainage of ground water to the *foundation* drainage system, and (See Note A-9.14.2.1.(1.1))
 - (b) any pyritic material in the crushed *rock* shall be limited to a concentration that will not damage the *building* to a degree that would adversely affect its stability or the performance of assemblies separating dissimilar environments. (See Note A-9.4.4.4.(1)) (See Sentence 9.12.3.3.(2))
- (3) Except when the insulation provides the drainage layer required in Clause (2)(a), when exterior insulation is provided, the drainage layer shall be installed on the exterior face of the insulation.
- (4) The drainage layer required in Sentence (2) is not required
 - (a) when the *foundation* wall is not required to be dampproofed, or
 - (b) when the *foundation* wall is waterproofed.
- (5) Where drainage is required in Sentence (1), the drainage shall conform to Subsection 9.14.3. or 9.14.4.

9.14.3. Drainage Tile and Pipe

9.14.3.1. Material Standards

- (1) Drain tile and drain pipe for *foundation* drainage shall conform to
 - (a) ASTM C4, “Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile,”
 - (b) ASTM C412M, “Standard Specification for Concrete Drain Tile,”
 - (c) ASTM C444M, “Perforated Concrete Pipe,”
 - (d) ASTM C700, “Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated,”
 - (e) BNQ 3624-115, “Polyethylene (PE) Pipe and Fittings for Soil and Foundation Drainage,”
 - (f) CAN/CSA-B182.1, “Plastic drain and sewer pipe and pipe fittings,” or
 - (g) CAN/CSA-G401, “Corrugated steel pipe products.”

9.14.3.2. Minimum Size

- (1) Drain tile or pipe used for *foundation* drainage shall be not less than 100 mm in diam.

9.14.3.3. Installation

- (1) Drain tile or pipe shall be laid on undisturbed or well-compacted *soil* so that the top of the tile or pipe is below the bottom of the floor slab or the ground cover of the crawl space.
- (2) Drain tile or pipe with butt joints shall be laid with 6 mm to 10 mm open joints.
- (3) The top half of joints referred to in Sentence (2) shall be covered with sheathing paper, 0.10 mm polyethylene or No. 15 asphalt or tar-saturated felt.
- (4) The top and sides of drain pipe or tile shall be covered with not less than 150 mm of crushed stone or other coarse clean granular material containing not more than 10% of material that will pass a 4 mm sieve.

9.14.4. Granular Drainage Layer

9.14.4.1. Type of Granular Material

- (1) Granular material used to drain the bottom of a *foundation* shall consist of a continuous layer of crushed stone or other coarse clean granular material containing
 - (a) not more than 10% of material that will pass a 4 mm sieve, and
 - (b) no pyritic material in a concentration that would adversely affect its stability or the performance of assemblies separating dissimilar environments.

9.14.4.2. Installation

- (1) Granular material described in Article 9.14.4.1. shall be laid on undisturbed or compacted *soil* to a minimum depth of not less than 125 mm beneath the footing of the *building* and extend not less than 300 mm beyond the outside edge of the footings.

9.14.4.3. Grading

- (1) The bottom of an *excavation* drained by a granular layer shall be graded so that the entire area described in Article 9.14.4.2. is drained to a sump conforming to Article 9.14.5.2.

9.14.4.4. Wet Site Conditions

- (1) Where because of wet site conditions *soil* becomes mixed with the granular drainage material, sufficient additional granular material shall be provided so that the top 125 mm are kept free of *soil*.

9.14.5. Drainage Disposal

9.14.5.1. Drainage Disposal

- (1) *Foundation* drains shall drain to a sewer, drainage ditch or dry well.

9.14.5.2. Sump Pits

- (1) Where a sump pit is provided it shall be
 - (a) not less than 750 mm deep,
 - (b) not less than 0.25 m² in area, and
 - (c) provided with a cover.
- (2) Covers for sump pits shall be designed
 - (a) to resist removal by children, and
 - (b) to be airtight in accordance with Sentence 9.25.3.3.(7)
- (3) Where gravity drainage is not practical, an automatic sump pump shall be provided to discharge the water from the sump pit described in Sentence (1) into a sewer, drainage ditch or dry well.

9.14.5.3. Dry Wells

- (1) Dry wells may be used only when located in areas where the natural *groundwater* level is below the bottom of the dry well.

(2) Dry wells shall be not less than 5 m from the *building foundation* and located so that drainage is away from the *building*.

9.14.6. Surface Drainage

9.14.6.1. Surface Drainage

(1) The *building* shall be located or the *building* site graded so that water will not accumulate at or near the *building* and will not adversely affect adjacent properties.

9.14.6.2. Drainage away from Wells or Septic Disposal Beds

(1) Surface drainage shall be directed away from the location of a water supply well or *leaching bed*.

9.14.6.3. Window Wells

(1) Every window well shall be drained to the footing level or other suitable location.

9.14.6.4. Catch Basin

(1) Where runoff water from a driveway is likely to accumulate or enter a garage, a catch basin shall be installed to provide adequate drainage.

9.14.6.5. Downspouts

(1) Downspouts shall conform to Article 9.26.18.2.

Section 9.15. Footings and Foundations

9.15.1. Application

9.15.1.1. General (See Notes A-9.15.1.1., and A-9.4.4.6. and 9.15.1.1.)

- (1) Except as provided in Articles 9.15.1.2. and 9.15.1.3., this Section applies to
- (a) concrete or unit masonry *foundation* walls and concrete footings not subject to surcharge
 - (i) on stable *soils* with an *allowable bearing pressure* of 75 kPa or greater, and
 - (ii) for *buildings* of wood-frame or masonry construction,
 - (b) wood-frame *foundation* walls and wood or concrete footings not subject to surcharge
 - (i) on stable *soils* with an *allowable bearing pressure* of 75 kPa or greater, and
 - (ii) for *buildings* of wood-frame construction, and
 - (c) flat insulating concrete form *foundation* walls and concrete footings not subject to surcharge (See Note A-9.15.1.1.(1)(c) and 9.20.1.1.(1)(b))
 - (i) on stable *soils* with an *allowable bearing pressure* of 75 kPa or greater, and
 - (ii) for *buildings* of light-frame or flat insulating concrete form construction that are not more than 2 *storeys* in *building height*, with a maximum floor-to-floor height of 3 m.
- (2) *Foundations* for applications other than as described in Sentence (1) shall be designed in accordance with Section 9.4.

(3) Where a *foundation* is erected on filled ground, peat or sensitive clay, the footing sizes shall be designed in conformance with Section 4.2.

(4) For the purpose of Sentence (3), sensitive clay means the grain size of the majority of the particles is smaller than 0.002 mm, including leda clay.

9.15.1.2. Permafrost

(1) *Buildings* erected on permafrost shall have *foundations* designed by a *designer* competent in this field in accordance with the appropriate requirements of Part 4.

9.15.1.3. Foundations for Deformation Resistant Buildings

(1) Where the superstructure of a detached *building* conforms to the requirements of the deformation resistance test in CSA Z240.2.1, “Structural requirements for manufactured homes,” the *foundation* shall be constructed in conformance with,

- (a) the remainder of this Section, or
- (b) CSA Z240.10.1, “Site preparation, foundation, and installation of buildings.”

9.15.2. General

9.15.2.1. Concrete

(1) Concrete shall conform to Section 9.3.

9.15.2.2. Unit Masonry Construction

(1) Concrete block shall conform to CSA A165.1, “Concrete block masonry units,” and shall have a compressive strength over the average net cross-sectional area of the block of not less than 15 MPa.

(2) Mortar, grout, mortar joints, corbelling and protection for unit masonry shall conform to Section 9.20.

(3) For concrete block *foundation* walls required to be reinforced,

- (a) mortar shall be Type S, conforming to CAN/CSA-A179, “Mortar and grout for unit masonry,”
- (b) grout shall be coarse, conforming to CAN/CSA-A179, “Mortar and grout for unit masonry,” and
- (c) placement of grout shall conform to CAN/CSA-A371, “Masonry construction for buildings.”

9.15.2.3. Pier Type Foundations

(1) Where pier type *foundations* are used, the piers shall be designed to support the applied loads from the superstructure.

(2) Where piers are used as a *foundation* system in a *building* of 1 storey in *building height*, the piers shall be installed to support the principal framing members and shall be spaced not more than 3.5 m apart along the framing, unless the piers and their footings are designed for larger spacings.

(3) The height of piers described in Sentence (2) shall not exceed 3 times their least dimension at the base of the pier.

(4) Where concrete block is used for piers described in Sentence (2), they shall be laid with cores placed vertically, and where the width of the *building* is 4.3 m or less, placed with their longest dimension at right angles to the longest dimension of the *building*.

9.15.2.4. Wood-Frame Foundations

- (1) *Foundations* of wood-frame construction shall conform to
 - (a) CSA S406, “Specification of permanent wood foundations for housing and small buildings,” or
 - (b) Part 4.
 (See Note A-9.15.2.4.(1))

9.15.3. Footings

9.15.3.1. Footings Required

- (1) Footings shall be provided under walls, pilasters, columns, piers, fireplaces and *chimneys* that bear on *soil* or *rock*, except that footings may be omitted under piers or monolithic concrete walls if the safe *loadbearing* capacity of the *soil* or *rock* is not exceeded.

9.15.3.2. Support of Footings

- (1) Footings shall rest on undisturbed *soil*, *rock* or compacted granular *fill*.
- (2) Granular *fill* shall not contain pyritic material in a concentration that would adversely affect its stability or the performance of assemblies separating dissimilar environments. (See also Article 9.4.4.4. and Note A-9.4.4.4.(1))

9.15.3.3. Application of Footing Width and Area Requirements

- (1) Except as provided in Sentence 9.15.3.4.(2), the minimum footing width or area requirements provided in Articles 9.15.3.4. to 9.15.3.7. shall apply to footings, where
 - (a) the footings support
 - (i) *foundation* walls of masonry, concrete, or flat insulating concrete form walls,
 - (ii) above ground walls of masonry, flat insulating concrete form walls or light wood-frame construction, and
 - (iii) floors and roofs of light wood-frame construction,
 - (b) the span of supported joists does not exceed 4.9 m, and
 - (c) the specified *live load* on any floor supported by the footing does not exceed 2.4 kPa. (See Table 4.1.5.3.)
- (2) Except as provided in Sentence 9.15.3.4.(2), where the span of the supported joists exceeds 4.9 m, footings shall be designed in accordance with Section 4.2.
- (3) Where the specified *live load* exceeds 2.4 kPa footings shall be designed in accordance with Section 4.2.

9.15.3.4. Basic Footing Widths and Areas

- (1) Except as provided in Sentences (2) and (3) and in Articles 9.15.3.5. to 9.15.3.7., the minimum footing width or area shall comply with Table 9.15.3.4.
- (2) Where the supported joist span exceeds 4.9 m in *buildings* with light wood-frame walls, floors and roofs, strip footing widths shall be determined according to
 - (a) Section 4.2., or
 - (b) the following formula:

$$W = w \times [\sum s_{js} / (\text{storeys} \times 4.9)]$$

where

W = minimum footing width,

w = minimum width of footings supporting joists not exceeding 4.9 m, as defined by Table 9.15.3.4.,

$\sum sjs$ = sum of the supported joist spans on each *storey* bearing on an exterior wall whose load is transferred to the footing, or sum of half of the supported joist spans on each *storey* bearing on both sides of an interior wall whose load is transferred to the footing, and

storeys = number of *storeys* supported by the footing.

(See Note A-9.15.3.4.(2))

- (3) Where a *foundation* rests on gravel, sand or silt in which the water table level is less than the width of the footings below the *bearing surface*,
- (a) the footing width for walls shall be not less than twice the width required by Sentences (1) and (2), and Articles 9.15.3.5. and 9.15.3.6., and
 - (b) the footing area for columns shall be not less than twice the area required by Sentences (1) and (2) and Article 9.15.3.7.

Table 9.15.3.4.
Minimum Footing Sizes
Forming Part of Sentence 9.15.3.4.(1)

Number of Floors Supported	Minimum Width of Strip Footings, mm		Minimum Footing Area for Columns Spaced 3 m o.c. ⁽¹⁾ , m ²
	Supporting Exterior Walls ⁽²⁾	Supporting Interior Walls ⁽³⁾	
1	250	200	0.40
2	350	350	0.75
3	450	500	1.0

Notes to Table 9.15.3.4.:

- (1) See Sentence 9.15.3.7.(1).
- (2) See Sentences 9.15.3.5.(1).
- (3) See Sentence 9.15.3.6.(1).

9.15.3.5. Adjustments to Footing Widths for Exterior Walls

- (1) The strip footing widths for exterior walls shown in Table 9.15.3.4. shall be increased by
- (a) 65 mm for each *storey* of masonry veneer over wood-frame construction supported by the *foundation* wall,
 - (b) 130 mm for each *storey* of masonry construction supported by the *foundation* wall, and
 - (c) 150 mm for each *storey* of flat insulating concrete form wall construction supported by the *foundation* wall.

9.15.3.6. Adjustments to Footing Widths for Interior Walls

- (1) The minimum strip footing widths for interior *loadbearing* masonry walls shown in Table 9.15.3.4. shall be increased by 100 mm for each *storey* of masonry construction supported by the footing.
- (2) Footings for interior *non-loadbearing* masonry walls shall be not less than 200 mm wide for walls up to 5.5 m high and the width shall be increased by 100 mm for each additional 2.7 m of height.

9.15.3.7. Adjustments to Footing Area for Columns

- (1) The footing area for column spacings other than shown in Table 9.15.3.4. shall be adjusted in proportion to the distance between columns.

9.15.3.8. Footing Thickness

- (1) Footing thickness shall be not less than the greater of
 - (a) 100 mm, or
 - (b) the width of the projection of the footing beyond the supported element.

9.15.3.9. Step Footings

- (1) Where step footings are used,
 - (a) the vertical rise between horizontal portions shall not exceed 600 mm, and
 - (b) the horizontal distance between risers shall be not less than 600 mm.

9.15.4. Foundation Walls

9.15.4.1. Flat Wall Insulating Concrete Form Units

- (1) Flat wall insulating concrete form units shall conform to CAN/ULC-S717.1, “Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties.”

9.15.4.2. Foundation Wall Thickness and Required Lateral Support

- (1) Except as required in Sentence (2), the thickness of *foundation* walls made of unreinforced concrete block, concrete core in flat wall insulating concrete forms or solid concrete and subject to lateral earth pressure shall conform to Table 9.15.4.2.-A for walls not exceeding 3.0 m in unsupported height.

- (2) The concrete core in flat insulating concrete form *foundation* walls shall be not less than the greater of
 - (a) 150 mm, or
 - (b) the thickness of the concrete in the wall above.

(2.1) *Foundation* walls made of flat insulating concrete form units shall be laterally supported at the top and at the bottom.

- (3) The thickness and reinforcing of *foundation* walls made of reinforced concrete block and subject to lateral earth pressure shall conform to Table 9.15.4.2.-B and Sentences (4) to (7), where

- (a) the walls are laterally supported at the top,
- (b) average stable *soils* are encountered, and
- (c) wind loads on the exposed portion of the *foundation* are no greater than 0.70 kPa.

- (4) For concrete block walls required to be reinforced, continuous vertical reinforcement shall

- (a) be provided at wall corners, wall ends, wall intersections, at changes in wall height, at the jambs of all openings and at movement joints,
- (b) extend from the top of the footing to the top of the *foundation* wall, and
- (c) where *foundation* walls are laterally supported at the top, have not less than 50 mm embedment into the footing, if the floor slab does not provide lateral support at the wall base.

- (5) For concrete block walls required to be reinforced, a continuous horizontal bond beam containing not less than one 15M bar shall be installed
 - (a) along the top of the wall,
 - (b) at the sill and head of all openings greater than 1.20 m in width, and
 - (c) at structurally connected floors.

- (6) In concrete block walls required to be reinforced, all vertical bar reinforcement shall be installed along the centre line of the wall.

- (7) In concrete block walls required to be reinforced, ladder- or truss-type lateral reinforcement not less than 3.8 mm in diameter (No. 9 ASWG) shall be installed in the bed joint of every second masonry course.

Table 9.15.4.2.-A
Thickness of Solid Concrete, Concrete Core in Flat Wall Insulating Concrete Form and
Unreinforced Concrete Block Foundation Walls
 Forming Part of Sentence 9.15.4.2.(1)

Type of <i>Foundation</i> Wall	Minimum Thickness of Concrete or Concrete Block, mm	Maximum Height of Finish Ground Above <i>Basement</i> Floor or Crawl Space Ground Cover, m			
		Height of <i>Foundation</i> Wall Laterally Unsupported at the Top ⁽¹⁾⁽²⁾	Height of <i>Foundation</i> Wall Laterally Supported at the Top ⁽¹⁾⁽²⁾		
			≤ 3.0 m	≤ 2.5 m	> 2.5 m and ≤ 2.75 m
Solid concrete and concrete core in flat wall insulating concrete forms, ⁽³⁾ 15 MPa min. strength	150	0.8	1.5	1.5	1.4
	200	1.2	2.15	2.15	2.1
	250	1.4	2.3	2.6	2.5
	300	1.5	2.3	2.6	2.85
Solid concrete and concrete core in flat wall insulating concrete forms, ⁽³⁾ 20 MPa min. strength	150	0.8	1.8	1.6	1.6
	200	1.2	2.3	2.3	2.2
	250	1.4	2.3	2.6	2.85
	300	1.5	2.3	2.6	2.85
Unreinforced concrete block	140	0.6	0.8	—	—
	190	0.9	1.2	⁽⁴⁾	⁽⁴⁾
	240	1.2	1.8	⁽⁴⁾	⁽⁴⁾
	290	1.4	2.2	—	—

Notes to Table 9.15.4.2.-A:

- (1) See Article 9.15.4.3.
- (2) See Article 9.15.4.6.
- (3) See Note A-Table 9.15.4.2.-A.
- (4) See Table 9.15.4.2.-B.

Table 9.15.4.2.-B
Reinforced Concrete Block Foundation Walls Laterally Supported at the Top⁽¹⁾
 Forming Part of Sentence 9.15.4.2.(3)

Maximum Height of Finished Ground Above Basement Floor or Crawl Space Ground Cover, m ⁽²⁾	Size and Spacing of Continuous Vertical Reinforcement, M at mm o.c.					
	190 mm Minimum Wall Thickness			240 mm Minimum Wall Thickness		
	<i>Foundation Wall Height</i>			<i>Foundation Wall Height</i>		
	≤ 2.5 m	≤ 2.75 m	≤ 3.0 m	≤ 2.5 m	≤ 2.75 m	≤ 3.0 m
0.8	(3)	(3)	(3)	(3)	(3)	(3)
1.0	(3)	1-15M at 1 800	1-15M at 1 800	(3)	(3)	(3)
1.2	(3)	1-15M at 1 600	1-15M at 1 600	(3)	1-20M at 2 000	1-20M at 2 000
1.4	1-15M at 1 600	1-15M at 1 600	1-15M at 1 600	(3)	1-20M at 1 800	1-20M at 1 800
1.6	1-15M at 1 400	1-15M at 1 400	1-15M at 1 400	(3)	1-20M at 1 600	1-20M at 1 600
1.8	1-15M at 1 400	1-15M at 1 400	1-15M at 1 200	(3)	1-20M at 1 600	1-20M at 1 600
2.0	1-15M at 1 200	1-15M at 1 000 or 1-20M at 1 200	2-15M at 1 200	1-20M at 1 600	1-20M at 1 600	1-20M at 1 600
2.2	2-15M at 1 200	2-15M at 1 000	2-15M at 1 000	1-20M at 1 400	1-20M at 1 400	1-20M at 1 400
2.4	2-15M at 1 000	2-15M at 1 000	2-15M at 800	1-20M at 1 400	1-20M at 1 400	1-20M at 1 200
2.6	n/a	2-15M at 800 or 1-25M at 1 000	2-15M at 800 or 1-25M at 1 000	n/a	1-20M at 1 000	1-20M at 1 000
2.8	n/a	n/a	1-20M at 600	n/a	n/a	1-20M at 800 or 2-15M at 1 000
3.0	n/a	n/a	1-20M at 400 or 1-25M at 600	n/a	n/a	2-15M at 800

Notes to Table 9.15.4.2.-B:

- (1) See Article 9.15.4.3.
 (2) See Article 9.15.4.6.
 (3) No reinforcement required.

9.15.4.3. Foundation Walls Considered to be Laterally Supported at the Top

- (1) Sentences (2) to (4) pertain to lateral support for walls described in Sentence 9.15.4.2.(1).
- (2) *Foundation* walls shall be considered to be laterally supported at the top if
- such walls support a *solid masonry* superstructure or flat insulating concrete form wall,
 - the floor joists are embedded in the top of the *foundation* walls,
 - the floor system is anchored to the top of the *foundation* walls with anchor bolts, in which case the joists may run either parallel or perpendicular to the *foundation* walls, or
 - they extend from the footing to no more than 300 mm above the finished ground level and are backfilled on both sides such that the difference in elevation between the finished ground levels on either side of the wall is no more than 150 mm.

- (3) Unless the wall around an opening is reinforced to withstand earth pressure, the portion of the *foundation* wall beneath an opening shall be considered laterally unsupported if
- (a) the opening is more than 1.2 m wide, or
 - (b) the total width of the openings in the *foundation* wall constitutes more than 25% of the length of the wall.
- (4) For the purposes of Sentence (3), the combined width of the openings shall be considered as a single opening if the average width is greater than the width of solid wall between them.
- (5) Flat insulating concrete form *foundation* walls shall be considered to be laterally supported at the top if the floor joists are installed according to Article 9.20.17.5.

9.15.4.4. Foundation Walls Considered to be Laterally Supported at the Bottom

- (1) Flat insulating concrete form *foundation* walls shall be considered to be laterally supported at the bottom where the *foundation* wall
- (a) supports backfill not more than 1.2 m in height,
 - (b) is supported at the footing by a shear key and at the top by the ground floor framing, or
 - (c) is dowelled to the footing with not less than
 - (i) 15M bars spaced not more than 1.2 m o.c., or
 - (ii) 10M bars spaced not more than 600 mm o.c.

9.15.4.5. Reinforcement for Flat Insulating Concrete Form Foundation Walls

- (1) Horizontal reinforcement in flat insulating concrete form *foundation* walls shall
- (a) consist of
 - (i) one 10M bar placed not more than 300 mm from the top of the wall, and
 - (ii) 10M bars spaced not more than 600 mm o.c., and
 - (b) be located
 - (i) in the inside half of the wall section, and
 - (ii) with a minimum cover of 30 mm from the inside face of the concrete.
- (2) Vertical reinforcement in flat insulating concrete form *foundation* walls shall be
- (a) provided in accordance with
 - (i) Table 9.15.4.5.-A for 150 mm walls,
 - (ii) Table 9.15.4.5.-B for 190 mm walls, and
 - (iii) Table 9.15.4.5.-C for 240 mm walls,
 - (b) located in the inside half of the wall section with a minimum cover of 30 mm from the inside face of the concrete wall, and
 - (c) where interrupted by wall openings, be placed not more than 600 mm from each side of the openings.
- (3) Cold joints in flat insulating concrete form *foundation* walls shall be reinforced with at least one 15M bar spaced not more than 600 mm o.c. and embedded not less than 300 mm on both sides of the joint.
- (4) Reinforcing around openings in flat insulating concrete form *foundation* walls shall comply with Article 9.20.17.3. or 9.20.17.4.

Table 9.15.4.5.-A
Vertical Reinforcement for 150 mm Flat Insulating Concrete Form Foundation Walls
 Forming Part of Sentence 9.15.4.5.(2)

Maximum Height of Finished Ground Above Finished <i>Basement</i> Floor, m	Minimum Vertical Reinforcement		
	Maximum Unsupported <i>Basement</i> Wall Height		
	2.44 m	2.75 m	3.00 m
1.35	10M at 400 mm o.c.	10M at 400 mm o.c.	10M at 400 mm o.c.
1.60	10M at 400 mm o.c.	10M at 380 mm o.c.	10M at 380 mm o.c.
2.00	10M at 380 mm o.c.	10M at 380 mm o.c.	10M at 380 mm o.c.
2.20	10M at 250 mm o.c.	10M at 250 mm o.c.	10M at 250 mm o.c.
2.35	n/a	10M at 250 mm o.c.	10M at 250 mm o.c.
2.60	n/a	10M at 250 mm o.c.	10M at 250 mm o.c.
3.00	n/a	n/a	10M at 250 mm o.c.

Table 9.15.4.5.-B
Vertical Reinforcement for 190 mm Flat Insulating Concrete Form Foundation Walls
 Forming Part of Sentence 9.15.4.5.(2)

Maximum Height of Finished Ground Above Finished <i>Basement</i> Floor, m	Minimum Vertical Reinforcement		
	Maximum Unsupported <i>Basement</i> Wall Height		
	2.44 m	2.75 m	3.00 m
2.20	none required	10M at 400 mm o.c.	10M at 400 mm o.c.
2.35	n/a	10M at 300 mm o.c.	10M at 300 mm o.c.
2.60	n/a	10M at 300 mm o.c.	15M at 400 mm o.c.
3.00	n/a	n/a	15M at 400 mm o.c.

Table 9.15.4.5.-C
Vertical Reinforcement for 240 mm Flat Insulating Concrete Form Foundation Walls
 Forming Part of Sentence 9.15.4.5.(2)

Maximum Height of Finished Ground Above Finished <i>Basement</i> Floor, m	Minimum Vertical Reinforcement		
	Maximum Unsupported <i>Basement</i> Wall Height		
	2.44 m	2.75 m	3.00 m
2.20	none required	none required	none required
2.60	n/a	15M at 400 mm o.c.	15M at 400 mm o.c.
3.00	n/a	n/a	15M at 400 mm o.c.

9.15.4.6. Extension Above Ground Level

- (1) Exterior *foundation* walls shall extend not less than 150 mm above finished ground level.

9.15.4.7. Reduction in Thickness

- (1) Where the top of a *foundation* wall is reduced in thickness to permit the installation of floor joists, the reduced section shall be not more than 350 mm high and not less than 90 mm thick.

- (2) Where the top of a *foundation* wall is reduced in thickness to permit the installation of a masonry exterior facing, the reduced section shall be
 - (a) not less than 90 mm thick, and
 - (b) tied to the facing material with metal ties conforming to Sentence 9.20.9.4.(3) spaced not more than
 - (i) 200 mm o.c. vertically, and
 - (ii) 900 mm o.c. horizontally.
- (3) The space between wall and facing described in Sentence (2) shall be filled with mortar.

9.15.4.8. Corbelling

- (1) Corbelling of masonry *foundation* walls supporting *cavity walls* shall conform to Article 9.20.12.2.

9.15.4.9. Crack Control Joints

- (1) Crack control joints shall be provided in *foundation* walls more than 25 m long at intervals of not more than 15 m.
- (2) Joints required in Sentence (1) shall be designed to resist moisture penetration and shall be keyed to prevent relative displacement of the wall portions adjacent to the joint.

9.15.4.10. Interior Masonry Walls

- (1) Interior masonry *foundation* walls not subject to lateral earth pressure shall conform to Section 9.20.

9.15.5. Support of Joists and Beams on Masonry Foundation Walls

9.15.5.1. Support of Floor Joists

- (1) Except as permitted in Sentence (2), *foundation* walls of hollow masonry units supporting floor joists shall be capped with
 - (a) not less than 50 mm of concrete,
 - (b) *solid masonry units* that are 100% solid and not less than 50 mm high, or
 - (c) semi-solid or hollow *solid masonry units* that have the top course completely filled with mortar, grout or concrete.
- (2) Capping required in Sentence (1) need not be provided
 - (a) in localities where termites are not known to occur,
 - (b) when the joists are supported on a wood plate not less than 38 mm by 89 mm, and
 - (c) when the siding overlaps the *foundation* wall not less than 12 mm.

9.15.5.2. Support of Beams

- (1) Not less than a 190 mm depth of *solid masonry* shall be provided beneath beams supported on masonry.
- (2) Where the beam referred to in Sentence (1) is supported below the top of the *foundation* walls, the ends of such beams shall be protected from the weather.

9.15.5.3. Pilasters

- (1) Pilasters shall be provided under beams that frame into unit masonry *foundation* walls 140 mm or less in thickness.
- (2) Pilasters required in Sentence (1) shall be not less than 90 mm by 290 mm and shall be bonded or tied into the wall.
- (3) The top 200 mm of pilasters required in Sentence (1) shall be *solid masonry* with the cells of hollow or semi-solid units filled with mortar, grout or concrete.

9.15.6. Parging and Finishing of Masonry Foundation Walls

9.15.6.1. Foundation Walls Below Ground

- (1) Concrete block *foundation* walls shall be parged on the exterior face below ground level as required in Section 9.13.

9.15.6.2. Foundation Walls Above Ground

- (1) Exterior surfaces of concrete block *foundation* walls above ground level shall have tooled joints, or shall be parged or otherwise suitably finished.

9.15.6.3. Form Ties

- (1) All form ties shall be removed at least flush with the concrete surface.

Section 9.16. Floors-on-Ground

9.16.1. Scope

9.16.1.1. Application

- (1) This Section applies to floors supported on ground or granular *fill* and that do not provide structural support for the superstructure.

9.16.1.2. Structural Floor Slabs

- (1) Floors-on-ground that support loads from the superstructure shall be designed in conformance with Part 4.

9.16.1.3. Required Floors-on-Ground

- (1) All spaces within *dwelling units*, except crawl spaces, shall be provided with a floor-on-ground, where
 - (a) access is provided to the space, and
 - (b) a floor supported by the structure is not provided.

9.16.1.4. Dampproofing and Waterproofing

- (1) Dampproofing and waterproofing shall conform to Section 9.13.

9.16.2. Material Beneath Floors

9.16.2.1. Required Installation of Granular Fill

- (1) Except as provided in Sentence (2), not less than 100 mm of coarse clean granular material containing not more than 10% of material that will pass a 4 mm sieve shall be placed beneath floors-on-ground. (See also Subsection 9.13.4. and Note A-9.13.4.)
- (2) Granular material need not be installed under
 - (a) slabs in garages, carports or accessory *buildings*, or
 - (b) *buildings* of *industrial occupancy* where the nature of the process contained therein permits or requires the use of large openings in the *building* envelope even during the winter.

9.16.2.2. Support of Floors

- (1) Material that is susceptible to changes in volume due to variations in moisture content or chemical-microbiological oxidation shall not be used as *fill* beneath floors-on-ground in a concentration that will damage the *building* to a degree that would adversely affect its stability or the performance of assemblies. (See also Article 9.4.4.4. and Note A-9.4.4.4.(1))
- (2) Material that is susceptible to changes in volume due to freezing shall not be used as *fill* beneath floors-on-ground that will be subjected to freezing temperatures. (See also Article 9.4.4.4. and Note A-9.4.4.4.(1))
- (3) Except as provided in Sentence (4), *fill* beneath floors-on-ground shall be compacted.
- (4) *Fill* beneath floors-on-ground need not be compacted where the material is clean coarse aggregate containing not more than 10% of material that will pass a 4 mm sieve.

9.16.3. Drainage

9.16.3.1. Control of Water Ingress

- (1) Except as provided in Article 9.16.3.2. or where it can be shown to be unnecessary, ingress of water underneath a floor-on-ground shall be prevented by grading or drainage.

9.16.3.2. Hydrostatic Pressure

- (1) Where *groundwater* levels may cause hydrostatic pressure beneath a floor-on-ground, the floor-on-ground shall be
 - (a) a poured concrete slab, and
 - (b) designed to resist such pressures.

9.16.3.3. Floor Drains

- (1) When floor drains are required (See Section 9.31.), the floor surface shall be sloped so that no water can accumulate.

9.16.4. Concrete

9.16.4.1. Surface Finish

- (1) The finished surface of concrete floor slabs shall be trowelled smooth and even.

- (2) Dry cement shall not be added to the floor surfaces to absorb surplus water.

9.16.4.2. Topping Course

- (1) When a topping course is provided for a concrete floor slab, it shall consist of 1 part cement to 2.5 parts clean, well graded sand by volume, with a water/cement ratio approximately equal to that of the base slab.
- (2) When concrete topping is provided it shall not be less than 20 mm thick.

9.16.4.3. Thickness

- (1) Concrete slabs shall be not less than 75 mm thick exclusive of concrete topping. (See Note A-9.16.4.3.(1))

9.16.4.4. Bond Break

- (1) A bond-breaking material shall be placed between the slab and footings or *rock*.

9.16.5. Wood

9.16.5.1. Wood-Frame Floors

- (1) Floors-on-ground constructed of wood shall conform to CSA S406, “Specification of permanent wood foundations for housing and small buildings.”

Section 9.17. Columns

9.17.1. Scope

9.17.1.1. Application

- (1) This Section applies to columns used to support
 - (a) beams carrying loads from not more than 2 wood-frame floors where
 - (i) the supported length of joists bearing on such beams does not exceed 5 m, and
 - (ii) the *live load* on any floor does not exceed 2.4 kPa, (See Table 4.1.5.3.)
 - (b) beams or header joists carrying loads from not more than 2 levels of wood-frame balconies, decks or other accessible exterior platforms, or 1 level plus the roof, where
 - (i) the supported length of joists bearing on such beams or joists does not exceed 5 m,
 - (ii) the sum of the specified snow and *occupancy* loads does not exceed 4.8 kPa for the determination of load on platform-type constructions, and (See Sentence 9.4.2.3.(1))
 - (iii) the platform serves only a single *suite* of *residential occupancy*, or
 - (c) carport roofs. (See Section 9.35.)
- (2) Columns for applications other than as described in Sentence (1) shall be designed in accordance with Part 4.

9.17.2. General

9.17.2.1. Location

- (1) Columns shall be centrally located on a footing conforming to Section 9.15.

9.17.2.2. Lateral Support

- (1) Columns shall be securely fastened to the supported member to reduce the likelihood of lateral differential movement between the column and the supported member. (See also Article 9.23.6.2.)
- (2) Except as permitted by Sentence (3), columns shall be laterally supported to resist racking
 - (a) directly, or
 - (b) by connection to the supported members.(See Note A-9.17.2.2.(2))
- (3) Columns need not be provided with lateral support as described in Sentence (2), where
 - (a) the length of the columns are not more than 600 mm measured from the finished ground to the underside of the supported member, and
 - (b) the columns support a deck with no superstructure.

9.17.3. Steel Columns

9.17.3.1. Size and Thickness

- (1) Except as permitted in Sentence (2), steel pipe columns shall have an outside diameter of not less than 73 mm and a wall thickness of not less than 4.76 mm.
- (2) Columns of sizes other than as specified in Sentence (1) are permitted to be used where the *loadbearing* capacities are shown to be adequate.

9.17.3.2. End Bearing Plates

- (1) Except as permitted in Sentence (2), steel columns shall be fitted with not less than 100 mm by 100 mm by 6.35 mm thick steel plates at each end, and where the column supports a wooden beam, the top plate shall extend across the full width of the beam.
- (2) The top plate required in Sentence (1) need not be provided where a column supports a steel beam and provision is made for the attachment of the column to the beam.

9.17.3.3. Paint

- (1) Exterior steel columns susceptible to corrosion shall be treated on the outside surface with at least one coat of rust-inhibitive paint.

9.17.3.4. Design of Adjustable Steel Columns (See Note A-9.17.3.4.)

- (1) Where the imposed load does not exceed 36 kN, adjustable steel columns shall conform to CAN/CGSB-7.2, “Adjustable Steel Columns.”
- (2) Adjustable steel columns other than those described in Sentence (1) shall be designed in accordance with Part 4.

9.17.4. Wood Columns

9.17.4.1. Column Sizes

- (1) The width or diameter of a wood column shall be not less than the width of the supported member.

- (2) Except as provided in Article 9.35.4.2., columns shall be not less than 184 mm for round columns and 140 mm by 140 mm for rectangular columns, unless calculations are provided to show that lesser sizes are adequate.

9.17.4.2. Materials

- (1) Wood columns shall be either solid, glued-laminated or built-up.
- (2) Built-up columns shall consist of not less than 38 mm thick full-length members
- (a) bolted together with not less than 9.52 mm diam bolts spaced not more than 450 mm o.c., or
- (b) nailed together with not less than 76 mm nails spaced not more than 300 mm o.c.
- (3) Glued-laminated columns shall conform to Section 4.3.

9.17.4.3. Columns in Contact With Concrete

- (1) Wood columns shall be separated from concrete in contact with the ground by 0.05 mm polyethylene film or Type S roll roofing.

9.17.4.4. Wood Column Termite Protection

- (1) Where termites are known to exist, exterior wood columns, such as porch supports, shall be
- (a) pressure-treated with a chemical that is toxic to such termites, in accordance with Article 9.3.2.9., or
- (b) supported on non-cellulosic material extending not less than 150 mm above the finished ground and shall be located not less than 50 mm from the exterior wall of an adjacent *building*.

9.17.5. Unit Masonry Columns

9.17.5.1. Materials

- (1) Unit masonry columns shall be built of masonry units
- (a) conforming to CSA A165.1, “Concrete block masonry units,” and
- (b) having a compressive strength over the net area of the block of not less than 15 MPa.

9.17.5.2. Sizes

- (1) Unit masonry columns shall be not less than 290 mm by 290 mm or 240 mm by 380 mm in size.

9.17.6. Solid Concrete Columns

9.17.6.1. Materials

- (1) Concrete shall conform to Section 9.3.

9.17.6.2. Sizes

- (1) Concrete columns shall be not less than 200 mm by 200 mm for rectangular columns and 230 mm diam for circular columns.

Section 9.18. Crawl Spaces

9.18.1. General

9.18.1.1. Application

- (1) In this Section, a crawl space refers to an enclosed space between the underside of a floor assembly and the ground cover directly below, with a clearance less than 1 800 mm in height.

9.18.1.2. Foundations

- (1) *Foundations* enclosing crawl spaces shall conform to Section 9.15.

9.18.1.3. Heated and Unheated Crawl Spaces

- (1) Crawl spaces shall be considered to be heated where the space
 - (a) is used as a warm air *plenum*,
 - (b) contains heating ducts or heating pipes that are not sealed and insulated to minimize heat loss to the space, or
 - (c) is not separated from heated space in accordance with Section 9.25.
- (2) Heating of heated crawl spaces shall conform to Section 9.33.
- (3) Insulation, an *air barrier system* and a *vapour barrier* shall be installed in the walls of heated crawl spaces in accordance with Section 9.25.

9.18.2. Access

9.18.2.1. Access Openings

- (1) An access opening of not less than 500 mm by 700 mm shall be provided to each crawl space where the crawl space serves a single *dwelling unit*, and not less than 550 mm by 900 mm for other crawl spaces.
- (2) Access openings shall be fitted with a door or hatch, except when the crawl space is heated and the access opening into the crawl space is from an adjacent heated space.

9.18.3. Ventilation

9.18.3.1. Ventilation of Unheated Crawl Spaces

- (1) Unheated crawl spaces shall be ventilated by natural or mechanical means.
- (2) Where an unheated crawl space is ventilated by natural means, ventilation shall be provided to the outside air by not less than 0.1 m² of unobstructed vent area for every 50 m² of *floor area*.
- (3) Vents shall be
 - (a) uniformly distributed on opposite sides of the *building*, and
 - (b) designed to prevent the entry of snow, rain and insects.

9.18.3.2. Ventilation of Heated Crawl Spaces

- (1) Heated crawl spaces shall be ventilated in accordance with Section 9.32.

9.18.4. Clearance (See also Article 9.3.2.9.)

9.18.4.1. Access Way to Services

- (1) Where equipment requiring service such as plumbing cleanouts, traps and burners is located in crawl spaces, an access way with a height and width of not less than 600 mm shall be provided from the access door to the equipment and for a distance of 900 mm on the side or sides of the equipment to be serviced.

9.18.5. Drainage

9.18.5.1. Drainage

- (1) Except where it can be shown to be unnecessary, the ingress of water into a crawl space shall be controlled by grading or drainage.
- (2) Drainage of *foundation* walls shall conform to Article 9.14.2.1.
- (3) Drainage of the ground cover or floor-on-ground in the crawl space shall conform to Subsection 9.16.3.
- (4) Drains shall conform to Section 9.14.

9.18.6. Ground Cover

9.18.6.1. Ground Cover in Unheated Crawl Spaces

- (1) Where a crawl space is unheated, a ground cover shall be provided consisting of not less than
 - (a) 50 mm of asphalt,
 - (b) 100 mm of 15 MPa Portland cement concrete,
 - (c) Type S roll roofing, or
 - (d) 0.10 mm polyethylene.
- (2) Joints in sheet-type ground cover required in Sentence (1) shall be lapped not less than 100 mm and weighted down.

9.18.6.2. Ground Cover in Heated Crawl Spaces

- (1) Where a crawl space is heated, a ground cover consisting of not less than 0.15 mm polyethylene sheet conforming to CAN/CGSB-51.34-M, "Vapour Barrier, Polyethylene Sheet, for Use in Building Construction," shall be installed as part of an *air barrier system* in accordance with Subsection 9.25.3.
- (2) The ground cover required in Sentence (1) shall have its joints lapped not less than 300 mm, and
 - (a) be sealed and evenly weighted down, or
 - (b) be covered with concrete not less than 50 mm thick.
- (3) The perimeter of the ground cover required in Sentence (1) shall be sealed to the *foundation* wall. (See Notes A-9.13.4., A-9.25.3.4. and 9.25.3.6., and A-9.25.3.6.(2) and (3))
- (4) All penetrations of the ground cover required in Sentence (1) shall be sealed against air leakage. (See Subsection 9.25.3.)

9.18.7. Fire Protection

9.18.7.1. Crawl Spaces as Warm Air Plenums

- (1) Only crawl spaces under 1-storey portions of *dwelling units* shall be used as warm air *plenums*.
- (2) Enclosing material in crawl spaces described in Sentence (1), including insulation, shall have a surface *flame-spread rating* not greater than 150.
- (3) *Combustible* ground cover used as enclosing material in Sentence (2) shall be covered with *noncombustible* material. (See Note A-9.18.7.1.(3) and (4))
- (4) *Noncombustible* material described in Sentence (3) shall
 - (a) extend not less than 300 mm beyond the projection of a register opening, and
 - (b) have turned-up edges.(See Note A-9.18.7.1.(3) and (4))

Section 9.19. Roof Spaces

9.19.1. Venting

9.19.1.1. Required Venting

- (1) Except where it can be shown to be unnecessary, where insulation is installed between a ceiling and the underside of the roof sheathing, a space shall be provided between the insulation and the sheathing, and vents shall be installed to permit the movement of air from the space to the exterior. (See Note A-9.19.1.1.(1))

9.19.1.2. Vent Requirements

- (1) Except as provided in Sentence (2), the unobstructed vent area shall be not less than 1/300 of the insulated ceiling area.
- (2) Where the roof slope is less than 1 in 6 or in roofs that are constructed with roof joists, the unobstructed vent area shall be not less than 1/150 of the insulated ceiling area.
- (3) Required vents may be roof type, eave type, gable-end type or any combination thereof, and shall be distributed
 - (a) uniformly on opposite sides of the *building*,
 - (b) with not less than 25% of the required openings located at the top of the space, and
 - (c) with not less than 25% of the required openings located at the bottom of the space.
- (4) Except where each roof joist space referred to in Sentence (2) is separately vented, roof joist spaces shall be interconnected by installing purlins not less than 38 mm by 38 mm on the top of the roof joists.
- (5) Vents shall comply with CAN3-A93-M, "Natural Airflow Ventilators for Buildings."

9.19.1.3. Clearances

- (1) Except as provided in Sentence (2), where venting is provided to a roof joist space, not less than 63 mm of space shall be provided between the top of the insulation and the underside of the roof sheathing.
- (2) Where venting is provided at the junction of sloped roofs and exterior walls and where preformed baffles are used to contain the insulation, the baffles shall
 - (a) provide an unobstructed air space, between the insulation and the underside of the roof sheathing, that is
 - (i) not less than 25 mm in dimension, and
 - (ii) of sufficient cross area to meet the *attic or roof space* venting requirements of Article 9.19.1.2., and
 - (b) extend vertically not less than 50 mm above the top of the insulation.
- (3) Ceiling insulation shall be installed in a manner that will not restrict the free flow of air through roof vents or through any portion of the *attic or roof space*.

9.19.1.4. Mansard or Gambrel Roof

- (1) The lower portion of a mansard or gambrel style roof need not be ventilated.
- (2) The upper portion of roofs described in Sentence (1) shall be ventilated in conformance with Articles 9.19.1.1. to 9.19.1.3.

9.19.2. Access

9.19.2.1. Access

- (1) Every *attic or roof space* shall be provided with an access hatch where the *attic or roof space*
 - (a) measures not less than
 - (i) 10 m² in area,
 - (ii) 1 000 mm in length or width, and
 - (iii) 600 mm in height over at least the area described in Subclauses (i) and (ii), or
 - (b) contains a fuel-fired *appliance*.(See Note A-9.19.2.1.(1))
- (2) The hatch required in Sentence (1) shall be not less than 550 mm by 900 mm except that, where the hatch serves not more than one *dwelling unit*, the hatch may be reduced to 0.32 m² in area with no dimension less than 500 mm. (See Note A-9.19.2.1.(2))
- (3) Hatchways to *attic or roof spaces* shall be fitted with doors or covers.

Section 9.20. Masonry and Insulating Concrete Form Walls Not In Contact with the Ground

9.20.1. Application

9.20.1.1. General

- (1) Except as provided in Article 9.20.1.2., this Section applies to
 - (a) unreinforced masonry and masonry veneer walls not in contact with the ground, where
 - (i) the height of the walls constructed on the *foundation* walls does not exceed 11 m, and
 - (ii) the roof or floor assembly above the *first storey* is not of concrete construction, and
 - (b) flat insulating concrete form walls not in contact with the ground that (See Note A-9.15.1.1.(1)(c) and 9.20.1.1.(1)(b))
 - (i) have a maximum floor-to-floor height of 3 m,
 - (ii) are erected in *buildings* not more than 2 *storeys* in *building height*, and
 - (iii) are erected in locations where the seismic spectral response acceleration, $S_a(0.2)$, is not greater than 0.4. (See Note A-9.20.1.2.)
- (2) For walls other than those described in Sentence (1), or where the masonry walls or insulating concrete form walls not in contact with the ground are designed for specified loads on the basis of ultimate and serviceability limit states, Subsection 4.3.2. shall apply.

9.20.1.2. Earthquake Reinforcement (See Note A-9-20.1.2.)

- (1) In locations where the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.55, *loadbearing* elements of masonry *buildings* more than 1 *storey* in *building height* shall be reinforced with not less than the minimum amount of reinforcement as required by Subsection 9.20.15.
- (2) In locations where the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.35, but less than or equal to 0.55, *loadbearing* elements of masonry *buildings* 3 *storeys* in *building height* shall be reinforced with not less than the minimum amount of reinforcement as required by Subsection 9.20.15.

9.20.2. Masonry Units

9.20.2.1. Masonry Unit Standards

- (1) Masonry units shall comply with
 - (a) ASTM C73, “Standard Specification for Calcium Silicate Brick (Sand-Lime Brick),”
 - (b) ASTM C126, “Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units,”
 - (c) ASTM C212, “Standard Specification for Structural Clay Facing Tile,”
 - (d) CAN/CSA-A82 “Fire masonry brick made from clay or shale,”
 - (e) CSA A165.1, “Concrete block masonry units,”
 - (f) CSA A165.2, “Concrete brick masonry units,” or
 - (g) CSA A165.3, “Prefaced concrete masonry units.”

9.20.2.2. Used Brick

- (1) Used bricks shall be free of old mortar, soot or other surface coating and shall conform to Article 9.20.2.1.

9.20.2.3. Glass Blocks

- (1) Glass blocks shall not be used as *loadbearing* units or in the construction of fireplaces or *chimneys*.

9.20.2.4. Cellular Concrete

- (1) Masonry made with cellular concrete shall not be used in contact with the *soil* or exposed to the weather.

9.20.2.5. Stone

- (1) Stone shall be sound and durable.

9.20.2.6. Concrete Units Exposed to the Weather

- (1) Concrete blocks exposed to the weather shall have density and water absorption characteristics conforming to concrete types A, B, C, or D described in CSA A165.1, “Concrete block masonry units.”

9.20.2.7. Compressive Strength

- (1) The compressive strength of concrete blocks shall conform to Table 9.20.2.7.

Table 9.20.2.7.
Compressive Strength of Concrete Blocks
 Forming Part of Sentence 9.20.2.7.(1)

Type of Unit	Minimum Compressive Strength Over Net Area, MPa	
	Exposed to Weather	Not Exposed to Weather
Solid or hollow concrete blocks	15	10
Solid <i>loadbearing</i> cellular blocks	Not permitted	5
Solid <i>non-loadbearing</i> cellular blocks	Not permitted	2

9.20.3. Mortar**9.20.3.1. Mortar Materials**

- (1) Cementitious materials and aggregates for mortar and grout shall comply with CAN/CSA-A179, “Mortar and grout for unit masonry.”
- (2) Water and aggregate shall be clean and free of significant amounts of deleterious materials.
- (3) Lime used in mortar shall be hydrated.
- (4) If lime putty is used in mortar, it shall be made by slaking quicklime in water for not less than 24 h or soaking hydrated lime in water for not less than 12 h.

9.20.3.2. Mortar and Grout Mixes

- (1) Mortar types shall be in accordance with Table 9.20.3.2.-A.
- (2) Mortar for glass block masonry shall be
 - (a) Type S Portland cement-lime where exposed to the exterior, or
 - (b) Type S or N where protected from the exterior.
- (3) Mortar shall be mixed within the proportion limits provided in Table 9.20.3.2.-B, with sufficient water to bring the mixture to a consistency adequate for laying masonry units.
- (4) Grout shall be mixed within the proportion limits provided in Table 9.20.3.2.-C, with sufficient water to provide a suitable flow to fill all voids completely, without excessive segregation or bleeding.
- (5) Except as provided in Sentence (6), mortar shall be used and placed in final position
 - (a) within 1.5 h after mixing when the air temperature is 25°C or higher, or
 - (b) within 2.5 h after mixing when the air temperature is less than 25°C.
- (6) Mortar and grout containing a set-control admixture shall be manufactured off-site in a batching plant and shall be used and placed in final position within a time not exceeding the useful life stipulated by the manufacturer.
- (7) Grout used for reinforced masonry shall be placed in accordance with the requirements of CAN/CSA-A371, “Masonry construction for buildings.”

Table 9.20.3.2.-A
Mortar Use
 Forming Part of Sentence 9.20.3.2.(1)

Location	Building Element	Mortar Type
Exterior, Above Ground	<i>Loadbearing</i> walls and columns	S
	<i>Non-loadbearing</i> walls and columns	N or S
	Parapets, <i>chimneys</i> and masonry veneer	N or S
Exterior, At or Below Ground	<i>Foundation</i> walls and <i>chimneys</i>	S
Interior	<i>Loadbearing</i> walls and columns	N
	<i>Non-loadbearing</i> walls and columns	N

Table 9.20.3.2.-B
Mortar Mix Proportions (by Volume)
 Forming Part of Sentence 9.20.3.2.(3)

Mortar Type	Portland Cement	Lime	Masonry Cement Type N	Masonry Cement Type S	Fine Aggregate (damp, loose-state sand)
S	1	½	—	—	3½ to 4½
	—	—	—	1	2¼ to 3
	½	—	1	—	3½ to 4½
N	1	1	—	—	4½ to 6
	—	—	1	—	2¼ to 3

Table 9.20.3.2.-C
Grout Mix Proportions (by Volume)
 Forming Part of Sentence 9.20.3.2.(4)

Portland Cement	Lime	Fine Aggregate (sand)	Coarse Aggregate
1	0 to 1/10	2¼ to 3 times the sum of the cement and lime volumes	1 to 2 times the sum of the cement and lime volumes

9.20.4. Mortar Joints

9.20.4.1. Thickness

- (1) Except as provided in Sentence (2), mortar joint thickness for burned clay brick and concrete masonry units shall be 10 mm.
- (2) Permitted tolerances in head and bed joints shall be not more than -5 mm to +10 mm.

9.20.4.2. Masonry Units

- (1) Hollow masonry units shall be laid with mortar applied to head and bed joints of both inner and outer face shells.
- (2) Vertically aligned webs of hollow masonry units shall be laid in a full bed of mortar
 - (a) under the starting course,
 - (b) in all courses of columns, and
 - (c) where adjacent to cells or cavities that are to be filled with grout.
- (3) Except for head joints left open for weep holes and ventilation, *solid masonry units* shall be laid with full head and bed joints.

9.20.5. Masonry Support

9.20.5.1. Masonry Support

- (1) All masonry shall be supported on masonry, concrete or steel, except that masonry veneer walls may be supported on *foundations* of wood frame constructed in conformance with Sentence 9.15.2.4.(1). (See Note A-9.20.5.1.(1))
- (2) Every masonry wall shall be at least as thick as the wall it supports, except as otherwise permitted in Article 9.20.12.2.

9.20.5.2. Lintels or Arches

- (1) Masonry over openings shall be supported by steel, reinforced concrete lintels or masonry arches designed to support the imposed loads.
- (2) Except as provided in Sentences (3) and (5), steel angle lintels supporting masonry above openings shall conform to Table 9.20.5.2.-A.
- (3) Steel angle lintels supporting masonry veneer above openings shall conform to Table 9.20.5.2.-B.

Table 9.20.5.2.-A
Loose Steel Lintels for Masonry – No. & Size of Angles Required⁽¹⁾⁽²⁾
 Forming Part of Sentence 9.20.5.2.(2)

Clear Span ⁽³⁾⁽⁵⁾	Exterior Angles, mm		Wall Thickness, mm	Interior Angles, mm						
	For Brick	For Stone		Maximum Floor Loads per Metre of Span in Newtons ⁽⁴⁾⁽⁶⁾⁽⁷⁾						
	100 mm	100 mm + 50 mm stone facing		None	3 650	7 300	10 950	14 600	18 250	21 900
	No Floor Load									
1.2 m or less	L-89 × 89 × 6.4	L-127 × 89 × 7.9	203	L-89 × 89 × 6.4	L-89 × 89 × 6.4	L-89 × 89 × 7.9	L-102 × 89 × 7.9	L-127 × 89 × 7.9	L-127 × 89 × 11	L-127 × 89 × 13
			305	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-102 × 89 × 7.9	2Ls-102 × 89 × 7.9
1.5 m	L-89 × 89 × 7.9	L-127 × 89 × 7.9	203	L-89 × 89 × 7.9	L-89 × 89 × 7.9	L-127 × 89 × 7.9	L-127 × 89 × 11	L-127 × 89 × 13	L-152 × 89 × 11	
			305	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-89 × 89 × 7.9	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 11
1.8 m	L-102 × 89 × 7.9	L-127 × 127 × 7.9	203	L-102 × 89 × 7.9	L-127 × 89 × 7.9	L-127 × 89 × 7.9	L-152 × 102 × 11			
			305	2Ls-102 × 89 × 7.9	2Ls-102 × 89 × 7.9	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 11	2Ls-152 × 102 × 11	2Ls-152 × 102 × 11
2.1 m	L-102 × 89 × 7.9	L-127 × 127 × 7.9	203	L-102 × 89 × 7.9	L-127 × 89 × 11	L-152 × 102 × 11				
			305	2Ls-102 × 89 × 7.9	2Ls-127 × 89 × 11	2Ls-127 × 89 × 11	2Ls-152 × 102 × 11	2Ls-152 × 102 × 11		
2.4 m	L-127 × 89 × 7.9	L-127 × 127 × 7.9	203	L-127 × 89 × 7.9	L-152 × 102 × 11					
			305	2Ls-127 × 89 × 7.9	2Ls-127 × 89 × 13	2Ls-152 × 102 × 11				
2.7 m	L-127 × 89 × 11	L-127 × 127 × 11	203	L-127 × 89 × 11						
			305	2Ls-127 × 152 × 11	2Ls-152 × 102 × 11					
3.0 m	L-152 × 102 × 11	L-127 × 127 × 13	203	L-152 × 102 × 11						
			305	2Ls-152 × 102 × 11						

Notes to Table 9.20.5.2.-A:

- (1) The figures in the Table indicating wall thickness and angle cross-section are in mm.
- (2) $f_s = 138$ MPa., Deflection maximum = $1/700$ span.
- (3) See Sentence 9.20.5.2.(3.1).
- (4) Omit floor load in lintel when distance to bottom of floor construction is greater than width of opening.
- (5) Interior and exterior angles in 200 mm walls and interior angles in 300 mm walls are bolted together when clear span is over 1 800 mm.
- (6) When masonry lighter than brick is used over interior angles floor load may be increased by the difference in weight per square metre times the width of the opening. Not generally available.
- (7) Interior angles have been designed for floor load plus brick masonry of height equal to width of opening.

Table 9.20.5.2.-B
Maximum Allowable Spans for Steel Lintels Supporting Masonry Veneer, m
 Forming Part of Sentence 9.20.5.2.(3)

Minimum Angle Size, mm			Maximum Allowable Spans, m		
Vertical Leg	Horizontal Leg	Thickness	70 mm Brick	90 mm Brick	100 mm Stone
89	76	6.4	2.55	—	—
89	89	6.4	2.59	2.47	2.30
102	89	6.4	2.79	2.66	2.48
127	89	7.9	3.47	3.31	3.08
127	89	11	3.64	3.48	3.24
127	89	13	3.82	3.59	3.33
152	89	11	4.06	3.82	3.54
152	89	13	4.32	4.07	3.77
152	102	13	4.37	4.12	3.82
178	102	11	4.57	4.30	3.99
178	102	13	4.87	4.59	4.25

(3.1) Steel lintels described in Sentences (2) and (3) shall

- (a) have even and level bearing and shall have not less than 150 mm length of bearing at end supports, and
- (b) bear on masonry, concrete or steel.

(4) Steel angle lintels supporting masonry shall be prime painted or otherwise protected from corrosion.

(5) Steel beams supporting masonry veneer and wood stud walls above openings shall conform to Table 9.20.5.2.-C.

(6) Steel beams described in Sentence (5) shall be supported at each end by a steel column, and have a minimum 6 mm plate welded to the flange to support the masonry veneer.

Table 9.20.5.2.-C
Maximum Allowable Spans for Steel Beams Supporting Masonry Veneer, m⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.20.5.2.(5)

Section	70 mm Brick	90 mm Brick	100 mm Stone
W150 × 22	4.23	4.09	3.92
W150 × 30	4.68	4.52	4.32
W200 × 27	5.26	5.08	4.84
W200 × 31	5.57	5.37	5.11
W200 × 36	5.70	5.49	5.23

Notes to Table 9.20.5.2.-C:

- (1) These spans assume that the beam supports the veneer, a wood stud wall and a maximum specified roof *live load* of 2.3 kN/m.
- (2) Where the steel beam carries floor loads or larger roof loads, refer to Article 9.23.4.3.
- (3) See Note A-Table 9.20.5.2.-C.

9.20.6. Thickness and Height

9.20.6.1. Thickness of Exterior Walls

- (1) Masonry exterior walls, other than *cavity walls*, in 1-storey buildings and the top storeys of 2- and 3-storey buildings shall be not less than 140 mm thick, provided the walls are not more than 2.8 m high at the eaves and 4.6 m high at the peaks of gable ends.
- (2) The exterior walls of the bottom storeys of 2-storey buildings, and exterior walls of the bottom 2 storeys of 3-storey buildings shall be not less than 190 mm thick.
- (3) In exterior walls composed of more than one wythe, each wythe shall be not less than 90 mm thick.

9.20.6.2. Cavity Walls

- (1) *Cavity walls* shall be made with not less than 90 mm wide units if the joints are raked and not less than 75 mm wide units if the joints are not raked.
- (2) The width of a cavity in a *cavity wall* shall be not less than 50 mm and not greater than 150 mm.
- (3) The minimum thickness of *cavity walls* above the supporting base shall be 230 mm for the top 7.6 m and 330 mm for the remaining portion, except that where 75 mm wide units are used, the wall height above the top of the *foundation* wall shall not exceed 6 m.

9.20.6.3. Thickness of Interior Walls

- (1) The thickness of *loadbearing* interior walls shall be determined on the basis of the maximum lateral support spacing as provided in Sentences 9.20.10.1.(2) and (3).
- (2) The thickness of interior non-*loadbearing* walls shall be
 - (a) determined on the basis of the maximum lateral support spacing as provided in Sentences 9.20.10.1.(2) and (3), and
 - (b) in any case, not less than 65 mm.

9.20.6.4. Masonry Veneer

- (1) Except for masonry veneer where each masonry unit is supported individually by the structural backing, masonry veneer shall consist of *solid masonry units* not less than 70 mm thick.
- (2) Veneer described in Sentence (1) over wood-frame walls shall have not less than a 25 mm air space behind the veneer.
- (3) Masonry veneer less than 90 mm thick shall have unraked joints.
- (4) Masonry veneer shall conform to Subsection 4.3.2. where the masonry units are required to be individually supported by the structural backing.

9.20.6.5. Parapet Walls

- (1) The height of parapet walls above the adjacent roof surface shall be not more than 3 times the parapet wall thickness.
- (2) A parapet wall shall be *solid masonry* that extends from the top of the parapet wall to not less than 300 mm below the adjacent roof level.
- (3) Where semi-solid or hollow units are used in a parapet wall, the cells of those units shall be filled with mortar, grout or concrete.

9.20.6.6. Stone or Concrete Facings

- (1) Slab and panel facings of precast concrete and natural or artificial stone shall conform to Subsection 4.3.2.

9.20.7. Chases and Recesses

9.20.7.1. Maximum Dimensions

- (1) Except as permitted in Sentence 9.20.7.2.(2) and Article 9.20.7.4., the depth of any chase or recess shall not exceed one-third the thickness of the wall, and the width of the chase or recess shall not exceed 500 mm.

9.20.7.2. Minimum Wall Thickness

- (1) Except as permitted in Sentence (2) and Article 9.20.7.4., no chase or recess shall be constructed in any wall 190 mm or less in thickness.
- (2) Recesses may be constructed in 190 mm walls provided they do not exceed 100 mm in depth, 750 mm in height and 500 mm in width.

9.20.7.3. Separation of Chases and Recesses

- (1) Chases and recesses shall be not less than
 - (a) 4 times the wall thickness apart, and
 - (b) 600 mm away from any pilaster, cross wall, buttress or other vertical element providing required lateral support for the wall.

9.20.7.4. Non-Conforming Chases or Recesses

(1) Chases or recesses that do not conform to the limits specified in Articles 9.20.7.1. to 9.20.7.3. shall be considered as openings, and any masonry supported above such a chase or recess shall be supported by a lintel or arch as provided in Article 9.20.5.2.

9.20.7.5. Chases or Recesses Cut into Walls

(1) Chases and recesses shall not be cut into walls made with hollow units after the masonry units are in place.

9.20.8. Support of Loads

9.20.8.1. Capping of Hollow Masonry Walls

(1) Except as permitted in Sentence (2), *loadbearing* walls of hollow masonry units supporting roof or floor framing members shall be capped with not less than 50 mm of *solid masonry* or have the top course filled with concrete.

(2) Capping required in Sentence (1) may be omitted where the roof framing is supported on a wood plate not less than 38 mm by 89 mm.

9.20.8.2. Cavity Walls Supporting Framing Members

(1) Floor joists supported on *cavity walls* shall be supported on *solid masonry units* not less than 57 mm high.

(2) Floor joists described in Sentence (1) shall not project into the cavity.

(3) Roof and ceiling framing members bearing on *cavity walls* shall be supported on

- (a) *solid masonry units* not less than 57 mm high that bridge the full thickness of the wall, or
- (b) a wood plate not less than 38 mm thick, bearing not less than 50 mm on each wythe.

9.20.8.3. Bearing of Beams and Joists

(1) The bearing area under beams and joists shall be sufficient to carry the supported load.

(2) In no case shall the minimum length of end bearing of beams supported on masonry be less than 90 mm.

(3) The length of end bearing of floor, roof or ceiling joists supported on masonry shall be not less than 40 mm.

9.20.8.4. Support of Beams and Columns

(1) Beams and columns supported on masonry walls shall be supported on pilasters where the thickness of the masonry wall or wythe is less than 190 mm.

(2) Not less than 190 mm depth of *solid masonry* or concrete shall be provided under the beam or column referred to in Sentence (1).

(3) Pilasters required in Sentence (1) shall be bonded or tied to masonry walls.

(4) Concrete pilasters required in Sentence (1) shall be not less than 50 mm by 300 mm.

(5) Unit masonry pilasters required in Sentence (1) shall be not less than 100 mm by 290 mm.

9.20.8.5. Projection of Masonry Veneer Beyond Supporting Members

- (1) Masonry veneer of *solid masonry units* resting on a bearing support shall not project more than one-third of the thickness of the veneer. (See Note A-9.20.8.5.(1))
- (2) Where the masonry veneer described in Sentence (1) is rough stone masonry,
 - (a) the projection shall be measured as the average projection of the units, and
 - (b) the thickness of the veneer shall be measured as the average thickness of the veneer.

9.20.9. Bonding and Tying

9.20.9.1. Joints to be Offset or Reinforced

- (1) Vertical joints in adjacent masonry courses shall be offset unless each wythe of masonry is reinforced with the equivalent of not less than 2 corrosion-resistant steel bars of 3.76 mm diam placed in the horizontal joints at vertical intervals not exceeding 460 mm.
- (2) Where joints in the reinforcing referred to in Sentence (1) occur, the bars shall be lapped not less than 150 mm.

9.20.9.2. Bonding or Tying of Other Than Masonry Veneer

- (1) Except as provided in Article 9.20.9.5. regarding masonry veneer, masonry walls that consist of 2 or more wythes shall have the wythes bonded or tied together with masonry bonding units as described in Article 9.20.9.3. or with metal ties as described in Article 9.20.9.4.

9.20.9.3. Bonding

- (1) Where wythes are bonded together with masonry units, the bonding units shall comprise not less than 4% of the wall surface area.
- (2) Bonding units described in Sentence (1) shall be spaced not more than 600 mm vertically and horizontally in the case of brick masonry and 900 mm o.c. in the case of block or tile.
- (3) Units described in Sentence (1) shall extend not less than 90 mm into adjacent wythes.

9.20.9.4. Tying

- (1) Where 2 or more wythes are tied together with metal ties of the individual rod type, the ties shall conform to the requirements in Sentences (3) to (6).
- (2) Other ties may be used where it can be shown that such ties provide walls that are at least as strong and as durable as those made with the individual rod type.
- (3) Metal ties of the individual rod type shall
 - (a) be corrosion-resistant,
 - (b) have a minimum cross-sectional area of not less than 17.8 mm², and
 - (c) have not less than a 50 mm portion bent at right angles at each end.
- (4) Metal ties of the individual rod type shall
 - (a) extend from within 25 mm of the outer face of the wall to within 25 mm of the inner face of the wall,
 - (b) be completely embedded in mortar except for the portion exposed in *cavity walls*, and
 - (c) be staggered from course to course.

- (5) Where 2 or more wythes in walls other than *cavity walls* and masonry veneer/masonry backing walls are tied together with metal ties of the individual rod type, the space between wythes shall be completely filled with mortar.
- (6) Ties described in Sentence (5) shall be
 - (a) located within 300 mm of openings and spaced not more than 900 mm apart around openings, and
 - (b) spaced not more than 900 mm apart horizontally and 460 mm apart vertically at other locations.
- (7) Except as required in Sentences (8) and (9), where the inner and outer wythes of *cavity walls* are tied with individual wire ties, the ties shall be spaced not more than 900 mm apart horizontally and 400 mm apart vertically.
- (8) Within 100 mm of the bottom of each floor or roof assembly where the cavity extends below the assemblies, the ties described in Sentence (7) shall be spaced not more than 600 mm apart horizontally.
- (9) Within 300 mm of any openings, the ties described in Sentence (7) shall be spaced not more than 900 mm apart.

9.20.9.5. Ties for Masonry Veneer

- (1) Masonry veneer 70 mm or more in thickness and resting on a bearing support shall be tied to masonry backing or to wood framing members with straps that are
 - (a) corrosion-resistant,
 - (b) not less than 0.76 mm thick,
 - (c) not less than 22 mm wide,
 - (d) shaped to provide a key with the mortar,
 - (e) pre-bent during manufacture to a right angle within 6 mm of the fastener hole,
 - (f) fastened with
 - (i) corrosion-resistant wood screws conforming to Sentence 9.23.3.1.(3) that have a minimum diameter of 4.16 mm (No. 8) and a wood penetration of not less than 38 mm, or
 - (ii) corrosion-resistant common spiral nails conforming to Sentence 9.23.3.1.(1) that are not less than 76 mm long and have a wood penetration of not less than 63 mm, and
 - (g) spaced in accordance with Table 9.20.9.5.

Table 9.20.9.5.
Veneer Tie Spacing
Forming Part of Sentence 9.20.9.5.(1)

Maximum Vertical Spacing, mm	Maximum Horizontal Spacing, mm
400	800
500	600
600	400

- (2) Where hot-dipped, zinc-coated straps are used to meet the requirements of Sentence (1), they shall be pre-bent and pre-drilled or pre-punched prior to hot-dip, zinc-coated galvanizing.
- (3) Masonry veneer individually supported by masonry or wood-frame backing shall be secured to the backing in conformance with Subsection 4.3.2.
- (4) The straps described in Sentence (1) may be installed against one of the sheathings listed in Table 9.23.17.2.-A provided that
 - (a) the tie is in contact with the exterior surface of the sheathing, and
 - (b) the sheathing beneath the tie is not compressed.

9.20.9.6. Reinforcing for Glass Block

- (1) Glass block shall have horizontal joint reinforcement of two corrosion-resistant bars of not less than 3.76 mm diam or expanded metal strips not less than 75 mm wide
 - (a) spaced at vertical intervals of not more than 600 mm for units 190 mm or less in height, and
 - (b) installed in every horizontal joint for units higher than 190 mm.
- (2) Reinforcement required in Sentence (1) shall be lapped not less than 150 mm.

9.20.10. Lateral Support

9.20.10.1. Lateral Support Required

- (1) Masonry walls shall be laterally supported by floor or roof construction or by intersecting masonry walls or buttresses.
- (2) The spacing of supports required in Sentence (1) shall be not more than
 - (a) 20 times the wall thickness for all *loadbearing* walls and exterior non-*loadbearing* walls, and
 - (b) 36 times the wall thickness for interior non-*loadbearing* walls.
- (3) In applying Sentence (2), the thickness of *cavity walls* shall be taken as the greater of
 - (a) two-thirds of the sum of the thicknesses of the wythes, or
 - (b) the thickness of the thicker wythe.
- (4) Floor and roof structural elements providing lateral support for walls as required in Sentence (1) shall be constructed to transfer lateral loads to walls or buttresses approximately at right angles to the laterally supported walls.

9.20.11. Anchorage of Roofs, Floors and Intersecting Walls

9.20.11.1. Anchorage to Floor or Roof Assemblies where Masonry Walls Require Lateral Support

- (1) Where required to receive lateral support (See Subsection 9.20.10.), masonry walls shall be anchored to each floor or roof assembly at maximum intervals of 2 m, except that anchorage to floor joists not more than 1 m above *grade* may be omitted.
- (2) Anchors required in Sentence (1) shall be corrosion-resistant and be not less than the equivalent of 40 mm by 4.76 mm thick steel straps.
- (3) Anchors required in Sentence (1) shall be shaped to provide a mechanical key with the masonry and shall be securely fastened to the horizontal support to develop the full strength of the anchor.
- (4) When joists are parallel to the wall, anchors required in Sentence (1) shall extend across not less than 3 joists.

9.20.11.2. Bonding and Tying Intersecting Masonry Walls where Walls Require Lateral Support

- (1) Where required to provide lateral support, intersecting walls shall be bonded or tied together.
- (2) Where bonding is used to satisfy the requirements of Sentence (1), 50% of the adjacent masonry units in the intersecting wall, distributed uniformly over the height of the intersection, shall be embedded in the laterally supported wall.

- (3) Where tying is used to satisfy the requirements of Sentence (1), the ties shall be
 - (a) corrosion-resistant metal,
 - (b) equivalent to not less than 4.76 mm by 40 mm steel strapping,
 - (c) spaced not more than 800 mm o.c. vertically, and
 - (d) shaped at both ends to provide sufficient mechanical key to develop the strength of the ties.

9.20.11.3. Anchoring Intersecting Wood-Frame Walls to Masonry Walls

- (1) Wood-frame walls shall be tied to intersecting masonry walls with not less than 4.76 mm diam corrosion-resistant steel rods spaced not more than 900 mm o.c. vertically.
- (2) Ties required in Sentence (1) shall be anchored to the wood framing at one end and shaped to provide a mechanical key at the other end to develop the strength of the tie.

9.20.11.4. Anchoring Wood-Frame Roof Systems to Masonry Walls

- (1) Except as permitted in Sentence (2), roof systems of wood-frame construction shall be tied to exterior masonry walls by not less than 12.7 mm diam anchor bolts,
 - (a) spaced not more than 2.4 m apart,
 - (b) embedded not less than 90 mm into the masonry, and
 - (c) fastened to a rafter plate of not less than 38 mm thick lumber.
- (2) The roof system described in Sentence (1) is permitted to be anchored by nailing the wall furring strips to the side of the rafter plate.

9.20.11.5. Anchoring Masonry Cornices, Sills and Trim to Masonry Walls

- (1) Cornices, sills or other trim of masonry material which project beyond the wall face shall have not less than 65% of their mass, but not less than 90 mm, within the wall or shall be adequately anchored to the wall with corrosion-resistant anchors.

9.20.11.6. Anchoring to Masonry Piers

- (1) Where anchor bolts are to be placed in the top of a masonry pier, the pier shall conform to the requirements of Sentence 9.15.2.3.(4) and shall be capped with concrete or reinforced masonry not less than 200 mm thick.

9.20.12. Corbelling

9.20.12.1. Corbelling

- (1) All corbelling shall consist of *solid masonry units*.
- (2) The units referred to in Sentence (1) shall be corbelled so that the horizontal projection of any unit does not exceed 25 mm and the total projection does not exceed one-third of the total wall thickness.

9.20.12.2. Corbelling for Cavity Walls

- (1) *Cavity walls* of greater thickness than the *foundation* wall on which they rest shall not be corbelled but may project 25 mm over the outer face of the *foundation* wall disregarding parging.
- (2) Where the *foundation* wall referred to in Sentence (1) is unit masonry, it is permitted to be corbelled to meet flush with the inner face of a *cavity wall* provided

- (a) the projection of each course does not exceed half the height or one-third the thickness of the corbelled unit, and
 - (b) the total corbel does not exceed one-third of the *foundation* wall thickness.
- (See Note A-9.20.12.2.(2))

9.20.12.3. Corbelling for Masonry Veneer

- (1) Masonry veneer resting on a bearing support shall not project more than 25 mm beyond the supporting base where the veneer is not less than 90 mm thick, and 12 mm beyond the supporting base where the veneer is less than 90 mm thick.
- (2) In the case of rough stone veneer, the projection, measured as the average projection of the stone units, shall not exceed one-third the bed width beyond the supporting base.

9.20.13. Control of Rainwater Penetration

9.20.13.1. Materials for Flashing

- (1) Materials used for flashing shall conform to Table 9.20.13.1.
- (2) Aluminum flashing in contact with masonry or concrete shall be effectively coated or separated from the masonry or concrete by an impervious membrane.

Table 9.20.13.1.
Flashing Materials
Forming Part of Sentence 9.20.13.1.(1)

Material	Minimum Thickness, mm	
	Exposed Flashing	Concealed Flashing
Aluminum	0.48	—
Copper	0.46	0.46
Copper or aluminum laminated to felt or kraft paper	—	0.05
Galvanized steel	0.33	0.33
Lead sheet	1.73	1.73
Polyethylene	—	0.50
Roll roofing, Type S	—	standard
Zinc	0.46	0.46

9.20.13.2. Fastening of Flashing

- (1) Fastening devices for flashing shall be corrosion-resistant and, where metal flashing is used, shall be compatible with the flashing with respect to galvanic action.

9.20.13.3. Location of Flashing

- (1) Flashing shall be installed in masonry and masonry veneer walls
 - (a) beneath jointed masonry window sills,
 - (b) over the back and top of parapet walls,
 - (c) over the heads of glass block panels,
 - (d) beneath weep holes, and
 - (e) over the heads of window or door openings in exterior walls when the vertical distance between the top of a window or door frame and the bottom edge of the eave exceeds one-quarter of the horizontal eave overhang.

(2) Throughwall flashing shall be provided in a masonry veneer wall such that any moisture that accumulates in the air space will be directed to the exterior of the *building*.

9.20.13.4. Extension of Flashing

(1) When installed beneath jointed masonry window sills and jointed masonry copings or over the heads of openings, flashing shall extend from the front edge of the masonry up behind the sill or lintel.

(2) A flashing may be omitted when the masonry at the sill of a wall opening or the top of a wall is protected by an impervious non-jointed masonry coping that conforms to Article 9.20.13.12.

9.20.13.5. Flashing for Weep Holes in Masonry Veneer/Masonry Walls

- (1) Flashing beneath weep holes in *cavity walls* and masonry veneer/masonry backing walls shall
- (a) be bedded not less than 25 mm in the inside wythe,
 - (b) extend to not less than 5 mm beyond the outer face of the *building* element below the flashing, and
 - (c) be installed with a nominally horizontal slope toward the outside wythe.

9.20.13.6. Flashing for Weep Holes in Masonry Veneer

(1) Flashing beneath weep holes in masonry veneer over masonry backing walls shall conform to the flashing requirements for *cavity walls* and masonry veneer/masonry backing walls in Article 9.20.13.5.

(2) Flashing beneath weep holes in masonry veneer over wood frame walls shall be installed so that it extends from a point not less than 5 mm beyond the outer face of the *building* element below the flashing to a point 150 mm up the wood-frame wall.

(3) Where the frame wall is sheathed with a sheathing membrane, a non-wood-based rigid exterior insulating sheathing or a semi-rigid insulating sheathing with an integral sheathing membrane, the flashing shall be installed behind the sheathing membrane or insulating sheathing.

(4) Flashing described in Sentence (2) is permitted to conform to the requirements for concealed flashing in Table 9.20.13.1.

9.20.13.7. Flashing Joints

(1) Joints in flashing shall be made watertight.

9.20.13.8. Required Weep Holes

- (1) Weep holes spaced not more than 800 mm apart shall be provided at the bottom of
- (a) cavities in *cavity walls*, and
 - (b) cavities or air spaces in masonry veneer walls.

(2) The cavities or air spaces described in Sentence (1) shall include those above lintels over window and door openings required to be flashed in conformance with Article 9.20.13.3.

(3) The weep holes required in Sentence (1) shall be in a location such that any water that collects in the cavity or space will be directed to the exterior of the *building*.

9.20.13.9. Protection of Interior Finish

- (1) Except as provided in Sentence (3), where the interior finish of the exterior walls of a *building* is a type that may be damaged by moisture, exterior masonry walls, other than *cavity walls* or walls that are protected for their full height by a roof of a carport or porch, shall be
 - (a) parged on the interior surface, and
 - (b) covered with No. 15 breather-type asphalt-saturated paper conforming to CAN/CGSB-51.32-M, “Sheathing, Membrane, Breather Type,” and shall be lapped not less than 100 mm at the joints.
- (2) In situations described in Sentence (1), flashing shall be provided where water will accumulate, to lead it to the exterior.
- (3) Where insulation effectively limits the passage of water vapour and is applied by a waterproof adhesive or by mortar directly to the masonry, the requirements for sheathing paper do not apply. (See Note A-9.20.13.9.(3))

9.20.13.10. Mortar Droppings

- (1) *Cavity walls* shall be constructed so that mortar droppings are prevented from forming a bridge to allow the passage of rainwater across the cavity.

9.20.13.11. Caulking at Door and Window Frames

- (1) The junction of door and window frames with masonry shall be caulked in conformance with Subsection 9.27.4.

9.20.13.12. Drips Beneath Window Sills

- (1) Except for wall openings located less than 150 mm above ground level, where a concealed flashing is not installed beneath window and door sills, such sills shall be provided with an outward slope and a drip located not less than 25 mm from the wall surface.

9.20.14. Protection During Work

9.20.14.1. Laying Temperature of Mortar and Masonry

- (1) Mortar and masonry shall be maintained at a temperature not below 5°C during installation and for not less than 48 h after installation.
- (2) No frozen material shall be used in mortar mix.

9.20.14.2. Protection from Weather

- (1) The top surface of uncompleted masonry exposed to the weather shall be completely covered with a waterproofing material when construction is not in progress.

9.20.15. Reinforcement for Earthquake Resistance

9.20.15.1. Amount of Reinforcement

(1) Where reinforcement is required in this Section, masonry walls shall be reinforced horizontally and vertically with steel having a total cross-sectional area of not less than 0.002 times the horizontal cross-sectional area of the wall, so that not less than one-third of the required steel area is installed either horizontally or vertically and the remainder in the other direction.

9.20.15.2. Installation Standard

(1) Where reinforcement for masonry is required in this Section, it shall be installed in conformance with the requirements for reinforced masonry as contained in CAN/CSA-A371, "Masonry construction for buildings."

9.20.16. Corrosion Resistance

9.20.16.1. Corrosion Resistance of Connectors

(1) Carbon steel connectors required to be corrosion-resistant shall be galvanized to at least the minimum standards in Table 9.20.16.1.

Table 9.20.16.1.
Minimum Requirements for Galvanizing
Forming Part of Sentence 9.20.16.1.(1)

Connector Material	ASTM Standard	Coating Class or Thickness
Wire ties and continuous reinforcing (hot-dipped galvanizing)	ASTM A153 / A153M	Class B2 or 458 g/m ²
Hardware and bolts	ASTM A153 / A153M	See ASTM A153 / A153M
Strip, plate, bars, and rolled sections (not less than 3.18 mm thick)	ASTM A123 / A123M	610 g/m ²
Sheet (less than 3.18 mm thick)	ASTM A123 / A123M	460 g/m ² on material 0.76 mm thick ⁽¹⁾

Notes to Table 9.20.16.1.:

(1) ASTM A123 / A123M does not apply to metal less than 0.76 mm thick. Galvanizing coatings may be interpolated for thicknesses between 3.18 mm and 0.76 mm.

9.20.17. Above-Ground Flat Insulating Concrete Form Walls

9.20.17.1. Thickness of Flat Insulating Concrete Form Walls

- (1) The thickness of concrete in flat insulating concrete form walls not in contact with the ground shall be
- not less than 140 mm, and
 - constant for the entire height of the wall.

9.20.17.2. Reinforcement for Flat Insulating Concrete Form Walls

- (1) Horizontal reinforcement in above-grade flat insulating concrete form walls shall
- consist of
 - one 10M bar placed not more than 300 mm from the top of the wall, and
 - 10M bars spaced not more than 600 mm o.c., and
 - be placed in the middle third of the wall section.

- (2) Vertical reinforcement in above-grade flat insulating concrete form walls shall
 - (a) consist of 10M bars spaced not more than 400 mm o.c., and
 - (b) be placed in the middle third of the wall section.
- (3) Vertical reinforcement required by Sentence (2) and interrupted by wall openings shall be placed not more than 600 mm from each side of the opening.

9.20.17.3. Openings in Non-Loadbearing Flat Insulating Concrete Form Walls

- (1) No openings shall occur within 1 200 mm of interior and exterior corners of exterior non-*loadbearing* flat insulating concrete form walls.
- (2) Portions of walls over openings in non-*loadbearing* flat insulating concrete form walls shall have a minimum depth of concrete of not less than 200 mm across the width of the opening.
- (3) Openings more than 600 mm but not more than 3 000 mm in width in non-*loadbearing* flat insulating concrete form walls shall be reinforced at the top and bottom with one 10M bar.
- (4) Openings more than 3 000 mm in width in non-*loadbearing* flat insulating concrete form walls shall be reinforced on all four sides with two 10M bars.
- (5) Reinforcing bars described in Sentences (3) and (4) shall extend 600 mm beyond the edges of the opening.
- (6) The cumulative width of openings in non-*loadbearing* flat insulating concrete form walls shall be not more than 70% of the length of any wall.

9.20.17.4. Openings in Loadbearing Flat Insulating Concrete Form Walls

- (1) No openings shall occur within 1 200 mm of interior and exterior corners of exterior *loadbearing* flat insulating concrete form walls.
- (2) In *loadbearing* flat insulating concrete form walls, lintels shall be provided over all openings wider than 900 mm.
- (3) Lintels described in Sentence (2) shall be constructed in accordance with Span Table 9.20.17.4.-A, 9.20.17.4.-B or 9.20.17.4.-C.
- (4) Lintels described in Sentence (2) over openings wider than 1 200 mm shall be reinforced for shear with 10M stirrups at a maximum spacing of half the distance from the bottom reinforcing bar to the top of the lintel.

9.20.17.5. Framing Supported on Flat Insulating Concrete Form Walls

- (1) Floor joists supported on the side of flat insulating concrete form walls shall be supported with joist hangers secured to wood ledger boards.
- (2) The ledger boards referred to in Sentence (1) shall be not less than
 - (a) 38 mm thick, and
 - (b) the depth of the floor joists.
- (3) Anchor bolts shall be used to secure ledger boards to flat insulating concrete form walls and shall be
 - (a) embedded in the wall to a depth not less than 100 mm, and
 - (b) spaced in accordance with Table 9.20.17.5.
- (4) Floor joists and *building* frames supported on the top of flat insulating concrete form walls shall be anchored in conformance with Article 9.23.6.1.

Table 9.20.17.5.
Maximum Anchor Bolt Spacing for the Connection of Floor Ledgers to Flat Insulating Concrete Form Walls
Forming Part of Sentence 9.20.17.5.(3)

Maximum Clear Floor Span, m	Maximum Anchor Bolt Spacing, mm	
	Staggered 12.7 mm Diameter Anchor Bolts	Staggered 16 mm Diameter Anchor Bolts
2.44	450	500
3.00	400	450
4.00	300	400
5.00	275	325

9.20.17.6. Anchoring of Roof Framing to Top of Flat Insulating Concrete Form Walls

- (1) Roof framing supported on the top of flat insulating concrete form walls shall be fixed to the top plates, which shall be anchored to the wall with anchor bolts
 - (a) not less than 12.7 mm in diameter, and
 - (b) spaced not more than 1 200 mm o.c.
- (2) The anchor bolts described in Sentence (1) shall be placed in the centre of the flat insulating concrete form wall and shall be embedded no less than 100 mm into the concrete.
- (3) Attachment of roof framing to wood top plates shall be in accordance with Table 9.23.3.4.

9.20.17.7. Protection from Precipitation and Damage

- (1) Above-ground flat insulating concrete form walls shall be protected from precipitation and damage in conformance with Section 9.27.

Section 9.21. Masonry and Concrete Chimneys and Flues

9.21.1. General

9.21.1.1. Application

- (1) This Section applies to,
 - (a) rectangular *masonry or concrete chimneys* not more than 12 m in height serving fireplaces or serving *appliances* having a combined total rated heat output of 120 kW or less, and
 - (b) *flue pipes* serving solid fuel-burning *appliances*.
- (2) Reserved.
- (3) Except as provided in Sentence 9.21.1.3.(1), *chimneys* (other than those described in Sentence (1) and Sentence 9.21.1.2.(1)), *gas vents* and *flue pipes* serving gas-, oil- or solid fuel-burning *appliances* and associated equipment shall conform to Section 6.3.

9.21.1.2. Chimney or Flue Pipe Walls

- (1) The walls of any *chimney* or *flue pipe* shall be constructed so as to be smoke- and flame-tight.

9.21.1.3. Factory-Built Chimneys

- (1) *Factory-built chimneys* serving solid fuel-burning *appliances*, and their installation, shall conform to CAN/ULC-S629, “Standard for 650°C Factory-Built Chimneys.” (See Note A-9.21.1.3.(1))

9.21.1.4. Flue Pipes

- (1) *Flue pipes* serving solid fuel-burning *stoves*, *cooktops* and *space heaters* shall conform to CSA B365, “Installation code for solid-fuel-burning appliances and equipment.”

9.21.2. Chimney Flues

9.21.2.1. Chimney Flue Limitations

- (1) A *chimney flue* that serves a fireplace or incinerator shall not serve any other *appliance*.
- (2) A *chimney flue* that serves a solid fuel-burning *appliance* shall not be connected to a natural gas- or propane-fired *appliance*.
- (3) A *chimney flue* that serves a solid fuel-burning *appliance* shall not be connected to an oil-burning *appliance* unless the solid fuel-burning *appliance* is *listed* for such installation and the installation of both *appliances* meets their respective installation requirements.

9.21.2.2. Connections of More Than One Appliance

- (1) Except as required in Article 9.21.2.1., two or more fuel-burning *appliances* are permitted to be connected to the same *chimney flue* provided adequate draft is maintained for the connected *appliances* and the connections are made as described in Sentences (2) and (3).
- (2) Where 2 or more fuel-burning *appliances* are connected to the same *chimney flue*, the *appliances* must be located on the same *storey*.
- (3) The connection referred to in Sentence (2) for a solid fuel-burning *appliance* shall be made below connections for *appliances* burning other fuels.

9.21.2.3. Inclined Chimney Flues

- (1) *Chimney flues* shall not be inclined more than 45° to the vertical.

9.21.2.4. Size of Chimney Flues

- r1 (1) Except for *chimneys* serving fireplaces, the size of a *chimney flue* shall conform to the requirements of the solid fuel-burning *appliance* installation standards referenced in Sentence 6.2.1.4.(1) and Article 9.33.5.3.
- (2) Where a *chimney flue* serves only one solid fuel-burning *appliance*, the *flue* area shall be at least equal to that of the *flue pipe* connected to it.

9.21.2.5. Fireplace Chimneys

(1) The size of a *chimney flue* serving a masonry fireplace shall conform to Table 9.21.2.5.-A or Table 9.21.2.5.-B.

Table 9.21.2.5.-A
Diameter of Round Flues for Fireplace Chimneys
 Forming Part of Sentence 9.21.2.5.(1)

Fireplace Opening, m ²	Chimney Height, m							
	3.0 to 4.5		> 4.5 to 5.9		> 5.9 to 8.9		> 8.9 to 12	
	Flue Diameter, mm							
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Up to 0.150	110	170	100	160	90	150	90	150
0.151 to 0.250	150	210	130	190	130	190	120	180
0.251 to 0.350	180	240	160	220	150	210	140	200
0.351 to 0.500	220	280	200	260	190	250	170	230
0.501 to 0.650	260	320	230	290	220	280	200	260
0.651 to 0.800	290	350	260	320	240	300	220	280
0.801 to 1.00	330	390	290	350	270	330	250	310
1.01 to 1.20	360	420	320	380	300	360	270	330
1.21 to 1.40	390	450	350	410	330	390	300	360
1.41 to 1.60	420	480	380	440	350	410	320	380
1.61 to 1.80	—	—	400	460	370	430	340	400
1.81 to 2.00	—	—	—	—	400	460	360	420
2.01 to 2.20	—	—	—	—	—	—	380	440

Table 9.21.2.5.-B
Rectangular Flue Sizes for Fireplace Chimneys
 Forming Part of Sentence 9.21.2.5.(1)

Fireplace Opening, m ²	Chimney Height, m							
	3.0 to 4.5		> 4.5 to 5.9		> 5.9 to 8.9		> 8.9 to 12	
	Flue Size, mm							
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Up to 0.150	200 × 200	200 × 200	100 × 200	100 × 200	100 × 200	100 × 200	100 × 200	100 × 200
0.151 to 0.250	200 × 200	200 × 200	200 × 200	200 × 200	200 × 200	200 × 200	200 × 200	200 × 200
0.251 to 0.350	200 × 300	200 × 300	200 × 200	200 × 300	200 × 200	200 × 200	200 × 200	200 × 200
0.351 to 0.500	300 × 300	300 × 300	200 × 300	200 × 300	200 × 300	200 × 300	200 × 200	200 × 300
0.501 to 0.650	300 × 300	300 × 400	300 × 300	300 × 300	300 × 300	300 × 300	200 × 300	200 × 300
0.651 to 0.800	300 × 400	300 × 400	300 × 300	300 × 400	300 × 300	300 × 300	300 × 300	300 × 300
0.801 to 1.00	400 × 400	400 × 400	300 × 400	300 × 400	300 × 400	300 × 400	300 × 300	300 × 300
1.01 to 1.20	400 × 400	400 × 400	400 × 400	400 × 400	300 × 400	300 × 400	300 × 400	300 × 400
1.21 to 1.40	—	—	400 × 400	400 × 400	400 × 400	400 × 400	300 × 400	300 × 400
1.41 to 1.60	—	—	—	—	400 × 400	400 × 400	400 × 400	400 × 400
1.61 to 1.80	—	—	—	—	—	—	400 × 400	400 × 400
1.81 to 2.00	—	—	—	—	—	—	400 × 400	400 × 400

9.21.2.6. Oval Chimney Flues

- (1) The width of an oval *chimney flue* shall be not less than two-thirds its breadth.

9.21.3. Chimney Lining

9.21.3.1. Lining Materials

- (1) Every *masonry or concrete chimney* shall have a lining of clay, concrete, firebrick or metal.

9.21.3.2. Joints in Chimney Liners

- (1) Joints of *chimney liners* shall be sealed to provide a barrier to the passage of *flue* gases and condensate into the cavity between the liner and the surrounding masonry.
- (2) Joints of clay, concrete or firebrick *chimney liners* shall be struck flush to provide a straight, smooth, aligned *chimney flue*.

9.21.3.3. Clay Liners

- (1) Clay liners shall conform to CAN/CSA-A324-M, “Clay Flue Liners.”
- (2) Liners referred to in Sentence (1) shall be not less than 15.9 mm thick and shall be capable of resisting, without softening or cracking, a temperature of 1 100°C.

9.21.3.4. Firebrick Liners

- (1) Firebrick liners shall conform to ASTM C27, “Standard Classification of Fireclay and High Alumina Refractory Brick.”
- (2) Firebrick liners shall be laid with high temperature cement mortar conforming to CAN/CGSB-10.3, “Air Setting Refractory Mortar.”

9.21.3.5. Concrete Liners

- (1) Concrete *flue* liners shall conform to Clause 4.2.6.4. of CAN/CSA-A405-M, “Design and Construction of Masonry Chimneys and Fireplaces.”

9.21.3.6. Metal Liners

- (1) Metal liners shall be constructed of not less than 0.3 mm thick stainless steel.
- (2) Except as provided in Sentence 9.22.10.2.(3), metal liners referred to in Sentence (1) shall only be used in *chimneys* serving gas- or oil-burning *appliances*. (See Note A-9.21.3.6.(2))

9.21.3.7. Installation of Chimney Liners

- (1) *Chimney liners* shall be installed when the surrounding masonry or concrete is placed.

9.21.3.8. Spaces Between Liners and Surrounding Masonry

- (1) A space not less than 10 mm wide shall be left between a *chimney liner* and the surrounding masonry.
- (2) The space required in Sentence (1) shall not be filled with mortar.

9.21.3.9. Mortar for Chimney Liners

- (1) *Chimney liners* used in *chimneys* for solid fuel-burning *appliances* shall be laid in a full bed of
 - (a) high temperature cement mortar conforming to CAN/CGSB-10.3, “Air Setting Refractory Mortar,” or
 - (b) mortar consisting of 1 part Portland cement to 3 parts sand by volume.
- (2) *Chimney liners* used in *chimneys* for oil- or gas-burning *appliances* shall be laid in a full bed of mortar consisting of 1 part Portland cement to 3 parts sand by volume.

9.21.3.10. Extension of Chimney Liners

- (1) *Chimney liners* shall extend from a point not less than 200 mm below the lowest *flue pipe* connection to a point not less than 50 mm or more than 100 mm above the *chimney* cap. See Note A-9.21.3.6.(2).)

9.21.4. Masonry and Concrete Chimney Construction

9.21.4.1. Unit Masonry

- (1) Unit masonry shall conform to Section 9.20.

9.21.4.2. Concrete

- (1) Concrete shall conform to Section 9.3.

9.21.4.3. Footings

- (1) Footings for masonry *chimneys* and concrete *chimneys* shall conform to Section 9.15.

9.21.4.4. Height of Chimney Flues

- (1) A *chimney flue* shall extend not less than
 - (a) 900 mm above the highest point at which the *chimney* comes in contact with the roof, and
 - (b) 600 mm above the highest roof surface or structure within 3 m of the *chimney*.(See Note A-9.21.4.4.(1))

9.21.4.5. Lateral Stability

- (1) Except as provided in Sentence (2), *chimneys* shall be braced in accordance with Subsection 4.3.2. to provide lateral stability under wind loads.
- (2) A *chimney* need not be laterally braced provided
 - (a) no horizontal outside dimension is less than 400 mm, and
 - (b) the *chimney* extends not more than 3.6 m above a roof or the masonry wall of which it forms a part.(See Note A-9.21.4.5.(2))

9.21.4.6. Chimney Caps

- (1) The top of a *chimney* shall have a waterproof cap of reinforced concrete, masonry or metal.
- (2) The cap required in Sentence (1) shall slope from the lining and be provided with a drip not less than 25 mm from the *chimney* wall.
- (3) Cast-in-place concrete caps shall be separated from the *chimney liner* by a bond break and be sealed at that location.
- (4) Jointed precast concrete or masonry *chimney* caps shall have flashing installed beneath the cap extending from the liner to the drip edge.

9.21.4.7. Cleanout

- (1) Except for a *chimney flue* constructed to serve a masonry fireplace, a cleanout opening with a metal frame and tight-fitting metal door shall be installed near the base of the *chimney flue*.

9.21.4.8. Wall Thickness

- (1) The walls of a masonry *chimney* shall be built of *solid masonry units* not less than 70 mm thick.

9.21.4.9. Separation of Flue Liners

- (1) *Flue* liners in the same *chimney* shall be separated by not less than 70 mm of masonry or concrete exclusive of liners where clay liners are used, or 90 mm of firebrick where firebrick liners are used.
- (2) *Flue* liners referred to in Sentence (1) shall be installed to prevent significant lateral movement.

9.21.4.10. Flashing

- (1) Junctions with adjacent materials shall be adequately flashed to shed water.

9.21.5. Clearance from Combustible Construction

9.21.5.1. Clearance from Combustible Materials

- (1) The clearance between *masonry or concrete chimneys* and *combustible* framing material shall be not less than,
 - (a) 50 mm for interior *chimneys*, and
 - (b) 12 mm for exterior *chimneys*.(See Note A-9.21.5.1.(1))
- (2) A clearance of not less than 150 mm shall be provided between a cleanout opening and *combustible* material.
- (3) *Combustible* flooring, subflooring and ceiling finishes shall have not less than a 12 mm clearance from *masonry or concrete chimneys*.

9.21.5.2. Sealing of Spaces

- (1) All spaces between *masonry or concrete chimneys* and *combustible* material shall be sealed top or bottom with *noncombustible* material.

9.21.5.3. Support of Joists or Beams

- (1) Joists or beams may be supported on masonry walls which enclose *chimney flues* provided the *combustible* members are separated from the *flue* by not less than 290 mm of *solid masonry*.

Section 9.22. Fireplaces

9.22.1. General

9.22.1.1. Application

- (1) Except when otherwise specifically stated herein, this Section applies to masonry fireplaces constructed on-site.

9.22.1.2. Masonry and Concrete

- (1) Except as otherwise stated in this Section, unit masonry shall conform to Section 9.20. and concrete to Section 9.3.
- (2) Masonry above openings shall be supported by steel lintels conforming to Sentence 9.20.5.2.(2), reinforced concrete or a masonry arch.

9.22.1.3. Footings

- (1) Footings for masonry and concrete fireplaces shall conform to Section 9.15.

9.22.1.4. Combustion Air

- (0.1) Every solid fuel-fired fireplace, including a factory-built fireplace, shall have a supply of combustion air from outdoors in accordance with Sentences (0.2) to (1).
- (0.2) The combustion air shall be supplied by a *noncombustible* and corrosion-resistant supply duct.
- (0.3) The supply duct shall have
- (a) a diameter of not less than 100 mm or equivalent area, and
 - (b) an exterior intake for entry of air from the outdoors.
- (0.4) The supply duct shall contain a tight-fitting damper that shall be located close to the interior outlet and be operable from the room containing the fireplace.
- (0.5) The operating mechanism shall clearly indicate the actual position of the damper.
- (0.6) The interior outlet shall
- (a) be located as close as possible to the opening in the face of the fireplace, and
 - (b) be designed to prevent embers from entering the supply duct.
- (1) Where a supply of combustion air is provided directly to the fire chamber of a fireplace, including a factory-built fireplace, the installation shall comply with the “Outdoor Air Supply” requirements provided in CAN/CSA-A405-M, “Design and Construction of Masonry Chimneys and Fireplaces.”

9.22.2. Fireplace Liners

9.22.2.1. Brick or Steel Liners

- (1) Except where a fireplace is equipped with a steel liner, every fireplace shall have a firebrick liner.

9.22.2.2. Firebrick Liners

- (1) Fireplace liners shall be not less than
 - (a) 50 mm thick for the sides and back, and
 - (b) 25 mm thick for the floor.
- (2) Firebrick liners shall be laid with high temperature cement mortar conforming to CAN/CGSB-10.3, “Air Setting Refractory Mortar.”
- (3) Joints between a firebrick liner and the adjacent backing masonry shall be offset.

9.22.2.3. Steel Liners

- (1) Steel liners for fireplaces shall conform to CAN/ULC-S639M, “Standard for Steel Liner Assemblies for Solid-Fuel Burning Masonry Fireplaces,” and shall be installed in accordance with the installation instructions in that standard.

9.22.3. Fireplace Walls

9.22.3.1. Thickness of Walls

- (1) Except as provided in Sentence (2), the thickness of the back and sides of a fireplace, including the thickness of any firebrick liner, shall be not less than 190 mm where a metal liner or a firebrick liner less than 51 mm thick is used.
- (2) When a steel fireplace liner is used with an air circulating chamber surrounding the firebox, the back and sides of the fireplace shall consist of
 - (a) *solid masonry units* not less than 90 mm thick, or
 - (b) hollow masonry units not less than 190 mm thick.

9.22.4. Fire Chamber

9.22.4.1. Fire Chamber Dimensions

- (1) The distance from the back of the fire chamber to the plane of the fireplace opening shall be not less than 300 mm.

9.22.5. Hearth

9.22.5.1. Hearth Extension

- (1) Except as required in Sentence (2), fireplaces shall have a *noncombustible* hearth extending not less than 400 mm in front of the fireplace opening measured from the facing, and not less than 200 mm beyond each side of the fireplace opening.

- (2) Where the fire chamber floor is elevated more than 150 mm above the hearth, the dimension of the hearth measured perpendicular to the plane of the fireplace opening shall be increased by not less than
- (a) 50 mm for an elevation above 150 mm and not more than 300 mm, and
 - (b) an additional 25 mm for every 50 mm in elevation above 300 mm.

9.22.5.2. Support of Hearth

- (1) Except as permitted in Sentence (2), the fire chamber floor and hearth shall be supported on a reinforced concrete slab not less than 100 mm thick at its supports and, if cantilevered, not less than 50 mm thick at its unsupported edge.
- (2) A hearth for a fireplace with an opening raised not less than 200 mm from a *combustible* floor is permitted to be supported on that floor provided the requirements of Clauses 5.3.6.5. to 5.3.6.7. of CAN/CSA-A405-M, “Design and Construction of Masonry Chimneys and Fireplaces,” are followed.

9.22.6. Damper

9.22.6.1. Required Damper and Size

- (1) The throat of every fireplace shall be equipped with a metal damper sufficiently large to cover the full area of the throat opening.

9.22.7. Smoke Chamber

9.22.7.1. Slope of Smoke Chamber

- (1) The sides of the smoke chamber connecting a fireplace throat with a *flue* shall not be sloped at an angle greater than 45° to the vertical.

9.22.7.2. Wall Thickness

- (1) The thickness of masonry walls surrounding the smoke chamber shall be not less than 190 mm at the sides, front and back, except that the portions of the back exposed to the outside may be 140 mm thick.

9.22.8. Factory-Built Fireplaces

9.22.8.1. Conformance to Standard

- (1) Factory-built fireplaces and their installation shall conform to CAN/ULC-S610, “Standard for Factory-Built Fireplace Systems.”

9.22.9. Clearance of Combustible Material

9.22.9.1. Clearance to the Fireplace Opening

- (1) *Combustible* material shall not be placed on or near the face of a fireplace within 150 mm of the fireplace opening, except that where the *combustible* material projects more than 38 mm out from the face of the fireplace above the opening, such material shall be not less than 300 mm above the top of the opening.

9.22.9.2. Metal Exposed to the Interior

(1) Metal exposed to the interior of a fireplace such as the damper control mechanism shall have not less than a 50 mm clearance from any *combustible* material on the face of the fireplace where such metal penetrates through the face of the fireplace.

9.22.9.3. Clearance to Combustible Framing

(1) Not less than a 100 mm clearance shall be provided between the back and sides of a fireplace and *combustible* framing, except that a 50 mm clearance is permitted where the fireplace is located in an exterior wall.

(2) Not less than a 50 mm clearance shall be provided between the back and sides of the smoke chamber of a fireplace and *combustible* framing, except that a 25 mm clearance is permitted where the fireplace is located in an exterior wall.

9.22.9.4. Heat Circulating Duct Outlets

(1) The clearance of *combustible* material above heat-circulating duct outlets from those outlets shall be not less than

(a) 300 mm where the *combustible* material projects not less than 38 mm from the face, and

(b) 150 mm where the projection is less than 38 mm.

9.22.10. Fireplace Inserts and Hearth-Mounted Stoves

9.22.10.1. Appliance Standard

(1) Fireplace inserts and hearth-mounted *stoves* vented through the throat of a fireplace shall conform to ULC-S628, “Standard for Fireplace Inserts.”

9.22.10.2. Installation

(1) The installation of fireplace inserts and hearth-mounted *stoves* vented through the throat of a fireplace shall conform to CSA B365, “Installation Code for Solid-Fuel-Burning Appliances and Equipment.”

(2) Fireplace inserts and hearth-mounted *stoves* vented through the throat of a fireplace described in Sentence (1) may be installed in existing fireplaces only if a minimum thickness of 190 mm of solid masonry is provided between the smoke chamber and any existing *combustible* materials, unless the insert is *listed* for lesser clearances.

(3) A fireplace insert installed in a masonry fireplace shall have

(a) a *listed* metal *chimney* liner installed from the insert collar to the top of the *chimney*, or

(b) a direct sealed connection to the *chimney flue* where such provision is part of an insert conforming to Sentence 9.22.10.1.(1).

Section 9.23. Wood Frame Construction

9.23.1. Application

9.23.1.1. Limitations (See Note A-9.23.1.1.)

(1) This Section applies to constructions where wall, floor and roof planes are generally comprised of lumber frames of small repetitive structural members, or engineered components, and where

(a) roof and wall planes are clad, sheathed or braced on at least one side,

- (b) the small repetitive structural members are spaced not more than 600 mm o.c.,
 - (c) the constructions do not serve as *foundations*,
 - (d) the specified *live load* on supported subfloors and floor framing does not exceed 2.4 kPa, and
 - (e) the span of any structural member does not exceed 12.20 m.
- (See Note A-9.23.1.1.(1))

(2) Where the conditions in Sentence (1) are exceeded for wood construction, the design of the framing and fastening shall conform to Subsection 4.3.1.

9.23.2. General

9.23.2.1. Strength and Rigidity

(1) All members shall be so framed, anchored, fastened, tied and braced to provide the necessary strength and rigidity.

9.23.2.2. Protection from Decay

(1) Ends of wood joists, beams and other members framing into masonry or concrete shall be treated to prevent decay where the bottom of the member is at or below ground level, or a 12 mm air space shall be provided at the end and sides of the member.

(2) Air spaces required in Sentence (1) shall not be blocked by insulation, *vapour barriers* or airtight materials.

9.23.2.3. Protection from Dampness

(1) Except as permitted in Sentence (2), wood framing members that are not pressure-treated with a wood preservative and that are supported on concrete in contact with the ground or *fill* shall be separated from the concrete by not less than 0.05 mm polyethylene film or Type S roll roofing.

(2) Dampproofing material referred to in Sentence (1) is not required where the wood member is at least 150 mm above the ground.

9.23.2.4. Connections to Preservative-Treated Wood

- (1) Except as provided in Sentence (3), connectors in contact with preservative-treated wood shall be made of
 - (a) hot-dipped, zinc-coated galvanized steel with a coating weight not less than Z550 conforming to ASTM A653 / A653M, “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process,”
 - (b) a material that provides an equivalent level of corrosion protection to that provided by the material described in Clause (a), or
 - (c) stainless steel.
- (2) Fasteners used to attach the connectors referred to in Sentence (1) shall be made of
 - (a) galvanized steel coated with zinc in accordance with ASTM A153 / A153M, “Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware,” or
 - (b) a material that provides an equivalent level of performance and is compatible with the connector.
- (3) Connectors and fasteners that are in contact with wood that has been treated with a disodium octaborate tetrahydrate (SBX (DOT)) or zinc borate preservative and is installed in a dry interior environment are permitted to be made of uncoated carbon steel. (See Note A-9.23.2.4.(3))

9.23.2.5. Lumber

- (1) Lumber shall conform to the appropriate requirements in Subsection 9.3.2.

9.23.3. Fasteners and Connectors**9.23.3.1. Standards for Nails and Screws**

- (1) Except as provided in Sentence (2) and unless otherwise indicated, nails specified in this Section shall be common steel wire nails or common spiral nails, conforming to
- ASTM F1667, “Standard Specification for Driven Fasteners: Nails, Spikes and Staples,” or
 - CSA B111, “Wire Nails, Spikes and Staples.”
- (2) Nails used to comply with Table 9.23.3.4. shall have a diameter not less than that stated in Table 9.23.3.1. (See Note A-9.23.3.1.(2))
- (3) Wood screws specified in this Section shall conform to ANSI/ASME B18.6.1., “Wood Screws (Inch Series)”. (See Note A-9.23.3.1.(3))

Table 9.23.3.1.
Diameter of Nails
Forming Part of Sentence 9.23.3.1.(2)

Minimum Length of Nails, mm	Minimum Diameter of Nails, mm
57	2.87
63	3.25
76	3.66
82	3.66
101 or greater	4.88

9.23.3.2. Length of Nails

- (1) All nails shall be long enough so that not less than half their required length penetrates into the second member.

9.23.3.3. Prevention of Splitting

- (1) Splitting of wood members shall be minimized by staggering the nails in the direction of the grain and by keeping nails well in from the edges. (See Note A-9.23.3.3.(1))

9.23.3.4. Nailing of Framing

- (1) Except as provided in Sentence (2), nailing of framing shall conform to Table 9.23.3.4.
- (2) Where the bottom wall plate or sole plate of an exterior wall is not nailed to joists or blocking in conformance with Table 9.23.3.4., the exterior wall is permitted to be fastened to the floor framing by
- having plywood, OSB or waferboard sheathing extend down over floor framing and fastened to the floor framing by nails or staples conforming to Article 9.23.3.5., or
 - tying the wall framing to the floor framing by 50 mm wide galvanized-metal strips
 - 50 mm wide,
 - not less than 0.41 mm thick,
 - spaced not more than 1.2 m apart, and
 - fastened at each end with at least two 63 mm nails.

Table 9.23.3.4.
Nailing for Framing
 Forming Part of Sentences 9.23.3.4.(1), (2) and 9.23.14.4.(2)

	Construction Detail	Minimum Length of Nails, mm	Minimum Number or Maximum Spacing of Nails
	Floor joist or blocking perpendicular to sill plate or top wall plate below – toe nail	82	2 per floor joist or blocking
	<i>Rim joist</i> , trimmer joist or blocking – supporting walls with required <i>braced wall panels</i> – to sill plate or top wall plate – toe nail	82	150 mm o.c.
	Wood or metal strapping to underside of floor joists	57	2
	Cross-bridging to joists	57	2 at each end
	Double header or trimmer joists	76	300 mm o.c.
	Floor joist to stud (balloon construction)	76	2
	Ledger strip to wood beam	82	2 per joist
	Joist to joist splice (See also Table 9.23.14.8.)	76	2 at each end
R1	Header joist end nailed to joists along perimeter	101	3
	Tail joist to adjacent header joist (end nailed) around openings	82	5
		101	3
	Each header joist to adjacent trimmer joist (end nailed) around openings	82	5
		101	3
	Stud to wall plate (each end) toe nail or end nail	63	4
		82	2
	Doubled studs at openings, or studs at walls or wall intersections and corners	76	750 mm o.c.
	Doubled top wall plates ⁽¹⁾	76	600 mm o.c.
	Bottom wall plate or sole plate to floor joists, <i>rim joists</i> or blocking (exterior walls) ⁽²⁾	82	400 mm o.c.
Bottom wall plate or sole plate – in required <i>braced wall panels</i> – to floor joists, <i>rim joists</i> or blocking (exterior walls) ⁽²⁾	82	150 mm o.c.	
Interior walls to framing or subflooring	82	600 mm o.c.	
Required <i>braced wall panels</i> – in interior walls – to framing above and below	82	150 mm o.c.	
Horizontal member over openings in non-loadbearing walls – each end	82	2	
Lintels to studs	82	2 at each end	
Ceiling joist to plate – toe nail each end	82	2	
Roof rafter, roof truss or roof joist to plate – toe nail ⁽³⁾	82	3	
Rafter plate to each ceiling joist	101	2	
Rafter to joist (with ridge supported)	76	3	
Rafter to joist (with ridge unsupported)	76	See Table 9.23.14.8.	
Gusset plate to each rafter at peak	57	4	
Rafter to ridge board – toe nail – end nail	82	3	
Collar tie to rafter – each end	76	3	
Collar tie lateral support to each collar tie	57	2	
Jack rafter to hip or valley rafter	82	2	
Roof strut to rafter	76	3	
Roof strut to loadbearing wall – toe nail	82	2	
38 mm × 140 mm or less plank decking to support	82	2	
Plank decking wider than 38 mm × 140 mm to support	82	3	
38 mm edge laid plank decking to support (toe nail)	76	1	
38 mm edge laid plank to each other	76	450 mm o.c.	
End-joist or end-rafter to built-up wall stud ⁽⁴⁾	76	5 or 8 ⁽⁵⁾	

Notes to Table 9.23.3.4.:

- (1) See Article 9.23.11.4. for requirements on the nailing of top plates in *braced wall bands*.
- (2) See Sentence 9.23.3.4.(2).
- (3) See Sentence 9.23.3.4.(3).
- (4) See Sentence 9.23.13.5.(3).
- (5) Where heavyweight construction is used in the roof of the space, at least 8 nails are required. (See Note A-9.23.13.2.(1)(a)(i))

9.23.3.5. Fastening for Sheathing or Subflooring

- (1) Except as required by Sentences (2) to (4), fastening of sheathing and subflooring shall conform to Table 9.23.3.5.-A.

Table 9.23.3.5.-A
Fasteners for Subflooring and for Sheathing where the 1-in-50 HWP < 0.8 kPa and $S_a(0.2) \leq 0.70$
 Forming Part of Sentence 9.23.3.5.(1)

Element	Minimum Length of Fasteners, mm				Minimum Number or Maximum Spacing of Fasteners
	Common or Spiral Nails	Ring Thread Nails or Screws	Roofing Nails	Staples	
Board lumber 184 mm or less wide	51	45	n/a	51	2 per support
Board lumber more than 184 mm wide	51	45	n/a	51	3 per support
Fibreboard sheathing up to 13 mm thick	n/a	n/a	44	28	150 mm o.c. along edges and 300 mm o.c. along intermediate supports
Gypsum sheathing up to 13 mm thick	n/a	n/a	44	n/a	
Plywood, OSB or waferboard up to 10 mm thick	51	45	n/a	38	
Plywood, OSB or waferboard over 10 mm and up to 20 mm thick	51	45	n/a	51	
Plywood, OSB or waferboard over 20 mm and up to 25 mm thick	57	51	n/a	n/a	

- (2) Fastening of roof sheathing and sheathing in required *braced wall panels* shall conform to Table 9.23.3.5.-B, where
 - (a) the 1-in-50 hourly wind pressure (HWP) is equal to or greater than 0.8 kPa and less than 1.2 kPa and the seismic spectral acceleration, $S_a(0.2)$, is not more than 0.90, or
 - (b) the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.70 and not more than 0.90.
- (3) Fastening of roof sheathing and sheathing in required *braced wall panels* shall conform to Table 9.23.3.5.-C, where
 - (a) the 1-in-50 hourly wind pressure (HWP) is equal to or greater than 0.8 kPa and less than 1.2 kPa and the spectral acceleration, $S_a(0.2)$, is not more than 1.8, or
 - (b) the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.90 and not more than 1.8.
- (4) Fastening of sheathing shall conform to Part 4,
 - (a) where the 1-in-50 hourly wind pressure is equal to or greater than 1.2 kPa, or
 - (b) for required *braced wall panels*, where the seismic spectral acceleration, $S_a(0.2)$, is greater than 1.8.
- (5) Staples shall not be less than 1.6 mm in diameter or thickness, with not less than a 9.5 mm crown driven with the crown parallel to framing.

Table 9.23.3.5.-B
Fasteners for Sheathing where $0.8 \text{ kPa} \leq 1\text{-in-50 HWP} < 1.2 \text{ kPa}$ and $S_a(0.2) \leq 0.90$ or where $0.70 < S_a(0.2) \leq 0.90$
 Forming Part of Sentence 9.23.3.5.(2)

Element	Minimum Length of Fasteners, mm			Minimum Number or Maximum Spacing of Fasteners
	Common, Spiral or Ring Thread Nails	Screws	14-gauge Staples	
Board lumber 184 mm or less wide	63	51	63	2 per support
Board lumber more than 184 mm wide	63	51	63	3 per support
Plywood, OSB or waferboard up to 20 mm thick ⁽¹⁾	63	51	63	150 mm o.c. along edges and 300 mm o.c. along intermediate supports; and for roof sheathing where HWP is equal to or greater than 0.8 kPa and less than 1.2 kPa, 50 mm o.c. within 1 m of the edges of the roof
Plywood, OSB or waferboard over 20 mm and up to 25 mm thick	63	57	n/a	

Notes to Table 9.23.3.5.-B:

(1) See Note A-Table 9.23.3.5.-B.

Table 9.23.3.5.-C
Fasteners for Sheathing where $0.8 \text{ kPa} \leq 1\text{-in-50 HWP} < 1.2 \text{ kPa}$ and $S_a(0.2) \leq 1.8$ or where $0.90 < S_a(0.2) \leq 1.8$
 Forming Part of Sentence 9.23.3.5.(3)

Element	Minimum Length of Fasteners, mm		Minimum Number or Maximum Spacing of Fasteners
	Common, Spiral or Ring Thread Nails	Screws	
Plywood, OSB or waferboard up to 20 mm thick ⁽¹⁾	63	51	75 mm o.c. along edges and 300 mm o.c. along intermediate supports; and for roof sheathing where 1-in-50 HWP is equal to or greater than 0.8 kPa and less than 1.2 kPa, 50 mm o.c. within 1 m of the edges of the roof
Plywood, OSB or waferboard over 20 mm and up to 25 mm thick	63	57	

Notes to Table 9.23.3.5.-C:

(1) See Note A-Table 9.23.3.5.-B.

(6) Roofing nails for the attachment of fibreboard or gypsum sheathing shall not be less than 3.2 mm in diameter with a minimum head diameter of 11.1 mm.

(7) Flooring screws shall not be less than 3.2 mm in diameter.

(7.1) Where roof sheathing supports are spaced at more than 400 mm o.c., the maximum spacing of fasteners for roof sheathing shall be 150 mm along edges and intermediate supports.

(8) The edges of sheathing in a *braced wall panel* shall be supported and fastened to wood blocking where

- the seismic spectral acceleration, $S_a(0.2)$, is greater than 1.2, or
- the *braced wall panel* supports more than a roof of lightweight construction.

9.23.4. Maximum Spans

9.23.4.1. Application

- (1) Spans provided in this Subsection for joists, beams and lintels supporting floors shall apply only where
 - (a) the floors serve residential areas as described in Table 4.1.5.3., or
 - (b) the uniformly distributed *live load* on the floors does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) Spans for joists, beams and lintels supporting floors shall be determined according to Subsection 4.1.3. where the supported floors
 - (a) serve other than residential areas, or
 - (b) support a uniform *live load* in excess of that specified for residential areas.

9.23.4.2. Spans for Joists, Rafters and Beams (See Note A-9.23.4.2.)

- (1) Except as required in Sentence (2) and Article 9.23.14.10., spans for wood joists and rafters shall conform to the spans shown in Span Tables 9.23.4.2.-A to 9.23.4.2.-G for the uniform *live loads* shown in the Tables. (See Article 9.4.2.2.)
- (2) Spans for floor joists that are not selected from Span Tables 9.23.4.2.-A and 9.23.4.2.-B and that are required to be designed for the same loading conditions, shall not exceed the design requirements for uniform loading and vibration criteria. (See Note A-9.23.4.2.(2))
- (3) Spans for built-up wood and glued-laminated timber floor beams shall conform to the spans in Span Tables 9.23.4.2.-H to 9.23.4.2.-K. (See Article 9.4.2.2.)
- (4) Spans for roof ridge beams shall conform to the spans in Span Table 9.23.4.2.-L for the uniform snow load shown. (See Articles 9.4.2.2. and 9.23.14.8.)

9.23.4.3. Steel Beams

- (1) The spans for steel beams with laterally supported top flanges shall conform to Table 9.23.4.3. for floors and Span Tables 9.23.4.3.-A to 9.23.4.3.-J for roofs and floors. (See Note A-9.23.4.3.(1))
- (2) Beams described in Sentence (1) shall at least meet the requirements for Grade 350 W steel in CSA G40.21, “Structural quality steel.”
- (3) A beam may be considered to be laterally supported if
 - (a) the wood joists bear on its top flange at intervals of 600 mm or less over its entire length,
 - (b) the load being applied to this beam is transmitted through the joists, and
 - (c) 19 mm by 38 mm wood strips in contact with the top flange are nailed on both sides of the beam to the bottom of the joist supported.

Table 9.23.4.3.
Maximum Spans for Steel Beams Supporting Floors in Dwelling Units⁽¹⁾
 Forming Part of Sentence 9.23.4.3.(1)

Section	Supported Joist Length, m (Half the sum of joist spans on both sides of the beam)						
	2.4	3.0	3.6	4.2	4.8	5.4	6.0
	One Storey Supported						
W150 × 22	5.5	5.2	4.9	4.8	4.6	4.5	4.3
W200 × 21	6.5	6.2	5.9	5.7	5.4	5.1	4.9
W200 × 27	7.3	6.9	6.6	6.3	6.1	5.9	5.8
W200 × 31	7.8	7.4	7.1	6.8	6.6	6.4	6.2
W250 × 24	8.1	7.6	7.3	7.0	6.6	6.2	5.9
W250 × 33	9.2	8.7	8.3	8.0	7.7	7.5	7.3
W250 × 39	10.0	9.4	9.0	8.6	8.4	8.1	7.9
W310 × 31	10.4	9.8	9.4	8.9	8.4	8.0	7.6
W310 × 39	11.4	10.7	10.2	9.8	9.5	9.2	9.0
	Two Storeys Supported						
W150 × 22	4.9	4.4	4.1	3.8	3.5	3.4	3.2
W200 × 21	5.6	5.1	4.6	4.3	4.1	3.8	3.7
W200 × 27	6.4	6.1	5.6	5.3	4.9	4.7	4.4
W200 × 31	6.9	6.5	6.2	5.8	5.4	5.1	4.9
W250 × 24	6.8	6.1	5.6	5.2	4.9	4.6	4.4
W250 × 33	8.2	7.7	7.0	6.5	6.1	5.8	5.5
W250 × 39	8.8	8.3	7.8	7.2	6.8	6.4	6.1
W310 × 31	8.7	7.8	7.2	6.7	6.2	5.9	5.6
W310 × 39	10.0	9.3	8.5	7.9	7.4	7.0	6.7

Notes to Table 9.23.4.3.:

(1) See Note A-Table 9.23.4.3.

9.23.4.4. Concrete Topping (See Note A-9.23.4.4.)

(1) Except as permitted in Sentence (2), where a floor is required to support a concrete topping, the joist spans shown Span Table 9.23.4.2.-A or the spacing of the members shall be reduced to allow for the loads due to the topping.

(2) Where a floor is required to support a concrete topping, joist spans are permitted to be selected from Span Table 9.23.4.2.-B provided the concrete

- (a) is 38 to 51 mm thick,
- (b) is normal weight,
- (c) is placed directly on the subflooring, and
- (d) has not less than 20 MPa compressive strength after 28 days.

(3) Where a floor is required to support a concrete topping not more than 51 mm thick, the allowable beam spans shown in Span Tables 9.23.4.2.-H to 9.23.4.2.-K shall be multiplied by 0.8 or the supported length of the floor joists shall be reduced to allow for the loads due to the topping.

9.23.4.5. Heavy Roofing Materials

- (1) Where a roof is required to support an additional uniform *dead load* from roofing materials such as concrete roofing tile, or materials other than as specified in Section 9.26., such as clay roofing tiles, the additional load shall be allowed for by reducing
- (a) the spans for roof joists and rafters in Span Tables 9.23.4.2.-D to 9.23.4.2.-G, or the spacing of the members, and
 - (b) the spans for ridge beams and lintels in Span Tables 9.23.4.2.-L and 9.23.12.3.-A to 9.23.12.3.-D.
- (See Note A-9.23.4.2.)

9.23.5. Notching and Drilling

9.23.5.1. Holes Drilled in Framing Members

- (1) Holes drilled in roof, floor or ceiling framing members shall be not larger than one-quarter the depth of the member and shall be located not less than 50 mm from the edges, unless the depth of the member is increased by the size of the hole.

9.23.5.2. Notching of Framing Members

- (1) Floor, roof and ceiling framing members are permitted to be notched provided the notch is located on the top of the member within half the joist depth from the edge of bearing and is not deeper than one-third the joist depth, unless the depth of the member is increased by the size of the notch.

9.23.5.3. Wall Studs

- (1) Wall studs shall not be notched, drilled or otherwise damaged so that the undamaged portion of the stud is less than two-thirds the depth of the stud if the stud is *loadbearing* or 40 mm if the stud is *non-loadbearing*, unless the weakened studs are suitably reinforced.

9.23.5.4. Top Plates

- (1) Top plates in walls shall not be notched, drilled or otherwise weakened to reduce the undamaged width to less than 50 mm unless the weakened plates are suitably reinforced.

9.23.5.5. Roof Trusses

- (1) Roof truss members shall not be notched, drilled or otherwise weakened unless such notching or drilling is allowed for in the design of the truss.

9.23.6. Anchorage

9.23.6.1. Anchorage of Building Frames

- (1) Except as required by Sentence 9.23.6.3.(1), *building* frames shall be anchored to the *foundation* unless a structural analysis that considers wind and earthquake loads and lateral earth pressures shows that anchorage is not required
- (2) Except as provided in Sentences (3) to (6), anchorage shall be provided by
- (a) embedding the ends of the first floor joists in concrete, or
 - (b) fastening the sill plate to the *foundation* with not less than 12.7 mm diam anchor bolts spaced not more than 2.4 m o.c.

- (3) For *buildings* with 2 or more floors supported by frame walls that are in areas where the seismic spectral acceleration, $S_a(0.2)$, is not greater than 0.70 or the 1-in-50 hourly wind pressure (HWP) is equal to or greater than 0.80 kPa but not greater than 1.20 kPa, anchorage shall be provided by fastening the sill plate to the *foundation* with not less than two anchor bolts per *braced wall panel*, where all anchor bolts used are
- (a) not less than 15.9 mm in diameter, located within 0.5 m of the end of the *foundation*, and spaced not more than 2.4 m o.c. or
 - (b) not less than 12.7 mm in diameter, located within 0.5 m of the end of the *foundation*, and spaced not more than 1.7 m o.c.
- (4) For *buildings* supported by frame walls that are in areas where the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.70 but not greater than 1.8 and the 1-in-50 hourly wind pressure (HWP) is not greater than 1.20 kPa, anchorage shall be provided by fastening the sill plate to the *foundation* with not less than two anchor bolts per *braced wall panel* located within 0.5 m of the end of the *foundation* and spaced in accordance with Table 9.23.6.1.
- (5) Anchor bolts referred to in Sentences (2) to (4) shall be
- (a) fastened to the sill plate with nuts and washers,
 - (b) embedded not less than 100 mm in the *foundation*, and
 - (c) so designed that they may be tightened without withdrawing them from the *foundation*.

Table 9.23.6.1.
Anchor Bolt Spacing where the 1-in-50 HWP \leq 1.20 kPa and $0.70 < S_a(0.2) \leq 1.8$
 Forming Part of Sentence 9.23.6.1.(4)

Anchor Bolt Diameter, mm	$S_a(0.2)$	Maximum Spacing of Anchor Bolts Along Braced Wall Band, m				
		Light Construction			Heavy Construction ⁽¹⁾	
		Number of Floors Supported ⁽²⁾				
		1	2	3	1	2
12.7	$0.70 < S_a(0.2) \leq 0.80$	2.4	2.3	1.8	2.4	2.0
	$0.80 < S_a(0.2) \leq 0.90$	2.4	2.3	1.8	2.4	2.0
	$0.90 < S_a(0.2) \leq 1.0$	2.4	2.2	1.5	2.4	1.8
	$1.0 < S_a(0.2) \leq 1.1$	2.4	2.1	1.4	2.4	1.6
	$1.1 < S_a(0.2) \leq 1.2$	2.4	2.0	1.3	2.4	1.5
	$1.2 < S_a(0.2) \leq 1.3$	2.4	1.9	1.3	2.4	1.5
	$1.3 < S_a(0.2) \leq 1.35$	2.4	1.8	1.2	2.3	1.4
	$1.35 < S_a(0.2) \leq 1.8$	2.4	1.8	1.1	2.3	1.4
15.9	$0.70 < S_a(0.2) \leq 0.80$	2.4	2.4	2.2	2.4	2.4
	$0.80 < S_a(0.2) \leq 0.90$	2.4	2.4	2.2	2.4	2.4
	$0.90 < S_a(0.2) \leq 1.0$	2.4	2.4	2.1	2.4	2.3
	$1.0 < S_a(0.2) \leq 1.1$	2.4	2.4	1.9	2.4	2.3
	$1.1 < S_a(0.2) \leq 1.2$	2.4	2.4	1.9	2.4	2.2
	$1.2 < S_a(0.2) \leq 1.3$	2.4	2.4	1.8	2.4	2.1
	$1.3 < S_a(0.2) \leq 1.35$	2.4	2.3	1.7	2.4	2.0
	$1.35 < S_a(0.2) \leq 1.8$	2.4	2.2	1.6	2.4	1.9

Notes to Table 9.23.6.1.:

- (1) See Note A-9.23.13.2.(1)(a)(i).
- (2) All constructions include support of a roof load in addition to the indicated number of floors.

(6) Where the seismic spectral acceleration, $S_a(0.2)$, is greater than 1.8 or the 1-in-50 hourly wind pressure is equal to or greater than 1.2 kPa, anchorage shall be designed according to Part 4.

9.23.6.2. Anchorage of Columns and Posts

- (1) Except as provided in Sentences (2) and (3), exterior columns and posts shall be anchored to resist uplift and lateral movement.
- (2) Except as provided in Sentence (3), where columns or posts support balconies, decks, verandas and other exterior platforms, and the distance from finished ground to the underside of the joists is not more than 600 mm,
 - (a) the columns or posts shall be anchored to the *foundation* to resist uplift and lateral movement, or
 - (b) the supported joists or beams shall be directly anchored to the ground to resist uplift.
- (3) Anchorage is not required for platforms described in Sentence (2) that
 - (a) are not more than 1 *storey* in height,
 - (b) are not more than 55 m² in area,
 - (c) do not support a roof, and
 - (d) are not attached to another structure, unless it can be demonstrated that differential movement will not adversely affect the performance of the structure to which the platform is attached.

9.23.6.3. Anchorage of Smaller Buildings

(1) *Buildings* not more than 4.3 m wide and not more than 1 *storey* in *building height* that are not anchored in accordance with Sentence 9.23.6.1.(1) shall be anchored in conformance with the requirements of CSA Z240.10.1, “Site preparation, foundation, and installation of buildings.”

9.23.7. Sill Plates

9.23.7.1. Size of Sill Plates

(1) Where sill plates provide bearing for the floor system, they shall be not less than 38 mm by 89 mm material.

9.23.7.2. Levelling and Sealing of Sill Plates

- (1) Sill plates shall be
 - (a) levelled by setting them on a full bed of mortar, or
 - (b) laid directly on the *foundation* where the top of the *foundation* is level.(See also Article 9.23.2.3.)
- (2) The joint between the sill plate for exterior walls and the *foundation* shall be sealed in accordance with Subsection 9.25.3.

9.23.8. Beams to Support Floors

9.23.8.1. Bearing for Beams

(1) Beams shall have even and level bearing and the bearing at end supports shall be not less than 89 mm long, except as stated in the notes to Span Tables 9.23.4.2.-H to 9.23.4.2.-K.

9.23.8.2. Priming of Steel Beams

- (1) Exterior steel beams shall be shop primed with rust-inhibitive paint.

9.23.8.3. Built-up Wood Beams (See Note A-9.23.8.3.)

- (1) Where a beam is made up of individual pieces of lumber that are nailed together, the individual members shall be 38 mm or greater in thickness and installed on edge.
- (2) Except as permitted in Sentence (3), where individual members of a built-up beam are butted together to form a joint, the joint shall occur over a support.
- (3) Where a beam is continuous over more than one span, individual members are permitted to be butted together to form a joint at or within 150 mm of the end quarter points of the clear spans, provided the quarter points are not those closest to the ends of the beam.
- (4) Members joined at quarter points shall be continuous over adjacent supports.
- (5) Joints in individual members of a beam that are located at or near the end quarter points shall not occur in adjacent members at the same quarter point and shall not reduce the effective beam width by more than half.
- (6) Not more than one butt joint shall occur in any individual member of a built-up beam within any one span.
- (7) Except as provided in Sentence (8), where 38 mm members are laid on edge to form a built-up beam, individual members shall be nailed together with a double row of nails not less than 89 mm in length, spaced not more than 450 mm apart in each row with the end nails located 100 mm to 150 mm from the end of each piece.
- (8) Where 38 mm members in built-up wood beams are not nailed together as provided in Sentence (7), they shall be bolted together with not less than 12.7 mm diam bolts equipped with washers and spaced not more than 1.2 m o.c., with the end bolts located not more than 600 mm from the ends of the members.

9.23.9. Floor Joists

9.23.9.1. End Bearing for Joists

- (1) Except when supported on ribbon boards, floor joists shall have not less than 38 mm length of end bearing.
- (2) Ribbon boards referred to in Sentence (1) shall be not less than 19 mm by 89 mm lumber let into the studs.

9.23.9.2. Joists Supported by Beams

- (1) Floor joists may be supported on the tops of beams or may be framed into the sides of beams.
- (2) When framed into the side of a wood beam, joists referred to in Sentence (1) shall be supported on
 - (a) joist hangers or other acceptable mechanical connectors, or
 - (b) not less than 38 mm by 64 mm ledger strips nailed to the side of the beam, except that 38 mm by 38 mm ledger strips may be used provided each joist is nailed to the beam by at least four 89 mm nails, in addition to the nailing for the ledger strip required in Table 9.23.3.4.
- (3) When framed into the side of a steel beam, joists referred to in Sentence (1) shall be supported on the bottom flange of the beam or on not less than 38 mm by 38 mm lumber bolted to the web with not less than 6.3 mm diam bolts spaced not more than 600 mm apart.

(4) Joists referred to in Sentence (3) shall be spliced above the beam with not less than 38 mm by 38 mm lumber at least 600 mm long to support the flooring.

(5) Not less than a 12 mm space shall be provided between the splice required in Sentence (4) and the beam to allow for shrinkage of the wood joists.

9.23.9.3. Restraint of Joist Bottoms

(1) Except as provided in Sentence 9.23.9.4.(1), bottoms of floor joists shall be restrained from twisting at each end by toe-nailing to the supports, end-nailing to the header joists or by providing continuous strapping, blocking between the joists or cross-bridging near the supports.

9.23.9.4. Strapping, Bridging, Furring and Ceilings in Span Tables 9.23.4.2.-A and 9.23.4.2.-B (See Note A-9.23.4.2.(2))

(1) Except as permitted by Sentence (5), where strapping is specified in Span Table 9.23.4.2.-A, it shall be

- (a) not less than 19 mm by 64 mm, nailed to the underside of floor joists,
- (b) located not more than 2 100 mm from each support or other rows of strapping, and
- (c) fastened at each end to a sill or header.

(2) Where bridging is specified in Span Table 9.23.4.2.-A, it shall consist of not less than 19 mm by 64 mm or 38 mm by 38 mm cross bridging located not more than 2 100 mm from each support or other rows of bridging.

(3) Where bridging and strapping are specified in Span Table 9.23.4.2.-A,

- (a) bridging shall
 - (i) comply with Sentence (2), or
 - (ii) consist of 38 mm solid blocking located not more than 2 100 mm from each support or other rows of bridging and securely fastened between the joists, and
- (b) except as provided in Sentence (5), strapping shall comply with Sentence (1) and be installed under the bridging.

(4) Bridging specified in Span Table 9.23.4.2.-B shall consist of

- (a) bridging as described in Sentence (2), or
- (b) 38 mm solid blocking located not more than 2 100 mm from each support or other rows of bridging and securely fastened between the joists.

(5) Strapping described in Sentence (1) and Clause (3)(b) is not required where

- (a) furring strips complying with Table 9.29.3.1. are fastened directly to the joists, or
- (b) a panel-type ceiling finish complying with Subsection 9.29.5., 9.29.6., 9.29.7., 9.29.8., or 9.29.9. is attached directly to the joists.

(6) Where a ceiling attached to wood furring is specified in Span Table 9.23.4.2.-B,

- (a) the ceiling finish shall consist of gypsum board, plywood or OSB not less than 12.7 mm thick, and
- (b) the furring shall be,
 - (i) 19 mm by 89 mm wood furring spaced at not more than 600 mm o.c., or
 - (ii) 19 mm by 64 mm wood furring spaced at not more than 400 mm o.c.

9.23.9.5. Header Joists

(1) Header joists around floor openings shall be doubled when they exceed 1.2 m in length.

(2) The size of header joists exceeding 3.2 m in length shall be determined by calculations.

9.23.9.6. Trimmer Joists

- (1) Trimmer joists around floor openings shall be doubled when the length of the header joist exceeds 800 mm.
- (2) When the header joist exceeds 2 m in length the size of the trimmer joists shall be determined by calculations.

9.23.9.7. Support of Tail and Header Joists

- (1) When tail joists and header joists are supported by the floor framing, they shall be supported by suitable joist hangers or nailing in accordance with Table 9.23.3.4.

9.23.9.8. Support of Walls

- (1) Non-loadbearing walls parallel to the floor joists shall be supported by joists beneath the wall or on blocking between the joists.
- (2) Blocking referred to in Sentence (1) for the support of non-loadbearing walls shall be
 - (a) not less than 38 mm by 89 mm lumber, and
 - (b) except as required for the fastening of walls constructed with required *braced wall panels*, spaced not more than 1.2 m apart.
- (3) Except as provided in Sentence (6), non-loadbearing interior walls at right angles to the floor joists are not restricted as to location.
- (4) Loadbearing interior walls parallel to floor joists shall be supported by beams or walls of sufficient strength to safely transfer the design loads to the vertical supports.
- (5) Unless the joist size is designed to support such loads, loadbearing interior walls at right angles to floor joists shall be located
 - (a) not more than 900 mm from the joist support where the wall does not support a floor, and
 - (b) not more than 600 mm from the joist support where the wall supports one or more floors.
- (6) Loadbearing and non-loadbearing walls constructed with required *braced wall panels* shall be continuously supported by floor joists, blocking or *rim joists* to allow for the required fastening. (See Table 9.23.3.4.)

9.23.9.9. Cantilevered Floor Joists

- (1) Floor joists supporting roof loads shall not be cantilevered more than 400 mm beyond their supports where 38 mm by 184 mm joists are used and not more than 600 mm beyond their supports where 38 mm by 235 mm or larger joists are used.
- (2) The cantilevered portions referred to in Sentence (1) shall not support floor loads from other *storeys* unless calculations are provided to show that the design resistances of the cantilevered joists are not exceeded.
- (3) Where cantilevered floor joists described in Sentences (1) and (2) are at right angles to the main floor joists, the tail joists in the cantilevered portion shall extend inward away from the cantilever support a distance equal to not less than 6 times the length of the cantilever, and shall be end nailed to an interior doubled header joist in conformance with Table 9.23.3.4.

9.23.10. Wall Studs**9.23.10.1. Stud Size and Spacing**

(1) Except as provided in Sentence (2), the size and spacing of studs shall conform to Table 9.23.10.1.

Table 9.23.10.1.
Size and Spacing of Studs
Forming Part of Sentence 9.23.10.1.(1)

Type of Wall	Supported Loads (including <i>dead loads</i>)	Minimum Stud Size, mm	Maximum Stud Spacing, mm	Maximum Unsupported Height, m
Interior	No load	38 × 38	400	2.4
		38 × 89 flat ⁽¹⁾	400	3.6
	Attic not accessible by a stairway	38 × 64	600	3.0
		38 × 64 flat ⁽¹⁾	400	2.4
		38 × 89	600	3.6
		38 × 89 flat ⁽¹⁾	400	2.4
	Attic accessible by a stairway plus one floor Roof load plus one floor Attic not accessible by stairway plus 2 floors	38 × 89	400	3.6
	Roof load, Attic accessible by a stairway Attic not accessible by a stairway plus one floor	38 × 64	400	2.4
		38 × 89	600	3.6
	Attic accessible by a stairway plus 2 floors Roof load plus 2 floors	38 × 89	300	3.6
		64 × 89	400	3.6
		38 × 140	400	4.2
	Attic accessible by a stairway plus 3 floors Roof load plus 3 floors	38 × 140	300	4.2
Exterior	Roof with or without attic storage	38 × 64	400	2.4
		38 × 89	600	3.0
	Roof with or without attic storage plus one floor	38 × 89	400	3.0
		38 × 140	600	3.0
	Roof with or without attic storage plus 2 floors	38 × 89	300	3.0
		64 × 89	400	3.0
		38 × 140	400	3.6
	Roof with or without attic storage plus 3 floors	38 × 140	300	1.8

Notes to Table 9.23.10.1.:

(1) See Article 9.23.10.3.

(2) Studs for walls not listed in Table 9.23.10.1. and supporting roof loads shall conform to Span Tables 9.23.10.1.-A to 9.23.10.1.-D, provided

- (a) the studs are clad with not less than 9.5 mm thick plywood, OSB or waferboard sheathing on the exterior face, and not less than 12.5 mm gypsum board on the interior face,
- (b) solid bridging is provided at not more than 1.2 m o.c.,
- (c) the studs are fastened to the top and bottom plates with no fewer than three 82 mm toe nails,

- (d) the double top plates are fastened together with not less than 76 mm nails spaced not more than 200 mm o.c,
 - (e) roof framing members spaced not more than 600 mm are fastened to the top plates with no fewer than four 82 mm toe nails, and
 - (f) the bottom plate is fastened to the floor joists, blocking or rim joist with not less than 82 mm nails spaced not more than 200 mm o.c.
- (See Note A-9.23.10.1.(2))

9.23.10.2. Bracing and Lateral Support (See Note A-9.23.10.2.)

(0.1) Except as provided in Sentence (0.2), each exterior wall in each *storey* shall be braced with at least one diagonal brace conforming to Sentence (0.3).

(0.2) Bracing is not required where the walls

- (a) have an interior finish conforming to the requirements of Section 9.29., or
- (b) where the walls are
 - (i) clad with panel-type siding,
 - (ii) diagonally sheathed with lumber, or
 - (iii) sheathed with plywood, OSB, waferboard, gypsum or fibreboard sheathing.

(0.3) Where bracing is required, it shall

- (a) consist of not less than 19 mm by 89 mm wood members,
- (b) be applied to the studs at an angle of approximately 45° to the horizontal, and
- (c) extend the full height of the wall on each *storey*.

(0.4) Bracing described in Sentence (0.3) shall be nailed to each stud and wall plate by at least two 63 mm nails.

(1) Where *loadbearing* interior walls are not finished in accordance with Sentence (0.2), blocking or strapping shall be fastened to the studs at mid-height to prevent sideways buckling.

9.23.10.3. Orientation of Studs

(1) Except as permitted in Sentences (2) and (3), all studs shall be placed at right angles to the wall face.

(2) Studs on the flat are permitted to be used in gable ends of roofs that contain only unfinished space or in non-*loadbearing* interior walls within the limits described in Article 9.23.10.1.

(3) Wall studs that support only a load from an attic not accessible by a stairway are permitted to be placed on the flat within the limits permitted in Article 9.23.10.1. provided

- (a) the studs are clad on at least one side with plywood, OSB or waferboard sheathing fastened to the face of the studs with a structural adhesive, and
- (b) the portion of the roof supported by the studs does not exceed 2.1 m in width.

9.23.10.4. Continuity of Studs

(1) Wall studs shall be continuous for the full *storey* height except at openings and shall not be spliced except by finger-jointing with a structural adhesive. (See Note A-9.23.10.4.(1))

9.23.10.5. Support for Cladding Materials

(1) Corners and intersections shall be designed to provide adequate support for the vertical edges of interior finishes, sheathing and cladding materials, and in no instance shall exterior corners be framed with less than the equivalent of two studs.

(2) Where the vertical edges of interior finishes at wall intersections are supported at vertical intervals by blocking or furring, the vertical distance between such supports shall not exceed the maximum distance between supports specified in Section 9.29.

9.23.10.6. Studs at Sides of Openings

(1) Where the lintel spanning the opening is more than 3 m long, studs shall be tripled on each side of the opening so that

- (a) the two inner studs on each side extend from the bottom of the supported lintel to the top of the bottom wall plate, and
- (b) the outer stud on each side extends from the bottom of the top wall plate to the bottom wall plate.

(2) Except as provided in Sentence (3), where the lintel spanning the opening is not more than 3 m long, studs shall be doubled on each side of the opening so that

- (a) the inner studs on each side extend from the bottom of the supported lintel to the top of the bottom wall plate, and
- (b) the outer stud on each side extends from the bottom of the top wall plate to the bottom wall plate.

(3) Single studs are permitted to be used on either side of openings

- (a) in *non-loadbearing* interior walls not required to have *fire-resistance ratings*, provided the studs extend from the top wall plate to the bottom wall plate, or
- (b) in *loadbearing* or *non-loadbearing* interior or exterior walls, provided
 - (i) the opening is less than and within the required stud spacing, and
 - (ii) no 2 such openings of full stud-space width are located in adjacent stud spaces.

(See Note A-9.23.10.6.(3))

9.23.10.7. Stud Posts Built into Walls

(1) Except as provided in Sentences (2) and (3), stud posts shall be designed in accordance with Part 4.

(2) The number of studs in a wall directly below a girder truss or roof beam shall conform to Tables 9.23.10.7-A to 9.23.10.7-D, provided

- (a) the studs are fastened together to form a post in accordance with Sentence 9.17.4.2.(2),
- (b) the wall is not less than 1.2 m long and sheathed on at least one side with plywood, OSB, waferboard or gypsum sheathing, and
- (c) the wall sheathing is fastened to the stud post with at least one row of fasteners conforming to Article 9.23.3.5. and spaced not more than 150 mm o.c.

(See Note A-9.23.10.7.(2))

(3) The width of the stud post shall be not less than the width of the girder or beam that it supports.

9.23.11. Wall Plates

9.23.11.1. Size of Wall Plates

(1) Except as provided in Sentence (2), wall plates shall be

- (a) not less than 38 mm thick, and
- (b) not less than the required width of the wall studs.

(2) In *non-loadbearing* walls and in *loadbearing* walls where the studs are located directly over framing members, the bottom wall plate may be 19 mm thick.

9.23.11.2. Bottom Wall Plates

- (1) A bottom wall plate shall be provided in all cases.
- (2) The bottom plate in exterior walls shall not project more than one-third the plate width over the support.

9.23.11.3. Top Plates

- (1) Except as permitted in Sentences (2) to (4), at least 2 top plates shall be provided in *loadbearing* walls.
- (2) A single top plate is permitted to be used in a section of a *loadbearing* wall containing a lintel provided the top plate forms a tie across the lintel.
- (3) A single top plate is permitted to be used in *loadbearing* walls where the concentrated loads from ceilings, floors and roofs are not more than 50 mm to one side of the supporting studs and in all non-*loadbearing* walls.
- (4) The top plates need not be provided in a section of *loadbearing* wall containing a lintel provided the lintel is tied to the adjacent wall section with not less than
 - (a) 75 mm by 150 mm by 0.91 mm thick galvanized steel, or
 - (b) 19 mm by 89 mm by 300 mm wood splice nailed to each wall section with at least three 63 mm nails.

9.23.11.4. Joints in Top Plates

- (1) Joints in the top plates of *loadbearing* walls shall be staggered not less than one stud spacing.
- (2) The top plates in *loadbearing* walls shall be lapped or otherwise tied at corners and intersecting walls in accordance with Sentence (4).
- (3) Joints in single top plates used with *loadbearing* walls shall be tied in accordance with Sentence (4).
- (4) Ties referred to in Sentences (2) and (3) shall be the equivalent of not less than 75 mm by 150 mm by 0.91 mm thick galvanized steel nailed to each wall with at least three 63 mm nails.
- (5) Where the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.70 but not more than 1.8, doubled top plates in *braced wall bands* shall be fastened on each side of a splice with 76 mm long common steel wire nails or spiral nails in accordance with Table 9.23.11.4.

Table 9.23.11.4.
Fasteners in Doubled Top Plate Splice Connections in Braced Wall Bands where $0.70 < S_a(0.2) \leq 1.8$
 Forming Part of Sentence 9.23.11.4.(5)

$S_a(0.2)$	Minimum Number of Nails on Each Side of Doubled Top Plate Splice				
	Light Construction			Heavy Construction ⁽¹⁾	
	Number of Supported Floors ⁽²⁾				
	0	1	2	0	1
$0.70 < S_a(0.2) \leq 0.80$	2	5	8	3	8
$0.80 < S_a(0.2) \leq 0.90$	2	5	8	4	8
$0.90 < S_a(0.2) \leq 1.0$	3	6	10	4	10
$1.0 < S_a(0.2) \leq 1.1$	3	7	11	5	11
$1.1 < S_a(0.2) \leq 1.2$	3	7	11	5	12
$1.2 < S_a(0.2) \leq 1.3$	3	8	12	5	12
$1.3 < S_a(0.2) \leq 1.35$	4	8	12	5	13
$1.35 < S_a(0.2) \leq 1.8$	4	8	13	5	13

Notes to Table 9.23.11.4.:

(1) See Note A-9.23.13.2.(1)(a)(i).

(2) All constructions include support of a roof load in addition to the number of floors indicated.

9.23.12. Framing Over Openings

9.23.12.1. Openings in Non-Loadbearing Walls

(1) Except as provided in Sentence (2), openings in *non-loadbearing* walls shall be framed with not less than 38 mm material the same width as the studs, securely nailed to adjacent studs.

(2) Openings for doors in *non-loadbearing* walls required to be *fire separations* with a *fire-resistance rating* shall be framed with the equivalent of at least two 38 mm thick members that are the same width as the wall plates.

9.23.12.2. Openings in Loadbearing Walls

(1) Openings in *loadbearing* walls greater than the required stud spacing shall be framed with lintels designed to carry the superimposed loads to adjacent studs. (See Note A-9.23.10.6.(3))

(2) Except as provided in Sentence 9.23.12.3.(2), where 2 or more members are used in lintels, they shall be fastened together with not less than 82 mm nails in a double row, with nails not more than 450 mm apart in each row.

(3) Lintel members are permitted to be separated by filler pieces.

9.23.12.3. Lintel Spans and Sizes

- (1) Spans and sizes of wood lintels shall conform to the spans shown in Span Tables 9.23.4.2.-L and 9.23.12.3.-A to 9.23.12.3.-D
 - (a) for *buildings of residential occupancy*,
 - (b) where the wall studs exceed 38 mm by 64 mm in size,
 - (c) where the spans of supported joists do not exceed 4.9 m, and
 - (d) where the spans of trusses do not exceed 9.8 m.
- (2) In *loadbearing* exterior and interior walls of 38 mm by 64 mm framing members, lintels shall consist of
 - (a) 64 mm thick members on edge, or
 - (b) 38 mm thick and 19 mm thick members fastened together with a double row of nails not less than 63 mm long and spaced not more than 450 mm apart.
- (3) Lintels referred to in Sentence (2)
 - (a) shall be not less than 50 mm greater in depth than those shown in Span Tables 9.23.4.2.-L and 9.23.12.3.-A to 9.23.12.3.-D for the maximum spans shown, and
 - (b) shall not exceed 2.24 m in length.

9.23.13. Bracing to Resist Lateral Loads Due to Wind and Earthquake

(See Note A-9.23.13.)

9.23.13.1. Requirements for Low to Moderate Wind and Seismic Forces

(See Note A-9.23.13.1.)

- (1) This Article applies in locations where the seismic spectral acceleration, $S_a(0.2)$, is not more than 0.70 and the 1-in-50 hourly wind pressure is less than 0.80 kPa.
- (2) Bracing to resist lateral loads shall be designed and constructed as follows:
 - (a) exterior walls shall be
 - (i) clad with panel-type cladding in accordance with Section 9.27.,
 - (ii) sheathed with plywood, OSB, waferboard, fibreboard, gypsum board or diagonal lumber sheathing complying with Subsection 9.23.17. and fastened in accordance with Table 9.23.3.5.-A, or
 - (iii) finished on the interior with a panel-type material in accordance with the requirements of Section 9.29., or
 - (b) in accordance with
 - (i) Articles 9.23.13.4. to 9.23.13.7.,
 - (ii) Part 4, or
 - (iii) good engineering practice such as that provided in CWC 2014, “Engineering Guide for Wood Frame Construction.”

9.23.13.2. Requirements for High Wind and Seismic Forces

- (1) Except as provided in Article 9.23.13.1., this Article applies in locations where
 - (a) the seismic spectral acceleration, $S_a(0.2)$, is greater than 0.70 but not more than 1.8 and
 - (i) the lowest exterior frame wall supports not more than 1 floor in *buildings* of heavy construction, or (See Note A-9.23.13.2.(1)(a)(i))
 - (ii) the lowest exterior frame wall supports not more than 2 floors in other types of construction, and
 - (b) the 1-in-50 hourly wind pressure is less than 1.20 kPa.
- (2) Bracing to resist lateral loads shall be designed and constructed in accordance with
 - (a) Articles 9.23.13.4. to 9.23.13.7.,
 - (b) Part 4, or
 - (c) good engineering practice such as that provided in CWC 2014, “Engineering Guide for Wood Frame Construction.”

9.23.13.3. Requirements for Extreme Wind and Seismic Forces

- (1) Except as provided in Articles 9.23.13.1. and 9.23.13.2., this Article applies in locations where
 - (a) the seismic spectral acceleration, $S_a(0.2)$, is
 - (i) greater than 1.8,
 - (ii) greater than 0.70 and the lowest exterior frame wall supports more than 2 floors in *buildings* of light construction, or
 - (iii) greater than 0.70 and the lowest exterior frame wall supports more than 1 floor in *buildings* of heavy construction, or
 - (b) the 1-in-50 hourly wind pressure is equal to or greater than 1.20 kPa.
- (2) Bracing to resist lateral loads shall be designed and constructed in accordance with
 - (a) Part 4, or
 - (b) good engineering practice such as that provided in CWC 2014, “Engineering Guide for Wood Frame Construction.”

9.23.13.4. Braced Wall Bands (See Note A-9.23.13.4.)

- (1) *Braced wall bands* shall
 - (a) be full *storey* height,
 - (b) be not more than 1.2 m wide,
 - (c) lap at both ends with another *braced wall band*,
 - (d) be aligned with *braced wall bands* on *storeys* above and below, and
 - (e) conform to the spacing and dimensions given in Table 9.23.13.5.
- (2) The perimeter of the *building* shall be located within *braced wall bands*.
- (3) For split-level *buildings*, a *braced wall band* shall be located where there is a change in floor level greater than the depth of one floor joist.

9.23.13.5. Braced Wall Panels in Braced Wall Bands

- (1) Except as provided in Sentences (2) to (5) and Article 9.23.13.7., *braced wall panels* shall
 - (a) be located within *braced wall bands*,
 - (b) extend, as applicable, from the top of the supporting footing, slab or subfloor to the underside of the floor, ceiling or roof framing above, and
 - (c) conform to the spacing and dimensions given in Table 9.23.13.5.
- (2) In *basements* or crawl spaces where the perimeter *foundation* walls extend from the footings to the underside of the supported floor, *braced wall bands* constructed with *braced wall panels* shall be spaced not more than
 - (a) 15 m from the perimeter *foundation* walls,
 - (b) 15 m from interior *foundation* walls, and
 - (c) 15 m from adjacent *braced wall bands* constructed with *braced wall panels*.(See Note A-9.23.13.5.(2))

Table 9.23.13.5.
Spacing and Dimensions of Braced Wall Bands and Braced Wall Panels
 Forming Part of Sentences 9.23.13.4.(1) and 9.23.13.5.(1)

Description	Spacing and Dimensions of <i>Braced Wall Bands</i> and <i>Braced Wall Panels</i> ⁽¹⁾⁽²⁾⁽³⁾	
	Seismic and Wind Loads	
	0.70 < S _a (0.2) < 1.0	1.0 ≤ S _a (0.2) ≤ 1.8 or 0.80 ≤ HWP < 1.2 kPa
Maximum distance between centre lines of adjacent <i>braced wall bands</i> measured from the furthest points between centres of the bands	10.6 m	7.6 m
Maximum distance between required <i>braced wall panels</i> measured from the edges of the panels	6.4 m	6.4 m
Maximum distance from the end of a <i>braced wall band</i> to the edge of the closest required <i>braced wall panel</i>	2.4 m	2.4 m
Minimum length of individual <i>braced wall panels</i> : <ul style="list-style-type: none"> • panel located at the end of a <i>braced wall band</i> where the <i>braced wall panel</i> connects to an intersecting <i>braced wall panel</i> • panel not located at the end of a <i>braced wall band</i> or <i>braced wall panel</i> located at the end of a <i>braced wall band</i> where the <i>braced wall panel</i> does not connect to an intersecting <i>braced wall panel</i> 	600 mm	750 mm
Minimum total length of all <i>braced wall panels</i> in a <i>braced wall band</i> <ul style="list-style-type: none"> • supporting 3 floors, light construction • supporting 2 floors, heavy construction⁽⁴⁾ • supporting 2 floors, light construction • supporting 1 floor, heavy construction⁽⁴⁾ • supporting 1 floor, light construction • not supporting a floor 	75% of length of <i>braced wall band</i>	75% of length of <i>braced wall band</i> 40% of length of <i>braced wall band</i> 40% of length of <i>braced wall band</i> 25% of length of <i>braced wall band</i> 25% of length of <i>braced wall band</i>

Notes to Table 9.23.13.5.:

- (1) See Note A-Table 9.23.13.5.
 - (2) All constructions include support of a roof load in addition to the indicated number of floors.
 - (3) See Article 9.23.13.7. for alternative methods of compliance.
 - (4) See Sentence 9.23.13.3.(1) for overall limit on application to heavy construction.
- (3) Portions of the perimeter of a single open or enclosed space need not comply with Sentence (1), where
- (a) the roof of the space projects not more than
 - (i) 3.5 m from the face of the framing of the nearest parallel *braced wall band*, and
 - (ii) the perpendicular plan dimension,
 - (b) that portion of the perimeter structure does not support a floor,
 - (c) the roof of the space is
 - (i) integral with the roof of the rest of the *building* with framing members not more than 400 mm o.c. where roof sheathing edges are not supported on blocking and not more than 600 mm o.c. where roof sheathing edges are supported on blocking securely fastened between framing members, or
 - (ii) constructed with roof framing not more than 400 mm o.c. where roof sheathing edges are not supported on blocking and not more than 600 mm o.c. where roof sheathing edges are supported on blocking securely fastened between framing members, and fastened to the wall framing, and (See Table 9.23.3.4. and Article 9.23.9.1. for balloon framing)

- (d) the end-joists or end-rafters for the roof of the space are fastened to a 3-ply, 38 mm × 140 mm built-up column or a 5-ply, 38 mm × 89 mm built-up column that is integral with the wall framing.
(See Note A-9.23.13.5.(3))

(4) Walls in detached garages and in accessory *buildings* serving a single *dwelling unit*, and the front wall of attached garages serving a single *dwelling unit* need not comply with Sentence (1) where these walls do not support a floor.

(5) *Braced wall panels* in the *braced wall band* at the front of an attached garage serving a single *dwelling unit* need not comply with Sentence (1), provided

- (a) the maximum spacing between the front of the garage and the back wall of the garage does not exceed 7.6 m,
(b) there is not more than one floor above the garage,
(c) not less than 50% of the length of the back wall of the garage is constructed of *braced wall panels*, and
(d) not less than 25% of the length of the side walls is constructed of *braced wall panels*.

9.23.13.6. Materials in Braced Wall Panels

- (1) Required *braced wall panels* shall be
- (a) clad with panel-type cladding complying with Section 9.27. and Table 9.23.3.4.,
(b) sheathed with plywood, OSB, waferboard or diagonal lumber sheathing complying with Subsection 9.23.16. and Table 9.23.13.6., and fastened in accordance with Article 9.23.3.5., or
(c) finished on the interior with a panel-type material in accordance with the requirements of Section 9.29. and Table 9.23.13.6.

Table 9.23.13.6.
Minimum Thicknesses of Cladding, Sheathing or Interior Finish for Braced Wall Panels
Forming Part of Sentence 9.23.13.6.(1)

Panel-Type Cladding, Sheathing or Interior Finish	Minimum Thickness			
	Where $S_a(0.2) \leq 0.90$		Where $S_a(0.2) > 0.90$	
	With supports 400 mm o.c.	With supports 600 mm o.c.	With supports 400 mm o.c.	With supports 600 mm o.c.
Gypsum board interior finish ⁽¹⁾	12.7 mm	15.9 mm	12.7 mm	15.9 mm
Sheathing complying with CSA O325	W16	W24	W16	W24
OSB O-1 and O-2 grades	11 mm	12.5 mm	11 mm	12.5 mm
Waferboard R-1 grade	9.5 mm	12.5 mm	n/a	n/a
Plywood	11 mm	12.5 mm	11 mm	12.5 mm
Diagonal lumber	17 mm	17 mm	n/a	n/a

Notes to Table 9.23.13.6.:

(1) See Sentences (5) and (6).

(2) Except as provided in Sentence (3), required interior *braced wall panels* shall be

- (a) sheathed or finished on both sides with a wood-based material, or
(b) finished on both sides with gypsum board.

(3) Required interior *braced wall panels* of wood-based material may be sheathed on one side only, provided

- (a) the sheathing material is plywood, OSB or waferboard, and
(b) the maximum spacing of fasteners along the edge is half of the maximum spacing shown in Table 9.23.3.5.-B.

(4) For stacked *braced wall bands*, where the construction of any one *braced wall panel* is required to be of a wood-based material, a wood-based material shall be installed in all the required *braced wall panels* in that *braced wall band*.

- (5) Gypsum board interior finish shall not be considered as an acceptable sheathing material to provide the required bracing in exterior walls. (See Note A-9.23.13.6.(5) and (6))
- (6) At *braced wall band* spacing intervals of not more than 15 m, *braced wall panels* shall be constructed with OSB, plywood or diagonal lumber. (See Note A-9.23.13.6.(5) and (6))

9.23.13.7. Additional System Considerations

- (1) Except as provided in Sentences (2) and (3), one exterior wall of the uppermost *storey* in each orthogonal direction may be set back from the exterior wall of the *storey* below, provided the adjacent interior *braced wall band* of the *storey* below the setback
- (a) is spaced not more than 10.6 m from the exterior wall of the *storey* below the setback wall,
 - (b) consists of *braced wall panels* that are constructed of a wood-based material in conformance with Sentence 9.23.13.6.(2),
 - (c) extends to the *foundation*, and
 - (d) is not taken into consideration when providing *braced wall panels* constructed of a wood-based material at spacing intervals of not more than 15 m as per Sentence 9.23.13.6.(6).
- (2) Where the exterior wall of the uppermost *storey* is set back from the exterior wall of the *storey* below, the roof and floor space supporting the setback wall shall be sheathed with a wood-based material between the exterior wall of the *storey* below the setback and the adjacent interior *braced wall bands* of the *storey* below the setback.
- (3) Where the exterior wall of the uppermost *storey* is set back from the exterior wall of the *storey* below, the exterior walls perpendicular to the setback wall shall
- (a) have their top plate connected with nails that are spaced at no greater than half the spacing required in Table 9.23.3.4., and
 - (b) have their top plate splices fastened with twice the number of nails specified in Sentences 9.23.11.4.(4) and (5).
- (4) The maximum distance between adjacent required *braced wall panels* in a *braced wall band*, measured from the edge of the panels, may be increased to 7.3 m provided that, throughout the height of the *building*, the length of any *braced wall panel* within the *braced wall band* is not less than 1.2 m.
- (5) The maximum spacing between the centre lines of required *braced wall bands* given in Table 9.23.13.5. may be increased from 7.6 m to no more than 10.6 m, provided that the interior *braced wall band* whose spacing is being increased is replaced with an interior *braced wall band* that
- (a) consists of *braced wall panels* that are constructed of a wood-based material in conformance with Sentence 9.23.13.6.(2),
 - (b) extends to the *foundation*, and
 - (c) is not taken into consideration when providing *braced wall panels* constructed of a wood-based material at spacing intervals no greater than 15 m as per Sentence 9.23.13.6.(6).
- (6) For each orthogonal direction of the *building*, the length of required *braced wall panels* of one exterior wall given in Table 9.23.13.5. may be reduced from 40% to no less than 25% of the length of the *braced wall band*, provided an additional parallel and adjacent interior *braced wall band* is constructed that
- (a) is spaced not more than 10.6 m from the exterior wall,
 - (b) consists of *braced wall panels* that are constructed of a wood-based material in conformance with Sentence 9.23.13.6.(2) and whose lengths sum to no less than 25% of the length of the *braced wall band*,
 - (c) extends to the *foundation*, and
 - (d) is not taken into consideration when providing *braced wall panels* constructed of a wood-based material at spacing intervals no greater than 15 m as per Sentence 9.23.13.6.(6).
- (7) Where the length of required *braced wall panels* of an exterior wall is reduced as described in Sentence (6), the ratio of the length of *braced wall panels* in the respective upper *braced wall bands* to the length of *braced wall panels* in the reduced exterior *braced wall band* shall not exceed 2.

9.23.14. Roof and Ceiling Framing

9.23.14.1. Continuity of Rafters and Joists

(1) Roof rafters and joists and ceiling joists shall be continuous or shall be spliced over vertical supports that extend to suitable bearing.

9.23.14.2. Framing Around Openings

(1) Roof and ceiling framing members shall be doubled on each side of openings greater than 2 rafter or joist spacings wide.

9.23.14.3. End Bearing Length

(1) The length of end bearing of joists and rafters shall be not less than 38 mm.

9.23.14.4. Location and Attachment of Rafters

(1) Rafters shall be located directly opposite each other and tied together at the peak, or may be offset by their own thickness if nailed to a ridge board not less than 17.5 mm thick.

(2) Except as permitted in Sentence (3), framing members shall be connected by gusset plates or nailing at the peak in conformance with Table 9.23.3.4.

(3) Where the roof framing on opposite sides of the peak is assembled separately, such as in the case of factory-built houses, the roof framing on opposite sides is permitted to be fastened together with galvanized-steel strips not less than 200 mm by 75 mm by 0.41 mm thick spaced not more than 1.2 m apart and nailed at each end to the framing by at least two 63 mm nails.

9.23.14.5. Shaping of Rafters

(1) Rafters shall be shaped at supports to provide even bearing surfaces and supported directly above the exterior walls.

9.23.14.6. Hip and Valley Rafters

(1) Hip and valley rafters shall be not less than 50 mm greater in depth than the common rafters and not less than 38 mm thick, actual dimension.

9.23.14.7. Intermediate Support for Rafters and Joists

(1) Ceiling joists and collar ties of not less than 38 mm by 89 mm lumber are permitted to be assumed to provide intermediate support to reduce the span for rafters and joists where the roof slope is 1 in 3 or greater.

(2) Collar ties referred to in Sentence (1) more than 2.4 m long shall be laterally supported near their centres by not less than 19 mm by 89 mm continuous members at right angles to the collar ties.

(3) Dwarf walls and struts are permitted to be used to provide intermediate support to reduce the span for rafters and joists.

- (4) When struts are used to provide intermediate support, they shall be not less than 38 mm by 89 mm material extending from each rafter to a *loadbearing* wall at an angle of not less than 45° to the horizontal.
- (5) When dwarf walls are used for rafter support, they shall be framed in the same manner as *loadbearing* walls and securely fastened top and bottom to the roof and ceiling framing to prevent overall movement.
- (6) Solid blocking shall be installed between floor joists beneath dwarf walls referred to in Sentence (5) that enclose finished rooms.

9.23.14.8. Ridge Support

- (1) Except as provided in Sentence (4), roof rafters and joists shall be supported at the ridge of the roof by
 - (a) a *loadbearing* wall extending from the ridge to suitable bearing, or
 - (b) a ridge beam supported by not less than 89 mm length of bearing.
- (2) Except as provided in Sentence (3), the ridge beam referred to in Sentence (1) shall conform to the sizes and spans shown in Span Table 9.23.4.2.-L, provided
 - (a) the supported rafter or joist length does not exceed 4.9 m, and
 - (b) the roof does not support any concentrated loads.
- (3) The ridge beam referred to in Sentence (1) need not comply with Sentence (2) where
 - (a) the beam is of not less than 38 mm by 140 mm material, and
 - (b) the beam is supported at intervals not exceeding 1.2 m by not less than 38 mm by 89 mm members extending vertically from the ridge to suitable bearing.
- (4) When the roof slope is 1 in 3 or steeper, ridge support need not be provided when the lower ends of the rafters are adequately tied to prevent outward movement.
- (5) Ties required in Sentence (4) are permitted to consist of tie rods or ceiling joists forming a continuous tie for opposing rafters and nailed in accordance with Table 9.23.14.8.
- (6) Except as permitted in Sentence (7), ceiling joists referred to in Sentence (5) shall be tied to the base of every rafter.
- (7) Where ceiling joists referred to in Sentence (5) are raised above the base of the rafters, the connections between the rafters and the ceiling joists shall be designed in accordance with Clause 9.4.1.1.(1)(b) or (c).
- (8) Ceiling joists referred to in Sentence (5) that are spliced to make a continuous joist shall be fastened together at each splice with at least one more nail than required for the rafter-to-joist connection shown in Table 9.23.14.8.
- (9) Members referred to in Sentences (6) and (8) are permitted to be fastened together either directly or through a gusset plate.

Table 9.23.14.8.
Rafter-to-Joist Nailing (Unsupported Ridge)
 Forming Part of Sentences 9.23.14.8.(5) and (8)

Roof Slope	Rafter Spacing, mm	Minimum Number of Nails not Less than 76 mm Long and 3.66 mm in Diameter ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾											
		Building Width up to 4 m			Building Width up to 6 m			Building Width up to 8 m			Building Width up to 10 m		
		Specified Roof Snow Load, kPa			Specified Roof Snow Load, kPa			Specified Roof Snow Load, kPa			Specified Roof Snow Load, kPa		
		1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5	2.0
1 in 3	300	3	4	5	5	6	7	6	8	10	7	10	(5)
	400	4	5	7	6	8	10	8	10	(5)	10	(5)	(5)
	600	6	8	10	9	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
1 in 2.4	300	3	3	4	4	5	6	5	6	8	6	8	10
	400	3	4	5	5	6	8	6	8	10	8	10	(5)
	600	5	6	8	7	9	(5)	9	(5)	(5)	(5)	(5)	(5)
1 in 2	300	2	3	4	3	4	5	4	5	7	5	7	8
	400	3	4	5	4	5	7	5	7	9	7	9	(5)
	600	4	5	7	6	8	10	8	10	(5)	10	(5)	(5)
1 in 1.71	300	2	3	3	3	4	4	4	5	6	4	6	7
	400	3	3	4	4	5	6	5	6	8	6	7	9
	600	4	5	6	5	7	8	7	9	(5)	8	(5)	(5)
1 in 1.5	300	2	3	3	3	4	4	4	5	6	4	6	7
	400	2	3	4	3	4	5	4	5	7	5	7	8
	600	3	4	5	5	6	7	6	8	10	7	10	(5)
1 in 1.33	300	2	2	3	2	3	4	3	4	5	4	5	6
	400	2	3	3	3	4	5	4	5	6	5	6	7
	600	3	4	5	4	5	7	5	7	9	7	9	(5)
1 in 1.2	300	2	2	2	2	3	3	3	3	4	3	4	5
	400	2	2	3	3	3	4	3	4	5	4	5	7
	600	3	3	4	4	5	6	5	6	8	6	8	10
1 in 1	300	2	2	2	2	2	3	2	3	4	3	4	4
	400	2	2	3	2	3	4	3	4	5	4	5	6
	600	2	3	4	3	4	5	4	5	7	5	7	8

Notes to Table 9.23.14.8.:

- (1) Nails with a diameter less than 3.66 mm are permitted to be used, provided the minimum number of nails stated in the Table is modified as follows:
 - For a nail diameter greater than or equal to 2.86 mm and less than 3.25 mm, add 3 nails to the minimum number of nails, up to a maximum of 10 nails.
 - For a nail diameter greater than or equal to 3.25 mm and less than 3.66 mm, add 2 nails to the minimum number of nails, up to a maximum of 10 nails.
 Where more than 10 nails are required, the connections between the rafters and the ceiling joists shall be designed in accordance with Clause 9.4.1.1.(1)(b) or (c).
- (2) The minimum number of nails stated in the Table is applicable to Spruce-Pine-Fir, Douglas Fir-Larch and Hem-Fir members. For Northern Species members, add 2 nails to the minimum number of nails, up to a maximum of 10 nails. Where more than 10 nails are required, the connections between the rafters and the ceiling joists shall be designed in accordance with Clause 9.4.1.1.(1)(b) or (c).
- (3) To accommodate nail spacing, not less than 38 mm × 140 mm joists shall be used where 6 or more nails are required, and not less than 38 mm × 184 mm joists shall be used where 8 or more nails are required.
- (4) The minimum number of nails in the Table is applicable for a maximum roof dead load of 0.5 kPa.
- (5) The connections between the rafters and the ceiling joists shall be designed in accordance with Clause 9.4.1.1.(1)(b) or (c).

9.23.14.9. Restraint of Joist Bottoms

(1) Roof joists supporting a finished ceiling, other than plywood, OSB or waferboard, shall be restrained from twisting along the bottom edges by means of furring, blocking, cross bridging or strapping conforming to Article 9.23.9.3.

9.23.14.10. Ceiling Joists Supporting Roof Load

(1) Except as permitted in Sentence (2), ceiling joists supporting part of the roof load from the rafters shall be not less than 25 mm greater in depth than required for ceiling joists not supporting part of the roof load.

(2) When the roof slope is 1 in 4 or less, the ceiling joist sizes referred to in Sentence (1) shall be determined from Span Tables 9.23.4.2.-C to 9.23.4.2.-F and 9.23.4.2.-L for roof joists.

9.23.14.11. Roof Trusses

(1) Roof Wood roof trusses shall be designed in accordance with good engineering practice such as that described in TPIC 2019, “Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses.”

(2) The joint connections used in trusses described in Sentence (1) shall be designed in conformance with the requirements in Subsection 4.3.1. (See Note A-9.23.14.11.(2))

(3) All member bracing shall be installed as per the truss design drawings, and continuous lateral bracing shall be adequately anchored to the roof and ceiling diaphragms at intervals no greater than 6.10 m o.c.

9.23.15. Subflooring

9.23.15.1. Subflooring Required

(1) Subflooring shall be provided beneath finish flooring where the finish flooring does not have adequate strength to support the design loads. (See Subsection 9.30.3.)

9.23.15.2. Material Standards

(1) Except as provided in Sentence (2), wood-based panels for subfloors shall conform to

- (a) CSA O121, “Douglas fir plywood,”
- (b) CSA O151, “Canadian softwood plywood,”
- (c) CSA O153, “Poplar plywood,”
- (d) CSA O325, “Construction sheathing,” or
- (e) CSA O437.0, “OSB and Waferboard.”

(2) Particleboard subflooring may be used only where a *building* is constructed in a factory so that the subfloor will not be exposed to the weather.

(3) Subflooring described in Sentence (2) shall conform to grade D-2 or D-3 in ANSI A208.1, “Particleboard.”

(4) Subflooring described in Sentence (2) shall have its upper surface and all edges treated to restrict water absorption where the subfloor is used in bathrooms, kitchens, laundry rooms or other areas subject to periodic wetting. (See Note A-9.23.15.2.(4))

9.23.15.3. Edge Support

(1) Where the edges of panel-type subflooring are required to be supported (See Sentence 9.30.2.1.(2)), such support shall consist of tongue-and-groove panel edges or not less than 38 mm by 38 mm blocking securely nailed between framing members.

9.23.15.4. Direction of Installation

(1) Plywood subflooring shall be installed with the surface grain at right angles to the joists and with joints parallel to floor joists staggered.

(2) OSB subflooring conforming to CSA O325, “Construction sheathing,” or to O-1 and O-2 grades in CSA O437.0, “OSB and Waferboard,” and waferboard subflooring conforming to R-1 grade in CSA O437.0 shall be installed so that the direction of face orientation is at right angles to the joists and the joints parallel to the floor joists are staggered. (See Note A-9.23.15.4.(2))

9.23.15.5. Subfloor Thickness or Rating

(1) Except as provided in Sentences (2) and (3), subfloors shall conform to Table 9.23.15.5.-A or 9.23.15.5.-B.

Table 9.23.15.5.-A
Thickness of Subflooring
Forming Part of Sentences 9.23.15.5.(1) and 9.23.16.7.(1)

Maximum Spacing of Supports, mm	Minimum Thickness, mm			
	Plywood and OSB, O-2 Grade	OSB, O-1 Grade, and Waferboard, R-1 Grade	Particleboard	Lumber
400	15.5	15.9	15.9	17.0
500	15.5	15.9	19.0	19.0
600	18.5	19.0	25.4	19.0

Table 9.23.15.5.-B
Rating for Subfloor when Applying CSA O325
Forming Part of Sentences 9.23.15.5.(1) and 9.23.16.7.(1)

Maximum Spacing of Supports, mm	Panel Mark	
	Subfloor	Subfloor Used with Panel-Type Underlay
400	1F16	2F16
500	1F20	2F20
600	1F24	2F24

(2) Where the finished flooring consists of not less than 19 mm matched wood strip flooring laid at right angles to joists spaced not more than 600 mm o.c., subflooring shall be permitted to consist of not less than

- (a) 12.5 mm thick plywood,
- (b) 12.5 mm thick OSB conforming to O-2 grade,
- (c) 12.7 mm thick OSB conforming to O-1 grade,
- (d) 12.7 mm thick waferboard conforming to R-1 grade, or
- (e) OSB conforming to 2R32 / 2F16 grade.

- (3) Except where the flooring consists of ceramic tiles applied with adhesive, where a separate panel-type underlay or concrete topping is applied to a subfloor on joists spaced not more than 400 mm o.c., the subfloor is permitted to consist of not less than
- 12.5 mm thick plywood,
 - 12.5 mm thick OSB conforming to O-2 grade,
 - 12.7 mm thick OSB conforming to O-1 grade,
 - 12.7 mm thick waferboard conforming to R-1 grade, or
 - OSB conforming to 2R32 / 2F16 grade.

9.23.15.6. Annular Grooved Nails

- (1) When resilient flooring is applied directly to an OSB, waferboard, particleboard or plywood subfloor, the subfloor shall be fastened to the supports with annular grooved nails.

9.23.15.7. Lumber Subflooring

- Lumber subflooring shall be laid at an angle of not less than 45° to the joists.
- Lumber subflooring shall be fully supported at the ends on solid bearing.
- Lumber for subflooring shall be of uniform thickness and not more than 184 mm wide.

9.23.16. Roof Sheathing

9.23.16.1. Required Roof Sheathing

- (1) Except where the 1-in-50 hourly wind pressure is less than 0.8 kPa and the seismic spectral acceleration, $S_a(0.2)$, is less than or equal to 0.70, continuous lumber or panel-type roof sheathing shall be installed to support the roofing.

9.23.16.2. Material Standards

- (1) Wood-based panels used for roof sheathing shall conform to the requirements of
- CSA O121, “Douglas fir plywood,”
 - CSA O151, “Canadian softwood plywood,”
 - CSA O153, “Poplar plywood,”
 - CSA O325, “Construction sheathing,” or
 - CSA O437.0, “OSB and Waferboard.”

9.23.16.3. Direction of Installation

- Plywood roof sheathing shall be installed with the surface grain at right angles to the roof framing.
- OSB roof sheathing conforming to CSA O325, “Construction sheathing,” or to O-1 and O-2 grades as specified in CSA O437.0, “OSB and Waferboard,” shall be installed with the direction of face orientation at right angles to the roof framing members. (See Note A-9.23.15.4.(2))

9.23.16.4. Joints in Panel-Type Sheathing

- Panel-type sheathing board shall be applied so that joints perpendicular to the roof ridge are staggered where

 - the sheathing is applied with the surface grain parallel to the roof ridge, and
 - the thickness of the sheathing is such that the edges are required to be supported.

(2) A gap of not less than 2 mm shall be left between sheets of plywood, OSB or waferboard.

9.23.16.5. Lumber Roof Sheathing

(1) Lumber roof sheathing shall not be more than 286 mm wide and shall be applied so that all ends are supported with end joints staggered.

9.23.16.6. Edge Support

(1) Except as permitted in Sentence (2), where panel-type roof sheathing requires edge support, the support shall consist of metal H clips or not less than 38 mm by 38 mm blocking securely nailed between framing members.

(2) The supports referred to in Sentence (1) are not required when tongued-and-grooved edged panel-type sheathing board is used.

9.23.16.7. Thickness or Rating

(1) The thickness or rating of roof sheathing on a flat roof used as a walking deck shall conform to either Table 9.23.15.5.-A or 9.23.15.5.-B for subfloors.

(2) The thickness or rating of roof sheathing on a roof not used as a walking deck shall conform to either Table 9.23.16.7.-A or Table 9.23.16.7.-B.

(3) Asphalt-coated or asphalt-impregnated fibreboard not less than 11.1 mm thick conforming to CAN/ULC-S706.1, "Standard for Wood Fibre Insulating Boards for Buildings," is permitted to be used as a roof sheathing over supports spaced not more than 400 mm o.c., provided the roofing consists of

- (a) a continuous sheet of galvanized steel not less than 0.33 mm in thickness, or
- (b) a continuous sheet of aluminum not less than 0.61 mm in thickness.

(4) All edges of sheathing described in Sentence (3) shall be supported by blocking or framing.

Table 9.23.16.7.-A
Thickness of Roof Sheathing
Forming Part of Sentence 9.23.16.7.(2)

Maximum Spacing of Supports, mm	Minimum Thickness, mm				Lumber
	Plywood and OSB, O-2 Grade		OSB, O-1 Grade and Waferboard, R-1 Grade		
	Edges Supported	Edges Unsupported	Edges Supported	Edges Unsupported	
300	7.5	7.5	9.5	9.5	17.0
400	7.5	9.5	9.5	11.1	17.0
600	9.5	12.5	11.1	12.7	19.0

Table 9.23.16.7.-B
Rating for Roof Sheathing When Applying CSA O325
Forming Part of Sentence 9.23.16.7.(2)

Maximum Spacing of Supports, mm	Panel Mark	
	Edges Supported	Edges Unsupported
400	2R16	1R16
500	2R20	1R20
600	2R24	1R24

9.23.17. Wall Sheathing

9.23.17.1. Required Sheathing

(1) Exterior walls and gable ends shall be sheathed when the *exterior cladding* requires intermediate fastening between supports or if the *exterior cladding* requires solid backing.

9.23.17.2. Thickness, Rating and Material Standards

(1) Where wall sheathing is required for the purpose of complying with this Section, it shall conform to Table 9.23.17.2.-A or Table 9.23.17.2.-B. (See also Article 9.25.5.1.)

Table 9.23.17.2.-A
Wall Sheathing Thickness and Specifications
 Forming Part of Sentence 9.23.17.2.(1)

Type of Sheathing	Minimum Thickness, mm ⁽¹⁾		Material Standards
	With Supports 400 mm o.c.	With Supports 600 mm o.c.	
Fibreboard (insulating)	9.5	11.1	CAN/ULC-S706.1
Gypsum Sheathing	9.5	12.7	ASTM C1177 / C1177M ASTM C1396 / C1396M ⁽²⁾
Lumber	17.0	17.0	See Table 9.3.2.1.
Mineral Fibre, Rigid Board, Type 2	25	25	CAN/ULC-S702.1
OSB, O-2 Grade	6.0	7.5	CSA O437.0
OSB, O-1 Grade, and Waferboard, R-1 Grade	6.35	7.9	CSA O437.0
Phenolic, faced	25	25	CAN/CGSB-51.25-M
Plywood (exterior type)	6.0	7.5	CSA O121 CSA O151 CSA O153
Polystyrene, Types 1 and 2	38	38	CAN/ULC-S701.1
Polystyrene, Types 3 and 4	25	25	CAN/ULC-S701.1
Polyurethane and Polyisocyanurate Type 1, faced	38	38	CAN/ULC-S704.1
Polyurethane and Polyisocyanurate Types 2 and 3, faced	25	25	CAN/ULC-S704.1

Notes to Table 9.23.17.2.-A:

- (1) See also Sentences 9.27.5.1.(2) and (3).
- (2) The *flame-spread rating* of gypsum board shall be determined in accordance with CAN/ULC-S102, "Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies."

Table 9.23.17.2.-B
Rating For Wall Sheathing When Applying CSA O325
 Forming Part of Sentence 9.23.17.2.(1)

Maximum Spacing of Supports, mm	Panel Mark
400	W16
500	W20
600	W24

9.23.17.3. Attachment of Cladding to Sheathing

- (1) Gypsum sheathing, rigid insulation and fibreboard shall not be used for the attachment of siding materials.
- (2) Nails used in attaching the materials listed in Sentence (1) shall be not less than 3.2 mm diam with a minimum head diameter of 11 mm.

9.23.17.4. Lumber Sheathing

- (1) Lumber wall sheathing shall be applied so that all ends are supported.
- (2) Where lumber wall sheathing is required to provide bracing according to Article 9.23.10.2., it shall be applied with end joints staggered.

9.23.17.5. Joints in Panel-Type Sheathing

- (1) A gap of not less than 2 mm shall be left between sheets of plywood, OSB, waferboard or fibreboard.

9.23.17.6. Mansard Style Roofs

- (1) Where the bottom portions of mansard style roofs are vented, the vertical framing members behind the sloping portions shall be considered on the same basis as exterior wall studs and shall conform to the appropriate requirements in Articles 9.27.3.2. to 9.27.3.6.

Section 9.24. Sheet Steel Stud Wall Framing

9.24.1. General

9.24.1.1. Application

- (1) This Section applies to sheet steel studs for use in non-*loadbearing* exterior and interior walls.
- (2) Where *loadbearing* steel studs are used, they shall be designed in conformance with Part 4.

9.24.1.2. Material Standards

- (1) Steel studs and runners shall conform to AISI S201, “North American Standard for Cold Formed Steel Framing – Product Data 2012 Edition.”

9.24.1.3. Metal Thickness

- (1) Metal thickness specified in this Section shall be the minimum base steel thickness exclusive of coatings.

9.24.1.4. Screws

- (1) Screws for the application of cladding, sheathing or interior finish materials to steel studs, runners and furring channels shall conform to
 - (a) ASTM C954, “Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness,” or

- (b) ASTM C1002, “Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.”

9.24.1.5. Cladding, Sheathing and Interior Finish Required

- (1) Cladding or sheathing, and interior finish shall be installed on steel stud framing and shall be fastened with screws
 - (a) spaced at the appropriate spacing described in Section 9.29., and
 - (b) penetrating not less than 10 mm through the metal.

9.24.2. Size of Framing

9.24.2.1. Size and Spacing of Studs in Interior Walls

- (1) Except as required in Articles 9.24.2.3. and 9.24.2.4., the size and spacing of steel studs for non-loadbearing interior walls shall conform to Table 9.24.2.1.

Table 9.24.2.1.
Steel Studs for Non-Loadbearing Interior Walls⁽¹⁾
 Forming Part of Sentence 9.24.2.1.(1)

Minimum Stud Size, mm	Maximum Stud Spacing, mm	Maximum Wall Height, m
32 x 41	400	3.0
	600	2.7
32 x 64	300	4.4
	400	4.0
	600	3.5
32 x 89	300	5.2
	400	4.6
	600	3.9
32 x 152	300	6.6
	400	5.8
	600	4.9

Notes to Table 9.24.2.1.:

- (1) The values in the Table are based on a single layer of 12.7 mm gypsum panel sheathing installed on each side of the studs. Where one side is not accessible, gypsum panels on only one side will suffice. The values are also based on attaching gypsum panel sheathing using screws not smaller than No. 6 spaced at a maximum of 300 mm at edges and at intermediate supports.

9.24.2.2. Thickness of Studs

- (1) Except as required in Article 9.24.2.4., steel studs in non-loadbearing interior walls shall have a metal thickness of not less than 0.46 mm.

9.24.2.3. Runners

- (1) Runners for interior and exterior non-loadbearing walls shall have a thickness not less than the thickness of the corresponding studs and shall have not less than 30 mm flanges.

9.24.2.4. Openings in Fire Separations

- (1) Where openings for doors in non-loadbearing fire separations required to have a fire-resistance rating do not exceed 1 200 mm in width,
 - (a) the width of steel studs shall be not less than 63 mm, and
 - (b) the metal thickness shall be not less than 0.46 mm.
- (2) Where openings described in Sentence (1) exceed 1 200 mm in width,
 - (a) the width of steel studs shall be not less than 91 mm, and
 - (b) the metal thickness shall be not less than 0.85 mm.
- (3) The distance to the first stud beyond the jamb of any door opening in a fire separation required to have a fire-resistance rating shall not exceed 400 mm.
- (4) Where the distance between the framing over the opening referred to in Sentence (3) and the top runner exceeds 400 mm in such walls, intermediate support shall be installed at intervals of not more than 400 mm above the opening.

9.24.2.5. Size and Spacing of Studs in Exterior Walls

- (1) The size and spacing of non-loadbearing steel studs for exterior walls shall conform to Table 9.24.2.5.

Table 9.24.2.5.
Size and Spacing of Steel Studs for Non-Loadbearing Exterior Walls
 Forming Part of Sentence 9.24.2.5.(1)

Minimum Stud Size, mm	Minimum Metal Thickness, mm	Maximum Stud Length, m		
		Spacing of Studs		
		300 mm o.c.	400 mm o.c.	600 mm o.c.
30 × 91	0.53	3.0	2.4	—
30 × 91	0.69	3.3	2.7	2.4
30 × 91	0.85	3.6	3.0	2.7
30 × 91	1.0	4.0	3.3	3.0

9.24.3. Installation

9.24.3.1. Installation of Runners

- (1) Runners shall be provided at the tops and bottoms of walls.
- (2) Runners required in Sentence (1) shall be securely attached to the *building* at approximately 50 mm from the ends, and at intervals of not more than 600 mm o.c. for interior walls and 300 mm o.c. for exterior walls.
- (3) Fasteners used for attachment described in Sentence (2) shall consist of the equivalent of 63 mm nails or 25 mm screws.
- (4) Studs at openings and which are not full wall height shall be supported by a runner at the ends of the studs, securely fastened to the full length studs at the sides of the opening.

9.24.3.2. Fire-Rated Walls

- (1) Steel studs used in walls required to have a *fire-resistance rating* shall be installed so that there is not less than a 12 mm clearance between the top of the stud and the top of the runner to allow for expansion in the event of fire.
- (2) Except as provided in Article 9.24.3.6., studs in walls referred to in Sentence (1) shall not be attached to the runners in a manner that will prevent such expansion.
- (3) Framing above doors with steel door frames in non-loadbearing *fire separations* required to have a *fire-resistance rating* shall consist of 2 runners on the flat fastened back to back. (See Note A-9.24.3.2.(3))
- (4) The lower runner required in Sentence (3) shall be cut through the flanges and be bent at each end to extend upwards at least 150 mm and fastened to the adjacent studs.

9.24.3.3. Orientation of Studs

- (1) Steel studs shall be installed with webs at right angles to the wall face and, except at openings, shall be continuous for the full wall height.

9.24.3.4. Support for Cladding Materials

- (1) Corners and intersections of walls shall be constructed to provide support for the cladding materials.

9.24.3.5. Framing Around Openings

- (1) Studs shall be doubled on each side of every opening where such openings involve more than one stud space, and shall be tripled where the openings in exterior walls exceed 2.4 m in width.
- (2) Studs described in Sentence (1) shall be fastened together by screws, crimping or welding to act as a single structural unit in resisting transverse loads.

9.24.3.6. Attachment of Studs to Runners

- (1) Studs shall be attached to runners by screws, crimping or welding around wall openings, and elsewhere where necessary to keep the studs in alignment during construction.
- (2) Where clearance for expansion is required in Article 9.24.3.2., attachment required in Sentence (1) shall be applied between studs and bottom runners only.

9.24.3.7. Openings for Fire Dampers

- (1) Openings for *fire dampers* in non-loadbearing *fire separations* required to have a *fire-resistance rating* shall be framed with double studs on each side of the opening.
- (2) The sill and header for openings described in Sentence (1) shall consist of a runner track with right angle bends made on each end so as to extend 300 mm above the header or below the sill and fastened to the studs.
- e1 (3) The openings described in Sentence (1) shall be lined with a layer of gypsum board not less than 12.7 mm thick fastened to stud and runner webs.

Section 9.25. Heat Transfer, Air Leakage and Condensation Control

9.25.1. General

9.25.1.1. Scope and Application

- (1) This Section is concerned with heat, air and water vapour transfer and measures to control condensation.
- (2) All walls, ceilings and floors separating *conditioned space* from unconditioned space, the exterior air or the ground shall be
 - (a) provided with
 - (i) thermal insulation conforming to Subsection 9.25.2.,
 - (ii) an *air barrier system* conforming to Subsection 9.25.3., and
 - (iii) a *vapour barrier* conforming to Subsection 9.25.4., and
 - (b) constructed in such a way that the properties and relative position of all materials conform to Subsection 9.25.5. (See Note A-9.25.1.1.(2))
- (3) Insulation and sealing of heating and ventilating ducts shall conform to Sections 9.32., 9.33.

9.25.2. Thermal Insulation

9.25.2.1. Required Insulation

- (1) All walls, ceilings and floors separating heated space from unheated space, the exterior air or the exterior *soil* shall be provided with sufficient thermal insulation to prevent moisture condensation on their room side during the winter and to ensure comfortable conditions for the occupants. (See Note A-9.1.1.1.(1))

9.25.2.2. Insulation Materials

- (1) Except as required in Sentence (2), thermal insulation shall conform to the requirements of
 - (a) ASTM C726, “Standard Specification for Mineral Wool Roof Insulation Board,”
 - (b) CAN/CGSB-51.25-M, “Thermal Insulation, Phenolic, Faced,”
 - (c) CGSB 51-GP-27M, “Thermal Insulation, Polystyrene, Loose Fill,”
 - (d) CAN/ULC-S701.1, “Standard for Thermal Insulation, Polystyrene Boards,”
 - (e) CAN/ULC-S702.1, “Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification,”
 - (f) CAN/ULC-S703, “Standard for Cellulose Fibre Insulation (CFI) for Buildings,”
 - (g) CAN/ULC-S704.1, “Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced,”
 - (h) CAN/ULC-S705.1, “Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material – Specification,” or
 - (i) CAN/ULC-S706.1, “Standard for Wood Fibre Insulating Boards for Buildings.”
- (2) The *flame-spread rating* requirements contained in the standards listed in Sentence (1) shall not apply. (See Note A-9.25.2.2.(2))
- (3) Insulation in contact with the ground shall be inert to the action of *soil* and water and be such that its insulative properties are not significantly reduced by moisture.
- (4) Type 1 expanded polystyrene insulation as described in CAN/ULC-S701.1, “Standard for Thermal Insulation, Polystyrene Boards,” shall not be used as roof insulation applied above the roofing membrane.

9.25.2.3. Installation of Thermal Insulation

- (1) Insulation shall be installed so that there is a reasonably uniform insulating value over the entire face of the insulated area.
- (2) Insulation shall be applied to the full width and length of the space between furring or framing.
- (3) Except where the insulation provides the principal resistance to air leakage, thermal insulation shall be installed so that at least one face is in full and continuous contact with an element with low air permeance. (See Note A-9.25.2.3.(3))
- (4) Insulation shall be installed over the full height of *foundation* walls enclosing a *basement* or heated crawl space.
- (5) Insulation around concrete slabs-on-ground shall be located so that heat from the *building* is not restricted from reaching the ground beneath the perimeter, where exterior walls are not supported by footings extending below frost level.
- (6) Where insulation is exposed to the weather and subject to mechanical damage, it shall be protected with not less than
 - (a) 6 mm preservative-treated plywood, or
 - (b) 12 mm cement parging on wire lath applied to the exposed face and edge.
- (7) Except as permitted in Sentence (7.1), insulation and vapour barrier located in areas where it may be subject to mechanical damage shall be protected by a covering such as gypsum board, plywood, particleboard, OSB, waferboard or hardboard.

(7.1) In unfinished *basements*, the protection required in Sentence (7) need not be provided for mineral fibre insulation, provided it is covered with a membrane which complies with the requirements of Section 9.25.4.
- (8) Insulation in factory-built *buildings* shall be installed so that it will not become dislodged during transportation.

9.25.2.4. Installation of Loose-Fill Insulation

- (1) Except as provided in Sentences (2) to (6), loose-fill insulation shall be used on horizontal surfaces only.
- (2) Where loose-fill insulation is installed in an unconfined sloped space, such as an attic space over a sloped ceiling, the supporting slope shall not be more than
 - (a) 4.5 in 12 for mineral fibre or cellulose fibre insulation, and
 - (b) 2.5 in 12 for other types of insulation.
- (3) Loose-fill insulation is permitted to be used in wood-frame walls of existing *buildings*. (See Note A-9.25.2.4.(3))
- (4) Where blown-in insulation is installed in above-ground or below-ground wood-frame walls of new *buildings*,
 - (a) the density of the installed insulation shall be sufficient to preclude settlement,
 - (b) the insulation shall be installed behind a membrane that will permit visual inspection prior to installation of the interior finish,
 - (c) the insulation shall be installed in a manner that will not interfere with the installation of the interior finish, and
 - (d) no water shall be added to the insulation, unless it can be shown that the added water will not adversely affect other materials in the assembly.
- (5) Water repellent loose-fill insulation is permitted to be used between the outer and inner wythes of masonry *cavity walls*. (See Note A-9.25.2.4.(5))

- (6) Where soffit venting is used, measures shall be taken
- (a) to prevent loose-fill insulation from blocking the soffit vents and to maintain an open path for circulation of air from the vents into the *attic or roof space*, and
- (b) to minimize airflow into the insulation near the soffit vents to maintain the thermal performance of the material. (See Article 9.19.1.3.)

9.25.2.5. Installation of Spray-Applied Polyurethane

- (1) Spray-applied polyurethane insulation shall be installed in accordance with CAN/ULC-S705.2, “Standard for Thermal Insulation – Spray-Applied Rigid Polyurethane Foam, Medium Density – Application.”

9.25.3. Air Barrier Systems

9.25.3.1. Required Barrier to Air Leakage

- (1) Wall, ceiling and floor assemblies that separate *conditioned space* from unconditioned space or from the ground shall be constructed so as to include an *air barrier system* that will provide a continuous barrier to air leakage
 - (a) from the interior of the *building* into wall, floor, *attic or roof spaces* sufficient to prevent excessive moisture condensation in such spaces during the winter, and
 - (b) from the exterior or the ground inward sufficient to
 - (i) prevent moisture condensation on the room side during winter,
 - (ii) ensure comfortable conditions for the occupants, and
 - (iii) minimize the ingress of *soil gas*.

(See Note A-9.25.3.1.(1))

- (2) The continuity of the *air barrier system* shall extend throughout the *basement*.

9.25.3.2. Air Barrier System Properties (See Note A-9.25.5.1.(1))

- (1) Sheet and panel type materials intended to provide the principal resistance to air leakage shall have an air leakage characteristic not greater than $0.02 \text{ L}/(\text{s}\cdot\text{m}^2)$ measured at an air pressure differential of 75 Pa.
- (2) Where polyethylene sheet is used to provide the airtightness in the *air barrier system*, it shall conform to CAN/CGSB-51.34-M, “Vapour Barrier, Polyethylene Sheet for Use in Building Construction.”

9.25.3.3. Continuity of the Air Barrier System

- (1) Where the *air barrier system* consists of an air-impermeable panel-type material, all joints shall be sealed to prevent air leakage.
- (2) Where the *air barrier system* consists of flexible sheet material, all joints shall be
 - (a) sealed with compatible material such as tape or flexible sealant, or
 - (b) except as required by Sentence (2.1), lapped not less than 100 mm and clamped, such as between framing members, furring or blocking, and rigid panels.

(2.1) Where an *air barrier system* consisting of flexible sheet material is installed at locations where it is not supported by an interior finish, such as a behind a bathtub, shower enclosure or fireplace, the continuity of the air barrier shall be maintained by sealing its joints.

- (3) Where an interior wall meets an exterior wall, ceiling, floor or roof required to be provided with air barrier protection, the *air barrier system* shall extend across the intersection and shall be sealed in accordance with Sentences (1) and (2).

- (4) Where an interior wall projects through a ceiling or extends to become an exterior wall, spaces in the wall shall be blocked to provide continuity across those spaces with the *air barrier system* in the abutting walls or ceiling by
- sealing each air barrier to the blocking, or
 - wrapping each air barrier around the transition and sealing in accordance with Sentences (1) and (2).

- (5) Where an interior floor projects through an exterior wall to become an exterior floor,
- the air barrier of the wall under the floor shall be continuous with or sealed to the subfloor or the air barrier on the underside of the floor,
 - the air barrier of the wall above the floor shall be continuous with or sealed to the subfloor or the air barrier on the top of the floor, and
 - the spaces between floor joists shall be blocked and sealed.

(5.1) Where a header wrap is used as an air barrier, it shall be sealed or lapped to the wall air barrier above and below in accordance with Sentences (1) and (2).

(6) Penetrations of the *air barrier system*, such as those created by the installation of electrical wiring, electrical boxes, piping or ductwork, shall be sealed to maintain the integrity of the *air barrier system* over the entire surface.

(6.1) Where an interior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with

- compatible tape, or
- spray foam insulation.

(6.2) Where an exterior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with

- compatible flexible flashing material,
- caulking, or
- spray foam insulation.

(7) Where access hatches and sump pit covers are installed through assemblies constructed with an *air barrier system*, they shall be weatherstripped around their perimeters to prevent air leakage.

(8) Clearances between *chimneys* or *gas vents* and the surrounding construction that would permit air leakage from within the *building* into a wall or *attic* or *roof space* shall be sealed by *noncombustible* material to prevent such leakage and shall be sealed to the air barrier with tape or another compatible material, and to the vent with high temperature caulking in accordance with the manufacturer's installation instructions.

r1 (9) Reserved.

(10) Sump pit covers shall be sealed to maintain continuity of the *air barrier system*.

9.25.3.3A. Vapour Barriers Used as Air Barriers

(1) A *vapour barrier* used as an air barrier shall comply with the requirements of this Subsection.

9.25.3.4. Reserved

9.25.3.5. Reserved

9.25.3.6. Reserved

9.25.4. Vapour Barriers

9.25.4.1. Required Barrier to Vapour Diffusion

(1) Thermally insulated wall, ceiling and floor assemblies shall be constructed with a *vapour barrier* so as to provide a barrier to diffusion of water vapour from the interior into wall spaces, floor spaces or *attic or roof spaces*.

9.25.4.2. Vapour Barrier Materials

(1) Except as provided in Sentence (2), *vapour barriers* shall have a permeance not greater than $60 \text{ ng}/(\text{Pa}\times\text{s}\times\text{m}^2)$ measured in accordance with ASTM E96 / E96M, “Standard Test Methods for Water Vapor Transmission of Materials,” using the desiccant method (dry cup).

(2) Thermally insulated *foundation* wall assemblies are permitted to be constructed with variable-permeance *vapour barriers* having a permeance not greater than $60 \text{ ng}/(\text{Pa}\times\text{s}\times\text{m}^2)$ using the desiccant method (dry cup) and greater than $300 \text{ ng}/(\text{Pa}\times\text{s}\times\text{m}^2)$ using the water method (wet cup) measured in accordance with ASTM E96 / E96M, “Standard Test Methods for Water Vapor Transmission of Materials.” (See Note A-9.25.4.2.(2))

(3) Where the intended use of the interior space will result in high moisture generation, the assembly shall be designed according to Part 5. (See Note A-9.25.4.2.(3))

(4) Where polyethylene is installed to serve only as the *vapour barrier*, it shall comply with Clause 4.4, Thermal Stability, and Clause 5.7, Oxidative Induction Time, of CAN/CGSB-51.34-M, “Vapour Barrier, Polyethylene Sheet for Use in Building Construction.”

(5) Membrane-type *vapour barriers* other than polyethylene shall conform to the requirements of CAN/CGSB-51.33-M, “Vapour Barrier, Sheet, Excluding Polyethylene, for Use in Building Construction.”

(6) Membrane-type *vapour barriers* other than polyethylene that are susceptible to deterioration under prolonged exposure to direct ultraviolet radiation shall

(a) be covered, or

(b) only be installed in locations that are not exposed to direct ultraviolet radiation after the completion of construction. (See Note A-9.25.4.2.(6))

(7) Where a coating is applied to gypsum board to function as the *vapour barrier*, the permeance of the coating shall be determined in accordance with CAN/CGSB-1.501-M, “Method for Permeance of Coated Wallboard.”

(8) Where insulation functions as the *vapour barrier*, it shall be sufficiently thick so as to meet the requirement of Sentence (1).

9.25.4.3. Installation of Vapour Barriers

(1) Products installed to function as the *vapour barrier* shall protect the warm side of wall, ceiling and floor assemblies.

(2) Where different products are used for the *vapour barrier* and the insulation, the *vapour barrier* shall be installed sufficiently close to the warm side of the insulation to prevent condensation at design conditions. (See Notes A-9.25.4.3.(2) and A-9.25.5.1.(1))

(3) Where the same product is used for the *vapour barrier* and the insulation, the product shall be installed sufficiently close to the warm side of the assembly to prevent condensation at design conditions. (See Notes A-9.25.4.3.(2), A-9.25.5.1.(1) and A-9.25.5.2.)

9.25.5. Properties and Position of Materials in the Building Envelope

9.25.5.1. General (See Note A-9.25.5.1.)

- (1) Except as provided in Sentences (2) to (4), sheet and panel-type materials incorporated into assemblies described in Article 9.25.1.1. shall conform to Article 9.25.5.2. where
 - (a) the material has
 - (i) an air leakage characteristic less than 0.1 L/(s×m²) at 75 Pa, and
 - (ii) a water vapour permeance less than 60 ng/(Pa×s×m²) when measured in accordance with ASTM E96 / E96M, “Standard Test Methods for Water Vapor Transmission of Materials,” using the desiccant method (dry cup), and (See Note A-9.25.5.1.(1)(a)(ii))
 - (b) the intended use of the interior space where the materials are installed will not result in high moisture generation. (See Note A-9.25.5.1.(1))
- (2) Where the intended use of the interior space will result in high moisture generation, the assembly shall be designed according to Part 5.
- (3) Wood-based sheathing materials not more than 12.5 mm thick and complying with Article 9.23.17.2. need not comply with Sentence (1). (See Note A-9.25.5.1.(3))
- (4) Where a material has a water vapour permeance not less than 30 ng/(Pa×s×m²) and a thermal resistance not less than 0.7 (m²×K)/W and the heating degree-days of the *building* location are less than 6000, the assembly need not comply with Sentence (1).

9.25.5.2. Position of Low Permeance Materials (See Note A-9.25.5.2.)

- (1) Sheet and panel-type materials described in Article 9.25.5.1. shall be installed
 - (a) on the warm face of the assembly, (See also Article 9.25.4.2.)
 - (b) at a location where the ratio between the total thermal resistance of all materials outboard of its innermost impermeable surface and the total thermal resistance of all materials inboard of that surface is not less than that required by Table 9.25.5.2., or
 - (c) outboard of an air space that is vented to the outdoors.

Table 9.25.5.2.
Ratio of Outboard to Inboard Thermal Resistance
 Forming Part of Sentence 9.25.5.2.(1)

Heating Degree Days of <i>Building</i> Location ⁽¹⁾ , Celsius Degree-Days	Minimum Ratio, Total Thermal Resistance Outboard of Material's Inner Surface to Total Thermal Resistance Inboard of Material's Inner Surface
Up to 4 999	0.20
5 000 to 5 999	0.30
6 000 to 6 999	0.35
7 000 to 7 999	0.40
8 000 to 8 999	0.50
9 000 to 9 999	0.55
10 000 to 10 999	0.60
11 000 to 11 999	0.65
12 000 or higher	0.75

Notes to Table 9.25.5.2.:

- (1) See MMAH Supplementary Standard SB-1, “Climatic and Seismic Data.”

- (2) For walls, the air space described in Clause (1)(c) shall be drained and ventilated and shall be not less than 10 mm deep behind the cladding, over the full height and width of the wall.

Section 9.26. Roofing

9.26.1. General

9.26.1.1. Definitions

- (1) For the purpose of this Section, the term “roof” shall mean sloped or near-horizontal assemblies that protect the spaces beneath them, including platforms that effectively serve as roofs with respect to the accumulation or drainage of precipitation. (See Note A-9.26.1.1.(1))
- (2) For the purpose of this Section, the term “roofing” shall mean the primary covering for roofs.

9.26.1.2. Required Protection

- (1) Roofs shall be protected with roofing, including flashing, installed so as to
- effectively shed water,
 - prevent the ingress of water and moisture into *building* assemblies and occupied space, and
 - minimize the ingress of water due to ice damming into *building* assemblies.
- (2) Compliance with Sentence (1) shall be demonstrated by conforming to
- this Section, or
 - Part 5.

9.26.1.3. Alternate Installation Methods

- (1) Methods described in CSA A123.51, “Asphalt shingle application on roof slopes 1:6 and steeper,” are permitted to be used for the installation of asphalt shingles in lieu of the methods described in this Section.

9.26.1.4. Solar Collector Systems

- (1) A solar collector system is permitted to be installed above roofing materials conforming to Sentence 9.26.2.1.(1).

9.26.2. Roofing Materials

9.26.2.1. Material Standards

- (1) Where materials used for the preparation of the substrate for roofing are covered in the scope of a standard listed in Table 9.26.2.1.-A, they shall conform to that standard.
- (2) Where roofing materials are covered in the scope of a standard listed in Table 9.26.2.1.-B, they shall conform to that standard.

Table 9.26.2.1.-A
Materials for Preparation of the Substrate for Roofing
 Forming Part of Sentence 9.26.2.1.(1)

Type of Material	Standards
Sheathing Membranes	CAN/CGSB-51.32-M, "Sheathing, Membrane, Breather Type"
Primers	CGSB 37-GP-9Ma, "Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing"

Table 9.26.2.1.-B
Roofing Materials
 Forming Part of Sentence 9.26.2.1.(2)

Type of Roof Covering	Standards
Built-up roofing (BUR)	ASTM D3019 / D3019M, "Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered and Fibered" (1) ASTM D4479 / D 4479M, "Standard Specification for Asphalt Roof Coatings - Asbestos-Free" CAN/CGSB-37.50-M, "Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing" CGSB 37-GP-56M, "Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing" CAN/CSA-A123.2, "Asphalt-Coated Roofing Sheets" CSA A123.3, "Asphalt Saturated Organic Roofing Felt" CAN/CSA-A123.4, "Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems" CSA A123.17, "Asphalt Glass Felt Used in Roofing and Waterproofing" CSA A123.23, "Product specification for polymer-modified bitumen sheet, prefabricated and reinforced"
Single-ply membranes	ASTM D4637 / D4637M, "Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane" ASTM D4811 / D4811M, "Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing" ASTM D6878 / D6878M, "Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing" CAN/CGSB-37.54, "Polyvinyl Chloride Roofing and Waterproofing Membrane" CAN/CGSB-37.58-M, "Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing"
Shingles, shakes, tiles, panels	CSA A123.5, "Asphalt shingles made from glass felt and surfaced with mineral granules" CAN/CSA-A220 Series, "Concrete Roof Tiles" CSA O118.1, "Western Red Cedar Shakes and Shingles" CSA O118.2, "Eastern White Cedar Shingles"
Eave protection	CAN/CSA-A123.16, "Asphalt-coated glass-base sheets" CSA A123.22, "Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection"
Flashing	ASTM D4811 / D4811M, "Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing"

Notes to Table 9.26.2.1.-B:

- (1) For the purpose of this Subsection, ASTM D3019 / D3019M shall only apply to the non-fibered and non-asbestos-fibered types (I and III) of asphalt roll roofing.

9.26.2.2. Installation of Materials

(1) Materials listed in Tables 9.26.2.1.-A and 9.26.2.1.-B shall be installed in conformance with the manufacturer's written instructions. (See Sentence 1.5.1.2.(1) of Division A)

9.26.2.3. Nails

- (1) Nails used for roofing shall be corrosion-resistant roofing or shingle nails conforming to
 - (a) ASTM F1667, "Standard Specification for Driven Fasteners: Nails, Spikes, and Staples," or
 - (b) CSA B111, "Wire Nails, Spikes and Staples."
- (2) Nails shall have sufficient length to penetrate through or 12 mm into, roof sheathing.
- (3) Nails used with asphalt roofing shall have a head diameter of not less than 9.5 mm and a shank thickness of not less than 2.95 mm.
- (4) Nails used with wood shingles or shakes shall have a head diameter of not less than 4.8 mm and a shank thickness of not less than 2.0 mm and shall be stainless steel, aluminum or hot-dipped galvanized. (See Note A-9.26.2.3.(4))

9.26.2.4. Staples

- (1) Staples used to apply asphalt or wood shingles shall be corrosion-resistant and shall be driven with the crown parallel to the eaves.
- (2) Staples used with asphalt shingles shall be not less than 19 mm long, 1.6 mm diam or thickness, with not less than a 25 mm crown, except that an 11 mm crown may be used as provided in Sentence 9.26.7.4.(2).
- (3) Staples used with wood shingles shall be not less than 29 mm long, 1.6 mm diam or thickness, with not less than a 9.5 mm crown and shall be stainless steel or aluminum. (See Note A-9.26.2.3.(4))

9.26.3. Slope of Roof Surfaces

9.26.3.1. Slope

- (1) Except as provided in Sentences (2) and (3), the slopes on which roof coverings may be applied shall conform to Table 9.26.3.1.
- (2) Asphalt and gravel or coal tar and gravel roofs may be constructed with lower slopes than required in Sentence (1) when effective drainage is provided by roof drains located at the lowest points on the roofs.
- (3) Profiled metal roof cladding systems specifically designed for low-slope applications are permitted to be installed with lower slopes than required in Sentence (1), provided they are installed in conformance with the manufacturer's written recommendations.
- (4) Except where back-slope will not adversely affect adjacent supported or supporting constructions due to water ingress, roofs and constructions that effectively serve as roofs shall be constructed with sufficient slope away from
 - (a) exterior walls, and
 - (b) *guards* that are connected to the roof, or to a construction that effectively serves as a roof, by more than pickets or posts.(See Notes A-9.26.1.1.(1), A-9.26.4.1. and A-9.27.3.8.(4))

- (5) The slope required in Sentence (4) shall be sufficient to maintain a positive slope
- (a) after expected shrinkage of the *building* frame, where these surfaces are supported by exterior walls and on exterior columns, and (See Note A-9.27.3.8.(4))
- (b) once design loading is taken into consideration, where these surfaces are cantilevered from exterior walls.

Table 9.26.3.1.
Roofing Types and Slope Limits
 Forming Part of Sentence 9.26.3.1.(1)

Type of Roofing	Minimum Slope	Maximum Slope
Asphalt Shingles		
Low slope application	1 in 6	no limit
Normal application	1 in 3	no limit
Built-up Roofing		
Asphalt base (without gravel)	1 in 25	1 in 2
Asphalt base (gravelled)	1 in 50 ⁽¹⁾	1 in 4
Coal-tar base (gravelled)	1 in 50 ⁽¹⁾	1 in 25
Cold process	1 in 25	1 in 1.33
Cedar Shakes	1 in 3	no limit
Clay Tile	1 in 2	no limit
Glass Fibre Reinforced Polyester Roofing Panels	1 in 4	no limit
Modified Bituminous Membranes	1 in 50	1 in 4
Profiled Metal Roofing	1 in 4 ⁽²⁾	no limit
Roll Roofing		
480 mm wide selvage asphalt roofing	1 in 6	no limit
Cold application felt	1 in 50	1 in 1.33
Smooth and mineral surfaced	1 in 4	no limit
Sheet Metal Shingles	1 in 4 ⁽²⁾	no limit
Slate Shingles	1 in 2	no limit
Wood Shingles	1 in 4	no limit

Notes to Table 9.26.3.1.:

- (1) See Sentence 9.26.3.1.(2).
- (2) See Sentence 9.26.3.1.(3).

9.26.4. Flashing at Intersections

9.26.4.1. Required Flashing at Intersections (See Notes A-9.26.4.1. and A-9.26.1.1.(1))

- (1) Except where the omission of flashing will not adversely affect adjacent supported or supporting constructions, flashing shall be installed at junctions between roofs and
- (a) walls that rise above the roof, and
- (b) *guards* that are connected to the roof by more than pickets or posts.

9.26.4.2. Materials

- (1) Sheet metal flashing shall consist of not less than
- (a) 1.73 mm thick sheet lead,
- (b) 0.33 mm thick galvanized steel,
- (c) 0.33 mm thick copper,

- (d) 0.35 mm thick zinc, or
- (e) 0.48 mm thick aluminum.

9.26.4.3. Valley Flashing

- (1) Where sloping surfaces of shingled roofs intersect to form a valley, the valley shall be flashed.
- (2) Valley flashing shall be installed over continuous sheathing.
- (3) Closed valleys shall not be used with rigid shingles on slopes of less than 1 in 1.2.

(3.1) Closed valley flashing shall consist of sheet metal, self sealing composite membranes consisting of polyethylene and bituminous material or one layer of either Type S smooth surface roll roofing or Type M mineral surface roll roofing (mineral surface down) not less than 600 mm wide, and nails shall not penetrate the flashing within 75 mm of its edge or 124 mm of the bottom of the valley centre line.

- (4) Open valleys shall be flashed with at least
 - (a) one layer of sheet metal not less than 600 mm wide, or
 - (b) 2 layers of roll roofing.

(5) The bottom layer of roofing required in Sentence (4) shall consist of at least Type S smooth roll roofing or Type M mineral surface roll roofing (mineral surface down) not less than 457 mm wide, centred in the valley and fastened with nails spaced not more than 450 mm o.c. located 25 mm away from the edges.

(6) The top layer of roofing required in Sentence (4) shall consist of at least Type M mineral surface roll roofing (mineral surface up), 914 mm wide, centred in the valley, applied over a 100 mm wide strip of cement along each edge of the bottom layer, and fastened with a sufficient number of nails to hold it in place until the shingles are applied.

9.26.4.4. Intersection of Shingle Roofs and Masonry

- (1) The intersection of shingle roofs and masonry walls or *chimneys* shall be protected with flashing.
- (2) Counter flashing required in Sentence (1) shall be embedded not less than 25 mm in the masonry and shall extend not less than 150 mm down the masonry and lap the lower flashing not less than 100 mm.
- (3) Flashing along the slopes of a roof described in Sentence (1) shall be stepped so that there is not less than a 75 mm head lap in both the lower flashing and counter flashing.
- (4) Where the roof described in Sentence (1) slopes upwards from the masonry, the flashing shall extend up the roof slope to a point equal in height to the flashing on the masonry, but not less than 1.5 times the shingle exposure.

9.26.4.5. Intersection of Shingle Roofs and Walls Other Than Masonry

- (1) The intersection of shingle roofs and walls clad with other than masonry shall be protected with flashing.
- (2) Flashing required in Sentence (1) shall be installed so that it extends up the wall not less than 75 mm behind the sheathing paper, and extends not less than 75 mm horizontally.
- (3) Along the slope of the roof, the flashing required in Sentence (1) shall be stepped with not less than a 75 mm head lap.

9.26.4.6. Intersection of Built-Up Roofs and Masonry

- (1) The intersection of built-up roofs with masonry walls or *chimneys* shall have a cant strip at the intersection and a roofing membrane shall be mopped over the cant strip and not less than 150 mm up the wall.
- (2) Counter flashing installed over the intersection referred to in Sentence (1) shall be embedded not less than 25 mm in the masonry, and shall be of sufficient length to extend down not less than 150 mm, lapping the membrane on the masonry not less than 100 mm.

9.26.4.7. Intersection of Built-Up Roofs and Walls Other Than Masonry

- (1) The intersection of built-up roofs with walls clad with other than masonry shall have a cant strip at the intersection.
- (2) The roofing membrane shall be mopped over the cant strip referred to in Sentence (1).
- (3) Flashing plies shall extend not less than 150 mm up the wall referred to in Sentence (1) behind the sheathing paper.

9.26.4.8. Chimney Saddles

- (1) Except as otherwise permitted in Sentence (5), *chimney* saddles shall be installed where the upper side of a *chimney* on a sloping roof is more than 750 mm wide.
- (2) *Chimney* saddles shall be covered with sheet metal or roofing material of weight and quality equivalent to the roofing.
- (3) Saddles shall be flashed where they intersect the roof.
- (4) The intersection of the saddle and the *chimney* shall be flashed and counterflashed as described in Article 9.26.4.4.
- (5) A *chimney* saddle need not be installed if the intersection between the *chimney* and roof is protected by sheet metal flashing that extends up the *chimney* to a height equal to at least one-sixth the width of the *chimney*, but not less than 150 mm, and up the roof slope to a point equal in height to the flashing on the *chimney*, but not less than 1.5 times the shingle exposure.
- (6) Flashing described in Sentence (5) at the *chimney* shall be counterflashed as required by Article 9.26.4.4.

9.26.5. Eave Protection for Shingles and Shakes

9.26.5.1. Required Eave Protection

- (1) Except as provided in Sentence (2), eave protection shall be provided on shingle, shake or tile roofs, extending from the edge of the roof a minimum of 900 mm up the roof slope to a line not less than 300 mm inside the inner face of the exterior wall.
- (2) Eave protection is not required
 - (a) over unheated garages, carports and porches,
 - (b) where the roof overhang exceeds 900 mm measured along the roof slope from the edge of the roof to the inner face of the exterior wall,
 - (c) on roofs of asphalt shingles installed in accordance with Subsection 9.26.8.,
 - (d) on roofs with slopes of 1 in 1.5 or greater, or
 - (e) in regions with 3 500 or fewer degree-days.

9.26.5.2. Materials

- (1) Eave protection shall be laid beneath the starter strip and shall consist of
 - (a) No. 15 asphalt-saturated felt laid in two plies lapped 480 mm and cemented together with lap cement,
 - (b) Type M or S roll roofing laid with not less than 100 mm head and end laps cemented together with lap cement,
 - (c) glass fibre or polyester fibre coated base sheets, or
 - (d) self-sealing composite membranes consisting of modified bituminous coated material.

9.26.6. Underlay Beneath Shingles

9.26.6.1. Materials

- (1) Except as required in Sentence (2), when underlay is used beneath shingles, it shall be
 - (a) asphalt-saturated sheathing paper weighing not less than 0.195 kg/m², or
 - (b) No. 15 plain or perforated asphalt-saturated felt.(See Note A-9.26.6.1.(1))
- (2) Underlay used beneath wood shingles shall be breather type.

9.26.6.2. Installation

- (1) When used with shingles, underlay shall be installed parallel to the eaves with head and end lap of not less than 50 mm.
- (2) The top edge of each strip of underlay referred to in Sentence (1) shall be fastened with sufficient roofing nails to hold it in place until the shingles are applied.
- (3) The underlay referred to in Sentence (1) shall overlap the eave protection by not less than 100 mm. (See Article 9.26.10.2. for underlay beneath wood shakes.)

9.26.7. Asphalt Shingles on Slopes of 1 in 3 or Greater

9.26.7.1. Coverage

- (1) Coverage shall be not less than 2 thicknesses of shingle over the entire roof, disregarding cutouts.

9.26.7.2. Starter Strip

- (1) A starter strip shall be installed along the lower edge of the roof so that it extends approximately 12 mm beyond the eaves and rake of the roof and fastened along the bottom edge with nails spaced not more than 300 mm o.c.
- (2) Starter strips shall be
 - (a) at least Type M mineral-surfaced roll roofing not less than 300 mm wide,
 - (b) shingles of the same weight and quality as those used as a roof covering with tabs facing up the roof slope, or
 - (c) pre-manufactured starter strips installed with sealant at the eaves.
- (3) Starter strips need not be provided where eave protection of not less than Type M mineral-surfaced roll roofing is provided or self-sealing composite membranes consisting of polyethylene and bituminous material is provided.

9.26.7.3. Head Lap

- (1) Shingles shall have a head lap of not less than 50 mm.

9.26.7.4. Fasteners

- (1) Except as provided in Sentence (2), shingles shall be fastened with at least 4 nails or staples for 1 m wide shingles so that no nails or staples are exposed.
- (2) Where staples with an 11 mm crown are used, shingles shall be fastened with at least 6 staples.
- (3) Fasteners may be reduced for narrower shingles in proportion to the width of the shingle or when shingles incorporating interlocking devices are used.
- (4) Fasteners referred to in Sentences (1) and (2) shall be located 25 mm to 40 mm from each end of each strip shingle with other fasteners equally spaced between them.
- (5) Fasteners referred to in Sentences (1) and (2) shall be located not less than 12 mm above the tops of the cutouts.

9.26.7.5. Securing of Tabs

- (1) Shingle tabs shall be secured by a spot of plastic cement not exceeding 25 mm diam under the centre of each tab or by interlocking devices or self-sealing strips.

9.26.7.6. Hips and Ridges

- (1) Shingles on hips and ridges shall be applied so they extend not less than 100 mm on either side of the hip or ridge, and shall be lapped not less than 150 mm.
- (2) Shingles referred to in Sentence (1) shall be fastened with nails or staples on each side located not more than 25 mm from the edge and 25 mm above the butt of the overlying shingle.

9.26.7.7. Eave Protection

- (1) Eave protection shall conform to Subsection 9.26.5.

9.26.7.8. Flashing

- (1) Flashing shall conform to Subsection 9.26.4.

9.26.8. Asphalt Shingles on Slopes of Less Than 1 in 3

9.26.8.1. Coverage

- (1) Except for the first 2 courses, coverage shall be not less than 3 thicknesses of shingle over the entire roof, disregarding cutouts.

9.26.8.2. Starter Strip

- (1) A starter strip shall be installed as in Article 9.26.7.2.
- (2) Starter strips required in Sentence (1) shall be laid in a continuous band of cement not less than 200 mm wide.

9.26.8.3. Securing of Tabs

- (1) Shingle tabs shall be secured with cold application cement applied at the rate of not less than 0.5 L/m² of cemented area, or hot application asphalt applied at the rate of 1 kg/m² of cemented area.

9.26.8.4. Securing of Shingle Courses

- (1) The first course of shingles shall be secured by a continuous band of cement along the eaves applied so that the width of the band equals the shingle exposure plus 100 mm.
- (2) The succeeding courses of shingles shall be secured by a continuous band of cement applied so that the width of the band equals the shingle exposure plus 50 mm.
- (3) The band required in Sentence (2) shall be located not more than 50 mm above the butt of the overlying course of shingles.

9.26.8.5. Hips and Ridges

- (1) Shingles on hips and ridges shall be not less than 300 mm wide applied to provide triple coverage.
- (2) Shingles referred to in Sentence (1) shall be cemented to the roof shingles and to each other with a coat of cement and fastened with nails or staples located 40 mm above the butt of the overlying shingle and 50 mm from each edge.

9.26.8.6. Flashing

- (1) Flashing shall conform to Subsection 9.26.4.

9.26.8.7. Fastening

- (1) Shingles shall be fastened in accordance with Article 9.26.7.4.

9.26.9. Wood Roof Shingles

9.26.9.1. Decking

- (1) Decking for wood shingled roofs may be continuous or spaced.

9.26.9.2. Grade

- (1) Western cedar shingles shall be not less than No. 2 grade.
- (2) Eastern white cedar shingles shall be not less than B (clear) grade.

9.26.9.3. Size

- (1) Wood shingles shall be not less than 400 mm long and not less than 75 mm nor more than 350 mm wide.

9.26.9.4. Spacing and Joints

- (1) Shingles shall be spaced approximately 6 mm apart and offset at the joints in adjacent courses not less than 40 mm so that joints in alternate courses are staggered.

9.26.9.5. Fastening

- (1) Shingles shall be fastened with 2 nails or staples located approximately 20 mm from the sides of the shingle and 40 mm above the exposure line.

9.26.9.6. Exposure

- (1) The exposure of wood roof shingles shall conform to Table 9.26.9.6.

Table 9.26.9.6.
Exposure of Wood Shingles
Forming Part of Sentence 9.26.9.6.(1)

Roof Slope	Maximum Exposure, mm					
	No. 1 or A Grade Length of Shingle, mm			No. 2 or B Grade Length of Shingle, mm		
	400	450	600	400	450	600
< 1 in 3	100	115	165	90	100	140
≥ 1 in 3	125	140	190	100	115	165

9.26.9.7. Flashing

- (1) Flashing shall conform to Subsection 9.26.4.

9.26.9.8. Eave Protection

- (1) Eave protection shall conform to Subsection 9.26.5.

9.26.10. Cedar Roof Shakes**9.26.10.1. Size and Thickness**

- (1) Shakes shall be not less than 450 mm long and not less than 100 mm nor more than 350 mm wide with a butt thickness of not more than 32 mm and not less than 9 mm.

9.26.10.2. Underlay

- (1) Where eave protection is not provided, an underlay conforming to the requirements in Article 9.26.6.1. for wood shingles shall be laid as a strip not less than 900 mm wide along the eaves.
- (2) A strip of material similar to that described in Sentence (1) not less than 450 mm wide shall be interlaid between each course of shakes with the bottom edge of the strip positioned above the butt line at a distance equal to double the exposure of the shakes.
- (3) Interlaid strips referred to in Sentence (2) shall be lapped not less than 150 mm at hips and ridges in a manner at will prevent water from reaching the roof sheathing.

9.26.10.3. Spacing and Joints

(1) Shakes shall be spaced 6 mm to 9 mm apart and the joints in any one course shall be separated not less than 40 mm from joints in adjacent courses.

9.26.10.4. Fastening

(1) Shakes shall be fastened with nails located approximately 20 mm from the sides of the shakes and 40 mm above the exposure line.

9.26.10.5. Exposure

- (1) The exposure of wood shakes shall not exceed
- (a) 190 mm for shakes not less than 450 mm long, and
 - (b) 240 mm for shakes not less than 600 mm long.

9.26.10.6. Flashing

(1) Flashing shall conform to Subsection 9.26.4.

9.26.10.7. Eave Protection

(1) Eave protection shall conform to Subsection 9.26.5.

9.26.10.8. Grade

(1) Shakes shall be not less than No. 1 or Handsplit grade.

9.26.11. Built-Up Roofs**9.26.11.1. Quantity of Materials**

(1) The quantities of bituminous materials used on built-up roofs shall conform to Table 9.26.11.1.

Table 9.26.11.1.
Quantities of Bitumen for Built-Up Roofs
 Forming Part of Sentence 9.26.11.1.(1)

Type of Roof	Amount of Bitumen per Square Metre of Roof Surface	
	Mopping Coats Between Layers	Flood Coat
Asphalt and aggregate	1 kg	3 kg
Coal-tar and aggregate	1.2 kg	3.6 kg
Cold process roofing	0.75 L cold process cement	2 L cold process top coating

9.26.11.2. Coal-Tar and Asphalt Products

(1) Coal-tar products and asphalt products shall not be used together in built-up roof construction.

9.26.11.3. Roof Felts

- (1) Bitumen roofing felts shall be at least No.15 felt.

9.26.11.4. Aggregate Surfacing

- (1) Aggregate used for surfacing built-up roofs shall be clean, dry and durable and shall consist of particles of gravel, crushed stone or air-cooled blast furnace slag having a size of from 6 mm to 15 mm.
- (2) The minimum amount of aggregate surfacing per square metre of roof surface shall be 15 kg gravel or crushed stone or 10 kg crushed slag.

9.26.11.5. Flashing

- (1) Flashing for built-up roofs shall conform to Subsection 9.26.4.

9.26.11.6. Number of Layers

- (1) Built-up roofing shall consist of not less than 3 three mopped-down layers of roofing felt flood coated with bitumen.

9.26.11.7. Installation of Layers

- (1) In hot process applications each layer of bitumen-saturated felt shall be laid while the bitumen is hot, with each layer overlapping the previous one.
- (2) The full width under each lap referred to in Sentence (1) shall be coated with bitumen so that in no place does felt touch felt.
- (3) Felt shall be laid free of wrinkles and shall be rolled directly into the hot bitumen and broomed forward and outward from the centre to ensure complete adhesion.

9.26.11.8. Roofing Over Wood-Based Sheathing

- (1) Except as permitted in Sentence (2), built-up roofing applied over wood, plywood, OSB or waferboard roof sheathing shall be laid over an additional base layer of felt laid dry over the entire roof deck with not less than a 50 mm headlap and a 50 mm sidelap between each sheet.
- (2) Where plywood, OSB or waferboard roof sheathing is used, the dry layer of felt required in Sentence (1) may be omitted when the joints are taped and the sheathing is primed with asphalt.

9.26.11.9. Attachment to Decking

- (1) Roofing shall be securely attached to the decking or where insulation is applied above the deck, the insulation shall be securely attached to the deck before the first layer of felt is fastened to the insulation.

9.26.11.10. Cant Strips

- (1) Except as permitted in Sentence (4), a cant strip shall be provided at the edges of roofs.
- (2) At least 2 plies of the roofing membrane shall be carried over the top of the cant strip.
- (3) Flashing shall extend over the top of the cant strip and be shaped to form a drip.

- (4) The cant strip required in Sentence (1) need not be provided where a gravel stop is installed at the edge of roofs.
- (5) The roofing membranes shall be carried over the edge of the roof before the gravel stop referred to in Sentence (4) is fastened and 2 plies of roofing membrane mopped to the top surface of the gravel stop before the flood coat is applied.
- (6) The gravel stop referred to in Sentence (4) shall extend over the edge of the roof to form a drip or shall be flashed so that the flashing extends over the edge to form a drip.

9.26.12. Selvage Roofing

9.26.12.1. Coverage

- (1) Wide selvage asphalt roofing shall provide double coverage over the entire roof surface.

9.26.12.2. Joints

- (1) Plies of selvage roofing shall be cemented together to ensure a watertight joint.

9.26.13. Sheet Metal Roofing

9.26.13.1. Thickness

- (1) Sheet metal roofing shall be not less than
 - (a) 0.33 mm thick galvanized steel,
 - (b) 0.46 mm thick copper,
 - (c) 0.46 mm thick zinc, or
 - (d) 0.48 mm thick aluminum.

9.26.13.2. Support

- (1) Where sheet metal roofing is not supported by roof decking but spans between spaced supports, the panels shall be designed to support the specified *live loads* for roofs.

9.26.14. Glass Reinforced Polyester Roofing

9.26.14.1. Support

- (1) Where glass reinforced polyester roofing panels are not supported by roof decking but span between spaced supports, the panels shall be designed to support the specified roof loads.

9.26.15. Hot Applied Rubberized Asphalt Roofing

9.26.15.1. Installation

- (1) Hot applied rubberized asphalt roofing shall be installed in accordance with CAN/CGSB-37.51-M, “Application for Hot Applied Rubberized Asphalt for Roofing and Waterproofing”.

9.26.16. Polyvinyl Chloride Sheet Roofing

9.26.16.1. Installation

- (1) Polyvinyl chloride sheet applied roofing membrane shall be installed in accordance with CGSB 37-GP-55M, “Application of Sheet Applied Flexible Polyvinyl Chloride Roofing Membrane.”

9.26.17. Concrete Roof Tiles

9.26.17.1. Installation

- (1) Concrete roof tiles shall be installed according to CAN/CSA-A220 Series, “Concrete Roof Tiles.” (See Note A-9.26.17.1.(1))

9.26.18. Roof Drains and Downspouts

9.26.18.1. Roof Drains

- (1) When roof drains are provided they shall conform to Part 7.

9.26.18.2. Downspouts

- (1) Where downspouts are provided and are not connected to a sewer, extensions shall be provided to carry rainwater away from the *building* in a manner which will prevent *soil* erosion.

Section 9.27. Cladding

9.27.1. Application

9.27.1.1. General

- (1) Where lumber, wood shingles, shakes, fibre-cement shingles, planks and sheets, plywood, OSB, waferboard, hardboard, vinyl, insulated vinyl, polypropylene, aluminum or steel, including trim and soffits, are installed as cladding on wood-frame walls or above-ground flat insulating concrete form walls exposed to precipitation, the cladding assembly shall comply with
 - (a) Subsections 9.27.2. to 9.27.13., or
 - (b) Part 5.
- (2) Where stucco is installed as cladding on wood-frame walls, above-ground flat insulating concrete form walls or masonry walls exposed to precipitation, the cladding assembly shall comply with
 - (a) Subsections 9.27.2. to 9.27.5., and Section 9.28., or
 - (b) Part 5.
- (3) Where masonry serves as cladding on wood-frame walls, above-ground flat insulating concrete form walls or masonry walls exposed to precipitation, the cladding assembly shall comply with
 - (a) Subsections 9.27.2. to 9.27.4., and Section 9.20., except for masonry veneer, which shall be attached to above-ground flat insulating concrete form walls in accordance with Sentence 9.27.5.4.(2), or
 - (b) Part 5.

(4) Where asphalt shingles are installed as cladding on wood-frame walls exposed to precipitation, the cladding assembly shall comply with

- (a) Subsections 9.26.7. and 9.27.2. to 9.27.4., or
- (b) Part 5.

(5) Where an exterior insulation finish system is installed as cladding on wood-frame, masonry, cold-formed steel stud, above-ground flat insulating concrete form or cast-in-place concrete walls exposed to precipitation, the cladding assembly shall comply with

- (a) Subsections 9.25.5., 9.27.2. to 9.27.4. and 9.27.14., or
- (b) Part 5.

(See Note A-9.27.1.1.(5))

(6) Where cladding materials other than those described in Sentences (1) to (5) are installed, or where the cladding materials described in Sentences (1) to (5) are installed on substrates other than those identified in Sentences (1) to (5), the materials and installation shall comply with Part 5.

9.27.2. Required Protection from Precipitation (See Note A-9.27.2.)

9.27.2.1. Minimizing and Preventing Ingress and Damage

(1) Except where exterior walls are protected from precipitation or where it can be shown that precipitation ingress will not adversely affect occupant health or safety, exterior walls shall be designed and constructed to

- (a) minimize the ingress of precipitation into the assembly, and
- (b) prevent the ingress of precipitation into interior space.

(See Note A-9.27.2.1.(1))

(2) Except where exterior walls are protected from specific mechanisms of deterioration, such as mechanical impact and ultraviolet radiation, exterior walls shall be designed and constructed to minimize the likelihood of their required performance being reduced to an unacceptable level as a result of those mechanisms.

9.27.2.2. Minimum Protection from Precipitation Ingress

(1) Reserved.

(2) Reserved.

(3) Reserved.

(4) Exterior walls exposed to precipitation shall be protected against precipitation ingress by an exterior cladding assembly consisting of a first plane of protection and a second plane of protection, where such walls enclose spaces of *residential occupancy* or spaces that directly serve spaces of *residential occupancy*. (See Note A-9.27.2.2.(4))

(5) Reserved.

(6) Reserved.

9.27.2.3. First and Second Planes of Protection

(1) Where walls required to provide protection from precipitation comprise cladding assemblies with first and second planes of protection,

- (a) the first plane of protection shall
 - (i) consist of cladding, with appropriate trim, accessory pieces and fasteners, and
 - (ii) be designed and constructed to minimize the passage of rain and snow into the wall by minimizing holes and managing precipitation ingress caused by kinetic energy of raindrops, surface tension, capillarity, gravity, and air pressure differences, (See Subsection 9.27.4.)
- (b) the second plane of protection shall be designed and constructed to (See Subsection 9.27.3.)
 - (i) intercept all rain and snow that gets past the first plane of protection, and
 - (ii) effectively dissipate any rain or snow to the exterior, and
- (c) the protection provided by the first and second planes of protection shall be maintained
 - (i) at wall penetrations created by the installation of components and services such as windows, doors, ventilation ducts, piping, wiring and electrical outlets, and
 - (ii) at the interface with other wall assemblies.

9.27.2.4. Protection of Cladding from Moisture

- (1) A clearance of not less than 200 mm shall be provided between finished ground and cladding that is adversely affected by moisture, such as untreated wood, plywood, OSB, waferboard and hardboard.
- (2) A clearance of not less than 50 mm shall be provided between a roof surface and cladding that is adversely affected by moisture, such as untreated wood, plywood, OSB, waferboard and hardboard.

9.27.3. Second Plane of Protection

9.27.3.1. Elements of the Second Plane of Protection (See Note A-9.27.3.1.)

- (1) The second plane of protection shall consist of a drainage plane having an appropriate inner boundary and flashing to dissipate rainwater to the exterior.
- (2) Except for cladding systems conforming to Subsection 9.27.14., the inner boundary of the drainage plane shall comply with Articles 9.27.3.2. to 9.27.3.6.
- (3) The protection provided by the second plane of protection shall be maintained
 - (a) at wall penetrations created by the installation of components and services such as windows, doors, ventilation ducts, piping, wiring and electrical outlets, and
 - (b) at the interface with other wall assemblies.
- (4) Flashing material and its installation shall comply with Articles 9.27.3.7. and 9.27.3.8.

9.27.3.2. Sheathing Membrane Material Standard

- (1) Sheathing membranes shall conform to the performance requirements of CAN/CGSB-51.32-M, “Sheathing, Membrane, Breather Type.”

9.27.3.3. Required Sheathing Membrane and Installation

- (1) Except as provided in Articles 9.27.3.4. to 9.27.3.6., at least one layer of sheathing membrane shall be applied beneath siding, stucco or masonry veneer.
- (2) Sheathing membrane required in Sentence (1) shall be applied so that joints are lapped not less than 100 mm.
- (3) Where sheathing membrane required in Sentence (1) is applied horizontally, the upper sheets shall overlap the lower sheets.

9.27.3.4. Insulating Sheathing in Lieu of Sheathing Membrane

- (1) Where non-wood-based rigid exterior insulating sheathing, or exterior insulating sheathing with an integral sheathing membrane is installed, a separate sheathing membrane is not required.
 - (2) Where insulating sheathing is installed as provided in Sentence (1),
 - (a) sheathing panels subject to moisture deterioration shall be sealed at all joints, and
 - (b) the joints of sheathing panels not subject to moisture deterioration shall be
 - (i) sealed at all joints, or
 - (ii) lapped or tongue and groove, and detailed to ensure drainage of water to the exterior.
- (See Note A-9.27.3.4.(2))

9.27.3.5. Sheathing Membranes in Lieu of Sheathing

- (1) Except as provided in Article 9.27.3.6., where no sheathing is used, at least 2 layers of sheathing membrane shall be applied beneath the cladding. (See Article 9.23.17.1. and Note A-9.27.3.5.(1))
- (2) All joints in the sheathing membrane required in Sentence (1) shall occur over framing, and the membrane shall be fastened to the framing with roofing nails or staples spaced not more than 150 mm along the edges of the outer layer of sheathing membrane.
- (3) Wall sheathing is permitted to be used in lieu of one layer of sheathing membrane required in Sentence (1), and the thickness need not conform to Table 9.23.17.2.-A.

9.27.3.6. Face Sealed Cladding (See Note A-9.27.3.6.)

- (1) Sheathing membrane is permitted to be omitted beneath cladding when the joints in the cladding are formed to effectively prevent the passage of wind and rain in conformance with Sentence (2) or (3), as applicable.
- (2) Cladding consisting of sheets of plywood, hardboard, OSB, waferboard or fibre cement is considered to meet the requirements of Sentence (1), provided the cladding is applied so that
 - (a) all edges are directly supported by framing,
 - (b) the vertical joints between adjacent sheets are sealed and
 - (i) covered with battens,
 - (ii) shiplapped, or
 - (iii) otherwise matched to provide weathertight joints, and
 - (c) the horizontal joints between adjacent sheets are sealed and
 - (i) shiplapped, or
 - (ii) otherwise matched to provide weathertight joints.
- (3) Metal siding consisting of sheets of metal is considered to meet the requirements of Sentence (1) where the joints between sheets are of the locked-seam type.

9.27.3.7. Flashing Materials

- (1) Flashing shall consist of not less than
 - (a) 1.73 mm thick sheet lead,
 - (b) 0.33 mm thick galvanized steel,
 - (c) 0.46 mm thick copper,
 - (d) 0.46 mm thick zinc,
 - (e) 0.48 mm thick aluminum, or
 - (f) 1.02 mm thick vinyl.

9.27.3.8. Flashing Installation

- (1) Except as provided in Sentence (2), flashing shall be installed at
 - (a) every horizontal junction between cladding elements,
 - (b) every horizontal offset in the cladding, and
 - (c) every horizontal line where the cladding substrates change and where
 - (i) the substrates differ sufficiently for stresses to be concentrated along that line, or
 - (ii) the installation of the cladding on the lower substrate may compromise the drainage of moisture from behind the cladding above.

(See Note A-9.27.3.8.(1))

- (2) Flashing need not be installed as described in Sentence (1)
 - (a) where the upper cladding elements overlap the lower cladding elements by not less than 25 mm,
 - (b) where,
 - (i) the cladding above and below the joint is installed outboard of a drained and vented air space, and (See Clause 9.27.2.2.(1)(a))
 - (ii) the horizontal detail is constructed so as to minimize the ingress of precipitation into the air space, or
 - (c) at horizontal construction joints in stucco, where
 - (i) the joint is finished with an expansion-contraction strip, and
 - (ii) the cladding is installed outboard of a drained and vented air space. (See Clause 9.27.2.2.(1)(a))

(3) Flashing shall be installed over exterior wall openings where the vertical distance from the bottom of the eave to the top of the trim is more than one-quarter of the horizontal overhang of the eave. (See Note A-9.27.3.8.(3))

- (4) Flashing described in Sentences (1) and (3) shall
 - (a) extend not less than 50 mm upward inboard of the sheathing membrane or sheathing installed in lieu of the sheathing membrane, (See Article 9.27.3.4.)
 - (b) have a slope of not less than 6% toward the exterior after the expected shrinkage of the *building* frame,
 - (c) terminate at each end with an end-dam
 - (i) with a height in millimetres not less than 25 mm or 1/10 the value of the 1-in-5 driving rain wind pressure in Pa, and
 - (ii) at the height defined in Subclause (c)(i), extending to the face of the adjacent cladding,
 - (d) lap not less than 10 mm vertically over the *building* element below, and
 - (e) terminate in a drip offset not less than 5 mm outward from the outer face of the *building* element below.

(See Note A-9.27.3.8.(4))

(5) Where the sills of windows and doors installed in exterior walls are not self-flashing, flashing shall be installed between the underside of the window or door and the wall construction below. (See Note A-9.27.3.8.(5))

9.27.4. Sealants

9.27.4.1. Required Sealants

- (1) Sealant shall be provided where required to prevent the entry of water into the structure.
- (2) Sealant shall be provided between masonry, siding or stucco and the adjacent door and window frames or trim, including sills unless such locations are completely protected from the entry of rain.
- (3) Sealant shall be provided at vertical joints between different cladding materials unless the joint is suitably lapped or flashed to prevent the entry of rain. (See Articles 9.7.6.2., 9.20.13.12. and 9.28.1.5.)

9.27.4.2. Materials

- (1) Sealants shall be
 - (a) non-hardening type suitable for exterior use,
 - (b) selected for their ability to resist the effects of weathering, and
 - (c) compatible with and adhere to the substrate to which they are applied.(See Note A-9.27.4.2.(1))
- (2) Sealants shall conform to
 - (a) ASTM C834, “Standard Specification for Latex Sealants,”
 - (b) ASTM C920, “Standard Specification for Elastomeric Joint Sealants,”
 - (c) ASTM C1184, “Standard Specification for Structural Silicone Sealants,” or
 - (d) ASTM C1311, “Standard Specification for Solvent Release Sealants.”
- (3) Backer rod shall conform to ASTM C1330, “Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.” (See Note A-9.27.4.2.(1))

9.27.5. Attachment of Cladding

9.27.5.1. Attachment

- (1) Except as permitted by Sentences (2) to (5), cladding shall be fastened to the framing members or furring members, or to blocking between the framing members.
- (2) Vertical lumber, stucco lath or reinforcing, vertically applied vinyl siding, vertically applied insulated vinyl siding, and polypropylene siding are permitted to be attached to sheathing only where the sheathing consists of not less than
 - (a) 14.3 mm lumber,
 - (b) 12.5 mm plywood, or
 - (c) 12.5 mm OSB or waferboard.
- (3) Vertically applied metal siding and wood shingles and shakes are permitted to be attached to the sheathing only where the sheathing consists of not less than
 - (a) 14.3 mm lumber,
 - (b) 7.5 mm plywood, or
 - (c) 7.5 mm OSB or waferboard.
- (4) Where wood shingles or shakes are applied to sheathing which is not suitable for attaching the shingles or shakes, the shingles or shakes are permitted to be attached to a wood lath not less than 38 mm by 9.5 mm thick securely nailed to the framing and applied as described in Article 9.27.7.5.
- (5) Cladding, trim and furring members are permitted to be attached to the web fastening strips of flat wall insulating concrete form units using screws in accordance with Sentence 9.27.5.4.(2)

9.27.5.2. Blocking

- (1) Blocking for the attachment of cladding shall be not less than 38 mm by 38 mm lumber securely nailed to the framing and spaced not more than 600 mm o.c.

9.27.5.3. Furring

- (1) Except as permitted in Sentence 9.27.5.1.(4), furring for the attachment of cladding shall be not less than 19 mm by 38 mm lumber when applied over sheathing.

- (2) When applied without sheathing, furring referred to in Sentence (1) shall be not less than
 - (a) 19 mm by 64 mm lumber on supports spaced not more than 400 mm o.c., or
 - (b) 19 mm by 89 mm lumber on supports spaced not more than 600 mm o.c.
- (3) Furring referred to in Sentence (1) shall be
 - (a) securely fastened to the framing, and
 - (b) spaced not more than 600 mm o.c.

9.27.5.4. Size and Spacing of Fasteners

(1) Nail or staple size and spacing for the attachment of cladding and trim to wood framing, furring members or blocking shall conform to Table 9.27.5.4.-A.

(2) Screw size and spacing for the attachment of cladding, trim and furring members to the web fastening strips of flat wall insulating concrete form (ICF) units shall conform to Table 9.27.5.4.-B where the 1-in-50 hourly wind pressure (HWP) is less than or equal to 0.60 kPa. (See Note A-9.27.5.4.(2))

Table 9.27.5.4.-A
Attachment of Cladding to Wood Framing, Furring Members or Blocking
 Forming Part of Sentence 9.27.5.4.(1)

Type of Cladding	Minimum Nail or Staple Length, mm ⁽¹⁾	Minimum Number of Nails or Staples	Maximum Nail or Staple Spacing, mm o.c.
Wood trim	51	—	600
Lumber siding or horizontal siding made from sheet metal	51	—	600
Metal cladding	38	—	600 (nailed to framing) 400 (nailed to sheathing only)
Wood shakes			
up to 200 mm in width	51	2	—
over 200 mm in width	51	3	—
Wood shingles			
up to 200 mm in width	32	2	—
over 200 mm in width	32	3	—
Vinyl and insulated vinyl siding			
horizontally applied	38	—	400 ⁽²⁾
vertically applied	38	—	300
Polypropylene siding	38	—	400 ⁽²⁾
Panel- or sheet-type cladding			
up to 7 mm thick	38	—	150 (along edges)
over 7 mm thick	51	—	300 (along intermediate supports)

Notes to Table 9.27.5.4.-A:

- (1) The minimum fastener length need not exceed the minimum fastener penetration depth required by Article 9.27.5.7.
- (2) The maximum spacing of 400 mm o.c. applies to nails and staples used to attach horizontally applied vinyl, insulated vinyl and polypropylene siding, unless a greater spacing is permitted in an evaluation report prepared by an accredited certification organization.

Table 9.27.5.4.-B
Attachment of Cladding to Flat Wall ICF Units where the 1-in-50 HWP \leq 0.60 kPa
 Forming Part of Sentence 9.27.5.4.(2)

Type of Cladding ⁽¹⁾	Minimum Screw Length	Minimum Screw Diameter, mm	Maximum Horizontal Spacing of Screws, mm o.c. ⁽²⁾
Wood trim	(3)	3.5	400 or 450 (screwed to web fastening strip)
Lumber siding or horizontal siding made from sheet material	(3)	4.2	400 or 450 (screwed to web fastening strip)
Metal cladding	(3)	4.2	400 or 450 (screwed to web fastening strip)
Vinyl cladding	(3)	3.5	400 or 450 (screwed to web fastening strip)
Masonry veneer ⁽⁴⁾	(3)	4.2	400 or 450 (masonry tie screwed to web fastening strip)
Panel- or sheet-type cladding			
up to 7 mm thick	(3)	3.5	150 or 200 (along edges)
over 7 mm thick	(3)	4.2	300 or 400 (along intermediate supports)

Notes to Table 9.27.5.4.-B:

- (1) Wood shakes and wood shingles are permitted to be attached to horizontal wood furring members in accordance with Table 9.27.5.4.-A. The wood furring members shall be attached to the web fastening strips of flat wall ICF units with screws not less than 4.2 mm in diameter spaced horizontally not more than 400 or 450 mm o.c. (two horizontal spacing options are given to accommodate the 150 and 200 mm o.c. horizontal spacing options for web fastening strips).
- (2) Two horizontal spacing options are given to accommodate the 150 mm o.c. and 200 mm o.c. horizontal spacing options for web fastening strips. The maximum vertical spacing of screws or masonry ties, as applicable, shall be 400 mm.
- (3) Screws must be long enough to penetrate through the web fastening strips by a minimum of 6 mm.
- (4) See also Subsection 9.20.5. for requirements on the support of masonry veneer.

9.27.5.5. Fastener Materials

- (1) Nails or staples for the attachment of cladding and wood trim shall be corrosion-resistant and shall be compatible with the cladding material.

9.27.5.6. Expansion and Contraction

- (1) Fasteners for metal cladding shall be positioned to permit expansion and contraction of the cladding.
- (2) Fasteners for vinyl siding, insulated vinyl siding and polypropylene siding shall be installed in the centre of the slots of the nail hem.

9.27.5.7. Penetration of Fasteners (See Note A-9.27.5.7.)

- (1) Fasteners for shakes and shingles shall penetrate through the nail-holding base or not less than 19 mm into the framing.
- (2) Fasteners for vinyl cladding, insulated vinyl cladding and polypropylene cladding shall penetrate through the nail-holding base or not less than 32 mm into the framing.
- (3) Fasteners for cladding other than that described in Sentences (1) and (2) shall penetrate through the nail-holding base or not less than 25 mm into the framing.

9.27.6. Lumber Siding

9.27.6.1. Materials

- (1) Lumber siding shall be sound, free of knot holes, loose knots, through checks or splits.

9.27.6.2. Thickness and Width

- (1) Drop, rustic, novelty, lapped board and vertical wood siding shall be not less than 14.3 mm thick and not more than 286 mm wide.
- (2) Bevel siding shall be
 - (a) not less than 5 mm thick at the top, and
 - (b) not less than
 - (i) 12 mm thick at the butt for siding 184 mm or less in width, and
 - (ii) 14.3 mm thick at the butt for siding wider than 184 mm.
- (3) Bevel siding shall be not more than 286 mm wide.

9.27.6.3. Joints

- (1) Lumber siding shall prevent water from entering at the joints by the use of lapped or matched joints or by vertical wood battens.
- (2) Siding shall overlap not less than 1 mm per 16 mm width of lumber, but not less than
 - (a) 9.5 mm for matched siding,
 - (b) 25 mm for lapped bevel siding, or
 - (c) 12 mm for vertical battens.

9.27.7. Wood Shingles and Shakes

9.27.7.1. Materials

- (1) Shingles and shakes shall conform to,
 - (a) CSA O118.1, “Western Red Cedar Shakes and Shingles,” or
 - (b) CSA O118.2, “Eastern White Cedar Shingles.”
- (2) Western cedar shakes shall be not less than No. 1 or Handsplit grade, and western cedar shingles not less than No. 2 grade, except that No. 3 grade may be used for undercoursing.
- (3) Eastern white cedar shingles shall be at least B (clear) grade, except that C grade may be used for undercoursing.

9.27.7.2. Width

- (1) Shingles and shakes shall be not less than 65 mm or more than 350 mm wide.

9.27.7.3. Fasteners

- (1) Shingles or shakes shall be fastened with nails located approximately 20 mm from each edge and not less than 25 mm above the exposure line for single-course applications, or approximately 50 mm above the butt for double-course applications.

9.27.7.4. Offsetting of Joints

- (1) In single-course application, joints in succeeding courses shall be offset not less than 40 mm so that joints in any 2 of 3 consecutive courses are staggered.
- (2) In double-course application, joints in the outer course shall be offset from joints in the under-course by not less than 40 mm, and joints in succeeding courses shall be offset not less than 40 mm.

9.27.7.5. Fastening to Lath

- (1) When lath is used with double-course application (See Sentence 9.27.5.1.(4)), it shall be spaced according to the exposure and securely fastened to the framing.
- (2) The butts of the under-course of the application referred to in Sentence (1) shall rest on the top edge of the lath.
- (3) The outer course of the application referred to in Sentence (1) shall be fastened to the lath with nails of sufficient length to penetrate through the lath.
- (4) The butts of the shingles or shakes shall be so located that they project not less than 12 mm below the bottom edge of the lath referred to in Sentence (1).
- (5) If wood lath is not used, the butts of the under-course shingles or shakes of the application referred to in Sentence (1) shall be located 12 mm above the butts of the outer course.

9.27.7.6. Exposure and Thickness

- (1) The exposure and butt thickness of shingles and shakes shall conform to Table 9.27.7.6.

Table 9.27.7.6.
Exposure and Thickness of Wood Shingles and Shakes
 Forming Part of Sentence 9.27.7.6.(1)

Shake or Shingle Length, mm	Maximum Exposure, mm		Minimum Butt Thickness, mm
	Single Coursing	Double Coursing	
400	190	305	10
450	216	356	11
600	292	406	13

9.27.8. Plywood**9.27.8.1. Material Standards**

- (1) Plywood cladding shall be exterior type conforming to
 - (a) ANSI/HPVA HP-1, “American National Standard for Hardwood and Decorative Plywood,”
 - (b) CSA O121, “Douglas fir plywood,”
 - (c) CSA O151, “Canadian softwood plywood,” or
 - (d) CSA O153, “Poplar plywood.”

9.27.8.2. Thickness

- (1) Plywood cladding shall be not less than 6 mm thick when applied directly to sheathing.
- (2) When applied directly to framing or over furring strips, plywood cladding thickness shall conform to Table 9.27.8.2.
- (3) The thickness of grooved or textured plywood cladding shall be measured at the point of least thickness.

Table 9.27.8.2.
Minimum Plywood Cladding Thickness
 Forming Part of Sentences 9.27.8.2.(2) and 9.27.10.2.(2)

Spacing of Supports, mm	Minimum Thickness, mm	
	Face Grain Parallel to Supports	Face Grain at Right Angles to Supports
400	8	6
600	11	8

9.27.8.3. Edge Treatment

- (1) The edges of plywood cladding shall be treated with a suitable paint or sealer.

9.27.8.4. Panel Cladding

- (1) Plywood applied in panels shall have all edges supported.
- (2) Not less than a 2 mm gap shall be provided between panels referred to in Sentence (1).
- (3) Vertical joints in cladding referred to in Sentence (1) shall be protected with batten strips or sealant when the plywood joints are not matched.
- (4) Horizontal joints in cladding referred to in Sentence (1) shall be lapped not less than 25 mm or shall be suitably flashed.

9.27.8.5. Lapped Strip Siding

- (1) Plywood applied in horizontal lapped strips shall have not less than a 2 mm gap provided at the butted ends, which shall be caulked.
- (2) The horizontal joints of siding described in Sentence (1) shall be lapped not less than 25 mm.
- (3) Wedges shall be inserted under all vertical butt joints and at all corners when horizontal lapped plywood is applied without sheathing.

9.27.9. Hardboard**9.27.9.1. Material Standards**

- (1) Hardboard cladding shall conform to ANSI A135.6, “Engineered Wood Siding.”

9.27.9.2. Thickness

- (1) Hardboard cladding shall be not less than
 - (a) 9.5 mm thick when applied over sheathing that provides continuous support or over furring or framing members not more than 400 mm o.c., or
 - (b) 11.1 mm thick when applied over furring or framing members not more than 600 mm o.c.
- (2) Where hardboard cladding is grooved, the grooves shall not extend more than 1.5 mm into the minimum required thickness. (See Note A-9.27.9.2.(2))

9.27.9.3. Panel Cladding

- (1) Hardboard cladding applied in panels shall have all edges supported with not less than a 5 mm gap provided between sheets.
- (2) Vertical joints in cladding described in Sentence (1) shall be protected with batten strips or sealant when the joints are not matched.
- (3) Horizontal joints in cladding described in Sentence (1) shall be lapped not less than 25 mm or shall be suitably flashed.

9.27.9.4. Lapped Strip Siding

- (1) Hardboard applied in horizontal lapped strips shall have not less than a 5 mm gap provided at the butted ends, which shall be sealed or otherwise protected with suitable mouldings.
- (2) The horizontal joints of siding described in Sentence (1) shall overlap not less than 1 mm per 16 mm width of siding board but not less than 9.5 mm for matched joint siding or 25 mm for lapped siding.

9.27.9.5. Clearance

- (1) Not less than 3 mm clearance shall be provided between hardboard cladding and door or window frames.

9.27.10. OSB and Waferboard

9.27.10.1. Material Standard

- (1) OSB and waferboard cladding shall conform to CSA O437.0, “OSB and Waferboard.”

9.27.10.2. Thickness

- (1) OSB conforming to O-2 grade shall be not less than 6.0 mm thick where applied directly to sheathing.
- (2) OSB conforming to O-2 grade applied directly to framing or over furring strips shall conform to the thickness shown for plywood in Table 9.27.8.2. (See Note A-9.27.10.2.(2))
- (3) OSB conforming to O-1 grade and waferboard conforming to R-1 grade shall be not less than 7.9 mm thick where applied directly to sheathing.
- (4) Where applied directly to framing or over furring strips, OSB conforming to O-1 grade and waferboard conforming to R-1 grade shall be not less than
 - (a) 9.5 mm thick on supports spaced not more than 400 mm o.c., and
 - (b) 12.7 mm thick on supports spaced not more than 600 mm o.c.

9.27.10.3. Panel Cladding

- (1) OSB and waferboard applied in panels shall have all edges supported and treated with a primer or sealer.
- (2) Not less than a 3 mm gap shall be provided between sheets in cladding described in Sentence (1).
- (3) Vertical joints in cladding described in Sentence (1) shall be protected with batten strips or sealant when the OSB and waferboard joints are not matched.
- (4) Horizontal joints in cladding described in Sentence (1) shall be lapped not less than 25 mm or shall be suitably flashed.

9.27.10.4. Clearance

- (1) Not less than a 3 mm clearance shall be provided between OSB and waferboard cladding and door or window frames.

9.27.11. Metal

9.27.11.1. Material Standards

- (1) Steel sheet cladding, including horizontal and vertical strip steel siding, flashing and trim accessories, shall
 - (a) have a minimum thickness of 0.33 mm, and
 - (b) conform to CSSBI 23M, “Standard for Residential Steel Cladding.”(See Note A-9.27.11.1.(1))
- (2) Horizontal and vertical strip aluminum siding, including flashing and trim accessories, shall conform to CAN/CGSB-93.2-M, “Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.” (See Note A-9.27.11.1.(2) and (3))
- (3) Aluminum sheet cladding shall conform to CAN/CGSB-93.1-M, “Sheet, Aluminum Alloy, Prefinished, Residential,” and shall have a thickness of not less than 0.58 mm, except that siding supported by backing or sheathing shall have a thickness of not less than 0.46 mm. (See Note A-9.27.11.1.(2) and (3))

9.27.12. Vinyl Siding, Insulated Vinyl Siding and Vinyl Soffits

9.27.12.1. Material Standards

- (1) Vinyl siding shall conform to ASTM D3679, “Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding.”
- (2) Insulated vinyl siding shall conform to ASTM D7793, “Standard Specification for Insulated Vinyl Siding.”
- (3) Rigid vinyl soffits shall conform to ASTM D4477, “Standard Specification for Rigid (Unplasticized) Poly(Vinyl Chloride) (PVC) Soffit.”
- (4) Where vinyl siding, insulated vinyl siding or rigid vinyl soffits are required to have a *flame-spread rating*, the rating shall be determined in accordance with CAN/ULC-S102.2, “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.”

9.27.12.2. Attachment

- (1) The attachment of vinyl siding and insulated vinyl siding shall conform to the requirements in Subsection 9.27.5.

9.27.13. Polypropylene Siding**9.27.13.1. Material Standard**

- (1) Polypropylene siding shall conform to ASTM D7254, “Standard Specification for Polypropylene (PP) Siding.”
- (2) Where polypropylene siding is required to have a *flame-spread rating*, the rating shall be determined in accordance with CAN/ULC-S102.2, “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.”

9.27.13.2. Attachment

- (1) The attachment of polypropylene siding shall conform to the requirements in Subsection 9.27.5.

9.27.14. Exterior Insulation Finish Systems**9.27.14.1. Application**

- (1) Except as provided in Sentence (2), this Subsection applies to exterior insulation finish systems (EIFS) that
- (a) are covered in the scope of CAN/ULC-S716.1, “Standard for Exterior Insulation and Finish Systems (EIFS) – Materials and Systems,” and
 - (b) have a geometrically defined drainage cavity with a minimum cavity depth of 6 mm and an open area equal to not less than 13% of the area of a full-size EIFS panel.
- (See Note A-9.27.14.1.(1))
- (2) EIFS that are not covered by Sentence (1) shall comply with Part 5.

9.27.14.2. Materials

- (1) The materials used in EIFS shall conform to CAN/ULC-S716.1, “Standard for Exterior Insulation and Finish Systems (EIFS) – Materials and Systems.”
- (2) The substrate on which the EIFS is installed shall
- (a) be compatible with that particular system, and (See Note A-9.27.14.2.(2)(a))
 - (b) comply with the structural requirements for sheathing materials stated in Section 9.23.

9.27.14.3. Design and Installation

- (1) The design of an exterior insulation finish system shall comply with CAN/ULC-S716.3, “Standard for Exterior Insulation and Finish Systems (EIFS) – Design Application.”
- (2) The installation of an exterior insulation finish system shall comply with CAN/ULC-S716.2, “Standard for Exterior Insulation and Finish Systems (EIFS) – Installation of EIFS Components and Water Resistive Barrier.”

Section 9.28. Stucco

9.28.1. General

9.28.1.1. Sheathing Beneath Stucco

- (1) Sheathing shall be provided beneath stucco applied over wood-frame walls except as permitted in Article 9.28.4.2.
- (2) Where applied beneath stucco, sheathing shall conform to Subsection 9.23.17.

9.28.1.2. Lath and Reinforcing

- (1) Stucco lath or reinforcing shall be used to attach stucco to any substrate other than masonry.
- (2) Stucco lath or reinforcing shall be used to attach stucco to masonry where
 - (a) the masonry is soft-burned tile or brick of less strength than the stucco, or
 - (b) the masonry surface is not sound, clean and sufficiently rough to provide a good key.
- (3) Stucco applied over masonry *chimneys* shall be reinforced.

9.28.1.3. Concrete Masonry Units

- (1) Stucco finish shall not be applied over concrete masonry units less than one month old unless the units have been cured by the autoclave process.

9.28.1.4. Clearance Over Ground Level

- (1) Stucco shall be not less than 200 mm above finished ground level except when it is applied over concrete or masonry.

9.28.1.5. Flashing and Caulking

- (1) Flashing and caulking used with stucco shall conform to Subsections 9.27.3. and 9.27.4., except that if aluminum flashing is used, it shall be separated from the stucco by an impervious membrane or coating. (See Article 9.7.6.2. for caulking around window frames.)

9.28.2. Stucco Materials

9.28.2.1. Portland Cement

- (1) Portland cement shall conform to CSA A3001, "Cementitious Materials for Use in Concrete."

9.28.2.2. Aggregate

- (1) Aggregate shall be clean, well-graded natural sand or sand manufactured from crushed stone, gravel or air-cooled blast furnace slag and shall contain no significant amounts of deleterious material.
- (2) Aggregate grading shall conform to Table 9.28.2.2.

Table 9.28.2.2.
Aggregate Grading for Stucco
Forming Part of Sentence 9.28.2.2.(2)

Sieve Sizes, mm	% Aggregate Passing Sieve	
	Maximum	Minimum
4	—	100
2	—	90
1	90	60
0.5	60	45
0.25	30	10
0.125	5	—

9.28.2.3. Water

- (1) Water shall be clean and free of significant amounts of deleterious material.

9.28.3. Fasteners

9.28.3.1. Materials

- (1) Fasteners for stucco lath or reinforcing shall be corrosion-resistant and of a material other than aluminum.

9.28.3.2. Nails and Staples

- (1) Nails for stucco lath or reinforcing shall be not less than 3.2 mm diam with a head diameter of not less than 11.1 mm.
- (2) Staples for stucco lath or reinforcing shall be not less than 1.98 mm diam or thickness.
- (3) Staples and nails for attaching stucco lath or reinforcing to vertical surfaces shall be of sufficient length to penetrate 25 mm into framing members or to the full depth of the sheathing where the sheathing is used for attachment.
- (4) On horizontal surfaces nails for stucco lath or reinforcing shall be not less than 38 mm long.

9.28.4. Stucco Lath

9.28.4.1. Materials

- (1) Rib lath or expanded metal stucco mesh shall be
- copper-alloy steel coated with rust-inhibitive paint after fabrication, or
 - galvanized.
- (2) Woven or welded wire mesh shall be galvanized.

9.28.4.2. No Sheathing Required

(1) Sheathing need not be provided beneath stucco where not less than 1.19 mm diam galvanized wire is applied horizontally to the framing at vertical intervals of not more than 150 mm, or where paper-backed welded wire metal lath is used.

9.28.4.3. Stucco Lath Specifications

(1) Stucco lath shall conform to Table 9.28.4.3.

Table 9.28.4.3.
Stucco Lath
Forming Part of Sentence 9.28.4.3.(1)

Location	Type of Lath	Minimum Diam of Wire, mm	Maximum Mesh Opening	Minimum Mass, kg/m ²
Vertical surfaces	Welded or woven wire	1.15	25 mm	—
		1.30	38 mm	—
		1.50	51 mm	—
	Stucco mesh reinforcing (expanded metal)	—	25.8 cm ²	0.98
Horizontal surfaces ⁽¹⁾	9.5 mm rib lath	—	—	1.84
	Cedar lath	—	—	—

Notes to Table 9.28.4.3.:

(1) See Note A-Table 9.28.4.3.

9.28.4.4. Self-Furring Devices

(1) Stucco lath shall be held not less than 6 mm away from the backing by means of suitable self-furring devices.

9.28.4.5. Application of Stucco Lath

- (1) Stucco lath shall be applied with the long dimension horizontal.
- (2) Horizontal and vertical joints in stucco lath shall be lapped not less than 50 mm.
- (3) End joints of stucco lath shall be staggered and shall occur over framing members.
- (4) External corners of stucco lath shall be reinforced with a vertical strip of lath or reinforcing extending not less than 150 mm on both sides of the corner, or the lath or reinforcing shall extend around corners not less than 150 mm.

9.28.4.6. Fastening

- (1) Stucco lath shall be fastened in conformance with Subsection 9.27.5.
- (2) Fasteners on vertical surfaces shall be spaced not more than
 - (a) 150 mm o.c. vertically and 400 mm o.c. horizontally, or
 - (b) 100 mm o.c. vertically and 600 mm o.c. horizontally.

(3) Nailing patterns other than those required in Sentence (2) are permitted to be used provided there are at least 20 fasteners per square metre of wall surface.

(4) Fasteners on horizontal surfaces shall be spaced not more than

- (a) 150 mm o.c. along the framing members when members are spaced not more than 400 mm o.c., and
- (b) 100 mm o.c. along the framing members when members are spaced not more than 600 mm o.c.

9.28.5. Stucco Mixes

9.28.5.1. Mixes

(1) Stucco mixes shall conform to Table 9.28.5.1.

Table 9.28.5.1.
Stucco Mixes
Forming Part of Sentence 9.28.5.1.(1)

Materials, volume			
Portland Cement	Masonry Cement	Lime	Aggregate
1	—	0.25 to 1	3.25 to 4 parts per part of cementitious material
1	1	—	

9.28.5.2. Pigments

- (1) Pigment if used shall consist of pure mineral oxides inert to the action of sun, lime and cement.
- (2) Pigment shall not exceed 6% of the Portland cement by weight.

9.28.5.3. Mixing

- (1) Materials shall be thoroughly mixed before and after water is added.
- (2) Stucco shall be applied not later than 3 h after the initial mixing.

9.28.6. Stucco Application

9.28.6.1. Low Temperature Conditions

- (1) The base for stucco shall be maintained above freezing.
- (2) Stucco shall be maintained at a temperature of not less than 10°C during application and for not less than 48 h afterwards.

9.28.6.2. Number of Coats and Total Thickness

- (1) Stucco shall be applied with at least 2 base coats and one finish coat, providing a total thickness of not less than 15 mm, measured from the face of the lath or face of the masonry where no lath is used.

9.28.6.3. First Coat

- (1) The first coat shall be not less than 6 mm thick, measured from the face of the lath or masonry, fully embedding the lath.
- (2) The surface of the first coat shall be scored to provide a key with the second coat.

9.28.6.4. Second Coat

- (1) The second coat shall be not less than 6 mm thick.
- (2) The surface of the second coat shall be lightly roughened to provide a key with the finish coat if the finish coat is other than stone dash.

9.28.6.5. Finish Coat

- (1) When the finish coat is other than stone dash, the base shall be dampened but not saturated before the finish coat is applied.
- (2) The thickness of the finish coat shall be not less than 3 mm.
- (3) When a stone dash finish is used, the stone shall be partially embedded in the second coat before the second coat starts to set or stiffen.

Section 9.29. Interior Wall and Ceiling Finishes**9.29.1. General****9.29.1.1. Fire Protection and Sound Control**

- (1) A wall or ceiling finish shall also conform to the appropriate requirements in Sections 9.10. and 9.11. in addition to the requirements in this Section.

9.29.2. Waterproof Wall Finish**9.29.2.1. Where Required**

- (1) Waterproof finish shall be provided to a height of not less than
 - (a) 1.8 m above the floor in shower stalls,
 - (b) 1.2 m above the rims of bathtubs equipped with showers, and
 - (c) 400 mm above the rims of bathtubs not equipped with showers.

9.29.2.2. Materials

- (1) Waterproof finish shall consist of ceramic, plastic or metal tile, sheet vinyl, tempered hardboard, laminated thermosetting decorative sheets or linoleum.

9.29.3. Wood Furring

9.29.3.1. Size and Spacing of Furring

- (1) Wood furring for the attachment of wall and ceiling finishes shall conform to Table 9.29.3.1.

Table 9.29.3.1.
Size and Spacing of Furring
 Forming Part of Sentence 9.29.3.1.(1)

Maximum Spacing of Furring, mm	Minimum Size of Furring, mm		
	Maximum Spacing of Furring Supports		
	Continuous Supports	400 mm o.c.	600 mm o.c.
300	19 × 38	19 × 38	19 × 64
400	19 × 38	19 × 38	19 × 64
600	19 × 38	19 × 64	19 × 89

9.29.3.2. Fastening

- (1) Furring shall be fastened to the framing or to wood blocks with not less than 51 mm nails.

9.29.4. Plastering

9.29.4.1. Application

- (1) Application of plaster wall and ceiling finishes, including installation of metal or gypsum lath, shall conform to CSA A82.30-M, “Interior Furring, Lathing and Gypsum Plastering.”

9.29.5. Gypsum Board Finish (Taped Joints)

9.29.5.1. Application

- (1) The requirements for application of gypsum board in this Subsection apply to the single layer application of gypsum board to wood furring or framing using nails or screws.
- (2) Except as provided in Sentence (3), gypsum board applications not described in this Subsection shall conform to CSA A82.31-M, “Gypsum Board Application.”
- (3) The application of gypsum board to flat insulating concrete form (ICF) walls shall conform to ASTM C840, “Standard Specification for Application and Finishing of Gypsum Board.” (See Note A-9.29.5.1.(3))

9.29.5.2. Materials

- (1) Gypsum products shall conform to
- (a) CAN/CSA-A82.27-M, “Gypsum Board”,
 - (b) ASTM C1178 / C1178M, “Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel,” or
 - (c) ASTM C1396 / C1396M, “Standard Specification for Gypsum Board,” except that the *flame-spread rating* of gypsum board shall be determined in accordance with CAN/ULC-S102, “Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.”

9.29.5.3. Maximum Spacing of Supports

(1) Maximum spacing of supports for gypsum board applied as a single layer shall conform to Table 9.29.5.3.

Table 9.29.5.3.
Spacing of Supports for Gypsum Board
 Forming Part of Sentence 9.29.5.3.(1)

Thickness, mm	Orientation of Board to Framing	Maximum Spacing of Supports, mm o.c.		
		Walls	Ceilings	
			Painted Finish	Water-Based Texture Finish
Gypsum board conforming to Sentence 9.29.5.2.(1) (except Sections 9 and 12 of ASTM C1396 / C1396M)				
9.5	parallel	—	—	—
	perpendicular	400	400	—
12.7	parallel	600	400	—
	perpendicular	600	600	400
15.9	parallel	600	400	—
	perpendicular	600	600	600
Gypsum board conforming to Clause 9.29.5.2.(1)(b) (only Section 12 of ASTM C1396 / C1396M)				
12.7	parallel	600	400	—
	perpendicular	600	600	600

9.29.5.4. Support of Insulation

(1) Gypsum board supporting insulation shall be not less than 12.7 mm thick.

9.29.5.5. Length of Fasteners

(1) The length of fasteners for gypsum board shall conform to Table 9.29.5.5., except that lesser depths of penetration are permitted for assemblies required to have a *fire-resistance rating* provided it can be shown, on the basis of fire tests, that such depths are adequate for the required rating

Table 9.29.5.5.
Fastener Penetration into Wood Supports
 Forming Part of Sentence 9.29.5.5.(1)

Required <i>Fire-Resistance Rating</i> of Assembly	Minimum Penetration, mm			
	Walls		Ceilings	
	Nails	Screws	Nails	Screws
Not required	20	15	20	15
45 min	20	20	30	30
1 h	20	20	45	45
1.5 h	20	20	60	60

9.29.5.6. Nails

- (1) Nails for fastening gypsum board to wood supports shall conform to
 - (a) ASTM F1667, “Standard Specification for Driven Fasteners: Nails, Spikes and Staples,” or
 - (b) CSA B111, “Wire Nails, Spikes and Staples.”

9.29.5.7. Screws

- (1) Screws for fastening gypsum board to wood supports shall conform to ASTM C1002, “Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.”

9.29.5.8. Spacing of Nails

- (1) For single-layer application on a ceiling, nails shall be spaced
 - (a) not more than 180 mm o.c. on ceiling supports, or
 - (b) every 300 mm o.c. along ceiling supports, in pairs about 50 mm apart.
- (2) Where the ceiling sheets are supported by the wall sheets around the perimeter of the ceiling, this support may be considered as equivalent to nailing at this location.
- (3) Except as required by Sentence (4), for single-layer application on walls, nails shall be spaced
 - (a) not more than 200 mm o.c. on vertical wall supports, or
 - (b) every 300 mm o.c. along vertical wall supports, in pairs about 50 mm apart.
- (4) For single-layer application on walls, where gypsum board provides required bracing in *braced wall panels*, lateral support for studs, or fire protection, nails shall be spaced not more than 200 mm o.c. on
 - (a) vertical wall supports, and
 - (b) top and bottom plates.(See Article 9.23.10.2. and Section 9.10.)
- (5) The uppermost nails on vertical wall supports shall be not more than 200 mm below the ceiling.
- (6) Nails shall be located not less than 10 mm from the side or edge of the board.
- (7) Nails shall be driven so that the heads do not puncture the paper.

9.29.5.9. Spacing of Screws

- (1) For single-layer application on a ceiling, screws shall be spaced not more than 300 mm o.c. on ceiling supports.
- (2) Where the ceiling sheets are supported by the wall sheets around the perimeter of the ceiling, this support may be considered as equivalent to screwing at this location.
- (3) Except as required by Sentence (4), for single-layer application on walls, screws shall be spaced
 - (a) not more than 300 mm o.c. on vertical wall supports where the supports are more than 400 mm o.c., or
 - (b) not more than 400 mm o.c. on vertical wall supports where the supports are not more than 400 mm o.c.
- (4) Except as provided in Sentence (5), for single-layer application on walls, where gypsum board provides required bracing in *braced wall panels*, lateral support for studs, or fire protection, screws shall be spaced not more than 300 mm o.c. on
 - (a) vertical wall supports, and
 - (b) top and bottom plates.
 (See Article 9.23.10.2. and Section 9.10.)
- (5) Where a *fire-resistance rating* is determined based on Table 1 of MMAH Supplementary Standard SB-3, “Fire and Sound Resistance Tables,” Sentence (4) need not apply for the purpose of fire protection.
- (6) Screws shall be located not less than 10 mm from the edge of the board.
- (7) Screws shall be driven so that the heads do not puncture the paper.

9.29.5.10. Low Temperature Conditions

- (1) In cold weather, heat shall be provided to maintain a temperature not below 10°C for 48 h prior to taping and finishing and maintained for not less than 48 h thereafter.

9.29.6. Plywood Finish

9.29.6.1. Thickness

- (1) Except as provided in Sentences (2) and (3), the minimum thickness of plywood interior finish shall conform to Table 9.29.6.1.
- (2) A manufacturing tolerance of –0.4 mm may be applied to the thicknesses listed in Table 9.29.6.1.
- (3) No minimum thickness is required where plywood is applied over continuous backing.

Table 9.29.6.1.
Thickness of Plywood Interior Finish
 Forming Part of Articles 9.29.6.1., 9.29.6.2. and 9.29.9.2.

Maximum Spacing of Supports, mm o.c.	Minimum Thickness, mm ⁽¹⁾	
	On Supports with no Horizontal Blocking	On Supports with Blocking at Vertical Intervals not Exceeding 1.2 m
400	4.7	4.0
600	8.0	4.7

Notes to Table 9.29.6.1.:

- (1) Thickness limits shall apply to the net effective thickness (NET) of grooved, striated, textured and/or embossed panels and to the actual thickness of flat panels.

9.29.6.2. Grooved Plywood

- (1) Except as permitted in Sentence (2), where plywood for interior finish is grooved, the grooves shall not extend through the face ply and into the plies below the face ply unless the groove is supported by framing or furring.
- (2) If the grain of the face ply is at right angles to the supporting members, the groove is permitted to extend into the plies below the face ply provided the thickness of the plywood exceeds the value shown in Table 9.29.6.1. by an amount equal to not less than the depth of penetration of the grooves into the plies below the face ply.

9.29.6.3. Nails and Staples

- (1) Except as provided in Sentence (2), nails for attaching plywood finishes shall not be less than 38 mm casing or finishing nails spaced not more than 150 mm o.c. along edge supports and 300 mm o.c. along intermediate supports, except that staples providing equivalent lateral resistance may also be used.
- (2) Where plywood finish provides required bracing in *braced wall panels*, the plywood shall be fastened in accordance with the fastening requirements for sheathing stated in Sentence 9.23.3.5.(2).

9.29.6.4. Edge Support

- (1) All plywood edges shall be supported by furring, blocking or framing.

9.29.7. Hardboard Finish

9.29.7.1. Material Standard

- (1) Hardboard shall conform to CAN/CGSB-11.3-M, “Hardboard.”

9.29.7.2. Thickness

- (1) Hardboard shall be not less than
 - (a) 3 mm thick where applied over continuous backing,
 - (b) 6 mm thick when applied over supports spaced not more than 400 mm o.c., and
 - (c) 9 mm thick when applied over supports spaced not more than 600 mm o.c.

9.29.7.3. Nails

- (1) Nails for fastening hardboard shall be casing or finishing nails not less than 38 mm long, spaced not more than 150 mm o.c. along edge supports and 300 mm o.c. along intermediate supports.

9.29.7.4. Edge Support

- (1) All hardboard edges shall be supported by furring, blocking or framing where the backing is not continuous.

9.29.8. Insulating Fibreboard Finish

9.29.8.1. Material Standard

- (1) Insulating fibreboard shall conform to CAN/ULC-S706.1, “Standard for Wood Fibre Insulating Boards for Buildings.”

9.29.8.2. Thickness

- (1) Insulating fibreboard sheets shall be not less than 11.1 mm thick on supports not more than 400 mm o.c.
- (2) Insulating fibreboard tile shall be not less than 12.7 mm thick on supports spaced not more than 400 mm o.c.

9.29.8.3. Nails

- (1) Nails for fastening fibreboard sheets shall be not less than 2.6 mm shank diameter casing or finishing nails of sufficient length to penetrate not less than 20 mm into the supports.
- (2) Nails shall be spaced not more than 100 mm o.c. along edge supports and 200 mm o.c. along intermediate supports.

9.29.8.4. Edge Support

- (1) All fibreboard edges shall be supported by blocking, furring or framing.

9.29.9. Particleboard, OSB or Waferboard Finish

9.29.9.1. Material Standard

- (1) Particleboard finish shall conform to ANSI A208.1, "Particleboard."
- (2) OSB or waferboard finish shall conform to
 - (a) CSA O325, "Construction sheathing," or
 - (b) CSA O437.0, "OSB and Waferboard."

9.29.9.2. Minimum Thickness

- (1) Except as provided in Sentences (2) and (3), the minimum thickness of O-2 grade OSB used as an interior finish shall conform to that shown for plywood in Table 9.29.6.1.
- (2) Thicknesses listed in Table 9.29.6.1. shall permit a manufacturing tolerance of -0.4 mm.
- (3) No minimum thickness is required where O-2 grade OSB is applied over continuous backing.
- (4) OSB conforming to O-1 grade, waferboard conforming to R-1 grade and particleboard shall be
 - (a) not less than 6.35 mm thick on supports not more than 400 mm o.c.,
 - (b) not less than 9.5 mm thick on supports not more than 600 mm o.c., and
 - (c) not less than 6.35 mm thick on supports not more than 600 mm o.c. in walls where blocking is provided at mid-wall height.
- (5) OSB conforming to CSA O325, "Construction sheathing," shall meet the minimum panel mark of
 - (a) W16, on supports not more than 400 mm o.c.,
 - (b) W24, on supports not more than 600 mm o.c., and
 - (c) W16, on supports not more than 600 mm o.c. where blocking is provided at mid-wall height.

9.29.9.3. Nails

- (1) Except as provided in Sentence (2), nails for fastening particleboard, OSB or waferboard shall be not less than 38 mm casing or finishing nails spaced not more than 150 mm o.c. along edge supports and 300 mm o.c. along intermediate supports.
- (2) Where OSB or waferboard provides required bracing in *braced wall panels*, the OSB or waferboard shall be fastened in accordance with the fastening requirements for sheathing stated in Sentence 9.23.3.5.(2).

9.29.9.4. Edge Support

- (1) All particleboard, OSB or waferboard edges shall be supported by furring, blocking or framing.

9.29.10. Wall Tile Finish

9.29.10.1. Tile Application

- (1) Ceramic tile shall be set in a mortar base or applied with an adhesive.
- (2) Plastic tile shall be applied with an adhesive.

9.29.10.2. Mortar Base

- (1) When ceramic tile is applied to a mortar base the cementitious material shall consist of one part Portland cement to not more than one-quarter part lime by volume.
- (2) The cementitious material described in Sentence (1) shall be mixed with not less than 3 nor more than 5 parts of aggregate per part of cementitious material by volume.
- (3) Mortar shall be applied over metal lath or masonry.
- (4) Ceramic tile applied to a mortar base shall be thoroughly soaked and pressed into place forcing the mortar into the joints while the tile is wet.

9.29.10.3. Adhesives

- (1) Adhesives to attach ceramic and plastic tile shall be applied to the finish coat or brown coat of plaster that has been steel-trowelled to an even surface or to gypsum board or to masonry provided the masonry has an even surface.

9.29.10.4. Moisture Resistant Backing

- (1) Ceramic and plastic tile installed on walls around bathtubs or showers shall be applied over moisture-resistant backing.

9.29.10.5. Joints Between Tiles and Bathtub

- (1) The joints between wall tiles and a bathtub or shower shall be suitably caulked with material conforming to CAN/CGSB-19.22-M, "Mildew Resistant Sealing Compound for Tubs and Tiles."

Section 9.30. Flooring

9.30.1. General

9.30.1.1. Required Finished Flooring

- (1) Finished flooring shall be provided in all *residential occupancies*.

9.30.1.2. Water Resistance

- (1) Finished flooring in bathrooms, kitchens, public entrance halls, laundry and general storage areas shall consist of resilient flooring, felted-synthetic-fibre floor coverings, concrete, terrazzo, ceramic tile, mastic or other types of flooring providing similar degrees of water resistance. (See Note A-9.30.1.2.(1))

9.30.1.3. Sleepers

- (1) Wood sleepers supporting finished flooring over a concrete base supported on the ground shall be not less than 19 mm by 38 mm and shall be treated with a wood preservative.

9.30.1.4. Finish Quality

- (1) Finished flooring shall have a surface that is smooth, even and free from roughness or open defects.

9.30.2. Panel-Type Underlay

9.30.2.1. Required Underlay

- (1) A panel-type underlay shall be provided under resilient flooring, parquet flooring, ceramic tile, felted-synthetic-fibre floor coverings or carpeting laid over lumber subflooring. (See Sentence 9.30.3.2.(1))
- (2) Panel-type underlay shall be provided under resilient flooring, parquet flooring, felted-synthetic-fibre floor coverings or carpeting on panel-type subflooring whose edges are unsupported. (See Article 9.23.15.3.)
- (3) Panel-type underlay shall be provided under ceramic tile applied with adhesive.
- (4) Panel-type underlay shall be provided under resilient flooring on waferboard or strandboard subflooring.

9.30.2.2. Materials and Thickness

- (1) Panel-type underlay shall be not less than 6 mm thick and shall conform to
 - (a) ANSI A208.1, "Particleboard,"
 - (b) CAN/CGSB-11.3-M, "Hardboard,"
 - (c) ANSI/HPVA HP-1, "American National Standard for Hardwood and Decorative Plywood,"
 - (d) CSA O121, "Douglas fir plywood,"
 - (e) CSA O151, "Canadian softwood plywood,"
 - (f) CSA O153, "Poplar plywood," or
 - (g) CSA O437.0, "OSB and Waferboard."

9.30.2.3. Fastening

- (1) Panel-type underlay shall be fastened to the subfloor with staples, annular grooved flooring nails or spiral nails, spaced not more than 150 mm o.c. along the edges and 200 mm o.c. both ways at other locations.
- (2) Nails for panel-type underlay shall be not less than 19 mm long for 6 mm thick underlay and 22 mm long for 7.9 mm thick underlay.
- (3) Staples for panel-type underlay shall
 - (a) have not less than a 1.2 mm shank diameter or thickness with a 4.7 mm crown, and
 - (b) be not less than
 - (i) 22 mm long for 6 mm underlay, and
 - (ii) 28 mm long for 7.9 mm and 9.5 mm underlay.

9.30.2.4. Joints Offset

- (1) Where panel-type underlay is required to be installed over plywood, OSB or waferboard, the joints in the underlay shall be offset not less than 200 mm from the joints in the underlying subfloor.

9.30.2.5. Surface Defects

- (1) Underlay beneath resilient or ceramic floors applied with an adhesive shall have all holes or open defects on the surface patched so that the defects will not be transmitted to the finished surface.

9.30.3. Wood Strip Flooring**9.30.3.1. Thickness**

- (1) The thickness of wood strip flooring shall conform to Table 9.30.3.1.

Table 9.30.3.1.
Thickness of Wood Strip Flooring
 Forming Part of Sentence 9.30.3.1.(1)

Type of Flooring	Maximum Joist Spacing, mm	Minimum Thickness of Flooring, mm	
		With Subfloor	No Subfloor
Matched hardwood (interior use only)	400	7.9	19.0
	600	7.9	33.3
Matched softwood (interior or exterior use)	400	19.0	19.0
	600	19.0	31.7
Square edge softwood (exterior use only)	400	—	25.4
	600	—	38.1

9.30.3.2. Strip Direction and End Joints

- (1) Wood strip flooring shall not be laid parallel to lumber subflooring unless a separate underlay is provided.
- (2) If wood strip flooring is applied without a subfloor, it shall be laid at right angles to the joists so that the end joints are staggered and occur over supports or are end matched.

(3) If the flooring is end matched, it shall be laid so that no 2 adjoining strips break joints in the same space between supports and each strip bears on no fewer than 2 supports.

9.30.3.3. Nailing

(1) When nails are used, wood strip flooring shall be toe nailed or face nailed with not less than one nail per strip at the spacings shown in Table 9.30.3.3., except that face nailed strips of more than 25 mm in width shall have at least 2 nails per strip.

(2) Face nails shall be countersunk.

Table 9.30.3.3.
Nailing of Wood Strip Flooring
Forming Part of Sentence 9.30.3.3.(1)

Finish Floor Thickness, mm	Minimum Length of Flooring Nails, mm	Maximum Spacing of Flooring Nails, mm
7.9	38 ⁽¹⁾	200
11.1	51	300
19.0	57	400
25.4	63	400
31.7	70	600
38.1	83	600

Notes to Table 9.30.3.3.:

(1) See Article 9.30.3.4.

9.30.3.4. Staples

(1) Staples are permitted to be used to fasten wood strip flooring not more than 7.9 mm in thickness and not more than 50 mm in width provided the staples

- (a) are not less than 29 mm long,
- (b) have a shank diameter of not less than 1.19 mm,
- (c) have a crown of not less than 4.7 mm, and
- (d) are spaced not more than 400 mm o.c.

(2) Staples are permitted to be used to fasten wood strip flooring not more than 19 mm in thickness and not more than 83 mm in width provided the staples

- (a) are not less than 51 mm long,
- (b) have a shank diameter of not less than 1.82 mm,
- (c) have a crown of not less than 12.7 mm, and
- (d) are spaced not more than 400 mm o.c.

9.30.4. Parquet Flooring

9.30.4.1. Adhesive

(1) Adhesive used to attach parquet block flooring shall be suitable for bonding wood to the applicable subfloor material.

9.30.5. Resilient Flooring

9.30.5.1. Materials

- (1) Resilient flooring used on concrete slabs supported on ground shall consist of asphalt, rubber, unbacked vinyl or vinyl with an inorganic type backing.
- (2) Flooring described in Sentence (1) shall be attached to the base with a suitable waterproof and alkali-resistant adhesive.

9.30.6. Ceramic Tile

9.30.6.1. Substrate

- (1) Ceramic tile shall be set in a mortar bed or applied to a sound smooth base with a suitable adhesive.
- (2) Panel-type subfloor to which ceramic tile is to be applied with adhesive shall have its edges supported according to Article 9.23.15.3.

Section 9.31. Plumbing Facilities

9.31.1. Scope

9.31.1.1. Application

- (1) This Section applies to the plumbing facilities and *plumbing systems* within *dwelling units*.
- (2) In *occupancies* other than *dwelling units*, plumbing facilities, grab bars, floor drains, and floor and wall finishes around urinals shall conform to Subsection 3.7.2. (See also Section 3.8. regarding *barrier-free* plumbing facilities.)
- (3) Medical gas piping systems shall conform to Subsection 3.7.5.

9.31.2. General

9.31.2.1. General

- (1) The construction, extension, *alteration*, renewal or repair of *plumbing systems* and sewage disposal systems shall conform to Part 7.

9.31.2.2. Corrosion Protection

- (1) Metal pipes in contact with cinders or other corrosive material shall be protected by a heavy coating of bitumen or other corrosion protection.

9.31.2.3. Grab Bars

- (1) When provided, grab bars shall be capable of resisting a load of not less than 1.3 kN applied vertically or horizontally.

9.31.3. Water Supply and Distribution

9.31.3.1. Required Water Supply

- (1) Every *dwelling unit* shall be supplied with a *water distribution system* where a *drinking water system* is available.

9.31.3.2. Required Connections

- (1) Where a *water distribution system* is available, piping for hot and cold water shall be connected to every kitchen sink, lavatory, bathtub, shower, slop sink and laundry area.
- (2) Piping for cold water shall be run to every water closet.

9.31.4. Required Facilities

9.31.4.1. Required Fixtures

- (1) A kitchen sink, lavatory, bathtub or shower, and water closet shall be provided for every *dwelling unit* where a *water distribution system* is available.

9.31.4.1A. Laundry Fixtures

- (1) Laundry facilities or a space for laundry facilities shall be provided in every *dwelling unit* or grouped elsewhere in the *building* in a location conveniently accessible to occupants of every *dwelling unit*.

9.31.4.2 Hot Water Supply

- (1) Where a *water distribution system* is available a hot water supply shall be provided in every *dwelling unit*.
- (2) A *water distribution system* supplying hot water to *plumbing fixtures* shall conform to the requirements in Subsection 7.2.10.

9.31.4.3. Floor Drains

- (1) Where gravity drainage to a sewer, drainage ditch or dry well is possible, a floor drain shall be installed in a *basement* forming part of a *dwelling unit*.

9.31.5. Reserved

9.31.6. Service Water Heating Facilities

9.31.6.1. Hot Water Supply

- (1) Where hot water is required to be supplied in accordance with Article 9.31.4.2., equipment shall
 - (a) provide an adequate supply of hot water, and
 - (b) be installed in conformance with Part 7.

9.31.6.1A. Hot Water Temperature

- (1) Where a hot water supply is required by Article 9.31.4.3., equipment shall be installed to provide to every *dwelling unit* an adequate supply of service hot water with a temperature range from 45°C to 60°C.
- (2) An electric *storage-type service water heater* shall have a minimum set storage temperature of 60°C.

9.31.6.2. Equipment and Installation

- (1) Every *service water heater* and its installation shall conform to Part 7.
- (2) Reserved
- (3) Where the *building* is in a location where the spectral response acceleration, $S_a(0.2)$, is greater than 0.55, *service water heaters* shall be secured to the structure to resist overturning. (See Note A-9.31.6.2.(3))

9.31.6.3. Corrosion-Resistant Coating

- (1) Where storage tanks for *service water heaters* are of steel, they shall be coated with zinc, vitreous enamel (glass lined), hydraulic cement or other corrosion-resistant material.

9.31.6.4. Fuel-Burning Heaters

- (1) Fuel-burning *service water heaters* shall be connected to a *chimney flue* conforming to Section 9.21.

9.31.6.5. Heating Coils

- (1) Heating coils of *service water heaters* shall not be installed in a *flue* or in the combustion chamber of a *boiler* or *furnace* heating a *building*.

Section 9.32. Ventilation

9.32.1. General

9.32.1.1. Application

- (1) This Section applies to the ventilation of rooms and spaces in *residential occupancies*.
- (2) Ventilation of all other *occupancies* shall comply with Part 6.
- (3) A *storage garage* for up to 4 motor vehicles that serves a *residential occupancy* may be considered to be part of that *occupancy*.

9.32.1.2. Required Ventilation

- (1) Every *residential occupancy* shall incorporate
 - (a) provisions for non-heating-season ventilation in accordance with Subsection 9.32.2., and
 - (b) except as required by Sentences (2) and (3), if supplied with electrical power and a heating system, provisions for heating-season ventilation in accordance with Part 6.

(2) A self-contained heating-season ventilation system serving a single *dwelling unit* shall comply with Subsection 9.32.3. (See Note A-9.32.1.2.(2))

(3) In houses that contain a *secondary suite*, heating-season ventilation need not be provided for

- (a) *exits*,
 - (b) *public corridors*, and
 - (c) ancillary spaces that are not within a *dwelling unit*, except as provided in Sentence (4).
- (See Note A-9.32.1.2.(2))

(4) Where ancillary spaces described in Clause (3)(c) contain exhaust devices, these spaces shall be provided with make-up air in accordance with Article 9.32.3.8.

9.32.1.3. Venting of Laundry-Drying Equipment

(1) *Exhaust ducts* or vents connected to laundry-drying equipment shall discharge directly to the outdoors.

(2) *Exhaust ducts* connected to laundry-drying equipment shall be

- (a) independent of other *exhaust ducts*,
 - (b) accessible for cleaning, and
 - (c) constructed of a smooth corrosion-resistant material.
- (See Note A-9.32.1.3.(2))

(3) Where collective venting of multiple installations of laundry-drying equipment is used, the ventilation system shall

- (a) be connected to a common *exhaust duct* that is vented by one central exhaust fan, and incorporates one central lint trap,
- (b) include an interlock to activate the central exhaust fan when laundry-drying equipment is in use, and
- (c) where required by Article 9.32.3.8., be provided with make-up air.

9.32.2. Non-Heating-Season Ventilation

9.32.2.1. Required Ventilation

(1) The non-heating-season ventilation required by Clause 9.32.1.2.(1)(a) shall be supplied by

- (a) natural ventilation in accordance with Article 9.32.2.2., or
- (b) a mechanical ventilation system in accordance with Article 9.32.2.3.

9.32.2.2 Non-Heating-Season Natural Ventilation

(1) The unobstructed openable ventilation area to the outdoors for rooms and spaces in residential *buildings* ventilated by natural means shall conform to Table 9.32.2.2.

(2) Where a vestibule opens directly off a living or dining room within a *dwelling unit*, ventilation to the outdoors for such rooms may be through the vestibule.

(3) Openings for natural ventilation other than windows shall provide protection from the weather and insects.

(4) Screening shall be of corrosion-resistant material.

Table 9.32.2.2.
Natural Ventilation
 Forming Part of Sentence 9.32.2.2.(1)

Location		Minimum Unobstructed Area
Within a dwelling unit	Bathrooms or water-closet rooms	0.09 m ²
	Unfinished <i>basement</i> space	0.2% of the <i>floor area</i>
	Dining rooms, living rooms, bedrooms, kitchens, combined rooms, dens, recreation rooms and all other finished rooms	0.28 m ² per room or combination of rooms
Other than within a dwelling unit	Bathrooms or water-closet rooms	0.09 m ² per water closet
	Sleeping areas	0.14 m ² per occupant
	Laundry rooms, kitchens, recreation rooms	4% of the <i>floor area</i>
	Corridors, storage rooms and other similar public rooms or spaces	2% of the <i>floor area</i>
	Unfinished <i>basement</i> space not used on a shared basis	0.2% of the <i>floor area</i>

9.32.2.3. Non-Heating-Season Mechanical Ventilation

- (1) Where a habitable room or space is not provided with natural ventilation as described in Article 9.32.2.2. and is mechanically cooled, its non-heating-season mechanical ventilation system shall
- have the capacity to exhaust air from inside the room or space, or to introduce outdoor air into that room or space, at a rate conforming with Table 9.32.2.3., or
 - comply with Subsection 9.32.3.
- (2) In applying Clause (1)(a),
- at least one bedroom in each *dwelling unit* shall be designated as the master bedroom,
 - air change rates for any combined living/dining or family/dining space shall be determined as if the spaces were individual rooms,
 - where a *basement* incorporates rooms of the types designated in Table 9.32.2.3., the assigned air change rate for each room shall be as specified for those types of rooms,
 - basement* areas used for other purposes that exceed 2/3 of the total *basement floor area* shall be assigned an air change rate of 10 L/s,
 - basement* areas used for other purposes that are 2/3 of the total *basement floor area* or less shall be assigned an air change rate of 5 L/s, and
 - other habitable rooms, other than spaces intended solely for access, egress, storage, or service equipment, shall be assigned an air change rate of 5 L/s.
- (3) Where a habitable room or space is not provided with natural ventilation as described in Article 9.32.2.2. and is not mechanically cooled, the non-heating-season mechanical ventilation system shall have the capacity to exhaust indoor air from the room or space or to introduce outdoor air to that room or space at a rate of one air change per hour.
- (4) A non-heating-season mechanical ventilation system shall be designed and installed in conformance with good practice such as that described in the ASHRAE Handbooks and Standards, the HRAI Digest, the Hydronics Institute Manuals and the SMACNA Manuals.

Table 9.32.2.3.
Air Change Rate
 Forming Part of Clause 9.32.2.3.(1)(a)

Room or Space	Rate, L/s
Master bedroom	10
Other bedrooms	5
Living room	5
Dining room	5
Family room	5
Recreation room	5
<i>Basement</i>	10
Kitchen	5
Bathroom or water closet room	5
Laundry room	5
Utility room	5
Other habitable rooms	5

9.32.3. Heating-Season Mechanical Ventilation (See Note A-9.32.3.)

9.32.3.1. Required Ventilation

(1) The heating-season ventilation required by Clause 9.32.1.2.(1)(b) shall be provided by a mechanical ventilation system complying with

- (a) good practice such as that described in CAN/CSA-F326-M, “Residential Mechanical Ventilation Systems,”
- (b) for *dwelling units* with 5 or fewer bedrooms, the balance of this Subsection, or
- (c) Part 6.

(See Note A-9.32.3.1.(1))

(2) Mechanical ventilation systems complying with the balance of this Subsection shall incorporate at least the following components:

- (a) a principal ventilation system complying with Article 9.32.3.3.,
- (b) supplemental exhaust fans complying with Article 9.32.3.7., and
- (c) protection against depressurization in accordance with Article 9.32.3.8.

9.32.3.2. Design and Installation

(1) Aspects of mechanical ventilation systems not specifically described in this Subsection shall be designed, constructed and installed in accordance with good practice such as that described in the ASHRAE Handbooks and Standards, the HRAI Digest, the HRAI Residential Mechanical Ventilation Manual, the Hydronics Institute Manuals and the SMACNA Manuals.

(2) Ventilation system equipment installed to meet the requirements of this Section shall be installed in accordance with the manufacturers' instructions and recommendations except that, where such instructions and recommendations are in conflict with the requirements of this Subsection, the requirements of this Subsection shall govern.

(3) Except where mounted on concrete foundations, fans and heat recovery ventilators shall be isolated from structural components by resilient mountings to minimize the transmission of noise and vibration to occupied spaces.

- (4) Where flow-regulating dampers are required,
 - (a) they shall be adjustable and accessible without requiring the removal of fans, motors or insulating materials, or the use of specialized tools, and
 - (b) a device on the outside of the duct or device in which they are installed shall indicate the position of the damper.
- (5) Ventilation equipment shall be accessible for inspection, maintenance, repair and cleaning.
- (6) Ventilation equipment installed in unheated spaces shall be installed so as to avoid condensation of moisture on fans and motors, in accordance with the manufacturers' instructions.

9.32.3.3. Principal Ventilation System (See Note A-9.32.3.3.)

- (1) The principal ventilation system shall incorporate the following components:
 - (a) a principal ventilation fan complying with this Article, and
 - (b) except as permitted by Article 9.32.3.6., provision for the introduction of outdoor air to the *dwelling unit*, in conformance with Article 9.32.3.4. or 9.32.3.5.
- (2) The principal ventilation fan shall be capable of operating at an exhaust capacity complying with Table 9.32.3.3., referred to hereinafter as the “normal operating exhaust capacity.” (See Note A-9.32.3.3.(2))

Table 9.32.3.3.
Normal Operating Exhaust Capacity of Principal Ventilation Fan
 Forming Part of Sentence 9.32.3.3.(2)

Number of Bedrooms in <i>Dwelling Unit</i>	Normal Operating Exhaust Capacity of Principal Ventilation Fan, L/s	
	Minimum	Maximum
1	16	24
2	18	28
3	22	32
4	26	38
5	30	45
More than 5	System must comply with Clause 9.32.3.1.(1)(a)	

- (3) The requirement for a principal ventilation fan may be satisfied by a single fan, by the exhaust side of a heat recovery ventilator, or by a group of fans, provided all fans in the group are controlled simultaneously by a controller complying with Sentences (5) to (7). (See Note A-9.32.3.3.(3))
- (4) The components of the principal ventilation system shall be approved by their manufacturer for continuous operation.
- (5) The principal ventilation fan shall be controlled by a manual switch located within the living area of the *dwelling unit* and clearly marked **VENTILATION FAN**. (See Note A-9.32.3.3.(5))
- (6) If all controls serving the principal ventilation fan are in the “off” position, the principal ventilation system shall not operate.
- (7) The requirement for a manual switch stated in Sentence (5) can be satisfied by a manual override incorporated in a dehumidistat or other automatic control, provided
 - (a) the automatic control is located within the living area of the *dwelling unit*, and
 - (b) the manual override is clearly marked **VENTILATION FAN**.
- (8) Where the principal ventilation fan is controlled by a dehumidistat or other automatic control in addition to the manual switch required by Sentence (5), the manual switch shall be capable of activating the fan regardless of the setting of the automatic control.

(9) Where an exhaust air intake for the principal ventilation fan is connected directly to the return side of the duct system of a forced air heating system or other forced air distribution system, it shall be connected, where applicable, not less than 1 m upstream from the connection of the outdoor air *supply duct* required by Sentence 9.32.3.4.(5).

(10) Exhaust air intakes for principal ventilation fans located in kitchens, bathrooms and water-closet rooms shall be located in the ceiling or on the wall not less than 2 m above the floor. (See Note A-9.32.3.3.(10))

9.32.3.4. Ventilation Systems Used in Conjunction with Forced Air Heating Systems (See Note A- 9.32.3.4.)

- (1) Where outdoor air is to be introduced to the *dwelling unit* through a forced air heating system, the provision of outdoor air shall comply with this Article.
- (2) Where the actual normal operating exhaust capacity of the fan installed to satisfy the requirement for a principal ventilation fan exceeds the maximum outdoor airflow permitted by Table 9.32.3.4. for a mixed air temperature of 15°C or exceeds the minimum acceptable return air temperature specified by the manufacturer of the *furnace*, whichever is less, then either
 - (a) the system shall incorporate a means for tempering outdoor air introduced to the heating system ducts so that a mixed air temperature of 15°C or the minimum acceptable return air temperature specified by the manufacturer of the *furnace*, whichever is less, is achieved when the outdoor air is at the January 2.5% temperature and the indoor air temperature is 22°C, or
 - (b) this Article shall be considered to be no longer applicable and the mechanical ventilation system shall comply with either Clause 9.32.3.1.(1)(a) or with Article 9.32.3.5.
- (3) For the purposes of Table 9.32.3.4., the *furnace* airflow shall be determined
 - (a) by operating the forced air heating system's circulation fan at the rate chosen to satisfy Clause (9)(a) when measuring the return airflow in the *furnace* return air *plenum* immediately upstream of the connection of the outdoor air *supply duct* required by Sentence (5) and then adding this return airflow measurement to the actual normal operating exhaust capacity of the fan installed to satisfy the requirement for a principal ventilation fan, or
 - (b) by using the manufacturer's rated flow for the *furnace* for 150 Pa static pressure and the wiring configuration necessary to achieve the flow specified in Clause (9)(a).

Table 9.32.3.4.
Maximum Outdoor Airflow
 Forming Part of Sentence 9.32.3.4.(2)

January 2.5% Temperature as per Supplementary Standard SB-1, °C	Maximum Outdoor Airflow for Indicated Mixed Temperature, L/s																	
	0	0	0	-10	-10	-10	-20	-20	-20	-30	-30	-30	-40	-40	-40	-50	-50	-50
Minimum Mixed Air Temperature, °C	15	10	5	15	10	5	15	10	5	15	10	5	15	10	5	15	10	5
Furnace Airflow, L/s																		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	32	55	77	22	38	53	17	29	40	13	23	33	11	19	27	10	17	24
200	64	109	155	44	75	106	33	57	81	27	46	65	23	39	55	19	33	47
300	—	—	—	66	113	159	50	86	121	40	69	98	34	58	82	29	50	71
400	—	—	—	—	—	—	—	—	—	54	92	131	45	77	110	39	67	94
500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	49	83	118

- (4) Linear interpolation is permitted in using Table 9.32.3.4.
- (5) An outdoor air *supply duct* shall be installed between the outdoors and the *furnace* return air *plenum* and shall be connected
 - (a) not less than 3 m upstream of the *plenum* connection to the *furnace*, as measured along the length of the duct, or
 - (b) through an acceptable mixing device installed in the return air *plenum*.
- (6) The outdoor air *supply duct* required by Sentence (5) shall incorporate a flow-regulating damper.
- (7) Where the outdoor air *supply duct* required by Sentence (5) is not connected to an outdoor air supply fan, it shall be connected downstream of all return branch connections.
- (8) Where the outdoor air *supply duct* required by Sentence (5) is connected to an auxiliary outdoor air supply fan, the auxiliary outdoor air supply fan shall be
 - (a) approved by the manufacturer for the handling of untempered outdoor air if it will be handling untempered outdoor air,
 - (b) approved by the manufacturer for continuous operation, and
 - (c) designed to provide an outdoor air supply flow within $\pm 10\%$ of the actual normal operating exhaust capacity of the exhaust fan installed to satisfy the requirement for a principal ventilation fan.
- (9) The principal ventilation fan control required by Sentence 9.32.3.3.(5) shall be wired in such a way that
 - (a) activation of the principal ventilation fan automatically activates the forced air heating system's circulation fan to provide an airflow not greater than the space-heating airflow,
 - (b) where applicable, activation of the principal ventilation fan automatically activates the auxiliary outdoor air supply fan described in Sentence (8), and
 - (c) the auxiliary outdoor air supply fan does not operate when the principal ventilation fan is not operating.
- (10) With the principal ventilation fan operating at its normal operating exhaust capacity, the airflow in the outdoor air *supply duct* shall be measured and the flow-regulating damper required by Sentence (6) shall be adjusted and permanently fixed so that the airflow in the outdoor air *supply duct* is within $\pm 10\%$ of the actual normal operating exhaust capacity of the principal ventilation fan.
- (11) The airflow measurements required by Sentences (3) and (10) shall be done using a method accurate to within $\pm 15\%$ of the flow rate being measured.
- (12) All connections between the ventilation system and the heating system shall be in accordance with Articles 9.33.4.1. and 9.33.5.2.

9.32.3.5. Ventilation Systems Not Used in Conjunction with Forced Air Heating Systems (See Note A-9.32.3.5.)

- (1) Where outdoor air is to be introduced to the *dwelling unit* through means other than a forced air heating system, the provision of outdoor air shall comply with this Article.
- (2) An outdoor air supply fan shall be installed with a rated capacity within $\pm 10\%$ of the actual normal operating exhaust capacity of the exhaust fan installed to satisfy the requirement for a principal ventilation fan.
- (3) The principal ventilation fan control required by Sentence 9.32.3.3.(5) shall be wired in such a way that
 - (a) activation of the principal ventilation fan automatically activates the outdoor air supply fan required by Sentence (2), and
 - (b) the outdoor air supply fan does not operate when the principal ventilation fan is not operating.
- (4) The outdoor air supply fan shall be connected to the outdoors through an outdoor air *supply duct*.
- (5) The outdoor air *supply duct* required by Sentence (4) shall incorporate a flow-regulating damper.

- (6) With the principal ventilation fan operating at its normal operating exhaust capacity, the airflow in the outdoor air *supply duct* shall be measured and the flow-regulating damper required by Sentence (5) shall be adjusted and permanently fixed so that the airflow in the outdoor air *supply duct* is within $\pm 10\%$ of the actual normal operating exhaust capacity of the principal ventilation fan.
- (7) The airflow measurements required by Sentence (6) shall be done using a method accurate to within $\pm 15\%$ of the flow rate being measured.
- (8) Except where a heat recovery ventilator is used to supply the outdoor air, the outdoor air shall be tempered to at least 12°C before being circulated to habitable spaces.
- (9) Any tempering device installed to comply with Sentence (8) shall be installed in accordance with Articles 9.33.4.1. and 9.33.5.2.
- (10) Except as provided in Sentence (11), outdoor air shall be distributed by a system of trunk and branch *supply ducts*, from the outdoor air supply fan required by Sentence (2) to
- each bedroom
 - any *storey*, including *basements* and heated crawl spaces, without a bedroom, and
 - if there is no *storey* without a bedroom, to the principal living area.
- (11) In a *dwelling unit* in which there is no *storey* without a bedroom, if an exhaust air intake for the principal ventilation fan is located in the principal living area and the principal ventilation fan has no more than 2 exhaust air intakes located in other rooms, distribution of outdoor air to the principal living area is not required.
- (12) All branch *supply ducts* that are not fitted with diffusers with adjustable balance stops shall be supplied with balancing dampers that
- can be fixed in their adjusted positions, and
 - include devices to indicate the positions of the dampers.
- (13) The air supply outlets through which outdoor air is delivered to the rooms shall be located in the ceiling or in a wall at not less than 2 m above the floor and shall be designed and installed to promote diffusion across the ceiling.
- (14) Provision shall be made for the free flow of air to or from all rooms by leaving gaps beneath doors, using louvred doors or installing grilles in doors.

9.32.3.6. Exhaust-Only Ventilation Systems (See Note A-9.32.3.6.)

- (1) A ventilation system with no provision for the introduction of outdoor air to the *dwelling unit* may only be used where the *dwelling unit*
- contains no solid-fuel-burning *appliance*, no fireplace of other than *direct-vented* type, and no other fuel-fired space- or water-heating *appliance* of other than *direct-vented* or *mechanically vented* types, and
 - has a forced air distribution system with a circulation fan with a rated capacity equal to at least 5 times the actual normal operating exhaust capacity of the fan installed to satisfy the requirement for a principal ventilation fan, a supply side that complies with Sentences 9.32.3.5.(10) to (12), and a return side that complies with Articles 9.33.6.12. and 9.33.6.13.
- (2) Except as provided in Sentence (3), where an exhaust-only system is installed, the principal ventilation fan control required by Sentence 9.32.3.3.(5) shall be wired in such a way that, where applicable, activation of the principal ventilation fan automatically activates the circulation fan of the forced air distribution system required by Clause (1)(b) at its rated capacity.
- (3) Interlocking the forced air distribution system's circulation fan with the principal ventilation fan as required by Sentence (2) is not required where the forced air distribution system is equipped with a control that automatically activates the circulation fan at user-selected intervals.

9.32.3.7. Supplemental Exhaust (See Note A-9.32.3.7.)

- (1) Except as provided in Sentences (2) and (3), a supplemental exhaust fan with a rated capacity not less than 50 L/s shall be installed in each kitchen.
- (2) A supplemental exhaust fan is not required in a kitchen where the only exhaust air intake for the principal ventilation fan is located in that kitchen.
- (3) A supplemental exhaust fan is not required in a kitchen where the principal ventilation fan draws from that kitchen and other rooms, provided
 - (a) the principal ventilation fan can be switched to a high exhaust rate equal to not less than 2.5 times the minimum normal operating exhaust capacity specified in Table 9.32.3.3., and
 - (b) the high exhaust rate of the principal ventilation fan, as described in Clause (a), is activated by a manual switch in the kitchen labeled “KITCHEN EXHAUST.”
- (4) Where an exhaust air intake for the principal ventilation fan is not located in a bathroom or water-closet room, a supplemental exhaust fan with a rated capacity not less than 25 L/s shall be installed in that bathroom or water-closet room.
- (5) Where the intake for a supplemental exhaust fan other than a cooking *appliance* exhaust fan serving a *cooktop* is installed in a kitchen, it shall be installed in the ceiling or on the wall at not less than 2 m above the floor.
- (6) A supplemental exhaust fan required by this Article shall be controlled by a manual switch located in the room served by the fan.
- (7) Where a kitchen or bathroom is exempted from the requirement to install a supplemental exhaust fan by virtue of Sentence (2) or (3), the principal ventilation fan shall be controlled by a manual switch located in the kitchen or bathroom and wired in parallel with the manual switch required by Sentence 9.32.3.3.(5).
- (8) Where a supplemental exhaust fan required by this Article is controlled by a dehumidistat or other automatic control in addition to the manual switch required by Sentence (6), the manual switch shall be capable of activating the fan regardless of the setting of the automatic control.

9.32.3.8. Protection Against Depressurization (See Note A-9.32.3.8.)

- (1) This Article applies to
 - (a) *dwelling units* that contain a fuel-fired *space-heating appliance* or fuel-fired water-heating *appliance* of other than *direct-vented* or *mechanically vented* types, and
 - (b) ancillary spaces that contain an exhaust device, where the space is not within a *dwelling unit* in a house with a *secondary suite* and where the house with a *secondary suite* contains a fuel-fired *space-heating appliance* or fuel-fired water-heating *appliance* of other than *direct-vented* or *mechanically vented* types.
- (2) Except as provided in Sentences (6) to (8), any mechanical air exhausting device, other than the principal ventilation fan operating at a rate not greater than the maximum permitted by Table 9.32.3.3., shall be provided with outdoor makeup air supplied by a fan rated to deliver outdoor air to the *dwelling unit* at a rate
 - (a) not less than the exhaust capacity of the device, and
 - (b) not greater than that exhaust capacity plus 10%.
- (3) An outdoor makeup air supply fan required by Sentence (2) shall be wired so that it is activated whenever the device for which it supplies outdoor makeup air is activated.
- (4) The outdoor makeup air required by Sentence (2) shall be
 - (a) introduced to a normally unoccupied area in the *dwelling unit*, or
 - (b) tempered to at least 12°C before being introduced to occupied areas or to a *supply duct* system.

- (5) If the outdoor makeup air required by Sentence (2) is not tempered upstream of the supply fan, the supply fan required by Sentence (2) shall be approved by the manufacturer for the handling of untempered outdoor air.
- (6) The provision of makeup air as described in Sentence (2) is not required in a *dwelling unit* with solid-fuel-burning *appliances*, where all other fuel-fired *appliances* are *direct-vented* or *mechanically vented*.
- (7) The provision of makeup air as described in Sentence (2) is not required if it can be shown using the test procedures in CAN/CGSB-51.71, “Depressurization Test,” that the maximum depressurization levels to which fuel-fired space- or water-heating *appliances* and their venting systems will be exposed will not exceed the limits set out in CAN/CGSB-51.71 for the categories of fuel-fired *appliances* and venting systems installed in the *dwelling unit*.
- (8) The provision of makeup air as described in Sentence (2) is not required for mechanical exhausting devices operating a subfloor depressurization system installed for the purpose of reducing the risk of radon ingress.

9.32.3.9. Application of Carbon Monoxide Alarms (See Note A-9.32.3.9.)

- (1) Article 9.32.3.9A. applies to every *building* that
 - (a) contains a *residential occupancy*, and contains a fuel-burning *appliance* or a *storage garage*, or
 - (b) contains a *residential occupancy* and is served by a forced-air fuel-burning *appliance* not contained within the *building*.
- (2) Articles 9.32.3.9B. and 9.32.3.9C. apply to every *building*.

9.32.3.9A. Location of Carbon Monoxide Alarms

- (1) A *carbon monoxide alarm* shall be installed in a *suite* of *residential occupancy* where
 - (a) a fuel-burning *appliance* or a *flue* is installed in the *suite*,
 - (b) a forced-air fuel-burning *appliance* provides heated air directly to the *suite*,
 - (c) a fuel-burning *appliance* or a *flue* is located in a room, *suite* or area that shares a common wall or floor or ceiling assembly with the *suite*, or
 - (d) a *storage garage* shares a common wall or floor or ceiling assembly with the *suite*.
- (2) Where a *carbon monoxide alarm* is required by Sentence (1) to be installed in a *suite* of *residential occupancy*, other than a *suite* that consists of a combined living and sleeping area, a *carbon monoxide alarm* shall be installed
 - (a) adjacent to each sleeping room in the *suite*, and
 - (b) on each *storey* without a sleeping room in the *suite*.
- (3) Where a *carbon monoxide alarm* is required by Sentence (1) to be installed in a *suite* of *residential occupancy* that consists of a combined living and sleeping area, a *carbon monoxide alarm* shall be installed in the combined living and sleeping area.
- (4) In addition to the *carbon monoxide alarms* required to be installed in a *suite* of *residential occupancy* in accordance with Sentence (2), a *carbon monoxide alarm* shall be installed in each sleeping room within the *suite* where the sleeping room
 - (a) contains a fuel-burning *appliance* or a *flue*, or
 - (b) shares a common wall or floor or ceiling assembly
 - (i) with a room, *suite* or area that is located outside the *suite* and contains a fuel-burning *appliance* or a *flue*,
 - (ii) with a *storage garage*, or
 - (iii) that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent.
- (5) *Carbon monoxide alarms* shall be installed in public corridors serving *suites* of *residential occupancy* where the corridor is directly heated by a forced-air fuel-burning *appliance*.

- (6) Where *carbon monoxide alarms* are required by Sentence (5) to be installed in a *public corridor*, the *carbon monoxide alarms* shall be installed such that
- (a) there is at least one *carbon monoxide alarm* in each portion of a divided corridor, and
 - (b) each *carbon monoxide alarm* in an undivided portion of a corridor is spaced not more than 25 m apart.

9.32.3.9B. Location of Carbon Monoxide Alarms in All Buildings

- (1) A *carbon monoxide alarm* shall be installed in *service rooms* or other areas of a *building* where the *service room* or other area
- (a) contains a fuel-burning *appliance* used for *building* services or laundry drying equipment, and
 - (b) is not located within a *suite of residential occupancy*.

9.32.3.9C. Installation and Conformance to Standards

- (1) The *carbon monoxide alarms* required by Articles 9.32.3.9A. and 9.32.3.9B. shall
- (a) except as permitted in Sentence (2), be permanently connected to an electrical circuit and shall have no disconnect switch between the overcurrent device and the *carbon monoxide alarm*,
 - (b) in case the regular power supply to the *carbon monoxide alarm* is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the *carbon monoxide alarm* for a period of not less than 8 h in the standby condition, followed by the operation of the *carbon monoxide alarm* for an alarm signal for at least 12 h,
 - (c) be wired so that
 - (i) activation of one *carbon monoxide alarm* within a *suite of residential occupancy* will activate all *carbon monoxide alarms* within the *suite*,
 - (ii) activation of one *carbon monoxide alarm* within a house with a *secondary suite* will activate all *carbon monoxide alarms* within the house with a *secondary suite* including their common spaces, and
 - (iii) activation of one *carbon monoxide alarm* located in a *public corridor* serving *suites of residential occupancy* will activate all *carbon monoxide alarms* within the corridor,
 - (d) be audible within sleeping rooms when the intervening doors are closed, where located adjacent to a sleeping room in a *suite of residential occupancy*, and
 - (e) conform to
 - (i) CAN/CSA-6.19, “Residential Carbon Monoxide Alarming Devices,” or
 - (ii) UL 2034, “Single and Multiple Station Carbon Monoxide Alarms.”
- (2) Where the *building* is not supplied with electrical power, *carbon monoxide alarms* are
- (a) permitted to be battery operated, and
 - (b) need not have a visual signaling component.
- (3) Except as permitted in Sentence (2), the *carbon monoxide alarms* required by Articles 9.32.3.9A. and 9.32.3.9B. shall have a visual signalling component conforming to the requirements in 18.5.3. (Light, Color and Pulse Characteristics) of NFPA 72, “National Fire Alarm and Signaling Code”.
- (4) The luminous intensity for visual signaling components required by Sentence (3) that are installed in sleeping rooms or combined living and sleeping areas shall be a minimum of 175 cd.
- (5) The visual signaling component required by Sentence (3) need not
- (a) be integrated with the *carbon monoxide alarm* provided it is interconnected to it,
 - (b) be on battery backup, or
 - (c) have synchronized flash rates, when installed in a *dwelling unit*.
- (6) The *carbon monoxide alarms* required by Articles 9.32.3.9A. and 9.32.3.9B. shall be installed
- (a) at the manufacturer’s recommended height, or
 - (b) in the absence of specific instructions, on or near the ceiling.

9.32.3.10. Fans (See Note A-9.32.3.10.)

- (1) Except as provided in Sentence (4), capacity ratings for required fans shall be determined in accordance with
 - (a) CAN/CSA-C260-M, “Rating the Performance of Residential Mechanical Ventilating Equipment,” or
 - (b) HVI Publication 916, “Airflow Test Procedure.”
- (2) Sound ratings for fans shall be determined in accordance with
 - (a) CAN/CSA-C260-M, “Rating the Performance of Residential Mechanical Ventilating Equipment,” or
 - (b) HVI Publication 915, “Loudness Testing and Rating Procedure.”
- (3) Capacity ratings for fans shall be measured at the external static pressure differentials shown in Table 9.32.3.10.-A.

Table 9.32.3.10.-A
Minimum External Static Pressure Differential for Rating of Fans
 Forming Part of Sentence 9.32.3.10.(3)

Fan Configuration or Application	Minimum External Static Pressure Differential to be Used in Determining Rated Capacity
Fans installed with ducts connected on both sides, any application	100 Pa (0.4 inch water column)
Fans installed with ducts on one side only, used as the principal ventilation fan in exhaust-only systems permitted by Article 9.32.3.6.	62 Pa (0.25 inch water column)
Other required fans	25 Pa (0.1 inch water column)

- (4) Fans in heat recovery ventilators used to provide one or more required fans shall have their airflow at normal temperature rated in accordance with CAN/CSA-C439, “Standard laboratory methods of test for rating the performance of heat/energy-recovery ventilators.”
- (5) Where a heat recovery ventilator is used to provide one or more required fans, it shall have a low-temperature ventilation reduction factor of not less than 50% when tested in accordance with CAN/CSA-C439, “Standard laboratory methods of test for rating the performance of heat/energy-recovery ventilators,” at an outdoor temperature at least as low as the outdoor design temperature for the location where the ventilation system is to be installed, but the outdoor design temperature need not be lower than -25°C.
- (6) Fans, including make-up air supply fans, installed to satisfy Articles 9.32.3.3. to 9.32.3.8. with less than 1 m of duct between themselves and the visible interior surfaces of rooms other than unfinished *basements*, furnace rooms, utility rooms and attics, shall have a sound rating complying with Table 9.32.3.10.-B when operating at the required flow rate.
- (7) Mechanical ventilation devices shall conform to CSA C22.2 No. 113, “Fans and Ventilators.”

Table 9.32.3.10.-B
Maximum Sound Rating for Fans
 Forming Part of Sentence 9.32.3.10.(6)

Fan Application	Maximum Sound Rating, sones	
	Rated according to CAN/CSA-C260-M	Rated according to HVI 915
Principal exhaust fan	2.0	2.5
Supplemental exhaust fans installed in bathrooms and their make-up air fans	2.5	3.5
Supplemental exhaust fans installed in kitchens and their make-up air fans	no rating required	no rating required

9.32.3.11. Ducts (See Note A-9.32.3.11.)

- (1) Except as provided in Sentence (6), ventilation ducts and their fittings shall conform to the requirements of Article 9.33.6.2., except that *exhaust ducts* serving only a bathroom or water-closet room are permitted to be of *combustible* material, provided they are reasonably airtight and constructed of a material impervious to water.
- (2) *Exhaust ducts* shall not discharge into heated or unheated enclosed spaces.
- (3) Where an *exhaust duct* passes through an unheated space or is not separated from an unheated space by an insulated *building* assembly, the duct shall be insulated to not less than RSI 0.5.
- (4) Where a duct carrying outdoor air that is not tempered and not mixed with indoor air passes through heated space, it shall be
 - (a) insulated to not less than RSI 0.5, and
 - (b) provided with a *vapour barrier*.
- (5) All exhaust intakes located within 3 m horizontally of a *cooktop* shall be equipped with a grease filter at the intake end.
- (6) Ductwork for cooking *appliance* exhaust fans shall
 - (a) be of *noncombustible*, corrosion-resistant material,
 - (b) lead directly to the outdoors with no connections to other exhaust fans or ducts, and
 - (c) be equipped with a grease filter at the intake end.
- (7) All ductwork shall be installed to avoid crushing and shall be permanently supported to prevent sagging.
- (8) Joints in all ventilation system ducting shall be sealed with mastic, metal foil duct tape or the manufacturers' specified sealants.
- (9) Except where the size of a duct can be determined using Table 9.32.3.11.-A or Table 9.32.3.11.-B, duct sizes shall be determined according to Subsection 9.33.4.
- (10) In using Table 9.32.3.11.-A,
 - (a) when sizing branch ducts, "maximum length of duct" refers to the physical length of the duct from the interior grille served by that branch duct to the exterior hood,
 - (b) when sizing a trunk duct, "maximum length of duct" refers to the physical length of the duct from the interior grille of the longest branch served by that trunk to the exterior hood,
 - (c) outdoor air supply ducts shall be sized as trunk ducts,
 - (d) "maximum airflow in duct" refers to the maximum airflow rate that a given section of duct (branch or trunk) must provide to satisfy the ventilation system design, and

(e) “fan’s external static pressure” refers to the external static pressure at which the fan is rated to achieve the maximum airflow rate that the fan is required or intended to provide.

(11) Where flexible duct is used, it may be sized by choosing the next higher diameter in Table 9.32.3.11.-A or by choosing the diameter for a duct twice as long as the actual length.

(12) Where rectangular duct is used in place of round duct, it shall be selected according to Table 9.32.3.11.-B.

Table 9.32.3.11.-A
Equivalent Duct Sizes
 Forming Part of Sentence 9.32.3.11.(9)

Fan's External Static Pressure, Pa	Duct Diameter, mm	Maximum Airflow in Duct, L/s						
		7	15	25	35	50	75	100
		Maximum Length of Duct, m						
25	75	6	1	0	0	0	0	0
	100	25	6	2	1	0	0	0
	125	60	17	6	3	1	0	0
	150	60	42	16	8	4	2	1
	175	60	60	34	18	9	4	2
	200	60	60	60	35	18	8	5
50	75	16	4	1	0	0	0	0
	100	60	16	6	3	1	0	0
	125	60	47	18	9	5	2	1
	150	60	60	44	23	12	5	3
	175	60	60	60	49	25	12	7
	200	60	60	60	60	48	22	13
62.5	75	22	5	2	1	0	0	0
	100	60	21	8	4	2	1	0
	125	60	60	24	12	6	3	1
	150	60	60	58	31	15	7	4
	175	60	60	60	60	33	15	9
	200	60	60	60	60	60	29	17
100	75	38	9	3	1	0	0	0
	100	60	36	14	7	3	1	1
	125	60	60	41	22	11	5	3
	150	60	60	60	53	27	12	7
	175	60	60	60	60	57	27	15
	200	60	60	60	60	60	51	30
150	75	59	14	5	2	1	0	0
	100	60	57	22	11	6	2	1
	125	60	60	60	34	17	8	4
	150	60	60	60	60	42	20	11
	175	60	60	60	60	60	42	24
	200	60	60	60	60	60	60	46

Table 9.32.3.11.-B
Equivalent Duct Sizes
 Forming Part of Sentences 9.32.3.11.(9) and (12)

Required Round Duct Size, mm	Permitted Equivalent Rectangular Duct Size, mm			
	Stack Duct	100 mm Depth	125 mm Depth	150 mm Depth
75	75 × 150	50 × 100	—	—
100	75 × 250	75 × 100	75 × 125	75 × 150
125	75 × 250	125 × 100	100 × 125	100 × 150
150	75 × 300	200 × 100	150 × 125	125 × 150
175	75 × 350	275 × 100	200 × 125	175 × 150
> 175	Design to Subsection 9.33.4.			

9.32.3.12. Heat Recovery Ventilators (See Note A-9.32.3.12.)

- (1) This Article shall apply to heat recovery ventilators installed to provide one or more of the fans required by this Subsection.
- (2) Two or more heat recovery ventilators shall not be connected in parallel airflow to a common air *supply duct*, unless specifically permitted by the manufacturer.
- (3) Two or more heat recovery ventilators shall not be connected in parallel airflow to a common downstream *exhaust duct*.
- (4) All start-up procedures recommended by the manufacturer, including air balancing and airflow determination, shall be followed.
- (5) A means for the free flow of condensate shall be provided in accordance with the manufacturer's recommendations or, in their absence, a condensate drain of at least 1/2 inch nominal pipe size pitched in the direction of flow and complete with a trap or condensate pump of sufficient capacity shall be installed and connected to the *dwelling unit's* drain, waste and vent system.
- (6) The heat recovery ventilator and all condensate lines shall be installed in a space where the ambient temperature will not adversely affect the operation of the system.

9.32.3.13. Outdoor Intake and Exhaust Openings

- (1) Intake openings shall be located so as to avoid contamination of the ventilation air from other local sources such as automobile exhaust and exhaust from the *building* or adjacent *buildings*.
- (2) The distance from the bottom of an air intake opening to finished ground or to any nearer and lower permanent horizontal surface shall be not less than 450 mm or the depth of expected snow accumulation, whichever is greater.
- (3) The distance separating air intakes for mechanical ventilation from exhaust outlets that are potential sources of contaminants, such as *gas vents* or oil fill pipes, shall be not less than 1 800 mm.
- (4) Except as provided in Sentences (5) and (6), exhaust outlets that discharge air containing moisture, such as bathroom ventilation and clothes dryer exhaust outlets, shall be located at least 1 800 mm from air intakes and vented soffits.
- (5) Where an exhaust outlet referred to in Sentence (4) is located within a soffit, the soffit shall either be unvented, or if vented, the full depth of the soffit shall be blocked for a distance of 1 800 mm on each side of the exhaust outlet.

(6) Where an exhaust outlet referred to in Sentence (4) is located in a side wall less than 1 800 mm from a soffit, a section of the soffit above the exhaust outlet shall be unvented, or if vented, the full depth of the soffit shall be blocked in accordance with the widths stipulated in Table 9.32.3.13.-A, centred over the location of the outlet.

Table 9.32.3.13.-A
Widths of Unvented or Blocked Soffits Where Exhaust Outlets Are Less Than 1 800 mm from a Soffit
 Forming Part of Sentence 9.32.3.13.(6)

Distance Between Exhaust Outlet and Soffit, mm	Total Width of Unvented or Blocked Soffit Centred Over Location of Exhaust Outlet, mm
1 to 300	3 600
301 to 600	3 400
601 to 900	3 100
901 to 1 200	2 700
1 201 to 1 500	2 000
1 501 to 1 799	1 000

- (7) Air intakes shall be clearly labeled as such for identification from locations outside the *dwelling unit*.
- (8) The distance from the bottom of an exhaust outlet to finished ground or to any nearer and lower permanent horizontal surface shall be not less than 100 mm.
- (9) Where air intake and exhaust openings are in exposed locations, provision shall be made to protect them from the entry of precipitation by the use of louvres, weather cowls or other suitable protection.
- (10) Air intake openings shall incorporate screens or grilles to protect against the entry of animals and insects.
- (11) Except for exhaust outlets serving heat recovery ventilators, exhaust outlets shall incorporate backdraft dampers.
- (12) An exhaust outlet that does not incorporate a backdraft damper located at the *building* envelope shall incorporate a screen located at the *building* envelope to protect against the entry of animals.
- (13) Screens, grilles and filters installed in air intake and exhaust openings shall be easily removable for cleaning purposes, without the need for special tools.
- (14) Where screens or grilles are installed in air intake and exhaust openings, the net free area of the air intake or exhaust opening shall be equal to or greater than the required cross-sectional area of the duct served or such openings shall comply with Table 9.32.3.13.-B.
- (15) Screens and grilles shall be of corrosion-resistant material.

Table 9.32.3.13.-B
Area of Openings with Screens or Grilles
 Forming Part of Sentence 9.32.3.13.(14)

Mesh Size of Screen or Grille, mm	Area of Opening
Less than 4	3 times required area of duct served
4 to 6	2 times required area of duct served
Larger than 6	Required area of duct served

Section 9.33. Heating and Air-Conditioning

9.33.1. General

9.33.1.1. Application

- (1) This Section applies to the design and installation of
 - (a) heating systems, including requirements for combustion air, and *air-conditioning* systems serving only one *dwelling unit*, and
 - (b) radiant heating systems in houses with a *secondary suite* including their common spaces.
- (2) The design and installation of heating systems, including requirements for combustion air, and *air-conditioning* systems other than those described in Sentence (1) shall conform to Part 6. (See Note A-9.33.1.1.(2) and Subsection 9.10.10.)
 - (2.1) Repairs or component replacements that change the capacity or extent of safety of an existing heating, ventilating or *air-conditioning* system and that alter the method of operation shall conform to this Code.
- (3) Air duct distribution systems serving one of the *dwelling units* in a house with a *secondary suite* shall not be directly interconnected with other parts of the house.

9.33.2. Required Heating Systems

9.33.2.1. Residential Heating Systems

- (1) Residential *buildings* intended for use in the winter months on a continuing basis shall be equipped with heating facilities conforming to this Section.

9.33.3. Design Temperatures

9.33.3.1. Indoor Design Temperatures

- (1) At the outside design temperature, required heating facilities shall be capable of maintaining an indoor air temperature of not less than
 - (a) 22°C in all living spaces,
 - (b) 18°C in unfinished *basements*,
 - (c) 18°C in common *service rooms*, ancillary spaces and *exits* in houses with a *secondary suite*, and
 - (d) 15°C in heated crawl spaces.

9.33.3.2. Outdoor Design Temperatures

- (1) The outdoor conditions to be used in designing heating, ventilating and *air-conditioning* systems shall be the appropriate values for the location as set out in MMAH Supplementary Standard SB-1, "Climatic and Seismic Data," using 2.5 percent design temperature criteria.

9.33.4. General Requirements for Heating and Air-Conditioning Systems

9.33.4.1. Design of Heating and Air-Conditioning Systems

(1) Heating, ventilating and *air-conditioning* systems, including related mechanical refrigeration systems, shall be designed, constructed and installed to conform to good engineering practice appropriate to the circumstances such as described in

- (a) the ASHRAE Handbooks and Standards,
- (b) CSA F280, “Determining the required capacity of residential space heating and cooling appliances,” and the outside winter design temperatures shall conform to MMAH Supplementary Standard SB-1, “Climatic and Seismic Data,”
- (c) CAN/CSA-F326-M, “Residential Mechanical Ventilation Systems,”
- (d) the NFPA Standards,
- (e) the HRAI Digest,
- (f) the Hydronics Institute Manuals, and
- (g) the SMACNA Manuals.

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(See also Subsection 9.32.3. for the design of systems that also provide ventilation.)

9.33.4.2. Installation of Hydronic Heating Systems

(1) The design and installation of hydronic heating systems shall conform to

- (a) CSA B214, “Installation code for hydronic heating systems”, or
- (b) good engineering practice appropriate to the circumstances such as described in Article 9.33.4.1.

9.33.4.3. Heating System Control

(1) Each *dwelling unit* shall be provided with a temperature control in accordance with Article 12.3.1.3. (See Note A-9.33.4.3.(1))

9.33.4.4. Access

(1) Equipment forming part of a heating or *air-conditioning* system, with the exception of embedded pipes or ducts, shall be installed with provision for access for inspection, maintenance, repair and cleaning.

9.33.4.5. Protection from Freezing

(1) Equipment forming part of a heating or *air-conditioning* system that may be adversely affected by freezing temperatures and that is located in an unheated area shall be protected from freezing.

9.33.4.6. Expansion, Contraction and System Pressure

(1) Heating and cooling systems shall be designed to allow for expansion and contraction of the heat transfer fluid and to maintain the system pressure within the rated working pressure limits of all components of the system.

9.33.4.7. Structural Movement

(1) Mechanical systems and equipment shall be designed and installed to accommodate the maximum amount of structural movement provided for in the construction of the *building*.

(2) Where the *building* is in a location where the spectral acceleration, $S_a(0.2)$, is greater than 0.55, heating and *air-conditioning* equipment with fuel or power connections shall be secured to the structure to resist overturning and displacement. (See Note A-9.31.6.2.(3))

9.33.4.8. Asbestos

- (1) Asbestos shall not be used in air distribution systems or equipment.

9.33.4.9. Contaminant Transfer

- (1) Systems serving garages, and systems serving other occupied parts of a *dwelling unit* but located in or running through a garage, shall be designed and constructed in a manner such that means are not provided for the transfer of contaminants from the garage into other spaces in the *dwelling unit*.

9.33.5. Heating and Air-Conditioning Appliances and Equipment

9.33.5.1. Capacity of Heating Appliances

- (1) The heating system capacity shall be based on the heating load calculated in accordance with Sentence 9.33.4.1.(1).
- (2) Where a cooling system is installed, the cooling system capacity shall be based on the cooling load calculated in accordance with Sentence 9.33.4.1.(1).
- (3) The oversizing and undersizing of heating and cooling equipment capacities shall be determined in accordance with the requirements of CSA F280, “Determining the required capacity of residential space heating and cooling appliances.”

9.33.5.2. Installation Standards (See also Article 9.33.5.3.)

- (1) The design and installation of earth energy systems shall conform to CAN/CSA-C448.2, “Design and installation of earth energy systems for residential and other small buildings,” where such systems use groundwater, submerged heat exchangers or ground heat exchangers to serve,
 - (a) a house with or without a *secondary unit*, or,
 - (b) a *building*, a house with or without a *secondary unit*, where the *conditioned space* is not more than 1 400 m².
- (2) Except for a house with or without a *secondary unit*, the design and installation of earth energy systems shall conform to CAN/CSA-C448.1, “Design and installation of earth energy systems for commercial and institutional buildings,” where such systems use groundwater, submerged heat exchangers or ground heat exchangers to condition a floor space area more than 1 400 m².

9.33.5.3. Design, Construction and Installation Standard for Solid-Fuel-Burning Appliances

- (1) The design, construction and installation, including the provision of combustion air, of solid-fuel-burning *appliances* and equipment, including *stoves*, *cooktops*, ovens and *space heaters*, shall conform to CSA B365, “Installation Code for Solid-Fuel-Burning Appliances and Equipment.” (See Note A-9.33.5.3.(1))
- (2) Solid fuel-burning *stoves*, *furnaces* and hydronic heating systems designed to burn solid fuels, other than coal, shall conform to the particulate emission limits of,
 - (a) CSA B415.1, “Performance Testing of Solid-Fuel-Burning Heating Appliances”, or
 - (b) the “Standards of Performance for New Residential Wood Heaters”, set out in Subpart AAA of Part 60 of Title 40 of the Code of Federal Regulations, published by the United States Environmental Protection Agency, as it read on March 16, 2015.

(See Note A-9.33.5.3.(2))

9.33.5.4. Fireplaces

- (1) Fireplaces shall conform to Section 9.22.

9.33.6. Air Duct Systems

9.33.6.1. Application

- (1) The requirements of this Subsection apply to the design, construction and installation of air duct distribution systems serving heating, ventilating and *air-conditioning* systems that serve an individual *dwelling unit* within the scope of Part 9.
- (2) Air duct distribution systems in which the rated heat input exceeds 120 kW shall conform to Part 6 and Subsection 3.6.5.

9.33.6.2. Materials in Air Duct Systems

- (1) Except as provided in Sentences (2) to (6.2) and in Article 3.6.4.3., all ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of steel, aluminum alloy, copper, clay or similar *noncombustible* material.
 - (2) Ducts, associated fittings and *plenums* are permitted to contain *combustible* material provided they
 - (a) conform to the appropriate requirements for Class 1 duct materials in CAN/ULC-S110, “Standard Methods of Test for Air Ducts,”
 - (b) conform to Article 3.1.5.18. and Subsection 3.1.9.,
 - (c) are not used in vertical runs serving more than 2 *storeys*, and
 - (d) are not used in air duct systems in which the air temperature may exceed 120°C.
 - (3) Duct sealants shall have a *flame-spread rating* of not more than 25 and a smoke developed classification of not more than 50.
 - (4) Duct connectors that contain *combustible* materials and that are used between ducts and air outlet units shall
 - (a) conform to the appropriate requirements for Class 1 air duct materials in CAN/ULC-S110, “Standard Methods of Test for Air Ducts,”
 - (b) be limited to 4 m in length,
 - (c) be used only in horizontal runs, and
 - (d) not penetrate required *fire separations*.
 - (5) *Combustible* ducts that are part of a duct system carrying only ventilation air and that are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) to (4).
 - (6) Except as provided in Sentences 9.33.6.13.(2) and (3), ducts that are part of a return-air duct system and that are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) to (4).
- (6.1) All ductwork and fittings shall be constructed and installed in conformance with SMACNA Manuals and ASHRAE Handbooks.

(6.2) All duct materials and fittings shall be

- (a) suitable for exposure to the temperature and humidity of the air being conveyed, and
- (b) resistant to corrosion due to contaminants in the air being conveyed in the duct.

(7) Materials referred to in Sentences (1) to (6.2), when used in a location where they may be subjected to excessive moisture, shall

- (a) have no appreciable loss of strength when wet, and
- (b) be corrosion-resistant

9.33.6.3. Tape

(1) Tape used for sealing joints in air ducts, *plenums* and other parts of air duct systems shall meet the flame-resistance requirements for fabric in CAN/ULC-S109, “Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.”

9.33.6.4. Coverings, Linings and Insulation

(1) Reserved.

(2) Reserved.

(3) Reserved.

(4) Reserved.

(5) Except as permitted in Sentences (6) and (7), foamed plastic insulation shall not be used as part of an air duct or for insulating an air duct.

(6) Foamed plastic insulation conforming to Article 9.25.2.2. is permitted to be used to insulate a galvanized steel, stainless steel or aluminum air duct, provided

- (a) the foamed plastic insulation applied to supply ductwork is not less than 3 m from the *furnace* bonnet,
- (b) the temperature within the ductwork where the insulation is installed is not greater than 50°C,
- (c) duct joints are taped with a product conforming to Sentence 9.33.6.3.(1),
- (d) return air *plenums* are separated from the foamed plastic insulation, and
- (e) the foamed plastic insulation is protected in accordance with Article 9.10.17.10.

(7) Foamed plastic insulation is permitted to be used in a ceiling space that acts as a return air *plenum* provided the foamed plastic insulation is protected from exposure to the *plenum* in accordance with Sentence 3.1.5.14.(4).

(8) Reserved.

(9) Linings of ducts shall be installed so that they will not interfere with the operation of volume or balancing dampers or of *fire dampers*, *fire stop flaps* and other *closures*.

9.33.6.5. Galvanized Steel or Aluminum Supply Ducts

(1) Galvanized steel or aluminum *supply ducts* shall conform to Table 9.33.6.5.

(2) The design of fittings for ducts shall conform to ANSI/SMACNA 006, “HVAC Duct Construction Standards – Metal and Flexible,” except that metal thicknesses shall conform to Table 9.33.6.5.

Table 9.33.6.5.
Minimum Metal Thickness of Ducts
 Forming Part of Article 9.33.6.5.

Type of Duct	Maximum Diameter, mm	Maximum Width or Depth, mm	Minimum Metal Thickness, mm	
			Duct Material	
			Galvanized Steel	Aluminum
Round ducts serving single <i>dwelling units</i>	125 or less	—	0.254	0.30
Round	350	—	0.33	0.30
	over 350	—	0.41	0.41
Rectangular, enclosed	—	350	0.33	0.30
	—	over 350	0.41	0.41
Rectangular, not enclosed, with required clearance up to 12 mm	—	350	0.33	0.41
	—	over 350	0.41	0.48
Rectangular, not enclosed, with required clearance of more than 12 mm	—	350	0.41	0.41
	—	over 350	0.48	0.48

9.33.6.6. Construction of Ducts and Plenums

- (1) Where the installation of heating *supply ducts* in walls and floors creates a space between the duct and construction material, the space shall be firestopped with *noncombustible* material at each end.
- (2) Ducts shall be securely supported by metal hangers, straps, lugs or brackets, except that, where zero clearance is permitted, wooden brackets are permitted to be used.
- (3) All round duct joints shall be tight-fitting and lapped not less than 25 mm.
- (4) Rectangular duct connections shall be made with S and drive cleats or equivalent mechanical connections.
- (4.1) Rectangular panels in plenums and ducts more than 300 mm wide shall be shaped to provide sufficient stiffness.
- (5) Duct systems shall have no openings other than those required for the proper operation and maintenance of the system.

9.33.6.7. Installation of Ducts and Plenums

- (1) Air duct systems serving garages shall not be interconnected with other parts of the *dwelling unit*.
- (2) Trunk *supply ducts* shall not be nailed directly to wood members.
- (3) Branch ducts shall be supported at suitable spacings to maintain alignment and prevent sagging.
- (4) Ducts passing through unheated spaces shall have all joints taped or otherwise sealed to ensure that the ducts are airtight throughout their length.
- (5) *Combustible* ducts in concrete slabs-on-ground that are connected to a *furnace supply plenum* shall be located not closer than 600 mm to that *plenum* and not less than 600 mm from its connection to a riser or register.

- (6) Ducts in or beneath concrete slabs-on-ground shall be watertight and corrosion-, decay-, and mildew-resistant.
- (7) Underground ducts shall
 - (a) be constructed to provide interior drainage from and access to all low points,
 - (b) not be connected directly to a sewer, and
 - (c) be installed and constructed of materials in conformance with ASHRAE Handbooks, SMACNA Manuals and the HRAI Digest.
- (8) Where a supply duct or return duct is not protected by an insulated exterior wall or where the duct is exposed to an unheated space it shall be insulated to provide a thermal resistance of not less than RSI 2.1.
- (9) Where a supply duct or return duct is located in an unconditioned space or outdoors, all joints of the ductwork shall be sealed to a Class A seal level in accordance with the SMACNA, “HVAC Duct Construction Standards – Metal and Flexible”.
- (10) Where a supply duct is located in a conditioned space, the ductwork shall be sealed to a Class C seal level in accordance with the SMACNA, “HVAC Duct Construction Standards – Metal and Flexible”.
- (11) A clean-out or pump-out connection shall be provided in an underground duct system at every low point of the duct system.

9.33.6.8. Clearances of Ducts and Plenums

- (1) Reserved.
- (2) Where the *plenum* clearance is 75 mm or less, the clearance between a supply duct and *combustible* material shall
 - (a) be equal to the required *plenum* clearance within 450 mm of the *plenum*, and
 - (b) be not less than 12 mm at a distance of 450 mm or more from the *plenum*, except that this clearance may be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.(See Note A-3.6.5.6.(2))
- (3) Where the *plenum* clearance is more than 75 mm but not more than 150 mm, the clearance between a *supply duct* and *combustible* material shall be
 - (a) equal to the required *plenum* clearance within a horizontal distance of 1.8 m of the *plenum*, and
 - (b) not less than 12 mm at a horizontal distance of 1.8 m or more from the *plenum*, except that this distance may be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the duct from direct radiation from the *furnace* heat exchanger.(See Note A-3.6.5.6.(3))
- (4) Where the *plenum* clearance is more than 150 mm, the clearance between a *supply duct* and *combustible* material shall be
 - (a) equal to the required *plenum* clearance within a horizontal distance of 1 m of the *plenum*,
 - (b) not less than 150 mm within a horizontal distance between 1 m and 1.8 m from the *plenum*, and
 - (c) not less than 25 mm at a horizontal distance of 1.8 m or more from the *plenum*, except that this distance may be reduced to 8 mm beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.(See Note A-3.6.5.6.(4))
- (5) Where a register is installed in a floor directly over a pipeless *furnace*, a double-walled register box with not less than 100 mm between walls, or a register box with the warm-air passage completely surrounded by the cold-air passage, shall be permitted in lieu of the clearances listed in Sentences (2) to (4).

9.33.6.9. Adjustable Dampers and Balance Stops

(1) All branch *supply ducts* for residential systems shall be equipped with volume control dampers at the boot to permit balancing or shall be fitted with a diffuser incorporating an adjustable and lockable volume control device that can be set in a fixed position.

9.33.6.10. Warm-Air Supply Outlets and Return Inlets — General

(1) Reserved.

(2) *Combustible* grilles, diffusers and other devices for the supply and return air openings installed in walls and ceilings shall have a *flame-spread rating* of

- (a) not more than 200 in bathrooms, and
- (b) not more than 150 in rooms or spaces other than bathrooms.

9.33.6.10A. Supply, Return, Intake and Exhaust Openings

(1) Supply, return and exhaust air openings in rooms or spaces shall be protected by grilles having openings of a size that will not allow the passage of a 15 mm diameter sphere.

(2) Outdoor air intakes and exhaust outlets at the *building* exterior shall be designed or located so that the air entering the building system will not contain more contaminants than the normal exterior air.

(3) Exterior openings for outdoor air intakes and exhaust outlets shall be shielded from the entry of snow and rain and shall be fitted with corrosion-resistant screens of mesh having openings not larger than 15 mm, except where climatic conditions may require larger openings.

(4) Screens required in Sentence (3) shall be accessible for maintenance.

9.33.6.11. Warm-Air Supply Outlets

(1) In a *dwelling unit*, a warm-air supply outlet shall be provided in each finished room that is located adjacent to unheated space.

(2) Except as provided in Sentence (3), when a room described in Sentence (1) is located adjacent to exterior walls, such outlet shall be located so as to bathe at least one exterior wall or window with warm air, except in bathrooms, utility rooms or kitchens, where this may not be practical.

(3) Where the heating system is also designed to provide ventilation air, ceiling outlets or outlets located high on interior walls are permitted to be installed, provided the outlets are designed for this purpose and are installed with diffusers.

(4) At least one warm-air supply outlet shall be provided for each 40 m² of floor surface area in unfinished *basements* serving *dwelling units*, and it shall be located so as to provide adequate distribution of warm air throughout the *basement*.

(5) At least one warm-air supply outlet shall be provided for each 80 m² of floor surface area in heated crawl spaces serving *dwelling units*, and it shall be located so as to provide adequate distribution of warm air throughout the crawl space.

(6) Except for pipeless *furnaces* and floor *furnaces*, the capacity of warm-air supply outlets serving *dwelling units* shall be not less than the design heat loss from the area served and shall not exceed 3 kW per outlet.

(7) In *basements* and heated crawl spaces, the calculated heat gain from the *supply ducts* and *plenum* surfaces is permitted to be considered in calculating the design heat loss.

- (8) The temperature of supply air at warm-air supply outlets shall not exceed 70°C.
- (9) Warm-air supply outlets located in finished areas shall be provided with diffusers and adjustable openings and shall not be located on a *furnace plenum*.
- (10) Air duct systems serving *storage garages* shall not be interconnected with other parts of the *building*.

9.33.6.12. Return-Air Inlets

- (1) Return-air inlets shall not be installed in an enclosed room or crawl space that provides combustion air to a *furnace*.
- (2) Except for floor levels which are less than 900 mm above or below an adjacent floor level which is provided with a return-air inlet, at least one return-air inlet shall be provided in each floor level in a *dwelling unit*.
- (3) Provision shall be made for the return of air from all rooms by leaving gaps beneath doors, using louvred doors or installing *return duct* inlets.

9.33.6.13. Return-Air System (See Note A-9.33.6.13.)

- (1) The return-air system shall be designed to handle the entire air supply.
 - (1.1) Except as provided in Sentences (2) and (3), *return ducts* shall be constructed of material having a surface *flame-spread rating* of not more than 150.
 - (2) Where any part of a *return duct* will be exposed to radiation from the *furnace* heat exchanger or other radiating part within the *furnace*, such part of a *return duct* directly above or within 600 mm of the outside *furnace* casing shall be *noncombustible*.
 - (3) *Return ducts* serving solid-fuel-burning *furnaces* shall be constructed of *noncombustible* material.
 - (4) *Combustible return ducts* shall be lined with *noncombustible* material
 - (a) below floor registers,
 - (b) at the bottom of vertical ducts, and
 - (c) under *furnaces* having a bottom return.
 - (5) Spaces between studs or joists used as *return ducts* shall be separated from the unused portions of such spaces by tight-fitting metal stops or wood blocking.
 - (6) A vertical *return duct* shall have openings to return air on not more than one floor.
 - (6.1) A *public corridor* shall comply with Sentences 6.3.2.7.(4) and (5).
 - (7) The return-air system shall be designed so that the negative pressure from the circulating fan cannot
 - (a) affect the *furnace* combustion air supply, nor
 - (b) draw combustion products from joints or openings in the *furnace* or *flue pipe*.
 - (7.1) Return-air from a *dwelling unit* shall not be recirculated to any other *dwelling unit*.

9.33.6.14. Filters and Odour Removal Equipment

- (1) Air filters for air duct systems shall conform to the requirements for Class 2 air filter units as described in CAN/ULC-S111, “Standard Method of Fire Tests for Air Filter Units.”

- (2) When electrostatic-type filters are used, they shall be installed so as to ensure that the electric circuit is automatically de-energized when filter access doors are opened or, in *dwelling units*, when the *furnace* circulation fan is not operating.
- (3) When odour removal equipment of the adsorption type is used it shall be
 - (a) installed to provide access so that adsorption material can be reactivated or renewed, and
 - (b) protected from dust accumulation by air filters installed on the inlet side.

9.33.6.14A. Exhaust Ducts and Outlets

- (1) Where an *exhaust duct* passes through or is adjacent to unheated space, the duct shall be insulated to prevent moisture or condensation in the duct.
- (2) Exhaust outlets shall be designed to prevent back draft under wind conditions.
- (3) *Exhaust ducts* directly connected to laundry drying equipment shall be independent of other *exhaust ducts*.
- (4) Exhaust systems shall discharge directly to the outdoors.

9.33.7. Radiators and Convectors

9.33.7.1. Recessed Radiators and Convectors

- (1) Every steam or hot water radiator and convector located in a recess or concealed space or attached to the face of a wall of *combustible construction* shall be provided with a *noncombustible* lining or backing.

9.33.7.2. Surface Temperature

- (1) The exposed surface temperature of a steam or hot water radiator shall not exceed 70°C unless precautions are taken to prevent human contact.

9.33.8. Piping for Heating and Cooling Systems

9.33.8.1. Piping Materials and Installation

- (1) Piping shall be made from materials designed to withstand the effects of temperatures and pressures that may occur in the system. (See Articles 3.1.5.19., 3.1.9.1. and 9.10.9.7., and Sentence 9.10.9.9.(3) for fire safety requirements.)
- (2) Every pipe used in a heating or *air-conditioning* system shall be installed to allow for expansion and contraction due to temperature changes.
- (3) Supports and anchors for piping in a heating or *air-conditioning* system shall be designed and installed to ensure that undue stress is not placed on the supporting structure.

9.33.8.2. Insulation and Coverings

- (1) Insulation and coverings on pipes shall be composed of material suitable for the operating temperature of the system to withstand deterioration from softening, melting, mildew and mould.
- (2) Insulation and coverings on pipes in which the temperature of the fluid exceeds 120°C
 - (a) shall be made of *noncombustible* material, or

- (b) shall not flame, glow, smoulder or smoke when tested in accordance with ASTM C411, “Standard Specification for Hot-Surface Performance of High-Temperature Thermal Insulation,” at the maximum temperature to which such insulation or covering is to be exposed in service.
- (3) Except as provided in Sentence (6), where *combustible* insulation is used on piping in a horizontal or *vertical service space*, the insulation and coverings on such pipes shall have a *flame-spread rating* throughout the material of not more than
- 25 in *buildings* of *noncombustible construction*, and
 - 75 in *buildings* of *combustible construction*.
- (4) Except as provided in Sentence (6), insulation and coverings on piping located in rooms and spaces other than the *service spaces* described in Sentence (3) shall have a *flame-spread rating* not more than that required for the interior finish for the ceiling of the room or space.
- (5) Pipes that are exposed to human contact shall be insulated so that the exposed surface does not exceed 52°C. (See Note A-6.5.1.1.(3))
- (6) No *flame-spread rating* or smoke developed classification limitations are required where *combustible* insulation and coverings are used on piping when such piping is
- located within a concealed space in a wall,
 - located in a floor slab, or
 - enclosed in a *noncombustible* raceway or conduit.

9.33.8.3. Clearances

- (1) Clearances between *combustible* material and bare pipes carrying steam or hot water shall conform to Table 9.33.8.3.

Table 9.33.8.3.
Clearance Between Steam or Hot Water Pipes and Combustible Material
 Forming Part of Sentence 9.33.8.3.(1)

Steam or Water Temperature (T), °C	Minimum Clearance, mm
$T \leq 95$	no clearance required
$95 < T \leq 120$	15
$T > 120$	25

9.33.8.4. Protection

- (1) Where a pipe carrying steam or hot water at a temperature above 120°C passes through a *combustible* floor, ceiling or wall, the construction shall be protected by a sleeve of metal or other *noncombustible* material not less than 50 mm larger in diameter than the pipe.
- (2) Unprotected steam or hot water pipes that pass through a storage space shall be covered with not less than 25 mm thickness of *noncombustible* insulation to prevent direct contact with the material stored.

9.33.9. Refrigerating Systems and Equipment for Air-Conditioning

9.33.9.1. Cooling Units

- (1) Where a cooling unit is combined with a fuel-fired *furnace* in the same duct system, the cooling unit shall be installed

- (a) in parallel with the heating *furnace*,
- (b) upstream of the *furnace*, provided the *furnace* is designed for such application, or
- (c) downstream of the *furnace*, provided the cooling unit is designed to prevent excessive temperature or pressure in the refrigeration system.

9.33.10. Chimneys and Venting Equipment

9.33.10.1. Requirement for Venting

(1) Except as provided in Articles 9.33.10.2. and 9.33.10.3., the products of combustion from oil-, gas- and solid-fuel-burning *appliances*, including *stoves*, *cooktops*, *ovens* and *space heaters*, shall be vented in conformance with the applicable *appliance* installation standard listed in Sentences 9.33.5.2.(1) and 9.33.5.3.(1).

9.33.10.2. Factory-Built Chimneys

(1) *Factory-built chimneys* serving solid-fuel-burning *appliances*, and their installation, shall comply with Sentence 9.21.1.3.(1). (See Note A-9.33.10.2.(1))

9.33.10.3. Masonry or Concrete Chimneys

(1) *Masonry or concrete chimneys* shall conform to Section 9.21.

9.34. Electrical Facilities

9.34.1. General

9.34.1.1. Reserved

9.34.1.2. Required Facilities

(1) Where electrical services are available, electrical facilities shall be provided for every *building* in conformance with this Section.

9.34.1.3. Location of Equipment in Public Areas

(1) Entrance switches, meters, panel boxes, splitter boxes, time clocks and other similar equipment shall not be located in any public area unless adequate precautions are taken to prevent interference with the equipment.

9.34.1.4. Recessed Lighting Fixtures

(1) Recessed lighting fixtures shall not be located in insulated ceilings unless the fixtures are designed for such installations.

9.34.1.5. Wiring and Cables

- (1) Except for *dwelling units* and except as required in Sentence (2), optical fibre cables and electrical wires and cables installed in *buildings* permitted to be of *combustible construction* shall
- (a) not convey flame or continue to burn for more than 1 min when tested in conformance with the Vertical Flame Test in Clause 4.11.1. of CSA C22.2 No. 0.3, “Test Methods for Electrical Wires and Cables,” (FT1 Rating), or

- (b) be located in
 - (i) totally enclosed *noncombustible* raceways, (See Note A-3.1.4.3.(1)(b)(i))
 - (ii) masonry walls,
 - (iii) concrete slabs, or
 - (iv) totally enclosed non metallic raceways conforming to Clause 3.1.5.23.(1)(b).

(2) Where a concealed space in a floor or ceiling assembly is used as a *plenum*, electrical wires and cables within the *plenum* shall conform to Clause 3.6.4.3.(1)(a).

9.34.2. Lighting Outlets

9.34.2.1. Lighting of Entrances

- (1) An exterior lighting outlet with fixture controlled by a wall switch located within the *building* shall be provided at every entrance to *buildings of residential occupancy*.
- (2) The exterior lighting outlet with fixture required by Sentence (1) may be controlled by a wall switch or panel accessible to authorized personnel only, where it serves,
 - (a) a *building* entrance serving multiple *suites of residential occupancy*,
 - (b) multiple *dwelling unit* entrances,
 - (c) *hotels*, or
 - (d) *motels*.

9.34.2.2. Outlets in Dwelling Units

- (1) Except as provided in Sentence (2), a lighting outlet with fixture controlled by a wall switch shall be provided in kitchens, bedrooms, living rooms, utility rooms, laundry rooms, dining rooms, bathrooms, water-closet rooms, vestibules and hallways in *dwelling units*.
- (2) Where a receptacle controlled by a wall switch is provided in bedrooms or living rooms, such rooms need not conform to the requirements of Sentence (1).

9.34.2.3. Stairways

- (1) Every stairway shall be lighted.
- (2) Except as provided in Sentence (3), 3-way wall switches located at the head and foot of every stairway shall be provided to control at least one lighting outlet with fixture for stairways with 4 or more risers in *dwelling units* and houses with a *secondary suite* including their common spaces.
- (3) The stairway lighting for *basements* that do not contain finished space or lead to an outside entrance or built-in garage and which serve not more than one *dwelling unit* is permitted to be controlled by a single switch located at the head of the stairs.

9.34.2.4. Basements

- (1) A lighting outlet with fixture shall be provided for each 30 m² or fraction thereof of *floor area* in unfinished *basements*.
- (2) The outlet required in Sentence (1) nearest the stairs shall be controlled by a wall switch located at the head of the stairs.

9.34.2.5. Storage Rooms

- (1) A lighting outlet with fixture shall be provided in storage rooms.

9.34.2.6. Garages and Carports

- (1) A lighting outlet with fixture shall be provided for an attached, built-in or detached garage or carport.
- (2) Except as provided in Sentence (3), outlets required in Sentence (1) shall be controlled by a wall switch near the doorway.
- (3) Where the outlet and fixture required in Sentence (1) are ceiling mounted above an area not normally occupied by a parked car, or are wall mounted, a fixture with a built-in switch is permitted to be used.
- (4) Where a carport is lighted by a light at the entrance to a *dwelling unit*, additional carport lighting is not required.

9.34.2.7. Public and Service Areas

- (1) Every public or service area in *buildings*, including a *recreational camp* and a *camp for housing of workers*, shall have lighting outlets with fixtures controlled by a wall switch or panel to illuminate such areas.
- (2) When provided by incandescent lighting, illumination required in Sentence (1) shall conform to Table 9.34.2.7. (See Article 9.9.12.2. for lighting in *means of egress*.)
- (3) When other types of lighting are used, illumination equivalent to that shown in Table 9.34.2.7. shall be provided.

Table 9.34.2.7.
Lighting for Public Areas
 Forming Part of Sentences 9.34.2.7.(2) and (3)

Room or Space	Minimum Illumination, lx	Minimum Lighting Power Density, W/m ² of floor area (incandescent lighting)
Storage rooms	50	5
Service rooms and laundry areas	200	20
Garages	50	5
Public water closet rooms	100	10
Service hallways and stairways	50	5
Recreation rooms	100	10
Hallways, corridors, stairways and sleeping areas in <i>recreational camps</i> and <i>camps for housing of workers</i>	100	10
Kitchen in <i>recreational camps</i> and <i>camps for housing of workers</i>	500	50
All other rooms in <i>recreational camps</i> and <i>camps for housing of workers</i>	250	25

9.34.3. Emergency Lighting

9.34.3.1. Criteria for Emergency Lighting

- (1) Emergency lighting shall conform to Subsection 9.9.12.

Section 9.35. Garages and Carports

9.35.1. Scope

9.35.1.1. Application

- (1) This Section applies to garages and carports serving not more than one *dwelling unit*.

9.35.1.2. Construction Requirements

- (1) The construction of a garage or carport shall conform to the requirements for other *buildings* in this Part except as provided in this Section.

9.35.2. General

9.35.2.1. Carport Considered to be Garage

- (1) Where a roofed enclosure used for the storage or parking of motor vehicles has more than 60 percent of the total perimeter enclosed by walls, doors or windows, the enclosure shall be considered a garage.

9.35.2.2. Garage Floor

- (1) Where an attached or built-in garage is provided, the garage floor shall be sloped to drain liquids to the outdoors.

9.35.3. Foundations

9.35.3.1. Foundation Required

- (1) Except as permitted in this Subsection, *foundations* conforming to Sections 9.12. and 9.15. shall be provided for the support of carport and garage super-structures, including that portion beneath garage doors.
- (2) Detached garages of less than 55 m² *floor area* and not more than 1 *storey* in height that are not of masonry or masonry veneer construction are permitted to be supported on
 - (a) wood mud sills, or
 - (b) a concrete floor slab having a minimum thickness of not less than 100 mm.

9.35.3.2. Protection from Damage Due to Soil Movement

- (1) In clay-type *soils* subject to significant movement with a change in *soil* moisture content, the *foundation* depth of carports or garages connected to a *dwelling unit* directly or by a breezeway shall be approximately the same depth as the *foundation* of the main *building*.

- (2) Where slab-on-ground construction is used, a construction joint shall be provided between the main *building* slab and a slab serving an attached garage, breezeway or carport.
- (3) Except as provided in Section 9.12., *foundations* for attached unheated garages or carports shall be below frost level.

9.35.3.3. Drainage

- (1) Detached garages of less than 55 m² *floor area* and not more than 1 *storey* in height that are not of masonry or masonry veneer construction need not conform with the *foundation* drainage requirements stated in Section 9.14. where the finished ground level is at or near the elevation of the garage's floor and where the ground slopes away from the *building*.

9.35.3.4. Column Piers

- (1) Piers for the support of carport columns shall extend not less than 150 mm above ground level.
- (2) Piers referred to in Sentence (1) shall project not less than 25 mm beyond the base of the column but in no case be less than 190 mm by 190 mm in size.

9.35.4. Walls and Columns

9.35.4.1. Interior Finish

- (1) Interior finish need not be applied to garage and carport walls.

9.35.4.2. Columns

- (1) Columns for garages and carports shall conform to Section 9.17., except that 89 mm by 89 mm wood columns may be used.

9.35.4.3. Anchorage

- (1) Garage or carport walls and columns shall be anchored to the *foundation* to resist wind uplift in conformance with Subsection 9.23.6., except that where a garage is supported on the surface of the ground, ground anchors shall be provided to resist wind uplift.

Section 9.36. Reserved

Section 9.37. Cottages

9.37.1. Scope

9.37.1.1. Application

- (1) This Section applies to *buildings of residential occupancy* used or intended to be used as seasonal recreational *buildings*.

(2) The *buildings* described in Sentence (1) shall comply with all the requirements of this Part, except where they are specifically exempted in this Section.

9.37.2. General

9.37.2.1. Exclusions

(1) Except as provided in Subsection 9.10.15. and Articles 9.37.2.4. and 9.37.3.1., *buildings* used or intended to be used as seasonal recreational *buildings* need not comply with Sections 9.5. to 9.7. and 9.9. to 9.11.

(2) Flooring need not comply with Section 9.30., but tight-fitting floors shall be provided to support the *live* and *dead* loads.

(3) Except as provided in Sentence (4), thermal insulation, *vapour barrier*, air barrier construction, interior finishes, plumbing, heating, mechanical ventilation, *air-conditioning* and electrical facilities, need not be provided, but where any of these are provided, they shall comply with the requirements of this Part.

(4) Where heating and *air-conditioning* are provided, Article 9.33.3.1. need not be complied with.

9.37.2.2. Foundations

(1) Continuous perimeter *foundation* walls are not required, but when they are provided, they shall comply with the requirements of this Part.

(2) Where unit masonry columns are used, the height of such columns shall not exceed,

(a) in the case of hollow masonry units, 4 times the least dimension of the units,

(b) in the case of solid masonry units or hollow units with voids filled with concrete, 10 times the least dimension of the column, or

(c) where the column is reinforced with at least four 13 mm diam bars and filled with concrete, 18 times the least dimension of the column.

(3) Columns in excess of the height limitations of Clauses (2)(a) to (c) shall be designed in accordance with Part 4.

9.37.2.3. Waterproofing and Dampproofing

(1) Where *foundations* below ground level and concrete floors on ground are used, they shall comply with Section 9.13.

9.37.2.4. Smoke Alarms

(1) Every *dwelling unit* within the scope of this Section shall be provided with a *smoke alarm* in accordance with Subsection 9.10.19.

9.37.3. Tourist Accommodation

9.37.3.1. Buildings for Seasonal Tourist Accommodation or for Rent

(1) Where *buildings* are used or intended to be used for seasonal tourist accommodation or for rent, they shall comply with Sections 9.5. to 9.8. in addition to the requirements of this Section.

Section 9.38. Log Construction

9.38.1. General

9.38.1.1. Material Requirements

(1) Logs that are sound and free of fractures may be used for *foundations*, beams, posts and similar members, provided it can be shown by a structural analysis or tests or previous experience that the strength of the member is adequate for its intended purposes.

9.38.1.2. Requirement for Wood Preservative

(1) The portion of any log coming in contact with masonry or concrete at or below *grade* shall be treated with a wood preservative to prevent decay.

9.38.1.3. Exterior Joints

(1) All exterior joints between logs shall be rendered water-tight by methods such as machined joints, oakum packing, cement parging, chinking, caulking or a combination of these.

9.38.2. Walls

9.38.2.1. Logs

(1) Walls may be built of natural or manufactured logs.

9.38.2.2. Attachment of Logs

(1) Walls made of logs in a horizontal position shall have interlocking intersections that will prevent the collection of water in the joints, or the horizontal logs shall butt to a vertical corner post to which the horizontal logs shall be firmly attached.

9.38.2.3. Joining Logs

(1) Each log in a horizontal position shall be scribed as close as possible to its bearer and fastened to the bearer in at least three places throughout its length, by dowels, continuous machined joints, vertical framing members or interlocking intersections or any combination of these, but in no case shall the distance between fastenings exceed 1 800 mm.

9.38.2.4. Vertical Logs

(1) Each log in a wall built of vertical logs shall be scribed to fit as closely as possible to the adjacent logs.

9.38.2.5. Plates

(1) Logs used in a vertical position shall have a plate at the top and a plate at the bottom and the plates shall be at least as wide as the largest end diameter of any of the logs.

9.38.3. Lintels

9.38.3.1. Support Over Openings

(1) Logs placed in vertical position shall be supported over window and door openings by lintels meeting the requirements of Tables 9.23.4.2.-L and 9.23.12.3.-A to 9.23.12.3.-D.

9.38.3.2. Clearance

(1) At every opening in a wall made of logs in a horizontal position where shrinkage can occur there shall be a clearance between the rough buck header and the lintel log of not less than 13 mm in width for each 300 mm of height to allow for settlement.

Section 9.39. Park Model Trailers

9.39.1. Scope

9.39.1.1. Application

(1) This Section applies to manufactured *buildings* designed and constructed in conformance with CAN/CSA-Z241 Series, “Park model trailers,” and used or intended to be used as a seasonal recreational *building of residential occupancy*.

9.39.2. General

9.39.2.1. General

(1) Except as provided in Subsection 9.39.3., a manufactured *building* used or intended to be used as a seasonal recreational *building of residential occupancy* is deemed to comply with this Code if it is designed and constructed in conformance with CAN/CSA-Z241 Series, “Park model trailers.”

9.39.3. Requirements

9.39.3.1. Other Building Components

(1) The requirements of this Code shall apply to *building* components designed and *constructed* outside the place of manufacture of a *building* described in Article 9.39.1.1.

9.39.3.2. Spatial Separation

- (1) *Buildings* described in Article 9.39.1.1. shall comply with Section 9.10. where the *building* is,
- (a) used or intended to be used for seasonal tourist accommodation, or
 - (b) leased or intended to be leased.

9.39.3.3. Foundations and Anchorage

(1) *Buildings* described in Article 9.39.1.1. shall be supported and anchored in conformance with the manufacturer's installation instructions.

9.39.3.4. Proximity to Above Ground Electrical Conductors

(1) *Buildings* described in Article 9.39.1.1. shall comply with Article 9.1.1.5.

Section 9.40. Reinforced Concrete Slabs (See Note A-9.40.)

9.40.1. Scope

9.40.1.1. Application

- (1) This Section applies to
 - (a) reinforced concrete slabs that are suspended over cold rooms in *basements*, and are supported by *foundation* walls along the perimeter of the slab with no additional interior supports, and
 - (b) slabs in which the clear span between supporting walls is not more than 2.5 m along the shortest dimension of the slab.
- (2) Slabs for conditions other than described in Sentence (1) shall be designed in accordance with Part 4.
- (3) This Section does not apply to reinforced concrete slabs intended to support motor vehicles.

9.40.1.2. Concrete

(1) Concrete shall conform to Section 9.3.

9.40.1.3. Reinforcing Steel

(1) Reinforcing steel shall conform to Grade 400 in CSA G30.18, "Carbon steel bars for concrete reinforcement."

9.40.1.4. Slab Construction

- (1) Concrete shall be cast against formwork in accordance with CSA A23.1, "Concrete materials and methods of concrete construction."
- (2) The slab shall be not less than 125 mm thick.
- (3) The slab shall be reinforced with 10M bars spaced not more than 200 mm o.c. in each direction, with 30 mm clear cover from the bottom of the slab to the first layer of bars, and the second layer of bars laid directly on top of the lower layer in the opposite direction.
- (4) The slab shall bear not less than 75 mm on the supporting *foundation* walls and be anchored to the walls with 600 mm × 600 mm 10M bent dowels spaced at not more than 600 mm o.c.
- (5) Exposed slabs shall be sloped to effectively shed water away from the exterior wall.

Section 9.41. Additional Requirements for Change of Use

9.41.1. Scope

9.41.1.1. Application

- (1) This Section applies where proposed *construction* in respect of an existing *building* will result in any of the following changes of use of all or part of the *building*:
 - (a) a change of the *major occupancy* of all or part of a *building* that is designated with a “Y” in Table 1.3.1.4. of Division C,
 - (b) a *suite* of a Group C *major occupancy* is converted into more than one *suite* of a Group C *major occupancy*,
 - (c) a *farm building* or part of a *farm building* is changed to another *major occupancy* other than a Group G *major occupancy*,
 - (d) a *building* or part of a *building* is changed to a *post-disaster building*,
 - (e) the use of a *building* or part of a *building* is changed and the previous *major occupancy* of the *building* or part of the *building* cannot be determined, or
 - (f) a *farm building* or part of a *farm building* is changed to a Group G, Division 1 *major occupancy*.
- (2) For the purposes of this Section and Sentences 11.4.2.1.(1) and 11.4.2.5.(4), the changes of use set out in Clauses (1)(b) to (f) are also deemed to constitute a change in *major occupancy*.
- (3) The requirements of this Section are in addition to the requirements of other Parts of the Code as they apply to the proposed *construction*.

9.41.2. Additional Construction

9.41.2.1. Change of Use and Compensating Construction

- (1) Where proposed *construction* will result in a change of use described in Clauses 9.40.1.1.(1)(a) to (f), additional *construction* shall be required in order that the *building* or part of a *building* subject to the change of use conforms to the requirements of Subsections 9.5.1. and 9.5.3. to 9.5.10., Section 9.6., Article 9.7.2.3. Sentences 9.7.5.1.(2) and 9.7.6.2.(1) and (3), Articles 9.8.8.1. and 9.9.10.1., Subsection 9.10.17. and Sections 9.31., 9.32. and 9.34. as they apply to the new *major occupancy* that the *building* or part of a *building* is to support.
- (2) For the purposes of this Article, existing *buildings* shall be classified as to their *construction* and *occupancy* as provided for in Sentence 11.2.1.1.(1).

9.41.2.2. Performance Level Evaluation and Compensating Construction

- (1) The *performance level* of a *building* after *construction* shall not be less than the *performance level* of the *building* prior to *construction*.
- (2) For the purposes of Sentence (1), reduction of *performance level* shall be determined in accordance with Articles 11.4.2.1., 11.4.2.3. and 11.4.2.5.
- (3) Where the proposed *construction* would reduce the *performance level* of an existing *building*, compensating *construction* shall be required in conformance with Articles 11.4.3.1., 11.4.3.2., 11.4.3.4. and 11.4.3.6.
- (4) Section 11.5. applies in respect of the requirements of Sentences 11.4.3.4.(1), (3) and (4).

Table 9.20.17.4.-A
Maximum Allowable Clear Spans for Lintels in Flat Loadbearing Insulating Concrete Form (ICF) Walls⁽¹⁾⁽²⁾⁽³⁾ (1-10M Bottom Bar)
 Forming Part of Sentences 9.3.2.8.(1) and 9.20.17.4.(3)

Minimum Lintel Thickness, mm	Minimum Lintel Depth, mm	Maximum Clear Span, m			
		Supporting Light-Frame Roof Only		Supporting ICF Second Storey and Light-Frame Roof	
		Maximum Ground Snow Load, kN/m ²			
		1.50	3.33	1.50	3.33
140	200	1.41	1.18	1.03	0.93
	300	1.78	1.50	1.30	1.18
	400	2.08	1.75	1.53	1.38
	500	2.33	1.97	1.72	1.56
	600	2.55	2.16	1.89	1.71
150	200	1.41	1.18	1.02	0.92
	300	1.78	1.50	1.29	1.17
	400	2.08	1.75	1.51	1.37
	500	2.33	1.97	1.70	1.54
	600	2.54	2.15	1.87	1.70
160	200	1.41	1.18	1.01	0.91
	300	1.78	1.50	1.28	1.16
	400	2.07	1.75	1.50	1.36
	500	2.32	1.96	1.68	1.53
	600	2.53	2.15	1.85	1.68
190	200	1.41	1.19	0.98	0.89
	300	1.78	1.50	1.24	1.13
	400	2.06	1.74	1.45	1.32
	500	2.30	1.95	1.63	1.49
	600	2.51	2.13	1.78	1.63
200	200	1.41	1.19	0.97	0.89
	300	1.77	1.49	1.23	1.12
	400	2.06	1.74	1.43	1.31
	500	2.30	1.95	1.61	1.48
	600	2.50	2.13	1.77	1.62
240	200	1.41	1.19	0.94	0.86
	300	1.76	1.49	1.18	1.09
	400	2.04	1.73	1.38	1.27
	500	2.27	1.93	1.55	1.43
	600	2.47	2.11	1.70	1.56

Notes to Table 9.20.17.4.-A:

- (1) Deflection criteria is L/240, where “L” is the clear span of the lintel.
- (2) Linear interpolation is permitted between ground snow loads and between lintel depths.
- (3) 10M stirrups are required at a maximum d/2 spacing for spans greater than 1 200 mm, where “d” is the distance from the top of the lintel to the level of the bottom reinforcing bar in the lintel.

Table 9.20.17.4.-B
Maximum Allowable Clear Spans for Lintels in Flat Loadbearing Insulating Concrete Form (ICF) Walls⁽¹⁾⁽²⁾⁽³⁾ (1-15M Bottom Bar)
 Forming Part of Sentences 9.3.2.8.(1) and 9.20.17.4.(3)

Minimum Lintel Thickness, mm	Minimum Lintel Depth, mm	Maximum Clear Span, m			
		Supporting Light-Frame Roof Only		Supporting ICF Second Storey and Light-Frame Roof	
		Maximum Ground Snow Load, kN/m ²			
		1.50	3.33	1.50	3.33
140	200	1.63	1.46	1.31	1.23
	300	2.43	2.08	1.81	1.64
	400	2.90	2.44	2.13	1.93
	500	3.26	2.75	2.41	2.18
	600	3.58	3.03	2.65	2.40
150	200	1.67	1.49	1.33	1.25
	300	2.48	2.08	1.79	1.62
	400	2.90	2.44	2.11	1.91
	500	3.26	2.75	2.38	2.16
	600	3.57	3.02	2.62	2.38
160	200	1.70	1.53	1.35	1.26
	300	2.48	2.08	1.78	1.61
	400	2.90	2.44	2.09	1.90
	500	3.25	2.75	2.36	2.14
	600	3.56	3.02	2.59	2.36
190	200	1.80	1.61	1.36	1.24
	300	2.48	2.09	1.73	1.58
	400	2.89	2.44	2.03	1.85
	500	3.23	2.74	2.29	2.09
	600	3.53	3.00	2.51	2.30
200	200	1.83	1.64	1.35	1.23
	300	2.48	2.09	1.71	1.57
	400	2.88	2.44	2.01	1.84
	500	3.22	2.74	2.26	2.07
	600	3.52	2.99	2.48	2.28
240	200	1.93	1.65	1.30	1.20
	300	2.47	2.08	1.66	1.52
	400	2.86	2.43	1.94	1.78
	500	3.19	2.72	2.18	2.01
	600	3.47	2.97	2.39	2.20

Notes to Table 9.20.17.4.-B:

- (1) Deflection criteria is L/240, where “L” is the clear span of the lintel.
- (2) Linear interpolation is permitted between ground snow loads and between lintel depths.
- (3) 10M stirrups are required at a maximum d/2 spacing for spans greater than 1 200 mm, where “d” is the distance from the top of the lintel to the level of the bottom reinforcing bar in the lintel.

Table 9.20.17.4.-C
Maximum Allowable Clear Spans for Lintels in Flat Loadbearing Insulating Concrete Form (ICF) Walls⁽¹⁾⁽²⁾⁽³⁾ (2-15M Bottom Bar)
 Forming Part of Sentences 9.3.2.8.(1) and 9.20.17.4.(3)

Minimum Lintel Thickness, mm	Minimum Lintel Depth, mm	Maximum Clear Span, m			
		Supporting Light-Frame Roof Only		Supporting ICF Second Storey and Light-Frame Roof	
		Maximum Ground Snow Load, kN/m ²			
		1.50	3.33	1.50	3.33
140	200	1.63	1.46	1.31	1.23
	300	2.43	2.18	1.96	1.84
	400	3.22	2.90	2.60	2.42
	500	4.00	3.60	3.25	2.70
	600	4.71	4.20	3.61	2.97
150	200	1.67	1.49	1.33	1.25
	300	2.48	2.23	1.99	1.87
	400	3.29	2.96	2.64	2.45
	500	4.80	3.68	3.29	2.74
	600	4.87	4.20	3.64	3.02
160	200	1.70	1.53	1.35	1.27
	300	2.53	2.28	2.02	1.90
	400	3.36	3.02	2.68	2.48
	500	4.16	3.76	3.27	2.78
	600	4.95	4.20	3.61	3.08
190	200	1.80	1.61	1.39	1.32
	300	2.67	2.40	2.09	1.97
	400	3.53	3.19	2.77	2.56
	500	4.38	3.81	3.18	2.90
	600	4.92	4.19	3.50	3.21
200	200	1.83	1.64	1.41	1.33
	300	2.87	2.44	2.11	2.00
	400	3.78	3.24	2.79	2.55
	500	4.46	3.81	3.15	2.89
	600	4.86	4.18	3.47	3.18
240	200	2.07	1.74	1.46	1.38
	300	3.07	2.59	2.18	2.07
	400	3.95	3.38	2.70	2.48
	500	4.40	3.80	3.04	2.80
	600	4.78	4.16	3.34	3.08

Notes to Table 9.20.17.4.-C:

- (1) Deflection criteria is L/240, where “L” is the clear span of the lintel.
- (2) Linear interpolation is permitted between ground snow loads and between lintel depths.
- (3) 10M stirrups are required at a maximum d/2 spacing for spans greater than 1 200 mm, where “d” is the distance from the top of the lintel to the level of the bottom reinforcing bar in the lintel.

Table 9.23.4.2.-A
Maximum Spans for Floor Joists – General Cases⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and (2), 9.23.4.4.(1) and 9.23.9.4.(1) to (3)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m									
			With Strapping ⁽²⁾			With Bridging			With Strapping ⁽²⁾ and Bridging			
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	2.13	1.97	1.73	2.19	1.99	1.73	2.19	1.99	1.73	
		38 × 140	3.23	3.07	2.73	3.44	3.12	2.73	3.44	3.12	2.73	
		38 × 184	3.88	3.69	3.51	4.18	3.92	3.59	4.37	4.07	3.59	
		38 × 235	4.57	4.34	4.13	4.86	4.57	4.29	5.05	4.70	4.39	
		38 × 286	5.21	4.95	4.71	5.49	5.16	4.85	5.66	5.28	4.92	
	No. 1 and No. 2	38 × 89	2.00	1.85	1.66	2.09	1.90	1.66	2.09	1.90	1.66	
		38 × 140	3.09	2.91	2.62	3.29	2.99	2.62	3.29	2.99	2.62	
		38 × 184	3.71	3.53	3.36	4.00	3.76	3.44	4.19	3.90	3.44	
		38 × 235	4.38	4.16	3.96	4.66	4.38	4.11	4.84	4.51	4.20	
		38 × 286	4.99	4.75	4.52	5.26	4.94	4.65	5.43	5.06	4.72	
	No. 3	38 × 89	1.90	1.69	1.38	1.95	1.69	1.38	1.95	1.69	1.38	
		38 × 140	2.78	2.41	1.97	2.78	2.41	1.97	2.78	2.41	1.97	
		38 × 184	3.38	2.93	2.39	3.38	2.93	2.39	3.38	2.93	2.39	
		38 × 235	4.14	3.58	2.93	4.14	3.58	2.93	4.14	3.58	2.93	
		38 × 286	4.80	4.16	3.39	4.80	4.16	3.39	4.80	4.16	3.39	
	Construction	38 × 89	1.90	1.77	1.61	2.03	1.84	1.61	2.03	1.84	1.61	
	Standard	38 × 89	1.81	1.63	1.33	1.88	1.63	1.33	1.88	1.63	1.33	
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	2.08	1.93	1.71	2.16	1.96	1.71	2.16	1.96	1.71
			38 × 140	3.18	3.03	2.69	3.39	3.08	2.69	3.39	3.08	2.69
			38 × 184	3.82	3.64	3.46	4.12	3.87	3.54	4.31	4.02	3.54
			38 × 235	4.50	4.28	4.08	4.80	4.51	4.23	4.98	4.64	4.33
38 × 286			5.14	4.89	4.65	5.42	5.09	4.78	5.59	5.21	4.86	
No. 1 and No. 2		38 × 89	2.00	1.85	1.66	2.09	1.90	1.66	2.09	1.90	1.66	
		38 × 140	3.09	2.91	2.62	3.29	2.99	2.62	3.29	2.99	2.62	
		38 × 184	3.71	3.53	3.36	4.00	3.76	3.44	4.19	3.90	3.44	
		38 × 235	4.38	4.16	3.96	4.66	4.38	4.11	4.84	4.51	4.20	
		38 × 286	4.99	4.75	4.52	5.26	4.94	4.65	5.43	5.06	4.72	
No. 3		38 × 89	1.90	1.77	1.61	2.03	1.84	1.61	2.03	1.84	1.61	
		38 × 140	2.99	2.78	2.43	3.19	2.90	2.43	3.19	2.90	2.43	
		38 × 184	3.60	3.42	2.95	3.88	3.61	2.95	4.06	3.61	2.95	
		38 × 235	4.24	4.03	3.61	4.51	4.24	3.61	4.68	4.37	3.61	
		38 × 286	4.84	4.60	4.19	5.10	4.79	4.19	5.26	4.90	4.19	
Construction		38 × 89	1.90	1.77	1.61	2.03	1.84	1.61	2.03	1.84	1.61	
Standard		38 × 89	1.81	1.68	1.39	1.96	1.71	1.39	1.96	1.71	1.39	

Table 9.23.4.2.-A (Cont'd)
Maximum Spans for Floor Joists – General Cases⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and (2), 9.23.4.4.(1) and 9.23.9.4.(1) to (3)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m									
			With Strapping ⁽²⁾			With Bridging			With Strapping ⁽²⁾ and Bridging			
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	1.95	1.81	1.64	2.06	1.87	1.64	2.06	1.87	1.64	
		38 × 140	3.05	2.85	2.57	3.24	2.95	2.57	3.24	2.95	2.57	
		38 × 184	3.66	3.48	3.31	3.94	3.70	3.38	4.12	3.84	3.38	
		38 × 235	4.31	4.10	3.90	4.59	4.31	4.05	4.76	4.44	4.14	
		38 × 286	4.91	4.67	4.45	5.18	4.87	4.57	5.34	4.98	4.64	
	No. 1 and No. 2	38 × 89	1.86	1.72	1.58	1.99	1.81	1.58	1.99	1.81	1.58	
		38 × 140	2.92	2.71	2.49	3.14	2.85	2.49	3.14	2.85	2.49	
		38 × 184	3.54	3.36	3.20	3.81	3.58	3.27	3.99	3.72	3.27	
		38 × 235	4.17	3.96	3.77	4.44	4.17	3.92	4.60	4.29	4.00	
		38 × 286	4.75	4.52	4.30	5.01	4.71	4.42	5.17	4.82	4.49	
	No. 3	38 × 89	1.81	1.68	1.55	1.96	1.78	1.55	1.96	1.78	1.55	
		38 × 140	2.84	2.64	2.43	3.08	2.80	2.43	3.08	2.80	2.43	
		38 × 184	3.47	3.30	2.95	3.74	3.52	2.95	3.92	3.61	2.95	
		38 × 235	4.09	3.89	3.61	4.36	4.09	3.61	4.52	4.22	3.61	
		38 × 286	4.67	4.44	4.19	4.92	4.62	4.19	5.08	4.73	4.19	
	Construction	38 × 89	1.81	1.68	1.55	1.96	1.78	1.55	1.96	1.78	1.55	
	Standard	38 × 89	1.70	1.58	1.44	1.88	1.71	1.44	1.88	1.71	1.44	
	Northern Species (includes any Canadian Species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	1.65	1.53	1.42	1.84	1.68	1.46	1.84	1.68	1.46
			38 × 140	2.59	2.41	2.24	2.90	2.63	2.30	2.90	2.63	2.30
			38 × 184	3.27	3.11	2.94	3.52	3.31	3.03	3.69	3.44	3.03
			38 × 235	3.85	3.66	3.48	4.10	3.85	3.62	4.26	3.97	3.70
38 × 286			4.39	4.18	3.97	4.63	4.35	4.09	4.78	4.45	4.15	
No. 1 and No. 2		38 × 89	1.59	1.48	1.37	1.80	1.64	1.43	1.80	1.64	1.43	
		38 × 140	2.51	2.33	2.16	2.83	2.57	2.25	2.83	2.57	2.25	
		38 × 184	3.19	3.04	2.84	3.44	3.23	2.96	3.60	3.36	2.96	
		38 × 235	3.76	3.58	3.41	4.01	3.77	3.54	4.16	3.88	3.62	
		38 × 286	4.29	4.08	3.88	4.53	4.25	4.00	4.67	4.35	4.06	
No. 3		38 × 89	1.54	1.43	1.32	1.74	1.57	1.36	1.76	1.60	1.36	
		38 × 140	2.42	2.24	1.94	2.74	2.38	1.94	2.75	2.38	1.94	
		38 × 184	3.12	2.90	2.37	3.35	2.90	2.37	3.35	2.90	2.37	
		38 × 235	3.67	3.49	2.89	3.91	3.54	2.89	4.06	3.54	2.89	
		38 × 286	4.19	3.98	3.36	4.42	4.11	3.36	4.55	4.11	3.36	
Construction		38 × 89	1.54	1.43	1.32	1.74	1.57	1.40	1.76	1.60	1.40	
Standard		38 × 89	1.48	1.37	1.15	1.63	1.41	1.15	1.63	1.41	1.15	

Notes to Table 9.23.4.2.-A:

- (1) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floor does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) See Sentence 9.23.9.4.(5) for alternatives to strapping.

Table 9.23.4.2.-B
Maximum Spans for Floor Joists – Special Cases⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and (2), 9.23.4.4.(2) and 9.23.9.4.(4) and (6)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m								
			Joists with Ceilings Attached to Wood Furring						Joists with Concrete Topping		
			Without Bridging			With Bridging			With or Without Bridging ⁽²⁾		
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm		
			300	400	600	300	400	600	300	400	600
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	2.19	1.99	1.73	2.19	1.99	1.73	2.19	1.99	1.73
		38 × 140	3.44	3.12	2.73	3.44	3.12	2.73	3.44	3.12	2.73
		38 × 184	4.24	3.99	3.59	4.52	4.11	3.59	4.52	4.11	3.59
		38 × 235	4.98	4.69	4.29	5.47	5.20	4.58	5.77	5.24	4.58
		38 × 286	5.67	5.34	4.88	6.19	5.89	5.54	6.83	6.37	5.58
	No. 1 and No. 2	38 × 89	2.09	1.90	1.66	2.09	1.90	1.66	2.09	1.90	1.66
		38 × 140	3.29	2.99	2.62	3.29	2.99	2.62	3.29	2.99	2.55
		38 × 184	4.06	3.83	3.44	4.33	3.93	3.44	4.33	3.81	3.11
		38 × 235	4.78	4.50	4.11	5.24	4.98	4.31	5.37	4.65	3.80
		38 × 286	5.44	5.12	4.68	5.93	5.64	5.00	6.24	5.40	4.41
	No. 3	38 × 89	1.95	1.69	1.38	1.95	1.69	1.38	1.72	1.49	1.21
		38 × 140	2.78	2.41	1.97	2.78	2.41	1.97	2.45	2.12	1.73
		38 × 184	3.38	2.93	2.39	3.38	2.93	2.39	2.98	2.58	2.11
		38 × 235	4.14	3.58	2.93	4.14	3.58	2.93	3.65	3.16	2.58
		38 × 286	4.80	4.16	3.39	4.80	4.16	3.39	4.23	3.66	2.99
	Construction	38 × 89	2.03	1.84	1.61	2.03	1.84	1.61	2.03	1.84	1.61
	Standard	38 × 89	1.88	1.63	1.33	1.88	1.63	1.33	1.66	1.44	1.17
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	2.16	1.96	1.71	2.16	1.96	1.71	2.16	1.96
38 × 140			3.39	3.08	2.69	3.39	3.08	2.69	3.39	3.08	2.69
38 × 184			4.18	3.94	3.54	4.46	4.05	3.54	4.46	4.05	3.54
38 × 235			4.92	4.63	4.23	5.39	5.13	4.52	5.69	5.17	4.52
38 × 286			5.60	5.27	4.82	6.10	5.81	5.47	6.74	6.28	5.50
No. 1 and No. 2		38 × 89	2.09	1.90	1.66	2.09	1.90	1.66	2.09	1.90	1.66
		38 × 140	3.29	2.99	2.62	3.29	2.99	2.62	3.29	2.99	2.62
		38 × 184	4.06	3.83	3.44	4.33	3.93	3.44	4.33	3.93	3.26
		38 × 235	4.78	4.50	4.11	5.24	4.98	4.39	5.53	4.88	3.99
		38 × 286	5.44	5.12	4.68	5.93	5.64	5.25	6.54	5.66	4.63
No. 3		38 × 89	2.03	1.84	1.61	2.03	1.84	1.61	2.03	1.83	1.50
		38 × 140	3.19	2.90	2.43	3.19	2.90	2.43	3.02	2.62	2.14
		38 × 184	3.94	3.61	2.95	4.17	3.61	2.95	3.68	3.18	2.60
		38 × 235	4.63	4.36	3.61	5.08	4.42	3.61	4.50	3.89	3.18
		38 × 286	5.27	4.96	4.19	5.74	5.13	4.19	5.22	4.52	3.69
Construction		38 × 89	2.03	1.84	1.61	2.03	1.84	1.61	2.03	1.84	1.61
Standard		38 × 89	1.96	1.71	1.39	1.96	1.71	1.39	1.74	1.50	1.23

Table 9.23.4.2.-B (Cont'd)
Maximum Spans for Floor Joists – Special Cases⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and (2), 9.23.4.4.(2) and 9.23.9.4.(4) and (6)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m									
			Joists with Ceilings Attached to Wood Furring						Joists with Concrete Topping			
			Without Bridging			With Bridging			With or Without Bridging ⁽²⁾			
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	2.06	1.87	1.64	2.06	1.87	1.64	2.06	1.87	1.64	
		38 × 140	3.24	2.95	2.57	3.24	2.95	2.57	3.24	2.95	2.57	
		38 × 184	4.00	3.77	3.38	4.26	3.87	3.38	4.26	3.87	3.38	
		38 × 235	4.70	4.43	4.05	5.16	4.91	4.32	5.45	4.95	4.32	
		38 × 286	5.35	5.04	4.61	5.84	5.55	5.23	6.45	6.01	5.26	
	No. 1 and No. 2	38 × 89	1.99	1.81	1.58	1.99	1.81	1.58	1.99	1.81	1.58	
		38 × 140	3.14	2.85	2.49	3.14	2.85	2.49	3.14	2.85	2.49	
		38 × 184	3.87	3.64	3.27	4.12	3.75	3.27	4.12	3.75	3.27	
		38 × 235	4.55	4.28	3.91	4.99	4.75	4.18	5.27	4.79	4.13	
		38 × 286	5.18	4.88	4.46	5.65	5.37	5.06	6.23	5.81	4.79	
	No. 3	38 × 89	1.96	1.78	1.55	1.96	1.78	1.55	1.96	1.78	1.50	
		38 × 140	3.08	2.80	2.43	3.08	2.80	2.43	3.02	2.62	2.14	
		38 × 184	3.80	3.58	2.95	4.05	3.61	2.95	3.68	3.18	2.60	
		38 × 235	4.47	4.21	3.61	4.90	4.42	3.61	4.50	3.89	3.18	
		38 × 286	5.09	4.79	4.19	5.55	5.13	4.19	5.22	4.52	3.69	
	Construction	38 × 89	1.96	1.78	1.55	1.96	1.78	1.55	1.96	1.78	1.55	
	Standard	38 × 89	1.88	1.71	1.44	1.88	1.71	1.44	1.80	1.56	1.27	
	Northern Species (includes any Canadian Species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	1.84	1.68	1.46	1.84	1.68	1.46	1.84	1.68	1.46
			38 × 140	2.90	2.63	2.30	2.90	2.63	2.30	2.90	2.63	2.30
			38 × 184	3.58	3.37	3.03	3.81	3.46	3.03	3.81	3.46	3.03
38 × 235			4.20	3.96	3.62	4.61	4.39	3.86	4.87	4.42	3.86	
38 × 286			4.79	4.51	4.12	5.22	4.96	4.68	5.76	5.37	4.54	
No. 1 and No. 2		38 × 89	1.80	1.64	1.43	1.80	1.64	1.43	1.80	1.64	1.43	
		38 × 140	2.83	2.57	2.25	2.83	2.57	2.25	2.83	2.57	2.23	
		38 × 184	3.50	3.29	2.96	3.72	3.38	2.96	3.72	3.32	2.71	
		38 × 235	4.11	3.87	3.54	4.51	4.29	3.76	4.69	4.06	3.31	
		38 × 286	4.68	4.40	4.03	5.10	4.85	4.36	5.44	4.71	3.84	
No. 3		38 × 89	1.76	1.60	1.36	1.76	1.60	1.36	1.70	1.47	1.20	
		38 × 140	2.75	2.38	1.94	2.75	2.38	1.94	2.42	2.10	1.71	
		38 × 184	3.35	2.90	2.37	3.35	2.90	2.37	2.95	2.55	2.08	
		38 × 235	4.01	3.54	2.89	4.09	3.54	2.89	3.61	3.12	2.55	
		38 × 286	4.56	4.11	3.36	4.75	4.11	3.36	4.18	3.62	2.96	
Construction		38 × 89	1.76	1.60	1.40	1.76	1.60	1.40	1.76	1.60	1.37	
Standard		38 × 89	1.63	1.41	1.15	1.63	1.41	1.15	1.44	1.25	1.02	

Notes to Table 9.23.4.2.-B:

- (1) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floor does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) No bridging is assumed for spans for floor joists with concrete topping.

Table 9.23.4.2.-C
Maximum Spans for Ceiling Joists – Attic Not Accessible by a Stairway
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m		
			Joist Spacing, mm		
			300	400	600
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	3.41	3.10	2.71
		38 × 140	5.37	4.88	4.26
		38 × 184	7.05	6.41	5.60
		38 × 235	9.01	8.18	7.15
		38 × 286	10.96	9.96	8.70
	No. 1 and No. 2	38 × 89	3.27	2.97	2.59
		38 × 140	5.14	4.67	4.08
		38 × 184	6.76	6.14	5.36
		38 × 235	8.63	7.84	6.85
		38 × 286	10.50	9.54	8.34
	No. 3	38 × 89	3.17	2.88	2.42
		38 × 140	4.89	4.23	3.46
		38 × 184	5.95	5.15	4.20
		38 × 235	7.27	6.30	5.14
38 × 286		8.44	7.31	5.97	
Construction	38 × 89	3.17	2.88	2.51	
Standard	38 × 89	3.06	2.78	2.34	
Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	3.36	3.06	2.67
		38 × 140	5.29	4.81	4.20
		38 × 184	6.96	6.32	5.52
		38 × 235	8.88	8.07	7.05
		38 × 286	10.81	9.82	8.58
	No. 1 and No. 2	38 × 89	3.27	2.97	2.59
		38 × 140	5.14	4.67	4.08
		38 × 184	6.76	6.14	5.36
		38 × 235	8.63	7.84	6.85
		38 × 286	10.50	9.54	8.34
	No. 3	38 × 89	3.17	2.88	2.51
		38 × 140	4.98	4.53	3.95
		38 × 184	6.55	5.95	5.19
		38 × 235	8.36	7.60	6.34
38 × 286		10.18	9.01	7.36	
Construction	38 × 89	3.17	2.88	2.50	
Standard	38 × 89	3.06	2.78	2.43	

Table 9.23.4.2.-C (Cont'd)
Maximum Spans for Ceiling Joists – Attic Not Accessible by a Stairway
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m		
			Joist Spacing, mm		
			300	400	600
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	3.22	2.92	2.55
		38 × 140	5.06	4.60	4.02
		38 × 184	6.65	6.05	5.28
		38 × 235	8.50	7.72	6.74
		38 × 286	10.34	9.40	8.21
	No. 1 and No. 2	38 × 89	3.11	2.83	2.47
		38 × 140	4.90	4.45	3.89
		38 × 184	6.44	5.85	5.11
		38 × 235	8.22	7.47	6.52
		38 × 286	10.00	9.09	7.94
	No. 3	38 × 89	3.06	2.78	2.43
		38 × 140	4.81	4.37	3.82
		38 × 184	6.32	5.74	5.02
		38 × 235	8.07	7.33	6.34
		38 × 286	9.82	8.93	7.36
	Construction	38 × 89	3.06	2.78	2.43
	Standard	38 × 89	2.94	2.67	2.33
	Northern Species (includes any Canadian Species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	2.88	2.61
38 × 140			4.53	4.11	3.59
38 × 184			5.95	5.40	4.72
38 × 235			7.60	6.90	6.03
38 × 286			9.25	8.40	7.34
No. 1 and No. 2		38 × 89	2.81	2.55	2.23
		38 × 140	4.42	4.02	3.51
		38 × 184	5.81	5.28	4.61
		38 × 235	7.42	6.74	5.89
		38 × 286	9.03	8.21	7.17
No. 3		38 × 89	2.74	2.49	2.18
		38 × 140	4.31	3.92	3.42
		38 × 184	5.67	5.09	4.16
		38 × 235	7.19	6.23	5.08
		38 × 286	8.34	7.23	5.90
Construction		38 × 89	2.74	2.49	2.18
Standard		38 × 89	2.67	2.43	2.03

Table 9.23.4.2.-D
Maximum Spans for Roof Joists – Specified Roof Snow Loads 1.0 to 2.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m									
			Specified Snow Load, kPa									
			1.0			1.5			2.0			
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	2.71	2.46	2.15	2.37	2.15	1.88	2.15	1.95	1.71	
		38 × 140	4.26	3.87	3.38	3.72	3.38	2.95	3.38	3.07	2.68	
		38 × 184	5.60	5.09	4.44	4.89	4.44	3.88	4.44	4.04	3.53	
		38 × 235	7.15	6.49	5.67	6.24	5.67	4.96	5.67	5.15	4.50	
		38 × 286	8.70	7.90	6.91	7.60	6.91	6.03	6.91	6.27	5.48	
	No. 1 and No. 2	38 × 89	2.59	2.36	2.06	2.27	2.06	1.80	2.06	1.87	1.63	
		38 × 140	4.08	3.71	3.24	3.57	3.24	2.83	3.24	2.94	2.57	
		38 × 184	5.36	4.87	4.26	4.69	4.26	3.72	4.26	3.87	3.38	
		38 × 235	6.85	6.22	5.44	5.98	5.44	4.74	5.44	4.94	4.22	
		38 × 286	8.34	7.57	6.40	7.28	6.62	5.50	6.62	6.00	4.90	
	No. 3	38 × 89	2.49	2.16	1.76	2.14	1.85	1.51	1.91	1.65	1.35	
		38 × 140	3.56	3.08	2.51	3.06	2.65	2.16	2.72	2.36	1.92	
		38 × 184	4.33	3.75	3.06	3.72	3.22	2.63	3.31	2.87	2.34	
		38 × 235	5.29	4.58	3.74	4.55	3.94	3.22	4.05	3.51	2.86	
		38 × 286	6.14	5.32	4.34	5.28	4.57	3.73	4.70	4.07	3.32	
	Construction	38 × 89	2.51	2.28	1.99	2.20	1.99	1.74	1.99	1.81	1.58	
	Standard	38 × 89	2.41	2.08	1.70	2.07	1.79	1.46	1.84	1.60	1.30	
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	2.67	2.43	2.12	2.33	2.12	1.85	2.12	1.93	1.68
			38 × 140	4.20	3.82	3.33	3.67	3.33	2.91	3.33	3.03	2.65
			38 × 184	5.52	5.02	4.38	4.82	4.38	3.83	4.38	3.98	3.48
38 × 235			7.05	6.41	5.60	6.16	5.60	4.89	5.60	5.09	4.44	
38 × 286			8.58	7.80	6.81	7.50	6.81	5.95	6.81	6.19	5.41	
No. 1 and No. 2		38 × 89	2.59	2.36	2.06	2.27	2.06	1.80	2.06	1.87	1.63	
		38 × 140	4.08	3.71	3.24	3.57	3.24	2.83	3.24	2.94	2.57	
		38 × 184	5.36	4.87	4.26	4.69	4.26	3.72	4.26	3.87	3.38	
		38 × 235	6.85	6.22	5.44	5.98	5.44	4.75	5.44	4.94	4.32	
		38 × 286	8.34	7.57	6.62	7.28	6.62	5.77	6.62	6.01	5.25	
No. 3		38 × 89	2.51	2.28	1.99	2.20	1.99	1.74	1.99	1.81	1.58	
		38 × 140	3.95	3.59	3.10	3.45	3.14	2.67	3.14	2.85	2.37	
		38 × 184	5.20	4.62	3.77	4.54	3.97	3.24	4.09	3.54	2.89	
		38 × 235	6.53	5.65	4.61	5.61	4.86	3.97	5.00	4.33	3.53	
		38 × 286	7.57	6.56	5.35	6.51	5.64	4.60	5.80	5.02	4.10	
Construction		38 × 89	2.51	2.28	1.99	2.20	1.99	1.74	1.99	1.81	1.58	
Standard		38 × 89	2.43	2.18	1.78	2.12	1.88	1.53	1.93	1.67	1.36	

Table 9.23.4.2.-D (Cont'd)
Maximum Spans for Roof Joists – Specified Roof Snow Loads 1.0 to 2.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m									
			Specified Snow Load, kPa									
			1.0			1.5			2.0			
			Joist Spacing, mm			Joist Spacing, mm			Joist Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	2.55	2.32	2.03	2.23	2.03	1.77	2.03	1.84	1.61	
		38 × 140	4.02	3.65	3.19	3.51	3.19	2.79	3.19	2.90	2.53	
		38 × 184	5.28	4.80	4.19	4.61	4.19	3.66	4.19	3.81	3.33	
		38 × 235	6.74	6.13	5.35	5.89	5.35	4.68	5.35	4.86	4.25	
		38 × 286	8.21	7.46	6.52	7.17	6.52	5.69	6.52	5.92	5.17	
	No. 1 and No. 2	38 × 89	2.47	2.24	1.96	2.16	1.96	1.71	1.96	1.78	1.56	
		38 × 140	3.89	3.53	3.08	3.40	3.08	2.69	3.08	2.80	2.45	
		38 × 184	5.11	4.64	4.05	4.46	4.05	3.54	4.05	3.68	3.22	
		38 × 235	6.52	5.93	5.18	5.70	5.18	4.52	5.18	4.70	4.11	
		38 × 286	7.94	7.21	6.30	6.94	6.30	5.50	6.30	5.73	5.00	
	No. 3	38 × 89	2.43	2.20	1.93	2.12	1.93	1.68	1.93	1.75	1.53	
		38 × 140	3.82	3.47	3.03	3.33	3.03	2.65	3.03	2.75	2.37	
		38 × 184	5.02	4.56	3.77	4.38	3.97	3.24	3.98	3.54	2.89	
		38 × 235	6.41	5.65	4.61	5.60	4.86	3.97	5.00	4.33	3.53	
		38 × 286	7.57	6.56	5.35	6.51	5.64	4.60	5.80	5.02	4.10	
	Construction	38 × 89	2.43	2.20	1.93	2.12	1.93	1.68	1.93	1.75	1.53	
	Standard	38 × 89	2.33	2.12	1.85	2.04	1.85	1.59	1.85	1.68	1.41	
	Northern Species (includes any Canadian Species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	2.28	2.07	1.81	1.99	1.81	1.58	1.81	1.65	1.44
			38 × 140	3.59	3.26	2.85	3.14	2.85	2.49	2.85	2.59	2.26
			38 × 184	4.72	4.29	3.75	4.12	3.75	3.27	3.75	3.40	2.97
			38 × 235	6.03	5.48	4.79	5.27	4.79	4.18	4.79	4.35	3.80
38 × 286			7.34	6.67	5.82	6.41	5.82	5.09	5.82	5.29	4.62	
No. 1 and No. 2		38 × 89	2.23	2.03	1.77	1.95	1.77	1.55	1.77	1.61	1.41	
		38 × 140	3.51	3.19	2.79	3.07	2.79	2.43	2.79	2.53	2.21	
		38 × 184	4.61	4.19	3.66	4.03	3.66	3.20	3.66	3.33	2.91	
		38 × 235	5.89	5.35	4.68	5.15	4.68	4.09	4.68	4.25	3.68	
		38 × 286	7.17	6.52	5.58	6.26	5.69	4.80	5.69	5.17	4.27	
No. 3		38 × 89	2.18	1.98	1.73	1.90	1.73	1.50	1.73	1.57	1.33	
		38 × 140	3.42	3.05	2.49	2.99	2.62	2.14	2.69	2.33	1.90	
		38 × 184	4.28	3.71	3.03	3.68	3.19	2.60	3.28	2.84	2.32	
		38 × 235	5.23	4.53	3.70	4.50	3.90	3.18	4.01	3.47	2.83	
		38 × 286	6.07	5.26	4.29	5.22	4.52	3.69	4.65	4.03	3.29	
Construction		38 × 89	2.18	1.98	1.73	1.90	1.73	1.51	1.73	1.57	1.37	
Standard		38 × 89	2.09	1.81	1.48	1.80	1.56	1.27	1.60	1.38	1.13	

Table 9.23.4.2.-E
Maximum Spans for Roof Joists – Specified Roof Snow Loads 2.5 and 3.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m					
			Specified Snow Load, kPa					
			2.5			3.0		
			Joist Spacing, mm			Joist Spacing, mm		
			300	400	600	300	400	600
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	1.99	1.81	1.58	1.88	1.71	1.49
		38 × 140	3.14	2.85	2.49	2.95	2.68	2.34
		38 × 184	4.12	3.75	3.27	3.88	3.53	3.08
		38 × 235	5.27	4.79	4.18	4.96	4.50	3.93
		38 × 286	6.41	5.82	5.09	6.03	5.48	4.79
	No. 1 and No. 2	38 × 89	1.91	1.74	1.52	1.80	1.63	1.43
		38 × 140	3.01	2.73	2.39	2.83	2.57	2.25
		38 × 184	3.95	3.59	3.14	3.72	3.38	2.90
		38 × 235	5.05	4.59	3.84	4.75	4.32	3.55
		38 × 286	6.14	5.46	4.46	5.78	5.05	4.12
	No. 3	38 × 89	1.74	1.50	1.23	1.60	1.39	1.13
		38 × 140	2.48	2.15	1.75	2.29	1.98	1.62
		38 × 184	3.01	2.61	2.13	2.79	2.41	1.97
		38 × 235	3.69	3.19	2.61	3.41	2.95	2.41
		38 × 286	4.28	3.70	3.03	3.95	3.42	2.79
	Construction	38 × 89	1.85	1.68	1.47	1.74	1.58	1.38
	Standard	38 × 89	1.68	1.45	1.19	1.55	1.34	1.10
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	1.97	1.79	1.56	1.85	1.68
38 × 140			3.10	2.81	2.46	2.91	2.65	2.31
38 × 184			4.07	3.70	3.23	3.83	3.48	3.04
38 × 235			5.20	4.72	4.12	4.89	4.44	3.88
38 × 286			6.32	5.75	5.02	5.95	5.41	4.72
No. 1 and No. 2		38 × 89	1.91	1.74	1.52	1.80	1.63	1.43
		38 × 140	3.01	2.73	2.39	2.83	2.57	2.25
		38 × 184	3.95	3.59	3.14	3.72	3.38	2.95
		38 × 235	5.05	4.59	4.01	4.75	4.32	3.72
		38 × 286	6.14	5.58	4.68	5.78	5.25	4.32
No. 3		38 × 89	1.85	1.68	1.47	1.74	1.58	1.38
		38 × 140	2.91	2.65	2.16	2.74	2.45	2.00
		38 × 184	3.72	3.22	2.63	3.44	2.98	2.43
		38 × 235	4.55	3.94	3.22	4.20	3.64	2.97
		38 × 286	5.28	4.57	3.73	4.88	4.22	3.45
Construction		38 × 89	1.85	1.68	1.47	1.74	1.58	1.38
Standard		38 × 89	1.76	1.52	1.24	1.62	1.40	1.15

Table 9.23.4.2.-E (Cont'd)
Maximum Spans for Roof Joists – Specified Roof Snow Loads 2.5 and 3.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Joist Size, mm	Maximum Span, m					
			Specified Snow Load, kPa					
			2.5			3.0		
			Joist Spacing, mm			Joist Spacing, mm		
			300	400	600	300	400	600
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	1.88	1.71	1.49	1.77	1.61	1.41
		38 × 140	2.96	2.69	2.35	2.79	2.53	2.21
		38 × 184	3.89	3.54	3.09	3.66	3.33	2.91
		38 × 235	4.97	4.52	3.94	4.68	4.25	3.71
		38 × 286	6.05	5.50	4.80	5.69	5.17	4.52
	No. 1 and No. 2	38 × 89	1.82	1.65	1.44	1.71	1.56	1.36
		38 × 140	2.86	2.60	2.27	2.69	2.45	2.14
		38 × 184	3.76	3.42	2.99	3.54	3.22	2.81
		38 × 235	4.81	4.37	3.82	4.52	4.11	3.59
		38 × 286	5.85	5.31	4.64	5.50	5.00	4.37
	No. 3	38 × 89	1.79	1.62	1.42	1.68	1.53	1.34
		38 × 140	2.81	2.56	2.16	2.65	2.40	2.005
		38 × 184	3.70	3.22	2.63	3.44	2.98	2.43
		38 × 235	4.55	3.94	3.22	4.20	3.64	2.97
		38 × 286	5.28	4.57	3.73	4.88	4.22	3.45
	Construction	38 × 89	1.79	1.62	1.42	1.68	1.53	1.34
	Standard	38 × 89	1.72	1.56	1.29	1.62	1.46	1.19
	Northern Species (includes any Canadian Species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	1.68	1.53	1.34	1.58	1.44
38 × 140			2.65	2.40	2.10	2.49	2.26	1.98
38 × 184			3.48	3.16	2.76	3.27	2.97	2.60
38 × 235			4.44	4.04	3.53	4.18	3.80	3.32
38 × 286			5.41	4.91	4.29	5.09	4.62	4.04
No. 1 and No. 2		38 × 89	1.64	1.49	1.31	1.55	1.41	1.23
		38 × 140	2.59	2.35	2.05	2.43	2.21	1.93
		38 × 184	3.40	3.09	2.70	3.20	2.91	2.53
		38 × 235	4.34	3.94	3.35	4.09	3.71	3.10
		38 × 286	5.28	4.76	3.89	4.97	4.40	3.59
No. 3		38 × 89	1.60	1.46	1.21	1.51	1.37	1.12
		38 × 140	2.45	2.12	1.73	2.26	1.96	1.60
		38 × 184	2.98	2.58	2.11	2.76	2.39	1.95
		38 × 235	3.65	3.16	2.58	3.37	2.92	2.38
		38 × 286	4.23	3.66	2.99	3.91	3.39	2.76
Construction		38 × 89	1.60	1.46	1.27	1.51	1.37	1.20
Standard		38 × 89	1.46	1.26	1.03	1.34	1.16	0.95

Table 9.23.4.2.-F
Maximum Spans for Roof Rafters – Specified Roof Snow Loads 1.0 to 2.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Rafter Size, mm	Maximum Span, m									
			Specified Snow Load, kPa									
			1.0			1.5			2.0			
			Rafter Spacing, mm			Rafter Spacing, mm			Rafter Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	3.41	3.10	2.71	2.98	2.71	2.37	2.71	2.46	2.15	
		38 × 140	5.37	4.88	4.26	4.69	4.26	3.72	4.26	3.87	3.38	
		38 × 184	7.05	6.41	5.60	6.16	5.60	4.89	5.60	5.09	4.44	
		38 × 235	9.01	8.18	7.15	7.87	7.15	6.24	7.15	6.49	5.62	
		38 × 286	10.96	9.96	8.70	9.58	8.70	7.40	8.70	7.90	6.52	
	No. 1 and No. 2	38 × 89	3.27	2.97	2.59	2.86	2.59	2.27	2.59	2.36	2.06	
		38 × 140	5.14	4.67	3.95	4.49	4.08	3.34	4.08	3.60	2.94	
		38 × 184	6.76	5.88	4.80	5.74	4.97	4.06	5.06	4.38	3.58	
		38 × 235	8.30	7.19	5.87	7.02	6.08	4.96	6.19	5.36	4.38	
		38 × 286	9.63	8.34	6.81	8.14	7.05	5.76	7.18	6.22	5.08	
	No. 3	38 × 89	2.65	2.30	1.87	2.24	1.94	1.58	1.98	1.71	1.40	
		38 × 140	3.78	3.28	2.68	3.20	2.77	2.26	2.82	2.44	1.99	
		38 × 184	4.61	3.99	3.26	3.89	3.37	2.75	3.43	2.97	2.43	
		38 × 235	5.63	4.88	3.98	4.76	4.12	3.37	4.20	3.64	2.97	
		38 × 286	6.53	5.66	4.62	5.52	4.78	3.91	4.87	4.22	3.44	
	Construction	38 × 89	3.17	2.88	2.42	2.77	2.50	2.04	2.51	2.21	1.80	
	Standard	38 × 89	2.56	2.22	1.81	2.17	1.88	1.53	1.91	1.65	1.35	
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	3.36	3.06	2.67	2.94	2.67	2.33	2.67	2.43	2.12
			38 × 140	5.29	4.81	4.20	4.62	4.20	3.67	4.20	3.82	3.33
			38 × 184	6.96	6.32	5.52	6.08	5.52	4.82	5.52	5.02	4.38
38 × 235			8.88	8.07	7.05	7.76	7.05	6.16	7.05	6.41	5.54	
38 × 286			10.81	9.82	8.58	9.45	8.58	7.28	8.58	7.80	6.42	
No. 1 and No. 2		38 × 89	3.27	2.97	2.59	2.86	2.59	2.27	2.59	2.36	2.06	
		38 × 140	5.14	4.67	4.08	4.49	4.08	3.50	4.08	3.71	3.08	
		38 × 184	6.76	6.14	5.04	5.90	5.21	4.26	5.31	4.60	3.75	
		38 × 235	8.63	7.54	6.16	7.36	6.37	5.20	6.49	5.62	4.59	
		38 × 286	10.11	8.75	7.15	8.54	7.40	6.04	7.53	6.52	5.33	
No. 3		38 × 89	3.17	2.83	2.31	2.76	2.39	1.95	2.44	2.11	1.72	
		38 × 140	4.67	4.04	3.30	3.95	3.42	2.79	3.48	3.01	2.46	
		38 × 184	5.68	4.92	4.02	4.80	4.16	3.40	4.23	3.67	2.99	
		38 × 235	6.95	6.02	4.91	5.87	5.08	4.15	5.18	4.48	3.66	
		38 × 286	8.06	6.98	5.70	6.81	5.90	4.82	6.01	5.20	4.25	
Construction		38 × 89	3.17	2.88	2.51	2.77	2.51	2.14	2.51	2.28	1.89	
Standard		38 × 89	2.68	2.32	1.90	2.27	1.96	1.60	2.00	1.73	1.41	

Table 9.23.4.2.-F (Cont'd)
Maximum Spans for Roof Rafters – Specified Roof Snow Loads 1.0 to 2.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1), 9.23.4.5.(1) and 9.23.14.10.(2)

Commercial Designation	Grade	Rafter Size, mm	Maximum Span, m									
			Specified Snow Load, kPa									
			1.0			1.5			2.0			
			Rafter Spacing, mm			Rafter Spacing, mm			Rafter Spacing, mm			
			300	400	600	300	400	600	300	400	600	
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	3.22	2.92	2.55	2.81	2.55	2.23	2.55	2.32	2.03	
		38 × 140	5.06	4.60	4.02	4.42	4.02	3.51	4.02	3.65	3.19	
		38 × 184	6.65	6.05	5.28	5.81	5.28	4.61	5.28	4.80	4.19	
		38 × 235	8.50	7.72	6.74	7.42	6.74	5.89	6.74	6.13	5.35	
		38 × 286	10.34	9.40	8.21	9.03	8.21	7.17	8.21	7.46	6.52	
	No. 1 and No. 2	38 × 89	3.11	2.83	2.47	2.72	2.47	2.16	2.47	2.24	1.96	
		38 × 140	4.90	4.45	3.89	4.28	3.89	3.40	3.89	3.53	3.08	
		38 × 184	6.44	5.85	5.11	5.62	5.11	4.41	5.11	4.64	3.89	
		38 × 235	8.22	7.47	6.38	7.18	6.52	5.39	6.52	5.82	4.75	
		38 × 286	10.00	9.06	7.40	8.74	7.66	6.25	7.80	6.76	5.52	
	No. 3	38 × 89	3.06	2.78	2.31	2.67	2.39	1.95	2.43	2.11	1.72	
		38 × 140	4.67	4.04	3.30	3.95	3.42	2.79	3.48	3.01	2.46	
		38 × 184	5.68	4.92	4.02	4.80	4.16	3.40	4.23	3.67	2.99	
		38 × 235	6.95	6.02	4.91	5.87	5.08	4.15	5.18	4.48	3.66	
		38 × 286	8.06	6.98	5.70	6.81	5.90	4.82	6.01	5.20	4.25	
	Construction	38 × 89	3.06	2.78	2.43	2.67	2.43	2.12	2.43	2.20	1.93	
	Standard	38 × 89	2.78	2.41	1.97	2.35	2.04	1.66	2.07	1.79	1.47	
	Northern Species (includes any Canadian species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	2.88	2.61	2.28	2.51	2.28	1.99	2.28	2.07	1.81
			38 × 140	4.53	4.11	3.59	3.95	3.59	3.14	3.59	3.26	2.85
			38 × 184	5.95	5.40	4.72	5.20	4.72	4.12	4.72	4.29	3.68
			38 × 235	7.60	6.90	6.03	6.64	6.03	5.11	6.03	5.48	4.51
38 × 286			9.25	8.40	7.01	8.08	7.26	5.93	7.34	6.40	5.23	
No. 1 and No. 2		38 × 89	2.81	2.55	2.23	2.46	2.23	1.95	2.23	2.03	1.77	
		38 × 140	4.42	4.02	3.44	3.86	3.51	2.91	3.51	3.14	2.56	
		38 × 184	5.81	5.13	4.19	5.00	4.33	3.54	4.41	3.82	3.12	
		38 × 235	7.24	6.27	5.12	6.12	5.30	4.33	5.40	4.67	3.82	
		38 × 286	8.40	7.27	5.94	7.10	6.15	5.02	6.26	5.42	4.43	
No. 3		38 × 89	2.62	2.27	1.85	2.22	1.92	1.57	1.95	1.69	1.38	
		38 × 140	3.74	3.24	2.65	3.16	2.74	2.24	2.79	2.42	1.97	
		38 × 184	4.56	3.94	3.22	3.85	3.33	2.72	3.40	2.94	2.40	
		38 × 235	5.57	4.82	3.94	4.71	4.08	3.33	4.15	3.60	2.94	
		38 × 286	6.46	5.60	4.57	5.46	4.73	3.86	4.82	4.17	3.41	
Construction		38 × 89	2.74	2.49	2.11	2.40	2.18	1.90	2.18	1.93	1.57	
Standard		38 × 89	2.22	1.93	1.57	1.88	1.63	1.33	1.66	1.44	1.17	

Table 9.23.4.2.-G
Maximum Spans for Roof Rafters – Specified Roof Snow Loads 2.5 and 3.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and 9.23.4.5.(1)

Commercial Designation	Grade	Rafter Size, mm	Maximum Span, m					
			Specified Snow Load, kPa					
			2.5			3.0		
			Rafter Spacing, mm			Rafter Spacing, mm		
			300	400	600	300	400	600
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	38 × 89	2.51	2.28	1.99	2.37	2.15	1.88
		38 × 140	3.95	3.59	3.14	3.72	3.38	2.95
		38 × 184	5.20	4.72	4.12	4.89	4.44	3.83
		38 × 235	6.64	6.03	5.08	6.24	5.67	4.68
		38 × 286	8.08	7.23	5.90	7.60	6.65	5.43
	No. 1 and No. 2	38 × 89	2.41	2.19	1.86	2.27	2.06	1.71
		38 × 140	3.76	3.26	2.66	3.46	3.00	2.45
		38 × 184	4.58	3.96	3.24	4.21	3.65	2.98
		38 × 235	5.60	4.85	3.96	5.15	4.46	3.64
		38 × 286	6.50	5.63	4.59	5.98	5.17	4.23
	No. 3	38 × 89	1.79	1.55	1.26	1.64	1.42	1.16
		38 × 140	2.55	2.21	1.80	2.35	2.03	1.66
		38 × 184	3.10	2.69	2.20	2.86	2.47	2.02
		38 × 235	3.80	3.29	2.68	3.49	3.02	2.47
		38 × 286	4.41	3.82	3.12	4.05	3.51	2.87
	Construction	38 × 89	2.30	2.00	1.63	2.12	1.84	1.50
	Standard	38 × 89	1.73	1.50	1.22	1.59	1.38	1.12
	Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	38 × 89	2.48	2.25	1.97	2.33	2.12
38 × 140			3.90	3.54	3.10	3.67	3.33	2.91
38 × 184			5.13	4.66	4.07	4.82	4.38	3.77
38 × 235			6.55	5.95	5.01	6.16	5.60	4.61
38 × 286			7.97	7.12	5.81	7.50	6.55	5.34
No. 1 and No. 2		38 × 89	2.41	2.19	1.91	2.27	2.06	1.80
		38 × 140	3.79	3.42	2.79	3.57	3.14	2.57
		38 × 184	4.80	4.16	3.40	4.42	3.83	3.12
		38 × 235	5.87	5.08	4.15	5.40	4.68	3.82
		38 × 286	6.81	5.90	4.82	6.27	5.43	4.43
No. 3		38 × 89	2.21	1.91	1.56	2.03	1.76	1.43
		38 × 140	3.15	2.73	2.23	2.90	2.51	2.05
		38 × 184	3.83	3.32	2.71	3.52	3.05	2.49
		38 × 235	4.68	4.06	3.31	4.31	3.73	3.05
		38 × 286	5.53	4.71	3.84	5.00	4.33	3.54
Commercial		38 × 89	2.33	2.09	1.71	2.20	1.93	1.57
Standard		38 × 89	1.81	1.57	1.28	1.66	1.44	1.18

Table 9.23.4.2.-G (Cont'd)
Maximum Spans for Roof Rafters – Specified Roof Snow Loads 2.5 and 3.0 kPa
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(1) and 9.23.4.5.(1)

Commercial Designation	Grade	Rafter Size, mm	Maximum Span, m					
			Specified Snow Load, kPa					
			2.5			3.0		
			Rafter Spacing, mm			Rafter Spacing, mm		
			300	400	600	300	400	600
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	38 × 89	2.37	2.15	1.88	2.23	2.03	1.77
		38 × 140	3.73	3.39	2.96	3.51	3.19	2.79
		38 × 184	4.90	4.45	3.89	4.61	4.19	3.66
		38 × 235	6.26	5.69	4.97	5.89	5.35	4.68
		38 × 286	7.62	6.92	5.90	7.17	6.52	5.43
	No. 1 and No. 2	38 × 89	2.29	2.08	1.82	2.16	1.96	1.71
		38 × 140	3.61	3.28	2.86	3.40	3.08	2.66
		38 × 184	4.74	4.31	3.52	4.46	3.96	3.23
		38 × 235	6.06	5.27	4.30	5.59	4.84	3.96
		38 × 286	7.06	6.11	4.99	6.49	5.62	4.59
	No. 3	38 × 89	2.21	1.91	1.56	2.03	1.76	1.43
		38 × 140	3.15	2.73	2.23	2.90	2.51	2.05
		38 × 184	3.83	3.32	2.71	3.52	3.05	2.49
		38 × 235	4.68	4.06	3.31	4.31	3.73	3.05
		38 × 286	5.43	4.71	3.84	5.00	4.33	3.54
	Construction	38 × 89	2.25	2.05	1.77	2.12	1.93	1.63
	Standard	38 × 89	1.87	1.62	1.33	1.72	1.49	1.22
	Northern Species (includes any Canadian species covered by the NLGA Standard Grading Rules)	Select Structural	38 × 89	2.12	1.93	1.68	1.99	1.81
38 × 140			3.33	3.03	2.65	3.14	2.85	2.49
38 × 184			4.38	3.98	3.33	4.12	3.75	3.07
38 × 235			5.60	4.99	4.08	5.27	4.59	3.75
38 × 286			6.69	5.79	4.73	6.15	5.33	4.35
No. 1 and No. 2		38 × 89	2.07	1.88	1.62	1.95	1.77	1.49
		38 × 140	3.26	2.84	2.32	3.02	2.61	2.13
		38 × 184	3.99	3.46	2.82	3.67	3.18	2.60
		38 × 235	4.88	4.23	3.45	4.49	3.89	3.17
		38 × 286	5.66	4.90	4.00	5.21	4.51	3.68
No. 3		38 × 89	1.77	1.53	1.25	1.63	1.41	1.15
		38 × 140	2.52	2.19	1.78	2.32	2.01	1.64
		38 × 184	3.07	2.66	2.17	2.82	2.45	2.00
		38 × 235	3.76	3.25	2.66	3.45	2.99	2.44
		38 × 286	4.36	3.77	3.08	4.01	3.47	2.83
Construction		38 × 89	2.01	1.74	1.42	1.85	1.60	1.31
Standard		38 × 89	1.50	1.30	1.06	1.38	1.19	0.98

Table 9.23.4.2.-H
Maximum Spans for Built-up Floor Beams Supporting Not More than One Floor⁽¹⁾⁽²⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	2.4	3.36	3.70	3.99	4.30	4.73	5.09	5.23	5.66	5.99
		3.0	3.12	3.44	3.70	3.99	4.39	4.73	4.84	5.34	5.66
		3.6	2.94	3.23	3.48	3.75	4.13	4.45	4.41	5.03	5.41
		4.2	2.79	3.07	3.31	3.52	3.92	4.23	4.09	4.72	5.14
		4.8	2.67	2.94	3.17	3.29	3.75	4.04	3.82	4.41	4.92
		5.4	2.54	2.83	3.04	3.11	3.59	3.89	3.60	4.16	4.65
		6.0	2.41	2.73	2.94	2.95	3.40	3.75	3.42	3.95	4.41
	No. 1 and No. 2	2.4	2.97	3.42	3.82	3.63	4.19	4.68	4.21	4.86	5.43
		3.0	2.65	3.06	3.42	3.24	3.75	4.19	3.76	4.35	4.86
		3.6	2.42	2.80	3.13	2.96	3.42	3.82	3.44	3.97	4.44
		4.2	2.24	2.59	2.89	2.74	3.17	3.54	3.18	3.67	4.11
		4.8	2.10	2.42	2.71	2.56	2.96	3.31	2.98	3.44	3.84
		5.4	1.98	2.28	2.55	2.42	2.79	3.12	2.81	3.24	3.62
		6.0	1.88	2.17	2.42	2.29	2.65	2.96	2.66	3.07	3.44
Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	2.4	3.32	3.65	3.93	4.24	4.66	5.03	5.16	5.61	5.93
		3.0	3.08	3.39	3.65	3.93	4.33	4.66	4.76	5.27	5.61
		3.6	2.90	3.19	3.44	3.70	4.08	4.39	4.35	4.96	5.34
		4.2	2.75	3.03	3.27	3.47	3.87	4.17	4.02	4.65	5.07
		4.8	2.63	2.90	3.12	3.24	3.70	3.99	3.66	4.35	4.85
		5.4	2.49	2.79	3.00	2.95	3.53	3.83	3.32	4.10	4.58
		6.0	2.28	2.69	2.90	2.70	3.35	3.70	3.04	3.87	4.35
	No. 1 and No. 2	2.4	3.11	3.55	3.82	3.80	4.39	4.88	4.41	5.10	5.70
		3.0	2.78	3.21	3.55	3.40	3.93	4.39	3.95	4.56	5.10
		3.6	2.54	2.93	3.28	3.11	3.59	4.01	3.60	4.16	4.65
		4.2	2.35	2.72	3.04	2.88	3.32	3.71	3.34	3.85	4.31
		4.8	2.20	2.54	2.84	2.69	3.11	3.47	3.12	3.60	4.03
		5.4	2.07	2.39	2.68	2.54	2.93	3.27	2.94	3.40	3.80
		6.0	1.97	2.27	2.54	2.41	2.78	3.11	2.79	3.22	3.60

Table 9.23.4.2.-H (Cont'd)
Maximum Spans for Built-up Floor Beams Supporting Not More than One Floor⁽¹⁾⁽²⁾
 Forming Part Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	2.4	3.17	3.49	3.76	4.05	4.46	4.81	4.93	5.42	5.73
		3.0	2.95	3.24	3.49	3.76	4.14	4.46	4.58	5.04	5.42
		3.6	2.77	3.05	3.29	3.54	3.90	4.20	4.31	4.74	5.11
		4.2	2.63	2.90	3.12	3.36	3.70	3.99	4.09	4.51	4.85
		4.8	2.52	2.77	2.99	3.22	3.54	3.81	3.82	4.31	4.64
		5.4	2.42	2.67	2.87	3.09	3.41	3.67	3.60	4.14	4.46
	No. 1 and No. 2	6.0	2.34	2.57	2.77	2.95	3.29	3.54	3.32	3.95	4.31
		2.4	3.07	3.38	3.64	3.92	4.32	4.65	4.57	5.25	5.59
		3.0	2.85	3.14	3.38	3.52	4.01	4.32	4.09	4.72	5.25
		3.6	2.63	2.95	3.18	3.22	3.71	4.06	3.73	4.31	4.82
		4.2	2.44	2.80	3.02	2.98	3.44	3.84	3.46	3.99	4.46
		4.8	2.28	2.63	2.89	2.79	3.22	3.60	3.23	3.73	4.17
Northern Species (includes any Canadian species covered by the NLGA Standard Grading Rules)	Select Structural	5.4	2.15	2.48	2.77	2.63	3.03	3.39	3.05	3.52	3.93
		6.0	2.04	2.35	2.63	2.49	2.88	3.22	2.89	3.34	3.73
		2.4	2.84	3.12	3.36	3.62	3.99	4.30	4.33	4.85	5.23
		3.0	2.63	2.90	3.12	3.34	3.70	3.99	3.88	4.47	4.85
		3.6	2.48	2.73	2.94	3.05	3.48	3.75	3.54	4.08	4.57
		4.2	2.31	2.59	2.79	2.82	3.26	3.57	3.28	3.78	4.23
	No. 1 and No. 2	4.8	2.16	2.48	2.67	2.64	3.05	3.41	3.06	3.54	3.96
		5.4	2.04	2.35	2.57	2.49	2.87	3.21	2.89	3.34	3.73
		6.0	1.93	2.23	2.48	2.36	2.73	3.05	2.74	3.16	3.54
		2.4	2.59	2.99	3.29	3.16	3.65	4.08	3.67	4.24	4.74
		3.0	2.31	2.67	2.99	2.83	3.27	3.65	3.28	3.79	4.24
		3.6	2.11	2.44	2.73	2.58	2.98	3.33	3.00	3.46	3.87
No. 1 and No. 2	4.2	1.95	2.26	2.52	2.39	2.76	3.09	2.77	3.20	3.58	
	4.8	1.83	2.11	2.36	2.24	2.58	2.89	2.59	3.00	3.35	
	5.4	1.72	1.99	2.23	2.11	2.43	2.72	2.45	2.82	3.16	
	6.0	1.64	1.89	2.11	2.00	2.31	2.58	2.32	2.68	3.00	

Notes to Table 9.23.4.2.-H:

- (1) Beam spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floors does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) When the floors have a concrete topping of not more than 51 mm, the spans must be multiplied by 0.8.
- (3) Supported length means half the sum of the joists spans on both sides of the beam.
- (4) Straight interpolation may be used for other supported lengths.
- (5) Spans are clear spans between supports. For total span, add two bearing lengths.
- (6) 3-ply beams with supported lengths greater than 4.2 m require minimum bearing length of 114 mm. All other beams require minimum bearing length of 76 mm.

Table 9.23.4.2.-I
Maximum Spans for Built-up Floor Beams Supporting Not More than Two Floors⁽¹⁾⁽²⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	2.4	2.80	3.08	3.32	3.49	3.93	4.24	4.05	4.67	5.16
		3.0	2.55	2.86	3.08	3.12	3.60	3.93	3.62	4.18	4.67
		3.6	2.33	2.69	2.90	2.85	3.29	3.68	3.30	3.82	4.27
		4.2	2.16	2.49	2.75	2.64	3.04	3.40	2.99	3.53	3.95
		4.8	2.00	2.33	2.60	2.38	2.85	3.18	2.69	3.30	3.69
		5.4	1.82	2.20	2.45	2.17	2.68	3.00	2.45	3.08	3.48
		6.0	1.67	2.08	2.33	2.00	2.51	2.85	2.26	2.83	3.30
	No. 1 and No. 2	2.4	2.22	2.56	2.87	2.72	3.14	3.51	3.15	3.64	4.07
		3.0	1.99	2.29	2.56	2.43	2.80	3.14	2.82	3.25	3.64
		3.6	1.81	2.09	2.34	2.22	2.56	2.86	2.57	2.97	3.32
		4.2	1.68	1.94	2.17	2.05	2.37	2.65	2.38	2.75	3.07
		4.8	1.57	1.81	2.03	1.92	2.22	2.48	2.23	2.57	2.88
		5.4	1.48	1.71	1.91	1.81	2.09	2.34	2.10	2.43	2.71
		6.0	1.40	1.62	1.81	1.72	1.98	2.22	1.99	2.30	2.57
Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	2.4	2.76	3.04	3.27	3.43	3.88	4.18	3.99	4.60	5.09
		3.0	2.51	2.82	3.04	2.97	3.55	3.88	3.34	4.12	4.60
		3.6	2.15	2.65	2.86	2.56	3.24	3.62	2.88	3.65	4.20
		4.2	1.90	2.40	2.72	2.26	2.85	3.35	2.55	3.21	3.87
		4.8	1.70	2.15	2.56	2.03	2.56	3.08	2.30	2.88	3.46
		5.4	1.56	1.95	2.35	1.86	2.32	2.79	2.11	2.62	3.14
		6.0	1.44	1.79	2.15	1.72	2.14	2.56	1.96	2.42	2.88
	No. 1 and No. 2	2.4	2.33	2.69	3.01	2.85	3.29	3.68	3.30	3.82	4.27
		3.0	2.08	2.41	2.69	2.55	2.94	3.29	2.96	3.41	3.82
		3.6	1.90	2.20	2.45	2.33	2.68	3.00	2.70	3.12	3.48
		4.2	1.76	2.03	2.27	2.15	2.49	2.78	2.50	2.88	3.22
		4.8	1.65	1.90	2.13	2.01	2.33	2.60	2.30	2.70	3.02
		5.4	1.55	1.79	2.00	1.86	2.19	2.45	2.11	2.54	2.84
		6.0	1.44	1.70	1.90	1.72	2.08	2.33	1.96	2.41	2.70

Table 9.23.4.2.-I (Cont'd)
Maximum Spans for Built-up Floor Beams Supporting Not More than Two Floors⁽¹⁾⁽²⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	2.4	2.64	2.91	3.13	3.37	3.71	4.00	4.05	4.52	4.87
		3.0	2.45	2.70	2.91	3.12	3.45	3.71	3.62	4.18	4.52
		3.6	2.31	2.54	2.73	2.79	3.24	3.49	3.14	3.82	4.25
		4.2	2.07	2.41	2.60	2.46	3.04	3.32	2.77	3.50	3.95
		4.8	1.85	2.31	2.48	2.21	2.79	3.17	2.50	3.14	3.69
		5.4	1.69	2.13	2.39	2.02	2.53	3.00	2.28	2.85	3.42
	6.0	1.56	1.95	2.31	1.86	2.32	2.79	2.11	2.62	3.14	
	No. 1 and No. 2	2.4	2.41	2.79	3.03	2.95	3.41	3.81	3.42	3.95	4.42
		3.0	2.16	2.49	2.79	2.64	3.05	3.41	3.06	3.53	3.95
		3.6	1.97	2.27	2.54	2.41	2.78	3.11	2.79	3.23	3.61
		4.2	1.82	2.11	2.35	2.23	2.57	2.88	2.59	2.99	3.34
		4.8	1.71	1.97	2.20	2.09	2.41	2.69	2.42	2.79	3.12
5.4		1.61	1.86	2.08	1.97	2.27	2.54	2.28	2.63	2.95	
6.0	1.53	1.76	1.97	1.86	2.15	2.41	2.11	2.50	2.79		
Northern Species (includes any Canadian species covered by the NLGA Standard Grading Rules)	Select Structural	2.4	2.29	2.60	2.80	2.80	3.23	3.57	3.24	3.75	4.19
		3.0	2.04	2.36	2.60	2.50	2.89	3.23	2.90	3.35	3.75
		3.6	1.87	2.16	2.41	2.28	2.64	2.95	2.65	3.06	3.42
		4.2	1.73	2.00	2.23	2.11	2.44	2.73	2.45	2.83	3.17
		4.8	1.62	1.87	2.09	1.98	2.28	2.55	2.29	2.65	2.96
		5.4	1.52	1.76	1.97	1.86	2.15	2.41	2.11	2.50	2.79
	6.0	1.44	1.67	1.87	1.72	2.04	2.28	1.96	2.37	2.65	
	No. 1 and No. 2	2.4	1.94	2.24	2.50	2.37	2.73	3.06	2.75	3.17	3.55
		3.0	1.73	2.00	2.24	2.12	2.44	2.73	2.46	2.84	3.17
		3.6	1.58	1.83	2.04	1.93	2.23	2.50	2.24	2.59	2.90
		4.2	1.46	1.69	1.89	1.79	2.07	2.31	2.08	2.40	2.68
		4.8	1.37	1.58	1.77	1.67	1.93	2.16	1.94	2.24	2.51
5.4		1.29	1.49	1.67	1.58	1.82	2.04	1.83	2.11	2.36	
6.0	1.22	1.41	1.58	1.50	1.73	1.93	1.74	2.01	2.24		

Notes to Table 9.23.4.2.-I:

- (1) Beam spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floors does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) When the floors have a concrete topping of not more than 51 mm, the spans must be multiplied by 0.8.
- (3) Supported length means half the sum of the joists spans on both sides of the beam.
- (4) Straight interpolation may be used for other supported lengths.
- (5) Spans are clear spans between supports. For total span, add two bearing lengths.
- (6) 3-ply beams require minimum bearing length of 114 mm. 4-ply and 5-ply beams with supported lengths greater than 3 m require minimum bearing length of 114 mm. All other beams require minimum bearing length of 76 mm.

Table 9.23.4.2.-J
Maximum Spans for Built-up Floor Beams Supporting Not More than Three Floors⁽¹⁾⁽²⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	Select Structural	2.4	2.38	2.74	2.95	2.91	3.36	3.75	3.37	3.89	4.35
		3.0	2.13	2.46	2.74	2.60	3.00	3.36	2.92	3.48	3.89
		3.6	1.88	2.24	2.51	2.24	2.74	3.06	2.53	3.18	3.56
		4.2	1.66	2.08	2.32	1.99	2.49	2.84	2.25	2.81	3.29
		4.8	1.50	1.88	2.17	1.80	2.24	2.65	2.04	2.53	3.02
		5.4	1.38	1.71	2.05	1.65	2.04	2.44	1.88	2.31	2.75
		6.0	1.28	1.58	1.88	1.53	1.89	2.24	1.75	2.14	2.53
	No. 1 and No. 2	2.4	1.85	2.14	2.39	2.26	2.61	2.92	2.63	3.03	3.39
		3.0	1.66	1.91	2.14	2.02	2.34	2.61	2.35	2.71	3.03
		3.6	1.51	1.74	1.95	1.85	2.13	2.39	2.14	2.48	2.77
		4.2	1.40	1.62	1.81	1.71	1.98	2.21	1.99	2.29	2.56
		4.8	1.31	1.51	1.69	1.60	1.85	2.07	1.86	2.14	2.40
		5.4	1.23	1.42	1.59	1.51	1.74	1.95	1.75	2.02	2.26
		6.0	1.17	1.35	1.51	1.43	1.65	1.85	1.66	1.92	2.14
Hem – Fir (includes Western Hemlock and Amabilis Fir)	Select Structural	2.4	2.22	2.70	2.91	2.64	3.31	3.70	2.98	3.78	4.29
		3.0	1.85	2.35	2.70	2.21	2.79	3.31	2.50	3.14	3.78
		3.6	1.61	2.02	2.43	1.92	2.40	2.89	2.18	2.71	3.24
		4.2	1.43	1.78	2.14	1.71	2.13	2.54	1.95	2.40	2.86
		4.8	1.30	1.61	1.92	1.56	1.92	2.28	1.77	2.18	2.58
		5.4	1.19	1.47	1.74	1.44	1.76	2.08	1.64	2.00	2.35
		6.0	1.11	1.36	1.61	1.34	1.63	1.92	1.53	1.85	2.18
	No. 1 and No. 2	2.4	1.94	2.24	2.51	2.37	2.74	3.06	2.75	3.18	3.56
		3.0	1.74	2.00	2.24	2.12	2.45	2.74	2.46	2.84	3.18
		3.6	1.58	1.83	2.05	1.92	2.24	2.50	2.18	2.60	2.90
		4.2	1.43	1.69	1.89	1.71	2.07	2.32	1.95	2.40	2.69
		4.8	1.30	1.58	1.77	1.56	1.92	2.17	1.77	2.18	2.51
		5.4	1.19	1.47	1.67	1.44	1.76	2.04	1.64	2.00	2.35
		6.0	1.11	1.36	1.58	1.34	1.63	1.92	1.53	1.85	2.18

Table 9.23.4.2.-J (Cont'd)
Maximum Spans for Built-up Floor Beams Supporting Not More than Three Floors⁽¹⁾⁽²⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Commercial Designation	Grade	Supported Length, m ⁽³⁾⁽⁴⁾	Maximum Span, m ⁽⁵⁾⁽⁶⁾								
			Size of Built-up Beam, mm								
			3 – 38 × 184	4 – 38 × 184	5 – 38 × 184	3 – 38 × 235	4 – 38 × 235	5 – 38 × 235	3 – 38 × 286	4 – 38 × 286	5 – 38 × 286
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	Select Structural	2.4	2.35	2.58	2.78	2.89	3.30	3.55	3.24	3.89	4.33
		3.0	2.02	2.40	2.58	2.40	3.00	3.30	2.71	3.42	3.89
		3.6	1.74	2.20	2.43	2.08	2.62	3.06	2.35	2.95	3.54
		4.2	1.55	1.94	2.31	1.85	2.31	2.77	2.10	2.61	3.12
		4.8	1.40	1.74	2.09	1.68	2.08	2.48	1.91	2.35	2.80
		5.4	1.28	1.59	1.90	1.54	1.90	2.26	1.76	2.16	2.55
	6.0	1.19	1.47	1.74	1.44	1.76	2.08	1.64	2.00	2.35	
	No. 1 and No. 2	2.4	2.01	2.32	2.60	2.46	2.84	3.17	2.85	3.29	3.68
		3.0	1.80	2.08	2.32	2.20	2.54	2.84	2.55	2.95	3.29
		3.6	1.64	1.90	2.12	2.01	2.32	2.59	2.33	2.69	3.01
		4.2	1.52	1.75	1.96	1.85	2.15	2.40	2.10	2.49	2.78
		4.8	1.40	1.64	1.84	1.68	2.01	2.24	1.91	2.33	2.60
5.4		1.28	1.55	1.73	1.54	1.89	2.12	1.76	2.16	2.46	
6.0	1.19	1.47	1.64	1.44	1.76	2.01	1.64	2.00	2.33		
Northern Species (includes any Canadian species covered by the NLGA Standard Grading Rules)	Select Structural	2.4	1.91	2.20	2.46	2.33	2.69	3.01	2.70	3.12	3.49
		3.0	1.70	1.97	2.20	2.08	2.41	2.69	2.42	2.79	3.12
		3.6	1.56	1.80	2.01	1.90	2.20	2.46	2.18	2.55	2.85
		4.2	1.43	1.66	1.86	1.71	2.03	2.27	1.95	2.36	2.64
		4.8	1.30	1.56	1.74	1.56	1.90	2.13	1.77	2.18	2.47
		5.4	1.19	1.47	1.64	1.44	1.76	2.01	1.64	2.00	2.33
	6.0	1.11	1.36	1.56	1.34	1.63	1.90	1.53	1.85	2.18	
	No. 1 and No. 2	2.4	1.61	1.86	2.08	1.97	2.28	2.55	2.29	2.64	2.96
		3.0	1.44	1.67	1.86	1.76	2.04	2.28	2.05	2.36	2.64
		3.6	1.32	1.52	1.70	1.61	1.86	2.08	1.87	2.16	2.41
		4.2	1.22	1.41	1.57	1.49	1.72	1.93	1.73	2.00	2.23
		4.8	1.14	1.32	1.47	1.40	1.61	1.80	1.62	1.87	2.09
5.4		1.08	1.24	1.39	1.32	1.52	1.70	1.53	1.76	1.97	
6.0	1.02	1.18	1.32	1.25	1.44	1.61	1.45	1.67	1.87		

Notes to Table 9.23.4.2.-J:

- (1) Beam spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floors does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) When the floors have a concrete topping of not more than 51 mm, the spans must be multiplied by 0.8.
- (3) Supported length means half the sum of the joists spans on both sides of the beam.
- (4) Straight interpolation may be used for other supported lengths.
- (5) Spans are clear spans between supports. For total span, add two bearing lengths.
- (6) 3-ply beams with supported lengths greater than 4.2 m require minimum bearing length of 152 mm. All other beams require minimum bearing length of 114 mm.

Table 9.23.4.2.-K
Maximum Spans for Glue-Laminated Floor Beams – 20f-E Grade⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(3), 9.23.4.4.(3) and 9.23.8.1.(1)

Number of Storeys Supported	Beam Width, mm	Supported Length, m ⁽²⁾⁽³⁾	Maximum Span, m ⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾						
			Beam Depth, mm						
			228	266	304	342	380	418	456
1	80	2.4	4.32	5.04	5.76	6.48	7.20	7.92	8.64
		3.0	3.87	4.51	5.15	5.80	6.44	7.09	7.73
		3.6	3.53	4.12	4.70	5.29	5.88	6.47	7.06
		4.2	3.27	3.81	4.36	4.90	5.44	5.99	6.53
		4.8	3.06	3.57	4.07	4.58	5.09	5.60	6.11
		5.4	2.88	3.36	3.84	4.32	4.80	5.28	5.76
		6.0	2.73	3.19	3.64	4.10	4.56	5.01	5.47
	130	2.4	5.51	6.43	7.35	8.26	9.18	10.10	11.02
		3.0	4.93	5.75	6.57	7.39	8.21	9.03	9.86
		3.6	4.50	5.25	6.00	6.75	7.50	8.25	9.00
		4.2	4.16	4.86	5.55	6.25	6.94	7.64	8.33
		4.8	3.90	4.54	5.19	5.84	6.49	7.14	7.79
		5.4	3.67	4.28	4.90	5.51	6.12	6.73	7.35
		6.0	3.48	4.07	4.65	5.23	5.81	6.39	6.97
2	80	2.4	3.28	3.83	4.37	4.92	5.47	6.01	6.56
		3.0	2.93	3.42	3.91	4.40	4.89	5.38	5.87
		3.6	2.68	3.12	3.57	4.02	4.46	4.91	5.36
		4.2	2.48	2.89	3.31	3.72	4.13	4.54	4.96
		4.8	2.32	2.71	3.09	3.48	3.86	4.25	4.64
		5.4	2.19	2.55	2.91	3.28	3.64	4.01	4.37
		6.0	2.07	2.42	2.77	3.11	3.46	3.80	4.15
	130	2.4	4.18	4.88	5.57	6.27	6.97	7.66	8.36
		3.0	3.74	4.36	4.99	5.61	6.23	6.85	7.48
		3.6	3.41	3.98	4.55	5.12	5.69	6.26	6.83
		4.2	3.16	3.69	4.21	4.74	5.27	5.79	6.32
		4.8	2.96	3.45	3.94	4.43	4.93	5.42	5.91
		5.4	2.79	3.25	3.72	4.18	4.64	5.11	5.57
		6.0	2.64	3.08	3.53	3.97	4.41	4.85	5.29
3	80	2.4	2.75	3.21	3.66	4.12	4.58	5.04	5.50
		3.0	2.46	2.87	3.28	3.69	4.10	4.51	4.92
		3.6	2.24	2.62	2.99	3.37	3.74	4.11	4.49
		4.2	2.08	2.42	2.77	3.12	3.46	3.81	4.15
		4.8	1.94	2.27	2.59	2.91	3.24	3.56	3.89
		5.4	1.83	2.14	2.44	2.75	3.05	3.36	3.66
		6.0	1.74	2.03	2.32	2.61	2.90	3.19	3.48
	130	2.4	3.50	4.09	4.67	5.25	5.84	6.42	7.01
		3.0	3.13	3.66	4.18	4.70	5.22	5.74	6.27
		3.6	2.86	3.34	3.81	4.29	4.77	5.24	5.72
		4.2	2.65	3.09	3.53	3.97	4.41	4.85	5.30
		4.8	2.48	2.89	3.30	3.72	4.13	4.54	4.95
		5.4	2.34	2.72	3.11	3.50	3.89	4.28	4.67
		6.0	2.22	2.58	2.95	3.32	3.69	4.06	4.43

Notes to Table 9.23.4.2.-K:

- (1) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* on the floor does not exceed that specified for residential areas as described in Table 4.1.5.3.
- (2) Supported length means half the sum of the joist spans on both sides of the beam.
- (3) Straight interpolation may be used for other supported lengths.
- (4) Spans are valid for glued-laminated timber conforming to CAN/CSA-O122 and CSA O177.
- (5) Spans are clear spans between supports. For total span, add two bearing lengths.
- (6) Provide a minimum bearing length of 89 mm. (Alternatively, the bearing length may be designed in accordance with Part 4.)
- (7) Top edge of beam assumed to be fully laterally supported by joists.

Table 9.23.4.2.-L
Maximum Spans for Built-up Ridge Beams and Lintels Supporting the Roof and Ceiling Only – No. 1 or No. 2 Grade
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.2.(4), 9.23.4.5.(1), 9.23.12.3.(1) and (3) and 9.23.14.10.(2)

Commercial Designation	Beam or Lintel Size, mm	Maximum Span, m ⁽¹⁾⁽²⁾⁽³⁾				
		Specified Snow Load, kPa				
		1.0	1.5	2.0	2.5	3.0
Douglas Fir – Larch (includes Douglas Fir and Western Larch)	3 – 38 × 184	2.65	2.28	2.03	1.85	1.71
	4 – 38 × 184	3.06	2.64	2.35	2.14	1.97
	5 – 38 × 184	3.43	2.95	2.62	2.39	2.21
	3 – 38 × 235	3.25	2.79	2.49	2.26	2.09
	4 – 38 × 235	3.75	3.22	2.87	2.61	2.41
	5 – 38 × 235	4.19	3.60	3.21	2.92	2.70
	3 – 38 × 286	3.77	3.24	2.88	2.62	2.43
	4 – 38 × 286	4.35	3.74	3.33	3.03	2.80
	5 – 38 × 286	4.86	4.18	3.72	3.39	3.13
Hem – Fir (includes Western Hemlock and Amabilis Fir)	3 – 38 × 184	2.78	2.39	2.13	1.94	1.79
	4 – 38 × 184	3.21	2.76	2.46	2.24	2.07
	5 – 38 × 184	3.59	3.09	2.75	2.50	2.31
	3 – 38 × 235	3.40	2.93	2.61	2.37	2.19
	4 – 38 × 235	3.93	3.38	3.01	2.74	2.53
	5 – 38 × 235	4.39	3.78	3.36	3.06	2.83
	3 – 38 × 286	3.95	3.40	3.02	2.75	2.54
	4 – 38 × 286	4.56	3.92	3.49	3.18	2.94
	5 – 38 × 286	5.10	4.38	3.90	3.55	3.28
Spruce – Pine – Fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	3 – 38 × 184	2.88	2.48	2.21	2.01	1.86
	4 – 38 × 184	3.30	2.86	2.55	2.32	2.14
	5 – 38 × 184	3.55	3.10	2.82	2.59	2.40
	3 – 38 × 235	3.53	3.03	2.70	2.46	2.27
	4 – 38 × 235	4.07	3.50	3.12	2.84	2.62
	5 – 38 × 235	4.54	3.91	3.49	3.17	2.93
	3 – 38 × 286	4.09	3.52	3.13	2.85	2.63
	4 – 38 × 286	4.72	4.06	3.62	3.29	3.04
	5 – 38 × 286	5.28	4.54	4.04	3.68	3.40

Notes to Table 9.23.4.2.-L:

- (1) Beam and lintel spans are calculated based on a maximum supported length of 4.9 m. Spans may be increased by 5% for supported lengths of not more than 4.3 m, by 10% for supported lengths of not more than 3.7 m, and by 25% for supported lengths of not more than 2.4 m.
- (2) For ridge beams, supported length means half the sum of the rafter, joist or truss spans on both sides of the beam. For lintels, supported length means half the sum of truss, roof joist or rafter spans supported by the lintel plus the length of the overhang beyond the lintel.
- (3) Provide a minimum bearing length of 76 mm.

Table 9.23.4.3.-A
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Exterior Stud Walls With Brick Veneer – 1.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

		Maximum Span, m							
Roof Live Load, kPa		1.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	2.96	2.79	2.86	2.71	2.78	2.65	2.71	2.59
	W 150 × 30	3.32	3.14	3.22	3.05	3.13	2.98	3.04	2.91
	W 150 × 37	3.62	3.41	3.50	3.32	3.40	3.24	3.32	3.17
	W 200 × 27	3.80	3.59	3.68	3.49	3.58	3.41	3.49	3.33
	W 200 × 31	4.06	3.83	3.93	3.73	3.82	3.64	3.72	3.56
	W 200 × 36	4.17	3.94	4.04	3.83	3.93	3.74	3.82	3.65
	W 200 × 42	4.42	4.18	4.29	4.06	4.16	3.96	4.05	3.87
	W 250 × 33	4.71	4.44	4.56	4.32	4.43	4.22	4.31	4.12
	W 250 × 39	5.04	4.76	4.88	4.63	4.75	4.52	4.62	4.41
	W 250 × 49	5.32	5.02	5.15	4.89	5.01	4.77	4.87	4.66
	W 310 × 39	5.66	5.34	5.49	5.20	5.33	5.07	5.19	4.96
	W 310 × 45	5.96	5.62	5.77	5.47	5.61	5.34	5.46	5.22
	W 310 × 52	6.33	5.98	6.13	5.82	5.96	5.67	5.8	5.54
	W 310 × 60	6.50	6.14	6.30	5.98	6.12	5.83	5.96	5.69
	W 360 × 33	5.61	5.29	5.43	5.15	5.28	5.03	5.14	4.91
	W 360 × 39	6.01	5.68	5.83	5.53	5.66	5.39	5.51	5.27
	W 360 × 45	6.38	6.03	6.19	5.87	6.01	5.72	5.85	5.59
	W 360 × 51	6.70	6.32	6.49	6.16	6.31	6.00	6.14	5.87
W 360 × 57	7.00	6.61	6.78	6.43	6.59	6.28	6.42	6.13	

Notes to Table 9.23.4.3.-A:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-B
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Interior Stud Walls or Exterior Stud Walls With Siding – 1.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

Maximum Span, m									
Roof Live Load, kPa		1.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	4.20	3.82	3.98	3.67	3.81	3.51	3.66	3.35
	W 150 × 30	4.72	4.30	4.48	4.13	4.28	3.98	4.11	3.85
	W 150 × 37	5.14	4.68	4.88	4.49	4.66	4.33	4.48	4.19
	W 200 × 27	5.41	4.92	5.13	4.72	4.90	4.56	4.71	4.41
	W 200 × 31	5.77	5.25	5.48	5.04	5.23	4.86	5.02	4.71
	W 200 × 36	5.93	5.40	5.63	5.18	5.38	5.00	5.16	4.84
	W 200 × 42	6.29	5.72	5.97	5.50	5.70	5.30	5.47	5.13
	W 250 × 33	6.69	6.09	6.35	5.85	6.06	5.64	5.82	5.45
	W 250 × 39	7.17	6.52	6.80	6.26	6.49	6.04	6.24	5.85
	W 250 × 49	7.56	6.88	7.17	6.61	6.85	6.37	6.58	6.17
	W 310 × 39	8.05	7.32	7.63	7.03	7.29	6.78	7.01	6.56
	W 310 × 45	8.47	7.71	8.03	7.40	7.68	7.14	7.37	6.91

Notes to Table 9.23.4.3.-B:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-C
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Exterior Stud Walls With Brick Veneer – 1.5 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

		Maximum Span, m							
Roof Live Load, kPa		1.5							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	2.86	2.71	2.74	2.62	2.64	2.53	2.55	2.46
	W 150 × 30	3.22	3.05	3.08	2.94	2.97	2.85	2.87	2.76
	W 150 × 37	3.50	3.32	3.36	3.20	3.23	3.10	3.13	3.01
	W 200 × 27	3.68	3.49	3.53	3.37	3.40	3.26	3.29	3.16
	W 200 × 31	3.93	3.73	3.77	3.60	3.63	3.48	3.51	3.38
	W 200 × 36	4.04	3.83	3.88	3.70	3.73	3.58	3.61	3.47
	W 200 × 42	4.29	4.06	4.11	3.92	3.96	3.79	3.82	3.68
	W 250 × 33	4.56	4.32	4.37	4.17	4.21	4.03	4.07	3.91
	W 250 × 39	4.88	4.63	4.68	4.47	4.51	4.32	4.36	4.19
	W 250 × 49	5.15	4.89	4.94	4.71	4.76	4.56	4.60	4.42
	W 310 × 39	5.49	5.20	5.26	5.01	5.06	4.85	4.89	4.71
	W 310 × 45	5.77	5.47	5.53	5.28	5.33	5.11	5.15	4.95
	W 310 × 52	6.13	5.82	5.88	5.61	5.66	5.43	5.47	5.26
	W 310 × 60	6.30	5.98	6.04	5.76	5.81	5.57	5.62	5.41
	W 360 × 33	5.43	5.15	5.21	4.97	5.01	4.81	4.85	4.66
	W 360 × 39	5.83	5.53	5.58	5.33	5.38	5.15	5.20	5.00
	W 360 × 45	6.19	5.87	5.93	5.65	5.71	5.47	5.52	5.31
	W 360 × 51	6.49	6.16	6.22	5.93	5.99	5.74	5.79	5.57
	W 360 × 57	6.78	6.43	6.50	6.20	6.26	6.00	6.05	5.82

Notes to Table 9.23.4.3.-C:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
 (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-D
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Interior Stud Walls or Exterior Stud Walls With Siding – 1.5 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

Maximum Span, m									
Roof Live Load, kPa		1.5							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	3.98	3.67	3.73	3.48	3.53	3.30	3.36	3.12
	W 150 × 30	4.48	4.13	4.19	3.91	3.97	3.74	3.78	3.59
	W 150 × 37	4.88	4.49	4.56	4.26	4.32	4.07	4.12	3.91
	W 200 × 27	5.13	4.72	4.80	4.48	4.54	4.28	4.33	4.11
	W 200 × 31	5.48	5.04	5.12	4.78	4.85	4.57	4.62	4.39
	W 200 × 36	5.63	5.18	5.27	4.92	4.98	4.70	4.75	4.51
	W 200 × 42	5.97	5.50	5.58	5.21	5.28	4.98	5.04	4.78
	W 250 × 33	6.35	5.85	5.94	5.54	5.62	5.30	5.36	5.09
	W 250 × 39	6.80	6.26	6.36	5.94	6.02	5.67	5.74	5.45
	W 250 × 49	7.17	6.61	6.71	6.27	6.35	5.99	6.06	5.75
	W 310 × 39	7.63	7.03	7.14	6.67	6.76	6.37	6.45	6.12
	W 310 × 45	8.03	7.40	7.52	7.02	7.11	6.71	6.78	6.44

Notes to Table 9.23.4.3.-D:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-E
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Exterior Stud Walls With Brick Veneer – 2.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

		Maximum Span, m							
Roof Live Load, kPa		2.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	2.78	2.65	2.64	2.53	2.53	2.43	2.43	2.35
	W 150 × 30	3.13	2.98	2.97	2.85	2.84	2.74	2.73	2.64
	W 150 × 37	3.40	3.24	3.23	3.10	3.09	2.98	2.97	2.88
	W 200 × 27	3.58	3.41	3.40	3.26	3.25	3.13	3.13	3.02
	W 200 × 31	3.82	3.64	3.63	3.48	3.47	3.34	3.34	3.23
	W 200 × 36	3.93	3.74	3.73	3.58	3.57	3.44	3.43	3.32
	W 200 × 42	4.16	3.96	3.96	3.79	3.78	3.64	3.64	3.52
	W 250 × 33	4.43	4.22	4.21	4.03	4.02	3.88	3.87	3.74
	W 250 × 39	4.75	4.52	4.51	4.32	4.31	4.15	4.15	4.01
	W 250 × 49	5.01	4.77	4.76	4.56	4.55	4.38	4.37	4.23
	W 310 × 39	5.33	5.07	5.06	4.85	4.84	4.66	4.65	4.50
	W 310 × 45	5.61	5.34	5.33	5.11	5.10	4.91	4.90	4.74
	W 310 × 52	5.96	5.67	5.66	5.43	5.41	5.21	5.21	5.03
	W 310 × 60	6.12	5.83	5.81	5.57	5.56	5.36	5.35	5.17
	W 360 × 33	5.28	5.03	5.01	4.81	4.80	4.62	4.61	4.46
	W 360 × 39	5.66	5.39	5.38	5.15	5.14	4.95	4.94	4.78
	W 360 × 45	6.01	5.72	5.71	5.47	5.46	5.26	5.25	5.08
	W 360 × 51	6.31	6.00	5.99	5.74	5.73	5.52	5.51	5.33
W 360 × 57	6.59	6.28	6.26	6.00	5.99	5.77	5.76	5.57	

Notes to Table 9.23.4.3.-E:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-F
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Interior Stud Walls or Exterior Stud Walls With Siding – 2.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

Maximum Span, m									
Roof Live Load, kPa		2.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	3.81	3.54	3.53	3.33	3.32	3.13	3.15	2.94
	W 150 × 30	4.28	3.98	3.97	3.74	3.73	3.55	3.54	3.39
	W 150 × 37	4.66	4.33	4.32	4.07	4.06	3.86	3.85	3.69
	W 200 × 27	4.90	4.56	4.54	4.28	4.27	4.06	4.05	3.88
	W 200 × 31	5.23	4.86	4.85	4.57	4.56	4.34	4.32	4.14
	W 200 × 36	5.38	5.00	4.98	4.70	4.68	4.46	4.45	4.26
	W 200 × 42	5.70	5.30	5.28	4.98	4.96	4.72	4.71	4.51
	W 250 × 33	6.06	5.64	5.62	5.30	5.28	5.03	5.01	4.80
	W 250 × 39	6.49	6.04	6.02	5.67	5.66	5.38	5.37	5.14
	W 250 × 49	6.85	6.37	6.35	5.99	5.97	5.68	5.67	5.43
	W 310 × 39	7.29	6.78	6.76	6.37	6.35	6.04	6.03	5.77
	W 310 × 45	7.68	7.14	7.11	6.71	6.69	6.36	6.35	6.08

Notes to Table 9.23.4.3.-F:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-G
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Exterior Stud Walls With Brick Veneer – 2.5 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

		Maximum Span, m							
Roof Live Load, kPa		2.5							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	2.71	2.59	2.55	2.46	2.43	2.35	2.33	2.26
	W 150 × 30	3.04	2.91	2.87	2.76	2.73	2.64	2.62	2.54
	W 150 × 37	3.32	3.17	3.13	3.01	2.97	2.88	2.85	2.77
	W 200 × 27	3.49	3.33	3.29	3.16	3.13	3.02	2.99	2.91
	W 200 × 31	3.72	3.56	3.51	3.38	3.34	3.23	3.20	3.10
	W 200 × 36	3.82	3.65	3.61	3.47	3.43	3.32	3.29	3.19
	W 200 × 42	4.05	3.87	3.82	3.68	3.64	3.52	3.48	3.38
	W 250 × 33	4.31	4.12	4.07	3.91	3.87	3.74	3.71	3.60
	W 250 × 39	4.62	4.41	4.36	4.19	4.15	4.01	3.97	3.85
	W 250 × 49	4.87	4.66	4.60	4.42	4.37	4.23	4.19	4.07
	W 310 × 39	5.19	4.96	4.89	4.71	4.65	4.50	4.46	4.33
	W 310 × 45	5.46	5.22	5.15	4.95	4.90	4.74	4.69	4.55
	W 310 × 52	5.80	5.54	5.47	5.26	5.21	5.03	4.98	4.84
	W 310 × 60	5.96	5.69	5.62	5.41	5.35	5.17	5.12	4.97
	W 360 × 33	5.14	4.91	4.85	4.66	4.61	4.46	4.42	4.29
	W 360 × 39	5.51	5.27	5.20	5.00	4.94	4.78	4.73	4.60
	W 360 × 45	5.85	5.59	5.52	5.31	5.25	5.08	5.03	4.88
	W 360 × 51	6.14	5.87	5.79	5.57	5.51	5.33	5.27	5.12
W 360 × 57	6.42	6.13	6.05	5.82	5.76	5.57	5.51	5.35	

Notes to Table 9.23.4.3.-G:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3.-H
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Interior Stud Walls or Exterior Stud Walls With Siding – 2.5 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

Maximum Span, m									
Roof Live Load, kPa		2.5							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	3.66	3.43	3.36	3.19	3.15	2.98	2.98	2.79
	W 150 × 30	4.11	3.85	3.78	3.59	3.54	3.39	3.35	3.23
	W 150 × 37	4.48	4.19	4.12	3.91	3.85	3.69	3.64	3.51
	W 200 × 27	4.71	4.41	4.33	4.11	4.05	3.88	3.83	3.69
	W 200 × 31	5.02	4.71	4.62	4.39	4.32	4.14	4.09	3.94
	W 200 × 36	5.16	4.84	4.75	4.51	4.45	4.26	4.21	4.05
	W 200 × 42	5.47	5.13	5.04	4.78	4.71	4.51	4.46	4.30
	W 250 × 33	5.82	5.46	5.36	5.09	5.01	4.80	4.74	4.54
	W 250 × 39	6.24	5.85	5.74	5.45	5.37	5.14	5.08	4.90
	W 250 × 49	6.58	6.17	6.06	5.75	5.67	5.43	5.36	5.17
	W 310 × 39	7.01	6.56	6.45	6.12	6.03	5.78	5.70	5.47
	W 310 × 45	7.37	6.91	6.78	6.44	6.35	6.08	6.00	5.79

Notes to Table 9.23.4.3.-H:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3-I
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Exterior Stud Walls With Brick Veneer – 3.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

		Maximum Span, m							
Roof Live Load, kPa		3.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	2.64	2.53	2.48	2.39	2.35	2.28	2.24	2.18
	W 150 × 30	2.97	2.85	2.78	2.69	2.64	2.56	2.52	2.45
	W 150 × 37	3.23	3.10	3.03	2.93	2.87	2.79	2.74	2.67
	W 200 × 27	3.40	3.26	3.19	3.08	3.02	2.93	2.88	2.81
	W 200 × 31	3.63	3.48	3.40	3.28	3.22	3.13	3.08	3.00
	W 200 × 36	3.73	3.58	3.50	3.38	3.31	3.21	3.16	3.08
	W 200 × 42	3.96	3.79	3.71	3.58	3.51	3.41	3.35	3.26
	W 250 × 33	4.21	4.03	3.94	3.81	3.74	3.62	3.57	3.47
	W 250 × 39	4.51	4.32	4.23	4.08	4.00	3.88	3.82	3.72
	W 250 × 49	4.76	4.56	4.46	4.30	4.22	4.10	4.03	3.93
	W 310 × 39	5.06	4.85	4.74	4.58	4.49	4.36	4.29	4.18
	W 310 × 45	5.33	5.11	4.99	4.82	4.73	4.59	4.51	4.40
	W 310 × 52	5.66	5.43	5.31	5.12	5.03	4.88	4.80	4.67
	W 310 × 60	5.81	5.57	5.45	5.26	5.16	5.01	4.93	4.80
	W 360 × 33	5.01	4.81	4.70	4.54	4.45	4.32	4.25	4.14
	W 360 × 39	5.38	5.15	5.04	4.86	4.77	4.63	4.56	4.44
	W 360 × 45	5.71	5.47	5.35	5.16	5.07	4.92	4.84	4.71
	W 360 × 51	5.99	5.74	5.61	5.42	5.32	5.16	5.08	4.94
W 360 × 57	6.26	6.00	5.87	5.66	5.56	5.39	5.31	5.17	

Notes to Table 9.23.4.3-I:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
 (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.4.3-J
Maximum Spans for Steel Beams Supporting a Roof and One Floor in Dwelling Units
Where Beams Support Interior Stud Walls or Exterior Stud Walls With Siding – 3.0 kPa Specified Roof Design Snow Load
 Forming Part of Sentence 9.23.4.3.(1)

Maximum Span, m									
Roof Live Load, kPa		3.0							
Supported Roof Length, m ⁽¹⁾		2.4		3.6		4.8		6.0	
Supported Floor Length, m ⁽²⁾		2.4	3.6	2.4	3.6	2.4	3.6	2.4	3.6
Steel Beam Section	W 150 × 22	3.53	3.33	3.23	3.08	3.01	2.85	2.83	2.66
	W 150 × 30	3.97	3.74	3.63	3.47	3.38	3.26	3.19	3.09
	W 150 × 37	4.32	4.07	3.95	3.77	3.68	3.55	3.48	3.37
	W 200 × 27	4.54	4.28	4.15	3.97	3.87	3.73	3.65	3.52
	W 200 × 31	4.85	4.57	4.43	4.23	4.13	3.98	3.90	3.78
	W 200 × 36	4.98	4.70	4.56	4.35	4.25	4.09	4.01	3.88
	W 200 × 42	5.28	4.98	4.83	4.61	4.50	4.34	4.25	4.12
	W 250 × 33	5.62	5.30	5.14	4.91	4.79	4.61	4.52	4.33
	W 250 × 39	6.02	5.67	5.51	5.26	5.13	4.94	4.84	4.69
	W 250 × 49	6.35	5.99	5.81	5.55	5.42	5.21	5.11	4.95
	W 310 × 39	6.76	6.37	6.18	5.90	5.76	5.55	5.44	5.21
	W 310 × 45	7.11	6.71	6.51	6.21	6.07	5.84	5.72	5.54

Notes to Table 9.23.4.3-J:

- (1) Supported roof length means half the sum of the roof framing spans on both sides of the beam.
- (2) Supported floor length means half the sum of the floor framing spans on both sides of the beam.

Table 9.23.10.1.-A
Sizes for Spruce-Pine-Fir No. 2 Grade Exterior Wall Studs With Brick Veneer⁽¹⁾⁽²⁾
 Forming Part of Sentence 9.23.10.1.(2)

Stud Size and Spacing									
Hourly Wind Pressure (1/50), kPa		0.40		0.45		0.50		0.60	
Specified Roof Snow Load, kPa	Stud Length, m	Supported Roof Length, m							
		3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
1.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	B	B	B	B
	4.6	B	B	B	B	C	C	C	C
	5.0	C	C	C	C	C	C	D	D
	5.3	C	C	C	C	D	D	D	D
	5.6	C	C	D	D	D	D		
1.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	B	B	B	B
	4.6	B	B	B	B	C	C	C	C
	5.0	C	C	C	C	C	C	D	D
	5.3	C	C	C	C	D	D	D	D
	5.6	C	C	D	D	D	D		
2.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	B	B	B	B
	4.6	B	B	B	B	C	C	C	C
	5.0	C	C	C	C	C	C	D	D
	5.3	C	C	C	C	D	D	D	D
	5.6	C	C	D	D	D	D		
2.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	B	B	B	B
	4.6	B	B	B	B	C	C	C	C
	5.0	C	C	C	C	C	C	D	D
	5.3	C	C	C	C	D	D	D	D
	5.6	C	C	D	D	D	D		
3.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	B	B	B	B
	4.6	B	B	B	B	C	C	C	C
	5.0	C	C	C	C	C	C	D	D
	5.3	C	C	C	C	D	D	D	D
	5.6	C	C	D	D	D	D		

Legend - Stud Size and Spacing

A = 38 × 140 mm at 400 mm on centre
 B = 38 × 140 mm at 300 mm on centre

C = two 38 × 140 mm studs at 400 mm on centre
 D = two 38 × 140 mm studs at 300 mm on centre

Notes to Table 9.23.10.1.-A:

- (1) A roof dead load of 0.5 kPa has been assumed. The Table does not apply where the stud supports additional loads from heavy roofing materials such as concrete tiles or clay roofing tiles.
- (2) Wall construction shall conform to the requirements of Sentence 9.23.10.1.(2).

Table 9.23.10.1-B
Sizes for Spruce-Pine-Fir No. 2 Grade Exterior Wall Studs With Siding⁽¹⁾⁽²⁾
 Forming Part of Sentence 9.23.10.1.(2)

		Stud Size and Spacing							
Hourly Wind Pressure (1/50), kPa		0.40		0.45		0.50		0.60	
Specified Roof Snow Load, kPa	Stud Length, m	Supported Roof Length, m							
		3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
1.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	A	A
	5.0	A	A	A	A	A	A	B	B
	5.3	A	A	A	A	B	B	B	B
	5.6	A	A	B	B	B	B	C	C
1.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	A	A
	5.0	A	A	A	A	A	A	B	B
	5.3	A	A	A	A	B	B	B	B
	5.6	A	A	B	B	B	B	C	C
2.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	A	A
	5.0	A	A	A	A	A	A	B	B
	5.3	A	A	A	A	B	B	B	B
	5.6	A	A	B	B	B	B	C	C
2.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	A	A
	5.0	A	A	A	A	A	A	B	B
	5.3	A	A	A	A	B	B	B	B
	5.6	A	B	B	B	B	B	C	C
3.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	A	A
	5.0	A	A	A	A	A	A	B	B
	5.3	A	B	A	B	B	B	B	B
	5.6	A	B	B	B	B	B	C	C

Legend - Stud Size and Spacing

A = 38 × 140 mm at 400 mm on centre
 B = 38 × 140 mm at 300 mm on centre

C = two 38 × 140 mm studs at 400 mm on centre
 D = two 38 × 140 mm studs at 300 mm on centre

Notes to Table 9.23.10.1-B:

- (1) A roof dead load of 0.5 kPa has been assumed. The Table does not apply where the stud supports additional loads from heavy roofing materials such as concrete tiles or clay roofing tiles.
- (2) Wall construction shall conform to the requirements of Sentence 9.23.10.1.(2).

Table 9.23.10.1.-C
Sizes for Northern Species No. 2 Grade Exterior Wall Studs With Brick Veneer⁽¹⁾⁽²⁾
 Forming Part of Sentence 9.23.10.1.(2)

		Stud Size and Spacing							
Hourly Wind Pressure (1/50), kPa		0.40		0.45		0.50		0.60	
Specified Roof Snow Load, kPa	Stud Length, m	Supported Roof Length, m							
		3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
1.0	3.8	A	A	A	A	B	B	B	B
	4.2	B	B	B	B	C	C	C	C
	4.6	C	C	C	C	C	C	D	D
	5.0	C	C	D	D	D	D		
	5.3	D	D	D	D				
	5.6								
1.5	3.8	A	A	A	A	B	B	B	B
	4.2	B	B	B	B	C	C	C	C
	4.6	C	C	C	C	C	C	D	D
	5.0	C	C	D	D	D	D		
	5.3	D	D	D	D				
	5.6								
2.0	3.8	A	A	A	A	B	B	B	B
	4.2	B	B	B	B	C	C	C	C
	4.6	C	C	C	C	C	C	D	D
	5.0	C	C	D	D	D	D		
	5.3	D	D	D	D				
	5.6								
2.5	3.8	A	A	A	A	B	B	B	B
	4.2	B	B	B	B	C	C	C	C
	4.6	C	C	C	C	C	C	D	D
	5.0	C	C	D	D	D	D		
	5.3	D	D	D	D				
	5.6								
3.0	3.8	A	A	A	A	B	B	B	B
	4.2	B	B	B	B	C	C	C	C
	4.6	C	C	C	C	C	C	D	D
	5.0	C	C	D	D	D	D		
	5.3	D	D	D	D				
	5.6								

Legend - Stud Size and Spacing

A = 38 × 140 mm at 400 mm on centre
 B = 38 × 140 mm at 300 mm on centre

C = two 38 × 140 mm studs at 400 mm on centre
 D = two 38 × 140 mm studs at 300 mm on centre

Notes to Table 9.23.10.1.-C:

- (1) A roof dead load of 0.5 kPa has been assumed. The Table does not apply where the stud supports additional loads from heavy roofing materials such as concrete tiles or clay roofing tiles.
- (2) Wall construction shall conform to the requirements of Sentence 9.23.10.1.(2).

Table 9.23.10.1-D
Sizes for Northern Species No. 2 Grade Exterior Wall Studs With Siding⁽¹⁾⁽²⁾
 Forming Part of Sentence 9.23.10.1.(2)

		Stud Size and Spacing							
Hourly Wind Pressure (1/50), kPa		0.40		0.45		0.50		0.60	
Specified Roof Snow Load, kPa	Stud Length, m	Supported Roof Length, m							
		3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
1.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	B	B
	5.0	A	A	B	B	B	B	C	C
	5.3	B	B	B	B	C	C	C	C
	5.6	C	C	C	C	C	C	D	D
1.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	B	B
	5.0	A	A	B	B	B	B	C	C
	5.3	B	B	B	B	C	C	C	C
	5.6	C	C	C	C	C	C	D	D
2.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	B	B
	5.0	A	A	B	B	B	B	C	C
	5.3	B	B	B	B	C	C	C	C
	5.6	C	C	C	C	C	C	D	D
2.5	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	A	A	A	A	A	B	B
	5.0	A	B	B	B	B	B	C	C
	5.3	B	B	B	B	C	C	C	C
	5.6	C	C	C	C	C	C	D	D
3.0	3.8	A	A	A	A	A	A	A	A
	4.2	A	A	A	A	A	A	A	A
	4.6	A	B	A	B	A	B	B	B
	5.0	A	B	B	B	B	B	C	C
	5.3	B	C	B	C	C	C	C	C
	5.6	C	C	C	C	C	C	D	D

Legend - Stud Size and Spacing

A = 38 × 140 mm at 400 mm on centre

B = 38 × 140 mm at 300 mm on centre

C = two 38 × 140 mm studs at 400 mm on centre

D = two 38 × 140 mm studs at 300 mm on centre

Notes to Table 9.23.10.1-D:

- (1) A roof dead load of 0.5 kPa has been assumed. The Table does not apply where the stud supports additional loads from heavy roofing materials such as concrete tiles or clay roofing tiles.
- (2) Wall construction shall conform to the requirements of Sentence 9.23.10.1.(2).

Table 9.23.10.7.-A
Minimum Number of 38 × 89 mm Spruce-Pine-Fir Stud Posts in
Exterior Stud Walls Supporting Girder Trusses and Roof Beams⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.23.10.7.(2)

Minimum Number of Studs																					
Stud Height, m	Span of Beam or Girder, m	Specified Roof Snow Load, kPa																			
		1.0				1.5				2.0				2.5				3.0			
		Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m			
		2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0
2.4	2.4	1	1	2	2	1	2	2	2	1	2	2	3	2	2	3	3	2	2	3	3
	3.6	1	2	2	2	2	2	3	3	2	2	3	4	2	3	4	4	2	3	4	5
	4.8	2	2	3	3	2	3	3	4	2	3	4	5	3	4	5		3	4	5	
	6.0	2	2	3	4	2	3	4	5	3	4	5		3	4			3	5		
	7.2	2	3	4	4	3	4	5		3	4			4	5			4			
	8.4	2	3	4	5	3	4	5		3	5			4				5			
	9.6	3	4	5		3	5			4				5				5			
	10.8	3	4	5		4	5			4				5							
	12.0	3	4			4				5											
3.0	2.4	1	2	2	2	2	2	3	3	2	2	3	4	2	3	4	4	2	3	4	5
	3.6	2	2	3	3	2	3	4	4	2	3	4	5	3	4	5		3	4		
	4.8	2	3	4	4	3	4	5		3	4			4	5			4			
	6.0	2	3	4	5	3	4			4	5			4				5			
	7.2	3	4	5		4	5			4				5							
	8.4	3	4			4				5											
	9.6	4	5			5															
	10.8	4				5															
	12.0	4																			

Notes to Table 9.23.10.7.-A:

- (1) A roof dead load of 0.62 kPa has been assumed.
- (2) Roof beams require a minimum bearing length of 89 mm.
- (3) Girder trusses require a minimum bearing length of 89 mm unless otherwise specified by the truss manufacturer.

Table 9.23.10.7.-B
Minimum Number of 38 × 140 mm Spruce-Pine-Fir Stud Posts in
Exterior Stud Walls Supporting Girder Trusses and Roof Beams⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.23.10.7.(2)

Minimum Number of Studs																					
Stud Height, m	Span of Beam or Girder, m	Specified Roof Snow Load, kPa																			
		1.0				1.5				2.0				2.5				3.0			
		Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m			
		2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0
3.0	2.4	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1	2	2	
	3.6	1	1	1	1	1	1	2	2	1	1	2	2	1	2	2	2	1	2	2	3
	4.8	1	1	2	2	1	2	2	2	1	2	2	3	2	2	3	3	2	2	3	4
	6.0	1	1	2	2	1	2	2	3	2	2	3	3	2	2	3	4	2	3	4	4
	7.2	1	2	2	2	2	2	3	3	2	2	3	4	2	3	4	4	2	3	4	5
	8.4	1	2	2	3	2	2	3	4	2	3	4	4	2	3	4	5	3	4	5	
	9.6	2	2	3	3	2	3	3	4	2	3	4	5	3	4	5		3	4	5	
	10.8	2	2	3	3	2	3	4	4	2	3	4	5	3	4	5		3	5		
	12.0	2	2	3	4	2	3	4	5	3	4	5		3	4			4	5		
3.6	2.4	1	1	1	1	1	1	1	2	1	1	2	2	1	1	2	2	1	2	2	2
	3.6	1	1	1	2	1	1	2	2	1	2	2	3	1	2	2	3	2	2	3	3
	4.8	1	1	2	2	1	2	2	3	2	2	3	3	2	2	3	4	2	3	4	4
	6.0	1	2	2	3	2	2	3	3	2	3	3	4	2	3	4	5	2	3	4	5
	7.2	1	2	2	3	2	2	3	4	2	3	4	5	2	3	4	5	3	4	5	
	8.4	2	2	3	3	2	3	4	4	2	3	4	5	3	4	5		3	4		
	9.6	2	2	3	4	2	3	4	5	3	4	5		3	4			4	5		
	10.8	2	3	3	4	2	3	4	5	3	4	5		3	5			4			
	12.0	2	3	4	5	3	4	5		3	5			4	5			4			

Notes to Table 9.23.10.7.-B:

- (1) A roof dead load of 0.62 kPa has been assumed.
- (2) Roof beams require a minimum bearing length of 140 mm.
- (3) Girder trusses require a minimum bearing length of 140 mm unless otherwise specified by the truss manufacturer.

Table 9.23.10.7.-C
Minimum Number of 38 × 89 mm Northern Species Stud Posts in
Exterior Stud Walls Supporting Girder Trusses and Roof Beams⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.23.10.7.(2)

Minimum Number of Studs																					
Stud Height, m	Span of Beam or Girder, m	Specified Roof Snow Load, kPa																			
		1.0				1.5				2.0				2.5				3.0			
		Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m			
		2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0
2.4	2.4	1	2	2	2	2	2	3	3	2	2	3	4	2	3	4	4	2	3	4	5
	3.6	2	2	3	3	2	3	4	4	2	3	4	5	3	4	5		3	4		
	4.8	2	3	4	4	3	4	5		3	4			4	5			4			
	6.0	2	3	4	5	3	4			4	5			4				5			
	7.2	3	4	5		4	5			4				5							
	8.4	3	4			4				5											
	9.6	4	5			5															
	10.8	4				5															
	12.0	4																			
3.0	2.4	2	2	3	3	2	3	3	4	2	3	4	5	3	4	5		3	4		
	3.6	2	3	4	5	3	4	5		3	5			4	5			4			
	4.8	3	4	5		3	5			4				5							
	6.0	3	5			4				5											
	7.2	4	5			5															
	8.4	4																			
	9.6	5																			
	10.8	5																			
	12.0																				

Notes to Table 9.23.10.7.-C:

- (1) A roof dead load of 0.62 kPa has been assumed.
- (2) Roof beams require a minimum bearing length of 89 mm.
- (3) Girder trusses require a minimum bearing length of 89 mm unless otherwise specified by the truss manufacturer.

Table 9.23.10.7.-D
Minimum Number of 38 × 140 mm Northern Species Stud Posts in
Exterior Stud Walls Supporting Girder Trusses and Roof Beams⁽¹⁾⁽²⁾⁽³⁾
 Forming Part of Sentence 9.23.10.7.(2)

Minimum Number of Studs																					
Stud Height, m	Span of Beam or Girder, m	Specified Roof Snow Load, kPa																			
		1.0				1.5				2.0				2.5				3.0			
		Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m				Supported Length, m			
		2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0	2.4	3.6	4.8	6.0
3.0	2.4	1	1	1	1	1	1	2	2	1	1	2	2	1	2	2	2	1	2	2	3
	3.6	1	1	2	2	1	2	2	2	1	2	2	3	2	2	3	3	2	3	3	4
	4.8	1	2	2	2	2	2	3	3	2	2	3	4	2	3	4	4	2	3	4	5
	6.0	1	2	2	3	2	2	3	4	2	3	4	5	2	3	4	5	3	4	5	
	7.2	2	2	3	3	2	3	4	4	2	3	4	5	3	4	5		3	5		
	8.4	2	3	3	4	2	3	4	5	3	4	5		3	5			4	5		
	9.6	2	3	4	4	3	4	5		3	4			4	5			4			
	10.8	2	3	4	5	3	4	5		3	5			4				5			
	12.0	2	3	4	5	3	4			4	5			4				5			
3.6	2.4	1	1	1	2	1	1	2	2	1	2	2	3	1	2	2	3	2	2	3	3
	3.6	1	2	2	2	1	2	2	3	2	2	3	4	2	3	3	4	2	3	4	5
	4.8	1	2	2	3	2	2	3	4	2	3	4	5	2	3	4	5	3	4	5	
	6.0	2	2	3	4	2	3	4	5	3	4	5		3	4	5		3	5		
	7.2	2	3	3	4	2	3	4	5	3	4	5		3	5			4			
	8.4	2	3	4	5	3	4	5		3	5			4				4			
	9.6	2	3	4	5	3	4			4	5			4				5			
	10.8	3	4	5		3	5			4				5							
	12.0	3	4	5		4	5			5				5							

Notes to Table 9.23.10.7.-D:

- (1) A roof dead load of 0.62 kPa has been assumed.
- (2) Roof beams require a minimum bearing length of 140 mm.
- (3) Girder trusses require a minimum bearing length of 140 mm unless otherwise specified by the truss manufacturer.

Table 9.23.12.3.-A
Maximum Spans for Douglas Fir – Larch Lintels – No. 1 or No. 2 Grade – Non-Structural Sheathing⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.5.(1), 9.23.12.3.(1) and (3)

Lintel Supporting	Lintel Size, mm ⁽²⁾	Maximum Span, m ⁽³⁾⁽⁴⁾					
		Exterior Walls					Interior Walls
		Specified Snow Load, kPa					
		1.0	1.5	2.0	2.5	3.0	
Limited attic storage and ceiling	2 – 38 × 89	This Area Intentionally Left Blank					1.25
	2 – 38 × 140						1.78
	2 – 38 × 184						2.17
	2 – 38 × 235						2.65
	2 – 38 × 286						3.08
Roof and ceiling only (tributary width of 0.6 m maximum) ⁽⁵⁾	2 – 38 × 89	2.68	2.34	2.13	1.97	1.86	1.97
	2 – 38 × 140	4.21	3.68	3.34	3.10	2.92	3.10
	2 – 38 × 184	5.50	4.84	4.39	4.08	3.84	4.08
	2 – 38 × 235	6.61	5.97	5.56	5.21	4.88	5.21
	2 – 38 × 286	7.66	6.92	6.44	6.09	5.66	6.09
Roof and ceiling only (tributary width of 4.9 m maximum) ⁽⁶⁾	2 – 38 × 89	1.25	1.07	0.96	0.87	0.80	0.87
	2 – 38 × 140	1.78	1.53	1.36	1.24	1.15	1.24
	2 – 38 × 184	2.17	1.86	1.66	1.51	1.40	1.51
	2 – 38 × 235	2.65	2.28	2.03	1.85	1.71	1.85
	2 – 38 × 286	3.08	2.64	2.35	2.14	1.98	2.14
Roof, ceiling and 1 storey ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.96	0.88	0.82	0.77	0.73	0.68
	2 – 38 × 140	1.37	1.26	1.17	1.10	1.04	0.97
	2 – 38 × 184	1.67	1.53	1.42	1.34	1.26	1.18
	2 – 38 × 235	2.04	1.88	1.74	1.63	1.54	1.44
	2 – 38 × 286	2.37	2.18	2.02	1.90	1.79	1.67
Roof, ceiling and 2 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.86	0.81	0.77	0.73	0.70	0.61
	2 – 38 × 140	1.23	1.16	1.09	1.04	0.99	0.87
	2 – 38 × 184	1.50	1.41	1.33	1.27	1.21	1.06
	2 – 38 × 235	1.84	1.72	1.63	1.55	1.48	1.30
	2 – 38 × 286	2.13	2.00	1.89	1.80	1.72	1.51
Roof, ceiling and 3 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.81	0.77	0.73	0.71	0.68	0.57
	2 – 38 × 140	1.15	1.10	1.05	1.01	0.97	0.82
	2 – 38 × 184	1.40	1.33	1.28	1.22	1.18	1.00
	2 – 38 × 235	1.71	1.63	1.56	1.50	1.44	1.22
	2 – 38 × 286	1.99	1.89	1.81	1.74	1.67	1.41

Notes to Table 9.23.12.3.-A:

- (1) Where structural sheathing is used, lintel spans may be increased by 15%. Structural sheathing consists of a minimum 9.5 mm thick structural panel conforming to CSA O121, CSA O151, CSA O325 or CSA O437.0 fastened with at least two rows of fasteners to the exterior face of the lintel, and a single row to the top plates and studs. Fasteners shall conform to Table 9.23.3.5.-A.
- (2) A single piece of 89 mm thick lumber may be used in lieu of 2 pieces of 38 mm thick lumber on edge.
- (3) If floor joists span the full width of the *building* without support, lintel spans shall be reduced by 15% for “Roof, ceiling and 1 storey”, by 20% for “Roof, ceiling and 2 storeys”, and by 25% for “Roof, ceiling and 3 storeys”.
- (4) For ends of lintels fully supported by walls, provide minimum bearing length of 38 mm for lintel spans up to 3 m, or minimum bearing length of 76 mm for lintel spans greater than 3 m.
- (5) Spans for 0.6 m tributary width are calculated for lintels in end walls that support only a 0.6 m width of roof and ceiling, but do not support roof joists, roof rafters or roof trusses.
- (6) Lintel spans are calculated based on a maximum floor joist, roof joist or rafter span of 4.9 m and a maximum roof truss span of 9.8 m. Lintel spans may be increased by 5% if rafter and joist spans are not more than 4.3 m and roof truss spans are not more than 8.6 m. Spans may be increased by 10% if rafter and joist spans are not more than 3.7 m and roof trusses are not more than 7.4 m.
- (7) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* does not exceed that specified for residential areas as described in Table 4.1.5.3.

Table 9.23.12.3.-B
Maximum Spans for Hem – Fir Lintels – No. 1 or No. 2 Grade – Non-Structural Sheathing⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.5.(1), 9.23.12.3.(1) and (3)

Lintel Supporting	Lintel Size, mm ⁽²⁾	Maximum Span, m ⁽³⁾⁽⁴⁾						Interior Walls
		Exterior Walls						
		Specified Snow Load, kPa						
		1.0	1.5	2.0	2.5	3.0		
Limited attic storage and ceiling	2 – 38 × 89	This Area Intentionally Left Blank					1.31	
	2 – 38 × 140						1.87	
	2 – 38 × 184						2.27	
	2 – 38 × 235						2.78	
	2 – 38 × 286						3.23	
Roof and ceiling only (tributary width of 0.6 m maximum) ⁽⁵⁾	2 – 38 × 89	2.68	2.34	2.13	1.97	1.86	1.97	
	2 – 38 × 140	4.21	3.68	3.34	3.10	2.92	3.10	
	2 – 38 × 184	5.50	4.84	4.39	4.08	3.84	4.08	
	2 – 38 × 235	6.61	5.97	5.56	5.21	4.90	5.21	
	2 – 38 × 286	7.66	6.92	6.44	6.09	5.82	6.09	
Roof and ceiling only (tributary width of 4.9 m maximum) ⁽⁶⁾	2 – 38 × 89	1.31	1.13	1.00	0.91	0.84	0.91	
	2 – 38 × 140	1.87	1.61	1.43	1.30	1.20	1.30	
	2 – 38 × 184	2.27	1.95	1.74	1.58	1.42	1.58	
	2 – 38 × 235	2.78	2.39	2.13	1.92	1.71	1.92	
	2 – 38 × 286	3.23	2.77	2.47	2.17	1.94	2.17	
Roof, ceiling and 1 storey ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	1.01	0.93	0.86	0.81	0.76	0.69	
	2 – 38 × 140	1.44	1.32	1.23	1.14	1.05	0.95	
	2 – 38 × 184	1.75	1.61	1.47	1.34	1.23	1.12	
	2 – 38 × 235	2.14	1.96	1.76	1.60	1.48	1.35	
	2 – 38 × 286	2.49	2.22	2.00	1.82	1.69	1.55	
Roof, ceiling and 2 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.91	0.85	0.80	0.76	0.72	0.60	
	2 – 38 × 140	1.29	1.21	1.13	1.05	0.98	0.82	
	2 – 38 × 184	1.57	1.44	1.33	1.24	1.16	0.98	
	2 – 38 × 235	1.90	1.73	1.60	1.49	1.40	1.19	
	2 – 38 × 286	2.15	1.97	1.82	1.70	1.60	1.37	
Roof, ceiling and 3 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.85	0.81	0.77	0.74	0.69	0.55	
	2 – 38 × 140	1.21	1.14	1.06	1.00	0.95	0.76	
	2 – 38 × 184	1.43	1.33	1.25	1.18	1.12	0.91	
	2 – 38 × 235	1.72	1.60	1.50	1.42	1.35	1.10	
	2 – 38 × 286	1.95	1.82	1.72	1.63	1.55	1.27	

Notes to Table 9.23.12.3.-B:

- (1) Where structural sheathing is used, lintel spans may be increased by 15%. Structural sheathing consists of a minimum 9.5 mm thick structural panel conforming to CSA O121, CSA O151, CSA O325 or CSA O437.0 fastened with at least two rows of fasteners to the exterior face of the lintel, and a single row to the top plates and studs. Fasteners shall conform to Table 9.23.3.5.-A.
- (2) A single piece of 89 mm thick lumber may be used in lieu of 2 pieces of 38 mm thick lumber on edge.
- (3) If floor joists span the full width of the *building* without support, lintel spans shall be reduced by 15% for “Roof, ceiling and 1 storey”, by 20% for “Roof, ceiling and 2 storeys”, and by 25% for “Roof, ceiling and 3 storeys”.
- (4) For ends of lintels fully supported by walls, provide minimum bearing length of 38 mm for lintel spans up to 3 m, or minimum bearing length of 76 mm for lintel spans greater than 3 m.
- (5) Spans for 0.6 m tributary width are calculated for lintels in end walls that support only a 0.6 m width of roof and ceiling, but do not support roof joists, roof rafters or roof trusses.
- (6) Lintel spans are calculated based on a maximum floor joist, roof joist or rafter span of 4.9 m and a maximum roof truss span of 9.8 m. Lintel spans may be increased by 5% if rafter and joist spans are not more than 4.3 m and roof truss spans are not more than 8.6 m. Spans may be increased by 10% if rafter and joist spans are not more than 3.7 m and roof trusses are not more than 7.4 m.
- (7) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* does not exceed that specified for residential areas as described in Table 4.1.5.3.

Table 9.23.12.3.-C
Maximum Spans for Spruce – Pine – Fir Lintels – No. 1 or No. 2 Grade – Non-Structural Sheathing⁽¹⁾
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.5.(1), 9.23.12.3.(1) and (3)

Lintel Supporting	Lintel Size, mm ⁽²⁾	Maximum Span, m ⁽³⁾⁽⁴⁾						Interior Walls
		Exterior Walls						
		Specified Snow Load, kPa						
		1.0	1.5	2.0	2.5	3.0		
Limited attic storage and ceiling	2 – 38 × 89	This Area Intentionally Left Blank					1.27	
	2 – 38 × 140						1.93	
	2 – 38 × 184						2.35	
	2 – 38 × 235						2.88	
	2 – 38 × 286						3.34	
Roof and ceiling only (tributary width of 0.6 m maximum) ⁽⁵⁾	2 – 38 × 89	2.55	2.23	2.02	1.88	1.77	1.88	
	2 – 38 × 140	4.01	3.50	3.18	2.96	2.78	2.96	
	2 – 38 × 184	5.27	4.61	4.18	3.88	3.66	3.88	
	2 – 38 × 235	6.37	5.76	5.34	4.96	4.67	4.96	
	2 – 38 × 286	7.38	6.67	6.21	5.87	5.61	5.87	
Roof and ceiling only (tributary width of 4.9 m maximum) ⁽⁶⁾	2 – 38 × 89	1.27	1.11	1.01	0.93	0.87	0.93	
	2 – 38 × 140	1.93	1.66	1.48	1.35	1.25	1.35	
	2 – 38 × 184	2.35	2.02	1.80	1.64	1.52	1.64	
	2 – 38 × 235	2.88	2.47	2.20	2.01	1.84	2.01	
	2 – 38 × 286	3.34	2.87	2.56	2.33	2.09	2.33	
Roof, ceiling and 1 storey ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	1.05	0.96	0.89	0.84	0.79	0.74	
	2 – 38 × 140	1.49	1.37	1.27	1.19	1.13	1.02	
	2 – 38 × 184	1.82	1.67	1.55	1.44	1.33	1.20	
	2 – 38 × 235	2.22	2.04	1.89	1.73	1.59	1.45	
	2 – 38 × 286	2.58	2.36	2.15	1.96	1.81	1.66	
Roof, ceiling and 2 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.94	0.88	0.83	0.79	0.76	0.64	
	2 – 38 × 140	1.34	1.26	1.19	1.13	1.06	0.88	
	2 – 38 × 184	1.63	1.53	1.44	1.33	1.25	1.05	
	2 – 38 × 235	1.99	1.87	1.72	1.60	1.50	1.27	
	2 – 38 × 286	2.31	2.12	1.96	1.82	1.71	1.45	
Roof, ceiling and 3 storeys ⁽³⁾⁽⁶⁾⁽⁷⁾	2 – 38 × 89	0.88	0.83	0.80	0.77	0.74	0.59	
	2 – 38 × 140	1.25	1.19	1.14	1.08	1.02	0.81	
	2 – 38 × 184	1.52	1.44	1.35	1.27	1.21	0.97	
	2 – 38 × 235	1.86	1.73	1.62	1.53	1.45	1.17	
	2 – 38 × 286	2.11	1.96	1.84	1.74	1.66	1.35	

Notes to Table 9.23.12.3.-C:

- (1) Where structural sheathing is used, lintel spans may be increased by 15%. Structural sheathing consists of a minimum 9.5 mm thick structural panel conforming to CSA O121, CSA O151, CSA O325 or CSA O437.0 fastened with at least two rows of fasteners to the exterior face of the lintel, and a single row to the top plates and studs. Fasteners shall conform to Table 9.23.3.5.-A.
- (2) A single piece of 89 mm thick lumber may be used in lieu of 2 pieces of 38 mm thick lumber on edge.
- (3) If floor joists span the full width of the *building* without support, lintel spans shall be reduced by 15% for “Roof, ceiling and 1 storey”, by 20% for “Roof, ceiling and 2 storeys”, and by 25% for “Roof, ceiling and 3 storeys”.
- (4) For ends of lintels fully supported by walls, provide minimum bearing length of 38 mm for lintel spans up to 3 m, or minimum bearing length of 76 mm for lintel spans greater than 3 m.
- (5) Spans for 0.6 m tributary width are calculated for lintels in end walls that support only a 0.6 m width of roof and ceiling, but do not support roof joists, roof rafters or roof trusses.
- (6) Lintel spans are calculated based on a maximum floor joist, roof joist or rafter span of 4.9 m and a maximum roof truss span of 9.8 m. Lintel spans may be increased by 5% if rafter and joist spans are not more than 4.3 m and roof truss spans are not more than 8.6 m. Spans may be increased by 10% if rafter and joist spans are not more than 3.7 m and roof trusses are not more than 7.4 m.
- (7) Spans apply only where the floors serve residential areas as described in Table 4.1.5.3., or the uniformly distributed *live load* does not exceed that specified for residential areas as described in Table 4.1.5.3.

Table 9.23.12.3.-D
Maximum Spans for Glued-Laminated Timber Lintels – 20f-E Stress Grade – Exterior Walls – Roof and Ceiling Load Only
 Forming Part of Sentences 9.23.2.8.(1), 9.23.4.5.(1), 9.23.12.3.(1) and (3)

Lintel Size, mm	Maximum Span, m ⁽¹⁾⁽²⁾⁽³⁾														
	Specified Snow Load, kPa														
	1.0			1.5			2.0			2.5			3.0		
	Supported Length, m ⁽⁴⁾⁽⁵⁾			Supported Length, m ⁽⁴⁾⁽⁵⁾			Supported Length, m ⁽⁴⁾⁽⁵⁾			Supported Length, m ⁽⁴⁾⁽⁵⁾			Supported Length, m ⁽⁴⁾⁽⁵⁾		
	2.4	3.6	4.8	2.4	3.6	4.8	2.4	3.6	4.8	2.4	3.6	4.8	2.4	3.6	4.8
130 × 304	6.23	5.63	5.24	5.63	5.09	4.73	5.24	4.73	4.40	4.95	4.48	4.17	4.73	4.28	3.87
80 × 380	6.52	5.89	5.48	5.89	5.32	4.96	5.48	4.96	4.52	5.19	4.69	4.11	4.96	4.39	3.80
130 × 342	6.80	6.15	5.72	6.15	5.56	5.17	5.72	5.17	4.81	5.41	4.89	4.55	5.17	4.67	4.35
80 × 418	7.00	6.33	5.89	6.33	5.72	5.32	5.89	5.32	4.96	5.57	5.03	4.52	5.32	4.81	4.18
130 × 380	7.36	6.65	6.19	6.65	6.01	5.59	6.19	5.59	5.21	5.86	5.29	4.92	5.59	5.06	4.70
80 × 456	7.48	6.76	6.29	6.76	6.10	5.68	6.29	5.68	5.29	5.95	5.37	4.93	5.68	5.13	4.56
130 × 418	7.91	7.15	6.65	7.15	6.46	6.01	6.65	6.01	5.59	6.29	5.68	5.29	6.01	5.43	5.05
80 × 494	7.94	7.17	6.68	7.17	6.48	6.03	6.68	6.03	5.61	6.31	5.71	5.31	6.03	5.45	4.94
80 × 532	8.39	7.58	7.06	7.58	6.85	6.38	7.06	6.38	5.93	6.67	6.03	5.61	6.38	5.76	5.32
130 × 456	8.44	7.63	7.10	7.63	6.89	6.41	7.10	6.41	5.97	6.71	6.07	5.65	6.41	5.80	5.39

Notes to Table 9.23.12.3.-D:

- (1) Spans are valid for glued-laminated timber conforming to CAN/CSA-O122 and CSA O177.
- (2) Provide a minimum bearing length of 89 mm. (Alternatively, the bearing length may be calculated in accordance with Part 4.)
- (3) Top edge of lintel assumed to be fully laterally supported.
- (4) Supported length means half the length of trusses or rafters, plus the length of overhang beyond the wall.
- (5) For intermediate supported lengths, straight interpolation may be used.

Part 10

Change of Use

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Part 10

Change of Use (See Note A-10)

Section 10.1. General

10.1.1. Scope

10.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

10.1.1.2. Change in Major Occupancy

- (1) The following changes of use are also deemed to be a change in *major occupancy* for the purposes of this Part:
 - (a) a *suite* of a Group C *major occupancy* is converted into more than one *suite* of a Group C *major occupancy*,
 - (b) a *suite* or part of a *suite* of a Group A, Division 2 or Group A, Division 4 *major occupancy* is converted to a *gaming premises*,
 - (c) a *farm building* or part of a *farm building* is changed to another *major occupancy* other than a Group G *major occupancy*,
 - (d) a *building* or part of a *building* is changed to a *post-disaster building*,
 - (e) a *building* or part of a *building* is changed to a *retirement home*,
 - (f) the use of a *building* or part of a *building* is changed and the previous *major occupancy* of the *building* or part of the *building* cannot be determined, or
 - (g) a *farm building* or part of a *farm building* is changed to a Group G, Division 1 *major occupancy*.

Section 10.2. Classification of Existing Buildings

10.2.1. Classification

10.2.1.1. Classification of Major Occupancy

- (1) Every existing *building* or part of it shall be classified according to its *major occupancy* in accordance with the requirements of Part 2 or Subsection 3.1.2.

10.2.1.2. Classification According to Construction and Occupancy

- (1) Except as provided in Sentence (2), for the purposes of this Part, existing *buildings* shall be classified as to their *construction* and *occupancy* as provided for in Sentence 11.2.1.1.(1).
- (2) For the purpose of Parts 10 and 11, the calculation of the *construction index* and *hazard index* for Group G *major occupancy* is permitted to be based on Group F, Division 2 *major occupancy*.

10.2.1.3. Building Size and Construction

- r1 (1) The requirements of Articles 2.2.2.3. to 2.2.2.8. and 3.2.2.20. to 3.2.2.93. do not apply to this Part.

Section 10.3. Requirements

10.3.1. General

10.3.1.1. General

- (1) Except as provided in Section 10.4., a *building* or part of a *building* subject to a change of *major occupancy* shall conform to the requirements of Subsection 3.2.6., Sections 3.7., 3.11. and 3.12., Sentences 6.3.1.1.(2), 6.3.2.7.(1) and 6.2.4.7.(1), Subsections 9.5.1. and 9.5.3., 9.5.3A. to 9.5.3F. and 9.5.4., Sentences 9.6.1.4.(3), (4), Article 9.7.2.3., Sentences 9.8.8.1.(4) to (8) and 9.9.10.1.(1) to (7), Subsection 9.10.17., Sections 9.31. and 9.32., and Subsections 9.34.1. to 9.34.3. as they apply to the new *major occupancy* that the *building* or part of a *building* is to support.
- (2) Where a *major occupancy* is changed to a Group B, Division 2 *major occupancy*, heating, ventilating, and air conditioning systems shall conform to the requirements of Sentence 6.2.1.1.(1).
- (3) Where a *major occupancy* is changed to a Group B, Division 3 *major occupancy*, ventilation, air circulation, and filtration systems, shall conform to the requirements of Sentence 6.2.1.1.(1).

10.3.2. Performance Level

10.3.2.1. General

- (1) The *performance level* of a *building* after the change of *major occupancy* shall not be less than the *performance level* prior to the change of *major occupancy*.
- (2) For the purposes of Sentence (1), reduction of *performance level* shall be determined in accordance with Article 10.3.2.2.
- (3) For the purpose of this Subsection, where a permit to construct a *farm building* has been applied for before January 1, 2025, the *performance level* of the *farm building* is permitted to be evaluated based on the applicable requirements of Ontario Regulation 332/12 (Building Code) made under the Act, as it read on December 31, 2024.

10.3.2.2. Reduction in Performance Level

- (1) Except as provided in Sentence (2), the *performance level* of a *building* or part of a *building* is reduced where the existing structural floor and roof framing systems and their supporting members are not adequate to support the proposed *dead loads* and *live loads* of the new *major occupancy* that the *building* is to support.
- (2) The inadequacy of the existing structural floor or roof framing system and its supporting members to support the proposed *dead loads* and *live loads* does not reduce the *performance level* of the *building* if the portion of the floor affected by the proposed loads is restricted to the loading it will support and signs stating the restrictions are posted.
- (3) Except as provided in Section 10.4., the *performance level* of a *building* or part of a *building* is reduced where the early warning and evacuation systems requirements of the *building* do not meet the early warning and evacuation systems requirements set out in Table 10.3.2.2.-A for the new *major occupancy* that the *building* is to support.

Table 10.3.2.2.-A
For Evaluation of Early Warning/Evacuation
 Forming Part of Sentence 10.3.2.2.(3)⁽²⁾

Early Warning / Evacuation Evaluation ⁽²⁾	Compliance Alternative ⁽¹⁾
Early Warning and Evacuation to be evaluated against (a) <i>access to exit</i> widths based on <i>occupant load</i> in Subsection 3.3.1. or 9.9.3.; (b) <i>exit</i> widths based on <i>occupant load</i> in Subsection 3.4.3. or 9.9.3.; (c) <i>exit</i> signs in Subsection 3.4.5. or 9.9.11.; (d) lighting of <i>exits</i> , lighting of <i>access to exits</i> and emergency lighting in Subsection 3.2.7. or 9.9.12.; (e) fire alarm system in Subsection 3.2.4. or 9.10.18.; (f) <i>smoke alarms</i> in Subsection 9.10.19.; (g) travel distance and number of <i>exits</i> in other Parts of this Division; (h) smoke control measures, and at least one elevator to permit transport of firefighters to all floors in <i>hotels</i> whose floor level is more than 18 m high, measured between <i>grade</i> and floor level of the top <i>storey</i> as per Subsection 3.2.6.; and (i) door release hardware requirements in Articles 3.3.1.13. and 3.4.6.16., and deficiencies shall be upgraded.	EARLY WARNING (a) <i>Compliance alternatives</i> as listed may be used. EVACUATION (b) <i>Compliance alternatives</i> as listed to <i>access to exit</i> and <i>exit</i> widths, number of <i>exits</i> , door release hardware, and travel distance may be used.

Notes to Table 10.3.2.2.-A:

- (1) See Tables 11.5.1.1.-A, 11.5.1.1.-B, 11.5.1.1.-C, 11.5.1.1.-D/E and 11.5.1.1.-F for *compliance alternatives* that may be used.
- (2) In the case of *farm buildings*, Early Warning and Evacuation to be evaluated against the corresponding Part 2 requirements to items (a) to (e) and (g) and (j) in this Table.

(4) Except as provided in Sentence (5), the *performance level* of an existing *building* is reduced where a change in use will result in a change of the *major occupancy* of all or part of an existing *building* to another *major occupancy* of a greater *hazard index*.

(5) Except as provided in Sentence (6), if the *hazard index* of the new *major occupancy* is greater than the *hazard index* of the existing *major occupancy*, the *performance level* is not reduced where the *hazard index* of the new *major occupancy* is not greater than the *construction index* of the existing *building*.

(6) Small or medium sized existing *buildings* as determined in Tables 11.2.1.1.-B to 11.2.1.1.-N facing multiple *streets* may be assigned a *hazard index* credit of 1, which may be subtracted from the *hazard index* of the new *major occupancy* provided,

- (a) the *building* does not contain a Group B, Division 1, a Group C, or a Group F, Division 1 *occupancy*, and
- (b) firefighting access complying with Articles 3.2.5.1. to 3.2.5.5. or Subsection 9.10.20. is provided.

(7) Except as provided in Sentence (8), the *performance level* of a *building* or part of a *building* is reduced in an existing *building* of *combustible construction* where,

- (a) the *occupancy* is changed to a *residential occupancy* in all or part of the *building*, and
- (b) if the *building* was new, it would have been required to be of *noncombustible construction* or to be constructed in accordance with Article 3.2.2.51. or 3.2.2.60.

(8) A change in the *occupancy* of a *building* or part of a *building* to a *residential occupancy* does not reduce the *performance level* of the *building* or part of the *building* where,

- (a) the *building* is *sprinklered*, and
- (b) the *building* does not exceed 6 *storeys* in *building height*.

(9) The *performance level* of a *building* or part of a *building* is reduced where the new *major occupancy* in an existing *building* of multiple *occupancy* is not separated from adjoining *major occupancies* by *fire separations* having *fire-resistance ratings* conforming to Article 3.1.3.1., Subsection 9.10.9. or Table 10.3.2.2.-B.

Table 10.3.2.2.-B⁽¹⁾
Additional Upgrading for Multiple Major Occupancies
 Forming Part of Sentence 10.3.2.2.(9)

New Major Occupancy	Code Requirements	Compliance Alternative	
		For Existing Building Reduce to	If Sprinklered Reduce to
All	Table 3.1.3.1. and Subsection 9.10.9. Where:		
	1 h rating required	45 min	30 min
	2 h rating required	1.5 h	1 h
	3 h rating required	2 h	1.5 h

Notes to Table 10.3.2.2.B:

(1) For *buildings* with multiple *major occupancies* only, where there is a change in *major occupancy*.

(10) The *performance level* of a *building* is reduced where the *building* after the change of *major occupancy* will not comply with Article 3.1.3.2. or 9.10.9.14.

(11) The *performance level* of a *building* or part of a *building* is reduced where, after a change of *major occupancy*,

- (a) the total daily design *sanitary sewage* flow of the new *major occupancy*, calculated in accordance with Article 8.2.1.3., exceeds the capacity of any component of a *sewage system* serving the *building*, or
- (b) the type or amount of *sanitary sewage* that will, under the new *major occupancy*, be discharged to a *sewage system* serving the *building* is prohibited by Article 8.1.3.1.

(12) The *performance level* of an existing *building* or part of an existing *building* is reduced where,

- (a) the use of the *building* or part of the *building* is changed to a *retirement home*, and
- (b) any of the following applies:
 - (i) the *retirement home* is not *sprinklered* throughout,
 - (ii) Clause 3.2.6.8.(1)(b) or (c), as applicable, requires that a voice communication system conforming to Article 3.2.4.22. be provided in the *building* and such a system is not provided in the *building*, or
 - (iii) the *retirement home* contains one or more doors to *suites* or sleeping rooms not within *suites*, other than doors leading directly to the exterior, that are not equipped with self-closing devices.

Section 10.4. Compliance Alternatives

10.4.1. Compliance Alternatives

10.4.1.1. Substitution

(1) Except as provided in Sentence (3), a *compliance alternative* to a requirement contained in Part 3, 4, 6 or 8 that is shown in Tables 11.5.1.1.-A, 11.5.1.1.-B, 11.5.1.1.-C, 11.5.1.1.-D/E or 11.5.1.1.-F may be substituted for the requirement where the *chief building official* is satisfied that compliance with the requirement is impracticable because,

- (a) of structural or *construction* difficulties, or
- (b) it is detrimental to the preservation of a *heritage building*.

(2) Except as provided in Sentence (3), a *compliance alternative* to a requirement contained in Part 9 or 12 shown in Tables 11.5.1.1.-C, 11.5.1.1.-D/E or 11.5.1.1.-F may be substituted for the requirement without satisfying the *chief building official* that the requirement is impracticable.

(3) Where the *building* has been in existence for less than five years, *compliance alternatives* may only be used in respect of requirements of this Division that are referenced in Sentences 10.3.2.2.(3), (5) and Table 10.3.2.2.-B.

Part 11

Renovation

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Part 11

Renovation

Section 11.1. General

11.1.1. Scope

11.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

11.1.1.2. Definitions

- (1) In this Part,

Building system means a combination of elements or components that form a complete major division of *construction* in the design of a *building* or part of a *building*, including a structural or framing system, a waterproofing system, a *drainage system*, an *exterior cladding* system, a roofing system, a window system, a *partition* system, a corridor system, a stair system, a fire alarm and detection system, a sprinkler system or a heating, ventilation or *air-conditioning* system, a *foundation* system, a standpipe and hose system, a flooring system, a *plumbing system*, a *sewage system* or an electrical system.

11.1.2. Application

11.1.2.1. Extension, Material Alteration or Repair

- (1) Where an existing *building* is subject to extension, material alteration or repair,
 - (a) the proposed *construction* shall comply with Section 11.3., and
 - (b) the *performance level* of the *building* shall be evaluated and compensating *construction* shall be undertaken in accordance with Section 11.4.

Section 11.2. Classification of Existing Buildings

11.2.1. Classification

11.2.1.1. Construction Index and Hazard Index

- (1) Where proposed *construction* will result in the change of *major occupancy* of all or part of an existing *building* to another *major occupancy*, the *building* shall be classified as to its,
 - (a) *construction* on the basis of its *construction index* as provided for in this Part, including Table 11.2.1.1.-A, and (See Note A-11.2.1.1.(1)(a))
 - (b) *occupancy* on the basis of its *hazard index* as provided for in this Part, including Tables 11.2.1.1.-B to 11.2.1.1.-N. (See Note A-11.2.1.1.(1)(b))

- (2) Small or medium sized existing *buildings* as determined in Tables 11.2.1.1.-B to 11.2.1.1.-N facing multiple *streets* may be assigned a *hazard index* credit of 1, which may be subtracted from the *hazard index* of the proposed *major occupancy* to reduce the additional upgrading required by Table 11.4.3.4.-A provided,
- (a) the *building* does not contain a Group B, Division 1, a Group C, or a Group F, Division 1 *occupancy*, and
- (b) firefighting access complying with Articles 3.2.5.1. to 3.2.5.5. or Subsection 9.10.20. is provided.
- r1 (3) The requirements of Articles 2.2.2.3. to 2.2.2.8. and 3.2.2.20. to 3.2.2.93. do not apply to this Part.
- (4) For the purpose of this Part, the calculation of the *construction index* and *hazard index* for a Group G *major occupancy* is permitted to be based on a Group F, Division 2 *major occupancy*.

11.2.1.2. Multiple Occupancies

- (1) The classification of an existing *building* of multiple *occupancy* under Article 11.2.1.1. shall be applied according to Articles 3.2.2.5. to 3.2.2.8.

11.2.1.3. Prohibition of Occupancy Combinations

- (1) Nothing in this Part relieves an applicant from complying with the requirements of Article 2.2.1.2., 3.1.3.2. or 9.10.9.14.

Section 11.3. Proposed Construction

11.3.1. New and Existing Building Systems

11.3.1.1. Material Alteration or Repair of a Building System

- (1) Where an existing *building system* is materially altered or repaired, the *performance level* of the *building* after the material alteration or repair shall be at least equal to the *performance level* of the *building* prior to the material alteration or repair. (See Note A-11.3.1.1.(1))

11.3.1.2. New Building Systems and Extension of Existing Building Systems

- (1) Except as provided in Article 11.3.3.1. and Section 11.5., the design and *construction* of a new *building system* or the extension of an existing *building system*, shall comply with all other Parts. (See Note A-11.3.1.2.(1))

11.3.2. Extension of Buildings

11.3.2.1. Portion of Extended Buildings

- (1) Where an existing *building* is extended,
- (a) this Part applies to the existing portion of the *building*, and
- (b) the extended portion of the *building* shall comply with all other Parts.

11.3.3. Renovation

11.3.3.1. Basic Renovation (See Note A-11.3.3.1.)

(1) Except as provided in Sentence (2) and Article 11.3.3.2., *construction* may be carried out to maintain the existing *performance level* of all or part of an existing *building*, by the reuse, relocation or extension of the same or similar materials or components, to retain the existing character, structural uniqueness, heritage value, or aesthetic appearance of all or part of the *building*, if the *construction* will not adversely affect the early warning and evacuation systems, *fire separations* or the structural adequacy or will not create an unhealthy environment in the *building*.

(2) *Construction* in respect of a Group B, Division 3 *occupancy*, a *hotel* or a *retirement home* may be carried out in accordance with Sentence (1) only if the *construction* will be in conformance with the Fire Code made under the *Fire Protection and Prevention Act, 1997*.

11.3.3.2. Extensive Renovation (See Note A-11.3.3.2.)

(1) Where existing interior walls or ceilings or floor assemblies or roof assemblies are substantially removed in an existing *building* and new interior walls, ceilings, floor assemblies or roof assemblies are installed in the *building*, structural and fire-resistance elements shall be constructed in compliance with the requirements of the other Parts.

(2) Except as provided in Section 11.5., the proposed *construction* within an existing *suite* shall comply with the requirements of Section 3.8. where,

- (a) new interior walls or floor assemblies are installed,
- (b) the *suite* has an area greater than 300 m², and
- (c) the *suite* is located in,

- (i) a *floor area* where the existing difference in elevation between the adjacent ground level and the floor level is not more than 200 mm, or
- (ii) a normally occupied *floor area* which is accessible by a passenger type elevator or other platform equipped passenger elevating device from an entrance *storey* where the existing difference in elevation between the adjacent ground level and the entrance *storey* level is not more than 200 mm.

(3) Except as provided in Section 11.5., the proposed *construction* within an existing *suite*, other than a *suite* described in Sentence (2) or a *suite* in a *building* described in Clause 3.8.1.1.(1)(a), (b), (c) or (d), shall comply with the requirements of Sentences 3.8.1.3.(6), 3.8.2.3.(6), 3.8.3.1.(6), 3.8.3.3.(19), 3.8.3.7.(1), 3.8.3.15.(5) and 3.8.3.16.(4) where new interior walls or floor assemblies are installed. (See Note A-11.3.3.2.(3))

(4) Except as provided in Sentence (5), where existing interior walls or ceilings or floor assemblies or roof assemblies are substantially removed on any *storey* in an existing *building* and new interior walls, ceilings, floor assemblies or roof assemblies are installed, the *storey* shall be *sprinklered* if,

- (a) the *storey* will contain a Group C *major occupancy*, and
- (b) the *building* is over 3 *storeys* in *building height*.

(5) Sentence (4) does not apply where the *building*,

- (a) conforms to Subclause 3.2.2.50.(1)(a)(ii), and
- (b) contains *dwelling units* having *means of egress* conforming to Sentence 3.3.4.4.(8).

(6) Where existing interior walls or ceilings or floor assemblies or roof assemblies are substantially removed and new interior walls, ceilings, floor assemblies or roof assemblies are installed in an existing *building* or part of an existing *building* that is a *retirement home*, the following requirements apply:

- (a) the *retirement home* shall be *sprinklered*,
- (b) a voice communication system conforming to Article 3.2.4.23. shall be provided in the *building*, if Clause 3.2.6.8.(1)(b) or (c), as applicable, requires that such a voice communication system be provided in the *building*, and
- (c) doors to *suites* and sleeping rooms not within *suites* in the *retirement home*, other than doors leading directly to the exterior, shall be equipped with self-closing devices.

11.3.4. Plumbing

11.3.4.1. Extension, Material Alteration or Repair

- (1) Despite Subsections 11.3.1. to 11.3.3., when an existing *building* is extended or subject to material alteration or repair, Part 7 applies,
 - (a) to the design and *construction* of *plumbing* in the extensions and those parts of the *building* subject to material alteration and repair, and
 - (b) to *plumbing* which is adversely affected by the extension, alteration or repair.

11.3.5. Sewage Systems

11.3.5.1. Existing Septic Tanks

- (1) Despite Subsections 11.3.1. to 11.3.3., where an existing *septic tank* is subject to material alteration, repair or replacement, the *construction* of the *septic tank* shall comply with Part 8.

11.3.5.2. Vertical Separations and Existing Sewage Systems

- (1) Despite Subsections 11.3.1. to 11.3.3., where an existing *sewage system* is extended or is subject to material alteration or repair, the requirements respecting the vertical separation to the water table set out in Part 8 apply to the extended, altered or repaired portions of the *sewage system* as well as to the existing portions of the *sewage system*.

Section 11.4. Performance Level Evaluation and Compensating Construction

11.4.1. General

11.4.1.1. Performance Level

- (1) The *performance level* of a *building* after *construction* shall not be less than the *performance level* of the *building* prior to *construction*.
- (2) For the purposes of Sentence (1), reduction of *performance level* shall be determined in accordance with Subsection 11.4.2.
- (3) Where the proposed *construction* would reduce the *performance level* of an existing *building*, compensating *construction* shall be required in conformance with Subsection 11.4.3.
- (4) For the purpose of this Subsection, where a permit to construct a *farm building* has been applied for before January 1, 2025, the *performance level* of the *farm building* is permitted to be evaluated based on the applicable requirements of Ontario Regulation 332/12 (Building Code) made under the Act, as it read on December 31, 2024.

11.4.2. Reduction in Performance Level

11.4.2.1. Structural

- (1) The *performance level* of an existing *building* is reduced where after proposed *construction* in all or part of an existing *building*,
 - (a) the *major occupancy* will change to a different *major occupancy*,
 - (b) the *occupant load* will increase by more than 15%, or
 - (c) the *live load* will increase due to change in use within the same *major occupancy*,

and the existing structural floor and roof framing systems and their supporting members after the *construction* are not adequate to support the proposed *dead loads* and *live loads*.

11.4.2.2. Increase in Occupant Load

- (1) Except as provided in Sentences 11.4.2.5.(2) and (3), the *performance level* of an existing *building* is reduced where proposed *construction* will increase the *occupant load* of an existing *building* by more than 15%.
- (2) The *performance level* of an existing *building* is reduced where proposed *construction* will increase the *occupant load* by 15% or less and the new *occupant load* will be more than 15% above the *occupant load* for which a fire alarm system is required under Sentence 3.2.4.1.(2).
- (3) The *performance level* of an existing *building* is reduced where proposed *construction* will increase the *occupant load* by 15% or less and the new *occupant load* will be more than 15% above the existing *exit capacity* as required under Article 3.4.3.2.

11.4.2.3. Change of Major Occupancy

- (1) Except as provided in Sentence 11.4.2.5.(4), the *performance level* of an existing *building* is reduced where proposed *construction* will result in,
 - (a) the change of the *major occupancy* of all or part of an existing *building* to another *major occupancy* of a greater *hazard index*,
 - (b) the conversion of a *suite* of a Group C *major occupancy* into more than one *suite* of Group C *major occupancy*,
 - (c) the conversion of a *suite* or part of a *suite* of a Group A, Division 2 or a Group A, Division 4 *major occupancy* into a *gaming premises*,
 - (d) the change of a *farm building* or part of a *farm building* to another *major occupancy other than a Group G major occupancy*,
 - (e) the change of a *building* or part of a *building* to a *post-disaster building*,
 - (f) the change of a *building* or part of a *building* to a *retirement home*,
 - (g) the change in use of a *building* or part of a *building* where the previous *major occupancy* of the *building* or part of the *building* cannot be determined, or
 - (h) the change of a *farm building* or part of a *farm building* to a Group G, Division 1 *major occupancy*.
- (2) For the purpose of this Article and Sentences 11.4.2.1.(1) and 11.4.2.5.(4), the change of use set out in Clauses (1)(b) to (h) is also deemed to constitute a change in *major occupancy*.
- (3) The *performance level* of an existing *building* is reduced where the early warning and evacuation systems requirements of other Parts for the proposed *major occupancy* exceed those of the existing *building*.
- (4) The *performance level* of an existing *building* is reduced where the proposed *major occupancy* in the *building* is not separated from the adjoining *major occupancies* by *fire separations* having *fire-resistance ratings* conforming to Tables 2.2.1.4., 3.1.3.1. and 11.4.3.4.-B.

(5) The *performance level* of an existing *building* is reduced where the *occupancy* of all or part of an existing *building* of *combustible construction* is changed to a new *major occupancy* that would require the *building*, if it were a new *building*, to be of *noncombustible construction* or to be constructed in accordance with Article 3.2.2.51. or 3.2.2.60.

(6) Despite Clause (1)(a), the *performance level* of an existing *building* is reduced where proposed *construction* will result in the change of the *major occupancy* of all or part of an existing *building* to a Group C *major occupancy* in a *building* over 3 *storeys* in *building height*, except in a *building* conforming to Subclause 3.2.2.50.(1)(a)(ii) and having an egress facility conforming to Sentence 3.3.4.4.(8).

11.4.2.4. Plumbing

(1) The *performance level* of an existing *building* is reduced where the existing *building* is extended or subject to material alteration or repair, and *plumbing* in the existing *building* is adversely affected by the extension, alteration or repair.

11.4.2.5. Sewage Systems

(1) The *performance level* of an existing *building* is reduced where the existing *building* is extended or subject to material alteration or repair and a *sewage system* serving the existing *building* is adversely affected by the extension, alteration or repair of the existing *building*.

(2) Except as provided in Sentence (3), the *performance level* of an existing *building* is reduced where proposed *construction* will increase the *occupant load* of an existing *building*, and the new *occupant load* will result in the total daily design *sanitary sewage* flow of the *building*, calculated in accordance with Article 8.2.1.3., exceeding the capacity of any component of a *sewage system* serving the *building*.

(3) The *performance level* of an existing *dwelling unit* is reduced where *proposed construction* that,
(a) increases the number of bedrooms in the *dwelling unit*,
(b) exceeds 15% of the finished area of the *dwelling unit*, or
(c) adds new *plumbing fixtures* to the *dwelling unit*,

will result in the total daily design *sanitary sewage* flow of the *dwelling unit*, calculated in accordance with Article 8.2.1.3., exceeding the capacity of any component of a *sewage system* serving the *dwelling unit*.

(4) The *performance level* of an existing *building* is reduced where proposed *construction* will result in the change of a *major occupancy* of all or part of the existing *building* to another *major occupancy* and,
(a) the total daily design *sanitary sewage* flow of the proposed *major occupancy*, calculated in accordance with Article 8.2.1.3., exceeds the capacity of any component of a *sewage system* serving the *building*, or
(b) the type or amount of *sanitary sewage* which will, under the proposed *major occupancy*, be discharged to a *sewage system* serving the *building*, is prohibited by Article 8.1.3.1.

11.4.2.6. Extension of Buildings of Combustible Construction

(1) The *performance level* of an existing *building* of *combustible construction* is reduced where the existing *building* is extended by adding a *storey* or *storeys* such that the extended *building* will be more than four *storeys* in *building height*.

11.4.3. Compensating Construction

11.4.3.1. General (See Note A-11.4.3.1.)

(1) Where the *performance level* of an existing *building* is reduced under Subsection 11.4.2., compensating *construction* shall be carried out in accordance with this Subsection.

- (2) Except as provided in Sentence (3), compensating *construction* required under this Subsection applies to the part of the *building* being altered and shall include,
 - (a) *fire separations*, with the required *fire-resistance ratings*, separating the part being altered from the *floor areas* immediately above and below and from the immediate adjacent areas, and
 - (b) *access to exits* and *exits* from the *building*, where the alteration adversely affects the *exit* system of the *building*.
- (3) Compensating *construction* required under this Subsection applies to the existing *building systems* that are adversely affected by the proposed *construction*.

11.4.3.2. Structural

- (1) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.1.(1),
 - (a) remedial measures shall be taken to support the proposed loads, or
 - (b) the portion of the floor affected by the proposed loads shall be restricted to the loading it will support and signs stating the restrictions shall be posted.
- (See Note A-11.4.3.2.(1))

11.4.3.3. Increase in Occupant Load (See Note A-11.4.3.3.)

- (1) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.2.(1), (2) or (3), the *building* shall be evaluated, and the early warning and evacuation systems shall be upgraded, in conformance with the applicable requirements of Table 11.4.3.3.
- (2) Sentence (1) does not apply in a Group C *occupancy* where the new total *occupant load* is,
 - (a) 14 persons or fewer in a *boarding, lodging or rooming house*, except that where the *occupant load* is between 10 and 15 persons, an interconnected system of *smoke alarms* in corridors near stairways is required, or
 - (b) 16 persons or fewer in a *building* containing residential *suites* which are *dwelling units*, except that where the *occupant load* is between 10 and 17 persons, an interconnected system of *smoke alarms* in corridors near stairways is required.
- (3) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.2.(1), additional *construction* shall be required in order that the *building* or part of the *building* subject to the increase in *occupant load* conforms to the requirements of Sentences 2.4.2.1.(1) and 6.3.1.1.(2), Subsection 3.7.4. and Article 9.31.1.1.

11.4.3.4. Change in Major Occupancy (See Note A-11.4.3.4.)

- (1) Where the *performance level* of an existing *building* is reduced under Clause 11.4.2.3.(1)(a), (b), (c), (d), (e) or (g), additional upgrading shall be required in conformance with Table 11.4.3.4.-A and so that the *construction index* of the *building* is increased to at least equal the *hazard index* of the new *major occupancy* that the *building* is to support.
- (2) A *building* or part of the *building* subject to a change of *major occupancy* shall conform to the requirements of Articles 2.4.2.3. to 2.4.2.5., Subsection 3.2.6., Sections 3.7., 3.11., 3.12., Sentences 6.3.1.1.(2), and 6.3.2.7.(1) and 9.33.6.13.(7.1), Subsections 9.5.1. and 9.5.3., 9.5.3A. to 9.5.3F. and 9.5.4., Section 9.7., Subsection 9.10.17., Sections 9.31. and 9.32., and Subsections 9.34.1. to 9.34.3. as they apply to the new *major occupancy* that the *building* or part of the *building* is to support.
- (3) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.3.(3), the *building* shall be evaluated, and the early warning and evacuation systems shall be upgraded, in conformance with the applicable requirements of Table 11.4.3.3.
- (4) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.3.(4), upgrading of the *fire separations* shall be required in conformance with the applicable requirements of Article 3.1.3.1. and Table 11.4.3.4.-B.

- (5) Where the *performance level* is reduced under Sentence 11.4.2.3.(5), the requirement for the *building* to be of *noncombustible construction* or to be constructed in accordance with Article 3.2.2.51. or 3.2.2.60. is satisfied if the *building* is *sprinklered*.
- (6) Where the *performance level* is reduced under Sentence 11.4.2.3.(6), the *storey* subject to the change shall be *sprinklered*.
- (7) Where the *performance level* of an existing *building* is reduced under Clause 11.4.2.3.(1)(f), the following requirements apply:
- (a) the *retirement home* shall be *sprinklered*,
 - (b) a voice communication system conforming to Article 3.2.4.22. shall be provided in the *building*, and
 - (c) doors to *suites* and sleeping rooms not within *suites* in the *retirement home*, other than doors leading directly to the exterior, shall be equipped with self-closing devices.
- (8) Where a *major occupancy* is changed to a Group B, Division 2 *major occupancy*, heating, ventilating, *air conditioning* systems shall conform to the requirements of Sentence 6.2.1.1.(1).
- (9) Where a *major occupancy* is changed to a Group B, Division 3 *major occupancy*, ventilation, air circulation, and filtration systems shall conform to the requirements of Sentence 6.2.1.1.(1).

11.4.3.5. Plumbing

- (1) Where the *performance level* of an existing *building* is reduced under Sentence 11.4.2.4.(1), upgrading of *plumbing* in the existing *building* which is adversely affected by the extension, alteration or repair shall be required in conformance with Part 7.

11.4.3.6. Sewage Systems

- (1) Where the *performance level* of an existing *building* is reduced under Article 11.4.2.5., upgrading of a *sewage system* which is adversely affected by the *construction*, increase in *occupant load*, increase in the total daily design *sanitary sewage* flow or change in amount or type of *sanitary sewage* shall be required in conformance with Part 8.

11.4.3.7. Extension of Buildings of Combustible Construction

- (1) Where the *performance level* of an existing *building* is reduced under Article 11.4.2.6., the *building* shall be *sprinklered*.

Section 11.5. Compliance Alternatives

11.5.1. Compliance Alternatives (See Note A-11.5.1.)

11.5.1.1. Compliance Alternatives

- (1) A *compliance alternative* shown in Table 11.5.1.1.-A, 11.5.1.1.-B, 11.5.1.1.-C, 11.5.1.1.-D/E or 11.5.1.1.-F may be substituted for a requirement contained in Part 3, 4, 6 or 8 where the *chief building official* is satisfied that compliance with the requirement is impracticable because,
- (a) of structural or *construction* difficulties, or
 - (b) it is detrimental to the preservation of a *heritage building*.

(2) A *compliance alternative* shown in Table 11.5.1.1.-A, 11.5.1.1.-B, 11.5.1.1.-C, 11.5.1.1.-D/E or 11.5.1.1.-F may be substituted for a requirement contained in Part 9 or 12 without satisfying the *chief building official* that compliance with the requirement is impracticable.

Table 11.2.1.1.-A
Construction Index
 Forming Part of Sentence 11.2.1.1.(1)

Fire-Resistance Rating			Type of Construction	C.I. ⁽²⁾
Floors over <i>Basement</i>	Other Floors	Roof		
3 h	3 h	1.5 h	<i>Noncombustible</i>	8 ⁽¹⁾
2 h	2 h	1 h	<i>Noncombustible</i>	7
1 h	1 h	45 min	<i>Noncombustible</i>	6
45 min	45 min	0 h	<i>Noncombustible</i>	5
45 min	45 min	45 min	<i>Heavy Timber</i>	5
45 min	45 min	45 min	<i>Combustible</i>	5
45 min	0 h	0 h	<i>Noncombustible</i>	4
45 min	45 min	0 h	<i>Combustible</i>	4
30 min	0 h	0 h	<i>Noncombustible</i>	3
30 min	30 min	0 h	<i>Combustible</i>	3
0 h	30 min	0 h	<i>Combustible</i>	2
0 h	0 h	0 h	<i>Combustible</i>	1 ⁽¹⁾

Notes to Table 11.2.1.1.-A:

- (1) *C.I.* of 1 is lowest fire protection *performance level* and *C.I.* of 8 is highest.
- (2) Take highest rating for *C.I.* from Table 11.2.1.1.-A for existing *building*.

Table 11.2.1.1.-B⁽¹⁾⁽⁴⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group A Division 1	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Dinner Theatres	4	5	6
Live Theatres	4	5	6
Motion Picture Theatres	4	5	6
Opera Houses	4	5	6
Television Studios (With Audience)	4	5	6

Notes to Table 11.2.1.1.-B:

(1) <i>Building Size (Maximum)</i> ⁽²⁾⁽³⁾	
<ul style="list-style-type: none"> – 300 <i>occupant load maximum / 1 storey</i> – 600 m² / 600 <i>occupant load maximum / 1 storey with less than 40% 2 storey</i>⁽⁶⁾ – Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top <i>storey</i> – Over 18 m high, measured between <i>grade</i> and the floor level of the top <i>storey</i> 	Small Medium Large H.I. = 7

(2) Sizes are based on *building area* and *building height*, unless noted.

(3) *Building size* is based on the existing *building* facing one *street*.

(4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.

(5) Take lowest rating for *H.I.* from Table for *major occupancy change*.

(6) *Building* may have less than 40% of its area as 2 *storeys* for purposes as described in Clauses 3.2.2.21.(1)(c) and (d).

Table 11.2.1.1.-C⁽¹⁾⁽⁴⁾⁽⁶⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group A Division 2	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Art Galleries	3	4	6
Auditoria	3	4	6
Billiard Halls, Amusement Arcades	3	4	6
Bowling Alleys	3	4	6
Churches	3	4	6
Clubs, Lodges (Non-Residential)	3	4	6
Community Halls	3	4	6
Concert Halls	3	4	6
Court Rooms	3	4	6
Dance Halls	3	4	6
Daycare Centres	3	4	6
Exhibition Halls (Without Sales)	3	4	6
Exhibition Halls (With Sales)	See Group E		
<i>Gaming premises</i>	3	4	6
Gymnasia (Multi-Purpose)	3	4	6
Gymnasia (Athletic)	3	4	6
Lecture Halls	3	4	6
Libraries	3	4	6
Licensed Beverage Establishments	3	4	6
Licensed Clubs, Lodges	3	4	6
Museums	3	4	6
Passenger Stations / Depots	3	4	6
<i>Public Heritage Buildings</i>	3	—	—
Recreational Piers	3	4	6
Restaurants	3	4	6
Schools, Colleges	3	4	6
Undertaking Premises	3	4	6

Table 11.2.1.1.-C⁽¹⁾⁽⁴⁾⁽⁶⁾ (Cont'd)
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Notes to Table 11.2.1.1.-C:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
- 400 m ² / 1 storey	Small
- 250 m ² / 3 storey (<i>Public Heritage Building</i>)	Small
- 800 m ² / 2 storey	Medium
- Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey	Large
- Over 18 m high, measured between <i>grade</i> and the floor level of the top storey	<i>H.I. = 7</i>

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building size* is based on the existing *building* facing one *street*.
- (4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (5) Take lowest rating for *H.I.* from Table for *major occupancy change*.
- (6) *Buildings* which exceed 3 storeys in *building height* and are of *combustible construction* shall be *sprinklered*.

Table 11.2.1.1.-D⁽¹⁾⁽⁴⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group A Division 3	Occupancy <i>H.I.</i> ⁽⁵⁾		
	Small	Medium	Large
Arenas (No Occupancy On Activity Surface)	3	4	6
Armouries (No Occupancy On Activity Surface)	3	4	6
Enclosed Stadia or Grandstand	3	4	6
Ice Rinks (No Occupancy On Activity Surface)	3	4	6
Indoor Swimming Pools	3	4	6

Notes to Table 11.2.1.1.-D:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
- 1 000 m ² / 1 storey	Small
- 2 000 m ² / 2 storey	Medium
- Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey	Large
- Over 18 m high, measured between <i>grade</i> and the floor level of the top storey	<i>H.I. = 7</i>

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building size* is based on the existing *building* facing one *street*.
- (4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (5) Take lowest rating for *H.I.* from Table for *major occupancy change*.

Table 11.2.1.1.-E⁽¹⁾⁽³⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group A Division 4	Occupancy H.I. ⁽⁴⁾		
	Small	Medium	Large
Amusement Park Structures	2	3	5
Bleachers	1	3	5
Grandstands (Open)	1	3	5
Reviewing Stands	1	3	5
Stadia (Open)	1	3	5

Notes to Table 11.2.1.1.-E:

(1)

<i>Building Size (Maximum)⁽²⁾</i>	
<ul style="list-style-type: none"> – 2 500 occupant load max. / min. limiting distance of 6 m (<i>combustible</i>) – 15 000 occupant load maximum (with roof at least ½ rating if <i>combustible</i>) – Unlimited occupant load 	Small Medium Large

- (2) *Building size is based on the existing building facing one street.*
- (3) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (4) Take lowest rating for *H.I.* from Table for *major occupancy change*.

Table 11.2.1.1.-F⁽¹⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group B Division 1	Occupancy H.I. ⁽³⁾⁽⁵⁾		
	Small	Medium	Large
Detention Facilities (Minimum Security) ⁽⁴⁾	4	5	6
Detention Facilities (All Other Types of Security)	6	6	7
Police Station with Detention	3	—	—

Notes to Table 11.2.1.1-F:

(1) <i>Building Size (Maximum)</i> ⁽²⁾	
<ul style="list-style-type: none"> – Any area / 1 storey – 600 m² / 1 storey (Police Station with Detention) – Any area (<i>noncombustible</i>) / 2 storey – Any area (<i>noncombustible</i>); 500 m² (<i>combustible</i>) / 2 storey – Over 18 m high, measured between <i>grade</i> and the floor level of the top storey (<i>noncombustible</i>) – Over 500 m² (<i>combustible</i>) / over 2 storey 	<ul style="list-style-type: none"> Small Small Medium Large H.I. = 7 H.I. = 7

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (4) Minimum security means occupants free to exit *building* in a fire emergency.
- (5) *Detention occupancy* with any *H.I.* shall be *sprinklered*.

Table 11.2.1.1-G⁽¹⁾⁽⁴⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group B Division 2	Occupancy <i>H.I.</i> ⁽⁵⁾⁽⁷⁾		
	Small	Medium	Large
Hospital, Long-Term Care Home (Immobile) ⁽⁶⁾	4	5	7
Hospital, Long-Term Care Home (Non-Ambulatory) ⁽⁶⁾	4	5	6
Hospital, Long-Term Care Home (Ambulatory) ⁽⁶⁾	3	4	6
Psychiatric Facility (Maximum Confinement)	4	5	7
Psychiatric Facility (Minimum Confinement)	3	4	6
Police Station With Detention (as Permitted in Article 3.1.2.4.)	3	—	—

Notes to Table 11.2.1.1-G:

(1) <i>Building Size (Maximum)</i> ⁽²⁾⁽³⁾	
<ul style="list-style-type: none"> – 250 m² / 1 storey – 600 m² / 1 storey (Police Station with Detention) – 500 m² / 2 storey; 1 000 m² / 1 storey – Any area (<i>noncombustible</i>); 500 m² (<i>combustible</i>) / 2 storey – Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey – Over 18 m high, measured between <i>grade</i> and the floor level of the top storey 	<ul style="list-style-type: none"> Small Small Medium Medium Large H.I. = 7

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building size* is based on the existing *building* facing one *street*.
- (4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (5) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (6) Immobile means patients are attached to life support systems and cannot be moved. Non-Ambulatory means patients are confined to bed and require transportation. Ambulatory means patients may walk on their own.
- (7) *Care and treatment occupancy* with any *H.I.* shall be *sprinklered*.

Table 11.2.1.1.-H⁽¹⁾
 Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group B Division 3	Occupancy H.I. ⁽⁴⁾⁽⁵⁾		
	Small	Medium	Large
Residential care facilities			
(Ambulatory) ⁽⁶⁾	3	4	6
(Non-Ambulatory) ⁽⁶⁾	4	5	6
Children Custodial Homes	3	4	6
Convalescent Homes			
(Ambulatory) ⁽⁶⁾	3	4	6
(Non-Ambulatory) ⁽⁶⁾	4	5	6
Group Homes For Adult Residents with Developmental Disabilities			
(Minimum Confinement)	3	4	6
(Maximum Confinement)	4	5	6

Notes to Table 11.2.1.1.-H:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
<ul style="list-style-type: none"> – 600 m² / 1 storey – 500 m² / 2 storey; 1 000 m² / 1 storey – Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey – Over 18 m high, measured between <i>grade</i> and the floor level of the top storey 	Small Medium Large H.I. = 7

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building* size is based on the existing *building* facing one *street*.
- (4) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (5) *Care occupancy* with any *H.I.* shall be *sprinklered*.
- (6) Non-Ambulatory means patients are confined to bed and require transportation. Ambulatory means patients may walk on their own.

Table 11.2.1.1.-I⁽¹⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group C	Occupancy H.I. ⁽⁴⁾		
	Small	Medium	Large
Apartments	3	4	6
Boarding Houses/Group Homes	3	—	—
Clubs, Residential	3	4	6
Colleges, Residential	3	4	6
Convents	3	4	6
Dormitories/Hostels	3	4	6
<i>Hotels</i>	3	5	6
Houses	2	2	—
Lodging Houses	3	—	—
<i>Live/work units</i>	4	5	7
Monasteries	3	4	6
<i>Public Heritage Buildings</i>	3	—	—
Rectories	2	—	—
<i>Retirement Homes</i>	3	4	6
Rooming Houses	3	—	—
Schools, Boarding	3	4	6

Notes to Table 11.2.1.1.-I:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
<ul style="list-style-type: none"> – 600 m² / 3 storey – 250 m² / 3 storey (<i>Public Heritage Building</i>) – 2 000 m² / not exceeding 6 storeys – Any area / not exceeding 36 m high, measured between <i>grade</i> and the floor level of the top storey – Over 36 m high, measured between <i>grade</i> and the floor level of the top storey – <i>Hotels</i> over 18 m high, measured between <i>grade</i> and the floor level of the top storey 	Small Small Medium Large <i>H.I. = 7</i> <i>H.I. = 7</i>

(2) Sizes are based on *building area* and *building height*, unless noted.

(3) *Buildings* which exceed 3 storeys in *building height* and are of *combustible construction* shall be *sprinklered*.

(4) Take lowest rating for *H.I.* from Table for *major occupancy change*.

Table 11.2.1.1.-J⁽¹⁾⁽⁴⁾⁽⁶⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group D	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Advertising and Sales Offices	3	3	5
Automatic Bank Deposit	3	4	5
Barber/Hairdresser Shops	3	4	5
Beauty Parlours	3	4	5
Branch Banks	3	4	5
Car Rental Premises	3	3	5
Chiropractic Offices	3	4	5
Communications Offices (Telecommunications)	3	4	5
Communications Offices (Courier)	3	3	5
Computer Centres	3	4	5
Construction Offices	3	3	5
Costume Rental Premises	3	4	5
Dental Offices (Denture Clinic)	3	4	5
Dental Offices (Surgical/Anaesthesia)	4	5	6
Dental Offices (General)	3	4	5
Dry Cleaning Depots	3	4	5
Dry Cleaning Premises (Self-Serve)	4	4	5
Health/Fitness Clubs	3	4	5
Laundries (Self-Serve)	4	4	5
Massage Parlours	3	4	5
Medical Offices (Examination)	3	4	5
Medical Offices (Surgical/Anaesthesia)	4	5	6
Offices (Business)	3	3	5
Offices (Charitable)	3	3	5
Offices (Legal/Accounting)	3	3	5
Offices/Studios (Design)	3	4	5

Table 11.2.1.1.-J⁽¹⁾⁽⁴⁾⁽⁶⁾ (Cont'd)
 Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group D	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Pharmacy Offices	3	4	5
Photographic Studios	3	4	5
Physiotherapy Offices	3	4	5
Police Stations (No Detention)	3	4	5
Printing and Duplicating	4	5	6
<i>Public Heritage Buildings</i>	3	—	—
Public Saunas	3	4	5
Radio Stations (No Audience)	3	4	5
Small Tool Rental Premises	3	4	5
Suntan Parlours	3	4	5
Veterinary Offices	3	4	5

Notes to Table 11.2.1.1.-J:

(1) <i>Building Size (Maximum)</i> ⁽²⁾⁽³⁾	
– 800 m ² / 2 storey	Small
– 250 m ² / 3 storey (<i>Public Heritage Building</i>)	Small
– 1 600 m ² / 3 storey	Medium
– Any area / not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey	Large
– Over 18 m high, measured between <i>grade</i> and the floor level of the top storey, but not exceeding 36 m high, measured between <i>grade</i> and the floor level of the top storey	H.I. = 6
– Over 36 m high, measured between <i>grade</i> and the floor level of the top storey	H.I. = 7

(2) Sizes are based on *building area* and *building height*, unless noted.

(3) *Building size* is based on the existing *building* facing one *street*.

(4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.

(5) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.

(6) *Buildings* which exceed 3 storeys in *building height* and are of *combustible construction* shall be *sprinklered*.

Table 11.2.1.1.-K⁽¹⁾⁽⁴⁾⁽⁶⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group E	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Automotive/Hardware Department Stores	4	5	7
China Shops	3	4	6
Department Stores	4	5	7
Electrical Stores (Fixtures)	3	3	5
Exhibition Halls (With Sales)	4	5	7
“Fast Food” Outlets	3	4	5
Feed and Seed Stores	4	5	7
Flea Markets	4	5	7
Flowers Shops	3	4	6
“Food” and Vegetable Markets	3	4	6
Garden Shops	3	4	6
“Gas” Bars	4	5	7
Gift Shops	3	4	6
Home Improvement Stores	4	5	7
Kitchen/Bathroom Cupboards Stores	3	4	6
Plumbing Stores (Fixtures/Accessories)	3	3	5
“Pop” Shops	3	4	6
<i>Public Heritage Buildings</i>	3	—	—
Rentals	See Group D		
Restaurants (Not More Than 30 Persons as Permitted by Article 3.1.2.7.)	3	4	5
Shopping Malls	4	5	7
Stationery/Office Supply Stores	3	4	6
Stores (Art)	3	4	6
Stores (Baked Goods)	3	4	6
Stores (Beer)	3	4	6
Stores (Book)	3	4	6
Stores (Camera)	3	4	6
Stores (Candy)	3	4	6

Table 11.2.1.1.-K⁽¹⁾⁽⁴⁾⁽⁶⁾ (Cont'd)
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group E	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Stores (Clothing)	3	4	6
Stores (Drugs)	4	4	6
Stores (Electronic)	3	4	6
Stores (Floor Coverings)	4	5	7
Stores (Food)	3	3	6
Stores (Furniture/Appliances)	3	4	6
Stores (Hardware)	4	5	7
Stores (Health)	4	4	6
Stores (Hobby)	3	4	6
Stores (Jewellery)	3	3	5
Stores (Paint/Wallpaper)	4	5	7
Stores (Pet)	3	4	6
Stores (Records/Tapes)	3	4	6
Stores (Spirits)	4	5	7
Stores (Toys)	4	5	7
Stores (Variety)	4	4	6
Stores (Video Sales/Rental)	3	4	6
Supermarkets	3	4	6

Notes to Table 11.2.1.1.-K:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
<ul style="list-style-type: none"> – 600 m² / 2 storey – 250 m² / 3 storey (<i>Public Heritage Building</i>) – 800 m² / 3 storey – Any area / up to 18 m high, measured between <i>grade</i> and the floor level of the top storey – Over 18 m high, measured between <i>grade</i> and the floor level of the top storey 	Small Small Medium Large H.I. = 7

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building size* is based on the existing *building* facing one *street*.
- (4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (5) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (6) All *buildings* 1 500 m² and over are to be *sprinklered*.

Table 11.2.1.1.-L⁽¹⁾⁽⁴⁾⁽⁵⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group F Division 1	Occupancy H.I. ⁽³⁾		
	Small	Medium	Large
Ammunition Manufacturing and Storage	3	6	8
Black Powder Manufacturing and Storage	3	6	8
Bulk Plants for Flammable Liquids	3	6	8
Bulk Storage Warehouse (Hazardous Substances)	3	6	8
Cereal and Feed Mills	3	6	8
Chemical Manufacturing/Processing Plant	3	6	8
<i>Distilleries</i>	3	6	8
Dry Cleaning Plants (Flammable)	3	6	8
Explosives Manufacturing and Storage	3	6	8
Fertilizer Manufacturing Plants	3	6	8
Fireworks Manufacturing and Storage	3	6	8
Flour Mills	3	6	8
Gas (Flammable) Compressor Stations	3	6	8
Gas (Flammable) Manufacturing and Storage	3	6	8
Grain Elevators	3	6	8
Lacquer Factories	3	6	8
Loading Area for all Group F, Division 1	3	6	8
Mattress Factories (High Fire Load)	3	6	8
Paint/Varnish/Pyroxylin Factories	3	6	8
Petrochemical Plants	3	6	8
Refineries	3	6	8
Rubber Processing Plants	3	6	8
Spray Painting Operations	3	6	8
Waste Paper Processing Plants (Dry)	3	6	8

Notes to Table 11.2.1.1.-L:

(1) <i>Building Size (Maximum)</i> ⁽²⁾	
<ul style="list-style-type: none"> - 400 m² / 2 storey - 600 m² / 4 storey - 1 500 m² / 4 storey 	Small Medium Large

- (2) Sizes are based on *building area* and *building height*.
- (3) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (4) All *buildings* 1 500 m² and over are to be *sprinklered*.
- (5) All floor assemblies shall be *fire separations*.

Table 11.2.1.1.-M⁽¹⁾⁽⁴⁾⁽⁶⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group F Division 2	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Aircraft Hangars	3	5	6
Abattoirs	3	4	5
Bakeries	3	5	6
Body Shops	3	5	6
Candy Plants	3	4	5
Cold Storage Plants <i>Combustible</i> Insulation Flammable Refrigerant <i>Combustible</i> Packaging	3	5	7
<i>Combustible</i> Insulation Flammable Refrigerant <i>Noncombustible</i> Packaging	3	5	6
<i>Combustible</i> Insulation Non-Flammable Refrigerant <i>Noncombustible</i> Packaging	3	4	5
<i>Noncombustible</i> Insulation Non-Flammable Refrigerant <i>Noncombustible</i> Packaging	2	3	4
Dry Cleaning Establishments (Non-flammable or Non-explosive)	3	4	5
Electrical Substations	3	4	5
Factories (High Fire Load)	3	5	6
Freight Depots (High Fire Load)	3	5	6
Helicopter Landings (On Roof)	3	4	5
Laboratories (High Fire Load)	3	5	6
Laundries (Not Self-Serve)	3	4	5
Manufacturer Sales (High Fire Load)	3	5	6
Mattress Factories	3	4	5
Meat Packing Plants	3	4	5

Table 11.2.1.1.-M⁽¹⁾⁽⁴⁾⁽⁶⁾ (Cont'd)
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group F Division 2	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Packaging Manufacturers (Cellulose)	3	4	5
Packaging Manufacturers (Noncombustible)	2	3	4
Packaging Manufacturers (Plastics)	3	5	6
Paper Processing Plants (Wet)	3	5	6
Planing Mills	3	5	6
Printing Plants	3	4	5
<i>Public Heritage Buildings</i>	3	3	—
Repair Garages	3	5	6
Sample Display Rooms (High Fire Load)	3	5	6
Self-Service Storage Buildings	3	4	5
Service Stations (No Spray Painting)	3	5	6
Storage Rooms (High Fire Load)	3	5	6
Television Studios (No Audience)	3	4	5
Tire Storage	3	5	6
Warehouses (High Fire Load)	3	5	6
Welding Shops	3	5	6
Wholesale Rooms (High Fire Load)	3	5	6
Wood Working Factories	3	5	6
Workshops (High Fire Load)	3	5	6

Notes to Table 11.2.1.1.-M:

(1) <i>Building Size (Maximum)⁽²⁾⁽³⁾</i>	
– 600 m ² / 2 storey	Small
– 800 m ² / 4 storey	Medium
– 600 m ² / 3 storey (<i>Public Heritage Building</i>)	Medium
– Any area / 6 storey not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey	Large
– Over 18 m high, measured between <i>grade</i> and the floor level of the top storey	H.I. = 7

- (2) Sizes are based on *building area* and *building height*, unless noted.
- (3) *Building size* is based on the existing *building* facing one *street*.
- (4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.
- (5) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.
- (6) All *buildings* 1 500 m² and over are to be *sprinklered*.

Table 11.2.1.1.-N⁽¹⁾⁽⁴⁾
Hazard Index
 Forming Part of Sentences 11.2.1.1.(1) and (2)

Group F Division 3	Occupancy H.I. ⁽⁵⁾		
	Small	Medium	Large
Creameries	2	2	3
Factories (Low Fire Load)	2	3	4
Freight Depots (Low Fire Load)	2	3	4
Laboratories (Low Fire Load)	2	3	4
Manufacturers Sales (Low Fire Load)	2	3	4
Power Plants	3	4	5
<i>Public Heritage Buildings</i>	3	3	—
Sample Display Rooms (Low Fire Load)	2	3	4
Storage Garages	2	3	4
Storage Rooms (Low Fire Load)	2	3	4
Warehouses (Low Fire Load)	2	3	4
Wholesale Rooms (Low Fire Load)	2	3	4
Workshops (Low Fire Load)	2	3	4

Notes to Table 11.2.1.1.-N:

(1) <i>Building Size (Maximum)</i> ⁽²⁾⁽³⁾	
– 800 m ² / 2 storey	Small
– 1 200 m ² / 4 storey	Medium
– 600 m ² / 3 storey (<i>Public Heritage Building</i>)	Medium
– Any area / 6 storey not exceeding 18 m high, measured between <i>grade</i> and the floor level of the top storey	Large
– Over 18 m, but not exceeding 36 m high, measured between <i>grade</i> and the floor level of the top storey	H.I. = 5
– Over 36 m high, measured between <i>grade</i> and the floor level of the top storey	H.I. = 6

(2) Sizes are based on *building area* and *building height*, unless noted.

(3) *Building size* is based on the existing *building* facing one *street*.

(4) For existing *buildings* facing multiple *streets*, see Sentence 11.2.1.1.(2) and Table 11.4.3.4.-A.

(5) When the size of a *building* falls into more than one category, the *H.I.* for the least restrictive is permitted to be used.

Table 11.4.3.3.
For Evaluation and Upgrading of Early Warning/Evacuation
 Forming Part of Sentences 11.4.3.3.(1) and 11.4.3.4.(3)

Notes	Early Warning and Evacuation, Evaluation and Upgrading	Part 11 <i>Compliance Alternative</i> ⁽¹⁾
(2)	Early warning and evacuation to be checked against (a) <i>access to exit</i> widths based on <i>occupant load</i> in Subsection 3.3.1. or 9.9.3.; (b) <i>exit</i> widths based on <i>occupant load</i> in Subsection 3.4.3. or 9.9.3.; (c) <i>exit</i> signs in Subsection 3.4.5. or 9.9.11.; (d) lighting of <i>exits</i> , lighting of <i>access to exits</i> and emergency lighting in Subsection 3.2.7. or 9.9.12.; (e) fire alarm system in Subsection 3.2.4. or 9.10.18.; (f) <i>smoke alarms</i> in Subsection 9.10.19.; (g) travel distance and number of <i>exits</i> in other Parts; and (h) door release hardware requirements in Articles 3.3.1.13. and 3.4.6.16., and deficiencies shall be upgraded.	EARLY WARNING (a) <i>Compliance alternatives</i> as listed may be used. EVACUATION (b) <i>Compliance alternatives</i> as listed to <i>access to exit</i> and <i>exit</i> widths, number of <i>exits</i> , door release hardware, and travel distance may be used.
(3)	Early warning and evacuation to be checked against (a) <i>access to exit</i> widths based on <i>occupant load</i> in Subsection 3.3.1. or 9.9.3.; (b) <i>exit</i> widths based on <i>occupant load</i> in Subsection 3.4.3. or 9.9.3.; (c) <i>exit</i> signs in Subsection 3.4.5. or 9.9.11.; (d) lighting of <i>exits</i> , lighting of <i>access to exits</i> and emergency lighting in Subsection 3.2.7. or 9.9.12.; (e) fire alarm system in Subsection 3.2.4. or 9.10.18.; (f) <i>smoke alarms</i> in Subsection 9.10.19.; (g) travel distance and number of <i>exits</i> in other Parts; (h) smoke control measures, and at least one elevator to permit transport of firefighters to all floors in <i>hotels</i> whose floor level is more than 18 m high measured between <i>grade</i> and floor level of the top <i>storey</i> as per Subsection 3.2.6., and (i) door release hardware requirements in Articles 3.3.1.13. and 3.4.6.16., and deficiencies shall be upgraded.	EARLY WARNING (a) <i>Compliance alternatives</i> as listed may be used. EVACUATION (b) <i>Compliance alternatives</i> as listed to <i>access to exit</i> and <i>exit</i> widths, number of <i>exits</i> , door release hardware, and travel distance may be used.

Notes to Table 11.4.3.3.:

- (1) See Tables 11.5.1.1.-A to 11.5.1.1.-F for *compliance alternatives* that may be used.
- (2) Applies to change of *major occupancy* to one of equal or lesser hazard, and to increase in *occupant load* by 15% or less.
- (3) Applies to change of *major occupancy* to one of greater hazard, and to increase in *occupant load* greater than 15%.

Table 11.4.3.4.-A
Additional Upgrading
 Forming Part of Sentences 11.2.1.1.(2) and 11.4.3.4.(1)

New Major Occupancy (H.I.) Number ⁽³⁾	Increase of C.I. to Equal H.I. to Support New Major Occupancy	Additional Required Upgrading	Part 11 Alternative Compliance (A.C.)	Comments ⁽¹⁾⁽²⁾
H.I. 2	C.I. 1 to 2	Comply with Table 11.2.1.1.-A ratings for C.I. of 2	(a) Provide early warning system, or (b) Comply with any A.C.'s in Col. 4.	
H.I. 3	C.I. (1 or 2) to 3	Comply with Table 11.2.1.1.-A ratings for C.I. of 3	(a) Provide early warning system, or (b) Comply with any A.C.'s in Col. 4.	Combustible to Combustible only.
H.I. 4	C.I. (1, 2 or 3) to 4	Comply with Table 11.2.1.1.-A ratings for C.I. of 4	Provide sprinklers in locations where assemblies do not comply with Table 11.2.1.1.-A	Combustible to Combustible. Noncombustible to Noncombustible.
H.I. 5	C.I. 4 to 5	Comply with Table 11.2.1.1.-A ratings for C.I. of 5	Provide sprinklers in locations where assemblies do not comply with Table 11.2.1.1.-A	
H.I. 5	C.I. (1, 2 or 3) to 5	Comply with Table 11.2.1.1.-A ratings for C.I. of 5	Provide sprinklers in locations where assemblies do not comply with Table 11.2.1.1.-A	Combustible to Combustible. Noncombustible to Noncombustible.
H.I. 6	C.I. 5 (Noncombustible) to 6	Comply with Table 11.2.1.1.-A ratings for C.I. of 6	(a) Provide sprinkler system, plus 45 min roof rating.	
H.I. 6	C.I. 5 (Heavy timber) to 6	Comply with A.C.	(b) Provide sprinkler system.	
H.I. 6	C.I. 5 (Combustible) to 6	Comply with A.C.	(c) Provide 1 h rating plus sprinkler system.	
H.I. 6	C.I. (3 or 4) to 6*	Comply with Table 11.2.1.1.-A ratings for C.I. of 6	(d) Provide sprinkler system, plus 45 min rating.	* For Noncombustible construction only.
H.I. 6	C.I. (1, 2, 3 or 4) to 6**	Comply with A.C.	(e) Provide 1 h rating plus sprinkler system.	** For Combustible construction only.
H.I. 7	C.I. 6 to 7	Comply with Table 11.2.1.1.-A ratings for C.I. of 7	(a) Provide sprinkler system.	
H.I. 7	C.I. (3, 4 or 5) to 7*	Comply with Table 11.2.1.1.-A ratings for C.I. of 7	(b) Provide 1 h rating plus sprinkler system.	* For Noncombustible construction only.

Table 11.4.3.4.-A (Cont'd)
Additional Upgrading
 Forming Part of Sentences 11.2.1.1.(2) and 11.4.3.4.(1)

New Major Occupancy (H.I.) Number ⁽³⁾	Increase of C.I. to Equal H.I. to Support New Major Occupancy	Additional Required Upgrading	Part 11 Alternative Compliance (A.C.)	Comments ⁽¹⁾⁽²⁾
H.I. 8	C.I. 7 to 8	Comply with Table 11.2.1.1.-A ratings for C.I. of 8	(a) Provide sprinkler system.	
H.I. 8	C.I. 6 to 8	Comply with Table 11.2.1.1.-A ratings for C.I. of 8	(b) Provide supervised sprinkler system.	
H.I. 8	C.I. (3, 4 or 5) to 8*	Comply with Table 11.2.1.1.-A ratings for C.I. of 8	(d) Provide sprinkler system, plus 1 h rating.	* For Noncombustible construction only.

Notes to Table 11.4.3.4.A.:

- (1) One asterisk (*) refers to *noncombustible construction*.
- (2) Two asterisks (**) refers to *combustible construction*.
- (3) Group B, occupancy with any H.I. shall be *sprinklered*.

Table 11.4.3.4.-B⁽¹⁾
Additional Upgrading for Multiple Major Occupancies
 Forming Part of Sentences 11.4.2.3.(4) and 11.4.3.4.(4)

New Major Occupancy	Code Requirements	Part 11 Compliance Alternative	
All ⁽²⁾	Table 3.1.3.1. and Subsection 9.10.9. Where:	For Existing Building Reduce to	If Sprinklered Reduce to
	1 h rating required	45 min	30 min
	2 h rating required	1.5 h	1 h
	3 h rating required	2 h	1.5 h

Notes to Table 11.4.3.4.B.:

- (1) For *buildings* with multiple major occupancies only, where there is a change in major occupancy.
- (2) See Section 11.4.

Table 11.5.1.1.-A
Compliance Alternatives for Assembly Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
A1	3.1.4.7.	Existing <i>heavy timber construction</i> acceptable where <i>construction</i> is within 90% of member sizes listed in Part 3.
A2	3.1.5.2. to 3.1.5.4.; 3.1.5.8.	Existing acceptable.
A3	3.1.5.9. to 3.1.5.12.	Except for exposed foamed plastics, existing acceptable. To match existing, materials may be added from on or off site.
A4	3.1.5.18. to 3.1.5.20.; 3.1.5.25.	Existing acceptable.
A5	3.1.7.1.	<i>Fire-resistance ratings</i> may also be used where they are based on: <ol style="list-style-type: none"> 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
A6	3.1.7.5.(3)	Existing assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
A7	3.1.8.5.(2)	<p>(a) Existing functional and sound doors in existing <i>buildings</i> that are either hollow metal or kalamein and containing wired glass at least 6 mm thick and conforming to Sentence 3.1.8.16.(2) are permitted in lieu of doors not required to exceed 45 min,</p> <p>(b) all existing functional and sound hollow metal or kalamein doors which carry existing 1.5 h labels are acceptable in lieu of current 1.5 h labels and may contain wired glass panels not exceeding 0.0645 m², at least 6 mm thick and conforming to Sentence 3.1.8.16.(2), and</p> <p>(c) every fire door, window assembly or glass block used as a <i>closure</i> in a required <i>fire separation</i> shall be installed in conformance with good engineering practice.</p>
A8	3.1.8.7., 3.1.8.8. and 3.1.8.10.	<i>Fire dampers</i> or <i>fire stop flaps</i> are not required to be installed in existing ducts at penetrations of existing <i>fire separations</i> .
A9	3.1.8.12.(1)	Existing 45 mm solid core wood doors acceptable.
A10	3.1.8.13.(1)	Existing functionally operable self-closing devices acceptable.
A11	3.1.8.15.	Existing functionally operable latching devices, excluding draw bolts, are acceptable.
A12	3.1.8.16.	Existing transoms or sidelights located in required <i>fire separations</i> may be retained if wired glass at least 6 mm thick is securely fixed to a steel frame with steel stops. Operable transoms shall be fixed closed.
A13	3.1.8.17. to 3.1.8.19.	Existing acceptable.
A14	3.1.11.	Where the concealed space is being materially altered, smoke or heat detection in that space in lieu of <i>fire blocks</i> and tied into fire alarm system is acceptable.
A15	3.1.13.10.	Existing acceptable.

Table 11.5.1.1.-A (Cont'd)
Compliance Alternatives for Assembly Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
A16	3.2.3.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies not closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, shall be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
A17	3.2.3.6.(3)	Existing roof soffit projections acceptable.
A18	3.2.4.	(a) Existing fire alarm system may remain except that Article 3.2.4.5. does not apply where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
A19	3.2.4.9.(2)(e)	Does not apply to existing installations in <i>buildings</i> .
A20	3.2.4.10.(5)(c)	Does not apply to existing installations in <i>buildings</i> .
A21	3.2.5.3.(1) and (2)	Existing acceptable.
A22	3.2.5.4. to 3.2.5.6.	Existing acceptable provided the <i>building</i> is <i>sprinklered</i> .
A23	3.2.5.7.	Does not apply, except where a change in <i>major occupancy</i> occurs from a lesser <i>hazard index</i> .
A24	3.2.5.8. to 3.2.5.11.	Does not apply to <i>buildings</i> 6 storeys and less. Does not apply to <i>sprinklered buildings</i> .
A25	3.2.5.12.	Existing sprinkler systems in existing <i>buildings</i> that do not conform to NFPA 13 may be altered, added to, or extended from the existing system without complying with NFPA 13, provided the system is operational and adequate with respect to coverage, water supply and controls, and provided the system is evaluated by a qualified designer.
A26	3.3.1.5.	One egress door is allowed where the occupant load is not greater than 100 persons, provided floor area is <i>sprinklered</i> and travel distance does not exceed 25 m.
A27	3.3.1.9.	Existing width of <i>public corridors</i> of not less than 914 mm is acceptable.
A28	3.3.1.9.(6)	An existing dead-end corridor is permitted where the <i>occupant load</i> is not greater than 20 persons, provided travel distance is not greater than 6 m plus corridor width to “ <i>exit choice</i> ” point.

Table 11.5.1.1.-A (Cont'd)
Compliance Alternatives for Assembly Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
A29	3.3.1.11.; 3.3.1.12.	Existing door swings may remain in <i>heritage buildings</i> , existing or being restored, with no change in <i>major occupancy</i> and with <i>occupant load</i> no greater than 100.
A30	3.3.1.13.	Existing doors may remain in a <i>heritage building</i> , existing or being restored, with no change in <i>major occupancy</i> .
A31	3.3.1.20.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
A32	3.3.5.4.(1); 3.3.5.7.(1), (3) and (4)	Need not comply where a gasketed door and self closer are provided in the existing <i>fire separation</i> .
A33	3.4.1.5.(1)	Existing acceptable.
A34	3.4.1.5.(2)	Existing acceptable provided the existing <i>guard</i> is not less than 914 mm.
A35	3.4.1.8.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
A36	3.4.2.5.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and where there is no change in <i>major occupancy</i> .
A37	3.4.3.2.(5)	Need not comply where there is no increase in <i>occupant load</i> .
A38	3.4.3.2.(8)	Existing width of <i>exits</i> acceptable provided the <i>occupant load</i> is not more than 15% above the <i>exit capacity</i> .
A39	3.4.3.3.	Existing acceptable.
A40	3.4.3.4.	Existing headroom clearance of not less than 1 980 mm is acceptable.
A41	3.4.4.4.(8)	Existing washrooms opening directly into an <i>exit stairwell</i> shall be separated from the <i>exit stairwell</i> by a 45 min <i>closure</i> .
A42	3.4.5.1.(2) and (9)	Existing illuminated legible <i>exit signs</i> are acceptable.
A43	3.4.6.2.	Existing acceptable, if visually apparent.
A44	3.4.6.3.	Existing acceptable.
A45	3.4.6.4.	Existing acceptable.
A46	3.4.6.5.(3) to (13)	Existing acceptable.
A47	3.4.6.6.(2) to (5)	Existing acceptable.
A48	3.4.6.7.(1)	Existing acceptable.
A49	3.4.6.8.	Existing acceptable.
A50	3.4.6.9.	Existing acceptable.
A51	3.4.6.11.(1) to (4) and (6)	Existing acceptable.
A52	3.4.6.12.	Existing acceptable in <i>public heritage buildings</i> or a change in <i>occupancy</i> with no increase in <i>occupant load</i> .
A53	3.4.6.16.(2) to (4)	Existing functionally operable panic hardware acceptable.

Table 11.5.1.1.-A (Cont'd)
 Compliance Alternatives for Assembly Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
A54	3.4.7.2.	Combustible fire escapes which are protected from fire in accordance with Sentence 3.2.3.14.(2) are permitted or may be reconstructed or recreated (as in the case of a heritage building).
A55	3.5.1.	Existing acceptable.
A56	3.6.2.1.(7)	Existing fire separation of not less than 30 min is acceptable.
A57	3.6.2.2.	Existing acceptable where explosion-resistant construction or venting is provided.
A58	3.6.2.6.	Existing acceptable.
A59	3.6.2.7.(1)	2 h fire separation acceptable.
A60	3.6.3.1.(1) to (5)	45 min fire separation acceptable.
A61	3.6.3.3.(1) to (5) and (8)	Existing acceptable.
A62	3.6.3.3.(9)	1 h acceptable if sprinklered.
A63	3.6.3.3.(10)	Existing acceptable.
A64	3.6.3.4.	Existing acceptable.
A65	3.6.4.	Existing acceptable.
A66	3.7.1.3.(3)	2.1 m is acceptable.
A67	3.7.2.1.(3)	The minimum glass areas may be reduced by 50%.
A68	3.7.4.	Where the occupant load is increased by more than 15% above the capacity of the existing facilities, facilities to be added to accommodate the increase.
A69	3.8.1.2.	Existing accessible entrance acceptable. (See C.A. A75) Existing curb ramp conforming to Sentence 3.8.3.2.(3) is acceptable. Existing principal entrance acceptable, provided at least one barrier-free entrance is available.
A70	3.8.1.3.(1)	Existing unobstructed width of 920 mm minimum is acceptable.
A71	3.8.1.3.(4)	Existing unobstructed space not less than 1 500 mm in width and 1 500 mm in length located not more than 30 m apart is acceptable.
A72	3.8.3.2.(3)(b)	Existing curb ramp acceptable, provided width not less than 1 200 mm.
A73	3.8.3.3.(1)	Existing doorway acceptable, provided not less than 800 mm wide.
A74	3.8.3.3.(11)(a)	Existing distance acceptable, provided not less than 1 200 mm plus the width of any door that swings into the space in the path of travel.
A75	3.8.3.4.(1)(a)	Existing ramp acceptable, provided not less than 870 mm between handrails.
A76	3.8.3.8.(5)	Existing grab bar is acceptable.
A77	3.8.3.12.	Existing universal washroom acceptable.
A78	3.8.3.13.(2)(g)	Existing grab bar is acceptable.

Table 11.5.1.1.-A (Cont'd)
 Compliance Alternatives for Assembly Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
A79	3.8.3.16.	Existing drinking fountain conforming to Clauses 3.8.3.16.(2)(a) and (b) acceptable.
A80	3.6.3.16A.	Existing water bottle filling stations are acceptable.
A81	3.11.3.1.(9)	Existing clear width acceptable, provided not less than 900 mm.
A82	3.11.3.1.(14)	Existing painted line acceptable.
A83	4.1.8.	The requirements under this Subsection do not apply.
A84	6.3.1.1.(2)	Required outdoor air rates may be provided by mechanical, natural or combination of natural and mechanical means.
A85	8.2.1.4.	Existing clearances acceptable where a <i>sewage system</i> is replaced with another <i>sewage system</i> within the same class and the capacity of the replacement <i>sewage system</i> does not exceed the capacity of the existing <i>sewage system</i> .
A86	8.2.1.4.	Existing clearances are acceptable where a replacement <i>sewage system</i> requires lesser clearances than those required in Part 8 for the existing <i>sewage system</i> .

Table 11.5.1.1.-B
Compliance Alternatives for Care, Care and Treatment or Detention Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
B1	3.1.5.2. to 3.1.5.4.; 3.1.5.8.	Existing acceptable.
B2	3.1.5.9. to 3.1.5.12.	Except for exposed foamed plastics, existing acceptable.
B3	3.1.5.18. to 3.1.5.20.; 3.1.5.25.	Existing acceptable.
B4	3.1.7.1.	<i>Fire-resistance ratings</i> may also be used where they are based on: <ol style="list-style-type: none"> 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
B5	3.1.7.5.(3)	Existing assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
B6	3.1.8.5.(2)	(a) Existing functional and sound doors in existing <i>buildings</i> that are either hollow metal or kalamein and containing wired glass at least 6 mm thick and conforming to Sentence 3.1.8.16.(2) are permitted in lieu of doors not required to exceed 45 min, (b) all existing functional and sound hollow metal or kalamein doors which carry existing 1.5 h labels are acceptable in lieu of current 1.5 h labels and may contain wired glass panels not exceeding 0.0645 m ² , at least 6 mm thick and conforming to Sentence 3.1.8.16.(2), and (c) every fire door, window assembly or glass block used as a <i>closure</i> in a required <i>fire separation</i> shall be installed in conformance with good engineering practice.
B7	3.1.8.7., 3.1.8.8. and 3.1.8.10.	<i>Fire dampers</i> or <i>fire stop flaps</i> are not required to be installed in existing ducts at penetrations of existing <i>fire separations</i> .
B8	3.1.8.12.(1)	For existing unlabelled doors in existing <i>buildings</i> , at least 45 mm solid core wood or metal clad are acceptable.
B9	3.1.8.13.(1)	Existing functionally operable self-closing devices acceptable, including devices with "pause" hardware.
B10	3.1.8.14.(1) and (2)	Between patient or inmate rooms, and corridors, existing "pause" type self-closing devices may be used as hold-open devices where functionally operable.
B11	3.1.8.15.	Existing functionally operable latching devices, excluding draw bolts, are acceptable.
B12	3.1.8.16.(1) and (2)	Except in zone or <i>exit fire separations</i> not required to be greater than 1 h, existing wired glass installations are acceptable provided they are set in steel or metal clad frames.
B13	3.1.8.16.(3)	Existing glass block acceptable.
B14	3.1.8.17. to 3.1.8.19.	Existing acceptable.
B15	3.1.9.5.(1) and (2)	Existing openings in existing ceiling membranes to remain. Existing openings may be moved to another location in the same ceiling provided the aggregate area of openings does not increase and are not cumulative, and the existing opening is blocked up to provide the same rating as the ceiling assembly.

Table 11.5.1.1.-B (Cont'd)
Compliance Alternatives for Care, Care and Treatment or Detention Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
B16	3.1.11.	Where the concealed space is being materially altered, provide smoke or heat detection in that space in lieu of <i>fire blocks</i> and tie into fire alarm system.
B17	3.1.14.; 3.1.15.	Existing roof assemblies and roof coverings acceptable.
B18	3.2.3.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies no closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, to be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
B19	3.2.3.6.(3)	Existing roof soffit projections acceptable.
B20	3.2.4.	(a) Existing fire alarm system may remain except that Article 3.2.4.5. does not apply where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
B21	3.2.4.8.(2)(e)	Does not apply to existing installations in <i>buildings</i> .
B22	3.2.4.9.(5)(c)	Does not apply to existing installations in <i>buildings</i> .
B23	3.2.5.1.; 3.2.5.2.	Existing access to an existing <i>occupancy</i> acceptable. Where the existing <i>building</i> is changed to a “B” <i>occupancy</i> , existing access are acceptable.
B24	3.2.5.3.(1)	Existing acceptable, except where a change in <i>occupancy</i> occurs to a “B1” or “B2” <i>occupancy</i> .
B25	3.2.5.3.(2)	Existing acceptable.
B26	3.2.5.4. to 3.2.5.6.	Existing access route to existing <i>occupancy</i> is acceptable if the <i>building</i> is <i>sprinklered</i> . Where existing <i>building</i> is changed to a “B” <i>occupancy</i> , access route shall be provided.
B27	3.2.5.7.; 3.2.5.18.	Does not apply except where a change in <i>occupancy</i> occurs to a “B1” or “B2” <i>occupancy</i> , where occupants are not normally evacuated from the <i>building</i> .

Table 11.5.1.1.-B (Cont'd)
Compliance Alternatives for Care, Care and Treatment or Detention Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
B28	3.2.5.13.	Existing sprinkler systems in existing <i>buildings</i> that do not conform to NFPA 13 may be altered, added to, or extended from the existing system without complying with NFPA 13, provided the system is operational and adequate with respect to coverage, water supply and controls, and provided the system is evaluated by a qualified designer.
B29	3.2.5.8. to 3.2.5.11.	Does not apply except where a change in <i>occupancy</i> occurs to a Group B <i>occupancy</i> , where occupants are not normally evacuated from the <i>building</i> .
B30	3.3.1.9.	Existing width of <i>public corridors</i> of not less than 914 mm is acceptable, except as provided in Sentence 3.3.3.3.(2).
B31	3.3.1.11.; 3.3.1.12.	Existing door swings may remain in <i>heritage buildings</i> , existing or being restored, with no change in <i>major occupancy</i> and with <i>occupant load</i> no greater than 100.
B32	3.3.1.12.	Existing doors acceptable.
B33	3.3.1.16.	Existing acceptable.
B34	3.3.1.17.	Existing non-conforming capacities of <i>access to exits</i> are acceptable, provided that the excessive capacity is no greater than 15% and, (a) <i>corridor fire separations</i> are rated to Code plus early warning system provided, or (b) there are sprinklers, plus <i>smoke alarms</i> in <i>suites</i> .
B35	3.3.1.18.	Existing acceptable.
B36	3.3.1.20.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
B37	3.3.3.3.(1)	Existing dead-end corridors acceptable with 30 min <i>fire separation</i> of corridor plus sprinklering of <i>floor area</i> , provided the <i>occupant load</i> is not greater than 10 persons and travel distance not greater than 6 m plus corridor width to “ <i>exit choice</i> ” point.
B38	3.3.3.7.	45 min <i>fire separation</i> acceptable.
B39	3.3.5.4.(1); 3.3.5.7.(4)	Need not comply where a gasketed door and self closer are provided in the existing <i>fire separation</i> .
B40	3.4.1.8.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
B41	3.4.2.5.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and provided <i>fire separations</i> comply with Part 3.
B42	3.4.3.2.(8)	Existing acceptable provided there is no change in <i>occupancy</i> to a “B2” or “B3”.
B43	3.4.3.3.	Existing acceptable.
B44	3.4.3.4.	Existing headroom clearance of not less than 1 980 mm is acceptable.
B45	3.4.5.1.(2) and (9)	Existing illuminated legible <i>exit</i> signs are acceptable.
B46	3.4.6.2.	Existing acceptable, if visually apparent.
B47	3.4.6.3.(1)	Existing acceptable with rise no greater than 3.7 m.
B48	3.4.6.4.(1)	Existing acceptable provided there is no change in <i>occupancy</i> to a “B2” or “B3”.
B49	3.4.6.4.(2) to (4)	Existing acceptable.
B50	3.4.6.5.(3) to (13)	Existing acceptable.

Table 11.5.1.1.-B (Cont'd)
Compliance Alternatives for Care, Care and Treatment or Detention Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
B51	3.4.6.6.(2) to (5)	Existing acceptable.
B52	3.4.6.7.(1)	Existing acceptable.
B53	3.4.6.8.	Existing acceptable.
B54	3.4.6.9.	Existing acceptable where there is no change in <i>major occupancy</i> or increase in <i>occupant load</i> greater than 15%.
B55	3.4.6.11.(1) to (4) and (6)	Existing acceptable.
B56	3.4.6.12.	Existing acceptable in <i>public heritage buildings</i> .
B57	3.4.6.16.(2) to (4)	Existing functionally operable panic hardware acceptable.
B58	3.4.6.18.(4)(b)	Existing access to existing <i>occupancy</i> is acceptable Where the existing <i>building</i> is changed to a "B" <i>occupancy</i> , existing access is acceptable.
B59	3.4.7.2.	<i>Combustible</i> fire escapes which are protected from fire in accordance with Sentence 3.2.3.14.(2) are permitted or may be reconstructed or recreated (as in the case of a <i>heritage building</i>). Where serving non-ambulatory persons, minimum width shall be 1 100 mm.
B60	3.5.1.	Existing acceptable, except where <i>building</i> is classified under Subsection 3.2.6.
B61	3.6.2.1.(7)	45 min <i>fire separation</i> acceptable.
B62	3.6.2.6.	Existing acceptable.
B63	3.6.2.7.(1)	2 h <i>fire separation</i> acceptable.
B64	3.6.3.1.(1) to (5)	45 min <i>fire separation</i> acceptable.
B65	3.6.3.3.(1), (3), (4)(a), (5) and (10)	Existing acceptable.
B66	3.6.3.3.(2)(a)	45 min <i>fire separation</i> acceptable.
B67	3.6.4.	Existing acceptable, except where a change in <i>occupancy</i> occurs to a Group B <i>occupancy</i> .
B68	3.7.1.3.(1)	Existing acceptable.
B69	3.7.2.1.(2)	The minimum glass areas may be reduced by 50%.
B70	3.7.4.	Where the <i>occupant load</i> is increased by more than 15% above the capacity of the existing facilities, facilities to be added to accommodate the increase.
B71	3.8.1.2.	Existing accessible entrance acceptable. (See C.A. B77) Existing curb <i>ramp</i> conforming to Sentence 3.8.3.2.(3) is acceptable. Existing principal entrance acceptable, provided at least one <i>barrier-free</i> entrance is available.
B72	3.8.1.3.(1)	Existing unobstructed width of 920 mm minimum is acceptable.

Table 11.5.1.1.-B (Cont'd)
Compliance Alternatives for Care, Care and Treatment or Detention Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
B73	3.8.1.3.(4)	Existing unobstructed space not less than 1 500 mm in width and 1 500 mm in length located not more than 30 m apart is acceptable.
B74	3.8.3.2.(3)(b)	Existing curb <i>ramp</i> acceptable, provided width not less than 1 200 mm.
B75	3.8.3.3.(1)	Existing doorway acceptable, provided not less than 800 mm wide.
B76	3.8.3.3.(11)(a)	Existing distance acceptable, provided not less than 1 200 mm plus the width of any door that swings into the space in the path of travel.
B77	3.8.3.4.(1)(a)	Existing <i>ramp</i> acceptable, provided not less than 870 mm between handrails.
B78	3.8.3.8.(5)	Existing grab bar is acceptable.
B79	3.8.3.12.	Existing universal washroom acceptable.
B80	3.8.3.13.(2) (g)	Existing grab bar is acceptable.
B81	3.8.3.16.	Existing drinking fountain conforming to Clauses 3.8.3.16.(2)(a) and (b) acceptable.
B82	3.8.3.16A.	Existing water bottle filling stations are acceptable.
B83	3.11.3.1.(9)	Existing clear width acceptable, provided not less than 900 mm.
B84	3.11.3.1.(14)	Existing painted line acceptable.
B85	4.1.8.	The requirements under this Subsection do not apply.
B86	8.2.1.4.	Existing clearances acceptable where a <i>sewage system</i> is replaced with another <i>sewage system</i> within the same class and the capacity of the replacement <i>sewage system</i> does not exceed the capacity of the existing <i>sewage system</i> .
B87	8.2.1.4.	Existing clearances are acceptable where a replacement <i>sewage system</i> requires lesser clearances than those required in Part 8 for the existing <i>sewage system</i> .

Table 11.5.1.1.-C
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C1	3.1.4.7.	Existing <i>heavy timber construction</i> acceptable where <i>construction</i> is within 90% of member sizes listed in Part 3.
C2	3.1.5.2. to 3.1.5.4.; 3.1.5.8.	Existing acceptable.
C3	3.1.5.9. to 3.1.5.12.	Except for exposed foamed plastics, existing acceptable. To match existing, materials may be added from on or off site.
C4	3.1.5.18. to 3.1.5.20.; 3.1.5.21.	Existing acceptable.
C5	3.1.7.1.	<i>Fire-resistance ratings</i> may also be used where they are based on: <ol style="list-style-type: none"> 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
C6	3.1.7.5.(3)	Existing assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
C7	3.1.8.1.(2); 3.1.8.6.(1) and (2)	Existing functional <i>closures</i> are acceptable and may be relocated within the same existing <i>fire separation</i> .
C8	3.1.8.5.(2)	<p>(a) Existing functional and sound doors in existing <i>buildings</i> that are either hollow metal or kalamein and containing wired glass at least 6 mm thick and conforming to Sentence 3.1.8.16.(2) are permitted in lieu of doors not required to exceed 45 min,</p> <p>(b) all existing functional and sound hollow metal or kalamein doors which carry existing 1.5 h labels are acceptable in lieu of current 1.5 h labels and may contain wired glass panels not exceeding 0.0645 m², at least 6 mm thick and conforming to Sentence 3.1.8.16.(2), and</p> <p>(c) every fire door, window assembly or glass block used as a <i>closure</i> in a required <i>fire separation</i> shall be installed in conformance with good engineering practice.</p>
C9	3.1.8.7. to 3.1.8.10.	Except for <i>hotels</i> , <i>fire dampers</i> or <i>fire stop flaps</i> are not required to be installed in existing ducts at penetrations of existing <i>fire separations</i> .
C10	3.1.8.12.(1)	For existing unlabeled doors in existing <i>buildings</i> , at least 45 mm solid core wood or metal clad are acceptable. Except for <i>residential occupancies</i> , existing closure rating of 20 min will not be required where the entire <i>floor area</i> is <i>sprinklered</i> .
C11	3.1.8.14.(1) and (2)	In <i>retirement homes</i> , between a <i>suite</i> and a <i>public corridor</i> , existing 'pause' type self-closing devices may be used as hold-open devices where functionally operable.
C12	3.1.8.15.	Existing functionally operable latching devices, excluding draw bolts, are acceptable.
C13	3.1.8.16.	Existing transoms or sidelights located in <i>fire separations</i> not required to be greater than 1 h may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
C14	3.1.8.17. to 3.1.8.19.	Existing acceptable.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C15	3.1.11.	Where the concealed space is being materially altered, provide smoke or heat detection in that space in lieu of <i>fire blocks</i> and tie into fire alarm system.
C16	3.2.3.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies not closer than 300 mm from a window in such other <i>building</i> , where the "opposite" window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, shall be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
C17	3.2.3.6.(3)	Existing roof soffit projections acceptable.
C18	3.2.4.	(a) Existing fire alarm system may remain except that Article 3.2.4.5. does not apply where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. "stage" system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
C19	3.2.4.8.(2)(e)	Does not apply to existing installations in <i>buildings</i> .
C20	3.2.4.9.(5)(c)	Does not apply to existing installations in <i>buildings</i> .
C21	3.2.4.20.	Except for <i>retirement homes</i> , such <i>smoke alarms</i> may be battery operated.
C22	3.2.5.1.; 3.2.5.2.	Existing acceptable.
C23	3.2.5.3.(1)	Existing access acceptable.
C24	3.2.5.3.(2)	Existing acceptable.
C25	3.2.5.4. to 3.2.5.6.	(a) For <i>buildings</i> 6 storeys and less, existing access to existing <i>occupancy</i> is acceptable, and (b) where existing <i>building</i> is changed to a "C" <i>occupancy</i> , an access route shall be provided, or the existing access is acceptable provided the <i>building</i> is <i>sprinklered</i> .
C26	3.2.5.7.	Existing water supply and hydrants are acceptable in <i>buildings</i> up to 6 storeys in <i>building height</i> .

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C27	3.2.5.8. to 3.2.5.11.	Does not apply to <i>buildings</i> 4 storeys and less. For existing <i>buildings</i> over 4 storeys in <i>building height</i> , existing standpipe and hose systems water supply is acceptable provided it can deliver a minimum flow rate of 265 L/min for 30 min at 345 kPa (gauge) at the two highest and most remote hose valves, with not less than 132 L/min from each of the two simultaneously.
C28	3.2.5.12.	Existing sprinkler systems in existing <i>buildings</i> that do not conform to NFPA 13 may be altered, added to, or extended from the existing system without complying with NFPA 13, provided the system is operational and adequate with respect to coverage, water supply and controls, and provided the system is evaluated by a qualified designer.
C29	3.3.1.4.(1); 3.3.4.2.(1)	30 min is acceptable to separate corridors or exits in <i>buildings</i> not exceeding 6 storeys in <i>building height</i> , except that 45 min is required for exits in <i>buildings</i> exceeding 3 storeys in <i>building height</i> . For <i>buildings</i> exceeding 6 storeys in <i>building height</i> , 30 min is acceptable where <i>smoke detectors</i> are installed in corridors, except 1 h is required in exits. 30 min is acceptable to separate <i>public corridors</i> , exits or <i>suites</i> in <i>hotels</i> , provided fire detectors are installed in every room in a <i>suite</i> and in every room not located in a <i>suite</i> , other than corridors, washrooms, closets in <i>suites</i> , saunas, refrigerated areas and swimming pools.
C30	3.3.1.5.(1)(c); Tables 3.3.1.5.-A and 3.3.1.5.-B	In Column 2, maximum area of room or <i>suite</i> to be unlimited.
C31	3.3.1.9.	Existing width of <i>public corridors</i> of not less than 914 mm is acceptable.
C32	3.3.1.11.; 3.3.1.12.	Existing door swings may remain in <i>heritage buildings</i> , existing or being restored, with no change in <i>major occupancy</i> and with <i>occupant load</i> no greater than 100.
C33	3.3.1.13.	Existing doors acceptable, provided not less than 600 mm wide.
C34	3.3.1.14.	Existing curved or spiral stairs acceptable.
C35	3.3.1.17.	Existing non-conforming capacities of <i>access to exits</i> are acceptable, provided that the excessive capacity is no greater than 15% and, (a) <i>corridor fire separations</i> are rated to Code plus early warning system provided, or (b) there are sprinklers, plus <i>smoke alarms</i> in <i>suites</i> .
C36	3.3.1.18.	Does not apply to <i>heritage buildings</i> .
C37	3.3.1.20.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
C38	3.3.4.2.(3)(b)(i) 3.3.4.2.(3)(b)(ii), (iii)	30 min <i>fire separation</i> acceptable. 45 min <i>fire separation</i> acceptable.
C39	3.3.4.4.(4) and (5)	For <i>buildings</i> 6 storeys and less, doorway from <i>dwelling unit</i> will be permitted to open directly into <i>exit</i> stairway or interior corridor served by a single <i>exit</i> if a fire alarm system complying with Subsection 3.2.4. is installed and the <i>dwelling unit</i> has a second and separate <i>means of egress</i> .
C40	3.3.5.4.(1) and 3.3.5.7.(4)	Need not comply where a gasketed door and self closer are provided in the existing <i>fire separation</i> .

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C41	3.4.1.4.	Except for <i>hotels</i> and <i>retirement homes</i> , the following types of <i>exits</i> may also be used for <i>buildings</i> not over 6 storeys in <i>building height</i> : (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to ground level, (b) areas of refuge where fire service rescue is possible and that comply with Measure L of Sentences (4) to (10), (18) and Clauses (20)(a), (b) and (d) in MMAH Supplementary Standard SB-4, "Measures for Fire Safety in High Buildings".
C42	3.4.1.8.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
C43	3.4.2.5.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and provided <i>fire separations</i> comply with Part 3.
C44	3.4.3.2.(7)	Existing width of <i>exits</i> acceptable provided the <i>occupant load</i> is not more than 15% above the <i>exit capacity</i> .
C45	3.4.3.3.	Except for <i>heritage buildings</i> , existing acceptable, provided not less than 800 mm.
C46	3.4.3.4.	Existing headroom clearance of not less than 1 980 mm is acceptable.
C47	3.4.4.1.(1)	Except for <i>exits</i> , no rating required where <i>floor areas</i> are <i>sprinklered</i> .
C48	3.4.4.1.	<i>Fire separations of exits</i> permitted in <i>buildings</i> : (a) 30 min, up to 3 storeys in <i>building height</i> , (b) 45 min, in <i>hotels</i> up to 3 storeys in <i>building height</i> , (c) 45 min, up to 6 storeys in <i>building height</i> , (d) 1 h, over 6 storeys in <i>building height</i> .
C49	3.4.4.4.(8)	Existing washrooms opening directly into an <i>exit stairwell</i> shall be separated from the <i>exit stairwell</i> by a 45 min <i>closure</i> .
C50	3.4.5.1.(2) and (9)	Existing illuminated legible <i>exit signs</i> are acceptable.
C51	3.4.6.1.	Existing acceptable.
C52	3.4.6.2.	Existing acceptable, if visually apparent.
C53	3.4.6.3.(1)	Existing acceptable with rise no greater than 3.7 m.
C54	3.4.6.4.(1) to (3)	Existing acceptable.
C55	3.4.6.4.(4) and (5)	Existing acceptable.
C56	3.4.6.5.(3) to (13)	Existing acceptable.
C57	3.4.6.6.(2) to (4)	Existing acceptable.
C58	3.4.6.7.(1)	Existing acceptable.
C59	3.4.6.8.	Existing acceptable.
C60	3.4.6.9.	(a) Except for <i>retirement homes</i> , existing acceptable. (b) For <i>retirement homes</i> , existing acceptable provided there is no change in <i>major occupancy</i> or increase in <i>occupant load</i> greater than 15%.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C61	3.4.6.10.(2) to (6)	Existing acceptable.
C62	3.4.6.11.(1) to (3)	Existing acceptable.
C63	3.4.6.12.	Existing acceptable in <i>heritage buildings</i> provided the <i>occupant load</i> is not more than 60.
C64	3.4.6.16.(1) to (4)	Existing functionally operable panic hardware acceptable.
C65	3.4.7.2.	Except for <i>retirement homes</i> , combustible fire escapes which are protected from fire in accordance with Sentence 3.2.3.13.(2) are permitted or may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
C66	3.5.1.	Existing acceptable except where <i>building</i> is classified under Subsection 3.2.6.
C67	3.6.2.1.(7)	45 min <i>fire separation</i> acceptable.
C68	3.6.2.2.	Existing acceptable where explosion-resistant construction or venting is provided.
C69	3.6.2.6.	Existing acceptable.
C70	3.6.2.7.(1)	2 h <i>fire separation</i> acceptable.
C71	3.6.3.1.(1) to (5)	45 min <i>fire separation</i> acceptable up to 6 storeys.
C72	3.6.3.3.(2)	Where 2 h <i>fire separation</i> is required, 1 h is acceptable. Except for linen discharge rooms where 1 h <i>fire separation</i> is required, 45 min is acceptable.
C73	3.6.3.3.(4) and (5)	Existing sizes acceptable.
C74	3.6.3.3.(9)	Where 2 h <i>fire separation</i> is required, 1 h is acceptable.
C75	3.6.4.2.	Except for <i>retirement homes</i> , ceiling <i>fire separation</i> need not have a <i>fire-resistance</i> rating where sprinklering, subject to C.A. C27, of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
C76	3.6.4.3.(1)	Existing to meet <i>flame-spread rating</i> of 25 or to be <i>sprinklered</i> .
C77	3.6.4.4. to 3.6.4.6.	Existing access acceptable.
C78	3.7.1.1.(2)	Minimum room height shall be not less than 1 950 mm over the required <i>floor area</i> and any location that would normally be used as a <i>means of egress</i> .
C79	3.7.2.1.	(a) Where windows are not used as <i>means of egress</i> and where they do not conflict with ventilation requirements, the minimum glass areas as shown in Table 9.7.2.3. may be reduced by 50%, or (b) an existing room converted to an interior room, created by an addition, shall not require a window, provided there is an opening in a dividing wall occupying not less than 30% of the separating plane to an adjoining room, where the adjoining room has a minimum of 5% window area of the combined floor areas, and provided the required ventilation for the combined room is maintained.
C80	3.7.4.	Where the <i>occupant load</i> is increased by more than 15% above the capacity of the existing facilities, facilities to be added to accommodate the increase.

Table 11.5.1.1.-C (Cont'd)
 Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C81	3.8.1.2.	Existing accessible entrance acceptable. (see C.A. C88) Existing curb <i>ramp</i> conforming to Sentence 3.8.3.2.(3) is acceptable. Existing principal entrance acceptable, provided at least one <i>barrier-free</i> entrance is available.
C82	3.8.1.3.(1)	Existing unobstructed width of 920 mm minimum is acceptable.
C83	3.8.1.3.(4)	Existing unobstructed space not less than 1 500 mm in width and 1 500 mm in length located not more than 30 m apart is acceptable.
C84	3.8.3.2.(3)(b)	Existing curb <i>ramp</i> acceptable, provided width not less than 1 200 mm.
C85	3.8.3.3.(1)	Existing doorway acceptable, provided not less than 800 mm wide.
C86	3.8.3.3.(11)(a)	Existing distance acceptable, provided not less than 1 200 mm plus the width of any door that swings into the space in the path of travel.
C87	3.8.3.4.(1)(a)	Existing <i>ramp</i> acceptable, provided not less than 870 mm between handrails.
C88	3.8.3.8.(5)	Existing grab bar is acceptable.
C89	3.8.3.12.	Existing universal washroom acceptable.
C90	3.8.3.13.(2) (g)	Existing grab bar is acceptable.
C91	3.8.3.16.	Existing drinking fountain conforming to Clauses 3.8.3.16.(2)(a) and (b) acceptable.
C92	3.11.3.1.(9)	Existing clear width acceptable, provided not less than 900 mm.
C93	3.11.3.1.(14)	Existing painted line acceptable.
C94	4.1.8.	The requirements under this Subsection do not apply.
C95	6.3.1.1.(2)	Required outdoor air rates may be provided by mechanical, natural or combination of natural and mechanical means.
C96	6.3.2.3.; 6.3.2.6.; 6.3.2.6A.; 6.3.2.10.	Existing acceptable.
C97	6.3.2.7.(1)	In a <i>building</i> containing not more than four <i>dwelling units</i> or residential <i>suites</i> , the existing heating or <i>air-conditioning</i> system may be altered to serve more than one <i>dwelling unit</i> or <i>suite</i> , provided <i>smoke alarms</i> are installed in <i>each</i> dwelling unit or <i>suite</i> and provided a <i>smoke detector</i> is installed in the supply or return air duct system serving the entire <i>building</i> which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.
C98	6.3.2.9.	Existing openings, grilles and diffusers acceptable.
C99	6.3.3.	Existing acceptable, provided products of combustion are safely vented.
C100	6.5.1.1.	Existing acceptable.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C101	6.9.4.4.(1)	<i>Carbon monoxide alarms</i> may be battery operated or plugged into an electrical outlet.
C102	8.2.1.4.	Existing clearances acceptable where a <i>sewage system</i> is replaced with another <i>sewage system</i> within the same class and the capacity of the replacement <i>sewage system</i> does not exceed the capacity of the existing <i>sewage system</i> .
C103	8.2.1.4.	Existing clearances are acceptable where a replacement <i>sewage system</i> requires lesser clearances than those required in Part 8 for the existing <i>sewage system</i> .
C104	9.3.2.1.	Sound used lumber may be acceptable for reuse without a grade stamp provided that: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, (b) where the grade or species is unknown, the minimum grade shall apply for span table use, and (c) lumber has not been subjected to termite infestation.
C105	9.5.3.1.	Except for <i>secondary suites</i> , in a <i>dwelling unit</i> , (a) minimum room height shall not be less than 1 950 mm over the required floor area and in any location that would normally be used as a <i>means of egress</i> , or (b) minimum room height shall not be less than 2 030 mm over at least 50% of the required floor area, provided that any part of the floor having a clear height of less than 1 400 mm shall not be considered in computing the required floor area.
C106	9.5.11.1.	Doors may be lesser heights to suit ceiling heights.
C107	9.5.11.2.	Existing acceptable, provided not less than 600 mm.
C108	9.6.1.2.(2) and (3); 9.6.1.4.(1) and (2)	Existing doors and sidelights being reused or relocated need not conform if identified or protected.
C109	9.6.1.4.(3)	Existing acceptable, if marked to indicate their existence and position.
C110	9.7.2.3.	(a) Where windows are not used as a <i>means of egress</i> and where they do not conflict with ventilation requirements, the minimum glass areas as shown in Table 9.7.2.3. may be reduced by 50%, and (b) an existing room converted to an interior room, created by an addition, shall not require a window, provided there is an opening in a dividing wall occupying not less than 30% of the separating plane to an adjoining room, where the adjoining room has a minimum of 5% window area of the combined floor areas, and provided the required ventilation for the combined room is maintained.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C111	9.7.4.	Existing acceptable.
C112	9.8.1. to 9.8.4.	Replacement or extension of existing stair systems shall be exempt from the provisions of these Subsections, except that they shall have: (a) a minimum width between wall faces of 700 mm, and (b) a minimum clear height over tread nosing or landing of 1 800 mm.
C113	9.8.4.3. and 9.8.4.7.	Existing curved or spiral stairs are acceptable.
C114	9.8.4.5.	Where a stair complies with Subsection 9.8.4., an extension to a stair may contain two sets of winders provided that they are separated by at least three treads or a landing.
C115	9.8.5.1.(2)	Existing ramps acceptable, where practical.
C116	9.8.7.	Existing handrails acceptable, unless considered unsafe by <i>chief building official</i> .
C117	9.8.8.	Existing guards acceptable, unless considered unsafe by <i>chief building official</i> .
C118	9.8.9.6.(4)	Existing acceptable.
C119	9.9.2.1.(1) to (2.1)	Except for <i>hotels</i> , the following types of <i>exits</i> may also be used: (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to grade, (b) areas of refuge approved by the <i>chief building official</i> , where fire service rescue is possible, or (c) <i>combustible</i> or <i>noncombustible</i> exterior stairways or fire escapes which are protected in accordance with Sentence 3.2.3.13.(2). These may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
C120	9.9.2.1.(4)	Except for <i>hotels</i> , existing acceptable.
C121	9.9.3.2.	(a) In a <i>building</i> containing not more than four <i>dwelling units</i> , the width of every <i>exit</i> facility may be as the existing, but not less than 800 mm, or (b) in a <i>building</i> containing more than four <i>dwelling units</i> , the width of every <i>exit</i> facility may be as the existing, but not less than 900 mm.
C122	9.9.3.3.	(a) In a <i>building</i> containing not more than four <i>dwelling units</i> , the minimum width of a <i>public corridor</i> may be 800 mm, or (b) in a <i>building</i> containing more than four <i>dwelling units</i> , the minimum width of a <i>public corridor</i> may be 900 mm.
C123	9.9.3.4.	Existing clear height of not less than 1 950 mm is acceptable.
C124	9.9.4.2.	Except as permitted in C.A. C136, in a <i>building</i> containing not more than four <i>dwelling units</i> or <i>suites</i> , one <i>exit</i> need not be separated from the remainder of the <i>building</i> at the <i>first storey</i> where there are one or more other <i>exits</i> complying with C.A. C122.
C125	9.9.4.2.(1) and (2)	30 min <i>fire separation</i> acceptable.
C126	9.9.5.4.	Existing acceptable.
C127	9.9.5.8.	Existing acceptable provided minimum 45 min <i>fire separation</i> and where explosion-resistant <i>construction</i> or venting is provided.
C128	9.9.5.9.	Existing acceptable, provided that the enclosure has a 45 min <i>fire-resistance rating</i> .

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C129	9.9.6.1.	Except for <i>hotels</i> , existing acceptable.
C130	9.9.6.2.	Existing clear opening height of not less than 1 950 mm is acceptable.
C131	9.9.6.3.	Existing door widths are acceptable, provided <i>exit</i> widths conform to C.A. C117.
C132	9.9.6.5.	Existing door swings acceptable. Existing acceptable in <i>public heritage buildings</i> , where approved by <i>chief building official</i> .
C133	9.9.6.6.(1)	Where exit doors open onto a landing, they shall not extend beyond the face of the first riser.
C134	9.9.6.8.	Existing functionally operable passage or panic hardware acceptable.
C135	9.9.7.4.(1)(a)	Maximum area of existing room or <i>suite</i> does not apply.
C136	9.9.7.5.	Except as provided in C.A. C139, in a single <i>dwelling unit</i> or a house with a <i>secondary suite</i> , the Code requirement applies.
C137	9.9.8.2.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and provided <i>fire separations</i> comply with Part 9.
C138	9.9.8.5.	In a <i>building</i> containing not more than four <i>dwelling units</i> or <i>suites</i> , existing glazed solid wood doors to lobby may remain in lieu of new 20 minute doors, provided the <i>fire separations</i> for the floor above or below are provided as per C.A. C154, and a second <i>means of egress</i> from the <i>dwelling units</i> complies with the Code requirements.
C139	9.9.9	In a single <i>dwelling unit</i> or a house with a <i>secondary suite</i> , <i>exit</i> requirements are acceptable if at least one of the following conditions exists: <ul style="list-style-type: none"> (a) a door, including a sliding door, that opens directly to the exterior from a <i>dwelling unit</i>, serves only that <i>dwelling unit</i> and has reasonable access to ground level, and the <i>dwelling units</i> are equipped with <i>smoke alarms</i> installed in conformance with Subsection 9.10.19., (b) an <i>exit</i> that is accessible to more than one <i>dwelling unit</i> and provides the only <i>means of egress</i> from each <i>dwelling unit</i>, provided that the <i>means of egress</i> is separated from the remainder of the <i>building</i> and common areas by a <i>fire separation</i> having a 30 min <i>fire-resistance rating</i> and provided further that the required <i>access to exit</i> from any <i>dwelling unit</i> cannot be through another <i>dwelling unit</i>, <i>service room</i> or other <i>occupancy</i>, and both <i>dwelling units</i> and common areas are provided with <i>smoke alarms</i> that are installed in conformance with Subsection 9.10.19. and are interconnected, or (c) access to an <i>exit</i> from one <i>dwelling unit</i> which leads through another <i>dwelling unit</i> where, <ul style="list-style-type: none"> (i) an additional means of escape is provided through a window that conforms to the following: <ul style="list-style-type: none"> (A) the sill height is not more than 1 000 mm above or below adjacent ground level, (B) the window can be opened from the inside without the use of tools, (C) the window has an individual unobstructed open portion having a minimum area of 0.38 m² with no dimension less than 460 mm,

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C139 (Cont'd)	9.9.9.	(D) the sill height does not exceed 900 mm above the floor or fixed steps, (E) where the window opens into a window well, a clearance of not less than 1 000 mm shall be provided in front of the window, and (F) <i>smoke alarms</i> are installed in every <i>dwelling unit</i> and in common areas in conformance with Subsection 9.10.19. and are interconnected, (ii) an additional means of escape is provided through a window that conforms to the following: (A) the window is a casement window not less than 1 060 mm high, 560 mm wide, with a sill height not more than 900 mm above the inside floor, (B) the sill height of the window is not more than 5 m above adjacent ground level, and (C) <i>smoke alarms</i> are installed in every <i>dwelling unit</i> and in common areas in conformance with Subsection 9.10.19. and are interconnected, or (iii) the <i>building</i> is <i>sprinklered</i> and the <i>dwelling units</i> are equipped with <i>smoke alarms</i> installed in conformance with Subsection 9.10.19.
C140	9.9.10.1.	In a single <i>dwelling unit</i> or a house with a <i>secondary suite</i> , existing acceptable, where there is direct access to the exterior.
C141	9.9.11.	In a single <i>dwelling unit</i> or a house with a <i>secondary suite</i> , the requirements under this Subsection do not apply.
C142	9.9.11.3.	Existing illuminated legible signs are acceptable for exit signs, if approved by <i>chief building official</i> .
C143	9.9.12.	In a single <i>dwelling unit</i> or a house with a <i>secondary suite</i> , the requirements under this Subsection apply only where the condition described in (b) of C.A. C139 exists.
C144	9.10.1.1.	Assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
C145	9.10.1.3.(8) to (10)	Existing installations acceptable subject to C.A. C26, C27 and C28.
C146	9.10.3.	<i>Fire-resistance ratings</i> may also be used where they are based on: 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
C147	9.10.5.1.	(a) Existing openings in existing wall or ceiling membranes to remain. (b) Existing openings may be moved to another location in the same wall or ceiling, provided the aggregate area of openings does not increase and are not cumulative, and the existing opening is blocked up to provide the same rating as the existing wall or ceiling assembly.
C148	9.10.6.2.	Existing <i>heavy timber construction</i> acceptable where <i>construction</i> is within 90% of member sizes listed in Part 3.
C149	9.10.7.	Existing acceptable for <i>heritage buildings</i> , subject to approval of <i>chief building official</i> .

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
e1 C150	9.10.8.1.; 9.10.8.3.; 9.10.8.8.	(a) Except as provided in (b) and (c), 30 min rating is acceptable. (b) In a house with a <i>secondary suite</i> , 15 min horizontal <i>fire separation</i> is acceptable where, (i) <i>smoke alarms</i> are installed in every <i>dwelling unit</i> and in common areas in conformance with Subsection 9.10.19., and (ii) <i>smoke alarms</i> are interconnected. (c) In a house with a <i>secondary suite</i> , the <i>fire-resistance rating</i> of the <i>fire separation</i> is waived where the <i>building</i> is <i>sprinklered</i> throughout.
C151	9.10.8.4.	Assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
C152	9.10.9.7.; 9.10.9.11.	Existing acceptable in existing <i>fire separations</i> .
C153	9.10.9.12.(1)	Ceiling <i>fire separation</i> need not have a <i>fire-resistance rating</i> where sprinklering, subject to C.A. C27, of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
C154	9.10.9.13.(1)	Except for hotels, 30 min <i>fire separation</i> acceptable.
C155	9.10.9.13.(2)	In lieu of the 2 h <i>fire separation</i> , sprinklers may be used in the <i>mercantile occupancy</i> or <i>medium-hazard industrial occupancy</i> , with a 1 h <i>fire separation</i> .
e1 C156	9.10.9.16.(1) and (3); 9.10.9.17.(1)	(a) Except as provided in (b) and (c), 30 min <i>fire separation</i> is acceptable. (b) In a house with a <i>secondary suite</i> , 15 min horizontal <i>fire separation</i> is acceptable where, (i) <i>smoke alarms</i> are installed in every <i>dwelling unit</i> and in common areas in conformance with Subsection 9.10.19., and (ii) <i>smoke alarms</i> are interconnected. (c) In a house with a <i>secondary suite</i> , the <i>fire-resistance rating</i> of the <i>fire separation</i> is waived where the <i>building</i> is <i>sprinklered</i> throughout.
e1 C157	9.10.10.3.	(a) Except as provided in (b) and (c) and in Articles 9.10.10.5. and 9.10.10.6., 30 min <i>fire separation</i> is acceptable. (b) In a house with a <i>secondary suite</i> , the <i>fire-resistance rating</i> of the vertical <i>fire separation</i> is waived where, (i) <i>smoke alarms</i> are installed in every <i>dwelling unit</i> and in common areas in conformance with Subsection 9.10.19., and (ii) <i>smoke alarms</i> are interconnected. (c) In a house with a <i>secondary suite</i> , the <i>fire-resistance rating</i> of the vertical <i>fire separation</i> is waived where <i>service rooms</i> are <i>sprinklered</i> .
C168	9.10.11.2.(1)	In an individual <i>dwelling unit</i> or a house with a <i>secondary suite</i> , a <i>party wall</i> with 1 h <i>fire-resistance rating</i> is acceptable.
C169	9.10.13.1	Existing functional <i>closures</i> are acceptable subject to C.A.C8 and C160.
C160	9.10.13.2.(1)	In an individual <i>dwelling unit</i> or a house with a <i>secondary suite</i> , existing unlabelled doors at least 45 mm solid core wood or metal clad are acceptable. For existing <i>closures</i> , ratings of 20 min will not be required where the entire <i>floor area</i> is <i>sprinklered</i> .

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C161	9.10.13.2.(1)	In a <i>building</i> containing not more than four <i>dwelling units</i> or <i>suites</i> , existing glazed solid wood doors to corridors may remain in lieu of new 20 min doors, provided they are not located in a dead-end corridor.
C162	9.10.13.3.	Existing acceptable provided that wood door frames are secured with hinge screws going through frame into the stud.
C163	9.10.13.5.	Existing wired glass acceptable.
		Existing transoms or sidelights located in required fire separations may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
C164	9.10.13.6.	Existing steel door frames acceptable.
C165	9.10.13.7.	Existing glass block acceptable.
C166	9.10.13.8.	Existing sizes acceptable.
C167	9.10.13.9.	Existing operable latches acceptable.
C168	9.10.13.10.(1)	Existing functionally operable self-closing devices acceptable.
C169	9.10.13.11.	Existing operable self-releasing electromagnetic hold-open device acceptable, and except for hotels, fusible link hold-open devices acceptable.
C170	9.10.13.12.	Existing swings acceptable.
C171	9.10.13.13.(1)	Except as permitted in C.A. C172, in a <i>building</i> containing not more than four <i>dwelling units</i> , the existing heating or <i>air-conditioning</i> system may be altered to serve more than one <i>dwelling unit</i> , provided <i>smoke alarms</i> are installed in each <i>dwelling unit</i> and provided a <i>smoke detector</i> is installed in the supply or return air duct system serving the entire <i>building</i> which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.
r1 C172	9.10.13.13.(1)	In detached houses, semi-detached houses, townhouses and row houses containing not more than two <i>dwelling units</i> , or houses with a <i>secondary suite</i> , existing acceptable.
C173	9.10.13.14.; 9.10.5.1.	Except as permitted in C.A. C174, in a <i>building</i> containing not more than four <i>dwelling units</i> , the existing heating or <i>air-conditioning</i> system may be altered to serve more than one <i>dwelling unit</i> , provided <i>smoke alarms</i> are installed in each <i>dwelling unit</i> and provided a <i>smoke detector</i> is installed in the supply or return air duct system serving the entire <i>building</i> which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.
C174	9.10.13.14.; 9.10.5.1.	In an individual <i>dwelling unit</i> or a house with a <i>secondary suite</i> , existing acceptable.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C175	9.10.14.2.(2) and (3); 9.10.14.4.(2); 9.10.15.2.(3) and (4); 9.10.15.4.(9)	Where an addition to an existing residential <i>building</i> has its <i>exposing building face</i> further distant from the line than the existing <i>exposing building face</i> and the limiting distance is at least 1 200 mm, the total area of allowable <i>unprotected openings</i> may be determined under Sentence 9.10.14.2.(2) or 9.10.15.2.(3) for the combined new and existing <i>exposing building faces</i> and, (a) where the existing <i>exposing building face</i> has no <i>unprotected openings</i> , or the existing <i>unprotected openings</i> are to be filled in, the total allowable area of <i>unprotected openings</i> may be installed in the new <i>exposing building face</i> , or (b) where the existing <i>unprotected openings</i> are to remain, (i) their area shall be deducted from the total allowable area of <i>unprotected openings</i> , and the balance may be installed in the new <i>exposing building face</i> , and (ii) Sentences 9.10.14.2.(3) and 9.10.14.4.(2) or Sentences 9.10.15.2.(4) and 9.10.15.4.(9) apply only to the new <i>exposing building face</i> .
C176	9.10.14.4.; 9.10.15.4.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies no closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, to be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
C177	9.10.16.2.(1)	Where balloon framing is exposed during renovation, <i>fire blocks</i> shall be provided.
C178	9.10.18.	(a) Subject to approval by the <i>chief building official</i> , existing fire alarm system may remain where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
C179	9.10.19.4.	<i>Smoke alarms</i> may be battery operated.
C180	9.10.20.	Existing access acceptable.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C181	9.11.1.1.	Where a house contains a <i>secondary suite</i> , each <i>dwelling unit</i> shall be separated from every other space in the house in which noise may be transmitted by: (a) <i>construction</i> (i) whose joist spaces are filled with sound-absorbing material of not less than 150 mm nominal thickness, (ii) whose stud spaces are filled with sound-absorbing material, (iii) having a resilient channel on one side of the separation spaced 400 or 600 mm o.c., and, (iv) having not less than 12.7 mm thick gypsum board on ceilings and on both sides of walls, (b) <i>construction</i> providing an <i>STC</i> rating of not less than 43, or (c) a separating assembly and adjoining constructions, which together provide an <i>ASTC</i> rating of not less than 40.
C182	9.14.2.1.(1.1)	Existing acceptable.
C183	9.18.2.	Existing access acceptable.
C184	9.18.3.	Existing vents and ventilation acceptable.
C185	9.19.	Existing acceptable.
C186	9.20.2.2.	Used masonry may be reused for patching and filling openings to match adjacent work. Used interior brick may not be used for exterior applications.
C187	9.20.3.	Archaic mortars may be used to match existing jointing.
C188	9.20.4.1.	Sound jointing techniques may be employed to match existing archaic joints.
C189	9.20.12.1.	Corbelling may be constructed to match existing or original details, provided that it is structurally adequate for the proposed use.
C190	9.21.	Existing acceptable, provided the products of combustion are safely vented and provided no fire hazard is created.
C191	9.22.1. to 9.22.7.	Sound period materials, designs and techniques may be employed in recreated fireplaces, provided no fire hazard is created. Existing need not comply with Article 9.22.1.4.
C192	9.23.	Existing acceptable.
C193	9.24.	Existing acceptable.
C194	9.25.	A <i>vapour barrier</i> may consist of paint or other coating with specified perm rating such as two coats of leafing aluminum pigmented paint.
C195	9.26.	Existing acceptable, except when removing and replacing shingles, comply with the eave protection requirements of Subsection 9.26.5.
C196	9.27.	Existing acceptable.
C197	9.28.	All replacement or recreation of existing stucco may be compatible with the existing materials and application.

Table 11.5.1.1.-C (Cont'd)
Compliance Alternatives for Residential Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
C198	9.29.4.	Existing acceptable. All replacement or recreation of existing plaster may be compatible with the existing materials and application.
C199	9.32.	In an individual <i>dwelling unit</i> or a house with a <i>secondary suite</i> , rooms or spaces shall be ventilated by natural means in accordance with Subsection 9.32.2. or by providing adequate mechanical ventilation.
r1 C200	9.32.3.9C.	<i>Carbon monoxide alarms</i> may be battery operated or plugged into an electrical outlet.
r1 C201	9.33.1.1.	In a <i>building</i> containing not more than four <i>dwelling units</i> , the existing heating or <i>air-conditioning</i> system may be altered to serve more than one <i>dwelling unit</i> , provided <i>smoke alarms</i> are installed in each <i>dwelling unit</i> and provided a <i>smoke detector</i> is installed in the supply or return air duct system serving the entire <i>building</i> which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.
C202	9.33.5.3.	Sound, used or antique <i>appliances</i> are acceptable, provided that: (a) visual examination shows no excessive weakening by corrosion or other damage, (b) no structural parts are missing, (c) no cracks are present in the components intended to support the <i>appliance</i> or enclose the fire, and (d) loading and ash removal door latches and hinges hold the door closed.
C203	9.33.6.5.(1); 9.33.6.6.(1) to (3), (5), (11) and (12)	Existing acceptable.
C204	9.33.6.6.(8)	Where the duct system is being altered, lesser amounts and extent of insulation will be permitted.
C205	9.33.6.13.(7.1)	In a <i>building</i> containing not more than four <i>dwelling units</i> or residential <i>suites</i> , the existing heating or <i>air-conditioning</i> system may be altered to serve more than one <i>dwelling unit</i> or <i>suite</i> , provided <i>smoke alarms</i> are installed in each <i>dwelling unit</i> or <i>suite</i> and provided a <i>smoke detector</i> is installed in the supply or return air duct system serving the entire <i>building</i> which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.
C206	9.38.	Sound used materials shall be acceptable for reuse, subject to the following limitations: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, and (b) logs have not been subjected to termite infestation.
C207	12.2.1.2.(3)	(a) Where the framing systems are being altered to match the existing framing, lesser amounts and extent of insulation and <i>vapour barrier</i> is acceptable. (b) Existing acceptable for Article 2.1.1.9. of MMA Supplementary Standard SB-12, "Energy Efficiency for Housing". (c) Existing previously occupied log houses that are dismantled and reconstructed are exempt from Article 3.1.1.6. of MMA Supplementary Standard SB-12, "Energy Efficiency for Housing".

Table 11.5.1.1.-D/E
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE1	3.1.4.7.	Existing <i>heavy timber construction</i> acceptable where <i>construction</i> is within 90% of member sizes listed in Part 3.
DE2	3.1.5.2. to 3.1.5.4.; 3.1.5.8.	Existing acceptable.
DE3	3.1.5.9. to 3.1.5.12.	Except for exposed foamed plastics, existing acceptable. To match existing, materials may be added from on or off site.
DE4	3.1.5.18. to 3.1.5.20.; 3.1.5.25.	Existing acceptable.
DE5	3.1.7.1.	<i>Fire-resistance ratings</i> may also be used where they are based on: 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
DE6	3.1.7.5.(3)	Existing assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
DE7	3.1.8.1.(2); 3.1.8.6.	Existing functional <i>closures</i> are acceptable and may be relocated within the same existing <i>fire separation</i> .
DE8	3.1.8.5.(2)	(a) Existing functional and sound doors in existing <i>buildings</i> that are either hollow metal or kalamein and containing wired glass at least 6 mm thick and conforming to Sentence 3.1.8.16.(2) are permitted in lieu of doors not required to exceed 45 min, (b) all existing functional and sound hollow doors which carry existing 1.5 h labels are acceptable in lieu of current 1.5 h labels and may contain wired glass panels not exceeding 0.0645 m ² , at least 6 mm thick and conforming to Sentence 3.1.8.16.(2), and (c) every fire door, window assembly or glass block used as a <i>closure</i> in a required <i>fire separation</i> shall be installed in conformance with good engineering practice.
DE9	3.1.8.7., 3.1.8.8. and 3.1.8.10.	<i>Fire dampers</i> or <i>fire stop flaps</i> are not required to be installed in existing ducts at penetrations of existing <i>fire separations</i> .
DE10	3.1.8.12.(1)	For existing unlabelled doors in existing <i>buildings</i> , at least 45 mm solid core wood or metal clad are acceptable.
DE11	3.1.8.15.	Existing functionally operable latching devices, excluding draw bolts, are acceptable.
DE12	3.1.8.16.	Existing transoms or sidelights located in required <i>fire separations</i> may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
DE13	3.1.8.17. to 3.1.8.19.	Existing acceptable.
DE14	3.1.11.	Where the concealed space is being materially altered, smoke or heat detection in that space in lieu of <i>fire blocks</i> and tied into fire alarm system is acceptable.

Table 11.5.1.1.-D/E (Cont'd)
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE15	3.2.3.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies not closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, shall be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
DE16	3.2.3.6.(3)	Existing roof soffit projections acceptable.
DE17	3.2.3.17.	Need not comply for “E” <i>occupancy</i> .
DE18	3.2.4.	(a) Existing fire alarm system may remain except that Article 3.2.4.5. does not apply where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
DE19	3.2.4.8.(2)(e)	Does not apply to existing installations in <i>buildings</i> .
DE20	3.2.4.9.(5)(c)	Does not apply to existing installations in <i>buildings</i> .
DE21	3.2.5.1.; 3.2.5.2.	Existing acceptable.
DE22	3.2.5.3.	Existing access acceptable.
DE23	3.2.5.4. to 3.2.5.6.	Existing acceptable provided the <i>building</i> is <i>sprinklered</i> throughout.
DE24	3.2.5.7.	Does not apply, except where a change in <i>major occupancy</i> occurs from a lesser <i>hazard index</i> .
DE25	3.2.5.8. to 3.2.5.11.	Does not apply to <i>buildings</i> 6 <i>storeys</i> and less. Does not apply to <i>sprinklered buildings</i> .
DE26	3.2.5.13.	Existing sprinkler systems in existing <i>buildings</i> that do not conform to NFPA 13 may be altered, added to, or extended from the existing system without complying with NFPA 13, provided the system is operational and adequate with respect to coverage, water supply and controls, and provided the system is evaluated by a qualified designer.
DE27	3.3.1.5.(1)(c); Tables 3.3.1.5.-A and 3.3.1.5.-B	In Column 2, maximum area of room or <i>suite</i> to be unlimited.

Table 11.5.1.1.-D/E (Cont'd)
Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE28	3.3.1.9.(1)	Existing width of <i>public corridors</i> of not less than 914 mm is acceptable.
DE29	3.3.1.11.; 3.3.1.12.	Existing door swings may remain in <i>heritage buildings</i> , existing or being restored, with no change in <i>major occupancy</i> and with <i>occupant load</i> no greater than 100.
DE30	3.3.1.13.	Existing doors acceptable, provided not less than 600 mm wide.
DE31	3.3.1.16.	Existing curved stairs acceptable.
DE32	3.3.1.17.	Existing non-conforming capacities of <i>access to exits</i> are acceptable, provided that: (a) the increase in <i>occupant load</i> is not greater than 15%, (b) the corridor <i>fire separations</i> are rated to Code, and (c) early warning systems are provided, or (d) there are sprinklers, plus <i>smoke alarms</i> in <i>suites</i> .
DE33	3.3.1.18.	Does not apply to <i>heritage buildings</i> .
DE34	3.3.1.20.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
DE35	3.3.5.4.; 3.3.5.7.(4)	Need not comply where a gasketed door and self closer are provided in the existing <i>fire separation</i> .
DE36	3.4.1.4.	The following types of <i>exits</i> may also be used for <i>buildings</i> not over 6 storeys in <i>building height</i> : (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to grade, (b) areas of refuge where fire service rescue is possible and that comply with Measure L of Sentences (4) to (10), (18), and Clauses (20)(a), (b) and (d) in MMAH Supplementary Standard SB-4, "Measures for Fire Safety in High Buildings".
DE37	3.4.1.8.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
DE38	3.4.2.5.(1)	Existing travel distance acceptable where floor area is sprinklered.
DE39	3.4.3.2.(8)	Existing width of exits acceptable provided the occupant load is not more than 15% above the exit capacity.
DE40	3.4.3.3.	Existing acceptable.
DE41	3.4.3.4.	Existing headroom clearance of not less than 1 980 mm is acceptable.
DE42	3.4.4.1.	<i>Fire separations</i> of exits permitted in <i>buildings</i> : (a) 30 min, up to 3 storeys in <i>building height</i> , (b) 45 min, up to 6 storeys in <i>building height</i> , (c) 1 h, over 6 storeys in <i>building height</i> .
DE43	3.4.4.4.(8)	Existing washrooms opening directly into <i>exit</i> stairwell shall be separated from exit stairwell by a 45 min <i>closure</i> .
DE44	3.4.5.1.(2) and (9)	Existing illuminated legible exit signs are acceptable.
DE45	3.4.6.1.	Existing acceptable.
DE46	3.4.6.2.	Existing acceptable, if visually apparent.
DE47	3.4.6.3.(1)	Existing acceptable with rise no greater than 3.7 m.

Table 11.5.1.1.-D/E (Cont'd)
Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE48	3.4.6.4.(1) to (3)	Existing acceptable.
DE49	3.4.6.4. (4) and (5)	Existing acceptable.
DE50	3.4.6.5.(3) to (13)	Existing acceptable.
DE51	3.4.6.6.(1) to (5)	Existing acceptable.
DE52	3.4.6.7.(1)	Existing acceptable.
DE53	3.4.6.8.	Existing acceptable.
DE54	3.4.6.9.	Existing acceptable.
DE55	3.4.6.10.(2) to (6)	Existing acceptable.
DE56	3.4.6.11.(1) to (3)	Existing acceptable.
DE57	3.4.6.12.	Existing acceptable in public heritage buildings or a change in <i>occupancy</i> with no increase in <i>occupant load</i> .
DE58	3.4.6.13.	Existing acceptable.
DE59	3.4.6.14.	Existing acceptable.
DE60	3.4.6.16.	Existing functionally operable panic hardware acceptable.
DE61	3.4.7.2.	<i>Combustible</i> fire escapes which are protected from fire in accordance with Sentence 3.2.3.13.(2) are permitted or may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
DE62	3.5.1.	Existing acceptable except where <i>building</i> is classified under Subsection 3.2.6.
DE63	3.6.2.1.(7)	Existing <i>fire separation</i> of not less than 30 min is acceptable.
DE64	3.6.2.2.	Existing acceptable where explosion-resistant construction or venting is provided.
DE65	3.6.2.6.	Existing acceptable.
DE66	3.6.2.7.(1)	2 h <i>fire separation</i> acceptable.
DE67	3.6.3.1.(1) to (5)	45 min <i>fire separation</i> acceptable up to 6 storeys.
DE68	3.6.3.3.	(a) Where 2 h <i>fire separation</i> is required, 1 h is acceptable. (b) Where 1 h <i>fire separation</i> is required, 45 min is acceptable. (c) Existing need not comply with Sentence 3.6.3.3.(5).
DE69	3.6.4.2.	Ceiling <i>fire separation</i> need not have a <i>fire-resistance rating</i> where sprinklering, subject to C.A. DE26, of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
DE70	3.6.4.3.(1)	Existing to meet <i>flame-spread rating</i> of 25 or to be <i>sprinklered</i> .
DE71	3.6.4.4. to 3.6.4.6.	Existing access acceptable.
DE72	3.7.4.	Where the <i>occupant load</i> is increased by more than 15% above the capacity of the existing facilities, facilities to be added to accommodate the increase.
DE73	3.8.1.2.	Existing accessible entrance acceptable. (See C.A. DE78) Existing curb ramp conforming to Sentence 3.8.3.2.(3) is acceptable. Existing principal entrance acceptable, provided at least one <i>barrier-free</i> entrance is available.

Table 11.5.1.1.-D/E (Cont'd)
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE74	3.8.1.3.(1)	Existing unobstructed width of 920 mm minimum is acceptable.
DE75	3.8.1.3.(4)	Existing unobstructed space not less than 1 500 mm in width and 1 500 mm in length located not more than 30 m apart is acceptable.
DE76	3.8.3.2.(3)(b)	Existing curb <i>ramp</i> acceptable, provided width not less than 1 200 mm.
DE77	3.8.3.3.(1)	Existing doorway acceptable, provided not less than 800 mm wide.
DE78	3.8.3.3.(11)(a)	Existing distance acceptable, provided not less than 1 200 mm plus the width of any door that swings into the space in the path of travel.
DE79	3.8.3.4.(1)(a)	Existing <i>ramp</i> acceptable, provided not less than 870 mm between handrails.
DE80	3.8.3.8.(5)	Existing grab bar is acceptable.
DE81	3.8.3.12.	Existing universal washroom acceptable.
DE82	3.8.3.13.(2)(g)	Existing grab bar is acceptable.
DE83	3.8.3.16.	Existing drinking fountain conforming to Clauses 3.8.3.16.(2)(a) and (b) acceptable.
DE84	4.1.8.	The requirements under this Subsection do not apply.
DE85	6.3.1.1.(2)	Required outdoor air rates may be provided by mechanical, natural or combination of natural and mechanical means.
DE86	6.3.2.3.; 6.3.2.6; 6.3.2.6A.; 6.3.2.10.	Existing acceptable.
DE87	6.3.2.9.	Existing openings, grilles and diffusers acceptable, subject to approval of <i>chief building official</i> .
DE88	8.2.1.4.	Existing clearances acceptable where a <i>sewage system</i> is replaced with another <i>sewage system</i> within the same class and the capacity of the replacement <i>sewage system</i> does not exceed the capacity of the existing <i>sewage system</i> .
DE89	8.2.1.4.	Existing clearances are acceptable where a replacement <i>sewage system</i> requires lesser clearances than those required in Part 8 for the existing <i>sewage system</i> .
DE90	9.3.2.1.	Sound used lumber may be acceptable for reuse without a grade stamp provided that: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, (b) where the grade or species is unknown, the minimum grade shall apply for span table use, and (c) lumber has not been subjected to termite infestation.
DE91	9.5.11.2.	Existing acceptable, provided not less than 600 mm.
DE92	9.6.1.2.(2) and (3); 9.6.1.4.(1) and (2)	Existing doors and sidelights being reused or relocated need not conform if identified or protected.
DE93	9.6.1.4.(3) and (4); 9.8.8.1.(6) and (8)	Existing acceptable.
DE94	9.7.4.	Existing acceptable.

Table 11.5.1.1.-D/E (Cont'd)
Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE95	9.8.1. to 9.8.4.	Replacement or extension of existing stair systems shall be exempt from the provisions of these Subsections, except that they shall have: (a) a minimum width between wall faces of 700 mm, and (b) a minimum clear height over tread nosing or landing of 1 800 mm.
DE96	9.8.3.2.	Existing acceptable.
DE97	9.8.4.3. and 9.8.4.7.	Existing tapered or spiral stairs acceptable.
DE98	9.8.5.1.(2)	Existing <i>ramps</i> acceptable, where practical.
DE99	9.8.7.	Existing handrails acceptable, unless considered unsafe by <i>chief building official</i> .
DE100	9.8.8.	Existing <i>guards</i> acceptable, unless considered unsafe by <i>chief building official</i> .
DE101	9.9.1.1.	Existing acceptable.
DE102	9.9.2.1.(1) to (2.1)	The following types of <i>exits</i> may also be used: (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to grade, (b) areas of refuge approved by the <i>chief building official</i> , where fire service rescue is possible, or (c) <i>combustible</i> or <i>noncombustible</i> exterior stairways or fire escapes which are protected in accordance with Sentence 3.2.3.13.(2). These may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
DE103	9.9.2.1.(3)	Existing acceptable.
DE104	9.9.3.2.	Existing width of exits acceptable.
DE105	9.9.3.3.	Existing width of public corridors of not less than 965 mm is acceptable.
DE106	9.9.3.4.	Existing clear height of not less than 1 950 mm is acceptable.
DE107	9.9.4.2.	30 min <i>fire separation</i> acceptable.
DE108	9.9.5.4.; 9.9.5.5.	Existing acceptable.
DE109	9.9.5.8.	Existing acceptable provided minimum 45 min <i>fire separation</i> and where explosion-resistant construction or venting is provided.
DE110	9.9.5.9.	Existing acceptable, provided that the enclosure has a 45 min <i>fire-resistance rating</i> .
DE111	9.9.6.1.	Existing acceptable.
DE112	9.9.6.2.	Existing clear opening height of not less than 1 950 mm is acceptable.
DE113	9.9.6.3.	Existing door widths are acceptable, provided <i>exit</i> widths comply with C.A. DE99.
DE114	9.9.6.5.	Existing door swings are acceptable. Existing acceptable in <i>public heritage buildings</i> , where approved by <i>chief building official</i> .
DE115	9.9.6.6.(1)	Where exit doors open onto a landing, they shall not extend beyond the face of the first riser.
DE116	9.9.6.8.	Existing functionally operable passage or panic hardware acceptable.

Table 11.5.1.1.-D/E (Cont'd)
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE117	9.9.7.4.	Maximum area of existing room or <i>suite</i> to be unlimited.
DE118	9.9.8.2.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and provided <i>fire separations</i> comply with Part 9.
DE119	9.9.11.3.	Existing illuminated legible signs are acceptable for <i>exit</i> signs, if approved by <i>chief building official</i> .
DE120	9.10.1.3.(8) to (10)	Existing installations acceptable subject to C.A. DE25 and DE26.
DE121	9.10.3.	<i>Fire-resistance ratings</i> may also be used where they are based on: 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222, "Fire Endurance of Light-Framed and Miscellaneous Assemblies".
DE122	9.10.5.1.	(a) Existing openings in existing wall or ceiling membranes to remain. (b) Existing openings may be moved to another location in the same wall or ceiling, provided the aggregate area of openings does not increase and are not cumulative, and the existing opening is blocked up to provide the same rating as the existing wall or ceiling assembly.
DE123	9.10.6.2.	Existing heavy timber construction acceptable where construction is within 90% of the member sizes listed in Part 3.
DE124	9.10.7.	Existing acceptable for <i>heritage buildings</i> , subject to approval of <i>chief building official</i> .
DE125	9.10.8.1.	Existing 30 min rating acceptable.
DE126	9.10.8.2.	Existing sprinkler systems complying with C.A. DE26 and Sentence 3.2.2.17.(1) are acceptable.
DE127	9.10.8.3.	Existing acceptable, subject to approval of <i>the chief building official</i> .
DE128	9.10.8.4.	Assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
DE129	9.10.8.8.	30 min rating acceptable.
DE130	9.10.9.7. to 9.10.9.9.; 9.10.9.11.	Existing acceptable in existing <i>fire separations</i> .
DE131	9.10.9.12.(1)	Ceiling <i>fire separation</i> need not be fire-resistance rated where sprinklering of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
DE132	9.10.9.13.(2)	In lieu of the 2 h <i>fire separation</i> , sprinklers may be used in the <i>mercantile</i> occupancy with a 1 h <i>fire separation</i> .
DE133	9.10.9.15.	30 min <i>fire separation</i> acceptable.
DE134	9.10.9.17.(1)	30 min <i>fire separation</i> acceptable.
DE135	9.10.9.17.(3)	Need not comply for <i>mercantile occupancy</i> .

Table 11.5.1.1.-D/E (Cont'd)
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE136	9.10.10.3.(1)	45 min <i>fire separation</i> acceptable.
DE137	9.10.13.1.	Existing functional <i>closures</i> are acceptable subject to C.A. DE8.
DE138	9.10.13.2.	Existing acceptable.
DE139	9.10.13.3.	Existing acceptable, provided that wood door frames are secured with hinge screws going through frame into the stud.
DE140	9.10.13.5.	Existing acceptable. Existing transoms or sidelights located in required <i>fire separations</i> may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
DE141	9.10.13.6.	Existing steel door frames acceptable.
DE142	9.10.13.7.	Existing glass block acceptable.
DE143	9.10.13.8.	Existing sizes acceptable.
DE144	9.10.13.9.	Existing operable latches acceptable.
DE145	9.10.13.10.(1)	Existing functionally operable self-closing devices acceptable.
DE146	9.10.13.10.(2)	Existing functionally operable self-closing devices acceptable in “E” <i>occupancy</i> .
DE147	9.10.13.11.	Existing operable self-releasing electromagnetic and fusible link hold-open devices acceptable.
DE148	9.10.13.12.	Existing swings acceptable.
DE149	9.10.14.4.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies no closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, to be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
DE150	9.10.16.2.(1)	Where balloon framing is exposed during renovation, fire blocks shall be provided.
DE151	9.10.18.	(a) Subject to approval by the <i>chief building official</i> , existing fire alarm system may remain where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.

Table 11.5.1.1.-D/E (Cont'd)
 Compliance Alternatives for Business/Mercantile Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
DE152	9.10.20.	Existing access acceptable.
DE153	9.18.2.	Existing access acceptable.
DE154	9.18.3.	Existing vents and ventilation acceptable.
DE155	9.19.	Existing acceptable.
DE156	9.20.2.2.	Used masonry may be reused for patching and filling openings to match adjacent work. Used interior brick may not be used for exterior applications.
DE157	9.20.3.	Archaic mortars may be used to match existing jointing.
DE158	9.20.4.1.	Sound jointing techniques may be employed to match existing archaic joints.
DE159	9.20.12.1.	Corbelling may be constructed to match existing or original details, provided that it is structurally adequate for the proposed use.
DE160	9.21.	Existing acceptable, provided the products of combustion are safely vented and provided no fire hazard is created.
DE161	9.22.1. to 9.22.7.	Sound period materials, designs and techniques may be employed in recreated fireplaces, provided no fire hazard is created. Existing need not comply with Article 9.22.1.4.
DE162	9.23.	Existing acceptable.
DE163	9.24.	Existing acceptable.
DE164	9.26.	Existing acceptable, except when removing and replacing shingles, comply with eave protection requirements in Subsection 9.26.5.
DE165	9.27.	Existing acceptable.
DE166	9.28.	All replacement or recreation of existing stucco may be compatible with the existing materials and application.
DE167	9.29.4.	Existing acceptable. All replacement or recreation of existing plaster may be compatible with the existing materials and application.
DE168	9.33.5.3.	Sound, used or antique <i>appliances</i> are acceptable, provided that: (a) visual examination shows no excessive weakening by corrosion or other damage, (b) no structural parts are missing, (c) no cracks are present in the components intended to support the <i>appliance</i> or enclose the fire, and (d) loading and ash removal door latches and hinges hold the door closed.
DE169	9.38.	Sound used materials shall be acceptable for reuse, subject to the following limitations: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, and (b) logs have not been subjected to termite infestation.

Table 11.5.1.1.-F
Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F1	3.1.4.7.	Existing <i>heavy timber construction</i> acceptable where <i>construction</i> is within 90% of member sizes listed in Part 3.
F2	3.1.5.2. to 3.1.5.4.; 3.1.5.8.	Existing acceptable.
F3	3.1.5.9. to 3.1.5.12.	Except for exposed foamed plastics, existing acceptable for “F2” and “F3” <i>occupancies</i> . To match existing, materials may be added from on or off site.
F4	3.1.5.18. to 3.1.5.20.; 3.1.5.25.	Existing acceptable.
F5	3.1.7.1.	<i>Fire-resistance ratings</i> may also be used where they are based on: <ol style="list-style-type: none"> 1. HUD Rehabilitation Guidelines, “Guideline on Fire Ratings of Archaic Materials and Assemblies”. 2. DBR Technical Paper No. 194, “Fire Endurance of Protected Steel Columns and Beams”. 3. DBR Technical Paper No. 207, “Fire Endurance of Unit Masonry Walls”. 4. DBR Technical Paper No. 222, “Fire Endurance of Light-Framed and Miscellaneous Assemblies”.
F6	3.1.7.5.(3)	Existing assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
F7	3.1.8.1.(2); 3.1.8.6.	Existing functional <i>closures</i> are acceptable and may be relocated within the same existing <i>fire separation</i> .
F8	3.1.8.5.(2)	<p>(a) Existing functional and sound doors in existing <i>buildings</i> that are either hollow metal or kalamein and containing wired glass at least 6 mm thick and conforming to Sentence 3.1.8.16.(2) are permitted in lieu of doors not required to exceed 45 min,</p> <p>(b) all existing functional and sound hollow metal or kalamein doors which carry existing 1.5 h labels are acceptable in lieu of current 1.5 h labels and may contain wired glass panels not exceeding 0.0645 m², at least 6 mm thick and conforming to Sentence 3.1.8.16.(2), and</p> <p>(c) every fire door, window assembly or glass block used as a <i>closure</i> in a required <i>fire separation</i> shall be installed in conformance with good engineering practice.</p>
F9	3.1.8.7., 3.1.8.8. and 3.1.8.10.	<i>Fire dampers</i> or <i>fire stop flaps</i> are not required to be installed in existing ducts at penetrations of existing <i>fire separations</i> .
F10	3.1.8.12.(1)	For existing unlabelled doors in existing <i>buildings</i> , at least 45 mm solid core wood or metal clad are acceptable.
F11	3.1.8.13.(1)	Existing functionally operable devices acceptable for “F2” and “F3” <i>occupancies</i> .
F12	3.1.8.15.	Existing functionally operable latching devices, excluding draw bolts, are acceptable.
F13	3.1.8.16.	Existing transoms or sidelights located in required <i>fire separations</i> may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
F14	3.1.8.17. to 3.1.8.19.	Existing acceptable.

Table 11.5.1.1.-F (Cont'd)
Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F15	3.1.11.	Where the concealed space is being materially altered, smoke or heat detection in that space in lieu of <i>fire blocks</i> and tied into fire alarm system is acceptable.
F16	3.2.3.	Existing need not comply with Article 3.2.3.18. for “F2” occupancy. Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies not closer than 300 mm from a window in such other <i>building</i> , where the “opposite” window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, shall be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.16. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
F17	3.2.3.6.(3)	Existing roof soffit projections acceptable.
F18	3.2.3.17.	Need not comply for “F2” occupancy.
F19	3.2.4.	(a) Existing fire alarm system may remain except that Article 3.2.4.5. does not apply where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. “stage” system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.
F20	3.2.4.8.(2)(e)	Does not apply to existing installations in <i>buildings</i> .
F21	3.2.4.9.(5)(c)	Does not apply to existing installations in <i>buildings</i> .
F22	3.2.5.1; 3.2.5.2.	Existing acceptable.
F23	3.2.5.3.	Existing access acceptable.
F24	3.2.5.4. to 3.2.5.6.	Existing acceptable provided the <i>building</i> is <i>sprinklered</i> throughout.
F25	3.2.5.7.	Does not apply, except where a change in <i>major occupancy</i> occurs from a lesser <i>hazard index</i> .
F26	3.2.5.8. to 3.2.5.11.	Does not apply to <i>buildings</i> 6 storeys and less of “F2” and “F3” occupancies. Does not apply to <i>sprinklered buildings</i> .
F27	3.2.5.12.	Existing sprinkler systems in existing <i>buildings</i> that do not conform to NFPA 13 may be altered, added to, or extended from the existing system without complying with NFPA 13, provided the system is operational and adequate with respect to coverage, water supply and controls, and provided the system is evaluated by a qualified designer.

Table 11.5.1.1.-F (Cont'd)
Compliance Alternatives for Industrial Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F28	3.3.1.4.(1)	30 min is acceptable to separate <i>public corridors</i> or <i>exits</i> in <i>buildings</i> not exceeding 6 storeys in <i>building height</i> , except that 45 min is required for <i>exits</i> in <i>buildings</i> exceeding 3 storeys in <i>building height</i> . Except for <i>exits</i> , no rating required where <i>floor areas</i> are <i>sprinklered</i> .
F29	3.3.1.5.(1)(c); Tables 3.3.1.5.-A and 3.3.1.5.-B	For "F2" and "F3" <i>occupancies</i> in Column 2, maximum area of room or <i>suite</i> to be unlimited.
F30	3.3.1.9.	Existing width of <i>public corridors</i> of not less than 914 mm is acceptable.
F31	3.3.1.9.(11) and (12)	Need not comply where connected balcony or area of refuge is provided in compliance with C.A. F38.
F32	3.3.1.11.; 3.3.1.12.	Existing door swings may remain in <i>heritage buildings</i> , existing or being restored, with no change in <i>major occupancy</i> and with <i>occupant load</i> no greater than 100.
F33	3.3.1.13.	Existing doors acceptable, provided not less than 600 mm wide.
F34	3.3.1.16.	Existing curved or spiral stairs acceptable.
F35	3.3.1.20.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
F36	3.3.5.4.(2), (3) and (5)	Existing acceptable.
F37	3.3.5.6.; 3.3.5.7.	Need not comply where a gasketed door and self closer are provided in the existing <i>fire separation</i> .
F38	3.4.1.4.	For "F2" and "F3" <i>occupancies</i> , the following types of <i>exits</i> may also be used for <i>buildings</i> not over 6 storeys in <i>building height</i> : (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to grade, (b) areas of refuge where fire service rescue is possible and that comply with Measure L in Sentences (4) to (10), (18) and Clauses (20)(a), (b) and (d) in MMAH Supplementary Standard SB-4, "Measures for Fire Safety in High Buildings".
F39	3.4.1.8.	Existing stained, etched, bevelled, leaded or figured glass acceptable.
F40	3.4.2.5.(1)	For "F2" and "F3" <i>occupancies</i> , existing travel distance acceptable where the <i>floor area</i> is <i>sprinklered</i> .
F41	3.4.3.2.(8)	For "F2" and "F3" <i>occupancies</i> , existing width of <i>exits</i> acceptable provided the <i>occupant load</i> is not more than 15% above the <i>exit capacity</i> .
F42	3.4.3.3.	Existing acceptable.
F43	3.4.3.4.	Existing headroom clearance of not less than 1 980 mm is acceptable.
F44	3.4.4.1.	<i>Fire separations</i> of <i>exits</i> permitted in <i>buildings</i> : (a) 30 min, up to 3 storeys in <i>building height</i> , (b) 45 min, up to 6 storeys in <i>building height</i> , (c) 1 h, over 6 storeys in <i>building height</i> .
F45	3.4.4.4.(8)	Existing washrooms opening directly into exit stairwell shall be separated from <i>exit stairwell</i> by 45 min closure.
F46	3.4.5.1.(2) and (9)	Existing illuminated legible <i>exit signs</i> are acceptable.
F47	3.4.6.1.	Existing acceptable.

Table 11.5.1.1.-F (Cont'd)
 Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F48	3.4.6.2.	Existing acceptable, if visually apparent.
F49	3.4.6.3.(1)	Existing acceptable with rise no greater than 3.7 m.
F50	3.4.6.4.(1) to (3)	Existing acceptable.
F51	3.4.6.4. (4) and (5)	Existing acceptable.
F52	3.4.6.5. (3) to (13)	Existing acceptable.
F53	3.4.6.6.(1) to (5)	Existing acceptable.
F54	3.4.6.7.(1)	Existing acceptable.
F55	3.4.6.8.	Existing acceptable.
F56	3.4.6.9.	Existing acceptable.
F57	3.4.6.10.(2) to (6)	Existing acceptable.
F58	3.4.6.11.(1) to (3)	Existing acceptable.
F59	3.4.6.12.	For “F2” and “F3” occupancies, existing acceptable in <i>public heritage buildings</i> or a change in occupancy with no increase in occupant load.
F60	3.4.6.13.; 3.4.6.14.	Existing acceptable.
F61	3.4.6.16.	Existing functionally operable panic hardware acceptable.
F62	3.4.7.2.	Combustible fire escapes which are protected from fire in accordance with Sentence 3.2.3.13.(2) are permitted or may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
F63	3.5.1.	Existing acceptable, except where <i>building</i> classified under Subsection 3.2.6. and except where existing elevators are “open” type.
F64	3.6.2.1.(7)	45 min <i>fire separation</i> acceptable.
F65	3.6.2.2.	Existing acceptable where explosion-resistant construction or venting is provided.
F66	3.6.2.6.	Existing acceptable.
F67	3.6.2.7.(1)	2 h <i>fire separation</i> acceptable.
F68	3.6.3.1.(1) to (5)	45 min <i>fire separation</i> acceptable up to 6 storeys.
F69	3.6.3.3.	(a) Where 2 h <i>fire separation</i> is required, 1 h is acceptable. (b) Where 1 h <i>fire separation</i> is required, 45 min is acceptable. (c) Existing need not comply with Sentences 3.6.3.3.(4) and (5).
F70	3.6.4.2.	Ceiling <i>fire separation</i> need not be fire-resistance rated where sprinklering, subject to C.A. F26, of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
F71	3.6.4.3.(1)	Existing to meet <i>flame-spread rating</i> of 25 or to be <i>sprinklered</i> .
F72	3.6.4.4. to 3.6.4.6.	Existing access acceptable.
F73	3.6.5.5.	Existing acceptable for “F2” and “F3” occupancies.

Table 11.5.1.1-F (Cont'd)
Compliance Alternatives for Industrial Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F74	3.8.1.2.	Existing accessible entrance acceptable. (See C.A. F780) Existing curb ramp conforming to Sentence 3.8.3.2.(3) is acceptable. Existing principal entrance acceptable, provided at least one <i>barrier-free</i> entrance is available.
F75	3.8.1.3.(1)	Existing unobstructed width of 920 mm minimum is acceptable.
F76	3.8.1.3.(4)	Existing unobstructed space not less than 1 500 mm in width and 1 500 mm in length located not more than 30 m apart is acceptable.
F77	3.8.3.2.(3)(b)	Existing curb <i>ramp</i> acceptable, provided width not less than 1 200 mm.
F78	3.8.3.3.(1)	Existing doorway acceptable, provided not less than 800 mm wide.
F79	3.8.3.3.(11)(a)	Existing distance acceptable, provided not less than 1 200 mm plus the width of any door that swings into the space in the path of travel.
F80	3.8.3.4.(1)(a)	Existing <i>ramp</i> acceptable, provided not less than 870 mm between handrails.
F81	3.8.3.8.(5)	Existing grab bar is acceptable.
F82	3.8.3.12.	Existing universal washroom acceptable.
F83	3.8.3.13.(2) (g)	Existing grab bar is acceptable.
F84	3.8.3.16.	Existing drinking fountain conforming to Clauses 3.8.3.16.(2)(a) and (b) acceptable.
F85	4.1.8.	The requirements under this Subsection do not apply.
F86	6.3.1.3.(1), (3) and (4)	<i>Storage garages</i> with a total capacity of fewer than 20 motor vehicles need not have mechanical ventilating systems if the downward slope of the floor to the outside door is 1 in 120 and the garage floor is above outside ground level.
F87	6.3.2.3.; 6.3.2.6.; 6.3.2.6A.; 6.3.2.10	Existing acceptable for "F2" and "F3" <i>occupancies</i> .
F88	6.3.2.9.	Existing openings, grilles and diffusers acceptable.
F89	8.2.1.4.	Existing clearances acceptable where a <i>sewage system</i> is replaced with another <i>sewage system</i> within the same class and the capacity of the replacement <i>sewage system</i> does not exceed the capacity of the existing <i>sewage system</i> .
F90	8.2.1.4.	Existing clearances are acceptable where a replacement <i>sewage system</i> requires lesser clearances than those required in Part 8 for the existing <i>sewage system</i> .
F91	9.3.2.1.	Sound used lumber is acceptable for reuse without a grade stamp provided that: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, (b) where the grade or species is unknown, the minimum grade shall apply for span table use, and (c) lumber has not been subjected to termite infestation.
F92	9.5.11.2.	Existing acceptable, provided not less than 600 mm.
F93	9.6.1.2.(2) and (3); 9.6.1.4.(1) and (2)	Existing doors and sidelights being reused or relocated need not conform if identified or protected.
F94	9.6.1.4.(3) and (4); 9.8.8.1.(6) and (8)	Existing barriers acceptable.

Table 11.5.1.1.-F (Cont'd)
 Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F95	9.7.4.	Existing acceptable.
F96	9.8.1. to 9.8.4.	Replacement or extension of existing stair systems shall be exempt from the provisions of these Articles, except that they shall have: (a) a minimum width between wall faces of 700 mm, and (b) a minimum clear height over tread nosing or landing of 1 800 mm.
F97	9.8.4.3. and 9.8.4.7.	Existing tapered or spiral stairs acceptable.
F98	9.8.5.1.(2)	Existing ramps acceptable, where practical.
F99	9.8.7.	Existing handrails acceptable, unless considered unsafe by <i>chief building official</i> .
F100	9.8.8.	Existing guards acceptable, unless considered unsafe by <i>chief building official</i> .
F101	9.8.9.6.(4)	Existing acceptable.
F102	9.9.1.1.	Existing acceptable.
F103	9.9.2.1.(1) to (3.1)	The following types of <i>exits</i> may also be used: (a) connected balconies, which connect across <i>firewalls</i> , or connect to another <i>exit</i> , or with access to grade, (b) areas of refuge approved by the <i>chief building official</i> , where fire service rescue is possible, or (c) <i>combustible</i> or <i>noncombustible</i> exterior stairways or fire escapes which are protected in accordance with Sentence 3.2.3.13.(2). These may be reconstructed or recreated (as in the case of a <i>heritage building</i>).
F104	9.9.2.1.(3)	Existing acceptable.
F105	9.9.3.2.	Existing width of <i>exits</i> acceptable.
F106	9.9.3.3.	Existing width of <i>public corridors</i> of not less than 965 mm is acceptable.
F107	9.9.3.4.	Existing clear height of not less than 1 950 mm is acceptable.
F108	9.9.4.2.	30 min <i>fire separation</i> acceptable.
F109	9.9.5.4.	Existing acceptable.
F110	9.9.5.8.	Existing acceptable provided minimum 45 min <i>fire separation</i> and where explosion-resistant construction or venting is provided.
F111	9.9.5.9.	Existing acceptable, provided that the enclosure has a 45 min <i>fire-resistance rating</i> .
F112	9.9.6.3.	Existing door widths are acceptable, provided <i>exit</i> widths comply with C.A. F107.
F113	9.9.6.5.	Existing door swings acceptable. Existing acceptable in <i>public heritage buildings</i> , where approved by <i>chief building official</i> .
F114	9.9.6.6.(1)	Where <i>exit</i> doors open onto a landing, such doors shall not extend beyond the face of the first riser.
F115	9.9.6.8.	Existing functionally operable passage or panic hardware acceptable.
F116	9.9.7.4.	Maximum area of existing room or <i>suite</i> does not apply.

Table 11.5.1.1-F (Cont'd)
Compliance Alternatives for Industrial Occupancies
Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F117	9.9.8.2.(1)	Existing travel distance acceptable where <i>floor area</i> is <i>sprinklered</i> and provided <i>fire separations</i> comply with Part 9.
F118	9.9.11.3.	Existing illuminated legible signs are acceptable for <i>exit signs</i> , if approved by <i>chief building official</i> .
F119	9.10.1.3.(8) to (10)	Existing acceptable subject to C.A. F26 and F27.
F120	9.10.3.	<i>Fire-resistance ratings</i> may also be used where they are based on: <ol style="list-style-type: none"> 1. HUD Rehabilitation Guidelines, "Guideline on Fire Ratings of Archaic Materials and Assemblies". 2. DBR Technical Paper No. 194, "Fire Endurance of Protected Steel Columns and Beams". 3. DBR Technical Paper No. 207, "Fire Endurance of Unit Masonry Walls". 4. DBR Technical Paper No. 222. Fire Endurance of Light-Framed and Miscellaneous Assemblies".
F121	9.10.5.1.	Existing openings in existing wall or ceiling membranes to remain. Existing openings may be moved to another location in the same wall or ceiling, provided the aggregate area of openings does not increase and are not cumulative, and the existing opening is blocked up to provide the same rating as the existing wall or ceiling assembly.
F122	9.10.6.2.	Existing heavy timber construction acceptable where construction is within 90% of the member sizes listed in Part 3.
F123	9.10.7.	Existing acceptable for <i>heritage buildings</i> , subject to approval of <i>chief building official</i> .
F124	9.10.8.1.	Existing 30 min rating acceptable.
F125	9.10.8.2.	Existing sprinkler systems complying with C.A. F26 and Sentence 3.2.2.17.(1) are acceptable.
F126	9.10.8.3.	Existing acceptable, subject to approval of <i>chief building official</i> .
F127	9.10.8.4.	Assemblies required to be of <i>noncombustible construction</i> may be supported by <i>combustible construction</i> having at least the same <i>fire-resistance rating</i> as that supported.
F128	9.10.8.8.	30 min rating acceptable.
F129	9.10.9.7. to 9.10.9.9.; 9.10.9.11.	Existing acceptable in existing <i>fire separations</i> .
F130	9.10.9.12.(1)	Ceiling <i>fire separation</i> need not be <i>fire-resistance rated</i> where sprinklering of <i>fire compartments</i> on both sides of vertical <i>fire separation</i> is provided and where such <i>fire separation</i> is not required to exceed 1 h.
F131	9.10.9.13.(2)	In lieu of the 2 h <i>fire separation</i> , sprinklers may be used in the <i>medium-hazard industrial occupancy</i> with a 1 h <i>fire separation</i> .
F132	9.10.9.15.; 9.10.9.17.(1)	30 min <i>fire separation</i> acceptable.
F133	9.10.10.3.(1)	45 min <i>fire separation</i> acceptable.
F134	9.10.13.1.	Existing functional <i>closures</i> are acceptable subject to C.A. F8.

Table 11.5.1.1.-F (Cont'd)
 Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F135	9.10.13.2.	Existing acceptable.
F136	9.10.13.3.	Existing acceptable, provided that wood door frames are secured with hinge screws going through frame into the stud.
F137	9.10.13.5.	Existing wired glass acceptable. Existing transoms or sidelights located in required fire separations may be retained if wired glass, at least 6 mm thick, is securely fixed to a wood frame of at least 50 mm thickness with steel stops. Operable transoms shall be fixed closed.
F138	9.10.13.6.	Existing steel door frames acceptable.
F139	9.10.13.7.	Existing glass block acceptable.
F140	9.10.13.8.	Existing sizes acceptable.
F141	9.10.13.9.	Existing operable latches acceptable.
F142	9.10.13.10.(1)	Existing functionally operable self-closing devices acceptable.
F143	9.10.13.11.	Existing operable self-releasing electromagnetic and fusible link hold-open devices acceptable.
F144	9.10.13.12.	Existing swings acceptable.
F145	9.10.14.4.	Existing windows. (a) Existing windows in walls may be relocated to another part of the wall, provided the existing opening is blocked up to provide the same fire rating for the wall, and the projection of the new opening, at a right angle to the property line onto another <i>building</i> , lies no closer than 300 mm from a window in such other <i>building</i> , where the "opposite" window is less than 2 400 mm from the opposite new opening, and (b) except relocation of units, to be restricted to the same <i>fire compartment</i> and shall conform to the requirements of Article 3.2.3.14. or 9.10.12.3. where applicable, or (c) where a <i>building</i> does not satisfy the requirements of Subsection 3.2.3. for the amount of openings facing a yard or space that does not have sufficient <i>limiting distance</i> , such existing openings are allowed to be relocated provided: (i) such openings are not increased in size and they are protected with wired glass in steel frames conforming to Sentence 3.1.8.16.(2), or (ii) the <i>building</i> is <i>sprinklered</i> .
F146	9.10.16.2.(1)	Where balloon framing is exposed during renovation, <i>fire blocks</i> shall be provided.
F147	9.10.18.	(a) Subject to approval by the <i>chief building official</i> , existing fire alarm system may remain where the fire safety plan (as described in the Fire Code made under the <i>Fire Protection and Prevention Act, 1997</i>) for the <i>building</i> addresses the intent of Subsection 3.2.4. (i.e. "stage" system, electrical supervision, detection as required, Fire Department connection, and emergency power supply), and (b) extension of an existing system must ensure continuity and compatibility, and integrity of the system.

Table 11.5.1.1.-F (Cont'd)
 Compliance Alternatives for Industrial Occupancies
 Forming Part of Article 11.5.1.1.

C.A. Number	Division B Requirements	Compliance Alternative
F148	9.10.20.	Existing access acceptable.
F149	9.18.2.	Existing access acceptable.
F150	9.18.3.	Existing vents and ventilation acceptable.
F151	9.19.2.1.	Existing access acceptable.
F152	9.20.2.2.	Used masonry may be reused for patching and filling openings to match adjacent work. Used interior brick may not be used for exterior applications.
F153	9.20.3.	Archaic mortars may be used to match existing jointing.
F154	9.20.4.1.	Sound jointing techniques may be employed to match existing archaic joints.
F155	9.20.12.1.	Corbelling may be constructed to match existing or original details, provided that it is structurally adequate for the proposed use.
F156	9.21.	Existing acceptable, provided the products of combustion are safely vented and provided no fire hazard is created.
F157	9.22.1. to 9.22.7.	Sound period materials, designs and techniques may be employed in recreated fireplaces provided no fire hazard is created. Existing need not comply with Article 9.22.1.4.
F158	9.23.	Existing acceptable.
F159	9.24.	Existing acceptable.
F160	9.26.	Existing acceptable.
F161	9.27.	Existing acceptable.
F162	9.28.	All replacement or recreation of existing stucco may be compatible with the existing materials and application.
F163	9.29.4.	Existing acceptable. All replacement or recreation of existing plaster may be compatible with the existing materials and application.
F164	9.33.5.3.	Sound, used or antique <i>appliances</i> are acceptable, provided that: (a) visual examination shows no excessive weakening by corrosion or other damage, (b) no structural parts are missing, (c) no cracks are present in the components intended to support the appliance or enclose the fire, and (d) loading and ash removal door latches and hinges hold the door closed.
F165	9.38.	Sound used materials shall be acceptable for reuse, subject to the following limitations: (a) visual examination shows no excessive weakening by holes, notches, nail splits or other damage, and (b) logs have not been subjected to termite infestation.

Part 12

Resource Conservation and Environmental Integrity

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Part 12

Resource Conservation and Environmental Integrity

Section 12.1. General

12.1.1. Application

12.1.1.1. Scope

- (1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

12.1.1.2. Application

- (1) This Part applies to resource conservation and environmental integrity in the design and *construction of buildings*.

Section 12.2. Energy Efficiency, Carbon Dioxide Equivalents and Peak Electric Demand

12.2.1. Energy Efficiency Design

12.2.1.1. Reserved

12.2.1.2. Energy Efficiency Design

- (1) Reserved.
- (2) Except as provided in Sentences (3) and (4), the energy efficiency of all *buildings* shall
 - (a) be designed to exceed by not less than 13% the energy efficiency levels required by Sentence 12.2.1.1.(2) of O. Reg. 332/12 (Building Code) as it read on December 31, 2024, or
 - (b) conform to Division 1 and Division 3 or 5 of MMA Supplementary Standard SB-10, “Energy Efficiency Requirements.”
- (3) Except as provided in Sentence (4), the energy efficiency of a *building* or part of a *building of residential occupancy* that is within the scope of Part 9 and is intended for occupancy on a continuing basis during the winter months shall
 - (a) be designed to exceed by not less than 15% the energy efficiency levels required by Sentence 12.2.1.1.(3) of O. Reg. 332/12 (Building Code) as it read on December 31, 2024, or
 - (b) conform to Chapters 1 and 3 of MMA Supplementary Standard SB-12, “Energy Efficiency for Housing.”

- (4) This Article does not apply to
 - (a) a *farm building*,
 - (b) a *building* that does not use electrical power or fossil fuel, or
 - (c) a seasonal recreational *building* described in Section 9.37. or 9.39.

12.2.2. Carbon Dioxide Equivalents

12.2.2.1. Carbon Dioxide Equivalents

- (1) Except as provided in Sentence (2), all *buildings* shall be designed to conform to the CO₂e emission requirements set out in MMA Supplementary Standard SB-10, “Energy Efficiency Requirements.”
- (2) This Article does not apply to
 - (a) a *building* or part of a *building* of *residential occupancy* that is within the scope of Part 9 and is intended for occupancy on a continuing basis during the winter months,
 - (b) a *farm building*,
 - (c) a *building* that does not use electrical power or fossil fuel, or
 - (d) a seasonal recreational *building* described in Section 9.37. or 9.39.

12.2.3. Peak Electric Demand

12.2.3.1. Peak Electric Demand

- (1) Except as provided in Sentence (2), all *buildings* shall be designed to conform to the peak electric demand requirements set out in MMA Supplementary Standard SB-10, “Energy Efficiency Requirements.”
- (2) This Article does not apply to
 - (a) a *building* or part of a *building* of *residential occupancy* that is within the scope of Part 9 and is intended for occupancy on a continuing basis during the winter months,
 - (b) a *farm building*,
 - (c) a *building* that does not use electrical power or fossil fuel, or
 - (d) a seasonal recreational *building* described in Section 9.37. or 9.39.

12.2.4. Motion Sensors

12.2.4.1. Motion Sensors

- (1) Lighting installed to provide the minimum illumination levels required by this Code may be controlled by motion sensors except where the lighting
 - (a) is installed in an *exit*,
 - (b) is installed in a corridor serving patients or residents in a Group B, Division 2 or Division 3 *occupancy*, or
 - (c) is required to conform to Sentence 3.2.7.1.(10).
- (2) Where motion sensors are used to control minimum lighting in a *public corridor* or corridor providing *access to exit* for the public, the motion sensors shall be installed with switch controllers equipped for fail-safe operation and illumination timers set for a minimum 15-minute duration.
- (3) A motion sensor shall not be used to control emergency lighting.

Section 12.3. Energy Efficiency for Buildings of Residential Occupancy Within the Scope of Part 9

12.3.1. General

12.3.1.1. Application

(1) This Section applies to the energy efficiency of a *building* or part of a *building* of *residential occupancy* that is within the scope of Part 9 and is intended for occupancy on a continuing basis during the winter months.

12.3.1.2. Windows and Sliding Glass Doors

- (1) The energy rating and the overall coefficient of heat transfer required for windows and sliding glass doors shall be determined in conformance with
- (a) CSA A440.2, “Fenestration Energy Performance,” or
 - (b) NFRC 100, “Procedure for Determining Fenestration Product U-factors” and NFRC 200, “Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.”

12.3.1.3. Temperature Control in Houses and Dwelling Units

- (1) Except as provided in Sentence (3) and except where space heating energy is provided by a solid fuel-burning *appliance* or a ground source heat pump,
- (a) heating system in an individual *dwelling unit* shall be controlled by at least one programmable thermostatic control device located in the *dwelling unit*, and
 - (b) where a house contains a *secondary suite*, each *dwelling unit* shall be controlled by at least one programmable thermostatic control device located in the *dwelling unit*.
- (2) The programmable thermostatic control device required in Sentence (1) shall
- (a) allow the setting of different air temperatures for at least
 - (i) four time periods per day, and
 - (ii) two different day-types per week,
 - (b) include a manual override, and
 - (c) allow the setting of the air temperature to
 - (i) 13°C or lower in heating mode, and
 - (ii) 29°C or higher in cooling mode, where *air-conditioning* is provided.
- (3) A manual thermostatic control device is permitted if it
- (a) controls a heating or cooling system where the heating or cooling capacity is not more than 2 kW, or
 - (b) serves an individual room or space.

12.3.1.4. Hot Water Piping Insulation

- (1) Hot water pipes that are vertically connected to a hot water storage tank shall have heat traps on both inlet and outlet piping as close as practical to the tank, except where the tank
- (a) has an integral heat trap, or
 - (b) serves a recirculating system.
- (2) The first 2.5 m of hot water outlet piping of a hot water storage tank serving a non-recirculating system shall be insulated to provide a thermal resistance of not less than RSI 0.62.

(3) The inlet pipe of a hot water storage tank between the heat trap and the tank serving a non-recirculating system shall be insulated to provide a thermal resistance of not less than RSI 0.62.

12.3.1.5. Residential Furnaces

(1) A furnace serving an individual *dwelling unit* in a house shall be equipped with a brushless direct current motor.
(See Note A-12.3.1.5.(1))

12.3.1.6. Energy Supply for Kitchen and Laundry Facilities

(1) In order to supply energy to cooking appliances and clothes dryers, every kitchen and laundry space shall be provided with

- (a) an electrical outlet,
- (b) a natural gas line, or
- (c) a propane line.

Section 12.4. Water Efficiency

12.4.1. General

12.4.1.1. Plumbing Systems

(1) All *buildings* shall conform to the water efficiency requirements of Subsection 7.6.4.

Division C

Administrative Provisions

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General

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Part 1

General

Section 1.1. Application

1.1.1. Application

1.1.1.1. Application

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

1.1.1.2. Conformance with Administrative Requirements

(1) This Code shall be administered in conformance with the Act.

Section 1.2. Design and General Review

1.2.1. Design

1.2.1.1. Application

(1) Article 1.2.1.2. applies with respect to a *building* described in clause 11(3)(a) or (b) of the *Architects Act* or subsection 12(4) or clause 12(5)(a) of the *Professional Engineers Act*.

1.2.1.2. Design by Architect or Professional Engineer

(1) A *foundation* of a *building* shall be designed by a *professional engineer* where,
(a) the *foundation* is to be constructed below the level of the footings of an adjacent *building* and within the angle of repose of the *soil*, as drawn from the bottom of the footings, or
(b) *underpinning* of a *foundation* is to be undertaken.

(2) A sprinkler protected glazed wall assembly described in Article 3.1.8.20. of Division B shall be designed by a *professional engineer*.

(3) A *shelf and rack storage system* described in Section 3.16. of Division B shall be designed by a *professional engineer*.

(4) The time-based egress analysis for a *shelf and rack storage system* described in Sentence 3.16.1.7.(7) of Division B shall be prepared or provided by an *architect* or a *professional engineer* or a combination of both.

- (5) The supporting framing structure and anchorage system for a tent occupying an area greater than 225 m² shall be designed by a *professional engineer*.
- (6) A sign structure attached in any manner to a *building* shall be designed by an *architect* or a *professional engineer* or a combination of both where it is,
- (a) a projecting sign that weighs more than 115 kg, or
 - (b) a roof sign that has any face that is more than 10 m².
- (7) A projecting sign attached in any manner to a parapet wall shall be designed by an *architect* or a *professional engineer* or a combination of both.

1.2.2. General Review

1.2.2.1. General Review by Architect or Professional Engineer

- (1) The *construction*, including, for greater certainty, enlargement or alteration, of every *building* or part of it described in Table 1.2.2.1. shall be reviewed by an *architect* or a *professional engineer* or a combination of both as set out in Column 3 of the Table.
- (2) A person who intends to *construct* or have *constructed* a *building* or part of it required by Sentences (1) and (4) to (9) to be reviewed by an *architect* or a *professional engineer* or a combination of both, shall ensure that an *architect*, *professional engineer* or both are retained to undertake the general review of the *construction* of the *building* in accordance with the performance standards of the Ontario Association of Architects or the Association of Professional Engineers of Ontario, as applicable, to determine whether the *construction* is in general conformity with the plans, sketches, drawings, graphic representations, specifications and other documents that form the basis for the issuance of a permit under section 8 of the Act or any changes to it authorized by the *chief building official*.
- (3) The *architect*, *professional engineer* or both who have been retained to undertake the general review of the *construction* of a *building*, shall forward copies of written reports arising out of the general review to the *chief building official* or *registered code agency*, as the case may be.
- (4) The *construction* of a *foundation* of a *building* shall be reviewed by a *professional engineer* where,
- (a) the *foundation* is to be *constructed* below the level of the footings of an adjacent *building* and within the angle of repose of the *soil*, as drawn from the bottom of the footings, or
 - (b) *underpinning* of a *foundation* is to be undertaken.
- (5) The *construction* of a sprinkler protected glazed wall assembly described in Article 3.1.8.20. of Division B shall be reviewed by a *professional engineer*.
- (6) The *construction* of a *shelf and rack storage system* described in Section 3.16. of Division B shall be reviewed by a *professional engineer*.
- (7) The *construction* of a supporting framing structure and anchorage system for a tent occupying an area greater than 225 m² shall be reviewed by a *professional engineer*.
- (8) The *construction* of a sign structure shall be reviewed by an *architect* or a *professional engineer* or a combination of both, where the sign is,
- (a) a ground sign that exceeds 7.5 m in height above the adjacent finished ground,
 - (b) a projecting sign that weighs more than 115 kg, or
 - (c) a roof sign that has any face that is more than 10 m².
- (9) The *construction* of a projecting sign attached in any manner to a parapet wall shall be reviewed by an *architect*, *professional engineer* or a combination of both.

(10) The construction of a demountable stage or demountable support structure regulated by Section 3.17. of Division B shall be reviewed by a professional engineer.

Table 1.2.2.1.
General Review⁽⁴⁾
 Forming Part of Sentence 1.2.2.1.(1)

<i>Building Classification by Major Occupancy⁽⁵⁾</i>	<i>Building Description</i>	<i>General Review by:</i>
<i>Assembly occupancy only</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Assembly occupancy and any other major occupancy except industrial</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Care, care and treatment or detention occupancy only</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Care, care and treatment or detention occupancy and any other major occupancy except industrial</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Residential occupancy only, other than retirement homes</i>	<i>Every building that exceeds 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
	<i>Every building that exceeds 600 m² in gross area and that contains a residential occupancy other than a dwelling unit or dwelling units</i>	<i>Architect⁽²⁾</i>
<i>Residential occupancy only, other than retirement homes</i>	<i>Every building that exceeds 600 m² in gross area and contains a dwelling unit above another dwelling unit</i>	<i>Architect⁽²⁾</i>
	<i>Every building that exceeds 600 m² in building area, contains 3 or more dwelling units and has no dwelling unit above another dwelling unit</i>	<i>Architect⁽²⁾</i>
<i>Residential occupancy, other than retirement homes, and any other major occupancy except assembly, care, care and treatment, detention or industrial occupancy</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Retirement home only</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Retirement home and any major occupancy except industrial</i>	<i>Every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Business and personal services occupancy only</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Business and personal services occupancy and any other major occupancy except assembly, care, care and treatment, detention or industrial occupancy</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Mercantile occupancy only</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Mercantile occupancy and any other major occupancy except assembly, care, care and treatment, detention or industrial occupancy</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect and professional engineer⁽¹⁾</i>
<i>Industrial occupancy only and where there are no subsidiary occupancies</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect or professional engineer⁽³⁾</i>
Column 1	2	3

Table 1.2.2.1. (Cont'd)
General Review⁽⁴⁾
 Forming Part of Sentence 1.2.2.1.(1)

<i>Building Classification by Major Occupancy⁽⁵⁾</i>	<i>Building Description</i>	<i>General Review by:</i>
<i>Industrial occupancy and one or more other major occupancies where the portion of the area occupied by one of the other major or subsidiary occupancies exceeds 600 m²</i>	<i>The non-industrial portion of every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
	<i>The industrial portion of every building</i>	<i>Architect or professional engineer⁽³⁾</i>
<i>Industrial occupancy and one or more other major occupancies where no portion of the area occupied by one of the other major or subsidiary occupancies exceeds 600 m²</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect or professional engineer⁽³⁾</i>
<i>Agricultural occupancy only and where there are no subsidiary occupancies</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect or professional engineer⁽³⁾</i>
<i>Agricultural occupancy and one or more other major occupancies where the portion of the area occupied by one of the other major or subsidiary occupancies exceeds 600 m²</i>	<i>The non-agricultural portion of every building</i>	<i>Architect and professional engineer⁽¹⁾</i>
	<i>The agricultural portion of every building</i>	<i>Architect or professional engineer⁽³⁾</i>
<i>Agricultural occupancy and one or more other major occupancies where no portion of the area occupied by one of the other major or subsidiary occupancies exceeds 600 m²</i>	<i>Every building that exceeds 600 m² in gross area or 3 storeys in building height</i>	<i>Architect or professional engineer⁽³⁾</i>
Column 1	2	3

Notes to Table 1.2.2.1.:

- (1) An *architect* shall provide general review services within the practice of architecture and a *professional engineer* shall provide general review services within the practice of professional engineering.
- (2) An *architect* may engage a *professional engineer* to provide general review services within the practice of professional engineering.
- (3) Only a *professional engineer* may provide general review services within the practice of professional engineering.
- (4) Requirements for general review by an *architect* or a *professional engineer* or a combination of both for the *construction*, including, for greater certainty, enlargement or alteration, of a *building* are set out in the *Architects Act* and the *Professional Engineers Act*.
- (5) For purposes of Table 1.2.2.1., a *retirement home* is deemed to be a separate *major occupancy*.

1.2.2.2. Restriction for General Review

- (1) Only an *architect* may carry out or provide the general review of the *construction* of a *building*,
 - (a) that is *constructed* in accordance with a design prepared or provided by an *architect*, or
 - (b) in relation to services that are provided by an *architect* in connection with the design in accordance with which the *building* is *constructed*.
- (2) Only a *professional engineer* may carry out or provide the general review of the *construction* of a *building*,
 - (a) that is *constructed* in accordance with a design prepared or provided by a *professional engineer*, or
 - (b) in relation to services that are provided by a *professional engineer* in connection with the design in accordance with which the *building* is *constructed*.

1.2.2.3. Demolition of a Building

- (1) The applicant for a permit respecting the *demolition* of a *building* shall retain a *professional engineer* to undertake the general review of the project during *demolition*, where,
 - (a) the *building* exceeds 3 *storeys* in *building height* or 600 m² in *building area*,
 - (b) the *building* structure includes pre-tensioned or post-tensioned members,
 - (c) it is proposed that the *demolition* will extend below the level of the footings of any adjacent *building* and occur within the angle of repose of the *soil*, as drawn from the bottom of such footings, or
 - (d) explosives or a laser are to be used during the course of *demolition*.

Section 1.3. Permits and Inspections

1.3.1. Permits

1.3.1.1. Requirement for Permits

- (1) A person is exempt from the requirement to obtain a permit under section 8 of the Act,
 - (a) for the *demolition* of a *farm building* located on a farm,
 - (b) subject to Sentence (2), for the *construction* or *demolition* of a *building* in territory without municipal organization, or
 - (c) for the *construction* of a Class 1 *sewage system*.
- (2) The exemption in Clause (1)(b) from the requirement to obtain a permit does not apply to the *construction* of a *sewage system* in territory without municipal organization.
- (3) The application for a permit respecting the *demolition* of a *building* to which Sentence 1.2.2.3.(1) applies shall include descriptions of the structural design characteristics of the *building* and the method of *demolition* of the *building*.
- (4) No person shall commence *demolition* of a *building* or any part of a *building* before the *building* has been vacated by the occupants except where the safety of the occupants is not affected.
- (5) A tent or group of tents is exempt from the requirement to obtain a permit under section 8 of the Act and is exempt from compliance with the Code provided that the tent or group of tents are,
 - (a) not more than 60 m² in aggregate ground area,
 - (b) not attached to a *building*, and
 - (c) constructed more than 3 m from other structures.
- (6) A shed is exempt from the requirement to obtain a permit under section 8 of the Act and is exempt from compliance with this Code, provided that the shed,
 - (a) is not more than 15 m² in *gross area*,
 - (b) is not more than one *storey* in *building height*,
 - (c) is not attached to a *building* or any other structure,
 - (d) is used only for storage purposes ancillary to a principal *building* on the lot, and
 - (e) does not have plumbing.
- (7) A *demountable stage* or *demountable support structure* not regulated by Section 3.17. of Division B is exempt from the requirement to obtain a permit under section 8 of the Act and is exempt from compliance with this Code.

1.3.1.2. Applications for Permits under Section 8 of the Act

- (1) An application for a permit under section 8 of the Act to *construct* or *demolish* a *building* shall be made by,
 - (a) the owner of the property on which the proposed *construction* or *demolition* is to take place, or
 - (b) the authorized agent of the owner referred to in Clause (a).
- (2) An application referred to in Sentence (1) shall be in a form approved by the *Minister*.
- (3) In Sentence (1),

“owner” includes, in respect of the property on which the *construction* or *demolition* will take place, the registered owner, a lessee and a mortgagee in possession.

1.3.1.3. Period Within Which a Permit is Issued or Refused

- (1) Subject to Sentences (2) and (3) and unless the circumstances set out in Sentence (6) exist, if an application for a permit under subsection 8(1) of the Act that meets the requirements of Sentence (5) is submitted to a *chief building official*, the *chief building official* shall, within the time period set out in Column 2 of Table 1.3.1.3. corresponding to the class of *building* described in Column 1 of Table 1.3.1.3. for which the application is made,
- issue the permit, or
 - refuse to issue the permit and provide in writing all of the reasons for the refusal.
- (2) If an application for a permit under subsection 8(1) of the Act proposes *construction* or *demolition* of two or more *buildings* of different classes described in Column 1 of Table 1.3.1.3. that have different time periods in Column 2 of Table 1.3.1.3., the longer of the time periods shall be the time period for the purposes of Sentence (1).
- (3) If an application for a permit under subsection 8(1) of the Act proposes *construction* or *demolition* of a *building* described in Sentence (4), the time period for the purposes of Sentence (1) shall be the longer of,
- 10 days, and
 - the time period corresponding to the class of the *building* described in Column 1 of Table 1.3.1.3. that the *building* described in Sentence (4) serves, if any.
- (4) A *building* referred to in Sentence (3) is,
- a structure occupying an area of 10 m² or less that contains *plumbing*, including the *plumbing* appurtenant to it,
 - plumbing* not located in a structure,
 - a *sewage system*, or
 - a structure designated in Article 1.3.3.5. of Division A.
- (5) The requirements that an application for a permit under subsection 8(1) of the Act must meet for the purposes of Sentence (1) are,
- that the application is made in the form described in Sentence 1.3.1.2.(2),
 - that the applicant for the permit is a person described in Clause 1.3.1.2.(1)(a) or (b),
 - that all applicable fields on the application form and required schedules are completed,
 - that all required schedules are submitted with the application,
 - that payment is made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the Act, to be paid when the application is made, and
 - that the applicant has declared in writing that,
 - the application meets all the requirements set out in Clauses (a) to (e),
 - the application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the Act,
 - the application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the Act which enable the *chief building official* to determine whether the proposed *building*, *construction* or *demolition* will contravene any *applicable law*, and
 - the proposed *building*, *construction* or *demolition* will not contravene any *applicable law*.
- (6) The *chief building official* is not required to make a decision within the time period required by Sentence (1) with respect to an application that meets the requirements of Sentence (5) if the *chief building official*,
- determines that,
 - the application is not accompanied by the plans, specifications, information and documents referred to in Subclauses (5)(f)(ii) and (iii), or
 - the proposed *building*, *construction* or *demolition* will contravene any *applicable law*, and
 - advises the applicant of his or her determination and provides in writing the reasons for the determination within two days.
- (7) Subject to Sentences (9) and (10), the time period described in Sentences (1) to (3) and in Clause (6)(b) shall begin on the day following the day on which an application that meets the requirements of Sentence (5) is submitted to the *chief building official*.

- (8) The time periods described in Column 2 of Table 1.3.1.3. and in Clause (6)(b) shall not include Saturdays, holidays and all other days when the offices of the *principal authority* are not open for the transaction of business with the public.
- (9) The time period in Sentence (10) applies where,
- (a) an application is made for the *construction* of a *building* that is served by a *sewage system*,
 - (b) *construction* is proposed in respect of the *sewage system* that serves the *building*, and
 - (c) a board of health, conservation authority, planning board or the council of an upper-tier municipality is responsible for the enforcement of the provisions of the Act and this Code related to the *sewage system* under section 3.1 of the Act or pursuant to an agreement under section 6.2 of the Act.
- (10) The time period described in Sentences (1) to (3) and in Clause (6)(b) for an application referred to in Clause (9)(a) shall begin on the day following the later of,
- (a) the day on which an application that meets the requirements of Sentence (5) is submitted to the *chief building official*, and
 - (b) the day on which a permit for the *construction* of the *sewage system* referred to in Clause (9)(b) is issued.

Table 1.3.1.3.
Period Within Which Permit Shall be Issued or Refused
 Forming Part of Article 1.3.1.3.

Item	Class of Building	Time Period
1.	(a) Except for a <i>retirement home</i> , a house where no <i>dwelling unit</i> is located above another <i>dwelling unit</i> . (b) A detached structure that serves a <i>building</i> described in Clause (a) and does not exceed 55 m ² in <i>building area</i> . (c) A tent to which Section 3.14. of Division B applies. (d) A sign to which Section 3.15. of Division B applies. (e) A <i>dismountable stage</i> or <i>dismountable support structure</i> to which Section 3.17. of Division B applies.	10 days
2.	(a) <i>Buildings</i> described in Clause 1.3.3.3.(1)(a), (b) or (c) of Division A, other than <i>buildings</i> described in Column 1 of any of Items 1 and 4 of this Table. (b) <i>Farm buildings</i> that do not exceed 600 m ² in <i>building area</i> .	15 days
3.	(a) <i>Buildings</i> described in Sentence 1.3.3.2.(1) of Division A, other than <i>buildings</i> described in Column 1 of any of Items 1 and 4 of this Table. (b) <i>Farm buildings</i> exceeding 600 m ² in <i>building area</i> . (c) <i>Retirement homes</i> .	20 days
4.	(a) <i>Post-disaster buildings</i> . (b) <i>Buildings</i> to which Subsection 3.2.6. of Division B or any provision in Articles 3.2.8.3. to 3.2.8.8. of Division B applies.	30 days
	Column 1	2

1.3.1.4. Permits Under Section 10 of the Act

- (1) Except as provided in Sentence (2), the following changes in use of a *building* or part of a *building* constitute an increase in hazard for the purposes of section 10 of the Act and require a permit under section 10 of the Act:
- (a) a change of the *major occupancy* of all or part of a *building* that is designated with a “Y” in Table 1.3.1.4. takes place,
 - (b) a *suite* of a Group C *major occupancy* is converted into more than one *suite* of Group C *major occupancy*,
 - (c) a *suite* or part of a *suite* of a Group A, Division 2 or a Group A, Division 4 *major occupancy* is converted to a *gaming premises*,
 - (d) a *farm building* or part of a *farm building* is changed to another *major occupancy* other than a Group G *major occupancy*,
 - (e) a *farm building* or part of a *farm building* is changed to a Group G, Division 1 *major occupancy*.

- (f) a *building* or part of a *building* is changed to a *post-disaster building*,
- (g) a *building* or part of a *building* is changed to a *retirement home*, or
- (h) the use of a *building* or part of a *building* is changed and the previous *major occupancy* of the *building* or part of the *building* cannot be determined.

(2) A person is exempt from the requirement to obtain a permit under section 10 of the Act where the change in use of the *building* or part of the *building* will result from proposed *construction* and a permit under section 8 of the Act has been issued in respect of such *construction*.

(3) A person is exempt from the requirement to obtain a permit under section 10 of the Act for the change of use of a *building* in unorganized territory.

Table 1.3.1.4.
Permit Required for Change of Use
 Forming Part of Sentence 1.3.1.4.(1)⁽¹⁾

		FROM ⁽²⁾												
		A-1	A-2	A-3	A-4	B-1	B-2	B-3	C	D	E	F-1	F-2	F-3
TO ⁽³⁾	A-1	N ⁽⁵⁾	Y	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y	Y	Y
	A-2	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y	Y	Y
	A-3	Y	Y	N ⁽⁵⁾	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y	Y	Y
	A-4	Y	Y	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y	Y	Y
	B-1	Y	Y	Y	N ⁽⁵⁾	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y	Y
	B-2	Y	Y	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	Y
	B-3	Y	Y	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y
	C	Y	Y	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	N ⁽⁵⁾	⁽⁴⁾	Y	Y	Y	Y	Y
	D	N ⁽⁵⁾	N ⁽⁵⁾	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	N ⁽⁵⁾	Y	N ⁽⁵⁾	Y	Y	N ⁽⁵⁾	N ⁽⁵⁾
	E	Y	Y	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	N ⁽⁵⁾	Y	Y	Y
	F-1	Y	Y	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	N ⁽⁵⁾	Y	Y
	F-2	Y	Y	Y	N ⁽⁵⁾	Y	Y	Y	Y	Y	Y	N ⁽⁵⁾	N ⁽⁵⁾	Y
F-3	Y	N ⁽⁵⁾	Y	N ⁽⁵⁾	Y	Y	Y	Y	N ⁽⁵⁾					

Notes to Table 1.3.1.4.:

- (1) See Clause 1.3.1.4.(1)(a), Subclause 3.18.1.1.(1)(a)(i) of Division B and Clause 9.41.1.1.(1)(a) of Division B.
- (2) *Major occupancy* of all or part of a *building* before change of use.
- (3) *Major occupancy* of all or part of a *building* after change of use.
- (4) See Clause 1.3.1.4.(1)(b), Subclause 3.18.1.1.(1)(a)(ii) of Division B and Clauses 9.41.1.1.(1)(b) and 11.4.2.3.(1)(b) of Division B.
- (5) "N" is only applicable where the *major occupancy* of the entire *suite* is changed.

1.3.1.5. Conditional Permits

(1) The *chief building official* shall not issue a conditional permit for any stage of *construction* under subsection 8(3) of the Act unless compliance with the following applicable laws has been achieved in respect of the proposed *building* or *construction*:

- (a) section 3 of the *Building Transit Faster Act, 2020* with respect to the issuance of a permit under that section,
- (b) section 28 of the *Conservation Authorities Act* with respect to the prohibition of development activities,
- (c) sections 28.1, 28.1.1 and 28.1.2 of the *Conservation Authorities Act* with respect to a permit issued for the *construction* of a *building* or structure or for any change to a *building* or structure that would increase its size, alter its use or increase the number of *dwelling units*,

- (d) regulations made by a conservation authority under clause 28(1)(c) of the *Conservation Authorities Act* as it read immediately before its repeal by section 25 of Schedule 4 to the *Building Better Communities and Conserving Watersheds Act, 2017*, with respect to permission of the authority for the *construction* of a *building* or structure if, in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development,
 - (e) section 17.2 of the *Environmental Assessment Act* with respect to the approval of the Minister or the Ontario Land Tribunal to proceed with a project,
 - (f) subsection 24(3) of the *Niagara Escarpment Planning and Development Act*,
 - (g) subsection 27(9) of the *Ontario Heritage Act*,
 - (h) subsection 30(2) of the *Ontario Heritage Act* with respect to a consent of the council of a *municipality* to the alteration or *demolition* of a *building* where the council of the *municipality* has given a notice of intent to designate the *building* under subsection 29(3) of that Act,
 - (i) section 33 of the *Ontario Heritage Act* with respect to the consent of the council of a *municipality* for the alteration of property,
 - (j) section 34 of the *Ontario Heritage Act* with respect to the consent of the council of a *municipality* for the *demolition* of a *building*,
 - (k) section 34.5 of the *Ontario Heritage Act* with respect to the consent of the Minister to the alteration or *demolition* of a designated *building*,
 - (l) subsection 34.7(2) of the *Ontario Heritage Act* with respect to a consent of the Minister to the alteration or *demolition* of a *building* where the Minister has given a notice of intent to designate the *building* under section 34.6 of that Act,
 - (m) by-laws made under section 40.1 of the *Ontario Heritage Act*,
 - (n) section 42 of the *Ontario Heritage Act* with respect to the permit given by the council of a *municipality* for the erection, alteration or *demolition* of a *building*,
 - (o) section 17.4 of the *Ontario New Home Warranties Plan Act* with respect to the provision of a confirmation by the Registrar for the *construction* of a residential condominium conversion project.
- (2) For the purposes of issuing a conditional permit under subsection 8(3) of the Act, a person is exempt from the requirement in clause 8(3)(a) of the Act of compliance with by-laws passed under sections 34 and 38 of the *Planning Act* where,
- (a) a committee of adjustment has made a decision under section 45 of the *Planning Act* authorizing one or more minor variances from the provisions of any by-laws made under sections 34 and 38 of that Act,
 - (b) such minor variance or variances result in the achievement of full compliance with such by-laws, and
 - (c) no person informed the committee of adjustment of objections to the minor variances either in writing or in person at the hearing of the application.
- (3) For the purposes of issuing a conditional permit under subsection 8 (3) of the Act, a person is exempt from the requirement in clause 8(3)(a) of the Act of compliance with by-laws passed under sections 34 and 38 of the *Planning Act* where the *construction* in respect of which the conditional permit is issued is required in order to comply with an order issued under subsection 21(1) of the *Fire Protection and Prevention Act, 1997* or under subsection 15.9 (4) of the Act.
- (4) A permit issued under subsection 8(3) of the Act shall indicate its conditional nature.

1.3.1.6. Information to be Given to Tarion Warranty Corporation

- (1) This Article prescribes, for the purposes of subsection 8(8.1) of the Act, the information relating to permits issued under section 8 of the Act and the applications for those permits that the *chief building official* is required to give to *Tarion Warranty Corporation* and the time within which the information is required to be given.
- (2) The *chief building official* shall give the following information to *Tarion Warranty Corporation* with respect to permits issued under section 8 of the Act in respect of the *construction* of *buildings* described in Sentence (4),
- (a) the dates the permits are issued and the numbers or other identifying symbols for the permits, and
 - (b) the information contained in the application forms submitted in respect of the permits, other than the information contained in the schedules or other attachments to the application forms.

- (3) Despite Sentence (2), the *chief building official* is not required to give to *Tarion Warranty Corporation* information which relates to the extension or material alteration or repair of an existing *building*.
- (4) The *buildings* referred to in Sentence (2) are any *building* whose proposed use is classified as a Group C *major occupancy* and which is not a *boarding, lodging or rooming house* or a *building* containing a *hotel*.
- (5) The *chief building official* shall give the information described in Sentence (2) within 45 days after the day on which the permits to which the information relates are issued.
- (6) The time period described in Sentence (5) shall not include Saturdays, holidays and all other days when the offices of the *principal authority* are not open for the transaction of business with the public.

1.3.1.7. Information to be Given to the Fire Chief or Clerk

- (1) This Article applies to *buildings*,
 - (a) *constructed* using,
 - (i) lightweight pre-engineered floor or roof systems containing lightweight elements such as wood I-joists, cold-formed steel joists, wood truss assemblies with metal or wood plates and metal web wood joists, or
 - (ii) lightweight floor or roof systems containing solid sawn lumber joist less than 38 mm by 235 mm,
 - (b) other than a house, and
 - (c) for which a permit under section 8 of the Act is issued after July 1, 2022.
- (2) The *chief building official* shall give the following information to the chief of the fire department and the clerk of every municipality that does not have a fire department in respect of *buildings* described in Sentence (1):
 - (a) the dates the permits are issued and the numbers or other identifying symbols for the permits,
 - (b) the address of the *building*, and
 - (c) a description of the floor or roof system.
- (3) The *chief building official* shall give the information described in Sentence (2) within 45 days after the day on which the permits to which the information relates are issued.
- (4) The time period described in Sentence (3) shall not include Saturdays, holidays and all other days when the offices of the *principal authority* are not open for the transaction of business with the public.

1.3.2. Site Documents

1.3.2.1. Permit Posting

- (1) Where a permit has been issued pursuant to the Act, the person to whom it is issued shall have the permit or a copy of it posted at all times during *construction* or *demolition* in a conspicuous place on the property in respect of which the permit was issued.

1.3.2.2. Documentation on Site

- (1) The person in charge of the *construction* of the *building* shall keep and maintain on the site of the *construction*,
 - (a) at least one copy of drawings and specifications certified by the *chief building official* or a person designated by the *chief building official* to be a copy of those submitted with the application for the permit to *construct* the *building*, together with changes that are authorized by the *chief building official* or a person designated by the *chief building official*,
 - (b) copies of authorizations of the Building Materials Evaluation Commission on the basis of which the permit was issued, and
 - (c) copies of rulings of the *Minister*, made under clause 29(1)(a) or (c) of the Act, on the basis of which the permit was issued.

1.3.3. Occupancy of Buildings

1.3.3.1. Occupancy Permit — General

- (1) Except as permitted in Sentence 1.3.3.2.(1), a person may occupy or permit to be occupied any *building* or part of it that has not been fully completed at the date of occupation where the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it prior to its completion in accordance with Sentence (3).
- (2) Sentence (1) does not apply in respect of the occupancy of a *building* to which Article 1.3.3.4., 1.3.3.5. or 1.3.3.7. applies.
- (3) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building*, where,
- (a) the structure of the *building* or part of it is completed to the roof,
 - (b) the enclosing walls of the *building* or part of them are completed to the roof,
 - (c) the walls enclosing the space to be occupied are completed, including balcony *guards*,
 - (d) all required *fire separations* and *closures* are completed on all *storeys* to be occupied,
 - (e) all required *exits* are completed, including all *fire separations*, doors, door hardware, self-closing devices, *guards* and handrails, from the uppermost floor to be occupied down to *grade* level and below if an *exit* connects with lower *storeys*,
 - (f) all shafts including *closures* are completed to the floor-ceiling assembly above the *storey* to be occupied and have a temporary *fire separation* at such assembly,
 - (g) measures have been taken to prevent access to parts of the *building* and site that are incomplete or still under construction,
 - (h) floors, halls, lobbies and required *means of egress* are free of loose materials and other hazards,
 - (i) if *service rooms* should be in operation, required *fire separations* and *closures* are completed,
 - (j) all *building drains*, *building sewers*, *water systems*, *drainage systems* and *venting systems* are complete and tested as operational for the *storeys* to be occupied,
 - (k) required lighting, heating and electrical supply are provided for the *suites*, rooms and common areas to be occupied,
 - (l) required lighting in corridors, stairways and *exits* is completed and operational up to and including all *storeys* to be occupied,
 - (m) required standpipe, sprinkler and fire alarm systems are complete and operational up to and including all *storeys* to be occupied, together with required pumper connections for such standpipes and sprinklers,
 - (n) required fire extinguishers have been installed on all *storeys* to be occupied,
 - (o) main garbage rooms, chutes and ancillary services are completed to all *storeys* to be occupied,
 - (p) required firefighting access routes have been provided and are accessible, and
 - (q) the *sewage system* has been completed and is operational.
- (4) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of the *building*, the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (3) after receipt of a *certificate for the occupancy of a building not fully completed* issued by the *registered code agency* in respect of the *building*.
- (5) Where applicable, the *chief building official* or a person designated by the *chief building official* shall not issue a permit authorizing occupation of the *building* or part of it, unless compliance with section 168.3.1 of the *Environmental Protection Act* has been achieved.

1.3.3.2. Conditions for Residential Occupancy

- (1) A person may occupy or permit to be occupied a *building* intended for *residential occupancy* that has not been fully completed at the date of occupation provided that,
- (a) the *building*,
 - (i) is of three or fewer *storeys* in *building height* and has a *building area* not exceeding 600 m²,
 - (ii) has not more than 1 *dwelling unit* above another *dwelling unit*,
 - (iii) has not more than 2 *dwelling units* sharing a common *means of egress*,
 - (iv) has no accommodation for tourists, and
 - (v) is not used for a *retirement home*,
 - (b) the following *building* components and systems are complete, operational and inspected:
 - (i) required *exits*, handrails and *guards*, fire alarm and detection systems, and *fire separations*,
 - (ii) required exhaust fume barriers and self-closing devices on doors between an attached or built-in garage and a *dwelling unit*,
 - (iii) water supply, sewage disposal, lighting and heating systems, and
 - (iv) protection of foamed plastics required by Article 9.10.17.10. of Division B,
 - (c) the following *building* components and systems are complete, operational, inspected and tested:
 - (i) *water systems*,
 - (ii) *building drains* and *building sewers*, and
 - (iii) *drainage systems* and *venting systems*, and
 - (iv) where applicable, the *building* conforms to Article 9.1.1.7. of Division B.
- (2) Sentence (1) does not apply in respect of the occupancy of a *building* to which Article 1.3.3.4. or 1.3.3.5. applies.
- (3) Where applicable, a person shall not occupy or permit to be occupied a *building* or part of it, unless compliance with section 168.3.1 of the *Environmental Protection Act* has been achieved.

1.3.3.3. Notification

- (1) Where a person has occupied or permitted the occupancy of a *building* under Article 1.3.3.1. or 1.3.3.2., such person shall notify the *chief building official* forthwith upon completion of the *building*.

1.3.3.4. Occupancy Permit — Certain Buildings of Residential Occupancy

- (1) No person shall occupy or permit to be occupied a *building* described in Sentence (3), or part of it, unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (4).
- (2) This Article does not apply in respect of the occupancy of an existing *building*, or part of it, that has been subject to extension or material alteration or repair.
- (3) A *building* referred to in Sentence (1) is a *building* intended for *residential occupancy* that,
- (a) is of three or fewer *storeys* in *building height* and has a *building area* not exceeding 600 m²,
 - (b) has no accommodation for tourists,
 - (c) does not have a *dwelling unit* above another *dwelling unit*,
 - (d) does not have any *dwelling units* sharing a common *means of egress*, and
 - (e) does not contain a *retirement home*.
- (4) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building* described in Sentence (3), where,
- (a) the structure of the *building* with respect to the *dwelling unit* to be occupied is substantially complete and ready to be used for its intended purpose,
 - (b) the *building* envelope, including, but not limited to, cladding, roofing, windows, doors, assemblies requiring *fire-resistance ratings*, *closures*, insulation, *vapour barriers* and air barriers, with respect to the *dwelling unit* to be occupied, is substantially complete,

- (c) the walls enclosing the *dwelling unit* to be occupied conform to Sentence 9.25.2.3.(7) of Division B,
- (d) required electrical supply is provided for the *dwelling unit* to be occupied,
- (e) required firefighting access routes to the *building* have been provided and are accessible,
- (f) the following *building* components and systems are complete and operational for the *dwelling unit* to be occupied:
 - (i) required *exits*, floor access and egress systems, handrails, *guards*, *smoke alarms*, *carbon monoxide alarms* and *fire separations*, including, but not limited to, *fire stops*,
 - (ii) required exhaust fume barriers and self-closing devices on doors between an attached or built-in garage and the *dwelling unit*,
 - (iii) water supply, sewage disposal, lighting and heating systems, and
 - (iv) protection of foamed plastics required by Article 9.10.17.10. of Division B,
- (g) the following *building* components and systems are complete, operational and tested for the *dwelling unit* to be occupied:
 - (i) *water system*,
 - (ii) *building drain* and *building sewer*, and
 - (iii) *drainage system* and *venting system*,
- (h) required *plumbing fixtures* in the *dwelling unit* to be occupied are substantially complete and operational, and
- (i) where applicable, the *building* conforms to Article 9.1.1.7. of Division B with respect to the *dwelling unit* to be occupied.

(5) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence (3), the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (4) after receipt of a *certificate for the occupancy of a building* described in Sentence 1.3.3.4.(3) of Division C issued by the *registered code agency* in respect of the *building*.

(6) Where applicable, the *chief building official* or a person designated by the *chief building official* shall not issue a permit authorizing occupation of the *building* or part of it, unless compliance with section 168.3.1 of the *Environmental Protection Act* has been achieved.

1.3.3.5. Occupancy Permit — Buildings Within the Scope of Article 3.2.2.51. or 3.2.2.60.

- (1) No person shall occupy or permit to be occupied a *building* within the scope of Article 3.2.2.51. or 3.2.2.60. of Division B, or part of it, unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (3).
- (2) This Article does not apply in respect of the occupancy of an existing *building*, or part of it, that has been subject to extension or material alteration or repair.
- (3) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building* described in Sentence (1), where
 - (a) the structure of the *building* is completed to the roof,
 - (b) the *building* envelope, including, but not limited to, cladding, roofing, windows, doors, assemblies requiring *fire-resistance ratings*, *closures*, insulation, *vapour barriers* and air barriers, is complete,
 - (c) the walls enclosing the space to be occupied are completed, including balcony *guards*,
 - (d) all required *fire separations* and *closures* are completed,
 - (e) all required *exits* are completed, including all *fire separations*, doors, door hardware, self-closing devices, *guards* and handrails,
 - (f) all shafts including *closures* are completed,
 - (g) measures have been taken to prevent access to parts of the *building* and site that are incomplete or still under construction,
 - (h) floors, halls, lobbies and required *means of egress* are free of loose materials and other hazards,
 - (i) if *service rooms* should be in operation, required *fire separations* and *closures* are completed,
 - (j) all *building drains*, *building sewers*, *water systems*, *drainage systems* and *venting systems* are complete and tested as operational for the *storeys* to be occupied,

- (k) required lighting, heating and electrical supply are provided for the *suites*, rooms and common areas to be occupied,
- (l) required lighting in corridors, stairways and *exits* is completed and operational,
- (m) required standpipe, sprinkler and fire alarm systems are complete and operational, together with required pumper connections for such standpipes and sprinklers,
- (n) required *smoke alarms* and *carbon monoxide alarms* are complete and operational,
- (o) required fire extinguishers have been installed,
- (p) main garbage rooms, chutes and ancillary services are completed to all *storeys* to be occupied,
- (q) required firefighting access routes have been provided and are accessible, and
- (r) the *sewage system* has been completed and is operational.

(4) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence (1), the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (3) after receipt of a *certificate for the occupancy* of a *building* described in Sentence 1.3.3.5.(1) of Division C issued by the *registered code agency* in respect of the *building*.

1.3.3.6. Occupancy Permit — Buildings in the Lower Don Area of Toronto

(1) Except as provided in Sentence (2), this Article applies to *buildings* constructed on land in the City of Toronto being the land outlined in red on a map numbered 230 and filed at the Toronto office of the Ministry of Municipal Affairs and Housing located at 777 Bay Street.

(2) This Article does not apply to a *building* that complies with,

- (a) the official plan of the City of Toronto approved under section 17 of the *Planning Act* as the official plan read on the day Ontario Regulation 388/18 is filed, or
- (b) a by-law made by the City of Toronto under section 34 of the *Planning Act* as the by-law read on the day Ontario Regulation 388/18 is filed.

(3) No person shall occupy or permit to be occupied a *building* or part of it to which this Article applies, unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (4).

(4) The *chief building official* or a person designated by the *chief building official* shall not issue a permit authorizing occupation of a *building* or part of it unless,

- (a) hydraulic modelling carried out by or on behalf of the Toronto Region Conservation Authority demonstrates that the lot or parcel of land on which the *building* is constructed is no longer susceptible to flooding due to the completion of the flood protection features described in Section 4.5 of WT, “Port Lands Flood Protection and Enabling Infrastructure Due Diligence Report”, and
- (b) the *construction* of the *building* or part of it is in compliance with Clauses 1.3.3.1.(3)(a) to (q), 1.3.3.2.(1)(a) to (d), 1.3.3.4.(4)(a) to (i), 1.3.3.5.(3)(a) to (r) or 1.3.3.7.(8)(a) to (y), as applicable.

1.3.3.7. Occupancy Permit — Super Tall Buildings

(1) This Article applies to a *building*,

- (a) that is 65 or more *storeys* in *building height* or more than 250 m in height, and
- (b) for which the applicant for the permit has provided notice in accordance with Sentence (6) to the *chief building official* that they intend to occupy or permit the *building* or part of the *building* to be occupied in accordance with this Article.

(2) This Article applies to the occupation of a *building* where the structure and enclosing walls of the *building* are not completed to the roof.

(3) For greater certainty, once the structure and enclosing walls of the *building* are completed to the roof, Article 1.3.3.1. applies to the authorization of occupation of the remainder of the *building*.

- (4) This Article does not permit the occupation of exterior balconies, podiums, terraces, platforms and contained open spaces.
- (5) This Article does not permit occupation if the *means of egress* are located on faces of the *building* where there is overhead lifting of heavy construction materials, elements and equipment.
- (6) The notice described in Clause (1)(b) must have been provided to the *chief building official* at the time the first application for a permit under section 8 of the Act is made in respect of the *building*.
- (7) No person shall occupy or permit to be occupied a *building* or part of a *building* described in Sentence (1) unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (8).
- (8) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building* where,
- (a) the structure of the *building* or part of it is completed to the floor of the *storey* that is 10 *storeys* above the uppermost *storey* to be occupied, other than parts of the floor-ceiling assemblies that are unable to be completed because of the ongoing *construction*,
 - (b) the enclosing walls of the *building* or part of the enclosing walls are completed to the floor of the *storey* that is 5 *storeys* above the uppermost *storey* to be occupied,
 - (c) the walls enclosing the space to be occupied are completed, including balcony *guards*,
 - (d) all required *fire separations* and doors, including door hardware and self-closing devices, are completed on all *storeys* up to the floor of the *storey* that is 5 *storeys* above the uppermost *storey* to be occupied,
 - (e) all required *closures* are completed on all *storeys* up to and including the uppermost *storey* to be occupied,
 - (f) all required *exits* are completed, including all *fire separations*, doors, door hardware, self-closing devices, *guards* and handrails, from the uppermost floor to be occupied down to *grade* level and below if an *exit* connects with lower *storeys*,
 - (g) all shafts, including *closures*, are completed to the floor-ceiling assembly that is 5 *storeys* above the uppermost *storey* to be occupied and have a temporary *fire separation* at such assembly,
 - (h) all shafts in the parts of the *building* that are incomplete or are still under *construction* are protected against falling objects,
 - (i) where there is a crane mast inside the *building*, walls acting as *guards* shall,
 - (i) separate the crane mast from the parts of the *building* to be occupied, and
 - (ii) be designed and constructed to withstand the loading values specified in Sentence 4.1.5.15.(1) of Division B, where the crane mast or part of the crane mast is located in a *storage garage*,
 - (j) the ceiling of the floor-ceiling assembly above the uppermost *storey* to be occupied is complete and weather-tight and the floor-ceiling assembly is insulated to prevent condensation,
 - (k) measures have been taken to,
 - (i) separate the parts of the *building* to be occupied from the parts of the *building* and site that are incomplete or still under *construction*,
 - (ii) prevent access to parts of the *building* and site that are incomplete or still under *construction*, and
 - (iii) protect occupants and members of the public while *construction* is ongoing,
 - (l) floors, halls, lobbies and required *means of egress* are free of loose materials and other hazards,
 - (m) if *service rooms* should be in operation, required *fire separations* and *closures* are completed,
 - (n) all *building drains*, *building sewers*, *water systems*, *drainage systems* and *venting systems* are complete and tested as operational for the *storeys* to be occupied,
 - (o) required lighting, heating and electrical supply are provided for the *suites*, rooms and common areas to be occupied,
 - (p) required lighting in corridors, stairways and *exits* is completed and operational up to and including all *storeys* to be occupied,
 - (q) required ventilation is installed and operational for the *floor areas* to be occupied,
 - (r) required sprinkler, fire alarm and smoke control systems, along with required pumper connections for the sprinklers, are complete and operational up to and including the *storey* to be occupied,
 - (s) required standpipe systems are installed and operational up to the *storey* below the uppermost *storey* for which the structure of the *building* is complete, including required pumper connections for such standpipe systems,

- (t) required fire extinguishers have been installed on all *storeys* to be occupied and for which the structure of the *building* is complete,
 - (u) main garbage rooms, chutes and ancillary services are completed to all *storeys* to be occupied,
 - (v) required firefighting access routes have been provided and are accessible,
 - (w) required elevators for use by firefighters are complete and tested as operational up to and including the *storey* immediately above the uppermost *storey* to be occupied,
 - (x) a covered way is installed and complete over all required *means of egress* from the *building*, and all other areas on the property that can be accessed by occupants of the *building*, that,
 - (i) has an unobstructed height of at least 2400 mm,
 - (ii) has an unobstructed width of at least the width of the *means of egress*,
 - (iii) is capable of supporting any loads likely to be encountered as determined by a *professional engineer*, including snow loads and impact loads from *construction*,
 - (iv) has a weather-tight roof,
 - (v) has partitions with smooth surfaces on the side accessible to occupants,
 - (vi) has adequate lighting within the covered way, and
 - (vii) otherwise complies with the requirements in Articles 3.8.1.3., and 3.8.2.2. of Division B, as applicable, and
 - (y) the requirements set out in Sentences (9) to (13) are complied with.
- (9) The person to whom a permit under section 8 of the Act is issued in respect of the *building*, and such other person as the *chief building official* determines, shall,
- (a) agree in writing with the *municipality* to assume all risk in occupying or authorizing the occupation of the *building* or part of it in accordance with this Article and comply with such other conditions as the *chief building official* considers necessary, including the provision of security, indemnities and evidence of insurance, and
 - (b) submit to the *chief building official*,
 - (i) a plan for phasing of *construction* and occupancy,
 - (ii) a site safety plan addressing the means to ensure safety of the occupants and public while *construction* is ongoing, including,
 - A. measures to protect occupants and the public from risks associated with the lifting of heavy construction materials, elements and equipment,
 - B. measures for safeguarding occupant wellbeing while *construction* is ongoing, including the disposal of construction debris, noise, dust, odour, harmful airborne chemicals, non-airborne contaminants, pests and vibrations, including the transfer of vibrations from concrete pumping and pouring to the parts of the *building* to be occupied, and
 - C. measures to address risks, hazards and occupant comfort associated with the proximity of exterior crane masts, concrete pumping pipes and exterior hoists and their tie-back systems,
 - (iii) a report from a *professional engineer* that attests,
 - A. to the adequacy of the measures to safeguard life, health and property,
 - B. that ongoing *construction* will not adversely impact the structural adequacy of the parts of the *building* to be occupied, and
 - C. that the design of the climbing barriers, fall protection systems and horizontal and vertical safety nets meets the requirements of Sentence (11),
 - (iv) a report from a third-party *professional engineer* that has reviewed the adequacy of the measures to safeguard life, health and property, if that review is required by *chief building official*, and
 - (v) the report arising from the review conducted in accordance with Sentence (12).
- (10) Measures described in Clause (8)(k) shall include,
- (a) providing heat, hot water, cold water, gas, electricity, plumbing or other utility services for the parts of the *building* to be occupied separate from the services that serve the parts of the *building* that are incomplete or still under *construction*,
 - (b) providing access to the parts of the *building* to be occupied, including access for occupants, vehicles and deliveries, that is separate and independent from access to the parts of the *building* and site that are incomplete or still under *construction*,
 - (c) ensuring that elevators that serve the parts of the *building* to be occupied are not used for *construction*,
 - (d) ensuring that access to the construction area, including any construction staging and loading areas, shall be on a different face of the *building* than the access to and within the parts of the *building* to be occupied,

- (e) installing temporary or permanent physical barriers to protect the parts of the *building* to be occupied from falling machinery, equipment, tools, construction materials and any other material or debris, and
 - (f) installing climbing physical barriers, fall protection and horizontal and vertical safety nets in accordance with Sentence (11).
- (11) The climbing physical barriers, fall protection systems and horizontal and vertical safety nets referred to in Clause (10)(f), shall,
- (a) in the case of horizontal fall protection systems and safety nets, extend not less than 3 m from the face of the *building*,
 - (b) be installed where there is *construction* on the exterior of the *building* or a *storey* that is unenclosed, and
 - (c) be located immediately below the *storey* where the *construction* is located.
- (12) Prior to occupancy, the *construction* of the parts of the *building* to be occupied shall be reviewed by a *professional engineer* or an *architect* in accordance with Article 1.2.2.1.
- (13) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of the *building*, the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (8) after receipt of a *certificate for the occupancy of a building not fully completed* issued by the *registered code agency* in respect of the *building*.

1.3.4. Fire Department Inspection

1.3.4.1. Fire Department Approval

- (1) Subject to Sentence (2), if the council of a *municipality* assigns specific responsibility for the enforcement of any portion of this Code respecting fire safety matters to an *inspector* who is the chief of the fire department of the *municipality*, the *chief building official* shall not issue a permit to *construct a building* unless the *inspector* approves the drawings submitted with the application for the permit as complying with that portion of this Code.
- (2) If a *registered code agency* has been appointed under clause 4.1(4)(a) or (c) of the Act,
 - (a) a *municipality* shall not assign responsibility under Sentence (1) to the chief of the fire department with respect to a *building* for which the *registered code agency* has been appointed, and
 - (b) any assignment of responsibility under Sentence (1) with respect to a *building* for which the *registered code agency* is appointed shall be cancelled as of the date of the appointment.

1.3.5. Notices and Inspections

1.3.5.1. Prescribed Notices

- (1) This Article sets out the notices that are required under section 10.2 of the Act.
- (2) The person to whom a permit under section 8 of the Act is issued shall notify the *chief building official* or, where a *registered code agency* is appointed under the Act in respect of the *construction* to which the notice relates, the *registered code agency* of,
 - (a) readiness to *construct* footings,
 - (b) substantial completion of footings and *foundations* prior to commencement of backfilling,
 - (c) substantial completion of structural framing and ductwork and piping for heating and *air-conditioning* systems, if the *building* is within the scope of Part 9 of Division B,
 - (d) substantial completion of structural framing and roughing-in of heating, ventilation, *air-conditioning* and air-contaminant extraction equipment, if the *building* is not a *building* to which Clause (c) applies,
 - (e) substantial completion of insulation and *vapour barriers*,
 - (f) substantial completion of *air barrier systems*,

- (g) substantial completion of all required *fire separations* and *closures* and all fire protection systems including standpipe, sprinkler, fire alarm and emergency lighting systems,
- (h) substantial completion of fire access routes,
- (i) readiness for inspection and testing of,
 - (i) *building sewers* and *building drains*,
 - (ii) *water service pipes*,
 - (iii) *fire service mains*,
 - (iv) *drainage systems* and *venting systems*,
 - (v) the *water distribution system*, and
 - (vi) *plumbing fixtures* and *plumbing appliances*,
- (j) readiness for inspection of suction and gravity outlets, covers and suction piping serving outlets of an *outdoor pool* described in Clause 1.3.1.1.(1)(j) of Division A, a *public pool* or a *public spa*,
- (k) substantial completion of the circulation / *recirculation system* of an *outdoor pool* described in Clause 1.3.1.1.(1)(j) of Division A, a *public pool* or *public spa* and substantial completion of the pool before it is first filled with water,
- (l) readiness to *construct* the *sewage system*,
- (m) substantial completion of the installation of the *sewage system* before the commencement of backfilling,
- (n) substantial completion of installation of *plumbing* not located in a structure, before the commencement of backfilling,
- (o) completion of *construction* and installation of components required to permit the issue of an occupancy permit under Sentence 1.3.3.1.(3) or to permit occupancy under Sentence 1.3.3.2.(1), if the *building* or part of the *building* to be occupied is not fully completed, and
- (p) completion of *construction* and installation of components required to permit the issue of an occupancy permit under Sentence 1.3.3.4.(4), 1.3.3.5.(3) or 1.3.3.7.(8).

1.3.5.2. Additional Notices

- (1) A by-law, resolution or regulation made by a *principal authority* under clause 7(1)(e) of the Act may require that notice of one or more of the following stages of *construction* be given by the person to whom a permit is issued under section 8 of the Act:
- (a) commencement of *construction* of the *building*,
 - (b) substantial completion of structural framing for each *storey*, if the *building* is a type of *building* that is within the scope of Division B, other than Part 9,
 - (c) commencement of *construction* of,
 - (i) masonry fireplaces and masonry *chimneys*,
 - (ii) factory-built fireplaces and allied *chimneys*, or
 - (iii) *stoves*, ranges, *space heaters* and add-on *furnaces* using solid fuels and allied *chimneys*,
 - (d) substantial completion of interior finishes,
 - (e) substantial completion of heating, ventilating, *air-conditioning* and air-contaminant extraction equipment,
 - (f) substantial completion of exterior cladding,
 - (g) substantial completion of site grading,
 - (h) substantial completion of the pool deck and dressing rooms for a *public pool* or *public spa* and readiness for inspection of the emergency stop system for a *public pool* or *public spa*,
 - (i) completion and availability of drawings of the *building* as constructed, and
 - (j) completion of a *building* for which an occupancy permit is required under Article 1.3.3.4., 1.3.3.5. or 1.3.3.7.

1.3.5.3. Prescribed Inspections

(1) Except as provided in Sentence (2), an *inspector* or *registered code agency*, as the case may be, shall, not later than two days after receipt of a notice given under Sentence 1.3.5.1.(2), undertake a site inspection of the *building* to which the notice relates.

(2) Where a notice given under Sentence 1.3.5.1.(2) relates to matters described in Clause 1.3.5.1.(2)(l) or (m), an *inspector* or *registered code agency*, as the case may be, shall, not later than five days after receipt of the notice, undertake a site inspection of the *sewage system* to which the notice relates.

- (3) When undertaking an inspection required under Sentence (1) or (2), the *inspector* or *registered code agency*, as the case may be, may consider reports concerning whether the *building* or a part of the *building* complies with the Act or this Code
- (4) For greater certainty, when undertaking an inspection required under Sentence (1) or (2), the *inspector* or *registered code agency*, as the case may be, may choose to not attend at the physical site of the *building* and may instead undertake the inspection using other means.
- (5) The time periods referred to in Sentences (1) and (2) shall begin on the day following the day on which the notice is given.
- (6) The time periods referred to in Sentences (1) and (2) shall not include Saturdays, holidays and all other days when the offices of the *principal authority* are not open for the transaction of business with the public.

1.3.5.4. Construction of Sewage Systems

- (1) The following information is prescribed for the purposes of subsection 15.12(3) of the Act and must be provided to the *chief building official* before the commencement of the *construction* of a *sewage system*:
- (a) the information described in Sentence 3.3.4.1.(2) as it relates to,
- (i) the person registered under Article 3.3.3.2., and
 - (ii) the person with the qualifications described in Clause 3.3.3.2.(1)(a) who will supervise *construction* on-site of the *sewage system*, and
- (b) the name and telephone number of the representative of the person described in Subclause (a)(i) who may be contacted by the *chief building official* in respect of the *construction* of the *sewage system*.

1.3.5.5. Orders

- (1) An order issued under subsection 12(2), 13(1) or (6), 14(1) or 15.10.1(2) or clause 18(1)(f) of the Act shall be in a form approved by the *Minister*.

1.3.6. As Constructed Plans

1.3.6.1. Application

- (1) Where a by-law, resolution or regulation has been made by a *principal authority* under clause 7(1)(g) of the Act, the *chief building official* may require that *as constructed plans* for the whole of, or any part or system of, a *building* or any class of *buildings* be provided by the persons responsible for the *construction*.

^{r1} 1.3.7. Temporary Health or Residential Facilities

1.3.7.1. Application

- (1) In this Subsection

“proponent” means a person or entity described in clause (a) or (b) of the definition of “temporary health or residential facility”;

“temporary health or residential facility” means a *building* or structure that was occupied, in accordance with Article 1.3.7.3. of Ontario Regulation 332/12 (Building Code), before April 1, 2024 and that is used or intended to be used to provide, on a temporary basis for the purpose of responding to the COVID-19 pandemic and its effects, health care or sleeping accommodation, by or on behalf of,

- (a) any health service provider as defined in paragraphs 1 to 5 of the definition of “health service provider” in subsection 1(2) of the *Connecting Care Act, 2019*, or
- (b) any government, including, for greater certainty, a municipality.

1.3.7.2. Exemption

- (1) The *construction* of a temporary health or residential facility and the conversion of all or part of an existing *building* or structure to a temporary health or residential facility are exempt from the requirement to obtain a permit under section 8 or 10 of the Act and are exempt from compliance with this Code.

1.3.7.3. Reserved

1.3.7.4. Inspections

- (1) A *chief building official* or an *inspector* shall, in accordance with Sentence (2), undertake an inspection of the temporary health or residential facility pursuant to subsection 15.9(1) of the Act to determine whether the facility is unsafe as described in subsection 15.9(2) of the Act.
- (2) An inspection described in Sentence (1) shall be undertaken on or before a date that is not later than one month after the date of the previous inspection.
- (3) For greater certainty, for the purpose of Sentence (2), if the temporary health or residential facility was inspected in accordance with Ontario Regulation 332/12 (Building Code), the date of the previous inspection is the date that it was last inspected under that Regulation.
- (4) When undertaking an inspection required under Sentence (1), the inspector may consider reports concerning whether the temporary health or residential facility or part of the facility is unsafe as described in subsection 15.9(2) of the Act.

Section 1.4. Search Warrant

1.4.1. Forms

1.4.1.1. Information & Warrant Forms

- (1) An information to obtain a warrant to enter and search a *building*, receptacle or place under subsection 21(1) of the Act shall be in Form 1.4.1.1.-A.
- (2) A warrant to enter and search a *building*, receptacle or place under subsection 21(1) of the Act shall be in Form 1.4.1.1.-B.

FORM 1.4.1.1.-A
 INFORMATION TO OBTAIN SEARCH WARRANT UNDER SECTION 21 OF THE BUILDING CODE ACT, 1992

Building Code Act, 1992

ONTARIO COURT OF JUSTICE
 PROVINCE OF ONTARIO

This is the information of _____
 (name)

of _____,
 (address) (occupation)

I have reasonable ground to believe and do believe that the offence of _____
 _____ contrary to *Building Code Act, 1992*

Section _____ has been committed and that the entry into and search of a certain building, receptacle or place, namely,

 (building, receptacle or place)

of _____, at _____
 (owner) (address)

will afford the following evidence: _____

 (describe evidence to be searched for, including things to be seized, if any)
 relevant to the commission of the offence.

And I further say that my grounds for so believing are:

Therefore, I request that a search warrant be issued to

• enter into and search the said _____
 (building, receptacle or place)
 _____ for the said evidence.

Check
 appropriate
 box

• enter into and search the said _____
 (building, receptacle or place)
 _____ for the said evidence and to seize the
 following things: _____
 (describe things to be seized)

 Informant

Sworn before me at _____,
 this _____ day of _____,

 Provincial Judge or Justice of the Peace in and for the Province of Ontario

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FORM 1.4.1.1.-B
SEARCH WARRANT UNDER SECTION 21 OF THE BUILDING CODE ACT, 1992

Building Code Act, 1992

ONTARIO COURT OF JUSTICE
PROVINCE OF ONTARIO

To: _____,

Whereas, on the information on oath of _____, I am satisfied that there is reasonable ground to believe that the offence of _____ contrary to *Building Code Act, 1992* Section _____ has been committed and that

_____ (describe evidence to be searched for, including things to be seized, if any)

that there is reasonable ground to believe will afford evidence of the said offence may be found

at _____

_____ (building, receptacle or place)

of _____, at _____ (owner) (address)

hereinafter called the premises.

This is therefore to authorize you to enter such _____

_____ (name or location of building, receptacle or place)

between the hours of 6:00 a.m. and 9:00 p.m., or _____ (time warrant to be executed)

and to search for the said evidence.
Check appropriate box

and to search for the said evidence and to seize the following things: _____ (describe things to be seized)

and carry them before me or another Provincial Judge or Justice of the Peace so that they may be dealt with according to the law.

This warrant expires on the _____ day of _____, _____, a day not later than the fifteenth day after its issue.

Issued at _____,

this _____ day of _____,

Provincial Judge or Justice of the Peace in and for the Province of Ontario

Section 1.5. Designated Persons and Powers

1.5.1. General

1.5.1.1. General

- (1) The *director* and employees in the Ministry of Municipal Affairs and Housing who work under the supervision of the *director* and are specified by the *director* are designated for the purposes of the enforcement of the Act and this Code in relation to the qualifications of,
 - (a) *chief building officials*,
 - (b) *inspectors*,
 - (c) *registered code agencies*,
 - (d) persons engaging in the activities described in subsection 15.11(5) of the Act, and
 - (e) persons engaged in the business of *constructing* on site, installing, repairing, servicing, cleaning or emptying *sewage systems*.
- (2) The *director* may, for the purposes set out in Sentence (1), exercise the following powers under the Act of a *chief building official*:
 - (a) certify for the purposes of subsection 37(2) of the Act statements as to any matter of record in the office of the *director*, and
 - (b) apply for an order under section 38 of the Act.
- (3) The employees in the Ministry of Municipal Affairs and Housing designated by the *director* may, for the purposes set out in Sentence (1), exercise the following powers under the Act of an *inspector*:
 - (a) subject to section 16 of the Act, exercise the powers of entry for inspection purposes in subsection 12(1) of the Act, and
 - (b) exercise the powers of an *inspector* under section 18 of the Act.
- (4) Sections 15.23 and 19 of the Act apply to the exercise of powers under this Article by the *director* and employees in the Ministry of Municipal Affairs and Housing designated by the *director*.

Section 1.6. Prescribed Person

1.6.1. General

1.6.1.1. General

- (1) The *director* is prescribed for the purposes of section 38.1 of the Act.

Section 1.7. Enforcement of the Provisions of the Act and this Code Related to Sewage Systems

1.7.1. General

1.7.1.1. General

(1) The boards of health and conservation authorities listed in Column 1 of Table 1.7.1.1. are prescribed, for the purposes of subsection 3.1(1) of the Act, as the boards of health and conservation authorities that are responsible for the enforcement of the provisions of the Act and this Code related to *sewage systems* in the *municipalities* and territory without municipal organization prescribed in Column 2 of Table 1.7.1.1.

Table 1.7.1.1.
Enforcement of the provisions of the Act and this Code Related to Sewage Systems
 Forming Part of Sentence 1.7.1.1.(1)

Board of Health or Conservation Authority	Geographic Area
Board of Health of the Northwestern Health Unit	All municipalities and territory without municipal organization located in the Northwestern Health Unit
Board of Health of the Thunder Bay District Health Unit	All municipalities and territory without municipal organization located in the Thunder Bay District Health Unit
Board of Health of the Porcupine Health Unit	All municipalities and territory without municipal organization located in the Porcupine Health Unit
Board of Health of the Algoma Health Unit	All municipalities and territory without municipal organization located in the Algoma Health Unit
Board of Health of the Sudbury and District Health Unit	All municipalities and territory without municipal organization located in the Sudbury and District Health Unit
Board of Health of the Timiskaming Health Unit	All municipalities and territory without municipal organization located in the Timiskaming Health Unit
North Bay-Mattawa Conservation Authority	All municipalities and territory without municipal organization located in: <ul style="list-style-type: none"> a. the District of Nipissing, except those parts of the District of Nipissing located in the Timiskaming Health Unit, and b. the District of Parry Sound, except for the Township of The Archipelago, the geographic Townships of Blair, Brown, Harrison, Henvey, Mowat and Wallbridge and the unsurveyed territory north of the geographic Township of Henvey to the French River.
Column 1	2

Section 1.8. Language

1.8.1. Language

1.8.1.1. Language Used on Required Signs

e1 (1) All required signs in this Code shall be displayed in the English language or in the English and French languages, including operational material on all life safety equipment and devices.

Section 1.9. Fees

1.9.1. Fees

1.9.1.1. Annual Report

- (1) The report referred to in subsection 7(4) of the Act shall contain the following information in respect of fees authorized under clause 7(1)(c) of the Act:
- (a) total fees collected in the 12-month period ending no earlier than three months before the release of the report,
 - (b) the direct and indirect costs of delivering services related to the administration and enforcement of the Act in the area of jurisdiction of the *principal authority* in the 12-month period referred to in Clause (a),
 - (c) a breakdown of the costs described in Clause (b) into at least the following categories:
 - (i) direct costs of administration and enforcement of the Act, including the review of applications for permits and inspection of *buildings*, and
 - (ii) indirect costs of administration and enforcement of the Act, including support and overhead costs, and
 - (d) if a reserve fund has been established for any purpose relating to the administration or enforcement of the Act, the amount of the fund at the end of the 12-month period referred to in Clause (a).
- (2) The *principal authority* shall give notice of the preparation of a report under subsection 7(4) of the Act to every person and organization that has requested that the *principal authority* provide the person or organization with such notice and has provided an address for the notice.

1.9.1.2. Change of Fees

- (1) Before passing a by-law or resolution or making a regulation under clause 7(1)(c) of the Act to introduce or change a fee imposed for applications for a permit, for the issuance of a permit or for a maintenance inspection, a *principal authority* shall,
- (a) hold the public meeting required under subsection 7(6) of the Act,
 - (b) ensure that a minimum of 21 days notice of the public meeting is given in accordance with Clause (c), including giving 21 days notice to every person and organization that has, within five years before the day of the public meeting, requested that the *principal authority* provide the person or organization with such notice and has provided an address for the notice,
 - (c) ensure that the notice under Clause (b),
 - (i) sets out the intention of the *principal authority* to pass the by-law or resolution or make a regulation under section 7 of the Act and whether the by-law, resolution or regulation would impose any fee that was not in effect on the day the notice is given or would change any fee that was in force on the day the notice is given,
 - (ii) is sent by regular mail to the last address provided by the person or organization that requested the notice in accordance with Clause (b), and
 - (iii) sets out the information described in Clause (d) or states that the information will be made available at no cost to any member of the public upon request, and
 - (d) make the following information available to the public:
 - (i) an estimate of the costs of administering and enforcing the Act by the *principal authority*,
 - (ii) the amount of the fee or of the change to the existing fee, and
 - (iii) the rationale for imposing or changing the fee.

Section 1.10. Sewage System Maintenance Inspection Programs

1.10.1. Discretionary Maintenance Inspection Programs

1.10.1.1. Scope

(1) This Subsection governs, for the purposes of subsection 34(2.1) of the Act, *maintenance inspection programs* established under clause 7(1)(b.1) of the Act in respect of *sewage systems*.

1.10.1.2. Application and Inspections

(1) A *maintenance inspection program* referred to in Sentence 1.10.1.1.(1) shall apply to all *sewage systems* in the area affected by the *maintenance inspection program*.

(2) A *maintenance inspection program* referred to in Sentence 1.10.1.1.(1) shall provide that, subject to Article 1.10.1.3., an *inspector* shall inspect all *sewage systems* affected by the *maintenance inspection program* for compliance with the standards prescribed under clause 34(2)(b) of the Act in relation to *sewage systems* that are enforced by the program.

1.10.1.3. Certificate as Alternative to Maintenance Inspection

(1) A *principal authority* that establishes a *maintenance inspection program* in respect of *sewage systems* may, as an alternative to conducting an inspection of a *sewage system* required under Sentence 1.10.1.2.(2) accept a certificate described in Sentence (2) from the owner of the property on which the *sewage system* is located.

(2) The certificate referred to in Sentence (1) shall,

- (a) be in a form approved by the *Minister*,
- (b) be signed by a person described in Sentence (3), and
- (c) confirm that the person,
 - (i) has conducted an inspection of the *sewage system* to which the certificate relates, and
 - (ii) is satisfied on reasonable grounds that, on the date on which the certificate is signed, the *sewage system* to which the certificate relates is in compliance with the standards prescribed under clause 34(2)(b) of the Act in relation to *sewage systems* that are enforced by the *maintenance inspection program*.

(3) Subject to Sentence (4), the following persons are authorized to sign a certificate referred to in Sentence (1):

- (a) a person registered under Article 3.2.4.2. in the class of registration set out in Column 1 of Item 10 of Table 3.5.2.1.,
- (b) a person registered under Article 3.3.3.2.,
- (c) an *architect*,
- (d) a *professional engineer*.

(4) A person shall not sign a certificate referred to in Sentence (1) if the person would be in a conflict of interest.

(5) For the purposes of Sentence (4), a person would be in a conflict of interest if the person, or an officer, director, partner or employee of the person (where the person is a corporation or partnership), or any person engaged by the person to perform functions for the person,

- (a) has participated or participates, in any capacity, in *design activities* or *construction* relating to any part of the *sewage system* to which the certificate relates,
- (b) is or has been employed within the previous 180 days by a person who carried out *design activities* or *construction* relating to any part of the *sewage system* to which the certificate relates,

- (c) has a professional or financial interest in,
 - (i) the *construction* of the *sewage system* to which the certificate relates,
 - (ii) the *sewage system* to which the certificate relates, or
 - (iii) the person responsible for the design of the *sewage system* to which the certificate relates, or
- (d) is an elected official, officer or employee of a *principal authority*.

1.10.2. Mandatory Maintenance Inspection Program

1.10.2.1. Scope

(1) This Subsection establishes and governs, for the purposes of subsection 34 (2.2) of the Act, a *maintenance inspection program* in respect of standards prescribed under clause 34 (2) (b) of the Act in relation to *sewage systems*.

1.10.2.2. Administration of Maintenance Inspection Program

(1) The *principal authority* that has jurisdiction in an area affected by the *maintenance inspection program* established under Sentence 1.10.2.3.(1) shall administer the program for that area and shall conduct inspections under the program in accordance with this Subsection.

1.10.2.3. Maintenance Inspection Program

(1) Subject to Article 1.10.2.5., an *inspector* shall inspect all *sewage systems* located in whole or in part in the areas set out in Sentence (2) for compliance with the requirements of Section 8.9. of Division B.

(2) The areas referred to in Sentence (1) are:

- (a) the strip of land that is located along the *Lake Simcoe shoreline* and that is 100 m wide measured horizontally and perpendicular to and upland from the *Lake Simcoe shoreline*, except for the portions of the strip of land that are described in Sentence (3),
- (b) portions of the strip of land along the *Lake Simcoe shoreline* described in Sentence (3),
- (c) the strip of land that is located along each of the following rivers, streams, lakes or ponds and that is 100 m wide measured horizontally and perpendicular to and upland from the river, stream, lake or pond,
 - (i) any river or stream in the *Lake Simcoe watershed* that continually flows in an average year,
 - (ii) any lake or pond in the *Lake Simcoe watershed* that is connected on the surface to a river or stream described in Subclause (i), and
 - (iii) any other lake or pond in the *Lake Simcoe watershed* that has a surface area greater than 8 hectares, and
- (d) areas within a *vulnerable area* that are located in a *source protection area* and that are identified in the most recent of the following documents as the areas where an activity described in Sentence (4) is or would be a *significant drinking water threat*:
 - (i) the assessment report for the *source protection area*, as initially approved under the *Clean Water Act, 2006* or as most recently approved following any updating under that Act, or
 - (ii) the *source protection plan* for the *source protection area*, as initially approved under the *Clean Water Act, 2006* or as most recently approved following any amendments or reviews under that Act.

(3) The excepted portions of the strip of land along the *Lake Simcoe shoreline* referred to in Clause (2)(a) are:

- (a) that portion of the strip of land in the geographic Township of Oro, now in the municipal Township of Oro-Medonte, in the County of Simcoe, and in the geographic Townships of Innisfil and Vespra, now in the City of Barrie, being bounded on the north by the east limit of Lot 1, Concession 1 East Penetanguishene Road of the said geographic Township of Oro and its southerly prolongation and on the south by the east limit of Lot 14, Concession 13 of the said geographic Township of Innisfil and its northerly prolongation,
- (b) that portion of the strip of land in the geographic Townships of North Gwillimbury and Georgina, now in the Town of Georgina, and in the geographic Township of East Gwillimbury, now in the Town of East Gwillimbury, all in The Regional Municipality of York, being bounded on the west by the west limit of Lot 6, Concession 1 of the said geographic Township of North Gwillimbury and its northerly prolongation and on the east by the east limit of Lot 3, Concession 8 of the said geographic Township of Georgina and its northerly prolongation, and

- (c) that portion of the strip of land in the geographic Township of Mara, now in the municipal Township of Ramara, in the County of Simcoe, and in the geographic Township of Thorah, now in the municipal Township of Brock, in The Regional Municipality of Durham, being bounded on the north by the west limit of Lot 13, Concession C of the said geographic Township of Mara and its southerly prolongation and on the south by the west limit of Lot 14, Concession 6 of the said geographic Township of Thorah and its northerly prolongation.
- (4) The activity referred to in Clause (2)(d) is an activity that is subject to the Act and that is described in paragraph 2 of subsection 1.1(1) of Ontario Regulation 287/07 (General) made under the *Clean Water Act, 2006*.

1.10.2.4. Time Periods for Maintenance Inspections

- (1) An inspection required under Sentence 1.10.2.3.(1) shall be conducted in respect of a *sewage system* in an area described in Clause 1.10.2.3.(2)(a),
 - (a) initially, no later than five years after the *construction* of the *sewage system*, and
 - (b) thereafter, every five years after the most recent inspection of the *sewage system* has been conducted.
- (2) An inspection required under Sentence 1.10.2.3.(1) shall be conducted in respect of a *sewage system* in an area described in Clause 1.10.2.3.(2)(b) or (c),
 - (a) initially, no later than five years after the *construction* of the *sewage system*, and
 - (b) thereafter, every five years after the most recent inspection of the *sewage system* has been conducted.
- (3) An inspection required under Sentence 1.10.2.3.(1) shall be conducted in respect of a *sewage system* in an *area affected by a significant drinking water threat*,
 - (a) initially, no later than,
 - (i) five years after the date on which notice of the approval of one of the following documents is published on the environmental registry under the *Clean Water Act, 2006*, in the case of a *sewage system constructed* before the date of publication,
 - (A) the assessment report for the *source protection area*, if the *source protection plan* is one prepared under section 22 of the *Clean Water Act, 2006*, or
 - (B) the *source protection plan* for the *source protection area*, if the *source protection plan* is one prepared under section 26 or 33 of the *Clean Water Act, 2006*, or
 - (ii) five years after the *construction* of the *sewage system*, in the case of a *sewage system constructed* on or after the date of publication, and
 - (b) thereafter, every five years after the most recent inspection of the *sewage system* has been conducted.
- (4) If additional *areas affected by a significant drinking water threat* are identified for a *source protection area* after the date of publication referred to in Clause (3)(a), an inspection required under Sentence 1.10.2.3.(1) shall be conducted in respect of a *sewage system* in those additional areas,
 - (a) initially, no later than,
 - (i) five years after the following date of approval or publication, as applicable, in the case of a *sewage system constructed* before that date,
 - (A) the date of approval under section 19 of the *Clean Water Act, 2006* of the updated assessment report in which the additional areas are identified, or
 - (B) the date of publication on the environmental registry under the *Clean Water Act, 2006* of notice of the approval of the amended or updated *source protection plan* in which the additional areas are identified, or
 - (ii) five years after the *construction* of the *sewage system*, in the case of a *sewage system constructed* on or after the date of approval or publication, as applicable, and
 - (b) thereafter, every five years after the most recent inspection of the *sewage system* has been conducted.

1.10.2.5. Certificate as Alternative to Maintenance Inspection

- (1) The *principal authority* that administers the *maintenance inspection program* established under Sentence 1.10.2.3.(1), may, as an alternative to conducting an inspection of a *sewage system* required under Sentence 1.10.2.3.(1), accept a certificate described in Sentence (2) from the owner of the property on which the *sewage system* is located.

(2) The certificate required by Sentence (1) shall satisfy the requirements of Sentence 1.10.1.3.(2) and for these purposes Sentences 1.10.1.3.(3) to (5) apply with necessary modifications.

Section 1.11. Tiny Houses

1.11.1. Tiny Houses Constructed Off-Site

1.11.1.1. Scope

- (1) This Section applies to houses that,
 - (a) have not more than one *dwelling unit*,
 - (b) are 37 m² or less in *building area*, and
 - (c) are to be,
 - (i) partially *constructed* in one *municipality* and moved to be installed at a location in another *municipality* without having been previously occupied, or
 - (ii) partially *constructed* at one location and moved to be installed at a location that is not yet known without having been previously occupied.
- (2) Except as provided in this Section, the requirements in this Part apply to houses described in Sentence (1).

1.11.1.2. Permits

- (1) Provided the conditions described in Sentence (2) are complied with, if an applicant for a permit under section 8 of the Act makes an application to the *chief building official* of the *municipality* in which a house is to be partially *constructed* but not installed, the applicant is exempt from demonstrating compliance with,
 - (a) either,
 - (i) if the application is for a permit described in subsection 8(1) of the Act, clause 8(2)(a) of the Act but only with respect to demonstrating compliance with *applicable law*, or
 - (ii) if the application is for a conditional permit described in subsection 8(3) of the Act, clause 8(3)(a) of the Act, and
 - (b) requirements of this Code related to site installation of the house.
- (2) For a permit applicant to be exempt from the provisions described in Sentence (1), the following conditions must be satisfied:
 1. If the site the house is intended to be installed on is known by the permit applicant,
 - (i) the permit application must state the address or location of the site,
 - (ii) the permit application must include such information about the anticipated site installation that is necessary to design the house, and
 - (iii) the proposed *construction* must comply with the location-dependent requirements of this Code that are applicable to a house that is *constructed* at that address or location.
 2. If the site the house is intended to be installed on is not known by the permit applicant,
 - (i) the permit application must include a declaration of assumptions related to the location of the house that have been used in the design of the house,
 - (ii) the permit application must include such information about the anticipated site installation that is necessary to design the house, and
 - (iii) the proposed *construction* must comply with the location-dependent requirements of this Code that are applicable to a house that is *constructed* at a location that has the characteristics set out in the declaration.
- (3) For the purposes of paragraphs 1 and 2 of Sentence (2), “location-dependent requirements” include, but are not limited to, provisions related to climatic loads, seismic loads, temperature based requirements, *limiting distance* and *exposing building face*, *soil gas control* and *firefighting access*.

- (4) An applicant for a permit described in Sentence (1) shall provide the following to a purchaser of a house *constructed* in accordance with a permit described in Sentence (1):
1. all plans, specifications, documents and other information submitted or received by the person described in Sentence (1) in respect of the permit described in Sentence (1), including any *as-constructed plans* and any declaration of assumptions described in subparagraph 2.i. of Sentence (2), and
 2. all letters of compliance described in Sentence 1.11.1.3.(3) and all documents and other information received by the person described in Sentence (1) in respect of all inspections completed by an *inspector* or *registered code agency*, as the case may be.
- (5) No person shall install a house at a site in a *municipality* unless a permit under section 8 of the Act has been issued therefor by the *chief building official* of that *municipality*.
- (6) The *chief building official* of the *municipality* in which the house is to be installed shall issue the permit described in Sentence (5) if the applicant,
- (a) demonstrates the proposed *construction* complies with the applicable provisions described in Clauses (1) (a) and (b),
 - (b) demonstrates compliance with the other requirements of section 8 of the Act, and
 - (c) submits all plans, specifications, documents and other information described in Sentence (4) that the applicant has been provided.
- (7) For the purposes of an application for a permit described in Sentence (5), the time periods described in Sentences 1.3.1.3.(1) and (3) and Clause 1.3.1.3.(6)(b) shall begin on the later of,
- (a) the date the permit described in Sentence (1) is issued, or
 - (b) the date described in Sentence 1.3.1.3.(7).

1.11.1.3. Inspections

- (1) Where a permit is applied for as described in Sentence 1.11.1.2.(1) or (5), the person to whom a permit under section 8 of the Act is issued shall give notice as described in Articles 1.3.5.1. and 1.3.5.2. to the *chief building official* or *registered code agency*, as the case may be, of the *municipality* who issued the permit in respect of the *construction* to which the notice relates.
- (2) Where a permit is applied for as described in Sentence 1.11.1.2.(5), the person to whom a permit under section 8 of the Act is issued shall provide the *chief building official* of the *municipality* in which the house is to be installed,
- (a) any additional letters of compliance, documents or other information related to inspections completed by an *inspector* or *registered code agency*, as the case may be, of the *municipality* in which the house was partially *constructed* that was not provided when the permit was applied for, or
 - (b) confirmation that no additional letters of compliance, documents or other information have been provided to the person.
- (3) The *chief building official* of the *municipality* in which a house was partially *constructed* but not installed shall provide the person to whom a permit was issued with a letter of compliance that confirms,
- (a) which prescribed notices described in Sentence 1.3.5.1.(2) were received by the *chief building official* or *registered code agency*, as the case may be,
 - (b) that inspections described in Sentence 1.3.5.3.(1) were undertaken in respect of the *construction* to which the notices relate, and
 - (c) that no contraventions of the Act or this Code were found or that remedial steps were carried out to resolve any contraventions that were found.

Section 1.12. Off-Site Construction of Buildings

1.12.1. Site Assembled and Factory-Built Buildings

1.12.1.1. Certification and Compliance

- (1) Except as provided in Sentence (2), a manufactured *building* or a manufactured part of a *building* within the scope of Part 3 is deemed to comply with this Code if it is certified in accordance with CSA A277, “Procedure for Certification of Prefabricated Buildings, Modules, and Panels.”
- (2) The requirements of this Code shall apply to,
 - (a) *building* components designed and constructed outside the place of manufacture, and
 - (b) site installation of such *buildings*.

Part 2

Alternative Solutions, Disputes, Rulings and Interpretations

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Part 2

Alternative Solutions, Disputes, Rulings and Interpretations

Section 2.0. Application

2.0.1. Application

2.0.1.1. Application

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

Section 2.1. Alternative Solutions

2.1.1. Documentation of Alternative Solutions

2.1.1.1. Documentation

- (1) The person proposing the use of an *alternative solution* shall provide documentation to the *chief building official* or *registered code agency* that,
- (a) identifies applicable objectives, functional statements and acceptable solutions, and
 - (b) establishes on the basis of past performance, tests described in Article 2.1.1.2. or other evaluation that the proposed alternative solution will achieve the level of performance required under Article 1.2.1.1. of Division A.
- (2) The documentation described in Sentence (1) shall include information about relevant assumptions, limiting or restricting factors, testing procedures, studies or *building* performance parameters, including any commissioning, operational and maintenance requirements.

2.1.1.2. Tests

- (1) Where no published test method to establish the suitability of an *alternative solution* proposed under Article 2.1.1.1. exists, then the tests used for the purposes of that Article shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the material or system with a similar material or system that is known to be acceptable.
- (2) The results of tests or evaluations based on test standards, other than as described in this Code, may be used for the purposes of Sentence (1), if the alternate test standards provide comparable results.

Section 2.2. Building Code Commission

2.2.1. Hearings

2.2.1.1. Divisions

(1) The Building Code Commission may sit in two or more divisions simultaneously so long as a quorum of each division is present.

2.2.1.2. Single Member

(1) One member of the Building Code Commission may, with the approval of the chair or vice-chair, hear and determine any dispute set out in Sentence (2) and, for that purpose, the member has all the jurisdiction and powers of the Commission.

(2) The results of tests or evaluations based on test standards, other than as described in this Code, may be used for the purposes of Sentence (1), if the alternate test standards provide comparable results.

- (a) any dispute described in clause 24(1)(a) of the Act respecting the sufficiency of compliance with technical requirements of this Code related to *sewage systems*, and
- (b) any dispute described in clause 24(1)(b) or (c) of the Act.

2.2.1.3. Time Period

(1) A hearing to decide a dispute described in Clause 2.2.1.2.(2)(b) shall be held not more than five days after the Commission receives an application for a hearing in a form approved by the Commission.

(2) The time period described in Sentence (1) commences on the day after the Commission receives the application and excludes Saturdays, holidays and all other days when the offices of the Government of Ontario are not open for the transaction of business with the public.

2.2.1.4. Eligibility

(1) The following relationships to a *registered code agency* are prescribed for the purposes of clause 23(3)(d) of the Act as relationships to a *registered code agency* that make a person ineligible to be a member of the Commission:

- (a) the person is registered under Article 3.4.3.2. as a *registered code agency*,
- (b) the person is an officer, director, partner or employee of a *registered code agency*, or
- (c) the person is engaged by a *registered code agency* to perform functions under the Act on behalf of the *registered code agency*.

2.2.1.5. Application Fee

(1) The fee on an application to the Building Code Commission under subsection 24(1.1) of the Act is \$212, for 2025 and subsequent calendar years.

Section 2.3. Building Materials Evaluation Commission

2.3.1. Application Fee

2.3.1.1. Application Fee

- (1) The fee on an application to the Building Materials Evaluation Commission is \$11,000, for 2025 and subsequent calendar years.

Section 2.4. Rulings and Interpretations

2.4.1. Minister's Rulings — Innovative Materials, Systems or Building Designs

2.4.1.1. Designated Materials Evaluation Bodies

- (1) The following body is designated as a materials evaluation body for the purposes of clause 29(1)(a) of the Act: Canadian Construction Materials Centre of the National Research Council of Canada.

2.4.1.2. Fee

- (1) The fee on a request for a ruling under clause 29(1)(a) of the Act is \$697, for 2025 and subsequent calendar years.

2.4.2. Minister's Rulings — Alternative Materials, Systems or Building Designs

2.4.2.1. Criteria

- (1) Sentence (2) sets out criteria to be followed by the *Minister* when making a ruling under clause 29(1)(c) of the Act to approve the use of an alternative material, system or *building* design.
- (2) The *Minister's* approval of the use of an alternative material, system or *building* design referred to in Sentence (1) may be granted only if the approval is consistent with,
 - (a) a decision of the Building Code Commission in respect of a dispute described in clause 24(1)(a) of the Act,
 - (b) an approval of the use of the material, system or *building* design in the whole of another province or territory in accordance with the law of that province or territory, or
 - (c) a revision of the NRCC-CONST-56435E 2020, "National Building Code of Canada", or the NRCC-CONST-56436E 2020, "National Plumbing Code of Canada", that has been approved by the Canadian Commission on Building and Fire Codes.

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2.4.3. Interpretations By Minister

2.4.3.1. Interpretations By Minister

- (1) Every interpretation issued by the *Minister* under section 28.1 of the Act shall be made available to the public,
 - (a) by posting the interpretation on the *Building Code website*, and
 - (b) by providing a written copy of the interpretation on receipt of a request for it.

Part 3

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Part 3

Qualifications

Section 3.1. Qualifications for Chief Building Officials and Inspectors

3.1.1. Scope and Definition

3.1.1.1. Scope

- (1) Except as provided in Sentence (2), this Section prescribes, for the purposes of subsections 15.11(1), (2) and (3) of the Act,
- (a) the qualifications that a person must satisfy to be appointed and to remain appointed as,
 - (i) a *chief building official* under the Act, or
 - (ii) an *inspector* who has the same powers and duties as a *chief building official* in relation to *plumbing*,
 - (b) the qualifications that a person must satisfy to be appointed and to remain appointed as,
 - (i) an *inspector* who has the same powers and duties as a *chief building official* in relation to *sewage systems*, or
 - (ii) an *inspector* whose duties include plans review or inspection of *sewage systems* under the Act, and
 - (c) the qualifications that a person must satisfy to be appointed and to remain appointed as an *inspector* under the Act, other than an *inspector* described in Subclause (a)(ii) or (b)(i) or (ii).
- (2) The qualification requirements for *chief building officials* and *inspectors* in Sentence (1) do not apply to plans review and inspection of,
- (a) site services including,
 - (i) surface drainage, and
 - (ii) *plumbing* located underground either outside a *building* or under a *building*,
 - (b) *construction* of a factory-built house certified to CSA A277, “Procedure for Factory Certification of Buildings,”
 - (c) *construction* of a mobile home conforming to CSA Z240 MH Series, “Manufactured Homes,”
 - (d) *construction* of a park model trailer conforming to CAN/CSA-Z241 Series, “Park Model Trailers,” or
 - (e) signs.

3.1.1.2. Definition

- (1) In this Section,
- “registered” means registered under Sentence 3.1.2.2.(1), 3.1.3.2.(1) or 3.1.4.2.(1), as applicable.

3.1.2. Chief Building Officials

3.1.2.1. Qualifications

- (1) The following are prescribed as qualifications for a person to be appointed and to remain appointed under the Act as a *chief building official* or as an *inspector* who has the same powers and duties as a *chief building official* in relation to *sewage systems* or *plumbing*:
- (a) the person must be registered with the *director*.

- (2) A registration shall be in a form established by the *director*.

3.1.2.2. Registration and Renewal of a Registration

- (1) Subject to Article 3.1.5.6., the *director* may register an applicant, or renew a registration, if,
- (a) the applicant or registered person has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs relating to the person's knowledge of the Act and this Code and the powers and duties of *chief building officials*,
 - (b) the applicant or registered person also has the qualification set out in Sentence 3.1.4.1.(1), in the case of an applicant or registered person who, under subsection 22(2) of the Act, will also exercise any of the powers or perform any of the duties of an *inspector*,
 - (c) the application is complete, and
 - (d) all fees required under Article 3.1.5.3. are paid.
- (2) Subject to Article 3.1.5.6., a person who, on December 31, 2024, is registered under Sentence 3.1.2.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.1.5.5. of Division C of that regulation is deemed to be registered under Sentence 3.1.2.2.(1) of this Code, and for these purposes, the person's registration is deemed to continue until its term expires.
- (3) For the purposes of a registration or a renewal of a registration, a person who, on December 31, 2024, has the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of this Code.

3.1.3. Supervisors and Managers

3.1.3.1. Qualifications

- (1) The following are prescribed as qualifications for a person to be appointed and to remain appointed under the Act as an *inspector* whose duties are solely the supervision or management of *inspectors*:
- (a) the person must be registered with the *director*.
- (2) A registration shall be in a form established by the *director*.

3.1.3.2. Registration and Renewal of a Registration

- (1) Subject to Article 3.1.5.6., the *director* may register an applicant, or renew a registration, if,
- (a) the applicant or registered person has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs relating to the person's knowledge of the Act and this Code and the powers and duties of *chief building officials*,
 - (b) the applicant or registered person has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs relating to the person's knowledge of the Act and this Code in any one category of qualification set out in Column 2 of Table 3.5.2.1.,
 - (c) the application is complete, and
 - (d) all fees required under Article 3.1.5.3. are paid.
- (2) Subject to Article 3.1.5.6., a person who, on December 31, 2024 is registered under Sentence 3.1.2.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.1.5.5. of Division C of that regulation is deemed to be registered under Sentence 3.1.2.2.(1) of this Code, and for these purposes, the person's registration is deemed to continue until its term expires.
- (3) For the purposes of a registration or a renewal of a registration, a person who, on December 31, 2024, has the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of this Code.

3.1.4. Inspectors

3.1.4.1. Qualifications

- (1) Except as provided in Article 3.1.4.3. or 3.1.4.4., the following are prescribed as qualifications for a person to be appointed and to remain appointed under the Act as an *inspector* whose duties include plans review or inspection under the Act:
 - (a) the person must be registered with the *director*.
- (2) A registration shall be in a form established by the *director*.

3.1.4.2. Registration and Renewal of a Registration

- (1) Subject to Article 3.1.5.6., the *director* may register an applicant, or renew a registration, in each class of registration applied for, if,
 - (a) the applicant or registered person has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person's knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.1. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.1. for which application is made,
 - (b) the application is complete, and
 - (c) all fees required under Article 3.1.5.3. are paid.
- (2) Subject to Article 3.1.5.6., a person who, on December 31, 2024, is registered under Sentence 3.1.2.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.1.5.5. of Division C of that regulation is deemed to be registered under Sentence 3.1.2.2.(1) of this Code, and for these purposes, the person's registration is deemed to continue until its term expires.
- (3) For the purposes of a registration or a renewal of a registration, a person who, on December 31, 2024, has the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.1.2.2.(1)(a) or (b), as applicable, of this Code.

3.1.4.3. Qualifications for Intern Inspectors

- (1) A person may be appointed or remain appointed under the Act as an intern *inspector* whose duties include supervised plans review or inspection under the Act, even if the person does not have the qualification set out in Article 3.1.4.1., if the person is enrolled in an internship program that,
 - (a) is approved by the Minister, or
 - (b) meets the minimum requirements described in Sentence (2).
- (2) For the purposes of Clause (1)(b), the following are the minimum requirements for an internship program:
 - (a) the internship program in a *municipality* shall be established and administered by the *chief building official* of the *municipality*,
 - (b) the *chief building official* shall notify the *director* in writing within 30 days of the date an internship program is established, altered or revoked,
 - (c) the *chief building official* shall establish and maintain a written policy with respect to the,
 - (i) enrolment of persons in the internship program, and
 - (ii) the supervision of an intern *inspector* by an *inspector* or *chief building official* who is registered in the class of registration in respect of which the intern *inspector* will exercise the powers or perform the duties,
 - (d) the *chief building official* shall ensure that the written policy described in Clause (c) is brought to the attention of the public,

- (e) every 12 months, the *chief building official* shall prepare and transmit to the *director* a report that contains information about,
 - (i) the number of intern *inspectors* that entered or left the internship program in the past 12 months,
 - (ii) the number of intern *inspectors* that were enrolled in the internship program that became registered with the *director* under Sentence 3.1.4.2.(1) in the past 12 months,
 - (iii) the number of intern *inspectors* enrolled in the internship program at any point in the past 12 months who has been trained or practiced as a building official in a country other than Canada, and
 - (iv) the number of persons who were refused enrolment in the program or whose enrolment in the program was terminated,
 - (f) subject to Sentence (3), each intern *inspector* enrolled in the internship program in respect of a type of *building* described in Column 3 of Table 3.5.2.1. is not eligible to be enrolled in the program in respect of that type of *building* for longer than 18 months, and
 - (g) the *chief building official* shall provide to the *director* such information as the *director* requests.
- (3) The *director* may, at the request of a *chief building official*, authorize an intern *inspector* to be enrolled in a program for more than 18 months if the *director* has reasonable grounds to believe there are extenuating circumstances including maternity or parental leave, illness, disability, bereavement or personal hardship.
- (4) The *chief building official* shall notify the *director* of any failure in *construction* or *demolition* or in the enforcement of the Act or this Code associated with the internship program or a person enrolled in the program within 10 days of the *chief building official* becoming aware of the failure.
- (5) The *director* may terminate a program described in Clause (1)(b) if the *director* has reasonable grounds to believe the program has or will result in a failure in *construction* or *demolition* or in the enforcement of the Act or this Code associated with the internship program or a person enrolled in the program.
- (6) An intern *inspector* who is exempt under Sentence (1) shall be supervised by an *inspector* or *chief building official* who is registered in the class of registration in respect of which the intern *inspector* will exercise the powers or perform the duties.

3.1.4.4. Qualifications for Maintenance Program Inspectors

- (1) A person may be appointed or remain appointed under the Act as an *inspector* whose duties include *maintenance inspections* of *sewage systems*, even if the person does not have the qualification set out in Article 3.1.4.1. in respect of these duties.
- (2) An *inspector* who is exempt under Sentence (1) is authorized to conduct *maintenance inspections* of *sewage systems* only if the following conditions are met:
 - (a) the person is supervised by an *inspector* or *chief building official* who is registered in the class of registration described in Column 1 of Item 10 of Table 3.5.2.1., and
 - (b) the person does not issue orders under the Act.

3.1.5. Qualifications — Chief Building Officials, Supervisors and Managers, and Inspectors

3.1.5.1. Application for Registration or Renewal of a Registration

- (1) An application for registration or renewal of a registration shall be made to the *director* in a form established by the *director*.
- (2) An application for renewal of a registration shall be made within 60 days before the expiry of the registration to be renewed.

- (3) An application for registration or renewal of a registration shall include an undertaking by the applicant or registered person to comply with the conditions set out in Article 3.1.5.5.
- (4) An application for registration or renewal of a registration shall,
 - (a) set out the applicant's or registered person's name, residence address, residential mailing address, if different from the residence address, and email address, if applicable,
 - (b) set out the name of every *principal authority* that has appointed the person as a *chief building official* or *inspector* under the Act, and
 - (c) contain evidence, provided by the applicant or registered person, that the applicant or registered person has the qualifications set out in Clauses 3.1.2.2.(1)(a) and (b), 3.1.3.2.(1)(a) and (b), or 3.1.4.2.(1)(a), as applicable.

3.1.5.2. Term

- (1) A registration expires one year after it is issued but the *director* may, for the purposes of staggering the renewal dates of the registrations, issue the initial registration for a term of not less than 90 days and not more than 18 months.

3.1.5.3. Fees

- (1) The fee payable for an application to take an examination that is part of an examination program referred to in Clause 3.1.2.2.(1)(a), 3.1.3.2.(1)(a) or (b) or 3.1.4.2.(1)(a) is \$150.
- (2) The fee for a registration or renewal of a registration is \$128, for 2025 and subsequent calendar years.

3.1.5.4. Not Transferable

- (1) A registration is not transferable.

3.1.5.5. Conditions

- (1) The following are the conditions of a registration:
 - (a) the registered person shall, within 15 days after the event, notify the *director* in writing of any change in the information set out in Clause 3.1.5.1.(4)(a) or (b), and
 - (b) in the case of an *inspector* registered under Sentence 3.1.4.2.(1), the person shall exercise his or her powers and perform his or her duties only in respect of the type of *buildings* described in Column 3 of Table 3.5.2.1. that correspond to the class or classes of registration held by the person.

3.1.5.6. Suspension, Revocation, Refusal to Register or Renew a Registration

- (1) The *director* may, in the circumstances set out in Sentence (2),
 - (a) refuse to register an applicant or to renew a registration, or
 - (b) suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are,
 - (a) the registered person is in breach of a condition of the registration,
 - (b) the registration was issued on the basis of mistaken, false or incorrect information,
 - (c) an order under subsection 69(2) of the *Provincial Offences Act* is in effect directing that the registration of the person be suspended and that no registration be issued to that person until a fine is paid,
 - (d) the application is incomplete, or
 - (e) any fees required under Article 3.1.5.3. remain unpaid.
- (3) If the *director* proposes to refuse to register or renew a registration or proposes to suspend or revoke a registration, the *director* shall serve a notice of the proposal, together with the reasons for it, on the applicant or registered person.

- (4) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (5) If the applicant or registered person does not request a hearing by the *Tribunal* in accordance with Sentence (4), the *director* may carry out the proposal stated in the notice under Sentence (3).
- (6) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (4), the *Tribunal* shall appoint a time for and hold a hearing and may by order direct the *director* to carry out the *director's* proposal or refrain from carrying it out and to take such other action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes, the *Tribunal* may substitute its opinion for that of the *director*.
- (7) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.
- (8) Sentences (3) to (7) do not apply and the *director* may cancel the registration of a registered person upon receipt of a request in writing for cancellation from the registered person in a form established by the *director*.
- (9) If, within the time period set out in Sentence 3.1.5.1.(2), the registered person has applied for renewal of a registration and paid the fee required under Article 3.1.5.3., the registration is deemed to continue until the earlier of,
- the day the registration is renewed, and
 - if the registered person is served with notice that the *director* proposes to refuse to renew the registration, the day the time for giving notice requesting a hearing expires or, if a hearing is held, the day the *Tribunal* makes its order.

3.1.6. Public Register

3.1.6.1. Public Register

- (1) The *director* shall establish and maintain a register available to the public that lists every person who has the qualifications required by subsections 15.11(1), (2) and (3) of the Act and has been appointed as a *chief building official* or *inspector* by a *principal authority*.
- (2) The register referred to in Sentence (1) shall contain the following information with respect to each registered person:
- the name of the registered person,
 - any identifying number assigned by the *director* to the registered person,
 - the name and address of each *principal authority* that has appointed the registered person as a *chief building official* or *inspector*, and
 - the classes of registration of the registered person.

3.1.7. Classes of Registration and Categories of Qualifications

3.1.7.1. Classes and Categories

- (1) Table 3.5.2.1. contains the classes of registration and categories of qualifications for the purposes of this Section.

Section 3.2. Qualifications for Designers

3.2.1. Scope

3.2.1.1. Scope

(1) This Section prescribes, for the purposes of clause 8(2)(c) and subsection 15.11(5) of the Act, the qualifications for a person who carries out *design activities*.

3.2.2. Other Designers

3.2.2.1. Other Designers

(1) Every person who carries out *design activities* must have the qualification set out in Sentence 3.2.5.1.(1), if the person is not required to have the qualification set out in Sentence 3.2.4.1.(1).

3.2.3. Definition

3.2.3.1. Definition

- (1) “Registered” means,
- (a) in Subsection 3.2.4., registered under Sentence 3.2.4.2.(1), and
 - (b) in Subsection 3.2.5., registered under Sentence 3.2.5.2.(1).

3.2.4. Qualifications – Persons Engaged in the Business of Providing Design Activities to the Public

3.2.4.1. General

- (1) Except as provided in Sentences (3) and (4), every person engaged in the business of providing *design activities* to the public must have the following qualification:
- (a) the person must be registered with the *director*.
 - (2) A registration shall be in a form established by the *director*.
 - (3) A person is exempt from the requirement to comply with the qualification in Sentence (1), if the person’s *design activities* relate only to,
 - (a) *construction* of a home as defined under the *Ontario New Home Warranties Plan Act* that will be constructed or sold by that person, if the person is a builder or vendor as defined in that Act and is registered under that Act,
 - (b) *construction* of a *building* that is owned by that person,
 - (c) *construction* of a *farm building* that,
 - (i) is of *low human occupancy*, other than Group G, Division 4, *agricultural occupancies with no human occupants*,
 - (ii) is 2 *storeys* or less in *building height*, and
 - (iii) has a *building area* of less than 600 m²,
 - (d) the extension, material alteration or repair of a house,
 - (e) a *sewage system* to be constructed by that person if the person is registered under Article 3.3.3.2.,
 - (f) *construction* of tents described in Sentence 3.14.1.2.(2) of Division B,
 - (g) *construction* of signs,

- (h) *construction* of site services, including,
 - (i) surface drainage, and
 - (ii) *plumbing* located underground, either outside a *building* or under a *building*,
 - (i) *construction* of a factory-built house certified to CSA A277, “Procedure for Certification of Prefabricated Buildings, Modules, and Panels”,
 - (j) *construction* of a mobile home conforming to CSA Z240 MH Series, “Manufactured Homes”,
 - (k) *construction* of a park model trailer conforming to CAN/CSA-Z241 Series, “Park Model Trailers”,
 - (l) *construction* of pre-engineered elements of a *building*, if the design of the elements is carried out by a person competent in the specific discipline appropriate to the circumstances,
 - (m) *construction* of appliances, equipment and similar incidental components of a *building*, or
 - (n) *construction* of a *building* for which a permit under section 8 of the Act is applied for or issued before January 1, 2006 and for which *construction* is commenced within six months after the permit is issued.
- (4) A person is exempt from the requirements to comply with the qualification in Sentence (1), if the person’s *design activities* are with respect to a house and the *design activities* relate only to,
- (a) a *plumbing* system,
 - (b) a heating, ventilation and *air-conditioning* system, or
 - (c) ancillary *buildings* such as garages.

3.2.4.2. Registration and Renewal of a Registration

- (1) Subject to Articles 3.2.4.8. and 3.2.4.9., the *director* may register an applicant, or renew a registration, in each class of registration applied for, if,
- (a) the applicant or registered person or, if the applicant or registered person is a corporation or partnership, a director, officer, partner or employee of the applicant or registered person, has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person’s knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.1. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.1. for which application is made,
 - (b) all other persons engaged by the applicant or registered person who will review and take responsibility for *design activities* provided to the public by the applicant or registered person for the purposes of Clause 3.2.4.7.(1)(d) have successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person’s knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.1. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.1. for which application is made,
 - (c) the applicant or registered person is covered by the insurance required under Subsection 3.6.2. during the term of the registration applied for,
 - (d) the application is complete, and
 - (e) all fees required under Article 3.2.4.5. are paid.
- (2) Subject to Articles 3.2.4.8. and 3.2.4.9. a person who, on December 31, 2024, is registered under Sentence 3.1.2.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.2.4.7. of Division C of that regulation is deemed to be registered under Sentence 3.2.4.2.(1) of this Code, and for these purposes, the person’s registration is deemed to continue until its term expires.
- (3) For the purposes of a registration or a renewal of a registration, a person who, on December 31, 2024, is registered under Clause 3.2.4.2.(1)(a) or (b), as applicable, of Division C of Ontario Regulation 332/12 (Building Code) made under the Act in a class of registration is deemed to have the qualifications set out in Clause 3.2.4.2.(1)(a) or (b), as applicable, of this Code, in the class of registration.

3.2.4.3. Application for Registration or Renewal of a Registration

- (1) An application for registration or renewal of a registration shall be made to the *director* in a form established by the *director*.

- (2) An application for renewal of a registration shall be made within 60 days before the expiry of the registration to be renewed.
- (3) An application for registration or renewal of a registration shall include an undertaking by the applicant or registered person to comply with the conditions set out in Article 3.2.4.7.
- (4) If a partnership or a corporation is the applicant for registration or renewal of a registration, the application shall set out the names and residence addresses of all its partners, directors or officers, as the case may be.
- (5) An application for registration or renewal of a registration shall contain the names of all partners, directors, officers or employees of the applicant or registered person, as the case may be, and all other persons engaged by the applicant or registered person, who,
 - (a) have the qualifications set out in Clause 3.2.4.2.(1)(a) in the class or classes of registration for which the application is made, and
 - (b) have the qualifications set out in Clause 3.2.4.2.(1)(b) and will review and take responsibility for the *design activities* provided to the public by the applicant or registered person in the class or classes of registration for which the application is made.
- (6) An application for registration or renewal of a registration shall contain evidence, provided by the applicant or registered person, that the persons referred to in Sentence (5) have the qualifications set out in Clause 3.2.4.2.(1)(a) or (b).
- (7) An application for registration or renewal of a registration shall contain evidence, provided by the applicant or registered person in such form and in such detail as may be required by the *director*, that the applicant or registered person is covered by the insurance required under Subsection 3.6.2. during the term of the registration applied for.

3.2.4.4. Term

- (1) A registration expires one year after it is issued but the *director* may, for the purposes of staggering the renewal dates of the registrations, issue the initial registration for a term of not less than 90 days and not more than 18 months.

3.2.4.5. Fees

- (1) The fee payable for an application to take an examination that is part of an examination program referred to in Clause 3.2.4.2.(1)(a) or (b) is \$150.
- (2) The fee for a registration is \$202, for 2025 and subsequent calendar years.
- (3) The fee for the addition of a new class of registration is \$44, for 2024 and subsequent calendar years.
- (4) The fee for renewal of a registration is \$152, for 2025 and subsequent calendar years.

3.2.4.6. Not Transferable

- (1) A registration is not transferable.

3.2.4.7. Conditions

- (1) The following are the conditions of a registration:
 - (a) the registered person shall carry out *design activities* only in respect of the type of *buildings* described in Column 3 of Table 3.5.2.1. that correspond to the class or classes of registration held by the registered person,
 - (b) if the registered person is a corporation or partnership, there must throughout the term of the registration be an officer, director, partner or employee of the registered person who has the qualifications set out in Clause 3.2.4.2.(1)(a) for each class of registration set out in Column 1 of Table 3.5.2.1. that is held by the registered person,

- (c) the registered person shall ensure that a person who has the qualifications set out in Clause 3.2.4.2.(1)(a) or (b) in respect of the class of registration set out in Column 1 of Table 3.5.2.1. to which the *design activities* relate will review and take responsibility for *design activities* in each class of registration that are provided to the public by the registered person,
- (d) the registered person shall ensure that a person described in Clause (c) who reviews and takes responsibility for *design activities* provided to the public by the registered person shall include the following information on any document submitted to a *chief building official* or *registered code agency* in the circumstances set out in subsection 15.11(5) of the Act:
 - (i) the name of the registered person and any registration number issued to the registered person by the *director*,
 - (ii) a statement that the person has reviewed and taken responsibility for the *design activities*,
 - (iii) the person's name and any identifying number issued to the person by the *director* in respect of the qualifications described in Clause 3.2.4.2.(1)(a) or (b) that the person has, and
 - (iv) the person's signature,
- (e) the registered person shall, during the term of the registration, be covered by the insurance required under Subsection 3.6.2.,
- (f) the registered person shall, within 15 days after the event, notify the *director* in writing of,
 - (i) any change in address of the registered person for correspondence relating to the registration, and
 - (ii) any change in the information set out in Sentences 3.2.4.3.(4) and (5),
- (g) the registered person shall give prompt written notice to the *director* of any material change in any of the information, other than the information referred to in Clause (f), that is contained in or accompanies an application for registration or renewal of a registration,
- (h) the registered person shall, from time to time, at the registered person's expense, give the *director* such documents or information relating to the registration or to activities carried out under the registration as the *director* may reasonably require, and
- (i) the registered person shall allow the representatives of the *director* access to the registered person's books and records during normal business hours for the purpose of confirming matters related to the registration.

3.2.4.8. Suspension, Revocation, Refusal to Register or Renew a Registration

- (1) The *director* may, in the circumstances set out in Sentence (2),
 - (a) refuse to register an applicant or to renew a registration, or
 - (b) suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are,
 - (a) the registered person is in contravention of the Act or this Code,
 - (b) the registered person is in breach of a condition of the registration other than the condition set out in Clause 3.2.4.7.(1)(f),
 - (c) the registration was issued on the basis of mistaken, false or incorrect information,
 - (d) the *director* is of the opinion that the past conduct of the applicant or registered person or, if the applicant or registered person is a partnership or a corporation, the partners, officers or directors of the applicant or registered person, as the case may be, affords reasonable grounds for belief that the business that would be or is authorized by the registration will not be carried on in accordance with law,
 - (e) the application is incomplete, or
 - (f) any fees required under Article 3.2.4.5. remain unpaid.
- (3) If the *director* proposes to refuse to register or renew a registration or proposes to suspend or revoke a registration under Sentence (1), the *director* shall serve a notice of the proposal, together with the reasons for it, on the applicant or registered person.
- (4) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (5) If the applicant or registered person does not request a hearing by the *Tribunal* in accordance with Sentence (4), the *director* may carry out the proposal stated in the notice under Sentence (3).

- (6) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (4), the *Tribunal* shall appoint a time for and hold a hearing and may by order direct the *director* to carry out the *director's* proposal or refrain from carrying it out and to take such other action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes the *Tribunal* may substitute its opinion for that of the *director*.
- (7) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.
- (8) Sentences (3) to (7) do not apply and the *director* may cancel the registration of a registered person upon receipt of a request in writing for cancellation from the registered person in a form established by the *director*.
- (9) If, within the time period set out in Sentence 3.2.4.3.(2), the registered person has applied for renewal of a registration, paid the fee required under Article 3.2.4.5. and provided evidence satisfactory to the *director* that the registered person is covered by insurance required under Subsection 3.6.2. for the term of the renewal of the registration, the registration is deemed to continue until the earliest of,
- the day the registration is renewed,
 - if the registered person is served with notice that the *director* proposes to refuse to renew the registration, the day the time for giving notice requesting a hearing expires or, if a hearing is held, the day the *Tribunal* makes its order, and
 - the day when the registered person ceases to be covered by the insurance required under Subsection 3.6.2.

3.2.4.9. Mandatory Suspension or Revocation of Registration or Refusal to Register or Renew Registration

- The *director* shall, in the circumstances set out in Sentence (2),
 - refuse to register an applicant,
 - refuse to renew a registration, or
 - suspend or revoke a registration.
- The circumstances referred to in Sentence (1) are that,
 - the applicant or registered person is not covered by the insurance required under Subsection 3.6.2., or
 - an order under subsection 69(2) of the *Provincial Offences Act* is in effect directing that the registration of the person be suspended and no registration be issued to the person until a fine is paid.
- If the *director* refuses to register an applicant, refuses to renew a registration or suspends or revokes a registration under Sentence (1), the *director* shall serve a notice of the refusal, suspension or revocation, together with the reasons for it, on the applicant or registered person.
- A suspension or revocation of a registration under Sentence (1) takes effect immediately and the commencement of a proceeding before the *Tribunal* does not stay the operation of the suspension or revocation of the registration.
- A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- The *Tribunal* may, on the application of the registered person, stay the operation of a decision of the *director* to suspend or revoke the registration, and may grant the stay subject to conditions.
- If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (5), the *Tribunal* shall appoint a time for and hold a hearing and may by order confirm, alter or revoke the decision of the *director* to refuse to register or to suspend or revoke the registration, as the case may be, and may take such action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes the *Tribunal* may substitute its opinion for that of the *director*.

(8) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.

3.2.5. Qualifications — Other Designers

3.2.5.1. General

- (1) Except as provided in Sentence (3), a person who carries out *design activities* but is not required under Sentence 3.2.4.1.(1) to be registered with the *director* under Sentence 3.2.4.2.(1) must have the following qualification:
- (a) the person must be registered with the *director* under Sentence 3.2.5.2.(1).
 - (2) A registration shall be in a form established by the *director*.
 - (3) A person is exempt from the requirement to comply with the qualification in Sentence (1), if his or her *design activities* relate only to,
 - (a) *design activities* in respect of which a person described in Clause 3.2.4.7.(1)(c) or who has the qualification required under Sentence (1) will review and take responsibility,
 - (b) *construction* of,
 - (i) a house owned by the person, or
 - (ii) an ancillary *building* that serves,
 - (A) a house described in Subclause (i), or
 - (B) an individual *dwelling unit* in a house described in Subclause (i),
 - (c) *construction* of a *farm building* that,
 - (i) is of *low human occupancy*,
 - (ii) is 2 *storeys* or less in *building height*, and
 - (iii) has a *building area* of less than 600 m²,
 - (d) a *sewage system* to be *constructed* by that person and,
 - (i) the person is registered under Article 3.3.3.2., or
 - (ii) the *sewage system* is owned by the person,
 - (e) *construction* of tents described in Sentence 3.14.1.2.(2) of Division B,
 - (f) *construction* of signs,
 - (g) *construction* of site services including,
 - (i) surface drainage, and
 - (ii) *plumbing* located underground, either outside a *building* or under a *building*,
 - (h) *construction* of pre-engineered elements of a *building*, if the design of the elements is carried out by a person competent in the specific discipline appropriate to the circumstances,
 - (i) *construction* of appliances, equipment and similar incidental components of a *building*,
 - (j) *construction* of an ancillary *building*,
 - (i) that serves a house or an individual *dwelling unit* in a house, and
 - (ii) that has a *building area* of not more than 55 m², or
 - (k) *construction* of a *building* for which a permit under section 8 of the Act is applied for or issued before January 1, 2006 and for which *construction* is commenced within six months after the permit is issued.

3.2.5.2. Registration and Renewal of a Registration

- (1) Subject to Article 3.2.5.7., the *director* may register an applicant, or renew a registration, in each class of registration applied for, if,
- (a) the applicant or registered person has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person's knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.1. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.1. for which application is made.
 - (b) the application is complete, and
 - (c) all fees required under Article 3.2.5.5. are paid.

(2) Subject to Article 3.2.5.7., a person who, on December 31, 2024, is registered under Sentence 3.2.5.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.2.5.6. of Division C of that regulation is deemed to be registered under Sentence 3.2.5.2.(1) of this Code, and for these purposes, the person's registration is deemed to continue until its term expires.

(3) For the purposes of a registration or a renewal of a registration, a person who, on December 31, 2024, has the qualifications set out in Clause 3.2.5.2.(1)(a) of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.2.5.2.(1)(a) of this Code.

3.2.5.3. Application for Registration or Renewal of a Registration

- (1) An application for registration or renewal of a registration shall be made to the *director* in a form established by the *director*.
- (2) An application for renewal of a registration shall be made within 60 days before the expiry of the registration to be renewed.
- (3) An application for registration or renewal of a registration shall include an undertaking by the applicant or registered person to comply with the conditions set out in Article 3.2.5.6.
- (4) An application for registration or renewal of a registration shall,
 - (a) set out the applicant's or registered person's name, residence address, residential mailing address, if different from the residence address, and email address, if applicable, and
 - (b) contain evidence, provided by the applicant or registered person, that the applicant or registered person has the qualifications set out in Clause 3.2.5.2.(1)(a).

3.2.5.4. Term

(1) A registration expires one year after it is issued but the *director* may, for the purposes of staggering the renewal dates of the registrations, issue the initial registration for a term of not less than 90 days and not more than 18 months.

3.2.5.5. Fees

- (1) The fee payable for an application to take an examination that is part of an examination program referred to in Clause 3.2.5.2.(1)(a) is \$150.
- (2) The fee for a registration or renewal of a registration is \$128, for 2025 and subsequent calendar years.

3.2.5.6. Conditions

- (1) The following are the conditions of a registration:
 - (a) the registered person shall carry out *design activities* only in respect of the type of *buildings* described in Column 3 of Table 3.5.2.1. that correspond to the class or classes of registration held by the registered person,
 - (b) the registered person shall, within 15 days after the event, notify the *director* in writing of any change in the information set out in Clause 3.2.5.3.(4)(a),
 - (c) the registered person shall include the following information on any document respecting *design activities* that the person has reviewed and taken responsibility for and that is submitted to a *chief building official* or *registered code agency* in the circumstances set out in subsection 15.11(5) of the Act:
 - (i) the person's name and any identifying number assigned to the person by the *director* in respect of the person's registration,
 - (ii) a statement that the person has reviewed and taken responsibility for the *design activities*, and
 - (iii) the person's signature.

3.2.5.7. Suspension, Revocation, Refusal to Register or Renew a Registration

- (1) The *director* may, in the circumstances set out in Sentence (2),
 - (a) refuse to register an applicant or to renew a registration, or
 - (b) suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are,
 - (a) the registered person is in breach of a condition of the registration,
 - (b) the registration was issued on the basis of mistaken, false or incorrect information,
 - (c) an order under subsection 69(2) of the *Provincial Offences Act* is in effect directing that the registration of the person be suspended and that no registration be issued to that person until a fine is paid,
 - (d) the application is incomplete, or
 - (e) any fees required under Article 3.2.5.5. remain unpaid.
- (3) If the *director* proposes to refuse to register or renew a registration or proposes to suspend or revoke a registration, the *director* shall serve a notice of the proposal, together with the reasons for it, on the applicant or registered person.
- (4) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (5) If the applicant or registered person does not request a hearing by the *Tribunal* in accordance with Sentence (4), the *director* may carry out the proposal stated in the notice under Sentence (3).
- (6) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (4), the *Tribunal* shall appoint a time for and hold a hearing and may by order direct the *director* to carry out the *director's* proposal or refrain from carrying it out and to take such other action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes, the *Tribunal* may substitute its opinion for that of the *director*.
- (7) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.
- (8) Sentences (3) to (7) do not apply and the *director* may cancel the registration of a registered person upon receipt of a request in writing for cancellation from the registered person in a form established by the *director*.
- (9) If, within the time period set out in Sentence 3.2.5.3.(2), the registered person has applied for renewal of a registration and paid the fee required under Article 3.2.5.5., the registration is deemed to continue until the earlier of,
 - (a) the day the registration is renewed, and
 - (b) if the registered person is served with notice that the *director* proposes to refuse to renew the registration, the day the time for giving notice requesting a hearing expires or, if a hearing is held, the day the *Tribunal* makes its order.

3.2.6. Public Register

3.2.6.1. Public Register

- (1) The *director* shall establish and maintain a register available to the public that lists every person who has the qualifications required by clause 8(2)(c) and subsection 15.11(5) of the Act.
- (2) The register referred to in Sentence (1) shall contain the following information with respect to every person registered under Sentence 3.2.4.2.(1):
 - (a) the name of the registered person,
 - (b) any identifying number assigned by the *director* to the registered person,
 - (c) the business address of the registered person,

- (d) the classes of registration of the registered person,
 - (e) the names of the person or persons who will review and take responsibility for *design activities* carried out by the registered person in each class of registration, and
 - (f) any identifying number assigned by the *director* to the person or persons referred to in Clause (e).
- (3) The register referred to in Sentence (1) shall contain the following information with respect to every person registered under Sentence 3.2.5.2.(1):
- (a) the name of the registered person,
 - (b) any identifying number assigned by the *director* to the registered person, and
 - (c) the classes of registration of the registered person.

3.2.7. Classes of Registration and Categories of Qualifications

3.2.7.1. Classes and Categories

- (1) Table 3.5.2.1. contains the classes of registration and categories of qualifications for the purposes of this Section.

Section 3.3. Qualifications for Persons Engaged in the Business of Constructing On Site, Installing, Repairing, Servicing, Cleaning or Emptying Sewage Systems

3.3.1. Scope

3.3.1.1. Scope

- (1) This Section prescribes, for the purposes of subsection 15.12(1) of the Act, the qualifications for persons engaged in the business of *constructing* on site, installing, repairing, servicing, cleaning or emptying *sewage systems*.

3.3.2. Definition

3.3.2.1. Definition

- (1) In this Section,
“registered” means registered under Sentence 3.3.3.2.(1).

3.3.3. Qualifications

3.3.3.1. General

- (1) Persons engaged in the business of *constructing* on site, installing, repairing, servicing, cleaning or emptying *sewage systems* shall have the following qualification:
- (a) the person must be registered with the *director*.
- (2) A registration shall be in a form established by the *director*.

- (3) A person is exempt from the requirement to comply with the qualification in Sentence (1) in respect of the activities of cleaning and emptying *sewage systems* if,
- (a) the person has been issued,
 - (i) before October 31, 2011, a certificate of approval under section 39 of the *Environmental Protection Act* in respect of these activities, or
 - (ii) on or after October 31, 2011, an environmental compliance approval under the *Environmental Protection Act* in respect of these activities, and
 - (b) the certificate of approval or the environmental compliance approval, as applicable, has not been suspended or revoked under that Act.

3.3.3.2. Registration and Renewal of a Registration

- (1) Subject to Article 3.3.3.8., the *director* may register an applicant, or renew a registered person's registration, if,
- (a) all persons who will supervise the *construction* on site, installation, repair, servicing, cleaning or emptying of *sewage systems* carried out by the applicant or registered person have successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person's knowledge of the Act, this Code and the *construction*, maintenance and operation of *sewage systems*,
 - (b) the application is complete, and
 - (c) all fees required under Article 3.3.3.5. are paid.
- (2) Subject to Article 3.3.3.8., a person who, on December 31, 2024, is registered under Sentence 3.3.3.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.3.3.7. of Division C of that regulation is deemed to be registered under Sentence 3.3.3.2.(1) of this Code, and for these purposes, the person's registration is deemed to continue until its term expires.
- (3) For the purposes of a registration or a renewal of a registration, a person who, on December 21, 2024, has the qualifications set out in Clause 3.3.3.2.(1)(a) of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.3.3.2.(1)(a) of this Code.

3.3.3.3. Application for Registration or Renewal of a Registration

- (1) An application for registration or renewal of a registration shall be made to the *director* in a form established by the *director*.
- (2) An application for renewal of a registration shall be made within 60 days before the expiry of the registration to be renewed.
- (3) An application for registration or renewal of a registration shall include an undertaking by the applicant or registered person to comply with the conditions set out in Article 3.3.3.7.
- (4) If a partnership or a corporation is the applicant for registration or renewal of a registration, the application shall set out the names and residence addresses of all its partners, directors or officers, as the case may be.
- (5) An application for registration or renewal of a registration shall contain the names of all partners, directors, officers or employees of the applicant or registered person, as the case may be, and all other persons engaged by the applicant or registered person, who,
- (a) have the qualifications set out in Clause 3.3.3.2.(1)(a), and
 - (b) will supervise the *construction* on site, installation, repair, servicing, cleaning or emptying of *sewage systems* to be carried out by the applicant or registered person.
- (6) An application for registration or renewal of a registration shall contain evidence, provided by the applicant or registered person, that the persons referred to in Sentence (5) have the qualifications set out in Clause 3.3.3.2.(1)(a).

3.3.3.4. Term

- (1) A registration expires one year after the date of its issuance.

3.3.3.5. Fees

- (1) The fee payable for an application to take an examination that is part of an examination program referred to in Clause 3.3.3.2.(1)(a) is \$150.
- (2) The fee for a registration or renewal of a registration is \$128, for 2025 and subsequent calendar years.

3.3.3.6. Not Transferable

- (1) A registration is not transferable.

3.3.3.7. Conditions

- (1) The following are the conditions of a registration:
 - (a) the registered person shall ensure that the *construction* on site, installation, repair, servicing, cleaning or emptying of *sewage systems* carried out by the registered person is supervised by a person who has the qualifications set out in Clause 3.3.3.2.(1)(a),
 - (b) the registered person shall, within 15 days after the event, notify the *director* in writing of,
 - (i) any change in address of the registered person for correspondence relating to the registration, and
 - (ii) any change in the information set out in Sentences 3.3.3.3.(4) and (5),
 - (c) the registered person shall give prompt written notice to the *director* of any material change in any of the information, other than the information referred to in Clause (b), that is contained in or accompanies an application for registration or renewal of a registration,
 - (d) the registered person shall, from time to time, at the registered person's expense, give the *director* such documents or information relating to the registration or to activities carried out under the registration as the *director* may reasonably require, and
 - (e) the registered person shall allow the representatives of the *director* access to the registered person's books and records during normal business hours for the purpose of confirming matters related to the registration.

3.3.3.8. Suspension, Revocation, Refusal to Register or Renew a Registration

- (1) The *director* may, in the circumstances set out in Sentence (2),
 - (a) refuse to register an applicant or to renew a registration, or
 - (b) suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are,
 - (a) the registered person is in contravention of the Act or this Code,
 - (b) the registered person is in breach of a condition of the registration,
 - (c) the registration was issued on the basis of mistaken, false or incorrect information,
 - (d) the *director* is of the opinion that the past conduct of the applicant or registered person or, if the applicant or registered person is a partnership or a corporation, the partners, officers or directors of the applicant or registered person, as the case may be, affords reasonable grounds for belief that the business that would be or is authorized by the registration will not be carried on in accordance with law,
 - (e) an order under subsection 69(2) of the *Provincial Offences Act* is in effect directing that the registration of the person be suspended and that no registration be issued to that person until a fine is paid,
 - (f) the application is incomplete, or
 - (g) any fees required under Article 3.3.3.5. remain unpaid.
- (3) If the *director* proposes to refuse to register or renew a registration or proposes to suspend or revoke a registration, the *director* shall serve a notice of the proposal, together with the reasons for it, on the applicant or registered person.

- (4) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (5) If the applicant or registered person does not request a hearing by the *Tribunal* in accordance with Sentence (4), the *director* may carry out the proposal stated in the notice under Sentence (3).
- (6) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (4), the *Tribunal* shall appoint a time for and hold a hearing and may by order direct the *director* to carry out the *director's* proposal or refrain from carrying it out and to take such other action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes the *Tribunal* may substitute its opinion for that of the *director*.
- (7) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.
- (8) Sentences (3) to (7) do not apply and the *director* may cancel the registration of a registered person upon receipt of a request in writing for cancellation from the registered person in a form established by the *director*.
- (9) If, within the time period set out in Sentence 3.3.3.3.(2), the registered person has applied for renewal of a registration and paid the fee required under Article 3.3.3.5., the registration is deemed to continue until the earlier of,
- the day the registration is renewed, and
 - if the registered person is served with notice that the *director* proposes to refuse to renew the registration, the day the time for giving notice requesting a hearing expires or, if a hearing is held, the day the *Tribunal* makes its order.

3.3.4. Public Register

3.3.4.1. Public Register

- (1) The *director* shall establish and maintain a register available to the public that lists every person who has the qualifications required by subsection 15.12(1) of the Act.
- (2) The register referred to in Sentence (1) shall contain the following information with respect to every registered person:
- the name of the registered person,
 - any identifying number assigned by the *director* to the registered person,
 - the business address of the registered person,
 - the names of the person or persons who will supervise the *construction* on site, installation, repair, servicing, cleaning or emptying of *sewage systems* carried out by the registered person, and
 - any identifying number assigned by the *director* to the person or persons referred to in Clause (d).

Section 3.4. Qualifications for Registered Code Agencies

3.4.1. Scope

3.4.1.1. Scope

- (1) This Section prescribes, for the purposes subsection 15.11(4) of the Act, the qualifications that a person must have in order to be eligible to be appointed as a *registered code agency* under the Act.

3.4.2. Definition

3.4.2.1. Definition

- (1) In this Section,
“registered” means registered under Sentence 3.4.3.2.(1).

3.4.3. Qualifications

3.4.3.1. General

- (1) The following are prescribed as qualifications for persons to be appointed under the Act as a *registered code agency*:
 - (a) the person must be registered with the *director*.
 - (2) A registration shall be in a form established by the *director*.

3.4.3.2. Registration and Renewal of a Registration

- (1) Subject to Articles 3.4.3.8. and 3.4.3.9., the *director* may register an applicant, or renew a registered person’s registration, in each class of registration applied for, if,
 - (a) the applicant or registered person or, if the applicant or registered person is a corporation or partnership, a director, officer, partner or employee of the applicant or registered person, has successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person’s knowledge of the Act and this Code and the powers and duties of a *registered code agency*,
 - (b) the applicant or registered person or, if the applicant or registered person is a corporation or partnership, one or more directors, officers, partners or employees of the applicant or registered person, have successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person’s knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.2. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.2. for which application is made,
 - (c) all persons who will carry out plans review and inspection activities on behalf of the registered person have successfully completed the examination program administered or authorized by the Ministry of Municipal Affairs and Housing relating to the person’s knowledge of the Act and this Code in the category of qualification set out in Column 2 of Table 3.5.2.2. that corresponds to each class of registration set out in Column 1 of Table 3.5.2.2. for which application is made,
 - (d) the applicant or registered person has in place a quality management plan referred to in Sentence 3.4.3.3.(3) for carrying out the activities of the applicant or registered person under the registration that is acceptable to the *director*,
 - (e) the applicant or registered person is covered by the insurance required under Subsection 3.6.2. during the term of the registration applied for,
 - (f) the application is complete, and
 - (g) all fees required under Article 3.4.3.5. are paid.

(2) Subject to Articles 3.4.3.8. and 3.4.3.9., a person who, on December 31, 2024, is registered in a class of registration under Sentence 3.4.3.2.(1) of Division C of Ontario Regulation 332/12 (Building Code) made under the Act and complies with the conditions of registration set out in Article 3.4.3.7. of Division C of that regulation is deemed to be registered in the class of registration under Sentence 3.4.3.2.(1) of this Code, and for these purposes, the person's registration in the class of registration is deemed to continue until its term expires.

- (3) For the purposes of a registration or a renewal of a registration,
- (a) a person who, on December 31, 2024, has the qualifications set out in Clause 3.4.3.2.(1)(a) of Division C of Ontario Regulation 332/12 is deemed to have the qualifications set out in Clause 3.4.3.2.(1)(a) of this Code,
 - (b) a person who, on December 31, 2024, has the qualifications set out in Clause 3.4.3.2.(1)(b) of Division C of Ontario Regulation 332/12 in a class of registration is deemed to have the qualifications set out in Clause 3.4.3.2.(1)(b) of this Code in the class of registration, and
 - (c) a person who, on December 31, 2024, has the qualifications set out in Clause 3.4.3.2.(1)(c) of Division C of Ontario Regulation 332/12 in a class of registration is deemed to have the qualifications set out in Clause 3.4.3.2.(1)(c) of this Code in the class of registration.

3.4.3.3. Application for Registration or Renewal of a Registration

- (1) An application for registration or renewal of a registration shall be made to the *director* in a form established by the *director*.
- (2) An application for renewal of a registration shall be made within 60 days before the expiry of the registration to be renewed.
- (3) An application for registration or renewal of a registration shall include a quality management plan for carrying out the activities of the applicant or registered person under the registration, including, without limitation,
- (a) procedures relating to the commencement of activities as a *registered code agency*, including procedures to verify that the applicant or registered person is qualified to undertake the activities and to verify that there exists no conflict of interest within the meaning of Sentence 3.7.2.1.(4),
 - (b) identification of the responsibilities of persons who will carry out plans review and inspection activities of the applicant or registered person and procedures for the supervision of those persons,
 - (c) procedures for assessing plans and specifications for conformity with this Code, including procedures for the assessment of *alternative solutions*,
 - (d) procedures for inspecting the *construction of buildings*,
 - (e) procedures for receipt of notices that *construction* is ready for inspection and of written reports from *architects* and *professional engineers* arising out of the general review of the *construction of buildings*,
 - (f) procedures for the issuance of certificates and orders under the Act, including the responsibility of the persons with the qualifications set out in Sentences 3.7.4.3.(1) and (2),
 - (g) procedures for referral of matters to a *chief building official* under subsection 14(5) of the Act,
 - (h) procedures for participation of the applicant or registered person in proceedings before the Building Code Commission under section 24 of the Act and before the Superior Court of Justice under section 25 of the Act,
 - (i) procedures for documenting the activities of the applicant or registered person under the registration, including data control, records retention and the maintenance of security and confidentiality of records, and transferring records to the *principal authority*,
 - (j) procedures for training and supervision of personnel, and
 - (k) procedures for the review and updating of the quality management plan.
- (4) An application for registration or renewal of a registration shall include an undertaking by the applicant or registered person to comply with the conditions set out in Article 3.4.3.7.
- (5) If a partnership or a corporation is the applicant for registration or renewal of a registration, the application shall set out the names and residence addresses of all its partners, directors or officers, as the case may be

- (6) An application for registration or renewal of a registration shall contain the names of all partners, directors, officers or employees of the applicant or registered person, as the case may be, and all other persons engaged by the applicant or registered person, who,
- (a) have the qualifications set out in Clause 3.4.3.2.(1)(a),
 - (b) have the qualifications set out in Clause 3.4.3.2.(1)(b) in the class or classes of registration for which the application is made, and
 - (c) have the qualifications set out in Clause 3.4.3.2.(1)(c) in the class or classes of registration for which the application is made and will exercise powers and perform functions under the Act on behalf of the applicant or registered person in that class of registration.
- (7) An application for registration or renewal of a registration shall contain evidence, provided by the applicant or registered person, that the persons referred to in Sentence (6) have the qualifications set out in Clause 3.4.3.2.(1)(a), (b) or (c).
- (8) An application for registration or renewal of a registration shall contain evidence, provided by the applicant or registered person in such form and in such detail as may be required by the *director*, that the applicant or registered person is covered by the insurance required under Subsection 3.6.2. during the term of the registration applied for.

3.4.3.4. Term

- (1) A registration expires one year after the date of its issuance.

3.4.3.5. Fees

- (1) The fee payable for an application to take an examination that is part of an examination program referred to in Clause 3.4.3.2.(1)(a), (b) or (c) is \$150.
- (2) The fee for a registration is \$484, for 2025 and subsequent calendar years.
- (3) The fee for the addition of a new class of registration is \$82, for 2024 and subsequent calendar years.
- (4) The fee for renewal of a registration is \$356, for 2025 and subsequent calendar years.

3.4.3.6. Not Transferable

- (1) A registration is not transferable.

3.4.3.7. Conditions

- (1) The following are the conditions of a registration:
- (a) the registered person shall carry out activities under the registration in accordance with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d),
 - (b) if the registered person is a corporation or partnership, during the term of the registration there must be,
 - (i) an officer, director, partner or employee of the registered person who has the qualifications set out in Clause 3.4.3.2.(1)(a), and
 - (ii) one or more officers, directors, partners or employees of the registered person who have the qualifications set out in Clause 3.4.3.2.(1)(b) in respect of each class of registration that is held by the registered person,
 - (c) the registered person shall, during the term of the registration, be covered by the insurance required under Subsection 3.6.2.,
 - (d) the registered person shall, within 15 days after the event, notify the *director* in writing of,
 - (i) any change in address of the registered person for correspondence relating to the registration, and
 - (ii) any change in the information set out in Sentences 3.4.3.3.(5) and (6),

- (e) the registered person shall give prompt written notice to the *director* of any material change in any of the information, other than the information referred to in Clause (d), that is contained in or accompanies an application for registration or renewal of a registration,
- (f) the registered person shall, from time to time, at the registered person's expense, give to the *director* such documents or information relating to the registration or to activities carried out under the registration as the *director* may reasonably require, and
- (g) the registered person shall allow the representatives of the *director* access to the registered person's books and records during normal business hours for the purpose of confirming matters related to the registration.

3.4.3.8. Suspension, Revocation, Refusal to Register or Renew a Registration

- (1) The *director* may, in the circumstances set out in Sentence (2),
 - (a) refuse to register an applicant,
 - (b) refuse to renew a registration, or
 - (c) suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are,
 - (a) the registered person is in contravention of the Act or this Code,
 - (b) the registered person is in breach of a condition of the registration other than the condition set out in Clause 3.4.3.7.(1)(d),
 - (c) the registration was issued on the basis of mistaken, false or incorrect information,
 - (d) the *director* is of the opinion that the past conduct of the applicant or registered person or, if the applicant or registered person is a partnership or a corporation, the partners, officers or directors of the applicant or registered person, as the case may be, affords reasonable grounds for belief that the business that would be or is authorized by the registration will not be carried on in accordance with law,
 - (e) the *director* is of the opinion that there are reasonable grounds for belief that the activities of the applicant or registered person are or will be carried on in a manner that poses a threat to public safety,
 - (f) the application is incomplete, or
 - (g) any fees required under Article 3.4.3.5. remain unpaid.
- (3) If the *director* proposes to refuse to register or renew a registration or proposes to suspend or revoke a registration under Sentence (1), the *director* shall serve a notice of the proposal, together with the reasons for it, on the applicant or registered person.
- (4) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (5) If an applicant or registered person does not request a hearing by the *Tribunal* in accordance with Sentence (4), the *director* may carry out the proposal stated in the notice under Sentence (3).
- (6) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (4), the *Tribunal* shall appoint a time for and hold a hearing and may by order direct the *director* to carry out the *director's* proposal or refrain from carrying it out and to take such other action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for those purposes the *Tribunal* may substitute its opinion for that of the *director*.
- (7) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.
- (8) A proposal to suspend or revoke a registration by reason of Clause (2)(e) takes effect immediately and the commencement of a proceeding before the *Tribunal* does not stay the operation of the proposal to suspend or revoke the registration.

- (9) The *Tribunal* may, on the application of the registered person, stay the operation of the proposal of the *director* to suspend or revoke the registration, and may grant the stay subject to conditions.
- (10) Sentences (3) to (9) do not apply and the *director* may cancel the registration of a registered person upon receipt of a request in writing for cancellation from the registered person in a form established by the *director*.
- (11) Subject to Sentence (8), if within the time period set out in Sentence 3.4.3.3.(2) a registered person has applied for renewal of a registration, paid the fee required under Article 3.4.3.5. and provided evidence satisfactory to the *director* that the registered person is covered by insurance required under Subsection 3.6.2. for the term of the renewal of the registration, the registration is deemed to continue until the earliest of,
- the day the registration is renewed,
 - if the registered person is served with notice that the *director* proposes to refuse to renew the registration, the day the time for giving notice requesting a hearing expires or, if a hearing is held, the day the *Tribunal* makes its order, and
 - the day when the registered person ceases to be covered by the insurance required under Subsection 3.6.2.

3.4.3.9. Mandatory Suspension or Revocation of Registration or Refusal to Register or Renew a Registration

- (1) The *director* shall, in the circumstances set out in Sentence (2),
- refuse to register an applicant,
 - refuse to renew a registration, or
 - suspend or revoke a registration.
- (2) The circumstances referred to in Sentence (1) are that,
- the applicant or registered person is not covered by the insurance required under Subsection 3.6.2., or
 - an order under subsection 69(2) of the *Provincial Offences Act* is in effect directing that the registration of the person be suspended and no registration be issued to that person until a fine is paid.
- (3) If the *director* refuses to register an applicant, refuses to renew a registration or suspends or revokes a registration under Sentence (1), the *director* shall serve a notice of the refusal, suspension or revocation, together with the reasons for it, on the applicant or registered person.
- (4) A suspension or revocation of a registration under Sentence (1) takes effect immediately and the commencement of a proceeding before the *Tribunal* does not stay the operation of the suspension or revocation of the registration.
- (5) The *Tribunal* may, on the application of the registered person, stay the operation of a decision of the *director* to suspend or revoke the registration, and may make the stay subject to conditions.
- (6) A notice under Sentence (3) shall state that the applicant or registered person is entitled to a hearing before the *Tribunal* if the applicant or registered person, within 15 days after service of the notice referred to in Sentence (3), serves the *director* and the *Tribunal* with notice in writing requesting a hearing.
- (7) If the applicant or registered person requests a hearing before the *Tribunal* in accordance with Sentence (6), the *Tribunal* shall appoint a time for and hold a hearing and may by order confirm, alter or revoke the decision of the *director* to refuse to register or to suspend or revoke the registration, as the case may be, and may take such action as the *Tribunal* considers the *director* ought to take in accordance with the Act and this Code, and for such purposes the *Tribunal* may substitute its opinion for that of the *director*.
- (8) The *director*, the applicant or registered person who requested the hearing, and such other persons as the *Tribunal* may specify, are parties to proceedings before the *Tribunal*.

3.4.4. Public Register

3.4.4.1. Public Register

- (1) The *director* shall establish and maintain a register available to the public that lists every person who has the qualifications required by subsection 15.11(4) of the Act.
- (2) The register referred to in Sentence (1) shall contain the following information with respect to every registered person:
 - (a) the name of the registered person,
 - (b) any identifying number assigned by the *director* to the registered person,
 - (c) the business address of the registered person,
 - (d) the classes of registration of the registered person, and
 - (e) the names of any persons who will exercise powers and perform functions under the Act on behalf of the registered person in each class of registration and any identifying number assigned by the *director* to that person.

3.4.5. Classes of Registration and Categories of Qualifications

3.4.5.1. Classes and Categories

- (1) Table 3.5.2.2. contains the classes of registration and categories of qualifications for the purposes of this Section.

Section 3.5. Classes of Registration and Categories of Qualifications

3.5.1. Scope

3.5.1.1. Scope

- (1) This Section sets out classes of registration and categories of qualifications for the purposes of Sections 3.1., 3.2., 3.4. and 3.7.

3.5.2. Classes of Registration and Categories of Qualifications

3.5.2.1. Inspectors and Persons Who Carry out Design Activities

- (1) Table 3.5.2.1. sets out the classes of registration and categories of qualifications for *inspectors* and persons who carry out *design activities*.

Table 3.5.2.1.
Classes of Registration and Categories of Qualifications for Inspectors and Persons Who Carry Out Design Activities⁽¹⁾⁽²⁾
 Forming Part of Sentence 3.5.2.1.(1)

Item	Classes of Registration for <i>Inspectors</i> and Persons Who Carry out <i>Design Activities</i>	Categories of Qualifications for <i>Inspectors</i> and Persons Described in Clauses 3.2.4.2.(1)(a) and (b) and 3.2.5.2.(1)(a)	Type of <i>Building</i>
1	House	House	(a) A house and the <i>building</i> systems, works, fixtures and service systems appurtenant to the house, including: (b) an ancillary <i>building</i> that serves the house, and excluding: (c) <i>buildings</i> and parts of <i>buildings</i> described in Column 3 of any of Items 5, 6, 7, 8, 10 and 11 of this Table.
2	Small <i>Buildings</i>	Small <i>Buildings</i>	(a) <i>Buildings</i> described in Sentence 1.3.3.3.(1) of Division A and the <i>building</i> systems, works, fixtures and service systems appurtenant to these <i>buildings</i> , including: (b) <i>buildings</i> and parts of <i>buildings</i> , (i) described in Column 3 of Item 1 of this Table, or (ii) to which any of Sections 3.10., 3.11., 3.12., 3.14. and 3.15. of Division B apply and that are appurtenant to or serve <i>buildings</i> described in Clause (a), excluding: (c) <i>buildings</i> and parts of <i>buildings</i> described in Column 3 of any of Items 4 to 10 of this Table, and (d) signs described in Clause 1.3.3.5.(1)(e) of Division A.
3	Large <i>Buildings</i>	Large <i>Buildings</i>	(a) <i>Buildings</i> described in Sentence 1.3.3.2.(1), (3) or (4) of Division A and the <i>building</i> systems, works, fixtures and service systems appurtenant to these <i>buildings</i> , excluding: (b) <i>buildings</i> and parts of <i>buildings</i> described in Column 3 of any of Items 4 to 11 of this Table, and (c) signs described in Clause 1.3.3.5.(1)(e) of Division A.
4	Complex <i>Buildings</i>	Complex <i>Buildings</i>	<i>Building</i> systems, works, fixtures and service systems to which Subsection 3.2.6. of Division B or any provision in Articles 3.2.8.3. to 3.2.8.8. of Division B applies.
5	<i>Plumbing</i> – House	<i>Plumbing</i> – House	All <i>plumbing</i> systems to which Part 7 of Division B applies that are appurtenant to a house.
6	<i>Plumbing</i> – All <i>Buildings</i>	<i>Plumbing</i> – All <i>Buildings</i>	(a) All <i>plumbing</i> systems to which Part 7 of Division B applies, including: (b) <i>buildings</i> and parts of <i>buildings</i> described in Column 3 of Item 5 of this Table.
7	HVAC – House	HVAC – House	All <i>building</i> systems, works, fixtures and service systems to which Section 9.32. or 9.33. of Division B applies that are appurtenant to a house.
	Column 1	2	3

Table 3.5.2.1. (Cont'd)
Classes of Registration and Categories of Qualifications for Inspectors and Persons Who Carry Out Design Activities⁽¹⁾⁽²⁾
 Forming Part of Sentence 3.5.2.1.(1)

Item	Classes of Registration for <i>Inspectors</i> and Persons Who Carry out <i>Design Activities</i>	Categories of Qualifications for <i>Inspectors</i> and Persons Described in Clauses 3.2.4.2.(1)(a) and (b) and 3.2.5.2.(1)(a)	Type of <i>Building</i>
8	Building Services	Building Services	(a) <i>Building</i> systems, works, fixtures and service systems that are appurtenant to <i>buildings</i> described in Sentence 1.3.3.2.(1), (3) or (4) or Sentence 1.3.3.3.(1) of Division A and that relate to fire suppression, fire detection, smoke control, exhaust, vertical movement of smoke, energy efficiency, lighting and emergency power, and (b) <i>building</i> systems, works, fixtures and service systems appurtenant to <i>buildings</i> to which Part 6 of Division B applies or to which Section 9.32. or 9.33. of Division B applies, including: (c) <i>buildings</i> and parts of <i>buildings</i> described in Column 3 of Item 7 or 11 of this Table.
9	Building Structural	Building Structural	Internal and external <i>loadbearing</i> structural elements essential to the stability or strength of a <i>building</i> described in Sentence 1.3.3.2.(2) or 1.3.3.3.(1) of Division A and that resist <i>dead loads</i> or <i>live loads</i> including, but not limited to, <i>foundations</i> , floors, walls, roofs, columns and beams.
10	On-Site Sewage Systems	On-Site Sewage Systems	<i>Sewage systems</i> to which Part 8 of Division B applies.
11	Detection, Lighting and Power	Detection, Lighting and Power	Early warning and electrical systems including systems appurtenant to <i>buildings</i> described in Sentence 1.3.3.2.(1) or 1.3.3.3.(1) of Division A and that relate to fire alarm and detection systems, voice communication systems, lighting systems, emergency lighting systems or emergency power systems for <i>building services</i> in all <i>buildings</i> .
12	Fire Protection	Fire Protection	Fire suppression, fire detection, firefighting and fire safety systems appurtenant to <i>buildings</i> described in Sentence 1.3.3.2.(1) or 1.3.3.3.(1) of Division A.
	Column 1	2	3

Notes to Table 3.5.2.1.:

- (1) An *inspector* registered in one class of registration may carry out plans review and inspection in another class where to do so does not constitute a substantial part of the plans review or inspection on any project.
- (2) A person registered in one class of registration may carry out *design activities* in another class where to do so does not constitute a substantial part of the *design activities* on any project.

3.5.2.2. Registered Code Agencies

- (1) Table 3.5.2.2. sets out the classes of registration for *registered code agencies* and the categories of qualifications for persons described in Clauses 3.4.3.2.(1)(a) to (c).

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Table 3.5.2.2.
Classes of Registration and Categories of Qualifications for Registered Code Agencies
 Forming Part of Sentence 3.5.2.2.(1)

Classes of Registration for Registered Code Agencies	Category of Qualification for Persons Described in Clauses 3.4.3.2.(1)(a) to (c)	Type of Building Reference to Table 3.5.2.1.
House	House	Column 3 of Item 1
	Plumbing – House	Column 3 of Item 5
	HVAC – House	Column 3 of Item 7
	On-Site Sewage Systems	Column 3 of Item 10
Small Buildings	Small Buildings	Column 3 of Item 2
	Plumbing – All Buildings	Column 3 of Item 6
	Building Services	Column 3 of Item 8
	Building Structural	Column 3 of Item 9
	On-Site Sewage Systems	Column 3 of Item 10
Large Buildings	Large Buildings	Column 3 of Item 3
	Plumbing – All Buildings	Column 3 of Item 6
	Building Services	Column 3 of Item 8
	Building Structural	Column 3 of Item 9
	On-site Sewage Systems	Column 3 of Item 10
Complex Buildings	Complex Buildings	Column 3 of Item 4
	Plumbing – All Buildings	Column 3 of Item 6
	Building Services	Column 3 of Item 8
	Building Structural	Column 3 of Item 9
	On-Site Sewage Systems	Column 3 of Item 10
On-Site Sewage Systems	On-Site Sewage Systems	Column 3 of Item 10
Column 1	2	3

Section 3.6. Insurance

3.6.1. Scope

3.6.1.1. Scope

(1) This Section prescribes, for the purposes of subsection 15.13(1) of the Act, the insurance coverage that *registered code agencies* and persons referred to in subsection 15.11(5) of the Act must have.

3.6.2. Insurance for Registered Code Agencies and Persons Referred to in Subsection 15.11(5) of the Act

3.6.2.1. Definition

(1) In this Subsection,

“registered person” means a person who is registered under Sentence 3.2.4.2.(1) or 3.4.3.2.(1).

3.6.2.2. Scope

- (1) Every registered person shall have insurance coverage under an insurance policy that satisfies the requirements set out in Article 3.6.2.3.

3.6.2.3. Insurance Coverage

- (1) The insurance policy,
- (a) shall indemnify the registered person against liability imposed by law arising out of the performance of or the failure to perform services as a registered person during any time while the person is registered under Sentence 3.2.4.2.(1) or 3.4.3.2.(1) for claims that are first made and reported to the insurer during the period of insurance or during any extended reporting period required by Clause (1)(c),
- (b) shall set out the name of the registered person,
- (c) in the case of a *registered code agency* registered under Sentence 3.4.3.2.(1),
- (i) shall require an extended reporting period of two years for the purposes of giving notice of any claim or occurrence that the *registered code agency* could reasonably foresee might give rise to a claim, with respect to an event that occurs prior to the person ceasing to be insured,
 - (ii) shall provide that the extended reporting period described in Subclause (i) shall commence on the day the *registered code agency* ceases to be insured, and
 - (iii) shall require the *registered code agency* to make full payment of all premiums for the extended reporting period referred to in Subclause (i) as part of the premiums for the issuance of the insurance policy,
- (d) shall provide for insurance coverage to commence,
- (i) on the date the registered person becomes registered, or
 - (ii) in the case of a registered person previously insured in accordance with this Article, on the expiry of the previous policy,
- (e) shall require the insurer to provide prompt written notice to the *director* if the policy is declared void for material misrepresentation,
- (f) shall specify a limit of indemnity for any one claim and in the aggregate during any one period of insurance that is not less than,
- (i) in the case of persons registered under Sentence 3.2.4.2.(1),
 - (A) \$1,000,000 per claim and \$2,000,000 in the aggregate, if the person billed \$100,000 or more in fees in the 12 months immediately before the issuance of the policy,
 - (B) \$500,000 per claim and \$1,000,000 in the aggregate, if the person billed more than \$50,000 and less than \$100,000 in fees in the 12 months immediately before the issuance of the policy,
 - (C) \$250,000 per claim and \$500,000 in the aggregate, if the person billed \$50,000 or less in fees in the 12 months immediately before the issuance of the policy, or
 - (D) the limits of indemnity for any one claim and in the aggregate that are set out in Sub-subclause (A), (B) or (C), as determined by reference to the person's estimated fees billings for the 12-month period immediately after the issuance of the policy, if the person has been registered less than one year before the issuance of the policy, and
 - (ii) in the case of a *registered code agency* registered under Sentence 3.4.3.2.(1), \$1,000,000 per claim and \$2,000,000 in the aggregate, except that those limits shall apply exclusively to the exercise of the powers and performance of the duties of a *registered code agency* under the Act and shall be in addition to any insurance applicable to any other activities carried on by the *registered code agency*,
- (g) shall provide that any costs and expenses necessarily incurred by the insurer in the investigation, defence or settlement of claims under the policy shall not be part of the limit of indemnity set out in Clause (f) unless the limit of indemnity from any one claim exceeds \$2,000,000,
- (h) shall not provide that the insured shall be responsible for the first portion of any sum that the insured becomes legally liable to pay in respect of a claim made against him, her or it in respect of any one claim or occurrence in an amount exceeding the lesser of,
- (i) \$70,000, and
 - (ii) 5% of,
 - (A) the amount of fees billed by the insured in the 12 months immediately before the issuance of the policy,
 - or

- (B) the amount of the insured's estimated fees billings for the 12-month period immediately after the issuance of the policy, if the insured has been registered under Sentence 3.2.4.2.(1) less than one year before the issuance of the policy,
- (i) shall provide that it cannot be cancelled by the insured unless,
 - (i) the insured immediately replaces the policy with another policy that satisfies the requirements of this Article,
 - (ii) the insurer has given notice in writing of the proposed cancellation to the *director*, and
 - (iii) the notice described in Subclause (ii) was received by the *director* at least 30 days before the day the policy is cancelled,
 - (j) shall provide that it cannot be cancelled by the insurer unless,
 - (i) it is cancelled for non-payment of a premium,
 - (ii) the insurer has given notice in writing of the proposed cancellation to the *director*, and
 - (iii) the notice described in Subclause (ii) was sent to the *director* at least 30 days before the day the policy is cancelled,
 - (k) shall provide for the continuation of coverage if the insured is adjudged a bankrupt, insolvent, incompetent or dies during the period of insurance, and
 - (l) may provide that coverage be subject to such exclusions and conditions and otherwise on such terms as are consistent with normal insurance industry practice from time to time.

Section 3.7. Registered Code Agencies

3.7.1. When a Registered Code Agency may not be Appointed under Section 4.1 of the Act

3.7.1.1. Agreements

- (1) A *registered code agency* may not be appointed under subsection 4.1(2) of the Act, unless the agreement entered into between a *principal authority* and the *registered code agency* complies with the requirements set out in Sentences (2) and (3).
- (2) An agreement described in Sentence (1) shall,
- (a) be made in writing,
 - (b) specify the functions that the *registered code agency* is authorized to perform,
 - (c) specify the *construction* of the *building* or class of *buildings* in respect of which the functions will be performed,
 - (d) set out the procedure by which the *principal authority* will appoint the *registered code agency* to perform specified functions in respect of the *construction* of a *building* or class of *buildings*,
 - (e) require that the *registered code agency* carry out its functions under the agreement in accordance with the Act and this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), and
 - (f) provide for the provision by the *principal authority* to the *registered code agency* of such plans, specifications and other information, including applications for permits, that the *registered code agency* may require in order to act under the appointment.
- (3) An agreement described in Sentence (1),
- (a) may contain provisions in addition to the provisions required under Sentence (2) if the additional provisions are not inconsistent with the provisions required under that Sentence, and
 - (b) shall not contain any provision that relates to the *construction* of *buildings* for a class of registration for which the *registered code agency* is not registered under Sentence 3.4.3.2.(1).

3.7.1.2. Appointments

- (1) A *registered code agency* may not be appointed under subsection 4.1(2) of the Act unless the appointment complies with the requirements of Sentences (2) and (3).

- (2) An appointment described in Sentence (1) shall,
 - (a) be made in writing,
 - (b) specify the *construction* of the *building* or class of *buildings* in respect of which the appointment relates,
 - (c) specify the functions described in section 15.15 of the Act that the *registered code agency* is appointed to perform, and
 - (d) require that the *registered code agency* carry out its functions under the appointment in accordance with the Act and this Code and the quality management plan described in Clause 3.4.3.2.(1)(d).
- (3) An appointment described in Sentence (1) may contain provisions in addition to the provisions required under Sentence (2) if the additional provisions are not inconsistent with the provisions required under that Sentence.

3.7.2. When a Registered Code Agency may not be Appointed or Continue to Act under an Appointment

3.7.2.1. General

- (1) A *registered code agency* may not be appointed to perform functions under section 15.15 of the Act in respect of a *building* or continue to act under an appointment in respect of a *building* if the *registered code agency*,
 - (a) is not registered under Sentence 3.4.3.2.(1) in respect of the class of registration to which the *construction* of the *building* relates, or
 - (b) is in breach of a condition of its registration under Article 3.4.3.7.
- (2) Where the design and general review of *construction* of a *building* must be undertaken by an *architect* or a *professional engineer* or a combination of both, a *registered code agency* may not be appointed to perform functions under section 15.15 of the Act or continue to act under an appointment in respect of the *construction* of the *building* unless the *registered code agency* or an officer, director, partner or employee of the *registered code agency* is an *architect* or *professional engineer* or both, as the case may be.
- (3) A *registered code agency* may not be appointed under the Act or continue to act under an appointment if the *registered code agency* would be in a conflict of interest.
- (4) For the purposes of Sentence (3), a *registered code agency* would be in a conflict of interest if the *registered code agency* or an officer, director, partner or employee of the *registered code agency* or any person engaged by the *registered code agency* to perform functions for it,
 - (a) has participated or participates, in any capacity, in *design activities* or *construction* relating to any part of the *building* to which an appointment relates,
 - (b) is or has been employed within the previous 180 days by a person who carried out *design activities* or *construction* relating to any part of the *building*,
 - (c) has a professional or financial interest in,
 - (i) the *construction* of the *building* to which the appointment relates,
 - (ii) the *building* to which the appointment relates, or
 - (iii) the person responsible for the design of the *building* to which the appointment relates, or
 - (d) is an elected official, officer or employee of a *principal authority*.
- (5) For the purposes of Clause (4)(c), involvement with a *building* as a *registered code agency* and entitlement to any fee paid for acting as a *registered code agency* in respect of a *building* shall not be considered to be a professional or financial interest in the *construction* of the *building*, the *building* or the person responsible for the design of the *building*.

3.7.3. Additional Functions that Registered Code Agencies may be Appointed to Perform

3.7.3.1. General

(1) In addition to the functions described in paragraphs 1 to 5 of section 15.15 of the Act, a *registered code agency* may be appointed to perform the functions set out in Sentence 3.7.4.3.(5) or (6).

3.7.4. Manner in Which Registered Code Agency Shall Perform Functions

3.7.4.1. General

(1) The *registered code agency* shall perform the functions specified in an appointment in accordance with the Act and this Code and the quality management plan described in Clause 3.4.3.2.(1)(d).

(2) The *registered code agency* shall perform the functions specified in an appointment in accordance with the code of conduct set out in MMAH Supplementary Standard SC-1, “Code of Conduct for Registered Code Agencies”.

3.7.4.2. Plans Review and Inspection Activities

(1) The *registered code agency* shall ensure that plans review and inspection activities of the *registered code agency* are carried out by a person who has the qualifications set out in Clause 3.4.3.2.(1)(b) or (c) in respect of the type of *building* set out in Column 3 of Table 3.5.2.2. for which the person is carrying out the activities.

(2) A *registered code agency* shall prepare written records of every inspection of the *construction* of a *building* that is undertaken by the *registered code agency* in the course of performing functions under an appointment.

(3) The record required under Sentence (2) shall include,

- (a) the date of receipt of the notice of readiness for inspection, if any,
- (b) the date of the inspection,
- (c) the reason for the inspection, and
- (d) whether non-compliance with this Code was observed in the course of the inspection and the details of the non-compliance.

(4) If a *registered code agency* has issued an order under subsection 12(2), 13(1) or 13(6) of the Act, the *registered code agency* shall prepare a written record consisting of,

- (a) a copy of the order,
- (b) the persons on whom the order was served and the date and manner of service,
- (c) when and how the order was complied with, and
- (d) if the order has not been complied with, the efforts made by the *registered code agency* to achieve compliance by the persons responsible for compliance.

3.7.4.3. Issuance of Certificates by Registered Code Agencies

(1) Subject to Sentence (2), every certificate issued under the Act by a *registered code agency* shall, in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d), be signed by the *registered code agency* or, if the *registered code agency* is a corporation or partnership, by a person who has the qualifications set out in Clause 3.4.3.2.(1)(a).

- (2) If the certificate is issued in respect of the *construction* of a *building* that would be required to be designed by and under the general review of an *architect* or a *professional engineer* or a combination of both, the certificate shall also be signed on behalf of the *registered code agency* by an *architect* or a *professional engineer* or both, as the case may be, who is an officer, director, partner or employee of the *registered code agency*.
- (3) A *registered code agency* may issue a *plans review certificate* if the *registered code agency*,
- (a) has been appointed to perform the functions described in clause 4.1(4)(a) or (c) of the Act in respect of the proposed *construction* of the *building* to which the *plans review certificate* applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that, on date on which the *plans review certificate* is issued, the proposed *construction* of the *building* to which the *plans review certificate* relates is in compliance with this Code.
- (4) A *registered code agency* may issue a *change certificate* if the *registered code agency*,
- (a) has been appointed to perform the functions described in clause 4.1(4) (a), (b) or (c) of the Act in respect of the *construction* or proposed *construction* of the *building* to which the *change certificate* applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d) , carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that, on the date on which the *change certificate* is issued, the proposed *construction* of the *building* to which the *change certificate* relates is in compliance with this Code.
- (5) A *registered code agency* may issue a *certificate for the occupancy of a building not fully completed* if the *registered code agency*,
- (a) has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of the *building* to which the *certificate for the occupancy of a building not fully completed* applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that, on the date on which the *certificate for the occupancy of a building not fully completed* is issued, the *construction* of the *building* to which the *certificate for the occupancy of a building not fully completed* relates is in compliance with Clauses 1.3.3.1.(3)(a) to (q) or 1.3.3.7.(8)(a) to (y), as applicable.
- (6) A *registered code agency* may issue a *certificate for the occupancy of a building described in Sentence 1.3.3.4.(3) of Division C* if the *registered code agency*,
- (a) has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence 1.3.3.4.(3) to which the certificate applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that, on the date on which the *certificate for the occupancy of a building described in Sentence 1.3.3.4.(3) of Division C* is issued, the *construction* of the *building* to which the certificate relates is in compliance with Clauses 1.3.3.4.(4)(a) to (i).
- (7) A *registered code agency* may issue a *certificate for the occupancy of a building described in Sentence 1.3.3.5.(1) of Division C* if the *registered code agency*,
- (a) has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence 1.3.3.5.(1) to which the certificate applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that, on the date on which the *certificate for the occupancy of a building described in Sentence 1.3.3.5.(1) of Division C* is issued, the *construction* of the *building* to which the certificate relates is in compliance with Clauses 1.3.3.5.(3)(a) to (r).

- (8) A *registered code agency* may issue a *final certificate* if the *registered code agency*,
 - (a) has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of the *building* to which the *final certificate* applies,
 - (b) has, in conformity with the Act, this Code and the quality management plan described in Clause 3.4.3.2.(1)(d), carried out the applicable functions for which the *registered code agency* was appointed, and
 - (c) is satisfied on reasonable grounds that on the date on which the *final certificate* is issued, the *construction* of the *building* to which the *final certificate* relates is in compliance with this Code.
- (9) Every certificate issued under the Act by a *registered code agency* shall be in a form approved by the *Minister*.

3.7.4.4. Issuance of Orders by Registered Code Agencies

- (1) Orders under subsections 13(6) and 14(1) of the Act shall, in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d), be signed by the *registered code agency* or a person who has the qualifications set out in Clause 3.4.3.2.(1)(a).
- (2) Orders under subsections 12(2) and 13(1) and clause 18(1)(f) of the Act shall, in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d), be signed by the *registered code agency* or by a person who has the qualifications set out in Clause 3.4.3.2.(1)(b) or (c).

3.7.4.5. Authorized Persons

- (1) Persons who have the qualifications set out in Clause 3.4.3.2.(1)(a), (b) or (c) are prescribed for the purposes of subsection 15.17(1) of the Act.
- (2) The certificate of authorization referred to in subsection 15.17(2) of the Act shall, in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d), be signed by a representative of the *registered code agency* who has the qualifications set out in Clause 3.4.3.2.(1)(a) and shall contain the following information:
 - (a) the name of the *registered code agency* and any identifying number issued by the *director* to the *registered code agency*,
 - (b) the title, business address and business telephone number of a representative of the *registered code agency* who may be contacted to answer questions about the certificate and the authorization to which it relates,
 - (c) the name of the authorized person and any identifying number issued by the *director* to the authorized person in respect of that person's qualifications,
 - (d) the scope of the powers that may be exercised and the functions that may be performed by the authorized person,
 - (e) the date of issuance of the certificate.
- (3) Every person described in Sentence (1) shall carry his or her certificate of authorization when performing duties and shall produce the certificate for inspection upon request.

3.7.4.6. Prohibition

- (1) A *registered code agency* shall not dismiss, suspend, demote, discipline, harass or otherwise disadvantage an employee, or deny an employee a benefit of employment, by reason that,
 - (a) the employee, acting in good faith and on the basis of reasonable belief, has disclosed to the *director* that the *registered code agency* or any other person has contravened or intends to contravene a provision of the Act or this Code or a predecessor of this Code,
 - (b) the employee, acting in good faith and on the basis of reasonable belief, has refused or stated an intention of refusing to do anything that is a contravention of a provision of the Act or this Code or a predecessor of this Code,
 - (c) the employee, acting in good faith and on the basis of reasonable belief, has done or stated an intention of doing anything that is required to be done in order that a provision of the Act or this Code or a predecessor of this Code not be contravened, or
 - (d) the *registered code agency* believes that the employee will do anything referred to in Clause (a), (b) or (c).

(2) Nothing in this Section impairs any right of an employee either at law or under an employment contract or collective agreement.

(3) In this Article,

“employee” includes an independent contractor and “employer” includes the person who retains an employee who is an independent contractor.

3.7.4.7. Information and Records

(1) The *registered code agency* shall maintain records of all plans review and inspection activity, of all certificates and orders and of any other activities taken in carrying out functions under an appointment in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d).

(2) Any information collected by a *registered code agency* in the course of the exercise of powers and the performance of duties under the Act may be used only for the purpose of performing functions under an appointment under subsection 4.1(2) of the Act and may be disclosed only,

(a) to a *principal authority* pursuant to an agreement under subsection 4.1(1) of the Act,

(b) to a *principal authority* to aid the enforcement in any manner of the Act, or

(c) where required or permitted under the Act, this Code, other applicable legislation or an order of a court.

(3) A *registered code agency* shall ensure that any agreement under which the *registered code agency* engages a person to assist the *registered code agency* to perform functions under an appointment includes a provision that requires the person to comply with Sentences (1) and (2).

3.7.5. Termination of Appointment of a Registered Code Agency

3.7.5.1. Termination of an Appointment Made under Subsection 4.1(2) of the Act

(1) A *principal authority* may, in accordance with the terms of an agreement under subsection 4.1(1) of the Act, terminate the appointment of a *registered code agency* before the appointment expires under section 15.19 of the Act.

3.7.6. Information to be Provided

3.7.6.1. Information to be Provided by a Principal Authority to the Director

(1) If a *principal authority* that has appointed a *registered code agency* terminates the appointment before the appointment expires under section 15.19 of the Act, the *principal authority* shall, as soon as possible after the termination, give the *director* notice of the termination and such other information concerning the circumstances of the termination and as may be required by the *director*.

(2) If a *chief building official* has issued an order under subsection 15.21(1) of the Act, the *principal authority* shall as soon as possible after the order is issued give the *director* a copy of the order and such other information concerning the circumstances of the order and as may be required by the *director*.

3.7.6.2. Information to be Provided by a Registered Code Agency to the Director

(1) A *registered code agency* that becomes or expects to become unable to carry out the functions for which the *registered code agency* was appointed shall as soon as possible give notice to the *director* of this situation.

3.7.6.3. Information to be Provided by a Registered Code Agency to the Chief Building Official

- (1) A *registered code agency* shall notify the *chief building official* if the *registered code agency* becomes or expects to become unable to carry out the functions for which the *registered code agency* was appointed.
- (2) A *registered code agency* shall give copies of the following records to the *chief building official*,
 - (a) all orders issued by the *registered code agency* under subsections 12(2), 13(1) and 13(6) of the Act,
 - (b) all written records prepared by the *registered code agency* under Sentences 3.7.4.2.(3), (4) and (5),
 - (c) all *final certificates* that are issued by the *registered code agency*,
 - (d) records described in Section 2.1. relating to the use of an *alternative solution*, and
 - (e) any records of information, copies of documents or things, tests, samples or photographs produced, removed, required, taken or ordered to be taken under subsection 18(1) of the Act.
- (3) The documents referred to in Sentence (2) shall be given to the *chief building official*,
 - (a) within the time period specified in any agreement under Article 3.7.1.1. or appointment under Article 3.7.1.2. in respect of which the documents relate, whichever time period ends earlier,
 - (b) within 15 days after the expiry or termination of the appointment of the *registered code agency* in respect of which the documents relate, if there is no time period specified in the agreement or appointment referred to in Clause (a), or
 - (c) if the *chief building official* has given notice to the *registered code agency* that he or she requires the documents before the time set out in Clause (a) or (b), within 2 days after the request for documents.
- (4) The requirements of Sentence (2) apply even if the *registered code agency* is no longer registered under Sentence 3.4.3.2.(1).
- (5) If a *registered code agency* in the course of carrying out functions under an appointment has reason to believe that a *building* described in Sentence (7) is unsafe within the meaning of subsection 15.9(2) or (3) of the Act, the *registered code agency* shall as soon as possible give notice to the *chief building official* of,
 - (a) the location of the *building*, and
 - (b) the reason why the *registered code agency* has reason to believe that the *building* is unsafe.
- (6) A *registered code agency* that has given a notice to the *chief building official* under Sentence (5) shall give the *chief building official* such other information about the unsafe condition as the *chief building official* may require.
- (7) Sentence (5) applies to,
 - (a) a *building* in respect of which the *registered code agency* has been appointed to perform functions, and
 - (b) a *building* that has been adversely affected by the *construction* of a *building* referred to in Clause (a).
- (8) For the purposes of Sentence (3), a time period referred to in Clause (3)(a), (b) or (c),
 - (a) does not start until the day after the day on which the obligation to provide the documents arises, and
 - (b) does not include Saturdays, holidays and all other days on which the offices of the *principal authority* are not open for the transaction of business with the public.

3.7.7. Referral of Stop Work Order

3.7.7.1. Referral

- (1) A *registered code agency* shall refer a matter under subsection 14(5) of the Act to the *chief building official* by giving the *chief building official*, as soon as possible,
- (a) a report that contains the following information:
- (i) a copy of the order made under section 12 or 13 of the Act that was not complied with and of the order under section 14 of the Act,
 - (ii) the persons on whom the orders were served and the date and manner of service,
 - (iii) a statement that the orders have not been complied with, and
 - (iv) the efforts made by the *registered code agency* to achieve compliance with the orders by the persons responsible for compliance, and
- (b) such other information as the *chief building official* may require in respect of the matter that has been referred.
- (2) The report under Clause (1)(a) shall be signed, in accordance with the quality management plan described in Clause 3.4.3.2.(1)(d), by the *registered code agency* or, if the *registered code agency* is a corporation or partnership, by a person who has the qualifications set out in Clause 3.4.3.2.(1)(a).

e1 **Index⁽¹⁾**

(1) Items contained in the Index are referenced to the numbering system used in this Code instead of to page numbers.

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